Northeast Site Solutions
Victoria Masse
420 Main St Unit 1 Box 2
Sturbridge, MA 01566
victoria@northeastsitesolutions.com

April 28, 2022

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

RE: Tower Share Application
62 Youngs Apple Orchard Road (a/k/a 59 Youngs Apple Orchard Road), North Branford, CT
Latitude: 41.42083300 N
Longitude: 72.74944444 W
Site#: BOHVN00032A

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Dish Wireless LLC. Dish Wireless LLC plans to install antennas and related equipment to the tower site located at 62 Youngs Apple Orchard Road (a/k/a 59 Youngs Apple Orchard Road), North Branford, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900/2100 5G MHz antenna and six (6) RRUs, at the 83-foot level of the existing 129-self-support tower, one (1) Fiber cable will also be installed. Dish Wireless LLC equipment cabinets will be placed within 7x5 lease area. Included are plans by Infinigy, dated April 6, 2022, Exhibit C. Also included is a structural analysis prepared by Armor Tower, dated February 10, 2022 confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. This facility was approved and built around 1997-1998, The Town of North Branford was unable to locate the exact approval. Please see attached Exhibit A.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of Dish Wireless LLC intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Michael Paulhus, Town Manager, Eric Knapp, Planning and Zoning Administrator for the Town of North Branford, as well as the tower owner and property.

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

1. The proposed modifications will not result in an increase in the height of the existing structure. The top of the tower is 129-feet; Dish Wireless LLC proposed antennas will be located at a center line height of 83-feet.

2.The proposed modification will not result in the increase of the site boundary as depicted on the attached site plan.

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

4.The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached power density calculations, the combined site operations will result in a total density of 20.65% as evidenced by Exhibit F.

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

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

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

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of Dish Wireless LLC equipment at the 83-foot level of the existing 129-foot tower would have an insignificant visual impact on the area around the self-support tower. Dish Wireless LLC ground equipment would be installed within the existing facility compound. Dish Wireless LLC shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by Exhibit F, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

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

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

Sincerely,

Victoria Masse
Mobile: 860-306-2326
Fax: 413-521-0558
Office: 420 Main Street, Unit 1 Box 2, Sturbridge, MA 01566
Email: victoria@northeastsitesolutions.com

NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development

www.northeastsitesolutions.com

Attachments
Cc:
Michael Paulhus, Town Manager
Town of North Branford
909 Foxon Road
North Branford CT 06471

Eric Knapp, Planning and Zoning Administrator
Town of North Branford
909 Foxon Road
North Branford CT 06471

Town of Wallingford Water Division
C/O Duff & Phelps/Telcom DIV, Property Owner
PO 2629
Addison, TX 75001

Everest, Tower Owners
100 Summer St. Suite 1600
Boston, MA 02110

Exhibit A

Original Facility Approval

Victoria Masse <victoria@northeastsitesolutions.com>

Dish Original Zoning Approval Request for 62 Youngs Apple Orchard Road

Eric Knapp <townplanner@townofnorthbranfordct.com> Thu, Apr 28, 2022 at 3:20 PM
To: Victoria Masse <victoria@northeastsitesolutions.com>
Cc: Chuck Regulbuto <chuck@northeastsitesolutions.com>

Victoria, we looked back as far as our records would go.

Here is what I emailed Chuck Regulbuto back in October:

Dear Mr. Regulbuto,

You have inquired about the zoning status of the tower located at 62 Young Apple Orchard Road in North Branford, Connecticut. Specifically, you are seeking the zoning approval status of the original tower at that location.

My research has revealed that evidence of the original lease from the Town of Wallingford's Water Department to the Southern New England Telephone company was recorded on the Land Records of the Town of North Branford on December 31, 1957, at Volume 36, Page 463.

Zoning was adopted by the Town of North Branford effective August 1, 1962. Therefore, there would be no evidence of zoning approval for the tower, because there would have been no Zoning Regulations to comply with.

I trust that this response will prove satisfactory, but should you have additional questions, or require additional information, please do not hesitate to contact me.

Very truly yours,

Eric Knapp

Town Planner

Town of North Branford

North Branford, CT 06471

(475) 655-0425

From: Victoria Masse <victoria@northeastsitesolutions.com>
Sent: Thursday, April 28, 2022 3:14 PM
To: Eric Knapp <townplanner@townofnorthbranfordct.com>
Cc: Chuck Regulbuto <chuck@northeastsitesolutions.com>
Subject: Dish Original Zoning Approval Request for 62 Youngs Apple Orchard Road

Good Afternoon,

I am reaching out on behalf of Dish regarding their proposed installation of antennas on an existing tower located at 62 Youngs Apple Orchard Road.

Currently we are working with Dish to file with the Connecticut Siting Council, part of the Siting Council's filing requirements is that we provide the original zoning approval of the tower build. It does not appear that the council has this on their website so that is why I am reaching out to you for this information.

I have attached the property card for your reference.

If you could review your records for any approvals of when this tower was originally approved to be built with the height that the tower was originally approved for that would be greatly appreciated.

Please let me know if you have any questions or need any additional information, I can be reached at 860-306-2326.

Thank you

--

Victoria Masse

Zoning & Permitting Specialist

Notary Public

Mobile: 860-306-2326

Office: 420 Main Street Unit 1 Box 2 Sturbridge, MA 01566

Email: victoria@northeastsitesolutions.com

Exhibit B

Property Card

62 YOUNGS APPLE ORCH

Location	62 YOUNGS APPLE ORCH	**Mblu**	81/ 22A/ / /
Acct#	003798	**Owner**	WALLINGFORD TOWN OF WATER DIV
Assessment	$269,700	**Appraisal**	$385,300
PID	5127	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$85,900	$299,400	$385,300
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$60,100	$209,600	$269,700

Owner of Record

Owner	WALLINGFORD TOWN OF WATER DIV	**Sale Price**	$0
Co-Owner	C/O DUFF & PHELPS / TELCOM DIV	**Certificate**	
		Book & Page	0036/0463

Address PO 2629
ADDISON, TX 75001

Sale Date 12/31/1957

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
WALLINGFORD TOWN OF WATER DIV	$0		0036/0463	12/31/1957

Building Information

Building 1 : Section 1

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

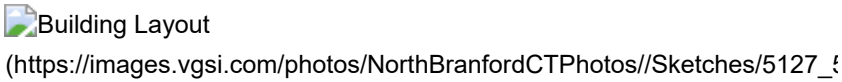
Building Attributes	
Field	**Description**
Style:	Outbuildings
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	

Building Photo

(https://images.vgsi.com/photos/NorthBranfordCTPhotos//\00\00\72\27.jpg)

Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Num Kitchens	
Cndtn	
Num Park	
Fireplaces	
Fndtn Cndtn	
Basement	

Building Layout


Building Layout
(https://images.vgsi.com/photos/NorthBranfordCTPhotos//Sketches/5127_

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

Use Code	504V
Description	PUB UTIL MDL-00
Zone	R40
Neighborhood	
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	2.2
Frontage	0
Depth	0
Assessed Value	$209,600
Appraised Value	$299,400

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
FN4	FENCE-8' CHAIN			300.00 L.F.	$3,000	1
TW1	CELL TOWER			75.00 HEIGHT	$28,900	1
ELCB	ELECTRONIC COMM BLDG			560.00 S.F.	$54,000	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$82,300	$290,700	$373,000
2018	$82,300	$290,700	$373,000

2017	$82,300	$151,300	$233,600

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$57,600	$203,500	$261,100
2018	$57,600	$203,500	$261,100
2017	$57,600	$105,900	$163,500

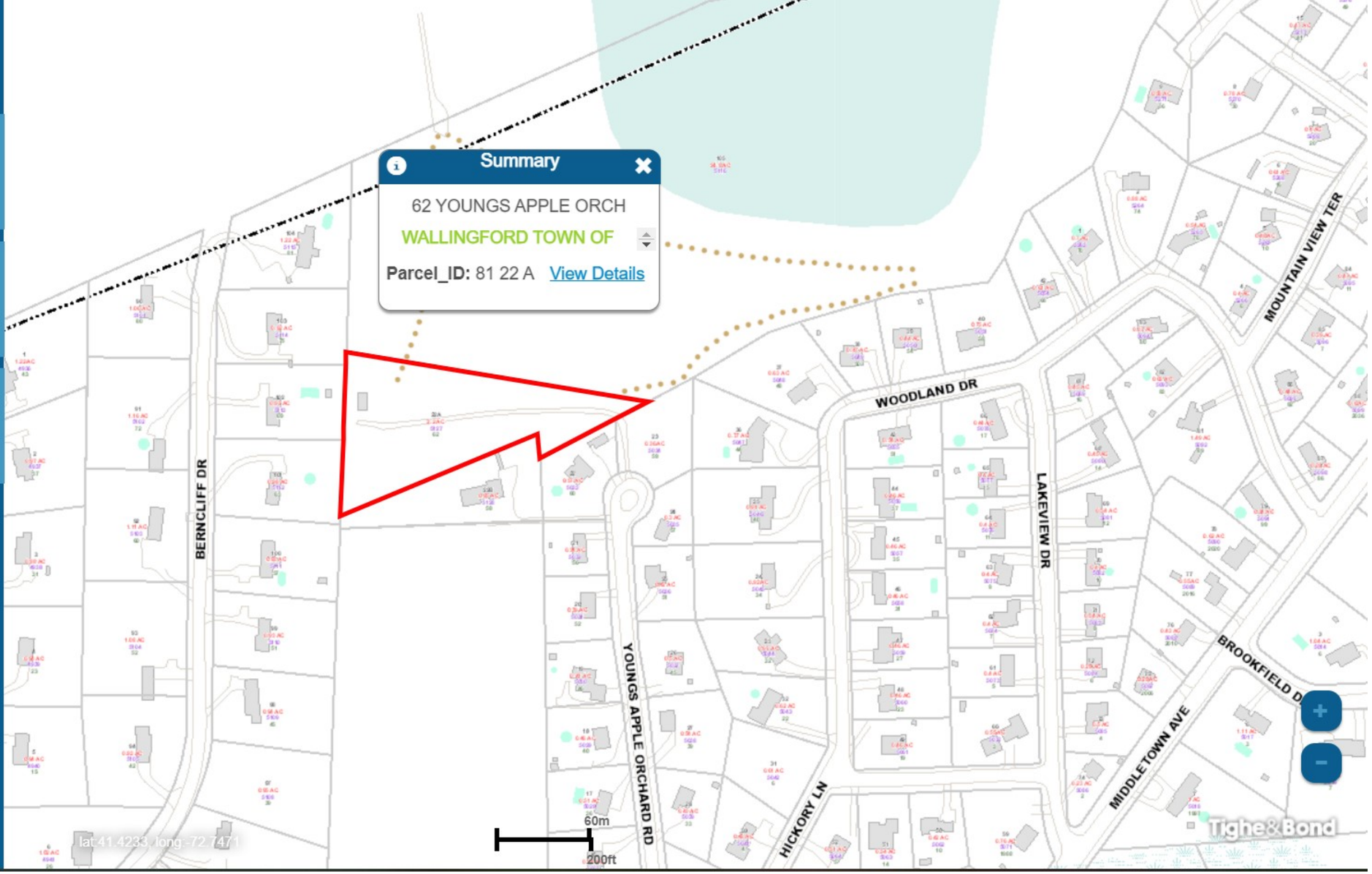

Summary
62 YOUNGS APPLE ORCH
WALLINGFORD TOWN OF
Parcel_ID: 81 22 A View Details
BERNCLIFF DR
WOODLAND DR
LAKEVIEW DR
MOUNTAIN VIEW TER
YOUNGS APPLE ORCHARD RD
HICKORY LN
MIDDLETOWN AVE
BROOKFIELD D
60m
200ft
lat 41.4233, long -72.7471
Tighe&Bond

Exhibit C

Construction Drawings

DISH Wireless L.L.C. SITE ID:

BOHVN00032A

DISH Wireless L.L.C. SITE ADDRESS:

62 YOUNGS APPLE ORCHARD RD
NORTH BRANFORD, CT 6472

CONNECTICUT CODE COMPLIANCE

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

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

SHEET INDEX

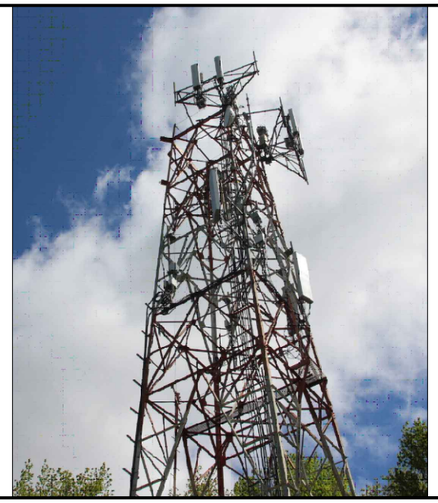
SCOPE OF WORK

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 ANTENNA MOUNTS (1 PER SECTOR)
- INSTALL PROPOSED JUMPERS
- INSTALL (6) PROPOSED RRUs (2 PER SECTOR)
- INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP)
- INSTALL (1) PROPOSED HYBRID CABLE

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

SITE PHOTO



UNDERGROUND SERVICE ALERT - OHIO 811
UTILITY NOTIFICATION CENTER OF OHIO
(800) 362-2764
WWW.OUPS.ORG

CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

811

GENERAL NOTES

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

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

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

SITE INFORMATION

PROPERTY OWNER:	TOWN OF WALLINGFORD WATER DIVISION
ADDRESS:	377 S. CHERRY STREET WALLINGFORD, CT 06492
TOWER TYPE:	SELF SUPPORT TOWER
TOWER CO SITE ID:	701778
TOWER APP NUMBER:	TBD
COUNTY:	NEW HAVEN
LATITUDE (NAD 83):	41° 25' 15.88" N 41.421078 N
LONGITUDE (NAD 83):	72° 44' 57.58" W 72.749328 W
ZONING JURISDICTION:	CONNECTICUT SITING COUNCIL
ZONING DISTRICT:	R40
PARCEL NUMBER:	81/22A
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	V-B
POWER COMPANY:	EVERSOURCE
TELEPHONE COMPANY:	AT&T

PROJECT DIRECTORY

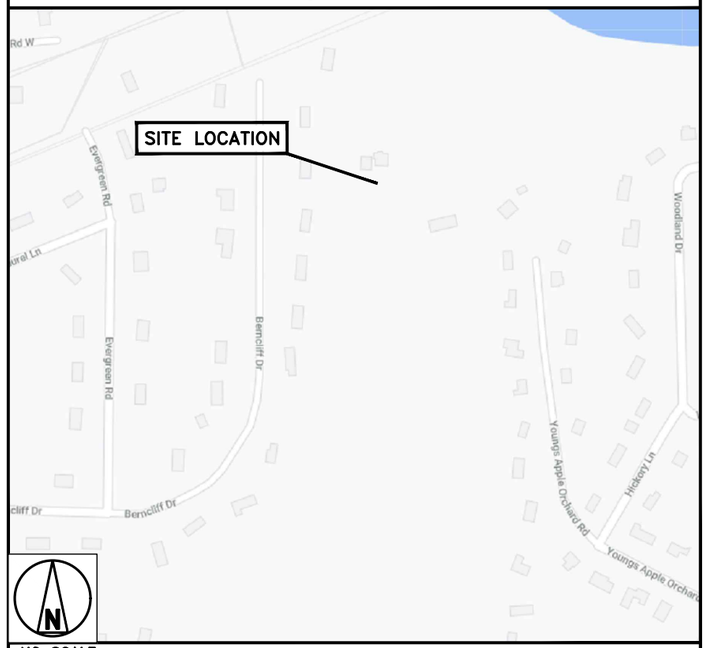
APPLICANT:	DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	EVEREST 100 SUMMER ST SUITE 1600 BOSTON, MA 02110
SITE DESIGNER:	INFINIGY 1033 WATERVLIET SHAKER RD ALBANY, NY 12205 (518) 690-0790
SITE ACQUISITION:	JEANNE CONTTRELL (203) 927-4317
CONSTRUCTION MANAGER:	JAVIER SOTO (617) 839-6514
RF ENGINEER:	JARED ROBINSON (978) 855-5870

DIRECTIONS

DIRECTIONS FROM MAPLEWOOD FARM AIRPORT:

HEAD NORTHWEST ON LINMAR DR TOWARD CLEMENTEL DR, TURN LEFT ONTO CT-68 / WALLINGFORD RD, BEAR LEFT ONTO N BRANFORD RD, TURN LEFT ONTO WHIRLWIND HILL RD, THEN IMMEDIATELY TURN RIGHT ONTO S BRANFORD RD, ROAD NAME CHANGES TO REEDS GAP RDTURN LEFT ONTO BERNCLIFF DR, ARRIVE AT, 62 YOUNGS APPLE ORCHARD RD, NORTH BRANFORD, CT 6472.

VICINITY MAP



NO SCALE

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
4/6/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	03/10/22	ISSUED FOR CONSTRUCTION
1	03/24/22	ISSUED FOR CONSTRUCTION
2	04/06/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

2039-Z5555C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00032A
TBD
62 YOUNGS APPLE ORCHARD RD
NORTH BRANFORD, CT 6472

SHEET TITLE

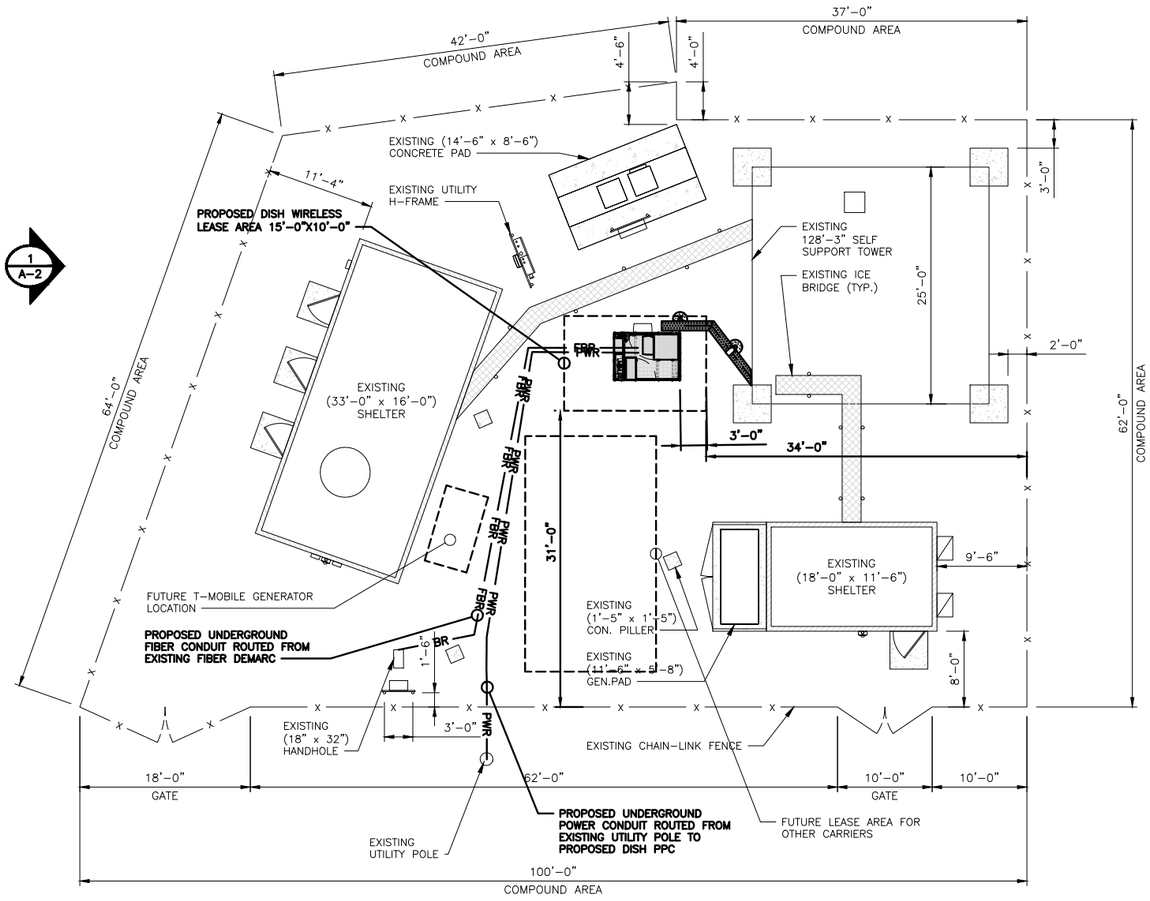
TITLE SHEET

SHEET NUMBER

T-1

NOTES

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



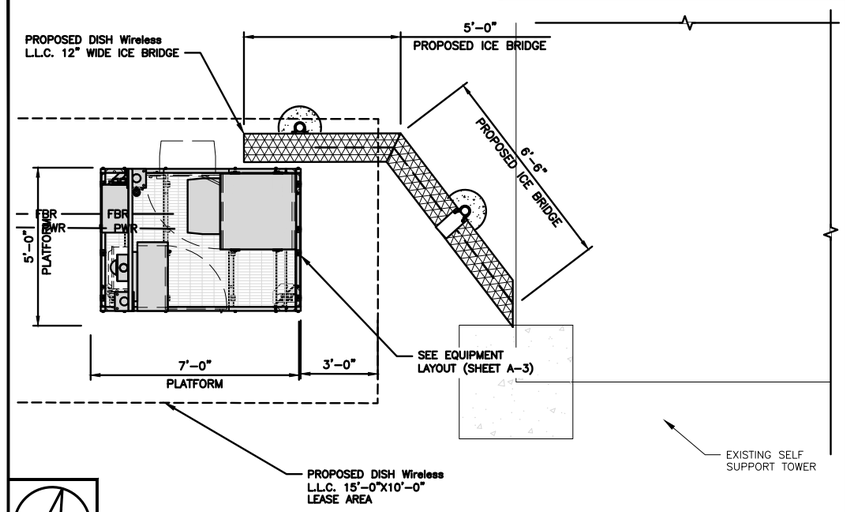
COMPOUND PLAN

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

1

NOTES

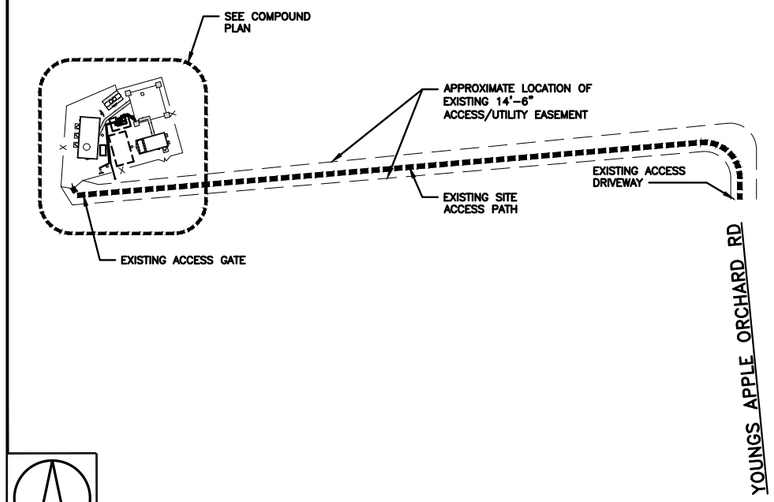
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



ENLARGED SITE PLAN

12" 6" 0 1' 2' 3' 4' 5'
1/2"=1'-0"

2



SITE PLAN

60' 30' 0 60' 120'
1"=60'

3

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
4/6/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	03/10/22	ISSUED FOR CONSTRUCTION
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A&E PROJECT NUMBER
2039-Z5555C

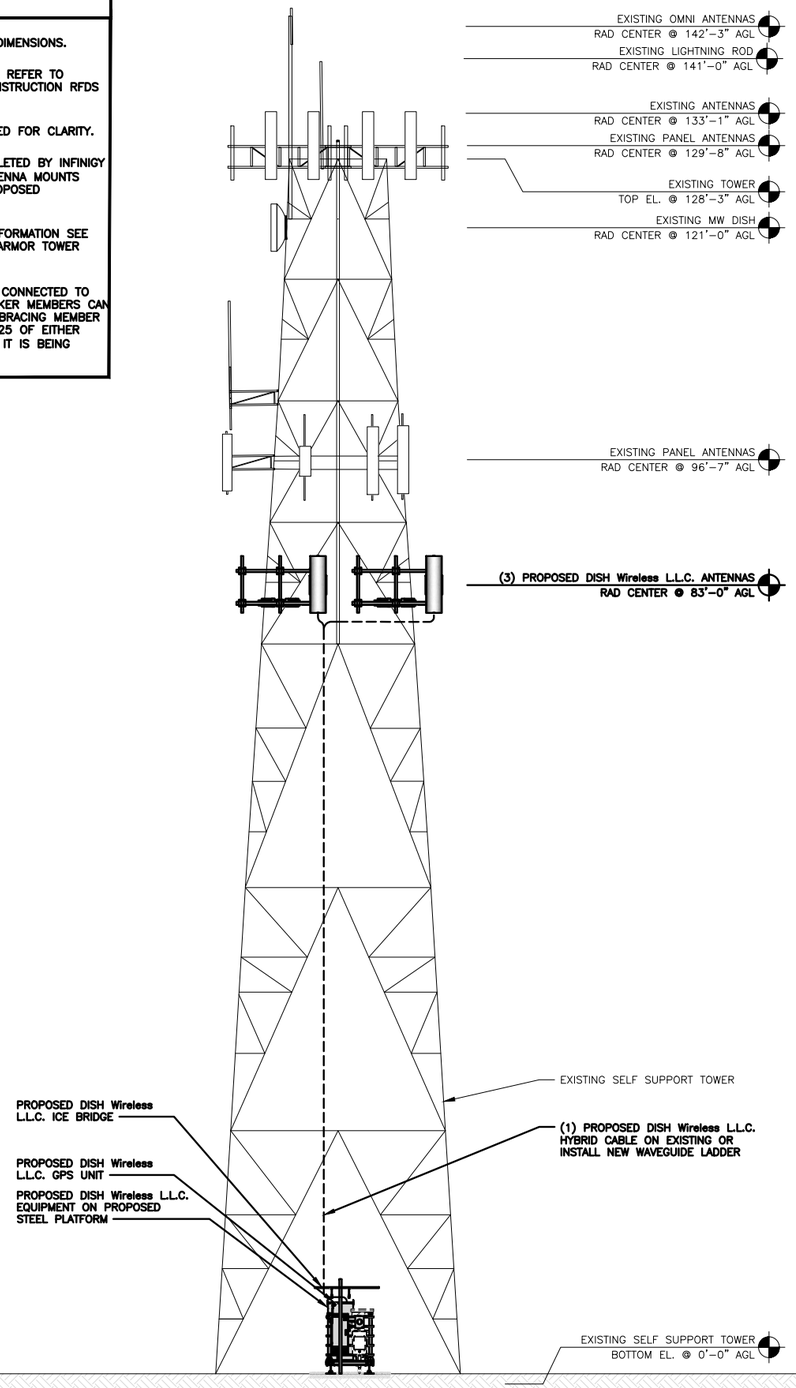
DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00032A
TBD
62 YOUNGS APPLE ORCHARD RD
NORTH BRANFORD, CT 6472

SHEET TITLE
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER
A-1

NOTES

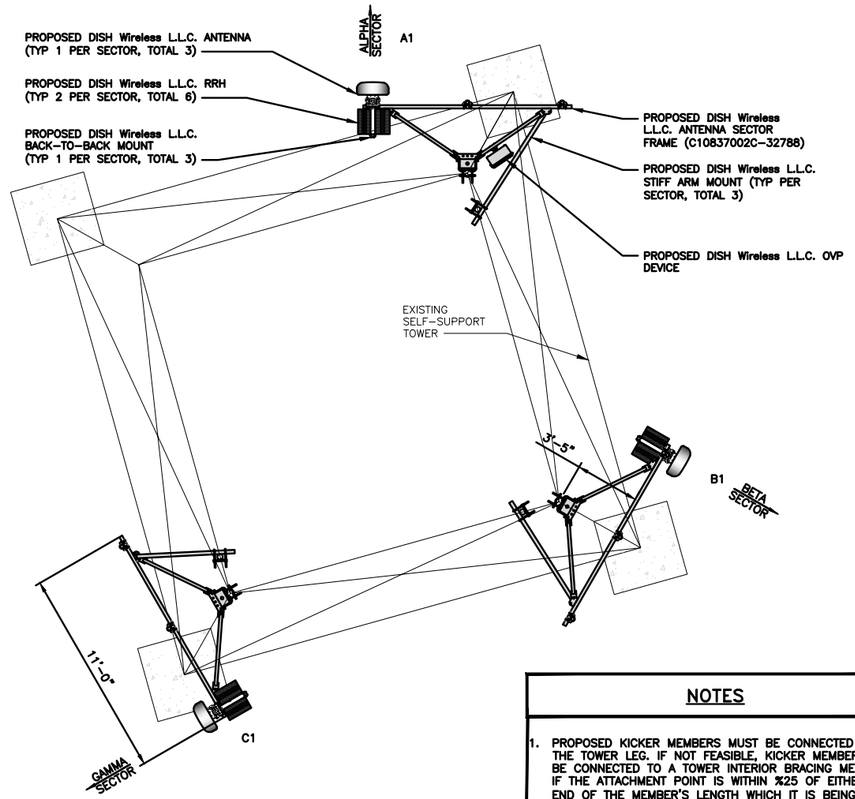
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.
4. BASED ON THE MOUNT ANALYSIS COMPLETED BY INFINIGY DATED 03/28/2022. THE EXISTING ANTENNA MOUNTS ARE CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION
5. FOR ADDITIONAL TOWER STRUCTURAL INFORMATION SEE STRUCTURAL ANALYSIS COMPLETED BY ARMOR TOWER ENGINEERING DATED: 02/10/22
6. PROPOSED KICKER MEMBERS MUST BE CONNECTED TO THE TOWER LEG. IF NOT FEASIBLE, KICKER MEMBERS CAN BE CONNECTED TO A TOWER INTERIOR BRACING MEMBER IF THE ATTACHMENT POINT IS WITHIN %25 OF EITHER END OF THE MEMBER'S LENGTH WHICH IT IS BEING ATTACHED TO.



PROPOSED NORTHWEST ELEVATION

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

1



NOTES

1. PROPOSED KICKER MEMBERS MUST BE CONNECTED TO THE TOWER LEG. IF NOT FEASIBLE, KICKER MEMBERS CAN BE CONNECTED TO A TOWER INTERIOR BRACING MEMBER IF THE ATTACHMENT POINT IS WITHIN %25 OF EITHER END OF THE MEMBER'S LENGTH WHICH IT IS BEING ATTACHED TO.

ANTENNA LAYOUT

4' 2' 0 4' 8'
1/4"=1'-0"

2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZMUITH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	0°	83'-0"	(1) HIGH-CAPACITY HYBRID CABLE (150' LONG)
BETA	B1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	120°	83'-0"	
GAMMA	C1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	240°	83'-0"	

NOTES

1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
2. ANTENNA OR 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.

SECTOR	POSITION	RRH	
		MANUFACTURER – MODEL NUMBER	TECHNOLOGY
ALPHA	A1	FUJITSU – TA08025-B604	5G
	A1	FUJITSU – TA08025-B605	5G
BETA	B1	FUJITSU – TA08025-B604	5G
	B1	FUJITSU – TA08025-B605	5G
GAMMA	C1	FUJITSU – TA08025-B604	5G
	C1	FUJITSU – TA08025-B605	5G

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

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STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
4/6/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

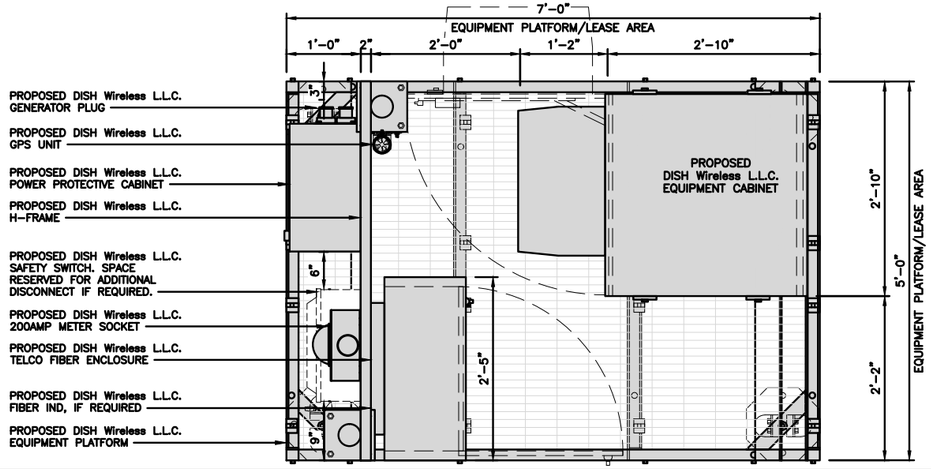
REV	DATE	DESCRIPTION
0	03/10/22	ISSUED FOR CONSTRUCTION
1	03/24/22	ISSUED FOR CONSTRUCTION
2	04/06/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
2039-Z5555C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00032A
TBD
62 YOUNGS APPLE ORCHARD RD
NORTH BRANFORD, CT 6472

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2



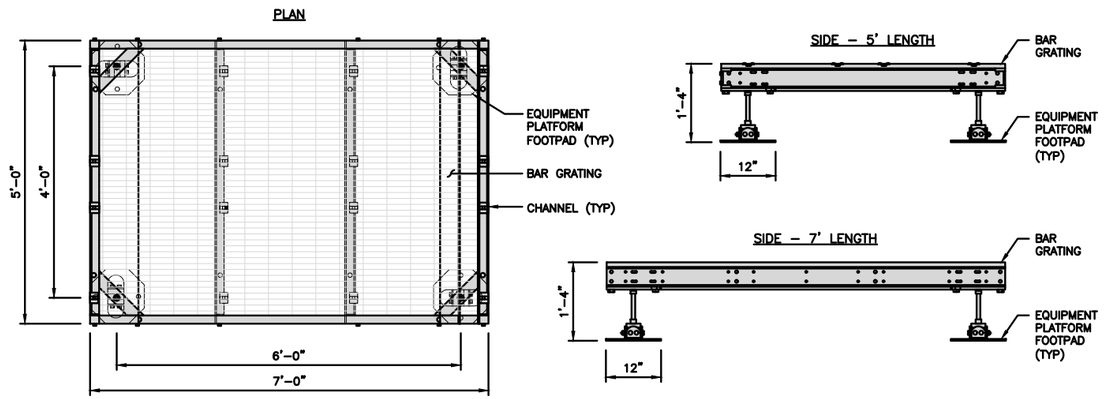
PLATFORM EQUIPMENT PLAN

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"

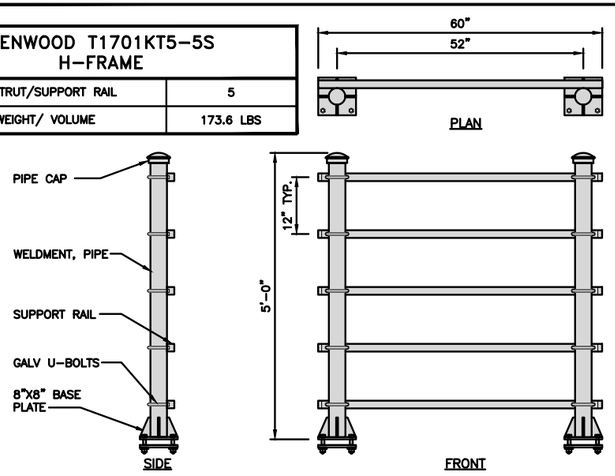


PLATFORM DETAIL

NO SCALE

2

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



H-FRAME DETAIL

NO SCALE

3

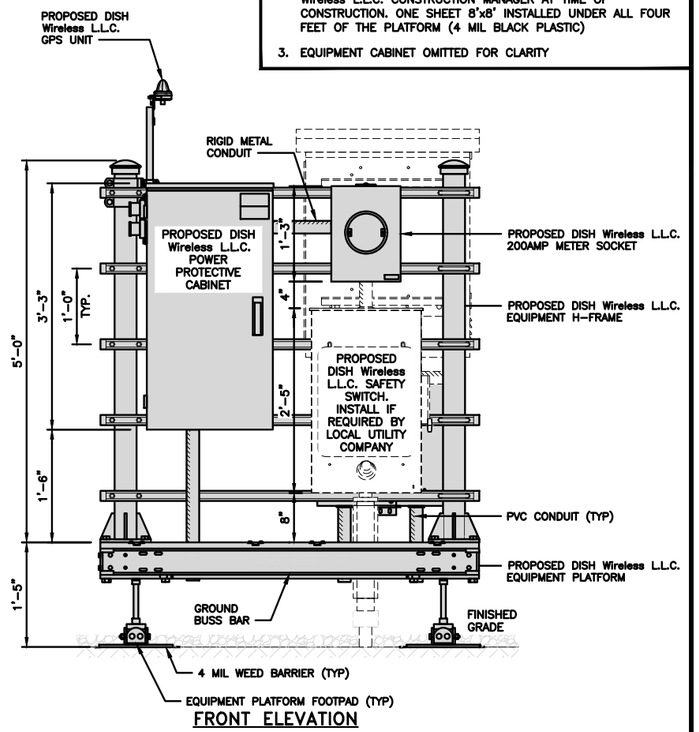
NOT USED

NO SCALE

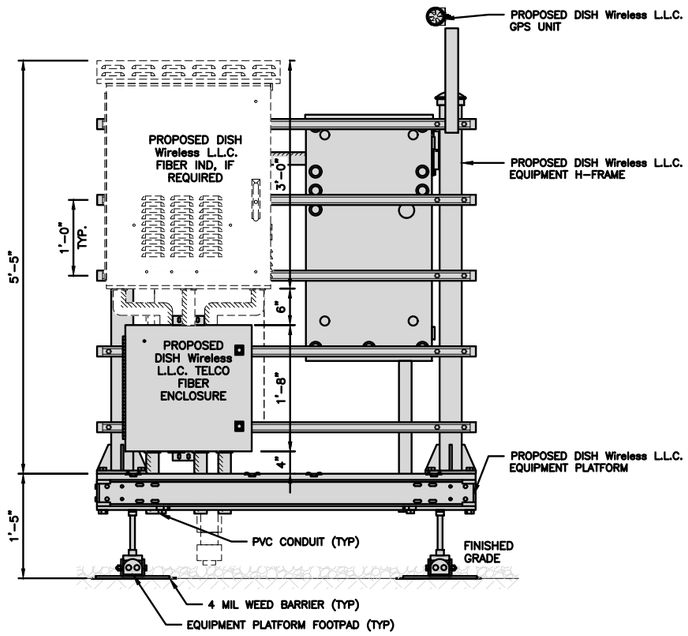
4

NOTES

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



FRONT ELEVATION



BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION

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

5

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TBD
62 YOUNGS APPLE ORCHARD RD
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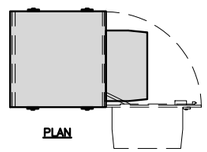
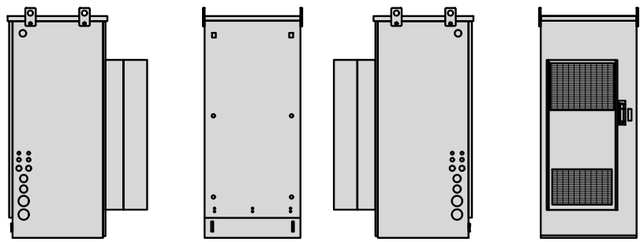
SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER
A-3

CHARLES INDUSTRY HEX CUBE–PM639155N4

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


PLAN

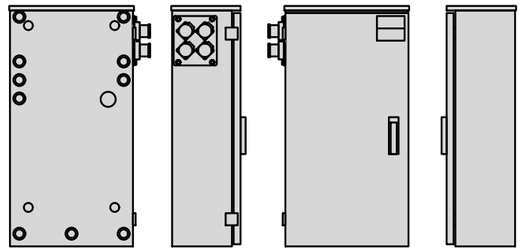

SIDE BACK SIDE FRONT

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


TOP

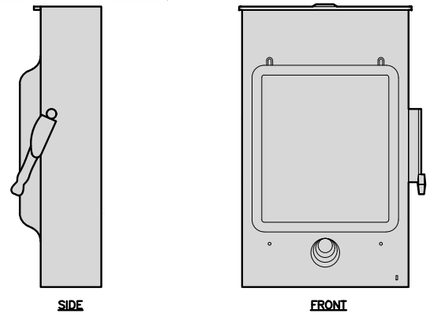

BACK SIDE FRONT SIDE

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

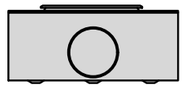

TOP

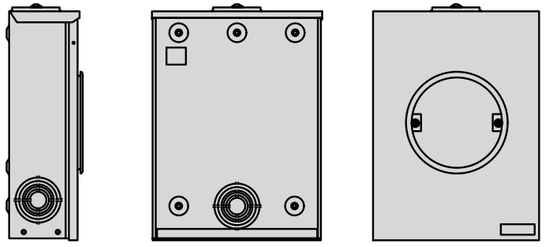

SIDE FRONT

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


PLAN

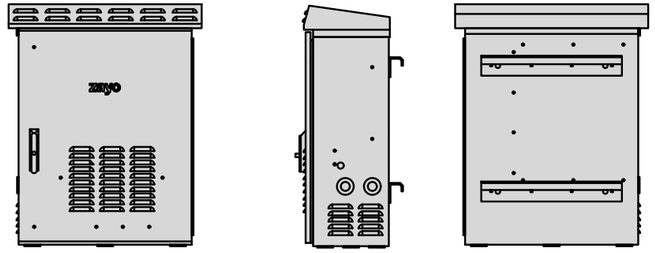

SIDE BACK FRONT

METER SOCKET DETAIL | NO SCALE | 4

ZAYO 5RU CABINET ("LIT" SITES)

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

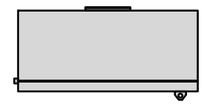

PLAN

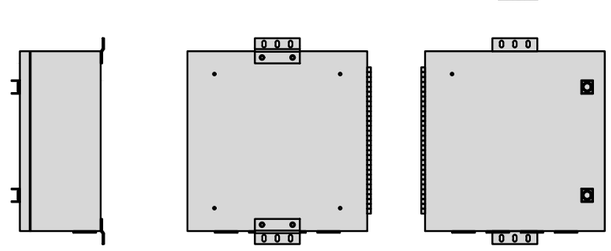

FRONT SIDE BACK

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


FRONT

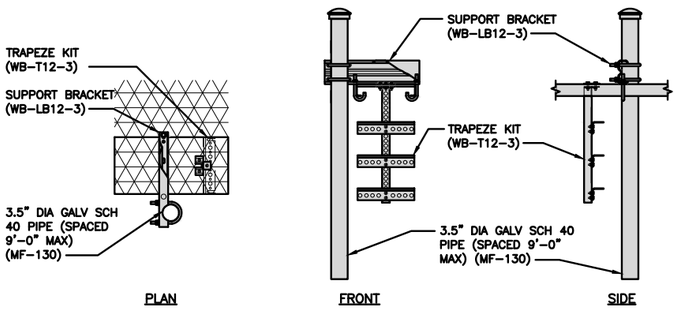

SIDE BACK FRONT

FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

COMMSCOPE WB–K110–B WAVEGUIDE BRIDGE KIT

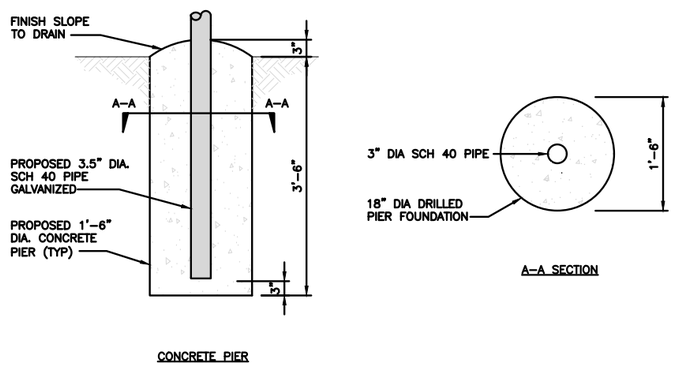
DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

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



PLAN FRONT SIDE

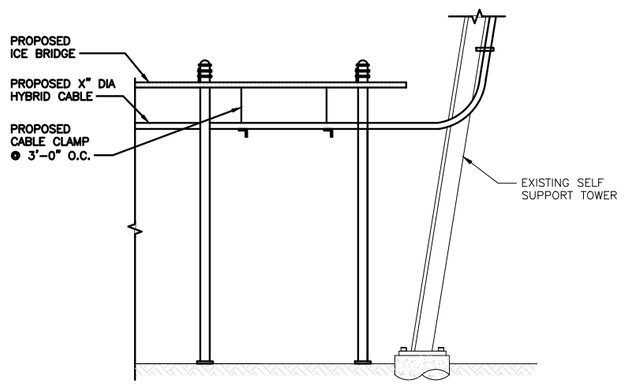
ICE BRIDGE DETAIL | NO SCALE | 7



CONCRETE PIER

A–A SECTION

TYPICAL ICE BRIDGE CONCRETE PIER DETAIL | NO SCALE | 8



HYBRID CABLE RUN | NO SCALE | 9

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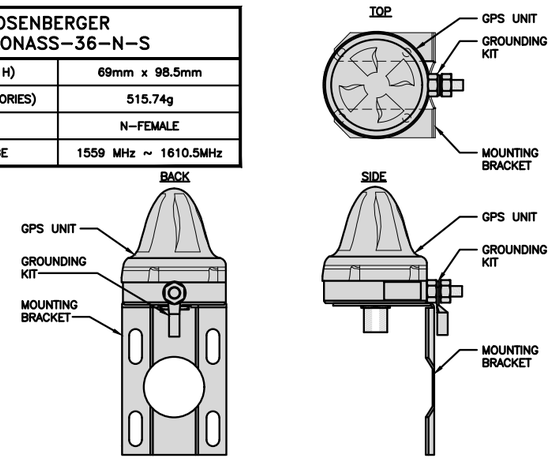
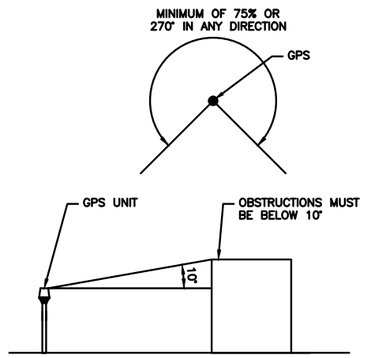
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

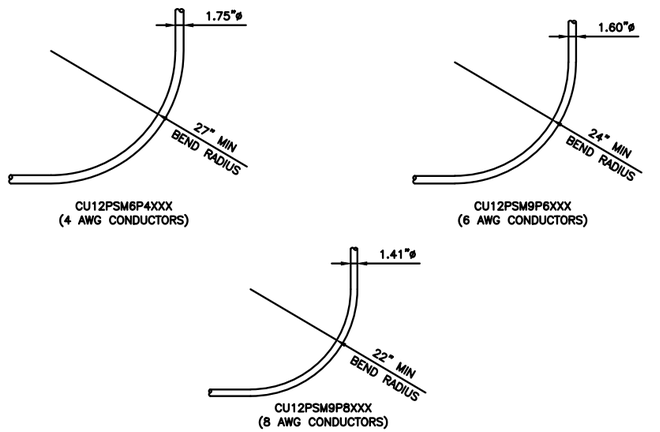
ROSENBERGER GPSGLONASS-36-N-S	
DIMENSION (DIA x H)	69mm x 98.5mm
WEIGHT (WITH ACCESSORIES)	515.74g
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1559 MHz ~ 1610.5MHz



GPS ANTENNA DETAIL | NO SCALE | 1



GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 2



CABLES UNLIMITED HYBRID CABLE MINIMUM BEND RADIUSES | NO SCALE | 3

NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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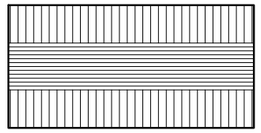
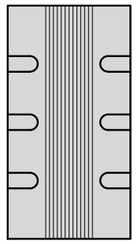
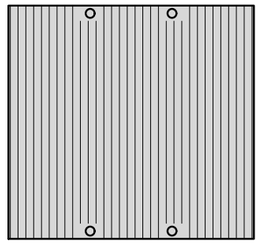
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

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

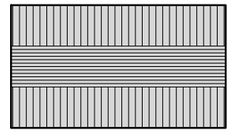


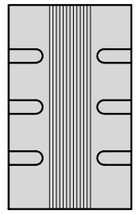


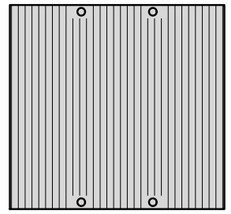


REMOTE RADIO HEAD DETAIL | NO SCALE | 1

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



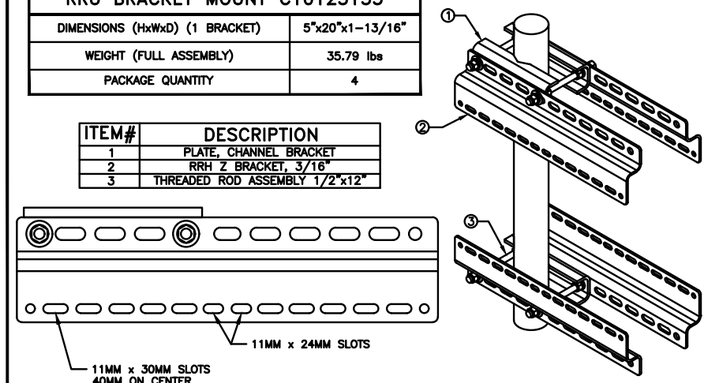




REMOTE RADIO HEAD DETAIL | NO SCALE | 2

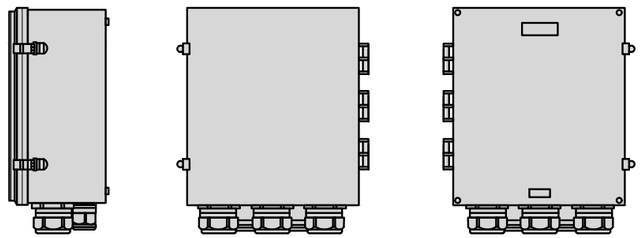
SABRE INDUSTRIES RRU BRACKET MOUNT C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

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



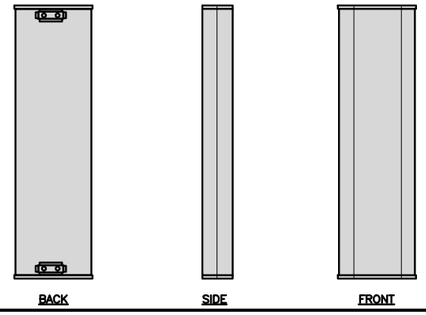
REMOTE RADIO MOUNT DETAIL | NO SCALE | 3

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



SURGE SUPPRESSION DETAIL | NO SCALE | 4

JMA WIRELESS MX08FRO665-21 ANTENNA	
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	54 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE

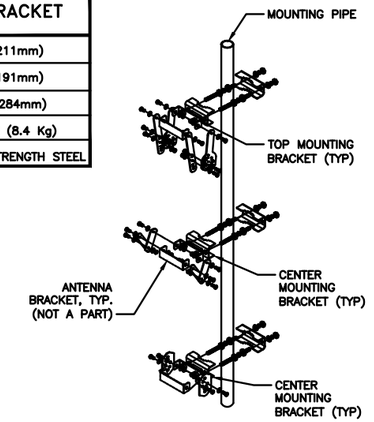


ANTENNA DETAIL | NO SCALE | 5

NOTES

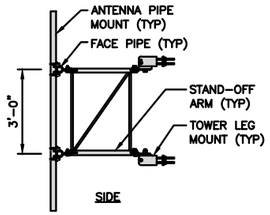
FINAL ANTENNA SPECIFICATIONS TO BE CONFIRMED BY GC

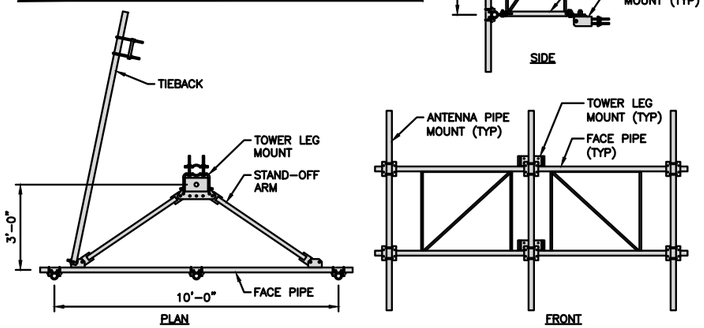
JMA 91900318 MOUNTING BRACKET	
WIDTH	8.3" (211mm)
DEPTH	7.5" (191mm)
HEIGHT	11.2" (284mm)
TOTAL WEIGHT (WITH BRACKETS)	18.5 LBS (8.4 Kg)
HOUSING MATERIAL	GALV. HIGH STRENGTH STEEL



ANTENNA MOUNTING DETAIL | NO SCALE | 6

SABRE INDUSTRIES C10837002C-32788 HD V-BOOM ASSEMBLY WITH TIEBACK	
FACE SIZE	10'-0"
WEIGHT	676 LB
TOWER LEG SIZE	1-1/2" TO 5-9/16" DIA ROUND LEG





ANTENNA FRAME DETAIL | NO SCALE | 7

NOT USED | NO SCALE | 8

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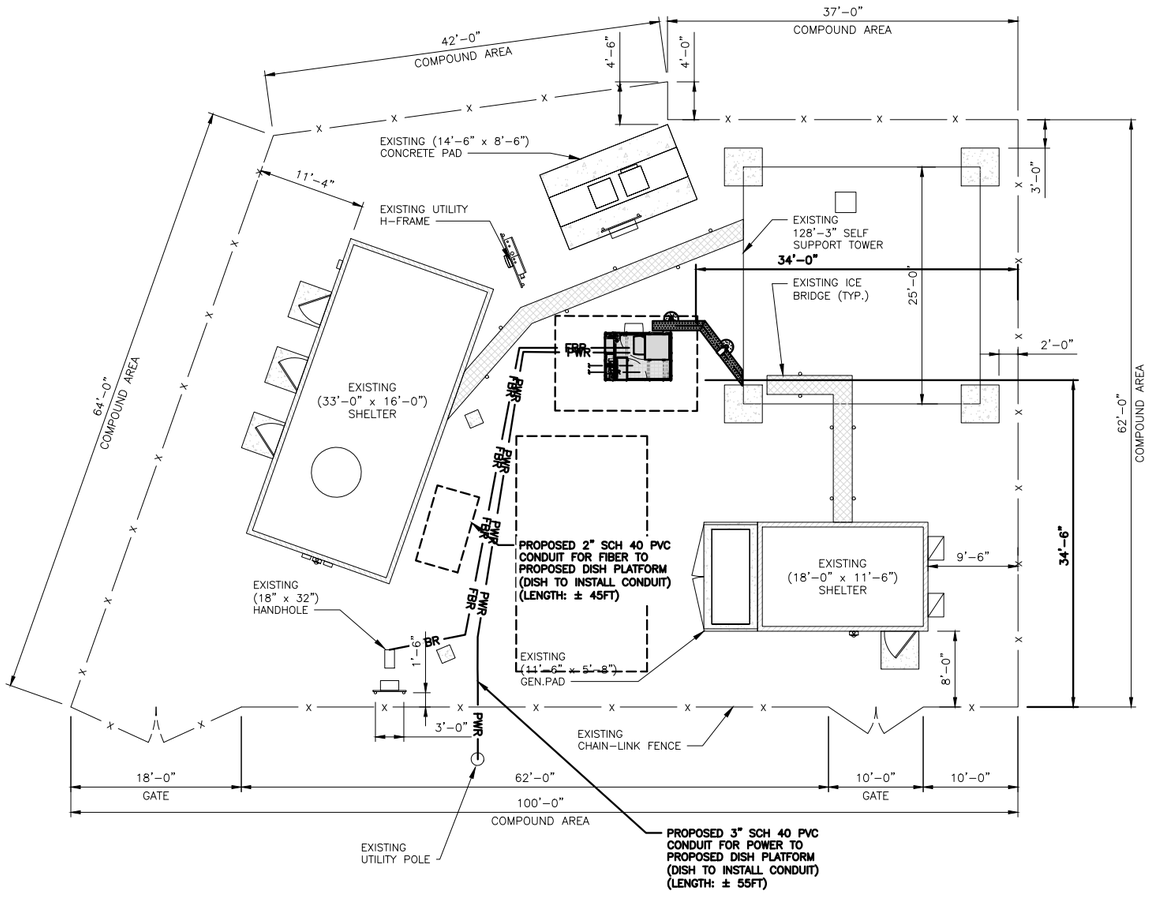
NORTH BRANFORD, CT 6472

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.



UTILITY ROUTE PLAN

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

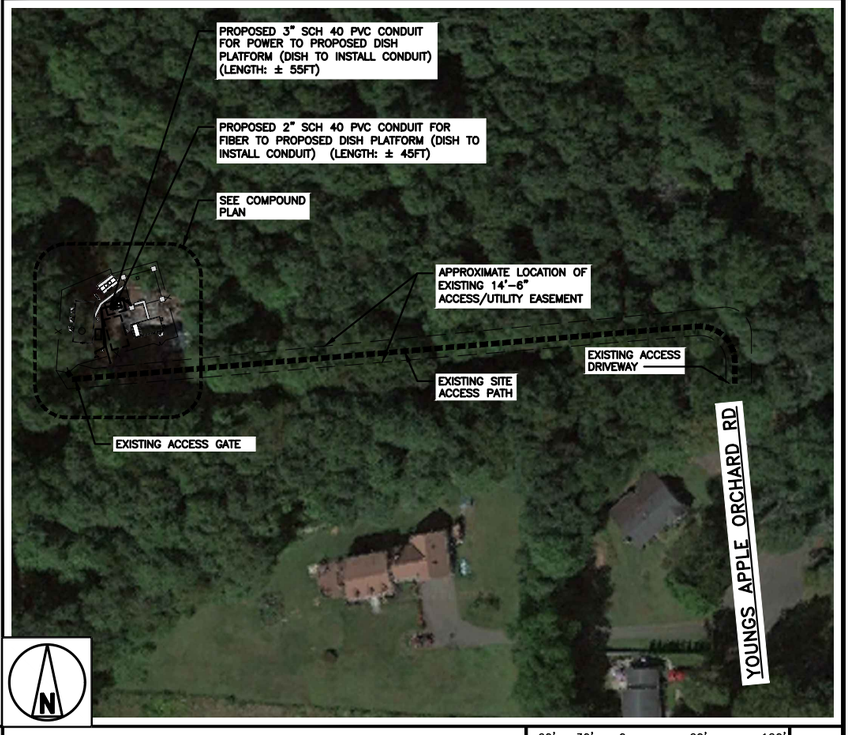
1

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

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

ELECTRICAL NOTES

2



OVERALL UTILITY ROUTE PLAN

60' 30' 0 60' 120'
1"=60'

3

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SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
4/6/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

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A&E PROJECT NUMBER
2039-Z5555C

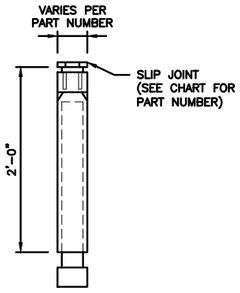
DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00032A
TBD
62 YOUNGS APPLE ORCHARD RD
NORTH BRANFORD, CT 6472

SHEET TITLE
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

SHEET NUMBER
E-1

CARLON EXPANSION FITTINGS

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

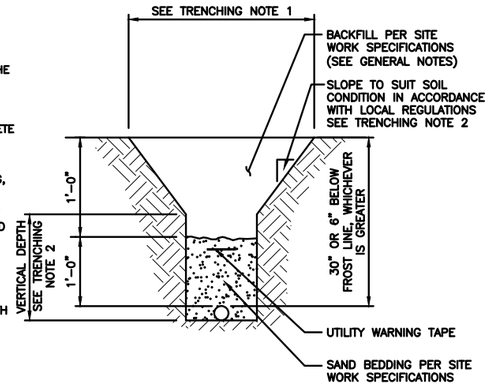


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

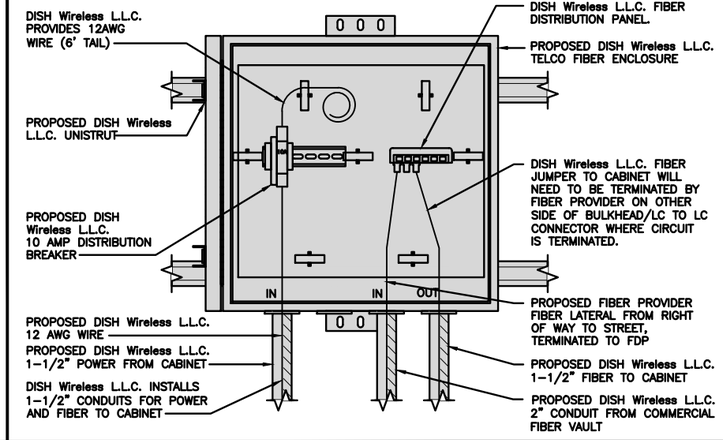
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

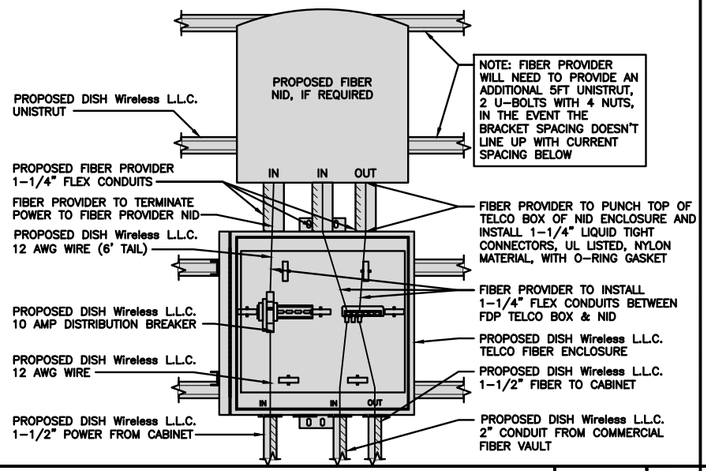
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT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



TYPICAL UNDERGROUND TRENCH DETAIL | NO SCALE | 2



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



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

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00032A
TBD
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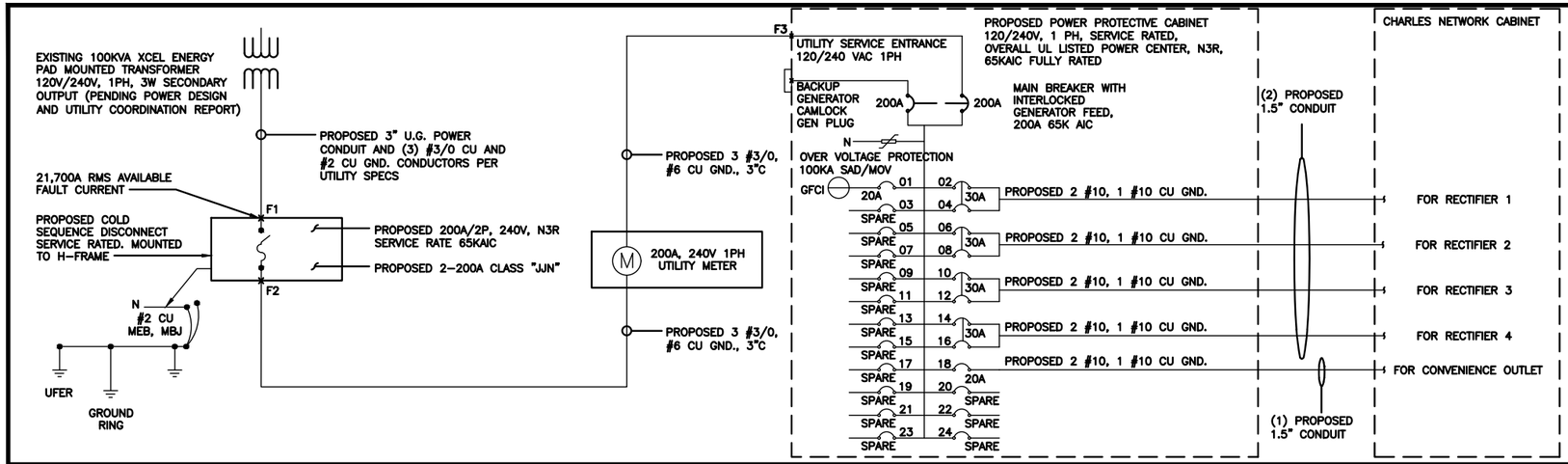
NORTH BRANFORD, CT 6472

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-2



NOTES

THERE ARE A TOTAL OF (10) CURRENT CARRYING CONDUCTORS IN A SINGLE CONDUIT. ADJUSTABLE FACTOR OF 50% PER NEC TABLE 310.15(B)(3)(a) SHALL APPLY.

#10 FOR 15A/1P BREAKER: 0.5 x 40A = 15.0A
#8 FOR 20A-25A/2P BREAKER: 0.5 x 55A = 27.5A
#6 FOR 30A-35A/2P BREAKER: 0.5 x 75A = 37.5A
#4 FOR 40A-45A/2P BREAKER: 0.5 x 95A = 47.5A

CONDUIT SIZING: ASSUME 1.5" EMT
AT 40% FILL PER NEC 358, TABLE 4 - 0.814A SQ. IN AREA

WIRES: USING THWN-2, CU. (INCLUDING 3 GROUND WIRES)
#6 - 0.0507 SQ. IN X 8 = 0.4056 SQ. IN
#8 - 0.0366 SQ. IN X 2 = 0.0732 SQ. IN
#10 - 0.0211 SQ. IN X 4 = 0.0844 SQ. IN <GROUND
#12 - 0.0133 SQ. IN X 1 = 0.0133 SQ. IN <GROUND
TOTAL = 0.5765 SQ. IN

1.5" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OR (15) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

CONDUIT SIZING: ASSUME 3.0" SCH 40 PVC
AT 40% FILL PER NEC 352,TABLE 4 - 1.216A SQ. IN AREA

WIRES: USING THHN, CU. (INCLUDING 2 GROUND WIRES)
#3/0 - 0.1318 SQ. IN X 3 = 0.3954 SQ. IN
#2 - 0.0521 SQ. IN X 1 = 0.0521 SQ. IN
TOTAL = 0.4475 SQ. IN

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

(CHARLES ABB GE INFINITY) WITH STAND ALONE METER 120V240V 1PH SOURCE | NO SCALE | 1

PROPOSED 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
-SPARE-				1	A	2	30A	2880		ABB/GE INFINITY RECTIFIER 1
-SPARE-				3	B	4			2880	
-SPARE-				5	A	6	30A	2880		ABB/GE INFINITY RECTIFIER 2
-SPARE-				7	B	8			2880	
-SPARE-				9	A	10	30A	2880		ABB/GE INFINITY RECTIFIER 3
-SPARE-				11	B	12			2880	
-SPARE-				13	A	14	30A	2880		ABB/GE INFINITY RECTIFIER 4
-SPARE-				15	B	16			2880	
-SPARE-				17	A	18	20A	1920		CHARLES GFCI OUTLET
-SPARE-				19	B	20				-SPARE-
-SPARE-				21	A	22				-SPARE-
-SPARE-				23	B	24				-SPARE-
VOLT AMPS								13440	11520	

200A MCB, 1ϕ, 3W, 120/240V	L1	L2	
MB RATING: 65,000 AIC	13440	11520	VOLT AMPS
	140	96	AMPS
	140		MAX AMPS
	175		MAX 125%

PANEL SCHEDULE
(CHARLES ABB GE INFINITY) WITH STAND ALONE METER 120V240V 1PH SOURCE | NO SCALE | 2

NOT USED | NO SCALE | 3

NOT USED | NO SCALE | 4

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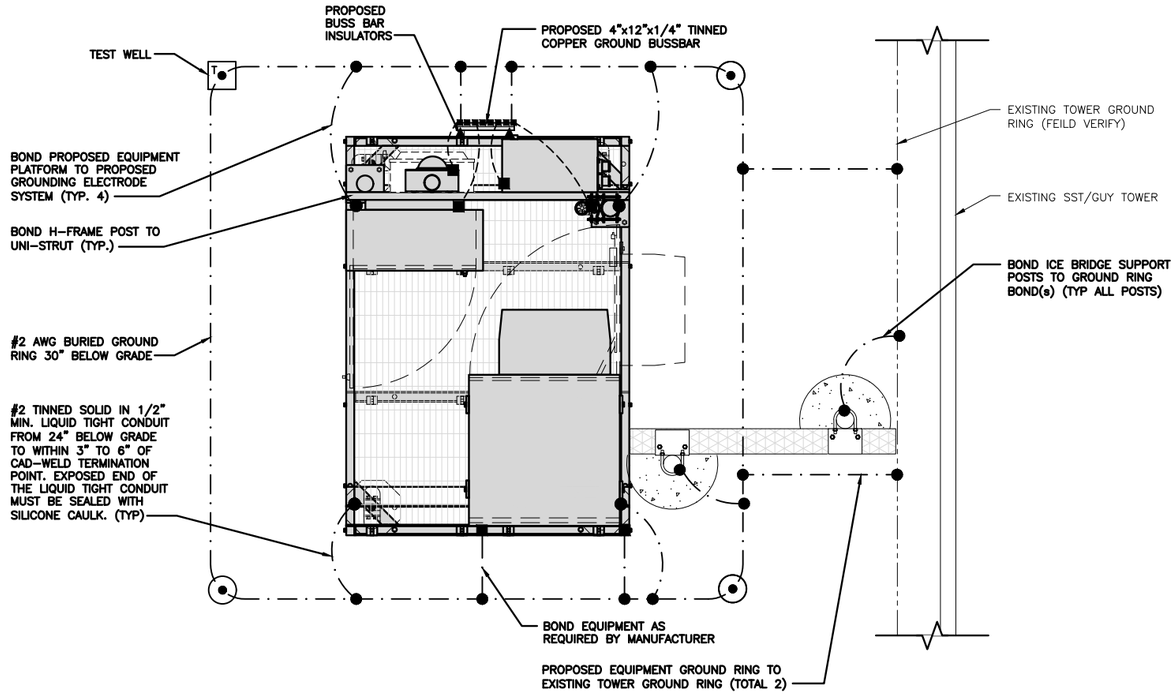
PROJECT INFORMATION
BOHVN00032A
TBD
62 YOUNGS APPLE ORCHARD RD
NORTH BRANFORD, CT 6472

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

SHEET NUMBER
E-3

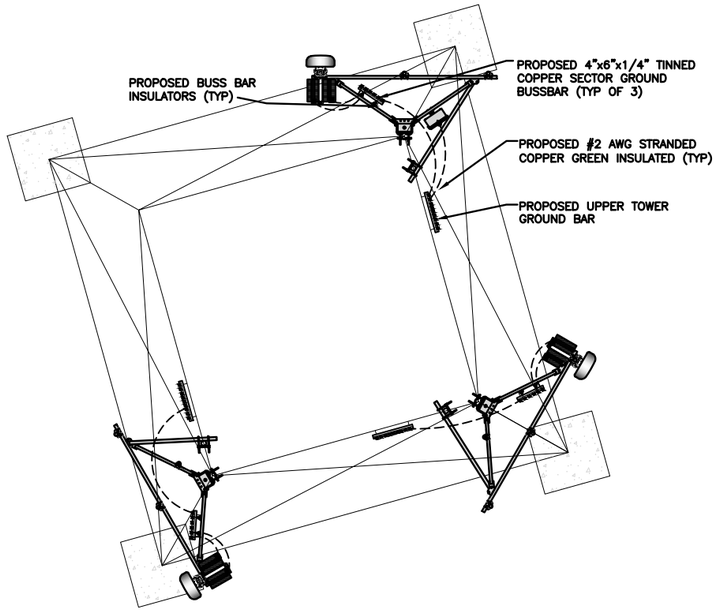


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE | 1

NOTES

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



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE | 2

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

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.

(J) TELCO GROUND BAR: BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.

(K) FRAME BONDING: THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.

(L) 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.

(M) 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.

(N) 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

(P) 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.

(Q) 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

(R) 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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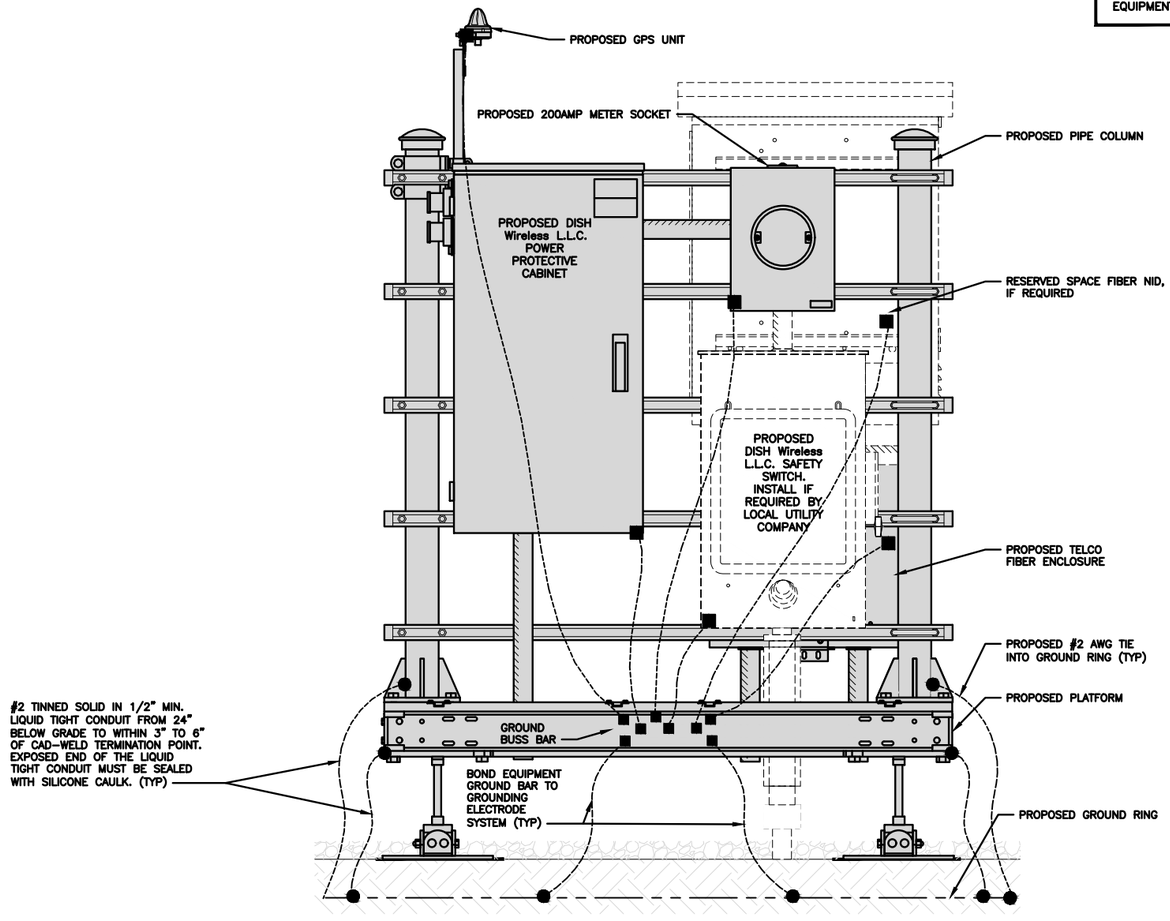
GROUNDING PLANS AND NOTES

SHEET NUMBER
G-1

NOTES

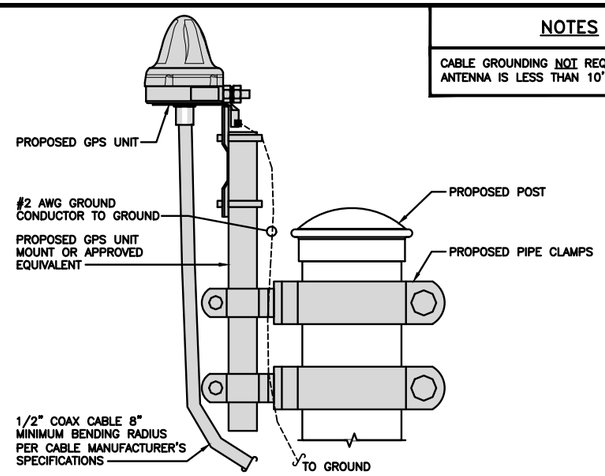
EQUIPMENT CABINET OMITTED FOR CLARITY



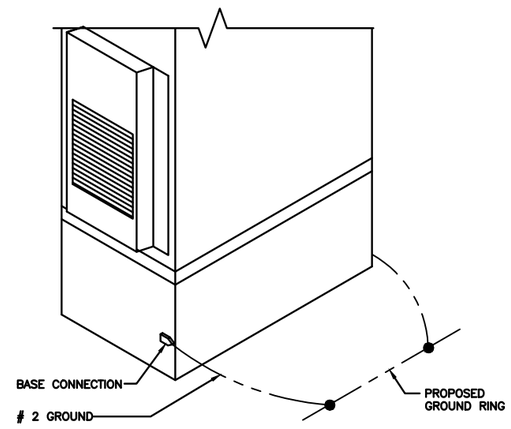
H-FRAME GROUNDING DETAIL | NO SCALE | 1

NOTES

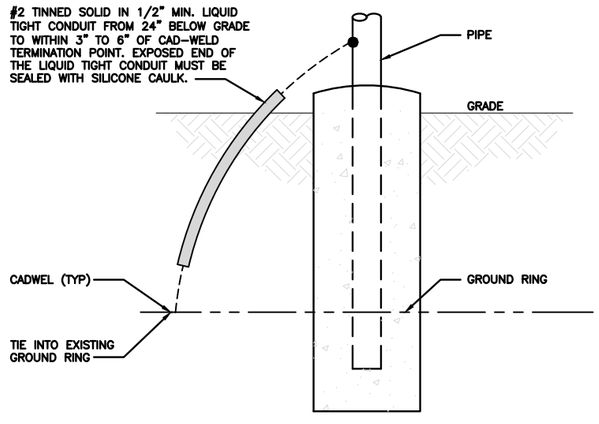
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



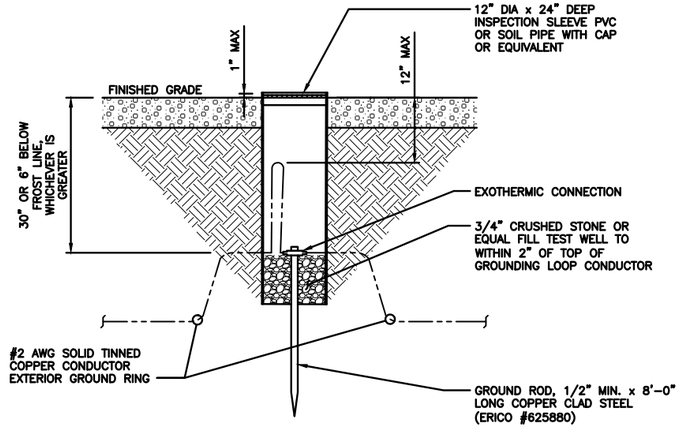
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



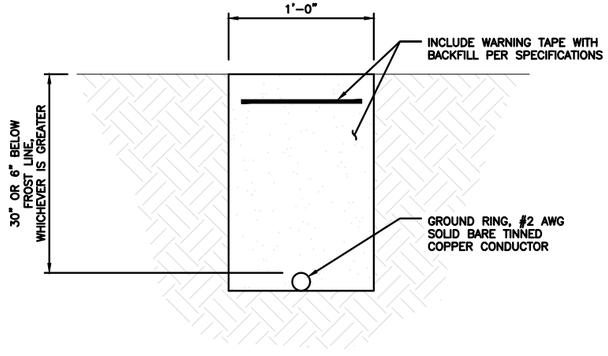
OUTDOOR CABINET GROUNDING | NO SCALE | 3



TRANSITIONING GROUND DETAIL | NO SCALE | 4



TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE | NO SCALE | 5



TYPICAL GROUND RING TRENCH | NO SCALE | 6

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SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
4/6/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	03/10/22	ISSUED FOR CONSTRUCTION
1	03/24/22	ISSUED FOR CONSTRUCTION
2	04/06/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

2039-Z5555C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00032A
TBD
62 YOUNGS APPLE ORCHARD RD
NORTH BRANFORD, CT 6472

SHEET TITLE

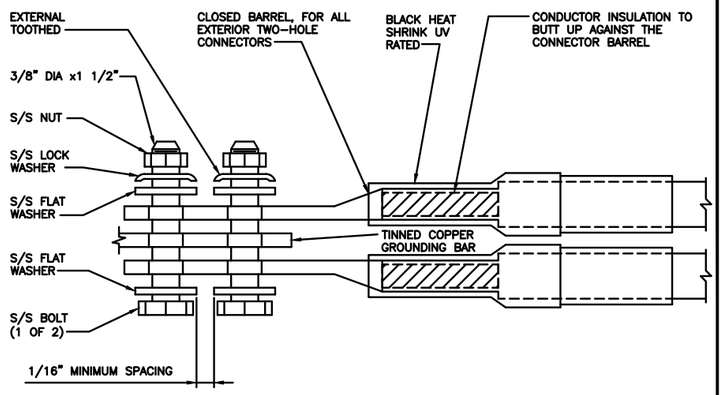
GROUNDING DETAILS

SHEET NUMBER

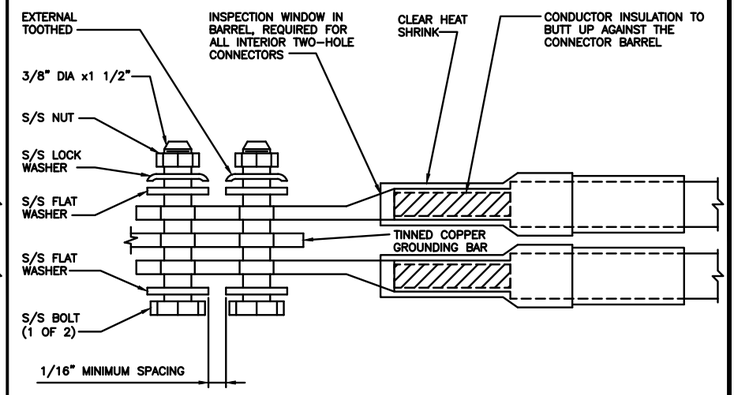
G-2

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

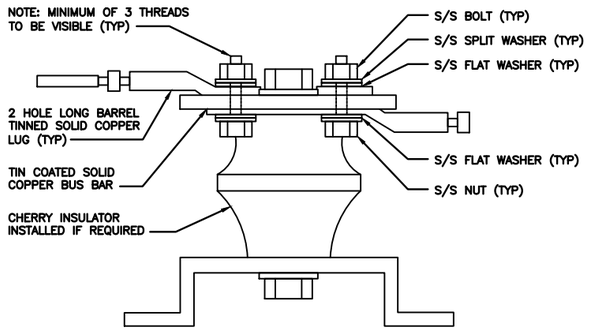
TYPICAL GROUNDING NOTES | NO SCALE | 1



TYPICAL EXTERIOR TWO HOLE LUG | NO SCALE | 2



TYPICAL INTERIOR TWO HOLE LUG | NO SCALE | 3



LUG DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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SHEET TITLE
GROUNDING DETAILS

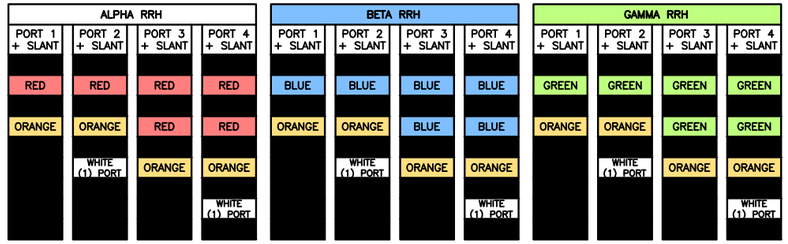
SHEET NUMBER
G-3

RF JUMPER COLOR CODING

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

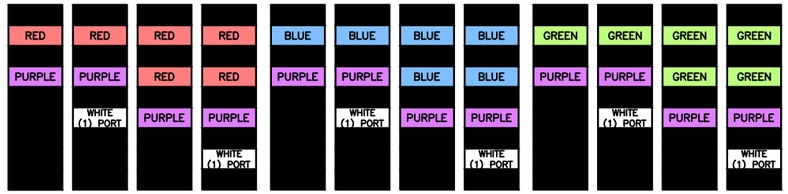
LOW-BAND RRH –
(600MHz N71 BASEBAND) +
(850MHz N26 BAND) +
(700MHz N29 BAND) – OPTIONAL PER MARKET

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



MID-BAND RRH –
(AWS BANDS N66+N70)

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

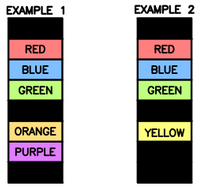


HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED AM LONG WITH FREQUENCY BANDS

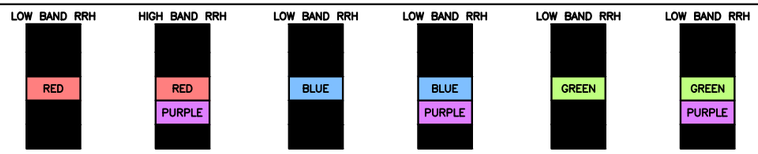
EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS

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



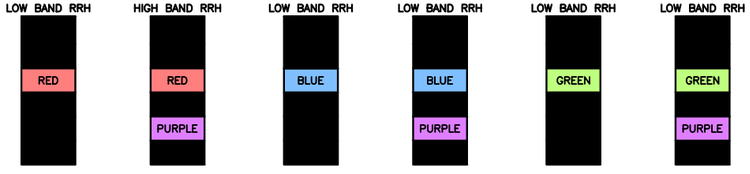
HYBRID/DISCREET CABLES

LOW-BAND RRH FIBER CABLES HAVE SECTOR STRIPE ONLY

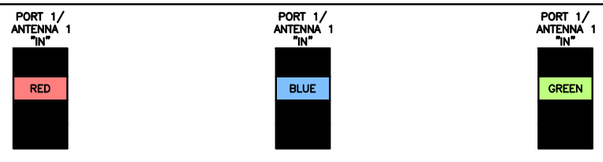


POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY



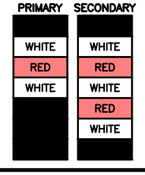
RET MOTORS AT ANTENNAS



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 CABINETS 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–N28)
OPTIONAL – (N29)
ORANGE

AWS
(N65+N70+H-BLOCK)
PURPLE

CBRS TECH
(3 GHz)
YELLOW

NEGATIVE SLANT PORT
ON ANTRRH
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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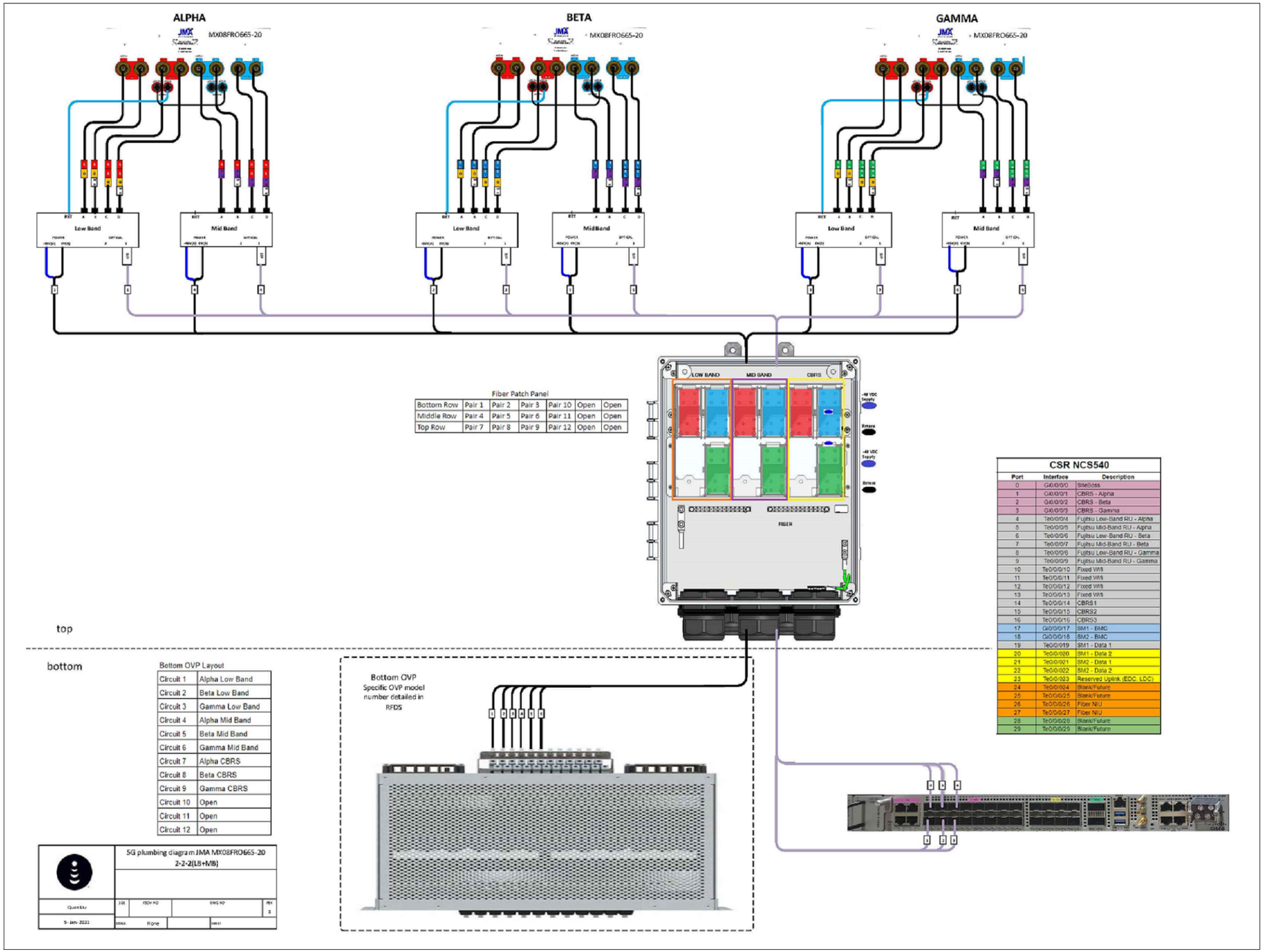
SHEET TITLE
RF
CABLE COLOR CODE

SHEET NUMBER
RF-1



Fiber Patch Panel

Bottom Row	Pair 1	Pair 2	Pair 3	Pair 10	Open	Open
Middle Row	Pair 4	Pair 5	Pair 6	Pair 11	Open	Open
Top Row	Pair 7	Pair 8	Pair 9	Pair 12	Open	Open

Bottom OVP Layout

Circuit 1	Alpha Low Band
Circuit 2	Beta Low Band
Circuit 3	Gamma Low Band
Circuit 4	Alpha Mid Band
Circuit 5	Beta Mid Band
Circuit 6	Gamma Mid Band
Circuit 7	Alpha CBRS
Circuit 8	Beta CBRS
Circuit 9	Gamma CBRS
Circuit 10	Open
Circuit 11	Open
Circuit 12	Open

5G plumbing diagram JMA MX08FRO665-20
2-2-2(LB+MB)

Quantity: 1 | ISSV NO | DWG NO | REV: 3
5-Jan-2021 | SCALE: None | SHEET

CSR NCS540

Port	Interface	Description
0	Gi0/0/0/0	SiteBoss
1	Gi0/0/0/1	CBRS - Alpha
2	Gi0/0/0/2	CBRS - Beta
3	Gi0/0/0/3	CBRS - Gamma
4	Te0/0/0/4	Fujitsu Low-Band RU - Alpha
5	Te0/0/0/5	Fujitsu Mid-Band RU - Alpha
6	Te0/0/0/6	Fujitsu Low-Band RU - Beta
7	Te0/0/0/7	Fujitsu Mid-Band RU - Beta
8	Te0/0/0/8	Fujitsu Low-Band RU - Gamma
9	Te0/0/0/9	Fujitsu Mid-Band RU - Gamma
10	Te0/0/0/10	Fixed WN
11	Te0/0/0/11	Fixed WN
12	Te0/0/0/12	Fixed WN
13	Te0/0/0/13	Fixed WN
14	Te0/0/0/14	CBRS1
15	Te0/0/0/15	CBRS2
16	Te0/0/0/16	CBRS3
17	Gi0/0/0/17	SM1 - BMC
18	Gi0/0/0/18	SM2 - BMC
19	Te0/0/019	SM1 - Data 1
20	Te0/0/020	SM1 - Data 2
21	Te0/0/021	SM2 - Data 1
22	Te0/0/022	SM2 - Data 2
23	Te0/0/023	Reserved Uplink (EDC, LDC)
24	Te0/0/024	Blank/Future
25	Te0/0/025	Blank/Future
26	Te0/0/026	Fiber NIU
27	Te0/0/027	Fiber NIU
28	Te0/0/028	Blank/Future
29	Te0/0/029	Blank/Future

PLUMBING DIAGRAM | NO SCALE | 1

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RF
PLUMBING DIAGRAM

SHEET NUMBER
RF-2

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

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE

UNDERGROUND POWER

UNDERGROUND TELCO

OVERHEAD POWER

OVERHEAD TELCO

UNDERGROUND TELCO/POWER

ABOVE GROUND POWER

ABOVE GROUND TELCO

ABOVE GROUND TELCO/POWER

WORKPOINT

SECTION REFERENCE

DETAIL REFERENCE

LEGEND

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

ABBREVIATIONS

dish wireless.

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LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SITE ACTIVITY REQUIREMENTS:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES:

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

CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION

CARRIER:DISH Wireless L.L.C.

TOWER OWNER:TOWER OWNER

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

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

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

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

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

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

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

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

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

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

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

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

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

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4/6/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	03/10/22	ISSUED FOR CONSTRUCTION
1	03/24/22	ISSUED FOR CONSTRUCTION
2	04/06/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
2039–Z5555C

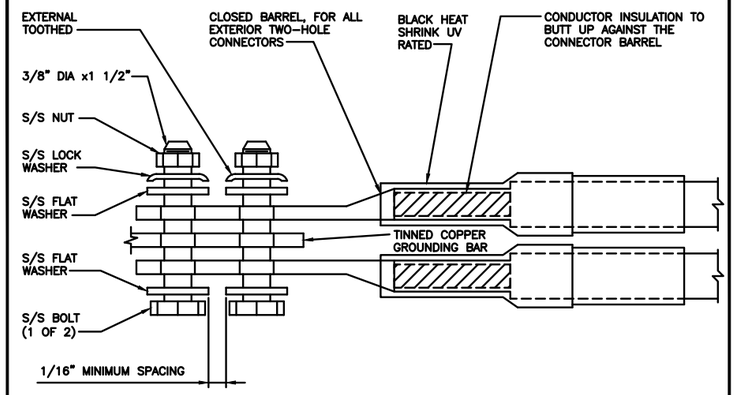
DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00032A
TBD
62 YOUNGS APPLE ORCHARD RD
NORTH BRANFORD, CT 6472

SHEET TITLE
GENERAL NOTES

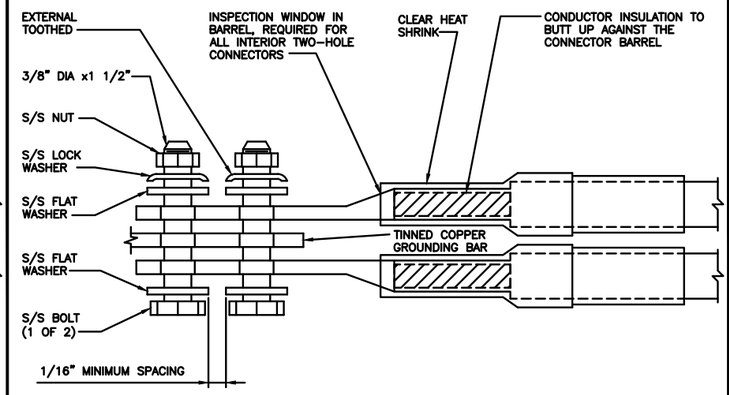
SHEET NUMBER
GN-2

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

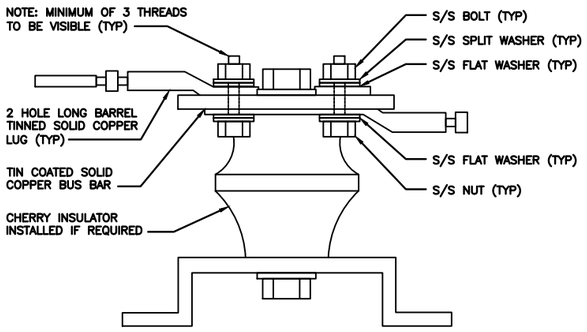
TYPICAL GROUNDING NOTES | NO SCALE | 1



TYPICAL EXTERIOR TWO HOLE LUG | NO SCALE | 2



TYPICAL INTERIOR TWO HOLE LUG | NO SCALE | 3



LUG DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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SHEET TITLE
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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4/6/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

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A&E PROJECT NUMBER

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DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00032A
TBD
62 YOUNGS APPLE ORCHARD RD
NORTH BRANFORD, CT 6472

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

Exhibit D

Structural Analysis Report

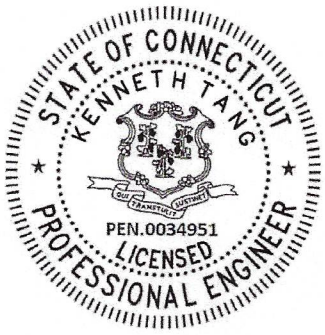
Structural Analysis of a 129 ft Self-Supporting Tower

Site Number Dish Wireless BOHVN00032A
EIP: 701778
Site Name: Youngs Apple Orchard
County: New Haven
Location: North Branford, CT

Checked By:

Patrick Propert

Patrick Propert
Structural Design Engineer III



2/10/2022

EVEREST
INFRASTRUCTURE PARTNERS

Two Allegheny Ctr

Nova Tower 2, Suite 703

Pittsburgh, PA 15212

February 2022

9 North Main Street, 2nd Floor, Cortland, NY 13045
(607)591-5381 Fax: (866)870-0840 www.ArmorTower.com

February 10, 2022

Tom Rigg
Everest Infrastructure Partners
Two Allegheny Ctr
Nova Tower 2, Suite 703
Pittsburgh, PA 15212

RE: Dish Wireless – BOHVN00032A
EIP – 701778 – Youngs Apple Orchard
62 Youngs Apple Orchard Rd, North Branford, CT

Tom:

We have completed the structural analysis of the subject tower and **have found it to be adequate within the scope of this analysis to support the proposed antenna loading.** The tower was analyzed according to the code wind and ice parameters outlined in the *Code Requirements Table* following this letter.

The subject tower is a 129 ft square self-supporting tower consisting of bolted angle legs and bracing. Tower face dimension ranges from 9.2' at the top to 24.3' at the base. Foundation capacities are based on a foundation mapping and geotechnical report by TEP dated September 2018.

The loading used in the analysis consisted of the existing antennas/lines as well as the following for Dish Wireless at 83 ft on a (3) Sabre THD 10' V-boom antenna frames:

- (3) MX08FRO665 antennas
- (3) TA08025-B604 RRUs, (3) TA08025-B605 RRUs
- (1) RDIDC-9181-PF-48 fed with (1) 1-5/8" hybrid cable installed as shown on E-7.

The results of the analysis showed all tower and apparent foundation elements to be loaded within allowable limits with a maximum stress rating of 79%. We recommend a post-construction inspection be completed by a structural engineer to document that tower-mounted equipment has been placed in compliance with the requirements of this analysis. For a detailed listing of tower performance, please see pages 34 to 35 of the calculations.

We appreciate the opportunity to provide our professional services to Everest Infrastructure and Dish Wireless and if you have any questions concerning this analysis, please contact us.

Sincerely,

ARMOR TOWER, INC.

Patrick Botimer
Structural Design Engineer V

STATE OF CONNECTICUT
KENNETH TANG
PEN.0034951
LICENSED
PROFESSIONAL ENGINEER

2/10/2022

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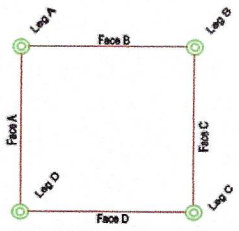
CODE REQUIREMENTS

Governing code:	2018 CT State Building Code
Code basis/adoption:	2015 International Building Code
Referenced standard:	ANSI/TIA 222-G-2
Basic wind speed: (3-sec. gust):	V_{ult}: 126 mph with no ice V_{asd}: 98 mph with no ice 50 mph with 3/4" concurrent ice
County of site location:	**New Haven**
ASCE 7 Special wind region:	No
Structure/Risk Category:	II
Exposure Category:	C
Topographic Category: (Method 1)	1 - no topographic escalation
Crest Height/Tower Base AMSL Elevation:	0 ft/ 451 ft
Site Spectral Response:	S_s=0.180, S_1=0.062

PRIMARY ASSUMPTIONS CONSIDERED IN THIS PROJECT

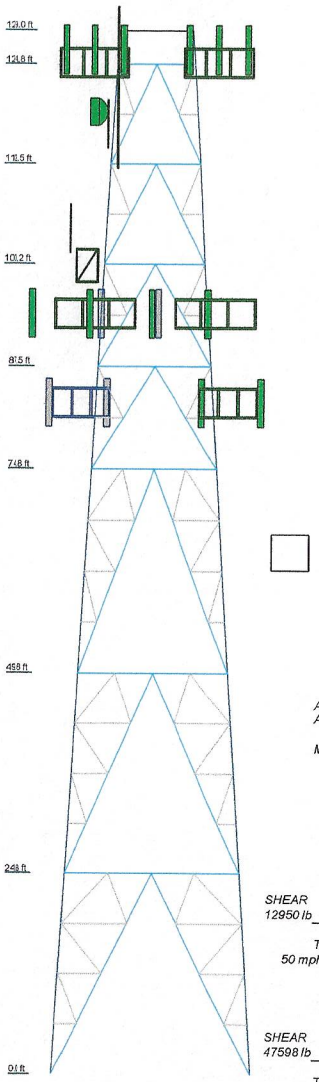


1. Leg A is assumed to be oriented Northwest.
2. Allowable steel stresses are defined by AISC-LRFD-99/360-16 and all welds conform to AWS D1.1 specification.
3. If reserved antennas/feed lines by other carriers are to be considered in this analysis, it is the responsibility of Everest Infrastructure and its affiliates to provide this information.
4. Any deviation from the analyzed antenna loading will require a re-analysis of the tower for verification of structural integrity. This analysis has considered the proposed hybrid line to be installed on the tower face as shown on drawing E-7.
5. This analysis assumes all tower members are galvanized adequately to prevent corrosion of the steel and that all tower members are in "like new" condition with no physical deterioration. This analysis also assumes the tower has been maintained properly per TIA 222-G Annex J recommended inspection and maintenance procedures for tower owners and is in a plumb condition. Armor Tower has not completed a condition assessment of the tower.
6. No accounting for residual stresses due to incorrect tower erection can be made. This analysis assumes all bolts are appropriately tightened providing necessary connection continuity and that the installation of the tower was performed by a qualified tower erector.
7. Foundation capacities are based on a foundation mapping and geotechnical report by TEP dated September 2018.
8. No conclusions, expressed or implied, shall indicate that Armor Tower has made an evaluation of the original design, materials, fabrication, or potential installation or erection deficiencies. Any information contrary to that assumed for the purpose of preparing this analysis could alter the findings and conclusions stated herein.
9. Tower member sizes, geometry, and existing antenna loading are based on a tower analysis by Ramaker & Associates dated July 2019. It is our assumption that this data is complete and accurately

reflects the existing conditions of the tower and equipment. Armor Tower has not been commissioned to field-validate this data. Armor Tower reserves the right to add to or modify this report as more information becomes available. Proposed equipment was outlined in a ColoApp dated July 2021.

10. The investigation of the load carrying capacities of the antenna supporting frames/mounts is outside the scope of this analysis. Antenna mount certification can be completed under a separate contract.
11. Armor Tower can assist the contractor in providing a Class IV rigging plan for equipment lifting.

Section	T8	T7	T6	T5	T4	T3	T2	T1
Legs	L8x8x1/2	L6x6x5/8	L8x8x1/2	L5x5x1/2	L4x4x3/8			
Leg Grade		A36						
Diagonals	L2 1/2x2x1/4	2L2 1/2x2x3/8x3/8		2L2 1/2x2x1/4x3/8		2L2 1/2x2x3/8x3/8		N.A.
Diagonal Grade		A36						N.A.
Top Girts		N.A.						A
Horizontals		2L2 1/2x2x1/4x3/8						C5x13.4
Red. Horizontals	L2 1/2x2x1/4	L2 1/2x2x3/16		L2x2x3/16		L2x2 1/2x3/16	L2x2x3/16	N.A.
Red. Diagonals	L2x2 1/2x1/4	L2x2 1/2x3/16		L2x2x3/16		L2x2 1/2x3/16	L2x2x3/16	N.A.
Red. Hips		N.A.		L2x2x3/16				N.A.
Inner Bracing	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16		L2 1/2x2x3/16				N.A.
Face Width (ft)	24.3333	21.4175	18.5018	15.5839	14.0459	11.1099	9.6804	8.1667
# Panels @ (ft)	2 @ 24.8			1 @ 25.2	2 @ 12.7	2 @ 12.3	1 @ 4.2	
Weight (lb)	34120.6	9849.9	7870.8	6847.4	2743.2	2555.7	2555.2	286.5



ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BAS
DOWN: 106215 lb
SHEAR: 17125 lb

UPLIFT: -81614 lb
SHEAR: 14820 lb

AXIAL 131401 lb
SHEAR 12950 lb *MOMENT 1036 kip-ft*
TORQUE 27 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL 55662 lb
SHEAR 47598 lb *MOMENT 3176 kip-ft*
TORQUE 71 kip-ft
REACTIONS - 98 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
CC807-08	132	Ericsson KRY 112 89/4 (TMO-LegA)	94
2.5"Sch40 x 20ft	132	Ericsson KRY 112 89/4 (TMO-LegC)	94
APXVSPP18-C-A20 w. Mtg Pipe (SP-LegB)	125	Ericsson KRY 112 89/4 (TMO-LegD)	94
APXVSPP18-C-A20 w. Mtg Pipe (SP-LegC)	125	Ericsson Radio 4449 B12/B71 (TMO-LegA)	94
APXVSPP18-C-A20 w. Mtg Pipe (SP-LegD)	125	Ericsson Radio 4449 B12/B71 (TMO-LegC)	94
800 MHz 2x50W RRH (SP-LegB)	125	Ericsson Radio 4449 B12/B71 (TMO-LegD)	94
800 MHz 2x50W RRH (SP-LegC)	125	Ericsson RRUS 4415 B25 (TMO-LegA)	94
800 MHz 2x50W RRH (SP-LegD)	125	Ericsson RRUS 4415 B25 (TMO-LegC)	94
800 Ext Notch Filter (SP-LegB)	125	Ericsson RRUS 4415 B25 (TMO-LegD)	94
800 Ext Notch Filter (SP-LegC)	125	Radio 4415 B66A (TMO-LegA)	94
800 Ext Notch Filter (SP-LegD)	125	Radio 4415 B66A (TMO-LegC)	94
1900MHz 4x45W RRH (SP-LegB)	125	Radio 4415 B66A (TMO-LegD)	94
1900MHz 4x45W RRH (SP-LegC)	125	(2) 2.5"Sch40 x 15ft (TMO-LegA)	94
1900MHz 4x45W RRH (SP-LegD)	125	(2) 2.5"Sch40 x 15ft (TMO-LegC)	94
DT465B-2XR w. Mtg Pipe (SP-LegB)	125	(2) 2.5"Sch40 x 15ft (TMO-LegD)	94
DT465B-2XR w. Mtg Pipe (SP-LegC)	125	6ft standoff-Flat (TMO)	94
DT465B-2XR w. Mtg Pipe (SP-LegD)	125	APXVAARR24_43-U-NA20 w. MtgPipe (TMO-LegA)	94
800 MHz 2x50W RRH (SP-LegB)	125	MX08FRO665 w. Mtg Pipe (P-DW-Alpha)	83
800 MHz 2x50W RRH (SP-LegC)	125	MX08FRO665 w. Mtg Pipe (P-DW-Beta)	83
800 MHz 2x50W RRH (SP-LegD)	125	MX08FRO665 w. Mtg Pipe (P-DW-Gamma)	83
TD-RRH-8x20-2500 (SP-LegB)	125	TA08025-B604 RRU (P-DW-Alpha)	83
TD-RRH-8x20-2500 (SP-LegC)	125	TA08025-B604 RRU (P-DW-Beta)	83
TD-RRH-8x20-2500 (SP-LegD)	125	TA08025-B604 RRU (P-DW-Gamma)	83
SectorMount SM702-1 (SP-LegB)	125	TA08025-B605 RRU (P-DW-Alpha)	83
SectorMount SM702-1 (SP-LegC)	125	TA08025-B605 RRU (P-DW-Beta)	83
SectorMount SM702-1 (SP-LegD)	125	TA08025-B605 RRU (P-DW-Gamma)	83
4'Sch40 x 4ft (Dishmount)	117.5	RDIDC-9181-PF-48 (P-DW-Alpha)	83
RFS SC3-xxx/SCX3-xxx	117.5	Sabre THD 10' V-Boom (P-DW-Alpha)	83
TMA	100	Sabre THD 10' V-Boom (P-DW-Beta)	83
Side Arm mount (SO801-1)	100	Sabre THD 10' V-Boom (P-DW-Gamma)	83
CC807-08	100	GPS	76.5
APXVAARR24_43-U-NA20 w. MtgPipe (TMO-LegC)	94	Catwalk	75
APXVAARR24_43-U-NA20 w. MtgPipe (TMO-LegD)	94		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	SR 5/16		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 98 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
9. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
10. Tower Rating: 78.9%

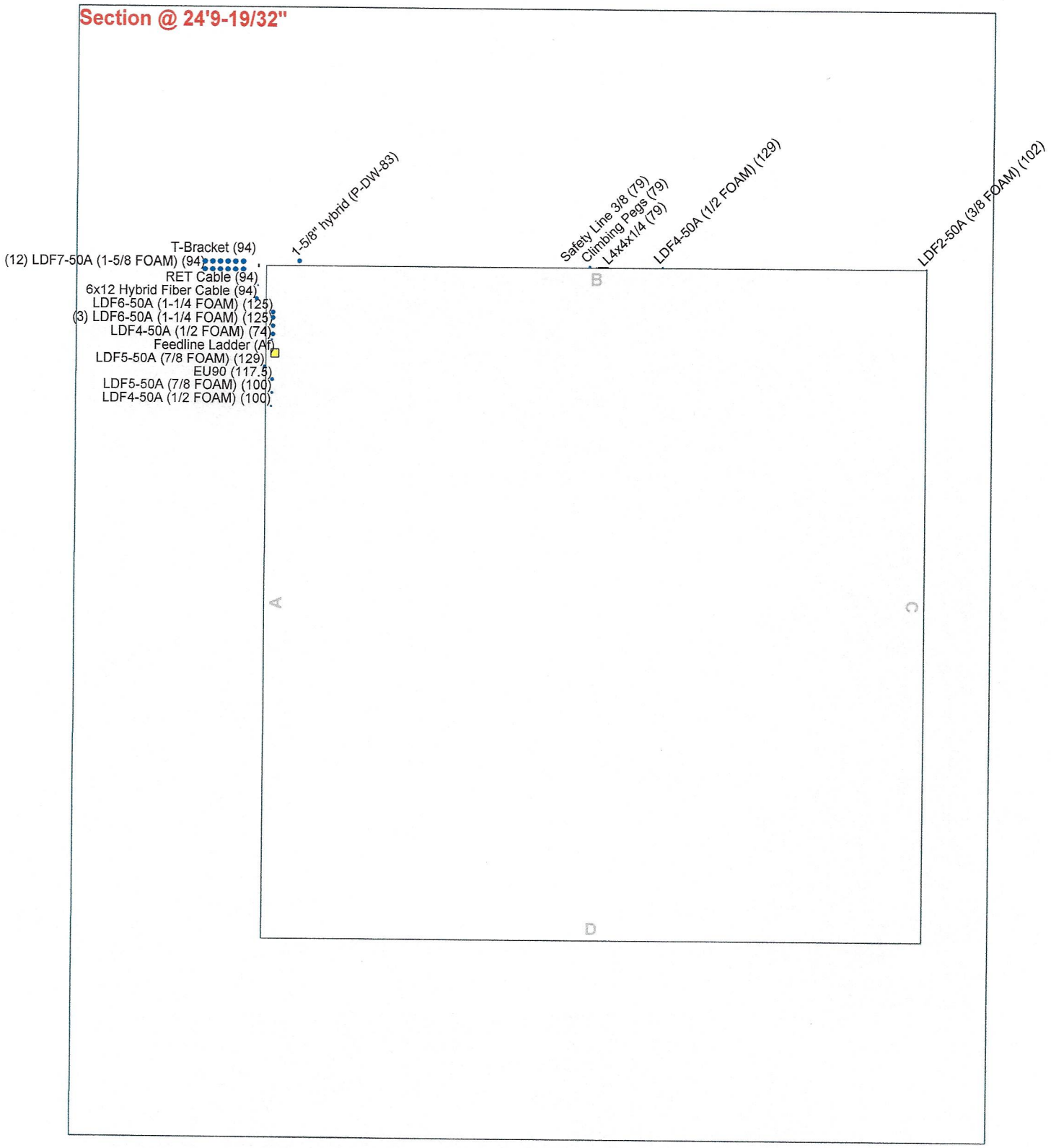
ARMOR TOWER

ARMOR TOWER, INC
9 North Main
Cortland, NY 13045
Phone: 607-591-5381
FAX: 866-870-0840

Job: ***129' Sqr SELF-SUPPORTING TOWER ANALYSIS***
Project: ***Dish Wireless BOHVN00032A - Youngs Apple Orchard, CT***
Client: Everest Infrastructure Partners - 701778 | Drawn by: PB | App'd:
Code: TIA-222-G | Date: 02/10/22 | Scale: NTS
Path: | Dwg No. E-1

Feed Line Plan
24'9-19/32"

Round Flat App In Face App Out Face



ARMOR TOWER	ARMOR TOWER, INC 9 North Main Cortland, NY 13045 Phone: 607-591-5381 FAX: 866-870-0840	Job: 129' Sqr SELF-SUPPORTING TOWER ANALYSIS	
		Project: Dish Wireless BOHVN00032A - Youngs Apple Orchard, CT	
		Client: Everest Infrastructure Partners - 701778	Drawn by: PB / App'd:
		Code: TIA-222-G	Date: 02/10/22 / Scale: NTS
		Path:	Dwg No. E-7

ARMOR TOWER ENGINEERING

ARMOR TOWER, INC
9 North Main
Cortland, NY 13045
Phone: 607-591-5381
FAX: 866-870-0840

Job	Page
129' Sqr SELF-SUPPORTING TOWER ANALYSIS	1 of 35
Project	**Date**
Dish Wireless BOHVN00032A - Youngs Apple Orchard, CT	09:58:35 02/10/22
Client	**Designed by**
Everest Infrastructure Partners - 701778	PB

Tower Input Data

The main tower is a 4x free standing tower with an overall height of 129.00 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 9.17 ft at the top and 24.33 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 98 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 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.
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
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

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Job	Page
129' Sqr SELF-SUPPORTING TOWER ANALYSIS	2 of 35
Project	**Date**
Dish Wireless BOHVN00032A - Youngs Apple Orchard, CT	09:58:35 02/10/22
Client	**Designed by**
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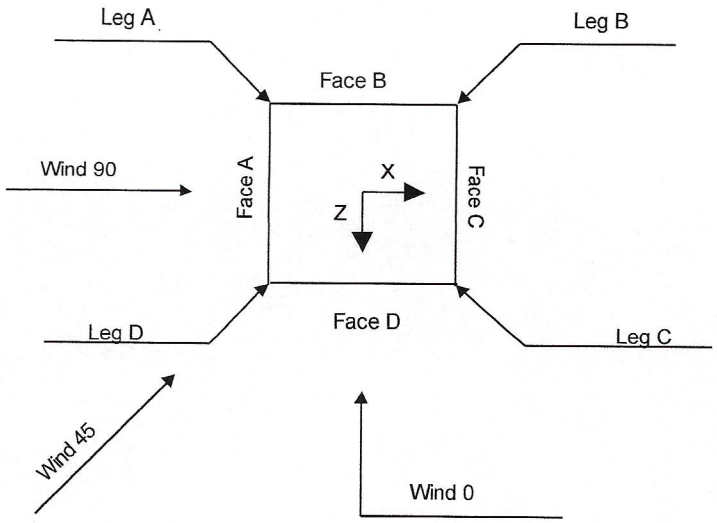


Square Tower

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	129.00-124.80			9.17	1	4.20
T2	124.80-112.50			9.66	1	12.30
T3	112.50-100.20			11.11	1	12.30
T4	100.20-87.50			12.55	1	12.70
T5	87.50-74.80			14.05	1	12.70
T6	74.80-49.60			15.54	1	25.20
T7	49.60-24.80			18.50	1	24.80
T8	24.80-0.00			21.42	1	24.80

Tower Section Geometry *(cont'd)*

Tower Section	*Tower Elevation*	*Diagonal Spacing*	*Bracing Type*	*Has K Brace End Panels*	*Has Horizontals*	*Top Girt Offset*	*Bottom Girt Offset*
	ft	*ft*				*in*	*in*
T1	129.00-124.80	4.20	X Brace	No	Yes	0.0000	0.0000
T2	124.80-112.50	12.30	K1 Down	No	Yes	0.0000	0.0000
T3	112.50-100.20	12.30	K1 Down	No	Yes	0.0000	0.0000
T4	100.20-87.50	12.70	K1 Down	No	Yes	0.0000	0.0000
T5	87.50-74.80	12.70	K1 Down	No	Yes	0.0000	0.0000
T6	74.80-49.60	25.20	K3A Down	No	Yes	0.0000	0.0000
T7	49.60-24.80	24.80	K3A Down	No	Yes	0.0000	0.0000
T8	24.80-0.00	24.80	K3A Down	No	Yes	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 129.00-124.80	Equal Angle	L4x4x3/8	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T2 124.80-112.50	Equal Angle	L4x4x3/8	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/8x3/8	A36 (36 ksi)
T3 112.50-100.20	Equal Angle	L4x4x3/8	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/8x3/8	A36 (36 ksi)
T4 100.20-87.50	Equal Angle	L5x5x1/2	A36 (36 ksi)	Double Angle	2L2 1/2x2x1/4x3/8	A36 (36 ksi)
T5 87.50-74.80	Equal Angle	L5x5x1/2	A36 (36 ksi)	Double Angle	2L2 1/2x2x1/4x3/8	A36 (36 ksi)
T6 74.80-49.60	Equal Angle	L6x6x1/2	A36 (36 ksi)	Double Angle	2L2 1/2x3x3/8x3/8	A36 (36 ksi)
T7 49.60-24.80	Equal Angle	L6x6x5/8	A36 (36 ksi)	Double Angle	2L2 1/2x3x3/8x3/8	A36 (36 ksi)
T8 24.80-0.00	Equal Angle	L8x8x1/2	A36 (36 ksi)	Double Angle	2L2 1/2x3x3/8x3/8	A36 (36 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 129.00-124.80	Solid Round	5/16	A36 (36 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*
T2 124.80-112.50	None	Flat Bar		A36 (36 ksi)	Channel	C9x13.4	A36 (36 ksi)
T3 112.50-100.20	None	Flat Bar		A36 (36 ksi)	Double Angle	2L2 1/2x2x1/4x3/8	A36 (36 ksi)
T4 100.20-87.50	None	Flat Bar		A36 (36 ksi)	Double Angle	2L2 1/2x2x1/4x3/8	A36 (36 ksi)
T5 87.50-74.80	None	Flat Bar		A36 (36 ksi)	Double Angle	2L2 1/2x2x1/4x3/8	A36 (36 ksi)
T6 74.80-49.60	None	Flat Bar		A36 (36 ksi)	Double Angle	2L2 1/2x2x1/4x3/8	A36 (36 ksi)
T7 49.60-24.80	None	Flat Bar		A36 (36 ksi)	Double Angle	2L2 1/2x2x1/4x3/8	A36 (36 ksi)
T8 24.80-0.00	None	Flat Bar		A36 (36 ksi)	Double Angle	2L2 1/2x2x1/4x3/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T1 129.00-124.80	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T2 124.80-112.50	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T3 112.50-100.20	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T4 100.20-87.50	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T5 87.50-74.80	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 74.80-49.60	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T7 49.60-24.80	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T8 24.80-0.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T2 124.80-112.50	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
		Hip (1)	Equal Angle	L2x2x3/16	1
T3 112.50-100.20	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2 1/2x3/16	1
		Hip (1)	Equal Angle	L2x2x3/16	1
T4 100.20-87.50	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
		Hip (1)	Equal Angle	L2x2x3/16	1
T5 87.50-74.80	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
		Hip (1)	Equal Angle	L2x2x3/16	1
T6 74.80-49.60	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2x3/16	1
		Horizontal (2)		L2 1/2x2x3/16	
		Horizontal (3)		L2 1/2x2x3/16	
		Diagonal (1)	Single Angle	L2x2 1/2x3/16	1
		Diagonal (2)		L2x2 1/2x3/16	
		Diagonal (3)		L2x2 1/2x3/16	
T7 49.60-24.80	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2x3/16	1
		Horizontal (2)		L2 1/2x2x3/16	
		Horizontal (3)		L2 1/2x2x3/16	
		Diagonal (1)	Single Angle	L2x2 1/2x3/16	1
		Diagonal (2)		L2x2 1/2x3/16	
		Diagonal (3)		L2x2 1/2x3/16	
T8 24.80-0.00	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2x1/4	1
		Horizontal (2)		L2 1/2x2x1/4	
		Horizontal (3)		L2 1/2x2x1/4	
		Diagonal (1)	Single Angle	L2x2 1/2x1/4	1

Tower Elevation ft	Redundant Bracing Grade	Redundant Type	Redundant Size	K Factor
		Diagonal (2)	L2x2 1/2x1/4	
		Diagonal (3)	L2x2 1/2x1/4	

Tower Section Geometry *(cont'd)*

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
T1 129.00-124.80	0.00	0.0000	A36 (36 ksi)	1.03	1	1.1	36.0000	36.0000	36.0000
T2 124.80-112.50	0.00	0.0000	A36 (36 ksi)	1.03	1	1.1	21.0000	58.0000	36.0000
T3 112.50-100.20	0.00	0.0000	A36 (36 ksi)	1.03	1	1.1	24.0000	19.0000	36.0000
T4 100.20-87.50	0.00	0.0000	A36 (36 ksi)	1.03	1	1.1	21.0000	28.0000	36.0000
T5 87.50-74.80	0.00	0.0000	A36 (36 ksi)	1.03	1	1.1	24.0000	28.0000	36.0000
T6 74.80-49.60	0.00	0.0000	A36 (36 ksi)	1.03	1	1.1	19.0000	21.0000	36.0000
T7 49.60-24.80	0.00	0.0000	A36 (36 ksi)	1.03	1	1.1	19.0000	20.0000	22.0000
T8 24.80-0.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.1	20.0000	21.0000	24.0000

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 129.00-124.80	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T2 124.80-112.50	No	No	1	1	0.5	1	1	1	1	1
				1	0.5	1	1	1	1	1
T3 112.50-100.20	No	No	1	1	0.5	1	1	1	1	1
				1	0.5	1	1	1	1	1
T4 100.20-87.50	No	No	1	1	0.5	1	1	1	1	1
				1	0.5	1	1	1	1	1
T5 87.50-74.80	No	No	1	1	0.5	1	1	1	1	1
				1	0.5	1	1	1	1	1
T6 74.80-49.60	No	No	1	1	1	1	1	1	1	1
				1	0.667	1	1	1	1	1
T7 49.60-24.80	No	No	1	1	1	1	1	1	1	1
				1	0.667	1	1	1	1	1
T8 24.80-0.00	No	No	1	1	1	1	1	1	1	1
				1	0.667	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	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 129.00-124.80	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 124.80-112.50	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 112.50-100.20	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 100.20-87.50	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 87.50-74.80	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 74.80-49.60	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
T7 49.60-24.80	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
T8 24.80-0.00	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 129.00-124.80	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 124.80-112.50	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 112.50-100.20	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 100.20-87.50	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 87.50-74.80	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 74.80-49.60	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
T7 49.60-24.80	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
T8 24.80-0.00	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 129.00-124.80	Sleeve SS	0.6250 A307	0	0.6250 A307	0	0.6250 A307	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T2 124.80-112.50	Sleeve SS	0.6250 A307	0	0.6250 A307	2	0.6250 A307	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	3	0.6250 A325N	0

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.
T3 112.50-100.20	Sleeve SS	0.6250 A307	24	0.6250 A307	2	0.6250 A307	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	2	0.6250 A325N	0
T4 100.20-87.50	Sleeve SS	0.6250 A307	0	0.6250 A307	2	0.6250 A307	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	2	0.6250 A325N	0
T5 87.50-74.80	Sleeve SS	0.6250 A307	24	0.6250 A307	2	0.6250 A307	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	2	0.6250 A325N	0
T6 74.80-49.60	Sleeve SS	0.6250 A307	32	0.6250 A307	2	0.6250 A307	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	2	0.6250 A325N	0
T7 49.60-24.80	Sleeve SS	0.6250 A307	40	0.6250 A307	2	0.6250 A307	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	2	0.6250 A325N	0
T8 24.80-0.00	Sleeve SS	0.6250 A307	48	0.6250 A307	2	0.6250 A307	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	2	0.6250 A325N	0

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	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 129.00-124.80	0.6250 A307	1	0.6250 A307	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	1	0.6250 A307	1
T2 124.80-112.50	0.6250 A307	1	0.6250 A307	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	1	0.6250 A307	1
T3 112.50-100.20	0.6250 A307	1	0.6250 A307	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	1	0.6250 A307	1
T4 100.20-87.50	0.6250 A307	1	0.6250 A307	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	1	0.6250 A307	1
T5 87.50-74.80	0.6250 A307	1	0.6250 A307	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	1	0.6250 A307	1
T6 74.80-49.60	0.6250 A307	1	0.6250 A307	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	1	0.6250 A307	1
T7 49.60-24.80	0.6250 A307	1	0.6250 A307	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	1	0.6250 A307	1
T8 24.80-0.00	0.6250 A307	1	0.6250 A307	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	1	0.6250 A307	1

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
L4x4x1/4 (129)	D	No	No	Af (CaAa)	129.00 - 75.00	0.0000	0.01	1	1	4.0000	4.0000		6.00
L4x4x1/4 (79)	B	No	No	Af (CaAa)	79.00 - 0.00	0.0000	0.01	1	1	4.0000	4.0000		6.00
Climbing Pegs (129)	D	No	No	Ar (CaAa)	129.00 - 75.00	0.0000	-0.01	1	1	0.8800 0.0000	0.8800		0.50
Climbing Pegs	B	No	No	Ar (CaAa)	79.00 - 0.00	0.0000	-0.01	1	1	0.8800	0.8800		0.50

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
(79) Safety Line 3/8 (129)	D	No	No	Ar (CaAa)	129.00 - 75.00	0.0000	0	1	1	0.0000 0.3750	0.3750		0.22
Safety Line 3/8 (79) *	B	No	No	Ar (CaAa)	79.00 - 0.00	0.0000	0	1	1	0.3750	0.3750		0.22
LDF4-50A (1/2 FOAM) (129) *	B	No	No	Ar (CaAa)	129.00 - 0.00	0.0000	0.1	1	1	0.6300	0.6300		0.15
LDF5-50A (7/8 FOAM) (129) *	A	No	No	Ar (CaAa)	129.00 - 0.00	0.0000	0.35	1	1	1.0900	1.0900		0.33
LDF6-50A (1-1/4 FOAM) (125)	A	No	No	Ar (CaAa)	125.00 - 0.00	-2.0000	0.41	3	3	1.5500	1.5500		0.66
LDF6-50A (1-1/4 FOAM) (125)	A	No	No	Ar (CaAa)	125.00 - 0.00	-2.0000	0.43	1	1	1.5500	1.5500		0.66
Feedline Ladder (Af) *	A	No	No	Af (CaAa)	125.00 - 0.00	-2.0000	0.37	1	1	3.0000	3.0000		8.40
EU90 (117.5) *	A	No	No	Ar (CaAa)	117.50 - 0.00	-2.0000	0.33	1	1	1.2900	1.2900		0.34
LDF2-50A (3/8 FOAM) (102) *	B	No	No	Ar (CaAa)	102.00 - 0.00	0.0000	0.5	1	1	0.4400	0.4400		0.08
LDF5-50A (7/8 FOAM) (100)	A	No	No	Ar (CaAa)	100.00 - 0.00	-2.0000	0.31	1	1	1.0900	1.0900		0.33
LDF4-50A (1/2 FOAM) (100) *	A	No	No	Ar (CaAa)	100.00 - 0.00	-2.0000	0.29	1	1	0.6300	0.6300		0.15
LDF7-50A (1-5/8 FOAM) (94)	A	No	No	Ar (CaAa)	94.00 - 0.00	8.0000	0.5	12	2	1.0000	1.9800		0.82
RET Cable (94)	A	No	No	Ar (CaAa)	94.00 - 0.00	3.0000	0.47	1	1	0.4400	0.4400		0.08
6x12 Hybrid Fiber Cable (94)	A	No	No	Ar (CaAa)	94.00 - 0.00	3.0000	0.45	1	1	1.4300	1.4300		1.72
T-Bracket (94) *	A	No	No	Af (CaAa)	94.00 - 0.00	3.0000	0.5	1	1	0.7500 1.0000	1.0000		1.50
LDF4-50A (1/2 FOAM) (74) *	A	No	No	Ar (CaAa)	74.00 - 0.00	-2.0000	0.39	1	1	0.6300	0.6300		0.15
*DishWireless Feb2022 1-5/8" hybrid (P-DW-83)	B	No	No	Ar (CaAa)	83.00 - 0.00	1.0000	-0.45	1	1	1.6250	1.6250		0.67

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C_AA_A ft^2/ft	Weight plf
*								

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 lb
T1	129.00-124.80	A	0.000	0.000	0.682	0.000	4
		B	0.000	0.000	0.265	0.000	1
		C	0.000	0.000	0.000	0.000	0
		D	0.000	0.000	3.327	0.000	28
T2	124.80-112.50	A	0.000	0.000	15.762	0.000	142
		B	0.000	0.000	0.775	0.000	2
		C	0.000	0.000	0.000	0.000	0
		D	0.000	0.000	9.744	0.000	83
T3	112.50-100.20	A	0.000	0.000	16.703	0.000	144
		B	0.000	0.000	0.854	0.000	2
		C	0.000	0.000	0.000	0.000	0
		D	0.000	0.000	9.744	0.000	83
T4	100.20-87.50	A	0.000	0.000	37.139	0.000	240
		B	0.000	0.000	1.359	0.000	3
		C	0.000	0.000	0.000	0.000	0
		D	0.000	0.000	10.061	0.000	85
T5	87.50-74.80	A	0.000	0.000	54.098	0.000	322
		B	0.000	0.000	6.019	0.000	37
		C	0.000	0.000	0.000	0.000	0
		D	0.000	0.000	9.902	0.000	84
T6	74.80-49.60	A	0.000	0.000	108.881	0.000	642
		B	0.000	0.000	26.754	0.000	192
		C	0.000	0.000	0.000	0.000	0
		D	0.000	0.000	0.000	0.000	0
T7	49.60-24.80	A	0.000	0.000	107.202	0.000	632
		B	0.000	0.000	26.329	0.000	189
		C	0.000	0.000	0.000	0.000	0
		D	0.000	0.000	0.000	0.000	0
T8	24.80-0.00	A	0.000	0.000	107.202	0.000	632
		B	0.000	0.000	26.329	0.000	189
		C	0.000	0.000	0.000	0.000	0
		D	0.000	0.000	0.000	0.000	0

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 lb
T1	129.00-124.80	A	1.716	0.000	0.000	2.474	0.000	36

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 lb
		B		0.000	0.000	1.706	0.000	21
		C		0.000	0.000	0.000	0.000	0
		D		0.000	0.000	7.652	0.000	112
T2	124.80-112.50	A	1.705	0.000	0.000	43.104	0.000	691
		B		0.000	0.000	4.969	0.000	62
		C		0.000	0.000	0.000	0.000	0
		D		0.000	0.000	22.325	0.000	324
T3	112.50-100.20	A	1.686	0.000	0.000	46.277	0.000	730
		B		0.000	0.000	5.609	0.000	69
		C		0.000	0.000	0.000	0.000	0
		D		0.000	0.000	22.188	0.000	320
T4	100.20-87.50	A	1.665	0.000	0.000	84.500	0.000	1384
		B		0.000	0.000	9.818	0.000	117
		C		0.000	0.000	0.000	0.000	0
		D		0.000	0.000	22.750	0.000	326
T5	87.50-74.80	A	1.641	0.000	0.000	109.235	0.000	1844
		B		0.000	0.000	21.183	0.000	279
		C		0.000	0.000	0.000	0.000	0
		D		0.000	0.000	22.211	0.000	315
T6	74.80-49.60	A	1.598	0.000	0.000	223.422	0.000	3678
		B		0.000	0.000	75.082	0.000	1007
		C		0.000	0.000	0.000	0.000	0
		D		0.000	0.000	0.000	0.000	0
T7	49.60-24.80	A	1.518	0.000	0.000	214.906	0.000	3452
		B		0.000	0.000	71.507	0.000	928
		C		0.000	0.000	0.000	0.000	0
		D		0.000	0.000	0.000	0.000	0
T8	24.80-0.00	A	1.360	0.000	0.000	204.521	0.000	3130
		B		0.000	0.000	66.807	0.000	811
		C		0.000	0.000	0.000	0.000	0
		D		0.000	0.000	0.000	0.000	0

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	129.00-124.80	-1.5368	-0.2509	-2.7682	2.7306
T2	124.80-112.50	-4.5692	-4.4568	-8.7218	-6.2418
T3	112.50-100.20	-6.2527	-6.0370	-10.8902	-8.1592
T4	100.20-87.50	-15.4536	-9.9044	-20.2693	-15.4279
T5	87.50-74.80	-23.2576	-14.2149	-27.7839	-22.3382
T6	74.80-49.60	-24.5289	-16.9863	-31.1936	-33.2992
T7	49.60-24.80	-27.1067	-18.8999	-34.3597	-36.5920
T8	24.80-0.00	-27.1441	-18.8631	-35.2491	-37.0843

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	L4x4x1/4	124.80 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	3	Climbing Pegs	129.00 - 124.80	0.6000	0.6000
T1	5	Safety Line 3/8	129.00 - 124.80	0.6000	0.6000
T1	8	LDF4-50A (1/2 FOAM)	129.00 - 124.80	0.6000	0.6000
T1	10	LDF5-50A (7/8 FOAM)	129.00 - 124.80	0.6000	0.6000
T1	12	LDF6-50A (1-1/4 FOAM)	129.00 - 124.80	0.6000	0.6000
T1	13	LDF6-50A (1-1/4 FOAM)	125.00 - 124.80	0.6000	0.6000
T1	14	Feedline Ladder (Af)	125.00 - 124.80	0.6000	0.6000
T2	1	L4x4x1/4	125.00 - 112.50	0.6000	0.6000
T2	3	Climbing Pegs	124.80 - 112.50	0.6000	0.6000
T2	5	Safety Line 3/8	124.80 - 112.50	0.6000	0.6000
T2	8	LDF4-50A (1/2 FOAM)	124.80 - 112.50	0.6000	0.6000
T2	10	LDF5-50A (7/8 FOAM)	124.80 - 112.50	0.6000	0.6000
T2	12	LDF6-50A (1-1/4 FOAM)	124.80 - 112.50	0.6000	0.6000
T2	13	LDF6-50A (1-1/4 FOAM)	124.80 - 112.50	0.6000	0.6000
T2	14	Feedline Ladder (Af)	124.80 - 112.50	0.6000	0.6000
T2	16	EU90	124.80 - 112.50	0.6000	0.6000
T3	1	L4x4x1/4	117.50 - 100.20	0.6000	0.6000
T3	3	Climbing Pegs	112.50 - 100.20	0.6000	0.6000
T3	5	Safety Line 3/8	112.50 - 100.20	0.6000	0.6000
T3	8	LDF4-50A (1/2 FOAM)	112.50 - 100.20	0.6000	0.6000
T3	10	LDF5-50A (7/8 FOAM)	112.50 - 100.20	0.6000	0.6000
T3	12	LDF6-50A (1-1/4 FOAM)	112.50 - 100.20	0.6000	0.6000
T3	13	LDF6-50A (1-1/4 FOAM)	112.50 - 100.20	0.6000	0.6000
T3	14	Feedline Ladder (Af)	112.50 - 100.20	0.6000	0.6000
T3	16	EU90	112.50 - 100.20	0.6000	0.6000
T3	18	LDF2-50A (3/8 FOAM)	112.50 - 100.20	0.6000	0.6000
T4	1	L4x4x1/4	102.00 - 87.50	0.6000	0.6000
T4	3	Climbing Pegs	100.20 - 87.50	0.6000	0.6000
T4	5	Safety Line 3/8	100.20 - 87.50	0.6000	0.6000
T4	8	LDF4-50A (1/2 FOAM)	100.20 - 87.50	0.6000	0.6000
T4	10	LDF5-50A (7/8 FOAM)	100.20 - 87.50	0.6000	0.6000
T4	12	LDF6-50A (1-1/4 FOAM)	100.20 - 87.50	0.6000	0.6000
T4	13	LDF6-50A (1-1/4 FOAM)	100.20 - 87.50	0.6000	0.6000
T4	14	Feedline Ladder (Af)	100.20 - 87.50	0.6000	0.6000
T4	16	EU90	100.20 - 87.50	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	18	LDF2-50A (3/8 FOAM)	87.50 - 100.20	0.6000	0.6000
T4	20	LDF5-50A (7/8 FOAM)	87.50 - 100.00	0.6000	0.6000
T4	21	LDF4-50A (1/2 FOAM)	87.50 - 100.00	0.6000	0.6000
T4	23	LDF7-50A (1-5/8 FOAM)	87.50 - 94.00	0.6000	0.6000
T4	24	RET Cable	87.50 - 94.00	0.6000	0.6000
T4	25	6x12 Hybrid Fiber Cable	87.50 - 94.00	0.6000	0.6000
T4	26	T-Bracket	87.50 - 94.00	0.6000	0.6000
T5	1	L4x4x1/4	75.00 - 87.50	0.6000	0.6000
T5	2	L4x4x1/4	74.80 - 79.00	0.6000	0.6000
T5	3	Climbing Pegs	75.00 - 87.50	0.6000	0.6000
T5	4	Climbing Pegs	74.80 - 79.00	0.6000	0.6000
T5	5	Safety Line 3/8	75.00 - 87.50	0.6000	0.6000
T5	6	Safety Line 3/8	74.80 - 79.00	0.6000	0.6000
T5	8	LDF4-50A (1/2 FOAM)	74.80 - 87.50	0.6000	0.6000
T5	10	LDF5-50A (7/8 FOAM)	74.80 - 87.50	0.6000	0.6000
T5	12	LDF6-50A (1-1/4 FOAM)	74.80 - 87.50	0.6000	0.6000
T5	13	LDF6-50A (1-1/4 FOAM)	74.80 - 87.50	0.6000	0.6000
T5	14	Feedline Ladder (Af)	74.80 - 87.50	0.6000	0.6000
T5	16	EU90	74.80 - 87.50	0.6000	0.6000
T5	18	LDF2-50A (3/8 FOAM)	74.80 - 87.50	0.6000	0.6000
T5	20	LDF5-50A (7/8 FOAM)	74.80 - 87.50	0.6000	0.6000
T5	21	LDF4-50A (1/2 FOAM)	74.80 - 87.50	0.6000	0.6000
T5	23	LDF7-50A (1-5/8 FOAM)	74.80 - 87.50	0.6000	0.6000
T5	24	RET Cable	74.80 - 87.50	0.6000	0.6000
T5	25	6x12 Hybrid Fiber Cable	74.80 - 87.50	0.6000	0.6000
T5	26	T-Bracket	74.80 - 87.50	0.6000	0.6000
T5	31	1-5/8" hybrid	74.80 - 83.00	0.6000	0.6000
T6	2	L4x4x1/4	49.60 - 74.80	0.6000	0.6000
T6	4	Climbing Pegs	49.60 - 74.80	0.6000	0.6000
T6	6	Safety Line 3/8	49.60 - 74.80	0.6000	0.6000
T6	8	LDF4-50A (1/2 FOAM)	49.60 - 74.80	0.6000	0.6000
T6	10	LDF5-50A (7/8 FOAM)	49.60 - 74.80	0.6000	0.6000
T6	12	LDF6-50A (1-1/4 FOAM)	49.60 - 74.80	0.6000	0.6000
T6	13	LDF6-50A (1-1/4 FOAM)	49.60 - 74.80	0.6000	0.6000
T6	14	Feedline Ladder (Af)	49.60 - 74.80	0.6000	0.6000
T6	16	EU90	49.60 - 74.80	0.6000	0.6000
T6	18	LDF2-50A (3/8 FOAM)	49.60 - 74.80	0.6000	0.6000
T6	20	LDF5-50A (7/8 FOAM)	49.60 - 74.80	0.6000	0.6000
T6	21	LDF4-50A (1/2 FOAM)	49.60 - 74.80	0.6000	0.6000
T6	23	LDF7-50A (1-5/8 FOAM)	49.60 - 74.80	0.6000	0.6000
T6	24	RET Cable	49.60 - 74.80	0.6000	0.6000
T6	25	6x12 Hybrid Fiber Cable	49.60 - 74.80	0.6000	0.6000
T6	26	T-Bracket	49.60 - 74.80	0.6000	0.6000
T6	28	LDF4-50A (1/2 FOAM)	49.60 - 74.00	0.6000	0.6000
T6	31	1-5/8" hybrid	49.60 - 74.80	0.6000	0.6000
T7	2	L4x4x1/4	24.80 - 49.60	0.6000	0.6000
T7	4	Climbing Pegs	24.80 - 49.60	0.6000	0.6000
T7	6	Safety Line 3/8	24.80 - 49.60	0.6000	0.6000
T7	8	LDF4-50A (1/2 FOAM)	24.80 - 49.60	0.6000	0.6000
T7	10	LDF5-50A (7/8 FOAM)	24.80 - 49.60	0.6000	0.6000
T7	12	LDF6-50A (1-1/4 FOAM)	24.80 - 49.60	0.6000	0.6000
T7	13	LDF6-50A (1-1/4 FOAM)	24.80 - 49.60	0.6000	0.6000
T7	14	Feedline Ladder (Af)	24.80 - 49.60	0.6000	0.6000
T7	16	EU90	24.80 - 49.60	0.6000	0.6000
T7	18	LDF2-50A (3/8 FOAM)	24.80 - 49.60	0.6000	0.6000
T7	20	LDF5-50A (7/8 FOAM)	24.80 - 49.60	0.6000	0.6000
T7	21	LDF4-50A (1/2 FOAM)	24.80 - 49.60	0.6000	0.6000
T7	23	LDF7-50A (1-5/8 FOAM)	24.80 - 49.60	0.6000	0.6000
T7	24	RET Cable	24.80 - 49.60	0.6000	0.6000
T7	25	6x12 Hybrid Fiber Cable	24.80 - 49.60	0.6000	0.6000
T7	26	T-Bracket	24.80 - 49.60	0.6000	0.6000
T7	28	LDF4-50A (1/2 FOAM)	24.80 - 49.60	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	31	1-5/8" hybrid	24.80 - 49.60	0.6000	0.6000
T8	2	L4x4x1/4	0.00 - 24.80	0.6000	0.6000
T8	4	Climbing Pegs	0.00 - 24.80	0.6000	0.6000
T8	6	Safety Line 3/8	0.00 - 24.80	0.6000	0.6000
T8	8	LDF4-50A (1/2 FOAM)	0.00 - 24.80	0.6000	0.6000
T8	10	LDF5-50A (7/8 FOAM)	0.00 - 24.80	0.6000	0.6000
T8	12	LDF6-50A (1-1/4 FOAM)	0.00 - 24.80	0.6000	0.6000
T8	13	LDF6-50A (1-1/4 FOAM)	0.00 - 24.80	0.6000	0.6000
T8	14	Feedline Ladder (Af)	0.00 - 24.80	0.6000	0.6000
T8	16	EU90	0.00 - 24.80	0.6000	0.6000
T8	18	LDF2-50A (3/8 FOAM)	0.00 - 24.80	0.6000	0.6000
T8	20	LDF5-50A (7/8 FOAM)	0.00 - 24.80	0.6000	0.6000
T8	21	LDF4-50A (1/2 FOAM)	0.00 - 24.80	0.6000	0.6000
T8	23	LDF7-50A (1-5/8 FOAM)	0.00 - 24.80	0.6000	0.6000
T8	24	RET Cable	0.00 - 24.80	0.6000	0.6000
T8	25	6x12 Hybrid Fiber Cable	0.00 - 24.80	0.6000	0.6000
T8	26	T-Bracket	0.00 - 24.80	0.6000	0.6000
T8	28	LDF4-50A (1/2 FOAM)	0.00 - 24.80	0.6000	0.6000
T8	31	1-5/8" hybrid	0.00 - 24.80	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft		ft^2	ft^2	lb
No Lightning Rod									
*									
CC807-08	D	From Leg	0.50	0.0000	132.00	No Ice	2.85	2.85	27
			0.00			1/2" Ice	3.83	3.83	48
			4.57			1" Ice	4.67	4.67	68
2.5"Sch40 x 20ft	D	From Leg	0.50	0.0000	132.00	No Ice	5.75	5.75	116
			0.00			1/2" Ice	7.78	7.78	158
			-10.00			1" Ice	9.83	9.83	212
*									
*Sprint-2019									
APXVSPP18-C-A20 w. Mtg Pipe (SP-LegB)	B	From Leg	4.00	0.0000	125.00	No Ice	8.02	6.71	79
			0.00			1/2" Ice	8.48	7.66	144
			1.66			1" Ice	8.94	8.49	217
APXVSPP18-C-A20 w. Mtg Pipe (SP-LegC)	C	From Leg	4.00	0.0000	125.00	No Ice	8.02	6.71	79
			0.00			1/2" Ice	8.48	7.66	144
			1.66			1" Ice	8.94	8.49	217
APXVSPP18-C-A20 w. Mtg Pipe (SP-LegD)	D	From Leg	4.00	0.0000	125.00	No Ice	8.02	6.71	79
			0.00			1/2" Ice	8.48	7.66	144
			1.66			1" Ice	8.94	8.49	217
800 MHz 2x50W RRH (SP-LegB)	B	From Leg	1.00	0.0000	125.00	No Ice	2.06	1.93	64
			0.00			1/2" Ice	2.24	2.11	86
			3.00			1" Ice	2.43	2.29	111
800 MHz 2x50W RRH (SP-LegC)	C	From Leg	1.00	0.0000	125.00	No Ice	2.06	1.93	64
			0.00			1/2" Ice	2.24	2.11	86
			3.00			1" Ice	2.43	2.29	111
800 MHz 2x50W RRH	D	From Leg	1.00	0.0000	125.00	No Ice	2.06	1.93	64

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(SP-LegD)			0.00				1/2" Ice	2.24	2.11	86
			3.00				1" Ice	2.43	2.29	111
800 Ext Notch Filter (SP-LegB)	B	From Leg	1.00	0.0000		125.00	No Ice	0.65	0.29	11
			0.00				1/2" Ice	0.76	0.37	17
			3.00				1" Ice	0.87	0.45	24
800 Ext Notch Filter (SP-LegC)	C	From Leg	1.00	0.0000		125.00	No Ice	0.65	0.29	11
			0.00				1/2" Ice	0.76	0.37	17
			3.00				1" Ice	0.87	0.45	24
800 Ext Notch Filter (SP-LegD)	D	From Leg	1.00	0.0000		125.00	No Ice	0.65	0.29	11
			0.00				1/2" Ice	0.76	0.37	17
			3.00				1" Ice	0.87	0.45	24
1900MHz 4x45W RRH (SP-LegB)	B	From Leg	1.00	0.0000		125.00	No Ice	2.32	2.24	60
			0.00				1/2" Ice	2.53	2.44	109
			-0.25				1" Ice	2.74	2.65	158
1900MHz 4x45W RRH (SP-LegC)	C	From Leg	1.00	0.0000		125.00	No Ice	2.32	2.24	60
			0.00				1/2" Ice	2.53	2.44	109
			-0.25				1" Ice	2.74	2.65	158
1900MHz 4x45W RRH (SP-LegD)	D	From Leg	1.00	0.0000		125.00	No Ice	2.32	2.24	60
			0.00				1/2" Ice	2.53	2.44	109
			-0.25				1" Ice	2.74	2.65	158
DT465B-2XR w. Mtg Pipe (SP-LegB)	B	From Leg	4.00	0.0000		125.00	No Ice	9.34	7.64	84
			6.00				1/2" Ice	9.91	8.82	160
			1.66				1" Ice	10.44	9.72	245
DT465B-2XR w. Mtg Pipe (SP-LegC)	C	From Leg	4.00	0.0000		125.00	No Ice	9.34	7.64	84
			6.00				1/2" Ice	9.91	8.82	160
			1.66				1" Ice	10.44	9.72	245
DT465B-2XR w. Mtg Pipe (SP-LegD)	D	From Leg	4.00	0.0000		125.00	No Ice	9.34	7.64	84
			6.00				1/2" Ice	9.91	8.82	160
			1.66				1" Ice	10.44	9.72	245
800 MHz 2x50W RRH (SP-LegB)	B	From Leg	4.00	0.0000		125.00	No Ice	2.06	1.93	64
			6.00				1/2" Ice	2.24	2.11	86
			4.66				1" Ice	2.43	2.29	111
800 MHz 2x50W RRH (SP-LegC)	C	From Leg	4.00	0.0000		125.00	No Ice	2.06	1.93	64
			6.00				1/2" Ice	2.24	2.11	86
			4.66				1" Ice	2.43	2.29	111
800 MHz 2x50W RRH (SP-LegD)	D	From Leg	4.00	0.0000		125.00	No Ice	2.06	1.93	64
			6.00				1/2" Ice	2.24	2.11	86
			4.66				1" Ice	2.43	2.29	111
TD-RRH-8x20-2500 (SP-LegB)	B	From Leg	4.00	0.0000		125.00	No Ice	4.05	1.53	70
			6.00				1/2" Ice	4.30	1.71	97
			1.66				1" Ice	4.56	1.90	128
TD-RRH-8x20-2500 (SP-LegC)	C	From Leg	4.00	0.0000		125.00	No Ice	4.05	1.53	70
			6.00				1/2" Ice	4.30	1.71	97
			1.66				1" Ice	4.56	1.90	128
TD-RRH-8x20-2500 (SP-LegD)	D	From Leg	4.00	0.0000		125.00	No Ice	4.05	1.53	70
			6.00				1/2" Ice	4.30	1.71	97
			1.66				1" Ice	4.56	1.90	128
SectorMount SM702-1 (SP-LegB)	B	From Leg	4.00	0.0000		125.00	No Ice	20.60	12.90	517
			0.00				1/2" Ice	28.80	19.40	784
			0.00				1" Ice	37.00	25.90	1051
SectorMount SM702-1 (SP-LegC)	C	From Leg	4.00	0.0000		125.00	No Ice	20.60	12.90	517
			0.00				1/2" Ice	28.80	19.40	784
			0.00				1" Ice	37.00	25.90	1051
SectorMount SM702-1 (SP-LegD)	D	From Leg	4.00	0.0000		125.00	No Ice	20.60	12.90	517
			0.00				1/2" Ice	28.80	19.40	784
			0.00				1" Ice	37.00	25.90	1051

*

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
4"Sch40 x 4ft	D	From Leg	1.00	0.0000	117.50	No Ice	1.13	1.13	50
(Dishmount)			0.00			1/2" Ice	1.58	1.58	63
			0.00			1" Ice	1.84	1.84	79
*									
CC807-08	D	From Leg	6.00	0.0000	100.00	No Ice	2.85	2.85	27
			0.00			1/2" Ice	3.83	3.83	48
			4.57			1" Ice	4.67	4.67	68
TMA	D	From Leg	2.00	0.0000	100.00	No Ice	1.20	0.60	5
			0.00			1/2" Ice	1.34	0.70	15
			0.00			1" Ice	1.48	0.80	28
Side Arm mount (SO601-1)	D	From Leg	3.00	0.0000	100.00	No Ice	1.22	6.30	159
			0.00			1/2" Ice	1.85	8.61	197
			0.00			1" Ice	2.48	10.92	234
*									
*TMO-2019									
APXVAARR24_43-U-NA20	A	From Leg	1.00	0.0000	94.00	No Ice	20.24	10.79	182
w. MtgPipe			6.00			1/2" Ice	20.89	12.21	316
(TMO-LegA)			0.00			1" Ice	21.55	13.49	460
APXVAARR24_43-U-NA20	C	From Leg	1.00	0.0000	94.00	No Ice	20.24	10.79	182
w. MtgPipe			6.00			1/2" Ice	20.89	12.21	316
(TMO-LegC)			0.00			1" Ice	21.55	13.49	460
APXVAARR24_43-U-NA20	D	From Leg	1.00	0.0000	94.00	No Ice	20.24	10.79	182
w. MtgPipe			6.00			1/2" Ice	20.89	12.21	316
(TMO-LegD)			0.00			1" Ice	21.55	13.49	460
Ericsson KRY 112 89/4	A	From Leg	1.00	0.0000	94.00	No Ice	0.56	0.36	15
(TMO-LegA)			6.00			1/2" Ice	0.66	0.44	20
			0.00			1" Ice	0.76	0.54	27
Ericsson KRY 112 89/4	C	From Leg	1.00	0.0000	94.00	No Ice	0.56	0.36	15
(TMO-LegC)			6.00			1/2" Ice	0.66	0.44	20
			0.00			1" Ice	0.76	0.54	27
Ericsson KRY 112 89/4	D	From Leg	1.00	0.0000	94.00	No Ice	0.56	0.36	15
(TMO-LegD)			6.00			1/2" Ice	0.66	0.44	20
			0.00			1" Ice	0.76	0.54	27
Ericsson Radio 4449	A	From Leg	1.00	0.0000	94.00	No Ice	1.64	1.14	74
B12/B71			6.00			1/2" Ice	1.80	1.28	90
(TMO-LegA)			0.00			1" Ice	1.97	1.42	109
Ericsson Radio 4449	C	From Leg	1.00	0.0000	94.00	No Ice	1.64	1.14	74
B12/B71			6.00			1/2" Ice	1.80	1.28	90
(TMO-LegC)			0.00			1" Ice	1.97	1.42	109
Ericsson Radio 4449	D	From Leg	1.00	0.0000	94.00	No Ice	1.64	1.14	74
B12/B71			6.00			1/2" Ice	1.80	1.28	90
(TMO-LegD)			0.00			1" Ice	1.97	1.42	109
Ericsson RRUS 4415 B25	A	From Leg	1.00	0.0000	94.00	No Ice	1.64	0.68	46
(TMO-LegA)			6.00			1/2" Ice	1.80	0.79	58
			0.00			1" Ice	1.97	0.91	73
Ericsson RRUS 4415 B25	C	From Leg	1.00	0.0000	94.00	No Ice	1.64	0.68	46
(TMO-LegC)			6.00			1/2" Ice	1.80	0.79	58
			0.00			1" Ice	1.97	0.91	73
Ericsson RRUS 4415 B25	D	From Leg	1.00	0.0000	94.00	No Ice	1.64	0.68	46
(TMO-LegD)			6.00			1/2" Ice	1.80	0.79	58
			0.00			1" Ice	1.97	0.91	73
Radio 4415 B66A	A	From Leg	1.00	0.0000	94.00	No Ice	1.86	0.82	44
(TMO-LegA)			6.00			1/2" Ice	2.03	0.94	58
			0.00			1" Ice	2.20	1.07	75
Radio 4415 B66A	C	From Leg	1.00	0.0000	94.00	No Ice	1.86	0.82	44
(TMO-LegC)			6.00			1/2" Ice	2.03	0.94	58
			0.00			1" Ice	2.20	1.07	75

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Radio 4415 B66A	D	From Leg	1.00		0.0000	94.00	No Ice	1.86	0.82	44
(TMO-LegD)			6.00				1/2" Ice	2.03	0.94	58
			0.00				1" Ice	2.20	1.07	75
(2) 2.5"Sch40 x 15ft	A	From Leg	1.00		0.0000	94.00	No Ice	4.31	4.31	87
(TMO-LegA)			0.00				1/2" Ice	5.84	5.84	118
			0.00				1" Ice	7.39	7.39	159
(2) 2.5"Sch40 x 15ft	C	From Leg	1.00		0.0000	94.00	No Ice	4.31	4.31	87
(TMO-LegC)			0.00				1/2" Ice	5.84	5.84	118
			0.00				1" Ice	7.39	7.39	159
(2) 2.5"Sch40 x 15ft	D	From Leg	1.00		0.0000	94.00	No Ice	4.31	4.31	87
(TMO-LegD)			0.00				1/2" Ice	5.84	5.84	118
			0.00				1" Ice	7.39	7.39	159
6ft standoff-Flat	D	From Leg	3.00		0.0000	94.00	No Ice	1.96	8.31	97
(TMO)			0.00				1/2" Ice	3.08	11.83	138
			0.00				1" Ice	4.20	15.35	179
*										
GPS	C	None			0.0000	76.50	No Ice	1.00	1.00	10
							1/2" Ice	1.50	1.50	15
							1" Ice	2.00	2.00	20
*										
Catwalk	C	None			0.0000	75.00	No Ice	18.00	4.00	1000
							1/2" Ice	23.00	6.00	1200
							1" Ice	28.00	8.00	1400
*										
*DishWireless Feb2022										
MX08FRO665-20 w. Mtg	A	From Leg	3.00		0.0000	83.00	No Ice	12.49	7.29	94
Pipe			0.00				1/2" Ice	12.99	8.25	184
(P-DW-Alpha)			0.00				1" Ice	13.49	9.08	282
MX08FRO665-20 w. Mtg	B	From Leg	3.00		0.0000	83.00	No Ice	12.49	7.29	94
Pipe			0.00				1/2" Ice	12.99	8.25	184
(P-DW-Beta)			0.00				1" Ice	13.49	9.08	282
MX08FRO665-20 w. Mtg	C	From Leg	3.00		0.0000	83.00	No Ice	12.49	7.29	94
Pipe			0.00				1/2" Ice	12.99	8.25	184
(P-DW-Gamma)			0.00				1" Ice	13.49	9.08	282
TA08025-B604 RRU	A	From Leg	3.00		0.0000	83.00	No Ice	1.98	1.04	64
(P-DW-Alpha)			0.00				1/2" Ice	2.15	1.18	81
			0.00				1" Ice	2.33	1.32	100
TA08025-B604 RRU	B	From Leg	3.00		0.0000	83.00	No Ice	1.98	1.04	64
(P-DW-Beta)			0.00				1/2" Ice	2.15	1.18	81
			0.00				1" Ice	2.33	1.32	100
TA08025-B604 RRU	C	From Leg	3.00		0.0000	83.00	No Ice	1.98	1.04	64
(P-DW-Gamma)			0.00				1/2" Ice	2.15	1.18	81
			0.00				1" Ice	2.33	1.32	100
TA08025-B605 RRU	A	From Leg	3.00		0.0000	83.00	No Ice	1.98	1.20	75
(P-DW-Alpha)			0.00				1/2" Ice	2.15	1.34	93
			0.00				1" Ice	2.33	1.49	114
TA08025-B605 RRU	B	From Leg	3.00		0.0000	83.00	No Ice	1.98	1.20	75
(P-DW-Beta)			0.00				1/2" Ice	2.15	1.34	93
			0.00				1" Ice	2.33	1.49	114
TA08025-B605 RRU	C	From Leg	3.00		0.0000	83.00	No Ice	1.98	1.20	75
(P-DW-Gamma)			0.00				1/2" Ice	2.15	1.34	93
			0.00				1" Ice	2.33	1.49	114
RDIDC-9181-PF-48	A	From Leg	1.00		0.0000	83.00	No Ice	2.31	1.29	22
(P-DW-Alpha)			0.00				1/2" Ice	2.50	1.45	41
			0.00				1" Ice	2.70	1.61	63
Sabre THD 10' V-Boom	A	From Leg	2.50		0.0000	83.00	No Ice	9.12	4.97	610
(P-DW-Alpha)			0.00				1/2" Ice	12.96	7.06	729

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 lb
Sabre THD 10' V-Boom (P-DW-Beta)	B	From Leg	0.00 2.50 0.00	0.0000	83.00	1" Ice No Ice 1/2" Ice	16.80 9.12 12.96	9.15 4.97 7.06	848 610 729
Sabre THD 10' V-Boom (P-DW-Gamma)	C	From Leg	0.00 2.50 0.00	0.0000	83.00	1" Ice No Ice 1/2" Ice	16.80 9.12 12.96	9.15 4.97 7.06	848 610 729
			0.00			1" Ice	16.80	9.15	848

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 lb
RFS SC3-xxx/SCX3-xxx	D	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 1.50	0.0000		117.50	3.28	No Ice 1/2" Ice 1" Ice	8.45 8.88 9.32	40 85 131

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 45 deg - No Ice
5	0.9 Dead+1.6 Wind 45 deg - No Ice
6	1.2 Dead+1.6 Wind 90 deg - No Ice
7	0.9 Dead+1.6 Wind 90 deg - No Ice
8	1.2 Dead+1.6 Wind 135 deg - No Ice
9	0.9 Dead+1.6 Wind 135 deg - No Ice
10	1.2 Dead+1.6 Wind 180 deg - No Ice
11	0.9 Dead+1.6 Wind 180 deg - No Ice
12	1.2 Dead+1.6 Wind 225 deg - No Ice
13	0.9 Dead+1.6 Wind 225 deg - No Ice
14	1.2 Dead+1.6 Wind 270 deg - No Ice
15	0.9 Dead+1.6 Wind 270 deg - No Ice
16	1.2 Dead+1.6 Wind 315 deg - No Ice
17	0.9 Dead+1.6 Wind 315 deg - No Ice
18	1.2 Dead+1.0 Ice+1.0 Temp
19	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
20	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
21	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
22	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
23	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
24	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
25	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
26	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 45 deg - Service
29	Dead+Wind 90 deg - Service
30	Dead+Wind 135 deg - Service
31	Dead+Wind 180 deg - Service
32	Dead+Wind 225 deg - Service
33	Dead+Wind 270 deg - Service
34	Dead+Wind 315 deg - Service

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg D	Max. Vert	12	104364	11215	-12713
	Max. H_x	14	73073	11384	-4713
	Max. H_z	3	-51497	-2275	11489
	Min. Vert	5	-80165	-9641	11074
	Min. H_x	7	-48851	-9809	3071
	Min. H_z	10	75719	3850	-13131
Leg C	Max. Vert	8	104225	-12265	-11856
	Max. H_x	17	-81614	10675	10280
	Max. H_z	17	-81614	10675	10280
	Min. Vert	17	-81614	10675	10280
	Min. H_x	8	104225	-12265	-11856
	Min. H_z	8	104225	-12265	-11856
Leg B	Max. Vert	4	104501	-12740	11222
	Max. H_x	13	-79995	11048	-9630
	Max. H_z	2	75833	-5371	11642
	Min. Vert	13	-79995	11048	-9630
	Min. H_x	4	104501	-12740	11222
	Min. H_z	11	-51350	3682	-10050
Leg A	Max. Vert	16	106215	11913	12303
	Max. H_x	14	74274	11950	4301
	Max. H_z	2	76944	3986	13154
	Min. Vert	9	-80122	-10238	-10647
	Min. H_x	7	-48204	-10288	-2636
	Min. H_z	11	-50827	-2318	-11486

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	46385	0	0	-19	22	0
1.2 Dead+1.6 Wind 0 deg - No Ice	55662	-145	-45897	-3040	27	-71
0.9 Dead+1.6 Wind 0 deg - No Ice	41747	-145	-45897	-3035	21	-71
1.2 Dead+1.6 Wind 45 deg - No Ice	55662	33332	-33332	-2228	-2180	-71
0.9 Dead+1.6 Wind 45 deg - No Ice	41747	33332	-33332	-2223	-2186	-71
1.2 Dead+1.6 Wind 90 deg - No	55662	42993	145	-21	-2863	-25

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Ice						
0.9 Dead+1.6 Wind 90 deg - No Ice	41747	42993	145	-16	-2870	-25
1.2 Dead+1.6 Wind 135 deg - No Ice	55662	33632	33681	2202	-2193	19
0.9 Dead+1.6 Wind 135 deg - No Ice	41747	33632	33681	2208	-2199	19
1.2 Dead+1.6 Wind 180 deg - No Ice	55662	191	45842	2989	19	71
0.9 Dead+1.6 Wind 180 deg - No Ice	41747	191	45842	2994	13	71
1.2 Dead+1.6 Wind 225 deg - No Ice	55662	-33277	33277	2177	2225	71
0.9 Dead+1.6 Wind 225 deg - No Ice	41747	-33277	33277	2182	2219	71
1.2 Dead+1.6 Wind 270 deg - No Ice	55662	-42938	-191	-29	2908	25
0.9 Dead+1.6 Wind 270 deg - No Ice	41747	-42938	-191	-24	2902	25
1.2 Dead+1.6 Wind 315 deg - No Ice	55662	-33681	-33632	-2241	2250	-19
0.9 Dead+1.6 Wind 315 deg - No Ice	41747	-33681	-33632	-2236	2244	-19
1.2 Dead+1.0 Ice+1.0 Temp	131401	0	0	-117	135	0
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	131401	-56	-11997	-913	138	-23
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	131401	9055	-9055	-717	-465	-27
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	131401	11709	56	-114	-651	-15
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	131401	9153	9162	490	-471	5
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	131401	65	11986	678	131	23
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	131401	-9045	9045	482	734	27
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	131401	-11698	-65	-121	920	15
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	131401	-9162	-9153	-723	742	-5
Dead+Wind 0 deg - Service	46385	-34	-10754	-726	22	-17
Dead+Wind 45 deg - Service	46385	7810	-7810	-536	-495	-17
Dead+Wind 90 deg - Service	46385	10074	34	-19	-655	-6
Dead+Wind 135 deg - Service	46385	7880	7892	502	-498	5
Dead+Wind 180 deg - Service	46385	45	10741	687	20	17
Dead+Wind 225 deg - Service	46385	-7797	7797	497	537	17
Dead+Wind 270 deg - Service	46385	-10061	-45	-20	697	6
Dead+Wind 315 deg - Service	46385	-7892	-7880	-539	543	-5

Solution Summary

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
1	0	-46385	0	0	46385	0	0.000%
2	-145	-55662	-45897	145	55662	45897	0.000%
3	-145	-41747	-45897	145	41747	45897	0.000%
4	33332	-55662	-33332	-33332	55662	33332	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
5	33332	-41747	-33332	-33332	41747	33332	0.000%
6	42993	-55662	145	-42993	55662	-145	0.000%
7	42993	-41747	145	-42993	41747	-145	0.000%
8	33632	-55662	33681	-33632	55662	-33681	0.000%
9	33632	-41747	33681	-33632	41747	-33681	0.000%
10	191	-55662	45842	-191	55662	-45842	0.000%
11	191	-41747	45842	-191	41747	-45842	0.000%
12	-33277	-55662	33277	33277	55662	-33277	0.000%
13	-33277	-41747	33277	33277	41747	-33277	0.000%
14	-42938	-55662	-191	42938	55662	191	0.000%
15	-42938	-41747	-191	42938	41747	191	0.000%
16	-33681	-55662	-33632	33681	55662	33632	0.000%
17	-33681	-41747	-33632	33681	41747	33632	0.000%
18	0	-131401	0	0	131401	0	0.000%
19	-56	-131401	-11997	56	131401	11997	0.000%
20	9055	-131401	-9055	-9055	131401	9055	0.000%
21	11709	-131401	56	-11709	131401	-56	0.000%
22	9153	-131401	9162	-9153	131401	-9162	0.000%
23	65	-131401	11986	-65	131401	-11986	0.000%
24	-9045	-131401	9045	9045	131401	-9045	0.000%
25	-11698	-131401	-65	11698	131401	65	0.000%
26	-9162	-131401	-9153	9162	131401	9153	0.000%
27	-34	-46385	-10754	34	46385	10754	0.000%
28	7810	-46385	-7810	-7810	46385	7810	0.000%
29	10074	-46385	34	-10074	46385	-34	0.000%
30	7880	-46385	7892	-7880	46385	-7892	0.000%
31	45	-46385	10741	-45	46385	-10741	0.000%
32	-7797	-46385	7797	7797	46385	-7797	0.000%
33	-10061	-46385	-45	10061	46385	45	0.000%
34	-7892	-46385	-7880	7892	46385	7880	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	129 - 124.8	0.437	34	0.0176	0.0124
T2	124.8 - 112.5	0.393	34	0.0192	0.0059
T3	112.5 - 100.2	0.344	34	0.0191	0.0060
T4	100.2 - 87.5	0.295	34	0.0179	0.0061
T5	87.5 - 74.8	0.240	34	0.0167	0.0055
T6	74.8 - 49.6	0.187	34	0.0152	0.0048
T7	49.6 - 24.8	0.094	34	0.0114	0.0030
T8	24.8 - 0	0.032	30	0.0063	0.0014

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
132.00	CC807-08	34	0.437	0.0176	0.0124	11106
125.00	APXVSPP18-C-A20 w. Mtg Pipe	34	0.395	0.0191	0.0060	11106

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
119.00	RFS SC3-xxx/SCX3-xxx	34	0.360	0.0197	0.0043	20484
117.50	4"Sch40 x 4ft	34	0.356	0.0197	0.0046	32899
100.00	CC807-08	34	0.294	0.0179	0.0061	317938
94.00	APXVAARR24_43-U-NA20 w. MtgPipe	34	0.268	0.0174	0.0057	347877
83.00	MX08FRO665-20 w. Mtg Pipe	34	0.221	0.0163	0.0053	Inf
76.50	GPS	34	0.194	0.0154	0.0049	593372
75.00	Catwalk	34	0.188	0.0152	0.0049	534320

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	129 - 124.8	1.838	16	0.0702	0.0530
T2	124.8 - 112.5	1.650	16	0.0777	0.0250
T3	112.5 - 100.2	1.441	16	0.0782	0.0257
T4	100.2 - 87.5	1.234	16	0.0741	0.0259
T5	87.5 - 74.8	1.007	16	0.0698	0.0234
T6	74.8 - 49.6	0.788	16	0.0627	0.0207
T7	49.6 - 24.8	0.401	16	0.0468	0.0127
T8	24.8 - 0	0.136	8	0.0256	0.0059

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
132.00	CC807-08	16	1.838	0.0702	0.0530	2775
125.00	APXVSPP18-C-A20 w. Mtg Pipe	16	1.657	0.0774	0.0257	2775
119.00	RFS SC3-xxx/SCX3-xxx	16	1.511	0.0808	0.0185	5103
117.50	4"Sch40 x 4ft	16	1.492	0.0805	0.0197	8168
100.00	CC807-08	16	1.230	0.0741	0.0259	81281
94.00	APXVAARR24_43-U-NA20 w. MtgPipe	16	1.121	0.0724	0.0244	84582
83.00	MX08FRO665-20 w. Mtg Pipe	16	0.929	0.0674	0.0226	294700
76.50	GPS	16	0.817	0.0637	0.0211	148003
75.00	Catwalk	16	0.792	0.0628	0.0207	134589

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T2	124.8	Diagonal	A307	0.6250	2	2119	12425	0.171 ✔	1	Bolt Shear
		Horizontal	A307	0.6250	3	586	6213	0.094 ✔	1	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Redund Horz 1 Bracing	A307	0.6250	1	206	6213	0.033 ✔	1	Bolt Shear
		Redund Diag 1 Bracing	A307	0.6250	1	367	6213	0.059 ✔	1	Bolt Shear
		Redund Hip 1 Bracing	A307	0.6250	1	23	6213	0.004 ✔	1	Bolt Shear
T3	112.5	Leg	A307	0.6250	24	712	6213	0.115 ✔	1	Bolt SS
		Diagonal	A307	0.6250	2	2525	12425	0.203 ✔	1	Bolt Shear
		Horizontal	A307	0.6250	2	1095	12425	0.088 ✔	1	Bolt Shear
		Redund Horz 1 Bracing	A307	0.6250	1	130	6213	0.021 ✔	1	Bolt Shear
		Redund Diag 1 Bracing	A307	0.6250	1	270	6213	0.044 ✔	1	Bolt Shear
		Redund Hip 1 Bracing	A307	0.6250	1	19	6213	0.003 ✔	1	Bolt Shear
T4	100.2	Diagonal	A307	0.6250	2	3723	12425	0.300 ✔	1	Bolt Shear
		Horizontal	A307	0.6250	2	1544	12425	0.124 ✔	1	Bolt Shear
		Redund Horz 1 Bracing	A307	0.6250	1	881	6213	0.142 ✔	1	Bolt Shear
		Redund Diag 1 Bracing	A307	0.6250	1	1048	6213	0.169 ✔	1	Bolt Shear
		Redund Hip 1 Bracing	A307	0.6250	1	20	6213	0.003 ✔	1	Bolt Shear
T5	87.5	Leg	A307	0.6250	24	1956	6213	0.315 ✔	1	Bolt SS
		Diagonal	A307	0.6250	2	4436	12425	0.357 ✔	1	Bolt Shear
		Horizontal	A307	0.6250	2	2216	12425	0.178 ✔	1	Bolt Shear
		Redund Horz 1 Bracing	A307	0.6250	1	526	6213	0.085 ✔	1	Bolt Shear
		Redund Diag 1 Bracing	A307	0.6250	1	617	6213	0.099 ✔	1	Bolt Shear
		Redund Hip 1 Bracing	A307	0.6250	1	19	6213	0.003 ✔	1	Bolt Shear
T6	74.8	Leg	A307	0.6250	32	2091	6213	0.337 ✔	1	Bolt SS
		Diagonal	A307	0.6250	2	8533	12425	0.687 ✔	1	Bolt Shear
		Horizontal	A307	0.6250	2	2673	12425	0.215 ✔	1	Bolt Shear
		Redund Horz 1 Bracing	A307	0.6250	1	517	6213	0.083 ✔	1	Bolt Shear
		Redund Horz 2 Bracing	A307	0.6250	1	517	6213	0.083 ✔	1	Bolt Shear
		Redund Horz 3 Bracing	A307	0.6250	1	517	6213	0.083 ✔	1	Bolt Shear
		Redund Diag 1 Bracing	A307	0.6250	1	865	6213	0.139 ✔	1	Bolt Shear
		Redund Diag 2 Bracing	A307	0.6250	1	500	6213	0.080 ✔	1	Bolt Shear
		Redund Diag 3 Bracing	A307	0.6250	1	555	6213	0.089 ✔	1	Bolt Shear
T7	49.6	Leg	A307	0.6250	40	2838	6213	0.457 ✔	1	Bolt SS
		Diagonal	A307	0.6250	2	9041	12425	0.728 ✔	1	Bolt Shear
		Horizontal	A307	0.6250	2	3416	12425	0.275 ✔	1	Bolt Shear
		Redund Horz 1 Bracing	A307	0.6250	1	862	6213	0.139 ✔	1	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Redund Horz 2 Bracing	A307	0.6250	1	862	6213	0.139 ✔	1	Bolt Shear
		Redund Horz 3 Bracing	A307	0.6250	1	862	6213	0.139 ✔	1	Bolt Shear
		Redund Diag 1 Bracing	A307	0.6250	1	1213	6213	0.195 ✔	1	Bolt Shear
		Redund Diag 2 Bracing	A307	0.6250	1	702	6213	0.113 ✔	1	Bolt Shear
		Redund Diag 3 Bracing	A307	0.6250	1	742	6213	0.119 ✔	1	Bolt Shear
T8	24.8	Leg	A307	0.6250	48	3397	6213	0.547 ✔	1	Bolt SS
		Diagonal	A307	0.6250	2	9809	12425	0.789 ✔	1	Bolt Shear
		Horizontal	A307	0.6250	2	4002	12425	0.322 ✔	1	Bolt Shear
		Redund Horz 1 Bracing	A307	0.6250	1	1232	6213	0.198 ✔	1	Bolt Shear
		Redund Horz 2 Bracing	A307	0.6250	1	1232	6213	0.198 ✔	1	Bolt Shear
		Redund Horz 3 Bracing	A307	0.6250	1	1232	6213	0.198 ✔	1	Bolt Shear
		Redund Diag 1 Bracing	A307	0.6250	1	1524	6213	0.245 ✔	1	Bolt Shear
		Redund Diag 2 Bracing	A307	0.6250	1	916	6213	0.147 ✔	1	Bolt Shear
		Redund Diag 3 Bracing	A307	0.6250	1	971	6213	0.156 ✔	1	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	129 - 124.8	L4x4x3/8	4.21	4.21	64.2 K=1.00	2.8600	-1617	74600	0.022
T2	124.8 - 112.5	L4x4x3/8	12.34	6.17	94.0 K=1.00	2.8600	-5523	58209	0.095 [1]
T3	112.5 - 100.2	L4x4x3/8	12.34	6.17	94.0 K=1.00	2.8600	-8544	58209	0.147 [1]
T4	100.2 - 87.5	L5x5x1/2	12.74	6.37	77.8 K=1.00	4.7500	-14661	111919	0.131 [1]
T5	87.5 - 74.8	L5x5x1/2	12.74	6.37	77.8 K=1.00	4.7500	-23473	111919	0.210 [1]
T6	74.8 - 49.6	L6x6x1/2	25.29	6.32	64.3 K=1.00	5.7500	-34391	149871	0.229 [1]
T7	49.6 - 24.8	L6x6x5/8	24.89	6.22	63.3 K=1.00	7.1100	-57362	186593	0.307 [1]
T8	24.8 - 0	L8x8x1/2	24.89	6.22	47.0 K=1.00	7.7500	-81966	216866	0.378 [1]

[1] P_u / ϕP_n controls

Leg Bending Design Data (Compression)

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	129 - 124.8	L4x4x3/8	1	10	0.107	0	5	0.059
T2	124.8 - 112.5	L4x4x3/8	0	10	0.000	0	5	0.000
T3	112.5 - 100.2	L4x4x3/8	0	10	0.000	0	5	0.000
T4	100.2 - 87.5	L5x5x1/2	0	22	0.000	0	11	0.000
T5	87.5 - 74.8	L5x5x1/2	0	22	0.000	0	11	0.000
T6	74.8 - 49.6	L6x6x1/2	0	32	0.000	0	16	0.000
T7	49.6 - 24.8	L6x6x5/8	0	39	0.000	0	20	0.000
T8	24.8 - 0	L8x8x1/2	0	55	0.000	0	28	0.000

Leg Interaction Design Data (Compression)

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	129 - 124.8	L4x4x3/8	0.022	0.107	0.059	0.177 ✔	1.000	4.8.1 ✔
T2	124.8 - 112.5	L4x4x3/8	0.095	0.000	0.000	0.095 [1] ✔	1.000	4.8.1 ✔
T3	112.5 - 100.2	L4x4x3/8	0.147	0.000	0.000	0.147 [1] ✔	1.000	4.8.1 ✔
T4	100.2 - 87.5	L5x5x1/2	0.131	0.000	0.000	0.131 [1] ✔	1.000	4.8.1 ✔
T5	87.5 - 74.8	L5x5x1/2	0.210	0.000	0.000	0.210 [1] ✔	1.000	4.8.1 ✔
T6	74.8 - 49.6	L6x6x1/2	0.229	0.000	0.000	0.229 [1] ✔	1.000	4.8.1 ✔
T7	49.6 - 24.8	L6x6x5/8	0.307	0.000	0.000	0.307 [1] ✔	1.000	4.8.1 ✔
T8	24.8 - 0	L8x8x1/2	0.378	0.000	0.000	0.378 [1] ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	124.8 - 112.5	2L2 1/2x2x3/8x3/8	13.51	13.51	98.1 K=0.50	3.0900	-4238	60334	0.070 [1] ✔
T3	112.5 - 100.2	2L2 1/2x2x3/8x3/8	13.83	13.83	103.5	3.0900	-5049	56943	0.089 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	100.2 - 87.5	2L2 1/2x2x1/4x3/8	14.53	14.53	K=0.50 105.6 K=0.50	2.1300	-7446	38373	✔ 0.194 [1] ✔
T5	87.5 - 74.8	2L2 1/2x2x1/4x3/8	14.91	14.91	111.2 K=0.50	2.1300	-8873	36013	0.246 [1] ✔
T6	74.8 - 49.6	2L2 1/2x3x3/8x3/8	26.89	26.89	150.8 K=0.67	3.8400	-17066	38125	0.448 [1] ✔
T7	49.6 - 24.8	2L2 1/2x3x3/8x3/8	27.05	27.05	151.7 K=0.67	3.8400	-18083	37682	0.480 [1] ✔
T8	24.8 - 0	2L2 1/2x3x3/8x3/8	27.66	27.66	155.4 K=0.67	3.8400	-19619	35916	0.546 [1] ✔

[1] $P_u / \phi P_n$ controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	124.8 - 112.5	C9x13.4	9.66	4.83	86.6 K=1.00	3.9400	-1759	85984	0.020 [1] ✔
T3	112.5 - 100.2	2L2 1/2x2x1/4x3/8	11.11	5.55	85.0 K=1.00	2.1300	-2144	47178	0.045 [1] ✔
T4	100.2 - 87.5	2L2 1/2x2x1/4x3/8	12.55	6.28	104.2 K=1.00	2.1300	-3088	38982	0.079 [1] ✔
T5	87.5 - 74.8	2L2 1/2x2x1/4x3/8	14.05	7.02	111.7 K=1.00	2.1300	-4432	35766	0.124 [1] ✔
T6	74.8 - 49.6	2L2 1/2x2x1/4x3/8	15.54	7.77	111.3 K=1.00	2.1300	-5643	35934	0.157 [1] ✔
T7	49.6 - 24.8	2L2 1/2x2x1/4x3/8	18.50	9.25	127.8 K=1.00	2.1300	-6999	29226	0.239 [1] ✔
T8	24.8 - 0	2L2 1/2x2x1/4x3/8	21.42	10.71	146.1 K=1.00	2.1300	-8248	22546	0.366 [1] ✔

[1] $P_u / \phi P_n$ controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	124.8 - 112.5	L2x2x3/16	2.42	2.42	73.6 K=1.00	0.7150	-206	17424	0.012 [1] ✔
T3	112.5 - 100.2	L2x2x3/16	2.78	2.78	84.6 K=1.00	0.7150	-129	15898	0.008 [1] ✔
T4	100.2 - 87.5	L2x2x3/16	3.14	3.14	95.6 K=1.00	0.7150	-881	14322	0.062 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	87.5 - 74.8	L2x2x3/16	3.51	3.51	106.9 K=1.00	0.7150	-526	12687	0.041 [1] ✓
T6	74.8 - 49.6	L2 1/2x2x3/16	1.94	1.94	54.6 K=1.00	0.8090	-517	22406	0.023 [1] ✓
T7	49.6 - 24.8	L2 1/2x2x3/16	2.31	2.31	65.0 K=1.00	0.8090	-862	20985	0.041 [1] ✓
T8	24.8 - 0	L2 1/2x2x1/4	2.68	2.68	75.8 K=1.00	1.0600	-1232	25386	0.049 [1] ✓

[1] $P_u / \phi P_n$ controls

Redundant Horizontal (2) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T6	74.8 - 49.6	L2 1/2x2x3/16	3.88	3.88	109.2 K=1.00	0.8090	-517	13996	0.037 [1] ✓
T7	49.6 - 24.8	L2 1/2x2x3/16	4.63	4.63	130.0 K=1.00	0.8090	-862	10769	0.080 [1] ✓
T8	24.8 - 0	L2 1/2x2x1/4	5.35	5.35	151.5 K=1.00	1.0600	-1232	10428	0.118 [1] ✓

[1] $P_u / \phi P_n$ controls

Redundant Horizontal (3) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T6	74.8 - 49.6	L2 1/2x2x3/16	5.83	5.83	163.8 K=1.00	0.8090	-517	6815	0.076 [1] ✓
T7	49.6 - 24.8	L2 1/2x2x3/16	6.94	6.94	195.0 K=1.00	0.8090	-862	4807	0.179 [1] ✓
T8	24.8 - 0	L2 1/2x2x1/4	8.03	8.03	227.3 K=1.00	1.0600	-1232	4635	0.266 [1] ✓

[1] $P_u / \phi P_n$ controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	124.8 - 112.5	L2x2x3/16	6.49	6.49	197.8 K=1.00	0.7150	-202	4129	0.049 [1] ✔
T3	112.5 - 100.2	L2x2 1/2x3/16	6.62	6.62	186.0 K=1.00	0.8090	-153	5285	0.029 [1] ✔
T4	100.2 - 87.5	L2x2x3/16	6.94	6.94	211.2 K=1.00	0.7150	-862	3620	0.238 [1] ✔
T5	87.5 - 74.8	L2x2x3/16	7.09	7.09	216.0 K=1.00	0.7150	-470	3461	0.136 [1] ✔
T6	74.8 - 49.6	L2x2 1/2x3/16	6.50	6.50	182.8 K=1.00	0.8090	-865	5471	0.158 [1] ✔
T7	49.6 - 24.8	L2x2 1/2x3/16	6.51	6.51	182.9 K=1.00	0.8090	-1213	5462	0.222 [1] ✔
T8	24.8 - 0	L2x2 1/2x1/4	6.63	6.63	187.6 K=1.00	1.0600	-1524	6807	0.224 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (2) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T6	74.8 - 49.6	L2x2 1/2x3/16	7.22	7.22	203.0 K=1.00	0.8090	-480	4435	0.108 [1] ✔
T7	49.6 - 24.8	L2x2 1/2x3/16	7.53	7.53	211.7 K=1.00	0.8090	-702	4079	0.172 [1] ✔
T8	24.8 - 0	L2x2 1/2x1/4	7.97	7.97	225.5 K=1.00	1.0600	-916	4710	0.195 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (3) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T6	74.8 - 49.6	L2x2 1/2x3/16	7.61	7.61	213.9 K=1.00	0.8090	-555	3994	0.139 [1] ✔
T7	49.6 - 24.8	L2x2 1/2x3/16	7.97	7.97	223.9 K=1.00	0.8090	-742	3646	0.204 [1] ✔
T8	24.8 - 0	L2x2 1/2x1/4	8.44	8.44	238.9 K=1.00	1.0600	-971	4194	0.232 [1] ✔

[1] P_u / ϕP_n controls

Redundant Hip (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	124.8 - 112.5	L2x2x3/16	3.42	3.42	104.0 K=1.00	0.7150	-23	13105	0.002 [1] ✔
T3	112.5 - 100.2	L2x2x3/16	3.93	3.93	119.6 K=1.00	0.7150	-19	10910	0.002 [1] ✔
T4	100.2 - 87.5	L2x2x3/16	4.44	4.44	135.2 K=1.00	0.7150	-20	8841	0.002 [1] ✔
T5	87.5 - 74.8	L2x2x3/16	4.97	4.97	151.2 K=1.00	0.7150	-19	7061	0.003 [1] ✔

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	129 - 124.8	L2 1/2x2x3/16	12.96	12.96	364.3 K=1.00	0.8090	-33	1377	0.024 [*1] ✔
T2	124.8 - 112.5	KL/R > 250 (C) - 6 L2 1/2x2x3/16	6.83	6.83	192.0 K=1.00	0.8090	-30	4959	0.006 [1] ✔
T3	112.5 - 100.2	L2 1/2x2x3/16	7.85	7.85	220.7 K=1.00	0.8090	-28	3752	0.007 [1] ✔
T4	100.2 - 87.5	L2 1/2x2x3/16	8.88	8.88	249.4 K=1.00	0.8090	-24	2937	0.008 [1] ✔
T5	87.5 - 74.8	L2 1/2x2x3/16	9.93	9.93	279.1 K=1.00	0.8090	-25	2346	0.011 [1] ✔
T6	74.8 - 49.6	KL/R > 250 (C) - 173 L2 1/2x2x3/16	10.99	10.99	308.8 K=1.00	0.8090	-67	1917	0.035 [1] ✔
T7	49.6 - 24.8	KL/R > 250 (C) - 249 L2 1/2x2x3/16	13.08	13.08	367.7 K=1.00	0.8090	-69	1352	0.051 [1] ✔
T8	24.8 - 0	KL/R > 250 (C) - 330 L2 1/2x2 1/2x3/16 KL/R > 250 (C) - 411	15.14	15.14	367.1 K=1.00	0.9020	-71	1512	0.047 [1] ✔

[*] DL controls
[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T1	129 - 124.8	L4x4x3/8	4.21	4.21	41.1	2.8600	151	92664	0.002
T3	112.5 - 100.2	L4x4x3/8	12.34	6.17	60.2	2.8600	3085	92664	0.033 [1]
T4	100.2 - 87.5	L5x5x1/2	12.74	6.37	49.7	4.7500	7534	153900	0.049 [1]
T5	87.5 - 74.8	L5x5x1/2	12.74	6.37	49.7	4.7500	14778	153900	0.096 [1]
T6	74.8 - 49.6	L6x6x1/2	25.29	6.32	40.8	5.7500	23217	186300	0.125 [1]
T7	49.6 - 24.8	L6x6x5/8	24.89	6.22	40.6	7.1100	41854	230364	0.182 [1]
T8	24.8 - 0	L8x8x1/2	24.89	6.22	29.9	7.7500	61660	251100	0.246 [1]

[1] P_u / ϕP_n controls

Leg Bending Design Data (Tension)

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
T1	129 - 124.8	L4x4x3/8	-1	10	0.100	0	5	0.055
T3	112.5 - 100.2	L4x4x3/8	0	10	0.000	0	5	0.000
T4	100.2 - 87.5	L5x5x1/2	0	22	0.000	0	11	0.000
T5	87.5 - 74.8	L5x5x1/2	0	22	0.000	0	11	0.000
T6	74.8 - 49.6	L6x6x1/2	0	32	0.000	0	16	0.000
T7	49.6 - 24.8	L6x6x5/8	0	39	0.000	0	20	0.000
T8	24.8 - 0	L8x8x1/2	0	55	0.000	0	28	0.000

Leg Interaction Design Data (Tension)

Section No.	Elevation	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	ft							
T1	129 - 124.8	L4x4x3/8	0.002	0.100	0.055	0.156 ✔	1.000	4.8.1 ✔
T3	112.5 - 100.2	L4x4x3/8	0.033	0.000	0.000	0.033 [1] ✔	1.000	4.8.1 ✔
T4	100.2 - 87.5	L5x5x1/2	0.049	0.000	0.000	0.049 [1] ✔	1.000	4.8.1 ✔
T5	87.5 - 74.8	L5x5x1/2	0.096	0.000	0.000	0.096 [1] ✔	1.000	4.8.1 ✔
T6	74.8 - 49.6	L6x6x1/2	0.125	0.000	0.000	0.125 [1] ✔	1.000	4.8.1 ✔
T7	49.6 - 24.8	L6x6x5/8	0.182	0.000	0.000	0.182 [1] ✔	1.000	4.8.1 ✔
T8	24.8 - 0	L8x8x1/2	0.246	0.000	0.000	0.246 [1] ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	124.8 - 112.5	2L2 1/2x2x3/8x3/8	13.51	13.51	168.8	1.8956	3876	82460	0.047 [1] ✔
T3	112.5 - 100.2	2L2 1/2x2x3/8x3/8	13.83	13.83	172.7	1.8956	4708	82460	0.057 [1] ✔
T4	100.2 - 87.5	2L2 1/2x2x1/4x3/8	14.53	14.53	186.5	1.3162	7243	57257	0.126 [1] ✔
T5	87.5 - 74.8	2L2 1/2x2x1/4x3/8	14.91	14.91	191.3	1.3162	8589	57257	0.150 [1] ✔
T6	74.8 - 49.6	2L2 1/2x3x3/8x3/8	26.89	26.89	219.5	2.4581	16537	106928	0.155 [1] ✔
T7	49.6 - 24.8	2L2 1/2x3x3/8x3/8	27.05	27.05	220.8	2.4581	17501	106928	0.164 [1] ✔
T8	24.8 - 0	2L2 1/2x3x3/8x3/8	27.66	27.66	225.8	2.4581	18786	106928	0.176 [1] ✔

[1] $P_u / \phi P_n$ controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	124.8 - 112.5	C9x13.4	9.66	4.83	86.6	2.8239	1547	122841	0.013 [1] ✔
T3	112.5 - 100.2	2L2 1/2x2x1/4x3/8	11.11	5.55	85.0	1.3162	2191	57257	0.038 [1] ✔
T4	100.2 - 87.5	2L2 1/2x2x1/4x3/8	12.55	6.28	96.1	1.3162	3060	57257	0.053 [1] ✔
T5	87.5 - 74.8	2L2 1/2x2x1/4x3/8	14.05	7.02	107.5	1.3162	4335	57257	0.076 [1] ✔
T6	74.8 - 49.6	2L2 1/2x2x1/4x3/8	15.54	7.77	99.7	1.3162	5470	57257	0.096 [1] ✔
T7	49.6 - 24.8	2L2 1/2x2x1/4x3/8	18.50	9.25	118.7	1.3162	6785	57257	0.119 [1] ✔
T8	24.8 - 0	2L2 1/2x2x1/4x3/8	21.42	10.71	137.4	1.3162	7985	57257	0.139 [1] ✔

[1] $P_u / \phi P_n$ controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T2	124.8 - 112.5	L2x2x3/16	2.42	2.42	47.0	0.4308	196	18739	0.010 [1] ✔
T3	112.5 - 100.2	L2x2x3/16	2.78	2.78	54.0	0.4308	130	18739	0.007 [1] ✔
T4	100.2 - 87.5	L2x2x3/16	3.14	3.14	61.0	0.4308	827	18739	0.044 [1] ✔
T5	87.5 - 74.8	L2x2x3/16	3.51	3.51	68.3	0.4308	508	18739	0.027 [1] ✔
T6	74.8 - 49.6	L2 1/2x2x3/16	1.94	1.94	38.9	0.5013	517	21806	0.024 [1] ✔
T7	49.6 - 24.8	L2 1/2x2x3/16	2.31	2.31	46.3	0.5013	862	21806	0.040 [1] ✔
T8	24.8 - 0	L2 1/2x2x1/4	2.68	2.68	54.2	0.6544	1232	28465	0.043 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (2) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T6	74.8 - 49.6	L2 1/2x2x3/16	3.88	3.88	77.7	0.5013	517	21806	0.024 [1] ✔
T7	49.6 - 24.8	L2 1/2x2x3/16	4.63	4.63	92.5	0.5013	862	21806	0.040 [1] ✔
T8	24.8 - 0	L2 1/2x2x1/4	5.35	5.35	108.5	0.6544	1232	28465	0.043 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (3) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T6	74.8 - 49.6	L2 1/2x2x3/16	5.83	5.83	116.6	0.5013	517	21806	0.024 [1] ✔
T7	49.6 - 24.8	L2 1/2x2x3/16	6.94	6.94	138.8	0.5013	862	21806	0.040 [1] ✔
T8	24.8 - 0	L2 1/2x2x1/4	8.03	8.03	162.7	0.6544	1232	28465	0.043 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T2	124.8 - 112.5	L2x2x3/16	6.49	6.49	126.3	0.4308	367	18739	0.020 [1] ✓
T3	112.5 - 100.2	L2x2 1/2x3/16	6.62	6.62	132.4	0.5013	270	21806	0.012 [1] ✓
T4	100.2 - 87.5	L2x2x3/16	6.94	6.94	134.9	0.4308	1048	18739	0.056 [1] ✓
T5	87.5 - 74.8	L2x2x3/16	7.09	7.09	137.9	0.4308	617	18739	0.033 [1] ✓
T6	74.8 - 49.6	L2x2 1/2x3/16	6.50	6.50	130.1	0.5013	865	21806	0.040 [1] ✓
T7	49.6 - 24.8	L2x2 1/2x3/16	6.51	6.51	130.2	0.5013	1213	21806	0.056 [1] ✓
T8	24.8 - 0	L2x2 1/2x1/4	6.63	6.63	134.2	0.6544	1524	28465	0.054 [1] ✓

[1] $P_u / \phi P_n$ controls

Redundant Diagonal (2) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T6	74.8 - 49.6	L2x2 1/2x3/16	7.22	7.22	144.5	0.5013	500	21806	0.023 [1] ✓
T7	49.6 - 24.8	L2x2 1/2x3/16	7.53	7.53	150.7	0.5013	702	21806	0.032 [1] ✓
T8	24.8 - 0	L2x2 1/2x1/4	7.97	7.97	161.4	0.6544	916	28465	0.032 [1] ✓

[1] $P_u / \phi P_n$ controls

Redundant Diagonal (3) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T6	74.8 - 49.6	L2x2 1/2x3/16	7.61	7.61	152.3	0.5013	506	21806	0.023 [1] ✓
T7	49.6 - 24.8	L2x2 1/2x3/16	7.97	7.97	159.4	0.5013	742	21806	0.034 [1] ✓
T8	24.8 - 0	L2x2 1/2x1/4	8.44	8.44	171.0	0.6544	971	28465	0.034 [1] ✓

[1] P_u / ϕP_n controls

Redundant Hip (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	124.8 - 112.5	L2x2x3/16	3.42	3.42	66.4	0.4308	1	18739	0.000 [1] ✔
T3	112.5 - 100.2	L2x2x3/16	3.93	3.93	76.4	0.4308	1	18739	0.000 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	129 - 124.8	Leg	L4x4x3/8	2	-1617	74600	17.7	Pass
T2	124.8 - 112.5	Leg	L4x4x3/8	12	-5523	58209	9.5	Pass
T3	112.5 - 100.2	Leg	L4x4x3/8	53	-8544	58209	14.7	Pass
T4	100.2 - 87.5	Leg	L5x5x1/2	93	-14661	111919	13.1	Pass
T5	87.5 - 74.8	Leg	L5x5x1/2	134	-23473	111919	21.0	Pass
T6	74.8 - 49.6	Leg	L6x6x1/2	175	-34391	149871	31.5 (b) 22.9	Pass
T7	49.6 - 24.8	Leg	L6x6x5/8	259	-57362	186593	33.7 (b) 30.7	Pass
T8	24.8 - 0	Leg	L8x8x1/2	340	-81966	216866	45.7 (b) 37.8	Pass
T2	124.8 - 112.5	Diagonal	2L2 1/2x2x3/8x3/8	16	-4238	60334	54.7 (b) 7.0	Pass
T3	112.5 - 100.2	Diagonal	2L2 1/2x2x3/8x3/8	57	-5049	56943	17.1 (b) 8.9	Pass
T4	100.2 - 87.5	Diagonal	2L2 1/2x2x1/4x3/8	121	-7446	38373	20.3 (b) 19.4	Pass
T5	87.5 - 74.8	Diagonal	2L2 1/2x2x1/4x3/8	162	-8873	36013	30.0 (b) 24.6	Pass
T6	74.8 - 49.6	Diagonal	2L2 1/2x3x3/8x3/8	239	-17066	38125	35.7 (b) 44.8	Pass
T7	49.6 - 24.8	Diagonal	2L2 1/2x3x3/8x3/8	320	-18083	37682	68.7 (b) 48.0	Pass
T8	24.8 - 0	Diagonal	2L2 1/2x3x3/8x3/8	401	-19619	35916	72.8 (b) 54.6	Pass
T2	124.8 - 112.5	Horizontal	C9x13.4	15	-1759	85984	78.9 (b) 2.0	Pass
T3	112.5 - 100.2	Horizontal	2L2 1/2x2x1/4x3/8	56	-2144	47178	9.4 (b) 4.5	Pass
T4	100.2 - 87.5	Horizontal	2L2 1/2x2x1/4x3/8	97	-3088	38982	8.8 (b) 7.9	Pass
T5	87.5 - 74.8	Horizontal	2L2 1/2x2x1/4x3/8	161	-4432	35766	12.4 (b) 12.4	Pass
T6	74.8 - 49.6	Horizontal	2L2 1/2x2x1/4x3/8	230	-5643	35934	17.8 (b) 15.7 21.5 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T7	49.6 - 24.8	Horizontal	2L2 1/2x2x1/4x3/8	311	-6999	29226	23.9 27.5 (b)	Pass
T8	24.8 - 0	Horizontal	2L2 1/2x2x1/4x3/8	392	-8248	22546	36.6	Pass
T2	124.8 - 112.5	Redund Horz 1 Bracing	L2x2x3/16	43	-206	17424	1.2 3.3 (b)	Pass
T3	112.5 - 100.2	Redund Horz 1 Bracing	L2x2x3/16	65	-129	15898	0.8 2.1 (b)	Pass
T4	100.2 - 87.5	Redund Horz 1 Bracing	L2x2x3/16	125	-881	14322	6.2 14.2 (b)	Pass
T5	87.5 - 74.8	Redund Horz 1 Bracing	L2x2x3/16	158	-526	12687	4.1 8.5 (b)	Pass
T6	74.8 - 49.6	Redund Horz 1 Bracing	L2 1/2x2x3/16	181	517	21806	2.4 8.3 (b)	Pass
T7	49.6 - 24.8	Redund Horz 1 Bracing	L2 1/2x2x3/16	304	-862	20985	4.1 13.9 (b)	Pass
T8	24.8 - 0	Redund Horz 1 Bracing	L2 1/2x2x1/4	385	-1232	25386	4.9 19.8 (b)	Pass
T6	74.8 - 49.6	Redund Horz 2 Bracing	L2 1/2x2x3/16	182	-517	13996	3.7 8.3 (b)	Pass
T7	49.6 - 24.8	Redund Horz 2 Bracing	L2 1/2x2x3/16	305	-862	10769	8.0 13.9 (b)	Pass
T8	24.8 - 0	Redund Horz 2 Bracing	L2 1/2x2x1/4	386	-1232	10428	11.8 19.8 (b)	Pass
T6	74.8 - 49.6	Redund Horz 3 Bracing	L2 1/2x2x3/16	184	-517	6815	7.6 8.3 (b)	Pass
T7	49.6 - 24.8	Redund Horz 3 Bracing	L2 1/2x2x3/16	307	-862	4807	17.9	Pass
T8	24.8 - 0	Redund Horz 3 Bracing	L2 1/2x2x1/4	388	-1232	4635	26.6	Pass
T2	124.8 - 112.5	Redund Diag 1 Bracing	L2x2x3/16	44	-202	4129	4.9 5.9 (b)	Pass
T3	112.5 - 100.2	Redund Diag 1 Bracing	L2x2 1/2x3/16	66	-153	5285	2.9 4.4 (b)	Pass
T4	100.2 - 87.5	Redund Diag 1 Bracing	L2x2x3/16	123	-862	3620	23.8	Pass
T5	87.5 - 74.8	Redund Diag 1 Bracing	L2x2x3/16	148	-470	3461	13.6	Pass
T6	74.8 - 49.6	Redund Diag 1 Bracing	L2x2 1/2x3/16	183	-865	5471	15.8	Pass
T7	49.6 - 24.8	Redund Diag 1 Bracing	L2x2 1/2x3/16	306	-1213	5462	22.2	Pass
T8	24.8 - 0	Redund Diag 1 Bracing	L2x2 1/2x1/4	396	-1524	6807	22.4 24.5 (b)	Pass
T6	74.8 - 49.6	Redund Diag 2 Bracing	L2x2 1/2x3/16	185	-480	4435	10.8	Pass
T7	49.6 - 24.8	Redund Diag 2 Bracing	L2x2 1/2x3/16	308	-702	4079	17.2	Pass
T8	24.8 - 0	Redund Diag 2 Bracing	L2x2 1/2x1/4	398	-916	4710	19.5	Pass
T6	74.8 - 49.6	Redund Diag 3 Bracing	L2x2 1/2x3/16	220	-555	3994	13.9	Pass
T7	49.6 - 24.8	Redund Diag 3 Bracing	L2x2 1/2x3/16	309	-742	3646	20.4	Pass
T8	24.8 - 0	Redund Diag 3 Bracing	L2x2 1/2x1/4	390	-971	4194	23.2	Pass
T2	124.8 - 112.5	Redund Hip 1 Bracing	L2x2x3/16	29	-11	13105	0.3 0.4 (b)	Pass
T3	112.5 - 100.2	Redund Hip 1 Bracing	L2x2x3/16	78	-17	10910	0.3	Pass
T4	100.2 - 87.5	Redund Hip 1 Bracing	L2x2x3/16	119	-20	8841	0.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T5	87.5 - 74.8	Redund Hip 1 Bracing	L2x2x3/16	152	-19	7061	0.4	Pass
T1	129 - 124.8	Inner Bracing	L2 1/2x2x3/16	6	-33	1377	2.4	Pass
T2	124.8 - 112.5	Inner Bracing	L2 1/2x2x3/16	51	-4	2480	0.7	Pass
T3	112.5 - 100.2	Inner Bracing	L2 1/2x2x3/16	92	-5	1876	0.8	Pass
T4	100.2 - 87.5	Inner Bracing	L2 1/2x2x3/16	133	-5	1469	0.9	Pass
T5	87.5 - 74.8	Inner Bracing	L2 1/2x2x3/16	173	-25	2346	1.1	Pass
T6	74.8 - 49.6	Inner Bracing	L2 1/2x2x3/16	249	-67	1917	3.5	Pass
T7	49.6 - 24.8	Inner Bracing	L2 1/2x2x3/16	330	-69	1352	5.1	Pass
T8	24.8 - 0	Inner Bracing	L2 1/2x2 1/2x3/16	411	-71	1512	4.7	Pass
							Summary	
						Leg (T8)	54.7	Pass
						Diagonal (T8)	78.9	Pass
						Horizontal (T8)	36.6	Pass
						Redund Horz 1 Bracing (T8)	19.8	Pass
						Redund Horz 2 Bracing (T8)	19.8	Pass
						Redund Horz 3 Bracing (T8)	26.6	Pass
						Redund Diag 1 Bracing (T8)	24.5	Pass
						Redund Diag 2 Bracing (T8)	19.5	Pass
						Redund Diag 3 Bracing (T8)	23.2	Pass
						Redund Hip 1 Bracing (T5)	0.4	Pass
						Inner Bracing (T7)	5.1	Pass
						Bolt Checks	78.9	Pass
						RATING =	**78.9**	**Pass**

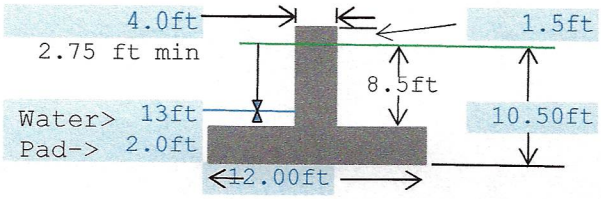
SS Tower Pad & Pier Calculations

Client: EIP/Dish
Project: YoungsApple Orchard, CT
02/10/22 10:19
Code: TIA-222-G

Factored Applied Loads:

OTM:	3176	kip-ft
Download:	106.2	kip
Uplift:	81.6	kip
1 Leg Shear:	17.1	kip
Tower Face:	24.333	ft

Ultimate Soil Bearing:	48475	psf
Specific Gravity:	2.65	
Soil Unit Weight:	114	lb/ft^3
Submerged Unit Wt:	70.98	lb/ft^3
Soil frustum θ:	36	°
Concrete Unit Wt:	150	lb/ft^3
Concrete f`c:	3000	psi
Rebar Fy:	60000	psi
Σ Concr Vol:	46.0	cuyd



A.bolt Circle 15 in

Uplift Capacity: ϕ=0.75

Soil1:	127.4 kip	Concrete Wt:	62.0 kip	
Soil2:	143.6 kip	Soil Wt:	320.3 kip	
Soil3:	49.3 kip			28.5% Loaded

Bearing Capacity: ϕ=0.75

fb(max):	2052.8 psf	5.6% Loaded
Fb:	36356.3 psf	

Pad Reinforcement:

Moment Mu:	197.1 kip-ft	Pad Cover:	3 in
As(strength)	2.103 inch²		
Req'd As:	2.803 inch²		

(11) bars of #7 Each Way 6.61 inch² 42.4% Loaded
Bar Spacing: 13.80 inches ACI 10.5.4: Spacing < 18" OK

Pier Reinforcement:

Pier Moment:	171 kip-ft		
Pier Cover:	3 in	Hoop #:	#4
(24) bars of	#7	C-C Spacing:	5.25 inch
As:	14.4 inch²	Clear Spacing:	4.38 inch
Bar Load:	11923 lbf	Cageϕ:	40.125 inch
Capacity:	32471 lbf		36.7% Loaded

Development Length: ACI 12.2.3

Ktr:	1.53 inch
c:	2.63 inch
ldb:	31.95 inch

Cage Wt:	1544	lbf(3 Piers)
Pad Bars:	1718	lbf
	3262	lbf Total Steel Wt

Global Check: OK

Min. Anchor Bolt Length: 46.78 inch

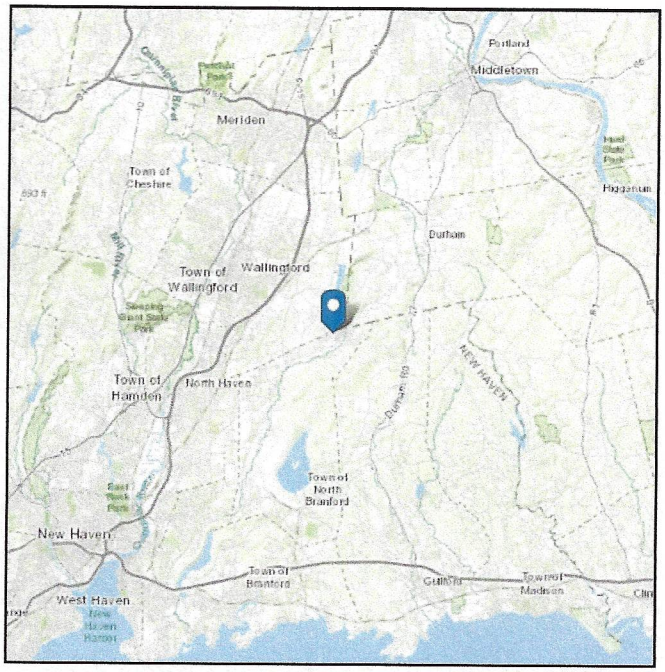
Foundation Analysis per ACI 318

ASCE 7 Hazards Report

Address:
62 Youngs Apple Orchard Rd
Northford, Connecticut
06472

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

Elevation: 451.16 ft (NAVD 88)
Latitude: 41.421021
Longitude: -72.749517



Wind

Results:

Wind Speed:	126 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	94 Vmph
100-year MRI	103 Vmph

CT State Building Code Appendix N: Vult=125/Vasd=97

Data Accessed: Thu Aug 26 2021

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

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

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

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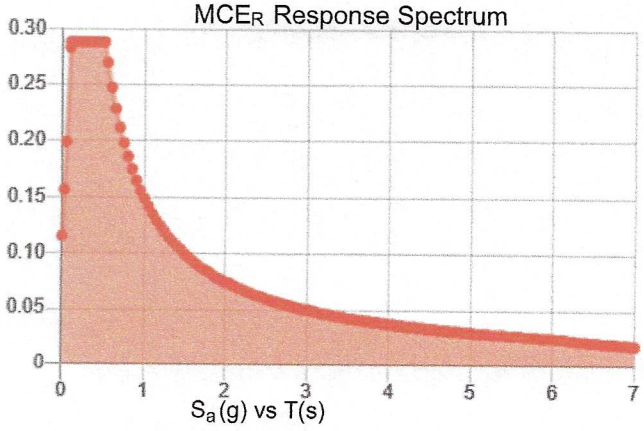
Seismic

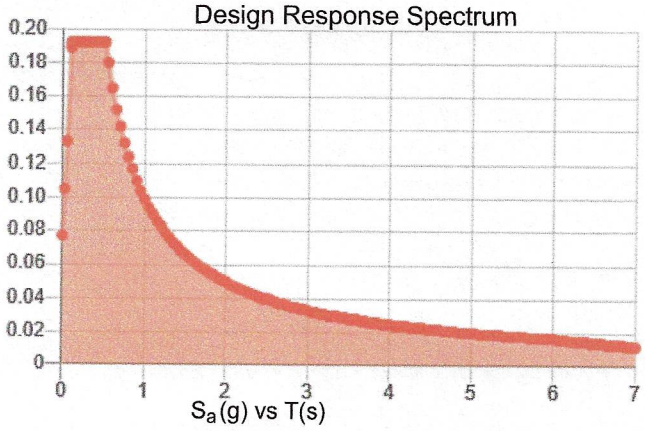
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.18	S_{DS} :	0.192
S_1 :	0.062	S_{D1} :	0.099
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.092
S_{MS} :	0.288	PGA_M :	0.148
S_{M1} :	0.149	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Thu Aug 26 2021

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

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Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Thu Aug 26 2021

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

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

Exhibit E

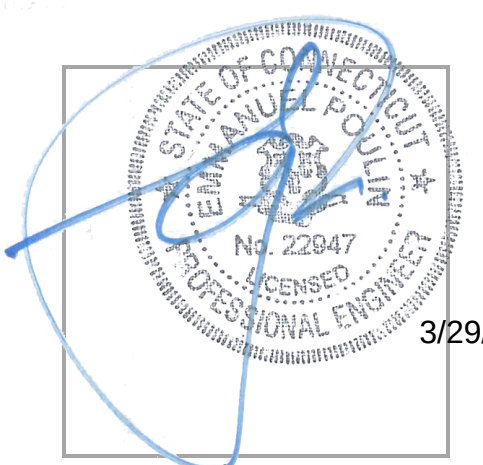
Mount Analysis

MOUNT ANALYSIS REPORT

March 28, 2022

Dish Wireless Site Number	BOHVN00032A
Infinigy Job Number	1197-F0001-B
Client	Northeast Site Solutions
Carrier	Dish Wireless
Site Location	62 Youngs Apple Orchard Road North Branford, CT 06472 New Haven County 41.42083300° N NAD83 72.74944444° W NAD83
Structure Type	Self-Supported Tower
Structure Height	128.3 ft
Mount Type	10.0 ft Sector Frame
Mount Elevation	83.0 ft AGL
Structural Usage Ratio	**28.2%**
Overall Result	**Pass**

The enclosed structural analysis has been performed in accordance with the 2015 International Building Code based on an ultimate 3-second gust wind speed of 130 mph. The evaluation criteria and applicable standards are presented in the next section of this report.



3/29/22

structural@infinigy.com

CONTENTS

1. INTRODUCTION

Infinigy performed a mount analysis on the Dish Wireless proposed telecommunication equipment supporting Sector Frame mounted to the existing structure located at the aforementioned address. All referenced supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The mount was analyzed using Risa3D version 19.0.4 analysis software.

2. DESIGN/ANALYSIS PARAMETERS

Wind Speed	130 mph (3-Second Gust)
Wind Speed w/ ice	50 mph (3-Second Gust) w/ 0.75" ice / No Ice Loading Considered
Adopted Code	2015 International Building Code
Standard(s)	TIA-222-G
Risk Category	II
Exposure Category	C
Topographic Factor	1.0
Seismic Spectral Response	S_s = 0.18 g / S_1 = 0.062 g
Ground Elevation (HMSL)	462.73 ft

3. PROPOSED LOADING CONFIGURATION - 83.0 ft. AGL Sector Frame

Centerline (ft)	Qty.	Appurtenance Manufacturers	Appurtenance Models
83.0	3	JMA	MX08FRO665-21
83.0	3	Fujitsu	TA08025-B605
83.0	3	Fujitsu	TA08025-B604
83.0	1	Raycap	RDIDC-9181-PF-48

4. SUPPORTING DOCUMENTATION

Construction Drawings	Infinigy Engineering, dated March 2022
Dish Wireless Proposed Loading	RFDS rev 1, dated 09/09/2021
Mount Design Drawings	Sabre Industries Part C10837002C

5. RESULTS

Components	Capacity	Pass/Fail
Antenna Pipe	28.2%	Pass
Kicker	05.8%	Pass
Bracing	13.5%	Pass
Standoff	08.1%	Pass
Horizontal	11.8%	Pass
Plate	20.7%	Pass
Mount Connection	22.5$	Pass
RATING =	**28.2%**	**Pass**

Notes:

1. See additional documentation in Appendix for calculations supporting the capacity consumed and detailed mount connection calculations.
2. All sectors are typical.

6. RECOMMENDATIONS

Infinigy recommends installing Dish Wireless's proposed equipment loading configuration on the Sector Frame at 83.0 ft. The installation shall be performed in accordance with the construction documents issued for this site.

If you have any questions, require additional information, or believe the actual conditions differ from those detailed in this report, please contact us immediately.

Alexandre Matout, MS, PE
Project Manager | **INFINIGY**

7. ASSUMPTIONS

The antenna mounting system was properly fabricated, installed and maintained in accordance with its original design and manufacturer's specifications.
The configuration of antennas, mounts, and other appurtenances are as specified in the proposed loading configuration table.
All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
The analysis will require revisions if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.
Steel grades have been assumed as follows, unless noted otherwise: Channel, Solid Round, Angle, Plate — ASTM A36 HSS (Rectangular) — ASTM A500-B GR 46 HSS (Circular) — ASTM A500-B GR 42 Pipe — ASTM A53-B GR 35 Connection Bolts — ASTM A325 U-Bolts — ASTM A307
All bolted connections are pretensioned in accordance with Table 8.2 of the RCSC 2014 Standard.

8. LIABILITY WAIVER AND LIMITATIONS

Our structural calculations are completed assuming all information provided to Infinigy is accurate and applicable to this site. For the purposes of calculations, we assume an overall structure condition as erected and all members and connections to be free of corrosion and/or structural defects. The structure owner and/or contractor shall verify the structure's condition prior to installation of any proposed equipment. If actual conditions differ from those described in this report, Infinigy should be notified immediately to assess the impact on the results of this report.

Our evaluation is completed using industry standard methods and procedures. The structural results, conclusions and recommendations contained in this report are proprietary and should not be used by others as their own. Infinigy is not responsible for decisions made by others that are or are not based on the stated assumptions and conclusions in this report.

This report is an evaluation of the mount structure only and does not determine the adequacy of the supporting structure, other carrier mounts or cable mounting attachments. The analysis of these elements is outside the scope of this analysis, are assumed to be adequate for the purpose of this report and to have been installed per their manufacturer requirements. This document is not for construction purposes.

Program Inputs

PROJECT INFORMATION	
Client:	Northeast Site Solutions
Carrier:	Dish Wireless
Engineer:	Alex Matout

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	C	
Topo Category:	1	
Site Class:	D - Stiff Soil (Assumed)	
Ground Elevation:	N/A	ft *Rev H

MOUNT INFORMATION		
Mount Type:	Sector Frame	
Num Sectors:	1	
Centerline AGL:	83.00	ft
Tower Height AGL:	128.25	ft

TOPOGRAPHIC DATA		
Topo Feature:	N/A	
Slope Distance:	N/A	ft
Crest Distance:	N/A	ft
Crest Height:	N/A	ft

FACTORS		
Directionality Fact. (K_d):	0.950	
Ground Ele. Factor (K_e):	N/A	*Rev H Only
Rooftop Speed-Up (K_s):	N/A	*Rev H Only
Topographic Factor (K_{zt}):	1.000	
Gust Effect Factor (G_h):	1.000	

CODE STANDARDS		
Building Code:	2015 IBC	
TIA Standard:	TIA-222-G	
ASCE Standard:	ASCE 7-10	

WIND AND ICE DATA		
Ultimate Wind (V_{ult}):	130	mph
Design Wind (V):	101	mph
Ice Wind (V_{ice}):	50	mph
Base Ice Thickness (t_i):	0.75	in
Flat Pressure:	60.381	psf
Round Pressure:	36.229	psf
Ice Wind Pressure:	8.879	psf

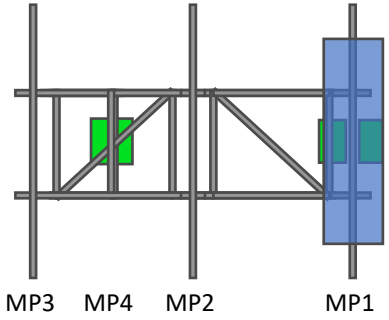
SEISMIC DATA		
Short-Period Accel. (S_s):	0.180	g
1-Second Accel. (S_1):	0.062	g
Short-Period Design (S_{DS}):	0.192	
1-Second Design (S_{D1}):	0.099	
Short-Period Coeff. (F_a):	1.600	
1-Second Coeff. (F_v):	2.400	
Amplification Factor (A_s):	3.000	
Response Mod. Coeff. (R):	2.000	

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

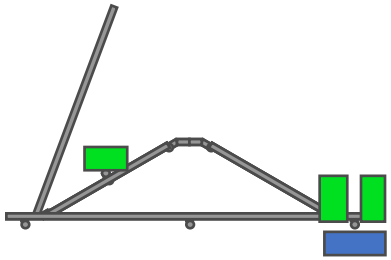
Infinigy Load Calculator V2.1.7

Program Inputs

ELEVATION VIEW



PLAN VIEW



INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

Infinigy Load Calculator V2.1.7

APPURTENANCE INFORMATION

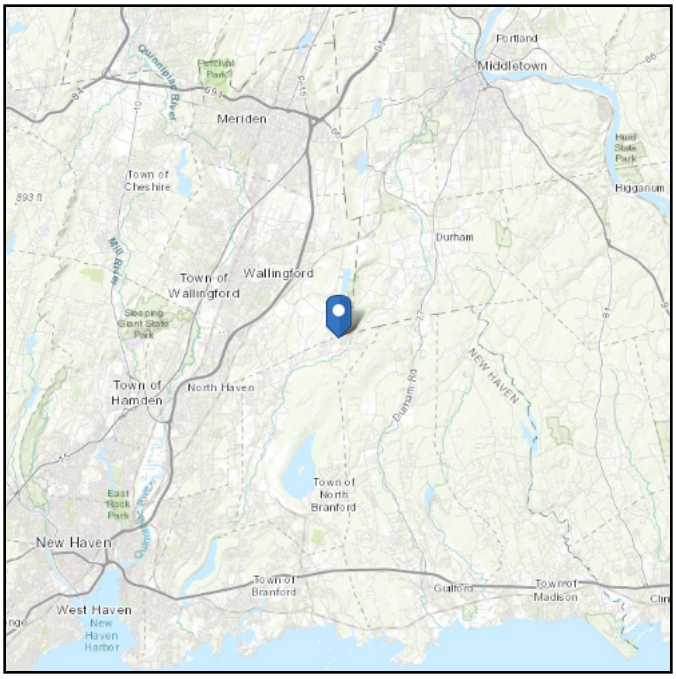
Appurtenance Name	Elevation	Qty.	K_a	q_z (psf)	EPA_N (ft^2)	EPA_T (ft^2)	Wind F_z (lbs)	Wind F_x (lbs)	Weight (lbs)	Seismic F (lbs)	Member (α sector)
JMA WIRELESS MX08FRO665-21	83.0	1	1.00	30.19	12.49	5.87	377.05	177.12	82.50	23.76	MP1
FUJITSU TA08025-B605	83.0	1	1.00	30.19	1.17	0.55	35.26	16.60	74.95	21.59	MP1
FUJITSU TA08025-B604	83.0	1	1.00	30.19	1.17	0.55	35.26	16.60	63.93	18.41	MP1
RAYCAP RDIDC-9181-PF-48	83.0	1	1.00	30.19	1.76	0.87	53.19	26.35	21.85	6.29	MP4

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 462.73 ft (NAVD 88)
Latitude: 41.420833
Longitude: -72.749444



Wind

Results:

Wind Speed	130 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	94 Vmph
100-year MRI	103 Vmph

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

Date Accessed: Mon Mar 28 2022

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

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

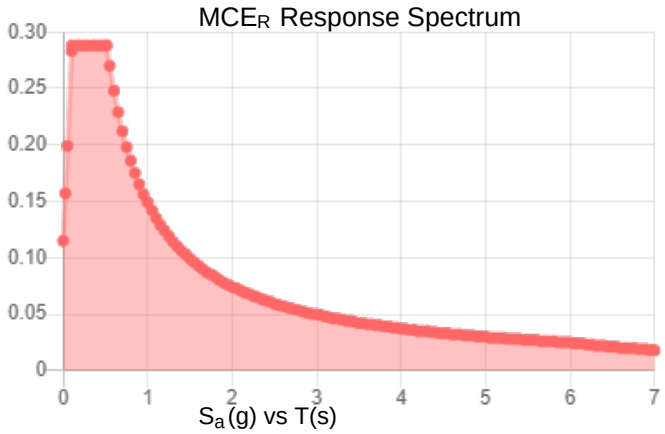
Seismic

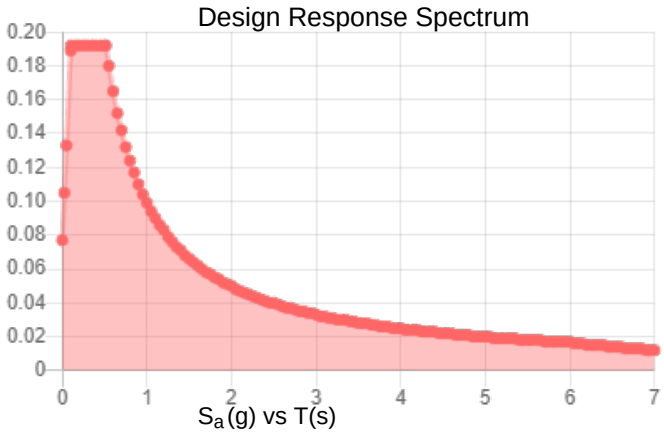
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.18	S_{DS} :	0.192
S_1 :	0.062	S_{D1} :	0.099
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.092
S_{MS} :	0.288	PGA_M :	0.148
S_{M1} :	0.149	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: **Mon Mar 28 2022**

Date Source:

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

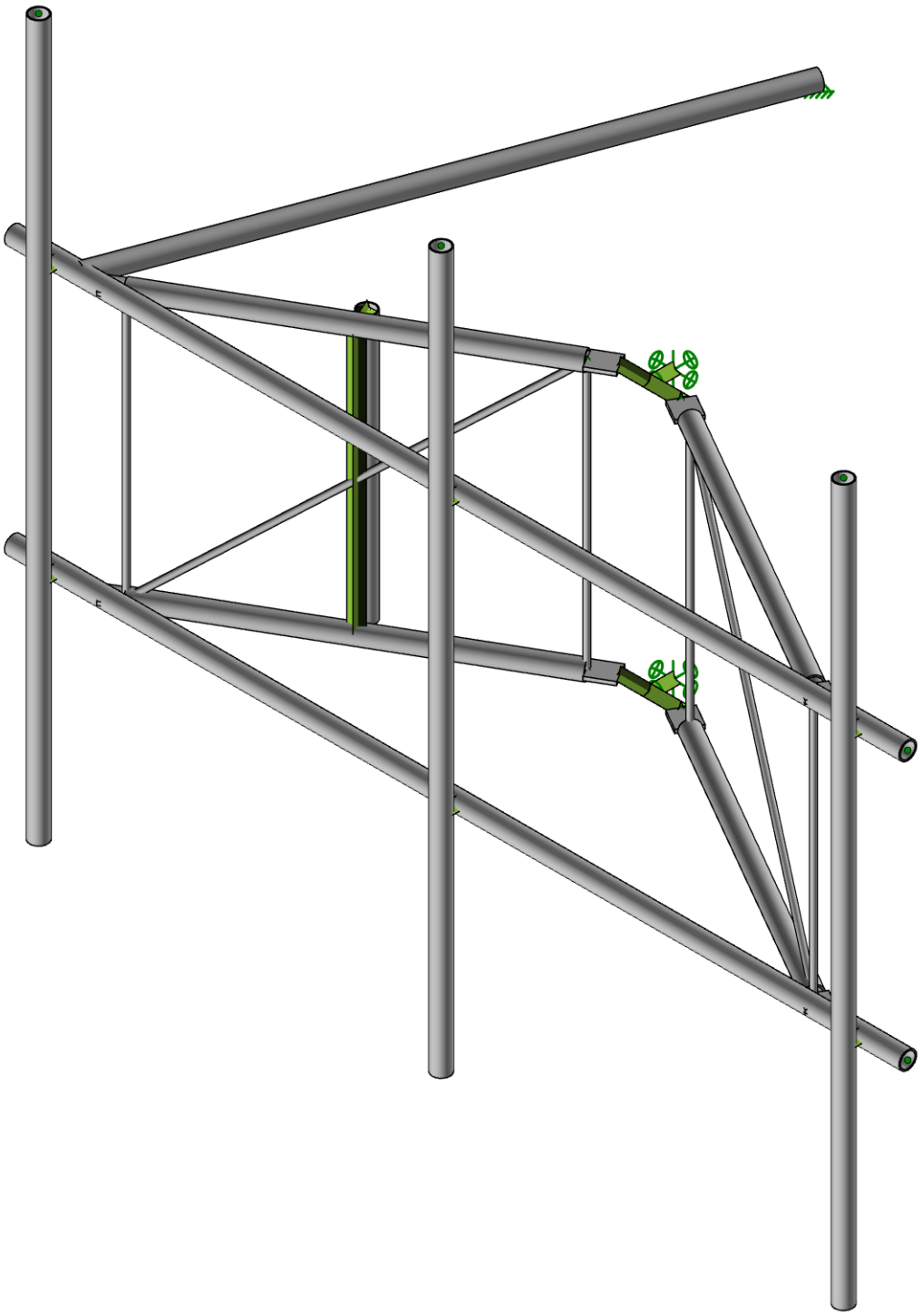
Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Mon Mar 28 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.



Envelope Only Solution

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AM		Mar 28, 2022
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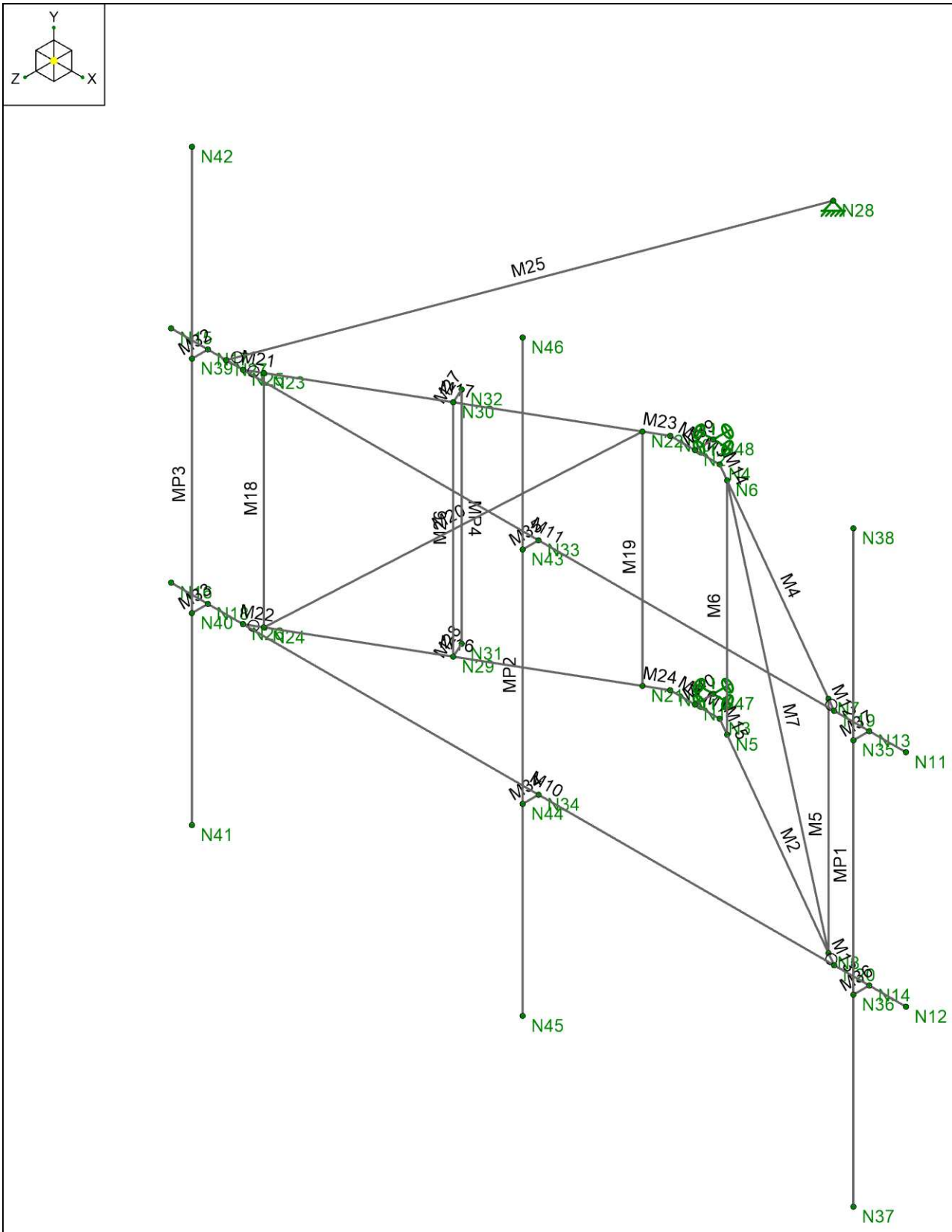

Envelope Only Solution

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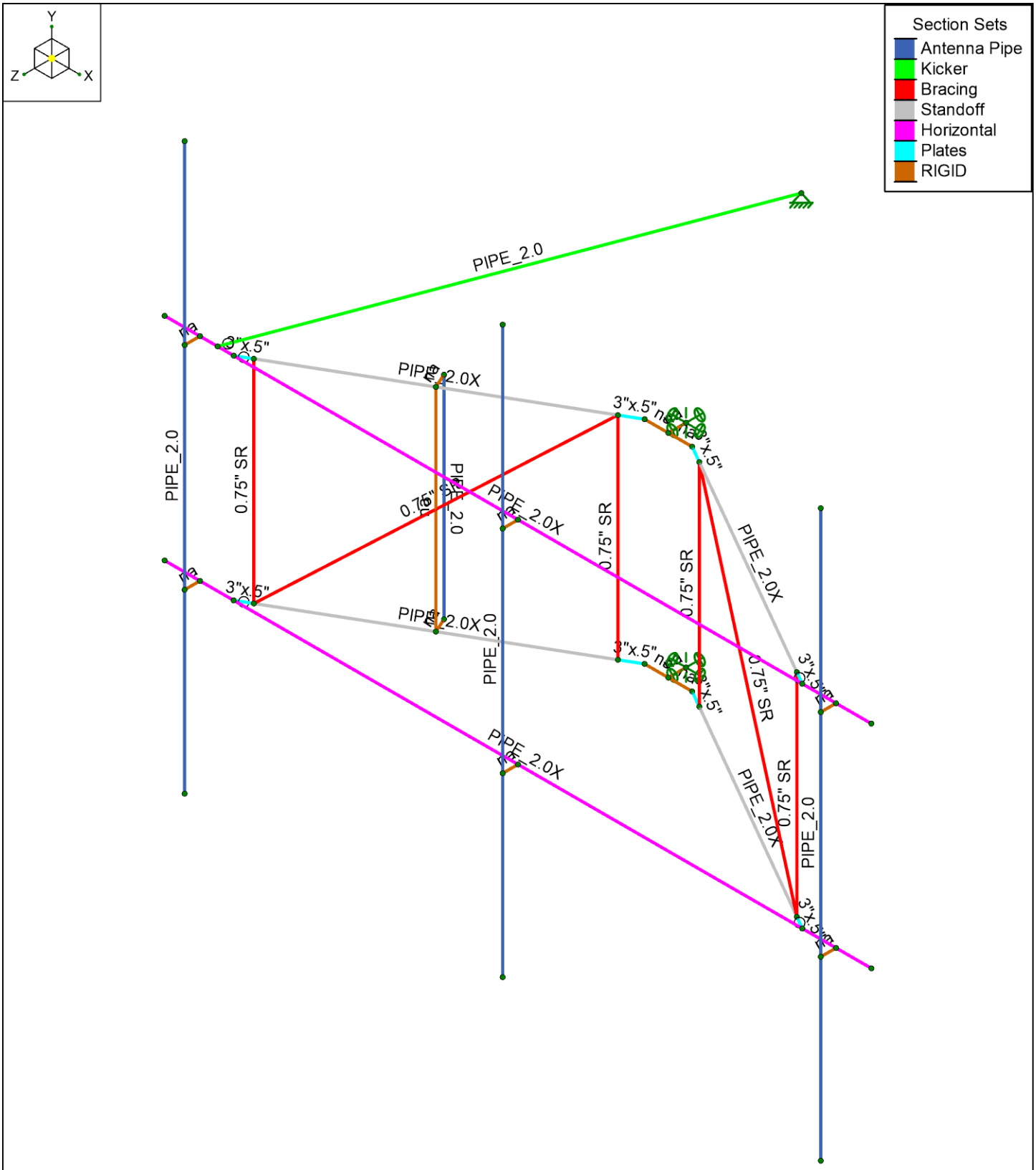

Envelope Only Solution

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AM		Mar 28, 2022
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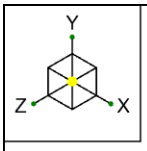

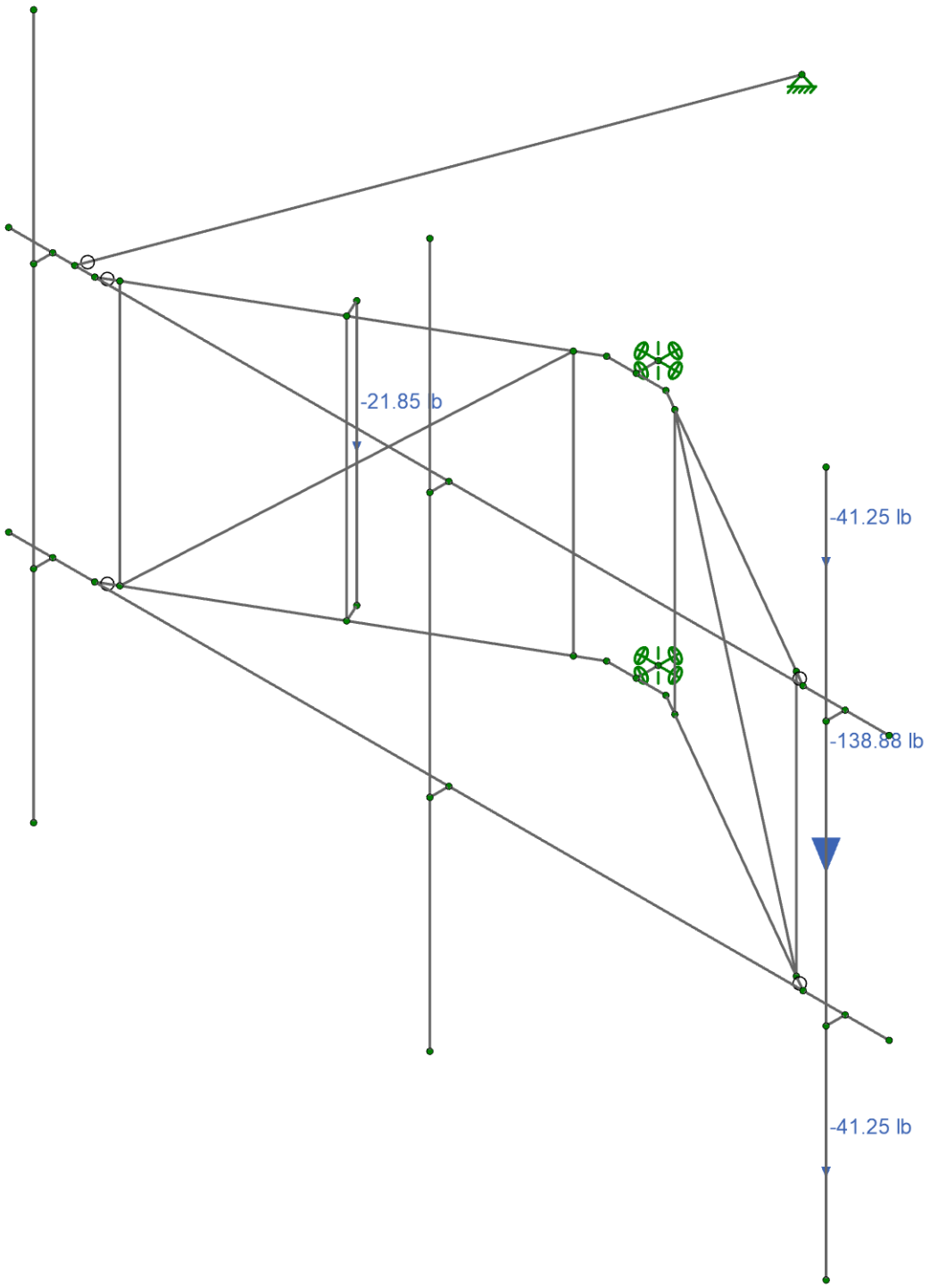

Loads: BLC 1, Self Weight
Envelope Only Solution

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AM		Mar 28, 2022
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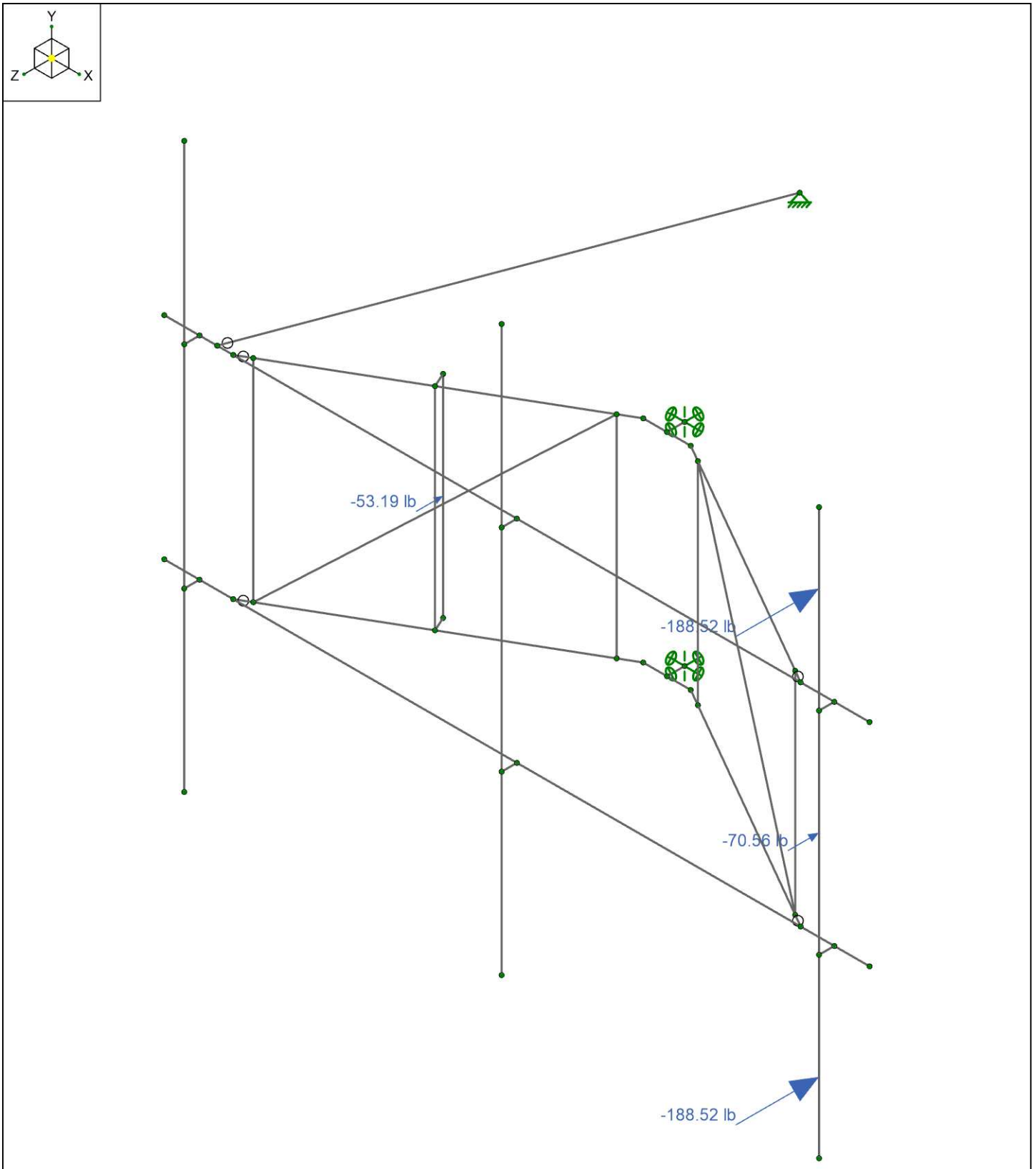

Loads: BLC 2, Wind Load AZI 0
Envelope Only Solution

Infinigy Engineering, PLLC	BOHVN00032A	SK-6
AM		Mar 28, 2022
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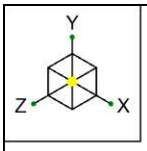
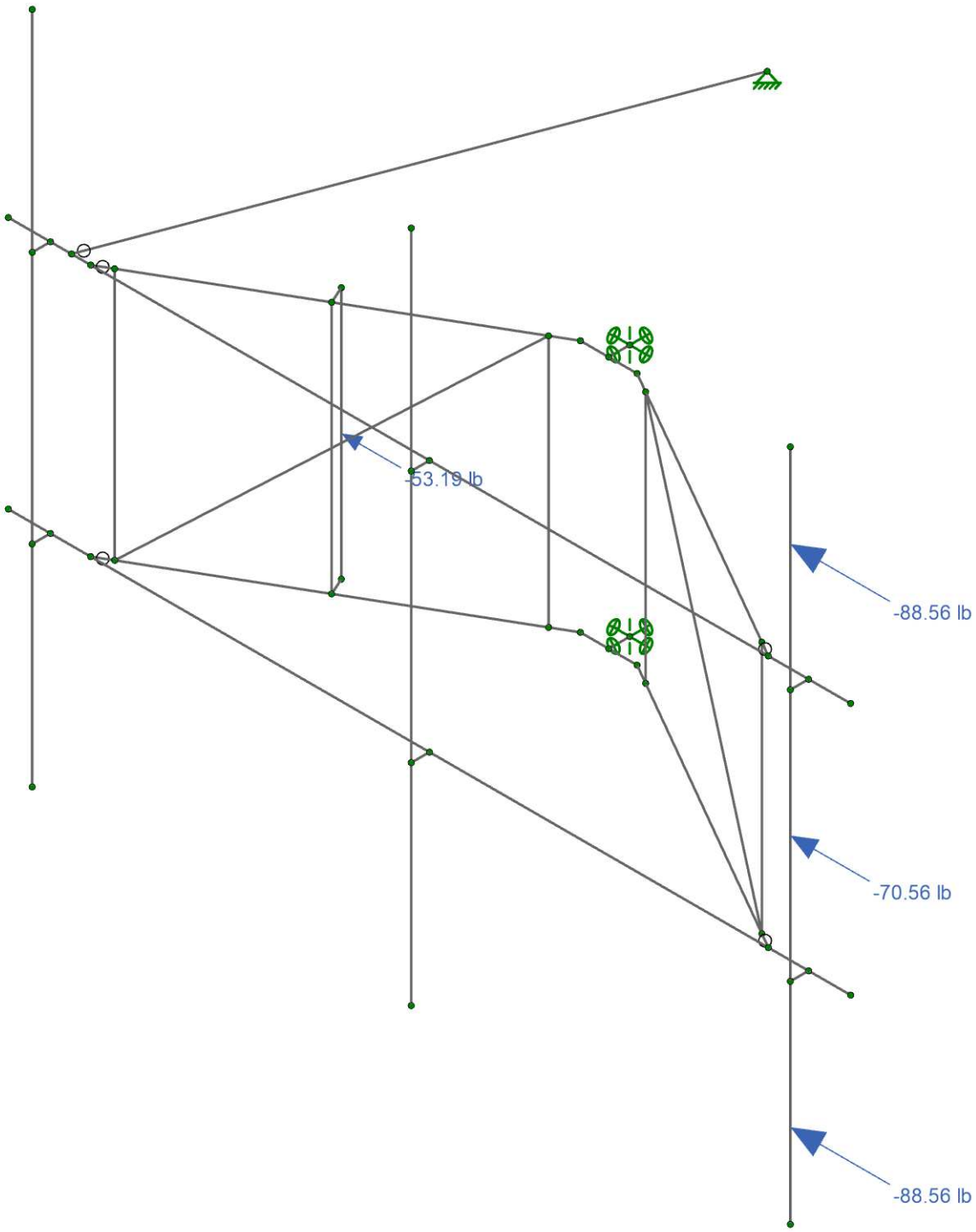
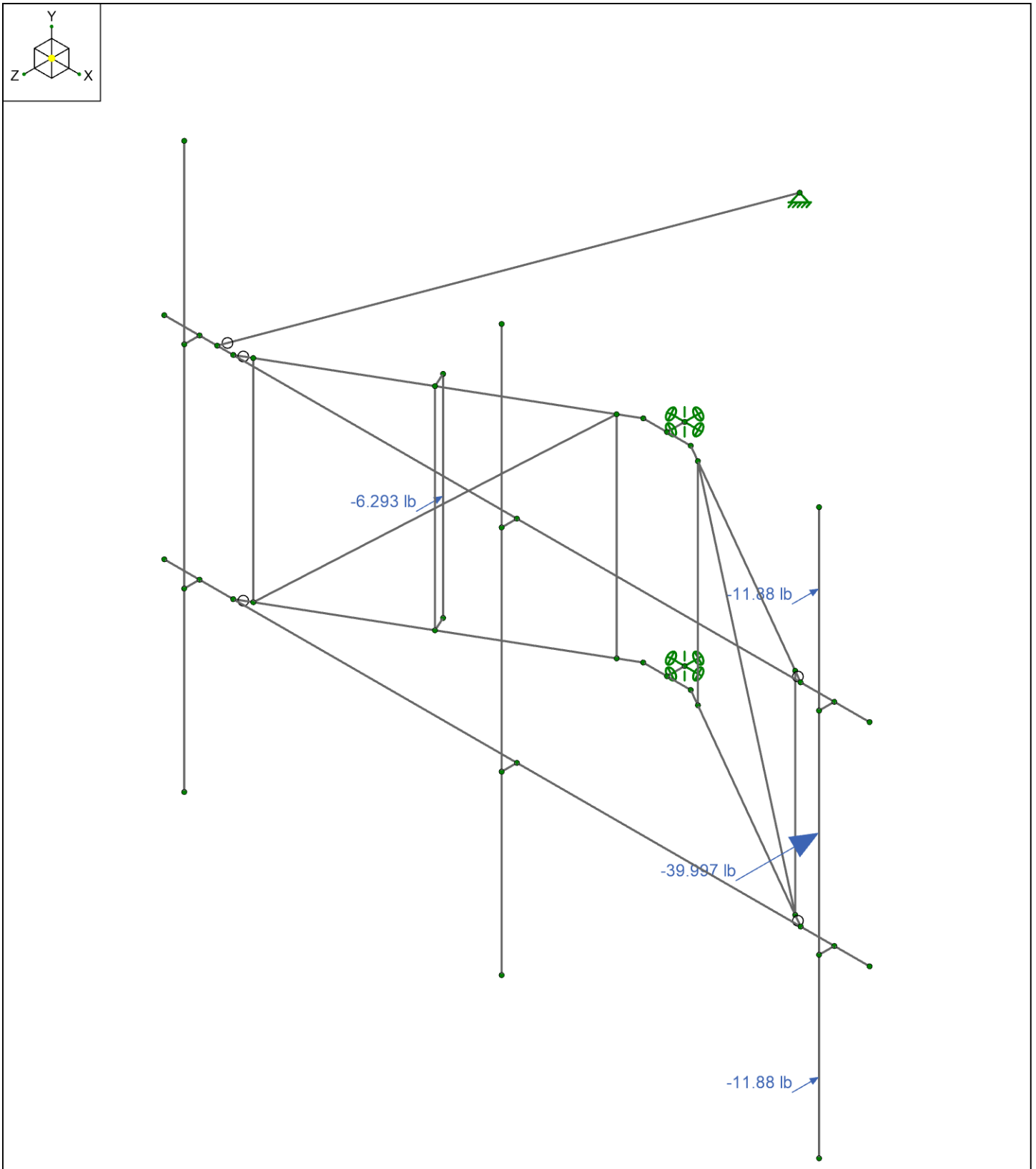




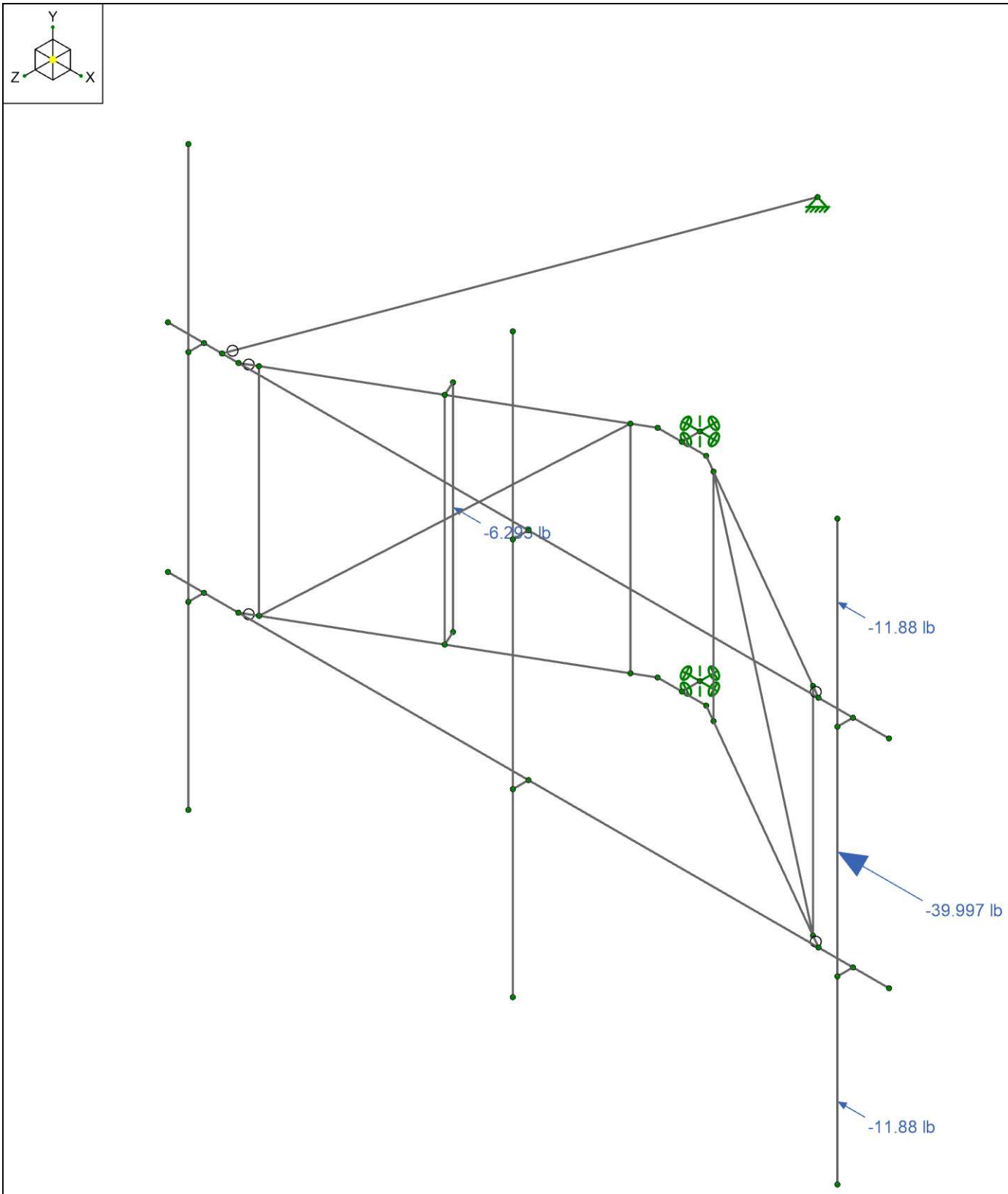
Loads: BLC 5, Wind Load AZI 90
Envelope Only Solution

Infinigy Engineering, PLLC	BOHVN00032A	SK-7
AM		Mar 28, 2022
1197-F0001		BOHVN00032A_loaded.r3d



Loads: BLC 31, Seismic Load Z
Envelope Only Solution

Infinigy Engineering, PLLC	BOHVN00032A	SK-8
AM		Mar 28, 2022
1197-F0001		BOHVN00032A_loaded.r3d



Loads: BLC 32, Seismic Load X
Envelope Only Solution

Infinigy Engineering, PLLC	BOHVN00032A	SK-9
AM		Mar 28, 2022
1197-F0001		BOHVN00032A_loaded.r3d

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N1	N3		RIGID	None	None	RIGID	Typical
2	M2	N5	N8		Standoff	Beam	Pipe	A500 Gr.C	Typical
3	M3	N2	N4		RIGID	None	None	RIGID	Typical
4	M4	N6	N7		Standoff	Beam	Pipe	A500 Gr.C	Typical
5	M5	N8	N7		Bracing	VBrace	BAR	A572 Gr.50	Typical
6	M6	N5	N6		Bracing	VBrace	BAR	A572 Gr.50	Typical
7	M7	N6	N8		Bracing	VBrace	BAR	A572 Gr.50	Typical
8	M8	N1	N9		RIGID	None	None	RIGID	Typical
9	M9	N2	N10		RIGID	None	None	RIGID	Typical
10	M10	N16	N12		Horizontal	Beam	Pipe	A500 Gr.C	Typical
11	M11	N15	N11		Horizontal	Beam	Pipe	A500 Gr.C	Typical
12	M12	N7	N19	90	Plates	Beam	BAR	A572 Gr.50	Typical
13	M13	N8	N20	90	Plates	Beam	BAR	A572 Gr.50	Typical
14	M14	N4	N6	90	Plates	Beam	BAR	A572 Gr.50	Typical
15	M15	N3	N5	90	Plates	Beam	BAR	A572 Gr.50	Typical
16	M16	N21	N24		Standoff	Beam	Pipe	A500 Gr.C	Typical
17	M17	N22	N23		Standoff	Beam	Pipe	A500 Gr.C	Typical
18	M18	N24	N23		Bracing	VBrace	BAR	A572 Gr.50	Typical
19	M19	N21	N22		Bracing	VBrace	BAR	A572 Gr.50	Typical
20	M20	N22	N24		Bracing	VBrace	BAR	A572 Gr.50	Typical
21	M21	N23	N25	90	Plates	Beam	BAR	A572 Gr.50	Typical
22	M22	N24	N26	90	Plates	Beam	BAR	A572 Gr.50	Typical
23	M23	N10	N22	90	Plates	Beam	BAR	A572 Gr.50	Typical
24	M24	N9	N21	90	Plates	Beam	BAR	A572 Gr.50	Typical
25	M25	N28	N27		Kicker	HBrace	Pipe	A53 Gr.B	Typical
26	M26	N29	N30	24.12	RIGID	None	None	RIGID	Typical
27	M27	N32	N30		RIGID	None	None	RIGID	Typical
28	M28	N29	N31		RIGID	None	None	RIGID	Typical
29	MP1	N37	N38		Antenna Pipe	Column	Pipe	A53 Gr.B	Typical
30	MP3	N41	N42		Antenna Pipe	Column	Pipe	A53 Gr.B	Typical
31	MP2	N45	N46		Antenna Pipe	Column	Pipe	A53 Gr.B	Typical
32	M32	N17	N39		RIGID	None	None	RIGID	Typical
33	M33	N18	N40		RIGID	None	None	RIGID	Typical
34	M34	N34	N44		RIGID	None	None	RIGID	Typical
35	M35	N33	N43		RIGID	None	None	RIGID	Typical
36	M36	N14	N36		RIGID	None	None	RIGID	Typical
37	M37	N13	N35		RIGID	None	None	RIGID	Typical
38	MP4	N32	N31		Antenna Pipe	Column	Pipe	A53 Gr.B	Typical
39	M39	N2	N48		RIGID	None	None	RIGID	Typical
40	M40	N1	N47		RIGID	None	None	RIGID	Typical

Material Take-Off

	Material	Pieces	Length[in]	Weight[K]
1	General Members			
2	RIGID	2	6	0
3	Total General	2	6	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed
1	Self Weight	DL		-1			5	
2	Wind Load AZI 0	WLZ					10	
3	Wind Load AZI 30	None					10	

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed
4	Wind Load AZI 60	None					10	
5	Wind Load AZI 90	WLX					10	
6	Wind Load AZI 120	None					10	
7	Wind Load AZI 150	None					10	
8	Wind Load AZI 180	None					10	
9	Wind Load AZI 210	None					10	
10	Wind Load AZI 240	None					10	
11	Wind Load AZI 270	None					10	
12	Wind Load AZI 300	None					10	
13	Wind Load AZI 330	None					10	
14	Distr. Wind Load Z	WLZ						38
15	Distr. Wind Load X	WLX						38
16	Ice Weight	OL1					5	38
17	Ice Wind Load AZI 0	OL2					10	
18	Ice Wind Load AZI 30	None					10	
19	Ice Wind Load AZI 60	None					10	
20	Ice Wind Load AZI 90	OL3					10	
21	Ice Wind Load AZI 120	None					10	
22	Ice Wind Load AZI 150	None					10	
23	Ice Wind Load AZI 180	None					10	
24	Ice Wind Load AZI 210	None					10	
25	Ice Wind Load AZI 240	None					10	
26	Ice Wind Load AZI 270	None					10	
27	Ice Wind Load AZI 300	None					10	
28	Ice Wind Load AZI 330	None					10	
29	Distr. Ice Wind Load Z	OL2						38
30	Distr. Ice Wind Load X	OL3						38
31	Seismic Load Z	ELZ			-0.288		5	
32	Seismic Load X	ELX	-0.288				5	
33	Service Live Loads	LL				1		

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4DL	Yes	Y	1	1.4								
2	1.2DL + 1.6WL AZI 0	Yes	Y	1	1.2	2	1.6	14	1.6	15			
3	1.2DL + 1.6WL AZI 30	Yes	Y	1	1.2	3	1.6	14	1.386	15	0.8		
4	1.2DL + 1.6WL AZI 60	Yes	Y	1	1.2	4	1.6	14	0.8	15	1.386		
5	1.2DL + 1.6WL AZI 90	Yes	Y	1	1.2	5	1.6	14		15	1.6		
6	1.2DL + 1.6WL AZI 120	Yes	Y	1	1.2	6	1.6	14	-0.8	15	1.386		
7	1.2DL + 1.6WL AZI 150	Yes	Y	1	1.2	7	1.6	14	-1.386	15	0.8		
8	1.2DL + 1.6WL AZI 180	Yes	Y	1	1.2	8	1.6	14	-1.6	15			
9	1.2DL + 1.6WL AZI 210	Yes	Y	1	1.2	9	1.6	14	-1.386	15	-0.8		
10	1.2DL + 1.6WL AZI 240	Yes	Y	1	1.2	10	1.6	14	-0.8	15	-1.386		
11	1.2DL + 1.6WL AZI 270	Yes	Y	1	1.2	11	1.6	14		15	-1.6		
12	1.2DL + 1.6WL AZI 300	Yes	Y	1	1.2	12	1.6	14	0.8	15	-1.386		
13	1.2DL + 1.6WL AZI 330	Yes	Y	1	1.2	13	1.6	14	1.386	15	-0.8		
14	0.9DL + 1.6WL AZI 0	Yes	Y	1	0.9	2	1.6	14	1.6	15			
15	0.9DL + 1.6WL AZI 30	Yes	Y	1	0.9	3	1.6	14	1.386	15	0.8		
16	0.9DL + 1.6WL AZI 60	Yes	Y	1	0.9	4	1.6	14	0.8	15	1.386		
17	0.9DL + 1.6WL AZI 90	Yes	Y	1	0.9	5	1.6	14		15	1.6		
18	0.9DL + 1.6WL AZI 120	Yes	Y	1	0.9	6	1.6	14	-0.8	15	1.386		
19	0.9DL + 1.6WL AZI 150	Yes	Y	1	0.9	7	1.6	14	-1.386	15	0.8		
20	0.9DL + 1.6WL AZI 180	Yes	Y	1	0.9	8	1.6	14	-1.6	15			
21	0.9DL + 1.6WL AZI 210	Yes	Y	1	0.9	9	1.6	14	-1.386	15	-0.8		
22	0.9DL + 1.6WL AZI 240	Yes	Y	1	0.9	10	1.6	14	-0.8	15	-1.386		

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
23	0.9DL + 1.6WL AZI 270	Yes	Y	1	0.9	11	1.6	14		15	-1.6		
24	0.9DL + 1.6WL AZI 300	Yes	Y	1	0.9	12	1.6	14	0.8	15	-1.386		
25	0.9DL + 1.6WL AZI 330	Yes	Y	1	0.9	13	1.6	14	1.386	15	-0.8		
26	1.2D + 1.0Di	Yes	Y	1	1.2	16	1						
27	1.2D + 1.0Di +1.0Wi AZI 0	Yes	Y	1	1.2	16	1	17	1	29	1.6	30	
28	1.2D + 1.0Di +1.0Wi AZI 30	Yes	Y	1	1.2	16	1	18	1	29	1.386	30	0.8
29	1.2D + 1.0Di +1.0Wi AZI 60	Yes	Y	1	1.2	16	1	19	1	29	0.8	30	1.386
30	1.2D + 1.0Di +1.0Wi AZI 90	Yes	Y	1	1.2	16	1	20	1	29		30	1.6
31	1.2D + 1.0Di +1.0Wi AZI 120	Yes	Y	1	1.2	16	1	21	1	29	-0.8	30	1.386
32	1.2D + 1.0Di +1.0Wi AZI 150	Yes	Y	1	1.2	16	1	22	1	29	-1.386	30	0.8
33	1.2D + 1.0Di +1.0Wi AZI 180	Yes	Y	1	1.2	16	1	23	1	29	-1.6	30	
34	1.2D + 1.0Di +1.0Wi AZI 210	Yes	Y	1	1.2	16	1	24	1	29	-1.386	30	-0.8
35	1.2D + 1.0Di +1.0Wi AZI 240	Yes	Y	1	1.2	16	1	25	1	29	-0.8	30	-1.386
36	1.2D + 1.0Di +1.0Wi AZI 270	Yes	Y	1	1.2	16	1	26	1	29		30	-1.6
37	1.2D + 1.0Di +1.0Wi AZI 300	Yes	Y	1	1.2	16	1	27	1	29	0.8	30	-1.386
38	1.2D + 1.0Di +1.0Wi AZI 330	Yes	Y	1	1.2	16	1	28	1	29	1.386	30	-0.8
39	(1.2 + 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	1.238	31	1	32					
40	(1.2 + 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	1.238	31	0.866	32	0.5				
41	(1.2 + 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	1.238	31	0.5	32	0.866				
42	(1.2 + 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	1.238	31		32	1				
43	(1.2 + 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	1.238	31	-0.5	32	0.866				
44	(1.2 + 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	1.238	31	-0.866	32	0.5				
45	(1.2 + 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	1.238	31	-1	32					
46	(1.2 + 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	1.238	31	-0.866	32	-0.5				
47	(1.2 + 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	1.238	31	-0.5	32	-0.866				
48	(1.2 + 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	1.238	31		32	-1				
49	(1.2 + 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	1.238	31	0.5	32	-0.866				
50	(1.2 + 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	1.238	31	0.866	32	-0.5				
51	(0.9 - 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	0.862	31	1	32					
52	(0.9 - 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	0.862	31	0.866	32	0.5				
53	(0.9 - 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	0.862	31	0.5	32	0.866				
54	(0.9 - 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	0.862	31		32	1				
55	(0.9 - 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	0.862	31	-0.5	32	0.866				
56	(0.9 - 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	0.862	31	-0.866	32	0.5				
57	(0.9 - 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	0.862	31	-1	32					
58	(0.9 - 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	0.862	31	-0.866	32	-0.5				
59	(0.9 - 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	0.862	31	-0.5	32	-0.866				
60	(0.9 - 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	0.862	31		32	-1				
61	(0.9 - 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	0.862	31	0.5	32	-0.866				
62	(0.9 - 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	0.862	31	0.866	32	-0.5				
63	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 0	Yes	Y	1	1	2	0.353	14	0.353	15		33	1.5
64	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 30	Yes	Y	1	1	3	0.353	14	0.306	15	0.176	33	1.5
65	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 60	Yes	Y	1	1	4	0.353	14	0.176	15	0.306	33	1.5
66	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 90	Yes	Y	1	1	5	0.353	14		15	0.353	33	1.5
67	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 120	Yes	Y	1	1	6	0.353	14	-0.176	15	0.306	33	1.5
68	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 150	Yes	Y	1	1	7	0.353	14	-0.306	15	0.176	33	1.5
69	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 180	Yes	Y	1	1	8	0.353	14	-0.353	15		33	1.5
70	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 210	Yes	Y	1	1	9	0.353	14	-0.306	15	-0.176	33	1.5
71	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 240	Yes	Y	1	1	10	0.353	14	-0.176	15	-0.306	33	1.5
72	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 270	Yes	Y	1	1	11	0.353	14		15	-0.353	33	1.5
73	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 300	Yes	Y	1	1	12	0.353	14	0.176	15	-0.306	33	1.5
74	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 330	Yes	Y	1	1	13	0.353	14	0.306	15	-0.176	33	1.5

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	Antenna Pipe	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
2	Kicker	PIPE_2.0	HBrace	Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
3	Bracing	0.75" SR	VBrace	BAR	A572 Gr.50	Typical	0.442	0.016	0.016	0.031
4	Standoff	PIPE_2.0X	Beam	Pipe	A500 Gr.C	Typical	1.4	0.827	0.827	1.65
5	Horizontal	PIPE_2.0X	Beam	Pipe	A500 Gr.C	Typical	1.4	0.827	0.827	1.65
6	Plates	3"x.5"	Beam	BAR	A572 Gr.50	Typical	1.5	0.031	1.125	0.112

Member Advanced Data

	Label	J Release	Physical	Deflection Ratio Options	Seismic DR
1	M1		Yes	** NA **	None
2	M2		Yes	Default	None
3	M3		Yes	** NA **	None
4	M4		Yes	Default	None
5	M5		Yes	** NA **	None
6	M6		Yes	** NA **	None
7	M7		Yes	** NA **	None
8	M8		Yes	** NA **	None
9	M9		Yes	** NA **	None
10	M10		Yes	Default	None
11	M11		Yes	Default	None
12	M12	BenPIN	Yes	Default	None
13	M13	BenPIN	Yes	Default	None
14	M14		Yes	Default	None
15	M15		Yes	Default	None
16	M16		Yes	Default	None
17	M17		Yes	Default	None
18	M18		Yes	** NA **	None
19	M19		Yes	** NA **	None
20	M20		Yes	** NA **	None
21	M21	BenPIN	Yes	Default	None
22	M22	BenPIN	Yes	Default	None
23	M23		Yes	Default	None
24	M24		Yes	Default	None
25	M25	BenPIN	Yes	** NA **	None
26	M26		Yes	** NA **	None
27	M27		Yes	** NA **	None
28	M28		Yes	** NA **	None
29	MP1		Yes	** NA **	None
30	MP3		Yes	** NA **	None
31	MP2		Yes	** NA **	None
32	M32		Yes	** NA **	None
33	M33		Yes	** NA **	None
34	M34		Yes	** NA **	None
35	M35		Yes	** NA **	None
36	M36		Yes	** NA **	None
37	M37		Yes	** NA **	None
38	MP4		Yes	** NA **	None
39	M39		Yes	** NA **	None
40	M40		Yes	** NA **	None

Hot Rolled Steel Design Parameters

	Label	Shape	Length [in]	Lcomp top [in]	K y-y	K z-z	Function
1	M2	Standoff	45.25	Lbyy			Lateral
2	M4	Standoff	45.25	Lbyy			Lateral
3	M5	Bracing	36		0.7	0.7	Lateral
4	M6	Bracing	36		0.7	0.7	Lateral
5	M7	Bracing	57.824		0.7	0.7	Lateral
6	M10	Horizontal	120	Lbyy			Lateral
7	M11	Horizontal	120	Lbyy			Lateral
8	M12	Plates	2.5	Lbyy			Lateral
9	M13	Plates	2.5	Lbyy			Lateral
10	M14	Plates	3.313	Lbyy			Lateral
11	M15	Plates	3.313	Lbyy			Lateral
12	M16	Standoff	45.25	Lbyy			Lateral
13	M17	Standoff	45.25	Lbyy			Lateral
14	M18	Bracing	36		0.7	0.7	Lateral
15	M19	Bracing	36		0.7	0.7	Lateral
16	M20	Bracing	57.824		0.7	0.7	Lateral
17	M21	Plates	2.5	Lbyy			Lateral
18	M22	Plates	2.5	Lbyy			Lateral
19	M23	Plates	3.313	Lbyy			Lateral
20	M24	Plates	3.313	Lbyy			Lateral
21	M25	Kicker	76.996				Lateral
22	MP1	Antenna Pipe	96				Lateral
23	MP3	Antenna Pipe	96				Lateral
24	MP2	Antenna Pipe	96				Lateral
25	MP4	Antenna Pipe	36				Lateral

Node Loads and Enforced Displacements (BLC 33 : Service Live Loads)

	Node Label	L, D, M	Direction	Magnitude [(lb, lb-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N12	L	Y	-500

Member Point Loads (BLC 1 : Self Weight)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Y	-41.25	12
2	MP1	Y	-41.25	84
3	MP1	Y	-74.95	48
4	MP1	Y	-63.93	48
5	MP4	Y	-21.85	18

Member Point Loads (BLC 2 : Wind Load AZI 0)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	0	12
2	MP1	Z	-188.52	12
3	MP1	X	0	84
4	MP1	Z	-188.52	84
5	MP1	X	0	48
6	MP1	Z	-35.28	48
7	MP1	X	0	48
8	MP1	Z	-35.28	48
9	MP4	X	0	18
10	MP4	Z	-53.19	18

Member Point Loads (BLC 3 : Wind Load AZI 30)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-81.77	12
2	MP1	Z	-141.62	12
3	MP1	X	-81.77	84
4	MP1	Z	-141.62	84
5	MP1	X	-17.64	48
6	MP1	Z	-30.56	48
7	MP1	X	-17.64	48
8	MP1	Z	-30.56	48
9	MP4	X	-26.59	18
10	MP4	Z	-46.06	18

Member Point Loads (BLC 4 : Wind Load AZI 60)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-98.34	12
2	MP1	Z	-56.78	12
3	MP1	X	-98.34	84
4	MP1	Z	-56.78	84
5	MP1	X	-30.56	48
6	MP1	Z	-17.64	48
7	MP1	X	-30.56	48
8	MP1	Z	-17.64	48
9	MP4	X	-46.06	18
10	MP4	Z	-26.59	18

Member Point Loads (BLC 5 : Wind Load AZI 90)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-88.56	12
2	MP1	Z	0	12
3	MP1	X	-88.56	84
4	MP1	Z	0	84
5	MP1	X	-35.28	48
6	MP1	Z	0	48
7	MP1	X	-35.28	48
8	MP1	Z	0	48
9	MP4	X	-53.19	18
10	MP4	Z	0	18

Member Point Loads (BLC 6 : Wind Load AZI 120)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-98.34	12
2	MP1	Z	56.78	12
3	MP1	X	-98.34	84
4	MP1	Z	56.78	84
5	MP1	X	-30.56	48
6	MP1	Z	17.64	48
7	MP1	X	-30.56	48
8	MP1	Z	17.64	48
9	MP4	X	-46.06	18
10	MP4	Z	26.59	18

Member Point Loads (BLC 7 : Wind Load AZI 150)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-81.77	12
2	MP1	Z	141.62	12
3	MP1	X	-81.77	84
4	MP1	Z	141.62	84
5	MP1	X	-17.64	48
6	MP1	Z	30.56	48
7	MP1	X	-17.64	48
8	MP1	Z	30.56	48
9	MP4	X	-26.59	18
10	MP4	Z	46.06	18

Member Point Loads (BLC 8 : Wind Load AZI 180)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	0	12
2	MP1	Z	188.52	12
3	MP1	X	0	84
4	MP1	Z	188.52	84
5	MP1	X	0	48
6	MP1	Z	35.28	48
7	MP1	X	0	48
8	MP1	Z	35.28	48
9	MP4	X	0	18
10	MP4	Z	53.19	18

Member Point Loads (BLC 9 : Wind Load AZI 210)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	81.77	12
2	MP1	Z	141.62	12
3	MP1	X	81.77	84
4	MP1	Z	141.62	84
5	MP1	X	17.64	48
6	MP1	Z	30.56	48
7	MP1	X	17.64	48
8	MP1	Z	30.56	48
9	MP4	X	26.59	18
10	MP4	Z	46.06	18

Member Point Loads (BLC 10 : Wind Load AZI 240)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	98.34	12
2	MP1	Z	56.78	12
3	MP1	X	98.34	84
4	MP1	Z	56.78	84
5	MP1	X	30.56	48
6	MP1	Z	17.64	48
7	MP1	X	30.56	48
8	MP1	Z	17.64	48
9	MP4	X	46.06	18
10	MP4	Z	26.59	18

Member Point Loads (BLC 11 : Wind Load AZI 270)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	88.56	12
2	MP1	Z	0	12
3	MP1	X	88.56	84
4	MP1	Z	0	84
5	MP1	X	35.28	48
6	MP1	Z	0	48
7	MP1	X	35.28	48
8	MP1	Z	0	48
9	MP4	X	53.19	18
10	MP4	Z	0	18

Member Point Loads (BLC 12 : Wind Load AZI 300)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	98.34	12
2	MP1	Z	-56.78	12
3	MP1	X	98.34	84
4	MP1	Z	-56.78	84
5	MP1	X	30.56	48
6	MP1	Z	-17.64	48
7	MP1	X	30.56	48
8	MP1	Z	-17.64	48
9	MP4	X	46.06	18
10	MP4	Z	-26.59	18

Member Point Loads (BLC 13 : Wind Load AZI 330)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	81.77	12
2	MP1	Z	-141.62	12
3	MP1	X	81.77	84
4	MP1	Z	-141.62	84
5	MP1	X	17.64	48
6	MP1	Z	-30.56	48
7	MP1	X	17.64	48
8	MP1	Z	-30.56	48
9	MP4	X	26.59	18
10	MP4	Z	-46.06	18

Member Point Loads (BLC 16 : Ice Weight)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Y	-134.113	12
2	MP1	Y	-134.113	84
3	MP1	Y	-69.888	48
4	MP1	Y	-65.575	48
5	MP4	Y	-63.952	18

Member Point Loads (BLC 17 : Ice Wind Load AZI 0)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	0	12
2	MP1	Z	-23.26	12

Member Point Loads (BLC 17 : Ice Wind Load AZI 0) (Continued)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
3	MP1	X	0	84
4	MP1	Z	-23.26	84
5	MP1	X	0	48
6	MP1	Z	-15.54	48
7	MP1	X	0	48
8	MP1	Z	-15.54	48
9	MP4	X	0	18
10	MP4	Z	-16.03	18

Member Point Loads (BLC 18 : Ice Wind Load AZI 30)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-10.49	12
2	MP1	Z	-18.17	12
3	MP1	X	-10.49	84
4	MP1	Z	-18.17	84
5	MP1	X	-7.77	48
6	MP1	Z	-13.45	48
7	MP1	X	-7.77	48
8	MP1	Z	-13.45	48
9	MP4	X	-8.02	18
10	MP4	Z	-13.89	18

Member Point Loads (BLC 19 : Ice Wind Load AZI 60)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-14.21	12
2	MP1	Z	-8.21	12
3	MP1	X	-14.21	84
4	MP1	Z	-8.21	84
5	MP1	X	-13.45	48
6	MP1	Z	-7.77	48
7	MP1	X	-13.45	48
8	MP1	Z	-7.77	48
9	MP4	X	-13.89	18
10	MP4	Z	-8.02	18

Member Point Loads (BLC 20 : Ice Wind Load AZI 90)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-14.13	12
2	MP1	Z	0	12
3	MP1	X	-14.13	84
4	MP1	Z	0	84
5	MP1	X	-15.54	48
6	MP1	Z	0	48
7	MP1	X	-15.54	48
8	MP1	Z	0	48
9	MP4	X	-16.03	18
10	MP4	Z	0	18

Member Point Loads (BLC 21 : Ice Wind Load AZI 120)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-14.21	12
2	MP1	Z	8.21	12
3	MP1	X	-14.21	84
4	MP1	Z	8.21	84
5	MP1	X	-13.45	48
6	MP1	Z	7.77	48
7	MP1	X	-13.45	48
8	MP1	Z	7.77	48
9	MP4	X	-13.89	18
10	MP4	Z	8.02	18

Member Point Loads (BLC 22 : Ice Wind Load AZI 150)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-10.49	12
2	MP1	Z	18.17	12
3	MP1	X	-10.49	84
4	MP1	Z	18.17	84
5	MP1	X	-7.77	48
6	MP1	Z	13.45	48
7	MP1	X	-7.77	48
8	MP1	Z	13.45	48
9	MP4	X	-8.02	18
10	MP4	Z	13.89	18

Member Point Loads (BLC 23 : Ice Wind Load AZI 180)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	0	12
2	MP1	Z	23.26	12
3	MP1	X	0	84
4	MP1	Z	23.26	84
5	MP1	X	0	48
6	MP1	Z	15.54	48
7	MP1	X	0	48
8	MP1	Z	15.54	48
9	MP4	X	0	18
10	MP4	Z	16.03	18

Member Point Loads (BLC 24 : Ice Wind Load AZI 210)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	10.49	12
2	MP1	Z	18.17	12
3	MP1	X	10.49	84
4	MP1	Z	18.17	84
5	MP1	X	7.77	48
6	MP1	Z	13.45	48
7	MP1	X	7.77	48
8	MP1	Z	13.45	48
9	MP4	X	8.02	18
10	MP4	Z	13.89	18

Member Point Loads (BLC 25 : Ice Wind Load AZI 240)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	14.21	12
2	MP1	Z	8.21	12
3	MP1	X	14.21	84
4	MP1	Z	8.21	84
5	MP1	X	13.45	48
6	MP1	Z	7.77	48
7	MP1	X	13.45	48
8	MP1	Z	7.77	48
9	MP4	X	13.89	18
10	MP4	Z	8.02	18

Member Point Loads (BLC 26 : Ice Wind Load AZI 270)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	14.13	12
2	MP1	Z	0	12
3	MP1	X	14.13	84
4	MP1	Z	0	84
5	MP1	X	15.54	48
6	MP1	Z	0	48
7	MP1	X	15.54	48
8	MP1	Z	0	48
9	MP4	X	16.03	18
10	MP4	Z	0	18

Member Point Loads (BLC 27 : Ice Wind Load AZI 300)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	14.21	12
2	MP1	Z	-8.21	12
3	MP1	X	14.21	84
4	MP1	Z	-8.21	84
5	MP1	X	13.45	48
6	MP1	Z	-7.77	48
7	MP1	X	13.45	48
8	MP1	Z	-7.77	48
9	MP4	X	13.89	18
10	MP4	Z	-8.02	18

Member Point Loads (BLC 28 : Ice Wind Load AZI 330)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	10.49	12
2	MP1	Z	-18.17	12
3	MP1	X	10.49	84
4	MP1	Z	-18.17	84
5	MP1	X	7.77	48
6	MP1	Z	-13.45	48
7	MP1	X	7.77	48
8	MP1	Z	-13.45	48
9	MP4	X	8.02	18
10	MP4	Z	-13.89	18

Member Point Loads (BLC 31 : Seismic Load Z)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Z	-11.88	12
2	MP1	Z	-11.88	84
3	MP1	Z	-21.586	48
4	MP1	Z	-18.412	48
5	MP4	Z	-6.293	18

Member Point Loads (BLC 32 : Seismic Load X)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-11.88	12
2	MP1	X	-11.88	84
3	MP1	X	-21.586	48
4	MP1	X	-18.412	48
5	MP4	X	-6.293	18

Member Distributed Loads (BLC 14 : Distr. Wind Load Z)

	Member Label	Direction	Start Magnitude [lb/ft, F, psf, lb-ft/in]	End Magnitude [lb/ft, F, psf, lb-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	M1	SZ	0	0	0	%100
2	M2	SZ	-36.229	-36.229	0	%100
3	M3	SZ	0	0	0	%100
4	M4	SZ	-36.229	-36.229	0	%100
5	M5	SZ	-36.229	-36.229	0	%100
6	M6	SZ	-36.229	-36.229	0	%100
7	M7	SZ	-36.229	-36.229	0	%100
8	M8	SZ	0	0	0	%100
9	M9	SZ	0	0	0	%100
10	M10	SZ	-36.229	-36.229	0	%100
11	M11	SZ	-36.229	-36.229	0	%100
12	M12	SZ	0	0	0	%100
13	M13	SZ	0	0	0	%100
14	M14	SZ	0	0	0	%100
15	M15	SZ	0	0	0	%100
16	M16	SZ	-36.229	-36.229	0	%100
17	M17	SZ	-36.229	-36.229	0	%100
18	M18	SZ	-36.229	-36.229	0	%100
19	M19	SZ	-36.229	-36.229	0	%100
20	M20	SZ	-36.229	-36.229	0	%100
21	M21	SZ	0	0	0	%100
22	M22	SZ	0	0	0	%100
23	M23	SZ	0	0	0	%100
24	M24	SZ	0	0	0	%100
25	M25	SZ	-36.229	-36.229	0	%100
26	M26	SZ	0	0	0	%100
27	M27	SZ	0	0	0	%100
28	M28	SZ	0	0	0	%100
29	MP1	SZ	-36.229	-36.229	0	%100
30	MP3	SZ	-36.229	-36.229	0	%100
31	MP2	SZ	-36.229	-36.229	0	%100
32	M32	SZ	0	0	0	%100
33	M33	SZ	0	0	0	%100
34	M34	SZ	0	0	0	%100
35	M35	SZ	0	0	0	%100
36	M36	SZ	0	0	0	%100

Member Distributed Loads (BLC 14 : Distr. Wind Load Z) (Continued)

	Member Label	Direction	Start Magnitude [lb/ft, F, psf, lb-ft/in]	End Magnitude [lb/ft, F, psf, lb-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
37	M37	SZ	0	0	0	%100
38	MP4	SZ	-36.229	-36.229	0	%100

Member Distributed Loads (BLC 15 : Distr. Wind Load X)

	Member Label	Direction	Start Magnitude [lb/ft, F, psf, lb-ft/in]	End Magnitude [lb/ft, F, psf, lb-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	M1	SX	0	0	0	%100
2	M2	SX	-36.229	-36.229	0	%100
3	M3	SX	0	0	0	%100
4	M4	SX	-36.229	-36.229	0	%100
5	M5	SX	-36.229	-36.229	0	%100
6	M6	SX	-36.229	-36.229	0	%100
7	M7	SX	-36.229	-36.229	0	%100
8	M8	SX	0	0	0	%100
9	M9	SX	0	0	0	%100
10	M10	SX	-36.229	-36.229	0	%100
11	M11	SX	-36.229	-36.229	0	%100
12	M12	SX	0	0	0	%100
13	M13	SX	0	0	0	%100
14	M14	SX	0	0	0	%100
15	M15	SX	0	0	0	%100
16	M16	SX	-36.229	-36.229	0	%100
17	M17	SX	-36.229	-36.229	0	%100
18	M18	SX	-36.229	-36.229	0	%100
19	M19	SX	-36.229	-36.229	0	%100
20	M20	SX	-36.229	-36.229	0	%100
21	M21	SX	0	0	0	%100
22	M22	SX	0	0	0	%100
23	M23	SX	0	0	0	%100
24	M24	SX	0	0	0	%100
25	M25	SX	-36.229	-36.229	0	%100
26	M26	SX	0	0	0	%100
27	M27	SX	0	0	0	%100
28	M28	SX	0	0	0	%100
29	MP1	SX	-36.229	-36.229	0	%100
30	MP3	SX	-36.229	-36.229	0	%100
31	MP2	SX	-36.229	-36.229	0	%100
32	M32	SX	0	0	0	%100
33	M33	SX	0	0	0	%100
34	M34	SX	0	0	0	%100
35	M35	SX	0	0	0	%100
36	M36	SX	0	0	0	%100
37	M37	SX	0	0	0	%100
38	MP4	SX	-36.229	-36.229	0	%100

Member Distributed Loads (BLC 16 : Ice Weight)

	Member Label	Direction	Start Magnitude [lb/ft, F, psf, lb-ft/in]	End Magnitude [lb/ft, F, psf, lb-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	M1	Y	-3.306	-3.306	0	%100
2	M2	Y	-8.079	-8.079	0	%100
3	M3	Y	-3.306	-3.306	0	%100
4	M4	Y	-8.079	-8.079	0	%100
5	M5	Y	-4.813	-4.813	0	%100
6	M6	Y	-4.813	-4.813	0	%100
7	M7	Y	-4.813	-4.813	0	%100

Member Distributed Loads (BLC 16 : Ice Weight) (Continued)

	Member Label	Direction	Start Magnitude [lb/ft, F, psf, lb-ft/in]	End Magnitude [lb/ft, F, psf, lb-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
8	M8	Y	-3.306	-3.306	0	%100
9	M9	Y	-3.306	-3.306	0	%100
10	M10	Y	-8.079	-8.079	0	%100
11	M11	Y	-8.079	-8.079	0	%100
12	M12	Y	-3.306	-3.306	0	%100
13	M13	Y	-3.306	-3.306	0	%100
14	M14	Y	-3.306	-3.306	0	%100
15	M15	Y	-3.306	-3.306	0	%100
16	M16	Y	-8.079	-8.079	0	%100
17	M17	Y	-8.079	-8.079	0	%100
18	M18	Y	-4.813	-4.813	0	%100
19	M19	Y	-4.813	-4.813	0	%100
20	M20	Y	-4.813	-4.813	0	%100
21	M21	Y	-3.306	-3.306	0	%100
22	M22	Y	-3.306	-3.306	0	%100
23	M23	Y	-3.306	-3.306	0	%100
24	M24	Y	-3.306	-3.306	0	%100
25	M25	Y	-8.079	-8.079	0	%100
26	M26	Y	-3.306	-3.306	0	%100
27	M27	Y	-3.306	-3.306	0	%100
28	M28	Y	-3.306	-3.306	0	%100
29	MP1	Y	-8.079	-8.079	0	%100
30	MP3	Y	-8.079	-8.079	0	%100
31	MP2	Y	-8.079	-8.079	0	%100
32	M32	Y	-3.306	-3.306	0	%100
33	M33	Y	-3.306	-3.306	0	%100
34	M34	Y	-3.306	-3.306	0	%100
35	M35	Y	-3.306	-3.306	0	%100
36	M36	Y	-3.306	-3.306	0	%100
37	M37	Y	-3.306	-3.306	0	%100
38	MP4	Y	-8.079	-8.079	0	%100

Member Distributed Loads (BLC 29 : Distr. Ice Wind Load Z)

	Member Label	Direction	Start Magnitude [lb/ft, F, psf, lb-ft/in]	End Magnitude [lb/ft, F, psf, lb-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	M1	SZ	0	0	0	%100
2	M2	SZ	-21.178	-21.178	0	%100
3	M3	SZ	0	0	0	%100
4	M4	SZ	-21.178	-21.178	0	%100
5	M5	SZ	-47.825	-47.825	0	%100
6	M6	SZ	-47.825	-47.825	0	%100
7	M7	SZ	-47.825	-47.825	0	%100
8	M8	SZ	0	0	0	%100
9	M9	SZ	0	0	0	%100
10	M10	SZ	-21.178	-21.178	0	%100
11	M11	SZ	-21.178	-21.178	0	%100
12	M12	SZ	0	0	0	%100
13	M13	SZ	0	0	0	%100
14	M14	SZ	0	0	0	%100
15	M15	SZ	0	0	0	%100
16	M16	SZ	-21.178	-21.178	0	%100
17	M17	SZ	-21.178	-21.178	0	%100
18	M18	SZ	-47.825	-47.825	0	%100
19	M19	SZ	-47.825	-47.825	0	%100
20	M20	SZ	-47.825	-47.825	0	%100
21	M21	SZ	0	0	0	%100

Member Distributed Loads (BLC 29 : Distr. Ice Wind Load Z) (Continued)

	Member Label	Direction	Start Magnitude [lb/ft, F, psf, lb-ft/in]	End Magnitude [lb/ft, F, psf, lb-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
22	M22	SZ	0	0	0	%100
23	M23	SZ	0	0	0	%100
24	M24	SZ	0	0	0	%100
25	M25	SZ	-21.178	-21.178	0	%100
26	M26	SZ	0	0	0	%100
27	M27	SZ	0	0	0	%100
28	M28	SZ	0	0	0	%100
29	MP1	SZ	-21.178	-21.178	0	%100
30	MP3	SZ	-21.178	-21.178	0	%100
31	MP2	SZ	-21.178	-21.178	0	%100
32	M32	SZ	0	0	0	%100
33	M33	SZ	0	0	0	%100
34	M34	SZ	0	0	0	%100
35	M35	SZ	0	0	0	%100
36	M36	SZ	0	0	0	%100
37	M37	SZ	0	0	0	%100
38	MP4	SZ	-21.178	-21.178	0	%100

Member Distributed Loads (BLC 30 : Distr. Ice Wind Load X)

	Member Label	Direction	Start Magnitude [lb/ft, F, psf, lb-ft/in]	End Magnitude [lb/ft, F, psf, lb-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	M1	SX	0	0	0	%100
2	M2	SX	-21.178	-21.178	0	%100
3	M3	SX	0	0	0	%100
4	M4	SX	-21.178	-21.178	0	%100
5	M5	SX	-47.825	-47.825	0	%100
6	M6	SX	-47.825	-47.825	0	%100
7	M7	SX	-47.825	-47.825	0	%100
8	M8	SX	0	0	0	%100
9	M9	SX	0	0	0	%100
10	M10	SX	-21.178	-21.178	0	%100
11	M11	SX	-21.178	-21.178	0	%100
12	M12	SX	0	0	0	%100
13	M13	SX	0	0	0	%100
14	M14	SX	0	0	0	%100
15	M15	SX	0	0	0	%100
16	M16	SX	-21.178	-21.178	0	%100
17	M17	SX	-21.178	-21.178	0	%100
18	M18	SX	-47.825	-47.825	0	%100
19	M19	SX	-47.825	-47.825	0	%100
20	M20	SX	-47.825	-47.825	0	%100
21	M21	SX	0	0	0	%100
22	M22	SX	0	0	0	%100
23	M23	SX	0	0	0	%100
24	M24	SX	0	0	0	%100
25	M25	SX	-21.178	-21.178	0	%100
26	M26	SX	0	0	0	%100
27	M27	SX	0	0	0	%100
28	M28	SX	0	0	0	%100
29	MP1	SX	-21.178	-21.178	0	%100
30	MP3	SX	-21.178	-21.178	0	%100
31	MP2	SX	-21.178	-21.178	0	%100
32	M32	SX	0	0	0	%100
33	M33	SX	0	0	0	%100
34	M34	SX	0	0	0	%100
35	M35	SX	0	0	0	%100

Member Distributed Loads (BLC 30 : Distr. Ice Wind Load X) (Continued)

	Member Label	Direction	Start Magnitude [lb/ft, F, psf, lb-ft/in]	End Magnitude [lb/ft, F, psf, lb-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
36	M36	SX	0	0	0	%100
37	M37	SX	0	0	0	%100
38	MP4	SX	-21.178	-21.178	0	%100

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
1	MP1	PIPE_2.0	0.282	66	2	0.043	66		2	14916.096	32130	1871.625	1871.625	3	H1-1b
2	M12	3"x.5"	0.207	0	64	0.064	2.5	y	8	66023.816	67500	705	4218.75	1.667	H1-1b
3	M14	3"x.5"	0.194	0	68	0.029	0	z	37	64929.826	67500	705	4218.75	1.042	H1-1b
4	M13	3"x.5"	0.189	0	9	0.129	2.5	y	2	66023.816	67500	705	4218.75	1.667	H1-1b
5	M15	3"x.5"	0.136	0	28	0.108	3.313	y	13	64929.826	67500	705	4218.75	1.055	H1-1b
6	M5	0.75" SR	0.135	0	64	0.007	36		13	5691.919	19890	256	256	2.269	H1-1b*
7	M23	3"x.5"	0.119	0	38	0.072	3.313	y	7	64929.826	67500	705	4218.75	1.114	H1-1b
8	M11	PIPE_2.0X	0.118	107.5	7	0.09	11.25		7	12974.268	57960	3325.8	3325.8	1.526	H1-1b
9	MP2	PIPE_2.0	0.116	66	7	0.043	66		7	14916.096	32130	1871.625	1871.625	3	H1-1b
10	M10	PIPE_2.0X	0.116	107.5	7	0.093	108.75		8	12974.268	57960	3325.8	3325.8	2.001	H1-1b
11	M7	0.75" SR	0.11	57.824	28	0.006	0		2	2206.248	19890	256	256	2.494	H1-1b
12	MP3	PIPE_2.0	0.097	30	13	0.053	30		13	14916.096	32130	1871.625	1871.625	3	H1-1b
13	M24	3"x.5"	0.09	0	35	0.073	3.313	y	7	64929.826	67500	705	4218.75	1.204	H1-1b
14	M6	0.75" SR	0.087	0	69	0.011	36		7	5691.919	19890	256	256	2.247	H1-1b*
15	M16	PIPE_2.0X	0.081	22.625	13	0.019	22.625		7	45905.544	57960	3325.8	3325.8	1.5	H1-1b
16	M17	PIPE_2.0X	0.079	22.625	13	0.021	0		7	45905.544	57960	3325.8	3325.8	1.292	H1-1b
17	M20	0.75" SR	0.076	57.824	38	0.004	57.824		2	2206.248	19890	256	256	2.15	H1-1b
18	M21	3"x.5"	0.07	0	13	0.058	2.5	y	7	66023.816	67500	705	4218.75	1.667	H1-1b
19	M25	PIPE_2.0	0.058	76.996	7	0.005	76.996		36	19612.716	32130	1871.625	1871.625	1.136	H1-1b*
20	M22	3"x.5"	0.058	0	33	0.033	2.5	y	28	66023.816	67500	705	4218.75	1.667	H1-1b
21	M2	PIPE_2.0X	0.051	45.25	70	0.022	45.25		8	45905.544	57960	3325.8	3325.8	2.286	H1-1b
22	M19	0.75" SR	0.048	0	27	0.012	36		7	5691.919	19890	256	256	2.272	H1-1b
23	M18	0.75" SR	0.047	0	38	0.014	0		7	5691.919	19890	256	256	2.25	H1-1b*
24	M4	PIPE_2.0X	0.044	45.25	3	0.009	0		8	45905.544	57960	3325.8	3325.8	2.297	H1-1b
25	MP4	PIPE_2.0	0.022	36	11	0.006	36		8	28843.414	32130	1871.625	1871.625	2.005	H1-1b

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N28	max	378.883	13	39.321	37	1045.485	7	0	74	0	74	0	74
2		min	-378.656	7	9.59	55	-1047.296	13	0	1	0	1	0	1
3	N47	max	1460.02	66	726.061	37	1400.774	27	-57.401	19	0	74	222.814	69
4		min	-180.573	23	150.738	15	-466.754	20	-252.446	31	0	1	-62.064	14
5	N48	max	581.256	18	1091.588	31	1390.342	25	-79.23	25	0	74	331.431	68
6		min	-1548.55	73	256.014	21	-2130.909	7	-374.939	28	0	1	-21.185	25
7	Totals:	max	964.062	17	1849.441	30	1589.85	2						
8		min	-964.062	11	500.933	61	-1589.85	8						

INFINIGY

Bolt Calculation Tool, V1.6.1

PROJECT DATA	
Site Name:	BOHVN00032A
Site Number:	BOHVN00032A
Connection Description:	Mount to Tower

MAXIMUM BOLT LOADS		
Bolt Tension:	1490.91	lbs
Bolt Shear:	486.58	lbs

WORST CASE BOLT LOADS[1]		
Bolt Tension:	1490.91	lbs
Bolt Shear:	427.12	lbs

WORST CASE CONNECTION SLIP LOADS[2]		
Sliding Force:	1091.24	lbs
Torsion About Leg:	0.00	lbs-ft

BOLT PROPERTIES		
Bolt Type:	Threaded Rod	-
Bolt Diameter:	0.5	in
Bolt Grade:	A307	-
# of Threaded Rods:	4	-
Leg Diameter:	3	in
Threads Excluded?	No	-

[1] *Worst case bolt loads correspond to Load combination #32 on member M39 in RISA-3D, which causes the maximum demand on the bolts.*

[2] *Worst Case slip loads correspond to Load combination #32 on member M40 in RISA 3D, which causes the maximum slip demand on the connection.*

Member Information
J nodes of M39, M40,

BOLT CHECK	
Tensile Strength	6626.80
Shear Strength	3976.08
Max Tensile Usage	22.5%
Max Shear Usage	12.2%
Combined Shear and Tension (Worst Case)	22.5%
Result	Pass

SLIP CHECK (WORST CASE)		
Torsional Slip Resistance	1062.63	
Sliding Resistance	8501.05	
Torsional Slip Usage	0.0%	
Sliding Usage	12.8%	
Interaction Check	0.02	***≤1.05***
Result	Pass	

Exhibit F

Power Density/RF Emissions Report

Fox Hill Telecom

Radio Frequency Emissions Analysis Report

Site ID: BOHVN00032A

EVE - Youngs Apple Orchard Rd
62 Youngs Apple Orchard Road
North Branford, CT 06472

October 11, 2021

Fox Hill Telecom Project Number: 210622

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**20.65 %**

Fox Hill Telecom

October 11, 2021

Dish Wireless
5701 South Santa Fe Drive
Littleton, CO 80120

Emissions Analysis for Site: **BOHVN00032A – EVE - Youngs Apple Orchard Rd**

Fox Hill Telecom, Inc ("Fox Hill") was directed to analyze the proposed radio installation for Dish Wireless, LLC (Dish) facility located at **62 Youngs Apple Orchard Road, North Branford, CT**, for the purpose of determining whether the emissions from the Proposed Dish radio and 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 (μW/cm2). 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.

Population 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 & 700 MHz 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) and 2100 MHz (AWS) 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 performed for the proposed radio system installation for **Dish** on the subject site located at **62 Youngs Apple Orchard Road, North Branford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since **Dish** 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 manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused toward 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.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
5G	600 MHz	4	61.5
5G	1900 MHz (PCS)	4	40
5G	2100 MHz (AWS)	4	40

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 600 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, 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.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	JMA MX08FRO665-21	83
B	1	JMA MX08FRO665-21	83
C	1	JMA MX08FRO665-21	83

Table 2: Antenna Data

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

RESULTS

Per the calculations completed for the proposed **Dish** configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	JMA MX08FRO665-21	600 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	11.45 / 16.15 / 16.65	12	566	17,426.72	7.50
						Sector A Composite MPE%	**7.50**
Antenna B1	JMA MX08FRO665-21	600 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	11.45 / 16.15 / 16.65	12	566	17,426.72	7.50
						Sector B Composite MPE%	**7.50**
Antenna C1	JMA MX08FRO665-21	600 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	11.45 / 16.15 / 16.65	12	566	17,426.72	7.50
						Sector C Composite MPE%	**7.50**

Table 3: Dish Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum **Dish** MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each **Dish** Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
Dish – Max Per Sector Value	**7.50 %**
T-Mobile	9.16 %
Sprint	3.99 %
Site Total MPE %:	**20.65 %**

Table 4: All Carrier MPE Contributions

Dish Sector A Total:	7.50 %
Dish Sector B Total:	7.50 %
Dish Sector C Total:	7.50 %
Site Total:	20.65 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated **Dish** sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

Dish _ Frequency Band / Technology Max Power Values (Per Sector)	**# Channels**	**Watts ERP (Per Channel)**	**Height (feet)**	**Total Power Density ($\mu W/cm^2$)**	**Frequency (MHz)**	**Allowable MPE ($\mu W/cm^2$)**	**Calculated % MPE**
Dish 600 MHz 5G	4	858.77	83	11.42	600 MHz	400	2.85%
Dish 1900 MHz (PCS) 5G	4	1,648.39	83	21.92	1900 MHz (PCS)	1000	2.19%
Dish 2100 MHz (AWS) 5G	4	1,849.52	83	24.59	2100 MHz (AWS)	1000	2.46%
						Total:	**7.50%**

Table 6: Dish Maximum Sector MPE Power Values

Fox Hill Telecom

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 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 Sector	Power Density Value (%)
Sector A:	7.50 %
Sector B:	7.50 %
Sector C:	7.50 %
Dish Maximum Total (per sector):	7.50 %
Site Total:	20.65 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **20.65 %** 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.

Scott Heffernan
Principal RF Engineer
Fox Hill Telecom, Inc
Holden, MA 01520
(978)660-3998

Exhibit G

Letter of Authorization

LETTER OF AUTHORIZATION

I, Michael Ashley Culbert, the owner representative for the telecommunications tower located at 62 Youngs Apple Orchard Road, North Branford, New Haven County, Connecticut, as evidenced by unrecorded Lease by and between The Town of Wallingford and EIP Communications I, LLC dated June 27, 2019.

As owner of the above-referenced telecommunications tower, I hereby authorize DISH Wireless L.L.C., through its designated agent, Northeast Site Solutions, to apply for all necessary municipal, state, federal and other permits necessary to accommodate the installation of DISH Wireless L.L.C.'s antennas and ancillary equipment on the subject tower and base station equipment on the ground on our leasehold property.

EIP Communications I, LLC

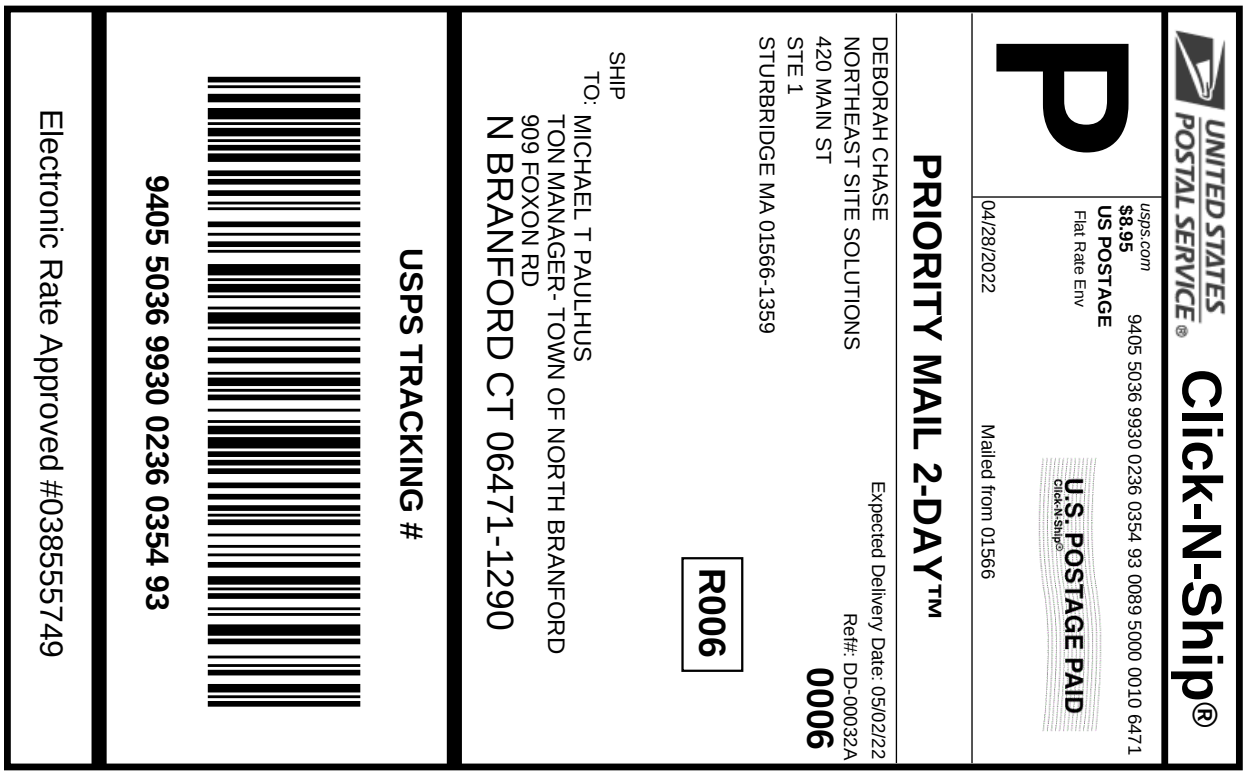
By: Michael Ashley Culbert

Michael Ashley Culbert
Vice President of Leasing & Collocation

Date: April 26, 2022

Exhibit H

Recipient Mailings



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Ship Date:	04/28/2022
Expected Delivery Date:	05/02/2022

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

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

Ref#: DD-00032A

To: MICHAEL T PAULHUS
TON MANAGER- TOWN OF NORTH BRANFORD
909 FOXON RD
N BRANFORD CT 06471-1290

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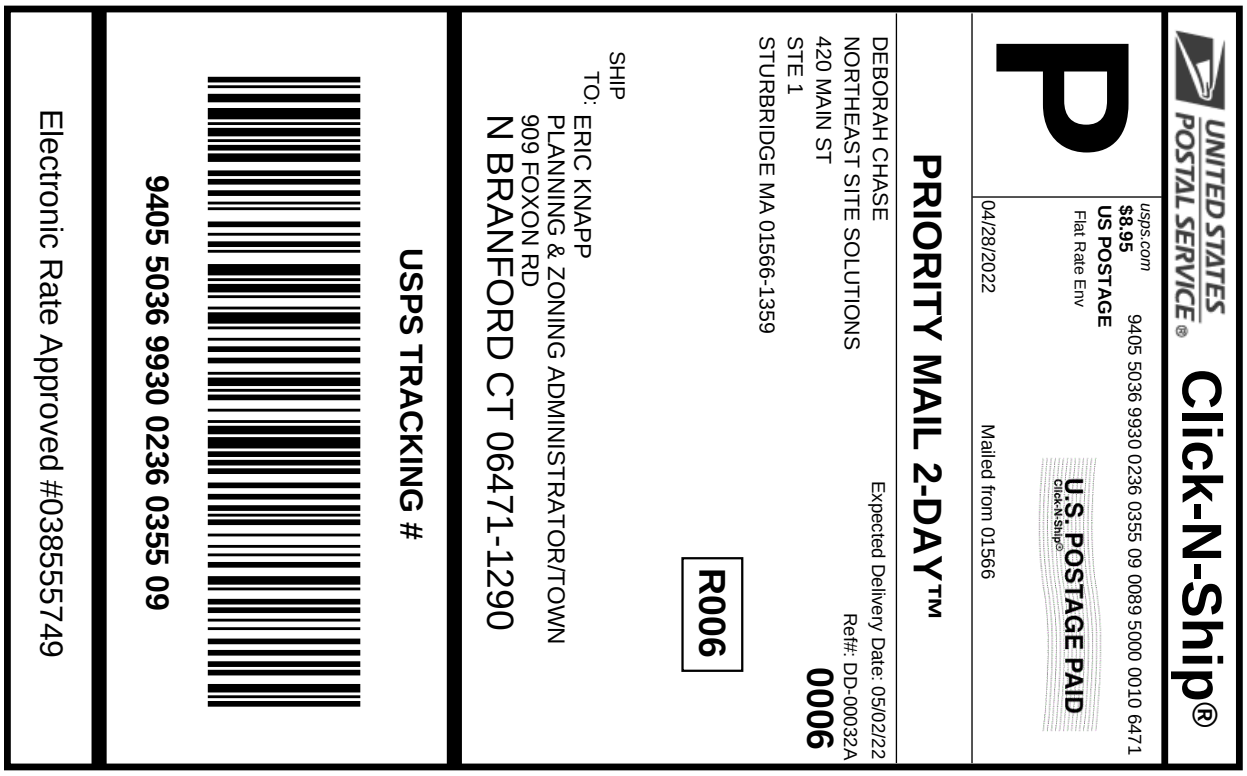

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Trans. #:	562406546
Print Date:	04/28/2022
Ship Date:	04/28/2022
Expected Delivery Date:	05/02/2022

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

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

Ref#: DD-00032A

To: ERIC KNAPP
PLANNING & ZONING ADMINISTRATOR/TOWN PLANNER
909 FOXON RD
N BRANFORD CT 06471-1290

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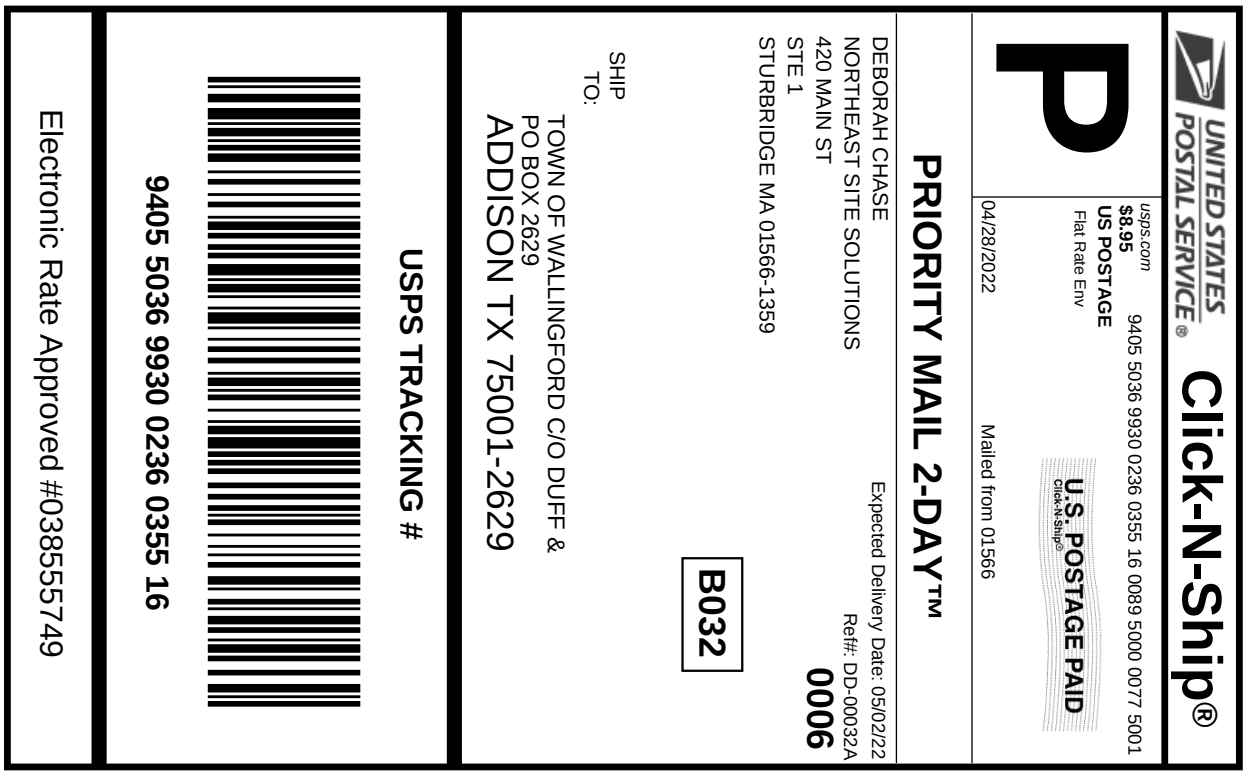

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USPS TRACKING # :
9405 5036 9930 0236 0355 16

Trans. #:	562406546
Print Date:	04/28/2022
Ship Date:	04/28/2022
Expected Delivery Date:	05/02/2022

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

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

Ref#: DD-00032A

To: TOWN OF WALLINGFORD C/O DUFF &
PHELPS/TELECOM DIV
PO BOX 2629
ADDISON TX 75001-2629

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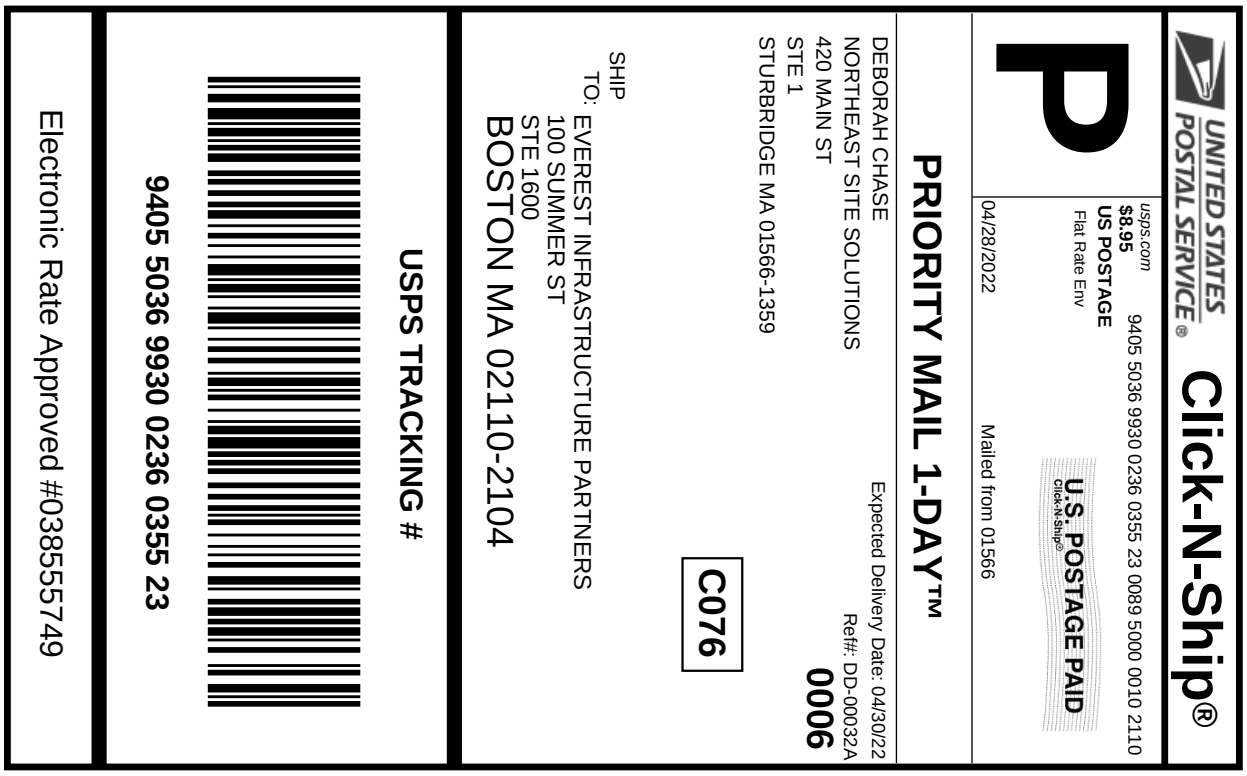

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9405 5036 9930 0236 0355 23

Trans. #:	562406546
Print Date:	04/28/2022
Ship Date:	04/28/2022
Expected Delivery Date:	04/30/2022

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

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359
Ref#: DD-00032A

To: EVEREST INFRASTRUCTURE PARTNERS
100 SUMMER ST
STE 1600
BOSTON MA 02110-2104

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Product	Qty	Unit Price	Price
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Prepaid Mail North Branford, CT 06471 Weight: 0 lb 8.10 oz Acceptance Date: Fri 04/29/2022 Tracking #: 9405 5036 9930 0236 0355 09	1		$0.00
Prepaid Mail Addison, TX 75001 Weight: 0 lb 8.10 oz Acceptance Date: Fri 04/29/2022 Tracking #: 9405 5036 9930 0236 0355 16	1		$0.00
Prepaid Mail Boston, MA 02110 Weight: 0 lb 8.10 oz Acceptance Date: Fri 04/29/2022 Tracking #: 9405 5036 9930 0236 0355 23	1		$0.00
Grand Total:			$0.00

****
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