nexius

Enabling smarter connections

May 12, 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: 435 Mill Street, Southington, CT 06489
Lat: 41,604579, Long: -72.894330
Dish Site #: BOBDL00004B

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 and associated compound at 435 Mill Street in the Town of Southington (the "Southington Facility"). The tower owner is the Town of Southington (the "Town"). DISH and the Town have agreed to share the use of the Southington Facility as detailed below. The Town has authorized the Applicant to prepare and file this tower share request for the DISH's use of the Southington Facility (Attachment 1).

The Southington Facility

The Southington Facility consists of an approximately one-hundred and twenty (120) foot lattice tower (the "Tower") and associated equipment. The Tower and compound are located on an approximately 2.8-acre parcel owned by the Town of Southington. The Town of Southington Planning and Zoning Commission granted the Southington Water Department's site plan and special permit approval for the Tower by letters dated August 27, 2018 and August 28, 2018 (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 sector frame mount system at an approximately 74-foot centerline height on the Tower. (Please see Construction Drawings dated April 25th, 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 Southington 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 Nexius dated April 26, 2022 (Attachment 5) and the Mount Analysis prepared by Nexius dated April 26, 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 Southington 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 53.20% of FCC Standards for General

Public/Uncontrolled Maximum Permissible Exposure (MPE). Please see the cumulative assessment of RF power density prepared by EBI dated March 8, 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 the Tower owner negotiated a lease agreement to share use of the Southington 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, (Town of Southington), to the chief elected official of the Town of Southington and the Southington Planning and Community Development Office by a tracked private delivery service. Proof of mailing is included at Attachment 8.

Conclusion

The proposed shared use of the Southington 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 Southington 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
Victoria Triano, Town Council Chair, Town of Southington;
Mark J. Sciota, Town Manager, Town of Southington
Maryellen Edwards, Director of Planning and Community Development, Town of Southington
DISH- *Via Electronic Mail*
Douglas R. Arndt, Superintendent, Southington Water Department darndt@southington.org- *Via Electronic Mail*

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

April 22, 2022

Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: Letter of Authorization
Dish Wireless, LLC
Installation of Wireless Telecommunications Facility
435 Mill Street, Southington, CT 06489

To Whom It May Concern:

Dish Wireless, LLC, is seeking to install an antenna facility at the above-referenced location. As owner of the tower, permission is hereby granted to Dish Wireless and/or its agents (including, but not limited to: Nexius) to apply for and obtain all necessary permits and approvals from the Connecticut Siting Council and/or Town of Southington.

Any fees or charges associated with these applications and any conditions placed upon Dish Wireless as Applicant shall be the responsibility of Dish Wireless and its subsidiaries and agents.

Sincerely

By: _____

Name: Louis J. Martocchio
Title: It's authorized agent

Attachment 2

435 MILL ST

Location	435 MILL ST	**Mblu**	109/ / 120/ /
Acct#	14081	**Owner**	SOUTHINGTON TOWN OF
Assessment	$790,370	**Appraisal**	$1,129,100
PID	10843	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$840,990	$288,110	$1,129,100

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$588,690	$201,680	$790,370

Owner of Record

Owner	SOUTHINGTON TOWN OF	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	75 MAIN ST SOUTHINGTON, CT 06489-2504	**Book & Page**	0087/0075
		Sale Date	09/30/1938
		Instrument	25

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
SOUTHINGTON TOWN OF	$0		0087/0075	25	09/30/1938

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Building Percent Good:

Building Attributes	
Field	**Description**
Style	Vacant w/OB

Model	
Grade:	
Stories	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Full Bthrms:	
Half Baths:	
Extra Fixtures	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Total Kitchens	
Fireplaces	
Whirlpool Tubs	
Fin Bsmt Area	
Fin Bsmt Quality	
Bsmt Garages	
.	
Bsmt Type	
Attic Type	
Cath Ceiling	

Building Photo

109 120 05/21/2015

(http://images.vgsi.com/photos2/SouthingtonCTPhotos//\00\04\35\89.JPG)

Building Layout

(http://images.vgsi.com/photos2/SouthingtonCTPhotos//Sketches/10843_1

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

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Land Line Valuation

Land Use | **Land Line Valuation**

Use Code	903V	**Size (Acres)**	2.8
Description	Municipality Lnd	**Depth**	
Zone	R-20/25		
Alt Land Appr	No		
Category			

Outbuildings

Outbuildings					Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Bldg #**
FN1	Fence - Chain			4848.00 L.F.	1
PCS	PreCast Shed/Bldg			80.00 S.F.	1
PCS	PreCast Shed/Bldg			80.00 S.F.	1
CTR	Cell Recievers			4.00 Units	1
TNK5	Elevated Tank			2000000.00 Gals	1
SHD1	Shed	MS	Masonry	160.00 S.F.	1
GEN	Generator		Generator	1.00 Units	1
PAV1	Paving	CN	Concrete	160.00 S.F.	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$839,570	$288,110	$1,127,680
2019	$217,730	$109,610	$327,340
2018	$217,730	$87,980	$305,710
2017	$217,730	$87,980	$305,710
2016	$217,730	$87,980	$305,710

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$587,700	$201,680	$789,380
2019	$152,410	$76,730	$229,140
2018	$152,410	$61,590	$214,000
2017	$152,410	$61,590	$214,000
2016	$152,410	$61,590	$214,000

Attachment 3

PLANNING AND ZONING DEPARTMENT

JOHN WEICHSEL MUNICIPAL CENTER – 196 NORTH MAIN STREET
SOUTHINGTON, CONNECTICUT 06489

Phone: (860)276-6248 / Fax: (860)628-3511

August 27, 2018

Southington Water Department
605 West Queen Street
PO Box 111
Southington, CT 06489

RE: Site plan application – 435 and 471 (rear) Mill Street (SPR #1760)

Dear Sir:

Please be advised that on August 21, 2018, the Southington Planning and Zoning Commission voted to approve your site plan application to construct a new 65 ft tall water storage tank and a 120' tall communications tower. The Commission also granted a waiver of the communications tower fall radius.

Please submit six sets of revised plans addressing Engineering comments prior to bidding. Building and zoning permits and a preconstruction meeting will also be required. Please note that this approval is good for a period of five (5) years, which will expire on August 21, 2023. You can request a five year extension prior to the expiration date if the work has not been completed.

Respectfully,

Robert A. Phillips, AICP
Director of Planning and Community Development

cc: Engineering Dept.
Building Dept.
Assessor's Dept.

PLANNING AND ZONING DEPARTMENT

JOHN WEICHSEL MUNICIPAL CENTER – 196 NORTH MAIN STREET
SOUTHINGTON, CONNECTICUT 06489

Phone: (860)276-6248 / Fax: (860)628-3511

August 28, 2018

Southington Water Department
605 West Queen Street
PO Box 111
Southington, CT 06489

RE: Special Permit Approval – 435 and 471 (rear) Mill Street (SPU #605)

Dear Sir:

On August 21, 2018, the Planning and Zoning Commission voted to approve your Special Permit Application to construct a new 65-ft water storage tank and a 120-ft tall communications tower on properties located at 435 and 471 (rear) Mill Street.

The special permit use becomes effective upon the filing of the approved special permit use plan with the Town Planner's office and the filing **of this original approval letter in the office of the Town Clerk**, pursuant to Section 8-3d of the General Statutes of Connecticut. Such plan shall be certified by the Planning and Zoning Commission prior to filing. An approved special permit use not put into effect within one year becomes null and void. A single one year extension may be granted before the approval's first anniversary date (Section 8-03.3).

Respectfully,

Robert A. Phillips, AICP
Director of Planning and Community Development

cc: Town Engineer
Building Dept.
Town Assessor

I:\Planning and Zoning\PZC Meetings 2018\August 21\SPU 605 approval.doc

Attachment 4

DISH Wireless L.L.C. SITE ID:

BOBDL00004B

DISH Wireless L.L.C. SITE ADDRESS:

435 MILL ST
SOUTHINGTON, CT 06489

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 (3) PROPOSED SECTOR FRAMES (1 PER SECTOR)
- INSTALL (3) PROPOSED BACK-TO-BACK RRH MOUNTS (1 PER SECTOR)
- INSTALL (6) PROPOSED RRUS (2 PER SECTOR)
- INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP)
- INSTALL (1) PROPOSED HYBRID CABLE
- INSTALL PROPOSED JUMPERS

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

SITE INFORMATION

PROPERTY OWNER:	TOWN OF SOUTHINGTON
ADDRESS:	435 MILL STREET SOUTHINGTON, CT 06489
TOWER TYPE:	SELF-SUPPORT TOWER
COUNTY:	HARTFORD
LATITUDE (NAD 83):	41.604579
LONGITUDE (NAD 83):	-72.894330
ZONING JURISDICTION:	TOWN OF SOUTHINGTON
PARCEL NUMBER:	Map 109 Lot 120
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	V-B
POWER COMPANY:	EVERSOURCE CT ELECTRIC
TELEPHONE COMPANY:	UNKNOWN

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:	APRIL PARROTT (860) 327-2290
CONSTRUCTION MANAGER:	JAVIER SOTO (617) 839-6514
RF ENGINEER:	BOSSNER CHARLES (917) 567-9837

CONNECTICUT CODE COMPLIANCE

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

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

SITE PHOTO

DIRECTIONS

DIRECTIONS FROM BRADLEY INTERNATIONAL AIRPORT (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. CONTINUE TO FOLLOW CT-75.
4. MERGE ONTO I-91 S TOWARD HARTFORD.
5. MERGE ONTO I-84 W VIA EXIT 32A TOWARD WATERBURY.
6. TAKE THE CT-229/WEST ST EXIT, EXIT 31.
7. KEEP LEFT AT THE FORK IN THE RAMP.
8. TURN LEFT ONTO WEST ST/CT-229. CONTINUE TO FOLLOW WEST ST.
9. TURN LEFT ONTO MILL ST.
10. 10. 435 MILL ST, SOUTHINGTON, CT 06489-4701, 435 MILL ST IS ON THE LEFT

SHEET INDEX

UNDERGROUND SERVICE ALERT
UTILITY NOTIFICATION CENTER OF CALIFORNIA
(800) 642-2444
WWW.CALIFORNIA811.ORG

CALL 2-14 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:
MLB	MDC	MDC

RFDS REV #: REV 2 – 01/19/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	3/23/2022	FINAL CD
1	4/25/2022	PER REDLINES

A&E PROJECT NUMBER

BOBDL00004B

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00004B
435 MILL ST
SOUTHINGTON, CT 06489

SHEET TITLE

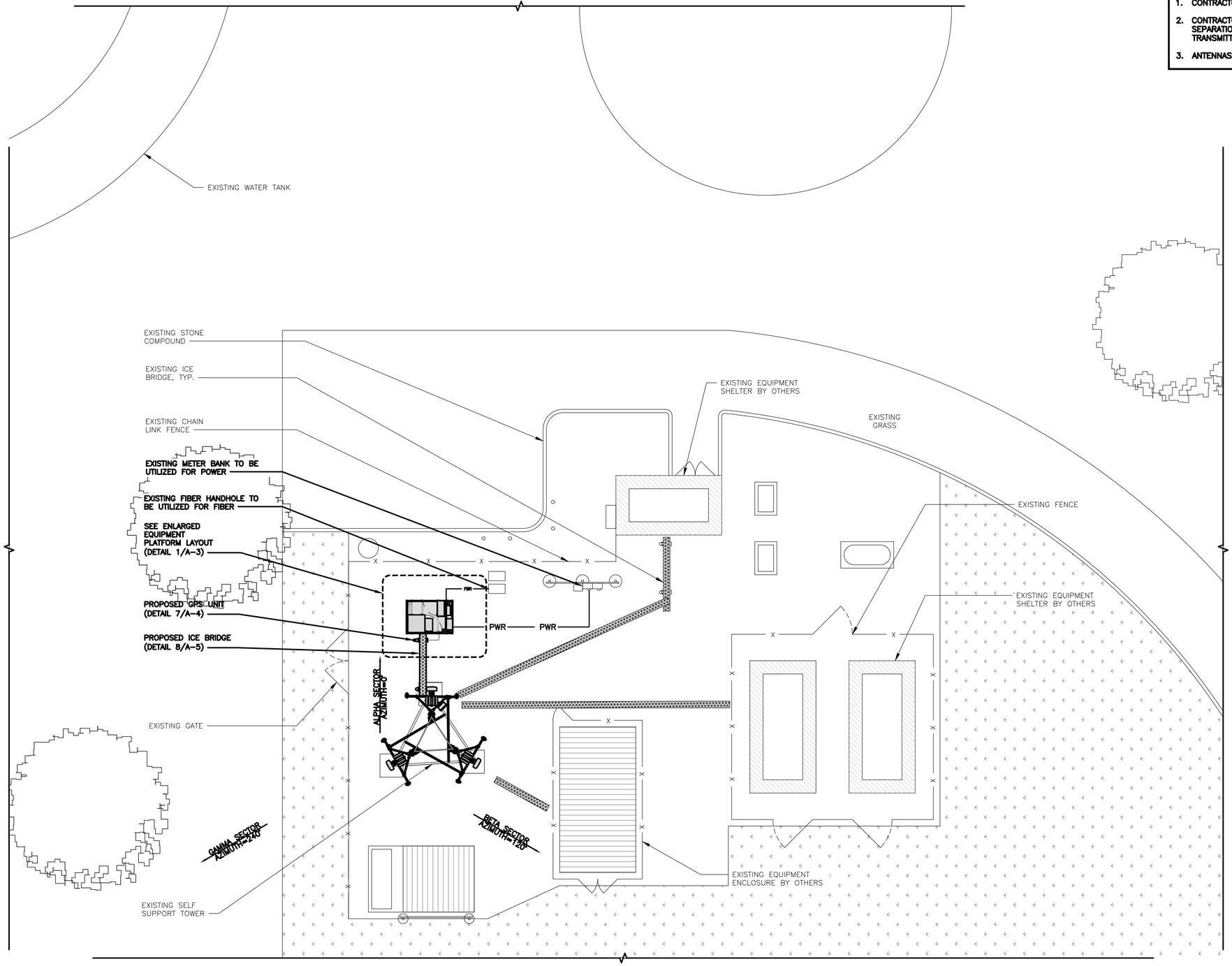
TITLE SHEET

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.



OVERALL SITE PLAN

16' 12' 8' 4' 0 16' 32'
1/16"=1'-0"

1

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:
MLB	MDC	MDC

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BOBDL00004B

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00004B
435 MILL ST
SOUTHINGTON, CT 06489

SHEET TITLE

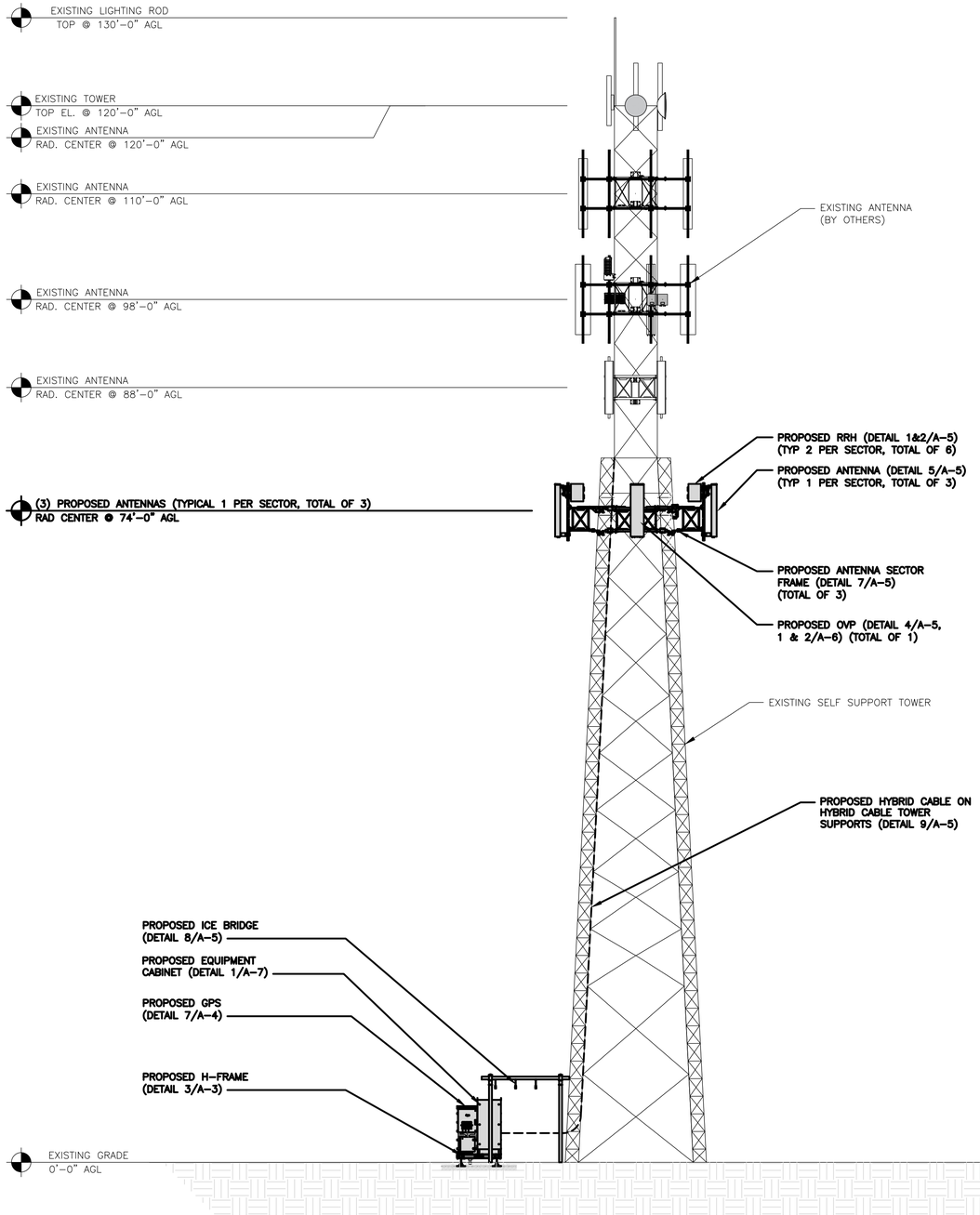
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

A-1

NOTES

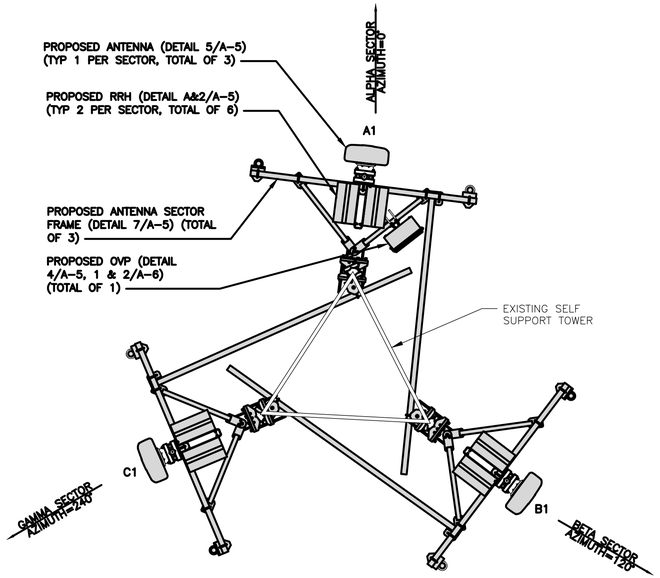
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



PROPOSED SOUTH 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	72.8" x 20.0"	0°	74'-0"	(1) HIGH-CAPACITY HYBRID CABLE CABLES UNLIMITED CU12PSM9P8100_8AWG (100' LONG)
BETA	B1	PROPOSED	JMA – MX08FR0665-21	n66 n70 n71	72.8" x 20.0"	120°	74'-0"	
GAMMA	C1	PROPOSED	JMA – MX08FR0665-21	n66 n70 n71	72.8" x 20.0"	240°	74'-0"	

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

NOTES

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

ANTENNA SCHEDULE

NO SCALE

3

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

nexius
2595 NORTH DALLAS PARKWAY
SUITE 300
FRISCO, TX 75034

STATE OF CONNECTICUT
JORDAN D. PHILLIPS
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DRAWN BY:	CHECKED BY:	APPROVED BY:
MLB	MDC	MDC

RFDS REV #: REV 2 – 01/19/2022

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A&E PROJECT NUMBER

BOBDL00004B

DISH Wireless L.L.C.
PROJECT INFORMATION

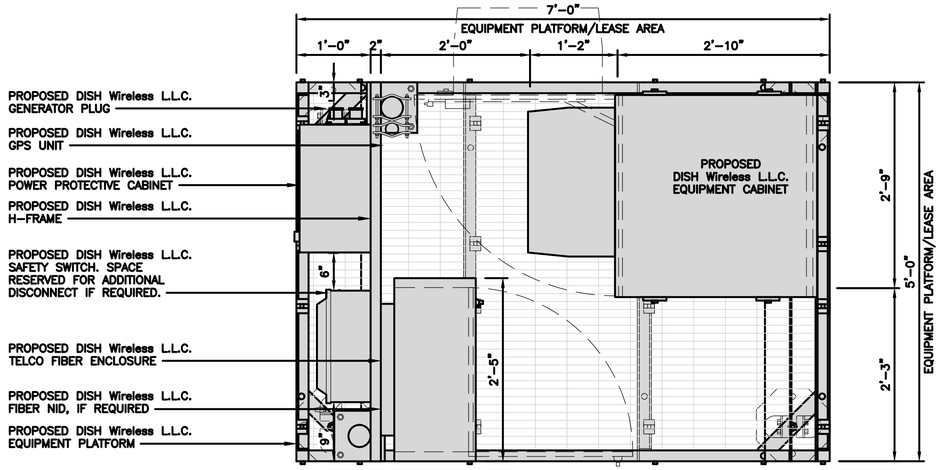
BOBDL00004B
435 MILL ST
SOUTHINGTON, CT 06489

SHEET TITLE

ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER

A-2



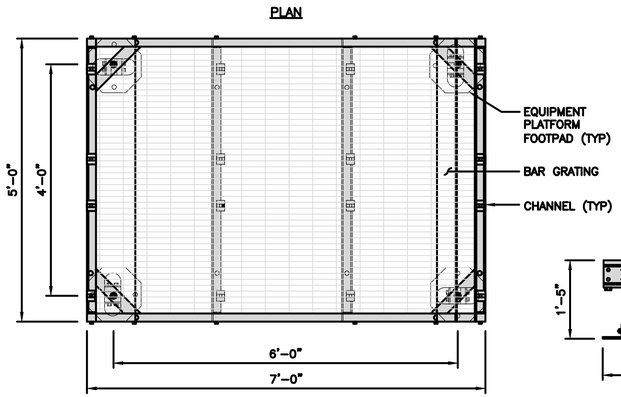
PLATFORM EQUIPMENT PLAN

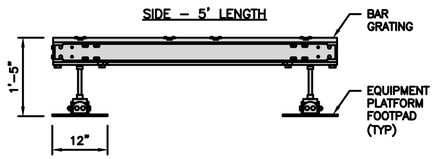
12" 9" 6" 3" 0 1' 2"
1"=1'-0"

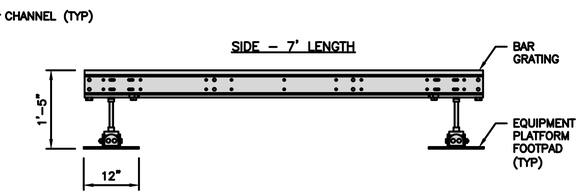
1

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"

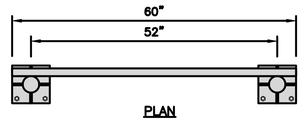


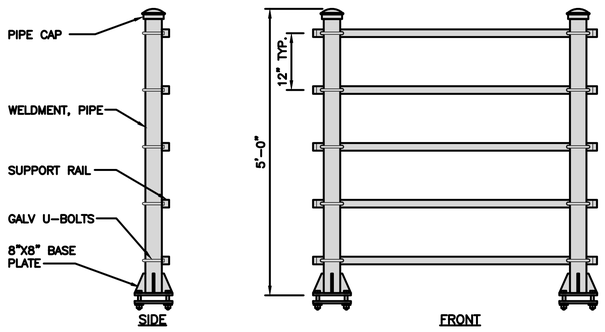




PLATFORM DETAIL | NO SCALE | 2

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

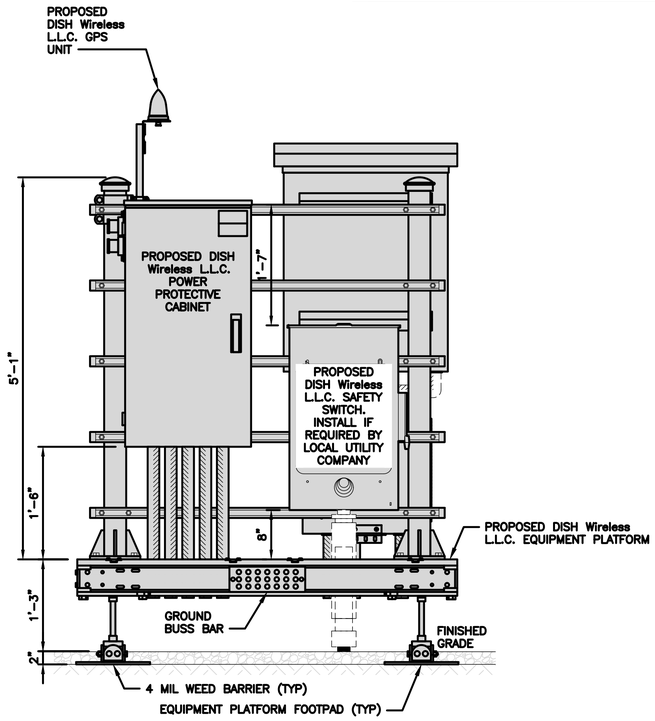




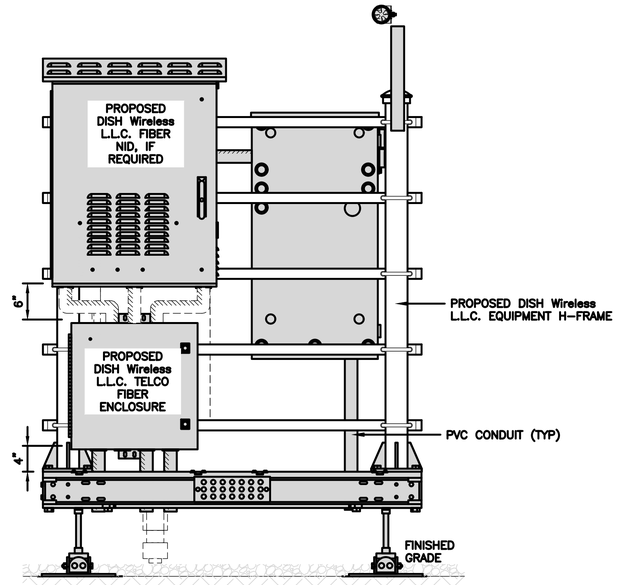
H-FRAME DETAIL | NO SCALE | 3

NOT USED | NO SCALE | 4

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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SUITE 300
FRISCO, TX 75034

STATE OF CONNECTICUT
JORDAN D. PHILLIPS
33483
LICENSED
PROFESSIONAL ENGINEER

DRAWN BY:	CHECKED BY:	APPROVED BY:
MLB	MDC	MDC

RFDS REV #: REV 2 – 01/19/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
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A&E PROJECT NUMBER

BOBDL00004B

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00004B
435 MILL ST
SOUTHINGTON, CT 06489

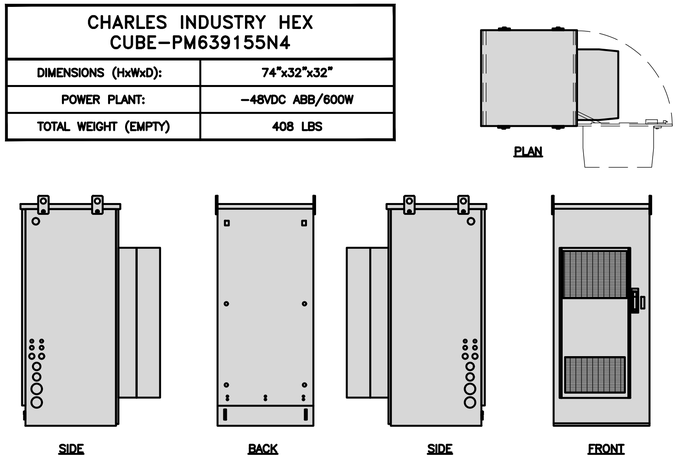
SHEET TITLE

EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER

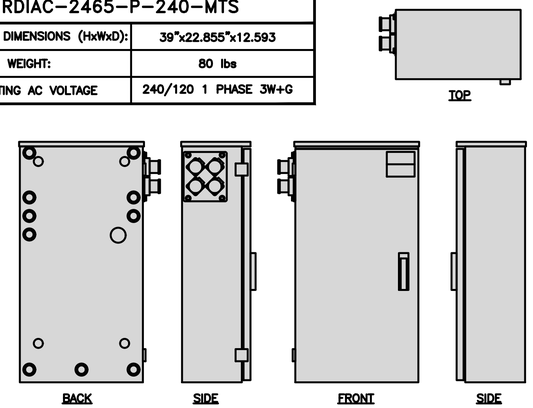
A-3

CHARLES INDUSTRY HEX CUBE–PM639155N4	
DIMENSIONS (HxWxD):	74"x32"x32"
POWER PLANT:	–48VDC ABB/600W
TOTAL WEIGHT (EMPTY)	408 LBS



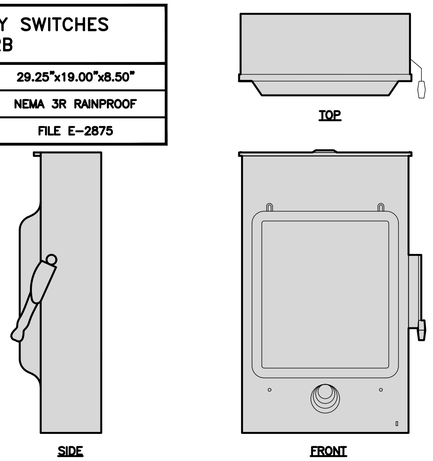
CABINET DETAIL | NO SCALE | 1

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



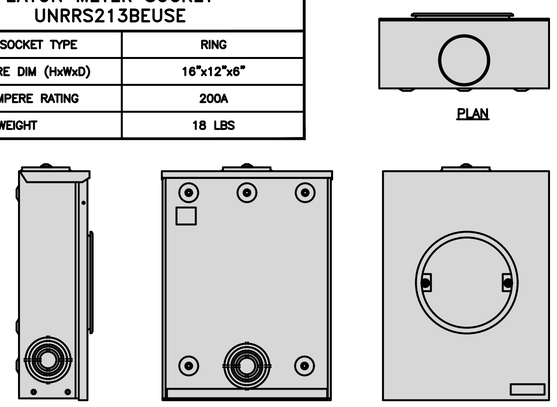
POWER PROTECTION CABINET (PPC) DETAIL | NO SCALE | 2

SQUARE D SAFETY SWITCHES D224NRB	
ENCLOSURE DIM (HxWxD)	29.25"x19.00"x8.50"
ENCLOSURE TYPE	NEMA 3R RAINPROOF
UL LISTED	FILE E–2875



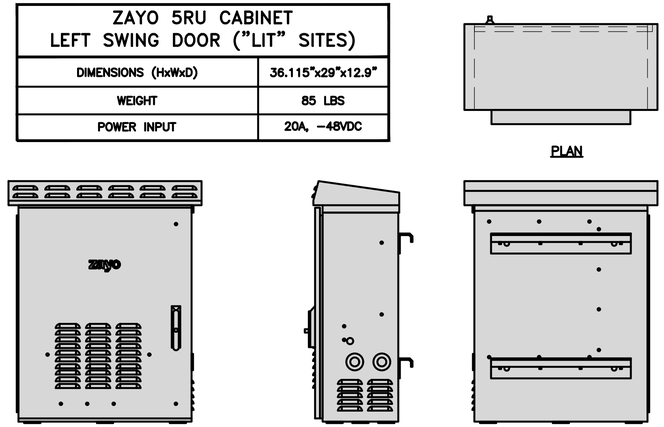
SAFETY SWITCH DETAIL | NO SCALE | 3

EATON METER SOCKET UNRRS213BEUSE	
METER SOCKET TYPE	RING
ENCLOSURE DIM (HxWxD)	16"x12"x6"
MAIN AMPERE RATING	200A
WEIGHT	18 LBS



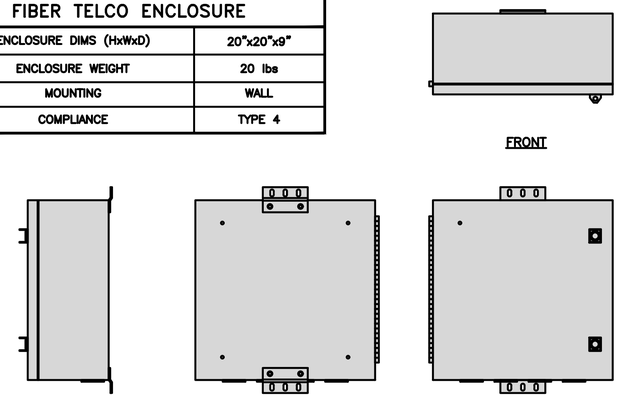
METER SOCKET DETAIL | NO SCALE | 4

ZAYO 5RU CABINET LEFT SWING DOOR ("LIT" SITES)	
DIMENSIONS (HxWxD)	36.115"x29"x12.9"
WEIGHT	85 LBS
POWER INPUT	20A, –48VDC



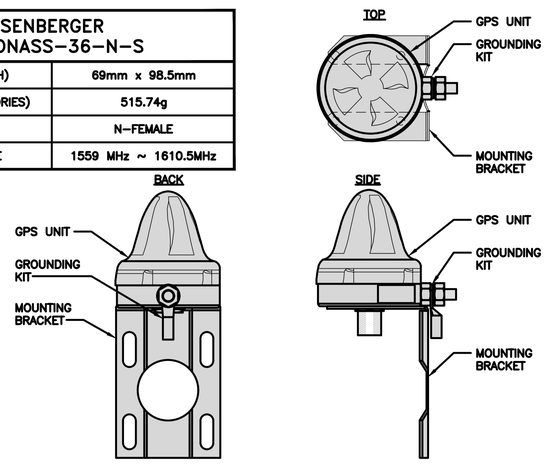
NETWORK INTERFACE UNIT DETAIL | NO SCALE | 5

CHARLES CFIT–PF2020DSH1 FIBER TELCO ENCLOSURE	
ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4

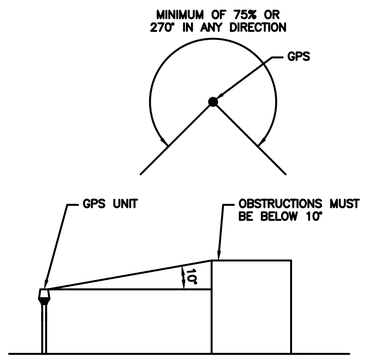


FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

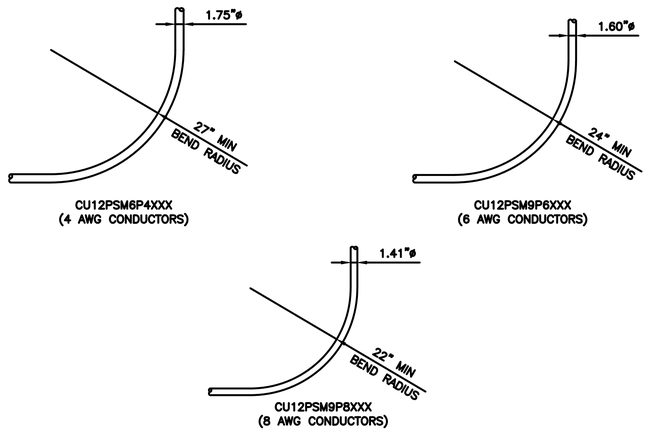
ROSENBERGER GPSGLONASS–36–N–S	
DIMENSION (DIA x H)	69mm x 98.5mm
WEIGHT (WITH ACCESSORIES)	515.74g
CONNECTOR	N–FEMALE
FREQUENCY RANGE	1559 MHz ~ 1610.5MHz



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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STATE OF CONNECTICUT
JORDAN D. PHILLIPS
33483
LICENSED PROFESSIONAL ENGINEER

DRAWN BY:	CHECKED BY:	APPROVED BY:
MLB	MDC	MDC

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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00004B
435 MILL ST
SOUTHINGTON, CT 06489

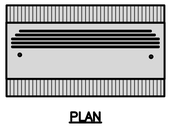
SHEET TITLE

EQUIPMENT DETAILS

SHEET NUMBER

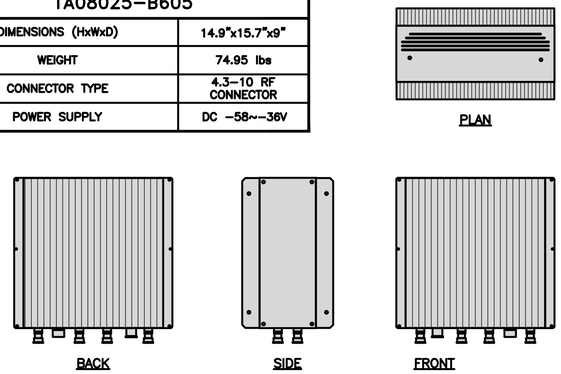
A-4

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



REMOTE RADIO HEAD DETAIL | NO SCALE | 1

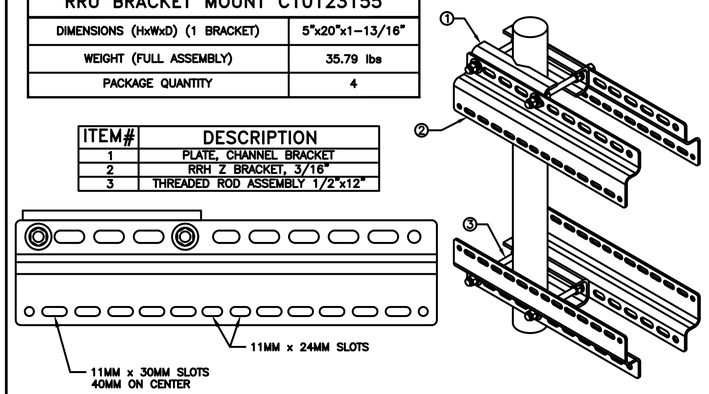
FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



REMOTE RADIO HEAD DETAIL | NO SCALE | 2

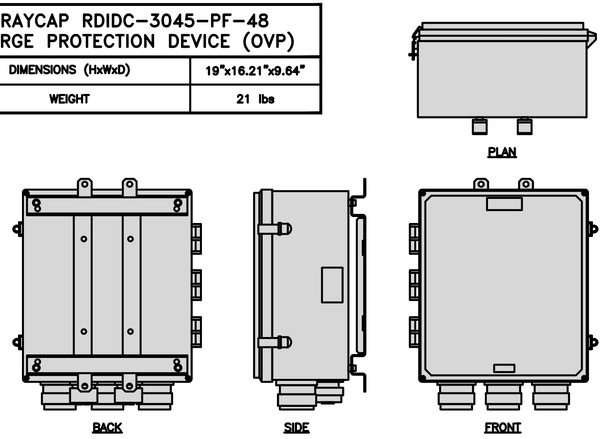
SABRE INDUSTRIES RRU BRACKET MOUNT C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

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



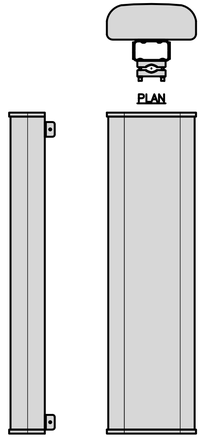
REMOTE RADIO MOUNT DETAIL | NO SCALE | 3

RAYCAP RDIDC-3045-PF-48 SURGE PROTECTION DEVICE (OVP)	
DIMENSIONS (HxWxD)	19"x16.21"x9.64"
WEIGHT	21 lbs



ANTENNA 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

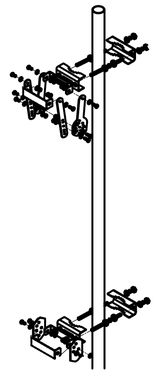


ANTENNA DETAIL | NO SCALE | 5

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

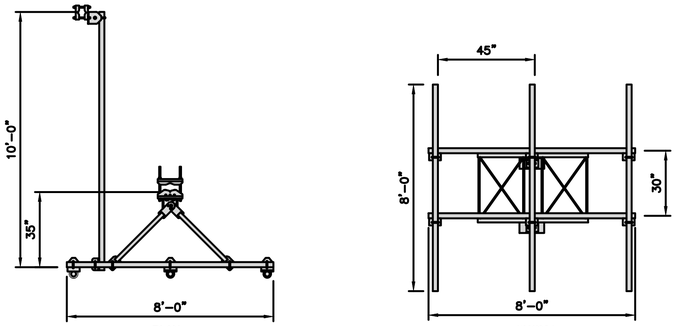
ANTENNA BRACKET NOT PART OF KIT



ANTENNA BRACKET DETAIL | NO SCALE | 6

COMMSCOPE V-FRAME MTC3975083	
FACE SIZE	8'-0"
WEIGHT	352.136 lbs

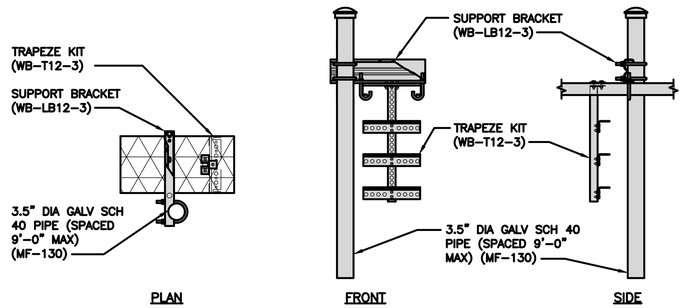
NOTE:
OR DISH Wireless L.L.C. APPROVED EQUIVALENT



ANTENNA FRAME DETAIL | NO SCALE | 7

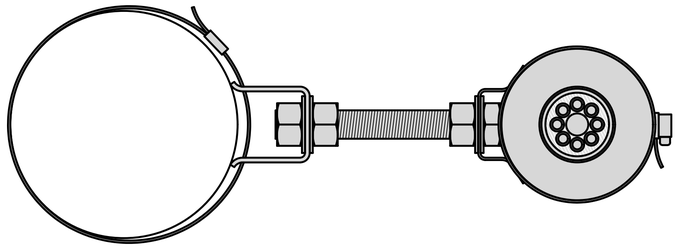
COMMSCOPE WB-K110-B WAVEGUIDE BRIDGE KIT	
DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

INCLUDED PRODUCTS:
- WB-T12-3 TRAPEZE KIT, 3 RUNGS
- WB-LB12-3 SUPPORT BRACKET
- MF-130 DIRECT BURIAL PIPE COLUMN, 13'-4"



ICE BRIDGE DETAIL | NO SCALE | 8

NOTE:
PROVIDED & INSTALLED BY CONTRACTOR



HYBRID CABLE TOWER LEG RUN | NO SCALE | 9

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5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

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DRAWN BY:	CHECKED BY:	APPROVED BY:
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DISH Wireless L.L.C.
PROJECT INFORMATION

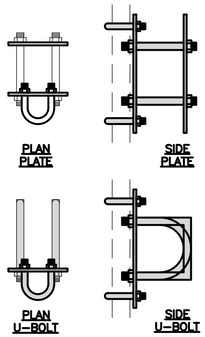
BOBDL00004B
435 MILL ST
SOUTHINGTON, CT 06489

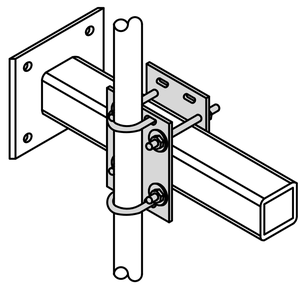
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

COMMSCOPE XP-2040 CROSSOVER PLATE	
DIMENSIONS (HxW)	10"x12"
WEIGHT	11 lbs

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

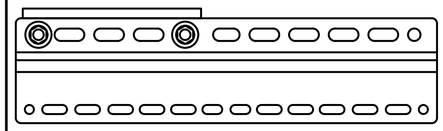




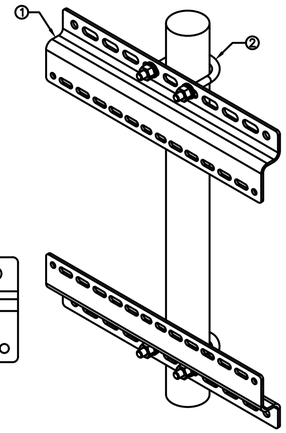
RRH/OVP MOUNT DETAIL | NO SCALE | 1

SABRE SINGLE Z-BRACKET C10123151	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	13.41 lbs
PACKAGE QUANTITY	2

#	DESCRIPTION
1	RRH Z BRACKET, 3/16"
2	U-BOLT ASSEMBLY, 1/2" FOR 2-7/8" PIPE



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



RRH MOUNT DETAIL | NO SCALE | 2

NOT USED | NO SCALE | 3

NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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PROJECT INFORMATION

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435 MILL ST
SOUTHINGTON, CT 06489

SHEET TITLE

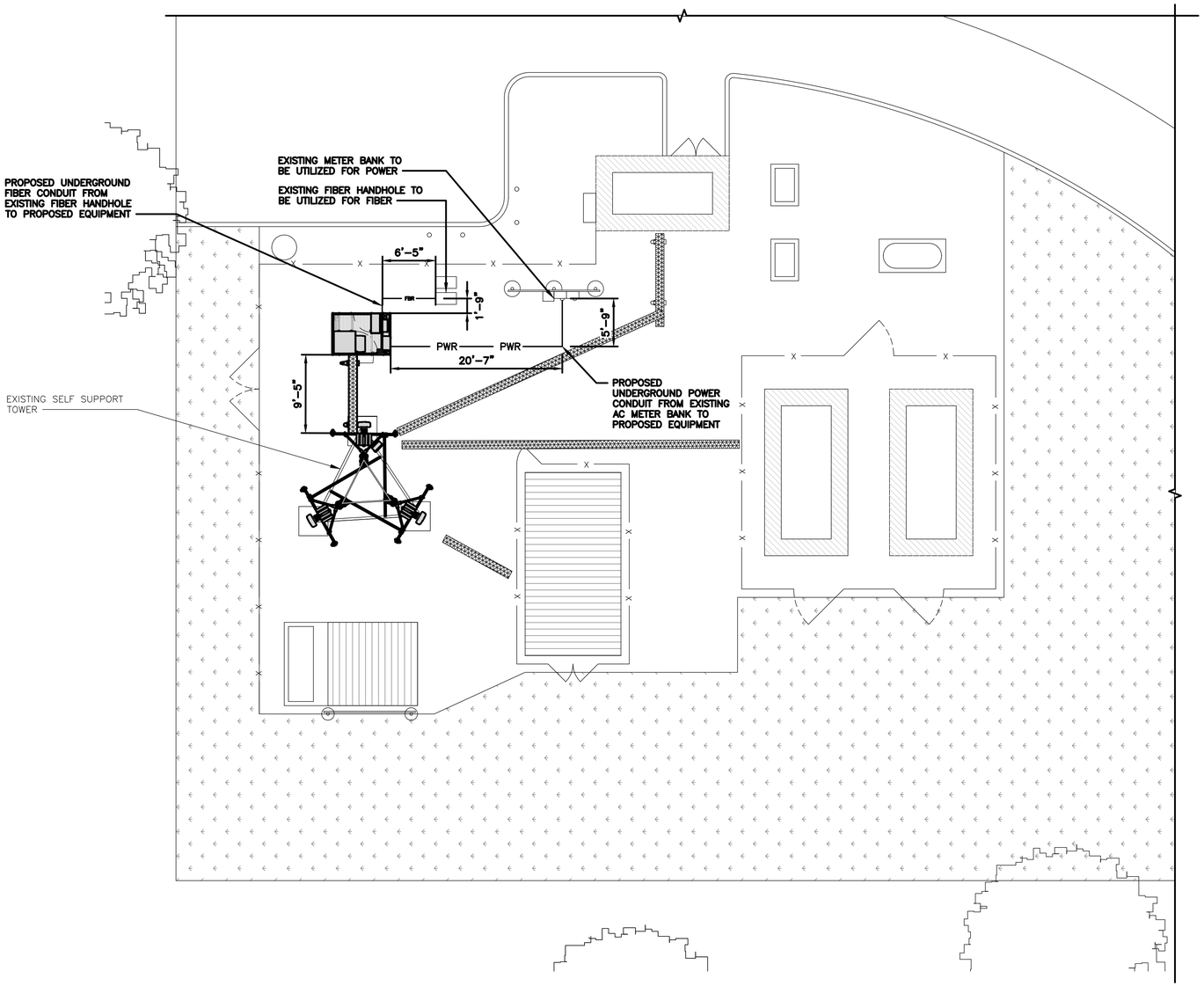
EQUIPMENT DETAILS

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.



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

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

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FRISCO, TX 75034

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

DocuSigned by: Mike Snyder 4/25/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
MLB	MDC	MDC

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SOUTHINGTON, CT 06489

SHEET TITLE

ELECTRICAL/FIBER ROUTE PLAN AND NOTES

SHEET NUMBER

E-1

UTILITY ROUTE PLAN

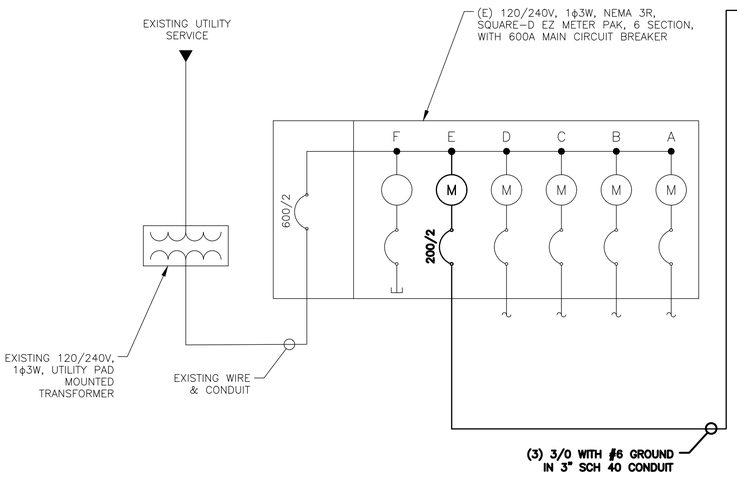
8' 4' 0 8' 16'
1/8"=1'-0"

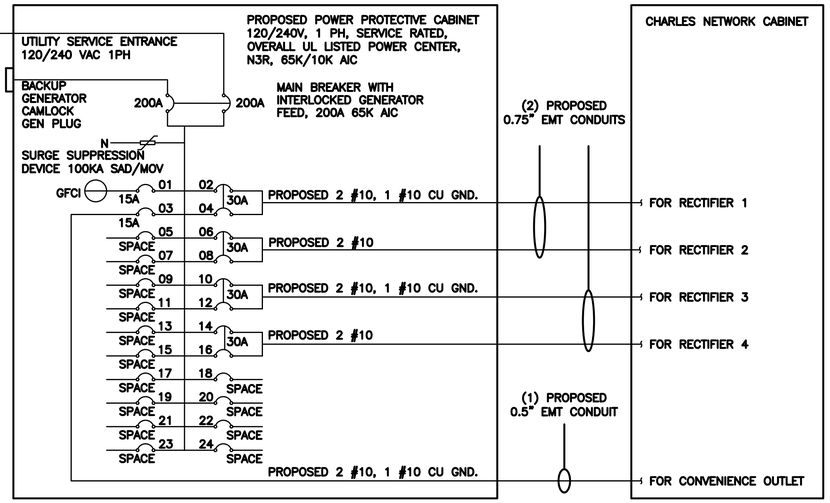
1

ELECTRICAL NOTES

NO SCALE

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

DocuSigned by: Mike Snyder 4/25/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
MLB	MDC	MDC

RFDS REV #: REV 2 - 01/19/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	3/23/2022	FINAL CD
1	4/25/2022	PER REDLINES

A&E PROJECT NUMBER

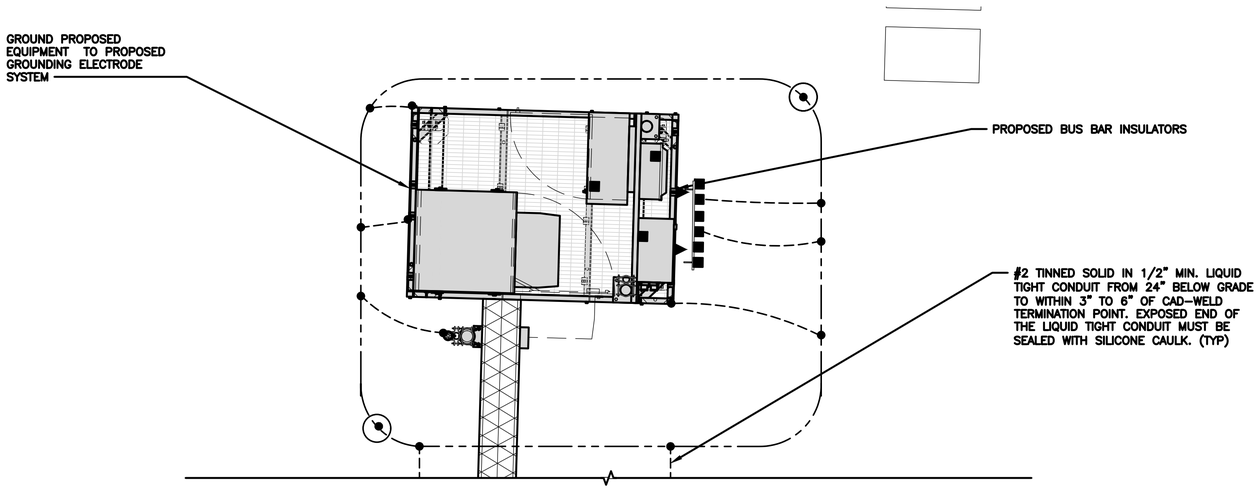
BOBDL00004B

DISH Wireless L.L.C.
PROJECT INFORMATION

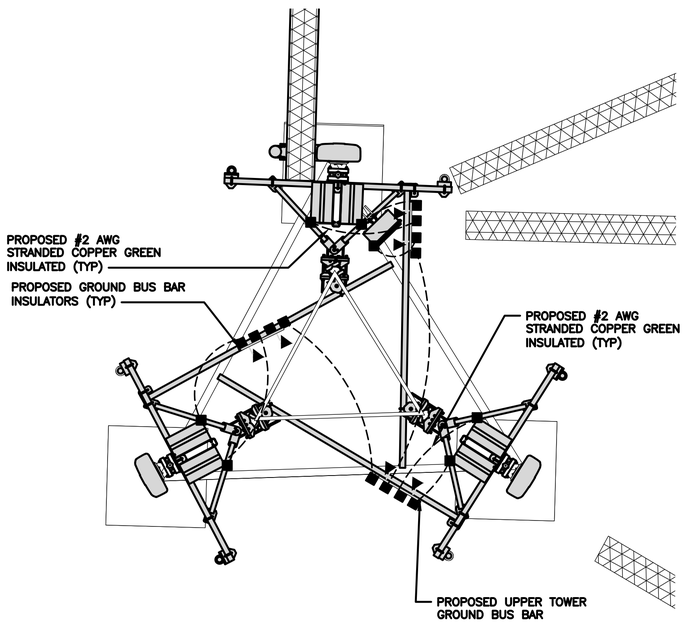
BOBDL00004B
435 MILL ST
SOUTHINGTON, CT 06489

SHEET TITLE
ELECTRICAL ONE-LINE & PANEL SCHEDULE

SHEET NUMBER
E-2



TYPICAL EQUIPMENT GROUNDING PLAN | NO SCALE | 1



TYPICAL ANTENNA GROUNDING PLAN | NO SCALE | 2

NOTES

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

- 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

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MICHAEL R. SHLADY
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DocuSigned by:
Mike Shlady
4/25/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
MLB	MDC	MDC

RFDS REV #: REV 2 – 01/19/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	3/23/2022	FINAL CD
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A&E PROJECT NUMBER

BOBDL00004B

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00004B
435 MILL ST
SOUTHINGTON, CT 06489

SHEET TITLE

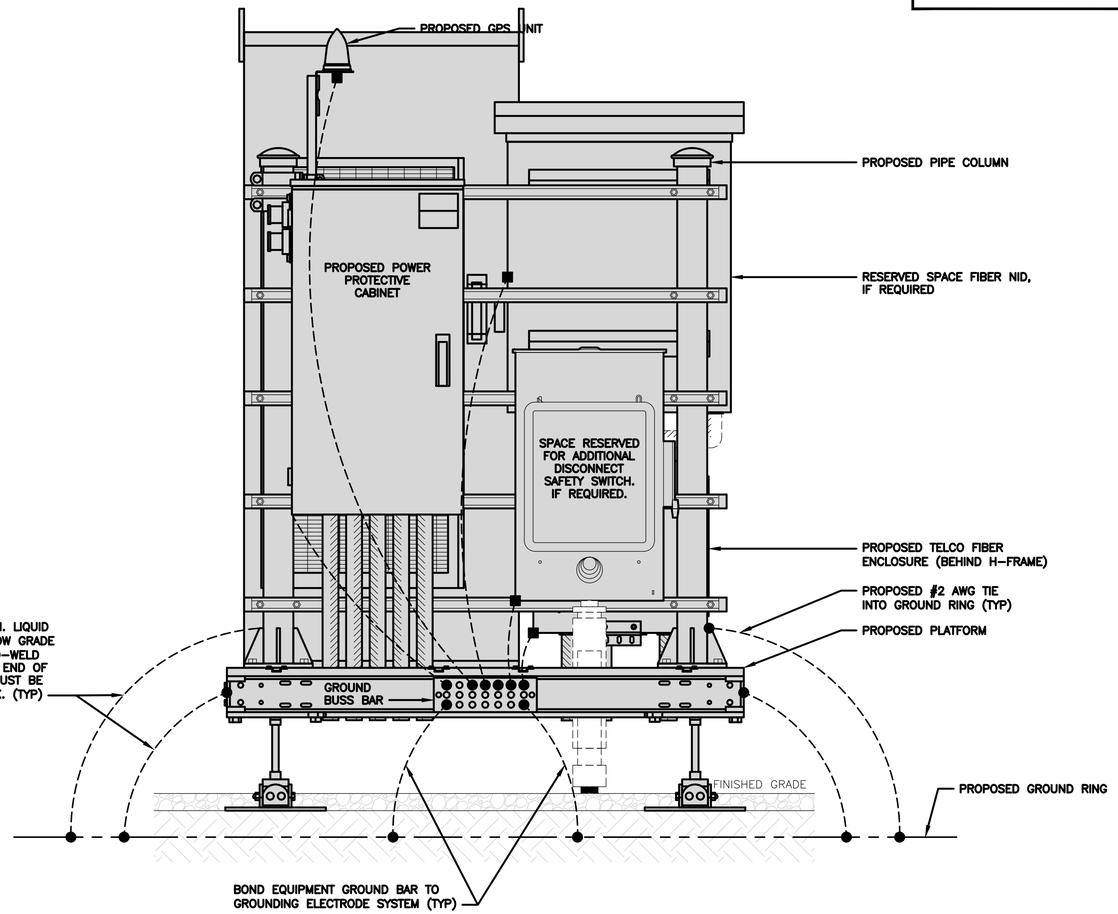
GROUNDING PLANS AND NOTES

SHEET NUMBER

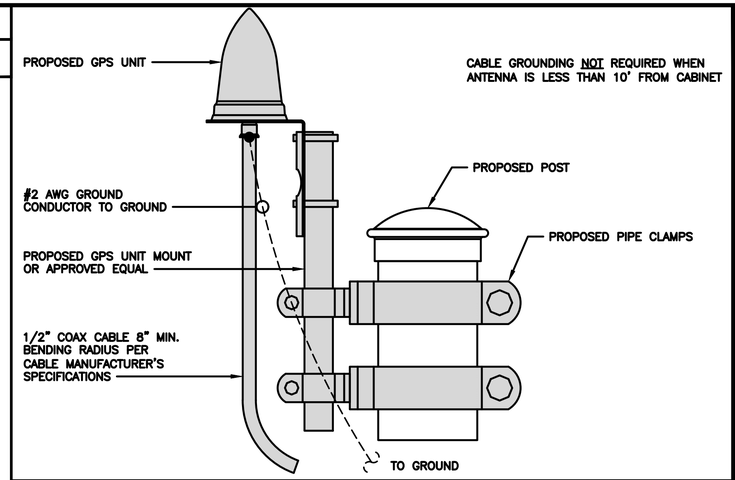
G-1

NOTES

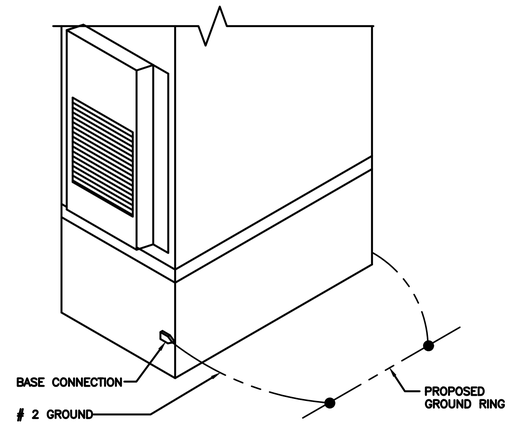
EQUIPMENT CABINET OMITTED FOR CLARITY



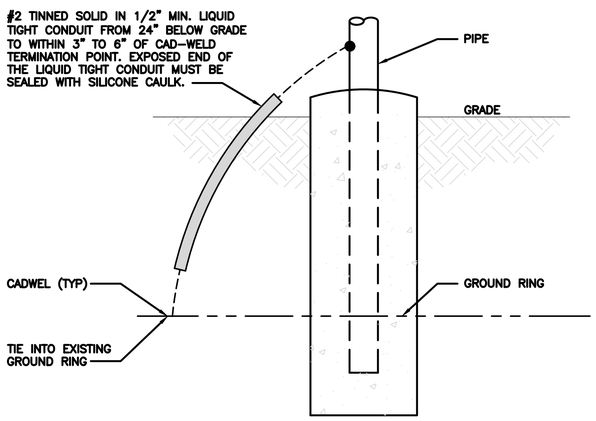
H-FRAME GROUNDING DETAIL | NO SCALE | 1



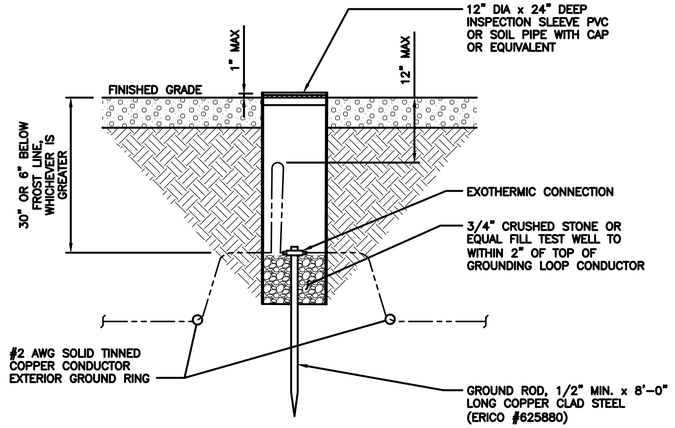
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



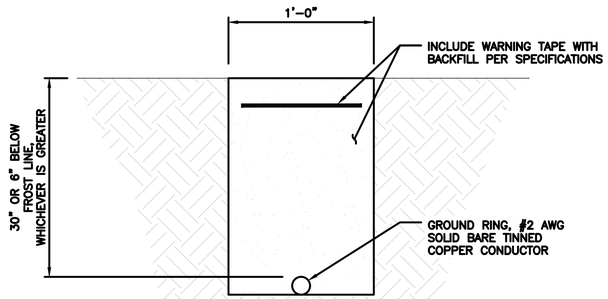
OUTDOOR CABINET GROUNDING | NO SCALE | 3



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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DocuSigned by:
Michael Snyder
4/25/2022

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MLB	MDC	MDC

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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00004B
435 MILL ST
SOUTHINGTON, CT 06489

SHEET TITLE

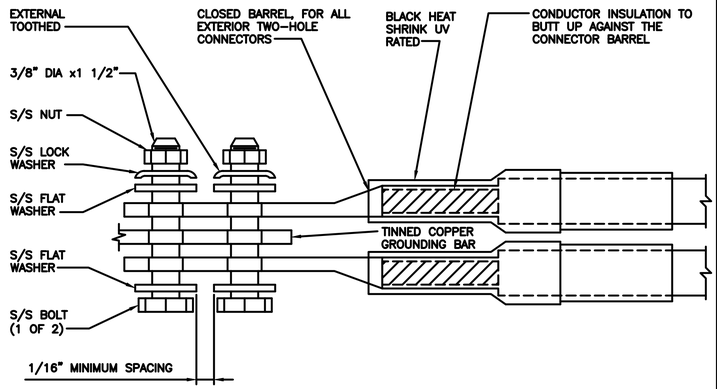
GROUNDING DETAILS

SHEET NUMBER

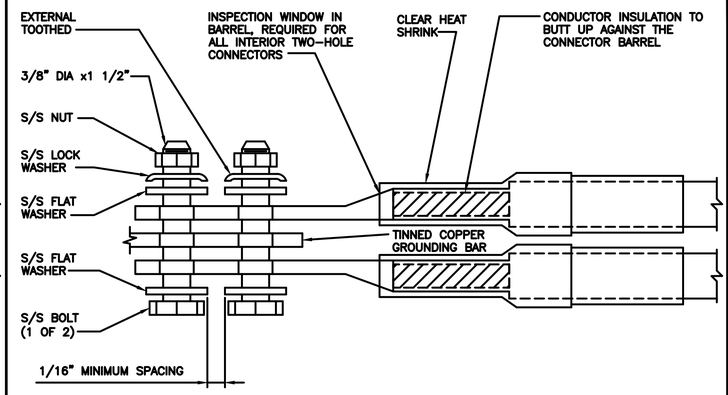
G-2

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).

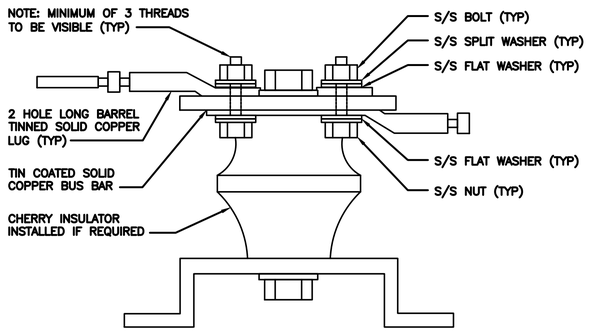
TYPICAL GROUNDING NOTES | NO SCALE | 1



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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4/25/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
MLB	MDC	MDC

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435 MILL ST
SOUTHINGTON, CT 06489

SHEET TITLE

GROUNDING DETAILS

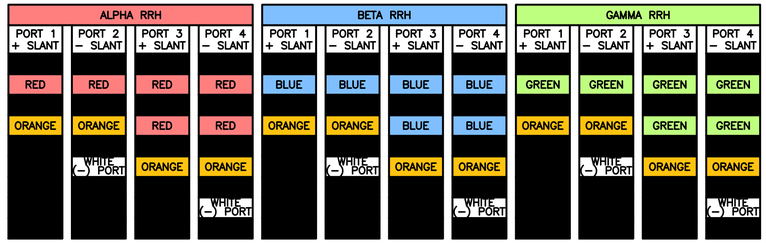
SHEET NUMBER

G-3

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

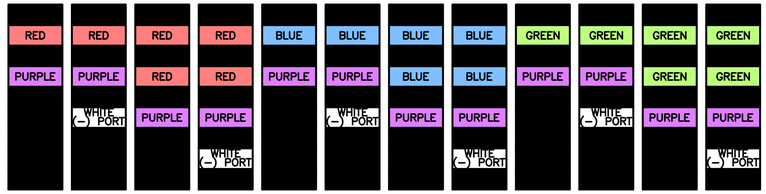
LOW–BAND RRH
(600 MHz N71 BASEBAND) +
(850 MHz N26 BAND) +
(700 MHz N29 BAND) – OPTIONAL PER MARKET

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)



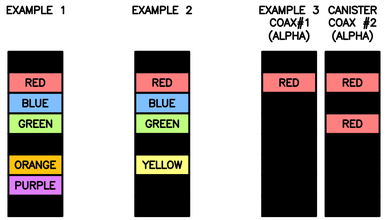
HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED ALONG WITH FREQUENCY BANDS.

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

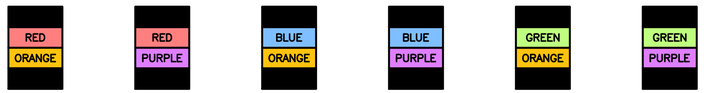
EXAMPLE 2 – HYBRID, OR DISCREET, SUPPORTS CBRS ONLY, ALL SECTORS.

EXAMPLE 3 – MAIN COAX WITH GROUND MOUNTED RRHs.



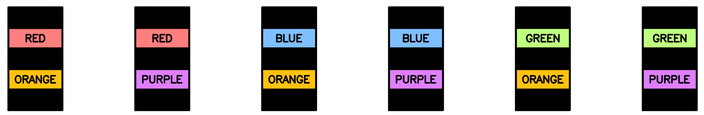
FIBER JUMPERS TO RRHs

LOW–BAND HHR FIBER CABLES HAVE SECTOR STRIPE ONLY.



POWER CABLES TO RRHs

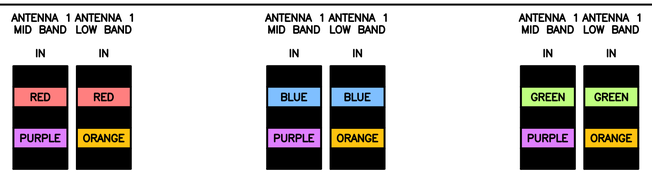
LOW–BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY



RET MOTORS AT ANTENNAS

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

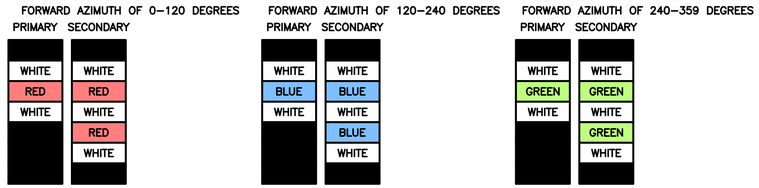
SEPARATE RET CABLES ARE USED WHEN ANTENNA PORTS PROVIDE INPUTS FOR BOTH LOW AND MID BANDS.



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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SOUTHINGTON, CT 06489

SHEET TITLE

RF
CABLE COLOR CODES

SHEET NUMBER

RF-1

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

BUSS BAR INSULATOR

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE

FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48–T8

SMOKE DETECTION (DC)

EMERGENCY LIGHTING (DC)

SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW LED–1–25A400/51K–SR4–120–PE–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.
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

nexius
2595 NORTH DALLAS PARKWAY
SUITE 300
FRISCO, TX 75034

DRAWN BY:	CHECKED BY:	APPROVED BY:
MLB	MDC	MDC

RFDS REV #: REV 2 – 01/19/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	3/23/2022	FINAL CD
1	4/25/2022	PER REDLINES

A&E PROJECT NUMBER

BOBDL00004B

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00004B
435 MILL ST
SOUTHINGTON, CT 06489

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.

5701 SOUTH SANTA FE DRIVE
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DRAWN BY:	CHECKED BY:	APPROVED BY:
MLB	MDC	MDC

RFDS REV #: REV 2 – 01/19/2022

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1	4/25/2022	PER REDLINES

A&E PROJECT NUMBER

BOBDL00004B

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00004B
435 MILL ST
SOUTHINGTON, CT 06489

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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SUITE 300
FRISCO, TX 75034

DRAWN BY:	CHECKED BY:	APPROVED BY:
MLB	MDC	MDC

RFDS REV #: REV 2 – 01/19/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	3/23/2022	FINAL CD
1	4/25/2022	PER REDLINES

A&E PROJECT NUMBER

BOBDL00004B

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00004B
435 MILL ST
SOUTHINGTON, CT 06489

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-3

GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

2. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.

4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.

7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.

8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.

11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.

13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.

14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.

15. APPROVED ANTIOXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.

17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

18. BOND ALL METALLIC OBJECTS WITHIN 6 ft OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.

19. GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.

20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).

21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). DO NOT ATTACH GROUNDING TO FIRE SPRINKLER SYSTEM PIPES.

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FRISCO, TX 75034

DRAWN BY:	CHECKED BY:	APPROVED BY:
MLB	MDC	MDC

RFDS REV #: REV 2 – 01/19/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	3/23/2022	FINAL CD
1	4/25/2022	PER REDLINES

A&E PROJECT NUMBER

BOBDL00004B

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00004B
435 MILL ST
SOUTHINGTON, CT 06489

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

Attachment 5

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SELF-SUPPORT TOWER STRUCTURAL ANALYSIS REPORT

dish wireless.

SITE ID: **BOBDL00004B**
Rev.1 - 04/26/2022
Tower Components : PASS (72.8%)
Tower Foundation: PASS (69.6%)

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STRUCTURAL ANALYSIS REPORT

Site Information				
Site ID:	BOBDL00004B			
Site Address:	435 Mill St, Southington, CT 06489			
Coordinates	**N. Lat.**	41.604700	**W. Lon.**	72.893900

Existing Tower Information	
Type:	Self-Support Tower
Manufacturer:	Valmont
Height:	120 ft
Base Width:	12 ft
Foundation Type:	Combined Foundation (Single Spread Footing w/ 3 Piers)

As requested, we have performed a structural analysis/evaluation of the above-mentioned tower structure subjected to proposed and existing loadings in order to assess the impact of the proposed loading changes. The information provided was evaluated to determine whether the existing tower structure can adequately support the proposed mount and equipment configuration. We have been provided with the documents as outlined below.

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

TABLE 1 - REFERENCED DOCUMENTS

Type	Preparer	Name	Date
CD	Nexius	BOBDL00004B_CD100_20220425_REV 1	4/25/2022
RF Design Sheet	Dish Wireless	RFDS-BOBDL00004B-Preliminary-20220119-v.2	1/19/2022
Site design Notes	Nexius	BOBDL00004B Site Design Photos and Notes	10/15/2021
Tower Equipment Photos	Nexius	BOBDL00004B Tower Equipment Photos and Notes	1/28/2022
Previous Structural Analysis	Tectonic	em-t-mobile-131-210222_filing_435-MILL-STREET-TANKS-SOUTHINGTON-CT11239A-Anchor	1/26/2021
Previous Structural Analysis	PJF	TS_VER-131-201005_filing_MillSt	9/4/2020

ANALYSIS CRITERIA:

This structural analysis has been performed in accordance with the **2018 Connecticut State Building Code/2015 IBC with Connecticut Amendments** as well as the **ANSI/TIA-222-G-05** "Structural Standards for Antenna Supporting Structures and Antennas".

The analysis design parameters considered in this analysis are presented in Table 2.

TABLE 2 – ANALYSIS / DESIGN PARAMETERS

Parameter	Value
Ultimate Wind Speed (3-Sec), V_{ult} =	**135 mph***
Nominal Wind Speed (3-sec), **V** =	**104.6 mph**
Basic Wind speed with Ice, V_i =	**50 mph**
Design Radial Ice Thickness, t_i =	**1.00 in**
Exposure Category	**B**
Risk Category (Structure Class)	**III**
Topographic Category	**I**
Seismic Parameter, S_1 =	**0.064**
Seismic Parameter, S_{DS} =	**0.197**

***AS REQUIRED BY JURISDICTION.**

LOADING INFORMATION:

The proposed and existing appurtenances/equipment loadings are shown below in Table 3.

If the existing/proposed appurtenances/equipment loadings listed below differ from the actual field conditions, we should be contacted immediately to review the discrepancies and evaluate their impact.

TABLE 3 - FINAL ANTENNA AND CABLE INFORMATION

Mount Center (ft.)	Carrier /Tenant	Number of Antenna	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
120.0±	Municipal	1	Tower Mounts	3ft Side Arm Mount	4 4	7/8 1/2
		2	Andrew	VHLP800-11 MW Dish		
		1	Commscope	DB404-B		
		1	Miscl	10' Dipole		
		3	Motorola	PTP 49400		
		2	RFI	BA4040-67-DIN		
110.0±	T-Mobile	3	Sitepro1	VFA12 Mount	6	6x12 Hybrid
		3	RFS	APXVAARR24_43-U-NA20 Antenna		
		3	Ericsson	AIR 32 B66A/B2A Antenna		
		3	Ericsson	AIR6449 B41 Antenna		
		3	Ericsson	RRUS 4449 B71+B85		
		3	Ericsson	RRUS 4415 B25		
		3	CommScope	SDX1926Q-43/E14F05P86 Diplexer		
98.0±	AT&T	1	Raycap	DC6-48-60-0-8C-EV	6 6 2	1-5/8 7/16 DC ½ Fiber
		2	Raycap	DC6-48-60-18-8C-EV		
		3	Sitepro1	VFA12 Mount		
		2	CCI Antenna	OPA65R-BU8D		
		6	CCI Antenna	TPA65R-BU8D		
		3	Ericsson	RADIO 4415 B30		
		3	Ericsson	RRUS 4449 B5/B12		
		3	Ericsson	RRUS 4478 B14		
		3	Ericsson	RRUS 8843 B2/B66A		
88.0±	Verizon Wireless	3	Commscope	NHH-65B-R2B Antenna	2	6x12 Hybrid
		3	Commscope	NHHSS-65B-R2B Antenna		
		3	Commscope	BSAMNT-SBS-1-2 Mount		
		3	Samsung	B2/B66A RRH-BR049		
		3	Samsung	B5/B13 RRH-BR04C		
		3	Samsung	CBRS RRH		
		1	Raycap	RVZDC-6627-PF-48		
		3	Sitepro1	VFA12-HD Mount		
74.0±	**Dish Wireless**	**3**	**JMA**	**MX08FR0665-21 Antenna**	**1**	**High-Cap. Hybrid Cable**
		3	**FUJITSU**	**TA08025-B605 RRU**		
		3	**FUJITSU**	**TA08025-B604 RRU**		
		1	**RAYCAP**	**RDIDC-9181-PF-48**		
		3	**COMMSCOPE**	**MTC3975083 V-Frame**		

***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:

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the self-support tower and calculate member stresses for various loading cases. The summary of results from tower structural analysis are shown below in Table 4.

TABLE 4: TOWER COMPONENTS ANALYSIS RESULTS

Tower Components	Capacity (%) *	Assessment *
Leg	**72.8**	**Pass**
Diagonal	71.6	Pass
Horizontal	62.4	Pass
Top Girt	19.7	Pass
Bottom Girt	19.8	Pass
Mid Girt	8.5	Pass
Bolt Checks	66.9	Pass
Anchor Rod	42.3	Pass

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

The results from the tower foundation analysis are shown below in Table 5.

TABLE 5: TOWER FOUNDATION ANALYSIS RESULTS

Foundation Analysis Checks	Rating (%) *	Assessment *
SOIL RATING		
Uplift	**69.6**	**Pass**
Lateral (Sliding)	44.6	Pass
Bearing Pressure	49.9	Pass
STRUCTURAL RATING		
Pier Flexure	27.8	Pass
Pier Compression	4.0	Pass
Pad Flexure	46.6	Pass
Pad Shear	**52.3**	**Pass**

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

GENERAL ASSUMPTIONS:

- The tower components, plates, bolts and antenna 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 tower and its foundation have **sufficient capacity** to support the proposed and existing loading as listed in the Table 3 of this report, subject to the attached standard conditions on page 7.

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

Sincerely,

Analysis by:

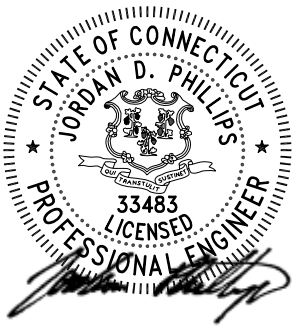
Binod Paudel, P.E.

binod.paudel@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).

14. It is assumed that all welded connections are performed in the shop under the latest American Welding Society Code. No field welds are permitted or assumed for the existing pre-manufactured equipment.
15. Steel grade and strength are unknown and cannot be field tested. We cannot be held responsible for equipment manufactured from inferior steel or bolts. Our analysis assumes that standard structural grade steel has been used by the equipment manufacturer for all assembled parts of the mounting apparatus. Acceptable steels and connection components are specified by the American Institute of Steel Construction. In case no accurate info available, following material assumptions were used:

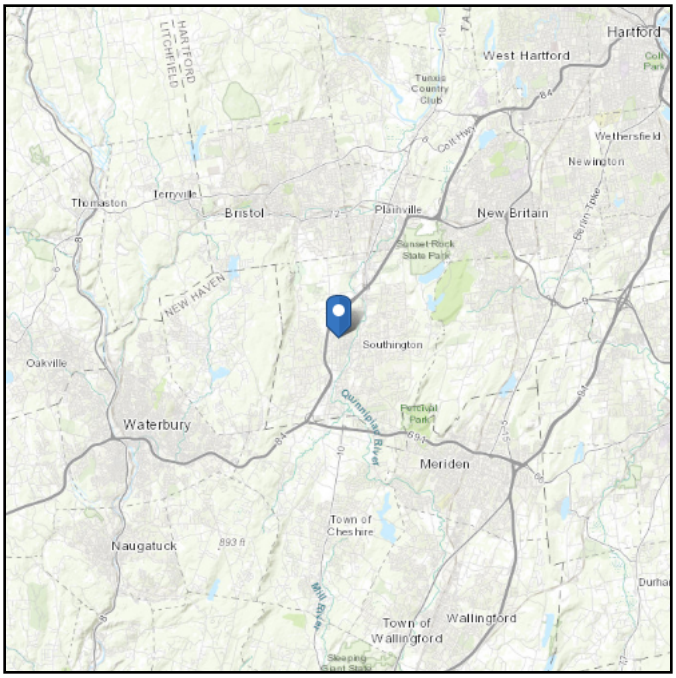
Pipe	ASTM A53 B-42
Connection Bolts	ASTM A325

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 312.85 ft (NAVD 88)
Latitude: 41.6047
Longitude: -72.8939



Wind

Results:

Wind Speed	131 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	92 Vmph
100-year MRI	99 Vmph

135 Vmph REQUIRED BY JURISDICTION

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

Date Accessed: Tue Feb 08 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 3% probability of exceedance in 50 years (annual exceedance probability = 0.000588, MRI = 1,700 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.

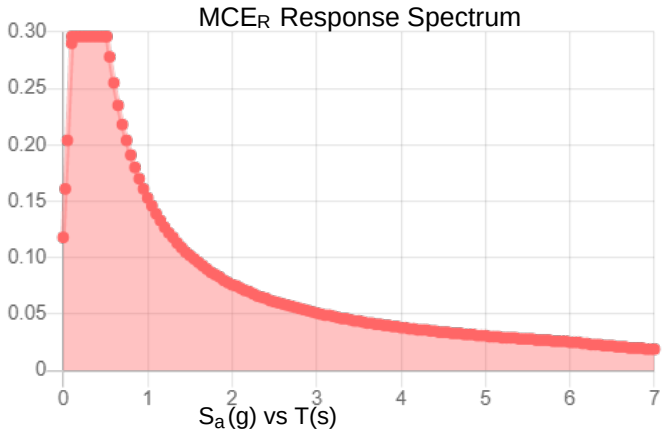
Seismic

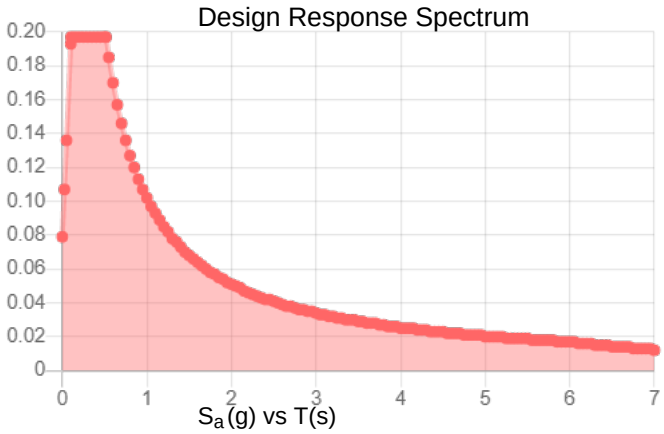
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.185	S_{DS} :	0.197
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.095
S_{MS} :	0.296	PGA_M :	0.152
S_{M1} :	0.153	F_{PGA} :	1.6
		I_e :	1.25

Seismic Design Category B





Data Accessed: **Tue Feb 08 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:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Tue Feb 08 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.

Snow

Results:

Ground Snow Load, p_g:	30 lb/ft^2
Elevation:	312.9 ft
Data Source:	ASCE/SEI 7-10, Fig. 7-1.
Date Accessed:	Tue Feb 08 2022

Values provided are ground snow loads. In areas designated "case study required," extreme local variations in ground snow loads preclude mapping at this scale. Site-specific case studies are required to establish ground snow loads at elevations not covered.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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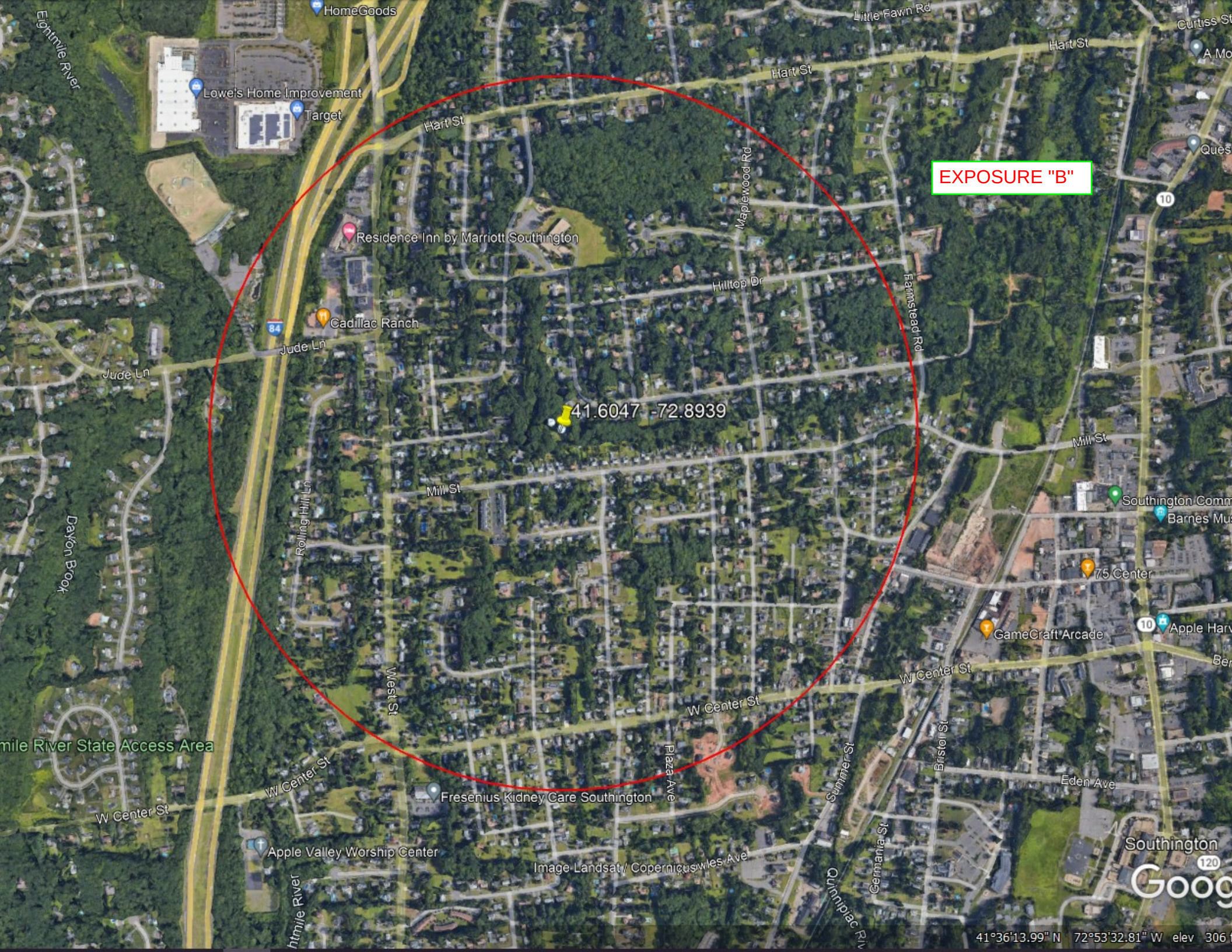
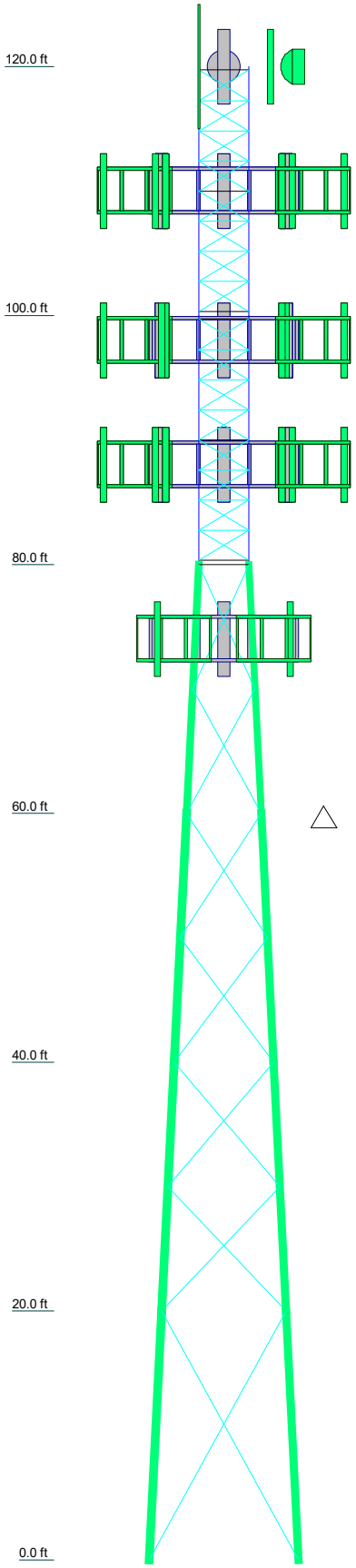

EXPOSURE "B"
41.6047 -72.8939
HomeGoods
Lowe's Home Improvement
Target
Residence Inn by Marriott Southington
Cadillac Ranch
Fresenius Kidney Care Southington
Apple Valley Worship Center
Hart St
Little Fawn Rd
Maplewood Rd
Farmstead Rd
Hilltop Dr
Jude Ln
Mill St
Rolling Hill Ln
West St
Plaza Ave
Summer St
Bristol St
Germania St
Quinnipiac River
W Center St
Eden Ave
Southington Comm
Barnes Mus
75 Center
GameCraft Arcade
Apple Harv
Eightmile River
Dayton Brook
mile River State Access Area
Southington
Image Landsat / Copernicus
41°36'13.99" N 72°53'32.81" W elev 306

Section		T1	T2	T3	T4	T5	T6
Legs		SR 1 3/4	SR 2 1/4	Pirod 194651 (Gr.58)	Pirod 195213 (Gr.58)	Pirod 195217 (Gr.58)	Pirod 196915 (Gr.58)
Leg Grade		A572-55					
Diagonals		SR 3/4	SR 7/8	L2 1/2x2 1/2x1/4	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x5/16	2L3 1/2x3 1/2x1/4
Diagonal Grade		A572-50					
Top Girts		SR 7/8	SR 1	L3x3x3/16	N.A.		
Mid Girts		SR 7/8	SR 1		N.A.		
Bottom Girts		SR 7/8	SR 1		N.A.		
Horizontals		SR 3/4			N.A.		
Face Width (ft)	12	4	16 @ 2.42708		6	8	10
# Panels @ (ft)		1.1	1.5	2.5	2.7	3.1	1 @ 20
Weight (K)	15.3						4.4



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
10' Ligthning Rod (Municipal)	120	(2) TPA65R-BU8D w/Mount Pipe (ATI)	98
PTP 49400 (Municipal)	120	(2) TPA65R-BU8D w/Mount Pipe (ATI)	98
PTP 49400 (Municipal)	120	(2) TPA65R-BU8D w/Mount Pipe (ATI)	98
PTP 49400 (Municipal)	120	Sitepro1 VFA12-HD (ATI)	98
10' Dipole (Municipal)	120	Sitepro1 VFA12-HD (ATI)	98
DB404-B (Municipal)	120	Sitepro1 VFA12-HD (ATI)	98
BA4040-67-DIN (Municipal)	120	DC6-48-60-18-8C-EV (ATI)	98
BA4040-67-DIN (Municipal)	120	DC6-48-60-18-8C-EV (ATI)	98
Pipe Mount (Municipal)	120	NHH-65B-R2B_TIA w/Mount Pipe (Verizon)	88
3ft Side Arm Mount (Municipal)	120	NHHSS-65B-R2BT4 w/Mount Pipe (Verizon)	88
VHLP800-11 (Municipal)	120	NHHSS-65B-R2BT4 w/Mount Pipe (Verizon)	88
VHLP800-11 (Municipal)	120	NHHSS-65B-R2BT4 w/Mount Pipe (Verizon)	88
APXVAARR24_43-U-NA20_TIA w/Mount Pipe (T-Mobile)	110	BSAMNT-SBS-1-2 (Verizon)	88
AIR-32 B2A/B66AA w/Mount Pipe (T-Mobile)	110	BSAMNT-SBS-1-2 (Verizon)	88
AIR-32 B2A/B66AA w/Mount Pipe (T-Mobile)	110	BSAMNT-SBS-1-2 (Verizon)	88
AIR-32 B2A/B66AA w/Mount Pipe (T-Mobile)	110	B2/B66 RRH-BR049 (Verizon)	88
AIR 6449 B41 w/ Mount Pipe (T-Mobile)	110	B2/B66 RRH-BR049 (Verizon)	88
AIR 6449 B41 w/ Mount Pipe (T-Mobile)	110	B2/B66 RRH-BR049 (Verizon)	88
AIR 6449 B41 w/ Mount Pipe (T-Mobile)	110	B5/B13 RRH-BR04C (Verizon)	88
RADIO 4449 B71/B85 (T-Mobile)	110	B5/B13 RRH-BR04C (Verizon)	88
RADIO 4449 B71/B85 (T-Mobile)	110	B5/B13 RRH-BR04C (Verizon)	88
RADIO 4449 B71/B85 (T-Mobile)	110	CBRS RRH-RT4401-48A (Verizon)	88
RRUS 4415 B25 (T-Mobile)	110	CBRS RRH-RT4401-48A (Verizon)	88
RRUS 4415 B25 (T-Mobile)	110	CBRS RRH-RT4401-48A (Verizon)	88
RRUS 4415 B25 (T-Mobile)	110	RVZDC-6627-PF-48 (Verizon)	88
SDX1926Q-43 (T-Mobile)	110	RVZDC-6627-PF-48 (Verizon)	88
SDX1926Q-43 (T-Mobile)	110	Sitepro VFA12-HD (Verizon)	88
SDX1926Q-43 (T-Mobile)	110	Sitepro VFA12-HD (Verizon)	88
4415 B66A (T-Mobile)	110	Sitepro VFA12-HD (Verizon)	88
4415 B66A (T-Mobile)	110	NHH-65B-R2B_TIA w/Mount Pipe (Verizon)	88
4415 B66A (T-Mobile)	110	NHH-65B-R2B_TIA w/Mount Pipe (Verizon)	88
Sitepro VFA12-RRU (T-Mobile)	110	JMA MX08FR0665-21 (Dish Wireless)	74
Sitepro VFA12-RRU (T-Mobile)	110	FUJITSU TA08025-B605 (Dish Wireless)	74
Sitepro VFA12-RRU (T-Mobile)	110	FUJITSU TA08025-B605 (Dish Wireless)	74
APXVAARR24_43-U-NA20_TIA w/Mount Pipe (T-Mobile)	110	FUJITSU TA08025-B605 (Dish Wireless)	74
APXVAARR24_43-U-NA20_TIA w/Mount Pipe (T-Mobile)	110	FUJITSU TA08025-B604 (Dish Wireless)	74
DC6-48-60-0-8C-EV (ATI)	98	FUJITSU TA08025-B604 (Dish Wireless)	74
RRUS 4449 B5/B12 (ATI)	98	FUJITSU TA08025-B604 (Dish Wireless)	74
RRUS 4449 B5/B12 (ATI)	98	RAYCAP RDIDC-9181-PF-48 OVP (Dish Wireless)	74
RRUS 4449 B5/B12 (ATI)	98	Commscope MTC3975083 V-Frame (Dish Wireless)	74
RRUS 8843 B2/B66A (ATI)	98	Commscope MTC3975083 V-Frame (Dish Wireless)	74
RRUS 8843 B2/B66A (ATI)	98	Commscope MTC3975083 V-Frame (Dish Wireless)	74
RRUS 8843 B2/B66A (ATI)	98	JMA MX08FR0665-21 (Dish Wireless)	74
RRUS 4478 B14 (ATI)	98	JMA MX08FR0665-21 (Dish Wireless)	74
RRUS 4478 B14 (ATI)	98		
RRUS 4478 B14 (ATI)	98		
RADIO 4415 B30 (ATI)	98		
RADIO 4415 B30 (ATI)	98		
RADIO 4415 B30 (ATI)	98		
OPA65R-BU8D w/Mount Pipe (ATI)	98		
OPA65R-BU8D w/Mount Pipe (ATI)	98		
OPA65R-BU8D w/Mount Pipe (ATI)	98		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-55	55 ksi	70 ksi	A572-50	50 ksi	65 ksi

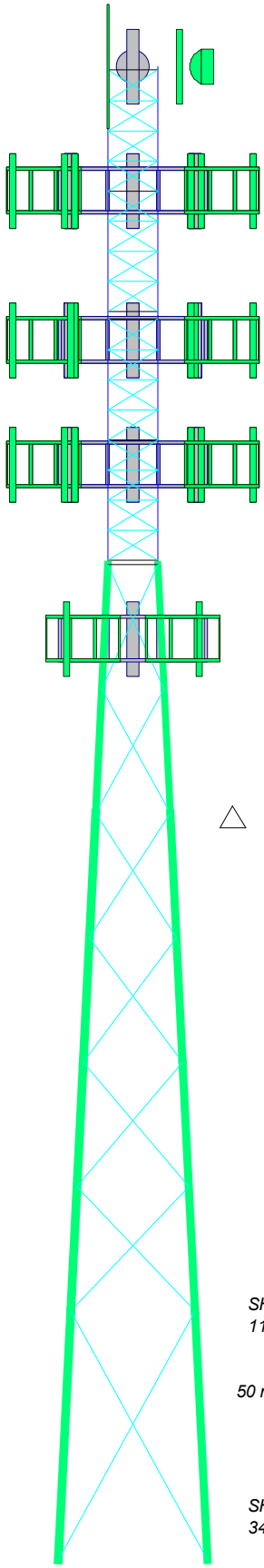
TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class III.
7. Topographic Category 1 with Crest Height of 0.00 ft

Nexius
2595 NORTH DALLAS PARKWAY, SUITE 300
FRISCO, TX 75034
Phone: (978) 581-9888
FAX:

Job: ***BOBDL00004B***			
Project: ***BOBDL00004B***			
Client: Dish Wireless	Drawn by: Binod Paudel	App'd:	
Code: TIA-222-G	Date: 02/11/22	Scale: NTS	
Path: X:\Projects\Dish\NE\CT\BOBDL00004B\STRUCTURAL\ANALYSIS\SAI\Tower\BOBDL00004B 120' SST Structural Analysis.eri		Dwg No. E-1	

Section	T1	T2	T3	T4	T5	T6
Legs	SR 1 3/4	SR 2 1/4	Pirod 194651 (Gr.58)	Pirod 195213 (Gr.58)	Pirod 195217 (Gr.58)	Pirod 196915 (Gr.58)
Leg Grade	A572-55					
Diagonals	SR 3/4	SR 7/8	L2 1/2x2 1/2x1/4	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x5/16	2L3 1/2x3 1/2x1/4
Diagonal Grade	A572-50					
Top Girts	SR 7/8	SR 1	L3x3x3/16	N.A.		
Mid Girts	SR 7/8	SR 1		N.A.		
Bottom Girts	SR 7/8	SR 1		N.A.		
Horizontals	SR 3/4			N.A.		
Face Width (ft)	4	16 @ 2.42708		6	8	10
# Panels @ (ft)	1.1		2.5	6 @ 10	3.1	1 @ 20
Weight (K)	15.3			2.7		4.4



MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-55	55 ksi	70 ksi	A572-50	50 ksi	65 ksi

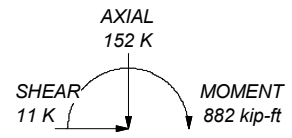
TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class III.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 72.8%

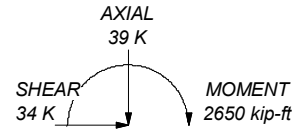
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 268 K
SHEAR: 28 K

UPLIFT: -243 K
SHEAR: 25 K



TORQUE 2 kip-ft
50 mph WIND - 1.0000 in ICE



TORQUE 6 kip-ft
REACTIONS - 105 mph WIND

Nexius
2595 NORTH DALLAS PARKWAY, SUITE 300
FRISCO, TX 75034
Phone: (978) 581-9888
FAX:

Job: **BOBDL00004B**			
Project: **BOBDL00004B**			
Client: Dish Wireless	Drawn by: Binod Paudel	App'd:	
Code: TIA-222-G	Date: 02/11/22	Scale: NTS	
Path: X:\Projects\Dish\NE\CT\BOBDL00004B\STRUCTURAL\ANALYSIS\SAI\Tower\BOBDL00004B 120' SST Structural Analysis.eri		Dwg No. E-1	

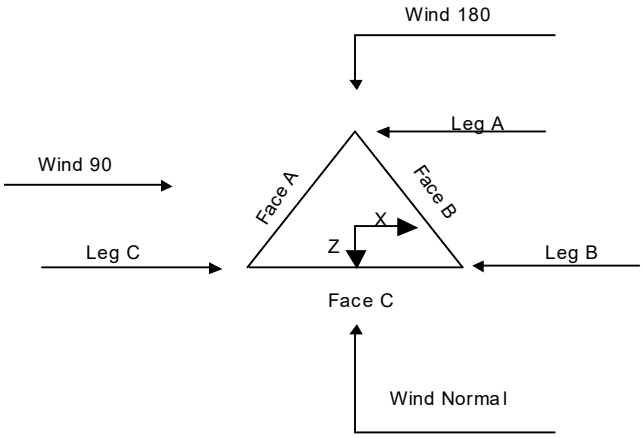
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 120.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 4.00 ft at the top and 12.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 105 mph.
Structure Class III.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	120.00-100.00			4.00	1	20.00
T2	100.00-80.00			4.00	1	20.00
T3	80.00-60.00			4.00	1	20.00
T4	60.00-40.00			6.00	1	20.00
T5	40.00-20.00			8.00	1	20.00
T6	20.00-0.00			10.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	120.00-100.00	2.43	X Brace	No	Yes	3.5000	3.5000
T2	100.00-80.00	2.43	X Brace	No	Yes	3.5000	3.5000
T3	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T4	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T5	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T6	20.00-0.00	20.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 120.00-100.00	Solid Round	1 3/4	A572-55 (55 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 100.00-80.00	Solid Round	2 1/4	A572-55 (55 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 80.00-60.00	Truss Leg	Pirod 194651 (Gr.58)	A572-55 (55 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A572-50 (50 ksi)
T4 60.00-40.00	Truss Leg	Pirod 195213 (Gr.58)	A572-55 (55 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A572-50 (50 ksi)
T5 40.00-20.00	Truss Leg	Pirod 195217 (Gr.58)	A572-55 (55 ksi)	Equal Angle	L2 1/2x2 1/2x5/16	A572-50 (50 ksi)
T6 20.00-0.00	Truss Leg	Pirod 196915 (Gr.58)	A572-55 (55 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 120.00-100.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 100.00-80.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T3 80.00-60.00	Equal Angle	L3x3x3/16	A572-50 (50 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 120.00-100.00	1	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 100.00-80.00	1	Solid Round	1	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1	0.00	0.0000	A36	1.03	1	1.05	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
120.00-100.00 T2	0.00	0.0000	(36 ksi) A36	1.03	1	1.05	36.0000	36.0000	36.0000
100.00-80.00 T3	0.00	0.0000	(36 ksi) A36	1.03	1	1.05	36.0000	36.0000	36.0000
80.00-60.00 T4	0.00	0.0000	(36 ksi) A36	1.03	1	1.05	36.0000	36.0000	36.0000
60.00-40.00 T5	0.00	0.0000	(36 ksi) A36	1.03	1	1.05	36.0000	36.0000	36.0000
40.00-20.00 T6	0.00	0.0000	(36 ksi) A36	1.03	1	1.05	36.0000	36.0000	36.0000
20.00-0.00			(36 ksi)						

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T6 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Truss-Leg K Factors: Truss-Legs Used As Leg Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals
T3 80.00-60.00	1	0.5	0.85	1	0.5	0.85
T4 60.00-40.00	1	0.5	0.85	1	0.5	0.85
T5 40.00-20.00	1	0.5	0.85	1	0.5	0.85
T6 20.00-0.00	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 120.00-100.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 100.00-80.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 80.00-60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 60.00-40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 40.00-20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 20.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 120.00-100.00	Flange	1.2500 A325N	2	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 100.00-80.00	Flange	1.0000 A325N	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 80.00-60.00	Flange	1.0000 A325N	6	1.0000 A325N	1	1.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 60.00-40.00	Flange	1.2500 A325N	6	1.0000 A325N	1	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 40.00-20.00	Flange	1.2500 A325N	6	1.0000 A325N	1	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 20.00-0.00	Flange	0.0000 A325N	0	0.8750 A325N	2	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF5-50A (7/8) (Municipal)	A	No	No	Ar (CaAa)	120.00 - 3.00	0.0000	-0.47	4	4	1.0300	1.0300		0.33
LDF4P-50A (1/2") (Municipal) ****	A	No	No	Ar (CaAa)	120.00 - 3.00	0.0000	-0.48	4	4	0.6300	0.6300		0.28
HCS 6X12 4AWG (1-5/8) (T-Mobile) ****	B	No	No	Ar (CaAa)	110.00 - 8.00	0.0000	-0.4	6	6	1.6600	1.9900		0.92
1-5/8 Coax (AT&T)	A	No	No	Ar (CaAa)	98.00 - 6.00	0.0000	-0.42	6	6	1.9800	1.9800		0.92
WR-VG122ST-BRDA (7/16") (AT&T)	A	No	No	Ar (CaAa)	98.00 - 6.00	0.0000	-0.45	6	6	0.4000	0.4000		0.27
FB-L98B-002-100000 (3/8") (AT&T) ****	A	No	No	Ar (CaAa)	98.00 - 6.00	0.0000	-0.4	2	2	0.4000	0.4000		0.22
HCS 6X12 4AWG (1-5/8) (Verizon) ****	C	No	No	Ar (CaAa)	88.00 - 6.00	0.0000	-0.4	2	2	1.6600 1.9900	1.9900		0.92
Feedline Ladder (Af) (Municipal)	A	No	No	Af (CaAa)	120.00 - 10.00	0.0000	-0.45	1	1	3.0000	3.0000		8.40
Feedline Ladder (Af) (T-Mobile)	B	No	No	Af (CaAa)	120.00 - 10.00	0.0000	-0.45	1	1	3.0000	3.0000		8.40
Feedline Ladder (Af) (Verizon) ****	C	No	No	Af (CaAa)	88.00 - 6.00	0.0000	-0.45	1	1	3.0000	3.0000		8.40
High Cap Hybrid Cable (Dish Wireless)	B	No	No	Ar (CaAa)	74.00 - 6.00	0.0000	0.4	1	1	1.6600	1.9900		0.92
Feedline Ladder (Af) (Dish Wireless)	B	No	No	Af (CaAa)	74.00 - 6.00	0.0000	0.4	1	1	3.0000	3.0000		8.40

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	120.00-100.00	A	0.000	0.000	23.280	0.000	0.22
		B	0.000	0.000	21.940	0.000	0.22
		C	0.000	0.000	0.000	0.000	0.00
T2	100.00-80.00	A	0.000	0.000	50.424	0.000	0.35
		B	0.000	0.000	33.880	0.000	0.28
		C	0.000	0.000	7.184	0.000	0.08
T3	80.00-60.00	A	0.000	0.000	53.440	0.000	0.37
		B	0.000	0.000	43.666	0.000	0.41
		C	0.000	0.000	17.960	0.000	0.20
T4	60.00-40.00	A	0.000	0.000	53.440	0.000	0.37
		B	0.000	0.000	47.860	0.000	0.46
		C	0.000	0.000	17.960	0.000	0.20
T5	40.00-20.00	A	0.000	0.000	53.440	0.000	0.37
		B	0.000	0.000	47.860	0.000	0.46
		C	0.000	0.000	17.960	0.000	0.20
T6	20.00-0.00	A	0.000	0.000	37.400	0.000	0.23
		B	0.000	0.000	29.114	0.000	0.28
		C	0.000	0.000	12.572	0.000	0.14

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	120.00-100.00	A	2.820	0.000	0.000	87.086	0.000	1.70
		B		0.000	0.000	55.006	0.000	1.37
		C		0.000	0.000	0.000	0.000	0.00
T2	100.00-80.00	A	2.764	0.000	0.000	196.012	0.000	3.59
		B		0.000	0.000	88.160	0.000	2.03
		C		0.000	0.000	21.884	0.000	0.48
T3	80.00-60.00	A	2.695	0.000	0.000	205.641	0.000	3.70
		B		0.000	0.000	112.340	0.000	2.65
		C		0.000	0.000	53.961	0.000	1.16
T4	60.00-40.00	A	2.606	0.000	0.000	202.286	0.000	3.56
		B		0.000	0.000	121.382	0.000	2.84
		C		0.000	0.000	52.986	0.000	1.12
T5	40.00-20.00	A	2.476	0.000	0.000	197.412	0.000	3.36
		B		0.000	0.000	119.025	0.000	2.69
		C		0.000	0.000	51.568	0.000	1.06
T6	20.00-0.00	A	2.219	0.000	0.000	136.309	0.000	2.10
		B		0.000	0.000	69.899	0.000	1.47
		C		0.000	0.000	34.129	0.000	0.66

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	120.00-100.00	-5.7323	-3.2186	-0.9648	-0.2329
T2	100.00-80.00	-6.4771	-1.3744	-1.4707	0.1031
T3	80.00-60.00	-2.4990	0.3881	-0.8826	0.6754
T4	60.00-40.00	-2.6453	0.7968	-2.0809	2.0998
T5	40.00-20.00	-3.2465	1.0224	-3.1766	3.1702
T6	20.00-0.00	-3.0593	2.5022	-3.6219	4.9180

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	LDF5-50A (7/8)	100.00 - 120.00	0.6000	0.1157
T1	2	LDF4P-50A (1/2")	100.00 - 120.00	0.6000	0.1157
T1	4	HCS 6X12 4AWG (1-5/8)	100.00 - 110.00	0.6000	0.1157
T1	12	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.1157
T1	13	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.1157
T2	1	LDF5-50A (7/8)	80.00 - 100.00	0.6000	0.1159
T2	2	LDF4P-50A (1/2")	80.00 - 100.00	0.6000	0.1159
T2	4	HCS 6X12 4AWG (1-5/8)	80.00 - 100.00	0.6000	0.1159
T2	6	1-5/8 Coax	80.00 - 98.00	0.6000	0.1159
T2	7	WR-VG122ST-BRDA (7/16")	80.00 - 98.00	0.6000	0.1159
T2	8	FB-L98B-002-100000 (3/8")	80.00 - 98.00	0.6000	0.1159
T2	10	HCS 6X12 4AWG (1-5/8)	80.00 - 88.00	0.6000	0.1159
T2	12	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.1159
T2	13	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.1159
T2	14	Feedline Ladder (Af)	80.00 - 88.00	0.6000	0.1159
T3	1	LDF5-50A (7/8)	60.00 - 80.00	0.6000	0.1497
T3	2	LDF4P-50A (1/2")	60.00 - 80.00	0.6000	0.1497
T3	4	HCS 6X12 4AWG (1-5/8)	60.00 - 80.00	0.6000	0.1497
T3	6	1-5/8 Coax	60.00 - 80.00	0.6000	0.1497
T3	7	WR-VG122ST-BRDA (7/16")	60.00 - 80.00	0.6000	0.1497
T3	8	FB-L98B-002-100000 (3/8")	60.00 - 80.00	0.6000	0.1497
T3	10	HCS 6X12 4AWG (1-5/8)	60.00 - 80.00	0.6000	0.1497
T3	12	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.1497
T3	13	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.1497
T3	14	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.1497
T3	16	High Cap Hybrid Cable	60.00 - 74.00	0.6000	0.1497
T3	17	Feedline Ladder (Af)	60.00 - 74.00	0.6000	0.1497
T4	1	LDF5-50A (7/8)	40.00 - 60.00	0.6000	0.3413
T4	2	LDF4P-50A (1/2")	40.00 - 60.00	0.6000	0.3413
T4	4	HCS 6X12 4AWG (1-5/8)	40.00 - 60.00	0.6000	0.3413
T4	6	1-5/8 Coax	40.00 - 60.00	0.6000	0.3413
T4	7	WR-VG122ST-BRDA (7/16")	40.00 - 60.00	0.6000	0.3413
T4	8	FB-L98B-002-100000 (3/8")	40.00 - 60.00	0.6000	0.3413
T4	10	HCS 6X12 4AWG (1-5/8)	40.00 - 60.00	0.6000	0.3413
T4	12	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.3413
T4	13	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.3413
T4	14	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.3413
T4	16	High Cap Hybrid Cable	40.00 - 60.00	0.6000	0.3413
T4	17	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.3413
T5	1	LDF5-50A (7/8)	20.00 - 40.00	0.6000	0.4575
T5	2	LDF4P-50A (1/2")	20.00 - 40.00	0.6000	0.4575
T5	4	HCS 6X12 4AWG (1-5/8)	20.00 - 40.00	0.6000	0.4575
T5	6	1-5/8 Coax	20.00 - 40.00	0.6000	0.4575
T5	7	WR-VG122ST-BRDA (7/16")	20.00 - 40.00	0.6000	0.4575

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	8	FB-L98B-002-100000 (3/8")	20.00 - 40.00	0.6000	0.4575
T5	10	HCS 6X12 4AWG (1-5/8)	20.00 - 40.00	0.6000	0.4575
T5	12	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.4575
T5	13	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.4575
T5	14	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.4575
T5	16	High Cap Hybrid Cable	20.00 - 40.00	0.6000	0.4575
T5	17	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.4575
T6	1	LDF5-50A (7/8)	3.00 - 20.00	0.6000	0.5590
T6	2	LDF4P-50A (1/2")	3.00 - 20.00	0.6000	0.5590
T6	4	HCS 6X12 4AWG (1-5/8)	8.00 - 20.00	0.6000	0.5590
T6	6	1-5/8 Coax	6.00 - 20.00	0.6000	0.5590
T6	7	WR-VG122ST-BRDA (7/16")	6.00 - 20.00	0.6000	0.5590
T6	8	FB-L98B-002-100000 (3/8")	6.00 - 20.00	0.6000	0.5590
T6	10	HCS 6X12 4AWG (1-5/8)	6.00 - 20.00	0.6000	0.5590
T6	12	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.5590
T6	13	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.5590
T6	14	Feedline Ladder (Af)	6.00 - 20.00	0.6000	0.5590
T6	16	High Cap Hybrid Cable	6.00 - 20.00	0.6000	0.5590
T6	17	Feedline Ladder (Af)	6.00 - 20.00	0.6000	0.5590

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
10' Ligthning Rod	C	From Leg	0.00	0.0000	120.00	No Ice	0.63	0.63	0.02
(Municipal)			0.00			1/2" Ice	1.64	1.64	0.03
			0.00			1" Ice	2.65	2.65	0.04
PTP 49400	A	From Leg	3.00	0.0000	120.00	No Ice	1.75	0.48	0.01
(Municipal)			0.00			1/2" Ice	1.92	0.58	0.02
			0.00			1" Ice	2.09	0.68	0.03
PTP 49400	B	From Leg	1.00	0.0000	120.00	No Ice	1.75	0.48	0.01
(Municipal)			0.00			1/2" Ice	1.92	0.58	0.02
			0.00			1" Ice	2.09	0.68	0.03
PTP 49400	C	From Leg	1.00	0.0000	120.00	No Ice	1.75	0.48	0.01
(Municipal)			0.00			1/2" Ice	1.92	0.58	0.02
			0.00			1" Ice	2.09	0.68	0.03
10' Dipole	A	From Leg	2.00	0.0000	120.00	No Ice	3.69	3.69	0.03
(Municipal)			0.00			1/2" Ice	4.73	4.73	0.05
			0.00			1" Ice	5.77	5.77	0.07
DB404-B	A	From Leg	3.00	0.0000	120.00	No Ice	1.14	1.14	0.01
(Municipal)			0.00			1/2" Ice	2.29	2.29	0.03
			0.00			1" Ice	3.44	3.44	0.05
BA4040-67-DIN	A	From Leg	3.00	0.0000	120.00	No Ice	12.76	4.92	0.18
(Municipal)			0.00			1/2" Ice	13.51	6.06	0.23
			0.00			1" Ice	14.26	7.20	0.28
BA4040-67-DIN	B	From Leg	2.00	0.0000	120.00	No Ice	12.76	4.92	0.18
(Municipal)			0.00			1/2" Ice	13.51	6.06	0.23
			0.00			1" Ice	14.26	7.20	0.28
Pipe Mount	B	From Leg	1.50	0.0000	120.00	No Ice	1.32	1.32	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(Municipal)			0.00			1/2" Ice	1.58	1.58	0.08
			0.00			1" Ice	1.84	1.84	0.09
3ft Side Arm Mount	A	From Leg	1.50	0.0000	120.00	No Ice	1.78	3.79	0.13
(Municipal)			0.00			1/2" Ice	2.24	4.47	0.15
			0.00			1" Ice	2.70	5.15	0.17
****									
APXVAARR24_43-U-NA20	A	From Leg	4.00	0.0000	110.00	No Ice	20.48	11.02	0.19
_TIA w/Mount Pipe			0.00			1/2" Ice	21.23	12.55	0.32
(T-Mobile)			0.00			1" Ice	21.98	14.08	0.45
APXVAARR24_43-U-NA20	B	From Leg	4.00	0.0000	110.00	No Ice	20.48	11.02	0.19
_TIA w/Mount Pipe			0.00			1/2" Ice	21.23	12.55	0.32
(T-Mobile)			0.00			1" Ice	21.98	14.08	0.45
APXVAARR24_43-U-NA20	C	From Leg	4.00	0.0000	110.00	No Ice	20.48	11.02	0.19
_TIA w/Mount Pipe			0.00			1/2" Ice	21.23	12.55	0.32
(T-Mobile)			0.00			1" Ice	21.98	14.08	0.45
AIR-32 B2A/B66AA	A	From Leg	4.00	0.0000	110.00	No Ice	6.75	6.07	0.15
w/Mount Pipe			0.00			1/2" Ice	7.20	6.87	0.21
(T-Mobile)			0.00			1" Ice	7.65	7.67	0.27
AIR-32 B2A/B66AA	B	From Leg	4.00	0.0000	110.00	No Ice	6.75	6.07	0.15
w/Mount Pipe			0.00			1/2" Ice	7.20	6.87	0.21
(T-Mobile)			0.00			1" Ice	7.65	7.67	0.27
AIR-32 B2A/B66AA	C	From Leg	4.00	0.0000	110.00	No Ice	6.75	6.07	0.15
w/Mount Pipe			0.00			1/2" Ice	7.20	6.87	0.21
(T-Mobile)			0.00			1" Ice	7.65	7.67	0.27
AIR 6449 B41 w/ Mount Pipe	A	From Leg	4.00	0.0000	110.00	No Ice	6.90	4.32	0.13
(T-Mobile)			0.00			1/2" Ice	7.74	5.37	0.19
			0.00			1" Ice	8.58	6.42	0.25
AIR 6449 B41 w/ Mount Pipe	B	From Leg	4.00	0.0000	110.00	No Ice	6.90	4.32	0.13
(T-Mobile)			0.00			1/2" Ice	7.74	5.37	0.19
			0.00			1" Ice	8.58	6.42	0.25
AIR 6449 B41 w/ Mount Pipe	C	From Leg	4.00	0.0000	110.00	No Ice	6.90	4.32	0.13
(T-Mobile)			0.00			1/2" Ice	7.74	5.37	0.19
			0.00			1" Ice	8.58	6.42	0.25
RADIO 4449 B71/B85	A	From Leg	4.00	0.0000	110.00	No Ice	1.64	1.31	0.07
(T-Mobile)			0.00			1/2" Ice	1.80	1.46	0.09
			0.00			1" Ice	1.96	1.61	0.11
RADIO 4449 B71/B85	B	From Leg	4.00	0.0000	110.00	No Ice	1.64	1.31	0.07
(T-Mobile)			0.00			1/2" Ice	1.80	1.46	0.09
			0.00			1" Ice	1.96	1.61	0.11
RADIO 4449 B71/B85	C	From Leg	4.00	0.0000	110.00	No Ice	1.64	1.31	0.07
(T-Mobile)			0.00			1/2" Ice	1.80	1.46	0.09
			0.00			1" Ice	1.96	1.61	0.11
RRUS 4415 B25	A	From Leg	4.00	0.0000	110.00	No Ice	1.64	0.68	0.04
(T-Mobile)			0.00			1/2" Ice	1.80	0.79	0.06
			0.00			1" Ice	1.96	0.90	0.08
RRUS 4415 B25	B	From Leg	4.00	0.0000	110.00	No Ice	1.64	0.68	0.04
(T-Mobile)			0.00			1/2" Ice	1.80	0.79	0.06
			0.00			1" Ice	1.96	0.90	0.08
RRUS 4415 B25	C	From Leg	4.00	0.0000	110.00	No Ice	1.64	0.68	0.04
(T-Mobile)			0.00			1/2" Ice	1.80	0.79	0.06
			0.00			1" Ice	1.96	0.90	0.08
SDX1926Q-43	A	From Leg	4.00	0.0000	110.00	No Ice	0.24	0.10	0.01
(T-Mobile)			0.00			1/2" Ice	0.31	0.14	0.01
			0.00			1" Ice	0.38	0.18	0.01
SDX1926Q-43	B	From Leg	4.00	0.0000	110.00	No Ice	0.24	0.10	0.01
(T-Mobile)			0.00			1/2" Ice	0.31	0.14	0.01
			0.00			1" Ice	0.38	0.18	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
SDX1926Q-43	C	From Leg	4.00	0.0000	110.00	No Ice	0.24	0.10	0.01
(T-Mobile)			0.00			1/2" Ice	0.31	0.14	0.01
			0.00			1" Ice	0.38	0.18	0.01
4415 B66A	A	From Leg	2.50	0.0000	110.00	No Ice	1.86	0.82	0.04
(T-Mobile)			0.00			1/2" Ice	2.03	0.94	0.06
			0.00			1" Ice	2.20	1.06	0.08
4415 B66A	B	From Leg	2.50	0.0000	110.00	No Ice	1.86	0.82	0.04
(T-Mobile)			0.00			1/2" Ice	2.03	0.94	0.06
			0.00			1" Ice	2.20	1.06	0.08
4415 B66A	C	From Leg	2.50	0.0000	110.00	No Ice	1.86	0.82	0.04
(T-Mobile)			0.00			1/2" Ice	2.03	0.94	0.06
			0.00			1" Ice	2.20	1.06	0.08
Sitepro VFA12-RRU	A	From Leg	2.00	0.0000	110.00	No Ice	15.40	14.00	0.56
(T-Mobile)			0.00			1/2" Ice	21.30	20.81	0.74
			0.00			1" Ice	27.20	27.62	0.92
Sitepro VFA12-RRU	B	From Leg	2.00	0.0000	110.00	No Ice	15.40	14.00	0.56
(T-Mobile)			0.00			1/2" Ice	21.30	20.81	0.74
			0.00			1" Ice	27.20	27.62	0.92
Sitepro VFA12-RRU	C	From Leg	2.00	0.0000	110.00	No Ice	15.40	14.00	0.56
(T-Mobile)			0.00			1/2" Ice	21.30	20.81	0.74
			0.00			1" Ice	27.20	27.62	0.92
****									
DC6-48-60-18-8C-EV	A	From Leg	1.00	0.0000	98.00	No Ice	1.09	1.09	0.03
(AT&T)			0.00			1/2" Ice	1.70	1.70	0.05
			2.00			1" Ice	2.31	2.31	0.07
DC6-48-60-18-8C-EV	B	From Leg	1.00	0.0000	98.00	No Ice	1.09	1.09	0.03
(AT&T)			0.00			1/2" Ice	1.70	1.70	0.05
			2.00			1" Ice	2.31	2.31	0.07
DC6-48-60-0-8C-EV	C	From Leg	1.00	0.0000	98.00	No Ice	1.09	1.09	0.03
(AT&T)			0.00			1/2" Ice	1.70	1.70	0.05
			2.00			1" Ice	2.31	2.31	0.07
RRUS 4449 B5/B12	A	From Leg	2.50	0.0000	98.00	No Ice	1.97	1.41	0.07
(AT&T)			0.00			1/2" Ice	2.14	1.56	0.09
			0.00			1" Ice	2.31	1.71	0.11
RRUS 4449 B5/B12	B	From Leg	2.50	0.0000	98.00	No Ice	1.97	1.41	0.07
(AT&T)			0.00			1/2" Ice	2.14	1.56	0.09
			0.00			1" Ice	2.31	1.71	0.11
RRUS 4449 B5/B12	C	From Leg	2.50	0.0000	98.00	No Ice	1.97	1.41	0.07
(AT&T)			0.00			1/2" Ice	2.14	1.56	0.09
			0.00			1" Ice	2.31	1.71	0.11
RRUS 8843 B2/B66A	A	From Leg	2.50	0.0000	98.00	No Ice	1.64	1.35	0.07
(AT&T)			0.00			1/2" Ice	1.80	1.50	0.09
			0.00			1" Ice	1.96	1.65	0.11
RRUS 8843 B2/B66A	B	From Leg	2.50	0.0000	98.00	No Ice	1.64	1.35	0.07
(AT&T)			0.00			1/2" Ice	1.80	1.50	0.09
			0.00			1" Ice	1.96	1.65	0.11
RRUS 8843 B2/B66A	C	From Leg	2.50	0.0000	98.00	No Ice	1.64	1.35	0.07
(AT&T)			0.00			1/2" Ice	1.80	1.50	0.09
			0.00			1" Ice	1.96	1.65	0.11
RRUS 4478 B14	A	From Leg	2.50	0.0000	98.00	No Ice	1.84	1.06	0.06
(AT&T)			0.00			1/2" Ice	2.01	1.20	0.08
			0.00			1" Ice	2.18	1.34	0.10
RRUS 4478 B14	B	From Leg	2.50	0.0000	98.00	No Ice	1.84	1.06	0.06
(AT&T)			0.00			1/2" Ice	2.01	1.20	0.08
			0.00			1" Ice	2.18	1.34	0.10
RRUS 4478 B14	C	From Leg	2.50	0.0000	98.00	No Ice	1.84	1.06	0.06
(AT&T)			0.00			1/2" Ice	2.01	1.20	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	2.18	1.34	0.10
RADIO 4415 B30	A	From Leg	2.50	0.0000	98.00	No Ice	1.64	0.64	0.04
(AT&T)			0.00			1/2" Ice	1.80	0.75	0.05
			0.00			1" Ice	1.96	0.86	0.06
RADIO 4415 B30	B	From Leg	2.50	0.0000	98.00	No Ice	1.64	0.64	0.04
(AT&T)			0.00			1/2" Ice	1.80	0.75	0.05
			0.00			1" Ice	1.96	0.86	0.06
RADIO 4415 B30	C	From Leg	2.50	0.0000	98.00	No Ice	1.64	0.64	0.04
(AT&T)			0.00			1/2" Ice	1.80	0.75	0.05
			0.00			1" Ice	1.96	0.86	0.06
OPA65R-BU8D w/Mount Pipe	A	From Leg	3.50	0.0000	98.00	No Ice	18.09	10.10	0.11
			0.00			1/2" Ice	18.72	11.52	0.23
(AT&T)			0.00			1" Ice	19.35	12.94	0.35
OPA65R-BU8D w/Mount Pipe	B	From Leg	3.50	0.0000	98.00	No Ice	18.09	10.10	0.11
			0.00			1/2" Ice	18.72	11.52	0.23
(AT&T)			0.00			1" Ice	19.35	12.94	0.35
OPA65R-BU8D w/Mount Pipe	C	From Leg	3.50	0.0000	98.00	No Ice	18.09	10.10	0.11
			0.00			1/2" Ice	18.72	11.52	0.23
(AT&T)			0.00			1" Ice	19.35	12.94	0.35
(2) TPA65R-BU8D w/Mount Pipe	A	From Leg	3.50	0.0000	98.00	No Ice	18.33	10.34	0.12
			0.00			1/2" Ice	19.06	11.86	0.24
(AT&T)			0.00			1" Ice	19.79	13.38	0.36
(2) TPA65R-BU8D w/Mount Pipe	B	From Leg	3.50	0.0000	98.00	No Ice	18.33	10.34	0.12
			0.00			1/2" Ice	19.06	11.86	0.24
(AT&T)			0.00			1" Ice	19.79	13.38	0.36
(2) TPA65R-BU8D w/Mount Pipe	C	From Leg	3.50	0.0000	98.00	No Ice	18.33	10.34	0.12
			0.00			1/2" Ice	19.06	11.86	0.24
(AT&T)			0.00			1" Ice	19.79	13.38	0.36
Sitepro1 VFA12-HD	A	From Leg	2.00	0.0000	98.00	No Ice	15.40	14.00	0.56
(AT&T)			0.00			1/2" Ice	21.30	20.81	0.74
			0.00			1" Ice	27.20	27.62	0.92
Sitepro1 VFA12-HD	B	From Leg	2.00	0.0000	98.00	No Ice	15.40	14.00	0.56
(AT&T)			0.00			1/2" Ice	21.30	20.81	0.74
			0.00			1" Ice	27.20	27.62	0.92
Sitepro1 VFA12-HD	C	From Leg	2.00	0.0000	98.00	No Ice	15.40	14.00	0.56
(AT&T)			0.00			1/2" Ice	21.30	20.81	0.74
			0.00			1" Ice	27.20	27.62	0.92
****									
NHH-65B-R2B_TIA w/Mount Pipe	A	From Leg	4.00	0.0000	88.00	No Ice	8.32	7.00	0.07
			0.00			1/2" Ice	8.88	8.19	0.14
(Verizon)			0.00			1" Ice	9.44	9.38	0.21
NHH-65B-R2B_TIA w/Mount Pipe	B	From Leg	4.00	0.0000	88.00	No Ice	8.32	7.00	0.07
			0.00			1/2" Ice	8.88	8.19	0.14
(Verizon)			0.00			1" Ice	9.44	9.38	0.21
NHH-65B-R2B_TIA w/Mount Pipe	C	From Leg	4.00	0.0000	88.00	No Ice	8.32	7.00	0.07
			0.00			1/2" Ice	8.88	8.19	0.14
(Verizon)			0.00			1" Ice	9.44	9.38	0.21
NHHSS-65B-R2BT4 w/Mount Pipe	A	From Leg	4.00	0.0000	88.00	No Ice	8.52	7.25	0.11
			0.00			1/2" Ice	9.19	8.54	0.18
(Verizon)			0.00			1" Ice	9.86	9.83	0.25
NHHSS-65B-R2BT4 w/Mount Pipe	B	From Leg	4.00	0.0000	88.00	No Ice	8.52	7.25	0.11
			0.00			1/2" Ice	9.19	8.54	0.18
(Verizon)			0.00			1" Ice	9.86	9.83	0.25
NHHSS-65B-R2BT4 w/Mount Pipe	C	From Leg	4.00	0.0000	88.00	No Ice	8.52	7.25	0.11
			0.00			1/2" Ice	9.19	8.54	0.18
(Verizon)			0.00			1" Ice	9.86	9.83	0.25
BSAMNT-SBS-1-2	A	From Leg	4.00	0.0000	88.00	No Ice	0.15	0.05	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(Verizon)			0.00			1/2" Ice	0.21	0.10	0.01
			0.00			1" Ice	0.27	0.15	0.01
BSAMNT-SBS-1-2	B	From Leg	4.00	0.0000	88.00	No Ice	0.15	0.05	0.01
(Verizon)			0.00			1/2" Ice	0.21	0.10	0.01
			0.00			1" Ice	0.27	0.15	0.01
BSAMNT-SBS-1-2	C	From Leg	4.00	0.0000	88.00	No Ice	0.15	0.05	0.01
(Verizon)			0.00			1/2" Ice	0.21	0.10	0.01
			0.00			1" Ice	0.27	0.15	0.01
B2/B66 RRH-BR049	A	From Leg	4.00	0.0000	88.00	No Ice	1.88	1.25	0.08
(Verizon)			0.00			1/2" Ice	2.05	1.39	0.10
			0.00			1" Ice	2.22	1.53	0.12
B2/B66 RRH-BR049	B	From Leg	4.00	0.0000	88.00	No Ice	1.88	1.25	0.08
(Verizon)			0.00			1/2" Ice	2.05	1.39	0.10
			0.00			1" Ice	2.22	1.53	0.12
B2/B66 RRH-BR049	C	From Leg	4.00	0.0000	88.00	No Ice	1.88	1.25	0.08
(Verizon)			0.00			1/2" Ice	2.05	1.39	0.10
			0.00			1" Ice	2.22	1.53	0.12
B5/B13 RRH-BR04C	A	From Leg	4.00	0.0000	88.00	No Ice	1.88	1.01	0.07
(Verizon)			0.00			1/2" Ice	2.05	1.14	0.09
			0.00			1" Ice	2.22	1.27	0.11
B5/B13 RRH-BR04C	B	From Leg	4.00	0.0000	88.00	No Ice	1.88	1.01	0.07
(Verizon)			0.00			1/2" Ice	2.05	1.14	0.09
			0.00			1" Ice	2.22	1.27	0.11
B5/B13 RRH-BR04C	C	From Leg	4.00	0.0000	88.00	No Ice	1.88	1.01	0.07
(Verizon)			0.00			1/2" Ice	2.05	1.14	0.09
			0.00			1" Ice	2.22	1.27	0.11
CBRS RRH-RT4401-48A	A	From Leg	4.00	0.0000	88.00	No Ice	1.54	0.75	0.02
(Verizon)			0.00			1/2" Ice	1.70	0.87	0.04
			0.00			1" Ice	1.86	0.99	0.06
CBRS RRH-RT4401-48A	B	From Leg	4.00	0.0000	88.00	No Ice	1.54	0.75	0.02
(Verizon)			0.00			1/2" Ice	1.70	0.87	0.04
			0.00			1" Ice	1.86	0.99	0.06
CBRS RRH-RT4401-48A	C	From Leg	4.00	0.0000	88.00	No Ice	1.54	0.75	0.02
(Verizon)			0.00			1/2" Ice	1.70	0.87	0.04
			0.00			1" Ice	1.86	0.99	0.06
RVZDC-6627-PF-48	A	From Leg	4.00	0.0000	88.00	No Ice	3.79	2.51	0.03
(Verizon)			0.00			1/2" Ice	4.04	2.73	0.06
			0.00			1" Ice	4.29	2.95	0.09
RVZDC-6627-PF-48	A	From Leg	4.00	0.0000	88.00	No Ice	3.79	2.51	0.03
(Verizon)			0.00			1/2" Ice	4.04	2.73	0.06
			0.00			1" Ice	4.29	2.95	0.09
Sitepro VFA12-HD	A	From Leg	2.00	0.0000	88.00	No Ice	15.40	14.00	0.56
(Verizon)			0.00			1/2" Ice	21.30	20.81	0.74
			0.00			1" Ice	27.20	27.62	0.92
Sitepro VFA12-HD	B	From Leg	2.00	0.0000	88.00	No Ice	15.40	14.00	0.56
(Verizon)			0.00			1/2" Ice	21.30	20.81	0.74
			0.00			1" Ice	27.20	27.62	0.92
Sitepro VFA12-HD	C	From Leg	2.00	0.0000	88.00	No Ice	15.40	14.00	0.56
(Verizon)			0.00			1/2" Ice	21.30	20.81	0.74
			0.00			1" Ice	27.20	27.62	0.92
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JMA MX08FR0665-21	A	From Leg	3.50	0.0000	74.00	No Ice	12.96	7.77	0.11
(Dish Wireless)			0.00			1/2" Ice	13.67	9.05	0.21
			0.00			1" Ice	14.34	10.19	0.31
JMA MX08FR0665-21	B	From Leg	3.50	0.0000	74.00	No Ice	12.96	7.77	0.11
(Dish Wireless)			0.00			1/2" Ice	13.67	9.05	0.21
			0.00			1" Ice	14.34	10.19	0.31

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
JMA MX08FR0665-21	C	From Leg	3.50	0.0000	74.00	No Ice	12.96	7.77	0.11
(Dish Wireless)			0.00			1/2" Ice	13.67	9.05	0.21
			0.00			1" Ice	14.34	10.19	0.31
FUJITSU TA08025-B605	A	From Leg	2.50	0.0000	74.00	No Ice	1.95	1.12	0.08
(Dish Wireless)			0.00			1/2" Ice	2.12	1.25	0.09
			0.00			1" Ice	2.30	1.40	0.11
FUJITSU TA08025-B605	B	From Leg	2.50	0.0000	74.00	No Ice	1.95	1.12	0.08
(Dish Wireless)			0.00			1/2" Ice	2.12	1.25	0.09
			0.00			1" Ice	2.30	1.40	0.11
FUJITSU TA08025-B605	C	From Leg	2.50	0.0000	74.00	No Ice	1.95	1.12	0.08
(Dish Wireless)			0.00			1/2" Ice	2.12	1.25	0.09
			0.00			1" Ice	2.30	1.40	0.11
FUJITSU TA08025-B604	A	From Leg	2.50	0.0000	74.00	No Ice	1.95	0.97	0.06
(Dish Wireless)			0.00			1/2" Ice	2.12	1.10	0.08
			0.00			1" Ice	2.30	1.24	0.10
FUJITSU TA08025-B604	B	From Leg	2.50	0.0000	74.00	No Ice	1.95	0.97	0.06
(Dish Wireless)			0.00			1/2" Ice	2.12	1.10	0.08
			0.00			1" Ice	2.30	1.24	0.10
FUJITSU TA08025-B604	C	From Leg	2.50	0.0000	74.00	No Ice	1.95	0.97	0.06
(Dish Wireless)			0.00			1/2" Ice	2.12	1.10	0.08
			0.00			1" Ice	2.30	1.24	0.10
RAYCAP	B	From Leg	2.50	0.0000	74.00	No Ice	2.28	1.29	0.02
RDIDC-9181-PF-48 OVP			0.00			1/2" Ice	2.47	1.44	0.04
(Dish Wireless)			0.00			1" Ice	2.66	1.61	0.06
Commscope MTC3975083	A	From Leg	2.00	0.0000	74.00	No Ice	10.30	9.33	0.36
V-Frame			0.00			1/2" Ice	14.20	13.87	0.49
(Dish Wireless)			0.00			1" Ice	18.10	18.41	0.62
Commscope MTC3975083	B	From Leg	2.00	0.0000	74.00	No Ice	10.30	9.33	0.36
V-Frame			0.00			1/2" Ice	14.20	13.87	0.49
(Dish Wireless)			0.00			1" Ice	18.10	18.41	0.62
Commscope MTC3975083	C	From Leg	2.00	0.0000	74.00	No Ice	10.30	9.33	0.36
V-Frame			0.00			1/2" Ice	14.20	13.87	0.49
(Dish Wireless)			0.00			1" Ice	18.10	18.41	0.62

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP800-11	A	Paraboloid	From	3.00	Worst		120.00	2.80	No Ice	6.16	0.05
(Municipal)		w/Shroud (HP)	Leg	0.00					1/2" Ice	6.53	0.08
				0.00					1" Ice	6.90	0.11
VHLP800-11	B	Paraboloid	From	3.00	Worst		120.00	2.80	No Ice	6.16	0.05
(Municipal)		w/Shroud (HP)	Leg	0.00					1/2" Ice	6.53	0.08
				0.00					1" Ice	6.90	0.11

Truss-Leg Properties

Section Designation	Area	Area Ice	Self Weight	Ice Weight	Equiv. Diameter	Equiv. Diameter Ice	Leg Area
	in^2	in^2	K	K	in	in	in^2
Pirod 194651 (Gr.58)	2147.4000	7415.6426	0.61	2.62	7.4562	25.7488	5.3014
Pirod 195213 (Gr.58)	2279.8092	7408.8085	0.75	2.50	7.9160	25.7250	7.2158
Pirod 195217 (Gr.58)	2279.8092	7294.0816	0.75	2.29	7.9160	25.3267	7.2158
Pirod 196915 (Gr.58)	2413.7763	7138.3308	0.91	1.93	8.3812	24.7859	9.4248

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	10.43					
Bracing Weight	4.83					
Total Member Self-Weight	15.26			-0.75	-0.68	
Total Weight	32.64			-0.75	-0.68	
Wind 0 deg - No Ice		-0.08	-20.55	-1610.28	8.56	-1.46
Wind 30 deg - No Ice		9.70	-16.95	-1348.30	-769.07	-0.19
Wind 60 deg - No Ice		17.72	-10.23	-803.13	-1392.24	-2.75
Wind 90 deg - No Ice		21.04	0.08	8.48	-1642.79	-1.76
Wind 120 deg - No Ice		18.21	10.60	827.03	-1417.79	1.31
Wind 150 deg - No Ice		10.15	17.57	1384.41	-801.44	3.70
Wind 180 deg - No Ice		0.08	20.23	1596.59	-9.91	1.46
Wind 210 deg - No Ice		-9.70	16.95	1346.80	767.72	0.19
Wind 240 deg - No Ice		-18.00	10.39	807.71	1401.44	2.75
Wind 270 deg - No Ice		-21.04	-0.08	-9.99	1641.44	1.76
Wind 300 deg - No Ice		-17.93	-10.44	-822.45	1405.89	-1.31
Wind 330 deg - No Ice		-10.15	-17.57	-1385.91	800.09	-3.70
Member Ice	50.49					
Total Weight Ice	145.88			3.46	24.63	
Wind 0 deg - Ice		-0.01	-10.36	-815.38	26.20	-0.40
Wind 30 deg - Ice		5.14	-8.92	-703.71	-382.41	-0.31
Wind 60 deg - Ice		9.04	-5.21	-407.04	-687.36	-0.89
Wind 90 deg - Ice		10.62	0.01	5.02	-805.51	-0.16
Wind 120 deg - Ice		9.24	5.35	420.91	-696.26	1.37
Wind 150 deg - Ice		5.25	9.08	717.76	-388.33	1.45
Wind 180 deg - Ice		0.01	10.30	820.26	23.07	0.40
Wind 210 deg - Ice		-5.14	8.92	710.63	431.67	0.31
Wind 240 deg - Ice		-9.08	5.24	414.98	738.39	0.89
Wind 270 deg - Ice		-10.62	-0.01	1.90	854.78	0.16
Wind 300 deg - Ice		-9.20	-5.32	-412.97	743.76	-1.37
Wind 330 deg - Ice		-5.25	-9.08	-710.84	437.60	-1.45
Total Weight	32.64			-0.75	-0.68	
Wind 0 deg - Service		-0.03	-6.71	-527.13	1.83	-0.48
Wind 30 deg - Service		3.17	-5.53	-441.58	-252.09	-0.06
Wind 60 deg - Service		5.79	-3.34	-263.57	-455.57	-0.90
Wind 90 deg - Service		6.87	0.03	1.45	-537.38	-0.57
Wind 120 deg - Service		5.95	3.46	268.73	-463.91	0.43
Wind 150 deg - Service		3.31	5.74	450.73	-262.66	1.21
Wind 180 deg - Service		0.03	6.60	520.01	-4.20	0.48
Wind 210 deg - Service		-3.17	5.53	438.45	249.72	0.06

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 240 deg - Service		-5.88	3.39	262.42	456.65	0.90
Wind 270 deg - Service		-6.87	-0.03	-4.58	535.02	0.57
Wind 300 deg - Service		-5.85	-3.41	-269.88	458.10	-0.43
Wind 330 deg - Service		-3.31	-5.74	-453.87	260.29	-1.21

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service

Comb. No.	Description
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 100	3.596	42	0.2720	0.0551
T2	100 - 80	2.459	42	0.2564	0.0368
T3	80 - 60	1.443	42	0.1963	0.0208
T4	60 - 40	0.743	42	0.1256	0.0080
T5	40 - 20	0.300	42	0.0766	0.0027
T6	20 - 0	0.058	42	0.0302	0.0010

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.00	VHLP800-11	42	3.596	0.2720	0.0551	217865
110.00	APXVAARR24_43-U-NA20_TIA w/Mount Pipe	42	3.022	0.2679	0.0457	108933
98.00	DC6-48-60-18-8C-EV	42	2.349	0.2525	0.0351	39547
88.00	NHH-65B-R2B_TIA w/Mount Pipe	42	1.820	0.2247	0.0270	17422
74.00	JMA MX08FR0665-21	42	1.199	0.1739	0.0162	13623

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 100	17.625	22	1.3248	0.2712
T2	100 - 80	12.060	8	1.2571	0.1813
T3	80 - 60	7.077	8	0.9637	0.1027
T4	60 - 40	3.646	8	0.6160	0.0392
T5	40 - 20	1.472	8	0.3755	0.0131
T6	20 - 0	0.288	10	0.1479	0.0050

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.00	VHLP800-11	22	17.625	1.3248	0.2712	49612
110.00	APXVAARR24_43-U-NA20_TIA	22	14.816	1.3114	0.2252	24806

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
	w/Mount Pipe					
98.00	DC6-48-60-18-8C-EV	8	11.519	1.2379	0.1730	8686
88.00	NHH-65B-R2B_TIA w/Mount Pipe	8	8.925	1.1025	0.1332	3631
74.00	JMA MX08FR0665-21	8	5.879	0.8534	0.0802	2789

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	120	Leg	A325N	1.2500	2	12.64	82.83	0.153 ✔	1	Bolt Tension
T2	100	Leg	A325N	1.0000	4	28.32	53.01	0.534 ✔	1	Bolt Tension
T3	80	Leg	A325N	1.0000	6	24.20	53.01	0.457 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	9.17	13.71	0.669 ✔	1	Member Block Shear
T4	60	Leg	A325N	1.2500	6	30.60	82.83	0.369 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	6.43	10.28	0.625 ✔	1	Member Block Shear
T5	40	Leg	A325N	1.2500	6	36.20	82.83	0.437 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	8.72	17.14	0.509 ✔	1	Member Block Shear
T6	20	Diagonal	A325N	0.8750	2	8.32	30.01	0.277 ✔	1	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	1 3/4	20.00	2.43	66.6 K=1.00	2.4053	-26.34	83.36	0.316 [1] ✔
T2	100 - 80	2 1/4	20.00	2.43	51.8 K=1.00	3.9761	-115.43	158.64	0.728 [1] ✔
T3	80 - 60	Pirod 194651 (Gr.58)	20.03	10.02	34.4 K=1.00	5.3014	-157.38	238.57	0.660 [1] ✔
T4	60 - 40	Pirod 195213 (Gr.58)	20.03	10.02	29.5 K=1.00	7.2158	-199.54	333.04	0.599 [1] ✔
T5	40 - 20	Pirod 195217 (Gr.58)	20.03	10.02	29.5 K=1.00	7.2158	-237.40	333.04	0.713 [1] ✔
T6	20 - 0	Pirod 196915 (Gr.58)	20.03	20.03	48.8 K=1.00	9.4248	-238.88	385.15	0.620 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T3	80 - 60	0.5	1.39	113.1	262.42	0.1963	1.85	3.83	0.485 ✔
T4	60 - 40	0.5	1.37	112.1	357.18	0.1963	0.64	3.88	0.167 ✔
T5	40 - 20	0.5	1.37	112.1	357.18	0.1963	2.23	3.88	0.576 ✔
T6	20 - 0	0.5	1.36	111.2	466.53	0.1963	1.14	3.91	0.292 ✔

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	3/4	4.68	2.25	129.8 K=0.90	0.4418	-3.68	5.92	0.622 [1] ✔
T2	100 - 80	7/8	4.68	2.23	110.1 K=0.90	0.6013	-7.99	11.16	0.716 [1] ✔
T3	80 - 60	L2 1/2x2 1/2x1/4	10.97	4.89	119.7 K=1.00	1.1900	-9.97	18.78	0.531 [1] ✔
T4	60 - 40	L2 1/2x2 1/2x3/16	11.93	5.42	131.5 K=1.00	0.9020	-6.76	11.78	0.573 [1] ✔
T5	40 - 20	L2 1/2x2 1/2x5/16	13.80	6.37	156.3 K=1.00	1.4600	-7.95	13.50	0.589 [1] ✔
T6	20 - 0	2L3 1/2x3 1/2x1/4	22.83	11.16	122.2 K=0.99	3.3800	-18.45	51.14	0.361 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	3/4	4.00	3.85	172.7 K=0.70	0.4418	-0.51	3.35	0.152 [1] ✔
T2	100 - 80	3/4	4.00	3.81	170.8	0.4418	-2.13	3.42	0.624 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
					K=0.70				✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8	4.00	3.85	148.0 K=0.70	0.6013	-0.32	6.20	0.052 [1] ✔
T2	100 - 80	1	4.00	3.81	128.1 K=0.70	0.7854	-2.13	10.81	0.197 [1] ✔
T3	80 - 60	L3x3x3/16	4.00	3.00	90.2 K=1.49	1.0900	-2.73	24.99	0.109 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8	4.00	3.85	148.0 K=0.70	0.6013	-1.23	6.20	0.198 [1] ✔
T2	100 - 80	1	4.00	3.81	128.1 K=0.70	0.7854	-2.13	10.81	0.197 [1] ✔

[1] P_u / ϕP_n controls

Mid Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8	4.00	3.85	148.0 K=0.70	0.6013	-0.50	6.20	0.080 [1] ✔
T2	100 - 80	1	4.00	3.81	128.1 K=0.70	0.7854	-0.92	10.81	0.085 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	1 3/4	20.00	0.29	8.0	2.4053	25.27	119.06	0.212 [1] ✔
T2	100 - 80	2 1/4	20.00	0.29	6.2	3.9761	113.30	196.82	0.576 [1] ✔
T3	80 - 60	Pirod 194651 (Gr.58)	20.03	10.02	34.4	5.3014	145.22	262.42	0.553 [1] ✔
T4	60 - 40	Pirod 195213 (Gr.58)	20.03	10.02	29.5	7.2158	183.60	357.18	0.514 [1] ✔
T5	40 - 20	Pirod 195217 (Gr.58)	20.03	10.02	29.5	7.2158	217.18	357.18	0.608 [1] ✔
T6	20 - 0	Pirod 196915 (Gr.58)	20.03	20.03	48.8	9.4248	219.77	466.53	0.471 [1] ✔

[1] $P_u / \phi P_n$ controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T3	80 - 60	0.5	1.39	113.1	262.42	0.1963	1.85	3.83	0.485 ✔
T4	60 - 40	0.5	1.37	112.1	357.18	0.1963	0.64	3.88	0.167 ✔
T5	40 - 20	0.5	1.37	112.1	357.18	0.1963	2.23	3.88	0.576 ✔
T6	20 - 0	0.5	1.36	111.2	466.53	0.1963	1.14	3.91	0.292 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	3/4	4.68	2.25	144.3	0.4418	3.57	19.88	0.179 [1] ✔
T2	100 - 80	7/8	4.68	2.23	122.3	0.6013	7.66	27.06	0.283 [1] ✔
T3	80 - 60	L2 1/2x2 1/2x1/4	10.97	4.89	78.9	0.6816	9.17	33.23	0.276 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T4	60 - 40	L2 1/2x2 1/2x3/16	11.93	5.42	86.2	0.5183	6.43	25.27	0.254 [1] ✔
T5	40 - 20	L2 1/2x2 1/2x5/16	13.80	6.37	103.1	0.8313	8.72	40.53	0.215 [1] ✔
T6	20 - 0	2L3 1/2x3 1/2x1/4	22.83	11.16	125.7	2.1600	16.65	105.30	0.158 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	3/4	4.00	3.85	246.7	0.4418	0.51	19.88	0.026 [1] ✔
T2	100 - 80	3/4	4.00	3.81	244.0	0.4418	2.13	19.88	0.107 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8	4.00	3.85	211.4	0.6013	0.33	27.06	0.012 [1] ✔
T2	100 - 80	1	4.00	3.81	183.0	0.7854	2.13	35.34	0.060 [1] ✔
T3	80 - 60	L3x3x3/16	4.00	3.00	38.3	0.8175	2.73	39.85	0.068 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8	4.00	3.85	211.4	0.6013	1.31	27.06	0.049 [1] ✔
T2	100 - 80	1	4.00	3.81	183.0	0.7854	2.13	35.34	0.060 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$

[1] P_u / ϕP_n controls

Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8	4.00	3.85	211.4	0.6013	0.60	27.06	0.022 [1]
T2	100 - 80	1	4.00	3.81	183.0	0.7854	1.16	35.34	0.033 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	120 - 100	Leg	1 3/4	3	-26.34	83.36	31.6	Pass
		Diagonal	3/4	15	-3.68	5.92	62.2	Pass
		Horizontal	3/4	38	-0.51	3.35	15.2	Pass
		Top Girt	7/8	6	-0.32	6.20	5.2	Pass
		Bottom Girt	7/8	9	-1.23	6.20	19.8	Pass
		Mid Girt	7/8	10	-0.50	6.20	8.0	Pass
T2	100 - 80	Leg	2 1/4	80	-115.43	158.64	72.8	Pass
		Diagonal	7/8	93	-7.99	11.16	71.6	Pass
		Horizontal	3/4	106	-2.13	3.42	62.4	Pass
		Top Girt	1	82	-2.13	10.81	19.7	Pass
		Bottom Girt	1	85	-2.13	10.81	19.7	Pass
		Mid Girt	1	90	-0.92	10.81	8.5	Pass
T3	80 - 60	Leg	Pirod 194651 (Gr.58)	158	-157.38	238.57	66.0	Pass
		Diagonal	L2 1/2x2 1/2x1/4	174	-9.97	18.78	53.1 66.9 (b)	Pass
		Top Girt	L3x3x3/16	160	-2.73	24.99	10.9	Pass
T4	60 - 40	Leg	Pirod 195213 (Gr.58)	176	-199.54	333.04	59.9	Pass
		Diagonal	L2 1/2x2 1/2x3/16	188	-6.76	11.78	57.3 62.5 (b)	Pass
T5	40 - 20	Leg	Pirod 195217 (Gr.58)	191	-237.40	333.04	71.3	Pass
		Diagonal	L2 1/2x2 1/2x5/16	197	-7.95	13.50	58.9	Pass
T6	20 - 0	Leg	Pirod 196915 (Gr.58)	206	-238.88	385.15	62.0	Pass
		Diagonal	2L3 1/2x3 1/2x1/4	213	-18.45	51.14	36.1	Pass
							Summary	
						Leg (T2)	72.8	Pass
						Diagonal (T2)	71.6	Pass
						Horizontal (T2)	62.4	Pass
						Top Girt	19.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
						(T2) Bottom Girt	19.8	Pass
						(T1) Mid Girt	8.5	Pass
						(T2) Bolt Checks	66.9	Pass
						RATING =	**72.8**	**Pass**

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ANCHOR ROD CAPACITY CHECK

Project Information	
Site ID:	BOBDL00004B
Site Name:	BOBDL00004B

Tower Information	
Tower Type:	Self Support
TIA-222 Rev.	G

Applied Load		
	Comp.	Uplift
Axial (k)	268	243
Shear (k)	28	25

Anchor Rod Data			
Quantity (N_anchors):	12		
Diameter of anchor rod (d_anchor):	1	in	
Net tensile area of anchor rod (An):	0.606	sq. in	(AISC, Table 7-17)
Material Grade:	F1554		(AISC, Table 2-6)
Minimum yield stress (Fy)	105	ksi	
Ultimate Tensile Stress (Fub)	125	ksi	
Safety Factor for Anchor (Φ)	0.75		(Section 4.9.9, TIA-222-G, Addendum 2)
Design Tensile Strength of anchor rod (Rnt)=FubxAn	75.75	kips	
Tcap = ΦxRnt=	56.8125	kips	
Eta Factor, η	0.55		For Detail Type C (with grout considered)

Anchor Rod Results			
Axial, Pu	243	kips	Tension (uplift) force for anchor detail type A, B and C
Shear, Vu	25	kips	Direct shear force corresponding to Pu
Max Load per anchor [Tmax=(Pu+Vu/η)/Nanchors]	24.04	kips	(Section 4.9.9, TIA-222-G, Addendum 2)
Anchor Rod Capacity = Tmax/Tcap=	42.3%	OK!	

Pier and Pad Foundation

SITE ID	BOBDL00004B
Site Name:	BOBDL00004B

TIA-222 Revision:	G
Tower Type:	Self Support

Block Foundation?:	☐

Superstructure Analysis Reactions

Compression, P_{comp}:	268	kips
Compression Shear, Vu_comp:	28	kips
Uplift, P_{uplift}:	243	kips
Uplift Shear, V_{u_uplift}:	25	kips
Tower Height, **H**:	120	ft
Base Face Width, **BW**:	12	ft
BP Dist. Above Fdn, bp_{dist}:		in

Foundation Analysis Checks

	Capacity	Demand	Rating	Check
Uplift (kips)	349.19	243.00	**69.6%**	**Pass**
Lateral (Sliding) (kips)	62.85	28.00	**44.6%**	**Pass**
Bearing Pressure (ksf)	2.61	1.30	**49.9%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	1023.24	140.00	**13.7%**	**Pass**
*Pier Flexure (Tension) (kip*ft)*	449.61	125.00	**27.8%**	**Pass**
Pier Compression (kip)	6889.11	276.66	**4.0%**	**Pass**
*Pad Flexure (kip*ft)*	1238.27	577.58	**46.6%**	**Pass**
Pad Shear - 1-way (kips)	388.39	102.34	**26.3%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.201	0.105	**52.3%**	**Pass**

Pier Properties

Pier Shape:	Circular	
Pier Diameter, **dpier**:	3.5	ft
Ext. Above Grade, **E**:	0.5	ft
Pier Rebar Size, **Sc**:	7	
Pier Rebar Quantity, **mc**:	16	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:		
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Soil Rating:	**69.6%**
Structural Rating:	**52.3%**

Pad Properties

Depth, **D**:	6	ft
Pad Width, **W**:	23.5	ft
Pad Thickness, **T**:	1.5	ft
Pad Rebar Size, **Sp**:	7	
Pad Rebar Quantity, **mp**:	35	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties

Rebar Grade, **Fy**:	60000	psi
Concrete Compressive Strength, **F'c**:	4500	psi
Dry Concrete Density, δc:	150	pcf

Soil Properties

Total Soil Unit Weight, γ:	100	pcf
Ultimate Net Bearing, Qnet:	2.876	ksf
Cohesion, **Cu**:	0.100	ksf
Friction Angle, φ:	0	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:		
Neglected Depth, **N**:	3.00	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	10.5	ft

<--Toggle between Gross and Net

Attachment 6

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SECTOR MOUNT ANALYSIS REPORT

dish wireless.

SITE ID: **BOBDL00004B**
Rev.1 - 04/26/2022
PASS (57%)

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MOUNT ANALYSIS REPORT

Site Information				
Site ID:	BOBDL00004B			
Site Address:	435 Mill St, Southington, CT 06489			
Coordinates	**N. Lat.**	41.604700	**W. Lon.**	72.893900

New Proposed Mount Information	
Size / Type:	V-frame
Manufacturer:	CommScope
Model:	**MTC3975083**
Tower Profile:	Self-Supporting Structure

As requested, we have performed a mount 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
CD	Nexius	BOBDL00004B_CD100_20220425_REV 1	4/25/2022
RF Design Sheet	Dish Wireless	RFDS-BOBDL00004B-Preliminary-20220119-v.2	1/19/2022
Assembly Drawings	CommScope	MTC3975083_AD C.pdf *	12/17/2021

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

ANALYSIS CRITERIA:

This structural analysis has been performed in accordance with the **2018 Connecticut State Building Code/2015 IBC with Connecticut Amendments** as well as the **ANSI/TIA-222-G-05** "Structural Standards for Antenna Supporting Structures and Antennas".

The analysis design parameters considered in this analysis are presented in Table 2.

TABLE 2 – ANALYSIS / DESIGN PARAMETERS

Parameter	Value
Ultimate Wind Speed (3-Sec), V_{ult} =	**135 mph***
Nominal Wind Speed (3-sec), **V** =	**104.6 mph**
Basic Wind speed with Ice, V_i =	**50 mph**
Design Radial Ice Thickness, t_i =	**1.00 in**
Exposure Category	**B**
Risk Category (Structure Class)	**III**
Topographic Category	**I**
Seismic Parameter, S_1 =	**0.064**
Seismic Parameter, S_{DS} =	**0.197**

*135 mph ultimate wind speed as required by the jurisdiction.

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
74	3	**JMA MX08FR0665-21**	**Antenna**
	3	**FUJITSU TA08025-B604**	**RRU, TMA, Filter**
	3	**FUJITSU TA08025-B605**	**RRU, TMA, Filter**
	1	**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 "MTC3975083"

Component	Capacity (%) *	Assessment *
Face Horizontal	9	Pass
Standoff Arms	21	Pass
Diagonal	**57**	**Pass**
Mount Pipes	18	Pass
Tie Back	6	Pass
Standoff Vertical	7	Pass
V-Arm Inner Plates	20	Pass
V-Arm Outer Plates	17	Pass
Leg Connection Check	32	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 7.

-The proposed installation shall have (3) CommScope MTC3975083 sector mounts and shall follow the proposed layout provided in Appendix A (please refer to the attached).

-The mount shall have only (3) antenna pipes centered vertically and equally spaced on the face horizontal of the sector frame. Use CommScope MT54696120 or equivalent.

-The antennas shall have a maximum vertical offset of 6 inches from the mount centerline.

- The RRHs shall be installed above the top face horizontal, back-to-back behind the antenna using Sabre RRU Bracket Mount C10123155.

- Install as per manufacturer instructions.

Please note that the proposed Raycap RDIDC-9181-PF-48 shall be installed on to new CommScope pipe part #MT-650-63 (1 per sector) or equivalent connected to the V-frame arm adjacent to position #1. Fasten the pipe using XP-2020 crossover plates (2 per sector). The OVP shall be connected to the pipe using Sabre Z-bracket C10123151.

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:

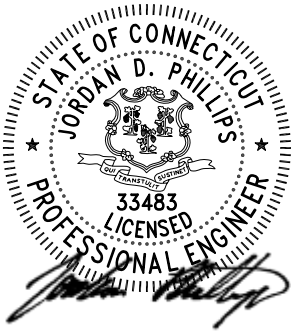
Binod Paudel, P.E.

binod.paudel@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

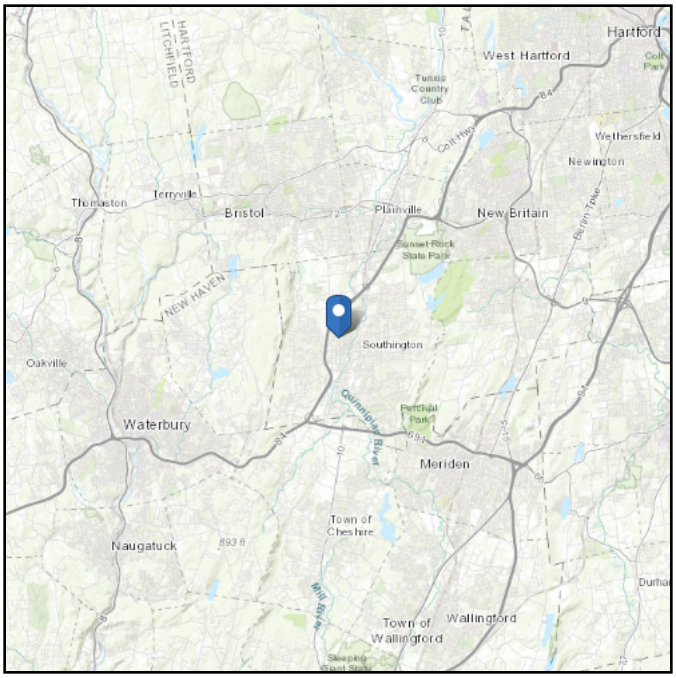
1. The evaluation assumes that the structure has been properly designed, constructed or structurally modified and maintained in accordance with the TIA-222-G Standard or a previous edition of this standard and that all items related to the integrity of the structure have been corrected and addressed.
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: III
Soil Class: D - Stiff Soil

Elevation: 312.85 ft (NAVD 88)
Latitude: 41.6047
Longitude: -72.8939



Wind

Results:

Wind Speed	131 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	92 Vmph
100-year MRI	99 Vmph

135 Vmph REQUIRED BY JURISDICTION

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

Date Accessed: Tue Feb 08 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 3% probability of exceedance in 50 years (annual exceedance probability = 0.000588, MRI = 1,700 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.

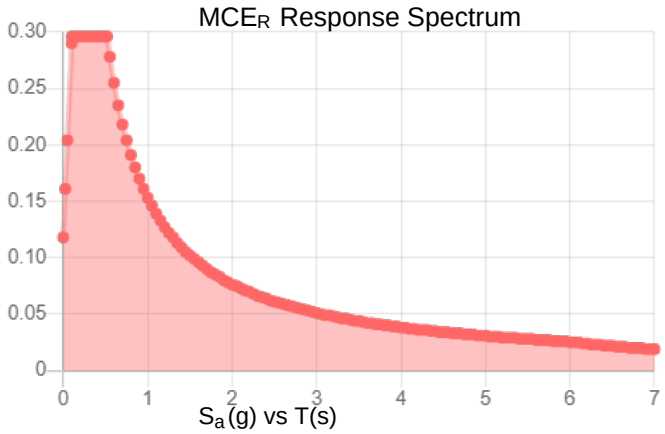
Seismic

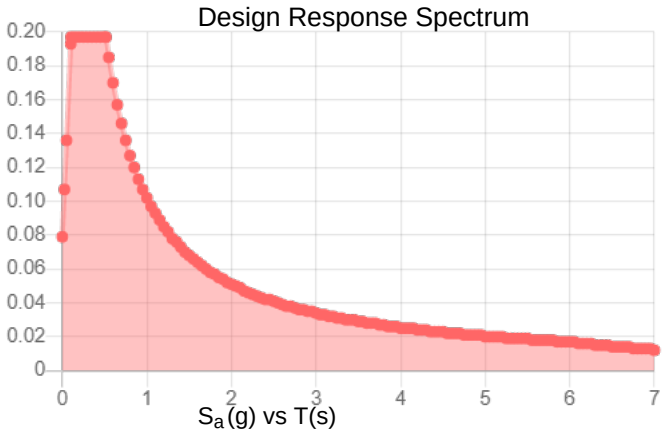
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.185	S_{DS} :	0.197
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.095
S_{MS} :	0.296	PGA_M :	0.152
S_{M1} :	0.153	F_{PGA} :	1.6
		I_e :	1.25

Seismic Design Category B





Data Accessed: **Tue Feb 08 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:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Tue Feb 08 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.

Snow

Results:

Ground Snow Load, p_g:	30 lb/ft^2
Elevation:	312.9 ft
Data Source:	ASCE/SEI 7-10, Fig. 7-1.
Date Accessed:	Tue Feb 08 2022

Values provided are ground snow loads. In areas designated "case study required," extreme local variations in ground snow loads preclude mapping at this scale. Site-specific case studies are required to establish ground snow loads at elevations not covered.

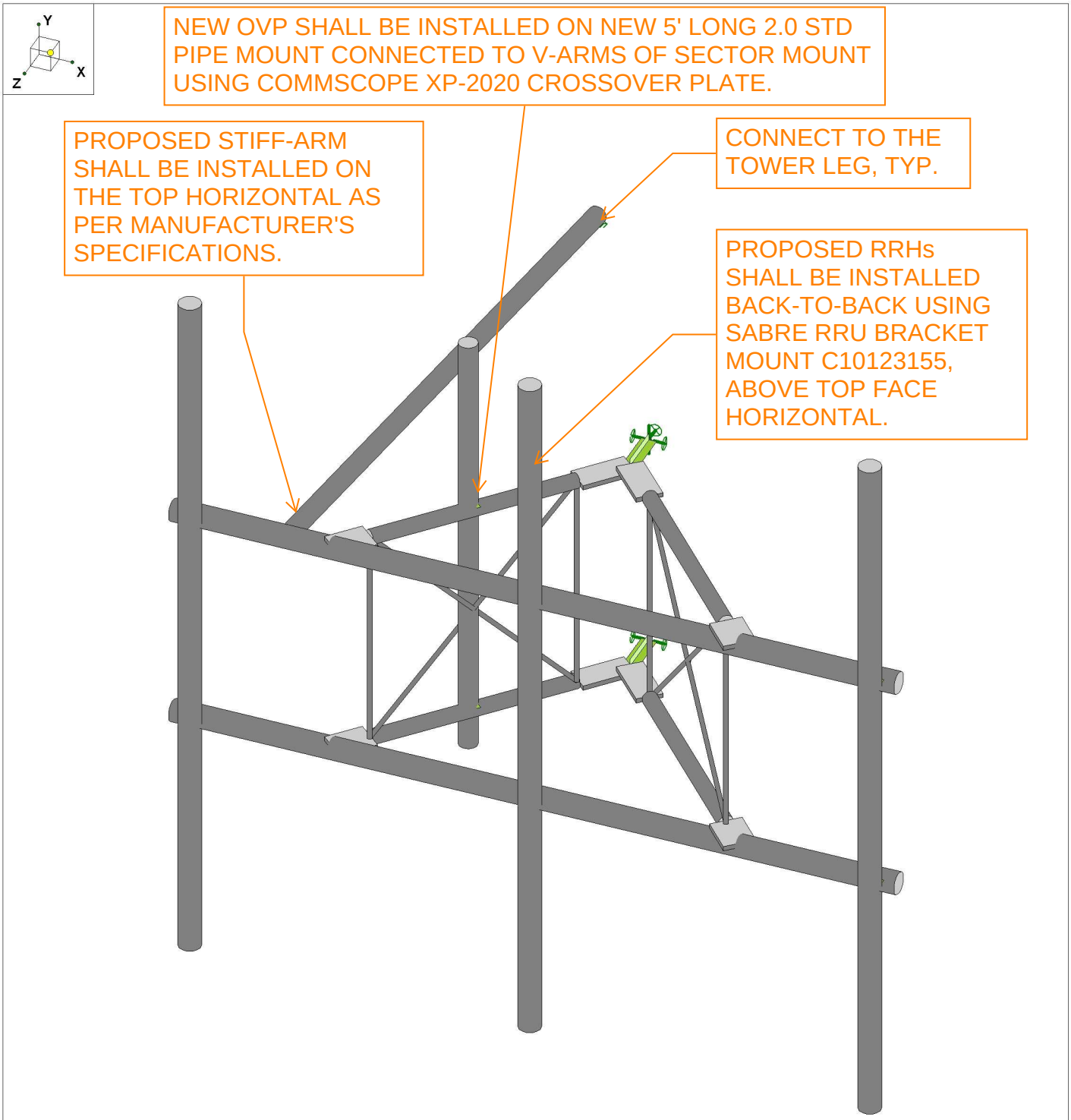
The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

APPENDIX A:

PROPOSED MOUNT LAYOUT



NEXIUS	BOBDL00004B	RENDERED
BP		Feb 8, 2022 at 4:23 PM
BOBDL00004B		BOBDL00004B MA.r3d

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Mount Analysis Loading Calculations

Legend
Input
Calculated
Notes

Site ID	BOBDL00004B
TIA-222 Code Rev.	G

Basic Parameters		
Mount Height	74	ft
Exposure Category	B	(B,C, or D)
Nominal Wind Speed	104.6	mph
Ice Wind Speed	50	mph
Design Ice Thickness, t_i	1	in
Maintenance Wind Speed	30	mph
Run Earthquake Analysis?	Yes	
Ground Elevation	313	ft, ASCE Hazard Tool
S_1	0.064	USGS
S_{DS}	0.197	2.7.5
Vertical Seismic Loads, E_v	0.039	2.7.6
Seismic Response Coefficient, C_s	0.099	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	0.907	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	24.128	psf, 2.6.9.6
C/D	99.605	Table 2-8
t_{iz}	2.168	in, 2.6.8
q_{iz}	5.513	psf, 2.6.9.6
C/D_{iz}	47.612	Table 2-8
$q_{Maintenance}$	1.786	psf, 2.6.9.6
$C/D_{Maintenance}$	28.567	Table 2-8
Ice Dead, Grating	0.020236647	ksf

Mounting Pipes (Orientation Drawn Top-Down)

Risa 3D Label	Elevation (ft)	Length (in)	Diameter (in)
M29A	74	96	2.875
M41	74	60	2.375

Appurtenances

Model	Type	Height (in)	Width (in)	Depth (in)	Weight (lbs)
JMA WIRELESS MX08FRO665-21	Antenna	72	20	8	82.5
FUJITSU TA08025-B605	RRU, TMA, Etc.	14.9	15.7	9	74.95
FUJITSU TA08025-B604	RRU, TMA, Etc.	14.9	15.7	7.8	63.9
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 %
M29A	JMA WIRELESS MX08FRO665-21	1	0	100.0%	100.0%	Antenna	72.000	20.000	8.000	82.500	12.489	5.867	0.301	0.142	15.0%	75.0%
M29A	FUJITSU TA08025-B605	1	90	100.0%	100.0%	RRU, TMA, Etc.	14.900	15.700	9.000	74.950	1.949	1.118	0.027	0.047	10.0%	10.0%
M29A	FUJITSU TA08025-B604	1	90	100.0%	100.0%	RRU, TMA, Etc.	14.900	15.700	7.800	63.900	1.949	0.969	0.023	0.047	10.0%	10.0%
M29A																
M29A																
M29A																
M41	RAYCAP RDIDC-9181-PF-48	1	0	100.0%	100.0%	RRU, TMA, Etc.	18.980	14.390	8.150	21.820	2.276	1.289	0.055	0.031	15.0%	15.0%
M41																
M41																
M41																
M41																
M41																

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Site ID: BOBDL00004B

		Shear X (k)		Vertical Y (k)		Shear Z (k)		MX (k-ft)		MY (k-ft)		MZ (k-ft)	Combined Shear (X +Y)+(Mz/Arm)	Axial Tension	Combined Tension (Tension)+[Mx/(HtPL/2)]
N48	max	1.0136	59	0.8406	22	0.7449	4	-0.2217	13	0	109	0.2167	1.591	0.000	1.064
N48	min	-0.9607	41	0.3082	7	-1.7699	10	-0.6491	19	0	1	-0.2385	0.708	1.770	4.886
N49	max	0.9235	48	0.8365	16	1.4633	14	-0.2305	11	0	109	0.219	1.523	0.000	1.106
N49	min	-0.9762	54	0.3078	13	0.1946	8	-0.6457	18	0	1	-0.2387	0.722	0.000	3.099

TIA-222-H **Section 4-9 - Connections**

Main Connection @ Leg Support

Qty.	2						
Bolt/Rod Dia.	0.625	in.	Fyb	Fub			
Bolt/Rod Grad	A449		92	120	ksi	UNC 11	Bolt threads per inch
Thread(s)	N	**N** = Included / **X** = Excluded				Ab 0.3068	in^2
Horiz. Dist. Between Bolts	9.5	in.				An 0.2260	in^2
Leg Dia / Width	2	in.	Ecc=	3.75	in.		

Front Support Member

Angle/Channel/Plate Ht.	5	in.			
Thickness	0.313	in.	Fyb	Fub	
Grade	A36		36	58	ksi
Edge Dist.	1	in. (Le)			
Slotted Hole	No	**N** = No / **Y** = Yes	Lc=	0.65625	in

Back Support Member

Back Member Type	Channel		Fyb	Fub	
Steel Grade	A36		36	58	ksi
Height	3.5	in.			
Width	2.6	in. (Note: Enter " **0** " for plate or flat bar)			
Thickness	0.31	in.			

Zy 1.7486 in.^3 (Plastic Modulus) https://calcresource.com/cross-sections.html

Strength Factors

Φv	0.75	Shear
Φt	0.75	Tension
Φb	0.80	Bearing
Φf	0.90	Flexure

Rb 1 Conn. length reduction factor (= to **1.00** for single bolt conn. or **Lb < 16 in.**) (**Lb** = dist. between bolts in same line of force)

ΦRnv	13.806	kips	Single Bolt/Rod **Shear** Strength		
ΦRnt	20.340	kips	Single Bolt/Rod **Tension** Strength	14.160	27.231
ΦRnb	14.160	kips	Single Bolt/Rod Member **Bearing** Strength (**Front**)	9.531	22.693
ΦRnb	14.024	kips	Single Bolt/Rod Member **Bearing** Strength (**Back**)		

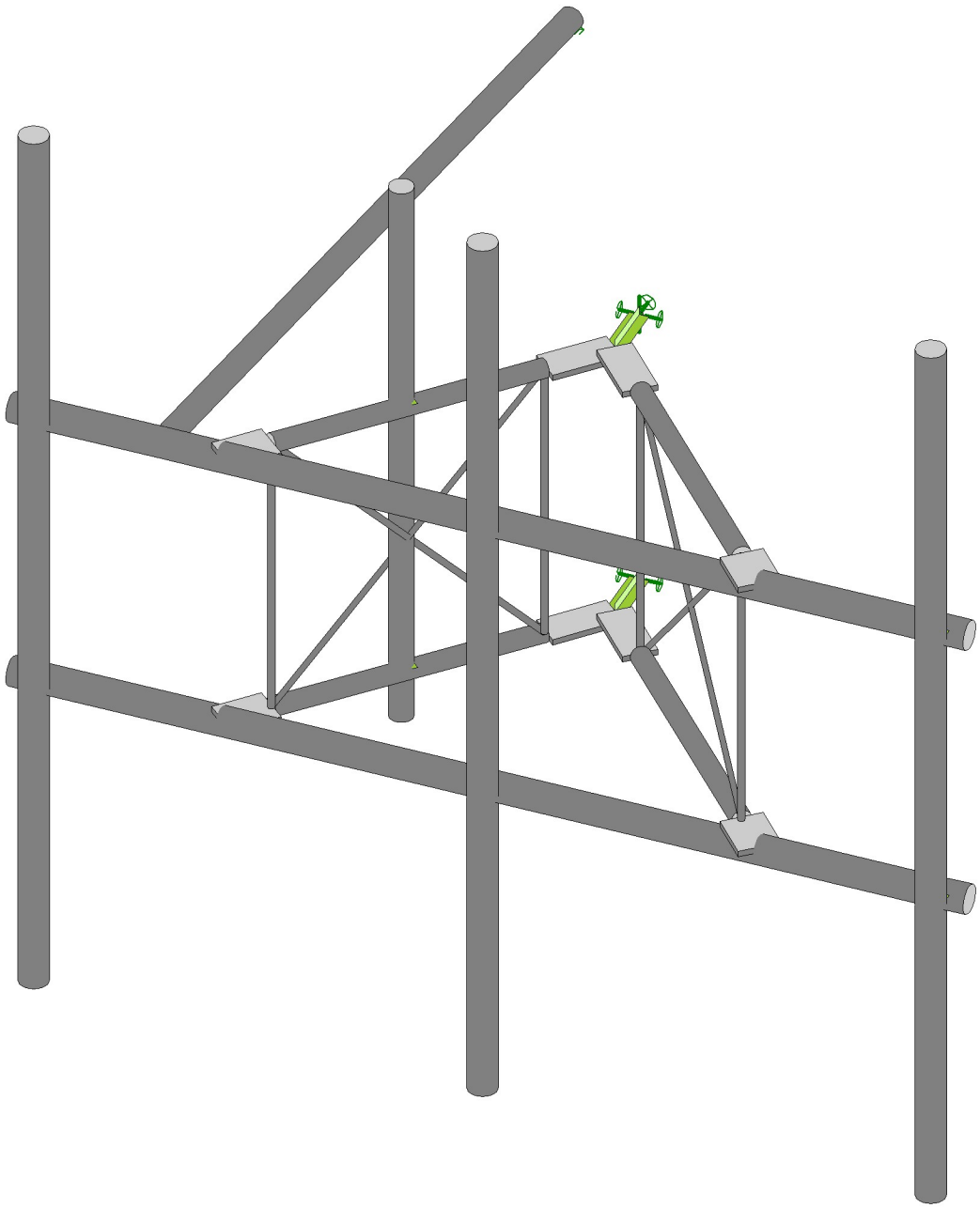
Combined Shear & Tension - Section 4.9.6.4

		Shear		Tension	Unity Check	Result
N48	V/ΦRnv=	0.058	T/ΦRnt=	0.052	0.078	Pass
N48	V/ΦRnv=	0.026	T/ΦRnt=	0.240	0.242	Pass
N49	V/ΦRnv=	0.055	T/ΦRnt=	0.054	0.077	Pass
N49	V/ΦRnv=	0.026	T/ΦRnt=	0.152	0.155	Pass

		Controlling Shear/Bearing		Tension	Unity Check	Result
N48	V/ΦRnv=	0.058	T/ΦRnt=	0.052	0.078	Pass
N48	V/ΦRnv=	0.026	T/ΦRnt=	0.240	0.242	Pass
N49	V/ΦRnv=	0.055	T/ΦRnt=	0.054	0.077	Pass
N49	V/ΦRnv=	0.026	T/ΦRnt=	0.152	0.155	Pass

		Back Bracket Bending	Unity Check	Result
N48	M/ΦMn	0.070	0.070	Pass
N48	M/ΦMn	0.323	0.323	Pass
N49	M/ΦMn	0.073	0.073	Pass
N49	M/ΦMn	0.205	0.205	Pass

	Unity Check	Result
Controlling Unity Check	0.323	< **1.000 Pass**



Envelope Only Solution

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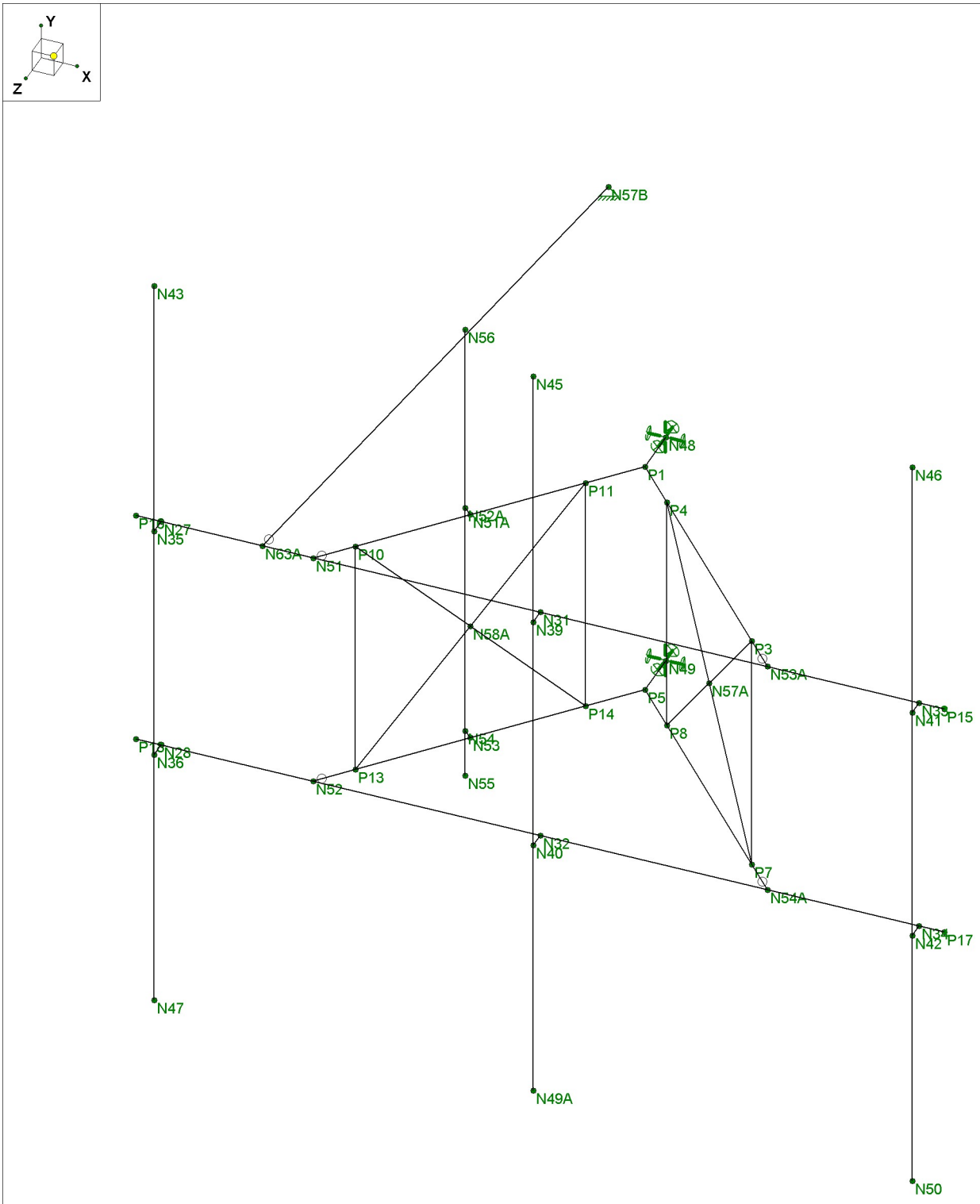

Envelope Only Solution

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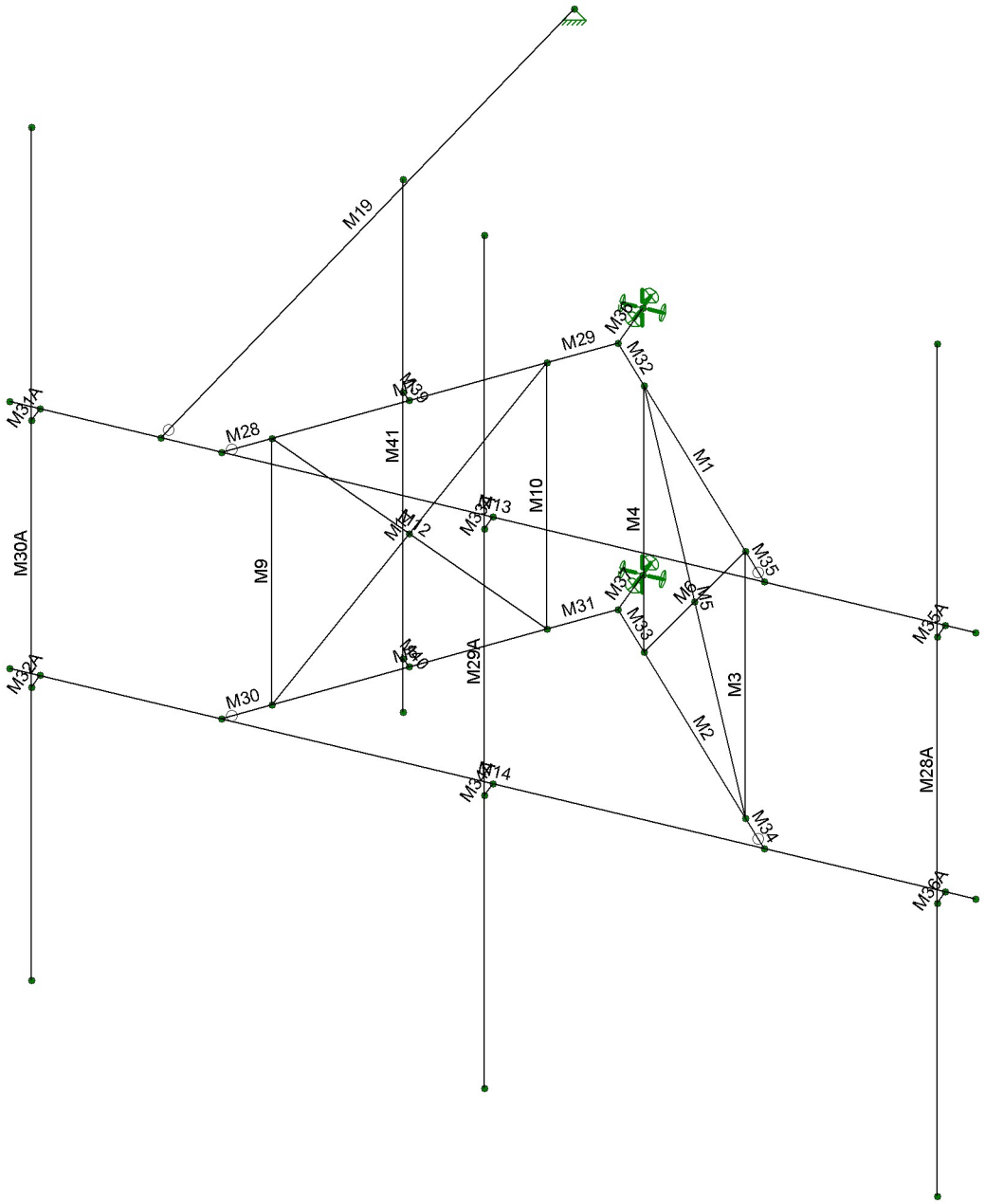

Envelope Only Solution

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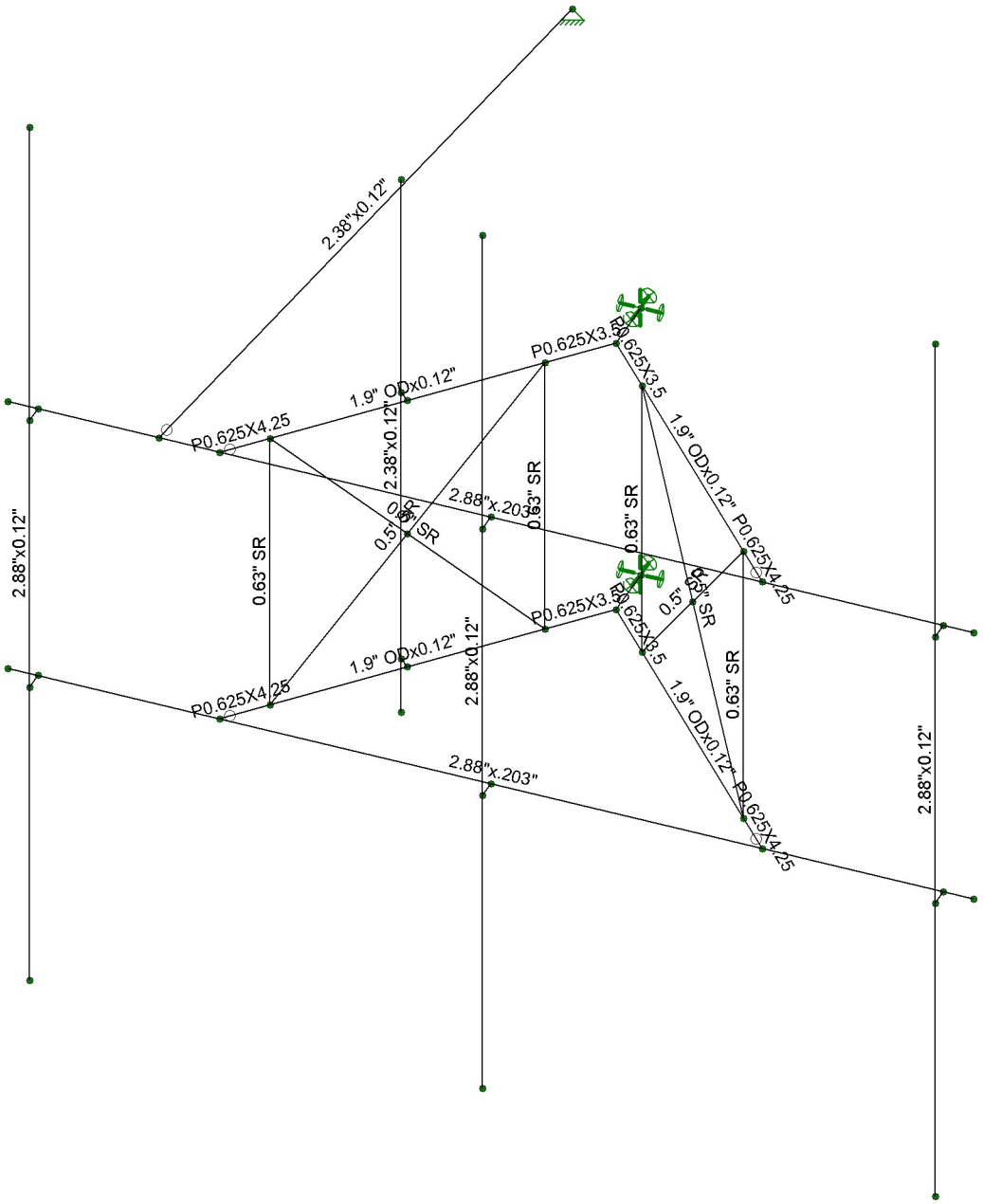

Envelope Only Solution

NEXIUS	BOBDL00004B	SHAPES
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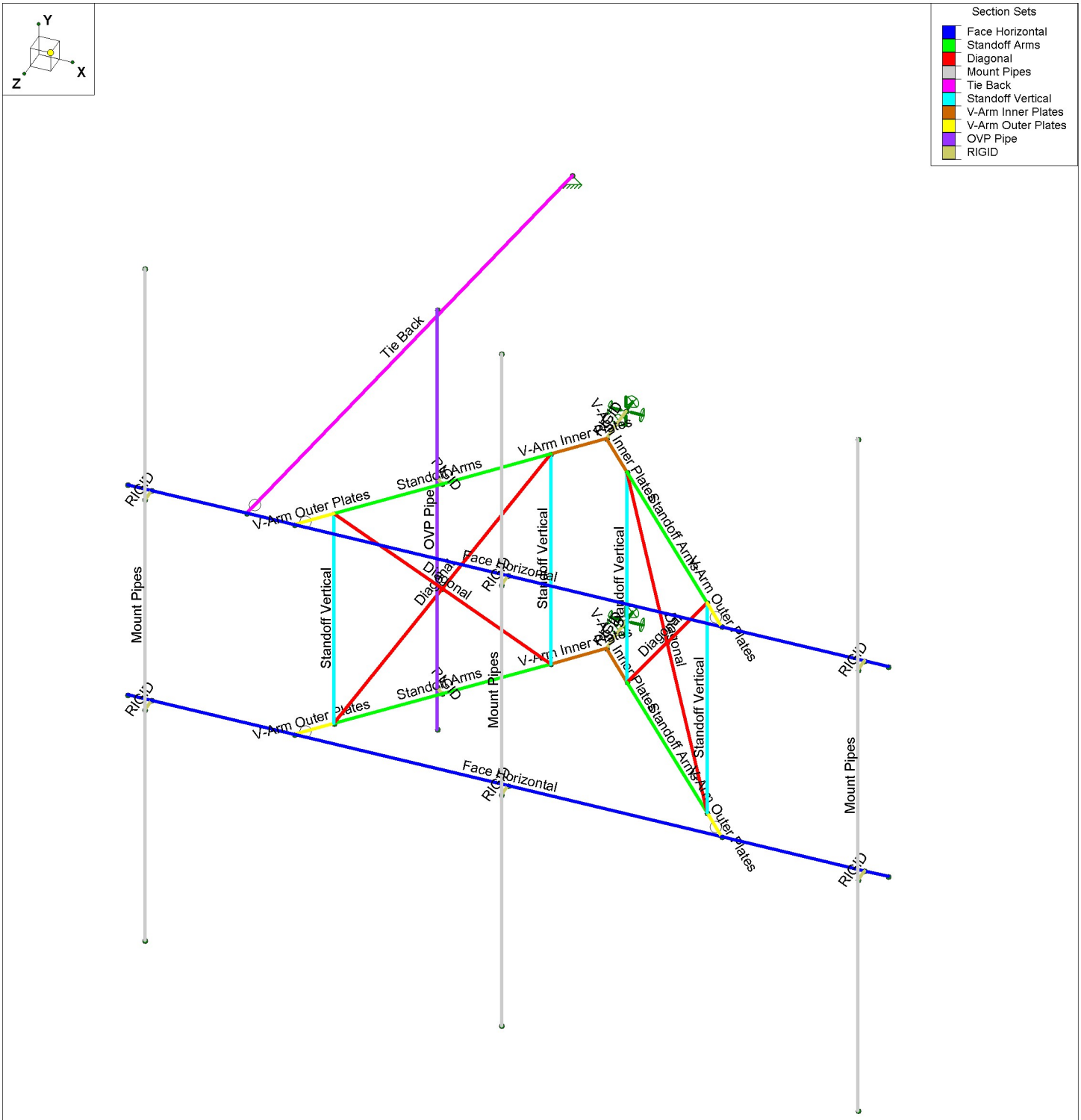

Envelope Only Solution

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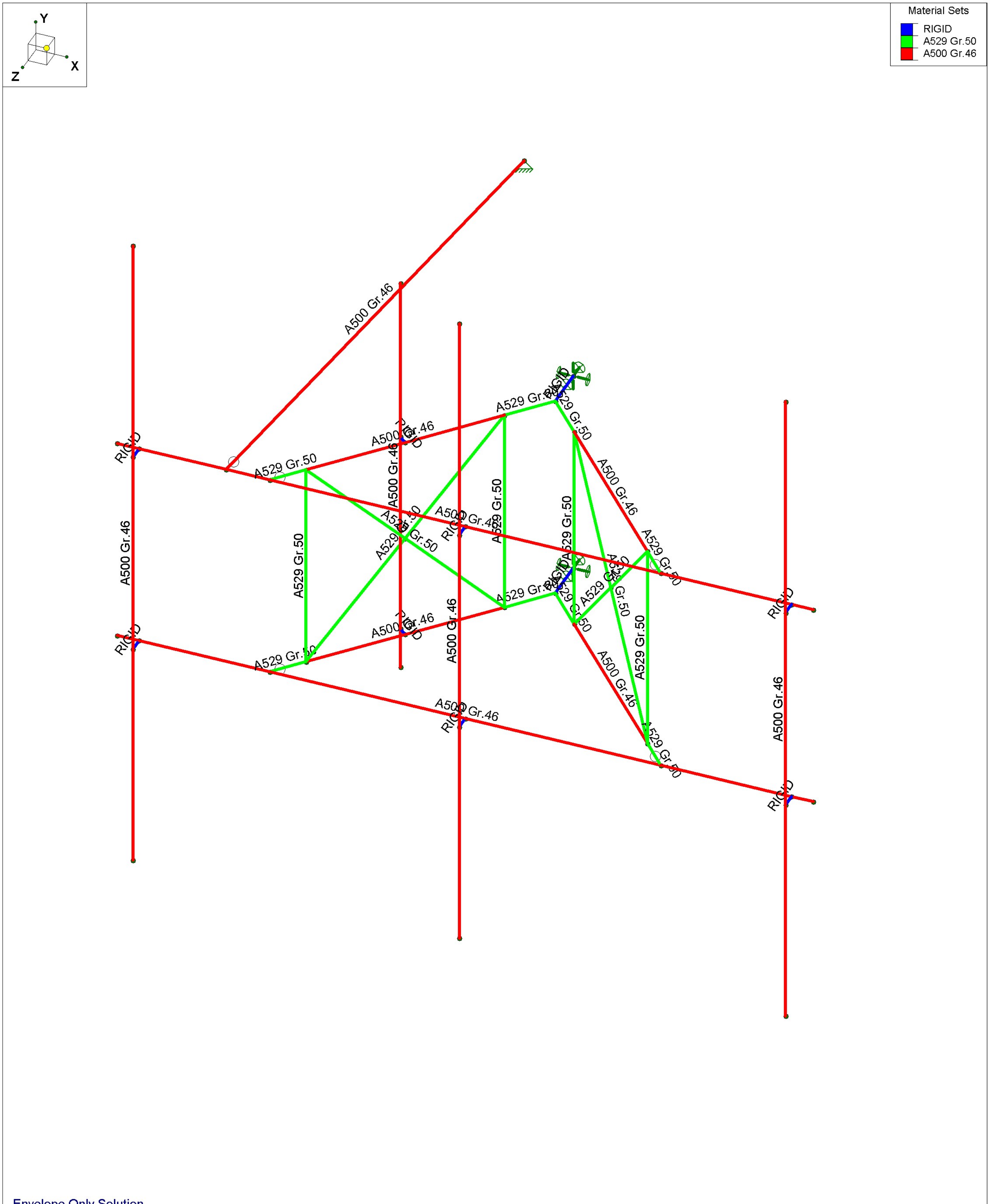

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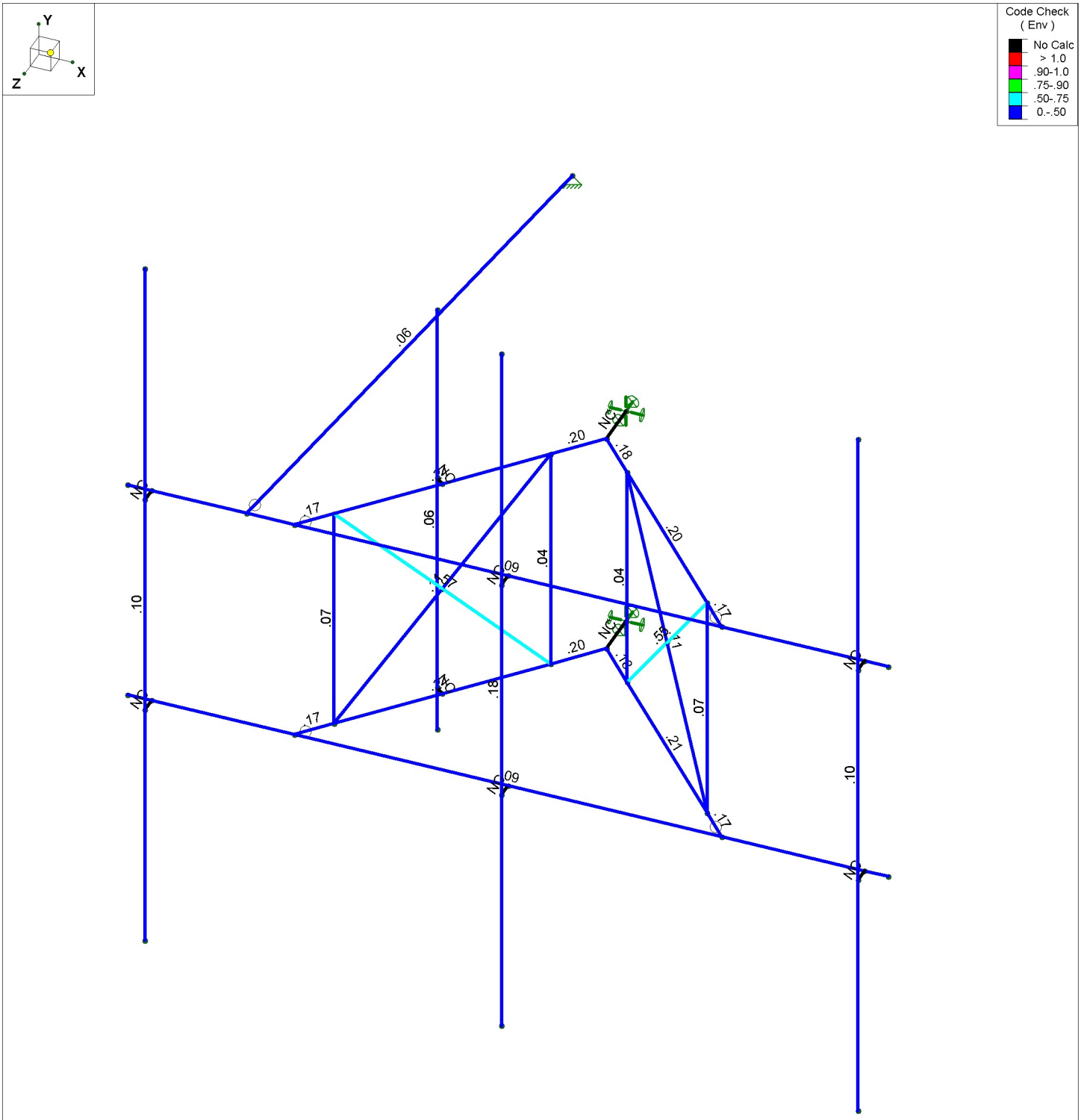
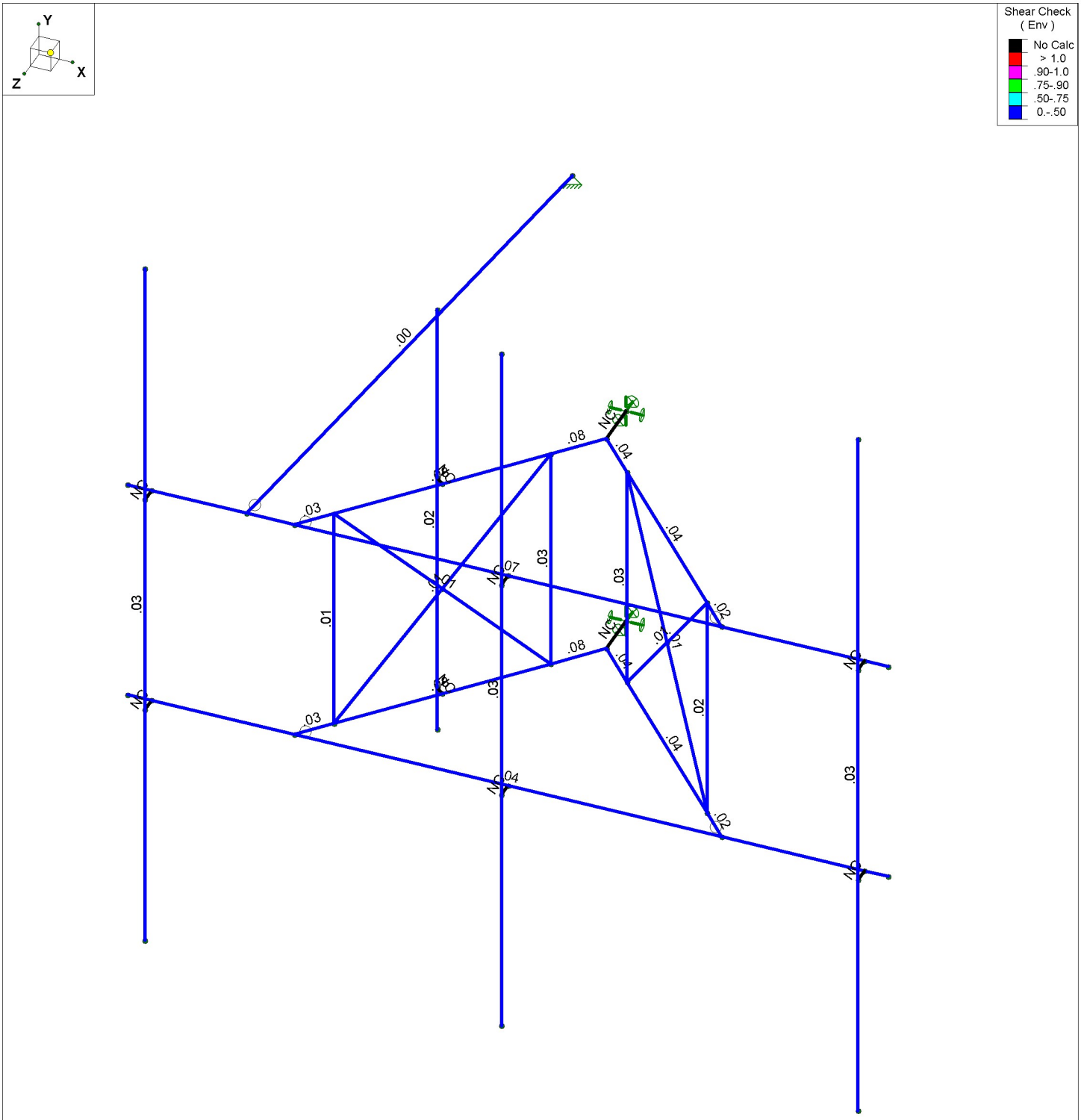


Member Code Checks Displayed (Enveloped)
Envelope Only Solution



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

NEXIUS	BOBDL00004B	SHEAR CHECK
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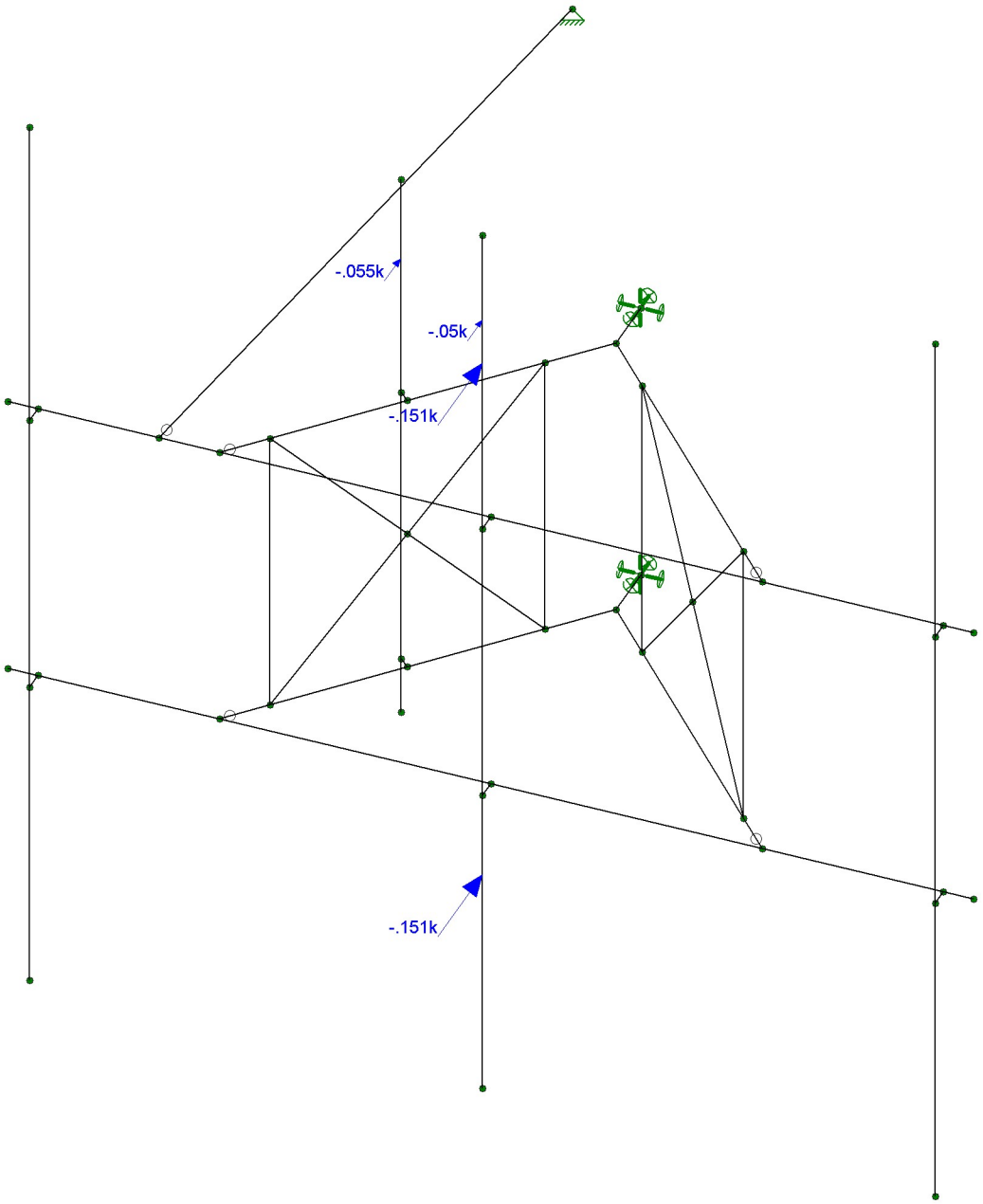

Loads: BLC 3, Full Wind Antenna (0 Deg)
Envelope Only Solution

NEXIUS	BOBDL00004B	FRONT WIND LOAD
BP		Feb 11, 2022 at 5:36 PM
BOBDL00004B		BOBDL00004B.r3d

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1...	Density[k/f...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A529 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
3	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.4	58	1.3
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.4	58	1.3
6	A53 Gr B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Face Horizontal	2.88"x.203"	Beam	Pipe	A500 Gr.46	Typical	1.707	1.538	1.538	3.076
2	Standoff Arms	1.9" ODx0.12"	Beam	Pipe	A500 Gr.46	Typical	.671	.267	.267	.534
3	Diagonal	0.5" SR	Column	BAR	A529 Gr.50	Typical	.196	.003	.003	.006
4	Mount Pipes	2.88"x0.12"	Column	Pipe	A500 Gr.46	Typical	1.04	.993	.993	1.985
5	Tie Back	2.38"x0.12"	Beam	Pipe	A500 Gr.46	Typical	.852	.545	.545	1.091
6	Standoff Vertical	0.63" SR	Column	BAR	A529 Gr.50	Typical	.312	.008	.008	.015
7	V-Arm Inner Plates	P0.625X3.5	Beam	RECT	A529 Gr.50	Typical	2.5	.081	3.333	.293
8	V-Arm Outer Plates	P0.625X4.25	Beam	RECT	A529 Gr.50	Typical	2.656	.086	3.998	.314
9	OVP Pipe	2.38"x0.12"	Column	Pipe	A500 Gr.46	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	P1						
2	P5						
3	N48	Reaction	Reaction	Reaction	Reaction		Reaction
4	N49	Reaction	Reaction	Reaction	Reaction		Reaction
5	N57B	Reaction	Reaction	Reaction			

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	Standoff Arms	2.333			Lbyy						Lateral
2	M2	Standoff Arms	2.333			Lbyy						Lateral
3	M3	Standoff Vertical	2.5			Lbyy			.7	.7		Lateral
4	M4	Standoff Vertical	2.5			Lbyy			.7	.7		Lateral
5	M5	Diagonal	3.42	1.658	1.658	Lbyy	1.658	1.658	.9	.9		Lateral
6	M6	Diagonal	3.42	1.658	1.658	Lbyy	1.658	1.658	.9	.9		Lateral
7	M7	Standoff Arms	2.333			Lbyy						Lateral
8	M8	Standoff Arms	2.333			Lbyy						Lateral
9	M9	Standoff Vertical	2.5			Lbyy			.7	.7		Lateral
10	M10	Standoff Vertical	2.5			Lbyy			.7	.7		Lateral
11	M11	Diagonal	3.42	1.658	1.658	Lbyy	1.658	1.658	.9	.9		Lateral
12	M12	Diagonal	3.42	1.658	1.658	Lbyy	1.658	1.658	.9	.9		Lateral
13	M13	Face Horizontal	8	5	5	5	5	5				Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
14	M14	Face Horizontal	8	4.5	4.5	4.5	4.5	4.5				Lateral
15	M19	Tie Back	6.506			Lbyy						Lateral
16	M28	V-Arm Outer Plates	.428			Lbyy						Lateral
17	M29	V-Arm Inner Plates	.6			Lbyy						Lateral
18	M30	V-Arm Outer Plates	.428			Lbyy						Lateral
19	M31	V-Arm Inner Plates	.6			Lbyy						Lateral
20	M32	V-Arm Inner Plates	.6			Lbyy						Lateral
21	M33	V-Arm Inner Plates	.6			Lbyy						Lateral
22	M34	V-Arm Outer Plates	.428			Lbyy						Lateral
23	M35	V-Arm Outer Plates	.428			Lbyy						Lateral
24	M28A	Mount Pipes	8									Lateral
25	M29A	Mount Pipes	8									Lateral
26	M30A	Mount Pipes	8									Lateral
27	M41	OVP Pipe	5			Lbyy						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, k*s^2*ft)]
1	N32	L	Y	-.5

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, k*s^2*ft)]
1	N34	L	Y	-.5

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, k*s^2*ft)]
1	N28	L	Y	-.5

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, k*s^2*ft)]
1	P17	L	Y	-.25

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, k*s^2*ft)]
1	P18	L	Y	-.25

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, k*s^2*ft)]
1	N32	L	Y	-.25

Member Point Loads (BLC 1 : Dead)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M29A	Y	-.041	%15
2	M29A	Y	-.075	%10
3	M29A	Y	-.064	%10
4	M41	Y	-.022	%15
5	M29A	Y	-.041	%75

Member Point Loads (BLC 2 : Ice Dead)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M29A	Y	-.188	%15
2	M29A	Y	-.067	%10

Member Point Loads (BLC 2 : Ice Dead) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
3	M29A	Y	-.065	%10
4	M41	Y	-.078	%15
5	M29A	Y	-.188	%75

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M29A	Z	-.151	%15
2	M29A	Z	-.027	%10
3	M29A	Z	-.023	%10
4	M41	Z	-.055	%15
5	M29A	Z	-.151	%75

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M29A	Z	-.113	%15
2	M29A	Z	-.028	%10
3	M29A	Z	-.025	%10
4	M41	Z	-.042	%15
5	M29A	Z	-.113	%75
6	M29A	X	.065	%15
7	M29A	X	.016	%10
8	M29A	X	.015	%10
9	M41	X	.024	%15
10	M29A	X	.065	%75

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M29A	Z	-.045	%15
2	M29A	Z	-.021	%10
3	M29A	Z	-.021	%10
4	M41	Z	-.019	%15
5	M29A	Z	-.045	%75
6	M29A	X	.079	%15
7	M29A	X	.036	%10
8	M29A	X	.036	%10
9	M41	X	.032	%15
10	M29A	X	.079	%75

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M29A	Z	0	%15
2	M29A	Z	0	%10
3	M29A	Z	0	%10
4	M41	Z	0	%15
5	M29A	Z	0	%75
6	M29A	X	.071	%15
7	M29A	X	.047	%10
8	M29A	X	.047	%10
9	M41	X	.031	%15
10	M29A	X	.071	%75

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M29A	Z	.045	%15

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
2	M29A	Z	.021	%10
3	M29A	Z	.021	%10
4	M41	Z	.019	%15
5	M29A	Z	.045	%75
6	M29A	X	.079	%15
7	M29A	X	.036	%10
8	M29A	X	.036	%10
9	M41	X	.032	%15
10	M29A	X	.079	%75

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M29A	Z	.113	%15
2	M29A	Z	.028	%10
3	M29A	Z	.025	%10
4	M41	Z	.042	%15
5	M29A	Z	.113	%75
6	M29A	X	.065	%15
7	M29A	X	.016	%10
8	M29A	X	.015	%10
9	M41	X	.024	%15
10	M29A	X	.065	%75

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M29A	Z	-.044	%15
2	M29A	Z	-.012	%10
3	M29A	Z	-.011	%10
4	M41	Z	-.02	%15
5	M29A	Z	-.044	%75

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M29A	Z	-.034	%15
2	M29A	Z	-.011	%10
3	M29A	Z	-.011	%10
4	M41	Z	-.016	%15
5	M29A	Z	-.034	%75
6	M29A	X	.019	%15
7	M29A	X	.007	%10
8	M29A	X	.006	%10
9	M41	X	.009	%15
10	M29A	X	.019	%75

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M29A	Z	-.015	%15
2	M29A	Z	-.008	%10
3	M29A	Z	-.008	%10
4	M41	Z	-.008	%15
5	M29A	Z	-.015	%75
6	M29A	X	.025	%15
7	M29A	X	.014	%10
8	M29A	X	.014	%10
9	M41	X	.013	%15

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
10	M29A	X	.025	%75

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M29A	Z	0	%15
2	M29A	Z	0	%10
3	M29A	Z	0	%10
4	M41	Z	0	%15
5	M29A	Z	0	%75
6	M29A	X	.025	%15
7	M29A	X	.018	%10
8	M29A	X	.018	%10
9	M41	X	.013	%15
10	M29A	X	.025	%75

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M29A	Z	.015	%15
2	M29A	Z	.008	%10
3	M29A	Z	.008	%10
4	M41	Z	.008	%15
5	M29A	Z	.015	%75
6	M29A	X	.025	%15
7	M29A	X	.014	%10
8	M29A	X	.014	%10
9	M41	X	.013	%15
10	M29A	X	.025	%75

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M29A	Z	.034	%15
2	M29A	Z	.008	%10
3	M29A	Z	.008	%10
4	M41	Z	.008	%15
5	M29A	Z	.034	%75
6	M29A	X	.019	%15
7	M29A	X	.014	%10
8	M29A	X	.014	%10
9	M41	X	.013	%15
10	M29A	X	.019	%75

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M29A	Z	-.008	%45
2	M29A	Z	-.007	%10
3	M29A	Z	-.006	%10
4	M41	Z	-.002	%15

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M29A	X	.008	%45
2	M29A	X	.007	%10
3	M29A	X	.006	%10
4	M41	X	.002	%15

Member Point Loads (BLC 41 : Seismic Vertical Antennas)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M29A	Y	-.017	%45
2	M29A	Y	-.015	%10
3	M29A	Y	-.013	%10
4	M41	Y	-.004	%15

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	Distribut...	Area(M...	Surface...
1	Dead	None		-1			5			
2	Ice Dead	None					5	37		
3	Full Wind Antenna (0 Deg)	None					5			
4	Full Wind Antenna (30 Deg)	None					10			
5	Full Wind Antenna (60 Deg)	None					10			
6	Full Wind Antenna (90 Deg)	None					10			
7	Full Wind Antenna (120 Deg)	None					10			
8	Full Wind Antenna (150 Deg)	None					10			
9	Full Wind Members (0 Deg)	None						56		
10	Full Wind Members (30 Deg)	None						56		
11	Full Wind Members (60 Deg)	None						56		
12	Full Wind Members (90 Deg)	None						56		
13	Full Wind Members (120 Deg)	None						56		
14	Full Wind Members (150 Deg)	None						56		
15	Ice Wind Antenna (0 Deg)	None					5			
16	Ice Wind Antenna (30 Deg)	None					10			
17	Ice Wind Antenna (60 Deg)	None					10			
18	Ice Wind Antenna (90 Deg)	None					10			
19	Ice Wind Antenna (120 Deg)	None					10			
20	Ice Wind Antenna (150 Deg)	None					10			
21	Ice Wind Members (0 Deg)	None						76		
22	Ice Wind Members (30 Deg)	None						76		
23	Ice Wind Members (60 Deg)	None						76		
24	Ice Wind Members (90 Deg)	None						76		
25	Ice Wind Members (120 Deg)	None						76		
26	Ice Wind Members (150 Deg)	None						76		
27	Seismic Antenna (0 Deg)	None					4			
28	Seismic Antenna (90 Deg)	None					4			
29	Seismic Members (0 Deg)	None		-.039	-.099					
30	Seismic Members (30 Deg)	None	.049	-.039	-.085					
31	Seismic Members (60 Deg)	None	.085	-.039	-.049					
32	Seismic Members (90 Deg)	None	.099	-.039	-6.034e-...					
33	Seismic Members (120 Deg)	None	.085	-.039	.049					
34	Seismic Members (150 Deg)	None	.049	-.039	.085					
35	Seismic Members (180 Deg)	None	1.207e-17	-.039	.099					
36	Seismic Members (210 Deg)	None	-.049	-.039	.085					
37	Seismic Members (240 Deg)	None	-.085	-.039	.049					
38	Seismic Members (270 Deg)	None	-.099	-.039	1.81e-17					
39	Seismic Members (300 Deg)	None	-.085	-.039	-.049					
40	Seismic Members (330 Deg)	None	-.049	-.039	-.085					
41	Seismic Vertical Antennas	None					4			
42	Man 1 (500 lbs)	None				1				
43	Man 2 (500 lbs)	None				1				

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(M...	Surface...
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	S...	PDelta	SRSS	BLC	Fa...	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
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 + 1.0...	Yes	Y		1	1.2	2	1	15	1	21	1												
15	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1	16	1	22	1												
16	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1	17	1	23	1												
17	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1	18	1	24	1												
18	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1	19	1	25	1												
19	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1	20	1	26	1												
20	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1	15	-1	21	-1												
21	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1	16	-1	22	-1												
22	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1	17	-1	23	-1												
23	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1	18	-1	24	-1												
24	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1	19	-1	25	-1												
25	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1	20	-1	26	-1												
26	1.2D + 1.5Lm_1 + ...	Yes	Y		1	1.2	3	.085	9	.085	42	1.5												
27	1.2D + 1.5Lm_1 + ...	Yes	Y		1	1.2	4	.085	10	.085	42	1.5												
28	1.2D + 1.5Lm_1 + ...	Yes	Y		1	1.2	5	.085	11	.085	42	1.5												
29	1.2D + 1.5Lm_1 + ...	Yes	Y		1	1.2	6	.085	12	.085	42	1.5												
30	1.2D + 1.5Lm_1 + ...	Yes	Y		1	1.2	7	.085	13	.085	42	1.5												
31	1.2D + 1.5Lm_1 + ...	Yes	Y		1	1.2	8	.085	14	.085	42	1.5												
32	1.2D + 1.5Lm_1 + ...	Yes	Y		1	1.2	3	-.0...	9	-.0...	42	1.5												
33	1.2D + 1.5Lm_1 + ...	Yes	Y		1	1.2	4	-.0...	10	-.0...	42	1.5												
34	1.2D + 1.5Lm_1 + ...	Yes	Y		1	1.2	5	-.0...	11	-.0...	42	1.5												
35	1.2D + 1.5Lm_1 + ...	Yes	Y		1	1.2	6	-.0...	12	-.0...	42	1.5												
36	1.2D + 1.5Lm_1 + ...	Yes	Y		1	1.2	7	-.0...	13	-.0...	42	1.5												
37	1.2D + 1.5Lm_1 + ...	Yes	Y		1	1.2	8	-.0...	14	-.0...	42	1.5												
38	1.2D + 1.5Lm_2 + ...	Yes	Y		1	1.2	3	.085	9	.085	43	1.5												
39	1.2D + 1.5Lm_2 + ...	Yes	Y		1	1.2	4	.085	10	.085	43	1.5												
40	1.2D + 1.5Lm_2 + ...	Yes	Y		1	1.2	5	.085	11	.085	43	1.5												
41	1.2D + 1.5Lm_2 + ...	Yes	Y		1	1.2	6	.085	12	.085	43	1.5												
42	1.2D + 1.5Lm_2 + ...	Yes	Y		1	1.2	7	.085	13	.085	43	1.5												
43	1.2D + 1.5Lm_2 + ...	Yes	Y		1	1.2	8	.085	14	.085	43	1.5												
44	1.2D + 1.5Lm_2 + ...	Yes	Y		1	1.2	3	-.0...	9	-.0...	43	1.5												
45	1.2D + 1.5Lm_2 + ...	Yes	Y		1	1.2	4	-.0...	10	-.0...	43	1.5												
46	1.2D + 1.5Lm_2 + ...	Yes	Y		1	1.2	5	-.0...	11	-.0...	43	1.5												
47	1.2D + 1.5Lm_2 + ...	Yes	Y		1	1.2	6	-.0...	12	-.0...	43	1.5												
48	1.2D + 1.5Lm_2 + ...	Yes	Y		1	1.2	7	-.0...	13	-.0...	43	1.5												

Load Combinations (Continued)

	Description	S...	PDelta	SRSS	BLC	Fa...	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
49	1.2D + 1.5Lm_2 + ...	Yes	Y		1	1.2	8	-.0...	14	-.0...	43	1.5												
50	1.2D + 1.5Lm_3 + ...	Yes	Y		1	1.2	3	.085	9	.085	44	1.5												
51	1.2D + 1.5Lm_3 + ...	Yes	Y		1	1.2	4	.085	10	.085	44	1.5												
52	1.2D + 1.5Lm_3 + ...	Yes	Y		1	1.2	5	.085	11	.085	44	1.5												
53	1.2D + 1.5Lm_3 + ...	Yes	Y		1	1.2	6	.085	12	.085	44	1.5												
54	1.2D + 1.5Lm_3 + ...	Yes	Y		1	1.2	7	.085	13	.085	44	1.5												
55	1.2D + 1.5Lm_3 + ...	Yes	Y		1	1.2	8	.085	14	.085	44	1.5												
56	1.2D + 1.5Lm_3 + ...	Yes	Y		1	1.2	3	-.0...	9	-.0...	44	1.5												
57	1.2D + 1.5Lm_3 + ...	Yes	Y		1	1.2	4	-.0...	10	-.0...	44	1.5												
58	1.2D + 1.5Lm_3 + ...	Yes	Y		1	1.2	5	-.0...	11	-.0...	44	1.5												
59	1.2D + 1.5Lm_3 + ...	Yes	Y		1	1.2	6	-.0...	12	-.0...	44	1.5												
60	1.2D + 1.5Lm_3 + ...	Yes	Y		1	1.2	7	-.0...	13	-.0...	44	1.5												
61	1.2D + 1.5Lm_3 + ...	Yes	Y		1	1.2	8	-.0...	14	-.0...	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 12...	Yes	Y		1	1.2	45	1.5																
67	1.2D + 1.5Lv_1 15...	Yes	Y		1	1.2	45	1.5																
68	1.2D + 1.5Lv_1 18...	Yes	Y		1	1.2	45	1.5																
69	1.2D + 1.5Lv_1 21...	Yes	Y		1	1.2	45	1.5																
70	1.2D + 1.5Lv_1 24...	Yes	Y		1	1.2	45	1.5																
71	1.2D + 1.5Lv_1 27...	Yes	Y		1	1.2	45	1.5																
72	1.2D + 1.5Lv_1 30...	Yes	Y		1	1.2	45	1.5																
73	1.2D + 1.5Lv_1 33...	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 12...	Yes	Y		1	1.2	46	1.5																
79	1.2D + 1.5Lv_2 15...	Yes	Y		1	1.2	46	1.5																
80	1.2D + 1.5Lv_2 18...	Yes	Y		1	1.2	46	1.5																
81	1.2D + 1.5Lv_2 21...	Yes	Y		1	1.2	46	1.5																
82	1.2D + 1.5Lv_2 24...	Yes	Y		1	1.2	46	1.5																
83	1.2D + 1.5Lv_2 27...	Yes	Y		1	1.2	46	1.5																
84	1.2D + 1.5Lv_2 30...	Yes	Y		1	1.2	46	1.5																
85	1.2D + 1.5Lv_2 33...	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 12...	Yes	Y		1	1.2	47	1.5																
91	1.2D + 1.5Lv_3 15...	Yes	Y		1	1.2	47	1.5																
92	1.2D + 1.5Lv_3 18...	Yes	Y		1	1.2	47	1.5																
93	1.2D + 1.5Lv_3 21...	Yes	Y		1	1.2	47	1.5																
94	1.2D + 1.5Lv_3 24...	Yes	Y		1	1.2	47	1.5																
95	1.2D + 1.5Lv_3 27...	Yes	Y		1	1.2	47	1.5																
96	1.2D + 1.5Lv_3 30...	Yes	Y		1	1.2	47	1.5																
97	1.2D + 1.5Lv_3 33...	Yes	Y		1	1.2	47	1.5																
98	1.2D + 1.0EV +1.0 ...	Yes	Y		1	1.2	27	1	28		29	1	41	1										
99	1.2D + 1.0EV +1.0 ...	Yes	Y		1	1.2	27	.866	28	.5	30	1	41	1										
100	1.2D + 1.0EV +1.0 ...	Yes	Y		1	1.2	27	.5	28	.866	31	1	41	1										
101	1.2D + 1.0EV +1.0 ...	Yes	Y		1	1.2	27		28	1	32	1	41	1										
102	1.2D + 1.0EV +1.0 ...	Yes	Y		1	1.2	27	-.5	28	.866	33	1	41	1										
103	1.2D + 1.0EV +1.0 ...	Yes	Y		1	1.2	27	-.8...	28	.5	34	1	41	1										
104	1.2D + 1.0EV +1.0 ...	Yes	Y		1	1.2	27	-1	28		35	1	41	1										
105	1.2D + 1.0EV +1.0 ...	Yes	Y		1	1.2	27	-.8...	28	-.5	36	1	41	1										

Load Combinations (Continued)

	Description	S...	PDelta	SRSS	BLC	Fa...	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
106	1.2D + 1.0EV +1.0 ...	Yes	Y		1	1.2	27	-.5	28	-.8...	37	1	41	1										
107	1.2D + 1.0EV +1.0 ...	Yes	Y		1	1.2	27		28	-1	38	1	41	1										
108	1.2D + 1.0EV +1.0 ...	Yes	Y		1	1.2	27	.5	28	-.8...	39	1	41	1										
109	1.2D + 1.0EV +1.0 ...	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	N48	max	1.0136	59	.8406	22	.7449	4	-.2217	13	0	109	.2167	41
2		min	-.9607	41	.3082	7	-1.7699	10	-.6491	19	0	1	-.2385	59
3	N49	max	.9235	48	.8365	16	1.4633	14	-.2305	11	0	109	.219	41
4		min	-.9762	54	.3078	13	.1946	8	-.6457	18	0	1	-.2387	59
5	N57B	max	.091	6	.0505	17	1.0269	11	0	109	0	109	0	109
6		min	-.0922	12	.0109	11	-1.0295	5	0	1	0	1	0	1
7	Totals:	max	.8957	11	1.7197	21	1.1642	2						
8		min	-.8957	5	.6374	2	-1.1642	8						

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

	Member	Shape	Code ...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc [...	phi*Pnt [k]	phi*Mn y...	phi*Mn z...	Cb	Eqn
1	M1	1.9" ODx0.12"	.200	0	41	.042	0		38	24.3312	27.7794	1.3144	1.3144	2...	H1-1b
2	M2	1.9" ODx0.12"	.207	0	46	.045	0		45	24.3312	27.7794	1.3144	1.3144	2...	H1-1b
3	M3	0.63" SR	.075	0	44	.015	0		41	3.9614	14.0276	.1473	.1473	2...	H1-1b
4	M4	0.63" SR	.044	2.5	59	.032	2.5		59	3.9614	14.0276	.1473	.1473	2...	H1-1b
5	M5	0.5" SR	.109	3.4197	40	.009	1.7099		11	2.1129	8.82	.072	.072	1	H1-1b
6	M6	0.5" SR	.547	0	49	.010	3.4197		5	2.1129	8.82	.072	.072	1	H1-1a
7	M7	1.9" ODx0.12"	.206	2.3333	59	.082	1.1667		60	24.3312	27.7794	1.3144	1.3144	2...	H1-1b
8	M8	1.9" ODx0.12"	.211	0	54	.082	1.1667		59	24.3312	27.7794	1.3144	1.3144	2...	H1-1b
9	M9	0.63" SR	.069	2.5	52	.014	2.5		60	3.9614	14.0276	.1473	.1473	2...	H1-1b
10	M10	0.63" SR	.044	2.5	16	.031	2.5		60	3.9614	14.0276	.1473	.1473	2...	H1-1b
11	M11	0.5" SR	.107	3.4197	60	.012	0		6	2.1129	8.82	.072	.072	1	H1-1b
12	M12	0.5" SR	.568	0	52	.011	0		6	2.1129	8.82	.072	.072	1	H1-1a
13	M13	2.88"x.203"	.091	4	7	.070	1.25		6	54.014	70.6698	5.0301	5.0301	1	H1-1b
14	M14	2.88"x.203"	.090	4	30	.043	6.25		49	56.844	70.6698	5.0301	5.0301	1	H1-1b
15	M19	2.38"x0.12"	.056	0	11	.005	0		24	18.592	35.2728	2.1165	2.1165	1...	H1-1b*
16	M28	P0.625X4.25	.170	.4279	60	.033	0	y	11	112.6585	119.5313	1.5564	10.5835	1...	H1-1b
17	M29	P0.625X3.5	.202	.6	59	.081	0	y	61	100.0796	112.5	1.4663	9.375	1...	H1-1b
18	M30	P0.625X4.25	.173	.4279	54	.026	0	y	12	112.6585	119.5313	1.5564	10.5835	1...	H1-1b
19	M31	P0.625X3.5	.202	.6	51	.081	.6	y	59	100.0796	112.5	1.4663	9.375	1...	H1-1b
20	M32	P0.625X3.5	.185	0	41	.036	.6	y	38	100.0796	112.5	1.4663	9.375	1...	H1-1b
21	M33	P0.625X3.5	.185	0	48	.039	0	y	43	100.0796	112.5	1.4663	9.375	1...	H1-1b
22	M34	P0.625X4.25	.171	0	45	.023	0	z	45	112.6585	119.5313	1.5564	10.5835	1...	H1-1b
23	M35	P0.625X4.25	.167	0	40	.021	0	z	38	112.6585	119.5313	1.5564	10.5835	1...	H1-1b
24	M28A	2.88"x0.12"	.099	2.75	43	.025	2.75		42	22.4917	43.0765	3.1557	3.1557	4...	H1-1b
25	M29A	2.88"x0.12"	.180	2.75	8	.034	2.75		52	22.4917	43.0765	3.1557	3.1557	4...	H1-1b
26	M30A	2.88"x0.12"	.101	2.75	56	.029	5.25		53	22.4917	43.0765	3.1557	3.1557	4...	H1-1b
27	M41	2.38"x0.12"	.061	1.9792	2	.016	2.0313		4	24.1643	35.2728	2.1165	2.1165	1...	H1-1b

Attachment 7

EBI Consulting

environmental | engineering | due diligence

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

Dish Wireless Existing Facility

Site ID: BOBDL00004B

BOBDL00004B
435 Mill Street
Southington, Connecticut 06489

March 8, 2022

EBI Project Number: 6222001379

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**53.20%**

March 8, 2022

Dish Wireless

Emissions Analysis for Site: BOBDL00004B - BOBDL00004B

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **435 Mill Street** in **Southington, 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 435 Mill Street in Southington, 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 74 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.

EBI Consulting

environmental | engineering | due diligence

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:	17.45 dBd / 22.65 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd
Height (AGL):	74 feet	Height (AGL):	74 feet	Height (AGL):	74 feet
Channel Count:	12	Channel Count:	12	Channel Count:	12
Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts
ERP (W):	5,236.31	ERP (W):	5,236.31	ERP (W):	5,236.31
Antenna A1 MPE %:	**5.11%**	Antenna B1 MPE %:	**5.11%**	Antenna C1 MPE %:	**5.11%**

Site Composite MPE %	
Carrier	**MPE %**
Dish Wireless (Max at Sector A):	5.11%
Others	1.82%
Verizon	12.93%
T-Mobile	22.61%
AT&T	10.73%
Site Total MPE % :	53.20%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	5.11%
Dish Wireless Sector B Total:	5.11%
Dish Wireless Sector C Total:	5.11%
Site Total MPE % :	53.20%

Dish Wireless Maximum MPE Power Values (Sector A)

Dish Wireless Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
Dish Wireless 600 MHz n71	4	223.68	74.0	6.96	600 MHz n71	400	1.74%
Dish Wireless 1900 MHz n70	4	542.70	74.0	16.88	1900 MHz n70	1000	1.69%
Dish Wireless 2190 MHz n66	4	542.70	74.0	16.88	2190 MHz n66	1000	1.69%
						Total:	**5.11%**

• 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:	5.11%
Sector B:	5.11%
Sector C:	5.11%
Dish Wireless Maximum MPE % (Sector A):	5.11%
Site Total:	53.20%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **53.20%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Attachment 8

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

4 MACARTHUR AVE.

DEVENS, MA 01434
UNITED STATES US

SHIP DATE: 12MAY22
ACTWGT: 2.00 LB
CAD: 9458778/INET4490

BILL SENDER

TO **MARYELLEN EDWARDS, DIRECTOR**
PLANNING & COMMUNITY DEVELOPMENT
75 MAIN STREET

SOUTHINGTON CT 06489
(860) 276-6200 REF: DN11000
INV:
PO: DEPT:

577J5/1BD6/FE4A

FedEx Express

TUE - 17 MAY 4:30P
EXPRESS SAVER

TRK# 0201 **7768 4319 2090**

4Z QNHVQ

06489
CT-US **BDL**

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

4 MACARTHUR AVE.

DEVENS, MA 01434
UNITED STATES US

SHIP DATE: 12MAY22
ACTWGT: 2.00 LB
CAD: 9458778/INET4490

BILL SENDER

TO **MARK J. SCIOTA**
TOWN OF SOUTHINGTON
75 MAIN STREET

SOUTHINGTON CT 06489
(860) 276-6200 REF: DN11000
INV:
PO: DEPT:

577J5/1BD6/FE4A

FedEx Express

TUE - 17 MAY 4:30P
EXPRESS SAVER

TRK# 0201 **7768 4315 3255**

4Z QNHVQ

06489
CT-US **BDL**

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

4 MACARTHUR AVE.

DEVENS, MA 01434
UNITED STATES US

SHIP DATE: 12MAY22
ACTWGT: 2.00 LB
CAD: 9458778/INET4490

BILL SENDER

TO VICTORIA TRIANO, CHAIR
SOUTHINGTON TOWN COUNCIL
75 MAIN STREET

SOUTHINGTON CT 06489
(860) 276-6200 REF: DN11000
INV:
PO: DEPT:

577J5/1BD6/FE4A

FedEx Express

TUE - 17 MAY 4:30P
EXPRESS SAVER

TRK# 0201 7768 4311 9216

4Z QNHVQ

06489
CT-US BDL

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

4 MACARTHUR AVE.

DEVENS, MA 01434
UNITED STATES US

SHIP DATE: 12MAY22
ACTWGT: 3.00 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:

577J5/1BD6/FE4A

FedEx Express

TUE - 17 MAY 4:30P
EXPRESS SAVER

TRK# 0201 7768 4305 1411

4Z QSWNQ

06051
CT-US BDL

(https://www.fedex.com/en-us/home.html)

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IN TRANSIT

Arrived at FedEx location
MIDDLETOWN, CT

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FedEx® Tracking

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Scheduled delivery:
Tuesday, 5/17/2022 before 4:30 pm

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FedEx® Tracking

776843192090

ADD NICKNAME

ON TIME

Scheduled delivery:
Tuesday, 5/17/2022 before 4:30 pm

IN TRANSIT

Arrived at FedEx location
MIDDLETOWN, CT

GET STATUS UPDATES

FROM	TO
Devens, MA US	SOUTHINGTON, CT US

MANAGE DELIVERY

Travel History

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Local Scan Time

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6:53 AM	MIDDLETOWN, CT	Arrived at FedEx hub
5:12 AM	WILLINGTON, CT	Departed FedEx hub
12:45 AM	WILLINGTON, CT	Shipment arriving On-Time
12:35 AM	WILLINGTON, CT	Arrived at FedEx hub
Thursday, May 12, 2022		
4:46 PM	LONDONDERRY, NH	Picked up