



TOTALLY COMMITTED.



October 11, 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  
191 Middle Haddam Road, Portland, CT 06480  
Latitude: 41'33'44.1" /Longitude: -72'34'25.6"

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 191 Middle Haddam Road in Portland (the "Property"). The existing 138.5-foot monopole tower is owned by American Tower Corporation ("ATC"). The underlying property is owned by Verizon Wireless. DISH requests that the Council find that the proposed shared use of American 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 Susan Bransfield, First Selectwoman for the Town of Portland, Lincoln White, Town of Portland Building Official and Verizon Wireless as the property owner.

### Background

The existing ATC facility consists of a 138.6-foot monopole tower located within an existing leased area. Verizon Wireless currently maintains antennas at the 138-foot and 131-foot level, T-Mobile currently maintains antennas at the 137-foot level, AT&T Mobility currently maintains antennas at the 119-foot and 117-foot level and City of Middletown, CT. currently maintains antennas at the 104-foot, 100-foot, 87-foot and 80-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 Verizon Wireless have agreed to the proposed shared use of the 191 Middle Haddam Road 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, (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 ground work.

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.

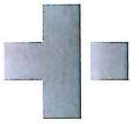
**A. Technical Feasibility.** The existing ATC tower is structurally capable of supporting DISH's proposed improvements. The proposed shared use of this tower is, therefore, technically feasible. A Feasibility Structural Analysis Report ("Structural Report") prepared for this project confirms that this 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 **191 Middle Haddam Road** 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 proposed shared use.

Sincerely,

*Margie Weber*

Margie Weber  
Program Manager  
215.416.0363  
[mweber@nbcllc.com](mailto:mweber@nbcllc.com)



**AMERICAN TOWER®**  
CORPORATION

**LETTER OF AUTHORIZATION**

**ATC SITE#/NAME/PROJECT: 411257/Middle Haddam Road-CROWN CT / 13681988**  
**SITE ADDRESS: 191 Middle Haddam Rd Portland, CT 06480-1767**  
**LICENSEE: DISH WIRELESS L.L.C.**

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

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

Signature:

Print Name: Margaret Robinson  
Senior Counsel  
American Tower\*

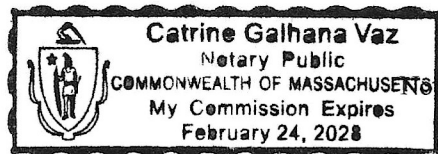
**NOTARY BLOCK**

Commonwealth of MASSACHUSETTS  
County of Middlesex

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

WITNESS my hand and official seal, this 11<sup>th</sup> day of August 2021.

NOTARY SEAL



My Commission Expires: February 24, 2028

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



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

**Dish Wireless Existing Facility**

**Site ID: BOBDL00024A**

**191 Middle Haddam Road  
Portland, Connecticut 06480**

**August 16, 2021**

**EBI Project Number: 6221003980**

<b>Site Compliance Summary</b>	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>27.98%</b>

August 16, 2021

Dish Wireless

Emissions Analysis for Site: BOBDL00024A

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **191 Middle Haddam Road** in **Portland, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The number of  $\mu\text{W}/\text{cm}^2$  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 ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately  $400 \mu\text{W}/\text{cm}^2$  and  $467 \mu\text{W}/\text{cm}^2$ , respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is  $1000 \mu\text{W}/\text{cm}^2$ . Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully

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

Additional details can be found in FCC OET 65.

## **CALCULATIONS**

Calculations were done for the proposed Dish Wireless antenna facility located at 191 Middle Haddam Road in Portland, 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 69 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):	69 feet	Height (AGL):	69 feet	Height (AGL):	69 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 AI MPE %:	<b>5.96%</b>	Antenna BI MPE %:	<b>5.96%</b>	Antenna CI MPE %:	<b>5.96%</b>

Site Composite MPE %	
Carrier	MPE %
Dish Wireless (Max at Sector A):	5.96%
Verizon	15.07%
AT&T	6.04%
T-Mobile	0.91%
<b>Site Total MPE % :</b>	<b>27.98%</b>

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	5.96%
Dish Wireless Sector B Total:	5.96%
Dish Wireless Sector C Total:	5.96%
Site Total MPE % :	27.98%

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 ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
Dish Wireless 600 MHz n71	4	223.68	69.0	8.10	600 MHz n71	400	2.03%
Dish Wireless 1900 MHz n70	4	542.70	69.0	19.66	1900 MHz n70	1000	1.97%
Dish Wireless 2190 MHz n66	4	542.70	69.0	19.66	2190 MHz n66	1000	1.97%
						<b>Total:</b>	<b>5.96%</b>

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



## Summary

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

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

Dish Wireless Sector	Power Density Value (%)
Sector A:	5.96%
Sector B:	5.96%
Sector C:	5.96%
Dish Wireless Maximum MPE % (Sector A):	5.96%
Site Total:	27.98%
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **27.98%** 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.



DISH Wireless L.L.C. SITE ID:

**BOBDL00024A**

DISH Wireless L.L.C. SITE ADDRESS:

**191 MIDDLE HADDAM RD  
PORTLAND, CT 06480**

**PROJECT NOTES**

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).

**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 TOWER PLATFORM MOUNT
- INSTALL PROPOSED JUMPERS
- INSTALL (6) PROPOSED RRU's (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 FIBER NID (IF REQUIRED)
- INSTALL (1) PROPOSED METER SOCKET

SITE INFORMATION	PROJECT DIRECTORY
PROPERTY OWNER: VERIZON WIRELESS ADDRESS: PO BOX 2549 ADDISON, TX 75001	APPLICANT: DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120 (303) 706-5008
TOWER TYPE: MONOPOLE	TOWER OWNER: AMERICAN TOWER CORPORATION 10 PRESIDENTIAL WAY WOBURN, MA 01801 (781) 926-4500
TOWER CO SITE ID: 411257	SITE DESIGNER: B+T GROUP 1717 S. BOULDER AVE, SUITE 300 TULSA, OK 74119 (918) 587-4630
TOWER APP NUMBER: 13681988	SITE ACQUISITION: JEAN COTTRELL JEAN.COTTRELL@DISH.COM
COUNTY: MIDDLESEX	CONSTRUCTION MANAGER: JAVIER SOTO JAVIER.SOTO@DISH.COM
LATITUDE (NAD 83): 41°33'44.1" N 41.562250 N	RF ENGINEER: BOSSENER CHARLES BOSSENER.CHARLES@DISH.COM
LONGITUDE (NAD 83): 72°34'25.6" W 72.573778 W	
ZONING JURISDICTION: CONNECTICUT SITING COUNCIL	
ZONING DISTRICT: RR	
PARCEL NUMBER: 00048801	
OCCUPANCY GROUP: U	
CONSTRUCTION TYPE: II-B	
POWER COMPANY: T.B.D.	
TELEPHONE COMPANY: EVERSTREAM	

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

10 PRESIDENTIAL WAY  
WOBURN, MA 01801

1717 S. BOULDER  
SUITE 300  
TULSA, OK 74119  
PH: (918) 587-4630  
www.btgrp.com



**B&T ENGINEERING, INC.**  
PEC.0001564  
Expires 2/10/22

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

DRAWN BY:	CHECKED BY:	APPROVED BY:
SR/CDW	RMC	MJP
RFDS REV #:		1

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/19/21	ISSUED FOR REVIEW
0	8/6/21	ISSUED FOR CONSTRUCTION
1	8/11/21	ISSUED FOR CONSTRUCTION

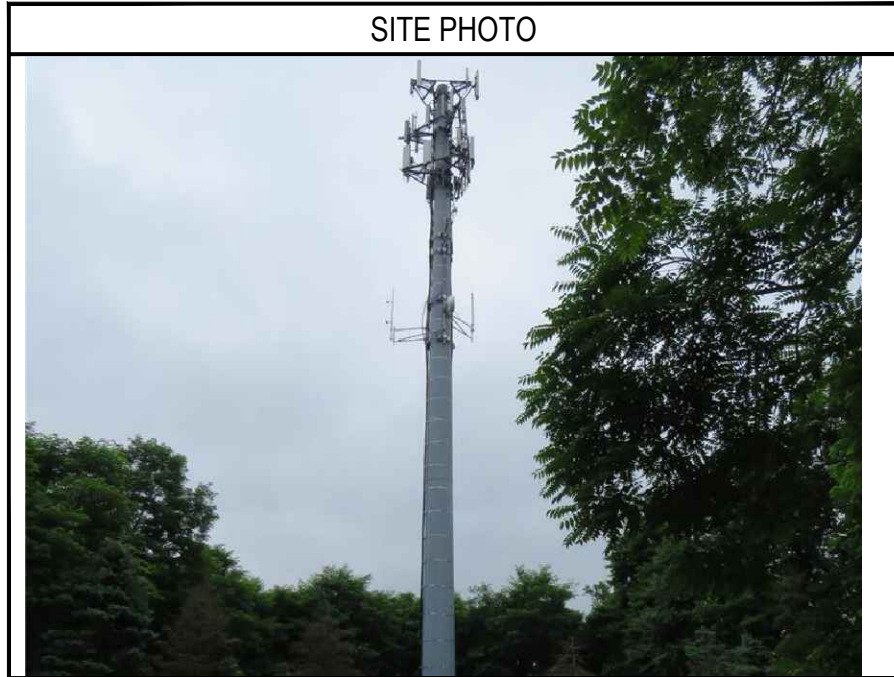
A&E PROJECT NUMBER  
**152515.002.01**

DISH Wireless L.L.C.  
PROJECT INFORMATION

**BOBDL00024A**  
**191 MIDDLE HADDAM RD**  
**PORTLAND, CT 06480**

SHEET TITLE  
**TITLE SHEET**

SHEET NUMBER  
**T-1**



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**

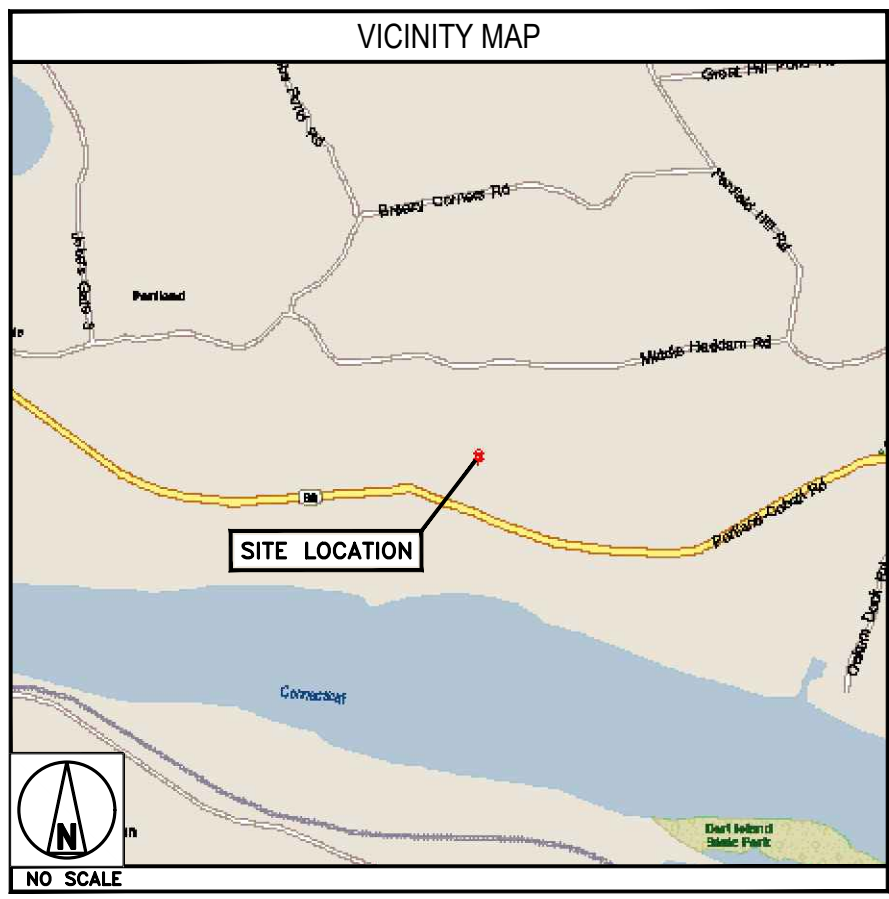
THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE, NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE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

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.

**DIRECTIONS**

DIRECTIONS FROM BRADLEY INTERNATIONAL AIRPORT:  
VIA I-91 S, CONTINUE TO BRADLEY INTERNATIONAL AIRPORT CON, HEAD NORTH TOWARD BRADLEY INTERNATIONAL AIRPORT, SLIGHT LEFT ONTO BRADLEY INTERNATIONAL AIRPORT, SLIGHT LEFT, TAKE I-91 S AND CT-9 S TO CT-17 N/ST JOHNS SQUARE IN MIDDLETOWN. TAKE EXIT 16 FROM CT-9 S, CONTINUE ONTO BRADLEY INTERNATIONAL AIRPORT CON, CONTINUE ONTO CT-20 E/BRADLEY INTERNATIONAL AIRPORT CON, USE THE RIGHT 2 LANES TO MERGE WITH I-91 S TOWARD HARTFORD, KEEP RIGHT TO STAY ON I-91 S, USE THE LEFT 2 LANES TO TAKE EXIT 22S TO MERGE WITH CT-9 S TOWARD MIDDLETOWN/OLD SAYBROOK, TAKE EXIT 16 FOR CT-17 N TOWARD CT-66 E/PORTLAND/WILLIMANTIC, DRIVE TO CT-66 E IN PORTLAND, CONTINUE ONTO CT-17 N/ST JOHNS SQUARE, TURN RIGHT ONTO MAIN ST, TURN RIGHT ONTO CT-66 E/MARLBOROUGH ST, ARRIVE AT BOBDL00024A.



**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**

SHEET NO.	SHEET TITLE
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T-2	APPENDIX B
T-3	APPENDIX B & ANSI COMPLIANCE REPORT
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A-2	ELEVATION, ANTENNA LAYOUT AND SCHEDULE
A-3	EQUIPMENT PLATFORM AND H-FRAME DETAILS
A-4	EQUIPMENT DETAILS
A-5	EQUIPMENT DETAILS
A-6	EQUIPMENT DETAILS
E-1	ELECTRICAL/FIBER ROUTE PLAN AND NOTES
E-2	ELECTRICAL DETAILS
E-3	ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE
G-1	GROUNDING PLANS AND NOTES
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS
RF-1	RF CABLE COLOR CODE
GN-1	LEGEND AND ABBREVIATIONS
GN-2	GENERAL NOTES
GN-3	GENERAL NOTES
GN-4	GENERAL NOTES

**(EXCEPT 1 AND 2-FAMILY DWELLINGS AND TOWNHOUSES)**  
(Reproduce the following data on the building plans sheet 1 or 2)

Name of Project: Middle Haddam Road-Crown CT  
 Address: 191 Middle Haddam Rd., Portland Zip Code 06480  
 Owner/Authorized Agent: ATC Phone # ( ) E-Mail  
 Owned By:  City/County  Private  State  
 Code Enforcement Jurisdiction:  City  County Middlesex  State

CONTACT:

DESIGNER	FIRM	NAME	LICENSE #	TELEPHONE #	E-MAIL
Architectural					
Civil					
Electrical					
Fire Alarm					
Plumbing					
Mechanical					
Sprinkler-Standpipe					
Structural					
Retaining Walls >5' High					
Other					

(\*Others\* should include firms and individuals such as truss, precast, pre-engineered, interior designers, etc.)

**2018 NC CODE FOR:**  New Construction  Addition  Renovation  
 1st Time Interior Completion  
 Shell/Core  
 Phased Construction - Shell/Core  
 Renovation

**2018 NC EXISTING BUILDING CODE:**  Prescriptive  Repair  Chapter 14  
 Alteration:  Level I  Level II  Level III  
 Historic Property  Change of Use

CONSTRUCTED:(date) ORIGINAL OCCUPANCY(S) (Ch. 3):  
 RENOVATED:(date) CURRENT OCCUPANCY(S) (Ch. 3):

**RISK CATEGORY (table 1604.5) Current:**  I  II  III  IV  
**Proposed:**  I  II  III  IV

**BASIC BUILDING DATA**  
 Construction Type:  I-A  II-A  III-A  IV  V-A  
 (check all that apply)  I-B  II-B  III-B  V-B  
 Sprinklers:  No  Partial  Yes  NFPA 13  NFPA 13R  NFPA 13D  
 Standpipes:  No  Yes Class  I  II  III  Wet  Dry  
 Fire District:  No  Yes (Primary) Flood Hazard Area:  No  Yes  
 Special Inspections Required:  No  Yes

**Gross Building Area:**

FLOOR	EXISTING (SQ FT)	NEW (SQ FT)	RENO/ALTER (SQ FT)	SUB-TOTAL
6th Floor				
5th Floor				
4th Floor				
3rd Floor				
2nd Floor				
Mezzanine				
1st Floor				
Basement				
TOTAL				

**ALLOWABLE AREA**  
 Primary Occupancy Classification: **SELECT ONE**  
 Assembly  A-1  A-2  A-3  A-4  A-5  
 Business   
 Educational   
 Factory  F-1 Moderate  F-2 Lr  
 Hazardous  H-1 Detonate  H-2 Deflagr  
 Institutional  I-1 Condition  I-2 Condition  I-3 Condition  I-4  
 Mercantile   
 Residential  R-1  R-2  R-3  
 Storage  S-1 Modern  S-2  
 Utility and Miscellaneous   
 Accessory Occupancy C   
 Incidental Uses (Table 509)   
 Special Uses (Chapter 4 - List C)   
 Special Provisions: (Chapter 5 - List B)   
**Mixed Occupancy:**  No  Yes  
 Non-Separated Use (508.3)  
 The required type of construction for the building shall be determined by applying the height and area limitations for each of the applicable occupancies to the entire building. The most restrictive type of construction, so

**N/A  
NO CHANGE**


1 Frontage area increases from Section 506.3 are computed thus:  
 a. Perimeter which fronts a public way or open space having 20 feet minimum width = (F)  
 b. Total Building Perimeter = (P)  
 c. Ratio (F/P) = (F/P)  
 d. W = Minimum width of public way = (W)  
 e. Percent of frontage increase If = 100 [ F/P - 0.25 ] x W/30 = (%)  
 2 Unlimited area applicable under conditions of Section 507.  
 3 Maximum Building Area = total number of stories in the building x D (m<sup>2</sup>) 3 stories (506.2).  
 4 The maximum area of open parking garages must comply with Table 4  
 5 Frontage increase is based on the un-sprinklered area value in Table

**ALLOWABLE**

Building Height in Feet (Table 504.3)	ALLOWABLE (T)	CODE REFERENCE
504.3 or 504.4		
412.3.1		
406.5.4		

1 Provide code reference if the "Show"  
 2 The maximum height of air traffic  
 3 The maximum height of open

**N/A  
NO CHANGE**

**FIRE PROTECTION REQUIREMENTS**

BUILDING ELEMENT	FIRE SEPARATION DISTANCE (FEET)	RATING		DETAIL # AND SHEET #	DESIGN # FOR RATED ASSEMBLY	DESIGN # FOR RATED PENETRATION	DESIGN # FOR RATED JOINTS
		REQ'D	PROVIDED (W/REDUCTION)				
Structural Frame, including columns, girders, trusses							
Bearing Walls							
Exterior							
North							
East							
West							
South							
Interior							
Nonbearing Walls and Partitions							
Exterior walls							
North							
East							
West							
South							
Interior walls and partitions							
Floor Construction including supporting beams and joists							
Floor Ceiling Assembly							
Column Supporting Floors							
Roof Construction, including supporting beams and joists							
Roof Ceiling Assembly							
Column Supporting Roof							
Shaft Enclosures - Exit							
Shaft Enclosures - Other							
Corridor Separation							
Occupancy/Fire Barrier Separation							
Party/Fire Wall Separation							
Smoke Barrier Separation							
Smoke Partition							
Tenant Dwelling Unit/Sleeping Unit Separation							

**N/A  
NO CHANGE**

Emergency Lighting:  No  Yes  
 Exit Signs:  No  Yes  
 Fire Alarm:  No  Yes  
 Smoke Detection Systems:  No  Yes  Partial  
 Carbon Monoxide Detection:  No  Yes

**LIFE SAFETY PLAN REQUIREMENTS**

Life Safety Plan Sheet #:  
 Fire and/or smoke rated wall locations (Chapter 7)  
 Assumed and real property line locations (if not on the site plan)  
 Exterior wall opening area with respect to distance to assumed property lines (705.8)  
 Occupancy types for each area as it relates to occupant load calculation (1004.1.2)  
 Occupant loads for each area  
 Exit access travel distances (1017)  
 Common path of travel distances (1006.2.1 & 2006.3.2(1))  
 Dead end lengths (1020.4)  
 Clear exit widths for each exit door  
 Maximum calculated occupant load capacity  
 Actual occupant load for each exit door  
 A separate schematic plan indicating w/occupancy separation and supporting structure is provided for purposes of  
 Location of doors with panic hardware  
 Location of doors with delay  
 Location of doors with egress width (1005.3)  
 Location of doors with egress width (1010.1.9.7)  
 Location of doors equip  
 Location of emerger  
 The square footings  
 The square footage of occupancy Classification I-2 (407.5)  
 Note any code exceptions  
 have been utilized regarding the items above

**N/A  
NO CHANGE**

Section/Table/Note	Title

**ACCESSIBLE DWELLING UNITS (SECTION 1107)**

TOTAL UNITS	ACCESSIBLE UNITS REQUIRED	ACCESSIBLE UNITS PROVIDED	TYPE A UNITS REQUIRED	TYPE A UNITS PROVIDED	TYPE B UNITS REQUIRED	TYPE B UNITS PROVIDED	TOTAL ACCESSIBLE UNITS PROVIDED

**ACCESSIBLE PARKING (SECTION 1106)**

LOT OR PARKING AREA	TOTAL # OF PARKING SPACES REQUIRED	TOTAL # OF PARKING SPACES PROVIDED	# OF ACCESSIBLE SPACES PROVIDED			TOTAL # ACCESSIBLE SPACES PROVIDED
			REGULAR WITH 5' ACCESS AISLE	12' ACCESS AISLE	8' ACCESS AISLE	
TOTAL						

**PLUMBING FIXTURE REQUIREMENTS (TABLE 2902.1)**

USE	EXIST'G	WATERCLOSETS			URINALS			LAVATORIES			SHOWERS / TUBS	DRINKING FOUNTAINS	
		MALE	FEMALE	UNISEX	MALE	FEMALE	UNISEX	REGULAR	ACCESSIBLE				
SPACE													
NEW													
REQ'D													

SPECIAL APPROVAL: (Local Jurisdiction, Department of In... describe below)

**N/A  
NO CHANGE**



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LITTLETON, CO 80120



**B+T GRP**  
 1717 S. BOULDER SUITE 300  
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RFDS REV #: 1

**CONSTRUCTION DOCUMENTS**

**SUBMITTALS**

REV	DATE	DESCRIPTION
A	7/18/21	ISSUED FOR REVIEW
0	8/6/21	ISSUED FOR CONSTRUCTION
1	8/11/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER  
152515.002.01

DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOBDL0024A  
191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

SHEET TITLE  
APPENDIX B

SHEET NUMBER  
T-2



**ENERGY SUMMARY**

**ENERGY REQUIREMENTS:**  
The following data shall be considered minimum and any special attribute required to meet the North Carolina Energy Conservation Code shall also be provided. Each Designer shall furnish the required portions of the project information for the plan data sheet. If performance method, state the annual energy cost for the standard reference design vs annual energy cost for the proposed design.

Existing building envelope complies with code:  No  Yes (The remainder of this section is not applicable)

Exempt Building:  No  Yes (Provide Code or Statutory reference): \_\_\_\_\_

Climate Zone:  3A  4A  5A

Method of Compliance: Energy Code  Performance  Prescriptive  
ASHRAE 90.1  Performance  Prescriptive  
(If "Other" specify source here) \_\_\_\_\_

**THERMAL ENVELOPE (Prescriptive method only)**

**Roof/ceiling Assembly (each assembly)**  
Description of assembly: \_\_\_\_\_  
U-Value of total assembly: \_\_\_\_\_  
R-Value of insulation: \_\_\_\_\_  
Skylights in each assembly: \_\_\_\_\_  
U-Value of skylight: \_\_\_\_\_  
Total square footage of: \_\_\_\_\_

**Exterior Walls (each assembly)**  
Description of assembly: \_\_\_\_\_  
U-Value of total assembly: \_\_\_\_\_  
R-Value of insulation: \_\_\_\_\_  
Opening: \_\_\_\_\_  
U-Solar Projective: \_\_\_\_\_  
Door R-Value: \_\_\_\_\_

**Walls below grade (each assembly)**  
Description of assembly: \_\_\_\_\_  
U-Value of total assembly: \_\_\_\_\_  
R-Value of insulation: \_\_\_\_\_

**Floors over unconditioned space (each assembly)**  
Description of assembly: \_\_\_\_\_  
U-Value of total assembly: \_\_\_\_\_  
R-Value of insulation: \_\_\_\_\_

**Floors slab on grade**  
Description of assembly: \_\_\_\_\_  
U-Value of total assembly: \_\_\_\_\_  
R-Value of insulation: \_\_\_\_\_  
Horizontal/Vertical requirement: \_\_\_\_\_  
Slab Heated: \_\_\_\_\_

N/A  
NO CHANGE

2018 NC ADMINISTRATIVE CODE AND POLICIES APPENDIX B FOR BUILDING 7

**2018 APPENDIX B  
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS**  
STRUCTURAL DESIGN  
(PROVIDE ON THE STRUCTURAL SHEETS IF APPLICABLE)

**DESIGN LOADS:**

Importance Factors: Snow (IS) \_\_\_\_\_  
Seismic (IE) \_\_\_\_\_  
Roof \_\_\_\_\_

**2018 APPENDIX B  
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS**  
MECHANICAL DESIGN  
(PROVIDE ON THE MECHANICAL SHEETS IF APPLICABLE)

**MECHANICAL SUMMARY**

**MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT**

**Thermal Zone**  
winter dry bulb: \_\_\_\_\_  
summer dry bulb: \_\_\_\_\_

**Interior design conditions**  
winter dry bulb: \_\_\_\_\_  
summer dry bulb: \_\_\_\_\_  
relative humidity: \_\_\_\_\_

**Building heating load:** \_\_\_\_\_

**Building cooling load:** \_\_\_\_\_

**Mechanical Spacing Conditioning System**  
Unitary description of unit:  
heating efficiency: \_\_\_\_\_  
cooling efficiency: \_\_\_\_\_  
size category: \_\_\_\_\_

Boiler Size: \_\_\_\_\_  
Chill: \_\_\_\_\_

List equipment etc. \_\_\_\_\_

N/A  
NO CHANGE

2018 NC ADMINISTRATIVE CODE AND POLICIES APPENDIX B FOR BUILDING 9

**2018 APPENDIX B  
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS**  
ELECTRICAL DESIGN  
(PROVIDE ON THE ELECTRICAL SHEETS IF APPLICABLE)

**ELECTRICAL SUMMARY**

**ELECTRICAL SYSTEM AND EQUIPMENT**

Method of Compliance: Energy Code:  Prescriptive  Performance  
ASHRAE 90.1:  Prescriptive  Performance

Lighting schedule (each fixture type)  
lamp type required in fixture \_\_\_\_\_  
number of lamps in fixture \_\_\_\_\_



July 2, 2021  
Subject: ANSI Compliance Report

ATC Site Name: \_\_\_\_\_  
ATC Site Number: 411257  
Dish Wireless Site Number: Dish Wireless Site Number:  
ATC Site Location: 191 Middle Haddam Rd. Portland, CT. 06480

ATC Site Coordinates: 41.562250 N , 72.573778 W

To whom it may concern,

This letter is to certify that all proposed modifications within the project scope of work for the telecommunications facility listed above are designed to meet or exceed all American National Standards Institute (ANSI) requirements. This scope of work includes the following:

- Installation of (3) new tower-mounted sector frames
- Installation of (3) new tower-mounted antennas
- Installation of (6) RRU's
- Installation of (1) OVP
- Installation of (1) Hybrid Cable

This scope of work will not increase the height of the existing tower.

Respectfully submitted by,  
John W Kelly, P.E.



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SR/CDW	RMC	MJP
RFDS REV #:	1	

**CONSTRUCTION DOCUMENTS**

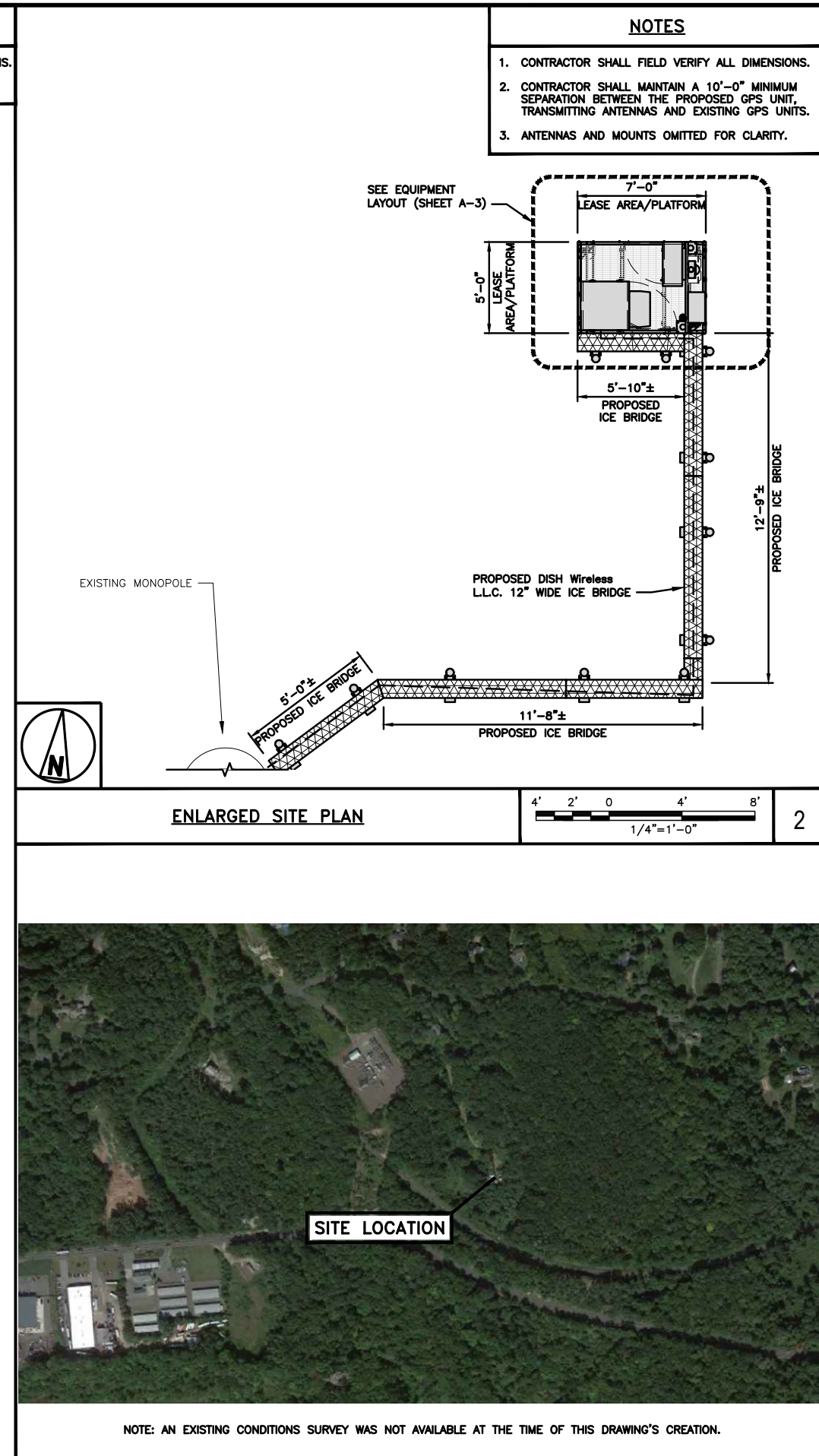
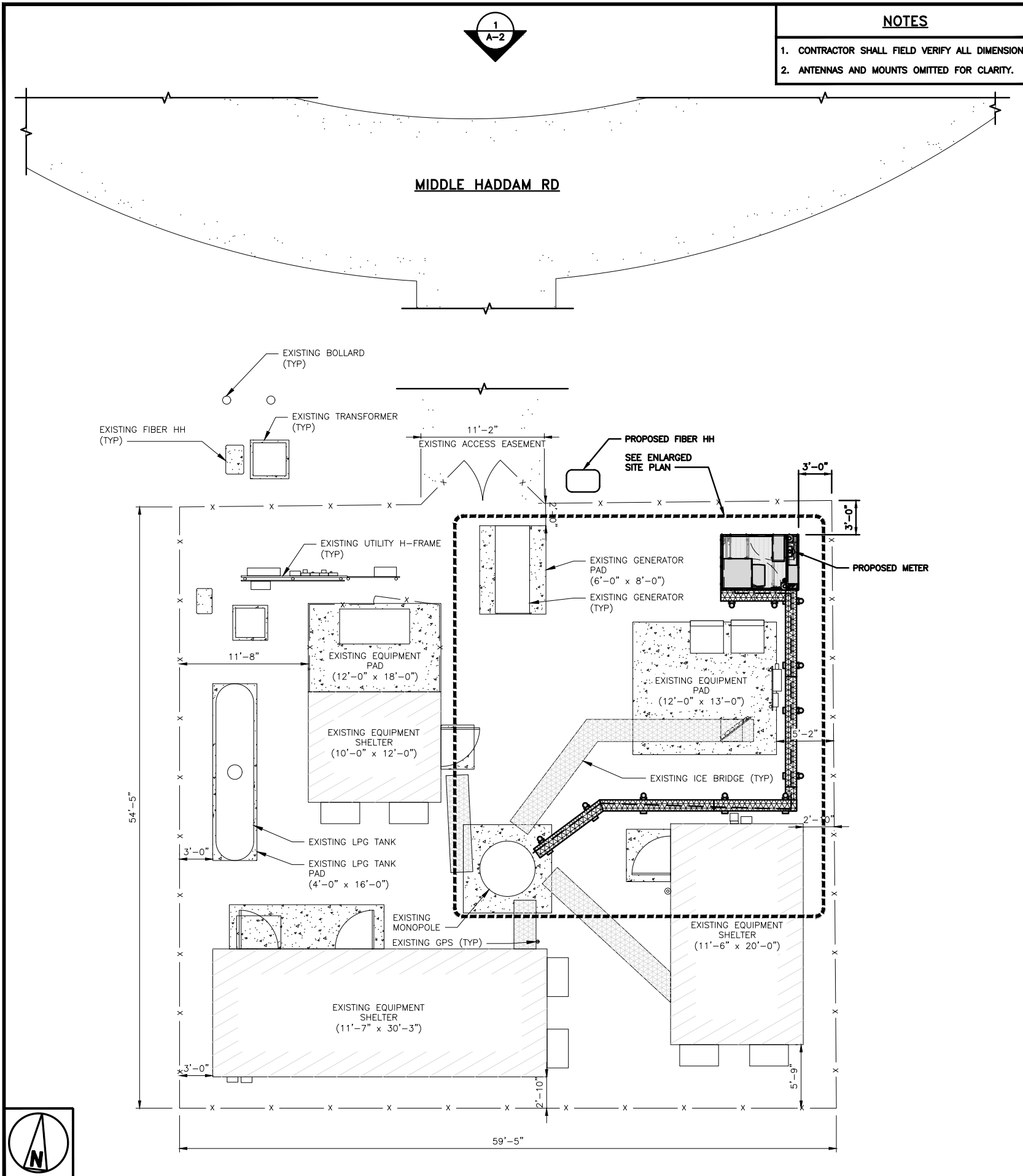
SUBMITTALS		
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A&E PROJECT NUMBER  
**152515.002.01**

DISH Wireless L.L.C.  
PROJECT INFORMATION  
**BOBDL0024A**  
191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

SHEET TITLE  
**APPENDIX B &  
ANSI COMPLIANCE REPORT**

SHEET NUMBER  
**T-3**



**dish wireless.**

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

**AMERICAN TOWER**  
10 PRESIDENTIAL WAY  
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**B+T GRP**  
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DISH Wireless L.L.C.  
PROJECT INFORMATION

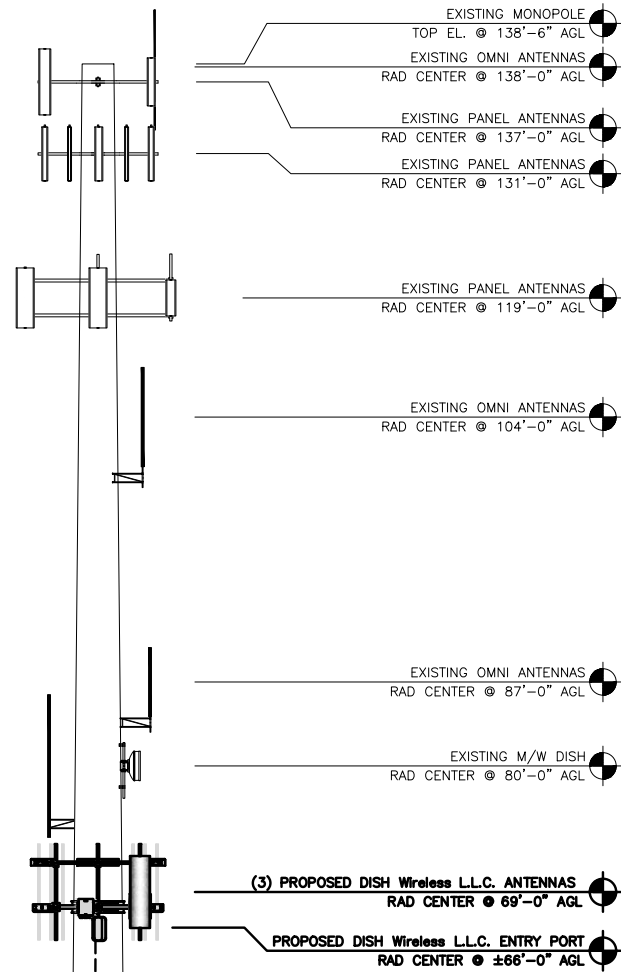
BOBDL00024A  
191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

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.



(1) PROPOSED DISH Wireless L.L.C. HYBRID CABLE ROUTED INSIDE POLE

PROPOSED DISH Wireless L.L.C. ICE BRIDGE

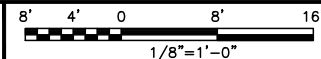
PROPOSED DISH Wireless L.L.C. GPS UNIT

PROPOSED DISH Wireless L.L.C. EQUIPMENT ON PROPOSED STEEL PLATFORM

EXISTING ENTRY PORT

EXISTING MONOPOLE BOTTOM EL. @ 6" AGL

**PROPOSED NORTH ELEVATION**

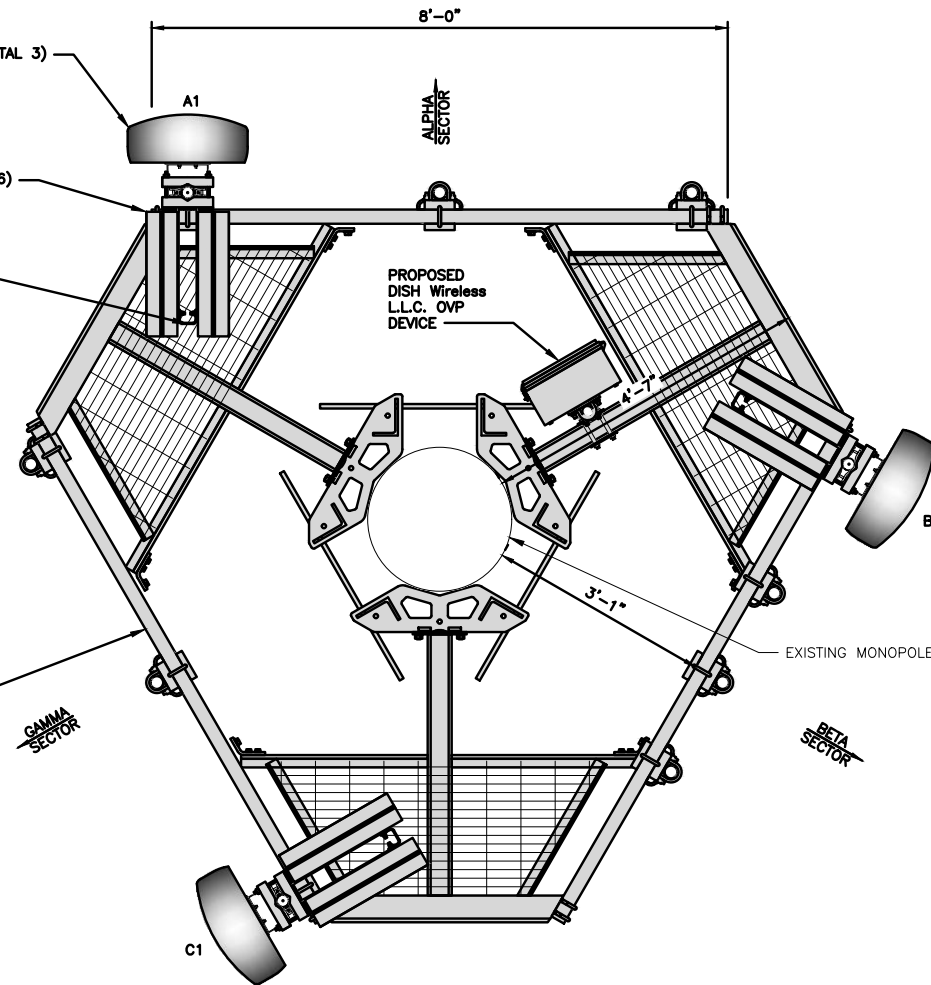


PROPOSED DISH Wireless L.L.C. ANTENNA (TYP 1 PER SECTOR, TOTAL 3)

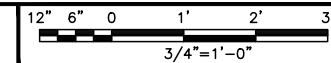
PROPOSED DISH Wireless L.L.C. RRH (TYP 2 PER SECTOR, TOTAL 6)

PROPOSED DISH Wireless L.L.C. BACK-TO-BACK MOUNT (TYP OF 1 PER SECTOR, TOTAL 3)

PROPOSED DISH Wireless L.L.C. ANTENNA PLATFORM



**ANTENNA LAYOUT**



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°	69'-0"	(1) HIGH-CAPACITY HYBRID CABLE (145'-0" LONG)
BETA	B1	PROPOSED	JMA - MX08FRO665-21	5G	72.0" x 20.0"	120°	69'-0"	
GAMMA	C1	PROPOSED	JMA - MX08FRO665-21	5G	72.0" x 20.0"	240°	69'-0"	

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

OVP		
EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	SIZE (HxWxD)
PROPOSED	RAYCAP-RDIDC-9181-PF-48	16"x14"x8"

**ANTENNA SCHEDULE**

NO SCALE

3



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RFDS REV #: 1

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152515.002.01

DISH Wireless L.L.C. PROJECT INFORMATION  
BOBDL0024A  
191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

SHEET TITLE  
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER

**A-2**





5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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DISH Wireless L.L.C.  
PROJECT INFORMATION

BOBDL0024A  
191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

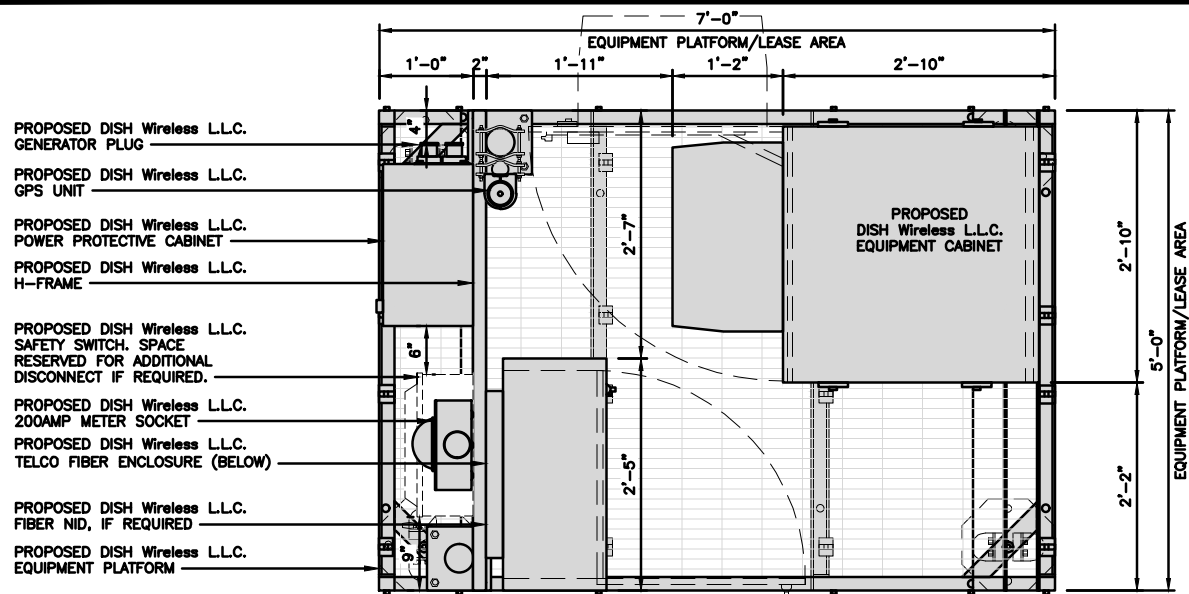
SHEET TITLE  
EQUIPMENT PLATFORM AND  
H-FRAME DETAILS

SHEET NUMBER

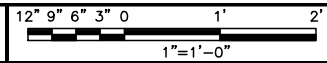
**A-3**

**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



PLATFORM EQUIPMENT PLAN

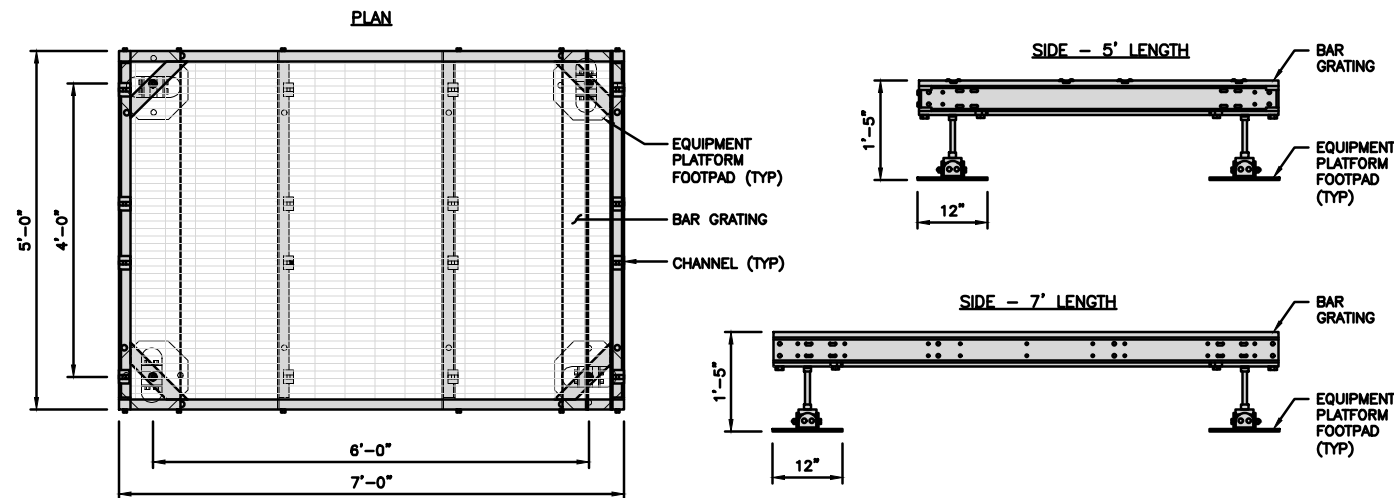


1

**COMMSCOPE MTC4045LP  
5X7 PLATFORM**

DIMENSIONS (HxWxD)	16"x84"x60"
TOTAL WEIGHT	423 LBS

NOTE:  
GC TO PROVIDE EXTENDED  
THREAD FOR PLATFORM IF  
REQUIRED HEIGHT EXCEEDS 17"



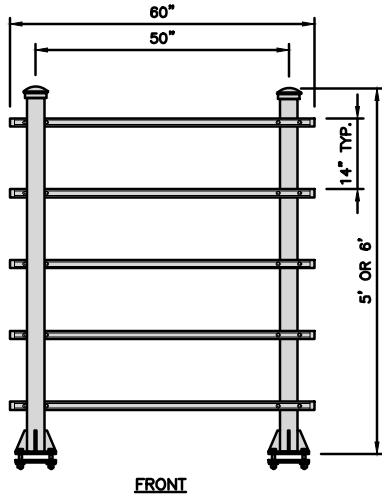
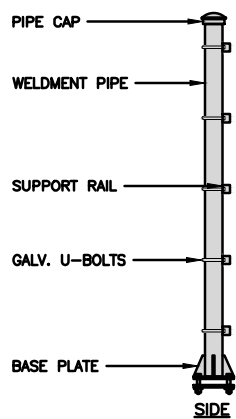
PLATFORM DETAIL

NO SCALE 2

**COMMSCOPE MTC4045HFLD  
H-FRAME**

UNISTRUT/SUPPORT RAILS QTY	5
WEIGHT	59.74 lbs

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

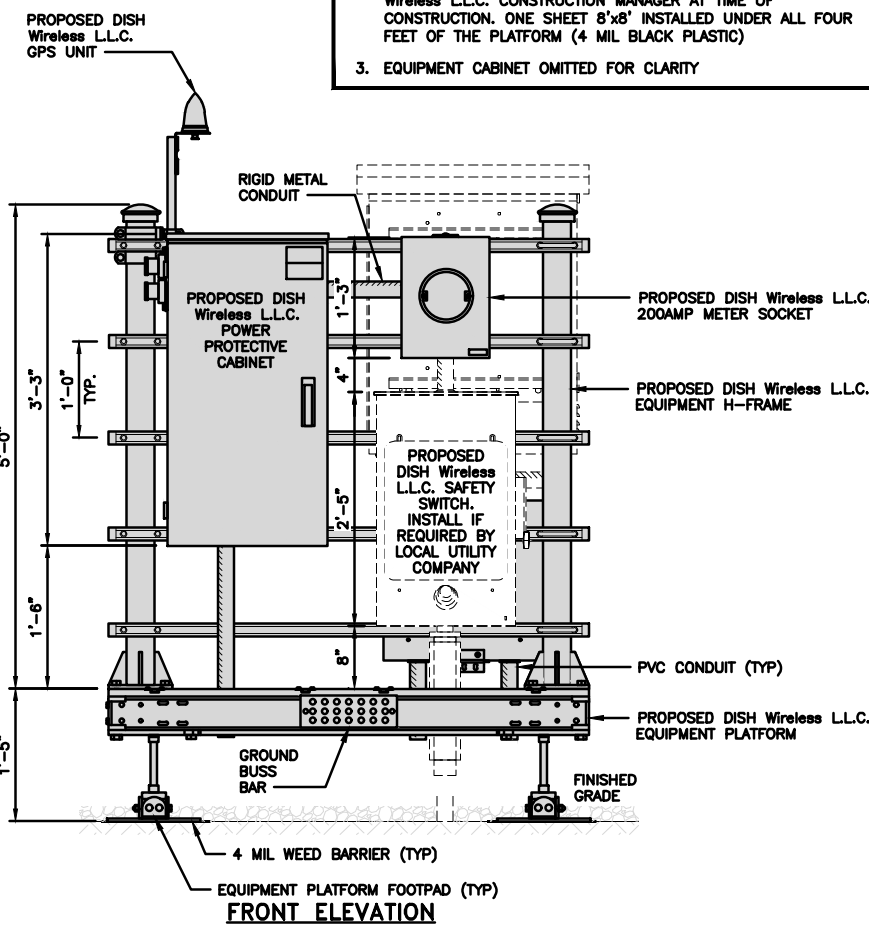


H-FRAME DETAIL

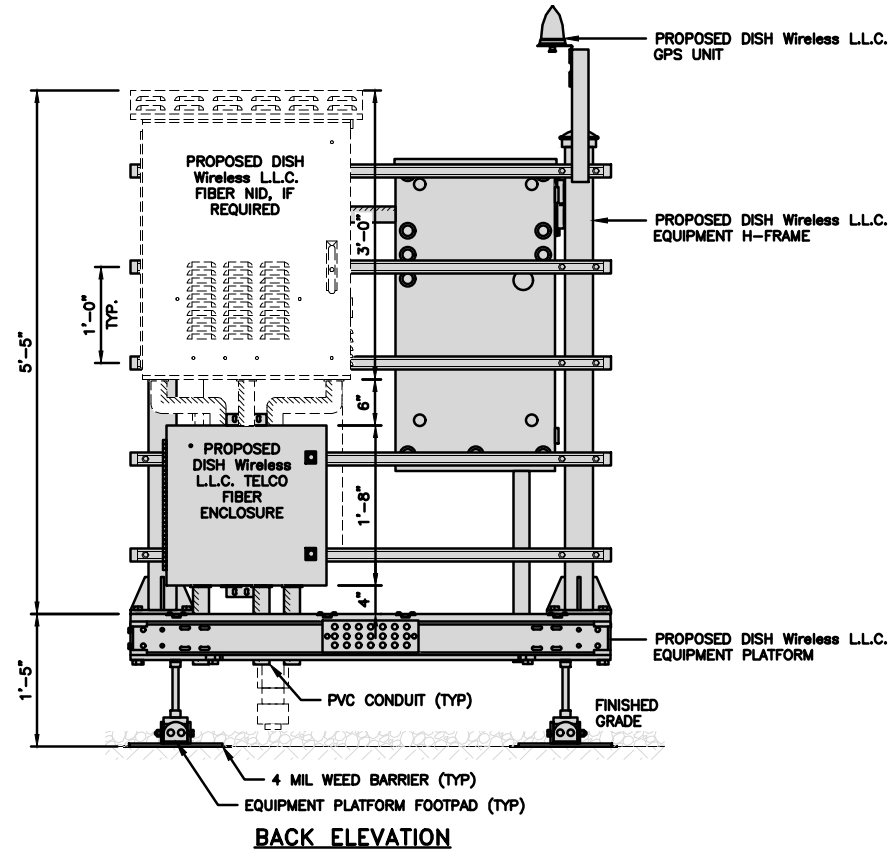
NO SCALE 3

NOT USED

NO SCALE 4

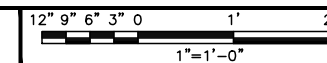


FRONT ELEVATION

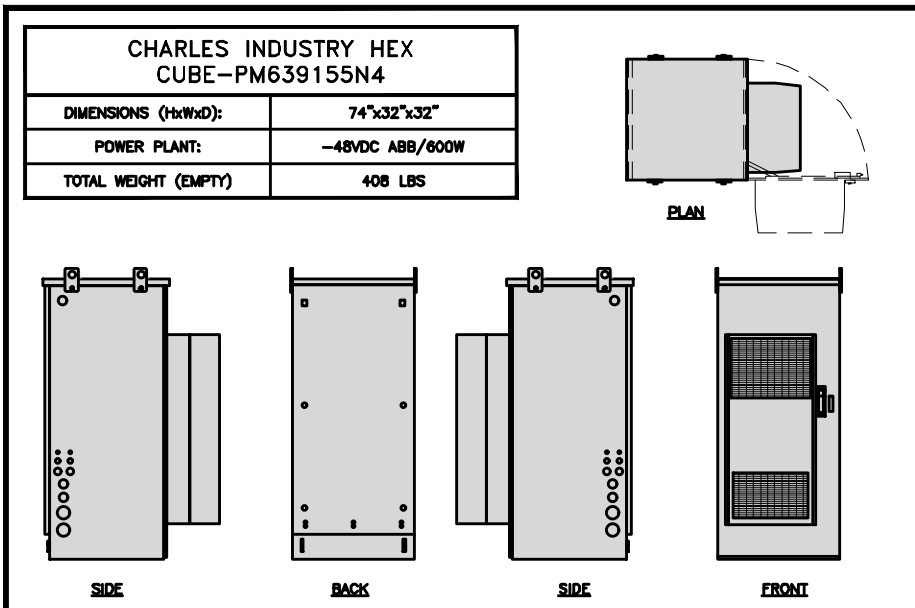


BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION



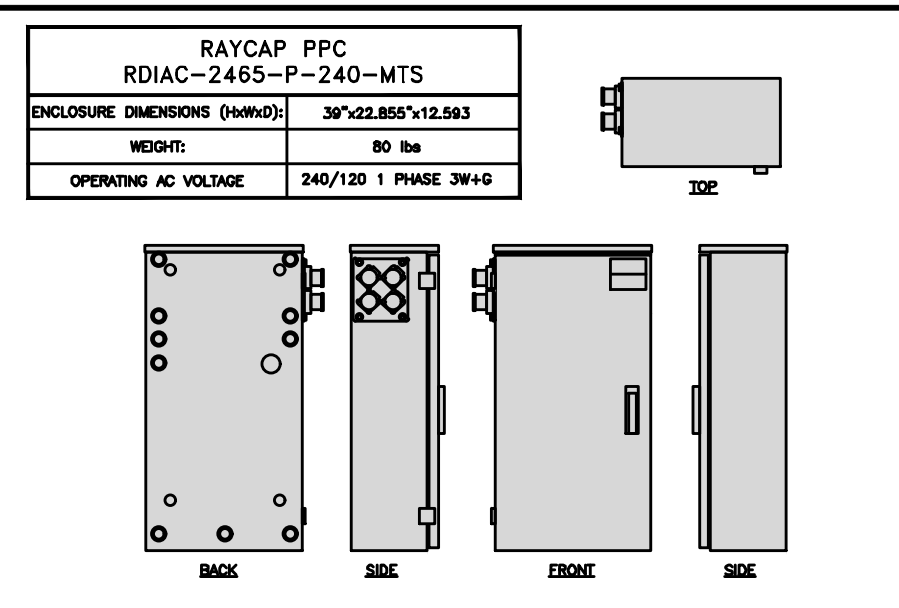
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CABINET DETAIL

NO SCALE

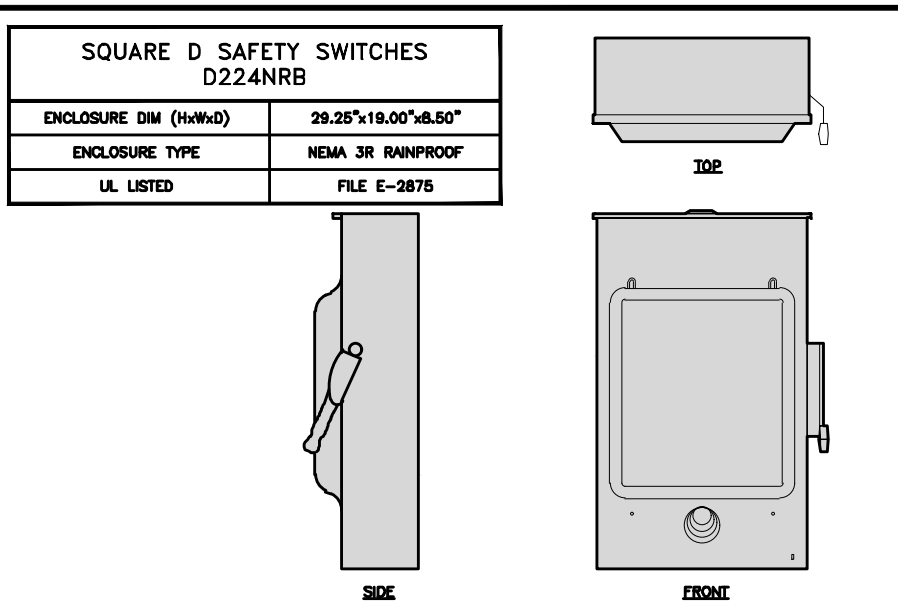
1



POWER PROTECTION CABINET (PPC) DETAIL

NO SCALE

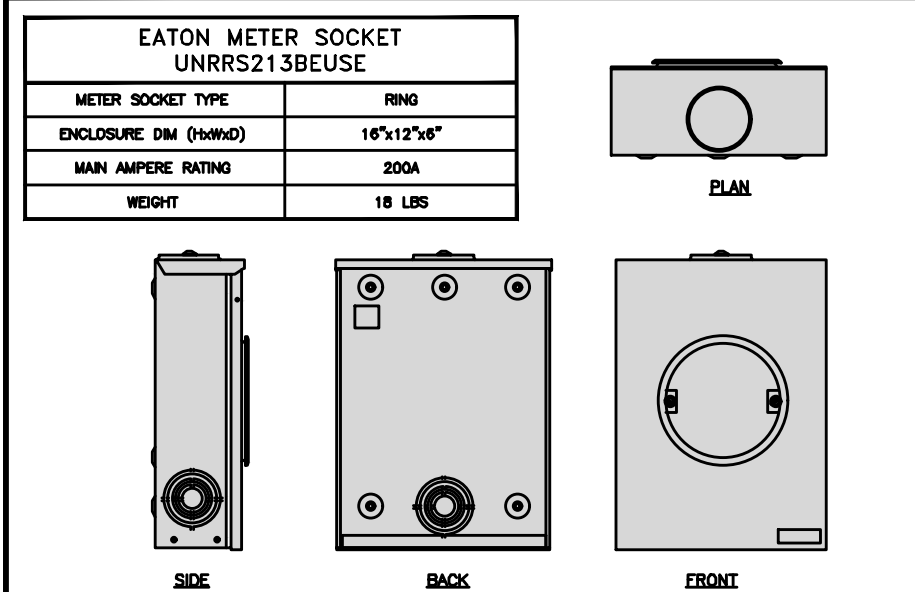
2



SAFETY SWITCH DETAIL

NO SCALE

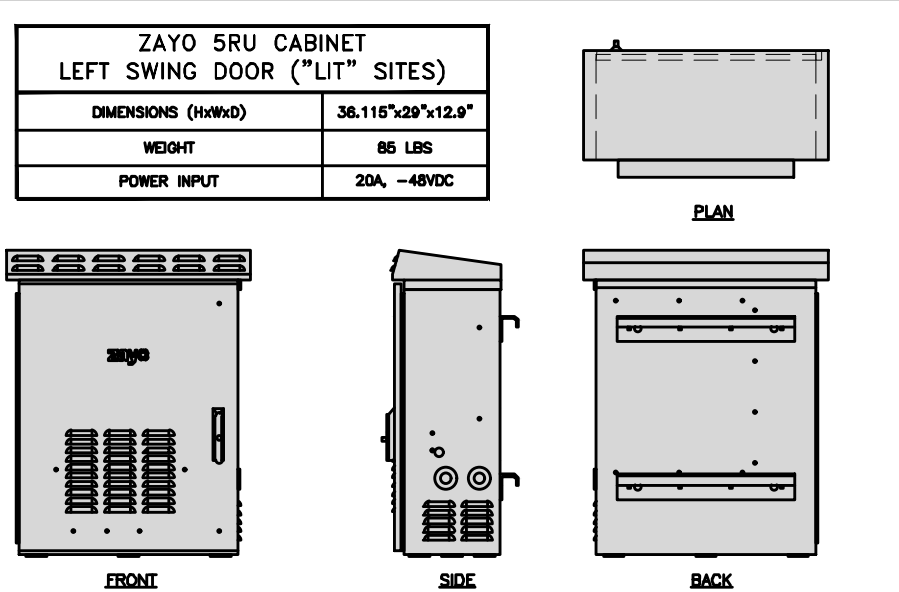
3



METER SOCKET DETAIL

NO SCALE

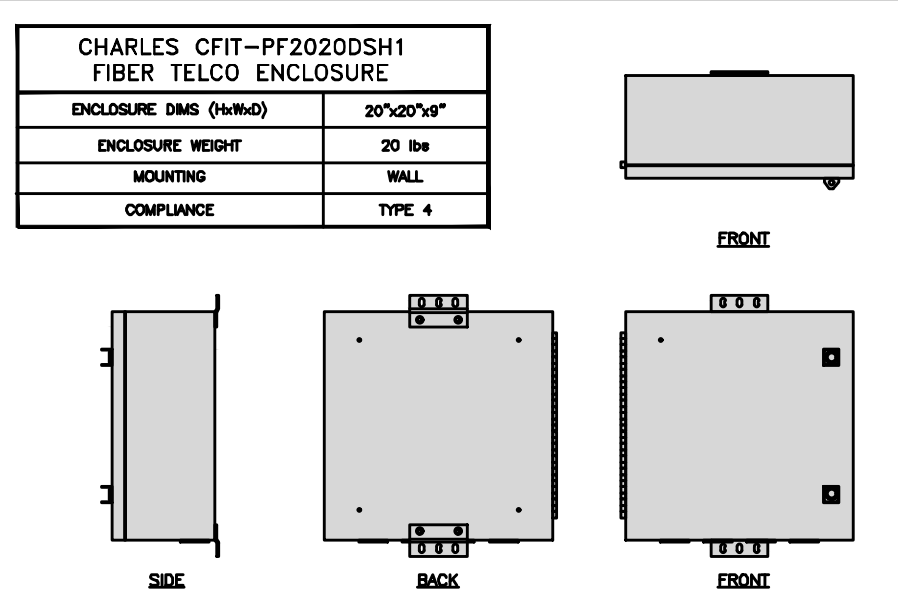
4



NETWORK INTERFACE UNIT DETAIL

NO SCALE

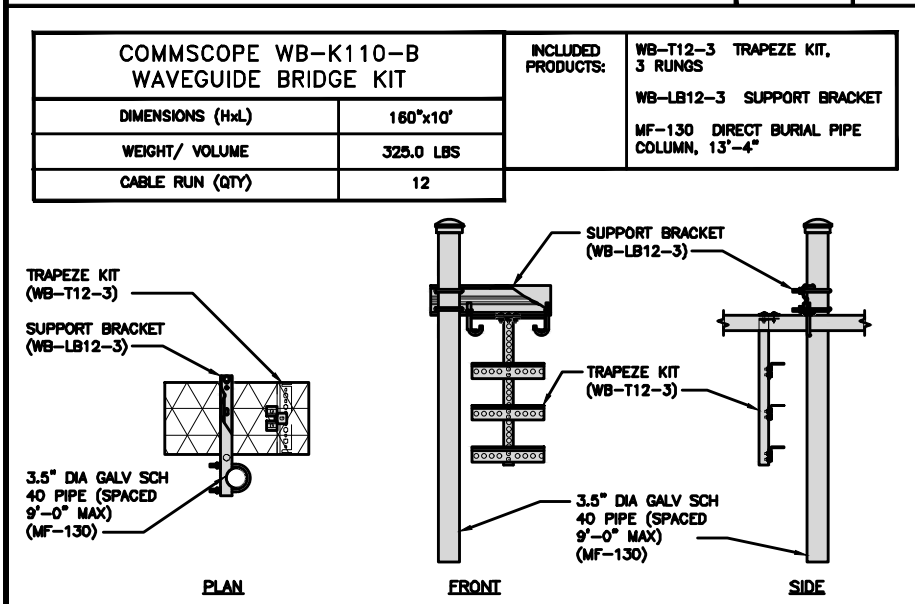
5



FIBER TELCO ENCLOSURE DETAIL

NO SCALE

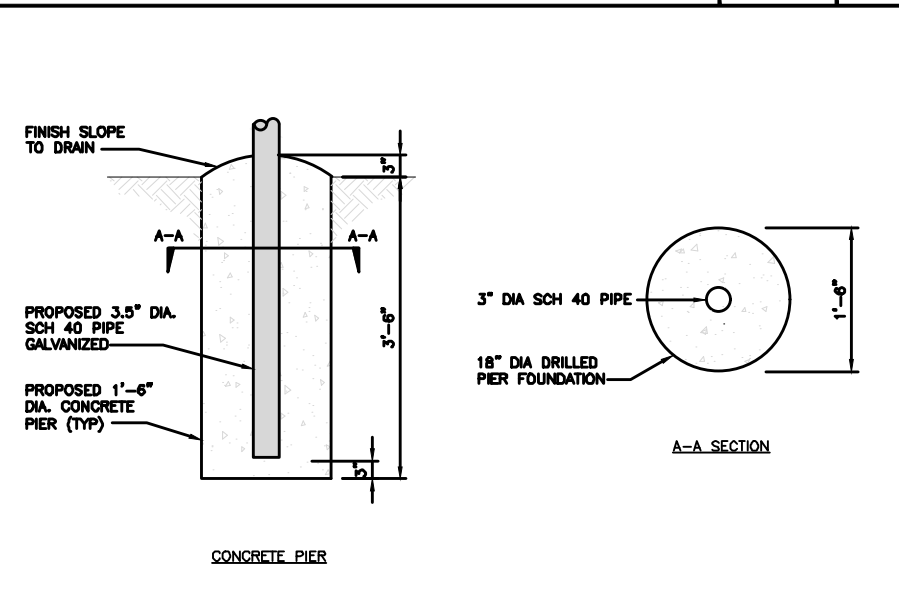
6



ICE BRIDGE DETAIL

NO SCALE

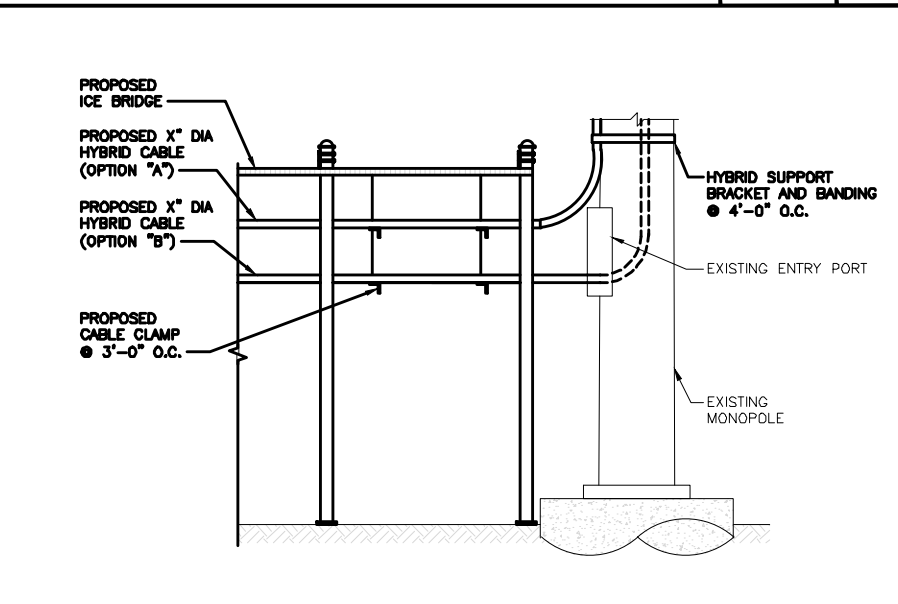
7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL

NO SCALE

8



HYBRID CABLE RUN

NO SCALE

9



5701 SOUTH SANTA FE DRIVE  
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SR/CDW	RMC	MJP
RFDS REV #:		1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/18/21	ISSUED FOR REVIEW
0	8/6/21	ISSUED FOR CONSTRUCTION
1	8/11/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER  
152515.002.01

DISH Wireless L.L.C.  
PROJECT INFORMATION

BOBDL0024A  
191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

SHEET TITLE  
EQUIPMENT DETAILS

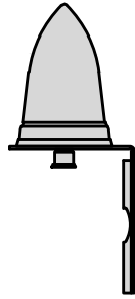
SHEET NUMBER  
A-4



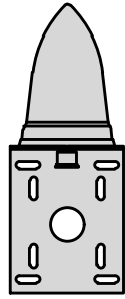
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



TOP



BACK

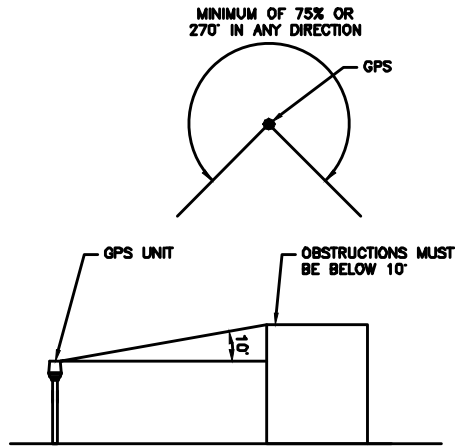


SIDE

GPS DETAIL

NO SCALE

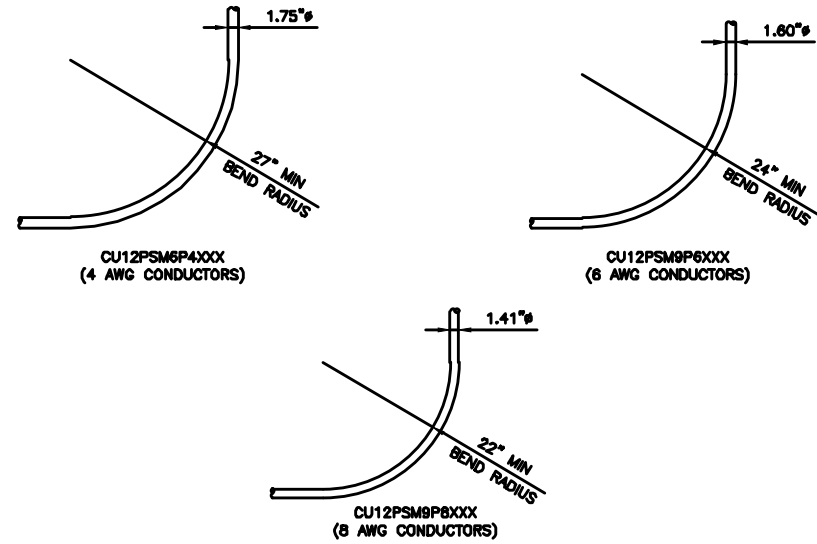
1



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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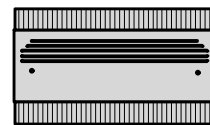
A&E PROJECT NUMBER  
152515.002.01

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BOBDL0024A  
191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

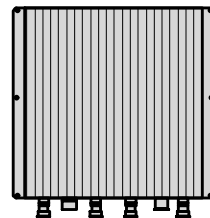
SHEET TITLE  
EQUIPMENT DETAILS

SHEET NUMBER  
A-5

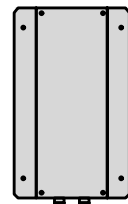
FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



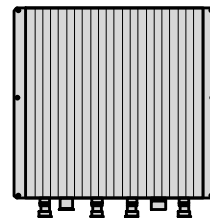
PLAN



BACK



SIDE



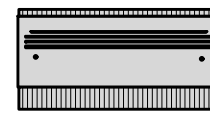
FRONT

RRH DETAIL

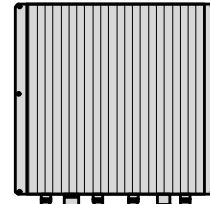
NO SCALE

1

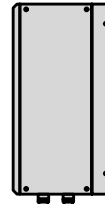
FUJITSU DUAL BAND TA08025-B604	
DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



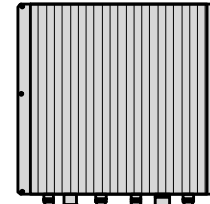
PLAN



BACK



SIDE



FRONT

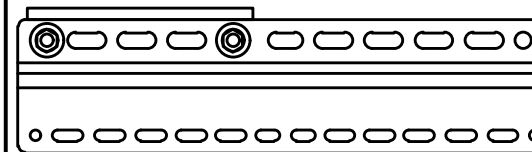
RRH DETAIL

NO SCALE

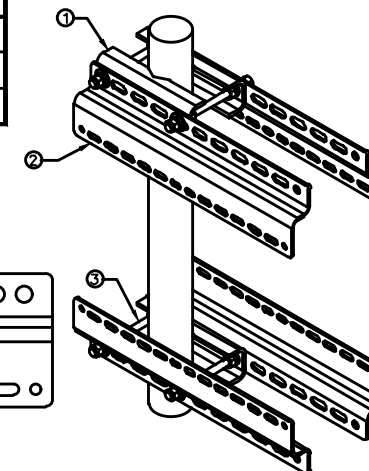
2

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

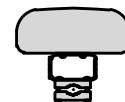


RRH MOUNT DETAIL

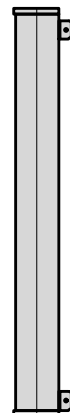
NO SCALE

3

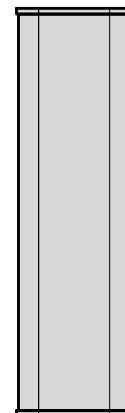
JMA MX08FRO665-21	
DIMENSIONS (HxWxD)	72"x20.0"x8.0"
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE
WEIGHT	64.5 lbs
WEIGHT WITH BRACKETS	82.5 lbs



PLAN



SIDE



FRONT

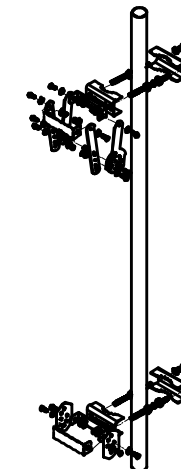
ANTENNA DETAIL

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

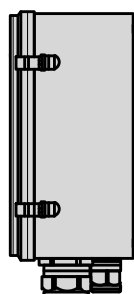
NO SCALE

6

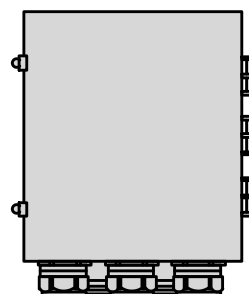
RAYCAP RDIC-9181-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.62 LBS



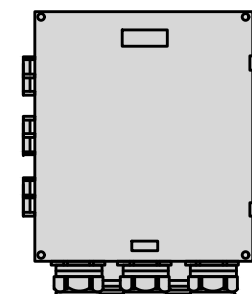
PLAN



SIDE



BACK



FRONT

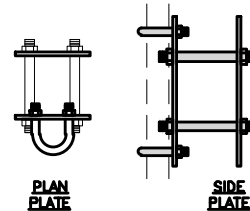
SURGE SUPPRESSION DETAIL (OVP)

NO SCALE

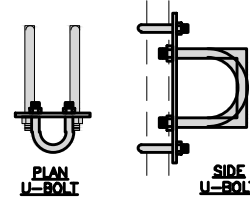
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COMMSCOPE XP-2040 CROSSOVER PLATE	
DIMENSIONS (HxW)	10"x12"
WEIGHT	11 lbs

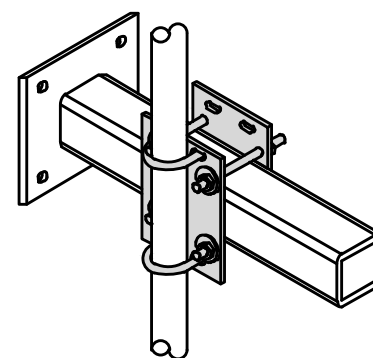
NOTE:  
OR DISH Wireless L.L.C.  
APPROVED EQUIVALENT



PLAN U-BOLT



SIDE U-BOLT



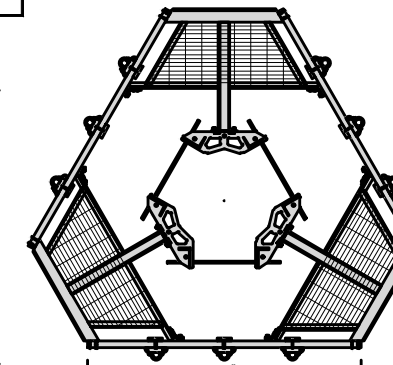
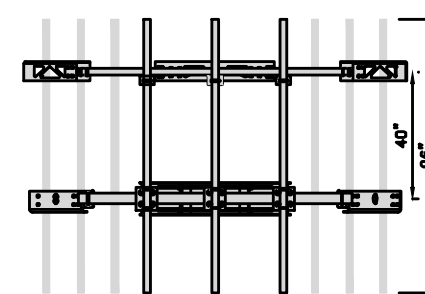
RRH/OVP MOUNT DETAIL

NO SCALE

8

COMMSCOPE MC-PK8-DSH	
FACE WIDTH	96"
WEIGHT	1373.08 lbs
NOTE: 15" TO 38" O.D.	

NOTE:  
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APPROVED EQUIVALENT



ANTENNA PLATFORM DETAIL

NO SCALE

9

**dish**  
wireless.

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LITTLETON, CO 80120

**AMERICAN TOWER**  
10 PRESIDENTIAL WAY  
WOBURN, MA 01801

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8/11/21

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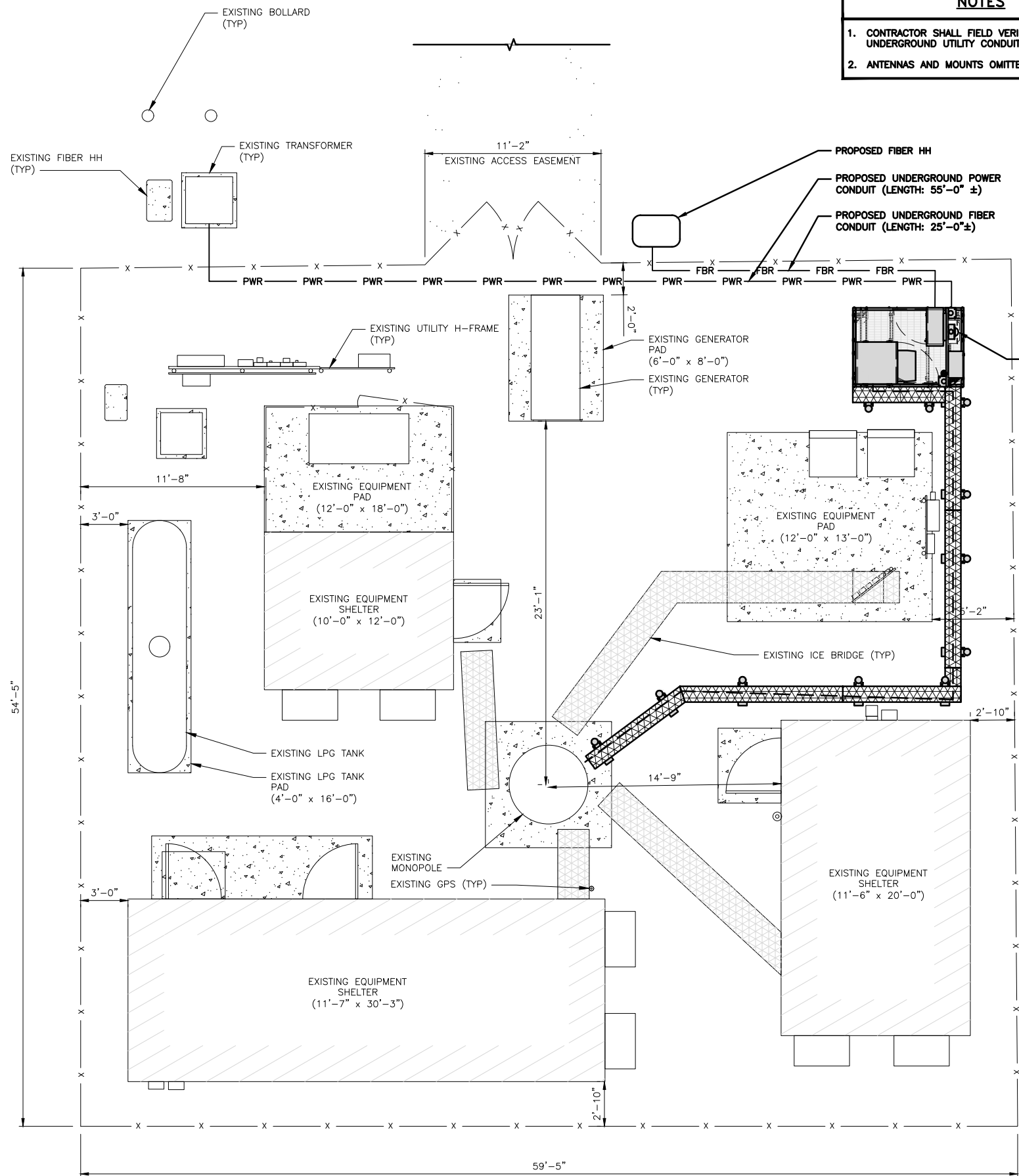
DISH Wireless L.L.C.  
PROJECT INFORMATION

BOBDL00024A  
191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

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.

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
14. AN EXISTING CONDITIONS SURVEY WAS NOT AVAILABLE AT THE TIME OF THIS DRAWING'S CREATION.



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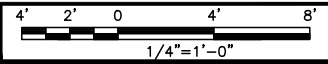
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191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

SHEET TITLE  
ELECTRICAL/FIBER ROUTE  
PLAN AND NOTES

SHEET NUMBER  
**E-1**



**UTILITY ROUTE PLAN**



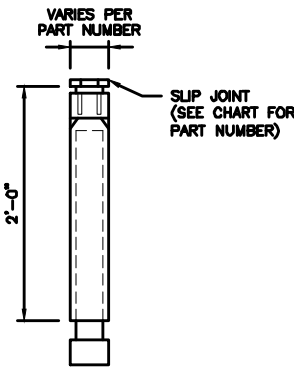
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**ELECTRICAL NOTES**

NO SCALE

2

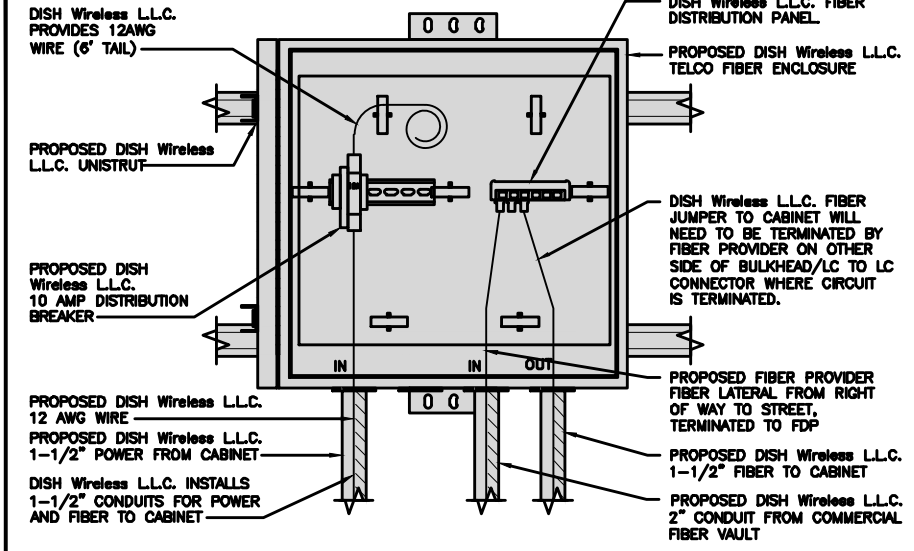
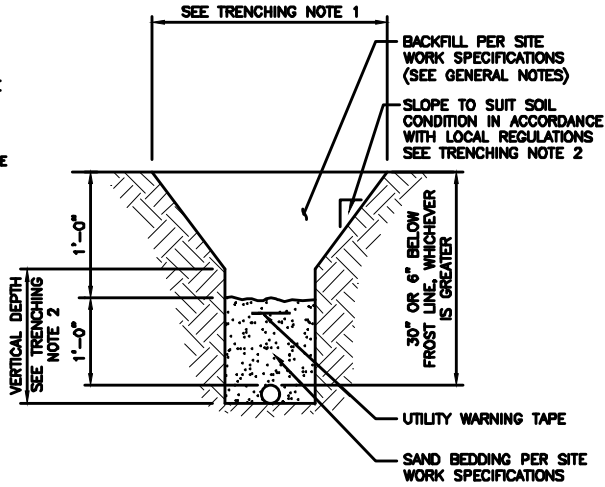
CARLON EXPANSION FITTINGS				
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"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



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

**TRENCHING NOTES**

- 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.
- TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT OSHA TRENCHING AND EXCAVATION SAFETY STANDARDS.
- 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.



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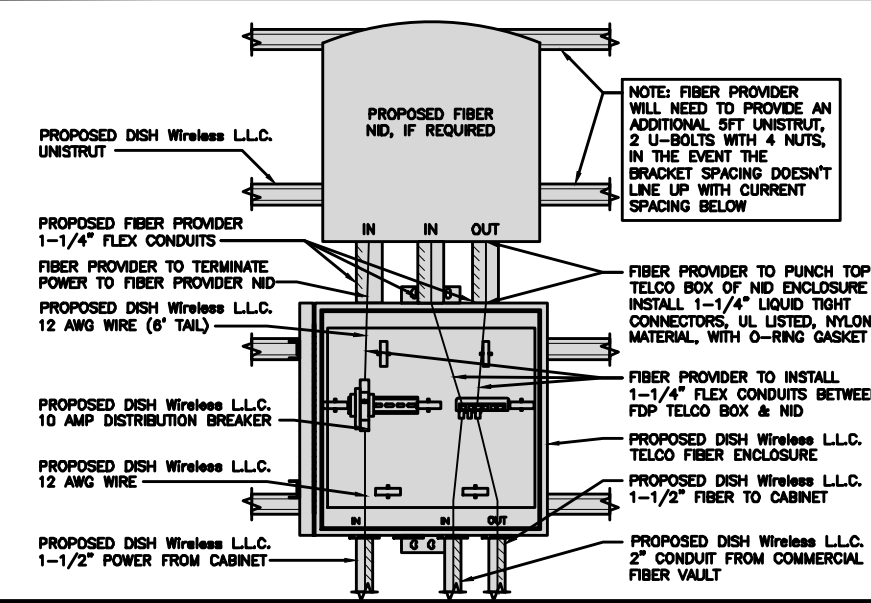
SHEET TITLE  
ELECTRICAL  
DETAILS

SHEET NUMBER  
**E-2**

EXPANSION JOINT DETAIL NO SCALE 1

TYPICAL UNDERGROUND TRENCH DETAIL NO SCALE 2

DARK TELCO BOX - INTERIOR WIRING LAYOUT NO SCALE 3



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

NOT USED NO SCALE 5

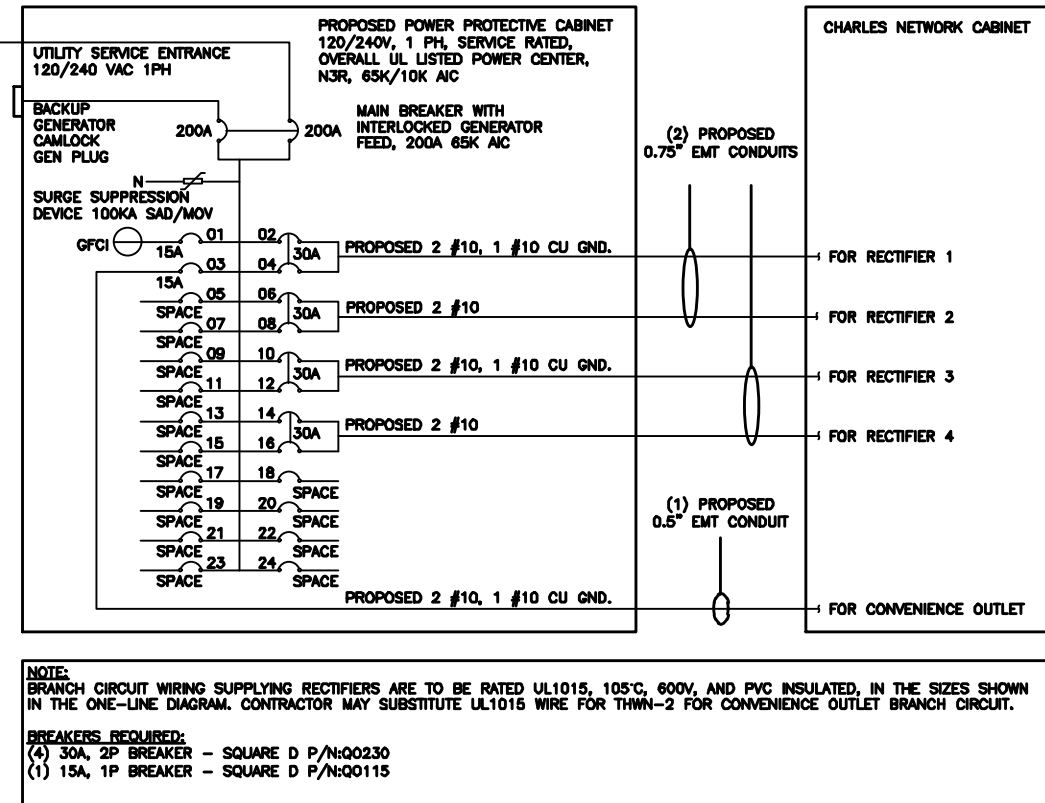
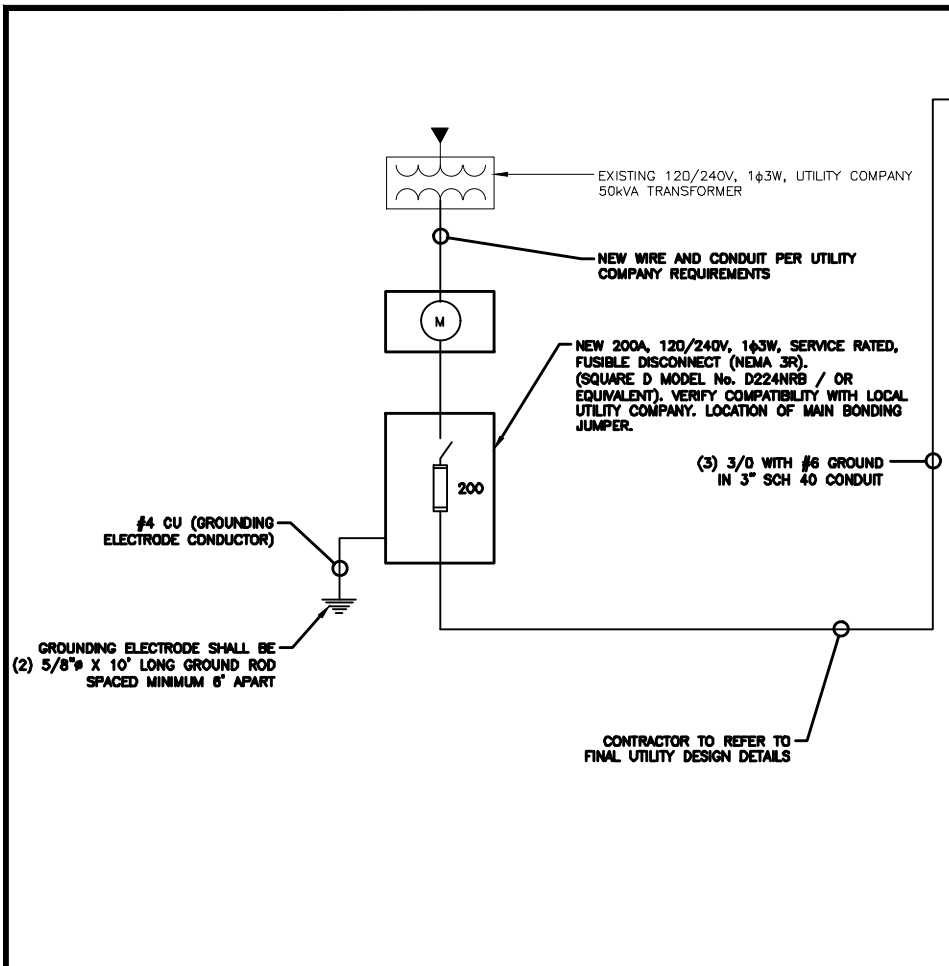
NOT USED NO SCALE 6

NOT USED NO SCALE 7

NOT USED NO SCALE 8

NOT USED NO SCALE 9





**NOTES**

THE (2) CONDUITS WITH (4) CURRENT CARRYING CONDUCTORS EACH, SHALL APPLY THE ADJUSTMENT FACTOR OF 80% PER 2014/17 NEC TABLE 310.15(B)(3)(a) OR 2020 NEC TABLE 310.15(C)(1) FOR UL1015 WIRE.

#12 FOR 15A-20A/1P BREAKER: 0.8 x 30A = 24.0A  
 #10 FOR 25A-30A/2P BREAKER: 0.8 x 40A = 32.0A  
 #8 FOR 35A-40A/2P BREAKER: 0.8 x 55A = 44.0A  
 #6 FOR 45A-60A/2P BREAKER: 0.8 x 75A = 60.0A

CONDUIT SIZING: AT 40% FILL PER NEC CHAPTER 9, TABLE 4, ARTICLE 368.

0.5" CONDUIT - 0.122 SQ. IN AREA  
 0.75" CONDUIT - 0.213 SQ. IN AREA  
 2.0" CONDUIT - 1.316 SQ. IN AREA  
 3.0" CONDUIT - 2.907 SQ. IN AREA

CABINET CONVENIENCE OUTLET CONDUCTORS (1 CONDUIT): USING THWN-2, CU.

#10 - 0.0211 SQ. IN X 2 = 0.0422 SQ. IN  
 #10 - 0.0211 SQ. IN X 1 = 0.0211 SQ. IN <GROUND  
 TOTAL = 0.0633 SQ. IN

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

RECTIFIER CONDUCTORS (2 CONDUITS): USING UL1015, CU.

#10 - 0.0286 SQ. IN X 4 = 0.1146 SQ. IN  
 #10 - 0.0082 SQ. IN X 1 = 0.0082 SQ. IN <BARE GROUND  
 TOTAL = 0.1146 SQ. IN

0.75" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (5) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

PPC FEED CONDUCTORS (1 CONDUIT): USING THWN, CU.

3/0 - 0.2679 SQ. IN X 3 = 0.8037 SQ. IN  
 #6 - 0.0507 SQ. IN X 1 = 0.0507 SQ. IN <GROUND  
 TOTAL = 0.8544 SQ. IN

3.0" SCH 40 PVC CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (4) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

PPC ONE-LINE DIAGRAM

NO SCALE 1

**PROPOSED CHARLES PANEL SCHEDULE**

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

PANEL SCHEDULE

NO SCALE 2

NOT USED

NO SCALE 3



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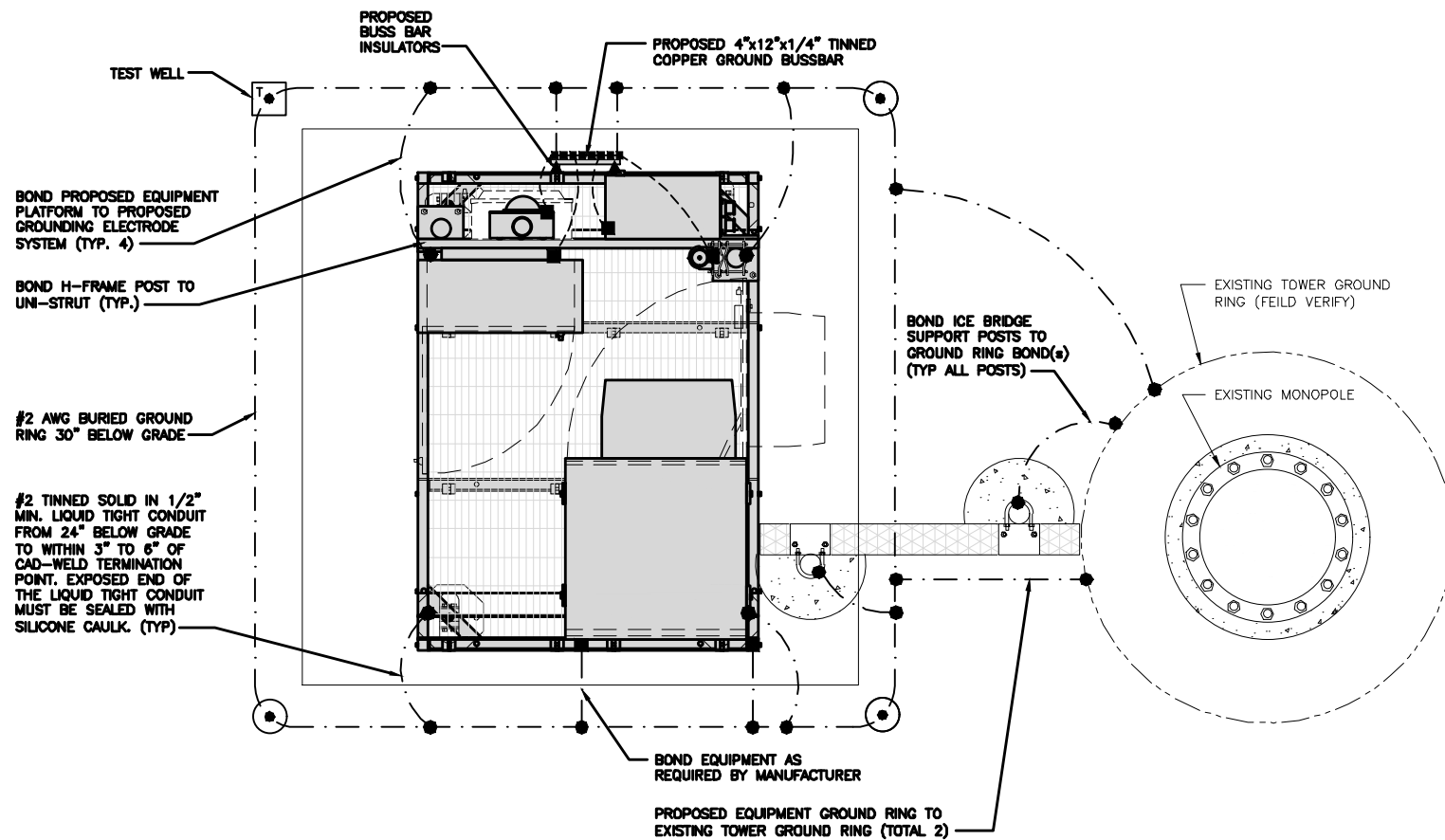
A&E PROJECT NUMBER  
152515.002.01

DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOBDL0024A  
191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

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

SHEET NUMBER  
E-3



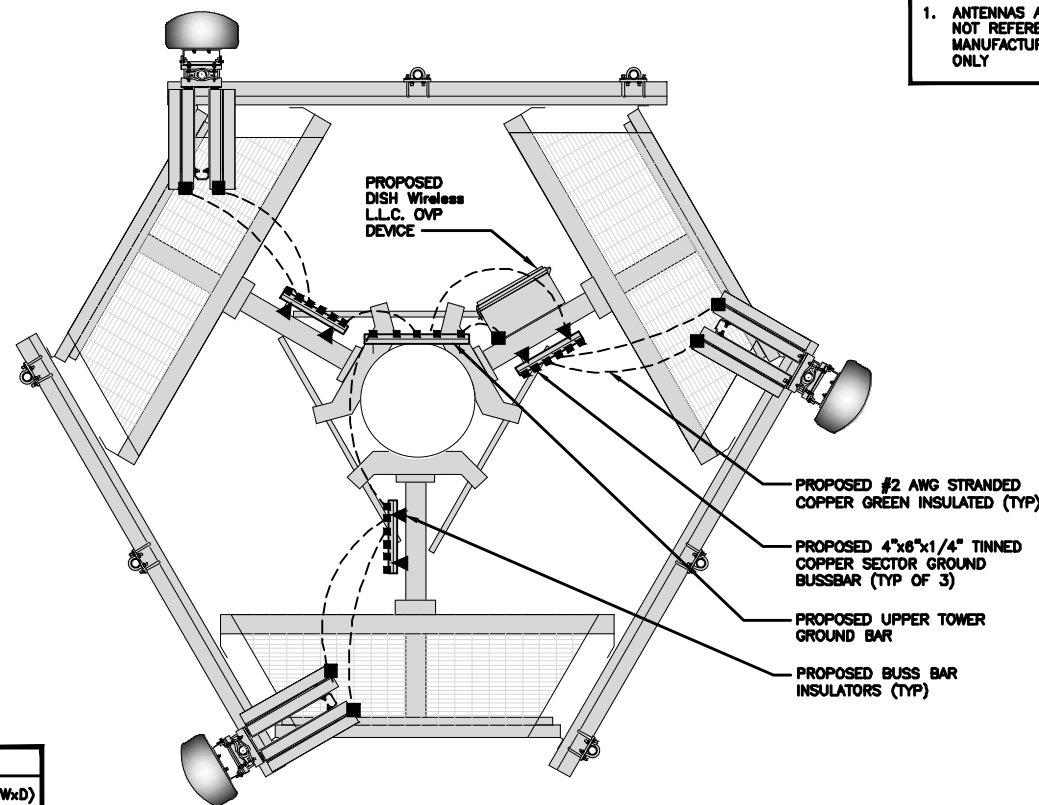


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1

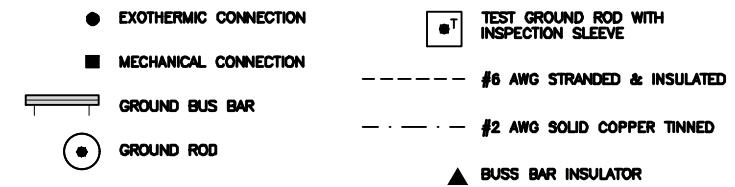
NOTES

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



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

- EXTERIOR GROUND RING:** #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 8 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.
- 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.
- 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.
- 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.
- GROUND ROD:** UL LISTED COPPER CLAD STEEL MINIMUM 1/2" DIAMETER BY EIGHT FEET LONG. GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR.
- 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.
- 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.
- 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.
- TELCO GROUND BAR:** BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.
- FRAME BONDING:** THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.
- 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.
- 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.
- 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.
- 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.
- 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**
- 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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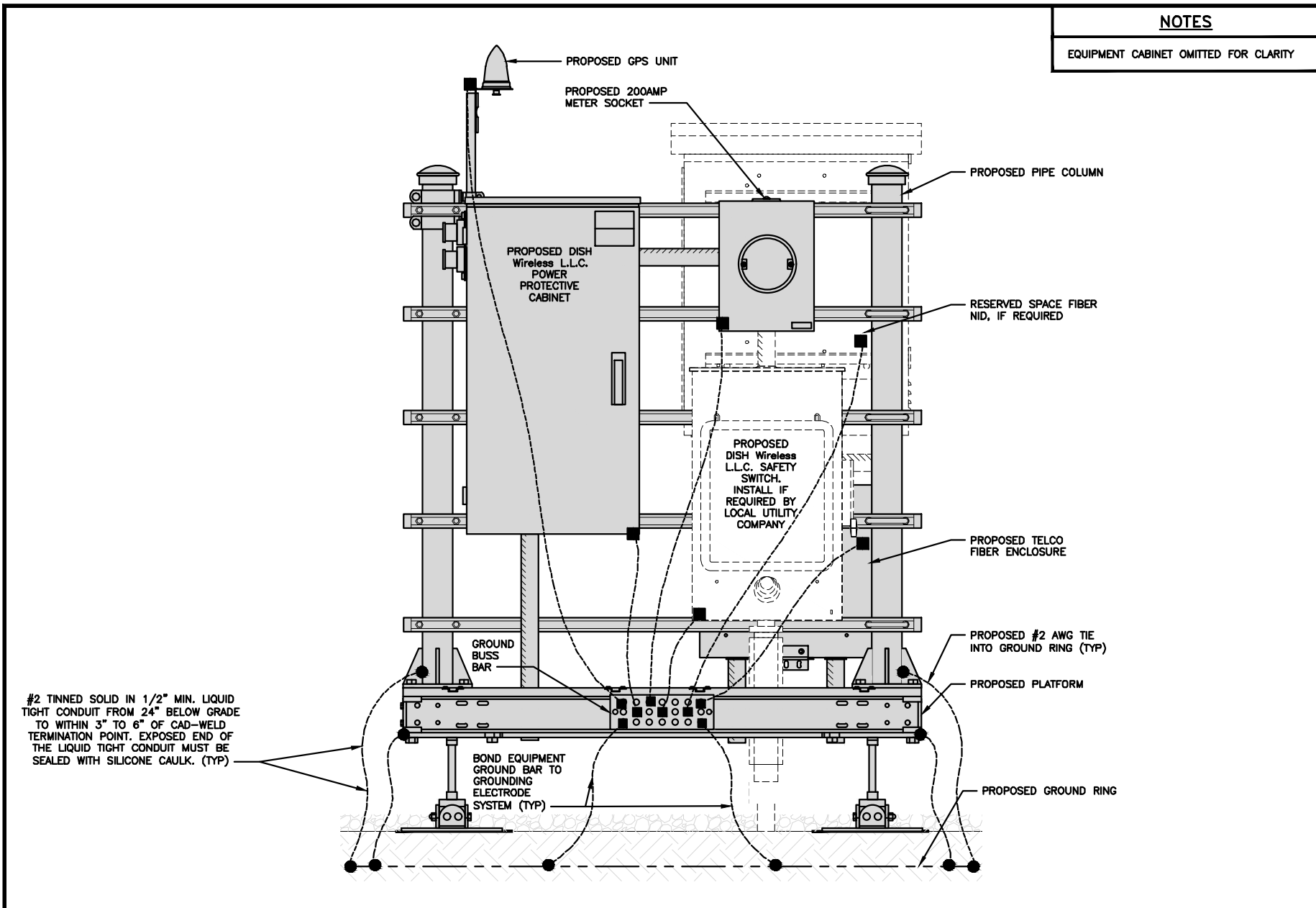
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PROJECT INFORMATION  
BOBDL0024A  
191 MIDDLE HADDAM RD  
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SHEET TITLE  
GROUNDING PLANS  
AND NOTES

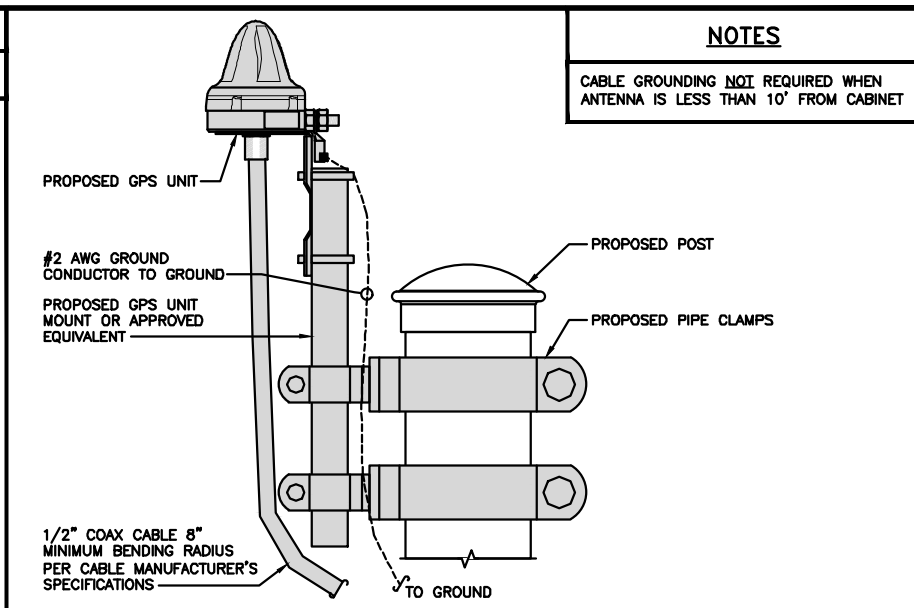
SHEET NUMBER

G-1



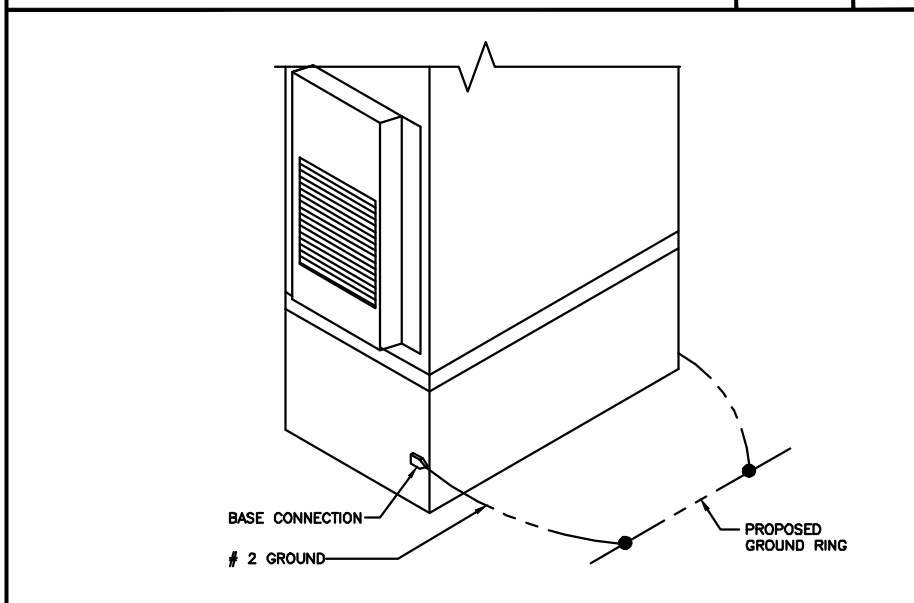
**H-FRAME GROUNDING DETAIL**

NO SCALE 1



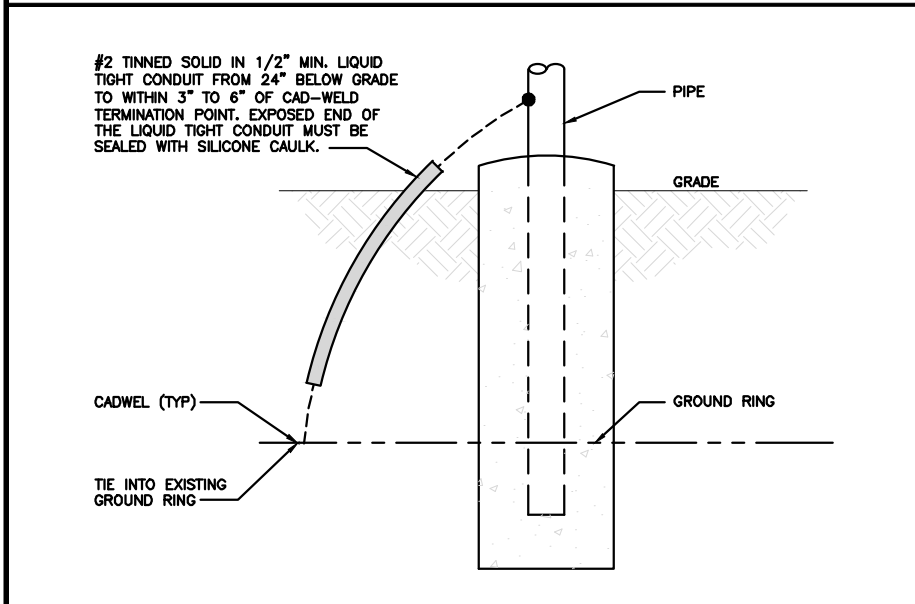
**TYPICAL GPS UNIT GROUNDING**

NO SCALE 2



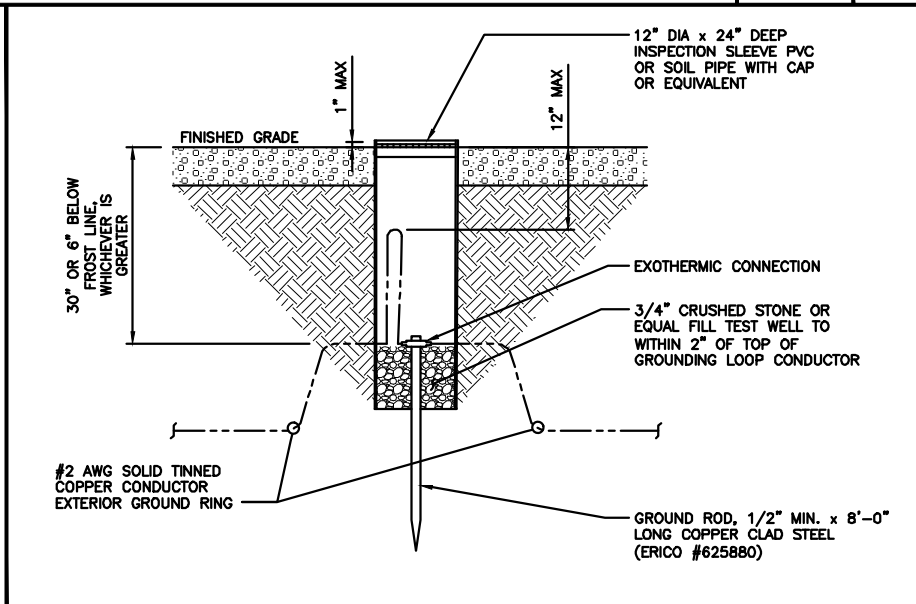
**OUTDOOR CABINET GROUNDING**

NO SCALE 3



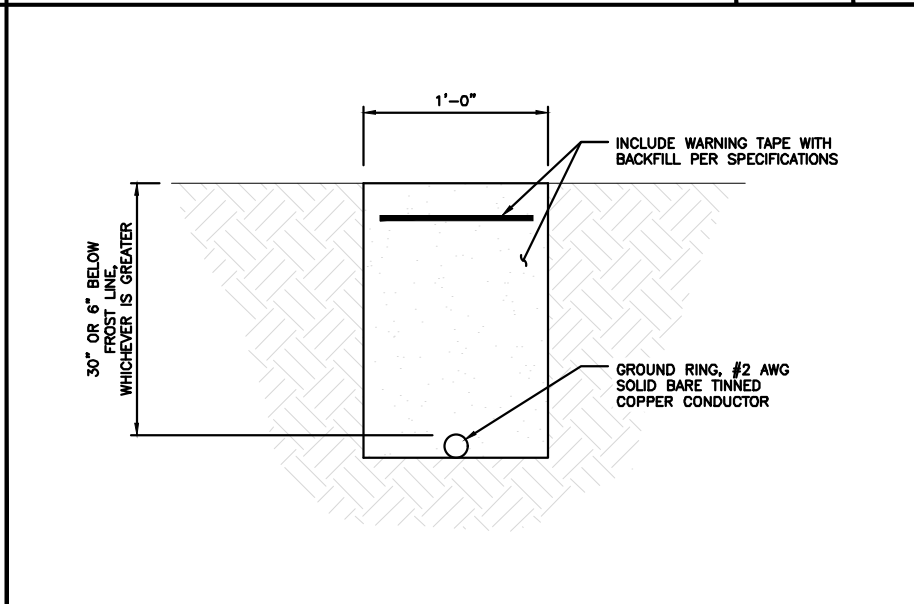
**TRANSITIONING GROUND DETAIL**

NO SCALE 4



**TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE**

NO SCALE 5



**TYPICAL GROUND RING TRENCH**

NO SCALE 6

**dish wireless.**

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**AMERICAN TOWER**  
10 PRESIDENTIAL WAY  
WOBURN, MA 01801

**B+T GRP**  
1717 S. BOULDER  
SUITE 300  
TULSA, OK 74119  
PH: (918) 587-4630  
www.btgrp.com



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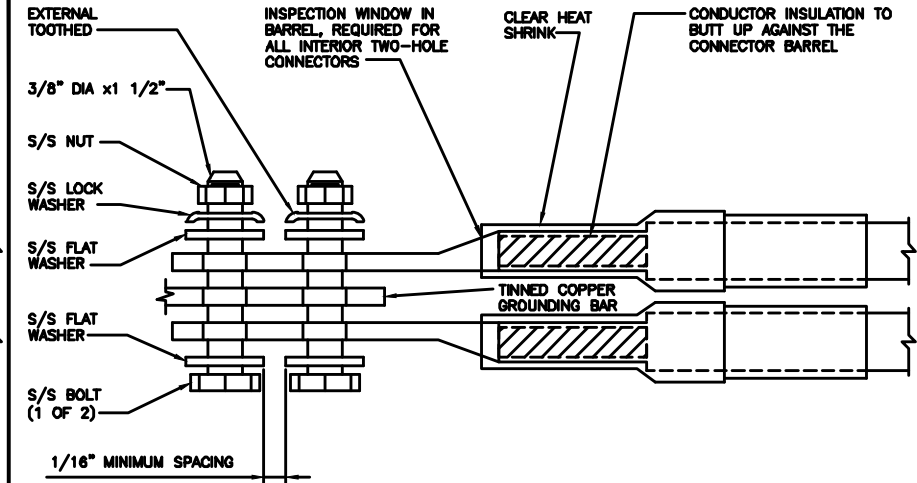
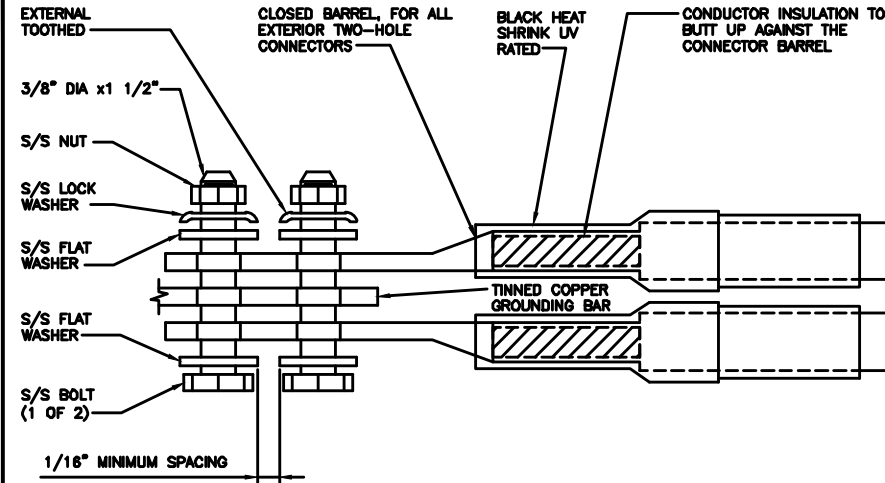
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PROJECT INFORMATION

BOBDL0024A  
191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

SHEET TITLE  
GROUNDING DETAILS

SHEET NUMBER  
**G-2**

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



TYPICAL GROUNDING NOTES

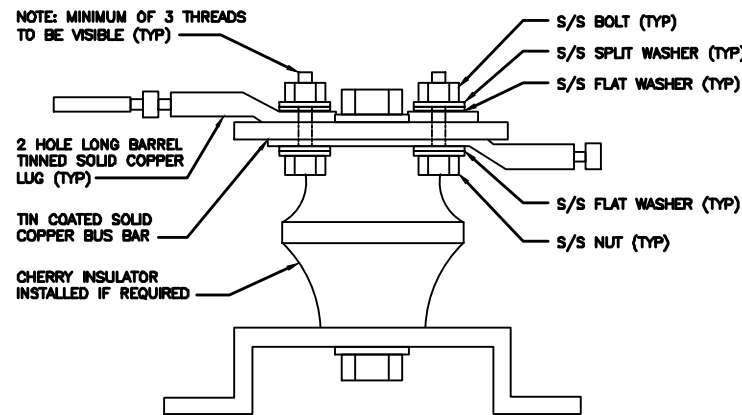
NO SCALE 1

TYPICAL EXTERIOR TWO HOLE LUG

NO SCALE 2

TYPICAL INTERIOR TWO HOLE LUG

NO SCALE 3



LUG DETAIL

NO SCALE 4

NOT USED

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 7

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9



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**BOBDL0024A**  
191 MIDDLE HADDAM RD  
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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)

ALPHA RRH				BETA RRH				GAMMA RRH			
PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT
RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
ORANGE	ORANGE	RED	RED	ORANGE	ORANGE	BLUE	BLUE	ORANGE	ORANGE	GREEN	GREEN
	WHITE (-) PORT	ORANGE	ORANGE		WHITE (-) PORT	ORANGE	ORANGE		WHITE (-) PORT	ORANGE	ORANGE
			WHITE (-) PORT				WHITE (-) PORT				WHITE (-) PORT

MID-BAND RRH -  
(AWS BANDS N66+N70)

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

RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
PURPLE	PURPLE	RED	RED	PURPLE	PURPLE	BLUE	BLUE	PURPLE	PURPLE	GREEN	GREEN
	WHITE (-) PORT	PURPLE	PURPLE		WHITE (-) PORT	PURPLE	PURPLE		WHITE (-) PORT	PURPLE	PURPLE
			WHITE (-) PORT				WHITE (-) PORT				WHITE (-) PORT

**HYBRID/DISCREET CABLES**

INCLUDE SECTOR BANDS BEING SUPPORTED  
ALONG WITH FREQUENCY BANDS

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

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

EXAMPLE 1	EXAMPLE 2	EXAMPLE 3
RED	RED	RED
BLUE	BLUE	
GREEN	GREEN	ORANGE
ORANGE	YELLOW	PURPLE
PURPLE		

**FIBER JUMPERS TO RRHs**

LOW-BAND RRH FIBER CABLES HAVE SECTOR  
STRIPE ONLY

LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH
RED	RED	BLUE	BLUE	GREEN	GREEN
	PURPLE		PURPLE		PURPLE

**POWER CABLES TO RRHs**

LOW-BAND RRH POWER CABLES HAVE SECTOR  
STRIPE ONLY

LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH
RED	RED	BLUE	BLUE	GREEN	GREEN
	PURPLE		PURPLE		PURPLE

**RET MOTORS AT ANTENNAS**

ANTENNA 1 LOW BAND/ "IN"	ANTENNA 1 HIGH BAND/ "IN"	ANTENNA 1 LOW BAND/ "IN"	ANTENNA 1 HIGH BAND/ "IN"	ANTENNA 1 LOW BAND/ "IN"	ANTENNA 1 HIGH BAND/ "IN"
RED	RED	BLUE	BLUE	GREEN	GREEN
	PURPLE		PURPLE		PURPLE

**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

FORWARD AZIMUTH OF 0-120 DEGREES		FORWARD AZIMUTH OF 120-240 DEGREES		FORWARD AZIMUTH OF 240-360 DEGREES	
PRIMARY	SECONDARY	PRIMARY	SECONDARY	PRIMARY	SECONDARY
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
RED	RED	BLUE	BLUE	GREEN	GREEN
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
	RED		BLUE		GREEN
	WHITE		WHITE		WHITE
	WHITE		WHITE		WHITE

**RF CABLE COLOR CODES**

NO SCALE

1

NOT USED

NO SCALE

4

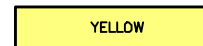
LOW BANDS (N71+N26)  
OPTIONAL - (N29)



AWS  
(N66+N70+H-BLOCK)



CBRS TECH  
(3 GHz)



NEGATIVE SLANT PORT  
ON ANT/RRH



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR



COLOR IDENTIFIER

NO SCALE

2

NOT USED

NO SCALE

3

NOT USED

NO SCALE

4



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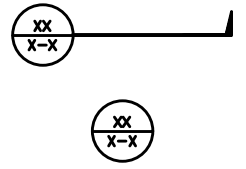
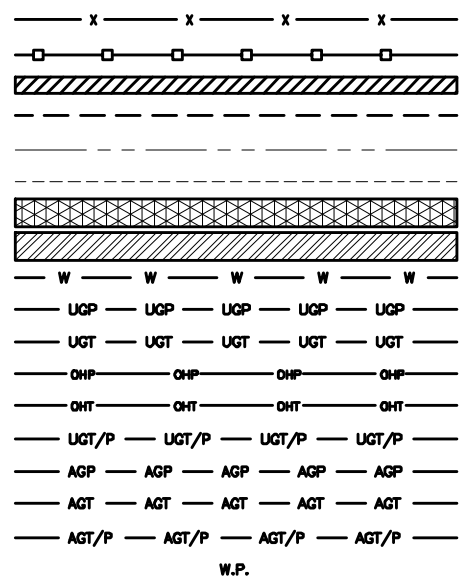
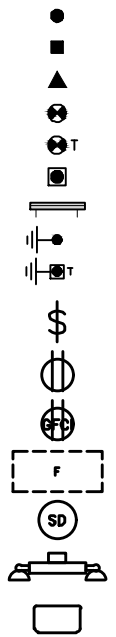
SHEET TITLE  
RF  
CABLE COLOR CODES

SHEET NUMBER

RF-1



EXOTHERMIC CONNECTION  
 MECHANICAL CONNECTION  
 BUSS BAR INSULATOR  
 CHEMICAL ELECTROLYTIC GROUNDING SYSTEM  
 TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM  
 EXOTHERMIC WITH INSPECTION SLEEVE  
 GROUNDING BAR  
 GROUND ROD  
 TEST GROUND ROD WITH INSPECTION SLEEVE  
 SINGLE POLE SWITCH  
 DUPLEX RECEPTACLE  
 DUPLEX GFCI RECEPTACLE  
 FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48-T8  
 SMOKE DETECTION (DC)  
 EMERGENCY LIGHTING (DC)  
 SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW  
 LED-1-25A400/51K-SR4-120-PE-DOBXTD  
 CHAIN LINK FENCE  
 WOOD/WROUGHT IRON FENCE  
 WALL STRUCTURE  
 LEASE AREA  
 PROPERTY LINE (PL)  
 SETBACKS  
 ICE BRIDGE  
 CABLE TRAY  
 WATER LINE  
 UNDERGROUND POWER  
 UNDERGROUND TELCO  
 OVERHEAD POWER  
 OVERHEAD TELCO  
 UNDERGROUND TELCO/POWER  
 ABOVE GROUND POWER  
 ABOVE GROUND TELCO  
 ABOVE GROUND TELCO/POWER  
 WORKPOINT



**LEGEND**

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

**ABBREVIATIONS**



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



**B&T ENGINEERING, INC.**  
 PEC.0001564  
 Expires 2/10/22

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

DRAWN BY:	CHECKED BY:	APPROVED BY:
SR/CDW	RMC	MJP

RFDS REV #: 1

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/18/21	ISSUED FOR REVIEW
0	8/6/21	ISSUED FOR CONSTRUCTION
1	8/11/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER  
152515.002.01

DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOBDL00024A  
191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

SHEET TITLE  
**LEGEND AND ABBREVIATIONS**

SHEET NUMBER  
**GN-1**



**SITE ACTIVITY REQUIREMENTS:**

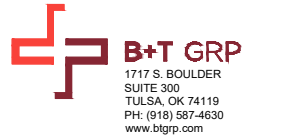
1. NOTICE TO PROCEED – NO WORK SHALL COMMENCE PRIOR TO CONTRACTOR RECEIVING A WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE DISH Wireless L.L.C. AND TOWER OWNER NOC & THE DISH Wireless L.L.C. AND TOWER OWNER CONSTRUCTION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



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



**B&T ENGINEERING, INC.**  
PEC.0001564  
Expires 2/10/22

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DRAWN BY:	CHECKED BY:	APPROVED BY:
SR/CDW	RMC	MJP
RFDS REV #:		1

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/18/21	ISSUED FOR REVIEW
0	8/6/21	ISSUED FOR CONSTRUCTION
1	8/11/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER  
**152515.002.01**

DISH Wireless L.L.C.  
PROJECT INFORMATION

**BOBDL0024A**  
191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

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 SPECIMATE 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.



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



**B&T ENGINEERING, INC.**  
PEC.0001564  
Expires 2/10/22

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DRAWN BY:	CHECKED BY:	APPROVED BY:
SR/CDW	RMC	MJP

RFDS REV #: 1

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/18/21	ISSUED FOR REVIEW
0	8/8/21	ISSUED FOR CONSTRUCTION
1	8/11/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER  
152515.002.01

DISH Wireless L.L.C.  
PROJECT INFORMATION  
  
BOBDL00024A  
191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

SHEET TITLE  
GENERAL NOTES

SHEET NUMBER  
**GN-3**



**GROUNDING NOTES:**

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.
7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
15. APPROVED ANTIOXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
18. BOND ALL METALLIC OBJECTS WITHIN 6 ft OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
19. GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).
21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). DO NOT ATTACH GROUNDING TO FIRE SPRINKLER SYSTEM PIPES.



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A&E PROJECT NUMBER  
152515.002.01

DISH Wireless L.L.C.  
PROJECT INFORMATION  
  
BOBDL0024A  
191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

SHEET TITLE  
GENERAL NOTES

SHEET NUMBER  
**GN-4**



**AMERICAN TOWER®**  
CORPORATION

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## Structural Analysis Report

**Structure** : 138.5 ft Monopole  
**ATC Site Name** : Middle Haddam Road-CROWN CT, CT  
**ATC Asset Number** : 411257  
**Engineering Number** : 13681988\_C3\_02  
**Proposed Carrier** : DISH WIRELESS L.L.C.  
**Carrier Site Name** : BOBDL00024A  
**Carrier Site Number** : BOBDL00024A  
**Site Location** : 191 Middle Haddam Rd  
Portland, CT 06480-1767  
41.562200,-72.573800  
**County** : Middlesex  
**Date** : June 11, 2021  
**Max Usage** : 46%  
**Result** : Pass

Prepared By:  
Megan Engle  
Structural Engineer

*Megan Engle*

Reviewed By:



**COA: PEC.0001553**





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## Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 138.5 ft monopole to reflect the change in loading by DISH WIRELESS L.L.C..

## Supporting Documents

<b>Tower Drawings</b>	EI Job #12477 Revision II, dated May 13, 2004 Mapping by HTS, ATC Site #411257, dated March 24, 2016
<b>Foundation Drawing</b>	Mapping by TPS Report #TPS-CT-257, dated October 22, 2015
<b>Geotechnical Report</b>	CHA Project #11869.1011.1502, dated September 23, 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.

<b>Basic Wind Speed:</b>	120 mph (3-Second Gust)
<b>Basic Wind Speed w/ Ice:</b>	50 mph (3-Second Gust) w/ 1" radial ice concurrent
<b>Code:</b>	ANSI/TIA-222-H / 2015 IBC / 2018 Connecticut State Building Code
<b>Exposure Category:</b>	B
<b>Risk Category:</b>	II
<b>Topographic Factor Procedure:</b>	Method 1
<b>Topographic Category:</b>	1
<b>Crest Height (H):</b>	0 ft
<b>Spectral Response:</b>	$S_s = 0.21, S_1 = 0.06$
<b>Site Class:</b>	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](mailto: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. <sup>1</sup> (ft)	Qty	Equipment	Mount Type	Lines	Carrier	
138.0	1	Generic 10' Omni	Triangular Low Profile Platform	-	VERIZON WIRELESS	
	1	Generic 10' Omni				
137.0	3	Andrew LNX-6515DS-A1M		Triangular Low Profile Platform	(12) 1 5/8" Coax	T-MOBILE
	3	RFS APXV18-209014-C				
	6	Ericsson KRY 112 20				
131.0	4	Decibel DB846H80E-SX		Triangular Low Profile Platform	(6) 1 5/8" Coax (1) 2.02 (51.2mm) Hybrid	VERIZON WIRELESS
	3	Samsung B2/B66A RRH-BR049				
	3	Samsung B5/B13 RRH-BR04C				
	6	Quintel QS6656-3 (65 lbs)				
	1	Raycap RCMDC-6627-PF-48				
128.0	1	VZW Unused Reserve (10535.05 sqin)				
119.0	6	Generic 7" x 6" x 3" Diplexer	Triangular Platform with Handrails	(2) 0.39" (10mm) Fiber Trunk (4) 0.78" (19.7mm) 8 AWG 6 (12) 1 5/8" Coax (1) 1/2" Coax (3) 3" conduit	AT&T MOBILITY	
	3	CCI DMP65R-BU6DA				
	3	Commscope NNH4-65B-R6				
	3	Powerwave Allgon 7770.00				
	3	Ericsson RRUS 4449 B5, B12				
	3	Ericsson Radio 8843 - B2 + B66A				
	6	Powerwave Allgon LGP21401				
117.0	6	Generic 7" x 6" x 3" Diplexer				
104.0	1	RFI Antennas CC807-08	Side Arm	(2) 1/2" Coax	CITY OF MIDDLETOWN, CT	
100.0	1	Bird DS428E83I01T		(1) 7/8" Coax		
87.0	1	RFI Antennas CC807-08		(1) 7/8" Coax		
80.0	1	RFI Antennas OA20-41-DIN	Pole Mount	(1) 7/8" Coax		
	2	Radio Waves HP3-11		(2) EW90		

**Equipment to be Removed**

Elev. <sup>1</sup> (ft)	Qty	Equipment	Mount Type	Lines	Carrier
No loading was considered as removed as part of this analysis.					

**Proposed Equipment**

Elev. <sup>1</sup> (ft)	Qty	Equipment	Mount Type	Lines	Carrier
69.0	1	Commscope RDIDC-9181-PF-48	Triangular 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			

<sup>1</sup> Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.

Install proposed lines inside the pole shaft.



**Structure Usages**

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	40%	Pass
Shaft	46%	Pass
Base Plate	20%	Pass
Flange Plate	3%	Pass

**Foundations**

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	2,715.9	8%
Axial (Kips)	58.3	2%

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

**Deflection and Sway\***

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
80.0	Radio Waves HP3-11	CITY OF MIDDLETOWN, CT	0.234	0.321
69.0	Commscope RDIDC-9181-PF-48	DISH WIRELESS L.L.C.	0.176	0.284
	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:

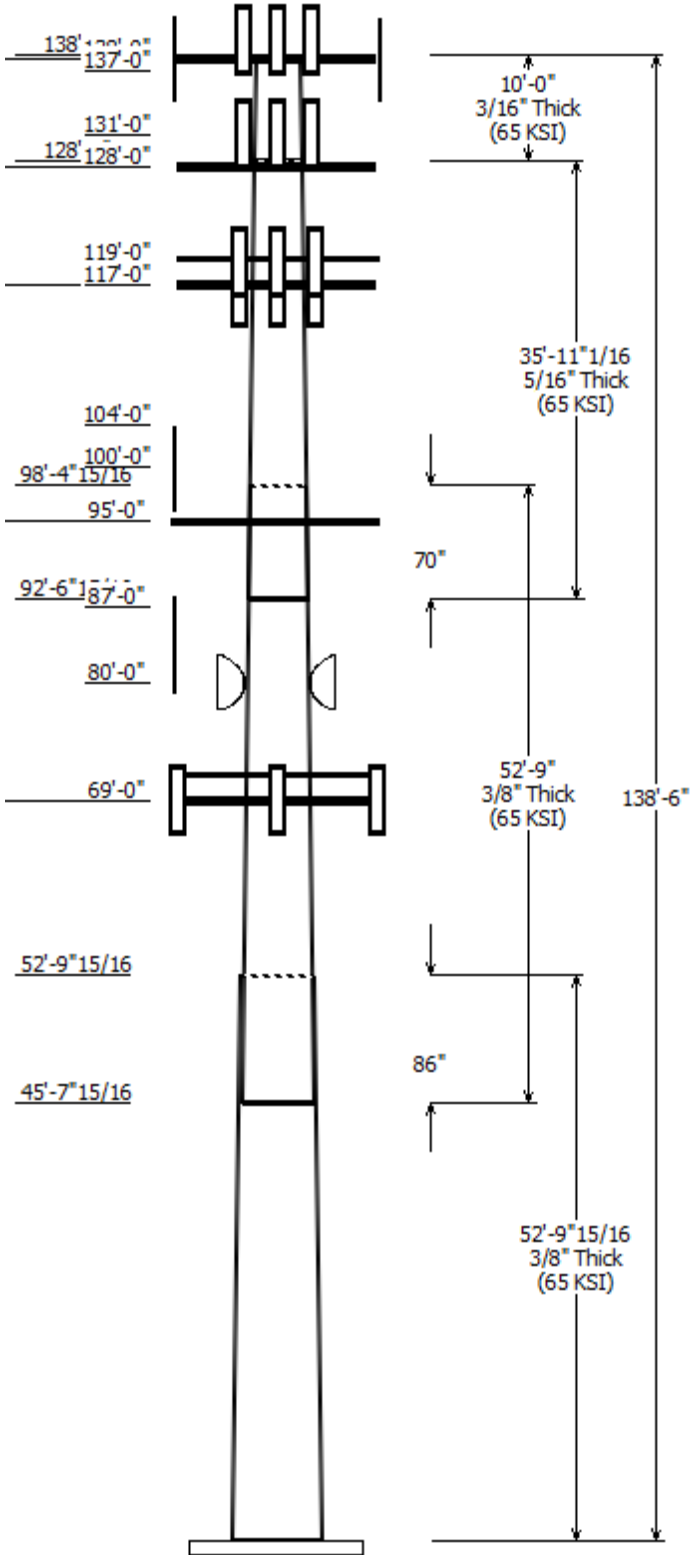
- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

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.

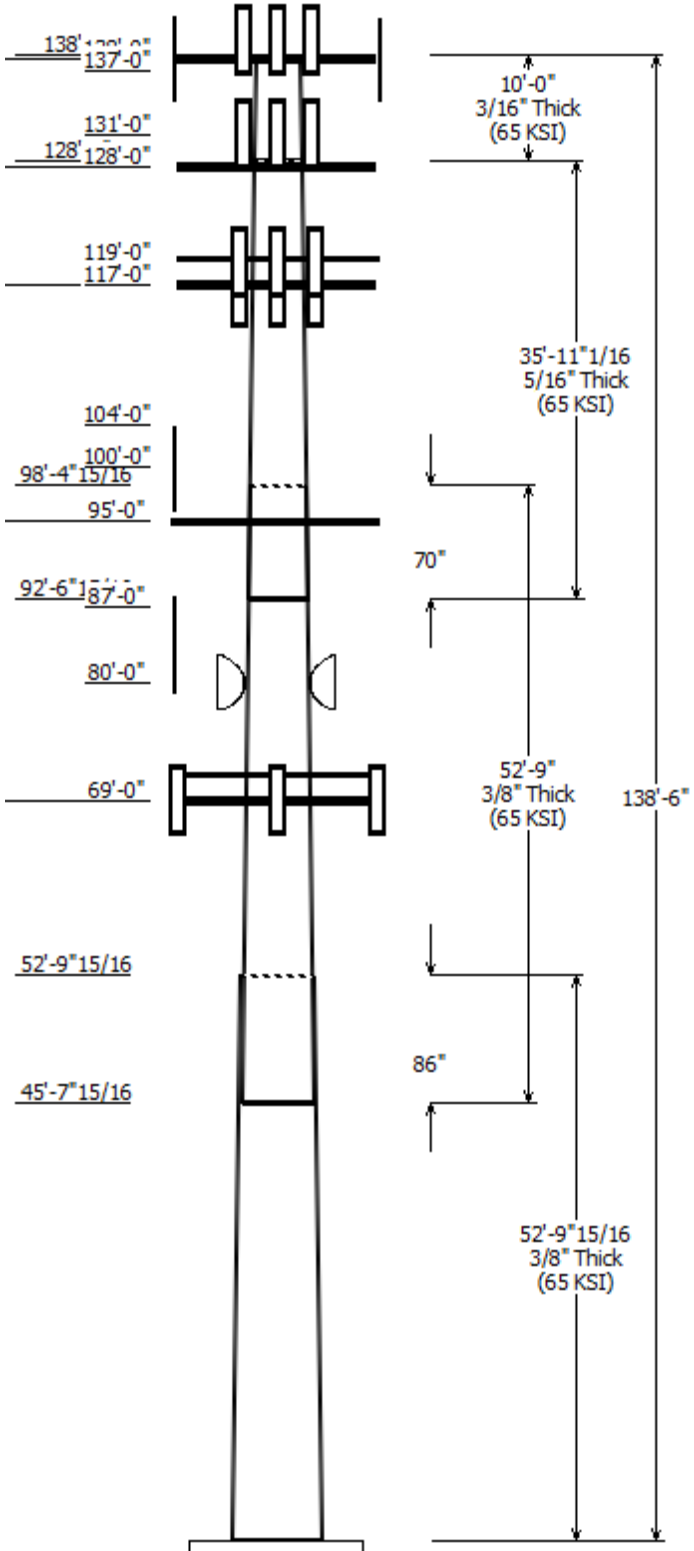


Job Information	
Client : DISH WIRELESS L.L.C.	
Pole : 411257	Code: ANSI/TIA-222-H
Location : Middle Haddam Road-CROWN CT, CT	
Description : 138.5 ft Monopole	Risk Category : II
Shape : 18 Sides	Exposure : B
Height : 138.50 (ft)	Topo Method : Method 1
Base Elev (ft): 0.00	Topographic Category : 1
Taper: 0.24552in/ft)	

Sections Properties							
Shaft Section	Length (ft)	Diameter (in)		Thick (in)	Joint Type	Overlap Length (in)	Steel Grade
		Top	Bottom				
1	52.830	51.40	64.38	0.375		0.000	18 Sides 65
2	52.750	40.96	53.91	0.375	Slip Joint	86.000	18 Sides 65
3	35.920	34.20	43.02	0.313	Slip Joint	70.000	18 Sides 65
4	10.000	31.75	34.20	0.188	Butt Joint	0.000	18 Sides 65

Discrete Appurtenance			
Attach Elev (ft)	Force Elev (ft)	Qty	Description
138.000	138.000	1	Generic Round Low Profile
138.000	138.000	1	Generic 10' Omni
138.000	138.000	1	Generic 10' Omni
137.000	139.000	3	Andrew LNX-6515DS-A1M
137.000	139.000	3	RFS APXV18-209014-C
137.000	139.000	6	Ericsson KRY 112 20
131.000	131.000	4	Decibel DB846H80E-SX
131.000	131.000	1	Raycap RCMD-6627-PF-48
131.000	131.000	2	RFS APL866513-44T0
131.000	131.000	6	Quintel QS6656-3 (65 lbs)
131.000	131.000	3	Samsung B5/B13 RRH-BR04C
131.000	131.000	3	Samsung B2/B66A RRH-BR049
128.000	128.000	1	Generic Flat Low Profile Platf
128.000	128.000	1	VZW Unused Reserve
119.000	119.000	3	CCI DMP65R-BU6DA
119.000	119.000	3	Commscope NNH4-65B-R6
119.000	117.000	3	Powerwave Allgon 7770.00
119.000	119.000	3	Ericsson RRUS 4449 B5, B12
119.000	119.000	3	Ericsson Radio 8843 - B2 + B66
119.000	117.000	2	Raycap DC6-48-60-18-8F
119.000	117.000	6	Powerwave Allgon LGP21401
119.000	119.000	6	Generic 7" x 6" x 3" Diplexer
117.000	117.000	1	Generic Round Platform with
117.000	117.000	6	Generic 7" x 6" x 3" Diplexer
104.000	102.000	1	RFI Antennas CC807-08
100.000	100.000	1	Bird DS428E83I01T
95.000	95.000	3	Flat Side Arm
87.000	86.000	1	RFI Antennas CC807-08
80.000	80.000	2	Radio Waves HP3-11
80.000	82.000	1	RFI Antennas OA20-41-DIN
69.000	69.000	1	Generic Flat Platform with Han
69.000	69.000	3	JMA Wireless MX08FRO665-21
69.000	69.000	3	Fujitsu TA08025-B604
69.000	69.000	3	Fujitsu TA08025-B605
69.000	69.000	1	Commscope RDIDC-9181-PF-48

Linear Appurtenance			
From Elev (ft)	To Elev (ft)	Description	Exposed To Wind
0.000	69.000	1.60" (40.6mm)	No
0.000	80.000	7/8" Coax	No
0.000	80.000	EW90	No



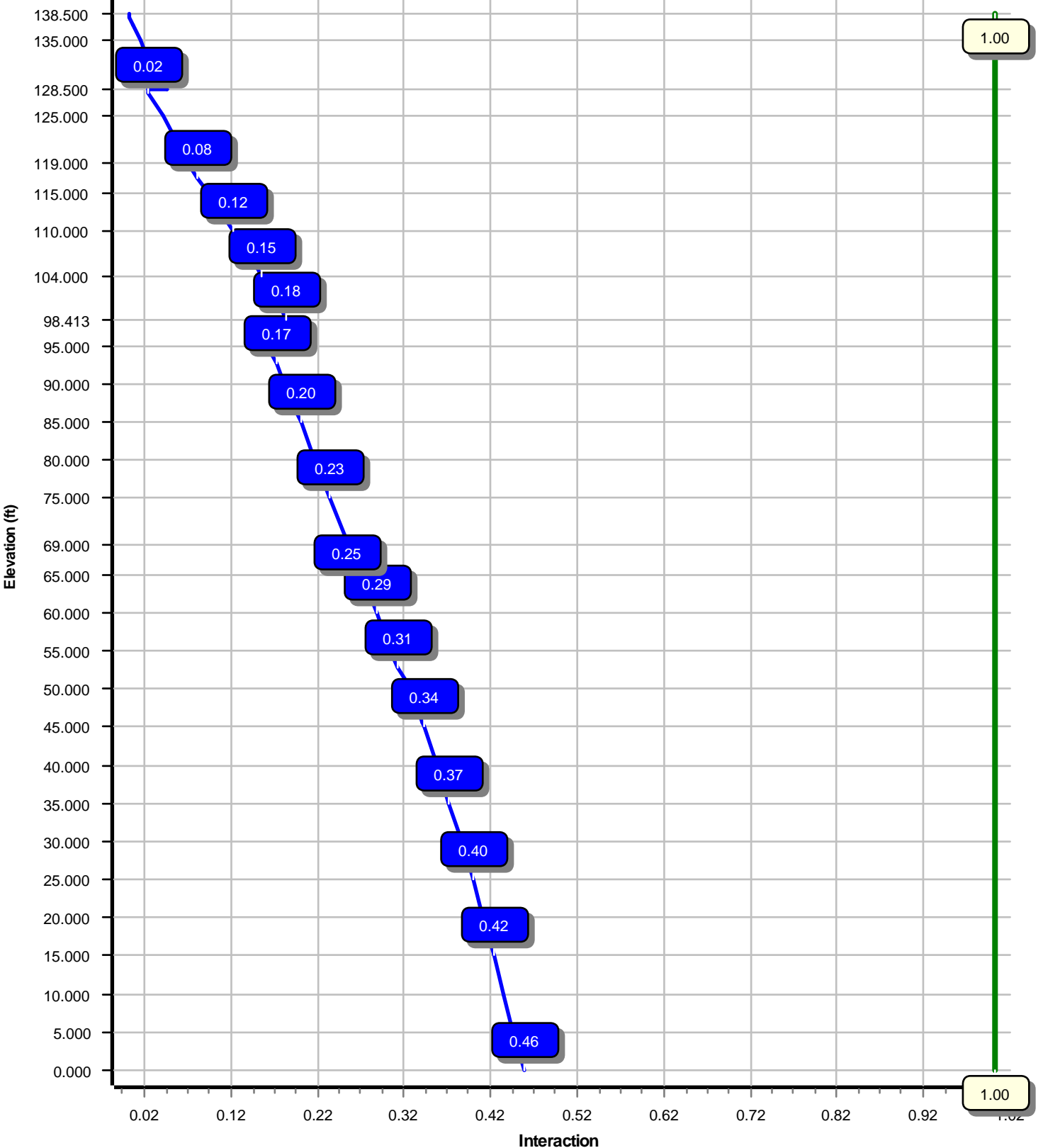
0.000	87.000	7/8" Coax	No
0.000	100.0	1/2" Coax	No
0.000	100.0	7/8" Coax	No
0.000	104.0	1/2" Coax	No
0.000	119.0	0.39" (10mm)	No
0.000	119.0	0.78" (19.7mm) 8	No
0.000	119.0	1 5/8" Coax	No
0.000	119.0	1/2" Coax	No
0.000	119.0	3" conduit	No
0.000	119.0	3" conduit	No
0.000	131.0	1 5/8" Coax	Yes
0.000	131.0	2.02 (51.2mm)	No
0.000	137.0	1 5/8" Coax	No
0.000	137.0	1 5/8" Coax	Yes

Load Cases	
1.2D + 1.0W	120 mph with No Ice
0.9D + 1.0W	120 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 1.00 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	2715.95	28.41	58.30
0.9D + 1.0W	2698.59	28.40	43.72
1.2D + 1.0Di + 1.0Wi	684.77	7.31	77.79
1.2D + 1.0Ev + 1.0Eh	183.85	1.73	58.55
0.9D - 1.0Ev + 1.0Eh	182.36	1.73	40.22
1.0D + 1.0W	604.98	6.35	48.60

Dish Deflections			
Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W	80.00	2.810	0.321

Load Case : 1.2D + 1.0W  
Max Ratio 45.53% at 0.0 ft





Site Number: 411257

Code: ANSI/TIA-222-H

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Site Name: Middle Haddam Road-CROWN CT Engineering Number: 13681988\_C3\_02

6/11/2021 9:50:57 AM

Customer: DISH WIRELESS L.L.C.

Analysis Parameters

Location :	Middlesex County, CT	Height (ft) :	138.5
Code :	ANSI/TIA-222-H	Base Diameter (in) :	64.38
Shape :	18 Sides	Top Diameter (in) :	31.75
Pole Type :	Taper	Taper (in/ft) :	0.246
Pole Manufacturer :	EEL	Rotation (deg) :	0.00
Kd (non-service) :	0.95	Ke :	0.99

Ice & Wind Parameters

Exposure Category:	B	Design Wind Speed Without Ice:	120 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:	1.00 in
Crest Height:	0 ft	HMSL:	250.00 ft

Seismic Parameters

Analysis Method:	Equivalent Lateral Force Method		
Site Class:	D - Stiff Soil		
Period Based on Rayleigh Method (sec):	1.68		
T <sub>L</sub> (sec):	6	p:	1
S <sub>s</sub> :	0.210	S <sub>1</sub> :	0.056
F <sub>a</sub> :	1.600	F <sub>v</sub> :	2.400
S <sub>ds</sub> :	0.224	S <sub>d1</sub> :	0.090
		C <sub>s</sub> :	0.036
		C <sub>s</sub> Max:	0.036
		C <sub>s</sub> Min:	0.030

Load Cases

1.2D + 1.0W	120 mph with No Ice
0.9D + 1.0W	120 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 1.00 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

Site Number: 411257

Code: ANSI/TIA-222-H

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Site Name: Middle Haddam Road-CROWN CT Engineering Number: 13681988\_C3\_02

6/11/2021 9:50:57 AM

Customer: DISH WIRELESS L.L.C.

**Shaft Section Properties**

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Joint Len (in)	Weight (lb)	Bottom						Top						
							Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Taper (in/ft)
1-18	52.830	0.3750	65		0.00	12,307	64.38	0.00	76.18	39429.1	28.51	171.68	51.40	52.83	60.74	19987.3	22.41	137.09	0.245523
2-18	52.750	0.3750	65	Slip	86.00	10,055	53.91	45.66	63.73	23083.3	23.59	143.78	40.96	98.41	48.31	10057.8	17.50	109.25	0.245523
3-18	35.920	0.3125	65	Slip	70.00	4,643	43.02	92.58	42.36	9764.3	22.51	137.68	34.20	128.50	33.62	4878.8	17.54	109.46	0.245523
4-18	10.000	0.1875	65	Butt	0.00	664	34.20	128.50	20.24	2959.8	30.40	182.43	31.75	138.50	18.78	2364.1	28.09	169.33	0.245523
Shaft Weight						27,670													

**Discrete Appurtenance Properties**

Attach Elev (ft)	Description	Qty	Ka	Vert Ecc (ft)	Weight (lb)	No Ice EPAa (sf)	Orientation Factor	Weight (lb)	Ice EPAa (sf)	Orientation Factor
138.00	Generic 10' Omni	1	1.00	0.000	25.00	3.000	1.00	75.27	5.383	1.00
138.00	Generic 10' Omni	1	0.80	0.000	25.00	3.000	1.00	75.27	5.383	1.00
138.00	Generic Round Low Profile	1	1.00	0.000	1,875.00	21.700	1.00	2,411.33	34.415	1.00
137.00	Ericsson KRY 112 20	6	0.80	2.000	12.10	0.449	0.50	22.45	0.782	0.50
137.00	RFS APXV18-209014-C	3	0.80	2.000	18.70	3.570	0.67	71.14	4.175	0.67
137.00	Andrew LNX-6515DS-A1M	3	0.80	2.000	49.80	11.410	0.70	201.34	13.555	0.70
131.00	Samsung B2/B66A RRH-BR049	3	0.80	0.000	84.40	1.875	0.50	126.43	2.470	0.50
131.00	Samsung B5/B13 RRH-BR04C	3	0.80	0.000	70.30	1.875	0.50	107.98	2.470	0.50
131.00	RFS APL866513-44T0	2	0.80	0.000	15.70	4.050	0.82	94.09	4.639	0.82
131.00	Raycap RCMDC-6627-PF-48	1	0.80	0.000	32.00	4.056	1.00	115.73	4.955	1.00
131.00	Decibel DB846H80E-SX	4	0.80	0.000	16.00	5.867	0.73	112.66	5.778	0.73
131.00	Raycap QS6656-3 (65 lbs)	6	0.80	0.000	65.00	8.133	0.74	196.26	9.969	0.74
128.00	Generic Flat Low Profile Platform	1	1.00	0.000	1,875.00	26.100	1.00	2,406.88	38.639	1.00
128.00	VZW Unused Reserve (10535.05	1	0.80	0.000	1,468.50	73.160	0.90	2,140.38	106.633	0.90
119.00	Generic 7" x 6" x 3" Diplexer	6	0.75	0.000	5.00	0.350	0.50	12.22	0.615	0.50
119.00	Powerwave Allgon LGP21401	6	0.75	-2.000	14.10	1.104	0.50	30.37	1.569	0.50
119.00	Raycap DC6-48-60-18-8F	2	0.75	-2.000	20.00	1.260	1.00	54.34	1.689	1.00
119.00	Ericsson Radio 8843 - B2 + B66A	3	0.75	0.000	71.90	1.650	0.50	112.08	2.203	0.50
119.00	Ericsson RRUS 4449 B5, B12	3	0.75	0.000	71.00	1.969	0.50	113.03	2.577	0.50
119.00	Powerwave Allgon 7770.00	3	0.75	-2.000	35.00	5.508	0.65	116.09	6.178	0.65
119.00	Commscope NNH4-65B-R6	3	0.75	0.000	89.70	12.271	0.64	253.58	14.100	0.64
119.00	CCI DMP65R-BU6DA	3	0.75	0.000	79.40	12.709	0.63	247.41	14.528	0.63
117.00	Generic 7" x 6" x 3" Diplexer	6	0.80	0.000	5.00	0.350	0.50	12.20	0.615	0.50
117.00	Generic Round Platform with	1	1.00	0.000	2,500.00	27.200	1.00	3,554.57	43.115	1.00
104.00	RFI Antennas CC807-08	1	1.00	-2.000	24.30	2.855	1.00	71.25	5.039	1.00
100.00	Bird DS428E83I01T	1	1.00	0.000	8.90	0.465	1.00	20.09	0.769	1.00
95.00	Flat Side Arm	3	1.00	0.000	150.00	6.300	0.67	196.62	7.867	0.67
87.00	RFI Antennas CC807-08	1	1.00	-1.000	24.30	2.855	1.00	70.46	5.002	1.00
80.00	RFI Antennas OA20-41-DIN	1	1.00	2.000	28.00	4.410	1.00	104.23	8.408	1.00
80.00	Radio Waves HP3-11	2	1.00	0.000	50.00	8.918	1.00	163.86	10.014	1.00
69.00	Commscope RDIDC-9181-PF-48	1	0.75	0.000	21.90	1.867	1.00	56.97	2.422	1.00
69.00	Fujitsu TA08025-B605	3	0.75	0.000	75.00	1.962	0.50	113.61	2.529	0.50
69.00	Fujitsu TA08025-B604	3	0.75	0.000	63.90	1.962	0.50	99.84	2.529	0.50
69.00	JMA Wireless MX08FRO665-21	3	0.75	0.000	64.50	12.489	0.64	222.91	14.221	0.64
69.00	Generic Flat Platform with	1	1.00	0.000	2,500.00	42.400	1.00	3,594.85	55.325	1.00
Totals	Num Loadings:35	92			14,021.30			23,359.69		

**Linear Appurtenance Properties**

Load Case Azimuth (deg) :

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Dia (in)	Coax Wt (lb/ft)	Max Coax / Row	Dist Between Rows (in)	Dist Between Cols (in)	Azimuth (deg)	Dist From Face (in)	Exposed To Wind Carrier
0.00	137.00	6	1 5/8" Coax	1.98	0.82	N 0	0.00	0.00	0	0.00	N T-MOBILE
0.00	137.00	6	1 5/8" Coax	1.98	0.82	N 6	0.50	0.50	270	0.50	Y T-MOBILE

Site Number: 411257

Code: ANSI/TIA-222-H

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Site Name: Middle Haddam Road-CROWN CT Engineering Number: 13681988\_C3\_02

6/11/2021 9:50:57 AM

Customer: DISH WIRELESS L.L.C.

0.00	131.00	6	1 5/8" Coax	1.98	0.82	N	6	0.50	0.50	90	0.50	Y	VERIZON WIRELESS
0.00	131.00	1	2.02 (51.2mm) Hybrid	2.02	3.04	N	0	0.00	0.00	0	0.00	N	VERIZON WIRELESS
0.00	119.00	2	0.39" (10mm) Fiber	0.39	0.06	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	119.00	4	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	119.00	12	1 5/8" Coax	1.98	0.82	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	119.00	1	1/2" Coax	0.63	0.15	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	119.00	2	3" conduit	3.50	7.58	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	119.00	1	3" conduit	3.50	7.58	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	104.00	1	1/2" Coax	0.63	0.15	N	0	0.00	0.00	0	0.00	N	CITY OF
0.00	100.00	1	1/2" Coax	0.63	0.15	N	0	0.00	0.00	0	0.00	N	CITY OF
0.00	100.00	1	7/8" Coax	1.09	0.33	N	0	0.00	0.00	0	0.00	N	CITY OF
0.00	87.00	1	7/8" Coax	1.09	0.33	N	0	0.00	0.00	0	0.00	N	CITY OF
0.00	80.00	1	7/8" Coax	1.09	0.33	N	0	0.00	0.00	0	0.00	N	CITY OF
0.00	80.00	2	EW90	1.32	0.32	N	0	0.00	0.00	0	0.00	N	CITY OF
0.00	69.00	1	1.60" (40.6mm) Hybrid	1.60	2.34	N	0	0.00	0.00	0	0.00	N	DISH WIRELESS

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

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	F'y (ksi)	S (in <sup>3</sup> )	Z (in <sup>3</sup> )	Weight (lb)
0.00		0.3750	64.380	76.179	39,429.1	28.51	171.68	67.9	1206.	0.0	0.0
5.00		0.3750	63.152	74.718	37,203.6	27.93	168.41	68.5	1160.	0.0	1,283.7
10.00		0.3750	61.925	73.257	35,063.5	27.35	165.13	69.2	1115.	0.0	1,258.8
15.00		0.3750	60.697	71.796	33,007.0	26.78	161.86	69.9	1071.	0.0	1,234.0
20.00		0.3750	59.470	70.335	31,032.5	26.20	158.59	70.6	1027.	0.0	1,209.1
25.00		0.3750	58.242	68.874	29,138.5	25.62	155.31	71.3	985.4	0.0	1,184.2
30.00		0.3750	57.014	67.412	27,323.0	25.05	152.04	71.9	943.9	0.0	1,159.4
35.00		0.3750	55.787	65.951	25,584.7	24.47	148.76	72.6	903.3	0.0	1,134.5
40.00		0.3750	54.559	64.490	23,921.6	23.89	145.49	73.3	863.6	0.0	1,109.7
45.00		0.3750	53.331	63.029	22,332.2	23.31	142.22	74.0	824.8	0.0	1,084.8
45.66	Bot - Section 2	0.3750	53.169	62.835	22,126.8	23.24	141.78	74.1	819.7	0.0	142.1
50.00		0.3750	52.104	61.568	20,814.9	22.74	138.94	74.7	786.8	0.0	1,849.0
52.83	Top - Section 1	0.3750	52.159	61.634	20,881.5	22.76	139.09	74.6	788.5	0.0	1,186.4
55.00		0.3750	51.626	61.000	20,243.6	22.51	137.67	74.9	772.3	0.0	452.8
60.00		0.3750	50.399	59.538	18,823.5	21.93	134.40	75.6	735.6	0.0	1,025.4
65.00		0.3750	49.171	58.077	17,471.4	21.36	131.12	76.3	699.8	0.0	1,000.6
69.00		0.3750	48.189	56.908	16,437.6	20.90	128.50	76.8	671.8	0.0	782.5
70.00		0.3750	47.943	56.616	16,185.7	20.78	127.85	77.0	664.9	0.0	193.1
75.00		0.3750	46.716	55.155	14,964.6	20.20	124.58	77.6	630.9	0.0	950.8
80.00		0.3750	45.488	53.694	13,806.5	19.63	121.30	78.3	597.8	0.0	926.0
85.00		0.3750	44.261	52.233	12,709.8	19.05	118.03	79.0	565.6	0.0	901.1
87.00		0.3750	43.769	51.648	12,287.9	18.82	116.72	79.3	553.0	0.0	353.5
90.00		0.3750	43.033	50.772	11,672.8	18.47	114.75	79.7	534.3	0.0	522.8
92.58	Bot - Section 3	0.3750	42.399	50.018	11,160.4	18.17	113.07	80.0	518.4	0.0	442.4
95.00		0.3750	41.805	49.311	10,693.7	17.89	111.48	80.4	503.8	0.0	755.4
98.41	Top - Section 2	0.3125	41.592	40.943	8,814.6	21.70	133.10	75.9	417.4	0.0	1,047.3
100.0		0.3125	41.203	40.556	8,567.4	21.49	131.85	76.1	409.5	0.0	220.0
104.0		0.3125	40.221	39.582	7,964.8	20.93	128.71	76.8	390.0	0.0	545.4
105.0		0.3125	39.975	39.339	7,818.7	20.79	127.92	76.9	385.2	0.0	134.3
110.0		0.3125	38.747	38.121	7,115.0	20.10	123.99	77.8	361.7	0.0	658.9
115.0		0.3125	37.520	36.904	6,454.7	19.41	120.06	78.6	338.8	0.0	638.2
117.0		0.3125	37.029	36.417	6,202.5	19.13	118.49	78.9	329.9	0.0	249.5
119.0		0.3125	36.538	35.930	5,957.0	18.85	116.92	79.2	321.1	0.0	246.2
120.0		0.3125	36.292	35.686	5,836.7	18.71	116.13	79.4	316.8	0.0	121.8
125.0		0.3125	35.065	34.468	5,259.4	18.02	112.21	80.2	295.4	0.0	596.8
128.0		0.3125	34.328	33.738	4,932.0	17.61	109.85	80.7	283.0	0.0	348.1
128.5	Top - Section 3	0.3125	34.205	33.616	4,878.8	17.54	109.46	80.8	280.9	0.0	57.3
128.5	Bot - Section 4	0.1875	34.205	20.244	2,959.8	30.40	182.43	65.6	170.4	0.0	
130.0		0.1875	33.837	20.025	2,864.7	30.06	180.46	66.0	166.8	0.0	102.8
131.0		0.1875	33.591	19.879	2,802.5	29.83	179.15	66.3	164.3	0.0	67.9
135.0		0.1875	32.609	19.294	2,562.5	28.90	173.92	67.4	154.8	0.0	266.6
137.0		0.1875	32.118	19.002	2,447.8	28.44	171.30	67.9	150.1	0.0	130.3
138.0		0.1875	31.873	18.856	2,391.8	28.21	169.99	68.2	147.8	0.0	64.4
138.5		0.1875	31.750	18.783	2,364.1	28.09	169.33	68.4	146.7	0.0	32.0
27,669.9											



<b>Load Case: 1.2D + 1.0W</b>	<b>120 mph with No Ice</b>	<b>21 Iterations</b>
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		Discrete Forces			Linear Forces		Sum of Forces				
		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		263.2	0.0					0.0	0.0	263.2	0.0	0.0	0.0
5.00		521.2	1,540.4					0.0	343.7	521.2	1,884.1	0.0	0.0
10.00		511.1	1,510.6					0.0	343.7	511.1	1,854.3	0.0	0.0
15.00		501.0	1,480.7					0.0	343.7	501.0	1,824.4	0.0	0.0
20.00		490.8	1,450.9					0.0	343.7	490.8	1,794.6	0.0	0.0
25.00		480.7	1,421.1					0.0	343.7	480.7	1,764.8	0.0	0.0
30.00		476.2	1,391.3					0.0	343.7	476.2	1,734.9	0.0	0.0
35.00		481.2	1,361.4					0.0	343.7	481.2	1,705.1	0.0	0.0
40.00		489.0	1,331.6					0.0	343.7	489.0	1,675.3	0.0	0.0
45.00		279.0	1,301.8					0.0	343.7	279.0	1,645.4	0.0	0.0
45.66	Bot - Section 2	251.3	170.5					0.0	45.6	251.3	216.1	0.0	0.0
50.00		361.7	2,218.7					0.0	298.1	361.7	2,516.8	0.0	0.0
52.83	Top - Section 1	253.2	1,423.7					0.0	194.5	253.2	1,618.2	0.0	0.0
55.00		363.7	543.3					0.0	149.2	363.7	692.5	0.0	0.0
60.00		507.3	1,230.5					0.0	343.7	507.3	1,574.2	0.0	0.0
65.00		456.0	1,200.7					0.0	343.7	456.0	1,544.3	0.0	0.0
69.00	Appurtenance(s)	253.0	939.1	2,246.2	0.0	0.0	3,758.5	0.0	274.9	2,499.2	4,972.5	0.0	0.0
70.00		305.1	231.8					0.0	65.9	305.1	297.7	0.0	0.0
75.00		511.2	1,141.0					0.0	329.6	511.2	1,470.6	0.0	0.0
80.00	Appurtenance(s)	515.4	1,111.2	788.5	0.0	314.4	153.6	0.0	329.6	1,303.9	1,594.4	0.0	0.0
85.00		362.6	1,081.3					0.0	323.8	362.6	1,405.2	0.0	0.0
87.00	Appurtenance(s)	260.3	424.2	103.2	0.0	-103.2	29.2	0.0	129.5	363.5	582.9	0.0	0.0
90.00		291.3	627.3					0.0	193.1	291.3	820.4	0.0	0.0
92.58	Bot - Section 3	263.7	530.9					0.0	166.1	263.7	697.0	0.0	0.0
95.00	Appurtenance(s)	311.0	906.5	470.8	0.0	0.0	540.0	0.0	155.8	781.7	1,602.2	0.0	0.0
98.41	Top - Section 2	266.2	1,256.8					0.0	219.7	266.2	1,476.5	0.0	0.0
100.00	Appurtenance(s)	296.4	264.0	17.5	0.0	0.0	10.7	0.0	102.1	313.9	376.8	0.0	0.0
104.00	Appurtenance(s)	265.5	654.5	108.3	0.0	-216.6	29.2	0.0	255.2	373.9	938.8	0.0	0.0
105.00		319.7	161.1					0.0	63.6	319.7	224.7	0.0	0.0
110.00		533.8	790.7					0.0	318.1	533.8	1,108.8	0.0	0.0
115.00		374.4	765.9					0.0	318.1	374.4	1,083.9	0.0	0.0
117.00	Appurtenance(s)	214.3	299.4	1,106.4	0.0	0.0	3,036.0	0.0	127.2	1,320.7	3,462.6	0.0	0.0
119.00	Appurtenance(s)	160.9	295.4	2,098.0	0.0	-980.9	1,434.7	0.0	127.2	2,258.8	1,857.4	0.0	0.0
120.00		322.2	146.2					0.0	21.4	322.2	167.6	0.0	0.0
125.00		430.0	716.2					0.0	106.8	430.0	823.0	0.0	0.0
128.00	Appurtenance(s)	188.3	417.8	3,189.1	0.0	0.0	4,012.2	0.0	64.1	3,377.4	4,494.0	0.0	0.0
128.50	Top - Section 3	107.7	68.8					0.0	10.7	107.7	79.4	0.0	0.0
130.00		134.7	123.3					0.0	32.0	134.7	155.4	0.0	0.0
131.00	Appurtenance(s)	221.3	81.5	2,268.0	0.0	0.0	1,177.8	0.0	21.4	2,489.2	1,280.6	0.0	0.0
135.00		249.7	319.9					0.0	47.2	249.7	367.1	0.0	0.0
137.00	Appurtenance(s)	117.6	156.4	1,077.1	0.0	2,154.2	333.7	0.0	23.6	1,194.7	513.7	0.0	0.0
138.00	Appurtenance(s)	52.8	77.3	1,120.9	0.0	0.0	2,310.0	0.0	0.0	1,173.7	2,387.3	0.0	0.0
138.50		17.5	38.4					0.0	0.0	17.5	38.4	0.0	0.0
<b>Totals:</b>										<b>28,627.2</b>	<b>58,324.0</b>	<b>0.00</b>	<b>0.00</b>

**Load Case: 1.2D + 1.0W**

120 mph with No Ice

21 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	-58.30	-28.41	0.00	-2,715.95	0.00	2,715.95	4,653.24	1,336.95	7,728.54	6,140.24	0.00	0.00	0.455
5.00	-56.37	-27.99	0.00	-2,573.88	0.00	2,573.88	4,609.64	1,311.30	7,434.94	5,965.37	0.05	-0.10	0.444
10.00	-54.47	-27.56	0.00	-2,433.96	0.00	2,433.96	4,564.26	1,285.66	7,147.03	5,790.45	0.20	-0.19	0.433
15.00	-52.60	-27.14	0.00	-2,296.16	0.00	2,296.16	4,517.10	1,260.02	6,864.80	5,615.62	0.46	-0.29	0.421
20.00	-50.77	-26.72	0.00	-2,160.46	0.00	2,160.46	4,468.14	1,234.37	6,588.26	5,441.02	0.81	-0.38	0.409
25.00	-48.96	-26.31	0.00	-2,026.85	0.00	2,026.85	4,417.41	1,208.73	6,317.40	5,266.79	1.26	-0.48	0.396
30.00	-47.19	-25.90	0.00	-1,895.29	0.00	1,895.29	4,364.88	1,183.09	6,052.23	5,093.05	1.82	-0.57	0.383
35.00	-45.45	-25.47	0.00	-1,765.80	0.00	1,765.80	4,310.58	1,157.45	5,792.74	4,919.95	2.47	-0.67	0.370
40.00	-43.74	-25.04	0.00	-1,638.44	0.00	1,638.44	4,254.48	1,131.80	5,538.94	4,747.62	3.22	-0.76	0.356
45.00	-42.07	-24.77	0.00	-1,513.26	0.00	1,513.26	4,196.60	1,106.16	5,290.83	4,576.20	4.08	-0.86	0.341
45.66	-41.84	-24.55	0.00	-1,496.83	0.00	1,496.83	4,188.79	1,102.76	5,258.34	4,553.54	4.20	-0.87	0.339
50.00	-39.30	-24.20	0.00	-1,390.36	0.00	1,390.36	4,136.94	1,080.52	5,048.39	4,405.83	5.03	-0.95	0.326
52.83	-37.67	-23.95	0.00	-1,321.89	0.00	1,321.89	4,139.66	1,081.67	5,059.17	4,413.46	5.61	-1.00	0.309
55.00	-36.96	-23.61	0.00	-1,269.93	0.00	1,269.93	4,113.24	1,070.54	4,955.61	4,339.86	6.07	-1.04	0.302
60.00	-35.36	-23.12	0.00	-1,151.88	0.00	1,151.88	4,051.10	1,044.90	4,721.08	4,171.16	7.21	-1.13	0.285
65.00	-33.79	-22.68	0.00	-1,036.26	0.00	1,036.26	3,987.17	1,019.26	4,492.23	4,003.84	8.44	-1.21	0.268
69.00	-28.86	-20.09	0.00	-945.54	0.00	945.54	3,934.74	998.74	4,313.24	3,871.06	9.49	-1.28	0.252
70.00	-28.56	-19.81	0.00	-925.45	0.00	925.45	3,921.45	993.61	4,269.07	3,838.03	9.76	-1.29	0.249
75.00	-27.07	-19.30	0.00	-826.42	0.00	826.42	3,853.95	967.97	4,051.59	3,673.85	11.15	-1.37	0.232
80.00	-25.49	-17.99	0.00	-729.63	0.00	729.63	3,784.66	942.33	3,839.79	3,511.46	12.63	-1.44	0.215
85.00	-24.08	-17.61	0.00	-639.70	0.00	639.70	3,713.59	916.69	3,633.69	3,350.99	14.18	-1.51	0.198
87.00	-23.49	-17.24	0.00	-604.49	0.00	604.49	3,684.66	906.43	3,552.83	3,287.37	14.82	-1.54	0.191
90.00	-22.67	-16.94	0.00	-552.76	0.00	552.76	3,640.73	891.04	3,433.26	3,192.57	15.80	-1.58	0.180
92.58	-21.97	-16.67	0.00	-509.05	0.00	509.05	3,602.44	877.81	3,332.07	3,111.67	16.67	-1.62	0.170
95.00	-20.38	-15.86	0.00	-468.70	0.00	468.70	3,566.09	865.40	3,238.53	3,036.33	17.49	-1.65	0.160
98.41	-18.91	-15.56	0.00	-414.58	0.00	414.58	2,795.76	718.55	2,679.07	2,375.28	18.68	-1.69	0.182
100.00	-18.53	-15.24	0.00	-389.89	0.00	389.89	2,778.82	711.77	2,628.75	2,338.44	19.25	-1.70	0.174
104.00	-17.60	-14.85	0.00	-328.92	0.00	328.92	2,735.29	694.67	2,504.01	2,246.11	20.70	-1.75	0.153
105.00	-17.37	-14.53	0.00	-314.07	0.00	314.07	2,724.23	690.40	2,473.30	2,223.16	21.07	-1.76	0.148
110.00	-16.27	-13.98	0.00	-241.40	0.00	241.40	2,667.87	669.03	2,322.58	2,109.24	22.94	-1.81	0.121
115.00	-15.19	-13.58	0.00	-171.50	0.00	171.50	2,609.71	647.66	2,176.60	1,996.83	24.86	-1.85	0.092
117.00	-11.77	-12.15	0.00	-144.35	0.00	144.35	2,585.95	639.11	2,119.53	1,952.32	25.64	-1.87	0.079
119.00	-9.99	-9.83	0.00	-120.05	0.00	120.05	2,561.90	630.56	2,063.23	1,908.08	26.43	-1.88	0.067
120.00	-9.83	-9.51	0.00	-110.22	0.00	110.22	2,549.77	626.29	2,035.36	1,886.06	26.82	-1.89	0.063
125.00	-9.02	-9.05	0.00	-62.70	0.00	62.70	2,488.05	604.92	1,898.85	1,777.07	28.81	-1.91	0.039
128.00	-4.64	-5.53	0.00	-35.54	0.00	35.54	2,450.16	592.10	1,819.22	1,712.59	30.01	-1.92	0.023
128.50	-4.56	-5.42	0.00	-32.78	0.00	32.78	2,443.78	589.96	1,806.12	1,701.91	30.22	-1.92	0.021
128.50	-4.56	-5.42	0.00	-32.78	0.00	32.78	1,195.95	355.28	1,091.56	839.05	30.22	-1.92	0.043
130.00	-4.41	-5.28	0.00	-24.66	0.00	24.66	1,190.35	351.44	1,068.05	826.02	30.82	-1.92	0.034
131.00	-3.22	-2.75	0.00	-19.38	0.00	19.38	1,186.52	348.87	1,052.52	817.33	31.22	-1.92	0.026
135.00	-2.86	-2.48	0.00	-8.40	0.00	8.40	1,170.50	338.62	991.55	782.45	32.83	-1.93	0.013
137.00	-2.38	-1.27	0.00	-1.28	0.00	1.28	1,162.06	333.49	961.74	764.98	33.64	-1.93	0.004
138.00	-0.04	-0.02	0.00	-0.01	0.00	0.01	1,157.73	330.92	947.01	756.23	34.04	-1.93	0.000

Site Number: 411257

Code: ANSI/TIA-222-H

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Site Name: Middle Haddam Road-CROWN CT Engineering Number: 13681988\_C3\_02

6/11/2021 9:51:02 AM

Customer: DISH WIRELESS L.L.C.

Load Case: 1.2D + 1.0W

120 mph with No Ice

21 Iterations

Gust Response Factor :1.10

Dead Load Factor :1.20

Wind Load Factor :1.00

138.50 0.00 -0.02 0.00 0.00 0.00 0.00 0.00 1,155.54 329.64 939.69 751.86 34.25 -1.93 0.000

<b>Load Case:</b> 0.9D + 1.0W	120 mph with No Ice (Reduced DL)	21 Iterations
Gust Response Factor :1.10		
Dead Load Factor :0.90		
Wind Load Factor :1.00		

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		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		263.2	0.0					0.0	0.0	263.2	0.0	0.0	0.0
5.00		521.2	1,155.3					0.0	257.8	521.2	1,413.1	0.0	0.0
10.00		511.1	1,132.9					0.0	257.8	511.1	1,390.7	0.0	0.0
15.00		501.0	1,110.6					0.0	257.8	501.0	1,368.3	0.0	0.0
20.00		490.8	1,088.2					0.0	257.8	490.8	1,345.9	0.0	0.0
25.00		480.7	1,065.8					0.0	257.8	480.7	1,323.6	0.0	0.0
30.00		476.2	1,043.4					0.0	257.8	476.2	1,301.2	0.0	0.0
35.00		481.2	1,021.1					0.0	257.8	481.2	1,278.8	0.0	0.0
40.00		489.0	998.7					0.0	257.8	489.0	1,256.5	0.0	0.0
45.00		279.0	976.3					0.0	257.8	279.0	1,234.1	0.0	0.0
45.66	Bot - Section 2	251.3	127.8					0.0	34.2	251.3	162.0	0.0	0.0
50.00		361.7	1,664.1					0.0	223.6	361.7	1,887.6	0.0	0.0
52.83	Top - Section 1	253.2	1,067.8					0.0	145.9	253.2	1,213.7	0.0	0.0
55.00		363.7	407.5					0.0	111.9	363.7	519.4	0.0	0.0
60.00		507.3	922.9					0.0	257.8	507.3	1,180.6	0.0	0.0
65.00		456.0	900.5					0.0	257.8	456.0	1,158.3	0.0	0.0
69.00	Appurtenance(s)	253.0	704.3	2,246.2	0.0	0.0	2,818.9	0.0	206.2	2,499.2	3,729.4	0.0	0.0
70.00		305.1	173.8					0.0	49.4	305.1	223.3	0.0	0.0
75.00		511.2	855.7					0.0	247.2	511.2	1,103.0	0.0	0.0
80.00	Appurtenance(s)	515.4	833.4	788.5	0.0	314.4	115.2	0.0	247.2	1,303.9	1,195.8	0.0	0.0
85.00		362.6	811.0					0.0	242.9	362.6	1,053.9	0.0	0.0
87.00	Appurtenance(s)	260.3	318.1	103.2	0.0	-103.2	21.9	0.0	97.1	363.5	437.2	0.0	0.0
90.00		291.3	470.5					0.0	144.8	291.3	615.3	0.0	0.0
92.58	Bot - Section 3	263.7	398.2					0.0	124.6	263.7	522.7	0.0	0.0
95.00	Appurtenance(s)	311.0	679.9	470.8	0.0	0.0	405.0	0.0	116.8	781.7	1,201.7	0.0	0.0
98.41	Top - Section 2	266.2	942.6					0.0	164.8	266.2	1,107.4	0.0	0.0
100.00	Appurtenance(s)	296.4	198.0	17.5	0.0	0.0	8.0	0.0	76.6	313.9	282.6	0.0	0.0
104.00	Appurtenance(s)	265.5	490.9	108.3	0.0	-216.6	21.9	0.0	191.4	373.9	704.1	0.0	0.0
105.00		319.7	120.8					0.0	47.7	319.7	168.6	0.0	0.0
110.00		533.8	593.1					0.0	238.5	533.8	831.6	0.0	0.0
115.00		374.4	574.4					0.0	238.5	374.4	813.0	0.0	0.0
117.00	Appurtenance(s)	214.3	224.5	1,106.4	0.0	0.0	2,277.0	0.0	95.4	1,320.7	2,597.0	0.0	0.0
119.00	Appurtenance(s)	160.9	221.6	2,098.0	0.0	-980.9	1,076.0	0.0	95.4	2,258.8	1,393.0	0.0	0.0
120.00		322.2	109.7					0.0	16.0	322.2	125.7	0.0	0.0
125.00		430.0	537.1					0.0	80.1	430.0	617.2	0.0	0.0
128.00	Appurtenance(s)	188.3	313.3	3,189.1	0.0	0.0	3,009.2	0.0	48.1	3,377.4	3,370.5	0.0	0.0
128.50	Top - Section 3	107.7	51.6					0.0	8.0	107.7	59.6	0.0	0.0
130.00		134.7	92.5					0.0	24.0	134.7	116.5	0.0	0.0
131.00	Appurtenance(s)	221.3	61.1	2,268.0	0.0	0.0	883.3	0.0	16.0	2,489.2	960.5	0.0	0.0
135.00		249.7	239.9					0.0	35.4	249.7	275.4	0.0	0.0
137.00	Appurtenance(s)	117.6	117.3	1,077.1	0.0	2,154.2	250.3	0.0	17.7	1,194.7	385.3	0.0	0.0
138.00	Appurtenance(s)	52.8	58.0	1,120.9	0.0	0.0	1,732.5	0.0	0.0	1,173.7	1,790.5	0.0	0.0
138.50		17.5	28.8					0.0	0.0	17.5	28.8	0.0	0.0
<b>Totals:</b>										28,627.2	43,743.0	0.00	0.00



**Load Case: 0.9D + 1.0W**

120 mph with No Ice (Reduced DL)

21 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	-43.72	-28.40	0.00	-2,698.59	0.00	2,698.59	4,653.24	1,336.95	7,728.54	6,140.24	0.00	0.00	0.449
5.00	-42.26	-27.95	0.00	-2,556.59	0.00	2,556.59	4,609.64	1,311.30	7,434.94	5,965.37	0.05	-0.09	0.438
10.00	-40.82	-27.50	0.00	-2,416.84	0.00	2,416.84	4,564.26	1,285.66	7,147.03	5,790.45	0.20	-0.19	0.427
15.00	-39.41	-27.06	0.00	-2,279.34	0.00	2,279.34	4,517.10	1,260.02	6,864.80	5,615.62	0.45	-0.29	0.415
20.00	-38.03	-26.63	0.00	-2,144.04	0.00	2,144.04	4,468.14	1,234.37	6,588.26	5,441.02	0.80	-0.38	0.403
25.00	-36.66	-26.20	0.00	-2,010.91	0.00	2,010.91	4,417.41	1,208.73	6,317.40	5,266.79	1.25	-0.48	0.391
30.00	-35.32	-25.77	0.00	-1,879.93	0.00	1,879.93	4,364.88	1,183.09	6,052.23	5,093.05	1.80	-0.57	0.378
35.00	-34.01	-25.33	0.00	-1,751.11	0.00	1,751.11	4,310.58	1,157.45	5,792.74	4,919.95	2.45	-0.67	0.364
40.00	-32.72	-24.88	0.00	-1,624.47	0.00	1,624.47	4,254.48	1,131.80	5,538.94	4,747.62	3.20	-0.76	0.350
45.00	-31.47	-24.61	0.00	-1,500.10	0.00	1,500.10	4,196.60	1,106.16	5,290.83	4,576.20	4.05	-0.85	0.336
45.66	-31.29	-24.38	0.00	-1,483.77	0.00	1,483.77	4,188.79	1,102.76	5,258.34	4,553.54	4.17	-0.86	0.334
50.00	-29.38	-24.02	0.00	-1,378.05	0.00	1,378.05	4,136.94	1,080.52	5,048.39	4,405.83	4.99	-0.94	0.320
52.83	-28.15	-23.77	0.00	-1,310.07	0.00	1,310.07	4,139.66	1,081.67	5,059.17	4,413.46	5.57	-1.00	0.304
55.00	-27.61	-23.43	0.00	-1,258.49	0.00	1,258.49	4,113.24	1,070.54	4,955.61	4,339.86	6.03	-1.04	0.297
60.00	-26.41	-22.94	0.00	-1,141.35	0.00	1,141.35	4,051.10	1,044.90	4,721.08	4,171.16	7.16	-1.12	0.281
65.00	-25.23	-22.49	0.00	-1,026.66	0.00	1,026.66	3,987.17	1,019.26	4,492.23	4,003.84	8.38	-1.20	0.263
69.00	-21.54	-19.93	0.00	-936.71	0.00	936.71	3,934.74	998.74	4,313.24	3,871.06	9.41	-1.27	0.248
70.00	-21.31	-19.63	0.00	-916.78	0.00	916.78	3,921.45	993.61	4,269.07	3,838.03	9.68	-1.28	0.245
75.00	-20.19	-19.12	0.00	-818.62	0.00	818.62	3,853.95	967.97	4,051.59	3,673.85	11.07	-1.36	0.228
80.00	-19.01	-17.81	0.00	-722.69	0.00	722.69	3,784.66	942.33	3,839.79	3,511.46	12.53	-1.43	0.211
85.00	-17.95	-17.44	0.00	-633.63	0.00	633.63	3,713.59	916.69	3,633.69	3,350.99	14.07	-1.50	0.194
87.00	-17.51	-17.07	0.00	-598.75	0.00	598.75	3,684.66	906.43	3,552.83	3,287.37	14.70	-1.53	0.187
90.00	-16.89	-16.78	0.00	-547.52	0.00	547.52	3,640.73	891.04	3,433.26	3,192.57	15.68	-1.57	0.176
92.58	-16.37	-16.51	0.00	-504.24	0.00	504.24	3,602.44	877.81	3,332.07	3,111.67	16.53	-1.60	0.167
95.00	-15.18	-15.70	0.00	-464.29	0.00	464.29	3,566.09	865.40	3,238.53	3,036.33	17.35	-1.63	0.157
98.41	-14.07	-15.41	0.00	-410.69	0.00	410.69	2,795.76	718.55	2,679.07	2,375.28	18.54	-1.67	0.178
100.00	-13.79	-15.10	0.00	-386.24	0.00	386.24	2,778.82	711.77	2,628.75	2,338.44	19.09	-1.69	0.171
104.00	-13.09	-14.71	0.00	-325.85	0.00	325.85	2,735.29	694.67	2,504.01	2,246.11	20.53	-1.74	0.150
105.00	-12.92	-14.39	0.00	-311.14	0.00	311.14	2,724.23	690.40	2,473.30	2,223.16	20.90	-1.75	0.145
110.00	-12.10	-13.84	0.00	-239.18	0.00	239.18	2,667.87	669.03	2,322.58	2,109.24	22.76	-1.80	0.118
115.00	-11.29	-13.45	0.00	-169.97	0.00	169.97	2,609.71	647.66	2,176.60	1,996.83	24.66	-1.84	0.090
117.00	-8.74	-12.05	0.00	-143.08	0.00	143.08	2,585.95	639.11	2,119.53	1,952.32	25.44	-1.85	0.077
119.00	-7.42	-9.74	0.00	-118.99	0.00	118.99	2,561.90	630.56	2,063.23	1,908.08	26.22	-1.87	0.065
120.00	-7.30	-9.42	0.00	-109.25	0.00	109.25	2,549.77	626.29	2,035.36	1,886.06	26.61	-1.87	0.061
125.00	-6.69	-8.97	0.00	-62.15	0.00	62.15	2,488.05	604.92	1,898.85	1,777.07	28.58	-1.89	0.038
128.00	-3.44	-5.48	0.00	-35.24	0.00	35.24	2,450.16	592.10	1,819.22	1,712.59	29.77	-1.90	0.022
128.50	-3.38	-5.37	0.00	-32.50	0.00	32.50	2,443.78	589.96	1,806.12	1,701.91	29.97	-1.90	0.021
128.50	-3.38	-5.37	0.00	-32.50	0.00	32.50	1,195.95	355.28	1,091.56	839.05	29.97	-1.90	0.042
130.00	-3.27	-5.24	0.00	-24.43	0.00	24.43	1,190.35	351.44	1,068.05	826.02	30.57	-1.90	0.033
131.00	-2.39	-2.72	0.00	-19.20	0.00	19.20	1,186.52	348.87	1,052.52	817.33	30.97	-1.90	0.026
135.00	-2.12	-2.46	0.00	-8.33	0.00	8.33	1,170.50	338.62	991.55	782.45	32.56	-1.91	0.013
137.00	-1.78	-1.25	0.00	-1.26	0.00	1.26	1,162.06	333.49	961.74	764.98	33.36	-1.91	0.003
138.00	-0.03	-0.02	0.00	-0.01	0.00	0.01	1,157.73	330.92	947.01	756.23	33.76	-1.91	0.000

Site Number: 411257

Code: ANSI/TIA-222-H

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Site Name: Middle Haddam Road-CROWN CT Engineering Number: 13681988\_C3\_02

6/11/2021 9:51:07 AM

Customer: DISH WIRELESS L.L.C.

Load Case: 0.9D + 1.0W

120 mph with No Ice (Reduced DL)

21 Iterations

Gust Response Factor :1.10

Dead Load Factor :0.90

Wind Load Factor :1.00

138.50 0.00 -0.02 0.00 0.00 0.00 0.00 0.00 1,155.54 329.64 939.69 751.86 33.96 -1.91 0.000

<b>Load Case:</b> 1.2D + 1.0Di + 1.0Wi	50 mph with 1.00 in Radial Ice	20 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		Discrete Forces			Linear Forces		Sum of Forces				
		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		76.9	0.0					0.0	0.0	76.9	0.0	0.0	0.0
5.00		152.5	1,849.8					0.0	442.3	152.5	2,292.1	0.0	0.0
10.00		150.0	1,849.8					0.0	449.8	150.0	2,299.6	0.0	0.0
15.00		147.3	1,831.0					0.0	453.7	147.3	2,284.7	0.0	0.0
20.00		144.5	1,806.1					0.0	456.4	144.5	2,262.5	0.0	0.0
25.00		141.7	1,778.1					0.0	458.4	141.7	2,236.5	0.0	0.0
30.00		140.5	1,748.0					0.0	460.1	140.5	2,208.1	0.0	0.0
35.00		142.2	1,716.6					0.0	461.5	142.2	2,178.2	0.0	0.0
40.00		144.7	1,684.2					0.0	462.8	144.7	2,147.0	0.0	0.0
45.00		82.6	1,651.0					0.0	463.9	82.6	2,114.9	0.0	0.0
45.66	Bot - Section 2	74.5	217.0					0.0	61.6	74.5	278.6	0.0	0.0
50.00		107.2	2,522.6					0.0	403.3	107.2	2,925.9	0.0	0.0
52.83	Top - Section 1	75.1	1,620.9					0.0	263.5	75.1	1,884.4	0.0	0.0
55.00		108.0	693.7					0.0	202.3	108.0	896.0	0.0	0.0
60.00		150.8	1,571.3					0.0	466.6	150.8	2,037.9	0.0	0.0
65.00		135.7	1,536.1					0.0	467.4	135.7	2,003.6	0.0	0.0
69.00	Appurtenance(s)	75.3	1,204.1	490.8	0.0	0.0	5,161.4	0.0	374.5	566.1	6,739.9	0.0	0.0
70.00		90.1	297.9					0.0	90.9	90.1	388.8	0.0	0.0
75.00		149.6	1,464.9					0.0	454.8	149.6	1,919.7	0.0	0.0
80.00	Appurtenance(s)	148.6	1,429.0	175.1	0.0	104.1	387.8	0.0	455.4	323.7	2,272.2	0.0	0.0
85.00		103.4	1,392.7					0.0	450.2	103.4	1,842.9	0.0	0.0
87.00	Appurtenance(s)	73.3	547.9	31.4	0.0	-31.4	64.8	0.0	180.2	104.7	793.0	0.0	0.0
90.00		81.4	810.4					0.0	269.3	81.4	1,079.8	0.0	0.0
92.58	Bot - Section 3	73.0	686.6					0.0	231.8	73.0	918.4	0.0	0.0
95.00	Appurtenance(s)	85.2	1,053.0	102.1	0.0	0.0	648.4	0.0	217.5	187.2	1,918.9	0.0	0.0
98.41	Top - Section 2	72.6	1,460.1					0.0	307.1	72.6	1,767.2	0.0	0.0
100.00	Appurtenance(s)	80.4	357.9	5.0	0.0	0.0	19.4	0.0	142.8	85.4	520.1	0.0	0.0
104.00	Appurtenance(s)	71.7	886.4	33.2	0.0	-66.4	65.6	0.0	357.9	104.8	1,310.0	0.0	0.0
105.00		84.8	218.9					0.0	89.4	84.8	308.3	0.0	0.0
110.00		140.0	1,071.8					0.0	447.1	140.0	1,518.9	0.0	0.0
115.00		96.8	1,039.6					0.0	447.5	96.8	1,487.1	0.0	0.0
117.00	Appurtenance(s)	54.6	407.8	305.5	0.0	0.0	3,891.8	0.0	179.1	360.1	4,478.7	0.0	0.0
119.00	Appurtenance(s)	40.7	402.6	431.5	0.0	-206.9	2,810.3	0.0	179.2	472.2	3,392.2	0.0	0.0
120.00		80.3	199.5					0.0	47.4	80.3	246.9	0.0	0.0
125.00		106.2	974.7					0.0	237.1	106.2	1,211.8	0.0	0.0
128.00	Appurtenance(s)	45.9	570.2	811.2	0.0	0.0	4,952.9	0.0	142.5	857.1	5,665.6	0.0	0.0
128.50	Top - Section 3	26.0	94.1					0.0	23.8	26.0	117.9	0.0	0.0
130.00		32.4	198.7					0.0	71.3	32.4	270.0	0.0	0.0
131.00	Appurtenance(s)	63.9	131.4	459.1	0.0	0.0	2,589.7	0.0	47.6	523.0	2,768.7	0.0	0.0
135.00		76.2	514.4					0.0	99.7	76.2	614.1	0.0	0.0
137.00	Appurtenance(s)	36.6	252.4	225.7	0.0	451.4	895.6	0.0	49.9	262.3	1,197.9	0.0	0.0
138.00	Appurtenance(s)	17.1	125.0	316.7	0.0	0.0	2,808.8	0.0	0.0	333.9	2,933.8	0.0	0.0
138.50		5.7	62.2					0.0	0.0	5.7	62.2	0.0	0.0
<b>Totals:</b>										7,373.40	77,794.8	0.00	0.00

<b>Load Case:</b> 1.2D + 1.0Di + 1.0Wi	50 mph with 1.00 in Radial Ice	20 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	-77.79	-7.31	0.00	-684.77	0.00	684.77	4,653.24	1,336.95	7,728.54	6,140.24	0.00	0.00	0.128
5.00	-75.50	-7.19	0.00	-648.21	0.00	648.21	4,609.64	1,311.30	7,434.94	5,965.37	0.01	-0.02	0.125
10.00	-73.20	-7.07	0.00	-612.25	0.00	612.25	4,564.26	1,285.66	7,147.03	5,790.45	0.05	-0.05	0.122
15.00	-70.91	-6.95	0.00	-576.90	0.00	576.90	4,517.10	1,260.02	6,864.80	5,615.62	0.11	-0.07	0.118
20.00	-68.64	-6.83	0.00	-542.14	0.00	542.14	4,468.14	1,234.37	6,588.26	5,441.02	0.20	-0.10	0.115
25.00	-66.40	-6.71	0.00	-507.99	0.00	507.99	4,417.41	1,208.73	6,317.40	5,266.79	0.32	-0.12	0.112
30.00	-64.19	-6.60	0.00	-474.42	0.00	474.42	4,364.88	1,183.09	6,052.23	5,093.05	0.46	-0.14	0.108
35.00	-62.01	-6.47	0.00	-441.44	0.00	441.44	4,310.58	1,157.45	5,792.74	4,919.95	0.62	-0.17	0.104
40.00	-59.86	-6.35	0.00	-409.08	0.00	409.08	4,254.48	1,131.80	5,538.94	4,747.62	0.81	-0.19	0.100
45.00	-57.75	-6.27	0.00	-377.35	0.00	377.35	4,196.60	1,106.16	5,290.83	4,576.20	1.02	-0.22	0.096
45.66	-57.47	-6.21	0.00	-373.20	0.00	373.20	4,188.79	1,102.76	5,258.34	4,553.54	1.05	-0.22	0.096
50.00	-54.54	-6.10	0.00	-346.29	0.00	346.29	4,136.94	1,080.52	5,048.39	4,405.83	1.26	-0.24	0.092
52.83	-52.66	-6.03	0.00	-329.02	0.00	329.02	4,139.66	1,081.67	5,059.17	4,413.46	1.41	-0.25	0.087
55.00	-51.76	-5.93	0.00	-315.94	0.00	315.94	4,113.24	1,070.54	4,955.61	4,339.86	1.52	-0.26	0.085
60.00	-49.72	-5.79	0.00	-286.28	0.00	286.28	4,051.10	1,044.90	4,721.08	4,171.16	1.81	-0.28	0.081
65.00	-47.71	-5.66	0.00	-257.34	0.00	257.34	3,987.17	1,019.26	4,492.23	4,003.84	2.12	-0.30	0.076
69.00	-40.98	-5.06	0.00	-234.71	0.00	234.71	3,934.74	998.74	4,313.24	3,871.06	2.38	-0.32	0.071
70.00	-40.59	-4.98	0.00	-229.64	0.00	229.64	3,921.45	993.61	4,269.07	3,838.03	2.45	-0.32	0.070
75.00	-38.67	-4.83	0.00	-204.75	0.00	204.75	3,853.95	967.97	4,051.59	3,673.85	2.80	-0.34	0.066
80.00	-36.40	-4.50	0.00	-180.50	0.00	180.50	3,784.66	942.33	3,839.79	3,511.46	3.16	-0.36	0.061
85.00	-34.55	-4.40	0.00	-157.98	0.00	157.98	3,713.59	916.69	3,633.69	3,350.99	3.55	-0.38	0.056
87.00	-33.76	-4.29	0.00	-149.18	0.00	149.18	3,684.66	906.43	3,552.83	3,287.37	3.71	-0.39	0.055
90.00	-32.68	-4.21	0.00	-136.31	0.00	136.31	3,640.73	891.04	3,433.26	3,192.57	3.96	-0.39	0.052
92.58	-31.76	-4.13	0.00	-125.46	0.00	125.46	3,602.44	877.81	3,332.07	3,111.67	4.17	-0.40	0.049
95.00	-29.84	-3.94	0.00	-115.46	0.00	115.46	3,566.09	865.40	3,238.53	3,036.33	4.38	-0.41	0.046
98.41	-28.08	-3.85	0.00	-102.02	0.00	102.02	2,795.76	718.55	2,679.07	2,375.28	4.68	-0.42	0.053
100.00	-27.56	-3.77	0.00	-95.91	0.00	95.91	2,778.82	711.77	2,628.75	2,338.44	4.82	-0.42	0.051
104.00	-26.25	-3.66	0.00	-80.83	0.00	80.83	2,735.29	694.67	2,504.01	2,246.11	5.18	-0.44	0.046
105.00	-25.94	-3.57	0.00	-77.17	0.00	77.17	2,724.23	690.40	2,473.30	2,223.16	5.27	-0.44	0.044
110.00	-24.42	-3.43	0.00	-59.30	0.00	59.30	2,667.87	669.03	2,322.58	2,109.24	5.74	-0.45	0.037
115.00	-22.93	-3.32	0.00	-42.17	0.00	42.17	2,609.71	647.66	2,176.60	1,996.83	6.22	-0.46	0.030
117.00	-18.46	-2.93	0.00	-35.53	0.00	35.53	2,585.95	639.11	2,119.53	1,952.32	6.41	-0.47	0.025
119.00	-15.07	-2.43	0.00	-29.68	0.00	29.68	2,561.90	630.56	2,063.23	1,908.08	6.61	-0.47	0.021
120.00	-14.82	-2.34	0.00	-27.25	0.00	27.25	2,549.77	626.29	2,035.36	1,886.06	6.70	-0.47	0.020
125.00	-13.61	-2.23	0.00	-15.53	0.00	15.53	2,488.05	604.92	1,898.85	1,777.07	7.20	-0.48	0.014
128.00	-7.95	-1.33	0.00	-8.84	0.00	8.84	2,450.16	592.10	1,819.22	1,712.59	7.50	-0.48	0.008
128.50	-7.84	-1.30	0.00	-8.18	0.00	8.18	2,443.78	589.96	1,806.12	1,701.91	7.55	-0.48	0.008
128.50	-7.84	-1.30	0.00	-8.18	0.00	8.18	1,195.95	355.28	1,091.56	839.05	7.55	-0.48	0.016
130.00	-7.57	-1.26	0.00	-6.23	0.00	6.23	1,190.35	351.44	1,068.05	826.02	7.70	-0.48	0.014
131.00	-4.80	-0.72	0.00	-4.96	0.00	4.96	1,186.52	348.87	1,052.52	817.33	7.80	-0.48	0.010
135.00	-4.19	-0.64	0.00	-2.09	0.00	2.09	1,170.50	338.62	991.55	782.45	8.20	-0.48	0.006
137.00	-2.99	-0.36	0.00	-0.37	0.00	0.37	1,162.06	333.49	961.74	764.98	8.40	-0.48	0.003
138.00	-0.06	-0.01	0.00	0.00	0.00	0.00	1,157.73	330.92	947.01	756.23	8.50	-0.48	0.000

Site Number: 411257

Code: ANSI/TIA-222-H

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Site Name: Middle Haddam Road-CROWN CT Engineering Number: 13681988\_C3\_02

6/11/2021 9:51:11 AM

Customer: DISH WIRELESS L.L.C.

Load Case: 1.2D + 1.0Di + 1.0Wi

50 mph with 1.00 in Radial Ice

20 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

138.50 0.00 -0.01 0.00 0.00 0.00 0.00 0.00 1,155.54 329.64 939.69 751.86 8.55 -0.48 0.000



<b>Load Case: 1.0D + 1.0W</b>	<b>Serviceability 60 mph</b>	<b>20 Iterations</b>
Gust Response Factor :1.10		
Dead Load Factor :1.00		
Wind Load Factor :1.00		

**Applied Segment Forces Summary**

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		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		58.9	0.0					0.0	0.0	58.9	0.0	0.0	0.0
5.00		116.6	1,283.7					0.0	286.4	116.6	1,570.1	0.0	0.0
10.00		114.3	1,258.8					0.0	286.4	114.3	1,545.2	0.0	0.0
15.00		112.1	1,234.0					0.0	286.4	112.1	1,520.4	0.0	0.0
20.00		109.8	1,209.1					0.0	286.4	109.8	1,495.5	0.0	0.0
25.00		107.5	1,184.2					0.0	286.4	107.5	1,470.6	0.0	0.0
30.00		106.5	1,159.4					0.0	286.4	106.5	1,445.8	0.0	0.0
35.00		107.6	1,134.5					0.0	286.4	107.6	1,420.9	0.0	0.0
40.00		109.4	1,109.7					0.0	286.4	109.4	1,396.1	0.0	0.0
45.00		62.4	1,084.8					0.0	286.4	62.4	1,371.2	0.0	0.0
45.66	Bot - Section 2	56.2	142.1					0.0	38.0	56.2	180.0	0.0	0.0
50.00		80.9	1,849.0					0.0	248.4	80.9	2,097.4	0.0	0.0
52.83	Top - Section 1	56.6	1,186.4					0.0	162.1	56.6	1,348.5	0.0	0.0
55.00		81.4	452.8					0.0	124.3	81.4	577.1	0.0	0.0
60.00		113.5	1,025.4					0.0	286.4	113.5	1,311.8	0.0	0.0
65.00		102.0	1,000.6					0.0	286.4	102.0	1,287.0	0.0	0.0
69.00	Appurtenance(s)	56.6	782.5	502.4	0.0	0.0	3,132.1	0.0	229.1	559.0	4,143.8	0.0	0.0
70.00		68.2	193.1					0.0	54.9	68.2	248.1	0.0	0.0
75.00		114.4	950.8					0.0	274.7	114.4	1,225.5	0.0	0.0
80.00	Appurtenance(s)	115.3	926.0	176.4	0.0	70.3	128.0	0.0	274.7	291.7	1,328.7	0.0	0.0
85.00		81.1	901.1					0.0	269.9	81.1	1,171.0	0.0	0.0
87.00	Appurtenance(s)	58.2	353.5	23.1	0.0	-23.1	24.3	0.0	107.9	81.3	485.7	0.0	0.0
90.00		65.2	522.8					0.0	160.9	65.2	683.7	0.0	0.0
92.58	Bot - Section 3	59.0	442.4					0.0	138.4	59.0	580.8	0.0	0.0
95.00	Appurtenance(s)	69.6	755.4	105.3	0.0	0.0	450.0	0.0	129.8	174.9	1,335.2	0.0	0.0
98.41	Top - Section 2	59.6	1,047.3					0.0	183.1	59.6	1,230.4	0.0	0.0
100.00	Appurtenance(s)	66.3	220.0	3.9	0.0	0.0	8.9	0.0	85.1	70.2	314.0	0.0	0.0
104.00	Appurtenance(s)	59.4	545.4	24.2	0.0	-48.5	24.3	0.0	212.6	83.6	782.3	0.0	0.0
105.00		71.5	134.3					0.0	53.0	71.5	187.3	0.0	0.0
110.00		119.4	658.9					0.0	265.1	119.4	924.0	0.0	0.0
115.00		83.8	638.2					0.0	265.1	83.8	903.3	0.0	0.0
117.00	Appurtenance(s)	47.9	249.5	247.5	0.0	0.0	2,530.0	0.0	106.0	295.4	2,885.5	0.0	0.0
119.00	Appurtenance(s)	36.0	246.2	469.3	0.0	-219.4	1,195.6	0.0	106.0	505.3	1,547.8	0.0	0.0
120.00		72.1	121.8					0.0	17.8	72.1	139.6	0.0	0.0
125.00		96.2	596.8					0.0	89.0	96.2	685.8	0.0	0.0
128.00	Appurtenance(s)	42.1	348.1	713.4	0.0	0.0	3,343.5	0.0	53.4	755.5	3,745.0	0.0	0.0
128.50	Top - Section 3	24.1	57.3					0.0	8.9	24.1	66.2	0.0	0.0
130.00		30.1	102.8					0.0	26.7	30.1	129.5	0.0	0.0
131.00	Appurtenance(s)	49.5	67.9	507.3	0.0	0.0	981.5	0.0	17.8	556.8	1,067.2	0.0	0.0
135.00		55.9	266.6					0.0	39.4	55.9	306.0	0.0	0.0
137.00	Appurtenance(s)	26.3	130.3	240.9	0.0	481.9	278.1	0.0	19.7	267.2	428.1	0.0	0.0
138.00	Appurtenance(s)	11.8	64.4	250.7	0.0	0.0	1,925.0	0.0	0.0	262.5	1,989.4	0.0	0.0
138.50		3.9	32.0					0.0	0.0	3.9	32.0	0.0	0.0
<b>Totals:</b>										<b>6,403.47</b>	<b>48,603.3</b>	<b>0.00</b>	<b>0.00</b>

Load Case: 1.0D + 1.0W

Serviceability 60 mph

20 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	-48.60	-6.35	0.00	-604.98	0.00	604.98	4,653.24	1,336.95	7,728.54	6,140.24	0.00	0.00	0.109
5.00	-47.03	-6.25	0.00	-573.21	0.00	573.21	4,609.64	1,311.30	7,434.94	5,965.37	0.01	-0.02	0.106
10.00	-45.48	-6.16	0.00	-541.94	0.00	541.94	4,564.26	1,285.66	7,147.03	5,790.45	0.05	-0.04	0.104
15.00	-43.96	-6.06	0.00	-511.16	0.00	511.16	4,517.10	1,260.02	6,864.80	5,615.62	0.10	-0.06	0.101
20.00	-42.46	-5.96	0.00	-480.87	0.00	480.87	4,468.14	1,234.37	6,588.26	5,441.02	0.18	-0.09	0.098
25.00	-40.99	-5.87	0.00	-451.06	0.00	451.06	4,417.41	1,208.73	6,317.40	5,266.79	0.28	-0.11	0.095
30.00	-39.54	-5.77	0.00	-421.72	0.00	421.72	4,364.88	1,183.09	6,052.23	5,093.05	0.40	-0.13	0.092
35.00	-38.12	-5.68	0.00	-392.85	0.00	392.85	4,310.58	1,157.45	5,792.74	4,919.95	0.55	-0.15	0.089
40.00	-36.72	-5.58	0.00	-364.47	0.00	364.47	4,254.48	1,131.80	5,538.94	4,747.62	0.72	-0.17	0.085
45.00	-35.35	-5.52	0.00	-336.59	0.00	336.59	4,196.60	1,106.16	5,290.83	4,576.20	0.91	-0.19	0.082
45.66	-35.17	-5.47	0.00	-332.93	0.00	332.93	4,188.79	1,102.76	5,258.34	4,553.54	0.93	-0.19	0.082
50.00	-33.07	-5.39	0.00	-309.23	0.00	309.23	4,136.94	1,080.52	5,048.39	4,405.83	1.12	-0.21	0.078
52.83	-31.72	-5.33	0.00	-293.99	0.00	293.99	4,139.66	1,081.67	5,059.17	4,413.46	1.25	-0.22	0.074
55.00	-31.14	-5.25	0.00	-282.42	0.00	282.42	4,113.24	1,070.54	4,955.61	4,339.86	1.35	-0.23	0.073
60.00	-29.83	-5.15	0.00	-256.15	0.00	256.15	4,051.10	1,044.90	4,721.08	4,171.16	1.61	-0.25	0.069
65.00	-28.54	-5.05	0.00	-230.42	0.00	230.42	3,987.17	1,019.26	4,492.23	4,003.84	1.88	-0.27	0.065
69.00	-24.40	-4.47	0.00	-210.24	0.00	210.24	3,934.74	998.74	4,313.24	3,871.06	2.11	-0.28	0.061
70.00	-24.15	-4.41	0.00	-205.77	0.00	205.77	3,921.45	993.61	4,269.07	3,838.03	2.17	-0.29	0.060
75.00	-22.93	-4.29	0.00	-183.75	0.00	183.75	3,853.95	967.97	4,051.59	3,673.85	2.48	-0.30	0.056
80.00	-21.60	-4.00	0.00	-162.22	0.00	162.22	3,784.66	942.33	3,839.79	3,511.46	2.81	-0.32	0.052
85.00	-20.43	-3.91	0.00	-142.23	0.00	142.23	3,713.59	916.69	3,633.69	3,350.99	3.16	-0.34	0.048
87.00	-19.94	-3.83	0.00	-134.40	0.00	134.40	3,684.66	906.43	3,552.83	3,287.37	3.30	-0.34	0.046
90.00	-19.26	-3.77	0.00	-122.90	0.00	122.90	3,640.73	891.04	3,433.26	3,192.57	3.52	-0.35	0.044
92.58	-18.68	-3.71	0.00	-113.19	0.00	113.19	3,602.44	877.81	3,332.07	3,111.67	3.71	-0.36	0.042
95.00	-17.34	-3.52	0.00	-104.22	0.00	104.22	3,566.09	865.40	3,238.53	3,036.33	3.89	-0.37	0.039
98.41	-16.11	-3.46	0.00	-92.19	0.00	92.19	2,795.76	718.55	2,679.07	2,375.28	4.16	-0.38	0.045
100.00	-15.80	-3.39	0.00	-86.70	0.00	86.70	2,778.82	711.77	2,628.75	2,338.44	4.28	-0.38	0.043
104.00	-15.01	-3.30	0.00	-73.14	0.00	73.14	2,735.29	694.67	2,504.01	2,246.11	4.61	-0.39	0.038
105.00	-14.83	-3.23	0.00	-69.84	0.00	69.84	2,724.23	690.40	2,473.30	2,223.16	4.69	-0.39	0.037
110.00	-13.90	-3.11	0.00	-53.69	0.00	53.69	2,667.87	669.03	2,322.58	2,109.24	5.11	-0.40	0.031
115.00	-13.00	-3.02	0.00	-38.15	0.00	38.15	2,609.71	647.66	2,176.60	1,996.83	5.53	-0.41	0.024
117.00	-10.12	-2.70	0.00	-32.11	0.00	32.11	2,585.95	639.11	2,119.53	1,952.32	5.71	-0.42	0.020
119.00	-8.57	-2.19	0.00	-26.71	0.00	26.71	2,561.90	630.56	2,063.23	1,908.08	5.88	-0.42	0.017
120.00	-8.43	-2.11	0.00	-24.52	0.00	24.52	2,549.77	626.29	2,035.36	1,886.06	5.97	-0.42	0.016
125.00	-7.75	-2.01	0.00	-13.95	0.00	13.95	2,488.05	604.92	1,898.85	1,777.07	6.41	-0.42	0.011
128.00	-4.01	-1.23	0.00	-7.91	0.00	7.91	2,450.16	592.10	1,819.22	1,712.59	6.68	-0.43	0.006
128.50	-3.94	-1.21	0.00	-7.29	0.00	7.29	2,443.78	589.96	1,806.12	1,701.91	6.72	-0.43	0.006
128.50	-3.94	-1.21	0.00	-7.29	0.00	7.29	1,195.95	355.28	1,091.56	839.05	6.72	-0.43	0.012
130.00	-3.81	-1.17	0.00	-5.48	0.00	5.48	1,190.35	351.44	1,068.05	826.02	6.86	-0.43	0.010
131.00	-2.75	-0.61	0.00	-4.31	0.00	4.31	1,186.52	348.87	1,052.52	817.33	6.95	-0.43	0.008
135.00	-2.45	-0.55	0.00	-1.87	0.00	1.87	1,170.50	338.62	991.55	782.45	7.31	-0.43	0.004
137.00	-2.02	-0.28	0.00	-0.28	0.00	0.28	1,162.06	333.49	961.74	764.98	7.49	-0.43	0.002
138.00	-0.03	0.00	0.00	0.00	0.00	0.00	1,157.73	330.92	947.01	756.23	7.58	-0.43	0.000

Site Number: 411257

Code: ANSI/TIA-222-H

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Site Name: Middle Haddam Road-CROWN CT Engineering Number: 13681988\_C3\_02

6/11/2021 9:51:15 AM

Customer: DISH WIRELESS L.L.C.

Load Case: 1.0D + 1.0W

Serviceability 60 mph

20 Iterations

Gust Response Factor :1.10

Dead Load Factor :1.00

Wind Load Factor :1.00

138.50 0.00 0.00 0.00 0.00 0.00 0.00 0.00 1,155.54 329.64 939.69 751.86 7.62 -0.43 0.000

### Equivalent Lateral Forces Method Analysis

Spectral Response Acceleration for Short Period ( $S_s$ ):	0.21
Spectral Response Acceleration at 1.0 Second Period ( $S_{d1}$ ):	0.06
Long-Period Transition Period ( $T_L$ ):	6
Importance Factor ( $I_E$ ):	1.00
Site Coefficient $F_a$ :	1.60
Site Coefficient $F_v$ :	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period ( $S_{ds}$ ):	0.22
Design Spectral Response Acceleration at 1.0 Second Period ( $S_{d1}$ ):	0.09
Seismic Response Coefficient ( $C_s$ ):	0.04
Upper Limit $C_s$	0.04
Lower Limit $C_s$	0.03
Period based on Rayleigh Method (sec):	1.68
Redundancy Factor ( $\rho$ ):	1.00
Seismic Force Distribution Exponent (k):	1.59
Total Unfactored Dead Load:	48.60 k
Seismic Base Shear (E):	1.73 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)
42	138.25	32	81	0.002	3	40
41	137.50	64	162	0.003	5	80
40	136.00	150	370	0.007	12	187
39	133.00	306	729	0.014	24	381
38	130.50	86	198	0.004	6	107
37	129.25	129	295	0.006	10	161
36	128.25	66	149	0.003	5	82
35	126.50	402	884	0.017	29	500
34	122.50	686	1,434	0.027	47	854
33	119.50	140	281	0.005	9	174
32	118.00	352	694	0.013	23	438
31	116.00	356	682	0.013	22	443
30	112.50	903	1,650	0.031	54	1,124
29	107.50	924	1,570	0.030	51	1,150
28	104.50	187	304	0.006	10	233
27	102.00	758	1,185	0.022	39	944
26	99.21	305	456	0.009	15	380
25	96.71	1,230	1,767	0.033	58	1,532
24	93.79	885	1,211	0.023	39	1,102
23	91.29	581	761	0.014	25	723
22	88.50	684	853	0.016	28	851
21	86.00	461	550	0.010	18	574
20	82.50	1,171	1,306	0.025	43	1,458
19	77.50	1,201	1,213	0.023	40	1,495
18	72.50	1,226	1,113	0.021	36	1,526

17	69.50	248	211	0.004	7	309
16	67.00	1,012	811	0.015	26	1,259
15	62.50	1,287	923	0.017	30	1,602
14	57.50	1,312	824	0.016	27	1,633
13	53.92	577	327	0.006	11	718
12	51.42	1,349	709	0.013	23	1,679
11	47.83	2,097	983	0.019	32	2,611
10	45.33	180	78	0.001	3	224
9	42.50	1,371	533	0.010	17	1,707
8	37.50	1,396	444	0.008	14	1,738
7	32.50	1,421	360	0.007	12	1,769
6	27.50	1,446	281	0.005	9	1,800
5	22.50	1,471	208	0.004	7	1,831
4	17.50	1,495	142	0.003	5	1,862
3	12.50	1,520	84	0.002	3	1,893
2	7.50	1,545	38	0.001	1	1,923
1	2.50	1,570	7	0.000	0	1,954
Generic 10' Omni	138.00	25	63	0.001	2	31
Generic 10' Omni	138.00	25	63	0.001	2	31
Generic Round Low Pr	138.00	1,875	4,739	0.089	155	2,334
Ericsson KRY 112 20	137.00	73	181	0.003	6	90
RFS APXV18-209014-C	137.00	56	140	0.003	5	70
Andrew LNX-6515DS-A1	137.00	149	373	0.007	12	186
Samsung B2/B66A RRH-	131.00	253	589	0.011	19	315
Samsung B5/B13 RRH-B	131.00	211	491	0.009	16	263
RFS APL866513-44T0	131.00	31	73	0.001	2	39
Raycap RCMDC-6627-PF	131.00	32	74	0.001	2	40
Decibel DB846H80E-SX	131.00	64	149	0.003	5	80
Quintel QS6656-3 (65	131.00	390	907	0.017	30	485
Generic Flat Low Pro	128.00	1,875	4,205	0.079	137	2,334
VZW Unused Reserve (	128.00	1,469	3,293	0.062	107	1,828
Generic 7" x 6" x 3"	119.00	30	60	0.001	2	37
Powerwave Allgon LGP	119.00	85	169	0.003	6	105
Raycap DC6-48-60-18-	119.00	40	80	0.002	3	50
Ericsson Radio 8843	119.00	216	431	0.008	14	269
Ericsson RRUS 4449 B	119.00	213	425	0.008	14	265
Powerwave Allgon 777	119.00	105	210	0.004	7	131
Commscope NNH4-65B-R	119.00	269	537	0.010	18	335
CCI DMP65R-BU6DA	119.00	238	476	0.009	16	297
Generic 7" x 6" x 3"	117.00	30	58	0.001	2	37
Generic Round Platfo	117.00	2,500	4,860	0.092	158	3,112
RFI Antennas CC807-0	104.00	24	39	0.001	1	30
Bird DS428E83I01T	100.00	9	13	0.000	0	11
Flat Side Arm	95.00	450	628	0.012	20	560
RFI Antennas CC807-0	87.00	24	29	0.001	1	30
RFI Antennas OA20-41	80.00	28	30	0.001	1	35
Radio Waves HP3-11	80.00	100	106	0.002	3	124
Commscope RDIDC-9181	69.00	22	18	0.000	1	27
Fujitsu TA08025-B605	69.00	225	189	0.004	6	280
Fujitsu TA08025-B604	69.00	192	161	0.003	5	239
JMA Wireless MX08FRO	69.00	193	162	0.003	5	241
Generic Flat Platfor	69.00	2,500	2,099	0.040	68	3,112
		48,603	52,986	1.000	1,728	60,501

Load Case 0.9D - 1.0Ev + 1.0Eh

Seismic (Reduced DL)

Segment	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
42	138.25	32	81	0.002	3	27
41	137.50	64	162	0.003	5	55
40	136.00	150	370	0.007	12	128



39	133.00	306	729	0.014	24	262
38	130.50	86	198	0.004	6	73
37	129.25	129	295	0.006	10	111
36	128.25	66	149	0.003	5	57
35	126.50	402	884	0.017	29	343
34	122.50	686	1,434	0.027	47	586
33	119.50	140	281	0.005	9	119
32	118.00	352	694	0.013	23	301
31	116.00	356	682	0.013	22	304
30	112.50	903	1,650	0.031	54	772
29	107.50	924	1,570	0.030	51	790
28	104.50	187	304	0.006	10	160
27	102.00	758	1,185	0.022	39	648
26	99.21	305	456	0.009	15	261
25	96.71	1,230	1,767	0.033	58	1,052
24	93.79	885	1,211	0.023	39	757
23	91.29	581	761	0.014	25	497
22	88.50	684	853	0.016	28	585
21	86.00	461	550	0.010	18	395
20	82.50	1,171	1,306	0.025	43	1,001
19	77.50	1,201	1,213	0.023	40	1,027
18	72.50	1,226	1,113	0.021	36	1,048
17	69.50	248	211	0.004	7	212
16	67.00	1,012	811	0.015	26	865
15	62.50	1,287	923	0.017	30	1,101
14	57.50	1,312	824	0.016	27	1,122
13	53.92	577	327	0.006	11	494
12	51.42	1,349	709	0.013	23	1,153
11	47.83	2,097	983	0.019	32	1,794
10	45.33	180	78	0.001	3	154
9	42.50	1,371	533	0.010	17	1,173
8	37.50	1,396	444	0.008	14	1,194
7	32.50	1,421	360	0.007	12	1,215
6	27.50	1,446	281	0.005	9	1,236
5	22.50	1,471	208	0.004	7	1,258
4	17.50	1,495	142	0.003	5	1,279
3	12.50	1,520	84	0.002	3	1,300
2	7.50	1,545	38	0.001	1	1,321
1	2.50	1,570	7	0.000	0	1,343
Generic 10' Omni	138.00	25	63	0.001	2	21
Generic 10' Omni	138.00	25	63	0.001	2	21
Generic Round Low Pr	138.00	1,875	4,739	0.089	155	1,604
Ericsson KRY 112 20	137.00	73	181	0.003	6	62
RFS APXV18-209014-C	137.00	56	140	0.003	5	48
Andrew LNX-6515DS-A1	137.00	149	373	0.007	12	128
Samsung B2/B66A RRH-	131.00	253	589	0.011	19	217
Samsung B5/B13 RRH-B	131.00	211	491	0.009	16	180
RFS APL866513-44T0	131.00	31	73	0.001	2	27
Raycap RCMDC-6627-PF	131.00	32	74	0.001	2	27
Decibel DB846H80E-SX	131.00	64	149	0.003	5	55
Quintel QS6656-3 (65	131.00	390	907	0.017	30	334
Generic Flat Low Pro	128.00	1,875	4,205	0.079	137	1,604
VZW Unused Reserve (	128.00	1,469	3,293	0.062	107	1,256
Generic 7" x 6" x 3"	119.00	30	60	0.001	2	26
Powerwave Allgon LGP	119.00	85	169	0.003	6	72
Raycap DC6-48-60-18-	119.00	40	80	0.002	3	34
Ericsson Radio 8843	119.00	216	431	0.008	14	184
Ericsson RRUS 4449 B	119.00	213	425	0.008	14	182
Powerwave Allgon 777	119.00	105	210	0.004	7	90
Commscope NNH4-65B-R	119.00	269	537	0.010	18	230
CCI DMP65R-BU6DA	119.00	238	476	0.009	16	204
Generic 7" x 6" x 3"	117.00	30	58	0.001	2	26
Generic Round Platfo	117.00	2,500	4,860	0.092	158	2,138
RFI Antennas CC807-0	104.00	24	39	0.001	1	21

Site Number: 411257

Code: ANSI/TIA-222-H

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Site Name: Middle Haddam Road-CROWN CT Engineering Number: 13681988\_C3\_02

6/11/2021 9:51:16 AM

Customer: DISH WIRELESS L.L.C.

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Bird DS428E83I01T	100.00	9	13	0.000	0	8
Flat Side Arm	95.00	450	628	0.012	20	385
RFI Antennas CC807-0	87.00	24	29	0.001	1	21
RFI Antennas OA20-41	80.00	28	30	0.001	1	24
Radio Waves HP3-11	80.00	100	106	0.002	3	86
Commscope RDIDC-9181	69.00	22	18	0.000	1	19
Fujitsu TA08025-B605	69.00	225	189	0.004	6	192
Fujitsu TA08025-B604	69.00	192	161	0.003	5	164
JMA Wireless MX08FRO	69.00	193	162	0.003	5	165
Generic Flat Platfor	69.00	2,500	2,099	0.040	68	2,138
		48,603	52,986	1.000	1,728	41,566

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	-58.55	-1.73	0.00	-183.85	0.00	183.85	4,653.24	1,336.95	7,728.54	6,140.24	0.00	0.00	0.043
5.00	-56.62	-1.74	0.00	-175.20	0.00	175.20	4,609.64	1,311.30	7,434.94	5,965.37	0.00	-0.01	0.042
10.00	-54.73	-1.74	0.00	-166.52	0.00	166.52	4,564.26	1,285.66	7,147.03	5,790.45	0.01	-0.01	0.041
15.00	-52.87	-1.74	0.00	-157.83	0.00	157.83	4,517.10	1,260.02	6,864.80	5,615.62	0.03	-0.02	0.040
20.00	-51.04	-1.74	0.00	-149.13	0.00	149.13	4,468.14	1,234.37	6,588.26	5,441.02	0.06	-0.03	0.039
25.00	-49.24	-1.73	0.00	-140.44	0.00	140.44	4,417.41	1,208.73	6,317.40	5,266.79	0.09	-0.03	0.038
30.00	-47.47	-1.73	0.00	-131.78	0.00	131.78	4,364.88	1,183.09	6,052.23	5,093.05	0.12	-0.04	0.037
35.00	-45.73	-1.72	0.00	-123.15	0.00	123.15	4,310.58	1,157.45	5,792.74	4,919.95	0.17	-0.05	0.036
40.00	-44.02	-1.70	0.00	-114.57	0.00	114.57	4,254.48	1,131.80	5,538.94	4,747.62	0.22	-0.05	0.034
45.00	-43.80	-1.70	0.00	-106.06	0.00	106.06	4,196.60	1,106.16	5,290.83	4,576.20	0.28	-0.06	0.034
45.66	-41.19	-1.67	0.00	-104.93	0.00	104.93	4,188.79	1,102.76	5,258.34	4,553.54	0.29	-0.06	0.033
50.00	-39.51	-1.65	0.00	-97.69	0.00	97.69	4,136.94	1,080.52	5,048.39	4,405.83	0.35	-0.07	0.032
52.83	-38.79	-1.64	0.00	-93.03	0.00	93.03	4,139.66	1,081.67	5,059.17	4,413.46	0.39	-0.07	0.030
55.00	-37.16	-1.61	0.00	-89.47	0.00	89.47	4,113.24	1,070.54	4,955.61	4,339.86	0.42	-0.07	0.030
60.00	-35.56	-1.58	0.00	-81.41	0.00	81.41	4,051.10	1,044.90	4,721.08	4,171.16	0.50	-0.08	0.028
65.00	-34.30	-1.56	0.00	-73.49	0.00	73.49	3,987.17	1,019.26	4,492.23	4,003.84	0.58	-0.08	0.027
69.00	-30.09	-1.46	0.00	-67.26	0.00	67.26	3,934.74	998.74	4,313.24	3,871.06	0.65	-0.09	0.025
70.00	-28.56	-1.42	0.00	-65.80	0.00	65.80	3,921.45	993.61	4,269.07	3,838.03	0.67	-0.09	0.024
75.00	-27.07	-1.38	0.00	-58.68	0.00	58.68	3,853.95	967.97	4,051.59	3,673.85	0.77	-0.10	0.023
80.00	-25.45	-1.34	0.00	-51.75	0.00	51.75	3,784.66	942.33	3,839.79	3,511.46	0.87	-0.10	0.021
85.00	-24.88	-1.32	0.00	-45.07	0.00	45.07	3,713.59	916.69	3,633.69	3,350.99	0.98	-0.11	0.020
87.00	-24.00	-1.29	0.00	-42.43	0.00	42.43	3,684.66	906.43	3,552.83	3,287.37	1.03	-0.11	0.019
90.00	-23.27	-1.27	0.00	-38.55	0.00	38.55	3,640.73	891.04	3,433.26	3,192.57	1.10	-0.11	0.018
92.58	-22.17	-1.22	0.00	-35.29	0.00	35.29	3,602.44	877.81	3,332.07	3,111.67	1.16	-0.11	0.017
95.00	-20.08	-1.14	0.00	-32.33	0.00	32.33	3,566.09	865.40	3,238.53	3,036.33	1.21	-0.11	0.016
98.41	-19.70	-1.13	0.00	-28.42	0.00	28.42	2,795.76	718.55	2,679.07	2,375.28	1.30	-0.12	0.019
100.00	-18.75	-1.09	0.00	-26.63	0.00	26.63	2,778.82	711.77	2,628.75	2,338.44	1.34	-0.12	0.018
104.00	-18.48	-1.08	0.00	-22.28	0.00	22.28	2,735.29	694.67	2,504.01	2,246.11	1.44	-0.12	0.017
105.00	-17.33	-1.02	0.00	-21.21	0.00	21.21	2,724.23	690.40	2,473.30	2,223.16	1.46	-0.12	0.016
110.00	-16.21	-0.97	0.00	-16.09	0.00	16.09	2,667.87	669.03	2,322.58	2,109.24	1.59	-0.13	0.014
115.00	-15.77	-0.95	0.00	-11.24	0.00	11.24	2,609.71	647.66	2,176.60	1,996.83	1.73	-0.13	0.012
117.00	-12.18	-0.75	0.00	-9.35	0.00	9.35	2,585.95	639.11	2,119.53	1,952.32	1.78	-0.13	0.010
119.00	-10.52	-0.66	0.00	-7.84	0.00	7.84	2,561.90	630.56	2,063.23	1,908.08	1.84	-0.13	0.008
120.00	-9.66	-0.62	0.00	-7.18	0.00	7.18	2,549.77	626.29	2,035.36	1,886.06	1.86	-0.13	0.008
125.00	-9.16	-0.59	0.00	-4.10	0.00	4.10	2,488.05	604.92	1,898.85	1,777.07	2.00	-0.13	0.006
128.00	-4.92	-0.33	0.00	-2.34	0.00	2.34	2,450.16	592.10	1,819.22	1,712.59	2.08	-0.13	0.003
128.50	-4.76	-0.32	0.00	-2.18	0.00	2.18	2,443.78	589.96	1,806.12	1,701.91	2.10	-0.13	0.003
128.50	-4.76	-0.32	0.00	-2.18	0.00	2.18	1,195.95	355.28	1,091.56	839.05	2.10	-0.13	0.007
130.00	-4.65	-0.31	0.00	-1.70	0.00	1.70	1,190.35	351.44	1,068.05	826.02	2.14	-0.13	0.006
131.00	-3.05	-0.21	0.00	-1.39	0.00	1.39	1,186.52	348.87	1,052.52	817.33	2.17	-0.13	0.004
135.00	-2.86	-0.20	0.00	-0.56	0.00	0.56	1,170.50	338.62	991.55	782.45	2.28	-0.13	0.003
137.00	-2.44	-0.17	0.00	-0.17	0.00	0.17	1,162.06	333.49	961.74	764.98	2.34	-0.13	0.002
138.00	0.00	0.00	0.00	0.00	0.00	0.00	1,157.73	330.92	947.01	756.23	2.36	-0.13	0.000
138.50	0.00	0.00	0.00	0.00	0.00	0.00	1,155.54	329.64	939.69	751.86	2.38	-0.13	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	-40.22	-1.73	0.00	-182.36	0.00	182.36	4,653.24	1,336.95	7,728.54	6,140.24	0.00	0.00	0.038
5.00	-38.90	-1.73	0.00	-173.72	0.00	173.72	4,609.64	1,311.30	7,434.94	5,965.37	0.00	-0.01	0.038
10.00	-37.60	-1.73	0.00	-165.05	0.00	165.05	4,564.26	1,285.66	7,147.03	5,790.45	0.01	-0.01	0.037
15.00	-36.32	-1.73	0.00	-156.39	0.00	156.39	4,517.10	1,260.02	6,864.80	5,615.62	0.03	-0.02	0.036
20.00	-35.06	-1.73	0.00	-147.72	0.00	147.72	4,468.14	1,234.37	6,588.26	5,441.02	0.05	-0.03	0.035
25.00	-33.83	-1.72	0.00	-139.08	0.00	139.08	4,417.41	1,208.73	6,317.40	5,266.79	0.09	-0.03	0.034
30.00	-32.61	-1.71	0.00	-130.46	0.00	130.46	4,364.88	1,183.09	6,052.23	5,093.05	0.12	-0.04	0.033
35.00	-31.42	-1.70	0.00	-121.89	0.00	121.89	4,310.58	1,157.45	5,792.74	4,919.95	0.17	-0.05	0.032
40.00	-30.24	-1.69	0.00	-113.37	0.00	113.37	4,254.48	1,131.80	5,538.94	4,747.62	0.22	-0.05	0.031
45.00	-30.09	-1.69	0.00	-104.93	0.00	104.93	4,196.60	1,106.16	5,290.83	4,576.20	0.28	-0.06	0.030
45.66	-28.30	-1.65	0.00	-103.81	0.00	103.81	4,188.79	1,102.76	5,258.34	4,553.54	0.29	-0.06	0.030
50.00	-27.14	-1.63	0.00	-96.64	0.00	96.64	4,136.94	1,080.52	5,048.39	4,405.83	0.34	-0.07	0.028
52.83	-26.65	-1.62	0.00	-92.01	0.00	92.01	4,139.66	1,081.67	5,059.17	4,413.46	0.38	-0.07	0.027
55.00	-25.53	-1.60	0.00	-88.49	0.00	88.49	4,113.24	1,070.54	4,955.61	4,339.86	0.41	-0.07	0.027
60.00	-24.43	-1.57	0.00	-80.51	0.00	80.51	4,051.10	1,044.90	4,721.08	4,171.16	0.49	-0.08	0.025
65.00	-23.56	-1.54	0.00	-72.67	0.00	72.67	3,987.17	1,019.26	4,492.23	4,003.84	0.58	-0.08	0.024
69.00	-20.67	-1.45	0.00	-66.50	0.00	66.50	3,934.74	998.74	4,313.24	3,871.06	0.65	-0.09	0.022
70.00	-19.62	-1.41	0.00	-65.06	0.00	65.06	3,921.45	993.61	4,269.07	3,838.03	0.67	-0.09	0.022
75.00	-18.60	-1.37	0.00	-58.01	0.00	58.01	3,853.95	967.97	4,051.59	3,673.85	0.76	-0.09	0.021
80.00	-17.49	-1.32	0.00	-51.16	0.00	51.16	3,784.66	942.33	3,839.79	3,511.46	0.87	-0.10	0.019
85.00	-17.09	-1.31	0.00	-44.54	0.00	44.54	3,713.59	916.69	3,633.69	3,350.99	0.97	-0.10	0.018
87.00	-16.49	-1.28	0.00	-41.93	0.00	41.93	3,684.66	906.43	3,552.83	3,287.37	1.02	-0.11	0.017
90.00	-15.99	-1.25	0.00	-38.11	0.00	38.11	3,640.73	891.04	3,433.26	3,192.57	1.08	-0.11	0.016
92.58	-15.23	-1.21	0.00	-34.88	0.00	34.88	3,602.44	877.81	3,332.07	3,111.67	1.14	-0.11	0.015
95.00	-13.79	-1.13	0.00	-31.95	0.00	31.95	3,566.09	865.40	3,238.53	3,036.33	1.20	-0.11	0.014
98.41	-13.53	-1.12	0.00	-28.09	0.00	28.09	2,795.76	718.55	2,679.07	2,375.28	1.28	-0.12	0.017
100.00	-12.88	-1.08	0.00	-26.32	0.00	26.32	2,778.82	711.77	2,628.75	2,338.44	1.32	-0.12	0.016
104.00	-12.70	-1.06	0.00	-22.02	0.00	22.02	2,735.29	694.67	2,504.01	2,246.11	1.42	-0.12	0.014
105.00	-11.91	-1.01	0.00	-20.96	0.00	20.96	2,724.23	690.40	2,473.30	2,223.16	1.45	-0.12	0.014
110.00	-11.13	-0.96	0.00	-15.90	0.00	15.90	2,667.87	669.03	2,322.58	2,109.24	1.58	-0.12	0.012
115.00	-10.83	-0.93	0.00	-11.11	0.00	11.11	2,609.71	647.66	2,176.60	1,996.83	1.71	-0.13	0.010
117.00	-8.37	-0.75	0.00	-9.24	0.00	9.24	2,585.95	639.11	2,119.53	1,952.32	1.76	-0.13	0.008
119.00	-7.22	-0.66	0.00	-7.75	0.00	7.75	2,561.90	630.56	2,063.23	1,908.08	1.82	-0.13	0.007
120.00	-6.64	-0.61	0.00	-7.10	0.00	7.10	2,549.77	626.29	2,035.36	1,886.06	1.84	-0.13	0.006
125.00	-6.29	-0.58	0.00	-4.05	0.00	4.05	2,488.05	604.92	1,898.85	1,777.07	1.98	-0.13	0.005
128.00	-3.38	-0.32	0.00	-2.31	0.00	2.31	2,450.16	592.10	1,819.22	1,712.59	2.06	-0.13	0.003
128.50	-3.27	-0.31	0.00	-2.15	0.00	2.15	2,443.78	589.96	1,806.12	1,701.91	2.08	-0.13	0.003
128.50	-3.27	-0.31	0.00	-2.15	0.00	2.15	1,195.95	355.28	1,091.56	839.05	2.08	-0.13	0.005
130.00	-3.20	-0.31	0.00	-1.68	0.00	1.68	1,190.35	351.44	1,068.05	826.02	2.12	-0.13	0.005
131.00	-2.09	-0.21	0.00	-1.38	0.00	1.38	1,186.52	348.87	1,052.52	817.33	2.15	-0.13	0.003
135.00	-1.97	-0.19	0.00	-0.55	0.00	0.55	1,170.50	338.62	991.55	782.45	2.26	-0.13	0.002
137.00	-1.67	-0.17	0.00	-0.17	0.00	0.17	1,162.06	333.49	961.74	764.98	2.31	-0.13	0.002
138.00	0.00	0.00	0.00	0.00	0.00	0.00	1,157.73	330.92	947.01	756.23	2.34	-0.13	0.000
138.50	0.00	0.00	0.00	0.00	0.00	0.00	1,155.54	329.64	939.69	751.86	2.35	-0.13	0.000

Analysis Summary

Load Case	Reactions						Max Usage	
	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	28.41	0.00	58.30	0.00	0.00	2715.95	0.00	0.46
0.9D + 1.0W	28.40	0.00	43.72	0.00	0.00	2698.59	0.00	0.45
1.2D + 1.0Di + 1.0Wi	7.31	0.00	77.79	0.00	0.00	684.77	0.00	0.13
1.2D + 1.0Ev + 1.0Eh	1.73	0.00	58.55	0.00	0.00	183.85	0.00	0.04
0.9D - 1.0Ev + 1.0Eh	1.73	0.00	40.22	0.00	0.00	182.36	0.00	0.04
1.0D + 1.0W	6.35	0.00	48.60	0.00	0.00	604.98	0.00	0.11



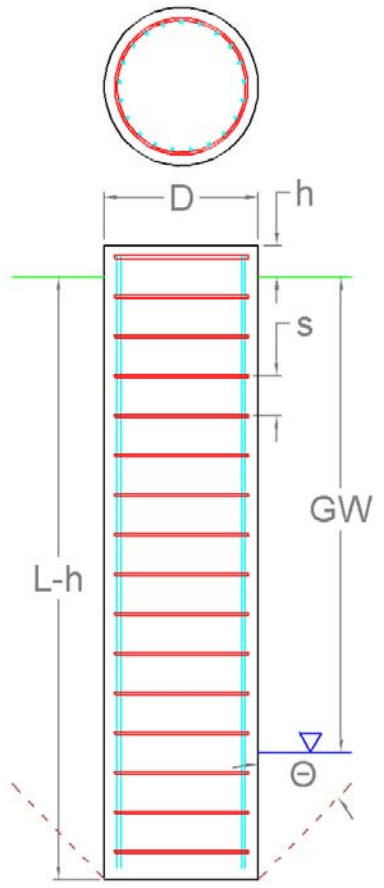
# Pier Foundation Analysis (ANSI/TIA-222-H)

Foundation Analysis Parameters			
Pier Diameter	<i>D</i>	8.00	ft
Pier Embedment	<i>L-h</i>	18.5	ft
Pier Height above Ground	<i>H</i>	0.50	ft
Water Table Depth [BGL]	<i>GW</i>	99	ft
Pullout Angle	$\Theta$	30	°
Unit Weight of Concrete		150	pcf
Uplift Skin Friction Factor		1.000	

Reactions		
Moment, $M_u$	2,716.0	k-ft
Shear, $V_u$	28.4	k
Axial, $P_u$	58.3	k
Uplift, $T_u$	0.0	k

Soil Properties						
Layer Depth (ft)		Unit Weight	Cohesion	Friction Angle	Ultimate Skin Friction	Ultimate Bearing Pressure
TOP	BTM	pcf	psf	°	psf	psf
0.0	2.0	105	0	0	0	0
2.0	4.0	140	11,323	0	0	0
4.0	9.0	140	13,483	0	6,067	0
9.0	19.5	140	16,171	0	7,277	48,270

Soil Strength Capacities		
Volume of Concrete	955.0	ft <sup>3</sup>
Weight of Concrete [Buoyancy Considered]	143.3	k
Average Soil Unit Weight	136.2	pcf
Skin Friction Resistance	2,499.9	k
Compressive Bearing Resistance	2,426.3	k
Pullout Weight [Minus Concrete Weight]	639.3	k
Compressive Force, $P_u$	73.7	k
Nominal Compressive Capacity, $\phi_s P_n$	3,694.6	k
$P_u / \phi_s P_n$	<b>2.0%</b>	
Total Lateral Resistance	13,306.5	k
Inflection Point [BGL]	10.8	ft
Moment at Inflection Point, $M_D$	3,036.7	k-ft
Nominal Moment Capacity, $\phi_s M_n$	38,592.2	k-ft
$M_D / \phi_s M_n$	<b>7.9%</b>	





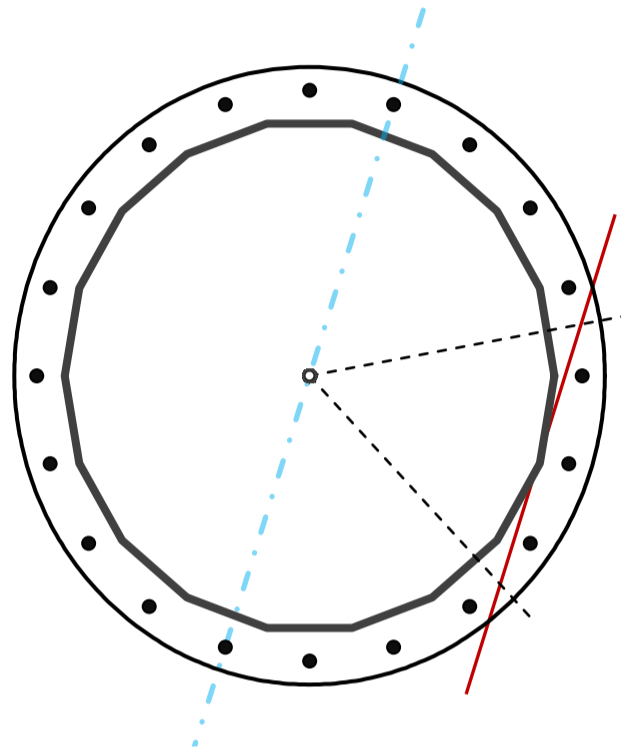
## Base Plate & Anchor Rod Analysis

Pole Dimensions		
Number of Sides	18	-
Diameter	64.38	in
Thickness	3/8	in
Orientation Offset		°

Base Reactions		
Moment, Mu	2,716.0	k-ft
Axial, Pu	58.3	k
Shear, Vu	28.4	k
Neutral Axis	252	°

Report Capacities		
Component	Capacity	Result
Base Plate	20%	Pass
Anchor Rods	40%	Pass
Dwyidag	-	-

Base Plate		
Shape	Round	-
Diameter, $\phi$	79	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		°
Anchor Rod Detail	d	$\eta=0.5$
Clear Distance	3	in
Applied Moment, Mu	532.7	k
Bending Stress, $\phi Mn$	2615.1	k



Original Anchor Rods		
Arrangement	Radial	-
Quantity	20	-
Diameter, $\phi$	2 1/4	in
Bolt Circle	73	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Spacing	11.5	in
Orientation Offset		°
Applied Force, Pu	95.2	k
Anchor Rods, $\phi Pn$	243.6	k

# Calculations for Monopole Base Plate & Anchor Rod Analysis

## Reaction Distribution

Reaction	Shear Vu	Moment Mu	Factor
-	k	k-ft	-
Base Forces	28.4	2716.0	1.00
Anchor Rod Forces	28.4	2716.0	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 <sup>2</sup>	in <sup>2</sup>	in <sup>4</sup>	#	in <sup>4</sup>
Pole	75.0219	4.1679	0.1959		38420.73
Bolt	3.9761	3.2477	0.8393	4.5	40514.59
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	79	in
Thickness, t	2.25	in
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	75	ksi
Base Plate Chord	45.784	in
Detail Type	d	-
Detail Factor	0.50	-
Clear Distance	3	-

### Anchor Rods

Anchor Rod Quantity, N	20	-
Rod Diameter, d	2.25	in
Bolt Circle, BC	73	in
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	95.2	k
Applied Shear, Vu	0.7	k
Compressive Capacity, $\phi P_n$	243.6	k
Tensile Capacity, $\phi R_n$	0.391	OK
Interaction Capacity	0.396	OK

### External Base Plate

Chord Length AA	39.235	in
Additional AA	4.500	in
Section Modulus, Z	55.352	in <sup>3</sup>
Applied Moment, Mu	532.7	k-ft
Bending Capacity, $\phi M_n$	2989.0	k-ft
Capacity, Mu/ $\phi M_n$	0.178	OK
Chord Length AB	37.550	in
Additional AB	4.500	in
Section Modulus, Z	53.219	in <sup>3</sup>
Applied Moment, Mu	395.1	k-ft
Bending Capacity, $\phi M_n$	2873.8	k-ft
Capacity, Mu/ $\phi M_n$	0.137	OK
Bend Line Length	38.264	in
Additional Bend Line	0.000	in
Section Modulus, Z	48.428	in <sup>3</sup>
Applied Moment, Mu	532.7	k-ft
Bending Capacity, $\phi M_n$	2615.1	k-ft
Capacity, Mu/ $\phi M_n$	0.204	OK

### Internal Base Plate

Arc Length	0.000	in
Section Modulus, Z	0.000	in <sup>3</sup>
Moment Arm	0.000	in
Applied Moment, Mu	0.0	k-ft
Bending Capacity, $\phi M_n$	0.0	k-ft
Capacity, Mu/ $\phi M_n$		

# Flange Plate Analysis

Flange Plate	Plate Type	<b>Flange</b>	<b>128.5 ft</b>
	Pole Diameter	34.2064	in
	Pole Thickness	0.1875	in
	Plate Diameter	41	in
	Plate Thickness	1	in
	Plate Fy	60	ksi
	Weld Length	0.55	in
	f <sub>s</sub> Resistance	62.98	k-in
	Applied	1.31	k-in

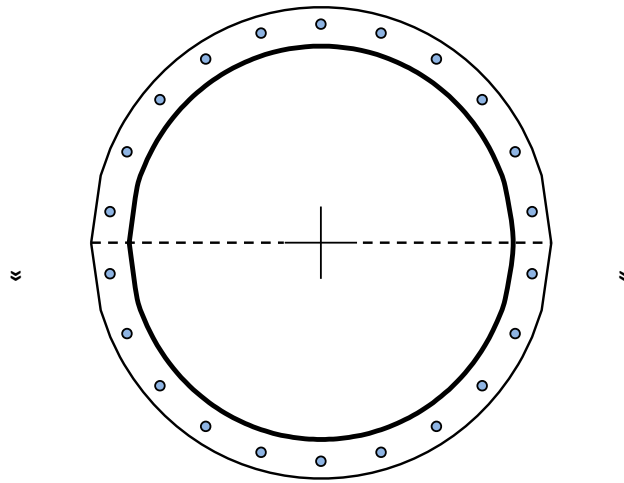
Code Rev.	<b>H</b>
Moment	32.8 k-ft
Axial	4.6 k

Date	6/11/2021
Engineer	Lucas.Tait
Site #	411257
Carrier	VZW

Required Flange Thickness:  
0.14 in OK

Stiffeners	#	
------------	---	--

Bolts	#	<b>22</b>	
	Bolt Circle (R)adial / (S)quare	38	in
	Bolt Gap	R	
	Diameter	6	in
	Hole Diameter	1	in
	Type	1.125	in
	Fy	A325	
	Fu	92	ksi
	f <sub>s</sub> Resistance	120	ksi
	Applied	54.52	k
	1.67	k	



Reinforcement	#	
---------------	---	--

**Plate Stress Ratio:**  
2% Pass

**Bolt Stress Ratio:**  
3% Pass

Extra Bolts	#	
-------------	---	--

# INFINIGY

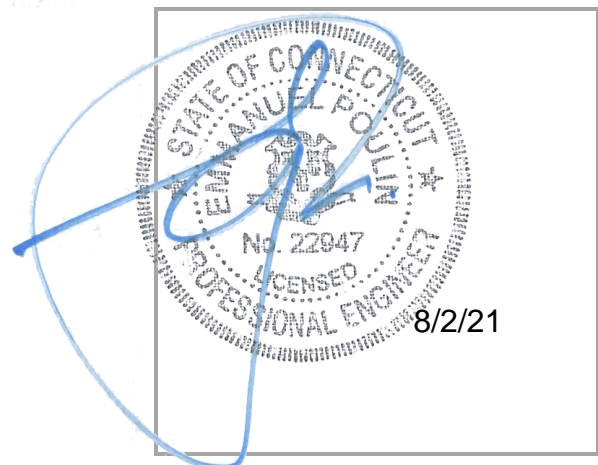
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## MOUNT ANALYSIS REPORT

August 2, 2021

Dish Wireless Site Name	BOBDL00024A
Dish Wireless Site Number	BOBDL00024A
ATC Site Name	Middle Haddam Road-CROWN CT, CT
ATC Site Number	411257
Infinigy Job Number	1197-F0001-C
Client	ATC
Carrier	Dish Wireless
Site Location	191 Middle Haddam Road Portland, CT 06480 Middlesex County 41° 33' 43.9" N NAD83 72° 34' 25.7" W NAD83
Structure Type	Monopole
Structure Height	138.5 ft AGL
Mount Type	8.0 ft Platform
Mount Elevation	69.0 ft AGL
Structural Usage Ratio	51.1%
<b>Overall Result</b>	<b>Pass</b>

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





**CONTENTS**

1. Introduction
2. Design/Analysis Parameters
3. Proposed Loading Configuration
4. Supporting Documentation
5. Results
6. Recommendations
7. Assumptions
8. Liability Waiver and Limitations
9. Calculations

**1. INTRODUCTION**

Infinigy performed a structural analysis on the Dish Wireless proposed telecommunication equipment supporting 8.0 ft 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 19.0.4 analysis software.

**2. DESIGN/ANALYSIS PARAMETERS**

Wind Speed	130 mph (3-Second Gust)
Wind Speed w/ ice	50 mph (3-Second Gust) w/ 1.5" ice
Code / Standard	TIA-222-H
Adopted Code	2018 Connecticut State Building Code (2015 IBC)
Risk Category	II
Exposure Category	C
Topographic Category	1
Calculated Crest Height	0 ft.
Seismic Spectral Response	$S_s = 0.180 \text{ g} / S_1 = 0.063 \text{ g}$

**3. PROPOSED LOADING CONFIGURATION - 69.0 ft AGL 8.0 ft Platform**

Antenna Centerline (ft)	Qty.	Appurtenance Manufacturers	Appurtenance Models
69.0	1	Commscope	RDIDC-9181-PF-48
	3	Fujitsu	TA08025-B605
	3	Fujitsu	TA08025-B604
	3	JMA Wireless	MX08FRO665-21

**4. SUPPORTING DOCUMENTATION**

Structural Analysis Report	ATC, Site No.: 411257, dated June 11, 2021
Mount Manufacturer Drawings	Commscope, Part No.: MC-PK8-DSH

**5. RESULTS**

Components	Capacity	Pass/Fail
Horizontal(s)	11.9%	Pass
Handrail(s)	20.6%	Pass
Mount Pipe(s)	51.1%	Pass
Standoff(s)	19.1%	Pass
Standoff Support(s)	38.5%	Pass
Platform Connection	11.8%	Pass
<b>MOUNT RATING =</b>	<b>51.1%</b>	<b>Pass</b>

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 69.0 ft. The installation shall be performed in accordance with the construction documents issued for this site.

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

Luis Mendoza, P.E.

Director of Structural Engineering | [INFINIGY](#)

**7. ASSUMPTIONS**

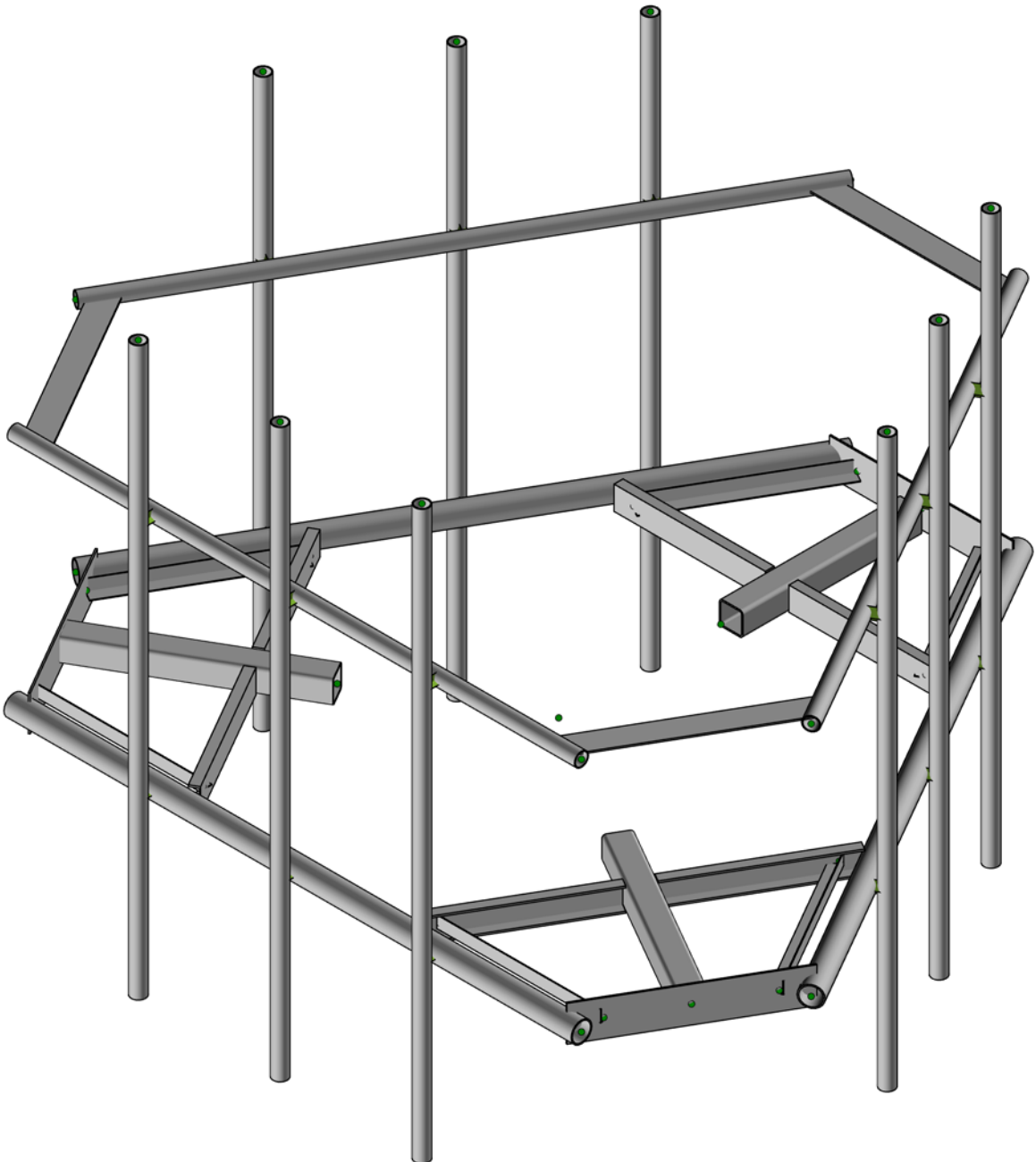
The antenna mounting system was properly fabricated, installed and maintained in accordance with its original design and manufacturer's specifications.	
The configuration of antennas, mounts, and other appurtenances are as specified in the proposed loading configuration table.	
All member connections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

**8. LIABILITY WAIVER AND LIMITATIONS**

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

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

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



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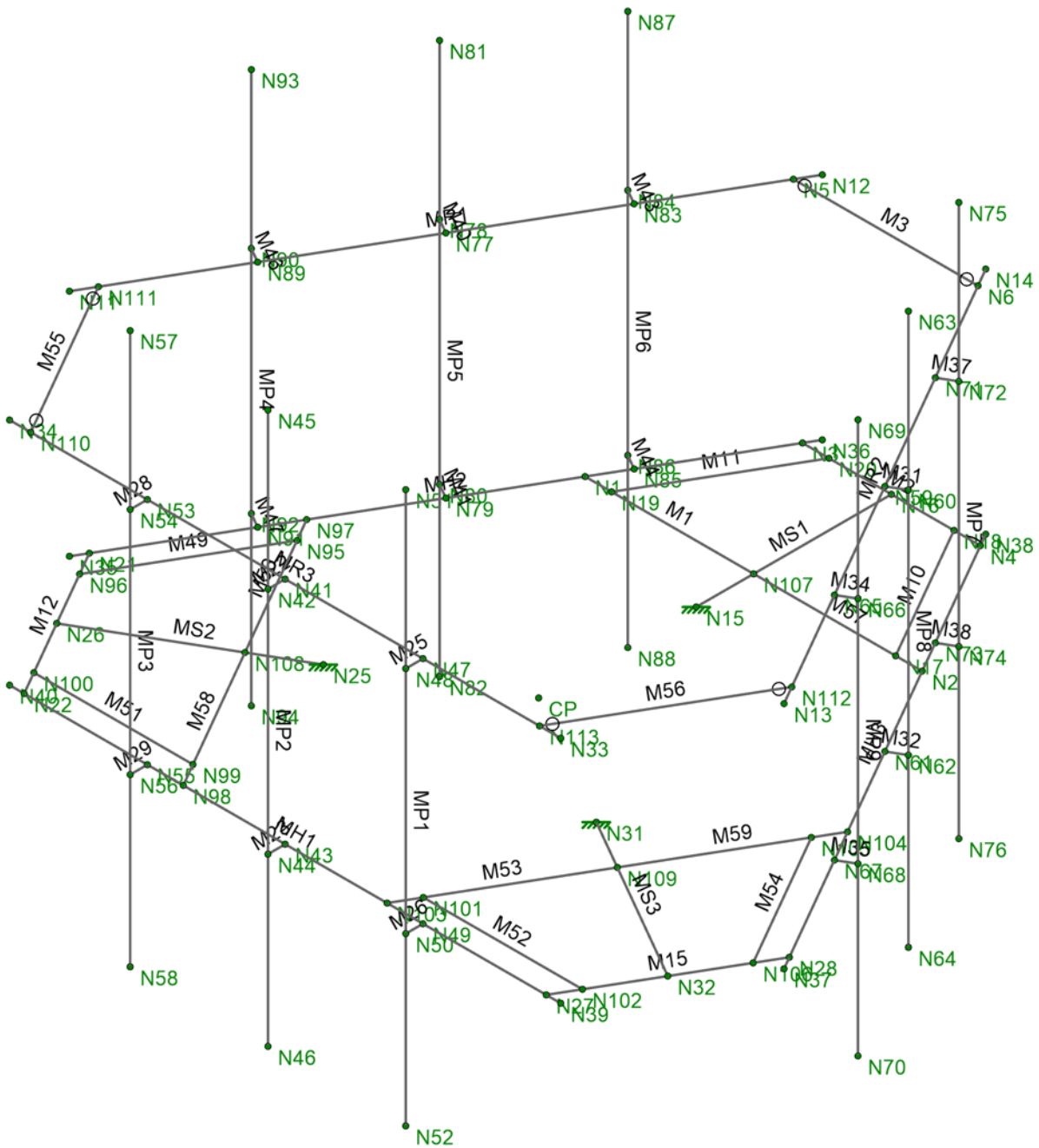
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Wireframe

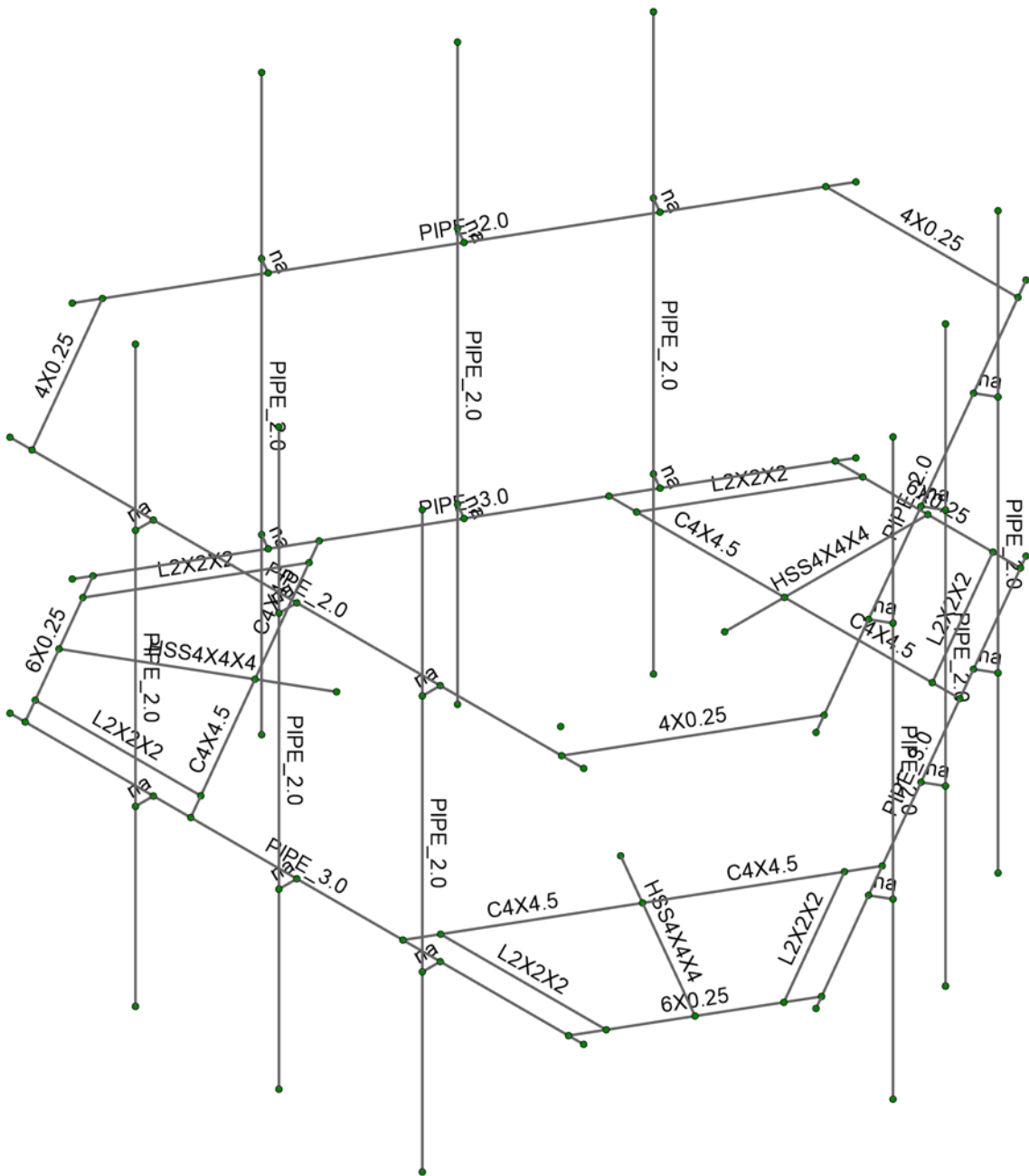
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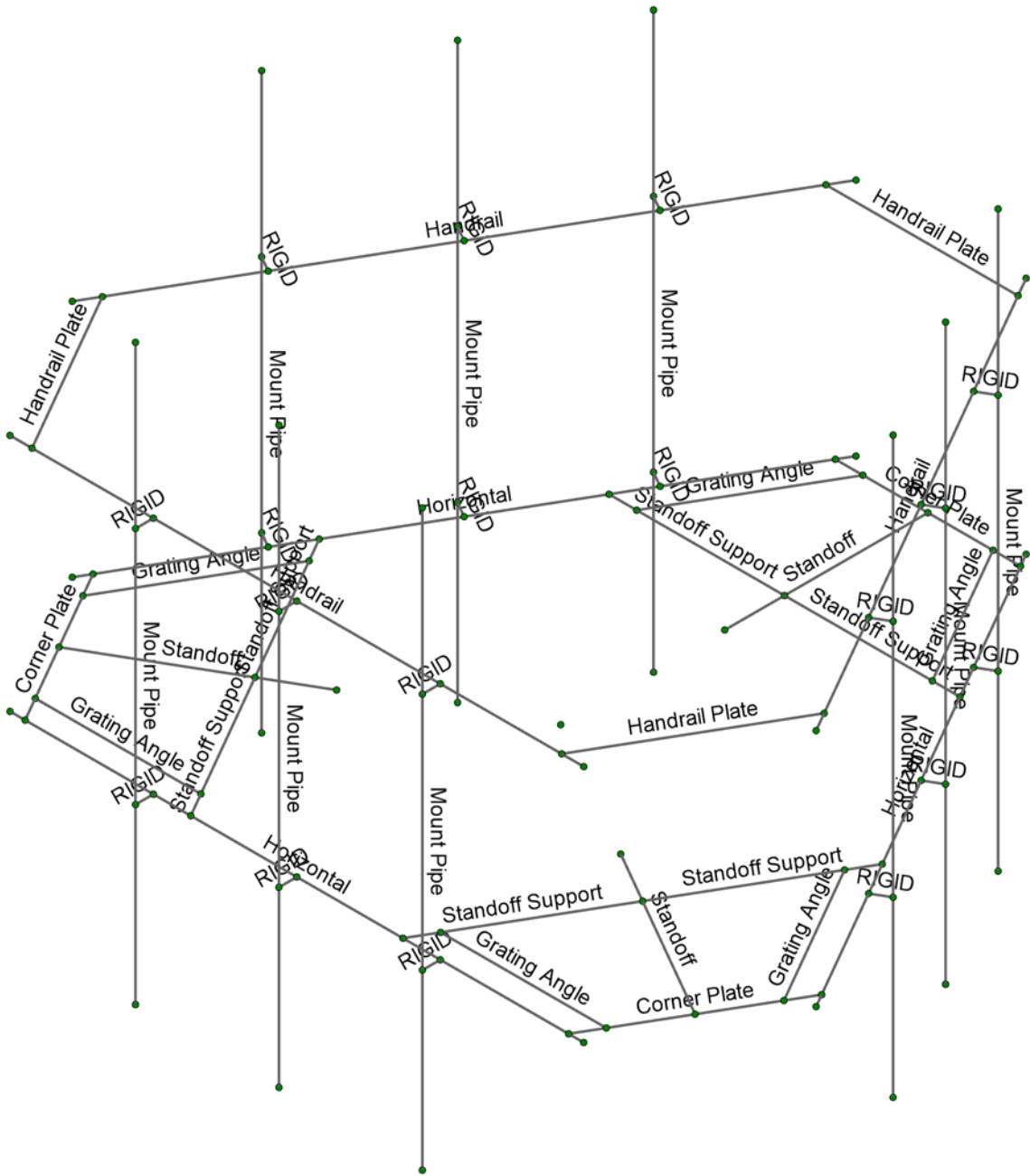
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Shape

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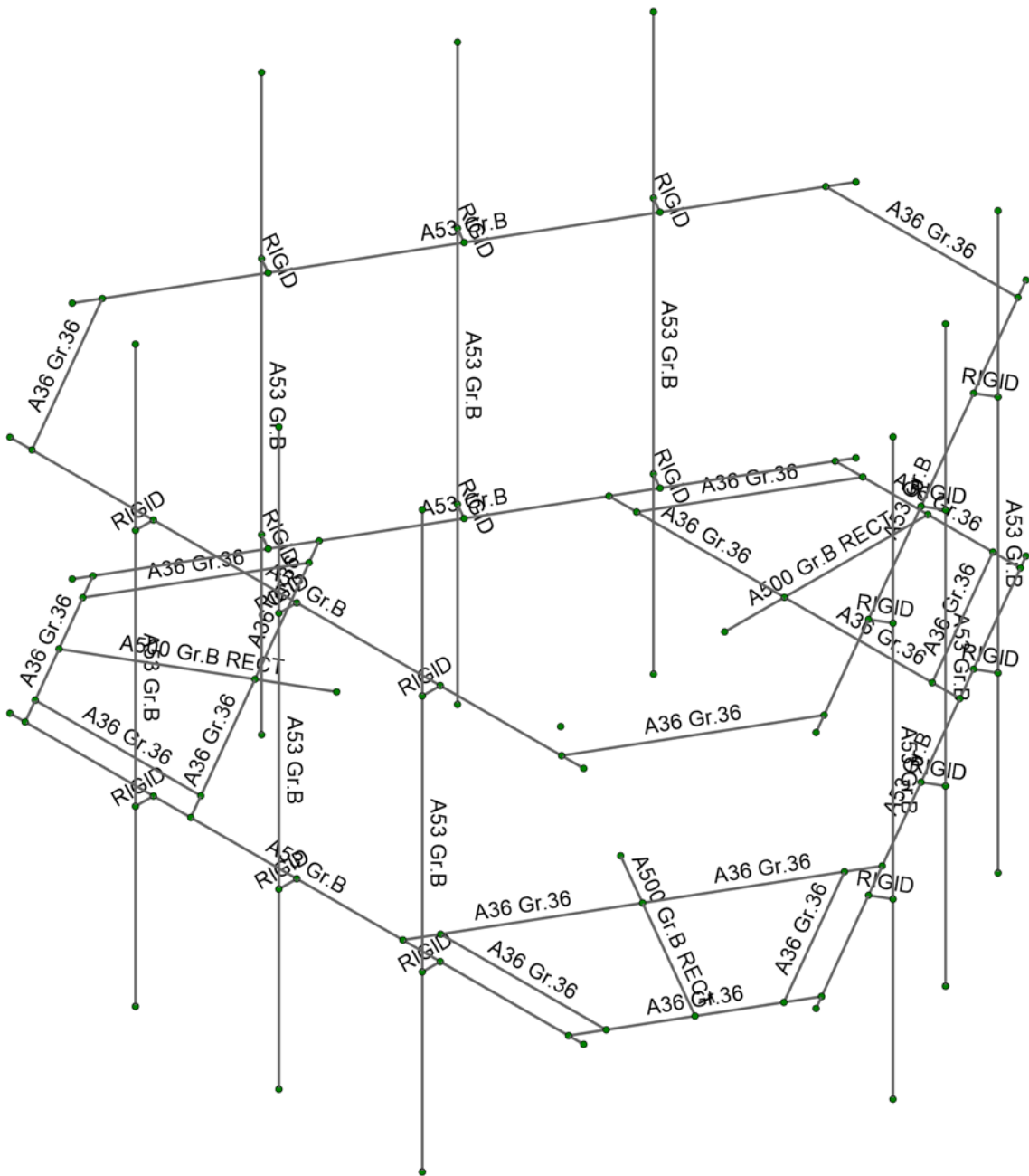
Section Sets

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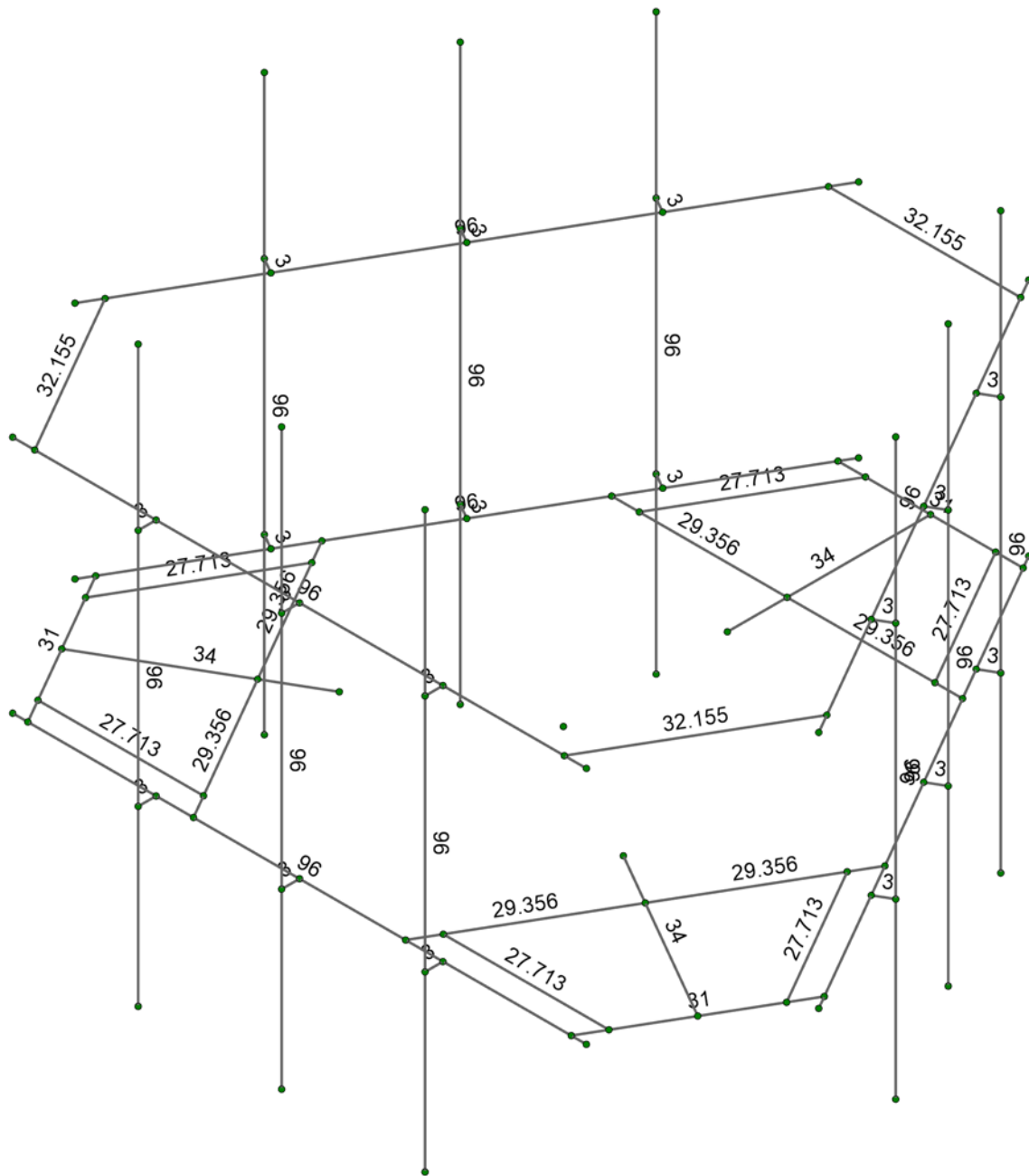
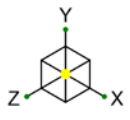
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Member Length (in) Displayed

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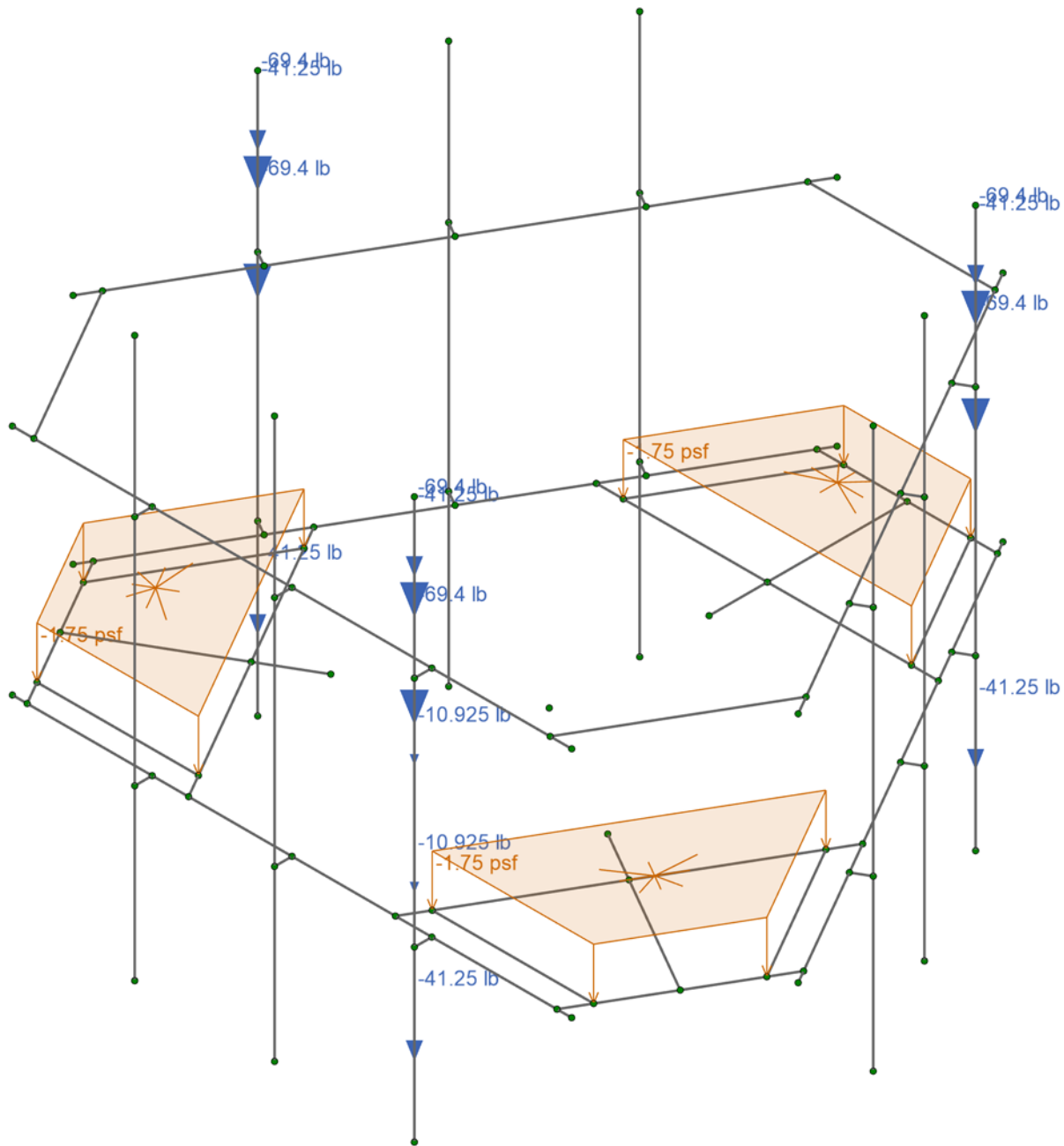
Length

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Loads: BLC 1, Self Weight

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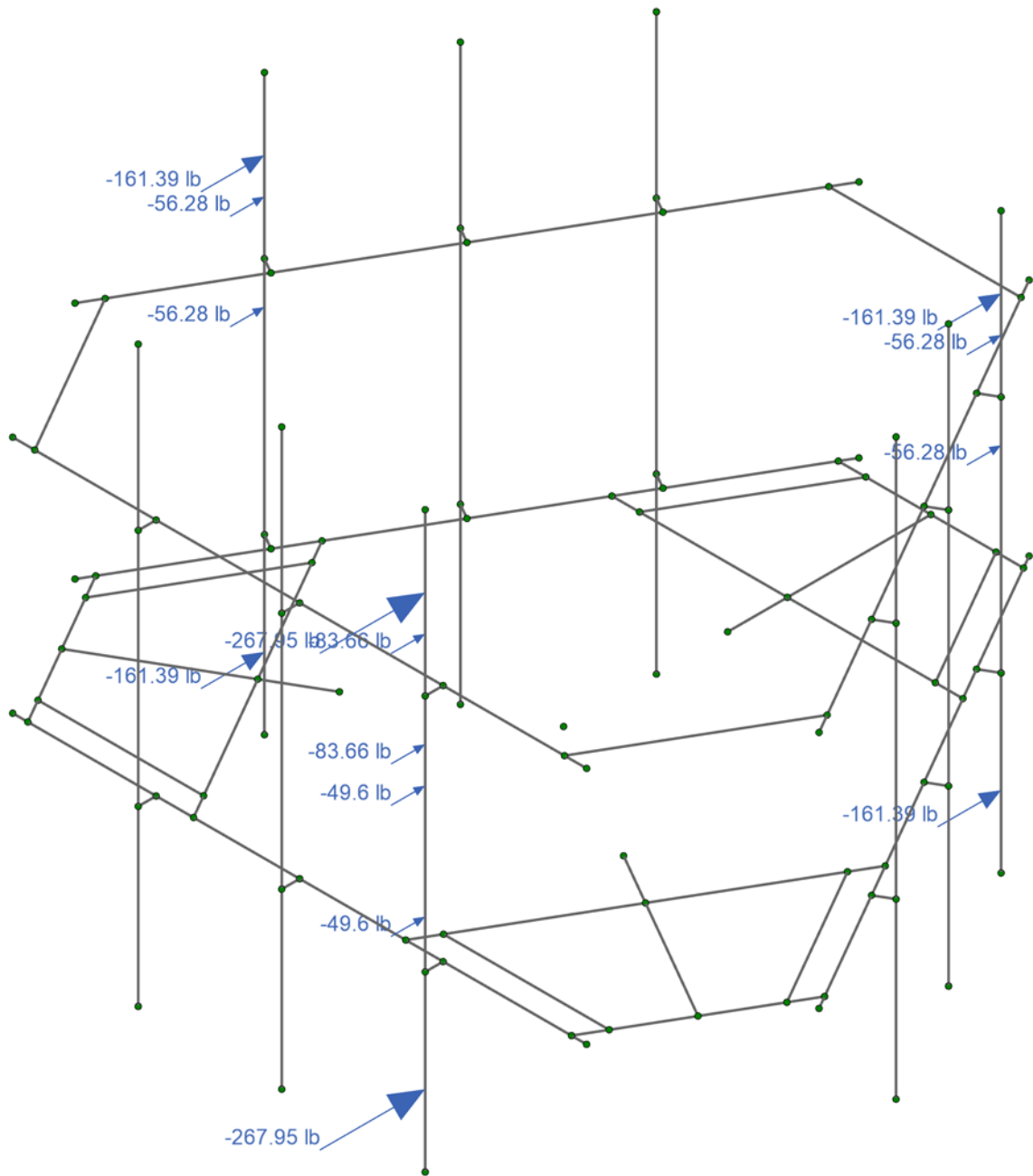
Self Weight

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Loads: BLC 2, Wind Load AZI 0

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BOBDL00024A

Wind Loading 0

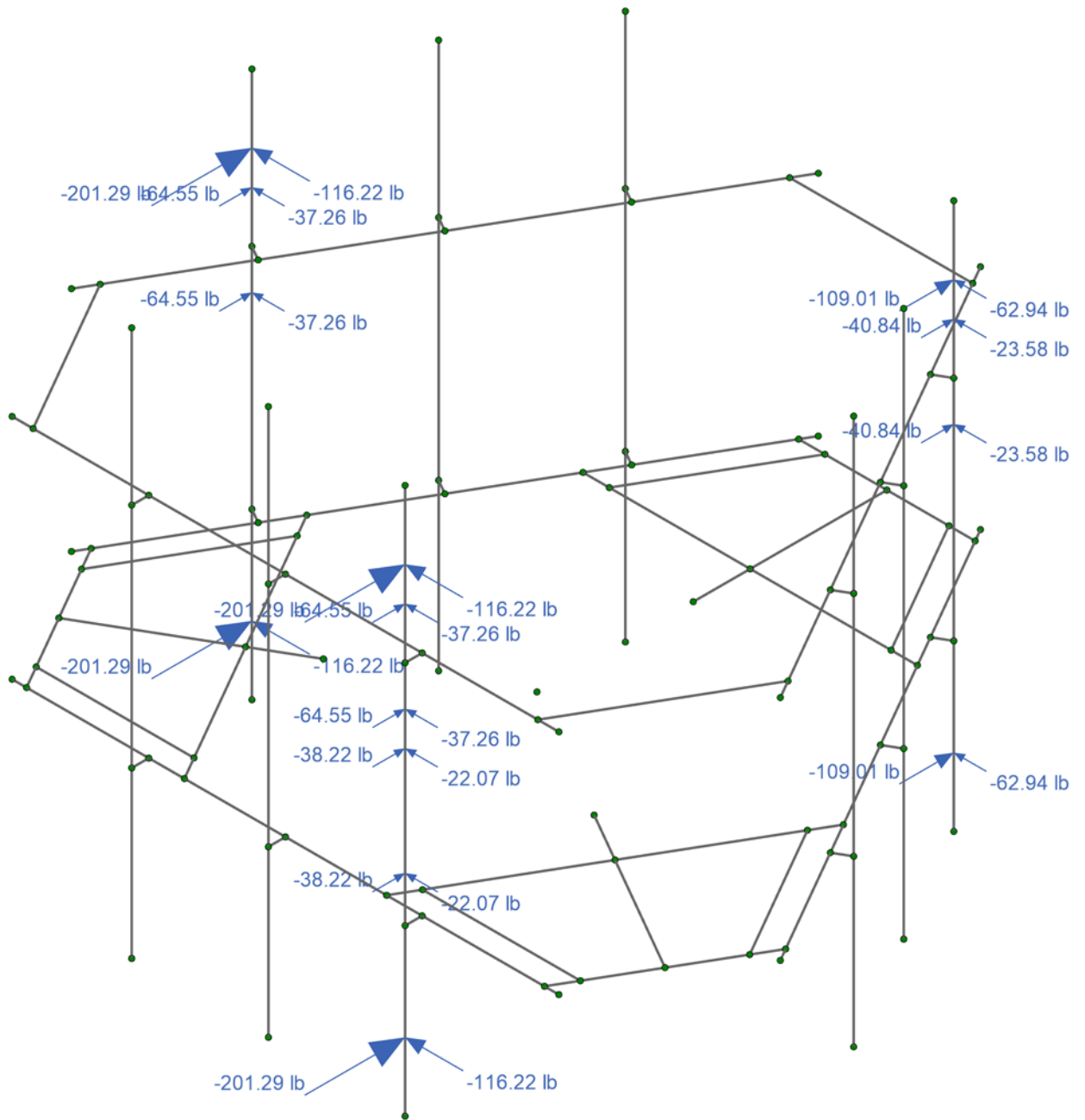
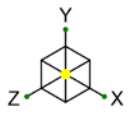
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Loads: BLC 3, Wind Load AZI 30

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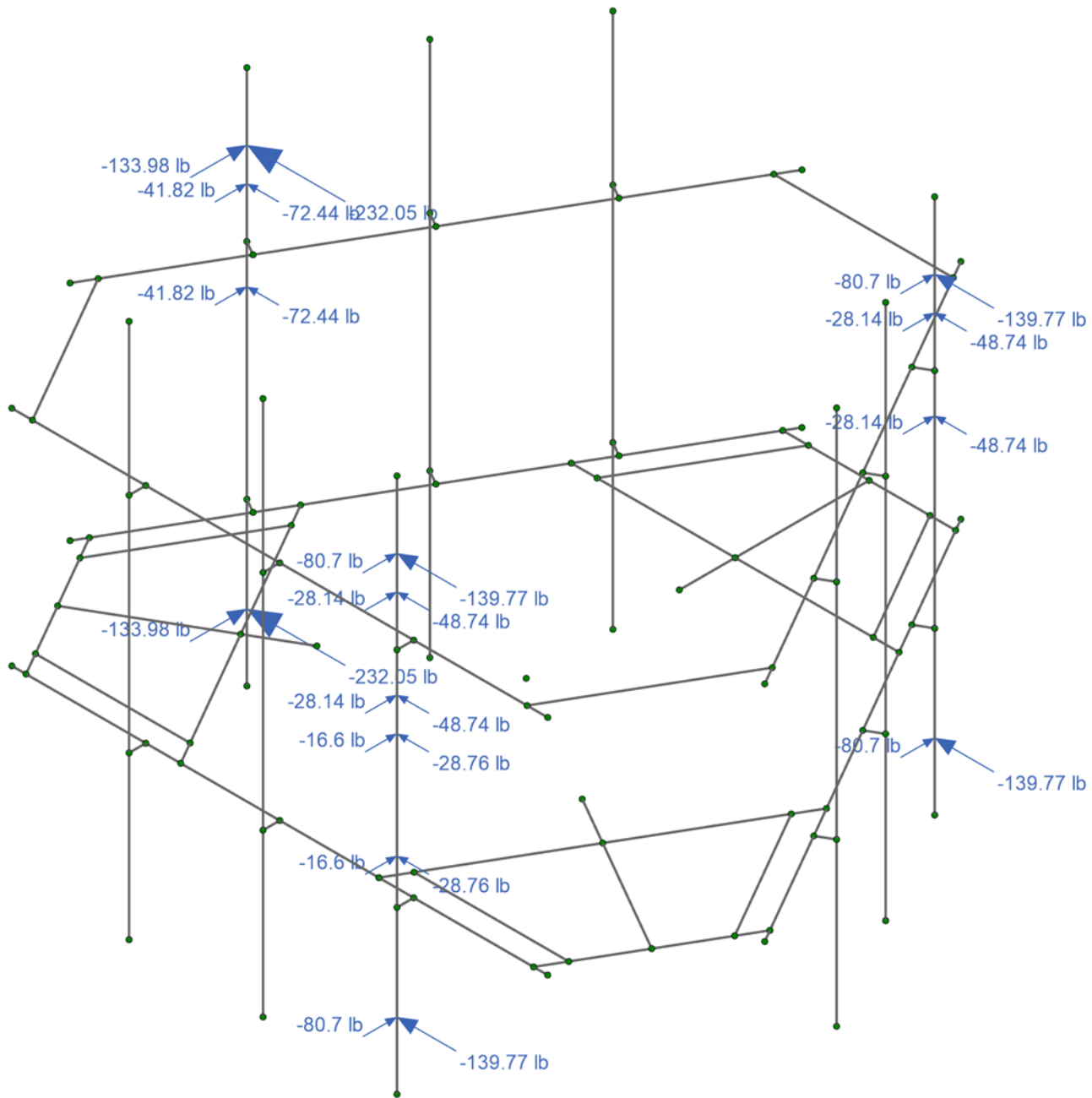
6039-Z0001-C

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Wind Loading 30

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Loads: BLC 4, Wind Load AZI 60

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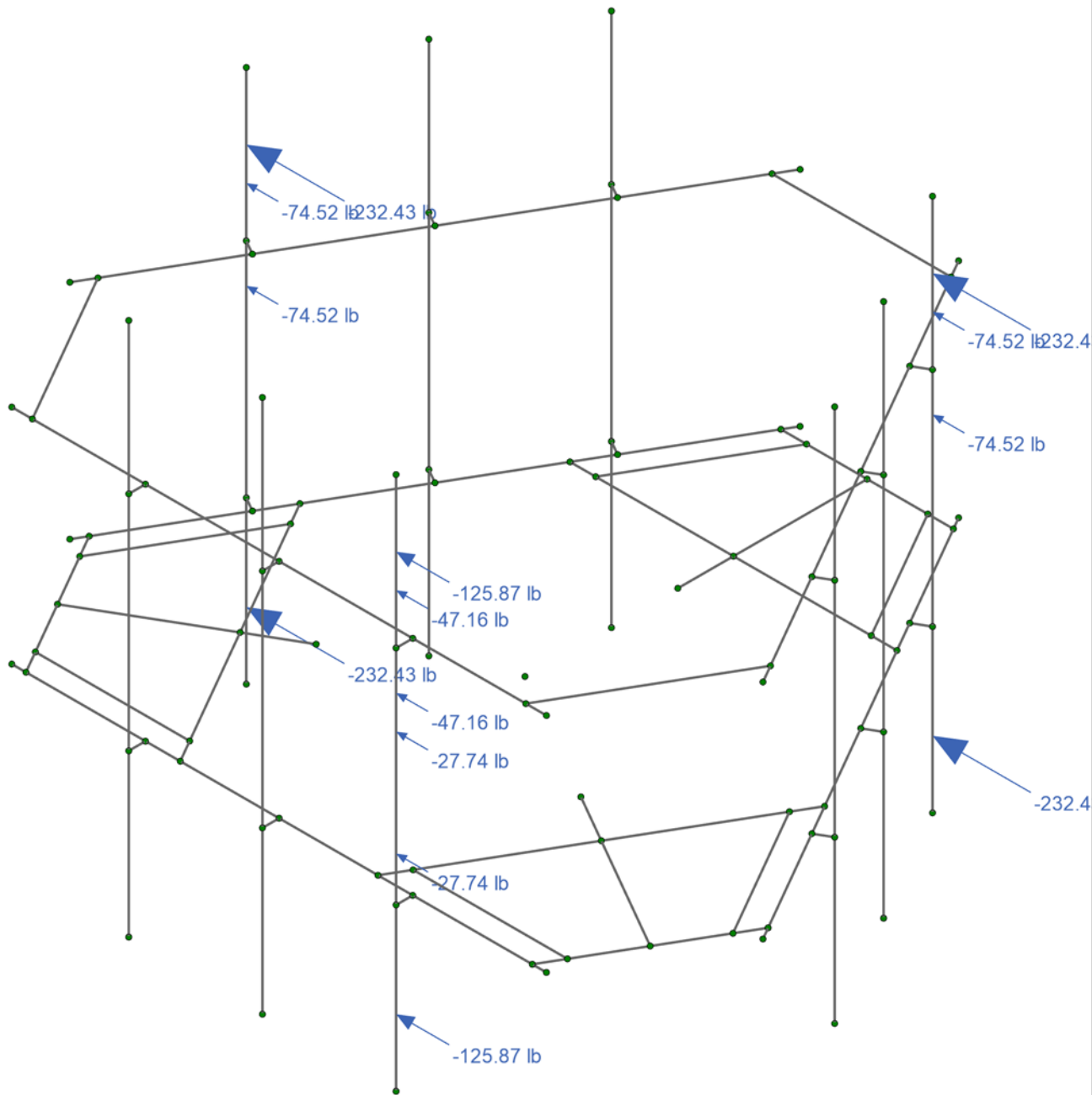
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Wind Loading 60

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Loads: BLC 5, Wind Load AZI 90

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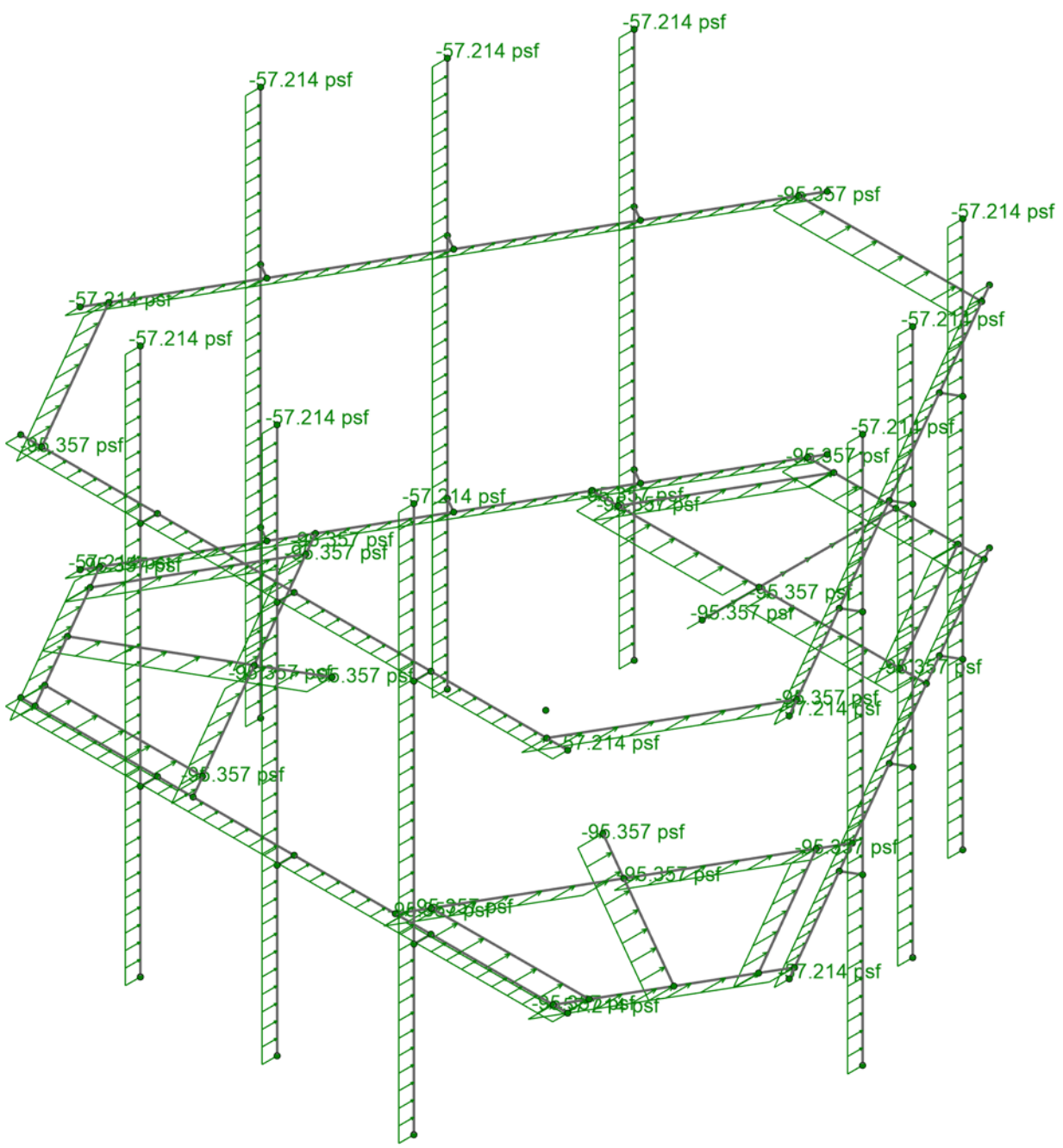
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Wind Loading 90

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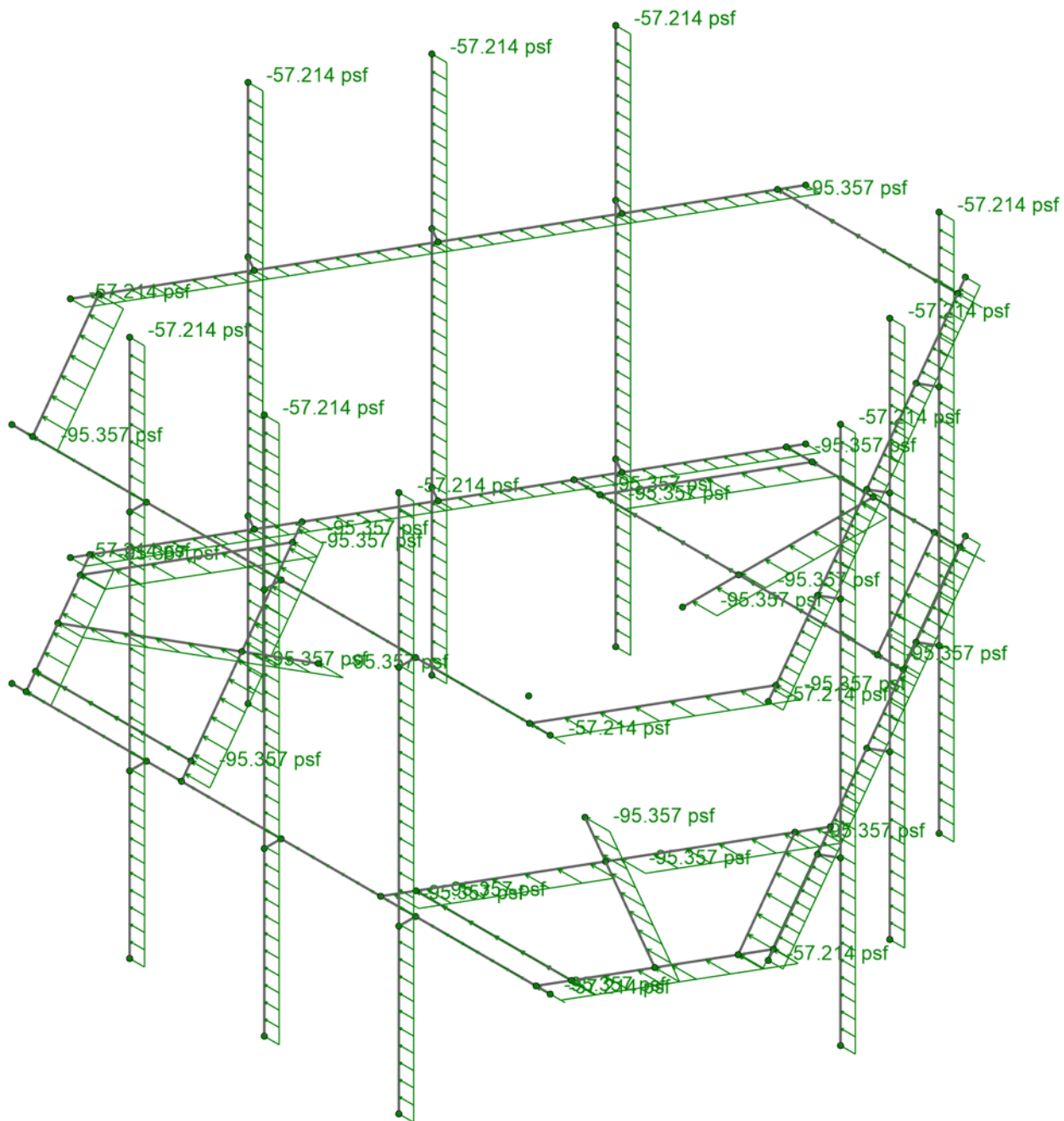
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Loads: BLC 14, Distr. Wind Load Z  
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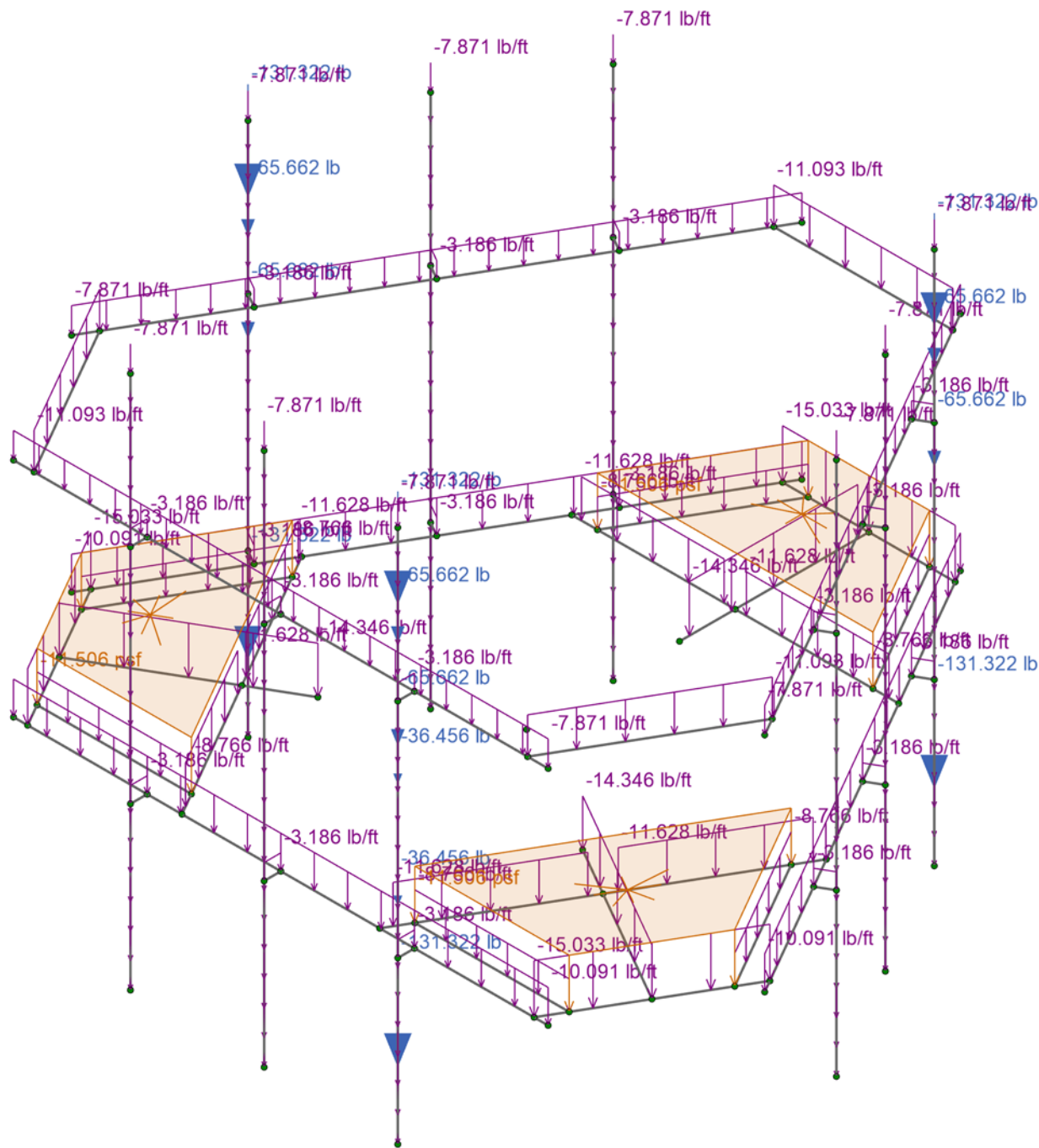
Dist. Wind Loading 0  
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Loads: BLC 15, Distr. Wind Load X
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Aug 02, 2021
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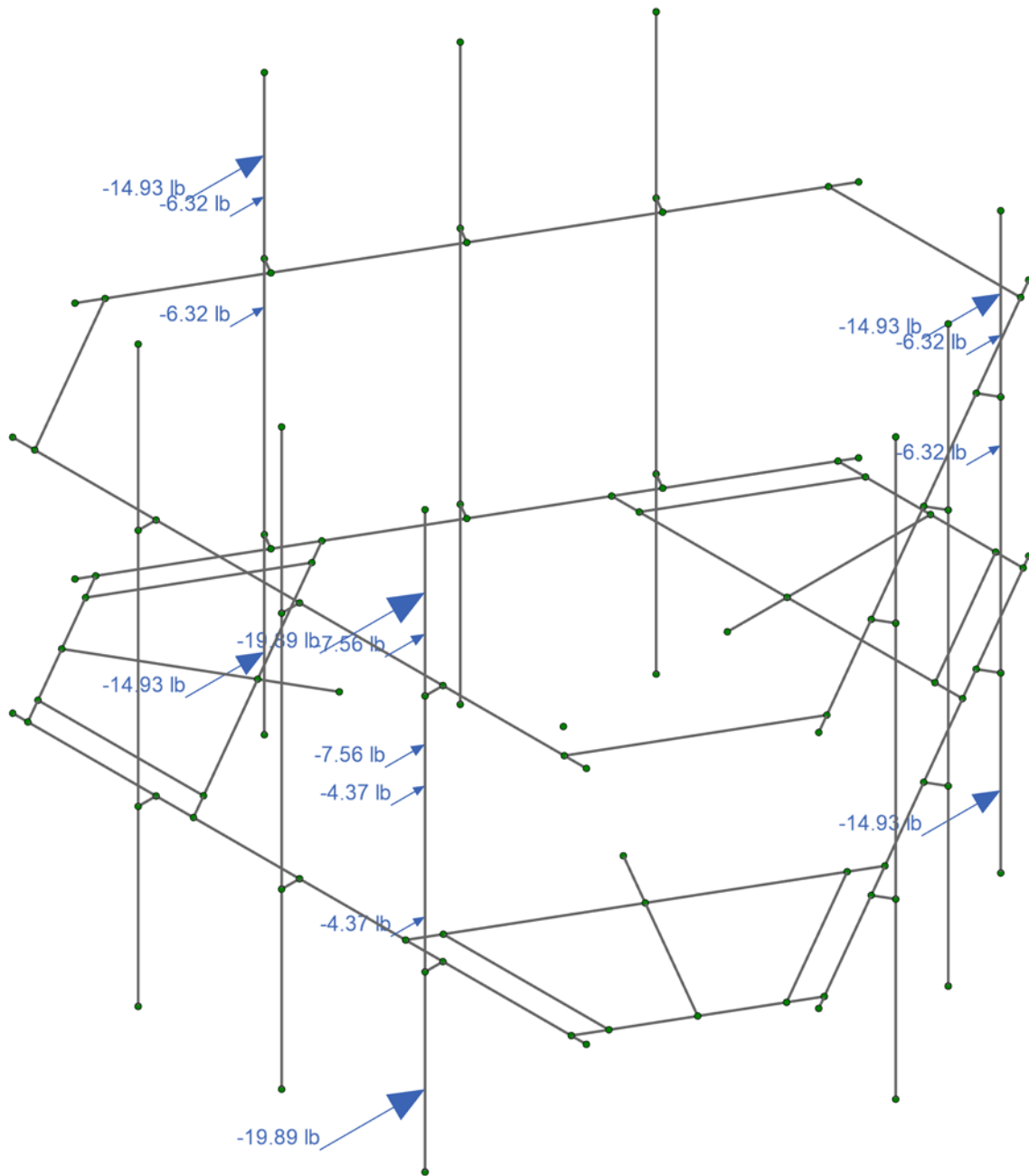
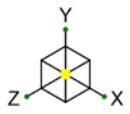


Loads: BLC 16, Ice Weight

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Ice Weight  
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Loads: BLC 17, Ice Wind Load AZI 0

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Ice Wind Loading 0

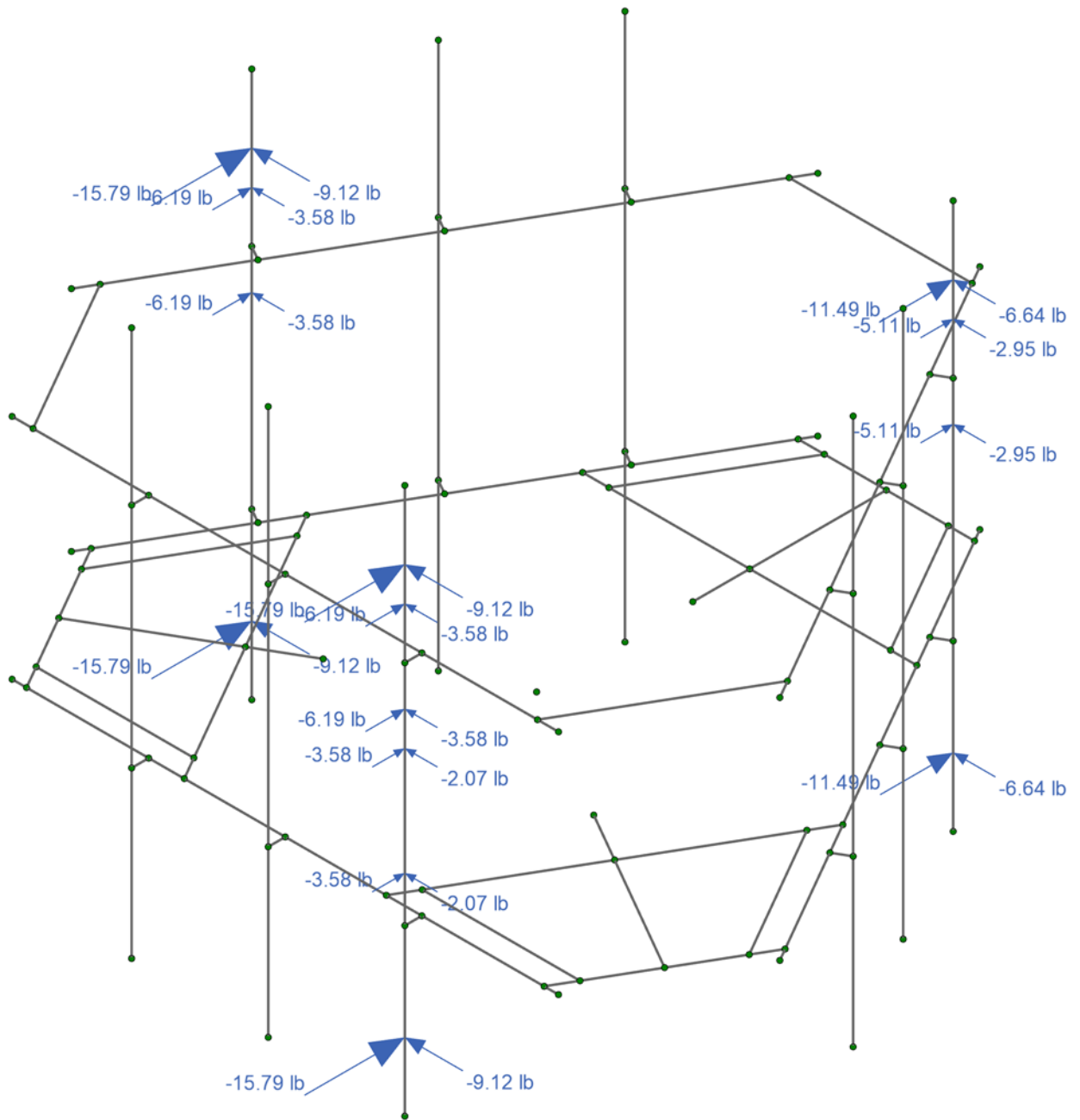
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Loads: BLC 18, Ice Wind Load AZI 30

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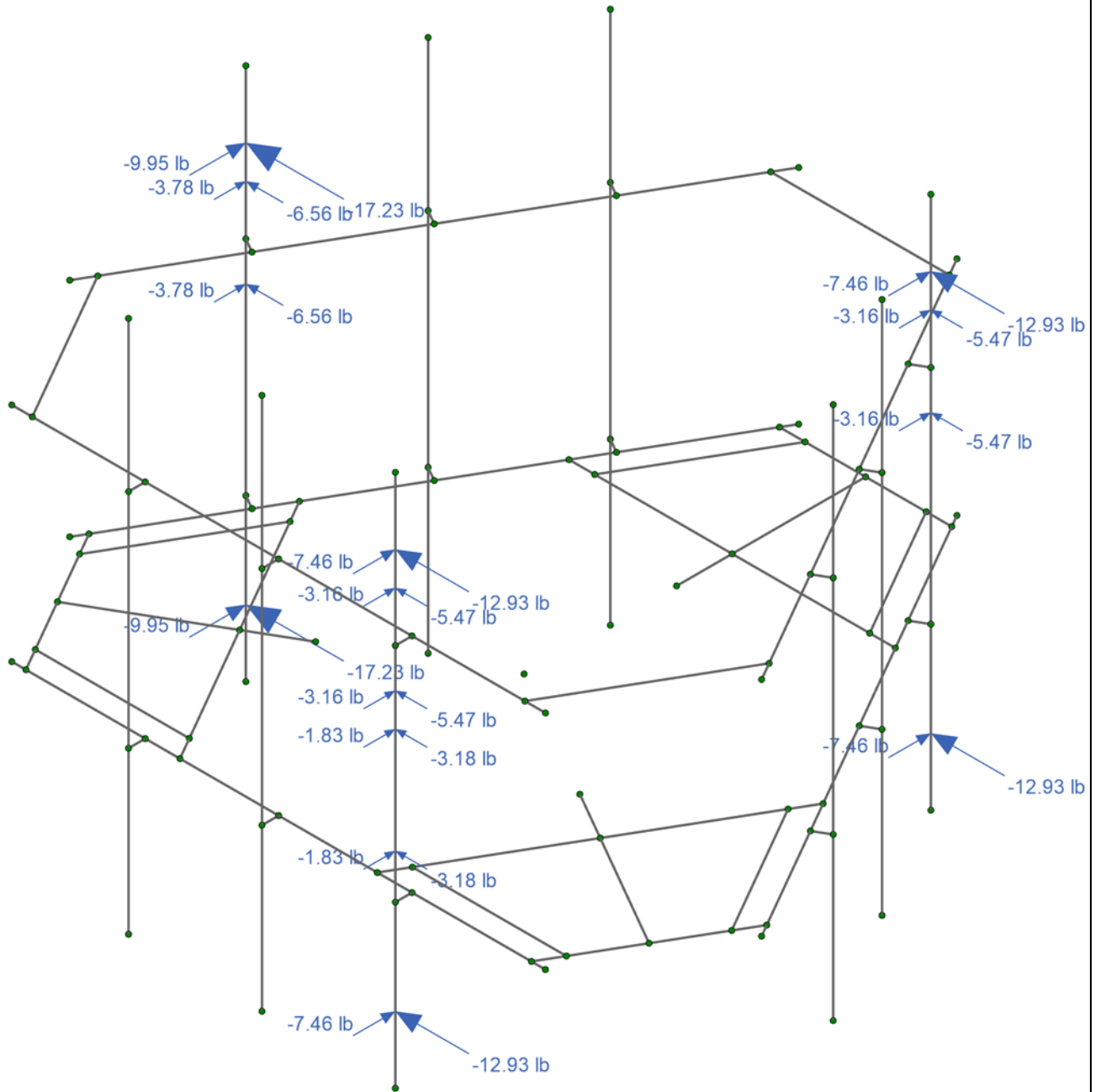
Ice Wind Loading 30

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Loads: BLC 19, Ice Wind Load AZI 60

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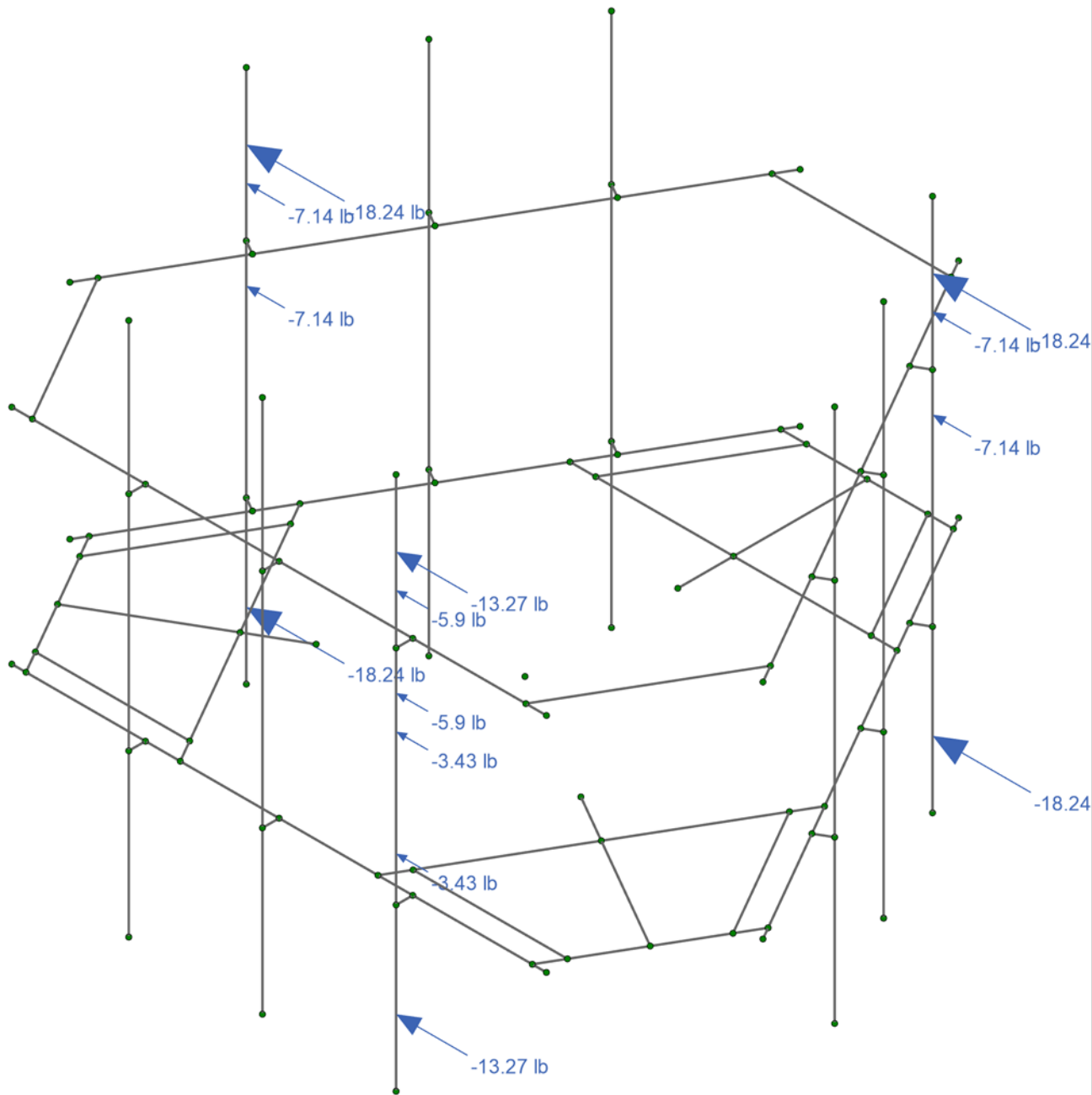
Ice Wind Loading 60

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Loads: BLC 20, Ice Wind Load AZI 90

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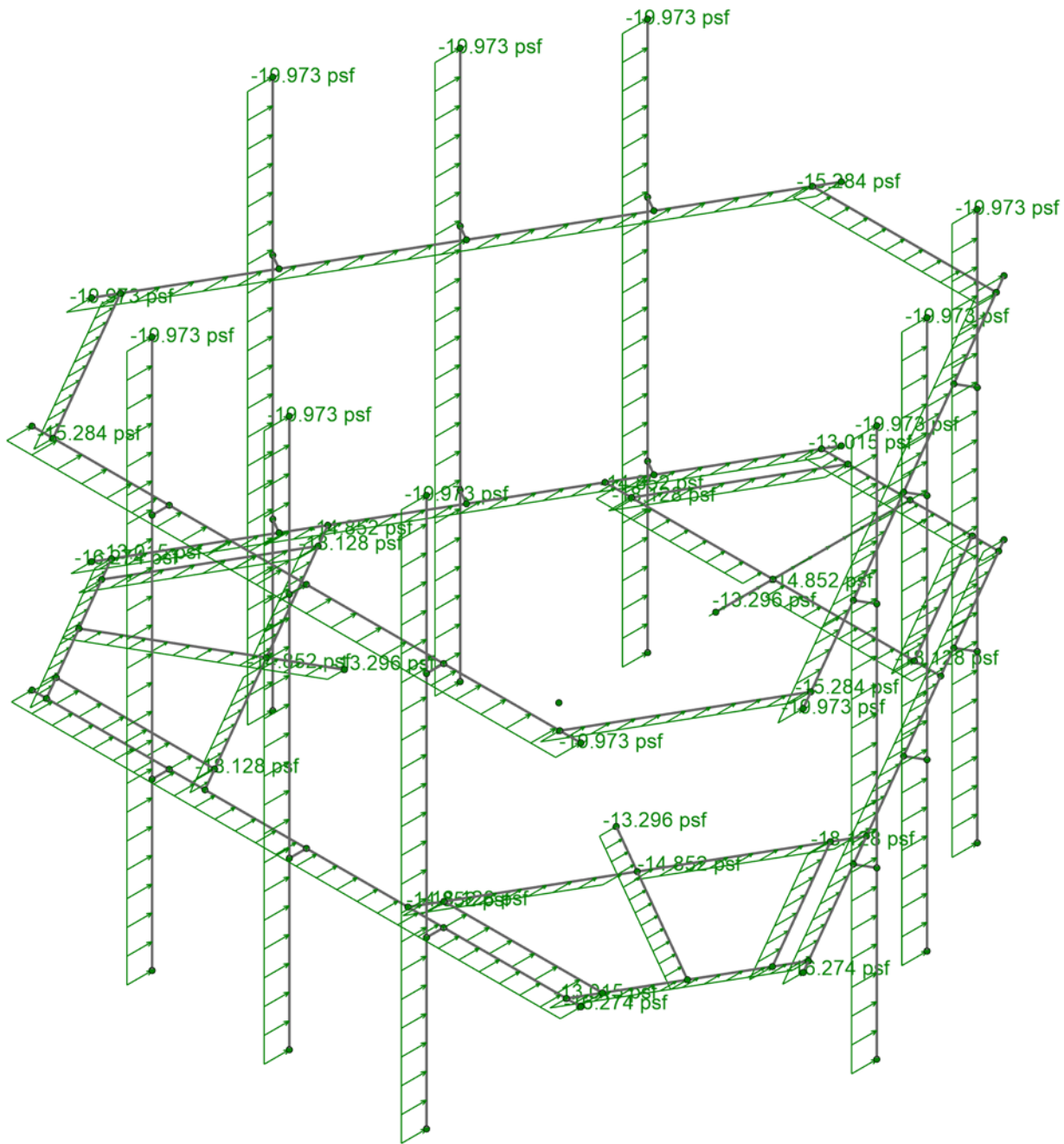
Ice Wind Loading 90

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Loads: BLC 29, Distr. Ice Wind Load Z

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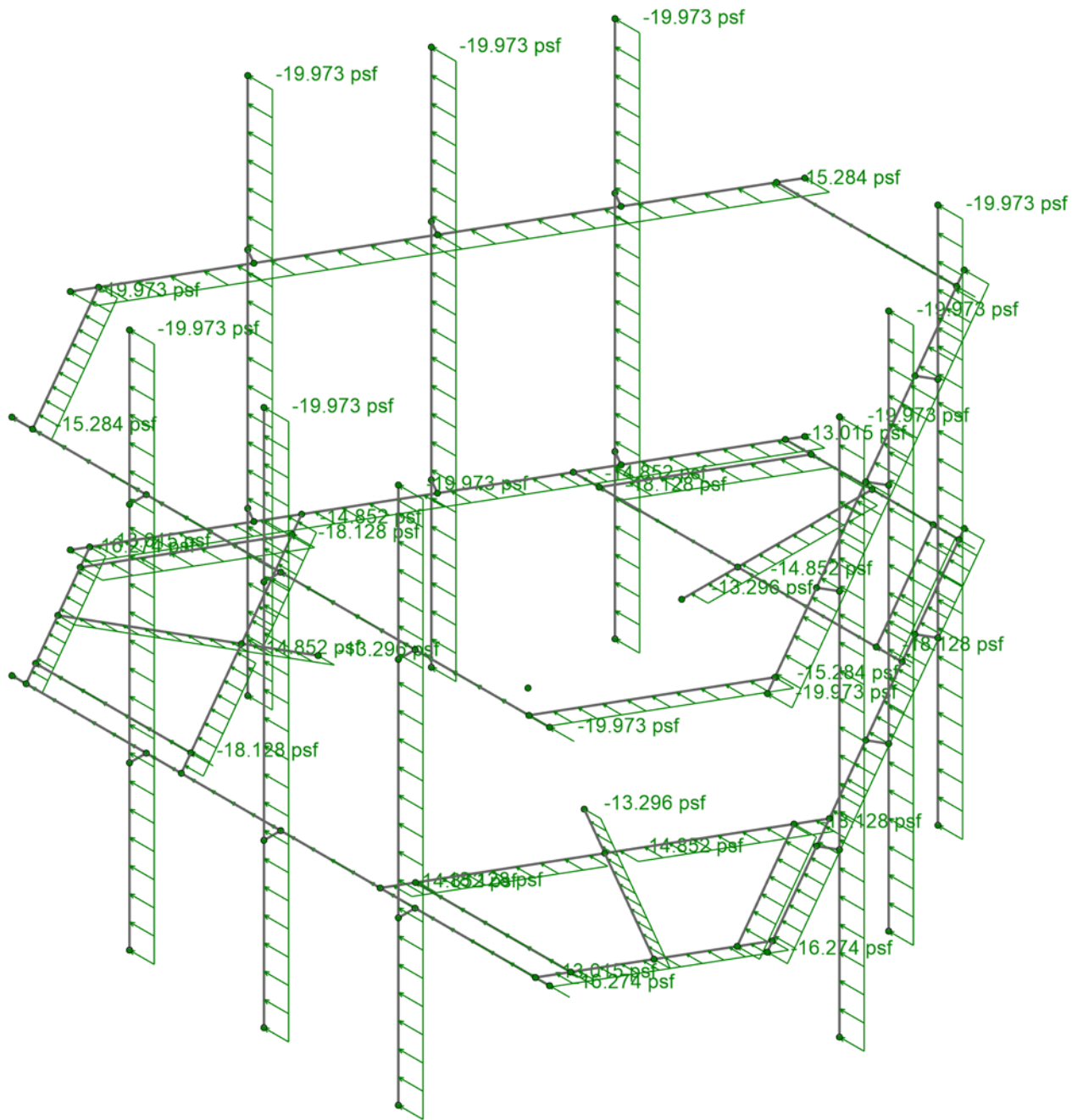
Dist. Ice Wind Loading 0

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Loads: BLC 30, Distr. Ice Wind Load X

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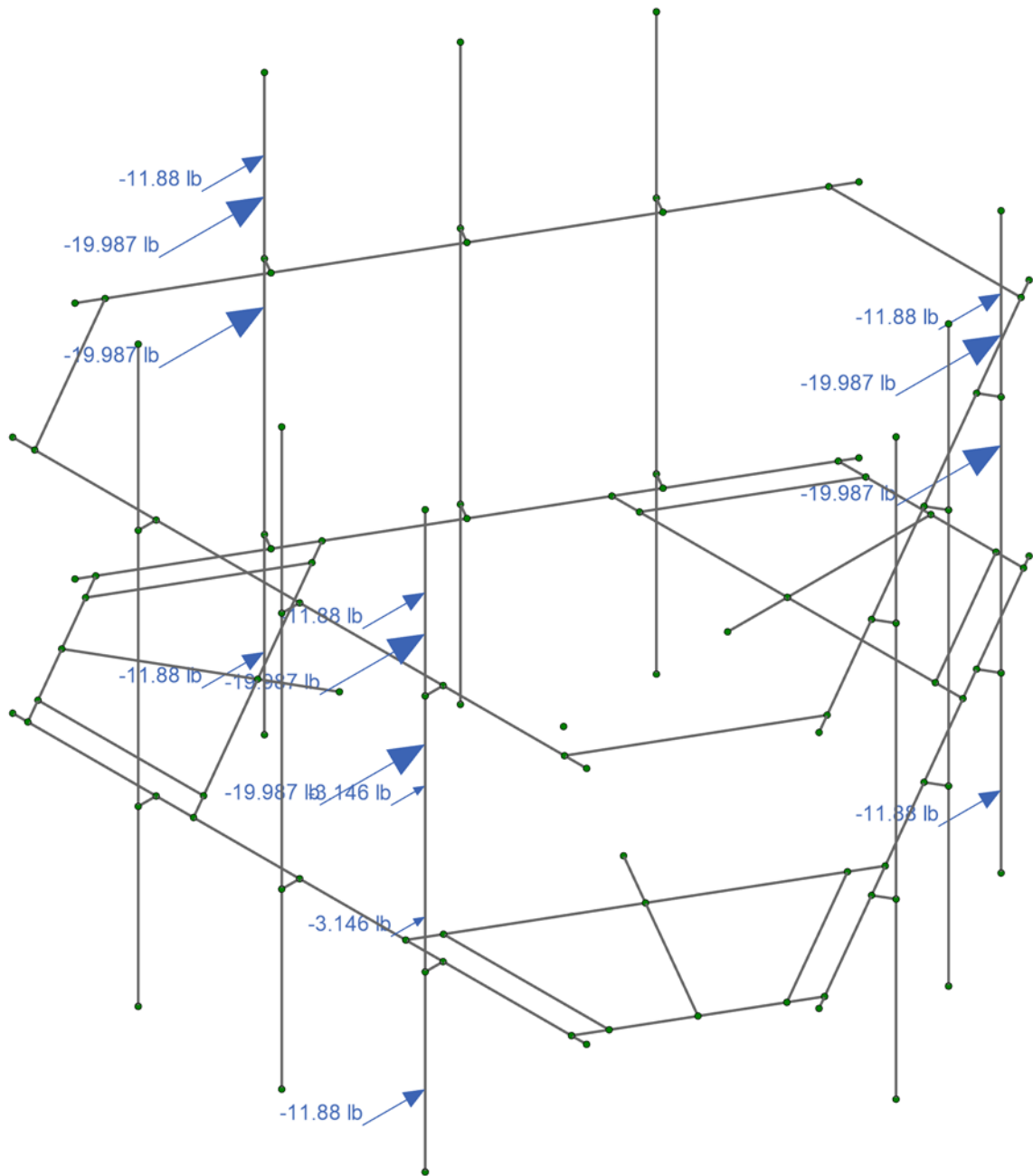
Dist. Ice Wind Loading 90

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Loads: BLC 31, Seismic Load Z

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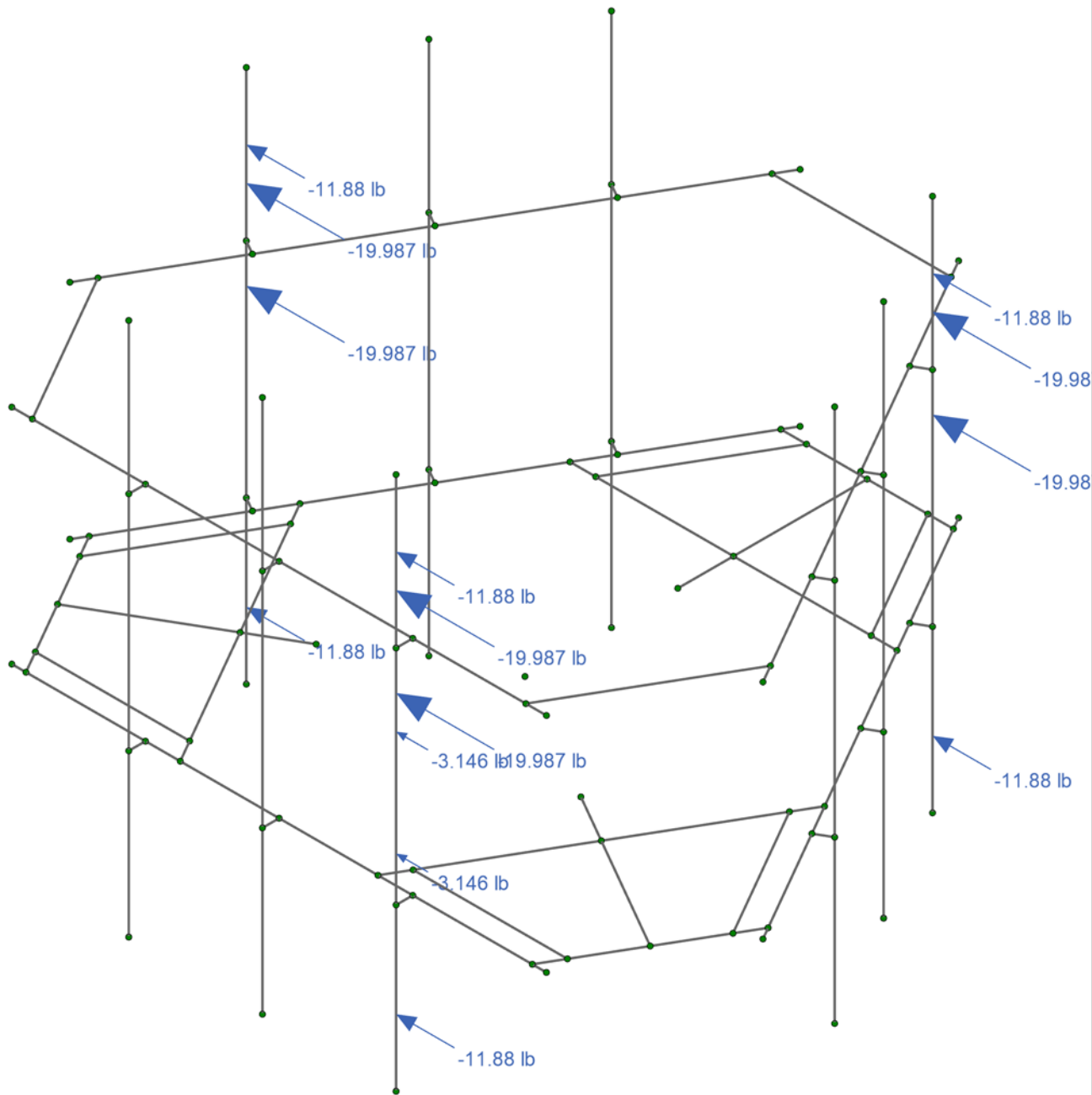
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Seismic Loading 0

Aug 02, 2021

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Loads: BLC 32, Seismic Load X

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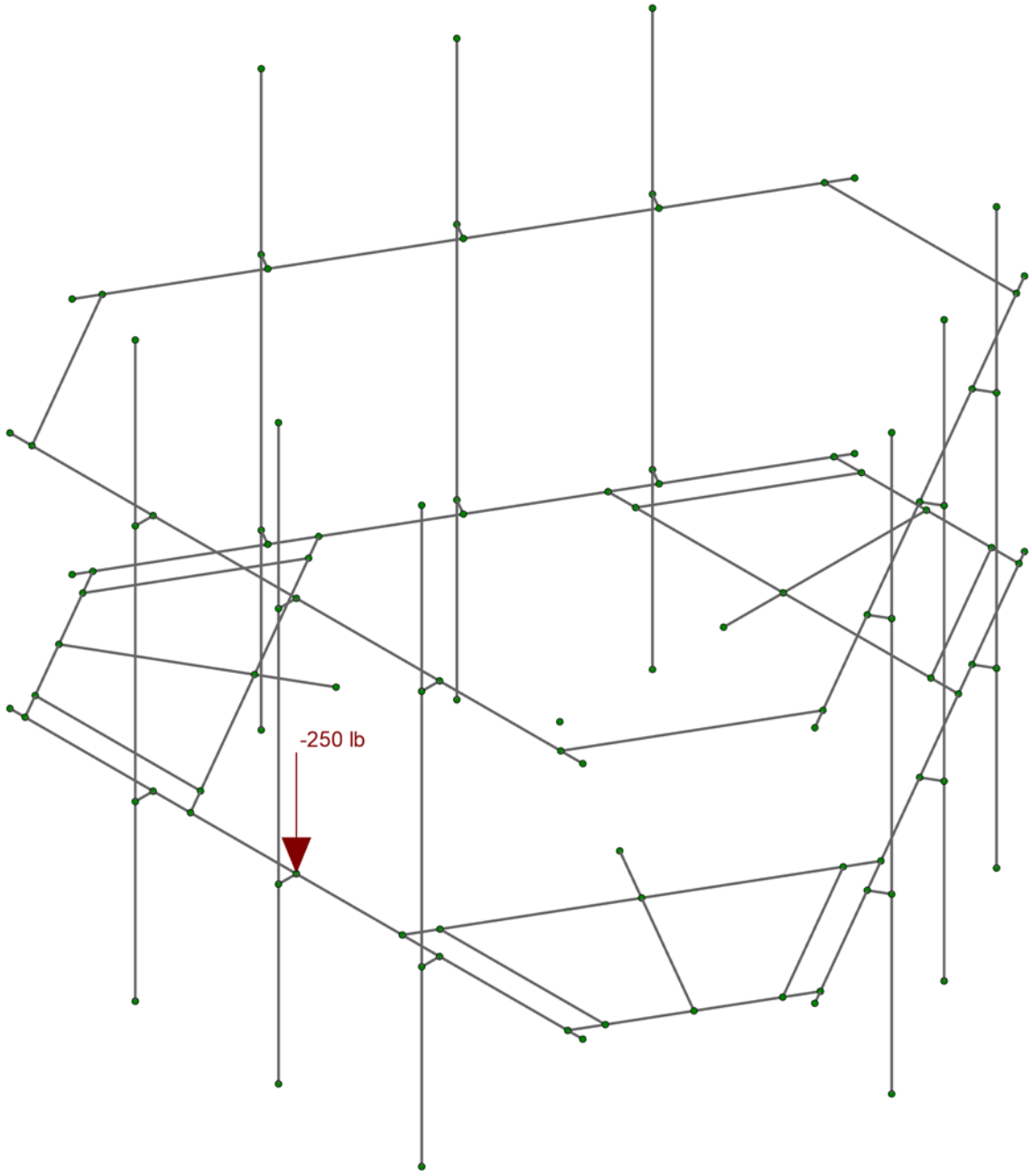
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Seismic Loading 90

Aug 02, 2021

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Loads: BLC 33, Service Live Loads

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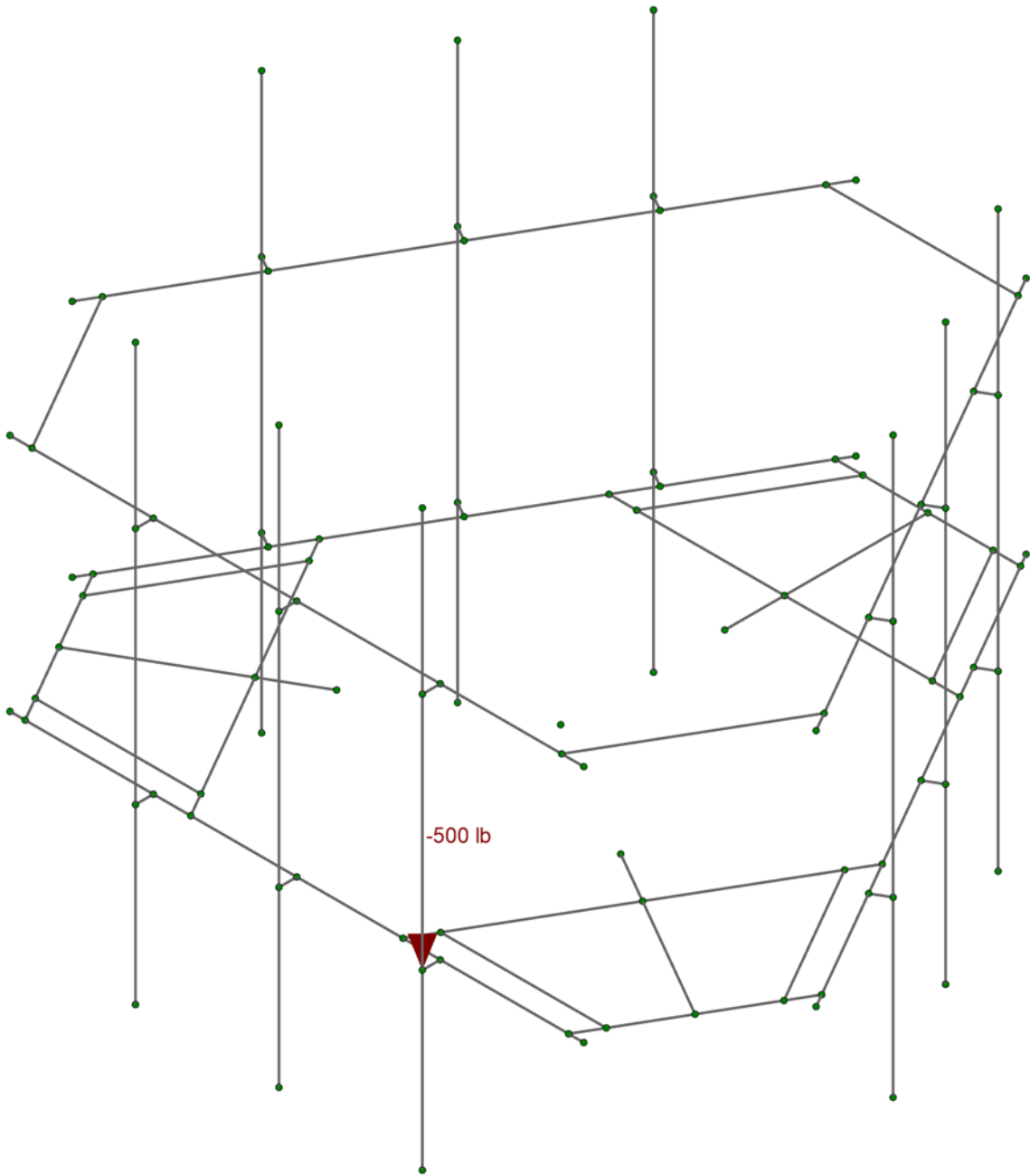
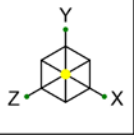
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Service Load

Aug 02, 2021

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Loads: BLC 35, Maintenance Load 2

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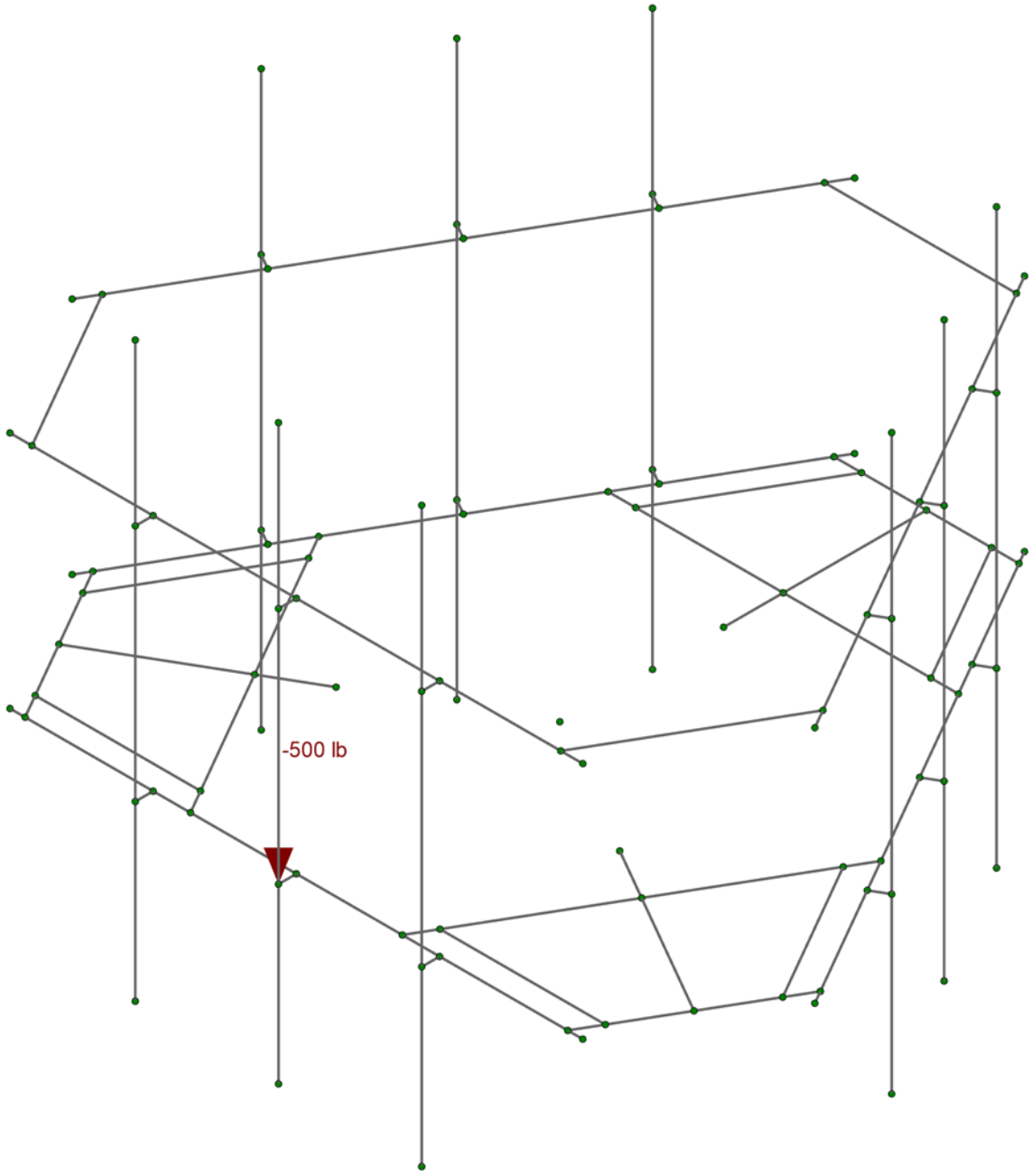
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BOBDL00024A

Maintenance Load 1

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Loads: BLC 34, Maintenance Load 1

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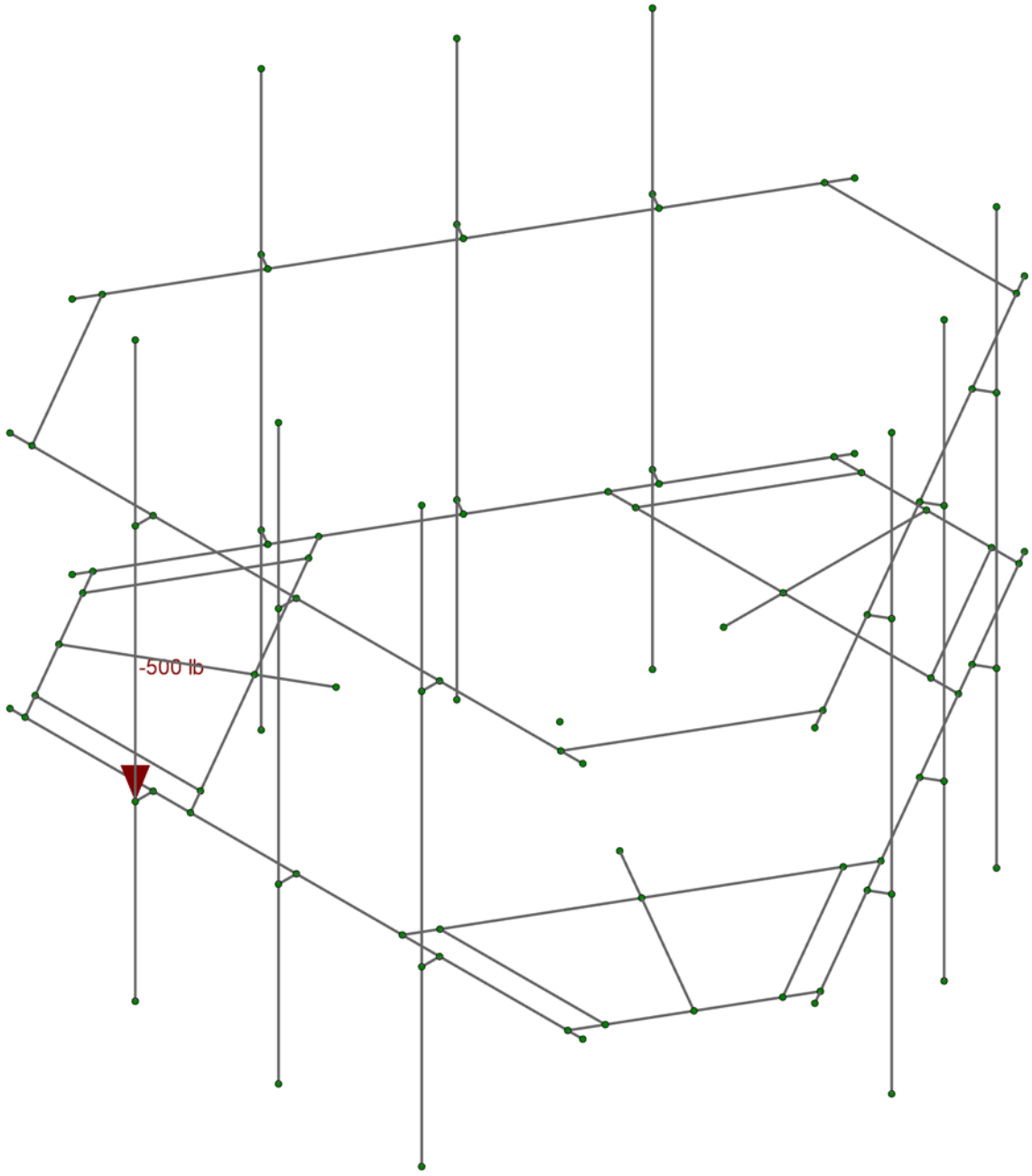
6039-Z0001-C

BOBDL00024A

Maintenance Load 2

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BOBDL00024A\_loaded.r3d



Loads: BLC 36, Maintenance Load 3

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6039-Z0001-C

BOBDL00024A

Maintenance Load 3  
Aug 02, 2021  
BOBDL00024A\_loaded.r3d

## Program Inputs

PROJECT INFORMATION		
Client:	ATC	
Carrier:	Dish Wireless	
Engineer:	Luis Mendoza, PE	

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	C	
Topo Factor Procedure:	Method 1, Category 1	
Site Class:	D - Stiff Soil (Assumed)	
Ground Elevation:	248.31	ft *Rev H

MOUNT INFORMATION		
Mount Type:	Platform	
Num Sectors:	3	
Centerline AGL:	69.00	ft
Tower Height AGL:	138.50	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 ( $K_e$ ):	0.991	*Rev H Only
Rooftop Speed-Up ( $K_s$ ):	1.000	*Rev H Only
Topographic Factor ( $K_{zt}$ ):	1.000	
Gust Effect Factor ( $G_f$ ):	1.000	

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

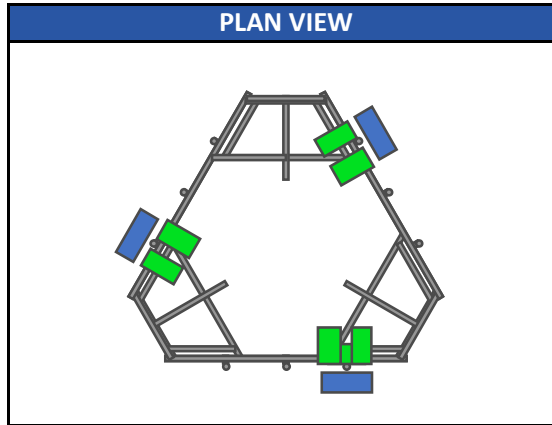
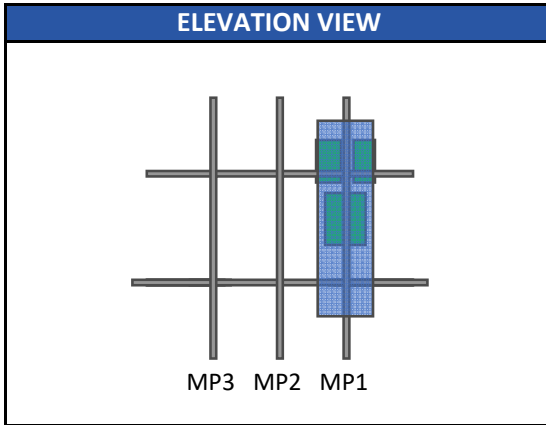
WIND AND ICE DATA		
Ultimate Wind ( $V_{ult}$ ):	130	mph
Design Wind ( $V$ ):	N/A	mph
Ice Wind ( $V_{ice}$ ):	50	mph
Base Ice Thickness ( $t_i$ ):	1.5	in
Flat Pressure:	95.357	psf
Round Pressure:	57.214	psf
Ice Wind Pressure:	8.464	psf

SEISMIC DATA		
Short-Period Accel. ( $S_s$ ):	0.180	g
1-Second Accel. ( $S_1$ ):	0.063	g
Short-Period Design ( $S_{DS}$ ):	0.192	
1-Second Design ( $S_{D1}$ ):	0.101	
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 Load Calculator V2.1.6

# Program Inputs



**INFINIGY**  
 FROM ZERO TO INFINIGY  
 the solutions are endless  
 Infinigy Load Calculator V2.1.6

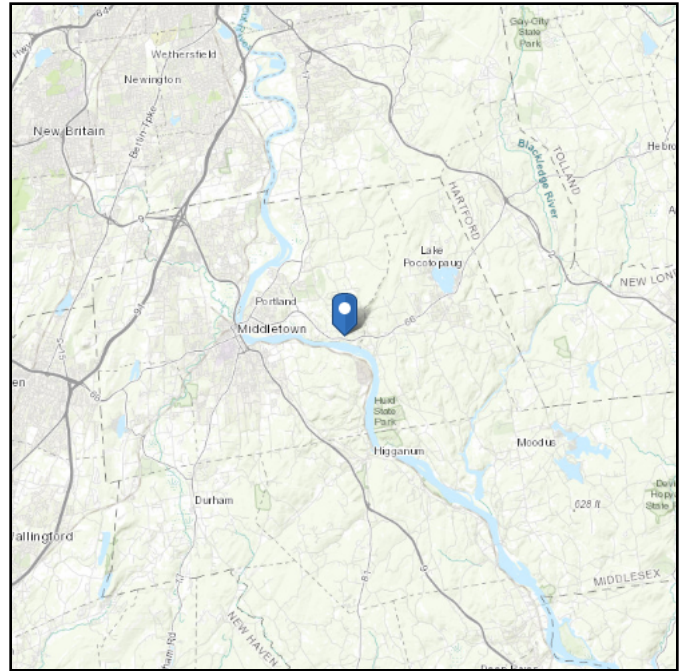
APPURTENANCE INFORMATION											
Appurtenance Name	Elevation	Qty.	$K_a$	$q_z$ (psf)	$EPA_N$ (ft <sup>2</sup> )	$EPA_T$ (ft <sup>2</sup> )	Wind $F_z$ (lbs)	Wind $F_x$ (lbs)	Weight (lbs)	Seismic F (lbs)	Member ( $\alpha$ sector)
COMMSCOPE RDIDC-9181-PF-48	69.0	1	0.90	47.68	2.31	1.29	99.20	55.49	21.85	6.29	MP1
FUJITSU TA08025-B605	69.0	3	0.90	47.68	1.95	1.18	83.65	50.53	74.90	21.57	MP1
FUJITSU TA08025-B604	69.0	3	0.90	47.68	1.95	1.02	83.65	43.79	63.90	18.40	MP1
JMA WIRELESS MX08FRO665-21	69.0	3	0.90	47.68	12.49	5.87	535.91	251.74	82.50	23.76	MP1

# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

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

**Elevation:** 248.31 ft (NAVD 88)  
**Latitude:** 41.5622  
**Longitude:** -72.5738



## Wind

### Results:

Wind Speed:	<b>130 Vmph per Portland City Requirements</b>
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	95 Vmph
100-year MRI	103 Vmph

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

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.

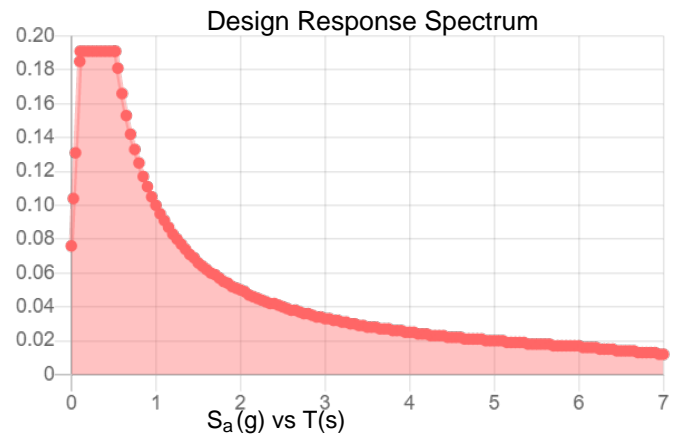
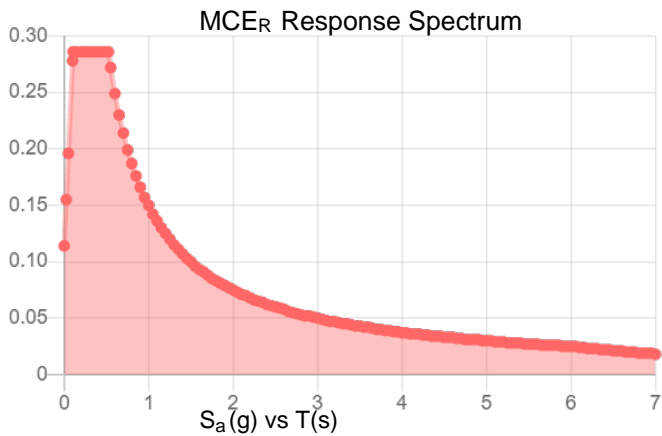


**Site Soil Class:** D - Stiff Soil

**Results:**

$S_s$ :	<b>0.180</b>	$S_{DS}$ :	0.191
$S_1$ :	<b>0.063</b>	$S_{D1}$ :	0.1
$F_a$ :	1.6	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.091
$S_{MS}$ :	0.286	PGA <sub>M</sub> :	0.145
$S_{M1}$ :	0.15	F <sub>PGA</sub> :	1.6
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:**

Sun Aug 01 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

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**Results:**

Ice Thickness: 0.75 in.

Concurrent Temperature: 15 F

Gust Speed: 50 mph

**Data Source:** Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

**Date Accessed:** Sun Aug 01 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.

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**Member Primary Data**

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N1	N107	180	Standoff Support	Beam	Channel	A36 Gr.36	Typical
2	M2	N3	N4		Corner Plate	Beam	RECT	A36 Gr.36	Typical
3	M3	N5	N6	90	Handrail Plate	Beam	RECT	A36 Gr.36	Typical
4	MR1	N11	N12		Handrail	Beam	Pipe	A53 Gr.B	Typical
5	MR2	N13	N14		Handrail	Beam	Pipe	A53 Gr.B	Typical
6	MS1	N15	N16		Standoff	Beam	Tube	A500 Gr.B RECT	Typical
7	M10	N17	N18	270	Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
8	M11	N19	N20		Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
9	M12	N21	N22		Corner Plate	Beam	RECT	A36 Gr.36	Typical
10	MS2	N25	N26		Standoff	Beam	Tube	A500 Gr.B RECT	Typical
11	M15	N27	N28		Corner Plate	Beam	RECT	A36 Gr.36	Typical
12	MS3	N31	N32		Standoff	Beam	Tube	A500 Gr.B RECT	Typical
13	MR3	N33	N34		Handrail	Beam	Pipe	A53 Gr.B	Typical
14	MH2	N35	N36		Horizontal	Beam	Pipe	A53 Gr.B	Typical
15	MH3	N37	N38		Horizontal	Beam	Pipe	A53 Gr.B	Typical
16	MH1	N39	N40		Horizontal	Beam	Pipe	A53 Gr.B	Typical
17	M22	N41	N42		RIGID	None	None	RIGID	Typical
18	M23	N43	N44		RIGID	None	None	RIGID	Typical
19	MP2	N45	N46		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
20	M25	N47	N48		RIGID	None	None	RIGID	Typical
21	M26	N49	N50		RIGID	None	None	RIGID	Typical
22	MP1	N51	N52		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
23	M28	N53	N54		RIGID	None	None	RIGID	Typical
24	M29	N55	N56		RIGID	None	None	RIGID	Typical
25	MP3	N57	N58		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
26	M31	N59	N60		RIGID	None	None	RIGID	Typical
27	M32	N61	N62		RIGID	None	None	RIGID	Typical
28	MP8	N63	N64		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
29	M34	N65	N66		RIGID	None	None	RIGID	Typical
30	M35	N67	N68		RIGID	None	None	RIGID	Typical
31	MP9	N69	N70		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
32	M37	N71	N72		RIGID	None	None	RIGID	Typical
33	M38	N73	N74		RIGID	None	None	RIGID	Typical
34	MP7	N75	N76		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
35	M40	N77	N78		RIGID	None	None	RIGID	Typical
36	M41	N79	N80		RIGID	None	None	RIGID	Typical
37	MP5	N81	N82		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
38	M43	N83	N84		RIGID	None	None	RIGID	Typical
39	M44	N85	N86		RIGID	None	None	RIGID	Typical
40	MP6	N87	N88		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
41	M46	N89	N90		RIGID	None	None	RIGID	Typical
42	M47	N91	N92		RIGID	None	None	RIGID	Typical
43	MP4	N93	N94		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
44	M49	N95	N96	270	Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
45	M50	N97	N108		Standoff Support	Beam	Channel	A36 Gr.36	Typical
46	M51	N99	N100		Grating Angle	Beam	Single Angle	A36 Gr.36	Typical

**Member Primary Data (Continued)**

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
47	M52	N101	N102	270	Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
48	M53	N103	N109		Standoff Support	Beam	Channel	A36 Gr.36	Typical
49	M54	N105	N106		Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
50	M55	N110	N111	90	Handrail Plate	Beam	RECT	A36 Gr.36	Typical
51	M56	N112	N113	90	Handrail Plate	Beam	RECT	A36 Gr.36	Typical
52	M57	N107	N2	180	Standoff Support	Beam	Channel	A36 Gr.36	Typical
53	M58	N108	N98		Standoff Support	Beam	Channel	A36 Gr.36	Typical
54	M59	N109	N104		Standoff Support	Beam	Channel	A36 Gr.36	Typical

**Member Advanced Data**

	Label	I Release	J Release	I Offset [in]	J Offset [in]	Physical	Deflection Ratio Options	Seismic DR
1	M1			1.75	2	Yes	Default	None
2	M2					Yes	Default	None
3	M3	BenPIN	BenPIN			Yes	Default	None
4	MR1					Yes	Default	None
5	MR2					Yes	Default	None
6	MS1			1.75	2	Yes	Default	None
7	M10					Yes	Default	None
8	M11					Yes	Default	None
9	M12					Yes	Default	None
10	MS2					Yes	Default	None
11	M15					Yes	Default	None
12	MS3					Yes	Default	None
13	MR3					Yes	Default	None
14	MH2					Yes	Default	None
15	MH3					Yes	Default	None
16	MH1					Yes	Default	None
17	M22					Yes	** NA **	None
18	M23					Yes	** NA **	None
19	MP2					Yes	** NA **	None
20	M25					Yes	** NA **	None
21	M26					Yes	** NA **	None
22	MP1					Yes	** NA **	None
23	M28					Yes	** NA **	None
24	M29					Yes	** NA **	None
25	MP3					Yes	** NA **	None
26	M31					Yes	** NA **	None
27	M32					Yes	** NA **	None
28	MP8					Yes	** NA **	None
29	M34					Yes	** NA **	None
30	M35					Yes	** NA **	None
31	MP9					Yes	** NA **	None
32	M37					Yes	** NA **	None
33	M38					Yes	** NA **	None
34	MP7					Yes	** NA **	None
35	M40					Yes	** NA **	None

**Member Advanced Data (Continued)**

	Label	I Release	J Release	I Offset [in]	J Offset [in]	Physical	Deflection Ratio Options	Seismic DR
36	M41					Yes	** NA **	None
37	MP5					Yes	** NA **	None
38	M43					Yes	** NA **	None
39	M44					Yes	** NA **	None
40	MP6					Yes	** NA **	None
41	M46					Yes	** NA **	None
42	M47					Yes	** NA **	None
43	MP4					Yes	** NA **	None
44	M49					Yes	Default	None
45	M50			1.75	2	Yes	Default	None
46	M51					Yes	Default	None
47	M52					Yes	Default	None
48	M53			1.75	2	Yes	Default	None
49	M54					Yes	Default	None
50	M55	BenPIN	BenPIN			Yes	Default	None
51	M56	BenPIN	BenPIN			Yes	Default	None
52	M57			2	1.75	Yes	Default	None
53	M58			2	1.75	Yes	Default	None
54	M59			2	1.75	Yes	Default	None

**Node Boundary Conditions**

	Node 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	N15	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N31	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N25	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

**Material Take-Off**

	Material	Size	Pieces	Length[in]	Weight[LB]
1	General Members				
2	RIGID		18	54	0
3	Total General		18	54	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	4x0.25	3	96.5	27.354
7	A36 Gr.36	6x0.25	3	93	39.557
8	A36 Gr.36	C4X4.5	6	153.6	58.379
9	A36 Gr.36	L2x2x2	6	166.3	23.151
10	A500 Gr.B RECT	HSS4X4X4	3	98.2	100.979
11	A53 Gr.B	PIPE_2.0	12	1152	333.2
12	A53 Gr.B	PIPE_3.0	3	288	169.05
13	Total HR Steel		36	2047.6	751.67



Company : Infinigy Engineering, PLLC  
 Designer : LM  
 Job Number : 6039-Z0001-C  
 Model Name : BOBDL00024A

8/2/2021  
 8:55:39 AM  
 Checked By : \_\_\_\_\_

**Basic Load Cases**

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed Area	(Member)
1	Self Weight	DL		-1			20		3
2	Wind Load AZI 0	WLZ					40		
3	Wind Load AZI 30	None					40		
4	Wind Load AZI 60	None					40		
5	Wind Load AZI 90	WLX					40		
6	Wind Load AZI 120	None					40		
7	Wind Load AZI 150	None					40		
8	Wind Load AZI 180	None					40		
9	Wind Load AZI 210	None					40		
10	Wind Load AZI 240	None					40		
11	Wind Load AZI 270	None					40		
12	Wind Load AZI 300	None					40		
13	Wind Load AZI 330	None					40		
14	Distr. Wind Load Z	WLZ						54	
15	Distr. Wind Load X	WLX						54	
16	Ice Weight	OL1					20	54	3
17	Ice Wind Load AZI 0	OL2					40		
18	Ice Wind Load AZI 30	None					40		
19	Ice Wind Load AZI 60	None					40		
20	Ice Wind Load AZI 90	OL3					40		
21	Ice Wind Load AZI 120	None					40		
22	Ice Wind Load AZI 150	None					40		
23	Ice Wind Load AZI 180	None					40		
24	Ice Wind Load AZI 210	None					40		
25	Ice Wind Load AZI 240	None					40		
26	Ice Wind Load AZI 270	None					40		
27	Ice Wind Load AZI 300	None					40		
28	Ice Wind Load AZI 330	None					40		
29	Distr. Ice Wind Load Z	OL2						54	
30	Distr. Ice Wind Load X	OL3						54	
31	Seismic Load Z	ELZ			-0.288		20		
32	Seismic Load X	ELX	-0.288				20		
33	Service Live Loads	LL				1			
34	Maintenance Load 1	LL				1			
35	Maintenance Load 2	LL				1			
36	Maintenance Load 3	LL				1			
37	Maintenance Load 4	LL				1			
38	Maintenance Load 5	LL				1			
39	Maintenance Load 6	LL				1			
40	Maintenance Load 7	LL				1			
41	Maintenance Load 8	LL				1			
42	Maintenance Load 9	LL				1			
43	BLC 1 Transient Area Loads	None						18	
44	BLC 16 Transient Area Loads	None						18	

**Load Combinations**

	Description	Solve	P-Delta	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor
1	1.4DL	Yes	Y	1	1.4									
2	1.2DL + 1WL AZI 0	Yes	Y	1	1.2	2	1	14	1	15				
3	1.2DL + 1WL AZI 30	Yes	Y	1	1.2	3	1	14	0.866	15	0.5			
4	1.2DL + 1WL AZI 60	Yes	Y	1	1.2	4	1	14	0.5	15	0.866			
5	1.2DL + 1WL AZI 90	Yes	Y	1	1.2	5	1	14		15	1			
6	1.2DL + 1WL AZI 120	Yes	Y	1	1.2	6	1	14	-0.5	15	0.866			
7	1.2DL + 1WL AZI 150	Yes	Y	1	1.2	7	1	14	-0.866	15	0.5			
8	1.2DL + 1WL AZI 180	Yes	Y	1	1.2	8	1	14	-1	15				
9	1.2DL + 1WL AZI 210	Yes	Y	1	1.2	9	1	14	-0.866	15	-0.5			
10	1.2DL + 1WL AZI 240	Yes	Y	1	1.2	10	1	14	-0.5	15	-0.866			
11	1.2DL + 1WL AZI 270	Yes	Y	1	1.2	11	1	14		15	-1			
12	1.2DL + 1WL AZI 300	Yes	Y	1	1.2	12	1	14	0.5	15	-0.866			
13	1.2DL + 1WL AZI 330	Yes	Y	1	1.2	13	1	14	0.866	15	-0.5			
14	0.9DL + 1WL AZI 0	Yes	Y	1	0.9	2	1	14	1	15				
15	0.9DL + 1WL AZI 30	Yes	Y	1	0.9	3	1	14	0.866	15	0.5			
16	0.9DL + 1WL AZI 60	Yes	Y	1	0.9	4	1	14	0.5	15	0.866			
17	0.9DL + 1WL AZI 90	Yes	Y	1	0.9	5	1	14		15	1			
18	0.9DL + 1WL AZI 120	Yes	Y	1	0.9	6	1	14	-0.5	15	0.866			
19	0.9DL + 1WL AZI 150	Yes	Y	1	0.9	7	1	14	-0.866	15	0.5			
20	0.9DL + 1WL AZI 180	Yes	Y	1	0.9	8	1	14	-1	15				
21	0.9DL + 1WL AZI 210	Yes	Y	1	0.9	9	1	14	-0.866	15	-0.5			
22	0.9DL + 1WL AZI 240	Yes	Y	1	0.9	10	1	14	-0.5	15	-0.866			
23	0.9DL + 1WL AZI 270	Yes	Y	1	0.9	11	1	14		15	-1			
24	0.9DL + 1WL AZI 300	Yes	Y	1	0.9	12	1	14	0.5	15	-0.866			
25	0.9DL + 1WL AZI 330	Yes	Y	1	0.9	13	1	14	0.866	15	-0.5			
26	1.2D + 1.0Di	Yes	Y	1	1.2	16	1							
27	1.2D + 1.0Di + 1.0Wi AZI 0	Yes	Y	1	1.2	16	1	17	1	29	1	30		
28	1.2D + 1.0Di + 1.0Wi AZI 30	Yes	Y	1	1.2	16	1	18	1	29	0.866	30	0.5	
29	1.2D + 1.0Di + 1.0Wi AZI 60	Yes	Y	1	1.2	16	1	19	1	29	0.5	30	0.866	
30	1.2D + 1.0Di + 1.0Wi AZI 90	Yes	Y	1	1.2	16	1	20	1	29		30	1	
31	1.2D + 1.0Di + 1.0Wi AZI 120	Yes	Y	1	1.2	16	1	21	1	29	-0.5	30	0.866	
32	1.2D + 1.0Di + 1.0Wi AZI 150	Yes	Y	1	1.2	16	1	22	1	29	-0.866	30	0.5	
33	1.2D + 1.0Di + 1.0Wi AZI 180	Yes	Y	1	1.2	16	1	23	1	29	-1	30		
34	1.2D + 1.0Di + 1.0Wi AZI 210	Yes	Y	1	1.2	16	1	24	1	29	-0.866	30	-0.5	
35	1.2D + 1.0Di + 1.0Wi AZI 240	Yes	Y	1	1.2	16	1	25	1	29	-0.5	30	-0.866	
36	1.2D + 1.0Di + 1.0Wi AZI 270	Yes	Y	1	1.2	16	1	26	1	29		30	-1	
37	1.2D + 1.0Di + 1.0Wi AZI 300	Yes	Y	1	1.2	16	1	27	1	29	0.5	30	-0.866	
38	1.2D + 1.0Di + 1.0Wi AZI 330	Yes	Y	1	1.2	16	1	28	1	29	0.866	30	-0.5	
39	(1.2 + 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	1.238	31	1	32						
40	(1.2 + 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	1.238	31	0.866	32	0.5					
41	(1.2 + 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	1.238	31	0.5	32	0.866					
42	(1.2 + 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	1.238	31		32	1					
43	(1.2 + 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	1.238	31	-0.5	32	0.866					
44	(1.2 + 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	1.238	31	-0.866	32	0.5					
45	(1.2 + 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	1.238	31	-1	32						
46	(1.2 + 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	1.238	31	-0.866	32	-0.5					





**Load Combinations (Continued)**

Description	Solve	P-Delta	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor
47 (1.2 + 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	1.238	31	-0.5	32	-0.866						
48 (1.2 + 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	1.238	31		32	-1						
49 (1.2 + 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	1.238	31	0.5	32	-0.866						
50 (1.2 + 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	1.238	31	0.866	32	-0.5						
51 (0.9 - 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	0.862	31	1	32							
52 (0.9 - 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	0.862	31	0.866	32	0.5						
53 (0.9 - 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	0.862	31	0.5	32	0.866						
54 (0.9 - 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	0.862	31		32	1						
55 (0.9 - 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	0.862	31	-0.5	32	0.866						
56 (0.9 - 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	0.862	31	-0.866	32	0.5						
57 (0.9 - 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	0.862	31	-1	32							
58 (0.9 - 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	0.862	31	-0.866	32	-0.5						
59 (0.9 - 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	0.862	31	-0.5	32	-0.866						
60 (0.9 - 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	0.862	31		32	-1						
61 (0.9 - 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	0.862	31	0.5	32	-0.866						
62 (0.9 - 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	0.862	31	0.866	32	-0.5						
63 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 0	Yes	Y	1	1	2	0.213	14	0.213	15			33	1.5	
64 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 30	Yes	Y	1	1	3	0.213	14	0.184	15	0.107		33	1.5	
65 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 60	Yes	Y	1	1	4	0.213	14	0.107	15	0.184		33	1.5	
66 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 90	Yes	Y	1	1	5	0.213	14		15	0.213		33	1.5	
67 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 120	Yes	Y	1	1	6	0.213	14	-0.107	15	0.184		33	1.5	
68 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 150	Yes	Y	1	1	7	0.213	14	-0.184	15	0.107		33	1.5	
69 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 180	Yes	Y	1	1	8	0.213	14	-0.213	15			33	1.5	
70 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 210	Yes	Y	1	1	9	0.213	14	-0.184	15	-0.107		33	1.5	
71 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 240	Yes	Y	1	1	10	0.213	14	-0.107	15	-0.184		33	1.5	
72 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 270	Yes	Y	1	1	11	0.213	14		15	-0.213		33	1.5	
73 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 300	Yes	Y	1	1	12	0.213	14	0.107	15	-0.184		33	1.5	
74 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 330	Yes	Y	1	1	13	0.213	14	0.184	15	-0.107		33	1.5	
75 1.2DL + 1.5LL	Yes	Y	1	1.2	33	1.5								
76 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	34	1.5	2	0.053	14	0.053	15			
77 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	34	1.5	3	0.053	14	0.046	15	0.027		
78 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	34	1.5	4	0.053	14	0.027	15	0.046		
79 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	34	1.5	5	0.053	14		15	0.053		
80 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	34	1.5	6	0.053	14	-0.027	15	0.046		
81 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	34	1.5	7	0.053	14	-0.046	15	0.027		
82 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	34	1.5	8	0.053	14	-0.053	15			
83 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	34	1.5	9	0.053	14	-0.046	15	-0.027		
84 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	34	1.5	10	0.053	14	-0.027	15	-0.046		
85 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	34	1.5	11	0.053	14		15	-0.053		
86 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	34	1.5	12	0.053	14	0.027	15	-0.046		
87 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	34	1.5	13	0.053	14	0.046	15	-0.027		
88 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	35	1.5	2	0.053	14	0.053	15			
89 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	35	1.5	3	0.053	14	0.046	15	0.027		
90 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	35	1.5	4	0.053	14	0.027	15	0.046		
91 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	35	1.5	5	0.053	14		15	0.053		
92 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	35	1.5	6	0.053	14	-0.027	15	0.046		



Company : Infinigy Engineering, PLLC  
 Designer : LM  
 Job Number : 6039-Z0001-C  
 Model Name : BOBDL00024A

8/2/2021  
 8:55:39 AM  
 Checked By : \_\_\_\_\_

**Load Combinations (Continued)**

	Description	Solve	P-Delta	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor
93	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	35	1.5	7	0.053	14	-0.046	15	0.027
94	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	35	1.5	8	0.053	14	-0.053	15	
95	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	35	1.5	9	0.053	14	-0.046	15	-0.027
96	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	35	1.5	10	0.053	14	-0.027	15	-0.046
97	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	35	1.5	11	0.053	14		15	-0.053
98	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	35	1.5	12	0.053	14	0.027	15	-0.046
99	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	35	1.5	13	0.053	14	0.046	15	-0.027
100	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	36	1.5	2	0.053	14	0.053	15	
101	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	36	1.5	3	0.053	14	0.046	15	0.027
102	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	36	1.5	4	0.053	14	0.027	15	0.046
103	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	36	1.5	5	0.053	14		15	0.053
104	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	36	1.5	6	0.053	14	-0.027	15	0.046
105	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	36	1.5	7	0.053	14	-0.046	15	0.027
106	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	36	1.5	8	0.053	14	-0.053	15	
107	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	36	1.5	9	0.053	14	-0.046	15	-0.027
108	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	36	1.5	10	0.053	14	-0.027	15	-0.046
109	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	36	1.5	11	0.053	14		15	-0.053
110	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	36	1.5	12	0.053	14	0.027	15	-0.046
111	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	36	1.5	13	0.053	14	0.046	15	-0.027
112	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	37	1.5	2	0.053	14	0.053	15	
113	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	37	1.5	3	0.053	14	0.046	15	0.027
114	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	37	1.5	4	0.053	14	0.027	15	0.046
115	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	37	1.5	5	0.053	14		15	0.053
116	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	37	1.5	6	0.053	14	-0.027	15	0.046
117	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	37	1.5	7	0.053	14	-0.046	15	0.027
118	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	37	1.5	8	0.053	14	-0.053	15	
119	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	37	1.5	9	0.053	14	-0.046	15	-0.027
120	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	37	1.5	10	0.053	14	-0.027	15	-0.046
121	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	37	1.5	11	0.053	14		15	-0.053
122	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	37	1.5	12	0.053	14	0.027	15	-0.046
123	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	37	1.5	13	0.053	14	0.046	15	-0.027
124	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	38	1.5	2	0.053	14	0.053	15	
125	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	38	1.5	3	0.053	14	0.046	15	0.027
126	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	38	1.5	4	0.053	14	0.027	15	0.046
127	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	38	1.5	5	0.053	14		15	0.053
128	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	38	1.5	6	0.053	14	-0.027	15	0.046
129	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	38	1.5	7	0.053	14	-0.046	15	0.027
130	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	38	1.5	8	0.053	14	-0.053	15	
131	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	38	1.5	9	0.053	14	-0.046	15	-0.027
132	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	38	1.5	10	0.053	14	-0.027	15	-0.046
133	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	38	1.5	11	0.053	14		15	-0.053
134	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	38	1.5	12	0.053	14	0.027	15	-0.046
135	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	38	1.5	13	0.053	14	0.046	15	-0.027
136	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	39	1.5	2	0.053	14	0.053	15	
137	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	39	1.5	3	0.053	14	0.046	15	0.027
138	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	39	1.5	4	0.053	14	0.027	15	0.046

**Load Combinations (Continued)**

	Description	Solve	P-Delta	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor
139	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	39	1.5	5	0.053	14		15	0.053
140	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	39	1.5	6	0.053	14	-0.027	15	0.046
141	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	39	1.5	7	0.053	14	-0.046	15	0.027
142	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	39	1.5	8	0.053	14	-0.053	15	
143	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	39	1.5	9	0.053	14	-0.046	15	-0.027
144	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	39	1.5	10	0.053	14	-0.027	15	-0.046
145	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	39	1.5	11	0.053	14		15	-0.053
146	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	39	1.5	12	0.053	14	0.027	15	-0.046
147	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	39	1.5	13	0.053	14	0.046	15	-0.027
148	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	40	1.5	2	0.053	14	0.053	15	
149	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	40	1.5	3	0.053	14	0.046	15	0.027
150	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	40	1.5	4	0.053	14	0.027	15	0.046
151	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	40	1.5	5	0.053	14		15	0.053
152	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	40	1.5	6	0.053	14	-0.027	15	0.046
153	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	40	1.5	7	0.053	14	-0.046	15	0.027
154	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	40	1.5	8	0.053	14	-0.053	15	
155	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	40	1.5	9	0.053	14	-0.046	15	-0.027
156	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	40	1.5	10	0.053	14	-0.027	15	-0.046
157	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	40	1.5	11	0.053	14		15	-0.053
158	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	40	1.5	12	0.053	14	0.027	15	-0.046
159	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	40	1.5	13	0.053	14	0.046	15	-0.027
160	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	41	1.5	2	0.053	14	0.053	15	
161	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	41	1.5	3	0.053	14	0.046	15	0.027
162	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	41	1.5	4	0.053	14	0.027	15	0.046
163	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	41	1.5	5	0.053	14		15	0.053
164	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	41	1.5	6	0.053	14	-0.027	15	0.046
165	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	41	1.5	7	0.053	14	-0.046	15	0.027
166	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	41	1.5	8	0.053	14	-0.053	15	
167	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	41	1.5	9	0.053	14	-0.046	15	-0.027
168	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	41	1.5	10	0.053	14	-0.027	15	-0.046
169	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	41	1.5	11	0.053	14		15	-0.053
170	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	41	1.5	12	0.053	14	0.027	15	-0.046
171	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	41	1.5	13	0.053	14	0.046	15	-0.027
172	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	42	1.5	2	0.053	14	0.053	15	
173	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	42	1.5	3	0.053	14	0.046	15	0.027
174	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	42	1.5	4	0.053	14	0.027	15	0.046
175	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	42	1.5	5	0.053	14		15	0.053
176	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	42	1.5	6	0.053	14	-0.027	15	0.046
177	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	42	1.5	7	0.053	14	-0.046	15	0.027
178	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	42	1.5	8	0.053	14	-0.053	15	
179	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	42	1.5	9	0.053	14	-0.046	15	-0.027
180	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	42	1.5	10	0.053	14	-0.027	15	-0.046
181	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	42	1.5	11	0.053	14		15	-0.053
182	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	42	1.5	12	0.053	14	0.027	15	-0.046

**Member Point Loads (BLC 1 : Self Weight)**

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Y	-10.925	40
2	MP1	Y	-10.925	59
3	MP1	Y	-37.45	18
4	MP1	Y	-37.45	34
5	MP1	Y	-31.95	18
6	MP1	Y	-31.95	34
7	MP1	Y	-41.25	12
8	MP1	Y	-41.25	84
9	MP4	Y	-37.45	18
10	MP4	Y	-37.45	34
11	MP4	Y	-31.95	18
12	MP4	Y	-31.95	34
13	MP4	Y	-41.25	12
14	MP4	Y	-41.25	84
15	MP7	Y	-37.45	18
16	MP7	Y	-37.45	34
17	MP7	Y	-31.95	18
18	MP7	Y	-31.95	34
19	MP7	Y	-41.25	12
20	MP7	Y	-41.25	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	0	40
2	MP1	Z	-49.6	40
3	MP1	X	0	59
4	MP1	Z	-49.6	59
5	MP1	X	0	18
6	MP1	Z	-41.83	18
7	MP1	X	0	34
8	MP1	Z	-41.83	34
9	MP1	X	0	18
10	MP1	Z	-41.83	18
11	MP1	X	0	34
12	MP1	Z	-41.83	34
13	MP1	X	0	12
14	MP1	Z	-267.95	12
15	MP1	X	0	84
16	MP1	Z	-267.95	84
17	MP4	X	0	18
18	MP4	Z	-29.4	18
19	MP4	X	0	34
20	MP4	Z	-29.4	34
21	MP4	X	0	18
22	MP4	Z	-26.88	18

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
23	MP4	X	0	34
24	MP4	Z	-26.88	34
25	MP4	X	0	12
26	MP4	Z	-161.39	12
27	MP4	X	0	84
28	MP4	Z	-161.39	84
29	MP7	X	0	18
30	MP7	Z	-29.4	18
31	MP7	X	0	34
32	MP7	Z	-29.4	34
33	MP7	X	0	18
34	MP7	Z	-26.88	18
35	MP7	X	0	34
36	MP7	Z	-26.88	34
37	MP7	X	0	12
38	MP7	Z	-161.39	12
39	MP7	X	0	84
40	MP7	Z	-161.39	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-22.07	40
2	MP1	Z	-38.22	40
3	MP1	X	-22.07	59
4	MP1	Z	-38.22	59
5	MP1	X	-18.84	18
6	MP1	Z	-32.64	18
7	MP1	X	-18.84	34
8	MP1	Z	-32.64	34
9	MP1	X	-18.42	18
10	MP1	Z	-31.91	18
11	MP1	X	-18.42	34
12	MP1	Z	-31.91	34
13	MP1	X	-116.22	12
14	MP1	Z	-201.29	12
15	MP1	X	-116.22	84
16	MP1	Z	-201.29	84
17	MP4	X	-18.84	18
18	MP4	Z	-32.64	18
19	MP4	X	-18.84	34
20	MP4	Z	-32.64	34
21	MP4	X	-18.42	18
22	MP4	Z	-31.91	18
23	MP4	X	-18.42	34
24	MP4	Z	-31.91	34
25	MP4	X	-116.22	12



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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
26	MP4	Z	-201.29	12
27	MP4	X	-116.22	84
28	MP4	Z	-201.29	84
29	MP7	X	-12.63	18
30	MP7	Z	-21.88	18
31	MP7	X	-12.63	34
32	MP7	Z	-21.88	34
33	MP7	X	-10.95	18
34	MP7	Z	-18.96	18
35	MP7	X	-10.95	34
36	MP7	Z	-18.96	34
37	MP7	X	-62.94	12
38	MP7	Z	-109.01	12
39	MP7	X	-62.94	84
40	MP7	Z	-109.01	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-28.76	40
2	MP1	Z	-16.6	40
3	MP1	X	-28.76	59
4	MP1	Z	-16.6	59
5	MP1	X	-25.46	18
6	MP1	Z	-14.7	18
7	MP1	X	-25.46	34
8	MP1	Z	-14.7	34
9	MP1	X	-23.28	18
10	MP1	Z	-13.44	18
11	MP1	X	-23.28	34
12	MP1	Z	-13.44	34
13	MP1	X	-139.77	12
14	MP1	Z	-80.7	12
15	MP1	X	-139.77	84
16	MP1	Z	-80.7	84
17	MP4	X	-36.22	18
18	MP4	Z	-20.91	18
19	MP4	X	-36.22	34
20	MP4	Z	-20.91	34
21	MP4	X	-36.22	18
22	MP4	Z	-20.91	18
23	MP4	X	-36.22	34
24	MP4	Z	-20.91	34
25	MP4	X	-232.05	12
26	MP4	Z	-133.98	12
27	MP4	X	-232.05	84
28	MP4	Z	-133.98	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
29	MP7	X	-25.46	18
30	MP7	Z	-14.7	18
31	MP7	X	-25.46	34
32	MP7	Z	-14.7	34
33	MP7	X	-23.28	18
34	MP7	Z	-13.44	18
35	MP7	X	-23.28	34
36	MP7	Z	-13.44	34
37	MP7	X	-139.77	12
38	MP7	Z	-80.7	12
39	MP7	X	-139.77	84
40	MP7	Z	-80.7	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-27.74	40
2	MP1	Z	0	40
3	MP1	X	-27.74	59
4	MP1	Z	0	59
5	MP1	X	-25.26	18
6	MP1	Z	0	18
7	MP1	X	-25.26	34
8	MP1	Z	0	34
9	MP1	X	-21.9	18
10	MP1	Z	0	18
11	MP1	X	-21.9	34
12	MP1	Z	0	34
13	MP1	X	-125.87	12
14	MP1	Z	0	12
15	MP1	X	-125.87	84
16	MP1	Z	0	84
17	MP4	X	-37.68	18
18	MP4	Z	0	18
19	MP4	X	-37.68	34
20	MP4	Z	0	34
21	MP4	X	-36.84	18
22	MP4	Z	0	18
23	MP4	X	-36.84	34
24	MP4	Z	0	34
25	MP4	X	-232.43	12
26	MP4	Z	0	12
27	MP4	X	-232.43	84
28	MP4	Z	0	84
29	MP7	X	-37.68	18
30	MP7	Z	0	18
31	MP7	X	-37.68	34



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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
32	MP7	Z	0	34
33	MP7	X	-36.84	18
34	MP7	Z	0	18
35	MP7	X	-36.84	34
36	MP7	Z	0	34
37	MP7	X	-232.43	12
38	MP7	Z	0	12
39	MP7	X	-232.43	84
40	MP7	Z	0	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-28.76	40
2	MP1	Z	16.6	40
3	MP1	X	-28.76	59
4	MP1	Z	16.6	59
5	MP1	X	-25.46	18
6	MP1	Z	14.7	18
7	MP1	X	-25.46	34
8	MP1	Z	14.7	34
9	MP1	X	-23.28	18
10	MP1	Z	13.44	18
11	MP1	X	-23.28	34
12	MP1	Z	13.44	34
13	MP1	X	-139.77	12
14	MP1	Z	80.7	12
15	MP1	X	-139.77	84
16	MP1	Z	80.7	84
17	MP4	X	-25.46	18
18	MP4	Z	14.7	18
19	MP4	X	-25.46	34
20	MP4	Z	14.7	34
21	MP4	X	-23.28	18
22	MP4	Z	13.44	18
23	MP4	X	-23.28	34
24	MP4	Z	13.44	34
25	MP4	X	-139.77	12
26	MP4	Z	80.7	12
27	MP4	X	-139.77	84
28	MP4	Z	80.7	84
29	MP7	X	-36.22	18
30	MP7	Z	20.91	18
31	MP7	X	-36.22	34
32	MP7	Z	20.91	34
33	MP7	X	-36.22	18
34	MP7	Z	20.91	18

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
35	MP7	X	-36.22	34
36	MP7	Z	20.91	34
37	MP7	X	-232.05	12
38	MP7	Z	133.98	12
39	MP7	X	-232.05	84
40	MP7	Z	133.98	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-22.07	40
2	MP1	Z	38.22	40
3	MP1	X	-22.07	59
4	MP1	Z	38.22	59
5	MP1	X	-18.84	18
6	MP1	Z	32.64	18
7	MP1	X	-18.84	34
8	MP1	Z	32.64	34
9	MP1	X	-18.42	18
10	MP1	Z	31.91	18
11	MP1	X	-18.42	34
12	MP1	Z	31.91	34
13	MP1	X	-116.22	12
14	MP1	Z	201.29	12
15	MP1	X	-116.22	84
16	MP1	Z	201.29	84
17	MP4	X	-12.63	18
18	MP4	Z	21.88	18
19	MP4	X	-12.63	34
20	MP4	Z	21.88	34
21	MP4	X	-10.95	18
22	MP4	Z	18.96	18
23	MP4	X	-10.95	34
24	MP4	Z	18.96	34
25	MP4	X	-62.94	12
26	MP4	Z	109.01	12
27	MP4	X	-62.94	84
28	MP4	Z	109.01	84
29	MP7	X	-18.84	18
30	MP7	Z	32.64	18
31	MP7	X	-18.84	34
32	MP7	Z	32.64	34
33	MP7	X	-18.42	18
34	MP7	Z	31.91	18
35	MP7	X	-18.42	34
36	MP7	Z	31.91	34
37	MP7	X	-116.22	12

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
38	MP7	Z	201.29	12
39	MP7	X	-116.22	84
40	MP7	Z	201.29	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	0	40
2	MP1	Z	49.6	40
3	MP1	X	0	59
4	MP1	Z	49.6	59
5	MP1	X	0	18
6	MP1	Z	41.83	18
7	MP1	X	0	34
8	MP1	Z	41.83	34
9	MP1	X	0	18
10	MP1	Z	41.83	18
11	MP1	X	0	34
12	MP1	Z	41.83	34
13	MP1	X	0	12
14	MP1	Z	267.95	12
15	MP1	X	0	84
16	MP1	Z	267.95	84
17	MP4	X	0	18
18	MP4	Z	29.4	18
19	MP4	X	0	34
20	MP4	Z	29.4	34
21	MP4	X	0	18
22	MP4	Z	26.88	18
23	MP4	X	0	34
24	MP4	Z	26.88	34
25	MP4	X	0	12
26	MP4	Z	161.39	12
27	MP4	X	0	84
28	MP4	Z	161.39	84
29	MP7	X	0	18
30	MP7	Z	29.4	18
31	MP7	X	0	34
32	MP7	Z	29.4	34
33	MP7	X	0	18
34	MP7	Z	26.88	18
35	MP7	X	0	34
36	MP7	Z	26.88	34
37	MP7	X	0	12
38	MP7	Z	161.39	12
39	MP7	X	0	84
40	MP7	Z	161.39	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	22.07	40
2	MP1	Z	38.22	40
3	MP1	X	22.07	59
4	MP1	Z	38.22	59
5	MP1	X	18.84	18
6	MP1	Z	32.64	18
7	MP1	X	18.84	34
8	MP1	Z	32.64	34
9	MP1	X	18.42	18
10	MP1	Z	31.91	18
11	MP1	X	18.42	34
12	MP1	Z	31.91	34
13	MP1	X	116.22	12
14	MP1	Z	201.29	12
15	MP1	X	116.22	84
16	MP1	Z	201.29	84
17	MP4	X	18.84	18
18	MP4	Z	32.64	18
19	MP4	X	18.84	34
20	MP4	Z	32.64	34
21	MP4	X	18.42	18
22	MP4	Z	31.91	18
23	MP4	X	18.42	34
24	MP4	Z	31.91	34
25	MP4	X	116.22	12
26	MP4	Z	201.29	12
27	MP4	X	116.22	84
28	MP4	Z	201.29	84
29	MP7	X	12.63	18
30	MP7	Z	21.88	18
31	MP7	X	12.63	34
32	MP7	Z	21.88	34
33	MP7	X	10.95	18
34	MP7	Z	18.96	18
35	MP7	X	10.95	34
36	MP7	Z	18.96	34
37	MP7	X	62.94	12
38	MP7	Z	109.01	12
39	MP7	X	62.94	84
40	MP7	Z	109.01	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	28.76	40
2	MP1	Z	16.6	40

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
3	MP1	X	28.76	59
4	MP1	Z	16.6	59
5	MP1	X	25.46	18
6	MP1	Z	14.7	18
7	MP1	X	25.46	34
8	MP1	Z	14.7	34
9	MP1	X	23.28	18
10	MP1	Z	13.44	18
11	MP1	X	23.28	34
12	MP1	Z	13.44	34
13	MP1	X	139.77	12
14	MP1	Z	80.7	12
15	MP1	X	139.77	84
16	MP1	Z	80.7	84
17	MP4	X	36.22	18
18	MP4	Z	20.91	18
19	MP4	X	36.22	34
20	MP4	Z	20.91	34
21	MP4	X	36.22	18
22	MP4	Z	20.91	18
23	MP4	X	36.22	34
24	MP4	Z	20.91	34
25	MP4	X	232.05	12
26	MP4	Z	133.98	12
27	MP4	X	232.05	84
28	MP4	Z	133.98	84
29	MP7	X	25.46	18
30	MP7	Z	14.7	18
31	MP7	X	25.46	34
32	MP7	Z	14.7	34
33	MP7	X	23.28	18
34	MP7	Z	13.44	18
35	MP7	X	23.28	34
36	MP7	Z	13.44	34
37	MP7	X	139.77	12
38	MP7	Z	80.7	12
39	MP7	X	139.77	84
40	MP7	Z	80.7	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	27.74	40
2	MP1	Z	0	40
3	MP1	X	27.74	59
4	MP1	Z	0	59
5	MP1	X	25.26	18

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
6	MP1	Z	0	18
7	MP1	X	25.26	34
8	MP1	Z	0	34
9	MP1	X	21.9	18
10	MP1	Z	0	18
11	MP1	X	21.9	34
12	MP1	Z	0	34
13	MP1	X	125.87	12
14	MP1	Z	0	12
15	MP1	X	125.87	84
16	MP1	Z	0	84
17	MP4	X	37.68	18
18	MP4	Z	0	18
19	MP4	X	37.68	34
20	MP4	Z	0	34
21	MP4	X	36.84	18
22	MP4	Z	0	18
23	MP4	X	36.84	34
24	MP4	Z	0	34
25	MP4	X	232.43	12
26	MP4	Z	0	12
27	MP4	X	232.43	84
28	MP4	Z	0	84
29	MP7	X	37.68	18
30	MP7	Z	0	18
31	MP7	X	37.68	34
32	MP7	Z	0	34
33	MP7	X	36.84	18
34	MP7	Z	0	18
35	MP7	X	36.84	34
36	MP7	Z	0	34
37	MP7	X	232.43	12
38	MP7	Z	0	12
39	MP7	X	232.43	84
40	MP7	Z	0	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	28.76	40
2	MP1	Z	-16.6	40
3	MP1	X	28.76	59
4	MP1	Z	-16.6	59
5	MP1	X	25.46	18
6	MP1	Z	-14.7	18
7	MP1	X	25.46	34
8	MP1	Z	-14.7	34

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
9	MP1	X	23.28	18
10	MP1	Z	-13.44	18
11	MP1	X	23.28	34
12	MP1	Z	-13.44	34
13	MP1	X	139.77	12
14	MP1	Z	-80.7	12
15	MP1	X	139.77	84
16	MP1	Z	-80.7	84
17	MP4	X	25.46	18
18	MP4	Z	-14.7	18
19	MP4	X	25.46	34
20	MP4	Z	-14.7	34
21	MP4	X	23.28	18
22	MP4	Z	-13.44	18
23	MP4	X	23.28	34
24	MP4	Z	-13.44	34
25	MP4	X	139.77	12
26	MP4	Z	-80.7	12
27	MP4	X	139.77	84
28	MP4	Z	-80.7	84
29	MP7	X	36.22	18
30	MP7	Z	-20.91	18
31	MP7	X	36.22	34
32	MP7	Z	-20.91	34
33	MP7	X	36.22	18
34	MP7	Z	-20.91	18
35	MP7	X	36.22	34
36	MP7	Z	-20.91	34
37	MP7	X	232.05	12
38	MP7	Z	-133.98	12
39	MP7	X	232.05	84
40	MP7	Z	-133.98	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	22.07	40
2	MP1	Z	-38.22	40
3	MP1	X	22.07	59
4	MP1	Z	-38.22	59
5	MP1	X	18.84	18
6	MP1	Z	-32.64	18
7	MP1	X	18.84	34
8	MP1	Z	-32.64	34
9	MP1	X	18.42	18
10	MP1	Z	-31.91	18
11	MP1	X	18.42	34



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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
12	MP1	Z	-31.91	34
13	MP1	X	116.22	12
14	MP1	Z	-201.29	12
15	MP1	X	116.22	84
16	MP1	Z	-201.29	84
17	MP4	X	12.63	18
18	MP4	Z	-21.88	18
19	MP4	X	12.63	34
20	MP4	Z	-21.88	34
21	MP4	X	10.95	18
22	MP4	Z	-18.96	18
23	MP4	X	10.95	34
24	MP4	Z	-18.96	34
25	MP4	X	62.94	12
26	MP4	Z	-109.01	12
27	MP4	X	62.94	84
28	MP4	Z	-109.01	84
29	MP7	X	18.84	18
30	MP7	Z	-32.64	18
31	MP7	X	18.84	34
32	MP7	Z	-32.64	34
33	MP7	X	18.42	18
34	MP7	Z	-31.91	18
35	MP7	X	18.42	34
36	MP7	Z	-31.91	34
37	MP7	X	116.22	12
38	MP7	Z	-201.29	12
39	MP7	X	116.22	84
40	MP7	Z	-201.29	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Y	-36.456	40
2	MP1	Y	-36.456	59
3	MP1	Y	-33.893	18
4	MP1	Y	-33.893	34
5	MP1	Y	-31.769	18
6	MP1	Y	-31.769	34
7	MP1	Y	-131.322	12
8	MP1	Y	-131.322	84
9	MP4	Y	-33.893	18
10	MP4	Y	-33.893	34
11	MP4	Y	-31.769	18
12	MP4	Y	-31.769	34
13	MP4	Y	-131.322	12
14	MP4	Y	-131.322	84

**Member Point Loads (BLC 16 : Ice Weight) (Continued)**

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
15	MP7	Y	-33.893	18
16	MP7	Y	-33.893	34
17	MP7	Y	-31.769	18
18	MP7	Y	-31.769	34
19	MP7	Y	-131.322	12
20	MP7	Y	-131.322	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	0	40
2	MP1	Z	-4.37	40
3	MP1	X	0	59
4	MP1	Z	-4.37	59
5	MP1	X	0	18
6	MP1	Z	-3.78	18
7	MP1	X	0	34
8	MP1	Z	-3.78	34
9	MP1	X	0	18
10	MP1	Z	-3.78	18
11	MP1	X	0	34
12	MP1	Z	-3.78	34
13	MP1	X	0	12
14	MP1	Z	-19.89	12
15	MP1	X	0	84
16	MP1	Z	-19.89	84
17	MP4	X	0	18
18	MP4	Z	-3.22	18
19	MP4	X	0	34
20	MP4	Z	-3.22	34
21	MP4	X	0	18
22	MP4	Z	-3.1	18
23	MP4	X	0	34
24	MP4	Z	-3.1	34
25	MP4	X	0	12
26	MP4	Z	-14.93	12
27	MP4	X	0	84
28	MP4	Z	-14.93	84
29	MP7	X	0	18
30	MP7	Z	-3.22	18
31	MP7	X	0	34
32	MP7	Z	-3.22	34
33	MP7	X	0	18
34	MP7	Z	-3.1	18
35	MP7	X	0	34
36	MP7	Z	-3.1	34
37	MP7	X	0	12

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
38	MP7	Z	-14.93	12
39	MP7	X	0	84
40	MP7	Z	-14.93	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-2.07	40
2	MP1	Z	-3.58	40
3	MP1	X	-2.07	59
4	MP1	Z	-3.58	59
5	MP1	X	-1.8	18
6	MP1	Z	-3.11	18
7	MP1	X	-1.8	34
8	MP1	Z	-3.11	34
9	MP1	X	-1.78	18
10	MP1	Z	-3.08	18
11	MP1	X	-1.78	34
12	MP1	Z	-3.08	34
13	MP1	X	-9.12	12
14	MP1	Z	-15.79	12
15	MP1	X	-9.12	84
16	MP1	Z	-15.79	84
17	MP4	X	-1.8	18
18	MP4	Z	-3.11	18
19	MP4	X	-1.8	34
20	MP4	Z	-3.11	34
21	MP4	X	-1.78	18
22	MP4	Z	-3.08	18
23	MP4	X	-1.78	34
24	MP4	Z	-3.08	34
25	MP4	X	-9.12	12
26	MP4	Z	-15.79	12
27	MP4	X	-9.12	84
28	MP4	Z	-15.79	84
29	MP7	X	-1.51	18
30	MP7	Z	-2.62	18
31	MP7	X	-1.51	34
32	MP7	Z	-2.62	34
33	MP7	X	-1.44	18
34	MP7	Z	-2.49	18
35	MP7	X	-1.44	34
36	MP7	Z	-2.49	34
37	MP7	X	-6.64	12
38	MP7	Z	-11.49	12
39	MP7	X	-6.64	84
40	MP7	Z	-11.49	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-3.18	40
2	MP1	Z	-1.83	40
3	MP1	X	-3.18	59
4	MP1	Z	-1.83	59
5	MP1	X	-2.79	18
6	MP1	Z	-1.61	18
7	MP1	X	-2.79	34
8	MP1	Z	-1.61	34
9	MP1	X	-2.68	18
10	MP1	Z	-1.55	18
11	MP1	X	-2.68	34
12	MP1	Z	-1.55	34
13	MP1	X	-12.93	12
14	MP1	Z	-7.46	12
15	MP1	X	-12.93	84
16	MP1	Z	-7.46	84
17	MP4	X	-3.28	18
18	MP4	Z	-1.89	18
19	MP4	X	-3.28	34
20	MP4	Z	-1.89	34
21	MP4	X	-3.28	18
22	MP4	Z	-1.89	18
23	MP4	X	-3.28	34
24	MP4	Z	-1.89	34
25	MP4	X	-17.23	12
26	MP4	Z	-9.95	12
27	MP4	X	-17.23	84
28	MP4	Z	-9.95	84
29	MP7	X	-2.79	18
30	MP7	Z	-1.61	18
31	MP7	X	-2.79	34
32	MP7	Z	-1.61	34
33	MP7	X	-2.68	18
34	MP7	Z	-1.55	18
35	MP7	X	-2.68	34
36	MP7	Z	-1.55	34
37	MP7	X	-12.93	12
38	MP7	Z	-7.46	12
39	MP7	X	-12.93	84
40	MP7	Z	-7.46	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-3.43	40
2	MP1	Z	0	40

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
3	MP1	X	-3.43	59
4	MP1	Z	0	59
5	MP1	X	-3.03	18
6	MP1	Z	0	18
7	MP1	X	-3.03	34
8	MP1	Z	0	34
9	MP1	X	-2.87	18
10	MP1	Z	0	18
11	MP1	X	-2.87	34
12	MP1	Z	0	34
13	MP1	X	-13.27	12
14	MP1	Z	0	12
15	MP1	X	-13.27	84
16	MP1	Z	0	84
17	MP4	X	-3.59	18
18	MP4	Z	0	18
19	MP4	X	-3.59	34
20	MP4	Z	0	34
21	MP4	X	-3.55	18
22	MP4	Z	0	18
23	MP4	X	-3.55	34
24	MP4	Z	0	34
25	MP4	X	-18.24	12
26	MP4	Z	0	12
27	MP4	X	-18.24	84
28	MP4	Z	0	84
29	MP7	X	-3.59	18
30	MP7	Z	0	18
31	MP7	X	-3.59	34
32	MP7	Z	0	34
33	MP7	X	-3.55	18
34	MP7	Z	0	18
35	MP7	X	-3.55	34
36	MP7	Z	0	34
37	MP7	X	-18.24	12
38	MP7	Z	0	12
39	MP7	X	-18.24	84
40	MP7	Z	0	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-3.18	40
2	MP1	Z	1.83	40
3	MP1	X	-3.18	59
4	MP1	Z	1.83	59
5	MP1	X	-2.79	18

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
6	MP1	Z	1.61	18
7	MP1	X	-2.79	34
8	MP1	Z	1.61	34
9	MP1	X	-2.68	18
10	MP1	Z	1.55	18
11	MP1	X	-2.68	34
12	MP1	Z	1.55	34
13	MP1	X	-12.93	12
14	MP1	Z	7.46	12
15	MP1	X	-12.93	84
16	MP1	Z	7.46	84
17	MP4	X	-2.79	18
18	MP4	Z	1.61	18
19	MP4	X	-2.79	34
20	MP4	Z	1.61	34
21	MP4	X	-2.68	18
22	MP4	Z	1.55	18
23	MP4	X	-2.68	34
24	MP4	Z	1.55	34
25	MP4	X	-12.93	12
26	MP4	Z	7.46	12
27	MP4	X	-12.93	84
28	MP4	Z	7.46	84
29	MP7	X	-3.28	18
30	MP7	Z	1.89	18
31	MP7	X	-3.28	34
32	MP7	Z	1.89	34
33	MP7	X	-3.28	18
34	MP7	Z	1.89	18
35	MP7	X	-3.28	34
36	MP7	Z	1.89	34
37	MP7	X	-17.23	12
38	MP7	Z	9.95	12
39	MP7	X	-17.23	84
40	MP7	Z	9.95	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-2.07	40
2	MP1	Z	3.58	40
3	MP1	X	-2.07	59
4	MP1	Z	3.58	59
5	MP1	X	-1.8	18
6	MP1	Z	3.11	18
7	MP1	X	-1.8	34
8	MP1	Z	3.11	34

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
9	MP1	X	-1.78	18
10	MP1	Z	3.08	18
11	MP1	X	-1.78	34
12	MP1	Z	3.08	34
13	MP1	X	-9.12	12
14	MP1	Z	15.79	12
15	MP1	X	-9.12	84
16	MP1	Z	15.79	84
17	MP4	X	-1.51	18
18	MP4	Z	2.62	18
19	MP4	X	-1.51	34
20	MP4	Z	2.62	34
21	MP4	X	-1.44	18
22	MP4	Z	2.49	18
23	MP4	X	-1.44	34
24	MP4	Z	2.49	34
25	MP4	X	-6.64	12
26	MP4	Z	11.49	12
27	MP4	X	-6.64	84
28	MP4	Z	11.49	84
29	MP7	X	-1.8	18
30	MP7	Z	3.11	18
31	MP7	X	-1.8	34
32	MP7	Z	3.11	34
33	MP7	X	-1.78	18
34	MP7	Z	3.08	18
35	MP7	X	-1.78	34
36	MP7	Z	3.08	34
37	MP7	X	-9.12	12
38	MP7	Z	15.79	12
39	MP7	X	-9.12	84
40	MP7	Z	15.79	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	0	40
2	MP1	Z	4.37	40
3	MP1	X	0	59
4	MP1	Z	4.37	59
5	MP1	X	0	18
6	MP1	Z	3.78	18
7	MP1	X	0	34
8	MP1	Z	3.78	34
9	MP1	X	0	18
10	MP1	Z	3.78	18
11	MP1	X	0	34



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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
12	MP1	Z	3.78	34
13	MP1	X	0	12
14	MP1	Z	19.89	12
15	MP1	X	0	84
16	MP1	Z	19.89	84
17	MP4	X	0	18
18	MP4	Z	3.22	18
19	MP4	X	0	34
20	MP4	Z	3.22	34
21	MP4	X	0	18
22	MP4	Z	3.1	18
23	MP4	X	0	34
24	MP4	Z	3.1	34
25	MP4	X	0	12
26	MP4	Z	14.93	12
27	MP4	X	0	84
28	MP4	Z	14.93	84
29	MP7	X	0	18
30	MP7	Z	3.22	18
31	MP7	X	0	34
32	MP7	Z	3.22	34
33	MP7	X	0	18
34	MP7	Z	3.1	18
35	MP7	X	0	34
36	MP7	Z	3.1	34
37	MP7	X	0	12
38	MP7	Z	14.93	12
39	MP7	X	0	84
40	MP7	Z	14.93	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	2.07	40
2	MP1	Z	3.58	40
3	MP1	X	2.07	59
4	MP1	Z	3.58	59
5	MP1	X	1.8	18
6	MP1	Z	3.11	18
7	MP1	X	1.8	34
8	MP1	Z	3.11	34
9	MP1	X	1.78	18
10	MP1	Z	3.08	18
11	MP1	X	1.78	34
12	MP1	Z	3.08	34
13	MP1	X	9.12	12
14	MP1	Z	15.79	12

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
15	MP1	X	9.12	84
16	MP1	Z	15.79	84
17	MP4	X	1.8	18
18	MP4	Z	3.11	18
19	MP4	X	1.8	34
20	MP4	Z	3.11	34
21	MP4	X	1.78	18
22	MP4	Z	3.08	18
23	MP4	X	1.78	34
24	MP4	Z	3.08	34
25	MP4	X	9.12	12
26	MP4	Z	15.79	12
27	MP4	X	9.12	84
28	MP4	Z	15.79	84
29	MP7	X	1.51	18
30	MP7	Z	2.62	18
31	MP7	X	1.51	34
32	MP7	Z	2.62	34
33	MP7	X	1.44	18
34	MP7	Z	2.49	18
35	MP7	X	1.44	34
36	MP7	Z	2.49	34
37	MP7	X	6.64	12
38	MP7	Z	11.49	12
39	MP7	X	6.64	84
40	MP7	Z	11.49	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	3.18	40
2	MP1	Z	1.83	40
3	MP1	X	3.18	59
4	MP1	Z	1.83	59
5	MP1	X	2.79	18
6	MP1	Z	1.61	18
7	MP1	X	2.79	34
8	MP1	Z	1.61	34
9	MP1	X	2.68	18
10	MP1	Z	1.55	18
11	MP1	X	2.68	34
12	MP1	Z	1.55	34
13	MP1	X	12.93	12
14	MP1	Z	7.46	12
15	MP1	X	12.93	84
16	MP1	Z	7.46	84
17	MP4	X	3.28	18

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
18	MP4	Z	1.89	18
19	MP4	X	3.28	34
20	MP4	Z	1.89	34
21	MP4	X	3.28	18
22	MP4	Z	1.89	18
23	MP4	X	3.28	34
24	MP4	Z	1.89	34
25	MP4	X	17.23	12
26	MP4	Z	9.95	12
27	MP4	X	17.23	84
28	MP4	Z	9.95	84
29	MP7	X	2.79	18
30	MP7	Z	1.61	18
31	MP7	X	2.79	34
32	MP7	Z	1.61	34
33	MP7	X	2.68	18
34	MP7	Z	1.55	18
35	MP7	X	2.68	34
36	MP7	Z	1.55	34
37	MP7	X	12.93	12
38	MP7	Z	7.46	12
39	MP7	X	12.93	84
40	MP7	Z	7.46	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	3.43	40
2	MP1	Z	0	40
3	MP1	X	3.43	59
4	MP1	Z	0	59
5	MP1	X	3.03	18
6	MP1	Z	0	18
7	MP1	X	3.03	34
8	MP1	Z	0	34
9	MP1	X	2.87	18
10	MP1	Z	0	18
11	MP1	X	2.87	34
12	MP1	Z	0	34
13	MP1	X	13.27	12
14	MP1	Z	0	12
15	MP1	X	13.27	84
16	MP1	Z	0	84
17	MP4	X	3.59	18
18	MP4	Z	0	18
19	MP4	X	3.59	34
20	MP4	Z	0	34

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
21	MP4	X	3.55	18
22	MP4	Z	0	18
23	MP4	X	3.55	34
24	MP4	Z	0	34
25	MP4	X	18.24	12
26	MP4	Z	0	12
27	MP4	X	18.24	84
28	MP4	Z	0	84
29	MP7	X	3.59	18
30	MP7	Z	0	18
31	MP7	X	3.59	34
32	MP7	Z	0	34
33	MP7	X	3.55	18
34	MP7	Z	0	18
35	MP7	X	3.55	34
36	MP7	Z	0	34
37	MP7	X	18.24	12
38	MP7	Z	0	12
39	MP7	X	18.24	84
40	MP7	Z	0	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	3.18	40
2	MP1	Z	-1.83	40
3	MP1	X	3.18	59
4	MP1	Z	-1.83	59
5	MP1	X	2.79	18
6	MP1	Z	-1.61	18
7	MP1	X	2.79	34
8	MP1	Z	-1.61	34
9	MP1	X	2.68	18
10	MP1	Z	-1.55	18
11	MP1	X	2.68	34
12	MP1	Z	-1.55	34
13	MP1	X	12.93	12
14	MP1	Z	-7.46	12
15	MP1	X	12.93	84
16	MP1	Z	-7.46	84
17	MP4	X	2.79	18
18	MP4	Z	-1.61	18
19	MP4	X	2.79	34
20	MP4	Z	-1.61	34
21	MP4	X	2.68	18
22	MP4	Z	-1.55	18
23	MP4	X	2.68	34

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
24	MP4	Z	-1.55	34
25	MP4	X	12.93	12
26	MP4	Z	-7.46	12
27	MP4	X	12.93	84
28	MP4	Z	-7.46	84
29	MP7	X	3.28	18
30	MP7	Z	-1.89	18
31	MP7	X	3.28	34
32	MP7	Z	-1.89	34
33	MP7	X	3.28	18
34	MP7	Z	-1.89	18
35	MP7	X	3.28	34
36	MP7	Z	-1.89	34
37	MP7	X	17.23	12
38	MP7	Z	-9.95	12
39	MP7	X	17.23	84
40	MP7	Z	-9.95	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	2.07	40
2	MP1	Z	-3.58	40
3	MP1	X	2.07	59
4	MP1	Z	-3.58	59
5	MP1	X	1.8	18
6	MP1	Z	-3.11	18
7	MP1	X	1.8	34
8	MP1	Z	-3.11	34
9	MP1	X	1.78	18
10	MP1	Z	-3.08	18
11	MP1	X	1.78	34
12	MP1	Z	-3.08	34
13	MP1	X	9.12	12
14	MP1	Z	-15.79	12
15	MP1	X	9.12	84
16	MP1	Z	-15.79	84
17	MP4	X	1.51	18
18	MP4	Z	-2.62	18
19	MP4	X	1.51	34
20	MP4	Z	-2.62	34
21	MP4	X	1.44	18
22	MP4	Z	-2.49	18
23	MP4	X	1.44	34
24	MP4	Z	-2.49	34
25	MP4	X	6.64	12
26	MP4	Z	-11.49	12

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
27	MP4	X	6.64	84
28	MP4	Z	-11.49	84
29	MP7	X	1.8	18
30	MP7	Z	-3.11	18
31	MP7	X	1.8	34
32	MP7	Z	-3.11	34
33	MP7	X	1.78	18
34	MP7	Z	-3.08	18
35	MP7	X	1.78	34
36	MP7	Z	-3.08	34
37	MP7	X	9.12	12
38	MP7	Z	-15.79	12
39	MP7	X	9.12	84
40	MP7	Z	-15.79	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Z	-3.146	40
2	MP1	Z	-3.146	59
3	MP1	Z	-10.786	18
4	MP1	Z	-10.786	34
5	MP1	Z	-9.202	18
6	MP1	Z	-9.202	34
7	MP1	Z	-11.88	12
8	MP1	Z	-11.88	84
9	MP4	Z	-10.786	18
10	MP4	Z	-10.786	34
11	MP4	Z	-9.202	18
12	MP4	Z	-9.202	34
13	MP4	Z	-11.88	12
14	MP4	Z	-11.88	84
15	MP7	Z	-10.786	18
16	MP7	Z	-10.786	34
17	MP7	Z	-9.202	18
18	MP7	Z	-9.202	34
19	MP7	Z	-11.88	12
20	MP7	Z	-11.88	84

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-3.146	40
2	MP1	X	-3.146	59
3	MP1	X	-10.786	18
4	MP1	X	-10.786	34

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

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
5	MP1	X	-9.202	18
6	MP1	X	-9.202	34
7	MP1	X	-11.88	12
8	MP1	X	-11.88	84
9	MP4	X	-10.786	18
10	MP4	X	-10.786	34
11	MP4	X	-9.202	18
12	MP4	X	-9.202	34
13	MP4	X	-11.88	12
14	MP4	X	-11.88	84
15	MP7	X	-10.786	18
16	MP7	X	-10.786	34
17	MP7	X	-9.202	18
18	MP7	X	-9.202	34
19	MP7	X	-11.88	12
20	MP7	X	-11.88	84

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

	Node A	Node B	Node C	Node D	Direction	Load Direction	Magnitude [psf]
1	N100	N96	N95	N99	Y	Two Way	-1.75
2	N19	N20	N18	N17	Y	Two Way	-1.75
3	N101	N105	N106	N102	Y	Two Way	-1.75

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

	Node A	Node B	Node C	Node D	Direction	Load Direction	Magnitude [psf]
1	N100	N96	N95	N99	Y	Two Way	-11.506
2	N19	N20	N18	N17	Y	Two Way	-11.506
3	N101	N105	N106	N102	Y	Two Way	-11.506

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

	Node Label	L, D, M	Direction	Magnitude [(lb, lb-ft), (in, rad), (lb*s <sup>2</sup> /in, lb*s <sup>2</sup> *in)]
1	N43	L	Y	-250

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

	Node Label	L, D, M	Direction	Magnitude [(lb, lb-ft), (in, rad), (lb*s <sup>2</sup> /in, lb*s <sup>2</sup> *in)]
1	N44	L	Y	-500



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

	Node Label	L, D, M	Direction	Magnitude [(lb, lb-ft), (in, rad), (lb*s <sup>2</sup> /in, lb*s <sup>2</sup> *in)]
1	N50	L	Y	-500

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

	Node Label	L, D, M	Direction	Magnitude [(lb, lb-ft), (in, rad), (lb*s <sup>2</sup> /in, lb*s <sup>2</sup> *in)]
1	N56	L	Y	-500

**Node Loads and Enforced Displacements (BLC 37 : Maintenance Load 4)**

	Node Label	L, D, M	Direction	Magnitude [(lb, lb-ft), (in, rad), (lb*s <sup>2</sup> /in, lb*s <sup>2</sup> *in)]
1	N62	L	Y	-500

**Node Loads and Enforced Displacements (BLC 38 : Maintenance Load 5)**

	Node Label	L, D, M	Direction	Magnitude [(lb, lb-ft), (in, rad), (lb*s <sup>2</sup> /in, lb*s <sup>2</sup> *in)]
1	N68	L	Y	-500

**Node Loads and Enforced Displacements (BLC 39 : Maintenance Load 6)**

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

**Node Loads and Enforced Displacements (BLC 40 : Maintenance Load 7)**

	Node Label	L, D, M	Direction	Magnitude [(lb, lb-ft), (in, rad), (lb*s <sup>2</sup> /in, lb*s <sup>2</sup> *in)]
1	N80	L	Y	-500

**Node Loads and Enforced Displacements (BLC 41 : Maintenance Load 8)**

	Node Label	L, D, M	Direction	Magnitude [(lb, lb-ft), (in, rad), (lb*s <sup>2</sup> /in, lb*s <sup>2</sup> *in)]
1	N86	L	Y	-500

**Node Loads and Enforced Displacements (BLC 42 : Maintenance Load 9)**

	Node Label	L, D, M	Direction	Magnitude [(lb, lb-ft), (in, rad), (lb*s <sup>2</sup> /in, lb*s <sup>2</sup> *in)]
1	N92	L	Y	-500

**Envelope Node Reactions**

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N15	max	1920.617	5	1682.849	27	554.291	14	2316.755	27	1711.932	11	1146.696	146
2		min	-1921.18	23	-280.437	20	-558.951	8	-669.571	20	-1708.73	17	-826.814	164

**Envelope Node Reactions (Continued)**

Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC	
3	N31	max	910.679	6	1800.187	35	1854.686	13	675.994	15	1768.643	7	1925.808	133
4		min	-908.695	24	-244.813	16	-1855.062	19	-1875.795	95	-1765.757	25	-515.589	17
5	N25	max	1220.906	16	1733.398	31	1674.696	3	458.608	25	1728.766	3	683.293	23
6		min	-1223.087	10	-252.923	24	-1674.151	9	-1551.634	105	-1725.807	21	-2189.602	30
7	Totals:	max	3587.594	17	4827.685	28	3767.652	2						
8		min	-3587.597	11	1265.334	58	-3767.651	20						

**Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks**

Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn	
1	MP1	PIPE_2.0	0.511	65.684	2	0.072	65.684	11	14916.096	32130	1871.625	1871.625	3	H1-1b	
2	MP4	PIPE_2.0	0.475	65.684	10	0.069	65.684	8	14916.096	32130	1871.625	1871.625	1.785	H1-1b	
3	MP7	PIPE_2.0	0.473	65.684	6	0.067	65.684	3	14916.096	32130	1871.625	1871.625	1.709	H1-1b	
4	MP9	PIPE_2.0	0.404	65.684	7	0.104	65.684	8	14916.096	32130	1871.625	1871.625	2.385	H1-1b	
5	MP3	PIPE_2.0	0.402	65.684	3	0.1	65.684	5	14916.096	32130	1871.625	1871.625	3	H1-1b	
6	MP6	PIPE_2.0	0.399	65.684	11	0.097	65.684	13	14916.096	32130	1871.625	1871.625	2.68	H1-1b	
7	M15	6x0.25	0.398	15.5	9	0.04	15.5	y	34	1836.566	48600	253.125	2783.072	1.336	H1-1b
8	M12	6x0.25	0.388	15.5	5	0.037	15.5	y	30	1836.566	48600	253.125	2780.602	1.335	H1-1b
9	M53	C4X4.5	0.385	25.606	9	0.098	2.695	y	95	36462.434	43416	1093.41	5535	1.312	H1-1b
10	M2	6x0.25	0.384	15.5	13	0.037	15.5	y	38	1836.566	48600	253.125	2761.902	1.326	H1-1b
11	MP2	PIPE_2.0	0.38	65.684	2	0.086	65.684	7	14916.096	32130	1871.625	1871.625	3	H1-1b	
12	M50	C4X4.5	0.379	25.606	5	0.096	2.695	y	175	36462.434	43416	1093.41	5535	1.336	H1-1b
13	M57	C4X4.5	0.372	0	2	0.095	22.911	y	136	36462.434	43416	1093.41	5535	1.542	H1-1b
14	MP8	PIPE_2.0	0.365	65.684	6	0.086	65.684	9	14916.096	32130	1871.625	1871.625	2.408	H1-1b	
15	MP5	PIPE_2.0	0.364	65.684	10	0.084	65.684	13	14916.096	32130	1871.625	1871.625	2.533	H1-1b	
16	M1	C4X4.5	0.301	0	11	0.087	2.695	y	36	36462.434	43416	1093.41	5535	1.886	H1-1b
17	M59	C4X4.5	0.301	0	10	0.098	22.911	y	32	36462.434	43416	1093.41	5535	1.647	H1-1b
18	M58	C4X4.5	0.288	25.606	3	0.097	22.911	y	28	36462.434	43416	1093.41	5535	1.966	H1-1b
19	MR1	PIPE_2.0	0.206	25.263	6	0.132	48	9	14916.096	32130	1871.625	1871.625	1.8	H1-1b	
20	MR3	PIPE_2.0	0.203	25.263	9	0.13	48	13	14916.096	32130	1871.625	1871.625	1.847	H1-1b	
21	MR2	PIPE_2.0	0.203	70.737	2	0.131	48	5	14916.096	32130	1871.625	1871.625	1.568	H1-1b	
22	MS3	HSS4X4X4	0.191	0	8	0.117	0	y	94	134908.476	139518	16180.5	16180.5	2.138	H1-1b
23	MS2	HSS4X4X4	0.183	0	4	0.112	0	y	174	134908.476	139518	16180.5	16180.5	2.161	H1-1b
24	MS1	HSS4X4X4	0.16	0	12	0.118	0	y	146	135856.476	139518	16180.5	16180.5	2.032	H1-1b
25	MH3	PIPE_3.0	0.119	30.316	8	0.137	27.789	8	46290.523	65205	5748.75	5748.75	2.341	H1-1b	
26	M52	L2x2x2	0.117	0	9	0.012	0	y	9	11286.78	15908.4	402.563	821.791	1.5	H2-1
27	MH2	PIPE_3.0	0.117	65.684	12	0.128	68.211	12	46290.523	65205	5748.75	5748.75	1.458	H1-1b	
28	MH1	PIPE_3.0	0.115	65.684	4	0.133	68.211	4	46290.523	65205	5748.75	5748.75	1.543	H1-1b	
29	M49	L2x2x2	0.112	0	5	0.011	0	y	5	11286.78	15908.4	402.563	821.791	1.5	H2-1
30	M10	L2x2x2	0.096	0	13	0.009	0	y	13	11286.78	15908.4	402.563	821.791	1.5	H2-1
31	M56	4x0.25	0.082	16.077	34	0.057	32.155	y	8	32074.159	32400	168.75	2700	1	H1-1b
32	M55	4x0.25	0.082	16.077	30	0.055	32.155	y	4	32074.159	32400	168.75	2700	1	H1-1b
33	M3	4x0.25	0.082	16.077	38	0.054	32.155	y	12	32074.159	32400	168.75	2700	1	H1-1b
34	M54	L2x2x2	0.066	0	11	0.01	0	z	11	11286.78	15908.4	402.563	821.791	1.5	H2-1
35	M51	L2x2x2	0.063	0	7	0.01	0	z	7	11286.78	15908.4	402.563	821.791	1.5	H2-1
36	M11	L2x2x2	0.054	0	2	0.008	0	z	3	11286.78	15908.4	402.563	821.791	1.5	H2-1

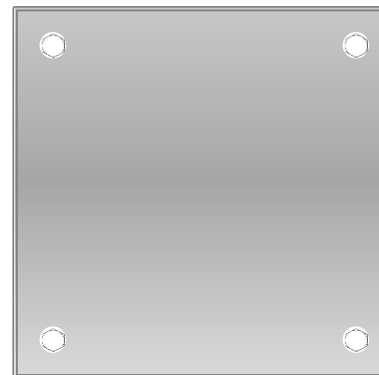
**Bolt Calculation Tool, V1.4**

PROJECT DATA	
Site Name:	BOBDL00024A
Site Number:	BOBDL00024A
Job Code:	6039-Z0001-C
Connection Description:	Standoff to Collar

APPLIED LOADS		
Bolt Tension:	2405.23	lbs
Bolt Shear:	999.03	lbs

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

BOLT CHECK		
Tensile Strength	20340.15	
Shear Strength	13805.83	
Tensile Usage	11.8%	
Shear Usage	7.2%	
Interaction Check	0.02	≤1.05
Result	Pass	





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**FROM**

BLUE BELL, PA US

**TO**

PORTLAND, CT US

Travel History

TIME ZONE

Local Scan Time



Friday, October 15,  
2021

11:18 AM	PORTLAND, CT	Delivered Package delivered to recipient address - release authorized
11:18 AM	PORTLAND, CT	Delivered Package delivered to recipient address - release authorized
9:13 AM	SOUTH WINDSOR, CT	On FedEx vehicle for delivery
6:42 AM	SOUTH WINDSOR, CT	At local FedEx facility

Thursday, October 14,  
2021

1:30 PM	KEASBEY, NJ	Arrived at FedEx hub
6:59 AM	NORTHAMPTON, PA	Departed FedEx hub

Wednesday, October 13,  
2021

11:22 PM	NORTHAMPTON, PA	Arrived at FedEx hub
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**FROM**  
BLUE BELL, PA US

**TO**  
PORTLAND, CT US

Travel History

**TIME ZONE**  
Local Scan Time



Friday, October 15,  
2021

1:07 PM	PORTLAND, CT	Delivered
10:44 AM	SOUTH WINDSOR, CT	On FedEx vehicle for delivery
5:51 AM	SOUTH WINDSOR, CT	At local FedEx facility

Thursday, October 14,  
2021

1:24 PM	KEASBEY, NJ	Arrived at FedEx hub
6:59 AM	NORTHAMPTON, PA	Departed FedEx hub

Wednesday, October 13,  
2021

11:22 PM	NORTHAMPTON, PA	Arrived at FedEx hub
9:05 PM	FORT WASHINGTON, PA	Left FedEx origin facility
6:46 PM	FORT WASHINGTON, PA	Picked up