PROJECT NARRATIVE

December 13, 2021

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

Re: Request of DISH Wireless LLC for an Order to Approve the Shared Use of an Existing Tower
373 Chamberlain Hill Rd Higganum (Haddam), CT 06441
Latitude: 41'29'46.00" / Longitude: -72' 37' 5.300"

Dear Ms. Bachman:

Pursuant to Connecticut General Statutes ("C.G.S.") §16-50aa, as amended, DISH Wireless LLC ("DISH") hereby requests an order from the Connecticut Siting Council ("Council") to approve the shared use by DISH of an existing telecommunication tower at 373 Chamberlain Hill Rd in Higganum (the "Property"). The existing 365-foot self-support tower is owned by American Tower Corporation ("ATC"). The underlying property is owned by American Towers Inc. DISH requests that the Council find that the proposed shared use of the ATC tower satisfies the criteria of C.G.S. §16-50aa and issue an order approving the proposed shared use. A copy of this filing is being sent to Robert McGarry, First Selectman of Town of Higganum, Gary Vivian, Town of Haddam Building Official and American Towers Inc. as the property owner.

Background

This facility was built prior to permitting code and records kept by The Town of Haddam. Correspondence from the Town of Haddam is attached. The existing ATC facility consists of a 365-foot self-support tower located within an existing leased area. Eversource Energy currently maintains antennas at the 375, 372, 365, 300, 179 and 175 foot-levels. Marcus Communications LLC currently maintains antennas at the 373, 339 and 329-foot levels. US Department of Homeland Security currently maintains antennas at the 372, 294, 289, 260 and 247-foot levels. Sigfox S.A. currently maintains antennas at the 315-foot level. Qualcomm currently maintains antennas at the 282-foot level. Equipment associated with these antennas are located at various positions within the tower and compound.

DISH is licensed by the Federal Communications Commission ("FCC") to provide wireless services throughout the State of Connecticut. DISH and ATC have agreed to the proposed shared use of the 373 Chamberlain Hill Rd tower pursuant to mutually acceptable terms and conditions. Likewise, DISH and ATC have agreed to the proposed installation of equipment cabinets on the ground on the south side of the tower within the existing compound. ATC has authorized DISH to apply for all necessary permits and approvals that may be required to share the existing tower.
(See attached Letter of Authorization)

DISH proposes to install three (3) antennas, (1) Tower platform mount, (6) Remote radio units at the 200-foot level along with, (1) over voltage protection device (OVP) and (1) Hybrid cable. DISH will install an equipment cabinet on a 5'x7' equipment platform. DISH's Construction Drawings provide project specifications for all proposed site improvement locations. The construction drawings also include specifications for DISH's proposed antenna and groundwork.

C.G.S. § 16-50aa(c)(1) provides that, upon written request for approval of a proposed shared use, "if the Council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns, the council shall issue an order approving such a shared use." DISH respectfully submits that the shared use of the tower satisfies these criteria.

A. Technical Feasibility. The existing ATC tower is structurally capable of supporting DISH's proposed improvements. The proposed shared use of this tower is, therefore, technically feasible. A Feasibility Structural Analysis Report ("Structural Report") prepared for this project confirms that this tower can support DISH's proposed loading. A copy of the Structural Report has been included in this application.

B. Legal Feasibility. Under C.G.S. § 16-50aa, the Council has been authorized to issue order approving the shared use of an existing tower such as the ATC tower. This authority complements the Council's prior-existing authority under C.G.S. § 16-50p to issue orders approving the construction of new towers that are subject to the Council's jurisdiction. In addition, § 16-50x(a) directs the Council to "give such consideration to the other state laws and municipal regulations as it shall deem appropriate" in ruling on requests for the shared use of existing tower facilities. Under the statutory authority vested in the Council, an order by the Council approving the requested shared use would permit the Applicant to obtain a building permit for the proposed installations.

C. Environmental Feasibility. The proposed shared use of the ATC tower would have a minimal environmental effect for the following reasons:

1. The proposed installation will have no visual impact on the area of the tower. DISH's equipment cabinet would be installed within the existing facility compound. DISH's shared use of this tower therefore will not cause any significant change or alteration in the physical or environmental characteristics of the existing site.

2. Operation of DISH's antennas at this site would not exceed the RF emissions standard adopted by the Federal Communications Commission ("FCC"). Included in the EME report of this filing are the approximation tables that demonstrate that DISH's proposed facility will operate well within the FCC RF emissions safety standards.

3. Under ordinary operating conditions, the proposed installation would not require the use of any water or sanitary facilities and would not generate air emissions or discharges to water bodies or sanitary facilities. After construction is complete the proposed installations would not generate any increased traffic to the ATC facility other than periodic maintenance. The proposed shared use of the ATC tower, would, therefore, have a minimal environmental effect, and is environmentally feasible.

D. **Economic Feasibility**. As previously mentioned, DISH has entered into an agreement with ATC for the shared use of the existing facility subject to mutually agreeable terms. The proposed tower sharing is, therefore, economically feasible.

E. **Public Safety Concerns**. As discussed above, the tower is structurally capable of supporting DISH's full array of three (3) antennas, (1) Tower platform mount, (6) Remote radio units, (1) over voltage protection device (OVP) and (1) Hybrid cable and all related equipment. DISH is not aware of any public safety concerns relative to the proposed sharing of the existing ATC tower

Conclusion

For the reasons discussed above, the proposed shared use of the existing ATC tower at 373 Chamberlain Hill Rd satisfies the criteria stated in C.G.S. §16-50aa and advances the Council's goal of preventing the unnecessary proliferation of towers in Connecticut. The Applicant, therefore, respectfully requests that the Council issue an order approving the prosed shared use.

Sincerely,

David Hoogasian

David Hoogasian
Project Manager

LETTER OF AUTHORIZATION

AMERICAN TOWER®
CORPORATION

LETTER OF AUTHORIZATION

ATC SITE#/NAME/PROJECT: 88010 / DURHAM CT / 13689461
SITE ADDRESS: 373 CHAMBERLAIN HILL RD HIGGANUM, CT 06441-4062
LICENSEE: DISH WIRELESS L.L.C.

I, Margaret Robinson, Senior Counsel for American Tower*, owner of the tower facility located at the address identified above (the "Tower Facility"), do hereby authorize DISH WIRELESS L.L.C. its successors and assigns, and/or its agent, (collectively, the "Licensee") to act as American Tower's non-exclusive agent for the sole purpose of filing and consummating any land-use or building permit application(s) as may be required by the applicable permitting authorities for Licensee's telecommunications' installation.

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

Signature:

Print Name: Margaret Robinson
Senior Counsel
American Tower*

NOTARY BLOCK

Commonwealth of MASSACHUSETTS
County of Middlesex

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

WITNESS my hand and official seal, this 11th day of August 2021.

NOTARY SEAL

Catrine Galhana Vaz
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
February 24, 2028

Notary Public
My Commission Expires: February 24, 2028

*American Tower includes all affiliates and subsidiaries of American Tower Corporation.

ORIGINAL FACILITY APPROVAL

Robidoux, Evan

From: Robert Karam <Robert.Karam@americantower.com>
Sent: Thursday, November 21, 2019 2:41 PM
To: Jason Hastie
Subject: W: [88010] FW: Council Incomplete Letter for TS-SIGFOX-061-191106 (373 Chamberlain Hill Road, Haddam)
Attachments: 20191121145555849.pdf

Hi Jason,

This email and attachment should satisfy the CSC. The tower was likely built before permitting was in effect, see email below from Haddam Building Dept.

Regards,
Bob

Robert Karam
Attorney
American Tower Corporation
10 Presidential Way
Woburn, MA 01801
Phone: (781) 926-7161
Robert.Karam@AmericanTower.com
1CW208

-----Original Message-----
From: Diane Murphy <building@haddam.org>
Sent: Thursday, November 21, 2019 2:38 PM
To: Robert Karam <Robert.Karam@americantower.com>
Subject: [EXTERNAL] 373 Chamberlain Hill Road Tower

Here is a copy of the assessors card for the tower. I do not have old records of permits on the tower of when it was built. It probably was built before the building code was in effect.
If there is anything else you need please contact our office.
Thank you

Diane H Murphy
Town of Haddam
30 Field Park Drive
Haddam, CT. 06438
860-345-8531 ext. 231
Email: building@haddam.org

Your message is ready to be sent with the following file or link attachments:

20191121145555849

Note: To protect against computer viruses, e-mail programs may prevent sending or receiving certain types of file attachments. Check your e-mail security settings to determine how attachments are handled.

ENGINEERING DRAWINGS

DISH WIRELESS, L.L.C. SITE ID:

BOBDL00029A

DISH WIRELESS, L.L.C. SITE ADDRESS:

373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

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)

SITE PHOTO

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

CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

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.

THE PROJECT DEPICTED IN THESE PLANS QUALIFIES AS AN ELIGIBLE FACILITIES REQUEST ENTITLED TO EXPEDITED REVIEW UNDER 47 U.S.C. § 1455(A) AS A MODIFICATION OF AN EXISTING WIRELESS TOWER THAT INVOLVES THE COLLOCATION, REMOVAL, AND/OR REPLACEMENT OF TRANSMISSION EQUIPMENT THAT IS NOT A SUBSTANTIAL CHANGE UNDER CFR § 1.61000 (B)(7).

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:	N/A
ADDRESS:	373 CHAMBERLAIN HILL RD HIGGANUM, CT 06441
TOWER TYPE:	SELF SUPPORT TOWER
TOWER CO SITE ID:	88010
TOWER APP NUMBER:	13689461
COUNTY:	MIDDLESEX
LATITUDE (NAD 83):	41° 29' 46.000" N 41.496111
LONGITUDE (NAD 83):	72° 37' 5.300" W -72.618139
ZONING JURISDICTION:	CONNETICUT SITING COUNCIL
ZONING DISTRICT:	R-2
PARCEL NUMBER:	02 019
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	V-B
POWER COMPANY:	EVERSOURCE CT ELECTRIC
TELEPHONE COMPANY:	FRONTIER COMMUNICATIONS

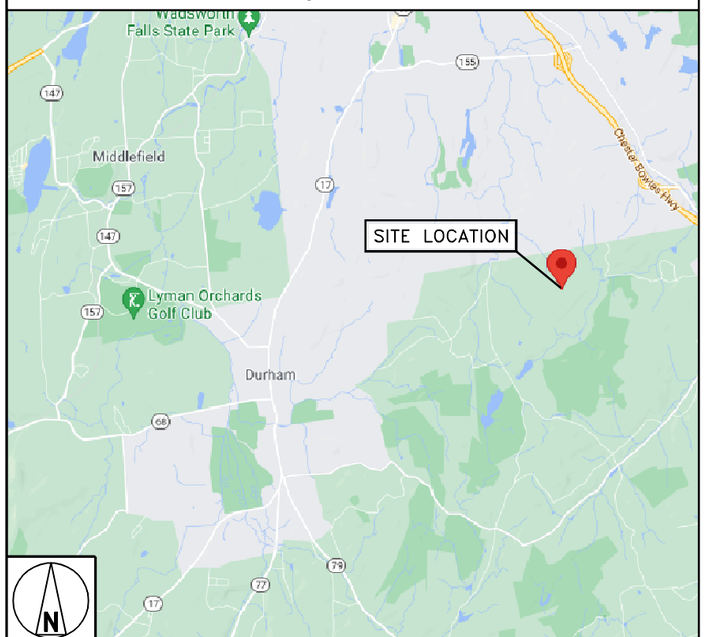
PROJECT DIRECTORY

APPLICANT:	DISH WIRELESS, L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	AMERICAN TOWER 10 PRESIDENTIAL WAY WOBURN, MA 01801
ENGINEER:	NB+C ENGINEERING SERVICES, LLC 8601 SIX FORKS ROAD, SUITE 540 RALEIGH, NC 27615
SITE ACQUISITION:	DAVID GOODFELLOW DAVID.GOODFELLOW@DISH.COM
CONSTRUCTION MANAGER:	JAVIER SOTO JAVIER.SOTO@DISH.COM
RF ENGINEER:	BOSSENER CHARLES BOSSENER.CHARLES@DISH.COM

DIRECTIONS

FROM HARTFORD, CT TAKE I-91 SOUTH TO RT 9 SOUTH. TAKE EXIT 11 AND TURN RIGHT ONTO RT 155/RANDOLPH RD. FOLLOW TO INTERSECTION AND TURN RIGHT ONTO BARTHOLOMEW ROAD. FOLLOW BARTHOLOMEW ROAD TO CHAMBERLAIN HILL ROAD AND TURN RIGHT. FOLLOW FOR ABOUT 1/2 MILE AND THE ACCESS ROAD WILL BE ON THE LEFT.

VICINITY MAP



NO SCALE

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NB+C™
TOTALLY COMMITTED.
NB+C ENGINEERING SERVICES, LLC
8601 SIX FORKS ROAD, SUITE 540
RALEIGH, NC 27615
(919) 657-9131

DRAWN BY:	CHECKED BY:	APPROVED BY:
RDS	BIW	BIW

RFDS REV #: 1

PRELIMINARY DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/05/2021	ISSUED FOR CONSTRUCTION
1	11/01/2021	ISSUED FOR CONSTRUCTION

STATE OF CONNECTICUT
BENJAMIN KOTKIN
PEN.0028997
LICENSED
PROFESSIONAL ENGINEER

11/01/2021

A&E PROJECT NUMBER

88010-13689461

DISH WIRELESS, L.L.C.
PROJECT INFORMATION

BOBDL00029A
373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

SHEET TITLE

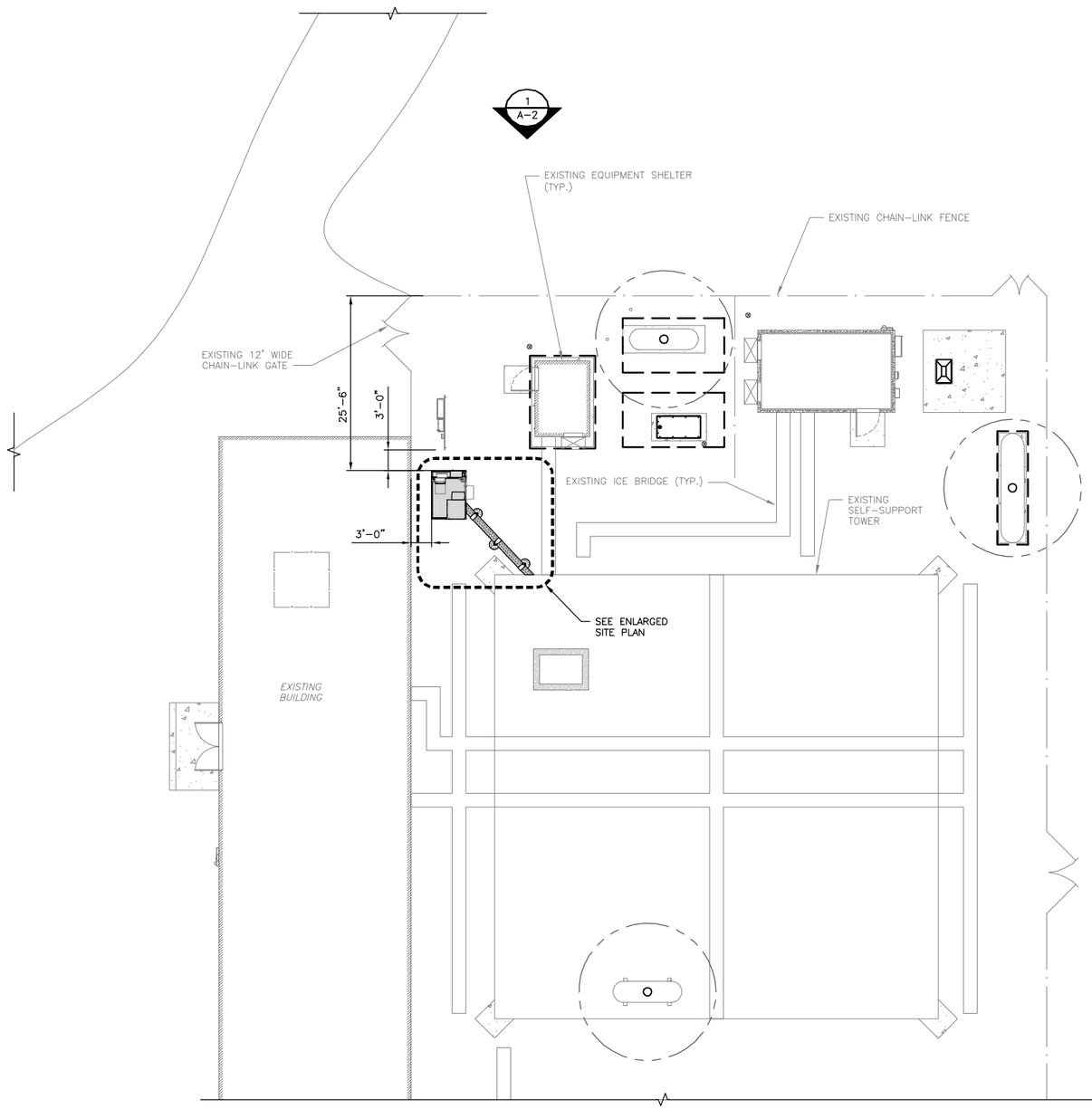
TITLE SHEET

SHEET NUMBER

T-1

NOTES

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



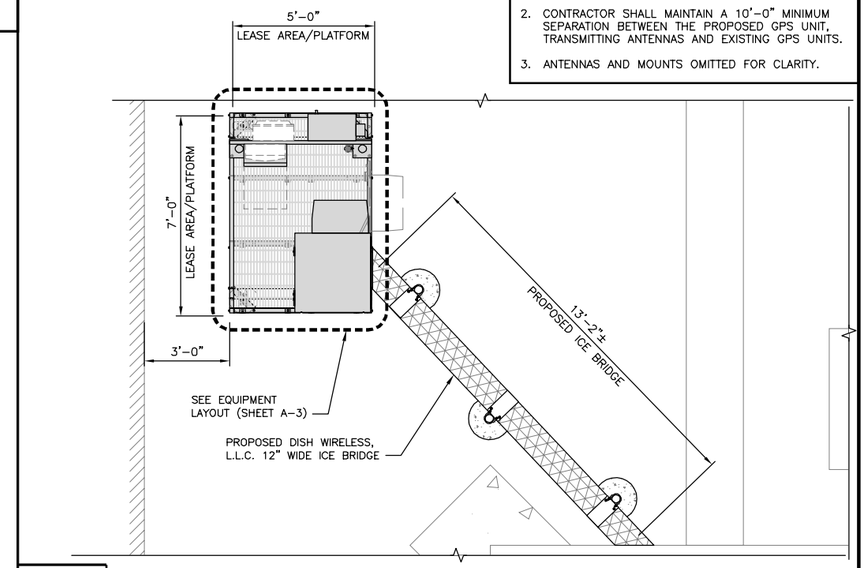
OVERALL SITE PLAN

10' 0 10' 20'
1"=10'

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.



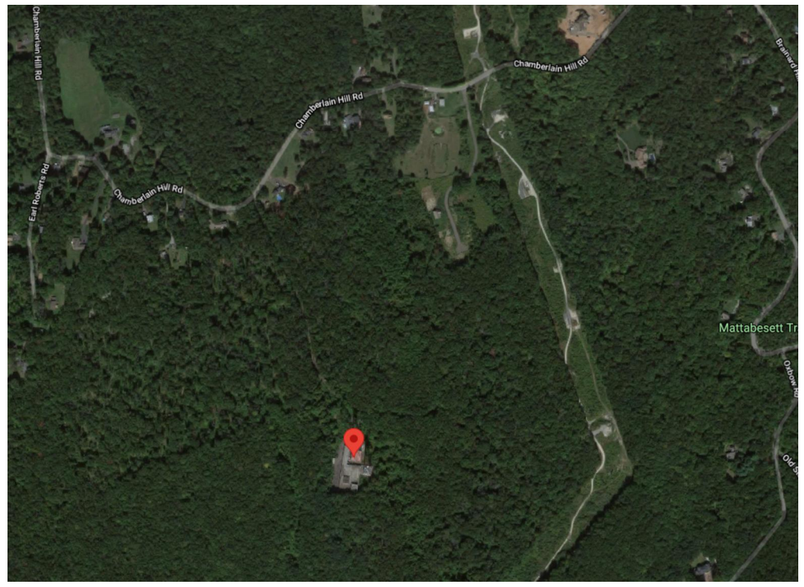
ENLARGED SITE PLAN

12" 6" 0 1' 2' 3' 4' 5' 6' 7'
3/8"=1'-0"

2

NOTES

1. AN EXISTING SURVEY WAS NOT AVAILABLE AT THE TIME OF DRAWING CREATION.



AERIAL VIEW

NO SCALE

3

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

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NB+C ENGINEERING SERVICES, LLC
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RALEIGH, NC 27615
(919) 657-9131

DRAWN BY:	CHECKED BY:	APPROVED BY:
RDS	BIW	BIW

RFDS REV #: 1

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STATE OF CONNECTICUT
BRIAN KOTANCHIK
PEN.0023997
LICENSED PROFESSIONAL ENGINEER
11/01/2021

A&E PROJECT NUMBER
88010-13689461

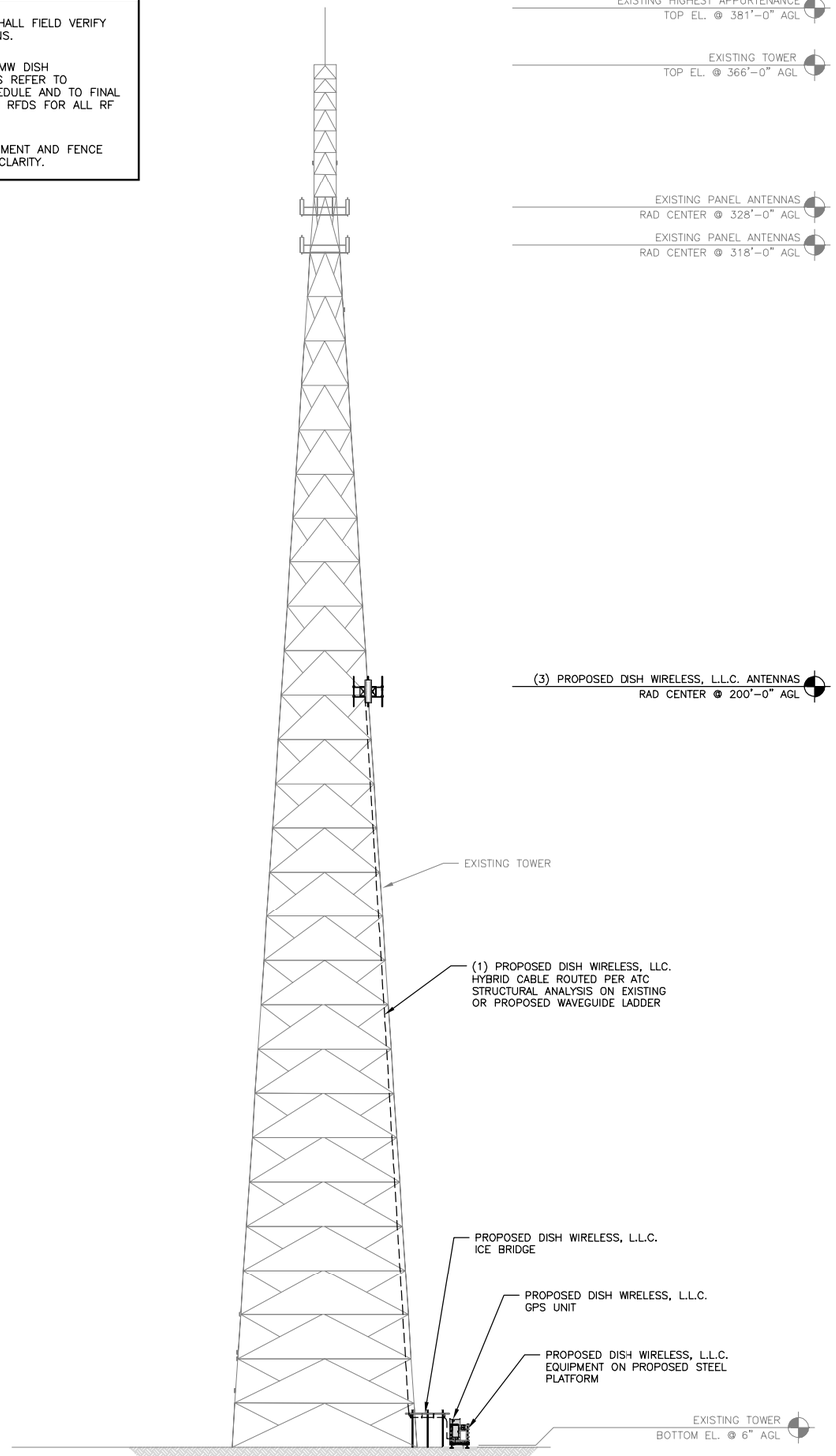
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00029A
373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

SHEET TITLE
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER
A-1

NOTES

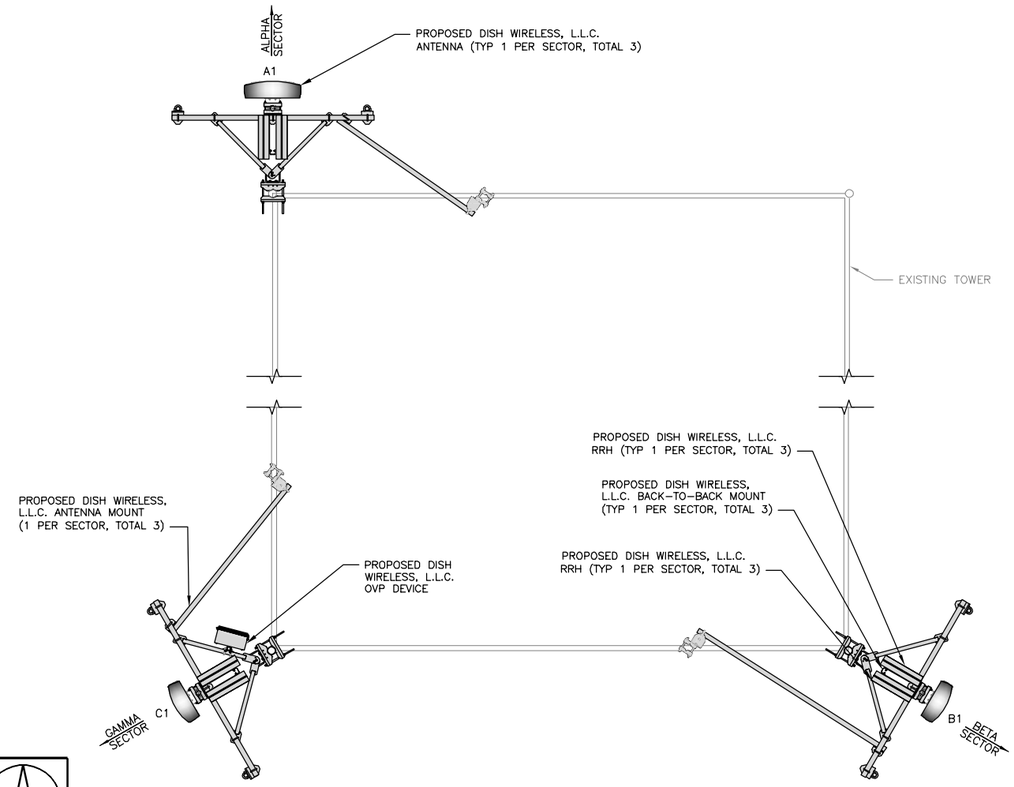
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



PROPOSED NORTH ELEVATION

20' 10' 0 20' 40'
1"=20'

1



ANTENNA LAYOUT

3' 0 3' 6'
1"=3'

2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA – MX08FRO665-21	5G	72.0" X 20.0"	0°	200'-0"	(1) HIGH-CAPACITY HYBRID CABLE (240' LONG)
BETA	B1	PROPOSED	JMA – MX08FRO665-21	5G	72.0" X 20.0"	120°	200'-0"	
GAMMA	C1	PROPOSED	JMA – MX08FRO665-21	5G	72.0" X 20.0"	240°	200'-0"	

SECTOR	POSITION	RRH	
		MANUFACTURER – MODEL NUMBER	TECHNOLOGY
ALPHA	A1	FUJITSU – TA08025-B604	N29, N71
	A1	FUJITSU – TA08025-B605	N66, N70
BETA	B1	FUJITSU – TA08025-B604	N29, N71
	B1	FUJITSU – TA08025-B605	N66, N70
GAMMA	C1	FUJITSU – TA08025-B604	N29, N71
	C1	FUJITSU – TA08025-B605	N66, N70

SECTOR	POSITION	OVP	
		MANUFACTURER – MODEL NUMBER	TECHNOLOGY
GAMMA	–	RAYCAP – RDIDC-9181-PF-48	–

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.

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LITTLETON, CO 80120

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NB+C ENGINEERING SERVICES, LLC
8601 SIX FORKS ROAD, SUITE 540
RALEIGH, NC 27615
(919) 657-9131

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RDS	BIW	BIW

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STATE OF CONNECTICUT
BRIAN KOTANCHIK
PEN.0028997
LICENSED PROFESSIONAL ENGINEER

11/01/2021

A&E PROJECT NUMBER
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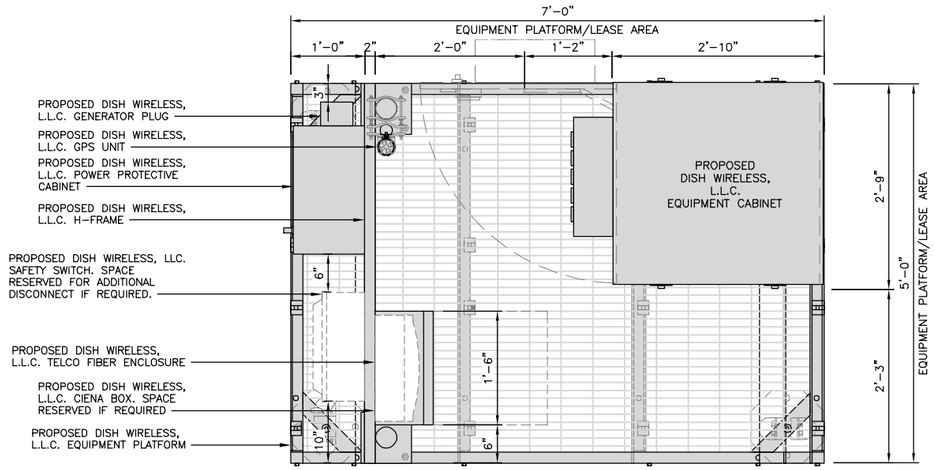
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00029A
373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2



PLATFORM EQUIPMENT PLAN

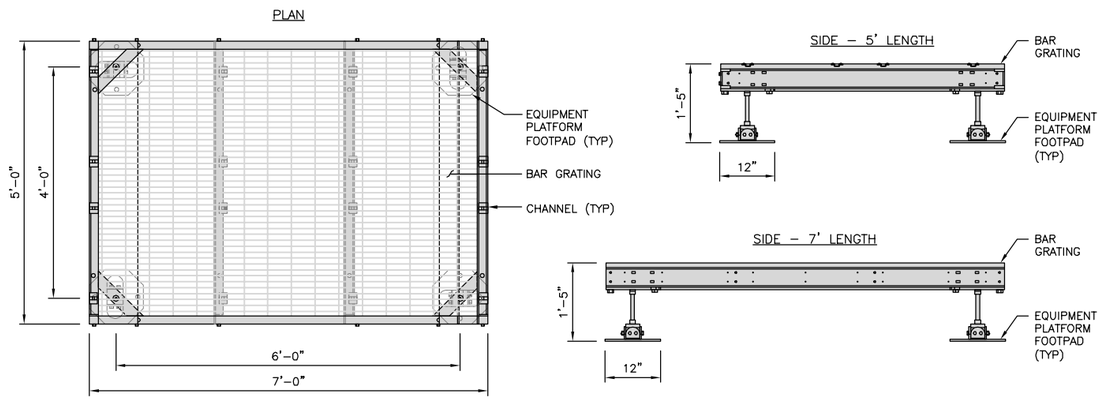
12" 9" 6" 3" 0 1' 2"
1"=1'-0"

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 TO BE WITHIN 1° OF LEVEL

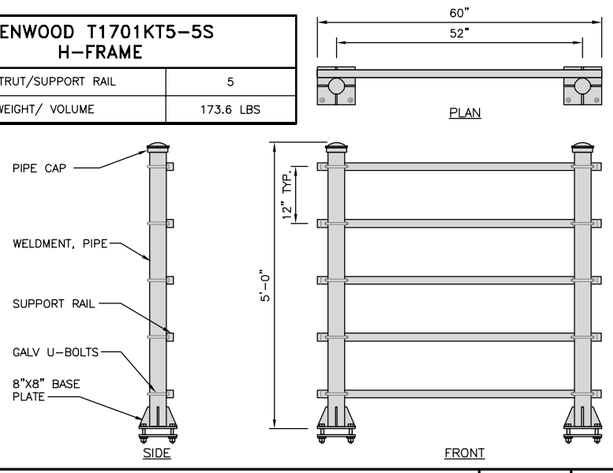


PLATFORM DETAIL

NO SCALE

2

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



H-FRAME DETAIL

NO SCALE

3

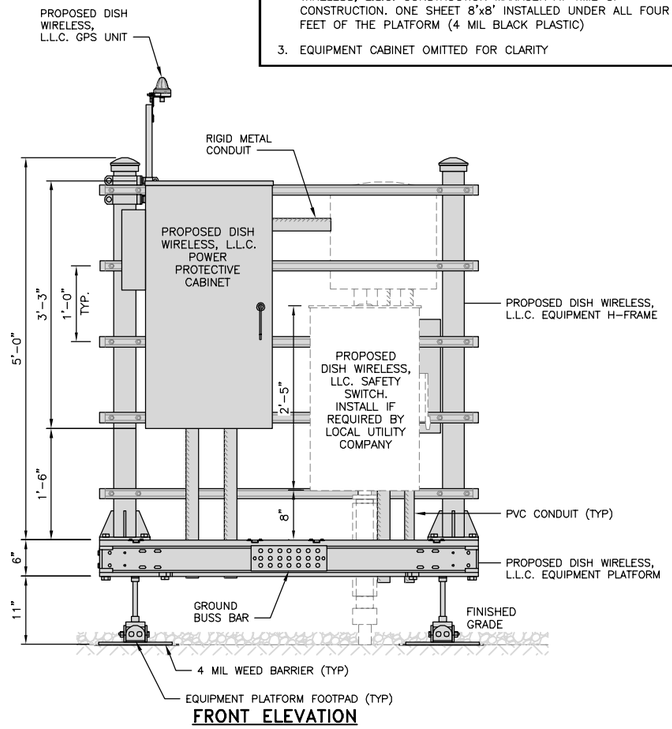
NOT USED

NO SCALE

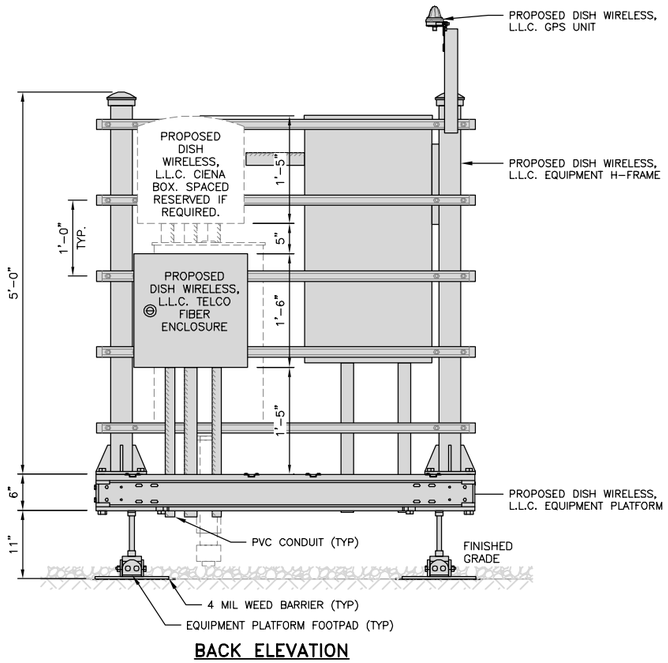
4

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

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

NB+C TOTALLY COMMITTED.
NB+C ENGINEERING SERVICES, LLC
8601 SIX FORKS ROAD, SUITE 540
RALEIGH, NC 27615
(919) 657-9131

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RDS	BIW	BIW

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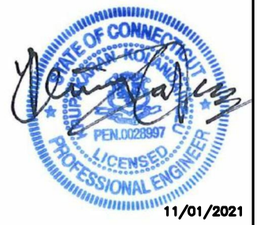


11/01/2021

A&E PROJECT NUMBER
88010-13689461

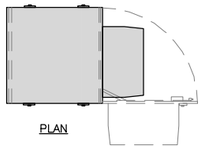
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00029A
373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

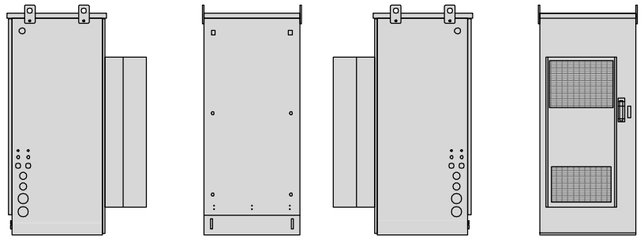
SHEET NUMBER
A-3

CHARLES INDUSTRY HEX CUBE–PM639155N4

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



PLAN

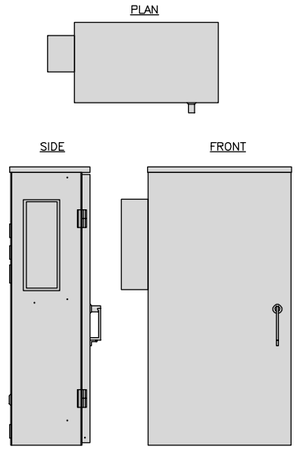


SIDE BACK SIDE FRONT

CABINET DETAIL | NO SCALE | 1

RAYCAP RDIAC–6512–P–240–MTS POWER & TELCO PROTECTION CABINET

DIMENSIONS (HxWxD)	40"x20"x10"
WEIGHT/ VOLUME	124 LBS
MANUAL TRANSFER SWITCH	200A
LOAD CENTER	30 POSITION
MAIN BREAKER	200A, 65kA AIC
GENERATOR RECEPTACLE	CAMLOCK
NEMA RATING	3R POWDER COATED ALUMINUM
SURGE PROTECTION DEVICE	UL 1449 4TH EDITION LISTED

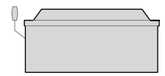


PLAN SIDE FRONT

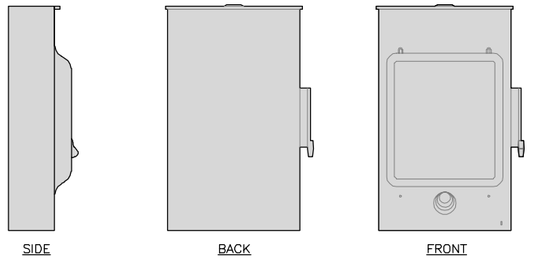
POWER PROTECTION CABINET (PPC) DETAIL | NO SCALE | 2

SQUARE D SAFETY SWITCH D324NRB

ENCLOSURE DIM (HxWxD)	29.25"x17.25"x8.25"
TOTAL WEIGHT (EMPTY)	45.33 LBS
MAX VOLTAGE/AMPS/WATT	240V/200A/48000W
ENCLOSURE RATING	OUTDOOR NEMA 3R



PLAN



SIDE BACK FRONT

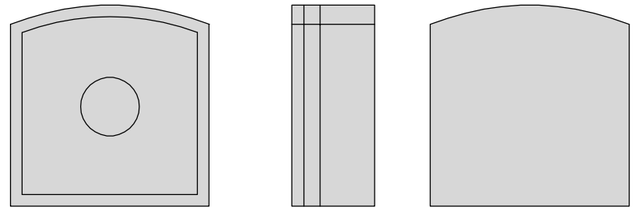
SAFETY SWITCH | NO SCALE | 3

NOT USED | NO SCALE | 4

CIENA 3931 SERVICE DELIVERY SWITCH

DIMENSIONS (HxWxD)	17.0"x16.8"x7.0" 431x427x178mm
WEIGHT	28.6 LBS/13.0 KG
POWER INPUT	60W MAX

PLAN



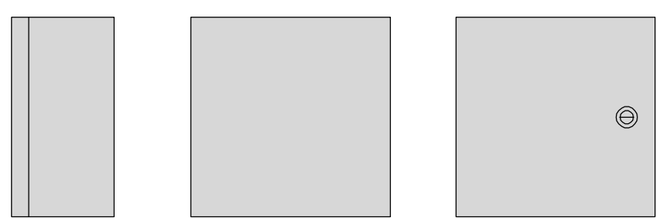
FRONT SIDE BACK

CIENA DETAIL | NO SCALE | 5

CHARLES FIBER TELCO ENCLOSURE CUBE–MP1818WB–A

ENCLOSURE DIM (HxWxD)	18.0"x18.0"x9.25"
NEMA RATING	4X
THERMAL	SEALED
MOUNTING BACKBOARD	WOOD

PLAN



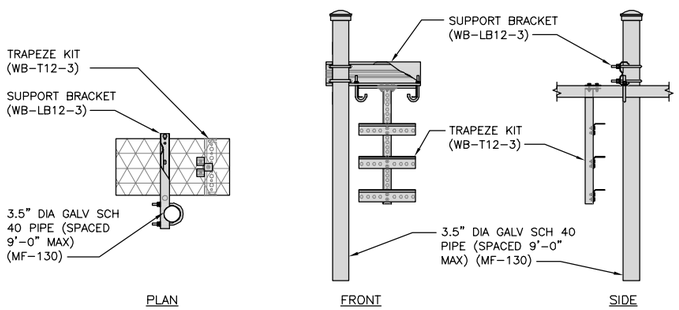
SIDE BACK FRONT

FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

COMMSCOPE WB–K110–B WAVEGUIDE BRIDGE KIT

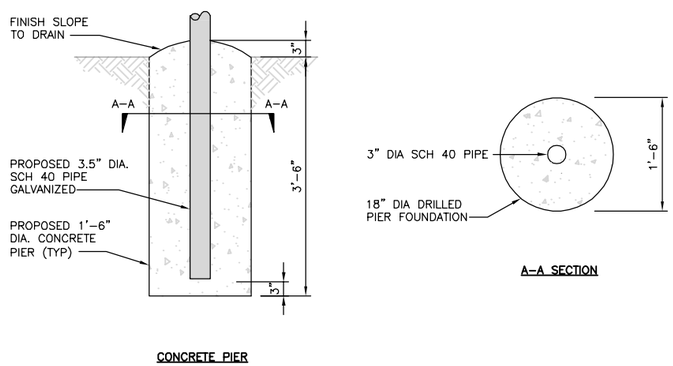
DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

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



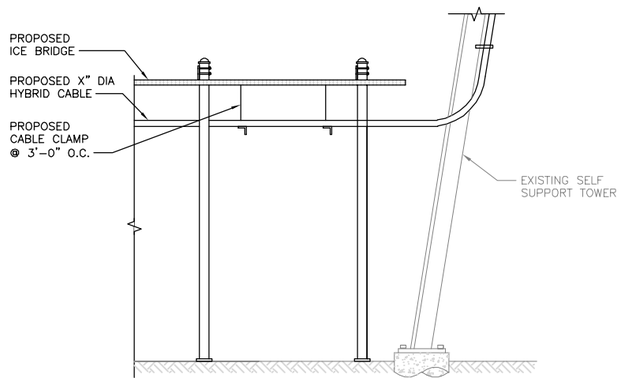
PLAN FRONT SIDE

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

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NB+C TOTALLY COMMITTED.
NB+C ENGINEERING SERVICES, LLC
8601 SIX FORKS ROAD, SUITE 540
RALEIGH, NC 27615
(919) 657-9131

DRAWN BY:	CHECKED BY:	APPROVED BY:
RDS	BIW	BIW

RFDS REV #: 1

PRELIMINARY DOCUMENTS

SUBMITTALS

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STATE OF CONNECTICUT · BRIAN I. ROTHENBERG · PEN.0028997 · LICENSED PROFESSIONAL ENGINEER

11/01/2021

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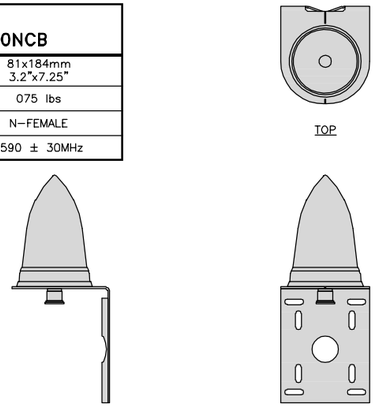
88010–13689461

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00029A
373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

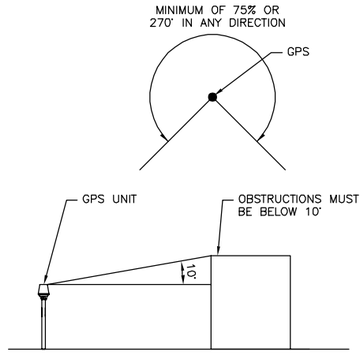
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

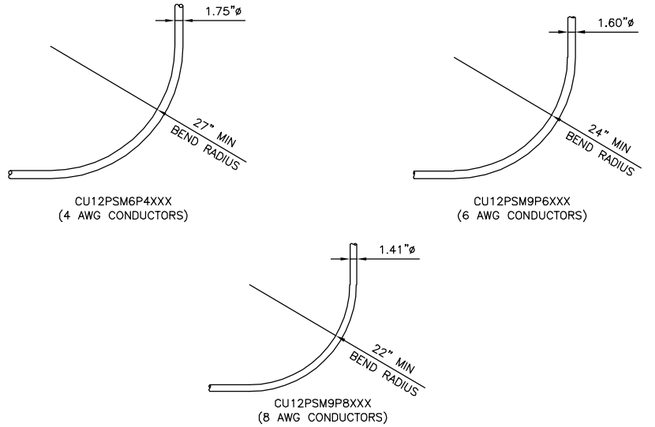
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



GPS 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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5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NB+C
TOTALLY COMMITTED.
NB+C ENGINEERING SERVICES, LLC
8601 SIX FORKS ROAD, SUITE 540
RALEIGH, NC 27615
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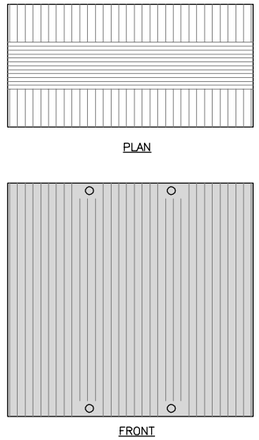
373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

FUJITSU TA08025-B604 RRH

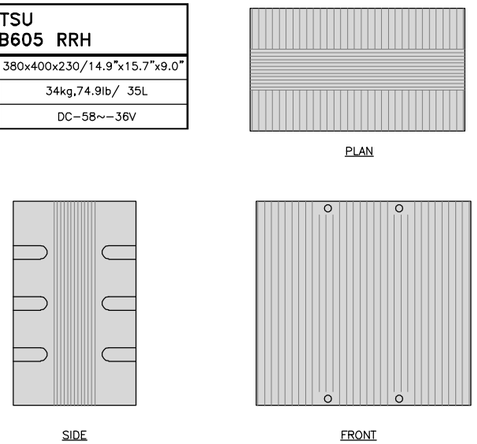
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-58~-36V



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

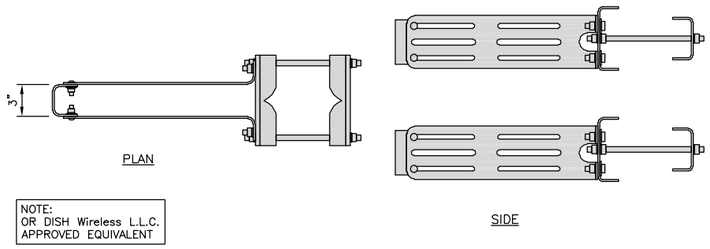


REMOTE RADIO HEAD DETAIL | NO SCALE | 2

COMMSCOPE RR-FA2 SMALL STABILIZER

DIMENSIONS (HxWxD)	16.4"x8.5"x18"
WEIGHT	39.2 lbs

DESIGN NOTES:
MOUNT WILL FIT LEGS UP TO:
- 5.6" ROUND
- 6.0" 60° ANGLE
- 4.5" 90° ANGLE

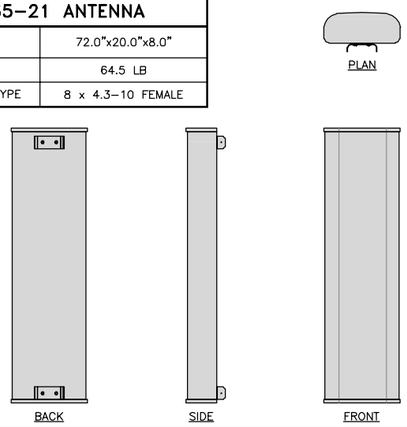


NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

RRH MOUNT DETAIL | NO SCALE | 3

JMA WIRELESS MX08FR0665-21 ANTENNA

DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	64.5 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE



ANTENNA DETAIL | NO SCALE | 4

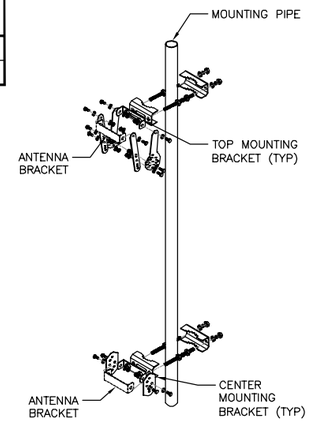
NOT USED | NO SCALE | 5

JMA ANTENNA MOUNTING BRACKET #91900318

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

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

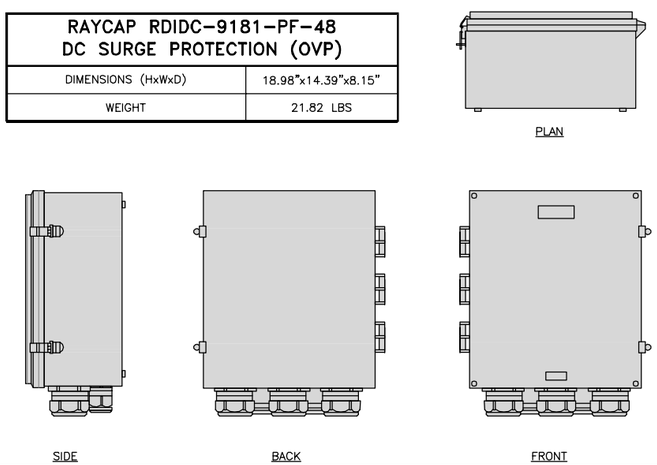
ANTENNA BRACKET NOT PART OF KIT



ANTENNA BRACKET DETAIL | NO SCALE | 6

RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION (OVP)

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

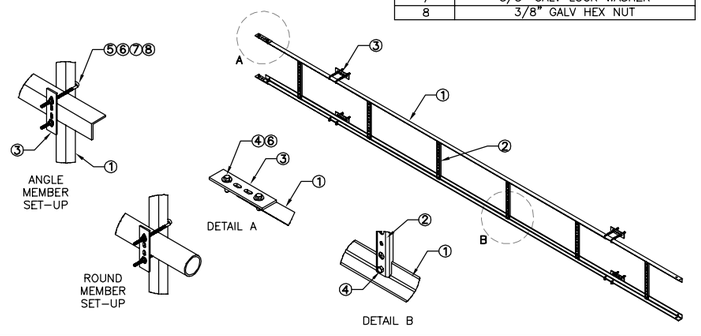


SURGE SUPPRESSION DETAIL (OVP) | NO SCALE | 7

COMMSCOPE 20' CABLE LADDER 6 HOLE RUNGS

DIMENSIONS (WxL)	20.5"x240"
WEIGHT	84.94 lbs

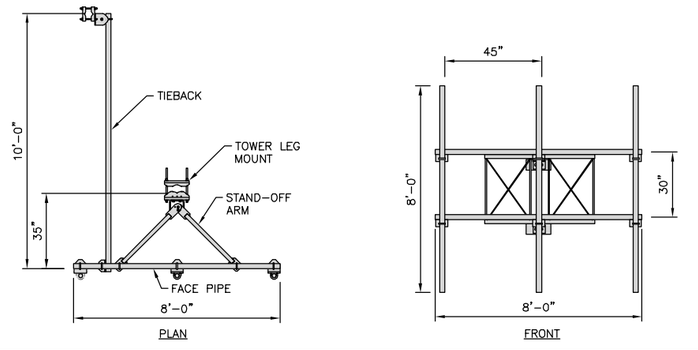
ITEM#	DESCRIPTION
1	20' ANGLE SIDE RAIL
2	20" LADDER RUNG
3	BACKING PLATE
4	3/8"x1-1/2" GALV BOLT KIT
5	8" GALV J-BOLT KIT
6	3/8" GALV FLAT WASHER
7	3/8" GALV LOCK WASHER
8	3/8" GALV HEX NUT



CABLE LADDER DETAIL | NO SCALE | 8

COMMSCOPE V-FRAME MTC3975083

FACE SIZE	8'-0"
WEIGHT	352.136 lbs



ANTENNA FRAME DETAIL | NO SCALE | 9

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5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

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NB+C ENGINEERING SERVICES, LLC
8601 SIX FORKS ROAD, SUITE 540
RALEIGH, NC 27615
(919) 657-9131

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STATE OF CONNECTICUT · BRIAN KOTKIN · PEN.0028997 · LICENSED PROFESSIONAL ENGINEER
11/01/2021

A&E PROJECT NUMBER
88010-13689461

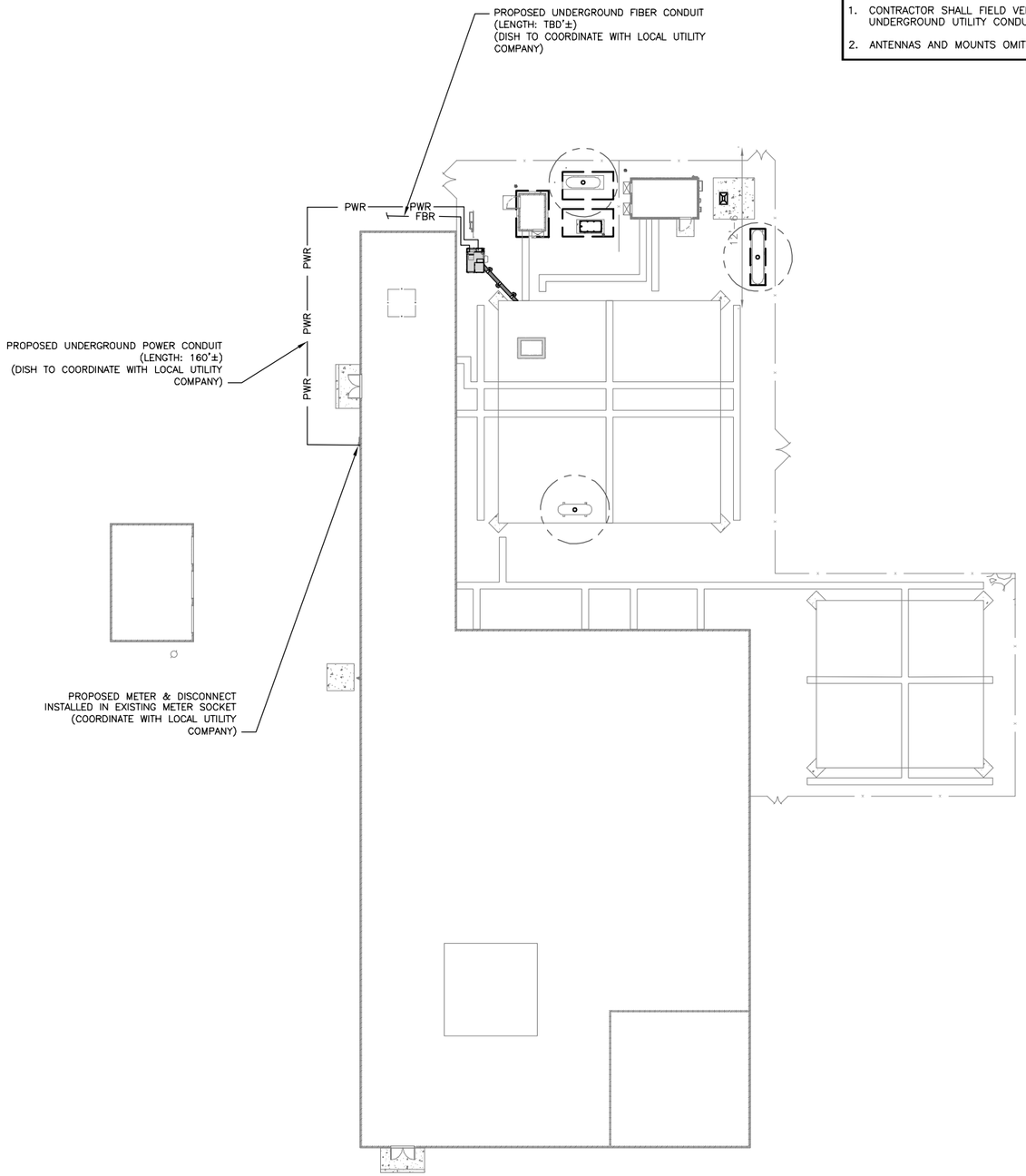
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00029A
373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

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

20' 10' 0 20' 40'
1"=20'

1

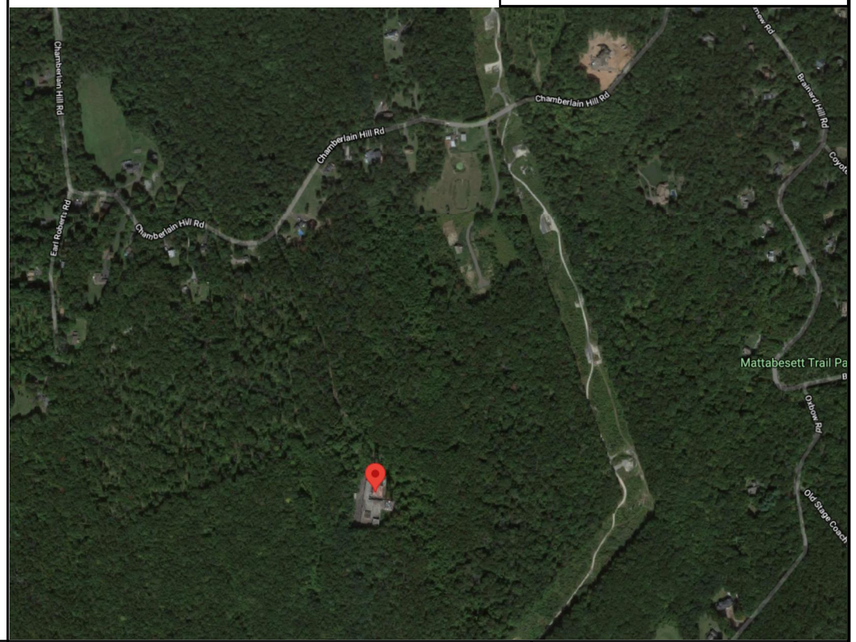
DC POWER WIRING SHALL BE COLOR CODED AT EACH END FOR IDENTIFYING +24V AND −48V CONDUCTORS. RED MARKINGS SHALL IDENTIFY +24V AND BLUE MARKINGS SHALL IDENTIFY −48V.

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

ELECTRICAL NOTES | NO SCALE | 2

NOTES

1. AN EXISTING SURVEY WAS NOT AVAILABLE AT THE TIME OF DRAWING CREATION.



AERIAL VIEW | NO SCALE | 3

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STATE OF CONNECTICUT — BRIAN KOTTMAN — PEN.0028997 — LICENSED PROFESSIONAL ENGINEER

11/01/2021

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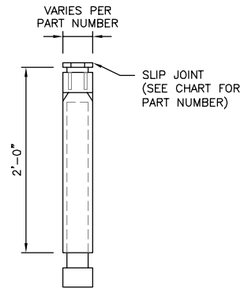
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00029A
373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

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"

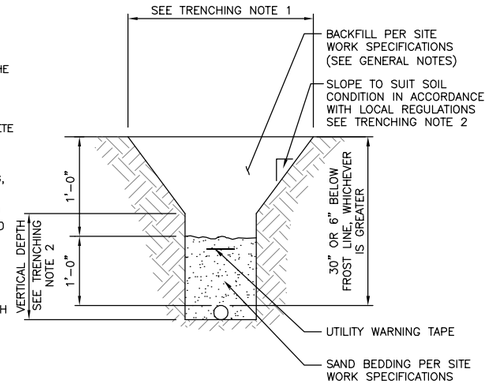


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

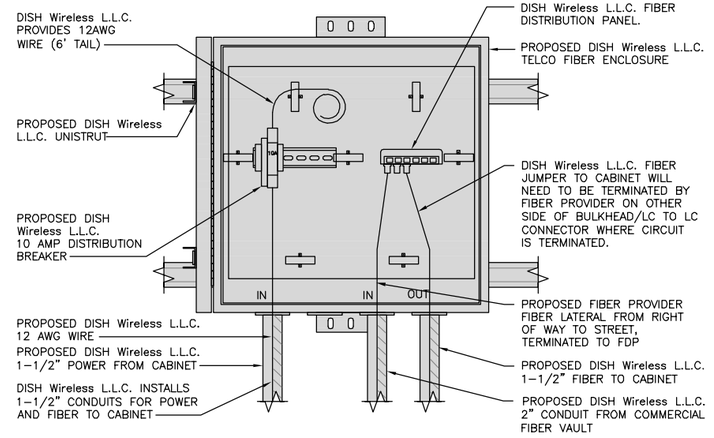
EXPANSION JOINT DETAIL — NO SCALE — 1

TRENCHING NOTES

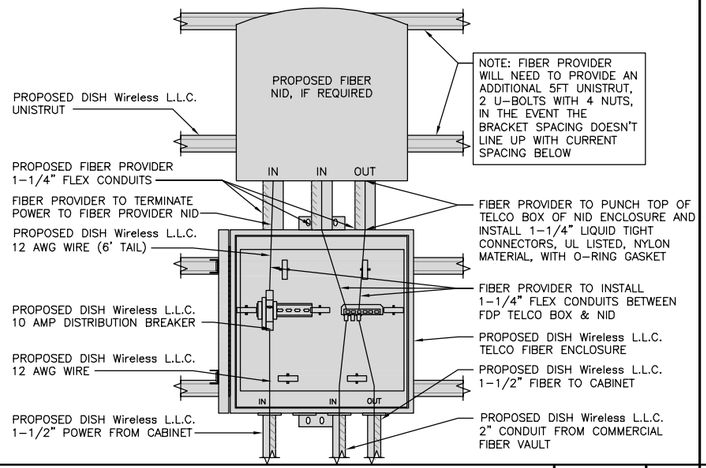
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT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

dish wireless.
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DRAWN BY:	CHECKED BY:	APPROVED BY:
RDS	BIW	BIW

RFDS REV #: 1

PRELIMINARY DOCUMENTS

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1	11/01/2021	ISSUED FOR CONSTRUCTION

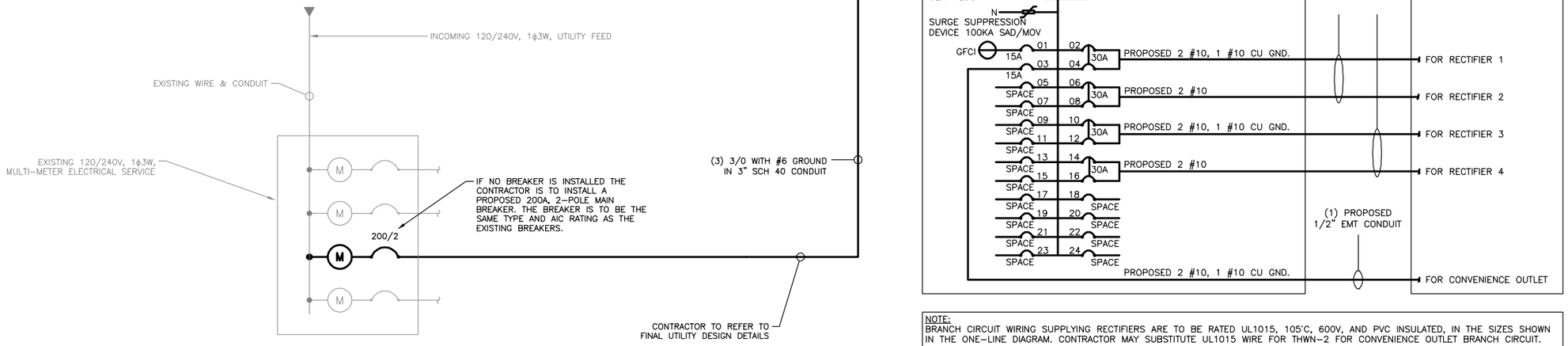
11/01/2021

A&E PROJECT NUMBER
88010-13689461

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00029A
373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-2



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

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

PPC ONE-LINE DIAGRAM — NO SCALE — 1

PROPOSED CHARLES PANEL SCHEDULE

LOAD SERVED	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	LOAD SERVED
PPC GFCI OUTLET	180		15A	1	A	2	30A	2880		ABB/GE INFINITY RECTIFIER 1
CHARLES GFCI OUTLET		180	15A	3	B	4			2880	
-SPACE-				5	A	6	30A	2880		ABB/GE INFINITY RECTIFIER 2
-SPACE-				7	B	8			2880	
-SPACE-				9	A	10	30A	2880		ABB/GE INFINITY RECTIFIER 3
-SPACE-				11	B	12			2880	
-SPACE-				13	A	14	30A	2880		ABB/GE INFINITY RECTIFIER 4
-SPACE-				15	B	16			2880	
-SPACE-				17	A	18				-SPACE-
-SPACE-				19	B	20				-SPACE-
-SPACE-				21	A	22				-SPACE-
-SPACE-				23	B	24				-SPACE-
VOLTAGE AMPS	180	180						11520	11520	

200A MCB, 1ϕ, 24 SPACE, 120/240V	L1	L2	
MB RATING: 65,000 AIC	11700	11700	VOLTAGE AMPS
	98	98	AMPS
	98		MAX AMPS
	123		MAX 125%

PANEL SCHEDULE — NO SCALE — 2

NOT USED — NO SCALE — 3

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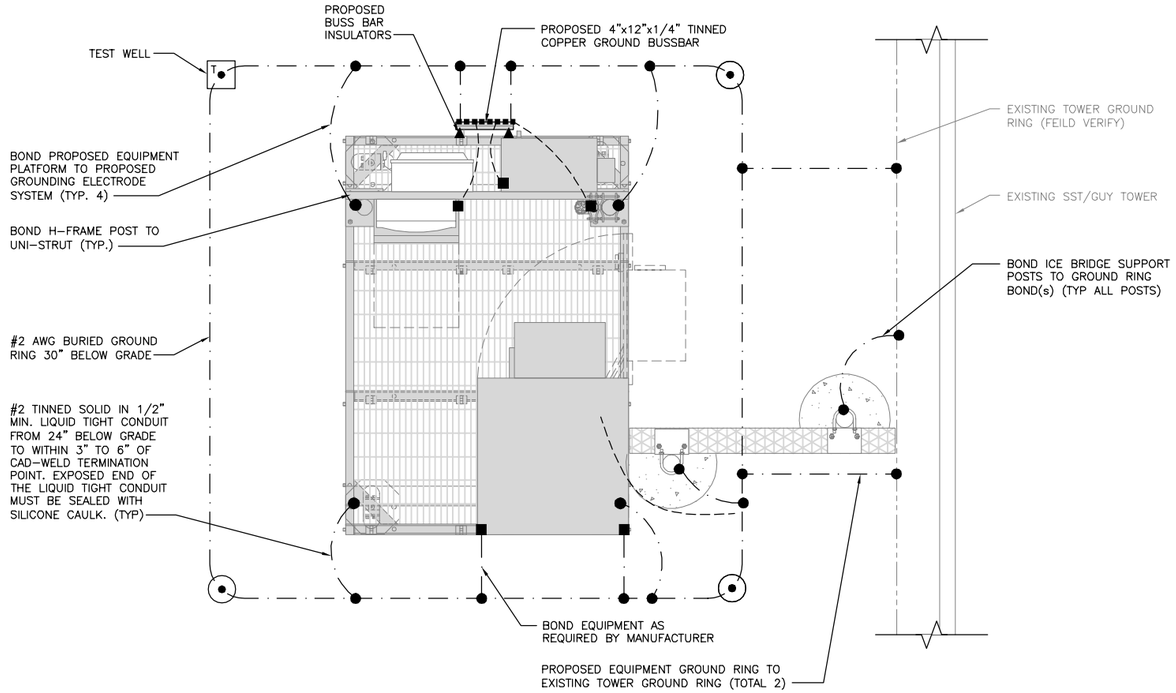
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00029A
373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

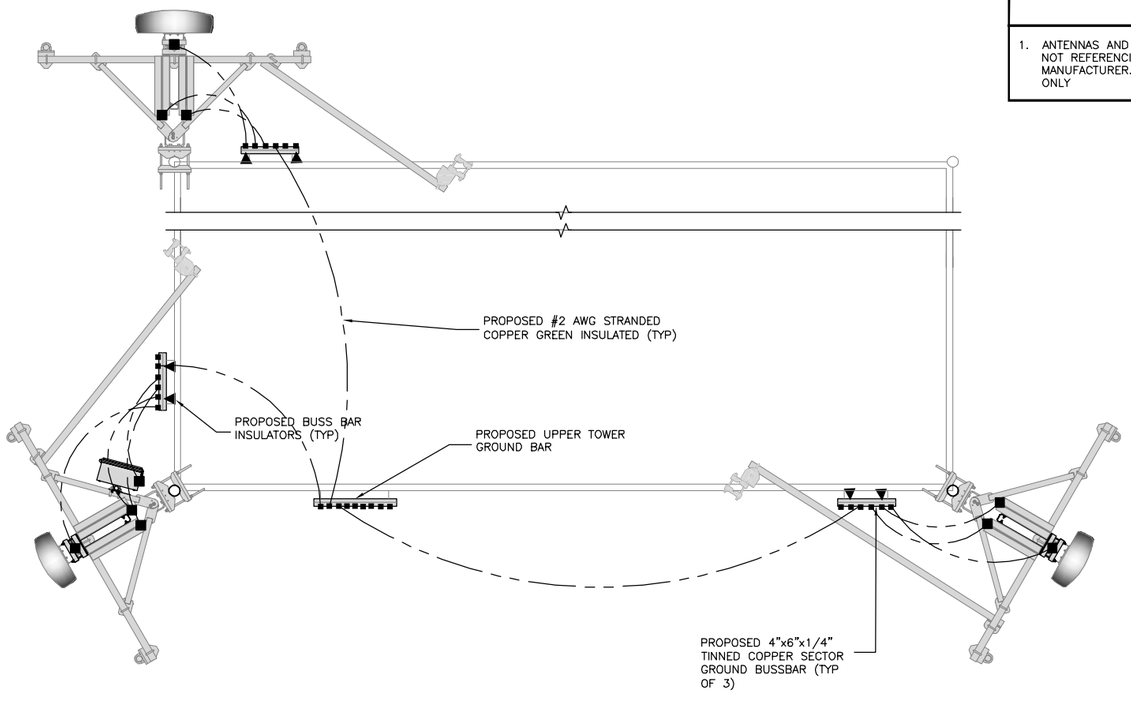
SHEET TITLE
ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3



TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE | 1



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE | 2

NOTES

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

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

GROUND BUS BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE

#6 AWG STRANDED & INSULATED

#2 AWG SOLID COPPER TINNED

BUSS BAR INSULATOR

GROUNDING LEGEND

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

GROUNDING KEY NOTES

(A) EXTERIOR GROUND RING: #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.

(B) TOWER GROUND RING: THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.

(C) INTERIOR GROUND RING: #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUNDED TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.

(D) BOND TO INTERIOR GROUND RING: #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING.

(E) GROUND ROD: UL LISTED COPPER CLAD STEEL. MINIMUM 5/8" 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

dish wireless.
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(919) 657-9131

DRAWN BY:	CHECKED BY:	APPROVED BY:
RDS	BIW	BIW

RFDS REV #: 1

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STATE OF CONNECTICUT · BRIAN KOTANCHIK · PEN.0028997 · LICENSED PROFESSIONAL ENGINEER

11/01/2021

A&E PROJECT NUMBER
88010-13689461

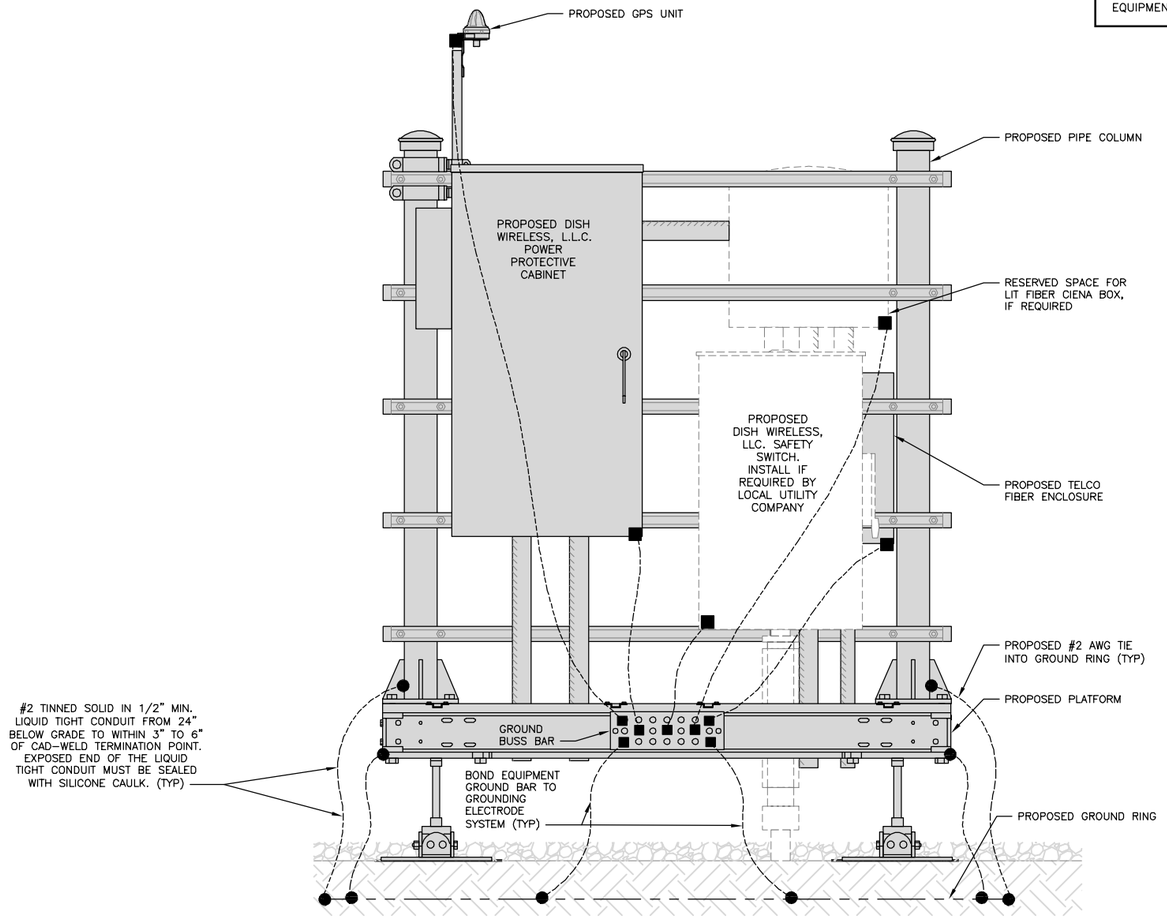
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00029A
373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

SHEET TITLE
GROUNDING PLANS AND NOTES

SHEET NUMBER
G-1

NOTES

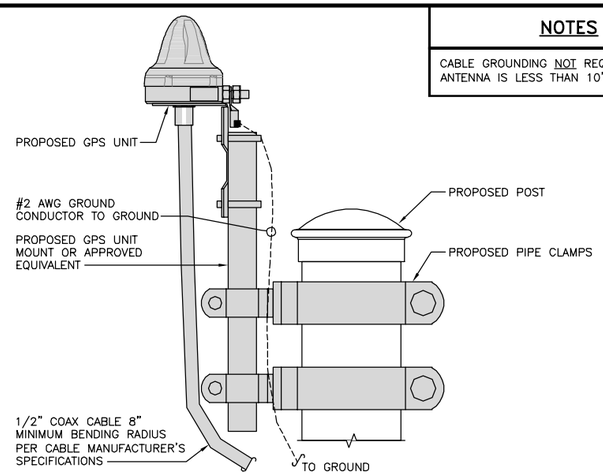
EQUIPMENT CABINET OMITTED FOR CLARITY



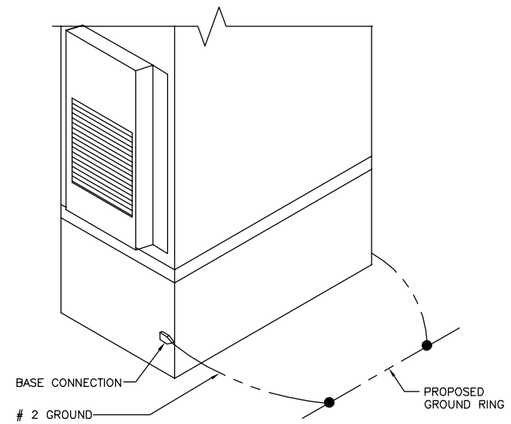
H-FRAME GROUNDING DETAIL | NO SCALE | 1

NOTES

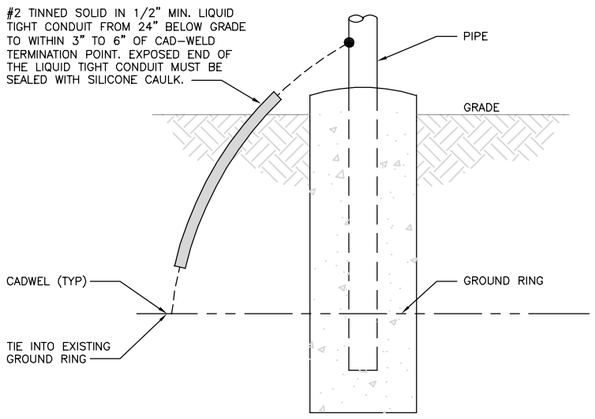
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



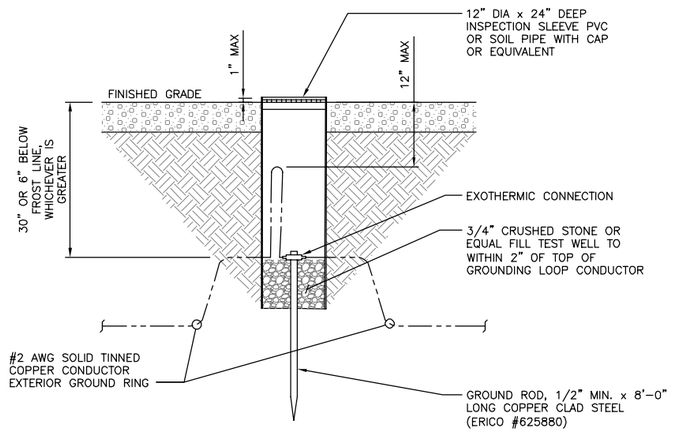
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



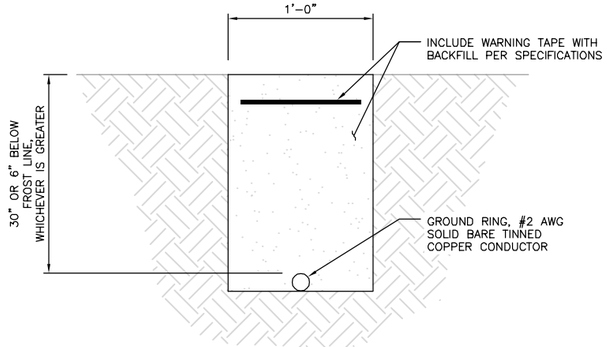
OUTDOOR CABINET GROUNDING | NO SCALE | 3



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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STATE OF CONNECTICUT · BENJAMIN KOTKIN · PEN.0028997 · LICENSED PROFESSIONAL ENGINEER

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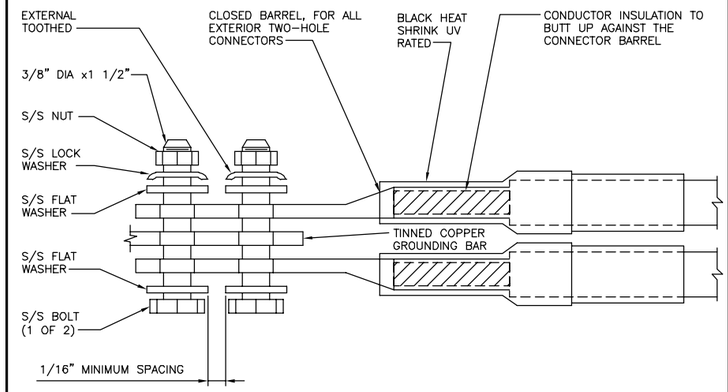
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00029A
373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

SHEET TITLE
GROUNDING DETAILS

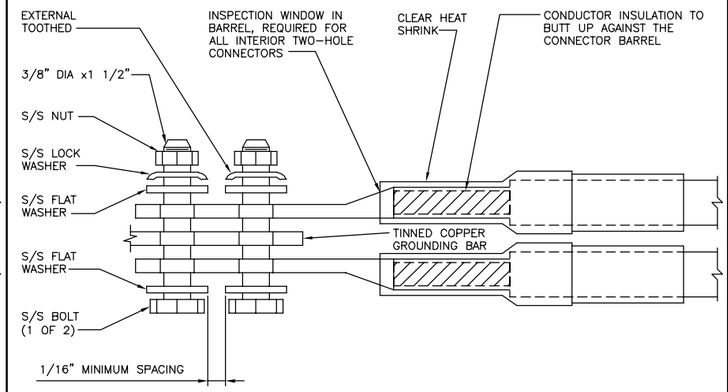
SHEET NUMBER
G-2

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.
9. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).

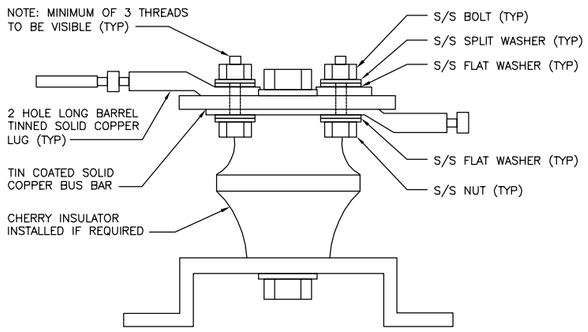
TYPICAL GROUNDING NOTES | NO SCALE | 1



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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373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

SHEET TITLE
GROUNDING DETAILS

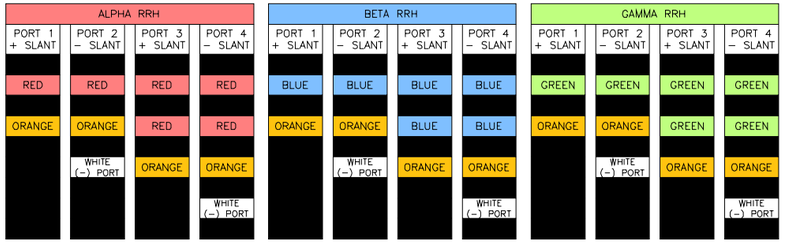
SHEET NUMBER
G-3

RF JUMPER COLOR CODING

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

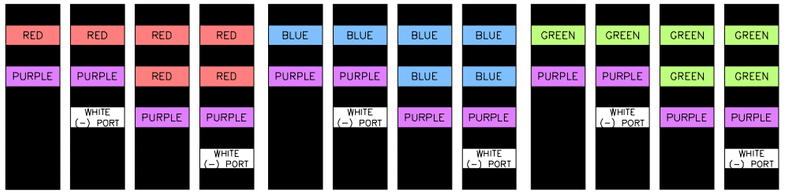
LOW-BAND RRH –
(600MHz N71 BASEBAND) +
(850MHz N26 BAND) +
(700MHz N29 BAND) – OPTIONAL PER MARKET

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)

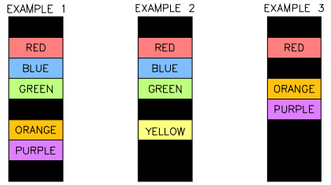


HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED
ALONG WITH FREQUENCY BANDS

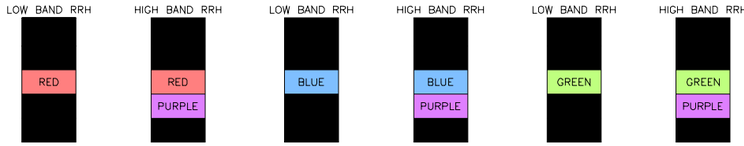
EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS
ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS

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



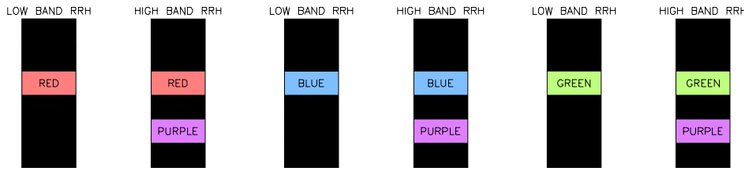
FIBER JUMPERS TO RRHs

LOW-BAND RRH FIBER CABLES HAVE SECTOR
STRIPE ONLY

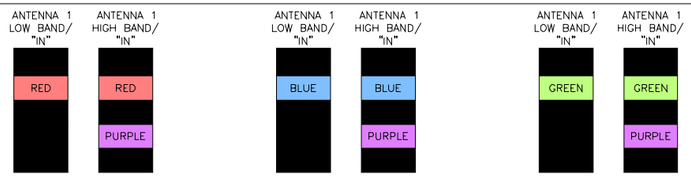


POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR
STRIPE ONLY



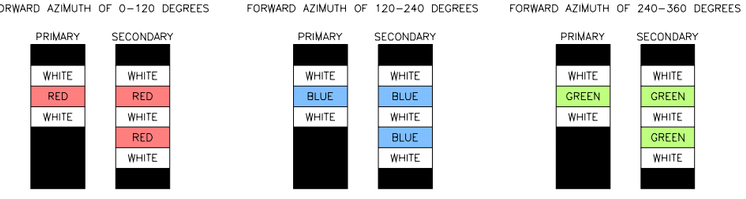
RET MOTORS AT ANTENNAS



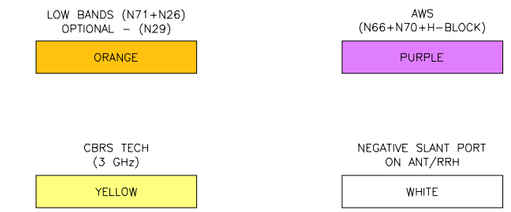
MICROWAVE RADIO LINKS

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



RF CABLE COLOR CODES | NO SCALE | 1



COLOR IDENTIFIER | NO SCALE | 2

NOT USED | NO SCALE | 3

NOT USED | NO SCALE | 4

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NB+C TOTALLY COMMITTED.
NB+C ENGINEERING SERVICES, LLC
8601 SIX FORKS ROAD, SUITE 540
RALEIGH, NC 27615
(919) 657-9131

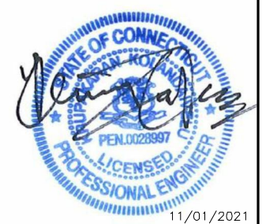
DRAWN BY:	CHECKED BY:	APPROVED BY:
RDS	BIW	BIW

RFDS REV #: 1

PRELIMINARY DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/05/2021	ISSUED FOR CONSTRUCTION
1	11/01/2021	ISSUED FOR CONSTRUCTION



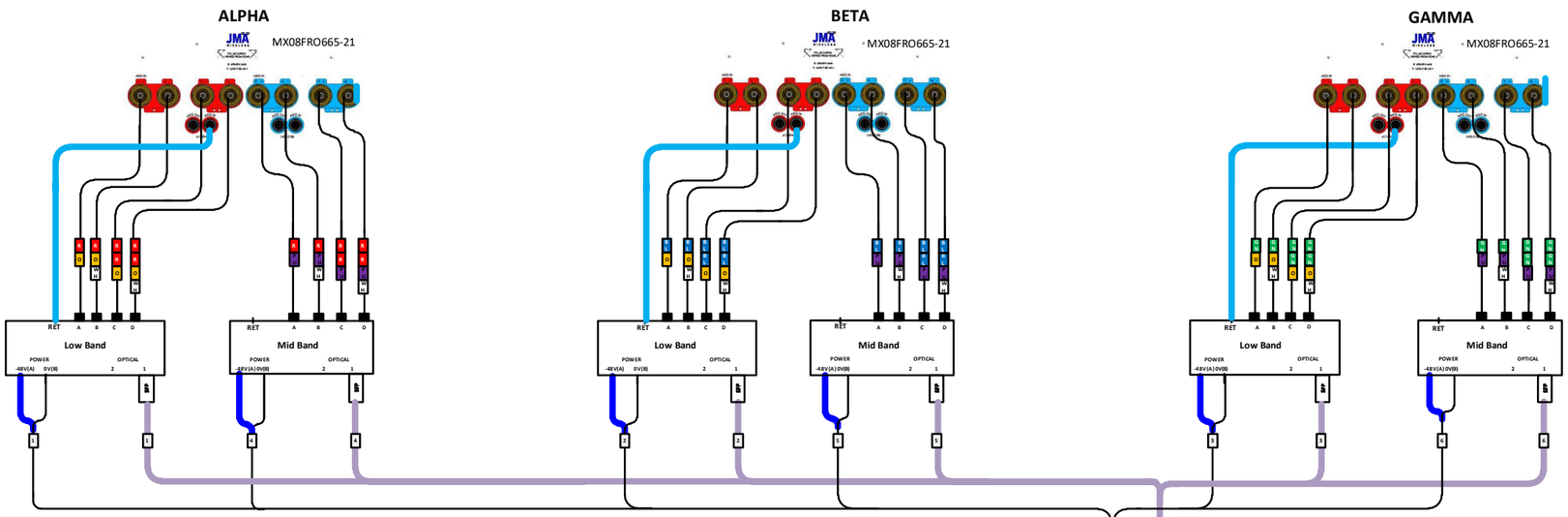
11/01/2021

A&E PROJECT NUMBER
88010-13689461

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00029A
373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

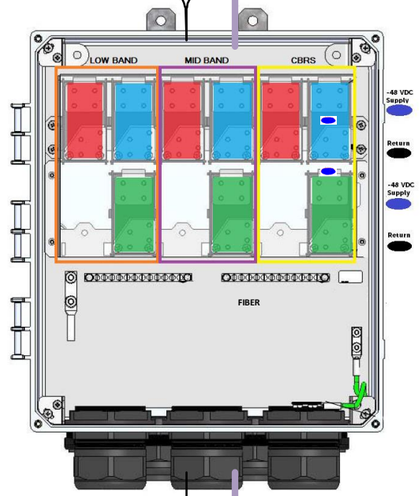
SHEET TITLE
RF
CABLE COLOR CODES

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



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 Wifi
11	Te0/0/0/11	Fixed Wifi
12	Te0/0/0/12	Fixed Wifi
13	Te0/0/0/13	Fixed Wifi
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	Te0/0/0/25	Blank/Future
26	Te0/0/0/26	Fiber NIU
27	Te0/0/0/27	Fiber NIU
28	Te0/0/0/28	Blank/Future
29	Te0/0/0/29	Blank/Future

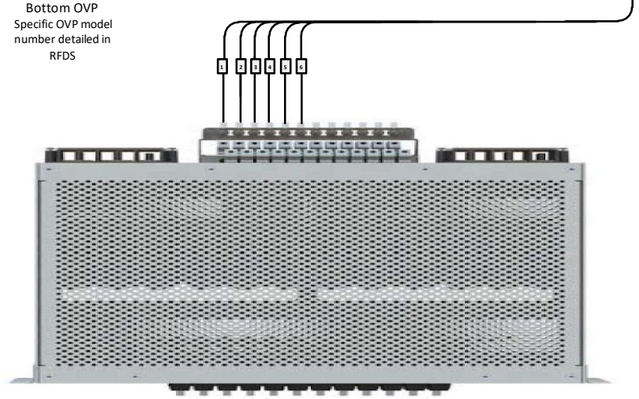
top

bottom

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

Bottom OVP
Specific OVP model number detailed in RFDS



5G plumbing diagram JMA MX08FRO665-21
2-2-2(LB+MB)

Quan Liu	SIZE	FSCM NO	DWG NO	REV 3
5-Jan-2021	SCALE None			SHEET

PLUMBING DIAGRAM

NO SCALE

1

dish wireless.
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STATE OF CONNECTICUT · KEVIN KOTKOWSKI · PEN.0028997 · LICENSED PROFESSIONAL ENGINEER
11/01/2021

A&E PROJECT NUMBER
88010-13689461

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00029A
373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

SHEET TITLE
RF
PLUMBING DIAGRAM

SHEET NUMBER
RF-2

LEGEND

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

BUSS BAR INSULATOR

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM — T

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE — T

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE — GFCI

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

SMOKE DETECTION (DC) — SD

EMERGENCY LIGHTING (DC)

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

CHAIN LINK FENCE — X X X X

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE — W W W W W

UNDERGROUND POWER — UGP UGP UGP UGP UGP

UNDERGROUND TELCO — UGT UGT UGT UGT UGT

OVERHEAD POWER — OHP OHP OHP OHP

OVERHEAD TELCO — OHT OHT OHT OHT

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

ABOVE GROUND POWER — AGP AGP AGP AGP AGP

ABOVE GROUND TELCO — AGT AGT AGT AGT AGT

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

WORKPOINT — W.P.

SECTION REFERENCE — XX / X–X

DETAIL REFERENCE — XX / X–X

ABBREVIATIONS

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

dish wireless.

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11/01/2021

A&E PROJECT NUMBER

88010–13689461

DISH WIRELESS, L.L.C.
PROJECT INFORMATION

BOBDL00029A

373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

SHEET TITLE

LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SITE ACTIVITY REQUIREMENTS:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES:

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

CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION

CARRIER:DISH WIRELESS, L.L.C.

TOWER OWNER:TOWER OWNER

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

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

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

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

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

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

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

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

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

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

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

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

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

dish wireless.

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DRAWN BY:	CHECKED BY:	APPROVED BY:
RDS	BIW	BIW

RFDS REV #: 1

PRELIMINARY DOCUMENTS

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0	08/05/2021	ISSUED FOR CONSTRUCTION
1	11/01/2021	ISSUED FOR CONSTRUCTION

STATE OF CONNECTICUT
BRIAN KOTANCHIK
PEN.0028997
LICENSED
PROFESSIONAL ENGINEER

11/01/2021

A&E PROJECT NUMBER

88010–13689461

DISH WIRELESS, L.L.C.
PROJECT INFORMATION

BOBDL00029A

373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.

2. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.

3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°f AT TIME OF PLACEMENT.

4. CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER-TO-CEMENT RATIO (W/C) OF 0.45.

5. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:

#4 BARS AND SMALLER 40 ksi

#5 BARS AND LARGER 60 ksi

6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

- CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"
- CONCRETE EXPOSED TO EARTH OR WEATHER:
- #6 BARS AND LARGER 2"
- #5 BARS AND SMALLER 1-1/2"
- CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
- SLAB AND WALLS 3/4"
- BEAMS AND COLUMNS 1-1/2"

7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.

2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.

3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.

4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.

4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.

4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.

5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.

6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).

7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.

8. TIE WRAPS ARE NOT ALLOWED.

9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.

10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.

11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.

12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.

13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).

14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.

15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.

17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.

18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.

19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.

20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.

21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).

22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).

23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER-ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.

24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3 (OR BETTER) FOR EXTERIOR LOCATIONS.

25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.

26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.

27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR DISH WIRELESS, L.L.C. AND TOWER OWNER BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.

28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.

29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "DISH WIRELESS, L.L.C.".

30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

dish wireless.

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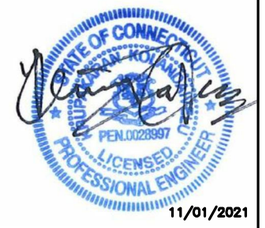

11/01/2021

A&E PROJECT NUMBER

88010-13689461

DISH WIRELESS, L.L.C.
PROJECT INFORMATION

BOBDL00029A

373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

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.

STRUCTURAL STEEL NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."

2. STRUCTURAL STEEL ROLLED SHAPES, PLATES AND BARS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:

A. ASTM A-572, GRADE 50 – ALL W SHAPES, UNLESS NOTED OR A992 OTHERWISE

B. ASTM A-36 – ALL OTHER ROLLED SHAPES, PLATES AND BARS UNLESS NOTED OTHERWISE.

C. ASTM A-500, GRADE B – HSS SECTION (SQUARE, RECTANGULAR, AND ROUND)

D. ASTM A-325, TYPE SC OR N – ALL BOLTS FOR CONNECTING STRUCTURAL MEMBERS

E. ASTM F-1554 07 – ALL ANCHOR BOLTS, UNLESS NOTED OTHERWISE

3. ALL EXPOSED STRUCTURAL STEEL MEMBERS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION PER ASTM A123. EXPOSED STEEL HARDWARE AND ANCHOR BOLTS SHALL BE GALVANIZED PER ASTM A153 OR B695.

4. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.

5. DO NOT DRILL HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.

6. CONNECTIONS:

A. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.1.

B. ALL WELDS SHALL BE INSPECTED VISUALLY. 25% OF WELDS SHALL BE INSPECTED WITH DYE PENETRANT OR MAGNETIC PARTICLE TO MEET THE ACCEPTANCE CRITERIA OF AWS D1.1. REPAIR ALL WELDS AS NECESSARY.

C. INSPECTION SHALL BE PERFORMED BY AN AWS CERTIFIED WELD INSPECTOR.

D. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE BURNING/WELDING PERMITS AS REQUIRED BY LOCAL GOVERNING AUTHORITY AND IF REQUIRED SHALL HAVE FIRE DEPARTMENT DETAIL FOR ANY WELDING ACTIVITY.

E. ALL ELECTRODES TO BE LOW HYDROGEN, MATCHING FILLER METAL, PER AWS D1.1, UNLESS NOTED OTHERWISE.

F. MINIMUM WELD SIZE TO BE 0.1875 INCH FILLET WELDS, UNLESS NOTED OTHERWISE.

G. PRIOR TO FIELD WELDING GALVANIZING MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING ½" BEYOND ALL FIELD WELD SURFACES. AFTER WELD AND WELD INSPECTION IS COMPLETE, REPAIR ALL GROUND AND WELDED SURFACES WITH ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS RECOMMENDATIONS.

H. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING AND/OR BRACING WHERE REQUIRED DURING CONSTRUCTION UNTIL ALL CONNECTIONS ARE COMPLETE.

I. ANY FIELD CHANGES OR SUBSTITUTIONS SHALL HAVE PRIOR APPROVAL FROM THE ENGINEER, AND DISH WIRELESS L.L.C. PROJECT MANAGER IN WRITING

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DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00029A
373 CHAMBERLAIN HILL RD
HIGGANUM, CT 06441

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-4

ENGINEERING:

STRUCTURAL ANALYSIS

MOUNT ANALYSIS

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**365 ft Self Supported Tower**
ATC Site Name	:	**DURHAM CT, CT**
ATC Asset Number	:	**88010**
Engineering Number	:	**13689461_C3_03**
Proposed Carrier	:	**DISH WIRELESS L.L.C.**
Carrier Site Name	:	**BOBDL00029A**
Carrier Site Number	:	**BOBDL00029A**
Site Location	:	**373 CHAMBERLAIN HILL RD** **Higganum, CT 06441-4062** **41.496100,-72.618100**
County	:	**Middlesex**
Date	:	**September 14, 2021**
Max Usage	:	**83%**
Result	:	**Pass**

Prepared By:
Adam Pittman
Structural Engineer II

Reviewed By:

COA: PEC.0001553

AMERICAN TOWER®
CORPORATION

Table of Contents

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 365 ft self supported tower to reflect the change in loading by DISH WIRELESS L.L.C..

Supporting Documents

Tower Drawings	CSEI Analysis: ATC Eng. #41405921, dated January 22, 2008
Foundation Drawing	Rose, Chulkoff & Rose Job #55101, dated October 21, 1955 CSEI Analysis: ATC Eng. #41405921, dated January 22, 2008
Modifications	CSEI Project #06175, dated June 26, 2006 ATC Project #59445536, dated November 6, 2014

Analysis

The tower was analyzed using Power Lines Systems INC., tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	120 mph (3-Second Gust)
Basic Wind Speed w/ Ice:	50 mph (3-second gust) w/1" radical ice concurrent
Code:	ANSI/TIA-222-H / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	B
Risk Category:	II
Topographic Factor Procedure:	Method 1
Topographic Category:	1

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

Existing and Reserved Equipment

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
375.0	1	dbSpectra DS9A09F36D-N	Flush	(2) 1 5/8" Coax	EVERSOURCE ENERGY
374.0	1	Generic 20' Dipole	Leg/Flush	-	OTHER
373.0	3	TX RX Systems 101-68-10-X-03N	Leg/Flush	(5) 1 1/4" Coax	MARCUS COMMUNICATIONS LLC
372.0	1	Kreco CO-41A	Pole Mount	(1) 7/8" Coax	EVERSOURCE ENERGY
	1	Rohde & Schwarz ADD090	Side Arm	(2) 7/8" Coax	US DEPT OF HOMELAND SECURITY
365.0	1	Bird 429-83H-01-T	Flush	(1) 1/2" Coax	EVERSOURCE ENERGY
339.0	2	Generic 4' Dish w/ Radome	Stand-Off	(2) 1/2" Coax	MARCUS COMMUNICATIONS LLC
329.0	1	Generic 10' Omni	Side Arm	(1) 7/8" Coax	
315.0	1	Generic 5" x 3" x 2" Cavity Filter	Side Arm	(1) 7/8" Coax	SIGFOX S.A.
	1	Procom CXL 900-3LW			
	1	Generic Low Noise Amplifier			
300.0	1	RFS SBX4-W60AC	Stand-Off	(2) E60	EVERSOURCE ENERGY
294.0	1	Sinclair SC281-L	Side Arm	-	US DEPT OF HOMELAND SECURITY
289.0	1	Sinclair SC381-HL	Side Arm	(1) 7/8" Coax	
282.0	1	Generic 20' FM	Side Arm	-	QUALCOMM
260.0	1	Sinclair SC281-L	Side Arm	(1) 7/8" Coax	US DEPT OF HOMELAND SECURITY
247.0	-	-	-	(1) 7/8" Coax	
180.0	1	Comprod 531-70HD	Side Arm	(3) 7/8" Coax	EVERSOURCE ENERGY
179.0	1	Telewave ANT450F6			
175.0	1	Kreco CO-41A			

Equipment to be Removed

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
No loading was considered as removed as part of this analysis.					

Proposed Equipment

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
200.0	1	Commscope RDIDC-9181-PF-48	Sector Frame	(1) 1.60" (40.6mm) Hybrid	DISH WIRELESS L.L.C.
	3	Fujitsu TA08025-B605			
	3	Fujitsu TA08025-B604			
	3	JMA Wireless MX08FRO665-21			

[1] Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Legs	68%	Pass
Diagonals	80%	Pass
Trussed Diagonals	79%	Pass
Horizontals	75%	Pass
Trussed Horizontals	38%	Pass
Anchor Bolts	49%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Uplift (Kips)	298.0	83%
Axial (Kips)	479.9	9%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Standard Conditions

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

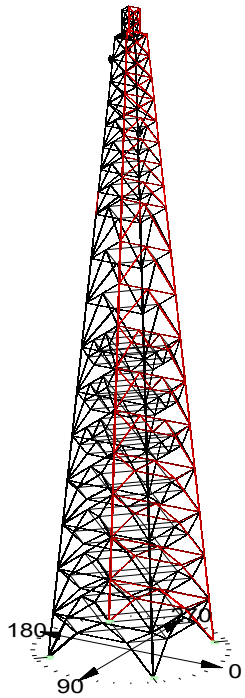
It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

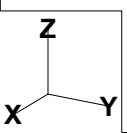
All assets of American Tower Corporation, its affiliates and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

American Tower Corp., Project: "88010"
Tower Version 16.01, 3:47:41 PM Tuesday, September 14, 2021
Undeformed geometry displayed





Project Name : 88010 - Durham CT, CT
Project Notes: OAA744811_C3_02 - Sigfox S.A.
Project File : X:\C-E\Durham CT, CT (88010)\13689461 DISH WIRELESS L.L.C\13689461_03_CUST_STR\88010.TOW
Date run : 3:46:13 PM Tuesday, September 14, 2021
by : Tower Version 16.01
Licensed to : American Tower Corp.

Successfully performed nonlinear analysis

Member check option: ANSI/TIA 222-G-1
Connection rupture check: Not Checked
Crossing diagonal check: Fixed
Included angle check: None
Climbing load check: None
Redundant members checked with: Actual Force
Loads from file: N:\L2 - ATC\88010\13689461 DISH WIRELESS L.L.C\dish.eia

*** Analysis Results:

Maximum element usage is 80.00% for Angle "D 15X" in load case "W -90"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Bending Moment (ft-k)	Foundation Usage %
W 0	0P	355.03	61.85	3.35	0.00
W 0	0X	346.38	60.32	3.18	0.00
W 0	0XY	-165.73	36.33	4.20	0.00
W 0	0Y	-167.74	37.51	4.33	0.00
W 180	0P	-166.71	37.64	4.37	0.00
W 180	0X	-161.39	36.13	4.25	0.00
W 180	0XY	344.79	60.42	3.22	0.00
W 180	0Y	351.25	61.66	3.39	0.00
W 45	0P	479.86	80.35	2.11	0.00
W 45	0X	93.06	27.10	4.36	0.00
W 45	0XY	-298.01	57.84	4.50	0.00
W 45	0Y	93.03	26.95	4.34	0.00
W -45	0P	96.41	28.24	4.50	0.00
W -45	0X	475.60	79.92	2.14	0.00
W -45	0XY	93.29	26.46	4.25	0.00
W -45	0Y	-297.36	58.06	4.54	0.00
W 90	0P	355.40	61.95	3.37	0.00
W 90	0X	-167.98	37.63	4.34	0.00
W 90	0XY	-165.47	36.25	4.19	0.00
W 90	0Y	345.98	60.25	3.17	0.00
W -90	0P	-166.08	37.63	4.38	0.00
W -90	0X	352.24	61.80	3.41	0.00
W -90	0XY	343.57	60.23	3.21	0.00
W -90	0Y	-161.79	36.09	4.24	0.00
W 0 Ice	0P	194.37	28.14	2.96	0.00
W 0 Ice	0X	189.19	27.53	2.92	0.00
W 0 Ice	0XY	61.69	5.31	4.04	0.00
W 0 Ice	0Y	63.95	5.32	4.09	0.00
W 180 Ice	0P	67.46	5.66	4.13	0.00
W 180 Ice	0X	66.09	5.71	4.09	0.00
W 180 Ice	0XY	185.31	27.35	2.89	0.00
W 180 Ice	0Y	190.33	27.88	2.94	0.00
W 45 Ice	0P	225.93	33.70	2.60	0.00
W 45 Ice	0X	127.85	16.74	3.57	0.00
W 45 Ice	0XY	27.91	2.15	4.29	0.00
W 45 Ice	0Y	127.50	16.71	3.56	0.00
W -45 Ice	0P	131.41	17.15	3.62	0.00
W -45 Ice	0X	222.19	33.40	2.57	0.00
W -45 Ice	0XY	124.28	16.58	3.53	0.00
W -45 Ice	0Y	31.31	1.98	4.33	0.00
W 90 Ice	0P	194.45	28.16	2.97	0.00
W 90 Ice	0X	64.24	5.35	4.09	0.00
W 90 Ice	0XY	61.75	5.31	4.04	0.00
W 90 Ice	0Y	188.76	27.50	2.91	0.00
W -90 Ice	0P	67.56	5.68	4.13	0.00
W -90 Ice	0X	190.88	27.93	2.94	0.00
W -90 Ice	0XY	185.06	27.31	2.88	0.00
W -90 Ice	0Y	65.68	5.67	4.09	0.00

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
W 0	0P	-54.52	-29.22	-355.03	61.85	-1.44	-3.03	3.35	-4.00	0.00
W 0	0X	-52.68	29.37	-346.38	60.32	1.30	-2.91	3.18	3.97	0.00
W 0	0XY	-33.77	-13.40	165.73	36.33	0.52	-4.17	4.20	3.55	0.00
W 0	0Y	-35.13	13.15	167.74	37.51	-0.47	-4.30	4.33	-3.55	0.00
W 180	0P	35.29	13.08	166.71	37.64	-0.47	4.34	4.37	3.56	0.00
W 180	0X	33.72	-12.98	161.39	36.13	0.52	4.22	4.25	-3.57	0.00
W 180	0XY	52.84	29.30	-344.79	60.42	1.30	2.95	3.22	-3.99	0.00
W 180	0Y	54.47	-28.89	-351.25	61.66	-1.44	3.07	3.39	4.02	0.00
W 45	0P	-56.75	-56.89	-479.86	80.35	1.50	-1.48	2.11	0.00	0.00
W 45	0X	-25.83	-8.19	-93.06	27.10	3.78	-2.18	4.36	5.50	0.00
W 45	0XY	-40.96	-40.84	298.01	57.84	3.18	-3.19	4.50	-0.00	0.00
W 45	0Y	-8.05	-25.72	-93.03	26.95	2.17	-3.76	4.34	-5.50	0.00
W -45	0P	-26.86	8.74	-96.41	28.24	-3.89	-2.26	4.50	-5.52	0.00
W -45	0X	-55.65	57.36	-475.60	79.92	-1.62	-1.40	2.14	-0.03	0.00
W -45	0XY	-7.25	25.45	-93.29	26.46	-2.14	-3.67	4.25	5.50	0.00
W -45	0Y	-41.61	40.49	297.36	58.06	-3.15	-3.27	4.54	0.01	0.00
W 90	0P	-29.13	-54.68	-355.40	61.95	3.04	1.46	3.37	4.01	0.00
W 90	0X	13.09	-35.28	167.98	37.63	4.32	0.46	4.34	3.55	0.00
W 90	0XY	-13.46	-33.65	165.47	36.25	4.16	-0.53	4.19	-3.55	0.00
W 90	0Y	29.46	-52.56	-345.98	60.25	2.90	-1.28	3.17	-3.97	0.00
W -90	0P	12.92	35.35	166.08	37.63	-4.35	0.46	4.38	-3.56	0.00
W -90	0X	-28.87	54.65	-352.24	61.80	-3.08	1.46	3.41	-4.02	0.00
W -90	0XY	29.30	52.62	-343.57	60.23	-2.94	-1.28	3.21	3.98	0.00
W -90	0Y	-13.12	33.63	161.79	36.09	-4.21	-0.53	4.24	3.56	0.00
W 0 Ice	0P	-22.31	-17.15	-194.37	28.14	-2.52	1.55	2.96	-0.92	0.00
W 0 Ice	0X	-21.54	17.15	-189.19	27.53	2.45	1.59	2.92	0.90	0.00
W 0 Ice	0XY	0.53	5.28	-61.69	5.31	2.37	-3.27	4.04	0.89	0.00
W 0 Ice	0Y	0.46	-5.30	-63.95	5.32	-2.41	-3.30	4.09	-0.88	0.00
W 180 Ice	0P	-0.43	-5.65	-67.46	5.66	-2.40	3.36	4.13	0.89	0.00
W 180 Ice	0X	-0.54	5.69	-66.09	5.71	2.38	3.33	4.09	-0.90	0.00
W 180 Ice	0XY	21.58	16.80	-185.31	27.35	2.45	-1.53	2.89	-0.92	0.00
W 180 Ice	0Y	22.29	-16.74	-190.33	27.88	-2.53	-1.50	2.94	0.93	0.00
W 45 Ice	0P	-23.80	-23.85	-225.93	33.70	-1.83	1.84	2.60	0.00	0.00
W 45 Ice	0X	-14.87	7.70	-127.85	16.74	3.10	1.76	3.57	1.33	0.00
W 45 Ice	0XY	-1.53	-1.52	-27.91	2.15	3.03	-3.03	4.29	-0.00	0.00
W 45 Ice	0Y	7.71	-14.82	-127.50	16.71	-1.76	-3.10	3.56	-1.33	0.00
W -45 Ice	0P	-15.39	-7.56	-131.41	17.15	-3.17	1.74	3.62	-1.34	0.00
W -45 Ice	0X	-23.26	23.97	-222.19	33.40	1.77	1.86	2.57	-0.02	0.00
W -45 Ice	0XY	7.60	14.74	-124.28	16.58	1.73	-3.07	3.53	1.34	0.00
W -45 Ice	0Y	-1.39	1.42	-31.31	1.98	-3.07	-3.06	4.33	0.01	0.00
W 90 Ice	0P	-17.11	-22.36	-194.45	28.16	-1.55	2.53	2.97	0.92	0.00
W 90 Ice	0X	-5.33	0.44	-64.24	5.35	3.31	2.41	4.09	0.88	0.00
W 90 Ice	0XY	5.29	0.54	-61.75	5.31	3.27	-2.37	4.04	-0.89	0.00
W 90 Ice	0Y	17.15	-21.49	-188.76	27.50	-1.59	-2.44	2.91	-0.90	0.00
W -90 Ice	0P	-5.66	-0.43	-67.56	5.68	-3.36	2.40	4.13	-0.89	0.00
W -90 Ice	0X	-16.75	22.35	-190.88	27.93	1.50	2.53	2.94	-0.93	0.00
W -90 Ice	0XY	16.82	21.51	-185.06	27.31	1.53	-2.44	2.88	0.91	0.00
W -90 Ice	0Y	5.64	-0.54	-65.68	5.67	-3.33	-2.38	4.09	0.90	0.00

Summary of Joint Support Reactions For All Load Cases in Direction of Leg:

Load Case	Support Joint	Origin Joint	Leg Member	Force In Leg Dir. (kips)	Residual Shear Perpendicular To Leg (kips)	Residual Shear Horizontal To Leg - Res. (kips)	Residual Shear Horizontal To Leg - Long. (kips)	Residual Shear Horizontal To Leg - Tran. (kips)	Total Long. Force (kips)	Total Tran. Force (kips)	Total Vert. Force (kips)
W 0	0P	1P	L 1P	359.293	27.947	28.039	27.917	2.617	-54.52	-29.22	-355.03
W 0	0X	1X	L 1X	350.567	26.850	26.943	26.725	-3.421	-52.68	29.37	-346.38
W 0	0XY	1XY	L 1XY	-168.322	21.308	21.373	21.351	0.983	-33.77	-13.40	165.73
W 0	0Y	1Y	L 1Y	-170.407	22.504	22.570	22.563	-0.586	-35.13	13.15	167.74
W 180	0P	1P	L 1P	-169.390	22.744	22.810	-22.803	-0.588	35.29	13.08	166.71
W 180	0X	1X	L 1X	-163.975	21.582	21.647	-21.629	0.884	33.72	-12.98	161.39
W 180	0XY	1XY	L 1XY	348.994	27.129	27.224	-27.003	-3.463	52.84	29.30	-344.79
W 180	0Y	1Y	L 1Y	355.507	28.178	28.271	-28.154	2.573	54.47	-28.89	-351.25
W 45	0P	1P	L 1P	485.660	29.342	29.506	20.792	20.936	-56.75	-56.89	-479.86
W 45	0X	1X	L 1X	93.856	24.201	24.202	18.862	15.165	-25.83	-8.19	-93.06
W 45	0XY	1XY	L 1XY	-302.448	26.114	26.260	18.626	18.512	-40.96	-40.84	298.01
W 45	0Y	1Y	L 1Y	93.825	24.022	24.023	15.021	18.748	-8.05	-25.72	-93.03
W -45	0P	1P	L 1P	97.220	25.302	25.304	19.634	-15.961	-26.86	8.74	-96.41
W -45	0X	1X	L 1X	481.368	29.378	29.542	20.016	-21.727	-55.65	57.36	-475.60
W -45	0XY	1XY	L 1XY	94.128	23.308	23.310	14.237	-18.457	-7.25	25.45	-93.29
W -45	0Y	1Y	L 1Y	-301.817	26.409	26.557	19.334	-18.206	-41.61	40.49	297.36
W 90	0P	1P	L 1P	359.669	28.066	28.158	2.501	28.047	-29.13	-54.68	-355.40
W 90	0X	1X	L 1X	-170.647	22.635	22.701	-0.502	22.695	13.09	-35.28	167.98
W 90	0XY	1XY	L 1XY	-168.055	21.217	21.282	1.066	21.255	-13.46	-33.65	165.47
W 90	0Y	1Y	L 1Y	350.164	26.771	26.865	-3.537	26.631	29.46	-52.56	-345.98
W -90	0P	1P	L 1P	-168.751	22.843	22.910	-0.473	-22.905	12.92	35.35	166.08

W -90	0X	1X	L 1X	356.497	28.271	28.363	2.476	-28.255	-28.87	54.65	-352.24
W -90	0XY	1XY	L 1XY	347.764	27.017	27.112	-3.559	-26.878	29.30	52.62	-343.57
W -90	0Y	1Y	L 1Y	-164.373	21.460	21.525	0.995	-21.502	-13.12	33.63	161.79
W 0 Ice	0P	1P	L 1P	196.225	8.131	8.168	7.748	2.583	-22.31	-17.15	-194.37
W 0 Ice	0X	1X	L 1X	191.014	7.901	7.938	7.361	-2.971	-21.54	17.15	-189.19
W 0 Ice	0XY	1XY	L 1XY	61.778	4.137	4.144	4.091	-0.662	0.53	5.28	-61.69
W 0 Ice	0Y	1Y	L 1Y	64.022	4.353	4.362	4.333	0.509	0.46	-5.30	-63.95
W 180 Ice	0P	1P	L 1P	67.533	4.654	4.663	-4.625	0.594	-0.43	-5.65	-67.46
W 180 Ice	0X	1X	L 1X	66.185	4.466	4.475	-4.414	-0.734	-0.54	5.69	-66.09
W 180 Ice	0XY	1XY	L 1XY	187.141	8.189	8.227	-7.693	-2.917	21.58	16.80	-185.31
W 180 Ice	0Y	1Y	L 1Y	192.180	8.369	8.405	-8.031	2.481	22.29	-16.74	-190.33
W 45 Ice	0P	1P	L 1P	228.218	9.701	9.755	6.874	6.922	-23.80	-23.85	-225.93
W 45 Ice	0X	1X	L 1X	128.020	5.607	5.612	5.288	1.881	-14.87	7.70	-127.85
W 45 Ice	0XY	1XY	L 1XY	27.532	5.082	5.111	3.619	3.609	-1.53	-1.52	-27.91
W 45 Ice	0Y	1Y	L 1Y	128.469	5.577	5.583	1.840	5.271	7.71	-14.82	-127.50
W -45 Ice	0P	1P	L 1P	132.389	5.989	5.994	5.541	-2.285	-15.39	-7.56	-131.41
W -45 Ice	0X	1X	L 1X	224.470	9.811	9.866	6.612	-7.322	-23.26	23.97	-222.19
W -45 Ice	0XY	1XY	L 1XY	125.254	5.687	5.693	1.716	-5.429	7.60	14.74	-124.28
W -45 Ice	0Y	1Y	L 1Y	30.927	5.273	5.302	3.734	-3.764	-1.39	1.42	-31.31
W 90 Ice	0P	1P	L 1P	196.304	8.161	8.197	2.541	7.793	-17.11	-22.36	-194.45
W 90 Ice	0X	1X	L 1X	64.315	4.392	4.401	0.519	4.370	-5.33	0.44	-64.24
W 90 Ice	0XY	1XY	L 1XY	61.836	4.131	4.139	-0.659	4.086	5.29	0.54	-61.75
W 90 Ice	0Y	1Y	L 1Y	190.585	7.903	7.940	-3.006	7.349	17.15	-21.49	-188.76
W -90 Ice	0P	1P	L 1P	67.639	4.659	4.669	0.603	-4.629	-5.66	-0.43	-67.56
W -90 Ice	0X	1X	L 1X	192.732	8.376	8.412	2.450	-8.048	-16.75	22.35	-190.88
W -90 Ice	0XY	1XY	L 1XY	186.888	8.158	8.196	-2.954	-7.645	16.82	21.51	-185.06
W -90 Ice	0Y	1Y	L 1Y	65.780	4.429	4.438	-0.720	-4.379	5.64	-0.54	-65.68

Overturning Moment Summary For All Load Cases:

Load Case	Transverse Moment (ft-k)	Longitudinal Moment (ft-k)	Torsional Moment (ft-k)	Resultant Moment (ft-k)	Transverse Force (kips)	Longitudinal Force (kips)	Vertical Force (kips)
W 0	215.502	-33607.877	117.022	33608.568	0.090	176.098	367.938
W 180	36.917	33259.360	-114.027	33259.381	-0.509	-176.327	367.938
W 45	25260.430	-25262.621	-16.707	35725.192	131.644	131.588	367.938
W -45	-25000.379	-25202.772	186.403	35499.277	-132.034	131.371	367.938
W 90	33605.952	-224.419	-144.710	33606.701	176.167	0.046	367.938
W -90	-33243.962	-142.042	142.421	33244.266	-176.243	-0.233	367.938
W 0 Ice	241.708	-8375.803	28.067	8379.290	0.017	42.859	509.189
W 180 Ice	207.325	7862.195	-27.473	7864.928	-0.098	-42.903	509.189
W 45 Ice	6418.992	-6441.787	-3.798	9093.958	32.493	32.483	509.189
W -45 Ice	-5967.218	-6430.259	44.250	8772.453	-32.568	32.441	509.189
W 90 Ice	8353.049	-265.812	-34.216	8357.277	42.872	0.009	509.189
W -90 Ice	-7881.601	-249.938	33.758	7885.563	-42.886	-0.045	509.189

EIA Sections Information:

Section Label	Top Z (ft)	Bottom Z (ft)	Joint Count	Member Count	Top Width (ft)	Bottom Width (ft)	Gross Area (ft^2)	Face Adjust Factor	Af Face Adjust Factor	Ar Face Adjust Factor	Dead Load Factor
358.0-365.0	365.000	358.000	8	20	7.00	7.00	49.00	1.0000	1.0000	1.0000	1.200
351.0-358.0	358.000	351.000	8	16	7.00	7.00	49.00	1.0000	1.0000	1.0000	1.200
350.0-351.0	351.000	350.000	8	16	7.00	12.50	9.75	1.2540	1.2540	1.2540	1.505
337.5-350.0	350.000	337.500	8	16	12.50	14.37	167.96	1.1140	1.1140	1.1140	1.337
325.0-337.5	337.500	325.000	8	16	14.37	16.25	191.37	1.1820	1.1820	1.1820	1.418
312.5-325.0	325.000	312.500	8	16	16.25	18.12	214.79	1.2060	1.2060	1.2060	1.447
300.0-312.5	312.500	300.000	12	24	18.12	19.99	238.20	1.2130	1.2130	1.2130	1.456
287.5-300.0	300.000	287.500	16	24	19.99	21.87	261.62	1.2170	1.2170	1.2170	1.460
275.0-287.5	287.500	275.000	16	24	21.87	23.74	285.03	1.2310	1.2310	1.2310	1.477
262.5-275.0	275.000	262.500	16	24	23.74	25.61	308.45	1.2380	1.2380	1.2380	1.485
250.0-262.5	262.500	250.000	16	24	25.61	27.49	331.86	1.2440	1.2440	1.2440	1.493
225.0-250.0	250.000	225.000	16	24	27.49	31.23	733.97	1.2640	1.2640	1.2640	1.517
200.0-225.0	225.000	200.000	16	24	31.23	34.98	827.63	1.2800	1.2800	1.2800	1.536
175.0-200.0	200.000	175.000	20	32	34.98	38.73	921.29	1.2880	1.2880	1.2880	1.546
150.0-175.0	175.000	150.000	36	76	38.73	42.47	1014.96	1.2960	1.2960	1.2960	1.555
125.0-150.0	150.000	125.000	36	76	42.47	46.22	1108.62	1.2140	1.2140	1.2140	1.457
100.0-125.0	125.000	100.000	32	68	46.22	49.96	1202.28	1.3670	1.3670	1.3670	1.640
75.00-100.0	100.000	75.000	24	52	49.96	53.71	1295.94	1.2280	1.2280	1.2280	1.473
50.00-75.00	75.000	50.000	24	52	53.71	57.46	1389.60	1.2300	1.2300	1.2300	1.476
25.00-50.00	50.000	25.000	24	52	57.46	61.20	1483.26	1.2260	1.2260	1.2260	1.471
0.000-25.00	25.000	0.000	20	40	61.20	64.95	1576.92	1.2060	1.2060	1.2060	1.447

Printed capacities do not include the strength factor entered for each load case.
The Group Summary reports on the member and load case that resulted in maximum usage which may not necessarily be the same as that which produces maximum force.

Group Summary (Compression Portion):

Group Label		Group Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage Cont-rol %	Max Use In Comp. %	Comp. Control Member	Comp. Force (kips)	Comp. Control Load Case	L/r Capacity (kips)	Comp. Connect. Shear Capacity (kips)	Comp. Connect. Bearing Capacity (kips)	RLX	RLY	RLZ	L/r	KL/r Comp. Member (ft)	Length	Curve No.	No. Of Bolts Comp.
Leg S1	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	56.89	Comp	56.89	L 1P	-437.078	W 45	768.230	0.000	0.000	0.333	0.333	0.333	64.47	64.47	25.140	1	0
Leg S2	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	66.58	Comp	66.58	L 2P	-398.774	W 45	598.960	0.000	0.000	0.333	0.333	0.333	64.47	64.47	25.140	1	0
Leg S3	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	64.87	Comp	64.87	L 3P	-361.546	W 45	557.370	0.000	0.000	0.333	0.333	0.333	64.47	64.47	25.140	1	0
Leg S4	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	68.38	Comp	68.38	L 4P	-324.867	W 45	475.110	0.000	0.000	0.333	0.333	0.333	64.47	64.47	25.140	1	0
Leg S5	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	56.24	Comp	56.24	L 5P	-294.165	W 45	523.024	0.000	0.000	0.222	0.222	0.222	42.99	42.99	25.140	1	0
Leg S6	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	52.71	Comp	52.71	L 6P	-256.462	W 45	486.589	0.000	0.000	0.333	0.333	0.333	64.44	64.44	25.140	1	0
Leg S7	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	45.25	Comp	45.25	L 7P	-220.179	W 45	486.589	0.000	0.000	0.333	0.333	0.333	64.44	64.44	25.140	1	0
Leg S8	L 8" x 8" x 1"	SAE	8X8X1	33.0	43.09	Comp	43.09	L 8P	-188.019	W 45	436.383	0.000	0.000	0.333	0.333	0.333	64.46	64.46	25.140	1	0
Leg S9	L 8" x 8" x 0.875"	SAE	8X8X0.88	33.0	40.19	Comp	40.19	L 9P	-154.861	W 45	385.330	0.000	0.000	0.333	0.333	0.333	64.04	64.04	25.140	1	0
Leg S10	L 8" x 8" x 0.75"	SAE	8X8X0.75	33.0	37.19	Comp	37.19	L 10P	-123.980	W 45	333.342	0.000	0.000	0.333	0.333	0.333	63.64	63.64	25.140	1	0
Leg S11	L 6" x 6" x 0.875"	SAE	6X6X0.88	33.0	37.67	Comp	37.67	L 11P	-106.607	W 45	282.971	0.000	0.000	0.500	0.500	0.500	64.46	64.46	12.570	1	0
Leg S12	L 6" x 6" x 0.875"	SAE	6X6X0.88	33.0	32.31	Comp	32.31	L 12P	-91.422	W 45	282.971	0.000	0.000	0.500	0.500	0.500	64.46	64.46	12.570	1	0
Leg S13	L 6" x 6" x 0.75"	SAE	6X6X0.75	33.0	31.22	Comp	31.22	L 13P	-76.628	W 45	245.466	0.000	0.000	0.500	0.500	0.500	64.46	64.46	12.570	1	0
Leg S14	L 6" x 6" x 0.75"	SAE	6X6X0.75	33.0	24.94	Comp	24.94	L 14X	-61.220	W -45	245.466	0.000	0.000	0.500	0.500	0.500	64.46	64.46	12.570	1	0
Leg S15	L 6" x 6" x 0.625"	SAE	6X6X0.63	33.0	29.16	Comp	29.16	L 15X	-60.387	W -45	207.060	0.000	0.000	0.500	0.500	0.500	63.92	63.92	12.570	1	0
Leg S16	L 6" x 6" x 0.625"	SAE	6X6X0.63	33.0	23.09	Comp	23.09	L 16X	-47.820	W -45	207.060	0.000	0.000	0.500	0.500	0.500	63.92	63.92	12.570	1	0
Leg S17	L 6" x 6" x 0.5"	SAE	6X6X0.5	33.0	19.61	Comp	19.61	L 17X	-32.882	W -45	167.709	0.000	0.000	0.500	0.500	0.500	63.92	63.92	12.570	1	0
Leg S18	L 6" x 6" x 0.5"	SAE	6X6X0.5	33.0	13.25	Comp	13.25	L 18X	-22.227	W -45	167.709	0.000	0.000	0.500	0.500	0.500	63.92	63.92	12.570	1	0
Leg S19	**L 6" x 6" x 0.5"**	**SAE**	**6X6X0.5**	**33.0**	**22.67**	**Comp**	**22.67**	**L 19P**	**-42.751**	**W 45**	**188.549**	**0.000**	**0.000**	**0.500**	**0.500**	**0.500**	**20.42**	**20.42**	**4.016**	**1**	**0**
Leg S20	**L 6" x 6" x 0.5"**	**SAE**	**6X6X0.5**	**33.0**	**8.46**	**Comp**	**8.46**	**L 20P**	**-13.720**	**W 45**	**162.256**	**0.000**	**0.000**	**1.000**	**1.000**	**1.000**	**71.19**	**71.19**	**7.000**	**1**	**0**
Leg S21	L 6" x 6" x 0.5"	SAE	6X6X0.5	33.0	5.30	Comp	5.30	L 21P	-8.600	W 45	162.256	0.000	0.000	1.000	1.000	1.000	71.19	71.19	7.000	1	0
Diag S1	B/B L3.5"x5"x0.4375"	DAS	5X3.5X0.44	33.0	38.79	Comp	38.79	D 2X	-42.023	W -90	108.344	0.000	0.000	0.500	1.000	0.500	142.38	133.76	23.967	6	0
Diag S2	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	63.60	Comp	63.60	D 4X	-40.836	W -90	64.207	0.000	0.000	0.450	0.900	0.450	141.88	133.45	23.305	6	0
Diag S3	B/B L3"x3.5"x0.3125"	DAS	3.5X3X0.31	33.0	77.65	Comp	77.65	D 6X	-39.622	W -90	51.029	0.000	0.000	0.450	0.900	0.450	147.44	136.88	22.662	6	0
Diag S4	B/B L3"x3.5"x0.3125"	DAS	3.5X3X0.31	33.0	70.40	Comp	70.40	D 8X	-38.830	W -90	55.155	0.000	0.000	0.450	0.880	0.450	140.21	132.43	22.040	6	0
Diag S5	B/B L3"x3"x0.375"	DAE	3X3X0.38	36.0	40.20	Comp	40.20	D 10X	-29.994	W -90	74.605	0.000	0.000	0.333	0.667	0.333	115.20	115.20	20.303	1	0
Diag S6	B/B L3"x3"x0.25"	DAE	3X3X0.25	33.0	55.77	Tens	54.51	D 12X	-28.045	W -90	51.449	0.000	0.000	0.333	0.667	0.333	114.20	114.20	19.842	1	0
Diag S7	B/B L3"x3"x0.25"	DAE	3X3X0.25	33.0	74.46	Comp	74.46	D 14X	-27.536	W -90	36.980	0.000	0.000	0.300	0.880	0.300	147.43	136.87	19.406	6	0
Diag S8	B/B L3"x3.5"x0.25"	DAS	3.5X3X0.25	33.0	80.00	Comp	80.00	D 15X	-26.680	W -90	33.349	0.000	0.000	0.333	0.667	0.333	153.59	140.66	31.677	6	0
Diag S9	B/B L3"x3.5"x0.25"	DAS	3.5X3X0.25	33.0	70.99	Comp	70.99	D 17X	-25.145	W -90	35.420	0.000	0.000	0.333	0.667	0.333	148.21	137.35	30.568	6	0
Diag S10	B/B L3"x3.5"x0.25"	DAS	3.5X3X0.25	33.0	62.03	Comp	62.03	D 19X	-23.275	W -90	37.525	0.000	0.000	0.333	0.667	0.333	143.21	134.28	29.536	6	0
Diag S11	B/B L2.5"x3"x0.25"	DAS	3X2.5X0.25	33.0	61.40	Comp	61.40	D 21X	-14.229	W -90	23.176	0.000	0.000	0.500	1.000	0.500	153.94	140.87	18.601	6	0
Diag S12	B/B L2.5"x3"x0.25"	DAS	3X2.5X0.25	33.0	54.84	Comp	54.84	D 23X	-13.562	W -90	24.732	0.000	0.000	0.500	1.000	0.500	148.30	137.41	17.920	6	0
Diag S13	B/B L2.5"x3"x0.25"	DAS	3X2.5X0.25	33.0	50.85	Comp	50.85	D 25X	-13.418	W -90	26.387	0.000	0.000	0.500	1.000	0.500	142.87	134.06	17.263	6	0
Diag S14	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	63.50	Comp	63.50	D 27X	-12.419	W -90	19.558	0.000	0.000	0.500	1.000	0.500	167.73	149.35	16.633	6	0
Diag S15	L 3" x 4" x 0.25"	SAU	4X3X0.25	33.0	27.29	Tens	0.00	D 30X	0.000		0.000	0.000	100.000	100.000	100.000	100.000	42044.94	32066.85	22.809	5	0
Diag S16	L 3" x 4" x 0.25"	SAU	4X3X0.25	33.0	25.50	Tens	0.00	D 32Y	0.000		0.001	0.000	0.000	100.000	100.000	100.000	39206.12	29903.66	21.269	5	0
Diag S17	L 3.5" x 3" x 0.25"	SAU	3.5X3X0.25	33.0	21.92	Tens	0.00	D 34Y	0.000		0.001	0.000	0.000	100.000	100.000	100.000	37629.43	28702.23	19.787	5	0
Diag S18	L 3.5" x 3.5" x 0.25"	SAE	3.5X3.5X0.25	33.0	16.35	Tens	0.00	D 36Y	0.000		0.001	0.000	0.000	100.000	100.000	100.000	31773.70	24240.16	18.376	5	0
Diag S19	B/B L3.5"x3.5"x0.25"	DAE	3.5X3.5X0.25	33.0	11.00	Comp	11.00	D 38X	-10.391	W 90	94.482	0.000	0.000	0.520	0.520	0.520	58.28	58.28	10.180	1	0
Diag S20	L 3" x 2" x 0.25"	SAU	3X2X0.25	33.0	13.85	Tens	0.00	D 40Y	0.000		0.001	0.000	0.000	100.000	100.000	100.000	27308.95	20838.02	9.899	5	0
Diag S21	L 3" x 2" x 0.25"	SAU	3X2X0.25	33.0	14.76	Tens	0.00	D 42Y	0.000		0.001	0.000	0.000	100.000	100.000	100.000	27308.95	20838.02	9.899	5	0
Horiz 1	B/B L5"x3"x0.375"	DAL	5X3.5X0.38	33.0	37.11	Comp	37.11	H 1P	-34.351	W -90	92.562	0.000	0.000	0.500	0.500	0.500	125.76	123.54	30.602	6	0
Horiz 2	B/B L4"x3"x0.3125"	DAL	4X3X0.31	33.0	57.43	Comp	57.43	H 3P	-33.044	W -90	57.540	0.000	0.000	0.500	0.500	0.500	135.73	129.67	28.729	6	0
Horiz 3	B/B L3.5"x3"x0.3125"	DAL	3.5X3X0.31	33.0	52.73	Comp	52.73	H 5P	-31.336	W -90	59.429	0.000	0.000	0.500	0.500	0.500	146.48	136.29	26.855	6	0
Horiz 4	B/B L3.5"x3"x0.3125"	DAL	3.5X3X0.31	33.0	55.97	Comp	55.97	H 7P	-36.538	W -90	65.283	0.000	0.000	0.500	0.500	0.500	136.27	130.00	24.982	6	0
Horiz 5	B/B L3.5"x3"x0.3125"	DAL	3.5X3X0.31	33.0	74.77	Comp	74.77	H 9P	-51.696	W -90	69.143	0.000	0.000	0.450	0.880	0.450	120.51	120.51	17.406	6	0
Horiz 6	B/B L3.5"x3"x0.3125"	DAL	3.5X3X0.31	33.0	70.91	Comp	70.91	H 11P	-46.439	W -90	65.494	0.000	0.000	0.880	0.880	0.880	135.91	129.78	14.157	6	0
Horiz 7	B/B L3"x3"x0.3125"	DAE	3X3X0.31	33.0	51.58	Comp	51.58	H 13P	-37.240	W -90	72.204	0.000	0.000	0.500	1.000	0.500	110.64	110.64	12.908	1	0
Horiz 8	B/B L3.5"x2.5"x0.3125"	DAL	3.5X2.5X0.31	33.0	51.03	Comp	51.03	H 15P	-14.338	W -90	28.099	0.000	0.000	1.000	1.000	1.000	190.79	163.54	17.489	6	0
Horiz 9	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	48.90	Comp	48.90	H 17P	-12.355	W -90	25.268	0.000	0.000	0.500	1.000	0.500	165.83	148.19	15.616	6	0
Horiz 10	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	36.26	Comp	36.26	H 19P	-11.118	W -90	30.664	0.000	0.000	1.000	1.000	1.000	174.51	153.53	13.743	6	0
Horiz 11	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	30.61	Comp	30.61	H 21P	-9.489	W -90	30.995	0.000	0.000	0.500	1.000	0.500	129.14	125.62	12.806	6	0
Horiz 12	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	32.17	Comp	32.17	H 23P	-8.538	W -90	26.541	0.000	0.000	1.000	1.000	1.000	185.22	160.11	11.870	6	0
Horiz 13	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	29.98	Comp	29.98	H 25P	-8.933	W -90	29.791	0.000	0.000	1.000	1.000	1.000	170.61	151.12	10.933	6	0
Horiz 14	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	28.77	Comp	28.77	H 27P	-13.836	W -90	48.088	0.000	0.000	1.000	1.000	1.000	126.94	124.27	9.996	6	0
Horiz 15	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	60.92	Comp	60.92	H 29P	-11.127	W -90	18.265	0.000	0.000	0.500	1.000	0.500	192.42	175.22	18.120	5	0
Horiz 16	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	24.08	Comp	24.08	H 32X	-9.455	W 180	39.265	0.000	0.000	0.500	0.500	0.500	103.15	111.58	16.246	3	0
Horiz 17	B/B L3.5"x3"x0.3125"	DAL	3.5X3X0.31	33.0	12.87	Comp	12.87	H 34X	-6.891	W 0	53.532	0.000	0.000	0.500	1.000	0.500	127.76	125.95	14.373	5	0
Horiz 18	L 6" x 3.5" x 0.5"	SAU	6X3.5X0.5	33.0	17.65	Tens	0.00	H 36X	0.000		40.152	0.000	0.000	1.000	1.000	1.000	197.63	179.19	12.500	5	0
Horiz 19	B/B L3.5"x3.5"x0.3125"	DAE	3.5X3.5X0.31	33.0	32.16	Comp	32.16	H 37P	-22.275	W 0	69.264	0.000	0.000	1.000	1.000	1.000	77.78	77.78	7.000	1	0
Horiz 20	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	19.89	Comp	19.89	H 39P	-3.958	W -90	19.901	0.000	0.000	1.000	1.000	1.000	107.14	113.57	7.000	3	0
Horiz 21	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	12.67	Comp	12.67	H 41P	-2.522	W -90	19.901	0.000	0.000	1.000	1.000	1.000	107.14	113.57	7.000	3	0
LD 1	B/B L3.5"x3"x0.25"	DAL	3.5X3X0.25	33.0	35.55	Comp	35.55	LD 1X	-12.058	W -90	33.921	0.000	0.000	1.000	1.000	1.000	188.46	162.10	17.433	6	0
LD 2	B/B L5"x3.5"x0.4375"	DAL	5X3.5X0.44	33.0	37.73	Comp	37.73	LD 3X	-45.480	W -90	120.552	0.000	0.000	0.900	0.900	0.900	128.08	124.97	17.433	6	0
LD 4	B/B L3.5"x3"x0.25"	DAL	3.5X3X0.25	33.0	32.07	Comp	32.07	LD 7X	-11.647	W -90	36.316	0.000	0.000	1.000	1.000	1.000	179.64	156.68	16.617	6	0
LD 5	B/B L4"x3"x0.375"	DAL	4X3X0.38	33.0	64.50	Comp	64.50	LD 9X	-43.569	W -90	67.553	0.000	0.000	1.000	1.000	1.000	158.25	143.53	16.617	6	0
LD 7	B/B L3.5"x2.5"x0.25"	DAL	3.5X2.5X0.25	33.0	42.57	Comp	42.57	LD 13X	-11.251	W -90	26.429	0.000	0.000	1.000	1.000	1.000	174.10	153.27	15.814	6	0
LD 8	B/B L4"x3"x0.3125"	DAL	4X3X0.31	33.0	75.01	Comp	75.01	LD 15X	-41.711	W -90	55.603	0.000	0.000	0.900	0.900	0.900	134.48	128.91	15.814	6	0
LD 10	B/B L3.5"x2.5"x0.25"	DAL	3.5X2.5X0.25	33.0	33.80	Comp	33.80	LD 19X	-10.749	W -90	31.806	0.000	0.000	0.900	0.900	0.900	148.89	137.77	15.027	6	0
LD 11	B/B L4"x3"x0.3125"	DAL	4X3X0.31	33.0	74.27	Comp	74.27	LD 21X	-40.096	W -90	53.986	0.000	0.000	1.000	1.000	1.000	141.99	133.52	15.027	6	0
LD 13	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	53.78	Tens	1.10	LD 25XY	-0.255	W -90	23.145	0.000	0.000	0.460	0.880	0.460	144.14	134.84	12.762	6	0
LD 14	B/B L3.5"x2.5"x0.25"	DAL	3.5X2.5X0.25	33.0	54.94	Comp	54.94	LD 27X	-28.685	W -90	52.210	0.000	0.000	1.000	1.000	1.000	111.69	111.69	10.145	1	0

LD 15	B/B L3.5"x3"x0.3125"	DAL	3.5X3X0.31	33.0	39.08	Comp	39.08	LD 29P	-28.308	W -90	72.439	0.000	0.000	1.000	1.000	1.000	123.96	122.43	11.363	6	0
LD 16	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	49.68	Tens	1.38	LD 31XY	-0.349	W -90	25.213	0.000	0.000	0.870	0.870	0.870	161.72	145.66	12.145	6	0
LD 17	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	55.55	Comp	55.55	LD 33X	-26.983	W -90	48.576	0.000	0.000	1.000	1.000	1.000	125.91	123.63	9.915	6	0
LD 18	B/B L3"x3"x0.3125"	DAE	3X3X0.31	33.0	47.15	Comp	47.15	LD 35P	-26.823	W -90	56.892	0.000	0.000	1.000	1.000	1.000	142.51	133.84	10.949	6	0
LD 19	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	47.12	Tens	1.70	LD 37XY	-0.434	W -90	25.568	0.000	0.000	0.930	0.930	0.930	164.48	147.35	11.555	6	0
LD 20	B/B L3"x2"x0.25"	DAL	3X2X0.25	33.0	79.41	Comp	79.41	LD 39X	-26.429	W -90	33.280	0.000	0.000	1.000	1.000	1.000	130.60	126.52	9.697	6	0
LD 21	B/B L3"x3"x0.25"	DAE	3X3X0.25	33.0	52.41	Comp	52.41	LD 41P	-25.582	W -90	48.807	0.000	0.000	1.000	1.000	1.000	136.21	129.97	10.556	6	0
LH 1	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	8.39	Tens	0.00	LH 2X	0.000		0.002	0.000	0.000	100.000	100.000	100.000	41400.39	25507.44	30.602	6	0
LH 2	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	5.06	Tens	0.00	LH 4X	0.000		0.002	0.000	0.000	100.000	100.000	100.000	38866.16	23948.89	28.729	6	0
LH 3	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	4.79	Tens	0.00	LH 6X	0.000		0.002	0.000	0.000	100.000	100.000	100.000	36331.94	22390.34	26.855	6	0
LH 4	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	4.83	Tens	0.00	LH 8X	0.000		0.003	0.000	0.000	100.000	100.000	100.000	33797.71	20831.79	24.982	6	0
LH 5	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	32.17	Tens	0.00	LH 10Y	0.000		0.009	0.000	0.000	100.000	100.000	100.000	18210.23	11245.49	13.460	6	0
LH 6	B/B L3"x3.5"x0.3125"	DAS	3.5X3X0.31	33.0	31.19	Tens	0.00	LH 12Y	0.000		0.011	0.000	0.000	100.000	100.000	100.000	16468.36	10174.24	12.420	6	0
LH 7	B/B L3"x3"x0.25"	DAE	3X3X0.25	33.0	37.98	Tens	0.00	LH 14Y	0.000		0.010	0.000	0.000	100.000	100.000	100.000	14683.07	9076.29	11.379	6	0
DUM 1	Dummy Bracing Member	DUM	0.1X0.1X1	36.0	0.00		0.00	BR 17XY	-1.102	W 45	0.324	0.000	0.000	1.000	1.000	1.000	2.65	2.65	22.084	1	0

Group Summary (Tension Portion):

Group Label	Group Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Usage Cont-rol	Max Tension Use In Tens. %	Tension Control Member	Tension Force (kips)	Tension Control Load Case	Net Section Capacity (kips)	Tension Connect. Shear Capacity (kips)	Tension Connect. Bearing Capacity (kips)	Tension Connect. Rupture Capacity (kips)	Length Tens. Member (ft)	No. Of Bolts Tens.	No. Of Holes	Hole Diameter (in)
Leg S1	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	56.89	Comp	53.20	L 1XY	264.524	W 45	496.880	0.000	0.000	0.000	25.140	0	0.000	0
Leg S2	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	66.58	Comp	49.46	L 2XY	245.740	W 45	496.880	0.000	0.000	0.000	25.140	0	0.000	0
Leg S3	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	64.87	Comp	44.95	L 3XY	223.336	W 45	496.880	0.000	0.000	0.000	25.140	0	0.000	0
Leg S4	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	68.38	Comp	40.44	L 4XY	200.942	W 45	496.880	0.000	0.000	0.000	25.140	0	0.000	0
Leg S5	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	56.24	Comp	31.80	L 5XY	158.017	W 45	496.880	0.000	0.000	0.000	25.140	0	0.000	0
Leg S6	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	52.71	Comp	27.38	L 6XY	136.042	W 45	496.880	0.000	0.000	0.000	25.140	0	0.000	0
Leg S7	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	45.25	Comp	23.05	L 7XY	114.550	W 45	496.880	0.000	0.000	0.000	25.140	0	0.000	0
Leg S8	L 8" x 8" x 1"	SAE	8X8X1	33.0	43.09	Comp	27.31	L 8XY	121.652	W 45	445.499	0.000	0.000	0.000	25.140	0	0.000	0
Leg S9	L 8" x 8" x 0.875"	SAE	8X8X0.88	33.0	40.19	Comp	25.18	L 9XY	98.932	W 45	392.930	0.000	0.000	0.000	25.140	0	0.000	0
Leg S10	L 8" x 8" x 0.75"	SAE	8X8X0.75	33.0	37.19	Comp	22.43	L 10XY	76.209	W 45	339.767	0.000	0.000	0.000	25.140	0	0.000	0
Leg S11	L 6" x 6" x 0.875"	SAE	6X6X0.88	33.0	37.67	Comp	22.77	L 11XY	65.815	W 45	288.981	0.000	0.000	0.000	12.570	0	0.000	0
Leg S12	L 6" x 6" x 0.875"	SAE	6X6X0.88	33.0	32.31	Comp	19.04	L 12XY	55.029	W 45	288.981	0.000	0.000	0.000	12.570	0	0.000	0
Leg S13	L 6" x 6" x 0.75"	SAE	6X6X0.75	33.0	31.22	Comp	17.66	L 13XY	44.265	W 45	250.668	0.000	0.000	0.000	12.570	0	0.000	0
Leg S14	L 6" x 6" x 0.75"	SAE	6X6X0.75	33.0	24.94	Comp	13.37	L 14XY	33.509	W 45	250.668	0.000	0.000	0.000	12.570	0	0.000	0
Leg S15	L 6" x 6" x 0.625"	SAE	6X6X0.63	33.0	29.16	Comp	10.80	L 15XY	22.806	W 45	211.167	0.000	0.000	0.000	12.570	0	0.000	0
Leg S16	L 6" x 6" x 0.625"	SAE	6X6X0.63	33.0	23.09	Comp	5.75	L 16XY	12.140	W 45	211.167	0.000	0.000	0.000	12.570	0	0.000	0
Leg S17	L 6" x 6" x 0.5"	SAE	6X6X0.5	33.0	19.61	Comp	3.29	L 17XY	5.611	W 45	170.775	0.000	0.000	0.000	12.570	0	0.000	0
Leg S18	L 6" x 6" x 0.5"	SAE	6X6X0.5	33.0	13.25	Comp	0.00	L 18Y	0.000		170.775	0.000	0.000	0.000	12.570	0	0.000	0
Leg S19	**L 6" x 6" x 0.5"**	**SAE**	**6X6X0.5**	**33.0**	**22.67**	**Comp**	**0.00**	**L 19Y**	**0.000**		**170.775**	**0.000**	**0.000**	**0.000**	**4.016**	**0**	**0.000**	**0**
Leg S20	**L 6" x 6" x 0.5"**	**SAE**	**6X6X0.5**	**33.0**	**8.46**	**Comp**	**0.52**	**L 20Y**	**0.888**	**W -45**	**170.775**	**0.000**	**0.000**	**0.000**	**7.000**	**0**	**0.000**	**0**
Leg S21	L 6" x 6" x 0.5"	SAE	6X6X0.5	33.0	5.30	Comp	0.00	L 21Y	0.000		170.775	0.000	0.000	0.000	7.000	0	0.000	0
Diag S1	B/B L3.5"x5"x0.4375"	DAS	5X3.5X0.44	33.0	38.79	Comp	15.71	D 2P	32.888	W -90	209.385	0.000	0.000	0.000	23.967	0	0.000	0
Diag S2	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	63.60	Comp	26.74	D 4P	33.202	W -90	124.146	0.000	0.000	0.000	23.305	0	0.000	0
Diag S3	B/B L3"x3.5"x0.3125"	DAS	3.5X3X0.31	33.0	77.65	Comp	28.98	D 6P	33.311	W -90	114.939	0.000	0.000	0.000	22.662	0	0.000	0
Diag S4	B/B L3"x3.5"x0.3125"	DAS	3.5X3X0.31	33.0	70.40	Comp	28.93	D 8P	33.246	W -90	114.939	0.000	0.000	0.000	22.040	0	0.000	0
Diag S5	B/B L3"x3"x0.375"	DAE	3X3X0.38	36.0	40.20	Comp	36.13	D 10P	49.398	W -90	136.728	0.000	0.000	0.000	20.303	0	0.000	0
Diag S6	B/B L3"x3"x0.25"	DAE	3X3X0.25	33.0	55.77	Tens	55.77	D 12P	47.706	W -90	85.536	0.000	0.000	0.000	19.842	0	0.000	0
Diag S7	B/B L3"x3"x0.25"	DAE	3X3X0.25	33.0	74.46	Comp	53.79	D 14P	46.011	W -90	85.536	0.000	0.000	0.000	19.406	0	0.000	0
Diag S8	B/B L3"x3.5"x0.25"	DAS	3.5X3X0.25	33.0	80.00	Comp	25.91	D 15P	24.086	W -90	92.961	0.000	0.000	0.000	31.677	0	0.000	0
Diag S9	B/B L3"x3.5"x0.25"	DAS	3.5X3X0.25	33.0	70.99	Comp	24.42	D 17P	22.701	W -90	92.961	0.000	0.000	0.000	30.568	0	0.000	0
Diag S10	B/B L3"x3.5"x0.25"	DAS	3.5X3X0.25	33.0	62.03	Comp	23.27	D 19P	21.629	W -90	92.961	0.000	0.000	0.000	29.536	0	0.000	0
Diag S11	B/B L2.5"x3"x0.25"	DAS	3X2.5X0.25	33.0	61.40	Comp	16.46	D 21P	12.856	W -90	78.111	0.000	0.000	0.000	18.601	0	0.000	0
Diag S12	B/B L2.5"x3"x0.25"	DAS	3X2.5X0.25	33.0	54.84	Comp	15.79	D 23P	12.330	W -90	78.111	0.000	0.000	0.000	17.920	0	0.000	0
Diag S13	B/B L2.5"x3"x0.25"	DAS	3X2.5X0.25	33.0	50.85	Comp	15.78	D 25P	12.324	W -90	78.111	0.000	0.000	0.000	17.263	0	0.000	0
Diag S14	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	63.50	Comp	15.96	D 27P	11.279	W -90	70.686	0.000	0.000	0.000	16.633	0	0.000	0
Diag S15	L 3" x 4" x 0.25"	SAU	4X3X0.25	33.0	27.39	Tens	27.39	D 30P	13.750	W -90	50.193	0.000	0.000	0.000	22.809	0	0.000	0
Diag S16	L 3" x 4" x 0.25"	SAU	4X3X0.25	33.0	25.50	Tens	25.50	D 31X	12.799	W 180	50.193	0.000	0.000	0.000	21.269	0	0.000	0
Diag S17	L 3.5" x 3" x 0.25"	SAU	3.5X3X0.25	33.0	21.92	Tens	21.92	D 33X	10.156	W 180	46.332	0.000	0.000	0.000	19.787	0	0.000	0
Diag S18	L 3.5" x 3.5" x 0.25"	SAE	3.5X3.5X0.25	33.0	16.35	Tens	16.35	D 36XY	8.206	W 90	50.193	0.000	0.000	0.000	18.376	0	0.000	0
Diag S19	B/B L3.5"x3.5"x0.25"	DAE	3.5X3.5X0.25	33.0	11.00	Comp	5.50	D 38P	5.523	W 90	100.386	0.000	0.000	0.000	10.180	0	0.000	0
Diag S20	L 3" x 2" x 0.25"	SAU	3X2X0.25	33.0	13.85	Tens	13.85	D 40P	4.896	W -90	35.343	0.000	0.000	0.000	9.899	0	0.000	0
Diag S21	L 3" x 2" x 0.25"	SAU	3X2X0.25	33.0	14.76	Tens	14.76	D 42P	5.216	W -90	35.343	0.000	0.000	0.000	9.899	0	0.000	0
Horiz 1	B/B L5"x3.5"x0.375"	DAL	5X3.5X0.38	33.0	37.11	Comp	20.93	H 1X	37.848	W -90	180.873	0.000	0.000	0.000	30.602	0	0.000	0
Horiz 2	B/B L4"x3"x0.3125"	DAL	4X3X0.31	33.0	57.43	Comp	28.84	H 3X	35.808	W -90	124.146	0.000	0.000	0.000	28.729	0	0.000	0
Horiz 3	B/B L3.5"x3"x0.3125"	DAL	3.5X3X0.31	33.0	52.73	Comp	29.48	H 5X	33.879	W -90	114.939	0.000	0.000	0.000	26.855	0	0.000	0
Horiz 4	B/B L3.5"x3"x0.3125"	DAL	3.5X3X0.31	33.0	55.97	Comp	22.07	H 7P	25.364	W 90	114.939	0.000	0.000	0.000	24.982	0	0.000	0
Horiz 5	B/B L3.5"x3"x0.3125"	DAL	3.5X3X0.31	33.0	74.77	Comp	12.52	H 9X	14.396	W -90	114.939	0.000	0.000	0.000	15.406	0	0.000	0
Horiz 6	B/B L3.5"x3"x0.3125"	DAL	3.5X3X0.31	33.0	70.91	Comp	11.68	H 11P	13.425	W 90	114.939	0.000	0.000	0.000	14.157	0	0.000	0
Horiz 7	B/B L3"x3"x0.3125"	DAE	3X3X0.31	33.0	51.50	Comp	15.52	H 13P	16.360	W 90	105.435	0.000	0.000	0.000	12.908	0	0.000	0
Horiz 8	B/B L3.5"x2.5"x0.3125"	DAL	3.5X2.5X0.31	33.0	51.03	Comp	14.01	H 15P	14.770	W 90	105.435	0.000	0.000	0.000	17.489	0	0.000	0
Horiz 9	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	48.90	Comp	16.25	H 17X	12.696	W -90	78.111	0.000	0.000	0.000	15.616	0	0.000	0
Horiz 10	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	36.26	Comp	14.42	H 19P	11.262	W 90	78.111	0.000	0.000	0.000	13.743	0	0.000	0
Horiz 11	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	30.61	Comp	13.91	H 21P	9.833	W 90	70.686	0.000	0.000	0.000	12.806	0	0.000	0
Horiz 12	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	32.17	Comp	12.85	H 23X	9.083	W -90	70.686	0.000	0.000	0.000	11.870	0	0.000	0
Horiz 13	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	29.27	Comp	12.84	H 25P	8.074	W 90	70.686	0.000	0.000	0.000	10.933	0	0.000	0
Horiz 14	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	28.77	Comp	2.96	H 27P	2.313	W 90	78.111	0.000	0.000	0.000	9.996	0	0.000	0
Horiz 15	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	60.92	Comp	0.00	H 30X	0.000		78.111	0.000	0.000	0.000	18.120	0	0.000	0
Horiz 16	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	24.08	Comp	0.00	H 32X	0.000		78.111	0.000	0.000	0.000	16.246	0	0.000	0
Horiz 17	B/B L3.5"x3"x0.3125"	DAL	3.5X3X0.31	33.0	12.87	Comp	0.00	H 34X	0.000		114.939	0.000	0.000	0.000	14.373	0	0.000	0
Horiz 18	L 3.5" x 3.5" x 0.25"	SAU	6X3.5X0.5	33.0	17.65	Tens	17.65	H 35P	23.586	W 0	133.650	0.000	0.000	0.000	12.500	0	0.000	0
Horiz 19	B/B L3.5"x3.5"x0.3125"	DAE	3.5X3.5X0.31	33.0	32.16	Comp	0.00	H 38X	0.000		124.146	0.000	0.000	0.000	7.000	0	0.000	0
Horiz 20	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	19.89	Comp	0.00	H 40X	0.000		63.261	0.000	0.000	0.000	7.000	0	0.000	0
Horiz 21	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	12.67	Comp	0.16	H 42X	0.099	W -90 Ic	63.261	0.000	0.000	0.000	7.000	0	0.000	0
LD 1	B/B L3.5"x3"x0.25"	DAL	3.5X3X0.25	33.0	35.55	Comp	16.36	LD 2Y	15.206	W -45	92.961	0.000	0.000	0.000	17.433	0	0.000	0
LD 2	B/B L5"x3.5"x0.4375"	DAL	5X3.5X0.44	33.0	37.73	Comp	18.43	LD 3P	38.594	W -90	209.385	0.000	0.000	0.000	17.433	0	0.000	0
LD 4	B/B L3.5"x3"x0.25"	DAL	3.5X3X0.25	33.0	32.07	Comp	13.46	LD 8Y	12.509	W -45	92.961	0.000	0.000	0.000	16.617	0	0.000	0
LD 5	B/B L4"x3"x0.375"	DAL	4X3X0.38	33.0	64.50	Comp	25.72	LD 9P	37.972	W -90	147.609	0.000	0.000	0.000	16.617	0	0.000	0
LD 7	B/B L3.5"x2.5"x0.25"	DAL	3.5X2.5X0.25	33.0	42.57	Comp	14.10	LD 14Y	12.062	W -45	85.536	0.000	0.000	0.000	15.814	0	0.000	0
LD 8	B/B L4"x3"x0.3125"	DAL	4X3X0.31	33.0	75.01	Comp	29.85	LD 15P	37.052	W -90	124.146	0.000	0.000	0.000	15.814	0	0.000	0
LD 10	B/B L3.5"x2.5"x0.25"	DAL	3.5X2.5X0.25	33.0	33.80	Comp	12.99	LD 19P	11.109	W -90	85.536	0.000	0.000	0.000	15.027	0	0.000	0
LD 11	B/B L4"x3"x0.3125"	DAL	4X3X0.31	33.0	74.27	Comp	29.12	LD 21P	37.145	W -90	124.146	0.000	0.000	0.000	15.027	0	0.000	0
LD 13	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	53.78	Tens	53.78	LD 25P	34.019	W -90	63.261	0.000	0.000	0.000	12.762	0	0.000	0
LD 14	B/B L3.5"x2.5"x0.25"	DAL	3.5X2.5X0.25	33.0	54.94	Comp	27.21	LD 27P	23.276	W -90	85.536	0.000	0.000	0.000	10.145	0	0.000	0
LD 15	B/B L3.5"x3"x0.3125"	DAL	3.5X3X0.31	33.0	39.08	Comp	25.73	LD 29X	29.575	W -90	114.939	0.000	0.000	0.000	11.363	0	0.000	0
LD 16	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	49.68	Tens	49.68	LD 31P	31.429	W -90	63.261	0.000	0.000	0.000	12.145	0	0.000	0
LD 17	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	55.55	Comp	29.03	LD 33P	22.674	W -90	78.111	0.000	0.000	0.000	9.915	0	0.000	0
LD 18	B/B L3"x3"x0.3125"	DAE	3X3X0.31	33.0	47.15	Comp	26.29	LD 35X	27.720	W -90	105.435	0.000	0.000	0.000	10.949	0	0.000	0
LD 19	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	47.12	Tens	47.12	LD 37P	29.809	W -90	63.261	0.000	0.000	0.000	11.555	0	0.000	0
LD 20	B/B L3"x2"x0.25"	DAL	3X2X0.25	33.0	79.41	Comp	30.59	LD 39P	21.623	W -90	70.686	0.000	0.000	0.000	9.697	0	0.000	0
LD 21	B/B L3"x3"x0.25"	DAE	3X3X0.25	33.0	52.41	Comp	30.92	LD 41X	26.451	W -90	85.536	0.000	0.000	0.000	10.556	0	0.000	0
LH 1	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	8.39	Tens	8.39	LH 1Y	10.412	W 0	124.146	0.000	0.000	0.000	30.602	0	0.000	0
LH 2	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	5.06	Tens	5.06	LH 3Y	6.285	W 0	124.146	0.000	0.000	0.000	28.729	0	0.000	0
LH 3	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	4.79	Tens	4.79	LH 5Y	5.950	W 0	124.146	0.000	0.000	0.000	26.855	0	0.000	0
LH 4	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	4.83	Tens	4.83	LH 7Y	5.993	W 0	124.146	0.000	0.000	0.000	24.982	0	0.000	0
LH 5	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	32.17	Tens	32.17	LH 9P	39.940	W -90	124.146	0.000	0.000	0.000	13.460	0	0.000	0
LH 6	B/B L3"x3.5"x0.3125"	DAS	3.5X3X0.31	33.0	31.19	Tens	31.19	LH 11P	35.846	W -90	114.939	0.000	0.000	0.000	12.420	0	0.000	0
LH 7	B/B L3"x3"x0.25"	DAE	3X3X0.25	33.0	37.98	Tens	37.98	LH 13P	32.489	W -90	85.536	0.000	0.000	0.000	11.379	0	0.000	0
DUM 1	Dummy Bracing Member	DUM	0.1X0.1X1	36.0	0.00		0.00	BR 17X	0.786	W -45	0.324	0.000	0.000	0.000	22.084	0	0.000	0

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
W 0	77.32	LD 40P	Angle
W 180	78.71	D 16Y	Angle
W 45	68.38	L 4P	Angle
W -45	67.48	L 4X	Angle
W 90	78.81	D 15P	Angle
W -90	80.00	D 15X	Angle
W 0 Ice	28.45	H 37P	Angle
W 180 Ice	27.98	LD 40Y	Angle
W 45 Ice	32.70	L 4P	Angle
W -45 Ice	31.72	L 4X	Angle
W 90 Ice	28.45	H 38P	Angle
W -90 Ice	28.09	LD 39X	Angle

*** Weight of structure (lbs):

Weight of Angles*Section DLF:	245241.2
Weight of Equipment:	492.0
Total:	245733.2

*** End of Report

Site #:	88010	Engineer:	axp	Windspeed:	No ice: 120 mph	Ice: 50 mph	Taper:	-0.149857	Taper Change: 350 ft
Name:	Durham CT, CT	Date:	adam.pittman	Carrier:	Dish		FW @ Base:	64.95 ft	FW @ Top: 12.5 ft

Spreadsheet Version Last Updated: 11/12/2014

Joint Label	Symmetry Code	X Coord. (ft)	Y Coord. (ft)	Z Coord. (ft)	X Disp. Rest.	Y Disp. Rest.	Z Disp. Rest.	X Rot. Rest.	Y Rot. Rest.	Z Rot. Rest.	Drop Sub-Brace (Y or Blank)	# Vert	Drop (ft)	Height (ft)	Type	Count	Z-Elev. (ft)	FW (ft)	# Sub-Brace
0	XY-Symmetry	32.475	32.475	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed		2	8.330	25	1	1	0	64.95	2
1	XY-Symmetry	30.60178571	30.60178571	25	Free	Free	Free	Free	Free	Free		2	8.330	25	1	2	25	61.20357143	2
2	XY-Symmetry	28.72857143	28.72857143	50	Free	Free	Free	Free	Free	Free		2	8.330	25	1	3	50	57.45714286	2
3	XY-Symmetry	26.85535714	26.85535714	75	Free	Free	Free	Free	Free	Free		2	8.330	25	1	4	75	53.71071429	2
4	XY-Symmetry	24.98214286	24.98214286	100	Free	Free	Free	Free	Free	Free	Y	3	8.330	25	2	5	100	49.96428571	4
5	XY-Symmetry	23.10892857	23.10892857	125	Free	Free	Free	Free	Free	Free			8.33	25	2	6	125	46.21785714	3
6	XY-Symmetry	21.23571429	21.23571429	150	Free	Free	Free	Free	Free	Free		3	8.33	25	2	7	150	42.47142857	3
7	XY-Symmetry	19.3625	19.3625	175	Free	Free	Free	Free	Free	Free				25	A	8	175	38.725	2
8	XY-Symmetry	17.48928571	17.48928571	200	Free	Free	Free	Free	Free	Free				25	A	9	200	34.97857143	2
9	XY-Symmetry	15.61607143	15.61607143	225	Free	Free	Free	Free	Free	Free				25	A	10	225	31.23214286	2
10	XY-Symmetry	13.74285714	13.74285714	250	Free	Free	Free	Free	Free	Free				12.5	A	11	250	27.48571429	1
11	XY-Symmetry	12.80625	12.80625	262.5	Free	Free	Free	Free	Free	Free				12.5	A	12	262.5	25.6125	1
12	XY-Symmetry	11.86964286	11.86964286	275	Free	Free	Free	Free	Free	Free				12.5	A	13	275	23.73928571	1
13	XY-Symmetry	10.93303571	10.93303571	287.5	Free	Free	Free	Free	Free	Free				12.5	A	14	287.5	21.86607143	1
14	XY-Symmetry	9.996428571	9.996428571	300	Free	Free	Free	Free	Free	Free		1		12.5	X	15	300	19.99285714	1
15	XY-Symmetry	9.059821429	9.059821429	312.5	Free	Free	Free	Free	Free	Free		1		12.5	X	16	312.5	18.11964286	1
16	XY-Symmetry	8.123214286	8.123214286	325	Free	Free	Free	Free	Free	Free		1		12.5	X	17	325	16.24642857	1
17	XY-Symmetry	7.186607143	7.186607143	337.5	Free	Free	Free	Free	Free	Free				12.5	X	18	337.5	14.37321429	1
18	XY-Symmetry	6.25	6.25	350	Free	Free	Free	Free	Free	Free				1	X	19	350	12.5	1
19	XY-Symmetry	3.5	3.5	351	Free	Free	Free	Free	Free	Free				7	X	20	351	7	
20	XY-Symmetry	3.5	3.5	358	Free	Free	Free	Free	Free	Free				7	X	21	358	7	
21	XY-Symmetry	3.5	3.5	365	Free	Free	Free	Free	Free	Free						22	365	7	

NOTES	
Types:	
1:	Built up Horizs. w/ A
2:	Built up Horizs. w/ M
A:	Typical A brace
X:	Typical X brace
Drop:	Use only for types 1 & 2

# Sections:	21

A1	Y-Symmetry	30.60178571	0	25	Free	Free	Free	Free	Free	Free
A2	X-Symmetry	0	30.60178571	25	Free	Free	Free	Free	Free	Free
A3	Y-Symmetry	28.72857143	0	50	Free	Free	Free	Free	Free	Free
A4	X-Symmetry	0	28.72857143	50	Free	Free	Free	Free	Free	Free
A5	Y-Symmetry	26.85535714	0	75	Free	Free	Free	Free	Free	Free
A6	X-Symmetry	0	26.85535714	75	Free	Free	Free	Free	Free	Free
A7	Y-Symmetry	24.98214286	0	100	Free	Free	Free	Free	Free	Free
A8	X-Symmetry	0	24.98214286	100	Free	Free	Free	Free	Free	Free
A9	XY-Symmetry	23.10892857	7.70297619	125	Free	Free	Free	Free	Free	Free
A10	XY-Symmetry	7.70297619	23.10892857	125	Free	Free	Free	Free	Free	Free
A11	XY-Symmetry	21.23571429	7.078571429	150	Free	Free	Free	Free	Free	Free
A12	XY-Symmetry	7.078571429	21.23571429	150	Free	Free	Free	Free	Free	Free
A13	XY-Symmetry	19.3625	6.454166667	175	Free	Free	Free	Free	Free	Free
A14	XY-Symmetry	6.454166667	19.3625	175	Free	Free	Free	Free	Free	Free
A15	Y-Symmetry	17.48928571	0	200	Free	Free	Free	Free	Free	Free
A16	X-Symmetry	0	17.48928571	200	Free	Free	Free	Free	Free	Free
A17	Y-Symmetry	15.61607143	0	225	Free	Free	Free	Free	Free	Free
A18	X-Symmetry	0	15.61607143	225	Free	Free	Free	Free	Free	Free
A19	Y-Symmetry	13.74285714	0	250	Free	Free	Free	Free	Free	Free
A20	X-Symmetry	0	13.74285714	250	Free	Free	Free	Free	Free	Free
A21	Y-Symmetry	12.80625	0	262.5	Free	Free	Free	Free	Free	Free
A22	X-Symmetry	0	12.80625	262.5	Free	Free	Free	Free	Free	Free
A23	Y-Symmetry	11.86964286	0	275	Free	Free	Free	Free	Free	Free
A24	X-Symmetry	0	11.86964286	275	Free	Free	Free	Free	Free	Free
A25	Y-Symmetry	10.93303571	0	287.5	Free	Free	Free	Free	Free	Free
A26	X-Symmetry	0	10.93303571	287.5	Free	Free	Free	Free	Free	Free
A27	Y-Symmetry	9.996428571	0	300	Free	Free	Free	Free	Free	Free
A28	X-Symmetry	0	9.996428571	300	Free	Free	Free	Free	Free	Free

H1	XY-Symmetry	31.22594071	15.30089286	16.67	Free	Free	Free	Free	Free	Free
H2	XY-Symmetry	15.30089286	31.22594071	16.67	Free	Free	Free	Free	Free	Free
H5	XY-Symmetry	29.35272643	14.36428571	41.67	Free	Free	Free	Free	Free	Free
H6	XY-Symmetry	14.36428571	29.35272643	41.67	Free	Free	Free	Free	Free	Free
H9	XY-Symmetry	27.47951214	13.42767857	66.67	Free	Free	Free	Free	Free	Free
H10	XY-Symmetry	13.42767857	27.47951214	66.67	Free	Free	Free	Free	Free	Free
H13	XY-Symmetry	25.60629786	12.49107143	91.67	Free	Free	Free	Free	Free	Free
H14	XY-Symmetry	12.49107143	25.60629786	91.67	Free	Free	Free	Free	Free	Free
H17	XY-Symmetry	23.73308357	13.46039452	116.67	Free	Free	Free	Free	Free	Free
H18	XY-Symmetry	13.46039452	23.73308357	116.67	Free	Free	Free	Free	Free	Free
H19	Y-Symmetry	23.73308357	0	116.67	Free	Free	Free	Free	Free	Free
H20	X-Symmetry	0	23.73308357	116.67	Free	Free	Free	Free	Free	Free
H21	XY-Symmetry	21.85986929	12.41988643	141.67	Free	Free	Free	Free	Free	Free
H22	XY-Symmetry	12.41988643	21.85986929	141.67	Free	Free	Free	Free	Free	Free
H23	Y-Symmetry	21.85986929	0	141.67	Free	Free	Free	Free	Free	Free
H24	X-Symmetry	0	21.85986929	141.67	Free	Free	Free	Free	Free	Free
H25	XY-Symmetry	19.986655	11.37937833	166.67	Free	Free	Free	Free	Free	Free
H26	XY-Symmetry	11.37937833	19.986655	166.67	Free	Free	Free	Free	Free	Free
H27	Y-Symmetry	19.986655	0	166.67	Free	Free	Free	Free	Free	Free
H28	X-Symmetry	0	19.986655	166.67	Free	Free	Free	Free	Free	Free

Legs

Site No.:	88010
Engineer:	asp
Date:	adam.pittman
Carrier:	Dish

When inputting thickness values, include all decimal places.

Tower Section #	Section Elevations *(ft)*	Type of Shape [1]	Diameter or Length *(in)*	Thickness [2] *(in)*	F_Y *(ksi)*
1	0.000-25.00	L	8	1.125	33
2	25.00-50.00	L	8	1.125	33
3	50.00-75.00	L	8	1.125	33
4	75.00-100.0	L	8	1.125	33
5	100.0-125.0	L	8	1.125	33
6	125.0-150.0	L	8	1.125	33
7	150.0-175.0	L	8	1.125	33
8	175.0-200.0	L	8	1	33
9	200.0-225.0	L	8	0.875	33
10	225.0-250.0	L	8	0.75	33
11	250.0-262.5	L	6	0.875	33
12	262.5-275.0	L	6	0.875	33
13	275.0-287.5	L	6	0.75	33
14	287.5-300.0	L	6	0.75	33
15	300.0-312.5	L	6	0.625	33
16	312.5-325.0	L	6	0.625	33
17	325.0-337.5	L	6	0.5	33
18	337.5-350.0	L	6	0.5	33
19	350.0-351.0	L	6	0.5	33
20	351.0-358.0	L	6	0.5	33
21	358.0-365.0	L	6	0.5	33

Notes:

[1] Type of Leg Shape: **R** = Round or **P** = Bent Plate or **S** = Schifflerized Angle. **L** = Even Le

[2] For Solid Round Leg Shapes Thickness Equals Zero.

[3] Adjust for Bent Plate Leg Shapes.

Diagonals

Site No.:	88010
Engineer:	asp
Date:	adam.pittman
Carrier:	Dish

When inputting thickness values, include all decimal places.

Tower Section #	Section Elevations *(ft)*	Type of Shape [1]	Diameter [2] *(in)*	Web Length [3] *(in)*	Flange Length [3] *(in)*	Thickness *(in)*	F_y *(ksi)*	Is Diag. Tension Only? *(Y/N)*
1	0.000-25.00	2L		3.5	5	0.4375	33	
2	25.00-50.00	2L		3	4	0.3125	33	
3	50.00-75.00	2L		3	3.5	0.3125	33	
4	75.00-100.0	2L		3	3.5	0.3125	33	
5	100.0-125.0	2L		3	3	0.375	36	
6	125.0-150.0	2L		3	3	0.25	33	
7	150.0-175.0	2L		3	3	0.25	33	
8	175.0-200.0	2L		3	3.5	0.25	33	
9	200.0-225.0	2L		3	3.5	0.25	33	
10	225.0-250.0	2L		3	3.5	0.25	33	
11	250.0-262.5	2L		2.5	3	0.25	33	
12	262.5-275.0	2L		2.5	3	0.25	33	
13	275.0-287.5	2L		2.5	3	0.25	33	
14	287.5-300.0	2L		2.5	2.5	0.25	33	
15	300.0-312.5	L		3	4	0.25	33	Y
16	312.5-325.0	L		3	4	0.25	33	Y
17	325.0-337.5	L		3.5	3	0.25	33	Y
18	337.5-350.0	L		3.5	3.5	0.25	33	Y
19	350.0-351.0	2L		3.5	3.5	0.25	33	
20	351.0-358.0	L		3	2	0.25	33	Y
21	358.0-365.0	L		3	2	0.25	33	Y

Notes:

[1] Type of Diagonal Shape: **R** = Round, **L** = Single-Angle or **2L** = Double-Angle.

[2] Applies to Pipes and Solid Round Shapes only. For Solid Round Shapes Thickness Equals Zero.

[3] Applies to Single-Angle and Double-Angle Shapes only.

[4] Applies to Double-Angle Shapes only.

[5] Applies to Single-Angle Shapes only.

Horizontals

Site No.:	88010
Engineer:	asp
Date:	adam.pittman
Carrier:	Dish

When inputting thickness values, include all decimal places.

Tower Section #	Section Elevations *(ft)*	Type of Shape [1]	Diameter [2] *(in)*	Web Length [3] *(in)*	Flange Length [3] *(in)*	Thickness *(in)*	F_y *(ksi)*	B/B Spacing (in.)
1	0.000-25.00	2L		5	3.5	0.375	33	
2	25.00-50.00	2L		4	3	0.3125	33	
3	50.00-75.00	2L		3.5	3	0.3125	33	
4	75.00-100.0	2L		3.5	3	0.3125	33	
5	100.0-125.0	2L		3.5	3	0.3125	33	
6	125.0-150.0	2L		3.5	3	0.3125	33	
7	150.0-175.0	2L		3	3	0.3125	33	
8	175.0-200.0	2L		3.5	2.5	0.3125	33	
9	200.0-225.0	2L		3	2.5	0.25	33	
10	225.0-250.0	2L		3	2.5	0.25	33	
11	250.0-262.5	2L		2.5	2.5	0.25	33	
12	262.5-275.0	2L		2.5	2.5	0.25	33	
13	275.0-287.5	2L		2.5	2.5	0.25	33	
14	287.5-300.0	2L		3	2.5	0.25	33	
15	300.0-312.5	2L		3	2.5	0.25	33	
16	312.5-325.0	2L		3	2.5	0.25	33	
17	325.0-337.5	2L		3.5	3	0.3125	33	
18	337.5-350.0	L		6	3.5	0.5	33	
19	350.0-351.0	2L		3.5	3.5	0.3125	33	
20	351.0-358.0	2L		2.5	2	0.25	33	
21	358.0-365.0	2L		2.5	2	0.25	33	

Notes:

[1] Type of Horizontal Shape: **R** = Round, **L** = Single-Angle, **2L** = Double-Angle, **C** = Channel, **W** = W Shape

[2] Applies to Pipes and Solid Round Shapes only. For Solid Round Shapes Thickness Equals Zero.

[3] Applies to Single-Angle and Double-Angle Shapes only.

[4] Applies to Double-Angle Shapes only.

[5] Applies to Single-Angle Shapes only.

Built-up Diagonals

Site No.:	88010
Engineer:	asp
Date:	adam.pittman
Carrier:	Dish

When inputting thickness values, include all decimal places.
Input diags. from left to center & from base section upward.

Tower Built-up Diag. #	Section Elevations (ft)	Type of Shape [1]	Diameter [2] (in)	Web Length [3] (in)	Flange Length [3] (in)	Thickness (in)	F_y (ksi)
1	0.000-25.00	2L		3.5	3	0.25	33
2	0.000-25.00	2L		5	3.5	0.4375	33
3	25.00-50.00	2L		3.5	3	0.25	33
4	25.00-50.00	2L		4	3	0.375	33
5	50.00-75.00	2L		3.5	2.5	0.25	33
6	50.00-75.00	2L		4	3	0.3125	33
7	75.00-100.0	2L		3.5	2.5	0.25	33
8	75.00-100.0	2L		4	3	0.3125	33
9	100.0-125.0	2L		2.5	2	0.25	33
10	100.0-125.0	2L		3.5	2.5	0.25	33
11	100.0-125.0	2L		3.5	3	0.3125	33
12	125.0-150.0	2L		2.5	2	0.25	33
13	125.0-150.0	2L		3	2.5	0.25	33
14	125.0-150.0	2L		3	3	0.3125	33
15	150.0-175.0	2L		2.5	2	0.25	33
16	150.0-175.0	2L		3	2	0.25	33
17	150.0-175.0	2L		3	3	0.25	33

Notes:

[1] Type of Diagonal Shape: **R** = Round, **L** = Single-Angle or **2L** = Double-Angle.

[2] Applies to Pipes and Solid Round Shapes only. For Solid Round Shapes Thickness Equals Zero.

[3] Applies to Single-Angle and Double-Angle Shapes only.

[4] Applies to Double-Angle Shapes only.

[5] Applies to Single-Angle Shapes only.

Built-up Horizontals

Site No.:	88010
Engineer:	asp
Date:	adam.pittman
Carrier:	Dish

When inputting thickness values, include all decimal places.

Tower Section #	Section Elevations *(ft)*	Type of Shape [1]	Diameter [2] *(in)*	Web Length [3] *(in)*	Flange Length [3] *(in)*	Thickness *(in)*	F_y *(ksi)*	Is Horiz. Tension Only? *(Y/N)*
1	0.000-25.00	2L		3	4	0.3125	33	Y
2	25.00-50.00	2L		3	4	0.3125	33	Y
3	50.00-75.00	2L		3	4	0.3125	33	Y
4	75.00-100.0	2L		3	4	0.3125	33	Y
5	100.0-125.0	2L		3	4	0.3125	33	Y
6	125.0-150.0	2L		3	3.5	0.3125	33	Y
7	150.0-175.0	2L		3	3	0.25	33	Y

Notes:

[1] Type of Horizontal Shape: **R** = Round, **L** = Single-Angle or **2L** = Double-Angle.

[2] Applies to Pipes and Solid Round Shapes only. For Solid Round Shapes Thickness Equals Zero.

[3] Applies to Single-Angle and Double-Angle Shapes only.

[4] Applies to Double-Angle Shapes only.

[5] Applies to Single-Angle Shapes only.

Coax (p. 1 of 2)

Orig by MED, Improved by ABL. Last update 6/25/13 MED

Site No.:	88010
Engineer:	asp
Date:	adam.pittman
Carrier:	Dish

Description	From (ft)	To (ft)	Quantity	Shape	Width or Diameter** (in)	Perimeter (in)	Unit Weight (lb/ft)	In Face Zone? (Yes/No)	Include in Wind Load (Yes/No)
1 Ladder	0	365	1	Flat	1.500	6.0	6	No	Yes
2 Coax Cage	8.33	33.33	3	Round	12.000	37.7	25	Yes	Yes
3 Coax Cage	8.33	33.33	3	Round	12.000	37.7	25	Yes	Yes
4 Coax Cage	8.33	33.33	1	Round	12.000	37.7	25	Yes	Yes
5 Coax Cage	8.33	33.33	1	Round	12.000	37.7	25	Yes	Yes
7 WG	5	365	2	Flat	1.500	6.0	6	Yes	Yes
8 Eversource Energy	5	365	1	Round	1.090	3.4	0.33	Yes	Yes
9 Eversource Energy	5	365	2	Round	1.980	6.2	0.82	Yes	Yes
10 Marcus Communications LLC	5	365	5	Round	1.550	4.9	0.63	Yes	Yes
11 US Dept Of Homeland Security	5	365	2	Round	1.090	3.4	0.33	Yes	Yes
12 Eversource Energy	5	365	1	Round	0.630	2.0	0.15	No	No
13 Marcus Communications LLC	5	339	1	Round	0.630	3.2	0.3	No	No
14 Marcus Communications LLC	5	329	1	Round	1.090	3.4	0.33	Yes	Yes
15 Sigfox S.A.	5	315	1	Round	1.090	3.4	0.33	Yes	Yes
16 Eversource Energy	5	301	2	Round	2.200	6.9	0.68	Yes	Yes
17 US Dept Of Homeland Security	5	289	1	Round	1.090	3.4	0.33	Yes	Yes
18 Sprint Nextel	5	288	2	Round	1.980	6.2	0.82	Yes	Yes
19 US Dept Of Homeland Security	5	260	1	Round	1.090	3.4	0.33	Yes	Yes
20 US Dept Of Homeland Security	5	247	1	Round	1.090	3.4	0.33	Yes	Yes
21 Sprint Nextel	5	235	4	Round	1.980	6.2	0.82	Yes	Yes
22 Eversource Energy	5	181	1	Round	1.090	3.4	0.33	Yes	Yes
23 Eversource Energy	5	180	1	Round	1.090	3.4	0.33	Yes	Yes
24 Eversource Energy	5	176	1	Round	1.090	3.4	0.33	Yes	Yes
25 Dish	5	200	1	Round	1.600	5.0	2.34	Yes	Yes

**Note: *Actual block width multiplied by 0.75 (1.5 block drag factor actual divided by 2.0 flat*

Coax (p. 2 of 2)

Site No.:	88010
Engineer:	asp
Date:	adam.pittman
Carrier:	Dish

Exposure B

Tia Code: TIA-222-H **Topo Cat:** 1

f

Ke 0.978868

α 7 $k_{z\ max}$ 2.01

z_g 1200 $k_{z\ min}$ 0.7

K_c 0.9 K_t

Description	From (ft)	To (ft)	Quantity	Face # (1-4, A-D)	Coax Width (in)	Coax Shape (Block / Flat / Ind)	% Exposed	Spacing (in)	Shape (Round/Flat)	Block Width (# coax)	Block Depth (# coax)	Perimeter (in)	Unit Weight (lb/ft)	In Face Zone (Yes/No)	Include in Wind Load (Yes/No)
Ladder	0	365	1	B	1.50	Flat	100	1	Flat	1	1	6.0	6	No	Yes
Coax Cage	8.33	33.33	3	1	12.00	Ind	100	1	Round	3	1	37.7	25	Yes	Yes
Coax Cage	8.33	33.33	3	3	12.00	Ind	100	1	Round	3	1	37.7	25	Yes	Yes
Coax Cage	8.33	33.33	1	2	12.00	Ind	100	1	Round	1	1	37.7	25	Yes	Yes
Coax Cage	8.33	33.33	1	4	12.00	Ind	100	1	Round	1	1	37.7	25	Yes	Yes
								1						No	No
WG	5	365	2	3	1.50	Flat	100	1	Flat	2	1	6.0	6	Yes	Yes
Eversource Energy	5	365	1	4	1.09	Ind	100	1	Round	1	1	3.4	0.33	Yes	Yes
Eversource Energy	5	365	2	4	1.98	Ind	100	1	Round	2	1	6.2	0.82	Yes	Yes
Marcus Communications LLC	5	365	5	3	1.55	Ind	100	1	Round	5	1	4.9	0.63	Yes	Yes
US Dept Of Homeland Security	5	365	2	4	1.09	Ind	100	1	Round	2	1	3.4	0.33	Yes	Yes
Eversource Energy	5	365	1	4	0.63	Ind	0	1	Round	1	1	2.0	0.15	Yes	No
Marcus Communications LLC	5	339	2	3	0.63	Ind	0	1	Round	1	2	3.2	0.3	Yes	No
Marcus Communications LLC	5	329	1	3	1.09	Ind	100	1	Round	1	1	3.4	0.33	Yes	Yes
Sigfox S.A.	5	315	1	4	1.09	Ind	100	1	Round	1	1	3.4	0.33	Yes	Yes
Eversource Energy	5	301	2	4	2.20	Ind	100	1	Round	2	1	6.9	0.68	Yes	Yes
US Dept Of Homeland Security	5	289	1	4	1.09	Ind	100	1	Round	1	1	3.4	0.33	Yes	Yes
Sprint Nextel	5	288	2	2	1.98	Ind	100	1	Round	2	1	6.2	0.82	Yes	Yes
US Dept Of Homeland Security	5	260	1	4	1.09	Ind	100	1	Round	1	1	3.4	0.33	Yes	Yes
US Dept Of Homeland Security	5	247	1	4	1.09	Ind	100	1	Round	1	1	3.4	0.33	Yes	Yes
Sprint Nextel	5	235	4	2	1.98	Ind	100	1	Round	4	1	6.2	0.82	Yes	Yes
Eversource Energy	5	181	1	4	1.09	Ind	100	1	Round	1	1	3.4	0.33	Yes	Yes
Eversource Energy	5	180	1	4	1.09	Ind	100	1	Round	1	1	3.4	0.33	Yes	Yes
Eversource Energy	5	176	1	4	1.09	Ind	100	1	Round	1	1	3.4	0.33	Yes	Yes
Dish	5	200	1	3	1.60	Ind	100	1	Round	1	1	5.0	2.34	Yes	Yes
								1						No	No
								1						No	No
								1						No	No
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Fac

Dishes

Site No.:	88010
Engineer:	asp
Date:	adam.pittman
Carrier:	Dish

Dish Types	
S	Standard
R	Standard w/ Radome
H	High Performance
G	Grid

Dish Number	Dish Elevation (ft)	Dish Dia. (ft)	Dish Angle (deg)	Dish Type	Joint Orientation	Equipment Staus
1	339	4	0	R	XY	
2	339	4	135	R	X	
3	301	4	245	S	P	
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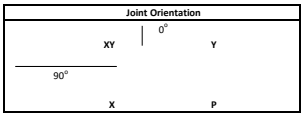
Equipment Label	Attach Label	Equipment Property Set	EIA Antenna Orientation Angle *(deg)*
4' RAD 1 @ 339'	17XY	4 ft RAD Dish	0
4' RAD 2 @ 339'	17X	4 ft RAD Dish	135
4' STD 3 @ 301'	14P	4 ft STD Dish	245

Joint Orientation



Task:	Determine Point Loads
Tower Height:	365 ft
Kzt:	0.85
Wind Speed:	120 mph,Vult
Ice Wind Speed:	50
Ice Density:	56
Tower Type:	S

Ice Thick:	1 in
Topographic Category (1-4):	1
Exposure Category (B-D):	B
Risk Category (1-4):	2
Height of Crest (H) if Topo Cat. >1:	0 ft
Load Factor, Wind:	1
Load Factor, Dead:	1.2

Rooftop Speed Up Factor (Ks)	1
Ground Elevation (AMSL)	590 ft
Topographic Factor Procedure	Method 1

Site No.:	
Engineer:	
Date:	
Carrier:	

No.	Carrier	Elevation (ft)	Quantity	# of Azimuths	Proposed?	Manufacturer	Model	Height (in)	Width (in)	Depth (in)	Weight (lbs/ea)	Flat/Round (f/R)	Reduction	C_AA_r (ft^2)	Weight (lb)	Ka
1		365	1	1				0.0001	0.0001	0.0001	0.0001	F	0.000			1
		365	1	4			Platform w/ HR						1.000	70.00	8.50	1
2		350	1	1			-	0.0001	0.0001	0.0001	0.0001	F	0.000			1
		350	1	4			Platform w/ HR						1.000	70.00	9.00	1
3		325	1	1			-	0.0001	0.0001	0.0001	0.0001	F	0.000			1
		325	1	4			Catwalk						1.000	65.00	8.00	1
4		315	1	1			-	0.0001	0.0001	0.0001	0.0001	F	0.000			1
		315	1	1			Horn Mount						1.000	10.00	0.50	1
5		300	1	1			-	0.0001	0.0001	0.0001	0.0001	F	0.000			1
		300	1	1			Rest Platform						1.000	15.00	0.50	1
6		250	1	1			-	0.0001	0.0001	0.0001	0.0001	F	0.000			1
		250	1	3			Access Platform						1.000	35.00	4.00	1
7		200	1	1			-	0.0001	0.0001	0.0001	0.0001	F	0.000			1
		200	1	1			Rest Platform						1.000	15.00	0.50	1
8		150	1	1			-	0.0001	0.0001	0.0001	0.0001	F	0.000			1
		150	1	1			Rest Platform						1.000	15.00	0.50	1
9		125	1	1			-	0.0001	0.0001	0.0001	0.0001	F	0.000			1
		125	1	3			Access Platform						1.000	45.00	5.00	1
10		100	1	1			-	0.0001	0.0001	0.0001	0.0001	F	0.000			1
		100	1	1			Rest Platform						1.000	15.00	0.50	1
11																1
																1
12	Eversource Energy	376	1	1			-	0.0001	0.0001	0.0001	0.0001	F	0.000			1
	Eversource Energy	376	1	1		Kreco	CO-41A						1.000	4.20	0.01	1
13	Other	374	1	1			-	0.0001	0.0001	0.0001	0.0001	F	0.000			1
	Other	374	1	1			20' Dipole						1.000	7.52	0.06	1
14	Eversource Energy	373	1	1		dbSpectra	DSNADPF36D-N	230.4	3.2	3.2	47	R	1.000			1
	Marcus Communications LLC	373	1	3		TX RX Systems	101-6B-10-K-03N						1.000	5.53	0.07	1
15	US Dept Of Homeland Security	372	1	1			-	0.0001	0.0001	0.0001	0.0001	F	0.000			1
	US Dept Of Homeland Security	372	1	1		Rohde & Schwarz	ADD090						1.000	20.76	0.09	1
16	Eversource Energy	366	1	1			-	0.0001	0.0001	0.0001	0.0001	F	0.000			1
	Eversource Energy	366	1	1		Bird	429-B3H-01-T						1.000	0.92	0.02	1
17	Marcus Communications LLC	329	1	1			10' Omni	120	3	3	25	R	1.000			1
	Marcus Communications LLC	329	1	1			Round Side Arm						1.000	5.20	0.15	1
18	Siglos S.A.	315	1	1		Procom	CXL 900-3LW	27.6	0.6	0.6	1.5	R	1.000			1
	Siglos S.A.	315	1	1			5" x 3" x 2" Cavity Filter						1.000	0.17	0.00	1
19	Siglos S.A.	315	1	1			Low Noise Amplifier	5	4	2	2	F	1.000			1
	Siglos S.A.	315	1	1			Flat Side Arm						1.000	6.30	0.15	1
20	Other	296	1	1			-	0.0001	0.0001	0.0001	0.0001	F	0.000			1
	Other	296	1	1			20' FM						1.000	21.12	0.60	1
21	US Dept Of Homeland Security	289	1	1		Sinclair	SC281-L	251	5	5	79	R	1.000			1
	US Dept Of Homeland Security	289	1	1			Round Side Arm						1.000	5.20	0.15	1
22	Sprint Nextel	288	2	1		Andrew	DB844H90E-XY	48	6.5	8	14	F	1.000			0.9
	Sprint Nextel	288	1	1			Flat Sector Frame						1.000	17.90	0.40	1
23	US Dept Of Homeland Security	260	1	1		Sinclair	SC281-L	251	5	5	79	R	1.000			1
	US Dept Of Homeland Security	260	1	1			Round Side Arm						1.000	5.20	0.15	1
24	US Dept Of Homeland Security	247	1	1		Sinclair	SC281-L	251	5	5	79	R	1.000			1
	US Dept Of Homeland Security	247	1	1			Round Side Arm						1.000	5.20	0.15	1
25	Sprint Nextel	235	2	2		Decibel	DB844H90E-XY	48	6.5	8	14	F	0.610			0.9
	Sprint Nextel	235	2	2		Andrew	B44G65VTZASX						1.000	5.31	0.02	0.9
26	Sprint Nextel	235	1	1			-	0.0001	0.0001	0.0001	0.0001	F	0.000			1
	Sprint Nextel	235	2	2			Flat Sector Frame						0.900	17.90	0.40	0.9
27	Eversource Energy	181	1	1			-	0.0001	0.0001	0.0001	0.0001	F	0.000			1
	Eversource Energy	181	1	1		Comprod	531-70HD						1.000	5.98	0.04	1
28	Eversource Energy	180	1	1		Telewave	ANT450F6	94	2.3	2.3	21	R	1.000			1
	Eversource Energy	180	1	1			Round Side Arm						1.000	5.20	0.15	1
29	Eversource Energy	176	1	1		Kreco	CO-41A	168	3	3	14	R	1.000			1
	Eversource Energy	176	1	1			Round Side Arm						1.000	5.20	0.15	1
30	DISH WIRELESS L.L.C.	200	1	1	Proposed	Commscope	RDIDC-9181-PF-48	16	14	8	21.9	F	0.500			0.8
	DISH WIRELESS L.L.C.	200	3	3			Flat Sector Frames						0.750	17.90	0.40	0.75
31	DISH WIRELESS L.L.C.	200	3	3	Proposed	Fujitsu	TA08025-B605	15.7	15	9.1	75	F	0.500			0.8
	DISH WIRELESS L.L.C.	200	1	1			-						0.001	0.00	0.00	0.8
32	DISH WIRELESS L.L.C.	200	3	3	Proposed	Fujitsu	TA08025-B604	15.7	15	7.9	63.9	F	0.500			0.8
	DISH WIRELESS L.L.C.	200	1	1			-						0.001	0.00	0.00	0.8
33	DISH WIRELESS L.L.C.	200	3	3	Proposed	JMA Wireless	MX08FRO665-21	72	20	8	64.5	F	0.640			0.8
	DISH WIRELESS L.L.C.	200	1	1			-						0.001	0.00	0.00	0.8
34																1
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35																1
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No.	Elevation (ft)	C_AA_r (ft^2)	C_AA_r (Ice) (ft^2)	Force (lb)	Force (Ice) (lb)	Weight (lb)	Weight (Ice) (lb)	60 Azi Mult.	Force mean	F (Ice) mean	Height Flag	Sum of Forces (No Ice) 60 Azi.	Sum of Forces (No Ice) 120 Azi.
1	365	0.00	0.00	0.000	0.000	0	0	1.00	**0.00**	**0.00**			
	365	70.00	94.50	2610.817	611.910	10200	13260	1.00	**1435.95**	**336.55**	1.5027397	2610.816508	
2	350	0.00	0.00	0.000	0.000	0	0	1.00	**0.00**	**0.00**	1.5027407		
	350	70.00	94.50	2579.700	604.617	10800	14040	1.00	**1418.84**	**332.54**	1.5028571	2579.700326	
3	325	0.00	0.00	0.000	0.000	0	0	1.00	**0.00**	**0.00**	1.5028581		
	325	65.00	87.75	2345.249	549.668	9600	12480	1.00	**1289.89**	**302.32**	1.5030769	2345.248956	
4	315	0.00	0.00	0.000	0.000	0	0	1.00	**0.00**	**0.00**	1.5030779		
	315	10.00	13.50	357.600	83.813	600	780	1.00	**196.68**	**46.10**	1.5031746	357.600115	
5	300	0.00	0.00	0.000	0.000	0	0	1.00	**0.00**	**0.00**	1.5031756		
	300	15.00	20.25	528.975	123.978	600	780	1.00	**290.94**	**68.19**	1.5033333	528.9746055	
6	250	0.00	0.00	0.000	0.000	0	0	1.00	**0.00**	**0.00**	1.5033343		
	250	35.00	47.25	1171.624	274.599	4800	6240	1.00	**644.39**	**151.03**	1.5040000	1171.624367	
7	200	0.00	0.00	0.000	0.000	0	0	1.00	**0.00**	**0.00**	1.5040010		
	200	15.00	20.25	471.111	110.417	600	780	1.00	**259.11**	**60.73**	1.5050000	471.1107726	
8	150	0.00	0.00	0.000	0.000	0	0	1.00	**0.00**	**0.00**	1.5050010		
	150	15.00	20.25	433.937	101.704	600	780	1.00	**238.67**	**55.94**	1.5066667	433.9365714	
9	125	0.00	0.00	0.000	0.000	0	0	1.00	**0.00**	**0.00**	1.5066677		
	125	45.00	60.75	1235.732	289.625	6000	7800	1.00	**679.65**	**159.29**	1.5080000	1235.732005	
10	100	0.00	0.00	0.000	0.000	0	0	1.00	**0.00**	**0.00**	1.5080010		
	100	15.00	20.25	386.469	90.579	600	780	1.00	**212.56**	**49.82**	1.5100000	386.4688234	
11					#VALUE!			1.00	**#VALUE!**	**#VALUE!**	1.5100010		
								1.00	**#VALUE!**	**#VALUE!**	#DIV/0!	#VALUE!	
12	376	0.00	0.00	0.000	0.000	0	0	1.00	**0.00**	**0.00**	#DIV/0!		
	376	4.20	5.67	157.984	37.027	17	22	1.00	**86.89**	**20.37**	1.5026596	157.9835544	
13	374	0.00	0.00	0.000	0.000	0	0	1.00	**0.00**	**0.00**	1.5026606		
	374	7.52	10.15	282.435	66.196	72	94	1.00	**155.34**	**36.41**	1.5026738	282.4350862	
14	373	6.14	10.07	230.579	65.615	56	276	1.00	**126.82**	**36.09**	1.5026748		
	373	16.59	22.40	622.808	145.924	252	328	1.00	**342.43**	**80.26**	1.5026810	853.1874175	
15	372	0.00	0.00	0.000	0.000	0	0	1.00	**0.00**	**0.00**	1.5026820		
	372	20.76	28.03	778.508	182.463	106	138	1.00	**428.18**	**100.35**	1.5026882	778.5075407	
16	366	0.00	0.00	0.000	0.000	0	0	1.00	**0.00**	**0.00**	1.5026892		
	366	0.92	1.24	34.340	8.049	24	31	1.00	**18.89**	**4.43**	1.5027322	34.3404221	
17	329	3.00	5.03	108.621	31.599	30	138	1.00	**59.74**	**17.38**	1.5027332		
	329	5.20	7.02	188.277	44.127	180	234	1.00	**103.55**	**24.27**	1.5030395	296.8980292	
18	315	0.14	0.48	4.395	2.978	2	11	1.00	**2.71**	**1.64**	1.5030405		
	315	0.17	0.23	6.079	1.425	2	2	1.00	**3.34**	**0.78**	1.5031746	11.01408354	
19	315	0.17	0.41	5.960	2.535	2	7	1.00	**3.28**	**1.39**	1.5031756		
	315	6.30	8.51	225.288	52.802	180	234	1.00	**123.91**	**29.04**	1.5031746	242.2621579	
20	296	0.00	0.00	0.000	0.000	0	0	1.00	**0.00**	**0.00**	1.5031756		
	296	21.12	28.51	741.945	173.893	720	936	1.00	**408.07**	**95.64**	1.5033784	741.9453107	
21	289	10.46	14.76	364.897	89.397	95	430	1.00	**200.69**	**49.17**	1.5033794		
	289	5.20	7.02	181.431	42.523	180	234	1.00	**99.79**	**23.39**	1.5034602	546.3284763	
22	288	6.72	8.75	234.233	52.950	34	124	1.00	**128.83**	**29.12**	1.5034612		
	288	17.90	24.17	623.923	146.232	480	624	1.00	**343.16**	**80.43**	1.5034722	858.1560151	
23	260	10.46	14.76	354.038	86.736	95	427	1.00	**196.72**	**47.71**	1.5034732		
	260	5.20	7.02	176.031	41.257	180	234	1.00	**96.82**	**22.69**	1.5038462	530.06918	
24	247	10.46	14.76	348.887	85.475	95	425	1.00	**191.89**	**47.01**	1.5038472		
	247	5.20	7.02	173.471	40.657	180	234	1.00	**95.41**	**22.36**	1.5040486	522.3575418	
25	235	4.10	5.34	134.816	30.476	34	123	1.00	**74.15**	**16.76**	1.5040496		
	235	9.56	12.90	282.912	66.308	38	50	1.00	**155.60**	**36.47**	1.5042553	417.7285787	
26	235	0.00	0.00	0.000	0.000	0	0	1.00	**0.00**	**0.00**	1.5042563		
	235	29.00	39.15	858.328	201.171	960	1248	1.00	**472.08**	**110.64**	1.5042553	1276.056322	
27	181	0.00	0.00	0.000	0.000	0	0	1.00	**0.00**	**0.00**	1.5042563		
	181	5.98	8.07	182.535	42.782	52	67	1.00	**100.39**	**23.53**	1.5055249	182.5352899	
28	180	1.80	3.27	54.908	17.300	25	91	1.00	**30.20**	**9.51**	1.5055259		
	180	5.20	7.02	158.475	37.143	180	234	1.00	**87.16**	**20.43**	1.5055556	213.3829124	
29	176	4.20	7.08	127.180	37.238	17	152	1.00	**69.95**	**20.48**	1.5055566		
	176	5.20	7.02	157.461	36.905	180	234	1.00	**86.60**	**20.30**	1.5056818	284.6410521	
30	200	0.75	1.12	23.451	6.107	26	72	1.00	**12.90**	**3.36**	1.5056828		
	200	30.21	40.78	711.524	166.764	1440	1872	1.00	**391.34**	**91.72**	1.5050000	734.9753361	
31	200	2.36	3.51	73.964	19.142	270	367	1.00	**40.68**	**10.53**	1.5050010		
	200	0.00	0.00	0.000	0.000	1	2	1.00	**0.00**	**0.00**	1.5050000	808.9397475	
32	200	2.36	3.51	73.964	19.142	230	318	1.00	**40.68**	**10.53**	1.5050010		
	200	0.00	0.00	0.000	0.000	1	2	1.00	**0.00**	**0.00**	1.5050000	882.9041589	
33	200	19.18	24.31	602.486	132.562	232	518	1.00	**331.37**	**72.91**	1.5050010		
	200	0.00	0.00	0.000	0.000	1	2	1.00	**0.00**	**0.00**	1.5050000	1485.389949	
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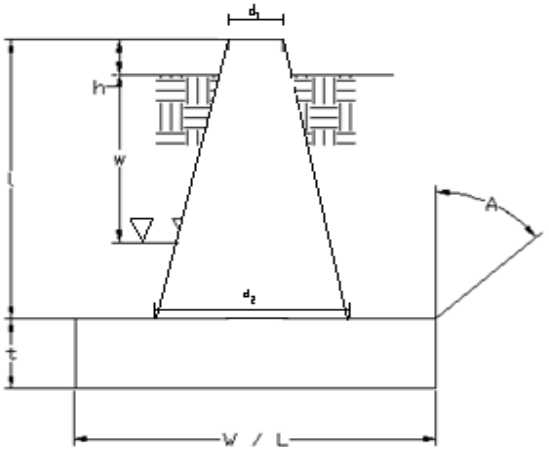
Foundation

Site No.:	88010
Engineer:	asp
Date:	adam.pittman
Carrier:	Dish

Design Loads (Factored)

Compression/Leg:	479.86	k
Uplift/Leg:	298.01	k
Shear/Leg	80.35	k

Face Width @ Top of Pier (d_1):	4.00	ft
Face Width @ Bottom of Pier (d_2):	8.00	ft
Total Length of Pier (l):	8.50	ft
Height of Pedestal Above Ground (h):	0.50	ft
Width of Pad (W):	18.50	ft
Length of Pad (L):	18.50	ft
Thickness of Pad (t):	4.08	ft
Water Table Depth (w):	3.50	ft
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Soil (Above Water Table):	100.0	pcf
Unit Weight of Soil (Below Water Table):	37.6	pcf
Friction Angle of Uplift (A):	30	°
Ultimate Compressive Bearing Pressure:	20000	psf
Ultimate Skin Friction:	155	psf



Volume Pier (Total):	317.33	ft³
Volume Pad (Total):	1396.38	ft³
Volume Soil (Total):	3975.03	ft³
Volume Pier (Buoyant):	218.49	ft³
Volume Pad (Buoyant):	1396.38	ft³
Volume Soil (Buoyant):	1786.02	ft³
Weight Pier:	33.97	k
Weight Pad:	122.32	k
Weight Soil:	286.06	k
Uplift Skin Friction:	35.10	k

Uplift Check

ϕs Uplift Resistance (k)	Ratio	Result
358.08	0.83	**OK**

Axial Check

ϕs Axial Resistance (k)	Ratio	Result
5133.75	0.09	**OK**

Anchor Bolt Check

Bolt Diameter (in)	2.25
# of Bolts	6
Steel Grade	A36
Steel Fy	36
Steel Fu	58
Detail Type	C

Usage Ratio	Result
0.49	**OK**

MOUNT ANALYSIS REPORT

August 16, 2021

Dish Wireless Site Name	BOBOS00029A
Dish Wireless Site Number	BOBOS00029A
ATC Site Name	-
ATC Site Number	89556
Infinigy Job Number	1197-F0001-C
Client	ATC
Carrier	Dish Wireless
Site Location	373 Chamberlain Hill Rd Haddam, CT 06438 Middlesex County 41.49585800 N NAD83 72.61783889 W NAD83
Mount Type	8.0 ft Sector Frames
Mount Elevation	200.0 ft AGL
Structural Usage Ratio	**43.8**
Overall Result	**Pass**

The enclosed mount structural analysis has been performed in accordance with the 2018 Connecticut State Building Code (2015 IBC) based on an ultimate 3-second gust wind speed of 130 mph. The evaluation criteria and applicable codes are presented in the next section of this report.

CONTENTS

1. INTRODUCTION

Infinigy performed a structural analysis on the Dish Wireless proposed telecommunication equipment supporting Sector Frames 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 Risa-3D version 17.0.4 analysis software.

2. DESIGN/ANALYSIS PARAMETERS

Wind Speed	130 mph (3-Second Gust)
Wind Speed w/ ice	50 mph (3-Second Gust) w/ 1.5" ice
Code / Standard	TIA-222-H
Adopted Code	2018 Connecticut State Building Code (2015 IBC)
Risk Category	II
Exposure Category	B
Topographic Category	1
Calculated Crest Height	0 ft.
Seismic Spectral Response	S_s = 0.178 g / S_1 = 0.062 g
Live Load Wind Speed	60 mph
Man Live Load at Mid/End Points	250 lbs
Man Live Load at Mount Pipes	500 lbs

3. PROPOSED LOADING CONFIGURATION - 200.0 ft. AGL Sector Frames

Antenna Centerline (ft)	Qty.	Appurtenance Manufacturers	Appurtenance Models
200.0	3	JMA WIRELESS	MX08FRO665-21
	3	FUJITSU	TA08025-B605
	3	FUJITSU	TA08025-B604
	1	RAYCAP	RDIDC-9181-PF-48

4. SUPPORTING DOCUMENTATION

Proposed Loading	Dish Wireless Asset ID CT-ATC-T-89556 Rev 2, Site #BOBDL00029A, dated May 27, 2021
Mount Manufacturer Drawings	Commscope Document # MTC3975083, dated March 17, 2021
Construction Drawings	NB+C Engineering Services, A&E Project #88010-13689461, dated August 05, 2021

5. RESULTS

Components	Capacity	Pass/Fail
Mount Pipes	27.2%	Pass
Horizontals	15.8%	Pass
Standoffs	43.8%	Pass
Connections	6.3%	Pass
MOUNT RATING =	**43.8 %**	**Pass**

Notes:
1. See additional documentation in Appendix for calculations supporting the capacity consumed and detailed mount connection calculations.

6. RECOMMENDATIONS

Infinigy recommends installing Dish Wireless's proposed equipment loading configuration on the mount at 200.0 ft. The installation shall be performed in accordance with the construction documents issued for this site.

Pradin Suinyal Magar
Project Engineer II | **INFINIGY**

7. ASSUMPTIONS

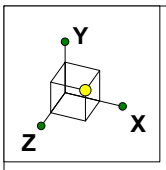
The antenna mounting system was properly fabricated, installed and maintained in accordance with its original design and manufacturer's specifications.
The configuration of antennas, mounts, and other appurtenances are as specified in the proposed loading configuration table.
All member connections are 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, Plate, Built-up Angle — ASTM A1011 36 KSI Solid Round — ASTM A529 Gr 50 Structural Angle — ASTM A529 Gr. 50 HSS (Rectangular) — ASTM A500-B GR 46 HSS (Circular) — ASTM A500-B GR 42 Pipe — ASTM A500 Gr 46 Connection Threaded Rods — ASTM A449 U-Bolts — ASTM A307
All bolted connections are pretensioned in accordance with Table 8.2 of the RCSC 2014 Standard

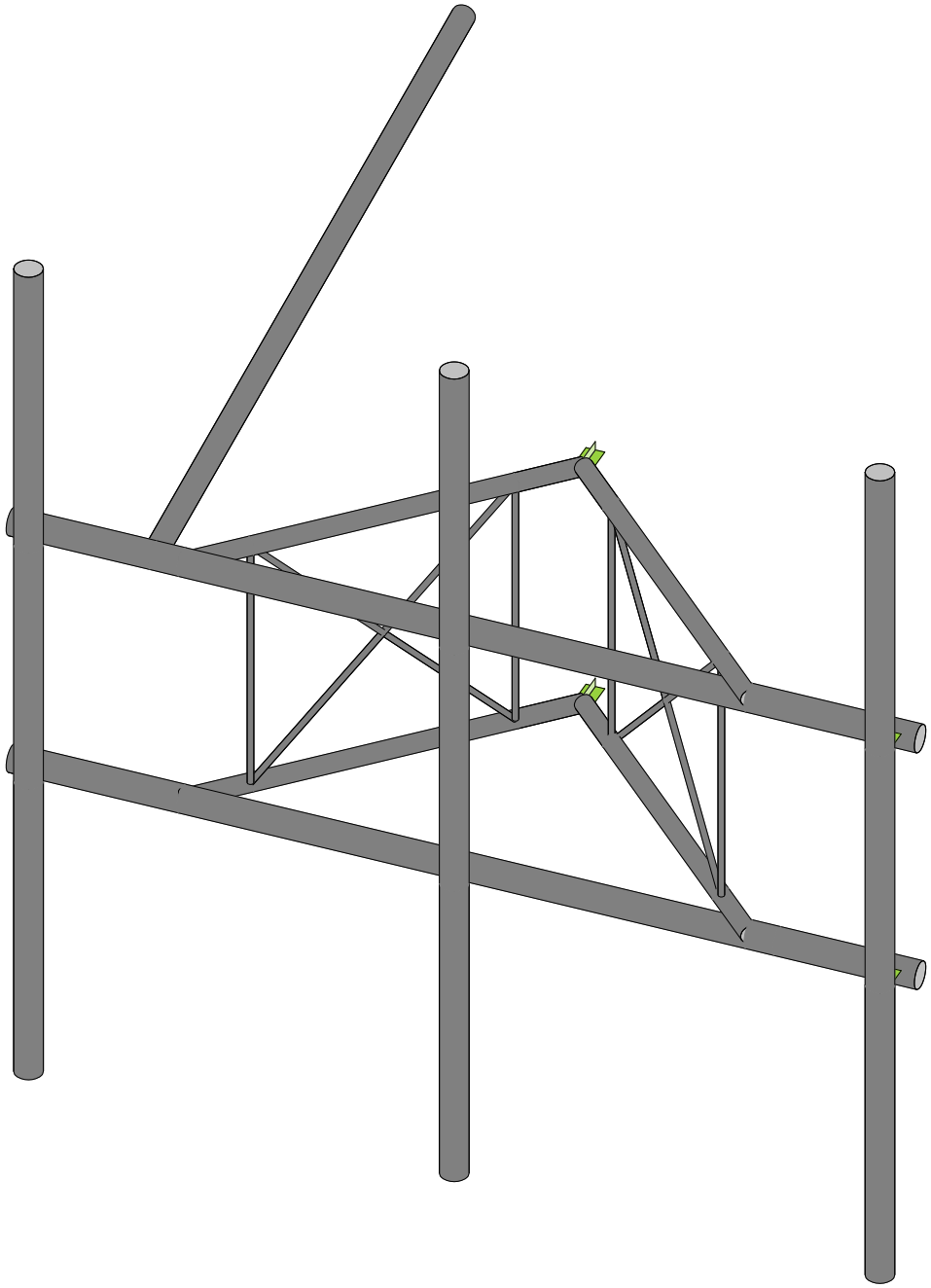
8. LIABILITY WAIVER AND LIMITATIONS

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.





Envelope Only Solution

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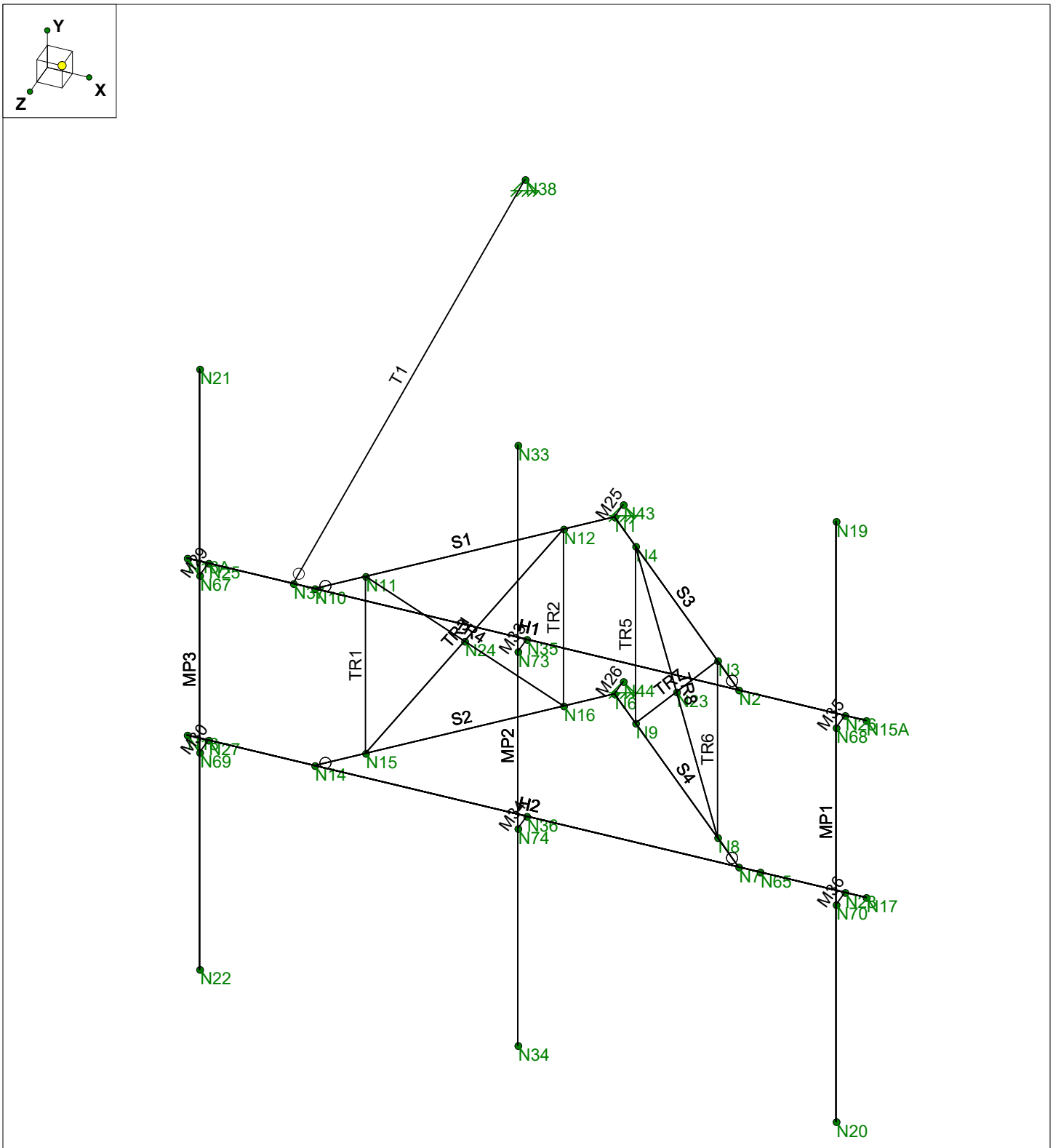

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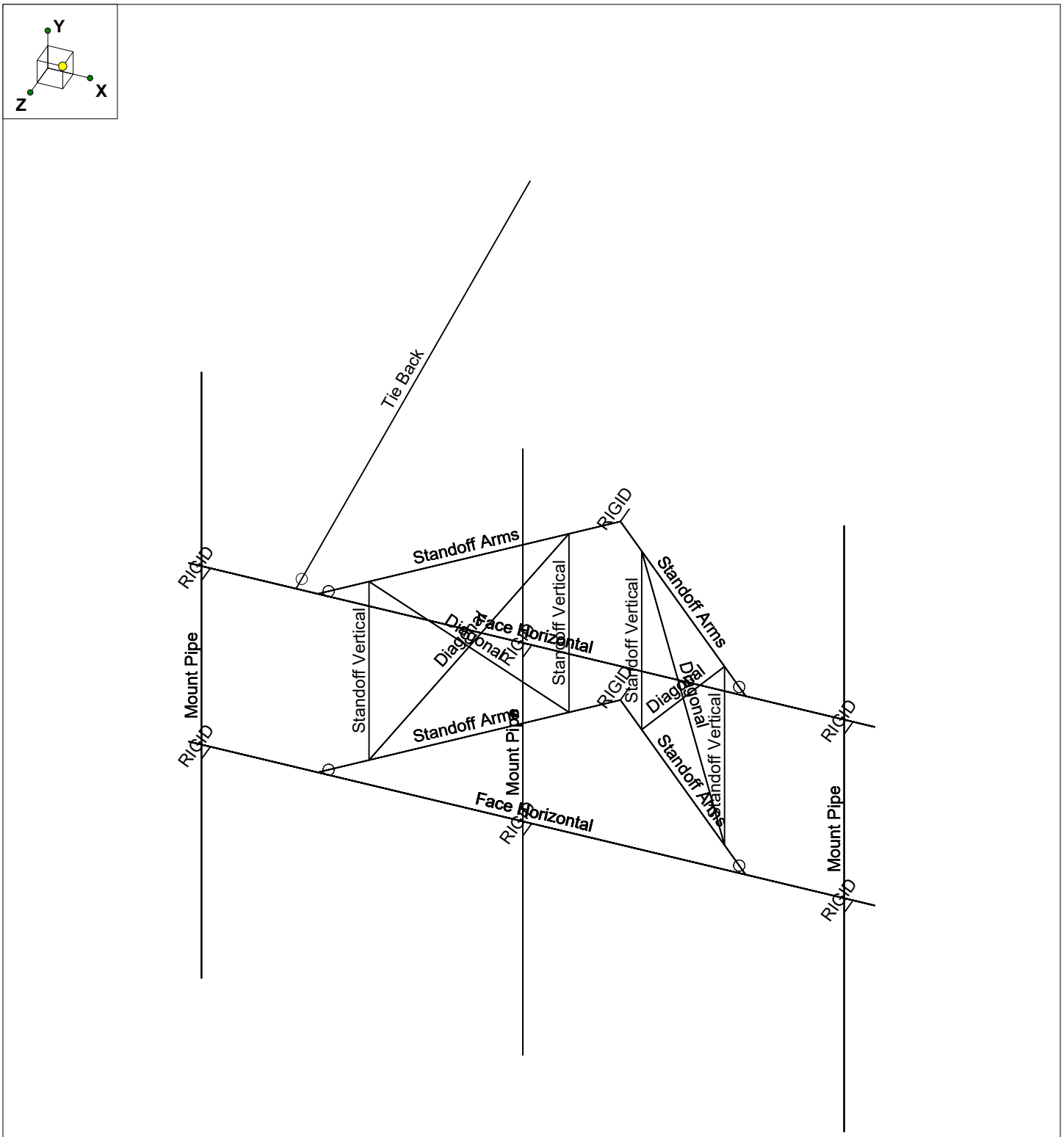

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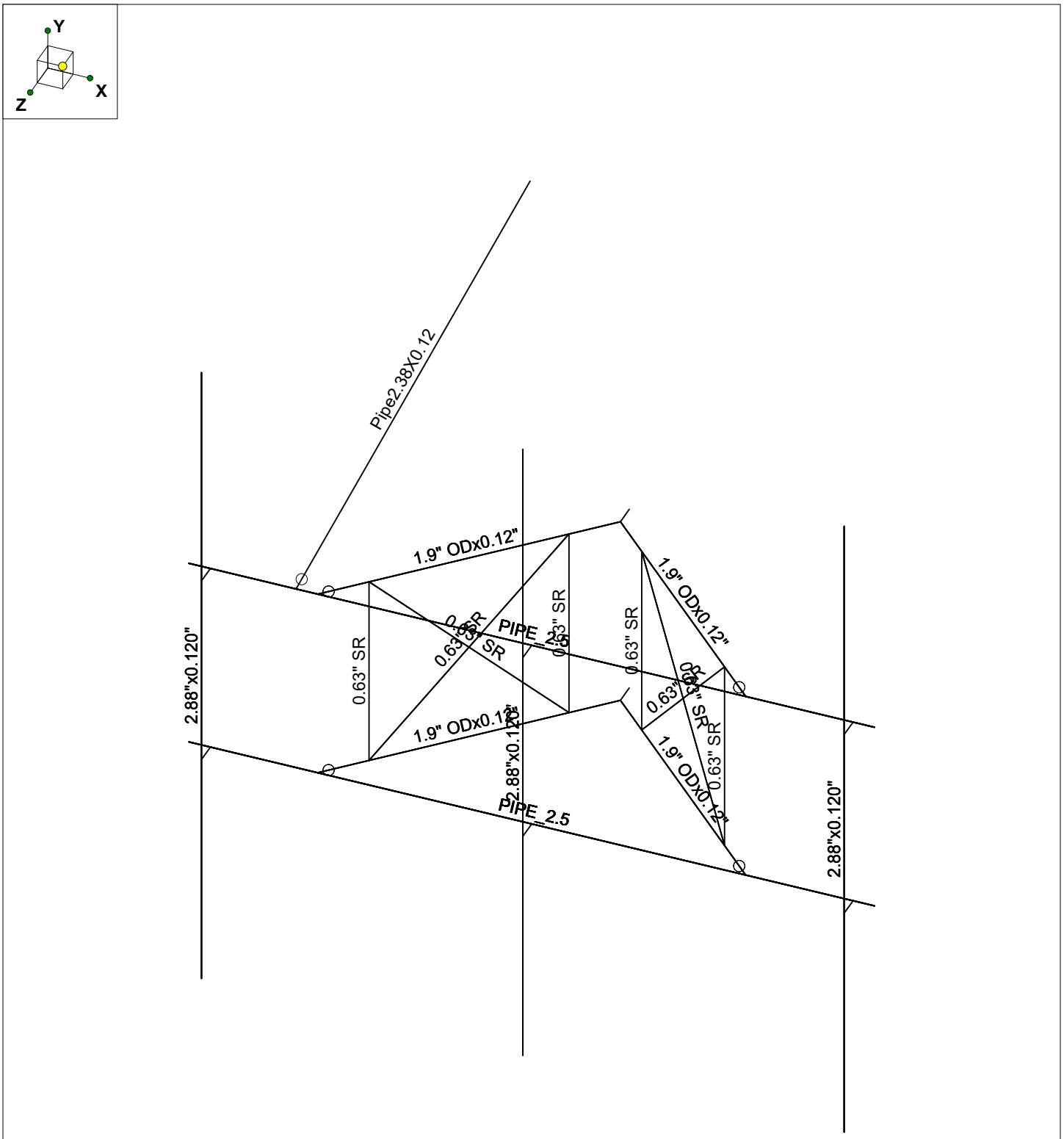

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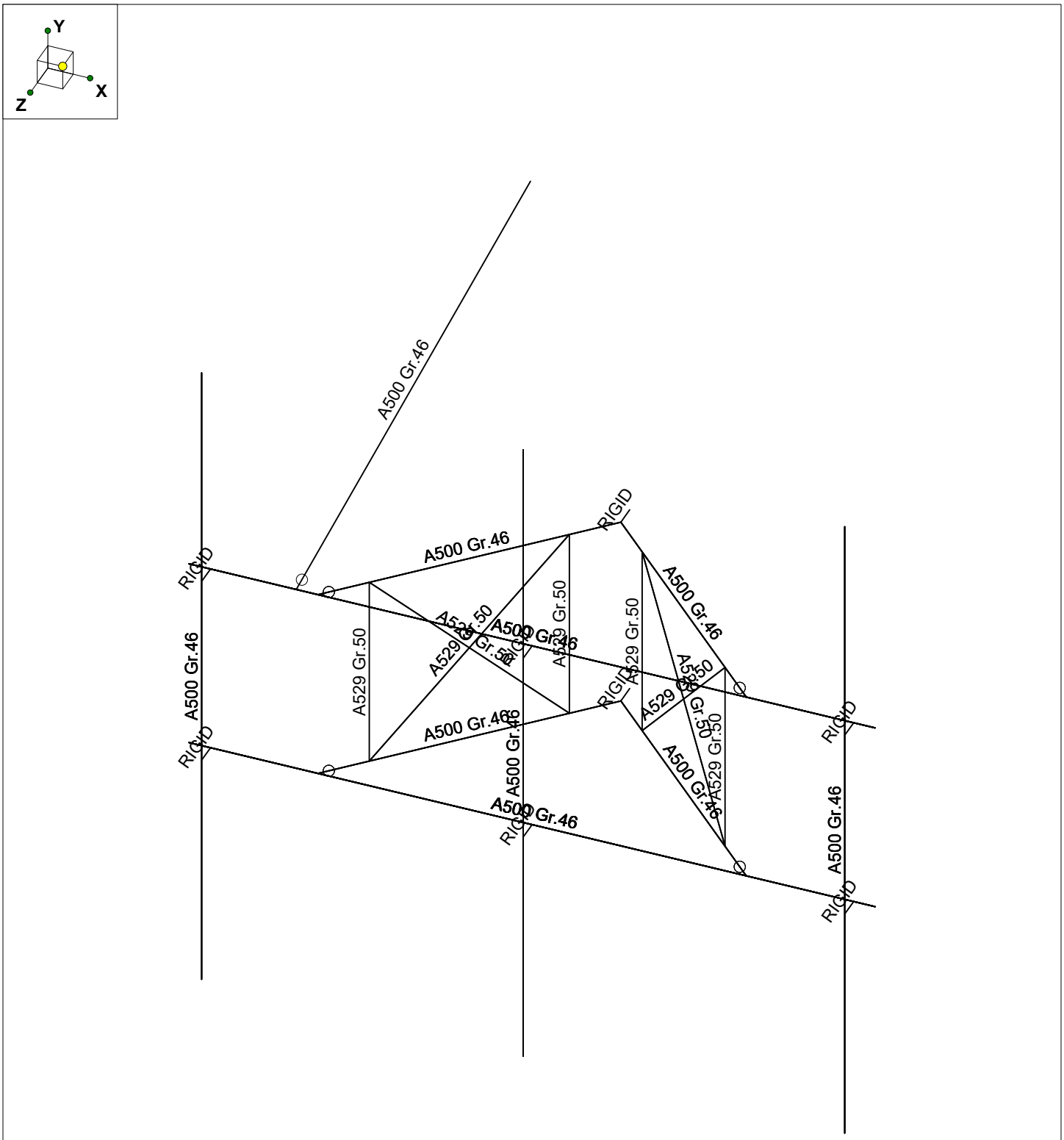

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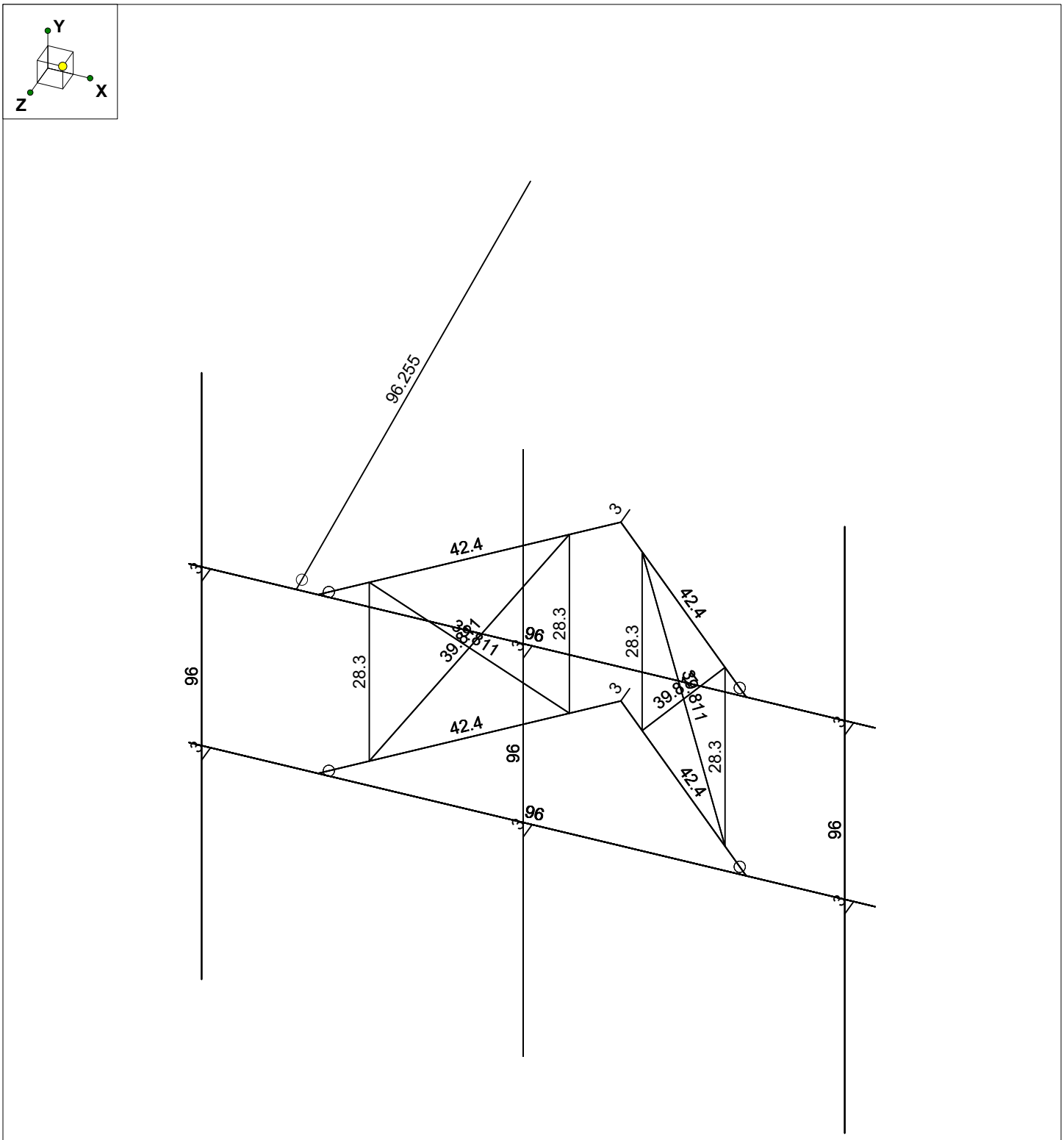

Member Length (in) Displayed
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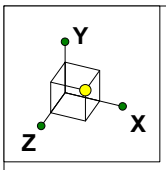

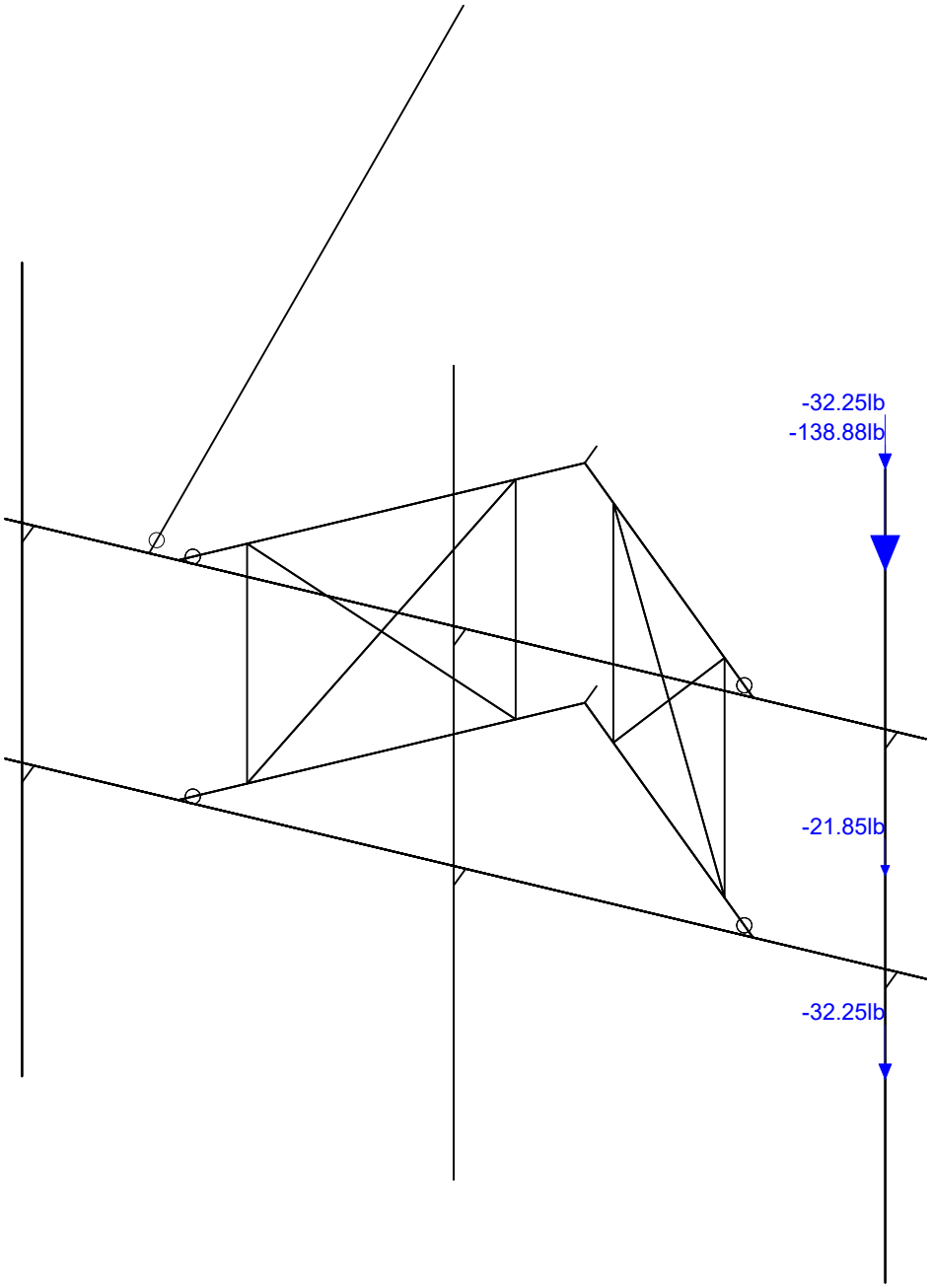

Loads: BLC 1, Self Weight
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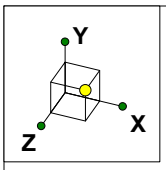

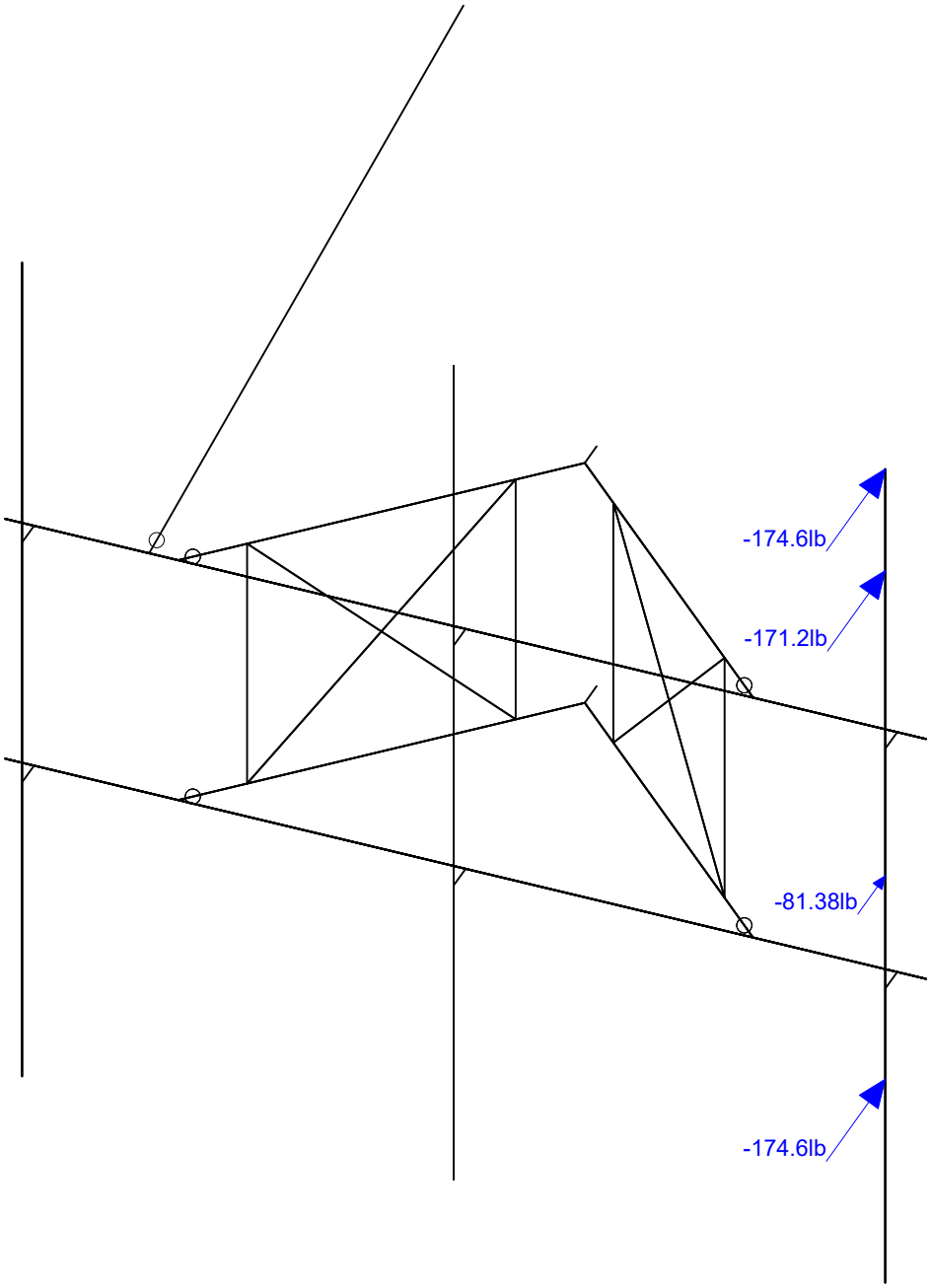

Loads: BLC 2, Wind Load AZI 0
Envelope Only Solution

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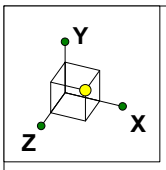

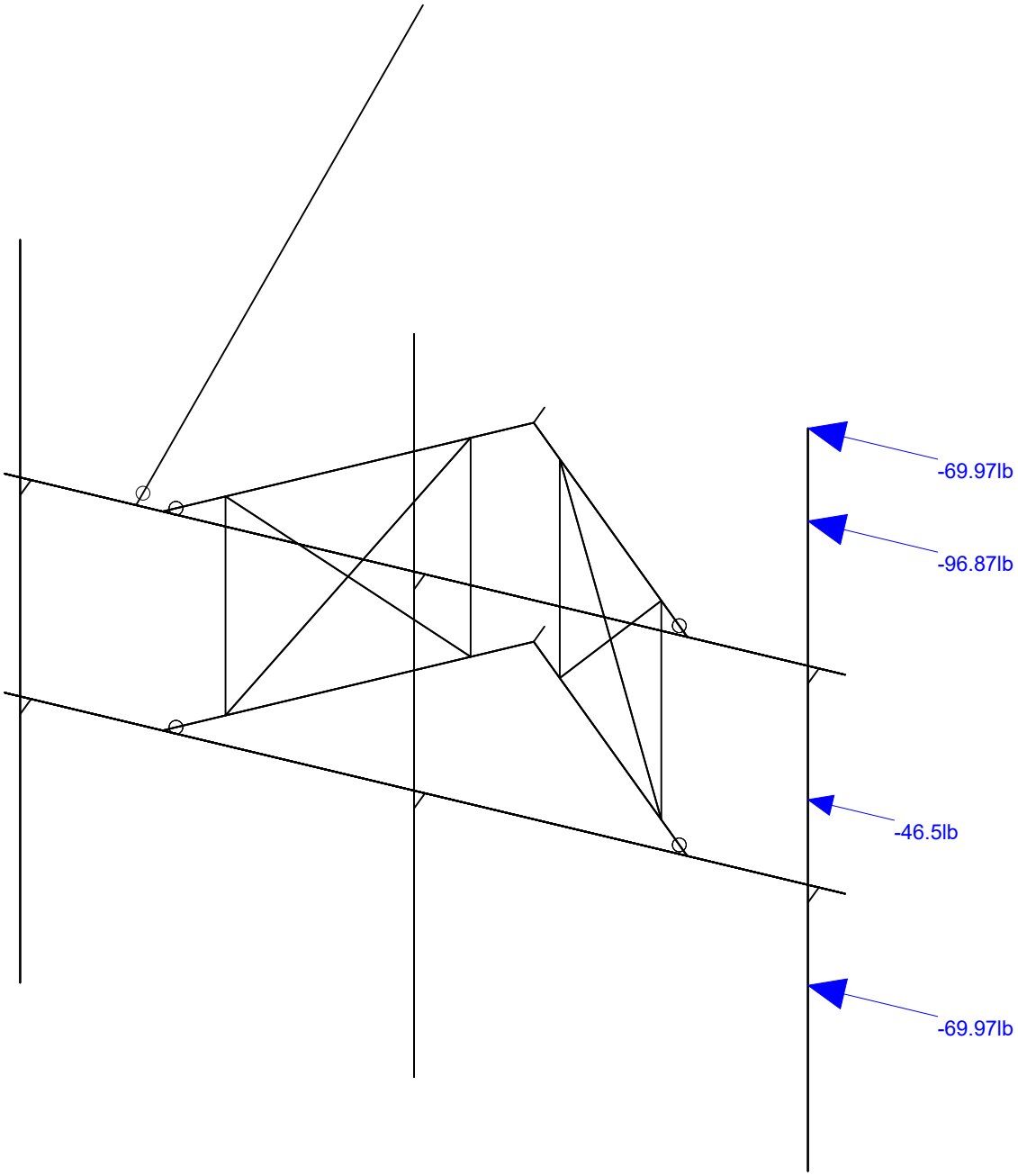

Loads: BLC 5, Wind Load AZI 90
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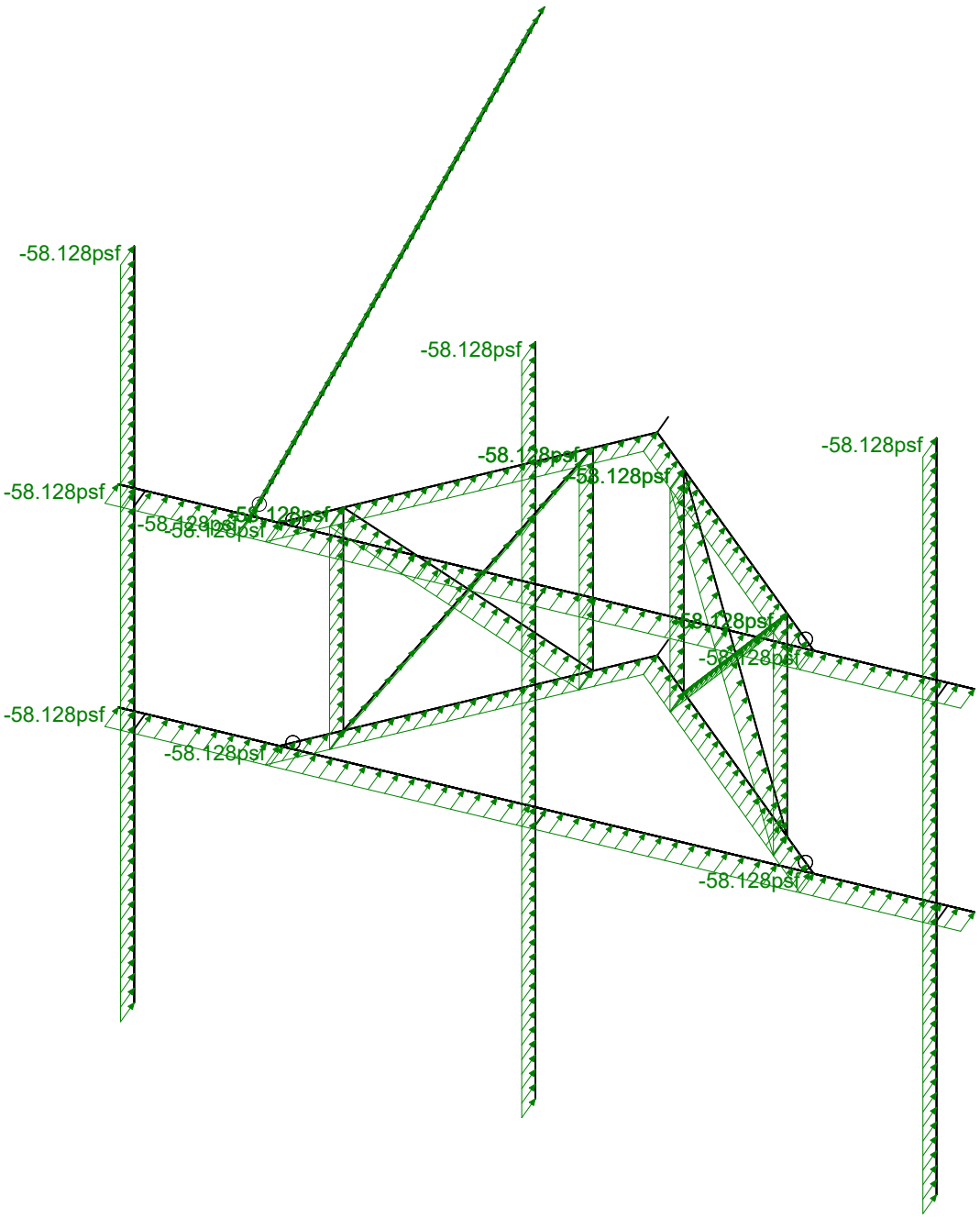

Loads: BLC 14, Distr. Wind Load Z
Envelope Only Solution

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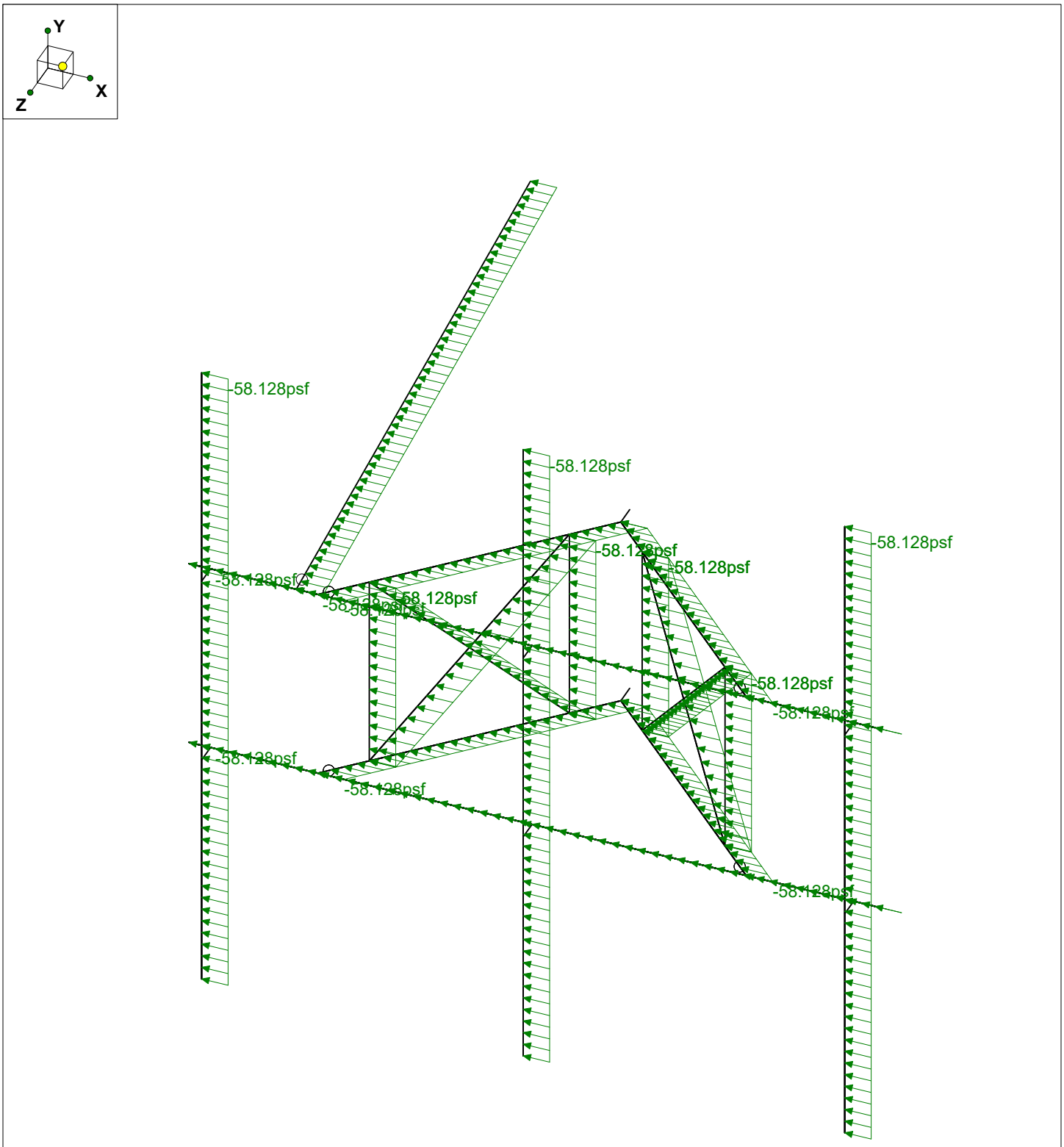

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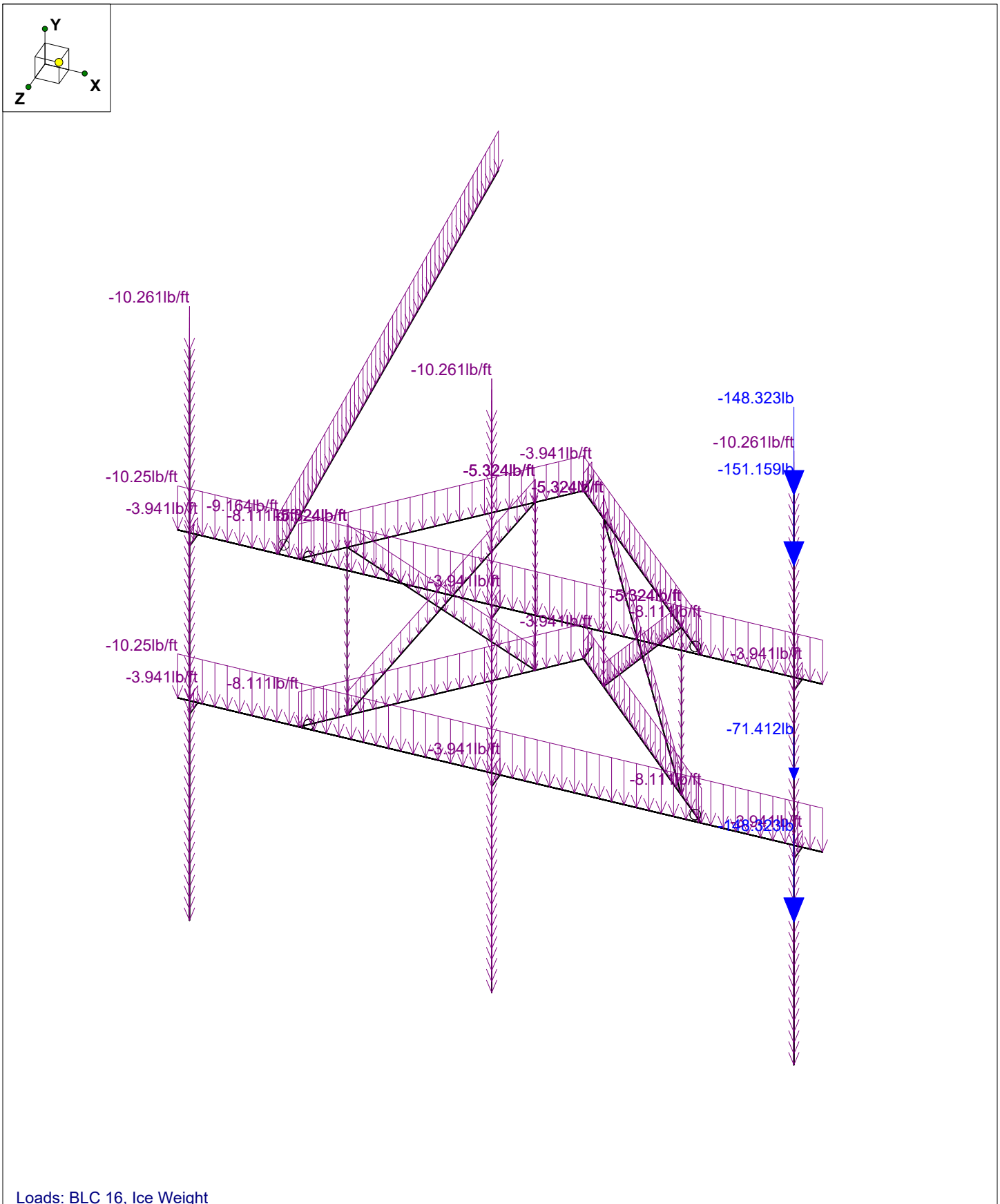

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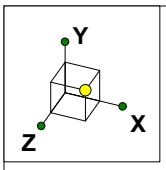
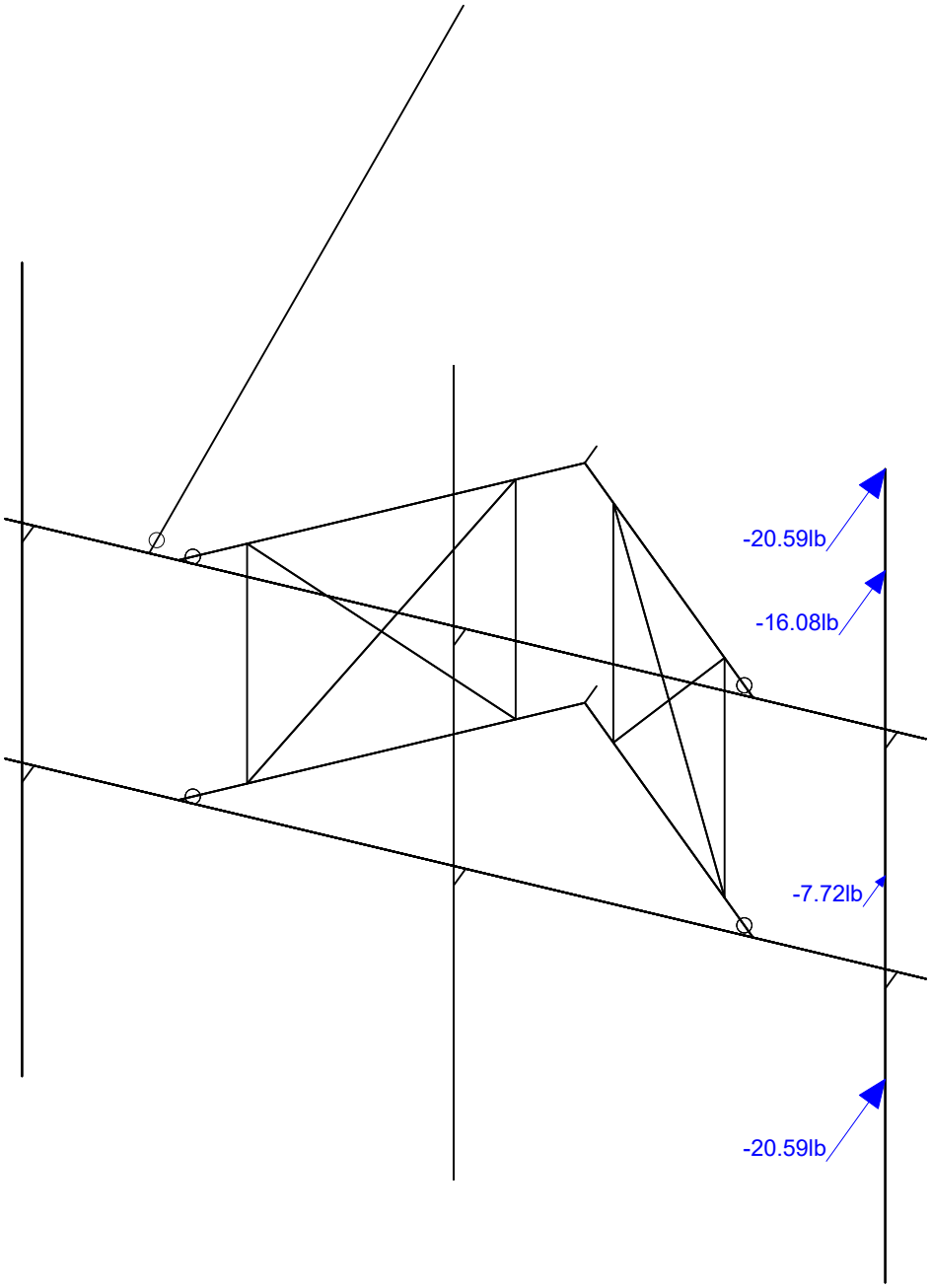
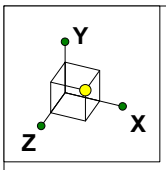
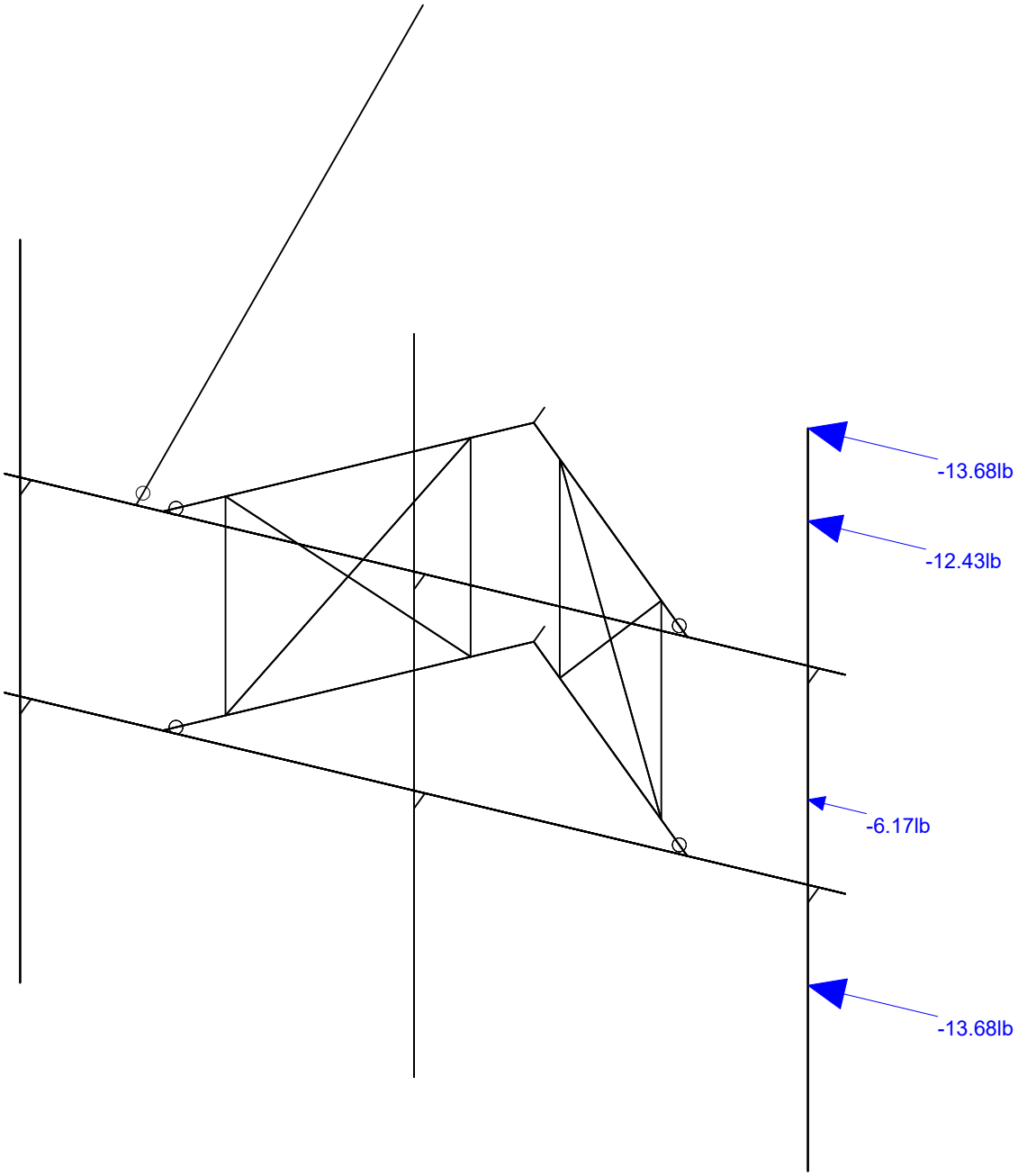




Loads: BLC 17, Ice Wind Load AZI 0
Envelope Only Solution

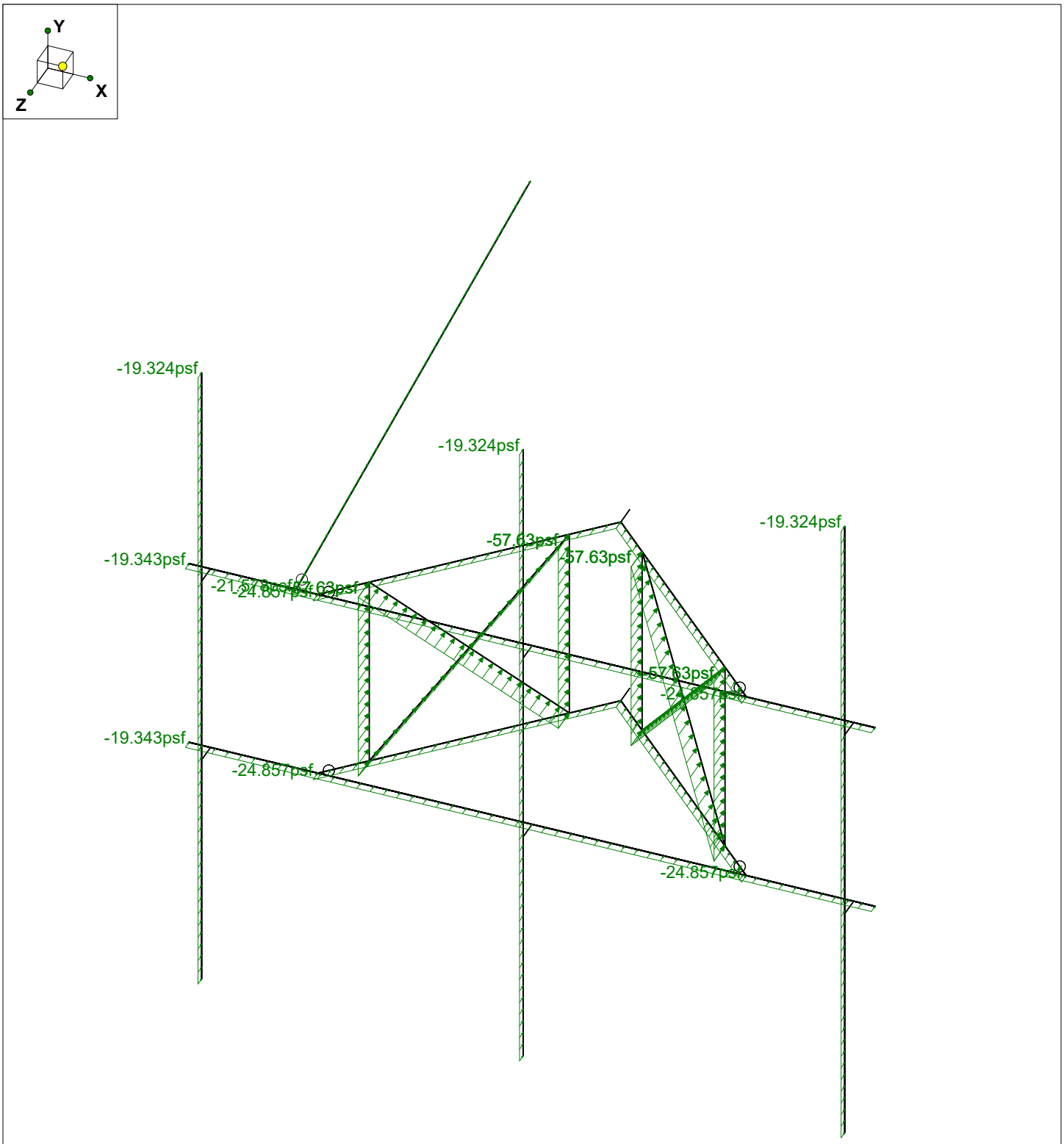
Infinigy Engineering, PLLC	BOBDL00029A	Ice + Wind Load AZI 000
PSM		Aug 16, 2021 at 11:04 AM
1197-F0001-C		BOBDL00029A_loaded.r3d





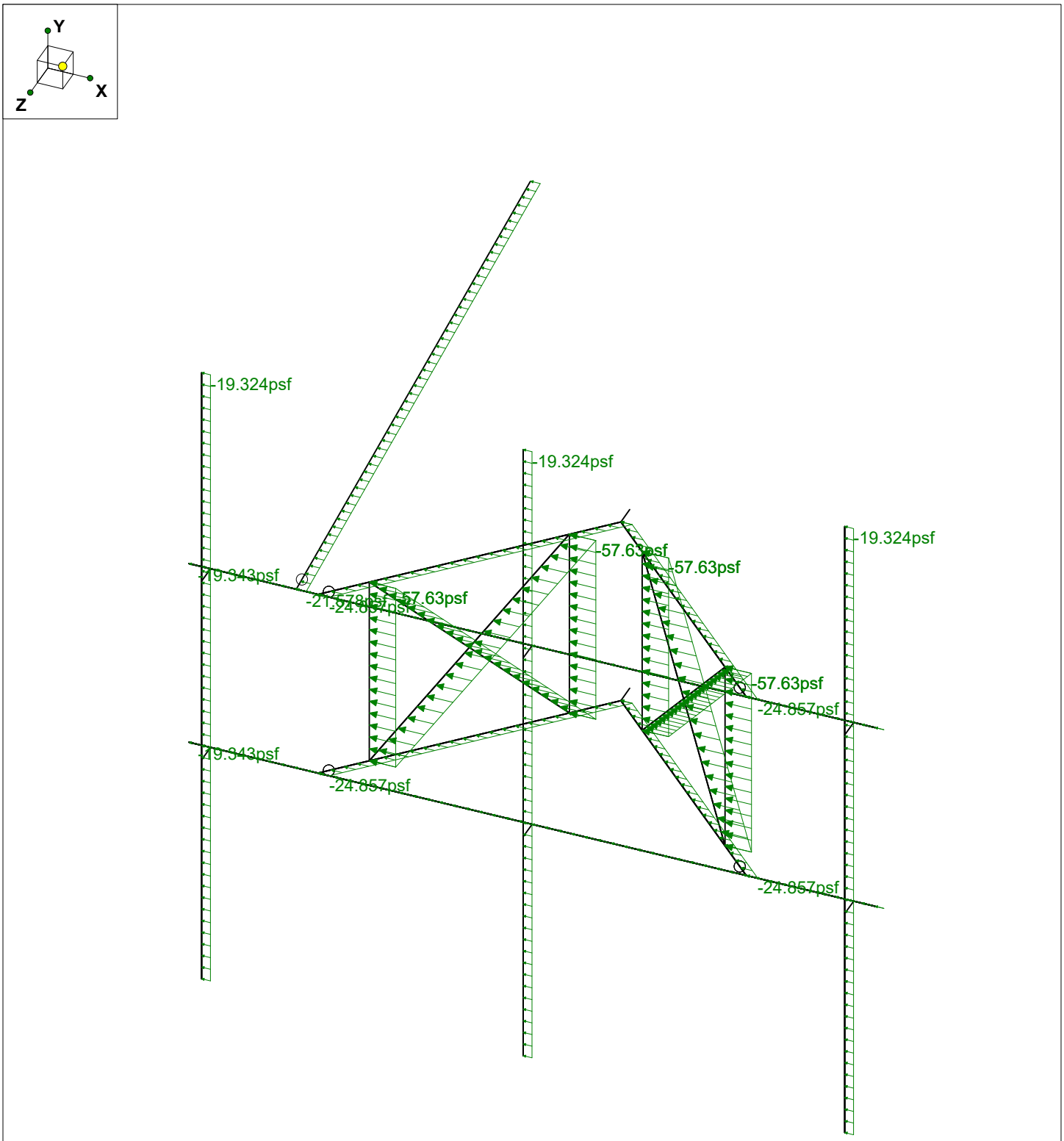
Loads: BLC 20, Ice Wind Load AZI 90
Envelope Only Solution

Infinigy Engineering, PLLC	BOBDL00029A	Ice + Wind Load AZI 090
PSM		Aug 16, 2021 at 11:04 AM
1197-F0001-C		BOBDL00029A_loaded.r3d



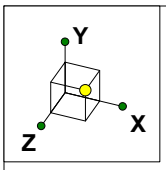
Loads: BLC 29, Distr. Ice Wind Load Z
Envelope Only Solution

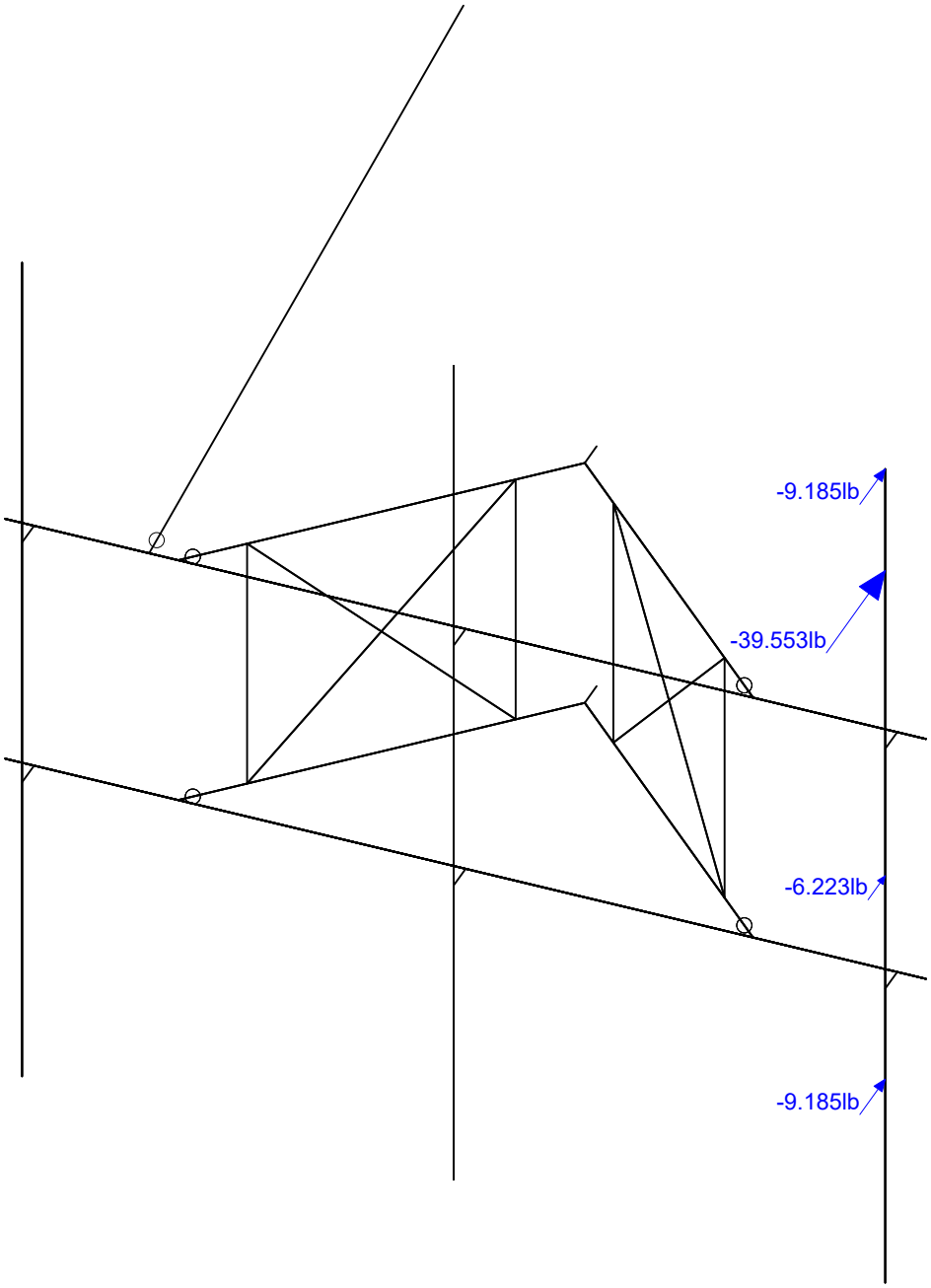
Infinigy Engineering, PLLC	BOBDL00029A	Distr Ice + Wind Load AZI 000
PSM		Aug 16, 2021 at 11:04 AM
1197-F0001-C		BOBDL00029A_loaded.r3d



Loads: BLC 30, Distr. Ice Wind Load X
Envelope Only Solution

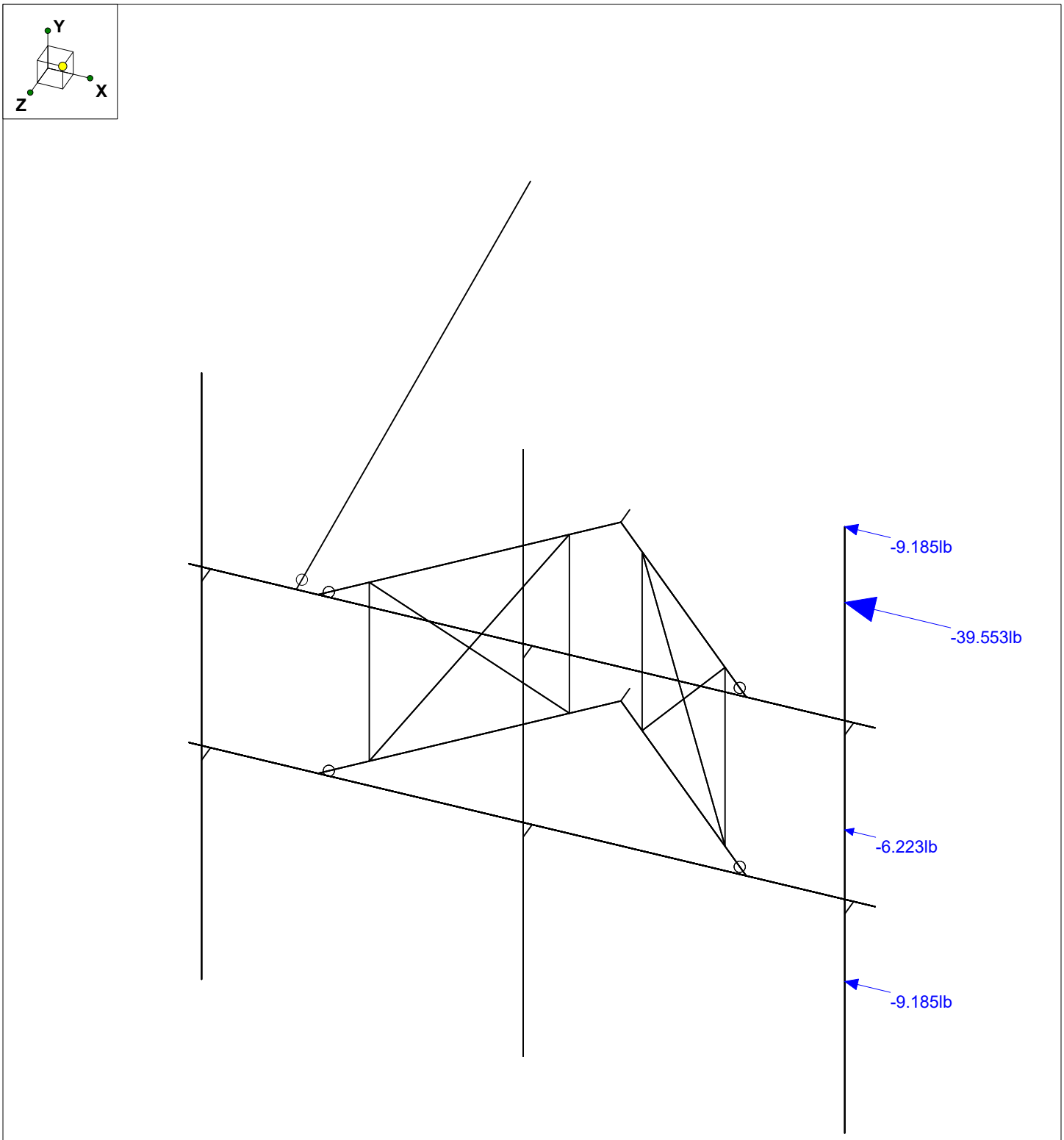
Infinigy Engineering, PLLC	BOBDL00029A	Distr Ice + Wind Load AZI 090
PSM		Aug 16, 2021 at 11:05 AM
1197-F0001-C		BOBDL00029A_loaded.r3d





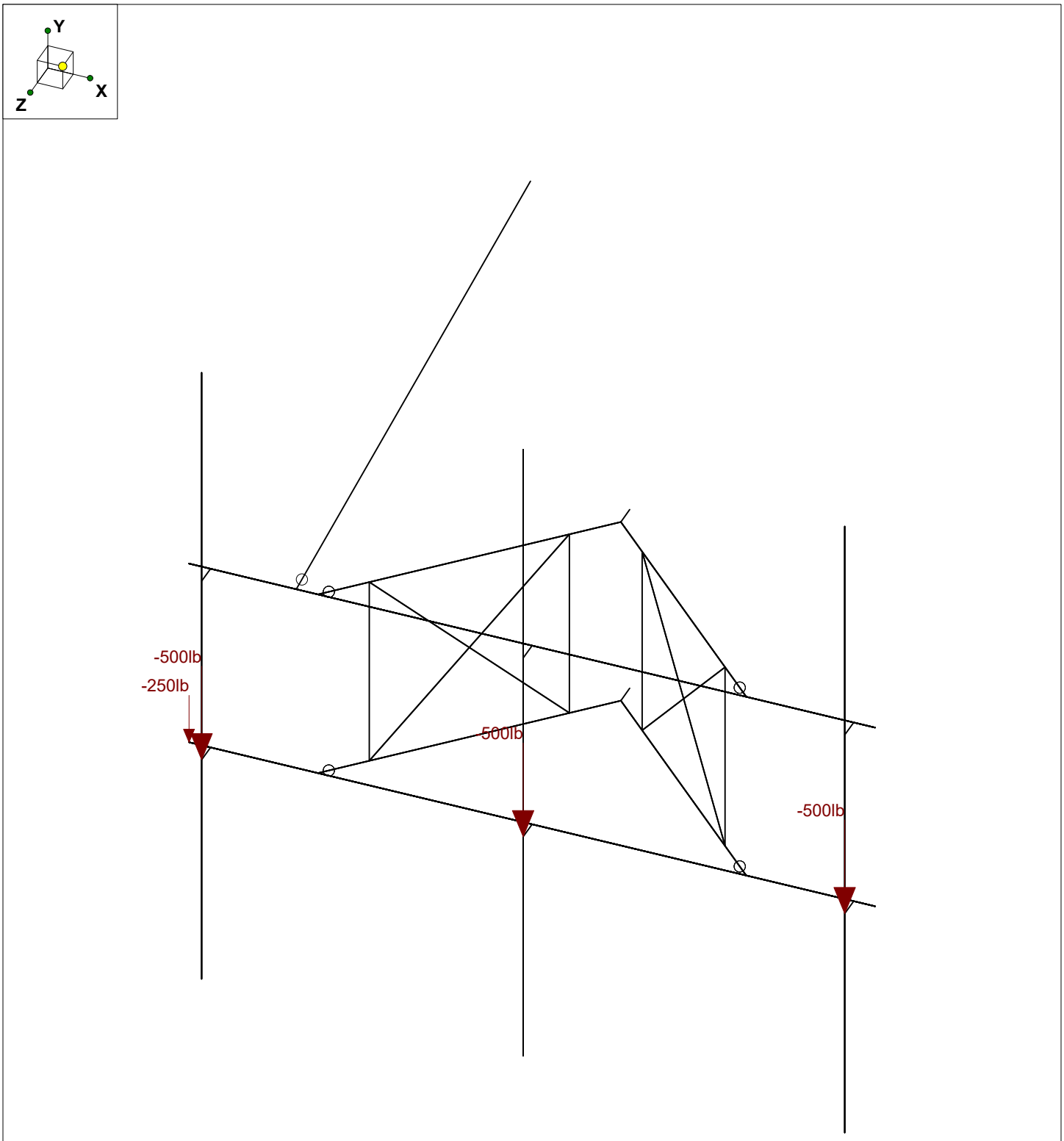
Loads: BLC 31, Seismic Load Z
Envelope Only Solution

Infinigy Engineering, PLLC	BOBDL00029A	Seismic Load AZI 000
PSM		Aug 16, 2021 at 11:05 AM
1197-F0001-C		BOBDL00029A_loaded.r3d



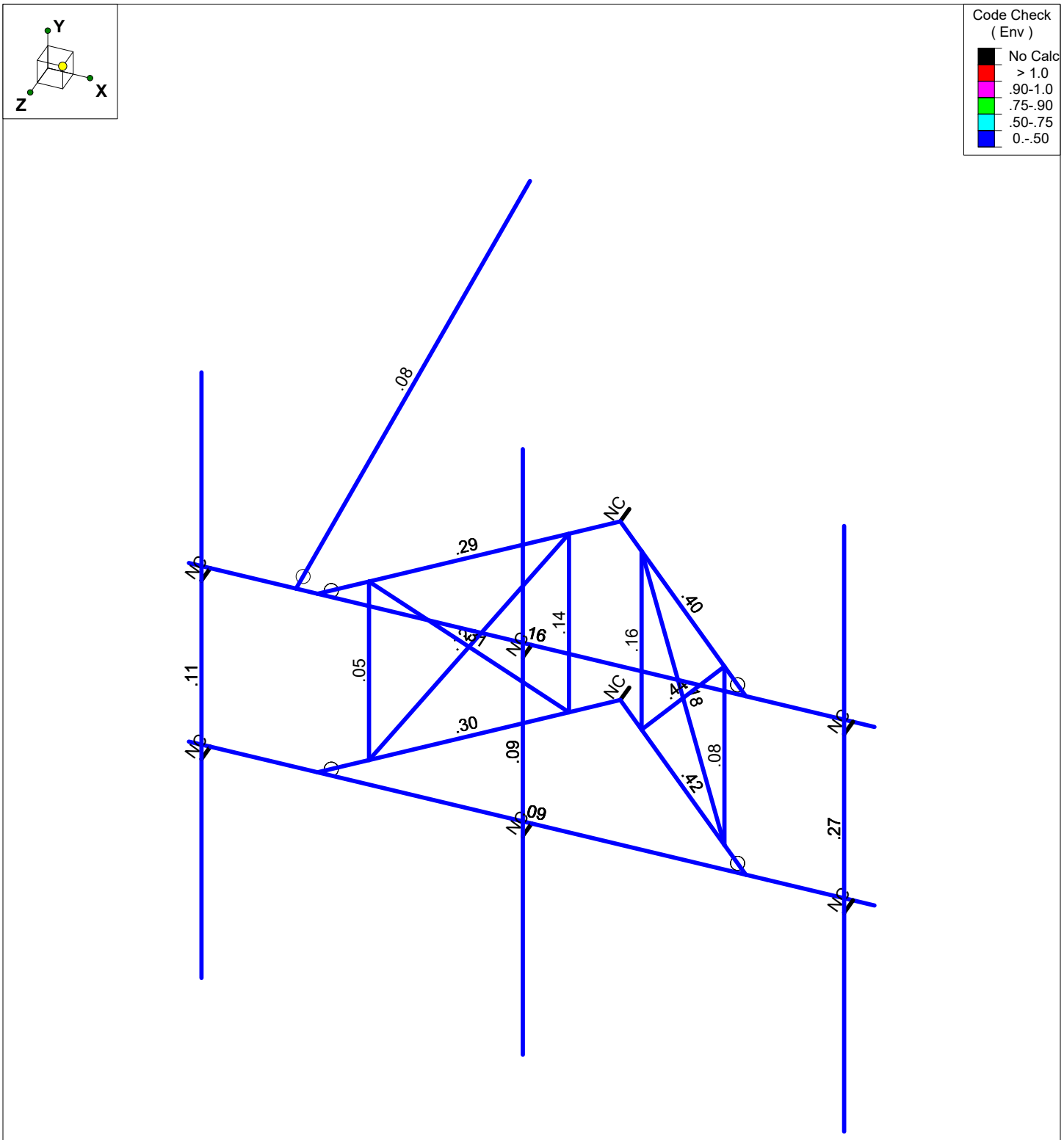
Loads: BLC 32, Seismic Load X
Envelope Only Solution

Infinigy Engineering, PLLC	BOBDL00029A	Seismic Load AZI 090
PSM		Aug 16, 2021 at 11:05 AM
1197-F0001-C		BOBDL00029A_loaded.r3d



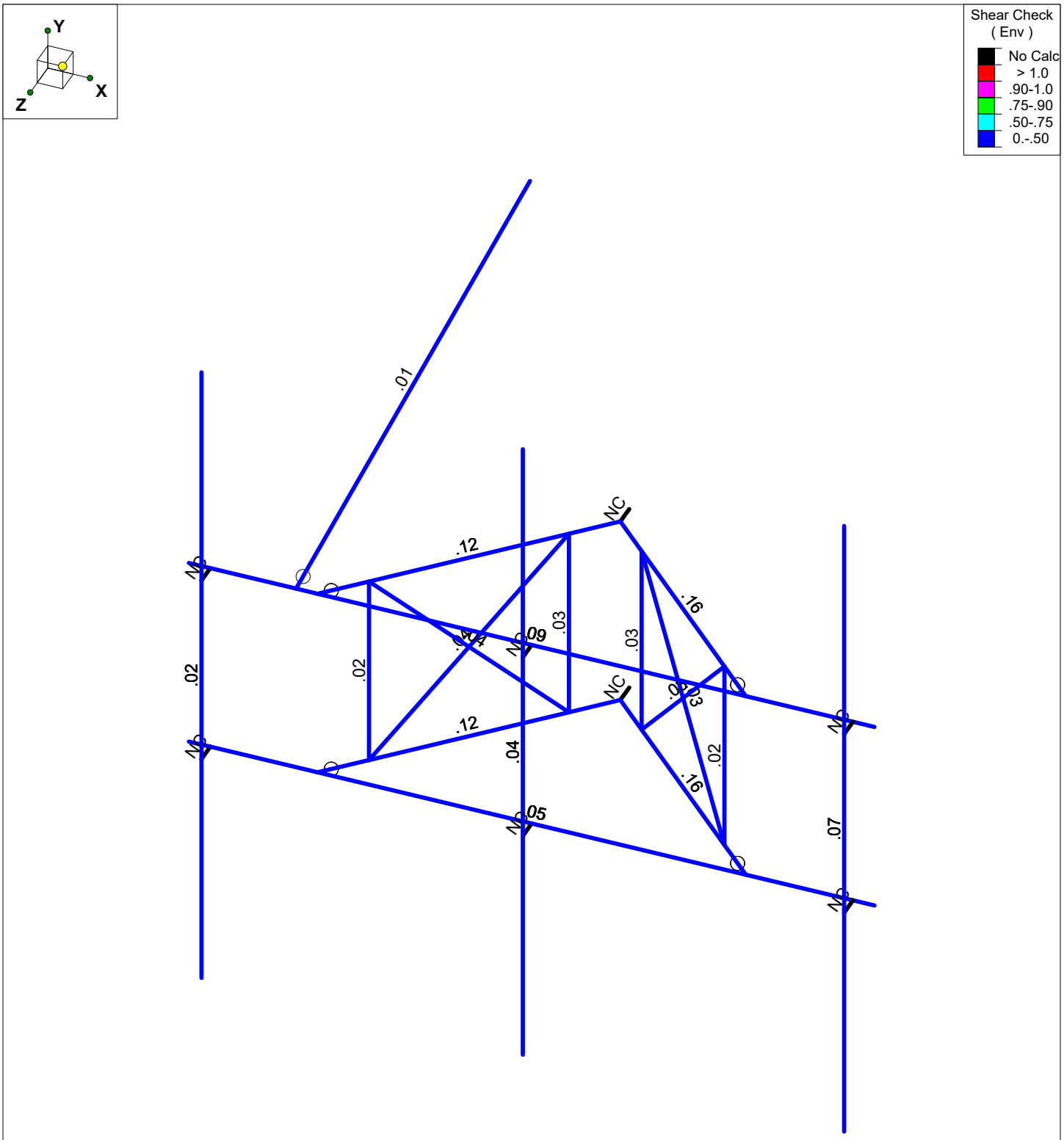
Loads: LL - Live Load
Envelope Only Solution

Infinigy Engineering, PLLC	BOBDL00029A	Non-concurrent Live Loads
PSM		Aug 16, 2021 at 11:06 AM
1197-F0001-C		BOBDL00029A_loaded.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Infinigy Engineering, PLLC	BOBDL00029A	Bending Check
PSM		Aug 16, 2021 at 11:06 AM
1197-F0001-C		BOBDL00029A_loaded.r3d



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Infinigy Engineering, PLLC	BOBDL00029A	Shear Check
PSM		Aug 16, 2021 at 11:06 AM
1197-F0001-C		BOBDL00029A_loaded.r3d

Program Inputs

PROJECT INFORMATION	
Client:	ATC
Carrier:	Dish Wireless
Engineer:	Pradin Suinyal Magar, M.S

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	B	
Topo Factor Procedure:	Method 1, Category 1	
Site Class:	D - Stiff Soil (Assumed)	
Ground Elevation:	604.92	ft *Rev H

MOUNT INFORMATION		
Mount Type:	Sector Frame	
Num Sectors:	3	
Centerline AGL:	200.00	ft
Tower Height AGL:	366.00	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):	0.978	*Rev H Only
Rooftop Speed-Up (K_s):	1.000	*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-H	
ASCE Standard:	ASCE 7-10	

WIND AND ICE DATA		
Ultimate Wind (V_{ult}):	130	mph
Design Wind (V):	N/A	mph
Ice Wind (V_{ice}):	50	mph
Base Ice Thickness (t_i):	1.5	in
Flat Pressure:	96.881	psf
Round Pressure:	58.128	psf
Ice Wind Pressure:	8.599	psf

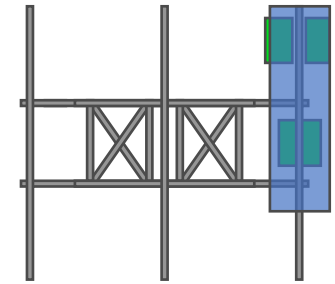
SEISMIC DATA		
Short-Period Accel. (S_s):	0.178	g
1-Second Accel. (S_1):	0.062	g
Short-Period Design (S_{DS}):	0.190	
1-Second Design (S_{D1}):	0.099	
Short-Period Coeff. (F_a):	1.600	
1-Second Coeff. (F_v):	2.400	
Amplification Factor (A_s):	3.000	
Response Mod. Coeff. (R):	2.000	

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

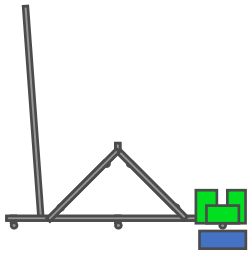
Infinigy Load Calculator V2.1.7

Program Inputs

ELEVATION VIEW



PLAN VIEW



INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

Infinigy Load Calculator V2.1.7

APPURTENANCE INFORMATION

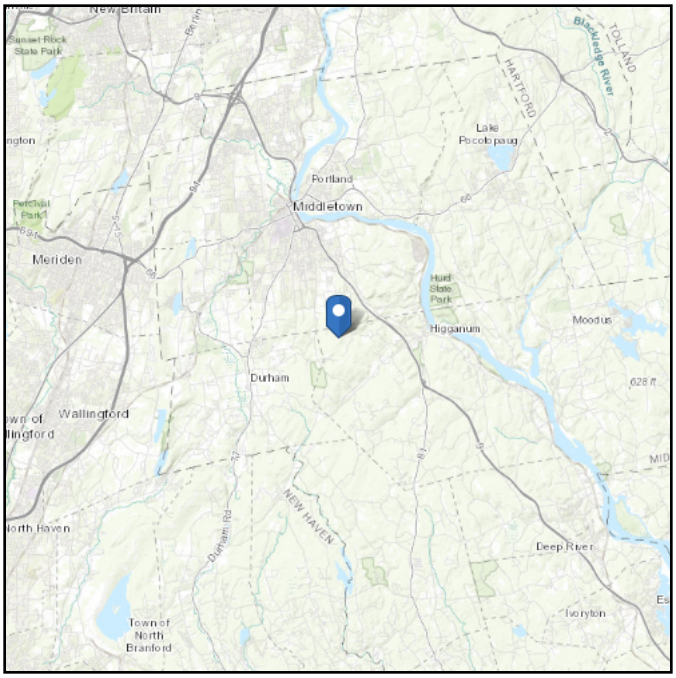
Appurtenance Name	Elevation	Qty.	K_a	q_z (psf)	EPA_N (ft^2)	EPA_T (ft^2)	Wind F_z (lbs)	Wind F_x (lbs)	Weight (lbs)	Seismic F (lbs)	Member (α sector)
JMA WIRELESS MX08FRO665-21	200.0	3	0.90	48.44	8.01	3.21	349.21	139.94	64.50	18.37	MP1
FUJITSU TA08025-B605	200.0	3	0.90	48.44	1.96	1.19	85.60	51.84	74.95	21.35	MP1
FUJITSU TA08025-B604	200.0	3	0.90	48.44	1.96	1.03	85.60	45.03	63.93	18.21	MP1
RAYCAP RDIDC-9181-PF-48	200.0	1	0.90	48.44	1.87	1.07	81.38	46.50	21.85	6.22	MP1

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 604.92 ft (NAVD 88)
Latitude: 41.495858
Longitude: -72.617839



Wind

Results:

Wind Speed:	130 mph per Haddam City Requirements in WSEL.
10-year MRI	78 Vmph
25-year MRI	87 Vmph
50-year MRI	95 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 Aug 16 2021

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

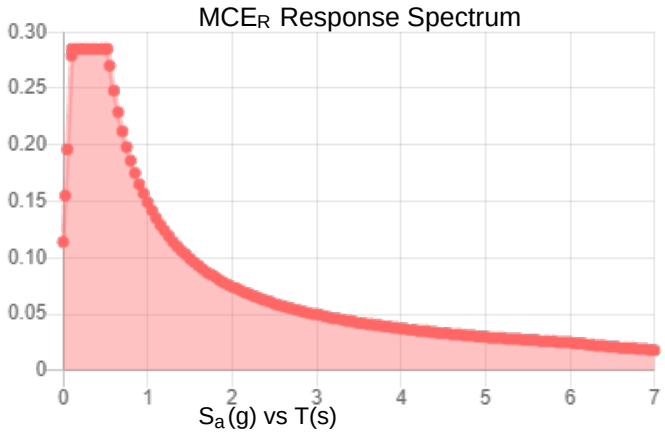
Seismic

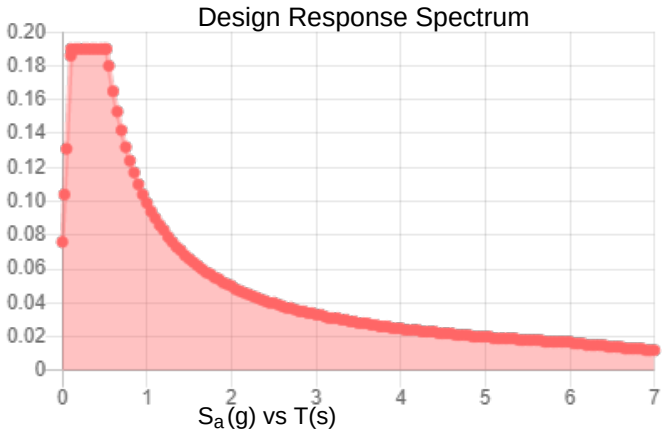
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.178	S_{DS} :	0.19
S_1 :	0.062	S_{D1} :	0.099
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.091
S_{MS} :	0.285	PGA_M :	0.145
S_{M1} :	0.149	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Mon Aug 16 2021

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

Ice

Results:

Ice Thickness:	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 Aug 16 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.

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design Rules
1	S3	N2	N1			Standoff Arms	Beam	Pipe	A500 Gr.46	Typical
2	S4	N7	N6			Standoff Arms	Beam	Pipe	A500 Gr.46	Typical
3	TR6	N3	N8			Standoff Vertical	None	None	A529 Gr.50	Typical
4	TR5	N4	N9			Standoff Vertical	None	None	A529 Gr.50	Typical
5	TR8	N4	N8			Diagonal	None	None	A529 Gr.50	Typical
6	TR7	N3	N9			Diagonal	None	None	A529 Gr.50	Typical
7	S1	N10	N1			Standoff Arms	Beam	Pipe	A500 Gr.46	Typical
8	S2	N14	N6			Standoff Arms	Beam	Pipe	A500 Gr.46	Typical
9	TR1	N11	N15			Standoff Vertical	None	None	A529 Gr.50	Typical
10	TR2	N12	N16			Standoff Vertical	None	None	A529 Gr.50	Typical
11	TR3	N12	N15			Diagonal	None	None	A529 Gr.50	Typical
12	TR4	N11	N16			Diagonal	None	None	A529 Gr.50	Typical
13	H1	N16A	N15A			Face Horizontal	Beam	Pipe	A500 Gr.46	Typical
14	H2	N18	N17			Face Horizontal	Beam	Pipe	A500 Gr.46	Typical
15	MP3	N21	N22			Mount Pipe	Colu...	Pipe	A500 Gr.46	Typical
16	MP1	N19	N20			Mount Pipe	Colu...	Pipe	A500 Gr.46	Typical
17	MP2	N33	N34			Mount Pipe	Colu...	Pipe	A500 Gr.46	Typical
18	T1	N37	N38			Tie Back	None	None	A500 Gr.46	Typical
19	M29	N25	N67			RIGID	None	None	RIGID	Typical
20	M30	N27	N69			RIGID	None	None	RIGID	Typical
21	M33	N35	N73			RIGID	None	None	RIGID	Typical
22	M34	N36	N74			RIGID	None	None	RIGID	Typical
23	M35	N26	N68			RIGID	None	None	RIGID	Typical
24	M36	N28	N70			RIGID	None	None	RIGID	Typical
25	M25	N43	N1			RIGID	None	None	RIGID	Typical
26	M26	N44	N6			RIGID	None	None	RIGID	Typical

Hot Rolled Steel Design Parameters

	Label	Shape	Lengt...	Lbyy[in]	Lbzz[in]	Lcomp t...	Lcomp b...	L-tor...	Kyy	Kzz	Cb	Func...
1	S3	Standoff Arms	42.4			Lbyy						Late...
2	S4	Standoff Arms	42.4			Lbyy						Late...
3	TR6	Standoff Vertical	28.3			Lbyy			.65	.65		Late...
4	TR5	Standoff Vertical	28.3			Lbyy			.65	.65		Late...
5	TR8	Diagonal	39.811			Lbyy			.7	.7		Late...
6	TR7	Diagonal	39.811			Lbyy			.5	.5		Late...
7	S1	Standoff Arms	42.4			Lbyy						Late...
8	S2	Standoff Arms	42.4			Lbyy						Late...
9	TR1	Standoff Vertical	28.3			Lbyy			.65	.65		Late...
10	TR2	Standoff Vertical	28.3			Lbyy			.65	.65		Late...
11	TR3	Diagonal	39.811			Lbyy			.7	.7		Late...

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Lengt...	Lbyy[in]	Lbzz[in]	Lcomp t...	Lcomp b...	L-tor...	Kyy	Kzz	Cb	Func...
12	TR4	Diagonal	39.811			Lbyy			.5	.5		Late...
13	H1	Face Horizontal	96			Lbyy						Late...
14	H2	Face Horizontal	96			Lbyy						Late...
15	MP3	Mount Pipe	96			Lbyy						Late...
16	MP1	Mount Pipe	96			Lbyy						Late...
17	MP2	Mount Pipe	96			Lbyy						Late...
18	T1	Tie Back	96.255			Lbyy						Late...

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Ra...	Analysis ...	Inactive	Seismi...
1	S3	BenPIN					Yes	Default			None
2	S4	BenPIN					Yes	Default			None
3	TR6						Yes	** NA **			None
4	TR5						Yes	** NA **			None
5	TR8						Yes	** NA **			None
6	TR7						Yes	** NA **			None
7	S1	BenPIN					Yes	Default			None
8	S2	BenPIN					Yes	Default			None
9	TR1						Yes	** NA **			None
10	TR2						Yes	** NA **			None
11	TR3						Yes	** NA **			None
12	TR4						Yes	** NA **			None
13	H1						Yes				None
14	H2						Yes				None
15	MP3						Yes	** NA **			None
16	MP1						Yes	** NA **			None
17	MP2						Yes	** NA **			None
18	T1	BenPIN					Yes	** NA **			None
19	M29						Yes	** NA **			None
20	M30						Yes	** NA **			None
21	M33						Yes	** NA **			None
22	M34						Yes	** NA **			None
23	M35						Yes	** NA **			None
24	M36						Yes	** NA **			None
25	M25						Yes	** NA **			None
26	M26						Yes	** NA **			None

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[LB]
1	General				
2	RIGID		8	24	0
3	Total General		8	24	0
4					
5	Hot Rolled Steel				
6	A500 Gr.46	1.9" ODx0.12"	4	169.6	32.27
7	A500 Gr.46	PIPE 2.5	2	192	87.656
8	A500 Gr.46	2.88"x0.120"	3	288	84.933
9	A500 Gr.46	Pipe2.38X0.12	1	96.3	23.255
10	A529 Gr.50	0.63" SR	8	272.4	24.082
11	Total HR Steel		18	1018.3	252.196

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design...	A [in2]	Iyy [in...	Izz [in...	J [in4]
1	Face Horizontal	PIPE 2.5	Beam	Pipe	A500 G...	Typical	1.61	1.45	1.45	2.89
2	Standoff Arms	1.9" ODx0.12"	Beam	Pipe	A500 G...	Typical	.671	.267	.267	.534
3	Diagonal	0.63" SR	None	None	A529 G...	Typical	.312	.008	.008	.015
4	Mount Pipe	2.88"x0.120"	Colu...	Pipe	A500 G...	Typical	1.04	.993	.993	1.985
5	Tie Back	Pipe2.38X0.12	None	None	A500 G...	Typical	.852	.545	.545	1.091
6	End Support Pipe	3.5"x0.120	None	None	A500 G...	Typical	1.274	1.822	1.822	3.644
7	Standoff Vertical	0.63" SR	None	None	A529 G...	Typical	.312	.008	.008	.015

Basic Load Cases

	BLC Description	Category	X Gr...	Y Gr...	Z Gr...	Joint	Point	Distributed	Area(Memb...	Surface(Plate/Wall)
1	Self Weight	DL		-1			5			
2	Wind Load AZI 0	WLZ					10			
3	Wind Load AZI 30	None					10			
4	Wind Load AZI 60	None					10			
5	Wind Load AZI 90	WLX					10			
6	Wind Load AZI 1...	None					10			
7	Wind Load AZI 1...	None					10			
8	Wind Load AZI 1...	None					10			
9	Wind Load AZI 2...	None					10			
10	Wind Load AZI 2...	None					10			
11	Wind Load AZI 2...	None					10			
12	Wind Load AZI 3...	None					10			
13	Wind Load AZI 3...	None					10			
14	Distr. Wind Load Z	WLZ						26		

Basic Load Cases (Continued)

	BLC Description	Category	X Gr...	Y Gr...	Z Gr...	Joint	Point	Distributed	Area(Memb...	Surface(Plate/Wall)
15	Distr. Wind Load X	WLX						26		
16	Ice Weight	OL1					5	26		
17	Ice Wind Load A...	OL2					10			
18	Ice Wind Load A...	None					10			
19	Ice Wind Load A...	None					10			
20	Ice Wind Load A...	OL3					10			
21	Ice Wind Load A...	None					10			
22	Ice Wind Load A...	None					10			
23	Ice Wind Load A...	None					10			
24	Ice Wind Load A...	None					10			
25	Ice Wind Load A...	None					10			
26	Ice Wind Load A...	None					10			
27	Ice Wind Load A...	None					10			
28	Ice Wind Load A...	None					10			
29	Distr. Ice Wind L...	OL2						26		
30	Distr. Ice Wind L...	OL3						26		
31	Seismic Load Z	ELZ			-.285		5			
32	Seismic Load X	ELX	-.285				5			
33	Service Live Loa...	LL				1				
34	Maintenance Loa...	LL				1				
35	Maintenance Loa...	LL				1				
36	Maintenance Loa...	LL				1				

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4DL	Y...	Y		1	1.4																				
2	1.2DL + 1WL AZI 0	Y...	Y		1	1.2	2	1	14	1	15															
3	1.2DL + 1WL AZI 30	Y...	Y		1	1.2	3	1	14	.866	15	.5														
4	1.2DL + 1WL AZI 60	Y...	Y		1	1.2	4	1	14	.5	15	.866														
5	1.2DL + 1WL AZI 90	Y...	Y		1	1.2	5	1	14		15	1														
6	1.2DL + 1WL AZI 120	Y...	Y		1	1.2	6	1	14	-.5	15	.866														
7	1.2DL + 1WL AZI 150	Y...	Y		1	1.2	7	1	14	-.8...	15	.5														
8	1.2DL + 1WL AZI 180	Y...	Y		1	1.2	8	1	14	-1	15															
9	1.2DL + 1WL AZI 210	Y...	Y		1	1.2	9	1	14	-.8...	15	-.5														
10	1.2DL + 1WL AZI 240	Y...	Y		1	1.2	10	1	14	-.5	15	-.8...														
11	1.2DL + 1WL AZI 270	Y...	Y		1	1.2	11	1	14		15	-1														
12	1.2DL + 1WL AZI 300	Y...	Y		1	1.2	12	1	14	.5	15	-.8...														
13	1.2DL + 1WL AZI 330	Y...	Y		1	1.2	13	1	14	.866	15	-.5														
14	0.9DL + 1WL AZI 0	Y...	Y		1	.9	2	1	14	1	15															
15	0.9DL + 1WL AZI 30	Y...	Y		1	.9	3	1	14	.866	15	.5														
16	0.9DL + 1WL AZI 60	Y...	Y		1	.9	4	1	14	.5	15	.866														

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
17	0.9DL + 1WL AZI 90	Y...	Y		1	.9	5	1	14		15	1														
18	0.9DL + 1WL AZI 120	Y...	Y		1	.9	6	1	14	-.5	15	.866														
19	0.9DL + 1WL AZI 150	Y...	Y		1	.9	7	1	14	-.8...	15	.5														
20	0.9DL + 1WL AZI 180	Y...	Y		1	.9	8	1	14	-1	15															
21	0.9DL + 1WL AZI 210	Y...	Y		1	.9	9	1	14	-.8...	15	-.5														
22	0.9DL + 1WL AZI 240	Y...	Y		1	.9	10	1	14	-.5	15	-.8...														
23	0.9DL + 1WL AZI 270	Y...	Y		1	.9	11	1	14		15	-1														
24	0.9DL + 1WL AZI 300	Y...	Y		1	.9	12	1	14	.5	15	-.8...														
25	0.9DL + 1WL AZI 330	Y...	Y		1	.9	13	1	14	.866	15	-.5														
26	1.2D + 1.0Di	Y...	Y		1	1.2	16	1																		
27	1.2D + 1.0Di +1.0Wi AZI 0	Y...	Y		1	1.2	16	1	17	1	29	1	30													
28	1.2D + 1.0Di +1.0Wi AZI 30	Y...	Y		1	1.2	16	1	18	1	29	.866	30	.5												
29	1.2D + 1.0Di +1.0Wi AZI 60	Y...	Y		1	1.2	16	1	19	1	29	.5	30	.866												
30	1.2D + 1.0Di +1.0Wi AZI 90	Y...	Y		1	1.2	16	1	20	1	29		30	1												
31	1.2D + 1.0Di +1.0Wi AZI 120	Y...	Y		1	1.2	16	1	21	1	29	-.5	30	.866												
32	1.2D + 1.0Di +1.0Wi AZI 150	Y...	Y		1	1.2	16	1	22	1	29	-.8...	30	.5												
33	1.2D + 1.0Di +1.0Wi AZI 180	Y...	Y		1	1.2	16	1	23	1	29	-1	30													
34	1.2D + 1.0Di +1.0Wi AZI 210	Y...	Y		1	1.2	16	1	24	1	29	-.8...	30	-.5												
35	1.2D + 1.0Di +1.0Wi AZI 240	Y...	Y		1	1.2	16	1	25	1	29	-.5	30	-.8...												
36	1.2D + 1.0Di +1.0Wi AZI 270	Y...	Y		1	1.2	16	1	26	1	29		30	-1												
37	1.2D + 1.0Di +1.0Wi AZI 300	Y...	Y		1	1.2	16	1	27	1	29	.5	30	-.8...												
38	1.2D + 1.0Di +1.0Wi AZI 330	Y...	Y		1	1.2	16	1	28	1	29	.866	30	-.5												
39	(1.2 + 0.2Sds)DL + 1.0E AZI 0	Y...	Y		1	1.2...	31	1	32																	
40	(1.2 + 0.2Sds)DL + 1.0E AZI 30	Y...	Y		1	1.2...	31	.866	32	.5																
41	(1.2 + 0.2Sds)DL + 1.0E AZI 60	Y...	Y		1	1.2...	31	.5	32	.866																
42	(1.2 + 0.2Sds)DL + 1.0E AZI 90	Y...	Y		1	1.2...	31		32	1																
43	(1.2 + 0.2Sds)DL + 1.0E AZI 1...	Y...	Y		1	1.2...	31	-.5	32	.866																
44	(1.2 + 0.2Sds)DL + 1.0E AZI 1...	Y...	Y		1	1.2...	31	-.8...	32	.5																
45	(1.2 + 0.2Sds)DL + 1.0E AZI 1...	Y...	Y		1	1.2...	31	-1	32																	
46	(1.2 + 0.2Sds)DL + 1.0E AZI 2...	Y...	Y		1	1.2...	31	-.8...	32	-.5																
47	(1.2 + 0.2Sds)DL + 1.0E AZI 2...	Y...	Y		1	1.2...	31	-.5	32	-.8...																
48	(1.2 + 0.2Sds)DL + 1.0E AZI 2...	Y...	Y		1	1.2...	31		32	-1																
49	(1.2 + 0.2Sds)DL + 1.0E AZI 3...	Y...	Y		1	1.2...	31	.5	32	-.8...																
50	(1.2 + 0.2Sds)DL + 1.0E AZI 3...	Y...	Y		1	1.2...	31	.866	32	-.5																
51	(0.9 - 0.2Sds)DL + 1.0E AZI 0	Y...	Y		1	.862	31	1	32																	
52	(0.9 - 0.2Sds)DL + 1.0E AZI 30	Y...	Y		1	.862	31	.866	32	.5																
53	(0.9 - 0.2Sds)DL + 1.0E AZI 60	Y...	Y		1	.862	31	.5	32	.866																
54	(0.9 - 0.2Sds)DL + 1.0E AZI 90	Y...	Y		1	.862	31		32	1																
55	(0.9 - 0.2Sds)DL + 1.0E AZI 1...	Y...	Y		1	.862	31	-.5	32	.866																
56	(0.9 - 0.2Sds)DL + 1.0E AZI 1...	Y...	Y		1	.862	31	-.8...	32	.5																
57	(0.9 - 0.2Sds)DL + 1.0E AZI 1...	Y...	Y		1	.862	31	-1	32																	
58	(0.9 - 0.2Sds)DL + 1.0E AZI 2...	Y...	Y		1	.862	31	-.8...	32	-.5																

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
59	(0.9 - 0.2Sds)DL + 1.0E AZI 2...	Y...	Y		1	.862	31	-.5	32	-.8...															
60	(0.9 - 0.2Sds)DL + 1.0E AZI 2...	Y...	Y		1	.862	31		32	-1															
61	(0.9 - 0.2Sds)DL + 1.0E AZI 3...	Y...	Y		1	.862	31	.5	32	-.8...															
62	(0.9 - 0.2Sds)DL + 1.0E AZI 3...	Y...	Y		1	.862	31	.866	32	-.5															
63	1.0DL + 1.5LL + 1.0SWL (60 ...	Y...	Y		1	1	2	.213	14	.213	15		33	1.5											
64	1.0DL + 1.5LL + 1.0SWL (60 ...	Y...	Y		1	1	3	.213	14	.184	15	.107	33	1.5											
65	1.0DL + 1.5LL + 1.0SWL (60 ...	Y...	Y		1	1	4	.213	14	.107	15	.184	33	1.5											
66	1.0DL + 1.5LL + 1.0SWL (60 ...	Y...	Y		1	1	5	.213	14		15	.213	33	1.5											
67	1.0DL + 1.5LL + 1.0SWL (60 ...	Y...	Y		1	1	6	.213	14	-.1...	15	.184	33	1.5											
68	1.0DL + 1.5LL + 1.0SWL (60 ...	Y...	Y		1	1	7	.213	14	-.1...	15	.107	33	1.5											
69	1.0DL + 1.5LL + 1.0SWL (60 ...	Y...	Y		1	1	8	.213	14	-.2...	15		33	1.5											
70	1.0DL + 1.5LL + 1.0SWL (60 ...	Y...	Y		1	1	9	.213	14	-.1...	15	-.1...	33	1.5											
71	1.0DL + 1.5LL + 1.0SWL (60 ...	Y...	Y		1	1	10	.213	14	-.1...	15	-.1...	33	1.5											
72	1.0DL + 1.5LL + 1.0SWL (60 ...	Y...	Y		1	1	11	.213	14		15	-.2...	33	1.5											
73	1.0DL + 1.5LL + 1.0SWL (60 ...	Y...	Y		1	1	12	.213	14	.107	15	-.1...	33	1.5											
74	1.0DL + 1.5LL + 1.0SWL (60 ...	Y...	Y		1	1	13	.213	14	.184	15	-.1...	33	1.5											
75	1.2DL + 1.5LL	Y...	Y		1	1.2	33	1.5																	
76	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y		1	1.2	34	1.5	2	.053	14	.053	15												
77	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y		1	1.2	34	1.5	3	.053	14	.046	15	.027											
78	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y		1	1.2	34	1.5	4	.053	14	.027	15	.046											
79	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y		1	1.2	34	1.5	5	.053	14		15	.053											
80	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y		1	1.2	34	1.5	6	.053	14	-.0...	15	.046											
81	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y		1	1.2	34	1.5	7	.053	14	-.0...	15	.027											
82	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y		1	1.2	34	1.5	8	.053	14	-.0...	15												
83	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y		1	1.2	34	1.5	9	.053	14	-.0...	15	-.0...											
84	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y		1	1.2	34	1.5	10	.053	14	-.0...	15	-.0...											
85	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y		1	1.2	34	1.5	11	.053	14		15	-.0...											
86	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y		1	1.2	34	1.5	12	.053	14	.027	15	-.0...											
87	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y		1	1.2	34	1.5	13	.053	14	.046	15	-.0...											
88	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y		1	1.2	35	1.5	2	.053	14	.053	15												
89	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y		1	1.2	35	1.5	3	.053	14	.046	15	.027											
90	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y		1	1.2	35	1.5	4	.053	14	.027	15	.046											
91	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y		1	1.2	35	1.5	5	.053	14		15	.053											
92	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y		1	1.2	35	1.5	6	.053	14	-.0...	15	.046											
93	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y		1	1.2	35	1.5	7	.053	14	-.0...	15	.027											
94	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y		1	1.2	35	1.5	8	.053	14	-.0...	15												
95	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y		1	1.2	35	1.5	9	.053	14	-.0...	15	-.0...											
96	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y		1	1.2	35	1.5	10	.053	14	-.0...	15	-.0...											
97	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y		1	1.2	35	1.5	11	.053	14		15	-.0...											
98	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y		1	1.2	35	1.5	12	.053	14	.027	15	-.0...											
99	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y		1	1.2	35	1.5	13	.053	14	.046	15	-.0...											
100	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y		1	1.2	36	1.5	2	.053	14	.053	15												

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
101	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y		1	1.2	36	1.5	3	.053	14	.046	15	.027										
102	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y		1	1.2	36	1.5	4	.053	14	.027	15	.046										
103	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y		1	1.2	36	1.5	5	.053	14		15	.053										
104	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y		1	1.2	36	1.5	6	.053	14	-.0...	15	.046										
105	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y		1	1.2	36	1.5	7	.053	14	-.0...	15	.027										
106	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y		1	1.2	36	1.5	8	.053	14	-.0...	15											
107	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y		1	1.2	36	1.5	9	.053	14	-.0...	15	-.0...										
108	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y		1	1.2	36	1.5	10	.053	14	-.0...	15	-.0...										
109	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y		1	1.2	36	1.5	11	.053	14		15	-.0...										
110	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y		1	1.2	36	1.5	12	.053	14	.027	15	-.0...										

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1						
2	N6						
3	N38	Reaction	Reaction	Reaction			
4	N43	Reaction	Reaction	Reaction			
5	N44	Reaction	Reaction	Reaction			

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N38	...	107.858	6	50.769	37	1056.32	7	0	110	0	110	0	110
2		...	-108.231	12	10.014	55	-1057.2...	25	0	1	0	1	0	1
3	N43	...	807.227	78	908.003	31	1358.8...	25	0	110	0	110	0	110
4		...	-1633.278	96	180.384	20	-2503.6...	7	0	1	0	1	0	1
5	N44	...	1615.671	91	865.489	37	2161.1...	27	0	110	0	110	0	110
6		...	-789.292	85	177.049	14	173.986	20	0	1	0	1	0	1
7	Totals:	...	830.976	5	1819.3...	31	1315.5...	2						
8		...	-830.976	11	411.555	52	-1315.5...	20						

Member Point Loads (BLC 1 : Self Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Y	-32.25	0
2	MP1	Y	-32.25	72
3	MP1	Y	-74.95	12
4	MP1	Y	-63.93	12
5	MP1	Y	-21.85	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	0	0
2	MP1	Z	-174.6	0
3	MP1	X	0	72
4	MP1	Z	-174.6	72
5	MP1	X	0	12
6	MP1	Z	-85.6	12
7	MP1	X	0	12
8	MP1	Z	-85.6	12
9	MP1	X	0	48
10	MP1	Z	-81.38	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-74.22	0
2	MP1	Z	-128.56	0
3	MP1	X	-74.22	72
4	MP1	Z	-128.56	72
5	MP1	X	-38.58	12
6	MP1	Z	-66.82	12
7	MP1	X	-37.73	12
8	MP1	Z	-65.35	12
9	MP1	X	-36.33	48
10	MP1	Z	-62.93	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-83.25	0
2	MP1	Z	-48.06	0
3	MP1	X	-83.25	72
4	MP1	Z	-48.06	72
5	MP1	X	-52.21	12
6	MP1	Z	-30.14	12
7	MP1	X	-47.78	12
8	MP1	Z	-27.59	12
9	MP1	X	-47.82	48
10	MP1	Z	-27.61	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-69.97	0
2	MP1	Z	0	0

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
3	MP1	X	-69.97	72
4	MP1	Z	0	72
5	MP1	X	-51.84	12
6	MP1	Z	0	12
7	MP1	X	-45.03	12
8	MP1	Z	0	12
9	MP1	X	-46.5	48
10	MP1	Z	0	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-83.25	0
2	MP1	Z	48.06	0
3	MP1	X	-83.25	72
4	MP1	Z	48.06	72
5	MP1	X	-52.21	12
6	MP1	Z	30.14	12
7	MP1	X	-47.78	12
8	MP1	Z	27.59	12
9	MP1	X	-47.82	48
10	MP1	Z	27.61	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-74.22	0
2	MP1	Z	128.56	0
3	MP1	X	-74.22	72
4	MP1	Z	128.56	72
5	MP1	X	-38.58	12
6	MP1	Z	66.82	12
7	MP1	X	-37.73	12
8	MP1	Z	65.35	12
9	MP1	X	-36.33	48
10	MP1	Z	62.93	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	0	0
2	MP1	Z	174.6	0
3	MP1	X	0	72
4	MP1	Z	174.6	72

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
5	MP1	X	0	12
6	MP1	Z	85.6	12
7	MP1	X	0	12
8	MP1	Z	85.6	12
9	MP1	X	0	48
10	MP1	Z	81.38	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	74.22	0
2	MP1	Z	128.56	0
3	MP1	X	74.22	72
4	MP1	Z	128.56	72
5	MP1	X	38.58	12
6	MP1	Z	66.82	12
7	MP1	X	37.73	12
8	MP1	Z	65.35	12
9	MP1	X	36.33	48
10	MP1	Z	62.93	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	83.25	0
2	MP1	Z	48.06	0
3	MP1	X	83.25	72
4	MP1	Z	48.06	72
5	MP1	X	52.21	12
6	MP1	Z	30.14	12
7	MP1	X	47.78	12
8	MP1	Z	27.59	12
9	MP1	X	47.82	48
10	MP1	Z	27.61	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	69.97	0
2	MP1	Z	0	0
3	MP1	X	69.97	72
4	MP1	Z	0	72
5	MP1	X	51.84	12
6	MP1	Z	0	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
7	MP1	X	45.03	12
8	MP1	Z	0	12
9	MP1	X	46.5	48
10	MP1	Z	0	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	83.25	0
2	MP1	Z	-48.06	0
3	MP1	X	83.25	72
4	MP1	Z	-48.06	72
5	MP1	X	52.21	12
6	MP1	Z	-30.14	12
7	MP1	X	47.78	12
8	MP1	Z	-27.59	12
9	MP1	X	47.82	48
10	MP1	Z	-27.61	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	74.22	0
2	MP1	Z	-128.56	0
3	MP1	X	74.22	72
4	MP1	Z	-128.56	72
5	MP1	X	38.58	12
6	MP1	Z	-66.82	12
7	MP1	X	37.73	12
8	MP1	Z	-65.35	12
9	MP1	X	36.33	48
10	MP1	Z	-62.93	48

Member Point Loads (BLC 16 : Ice Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Y	-148.323	0
2	MP1	Y	-148.323	72
3	MP1	Y	-77.956	12
4	MP1	Y	-73.204	12
5	MP1	Y	-71.412	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	0	0
2	MP1	Z	-20.59	0
3	MP1	X	0	72
4	MP1	Z	-20.59	72
5	MP1	X	0	12
6	MP1	Z	-8.04	12
7	MP1	X	0	12
8	MP1	Z	-8.04	12
9	MP1	X	0	48
10	MP1	Z	-7.72	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-9.43	0
2	MP1	Z	-16.34	0
3	MP1	X	-9.43	72
4	MP1	Z	-16.34	72
5	MP1	X	-3.81	12
6	MP1	Z	-6.6	12
7	MP1	X	-3.77	12
8	MP1	Z	-6.53	12
9	MP1	X	-3.67	48
10	MP1	Z	-6.35	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-13.34	0
2	MP1	Z	-7.7	0
3	MP1	X	-13.34	72
4	MP1	Z	-7.7	72
5	MP1	X	-5.88	12
6	MP1	Z	-3.39	12
7	MP1	X	-5.67	12
8	MP1	Z	-3.28	12
9	MP1	X	-5.68	48
10	MP1	Z	-3.28	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-13.68	0
2	MP1	Z	0	0

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
3	MP1	X	-13.68	72
4	MP1	Z	0	72
5	MP1	X	-6.37	12
6	MP1	Z	0	12
7	MP1	X	-6.06	12
8	MP1	Z	0	12
9	MP1	X	-6.17	48
10	MP1	Z	0	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-13.34	0
2	MP1	Z	7.7	0
3	MP1	X	-13.34	72
4	MP1	Z	7.7	72
5	MP1	X	-5.88	12
6	MP1	Z	3.39	12
7	MP1	X	-5.67	12
8	MP1	Z	3.28	12
9	MP1	X	-5.68	48
10	MP1	Z	3.28	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-9.43	0
2	MP1	Z	16.34	0
3	MP1	X	-9.43	72
4	MP1	Z	16.34	72
5	MP1	X	-3.81	12
6	MP1	Z	6.6	12
7	MP1	X	-3.77	12
8	MP1	Z	6.53	12
9	MP1	X	-3.67	48
10	MP1	Z	6.35	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	0	0
2	MP1	Z	20.59	0
3	MP1	X	0	72
4	MP1	Z	20.59	72

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
5	MP1	X	0	12
6	MP1	Z	8.04	12
7	MP1	X	0	12
8	MP1	Z	8.04	12
9	MP1	X	0	48
10	MP1	Z	7.72	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	9.43	0
2	MP1	Z	16.34	0
3	MP1	X	9.43	72
4	MP1	Z	16.34	72
5	MP1	X	3.81	12
6	MP1	Z	6.6	12
7	MP1	X	3.77	12
8	MP1	Z	6.53	12
9	MP1	X	3.67	48
10	MP1	Z	6.35	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	13.34	0
2	MP1	Z	7.7	0
3	MP1	X	13.34	72
4	MP1	Z	7.7	72
5	MP1	X	5.88	12
6	MP1	Z	3.39	12
7	MP1	X	5.67	12
8	MP1	Z	3.28	12
9	MP1	X	5.68	48
10	MP1	Z	3.28	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	13.68	0
2	MP1	Z	0	0
3	MP1	X	13.68	72
4	MP1	Z	0	72
5	MP1	X	6.37	12
6	MP1	Z	0	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
7	MP1	X	6.06	12
8	MP1	Z	0	12
9	MP1	X	6.17	48
10	MP1	Z	0	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	13.34	0
2	MP1	Z	-7.7	0
3	MP1	X	13.34	72
4	MP1	Z	-7.7	72
5	MP1	X	5.88	12
6	MP1	Z	-3.39	12
7	MP1	X	5.67	12
8	MP1	Z	-3.28	12
9	MP1	X	5.68	48
10	MP1	Z	-3.28	48

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	9.43	0
2	MP1	Z	-16.34	0
3	MP1	X	9.43	72
4	MP1	Z	-16.34	72
5	MP1	X	3.81	12
6	MP1	Z	-6.6	12
7	MP1	X	3.77	12
8	MP1	Z	-6.53	12
9	MP1	X	3.67	48
10	MP1	Z	-6.35	48

Member Point Loads (BLC 31 : Seismic Load Z)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Z	-9.185	0
2	MP1	Z	-9.185	72
3	MP1	Z	-21.346	12
4	MP1	Z	-18.207	12
5	MP1	Z	-6.223	48

Member Point Loads (BLC 32 : Seismic Load X)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]

Member Point Loads (BLC 32 : Seismic Load X) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-9.185	0
2	MP1	X	-9.185	72
3	MP1	X	-21.346	12
4	MP1	X	-18.207	12
5	MP1	X	-6.223	48

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

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N18	L	Y	-250

Joint Loads and Enforced Displacements (BLC 34 : Maintenance Load 1)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N69	L	Y	-500

Joint Loads and Enforced Displacements (BLC 35 : Maintenance Load 2)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N70	L	Y	-500

Joint Loads and Enforced Displacements (BLC 36 : Maintenance Load 3)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N74	L	Y	-500

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in,%]
1	S3	SZ	-58.128	-58.128	0	%100
2	S4	SZ	-58.128	-58.128	0	%100
3	TR6	SZ	-58.128	-58.128	0	%100
4	TR5	SZ	-58.128	-58.128	0	%100
5	TR8	SZ	-58.128	-58.128	0	%100
6	TR7	SZ	-58.128	-58.128	0	%100
7	S1	SZ	-58.128	-58.128	0	%100
8	S2	SZ	-58.128	-58.128	0	%100
9	TR1	SZ	-58.128	-58.128	0	%100
10	TR2	SZ	-58.128	-58.128	0	%100
11	TR3	SZ	-58.128	-58.128	0	%100
12	TR4	SZ	-58.128	-58.128	0	%100
13	H1	SZ	-58.128	-58.128	0	%100
14	H2	SZ	-58.128	-58.128	0	%100

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in,%]
15	MP3	SZ	-58.128	-58.128	0	%100
16	MP1	SZ	-58.128	-58.128	0	%100
17	MP2	SZ	-58.128	-58.128	0	%100
18	T1	SZ	-58.128	-58.128	0	%100
19	M29	SZ	0	0	0	%100
20	M30	SZ	0	0	0	%100
21	M33	SZ	0	0	0	%100
22	M34	SZ	0	0	0	%100
23	M35	SZ	0	0	0	%100
24	M36	SZ	0	0	0	%100
25	M25	SZ	0	0	0	%100
26	M26	SZ	0	0	0	%100

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in,%]
1	S3	SX	-58.128	-58.128	0	%100
2	S4	SX	-58.128	-58.128	0	%100
3	TR6	SX	-58.128	-58.128	0	%100
4	TR5	SX	-58.128	-58.128	0	%100
5	TR8	SX	-58.128	-58.128	0	%100
6	TR7	SX	-58.128	-58.128	0	%100
7	S1	SX	-58.128	-58.128	0	%100
8	S2	SX	-58.128	-58.128	0	%100
9	TR1	SX	-58.128	-58.128	0	%100
10	TR2	SX	-58.128	-58.128	0	%100
11	TR3	SX	-58.128	-58.128	0	%100
12	TR4	SX	-58.128	-58.128	0	%100
13	H1	SX	-58.128	-58.128	0	%100
14	H2	SX	-58.128	-58.128	0	%100
15	MP3	SX	-58.128	-58.128	0	%100
16	MP1	SX	-58.128	-58.128	0	%100
17	MP2	SX	-58.128	-58.128	0	%100
18	T1	SX	-58.128	-58.128	0	%100
19	M29	SX	0	0	0	%100
20	M30	SX	0	0	0	%100
21	M33	SX	0	0	0	%100
22	M34	SX	0	0	0	%100
23	M35	SX	0	0	0	%100
24	M36	SX	0	0	0	%100
25	M25	SX	0	0	0	%100
26	M26	SX	0	0	0	%100

Member Distributed Loads (BLC 16 : Ice Weight)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in,%]
1	S3	Y	-8.111	-8.111	0	%100
2	S4	Y	-8.111	-8.111	0	%100
3	TR6	Y	-5.324	-5.324	0	%100
4	TR5	Y	-5.324	-5.324	0	%100
5	TR8	Y	-5.324	-5.324	0	%100
6	TR7	Y	-5.324	-5.324	0	%100
7	S1	Y	-8.111	-8.111	0	%100
8	S2	Y	-8.111	-8.111	0	%100
9	TR1	Y	-5.324	-5.324	0	%100
10	TR2	Y	-5.324	-5.324	0	%100
11	TR3	Y	-5.324	-5.324	0	%100
12	TR4	Y	-5.324	-5.324	0	%100
13	H1	Y	-10.25	-10.25	0	%100
14	H2	Y	-10.25	-10.25	0	%100
15	MP3	Y	-10.261	-10.261	0	%100
16	MP1	Y	-10.261	-10.261	0	%100
17	MP2	Y	-10.261	-10.261	0	%100
18	T1	Y	-9.164	-9.164	0	%100
19	M29	Y	-3.941	-3.941	0	%100
20	M30	Y	-3.941	-3.941	0	%100
21	M33	Y	-3.941	-3.941	0	%100
22	M34	Y	-3.941	-3.941	0	%100
23	M35	Y	-3.941	-3.941	0	%100
24	M36	Y	-3.941	-3.941	0	%100
25	M25	Y	-3.941	-3.941	0	%100
26	M26	Y	-3.941	-3.941	0	%100

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in,%]
1	S3	SZ	-24.857	-24.857	0	%100
2	S4	SZ	-24.857	-24.857	0	%100
3	TR6	SZ	-57.63	-57.63	0	%100
4	TR5	SZ	-57.63	-57.63	0	%100
5	TR8	SZ	-57.63	-57.63	0	%100
6	TR7	SZ	-57.63	-57.63	0	%100
7	S1	SZ	-24.857	-24.857	0	%100
8	S2	SZ	-24.857	-24.857	0	%100
9	TR1	SZ	-57.63	-57.63	0	%100
10	TR2	SZ	-57.63	-57.63	0	%100
11	TR3	SZ	-57.63	-57.63	0	%100
12	TR4	SZ	-57.63	-57.63	0	%100
13	H1	SZ	-19.343	-19.343	0	%100

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in,%]
14	H2	SZ	-19.343	-19.343	0	%100
15	MP3	SZ	-19.324	-19.324	0	%100
16	MP1	SZ	-19.324	-19.324	0	%100
17	MP2	SZ	-19.324	-19.324	0	%100
18	T1	SZ	-21.578	-21.578	0	%100
19	M29	SZ	0	0	0	%100
20	M30	SZ	0	0	0	%100
21	M33	SZ	0	0	0	%100
22	M34	SZ	0	0	0	%100
23	M35	SZ	0	0	0	%100
24	M36	SZ	0	0	0	%100
25	M25	SZ	0	0	0	%100
26	M26	SZ	0	0	0	%100

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in,%]
1	S3	SX	-24.857	-24.857	0	%100
2	S4	SX	-24.857	-24.857	0	%100
3	TR6	SX	-57.63	-57.63	0	%100
4	TR5	SX	-57.63	-57.63	0	%100
5	TR8	SX	-57.63	-57.63	0	%100
6	TR7	SX	-57.63	-57.63	0	%100
7	S1	SX	-24.857	-24.857	0	%100
8	S2	SX	-24.857	-24.857	0	%100
9	TR1	SX	-57.63	-57.63	0	%100
10	TR2	SX	-57.63	-57.63	0	%100
11	TR3	SX	-57.63	-57.63	0	%100
12	TR4	SX	-57.63	-57.63	0	%100
13	H1	SX	-19.343	-19.343	0	%100
14	H2	SX	-19.343	-19.343	0	%100
15	MP3	SX	-19.324	-19.324	0	%100
16	MP1	SX	-19.324	-19.324	0	%100
17	MP2	SX	-19.324	-19.324	0	%100
18	T1	SX	-21.578	-21.578	0	%100
19	M29	SX	0	0	0	%100
20	M30	SX	0	0	0	%100
21	M33	SX	0	0	0	%100
22	M34	SX	0	0	0	%100
23	M35	SX	0	0	0	%100
24	M36	SX	0	0	0	%100
25	M25	SX	0	0	0	%100
26	M26	SX	0	0	0	%100

Member Area Loads

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

Envelope AISC 15th(360-16): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	She...	Loc[in]	Dir	LC	phi*P...	phi*P...	phi*M...	phi*Mn z-z [lb...	Cb	Eqn
1	TR7	0.63" SR	.438	39.811	27	.025	19.905		85	4409....	1402...	147.2...	147.295	2....	H1-1a
2	S4	1.9" ODx0.1...	.425	35.333	30	.162	42.4		28	2049...	2777...	1314....	1314.45	1....	H1-1b
3	S3	1.9" ODx0.1...	.404	35.333	31	.163	42.4		30	2049...	2777...	1314....	1314.45	1....	H1-1b
4	TR4	0.63" SR	.311	39.811	87	.039	19.905		30	4409....	1402...	147.2...	147.295	2....	H1-1a
5	S2	1.9" ODx0.1...	.299	35.333	85	.117	42.4		84	2049...	2777...	1314....	1314.45	1....	H1-1b
6	S1	1.9" ODx0.1...	.287	35.333	81	.118	42.4		87	2049...	2777...	1314....	1314.45	1.83	H1-1b
7	MP1	2.88"x0.120"	.272	33	2	.074	33		2	2249...	43056	3156....	3156.75	3....	H1-1b
8	TR8	0.63" SR	.181	0	32	.025	19.905		81	2249....	1402...	147.2...	147.295	2.15	H1-1b
9	TR5	0.63" SR	.164	28.3	27	.034	0		95	5162....	1402...	147.2...	147.295	2....	H1-1b
10	H1	PIPE 2.5	.158	77	8	.089	78		2	3348...	66654	4726.5	4726.5	1....	H1-1b
11	TR2	0.63" SR	.143	0	32	.035	0		95	5162....	1402...	147.2...	147.295	2....	H1-1b
12	TR3	0.63" SR	.122	0	81	.038	19.905		36	2249....	1402...	147.2...	147.295	2....	H1-1b
13	MP3	2.88"x0.120"	.109	33	81	.022	61		87	2249...	43056	3156....	3156.75	4.5	H1-1b
14	H2	PIPE 2.5	.090	93	96	.049	78		94	3348...	66654	4726.5	4726.5	2....	H1-1b
15	MP2	2.88"x0.120"	.087	33	8	.039	33		93	2249...	43056	3156....	3156.75	4....	H1-1b
16	T1	Pipe2.38X0....	.080	0	7	.005	96.255		36	1328...	3527...	2114....	2114.85	1....	H1-1...
17	TR6	0.63" SR	.078	0	32	.016	28.3		98	5162....	1402...	147.2...	147.295	2....	H1-1b
18	TR1	0.63" SR	.054	28.3	77	.015	0		98	5162....	1402...	147.2...	147.295	2....	H1-1b

INFINIGY

FROM ZERO TO INFINIGY

the solutions are endless

Bolt Calculation Tool, V1.5.1

PROJECT DATA	
Site Name:	BOBDL00029A
Site Number:	BOBDL00029A
Connection Description:	Sector Frame to Tower Leg

MAXIMUM BOLT LOADS		
Bolt Tension:	1251.81	lbs
Bolt Shear:	876.46	lbs

WORST CASE BOLT LOADS[1]		
Bolt Tension:	802.68	lbs
Bolt Shear:	876.46	lbs

BOLT PROPERTIES		
Bolt Type:	Threaded Rod	-
Bolt Diameter:	0.625	in
Bolt Grade:	A449	-
# of Threaded Rods:	2	-
Threads Excluded?	No	-

[1] *Worst case bolt loads correspond to Load combination #96 on member M25 in RISA-3D, which causes the maximum demand on the bolts.*

Member Information
I nodes of M25, M26

BOLT CHECK		
Tensile Strength	20340.15	
Shear Strength	13805.83	
Max Tensile Usage	6.2%	
Max Shear Usage	6.3%	
Interaction Check (Worst Case)	0.01	***≤1.05***
Result	Pass	

POWER DENSITY STUDY

EBI Consulting

environmental | engineering | due diligence

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

Dish Wireless Existing Facility

Site ID: BOBDL00029A

BOBDL00029A
373 Chamberlain Hill Road
Haddam, Connecticut 06348

October 27, 2021

EBI Project Number: 6221003985

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**2.50%**

October 27, 2021

Dish Wireless

Emissions Analysis for Site: BOBDL00029A - BOBDL00029A

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **373 Chamberlain Hill Road** in **Haddam, Connecticut** for the purpose of determining whether the emissions from the Proposed Dish Wireless Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu W/cm^2$). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed Dish Wireless antenna facility located at 373 Chamberlain Hill Road in Haddam, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since Dish Wireless is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

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

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

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

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

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

7) The antenna mounting height centerline of the proposed antennas is 200 feet above ground level (AGL).

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

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

Dish Wireless Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21
Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz	Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz	Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz
Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd
Height (AGL):	200 feet	Height (AGL):	200 feet	Height (AGL):	200 feet
Channel Count:	12	Channel Count:	12	Channel Count:	12
Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts
ERP (W):	5,236.31	ERP (W):	5,236.31	ERP (W):	5,236.31
Antenna A1 MPE %:	**0.63%**	Antenna B1 MPE %:	**0.63%**	Antenna C1 MPE %:	**0.63%**

Site Composite MPE %	
Carrier	**MPE %**
Dish Wireless (Max at Sector A):	0.63%
Sigfox	0%
Nextel	0.18%
AT&T	0.02%
MediaFLO	0.89%
Marcus	0.12%
Rescue 21	0.25%
NE Utilities	0.41%
Site Total MPE % :	2.50%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	0.63%
Dish Wireless Sector B Total:	0.63%
Dish Wireless Sector C Total:	0.63%
Site Total MPE % :	2.50%

Dish Wireless Maximum MPE Power Values (Sector A)

Dish Wireless Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
Dish Wireless 600 MHz n71	4	223.68	200.0	0.85	600 MHz n71	400	0.21%
Dish Wireless 1900 MHz n70	4	542.70	200.0	2.07	1900 MHz n70	1000	0.21%
Dish Wireless 2190 MHz n66	4	542.70	200.0	2.07	2190 MHz n66	1000	0.21%
						Total:	**0.63%**

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

Summary

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

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

Dish Wireless Sector	Power Density Value (%)
Sector A:	0.63%
Sector B:	0.63%
Sector C:	0.63%
Dish Wireless Maximum MPE % (Sector A):	0.63%
Site Total:	2.50%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **2.50%** 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.

UNDERLYING PROPERTY INFORMATION

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2020.

Information on the Property Records for the Municipality of Haddam was last updated on 12/10/2021.

Parcel Information

Location:	373 CHAMBERLAIN HILL RD	Property Use:	Industrial	Primary Use:	Warehouse
Unique ID:	C0104000	Map Block Lot:	02 019	Acres:	3.60
490 Acres:	0.00	Zone:	R-2	Volume / Page:	0229/0610
Developers Map / Lot:		Census:	5901		

Value Information

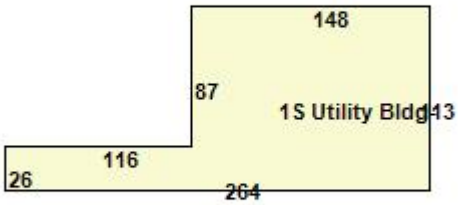
	Appraised Value	Assessed Value
Land	104,800	73,360
Buildings	504,960	353,470
Detached Outbuildings	422,850	296,000

	Appraised Value	Assessed Value
Total	1,032,610	722,830

Owner's Information

Owner's Data
AMERICAN TOWERS INC PROPERTY TAX DEPT PO BOX 723597 ATLANTA, GA 31139

Building 1



Category:	Industrial	Use:	Utility Building	GLA:	19,740
Stories:	1.00	Construction:	Masonry	Year Built:	1952
Heating:	Forced Hot Air	Fuel:	Oil	Cooling Percent:	100
Siding:	Concr/Cinder	Roof Material:	Tar and Gravel	Beds/Units:	0

Special Features

Commercial Generator	1

Attached Components

Detached Outbuildings

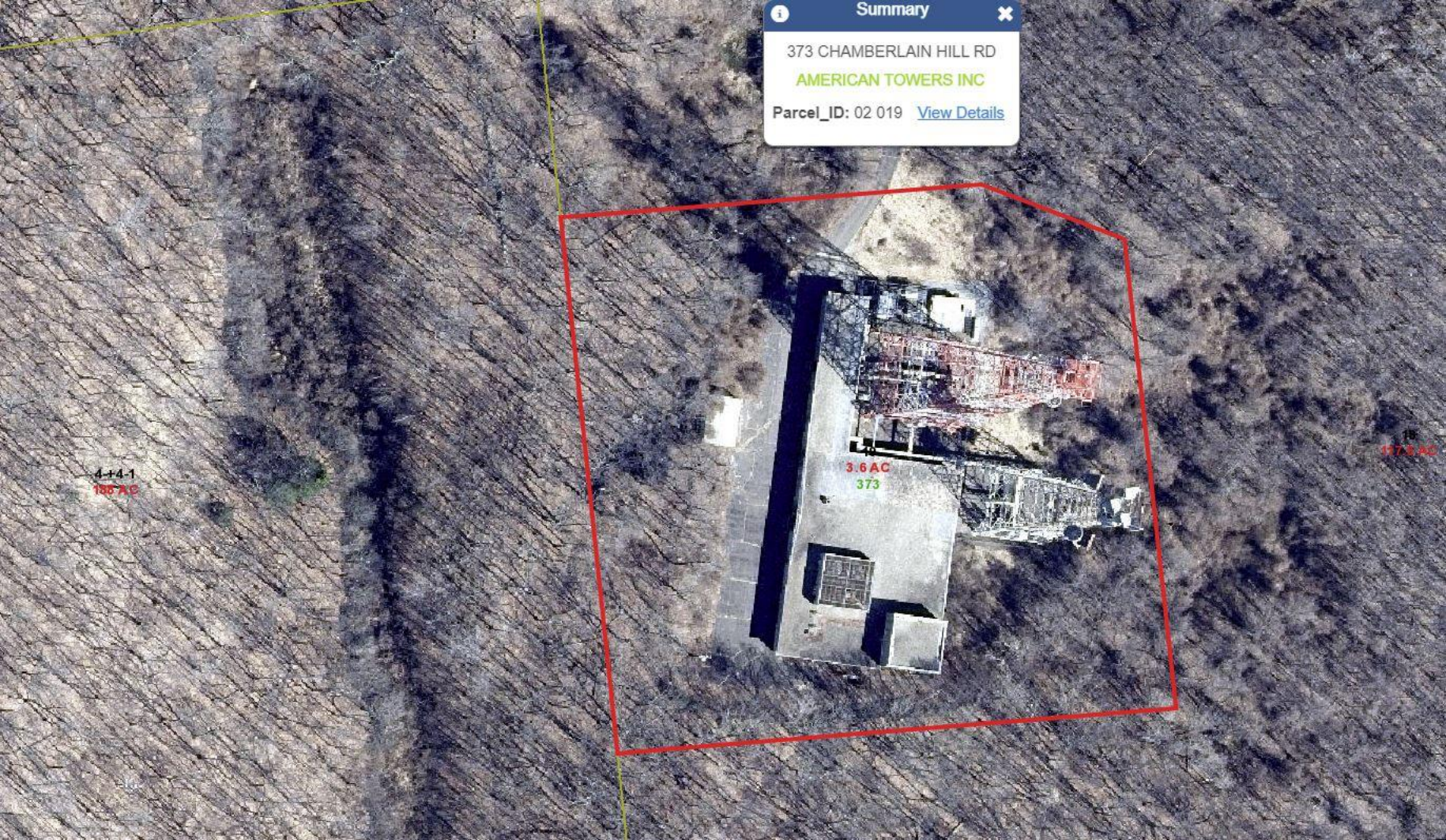
Type:	Year Built:	Length:	Width:	Area:
10 Ft Chain Fence	2015	0.00	0.00	1,800
8 Ft Chain Fence	2015	0.00	0.00	4,100
Paving	1969	0.00	0.00	33,852
Cell Tower	2017	0.00	0.00	1
Building Utility	2015	14.00	20.00	280
Building Utility	1969	36.00	16.00	576

Owner History - Sales

Owner Name	Volume	Page	Sale Date	Deed Type	Sale Price
AMERICAN TOWERS INC	0229	0610	02/16/2000		$0

Building Permits

Permit Number	Permit Type	Date Opened	Reason
12761	Addition	09/25/2015	7 NEW ANTENNAE W/COAX CABLES
12541	Addition	05/14/2015	1000 GAL PROP TANK-AG
11289	Addition	09/25/2012	2 ANTENNA+SUPPORT EQPT+1 NEW CABINET
7257	Unknown	05/28/2002	WHIP ANTENAS AND MICROWAVE DIS


Summary
373 CHAMBERLAIN HILL RD
AMERICAN TOWERS INC
Parcel_ID: 02 019 View Details
3.6 AC
373
4-1-4-1
156 AC
18
117.5 AC

NOTIFICATIONS

December 13, 2021

Dear Customer,

The following is the proof-of-delivery for tracking number: 775348830050

Delivery Information:

Status:	Delivered	**Delivered To:**	Residence
Signed for by:	Signature not required	**Delivery Location:**	30 FIELD PARK DR
Service type:	FedEx 2Day		
Special Handling:	Deliver Weekday		HADDAM, CT, 06438
		Delivery date:	Dec 2, 2021 15:22

Shipping Information:

Tracking number:	775348830050	**Ship Date:**	Nov 30, 2021
		Weight:	1.0 LB/0.45 KG

Recipient:
Gary Vivian - Building Official,
Town Office Building
30 Field Park Drive
HADDAM, CT, US, 06438

Shipper:
Corey Milan, NB+C
100 Apollo Dr.
Suite 303
CHELMSFORD, MA, US, 01824

Reference 100814

Thank you for choosing FedEx

USPS Tracking®

FAQs >

Track Another Package +

Tracking Number: 9505511588611335444567

Remove ×

Your item has been delivered and is available at a PO Box at 12:56 pm on December 16, 2021 in ATLANTA, GA 31139.

USPS Tracking Plus™ Available

Delivered, PO Box

December 16, 2021 at 12:56 pm
ATLANTA, GA 31139

Get Updates

Feedback

Text & Email Updates

Tracking History

December 16, 2021, 12:56 pm
Delivered, PO Box
ATLANTA, GA 31139
Your item has been delivered and is available at a PO Box at 12:56 pm on December 16, 2021 in ATLANTA, GA 31139.

December 15, 2021
In Transit to Next Facility

December 13, 2021

Dear Customer,

The following is the proof-of-delivery for tracking number: 775348767124

Delivery Information:

Status:	Delivered	**Delivered To:**	Residence
Signed for by:	Signature not required	**Delivery Location:**	30 FIELD PARK DR
Service type:	FedEx 2Day		
Special Handling:	Deliver Weekday		HADDAM, CT, 06438
		Delivery date:	Dec 2, 2021 15:22

Shipping Information:

Tracking number:	775348767124	**Ship Date:**	Nov 30, 2021
		Weight:	0.5 LB/0.23 KG

Recipient:
Robert McGarry - First Selectman,
Town Office Building
30 Field Park Drive
HADDAM, CT, US, 06438

Shipper:
Corey Milan, NB+C
100 Apollo Dr.
Suite 303
CHELMSFORD, MA, US, 01824

Reference 100814

Thank you for choosing FedEx