



January 5, 2022

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

Re: Tower Share Application – Dish Site 13726411  
Dish Wireless Telecommunications Facility @ 148 Roberts Street, East Hartford, CT 06108

Dear Ms. Bachman,

Dish Wireless (“Dish”) is proposing a wireless telecommunications facility on an existing monopole tower at 148 Roberts Street, East Hartford, CT, 06108. Enclosed please find Check Number 030130 in the amount of Six Hundred and Twenty Five Dollars (\$625.00); an original and two (2) copies of the following documents: the CSC Application letter; a Letter of Authorization from the tower owner; the Property Cards and GIS data for the property; a set of Construction Drawings; a Structural Analysis Report; an Antenna Mount Analysis Report; an EME Study Report; the original CSC tower approval; four (4) Notices dated December 3, 2021 with USPS Confirmations; and four additional Notices dated December 15, 2021 with USPS Confirmations.

The Notices and drawings that were mailed on December 3, 2021, erroneously listed Greater Hartford Transit District as the property owner. Shortly thereafter, the GHTD contacted me to disavow ownership of that portion of 148 Roberts Street that contains the tower. The correct owner of the portion of 148 Roberts Street that is improved with the tower is Caro, LLC.; the drawings were revised with accurate ownership information. Errata letters with the corrected page 1 were sent to the three (3) previous recipients and a Notice with all enclosures was sent to the correct owner. As noted above, copies of these letters are enclosed.

I will email copies of these documents to the Council. If you have any questions, please feel free to contact me; I can be reached at 443-677-0144 or via email at [jmandrews@clinellc.com](mailto:jmandrews@clinellc.com). Thank you for your kind cooperation in this matter.

Respectfully Submitted,

A handwritten signature in blue ink, appearing to read 'Jack Andrews', is written over a circular blue stamp or watermark.

Jack Andrews  
Zoning Manager, Centerline Communications



December 15, 2021

Blake Paynter  
Project Manager, Site Development  
American Tower Corporation  
10 Presidential Way  
Woburn, MA 01801

Re: Tower Share Application – Dish Site 13726411  
Dish Wireless Telecommunications Facility @ 148 Roberts Street, East Hartford, CT 06108

Dear Mr. Paynter,

I discovered that my December 3, 2021, correspondence to you erroneously listed Greater Hartford Transit as the property owner. **The correct owner of the tower portion of the subject property is Caro LLC.** I have also enclosed a revised cover page to the drawings that were enclosed with my original correspondence that now lists the correct owner. Please accept my apologies for any inconvenience that my error may have caused.

This letter is intended to serve as the required notice to the tower owner. As required by Regulations of Connecticut State Agencies (“RCSA”) 16-50j-73 the Connecticut Siting Council (“CSC”) has been notified of this proposal and will review this application. Please accept this letter as notification pursuant to RSCA 16-50j-73.

If you have any questions or require any additional information concerning our plans or the CSC procedures, please contact me at 443-677-0144 or contact Melanie Bachmann, Acting Executive Director of the CSC at 860-972-2935.

Respectfully Submitted,

A handwritten signature in blue ink, appearing to read 'Jack Andrews', is written over the printed name.

Jack Andrews  
Zoning Manager, Centerline Communications  
10130 Donleigh Drive  
Columbia, MD 21046  
443-677-0144

cc: Melanie Bachmann, Acting Executive Director, CSC

Jack Andrews, Zoning Manager, 10130 Donleigh Drive, Columbia, MD 21046 (443) 677-0144



December 15, 2021

Eileen Buckheit, Development Director  
740 Main Street  
2nd Floor  
East Hartford, CT 06108

Re: Tower Share Application – Dish Site 13726411  
Dish Wireless Telecommunications Facility @ 148 Roberts Street, East Hartford, CT 06108

Dear Ms. Buckheit:

I discovered that my December 3, 2021, correspondence to you erroneously listed Greater Hartford Transit as the property owner. **The correct owner of the tower portion of the subject property is Caro LLC.** I have also enclosed a revised cover page to the drawings that were enclosed with my original correspondence that now lists the correct owner. Please accept my apologies for any inconvenience that my error may have caused.

This letter is intended to serve as the required notice to the municipal planning agency. As required by Regulations of Connecticut State Agencies (“RCSA”) 16-50j-73 the Connecticut Siting Council (“CSC”) has been notified of this proposal and will review this application. Please accept this letter as notification pursuant to RSCA 16-50j-73.

If you have any questions or require any additional information concerning our plans or the CSC procedures, please contact me at 443-677-0144 or contact Melanie Bachmann, Acting Executive Director of the CSC at 860-972-2935.

Respectfully Submitted,

A handwritten signature in blue ink, appearing to read 'JA', is written over the printed name 'Jack Andrews'.

Jack Andrews  
Zoning Manager, Centerline Communications  
10130 Donleigh Drive  
Columbia, MD 21046  
443-677-0144

cc: Melanie Bachmann, Acting Executive Director, CSC

Jack Andrews, Zoning Manager, 10130 Donleigh Drive, Columbia, MD 21046 (443) 677-0144



December 15, 2021

The Honorable Michael Walsh  
740 Main Street  
East Hartford, CT 06108  
United States

Re: Tower Share Application – Dish Site 13726411  
Dish Wireless Telecommunications Facility @ 148 Roberts Street, East Hartford, CT 06108

Dear Mayor Walsh:

I discovered that my December 3, 2021, correspondence to you erroneously listed Greater Hartford Transit as the property owner. **The correct owner of the tower portion of the subject property is Caro LLC.** I have also enclosed a revised cover page to the drawings that were enclosed with my original correspondence that now lists the correct owner. Please accept my apologies for any inconvenience that my error may have caused.

This letter is intended to serve as the required notice to the municipality. As required by Regulations of Connecticut State Agencies (“RCSA”) 16-50j-73 the Connecticut Siting Council (“CSC”) has been notified of this proposal and will review this application. Please accept this letter as notification pursuant to RCSA 16-50j-73.

If you have any questions or require any additional information concerning our plans or the CSC procedures, please contact me at 443-677-0144 or contact Melanie Bachmann, Acting Executive Director of the CSC at 860-972-2935.

Respectfully Submitted,

A handwritten signature in blue ink, appearing to read 'Jack Andrews', is written over a circular blue stamp or seal.

Jack Andrews  
Zoning Manager, Centerline Communications  
10130 Donleigh Drive  
Columbia, MD 21046  
443-677-0144

cc: Melanie Bachmann, Acting Executive Director, CSC



December 15, 2021

Caro LLC  
C/O Property Tax Division  
PO Box 723597  
Atlanta, GA 31139

Re: Tower Share Application – Dish Site 13726411  
Dish Wireless Telecommunications Facility @ 148 Roberts Street, East Hartford, CT  
06108

Dear Caro LLC,

Dish Wireless (“Dish”) is proposing a wireless telecommunications facility on an existing 130-foot monopole tower at 148 Roberts Street, East Hartford, CT 06108 (Latitude: 41.77330556, Longitude: -72.61341667) and within the existing 120’ by 60’ fenced compound. The monopole tower is owned and operated by American Tower Corporation. The subject property is owned by Caro LLC.

Dish proposes to install a five (5) foot by seven (7) foot metal platform within the existing fenced compound and install three (3) antennas, a single antenna mount, six (6) RRUs, and cables on the existing tower at seventy-nine (79) feet as more particularly detailed and described on the enclosed Construction Drawings. The overall height of the existing tower is and will remain at 130 feet and no changes will be made to the compound dimensions.

This letter is intended to serve as the required notice to the property owner. As required by Regulations of Connecticut State Agencies (“RCSA”) 16-50j-73 the Connecticut Siting Council (“CSC”) has been notified of this proposal and will review this application. Please accept this letter as notification pursuant to RCSA 16-50j-73.

Jack Andrews, Zoning Manager, 10130 Donleigh Drive, Columbia, MD 21046 (443) 677-0144



The enclosed letter and attachments to the CSC fully describe Dish's proposal for the site. However, if you have any questions or require any additional information concerning our plans or the CSC procedures, please contact me at 443-677-0144 or contact Melanie Bachmann, Acting Executive Director of the CSC at 860-972-2935.

Respectfully Submitted,

A handwritten signature in blue ink, appearing to be 'JA', is written over the printed name 'Jack Andrews'.

Jack Andrews  
Zoning Manager, Centerline  
Communications  
10130 Donleigh Drive  
Columbia, MD 21046  
443-677-0144

cc: Melanie Bachmann, Acting Executive Director, CSC



December 17, 2021

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

Re: Tower Share Application – Dish Site 13726411  
Dish Wireless Telecommunications Facility @ 148 Roberts Street, East Hartford, CT 06108

Dear Ms. Bachman,

Dish Wireless (“Dish”) is proposing a wireless telecommunications facility on an existing 130-foot monopole tower at 148 Roberts Street, East Hartford, CT 06108 (Latitude: 41.77330556, Longitude: -72.61341667) and within the existing 120’ by 60’ fenced compound. The monopole tower is owned and operated by American Tower Corporation. The subject property is owned by Caro LLC.

Dish proposes to install a five (5) foot by seven (7) foot metal platform within the existing fenced compound and install three (3) antennas, a single antenna mount, six (6) RRUs, and cables on the existing tower at seventy-nine (79) feet as more particularly detailed and described on the enclosed Construction Drawings prepared by NB&C Engineering Services., dated 9/14/2021. The overall height of the existing tower is and will remain at 130 feet and no changes will be made to the compound dimensions.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of Dish's intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A §16-50j-73, a copy of this letter is being sent to the following individuals: American Tower Corporation as Tower Operator/Owner; the Greater Hartford Transit District as Property Owner; the Honorable Michael Walsh as Mayor of the Town of East Hartford and Eileen Buckheit as Development Director for the Town of East Hartford.

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

1. The proposed modifications will NOT result in an increase in the height of the existing structure.
2. The proposed modifications will NOT require an extension of the site boundary.



3. The proposed modifications will NOT increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will NOT increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. Please see the RF emissions calculation for DISH's modified facility enclosed herewith.
5. The proposed modifications will NOT cause an ineligible change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading. Please see the structural analysis dated September 10, 2021, prepared by American Tower Corporation enclosed herewith.

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

- A. **Technical Feasibility.** The existing monopole has been deemed structurally capable of supporting Dish's proposed loading (see attached Structural Analysis).
- B. **Legal Feasibility.** As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit Dish to obtain a building permit for the proposed installation. Further, a Letter of Authorization is attached, authorizing Dish to file this application for shared use.
- C. **Environmental Feasibility.** The proposed shared use of this facility would have a minimal environmental impact. The installation of Dish equipment at the 79-foot level of the existing 130-foot tower would have an insignificant visual impact on the area around the tower. Dish ground equipment would be installed within the existing facility compound. DISH shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by the attached EME study, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.
- D. **Economic Feasibility.** Dish will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the Letter of Authorization has been provided by the owner to assist Dish with this tower sharing application.
- E. **Public Safety Concerns.** As discussed above, the tower is structurally capable of supporting the proposed loading. Dish is not aware of any public safety concerns relative to the proposed sharing of the existing tower. Dish's intentions of providing new and improved wireless service





through the shared use of this facility is expected to enhance the safety and welfare of local residents and individuals traveling through East Hartford.

For the foregoing reasons, Dish respectfully requests that the Council approve this request for the shared use of this tower located at 148 Roberts Street, East Hartford, CT 06108.

If you have any questions, please feel free to contact me.

Sincerely,

Jack Andrews  
Zoning Manager, Centerline Communications  
10130 Donleigh Drive  
Columbia, MD 21046  
443-677-0144

Enclosures:           Exhibit 1 – Letter of Authorization from tower owner  
                              Exhibit 2 – Property Card and GIS  
                              Exhibit 3 – Construction Drawings  
                              Exhibit 4 – Structural Analysis Report  
                              Exhibit 5 – Antenna Mount Analysis Report  
                              Exhibit 6 – EME Study Report  
                              Exhibit 7 – Original Tower Approval  
                              Exhibit 8 – (4) Notice Confirmations

cc:                        American Tower Corporation – Tower Operator/Owner  
                              Caro LLC – Property Owner  
                              The Honorable Michael Walsh - Mayor of the Town of East Hartford  
                              Eileen Buckheit – Development Director for the Town of East Hartford

# Town of East Hartford Property Summary Report

**148 ROBERTS ST**

<b>MAP LOT:</b>	35-18A	<b>CAMA PID:</b>	50278
<b>LOCATION:</b>	148 ROBERTS ST		
<b>OWNER NAME:</b>	CARO LLC / C/O PROPERTY TAX DEPT		

<b>OWNER OF RECORD</b>
CARO LLC C/O PROPERTY TAX DEPT P O BOX 723597  ATLANTA, GA 31139

<b>LIVING AREA:</b>		<b>ZONING:</b>		<b>ACREAGE:</b>	1.07
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## SALES HISTORY

OWNER	BOOK / PAGE	SALE DATE	SALE PRICE
CARO LLC C/O PROPERTY TAX DEPT	3560/0154	26-Sep-2015	\$0.00
DOUBLE E PROPERTIES OF MIDDLETOWN LLC C/O CARMINE	3442/0174	28-Dec-2013	\$0.00
DOUBLE E PROPERTIES OF EAST HARTFORD LLC C/O CARMINE	3205/0125	05-Oct-2010	\$0.00

## CURRENT PARCEL ASSESSMENT

<b>TOTAL:</b>	\$91,520.00	<b>IMPROVEMENTS:</b>	\$2,790.00	<b>LAND:</b>	\$88,730.00
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## ASSESSING HISTORY

FISCAL YEAR	TOTAL VALUE	IMPROVEMENT VALUE	LAND VALUE
2019	\$91,520.00	\$2,790.00	\$88,730.00
2018	\$91,520.00	\$2,790.00	\$88,730.00
2017	\$91,520.00	\$2,790.00	\$88,730.00
2016	\$91,520.00	\$2,790.00	\$88,730.00
2015	\$91,510.00	\$2,780.00	\$88,730.00

# Town of East Hartford Property Summary Report

148 ROBERTS ST

MAP LOT:	35-18A	CAMA PID:	50278
LOCATION:	148 ROBERTS ST		
OWNER NAME:	CARO LLC / C/O PROPERTY TAX DEPT		

## BUILDING # 1

YEAR BUILT		EXT WALL 1	
STYLE		INT WALLS 1	
MODEL	Vacant	HEAT FUEL	
STORIES		HEAT TYPE	
OCCUPANCY	Comm w/ OB	AC TYPE	
ROOF		BEDROOMS	
ROOF COVER		FULL BATHS	
FLOOR COVER 1		HALF BATHS	
% BSMT	null	TOTAL ROOMS	
% FIN BSMT	null	% REC RM	null
% SEMI FIN		% ATTIC FINISH	null
BSMT GARAGE	null	FIREPLACES	null

## EXTRA FEATURES

DESCRIPTION	CODE	UNITS
Fence-C/L	FN1	260.00 L.F.



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

**BBDL00032B**

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

**148 ROBERTS ST.  
EAST HARTFORD, CT 06108**

**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
T-1	TITLE SHEET
A-1	OVERALL AND ENLARGED SITE PLAN
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
RF-2	RF PLUMBING DIAGRAM
GN-1	LEGEND AND ABBREVIATIONS
GN-2	GENERAL NOTES
GN-3	GENERAL NOTES
GN-4	GENERAL NOTES

**SCOPE OF WORK**

THIS IS NOT AN ALL INCLUSIVE LIST. CONTRACTOR SHALL UTILIZE SPECIFIED EQUIPMENT PART OR ENGINEER APPROVED EQUIVALENT. CONTRACTOR SHALL VERIFY ALL NEEDED EQUIPMENT TO PROVIDE A FUNCTIONAL SITE. THE PROJECT GENERALLY CONSISTS OF THE FOLLOWING:

- TOWER SCOPE OF WORK:**
- INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR)
  - INSTALL (1) PROPOSED ANTENNA PLATFORM MOUNT
  - INSTALL PROPOSED JUMPERS
  - INSTALL (6) PROPOSED RRUs (2 PER SECTOR)
  - INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP)
  - INSTALL (1) PROPOSED HYBRID CABLE

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

**SITE PHOTO**



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



CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

**GENERAL NOTES**

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

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

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

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

**SITE INFORMATION**

PROPERTY OWNER: CARO LLC  
C/O PROPERTY TAX DEPT  
PO BOX 723597  
ATLANTA, GA 31139

TOWER TYPE: MONOPOLE

TOWER CO SITE ID: 370626

TOWER APP NUMBER: 13726411

COUNTY: HARTFORD

LATITUDE (NAD 83): 41° 46' 23.900" N  
41.77330556

LONGITUDE (NAD 83): 72° 36' 48.300" W  
-72.61341667

ZONING JURISDICTION: CONNECTICUT SITING COUNCIL

ZONING DISTRICT: I2

PARCEL NUMBER: 17166

OCCUPANCY GROUP: U

CONSTRUCTION TYPE: II-B

POWER COMPANY: EVER SOURCE

TELEPHONE COMPANY: FRONTIER COMMUNICATIONS

**PROJECT DIRECTORY**

APPLICANT: DISH WIRELESS, L.L.C.  
5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120  
(303) 706-5008

TOWER OWNER: AMERICAN TOWER  
10 PRESIDENTIAL WAY  
WOBURN, MA 01801

ENGINEER: NB+C ENGINEERING SERVICES, LLC.  
8601 SIX FORKS ROAD, SUITE 540  
RALEIGH, NC 27615

SITE ACQUISITION: APRIL PARROTT  
APRIL.PARROTT@DISH.COM

CONSTRUCTION MANAGER: JAVIER SOTO  
JAVIER.SOTO@DISH.COM

RF ENGINEER: BOSSENER CHARLES  
BOSSENER.CHARLES@DISH.COM

**DIRECTIONS**

FROM HARTFORD CT NORTH ON MAIN STREET TURN RIGHT ON MORGAN STREET SOUTH / US 44 EAST. MERGE ONTO I-84 EAST / US 6 EAST. TAKE EXIT 58 ROBERTS STREET TOWARD SILVER LANE / BURNSIDE AVENUE. TURN LEFT ONTO ROBERTS STREET. SITE IS ON THE LEFT

**VICINITY MAP**



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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

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

RFDS REV #: 1

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
0	09/14/2021	ISSUED FOR CONSTRUCTION
1	12/14/2021	ISSUED FOR CONSTRUCTION



12/14/2021

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.

**A&E PROJECT NUMBER**  
370626-13726411

**DISH WIRELESS, L.L.C.**  
PROJECT INFORMATION  
**BBDL00032B**  
**148 ROBERTS ST.**  
**EAST HARTFORD, CT 06108**

**SHEET TITLE**  
TITLE SHEET

**SHEET NUMBER**

**T-1**

**NOTES**

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

**NOTES**

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

**dish**  
wireless.

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

**NB+C**  
TOTALLY COMMITTED.

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

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

RFDS REV #: 1

**CONSTRUCTION DOCUMENTS**

**SUBMITTALS**

REV	DATE	DESCRIPTION
0	09/14/2021	ISSUED FOR CONSTRUCTION
1	12/14/2021	ISSUED FOR CONSTRUCTION



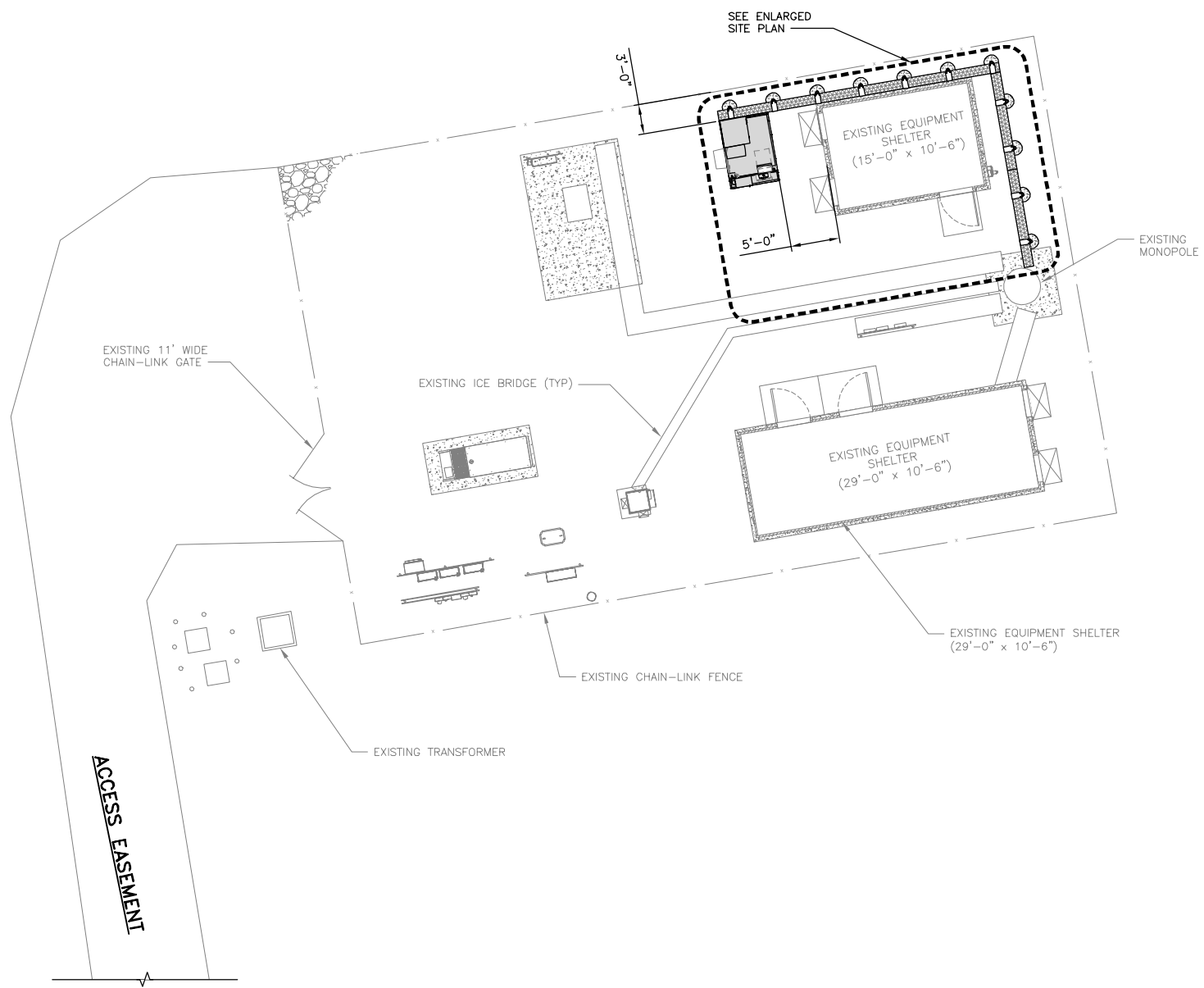
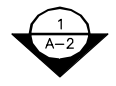
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

**A&E PROJECT NUMBER**  
370626-13726411

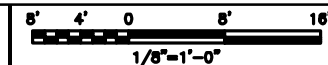
**DISH WIRELESS, L.L.C. PROJECT INFORMATION**  
BBDL00032B  
148 ROBERTS ST.  
EAST HARTFORD, CT 06108

**SHEET TITLE**  
OVERALL AND ENLARGED SITE PLAN

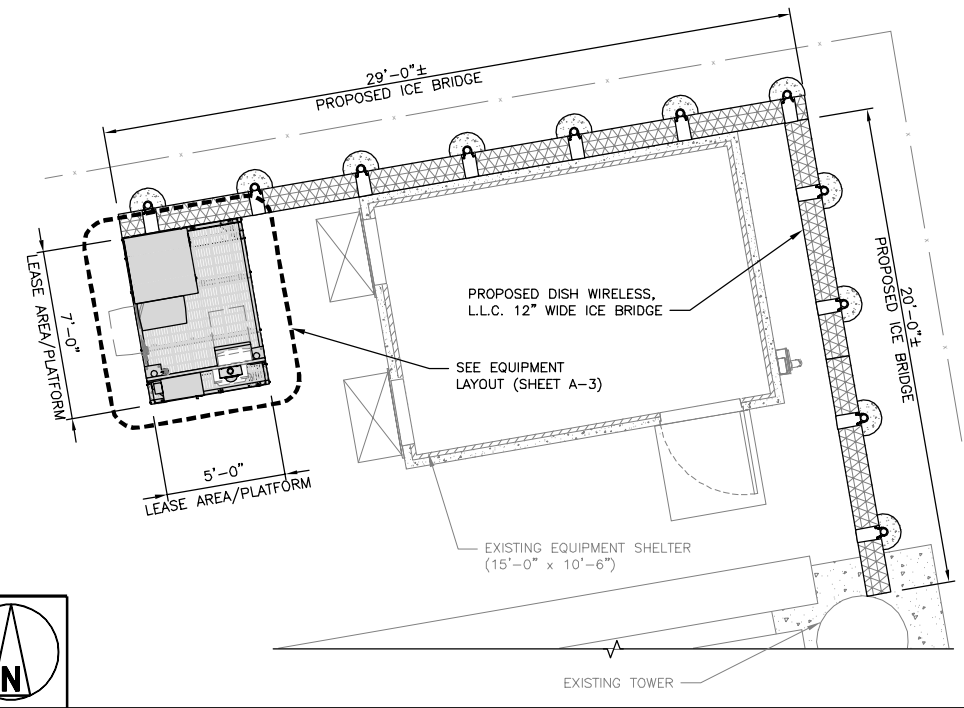
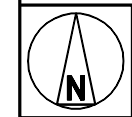
**SHEET NUMBER**  
A-1



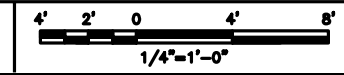
**OVERALL SITE PLAN**



1



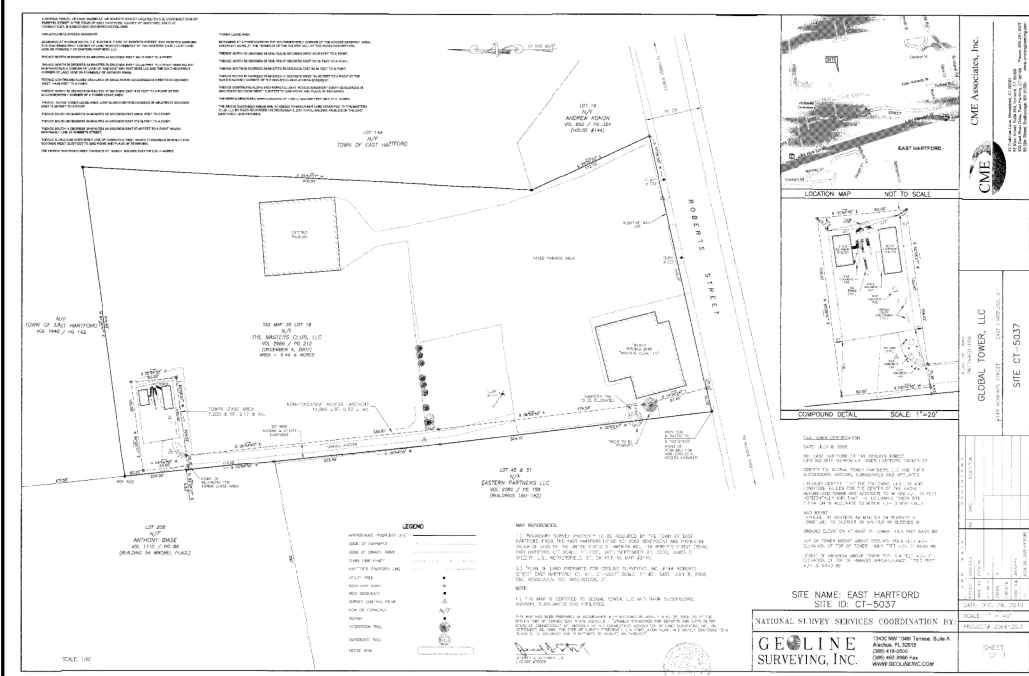
**ENLARGED SITE PLAN**



2

**NOTES**

1. THE SURVEY PROVIDED ON THIS SHEET IS PROVIDED FOR REFERENCE ONLY, THE UTILITY ROUTE AND EXISTING EASEMENTS MUST BE VERIFIED PRIOR TO CONSTRUCTION.



**EXISTING SURVEY (BY OTHERS)**

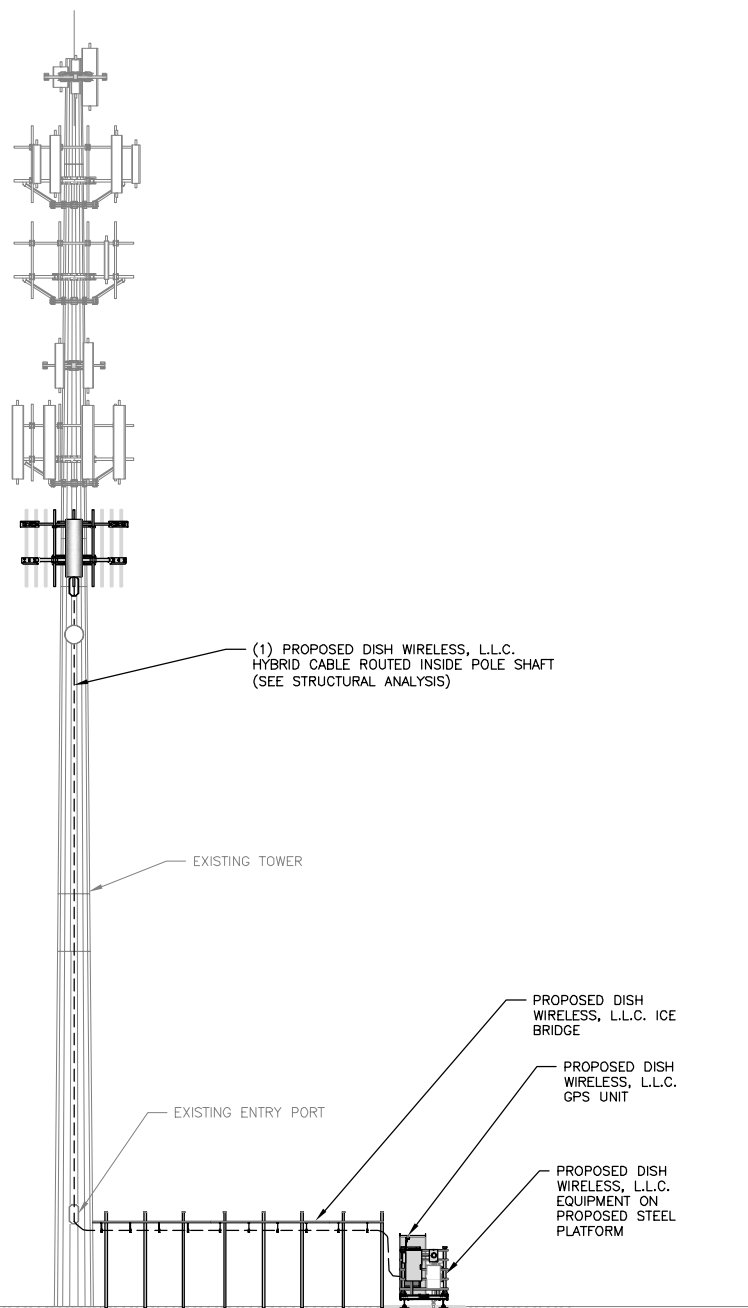
NO SCALE

3

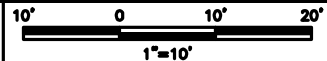
**NOTES**

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.

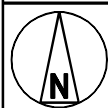
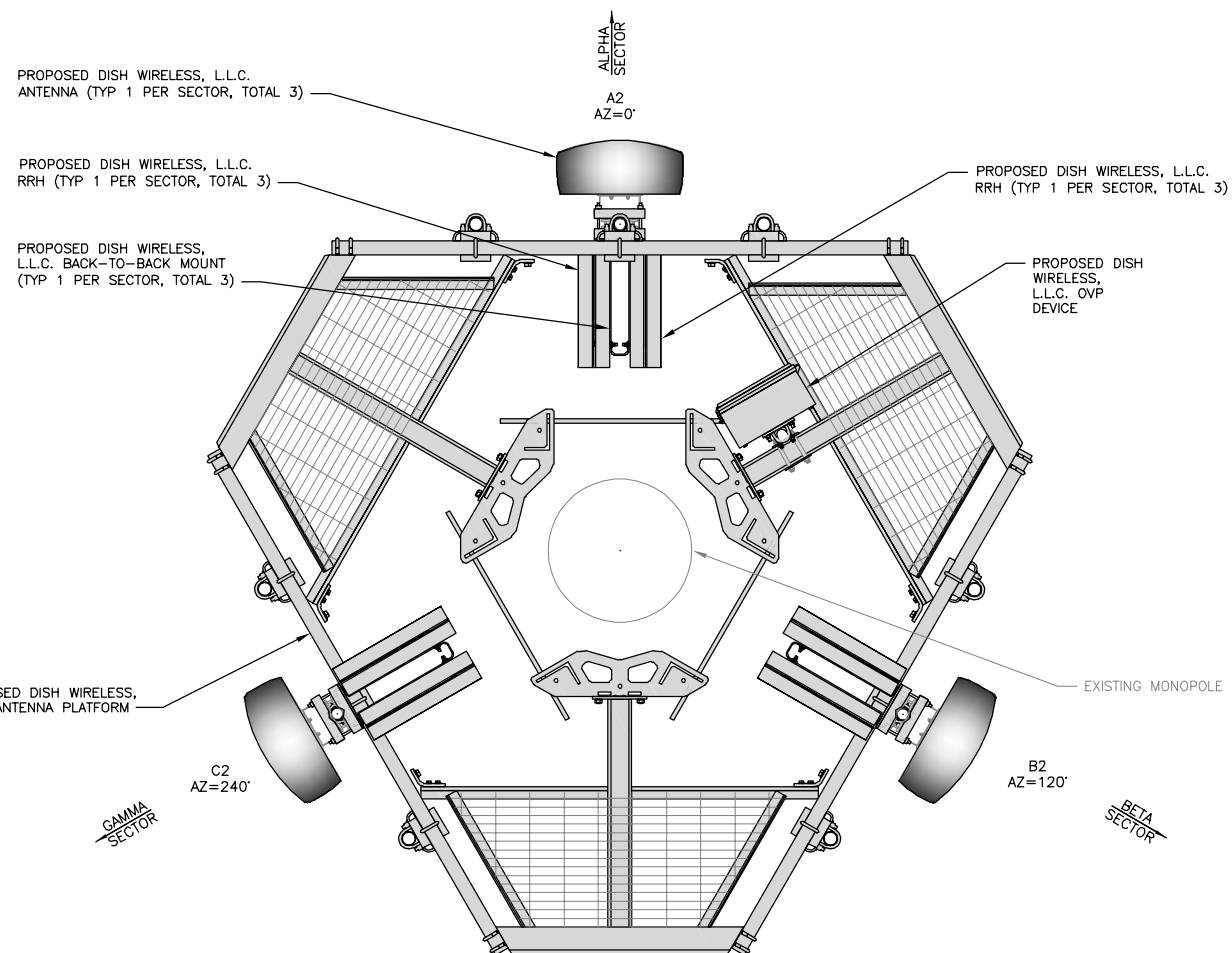
- EXISTING HIGHEST APPURTENANCE  
TOP EL. @ 135'-0"± AGL
- EXISTING TOWER  
TOP EL. @ 130'-0" AGL
- EXISTING PANEL ANTENNAS  
RAD CENTER @ 128'-0" AGL
- EXISTING PANEL ANTENNAS  
RAD CENTER @ 119'-0" AGL
- EXISTING PANEL ANTENNAS  
RAD CENTER @ 109'-0" AGL
- EXISTING PANEL ANTENNAS  
RAD CENTER @ 98'-0" AGL
- EXISTING PANEL ANTENNAS  
RAD CENTER @ 90'-0" AGL
- (3) PROPOSED DISH WIRELESS, L.L.C. ANTENNAS  
RAD CENTER @ 79'-0" AGL
- PROPOSED DISH WIRELESS, L.L.C. EXIT PORT  
RAD CENTER @ 75'-0"± AGL
- EXISTING MICROWAVE DISH  
RAD CENTER @ 70'-0" AGL



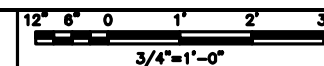
**PROPOSED NORTH ELEVATION**



1



**ANTENNA LAYOUT**



2

SECTOR	POSITION	ANTENNA					TRANSMISSION CABLE	
		EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A2	PROPOSED	JMA - MX08FRO665-21	5G	72.0" x 20.0"	0°	79'-0"	(1) HIGH-CAPACITY HYBRID CABLE (151' LONG)
BETA	B2	PROPOSED	JMA - MX08FRO665-21	5G	72.0" x 20.0"	120°	79'-0"	
GAMMA	C2	PROPOSED	JMA - MX08FRO665-21	5G	72.0" x 20.0"	240°	79'-0"	
SECTOR	POSITION	RRH		<b>NOTES</b> 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.				
		MANUFACTURER - MODEL NUMBER	TECHNOLOGY					
ALPHA	A2	FUJITSU - TA08025-B605	N66, N70					
	A2	FUJITSU - TA08025-B604	N29, N71					
BETA	B2	FUJITSU - TA08025-B605	N66, N70					
	B2	FUJITSU - TA08025-B604	N29, N71					
GAMMA	C2	FUJITSU - TA08025-B605	N66, N70					
	C2	FUJITSU - TA08025-B604	N29, N71					
SECTOR	POSITION	OVP						
		MANUFACTURER - MODEL NUMBER	TECHNOLOGY					
ALPHA	-	RAYCAP - RDIDC-9181-PF-48	--					

**ANTENNA SCHEDULE**

NO SCALE

3



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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

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

RFDS REV #: 1

**CONSTRUCTION DOCUMENTS**

**SUBMITTALS**

REV	DATE	DESCRIPTION
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1	12/14/2021	ISSUED FOR CONSTRUCTION



12/14/2021

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.

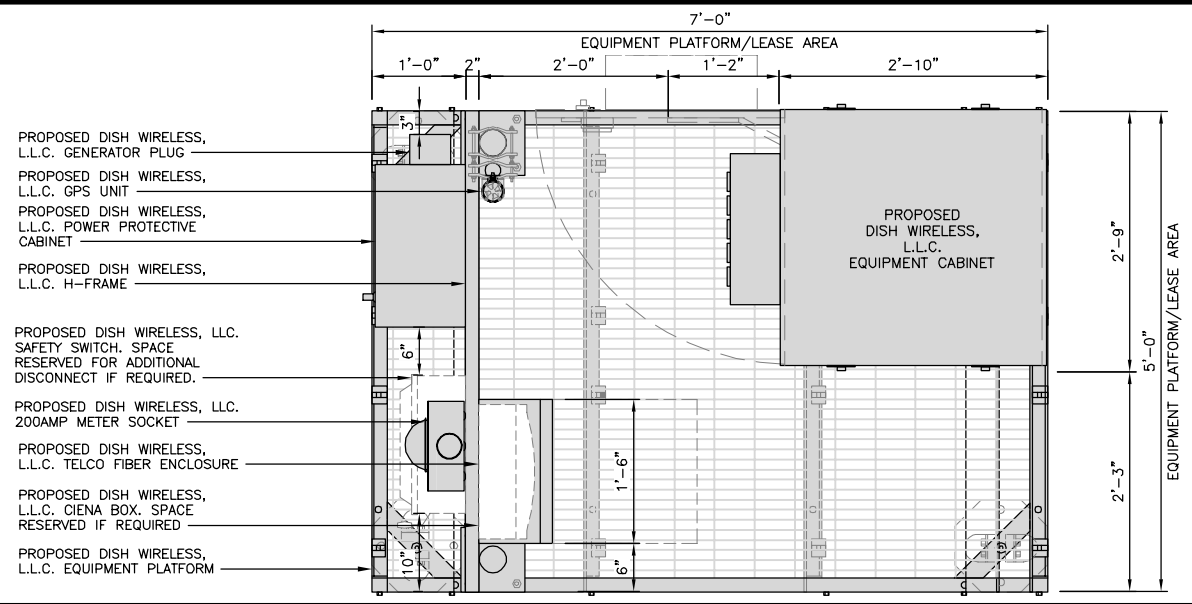
**A&E PROJECT NUMBER**  
**370626-13726411**

**DISH WIRELESS, L.L.C. PROJECT INFORMATION**  
**BBDL00032B**  
**148 ROBERTS ST.**  
**EAST HARTFORD, CT 06108**

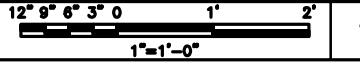
**SHEET TITLE**  
**ELEVATION, ANTENNA LAYOUT AND SCHEDULE**

**SHEET NUMBER**

**A-2**

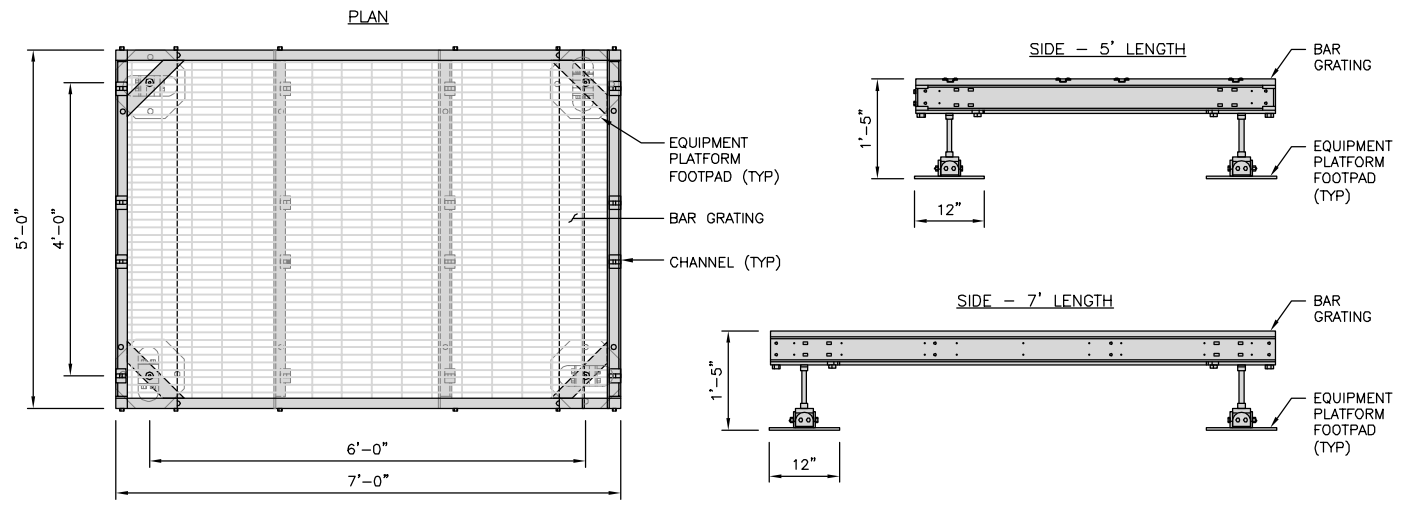


PLATFORM EQUIPMENT PLAN



COMMSCOPE MTC4045LP 5X7 PLATFORM	
DIMENSIONS (HxWxD)	16"x84"x60"
TOTAL WEIGHT	423 LBS

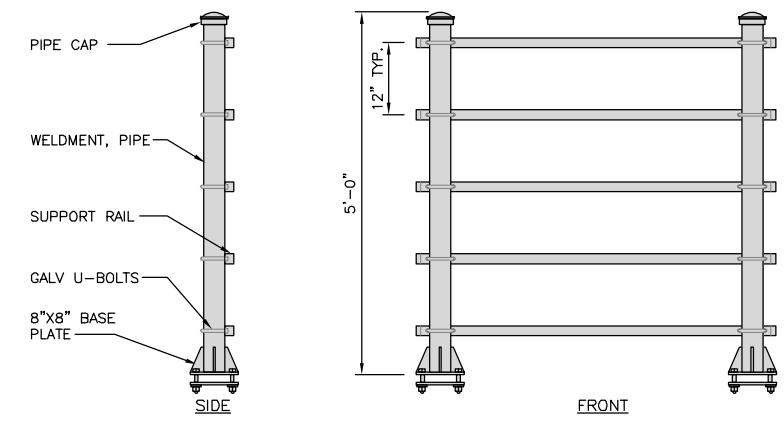
NOTE:  
GC TO PROVIDE EXTENDED THREAD FOR PLATFORM IF REQUIRED HEIGHT EXCEEDS 17"  
PLATFORM TO BE WITHIN 1' OF LEVEL



PLATFORM DETAIL

NO SCALE 2

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



H-FRAME DETAIL

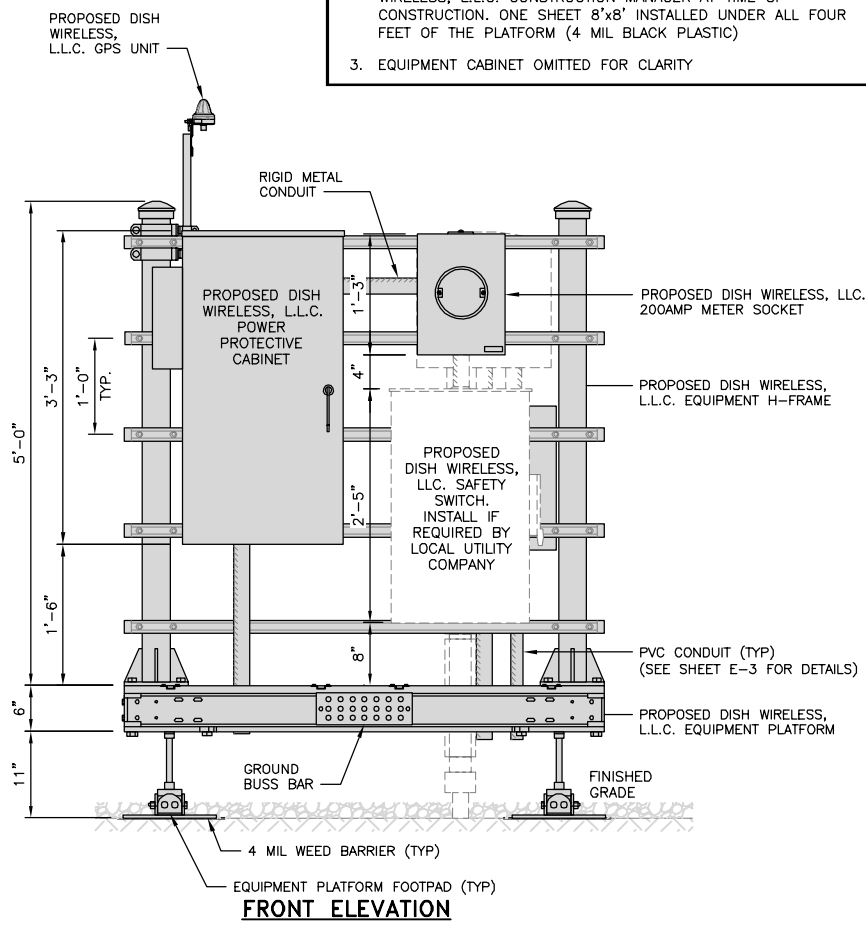
NO SCALE 3

NOT USED

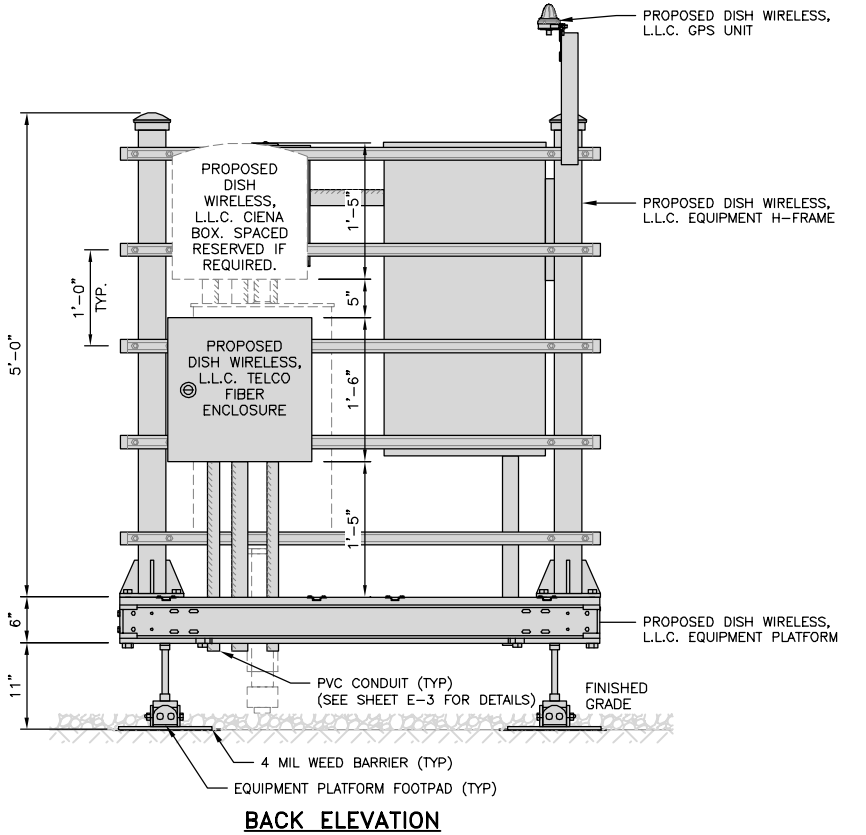
NO SCALE 4

NOTES

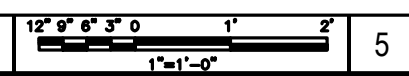
- CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
- WEED BARRIER FABRIC TO BE ADDED AT DISCRETION OF DISH WIRELESS, L.L.C. CONSTRUCTION MANAGER AT TIME OF CONSTRUCTION. ONE SHEET 8'x8' INSTALLED UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)
- EQUIPMENT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



FRONT ELEVATION



BACK ELEVATION



H-FRAME EQUIPMENT ELEVATION

NO SCALE 5



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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

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RDS	BIW	BIW

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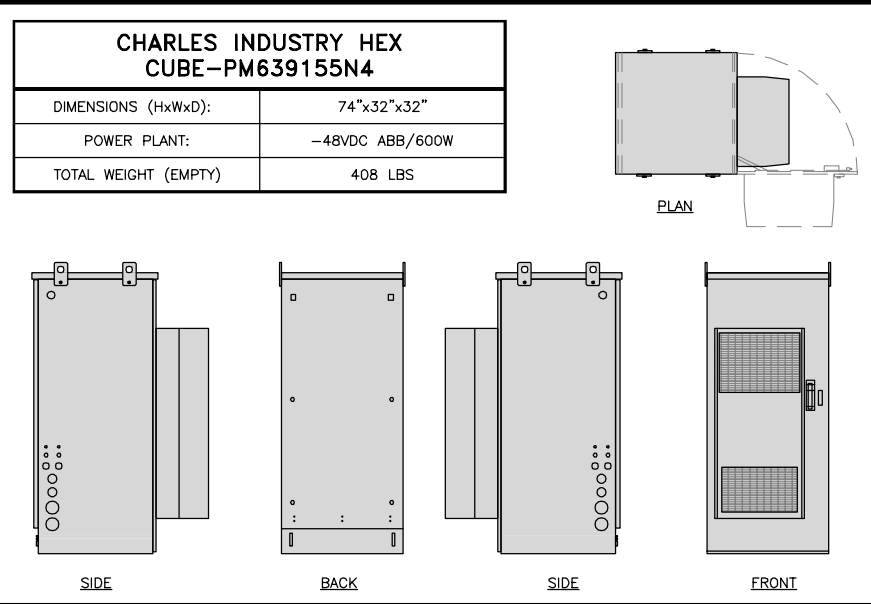
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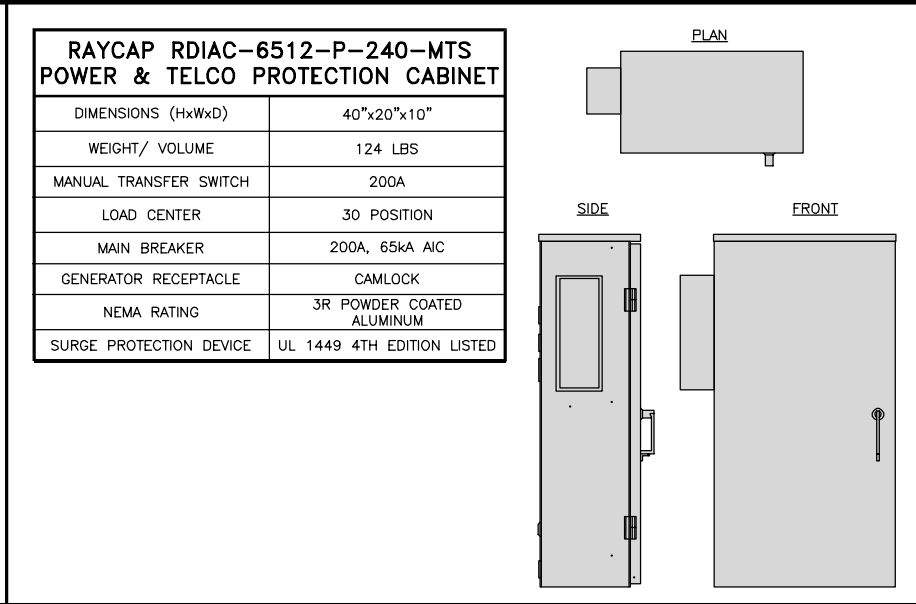
DISH WIRELESS, L.L.C.  
PROJECT INFORMATION  
BBDL00032B  
148 ROBERTS ST.  
EAST HARTFORD, CT 06108

SHEET TITLE  
EQUIPMENT PLATFORM AND  
H-FRAME DETAILS

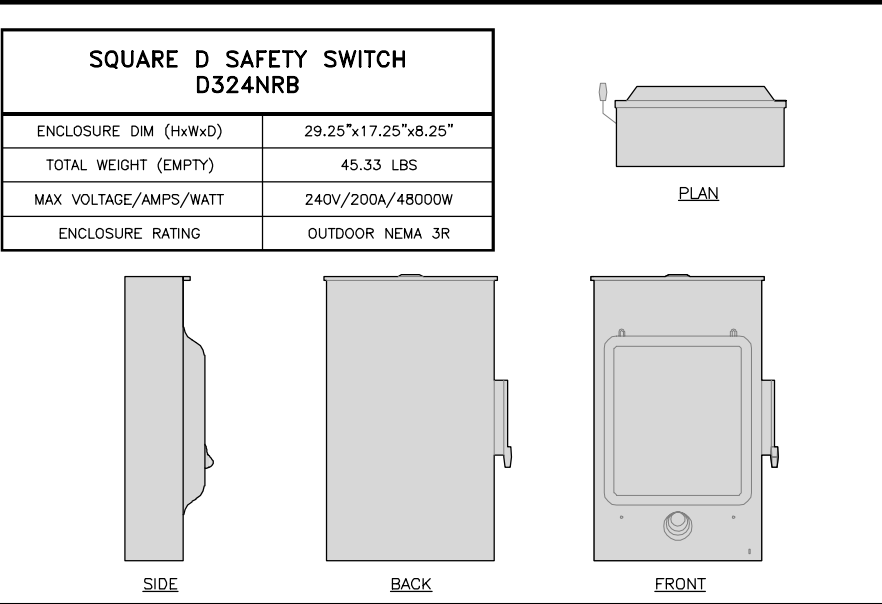
SHEET NUMBER  
A-3



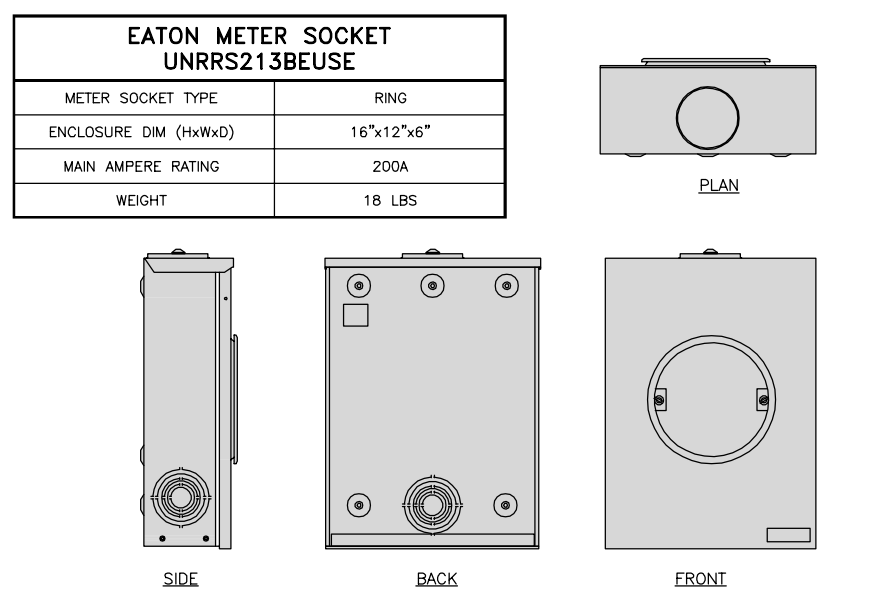
**CABINET DETAIL** NO SCALE 1



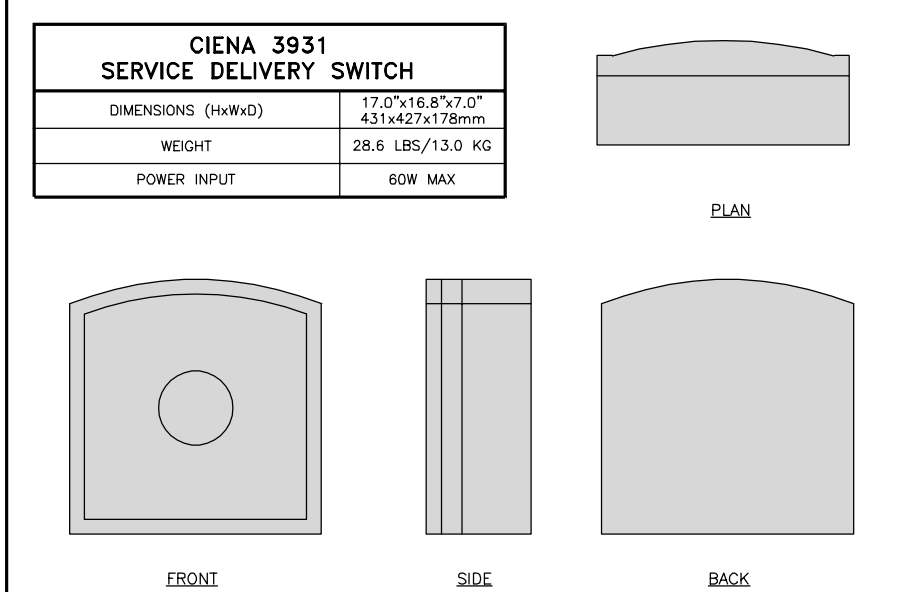
**POWER PROTECTION CABINET (PPC) DETAIL** NO SCALE 2



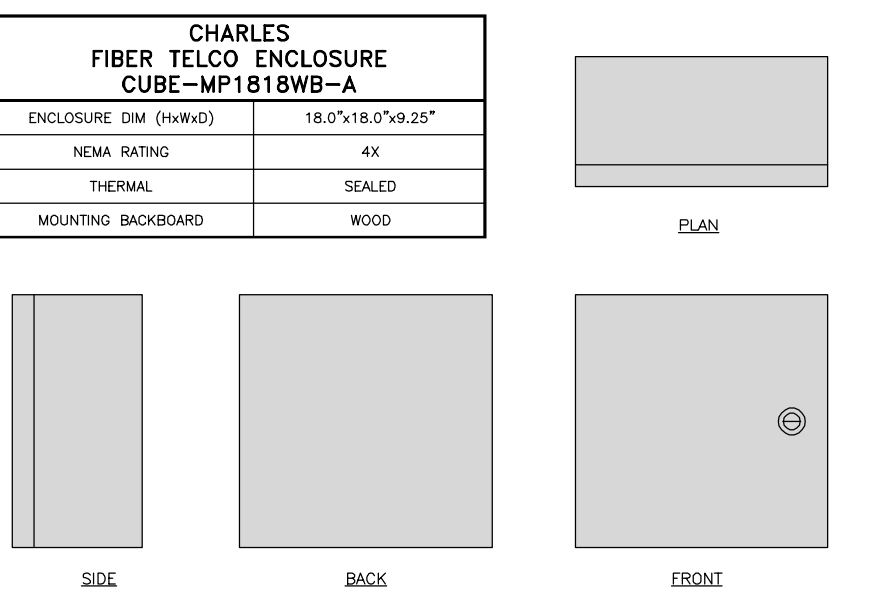
**SAFETY SWITCH** NO SCALE 3



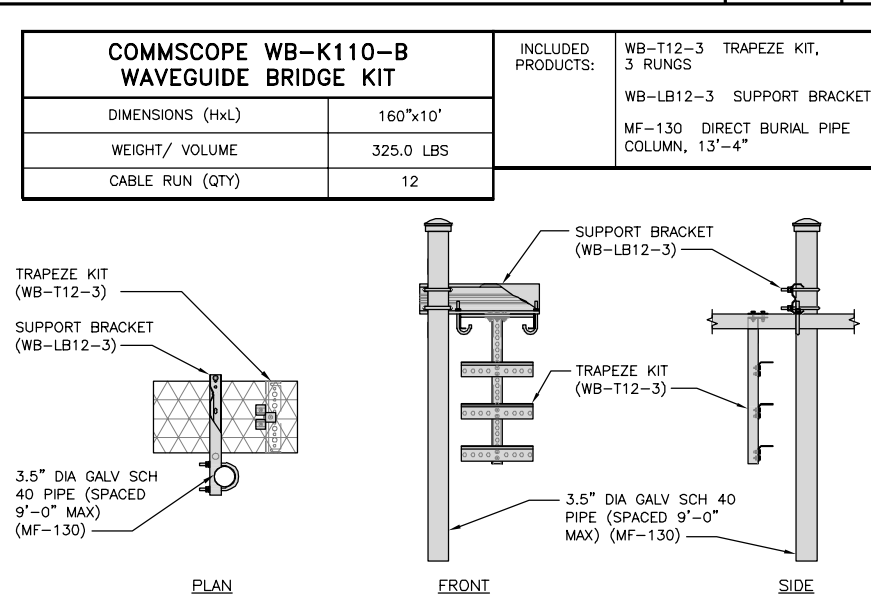
**METER SOCKET DETAIL** NO SCALE 4



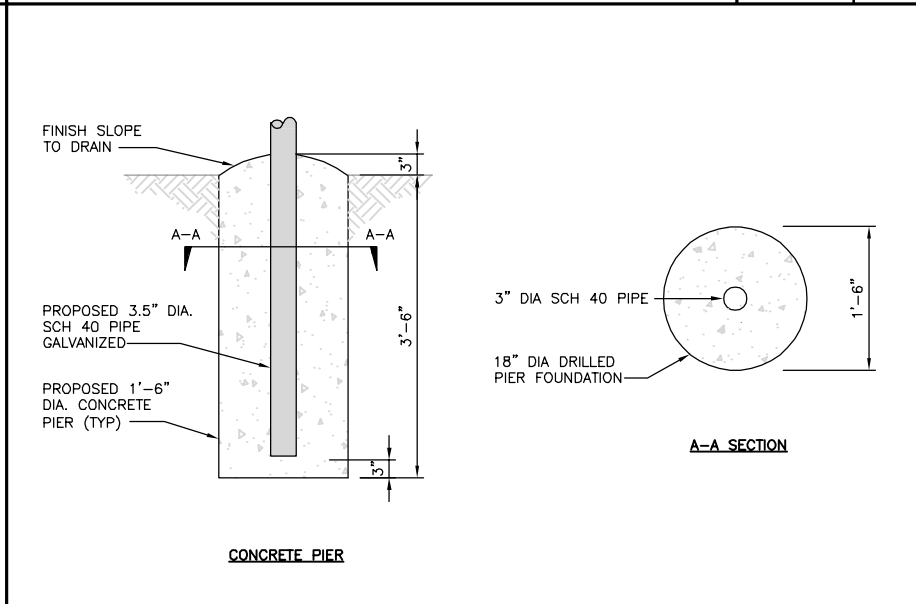
**CIENA DETAIL** NO SCALE 5



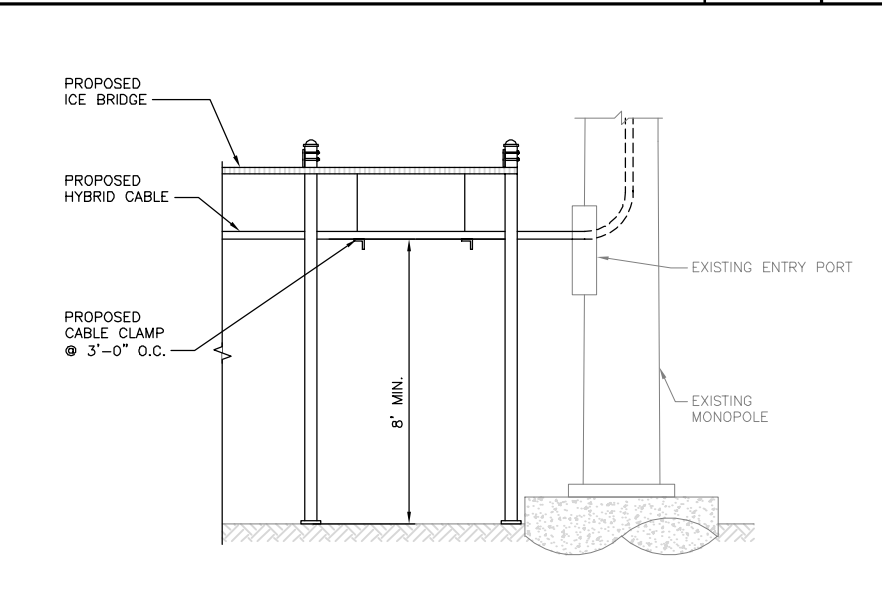
**FIBER TELCO ENCLOSURE DETAIL** NO SCALE 6



**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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NB+C ENGINEERING SERVICES, LLC.  
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(919) 657-9131

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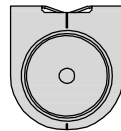
**DISH WIRELESS, LLC. PROJECT INFORMATION**  
BBDL00032B  
148 ROBERTS ST.  
EAST HARTFORD, CT 06108

**SHEET TITLE**  
EQUIPMENT DETAILS

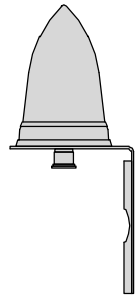
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A-4



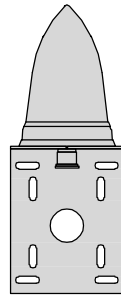
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



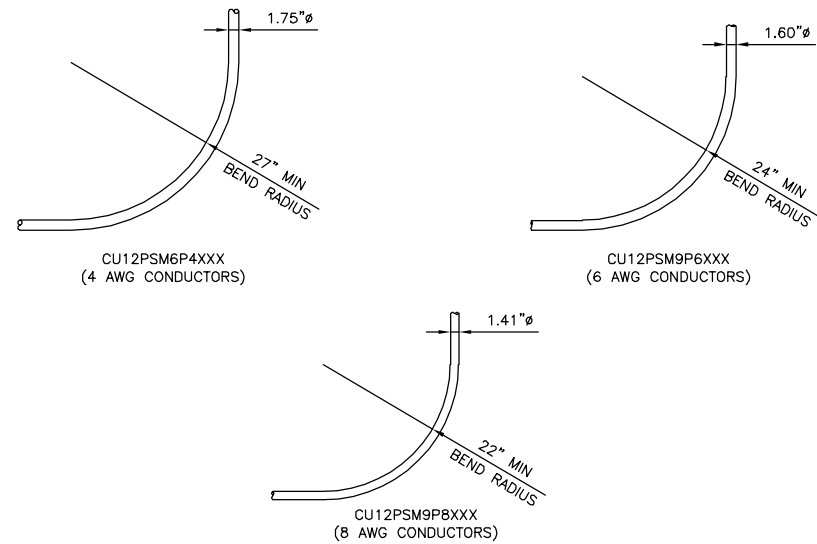
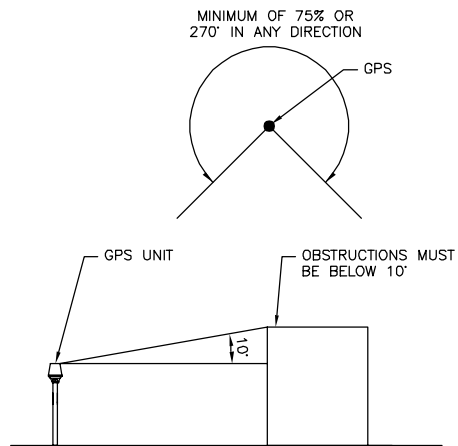
TOP



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

**dish**  
wireless.

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

**NB+C**  
TOTALLY COMMITTED.

NB+C ENGINEERING SERVICES, LLC.  
8601 SIX FORKS ROAD, SUITE 540  
RALEIGH, NC 27615  
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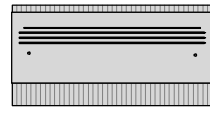
A&E PROJECT NUMBER  
370626-13726411

DISH WIRELESS, L.L.C.  
PROJECT INFORMATION  
BBDL00032B  
148 ROBERTS ST.  
EAST HARTFORD, CT 06108

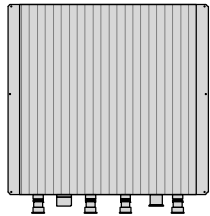
SHEET TITLE  
EQUIPMENT DETAILS

SHEET NUMBER  
A-5

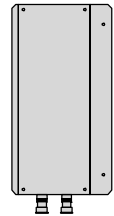
FUJITSU DUAL BAND TA08025-B604	
DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



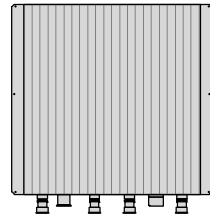
PLAN



BACK

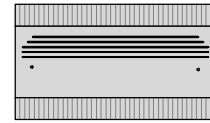


SIDE

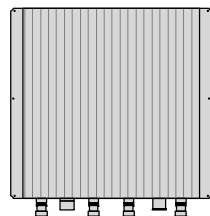


FRONT

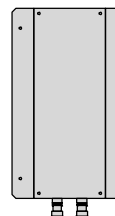
FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



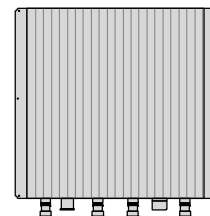
PLAN



BACK



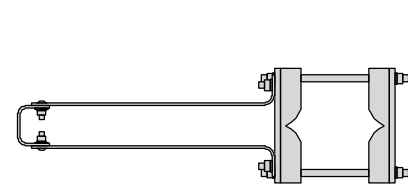
SIDE



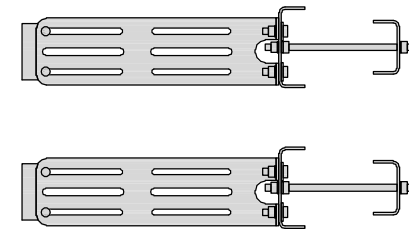
FRONT

COMMSCOPE RR-FA2 SMALL STABILIZER	
DIMENSIONS (HxWxD)	16.4"x8.5"x18"
WEIGHT	39.2 lbs

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



PLAN



SIDE

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

RRH\_DETAIL

NO SCALE

1

RRH\_DETAIL

NO SCALE

2

RRH\_MOUNT\_DETAIL

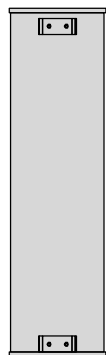
NO SCALE

3

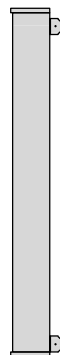
JMA WIRELESS MX08FR0665-21 ANTENNA	
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	64.5 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE



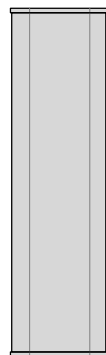
PLAN



BACK



SIDE



FRONT

ANTENNA\_DETAIL

NO SCALE

4

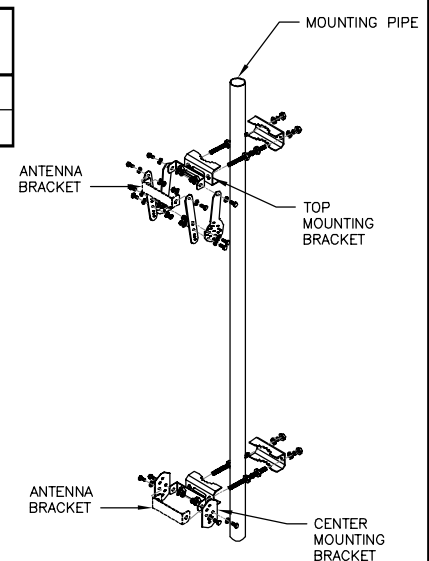
NOT USED

NO SCALE

5

JMA ANTENNA MOUNT BRACKET #91900318	
TOTAL WEIGHT (WITH BRACKETS)	18 lbs (8.18 Kg)
POLE DIAMETER RANGE	2.5" TO 4.5"

NOTE:  
KIT #91900318: TOP AND BOTTOM BRACKETS  
FOR 4-, 6-, AND 8-FOOT ANTENNAS  
ANTENNA BRACKET NOT PART OF KIT



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

ANTENNA BRACKET\_DETAIL

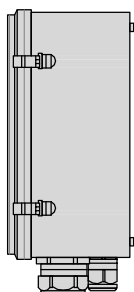
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6

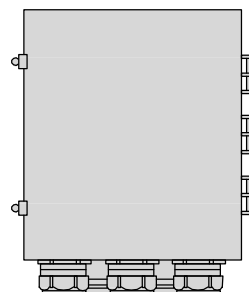
RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



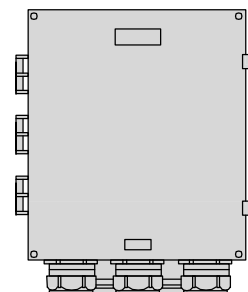
PLAN



SIDE



BACK



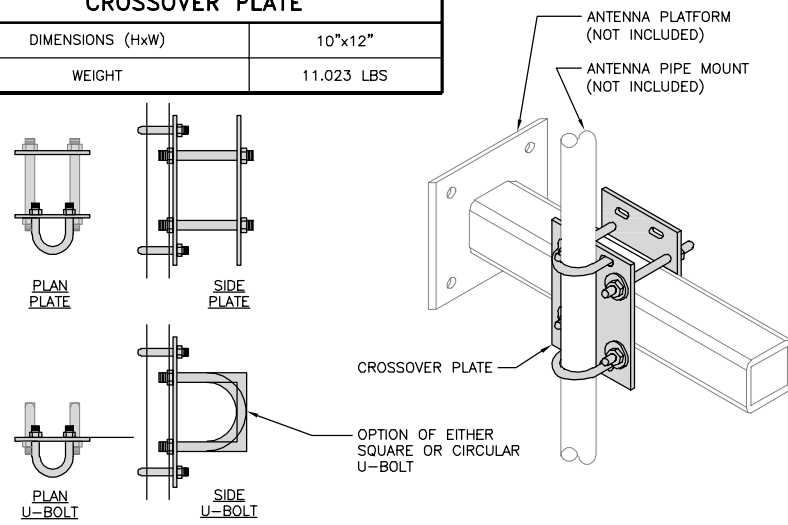
FRONT

SURGE SUPPRESSION\_DETAIL (OVP)

NO SCALE

7

COMMSCOPE XP-2040 CROSSOVER PLATE	
DIMENSIONS (HxW)	10"x12"
WEIGHT	11.023 LBS



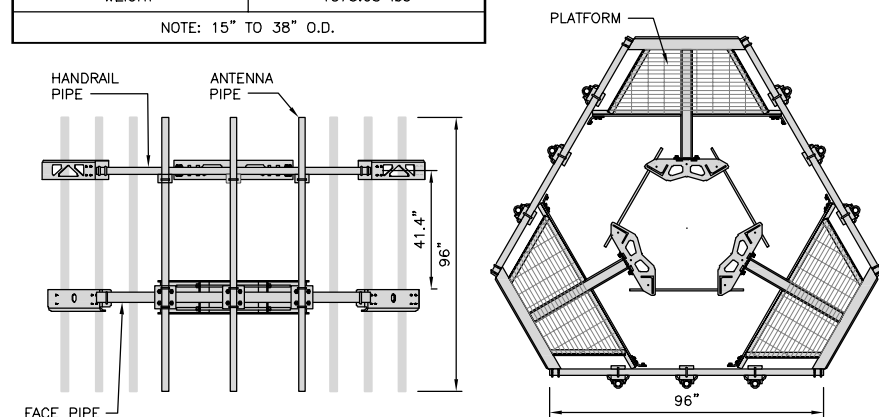
RRH/OVP\_MOUNT\_DETAIL

NO SCALE

8

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

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



ANTENNA PLATFORM\_DETAIL

NO SCALE

9



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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SHEET TITLE  
EQUIPMENT DETAILS

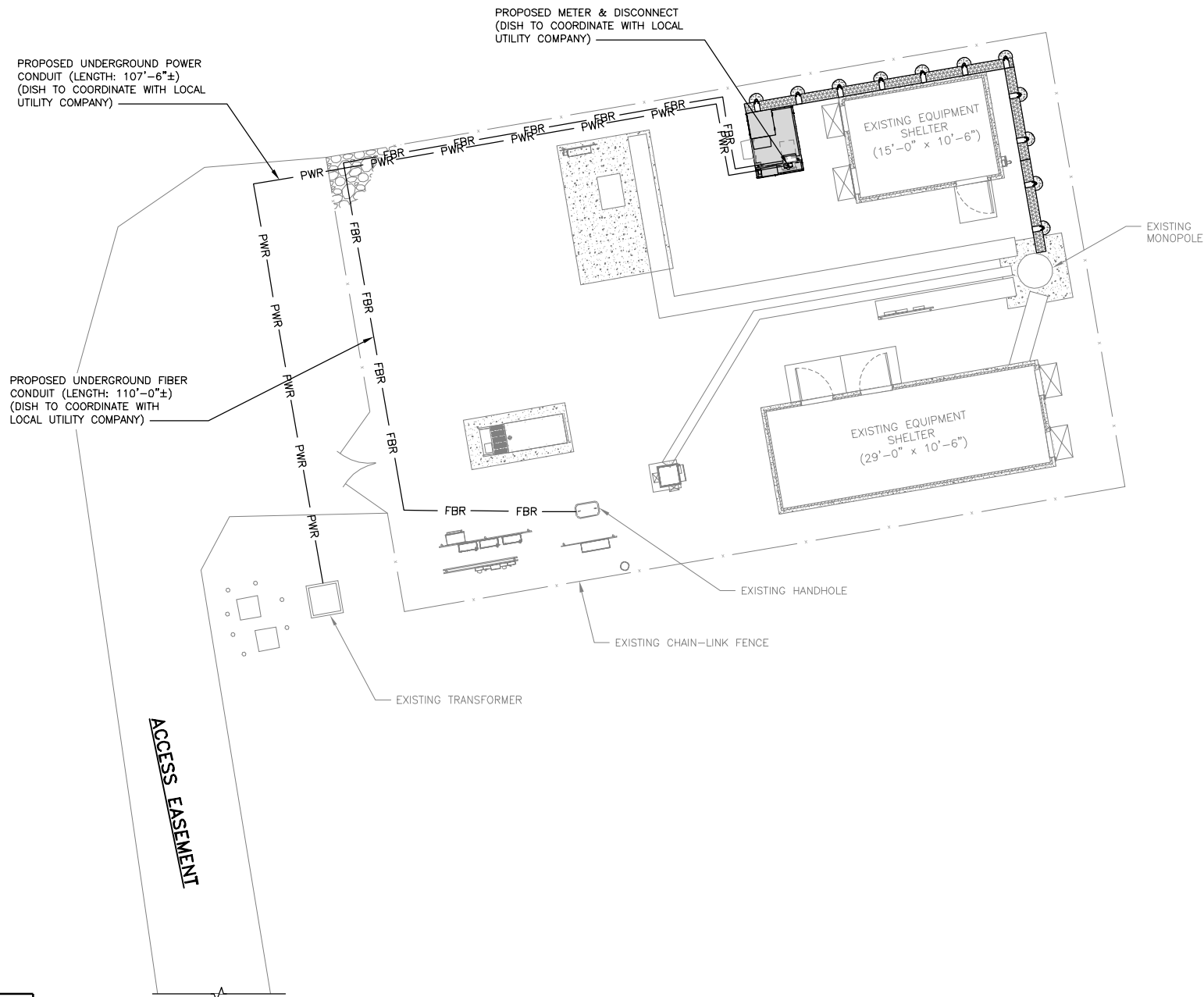
SHEET NUMBER  
A-6

**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



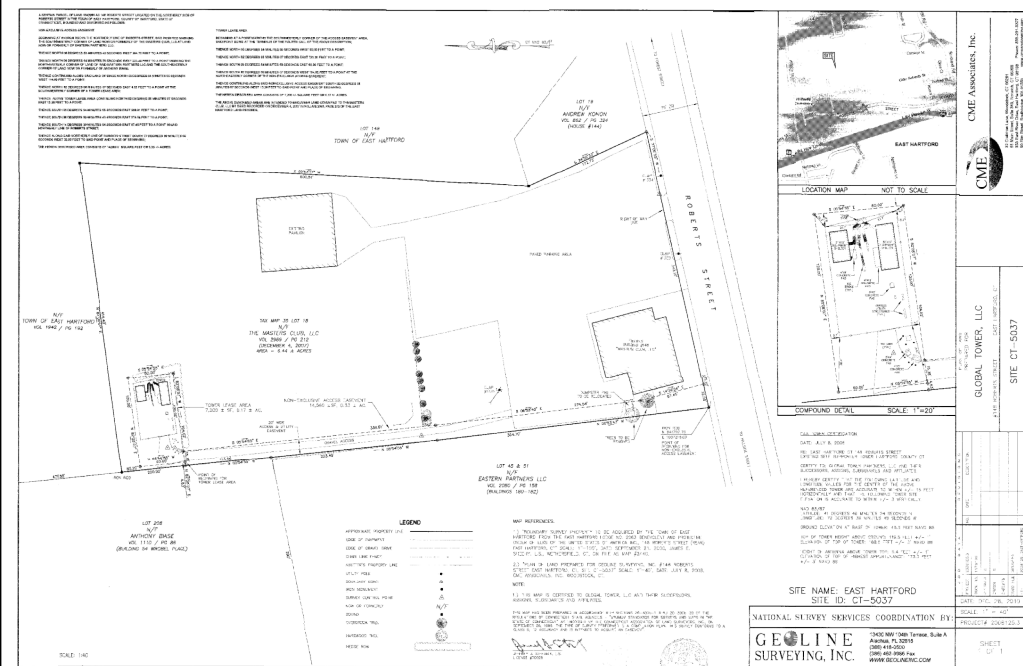
**ELECTRICAL NOTES**

NO SCALE

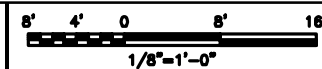
2

**NOTES**

1. THE SURVEY PROVIDED ON THIS SHEET IS PROVIDED FOR REFERENCE ONLY, THE UTILITY ROUTE AND EXISTING EASEMENTS MUST BE VERIFIED PRIOR TO CONSTRUCTION.



UTILITY ROUTE PLAN



1

EXISTING SURVEY (BY OTHERS)

NO SCALE

3



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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

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

RFDS REV #: 1

**CONSTRUCTION DOCUMENTS**

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12/14/2021

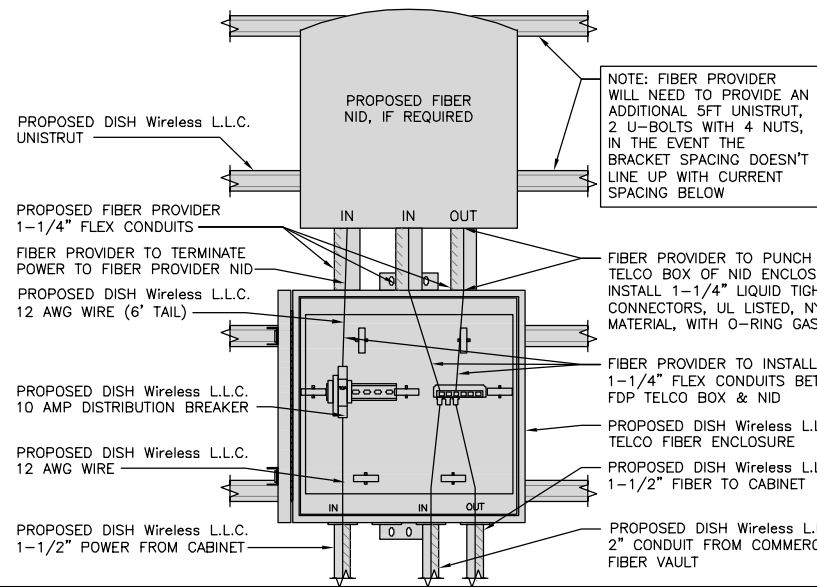
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A&E PROJECT NUMBER  
370626-13726411

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BBDL00032B  
148 ROBERTS ST.  
EAST HARTFORD, CT 06108

SHEET TITLE  
ELECTRICAL/FIBER ROUTE  
PLAN AND NOTES

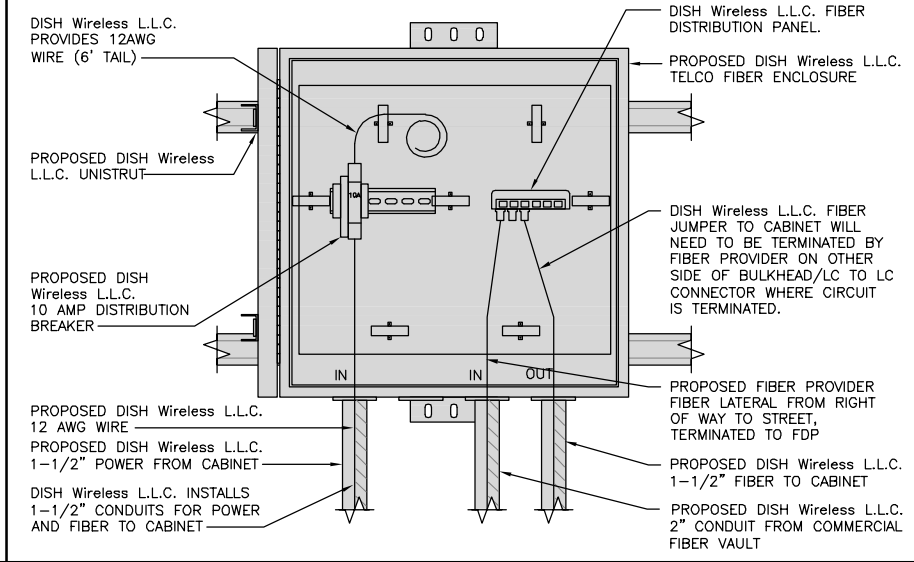
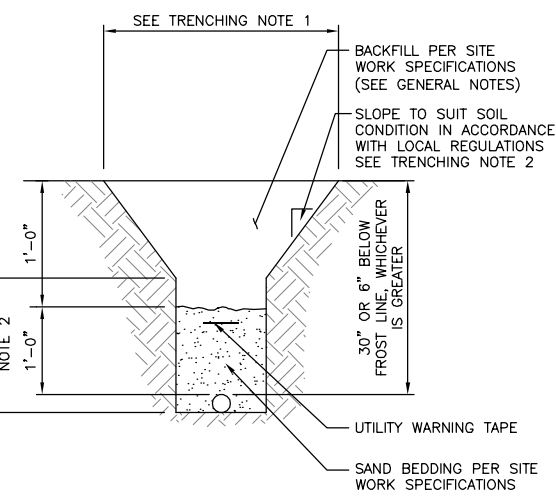
SHEET NUMBER  
E-1



NOTE: FIBER PROVIDER WILL NEED TO PROVIDE AN ADDITIONAL 5FT UNISTRUT, 2 U-BOLTS WITH 4 NUTS, IN THE EVENT THE BRACKET SPACING DOESN'T LINE UP WITH CURRENT SPACING BELOW

**TRENCHING NOTES**

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



LIT TELCO BOX – INTERIOR WIRING LAYOUT (OPTIONAL)

NO SCALE 1

TYPICAL UNDERGROUND TRENCH DETAIL

NO SCALE 2

DARK TELCO BOX – INTERIOR WIRING LAYOUT

NO SCALE 3

NOT USED

NO SCALE 4

NOT USED

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 7

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



**TOTALLY COMMITTED.**  
NB+C ENGINEERING SERVICES, L.L.C.  
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RALEIGH, NC 27615  
(919) 657-9131

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CHECKED BY: BIW  
APPROVED BY: BIW

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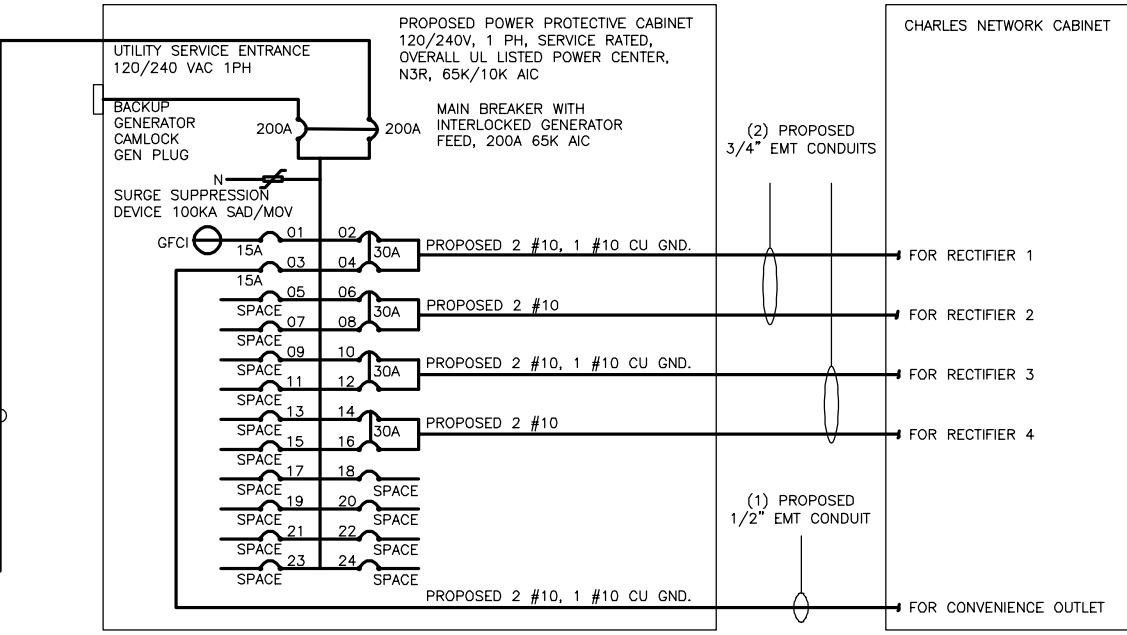
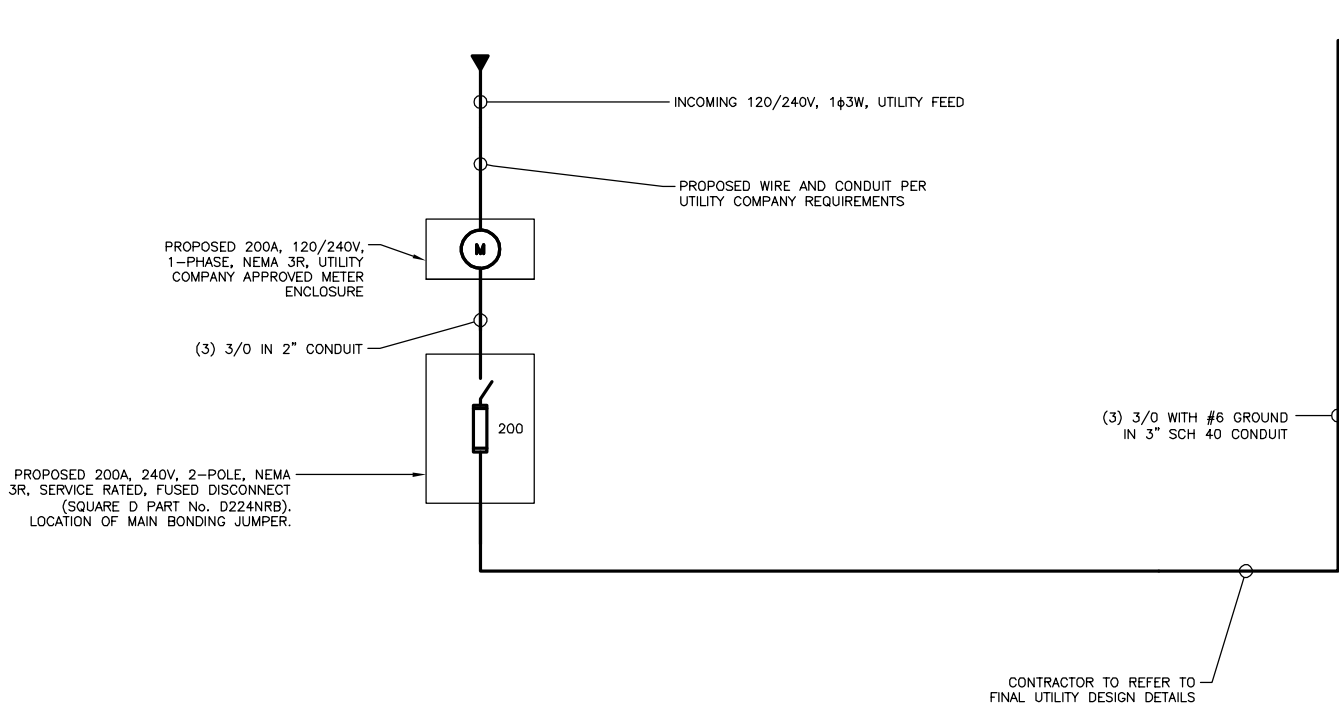
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PROJECT INFORMATION  
BBDL00032B  
148 ROBERTS ST.  
EAST HARTFORD, CT 06108

SHEET TITLE  
ELECTRICAL  
DETAILS

SHEET NUMBER  
E-2



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

BREAKERS REQUIRED:  
(4) 30A, 2P BREAKER - SQUARE D P/N:Q0230  
(1) 15A, 1P BREAKER - SQUARE D P/N:Q0115

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			15A	3	B	4	30A	2880	2880	ABB/GE INFINITY RECTIFIER 1
--SPACE--				5	A	6	30A	2880	2880	ABB/GE INFINITY RECTIFIER 2
--SPACE--				7	B	8	30A	2880	2880	ABB/GE INFINITY RECTIFIER 2
--SPACE--				9	A	10	30A	2880	2880	ABB/GE INFINITY RECTIFIER 3
--SPACE--				11	B	12	30A	2880	2880	ABB/GE INFINITY RECTIFIER 3
--SPACE--				13	A	14	30A	2880	2880	ABB/GE INFINITY RECTIFIER 4
--SPACE--				15	B	16	30A	2880	2880	ABB/GE INFINITY RECTIFIER 4
--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, 1 $\phi$ , 24 SPACE, 120/240V				L1	L2					
MB RATING: 65,000 AIC				11700	11700			VOLTAGE AMPS		
				98	98			AMPS		
				98				MAX AMPS		
				123				MAX 125%		

PANEL SCHEDULE

NO SCALE 2

NOT USED

NO SCALE 3



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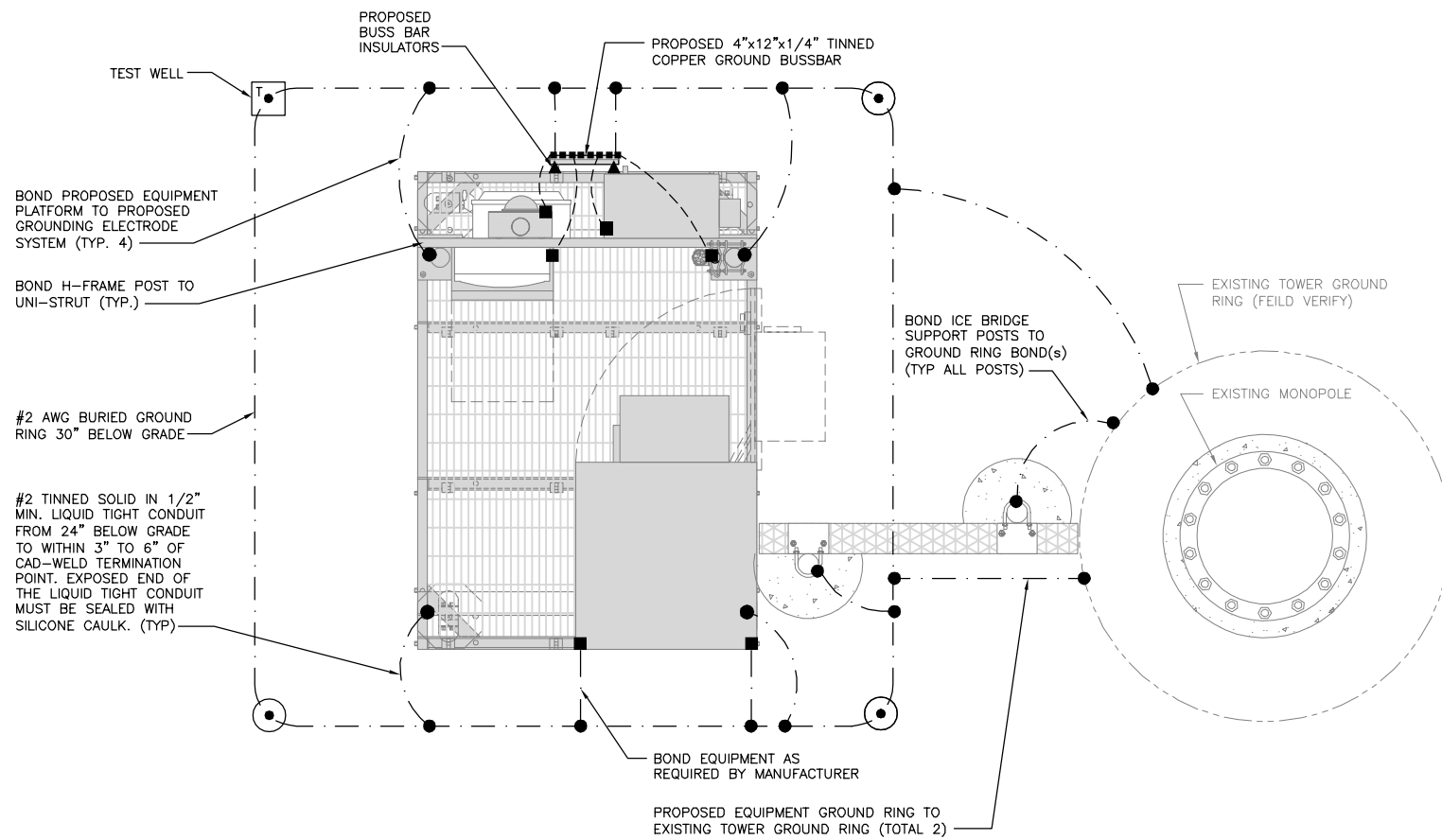
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PROJECT INFORMATION  
BBDL00032B  
148 ROBERTS ST.  
EAST HARTFORD, CT 06108

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

SHEET NUMBER  
E-3

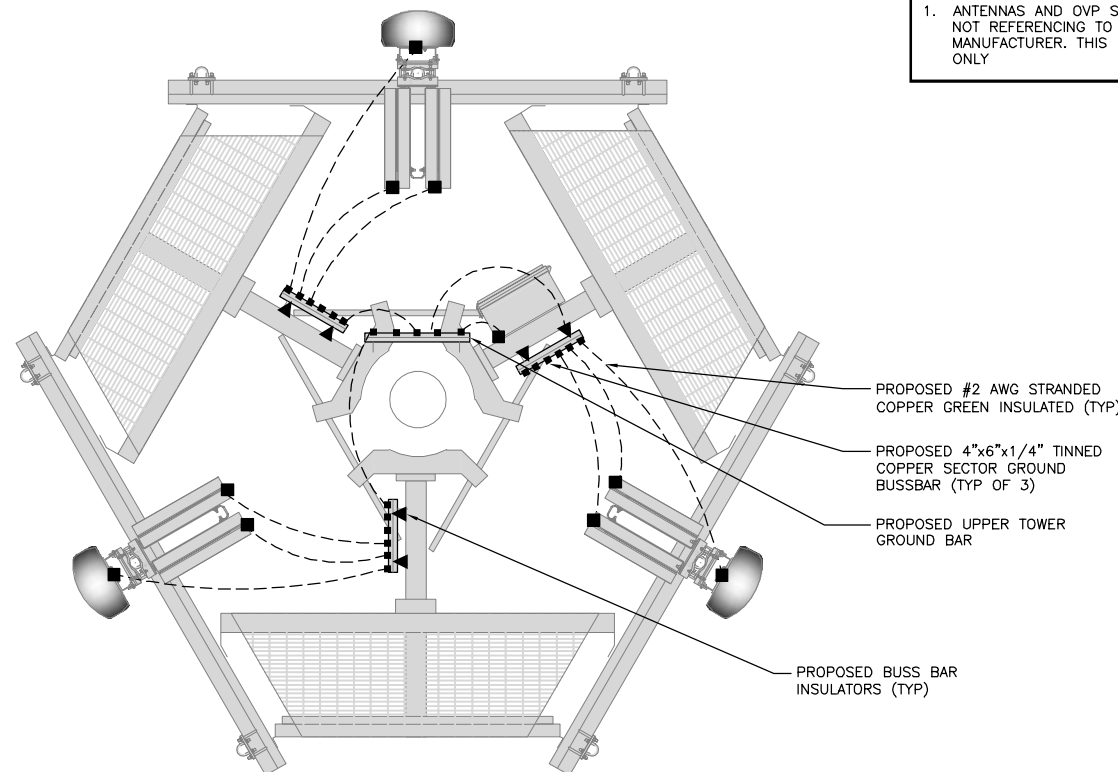


**TYPICAL EQUIPMENT GROUNDING PLAN**

NO SCALE 1

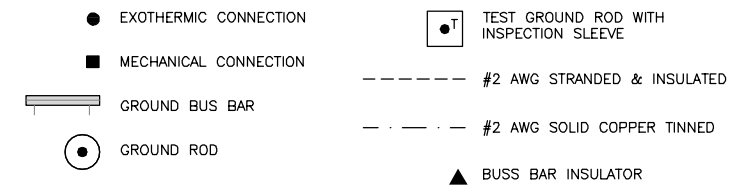
**NOTES**

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**

- (A) **EXTERIOR GROUND RING:** #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.
- (B) **TOWER GROUND RING:** THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.
- (C) **INTERIOR GROUND RING:** #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUND TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.
- (D) **BOND TO INTERIOR GROUND RING:** #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING.
- (E) **GROUND ROD:** UL LISTED COPPER CLAD STEEL. MINIMUM 5/8" DIAMETER BY EIGHT FEET LONG. GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR.

**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.

- (J) **TELCO GROUND BAR:** BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.
- (K) **FRAME BONDING:** THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.
- (L) **INTERIOR UNIT BONDS:** METAL FRAMES, CABINETS AND INDIVIDUAL METALLIC UNITS LOCATED WITH THE AREA OF THE INTERIOR GROUND RING REQUIRE A #6 AWG STRANDED GREEN INSULATED COPPER BOND TO THE INTERIOR GROUND RING.
- (M) **FENCE AND GATE GROUNDING:** METAL FENCES WITHIN 7 FEET OF THE EXTERIOR GROUND RING OR OBJECTS BONDED TO THE EXTERIOR GROUND RING SHALL BE BONDED TO THE GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTOR AT AN INTERVAL NOT EXCEEDING 25 FEET. BONDS SHALL BE MADE AT EACH GATE POST AND ACROSS GATE OPENINGS.
- (N) **EXTERIOR UNIT BONDS:** METALLIC OBJECTS, EXTERNAL TO OR MOUNTED TO THE BUILDING, SHALL BE BONDED TO THE EXTERIOR GROUND RING. USING #2 TINNED SOLID COPPER WIRE
- (P) **ICE BRIDGE SUPPORTS:** EACH ICE BRIDGE LEG SHALL BE BONDED TO THE GROUND RING WITH #2 AWG BARE TINNED COPPER CONDUCTOR. PROVIDE EXOTHERMIC WELDS AT BOTH THE ICE BRIDGE LEG AND BURIED GROUND RING.
- (Q) **DURING ALL DC POWER SYSTEM CHANGES** INCLUDING DC SYSTEM CHANGE OUTS, RECTIFIER REPLACEMENTS OR ADDITIONS, BREAKER DISTRIBUTION CHANGES, BATTERY ADDITIONS, BATTERY REPLACEMENTS AND INSTALLATIONS OR CHANGES TO DC CONVERTER SYSTEMS IT SHALL BE REQUIRED THAT SERVICE CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH A MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR
- (R) **TOWER TOP COLLECTOR BUSS BAR** IS TO BE MECHANICALLY BONDED TO PROPOSED ANTENNA MOUNT COLLAR. REFER TO DISH WIRELESS, L.L.C. GROUNDING NOTES.

**GROUNDING KEY NOTES**

NO SCALE 3



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LITTLETON, CO 80120



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8601 SIX FORKS ROAD, SUITE 540  
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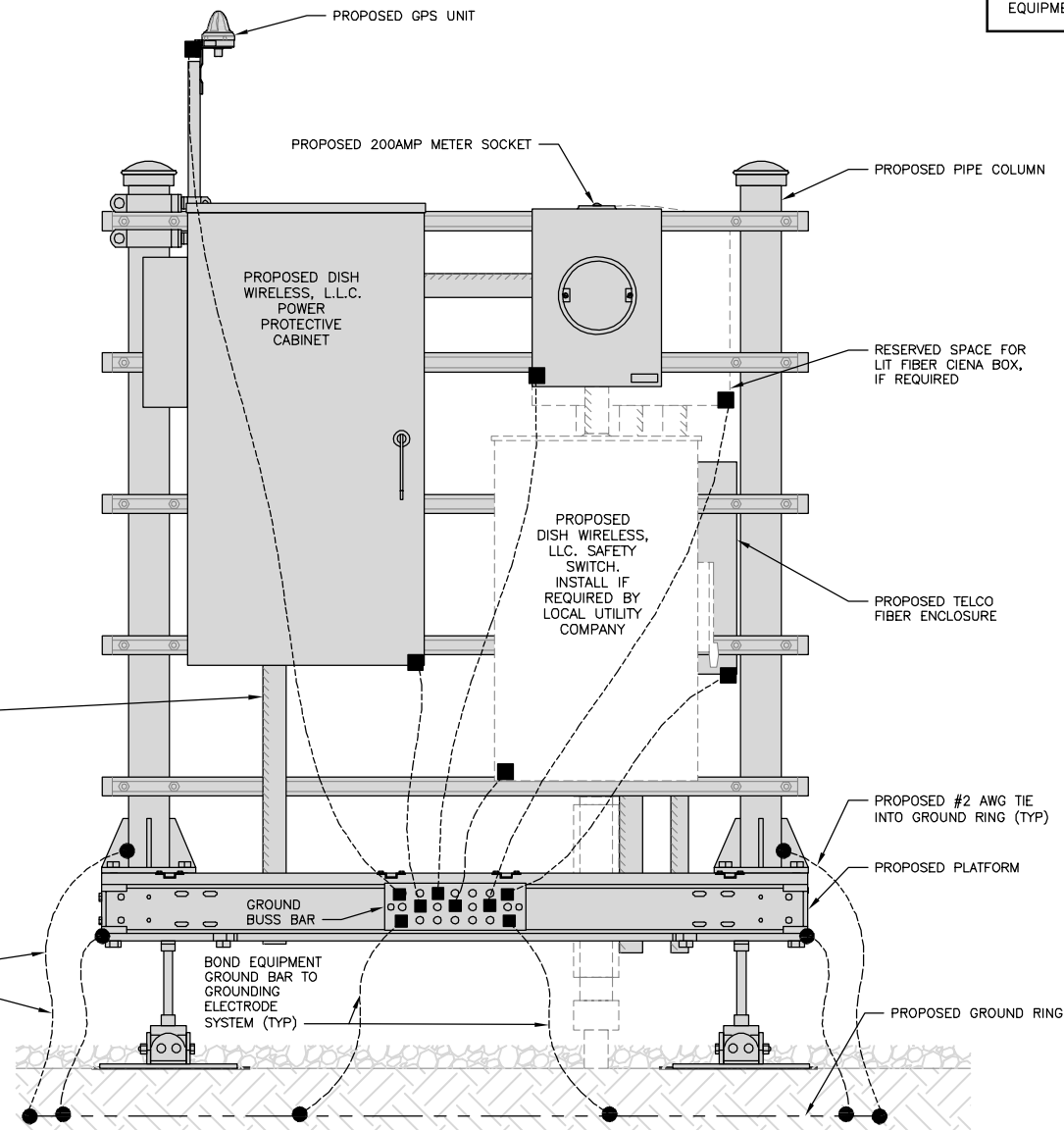
SHEET TITLE  
GROUNDING PLANS  
AND NOTES

SHEET NUMBER

G-1

**NOTES**

EQUIPMENT CABINET OMITTED FOR CLARITY

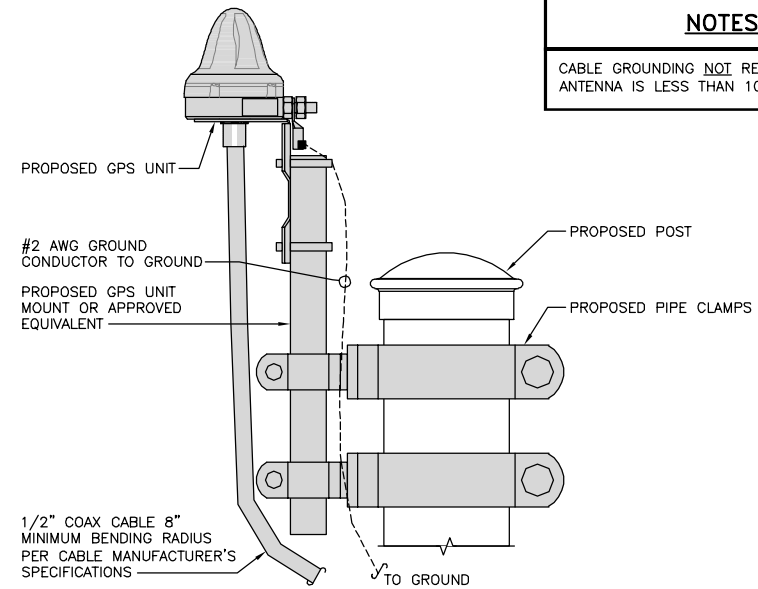


**H-FRAME GROUNDING DETAIL**

NO SCALE 1

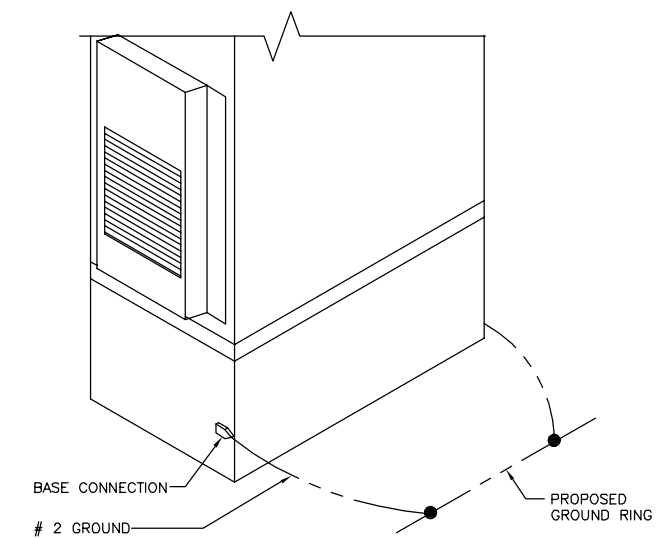
**NOTES**

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



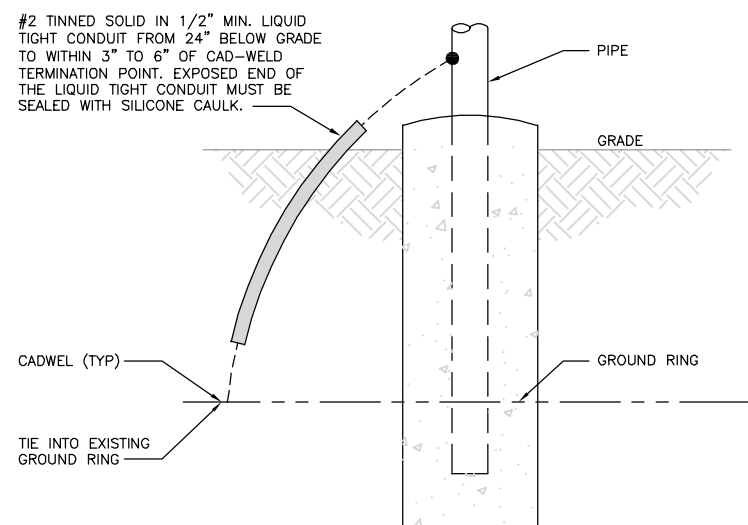
**TYPICAL GPS UNIT GROUNDING**

NO SCALE 2



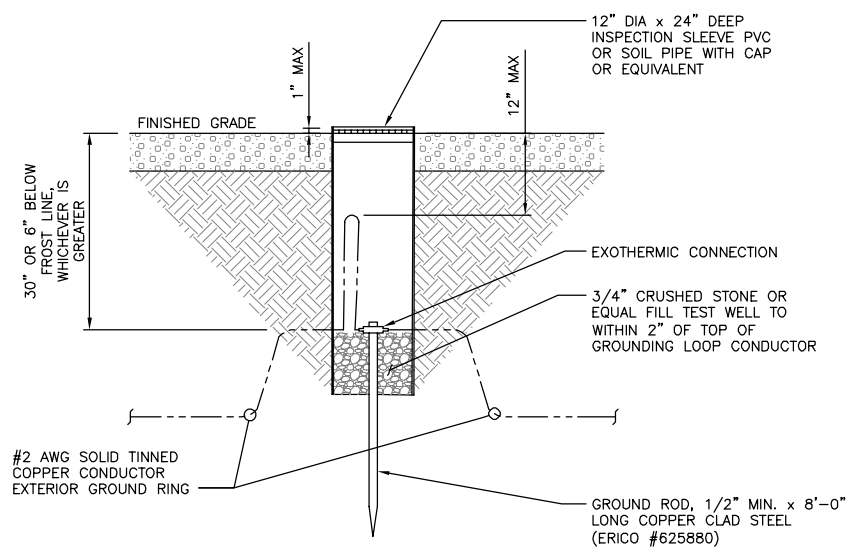
**OUTDOOR CABINET GROUNDING**

NO SCALE 3



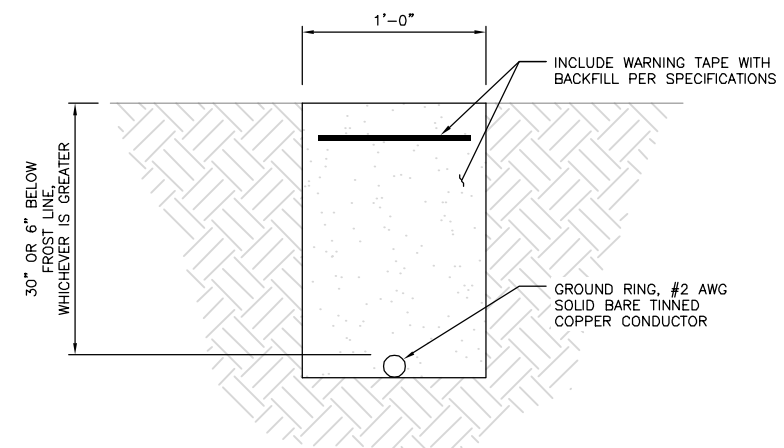
**TRANSITIONING GROUND DETAIL**

NO SCALE 4



**TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE**

NO SCALE 5



**TYPICAL GROUND RING TRENCH**

NO SCALE 6

**dish wireless.**

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

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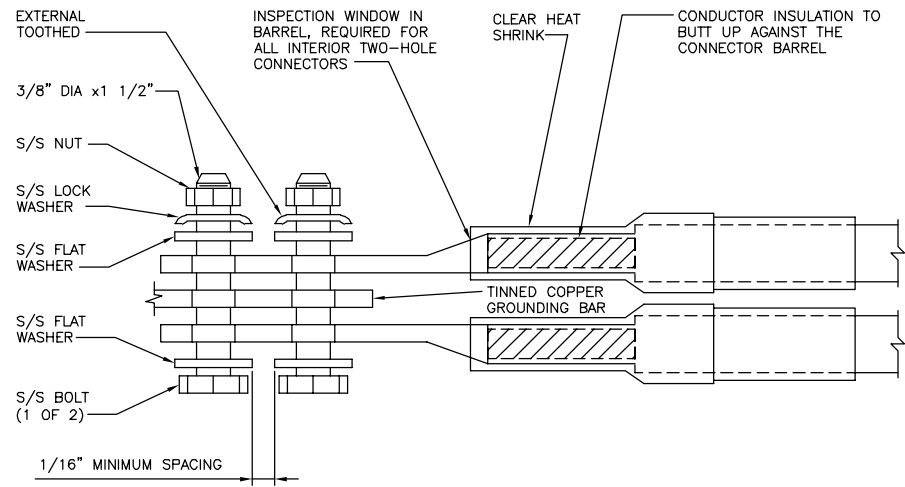
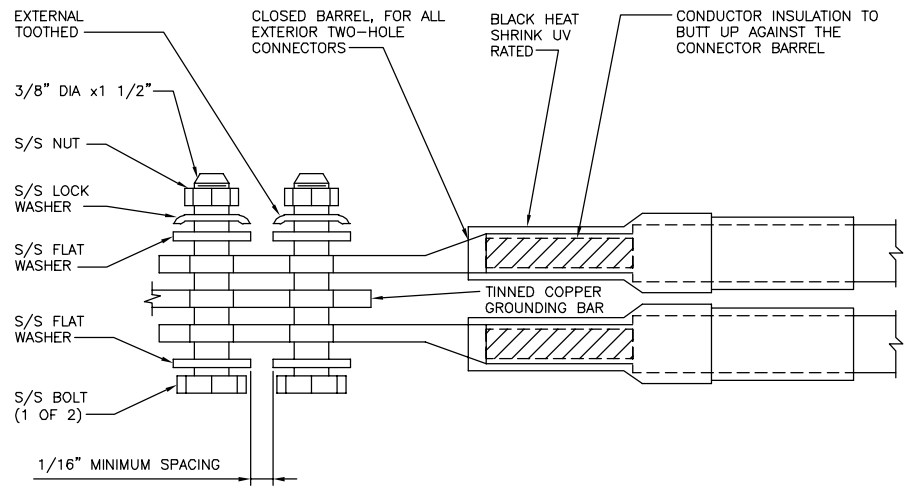
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BBDL00032B  
148 ROBERTS ST.  
EAST HARTFORD, CT 06108

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**

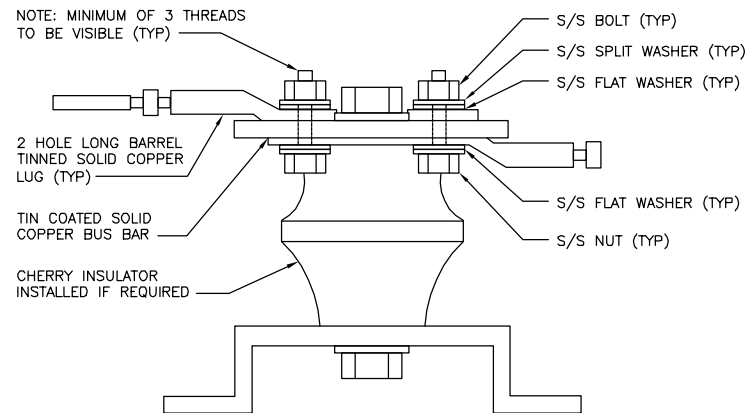
NO SCALE 1

**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



5701 SOUTH SANTA FE DRIVE  
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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	YELLOW	ORANGE
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

RF CABLE COLOR CODES

NO SCALE

1

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



CBRS TECH  
(3 GHz)



AWS  
(N66+N70+H-BLOCK)



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



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



**TOTALLY COMMITTED.**  
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8601 SIX FORKS ROAD, SUITE 540  
RALEIGH, NC 27615  
(919) 657-9131

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

RFDS REV #: 1

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A&E PROJECT NUMBER  
370626-13726411

DISH WIRELESS, L.L.C.  
PROJECT INFORMATION  
BBDL00032B  
148 ROBERTS ST.  
EAST HARTFORD, CT 06108

SHEET TITLE  
RF  
CABLE COLOR CODES

SHEET NUMBER  
**RF-1**

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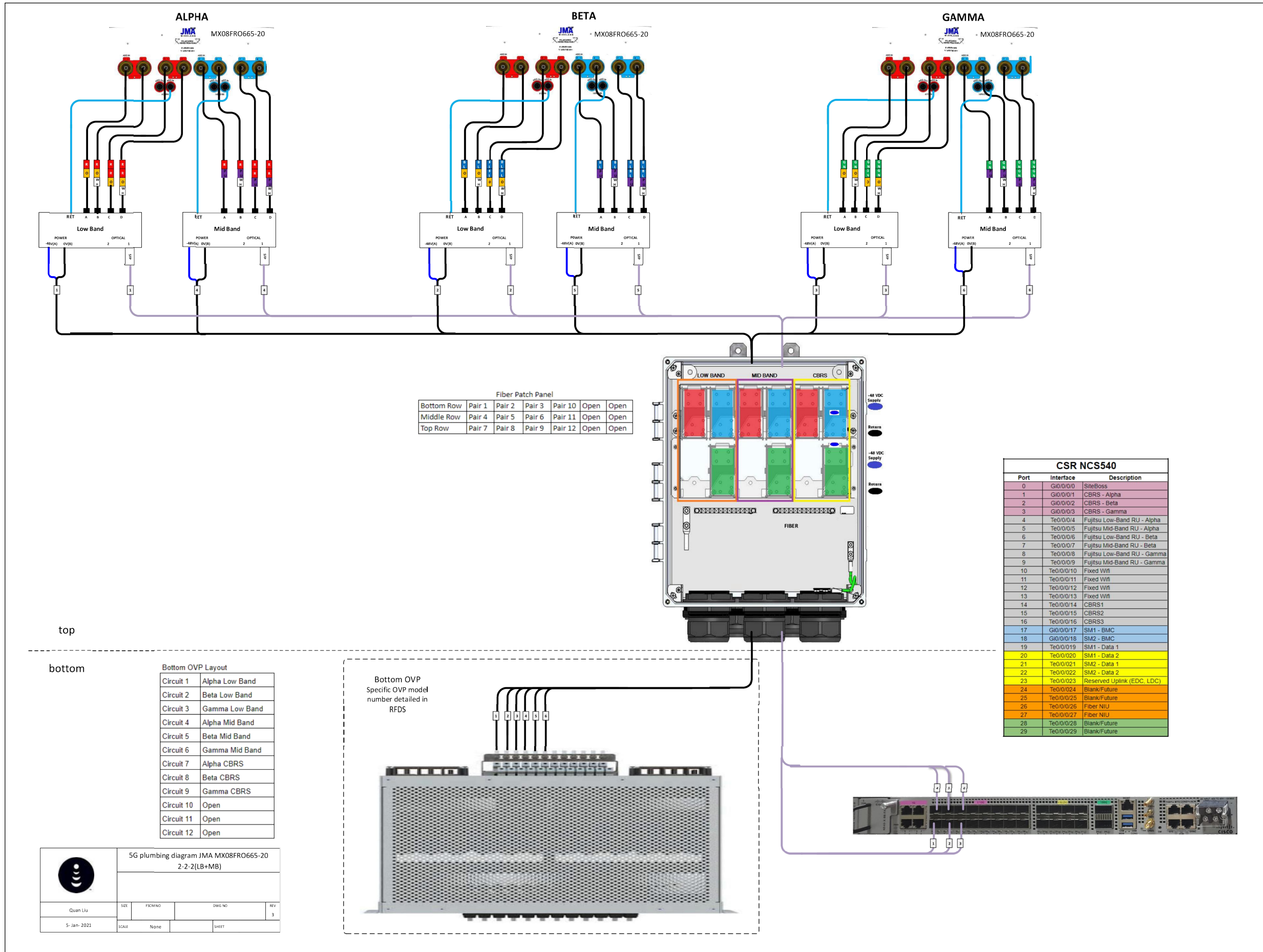
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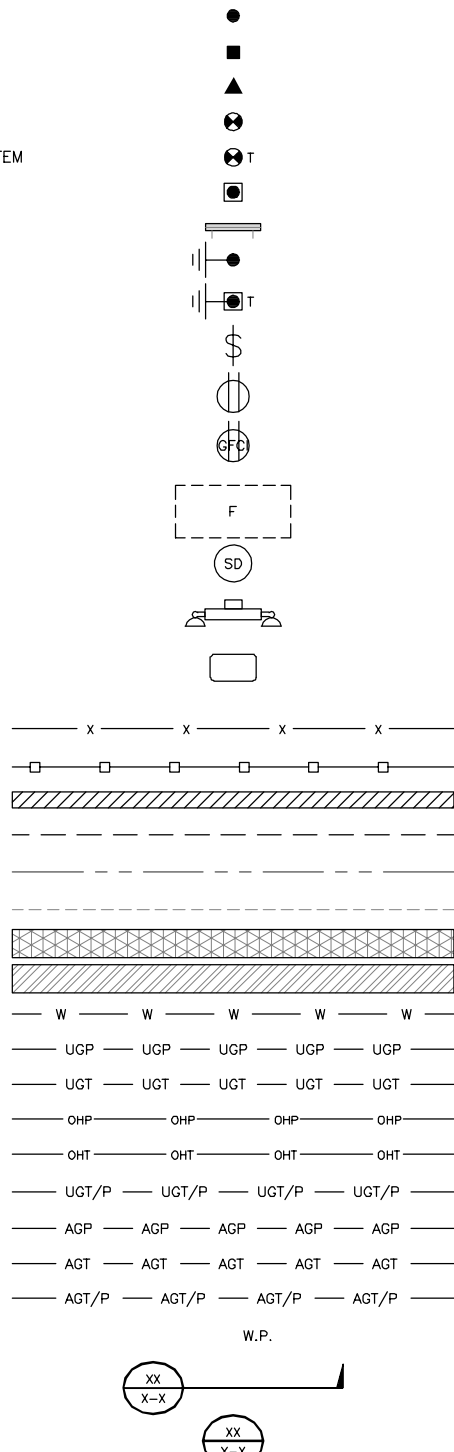
DISH WIRELESS, LLC.  
PROJECT INFORMATION  
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EAST HARTFORD, CT 06108

SHEET TITLE  
**RF PLUMBING DIAGRAM**

SHEET NUMBER  
**RF-2**



EXOTHERMIC CONNECTION  
 MECHANICAL CONNECTION  
 BUSS BAR INSULATOR  
 CHEMICAL ELECTROLYTIC GROUNDING SYSTEM  
 TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM  
 EXOTHERMIC WITH INSPECTION SLEEVE  
 GROUNDING BAR  
 GROUND ROD  
 TEST GROUND ROD WITH INSPECTION SLEEVE  
 SINGLE POLE SWITCH  
 DUPLEX RECEPTACLE  
 DUPLEX GFCI RECEPTACLE  
 FLUORESCENT LIGHTING FIXTURE  
 (2) TWO LAMPS 4B-T8  
 SMOKE DETECTION (DC)  
 EMERGENCY LIGHTING (DC)  
 SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW  
 LED-1-25A400/51K-SR4-120-PE-DEBTD  
 CHAIN LINK FENCE  
 WOOD/WROUGHT IRON FENCE  
 WALL STRUCTURE  
 LEASE AREA  
 PROPERTY LINE (PL)  
 SETBACKS  
 ICE BRIDGE  
 CABLE TRAY  
 WATER LINE  
 UNDERGROUND POWER  
 UNDERGROUND TELCO  
 OVERHEAD POWER  
 OVERHEAD TELCO  
 UNDERGROUND TELCO/POWER  
 ABOVE GROUND POWER  
 ABOVE GROUND TELCO  
 ABOVE GROUND TELCO/POWER  
 WORKPOINT  
 SECTION REFERENCE  
 DETAIL REFERENCE



**LEGEND**

AB ANCHOR BOLT	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
HDG 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**



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**DISH WIRELESS, L.L.C.**  
**PROJECT INFORMATION**  
**BBDL00032B**  
**148 ROBERTS ST.**  
**EAST HARTFORD, CT 06108**

**SHEET TITLE**  
**LEGEND AND ABBREVIATIONS**

**SHEET NUMBER**  
**GN-1**

SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED – NO WORK SHALL COMMENCE PRIOR TO CONTRACTOR RECEIVING A WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE DISH WIRELESS, L.L.C. AND TOWER OWNER NOC & THE DISH WIRELESS, L.L.C. AND TOWER OWNER CONSTRUCTION MANAGER.
2. "LOOK UP" – DISH WIRELESS, L.L.C. AND TOWER OWNER SAFETY CLIMB REQUIREMENT:  
THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR DISH WIRELESS, L.L.C. AND DISH WIRELESS, L.L.C. AND TOWER OWNER POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND DISH WIRELESS, L.L.C. AND TOWER OWNER STANDARDS, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA-322 (LATEST EDITION).
5. ALL SITE WORK TO COMPLY WITH DISH WIRELESS, L.L.C. AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH WIRELESS, L.L.C. AND TOWER OWNER TOWER SITE AND LATEST VERSION OF ANSI/TIA-1019-A-2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY DISH WIRELESS, L.L.C. AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES INCLUDING PRIVATE LOCATES SERVICES PRIOR TO THE START OF CONSTRUCTION.
10. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.
11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND DISH PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
13. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF DISH WIRELESS, L.L.C. AND TOWER OWNER, AND/OR LOCAL UTILITIES.
14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
17. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
18. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS AND RADIOS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
22. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:  
CONTRACTOR: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION  
CARRIER: DISH WIRELESS, L.L.C.  
TOWER OWNER: TOWER OWNER
2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.
4. NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.
5. SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.
6. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CARRIER POC AND TOWER OWNER.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
10. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION, BEFORE SUBMITTING BIDS, TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.
12. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF DISH WIRELESS, L.L.C. AND TOWER OWNER
13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
14. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.



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A&E PROJECT NUMBER  
**370626-13726411**

DISH WIRELESS, L.L.C.  
PROJECT INFORMATION  
**BBDL00032B**  
**148 ROBERTS ST.**  
**EAST HARTFORD, CT 06108**

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



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

<b>DRAWN BY:</b>	<b>CHECKED BY:</b>	<b>APPROVED BY:</b>
RDS	BIW	BIW

RFDS REV #: 1

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
0	09/14/2021	ISSUED FOR CONSTRUCTION
1	12/14/2021	ISSUED FOR CONSTRUCTION



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**SHEET TITLE**  
**GENERAL NOTES**

**SHEET NUMBER**  
**GN-3**

GROUNDING NOTES:

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

STRUCTURAL STEEL NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
2. STRUCTURAL STEEL ROLLED SHAPES, PLATES AND BARS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:
  - A. ASTM A-572, GRADE 50 – ALL W SHAPES, UNLESS NOTED OR A992 OTHERWISE
  - B. ASTM A-36 – ALL OTHER ROLLED SHAPES, PLATES AND BARS UNLESS NOTED OTHERWISE.
  - C. ASTM A-500, GRADE B – HSS SECTION (SQUARE, RECTANGULAR, AND ROUND)
  - D. ASTM A-325, TYPE SC OR N – ALL BOLTS FOR CONNECTING STRUCTURAL MEMBERS
  - E. ASTM F-1554 07 – ALL ANCHOR BOLTS, UNLESS NOTED OTHERWISE
3. ALL EXPOSED STRUCTURAL STEEL MEMBERS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION PER ASTM A123. EXPOSED STEEL HARDWARE AND ANCHOR BOLTS SHALL BE GALVANIZED PER ASTM A153 OR B695.
4. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.
5. DO NOT DRILL HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
6. CONNECTIONS:
  - A. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.1.
  - B. ALL WELDS SHALL BE INSPECTED VISUALLY. 25% OF WELDS SHALL BE INSPECTED WITH DYE PENETRANT OR MAGNETIC PARTICLE TO MEET THE ACCEPTANCE CRITERIA OF AWS D1.1. REPAIR ALL WELDS AS NECESSARY.
  - C. INSPECTION SHALL BE PERFORMED BY AN AWS CERTIFIED WELD INSPECTOR.
  - D. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE BURNING/WELDING PERMITS AS REQUIRED BY LOCAL GOVERNING AUTHORITY AND IF REQUIRED SHALL HAVE FIRE DEPARTMENT DETAIL FOR ANY WELDING ACTIVITY.
  - E. ALL ELECTRODES TO BE LOW HYDROGEN, MATCHING FILLER METAL, PER AWS D1.1, UNLESS NOTED OTHERWISE.
  - F. MINIMUM WELD SIZE TO BE 0.1875 INCH FILLET WELDS, UNLESS NOTED OTHERWISE.
  - G. PRIOR TO FIELD WELDING GALVANIZING MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING 1/2" BEYOND ALL FIELD WELD SURFACES. AFTER WELD AND WELD INSPECTION IS COMPLETE, REPAIR ALL GROUND AND WELDED SURFACES WITH ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS RECOMMENDATIONS.
  - H. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING AND/OR BRACING WHERE REQUIRED DURING CONSTRUCTION UNTIL ALL CONNECTIONS ARE COMPLETE.
  - I. ANY FIELD CHANGES OR SUBSTITUTIONS SHALL HAVE PRIOR APPROVAL FROM THE ENGINEER, AND DISH WIRELESS L.L.C. PROJECT MANAGER IN WRITING



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8601 SIX FORKS ROAD, SUITE 540  
RALEIGH, NC 27615  
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<b>DRAWN BY:</b>	<b>CHECKED BY:</b>	<b>APPROVED BY:</b>
RDS	BIW	BIW

**RFDS REV #:** 1

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**SHEET TITLE**  
**GENERAL NOTES**

**SHEET NUMBER**  
**GN-4**

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

Dish Wireless Existing Facility

Site ID: BOBDL0032B

BOBDL0032B  
148 Roberts Road  
East Hartford, Connecticut 06108

**October 27, 2021**

**EBI Project Number: 6221005875**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>38.51%</b>

October 27, 2021

Dish Wireless

Emissions Analysis for Site: BOBDL0032B - BOBDL0032B

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **148 Roberts Road in East Hartford, 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 Wireless antenna facility located at 148 Roberts Road in East Hartford, 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 79 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 #:	I	Antenna #:	I	Antenna #:	I
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):	79 feet	Height (AGL):	79 feet	Height (AGL):	79 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>4.44%</b>	Antenna BI MPE %:	<b>4.44%</b>	Antenna CI MPE %:	<b>4.44%</b>

Site Composite MPE %	
Carrier	MPE %
Dish Wireless (Max at Sector A):	4.44%
T-Mobile	6.66%
Verizon	6.69%
Sprint	7.14%
AT&T	13.58%
<b>Site Total MPE % :</b>	<b>38.51%</b>

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	4.44%
Dish Wireless Sector B Total:	4.44%
Dish Wireless Sector C Total:	4.44%
<b>Site Total MPE % :</b>	<b>38.51%</b>

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	79.0	6.04	600 MHz n71	400	1.51%
Dish Wireless 1900 MHz n70	4	542.70	79.0	14.65	1900 MHz n70	1000	1.46%
Dish Wireless 2190 MHz n66	4	542.70	79.0	14.65	2190 MHz n66	1000	1.46%
						<b>Total:</b>	<b>4.44%</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:	4.44%
Sector B:	4.44%
Sector C:	4.44%
Dish Wireless Maximum MPE % (Sector A):	4.44%
Site Total:	38.51%
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **38.51%** 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.

# INFINIGY

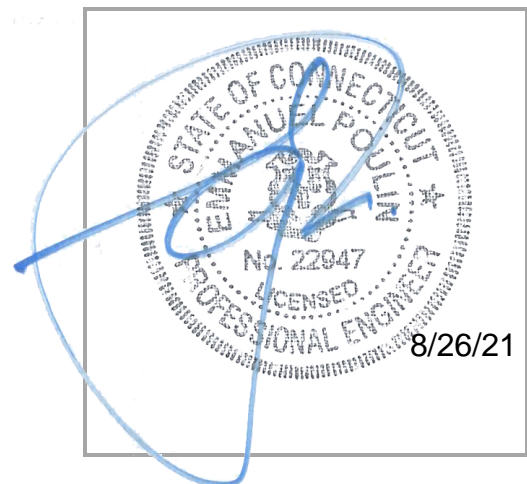
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## MOUNT ANALYSIS REPORT

August 26, 2021

Dish Wireless Site Name	ATC - 370626
Dish Wireless Site Number	BOBDL00032B
ATC Site Name	-
ATC Site Number	370626
Infinigy Job Number	1197-F0001-C
Client	ATC
Carrier	Dish Wireless
Site Location	148 Roberts St. East Hartford, CT 06108 Hartford County 41.773300 N NAD83 72.613400 W NAD83
Mount Type	8.0 ft Platform
Mount Elevation	79.0 ft AGL
Structural Usage Ratio	<b>42.1</b>
<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 125 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 Platform mounted to the existing structure located at the aforementioned address. All referenced supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The mount was analyzed using Risa-3D version 17.0.4 analysis software.

## 2. DESIGN/ANALYSIS PARAMETERS

Wind Speed	125 mph (3-Second Gust)
Wind Speed w/ ice	50 mph (3-Second Gust) w/ 2.0" ice
Code / Standard	TIA-222-H
Adopted Code	2018 Connecticut State Building Code (2015 IBC)
Risk Category	II
Exposure Category	C
Topographic Category	1
Calculated Crest Height	0 ft.
Seismic Spectral Response	$S_s = 0.180 \text{ g} / S_1 = 0.064 \text{ g}$
Live Load Wind Speed	60 mph
Man Live Load at Mid/End Points	250 lbs
Man Live Load at Mount Pipes	500 lbs

## 3. PROPOSED LOADING CONFIGURATION - 79.0 ft. AGL Platform

Antenna Centerline (ft)	Qty.	Appurtenance Manufacturers	Appurtenance Models
79.0	3	JMA WIRELESS	MX08FRO665-21
	3	FUJITSU	TA08025-B605
	3	FUJITSU	TA08025-B604
	1	RAYCAP	RDIDC-9181-PF-48

## 4. SUPPORTING DOCUMENTATION

Proposed Loading	Dish Wireless Asset ID CT-ATC-T-370626 Rev 1, Site #BOBDL00032B, dated July 08, 2021
Mount Manufacturer Drawings	Commscope Document # MC-PK8-DSH, dated March 08, 2021



**5. RESULTS**

<b>Components</b>	<b>Capacity</b>	<b>Pass/Fail</b>
Mount Pipes	22.7%	Pass
Horizontals	13.9%	Pass
Standoffs	34.1%	Pass
Handrails	27.8%	Pass
Connections	42.1%	Pass
<b>MOUNT RATING =</b>	<b>42.1 %</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 79.0 ft. The installation shall be performed in accordance with the construction documents issued for this site.

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

**7. ASSUMPTIONS**

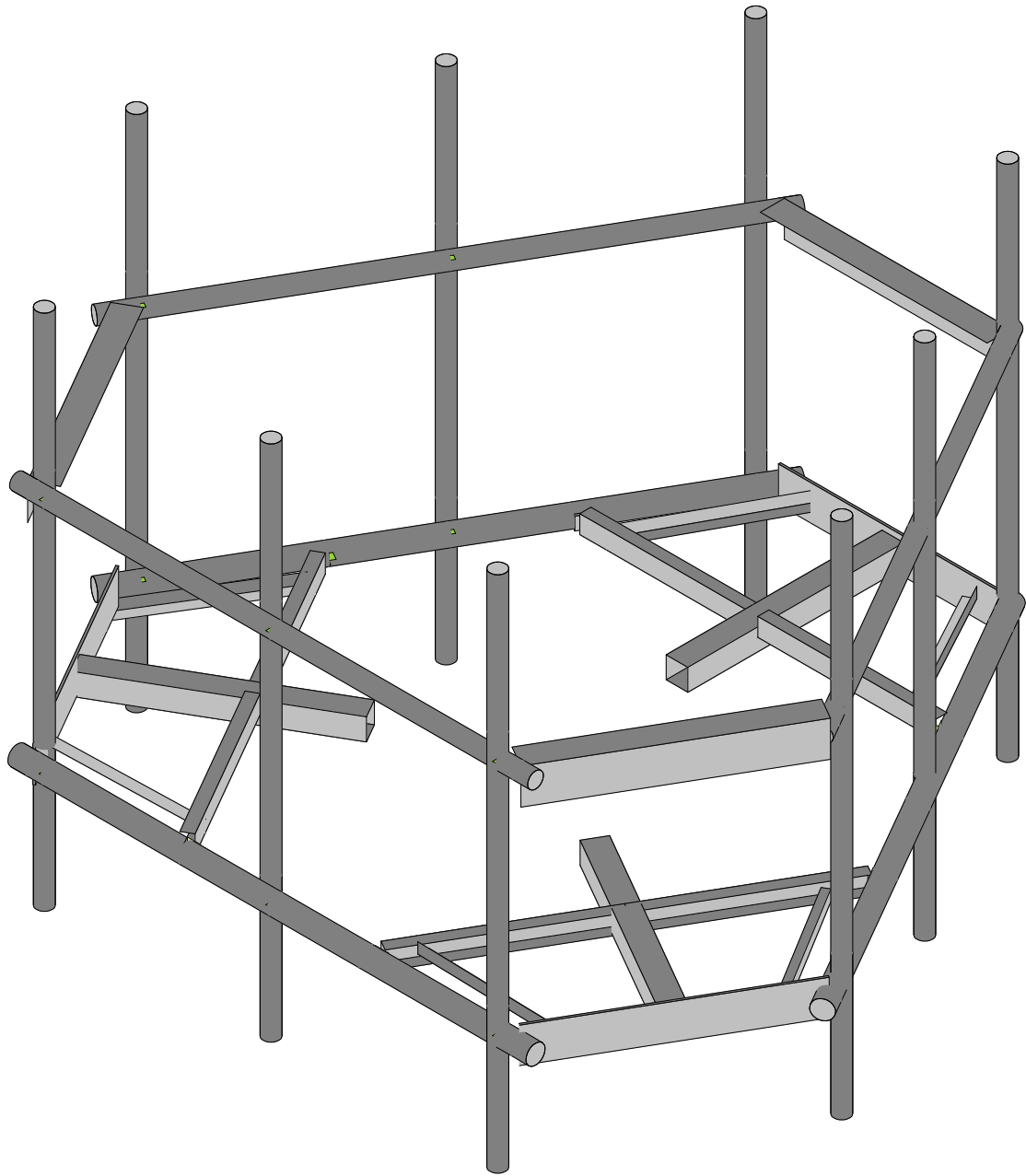
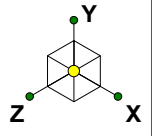
The antenna mounting system was properly fabricated, installed and maintained in accordance with its original design and manufacturer's specifications.	
The configuration of antennas, mounts, and other appurtenances are as specified in the proposed loading configuration table.	
All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.	
The analysis will require revisions if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.	
Steel grades have been assumed as follows, unless noted otherwise:	
Channel, Solid Round, Plate, Built-up Angle	ASTM A1011 36 KSI
Structural Angle	ASTM A529 Gr. 50
HSS (Rectangular)	ASTM A500-B GR 46
HSS (Circular)	ASTM A500-B GR 42
Pipe	ASTM A500 Gr C
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.

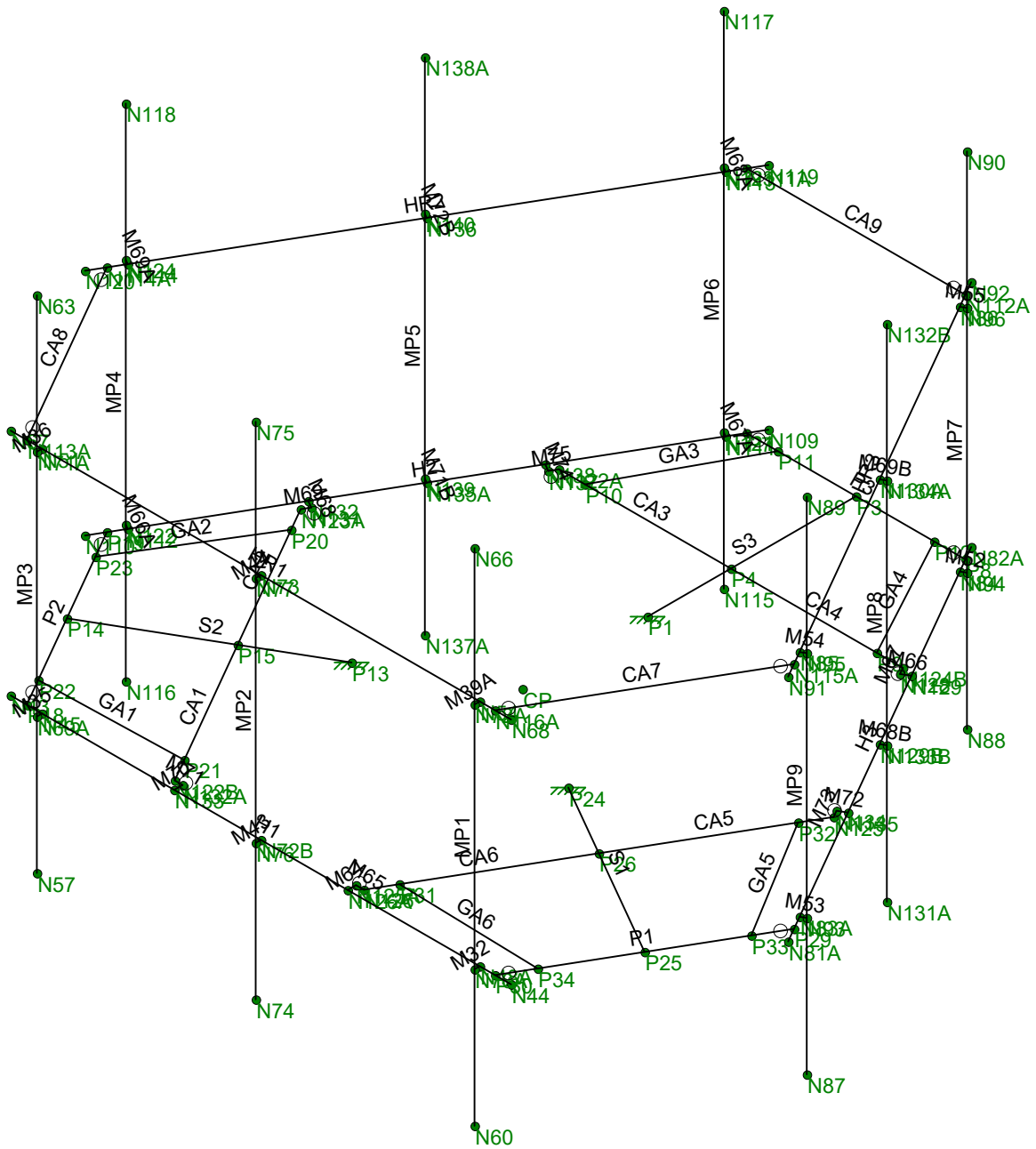
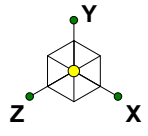
This report is an evaluation of the mount structure only and does not determine the adequacy of the supporting structure, other carrier mounts or cable mounting attachments. The analysis of these elements is outside the scope of this analysis, are assumed to be adequate for the purpose of this report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



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1197-F0001-C

ATC - 370626

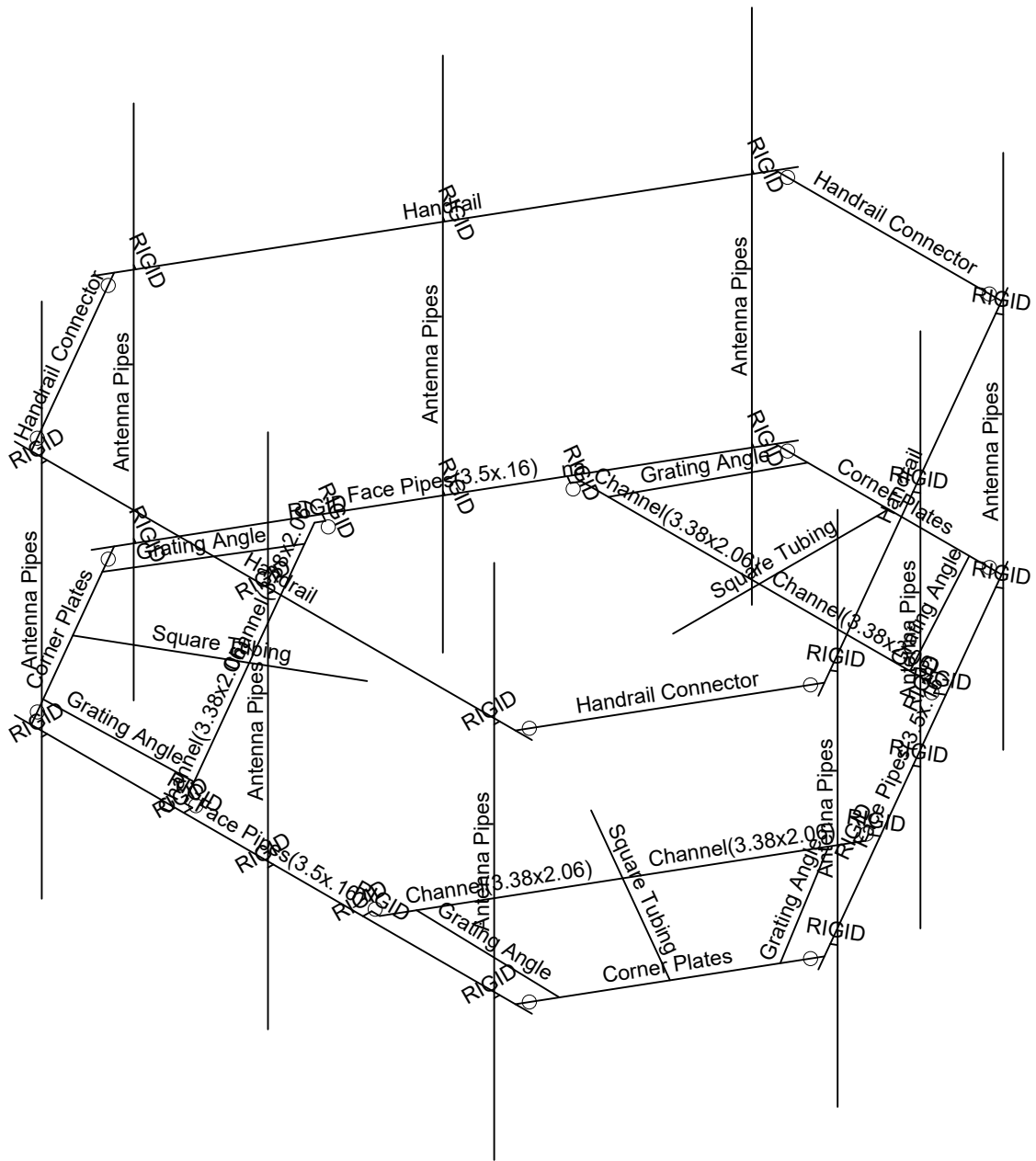
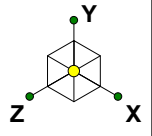
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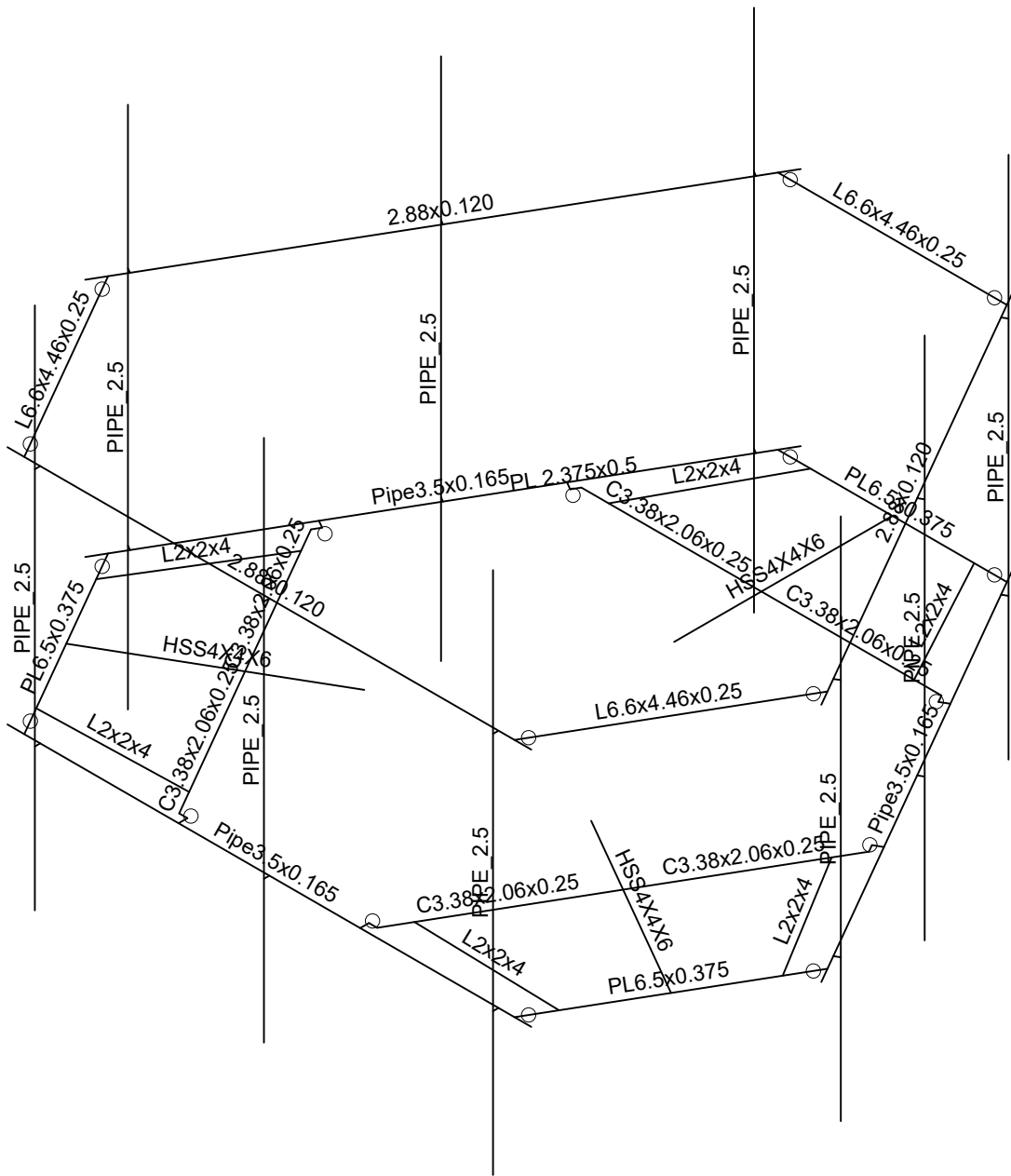
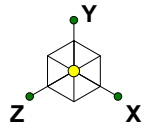
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 1197-F0001-C

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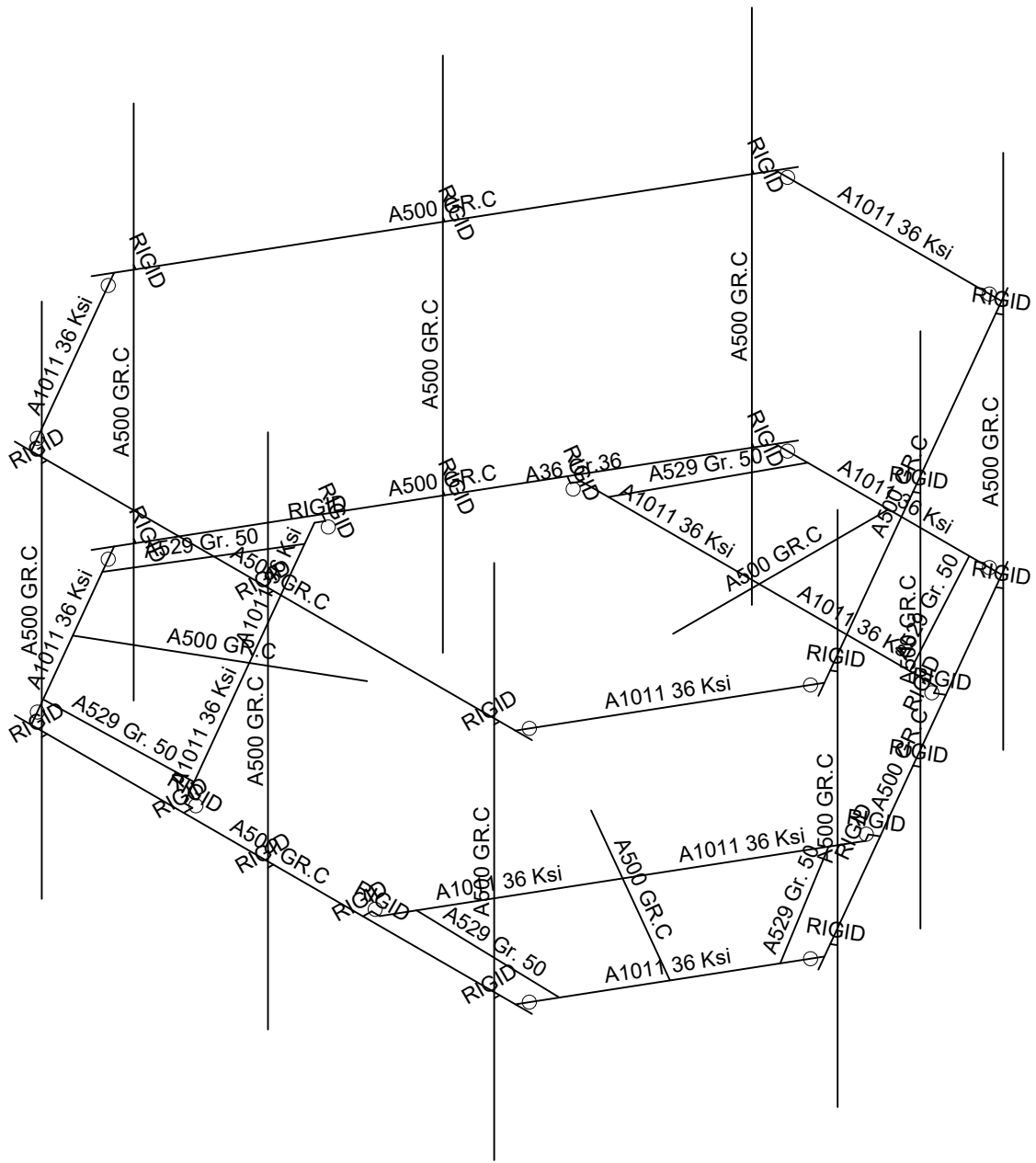
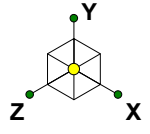
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 1197-F0001-C

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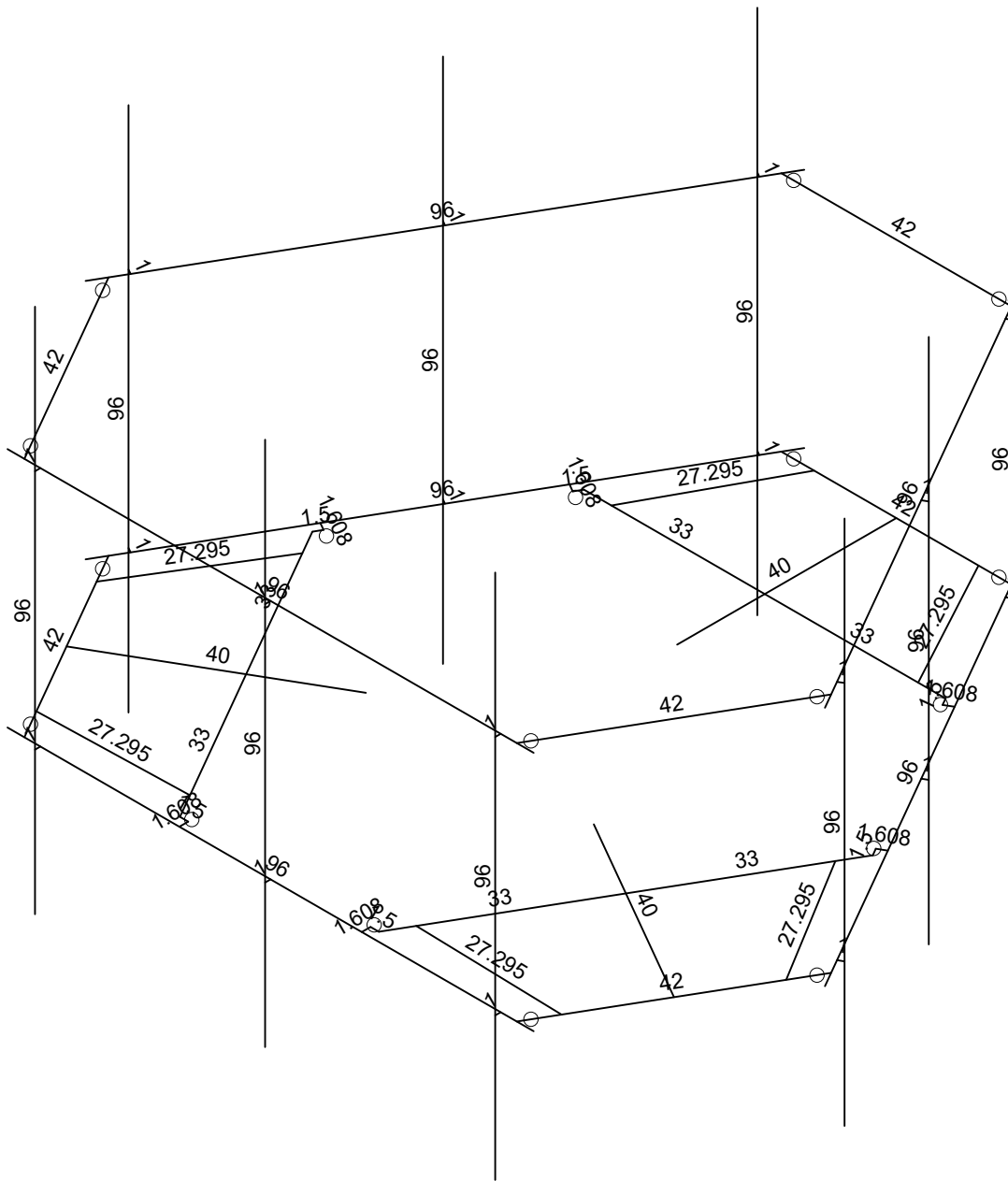
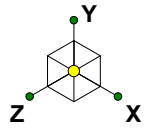
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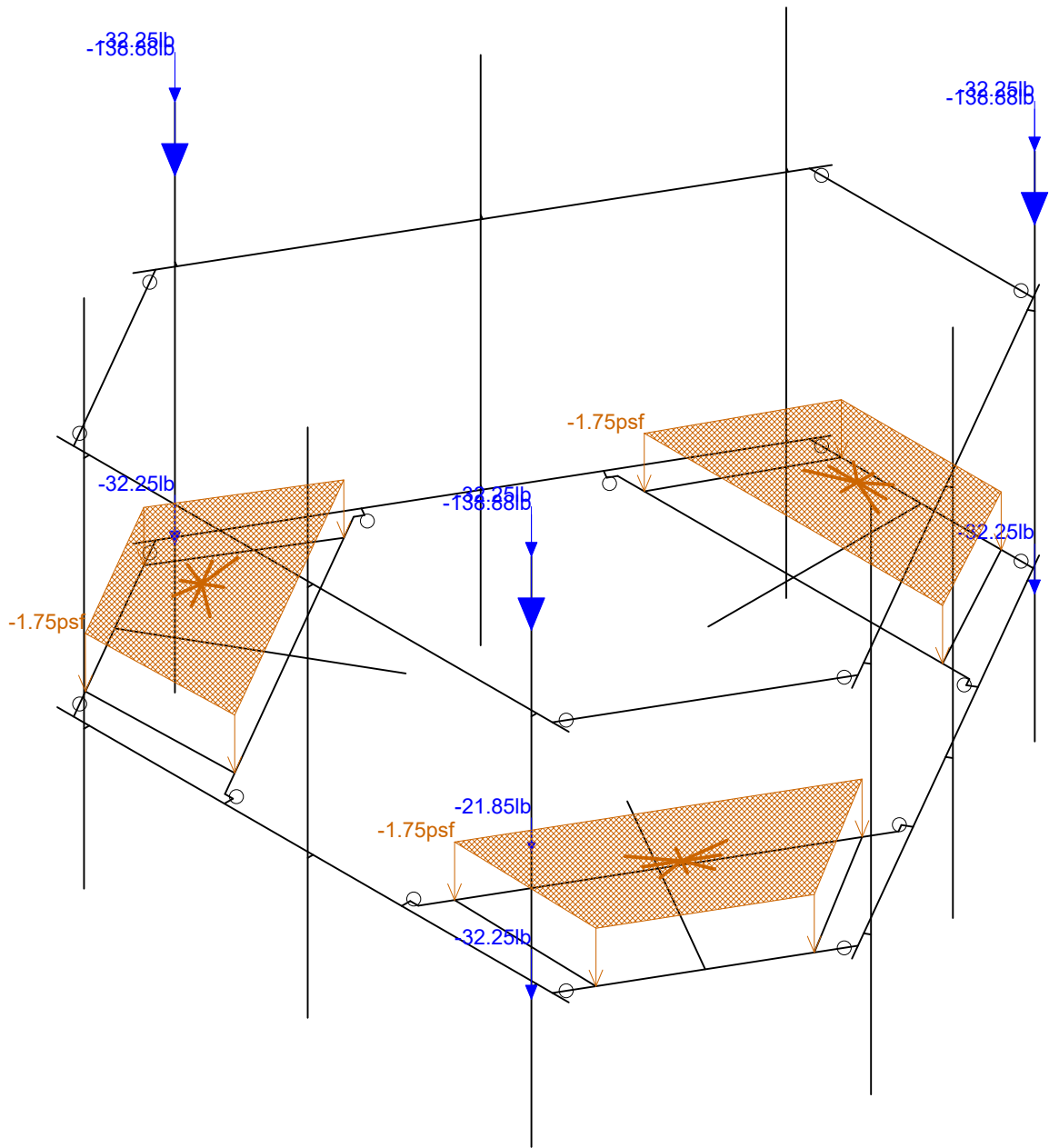
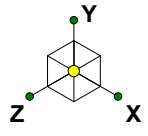
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Member Length (in) Displayed

Infinigy Engineering, PLLC	ATC - 370626	Member Lengths
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Loads: BLC 1, Self Weight

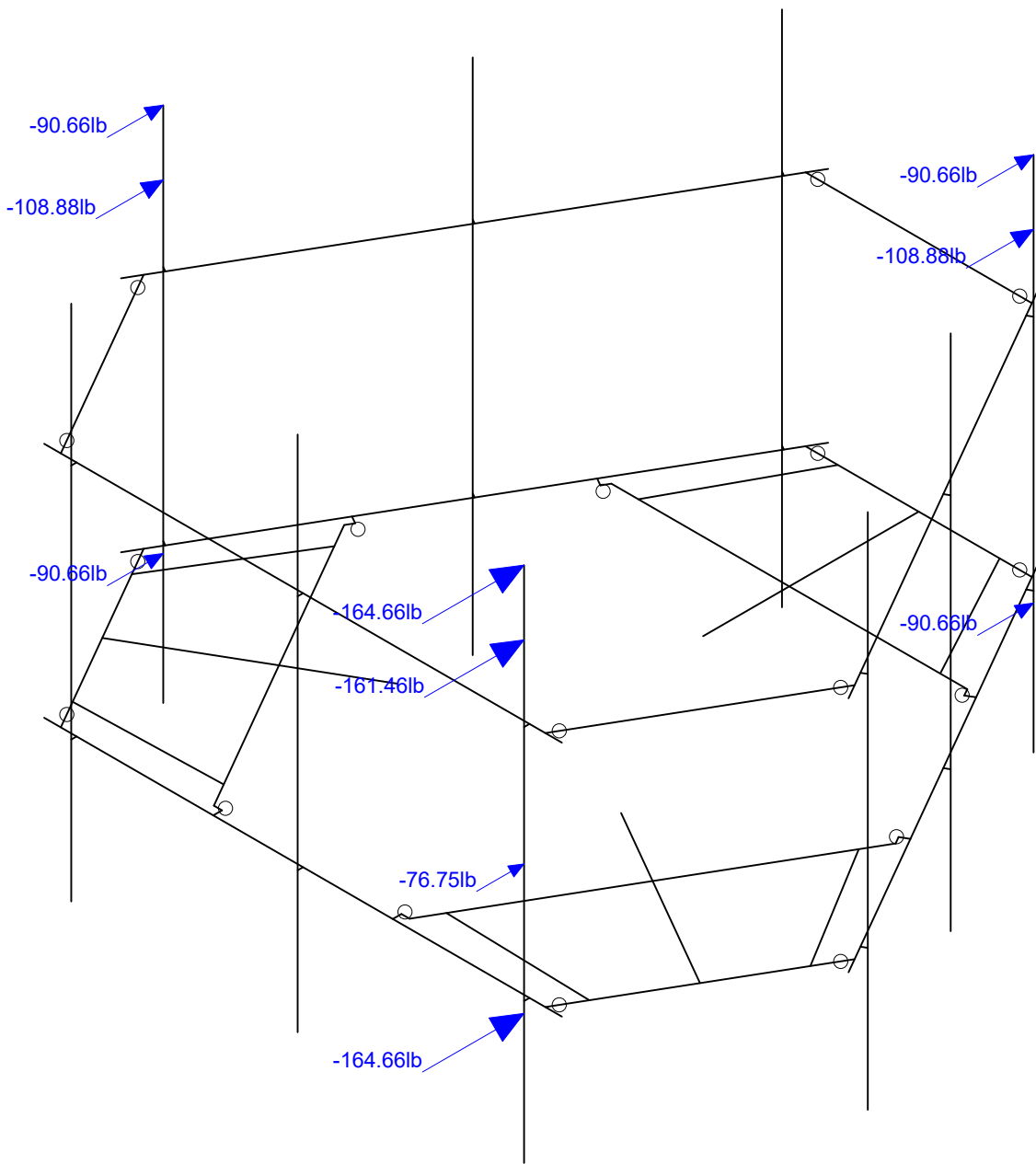
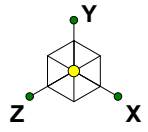
Infinigy Engineering, PLLC  
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ATC - 370626

Self Weight

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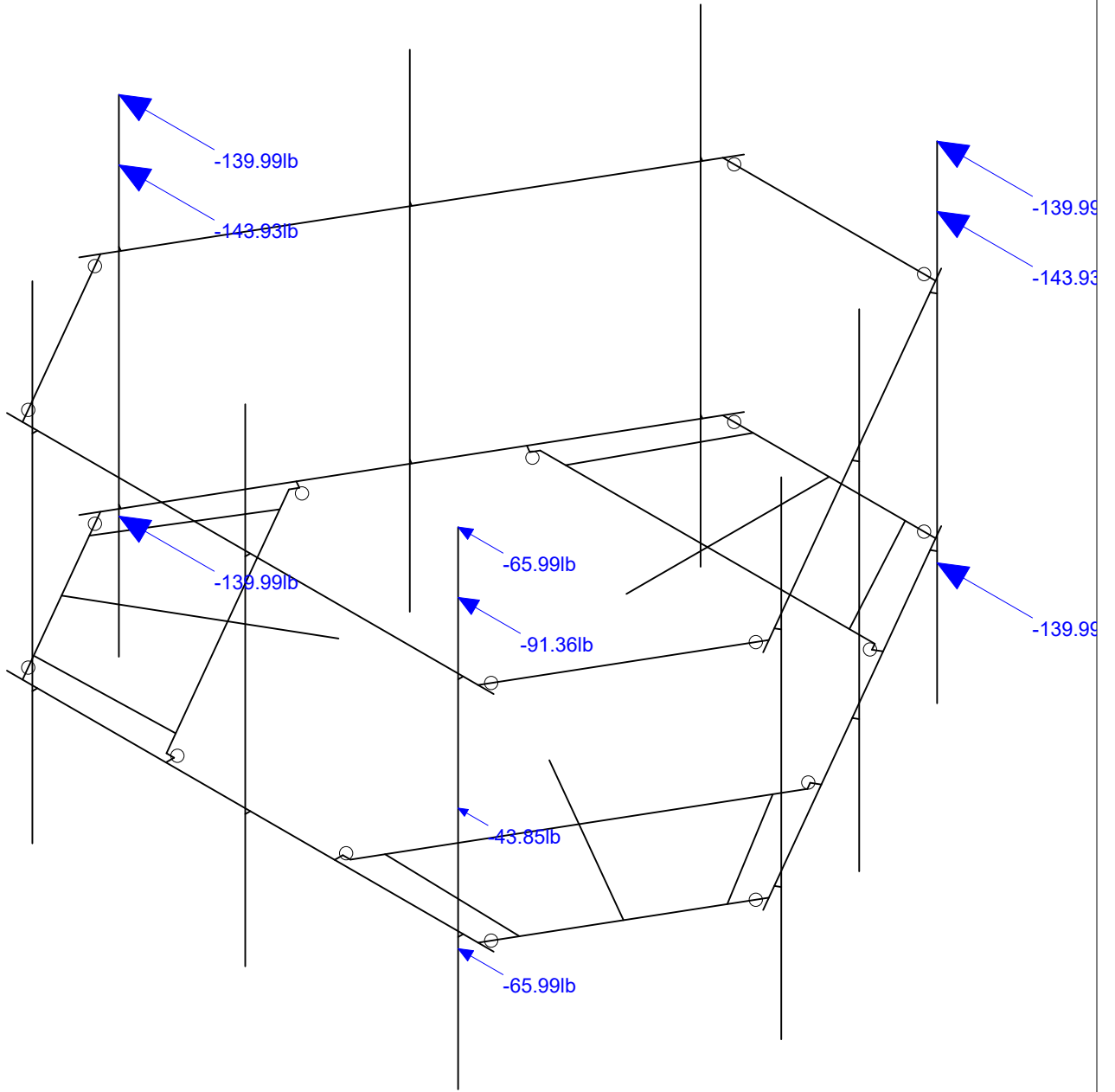
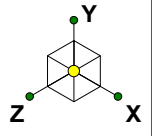


Loads: BLC 2, Wind Load AZI 0

Infinigy Engineering, PLLC  
PSM  
1197-F0001-C

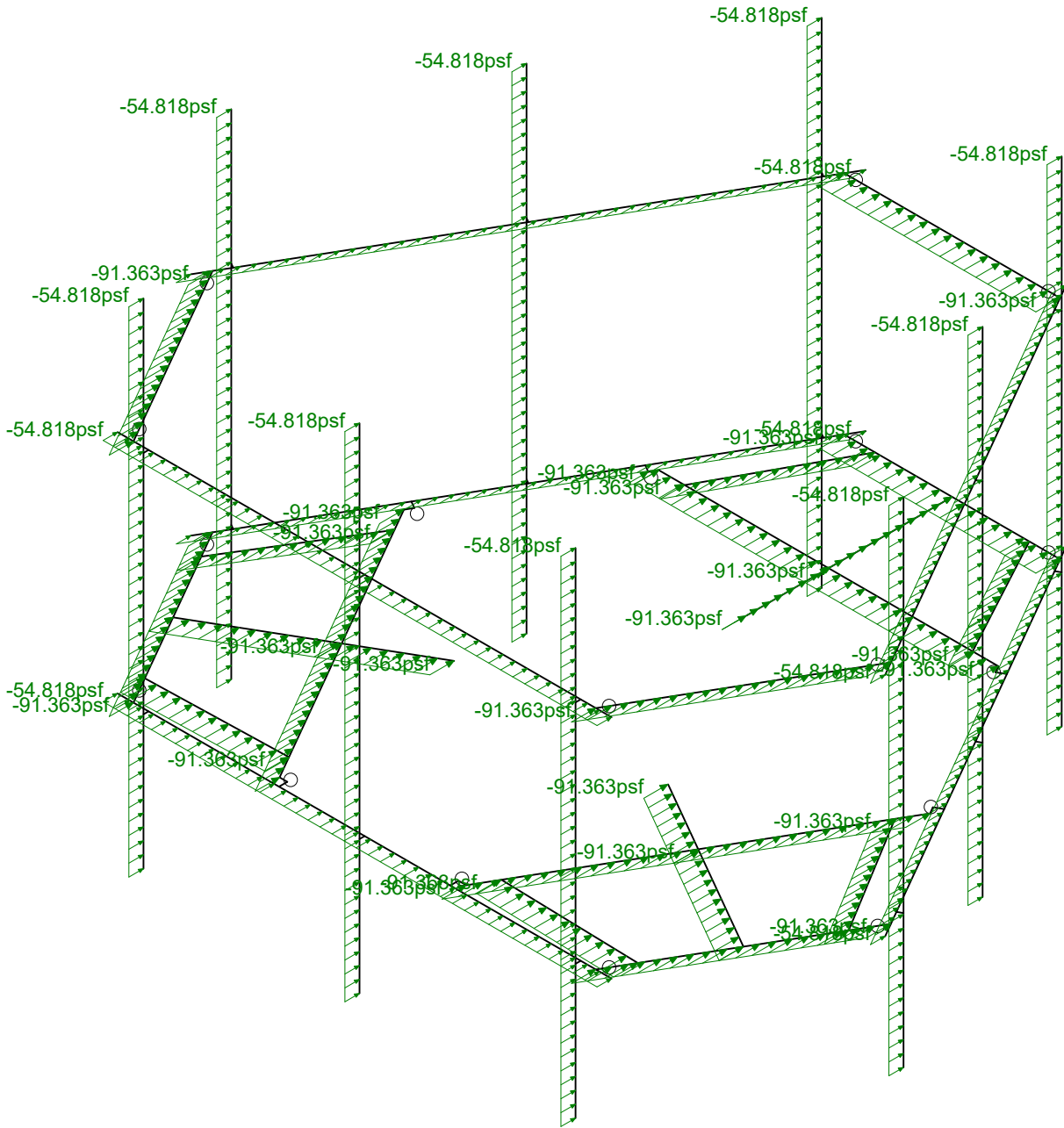
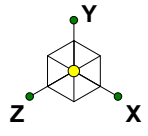
ATC - 370626

Wind Load AZI 000  
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Loads: BLC 5, Wind Load AZI 90

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Loads: BLC 14, Distr. Wind Load Z

Infinigy Engineering, PLLC

PSM

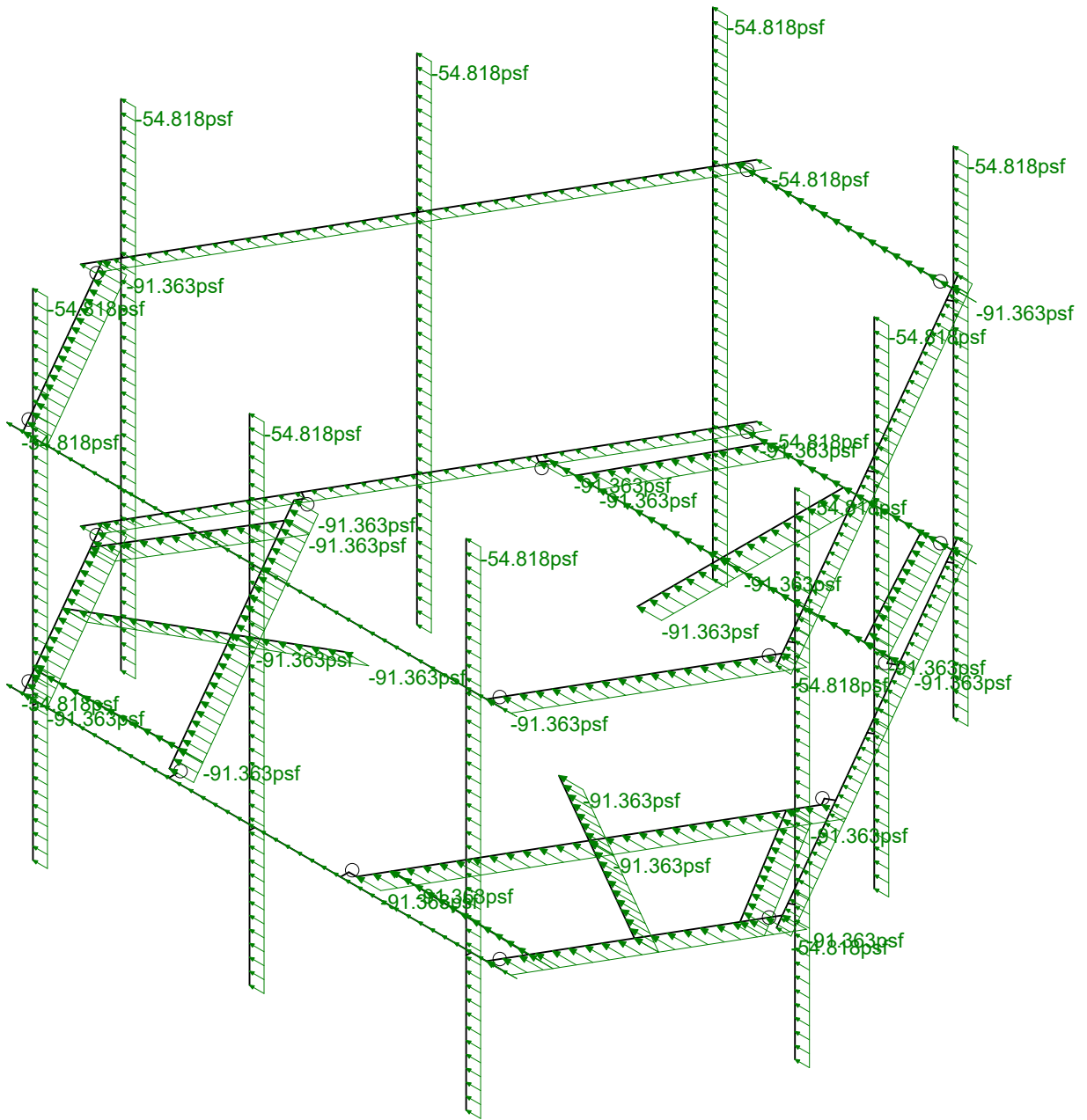
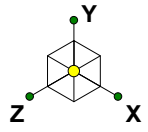
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ATC - 370626

Distr Wind Load AZI 000

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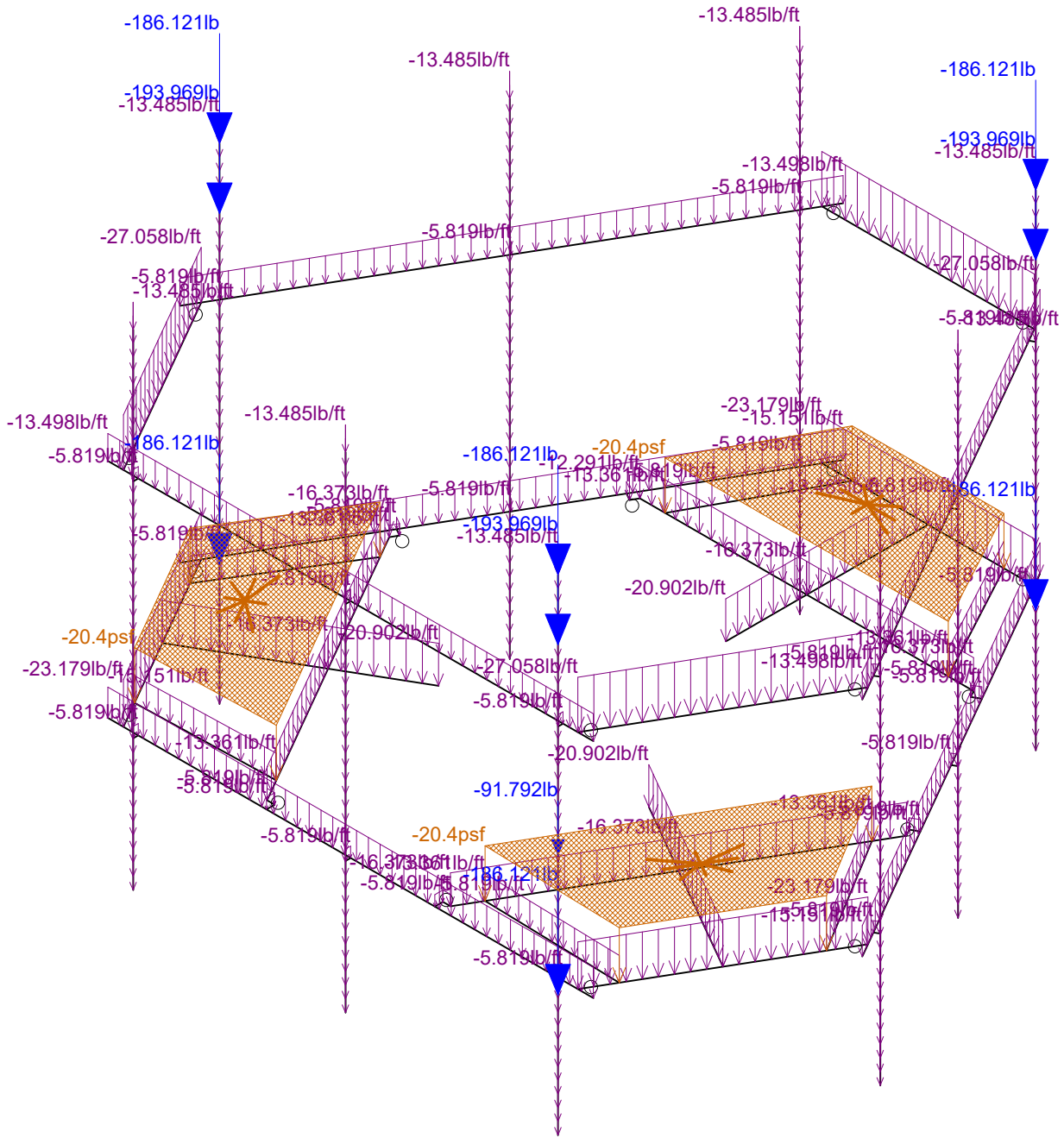
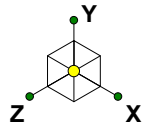


Loads: BLC 15, Distr. Wind Load X

Infinigy Engineering, PLLC  
PSM  
1197-F0001-C

ATC - 370626

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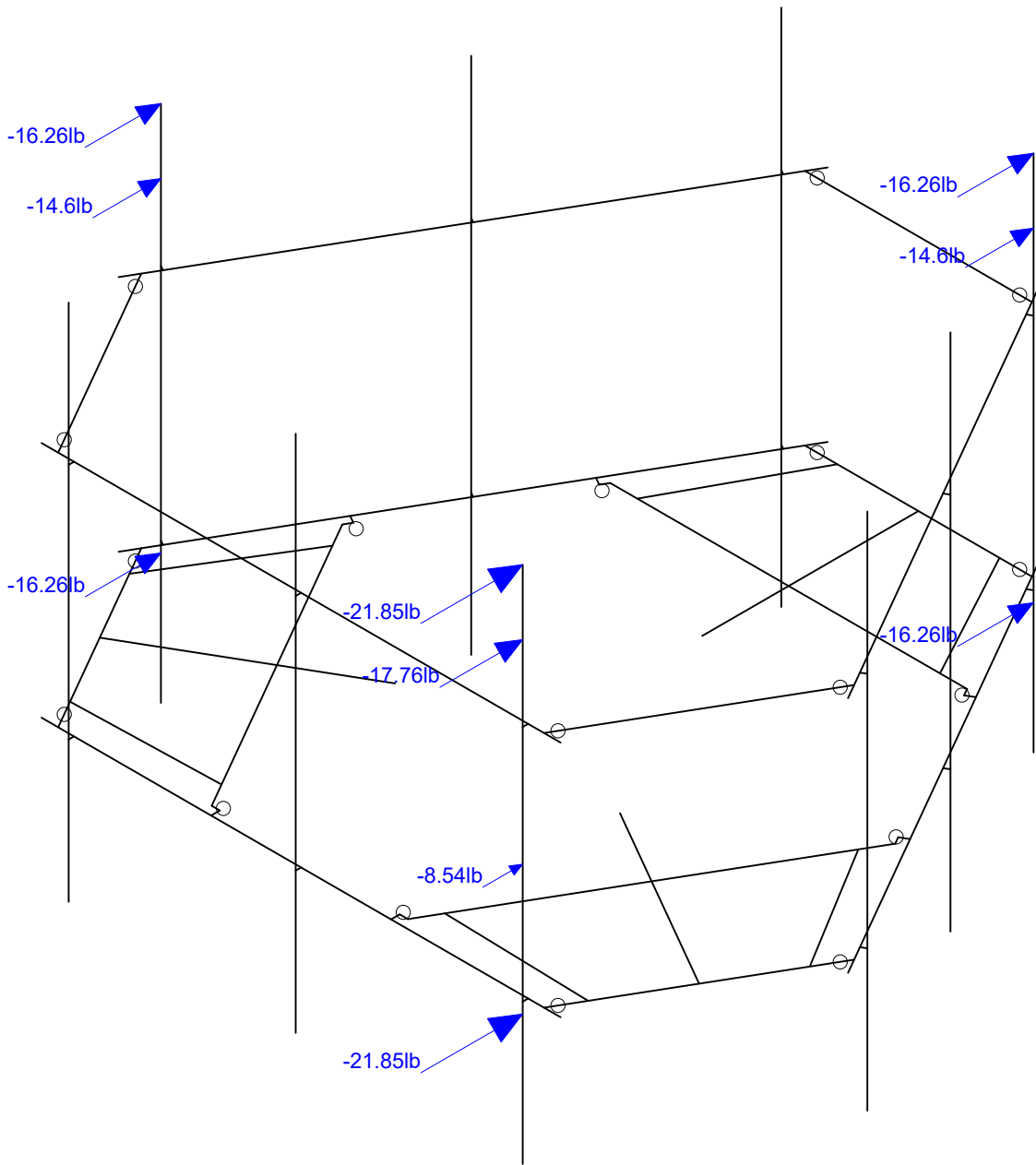
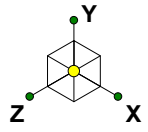


Loads: BLC 16, Ice Weight

Infinigy Engineering, PLLC  
 PSM  
 1197-F0001-C

ATC - 370626

Ice Weight  
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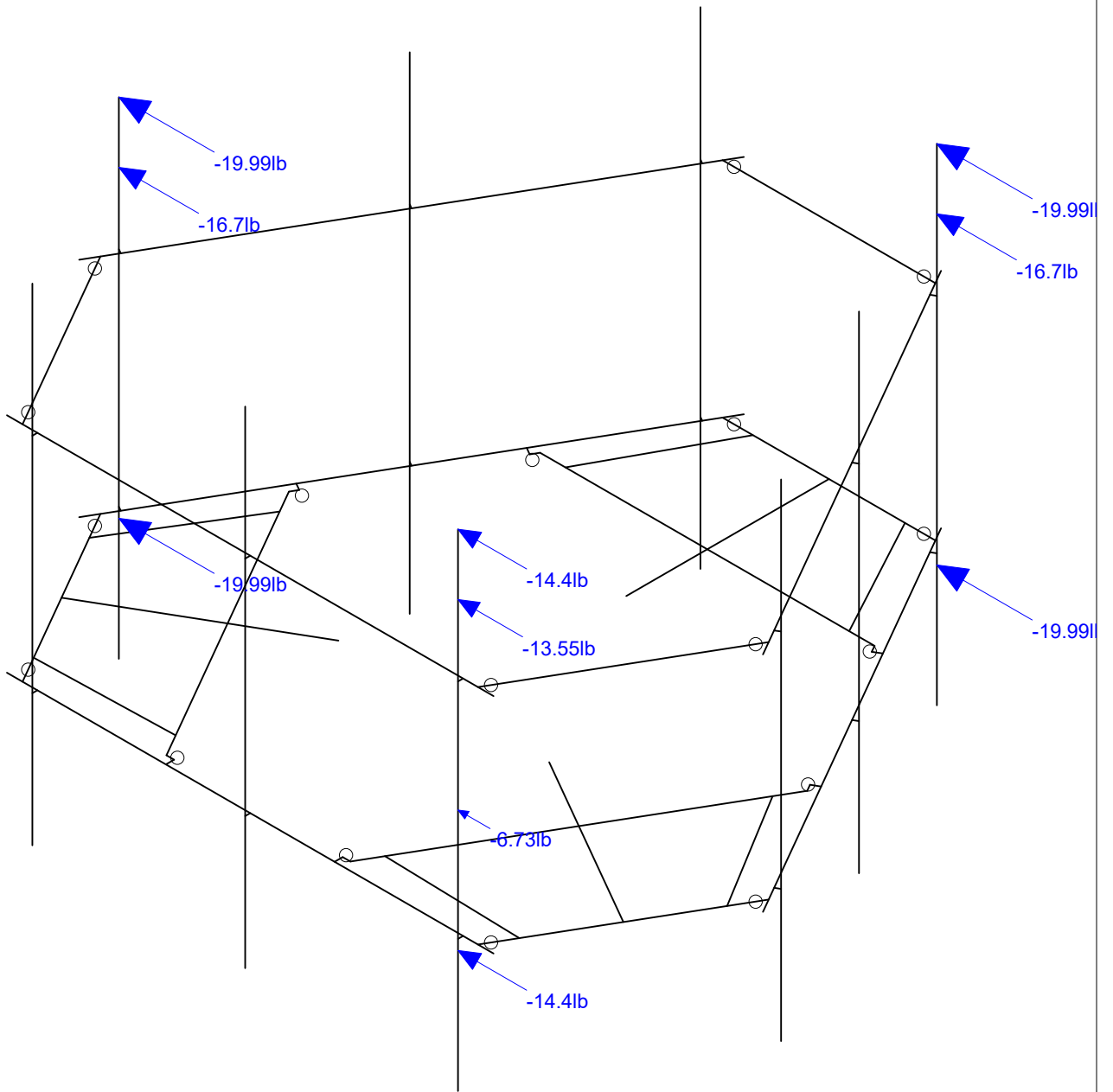
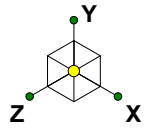


Loads: BLC 17, Ice Wind Load AZI 0

Infinigy Engineering, PLLC  
PSM  
1197-F0001-C

ATC - 370626

Ice + Wind Load AZI 000  
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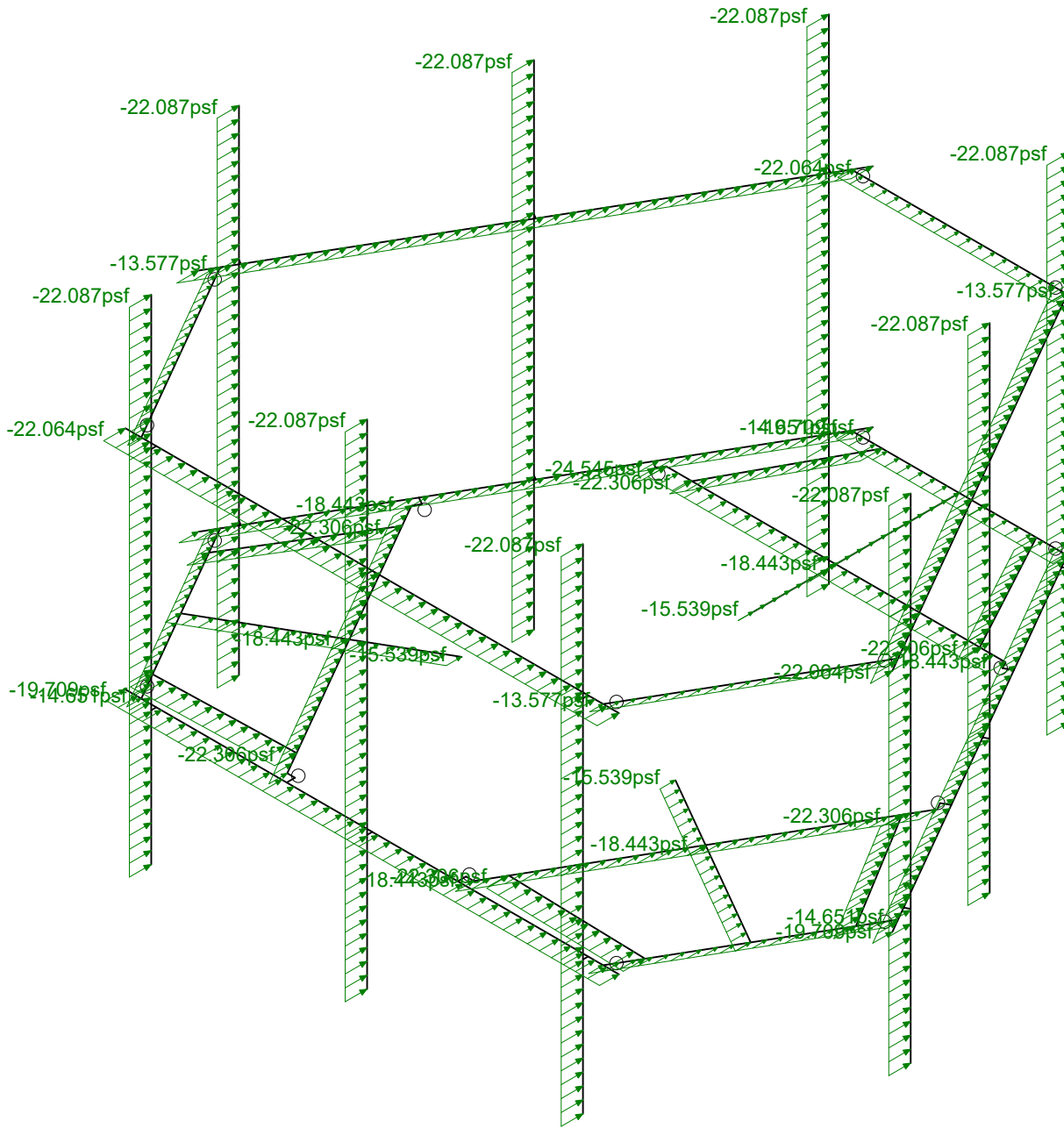
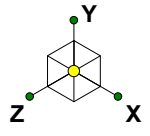
Loads: BLC 20, Ice Wind Load AZI 90

Infinigy Engineering, PLLC  
PSM  
1197-F0001-C

ATC - 370626

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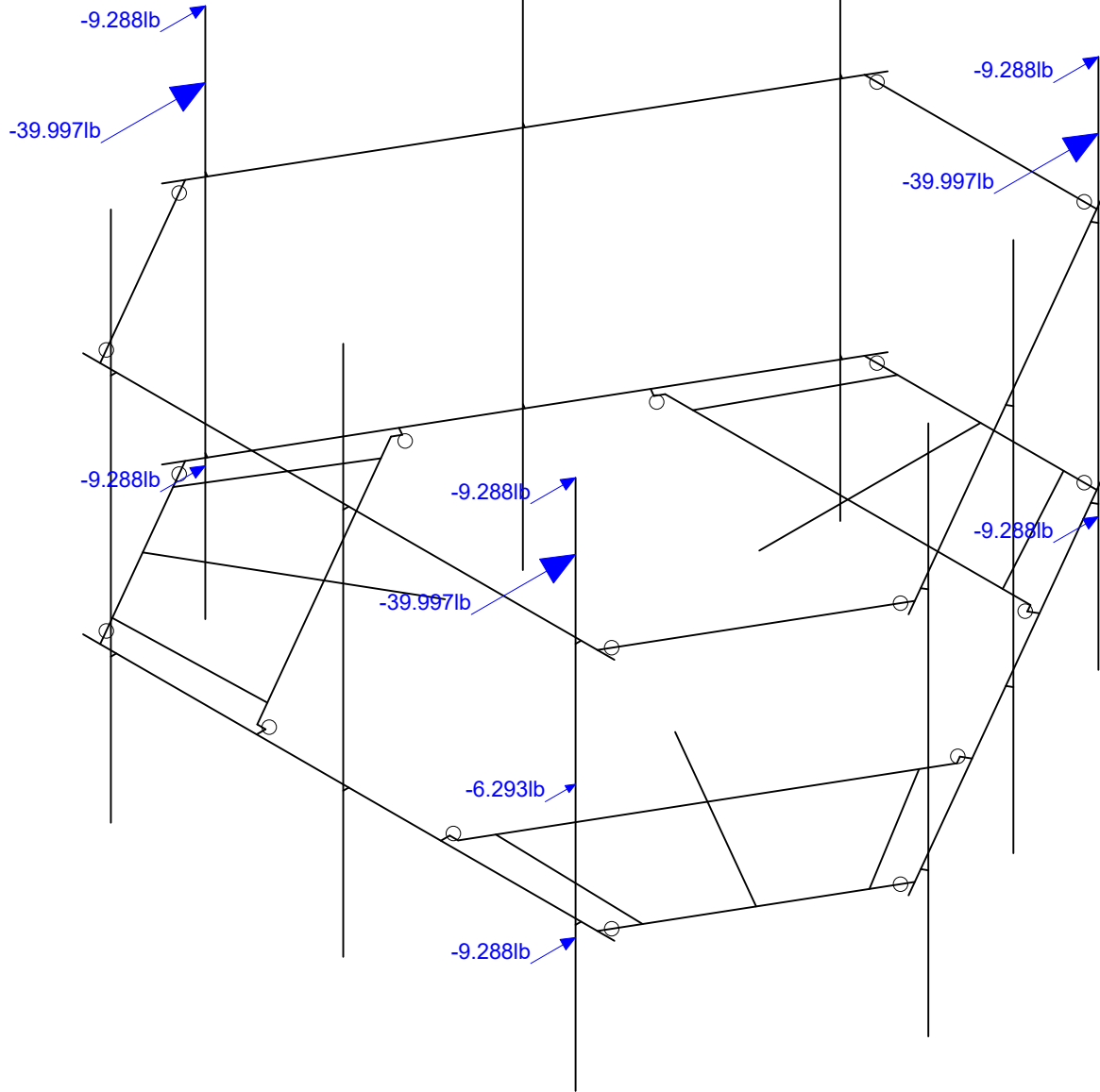
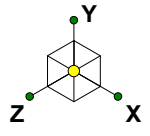




Loads: BLC 29, Distr. Ice Wind Load Z

Infinigy Engineering, PLLC	ATC - 370626	Distr Ice + Wind Load AZI 000
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1197-F0001-C		BOBDL00032B_loaded.r3d



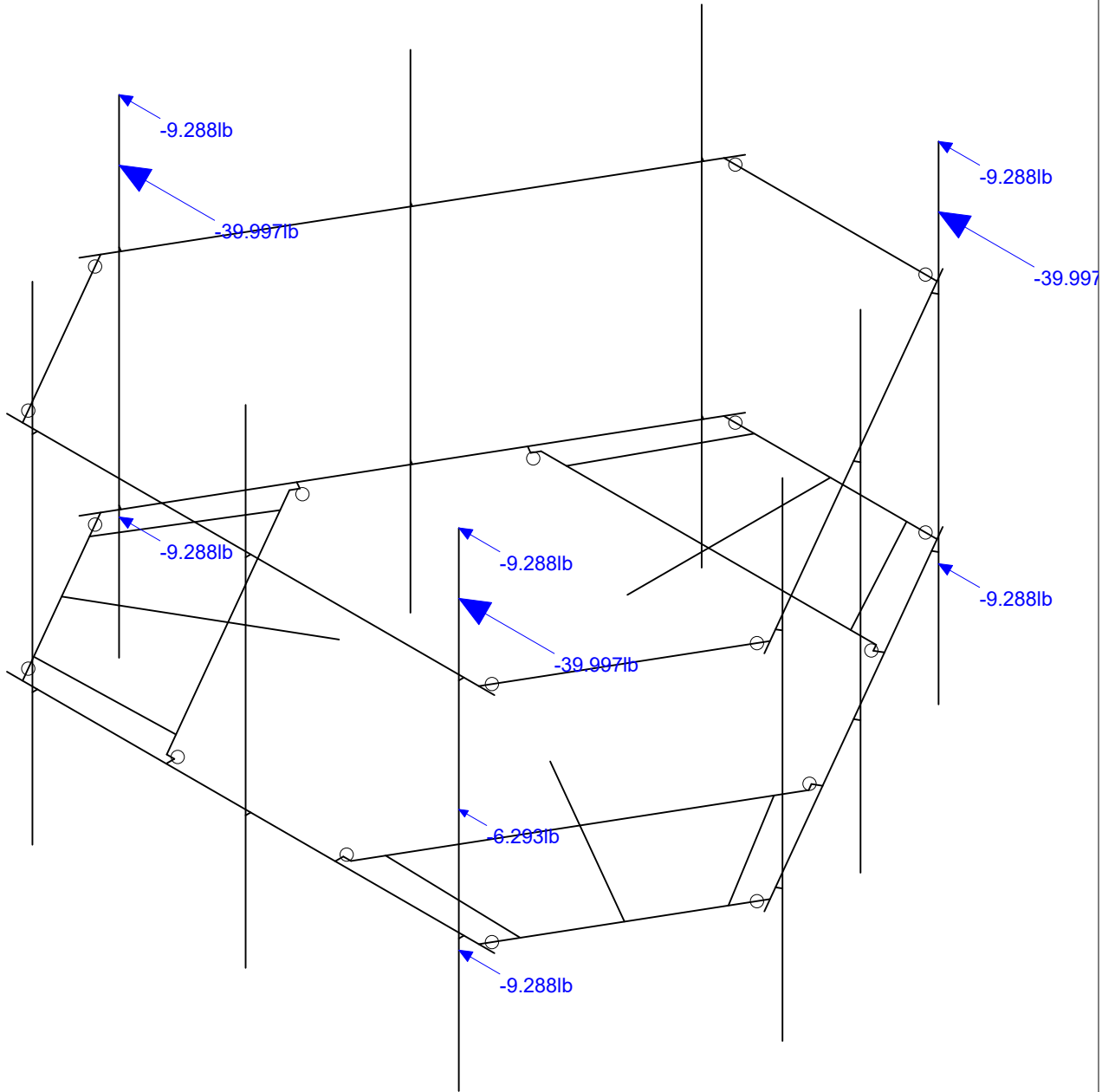
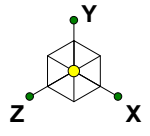


Loads: BLC 31, Seismic Load Z

Infinigy Engineering, PLLC  
 PSM  
 1197-F0001-C

ATC - 370626

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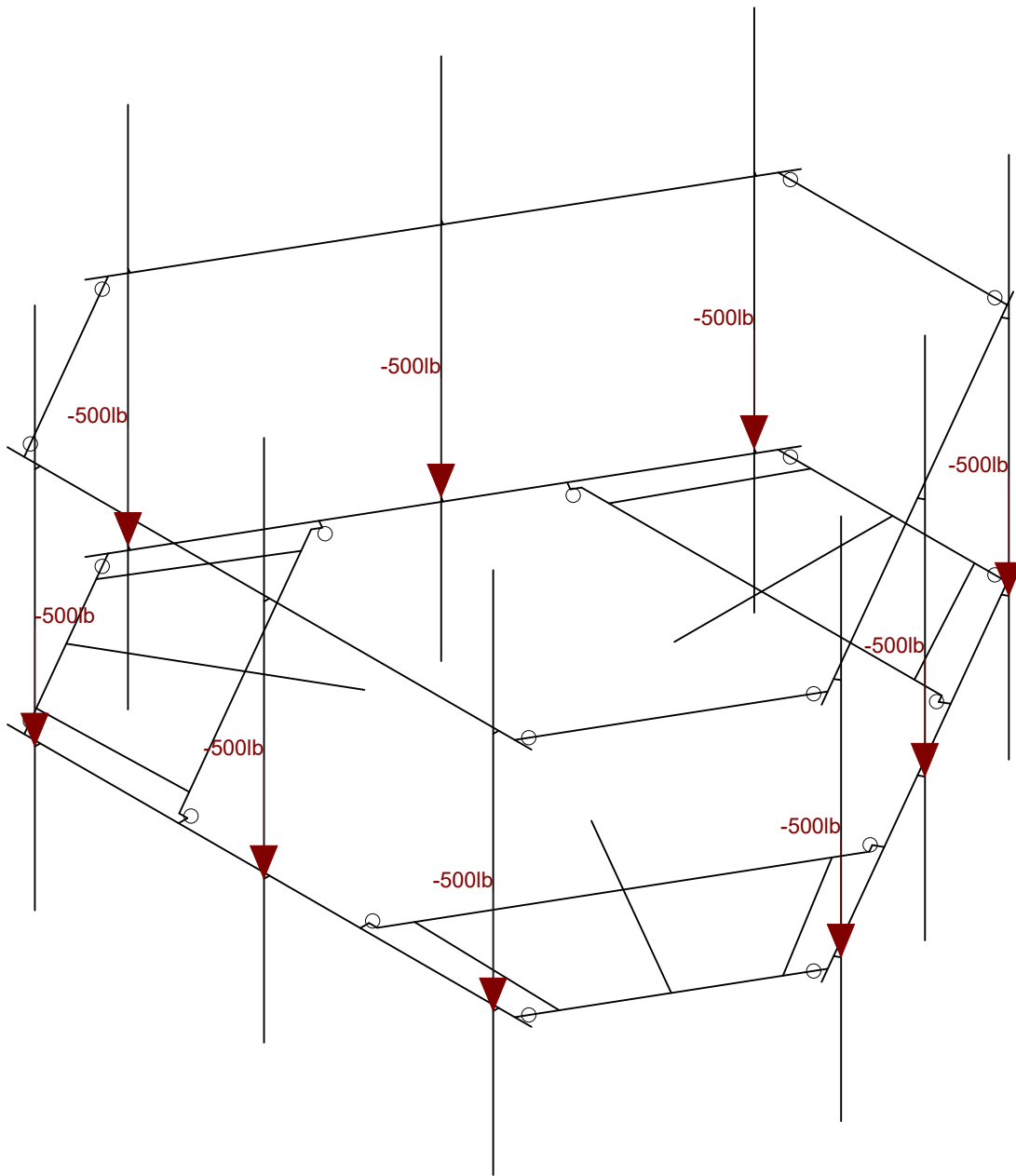
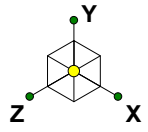


Loads: BLC 32, Seismic Load X

Infinigy Engineering, PLLC  
PSM  
1197-F0001-C

ATC - 370626

Seismic Load AZI 090  
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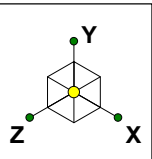


Loads: LL - Live Load

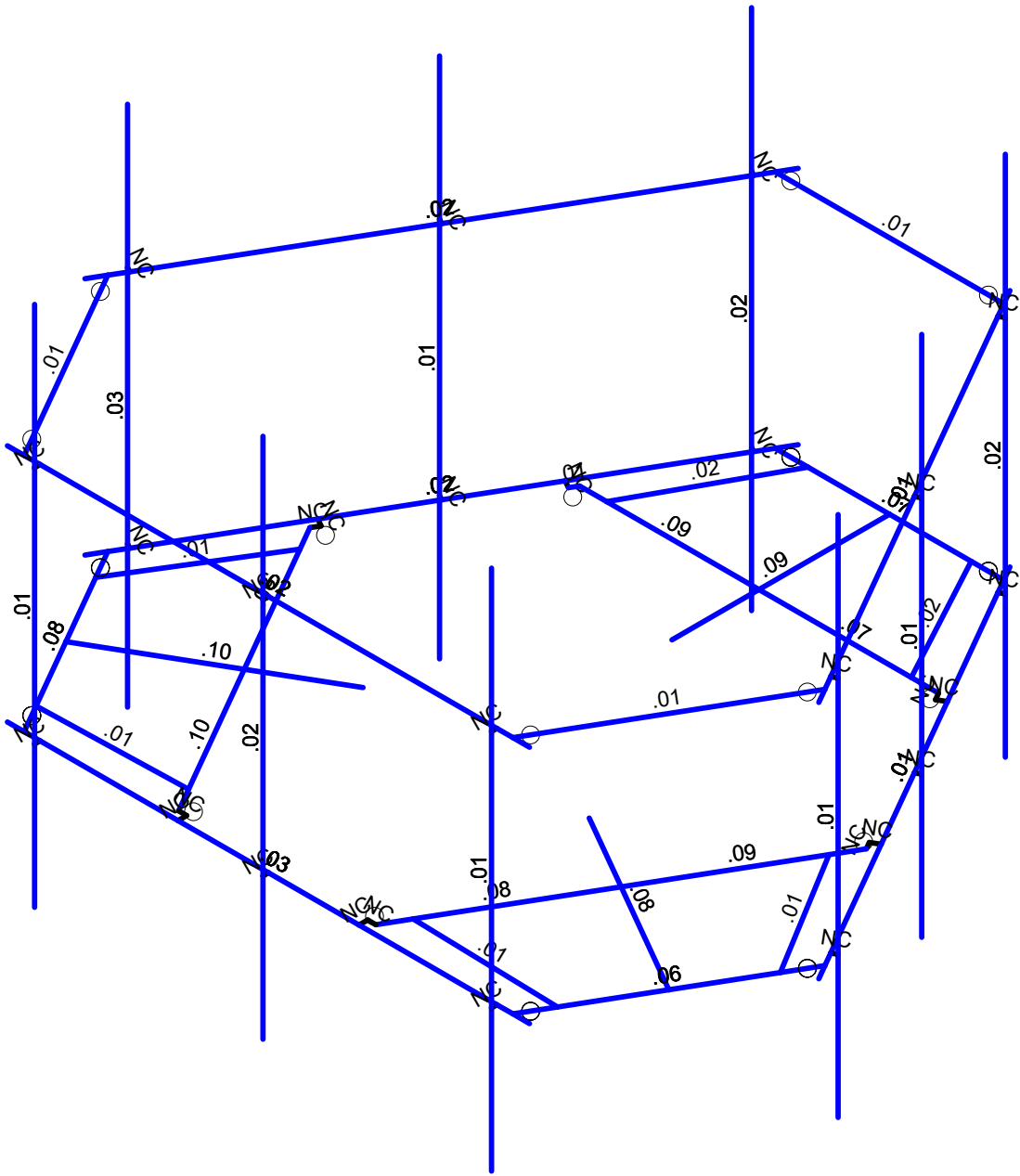
Infinigy Engineering, PLLC  
PSM  
1197-F0001-C

ATC - 370626

Non-concurrent Live Loads  
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Code Check ( LC 1 )	
Black	No Calc
Red	> 1.0
Magenta	.90-1.0
Green	.75-.90
Cyan	.50-.75
Blue	0-.50



Member Code Checks Displayed  
Results for LC 1, 1.4DL

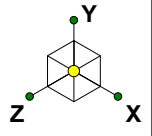
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PSM
1197-F0001-C

ATC - 370626

Bending Check

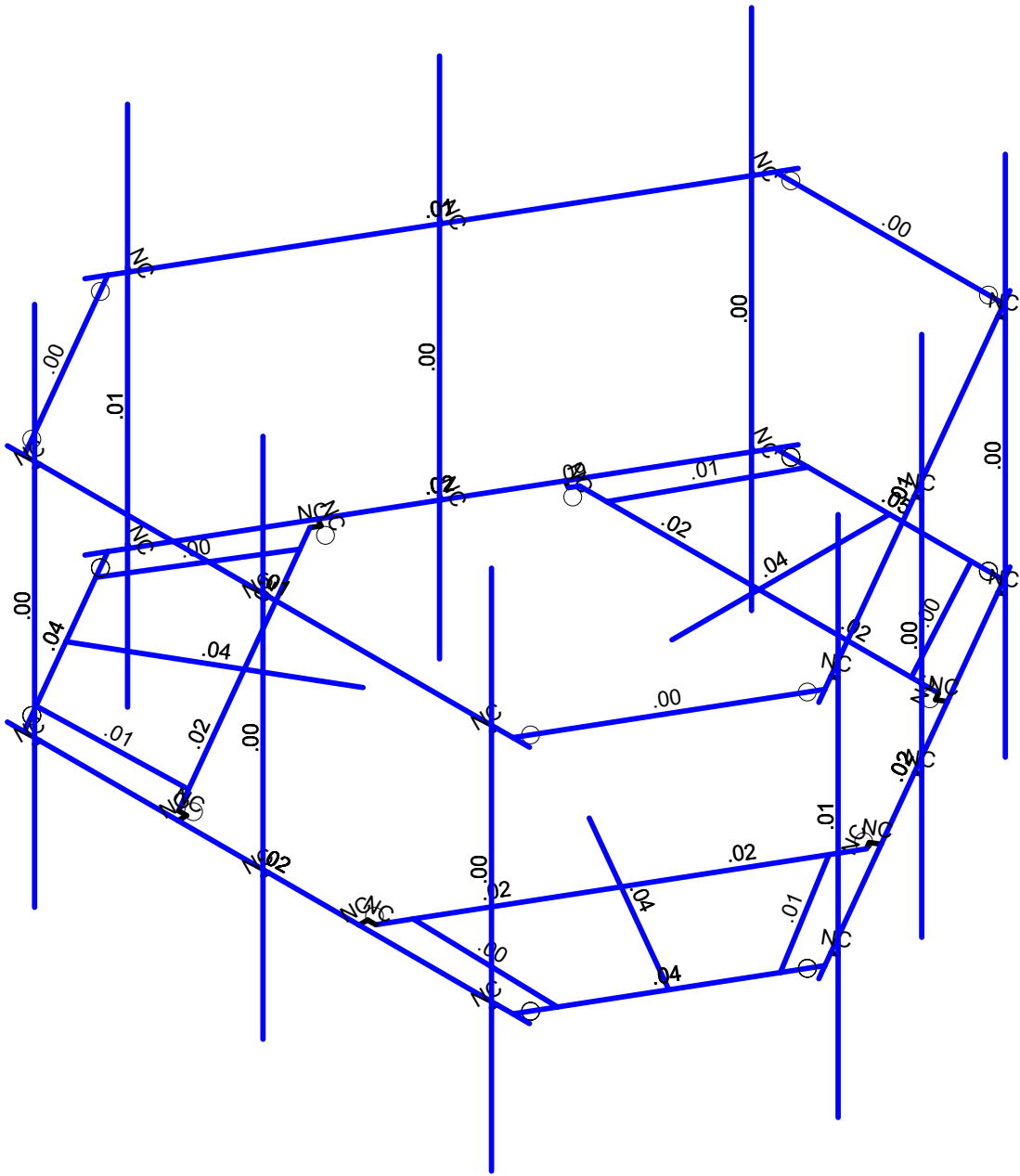
Aug 26, 2021 at 11:01 AM

BOBDL00032B\_loaded.r3d



Shear Check  
(LC 1)

Black	No Calc
Red	> 1.0
Magenta	.90-1.0
Green	.75-.90
Cyan	.50-.75
Blue	0-.50



Member Shear Checks Displayed  
Results for LC 1, 1.4DL

Infinigy Engineering, PLLC	ATC - 370626	Shear Check
PSM		Aug 26, 2021 at 11:01 AM
1197-F0001-C		BOBDL00032B_loaded.r3d

## Program Inputs

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

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	C	
Topo Factor Procedure:	Method 1, Category 1	
Site Class:	D - Stiff Soil (Assumed)	
Ground Elevation:	50.42	ft *Rev H

MOUNT INFORMATION		
Mount Type:	Platform	
Num Sectors:	3	
Centerline AGL:	79.00	ft
Tower Height AGL:	130.00	ft

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

FACTORS		
Directionality Fact. ( $K_d$ ):	0.950	
Ground Ele. Factor ( $K_e$ ):	0.998	*Rev H Only
Rooftop Speed-Up ( $K_s$ ):	1.000	*Rev H Only
Topographic Factor ( $K_{zt}$ ):	1.000	
Gust Effect Factor ( $G_h$ ):	1.000	

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

WIND AND ICE DATA		
Ultimate Wind ( $V_{ult}$ ):	125	mph
Design Wind ( $V$ ):	N/A	mph
Ice Wind ( $V_{ice}$ ):	50	mph
Base Ice Thickness ( $t_i$ ):	2	in
Flat Pressure:	91.363	psf
Round Pressure:	54.818	psf
Ice Wind Pressure:	8.771	psf

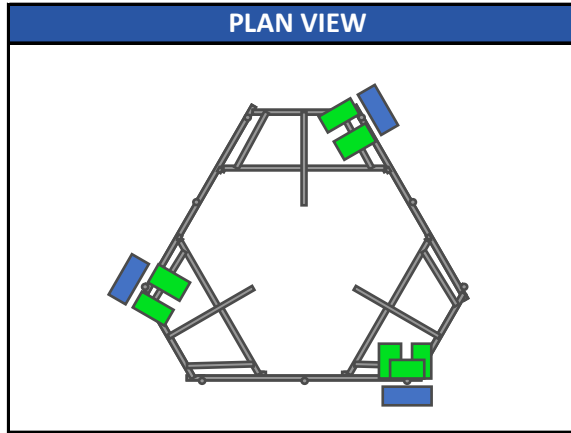
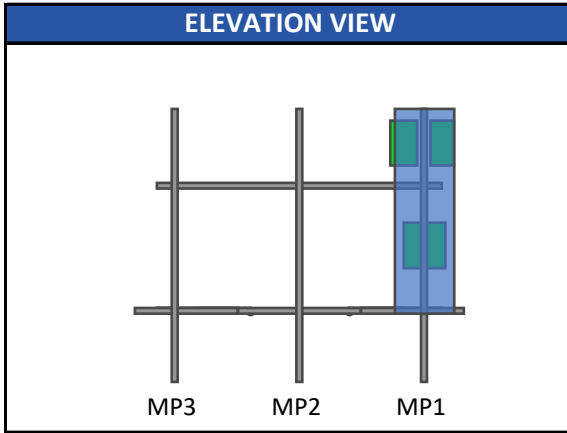
SEISMIC DATA		
Short-Period Accel. ( $S_s$ ):	0.180	g
1-Second Accel. ( $S_1$ ):	0.064	g
Short-Period Design ( $S_{DS}$ ):	0.192	
1-Second Design ( $S_{D1}$ ):	0.102	
Short-Period Coeff. ( $F_a$ ):	1.600	
1-Second Coeff. ( $F_v$ ):	2.400	
Amplification Factor ( $A_s$ ):	3.000	
Response Mod. Coeff. ( $R$ ):	2.000	



Infinigy Load Calculator V2.1.7



# Program Inputs



Infinigy Load Calculator V2.1.7

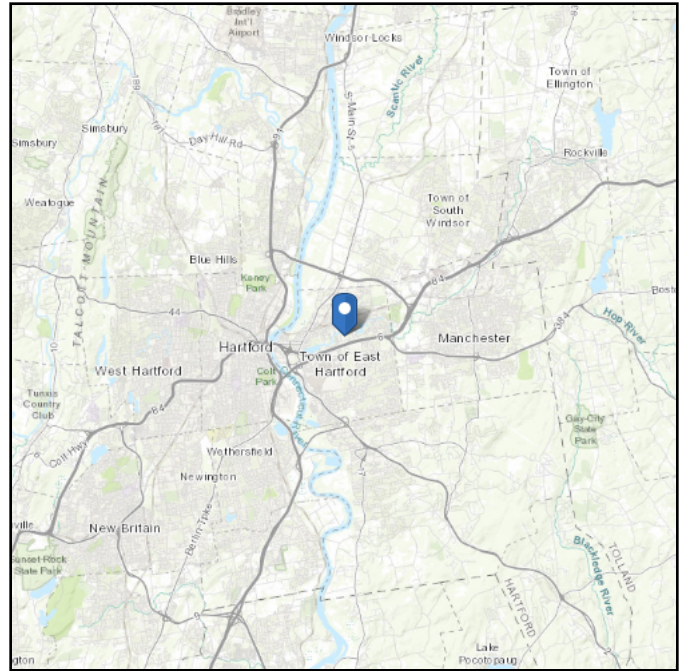
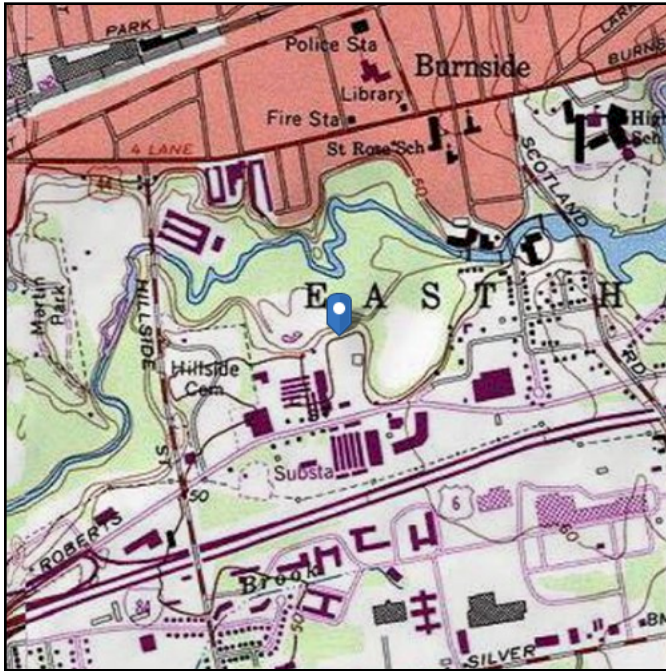
APPURTENANCE INFORMATION											
Appurtenance Name	Elevation	Qty.	$K_a$	$q_z$ (psf)	$EPA_N$ (ft <sup>2</sup> )	$EPA_T$ (ft <sup>2</sup> )	Wind $F_z$ (lbs)	Wind $F_x$ (lbs)	Weight (lbs)	Seismic F (lbs)	Member ( $\alpha$ sector)
JMA WIRELESS MX08FRO665-21	79.0	3	0.90	45.68	8.01	3.21	329.32	131.97	64.50	18.58	MP1
FUJITSU TA08025-B605	79.0	3	0.90	45.68	1.96	1.19	80.73	48.89	74.95	21.59	MP1
FUJITSU TA08025-B604	79.0	3	0.90	45.68	1.96	1.03	80.73	42.47	63.93	18.41	MP1
RAYCAP RDIDC-9181-PF-48	79.0	1	0.90	45.68	1.87	1.07	76.75	43.85	21.85	6.29	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:** 50.42 ft (NAVD 88)  
**Latitude:** 41.7733  
**Longitude:** -72.6134



## Wind

### Results:

Wind Speed:	<b>125 mph per East Hartford City Requirements in WSEL</b>
10-year MRI	77 Vmph
25-year MRI	86 Vmph
50-year MRI	93 Vmph
100-year MRI	100 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).

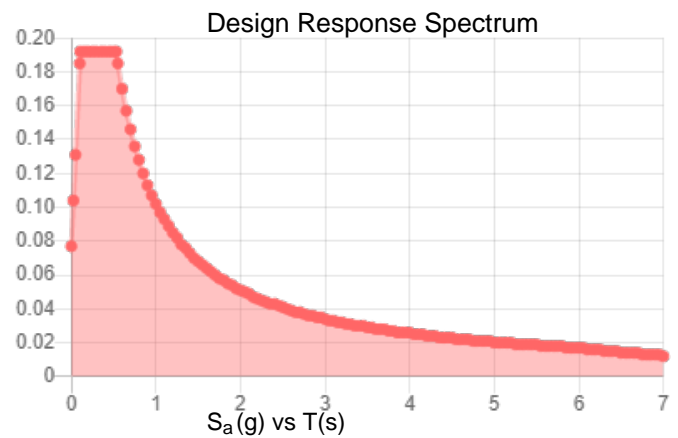
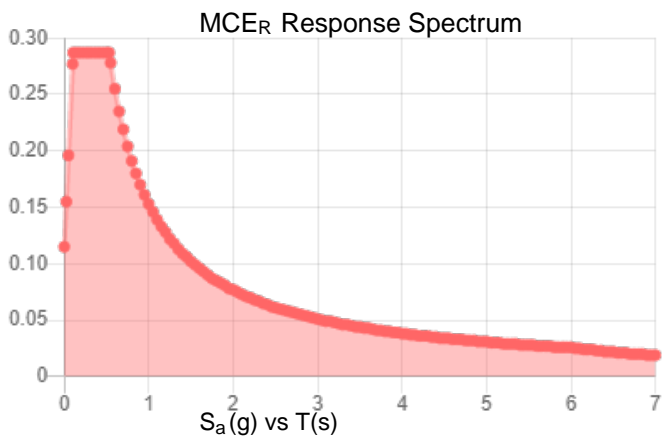
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

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

**Results:**

$S_S$ :	0.18	$S_{DS}$ :	0.192
$S_1$ :	0.064	$S_{D1}$ :	0.102
$F_a$ :	1.6	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.09
$S_{MS}$ :	0.287	PGA <sub>M</sub> :	0.144
$S_{M1}$ :	0.153	F <sub>PGA</sub> :	1.6
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:**

Thu Aug 26 2021

**Date Source:**

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

## Ice

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**Results:**

Ice Thickness: 1.00 in.

Concurrent Temperature: 5 F

Gust Speed: 50 mph

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

**Date Accessed:** Thu Aug 26 2021

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

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

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**Member Primary Data**

	Label	I Joint	J Joint	K Joint	Rotate(...)	Section/Shape	Type	Design List	Material	Design Rules
1	S3	P1	P3			Square Tubing	Beam	None	A500 GR.C	Typical
2	GA4	P9	P12		270	Grating Angle	Beam	None	A529 Gr. 50	Typical
3	GA3	P10	P11			Grating Angle	Beam	None	A529 Gr. 50	Typical
4	P3	P7	P8			Corner Plates	Beam	None	A1011 36 Ksi	Typical
5	S2	P13	P14			Square Tubing	Beam	None	A500 GR.C	Typical
6	GA2	P20	P23		270	Grating Angle	Beam	None	A529 Gr. 50	Typical
7	GA1	P21	P22			Grating Angle	Beam	None	A529 Gr. 50	Typical
8	P2	P18	P19			Corner Plates	Beam	None	A1011 36 Ksi	Typical
9	S1	P24	P25			Square Tubing	Beam	None	A500 GR.C	Typical
10	GA6	P31	P34		270	Grating Angle	Beam	None	A529 Gr. 50	Typical
11	GA5	P32	P33			Grating Angle	Beam	None	A529 Gr. 50	Typical
12	P1	P29	P30			Corner Plates	Beam	None	A1011 36 Ksi	Typical
13	H1	N43	N44			Face Pipes(3.5x.16)	Beam	None	A500 GR.C	Typical
14	MP1	N66	N60			Antenna Pipes	Beam	None	A500 GR.C	Typical
15	MP3	N63	N57			Antenna Pipes	Beam	None	A500 GR.C	Typical
16	HR1	N67	N68			Handrail	Beam	None	A500 GR.C	Typical
17	CA8	N114A	N113A		180	Handrail Connector	Beam	None	A1011 36 Ksi	Typical
18	CA9	N112A	N111A		180	Handrail Connector	Beam	None	A1011 36 Ksi	Typical
19	CA7	N116A	N115A		180	Handrail Connector	Beam	None	A1011 36 Ksi	Typical
20	M32	N48A	N70A			RIGID	None	None	RIGID	Typical
21	M35	N45	N69A			RIGID	None	None	RIGID	Typical
22	M36	N51	N71A			RIGID	None	None	RIGID	Typical
23	M39A	N54	N72A			RIGID	None	None	RIGID	Typical
24	CA3	P4	N122A			Channel(3.38x2.06)	Beam	None	A1011 36 Ksi	Typical
25	CA4	N124B	P4			Channel(3.38x2.06)	Beam	None	A1011 36 Ksi	Typical
26	CA1	P15	N122B			Channel(3.38x2.06)	Beam	None	A1011 36 Ksi	Typical
27	CA2	N123A	P15			Channel(3.38x2.06)	Beam	None	A1011 36 Ksi	Typical
28	CA5	P26	N125			Channel(3.38x2.06)	Beam	None	A1011 36 Ksi	Typical
29	CA6	N126	P26			Channel(3.38x2.06)	Beam	None	A1011 36 Ksi	Typical
30	M64	N126A	N125A			RIGID	None	None	RIGID	Typical
31	M65	N126	N125A			RIGID	None	None	RIGID	Typical
32	M66	N129	N128			RIGID	None	None	RIGID	Typical
33	M67	N124B	N128			RIGID	None	None	RIGID	Typical
34	M68	N132	N131			RIGID	None	None	RIGID	Typical
35	M69	N123A	N131			RIGID	None	None	RIGID	Typical
36	M70	N133	N132A			RIGID	None	None	RIGID	Typical
37	M71	N122B	N132A			RIGID	None	None	RIGID	Typical
38	M72	N135	N134			RIGID	None	None	RIGID	Typical
39	M73	N125	N134			RIGID	None	None	RIGID	Typical
40	M74	N138	N137			RIGID	None	None	RIGID	Typical
41	M75	N122A	N137			PL 2.375x0.5	None	None	A36 Gr.36	Typical

**Member Primary Data (Continued)**

	Label	I Joint	J Joint	K Joint	Rotate(...)	Section/Shape	Type	Design List	Material	Design Rules
42	MP2	N75	N74			Antenna Pipes	Beam	None	A500 GR.C	Typical
43	M43	N72B	N76			RIGID	None	None	RIGID	Typical
44	M44	N73	N77			RIGID	None	None	RIGID	Typical
45	H3	N81A	N82A			Face Pipes(3.5x.16)	Beam	None	A500 GR.C	Typical
46	MP7	N90	N88			Antenna Pipes	Beam	None	A500 GR.C	Typical
47	MP9	N89	N87			Antenna Pipes	Beam	None	A500 GR.C	Typical
48	HR3	N91	N92			Handrail	Beam	None	A500 GR.C	Typical
49	M52	N84	N94			RIGID	None	None	RIGID	Typical
50	M53	N83A	N93			RIGID	None	None	RIGID	Typical
51	M54	N85	N95			RIGID	None	None	RIGID	Typical
52	M55	N86	N96			RIGID	None	None	RIGID	Typical
53	H2	N109	N110			Face Pipes(3.5x.16)	Beam	None	A500 GR.C	Typical
54	MP4	N118	N116			Antenna Pipes	Beam	None	A500 GR.C	Typical
55	MP6	N117	N115			Antenna Pipes	Beam	None	A500 GR.C	Typical
56	HR2	N119	N120			Handrail	Beam	None	A500 GR.C	Typical
57	M66A	N112	N122			RIGID	None	None	RIGID	Typical
58	M67A	N111	N121			RIGID	None	None	RIGID	Typical
59	M68A	N113	N123			RIGID	None	None	RIGID	Typical
60	M69A	N114	N124			RIGID	None	None	RIGID	Typical
61	MP8	N132B	N131A			Antenna Pipes	Beam	None	A500 GR.C	Typical
62	M68B	N129B	N133B			RIGID	None	None	RIGID	Typical
63	M69B	N130A	N134A			RIGID	None	None	RIGID	Typical
64	MP5	N138A	N137A			Antenna Pipes	Beam	None	A500 GR.C	Typical
65	M71B	N135A	N139			RIGID	None	None	RIGID	Typical
66	M72B	N136	N140			RIGID	None	None	RIGID	Typical

**Hot Rolled Steel Design Parameters**

	Label	Shape	Lengt...	Lbby[in]	Lbzz[in]	Lcomp t...	Lcomp b...	L-tor...	Kyy	Kzz	Cb	Func...
1	S3	Square Tubing	40			Lbby						Late...
2	GA4	Grating Angle	27.295			Lbby						Late...
3	GA3	Grating Angle	27.295			Lbby						Late...
4	P3	Corner Plates	42			Lbby						Late...
5	S2	Square Tubing	40			Lbby						Late...
6	GA2	Grating Angle	27.295			Lbby						Late...
7	GA1	Grating Angle	27.295			Lbby						Late...
8	P2	Corner Plates	42			Lbby						Late...
9	S1	Square Tubing	40			Lbby						Late...
10	GA6	Grating Angle	27.295			Lbby						Late...
11	GA5	Grating Angle	27.295			Lbby						Late...
12	P1	Corner Plates	42			Lbby						Late...
13	H1	Face Pipes(3.5x.16)	96			Lbby						Late...

**Hot Rolled Steel Design Parameters (Continued)**

	Label	Shape	Lengt...	Lbby[in]	Lbzz[in]	Lcomp t...	Lcomp b...	L-tor...	Kyy	Kzz	Cb	Func...
14	MP1	Antenna Pipes	96			Lbby						Late...
15	MP3	Antenna Pipes	96			Lbby						Late...
16	HR1	Handrail	96			Lbby						Late...
17	CA8	Handrail Connector	42			Lbby						Late...
18	CA9	Handrail Connector	42			Lbby						Late...
19	CA7	Handrail Connector	42			Lbby						Late...
20	CA3	Channel(3.38x2.06)	33			Lbby						Late...
21	CA4	Channel(3.38x2.06)	33			Lbby						Late...
22	CA1	Channel(3.38x2.06)	33			Lbby						Late...
23	CA2	Channel(3.38x2.06)	33			Lbby						Late...
24	CA5	Channel(3.38x2.06)	33			Lbby						Late...
25	CA6	Channel(3.38x2.06)	33			Lbby						Late...
26	M75	PL 2.375x0.5	1.5			Lbby						Late...
27	MP2	Antenna Pipes	96			Lbby						Late...
28	H3	Face Pipes(3.5x.16)	96			Lbby						Late...
29	MP7	Antenna Pipes	96			Lbby						Late...
30	MP9	Antenna Pipes	96			Lbby						Late...
31	HR3	Handrail	96			Lbby						Late...
32	H2	Face Pipes(3.5x.16)	96			Lbby						Late...
33	MP4	Antenna Pipes	96			Lbby						Late...
34	MP6	Antenna Pipes	96			Lbby						Late...
35	HR2	Handrail	96			Lbby						Late...
36	MP8	Antenna Pipes	96			Lbby						Late...
37	MP5	Antenna Pipes	96			Lbby						Late...

**Member Advanced Data**

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical Defl Ra..	Analysis ...	Inactive	Seismi...
1	S3						Yes			None
2	GA4						Yes			None
3	GA3						Yes			None
4	P3	BenPIN	BenPIN				Yes	Default		None
5	S2						Yes			None
6	GA2						Yes			None
7	GA1						Yes			None
8	P2	BenPIN	BenPIN				Yes	Default		None
9	S1						Yes	Default		None
10	GA6						Yes			None
11	GA5						Yes			None
12	P1	BenPIN	BenPIN				Yes	Default		None
13	H1						Yes			None
14	MP1						Yes	+y+3		None



**Member Advanced Data (Continued)**

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Ra..	Analysis ...	Inactive	Seismi...
15	MP3						Yes		+y+3		None
16	HR1						Yes				None
17	CA8	00000X	00000X				Yes				None
18	CA9	00000X	00000X				Yes				None
19	CA7	00000X	00000X				Yes	Default			None
20	M32						Yes	** NA **			None
21	M35						Yes	** NA **			None
22	M36						Yes	** NA **			None
23	M39A						Yes	** NA **			None
24	CA3						Yes	Default			None
25	CA4						Yes	Default			None
26	CA1						Yes	Default			None
27	CA2						Yes	Default			None
28	CA5						Yes	Default			None
29	CA6						Yes	Default			None
30	M64	BenPIN					Yes	** NA **			None
31	M65						Yes	** NA **			None
32	M66	BenPIN					Yes	** NA **			None
33	M67						Yes	** NA **			None
34	M68	BenPIN					Yes	** NA **			None
35	M69						Yes	** NA **			None
36	M70	BenPIN					Yes	** NA **			None
37	M71						Yes	** NA **			None
38	M72	BenPIN					Yes	** NA **			None
39	M73						Yes	** NA **			None
40	M74	BenPIN					Yes	** NA **			None
41	M75						Yes	** NA **			None
42	MP2						Yes		+y+3		None
43	M43						Yes	** NA **			None
44	M44						Yes	** NA **			None
45	H3						Yes				None
46	MP7						Yes		+y+3		None
47	MP9						Yes		+y+3		None
48	HR3						Yes				None
49	M52						Yes	** NA **			None
50	M53						Yes	** NA **			None
51	M54						Yes	** NA **			None
52	M55						Yes	** NA **			None
53	H2						Yes				None
54	MP4						Yes		+y+3		None
55	MP6						Yes		+y+3		None
56	HR2						Yes				None



**Member Advanced Data (Continued)**

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

**Material Takeoff**

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

**Hot Rolled Steel Section Sets**

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



**Hot Rolled Steel Section Sets (Continued)**

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

**Basic Load Cases**

BLC Description	Category	X Gr...	Y Gr...	Z Gr...	Joint	Point	Distributed	Area(Memb...	Surface(Plate/Wall)
1 Self Weight	DL		-1			13		3	
2 Wind Load AZI 0	WLZ					26			
3 Wind Load AZI 30	None					26			
4 Wind Load AZI 60	None					26			
5 Wind Load AZI 90	WLX					26			
6 Wind Load AZI 1...	None					26			
7 Wind Load AZI 1...	None					26			
8 Wind Load AZI 1...	None					26			
9 Wind Load AZI 2...	None					26			
10 Wind Load AZI 2...	None					26			
11 Wind Load AZI 2...	None					26			
12 Wind Load AZI 3...	None					26			
13 Wind Load AZI 3...	None					26			
14 Distr. Wind Load Z	WLZ						66		
15 Distr. Wind Load X	WLX						66		
16 Ice Weight	OL1					13	66	3	
17 Ice Wind Load A...	OL2					26			
18 Ice Wind Load A...	None					26			
19 Ice Wind Load A...	None					26			
20 Ice Wind Load A...	OL3					26			
21 Ice Wind Load A...	None					26			
22 Ice Wind Load A...	None					26			
23 Ice Wind Load A...	None					26			
24 Ice Wind Load A...	None					26			
25 Ice Wind Load A...	None					26			
26 Ice Wind Load A...	None					26			
27 Ice Wind Load A...	None					26			
28 Ice Wind Load A...	None					26			
29 Distr. Ice Wind L...	OL2						66		
30 Distr. Ice Wind L...	OL3						66		
31 Seismic Load Z	ELZ			-.288		13			
32 Seismic Load X	ELX	-.288				13			
33 Service Live Loa...	LL								
34 Maintenance Loa...	LL				1				
35 Maintenance Loa...	LL				1				
36 Maintenance Loa...	LL				1				
37 Maintenance Loa...	LL				1				



**Basic Load Cases (Continued)**

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

**Load Combinations**

	Description	S...	P...	S...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...
1	1.4DL	Y...Y		1	1.4													
2	1.2DL + 1WL AZI 0	Y...Y		1	1.2	2	1	14	1	15								
3	1.2DL + 1WL AZI 30	Y...Y		1	1.2	3	1	14	.866	15	.5							
4	1.2DL + 1WL AZI 60	Y...Y		1	1.2	4	1	14	.5	15	.866							
5	1.2DL + 1WL AZI 90	Y...Y		1	1.2	5	1	14		15	1							
6	1.2DL + 1WL AZI 120	Y...Y		1	1.2	6	1	14	-.5	15	.866							
7	1.2DL + 1WL AZI 150	Y...Y		1	1.2	7	1	14	-.8...	15	.5							
8	1.2DL + 1WL AZI 180	Y...Y		1	1.2	8	1	14	-1	15								
9	1.2DL + 1WL AZI 210	Y...Y		1	1.2	9	1	14	-.8...	15	-.5							
10	1.2DL + 1WL AZI 240	Y...Y		1	1.2	10	1	14	-.5	15	-.8...							
11	1.2DL + 1WL AZI 270	Y...Y		1	1.2	11	1	14		15	-1							
12	1.2DL + 1WL AZI 300	Y...Y		1	1.2	12	1	14	.5	15	-.8...							
13	1.2DL + 1WL AZI 330	Y...Y		1	1.2	13	1	14	.866	15	-.5							
14	0.9DL + 1WL AZI 0	Y...Y		1	.9	2	1	14	1	15								
15	0.9DL + 1WL AZI 30	Y...Y		1	.9	3	1	14	.866	15	.5							
16	0.9DL + 1WL AZI 60	Y...Y		1	.9	4	1	14	.5	15	.866							
17	0.9DL + 1WL AZI 90	Y...Y		1	.9	5	1	14		15	1							
18	0.9DL + 1WL AZI 120	Y...Y		1	.9	6	1	14	-.5	15	.866							
19	0.9DL + 1WL AZI 150	Y...Y		1	.9	7	1	14	-.8...	15	.5							
20	0.9DL + 1WL AZI 180	Y...Y		1	.9	8	1	14	-1	15								
21	0.9DL + 1WL AZI 210	Y...Y		1	.9	9	1	14	-.8...	15	-.5							
22	0.9DL + 1WL AZI 240	Y...Y		1	.9	10	1	14	-.5	15	-.8...							
23	0.9DL + 1WL AZI 270	Y...Y		1	.9	11	1	14		15	-1							
24	0.9DL + 1WL AZI 300	Y...Y		1	.9	12	1	14	.5	15	-.8...							
25	0.9DL + 1WL AZI 330	Y...Y		1	.9	13	1	14	.866	15	-.5							
26	1.2D + 1.0Di	Y...Y		1	1.2	16	1											
27	1.2D + 1.0Di + 1.0Wi AZI 0	Y...Y		1	1.2	16	1	17	1	29	1	30						
28	1.2D + 1.0Di + 1.0Wi AZI 30	Y...Y		1	1.2	16	1	18	1	29	.866	30	.5					
29	1.2D + 1.0Di + 1.0Wi AZI 60	Y...Y		1	1.2	16	1	19	1	29	.5	30	.866					
30	1.2D + 1.0Di + 1.0Wi AZI 90	Y...Y		1	1.2	16	1	20	1	29		30	1					
31	1.2D + 1.0Di + 1.0Wi AZI 120	Y...Y		1	1.2	16	1	21	1	29	-.5	30	.866					





**Load Combinations (Continued)**

Description	S...	P...	S...B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...
74	1.0DL + 1.5LL + 1.0SWL (60 ...	Y...	Y	1	1	13	.23	14	.2	15	-1...	33	1.5								
75	1.2DL + 1.5LL	Y...	Y	1	1.2	33	1.5														
76	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y	1	1.2	34	1.5	2	.058	14	.058	15									
77	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y	1	1.2	34	1.5	3	.058	14	.05	15	.029								
78	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y	1	1.2	34	1.5	4	.058	14	.029	15	.05								
79	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y	1	1.2	34	1.5	5	.058	14		15	.058								
80	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y	1	1.2	34	1.5	6	.058	14	-0...	15	.05								
81	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y	1	1.2	34	1.5	7	.058	14	-.05	15	.029								
82	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y	1	1.2	34	1.5	8	.058	14	-0...	15									
83	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y	1	1.2	34	1.5	9	.058	14	-.05	15	-0...								
84	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y	1	1.2	34	1.5	10	.058	14	-0...	15	-.05								
85	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y	1	1.2	34	1.5	11	.058	14		15	-0...								
86	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y	1	1.2	34	1.5	12	.058	14	.029	15	-.05								
87	1.2DL + 1.5LM-MP1 + 1SWL (...	Y...	Y	1	1.2	34	1.5	13	.058	14	.05	15	-0...								
88	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y	1	1.2	35	1.5	2	.058	14	.058	15									
89	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y	1	1.2	35	1.5	3	.058	14	.05	15	.029								
90	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y	1	1.2	35	1.5	4	.058	14	.029	15	.05								
91	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y	1	1.2	35	1.5	5	.058	14		15	.058								
92	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y	1	1.2	35	1.5	6	.058	14	-0...	15	.05								
93	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y	1	1.2	35	1.5	7	.058	14	-.05	15	.029								
94	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y	1	1.2	35	1.5	8	.058	14	-0...	15									
95	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y	1	1.2	35	1.5	9	.058	14	-.05	15	-0...								
96	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y	1	1.2	35	1.5	10	.058	14	-0...	15	-.05								
97	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y	1	1.2	35	1.5	11	.058	14		15	-0...								
98	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y	1	1.2	35	1.5	12	.058	14	.029	15	-.05								
99	1.2DL + 1.5LM-MP2 + 1SWL (...	Y...	Y	1	1.2	35	1.5	13	.058	14	.05	15	-0...								
100	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y	1	1.2	36	1.5	2	.058	14	.058	15									
101	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y	1	1.2	36	1.5	3	.058	14	.05	15	.029								
102	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y	1	1.2	36	1.5	4	.058	14	.029	15	.05								
103	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y	1	1.2	36	1.5	5	.058	14		15	.058								
104	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y	1	1.2	36	1.5	6	.058	14	-0...	15	.05								
105	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y	1	1.2	36	1.5	7	.058	14	-.05	15	.029								
106	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y	1	1.2	36	1.5	8	.058	14	-0...	15									
107	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y	1	1.2	36	1.5	9	.058	14	-.05	15	-0...								
108	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y	1	1.2	36	1.5	10	.058	14	-0...	15	-.05								
109	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y	1	1.2	36	1.5	11	.058	14		15	-0...								
110	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y	1	1.2	36	1.5	12	.058	14	.029	15	-.05								
111	1.2DL + 1.5LM-MP3 + 1SWL (...	Y...	Y	1	1.2	36	1.5	13	.058	14	.05	15	-0...								
112	1.2DL + 1.5LM-MP4 + 1SWL (...	Y...	Y	1	1.2	37	1.5	2	.058	14	.058	15									
113	1.2DL + 1.5LM-MP4 + 1SWL (...	Y...	Y	1	1.2	37	1.5	3	.058	14	.05	15	.029								
114	1.2DL + 1.5LM-MP4 + 1SWL (...	Y...	Y	1	1.2	37	1.5	4	.058	14	.029	15	.05								
115	1.2DL + 1.5LM-MP4 + 1SWL (...	Y...	Y	1	1.2	37	1.5	5	.058	14		15	.058								



**Load Combinations (Continued)**

	Description	S...	P...	S...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...
116	1.2DL + 1.5LM-MP4 + 1SWL (...Y...Y		Y	1	1.2	37	1.5	6	.058	14	-0...	15	.05						
117	1.2DL + 1.5LM-MP4 + 1SWL (...Y...Y		Y	1	1.2	37	1.5	7	.058	14	-05	15	.029						
118	1.2DL + 1.5LM-MP4 + 1SWL (...Y...Y		Y	1	1.2	37	1.5	8	.058	14	-0...	15							
119	1.2DL + 1.5LM-MP4 + 1SWL (...Y...Y		Y	1	1.2	37	1.5	9	.058	14	-05	15	-0...						
120	1.2DL + 1.5LM-MP4 + 1SWL (...Y...Y		Y	1	1.2	37	1.5	10	.058	14	-0...	15	-05						
121	1.2DL + 1.5LM-MP4 + 1SWL (...Y...Y		Y	1	1.2	37	1.5	11	.058	14		15	-0...						
122	1.2DL + 1.5LM-MP4 + 1SWL (...Y...Y		Y	1	1.2	37	1.5	12	.058	14	.029	15	-05						
123	1.2DL + 1.5LM-MP4 + 1SWL (...Y...Y		Y	1	1.2	37	1.5	13	.058	14	.05	15	-0...						
124	1.2DL + 1.5LM-MP5 + 1SWL (...Y...Y		Y	1	1.2	38	1.5	2	.058	14	.058	15							
125	1.2DL + 1.5LM-MP5 + 1SWL (...Y...Y		Y	1	1.2	38	1.5	3	.058	14	.05	15	.029						
126	1.2DL + 1.5LM-MP5 + 1SWL (...Y...Y		Y	1	1.2	38	1.5	4	.058	14	.029	15	.05						
127	1.2DL + 1.5LM-MP5 + 1SWL (...Y...Y		Y	1	1.2	38	1.5	5	.058	14		15	.058						
128	1.2DL + 1.5LM-MP5 + 1SWL (...Y...Y		Y	1	1.2	38	1.5	6	.058	14	-0...	15	.05						
129	1.2DL + 1.5LM-MP5 + 1SWL (...Y...Y		Y	1	1.2	38	1.5	7	.058	14	-05	15	.029						
130	1.2DL + 1.5LM-MP5 + 1SWL (...Y...Y		Y	1	1.2	38	1.5	8	.058	14	-0...	15							
131	1.2DL + 1.5LM-MP5 + 1SWL (...Y...Y		Y	1	1.2	38	1.5	9	.058	14	-05	15	-0...						
132	1.2DL + 1.5LM-MP5 + 1SWL (...Y...Y		Y	1	1.2	38	1.5	10	.058	14	-0...	15	-05						
133	1.2DL + 1.5LM-MP5 + 1SWL (...Y...Y		Y	1	1.2	38	1.5	11	.058	14		15	-0...						
134	1.2DL + 1.5LM-MP5 + 1SWL (...Y...Y		Y	1	1.2	38	1.5	12	.058	14	.029	15	-05						
135	1.2DL + 1.5LM-MP5 + 1SWL (...Y...Y		Y	1	1.2	38	1.5	13	.058	14	.05	15	-0...						
136	1.2DL + 1.5LM-MP6 + 1SWL (...Y...Y		Y	1	1.2	39	1.5	2	.058	14	.058	15							
137	1.2DL + 1.5LM-MP6 + 1SWL (...Y...Y		Y	1	1.2	39	1.5	3	.058	14	.05	15	.029						
138	1.2DL + 1.5LM-MP6 + 1SWL (...Y...Y		Y	1	1.2	39	1.5	4	.058	14	.029	15	.05						
139	1.2DL + 1.5LM-MP6 + 1SWL (...Y...Y		Y	1	1.2	39	1.5	5	.058	14		15	.058						
140	1.2DL + 1.5LM-MP6 + 1SWL (...Y...Y		Y	1	1.2	39	1.5	6	.058	14	-0...	15	.05						
141	1.2DL + 1.5LM-MP6 + 1SWL (...Y...Y		Y	1	1.2	39	1.5	7	.058	14	-05	15	.029						
142	1.2DL + 1.5LM-MP6 + 1SWL (...Y...Y		Y	1	1.2	39	1.5	8	.058	14	-0...	15							
143	1.2DL + 1.5LM-MP6 + 1SWL (...Y...Y		Y	1	1.2	39	1.5	9	.058	14	-05	15	-0...						
144	1.2DL + 1.5LM-MP6 + 1SWL (...Y...Y		Y	1	1.2	39	1.5	10	.058	14	-0...	15	-05						
145	1.2DL + 1.5LM-MP6 + 1SWL (...Y...Y		Y	1	1.2	39	1.5	11	.058	14		15	-0...						
146	1.2DL + 1.5LM-MP6 + 1SWL (...Y...Y		Y	1	1.2	39	1.5	12	.058	14	.029	15	-05						
147	1.2DL + 1.5LM-MP6 + 1SWL (...Y...Y		Y	1	1.2	39	1.5	13	.058	14	.05	15	-0...						
148	1.2DL + 1.5LM-MP7 + 1SWL (...Y...Y		Y	1	1.2	40	1.5	2	.058	14	.058	15							
149	1.2DL + 1.5LM-MP7 + 1SWL (...Y...Y		Y	1	1.2	40	1.5	3	.058	14	.05	15	.029						
150	1.2DL + 1.5LM-MP7 + 1SWL (...Y...Y		Y	1	1.2	40	1.5	4	.058	14	.029	15	.05						
151	1.2DL + 1.5LM-MP7 + 1SWL (...Y...Y		Y	1	1.2	40	1.5	5	.058	14		15	.058						
152	1.2DL + 1.5LM-MP7 + 1SWL (...Y...Y		Y	1	1.2	40	1.5	6	.058	14	-0...	15	.05						
153	1.2DL + 1.5LM-MP7 + 1SWL (...Y...Y		Y	1	1.2	40	1.5	7	.058	14	-05	15	.029						
154	1.2DL + 1.5LM-MP7 + 1SWL (...Y...Y		Y	1	1.2	40	1.5	8	.058	14	-0...	15							
155	1.2DL + 1.5LM-MP7 + 1SWL (...Y...Y		Y	1	1.2	40	1.5	9	.058	14	-05	15	-0...						
156	1.2DL + 1.5LM-MP7 + 1SWL (...Y...Y		Y	1	1.2	40	1.5	10	.058	14	-0...	15	-05						
157	1.2DL + 1.5LM-MP7 + 1SWL (...Y...Y		Y	1	1.2	40	1.5	11	.058	14		15	-0...						

**Load Combinations (Continued)**

	Description	S...	P...	S...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...
158	1.2DL + 1.5LM-MP7 + 1SWL (...Y...)	Y		1	1.2	40	1.5	12	.058	14	.029	15	-.05					
159	1.2DL + 1.5LM-MP7 + 1SWL (...Y...)	Y		1	1.2	40	1.5	13	.058	14	.05	15	-.0...					
160	1.2DL + 1.5LM-MP8 + 1SWL (...Y...)	Y		1	1.2	41	1.5	2	.058	14	.058	15						
161	1.2DL + 1.5LM-MP8 + 1SWL (...Y...)	Y		1	1.2	41	1.5	3	.058	14	.05	15	.029					
162	1.2DL + 1.5LM-MP8 + 1SWL (...Y...)	Y		1	1.2	41	1.5	4	.058	14	.029	15	.05					
163	1.2DL + 1.5LM-MP8 + 1SWL (...Y...)	Y		1	1.2	41	1.5	5	.058	14		15	.058					
164	1.2DL + 1.5LM-MP8 + 1SWL (...Y...)	Y		1	1.2	41	1.5	6	.058	14	-.0...	15	.05					
165	1.2DL + 1.5LM-MP8 + 1SWL (...Y...)	Y		1	1.2	41	1.5	7	.058	14	-.05	15	.029					
166	1.2DL + 1.5LM-MP8 + 1SWL (...Y...)	Y		1	1.2	41	1.5	8	.058	14	-.0...	15						
167	1.2DL + 1.5LM-MP8 + 1SWL (...Y...)	Y		1	1.2	41	1.5	9	.058	14	-.05	15	-.0...					
168	1.2DL + 1.5LM-MP8 + 1SWL (...Y...)	Y		1	1.2	41	1.5	10	.058	14	-.0...	15	-.05					
169	1.2DL + 1.5LM-MP8 + 1SWL (...Y...)	Y		1	1.2	41	1.5	11	.058	14		15	-.0...					
170	1.2DL + 1.5LM-MP8 + 1SWL (...Y...)	Y		1	1.2	41	1.5	12	.058	14	.029	15	-.05					
171	1.2DL + 1.5LM-MP8 + 1SWL (...Y...)	Y		1	1.2	41	1.5	13	.058	14	.05	15	-.0...					
172	1.2DL + 1.5LM-MP9 + 1SWL (...Y...)	Y		1	1.2	42	1.5	2	.058	14	.058	15						
173	1.2DL + 1.5LM-MP9 + 1SWL (...Y...)	Y		1	1.2	42	1.5	3	.058	14	.05	15	.029					
174	1.2DL + 1.5LM-MP9 + 1SWL (...Y...)	Y		1	1.2	42	1.5	4	.058	14	.029	15	.05					
175	1.2DL + 1.5LM-MP9 + 1SWL (...Y...)	Y		1	1.2	42	1.5	5	.058	14		15	.058					
176	1.2DL + 1.5LM-MP9 + 1SWL (...Y...)	Y		1	1.2	42	1.5	6	.058	14	-.0...	15	.05					
177	1.2DL + 1.5LM-MP9 + 1SWL (...Y...)	Y		1	1.2	42	1.5	7	.058	14	-.05	15	.029					
178	1.2DL + 1.5LM-MP9 + 1SWL (...Y...)	Y		1	1.2	42	1.5	8	.058	14	-.0...	15						
179	1.2DL + 1.5LM-MP9 + 1SWL (...Y...)	Y		1	1.2	42	1.5	9	.058	14	-.05	15	-.0...					
180	1.2DL + 1.5LM-MP9 + 1SWL (...Y...)	Y		1	1.2	42	1.5	10	.058	14	-.0...	15	-.05					
181	1.2DL + 1.5LM-MP9 + 1SWL (...Y...)	Y		1	1.2	42	1.5	11	.058	14		15	-.0...					
182	1.2DL + 1.5LM-MP9 + 1SWL (...Y...)	Y		1	1.2	42	1.5	12	.058	14	.029	15	-.05					

**Joint Boundary Conditions**

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	P24	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	P13	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	P1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

**Envelope Joint Reactions**

Joint	X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC		
1	P24	...	1039.026	6	2561.4...	35	1597.3...	13	1040.9...	16	2040.317	19	4575.032	35
2		...	-1021.221	24	-571.9...	16	-1589.4...	19	-4077.24	35	-2056.404	13	-1838.386	16
3	P13	...	1212.379	4	2812.5...	31	1586.4...	15	1024.2...	24	2159.96	15	1701.947	24
4		...	-1211.343	22	-514.9...	24	-1593.0...	9	-2815.7...	92	-2205.564	9	-6443.495	31
5	P1	...	1583.251	17	2607.8...	27	825.017	2	6280.1...	27	1794.844	11	1581.858	115

**Envelope Joint Reactions (Continued)**

Joint	X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
6	-1602.212	11	-590.2...	20	-831.796	8	-2168.0...	20	-1743.572	17	-863.658	157
7	Totals: ... 3641.139	5	7229.9	34	3856.5...	14						
8	-3641.131	23	1532.8...	53	-3856.5...	8						

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	Y	-32.25	0
2	MP1	Y	-32.25	72
3	MP1	Y	-74.95	12
4	MP1	Y	-63.93	12
5	MP1	Y	-21.85	48
6	MP4	Y	-32.25	0
7	MP4	Y	-32.25	72
8	MP4	Y	-74.95	12
9	MP4	Y	-63.93	12
10	MP7	Y	-32.25	0
11	MP7	Y	-32.25	72
12	MP7	Y	-74.95	12
13	MP7	Y	-63.93	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	X	0	0
2	MP1	Z	-164.66	0
3	MP1	X	0	72
4	MP1	Z	-164.66	72
5	MP1	X	0	12
6	MP1	Z	-80.73	12
7	MP1	X	0	12
8	MP1	Z	-80.73	12
9	MP1	X	0	48
10	MP1	Z	-76.75	48
11	MP4	X	0	0
12	MP4	Z	-90.66	0
13	MP4	X	0	72
14	MP4	Z	-90.66	72
15	MP4	X	0	12
16	MP4	Z	-56.85	12
17	MP4	X	0	12
18	MP4	Z	-52.03	12





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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
19	MP7	X	0	0
20	MP7	Z	-90.66	0
21	MP7	X	0	72
22	MP7	Z	-90.66	72
23	MP7	X	0	12
24	MP7	Z	-56.85	12
25	MP7	X	0	12
26	MP7	Z	-52.03	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-70	0
2	MP1	Z	-121.24	0
3	MP1	X	-70	72
4	MP1	Z	-121.24	72
5	MP1	X	-36.38	12
6	MP1	Z	-63.02	12
7	MP1	X	-35.58	12
8	MP1	Z	-61.63	12
9	MP1	X	-34.26	48
10	MP1	Z	-59.34	48
11	MP4	X	-70	0
12	MP4	Z	-121.24	0
13	MP4	X	-70	72
14	MP4	Z	-121.24	72
15	MP4	X	-36.38	12
16	MP4	Z	-63.02	12
17	MP4	X	-35.58	12
18	MP4	Z	-61.63	12
19	MP7	X	-32.99	0
20	MP7	Z	-57.15	0
21	MP7	X	-32.99	72
22	MP7	Z	-57.15	72
23	MP7	X	-24.44	12
24	MP7	Z	-42.34	12
25	MP7	X	-21.23	12
26	MP7	Z	-36.78	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-78.51	0



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
2	MP1	Z	-45.33	0
3	MP1	X	-78.51	72
4	MP1	Z	-45.33	72
5	MP1	X	-49.23	12
6	MP1	Z	-28.42	12
7	MP1	X	-45.06	12
8	MP1	Z	-26.02	12
9	MP1	X	-45.1	48
10	MP1	Z	-26.04	48
11	MP4	X	-142.6	0
12	MP4	Z	-82.33	0
13	MP4	X	-142.6	72
14	MP4	Z	-82.33	72
15	MP4	X	-69.91	12
16	MP4	Z	-40.36	12
17	MP4	X	-69.91	12
18	MP4	Z	-40.36	12
19	MP7	X	-78.51	0
20	MP7	Z	-45.33	0
21	MP7	X	-78.51	72
22	MP7	Z	-45.33	72
23	MP7	X	-49.23	12
24	MP7	Z	-28.42	12
25	MP7	X	-45.06	12
26	MP7	Z	-26.02	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-65.99	0
2	MP1	Z	0	0
3	MP1	X	-65.99	72
4	MP1	Z	0	72
5	MP1	X	-48.89	12
6	MP1	Z	0	12
7	MP1	X	-42.47	12
8	MP1	Z	0	12
9	MP1	X	-43.85	48
10	MP1	Z	0	48
11	MP4	X	-139.99	0
12	MP4	Z	0	0
13	MP4	X	-139.99	72
14	MP4	Z	0	72



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
15	MP4	X	-72.77	12
16	MP4	Z	0	12
17	MP4	X	-71.16	12
18	MP4	Z	0	12
19	MP7	X	-139.99	0
20	MP7	Z	0	0
21	MP7	X	-139.99	72
22	MP7	Z	0	72
23	MP7	X	-72.77	12
24	MP7	Z	0	12
25	MP7	X	-71.16	12
26	MP7	Z	0	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-78.51	0
2	MP1	Z	45.33	0
3	MP1	X	-78.51	72
4	MP1	Z	45.33	72
5	MP1	X	-49.23	12
6	MP1	Z	28.42	12
7	MP1	X	-45.06	12
8	MP1	Z	26.02	12
9	MP1	X	-45.1	48
10	MP1	Z	26.04	48
11	MP4	X	-78.51	0
12	MP4	Z	45.33	0
13	MP4	X	-78.51	72
14	MP4	Z	45.33	72
15	MP4	X	-49.23	12
16	MP4	Z	28.42	12
17	MP4	X	-45.06	12
18	MP4	Z	26.02	12
19	MP7	X	-142.6	0
20	MP7	Z	82.33	0
21	MP7	X	-142.6	72
22	MP7	Z	82.33	72
23	MP7	X	-69.91	12
24	MP7	Z	40.36	12
25	MP7	X	-69.91	12
26	MP7	Z	40.36	12



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-70	0
2	MP1	Z	121.24	0
3	MP1	X	-70	72
4	MP1	Z	121.24	72
5	MP1	X	-36.38	12
6	MP1	Z	63.02	12
7	MP1	X	-35.58	12
8	MP1	Z	61.63	12
9	MP1	X	-34.26	48
10	MP1	Z	59.34	48
11	MP4	X	-32.99	0
12	MP4	Z	57.15	0
13	MP4	X	-32.99	72
14	MP4	Z	57.15	72
15	MP4	X	-24.44	12
16	MP4	Z	42.34	12
17	MP4	X	-21.23	12
18	MP4	Z	36.78	12
19	MP7	X	-70	0
20	MP7	Z	121.24	0
21	MP7	X	-70	72
22	MP7	Z	121.24	72
23	MP7	X	-36.38	12
24	MP7	Z	63.02	12
25	MP7	X	-35.58	12
26	MP7	Z	61.63	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	0	0
2	MP1	Z	164.66	0
3	MP1	X	0	72
4	MP1	Z	164.66	72
5	MP1	X	0	12
6	MP1	Z	80.73	12
7	MP1	X	0	12
8	MP1	Z	80.73	12
9	MP1	X	0	48
10	MP1	Z	76.75	48
11	MP4	X	0	0
12	MP4	Z	90.66	0
13	MP4	X	0	72



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
14	MP4	Z	90.66	72
15	MP4	X	0	12
16	MP4	Z	56.85	12
17	MP4	X	0	12
18	MP4	Z	52.03	12
19	MP7	X	0	0
20	MP7	Z	90.66	0
21	MP7	X	0	72
22	MP7	Z	90.66	72
23	MP7	X	0	12
24	MP7	Z	56.85	12
25	MP7	X	0	12
26	MP7	Z	52.03	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	70	0
2	MP1	Z	121.24	0
3	MP1	X	70	72
4	MP1	Z	121.24	72
5	MP1	X	36.38	12
6	MP1	Z	63.02	12
7	MP1	X	35.58	12
8	MP1	Z	61.63	12
9	MP1	X	34.26	48
10	MP1	Z	59.34	48
11	MP4	X	70	0
12	MP4	Z	121.24	0
13	MP4	X	70	72
14	MP4	Z	121.24	72
15	MP4	X	36.38	12
16	MP4	Z	63.02	12
17	MP4	X	35.58	12
18	MP4	Z	61.63	12
19	MP7	X	32.99	0
20	MP7	Z	57.15	0
21	MP7	X	32.99	72
22	MP7	Z	57.15	72
23	MP7	X	24.44	12
24	MP7	Z	42.34	12
25	MP7	X	21.23	12
26	MP7	Z	36.78	12



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	78.51	0
2	MP1	Z	45.33	0
3	MP1	X	78.51	72
4	MP1	Z	45.33	72
5	MP1	X	49.23	12
6	MP1	Z	28.42	12
7	MP1	X	45.06	12
8	MP1	Z	26.02	12
9	MP1	X	45.1	48
10	MP1	Z	26.04	48
11	MP4	X	142.6	0
12	MP4	Z	82.33	0
13	MP4	X	142.6	72
14	MP4	Z	82.33	72
15	MP4	X	69.91	12
16	MP4	Z	40.36	12
17	MP4	X	69.91	12
18	MP4	Z	40.36	12
19	MP7	X	78.51	0
20	MP7	Z	45.33	0
21	MP7	X	78.51	72
22	MP7	Z	45.33	72
23	MP7	X	49.23	12
24	MP7	Z	28.42	12
25	MP7	X	45.06	12
26	MP7	Z	26.02	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	65.99	0
2	MP1	Z	0	0
3	MP1	X	65.99	72
4	MP1	Z	0	72
5	MP1	X	48.89	12
6	MP1	Z	0	12
7	MP1	X	42.47	12
8	MP1	Z	0	12
9	MP1	X	43.85	48
10	MP1	Z	0	48
11	MP4	X	139.99	0
12	MP4	Z	0	0
13	MP4	X	139.99	72



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
14	MP4	Z	0	72
15	MP4	X	72.77	12
16	MP4	Z	0	12
17	MP4	X	71.16	12
18	MP4	Z	0	12
19	MP7	X	139.99	0
20	MP7	Z	0	0
21	MP7	X	139.99	72
22	MP7	Z	0	72
23	MP7	X	72.77	12
24	MP7	Z	0	12
25	MP7	X	71.16	12
26	MP7	Z	0	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	78.51	0
2	MP1	Z	-45.33	0
3	MP1	X	78.51	72
4	MP1	Z	-45.33	72
5	MP1	X	49.23	12
6	MP1	Z	-28.42	12
7	MP1	X	45.06	12
8	MP1	Z	-26.02	12
9	MP1	X	45.1	48
10	MP1	Z	-26.04	48
11	MP4	X	78.51	0
12	MP4	Z	-45.33	0
13	MP4	X	78.51	72
14	MP4	Z	-45.33	72
15	MP4	X	49.23	12
16	MP4	Z	-28.42	12
17	MP4	X	45.06	12
18	MP4	Z	-26.02	12
19	MP7	X	142.6	0
20	MP7	Z	-82.33	0
21	MP7	X	142.6	72
22	MP7	Z	-82.33	72
23	MP7	X	69.91	12
24	MP7	Z	-40.36	12
25	MP7	X	69.91	12
26	MP7	Z	-40.36	12



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	70	0
2	MP1	Z	-121.24	0
3	MP1	X	70	72
4	MP1	Z	-121.24	72
5	MP1	X	36.38	12
6	MP1	Z	-63.02	12
7	MP1	X	35.58	12
8	MP1	Z	-61.63	12
9	MP1	X	34.26	48
10	MP1	Z	-59.34	48
11	MP4	X	32.99	0
12	MP4	Z	-57.15	0
13	MP4	X	32.99	72
14	MP4	Z	-57.15	72
15	MP4	X	24.44	12
16	MP4	Z	-42.34	12
17	MP4	X	21.23	12
18	MP4	Z	-36.78	12
19	MP7	X	70	0
20	MP7	Z	-121.24	0
21	MP7	X	70	72
22	MP7	Z	-121.24	72
23	MP7	X	36.38	12
24	MP7	Z	-63.02	12
25	MP7	X	35.58	12
26	MP7	Z	-61.63	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Y	-186.121	0
2	MP1	Y	-186.121	72
3	MP1	Y	-99.937	12
4	MP1	Y	-94.033	12
5	MP1	Y	-91.792	48
6	MP4	Y	-186.121	0
7	MP4	Y	-186.121	72
8	MP4	Y	-99.937	12
9	MP4	Y	-94.033	12
10	MP7	Y	-186.121	0
11	MP7	Y	-186.121	72
12	MP7	Y	-99.937	12
13	MP7	Y	-94.033	12





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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	0	0
2	MP1	Z	-21.85	0
3	MP1	X	0	72
4	MP1	Z	-21.85	72
5	MP1	X	0	12
6	MP1	Z	-8.88	12
7	MP1	X	0	12
8	MP1	Z	-8.88	12
9	MP1	X	0	48
10	MP1	Z	-8.54	48
11	MP4	X	0	0
12	MP4	Z	-16.26	0
13	MP4	X	0	72
14	MP4	Z	-16.26	72
15	MP4	X	0	12
16	MP4	Z	-7.42	12
17	MP4	X	0	12
18	MP4	Z	-7.18	12
19	MP7	X	0	0
20	MP7	Z	-16.26	0
21	MP7	X	0	72
22	MP7	Z	-16.26	72
23	MP7	X	0	12
24	MP7	Z	-7.42	12
25	MP7	X	0	12
26	MP7	Z	-7.18	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-9.99	0
2	MP1	Z	-17.31	0
3	MP1	X	-9.99	72
4	MP1	Z	-17.31	72
5	MP1	X	-4.2	12
6	MP1	Z	-7.27	12
7	MP1	X	-4.16	12
8	MP1	Z	-7.2	12
9	MP1	X	-4.04	48
10	MP1	Z	-7.01	48
11	MP4	X	-9.99	0
12	MP4	Z	-17.31	0
13	MP4	X	-9.99	72



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
14	MP4	Z	-17.31	72
15	MP4	X	-4.2	12
16	MP4	Z	-7.27	12
17	MP4	X	-4.16	12
18	MP4	Z	-7.2	12
19	MP7	X	-7.2	0
20	MP7	Z	-12.47	0
21	MP7	X	-7.2	72
22	MP7	Z	-12.47	72
23	MP7	X	-3.47	12
24	MP7	Z	-6.01	12
25	MP7	X	-3.31	12
26	MP7	Z	-5.73	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-14.08	0
2	MP1	Z	-8.13	0
3	MP1	X	-14.08	72
4	MP1	Z	-8.13	72
5	MP1	X	-6.43	12
6	MP1	Z	-3.71	12
7	MP1	X	-6.22	12
8	MP1	Z	-3.59	12
9	MP1	X	-6.22	48
10	MP1	Z	-3.59	48
11	MP4	X	-18.92	0
12	MP4	Z	-10.92	0
13	MP4	X	-18.92	72
14	MP4	Z	-10.92	72
15	MP4	X	-7.69	12
16	MP4	Z	-4.44	12
17	MP4	X	-7.69	12
18	MP4	Z	-4.44	12
19	MP7	X	-14.08	0
20	MP7	Z	-8.13	0
21	MP7	X	-14.08	72
22	MP7	Z	-8.13	72
23	MP7	X	-6.43	12
24	MP7	Z	-3.71	12
25	MP7	X	-6.22	12
26	MP7	Z	-3.59	12



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-14.4	0
2	MP1	Z	0	0
3	MP1	X	-14.4	72
4	MP1	Z	0	72
5	MP1	X	-6.94	12
6	MP1	Z	0	12
7	MP1	X	-6.61	12
8	MP1	Z	0	12
9	MP1	X	-6.73	48
10	MP1	Z	0	48
11	MP4	X	-19.99	0
12	MP4	Z	0	0
13	MP4	X	-19.99	72
14	MP4	Z	0	72
15	MP4	X	-8.39	12
16	MP4	Z	0	12
17	MP4	X	-8.31	12
18	MP4	Z	0	12
19	MP7	X	-19.99	0
20	MP7	Z	0	0
21	MP7	X	-19.99	72
22	MP7	Z	0	72
23	MP7	X	-8.39	12
24	MP7	Z	0	12
25	MP7	X	-8.31	12
26	MP7	Z	0	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-14.08	0
2	MP1	Z	8.13	0
3	MP1	X	-14.08	72
4	MP1	Z	8.13	72
5	MP1	X	-6.43	12
6	MP1	Z	3.71	12
7	MP1	X	-6.22	12
8	MP1	Z	3.59	12
9	MP1	X	-6.22	48
10	MP1	Z	3.59	48
11	MP4	X	-14.08	0
12	MP4	Z	8.13	0
13	MP4	X	-14.08	72



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
14	MP4	Z	8.13	72
15	MP4	X	-6.43	12
16	MP4	Z	3.71	12
17	MP4	X	-6.22	12
18	MP4	Z	3.59	12
19	MP7	X	-18.92	0
20	MP7	Z	10.92	0
21	MP7	X	-18.92	72
22	MP7	Z	10.92	72
23	MP7	X	-7.69	12
24	MP7	Z	4.44	12
25	MP7	X	-7.69	12
26	MP7	Z	4.44	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	X	-9.99	0
2	MP1	Z	17.31	0
3	MP1	X	-9.99	72
4	MP1	Z	17.31	72
5	MP1	X	-4.2	12
6	MP1	Z	7.27	12
7	MP1	X	-4.16	12
8	MP1	Z	7.2	12
9	MP1	X	-4.04	48
10	MP1	Z	7.01	48
11	MP4	X	-7.2	0
12	MP4	Z	12.47	0
13	MP4	X	-7.2	72
14	MP4	Z	12.47	72
15	MP4	X	-3.47	12
16	MP4	Z	6.01	12
17	MP4	X	-3.31	12
18	MP4	Z	5.73	12
19	MP7	X	-9.99	0
20	MP7	Z	17.31	0
21	MP7	X	-9.99	72
22	MP7	Z	17.31	72
23	MP7	X	-4.2	12
24	MP7	Z	7.27	12
25	MP7	X	-4.16	12
26	MP7	Z	7.2	12



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	0	0
2	MP1	Z	21.85	0
3	MP1	X	0	72
4	MP1	Z	21.85	72
5	MP1	X	0	12
6	MP1	Z	8.88	12
7	MP1	X	0	12
8	MP1	Z	8.88	12
9	MP1	X	0	48
10	MP1	Z	8.54	48
11	MP4	X	0	0
12	MP4	Z	16.26	0
13	MP4	X	0	72
14	MP4	Z	16.26	72
15	MP4	X	0	12
16	MP4	Z	7.42	12
17	MP4	X	0	12
18	MP4	Z	7.18	12
19	MP7	X	0	0
20	MP7	Z	16.26	0
21	MP7	X	0	72
22	MP7	Z	16.26	72
23	MP7	X	0	12
24	MP7	Z	7.42	12
25	MP7	X	0	12
26	MP7	Z	7.18	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	9.99	0
2	MP1	Z	17.31	0
3	MP1	X	9.99	72
4	MP1	Z	17.31	72
5	MP1	X	4.2	12
6	MP1	Z	7.27	12
7	MP1	X	4.16	12
8	MP1	Z	7.2	12
9	MP1	X	4.04	48
10	MP1	Z	7.01	48
11	MP4	X	9.99	0
12	MP4	Z	17.31	0
13	MP4	X	9.99	72



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
14	MP4	Z	17.31	72
15	MP4	X	4.2	12
16	MP4	Z	7.27	12
17	MP4	X	4.16	12
18	MP4	Z	7.2	12
19	MP7	X	7.2	0
20	MP7	Z	12.47	0
21	MP7	X	7.2	72
22	MP7	Z	12.47	72
23	MP7	X	3.47	12
24	MP7	Z	6.01	12
25	MP7	X	3.31	12
26	MP7	Z	5.73	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	14.08	0
2	MP1	Z	8.13	0
3	MP1	X	14.08	72
4	MP1	Z	8.13	72
5	MP1	X	6.43	12
6	MP1	Z	3.71	12
7	MP1	X	6.22	12
8	MP1	Z	3.59	12
9	MP1	X	6.22	48
10	MP1	Z	3.59	48
11	MP4	X	18.92	0
12	MP4	Z	10.92	0
13	MP4	X	18.92	72
14	MP4	Z	10.92	72
15	MP4	X	7.69	12
16	MP4	Z	4.44	12
17	MP4	X	7.69	12
18	MP4	Z	4.44	12
19	MP7	X	14.08	0
20	MP7	Z	8.13	0
21	MP7	X	14.08	72
22	MP7	Z	8.13	72
23	MP7	X	6.43	12
24	MP7	Z	3.71	12
25	MP7	X	6.22	12
26	MP7	Z	3.59	12



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	14.4	0
2	MP1	Z	0	0
3	MP1	X	14.4	72
4	MP1	Z	0	72
5	MP1	X	6.94	12
6	MP1	Z	0	12
7	MP1	X	6.61	12
8	MP1	Z	0	12
9	MP1	X	6.73	48
10	MP1	Z	0	48
11	MP4	X	19.99	0
12	MP4	Z	0	0
13	MP4	X	19.99	72
14	MP4	Z	0	72
15	MP4	X	8.39	12
16	MP4	Z	0	12
17	MP4	X	8.31	12
18	MP4	Z	0	12
19	MP7	X	19.99	0
20	MP7	Z	0	0
21	MP7	X	19.99	72
22	MP7	Z	0	72
23	MP7	X	8.39	12
24	MP7	Z	0	12
25	MP7	X	8.31	12
26	MP7	Z	0	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	14.08	0
2	MP1	Z	-8.13	0
3	MP1	X	14.08	72
4	MP1	Z	-8.13	72
5	MP1	X	6.43	12
6	MP1	Z	-3.71	12
7	MP1	X	6.22	12
8	MP1	Z	-3.59	12
9	MP1	X	6.22	48
10	MP1	Z	-3.59	48
11	MP4	X	14.08	0
12	MP4	Z	-8.13	0
13	MP4	X	14.08	72



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
14	MP4	Z	-8.13	72
15	MP4	X	6.43	12
16	MP4	Z	-3.71	12
17	MP4	X	6.22	12
18	MP4	Z	-3.59	12
19	MP7	X	18.92	0
20	MP7	Z	-10.92	0
21	MP7	X	18.92	72
22	MP7	Z	-10.92	72
23	MP7	X	7.69	12
24	MP7	Z	-4.44	12
25	MP7	X	7.69	12
26	MP7	Z	-4.44	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	9.99	0
2	MP1	Z	-17.31	0
3	MP1	X	9.99	72
4	MP1	Z	-17.31	72
5	MP1	X	4.2	12
6	MP1	Z	-7.27	12
7	MP1	X	4.16	12
8	MP1	Z	-7.2	12
9	MP1	X	4.04	48
10	MP1	Z	-7.01	48
11	MP4	X	7.2	0
12	MP4	Z	-12.47	0
13	MP4	X	7.2	72
14	MP4	Z	-12.47	72
15	MP4	X	3.47	12
16	MP4	Z	-6.01	12
17	MP4	X	3.31	12
18	MP4	Z	-5.73	12
19	MP7	X	9.99	0
20	MP7	Z	-17.31	0
21	MP7	X	9.99	72
22	MP7	Z	-17.31	72
23	MP7	X	4.2	12
24	MP7	Z	-7.27	12
25	MP7	X	4.16	12
26	MP7	Z	-7.2	12



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Z	-9.288	0
2	MP1	Z	-9.288	72
3	MP1	Z	-21.586	12
4	MP1	Z	-18.412	12
5	MP1	Z	-6.293	48
6	MP4	Z	-9.288	0
7	MP4	Z	-9.288	72
8	MP4	Z	-21.586	12
9	MP4	Z	-18.412	12
10	MP7	Z	-9.288	0
11	MP7	Z	-9.288	72
12	MP7	Z	-21.586	12
13	MP7	Z	-18.412	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-9.288	0
2	MP1	X	-9.288	72
3	MP1	X	-21.586	12
4	MP1	X	-18.412	12
5	MP1	X	-6.293	48
6	MP4	X	-9.288	0
7	MP4	X	-9.288	72
8	MP4	X	-21.586	12
9	MP4	X	-18.412	12
10	MP7	X	-9.288	0
11	MP7	X	-9.288	72
12	MP7	X	-21.586	12
13	MP7	X	-18.412	12

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

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N70A	L	Y	-500

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

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N69A	L	Y	-500

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

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
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**Joint Loads and Enforced Displacements (BLC 36 : Maintenance Load 3) (Continued)**

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N76	L	Y	-500

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

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

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

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

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

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

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

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

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

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

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

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N139	L	Y	-500

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in,%]
1	S3	SZ	-91.363	-91.363	0	%100
2	GA4	SZ	-91.363	-91.363	0	%100
3	GA3	SZ	-91.363	-91.363	0	%100
4	P3	SZ	-91.363	-91.363	0	%100
5	S2	SZ	-91.363	-91.363	0	%100
6	GA2	SZ	-91.363	-91.363	0	%100
7	GA1	SZ	-91.363	-91.363	0	%100
8	P2	SZ	-91.363	-91.363	0	%100
9	S1	SZ	-91.363	-91.363	0	%100
10	GA6	SZ	-91.363	-91.363	0	%100
11	GA5	SZ	-91.363	-91.363	0	%100



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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in,%]
12	P1	SZ	-91.363	-91.363	0	%100
13	H1	SZ	-54.818	-54.818	0	%100
14	MP1	SZ	-54.818	-54.818	0	%100
15	MP3	SZ	-54.818	-54.818	0	%100
16	HR1	SZ	-54.818	-54.818	0	%100
17	CA8	SZ	-91.363	-91.363	0	%100
18	CA9	SZ	-91.363	-91.363	0	%100
19	CA7	SZ	-91.363	-91.363	0	%100
20	M32	SZ	0	0	0	%100
21	M35	SZ	0	0	0	%100
22	M36	SZ	0	0	0	%100
23	M39A	SZ	0	0	0	%100
24	CA3	SZ	-91.363	-91.363	0	%100
25	CA4	SZ	-91.363	-91.363	0	%100
26	CA1	SZ	-91.363	-91.363	0	%100
27	CA2	SZ	-91.363	-91.363	0	%100
28	CA5	SZ	-91.363	-91.363	0	%100
29	CA6	SZ	-91.363	-91.363	0	%100
30	M64	SZ	0	0	0	%100
31	M65	SZ	0	0	0	%100
32	M66	SZ	0	0	0	%100
33	M67	SZ	0	0	0	%100
34	M68	SZ	0	0	0	%100
35	M69	SZ	0	0	0	%100
36	M70	SZ	0	0	0	%100
37	M71	SZ	0	0	0	%100
38	M72	SZ	0	0	0	%100
39	M73	SZ	0	0	0	%100
40	M74	SZ	0	0	0	%100
41	M75	SZ	-91.363	-91.363	0	%100
42	MP2	SZ	-54.818	-54.818	0	%100
43	M43	SZ	0	0	0	%100
44	M44	SZ	0	0	0	%100
45	H3	SZ	-54.818	-54.818	0	%100
46	MP7	SZ	-54.818	-54.818	0	%100
47	MP9	SZ	-54.818	-54.818	0	%100
48	HR3	SZ	-54.818	-54.818	0	%100
49	M52	SZ	0	0	0	%100
50	M53	SZ	0	0	0	%100
51	M54	SZ	0	0	0	%100
52	M55	SZ	0	0	0	%100
53	H2	SZ	-54.818	-54.818	0	%100



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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in, %]
54	MP4	SZ	-54.818	-54.818	0	%100
55	MP6	SZ	-54.818	-54.818	0	%100
56	HR2	SZ	-54.818	-54.818	0	%100
57	M66A	SZ	0	0	0	%100
58	M67A	SZ	0	0	0	%100
59	M68A	SZ	0	0	0	%100
60	M69A	SZ	0	0	0	%100
61	MP8	SZ	-54.818	-54.818	0	%100
62	M68B	SZ	0	0	0	%100
63	M69B	SZ	0	0	0	%100
64	MP5	SZ	-54.818	-54.818	0	%100
65	M71B	SZ	0	0	0	%100
66	M72B	SZ	0	0	0	%100

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in, %]
1	S3	SX	-91.363	-91.363	0	%100
2	GA4	SX	-91.363	-91.363	0	%100
3	GA3	SX	-91.363	-91.363	0	%100
4	P3	SX	-91.363	-91.363	0	%100
5	S2	SX	-91.363	-91.363	0	%100
6	GA2	SX	-91.363	-91.363	0	%100
7	GA1	SX	-91.363	-91.363	0	%100
8	P2	SX	-91.363	-91.363	0	%100
9	S1	SX	-91.363	-91.363	0	%100
10	GA6	SX	-91.363	-91.363	0	%100
11	GA5	SX	-91.363	-91.363	0	%100
12	P1	SX	-91.363	-91.363	0	%100
13	H1	SX	-54.818	-54.818	0	%100
14	MP1	SX	-54.818	-54.818	0	%100
15	MP3	SX	-54.818	-54.818	0	%100
16	HR1	SX	-54.818	-54.818	0	%100
17	CA8	SX	-91.363	-91.363	0	%100
18	CA9	SX	-91.363	-91.363	0	%100
19	CA7	SX	-91.363	-91.363	0	%100
20	M32	SX	0	0	0	%100
21	M35	SX	0	0	0	%100
22	M36	SX	0	0	0	%100
23	M39A	SX	0	0	0	%100
24	CA3	SX	-91.363	-91.363	0	%100
25	CA4	SX	-91.363	-91.363	0	%100
26	CA1	SX	-91.363	-91.363	0	%100



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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in, %]
27	CA2	SX	-91.363	-91.363	0	%100
28	CA5	SX	-91.363	-91.363	0	%100
29	CA6	SX	-91.363	-91.363	0	%100
30	M64	SX	0	0	0	%100
31	M65	SX	0	0	0	%100
32	M66	SX	0	0	0	%100
33	M67	SX	0	0	0	%100
34	M68	SX	0	0	0	%100
35	M69	SX	0	0	0	%100
36	M70	SX	0	0	0	%100
37	M71	SX	0	0	0	%100
38	M72	SX	0	0	0	%100
39	M73	SX	0	0	0	%100
40	M74	SX	0	0	0	%100
41	M75	SX	-91.363	-91.363	0	%100
42	MP2	SX	-54.818	-54.818	0	%100
43	M43	SX	0	0	0	%100
44	M44	SX	0	0	0	%100
45	H3	SX	-54.818	-54.818	0	%100
46	MP7	SX	-54.818	-54.818	0	%100
47	MP9	SX	-54.818	-54.818	0	%100
48	HR3	SX	-54.818	-54.818	0	%100
49	M52	SX	0	0	0	%100
50	M53	SX	0	0	0	%100
51	M54	SX	0	0	0	%100
52	M55	SX	0	0	0	%100
53	H2	SX	-54.818	-54.818	0	%100
54	MP4	SX	-54.818	-54.818	0	%100
55	MP6	SX	-54.818	-54.818	0	%100
56	HR2	SX	-54.818	-54.818	0	%100
57	M66A	SX	0	0	0	%100
58	M67A	SX	0	0	0	%100
59	M68A	SX	0	0	0	%100
60	M69A	SX	0	0	0	%100
61	MP8	SX	-54.818	-54.818	0	%100
62	M68B	SX	0	0	0	%100
63	M69B	SX	0	0	0	%100
64	MP5	SX	-54.818	-54.818	0	%100
65	M71B	SX	0	0	0	%100
66	M72B	SX	0	0	0	%100



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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in,%]
1	S3	Y	-20.902	-20.902	0	%100
2	GA4	Y	-13.361	-13.361	0	%100
3	GA3	Y	-13.361	-13.361	0	%100
4	P3	Y	-23.179	-23.179	0	%100
5	S2	Y	-20.902	-20.902	0	%100
6	GA2	Y	-13.361	-13.361	0	%100
7	GA1	Y	-13.361	-13.361	0	%100
8	P2	Y	-23.179	-23.179	0	%100
9	S1	Y	-20.902	-20.902	0	%100
10	GA6	Y	-13.361	-13.361	0	%100
11	GA5	Y	-13.361	-13.361	0	%100
12	P1	Y	-23.179	-23.179	0	%100
13	H1	Y	-15.151	-15.151	0	%100
14	MP1	Y	-13.485	-13.485	0	%100
15	MP3	Y	-13.485	-13.485	0	%100
16	HR1	Y	-13.498	-13.498	0	%100
17	CA8	Y	-27.058	-27.058	0	%100
18	CA9	Y	-27.058	-27.058	0	%100
19	CA7	Y	-27.058	-27.058	0	%100
20	M32	Y	-5.819	-5.819	0	%100
21	M35	Y	-5.819	-5.819	0	%100
22	M36	Y	-5.819	-5.819	0	%100
23	M39A	Y	-5.819	-5.819	0	%100
24	CA3	Y	-16.373	-16.373	0	%100
25	CA4	Y	-16.373	-16.373	0	%100
26	CA1	Y	-16.373	-16.373	0	%100
27	CA2	Y	-16.373	-16.373	0	%100
28	CA5	Y	-16.373	-16.373	0	%100
29	CA6	Y	-16.373	-16.373	0	%100
30	M64	Y	-5.819	-5.819	0	%100
31	M65	Y	-5.819	-5.819	0	%100
32	M66	Y	-5.819	-5.819	0	%100
33	M67	Y	-5.819	-5.819	0	%100
34	M68	Y	-5.819	-5.819	0	%100
35	M69	Y	-5.819	-5.819	0	%100
36	M70	Y	-5.819	-5.819	0	%100
37	M71	Y	-5.819	-5.819	0	%100
38	M72	Y	-5.819	-5.819	0	%100
39	M73	Y	-5.819	-5.819	0	%100
40	M74	Y	-5.819	-5.819	0	%100
41	M75	Y	-12.291	-12.291	0	%100
42	MP2	Y	-13.485	-13.485	0	%100



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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in, %]
43	M43	Y	-5.819	-5.819	0	%100
44	M44	Y	-5.819	-5.819	0	%100
45	H3	Y	-15.151	-15.151	0	%100
46	MP7	Y	-13.485	-13.485	0	%100
47	MP9	Y	-13.485	-13.485	0	%100
48	HR3	Y	-13.498	-13.498	0	%100
49	M52	Y	-5.819	-5.819	0	%100
50	M53	Y	-5.819	-5.819	0	%100
51	M54	Y	-5.819	-5.819	0	%100
52	M55	Y	-5.819	-5.819	0	%100
53	H2	Y	-15.151	-15.151	0	%100
54	MP4	Y	-13.485	-13.485	0	%100
55	MP6	Y	-13.485	-13.485	0	%100
56	HR2	Y	-13.498	-13.498	0	%100
57	M66A	Y	-5.819	-5.819	0	%100
58	M67A	Y	-5.819	-5.819	0	%100
59	M68A	Y	-5.819	-5.819	0	%100
60	M69A	Y	-5.819	-5.819	0	%100
61	MP8	Y	-13.485	-13.485	0	%100
62	M68B	Y	-5.819	-5.819	0	%100
63	M69B	Y	-5.819	-5.819	0	%100
64	MP5	Y	-13.485	-13.485	0	%100
65	M71B	Y	-5.819	-5.819	0	%100
66	M72B	Y	-5.819	-5.819	0	%100

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in, %]
1	S3	SZ	-15.539	-15.539	0	%100
2	GA4	SZ	-22.306	-22.306	0	%100
3	GA3	SZ	-22.306	-22.306	0	%100
4	P3	SZ	-14.651	-14.651	0	%100
5	S2	SZ	-15.539	-15.539	0	%100
6	GA2	SZ	-22.306	-22.306	0	%100
7	GA1	SZ	-22.306	-22.306	0	%100
8	P2	SZ	-14.651	-14.651	0	%100
9	S1	SZ	-15.539	-15.539	0	%100
10	GA6	SZ	-22.306	-22.306	0	%100
11	GA5	SZ	-22.306	-22.306	0	%100
12	P1	SZ	-14.651	-14.651	0	%100
13	H1	SZ	-19.709	-19.709	0	%100
14	MP1	SZ	-22.087	-22.087	0	%100
15	MP3	SZ	-22.087	-22.087	0	%100



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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in, %]
16	HR1	SZ	-22.064	-22.064	0	%100
17	CA8	SZ	-13.577	-13.577	0	%100
18	CA9	SZ	-13.577	-13.577	0	%100
19	CA7	SZ	-13.577	-13.577	0	%100
20	M32	SZ	0	0	0	%100
21	M35	SZ	0	0	0	%100
22	M36	SZ	0	0	0	%100
23	M39A	SZ	0	0	0	%100
24	CA3	SZ	-18.443	-18.443	0	%100
25	CA4	SZ	-18.443	-18.443	0	%100
26	CA1	SZ	-18.443	-18.443	0	%100
27	CA2	SZ	-18.443	-18.443	0	%100
28	CA5	SZ	-18.443	-18.443	0	%100
29	CA6	SZ	-18.443	-18.443	0	%100
30	M64	SZ	0	0	0	%100
31	M65	SZ	0	0	0	%100
32	M66	SZ	0	0	0	%100
33	M67	SZ	0	0	0	%100
34	M68	SZ	0	0	0	%100
35	M69	SZ	0	0	0	%100
36	M70	SZ	0	0	0	%100
37	M71	SZ	0	0	0	%100
38	M72	SZ	0	0	0	%100
39	M73	SZ	0	0	0	%100
40	M74	SZ	0	0	0	%100
41	M75	SZ	-24.545	-24.545	0	%100
42	MP2	SZ	-22.087	-22.087	0	%100
43	M43	SZ	0	0	0	%100
44	M44	SZ	0	0	0	%100
45	H3	SZ	-19.709	-19.709	0	%100
46	MP7	SZ	-22.087	-22.087	0	%100
47	MP9	SZ	-22.087	-22.087	0	%100
48	HR3	SZ	-22.064	-22.064	0	%100
49	M52	SZ	0	0	0	%100
50	M53	SZ	0	0	0	%100
51	M54	SZ	0	0	0	%100
52	M55	SZ	0	0	0	%100
53	H2	SZ	-19.709	-19.709	0	%100
54	MP4	SZ	-22.087	-22.087	0	%100
55	MP6	SZ	-22.087	-22.087	0	%100
56	HR2	SZ	-22.064	-22.064	0	%100
57	M66A	SZ	0	0	0	%100





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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in, %]
58	M67A	SZ	0	0	0	%100
59	M68A	SZ	0	0	0	%100
60	M69A	SZ	0	0	0	%100
61	MP8	SZ	-22.087	-22.087	0	%100
62	M68B	SZ	0	0	0	%100
63	M69B	SZ	0	0	0	%100
64	MP5	SZ	-22.087	-22.087	0	%100
65	M71B	SZ	0	0	0	%100
66	M72B	SZ	0	0	0	%100

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in, %]
1	S3	SX	-15.539	-15.539	0	%100
2	GA4	SX	-22.306	-22.306	0	%100
3	GA3	SX	-22.306	-22.306	0	%100
4	P3	SX	-14.651	-14.651	0	%100
5	S2	SX	-15.539	-15.539	0	%100
6	GA2	SX	-22.306	-22.306	0	%100
7	GA1	SX	-22.306	-22.306	0	%100
8	P2	SX	-14.651	-14.651	0	%100
9	S1	SX	-15.539	-15.539	0	%100
10	GA6	SX	-22.306	-22.306	0	%100
11	GA5	SX	-22.306	-22.306	0	%100
12	P1	SX	-14.651	-14.651	0	%100
13	H1	SX	-19.709	-19.709	0	%100
14	MP1	SX	-22.087	-22.087	0	%100
15	MP3	SX	-22.087	-22.087	0	%100
16	HR1	SX	-22.064	-22.064	0	%100
17	CA8	SX	-13.577	-13.577	0	%100
18	CA9	SX	-13.577	-13.577	0	%100
19	CA7	SX	-13.577	-13.577	0	%100
20	M32	SX	0	0	0	%100
21	M35	SX	0	0	0	%100
22	M36	SX	0	0	0	%100
23	M39A	SX	0	0	0	%100
24	CA3	SX	-18.443	-18.443	0	%100
25	CA4	SX	-18.443	-18.443	0	%100
26	CA1	SX	-18.443	-18.443	0	%100
27	CA2	SX	-18.443	-18.443	0	%100
28	CA5	SX	-18.443	-18.443	0	%100
29	CA6	SX	-18.443	-18.443	0	%100
30	M64	SX	0	0	0	%100



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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in, %]
31	M65	SX	0	0	0	%100
32	M66	SX	0	0	0	%100
33	M67	SX	0	0	0	%100
34	M68	SX	0	0	0	%100
35	M69	SX	0	0	0	%100
36	M70	SX	0	0	0	%100
37	M71	SX	0	0	0	%100
38	M72	SX	0	0	0	%100
39	M73	SX	0	0	0	%100
40	M74	SX	0	0	0	%100
41	M75	SX	-24.545	-24.545	0	%100
42	MP2	SX	-22.087	-22.087	0	%100
43	M43	SX	0	0	0	%100
44	M44	SX	0	0	0	%100
45	H3	SX	-19.709	-19.709	0	%100
46	MP7	SX	-22.087	-22.087	0	%100
47	MP9	SX	-22.087	-22.087	0	%100
48	HR3	SX	-22.064	-22.064	0	%100
49	M52	SX	0	0	0	%100
50	M53	SX	0	0	0	%100
51	M54	SX	0	0	0	%100
52	M55	SX	0	0	0	%100
53	H2	SX	-19.709	-19.709	0	%100
54	MP4	SX	-22.087	-22.087	0	%100
55	MP6	SX	-22.087	-22.087	0	%100
56	HR2	SX	-22.064	-22.064	0	%100
57	M66A	SX	0	0	0	%100
58	M67A	SX	0	0	0	%100
59	M68A	SX	0	0	0	%100
60	M69A	SX	0	0	0	%100
61	MP8	SX	-22.087	-22.087	0	%100
62	M68B	SX	0	0	0	%100
63	M69B	SX	0	0	0	%100
64	MP5	SX	-22.087	-22.087	0	%100
65	M71B	SX	0	0	0	%100
66	M72B	SX	0	0	0	%100

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in, %]
1	S2	Y	-3.185	-3.185	16.404	40
2	GA2	Y	-1.605	-1.605	3.828	27.295
3	GA1	Y	-1.605	-1.605	3.828	27.295



**Member Distributed Loads (BLC 43 : BLC 1 Transient Area Loads) (Continued)**

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

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magn...	Start Location...	End Location[in,%]
1	S2	Y	-37.131	-37.131	16.404	40
2	GA2	Y	-18.712	-18.712	3.828	27.295
3	GA1	Y	-18.712	-18.712	3.828	27.295
4	S3	Y	-37.131	-37.131	16.404	40
5	GA4	Y	-18.712	-18.712	3.828	27.295
6	GA3	Y	-18.712	-18.712	3.828	27.295
7	S1	Y	-37.131	-37.131	16.404	40
8	GA6	Y	-18.712	-18.712	3.828	27.295
9	GA5	Y	-18.712	-18.712	3.828	27.295

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

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

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

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	P22	P21	P20	P23	Y	Two Way	-20.4
2	P10	P11	P12	P9	Y	Two Way	-20.4
3	P31	P34	P33	P32	Y	Two Way	-20.4

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

	Member	Shape	Code Check	Loc[in]	LC	She...Loc[in]	Dir	LC	phi*P...	phi*P...	phi*M...	phi*Mn z-z [lb...Cb	Eqn
1	CA1	C3.38x2.06...	.341	0	31	.058 28.188	y	36	4776...	56700	2202...	5751.945	1.... H1-1b
2	P3	PL6.5x0.375	.334	21	2	.167 36.312	y	30	3658...	78975	616.9...	7943.494	1.... H1-1b
3	P2	PL6.5x0.375	.324	21	6	.143 36.312	y	10	3658...	78975	616.9...	7916.274	1.... H1-1b
4	S2	HSS4X4X6	.322	0	32	.111 0	y	32	1882...	1978...	2204...	22045.5	1.... H1-1b
5	P1	PL6.5x0.375	.310	21	10	.160 36.312	y	2	3658...	78975	616.9...	7976.832	1.... H1-1b
6	CA5	C3.38x2.06...	.310	0	35	.055 28.187	y	28	4776...	56700	2202...	5751.945	1.... H1-1b



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

Member	Shape	Code Check	Loc[in]	LC	She...	Loc[in]	Dir	LC	phi*P...	phi*P...	phi*M...	phi*Mn z-z [lb...	Cb	Eqn
7	CA4	C3.38x2.06...	.304	33	2	.046	33	y	31	4776...	56700	2202...	5751.945	1.... H1-1b
8	CA3	C3.38x2.06...	.303	0	27	.055	28.188	y	32	4776...	56700	2202...	5751.945	1.... H1-1b
9	S3	HSS4X4X6	.297	0	38	.115	0	y	29	1882...	1978...	2204...	22045.5	1.93 H1-1b
10	CA6	C3.38x2.06...	.289	33	10	.048	33	y	38	4776...	56700	2202...	5751.945	1.... H1-1b
11	CA2	C3.38x2.06...	.287	33	6	.047	33	y	34	4776...	56700	2202...	5751.945	1.... H1-1b
12	CA7	L6.6x4.46x0...	.283	41.562	3	.038	42	z	8	5117...	87561	2464...	7125.374	1.... H2-1
13	CA8	L6.6x4.46x0...	.279	41.562	22	.039	42	z	4	5117...	87561	2464...	7125.374	1.... H2-1
14	S1	HSS4X4X6	.279	0	36	.116	0	y	37	1882...	1978...	2204...	22045.5	1.... H1-1b
15	HR3	2.88x0.120	.278	6	2	.126	92		6	2249...	4307...	3155...	3155.674	1.... H1-1b
16	M75	PL 2.375x0.5	.276	1.5	12	.263	0	y	28	3825...	38475	400.7...	1903.711	2.... H1-1b
17	HR2	2.88x0.120	.272	90	3	.135	92		4	2249...	4307...	3155...	3155.674	1.... H1-1b
18	HR1	2.88x0.120	.259	6	4	.117	6		4	2249...	4307...	3155...	3155.674	1.... H1-1b
19	CA9	L6.6x4.46x0...	.250	41.562	6	.035	42	z	12	5117...	87561	2464...	7125.374	1.... H2-1
20	MP2	PIPE 2.5	.227	70	5	.081	70		5	3348...	66654	4726.5	4726.5	4.... H1-1b
21	MP5	PIPE 2.5	.222	70	7	.069	70		7	3348...	66654	4726.5	4726.5	4.... H1-1b
22	GA4	L2x2x4	.210	0	2	.015	27.295	y	9	2952...	42480	959.63	2190.068	2.... H2-1
23	MP8	PIPE 2.5	.201	70	9	.086	70		3	3348...	66654	4726.5	4726.5	4.... H1-1b
24	GA5	L2x2x4	.198	0	9	.026	27.295	y	38	2952...	42480	959.63	2190.068	2.... H2-1
25	GA2	L2x2x4	.193	0	12	.015	0	y	12	2952...	42480	959.63	2190.068	2.... H2-1
26	GA6	L2x2x4	.184	0	4	.015	0	y	4	2952...	42480	959.63	2190.068	2.... H2-1
27	GA1	L2x2x4	.183	0	5	.026	27.295	y	34	2952...	42480	959.63	2190.068	2.... H2-1
28	MP9	PIPE 2.5	.179	70	2	.081	70		7	3348...	66654	4726.5	4726.5	3.... H1-1b
29	GA3	L2x2x4	.178	0	7	.026	27.295	y	30	2952...	42480	959.63	2190.068	2.... H2-1
30	MP1	PIPE 2.5	.163	70	11	.099	26		8	3348...	66654	4726.5	4726.5	2.... H1-1b
31	MP6	PIPE 2.5	.161	70	7	.086	70		6	3348...	66654	4726.5	4726.5	4.... H1-1b
32	MP3	PIPE 2.5	.157	70	5	.089	70		3	3348...	66654	4726.5	4726.5	4.... H1-1b
33	MP4	PIPE 2.5	.152	70	7	.088	26		4	3348...	66654	4726.5	4726.5	1.... H1-1b
34	MP7	PIPE 2.5	.150	70	9	.080	26		6	3348...	66654	4726.5	4726.5	3.... H1-1b
35	H3	Pipe3.5x0.1...	.139	31	2	.085	90		2	4587...	7158...	6337...	6337.65	1.... H1-1b
36	H1	Pipe3.5x0.1...	.134	31	10	.075	48		4	4587...	7158...	6337...	6337.65	2.... H1-1b
37	H2	Pipe3.5x0.1...	.129	31	6	.060	48		12	4587...	7158...	6337...	6337.65	1.... H1-1b

## Bolt Calculation Tool, V1.5.1

PROJECT DATA	
Site Name:	ATC - 370626
Site Number:	BOBDL00032B
Connection Description:	Platform to Monopole

MAXIMUM BOLT LOADS		
Bolt Tension:	8553.37	lbs
Bolt Shear:	1654.68	lbs

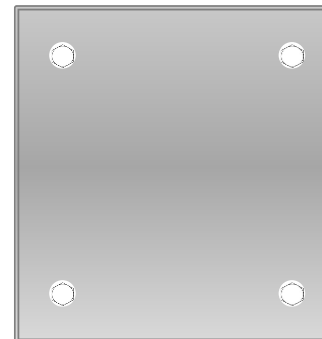
WORST CASE BOLT LOADS <sup>1</sup>		
Bolt Tension:	8553.37	lbs
Bolt Shear:	1481.54	lbs

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

<sup>1</sup> Worst case bolt loads correspond to Load combination #32 on member S2 in RISA-3D, which causes the maximum demand on the bolts.

Member Information
I nodes of S3, S2, S1

BOLT CHECK		
Tensile Strength	20340.15	
Shear Strength	13805.83	
Max Tensile Usage	42.1%	
Max Shear Usage	12.0%	
Interaction Check (Worst Case)	0.19	≤1.05
Result	Pass	





## LETTER OF AUTHORIZATION

**SITE NO:** See Site List Below

**SITE NAME:** See Site List Below

**ADDRESS:** See Site List Below

I, Margaret Robinson, Senior Counsel, US Tower Division on behalf of American Tower\*, owner and/or operator of the tower facilities located at the addresses identified below (the "Tower Facilities"), do hereby authorize Centerline Communications LLC ("Centerline"), its agents, successors and assigns, to act as American Tower's non-exclusive agent for the purpose of filing and securing any zoning, land-use, building permit and/or electrical permit application(s) and approvals of the applicable jurisdiction for and to conduct the construction of the installation of antennas and related telecommunications equipment on the Tower Facilities located at the addresses identified below. This installation shall not affect adjoining lands and will occur only within the areas leased or owned by American Tower.

American Tower understands that the applications may be denied, modified or approved with conditions. The above authorization is limited to the acceptance by American Tower of conditions related to American Tower's installations. Any such conditions of approval or modifications will not be effective unless approved in writing by American Tower.

The above authorization does not permit Centerline to modify or alter any existing permit(s) and/or zoning or land-use conditions or impose any additional conditions unrelated to American Tower's installations of telecommunications equipment without the prior written approval of American Tower.

Site Authorized:

ATC Project #	ATC Tower #	ATC Site Name	Customer Site Name
13726411	370626	East Hartford	BOBDL00032B
13728728	383657	Atlas Container	BOBDL00095B
13733451	209280	Stafford 2	BOBDL00112A
13726719	302481	Hrfr - South	BOBDL00153B
13741553	283425	WOODSTOCK 2 CT	BOBOS00019A
13726721	302532	Hartford - Nyc	BOBOS00022A
13733429	415439	Woodstock NW PCS CT	BOBOS00027A
13733431	415484	East Woodstock, CT CT	BOBOS00028A
13733433	415784	East Putnam CT	BOBOS00029A
13733434	418609	Woodstock Relo CT	BOBOS00030A
13733436	6270	East Killingly	BOBOS00031A
13733438	6300	WOODSTOCK CT	BOBOS00032A
13746611	302503	Lisbon CT 3	BOBOS00068B
13733440	411216	CT Chaplin South CT	BOBOS00893A
13733446	10029	HAMPTON CT	BOBOS00894A
13733449	208478	Cheshire	BOHVN00033A



**AMERICAN TOWER®**  
CORPORATION

13729958	208205	Great Hill Road Seymour	BOHVN00035A
13729960	207941	Wolcott-Waterbury	BOHVN00036A

Signature: \_\_\_\_\_

Margaret Robinson, Senior Counsel  
US Tower Division

**NOTARY BLOCK**

COMMONWEALTH OF MASSACHUSETTS  
County of Middlesex

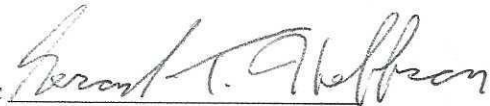
This instrument was acknowledged before me by Margaret Robinson, Senior Counsel of American Tower (owner and/or operator of the above referenced Tower Facilities), personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument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

WITNESS my hand and official seal, this 3rd day of December, 2021.

NOTARY SEAL



**GERARD T. HEFFRON**  
Notary Public  
Commonwealth of Massachusetts  
My Commission Expires  
August 9, 2024

Notary Public   
My Commission Expires: August 9th, 2024

\* American Tower as used herein is defined as American Tower Corporation and any of its affiliates or subsidiaries.

# Connecticut Siting Council <sup>(/CSC)</sup>

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**DOCKET NO. 228** – The Marcus Group, LLC application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a cellular telecommunications facility at 148 Roberts Street, East Hartford, Connecticut. } Connecticut  
} Siting  
} Council  
} November 7, 2002

**Decision and Order**



Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to The Marcus Group (Marcus) for the construction, maintenance and operation of a wireless telecommunications facility at the proposed prime site located at 148 Roberts Street, East Hartford, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of AT&T Wireless LLC, Cellco Partnership b/b/a Verizon Wireless, Nextel Communications of the Mid-Atlantic, and other entities, both public and private, but such tower shall not exceed a height of 120 feet above ground level. The access road to the facility shall be finished with gravel. The north edge of the facility compound shall be a minimum distance of 52 feet to the nearest wetland area.
2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include: a final site plan(s) for site development to include the location and specifications for the tower, tower foundation, antennas, equipment buildings, security fence, access road, utility line, and landscaping plan. The D&M Plan shall also include construction plans to be submitted prior to construction for site clearing, water drainage, and erosion and sedimentation control consistent with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.
3. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall provide a recalculated report of electromagnetic radio frequency power density if and

when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. Upon the establishment of any new state or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.
5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.
6. If the facility does not initially provide, or permanently ceases to provide wireless services following completion of construction, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.
7. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and ceases to function.
8. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The Hartford Courant, and The East Hartford Gazette.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

**Applicant**

The Marcus Group, LLC

**Intervenor**

Cellco Partnership  
d/b/a Verizon Wireless

**Its Representative**

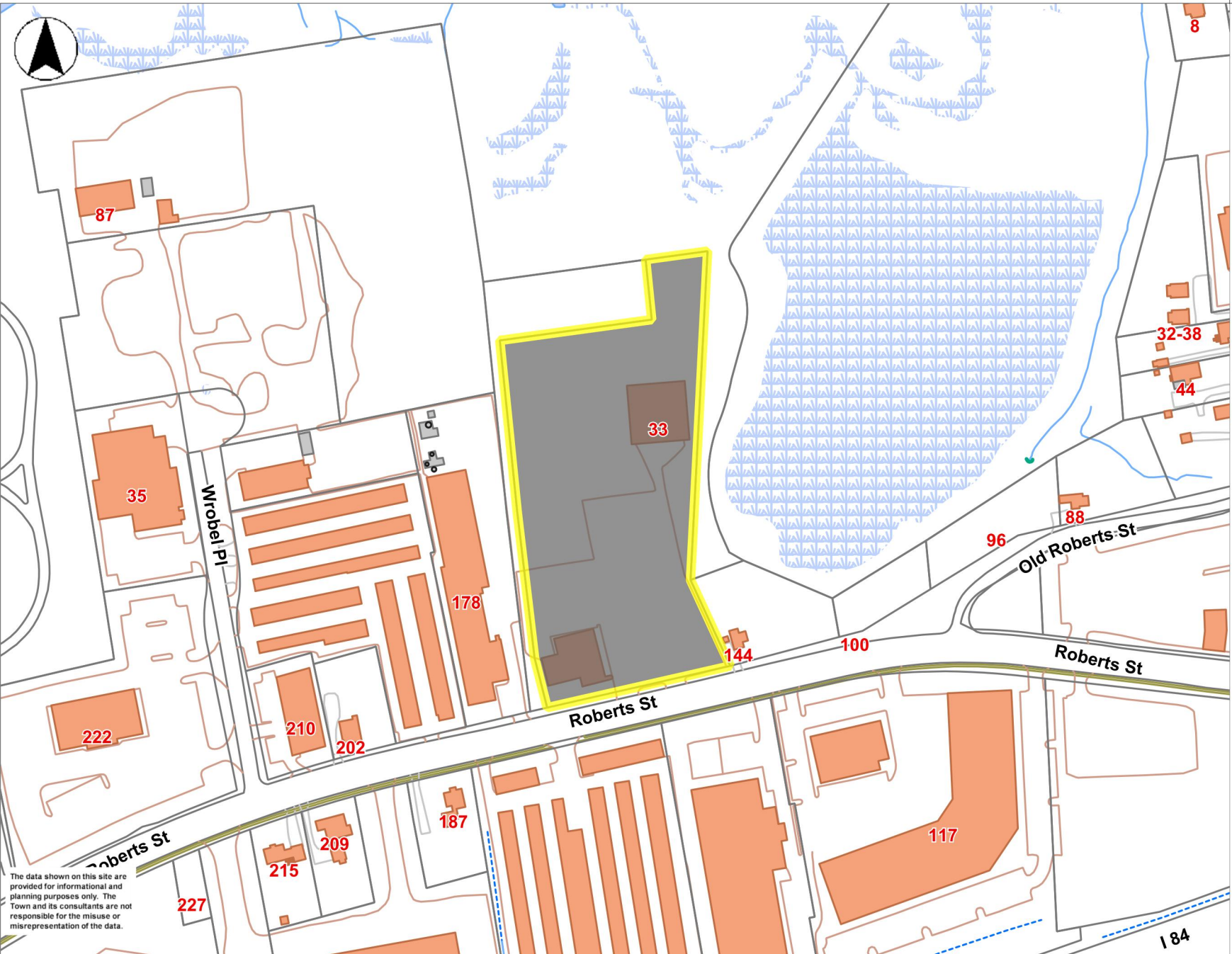
Julie Donaldson Kohler, Esq.  
Hurwitz & Sagarin, LLC  
147 N. Broad Street  
Milford, CT 06460  
(203) 877-8000

**Its Representative**

Kenneth C. Baldwin, Esq.  
Robinson & Cole LLP  
280 Trumbull Street  
Hartford, CT 06103-3597  
(860) 275-8200

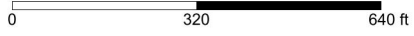


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  - Perennial Stream
  - Draining Ditch
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148 Roberts Street, East Hartford, CT 06108



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**AMERICAN TOWER®**  
CORPORATION

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## Structural Analysis Report

**Structure** : 130 ft Monopole  
**ATC Site Name** : East Hartford,CT  
**ATC Site Number** : 370626  
**Engineering Number** : 13726411\_C3\_03  
**Proposed Carrier** : DISH WIRELESS L.L.C.  
**Carrier Site Name** : BOBDL00032B  
**Carrier Site Number** : BOBDL00032B  
**Site Location** : 148 Roberts St.  
East Hartford, CT 06108-0000  
41.7733, -72.6134  
**County** : Hartford  
**Date** : September 10, 2021  
**Max Usage** : 72%  
**Result** : Pass

Prepared By:

Sarah Kramer  
Structural Engineer

*Sarah D. Kramer*

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 130 ft Monopole to reflect the change in loading by DISH WIRELESS L.L.C..

## Supporting Documents

<b>Tower Drawings</b>	Glen Martin Engineering Drawing #MP1400800-0001, dated August 20, 2003
<b>Foundation Drawing</b>	Glen Martin Engineering Drawing #GME-03309, dated August 26, 2003
<b>Geotechnical Report</b>	Geotechnical Engineering Project Name: The Marcus Group, dated April 25, 2003

## 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>	118 mph (3-second gust)
<b>Basic Wind Speed w/ Ice:</b>	50 mph (3-second gust) w/ 1.50" 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>Crest Length (L):</b>	0 ft
<b>Spectral Response:</b>	$S_s = 0.19, S_i = 0.06$
<b>Site Class:</b>	D - Stiff Soil - Default

## 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
128.0	3	Nokia 2.5G MAA - AAHC(64T64R)	T-Arm	(2) 0.41" (10.3mm) Fiber (3) 1 1/4" Hybriflex Cable (1) 1.7" (43.2mm) Hybrid (3) 1/2" Coax (2) 2" Carflex Non-Metallic Conduit (3) 5/8" Coax	CLEARWIRE CORPORATION
	3	DragonWave Horizon Compact (11.5 lbs)			
	6	Alcatel-Lucent RRH2x50-08			
	3	Commscope NNVV-65B-R4			
	3	DragonWave A-ANT-18G-2-C			
	3	Argus LLPX310R			
	3	Alcatel-Lucent 1900 MHz 4X45 RRH			
118.0	6	Andrew DB844G65ZAXY	Triangular Low Profile Platform	(2) 1 1/4" Hybriflex Cable (6) 1 5/8" Coax (2) 1 5/8" Hybriflex	VERIZON WIRELESS
	3	Commscope NHH-65B-R2B			
	3	Commscope NHHSS-65B-R2BT4			
	2	RFS DB-T1-6Z-8AB-0Z			
	3	Andrew LNX-6513DS-A1M (32.6lb)			
	3	Samsung MT6407-77A			
	3	Samsung B5/B13 RRH-BR04C			
	3	Samsung B2/B66A RRH-BR049			
	3	Samsung RT4401-48A			
110.0	9	Generic 48" x 12" Panel	Triangular Low Profile Platform	(9) 1 5/8" Coax	SPRINT NEXTEL
100.0	3	Ericsson Radio 4449 B71 B85A	Triangular Platform with Handrails	(4) 1 5/8" Hybriflex (6) 7/8" Coax (2) 1 1/4" Hybriflex Cable	T-MOBILE
	3	Ericsson RRUS 4415 B66			
	3	Ericsson RRUS 4415 B25			
	3	Ericsson Air6449 B41			
	3	Commscope SDX1926Q-43			
	3	RFS APXVAALL24 43-U-NA20			
	3	Ericsson AIR32 B66Aa/B2a			
90.0	12	CCI HPA-65R-BUU-H8	Triangular Platform with Handrails	(3) 0.35" (9mm) Fiber (2) 0.39" (10mm) Fiber Trunk (8) 0.76" (19.2mm) 8 AWG 6 (8) 0.78" (19.7mm) 8 AWG 6 (3) 1/2" Coax (6) 2" conduit	AT&T MOBILITY
	6	Ericsson RRUS-11			
	3	Ericsson RRUS-32 (77 lbs)			
	3	Ericsson RRUS 32 B66			
	3	Ericsson RRUS E2 B29			
	2	Raycap DC6-48-60-18-8F			
	3	Ericsson RRUS 32 B2			
	3	Ericsson RRUS 4478 B14			
	2	Raycap DC6-48-60-0-8F			
70.0	1	Generic 2' Std. Dish	Flush	(1) 1 5/8" Coax	SPRINT NEXTEL
50.0	1	Generic GPS	Side Arm	(1) 1/2" Coax	

**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
79.0	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	57%	Pass
Shaft	68%	Pass
Base Plate	25%	Pass
Flange Plate	16%	Pass

### Foundations

Reaction Component	Original Design Reactions	Factored Design Reactions*	Analysis Reactions	% of Design
Moment (Kips-Ft)	2740.2	3699.3	2599.7	70%
Shear (Kips)	28.5	38.4	27.7	72%

\* The design reactions are factored by 1.35 per ANSI/TIA-222-H, Sec. 15.6.2

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

### Deflection and Sway\*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
128.0	DragonWave A-ANT-18G-2-C	CLEARWIRE CORPORATION	1.397	1.080
79.0	Fujitsu TA08025-B605	DISH WIRELESS L.L.C.	0.552	0.820
	JMA Wireless MX08FRO665-21			
	Commscope RDIDC-9181-PF-48			
79.0	Fujitsu TA08025-B604	SPRINT NEXTEL	0.430	0.730
70.0	Generic 2' Std. Dish			

\*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.

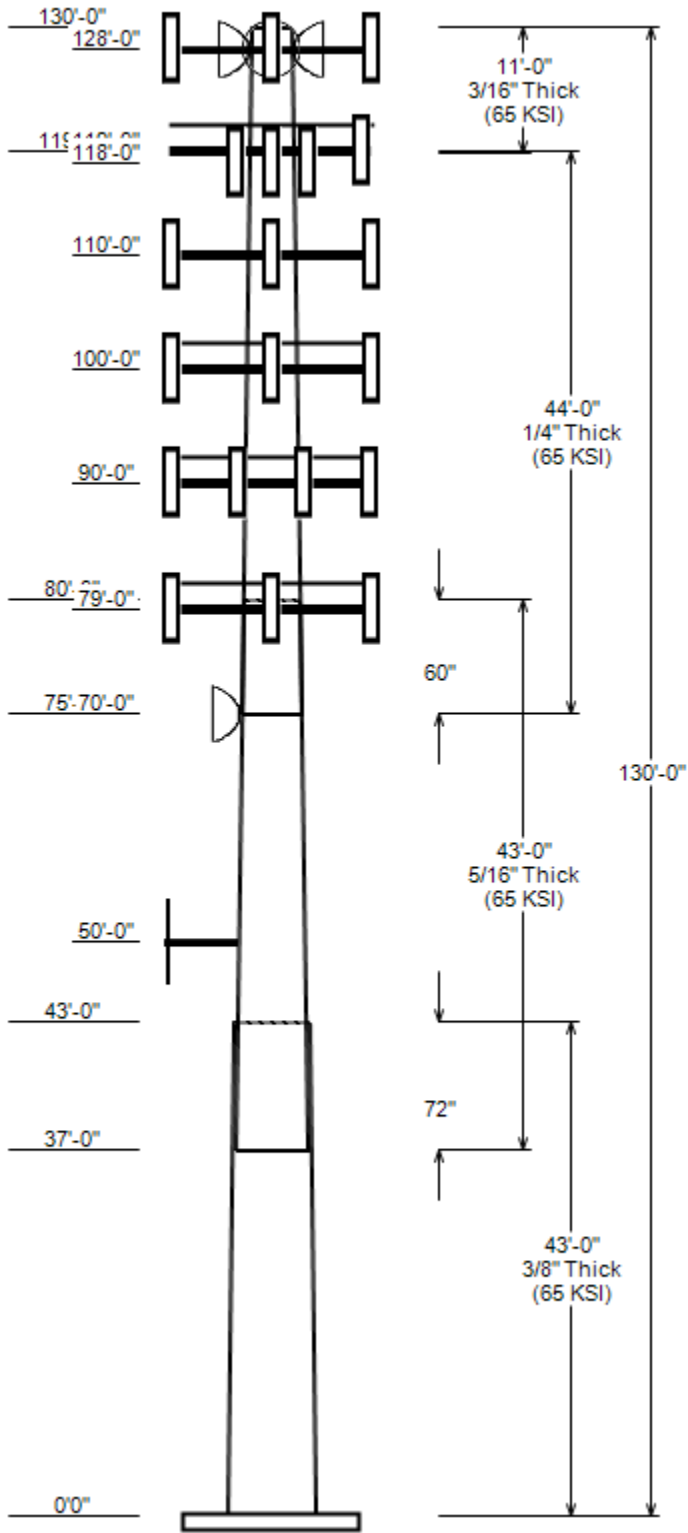
Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

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

Asset : 370626, East Hartford  
 Client : DISH WIRELESS L.L.C.  
 Code : ANSI/TIA-222-H

Height : 130 ft  
 Base Width : 49.19  
 Shape : 16 Sides



SITE PARAMETERS

Base Elev (ft): 0.00 Structure Class: II  
 Taper : 0.23300 (In/ft) Exposure : B  
 Topographic Category : 1 Topographic Feature:  
 Topo Method : Method 1

SECTION PROPERTIES

Shaft Section	Length (ft)	Diameter (in)		Thick (in)	Overlap Length (in)	Steel Grade (ksi)
		Top	Bottom			
1	43.000	39.16	49.19	0.375	0.000	65
2	43.000	31.16	41.19	0.312	72.000	65
3	44.000	22.56	32.83	0.250	60.000	65
4	11.000	20.00	22.56	0.188	0.000	65

DISCRETE APPURTENANCE

Attach Elev (ft)	Force Elev (ft)	Qty	Description
128.0	128.0	3	DragonWave Horizon Compact (11
128.0	128.0	6	Alcatel-Lucent RRH2x50-08
128.0	128.0	3	Alcatel-Lucent 1900 MHz 4X45 R
128.0	128.0	3	Nokia 2.5G MAA - AAHC(64T64R)
128.0	128.0	3	Argus LLPX310R
128.0	128.0	3	DragonWave A-ANT-18G-2-C
128.0	128.0	3	Generic Round T-Arm
128.0	128.0	3	Commscope NNVV-65B-R4
119.0	119.0	6	Andrew DB844G65ZAXY
119.0	119.0	1	Generic Round Platform with Ha
118.0	118.0	3	Samsung RT4401-48A
118.0	118.0	3	Samsung B2/B66A RRH-BR049
118.0	118.0	3	Samsung B5/B13 RRH-BR04C
118.0	118.0	3	Samsung MT6407-77A
118.0	120.0	2	RFS DB-T1-6Z-8AB-0Z
118.0	118.0	3	Andrew LNX-6513DS-A1M (32.6lb)
118.0	118.0	3	Commscope NHH-65B-R2B
118.0	118.0	3	Commscope NHHSS-65B-R2BT4
110.0	110.0	9	Generic 48" x 12" Panel
110.0	110.0	1	Generic Round Low Profile Plat
100.0	100.0	3	Commscope SDX1926Q-43
100.0	100.0	3	Ericsson RRUS 4415 B66
100.0	100.0	3	Ericsson Radio 4449 B71 B85A
100.0	100.0	3	Ericsson RRUS 4415 B25
100.0	100.0	3	Ericsson Air6449 B41
100.0	100.0	3	Ericsson AIR32 B66Aa/B2a
100.0	100.0	3	RFS APXVAALL24 43-U-NA20
100.0	100.0	1	Generic Round Platform with Ha
90.0	90.0	2	Raycap DC6-48-60-18-8F
90.0	90.0	2	Raycap DC6-48-60-0-8F
90.0	90.0	3	Ericsson RRUS 4478 B14
90.0	90.0	3	Ericsson RRUS 32 B66
90.0	90.0	3	Ericsson RRUS 32 B2
90.0	90.0	3	Ericsson RRUS E2 B29
90.0	90.0	3	Ericsson RRUS-32 (77 lbs)
90.0	90.0	6	Ericsson RRUS-11
90.0	90.0	12	CCI HPA-65R-BUU-H8
90.0	90.0	1	Generic Round Platform with Ha
79.0	79.0	1	Commscope RDIDC-9181-PF-48
79.0	79.0	3	Fujitsu TA08025-B604
79.0	79.0	3	Fujitsu TA08025-B605
79.0	79.0	3	JMA Wireless MX08FRO665-21
79.0	79.0	1	Generic Flat Platform with Han
70.0	70.0	1	Generic 2' Std. Dish

**JOB INFORMATION**

Asset : 370626, East Hartford  
 Client : DISH WIRELESS L.L.C.  
 Code : ANSI/TIA-222-H

Height : 130 ft  
 Base Width : 49.19  
 Shape : 16 Sides

**DISCRETE APPURTENANCE**

Attach Elev (ft)	Force Elev (ft)	Qty	Description
50.0	50.0	1	Generic GPS
50.0	50.0	1	Generic Round Side Arm

**LINEAR APPURTENANCE**

Elev From (ft)	Elev To (ft)	Description	Exp To Wind
0.0	128.0	5/8" Coax	No
0.0	128.0	2" Carflex Non-Metallic Conduit	No
0.0	128.0	1/2" Coax	No
0.0	128.0	1.7" (43.2mm) Hybrid	No
0.0	128.0	1 1/4" Hybriflex Cable	No
0.0	128.0	0.41" (10.3mm) Fiber	No
0.0	119.0	1 1/4" Hybriflex Cable	Yes
0.0	118.0	1 5/8" Hybriflex	No
0.0	118.0	1 5/8" Coax	No
0.0	110.0	1 5/8" Coax	No
0.0	100.0	7/8" Coax	Yes
0.0	100.0	1 5/8" Hybriflex	No
0.0	98.0	1 1/4" Hybriflex Cable	No
0.0	90.0	2" conduit	No
0.0	90.0	1/2" Coax	No
0.0	90.0	0.78" (19.7mm) 8 AWG 6	No
0.0	90.0	0.76" (19.2mm) 8 AWG 6	No
0.0	90.0	0.39" (10mm) Fiber Trunk	No
0.0	90.0	0.35" (9mm) Fiber	No
0.0	79.0	1.60" (40.6mm) Hybrid	No
0.0	70.0	1 5/8" Coax	Yes
0.0	50.0	1/2" Coax	No

**LOAD CASES**

1.2D + 1.0W Normal	118 mph wind with no ice
0.9D + 1.0W Normal	118 mph wind with no ice
1.2D + 1.0Di + 1.0Wi Nor	50 mph wind with 1.5" radial ice
1.2D + 1.0Ev + 1.0Eh Nor	Seismic
0.9D - 1.0Ev + 1.0Eh Nor	Seismic (Reduced DL)
1.0D + 1.0W Service Norm	60 mph Wind with No Ice

**REACTIONS**

Load Case	Moment (kip-ft)	Shear (Kip)	Axial (Kip)
1.2D + 1.0W Normal	2599.74	27.67	52.44
0.9D + 1.0W Normal	2563.04	27.65	39.32
1.2D + 1.0Di + 1.0Wi Normal	737.78	7.58	83.35
1.2D + 1.0Ev + 1.0Eh Normal	138.09	1.32	52.62
0.9D - 1.0Ev + 1.0Eh Normal	135.52	1.31	36.47
1.0D + 1.0W Service Normal	596.26	6.40	43.74

**DISH DEFLECTIONS**

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W Service Normal	70.00	5.163	0.727
1.0D + 1.0W Service Normal	128.00	16.764	1.077

ASSET: 370626, East Hartford  
CUSTOMER: DISH WIRELESS L.L.C.

CODE: ANSI/TIA-222-H  
ENG NO: 13726411\_C3\_03

#### ANALYSIS PARAMETERS

Location:	Hartford County,CT	Height:	130 ft
Type and Shape:	Taper, 16 Sides	Base Diameter:	49.19 in
Manufacturer:	Undetermined	Top Diameter:	20.00 in
K <sub>d</sub> (non-service):	0.95	Taper:	0.2330 in/ft
K <sub>e</sub> :	1.00	Rotation:	0.000°

#### ICE & WIND PARAMETERS

Exposure Category:	B	Design Wind Speed w/o Ice:	118 mph
Risk Category:	II	Design Wind Speed w/Ice:	50 mph
Topo Factor Procedure:	Method 1	Operational Wind Speed:	60 mph
Topographic Category:	1	Design Ice Thickness:	1.50 in
Crest Height:	0 ft	HMSL:	49.00 ft

#### SEISMIC PARAMETERS

Analysis Method:	Equivalent Lateral Force Method				
Site Class:	D - Stiff Soil	Period Based on Rayleigh Method (sec):	2.37		
T <sub>L</sub> (sec):	6	P:	1	C <sub>s</sub> :	0.030
S <sub>s</sub> :	0.189	S <sub>1</sub> :	0.055	C <sub>s</sub> Max:	0.030
F <sub>a</sub> :	1.600	F <sub>v</sub> :	2.400	C <sub>s</sub> Min:	0.030
S <sub>ds</sub> :	0.202	S <sub>d1</sub> :	0.088		

#### LOAD CASES

1.2D + 1.0W Normal	118 mph wind with no ice
0.9D + 1.0W Normal	118 mph wind with no ice
1.2D + 1.0Di + 1.0Wi Normal	50 mph wind with 1.5" radial ice
1.2D + 1.0Ev + 1.0Eh Normal	Seismic
0.9D - 1.0Ev + 1.0Eh Normal	Seismic (Reduced DL)
1.0D + 1.0W Service Normal	60 mph Wind with No Ice

ASSET: 370626, East Hartford  
 CUSTOMER: DISH WIRELESS L.L.C.

CODE: ANSI/TIA-222-H  
 ENG NO: 13726411\_C3\_03

SHAFT SECTION PROPERTIES

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint len (in)	Bottom							Top						
						Weight (lb)	Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Dia (in)	Elev (in)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Taper (in/ft)
1-16	43.00	0.3750	65		0.00	7,667	49.19	0.000	58.39	17,579.1	24.10	131.17	39.16	43.00	46.40	8,819.0	18.78	104.43	0.2332
2-16	43.00	0.3125	65	Slip	72.00	5,231	41.19	37.000	40.75	8,600.2	24.23	131.80	31.16	80.00	30.75	3,696.6	17.84	99.71	0.2332
3-16	44.00	0.2500	65	Slip	60.00	3,277	32.83	75.000	25.98	3,482.7	24.13	131.30	22.56	119.00	17.80	1,119.5	15.96	90.26	0.2332
4-16	11.00	0.1875	65	Butt	0.00	472	22.56	119.000	13.38	846.7	21.95	120.35	20.00	130.00	11.85	587.7	19.23	106.67	0.2332

Shaft Weight 16,647

DISCRETE APPURTENANCE PROPERTIES

Attach Elev (ft)	Description	Qty	Ka	Vert Ecc (ft)	No Ice			Ice		
					Weight (lb)	EPAA (sf)	Orientation Factor	Weight (lb)	EPAA (sf)	Orientation Factor
128.00	Generic Round T-Arm	3	0.75	0.000	312.50	9.700	0.67	569.86	17.822	0.67
128.00	DragonWave A-ANT-18G-2-C	3	0.80	0.000	27.10	4.688	1.00	123.24	5.943	1.00
128.00	Argus LLPX310R	3	0.80	0.000	28.60	4.292	0.63	117.38	5.921	0.63
128.00	Nokia 2.5G MAA - AAHC(64T64R)	3	0.80	0.000	103.60	4.203	0.64	214.66	5.524	0.64
128.00	Alcatel-Lucent 1900 MHz 4X45 R	3	0.80	0.000	60.00	2.322	0.67	139.39	3.387	0.67
128.00	Alcatel-Lucent RRHx50-08	6	0.80	0.000	52.90	1.701	0.50	111.28	2.551	0.50
128.00	DragonWave Horizon Compact (11	3	1.00	0.000	11.50	0.721	0.50	33.65	1.282	0.50
128.00	Commscope NNVV-65B-R4	3	0.80	0.000	77.40	12.271	0.64	324.93	15.033	0.64
119.00	Andrew DB844G65ZAXY	6	0.75	0.000	12.00	4.341	0.75	145.83	5.258	0.75
119.00	Generic Round Platform with Ha	1	1.00	0.000	2500.00	27.200	1.00	4085.24	51.124	1.00
118.00	Samsung RT4401-48A	3	0.75	0.000	18.60	0.996	0.50	44.98	1.664	0.50
118.00	Samsung B2/B66A RRH-BR049	3	0.75	0.000	84.40	1.875	0.50	146.73	2.757	0.50
118.00	Samsung B5/B13 RRH-BR04C	3	0.75	0.000	70.30	1.875	0.50	126.19	2.757	0.50
118.00	Samsung MT6407-77A	3	0.75	0.000	81.60	4.709	0.61	181.19	6.193	0.61
118.00	RFS DB-T1-6Z-8AB-0Z	2	0.75	2.000	44.00	4.800	0.72	166.97	6.189	0.72
118.00	Commscope NHH-65B-R2B	3	0.75	0.000	43.70	8.079	0.69	214.05	10.801	0.69
118.00	Andrew LNX-6513DS-A1M (32.6lb)	3	0.75	0.000	32.60	5.846	0.69	164.78	7.911	0.69
118.00	Commscope NHHSS-65B-R2BT4	3	0.75	0.000	51.00	8.079	0.69	220.82	10.812	0.69
110.00	Generic Round Low Profile Plat	1	1.00	0.000	1875.00	21.700	1.00	2659.93	40.308	1.00
110.00	Generic 48" x 12" Panel	9	0.80	0.000	30.00	5.067	0.66	139.73	6.880	0.66
100.00	Generic Round Platform with Ha	1	1.00	0.000	2500.00	27.200	1.00	4054.62	50.662	1.00
100.00	RFS APXVAALL24 43-U-NA20	3	0.75	0.000	122.80	20.243	0.63	496.65	23.803	0.63
100.00	Ericsson AIR32 B66Aa/B2a	3	0.75	0.000	132.20	6.510	0.71	285.39	8.612	0.71
100.00	Ericsson Air6449 B41	3	0.75	0.000	104.00	5.682	0.63	234.80	7.206	0.63
100.00	Ericsson RRUS 4415 B25	3	0.75	0.000	46.00	1.842	0.50	93.06	2.703	0.50
100.00	Ericsson RRUS 4415 B66	3	0.75	0.000	46.00	1.650	0.50	87.55	2.465	0.50
100.00	Commscope SDX1926Q-43	3	0.75	0.000	6.20	0.242	0.50	14.45	0.580	0.50
100.00	Ericsson Radio 4449 B71 B85A	3	0.75	0.000	75.00	1.650	0.50	132.72	2.465	0.50
90.00	Raycap DC6-48-60-18-8F	2	0.75	0.000	20.00	1.260	0.50	69.99	1.885	0.50
90.00	CCI HPA-65R-BUU-H8	12	0.75	0.000	68.00	12.976	0.67	311.97	16.375	0.67
90.00	Ericsson RRUS-11	6	0.75	0.000	55.00	3.792	0.61	140.24	5.011	0.61
90.00	Ericsson RRUS-32 (77 lbs)	3	0.75	0.000	77.00	3.314	0.71	169.34	4.533	0.71
90.00	Ericsson RRUS E2 B29	3	0.75	0.000	60.00	3.145	0.62	136.79	4.245	0.62
90.00	Ericsson RRUS 32 B66	3	0.75	0.000	53.00	2.743	0.67	122.83	3.853	0.67
90.00	Ericsson RRUS 32 B2	3	0.75	0.000	53.00	2.743	0.67	122.83	3.853	0.67
90.00	Ericsson RRUS 4478 B14	3	0.75	0.000	59.40	2.021	0.67	117.67	2.917	0.67
90.00	Generic Round Platform with Ha	1	1.00	0.000	2500.00	27.200	1.00	4037.88	50.409	1.00
90.00	Raycap DC6-48-60-0-8F	2	0.75	0.000	32.80	1.360	0.50	87.99	1.990	0.50
79.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	4165.29	62.060	1.00
79.00	JMA Wireless MX08FRO665-21	3	0.75	0.000	64.50	12.489	0.64	305.44	15.123	0.64
79.00	Fujitsu TA08025-B604	3	0.75	0.000	63.90	1.962	0.50	118.57	2.824	0.50
79.00	Fujitsu TA08025-B605	3	0.75	0.000	75.00	1.962	0.50	133.73	2.824	0.50
79.00	Commscope RDIDC-9181-PF-48	1	0.75	0.000	21.90	1.867	1.00	75.25	2.711	1.00
70.00	Generic 2' Std. Dish	1	1.00	0.000	14.00	5.228	1.00	65.26	6.660	1.00
50.00	Generic Round Side Arm	1	1.00	0.000	187.50	5.200	1.00	269.17	7.627	1.00
50.00	Generic GPS	1	1.00	0.000	10.00	0.900	1.00	36.13	1.471	1.00

Totals Num Loadings: 46 141 20,230.10 43,064.99

LINEAR APPURTENANCE PROPERTIES

Load Case Azimuth (deg) : 270.00

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Dia (in)	Coax Wt (lb/ft)	Max Flat	Dist Coax/ Row	Dist Between Rows(in)	Dist Between Cols(in)	Azimuth (deg)	Dist From Face (in)	Exposed To Wind	Carrier
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ASSET: 370626, East Hartford  
 CUSTOMER: DISH WIRELESS L.L.C.

CODE: ANSI/TIA-222-H  
 ENG NO: 13726411\_C3\_03

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Dia (in)	Coax Wt (lb/ft)	Flat	Max Coax/ Row	Dist Between Rows(in)	Dist Between Cols(in)	Azimuth (deg)	Dist From Face (in)	Exposed To Wind	Carrier
0.00	128.00	3	1/2" Coax	0.63	0.15	N	0	0	0	0	0	N	CLEARWIRE COR
0.00	128.00	3	1 1/4" Hybriflex Cabl	1.54	1	N	0	0	0	0	0	N	CLEARWIRE COR
0.00	128.00	3	5/8" Coax	0.86	0.15	N	0	0	0	0	0	N	CLEARWIRE COR
0.00	128.00	2	0.41" (10.3mm) Fiber	0.41	0.09	N	0	0	0	0	0	N	CLEARWIRE COR
0.00	128.00	2	2" Carflex Non-Metall	2.36	0.68	N	0	0	0	0	0	N	CLEARWIRE COR
0.00	128.00	1	1.7" (43.2mm) Hybrid	1.7	1.78	N	0	0	0	0	0	N	CLEARWIRE COR
0.00	119.00	2	1 1/4" Hybriflex Cabl	1.54	1	N	2	1	1	180	1	Y	VERIZON WIREL
0.00	118.00	6	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	VERIZON WIREL
0.00	118.00	2	1 5/8" Hybriflex	1.98	1.3	N	0	0	0	0	0	N	VERIZON WIREL
0.00	110.00	9	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	SPRINT NEXTEL
0.00	100.00	6	7/8" Coax	1.09	0.33	N	6	1	1	330	1	Y	T-MOBILE
0.00	100.00	4	1 5/8" Hybriflex	1.98	1.3	N	0	0	0	0	0	N	T-MOBILE
0.00	98.00	2	1 1/4" Hybriflex Cabl	1.54	1	N	0	0	0	0	0	N	T-MOBILE
0.00	90.00	8	0.76" (19.2mm) 8 AWG	0.76	0.53	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	90.00	8	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	90.00	6	2" conduit	2.38	3.65	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	90.00	3	1/2" Coax	0.63	0.15	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	90.00	3	0.35" (9mm) Fiber	0.35	0.05	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	90.00	2	0.39" (10mm) Fiber Tr	0.39	0.06	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	79.00	1	1.60" (40.6mm) Hybrid	1.6	2.34	N	0	0	0	0	0	N	DISH WIRELESS
0.00	70.00	1	1 5/8" Coax	1.98	0.82	N	1	1	1	0	1	Y	SPRINT NEXTEL
0.00	50.00	1	1/2" Coax	0.63	0.15	N	0	0	0	0	0	N	SPRINT NEXTEL



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	49.190	58.395	17,579.10	24.10	131.17	75.3	701.0	0.0	0.0
5.00		0.3750	48.024	57.000	16,349.30	23.48	128.06	76	667.8	0.0	981.7
10.00		0.3750	46.858	55.605	15,178.20	22.87	124.95	76.7	635.4	0.0	957.9
15.00		0.3750	45.692	54.211	14,064.50	22.25	121.85	77.4	603.8	0.0	934.2
20.00		0.3750	44.526	52.816	13,006.60	21.63	118.74	78.1	573.0	0.0	910.5
25.00		0.3750	43.360	51.421	12,003.10	21.01	115.63	78.8	543.0	0.0	886.7
30.00		0.3750	42.194	50.026	11,052.60	20.39	112.52	79.5	513.8	0.0	863.0
35.00		0.3750	41.028	48.631	10,153.70	19.77	109.41	80.2	485.4	0.0	839.3
37.00	Bot - Section 2	0.3750	40.562	48.074	9,808.20	19.53	108.17	80.5	474.3	0.0	329.1
40.00		0.3750	39.862	47.237	9,304.80	19.16	106.30	80.9	457.9	0.0	898.9
43.00	Top - Section 1	0.3125	39.788	39.352	7,746.90	23.34	127.32	76.2	381.9	0.0	883.2
45.00		0.3125	39.321	38.887	7,475.60	23.04	125.83	76.5	372.9	0.0	266.2
50.00		0.3125	38.155	37.725	6,825.10	22.30	122.10	77.3	350.9	0.0	651.7
55.00		0.3125	36.989	36.562	6,213.50	21.56	118.37	78.2	329.5	0.0	632.0
60.00		0.3125	35.823	35.400	5,639.50	20.81	114.64	79	308.8	0.0	612.2
65.00		0.3125	34.658	34.238	5,102.10	20.07	110.90	79.9	288.8	0.0	592.4
70.00		0.3125	33.492	33.075	4,599.90	19.33	107.17	80.7	269.4	0.0	572.6
75.00	Bot - Section 3	0.3125	32.326	31.913	4,131.80	18.59	103.44	81.5	250.7	0.0	552.9
79.00		0.3125	31.393	30.983	3,781.00	17.99	100.46	82.2	236.3	0.0	776.6
80.00	Top - Section 2	0.2500	31.660	25.049	3,122.00	23.20	126.64	76.3	193.4	0.0	190.6
85.00		0.2500	30.494	24.119	2,787.10	22.27	121.97	77.4	179.3	0.0	418.3
90.00		0.2500	29.328	23.189	2,477.00	21.35	117.31	78.4	165.7	0.0	402.5
95.00		0.2500	28.162	22.260	2,190.80	20.42	112.65	79.5	152.6	0.0	386.6
100.00		0.2500	26.996	21.330	1,927.60	19.49	107.98	80.5	140.1	0.0	370.8
105.00		0.2500	25.830	20.400	1,686.30	18.56	103.32	81.6	128.1	0.0	355.0
110.00		0.2500	24.664	19.470	1,466.10	17.63	98.66	82.6	116.6	0.0	339.2
115.00		0.2500	23.498	18.540	1,265.90	16.71	93.99	82.6	105.7	0.0	323.4
118.00		0.2500	22.798	17.982	1,155.00	16.15	91.19	82.6	99.4	0.0	186.4
119.00	Top - Section 3	0.2500	22.565	17.796	1,119.50	15.96	90.26	82.6	97.3	0.0	60.9
119.00	Bot - Section 4	0.1875	22.565	13.385	846.70	21.95	120.35	77.7	73.6	0.0	
120.00		0.1875	22.332	13.245	820.50	21.70	119.10	78	72.1	0.0	45.3
125.00		0.1875	21.166	12.548	697.60	20.47	112.89	79.4	64.7	0.0	219.4
128.00		0.1875	20.466	12.129	630.10	19.72	109.15	80.3	60.4	0.0	126.0
130.00		0.1875	20.000	11.850	587.70	19.23	106.67	80.8	57.6	0.0	81.6

Totals: 16,647.1

Load Case: 1.2D + 1.0W Normal	118 mph wind with no ice	23 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	-52.44	-27.67	0.00	-2,599.7	0.00	2,599.74	3,957.37	1,024.83	4,561.65	3,958.89	0	0	0.671
5.00	-50.76	-27.45	0.00	-2,461.4	0.00	2,461.39	3,898.74	1,000.35	4,346.37	3,806.37	0.11	-0.2	0.660
10.00	-49.10	-27.24	0.00	-2,324.1	0.00	2,324.13	3,838.36	975.87	4,136.30	3,655.01	0.44	-0.41	0.649
15.00	-47.47	-27.02	0.00	-2,188.0	0.00	2,187.96	3,776.22	951.40	3,931.43	3,504.92	0.98	-0.62	0.638
20.00	-45.88	-26.80	0.00	-2,052.9	0.00	2,052.87	3,712.33	926.92	3,731.76	3,356.23	1.75	-0.84	0.625
25.00	-44.31	-26.58	0.00	-1,918.9	0.00	1,918.86	3,646.67	902.44	3,537.29	3,209.08	2.75	-1.06	0.611
30.00	-42.77	-26.35	0.00	-1,785.9	0.00	1,785.94	3,579.26	877.96	3,348.03	3,063.58	3.97	-1.28	0.596
35.00	-41.29	-26.17	0.00	-1,654.2	0.00	1,654.17	3,510.10	853.48	3,163.97	2,919.87	5.43	-1.5	0.579
37.00	-40.69	-26.05	0.00	-1,601.8	0.00	1,601.83	3,481.94	843.69	3,091.80	2,862.92	6.07	-1.59	0.572
40.00	-39.31	-25.87	0.00	-1,523.7	0.00	1,523.68	3,439.17	829.00	2,985.11	2,778.07	7.12	-1.72	0.561
43.00	-37.96	-25.71	0.00	-1,446.1	0.00	1,446.08	2,697.55	690.63	2,485.92	2,181.76	8.24	-1.86	0.678
45.00	-37.41	-25.53	0.00	-1,394.7	0.00	1,394.66	2,677.43	682.47	2,427.54	2,139.70	9.04	-1.95	0.667
50.00	-35.89	-25.05	0.00	-1,267.0	0.00	1,267.03	2,625.91	662.07	2,284.61	2,035.31	11.22	-2.21	0.638
55.00	-34.63	-24.74	0.00	-1,141.8	0.00	1,141.80	2,572.64	641.67	2,146.02	1,932.08	13.67	-2.46	0.606
60.00	-33.41	-24.42	0.00	-1,018.1	0.00	1,018.09	2,517.61	621.27	2,011.77	1,830.13	16.38	-2.7	0.571
65.00	-32.21	-24.08	0.00	-896.0	0.00	896.01	2,460.82	600.87	1,881.85	1,729.60	19.34	-2.94	0.533
70.00	-31.04	-23.58	0.00	-775.6	0.00	775.63	2,402.27	580.47	1,756.27	1,630.62	22.55	-3.18	0.490
75.00	-29.91	-23.30	0.00	-657.7	0.00	657.74	2,341.97	560.07	1,635.02	1,533.30	26	-3.4	0.443
79.00	-25.02	-20.60	0.00	-564.5	0.00	564.53	2,292.47	543.75	1,541.15	1,456.74	28.92	-3.57	0.400
80.00	-24.68	-20.42	0.00	-543.9	0.00	543.94	1,720.57	439.61	1,259.08	1,107.21	29.67	-3.61	0.508
85.00	-23.75	-20.10	0.00	-441.8	0.00	441.83	1,679.48	423.29	1,167.35	1,040.33	33.55	-3.8	0.441
90.00	-17.62	-14.43	0.00	-341.3	0.00	341.34	1,636.64	406.98	1,079.09	974.39	37.64	-4	0.362
95.00	-16.94	-14.07	0.00	-269.2	0.00	269.21	1,592.04	390.66	994.30	909.51	41.92	-4.17	0.308
100.00	-11.62	-10.41	0.00	-198.9	0.00	198.86	1,545.69	374.34	912.98	845.81	46.37	-4.33	0.243
105.00	-11.05	-10.08	0.00	-146.8	0.00	146.83	1,497.58	358.02	835.13	783.43	50.97	-4.45	0.196
110.00	-8.08	-7.83	0.00	-96.4	0.00	96.43	1,446.53	341.70	760.75	721.90	55.69	-4.56	0.140
115.00	-7.61	-7.56	0.00	-57.3	0.00	57.30	1,377.44	325.38	689.83	654.26	60.5	-4.63	0.094
118.00	-6.02	-5.35	0.00	-34.2	0.00	34.21	1,335.99	315.59	648.95	615.27	63.42	-4.66	0.060
119.00	-2.99	-3.42	0.00	-28.9	0.00	28.86	1,322.18	312.33	635.60	602.54	64.4	-4.67	0.050
119.00	-2.99	-3.42	0.00	-28.9	0.00	28.86	936.41	234.90	479.32	429.14	64.4	-4.67	0.071
120.00	-2.94	-3.26	0.00	-25.4	0.00	25.44	929.99	232.45	469.38	421.71	65.37	-4.68	0.064
125.00	-2.65	-3.02	0.00	-9.2	0.00	9.16	896.83	220.21	421.26	385.08	70.29	-4.71	0.027
128.00	-0.09	-0.05	0.00	-0.1	0.00	0.10	876.09	212.87	393.64	363.52	73.24	-4.71	0.000
130.00	0.00	-0.04	0.00	0.0	0.00	0.00	861.91	207.97	375.75	349.34	75.21	-4.71	0.000

ASSET: 370626, East Hartford  
 CUSTOMER: DISH WIRELESS L.L.C.

CODE: ANSI/TIA-222-H  
 ENG NO: 13726411\_C3\_03

Load Case: 0.9D + 1.0W Normal	118 mph wind with no ice	23 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	-39.32	-27.65	0.00	-2,563.0	0.00	2,563.04	3,957.37	1,024.83	4,561.65	3,958.89	0	0	0.658
5.00	-38.03	-27.38	0.00	-2,424.8	0.00	2,424.82	3,898.74	1,000.35	4,346.37	3,806.37	0.11	-0.2	0.648
10.00	-36.77	-27.12	0.00	-2,287.9	0.00	2,287.92	3,838.36	975.87	4,136.30	3,655.01	0.43	-0.41	0.636
15.00	-35.53	-26.86	0.00	-2,152.3	0.00	2,152.34	3,776.22	951.40	3,931.43	3,504.92	0.97	-0.61	0.624
20.00	-34.31	-26.60	0.00	-2,018.0	0.00	2,018.04	3,712.33	926.92	3,731.76	3,356.23	1.73	-0.83	0.611
25.00	-33.11	-26.34	0.00	-1,885.0	0.00	1,885.04	3,646.67	902.44	3,537.29	3,209.08	2.71	-1.04	0.597
30.00	-31.94	-26.08	0.00	-1,753.3	0.00	1,753.32	3,579.26	877.96	3,348.03	3,063.58	3.91	-1.25	0.582
35.00	-30.81	-25.88	0.00	-1,622.9	0.00	1,622.93	3,510.10	853.48	3,163.97	2,919.87	5.34	-1.47	0.566
37.00	-30.35	-25.73	0.00	-1,571.2	0.00	1,571.17	3,481.94	843.69	3,091.80	2,862.92	5.98	-1.56	0.558
40.00	-29.30	-25.54	0.00	-1,494.0	0.00	1,493.98	3,439.17	829.00	2,985.11	2,778.07	7	-1.69	0.547
43.00	-28.28	-25.37	0.00	-1,417.4	0.00	1,417.36	2,697.55	690.63	2,485.92	2,181.76	8.11	-1.83	0.661
45.00	-27.85	-25.16	0.00	-1,366.6	0.00	1,366.62	2,677.43	682.47	2,427.54	2,139.70	8.9	-1.92	0.650
50.00	-26.70	-24.65	0.00	-1,240.8	0.00	1,240.81	2,625.91	662.07	2,284.61	2,035.31	11.04	-2.17	0.621
55.00	-25.73	-24.32	0.00	-1,117.6	0.00	1,117.55	2,572.64	641.67	2,146.02	1,932.08	13.44	-2.41	0.590
60.00	-24.80	-23.97	0.00	-996.0	0.00	995.97	2,517.61	621.27	2,011.77	1,830.13	16.1	-2.65	0.556
65.00	-23.88	-23.60	0.00	-876.1	0.00	876.13	2,460.82	600.87	1,881.85	1,729.60	19.01	-2.89	0.518
70.00	-22.99	-23.09	0.00	-758.1	0.00	758.11	2,402.27	580.47	1,756.27	1,630.62	22.16	-3.12	0.476
75.00	-22.13	-22.80	0.00	-642.7	0.00	642.67	2,341.97	560.07	1,635.02	1,533.30	25.54	-3.33	0.430
79.00	-18.49	-20.16	0.00	-551.5	0.00	551.46	2,292.47	543.75	1,541.15	1,456.74	28.4	-3.5	0.388
80.00	-18.23	-19.98	0.00	-531.3	0.00	531.30	1,720.57	439.61	1,259.08	1,107.21	29.14	-3.54	0.493
85.00	-17.52	-19.65	0.00	-431.4	0.00	431.40	1,679.48	423.29	1,167.35	1,040.33	32.95	-3.73	0.427
90.00	-13.00	-14.08	0.00	-333.2	0.00	333.16	1,636.64	406.98	1,079.09	974.39	36.96	-3.92	0.351
95.00	-12.49	-13.72	0.00	-262.8	0.00	262.79	1,592.04	390.66	994.30	909.51	41.15	-4.09	0.298
100.00	-8.55	-10.16	0.00	-194.2	0.00	194.19	1,545.69	374.34	912.98	845.81	45.52	-4.24	0.236
105.00	-8.12	-9.83	0.00	-143.4	0.00	143.41	1,497.58	358.02	835.13	783.43	50.02	-4.36	0.189
110.00	-5.93	-7.64	0.00	-94.2	0.00	94.25	1,446.53	341.70	760.75	721.90	54.65	-4.46	0.135
115.00	-5.58	-7.39	0.00	-56.0	0.00	56.03	1,377.44	325.38	689.83	654.26	59.36	-4.54	0.090
118.00	-4.42	-5.21	0.00	-33.5	0.00	33.46	1,335.99	315.59	648.95	615.27	62.22	-4.57	0.058
119.00	-2.18	-3.35	0.00	-28.3	0.00	28.26	1,322.18	312.33	635.60	602.54	63.18	-4.58	0.049
119.00	-2.18	-3.35	0.00	-28.3	0.00	28.26	936.41	234.90	479.32	429.14	63.18	-4.58	0.068
120.00	-2.15	-3.19	0.00	-24.9	0.00	24.90	929.99	232.45	469.38	421.71	64.13	-4.58	0.062
125.00	-1.94	-2.96	0.00	-9.0	0.00	8.97	896.83	220.21	421.26	385.08	68.95	-4.61	0.026
128.00	-0.07	-0.05	0.00	-0.1	0.00	0.10	876.09	212.87	393.64	363.52	71.84	-4.62	0.000
130.00	0.00	-0.04	0.00	0.0	0.00	0.00	861.91	207.97	375.75	349.34	73.77	-4.62	0.000

ASSET: 370626, East Hartford  
 CUSTOMER: DISH WIRELESS L.L.C.

CODE: ANSI/TIA-222-H  
 ENG NO: 13726411\_C3\_03

Load Case: 1.2D + 1.0Di + 1.0Wi Normal		50 mph wind with 1.5" radial ice		23 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	-83.35	-7.58	0.00	-737.8	0.00	737.78	3,957.37	1,024.83	4,561.65	3,958.89	0	0	0.207
5.00	-81.31	-7.55	0.00	-699.9	0.00	699.86	3,898.74	1,000.35	4,346.37	3,806.37	0.03	-0.06	0.205
10.00	-79.25	-7.51	0.00	-662.1	0.00	662.12	3,838.36	975.87	4,136.30	3,655.01	0.12	-0.12	0.202
15.00	-77.21	-7.47	0.00	-624.6	0.00	624.58	3,776.22	951.40	3,931.43	3,504.92	0.28	-0.18	0.199
20.00	-75.19	-7.43	0.00	-587.2	0.00	587.24	3,712.33	926.92	3,731.76	3,356.23	0.5	-0.24	0.195
25.00	-73.20	-7.39	0.00	-550.1	0.00	550.08	3,646.67	902.44	3,537.29	3,209.08	0.78	-0.3	0.192
30.00	-71.23	-7.35	0.00	-513.1	0.00	513.13	3,579.26	877.96	3,348.03	3,063.58	1.13	-0.36	0.187
35.00	-69.30	-7.31	0.00	-476.4	0.00	476.38	3,510.10	853.48	3,163.97	2,919.87	1.55	-0.43	0.183
37.00	-68.53	-7.29	0.00	-461.8	0.00	461.75	3,481.94	843.69	3,091.80	2,862.92	1.73	-0.45	0.181
40.00	-66.89	-7.26	0.00	-439.9	0.00	439.88	3,439.17	829.00	2,985.11	2,778.07	2.03	-0.49	0.178
43.00	-65.27	-7.22	0.00	-418.1	0.00	418.11	2,697.55	690.63	2,485.92	2,181.76	2.35	-0.53	0.216
45.00	-64.58	-7.19	0.00	-403.7	0.00	403.66	2,677.43	682.47	2,427.54	2,139.70	2.58	-0.56	0.213
50.00	-62.55	-7.09	0.00	-367.7	0.00	367.69	2,625.91	662.07	2,284.61	2,035.31	3.21	-0.63	0.205
55.00	-60.88	-7.03	0.00	-332.2	0.00	332.24	2,572.64	641.67	2,146.02	1,932.08	3.91	-0.71	0.196
60.00	-59.24	-6.97	0.00	-297.1	0.00	297.07	2,517.61	621.27	2,011.77	1,830.13	4.69	-0.78	0.186
65.00	-57.63	-6.91	0.00	-262.2	0.00	262.20	2,460.82	600.87	1,881.85	1,729.60	5.54	-0.85	0.175
70.00	-55.99	-6.80	0.00	-227.7	0.00	227.66	2,402.27	580.47	1,756.27	1,630.62	6.47	-0.92	0.163
75.00	-54.47	-6.73	0.00	-193.7	0.00	193.68	2,341.97	560.07	1,635.02	1,533.30	7.46	-0.98	0.150
79.00	-46.75	-5.99	0.00	-166.8	0.00	166.77	2,292.47	543.75	1,541.15	1,456.74	8.31	-1.03	0.135
80.00	-46.35	-5.95	0.00	-160.8	0.00	160.78	1,720.57	439.61	1,259.08	1,107.21	8.52	-1.04	0.172
85.00	-45.01	-5.86	0.00	-131.0	0.00	131.04	1,679.48	423.29	1,167.35	1,040.33	9.65	-1.1	0.153
90.00	-32.81	-4.30	0.00	-101.8	0.00	101.75	1,636.64	406.98	1,079.09	974.39	10.83	-1.16	0.125
95.00	-31.72	-4.20	0.00	-80.3	0.00	80.27	1,592.04	390.66	994.30	909.51	12.07	-1.21	0.108
100.00	-22.38	-3.13	0.00	-59.3	0.00	59.29	1,545.69	374.34	912.98	845.81	13.37	-1.26	0.085
105.00	-21.48	-3.03	0.00	-43.6	0.00	43.62	1,497.58	358.02	835.13	783.43	14.71	-1.29	0.070
110.00	-16.54	-2.33	0.00	-28.5	0.00	28.49	1,446.53	341.70	760.75	721.90	16.08	-1.33	0.051
115.00	-15.74	-2.24	0.00	-16.8	0.00	16.85	1,377.44	325.38	689.83	654.26	17.48	-1.35	0.037
118.00	-11.76	-1.63	0.00	-10.0	0.00	10.04	1,335.99	315.59	648.95	615.27	18.33	-1.36	0.025
119.00	-6.39	-1.01	0.00	-8.4	0.00	8.41	1,322.18	312.33	635.60	602.54	18.61	-1.36	0.019
119.00	-6.39	-1.01	0.00	-8.4	0.00	8.41	936.41	234.90	479.32	429.14	18.61	-1.36	0.026
120.00	-6.27	-0.95	0.00	-7.4	0.00	7.40	929.99	232.45	469.38	421.71	18.9	-1.36	0.024
125.00	-5.72	-0.87	0.00	-2.6	0.00	2.64	896.83	220.21	421.26	385.08	20.33	-1.37	0.013
128.00	-0.19	-0.02	0.00	-0.0	0.00	0.04	876.09	212.87	393.64	363.52	21.19	-1.37	0.000
130.00	0.00	-0.02	0.00	0.0	0.00	0.00	861.91	207.97	375.75	349.34	21.76	-1.37	0.000

ASSET: 370626, East Hartford  
 CUSTOMER: DISH WIRELESS L.L.C.

CODE: ANSI/TIA-222-H  
 ENG NO: 13726411\_C3\_03

Load Case: 1.0D + 1.0W Service Normal	60 mph Wind with No Ice	22 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	-43.74	-6.40	0.00	-596.3	0.00	596.26	3,957.37	1,024.83	4,561.65	3,958.89	0	0	0.162
5.00	-42.41	-6.34	0.00	-564.3	0.00	564.27	3,898.74	1,000.35	4,346.37	3,806.37	0.03	-0.05	0.159
10.00	-41.11	-6.28	0.00	-532.6	0.00	532.58	3,838.36	975.87	4,136.30	3,655.01	0.1	-0.09	0.156
15.00	-39.83	-6.23	0.00	-501.2	0.00	501.17	3,776.22	951.40	3,931.43	3,504.92	0.23	-0.14	0.154
20.00	-38.57	-6.17	0.00	-470.0	0.00	470.04	3,712.33	926.92	3,731.76	3,356.23	0.4	-0.19	0.150
25.00	-37.34	-6.11	0.00	-439.2	0.00	439.19	3,646.67	902.44	3,537.29	3,209.08	0.63	-0.24	0.147
30.00	-36.13	-6.06	0.00	-408.6	0.00	408.63	3,579.26	877.96	3,348.03	3,063.58	0.91	-0.29	0.144
35.00	-34.95	-6.01	0.00	-378.4	0.00	378.35	3,510.10	853.48	3,163.97	2,919.87	1.24	-0.34	0.140
37.00	-34.48	-5.98	0.00	-366.3	0.00	366.33	3,481.94	843.69	3,091.80	2,862.92	1.39	-0.36	0.138
40.00	-33.37	-5.94	0.00	-348.4	0.00	348.39	3,439.17	829.00	2,985.11	2,778.07	1.63	-0.39	0.135
43.00	-32.28	-5.90	0.00	-330.6	0.00	330.58	3,387.55	816.63	2,885.92	2,681.76	1.89	-0.43	0.164
45.00	-31.88	-5.85	0.00	-318.8	0.00	318.79	2,677.43	682.47	2,427.54	2,139.70	2.07	-0.45	0.161
50.00	-30.68	-5.74	0.00	-289.5	0.00	289.53	2,625.91	662.07	2,284.61	2,035.31	2.57	-0.5	0.154
55.00	-29.71	-5.66	0.00	-260.8	0.00	260.84	2,572.64	641.67	2,146.02	1,932.08	3.13	-0.56	0.147
60.00	-28.75	-5.59	0.00	-232.5	0.00	232.53	2,517.61	621.27	2,011.77	1,830.13	3.75	-0.62	0.139
65.00	-27.81	-5.50	0.00	-204.6	0.00	204.61	2,460.82	600.87	1,881.85	1,729.60	4.43	-0.67	0.130
70.00	-26.88	-5.39	0.00	-177.1	0.00	177.09	2,402.27	580.47	1,756.27	1,630.62	5.16	-0.73	0.120
75.00	-25.99	-5.32	0.00	-150.2	0.00	150.16	2,341.97	560.07	1,635.02	1,533.30	5.95	-0.78	0.109
79.00	-21.82	-4.71	0.00	-128.9	0.00	128.87	2,292.47	543.75	1,541.15	1,456.74	6.62	-0.82	0.098
80.00	-21.56	-4.66	0.00	-124.2	0.00	124.16	1,720.57	439.61	1,259.08	1,107.21	6.79	-0.83	0.125
85.00	-20.82	-4.59	0.00	-100.8	0.00	100.84	1,679.48	423.29	1,167.35	1,040.33	7.68	-0.87	0.109
90.00	-15.45	-3.29	0.00	-77.9	0.00	77.90	1,636.64	406.98	1,079.09	974.39	8.62	-0.91	0.089
95.00	-14.90	-3.21	0.00	-61.4	0.00	61.45	1,592.04	390.66	994.30	909.51	9.6	-0.95	0.077
100.00	-10.28	-2.37	0.00	-45.4	0.00	45.40	1,545.69	374.34	912.98	845.81	10.62	-0.99	0.060
105.00	-9.80	-2.30	0.00	-33.5	0.00	33.53	1,497.58	358.02	835.13	783.43	11.67	-1.02	0.049
110.00	-7.21	-1.79	0.00	-22.0	0.00	22.03	1,446.53	341.70	760.75	721.90	12.75	-1.04	0.036
115.00	-6.80	-1.73	0.00	-13.1	0.00	13.10	1,377.44	325.38	689.83	654.26	13.85	-1.06	0.025
118.00	-5.34	-1.22	0.00	-7.8	0.00	7.82	1,335.99	315.59	648.95	615.27	14.52	-1.07	0.017
119.00	-2.70	-0.78	0.00	-6.6	0.00	6.60	1,322.18	312.33	635.60	602.54	14.74	-1.07	0.013
119.00	-2.70	-0.78	0.00	-6.6	0.00	6.60	936.41	234.90	479.32	429.14	14.74	-1.07	0.018
120.00	-2.65	-0.74	0.00	-5.8	0.00	5.82	929.99	232.45	469.38	421.71	14.96	-1.07	0.017
125.00	-2.40	-0.69	0.00	-2.1	0.00	2.10	896.83	220.21	421.26	385.08	16.09	-1.08	0.008
128.00	-0.08	-0.01	0.00	-0.0	0.00	0.02	876.09	212.87	393.64	363.52	16.76	-1.08	0.000
130.00	0.00	-0.01	0.00	0.0	0.00	0.00	861.91	207.97	375.75	349.34	17.21	-1.08	0.000

**EQUIVALENT LATERAL FORCES METHOD ANALYSIS**  
 (Based on ASCE7-16 Chapters 11, 12 and 15)

Spectral Response Acceleration for Short Period ( $S_S$ ):	0.189
Spectral Response Acceleration at 1.0 Second Period ( $S_1$ ):	0.055
Long-Period Transition Period ( $T_L$ – Seconds):	6
Importance Factor ( $I_a$ ):	1.000
Site Coefficient $F_a$ :	1.600
Site Coefficient $F_v$ :	2.400
Response Modification Coefficient (R):	1.500
Design Spectral Response Acceleration at Short Period ( $S_{ds}$ ):	0.202
Design Spectral Response Acceleration at 1.0 Second Period ( $S_{d1}$ ):	0.088
Seismic Response Coefficient ( $C_s$ ):	0.030
Upper Limit $C_s$ :	0.030
Lower Limit $C_s$ :	0.030
Period based on Rayleigh Method (sec):	2.370
Redundancy Factor ( $\rho$ ):	1.000
Seismic Force Distribution Exponent ( $k$ ):	1.940
Total Unfactored Dead Load:	43.740 k
Seismic Base Shear (E):	1.310 k

**1.2D + 1.0Ev + 1.0Eh Normal Seismic**

Segment	Height Above Base (ft)	Weight (lb)	$W_z$ (lb-ft)	$C_{vx}$	Horizontal Force (lb)	Vertical Force (lb)
32	129	82	992	0.004	6	101
31	126.5	148	1,727	0.008	10	183
30	122.5	256	2,810	0.013	17	317
29	119.5	53	551	0.002	3	65
28	118.5	70	723	0.003	4	87
27	116.5	237	2,361	0.011	14	294
26	112.5	407	3,796	0.017	22	505
25	107.5	460	3,926	0.018	23	570
24	102.5	476	3,704	0.017	22	590
23	97.5	533	3,770	0.017	22	661
22	92.5	553	3,532	0.016	21	686
21	87.5	727	4,168	0.019	25	902
20	82.5	743	3,800	0.017	22	921
19	79.5	255	1,217	0.006	7	317
18	77	1,045	4,681	0.021	28	1,297
17	72.5	889	3,542	0.016	21	1,103
16	67.5	913	3,167	0.014	19	1,132
15	62.5	933	2,788	0.012	16	1,157
14	57.5	952	2,423	0.011	14	1,181
13	52.5	972	2,074	0.009	12	1,206
12	47.5	993	1,745	0.008	10	1,231
11	44	403	610	0.003	4	499
10	41.5	1,088	1,472	0.007	9	1,349
9	38.5	1,103	1,292	0.006	8	1,369
8	36	465	478	0.002	3	577
7	32.5	1,180	995	0.004	6	1,464
6	27.5	1,204	735	0.003	4	1,493
5	22.5	1,228	508	0.002	3	1,523
4	17.5	1,251	318	0.001	2	1,552
3	12.5	1,275	169	0.001	1	1,582
2	7.5	1,299	64	0.000	0	1,611
1	2.5	1,323	8	0.000	0	1,640
DragonWave Horizon Compact (11.5 lbs)	128	34	413	0.002	2	43
Alcatel-Lucent RRH2x50-08	128	317	3,800	0.017	22	394

Segment	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
Alcatel-Lucent 1900 MHz 4X45 RRH	128	180	2,155	0.010	13	223
Nokia 2.5G MAA - AAHC(64T64R)	128	311	3,721	0.017	22	385
Argus LLPX310R	128	86	1,027	0.005	6	106
DragonWave A-ANT-18G-2-C	128	81	973	0.004	6	101
Generic Round T-Arm	128	938	11,223	0.050	66	1,163
Commscope NNVV-65B-R4	128	232	2,780	0.012	16	288
Andrew DB844G65ZAXY	119	72	749	0.003	4	89
Generic Round Platform with Handrails	119	2,500	25,991	0.117	153	3,101
Generic Round Platform with Handrails	100	2,500	18,561	0.083	109	3,101
Generic Round Platform with Handrails	90	2,500	15,137	0.068	89	3,101
Samsung RT4401-48A	118	56	571	0.003	3	69
Samsung B2/B66A RRH-BR049	118	253	2,590	0.012	15	314
Samsung B5/B13 RRH-BR04C	118	211	2,157	0.010	13	262
Samsung MT6407-77A	118	245	2,504	0.011	15	304
RFS DB-T1-6Z-8AB-0Z	118	88	900	0.004	5	109
Andrew LNX-6513DS-A1M (32.6lb)	118	98	1,000	0.004	6	121
Commscope NHHSS-65B-R2BT4	118	153	1,565	0.007	9	190
Commscope NHH-65B-R2B	118	131	1,341	0.006	8	163
Generic 48" x 12" Panel	110	270	2,411	0.011	14	335
Generic Round Low Profile Platform	110	1,875	16,741	0.075	99	2,326
Commscope SDX1926Q-43	100	19	138	0.001	1	23
Ericsson Radio 4449 B71 B85A	100	225	1,671	0.008	10	279
Ericsson RRUS 4415 B66	100	138	1,025	0.005	6	171
Ericsson RRUS 4415 B25	100	138	1,025	0.005	6	171
Ericsson Air6449 B41	100	312	2,316	0.010	14	387
Ericsson AIR32 B66Aa/B2a	100	397	2,945	0.013	17	492
RFS APXVAALL24 43-U-NA20	100	368	2,735	0.012	16	457
Raycap DC6-48-60-18-8F	90	40	242	0.001	1	50
Raycap DC6-48-60-0-8F	90	66	397	0.002	2	81
Ericsson RRUS 4478 B14	90	178	1,079	0.005	6	221
Ericsson RRUS 32 B2	90	159	963	0.004	6	197
Ericsson RRUS 32 B66	90	159	963	0.004	6	197
Ericsson RRUS E2 B29	90	180	1,090	0.005	6	223
Ericsson RRUS-32 (77 lbs)	90	231	1,399	0.006	8	287
Ericsson RRUS-11	90	330	1,998	0.009	12	409
CCI HPA-65R-BUU-H8	90	816	4,941	0.022	29	1,012
Commscope RDIDC-9181-PF-48	79	22	103	0.000	1	27
Fujitsu TA08025-B605	79	225	1,059	0.005	6	279
Fujitsu TA08025-B604	79	192	902	0.004	5	238
JMA Wireless MX08FRO665-21	79	194	910	0.004	5	240
Generic Flat Platform with Handrails	79	2,500	11,762	0.053	69	3,101
Generic 2' Std. Dish	70	14	52	0.000	0	17
Generic GPS	50	10	19	0.000	0	12
Generic Round Side Arm	50	188	364	0.002	2	233
		43,744	222,552	1.000	1,312	54,257

**0.9D - 1.0Ev + 1.0Eh Normal 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)
32	129	82	992	0.004	6	70
31	126.5	148	1,727	0.008	10	127
30	122.5	256	2,810	0.013	17	220
29	119.5	53	551	0.002	3	45
28	118.5	70	723	0.003	4	60
27	116.5	237	2,361	0.011	14	203
26	112.5	407	3,796	0.017	22	350
25	107.5	460	3,926	0.018	23	395
24	102.5	476	3,704	0.017	22	409
23	97.5	533	3,770	0.017	22	458
22	92.5	553	3,532	0.016	21	476
21	87.5	727	4,168	0.019	25	625
20	82.5	743	3,800	0.017	22	638

ASSET: 370626, East Hartford  
 CUSTOMER: DISH WIRELESS L.L.C.

CODE: ANSI/TIA-222-H  
 ENG NO: 13726411\_C3\_03

Segment	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
19	79.5	255	1,217	0.006	7	220
18	77	1,045	4,681	0.021	28	899
17	72.5	889	3,542	0.016	21	764
16	67.5	913	3,167	0.014	19	785
15	62.5	933	2,788	0.012	16	802
14	57.5	952	2,423	0.011	14	819
13	52.5	972	2,074	0.009	12	836
12	47.5	993	1,745	0.008	10	853
11	44	403	610	0.003	4	346
10	41.5	1,088	1,472	0.007	9	935
9	38.5	1,103	1,292	0.006	8	949
8	36	465	478	0.002	3	400
7	32.5	1,180	995	0.004	6	1,015
6	27.5	1,204	735	0.003	4	1,035
5	22.5	1,228	508	0.002	3	1,055
4	17.5	1,251	318	0.001	2	1,076
3	12.5	1,275	169	0.001	1	1,096
2	7.5	1,299	64	0.000	0	1,117
1	2.5	1,323	8	0.000	0	1,137
DragonWave Horizon Compact (11.5 lbs)	128	34	413	0.002	2	30
Alcatel-Lucent RRH2x50-08	128	317	3,800	0.017	22	273
Alcatel-Lucent 1900 MHz 4X45 RRH	128	180	2,155	0.010	13	155
Nokia 2.5G MAA - AAHC(64T64R)	128	311	3,721	0.017	22	267
Argus LLPX310R	128	86	1,027	0.005	6	74
DragonWave A-ANT-18G-2-C	128	81	973	0.004	6	70
Generic Round T-Arm	128	938	11,223	0.050	66	806
Commscope NNVV-65B-R4	128	232	2,780	0.012	16	200
Andrew DB844G65ZAXY	119	72	749	0.003	4	62
Generic Round Platform with Handrails	119	2,500	25,991	0.117	153	2,149
Generic Round Platform with Handrails	100	2,500	18,561	0.083	109	2,149
Generic Round Platform with Handrails	90	2,500	15,137	0.068	89	2,149
Samsung RT4401-48A	118	56	571	0.003	3	48
Samsung B2/B66A RRH-BR049	118	253	2,590	0.012	15	218
Samsung B5/B13 RRH-BR04C	118	211	2,157	0.010	13	181
Samsung MT6407-77A	118	245	2,504	0.011	15	210
RFS DB-T1-6Z-8AB-0Z	118	88	900	0.004	5	76
Andrew LNX-6513DS-A1M (32.6lb)	118	98	1,000	0.004	6	84
Commscope NHHSS-65B-R2BT4	118	153	1,565	0.007	9	132
Commscope NHH-65B-R2B	118	131	1,341	0.006	8	113
Generic 48" x 12" Panel	110	270	2,411	0.011	14	232
Generic Round Low Profile Platform	110	1,875	16,741	0.075	99	1,612
Commscope SDX1926Q-43	100	19	138	0.001	1	16
Ericsson Radio 4449 B71 B85A	100	225	1,671	0.008	10	193
Ericsson RRUS 4415 B66	100	138	1,025	0.005	6	119
Ericsson RRUS 4415 B25	100	138	1,025	0.005	6	119
Ericsson Air6449 B41	100	312	2,316	0.010	14	268
Ericsson AIR32 B66Aa/B2a	100	397	2,945	0.013	17	341
RFS APXVAALL24 43-U-NA20	100	368	2,735	0.012	16	317
Raycap DC6-48-60-18-8F	90	40	242	0.001	1	34
Raycap DC6-48-60-0-8F	90	66	397	0.002	2	56
Ericsson RRUS 4478 B14	90	178	1,079	0.005	6	153
Ericsson RRUS 32 B2	90	159	963	0.004	6	137
Ericsson RRUS 32 B66	90	159	963	0.004	6	137
Ericsson RRUS E2 B29	90	180	1,090	0.005	6	155
Ericsson RRUS-32 (77 lbs)	90	231	1,399	0.006	8	199
Ericsson RRUS-11	90	330	1,998	0.009	12	284
CCI HPA-65R-BUU-H8	90	816	4,941	0.022	29	701
Commscope RDIDC-9181-PF-48	79	22	103	0.000	1	19
Fujitsu TA08025-B605	79	225	1,059	0.005	6	193
Fujitsu TA08025-B604	79	192	902	0.004	5	165
JMA Wireless MX08FRO665-21	79	194	910	0.004	5	166
Generic Flat Platform with Handrails	79	2,500	11,762	0.053	69	2,149
Generic 2' Std. Dish	70	14	52	0.000	0	12
Generic GPS	50	10	19	0.000	0	9
Generic Round Side Arm	50	188	364	0.002	2	161
		43,744	222,552	1.000	1,312	37,606

1.2D + 1.0Ev + 1.0Eh Normal Seismic



CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-52.62	-1.32	0.00	-138.09	0.00	138.09	3,957.37	1,024.83	4,562	3,958.89	0.00	0.00	0.05
5.00	-51.00	-1.33	0.00	-131.50	0.00	131.50	3,898.74	1,000.35	4,346	3,806.37	0.01	-0.01	0.05
10.00	-49.42	-1.33	0.00	-124.87	0.00	124.87	3,838.36	975.87	4,136	3,655.01	0.02	-0.02	0.05
15.00	-47.87	-1.34	0.00	-118.20	0.00	118.20	3,776.22	951.40	3,931	3,504.92	0.05	-0.03	0.05
20.00	-46.35	-1.35	0.00	-111.49	0.00	111.49	3,712.33	926.92	3,732	3,356.23	0.09	-0.05	0.05
25.00	-44.85	-1.35	0.00	-104.76	0.00	104.76	3,646.67	902.44	3,537	3,209.08	0.15	-0.06	0.05
30.00	-43.39	-1.35	0.00	-98.01	0.00	98.01	3,579.26	877.96	3,348	3,063.58	0.21	-0.07	0.04
35.00	-42.81	-1.36	0.00	-91.24	0.00	91.24	3,510.10	853.48	3,164	2,919.87	0.29	-0.08	0.04
37.00	-41.44	-1.35	0.00	-88.53	0.00	88.53	3,481.94	843.69	3,092	2,862.92	0.33	-0.09	0.04
40.00	-40.09	-1.34	0.00	-84.48	0.00	84.48	3,439.17	829.00	2,985	2,778.07	0.38	-0.09	0.04
43.00	-39.59	-1.34	0.00	-80.45	0.00	80.45	2,697.55	690.63	2,486	2,181.76	0.45	-0.10	0.05
45.00	-38.36	-1.34	0.00	-77.76	0.00	77.76	2,677.43	682.47	2,428	2,139.70	0.49	-0.11	0.05
50.00	-36.91	-1.33	0.00	-71.07	0.00	71.07	2,625.91	662.07	2,285	2,035.31	0.61	-0.12	0.05
55.00	-35.73	-1.32	0.00	-64.42	0.00	64.42	2,572.64	641.67	2,146	1,932.08	0.74	-0.13	0.05
60.00	-34.57	-1.31	0.00	-57.81	0.00	57.81	2,517.61	621.27	2,012	1,830.13	0.89	-0.15	0.05
65.00	-33.44	-1.30	0.00	-51.25	0.00	51.25	2,460.82	600.87	1,882	1,729.60	1.05	-0.16	0.04
70.00	-32.32	-1.28	0.00	-44.77	0.00	44.77	2,402.27	580.47	1,756	1,630.62	1.23	-0.18	0.04
75.00	-31.02	-1.25	0.00	-38.36	0.00	38.36	2,341.97	560.07	1,635	1,533.30	1.42	-0.19	0.04
79.00	-26.82	-1.15	0.00	-33.35	0.00	33.35	2,292.47	543.75	1,541	1,456.74	1.58	-0.20	0.04
80.00	-25.90	-1.13	0.00	-32.20	0.00	32.20	1,720.57	439.61	1,259	1,107.21	1.63	-0.20	0.04
85.00	-25.00	-1.10	0.00	-26.56	0.00	26.56	1,679.48	423.29	1,167	1,040.33	1.84	-0.21	0.04
90.00	-18.54	-0.90	0.00	-21.04	0.00	21.04	1,636.64	406.98	1,079	974.39	2.07	-0.22	0.03
95.00	-17.87	-0.87	0.00	-16.56	0.00	16.56	1,592.04	390.66	994	909.51	2.31	-0.24	0.03
100.00	-12.20	-0.65	0.00	-12.19	0.00	12.19	1,545.69	374.34	913	845.81	2.56	-0.24	0.02
105.00	-11.63	-0.63	0.00	-8.93	0.00	8.93	1,497.58	358.02	835	783.43	2.82	-0.25	0.02
110.00	-8.47	-0.48	0.00	-5.80	0.00	5.80	1,446.53	341.70	761	721.90	3.09	-0.26	0.01
115.00	-8.18	-0.46	0.00	-3.41	0.00	3.41	1,377.44	325.38	690	654.26	3.37	-0.26	0.01
118.00	-6.56	-0.38	0.00	-2.02	0.00	2.02	1,335.99	315.59	649	615.27	3.53	-0.26	0.01
119.00	-3.30	-0.20	0.00	-1.64	0.00	1.64	1,322.18	312.33	636	602.54	3.59	-0.27	0.01
119.00	-3.30	-0.20	0.00	-1.64	0.00	1.64	936.41	234.90	479	429.14	3.59	-0.27	0.01
120.00	-2.99	-0.18	0.00	-1.44	0.00	1.44	929.99	232.45	469	421.71	3.64	-0.27	0.01
125.00	-2.80	-0.17	0.00	-0.52	0.00	0.52	896.83	220.21	421	385.08	3.92	-0.27	0.00
128.00	0.00	0.00	0.00	0.00	0.00	0.00	876.09	212.87	394	363.52	4.09	-0.27	0.00
130.00	0.00	0.00	0.00	0.00	0.00	0.00	861.91	207.97	376	349.34	4.20	-0.27	0.00

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

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-36.47	-1.31	0.00	-135.52	0.00	135.52	3,957.37	1,024.83	4,562	3,958.89	0.00	0.00	0.04
5.00	-35.35	-1.32	0.00	-128.95	0.00	128.95	3,898.74	1,000.35	4,346	3,806.37	0.01	-0.01	0.04
10.00	-34.26	-1.33	0.00	-122.35	0.00	122.35	3,838.36	975.87	4,136	3,655.01	0.02	-0.02	0.04
15.00	-33.18	-1.33	0.00	-115.72	0.00	115.72	3,776.22	951.40	3,931	3,504.92	0.05	-0.03	0.04
20.00	-32.12	-1.33	0.00	-109.07	0.00	109.07	3,712.33	926.92	3,732	3,356.23	0.09	-0.04	0.04
25.00	-31.09	-1.33	0.00	-102.40	0.00	102.40	3,646.67	902.44	3,537	3,209.08	0.14	-0.06	0.04
30.00	-30.07	-1.33	0.00	-95.73	0.00	95.73	3,579.26	877.96	3,348	3,063.58	0.21	-0.07	0.04
35.00	-29.67	-1.33	0.00	-89.07	0.00	89.07	3,510.10	853.48	3,164	2,919.87	0.29	-0.08	0.04
37.00	-28.72	-1.33	0.00	-86.40	0.00	86.40	3,481.94	843.69	3,092	2,862.92	0.32	-0.08	0.04
40.00	-27.79	-1.32	0.00	-82.41	0.00	82.41	3,439.17	829.00	2,985	2,778.07	0.38	-0.09	0.04
43.00	-27.44	-1.32	0.00	-78.45	0.00	78.45	2,697.55	690.63	2,486	2,181.76	0.44	-0.10	0.05
45.00	-26.59	-1.31	0.00	-75.81	0.00	75.81	2,677.43	682.47	2,428	2,139.70	0.48	-0.10	0.05
50.00	-25.58	-1.30	0.00	-69.24	0.00	69.24	2,625.91	662.07	2,285	2,035.31	0.59	-0.12	0.04
55.00	-24.76	-1.29	0.00	-62.73	0.00	62.73	2,572.64	641.67	2,146	1,932.08	0.73	-0.13	0.04
60.00	-23.96	-1.28	0.00	-56.26	0.00	56.26	2,517.61	621.27	2,012	1,830.13	0.87	-0.15	0.04
65.00	-23.18	-1.26	0.00	-49.86	0.00	49.86	2,460.82	600.87	1,882	1,729.60	1.03	-0.16	0.04
70.00	-22.40	-1.25	0.00	-43.54	0.00	43.54	2,402.27	580.47	1,756	1,630.62	1.20	-0.17	0.04
75.00	-21.50	-1.22	0.00	-37.31	0.00	37.31	2,341.97	560.07	1,635	1,533.30	1.39	-0.18	0.03
79.00	-18.59	-1.12	0.00	-32.43	0.00	32.43	2,292.47	543.75	1,541	1,456.74	1.55	-0.19	0.03
80.00	-17.95	-1.10	0.00	-31.31	0.00	31.31	1,720.57	439.61	1,259	1,107.21	1.59	-0.20	0.04
85.00	-17.33	-1.07	0.00	-25.83	0.00	25.83	1,679.48	423.29	1,167	1,040.33	1.80	-0.21	0.04
90.00	-12.85	-0.87	0.00	-20.47	0.00	20.47	1,636.64	406.98	1,079	974.39	2.02	-0.22	0.03
95.00	-12.39	-0.85	0.00	-16.11	0.00	16.11	1,592.04	390.66	994	909.51	2.26	-0.23	0.03
100.00	-8.46	-0.63	0.00	-11.86	0.00	11.86	1,545.69	374.34	913	845.81	2.50	-0.24	0.02

ASSET: 370626, East Hartford  
 CUSTOMER: DISH WIRELESS L.L.C.

CODE: ANSI/TIA-222-H  
 ENG NO: 13726411\_C3\_03

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
105.00	-8.06	-0.61	0.00	-8.69	0.00	8.69	1,497.58	358.02	835	783.43	2.76	-0.25	0.02
110.00	-5.87	-0.47	0.00	-5.64	0.00	5.64	1,446.53	341.70	761	721.90	3.02	-0.25	0.01
115.00	-5.67	-0.45	0.00	-3.32	0.00	3.32	1,377.44	325.38	690	654.26	3.29	-0.26	0.01
118.00	-4.54	-0.37	0.00	-1.96	0.00	1.96	1,335.99	315.59	649	615.27	3.45	-0.26	0.01
119.00	-2.29	-0.20	0.00	-1.60	0.00	1.60	1,322.18	312.33	636	602.54	3.50	-0.26	0.00
119.00	-2.29	-0.20	0.00	-1.60	0.00	1.60	936.41	234.90	479	429.14	3.50	-0.26	0.01
120.00	-2.07	-0.18	0.00	-1.40	0.00	1.40	929.99	232.45	469	421.71	3.56	-0.26	0.01
125.00	-1.94	-0.17	0.00	-0.50	0.00	0.50	896.83	220.21	421	385.08	3.83	-0.26	0.00
128.00	0.00	0.00	0.00	0.00	0.00	0.00	876.09	212.87	394	363.52	3.99	-0.26	0.00
130.00	0.00	0.00	0.00	0.00	0.00	0.00	861.91	207.97	376	349.34	4.10	-0.26	0.00

ASSET: 370626, East Hartford  
 CUSTOMER: DISH WIRELESS L.L.C.

CODE: ANSI/TIA-222-H  
 ENG NO: 13726411\_C3\_03

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 Normal	27.67	0.00	52.44	0.00	0.00	2599.74	43.00	0.68
0.9D + 1.0W Normal	27.65	0.00	39.32	0.00	0.00	2563.04	43.00	0.66
1.2D + 1.0Di + 1.0Wi Normal	7.58	0.00	83.35	0.00	0.00	737.78	43.00	0.22
1.2D + 1.0Ev + 1.0Eh Normal	1.36	0.00	52.62	0.00	0.00	138.09	43.00	0.05
0.9D - 1.0Ev + 1.0Eh Normal	1.33	0.00	36.47	0.00	0.00	135.52	43.00	0.05
1.0D + 1.0W Service Normal	6.40	0.00	43.74	0.00	0.00	596.26	43.00	0.16

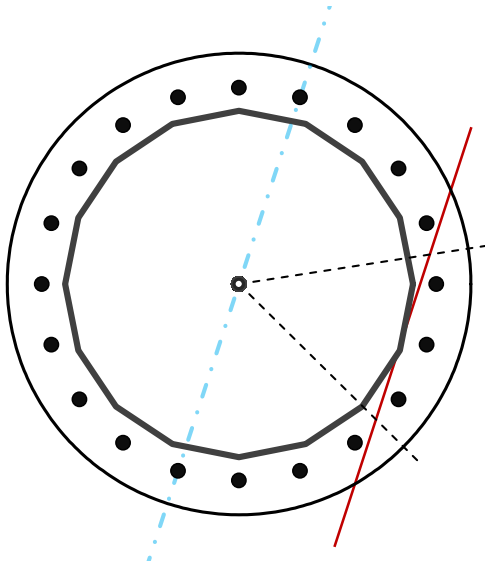
## Base Plate & Anchor Rod Analysis

Pole Dimensions		
Number of Sides	16	-
Diameter	49.19	in
Thickness	3/8	in
Orientation Offset	0	°

Base Reactions		
Moment, Mu	2,599.7	k-ft
Axial, Pu	52.4	k
Shear, Vu	27.7	k
Neutral Axis	252	°

Report Capacities		
Component	Capacity	Result
Base Plate	25%	Pass
Anchor Rods	57%	Pass
Dwyidag	-	-

Base Plate		
Shape	Round	-
Diameter, $\phi$	67	in
Thickness	2 1/2	in
Grade	A572-55	
Yield Strength, Fy	55	ksi
Tensile Strength, Fu	70	ksi
Clip	N/A	in
Orientation Offset	0	°
Anchor Rod Detail	d	$\eta=0.5$
Clear Distance	4	in
Applied Moment, Mu	564.5	k
Bending Stress, $\phi Mn$	2236.3	k



Original Anchor Rods		
Arrangement	Radial	-
Quantity	20	-
Diameter, $\phi$	2 1/2	in
Bolt Circle	57	in
Grade	Other	
Yield Strength, Fy	55	ksi
Tensile Strength, Fu	70	ksi
Spacing	9.0	in
Orientation Offset	0	°
Applied Force, Pu	117.3	k
Anchor Rods, $\phi Pn$	209.9	k

# Calculations for Monopole Base Plate & Anchor Rod Analysis

## Reaction Distribution

Reaction	Shear Vu	Moment Mu	Factor
-	k	k-ft	-
Base Forces	27.7	2599.7	1.00
Anchor Rod Forces	27.7	2599.7	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	57.1400	3.5713	0.1680		17022.58
Bolt	4.9087	3.9988	1.2725	4	29583.19
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	67	in
Thickness, t	2.5	in
Yield Strength, Fy	55	ksi
Tensile Strength, Fu	70	ksi
Base Plate Chord	45.490	in
Detail Type	d	-
Detail Factor	0.50	-
Clear Distance	4	-

Anchor Rods		
Anchor Rod Quantity, N	20	-
Rod Diameter, d	2.5	in
Bolt Circle, BC	57	in
Yield Strength, Fy	55	ksi
Tensile Strength, Fu	70	ksi
Applied Axial, Pu	117.3	k
Applied Shear, Vu	0.7	k
Compressive Capacity, $\phi P_n$	209.9	k
Tensile Capacity, $\phi R_n$	0.559	OK
Interaction Capacity	0.565	OK

External Base Plate		
Chord Length AA	33.736	in
Additional AA	5.000	in
Section Modulus, Z	60.524	in <sup>3</sup>
Applied Moment, Mu	564.5	k-ft
Bending Capacity, $\phi M_n$	2996.0	k-ft
Capacity, Mu/ $\phi M_n$	0.188	OK
Chord Length AB	32.278	in
Additional AB	5.000	in
Section Modulus, Z	58.247	in <sup>3</sup>
Applied Moment, Mu	400.0	k-ft
Bending Capacity, $\phi M_n$	2883.2	k-ft
Capacity, Mu/ $\phi M_n$	0.139	OK
Bend Line Length	28.914	in
Additional Bend Line	0.000	in
Section Modulus, Z	45.178	in <sup>3</sup>
Applied Moment, Mu	564.5	k-ft
Bending Capacity, $\phi M_n$	2236.3	k-ft
Capacity, Mu/ $\phi M_n$	0.252	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>@ 119 ft</b>
	Pole Diameter	22	in
	Pole Thickness	0.1875	in
	Plate Diameter	31	in
	Plate Thickness	1	in
	Plate Fy	36	ksi
	Weld Length	0.3125	in
	f <sub>s</sub> Resistance	61.38	k-in
	Applied	9.82	k-in

Code Rev. **H**

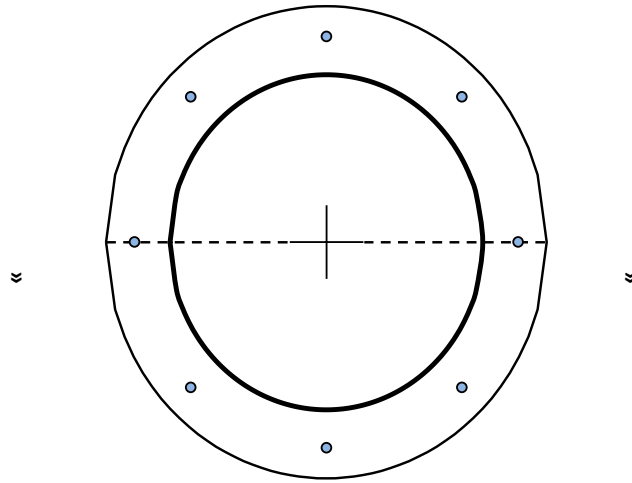
Date	9/10/2021
Engineer	SDK
Site #	370626
Carrier	DISH WIRELESS LLC

Moment	28.9 k-ft
Axial	3.0 k

Required Flange Thickness:  
0.40 in OK

Stiffeners	#	
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Bolts	#	<b>8</b>	
	Bolt Circle	27	in
	(R)adial / (S)quare	R	
	Bolt Gap	6	in
	Diameter	1	in
	Hole Diameter	1.125	in
	Type	A325	
	Fy	92	ksi
	Fu	120	ksi
f <sub>s</sub> Resistance	54.52	k	
Applied	6.05	k	



Reinforcement	#	
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**Plate Stress Ratio:**  
16% Pass

**Bolt Stress Ratio:**  
11% Pass

Extra Bolts	#	
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