# PROJECT NARRATIVE

October 26, 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
650 Albany Turnpike Collinsville, CT 06019
Latitude: 41'51'2.030" / Longitude: -72'56'55.410"

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 650 Albany Turnpike in Collinsville (Canton) (the "Property"). The existing 120-foot monopole tower is owned by American Tower Corporation ("ATC"). The underlying property is owned by Perry W. Lansford. 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 Bessel, First Selectman for the Town of Canton, Jerry Waters, Town of Canton Building Official and Perry W. Lansford as the property owner.

**Background**

The existing ATC facility consists of a 120-foot monopole tower located within an existing leased area. Verizon Wireless currently maintains antennas at the 120-foot level. AT&T Mobility currently maintains antennas at the 110-foot level. T-Mobile currently maintains antennas at the 100-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 Crown Castle have agreed to the proposed shared use of the 650 Albany Turnpike 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 89-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 650 Albany Turnpike 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
## LICENSEE: DISH WIRELESS L.L.C.

I, Margaret Robinson, Senior Counsel for American Tower*, owner/operator 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.

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

| Project # | ATC Site # | ATC Site Name | ATC Site Address |
|---|---|---|---|
| 13688133 | 208450 | Enfield | 1A Ecology Drive, Enfield CT |
| 13700322 | 209115 | Ridgefield 2 | 320 Old Stagecoach Road, Ridgefield, CT |
| 13688136 | 209185 | Burlington 2 | 87 Monce Road, Burlington CT |
| 13700320 | 209271 | Brookfield 2 | 100 Pocono Road, Brookfield CT |
| 13693702 | 243036 | WEST HAVEN & RT 162 CT | 668 Jones Hill Road, West Haven CT |
| 13693677 | 280501 | ROXBURY CT | 377 Southbury Road, Roxbury CT |
| 13685406 | 281416 | WILLINGTON CT | 196 Tolland Turnpike, Willington CT |
| 13709418 | 281862 | BRIDGEWATER CT | 111 SECOND HILL RD, Bridgewater CT |
| 13693659 | 283418 | NORTH HAVEN CT | 50 Devine Street, North Haven CT |
| 13694329 | 283419 | PINE ORCHARD BRANFORD CT | 123 Pine Orchard Road, Branford CT |
| 13694332 | 283422 | SHORT BEACH BRANFORD CT | 171 Short Beach Road, Branford CT |
| 13698427 | 283423 | NAUGATUCK CT | 880 Andrew Mountain Road, Naugatuck CT |
| 13685464 | 283563 | MANSFIELD CT | 343 Daleville Road, Willington CT |
| 13692735 | 284983 | OLD LYME CT | 61-1 Buttonball Road, Old Lyme CT |
| 13693120 | 284984 | PAWCATUCK CT | 166 Pawcatuck Ave, Pawcatuck CT |
| 13693144 | 284988 | GUILFORD CT | Moose Hill Road, Guilford CT |
| 13694582 | 302465 | Colchester CT 6 | 355 Route 85, Colchester CT |
| 13683501 | 302468 | Petro Lock | 99 Meadow St, Hartford CT |
| 13685427 | 302469 | Bridgeport CT 2 | 1069 Connecticut Avenue, Bridgeport CT |
| 13683503 | 302472 | Andover-bunker Hill Road | 104 Bunker Hill Road, Andover CT |
| 13683507 | 302473 | E H F R - Prestige Park | 310 Prestige Park Road, East Hartford CT |

AMERICAN TOWER®
CORPORATION

| Project # | ATC Site # | ATC Site Name | ATC Site Address |
|---|---|---|---|
| 13683510 | 302474 | South Windsor | 391 Niederwerfer Road, South Windsor CT |
| 13683513 | 302483 | Brln - Berlin | 286 Beckley Road, Berlin CT |
| 13692185 | 302488 | Cntn - Canton | 4 Hoffmann Road, Canton CT |
| 13692173 | 302495 | Tolland CT | 56 Ruops Road, Tolland CT |
| 13694579 | 302496 | Clch - Colchester | Chestnut Hill Road, Colchester CT |
| 13701212 | 302501 | Plymouth CT 3 | 297 North Street, Plymouth CT |
| 13685414 | 302515 | SMFR - North | 5 High Ridge Park Road, Stamford CT |
| 13702496 | 302516 | Mlfd - Milford | 438 Bridgeport Ave, Milford CT |
| 13688395 | 302518 | Newtown CT 3 | 25 Meridian Ridge Drive, Newton CT |
| 13692174 | 302529 | Vernon CT 6 | 777 Talcotville Road, Vernon Rockville CT |
| 13693124 | 311014 | NORWICH CT | 202 N Wawecus Hill Rd, Norwich CT |
| 13702522 | 311305 | GLFD-GUILFORD REBUILD CT | 10 Tanner Marsh Road, Guilford CT |
| 13693127 | 370623 | MONTVILLE CT | 139 Sharp Hill Road, Uncasville CT |
| 13681964 | 370625 | Old Saybrook | 77 Springbrook Road, Old Saybrook CT |
| 13702535 | 383660 | North Madison Volunteer FD | 864 Opening Hill Road, Madison CT |
| 13702538 | 411180 | Good Hill CT | 481 GOOD HILL ROAD, Woodbury CT |
| 13693709 | 411182 | Nepaug CT | 20 Antolini Road, New Hartford CT |
| 13693131 | 411183 | WATERFORD CT | 53 Dayton Rd., Waterford CT |
| 13693135 | 411184 | SALEM CT SQA | 399 West Road, Salem CT |
| 13692177 | 411186 | West Granby, CT CT | 207 West Granby Road, Granby CT |
| 13692178 | 411187 | Hartford North 2 CT | 811 Blue Hills Avenue, Bloomfield CT |
| 13693705 | 411188 | Southbury CT | 111 Upper Fishrock Road, Southbury CT |
| 13692179 | 411256 | CANTON CT | 14 CANTON SPRINGS ROAD, Canton CT |
| 13681988 | 411257 | Middle Haddam Road-CROWN CT | 191 Middle Haddam Rd, Portland CT |
| 13692180 | 411258 | Farmington North 2 CT | 199 Town Farm Road, Farmington CT |
| 13692182 | 411259 | CT Collinsville CAC 802816 CT | 650 Albany Turnpike, Collinsville CT |
| 13692184 | 416862 | SUFFIELD SW CT CT | 106 South Grand St., West Suffield CT |
| 13694578 | 6260 | NORTH STONINGTON CT | 118C Wintechog Hill Rd., off of Rt. 2, North Stonington CT |
| 13681397 | 88013 | Killingworth | 131 Little City Road, Killingworth CT |

Signature:

Print Name: Margaret Robinson
Senior Counsel
American Tower*

AMERICAN TOWER®
CORPORATION

**LETTER OF AUTHORIZATION**
**LICENSEE: DISH WIRELESS L.L.C.**

**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 10th day of September 2021.

NOTARY SEAL

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

Notary Public _____
My Commission Expires: March 14, 2025

# ENGINEERING DRAWINGS

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

# BOBDL00026A

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

# 650 ALBANY TURNPIKE
# COLLINSVILLE, CT 06019

## 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 (1) PROPOSED ANTENNA PLATFORM MOUNT
- INSTALL PROPOSED JUMPERS
- INSTALL (6) PROPOSED RRHs (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

## 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: | LANDMARK INFRASTRUCTURE INC |
| ADDRESS: | 650 ALBANY TURNPIKE<br>COLLINSVILLE, CT 06019 |
| TOWER TYPE: | MONOPOLE |
| TOWER CO SITE ID: | 411259 |
| TOWER APP NUMBER: | 13692182 |
| COUNTY: | HARTFORD |
| LATITUDE (NAD 83): | 41° 51' 2.030" N<br>41.850564 |
| LONGITUDE (NAD 83): | 72° 56' 55.410" W<br>-72.948725 |
| ZONING JURISDICTION: | CONNECTICUT SITING COUNCIL |
| ZONING DISTRICT: | R-2 |
| PARCEL NUMBER: | 21/101/0650 |
| OCCUPANCY GROUP: | U |
| CONSTRUCTION TYPE: | II-B |
| POWER COMPANY: | NORTH UTILITY SERVICE |
| TELEPHONE COMPANY: | SNET |

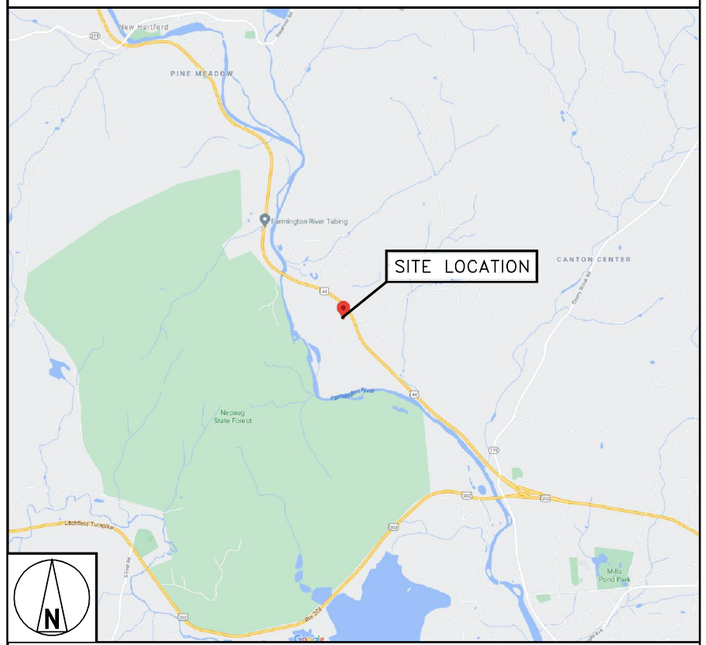
## PROJECT DIRECTORY

| | |
|---|---|
| APPLICANT: | DISH WIRELESS, L.L.C.<br>5701 SOUTH SANTA FE DRIVE<br>LITTLETON, CO 80120<br>(303) 706-5008 |
| TOWER OWNER: | AMERICAN TOWER<br>10 PRESIDENTIAL WAY<br>WOBURN, MA 01801 |
| ENGINEER: | NB+C ENGINEERING SERVICES, LLC<br>8601 SIX FORKS RD, SUITE 540<br>RALEIGH, NC 27615<br>(919) 657-9131 |
| SITE ACQUISITION: | APRIL PARROTT<br>APRIL.PARROTT@DISH.COM |
| CONSTRUCTION MANAGER: | AARON CHANDLER<br>AARON.CHANDLER@DISH.COM |
| RF ENGINEER: | BOSSENER CHARLES<br>BOSSENER.CHARLES@DISH.COM |

## DIRECTIONS

FROM 99 EAST RIVER DR....I-84 WEST TO US-44 WEST/MAIN ST. (I-91) CONTINUE ON US-44 WEST....US-WEST/US 202 BECOMES US-44 WEST/US-202 SOUTH...CONTINUE ON US-44 WEST...ARRIVE AT 650 ALBANY TPKE COLLINSVILLE LOOK FOR MAILBOX WITH 650 ON IT GO UP THE DRIVEWAY AND SITE IS PAST THE HOUSE

## 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: |
|---|---|---|
| MFS | BIW | BIW |

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS

| REV | DATE | DESCRIPTION |
|---|---|---|
| A | 08/17/2021 | ISSUED FOR REVIEW |
| 0 | 09/13/2021 | ISSUED FOR CONSTRUCTION |

STATE OF CONNECTICUT
BENJAMIN KOTARA
PEN.0028997
LICENSED PROFESSIONAL ENGINEER

09/13/2021



A&E PROJECT NUMBER

411259-13692182

DISH WIRELESS, L.L.C.
PROJECT INFORMATION

BOBDL00026A
650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

SHEET TITLE

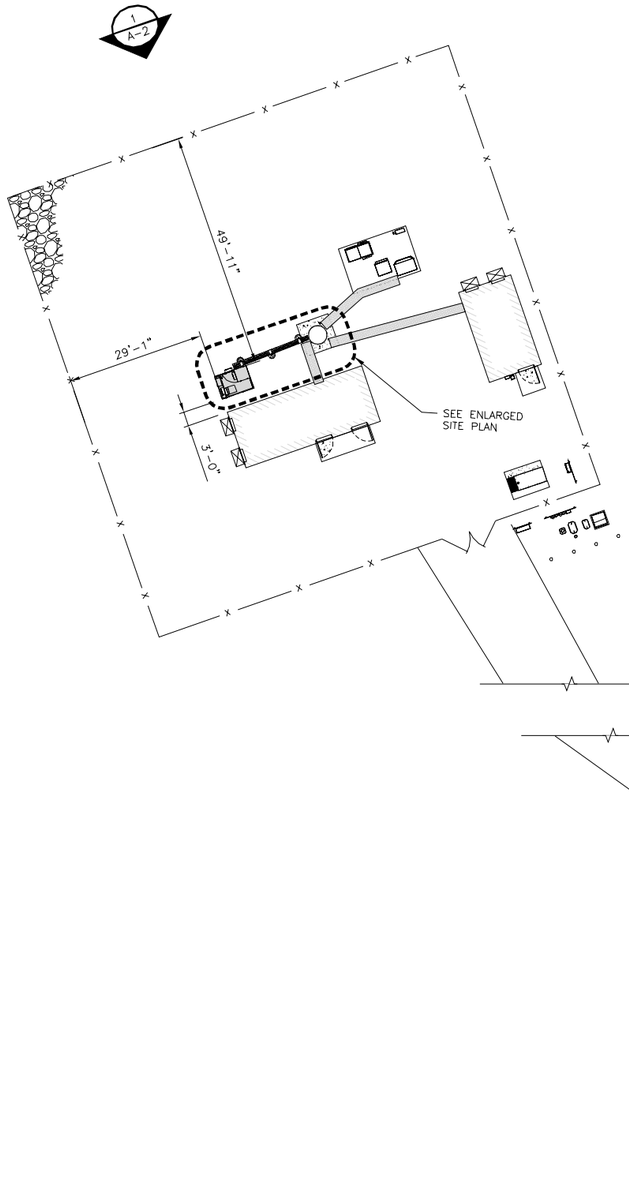
TITLE SHEET

SHEET NUMBER

**T-1**

## NOTES

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



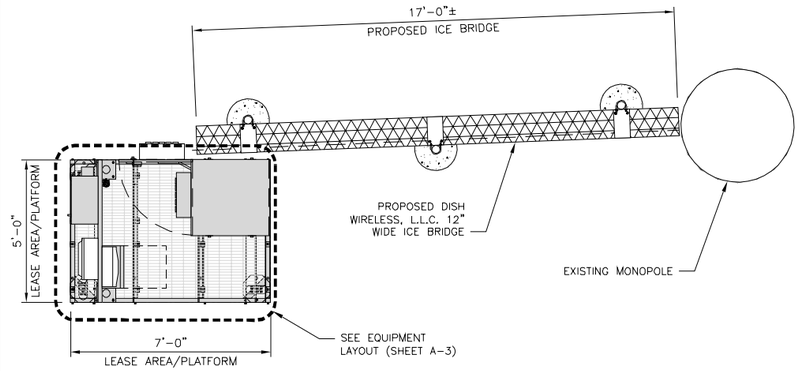

OVERALL SITE PLAN

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

1

## NOTES

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




ENLARGED SITE PLAN

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

2


AERIAL VIEW

NO SCALE

3

## NOTES

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


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: |
|---|---|---|
| MFS | BIW | BIW |

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STATE OF CONNECTICUT
PEN.0028997
LICENSED PROFESSIONAL ENGINEER

09/13/2021



A&E PROJECT NUMBER
411259-13692182

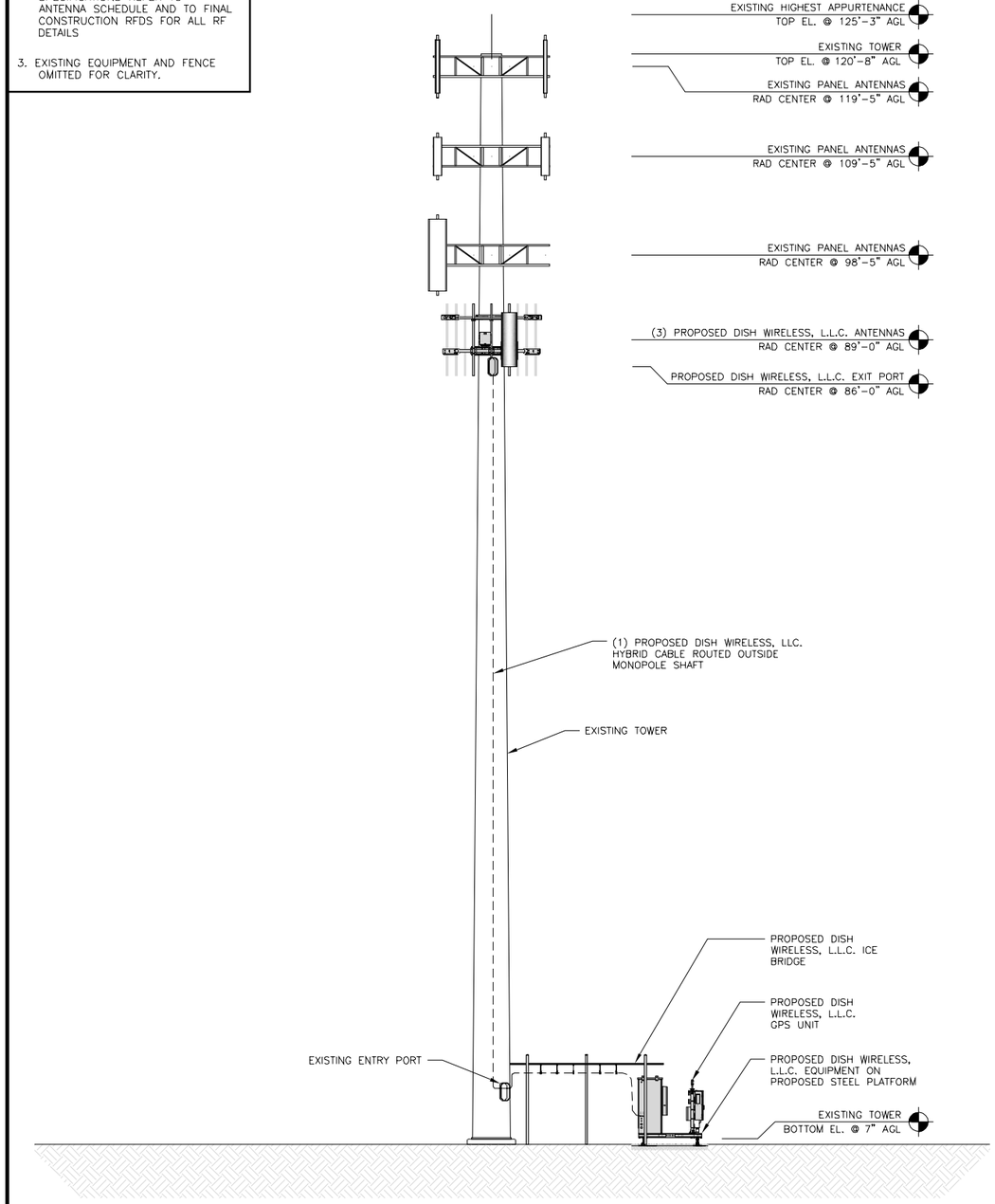
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00026A
650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

SHEET TITLE
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER
**A-1**

## NOTES

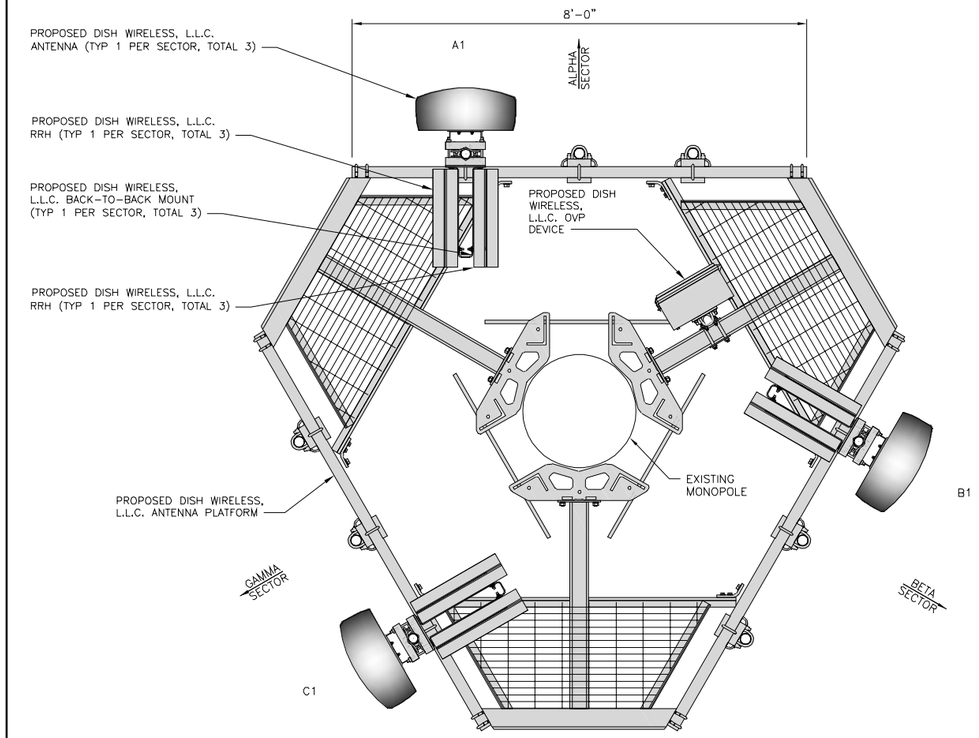
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.




PROPOSED NORTHWEST ELEVATION

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

1




ANTENNA LAYOUT

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

2

| SECTOR | POSITION | ANTENNA | | | | | | TRANSMISSION CABLE |
|---|---|---|---|---|---|---|---|---|
| | | EXISTING OR PROPOSED | MANUFACTURER – MODEL NUMBER | TECHNOLOGY | SIZE (HxW) | AZIMUTH | RAD CENTER | FEED LINE TYPE AND LENGTH |
| ALPHA | A1 | PROPOSED | JMA – MX08FRO665-21 | 5G | 72.0" x 20.0" | 0° | 89'-0" | (1) HIGH-CAPACITY HYBRID CABLE (130' LONG) |
| BETA | B1 | PROPOSED | JMA – MX08FRO665-21 | 5G | 72.0" x 20.0" | 120° | 89'-0" | |
| GAMMA | C1 | PROPOSED | JMA – MX08FRO665-21 | 5G | 72.0" x 20.0" | 240° | 89'-0" | |

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

NOTES

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

ANTENNA SCHEDULE

NO SCALE

3


dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

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: |
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| MFS | BIW | BIW |

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A&E PROJECT NUMBER
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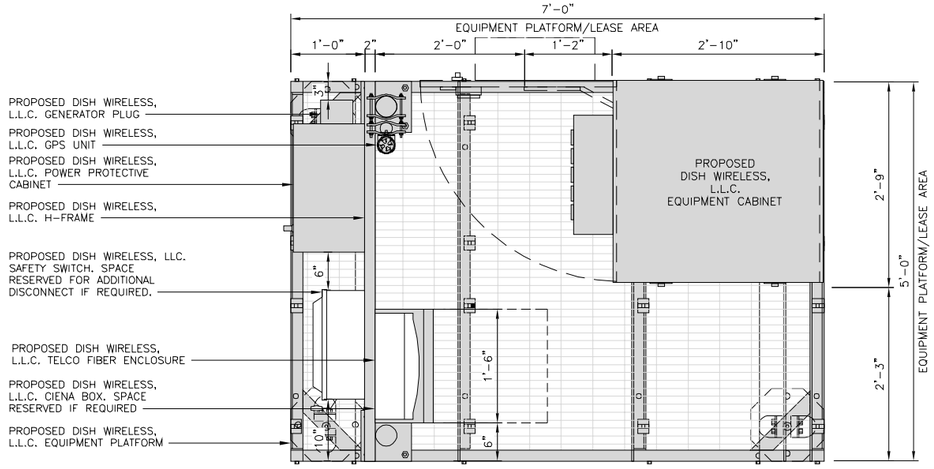
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00026A
650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
**A-2**




PLATFORM EQUIPMENT PLAN

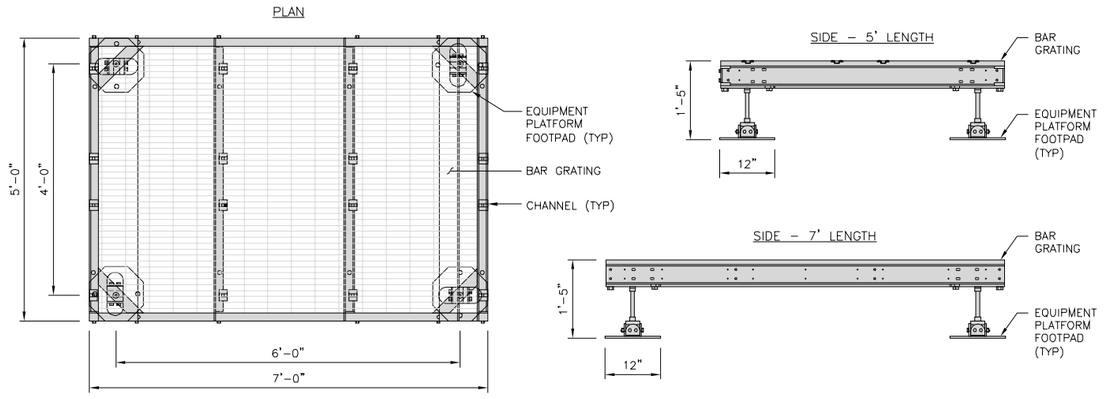
12" 9" 6" 3" 0 1' 2'
1"=1'-0"

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"

NOTE:
PLATFORM MUST BE LEVEL WITHIN 1 DEGREE

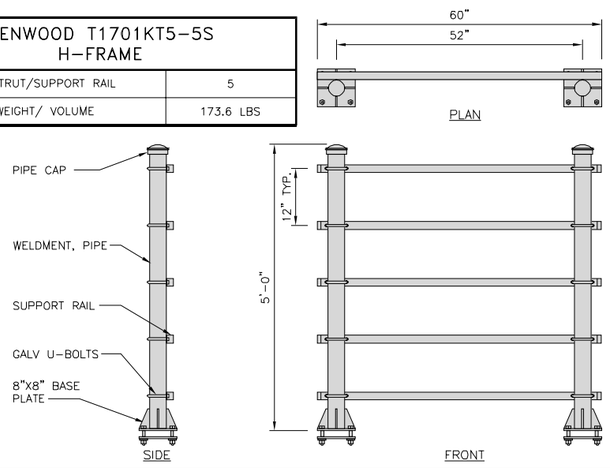



PLATFORM DETAIL

NO SCALE

2

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




H-FRAME DETAIL

NO SCALE

3

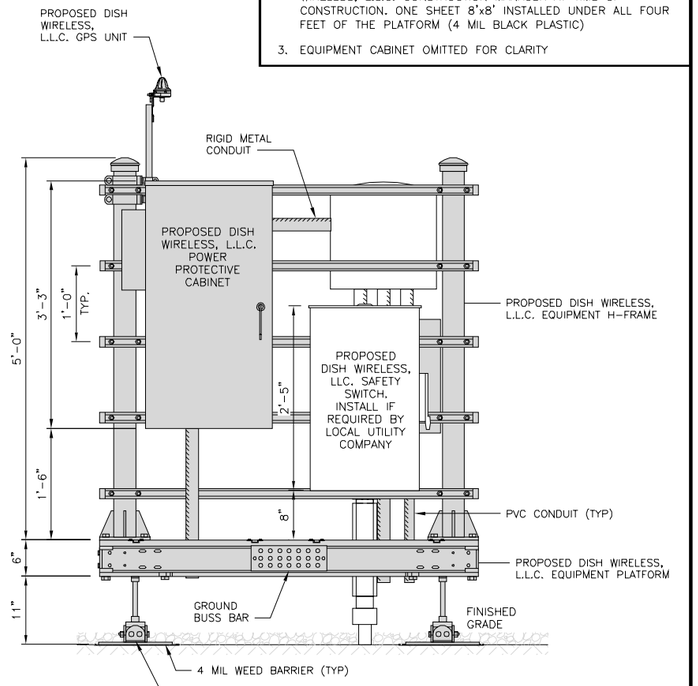
NOT USED

NO SCALE

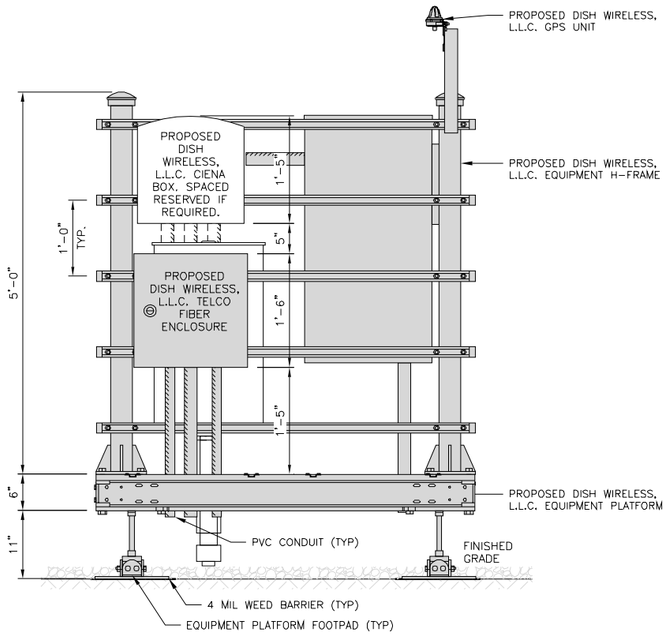
4

## NOTES

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




FRONT ELEVATION




BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION

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

5

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8601 SIX FORKS ROAD, SUITE 540
RALEIGH, NC 27615
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|---|---|---|
| MFS | BIW | BIW |

RFDS REV #: 1

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STATE OF CONNECTICUT
BRIAN KOTARA
PEN.0028997
LICENSED PROFESSIONAL ENGINEER
09/13/2021



A&E PROJECT NUMBER
411259-13692182

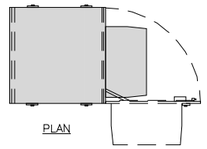
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00026A
650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

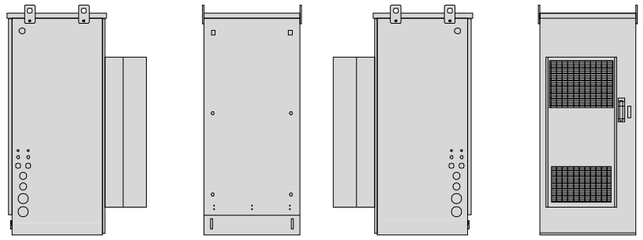
SHEET NUMBER
A-3

## CHARLES INDUSTRY HEX CUBE–PM639155N4

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



PLAN

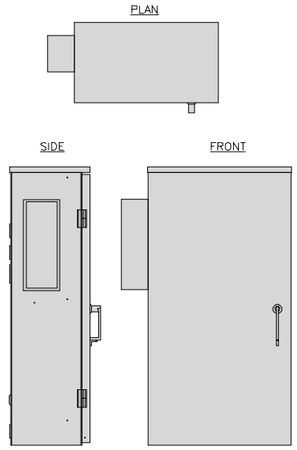


SIDE BACK SIDE FRONT

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 |

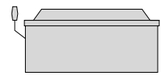


PLAN SIDE FRONT

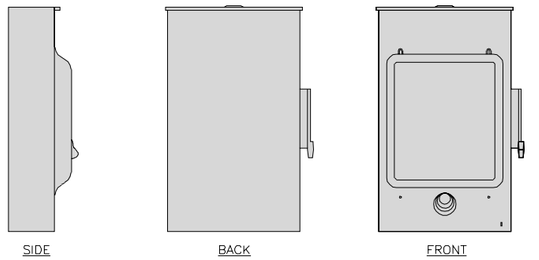
POWER PROTECTION CABINET (PPC) DETAIL | NO SCALE | 2

## 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



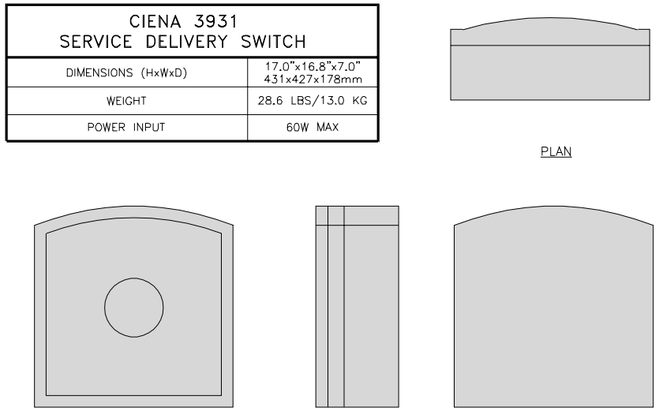
SIDE BACK FRONT

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 |

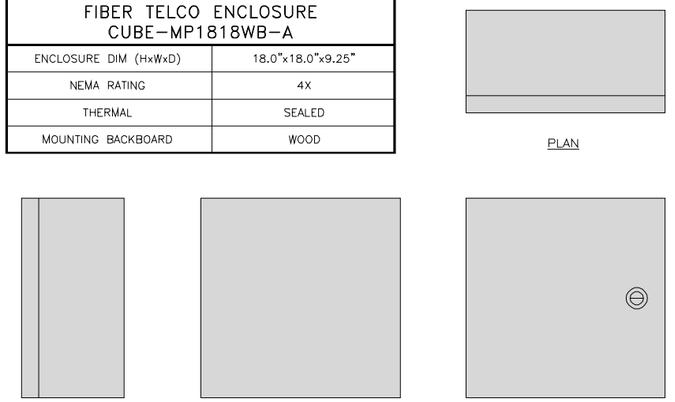


PLAN FRONT SIDE BACK

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 |



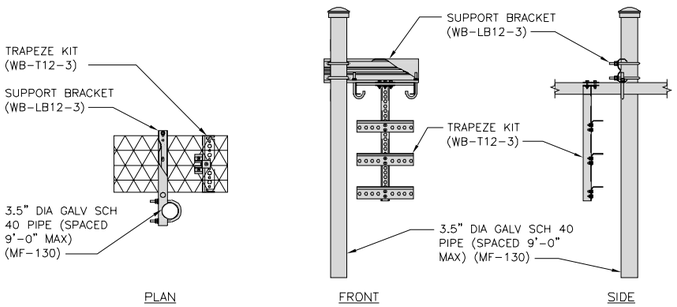
PLAN SIDE BACK FRONT

FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

## COMMSCOPE WB–K110–B WAVEGUIDE BRIDGE KIT

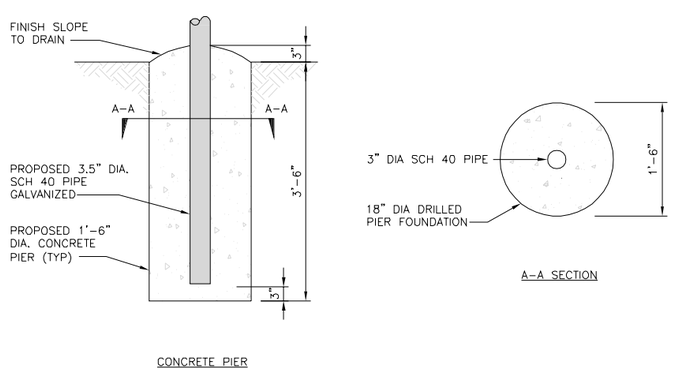
| | |
|---|---|
| DIMENSIONS (HxL) | 160"x10' |
| WEIGHT/ VOLUME | 325.0 LBS |
| CABLE RUN (QTY) | 12 |

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



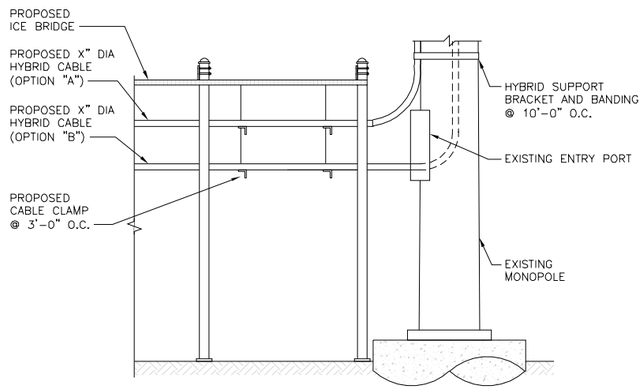

PLAN FRONT SIDE

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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| DRAWN BY: | CHECKED BY: | APPROVED BY: |
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STATE OF CONNECTICUT · BRIAN KOTAN · PEN.0028997 · LICENSED PROFESSIONAL ENGINEER

09/13/2021



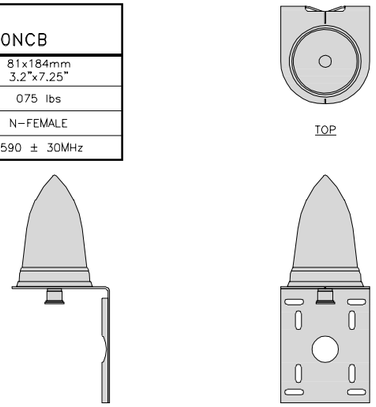
A&E PROJECT NUMBER
411259–13692182

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00026A
650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

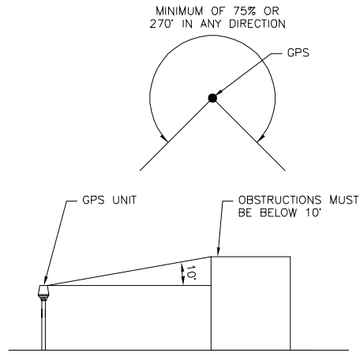
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
**A-4**

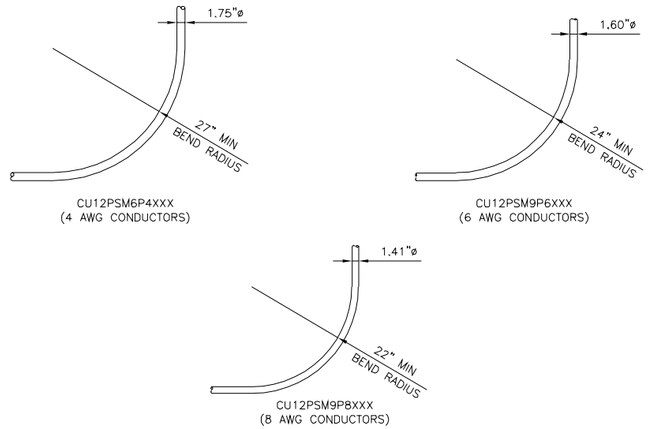
| PCTEL GPSGL-TMG-SPI-40NCB | |
|---|---|
| DIMENSIONS (DIAxH) MM/INCH | 81x184mm 3.2"x7.25" |
| WEIGHT W/ACCESSORIES | 075 lbs |
| CONNECTOR | N-FEMALE |
| FREQUENCY RANGE | 1590 ± 30MHz |




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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| DRAWN BY: | CHECKED BY: | APPROVED BY: |
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| MFS | BIW | BIW |

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09/13/2021



A&E PROJECT NUMBER
411259-13692182

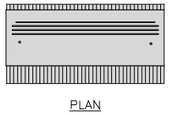
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00026A
650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

SHEET TITLE
EQUIPMENT DETAILS

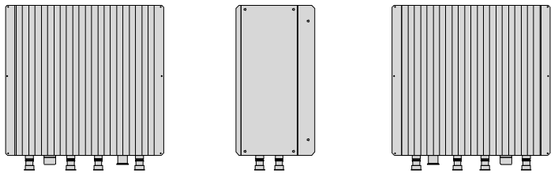
SHEET NUMBER
**A-5**

## FUJITSU DUAL BAND TA08025-B604

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



PLAN

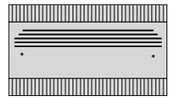


BACK SIDE FRONT

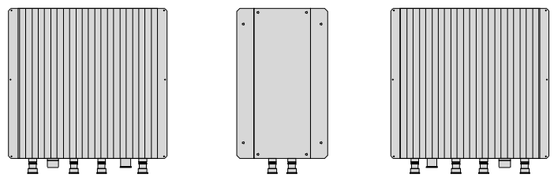
RRH DETAIL | NO SCALE | 1

## FUJITSU TRIPLE BAND TA08025-B605

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



PLAN



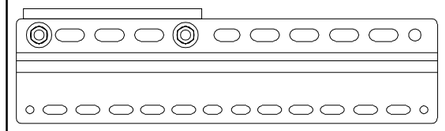
BACK SIDE FRONT

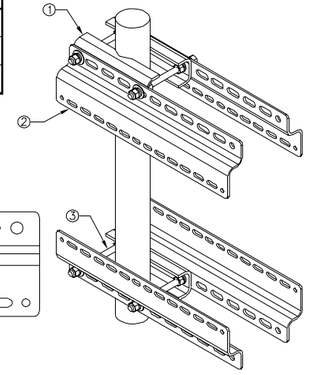
RRH DETAIL | NO SCALE | 2

## SABRE DOUBLE Z-BRACKET C10123155

| | |
|---|---|
| DIMENSIONS (HxWxD) (1 BRACKET) | 5"x20"x1-13/16" |
| WEIGHT (FULL ASSEMBLY) | 35.79 lbs |
| PACKAGE QUANTITY | 4 |

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





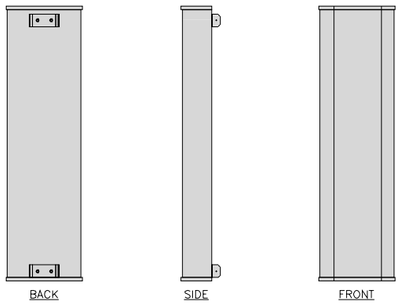

NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

RRH MOUNT DETAIL | NO SCALE | 3

## JMA WIRELESS MX08FRO665-21 ANTENNA

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

PLAN



BACK SIDE FRONT

ANTENNA DETAIL | NO SCALE | 4

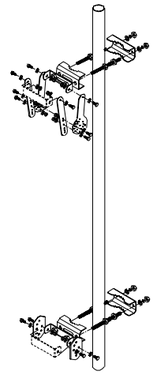
## JMA ANTENNA MOUNT BRACKET #91900318

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

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

ANTENNA BRACKET NOT PART OF KIT

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

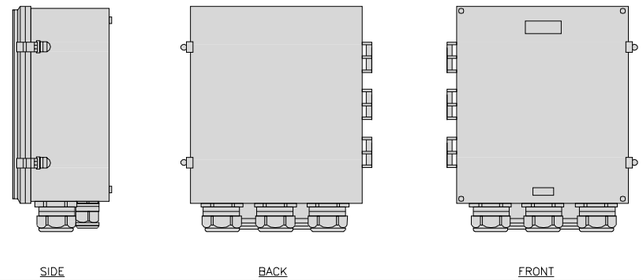


ANTENNA BRACKET DETAIL | NO SCALE | 5

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

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

PLAN

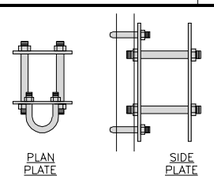


SIDE BACK FRONT

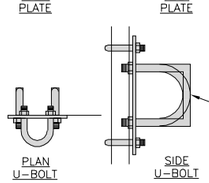
SURGE SUPPRESSION DETAIL (OVP) | NO SCALE | 6

## COMMSCOPE XP-2040 CROSSOVER PLATE

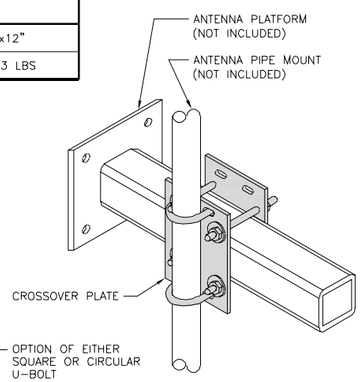
| | |
|---|---|
| DIMENSIONS (HxW) | 10"x12" |
| WEIGHT | 11.023 LBS |



PLAN PLATE SIDE PLATE



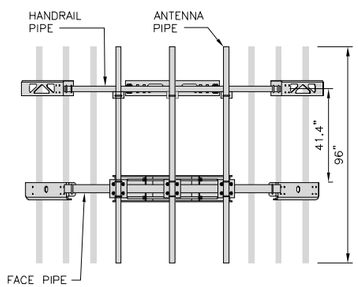
PLAN U-BOLT SIDE U-BOLT



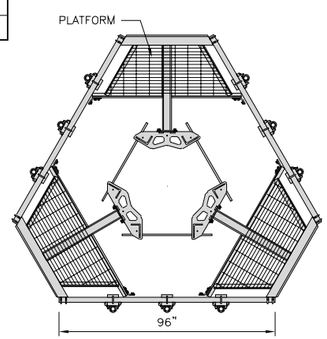

RRH/OVP MOUNT DETAIL | NO SCALE | 7

## COMMSCOPE MC-PK8-DSH

| | |
|---|---|
| FACE WIDTH | 96" |
| WEIGHT | 1373.08 lbs |
| NOTE: 15" TO 38" O.D. | |




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




ANTENNA PLATFORM DETAIL | NO SCALE | 8

NOT USED | NO SCALE | 9

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| DRAWN BY: | CHECKED BY: | APPROVED BY: |
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RFDS REV #: 1

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

09/13/2021



A&E PROJECT NUMBER
411259-13692182

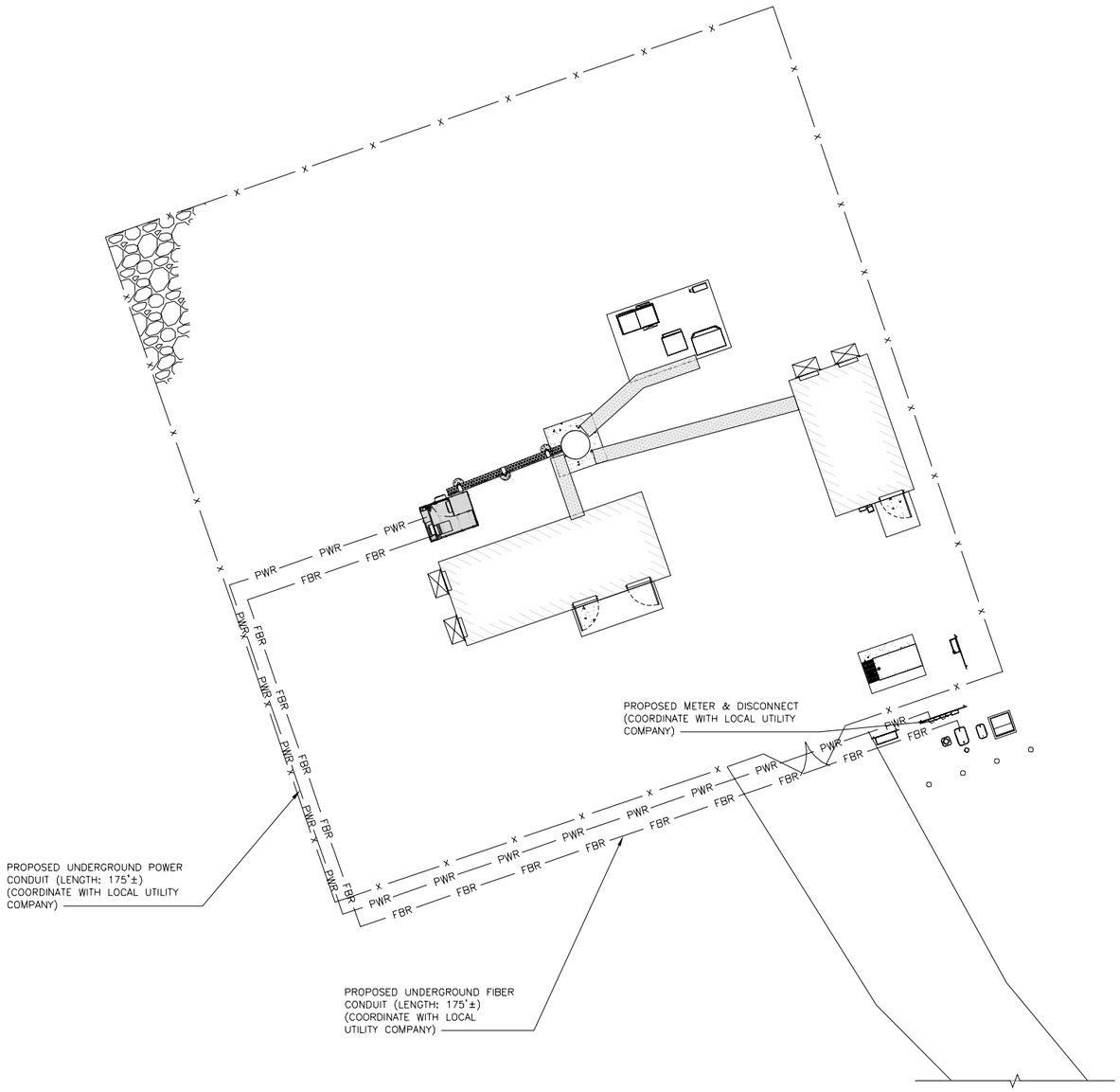
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00026A
650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

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.




N

UTILITY ROUTE PLAN | 10' 0 10' 20' (1"=10') | 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


AERIAL VIEW | NO SCALE | 3

## NOTES

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

dish wireless.
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(919) 657-9131

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|---|---|---|
| MFS | BIW | BIW |

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| 0 | 09/13/2021 | ISSUED FOR CONSTRUCTION |

STATE OF CONNECTICUT · BRIAN KOTTMAN · PEN.0028997 · LICENSED PROFESSIONAL ENGINEER
09/13/2021

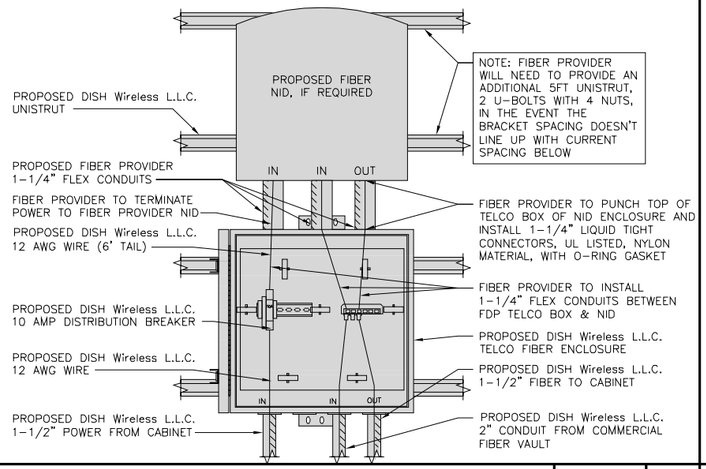


A&E PROJECT NUMBER
411259-13692182

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00026A
650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

SHEET TITLE
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

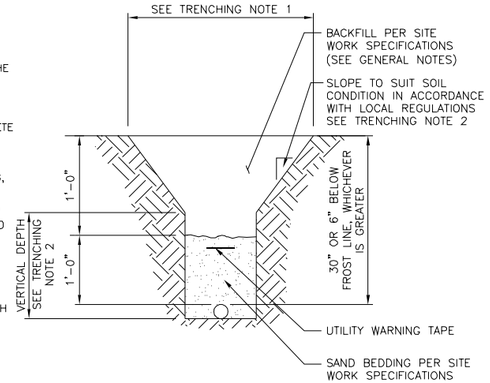
SHEET NUMBER
**E-1**



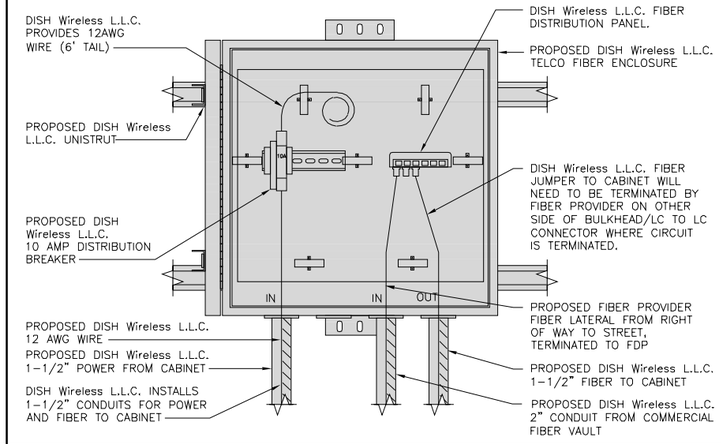

LIT TELCO BOX – INTERIOR WIRING LAYOUT (OPTIONAL) | NO SCALE | 1

## 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

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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09/13/2021

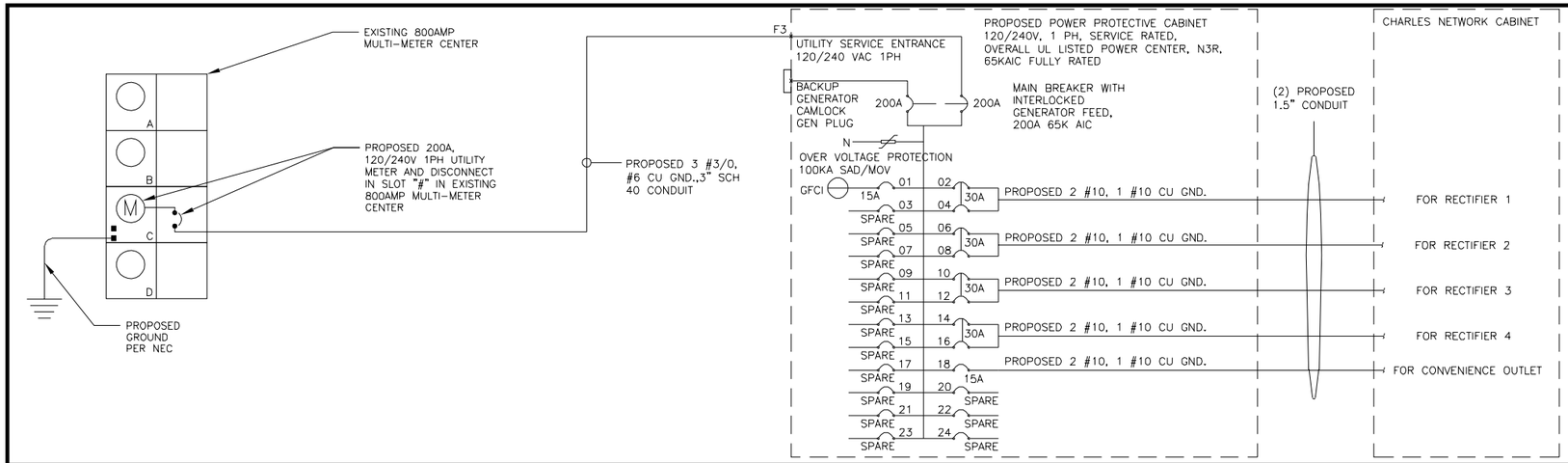


A&E PROJECT NUMBER
411259-13692182

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00026A
650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-2




(CHARLES ABB GE INFINITY DC PLANT) WITH MULTI-METER CENTER 120V240V 1PH SOURCE | NO SCALE | 1

## PROPOSED PANEL SCHEDULE

| LOAD SERVED | VOLT AMPS (WATTS) L1 | VOLT AMPS (WATTS) L2 | TRIP | CKT # | PHASE | CKT # | TRIP | VOLT AMPS (WATTS) L1 | VOLT AMPS (WATTS) L2 | LOAD SERVED |
|---|---|---|---|---|---|---|---|---|---|---|
| GFCI IN PPC CAB. | 1440 | | 15A | 1 | A | 2 | 30A | 2880 | | ABB/GE INFINITY RECTIFIER 1 |
| -SPARE- | | | | 3 | B | 4 | | | 2880 | |
| -SPARE- | | | | 5 | A | 6 | 30A | 2880 | | ABB/GE INFINITY RECTIFIER 2 |
| -SPARE- | | | | 7 | B | 8 | | | 2880 | |
| -SPARE- | | | | 9 | A | 10 | 30A | 2880 | | ABB/GE INFINITY RECTIFIER 3 |
| -SPARE- | | | | 11 | B | 12 | | | 2880 | |
| -SPARE- | | | | 13 | A | 14 | 30A | 2880 | | ABB/GE INFINITY RECTIFIER 4 |
| -SPARE- | | | | 15 | B | 16 | | | 2880 | |
| -SPARE- | | | | 17 | A | 18 | 15A | 1440A | | CHARLES GFCI OUTLET |
| -SPARE- | | | | 19 | B | 20 | | | | -SPARE- |
| -SPARE- | | | | 21 | A | 22 | | | | -SPARE- |
| -SPARE- | | | | 23 | B | 24 | | | | -SPARE- |
| VOLT AMPS | 1440 | | | | | | | 12960A | 11520 | |

| 200A MCB, 1ϕ, 3W, 120/240V | L1 | L2 | |
|---|---|---|---|
| MB RATING: 65,000 AIC | 14400 | 11520 | VOLT AMPS |
| | 120 | 96 | AMPS |
| | 120 | | MAX AMPS |
| | 150 | | MAX 125% |

PANEL SCHEDULE
(CHARLES ABB GE INFINITY DC PLANT) WITH MULTI-METER CENTER 120V240V 1PH SOURCE | NO SCALE | 2

NOT USED | NO SCALE | 3

NOT USED | NO SCALE | 4

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STATE OF CONNECTICUT
BRIAN KOTNIK
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LICENSED PROFESSIONAL ENGINEER
09/13/2021

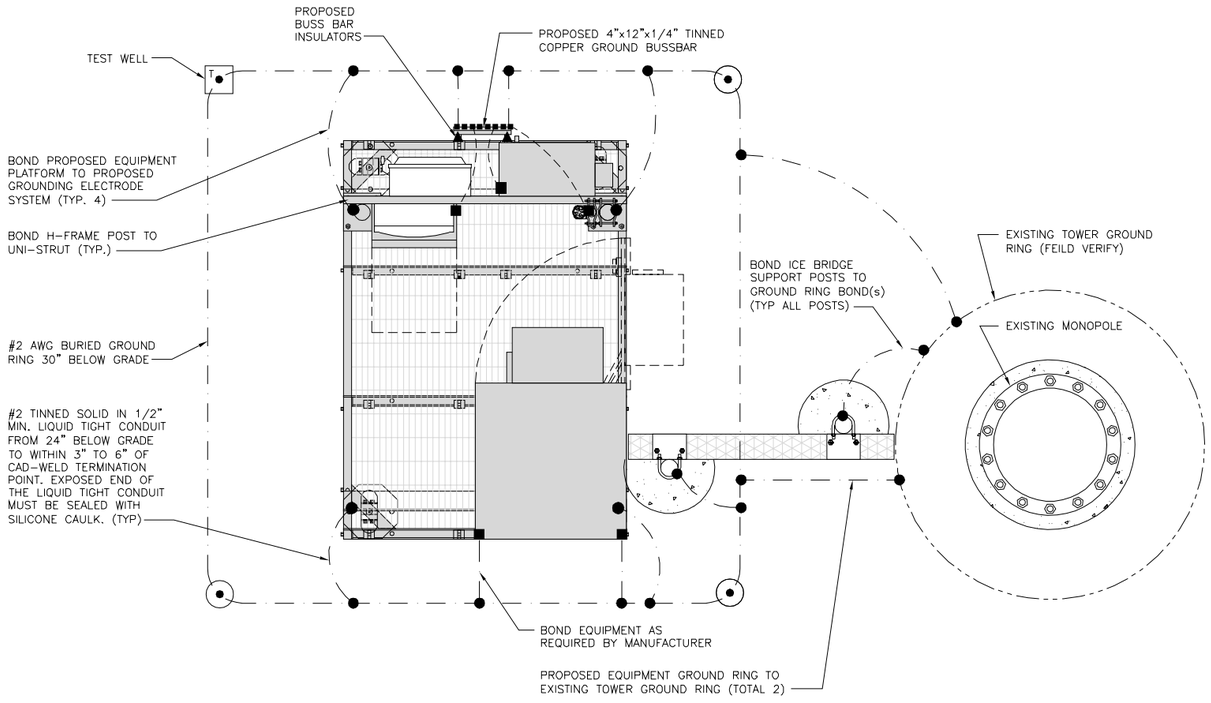


A&E PROJECT NUMBER
411259-13692182

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00026A
650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

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

SHEET NUMBER
**E-3**

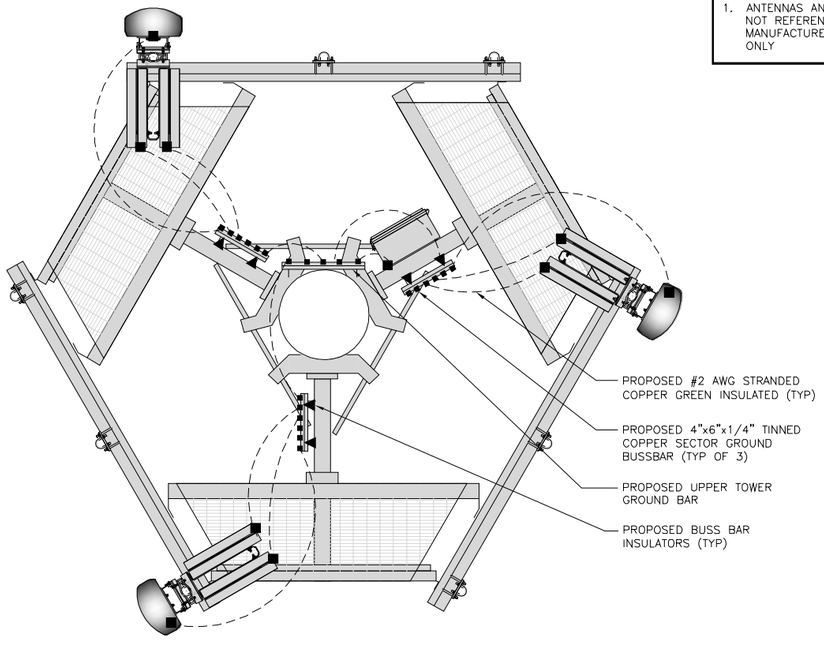



## TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE | 1

### NOTES

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




## TYPICAL ANTENNA GROUNDING PLAN

NO SCALE | 2

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

## GROUNDING LEGEND

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

## GROUNDING KEY NOTES

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

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

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

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

(E) GROUND ROD: UL LISTED COPPER CLAD STEEL. MINIMUM 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

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RFDS REV #: 1

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

09/13/2021



A&E PROJECT NUMBER
411259-13692182

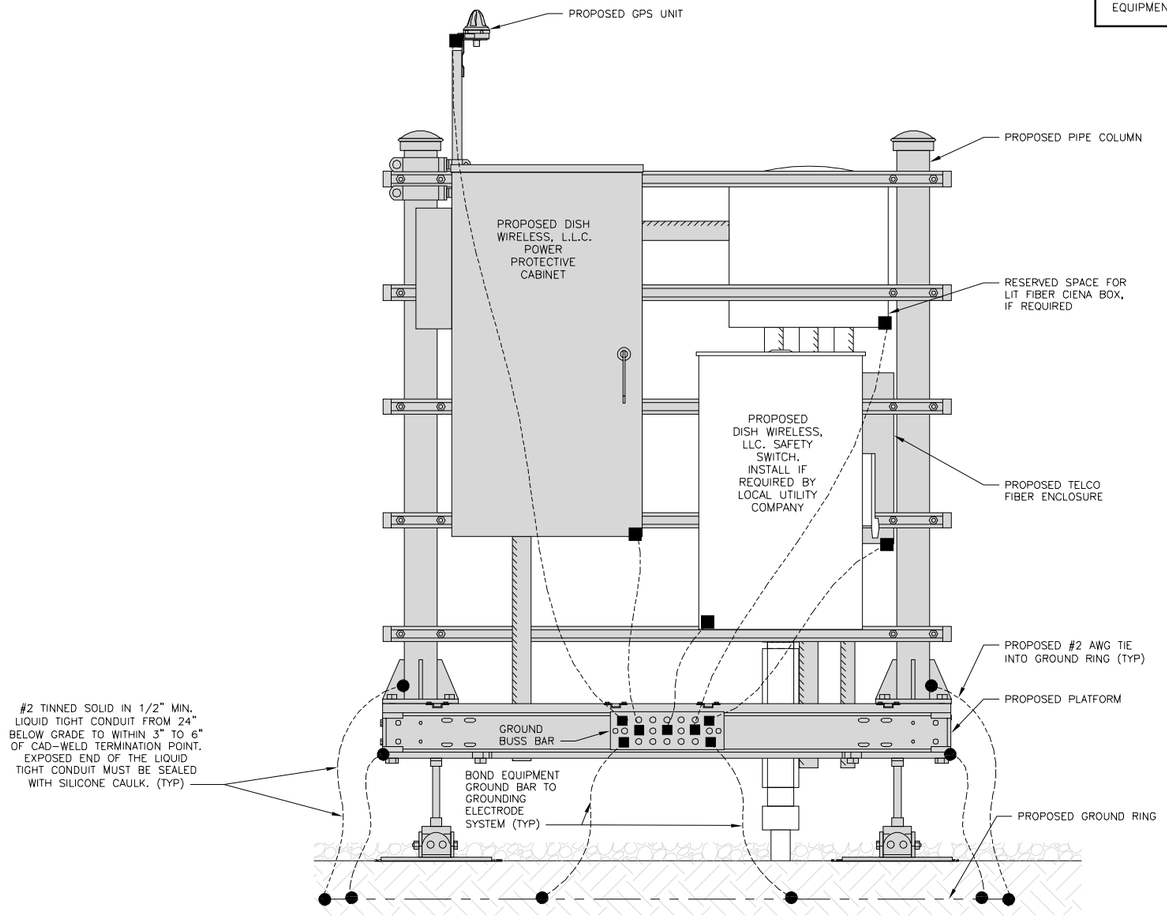
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00026A
650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

SHEET TITLE
GROUNDING PLANS AND NOTES

SHEET NUMBER
G-1

## NOTES

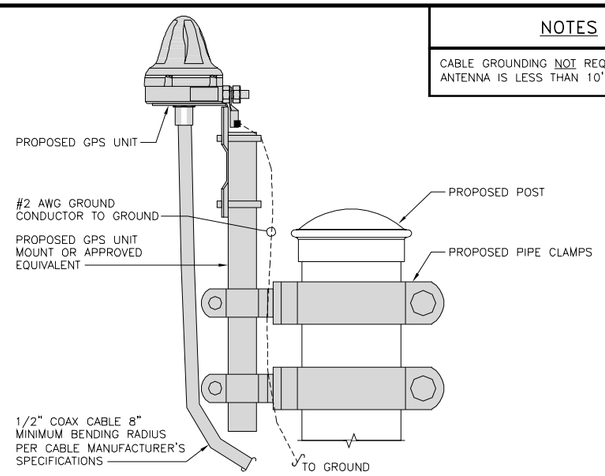
EQUIPMENT CABINET OMITTED FOR CLARITY



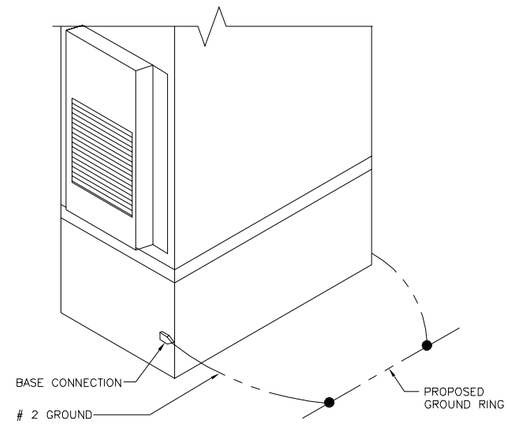

H-FRAME GROUNDING DETAIL | NO SCALE | 1

## NOTES

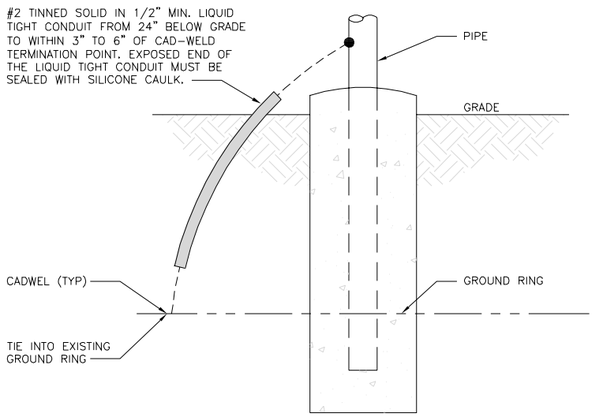
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



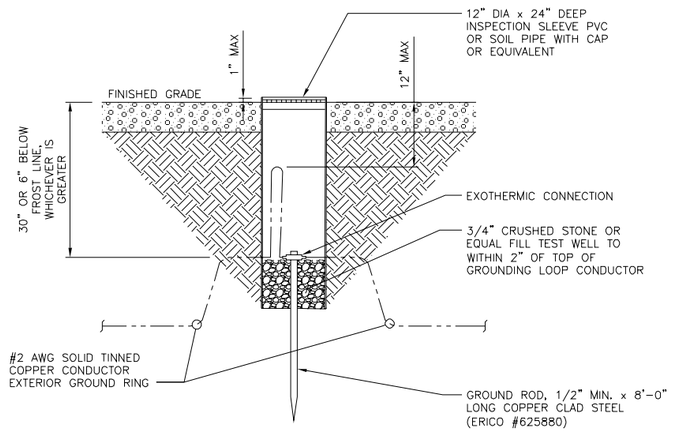

TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



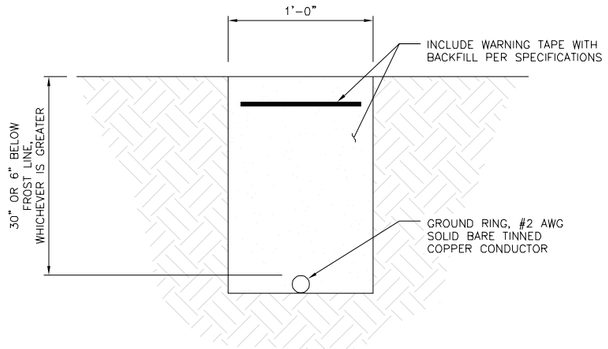

OUTDOOR CABINET GROUNDING | NO SCALE | 3




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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DISH WIRELESS, L.L.C.
PROJECT INFORMATION

BOBDL00026A
650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

SHEET TITLE

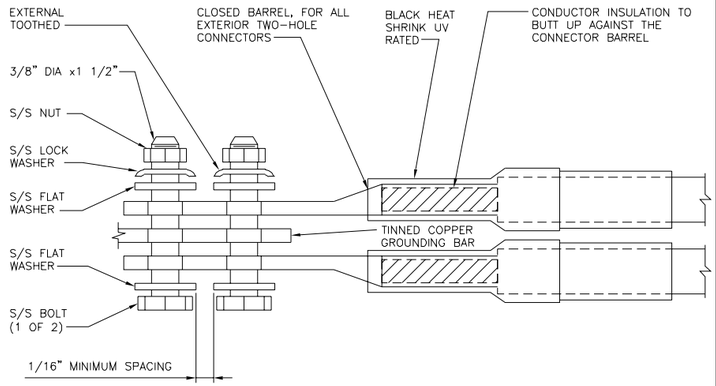
GROUNDING DETAILS

SHEET NUMBER

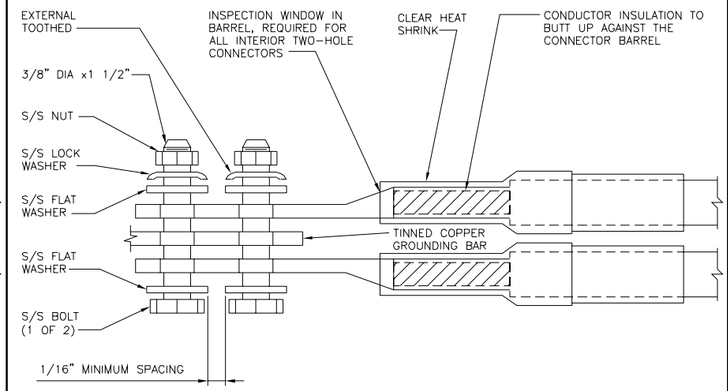
**G-2**

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).

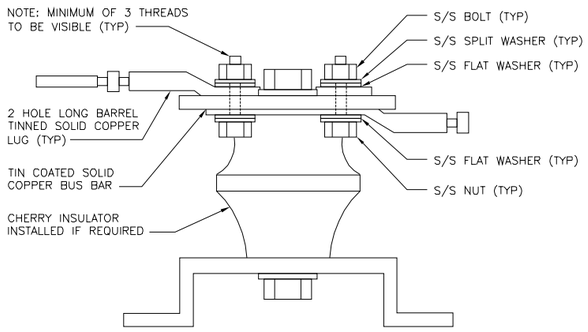
TYPICAL GROUNDING NOTES | NO SCALE | 1




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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SHEET TITLE
GROUNDING DETAILS

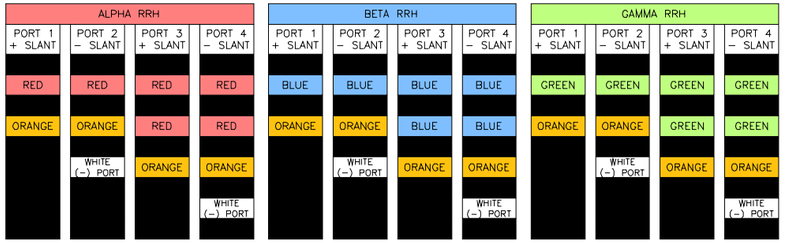
SHEET NUMBER
**G-3**

## RF JUMPER COLOR CODING

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

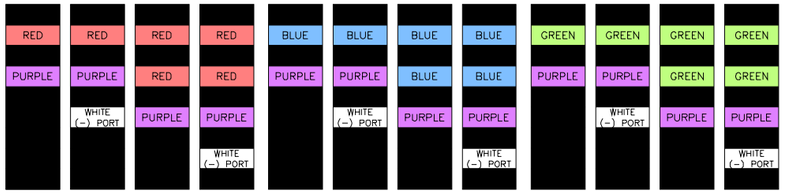
LOW-BAND RRH –
(600MHz N71 BASEBAND) +
(850MHz N26 BAND) +
(700MHz N29 BAND) – OPTIONAL PER MARKET

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)

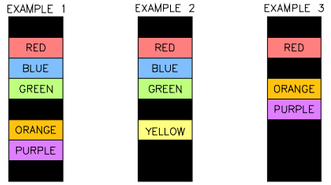



### HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED
ALONG WITH FREQUENCY BANDS

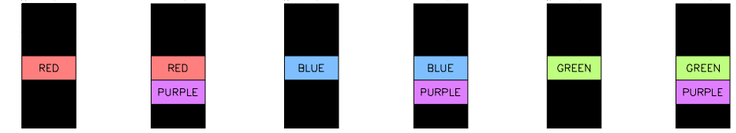
EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS
ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS

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



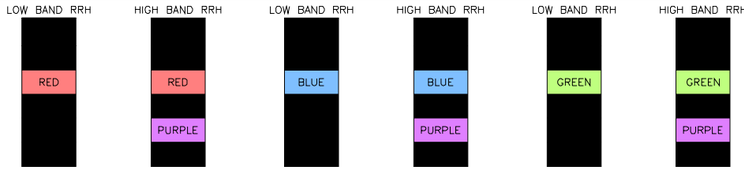

### FIBER JUMPERS TO RRHs

LOW-BAND RRH FIBER CABLES HAVE SECTOR
STRIPE ONLY

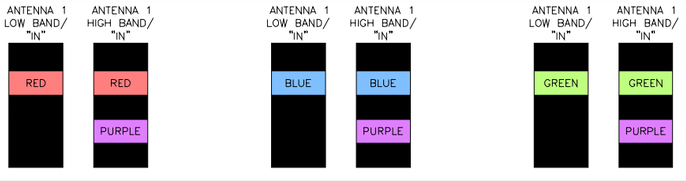



### POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR
STRIPE ONLY



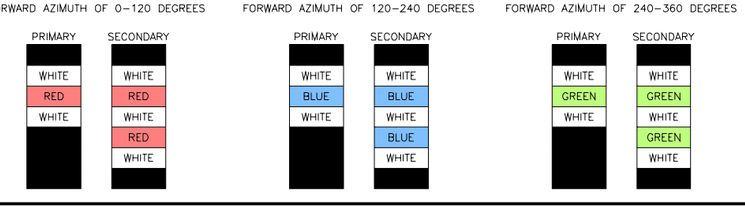

### RET MOTORS AT ANTENNAS




### 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 |
|---|---|---|

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

AWS
(N66+N70+H-BLOCK)
PURPLE

CBRS TECH
(3 GHz)
YELLOW

NEGATIVE SLANT PORT
ON ANT/RRH
WHITE

ALPHA SECTOR
RED

BETA SECTOR
BLUE

GAMMA SECTOR
GREEN

| COLOR IDENTIFIER | NO SCALE | 2 |
|---|---|---|

| NOT USED | NO SCALE | 3 |
|---|---|---|

| NOT USED | NO SCALE | 4 |
|---|---|---|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| MFS | BIW | BIW |

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

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| A | 08/17/2021 | ISSUED FOR REVIEW |
| 0 | 09/13/2021 | ISSUED FOR CONSTRUCTION |


09/13/2021

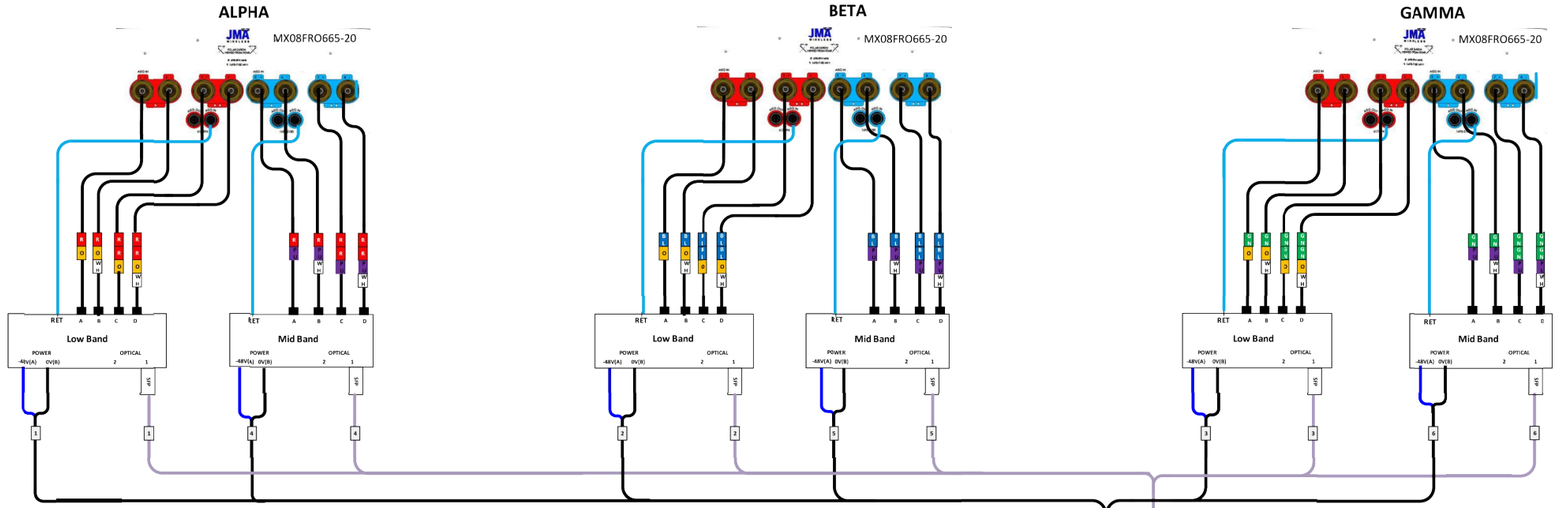


A&E PROJECT NUMBER
411259-13692182

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00026A
650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

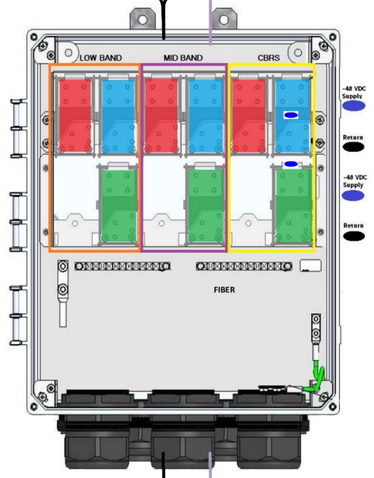
SHEET TITLE
RF
CABLE COLOR CODES

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 | Te0/0/025 | Blank/Future |
| 26 | Te0/0/026 | Fiber NIU |
| 27 | Te0/0/027 | Fiber NIU |
| 28 | Te0/0/028 | Blank/Future |
| 29 | Te0/0/029 | Blank/Future |

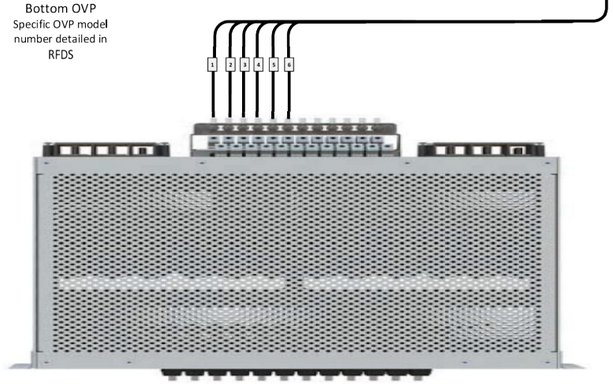
top

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



| | | |
|---|---|---|
| Quan Liu | 5G plumbing diagram JMA MX08FRO665-20 2-2-2(LB+MB) | |
| 5- Jan- 2021 | SIZE / FSCM NO / DWG NO / REV: 3 | SCALE: None / SHEET |

PLUMBING DIAGRAM | NO SCALE | 1

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411259-13692182

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00026A
650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

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

09/13/2021



A&E PROJECT NUMBER

411259-13692182

DISH WIRELESS, L.L.C.
PROJECT INFORMATION

BOBDL00026A
650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

SHEET TITLE

LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SITE ACTIVITY REQUIREMENTS:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES:

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

CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION

CARRIER:DISH WIRELESS, L.L.C.

TOWER OWNER:TOWER OWNER

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

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

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

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

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

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

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

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

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

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

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

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

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


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09/13/2021



A&E PROJECT NUMBER

411259-13692182

DISH WIRELESS, L.L.C.
PROJECT INFORMATION

BOBDL00026A

650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

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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STATE OF CONNECTICUT
BRIAN WESLEY KOTARA
PEN.0028997
LICENSED
PROFESSIONAL ENGINEER

09/13/2021



A&E PROJECT NUMBER

411259-13692182

DISH WIRELESS, L.L.C.
PROJECT INFORMATION

BOBDL00026A
650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

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

dish wireless.

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| A | 08/17/2021 | ISSUED FOR REVIEW |
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STATE OF CONNECTICUT · BRIAN KOTTNER · PEN.0023997 · LICENSED PROFESSIONAL ENGINEER

09/13/2021



A&E PROJECT NUMBER
411259-13692182

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
BOBDL00026A
650 ALBANY TURNPIKE
COLLINSVILLE, CT 06019

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
**GN-4**

# ENGINEERING:

# STRUCTURAL ANALYSIS

# MOUNT ANALYSIS

AMERICAN TOWER®
CORPORATION

This report was prepared for American Tower Corporation by

TOWER ENGINEERING PROFESSIONALS

# Structural Analysis Report

| | | |
|---|---|---|
| **Structure** | : | **120 ft Monopole** |
| **ATC Site Name** | : | **CT Collinsville CAC 802816 CT, CT** |
| **ATC Asset Number** | : | **411259** |
| **Engineering Number** | : | **13692182_C3_02** |
| **Proposed Carrier** | : | **DISH WIRELESS L.L.C.** |
| **Carrier Site Name** | : | **BOBDL00026A** |
| **Carrier Site Number** | : | **BOBDL00026A** |
| **Site Location** | : | **650 Albany Turnpike**<br>**Collinsville, CT 06019-3522**<br>**41.850600,-72.948700** |
| **County** | : | **Hartford** |
| **Date** | : | **July 26, 2021** |
| **Max Usage** | : | **57%** |
| **Result** | : | **Pass** |

Prepared By:
Siddharth Yadav
TEP

Reviewed By:

STATE OF CONNECTICUT
AARON THOMAS RUCKER
32608
LICENSED
PROFESSIONAL ENGINEER

07/27/2021

**COA: PEC.0001553**

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## Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 120 ft monopole to reflect the change in loading by DISH WIRELESS L.L.C..

## Supporting Documents

| | |
|---|---|
| **Tower Drawings** | EEI Project #11936 Rev 3, dated January 29, 2004 |
| **Foundation Drawing** | EEI Project #11936, dated September 10, 2003 |
| **Geotechnical Report** | CHA Project #11869.1006.1502, dated November 20, 2002 |

## Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

| | |
|---|---|
| **Basic Wind Speed:** | 115 mph (3-Second Gust) |
| **Basic Wind Speed w/ Ice:** | 50 mph (3-Second Gust) w/ 1 1/2" radial 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 |
| **Spectral Response:** | Ss = 0.17, $S_1$ = 0.05 |
| **Site Class:** | D - Stiff Soil |

## 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 |
|---|---|---|---|---|---|
| 121.0 | 3 | Antel BXA-70063/6CF __ 2° | Low Profile Platform | (18) 1 5/8" Coax | VERIZON WIRELESS |
| | 1 | VZW Unused Reserve (20687.01 sqin) | | | |
| | 3 | Amphenol Antel BXA-171085-12BF-EDIN-X | | | |
| | 6 | Antel LPA-80080/6CF ___ | | | |
| 110.0 | 3 | Powerwave Allgon P65-17-XLH-RR | Low Profile Platform | (1) 0.39" (10mm) Fiber Trunk<br>(2) 0.78" (19.7mm) 8 AWG 6<br>(12) 1 5/8" Coax<br>(1) 3" conduit | AT&T MOBILITY |
| | 6 | Ericsson RRUS-11 (50 lbs.) | | | |
| | 1 | Raycap DC6-48-60-0-8F | | | |
| | 12 | Powerwave Allgon TT19-08BP111-001 | | | |
| | 1 | Andrew ABT-DFDM-ADB | | | |
| | 6 | Powerwave Allgon P65-15-XLH-RR | | | |
| 100.0 | 3 | Ericsson KRY 112 489/2 | Platform with Handrails | (3) 1 5/8" (1.63"-41.3mm) Fiber<br>(12) 1 5/8" Coax | T-MOBILE |
| | 3 | Ericsson Radio 4449 B12,B71 | | | |
| | 3 | RFS APX16DWV-16DWV-S-E-ACU | | | |
| | 3 | RFS APXVAARR24_43-U-NA20 | | | |
| | 3 | Ericsson KRY 112 144/1 | | | |

**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 |
|---|---|---|---|---|---|
| 89.0 | 1 | Commscope RDIDC-9181-PF-48 | Platform with Handrails | (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.

Install proposed coax outside the pole shaft. Stacking coax is not allowed.

## Structure Usages

| Structural Component | Controlling Usage | Pass/Fail |
|---|---|---|
| Anchor Bolts | 41% | Pass |
| Shaft | 42% | Pass |
| Base Plate | 28% | Pass |

## Foundations

| Reaction Component | Original Design Reactions | Factored Design Reactions* | Analysis Reactions | % of Design |
|---|---|---|---|---|
| Moment (Kips-Ft) | 3,083.8 | 4,163.1 | 1,996.4 | 48% |
| Shear (Kips) | 27.5 | 37.1 | 21.2 | 57% |
| * The design reactions are factored by 1.35 per ANSI/TIA-222-H, Sec. 15.6.2 | | | | |

The structure base reactions resulting from this analysis are acceptable when compared to those shown on the original structure drawings, therefore no modification or reinforcement of the foundation will be required.

## Deflection and Sway*

| Antenna Elevation (ft) | Antenna | Carrier | Deflection (ft) | Sway (Rotation) (°) |
|---|---|---|---|---|
| 89.0 | Commscope RDIDC-9181-PF-48 | DISH WIRELESS L.L.C. | 0.458 | 0.565 |
| | Fujitsu TA08025-B605 | | | |
| | Fujitsu TA08025-B604 | | | |
| | JMA Wireless MX08FRO665-21 | | | |

***Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-H**

## 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:

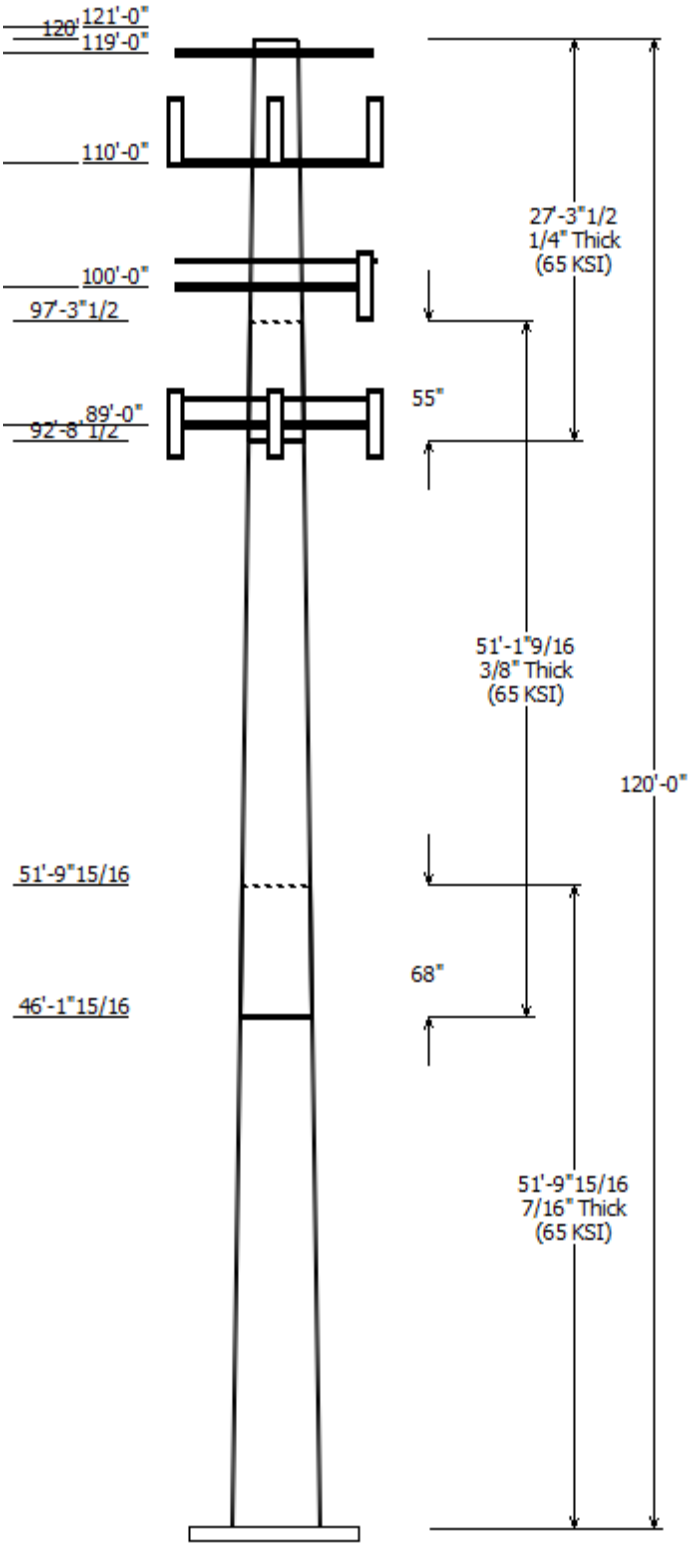
- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

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.




## Job Information

| | | | |
|---|---|---|---|
| Client : | DISH WIRELESS L.L.C. | | |
| Pole : | 411259 | Code: | ANSI/TIA-222-H |
| Location : | CT Collinsville CAC 802816 CT, CT | | |
| Description : | | Risk Category : | II |
| Shape : | 18 Sides | Exposure : | B |
| Height : | 120.00 (ft) | Topo Method : | Method 1 |
| Base Elev (ft): | 0.00 | Topographic Category : | 1 |
| Taper: | 0.194583 (in/ft) | | |

## Sections Properties

| Shaft Section | Length (ft) | Diameter (in) Across Flats Top | Bottom | Thick (in) | Joint Type | Overlap Length (in) | Shape | Steel Grade (ksi) |
|---|---|---|---|---|---|---|---|---|
| 1 | 51.830 | 38.91 | 49.00 | 0.438 | | 0.000 | 18 Sides | 65 |
| 2 | 51.130 | 30.81 | 40.76 | 0.375 | Slip Joint | 68.000 | 18 Sides | 65 |
| 3 | 27.290 | 26.90 | 32.21 | 0.250 | Slip Joint | 55.000 | 18 Sides | 65 |

## Discrete Appurtenance

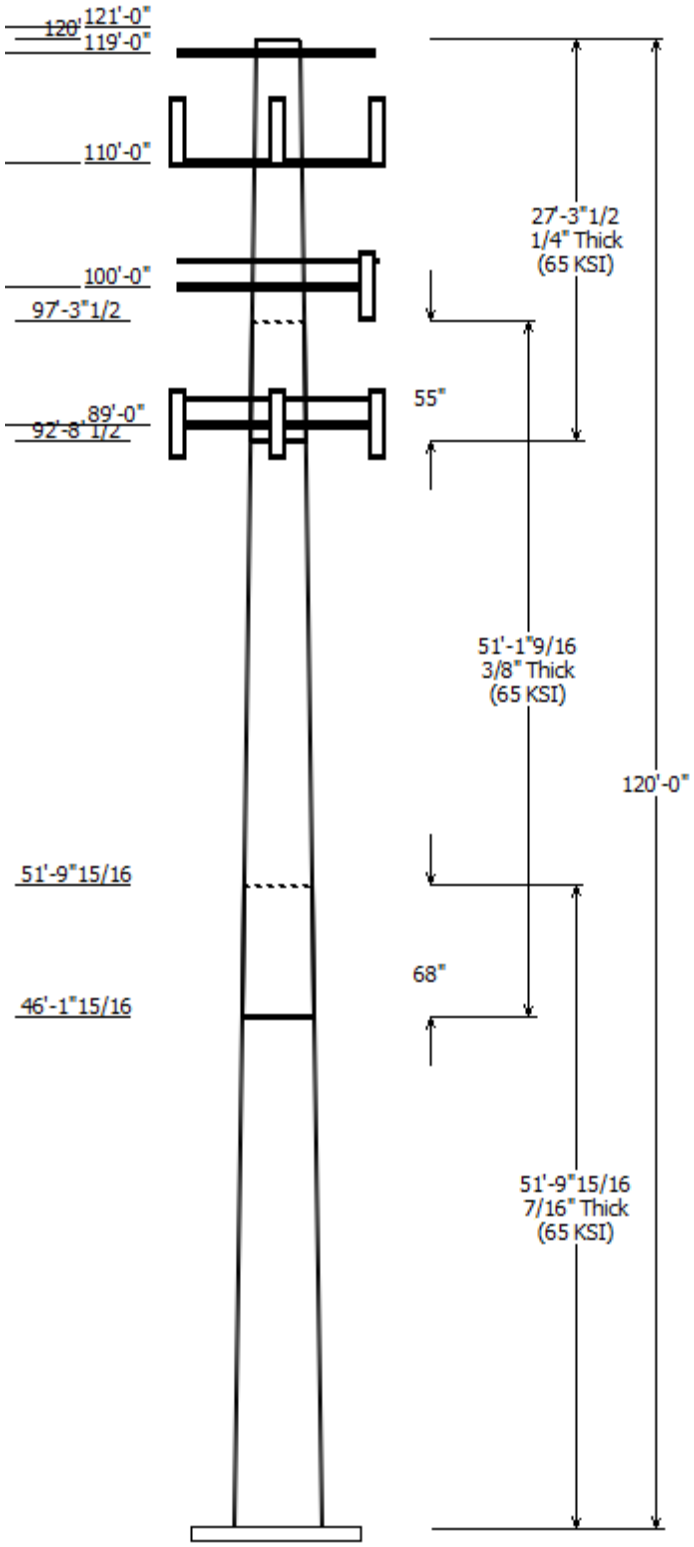
| Attach Elev (ft) | Force Elev (ft) | Qty | Description |
|---|---|---|---|
| 121.000 | 121.000 | 6 | Antel LPA-80080/6CF ___ |
| 121.000 | 121.000 | 3 | Antel BXA-70063/6CF __ 2° |
| 121.000 | 121.000 | 3 | Amphenol Antel BXA-171085- |
| 121.000 | 121.000 | 1 | VZW Unused Reserve |
| 119.000 | 119.000 | 1 | Flat Low Profile Platform |
| 110.000 | 111.000 | 3 | Powerwave Allgon P65-17- |
| 110.000 | 111.000 | 6 | Powerwave Allgon P65-15- |
| 110.000 | 111.000 | 6 | Ericsson RRUS-11 (50 lbs.) |
| 110.000 | 111.000 | 1 | Raycap DC6-48-60-0-8F |
| 110.000 | 111.000 | 1 | Andrew ABT-DFDM-ADB |
| 110.000 | 110.000 | 12 | Powerwave Allgon TT19- |
| 110.000 | 110.000 | 1 | Round Low Profile Platform |
| 100.000 | 100.000 | 3 | RFS APXVAARR24_43-U-NA20 |
| 100.000 | 100.000 | 3 | RFS APX16DWV-16DWV-S-E- |
| 100.000 | 100.000 | 3 | Ericsson Radio 4449 B12,B71 |
| 100.000 | 100.000 | 3 | Ericsson KRY 112 489/2 |
| 100.000 | 100.000 | 3 | Ericsson KRY 112 144/1 |
| 100.000 | 100.000 | 1 | Site PRO 1 RMQP-4096-HK (Platf |
| 89.000 | 89.000 | 1 | Commscope RDIDC-9181-PF-48 |
| 89.000 | 89.000 | 1 | Round Platform w/ Handrails |
| 89.000 | 89.000 | 3 | JMA Wireless MX08FRO665-21 |
| 89.000 | 89.000 | 3 | Fujitsu TA08025-B604 |
| 89.000 | 89.000 | 3 | Fujitsu TA08025-B605 |

## Linear Appurtenance

| Elev (ft) From | To | Description | Exposed To Wind |
|---|---|---|---|
| 0.000 | 89.000 | 1.60" (40.6mm) | Yes |
| 0.000 | 100.0 | 1 5/8" (1.63"- | No |
| 0.000 | 100.0 | 1 5/8" Coax | No |
| 0.000 | 110.0 | 0.39" (10mm) | No |
| 0.000 | 110.0 | 0.78" (19.7mm) 8 | No |
| 0.000 | 110.0 | 1 5/8" Coax | No |
| 0.000 | 110.0 | 3" conduit | No |
| 0.000 | 121.0 | 1 5/8" Coax | Yes |
| 0.000 | 121.0 | 1 5/8" Coax | No |

## Load Cases

| | |
|---|---|
| 1.2D + 1.0W | 115 mph with No Ice |
| 0.9D + 1.0W | 115 mph with No Ice (Reduced DL) |



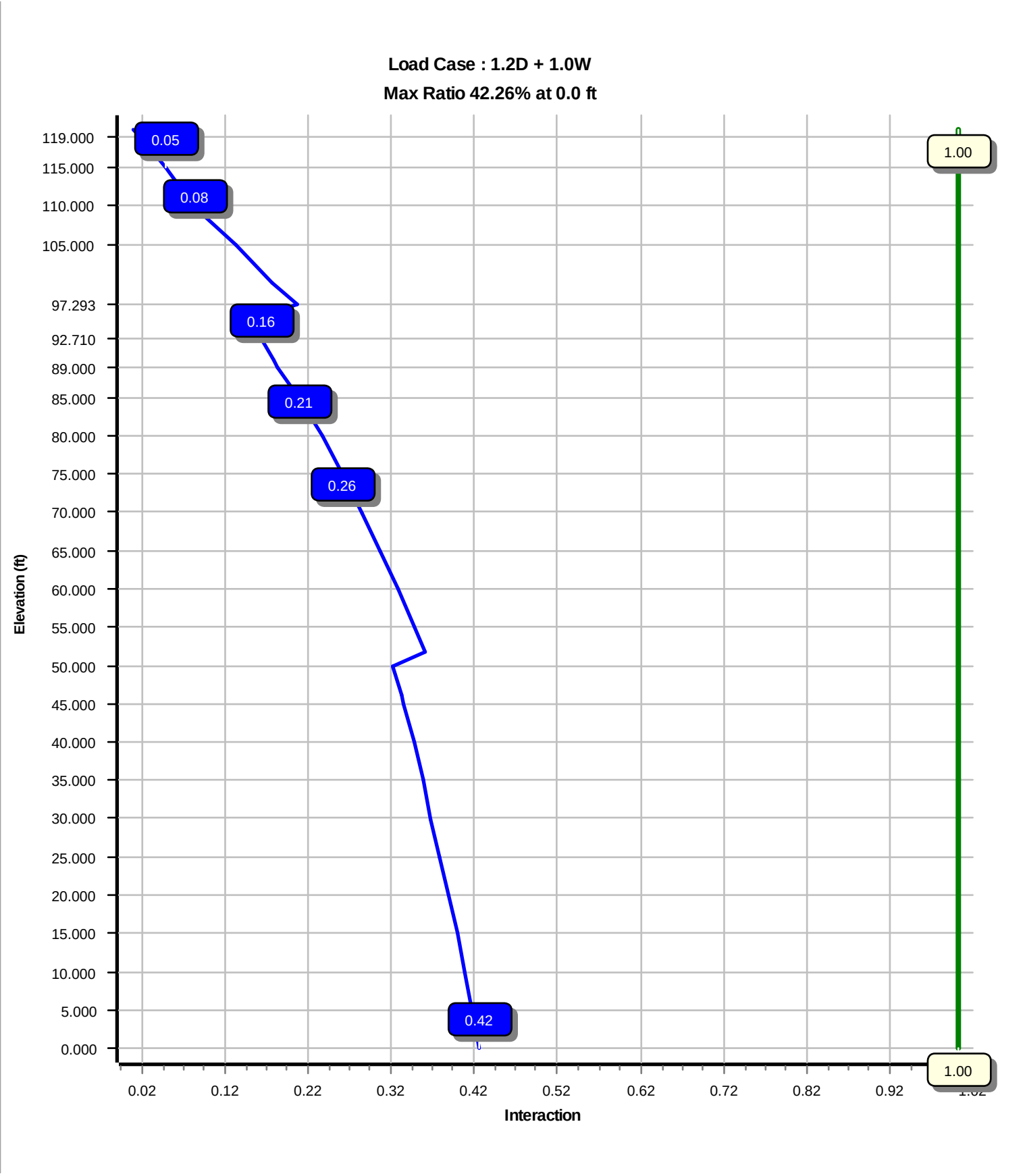

| | |
|---|---|
| 1.2D + 1.0Di + 1.0Wi | 50 mph with 1.50 in Radial Ice |
| 1.2D + 1.0Ev + 1.0Eh | Seismic |
| 0.9D - 1.0Ev + 1.0Eh | Seismic (Reduced DL) |
| 1.0D + 1.0W | Serviceability 60 mph |

## Reactions

| Load Case | Moment (kip-ft) | Shear (kip) | Axial (kip) |
|---|---|---|---|
| 1.2D + 1.0W | 1996.35 | 21.24 | 45.79 |
| 0.9D + 1.0W | 1978.86 | 21.23 | 34.34 |
| 1.2D + 1.0Di + 1.0Wi | 600.93 | 6.36 | 67.84 |
| 1.2D + 1.0Ev + 1.0Eh | 117.97 | 1.21 | 45.52 |
| 0.9D - 1.0Ev + 1.0Eh | 116.76 | 1.20 | 31.75 |
| 1.0D + 1.0W | 483.52 | 5.17 | 38.18 |

## Dish Deflections

| Load Case | Attach Elev (ft) | Deflection (in) | Rotation (deg) |
|---|---|---|---|
| | 0.00 | 0.000 | 0.000 |


Load Case : 1.2D + 1.0W
Max Ratio 42.26% at 0.0 ft
Elevation (ft)
119.000
115.000
110.000
105.000
97.293
92.710
89.000
85.000
80.000
75.000
70.000
65.000
60.000
55.000
50.000
45.000
40.000
35.000
30.000
25.000
20.000
15.000
10.000
5.000
0.000
0.05
0.08
0.16
0.21
0.26
0.42
1.00
1.00
0.02
0.12
0.22
0.32
0.42
0.52
0.62
0.72
0.82
0.92
Interaction

Site Number: 411259 Code: ANSI/TIA-222-H 

Site Name: CT Collinsville CAC 802816 CT, CT Engineering Number:13692182_C3_02 7/26/2021 3:56:26 PM

Customer: DISH WIRELESS L.L.C.

## Analysis Parameters

| | | | |
|---|---|---|---|
| Location : | Hartford County, CT | Height (ft) : | 120 |
| Code : | ANSI/TIA-222-H | Base Diameter (in) : | 49.00 |
| Shape : | 18 Sides | Top Diameter (in) : | 26.90 |
| Pole Type : | Taper | Taper (in/ft) : | 0.195 |
| Pole Manfacturer : | EEI | Rotation (deg) : | 0.00 |
| Kd (non-service) : | 0.95 | Ke : | 0.98 |

## Ice & Wind Parameters

| | | | |
|---|---|---|---|
| Exposure Category: | B | Design Wind Speed Without Ice: | 115 mph |
| Risk Category: | II | Design Wind Speed With Ice: | 50 mph |
| Topographic Factor Procedure: | Method 1 | Operational Wind Speed: | 60 mph |
| Topographic Category: | 1 | Design Ice Thickness: | 1.50 in |
| Crest Height: | 0 ft | HMSL: | 490.00 ft |

## Seismic Parameters

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | Equivalent Lateral Force Method | | | | |
| Site Class: | D - Stiff Soil | | | | |
| Period Based on Rayleigh Method (sec): | 1.83 | | | | |
| $T_L$ (sec): | 6 | p: | 1 | $C_s$: | 0.032 |
| $S_s$: | 0.174 | $S_1$: | 0.054 | $C_s$ Max: | 0.032 |
| $F_a$: | 1.600 | $F_v$: | 2.400 | $C_s$ Min: | 0.030 |
| $S_{ds}$: | 0.186 | $S_{d1}$: | 0.086 | | |

## Load Cases

| | |
|---|---|
| 1.2D + 1.0W | 115 mph with No Ice |
| 0.9D + 1.0W | 115 mph with No Ice (Reduced DL) |
| 1.2D + 1.0Di + 1.0Wi | 50 mph with 1.50 in Radial Ice |
| 1.2D + 1.0Ev + 1.0Eh | Seismic |
| 0.9D - 1.0Ev + 1.0Eh | Seismic (Reduced DL) |
| 1.0D + 1.0W | Serviceability 60 mph |

## Shaft Section Properties

| Sect Info | Length (ft) | Thick (in) | Fy (ksi) | Slip Joint Type | Slip Joint Len (in) | Weight (lb) | Bottom Dia (in) | Bottom Elev (ft) | Bottom Area (in²) | Bottom Ix (in⁴) | Bottom W/t Ratio | Bottom D/t Ratio | Top Dia (in) | Top Elev (ft) | Top Area (in²) | Top Ix (in⁴) | Top W/t Ratio | Top D/t Ratio | Taper (in/ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-18 | 51.830 | 0.4375 | 65 | | 0.00 | 10,658 | 49.00 | 0.00 | 67.43 | 20092.1 | 18.34 | 112.00 | 38.91 | 51.83 | 53.43 | 9993.9 | 14.27 | 88.95 | 0.194583 |
| 2-18 | 51.130 | 0.3750 | 65 | Slip | 68.00 | 7,334 | 40.76 | 46.16 | 48.08 | 9910.0 | 17.76 | 108.71 | 30.81 | 97.29 | 36.23 | 4242.8 | 13.08 | 82.18 | 0.194583 |
| 3-18 | 27.290 | 0.2500 | 65 | Slip | 55.00 | 2,159 | 32.21 | 92.71 | 25.36 | 3272.7 | 21.31 | 128.84 | 26.90 | 120.00 | 21.15 | 1897.5 | 17.56 | 107.60 | 0.194583 |
| | | | | Shaft Weight | | 20,151 | | | | | | | | | | | | | |

## Discrete Appurtenance Properties

| Attach Elev (ft) | Description | Qty | Ka | Vert Ecc (ft) | No Ice Weight (lb) | No Ice EPAa (sf) | No Ice Orientation Factor | Ice Weight (lb) | Ice EPAa (sf) | Ice Orientation Factor |
|---|---|---|---|---|---|---|---|---|---|---|
| 121.00 | Amphenol Antel BXA-171085- | 3 | 0.80 | 0.000 | 15.00 | 4.730 | 0.72 | 107.80 | 7.022 | 0.72 |
| 121.00 | Antel BXA-70063/6CF __ 2° | 3 | 0.80 | 0.000 | 17.00 | 7.569 | 0.65 | 155.52 | 10.270 | 0.65 |
| 121.00 | Antel LPA-80080/6CF ___ | 6 | 0.80 | 0.000 | 21.00 | 8.628 | 0.62 | 210.72 | 5.481 | 0.62 |
| 121.00 | VZW Unused Reserve (20687.01 | 1 | 0.80 | 0.000 | 2,278.00 | 143.660 | 0.90 | 3,832.50 | 241.693 | 0.90 |
| 119.00 | Flat Low Profile Platform | 1 | 1.00 | 0.000 | 1,500.00 | 26.100 | 1.00 | 2,133.29 | 44.762 | 1.00 |
| 110.00 | Andrew ABT-DFDM-ADB | 1 | 0.80 | 1.000 | 1.10 | 0.045 | 1.00 | 3.26 | 0.213 | 1.00 |
| 110.00 | Powerwave Allgon TT19- | 12 | 0.80 | 0.000 | 16.00 | 0.553 | 0.50 | 35.58 | 1.048 | 0.50 |
| 110.00 | Raycap DC6-48-60-0-8F | 1 | 0.80 | 1.000 | 32.80 | 1.360 | 1.00 | 89.14 | 2.003 | 1.00 |
| 110.00 | Ericsson RRUS-11 (50 lbs.) | 6 | 0.80 | 1.000 | 50.00 | 2.566 | 0.67 | 116.07 | 3.581 | 0.67 |
| 110.00 | Powerwave Allgon P65-15-XLH- | 6 | 0.80 | 1.000 | 41.00 | 5.431 | 0.66 | 156.97 | 7.349 | 0.66 |
| 110.00 | Powerwave Allgon P65-17-XLH- | 3 | 0.80 | 1.000 | 59.00 | 11.460 | 0.67 | 268.51 | 14.594 | 0.67 |
| 110.00 | Round Low Profile Platform | 1 | 1.00 | 0.000 | 1,500.00 | 21.700 | 1.00 | 2,127.95 | 40.308 | 1.00 |
| 100.00 | Ericsson KRY 112 144/1 | 3 | 0.75 | 0.000 | 11.00 | 0.351 | 0.50 | 21.34 | 0.741 | 0.50 |
| 100.00 | Ericsson KRY 112 489/2 | 3 | 0.75 | 0.000 | 15.40 | 0.559 | 0.50 | 32.37 | 1.063 | 0.50 |
| 100.00 | Ericsson Radio 4449 B12,B71 | 3 | 0.75 | 0.000 | 74.00 | 1.639 | 0.50 | 127.80 | 2.450 | 0.50 |
| 100.00 | RFS APX16DWV-16DWV-S-E-ACU | 3 | 0.75 | 0.000 | 39.60 | 6.077 | 0.60 | 118.41 | 8.054 | 0.60 |
| 100.00 | RFS APXVAARR24_43-U-NA20 | 3 | 0.75 | 0.000 | 127.90 | 20.243 | 0.63 | 505.14 | 23.807 | 0.63 |
| 100.00 | Site PRO 1 RMQP-4096-HK | 1 | 1.00 | 0.000 | 2,645.80 | 27.200 | 1.00 | 4,293.01 | 50.689 | 1.00 |
| 89.00 | Commscope RDIDC-9181-PF-48 | 1 | 0.75 | 0.000 | 21.90 | 1.867 | 1.00 | 75.90 | 2.721 | 1.00 |
| 89.00 | Fujitsu TA08025-B605 | 3 | 0.75 | 0.000 | 75.00 | 1.962 | 0.50 | 134.45 | 2.835 | 0.50 |
| 89.00 | Fujitsu TA08025-B604 | 3 | 0.75 | 0.000 | 63.90 | 1.962 | 0.50 | 119.24 | 2.835 | 0.50 |
| 89.00 | JMA Wireless MX08FRO665-21 | 3 | 0.75 | 0.000 | 64.50 | 12.489 | 0.64 | 308.40 | 15.156 | 0.64 |
| 89.00 | Round Platform w/ Handrails | 1 | 1.00 | 0.000 | 2,000.00 | 27.200 | 1.00 | 3,229.60 | 50.396 | 1.00 |
| Totals | Num Loadings:23 | 71 | | | 12,530.50 | | | 24,811.02 | | |

## Linear Appurtenance Properties

Load Case Azimuth (deg) : 90

| Elev From (ft) | Elev To (ft) | Qty | Description | Coax Dia (in) | Coax Wt (lb/ft) | Flat | Max Coax / Row | Dist Between Rows (in) | Dist Between Cols (in) | Azimuth (deg) | Dist From Face (in) | Exposed To Wind | Carrier |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 121.00 | 6 | 1 5/8" Coax | 1.98 | 0.82 | N | 6 | 1.00 | 1.00 | 0 | 1.00 | Y | VERIZON WIRELESS |
| 0.00 | 121.00 | 12 | 1 5/8" Coax | 1.98 | 0.82 | N | 0 | 0.00 | 0.00 | 0 | 0.00 | N | VERIZON WIRELESS |
| 0.00 | 110.00 | 1 | 0.39" (10mm) Fiber | 0.39 | 0.06 | N | 0 | 0.00 | 0.00 | 0 | 0.00 | N | AT&T MOBILITY |
| 0.00 | 110.00 | 2 | 0.78" (19.7mm) 8 AWG | 0.78 | 0.59 | N | 0 | 0.00 | 0.00 | 0 | 0.00 | N | AT&T MOBILITY |
| 0.00 | 110.00 | 12 | 1 5/8" Coax | 1.98 | 0.82 | N | 0 | 0.00 | 0.00 | 0 | 0.00 | N | AT&T MOBILITY |
| 0.00 | 110.00 | 1 | 3" conduit | 3.50 | 7.58 | N | 0 | 0.00 | 0.00 | 0 | 0.00 | N | AT&T MOBILITY |
| 0.00 | 100.00 | 3 | 1 5/8" (1.63"-41.3mm) | 1.63 | 1.61 | N | 0 | 0.00 | 0.00 | 0 | 0.00 | N | T-MOBILE |
| 0.00 | 100.00 | 12 | 1 5/8" Coax | 1.98 | 0.82 | N | 0 | 0.00 | 0.00 | 0 | 0.00 | N | T-MOBILE |
| 0.00 | 89.00 | 1 | 1.60" (40.6mm) Hybrid | 1.60 | 2.34 | N | 1 | 1.00 | 1.00 | 180 | 1.00 | Y | DISH WIRELESS |

## Segment Properties (Max Len : 5. ft)

| Seg Top Elev (ft) | Description | Thick (in) | Flat Dia (in) | Area ($in^2$) | Ix ($in^4$) | W/t Ratio | D/t Ratio | F'y (ksi) | S ($in^3$) | Z ($in^3$) | Weight (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 0.4375 | 49.000 | 67.433 | 20,092.1 | 18.34 | 112.00 | 79.8 | 807.6 | 0.0 | 0.0 |
| 5.00 | | 0.4375 | 48.027 | 66.082 | 18,908.5 | 17.95 | 109.78 | 80.3 | 775.4 | 0.0 | 1,135.8 |
| 10.00 | | 0.4375 | 47.054 | 64.731 | 17,772.4 | 17.55 | 107.55 | 80.8 | 743.9 | 0.0 | 1,112.8 |
| 15.00 | | 0.4375 | 46.081 | 63.380 | 16,682.7 | 17.16 | 105.33 | 81.2 | 713.1 | 0.0 | 1,089.8 |
| 20.00 | | 0.4375 | 45.108 | 62.029 | 15,638.5 | 16.77 | 103.10 | 81.7 | 682.8 | 0.0 | 1,066.8 |
| 25.00 | | 0.4375 | 44.135 | 60.678 | 14,638.8 | 16.38 | 100.88 | 82.1 | 653.3 | 0.0 | 1,043.9 |
| 30.00 | | 0.4375 | 43.162 | 59.327 | 13,682.6 | 15.99 | 98.66 | 82.6 | 624.4 | 0.0 | 1,020.9 |
| 35.00 | | 0.4375 | 42.190 | 57.976 | 12,769.0 | 15.59 | 96.43 | 82.6 | 596.1 | 0.0 | 997.9 |
| 40.00 | | 0.4375 | 41.217 | 56.625 | 11,897.0 | 15.20 | 94.21 | 82.6 | 568.5 | 0.0 | 974.9 |
| 45.00 | | 0.4375 | 40.244 | 55.274 | 11,065.6 | 14.81 | 91.99 | 82.6 | 541.6 | 0.0 | 951.9 |
| 46.16 | Bot - Section 2 | 0.4375 | 40.017 | 54.960 | 10,877.9 | 14.72 | 91.47 | 82.6 | 535.4 | 0.0 | 218.2 |
| 50.00 | | 0.4375 | 39.271 | 53.923 | 10,273.9 | 14.42 | 89.76 | 82.6 | 515.3 | 0.0 | 1,332.6 |
| 51.83 | Top - Section 1 | 0.3750 | 39.665 | 46.763 | 9,120.4 | 17.24 | 105.77 | 81.1 | 452.9 | 0.0 | 626.8 |
| 55.00 | | 0.3750 | 39.048 | 46.029 | 8,697.5 | 16.95 | 104.13 | 81.5 | 438.7 | 0.0 | 500.5 |
| 60.00 | | 0.3750 | 38.075 | 44.871 | 8,057.5 | 16.49 | 101.53 | 82.0 | 416.8 | 0.0 | 773.3 |
| 65.00 | | 0.3750 | 37.102 | 43.713 | 7,449.6 | 16.03 | 98.94 | 82.5 | 395.5 | 0.0 | 753.6 |
| 70.00 | | 0.3750 | 36.129 | 42.555 | 6,873.1 | 15.58 | 96.34 | 82.6 | 374.7 | 0.0 | 733.9 |
| 75.00 | | 0.3750 | 35.156 | 41.397 | 6,327.2 | 15.12 | 93.75 | 82.6 | 354.5 | 0.0 | 714.2 |
| 80.00 | | 0.3750 | 34.183 | 40.239 | 5,810.9 | 14.66 | 91.16 | 82.6 | 334.8 | 0.0 | 694.5 |
| 85.00 | | 0.3750 | 33.210 | 39.081 | 5,323.6 | 14.21 | 88.56 | 82.6 | 315.7 | 0.0 | 674.8 |
| 89.00 | | 0.3750 | 32.432 | 38.155 | 4,953.9 | 13.84 | 86.49 | 82.6 | 300.9 | 0.0 | 525.6 |
| 90.00 | | 0.3750 | 32.237 | 37.923 | 4,864.2 | 13.75 | 85.97 | 82.6 | 297.2 | 0.0 | 129.4 |
| 92.71 | Bot - Section 3 | 0.3750 | 31.710 | 37.295 | 4,626.7 | 13.50 | 84.56 | 82.6 | 287.4 | 0.0 | 346.8 |
| 95.00 | | 0.3750 | 31.265 | 36.765 | 4,432.1 | 13.29 | 83.37 | 82.6 | 279.2 | 0.0 | 484.8 |
| 97.29 | Top - Section 2 | 0.2500 | 31.318 | 24.652 | 3,006.3 | 20.68 | 125.27 | 77.1 | 189.1 | 0.0 | 478.6 |
| 100.0 | | 0.2500 | 30.792 | 24.234 | 2,856.0 | 20.31 | 123.17 | 77.5 | 182.7 | 0.0 | 225.1 |
| 105.0 | | 0.2500 | 29.819 | 23.462 | 2,591.7 | 19.62 | 119.27 | 78.3 | 171.2 | 0.0 | 405.7 |
| 110.0 | | 0.2500 | 28.846 | 22.690 | 2,344.2 | 18.93 | 115.38 | 79.1 | 160.1 | 0.0 | 392.6 |
| 115.0 | | 0.2500 | 27.873 | 21.918 | 2,113.0 | 18.25 | 111.49 | 79.9 | 149.3 | 0.0 | 379.5 |
| 119.0 | | 0.2500 | 27.095 | 21.300 | 1,939.3 | 17.70 | 108.38 | 80.6 | 141.0 | 0.0 | 294.1 |
| 120.0 | | 0.2500 | 26.900 | 21.146 | 1,897.5 | 17.56 | 107.60 | 80.7 | 138.9 | 0.0 | 72.2 |
| | | | | | | | | | | | 20,151.4 |

**Load Case:** 1.2D + 1.0W — 115 mph with No Ice — 20 Iterations

Gust Response Factor :1.10
Dead Load Factor :1.20
Wind Load Factor :1.00

## Applied Segment Forces Summary

| Seg Elev (ft) | Description | Shaft Forces Wind FX (lb) | Shaft Forces Dead Load (lb) | Discrete Forces Wind FX (lb) | Discrete Forces Torsion MY (lb-ft) | Discrete Forces Moment MZ (lb-ft) | Discrete Forces Dead Load (lb) | Linear Forces Wind FX (lb) | Linear Forces Dead Load (lb) | Sum of Forces Wind FX (lb) | Sum of Forces Dead Load (lb) | Sum of Forces Torsion MY (lb-ft) | Sum of Forces Moment MZ (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 182.3 | 0.0 | | | | | 0.0 | 0.0 | 182.3 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 360.9 | 1,363.0 | | | | | 0.0 | 302.6 | 360.9 | 1,665.5 | 0.0 | 0.0 |
| 10.00 | | 353.6 | 1,335.4 | | | | | 0.0 | 302.6 | 353.6 | 1,638.0 | 0.0 | 0.0 |
| 15.00 | | 346.3 | 1,307.8 | | | | | 0.0 | 302.6 | 346.3 | 1,610.4 | 0.0 | 0.0 |
| 20.00 | | 339.0 | 1,280.2 | | | | | 0.0 | 302.6 | 339.0 | 1,582.8 | 0.0 | 0.0 |
| 25.00 | | 333.9 | 1,252.6 | | | | | 0.0 | 302.6 | 333.9 | 1,555.2 | 0.0 | 0.0 |
| 30.00 | | 335.0 | 1,225.0 | | | | | 0.0 | 302.6 | 335.0 | 1,527.6 | 0.0 | 0.0 |
| 35.00 | | 343.0 | 1,197.5 | | | | | 0.0 | 302.6 | 343.0 | 1,500.0 | 0.0 | 0.0 |
| 40.00 | | 353.3 | 1,169.9 | | | | | 0.0 | 302.6 | 353.3 | 1,472.5 | 0.0 | 0.0 |
| 45.00 | | 221.3 | 1,142.3 | | | | | 0.0 | 302.6 | 221.3 | 1,444.9 | 0.0 | 0.0 |
| 46.16 | Bot - Section 2 | 185.9 | 261.8 | | | | | 0.0 | 70.4 | 185.9 | 332.2 | 0.0 | 0.0 |
| 50.00 | | 212.9 | 1,599.1 | | | | | 0.0 | 232.2 | 212.9 | 1,831.3 | 0.0 | 0.0 |
| 51.83 | Top - Section 1 | 189.0 | 752.1 | | | | | 0.0 | 110.7 | 189.0 | 862.9 | 0.0 | 0.0 |
| 55.00 | | 311.1 | 600.6 | | | | | 0.0 | 191.8 | 311.1 | 792.4 | 0.0 | 0.0 |
| 60.00 | | 385.8 | 927.9 | | | | | 0.0 | 302.6 | 385.8 | 1,230.5 | 0.0 | 0.0 |
| 65.00 | | 391.3 | 904.3 | | | | | 0.0 | 302.6 | 391.3 | 1,206.9 | 0.0 | 0.0 |
| 70.00 | | 396.3 | 880.6 | | | | | 0.0 | 302.6 | 396.3 | 1,183.2 | 0.0 | 0.0 |
| 75.00 | | 400.8 | 857.0 | | | | | 0.0 | 302.6 | 400.8 | 1,159.6 | 0.0 | 0.0 |
| 80.00 | | 404.9 | 833.4 | | | | | 0.0 | 302.6 | 404.9 | 1,135.9 | 0.0 | 0.0 |
| 85.00 | | 367.4 | 809.7 | | | | | 0.0 | 302.6 | 367.4 | 1,112.3 | 0.0 | 0.0 |
| 89.00 | Appurtenance(s) | 197.2 | 630.8 | 1,694.4 | 0.0 | 0.0 | 3,158.5 | 0.0 | 242.1 | 1,891.6 | 4,031.3 | 0.0 | 0.0 |
| 90.00 | | 122.8 | 155.3 | | | | | 0.0 | 57.7 | 122.8 | 213.0 | 0.0 | 0.0 |
| 92.71 | Bot - Section 3 | 165.9 | 416.2 | | | | | 0.0 | 156.4 | 165.9 | 572.6 | 0.0 | 0.0 |
| 95.00 | | 152.2 | 581.7 | | | | | 0.0 | 132.2 | 152.2 | 713.9 | 0.0 | 0.0 |
| 97.29 | Top - Section 2 | 164.7 | 574.3 | | | | | 0.0 | 132.3 | 164.7 | 706.6 | 0.0 | 0.0 |
| 100.00 | Appurtenance(s) | 250.7 | 270.1 | 2,300.2 | 0.0 | 0.0 | 4,139.4 | 0.0 | 156.2 | 2,550.9 | 4,565.7 | 0.0 | 0.0 |
| 105.00 | | 320.7 | 486.9 | | | | | 0.0 | 200.5 | 320.7 | 687.4 | 0.0 | 0.0 |
| 110.00 | Appurtenance(s) | 315.5 | 471.1 | 2,452.4 | 0.0 | 1,592.8 | 2,938.7 | 0.0 | 200.5 | 2,767.9 | 3,610.3 | 0.0 | 0.0 |
| 115.00 | | 281.8 | 455.4 | | | | | 0.0 | 88.6 | 281.8 | 543.9 | 0.0 | 0.0 |
| 119.00 | Appurtenance(s) | 156.4 | 353.0 | 942.2 | 0.0 | 0.0 | 1,800.0 | 0.0 | 70.8 | 1,098.6 | 2,223.8 | 0.0 | 0.0 |
| 120.00 | | 31.3 | 86.7 | | | | | 0.0 | 17.7 | 31.3 | 104.4 | 0.0 | 0.0 |
| | | | | | | | | Totals: | | 15,962.1 | 42,817.1 | 0.00 | 0.00 |

Load Case: 1.2D + 1.0W 115 mph with No Ice 20 Iterations

Gust Response Factor :1.10
Dead Load Factor :1.20
Wind Load Factor :1.00

## Calculated Forces

| Seg Elev (ft) | Pu FY (-) (kips) | Vu FX (-) (kips) | Tu MY (ft-kips) | Mu MZ (ft-kips) | Mu MX (ft-kips) | Resultant Moment (ft-kips) | phi Pn (kips) | phi Vn (kips) | phi Tn (ft-kips) | phi Mn (ft-kips) | Total Deflect (in) | Rotation (deg) | Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -45.79 | -21.24 | 0.00 | -1,996.35 | 0.00 | 1,996.35 | 4,844.94 | 1,183.44 | 5,191.11 | 4,835.57 | 0.00 | 0.00 | 0.423 |
| 5.00 | -44.08 | -20.99 | 0.00 | -1,890.14 | 0.00 | 1,890.14 | 4,775.31 | 1,159.73 | 4,985.22 | 4,669.74 | 0.07 | -0.14 | 0.414 |
| 10.00 | -42.39 | -20.73 | 0.00 | -1,785.20 | 0.00 | 1,785.20 | 4,704.55 | 1,136.02 | 4,783.50 | 4,505.63 | 0.29 | -0.28 | 0.406 |
| 15.00 | -40.73 | -20.47 | 0.00 | -1,681.56 | 0.00 | 1,681.56 | 4,632.67 | 1,112.31 | 4,585.94 | 4,343.33 | 0.66 | -0.41 | 0.396 |
| 20.00 | -39.10 | -20.22 | 0.00 | -1,579.20 | 0.00 | 1,579.20 | 4,559.67 | 1,088.61 | 4,392.55 | 4,182.90 | 1.17 | -0.55 | 0.386 |
| 25.00 | -37.50 | -19.96 | 0.00 | -1,478.12 | 0.00 | 1,478.12 | 4,485.55 | 1,064.90 | 4,203.32 | 4,024.42 | 1.82 | -0.69 | 0.376 |
| 30.00 | -35.93 | -19.69 | 0.00 | -1,378.35 | 0.00 | 1,378.35 | 4,407.69 | 1,041.19 | 4,018.26 | 3,865.64 | 2.62 | -0.83 | 0.365 |
| 35.00 | -34.39 | -19.40 | 0.00 | -1,279.91 | 0.00 | 1,279.91 | 4,307.32 | 1,017.48 | 3,837.37 | 3,690.72 | 3.57 | -0.97 | 0.355 |
| 40.00 | -32.88 | -19.10 | 0.00 | -1,182.90 | 0.00 | 1,182.90 | 4,206.95 | 993.77 | 3,660.64 | 3,519.85 | 4.65 | -1.11 | 0.344 |
| 45.00 | -31.41 | -18.90 | 0.00 | -1,087.39 | 0.00 | 1,087.39 | 4,106.58 | 970.06 | 3,488.08 | 3,353.03 | 5.89 | -1.24 | 0.332 |
| 46.16 | -31.06 | -18.74 | 0.00 | -1,065.41 | 0.00 | 1,065.41 | 4,083.23 | 964.54 | 3,448.53 | 3,314.80 | 6.19 | -1.27 | 0.329 |
| 50.00 | -29.21 | -18.52 | 0.00 | -993.51 | 0.00 | 993.51 | 4,006.21 | 946.35 | 3,319.69 | 3,190.26 | 7.26 | -1.38 | 0.319 |
| 51.83 | -28.33 | -18.35 | 0.00 | -959.62 | 0.00 | 959.62 | 3,414.21 | 820.69 | 2,912.57 | 2,755.48 | 7.80 | -1.43 | 0.357 |
| 55.00 | -27.51 | -18.07 | 0.00 | -901.46 | 0.00 | 901.46 | 3,374.74 | 807.81 | 2,821.85 | 2,680.46 | 8.78 | -1.51 | 0.345 |
| 60.00 | -26.25 | -17.71 | 0.00 | -811.11 | 0.00 | 811.11 | 3,311.56 | 787.48 | 2,681.68 | 2,563.48 | 10.43 | -1.65 | 0.325 |
| 65.00 | -25.02 | -17.34 | 0.00 | -722.55 | 0.00 | 722.55 | 3,247.27 | 767.16 | 2,545.07 | 2,448.20 | 12.24 | -1.79 | 0.303 |
| 70.00 | -23.81 | -16.96 | 0.00 | -635.83 | 0.00 | 635.83 | 3,161.61 | 746.84 | 2,412.04 | 2,319.84 | 14.18 | -1.92 | 0.282 |
| 75.00 | -22.63 | -16.57 | 0.00 | -551.02 | 0.00 | 551.02 | 3,075.58 | 726.52 | 2,282.58 | 2,194.67 | 16.25 | -2.04 | 0.259 |
| 80.00 | -21.48 | -16.16 | 0.00 | -468.18 | 0.00 | 468.18 | 2,989.55 | 706.19 | 2,156.68 | 2,072.97 | 18.45 | -2.15 | 0.234 |
| 85.00 | -20.36 | -15.79 | 0.00 | -387.37 | 0.00 | 387.37 | 2,903.52 | 685.87 | 2,034.36 | 1,954.74 | 20.77 | -2.26 | 0.206 |
| 89.00 | -16.39 | -13.75 | 0.00 | -324.23 | 0.00 | 324.23 | 2,834.69 | 669.61 | 1,939.08 | 1,862.66 | 22.69 | -2.33 | 0.180 |
| 90.00 | -16.18 | -13.62 | 0.00 | -310.48 | 0.00 | 310.48 | 2,817.49 | 665.55 | 1,915.61 | 1,839.98 | 23.18 | -2.35 | 0.175 |
| 92.71 | -15.60 | -13.45 | 0.00 | -273.56 | 0.00 | 273.56 | 2,770.86 | 654.53 | 1,852.74 | 1,779.23 | 24.53 | -2.40 | 0.160 |
| 95.00 | -14.89 | -13.27 | 0.00 | -242.77 | 0.00 | 242.77 | 2,731.46 | 645.23 | 1,800.43 | 1,728.70 | 25.69 | -2.44 | 0.146 |
| 97.29 | -14.18 | -13.09 | 0.00 | -212.33 | 0.00 | 212.33 | 1,710.13 | 432.64 | 1,214.07 | 1,093.00 | 26.87 | -2.47 | 0.203 |
| 100.00 | -9.72 | -10.35 | 0.00 | -176.91 | 0.00 | 176.91 | 1,690.67 | 425.31 | 1,173.26 | 1,062.09 | 28.28 | -2.50 | 0.173 |
| 105.00 | -9.04 | -10.01 | 0.00 | -125.16 | 0.00 | 125.16 | 1,653.85 | 411.76 | 1,099.71 | 1,005.60 | 30.95 | -2.58 | 0.131 |
| 110.00 | -5.55 | -7.08 | 0.00 | -73.52 | 0.00 | 73.52 | 1,615.92 | 398.21 | 1,028.54 | 949.94 | 33.68 | -2.63 | 0.081 |
| 115.00 | -5.02 | -6.78 | 0.00 | -38.10 | 0.00 | 38.10 | 1,576.86 | 384.66 | 959.75 | 895.16 | 36.46 | -2.67 | 0.046 |
| 119.00 | -2.85 | -5.58 | 0.00 | -10.99 | 0.00 | 10.99 | 1,544.80 | 373.82 | 906.44 | 852.03 | 38.70 | -2.68 | 0.015 |
| 120.00 | 0.00 | -5.44 | 0.00 | -5.41 | 0.00 | 5.41 | 1,536.68 | 371.11 | 893.35 | 841.35 | 39.26 | -2.68 | 0.007 |

**Load Case:** 0.9D + 1.0W — 115 mph with No Ice (Reduced DL) — 20 Iterations

Gust Response Factor :1.10
Dead Load Factor :0.90
Wind Load Factor :1.00

## Applied Segment Forces Summary

| | | Shaft Forces | | Discrete Forces | | | | Linear Forces | | Sum of Forces | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seg Elev (ft) | Description | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Torsion MY (lb-ft) | Moment MZ (lb) |
| 0.00 | | 182.3 | 0.0 | | | | | 0.0 | 0.0 | 182.3 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 360.9 | 1,022.2 | | | | | 0.0 | 226.9 | 360.9 | 1,249.2 | 0.0 | 0.0 |
| 10.00 | | 353.6 | 1,001.5 | | | | | 0.0 | 226.9 | 353.6 | 1,228.5 | 0.0 | 0.0 |
| 15.00 | | 346.3 | 980.8 | | | | | 0.0 | 226.9 | 346.3 | 1,207.8 | 0.0 | 0.0 |
| 20.00 | | 339.0 | 960.2 | | | | | 0.0 | 226.9 | 339.0 | 1,187.1 | 0.0 | 0.0 |
| 25.00 | | 333.9 | 939.5 | | | | | 0.0 | 226.9 | 333.9 | 1,166.4 | 0.0 | 0.0 |
| 30.00 | | 335.0 | 918.8 | | | | | 0.0 | 226.9 | 335.0 | 1,145.7 | 0.0 | 0.0 |
| 35.00 | | 343.0 | 898.1 | | | | | 0.0 | 226.9 | 343.0 | 1,125.0 | 0.0 | 0.0 |
| 40.00 | | 353.3 | 877.4 | | | | | 0.0 | 226.9 | 353.3 | 1,104.3 | 0.0 | 0.0 |
| 45.00 | | 221.3 | 856.7 | | | | | 0.0 | 226.9 | 221.3 | 1,083.7 | 0.0 | 0.0 |
| 46.16 | Bot - Section 2 | 185.9 | 196.4 | | | | | 0.0 | 52.8 | 185.9 | 249.2 | 0.0 | 0.0 |
| 50.00 | | 212.9 | 1,199.3 | | | | | 0.0 | 174.1 | 212.9 | 1,373.5 | 0.0 | 0.0 |
| 51.83 | Top - Section 1 | 189.0 | 564.1 | | | | | 0.0 | 83.1 | 189.0 | 647.1 | 0.0 | 0.0 |
| 55.00 | | 311.1 | 450.4 | | | | | 0.0 | 143.9 | 311.1 | 594.3 | 0.0 | 0.0 |
| 60.00 | | 385.8 | 695.9 | | | | | 0.0 | 226.9 | 385.8 | 922.9 | 0.0 | 0.0 |
| 65.00 | | 391.3 | 678.2 | | | | | 0.0 | 226.9 | 391.3 | 905.2 | 0.0 | 0.0 |
| 70.00 | | 396.3 | 660.5 | | | | | 0.0 | 226.9 | 396.3 | 887.4 | 0.0 | 0.0 |
| 75.00 | | 400.8 | 642.8 | | | | | 0.0 | 226.9 | 400.8 | 869.7 | 0.0 | 0.0 |
| 80.00 | | 404.9 | 625.0 | | | | | 0.0 | 226.9 | 404.9 | 852.0 | 0.0 | 0.0 |
| 85.00 | | 367.4 | 607.3 | | | | | 0.0 | 226.9 | 367.4 | 834.2 | 0.0 | 0.0 |
| 89.00 | Appurtenance(s) | 197.2 | 473.1 | 1,694.4 | 0.0 | 0.0 | 2,368.9 | 0.0 | 181.5 | 1,891.6 | 3,023.5 | 0.0 | 0.0 |
| 90.00 | | 122.8 | 116.5 | | | | | 0.0 | 43.3 | 122.8 | 159.8 | 0.0 | 0.0 |
| 92.71 | Bot - Section 3 | 165.9 | 312.1 | | | | | 0.0 | 117.3 | 165.9 | 429.4 | 0.0 | 0.0 |
| 95.00 | | 152.2 | 436.3 | | | | | 0.0 | 99.1 | 152.2 | 535.4 | 0.0 | 0.0 |
| 97.29 | Top - Section 2 | 164.7 | 430.7 | | | | | 0.0 | 99.3 | 164.7 | 530.0 | 0.0 | 0.0 |
| 100.00 | Appurtenance(s) | 250.7 | 202.6 | 2,300.2 | 0.0 | 0.0 | 3,104.5 | 0.0 | 117.1 | 2,550.9 | 3,424.3 | 0.0 | 0.0 |
| 105.00 | | 320.7 | 365.2 | | | | | 0.0 | 150.4 | 320.7 | 515.6 | 0.0 | 0.0 |
| 110.00 | Appurtenance(s) | 315.5 | 353.4 | 2,452.4 | 0.0 | 1,592.8 | 2,204.0 | 0.0 | 150.4 | 2,767.9 | 2,707.8 | 0.0 | 0.0 |
| 115.00 | | 281.8 | 341.5 | | | | | 0.0 | 66.4 | 281.8 | 407.9 | 0.0 | 0.0 |
| 119.00 | Appurtenance(s) | 156.4 | 264.7 | 942.2 | 0.0 | 0.0 | 1,350.0 | 0.0 | 53.1 | 1,098.6 | 1,667.8 | 0.0 | 0.0 |
| 120.00 | | 31.3 | 65.0 | | | | | 0.0 | 13.3 | 31.3 | 78.3 | 0.0 | 0.0 |
| | | | | | | | | Totals: | | 15,962.1 | 32,112.8 | 0.00 | 0.00 |

Load Case: 0.9D + 1.0W 115 mph with No Ice (Reduced DL) 20 Iterations

Gust Response Factor :1.10
Dead Load Factor :0.90
Wind Load Factor :1.00

## Calculated Forces

| Seg Elev (ft) | Pu FY (-) (kips) | Vu FX (-) (kips) | Tu MY (ft-kips) | Mu MZ (ft-kips) | Mu MX (ft-kips) | Resultant Moment (ft-kips) | phi Pn (kips) | phi Vn (kips) | phi Tn (ft-kips) | phi Mn (ft-kips) | Total Deflect (in) | Rotation (deg) | Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -34.34 | -21.23 | 0.00 | -1,978.86 | 0.00 | 1,978.86 | 4,844.94 | 1,183.44 | 5,191.11 | 4,835.57 | 0.00 | 0.00 | 0.417 |
| 5.00 | -33.04 | -20.95 | 0.00 | -1,872.71 | 0.00 | 1,872.71 | 4,775.31 | 1,159.73 | 4,985.22 | 4,669.74 | 0.07 | -0.14 | 0.408 |
| 10.00 | -31.76 | -20.66 | 0.00 | -1,767.99 | 0.00 | 1,767.99 | 4,704.55 | 1,136.02 | 4,783.50 | 4,505.63 | 0.29 | -0.27 | 0.399 |
| 15.00 | -30.51 | -20.38 | 0.00 | -1,664.67 | 0.00 | 1,664.67 | 4,632.67 | 1,112.31 | 4,585.94 | 4,343.33 | 0.65 | -0.41 | 0.390 |
| 20.00 | -29.27 | -20.10 | 0.00 | -1,562.75 | 0.00 | 1,562.75 | 4,559.67 | 1,088.61 | 4,392.55 | 4,182.90 | 1.15 | -0.55 | 0.380 |
| 25.00 | -28.06 | -19.83 | 0.00 | -1,462.23 | 0.00 | 1,462.23 | 4,485.55 | 1,064.90 | 4,203.32 | 4,024.42 | 1.80 | -0.69 | 0.370 |
| 30.00 | -26.88 | -19.54 | 0.00 | -1,363.10 | 0.00 | 1,363.10 | 4,407.69 | 1,041.19 | 4,018.26 | 3,865.64 | 2.59 | -0.82 | 0.359 |
| 35.00 | -25.71 | -19.24 | 0.00 | -1,265.40 | 0.00 | 1,265.40 | 4,307.32 | 1,017.48 | 3,837.37 | 3,690.72 | 3.53 | -0.96 | 0.349 |
| 40.00 | -24.57 | -18.93 | 0.00 | -1,169.20 | 0.00 | 1,169.20 | 4,206.95 | 993.77 | 3,660.64 | 3,519.85 | 4.61 | -1.10 | 0.338 |
| 45.00 | -23.46 | -18.72 | 0.00 | -1,074.57 | 0.00 | 1,074.57 | 4,106.58 | 970.06 | 3,488.08 | 3,353.03 | 5.83 | -1.23 | 0.327 |
| 46.16 | -23.20 | -18.55 | 0.00 | -1,052.80 | 0.00 | 1,052.80 | 4,083.23 | 964.54 | 3,448.53 | 3,314.80 | 6.13 | -1.26 | 0.324 |
| 50.00 | -21.80 | -18.34 | 0.00 | -981.63 | 0.00 | 981.63 | 4,006.21 | 946.35 | 3,319.69 | 3,190.26 | 7.19 | -1.36 | 0.314 |
| 51.83 | -21.14 | -18.16 | 0.00 | -948.07 | 0.00 | 948.07 | 3,414.21 | 820.69 | 2,912.57 | 2,755.48 | 7.72 | -1.41 | 0.351 |
| 55.00 | -20.52 | -17.87 | 0.00 | -890.52 | 0.00 | 890.52 | 3,374.74 | 807.81 | 2,821.85 | 2,680.46 | 8.69 | -1.50 | 0.339 |
| 60.00 | -19.57 | -17.51 | 0.00 | -801.17 | 0.00 | 801.17 | 3,311.56 | 787.48 | 2,681.68 | 2,563.48 | 10.33 | -1.63 | 0.319 |
| 65.00 | -18.63 | -17.13 | 0.00 | -713.64 | 0.00 | 713.64 | 3,247.27 | 767.16 | 2,545.07 | 2,448.20 | 12.11 | -1.77 | 0.298 |
| 70.00 | -17.72 | -16.74 | 0.00 | -627.99 | 0.00 | 627.99 | 3,161.61 | 746.84 | 2,412.04 | 2,319.84 | 14.03 | -1.90 | 0.277 |
| 75.00 | -16.83 | -16.35 | 0.00 | -544.27 | 0.00 | 544.27 | 3,075.58 | 726.52 | 2,282.58 | 2,194.67 | 16.08 | -2.02 | 0.254 |
| 80.00 | -15.97 | -15.94 | 0.00 | -462.53 | 0.00 | 462.53 | 2,989.55 | 706.19 | 2,156.68 | 2,072.97 | 18.26 | -2.13 | 0.229 |
| 85.00 | -15.12 | -15.57 | 0.00 | -382.81 | 0.00 | 382.81 | 2,903.52 | 685.87 | 2,034.36 | 1,954.74 | 20.54 | -2.23 | 0.202 |
| 89.00 | -12.17 | -13.57 | 0.00 | -320.54 | 0.00 | 320.54 | 2,834.69 | 669.61 | 1,939.08 | 1,862.66 | 22.45 | -2.31 | 0.177 |
| 90.00 | -12.01 | -13.45 | 0.00 | -306.97 | 0.00 | 306.97 | 2,817.49 | 665.55 | 1,915.61 | 1,839.98 | 22.93 | -2.33 | 0.172 |
| 92.71 | -11.57 | -13.27 | 0.00 | -270.54 | 0.00 | 270.54 | 2,770.86 | 654.53 | 1,852.74 | 1,779.23 | 24.27 | -2.37 | 0.157 |
| 95.00 | -11.04 | -13.10 | 0.00 | -240.15 | 0.00 | 240.15 | 2,731.46 | 645.23 | 1,800.43 | 1,728.70 | 25.41 | -2.41 | 0.143 |
| 97.29 | -10.51 | -12.92 | 0.00 | -210.10 | 0.00 | 210.10 | 1,710.13 | 432.64 | 1,214.07 | 1,093.00 | 26.58 | -2.44 | 0.199 |
| 100.00 | -7.18 | -10.23 | 0.00 | -175.13 | 0.00 | 175.13 | 1,690.67 | 425.31 | 1,173.26 | 1,062.09 | 27.97 | -2.48 | 0.170 |
| 105.00 | -6.67 | -9.90 | 0.00 | -123.96 | 0.00 | 123.96 | 1,653.85 | 411.76 | 1,099.71 | 1,005.60 | 30.61 | -2.55 | 0.128 |
| 110.00 | -4.09 | -7.01 | 0.00 | -72.88 | 0.00 | 72.88 | 1,615.92 | 398.21 | 1,028.54 | 949.94 | 33.31 | -2.61 | 0.080 |
| 115.00 | -3.69 | -6.72 | 0.00 | -37.81 | 0.00 | 37.81 | 1,576.86 | 384.66 | 959.75 | 895.16 | 36.06 | -2.64 | 0.045 |
| 119.00 | -2.07 | -5.54 | 0.00 | -10.95 | 0.00 | 10.95 | 1,544.80 | 373.82 | 906.44 | 852.03 | 38.28 | -2.65 | 0.014 |
| 120.00 | 0.00 | -5.44 | 0.00 | -5.41 | 0.00 | 5.41 | 1,536.68 | 371.11 | 893.35 | 841.35 | 38.83 | -2.65 | 0.007 |

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 1.50 in Radial Ice 19 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00
Dead Load Factor :1.20 Ice Importance Factor :1.00
Wind Load Factor :1.00

## Applied Segment Forces Summary

| Seg Elev (ft) | Description | Shaft Forces Wind FX (lb) | Shaft Forces Dead Load (lb) | Discrete Forces Wind FX (lb) | Discrete Forces Torsion MY (lb-ft) | Discrete Forces Moment MZ (lb-ft) | Discrete Forces Dead Load (lb) | Linear Forces Wind FX (lb) | Linear Forces Dead Load (lb) | Sum of Forces Wind FX (lb) | Sum of Forces Dead Load (lb) | Sum of Forces Torsion MY (lb-ft) | Sum of Forces Moment MZ (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 59.3 | 0.0 | | | | | 0.0 | 0.0 | 59.3 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 117.8 | 1,720.0 | | | | | 0.0 | 391.5 | 117.8 | 2,111.6 | 0.0 | 0.0 |
| 10.00 | | 116.0 | 1,727.1 | | | | | 0.0 | 399.4 | 116.0 | 2,126.5 | 0.0 | 0.0 |
| 15.00 | | 114.0 | 1,712.3 | | | | | 0.0 | 403.5 | 114.0 | 2,115.8 | 0.0 | 0.0 |
| 20.00 | | 111.9 | 1,690.4 | | | | | 0.0 | 406.3 | 111.9 | 2,096.7 | 0.0 | 0.0 |
| 25.00 | | 109.8 | 1,664.8 | | | | | 0.0 | 408.5 | 109.8 | 2,073.3 | 0.0 | 0.0 |
| 30.00 | | 108.9 | 1,636.8 | | | | | 0.0 | 410.3 | 108.9 | 2,047.1 | 0.0 | 0.0 |
| 35.00 | | 110.2 | 1,607.3 | | | | | 0.0 | 411.8 | 110.2 | 2,019.1 | 0.0 | 0.0 |
| 40.00 | | 112.2 | 1,576.5 | | | | | 0.0 | 413.1 | 112.2 | 1,989.7 | 0.0 | 0.0 |
| 45.00 | | 69.7 | 1,544.9 | | | | | 0.0 | 414.3 | 69.7 | 1,959.2 | 0.0 | 0.0 |
| 46.16 | Bot - Section 2 | 57.8 | 355.7 | | | | | 0.0 | 96.6 | 57.8 | 452.2 | 0.0 | 0.0 |
| 50.00 | | 65.9 | 1,910.3 | | | | | 0.0 | 318.8 | 65.9 | 2,229.2 | 0.0 | 0.0 |
| 51.83 | Top - Section 1 | 58.4 | 900.2 | | | | | 0.0 | 152.3 | 58.4 | 1,052.4 | 0.0 | 0.0 |
| 55.00 | | 95.8 | 854.4 | | | | | 0.0 | 264.1 | 95.8 | 1,118.5 | 0.0 | 0.0 |
| 60.00 | | 117.4 | 1,321.8 | | | | | 0.0 | 417.3 | 117.4 | 1,739.1 | 0.0 | 0.0 |
| 65.00 | | 117.3 | 1,291.8 | | | | | 0.0 | 418.1 | 117.3 | 1,709.9 | 0.0 | 0.0 |
| 70.00 | | 117.0 | 1,261.5 | | | | | 0.0 | 418.9 | 117.0 | 1,680.4 | 0.0 | 0.0 |
| 75.00 | | 116.5 | 1,230.8 | | | | | 0.0 | 419.6 | 116.5 | 1,650.4 | 0.0 | 0.0 |
| 80.00 | | 115.7 | 1,199.8 | | | | | 0.0 | 420.3 | 115.7 | 1,620.1 | 0.0 | 0.0 |
| 85.00 | | 103.3 | 1,168.5 | | | | | 0.0 | 420.9 | 103.3 | 1,589.5 | 0.0 | 0.0 |
| 89.00 | Appurtenance(s) | 57.1 | 913.0 | 506.5 | 0.0 | 0.0 | 4,947.2 | 0.0 | 337.2 | 563.5 | 6,197.4 | 0.0 | 0.0 |
| 90.00 | | 42.1 | 225.7 | | | | | 0.0 | 79.1 | 42.1 | 304.8 | 0.0 | 0.0 |
| 92.71 | Bot - Section 3 | 56.8 | 604.3 | | | | | 0.0 | 214.4 | 56.8 | 818.7 | 0.0 | 0.0 |
| 95.00 | | 52.2 | 741.4 | | | | | 0.0 | 181.3 | 52.2 | 922.7 | 0.0 | 0.0 |
| 97.29 | Top - Section 2 | 56.6 | 732.5 | | | | | 0.0 | 181.7 | 56.6 | 914.1 | 0.0 | 0.0 |
| 100.00 | Appurtenance(s) | 86.3 | 454.3 | 649.9 | 0.0 | 0.0 | 6,911.3 | 0.0 | 214.5 | 736.3 | 7,580.2 | 0.0 | 0.0 |
| 105.00 | | 110.8 | 818.2 | | | | | 0.0 | 308.6 | 110.8 | 1,126.9 | 0.0 | 0.0 |
| 110.00 | Appurtenance(s) | 109.0 | 793.9 | 704.2 | 0.0 | 401.6 | 5,189.5 | 0.0 | 309.1 | 813.2 | 6,292.4 | 0.0 | 0.0 |
| 115.00 | | 96.6 | 769.3 | | | | | 0.0 | 197.5 | 96.6 | 966.8 | 0.0 | 0.0 |
| 119.00 | Appurtenance(s) | 53.1 | 598.5 | 305.5 | 0.0 | 0.0 | 2,340.3 | 0.0 | 158.3 | 358.5 | 3,097.1 | 0.0 | 0.0 |
| 120.00 | | 10.5 | 147.8 | | | | | 0.0 | 39.6 | 10.5 | 187.4 | 0.0 | 0.0 |
| | | | | | | | | Totals: | | 4,891.82 | 61,789.1 | 0.00 | 0.00 |

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 1.50 in Radial Ice 19 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00
Dead Load Factor :1.20 Ice Importance Factor :1.00
Wind Load Factor :1.00

## Calculated Forces

| Seg Elev (ft) | Pu FY (-) (kips) | Vu FX (-) (kips) | Tu MY (ft-kips) | Mu MZ (ft-kips) | Mu MX (ft-kips) | Resultant Moment (ft-kips) | phi Pn (kips) | phi Vn (kips) | phi Tn (ft-kips) | phi Mn (ft-kips) | Total Deflect (in) | Rotation (deg) | Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -67.84 | -6.36 | 0.00 | -600.93 | 0.00 | 600.93 | 4,844.94 | 1,183.44 | 5,191.11 | 4,835.57 | 0.00 | 0.00 | 0.138 |
| 5.00 | -65.73 | -6.28 | 0.00 | -569.16 | 0.00 | 569.16 | 4,775.31 | 1,159.73 | 4,985.22 | 4,669.74 | 0.02 | -0.04 | 0.136 |
| 10.00 | -63.60 | -6.21 | 0.00 | -537.74 | 0.00 | 537.74 | 4,704.55 | 1,136.02 | 4,783.50 | 4,505.63 | 0.09 | -0.08 | 0.133 |
| 15.00 | -61.48 | -6.14 | 0.00 | -506.68 | 0.00 | 506.68 | 4,632.67 | 1,112.31 | 4,585.94 | 4,343.33 | 0.20 | -0.12 | 0.130 |
| 20.00 | -59.38 | -6.07 | 0.00 | -475.99 | 0.00 | 475.99 | 4,559.67 | 1,088.61 | 4,392.55 | 4,182.90 | 0.35 | -0.17 | 0.127 |
| 25.00 | -57.30 | -5.99 | 0.00 | -445.66 | 0.00 | 445.66 | 4,485.55 | 1,064.90 | 4,203.32 | 4,024.42 | 0.55 | -0.21 | 0.124 |
| 30.00 | -55.25 | -5.91 | 0.00 | -415.71 | 0.00 | 415.71 | 4,407.69 | 1,041.19 | 4,018.26 | 3,865.64 | 0.79 | -0.25 | 0.120 |
| 35.00 | -53.23 | -5.83 | 0.00 | -386.14 | 0.00 | 386.14 | 4,307.32 | 1,017.48 | 3,837.37 | 3,690.72 | 1.07 | -0.29 | 0.117 |
| 40.00 | -51.23 | -5.75 | 0.00 | -356.98 | 0.00 | 356.98 | 4,206.95 | 993.77 | 3,660.64 | 3,519.85 | 1.40 | -0.33 | 0.114 |
| 45.00 | -49.27 | -5.69 | 0.00 | -328.25 | 0.00 | 328.25 | 4,106.58 | 970.06 | 3,488.08 | 3,353.03 | 1.77 | -0.37 | 0.110 |
| 46.16 | -48.82 | -5.64 | 0.00 | -321.63 | 0.00 | 321.63 | 4,083.23 | 964.54 | 3,448.53 | 3,314.80 | 1.87 | -0.38 | 0.109 |
| 50.00 | -46.59 | -5.58 | 0.00 | -299.98 | 0.00 | 299.98 | 4,006.21 | 946.35 | 3,319.69 | 3,190.26 | 2.19 | -0.42 | 0.106 |
| 51.83 | -45.53 | -5.53 | 0.00 | -289.77 | 0.00 | 289.77 | 3,414.21 | 820.69 | 2,912.57 | 2,755.48 | 2.35 | -0.43 | 0.119 |
| 55.00 | -44.41 | -5.45 | 0.00 | -272.24 | 0.00 | 272.24 | 3,374.74 | 807.81 | 2,821.85 | 2,680.46 | 2.64 | -0.46 | 0.115 |
| 60.00 | -42.67 | -5.35 | 0.00 | -244.98 | 0.00 | 244.98 | 3,311.56 | 787.48 | 2,681.68 | 2,563.48 | 3.15 | -0.50 | 0.108 |
| 65.00 | -40.96 | -5.25 | 0.00 | -218.23 | 0.00 | 218.23 | 3,247.27 | 767.16 | 2,545.07 | 2,448.20 | 3.69 | -0.54 | 0.102 |
| 70.00 | -39.27 | -5.14 | 0.00 | -191.99 | 0.00 | 191.99 | 3,161.61 | 746.84 | 2,412.04 | 2,319.84 | 4.27 | -0.58 | 0.095 |
| 75.00 | -37.62 | -5.03 | 0.00 | -166.29 | 0.00 | 166.29 | 3,075.58 | 726.52 | 2,282.58 | 2,194.67 | 4.90 | -0.62 | 0.088 |
| 80.00 | -36.00 | -4.92 | 0.00 | -141.15 | 0.00 | 141.15 | 2,989.55 | 706.19 | 2,156.68 | 2,072.97 | 5.56 | -0.65 | 0.080 |
| 85.00 | -34.41 | -4.81 | 0.00 | -116.56 | 0.00 | 116.56 | 2,903.52 | 685.87 | 2,034.36 | 1,954.74 | 6.26 | -0.68 | 0.072 |
| 89.00 | -28.22 | -4.18 | 0.00 | -97.32 | 0.00 | 97.32 | 2,834.69 | 669.61 | 1,939.08 | 1,862.66 | 6.84 | -0.70 | 0.062 |
| 90.00 | -27.91 | -4.14 | 0.00 | -93.14 | 0.00 | 93.14 | 2,817.49 | 665.55 | 1,915.61 | 1,839.98 | 6.99 | -0.71 | 0.061 |
| 92.71 | -27.10 | -4.08 | 0.00 | -81.92 | 0.00 | 81.92 | 2,770.86 | 654.53 | 1,852.74 | 1,779.23 | 7.40 | -0.72 | 0.056 |
| 95.00 | -26.17 | -4.02 | 0.00 | -72.59 | 0.00 | 72.59 | 2,731.46 | 645.23 | 1,800.43 | 1,728.70 | 7.75 | -0.73 | 0.052 |
| 97.29 | -25.26 | -3.95 | 0.00 | -63.37 | 0.00 | 63.37 | 1,710.13 | 432.64 | 1,214.07 | 1,093.00 | 8.10 | -0.74 | 0.073 |
| 100.00 | -17.69 | -3.12 | 0.00 | -52.67 | 0.00 | 52.67 | 1,690.67 | 425.31 | 1,173.26 | 1,062.09 | 8.53 | -0.75 | 0.060 |
| 105.00 | -16.56 | -3.00 | 0.00 | -37.04 | 0.00 | 37.04 | 1,653.85 | 411.76 | 1,099.71 | 1,005.60 | 9.33 | -0.78 | 0.047 |
| 110.00 | -10.28 | -2.11 | 0.00 | -21.62 | 0.00 | 21.62 | 1,615.92 | 398.21 | 1,028.54 | 949.94 | 10.16 | -0.79 | 0.029 |
| 115.00 | -9.31 | -2.00 | 0.00 | -11.09 | 0.00 | 11.09 | 1,576.86 | 384.66 | 959.75 | 895.16 | 10.99 | -0.80 | 0.018 |
| 119.00 | -6.22 | -1.60 | 0.00 | -3.09 | 0.00 | 3.09 | 1,544.80 | 373.82 | 906.44 | 852.03 | 11.67 | -0.81 | 0.008 |
| 120.00 | 0.00 | -1.51 | 0.00 | -1.50 | 0.00 | 1.50 | 1,536.68 | 371.11 | 893.35 | 841.35 | 11.84 | -0.81 | 0.002 |

Load Case: 1.0D + 1.0W Serviceability 60 mph 19 Iterations

Gust Response Factor :1.10
Dead Load Factor :1.00
Wind Load Factor :1.00

## Applied Segment Forces Summary

| | | Shaft Forces | | Discrete Forces | | | | Linear Forces | | Sum of Forces | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seg Elev (ft) | Description | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Torsion MY (lb-ft) | Moment MZ (lb) |
| 0.00 | | 44.4 | 0.0 | | | | | 0.0 | 0.0 | 44.4 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 87.9 | 1,135.8 | | | | | 0.0 | 252.2 | 87.9 | 1,387.9 | 0.0 | 0.0 |
| 10.00 | | 86.1 | 1,112.8 | | | | | 0.0 | 252.2 | 86.1 | 1,365.0 | 0.0 | 0.0 |
| 15.00 | | 84.3 | 1,089.8 | | | | | 0.0 | 252.2 | 84.3 | 1,342.0 | 0.0 | 0.0 |
| 20.00 | | 82.6 | 1,066.8 | | | | | 0.0 | 252.2 | 82.6 | 1,319.0 | 0.0 | 0.0 |
| 25.00 | | 81.3 | 1,043.9 | | | | | 0.0 | 252.2 | 81.3 | 1,296.0 | 0.0 | 0.0 |
| 30.00 | | 81.6 | 1,020.9 | | | | | 0.0 | 252.2 | 81.6 | 1,273.0 | 0.0 | 0.0 |
| 35.00 | | 83.5 | 997.9 | | | | | 0.0 | 252.2 | 83.5 | 1,250.0 | 0.0 | 0.0 |
| 40.00 | | 86.0 | 974.9 | | | | | 0.0 | 252.2 | 86.0 | 1,227.1 | 0.0 | 0.0 |
| 45.00 | | 53.9 | 951.9 | | | | | 0.0 | 252.2 | 53.9 | 1,204.1 | 0.0 | 0.0 |
| 46.16 | Bot - Section 2 | 45.3 | 218.2 | | | | | 0.0 | 58.7 | 45.3 | 276.9 | 0.0 | 0.0 |
| 50.00 | | 51.8 | 1,332.6 | | | | | 0.0 | 193.5 | 51.8 | 1,526.1 | 0.0 | 0.0 |
| 51.83 | Top - Section 1 | 46.0 | 626.8 | | | | | 0.0 | 92.3 | 46.0 | 719.0 | 0.0 | 0.0 |
| 55.00 | | 75.8 | 500.5 | | | | | 0.0 | 159.9 | 75.8 | 660.3 | 0.0 | 0.0 |
| 60.00 | | 94.0 | 773.3 | | | | | 0.0 | 252.2 | 94.0 | 1,025.4 | 0.0 | 0.0 |
| 65.00 | | 95.3 | 753.6 | | | | | 0.0 | 252.2 | 95.3 | 1,005.7 | 0.0 | 0.0 |
| 70.00 | | 96.5 | 733.9 | | | | | 0.0 | 252.2 | 96.5 | 986.0 | 0.0 | 0.0 |
| 75.00 | | 97.6 | 714.2 | | | | | 0.0 | 252.2 | 97.6 | 966.3 | 0.0 | 0.0 |
| 80.00 | | 98.6 | 694.5 | | | | | 0.0 | 252.2 | 98.6 | 946.6 | 0.0 | 0.0 |
| 85.00 | | 89.5 | 674.8 | | | | | 0.0 | 252.2 | 89.5 | 926.9 | 0.0 | 0.0 |
| 89.00 | Appurtenance(s) | 48.0 | 525.6 | 412.7 | 0.0 | 0.0 | 2,632.1 | 0.0 | 201.7 | 460.7 | 3,359.5 | 0.0 | 0.0 |
| 90.00 | | 29.9 | 129.4 | | | | | 0.0 | 48.1 | 29.9 | 177.5 | 0.0 | 0.0 |
| 92.71 | Bot - Section 3 | 40.4 | 346.8 | | | | | 0.0 | 130.3 | 40.4 | 477.1 | 0.0 | 0.0 |
| 95.00 | | 37.1 | 484.8 | | | | | 0.0 | 110.1 | 37.1 | 594.9 | 0.0 | 0.0 |
| 97.29 | Top - Section 2 | 40.1 | 478.6 | | | | | 0.0 | 110.3 | 40.1 | 588.9 | 0.0 | 0.0 |
| 100.00 | Appurtenance(s) | 61.1 | 225.1 | 560.2 | 0.0 | 0.0 | 3,449.5 | 0.0 | 130.2 | 621.3 | 3,804.8 | 0.0 | 0.0 |
| 105.00 | | 78.1 | 405.7 | | | | | 0.0 | 167.1 | 78.1 | 572.8 | 0.0 | 0.0 |
| 110.00 | Appurtenance(s) | 76.8 | 392.6 | 597.3 | 0.0 | 387.9 | 2,448.9 | 0.0 | 167.1 | 674.1 | 3,008.6 | 0.0 | 0.0 |
| 115.00 | | 68.6 | 379.5 | | | | | 0.0 | 73.8 | 68.6 | 453.3 | 0.0 | 0.0 |
| 119.00 | Appurtenance(s) | 38.1 | 294.1 | 229.5 | 0.0 | 0.0 | 1,500.0 | 0.0 | 59.0 | 267.6 | 1,853.2 | 0.0 | 0.0 |
| 120.00 | | 7.6 | 72.2 | | | | | 0.0 | 14.8 | 7.6 | 87.0 | 0.0 | 0.0 |
| | | | | | | | | Totals: | | 3,887.71 | 35,680.9 | 0.00 | 0.00 |

Load Case: 1.0D + 1.0W Serviceability 60 mph 19 Iterations

Gust Response Factor :1.10
Dead Load Factor :1.00
Wind Load Factor :1.00

## Calculated Forces

| Seg Elev (ft) | Pu FY (-) (kips) | Vu FX (-) (kips) | Tu MY (ft-kips) | Mu MZ (ft-kips) | Mu MX (ft-kips) | Resultant Moment (ft-kips) | phi Pn (kips) | phi Vn (kips) | phi Tn (ft-kips) | phi Mn (ft-kips) | Total Deflect (in) | Rotation (deg) | Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -38.18 | -5.17 | 0.00 | -483.52 | 0.00 | 483.52 | 4,844.94 | 1,183.44 | 5,191.11 | 4,835.57 | 0.00 | 0.00 | 0.108 |
| 5.00 | -36.79 | -5.10 | 0.00 | -457.66 | 0.00 | 457.66 | 4,775.31 | 1,159.73 | 4,985.22 | 4,669.74 | 0.02 | -0.03 | 0.106 |
| 10.00 | -35.42 | -5.04 | 0.00 | -432.14 | 0.00 | 432.14 | 4,704.55 | 1,136.02 | 4,783.50 | 4,505.63 | 0.07 | -0.07 | 0.103 |
| 15.00 | -34.08 | -4.97 | 0.00 | -406.95 | 0.00 | 406.95 | 4,632.67 | 1,112.31 | 4,585.94 | 4,343.33 | 0.16 | -0.10 | 0.101 |
| 20.00 | -32.75 | -4.91 | 0.00 | -382.09 | 0.00 | 382.09 | 4,559.67 | 1,088.61 | 4,392.55 | 4,182.90 | 0.28 | -0.13 | 0.099 |
| 25.00 | -31.46 | -4.84 | 0.00 | -357.56 | 0.00 | 357.56 | 4,485.55 | 1,064.90 | 4,203.32 | 4,024.42 | 0.44 | -0.17 | 0.096 |
| 30.00 | -30.18 | -4.77 | 0.00 | -333.37 | 0.00 | 333.37 | 4,407.69 | 1,041.19 | 4,018.26 | 3,865.64 | 0.63 | -0.20 | 0.093 |
| 35.00 | -28.93 | -4.70 | 0.00 | -309.51 | 0.00 | 309.51 | 4,307.32 | 1,017.48 | 3,837.37 | 3,690.72 | 0.86 | -0.23 | 0.091 |
| 40.00 | -27.70 | -4.62 | 0.00 | -286.02 | 0.00 | 286.02 | 4,206.95 | 993.77 | 3,660.64 | 3,519.85 | 1.13 | -0.27 | 0.088 |
| 45.00 | -26.49 | -4.57 | 0.00 | -262.89 | 0.00 | 262.89 | 4,106.58 | 970.06 | 3,488.08 | 3,353.03 | 1.42 | -0.30 | 0.085 |
| 46.16 | -26.22 | -4.53 | 0.00 | -257.57 | 0.00 | 257.57 | 4,083.23 | 964.54 | 3,448.53 | 3,314.80 | 1.50 | -0.31 | 0.084 |
| 50.00 | -24.69 | -4.48 | 0.00 | -240.18 | 0.00 | 240.18 | 4,006.21 | 946.35 | 3,319.69 | 3,190.26 | 1.76 | -0.33 | 0.081 |
| 51.83 | -23.97 | -4.44 | 0.00 | -231.97 | 0.00 | 231.97 | 3,414.21 | 820.69 | 2,912.57 | 2,755.48 | 1.89 | -0.35 | 0.091 |
| 55.00 | -23.31 | -4.37 | 0.00 | -217.90 | 0.00 | 217.90 | 3,374.74 | 807.81 | 2,821.85 | 2,680.46 | 2.12 | -0.37 | 0.088 |
| 60.00 | -22.28 | -4.28 | 0.00 | -196.06 | 0.00 | 196.06 | 3,311.56 | 787.48 | 2,681.68 | 2,563.48 | 2.53 | -0.40 | 0.083 |
| 65.00 | -21.27 | -4.19 | 0.00 | -174.65 | 0.00 | 174.65 | 3,247.27 | 767.16 | 2,545.07 | 2,448.20 | 2.96 | -0.43 | 0.078 |
| 70.00 | -20.28 | -4.10 | 0.00 | -153.69 | 0.00 | 153.69 | 3,161.61 | 746.84 | 2,412.04 | 2,319.84 | 3.43 | -0.46 | 0.073 |
| 75.00 | -19.32 | -4.00 | 0.00 | -133.20 | 0.00 | 133.20 | 3,075.58 | 726.52 | 2,282.58 | 2,194.67 | 3.93 | -0.49 | 0.067 |
| 80.00 | -18.37 | -3.90 | 0.00 | -113.20 | 0.00 | 113.20 | 2,989.55 | 706.19 | 2,156.68 | 2,072.97 | 4.46 | -0.52 | 0.061 |
| 85.00 | -17.44 | -3.81 | 0.00 | -93.68 | 0.00 | 93.68 | 2,903.52 | 685.87 | 2,034.36 | 1,954.74 | 5.02 | -0.55 | 0.054 |
| 89.00 | -14.09 | -3.32 | 0.00 | -78.43 | 0.00 | 78.43 | 2,834.69 | 669.61 | 1,939.08 | 1,862.66 | 5.49 | -0.56 | 0.047 |
| 90.00 | -13.91 | -3.29 | 0.00 | -75.11 | 0.00 | 75.11 | 2,817.49 | 665.55 | 1,915.61 | 1,839.98 | 5.61 | -0.57 | 0.046 |
| 92.71 | -13.43 | -3.25 | 0.00 | -66.19 | 0.00 | 66.19 | 2,770.86 | 654.53 | 1,852.74 | 1,779.23 | 5.94 | -0.58 | 0.042 |
| 95.00 | -12.84 | -3.21 | 0.00 | -58.75 | 0.00 | 58.75 | 2,731.46 | 645.23 | 1,800.43 | 1,728.70 | 6.22 | -0.59 | 0.039 |
| 97.29 | -12.25 | -3.16 | 0.00 | -51.40 | 0.00 | 51.40 | 1,710.13 | 432.64 | 1,214.07 | 1,093.00 | 6.50 | -0.60 | 0.054 |
| 100.00 | -8.45 | -2.50 | 0.00 | -42.83 | 0.00 | 42.83 | 1,690.67 | 425.31 | 1,173.26 | 1,062.09 | 6.84 | -0.61 | 0.045 |
| 105.00 | -7.88 | -2.42 | 0.00 | -30.31 | 0.00 | 30.31 | 1,653.85 | 411.76 | 1,099.71 | 1,005.60 | 7.49 | -0.62 | 0.035 |
| 110.00 | -4.87 | -1.72 | 0.00 | -17.82 | 0.00 | 17.82 | 1,615.92 | 398.21 | 1,028.54 | 949.94 | 8.15 | -0.64 | 0.022 |
| 115.00 | -4.42 | -1.64 | 0.00 | -9.24 | 0.00 | 9.24 | 1,576.86 | 384.66 | 959.75 | 895.16 | 8.82 | -0.65 | 0.013 |
| 119.00 | -2.57 | -1.35 | 0.00 | -2.67 | 0.00 | 2.67 | 1,544.80 | 373.82 | 906.44 | 852.03 | 9.36 | -0.65 | 0.005 |
| 120.00 | 0.00 | -1.32 | 0.00 | -1.32 | 0.00 | 1.32 | 1,536.68 | 371.11 | 893.35 | 841.35 | 9.50 | -0.65 | 0.002 |

## Equivalent Lateral Forces Method Analysis

| | | |
|---|---|---|
| Spectral Response Acceleration for Short Period ($S_s$): | 0.17 | |
| Spectral Response Acceleration at 1.0 Second Period ($S_1$): | 0.05 | |
| Long-Period Transition Period ($T_L$): | 6 | |
| Importance Factor ($I_E$): | 1.00 | |
| Site Coefficient $F_a$: | 1.60 | |
| Site Coeffiecient $F_v$: | 2.40 | |
| Response Modification Coefficient (R): | 1.50 | |
| Design Spectral Response Acceleration at Short Period ($S_{ds}$): | 0.19 | |
| Design Spectral Response Acceleration at 1.0 Second Period ($S_{d1}$): | 0.09 | |
| Seismic Response Coefficient ($C_s$): | 0.03 | |
| Upper Limit $C_s$ | 0.03 | |
| Lower Limit $C_s$ | 0.03 | |
| Period based on Rayleigh Method (sec): | 1.83 | |
| Redundancy Factor (p): | 1.00 | |
| Seismic Force Distribution Exponent (k): | 1.66 | |
| Total Unfactored Dead Load: | 38.18 | k |
| Seismic Base Shear (E): | 1.20 | k |

Load Case 1.2D + 1.0Ev + 1.0Eh Seismic

| Segment | Height Above Base (ft) | Weight (lb) | $W_z$ (lb-ft) | $C_{vx}$ | Horizontal Force (lb) | Vertical Force (lb) |
|---|---|---|---|---|---|---|
| 30 | 119.50 | 87 | 249 | 0.005 | 6 | 108 |
| 29 | 117.00 | 353 | 977 | 0.019 | 23 | 437 |
| 28 | 112.50 | 453 | 1,175 | 0.023 | 27 | 561 |
| 27 | 107.50 | 560 | 1,345 | 0.026 | 31 | 692 |
| 26 | 102.50 | 573 | 1,271 | 0.025 | 30 | 709 |
| 25 | 98.65 | 355 | 740 | 0.014 | 17 | 440 |
| 24 | 96.15 | 589 | 1,175 | 0.023 | 27 | 729 |
| 23 | 93.85 | 595 | 1,140 | 0.022 | 27 | 736 |
| 22 | 91.35 | 477 | 874 | 0.017 | 20 | 590 |
| 21 | 89.50 | 178 | 314 | 0.006 | 7 | 220 |
| 20 | 87.00 | 727 | 1,229 | 0.024 | 29 | 900 |
| 19 | 82.50 | 927 | 1,434 | 0.028 | 34 | 1,147 |
| 18 | 77.50 | 947 | 1,319 | 0.026 | 31 | 1,171 |
| 17 | 72.50 | 966 | 1,205 | 0.023 | 28 | 1,195 |
| 16 | 67.50 | 986 | 1,092 | 0.021 | 26 | 1,220 |
| 15 | 62.50 | 1,006 | 980 | 0.019 | 23 | 1,244 |
| 14 | 57.50 | 1,025 | 870 | 0.017 | 20 | 1,269 |
| 13 | 53.42 | 660 | 495 | 0.010 | 12 | 817 |
| 12 | 50.92 | 719 | 498 | 0.010 | 12 | 890 |
| 11 | 48.08 | 1,526 | 961 | 0.019 | 22 | 1,888 |
| 10 | 45.58 | 277 | 160 | 0.003 | 4 | 342 |
| 9 | 42.50 | 1,204 | 617 | 0.012 | 14 | 1,490 |
| 8 | 37.50 | 1,227 | 511 | 0.010 | 12 | 1,518 |
| 7 | 32.50 | 1,250 | 410 | 0.008 | 10 | 1,546 |
| 6 | 27.50 | 1,273 | 316 | 0.006 | 7 | 1,575 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5 | 22.50 | 1,296 | 231 | 0.004 | 5 | 1,603 |
| 4 | 17.50 | 1,319 | 154 | 0.003 | 4 | 1,632 |
| 3 | 12.50 | 1,342 | 90 | 0.002 | 2 | 1,660 |
| 2 | 7.50 | 1,365 | 39 | 0.001 | 1 | 1,689 |
| 1 | 2.50 | 1,388 | 6 | 0.000 | 0 | 1,717 |
| Amphenol Antel BXA-1 | 120.00 | 45 | 130 | 0.003 | 3 | 56 |
| Antel BXA-70063/6CF | 120.00 | 51 | 147 | 0.003 | 3 | 63 |
| Antel LPA-80080/6CF | 120.00 | 126 | 364 | 0.007 | 9 | 156 |
| VZW Unused Reserve ( | 120.00 | 2,278 | 6,573 | 0.128 | 154 | 2,818 |
| Flat Low Profile Pla | 119.00 | 1,500 | 4,268 | 0.083 | 100 | 1,856 |
| Andrew ABT-DFDM-ADB | 110.00 | 1 | 3 | 0.000 | 0 | 1 |
| Powerwave Allgon TT1 | 110.00 | 192 | 479 | 0.009 | 11 | 238 |
| Raycap DC6-48-60-0-8 | 110.00 | 33 | 82 | 0.002 | 2 | 41 |
| Ericsson RRUS-11 (50 | 110.00 | 300 | 749 | 0.015 | 18 | 371 |
| Powerwave Allgon P65 | 110.00 | 246 | 614 | 0.012 | 14 | 304 |
| Powerwave Allgon P65 | 110.00 | 177 | 442 | 0.009 | 10 | 219 |
| Round Low Profile Pl | 110.00 | 1,500 | 3,745 | 0.073 | 88 | 1,856 |
| Ericsson KRY 112 144 | 100.00 | 33 | 70 | 0.001 | 2 | 41 |
| Ericsson KRY 112 489 | 100.00 | 46 | 98 | 0.002 | 2 | 57 |
| Ericsson Radio 4449 | 100.00 | 222 | 473 | 0.009 | 11 | 275 |
| RFS APX16DWV-16DWV-S | 100.00 | 119 | 253 | 0.005 | 6 | 147 |
| RFS APXVAARR24_43-U- | 100.00 | 384 | 817 | 0.016 | 19 | 475 |
| Site PRO 1 RMQP-4096 | 100.00 | 2,646 | 5,636 | 0.110 | 132 | 3,273 |
| Commscope RDIDC-9181 | 89.00 | 22 | 38 | 0.001 | 1 | 27 |
| Fujitsu TA08025-B605 | 89.00 | 225 | 395 | 0.008 | 9 | 278 |
| Fujitsu TA08025-B604 | 89.00 | 192 | 336 | 0.007 | 8 | 237 |
| JMA Wireless MX08FRO | 89.00 | 193 | 340 | 0.007 | 8 | 239 |
| Round Platform w/ Ha | 89.00 | 2,000 | 3,509 | 0.068 | 82 | 2,474 |
| | | 38,181 | 51,440 | 1.000 | 1,203 | 47,234 |

Load Case 0.9D - 1.0Ev + 1.0Eh Seismic (Reduced DL)

| Segment | Height Above Base (ft) | Weight (lb) | $W_z$ (lb-ft) | $C_{vx}$ | Horizontal Force (lb) | Vertical Force (lb) |
|---|---|---|---|---|---|---|
| 30 | 119.50 | 87 | 249 | 0.005 | 6 | 75 |
| 29 | 117.00 | 353 | 977 | 0.019 | 23 | 305 |
| 28 | 112.50 | 453 | 1,175 | 0.023 | 27 | 391 |
| 27 | 107.50 | 560 | 1,345 | 0.026 | 31 | 483 |
| 26 | 102.50 | 573 | 1,271 | 0.025 | 30 | 494 |
| 25 | 98.65 | 355 | 740 | 0.014 | 17 | 307 |
| 24 | 96.15 | 589 | 1,175 | 0.023 | 27 | 508 |
| 23 | 93.85 | 595 | 1,140 | 0.022 | 27 | 513 |
| 22 | 91.35 | 477 | 874 | 0.017 | 20 | 412 |
| 21 | 89.50 | 178 | 314 | 0.006 | 7 | 153 |
| 20 | 87.00 | 727 | 1,229 | 0.024 | 29 | 628 |
| 19 | 82.50 | 927 | 1,434 | 0.028 | 34 | 800 |
| 18 | 77.50 | 947 | 1,319 | 0.026 | 31 | 817 |
| 17 | 72.50 | 966 | 1,205 | 0.023 | 28 | 834 |
| 16 | 67.50 | 986 | 1,092 | 0.021 | 26 | 851 |
| 15 | 62.50 | 1,006 | 980 | 0.019 | 23 | 868 |
| 14 | 57.50 | 1,025 | 870 | 0.017 | 20 | 885 |
| 13 | 53.42 | 660 | 495 | 0.010 | 12 | 570 |
| 12 | 50.92 | 719 | 498 | 0.010 | 12 | 620 |
| 11 | 48.08 | 1,526 | 961 | 0.019 | 22 | 1,317 |
| 10 | 45.58 | 277 | 160 | 0.003 | 4 | 239 |
| 9 | 42.50 | 1,204 | 617 | 0.012 | 14 | 1,039 |
| 8 | 37.50 | 1,227 | 511 | 0.010 | 12 | 1,059 |
| 7 | 32.50 | 1,250 | 410 | 0.008 | 10 | 1,079 |
| 6 | 27.50 | 1,273 | 316 | 0.006 | 7 | 1,098 |
| 5 | 22.50 | 1,296 | 231 | 0.004 | 5 | 1,118 |
| 4 | 17.50 | 1,319 | 154 | 0.003 | 4 | 1,138 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | 12.50 | 1,342 | 90 | 0.002 | 2 | 1,158 |
| 2 | 7.50 | 1,365 | 39 | 0.001 | 1 | 1,178 |
| 1 | 2.50 | 1,388 | 6 | 0.000 | 0 | 1,198 |
| Amphenol Antel BXA-1 | 120.00 | 45 | 130 | 0.003 | 3 | 39 |
| Antel BXA-70063/6CF | 120.00 | 51 | 147 | 0.003 | 3 | 44 |
| Antel LPA-80080/6CF | 120.00 | 126 | 364 | 0.007 | 9 | 109 |
| VZW Unused Reserve ( | 120.00 | 2,278 | 6,573 | 0.128 | 154 | 1,966 |
| Flat Low Profile Pla | 119.00 | 1,500 | 4,268 | 0.083 | 100 | 1,294 |
| Andrew ABT-DFDM-ADB | 110.00 | 1 | 3 | 0.000 | 0 | 1 |
| Powerwave Allgon TT1 | 110.00 | 192 | 479 | 0.009 | 11 | 166 |
| Raycap DC6-48-60-0-8 | 110.00 | 33 | 82 | 0.002 | 2 | 28 |
| Ericsson RRUS-11 (50 | 110.00 | 300 | 749 | 0.015 | 18 | 259 |
| Powerwave Allgon P65 | 110.00 | 246 | 614 | 0.012 | 14 | 212 |
| Powerwave Allgon P65 | 110.00 | 177 | 442 | 0.009 | 10 | 153 |
| Round Low Profile Pl | 110.00 | 1,500 | 3,745 | 0.073 | 88 | 1,294 |
| Ericsson KRY 112 144 | 100.00 | 33 | 70 | 0.001 | 2 | 28 |
| Ericsson KRY 112 489 | 100.00 | 46 | 98 | 0.002 | 2 | 40 |
| Ericsson Radio 4449 | 100.00 | 222 | 473 | 0.009 | 11 | 192 |
| RFS APX16DWV-16DWV-S | 100.00 | 119 | 253 | 0.005 | 6 | 103 |
| RFS APXVAARR24_43-U- | 100.00 | 384 | 817 | 0.016 | 19 | 331 |
| Site PRO 1 RMQP-4096 | 100.00 | 2,646 | 5,636 | 0.110 | 132 | 2,283 |
| Commscope RDIDC-9181 | 89.00 | 22 | 38 | 0.001 | 1 | 19 |
| Fujitsu TA08025-B605 | 89.00 | 225 | 395 | 0.008 | 9 | 194 |
| Fujitsu TA08025-B604 | 89.00 | 192 | 336 | 0.007 | 8 | 165 |
| JMA Wireless MX08FRO | 89.00 | 193 | 340 | 0.007 | 8 | 167 |
| Round Platform w/ Ha | 89.00 | 2,000 | 3,509 | 0.068 | 82 | 1,726 |
| | | 38,181 | 51,440 | 1.000 | 1,203 | 32,946 |

Load Case 1.2D + 1.0Ev + 1.0Eh Seismic

Calculated Forces

| Seg Elev (ft) | Pu FY (-) (kips) | Vu FX (-) (kips) | Tu MY (ft-kips) | Mu MZ (ft-kips) | Mu MX (ft-kips) | Resultant Moment (ft-kips) | phi Pn (kips) | phi Vn (kips) | phi Tn (ft-kips) | phi Mn (ft-kips) | Total Deflect (in) | Rotation (deg) | Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -45.52 | -1.21 | 0.00 | -117.97 | 0.00 | 117.97 | 4,844.94 | 1,183.44 | 5,191.11 | 4,835.57 | 0.00 | 0.00 | 0.034 |
| 5.00 | -43.83 | -1.21 | 0.00 | -111.94 | 0.00 | 111.94 | 4,775.31 | 1,159.73 | 4,985.22 | 4,669.74 | 0.00 | -0.01 | 0.033 |
| 10.00 | -42.17 | -1.21 | 0.00 | -105.89 | 0.00 | 105.89 | 4,704.55 | 1,136.02 | 4,783.50 | 4,505.63 | 0.02 | -0.02 | 0.032 |
| 15.00 | -40.54 | -1.22 | 0.00 | -99.82 | 0.00 | 99.82 | 4,632.67 | 1,112.31 | 4,585.94 | 4,343.33 | 0.04 | -0.02 | 0.032 |
| 20.00 | -38.93 | -1.22 | 0.00 | -93.74 | 0.00 | 93.74 | 4,559.67 | 1,088.61 | 4,392.55 | 4,182.90 | 0.07 | -0.03 | 0.031 |
| 25.00 | -37.36 | -1.21 | 0.00 | -87.66 | 0.00 | 87.66 | 4,485.55 | 1,064.90 | 4,203.32 | 4,024.42 | 0.11 | -0.04 | 0.030 |
| 30.00 | -35.81 | -1.21 | 0.00 | -81.60 | 0.00 | 81.60 | 4,407.69 | 1,041.19 | 4,018.26 | 3,865.64 | 0.16 | -0.05 | 0.029 |
| 35.00 | -34.29 | -1.20 | 0.00 | -75.57 | 0.00 | 75.57 | 4,307.32 | 1,017.48 | 3,837.37 | 3,690.72 | 0.21 | -0.06 | 0.028 |
| 40.00 | -32.80 | -1.19 | 0.00 | -69.58 | 0.00 | 69.58 | 4,206.95 | 993.77 | 3,660.64 | 3,519.85 | 0.28 | -0.07 | 0.028 |
| 45.00 | -32.46 | -1.19 | 0.00 | -63.65 | 0.00 | 63.65 | 4,106.58 | 970.06 | 3,488.08 | 3,353.03 | 0.35 | -0.07 | 0.027 |
| 46.16 | -30.57 | -1.16 | 0.00 | -62.27 | 0.00 | 62.27 | 4,083.23 | 964.54 | 3,448.53 | 3,314.80 | 0.37 | -0.08 | 0.026 |
| 50.00 | -29.68 | -1.15 | 0.00 | -57.81 | 0.00 | 57.81 | 4,006.21 | 946.35 | 3,319.69 | 3,190.26 | 0.43 | -0.08 | 0.026 |
| 51.83 | -28.87 | -1.14 | 0.00 | -55.70 | 0.00 | 55.70 | 3,414.21 | 820.69 | 2,912.57 | 2,755.48 | 0.46 | -0.08 | 0.029 |
| 55.00 | -27.60 | -1.12 | 0.00 | -52.08 | 0.00 | 52.08 | 3,374.74 | 807.81 | 2,821.85 | 2,680.46 | 0.52 | -0.09 | 0.028 |
| 60.00 | -26.35 | -1.10 | 0.00 | -46.47 | 0.00 | 46.47 | 3,311.56 | 787.48 | 2,681.68 | 2,563.48 | 0.62 | -0.10 | 0.026 |
| 65.00 | -25.13 | -1.08 | 0.00 | -40.97 | 0.00 | 40.97 | 3,247.27 | 767.16 | 2,545.07 | 2,448.20 | 0.72 | -0.10 | 0.024 |
| 70.00 | -23.94 | -1.05 | 0.00 | -35.59 | 0.00 | 35.59 | 3,161.61 | 746.84 | 2,412.04 | 2,319.84 | 0.84 | -0.11 | 0.023 |
| 75.00 | -22.77 | -1.02 | 0.00 | -30.34 | 0.00 | 30.34 | 3,075.58 | 726.52 | 2,282.58 | 2,194.67 | 0.96 | -0.12 | 0.021 |
| 80.00 | -21.62 | -0.98 | 0.00 | -25.25 | 0.00 | 25.25 | 2,989.55 | 706.19 | 2,156.68 | 2,072.97 | 1.09 | -0.13 | 0.019 |
| 85.00 | -20.72 | -0.96 | 0.00 | -20.33 | 0.00 | 20.33 | 2,903.52 | 685.87 | 2,034.36 | 1,954.74 | 1.22 | -0.13 | 0.018 |
| 89.00 | -17.24 | -0.83 | 0.00 | -16.51 | 0.00 | 16.51 | 2,834.69 | 669.61 | 1,939.08 | 1,862.66 | 1.33 | -0.13 | 0.015 |
| 90.00 | -16.65 | -0.81 | 0.00 | -15.67 | 0.00 | 15.67 | 2,817.49 | 665.55 | 1,915.61 | 1,839.98 | 1.36 | -0.14 | 0.014 |
| 92.71 | -15.92 | -0.78 | 0.00 | -13.48 | 0.00 | 13.48 | 2,770.86 | 654.53 | 1,852.74 | 1,779.23 | 1.44 | -0.14 | 0.013 |
| 95.00 | -15.19 | -0.75 | 0.00 | -11.68 | 0.00 | 11.68 | 2,731.46 | 645.23 | 1,800.43 | 1,728.70 | 1.51 | -0.14 | 0.012 |
| 97.29 | -14.75 | -0.74 | 0.00 | -9.95 | 0.00 | 9.95 | 1,710.13 | 432.64 | 1,214.07 | 1,093.00 | 1.57 | -0.14 | 0.018 |
| 100.00 | -9.77 | -0.52 | 0.00 | -7.95 | 0.00 | 7.95 | 1,690.67 | 425.31 | 1,173.26 | 1,062.09 | 1.65 | -0.14 | 0.013 |
| 105.00 | -9.08 | -0.49 | 0.00 | -5.34 | 0.00 | 5.34 | 1,653.85 | 411.76 | 1,099.71 | 1,005.60 | 1.81 | -0.15 | 0.011 |
| 110.00 | -5.49 | -0.31 | 0.00 | -2.88 | 0.00 | 2.88 | 1,615.92 | 398.21 | 1,028.54 | 949.94 | 1.96 | -0.15 | 0.006 |
| 115.00 | -5.06 | -0.29 | 0.00 | -1.33 | 0.00 | 1.33 | 1,576.86 | 384.66 | 959.75 | 895.16 | 2.12 | -0.15 | 0.005 |
| 119.00 | -3.09 | -0.18 | 0.00 | -0.18 | 0.00 | 0.18 | 1,544.80 | 373.82 | 906.44 | 852.03 | 2.24 | -0.15 | 0.002 |
| 120.00 | 0.00 | -0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 1,536.68 | 371.11 | 893.35 | 841.35 | 2.27 | -0.15 | 0.000 |

Load Case 0.9D - 1.0Ev + 1.0Eh Seismic (Reduced DL)

Calculated Forces

| Seg Elev (ft) | Pu FY (-) (kips) | Vu FX (-) (kips) | Tu MY (ft-kips) | Mu MZ (ft-kips) | Mu MX (ft-kips) | Resultant Moment (ft-kips) | phi Pn (kips) | phi Vn (kips) | phi Tn (ft-kips) | phi Mn (ft-kips) | Total Deflect (in) | Rotation (deg) | Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -31.75 | -1.20 | 0.00 | -116.76 | 0.00 | 116.76 | 4,844.94 | 1,183.44 | 5,191.11 | 4,835.57 | 0.00 | 0.00 | 0.031 |
| 5.00 | -30.57 | -1.21 | 0.00 | -110.74 | 0.00 | 110.74 | 4,775.31 | 1,159.73 | 4,985.22 | 4,669.74 | 0.00 | -0.01 | 0.030 |
| 10.00 | -29.41 | -1.21 | 0.00 | -104.70 | 0.00 | 104.70 | 4,704.55 | 1,136.02 | 4,783.50 | 4,505.63 | 0.02 | -0.02 | 0.029 |
| 15.00 | -28.27 | -1.21 | 0.00 | -98.65 | 0.00 | 98.65 | 4,632.67 | 1,112.31 | 4,585.94 | 4,343.33 | 0.04 | -0.02 | 0.029 |
| 20.00 | -27.15 | -1.21 | 0.00 | -92.60 | 0.00 | 92.60 | 4,559.67 | 1,088.61 | 4,392.55 | 4,182.90 | 0.07 | -0.03 | 0.028 |
| 25.00 | -26.06 | -1.20 | 0.00 | -86.56 | 0.00 | 86.56 | 4,485.55 | 1,064.90 | 4,203.32 | 4,024.42 | 0.11 | -0.04 | 0.027 |
| 30.00 | -24.98 | -1.20 | 0.00 | -80.55 | 0.00 | 80.55 | 4,407.69 | 1,041.19 | 4,018.26 | 3,865.64 | 0.15 | -0.05 | 0.027 |
| 35.00 | -23.92 | -1.19 | 0.00 | -74.57 | 0.00 | 74.57 | 4,307.32 | 1,017.48 | 3,837.37 | 3,690.72 | 0.21 | -0.06 | 0.026 |
| 40.00 | -22.88 | -1.17 | 0.00 | -68.63 | 0.00 | 68.63 | 4,206.95 | 993.77 | 3,660.64 | 3,519.85 | 0.27 | -0.06 | 0.025 |
| 45.00 | -22.64 | -1.17 | 0.00 | -62.76 | 0.00 | 62.76 | 4,106.58 | 970.06 | 3,488.08 | 3,353.03 | 0.34 | -0.07 | 0.024 |
| 46.16 | -21.32 | -1.15 | 0.00 | -61.40 | 0.00 | 61.40 | 4,083.23 | 964.54 | 3,448.53 | 3,314.80 | 0.36 | -0.07 | 0.024 |
| 50.00 | -20.70 | -1.14 | 0.00 | -56.99 | 0.00 | 56.99 | 4,006.21 | 946.35 | 3,319.69 | 3,190.26 | 0.43 | -0.08 | 0.023 |
| 51.83 | -20.13 | -1.13 | 0.00 | -54.91 | 0.00 | 54.91 | 3,414.21 | 820.69 | 2,912.57 | 2,755.48 | 0.46 | -0.08 | 0.026 |
| 55.00 | -19.25 | -1.11 | 0.00 | -51.33 | 0.00 | 51.33 | 3,374.74 | 807.81 | 2,821.85 | 2,680.46 | 0.51 | -0.09 | 0.025 |
| 60.00 | -18.38 | -1.09 | 0.00 | -45.79 | 0.00 | 45.79 | 3,311.56 | 787.48 | 2,681.68 | 2,563.48 | 0.61 | -0.10 | 0.023 |
| 65.00 | -17.53 | -1.06 | 0.00 | -40.36 | 0.00 | 40.36 | 3,247.27 | 767.16 | 2,545.07 | 2,448.20 | 0.71 | -0.10 | 0.022 |
| 70.00 | -16.70 | -1.03 | 0.00 | -35.05 | 0.00 | 35.05 | 3,161.61 | 746.84 | 2,412.04 | 2,319.84 | 0.83 | -0.11 | 0.020 |
| 75.00 | -15.88 | -1.00 | 0.00 | -29.88 | 0.00 | 29.88 | 3,075.58 | 726.52 | 2,282.58 | 2,194.67 | 0.95 | -0.12 | 0.019 |
| 80.00 | -15.08 | -0.97 | 0.00 | -24.87 | 0.00 | 24.87 | 2,989.55 | 706.19 | 2,156.68 | 2,072.97 | 1.07 | -0.12 | 0.017 |
| 85.00 | -14.45 | -0.94 | 0.00 | -20.02 | 0.00 | 20.02 | 2,903.52 | 685.87 | 2,034.36 | 1,954.74 | 1.21 | -0.13 | 0.015 |
| 89.00 | -12.03 | -0.82 | 0.00 | -16.26 | 0.00 | 16.26 | 2,834.69 | 669.61 | 1,939.08 | 1,862.66 | 1.32 | -0.13 | 0.013 |
| 90.00 | -11.62 | -0.80 | 0.00 | -15.44 | 0.00 | 15.44 | 2,817.49 | 665.55 | 1,915.61 | 1,839.98 | 1.34 | -0.13 | 0.013 |
| 92.71 | -11.10 | -0.77 | 0.00 | -13.27 | 0.00 | 13.27 | 2,770.86 | 654.53 | 1,852.74 | 1,779.23 | 1.42 | -0.14 | 0.011 |
| 95.00 | -10.59 | -0.74 | 0.00 | -11.51 | 0.00 | 11.51 | 2,731.46 | 645.23 | 1,800.43 | 1,728.70 | 1.49 | -0.14 | 0.011 |
| 97.29 | -10.29 | -0.73 | 0.00 | -9.80 | 0.00 | 9.80 | 1,710.13 | 432.64 | 1,214.07 | 1,093.00 | 1.55 | -0.14 | 0.015 |
| 100.00 | -6.82 | -0.52 | 0.00 | -7.84 | 0.00 | 7.84 | 1,690.67 | 425.31 | 1,173.26 | 1,062.09 | 1.63 | -0.14 | 0.011 |
| 105.00 | -6.33 | -0.48 | 0.00 | -5.26 | 0.00 | 5.26 | 1,653.85 | 411.76 | 1,099.71 | 1,005.60 | 1.78 | -0.14 | 0.009 |
| 110.00 | -3.83 | -0.31 | 0.00 | -2.84 | 0.00 | 2.84 | 1,615.92 | 398.21 | 1,028.54 | 949.94 | 1.93 | -0.15 | 0.005 |
| 115.00 | -3.53 | -0.28 | 0.00 | -1.31 | 0.00 | 1.31 | 1,576.86 | 384.66 | 959.75 | 895.16 | 2.09 | -0.15 | 0.004 |
| 119.00 | -2.16 | -0.17 | 0.00 | -0.17 | 0.00 | 0.17 | 1,544.80 | 373.82 | 906.44 | 852.03 | 2.21 | -0.15 | 0.002 |
| 120.00 | 0.00 | -0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 1,536.68 | 371.11 | 893.35 | 841.35 | 2.24 | -0.15 | 0.000 |

## Analysis Summary

| | Reactions | | | | | | Max Usage | |
|---|---|---|---|---|---|---|---|---|
| Load Case | Shear FX (kips) | Shear FZ (kips) | Axial FY (kips) | Moment MX (ft-kips) | Moment MY (ft-kips) | Moment MZ (ft-kips) | Elev (ft) | Interaction Ratio |
| 1.2D + 1.0W | 21.24 | 0.00 | 45.79 | 0.00 | 0.00 | 1996.35 | 0.00 | 0.42 |
| 0.9D + 1.0W | 21.23 | 0.00 | 34.34 | 0.00 | 0.00 | 1978.86 | 0.00 | 0.42 |
| 1.2D + 1.0Di + 1.0Wi | 6.36 | 0.00 | 67.84 | 0.00 | 0.00 | 600.93 | 0.00 | 0.14 |
| 1.2D + 1.0Ev + 1.0Eh | 1.21 | 0.00 | 45.52 | 0.00 | 0.00 | 117.97 | 0.00 | 0.03 |
| 0.9D - 1.0Ev + 1.0Eh | 1.20 | 0.00 | 31.75 | 0.00 | 0.00 | 116.76 | 0.00 | 0.03 |
| 1.0D + 1.0W | 5.17 | 0.00 | 38.18 | 0.00 | 0.00 | 483.52 | 0.00 | 0.11 |

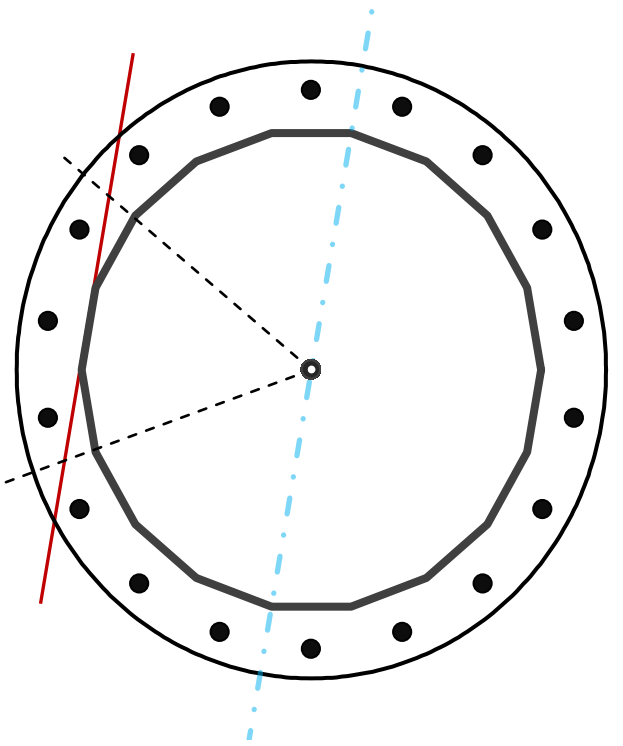
# Base Plate & Anchor Rod Analysis

| Pole Dimensions | | |
|---|---|---|
| Number of Sides | 18 | - |
| Diameter | 49 | in |
| Thickness | 7/16 | in |
| Orientation Offset | | ° |

| Base Reactions | | |
|---|---|---|
| Moment, Mu | 1,996.4 | k-ft |
| Axial, Pu | 45.8 | k |
| Shear, Vu | 21.2 | k |
| Neutral Axis | 80 | ° |

| Report Capacities | | |
|---|---|---|
| Component | Capacity | Result |
| Base Plate | 28% | Pass |
| Anchor Rods | 41% | Pass |
| Dwyidag | - | - |

| Base Plate | | |
|---|---|---|
| Shape | Round | - |
| Diameter, ø | 64 | in |
| Thickness | 2 1/4 | in |
| Grade | A572-60 | |
| Yield Strength, Fy | 60 | ksi |
| Tensile Strength, Fu | 75 | ksi |
| Clip | N/A | in |
| Orientation Offset | 0 | ° |
| Anchor Rod Detail | d | η=0.5 |
| Clear Distance | 3 | in |
| Applied Moment, Mu | 609.8 | k |
| Bending Stress, ϕMn | 2172.9 | k |



| Original Anchor Rods | | |
|---|---|---|
| Arrangement | Radial | - |
| Quantity | 18 | - |
| Diameter, ø | 2 1/4 | in |
| Bolt Circle | 58 | in |
| Grade | A615-75 | |
| Yield Strength, Fy | 75 | ksi |
| Tensile Strength, Fu | 100 | ksi |
| Spacing | 10.1 | in |
| Orientation Offset | 10 | ° |
| Applied Force, Pu | 98.2 | k |
| Anchor Rods, ϕPn | 243.6 | k |

# Calculations for Monopole Base Plate & Anchor Rod Analysis

**Reaction Distribution**

| Reaction | Shear Vu | Moment Mu | Factor |
|---|---|---|---|
| - | k | k-ft | - |
| Base Forces | 21.2 | 1996.4 | 1.00 |
| Anchor Rod Forces | 21.2 | 1996.4 | 1.00 |
| Additional Bolt (Grp1) Forces | 0.0 | 0.0 | 0.00 |
| Additional Bolt (Grp2) Forces | 0.0 | 0.0 | 0.00 |
| Dywidag Forces | 0.0 | 0.0 | 0.00 |
| Stiffener Forces | 0.0 | 0.0 | 0.00 |

**Geometric Properties**

| Section | Gross Area | Net Area | Individual Inertia | Threads per Inch | Moment of Inertia |
|---|---|---|---|---|---|
| - | $in^2$ | $in^2$ | $in^4$ | # | $in^4$ |
| Pole | 66.4082 | 3.6893 | 0.2364 | | 19580.70 |
| Bolt | 3.9761 | 3.2477 | 0.8393 | 4.5 | 22624.93 |
| Bolt1 | 0.0000 | 0.0000 | 0.0000 | 0 | 0.00 |
| Bolt2 | 0.0000 | 0.0000 | 0.0000 | 0 | 0.00 |
| Dywidag | 0.0000 | 0.0000 | 0.0000 | | 0.00 |
| Stiffener | 0.0000 | 0.0000 | 0.0000 | | 0.00 |

| Base Plate | | |
|---|---|---|
| Shape | Round | - |
| Diameter, D | 64 | in |
| Thickness, t | 2.25 | in |
| Yield Strength, Fy | 60 | ksi |
| Tensile Strength, Fu | 75 | ksi |
| Base Plate Chord | 41.170 | in |
| Detail Type | d | - |
| Detail Factor | 0.50 | - |
| Clear Distance | 3 | - |

| Anchor Rods | | |
|---|---|---|
| Anchor Rod Quantity, N | 18 | - |
| Rod Diameter, d | 2.25 | in |
| Bolt Circle, BC | 58 | in |
| Yield Strength, Fy | 75 | ksi |
| Tensile Strength, Fu | 100 | ksi |
| Applied Axial, Pu | 98.2 | k |
| Applied Shear, Vu | 0.3 | k |
| Compressive Capacity, ϕPn | 243.6 | k |
| Tensile Capacity, ϕRnt | 0.403 | OK |
| Interaction Capacity | 0.406 | OK |

| External Base Plate | | |
|---|---|---|
| Chord Length AA | 35.313 | in |
| Additional AA | 4.500 | in |
| Section Modulus, Z | 50.388 | $in^3$ |
| Applied Moment, Mu | 609.8 | k-ft |
| Bending Capacity, ϕMn | 2720.9 | k-ft |
| Capacity, Mu/ϕMn | 0.224 | OK |
| | | |
| Chord Length AB | 34.234 | in |
| Additional AB | 4.500 | in |
| Section Modulus, Z | 49.022 | $in^3$ |
| Applied Moment, Mu | 502.6 | k-ft |
| Bending Capacity, ϕMn | 2647.2 | k-ft |
| Capacity, Mu/ϕMn | 0.190 | OK |
| | | |
| Bend Line Length | 31.794 | in |
| Additional Bend Line | 0.000 | in |
| Section Modulus, Z | 40.239 | $in^3$ |
| Applied Moment, Mu | 609.8 | k-ft |
| Bending Capacity, ϕMn | 2172.9 | k-ft |
| Capacity, Mu/ϕMn | 0.281 | OK |

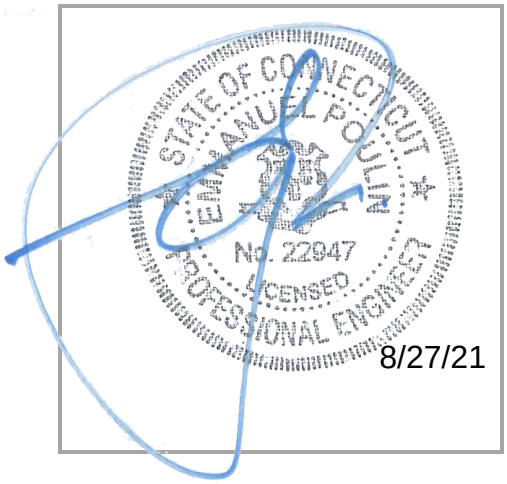
| Internal Base Plate | | |
|---|---|---|
| Arc Length | 0.000 | in |
| Section Modulus, Z | 0.000 | $in^3$ |
| Moment Arm | 0.000 | in |
| Applied Moment, Mu | 0.0 | k-ft |
| Bending Capacity, ϕMn | 0.0 | k-ft |
| Capacity, Mu/ϕMn | | |

# MOUNT ANALYSIS REPORT

August 27, 2021

| | |
|---|---|
| Dish Wireless Site Name | BOBDL00026A |
| Dish Wireless Site Number | BOBDL00026A |
| ATC Site Name | CT Collinsville CAC 802816 CT, CT |
| ATC Site Number | 411259 |
| Infinigy Job Number | 1197-F0001-B |
| Client | ATC |
| Carrier | Dish Wireless |
| Site Location | 650 Albany Turnpike<br>Canton, CT 06019<br>Hartford County<br>41.850564 N NAD83<br>72.948725 W NAD83 |
| Mount Type | 8.0 ft Platform |
| Mount Elevation | 89.0 ft AGL |
| Structural Usage Ratio | **42.0** |
| **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 120 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 Platform 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 | 120 mph (3-Second Gust) |
| Wind Speed w/ ice | 50 mph (3-Second Gust) w/ 2.0" 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 | $S_s$ = 0.180 g / $S_1$ = 0.065 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 - 89.0 ft. AGL Platform

| Antenna Centerline (ft) | Qty. | Appurtenance Manufacturers | Appurtenance Models |
|---|---|---|---|
| 89.0 | 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-411259 Rev 1, Site #BOBDL00021A, dated June 14, 2021 |
| Mount Manufacturer Drawings | Commscope Document # MC-PK8-DSH, dated March 08, 2021 |
| Structural Analysis Report | ATC, Asset #411259, dated July 26 2021 |

## 5. RESULTS

| Components | Capacity | Pass/Fail |
|---|---|---|
| Mount Pipes | 16.5% | Pass |
| Horizontals | 10.2% | Pass |
| Standoffs | 32.5% | Pass |
| Handrails | 19.6% | Pass |
| Connections | 42.0% | Pass |
| **MOUNT RATING =** | **42.0 %** | **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 89.0 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

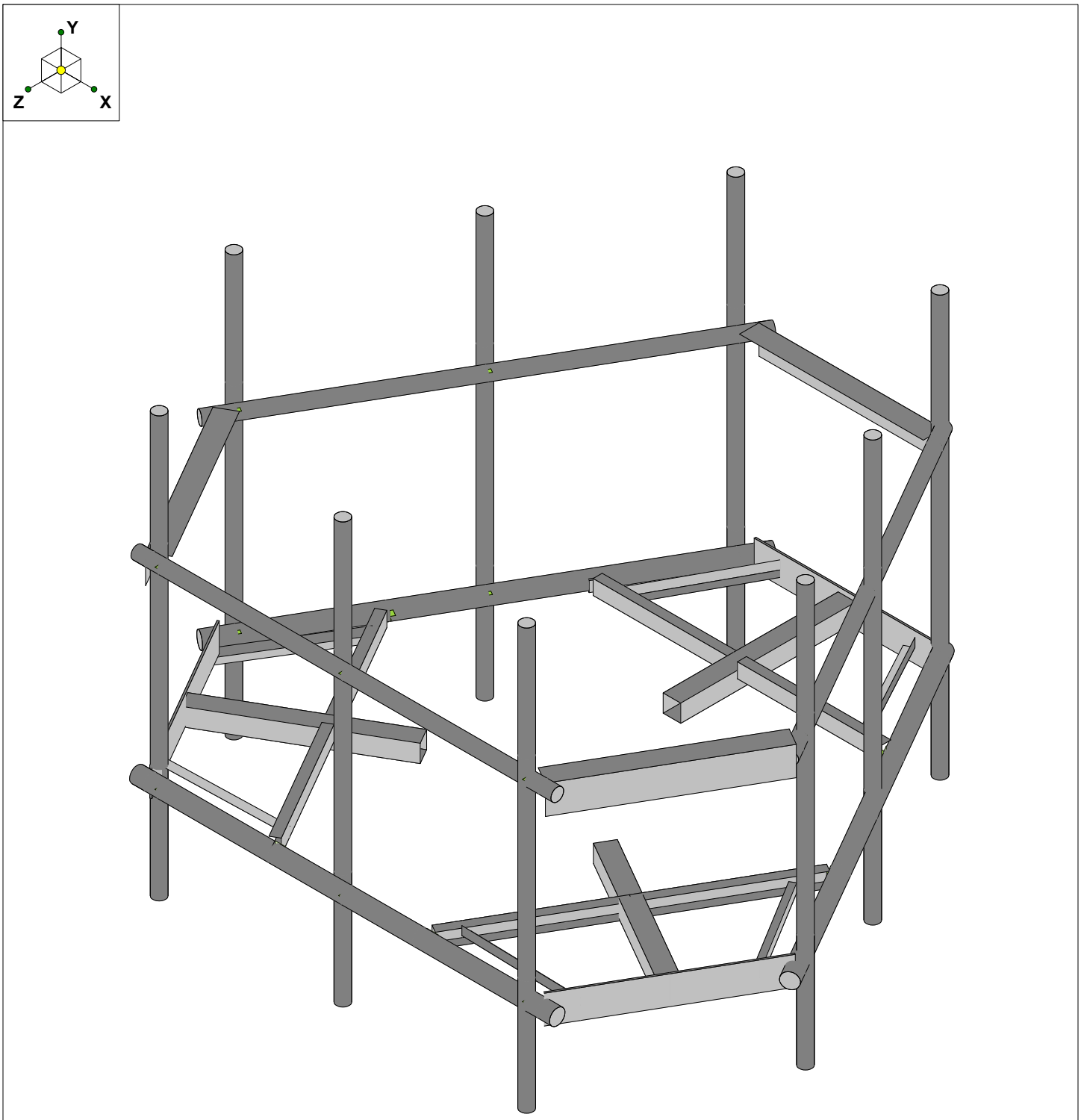
| |
|---|
| The antenna mounting system was properly fabricated, installed and maintained in accordance with its original design and manufacturer's specifications. |
| The configuration of antennas, mounts, and other appurtenances are as specified in the proposed loading configuration table. |
| All 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:<br>Channel, Solid Round, Plate, Built-up Angle — ASTM A1011 36 KSI<br>Structural Angle — ASTM A529 Gr. 50<br>HSS (Rectangular) — ASTM A500-B GR 46<br>HSS (Circular) — ASTM A500-B GR 42<br>Pipe — ASTM A500 Gr C<br>Connection Bolts — ASTM A325<br>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.

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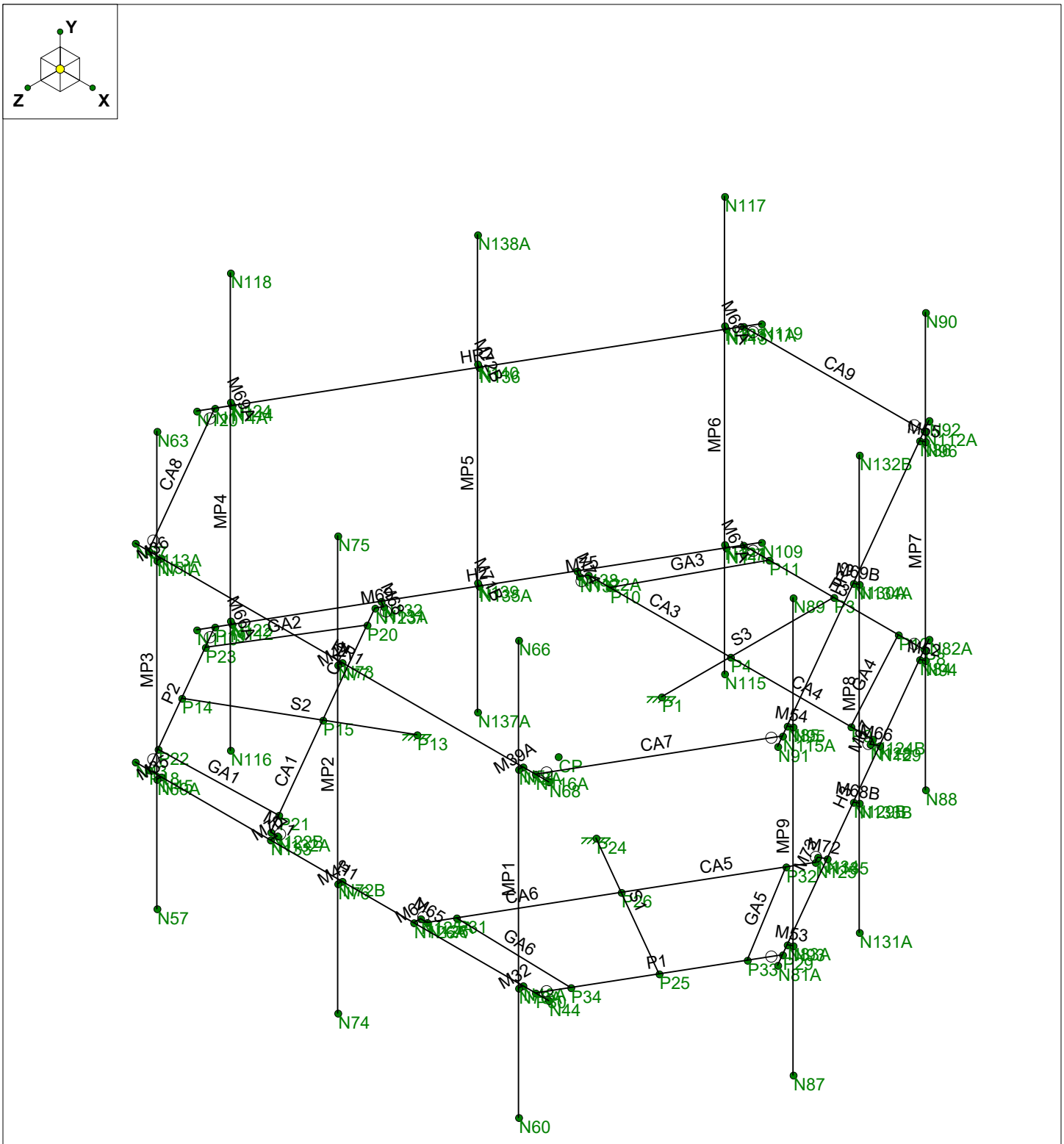


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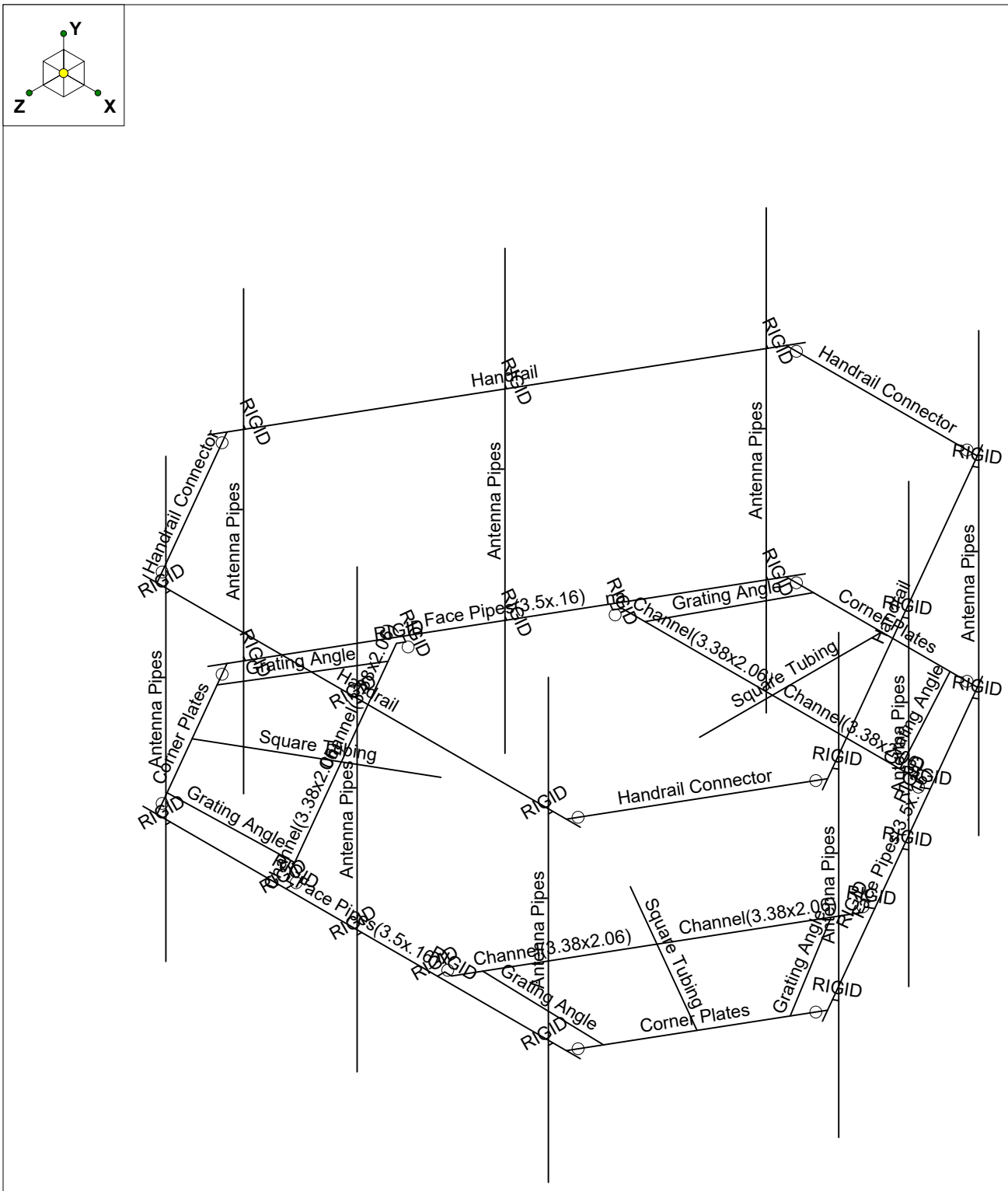


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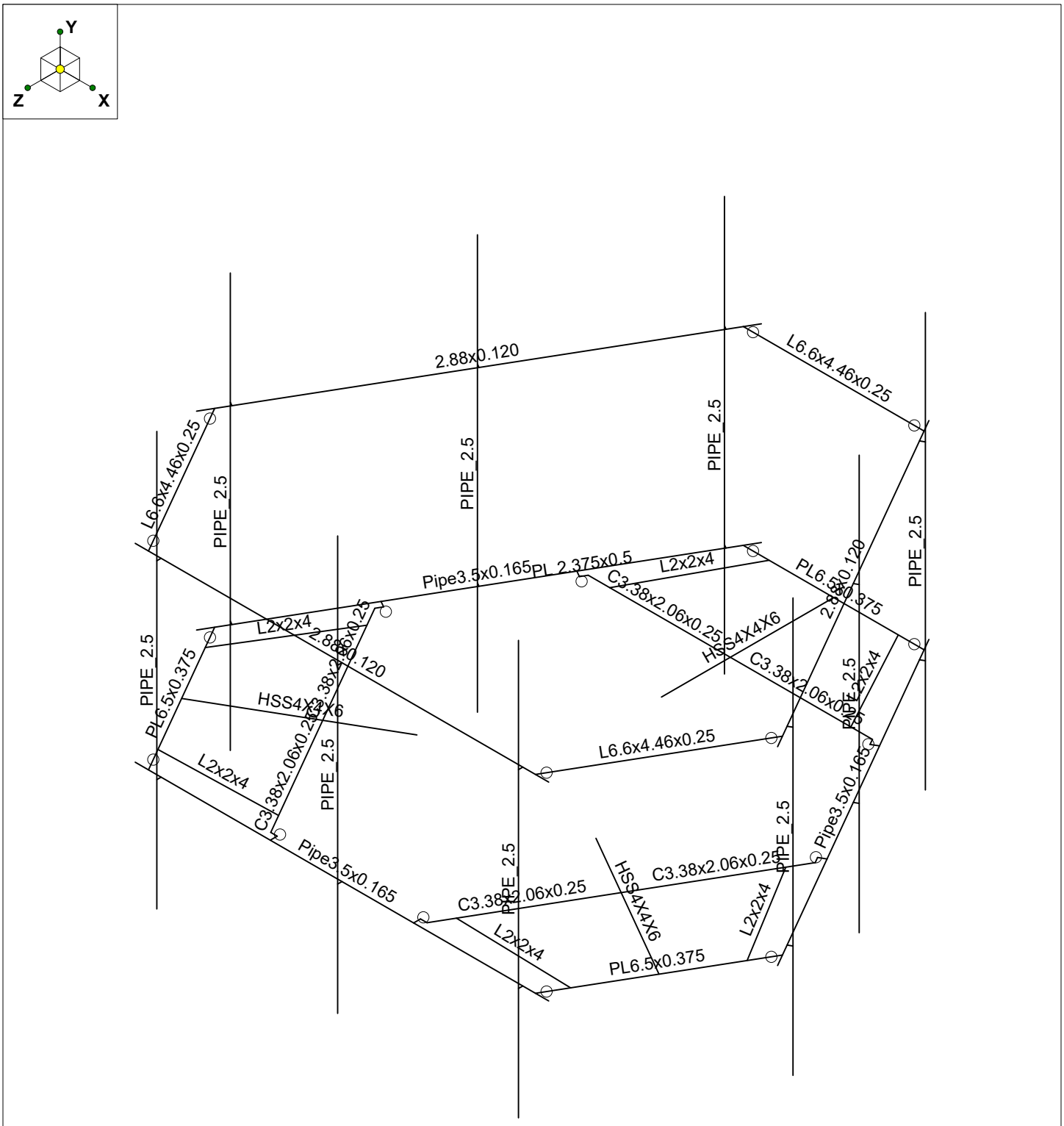


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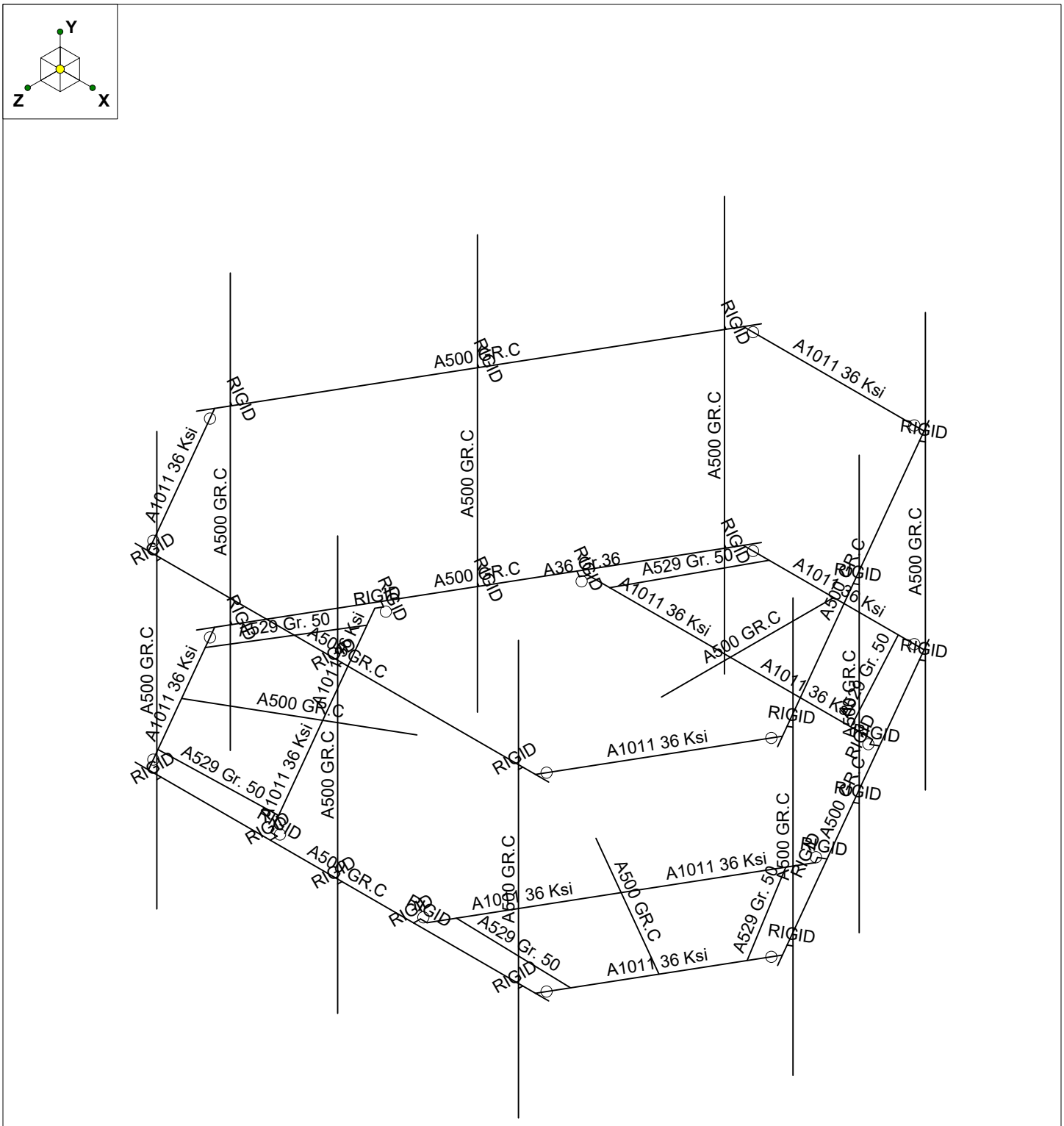


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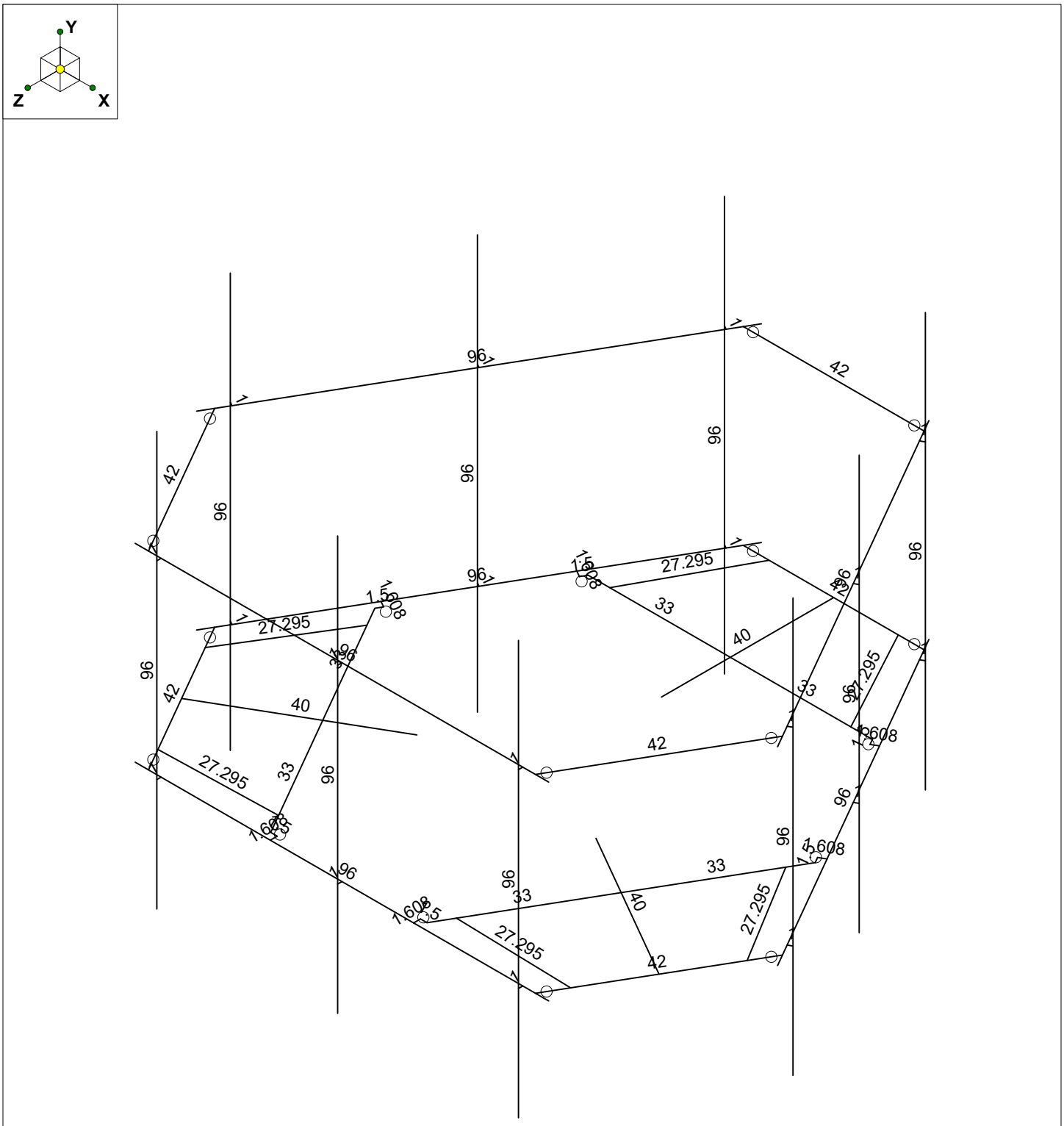


Member Length (in) Displayed
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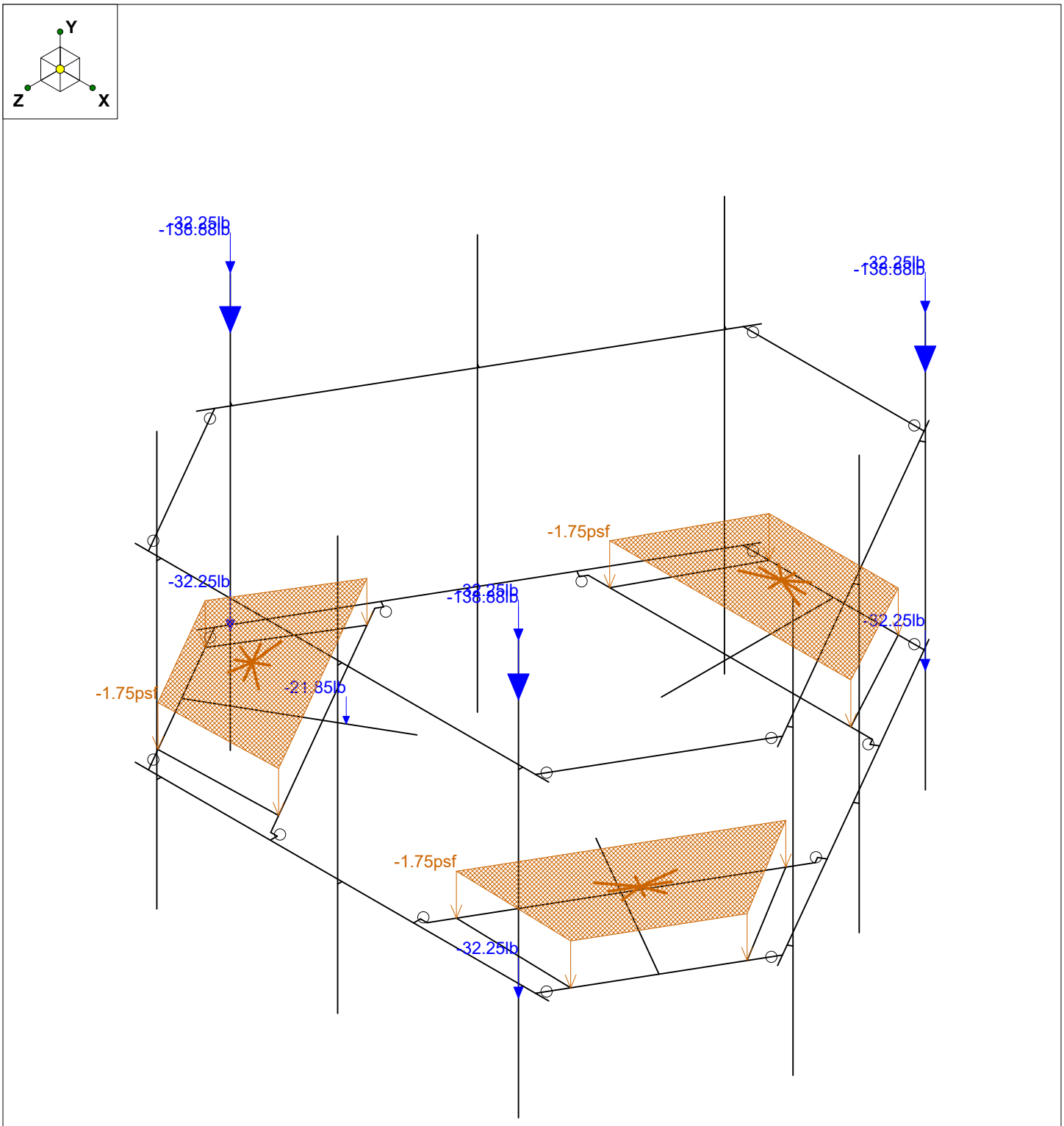


Loads: BLC 1, Self Weight
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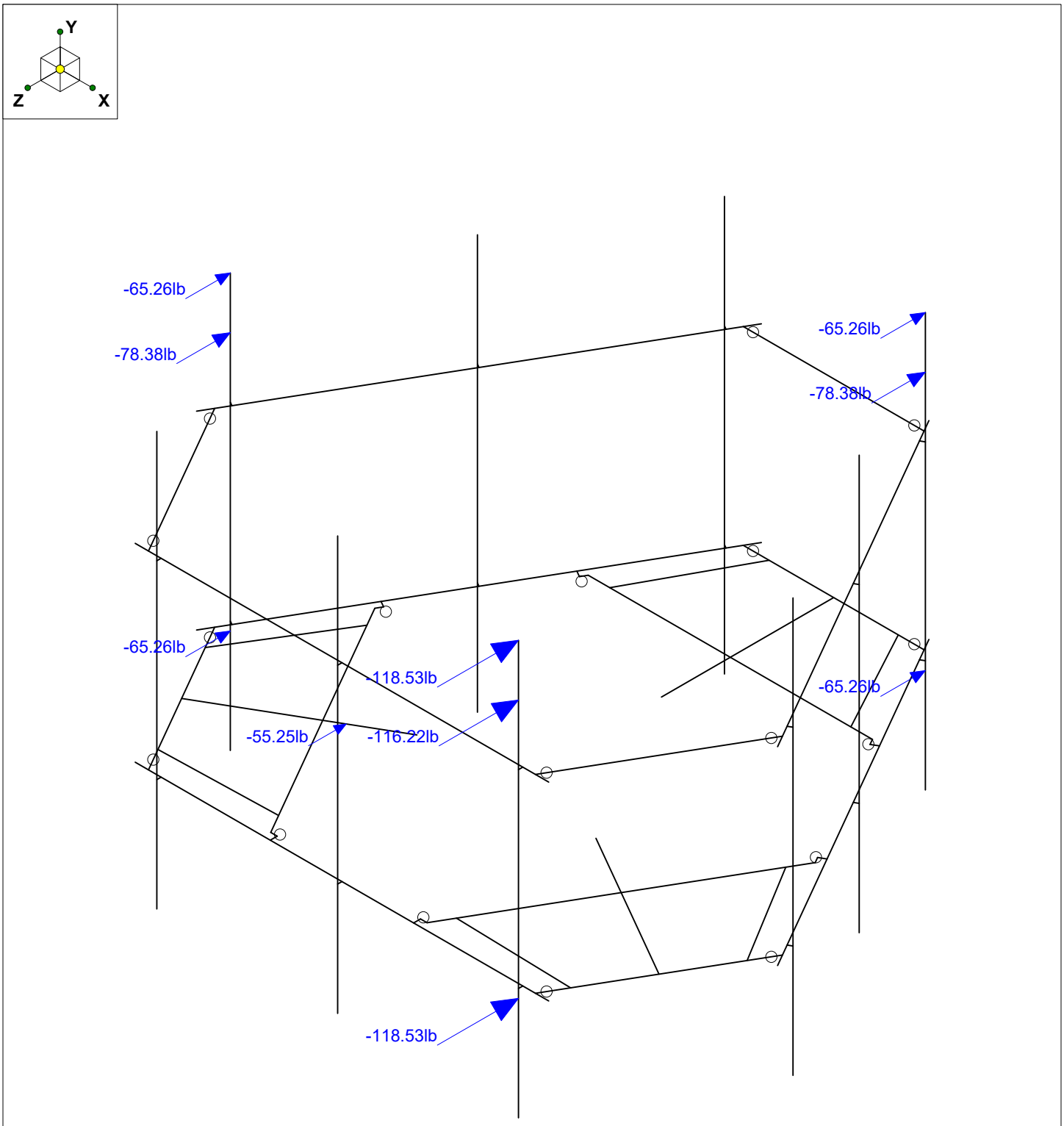


Loads: BLC 2, Wind Load AZI 0
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| | | |
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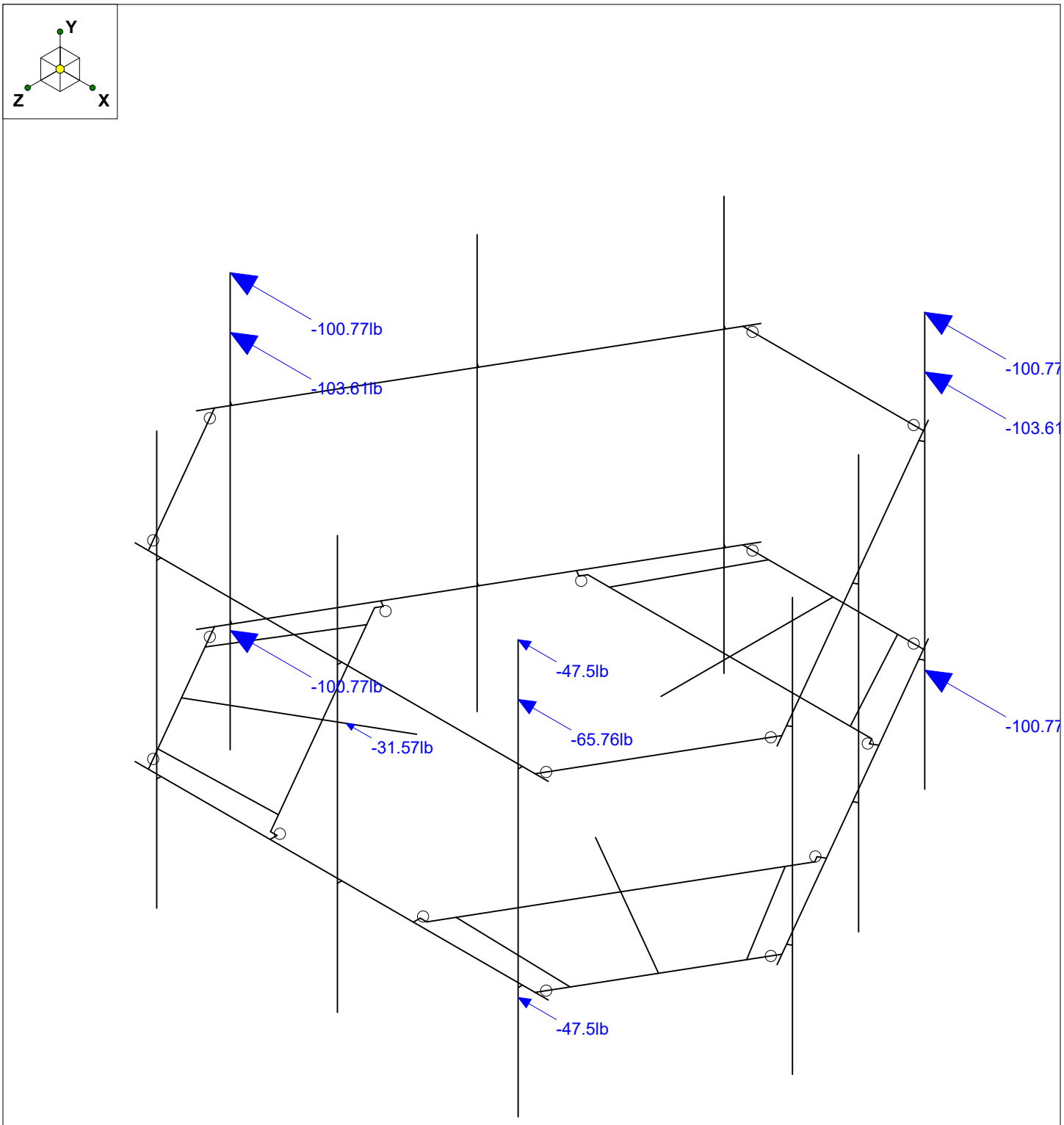


Loads: BLC 5, Wind Load AZI 90
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|---|---|---|
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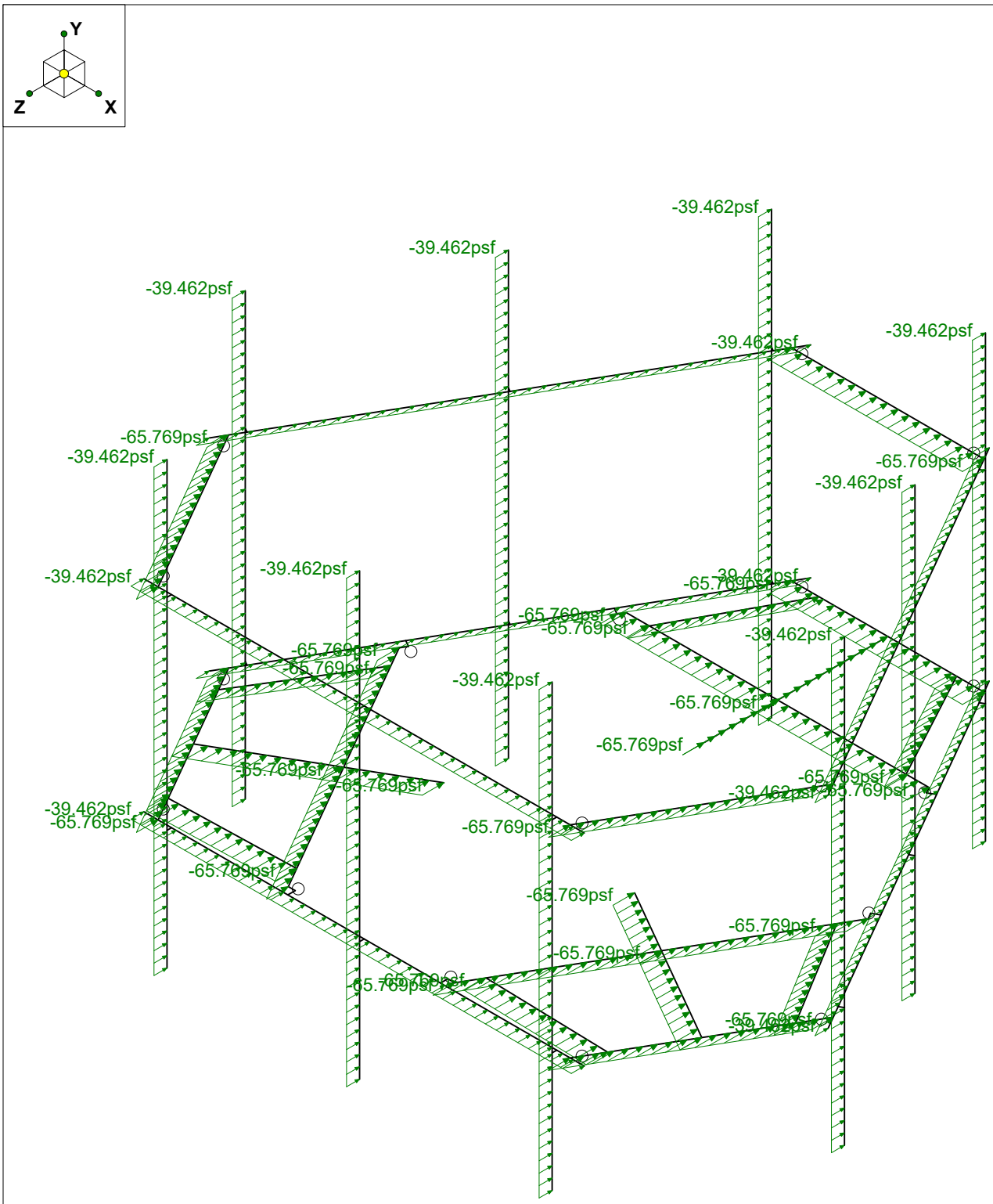
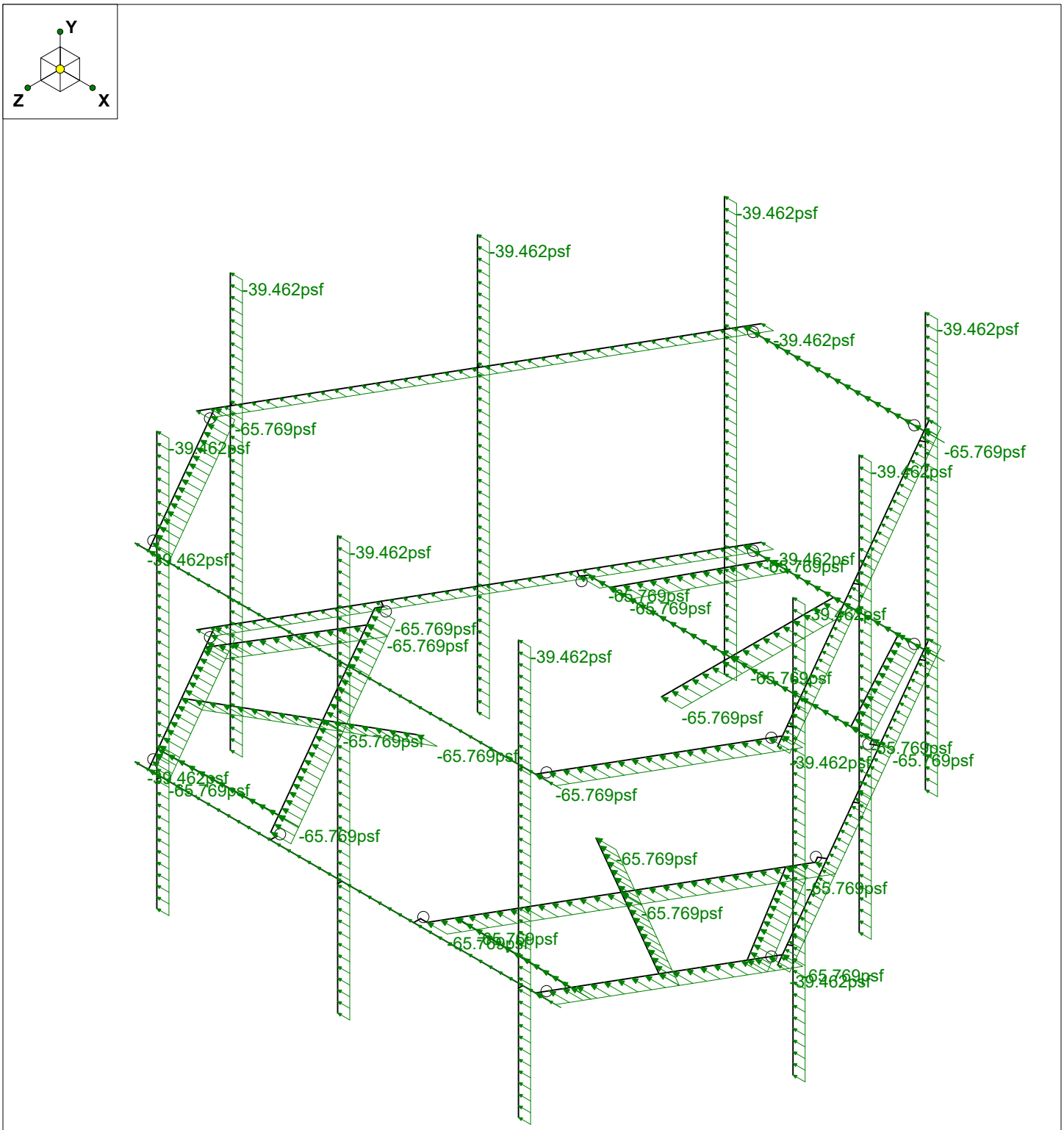


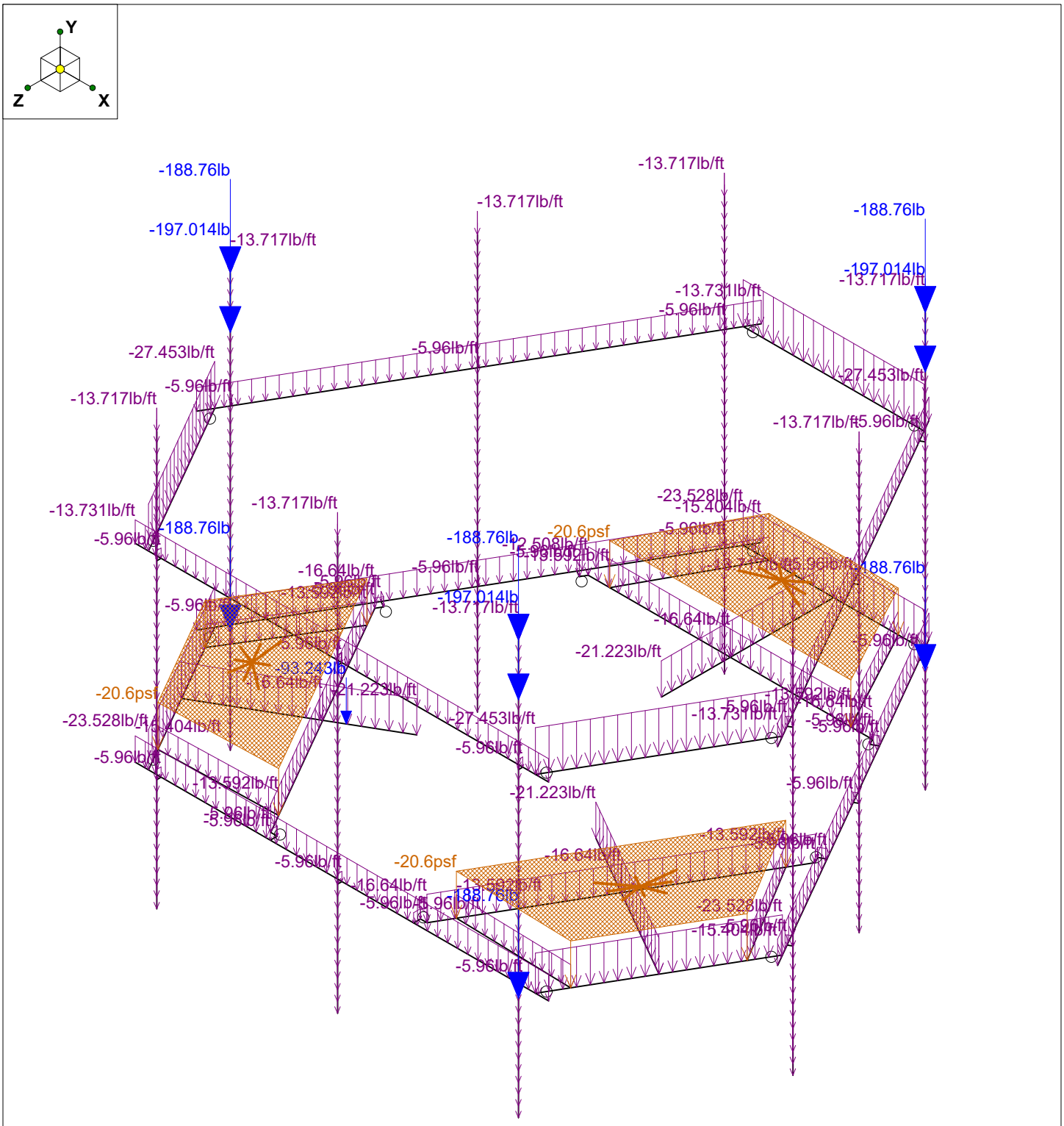

Loads: BLC 14, Distr. Wind Load Z
Envelope Only Solution

| | | |
|---|---|---|
| Infinigy Engineering, PLLC | BOBDL00026A | Distr Wind Load AZI 000 |
| PSM | | Aug 27, 2021 at 1:37 PM |
| 1197-F0001-B | | BOBDL00026A_loaded.r3d |



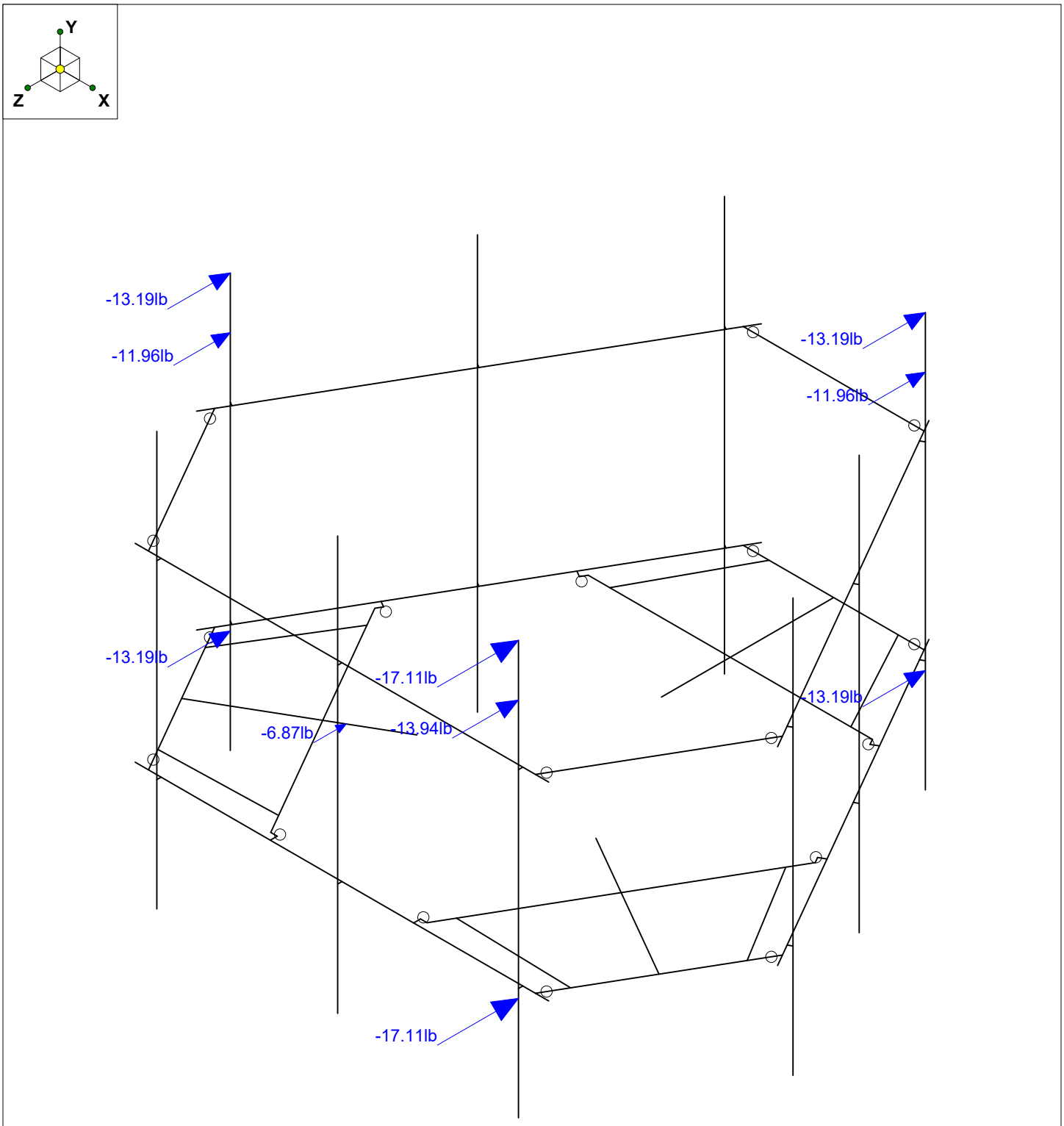

Loads: BLC 15, Distr. Wind Load X
Envelope Only Solution

| | | |
|---|---|---|
| Infinigy Engineering, PLLC | BOBDL00026A | Distr Wind Load AZI 090 |
| PSM | | Aug 27, 2021 at 1:37 PM |
| 1197-F0001-B | | BOBDL00026A_loaded.r3d |



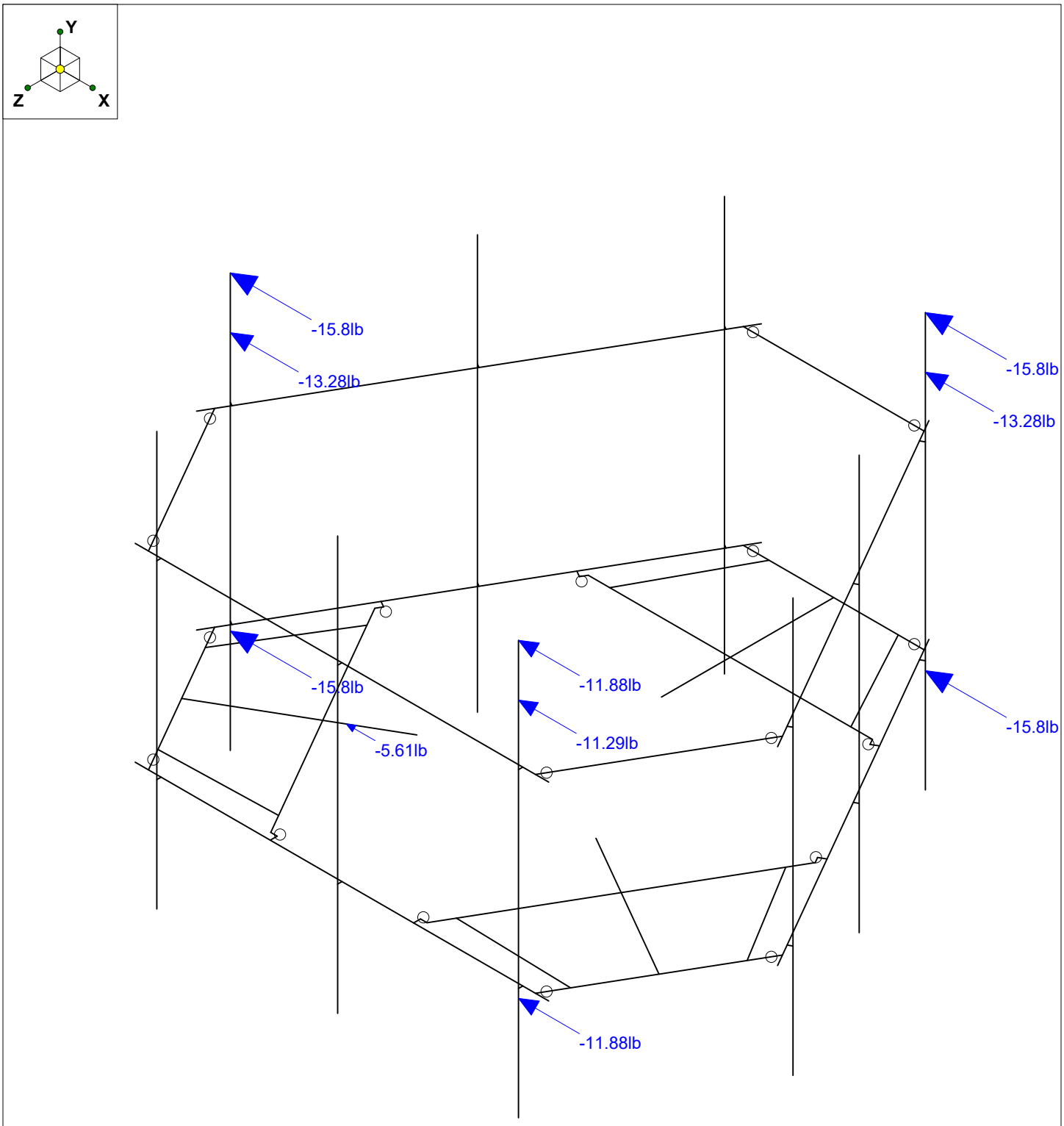

Loads: BLC 16, Ice Weight
Envelope Only Solution

| | | |
|---|---|---|
| Infinigy Engineering, PLLC | BOBDL00026A | Ice Weight |
| PSM | | Aug 27, 2021 at 1:37 PM |
| 1197-F0001-B | | BOBDL00026A_loaded.r3d |



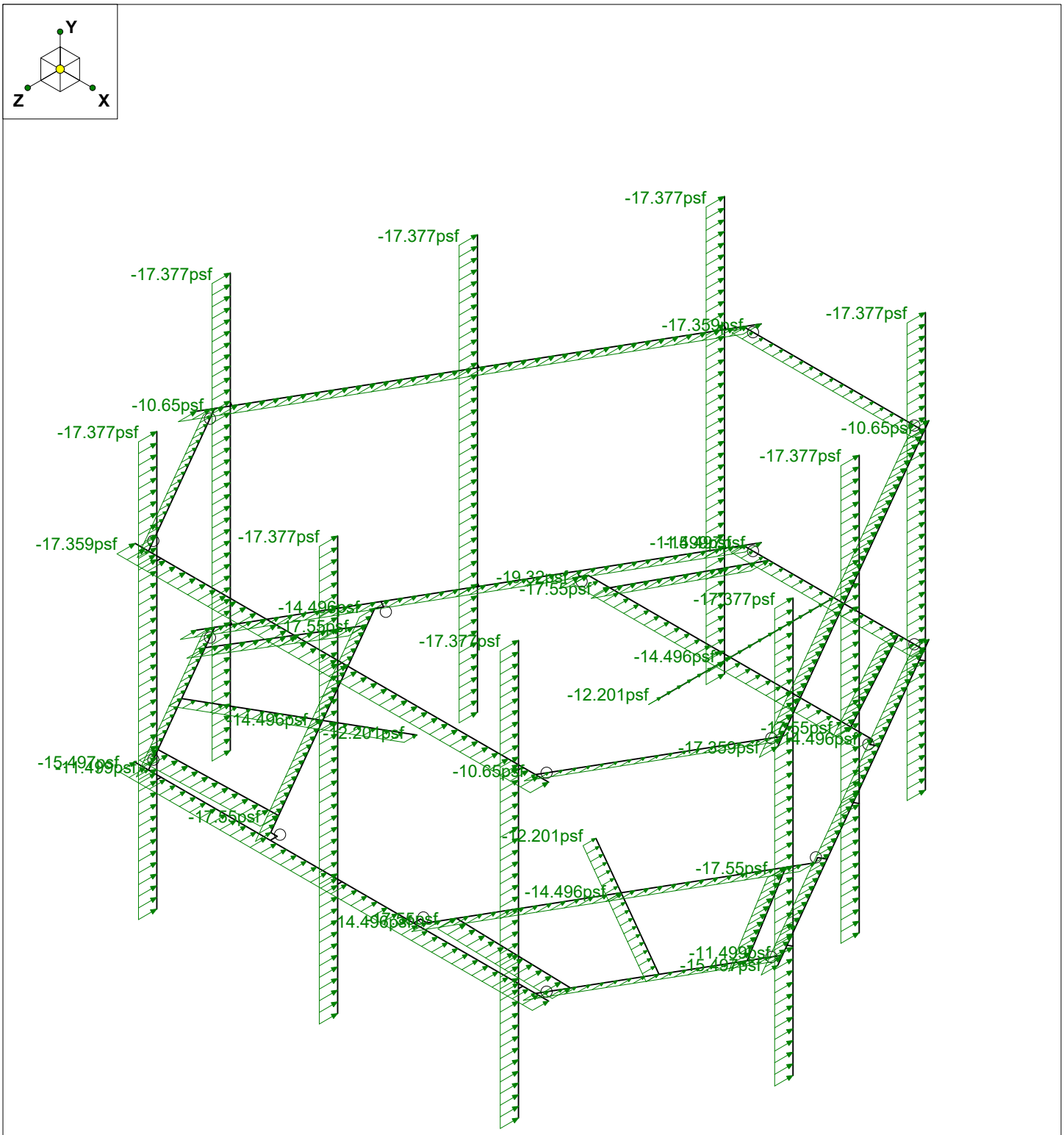

Loads: BLC 17, Ice Wind Load AZI 0
Envelope Only Solution

| | | |
|---|---|---|
| Infinigy Engineering, PLLC | BOBDL00026A | Ice + Wind Load AZI 000 |
| PSM | | Aug 27, 2021 at 1:38 PM |
| 1197-F0001-B | | BOBDL00026A_loaded.r3d |



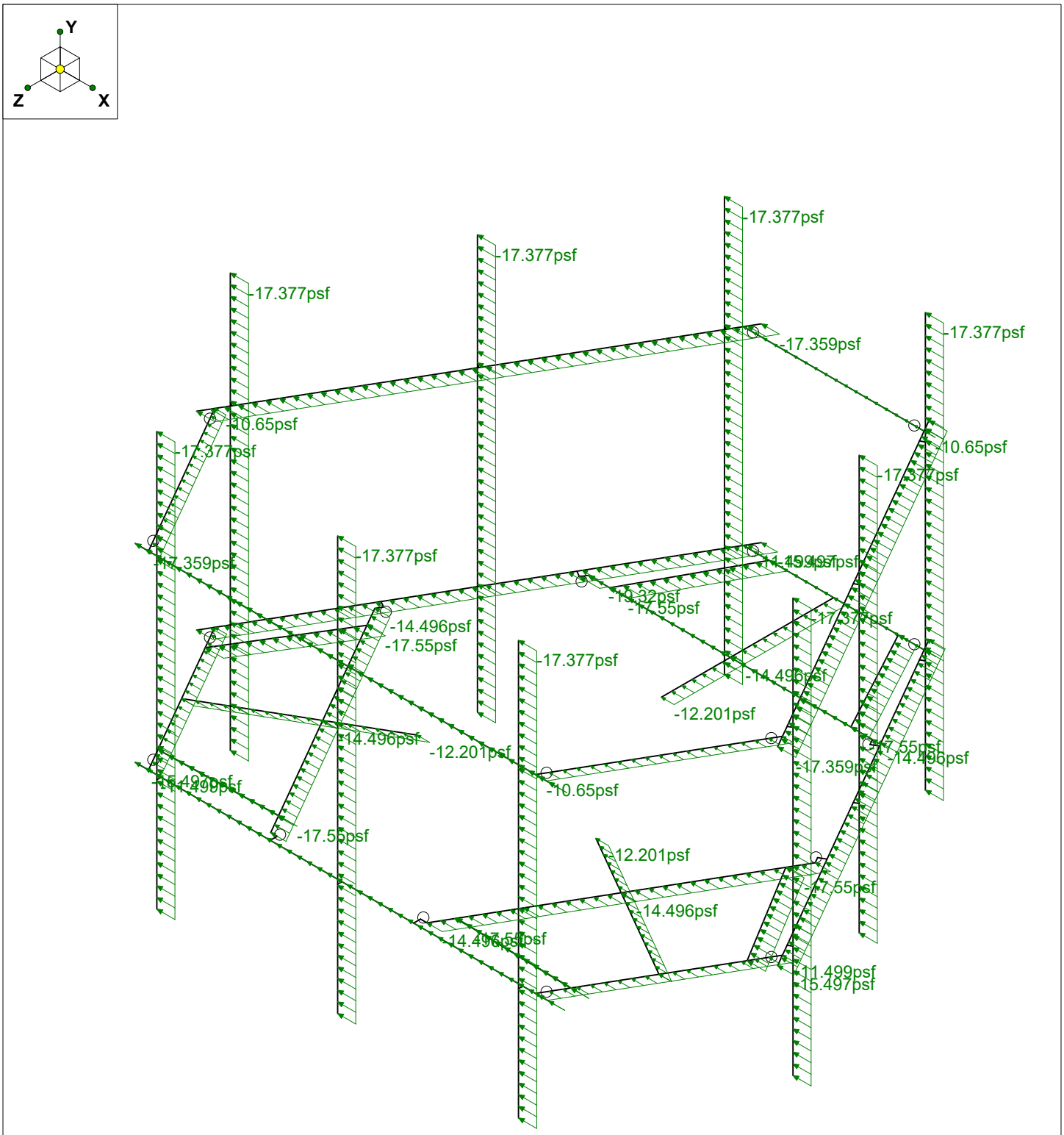

Loads: BLC 20, Ice Wind Load AZI 90
Envelope Only Solution

| | | |
|---|---|---|
| Infinigy Engineering, PLLC | BOBDL00026A | Ice + Wind Load AZI 090 |
| PSM | | Aug 27, 2021 at 1:38 PM |
| 1197-F0001-B | | BOBDL00026A_loaded.r3d |



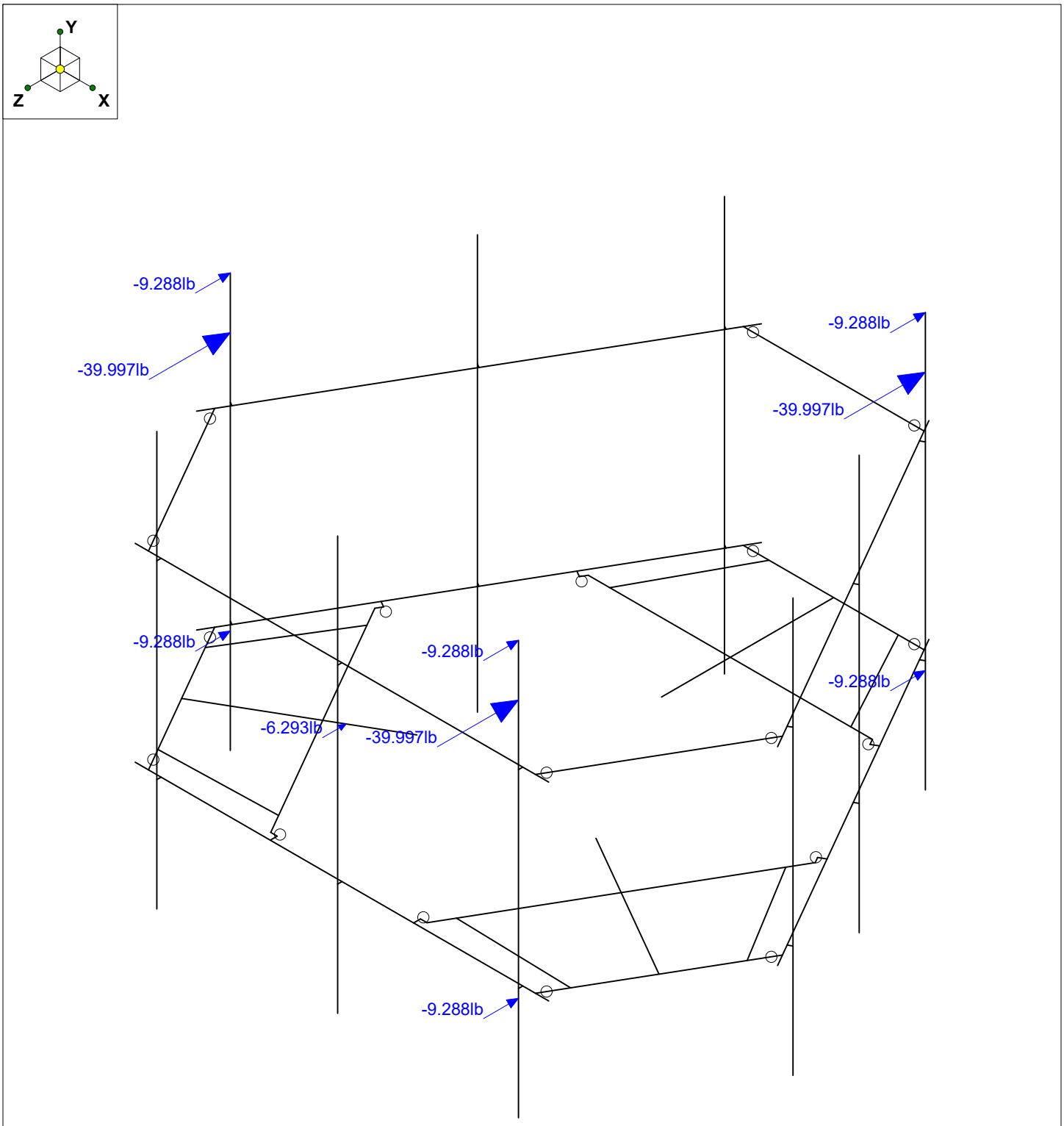

Loads: BLC 29, Distr. Ice Wind Load Z
Envelope Only Solution

| | | |
|---|---|---|
| Infinigy Engineering, PLLC | BOBDL00026A | Distr Ice + Wind Load AZI 000 |
| PSM | | Aug 27, 2021 at 1:38 PM |
| 1197-F0001-B | | BOBDL00026A_loaded.r3d |



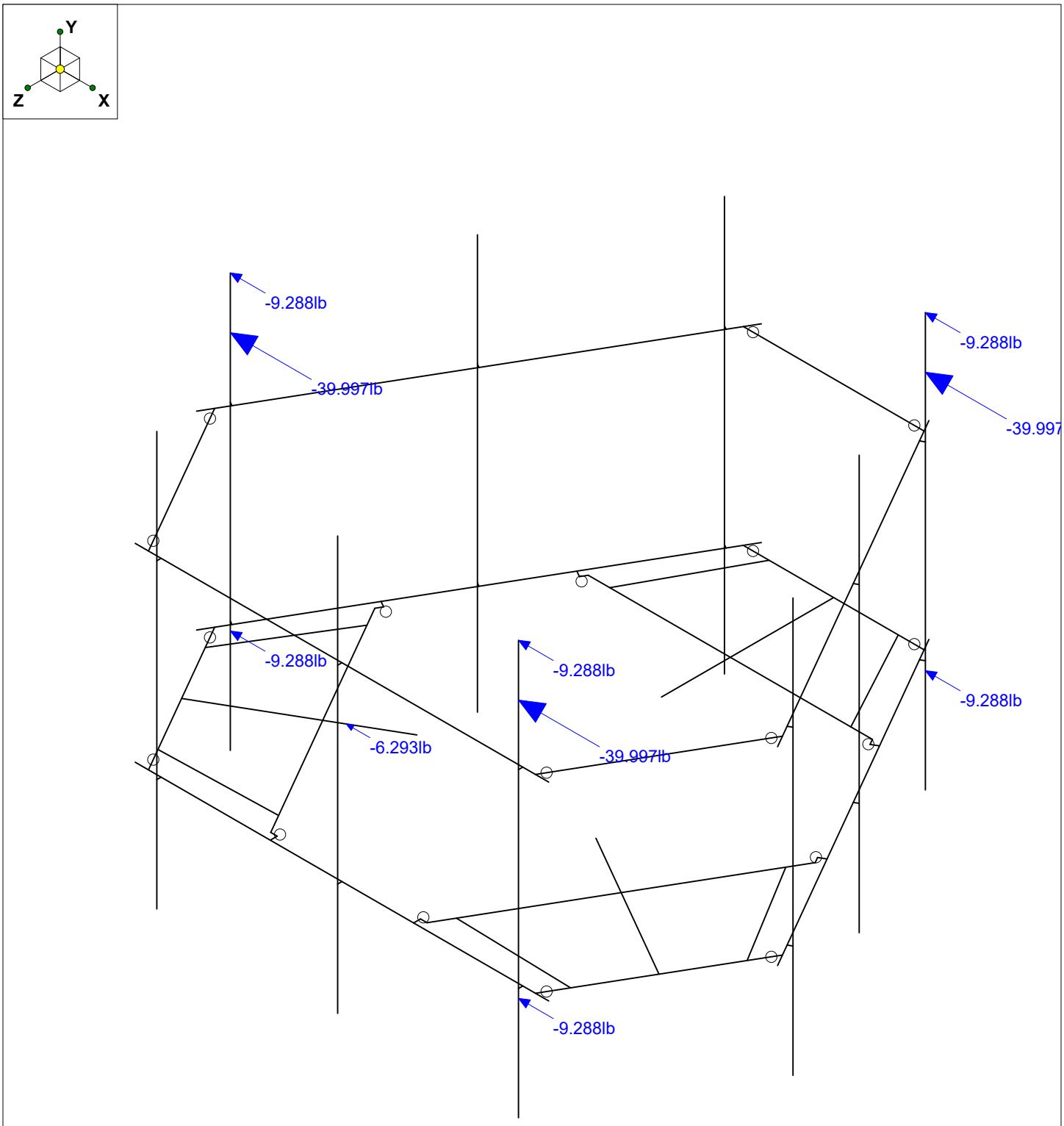

Loads: BLC 30, Distr. Ice Wind Load X
Envelope Only Solution

| | | |
|---|---|---|
| Infinigy Engineering, PLLC | BOBDL00026A | Distr Ice + Wind Load AZI 090 |
| PSM | | Aug 27, 2021 at 1:38 PM |
| 1197-F0001-B | | BOBDL00026A_loaded.r3d |



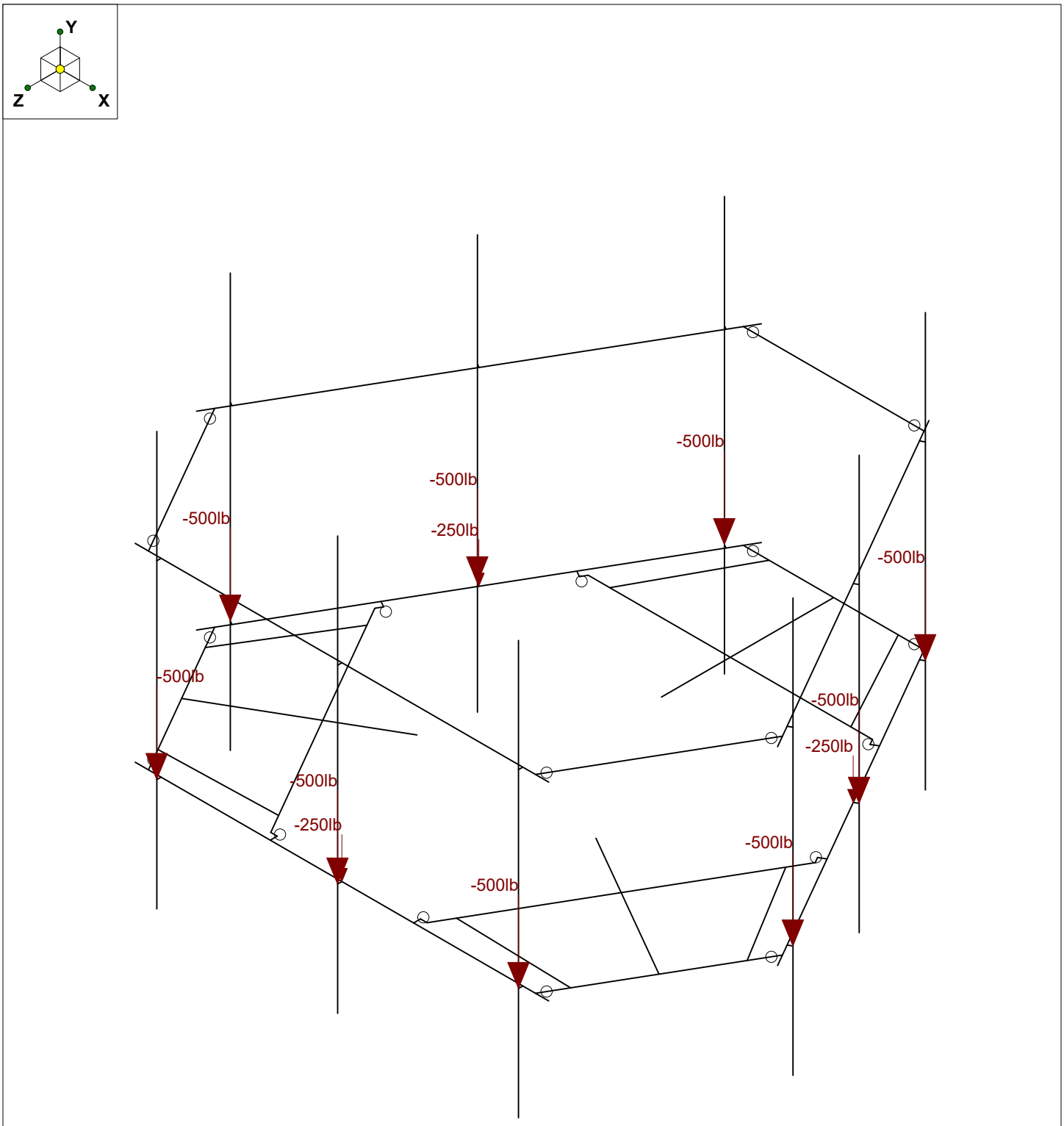

Loads: BLC 31, Seismic Load Z
Envelope Only Solution

| | | |
|---|---|---|
| Infinigy Engineering, PLLC | BOBDL00026A | Seismic Load AZI 000 |
| PSM | | Aug 27, 2021 at 1:39 PM |
| 1197-F0001-B | | BOBDL00026A_loaded.r3d |



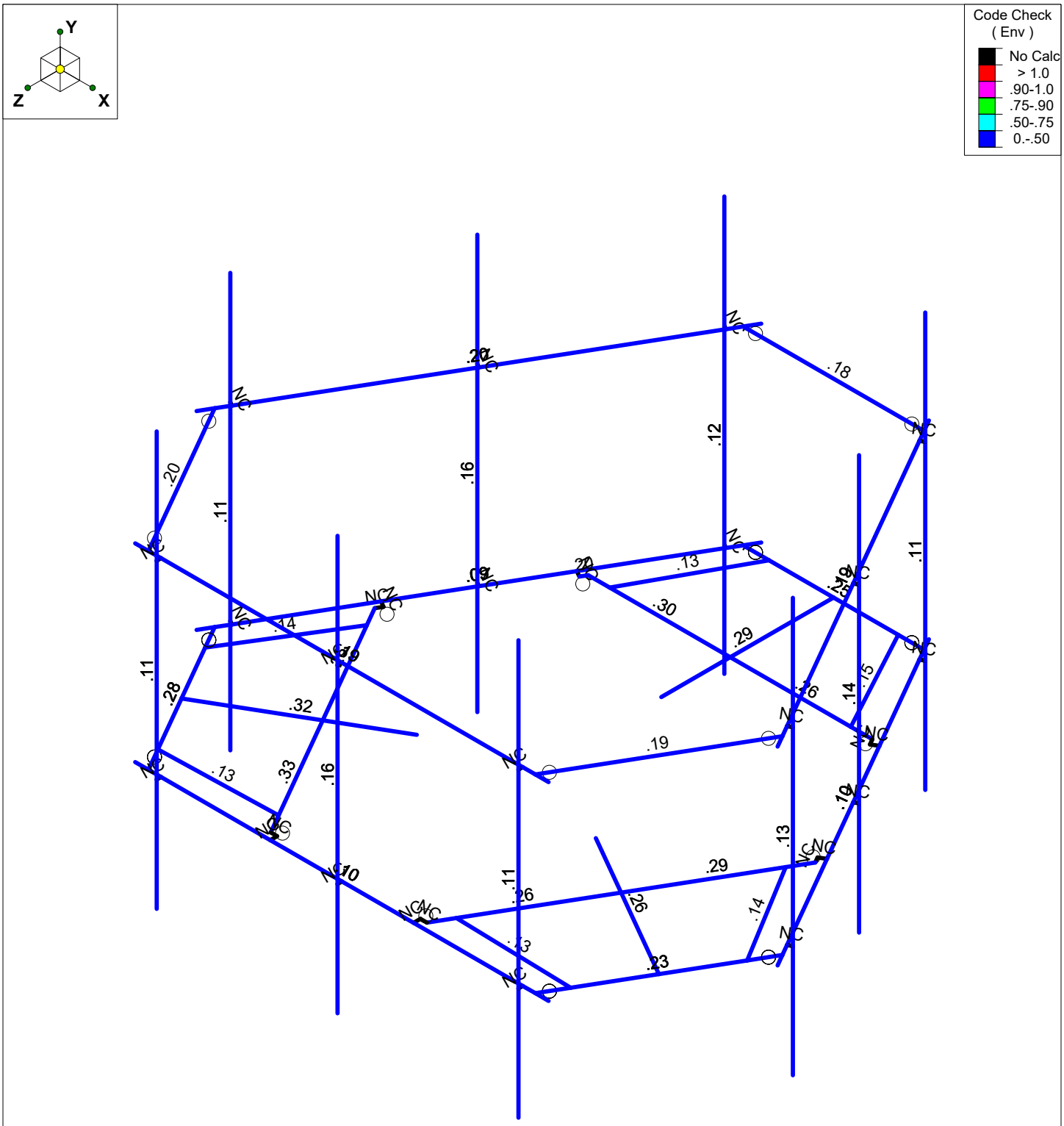

Loads: BLC 32, Seismic Load X
Envelope Only Solution

| | | |
|---|---|---|
| Infinigy Engineering, PLLC | BOBDL00026A | Seismic Load AZI 090 |
| PSM | | Aug 27, 2021 at 1:39 PM |
| 1197-F0001-B | | BOBDL00026A_loaded.r3d |



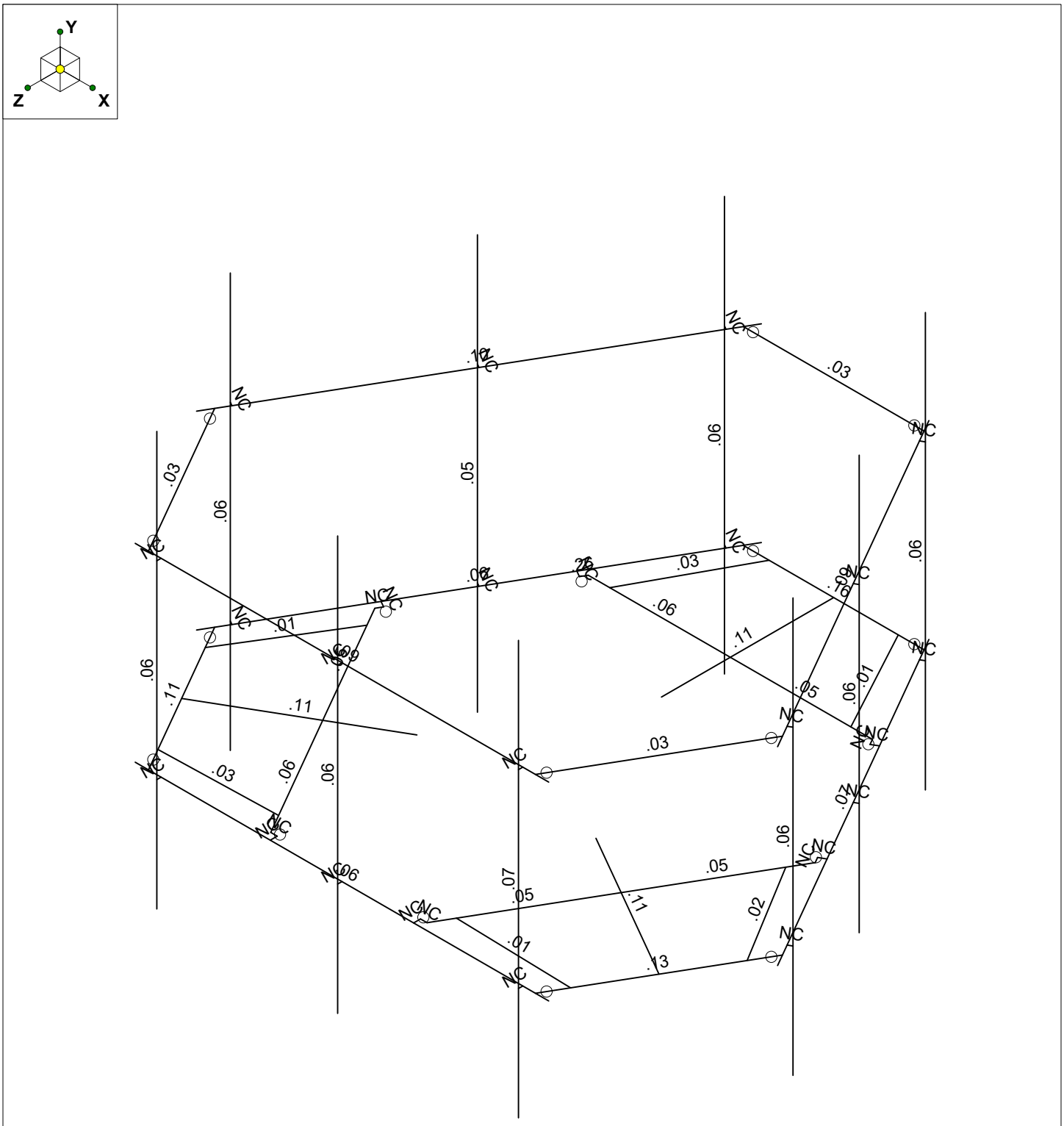

Loads: LL - Live Load
Envelope Only Solution

| | | |
|---|---|---|
| Infinigy Engineering, PLLC | BOBDL00026A | Non-concurrent Live Loads |
| PSM | | Aug 27, 2021 at 1:39 PM |
| 1197-F0001-B | | BOBDL00026A_loaded.r3d |




Member Code Checks Displayed (Enveloped)
Envelope Only Solution

| | | |
|---|---|---|
| Infinigy Engineering, PLLC | BOBDL00026A | Bending Check |
| PSM | | Aug 27, 2021 at 1:39 PM |
| 1197-F0001-B | | BOBDL00026A_loaded.r3d |




Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

| | | |
|---|---|---|
| Infinigy Engineering, PLLC | BOBDL00026A | Shear Check |
| PSM | | Aug 27, 2021 at 1:40 PM |
| 1197-F0001-B | | BOBDL00026A_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: | 491.78 | ft *Rev H |

| MOUNT INFORMATION | | |
|---|---|---|
| Mount Type: | Platform | |
| Num Sectors: | 3 | |
| Centerline AGL: | 89.00 | ft |
| Tower Height AGL: | 120.00 | 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 ($K_e$): | 0.982 | *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 ($V_{ult}$): | 120 | mph |
| Design Wind (V): | N/A | mph |
| Ice Wind ($V_{ice}$): | 50 | mph |
| Base Ice Thickness ($t_i$): | 2 | in |
| Flat Pressure: | 65.769 | psf |
| Round Pressure: | 39.462 | psf |
| Ice Wind Pressure: | 6.851 | psf |

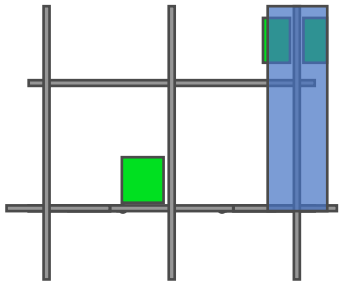
| SEISMIC DATA | | |
|---|---|---|
| Short-Period Accel. ($S_s$): | 0.180 | g |
| 1-Second Accel. ($S_1$): | 0.065 | g |
| Short-Period Design ($S_{DS}$): | 0.192 | |
| 1-Second Design ($S_{D1}$): | 0.104 | |
| Short-Period Coeff. ($F_a$): | 1.600 | |
| 1-Second Coeff. ($F_v$): | 2.400 | |
| Amplification Factor ($A_s$): | 3.000 | |
| Response Mod. Coeff. (R): | 2.000 | |

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

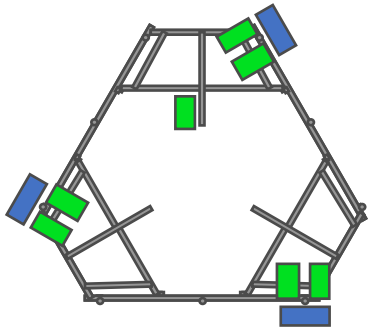
Infinigy Load Calculator V2.1.7

# Program Inputs

**ELEVATION VIEW**




**PLAN VIEW**



INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

Infinigy Load Calculator V2.1.7

**APPURTENANCE INFORMATION**

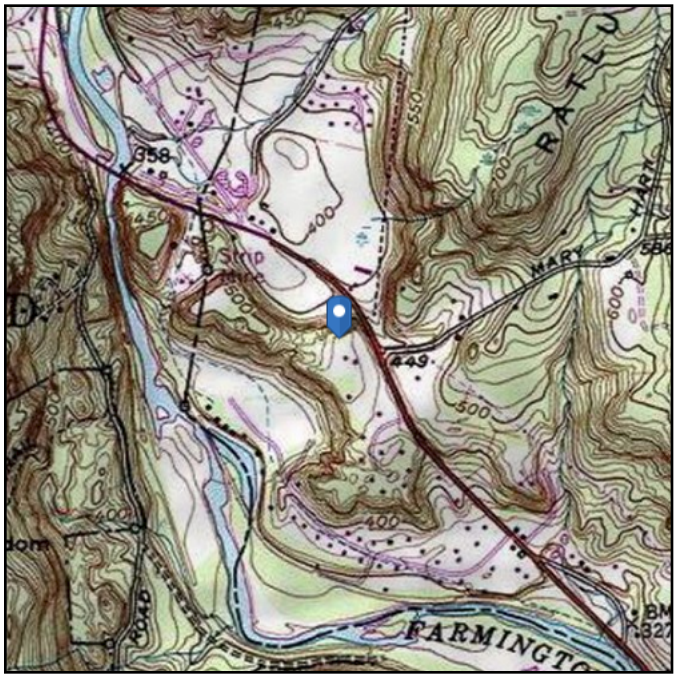
| Appurtenance Name | Elevation | Qty. | $K_a$ | $q_z$ (psf) | $EPA_N$ ($ft^2$) | $EPA_T$ ($ft^2$) | Wind $F_z$ (lbs) | Wind $F_x$ (lbs) | Weight (lbs) | Seismic F (lbs) | Member (α sector) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JMA WIRELESS MX08FRO665-21 | 89.0 | 3 | 0.90 | 32.88 | 8.01 | 3.21 | 237.07 | 95.00 | 64.50 | 18.58 | MP1 |
| FUJITSU TA08025-B605 | 89.0 | 3 | 0.90 | 32.88 | 1.96 | 1.19 | 58.11 | 35.19 | 74.95 | 21.59 | MP1 |
| FUJITSU TA08025-B604 | 89.0 | 3 | 0.90 | 32.88 | 1.96 | 1.03 | 58.11 | 30.57 | 63.93 | 18.41 | MP1 |
| RAYCAP RDIDC-9181-PF-48 | 89.0 | 1 | 0.90 | 32.88 | 1.87 | 1.07 | 55.25 | 31.57 | 21.85 | 6.29 | S2 |

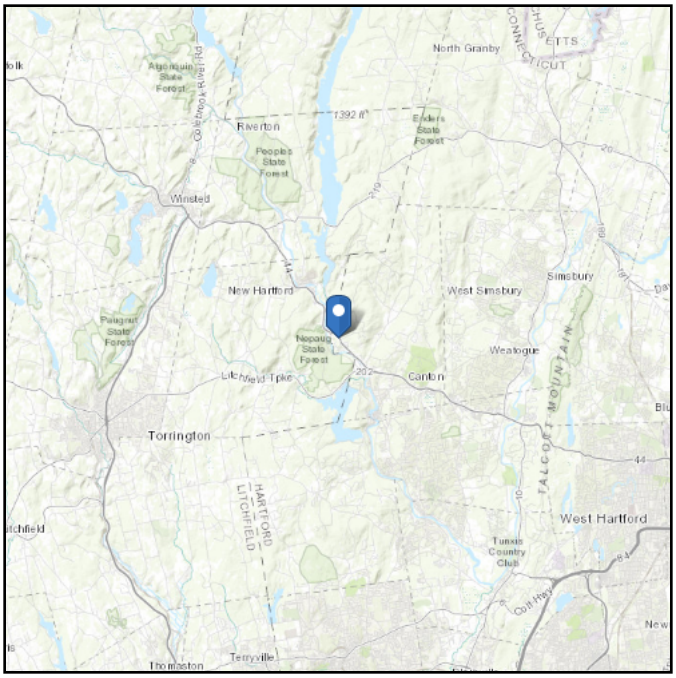
# ASCE 7 Hazards Report

**Address:**
No Address at This Location

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

**Elevation:** 491.78 ft (NAVD 88)
**Latitude:** 41.850564
**Longitude:** -72.948725




## Wind

**Results:**

| | |
|---|---|
| Wind Speed: | 120 mph per Canton City Requirements in WSEL |
| 10-year MRI | 76 Vmph |
| 25-year MRI | 85 Vmph |
| 50-year MRI | 90 Vmph |
| 100-year MRI | 97 Vmph |

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

Date Accessed: Fri Aug 27 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.

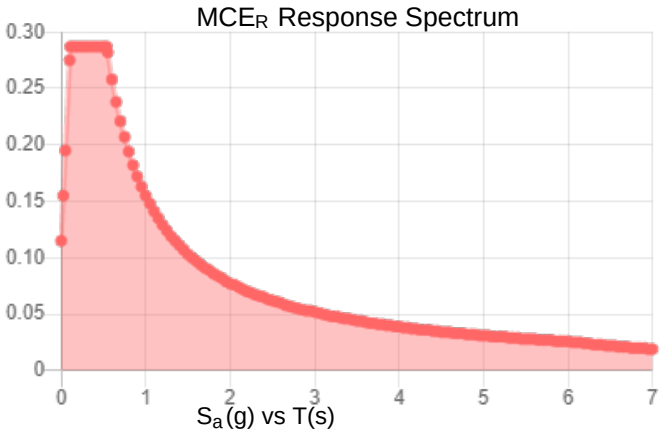
# Seismic

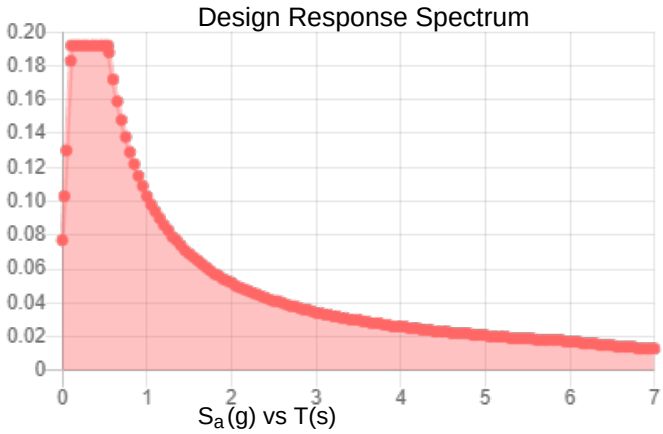
**Site Soil Class:** D - Stiff Soil

**Results:**

| | | | |
|---|---|---|---|
| $S_S$ : | 0.18 | $S_{DS}$ : | 0.192 |
| $S_1$ : | 0.065 | $S_{D1}$ : | 0.103 |
| $F_a$ : | 1.6 | $T_L$ : | 6 |
| $F_v$ : | 2.4 | PGA : | 0.09 |
| $S_{MS}$ : | 0.287 | $PGA_M$ : | 0.144 |
| $S_{M1}$ : | 0.155 | $F_{PGA}$ : | 1.6 |
| | | $I_e$ : | 1 |

**Seismic Design Category** B




**Data Accessed:** Fri Aug 27 2021

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

# Ice

**Results:**

| | |
|---|---|
| Ice Thickness: | 1.00 in. |
| Concurrent Temperature: | 5 F |
| Gust Speed: | 50 mph |
| **Data Source:** | Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8 |
| **Date Accessed:** | Fri Aug 27 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 | P1 | P3 | | | Square Tubing | Beam | None | A500 GR.C | Typical |
| 2 | GA4 | P9 | P12 | | 270 | Grating Angle | Beam | None | A529 Gr. 50 | Typical |
| 3 | GA3 | P10 | P11 | | | Grating Angle | Beam | None | A529 Gr. 50 | Typical |
| 4 | P3 | P7 | P8 | | | Corner Plates | Beam | None | A1011 36 Ksi | Typical |
| 5 | S2 | P13 | P14 | | | Square Tubing | Beam | None | A500 GR.C | Typical |
| 6 | GA2 | P20 | P23 | | 270 | Grating Angle | Beam | None | A529 Gr. 50 | Typical |
| 7 | GA1 | P21 | P22 | | | Grating Angle | Beam | None | A529 Gr. 50 | Typical |
| 8 | P2 | P18 | P19 | | | Corner Plates | Beam | None | A1011 36 Ksi | Typical |
| 9 | S1 | P24 | P25 | | | Square Tubing | Beam | None | A500 GR.C | Typical |
| 10 | GA6 | P31 | P34 | | 270 | Grating Angle | Beam | None | A529 Gr. 50 | Typical |
| 11 | GA5 | P32 | P33 | | | Grating Angle | Beam | None | A529 Gr. 50 | Typical |
| 12 | P1 | P29 | P30 | | | Corner Plates | Beam | None | A1011 36 Ksi | Typical |
| 13 | H1 | N43 | N44 | | | Face Pipes(3.5x.16) | Beam | None | A500 GR.C | Typical |
| 14 | MP1 | N66 | N60 | | | Antenna Pipes | Beam | None | A500 GR.C | Typical |
| 15 | MP3 | N63 | N57 | | | Antenna Pipes | Beam | None | A500 GR.C | Typical |
| 16 | HR1 | N67 | N68 | | | Handrail | Beam | None | A500 GR.C | Typical |
| 17 | CA8 | N114A | N113A | | 180 | Handrail Connector | Beam | None | A1011 36 Ksi | Typical |
| 18 | CA9 | N112A | N111A | | 180 | Handrail Connector | Beam | None | A1011 36 Ksi | Typical |
| 19 | CA7 | N116A | N115A | | 180 | Handrail Connector | Beam | None | A1011 36 Ksi | Typical |
| 20 | M32 | N48A | N70A | | | RIGID | None | None | RIGID | Typical |
| 21 | M35 | N45 | N69A | | | RIGID | None | None | RIGID | Typical |
| 22 | M36 | N51 | N71A | | | RIGID | None | None | RIGID | Typical |
| 23 | M39A | N54 | N72A | | | RIGID | None | None | RIGID | Typical |
| 24 | CA3 | P4 | N122A | | | Channel(3.38x2.06) | Beam | None | A1011 36 Ksi | Typical |
| 25 | CA4 | N124B | P4 | | | Channel(3.38x2.06) | Beam | None | A1011 36 Ksi | Typical |
| 26 | CA1 | P15 | N122B | | | Channel(3.38x2.06) | Beam | None | A1011 36 Ksi | Typical |
| 27 | CA2 | N123A | P15 | | | Channel(3.38x2.06) | Beam | None | A1011 36 Ksi | Typical |
| 28 | CA5 | P26 | N125 | | | Channel(3.38x2.06) | Beam | None | A1011 36 Ksi | Typical |
| 29 | CA6 | N126 | P26 | | | Channel(3.38x2.06) | Beam | None | A1011 36 Ksi | Typical |
| 30 | M64 | N126A | N125A | | | RIGID | None | None | RIGID | Typical |
| 31 | M65 | N126 | N125A | | | RIGID | None | None | RIGID | Typical |
| 32 | M66 | N129 | N128 | | | RIGID | None | None | RIGID | Typical |
| 33 | M67 | N124B | N128 | | | RIGID | None | None | RIGID | Typical |
| 34 | M68 | N132 | N131 | | | RIGID | None | None | RIGID | Typical |
| 35 | M69 | N123A | N131 | | | RIGID | None | None | RIGID | Typical |
| 36 | M70 | N133 | N132A | | | RIGID | None | None | RIGID | Typical |
| 37 | M71 | N122B | N132A | | | RIGID | None | None | RIGID | Typical |
| 38 | M72 | N135 | N134 | | | RIGID | None | None | RIGID | Typical |
| 39 | M73 | N125 | N134 | | | RIGID | None | None | RIGID | Typical |
| 40 | M74 | N138 | N137 | | | RIGID | None | None | RIGID | Typical |
| 41 | M75 | N122A | N137 | | | PL 2.375x0.5 | None | None | A36 Gr.36 | Typical |

## Member Primary Data (Continued)

| | Label | I Joint | J Joint | K Joint | Rotate(... | Section/Shape | Type | Design List | Material | Design Rules |
|---|---|---|---|---|---|---|---|---|---|---|
| 42 | MP2 | N75 | N74 | | | Antenna Pipes | Beam | None | A500 GR.C | Typical |
| 43 | M43 | N72B | N76 | | | RIGID | None | None | RIGID | Typical |
| 44 | M44 | N73 | N77 | | | RIGID | None | None | RIGID | Typical |
| 45 | H3 | N81A | N82A | | | Face Pipes(3.5x.16) | Beam | None | A500 GR.C | Typical |
| 46 | MP7 | N90 | N88 | | | Antenna Pipes | Beam | None | A500 GR.C | Typical |
| 47 | MP9 | N89 | N87 | | | Antenna Pipes | Beam | None | A500 GR.C | Typical |
| 48 | HR3 | N91 | N92 | | | Handrail | Beam | None | A500 GR.C | Typical |
| 49 | M52 | N84 | N94 | | | RIGID | None | None | RIGID | Typical |
| 50 | M53 | N83A | N93 | | | RIGID | None | None | RIGID | Typical |
| 51 | M54 | N85 | N95 | | | RIGID | None | None | RIGID | Typical |
| 52 | M55 | N86 | N96 | | | RIGID | None | None | RIGID | Typical |
| 53 | H2 | N109 | N110 | | | Face Pipes(3.5x.16) | Beam | None | A500 GR.C | Typical |
| 54 | MP4 | N118 | N116 | | | Antenna Pipes | Beam | None | A500 GR.C | Typical |
| 55 | MP6 | N117 | N115 | | | Antenna Pipes | Beam | None | A500 GR.C | Typical |
| 56 | HR2 | N119 | N120 | | | Handrail | Beam | None | A500 GR.C | Typical |
| 57 | M66A | N112 | N122 | | | RIGID | None | None | RIGID | Typical |
| 58 | M67A | N111 | N121 | | | RIGID | None | None | RIGID | Typical |
| 59 | M68A | N113 | N123 | | | RIGID | None | None | RIGID | Typical |
| 60 | M69A | N114 | N124 | | | RIGID | None | None | RIGID | Typical |
| 61 | MP8 | N132B | N131A | | | Antenna Pipes | Beam | None | A500 GR.C | Typical |
| 62 | M68B | N129B | N133B | | | RIGID | None | None | RIGID | Typical |
| 63 | M69B | N130A | N134A | | | RIGID | None | None | RIGID | Typical |
| 64 | MP5 | N138A | N137A | | | Antenna Pipes | Beam | None | A500 GR.C | Typical |
| 65 | M71B | N135A | N139 | | | RIGID | None | None | RIGID | Typical |
| 66 | M72B | N136 | N140 | | | 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 | Square Tubing | 40 | | | Lbyy | | | | | | Late... |
| 2 | GA4 | Grating Angle | 27.295 | | | Lbyy | | | | | | Late... |
| 3 | GA3 | Grating Angle | 27.295 | | | Lbyy | | | | | | Late... |
| 4 | P3 | Corner Plates | 42 | | | Lbyy | | | | | | Late... |
| 5 | S2 | Square Tubing | 40 | | | Lbyy | | | | | | Late... |
| 6 | GA2 | Grating Angle | 27.295 | | | Lbyy | | | | | | Late... |
| 7 | GA1 | Grating Angle | 27.295 | | | Lbyy | | | | | | Late... |
| 8 | P2 | Corner Plates | 42 | | | Lbyy | | | | | | Late... |
| 9 | S1 | Square Tubing | 40 | | | Lbyy | | | | | | Late... |
| 10 | GA6 | Grating Angle | 27.295 | | | Lbyy | | | | | | Late... |
| 11 | GA5 | Grating Angle | 27.295 | | | Lbyy | | | | | | Late... |
| 12 | P1 | Corner Plates | 42 | | | Lbyy | | | | | | Late... |
| 13 | H1 | Face Pipes(3.5x.16) | 96 | | | Lbyy | | | | | | Late... |

## Hot Rolled Steel Design Parameters (Continued)

| | Label | Shape | Lengt... | Lbyy[in] | Lbzz[in] | Lcomp t... | Lcomp b... | L-tor... | Kyy | Kzz | Cb | Func... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | MP1 | Antenna Pipes | 96 | | | Lbyy | | | | | | Late... |
| 15 | MP3 | Antenna Pipes | 96 | | | Lbyy | | | | | | Late... |
| 16 | HR1 | Handrail | 96 | | | Lbyy | | | | | | Late... |
| 17 | CA8 | Handrail Connector | 42 | | | Lbyy | | | | | | Late... |
| 18 | CA9 | Handrail Connector | 42 | | | Lbyy | | | | | | Late... |
| 19 | CA7 | Handrail Connector | 42 | | | Lbyy | | | | | | Late... |
| 20 | CA3 | Channel(3.38x2.06) | 33 | | | Lbyy | | | | | | Late... |
| 21 | CA4 | Channel(3.38x2.06) | 33 | | | Lbyy | | | | | | Late... |
| 22 | CA1 | Channel(3.38x2.06) | 33 | | | Lbyy | | | | | | Late... |
| 23 | CA2 | Channel(3.38x2.06) | 33 | | | Lbyy | | | | | | Late... |
| 24 | CA5 | Channel(3.38x2.06) | 33 | | | Lbyy | | | | | | Late... |
| 25 | CA6 | Channel(3.38x2.06) | 33 | | | Lbyy | | | | | | Late... |
| 26 | M75 | PL 2.375x0.5 | 1.5 | | | Lbyy | | | | | | Late... |
| 27 | MP2 | Antenna Pipes | 96 | | | Lbyy | | | | | | Late... |
| 28 | H3 | Face Pipes(3.5x.16) | 96 | | | Lbyy | | | | | | Late... |
| 29 | MP7 | Antenna Pipes | 96 | | | Lbyy | | | | | | Late... |
| 30 | MP9 | Antenna Pipes | 96 | | | Lbyy | | | | | | Late... |
| 31 | HR3 | Handrail | 96 | | | Lbyy | | | | | | Late... |
| 32 | H2 | Face Pipes(3.5x.16) | 96 | | | Lbyy | | | | | | Late... |
| 33 | MP4 | Antenna Pipes | 96 | | | Lbyy | | | | | | Late... |
| 34 | MP6 | Antenna Pipes | 96 | | | Lbyy | | | | | | Late... |
| 35 | HR2 | Handrail | 96 | | | Lbyy | | | | | | Late... |
| 36 | MP8 | Antenna Pipes | 96 | | | Lbyy | | | | | | Late... |
| 37 | MP5 | Antenna Pipes | 96 | | | 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 | | | | | | Yes | | | | None |
| 2 | GA4 | | | | | | Yes | | | | None |
| 3 | GA3 | | | | | | Yes | | | | None |
| 4 | P3 | BenPIN | BenPIN | | | | Yes | Default | | | None |
| 5 | S2 | | | | | | Yes | | | | None |
| 6 | GA2 | | | | | | Yes | | | | None |
| 7 | GA1 | | | | | | Yes | | | | None |
| 8 | P2 | BenPIN | BenPIN | | | | Yes | Default | | | None |
| 9 | S1 | | | | | | Yes | Default | | | None |
| 10 | GA6 | | | | | | Yes | | | | None |
| 11 | GA5 | | | | | | Yes | | | | None |
| 12 | P1 | BenPIN | BenPIN | | | | Yes | Default | | | None |
| 13 | H1 | | | | | | Yes | | | | None |
| 14 | MP1 | | | | | | Yes | | +y+3 | | None |

## Member Advanced Data (Continued)

| | Label | I Release | J Release | I Offset[in] | J Offset[in] | T/C Only | Physical | Defl Ra.. | Analysis ... | Inactive | Seismi... |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 | MP3 | | | | | | Yes | | +y+3 | | None |
| 16 | HR1 | | | | | | Yes | | | | None |
| 17 | CA8 | OOOOOX | OOOOOX | | | | Yes | | | | None |
| 18 | CA9 | OOOOOX | OOOOOX | | | | Yes | | | | None |
| 19 | CA7 | OOOOOX | OOOOOX | | | | Yes | Default | | | None |
| 20 | M32 | | | | | | Yes | ** NA ** | | | None |
| 21 | M35 | | | | | | Yes | ** NA ** | | | None |
| 22 | M36 | | | | | | Yes | ** NA ** | | | None |
| 23 | M39A | | | | | | Yes | ** NA ** | | | None |
| 24 | CA3 | | | | | | Yes | Default | | | None |
| 25 | CA4 | | | | | | Yes | Default | | | None |
| 26 | CA1 | | | | | | Yes | Default | | | None |
| 27 | CA2 | | | | | | Yes | Default | | | None |
| 28 | CA5 | | | | | | Yes | Default | | | None |
| 29 | CA6 | | | | | | Yes | Default | | | None |
| 30 | M64 | BenPIN | | | | | Yes | ** NA ** | | | None |
| 31 | M65 | | | | | | Yes | ** NA ** | | | None |
| 32 | M66 | BenPIN | | | | | Yes | ** NA ** | | | None |
| 33 | M67 | | | | | | Yes | ** NA ** | | | None |
| 34 | M68 | BenPIN | | | | | Yes | ** NA ** | | | None |
| 35 | M69 | | | | | | Yes | ** NA ** | | | None |
| 36 | M70 | BenPIN | | | | | Yes | ** NA ** | | | None |
| 37 | M71 | | | | | | Yes | ** NA ** | | | None |
| 38 | M72 | BenPIN | | | | | Yes | ** NA ** | | | None |
| 39 | M73 | | | | | | Yes | ** NA ** | | | None |
| 40 | M74 | BenPIN | | | | | Yes | ** NA ** | | | None |
| 41 | M75 | | | | | | Yes | ** NA ** | | | None |
| 42 | MP2 | | | | | | Yes | | +y+3 | | None |
| 43 | M43 | | | | | | Yes | ** NA ** | | | None |
| 44 | M44 | | | | | | Yes | ** NA ** | | | None |
| 45 | H3 | | | | | | Yes | | | | None |
| 46 | MP7 | | | | | | Yes | | +y+3 | | None |
| 47 | MP9 | | | | | | Yes | | +y+3 | | None |
| 48 | HR3 | | | | | | Yes | | | | None |
| 49 | M52 | | | | | | Yes | ** NA ** | | | None |
| 50 | M53 | | | | | | Yes | ** NA ** | | | None |
| 51 | M54 | | | | | | Yes | ** NA ** | | | None |
| 52 | M55 | | | | | | Yes | ** NA ** | | | None |
| 53 | H2 | | | | | | Yes | | | | None |
| 54 | MP4 | | | | | | Yes | | +y+3 | | None |
| 55 | MP6 | | | | | | Yes | | +y+3 | | None |
| 56 | HR2 | | | | | | Yes | | | | None |

## Member Advanced Data (Continued)

| | Label | I Release | J Release | I Offset[in] | J Offset[in] | T/C Only | Physical | Defl Ra.. | Analysis ... | Inactive | Seismi... |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 57 | M66A | | | | | | Yes | ** NA ** | | | None |
| 58 | M67A | | | | | | Yes | ** NA ** | | | None |
| 59 | M68A | | | | | | Yes | ** NA ** | | | None |
| 60 | M69A | | | | | | Yes | ** NA ** | | | None |
| 61 | MP8 | | | | | | Yes | | +y+3 | | None |
| 62 | M68B | | | | | | Yes | ** NA ** | | | None |
| 63 | M69B | | | | | | Yes | ** NA ** | | | None |
| 64 | MP5 | | | | | | Yes | | +y+3 | | None |
| 65 | M71B | | | | | | Yes | ** NA ** | | | None |
| 66 | M72B | | | | | | Yes | ** NA ** | | | None |

## Material Takeoff

| | Material | Size | Pieces | Length[in] | Weight[LB] |
|---|---|---|---|---|---|
| 1 | General | | | | |
| 2 | RIGID | | 29 | 35.1 | 0 |
| 3 | Total General | | 29 | 35.1 | 0 |
| 4 | | | | | |
| 5 | Hot Rolled Steel | | | | |
| 6 | A1011 36 Ksi | C3.38x2.06x0.25 | 6 | 198 | 98.255 |
| 7 | A1011 36 Ksi | PL6.5x0.375 | 3 | 126 | 87.09 |
| 8 | A1011 36 Ksi | L6.6x4.46x0.25 | 3 | 126 | 96.558 |
| 9 | A36 Gr.36 | PL 2.375x0.5 | 1 | 1.5 | .505 |
| 10 | A500 GR.C | 2.88x0.120 | 3 | 288 | 84.974 |
| 11 | A500 GR.C | HSS4X4X6 | 3 | 120 | 162.653 |
| 12 | A500 GR.C | Pipe3.5x0.165 | 3 | 288 | 141.202 |
| 13 | A500 GR.C | PIPE 2.5 | 9 | 864 | 394.45 |
| 14 | A529 Gr. 50 | L2x2x4 | 6 | 163.8 | 43.838 |
| 15 | Total HR Steel | | 37 | 2175.3 | 1109.525 |

## Hot Rolled Steel Section Sets

| | Label | Shape | Type | Design List | Material | Design... | A [in2] | Iyy [in... | Izz [in... | J [in4] |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Corner Plates | PL6.5x0.375 | Beam | None | A1011 ... | Typical | 2.438 | .029 | 8.582 | .11 |
| 2 | 6"x0.37" Plate | Plate 6x.37 | Beam | None | A1011 ... | Typical | 2.22 | .025 | 6.66 | .097 |
| 3 | Grating Angle | L2x2x4 | Beam | None | A529 G... | Typical | .944 | .346 | .346 | .021 |
| 4 | Face Pipes(3.5x.1... | Pipe3.5x0.165 | Beam | None | A500 G... | Typical | 1.729 | 2.409 | 2.409 | 4.819 |
| 5 | Antenna Pipes | PIPE 2.5 | Beam | None | A500 G... | Typical | 1.61 | 1.45 | 1.45 | 2.89 |
| 6 | Channel(3.38x2.06) | C3.38x2.06x0.25 | Beam | None | A1011 ... | Typical | 1.75 | .715 | 3.026 | .034 |
| 7 | Square Tubing | HSS4X4X6 | Beam | None | A500 G... | Typical | 4.78 | 10.3 | 10.3 | 17.5 |
| 8 | Handrail Connector | L6.6x4.46x0.25 | Beam | None | A1011 ... | Typical | 2.703 | 4.759 | 12.473 | .055 |

## Hot Rolled Steel Section Sets (Continued)

| | Label | Shape | Type | Design List | Material | Design... | A [in2] | Iyy [in... | Izz [in... | J [in4] |
|---|---|---|---|---|---|---|---|---|---|---|
| 9 | Handrail | 2.88x0.120 | Beam | None | A500 G... | Typical | 1.04 | .993 | .993 | 1.985 |

## 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 | | | 13 | | 3 | |
| 2 | Wind Load AZI 0 | WLZ | | | | | 26 | | | |
| 3 | Wind Load AZI 30 | None | | | | | 26 | | | |
| 4 | Wind Load AZI 60 | None | | | | | 26 | | | |
| 5 | Wind Load AZI 90 | WLX | | | | | 26 | | | |
| 6 | Wind Load AZI 1... | None | | | | | 26 | | | |
| 7 | Wind Load AZI 1... | None | | | | | 26 | | | |
| 8 | Wind Load AZI 1... | None | | | | | 26 | | | |
| 9 | Wind Load AZI 2... | None | | | | | 26 | | | |
| 10 | Wind Load AZI 2... | None | | | | | 26 | | | |
| 11 | Wind Load AZI 2... | None | | | | | 26 | | | |
| 12 | Wind Load AZI 3... | None | | | | | 26 | | | |
| 13 | Wind Load AZI 3... | None | | | | | 26 | | | |
| 14 | Distr. Wind Load Z | WLZ | | | | | | 66 | | |
| 15 | Distr. Wind Load X | WLX | | | | | | 66 | | |
| 16 | Ice Weight | OL1 | | | | | 13 | 66 | 3 | |
| 17 | Ice Wind Load A... | OL2 | | | | | 26 | | | |
| 18 | Ice Wind Load A... | None | | | | | 26 | | | |
| 19 | Ice Wind Load A... | None | | | | | 26 | | | |
| 20 | Ice Wind Load A... | OL3 | | | | | 26 | | | |
| 21 | Ice Wind Load A... | None | | | | | 26 | | | |
| 22 | Ice Wind Load A... | None | | | | | 26 | | | |
| 23 | Ice Wind Load A... | None | | | | | 26 | | | |
| 24 | Ice Wind Load A... | None | | | | | 26 | | | |
| 25 | Ice Wind Load A... | None | | | | | 26 | | | |
| 26 | Ice Wind Load A... | None | | | | | 26 | | | |
| 27 | Ice Wind Load A... | None | | | | | 26 | | | |
| 28 | Ice Wind Load A... | None | | | | | 26 | | | |
| 29 | Distr. Ice Wind L... | OL2 | | | | | | 66 | | |
| 30 | Distr. Ice Wind L... | OL3 | | | | | | 66 | | |
| 31 | Seismic Load Z | ELZ | | | -.288 | | 13 | | | |
| 32 | Seismic Load X | ELX | -.288 | | | | 13 | | | |
| 33 | Service Live Loa... | LL | | | | 3 | | | | |
| 34 | Maintenance Loa... | LL | | | | 1 | | | | |
| 35 | Maintenance Loa... | LL | | | | 1 | | | | |
| 36 | Maintenance Loa... | LL | | | | 1 | | | | |
| 37 | Maintenance Loa... | LL | | | | 1 | | | | |

## Basic Load Cases (Continued)

| | BLC Description | Category | X Gr... | Y Gr... | Z Gr... | Joint | Point | Distributed | Area(Memb... | Surface(Plate/Wall) |
|---|---|---|---|---|---|---|---|---|---|---|
| 38 | Maintenance Loa... | LL | | | | 1 | | | | |
| 39 | Maintenance Loa... | LL | | | | 1 | | | | |
| 40 | Maintenance Loa... | LL | | | | 1 | | | | |
| 41 | Maintenance Loa... | LL | | | | 1 | | | | |
| 42 | Maintenance Loa... | LL | | | | 1 | | | | |
| 43 | BLC 1 Transient ... | None | | | | | | 9 | | |
| 44 | BLC 16 Transien... | None | | | | | | 9 | | |

## 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 | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | | | | |

## 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... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | | | | | | | | | | | | | | | | |
| 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 | .25 | 14 | .25 | 15 | | 33 | 1.5 | | | | | | | | | | | | |
| 64 | 1.0DL + 1.5LL + 1.0SWL (60 ... | Y... | Y | | 1 | 1 | 3 | .25 | 14 | .216 | 15 | .125 | 33 | 1.5 | | | | | | | | | | | | |
| 65 | 1.0DL + 1.5LL + 1.0SWL (60 ... | Y... | Y | | 1 | 1 | 4 | .25 | 14 | .125 | 15 | .216 | 33 | 1.5 | | | | | | | | | | | | |
| 66 | 1.0DL + 1.5LL + 1.0SWL (60 ... | Y... | Y | | 1 | 1 | 5 | .25 | 14 | | 15 | .25 | 33 | 1.5 | | | | | | | | | | | | |
| 67 | 1.0DL + 1.5LL + 1.0SWL (60 ... | Y... | Y | | 1 | 1 | 6 | .25 | 14 | -.1... | 15 | .216 | 33 | 1.5 | | | | | | | | | | | | |
| 68 | 1.0DL + 1.5LL + 1.0SWL (60 ... | Y... | Y | | 1 | 1 | 7 | .25 | 14 | -.2... | 15 | .125 | 33 | 1.5 | | | | | | | | | | | | |
| 69 | 1.0DL + 1.5LL + 1.0SWL (60 ... | Y... | Y | | 1 | 1 | 8 | .25 | 14 | -.25 | 15 | | 33 | 1.5 | | | | | | | | | | | | |
| 70 | 1.0DL + 1.5LL + 1.0SWL (60 ... | Y... | Y | | 1 | 1 | 9 | .25 | 14 | -.2... | 15 | -.1... | 33 | 1.5 | | | | | | | | | | | | |
| 71 | 1.0DL + 1.5LL + 1.0SWL (60 ... | Y... | Y | | 1 | 1 | 10 | .25 | 14 | -.1... | 15 | -.2... | 33 | 1.5 | | | | | | | | | | | | |
| 72 | 1.0DL + 1.5LL + 1.0SWL (60 ... | Y... | Y | | 1 | 1 | 11 | .25 | 14 | | 15 | -.25 | 33 | 1.5 | | | | | | | | | | | | |
| 73 | 1.0DL + 1.5LL + 1.0SWL (60 ... | Y... | Y | | 1 | 1 | 12 | .25 | 14 | .125 | 15 | -.2... | 33 | 1.5 | | | | | | | | | | | | |

## 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... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 74 | 1.0DL + 1.5LL + 1.0SWL (60 ... | Y... | Y | | 1 | 1 | 13 | .25 | 14 | .216 | 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 | .063 | 14 | .063 | 15 | | | | | | | | | | | | | |
| 77 | 1.2DL + 1.5LM-MP1 + 1SWL (... | Y... | Y | | 1 | 1.2 | 34 | 1.5 | 3 | .063 | 14 | .054 | 15 | .031 | | | | | | | | | | | | |
| 78 | 1.2DL + 1.5LM-MP1 + 1SWL (... | Y... | Y | | 1 | 1.2 | 34 | 1.5 | 4 | .063 | 14 | .031 | 15 | .054 | | | | | | | | | | | | |
| 79 | 1.2DL + 1.5LM-MP1 + 1SWL (... | Y... | Y | | 1 | 1.2 | 34 | 1.5 | 5 | .063 | 14 | | 15 | .063 | | | | | | | | | | | | |
| 80 | 1.2DL + 1.5LM-MP1 + 1SWL (... | Y... | Y | | 1 | 1.2 | 34 | 1.5 | 6 | .063 | 14 | -.0... | 15 | .054 | | | | | | | | | | | | |
| 81 | 1.2DL + 1.5LM-MP1 + 1SWL (... | Y... | Y | | 1 | 1.2 | 34 | 1.5 | 7 | .063 | 14 | -.0... | 15 | .031 | | | | | | | | | | | | |
| 82 | 1.2DL + 1.5LM-MP1 + 1SWL (... | Y... | Y | | 1 | 1.2 | 34 | 1.5 | 8 | .063 | 14 | -.0... | 15 | | | | | | | | | | | | | |
| 83 | 1.2DL + 1.5LM-MP1 + 1SWL (... | Y... | Y | | 1 | 1.2 | 34 | 1.5 | 9 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 84 | 1.2DL + 1.5LM-MP1 + 1SWL (... | Y... | Y | | 1 | 1.2 | 34 | 1.5 | 10 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 85 | 1.2DL + 1.5LM-MP1 + 1SWL (... | Y... | Y | | 1 | 1.2 | 34 | 1.5 | 11 | .063 | 14 | | 15 | -.0... | | | | | | | | | | | | |
| 86 | 1.2DL + 1.5LM-MP1 + 1SWL (... | Y... | Y | | 1 | 1.2 | 34 | 1.5 | 12 | .063 | 14 | .031 | 15 | -.0... | | | | | | | | | | | | |
| 87 | 1.2DL + 1.5LM-MP1 + 1SWL (... | Y... | Y | | 1 | 1.2 | 34 | 1.5 | 13 | .063 | 14 | .054 | 15 | -.0... | | | | | | | | | | | | |
| 88 | 1.2DL + 1.5LM-MP2 + 1SWL (... | Y... | Y | | 1 | 1.2 | 35 | 1.5 | 2 | .063 | 14 | .063 | 15 | | | | | | | | | | | | | |
| 89 | 1.2DL + 1.5LM-MP2 + 1SWL (... | Y... | Y | | 1 | 1.2 | 35 | 1.5 | 3 | .063 | 14 | .054 | 15 | .031 | | | | | | | | | | | | |
| 90 | 1.2DL + 1.5LM-MP2 + 1SWL (... | Y... | Y | | 1 | 1.2 | 35 | 1.5 | 4 | .063 | 14 | .031 | 15 | .054 | | | | | | | | | | | | |
| 91 | 1.2DL + 1.5LM-MP2 + 1SWL (... | Y... | Y | | 1 | 1.2 | 35 | 1.5 | 5 | .063 | 14 | | 15 | .063 | | | | | | | | | | | | |
| 92 | 1.2DL + 1.5LM-MP2 + 1SWL (... | Y... | Y | | 1 | 1.2 | 35 | 1.5 | 6 | .063 | 14 | -.0... | 15 | .054 | | | | | | | | | | | | |
| 93 | 1.2DL + 1.5LM-MP2 + 1SWL (... | Y... | Y | | 1 | 1.2 | 35 | 1.5 | 7 | .063 | 14 | -.0... | 15 | .031 | | | | | | | | | | | | |
| 94 | 1.2DL + 1.5LM-MP2 + 1SWL (... | Y... | Y | | 1 | 1.2 | 35 | 1.5 | 8 | .063 | 14 | -.0... | 15 | | | | | | | | | | | | | |
| 95 | 1.2DL + 1.5LM-MP2 + 1SWL (... | Y... | Y | | 1 | 1.2 | 35 | 1.5 | 9 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 96 | 1.2DL + 1.5LM-MP2 + 1SWL (... | Y... | Y | | 1 | 1.2 | 35 | 1.5 | 10 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 97 | 1.2DL + 1.5LM-MP2 + 1SWL (... | Y... | Y | | 1 | 1.2 | 35 | 1.5 | 11 | .063 | 14 | | 15 | -.0... | | | | | | | | | | | | |
| 98 | 1.2DL + 1.5LM-MP2 + 1SWL (... | Y... | Y | | 1 | 1.2 | 35 | 1.5 | 12 | .063 | 14 | .031 | 15 | -.0... | | | | | | | | | | | | |
| 99 | 1.2DL + 1.5LM-MP2 + 1SWL (... | Y... | Y | | 1 | 1.2 | 35 | 1.5 | 13 | .063 | 14 | .054 | 15 | -.0... | | | | | | | | | | | | |
| 100 | 1.2DL + 1.5LM-MP3 + 1SWL (... | Y... | Y | | 1 | 1.2 | 36 | 1.5 | 2 | .063 | 14 | .063 | 15 | | | | | | | | | | | | | |
| 101 | 1.2DL + 1.5LM-MP3 + 1SWL (... | Y... | Y | | 1 | 1.2 | 36 | 1.5 | 3 | .063 | 14 | .054 | 15 | .031 | | | | | | | | | | | | |
| 102 | 1.2DL + 1.5LM-MP3 + 1SWL (... | Y... | Y | | 1 | 1.2 | 36 | 1.5 | 4 | .063 | 14 | .031 | 15 | .054 | | | | | | | | | | | | |
| 103 | 1.2DL + 1.5LM-MP3 + 1SWL (... | Y... | Y | | 1 | 1.2 | 36 | 1.5 | 5 | .063 | 14 | | 15 | .063 | | | | | | | | | | | | |
| 104 | 1.2DL + 1.5LM-MP3 + 1SWL (... | Y... | Y | | 1 | 1.2 | 36 | 1.5 | 6 | .063 | 14 | -.0... | 15 | .054 | | | | | | | | | | | | |
| 105 | 1.2DL + 1.5LM-MP3 + 1SWL (... | Y... | Y | | 1 | 1.2 | 36 | 1.5 | 7 | .063 | 14 | -.0... | 15 | .031 | | | | | | | | | | | | |
| 106 | 1.2DL + 1.5LM-MP3 + 1SWL (... | Y... | Y | | 1 | 1.2 | 36 | 1.5 | 8 | .063 | 14 | -.0... | 15 | | | | | | | | | | | | | |
| 107 | 1.2DL + 1.5LM-MP3 + 1SWL (... | Y... | Y | | 1 | 1.2 | 36 | 1.5 | 9 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 108 | 1.2DL + 1.5LM-MP3 + 1SWL (... | Y... | Y | | 1 | 1.2 | 36 | 1.5 | 10 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 109 | 1.2DL + 1.5LM-MP3 + 1SWL (... | Y... | Y | | 1 | 1.2 | 36 | 1.5 | 11 | .063 | 14 | | 15 | -.0... | | | | | | | | | | | | |
| 110 | 1.2DL + 1.5LM-MP3 + 1SWL (... | Y... | Y | | 1 | 1.2 | 36 | 1.5 | 12 | .063 | 14 | .031 | 15 | -.0... | | | | | | | | | | | | |
| 111 | 1.2DL + 1.5LM-MP3 + 1SWL (... | Y... | Y | | 1 | 1.2 | 36 | 1.5 | 13 | .063 | 14 | .054 | 15 | -.0... | | | | | | | | | | | | |
| 112 | 1.2DL + 1.5LM-MP4 + 1SWL (... | Y... | Y | | 1 | 1.2 | 37 | 1.5 | 2 | .063 | 14 | .063 | 15 | | | | | | | | | | | | | |
| 113 | 1.2DL + 1.5LM-MP4 + 1SWL (... | Y... | Y | | 1 | 1.2 | 37 | 1.5 | 3 | .063 | 14 | .054 | 15 | .031 | | | | | | | | | | | | |
| 114 | 1.2DL + 1.5LM-MP4 + 1SWL (... | Y... | Y | | 1 | 1.2 | 37 | 1.5 | 4 | .063 | 14 | .031 | 15 | .054 | | | | | | | | | | | | |
| 115 | 1.2DL + 1.5LM-MP4 + 1SWL (... | Y... | Y | | 1 | 1.2 | 37 | 1.5 | 5 | .063 | 14 | | 15 | .063 | | | | | | | | | | | | |

## 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... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 116 | 1.2DL + 1.5LM-MP4 + 1SWL (... | Y... | Y | | 1 | 1.2 | 37 | 1.5 | 6 | .063 | 14 | -.0... | 15 | .054 | | | | | | | | | | | | |
| 117 | 1.2DL + 1.5LM-MP4 + 1SWL (... | Y... | Y | | 1 | 1.2 | 37 | 1.5 | 7 | .063 | 14 | -.0... | 15 | .031 | | | | | | | | | | | | |
| 118 | 1.2DL + 1.5LM-MP4 + 1SWL (... | Y... | Y | | 1 | 1.2 | 37 | 1.5 | 8 | .063 | 14 | -.0... | 15 | | | | | | | | | | | | | |
| 119 | 1.2DL + 1.5LM-MP4 + 1SWL (... | Y... | Y | | 1 | 1.2 | 37 | 1.5 | 9 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 120 | 1.2DL + 1.5LM-MP4 + 1SWL (... | Y... | Y | | 1 | 1.2 | 37 | 1.5 | 10 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 121 | 1.2DL + 1.5LM-MP4 + 1SWL (... | Y... | Y | | 1 | 1.2 | 37 | 1.5 | 11 | .063 | 14 | | 15 | -.0... | | | | | | | | | | | | |
| 122 | 1.2DL + 1.5LM-MP4 + 1SWL (... | Y... | Y | | 1 | 1.2 | 37 | 1.5 | 12 | .063 | 14 | .031 | 15 | -.0... | | | | | | | | | | | | |
| 123 | 1.2DL + 1.5LM-MP4 + 1SWL (... | Y... | Y | | 1 | 1.2 | 37 | 1.5 | 13 | .063 | 14 | .054 | 15 | -.0... | | | | | | | | | | | | |
| 124 | 1.2DL + 1.5LM-MP5 + 1SWL (... | Y... | Y | | 1 | 1.2 | 38 | 1.5 | 2 | .063 | 14 | .063 | 15 | | | | | | | | | | | | | |
| 125 | 1.2DL + 1.5LM-MP5 + 1SWL (... | Y... | Y | | 1 | 1.2 | 38 | 1.5 | 3 | .063 | 14 | .054 | 15 | .031 | | | | | | | | | | | | |
| 126 | 1.2DL + 1.5LM-MP5 + 1SWL (... | Y... | Y | | 1 | 1.2 | 38 | 1.5 | 4 | .063 | 14 | .031 | 15 | .054 | | | | | | | | | | | | |
| 127 | 1.2DL + 1.5LM-MP5 + 1SWL (... | Y... | Y | | 1 | 1.2 | 38 | 1.5 | 5 | .063 | 14 | | 15 | .063 | | | | | | | | | | | | |
| 128 | 1.2DL + 1.5LM-MP5 + 1SWL (... | Y... | Y | | 1 | 1.2 | 38 | 1.5 | 6 | .063 | 14 | -.0... | 15 | .054 | | | | | | | | | | | | |
| 129 | 1.2DL + 1.5LM-MP5 + 1SWL (... | Y... | Y | | 1 | 1.2 | 38 | 1.5 | 7 | .063 | 14 | -.0... | 15 | .031 | | | | | | | | | | | | |
| 130 | 1.2DL + 1.5LM-MP5 + 1SWL (... | Y... | Y | | 1 | 1.2 | 38 | 1.5 | 8 | .063 | 14 | -.0... | 15 | | | | | | | | | | | | | |
| 131 | 1.2DL + 1.5LM-MP5 + 1SWL (... | Y... | Y | | 1 | 1.2 | 38 | 1.5 | 9 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 132 | 1.2DL + 1.5LM-MP5 + 1SWL (... | Y... | Y | | 1 | 1.2 | 38 | 1.5 | 10 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 133 | 1.2DL + 1.5LM-MP5 + 1SWL (... | Y... | Y | | 1 | 1.2 | 38 | 1.5 | 11 | .063 | 14 | | 15 | -.0... | | | | | | | | | | | | |
| 134 | 1.2DL + 1.5LM-MP5 + 1SWL (... | Y... | Y | | 1 | 1.2 | 38 | 1.5 | 12 | .063 | 14 | .031 | 15 | -.0... | | | | | | | | | | | | |
| 135 | 1.2DL + 1.5LM-MP5 + 1SWL (... | Y... | Y | | 1 | 1.2 | 38 | 1.5 | 13 | .063 | 14 | .054 | 15 | -.0... | | | | | | | | | | | | |
| 136 | 1.2DL + 1.5LM-MP6 + 1SWL (... | Y... | Y | | 1 | 1.2 | 39 | 1.5 | 2 | .063 | 14 | .063 | 15 | | | | | | | | | | | | | |
| 137 | 1.2DL + 1.5LM-MP6 + 1SWL (... | Y... | Y | | 1 | 1.2 | 39 | 1.5 | 3 | .063 | 14 | .054 | 15 | .031 | | | | | | | | | | | | |
| 138 | 1.2DL + 1.5LM-MP6 + 1SWL (... | Y... | Y | | 1 | 1.2 | 39 | 1.5 | 4 | .063 | 14 | .031 | 15 | .054 | | | | | | | | | | | | |
| 139 | 1.2DL + 1.5LM-MP6 + 1SWL (... | Y... | Y | | 1 | 1.2 | 39 | 1.5 | 5 | .063 | 14 | | 15 | .063 | | | | | | | | | | | | |
| 140 | 1.2DL + 1.5LM-MP6 + 1SWL (... | Y... | Y | | 1 | 1.2 | 39 | 1.5 | 6 | .063 | 14 | -.0... | 15 | .054 | | | | | | | | | | | | |
| 141 | 1.2DL + 1.5LM-MP6 + 1SWL (... | Y... | Y | | 1 | 1.2 | 39 | 1.5 | 7 | .063 | 14 | -.0... | 15 | .031 | | | | | | | | | | | | |
| 142 | 1.2DL + 1.5LM-MP6 + 1SWL (... | Y... | Y | | 1 | 1.2 | 39 | 1.5 | 8 | .063 | 14 | -.0... | 15 | | | | | | | | | | | | | |
| 143 | 1.2DL + 1.5LM-MP6 + 1SWL (... | Y... | Y | | 1 | 1.2 | 39 | 1.5 | 9 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 144 | 1.2DL + 1.5LM-MP6 + 1SWL (... | Y... | Y | | 1 | 1.2 | 39 | 1.5 | 10 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 145 | 1.2DL + 1.5LM-MP6 + 1SWL (... | Y... | Y | | 1 | 1.2 | 39 | 1.5 | 11 | .063 | 14 | | 15 | -.0... | | | | | | | | | | | | |
| 146 | 1.2DL + 1.5LM-MP6 + 1SWL (... | Y... | Y | | 1 | 1.2 | 39 | 1.5 | 12 | .063 | 14 | .031 | 15 | -.0... | | | | | | | | | | | | |
| 147 | 1.2DL + 1.5LM-MP6 + 1SWL (... | Y... | Y | | 1 | 1.2 | 39 | 1.5 | 13 | .063 | 14 | .054 | 15 | -.0... | | | | | | | | | | | | |
| 148 | 1.2DL + 1.5LM-MP7 + 1SWL (... | Y... | Y | | 1 | 1.2 | 40 | 1.5 | 2 | .063 | 14 | .063 | 15 | | | | | | | | | | | | | |
| 149 | 1.2DL + 1.5LM-MP7 + 1SWL (... | Y... | Y | | 1 | 1.2 | 40 | 1.5 | 3 | .063 | 14 | .054 | 15 | .031 | | | | | | | | | | | | |
| 150 | 1.2DL + 1.5LM-MP7 + 1SWL (... | Y... | Y | | 1 | 1.2 | 40 | 1.5 | 4 | .063 | 14 | .031 | 15 | .054 | | | | | | | | | | | | |
| 151 | 1.2DL + 1.5LM-MP7 + 1SWL (... | Y... | Y | | 1 | 1.2 | 40 | 1.5 | 5 | .063 | 14 | | 15 | .063 | | | | | | | | | | | | |
| 152 | 1.2DL + 1.5LM-MP7 + 1SWL (... | Y... | Y | | 1 | 1.2 | 40 | 1.5 | 6 | .063 | 14 | -.0... | 15 | .054 | | | | | | | | | | | | |
| 153 | 1.2DL + 1.5LM-MP7 + 1SWL (... | Y... | Y | | 1 | 1.2 | 40 | 1.5 | 7 | .063 | 14 | -.0... | 15 | .031 | | | | | | | | | | | | |
| 154 | 1.2DL + 1.5LM-MP7 + 1SWL (... | Y... | Y | | 1 | 1.2 | 40 | 1.5 | 8 | .063 | 14 | -.0... | 15 | | | | | | | | | | | | | |
| 155 | 1.2DL + 1.5LM-MP7 + 1SWL (... | Y... | Y | | 1 | 1.2 | 40 | 1.5 | 9 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 156 | 1.2DL + 1.5LM-MP7 + 1SWL (... | Y... | Y | | 1 | 1.2 | 40 | 1.5 | 10 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 157 | 1.2DL + 1.5LM-MP7 + 1SWL (... | Y... | Y | | 1 | 1.2 | 40 | 1.5 | 11 | .063 | 14 | | 15 | -.0... | | | | | | | | | | | | |

## 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... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 158 | 1.2DL + 1.5LM-MP7 + 1SWL (... | Y... | Y | | 1 | 1.2 | 40 | 1.5 | 12 | .063 | 14 | .031 | 15 | -.0... | | | | | | | | | | | | |
| 159 | 1.2DL + 1.5LM-MP7 + 1SWL (... | Y... | Y | | 1 | 1.2 | 40 | 1.5 | 13 | .063 | 14 | .054 | 15 | -.0... | | | | | | | | | | | | |
| 160 | 1.2DL + 1.5LM-MP8 + 1SWL (... | Y... | Y | | 1 | 1.2 | 41 | 1.5 | 2 | .063 | 14 | .063 | 15 | | | | | | | | | | | | | |
| 161 | 1.2DL + 1.5LM-MP8 + 1SWL (... | Y... | Y | | 1 | 1.2 | 41 | 1.5 | 3 | .063 | 14 | .054 | 15 | .031 | | | | | | | | | | | | |
| 162 | 1.2DL + 1.5LM-MP8 + 1SWL (... | Y... | Y | | 1 | 1.2 | 41 | 1.5 | 4 | .063 | 14 | .031 | 15 | .054 | | | | | | | | | | | | |
| 163 | 1.2DL + 1.5LM-MP8 + 1SWL (... | Y... | Y | | 1 | 1.2 | 41 | 1.5 | 5 | .063 | 14 | | 15 | .063 | | | | | | | | | | | | |
| 164 | 1.2DL + 1.5LM-MP8 + 1SWL (... | Y... | Y | | 1 | 1.2 | 41 | 1.5 | 6 | .063 | 14 | -.0... | 15 | .054 | | | | | | | | | | | | |
| 165 | 1.2DL + 1.5LM-MP8 + 1SWL (... | Y... | Y | | 1 | 1.2 | 41 | 1.5 | 7 | .063 | 14 | -.0... | 15 | .031 | | | | | | | | | | | | |
| 166 | 1.2DL + 1.5LM-MP8 + 1SWL (... | Y... | Y | | 1 | 1.2 | 41 | 1.5 | 8 | .063 | 14 | -.0... | 15 | | | | | | | | | | | | | |
| 167 | 1.2DL + 1.5LM-MP8 + 1SWL (... | Y... | Y | | 1 | 1.2 | 41 | 1.5 | 9 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 168 | 1.2DL + 1.5LM-MP8 + 1SWL (... | Y... | Y | | 1 | 1.2 | 41 | 1.5 | 10 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 169 | 1.2DL + 1.5LM-MP8 + 1SWL (... | Y... | Y | | 1 | 1.2 | 41 | 1.5 | 11 | .063 | 14 | | 15 | -.0... | | | | | | | | | | | | |
| 170 | 1.2DL + 1.5LM-MP8 + 1SWL (... | Y... | Y | | 1 | 1.2 | 41 | 1.5 | 12 | .063 | 14 | .031 | 15 | -.0... | | | | | | | | | | | | |
| 171 | 1.2DL + 1.5LM-MP8 + 1SWL (... | Y... | Y | | 1 | 1.2 | 41 | 1.5 | 13 | .063 | 14 | .054 | 15 | -.0... | | | | | | | | | | | | |
| 172 | 1.2DL + 1.5LM-MP9 + 1SWL (... | Y... | Y | | 1 | 1.2 | 42 | 1.5 | 2 | .063 | 14 | .063 | 15 | | | | | | | | | | | | | |
| 173 | 1.2DL + 1.5LM-MP9 + 1SWL (... | Y... | Y | | 1 | 1.2 | 42 | 1.5 | 3 | .063 | 14 | .054 | 15 | .031 | | | | | | | | | | | | |
| 174 | 1.2DL + 1.5LM-MP9 + 1SWL (... | Y... | Y | | 1 | 1.2 | 42 | 1.5 | 4 | .063 | 14 | .031 | 15 | .054 | | | | | | | | | | | | |
| 175 | 1.2DL + 1.5LM-MP9 + 1SWL (... | Y... | Y | | 1 | 1.2 | 42 | 1.5 | 5 | .063 | 14 | | 15 | .063 | | | | | | | | | | | | |
| 176 | 1.2DL + 1.5LM-MP9 + 1SWL (... | Y... | Y | | 1 | 1.2 | 42 | 1.5 | 6 | .063 | 14 | -.0... | 15 | .054 | | | | | | | | | | | | |
| 177 | 1.2DL + 1.5LM-MP9 + 1SWL (... | Y... | Y | | 1 | 1.2 | 42 | 1.5 | 7 | .063 | 14 | -.0... | 15 | .031 | | | | | | | | | | | | |
| 178 | 1.2DL + 1.5LM-MP9 + 1SWL (... | Y... | Y | | 1 | 1.2 | 42 | 1.5 | 8 | .063 | 14 | -.0... | 15 | | | | | | | | | | | | | |
| 179 | 1.2DL + 1.5LM-MP9 + 1SWL (... | Y... | Y | | 1 | 1.2 | 42 | 1.5 | 9 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 180 | 1.2DL + 1.5LM-MP9 + 1SWL (... | Y... | Y | | 1 | 1.2 | 42 | 1.5 | 10 | .063 | 14 | -.0... | 15 | -.0... | | | | | | | | | | | | |
| 181 | 1.2DL + 1.5LM-MP9 + 1SWL (... | Y... | Y | | 1 | 1.2 | 42 | 1.5 | 11 | .063 | 14 | | 15 | -.0... | | | | | | | | | | | | |
| 182 | 1.2DL + 1.5LM-MP9 + 1SWL (... | Y... | Y | | 1 | 1.2 | 42 | 1.5 | 12 | .063 | 14 | .031 | 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 | P24 | Reaction | Reaction | Reaction | Reaction | Reaction | Reaction |
| 2 | P13 | Reaction | Reaction | Reaction | Reaction | Reaction | Reaction |
| 3 | P1 | Reaction | Reaction | Reaction | 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 | P24 | ... | 727.05 | 6 | 2416.0... | 35 | 1106.1... | 13 | 551.084 | 16 | 1395.065 | 19 | 4297.903 | 35 |
| 2 | | ... | -711.74 | 24 | -278.77 | 16 | -1098.0... | 19 | -3711.96 | 35 | -1413.343 | 13 | -1090.355 | 16 |
| 3 | P13 | ... | 887.314 | 4 | 2895.0... | 31 | 1169.29 | 15 | 576.565 | 24 | 1567.236 | 15 | 826.857 | 24 |
| 4 | | ... | -884.523 | 22 | -183.26 | 24 | -1177.6... | 9 | -2802.61 | 92 | -1614.898 | 9 | -6478.83 | 31 |
| 5 | P1 | ... | 1138.844 | 17 | 2587.56 | 27 | 590.142 | 2 | 6189.8... | 27 | 1303.364 | 11 | 1576.717 | 115 |

## Envelope Joint Reactions (Continued)

| | Joint | | X [lb] | LC | Y [lb] | LC | Z [lb] | LC | MX [lb-ft] | LC | MY [lb-ft] | LC | MZ [lb-ft] | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | | ... | -1156.991 | 11 | -263.26 | 20 | -592.764 | 20 | -1177.8... | 20 | -1252.378 | 17 | -855.484 | 157 |
| 7 | Totals: | ... | 2621.105 | 5 | 7307.9... | 34 | 2776.1... | 14 | | | | | | |
| 8 | | ... | -2621.097 | 23 | 1532.8... | 53 | -2776.2... | 8 | | | | | | |

## 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 | S2 | Y | -21.85 | 12 |
| 6 | MP4 | Y | -32.25 | 0 |
| 7 | MP4 | Y | -32.25 | 72 |
| 8 | MP4 | Y | -74.95 | 12 |
| 9 | MP4 | Y | -63.93 | 12 |
| 10 | MP7 | Y | -32.25 | 0 |
| 11 | MP7 | Y | -32.25 | 72 |
| 12 | MP7 | Y | -74.95 | 12 |
| 13 | MP7 | Y | -63.93 | 12 |

## 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 | -118.53 | 0 |
| 3 | MP1 | X | 0 | 72 |
| 4 | MP1 | Z | -118.53 | 72 |
| 5 | MP1 | X | 0 | 12 |
| 6 | MP1 | Z | -58.11 | 12 |
| 7 | MP1 | X | 0 | 12 |
| 8 | MP1 | Z | -58.11 | 12 |
| 9 | S2 | X | 0 | 12 |
| 10 | S2 | Z | -55.25 | 12 |
| 11 | MP4 | X | 0 | 0 |
| 12 | MP4 | Z | -65.26 | 0 |
| 13 | MP4 | X | 0 | 72 |
| 14 | MP4 | Z | -65.26 | 72 |
| 15 | MP4 | X | 0 | 12 |
| 16 | MP4 | Z | -40.92 | 12 |
| 17 | MP4 | X | 0 | 12 |
| 18 | MP4 | Z | -37.46 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 19 | MP7 | X | 0 | 0 |
| 20 | MP7 | Z | -65.26 | 0 |
| 21 | MP7 | X | 0 | 72 |
| 22 | MP7 | Z | -65.26 | 72 |
| 23 | MP7 | X | 0 | 12 |
| 24 | MP7 | Z | -40.92 | 12 |
| 25 | MP7 | X | 0 | 12 |
| 26 | MP7 | Z | -37.46 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | -50.39 | 0 |
| 2 | MP1 | Z | -87.27 | 0 |
| 3 | MP1 | X | -50.39 | 72 |
| 4 | MP1 | Z | -87.27 | 72 |
| 5 | MP1 | X | -26.19 | 12 |
| 6 | MP1 | Z | -45.36 | 12 |
| 7 | MP1 | X | -25.61 | 12 |
| 8 | MP1 | Z | -44.36 | 12 |
| 9 | S2 | X | -24.66 | 12 |
| 10 | S2 | Z | -42.72 | 12 |
| 11 | MP4 | X | -50.39 | 0 |
| 12 | MP4 | Z | -87.27 | 0 |
| 13 | MP4 | X | -50.39 | 72 |
| 14 | MP4 | Z | -87.27 | 72 |
| 15 | MP4 | X | -26.19 | 12 |
| 16 | MP4 | Z | -45.36 | 12 |
| 17 | MP4 | X | -25.61 | 12 |
| 18 | MP4 | Z | -44.36 | 12 |
| 19 | MP7 | X | -23.75 | 0 |
| 20 | MP7 | Z | -41.14 | 0 |
| 21 | MP7 | X | -23.75 | 72 |
| 22 | MP7 | Z | -41.14 | 72 |
| 23 | MP7 | X | -17.6 | 12 |
| 24 | MP7 | Z | -30.48 | 12 |
| 25 | MP7 | X | -15.29 | 12 |
| 26 | MP7 | Z | -26.48 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | -56.52 | 0 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 2 | MP1 | Z | -32.63 | 0 |
| 3 | MP1 | X | -56.52 | 72 |
| 4 | MP1 | Z | -32.63 | 72 |
| 5 | MP1 | X | -35.44 | 12 |
| 6 | MP1 | Z | -20.46 | 12 |
| 7 | MP1 | X | -32.44 | 12 |
| 8 | MP1 | Z | -18.73 | 12 |
| 9 | S2 | X | -32.47 | 12 |
| 10 | S2 | Z | -18.74 | 12 |
| 11 | MP4 | X | -102.65 | 0 |
| 12 | MP4 | Z | -59.27 | 0 |
| 13 | MP4 | X | -102.65 | 72 |
| 14 | MP4 | Z | -59.27 | 72 |
| 15 | MP4 | X | -50.33 | 12 |
| 16 | MP4 | Z | -29.06 | 12 |
| 17 | MP4 | X | -50.33 | 12 |
| 18 | MP4 | Z | -29.06 | 12 |
| 19 | MP7 | X | -56.52 | 0 |
| 20 | MP7 | Z | -32.63 | 0 |
| 21 | MP7 | X | -56.52 | 72 |
| 22 | MP7 | Z | -32.63 | 72 |
| 23 | MP7 | X | -35.44 | 12 |
| 24 | MP7 | Z | -20.46 | 12 |
| 25 | MP7 | X | -32.44 | 12 |
| 26 | MP7 | Z | -18.73 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | -47.5 | 0 |
| 2 | MP1 | Z | 0 | 0 |
| 3 | MP1 | X | -47.5 | 72 |
| 4 | MP1 | Z | 0 | 72 |
| 5 | MP1 | X | -35.19 | 12 |
| 6 | MP1 | Z | 0 | 12 |
| 7 | MP1 | X | -30.57 | 12 |
| 8 | MP1 | Z | 0 | 12 |
| 9 | S2 | X | -31.57 | 12 |
| 10 | S2 | Z | 0 | 12 |
| 11 | MP4 | X | -100.77 | 0 |
| 12 | MP4 | Z | 0 | 0 |
| 13 | MP4 | X | -100.77 | 72 |
| 14 | MP4 | Z | 0 | 72 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 15 | MP4 | X | -52.38 | 12 |
| 16 | MP4 | Z | 0 | 12 |
| 17 | MP4 | X | -51.23 | 12 |
| 18 | MP4 | Z | 0 | 12 |
| 19 | MP7 | X | -100.77 | 0 |
| 20 | MP7 | Z | 0 | 0 |
| 21 | MP7 | X | -100.77 | 72 |
| 22 | MP7 | Z | 0 | 72 |
| 23 | MP7 | X | -52.38 | 12 |
| 24 | MP7 | Z | 0 | 12 |
| 25 | MP7 | X | -51.23 | 12 |
| 26 | MP7 | Z | 0 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | -56.52 | 0 |
| 2 | MP1 | Z | 32.63 | 0 |
| 3 | MP1 | X | -56.52 | 72 |
| 4 | MP1 | Z | 32.63 | 72 |
| 5 | MP1 | X | -35.44 | 12 |
| 6 | MP1 | Z | 20.46 | 12 |
| 7 | MP1 | X | -32.44 | 12 |
| 8 | MP1 | Z | 18.73 | 12 |
| 9 | S2 | X | -32.47 | 12 |
| 10 | S2 | Z | 18.74 | 12 |
| 11 | MP4 | X | -56.52 | 0 |
| 12 | MP4 | Z | 32.63 | 0 |
| 13 | MP4 | X | -56.52 | 72 |
| 14 | MP4 | Z | 32.63 | 72 |
| 15 | MP4 | X | -35.44 | 12 |
| 16 | MP4 | Z | 20.46 | 12 |
| 17 | MP4 | X | -32.44 | 12 |
| 18 | MP4 | Z | 18.73 | 12 |
| 19 | MP7 | X | -102.65 | 0 |
| 20 | MP7 | Z | 59.27 | 0 |
| 21 | MP7 | X | -102.65 | 72 |
| 22 | MP7 | Z | 59.27 | 72 |
| 23 | MP7 | X | -50.33 | 12 |
| 24 | MP7 | Z | 29.06 | 12 |
| 25 | MP7 | X | -50.33 | 12 |
| 26 | MP7 | Z | 29.06 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | -50.39 | 0 |
| 2 | MP1 | Z | 87.27 | 0 |
| 3 | MP1 | X | -50.39 | 72 |
| 4 | MP1 | Z | 87.27 | 72 |
| 5 | MP1 | X | -26.19 | 12 |
| 6 | MP1 | Z | 45.36 | 12 |
| 7 | MP1 | X | -25.61 | 12 |
| 8 | MP1 | Z | 44.36 | 12 |
| 9 | S2 | X | -24.66 | 12 |
| 10 | S2 | Z | 42.72 | 12 |
| 11 | MP4 | X | -23.75 | 0 |
| 12 | MP4 | Z | 41.14 | 0 |
| 13 | MP4 | X | -23.75 | 72 |
| 14 | MP4 | Z | 41.14 | 72 |
| 15 | MP4 | X | -17.6 | 12 |
| 16 | MP4 | Z | 30.48 | 12 |
| 17 | MP4 | X | -15.29 | 12 |
| 18 | MP4 | Z | 26.48 | 12 |
| 19 | MP7 | X | -50.39 | 0 |
| 20 | MP7 | Z | 87.27 | 0 |
| 21 | MP7 | X | -50.39 | 72 |
| 22 | MP7 | Z | 87.27 | 72 |
| 23 | MP7 | X | -26.19 | 12 |
| 24 | MP7 | Z | 45.36 | 12 |
| 25 | MP7 | X | -25.61 | 12 |
| 26 | MP7 | Z | 44.36 | 12 |

## 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 | 118.53 | 0 |
| 3 | MP1 | X | 0 | 72 |
| 4 | MP1 | Z | 118.53 | 72 |
| 5 | MP1 | X | 0 | 12 |
| 6 | MP1 | Z | 58.11 | 12 |
| 7 | MP1 | X | 0 | 12 |
| 8 | MP1 | Z | 58.11 | 12 |
| 9 | S2 | X | 0 | 12 |
| 10 | S2 | Z | 55.25 | 12 |
| 11 | MP4 | X | 0 | 0 |
| 12 | MP4 | Z | 65.26 | 0 |
| 13 | MP4 | X | 0 | 72 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 14 | MP4 | Z | 65.26 | 72 |
| 15 | MP4 | X | 0 | 12 |
| 16 | MP4 | Z | 40.92 | 12 |
| 17 | MP4 | X | 0 | 12 |
| 18 | MP4 | Z | 37.46 | 12 |
| 19 | MP7 | X | 0 | 0 |
| 20 | MP7 | Z | 65.26 | 0 |
| 21 | MP7 | X | 0 | 72 |
| 22 | MP7 | Z | 65.26 | 72 |
| 23 | MP7 | X | 0 | 12 |
| 24 | MP7 | Z | 40.92 | 12 |
| 25 | MP7 | X | 0 | 12 |
| 26 | MP7 | Z | 37.46 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | 50.39 | 0 |
| 2 | MP1 | Z | 87.27 | 0 |
| 3 | MP1 | X | 50.39 | 72 |
| 4 | MP1 | Z | 87.27 | 72 |
| 5 | MP1 | X | 26.19 | 12 |
| 6 | MP1 | Z | 45.36 | 12 |
| 7 | MP1 | X | 25.61 | 12 |
| 8 | MP1 | Z | 44.36 | 12 |
| 9 | S2 | X | 24.66 | 12 |
| 10 | S2 | Z | 42.72 | 12 |
| 11 | MP4 | X | 50.39 | 0 |
| 12 | MP4 | Z | 87.27 | 0 |
| 13 | MP4 | X | 50.39 | 72 |
| 14 | MP4 | Z | 87.27 | 72 |
| 15 | MP4 | X | 26.19 | 12 |
| 16 | MP4 | Z | 45.36 | 12 |
| 17 | MP4 | X | 25.61 | 12 |
| 18 | MP4 | Z | 44.36 | 12 |
| 19 | MP7 | X | 23.75 | 0 |
| 20 | MP7 | Z | 41.14 | 0 |
| 21 | MP7 | X | 23.75 | 72 |
| 22 | MP7 | Z | 41.14 | 72 |
| 23 | MP7 | X | 17.6 | 12 |
| 24 | MP7 | Z | 30.48 | 12 |
| 25 | MP7 | X | 15.29 | 12 |
| 26 | MP7 | Z | 26.48 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | 56.52 | 0 |
| 2 | MP1 | Z | 32.63 | 0 |
| 3 | MP1 | X | 56.52 | 72 |
| 4 | MP1 | Z | 32.63 | 72 |
| 5 | MP1 | X | 35.44 | 12 |
| 6 | MP1 | Z | 20.46 | 12 |
| 7 | MP1 | X | 32.44 | 12 |
| 8 | MP1 | Z | 18.73 | 12 |
| 9 | S2 | X | 32.47 | 12 |
| 10 | S2 | Z | 18.74 | 12 |
| 11 | MP4 | X | 102.65 | 0 |
| 12 | MP4 | Z | 59.27 | 0 |
| 13 | MP4 | X | 102.65 | 72 |
| 14 | MP4 | Z | 59.27 | 72 |
| 15 | MP4 | X | 50.33 | 12 |
| 16 | MP4 | Z | 29.06 | 12 |
| 17 | MP4 | X | 50.33 | 12 |
| 18 | MP4 | Z | 29.06 | 12 |
| 19 | MP7 | X | 56.52 | 0 |
| 20 | MP7 | Z | 32.63 | 0 |
| 21 | MP7 | X | 56.52 | 72 |
| 22 | MP7 | Z | 32.63 | 72 |
| 23 | MP7 | X | 35.44 | 12 |
| 24 | MP7 | Z | 20.46 | 12 |
| 25 | MP7 | X | 32.44 | 12 |
| 26 | MP7 | Z | 18.73 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | 47.5 | 0 |
| 2 | MP1 | Z | 0 | 0 |
| 3 | MP1 | X | 47.5 | 72 |
| 4 | MP1 | Z | 0 | 72 |
| 5 | MP1 | X | 35.19 | 12 |
| 6 | MP1 | Z | 0 | 12 |
| 7 | MP1 | X | 30.57 | 12 |
| 8 | MP1 | Z | 0 | 12 |
| 9 | S2 | X | 31.57 | 12 |
| 10 | S2 | Z | 0 | 12 |
| 11 | MP4 | X | 100.77 | 0 |
| 12 | MP4 | Z | 0 | 0 |
| 13 | MP4 | X | 100.77 | 72 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 14 | MP4 | Z | 0 | 72 |
| 15 | MP4 | X | 52.38 | 12 |
| 16 | MP4 | Z | 0 | 12 |
| 17 | MP4 | X | 51.23 | 12 |
| 18 | MP4 | Z | 0 | 12 |
| 19 | MP7 | X | 100.77 | 0 |
| 20 | MP7 | Z | 0 | 0 |
| 21 | MP7 | X | 100.77 | 72 |
| 22 | MP7 | Z | 0 | 72 |
| 23 | MP7 | X | 52.38 | 12 |
| 24 | MP7 | Z | 0 | 12 |
| 25 | MP7 | X | 51.23 | 12 |
| 26 | MP7 | Z | 0 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | 56.52 | 0 |
| 2 | MP1 | Z | -32.63 | 0 |
| 3 | MP1 | X | 56.52 | 72 |
| 4 | MP1 | Z | -32.63 | 72 |
| 5 | MP1 | X | 35.44 | 12 |
| 6 | MP1 | Z | -20.46 | 12 |
| 7 | MP1 | X | 32.44 | 12 |
| 8 | MP1 | Z | -18.73 | 12 |
| 9 | S2 | X | 32.47 | 12 |
| 10 | S2 | Z | -18.74 | 12 |
| 11 | MP4 | X | 56.52 | 0 |
| 12 | MP4 | Z | -32.63 | 0 |
| 13 | MP4 | X | 56.52 | 72 |
| 14 | MP4 | Z | -32.63 | 72 |
| 15 | MP4 | X | 35.44 | 12 |
| 16 | MP4 | Z | -20.46 | 12 |
| 17 | MP4 | X | 32.44 | 12 |
| 18 | MP4 | Z | -18.73 | 12 |
| 19 | MP7 | X | 102.65 | 0 |
| 20 | MP7 | Z | -59.27 | 0 |
| 21 | MP7 | X | 102.65 | 72 |
| 22 | MP7 | Z | -59.27 | 72 |
| 23 | MP7 | X | 50.33 | 12 |
| 24 | MP7 | Z | -29.06 | 12 |
| 25 | MP7 | X | 50.33 | 12 |
| 26 | MP7 | Z | -29.06 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | 50.39 | 0 |
| 2 | MP1 | Z | -87.27 | 0 |
| 3 | MP1 | X | 50.39 | 72 |
| 4 | MP1 | Z | -87.27 | 72 |
| 5 | MP1 | X | 26.19 | 12 |
| 6 | MP1 | Z | -45.36 | 12 |
| 7 | MP1 | X | 25.61 | 12 |
| 8 | MP1 | Z | -44.36 | 12 |
| 9 | S2 | X | 24.66 | 12 |
| 10 | S2 | Z | -42.72 | 12 |
| 11 | MP4 | X | 23.75 | 0 |
| 12 | MP4 | Z | -41.14 | 0 |
| 13 | MP4 | X | 23.75 | 72 |
| 14 | MP4 | Z | -41.14 | 72 |
| 15 | MP4 | X | 17.6 | 12 |
| 16 | MP4 | Z | -30.48 | 12 |
| 17 | MP4 | X | 15.29 | 12 |
| 18 | MP4 | Z | -26.48 | 12 |
| 19 | MP7 | X | 50.39 | 0 |
| 20 | MP7 | Z | -87.27 | 0 |
| 21 | MP7 | X | 50.39 | 72 |
| 22 | MP7 | Z | -87.27 | 72 |
| 23 | MP7 | X | 26.19 | 12 |
| 24 | MP7 | Z | -45.36 | 12 |
| 25 | MP7 | X | 25.61 | 12 |
| 26 | MP7 | Z | -44.36 | 12 |

## Member Point Loads (BLC 16 : Ice Weight)

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | Y | -188.76 | 0 |
| 2 | MP1 | Y | -188.76 | 72 |
| 3 | MP1 | Y | -101.499 | 12 |
| 4 | MP1 | Y | -95.515 | 12 |
| 5 | S2 | Y | -93.243 | 12 |
| 6 | MP4 | Y | -188.76 | 0 |
| 7 | MP4 | Y | -188.76 | 72 |
| 8 | MP4 | Y | -101.499 | 12 |
| 9 | MP4 | Y | -95.515 | 12 |
| 10 | MP7 | Y | -188.76 | 0 |
| 11 | MP7 | Y | -188.76 | 72 |
| 12 | MP7 | Y | -101.499 | 12 |
| 13 | MP7 | Y | -95.515 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | 0 | 0 |
| 2 | MP1 | Z | -17.11 | 0 |
| 3 | MP1 | X | 0 | 72 |
| 4 | MP1 | Z | -17.11 | 72 |
| 5 | MP1 | X | 0 | 12 |
| 6 | MP1 | Z | -6.97 | 12 |
| 7 | MP1 | X | 0 | 12 |
| 8 | MP1 | Z | -6.97 | 12 |
| 9 | S2 | X | 0 | 12 |
| 10 | S2 | Z | -6.87 | 12 |
| 11 | MP4 | X | 0 | 0 |
| 12 | MP4 | Z | -13.19 | 0 |
| 13 | MP4 | X | 0 | 72 |
| 14 | MP4 | Z | -13.19 | 72 |
| 15 | MP4 | X | 0 | 12 |
| 16 | MP4 | Z | -6.08 | 12 |
| 17 | MP4 | X | 0 | 12 |
| 18 | MP4 | Z | -5.88 | 12 |
| 19 | MP7 | X | 0 | 0 |
| 20 | MP7 | Z | -13.19 | 0 |
| 21 | MP7 | X | 0 | 72 |
| 22 | MP7 | Z | -13.19 | 72 |
| 23 | MP7 | X | 0 | 12 |
| 24 | MP7 | Z | -6.08 | 12 |
| 25 | MP7 | X | 0 | 12 |
| 26 | MP7 | Z | -5.88 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | -7.9 | 0 |
| 2 | MP1 | Z | -13.69 | 0 |
| 3 | MP1 | X | -7.9 | 72 |
| 4 | MP1 | Z | -13.69 | 72 |
| 5 | MP1 | X | -3.34 | 12 |
| 6 | MP1 | Z | -5.78 | 12 |
| 7 | MP1 | X | -3.3 | 12 |
| 8 | MP1 | Z | -5.72 | 12 |
| 9 | S2 | X | -3.28 | 12 |
| 10 | S2 | Z | -5.68 | 12 |
| 11 | MP4 | X | -7.9 | 0 |
| 12 | MP4 | Z | -13.69 | 0 |
| 13 | MP4 | X | -7.9 | 72 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 14 | MP4 | Z | -13.69 | 72 |
| 15 | MP4 | X | -3.34 | 12 |
| 16 | MP4 | Z | -5.78 | 12 |
| 17 | MP4 | X | -3.3 | 12 |
| 18 | MP4 | Z | -5.72 | 12 |
| 19 | MP7 | X | -5.94 | 0 |
| 20 | MP7 | Z | -10.29 | 0 |
| 21 | MP7 | X | -5.94 | 72 |
| 22 | MP7 | Z | -10.29 | 72 |
| 23 | MP7 | X | -2.89 | 12 |
| 24 | MP7 | Z | -5 | 12 |
| 25 | MP7 | X | -2.76 | 12 |
| 26 | MP7 | Z | -4.77 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | -11.42 | 0 |
| 2 | MP1 | Z | -6.6 | 0 |
| 3 | MP1 | X | -11.42 | 72 |
| 4 | MP1 | Z | -6.6 | 72 |
| 5 | MP1 | X | -5.26 | 12 |
| 6 | MP1 | Z | -3.04 | 12 |
| 7 | MP1 | X | -5.09 | 12 |
| 8 | MP1 | Z | -2.94 | 12 |
| 9 | S2 | X | -5.13 | 12 |
| 10 | S2 | Z | -2.96 | 12 |
| 11 | MP4 | X | -14.82 | 0 |
| 12 | MP4 | Z | -8.56 | 0 |
| 13 | MP4 | X | -14.82 | 72 |
| 14 | MP4 | Z | -8.56 | 72 |
| 15 | MP4 | X | -6.04 | 12 |
| 16 | MP4 | Z | -3.49 | 12 |
| 17 | MP4 | X | -6.04 | 12 |
| 18 | MP4 | Z | -3.49 | 12 |
| 19 | MP7 | X | -11.42 | 0 |
| 20 | MP7 | Z | -6.6 | 0 |
| 21 | MP7 | X | -11.42 | 72 |
| 22 | MP7 | Z | -6.6 | 72 |
| 23 | MP7 | X | -5.26 | 12 |
| 24 | MP7 | Z | -3.04 | 12 |
| 25 | MP7 | X | -5.09 | 12 |
| 26 | MP7 | Z | -2.94 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | -11.88 | 0 |
| 2 | MP1 | Z | 0 | 0 |
| 3 | MP1 | X | -11.88 | 72 |
| 4 | MP1 | Z | 0 | 72 |
| 5 | MP1 | X | -5.78 | 12 |
| 6 | MP1 | Z | 0 | 12 |
| 7 | MP1 | X | -5.51 | 12 |
| 8 | MP1 | Z | 0 | 12 |
| 9 | S2 | X | -5.61 | 12 |
| 10 | S2 | Z | 0 | 12 |
| 11 | MP4 | X | -15.8 | 0 |
| 12 | MP4 | Z | 0 | 0 |
| 13 | MP4 | X | -15.8 | 72 |
| 14 | MP4 | Z | 0 | 72 |
| 15 | MP4 | X | -6.67 | 12 |
| 16 | MP4 | Z | 0 | 12 |
| 17 | MP4 | X | -6.61 | 12 |
| 18 | MP4 | Z | 0 | 12 |
| 19 | MP7 | X | -15.8 | 0 |
| 20 | MP7 | Z | 0 | 0 |
| 21 | MP7 | X | -15.8 | 72 |
| 22 | MP7 | Z | 0 | 72 |
| 23 | MP7 | X | -6.67 | 12 |
| 24 | MP7 | Z | 0 | 12 |
| 25 | MP7 | X | -6.61 | 12 |
| 26 | MP7 | Z | 0 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | -11.42 | 0 |
| 2 | MP1 | Z | 6.6 | 0 |
| 3 | MP1 | X | -11.42 | 72 |
| 4 | MP1 | Z | 6.6 | 72 |
| 5 | MP1 | X | -5.26 | 12 |
| 6 | MP1 | Z | 3.04 | 12 |
| 7 | MP1 | X | -5.09 | 12 |
| 8 | MP1 | Z | 2.94 | 12 |
| 9 | S2 | X | -5.13 | 12 |
| 10 | S2 | Z | 2.96 | 12 |
| 11 | MP4 | X | -11.42 | 0 |
| 12 | MP4 | Z | 6.6 | 0 |
| 13 | MP4 | X | -11.42 | 72 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 14 | MP4 | Z | 6.6 | 72 |
| 15 | MP4 | X | -5.26 | 12 |
| 16 | MP4 | Z | 3.04 | 12 |
| 17 | MP4 | X | -5.09 | 12 |
| 18 | MP4 | Z | 2.94 | 12 |
| 19 | MP7 | X | -14.82 | 0 |
| 20 | MP7 | Z | 8.56 | 0 |
| 21 | MP7 | X | -14.82 | 72 |
| 22 | MP7 | Z | 8.56 | 72 |
| 23 | MP7 | X | -6.04 | 12 |
| 24 | MP7 | Z | 3.49 | 12 |
| 25 | MP7 | X | -6.04 | 12 |
| 26 | MP7 | Z | 3.49 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | -7.9 | 0 |
| 2 | MP1 | Z | 13.69 | 0 |
| 3 | MP1 | X | -7.9 | 72 |
| 4 | MP1 | Z | 13.69 | 72 |
| 5 | MP1 | X | -3.34 | 12 |
| 6 | MP1 | Z | 5.78 | 12 |
| 7 | MP1 | X | -3.3 | 12 |
| 8 | MP1 | Z | 5.72 | 12 |
| 9 | S2 | X | -3.28 | 12 |
| 10 | S2 | Z | 5.68 | 12 |
| 11 | MP4 | X | -5.94 | 0 |
| 12 | MP4 | Z | 10.29 | 0 |
| 13 | MP4 | X | -5.94 | 72 |
| 14 | MP4 | Z | 10.29 | 72 |
| 15 | MP4 | X | -2.89 | 12 |
| 16 | MP4 | Z | 5 | 12 |
| 17 | MP4 | X | -2.76 | 12 |
| 18 | MP4 | Z | 4.77 | 12 |
| 19 | MP7 | X | -7.9 | 0 |
| 20 | MP7 | Z | 13.69 | 0 |
| 21 | MP7 | X | -7.9 | 72 |
| 22 | MP7 | Z | 13.69 | 72 |
| 23 | MP7 | X | -3.34 | 12 |
| 24 | MP7 | Z | 5.78 | 12 |
| 25 | MP7 | X | -3.3 | 12 |
| 26 | MP7 | Z | 5.72 | 12 |

## 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 | 17.11 | 0 |
| 3 | MP1 | X | 0 | 72 |
| 4 | MP1 | Z | 17.11 | 72 |
| 5 | MP1 | X | 0 | 12 |
| 6 | MP1 | Z | 6.97 | 12 |
| 7 | MP1 | X | 0 | 12 |
| 8 | MP1 | Z | 6.97 | 12 |
| 9 | S2 | X | 0 | 12 |
| 10 | S2 | Z | 6.87 | 12 |
| 11 | MP4 | X | 0 | 0 |
| 12 | MP4 | Z | 13.19 | 0 |
| 13 | MP4 | X | 0 | 72 |
| 14 | MP4 | Z | 13.19 | 72 |
| 15 | MP4 | X | 0 | 12 |
| 16 | MP4 | Z | 6.08 | 12 |
| 17 | MP4 | X | 0 | 12 |
| 18 | MP4 | Z | 5.88 | 12 |
| 19 | MP7 | X | 0 | 0 |
| 20 | MP7 | Z | 13.19 | 0 |
| 21 | MP7 | X | 0 | 72 |
| 22 | MP7 | Z | 13.19 | 72 |
| 23 | MP7 | X | 0 | 12 |
| 24 | MP7 | Z | 6.08 | 12 |
| 25 | MP7 | X | 0 | 12 |
| 26 | MP7 | Z | 5.88 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | 7.9 | 0 |
| 2 | MP1 | Z | 13.69 | 0 |
| 3 | MP1 | X | 7.9 | 72 |
| 4 | MP1 | Z | 13.69 | 72 |
| 5 | MP1 | X | 3.34 | 12 |
| 6 | MP1 | Z | 5.78 | 12 |
| 7 | MP1 | X | 3.3 | 12 |
| 8 | MP1 | Z | 5.72 | 12 |
| 9 | S2 | X | 3.28 | 12 |
| 10 | S2 | Z | 5.68 | 12 |
| 11 | MP4 | X | 7.9 | 0 |
| 12 | MP4 | Z | 13.69 | 0 |
| 13 | MP4 | X | 7.9 | 72 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 14 | MP4 | Z | 13.69 | 72 |
| 15 | MP4 | X | 3.34 | 12 |
| 16 | MP4 | Z | 5.78 | 12 |
| 17 | MP4 | X | 3.3 | 12 |
| 18 | MP4 | Z | 5.72 | 12 |
| 19 | MP7 | X | 5.94 | 0 |
| 20 | MP7 | Z | 10.29 | 0 |
| 21 | MP7 | X | 5.94 | 72 |
| 22 | MP7 | Z | 10.29 | 72 |
| 23 | MP7 | X | 2.89 | 12 |
| 24 | MP7 | Z | 5 | 12 |
| 25 | MP7 | X | 2.76 | 12 |
| 26 | MP7 | Z | 4.77 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | 11.42 | 0 |
| 2 | MP1 | Z | 6.6 | 0 |
| 3 | MP1 | X | 11.42 | 72 |
| 4 | MP1 | Z | 6.6 | 72 |
| 5 | MP1 | X | 5.26 | 12 |
| 6 | MP1 | Z | 3.04 | 12 |
| 7 | MP1 | X | 5.09 | 12 |
| 8 | MP1 | Z | 2.94 | 12 |
| 9 | S2 | X | 5.13 | 12 |
| 10 | S2 | Z | 2.96 | 12 |
| 11 | MP4 | X | 14.82 | 0 |
| 12 | MP4 | Z | 8.56 | 0 |
| 13 | MP4 | X | 14.82 | 72 |
| 14 | MP4 | Z | 8.56 | 72 |
| 15 | MP4 | X | 6.04 | 12 |
| 16 | MP4 | Z | 3.49 | 12 |
| 17 | MP4 | X | 6.04 | 12 |
| 18 | MP4 | Z | 3.49 | 12 |
| 19 | MP7 | X | 11.42 | 0 |
| 20 | MP7 | Z | 6.6 | 0 |
| 21 | MP7 | X | 11.42 | 72 |
| 22 | MP7 | Z | 6.6 | 72 |
| 23 | MP7 | X | 5.26 | 12 |
| 24 | MP7 | Z | 3.04 | 12 |
| 25 | MP7 | X | 5.09 | 12 |
| 26 | MP7 | Z | 2.94 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | 11.88 | 0 |
| 2 | MP1 | Z | 0 | 0 |
| 3 | MP1 | X | 11.88 | 72 |
| 4 | MP1 | Z | 0 | 72 |
| 5 | MP1 | X | 5.78 | 12 |
| 6 | MP1 | Z | 0 | 12 |
| 7 | MP1 | X | 5.51 | 12 |
| 8 | MP1 | Z | 0 | 12 |
| 9 | S2 | X | 5.61 | 12 |
| 10 | S2 | Z | 0 | 12 |
| 11 | MP4 | X | 15.8 | 0 |
| 12 | MP4 | Z | 0 | 0 |
| 13 | MP4 | X | 15.8 | 72 |
| 14 | MP4 | Z | 0 | 72 |
| 15 | MP4 | X | 6.67 | 12 |
| 16 | MP4 | Z | 0 | 12 |
| 17 | MP4 | X | 6.61 | 12 |
| 18 | MP4 | Z | 0 | 12 |
| 19 | MP7 | X | 15.8 | 0 |
| 20 | MP7 | Z | 0 | 0 |
| 21 | MP7 | X | 15.8 | 72 |
| 22 | MP7 | Z | 0 | 72 |
| 23 | MP7 | X | 6.67 | 12 |
| 24 | MP7 | Z | 0 | 12 |
| 25 | MP7 | X | 6.61 | 12 |
| 26 | MP7 | Z | 0 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | 11.42 | 0 |
| 2 | MP1 | Z | -6.6 | 0 |
| 3 | MP1 | X | 11.42 | 72 |
| 4 | MP1 | Z | -6.6 | 72 |
| 5 | MP1 | X | 5.26 | 12 |
| 6 | MP1 | Z | -3.04 | 12 |
| 7 | MP1 | X | 5.09 | 12 |
| 8 | MP1 | Z | -2.94 | 12 |
| 9 | S2 | X | 5.13 | 12 |
| 10 | S2 | Z | -2.96 | 12 |
| 11 | MP4 | X | 11.42 | 0 |
| 12 | MP4 | Z | -6.6 | 0 |
| 13 | MP4 | X | 11.42 | 72 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 14 | MP4 | Z | -6.6 | 72 |
| 15 | MP4 | X | 5.26 | 12 |
| 16 | MP4 | Z | -3.04 | 12 |
| 17 | MP4 | X | 5.09 | 12 |
| 18 | MP4 | Z | -2.94 | 12 |
| 19 | MP7 | X | 14.82 | 0 |
| 20 | MP7 | Z | -8.56 | 0 |
| 21 | MP7 | X | 14.82 | 72 |
| 22 | MP7 | Z | -8.56 | 72 |
| 23 | MP7 | X | 6.04 | 12 |
| 24 | MP7 | Z | -3.49 | 12 |
| 25 | MP7 | X | 6.04 | 12 |
| 26 | MP7 | Z | -3.49 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | 7.9 | 0 |
| 2 | MP1 | Z | -13.69 | 0 |
| 3 | MP1 | X | 7.9 | 72 |
| 4 | MP1 | Z | -13.69 | 72 |
| 5 | MP1 | X | 3.34 | 12 |
| 6 | MP1 | Z | -5.78 | 12 |
| 7 | MP1 | X | 3.3 | 12 |
| 8 | MP1 | Z | -5.72 | 12 |
| 9 | S2 | X | 3.28 | 12 |
| 10 | S2 | Z | -5.68 | 12 |
| 11 | MP4 | X | 5.94 | 0 |
| 12 | MP4 | Z | -10.29 | 0 |
| 13 | MP4 | X | 5.94 | 72 |
| 14 | MP4 | Z | -10.29 | 72 |
| 15 | MP4 | X | 2.89 | 12 |
| 16 | MP4 | Z | -5 | 12 |
| 17 | MP4 | X | 2.76 | 12 |
| 18 | MP4 | Z | -4.77 | 12 |
| 19 | MP7 | X | 7.9 | 0 |
| 20 | MP7 | Z | -13.69 | 0 |
| 21 | MP7 | X | 7.9 | 72 |
| 22 | MP7 | Z | -13.69 | 72 |
| 23 | MP7 | X | 3.34 | 12 |
| 24 | MP7 | Z | -5.78 | 12 |
| 25 | MP7 | X | 3.3 | 12 |
| 26 | MP7 | Z | -5.72 | 12 |

## Member Point Loads (BLC 31 : Seismic Load Z)

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | Z | -9.288 | 0 |
| 2 | MP1 | Z | -9.288 | 72 |
| 3 | MP1 | Z | -21.586 | 12 |
| 4 | MP1 | Z | -18.412 | 12 |
| 5 | S2 | Z | -6.293 | 12 |
| 6 | MP4 | Z | -9.288 | 0 |
| 7 | MP4 | Z | -9.288 | 72 |
| 8 | MP4 | Z | -21.586 | 12 |
| 9 | MP4 | Z | -18.412 | 12 |
| 10 | MP7 | Z | -9.288 | 0 |
| 11 | MP7 | Z | -9.288 | 72 |
| 12 | MP7 | Z | -21.586 | 12 |
| 13 | MP7 | Z | -18.412 | 12 |

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

| | Member Label | Direction | Magnitude[lb,lb-ft] | Location[in,%] |
|---|---|---|---|---|
| 1 | MP1 | X | -9.288 | 0 |
| 2 | MP1 | X | -9.288 | 72 |
| 3 | MP1 | X | -21.586 | 12 |
| 4 | MP1 | X | -18.412 | 12 |
| 5 | S2 | X | -6.293 | 12 |
| 6 | MP4 | X | -9.288 | 0 |
| 7 | MP4 | X | -9.288 | 72 |
| 8 | MP4 | X | -21.586 | 12 |
| 9 | MP4 | X | -18.412 | 12 |
| 10 | MP7 | X | -9.288 | 0 |
| 11 | MP7 | X | -9.288 | 72 |
| 12 | MP7 | X | -21.586 | 12 |
| 13 | MP7 | X | -18.412 | 12 |

## 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 | N72B | L | Y | -250 |
| 2 | N129B | L | Y | -250 |
| 3 | N135A | 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 | N70A | 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 | N69A | 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 | N76 | L | Y | -500 |

### Joint Loads and Enforced Displacements (BLC 37 : Maintenance Load 4)

| | Joint Label | L,D,M | Direction | Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)] |
|---|---|---|---|---|
| 1 | N94 | L | Y | -500 |

### Joint Loads and Enforced Displacements (BLC 38 : Maintenance Load 5)

| | Joint Label | L,D,M | Direction | Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)] |
|---|---|---|---|---|
| 1 | N93 | L | Y | -500 |

### Joint Loads and Enforced Displacements (BLC 39 : Maintenance Load 6)

| | Joint Label | L,D,M | Direction | Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)] |
|---|---|---|---|---|
| 1 | N122 | L | Y | -500 |

### Joint Loads and Enforced Displacements (BLC 40 : Maintenance Load 7)

| | Joint Label | L,D,M | Direction | Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)] |
|---|---|---|---|---|
| 1 | N121 | L | Y | -500 |

### Joint Loads and Enforced Displacements (BLC 41 : Maintenance Load 8)

| | Joint Label | L,D,M | Direction | Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)] |
|---|---|---|---|---|
| 1 | N133B | L | Y | -500 |

### Joint Loads and Enforced Displacements (BLC 42 : Maintenance Load 9)

| | Joint Label | L,D,M | Direction | Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)] |
|---|---|---|---|---|
| 1 | N139 | 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 | -65.769 | -65.769 | 0 | %100 |
| 2 | GA4 | SZ | -65.769 | -65.769 | 0 | %100 |
| 3 | GA3 | SZ | -65.769 | -65.769 | 0 | %100 |
| 4 | P3 | SZ | -65.769 | -65.769 | 0 | %100 |
| 5 | S2 | SZ | -65.769 | -65.769 | 0 | %100 |
| 6 | GA2 | SZ | -65.769 | -65.769 | 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,%] |
|---|---|---|---|---|---|---|
| 7 | GA1 | SZ | -65.769 | -65.769 | 0 | %100 |
| 8 | P2 | SZ | -65.769 | -65.769 | 0 | %100 |
| 9 | S1 | SZ | -65.769 | -65.769 | 0 | %100 |
| 10 | GA6 | SZ | -65.769 | -65.769 | 0 | %100 |
| 11 | GA5 | SZ | -65.769 | -65.769 | 0 | %100 |
| 12 | P1 | SZ | -65.769 | -65.769 | 0 | %100 |
| 13 | H1 | SZ | -39.462 | -39.462 | 0 | %100 |
| 14 | MP1 | SZ | -39.462 | -39.462 | 0 | %100 |
| 15 | MP3 | SZ | -39.462 | -39.462 | 0 | %100 |
| 16 | HR1 | SZ | -39.462 | -39.462 | 0 | %100 |
| 17 | CA8 | SZ | -65.769 | -65.769 | 0 | %100 |
| 18 | CA9 | SZ | -65.769 | -65.769 | 0 | %100 |
| 19 | CA7 | SZ | -65.769 | -65.769 | 0 | %100 |
| 20 | M32 | SZ | 0 | 0 | 0 | %100 |
| 21 | M35 | SZ | 0 | 0 | 0 | %100 |
| 22 | M36 | SZ | 0 | 0 | 0 | %100 |
| 23 | M39A | SZ | 0 | 0 | 0 | %100 |
| 24 | CA3 | SZ | -65.769 | -65.769 | 0 | %100 |
| 25 | CA4 | SZ | -65.769 | -65.769 | 0 | %100 |
| 26 | CA1 | SZ | -65.769 | -65.769 | 0 | %100 |
| 27 | CA2 | SZ | -65.769 | -65.769 | 0 | %100 |
| 28 | CA5 | SZ | -65.769 | -65.769 | 0 | %100 |
| 29 | CA6 | SZ | -65.769 | -65.769 | 0 | %100 |
| 30 | M64 | SZ | 0 | 0 | 0 | %100 |
| 31 | M65 | SZ | 0 | 0 | 0 | %100 |
| 32 | M66 | SZ | 0 | 0 | 0 | %100 |
| 33 | M67 | SZ | 0 | 0 | 0 | %100 |
| 34 | M68 | SZ | 0 | 0 | 0 | %100 |
| 35 | M69 | SZ | 0 | 0 | 0 | %100 |
| 36 | M70 | SZ | 0 | 0 | 0 | %100 |
| 37 | M71 | SZ | 0 | 0 | 0 | %100 |
| 38 | M72 | SZ | 0 | 0 | 0 | %100 |
| 39 | M73 | SZ | 0 | 0 | 0 | %100 |
| 40 | M74 | SZ | 0 | 0 | 0 | %100 |
| 41 | M75 | SZ | -65.769 | -65.769 | 0 | %100 |
| 42 | MP2 | SZ | -39.462 | -39.462 | 0 | %100 |
| 43 | M43 | SZ | 0 | 0 | 0 | %100 |
| 44 | M44 | SZ | 0 | 0 | 0 | %100 |
| 45 | H3 | SZ | -39.462 | -39.462 | 0 | %100 |
| 46 | MP7 | SZ | -39.462 | -39.462 | 0 | %100 |
| 47 | MP9 | SZ | -39.462 | -39.462 | 0 | %100 |
| 48 | HR3 | SZ | -39.462 | -39.462 | 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,%] |
|---|---|---|---|---|---|---|
| 49 | M52 | SZ | 0 | 0 | 0 | %100 |
| 50 | M53 | SZ | 0 | 0 | 0 | %100 |
| 51 | M54 | SZ | 0 | 0 | 0 | %100 |
| 52 | M55 | SZ | 0 | 0 | 0 | %100 |
| 53 | H2 | SZ | -39.462 | -39.462 | 0 | %100 |
| 54 | MP4 | SZ | -39.462 | -39.462 | 0 | %100 |
| 55 | MP6 | SZ | -39.462 | -39.462 | 0 | %100 |
| 56 | HR2 | SZ | -39.462 | -39.462 | 0 | %100 |
| 57 | M66A | SZ | 0 | 0 | 0 | %100 |
| 58 | M67A | SZ | 0 | 0 | 0 | %100 |
| 59 | M68A | SZ | 0 | 0 | 0 | %100 |
| 60 | M69A | SZ | 0 | 0 | 0 | %100 |
| 61 | MP8 | SZ | -39.462 | -39.462 | 0 | %100 |
| 62 | M68B | SZ | 0 | 0 | 0 | %100 |
| 63 | M69B | SZ | 0 | 0 | 0 | %100 |
| 64 | MP5 | SZ | -39.462 | -39.462 | 0 | %100 |
| 65 | M71B | SZ | 0 | 0 | 0 | %100 |
| 66 | M72B | 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 | -65.769 | -65.769 | 0 | %100 |
| 2 | GA4 | SX | -65.769 | -65.769 | 0 | %100 |
| 3 | GA3 | SX | -65.769 | -65.769 | 0 | %100 |
| 4 | P3 | SX | -65.769 | -65.769 | 0 | %100 |
| 5 | S2 | SX | -65.769 | -65.769 | 0 | %100 |
| 6 | GA2 | SX | -65.769 | -65.769 | 0 | %100 |
| 7 | GA1 | SX | -65.769 | -65.769 | 0 | %100 |
| 8 | P2 | SX | -65.769 | -65.769 | 0 | %100 |
| 9 | S1 | SX | -65.769 | -65.769 | 0 | %100 |
| 10 | GA6 | SX | -65.769 | -65.769 | 0 | %100 |
| 11 | GA5 | SX | -65.769 | -65.769 | 0 | %100 |
| 12 | P1 | SX | -65.769 | -65.769 | 0 | %100 |
| 13 | H1 | SX | -39.462 | -39.462 | 0 | %100 |
| 14 | MP1 | SX | -39.462 | -39.462 | 0 | %100 |
| 15 | MP3 | SX | -39.462 | -39.462 | 0 | %100 |
| 16 | HR1 | SX | -39.462 | -39.462 | 0 | %100 |
| 17 | CA8 | SX | -65.769 | -65.769 | 0 | %100 |
| 18 | CA9 | SX | -65.769 | -65.769 | 0 | %100 |
| 19 | CA7 | SX | -65.769 | -65.769 | 0 | %100 |
| 20 | M32 | SX | 0 | 0 | 0 | %100 |
| 21 | M35 | SX | 0 | 0 | 0 | %100 |

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

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magn... | Start Location... | End Location[in,%] |
|---|---|---|---|---|---|---|
| 22 | M36 | SX | 0 | 0 | 0 | %100 |
| 23 | M39A | SX | 0 | 0 | 0 | %100 |
| 24 | CA3 | SX | -65.769 | -65.769 | 0 | %100 |
| 25 | CA4 | SX | -65.769 | -65.769 | 0 | %100 |
| 26 | CA1 | SX | -65.769 | -65.769 | 0 | %100 |
| 27 | CA2 | SX | -65.769 | -65.769 | 0 | %100 |
| 28 | CA5 | SX | -65.769 | -65.769 | 0 | %100 |
| 29 | CA6 | SX | -65.769 | -65.769 | 0 | %100 |
| 30 | M64 | SX | 0 | 0 | 0 | %100 |
| 31 | M65 | SX | 0 | 0 | 0 | %100 |
| 32 | M66 | SX | 0 | 0 | 0 | %100 |
| 33 | M67 | SX | 0 | 0 | 0 | %100 |
| 34 | M68 | SX | 0 | 0 | 0 | %100 |
| 35 | M69 | SX | 0 | 0 | 0 | %100 |
| 36 | M70 | SX | 0 | 0 | 0 | %100 |
| 37 | M71 | SX | 0 | 0 | 0 | %100 |
| 38 | M72 | SX | 0 | 0 | 0 | %100 |
| 39 | M73 | SX | 0 | 0 | 0 | %100 |
| 40 | M74 | SX | 0 | 0 | 0 | %100 |
| 41 | M75 | SX | -65.769 | -65.769 | 0 | %100 |
| 42 | MP2 | SX | -39.462 | -39.462 | 0 | %100 |
| 43 | M43 | SX | 0 | 0 | 0 | %100 |
| 44 | M44 | SX | 0 | 0 | 0 | %100 |
| 45 | H3 | SX | -39.462 | -39.462 | 0 | %100 |
| 46 | MP7 | SX | -39.462 | -39.462 | 0 | %100 |
| 47 | MP9 | SX | -39.462 | -39.462 | 0 | %100 |
| 48 | HR3 | SX | -39.462 | -39.462 | 0 | %100 |
| 49 | M52 | SX | 0 | 0 | 0 | %100 |
| 50 | M53 | SX | 0 | 0 | 0 | %100 |
| 51 | M54 | SX | 0 | 0 | 0 | %100 |
| 52 | M55 | SX | 0 | 0 | 0 | %100 |
| 53 | H2 | SX | -39.462 | -39.462 | 0 | %100 |
| 54 | MP4 | SX | -39.462 | -39.462 | 0 | %100 |
| 55 | MP6 | SX | -39.462 | -39.462 | 0 | %100 |
| 56 | HR2 | SX | -39.462 | -39.462 | 0 | %100 |
| 57 | M66A | SX | 0 | 0 | 0 | %100 |
| 58 | M67A | SX | 0 | 0 | 0 | %100 |
| 59 | M68A | SX | 0 | 0 | 0 | %100 |
| 60 | M69A | SX | 0 | 0 | 0 | %100 |
| 61 | MP8 | SX | -39.462 | -39.462 | 0 | %100 |
| 62 | M68B | SX | 0 | 0 | 0 | %100 |
| 63 | M69B | SX | 0 | 0 | 0 | %100 |

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

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magn... | Start Location... | End Location[in,%] |
|---|---|---|---|---|---|---|
| 64 | MP5 | SX | -39.462 | -39.462 | 0 | %100 |
| 65 | M71B | SX | 0 | 0 | 0 | %100 |
| 66 | M72B | 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 | -21.223 | -21.223 | 0 | %100 |
| 2 | GA4 | Y | -13.592 | -13.592 | 0 | %100 |
| 3 | GA3 | Y | -13.592 | -13.592 | 0 | %100 |
| 4 | P3 | Y | -23.528 | -23.528 | 0 | %100 |
| 5 | S2 | Y | -21.223 | -21.223 | 0 | %100 |
| 6 | GA2 | Y | -13.592 | -13.592 | 0 | %100 |
| 7 | GA1 | Y | -13.592 | -13.592 | 0 | %100 |
| 8 | P2 | Y | -23.528 | -23.528 | 0 | %100 |
| 9 | S1 | Y | -21.223 | -21.223 | 0 | %100 |
| 10 | GA6 | Y | -13.592 | -13.592 | 0 | %100 |
| 11 | GA5 | Y | -13.592 | -13.592 | 0 | %100 |
| 12 | P1 | Y | -23.528 | -23.528 | 0 | %100 |
| 13 | H1 | Y | -15.404 | -15.404 | 0 | %100 |
| 14 | MP1 | Y | -13.717 | -13.717 | 0 | %100 |
| 15 | MP3 | Y | -13.717 | -13.717 | 0 | %100 |
| 16 | HR1 | Y | -13.731 | -13.731 | 0 | %100 |
| 17 | CA8 | Y | -27.453 | -27.453 | 0 | %100 |
| 18 | CA9 | Y | -27.453 | -27.453 | 0 | %100 |
| 19 | CA7 | Y | -27.453 | -27.453 | 0 | %100 |
| 20 | M32 | Y | -5.96 | -5.96 | 0 | %100 |
| 21 | M35 | Y | -5.96 | -5.96 | 0 | %100 |
| 22 | M36 | Y | -5.96 | -5.96 | 0 | %100 |
| 23 | M39A | Y | -5.96 | -5.96 | 0 | %100 |
| 24 | CA3 | Y | -16.64 | -16.64 | 0 | %100 |
| 25 | CA4 | Y | -16.64 | -16.64 | 0 | %100 |
| 26 | CA1 | Y | -16.64 | -16.64 | 0 | %100 |
| 27 | CA2 | Y | -16.64 | -16.64 | 0 | %100 |
| 28 | CA5 | Y | -16.64 | -16.64 | 0 | %100 |
| 29 | CA6 | Y | -16.64 | -16.64 | 0 | %100 |
| 30 | M64 | Y | -5.96 | -5.96 | 0 | %100 |
| 31 | M65 | Y | -5.96 | -5.96 | 0 | %100 |
| 32 | M66 | Y | -5.96 | -5.96 | 0 | %100 |
| 33 | M67 | Y | -5.96 | -5.96 | 0 | %100 |
| 34 | M68 | Y | -5.96 | -5.96 | 0 | %100 |
| 35 | M69 | Y | -5.96 | -5.96 | 0 | %100 |
| 36 | M70 | Y | -5.96 | -5.96 | 0 | %100 |

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

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magn... | Start Location... | End Location[in,%] |
|---|---|---|---|---|---|---|
| 37 | M71 | Y | -5.96 | -5.96 | 0 | %100 |
| 38 | M72 | Y | -5.96 | -5.96 | 0 | %100 |
| 39 | M73 | Y | -5.96 | -5.96 | 0 | %100 |
| 40 | M74 | Y | -5.96 | -5.96 | 0 | %100 |
| 41 | M75 | Y | -12.508 | -12.508 | 0 | %100 |
| 42 | MP2 | Y | -13.717 | -13.717 | 0 | %100 |
| 43 | M43 | Y | -5.96 | -5.96 | 0 | %100 |
| 44 | M44 | Y | -5.96 | -5.96 | 0 | %100 |
| 45 | H3 | Y | -15.404 | -15.404 | 0 | %100 |
| 46 | MP7 | Y | -13.717 | -13.717 | 0 | %100 |
| 47 | MP9 | Y | -13.717 | -13.717 | 0 | %100 |
| 48 | HR3 | Y | -13.731 | -13.731 | 0 | %100 |
| 49 | M52 | Y | -5.96 | -5.96 | 0 | %100 |
| 50 | M53 | Y | -5.96 | -5.96 | 0 | %100 |
| 51 | M54 | Y | -5.96 | -5.96 | 0 | %100 |
| 52 | M55 | Y | -5.96 | -5.96 | 0 | %100 |
| 53 | H2 | Y | -15.404 | -15.404 | 0 | %100 |
| 54 | MP4 | Y | -13.717 | -13.717 | 0 | %100 |
| 55 | MP6 | Y | -13.717 | -13.717 | 0 | %100 |
| 56 | HR2 | Y | -13.731 | -13.731 | 0 | %100 |
| 57 | M66A | Y | -5.96 | -5.96 | 0 | %100 |
| 58 | M67A | Y | -5.96 | -5.96 | 0 | %100 |
| 59 | M68A | Y | -5.96 | -5.96 | 0 | %100 |
| 60 | M69A | Y | -5.96 | -5.96 | 0 | %100 |
| 61 | MP8 | Y | -13.717 | -13.717 | 0 | %100 |
| 62 | M68B | Y | -5.96 | -5.96 | 0 | %100 |
| 63 | M69B | Y | -5.96 | -5.96 | 0 | %100 |
| 64 | MP5 | Y | -13.717 | -13.717 | 0 | %100 |
| 65 | M71B | Y | -5.96 | -5.96 | 0 | %100 |
| 66 | M72B | Y | -5.96 | -5.96 | 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 | -12.201 | -12.201 | 0 | %100 |
| 2 | GA4 | SZ | -17.55 | -17.55 | 0 | %100 |
| 3 | GA3 | SZ | -17.55 | -17.55 | 0 | %100 |
| 4 | P3 | SZ | -11.499 | -11.499 | 0 | %100 |
| 5 | S2 | SZ | -12.201 | -12.201 | 0 | %100 |
| 6 | GA2 | SZ | -17.55 | -17.55 | 0 | %100 |
| 7 | GA1 | SZ | -17.55 | -17.55 | 0 | %100 |
| 8 | P2 | SZ | -11.499 | -11.499 | 0 | %100 |
| 9 | S1 | SZ | -12.201 | -12.201 | 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,%] |
|---|---|---|---|---|---|---|
| 10 | GA6 | SZ | -17.55 | -17.55 | 0 | %100 |
| 11 | GA5 | SZ | -17.55 | -17.55 | 0 | %100 |
| 12 | P1 | SZ | -11.499 | -11.499 | 0 | %100 |
| 13 | H1 | SZ | -15.497 | -15.497 | 0 | %100 |
| 14 | MP1 | SZ | -17.377 | -17.377 | 0 | %100 |
| 15 | MP3 | SZ | -17.377 | -17.377 | 0 | %100 |
| 16 | HR1 | SZ | -17.359 | -17.359 | 0 | %100 |
| 17 | CA8 | SZ | -10.65 | -10.65 | 0 | %100 |
| 18 | CA9 | SZ | -10.65 | -10.65 | 0 | %100 |
| 19 | CA7 | SZ | -10.65 | -10.65 | 0 | %100 |
| 20 | M32 | SZ | 0 | 0 | 0 | %100 |
| 21 | M35 | SZ | 0 | 0 | 0 | %100 |
| 22 | M36 | SZ | 0 | 0 | 0 | %100 |
| 23 | M39A | SZ | 0 | 0 | 0 | %100 |
| 24 | CA3 | SZ | -14.496 | -14.496 | 0 | %100 |
| 25 | CA4 | SZ | -14.496 | -14.496 | 0 | %100 |
| 26 | CA1 | SZ | -14.496 | -14.496 | 0 | %100 |
| 27 | CA2 | SZ | -14.496 | -14.496 | 0 | %100 |
| 28 | CA5 | SZ | -14.496 | -14.496 | 0 | %100 |
| 29 | CA6 | SZ | -14.496 | -14.496 | 0 | %100 |
| 30 | M64 | SZ | 0 | 0 | 0 | %100 |
| 31 | M65 | SZ | 0 | 0 | 0 | %100 |
| 32 | M66 | SZ | 0 | 0 | 0 | %100 |
| 33 | M67 | SZ | 0 | 0 | 0 | %100 |
| 34 | M68 | SZ | 0 | 0 | 0 | %100 |
| 35 | M69 | SZ | 0 | 0 | 0 | %100 |
| 36 | M70 | SZ | 0 | 0 | 0 | %100 |
| 37 | M71 | SZ | 0 | 0 | 0 | %100 |
| 38 | M72 | SZ | 0 | 0 | 0 | %100 |
| 39 | M73 | SZ | 0 | 0 | 0 | %100 |
| 40 | M74 | SZ | 0 | 0 | 0 | %100 |
| 41 | M75 | SZ | -19.32 | -19.32 | 0 | %100 |
| 42 | MP2 | SZ | -17.377 | -17.377 | 0 | %100 |
| 43 | M43 | SZ | 0 | 0 | 0 | %100 |
| 44 | M44 | SZ | 0 | 0 | 0 | %100 |
| 45 | H3 | SZ | -15.497 | -15.497 | 0 | %100 |
| 46 | MP7 | SZ | -17.377 | -17.377 | 0 | %100 |
| 47 | MP9 | SZ | -17.377 | -17.377 | 0 | %100 |
| 48 | HR3 | SZ | -17.359 | -17.359 | 0 | %100 |
| 49 | M52 | SZ | 0 | 0 | 0 | %100 |
| 50 | M53 | SZ | 0 | 0 | 0 | %100 |
| 51 | M54 | SZ | 0 | 0 | 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,%] |
|---|---|---|---|---|---|---|
| 52 | M55 | SZ | 0 | 0 | 0 | %100 |
| 53 | H2 | SZ | -15.497 | -15.497 | 0 | %100 |
| 54 | MP4 | SZ | -17.377 | -17.377 | 0 | %100 |
| 55 | MP6 | SZ | -17.377 | -17.377 | 0 | %100 |
| 56 | HR2 | SZ | -17.359 | -17.359 | 0 | %100 |
| 57 | M66A | SZ | 0 | 0 | 0 | %100 |
| 58 | M67A | SZ | 0 | 0 | 0 | %100 |
| 59 | M68A | SZ | 0 | 0 | 0 | %100 |
| 60 | M69A | SZ | 0 | 0 | 0 | %100 |
| 61 | MP8 | SZ | -17.377 | -17.377 | 0 | %100 |
| 62 | M68B | SZ | 0 | 0 | 0 | %100 |
| 63 | M69B | SZ | 0 | 0 | 0 | %100 |
| 64 | MP5 | SZ | -17.377 | -17.377 | 0 | %100 |
| 65 | M71B | SZ | 0 | 0 | 0 | %100 |
| 66 | M72B | 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 | -12.201 | -12.201 | 0 | %100 |
| 2 | GA4 | SX | -17.55 | -17.55 | 0 | %100 |
| 3 | GA3 | SX | -17.55 | -17.55 | 0 | %100 |
| 4 | P3 | SX | -11.499 | -11.499 | 0 | %100 |
| 5 | S2 | SX | -12.201 | -12.201 | 0 | %100 |
| 6 | GA2 | SX | -17.55 | -17.55 | 0 | %100 |
| 7 | GA1 | SX | -17.55 | -17.55 | 0 | %100 |
| 8 | P2 | SX | -11.499 | -11.499 | 0 | %100 |
| 9 | S1 | SX | -12.201 | -12.201 | 0 | %100 |
| 10 | GA6 | SX | -17.55 | -17.55 | 0 | %100 |
| 11 | GA5 | SX | -17.55 | -17.55 | 0 | %100 |
| 12 | P1 | SX | -11.499 | -11.499 | 0 | %100 |
| 13 | H1 | SX | -15.497 | -15.497 | 0 | %100 |
| 14 | MP1 | SX | -17.377 | -17.377 | 0 | %100 |
| 15 | MP3 | SX | -17.377 | -17.377 | 0 | %100 |
| 16 | HR1 | SX | -17.359 | -17.359 | 0 | %100 |
| 17 | CA8 | SX | -10.65 | -10.65 | 0 | %100 |
| 18 | CA9 | SX | -10.65 | -10.65 | 0 | %100 |
| 19 | CA7 | SX | -10.65 | -10.65 | 0 | %100 |
| 20 | M32 | SX | 0 | 0 | 0 | %100 |
| 21 | M35 | SX | 0 | 0 | 0 | %100 |
| 22 | M36 | SX | 0 | 0 | 0 | %100 |
| 23 | M39A | SX | 0 | 0 | 0 | %100 |
| 24 | CA3 | SX | -14.496 | -14.496 | 0 | %100 |

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

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magn... | Start Location... | End Location[in,%] |
|---|---|---|---|---|---|---|
| 25 | CA4 | SX | -14.496 | -14.496 | 0 | %100 |
| 26 | CA1 | SX | -14.496 | -14.496 | 0 | %100 |
| 27 | CA2 | SX | -14.496 | -14.496 | 0 | %100 |
| 28 | CA5 | SX | -14.496 | -14.496 | 0 | %100 |
| 29 | CA6 | SX | -14.496 | -14.496 | 0 | %100 |
| 30 | M64 | SX | 0 | 0 | 0 | %100 |
| 31 | M65 | SX | 0 | 0 | 0 | %100 |
| 32 | M66 | SX | 0 | 0 | 0 | %100 |
| 33 | M67 | SX | 0 | 0 | 0 | %100 |
| 34 | M68 | SX | 0 | 0 | 0 | %100 |
| 35 | M69 | SX | 0 | 0 | 0 | %100 |
| 36 | M70 | SX | 0 | 0 | 0 | %100 |
| 37 | M71 | SX | 0 | 0 | 0 | %100 |
| 38 | M72 | SX | 0 | 0 | 0 | %100 |
| 39 | M73 | SX | 0 | 0 | 0 | %100 |
| 40 | M74 | SX | 0 | 0 | 0 | %100 |
| 41 | M75 | SX | -19.32 | -19.32 | 0 | %100 |
| 42 | MP2 | SX | -17.377 | -17.377 | 0 | %100 |
| 43 | M43 | SX | 0 | 0 | 0 | %100 |
| 44 | M44 | SX | 0 | 0 | 0 | %100 |
| 45 | H3 | SX | -15.497 | -15.497 | 0 | %100 |
| 46 | MP7 | SX | -17.377 | -17.377 | 0 | %100 |
| 47 | MP9 | SX | -17.377 | -17.377 | 0 | %100 |
| 48 | HR3 | SX | -17.359 | -17.359 | 0 | %100 |
| 49 | M52 | SX | 0 | 0 | 0 | %100 |
| 50 | M53 | SX | 0 | 0 | 0 | %100 |
| 51 | M54 | SX | 0 | 0 | 0 | %100 |
| 52 | M55 | SX | 0 | 0 | 0 | %100 |
| 53 | H2 | SX | -15.497 | -15.497 | 0 | %100 |
| 54 | MP4 | SX | -17.377 | -17.377 | 0 | %100 |
| 55 | MP6 | SX | -17.377 | -17.377 | 0 | %100 |
| 56 | HR2 | SX | -17.359 | -17.359 | 0 | %100 |
| 57 | M66A | SX | 0 | 0 | 0 | %100 |
| 58 | M67A | SX | 0 | 0 | 0 | %100 |
| 59 | M68A | SX | 0 | 0 | 0 | %100 |
| 60 | M69A | SX | 0 | 0 | 0 | %100 |
| 61 | MP8 | SX | -17.377 | -17.377 | 0 | %100 |
| 62 | M68B | SX | 0 | 0 | 0 | %100 |
| 63 | M69B | SX | 0 | 0 | 0 | %100 |
| 64 | MP5 | SX | -17.377 | -17.377 | 0 | %100 |
| 65 | M71B | SX | 0 | 0 | 0 | %100 |
| 66 | M72B | SX | 0 | 0 | 0 | %100 |

## Member Distributed Loads (BLC 43 : BLC 1 Transient Area Loads)

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magn... | Start Location... | End Location[in,%] |
|---|---|---|---|---|---|---|
| 1 | S2 | Y | -3.185 | -3.185 | 16.404 | 40 |
| 2 | GA2 | Y | -1.605 | -1.605 | 3.828 | 27.295 |
| 3 | GA1 | Y | -1.605 | -1.605 | 3.828 | 27.295 |
| 4 | S3 | Y | -3.185 | -3.185 | 16.404 | 40 |
| 5 | GA4 | Y | -1.605 | -1.605 | 3.828 | 27.295 |
| 6 | GA3 | Y | -1.605 | -1.605 | 3.828 | 27.295 |
| 7 | S1 | Y | -3.185 | -3.185 | 16.404 | 40 |
| 8 | GA6 | Y | -1.605 | -1.605 | 3.828 | 27.295 |
| 9 | GA5 | Y | -1.605 | -1.605 | 3.828 | 27.295 |

## Member Distributed Loads (BLC 44 : BLC 16 Transient Area Loads)

| | Member Label | Direction | Start Magnitude[lb/ft,... | End Magn... | Start Location... | End Location[in,%] |
|---|---|---|---|---|---|---|
| 1 | S2 | Y | -37.495 | -37.495 | 16.404 | 40 |
| 2 | GA2 | Y | -18.896 | -18.896 | 3.828 | 27.295 |
| 3 | GA1 | Y | -18.896 | -18.896 | 3.828 | 27.295 |
| 4 | S3 | Y | -37.495 | -37.495 | 16.404 | 40 |
| 5 | GA4 | Y | -18.896 | -18.896 | 3.828 | 27.295 |
| 6 | GA3 | Y | -18.896 | -18.896 | 3.828 | 27.295 |
| 7 | S1 | Y | -37.495 | -37.495 | 16.404 | 40 |
| 8 | GA6 | Y | -18.896 | -18.896 | 3.828 | 27.295 |
| 9 | GA5 | Y | -18.896 | -18.896 | 3.828 | 27.295 |

## Member Area Loads (BLC 1 : Self Weight)

| | Joint A | Joint B | Joint C | Joint D | Direction | Distribution | Magnitude[psf] |
|---|---|---|---|---|---|---|---|
| 1 | P22 | P21 | P20 | P23 | Y | Two Way | -1.75 |
| 2 | P10 | P11 | P12 | P9 | Y | Two Way | -1.75 |
| 3 | P31 | P34 | P33 | P32 | Y | Two Way | -1.75 |

## Member Area Loads (BLC 16 : Ice Weight)

| | Joint A | Joint B | Joint C | Joint D | Direction | Distribution | Magnitude[psf] |
|---|---|---|---|---|---|---|---|
| 1 | P22 | P21 | P20 | P23 | Y | Two Way | -20.6 |
| 2 | P10 | P11 | P12 | P9 | Y | Two Way | -20.6 |
| 3 | P31 | P34 | P33 | P32 | Y | Two Way | -20.6 |

## 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 | CA1 | C3.38x2.06... | .325 | 0 | 31 | .056 | 28.188 | y | 36 | 4776... | 56700 | 2202.... | 5751.945 | 1.65 | H1-1b |
| 2 | S2 | HSS4X4X6 | .322 | 0 | 32 | .114 | 0 | y | 32 | 1882... | 1978... | 2204... | 22045.5 | 1.94 | H1-1b |
| 3 | CA3 | C3.38x2.06... | .296 | 0 | 27 | .055 | 28.188 | y | 32 | 4776... | 56700 | 2202.... | 5751.945 | 1.... | H1-1b |

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

| | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | CA5 | C3.38x2.06... | .294 | 0 | 35 | .054 | 28.187 | y | 28 | 4776... | 56700 | 2202.... | 5751.945 | 1.... | H1-1b |
| 5 | S3 | HSS4X4X6 | .291 | 0 | 38 | .115 | 0 | y | 29 | 1882... | 1978... | 2204... | 22045.5 | 1.... | H1-1b |
| 6 | P2 | PL6.5x0.375 | .283 | 21 | 31 | .114 | 21 | y | 31 | 3658.... | 78975 | 616.9... | 8392.113 | 1.... | H1-1b |
| 7 | CA4 | C3.38x2.06... | .264 | 33 | 27 | .046 | 33 | y | 31 | 4776... | 56700 | 2202.... | 5751.945 | 1.... | H1-1b |
| 8 | CA6 | C3.38x2.06... | .264 | 33 | 30 | .046 | 33 | y | 38 | 4776... | 56700 | 2202.... | 5751.945 | 1.... | H1-1b |
| 9 | CA2 | C3.38x2.06... | .260 | 33 | 38 | .047 | 33 | y | 34 | 4776... | 56700 | 2202.... | 5751.945 | 1.... | H1-1b |
| 10 | S1 | HSS4X4X6 | .259 | 0 | 36 | .107 | 0 | y | 86 | 1882... | 1978... | 2204... | 22045.5 | 1.... | H1-1b |
| 11 | P3 | PL6.5x0.375 | .254 | 21 | 2 | .164 | 36.312 | y | 30 | 3658.... | 78975 | 616.9... | 8021.377 | 1.... | H1-1b |
| 12 | P1 | PL6.5x0.375 | .232 | 21 | 10 | .129 | 36.312 | y | 27 | 3658.... | 78975 | 616.9... | 8018.273 | 1.... | H1-1b |
| 13 | M75 | PL 2.375x0.5 | .198 | 1.5 | 6 | .264 | 0 | y | 28 | 3825... | 38475 | 400.7... | 1903.711 | 1.... | H1-1b |
| 14 | CA8 | L6.6x4.46x0... | .198 | 41.562 | 22 | .029 | 42 | z | 4 | 5117... | 87561 | 2464.... | 7125.374 | 1.... | H2-1 |
| 15 | HR2 | 2.88x0.120 | .196 | 90 | 3 | .098 | 92 | | 4 | 2249... | 4307... | 3155.... | 3155.674 | 1.... | H1-1b |
| 16 | CA7 | L6.6x4.46x0... | .195 | 41.562 | 3 | .027 | 42 | z | 8 | 5117... | 87561 | 2464.... | 7125.374 | 1.... | H2-1 |
| 17 | HR3 | 2.88x0.120 | .193 | 6 | 2 | .091 | 92 | | 6 | 2249... | 4307... | 3155.... | 3155.674 | 1.... | H1-1b |
| 18 | HR1 | 2.88x0.120 | .189 | 6 | 4 | .086 | 6 | | 4 | 2249... | 4307... | 3155.... | 3155.674 | 1.... | H1-1b |
| 19 | CA9 | L6.6x4.46x0... | .178 | 41.562 | 18 | .025 | 42 | z | 12 | 5117... | 87561 | 2464.... | 7125.374 | 1.... | H2-1 |
| 20 | MP2 | PIPE_2.5 | .165 | 70 | 5 | .059 | 70 | | 5 | 3348... | 66654 | 4726.5 | 4726.5 | 4.... | H1-1b |
| 21 | MP5 | PIPE_2.5 | .159 | 70 | 7 | .049 | 70 | | 7 | 3348... | 66654 | 4726.5 | 4726.5 | 4.... | H1-1b |
| 22 | GA4 | L2x2x4 | .152 | 0 | 2 | .011 | 27.295 | y | 9 | 2952... | 42480 | 959.63 | 2190.068 | 2.19 | H2-1 |
| 23 | MP8 | PIPE_2.5 | .142 | 70 | 9 | .062 | 70 | | 3 | 3348... | 66654 | 4726.5 | 4726.5 | 4.03 | H1-1b |
| 24 | GA5 | L2x2x4 | .142 | 0 | 9 | .024 | 27.295 | y | 38 | 2952... | 42480 | 959.63 | 2190.068 | 2.... | H2-1 |
| 25 | GA2 | L2x2x4 | .138 | 0 | 12 | .011 | 0 | y | 12 | 2952... | 42480 | 959.63 | 2190.068 | 2.... | H2-1 |
| 26 | GA1 | L2x2x4 | .130 | 0 | 6 | .025 | 27.295 | y | 34 | 2952... | 42480 | 959.63 | 2190.068 | 2.... | H2-1 |
| 27 | MP9 | PIPE_2.5 | .129 | 70 | 2 | .058 | 70 | | 7 | 3348... | 66654 | 4726.5 | 4726.5 | 3.... | H1-1b |
| 28 | GA3 | L2x2x4 | .128 | 0 | 7 | .026 | 27.295 | y | 30 | 2952... | 42480 | 959.63 | 2190.068 | 2.... | H2-1 |
| 29 | GA6 | L2x2x4 | .128 | 0 | 4 | .011 | 0 | y | 4 | 2952... | 42480 | 959.63 | 2190.068 | 2.... | H2-1 |
| 30 | MP6 | PIPE_2.5 | .118 | 70 | 7 | .063 | 70 | | 6 | 3348... | 66654 | 4726.5 | 4726.5 | 4.65 | H1-1b |
| 31 | MP1 | PIPE_2.5 | .114 | 70 | 11 | .070 | 26 | | 8 | 3348... | 66654 | 4726.5 | 4726.5 | 2.62 | H1-1b |
| 32 | MP3 | PIPE_2.5 | .111 | 70 | 5 | .064 | 70 | | 3 | 3348... | 66654 | 4726.5 | 4726.5 | 4.... | H1-1b |
| 33 | MP4 | PIPE_2.5 | .111 | 70 | 7 | .064 | 26 | | 4 | 3348... | 66654 | 4726.5 | 4726.5 | 1.... | H1-1b |
| 34 | MP7 | PIPE_2.5 | .109 | 70 | 9 | .057 | 26 | | 6 | 3348... | 66654 | 4726.5 | 4726.5 | 3.... | H1-1b |
| 35 | H1 | Pipe3.5x0.1... | .102 | 90 | 31 | .055 | 48 | | 4 | 4587... | 7158... | 6337.... | 6337.65 | 2.... | H1-1b |
| 36 | H3 | Pipe3.5x0.1... | .098 | 31 | 2 | .065 | 90 | | 27 | 4587... | 7158... | 6337.... | 6337.65 | 1.... | H1-1b |
| 37 | H2 | Pipe3.5x0.1... | .094 | 31 | 6 | .055 | 90 | | 34 | 4587... | 7158... | 6337.... | 6337.65 | 1.... | H1-1b |

INFINIGY

FROM ZERO TO INFINIGY

the solutions are endless

**Bolt Calculation Tool, V1.5.1**

| PROJECT DATA | |
|---|---|
| Site Name: | BOBDL00026A |
| Site Number: | BOBDL00026A |
| Connection Description: | Platform to Monopole |

| MAXIMUM BOLT LOADS | | |
|---|---|---|
| Bolt Tension: | 8536.96 | lbs |
| Bolt Shear: | 1627.02 | lbs |

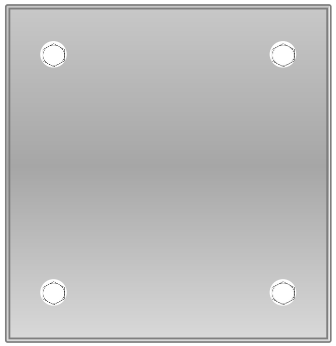
| WORST CASE BOLT LOADS[1] | | |
|---|---|---|
| Bolt Tension: | 8536.96 | lbs |
| Bolt Shear: | 1527.14 | lbs |

| BOLT PROPERTIES | | |
|---|---|---|
| Bolt Type: | Bolt | - |
| Bolt Diameter: | 0.625 | in |
| Bolt Grade: | A325 | - |
| # of Bolts: | 4 | - |
| Threads Excluded? | No | - |

[1] *Worst case bolt loads correspond to Load combination #32 on member S2 in RISA-3D, which causes the maximum demand on the bolts.*

| Member Information |
|---|
| I nodes of S3, S2, S1 |

| BOLT CHECK | | |
|---|---|---|
| Tensile Strength | 20340.15 | |
| Shear Strength | 13805.83 | |
| Max Tensile Usage | 42.0% | |
| Max Shear Usage | 11.8% | |
| Interaction Check (Worst Case) | 0.19 | ***≤1.05*** |
| Result | Pass | |



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: BOBDL00026A

BOBDL00026A
650 Albany Turnpike
Canton, Connecticut 06019

**October 5, 2021**

**EBI Project Number: 6221003982**

| Site Compliance Summary | |
|---|---|
| Compliance Status: | **COMPLIANT** |
| Site total MPE% of FCC general population allowable limit: | **17.83%** |

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

October 5, 2021

Dish Wireless

Emissions Analysis for Site: BOBDL00026A - BOBDL00026A

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **650 Albany Turnpike** in **Canton, Connecticut** for the purpose of determining whether the emissions from the Proposed Dish Wireless Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

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

Additional details can be found in FCC OET 65.

## CALCULATIONS

Calculations were done for the proposed Dish Wireless Wireless antenna facility located at 650 Albany Turnpike in Canton, 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 89 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): | 89 feet | Height (AGL): | 89 feet | Height (AGL): | 89 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 %: | **3.43%** | Antenna B1 MPE %: | **3.43%** | Antenna C1 MPE %: | **3.43%** |

| Site Composite MPE % | |
|---|---|
| **Carrier** | **MPE %** |
| Dish Wireless (Max at Sector A): | 3.43% |
| AT&T | 3.82% |
| Verizon | 2.53% |
| Metro PCS | 0.96% |
| T-Mobile | 7.09% |
| | |
| | |
| | |
| **Site Total MPE % :** | 17.83% |

| Dish Wireless MPE % Per Sector | |
|---|---|
| Dish Wireless Sector A Total: | 3.43% |
| Dish Wireless Sector B Total: | 3.43% |
| Dish Wireless Sector C Total: | 3.43% |
| | |
| Site Total MPE % : | 17.83% |

## 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 | 89.0 | 4.67 | 600 MHz n71 | 400 | 1.17% |
| Dish Wireless 1900 MHz n70 | 4 | 542.70 | 89.0 | 11.33 | 1900 MHz n70 | 1000 | 1.13% |
| Dish Wireless 2190 MHz n66 | 4 | 542.70 | 89.0 | 11.33 | 2190 MHz n66 | 1000 | 1.13% |
| | | | | | | **Total:** | **3.43%** |

• 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: | 3.43% |
| Sector B: | 3.43% |
| Sector C: | 3.43% |
| Dish Wireless Maximum MPE % (Sector A): | 3.43% |
| | |
| Site Total: | 17.83% |
| | |
| Site Compliance Status: | **COMPLIANT** |

The anticipated composite MPE value for this site assuming all carriers present is **17.83%** 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.

# POWER DENSITY STUDY

November 10, 2021

Dear Customer,

The following is the proof-of-delivery for tracking number: 775112749552

**Delivery Information:**

| | | | |
|---|---|---|---|
| **Status:** | Delivered | **Delivered To:** | Residence |
| **Signed for by:** | Signature not required | **Delivery Location:** | 650 ALBANY TPKE |
| **Service type:** | FedEx 2Day | | |
| **Special Handling:** | Deliver Weekday;<br>Residential Delivery | | COLLINSVILLE, CT, 06019 |
| | | **Delivery date:** | Nov 9, 2021 17:28 |

**Shipping Information:**

| | | | |
|---|---|---|---|
| **Tracking number:** | 775112749552 | **Ship Date:** | Nov 5, 2021 |
| | | **Weight:** | 1.0 LB/0.45 KG |

**Recipient:**
Perry W. Lansford,
650 Albany Turnpike
COLLINSVILLE, CT, US, 06019

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

**Reference** 100814

Proof-of-delivery details appear below; however, no signature is available for this FedEx Express shipment because a signature was not required.

Thank you for choosing FedEx

November 09, 2021

Dear Customer,

The following is the proof-of-delivery for tracking number: 775109397763

**Delivery Information:**

| | | | |
|---|---|---|---|
| **Status:** | Delivered | **Delivered To:** | Receptionist/Front Desk |
| **Signed for by:** | L.SMITH | **Delivery Location:** | 4 MARKET ST |
| **Service type:** | FedEx 2Day | | |
| **Special Handling:** | Deliver Weekday | | COLLINSVILLE, CT, 06022 |
| | | **Delivery date:** | Nov 9, 2021 11:17 |

**Shipping Information:**

| | | | |
|---|---|---|---|
| **Tracking number:** | 775109397763 | **Ship Date:** | Nov 5, 2021 |
| | | **Weight:** | 1.0 LB/0.45 KG |

**Recipient:**
Jerry Waters,
PO Box 168
4 Market Street
COLLINSVILLE, CT, US, 06022

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

**Reference** 100814

Thank you for choosing FedEx

November 09, 2021

Dear Customer,

The following is the proof-of-delivery for tracking number: 775109368480

**Delivery Information:**

| | | | |
|---|---|---|---|
| **Status:** | Delivered | **Delivered To:** | Receptionist/Front Desk |
| **Signed for by:** | L.SMITH | **Delivery Location:** | 4 MARKET ST |
| **Service type:** | FedEx 2Day | | |
| **Special Handling:** | Deliver Weekday | | COLLINSVILLE, CT, 06022 |
| | | **Delivery date:** | Nov 9, 2021 11:17 |

**Shipping Information:**

| | | | |
|---|---|---|---|
| **Tracking number:** | 775109368480 | **Ship Date:** | Nov 5, 2021 |
| | | **Weight:** | 3.0 LB/1.36 KG |

**Recipient:**
Robert Bessel,
PO Box 168
4 Market Street
COLLINSVILLE, CT, US, 06022

**Shipper:**
Corey Milan, NB+C
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