Northeast Site Solutions
Denise Sabo
4 Angela's Way, Burlington CT 06013
denise@northeastsitesolutions.com

September 30, 2021

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

RE: Tower Share Application
63 Woodland Street, Glastonbury CT 06033
Latitude: 41.6608
Longitude: -72.5741
Site#: Dish Wireless - BOBDL00104A; Vertical Bridge/Eco-Site: US-CT-5018/Hopewell

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Dish Wireless LLC. Dish Wireless LLC plans to install antennas and related equipment to the tower site located at 63 Woodland Street, Glastonbury, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/19005G MHz antenna and six (6) RRUs, at the 125-foot level of the existing 150-foot monopole tower, one (1) Fiber cables will also be installed. Dish Wireless LLC equipment cabinets will be placed within 7x5 lease area. Included are plans by Infinigy, dated September 1, 2021 Exhibit C. Also included is a structural analysis prepared by Vertical Bridge Engineering, LLC, dated May 20, 2021, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. This facility was approved by the Connecticut Siting Council, Docket No. 478 on March 29, 2018. Please see attached Exhibit A.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of Dish Wireless LLC intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Town Manager Richard J. Johnson for the Town of Glastonbury, Rebecca Augur, Director of Planning & Land Use Services for the Town of Glastonbury, as well as the property owner Paul J Cavanna and Vertical Bridge REIT, LLC tower owner.

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

1. The proposed modifications will not result in an increase in the height of the existing structure. The top of the tower is 150-feet; Dish Wireless LLC proposed antennas will be located at a center line height of 125-feet.

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

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

4.The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached power density calculations, the combined site operations will result in a total density of 16.47% as evidenced by Exhibit F.

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

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

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

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of Dish Wireless LLC equipment at the 125-foot level of the existing 150-foot tower would have an insignificant visual impact on the area around the tower. Dish Wireless LLC ground equipment would be installed within the existing facility compound. Dish Wireless LLC shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by Exhibit F, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

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

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

Sincerely,

Denise Sabo

Denise Sabo
Mobile: 203-435-3640
Fax: 413-521-0558
Office: Angela's Way, Burlington CT 06013
Email: denise@northeastsitesolutions.com

Attachments
Cc: Town Manager, Richard J. Johnson
Town of Glastonbury
2nd FLoor
2155 Main Street Glastonbury CT 06073

Rebecca Augur, Director of Planning & Land Use Services
Town of Glastonbury
3rd Floor
2155 Main Street Glastonbury CT 06073

Paul J Cavanna
80 Woodland Street
S Glastonbury CT 06073

Vertical Bridge, REIT, LLC, Tower Owner
750 Park of Commerce Drive, Suite 200
Boca Raton, FL 33487

Exhibit A

Original Facility Approval

DOCKET NO. 478 - Eco-Site, Inc. and T-Mobile Northeast, LLC application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a telecommunications facility located at 63 Woodland Street, Glastonbury, Connecticut.	} } }	Connecticut Siting Council

March 29, 2018

Decision and Order

Pursuant to Connecticut General Statutes §16-50p, and the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, maintenance, and operation of a telecommunications facility, including effects on the natural environment, ecological balance, public health and safety, scenic, historic, and recreational values, agriculture, forests and parks, air and water purity, and fish, aquaculture 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 Eco-Site, Inc., hereinafter referred to as the Certificate Holder, for a telecommunications facility at 63 Woodland Street, Glastonbury, Connecticut.

Unless otherwise approved by the Council, 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 either as a monopine or monopole at a height of 150 feet above ground level (excluding faux monopine branches) to provide the proposed wireless services, sufficient to accommodate the antennas of T-Mobile Northeast, LLC, the Town of Glastonbury, and other entities, both public and private. The height of the tower may be extended after the date of this Decision and Order pursuant to regulations of the Federal Communications Commission. Prior to submission of the Development and Management Plan to the Council, the Certificate Holder shall consult with the Town of Glastonbury in regards to the Town's emergency communication equipment needs and the appropriateness of a monopine design based on those needs. The final tower design, either a monopole or monopine, shall be determined after this consultation.

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 served on the Town of Glastonbury for comment, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
    a) final site plan(s) for development of the facility that employ the governing standard in the State of Connecticut for tower design in accordance with the currently adopted International Building Code and include specifications for the tower, tower foundation, antennas, and equipment compound including, but not limited to, fencing, radio equipment, access road, utility line, and emergency backup power source;
    b) construction plans for site clearing, grading, utility installation, water drainage and stormwater control, and erosion and sedimentation controls consistent with the <u>2002 Connecticut Guidelines for Soil Erosion and Sediment Control</u>, as amended;
    c) schedule for deployment of T-Mobile Northeast LLC's, and the Town of Glastonbury's equipment; and
    d) hours of construction.

3. Prior to the commencement of operation, the Certificate Holder shall provide the Council worst-case modeling of the 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 ensure a recalculated report of the electromagnetic radio frequency power density be submitted to the Council 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 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. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed with at least one fully operational wireless telecommunications carrier providing wireless service within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), 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. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline. Authority to monitor and modify this schedule, as necessary, is delegated to the Executive Director. The Certificate Holder shall provide written notice to the Executive Director of any schedule changes as soon as is practicable.

7. Any request for extension of the time period referred to in Condition 6 shall be filed with the Council not later than 60 days prior to the expiration date of this Certificate and shall be served on all parties and intervenors, as listed in the service list, and the Town of Glastonbury.

8. If the facility ceases to provide wireless services for a period of one year, 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 within 90 days from the one year period of cessation of service. The Certificate Holder may submit a written request to the Council for an extension of the 90 day period not later than 60 days prior to the expiration of the 90 day period.

9. Any nonfunctioning antenna, and associated antenna mounting equipment, on this facility shall be removed within 60 days of the date the antenna ceased to function.

10. In accordance with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council with written notice two weeks prior to the commencement of site construction activities. In addition, the Certificate Holder shall provide the Council with written notice of the completion of site construction, and the commencement of site operation.

11. The Certificate Holder shall remit timely payments associated with annual assessments and invoices submitted by the Council for expenses attributable to the facility under Conn. Gen. Stat. §16-50v.

12. This Certificate may be transferred in accordance with Conn. Gen. Stat. §16-50k(b), provided both the Certificate Holder/transferor and the transferee are current with payments to the Council for their respective annual assessments and invoices under Conn. Gen. Stat. §16-50v. In addition, both the Certificate Holder/transferor and the transferee shall provide the Council a written agreement as to the entity responsible for any quarterly assessment charges under Conn. Gen. Stat. §16-50v(b)(2) that may be associated with this facility.

13. The Certificate Holder shall maintain the facility and associated equipment, including but not limited to, the tower, tower foundation, antennas, equipment compound, radio equipment, access road, and utility line in a reasonable physical and operational condition that is consistent with this Decision and Order and a Development and Management Plan to be approved by the Council.

14. If the Certificate Holder is a wholly-owned subsidiary of a corporation or other entity and is sold/transferred to another corporation or other entity, the Council shall be notified of such sale and/or transfer and of any change in contact information for the individual or representative responsible for management and operations of the Certificate Holder within 30 days of the sale and/or transfer.

15. This Certificate may be surrendered by the Certificate Holder upon written notification and approval by the Council.

We hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed in the Service List, dated October 26, 2017, and notice of issuance published in the Hartford Courant.

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.

Exhibit B

Property Card

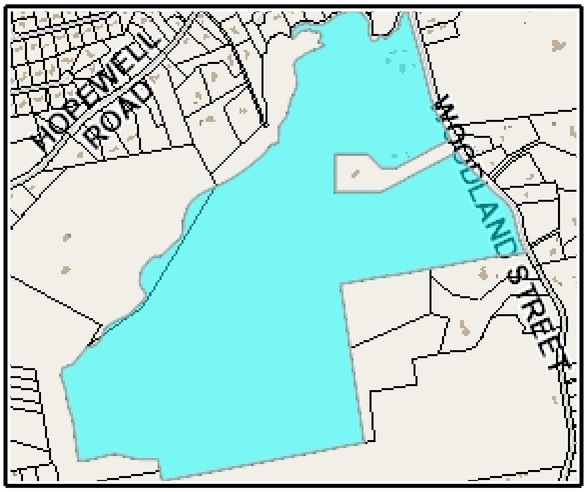
Town of Glastonbury GIS Parcel Report

Report Generated 9/28/2021 9:50:37 AM

Owner of Record

GIS ID: 78000063
Owner: CAVANNA PAUL J
Co-Owner:
Address: 80 WOODLAND ST
City, State ZIP: S GLASTONBURY, CT 06073-2715

Account Number: 78000063
Property Address: 63-65 WOODLAND ST



Property highlighted in blue

Parcel Information

Map/Street/Lot G11 / 7800 / W0002 **Property ID:** 1451
Developer Lot ID: **Water:** Well
Parcel Acreage: 177.10 **Sewer:** Septic
Zoning Code: RR **Census:** 5205.02

Valuation Summary

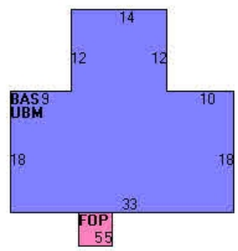
Item	Appraised Value	Assessed Value
Buildings	251100	175700
Land	3470000	694500
Appurtenances	93900	65700
Total	**3815000**	**935900**

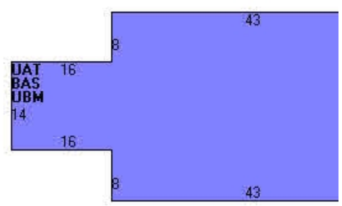
Owner of Record	Deed / Page	Sale Date	Sale Price
CAVANNA PAUL J	0973/0350	1995-11-20	0
CAVANNA GEORGE A ESTATE	0894/0253	1994-08-25	0
CAVANNA GEORGE A	0071/0372	1943-08-08	0

Building Information

Building ID 1451

Year Constructed :	1800	**Number of Rooms :**	7
Building Type :	Residential	**Number of Bedrooms :**	04
Style :	Century+	**Number of Bathrooms :**	1
Occupany :	Single Family	**Number of Half-Baths :**	0
Stories :	2	**Exterior Wall :**	Vinyl
Building Zone :	RR	**Interior Wall :**	Drywall
Roof Type :	Gable	**Interior Floor :**	Carpet
Roof Material :	Asphalt Shingl	**Interior Floor #2 :**	No entry
Est. Gross S.F. :	2614	**Air Conditioning Type :**	None
Est. Living S.F. :	1628	**Heat Type :**	Hot Water
		Fuel Type :	Oil





1C

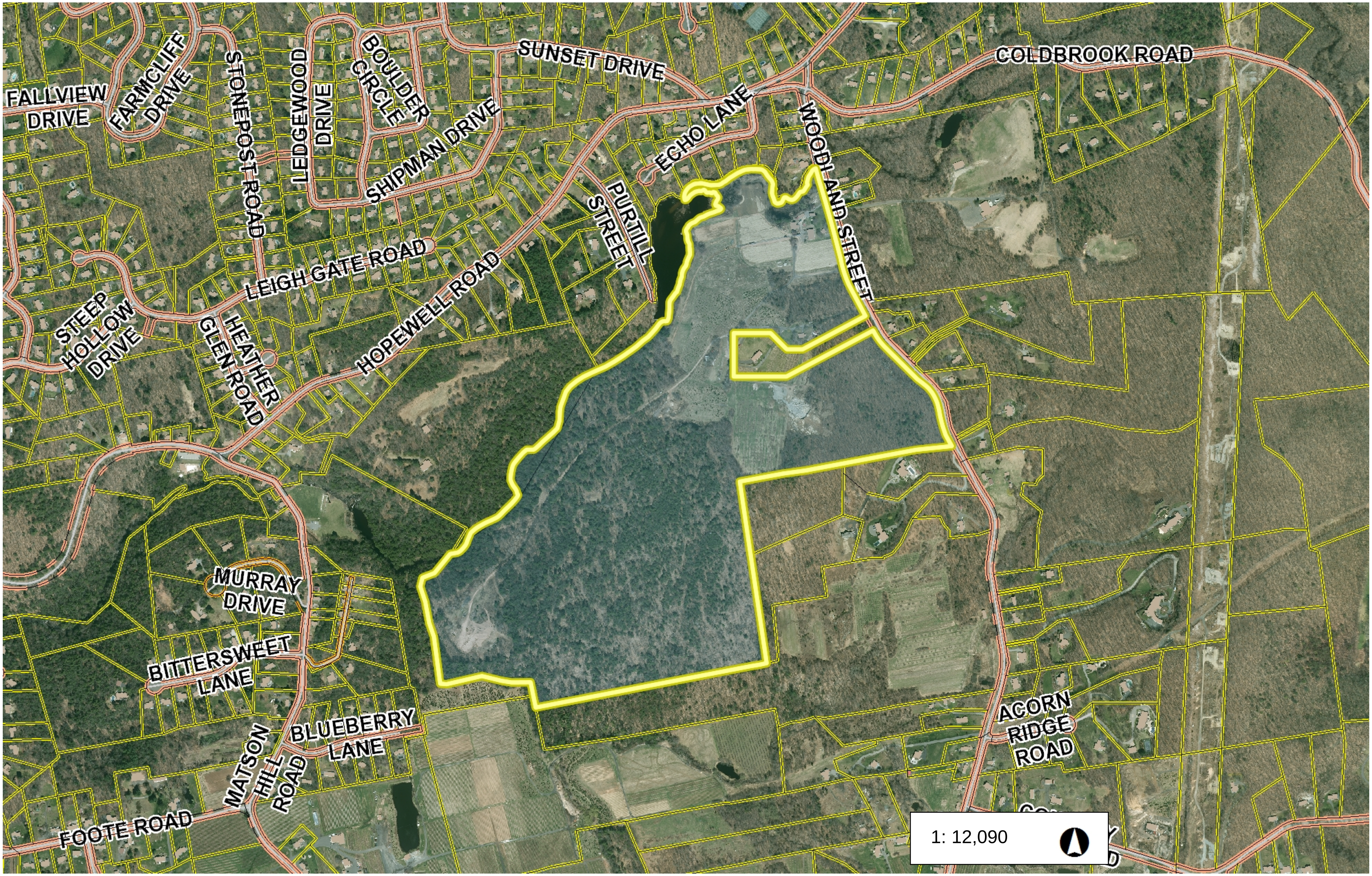
Subarea Type	Est. Gross S.F.	Est. Living S.F.
First Floor	814	814
Porch, Enclosed	32	0
Porch, Open	140	0
Upper Story, Finished	814	814
Slab	264	0
Basement	550	0
First Floor	762	762

Outbuilding Type	Est. Gross S.F.	Comments
Barn 1story	375.00	
Barn 1story	960.00	
Barn 1story	4000.00	
Barn w/Loft	1250.00	
Lean-to	864.00	
Patio-Concrete	66.00	
Shed-Wood/Comp	117.00	

Porch, Open	25	0	Shed-Wood/Comp	48.00
Basement	762	0	Shed-Wood/Comp	176.00
First Floor	1514	1514	Shed-Wood/Comp	192.00
Attic, Unfinished	1514	0	Wood Deck	192.00
Basement	1514	0		

Town of Glastonbury

Town of Glastonbury GIS



2,015 0 1,008 2,015 Feet

NAD_1983_StatePlane_Connecticut_FIPS_0600_Feet

Exhibit C

Construction Drawings

dish wireless™

DISH WIRELESS, LLC. SITE ID:

BOBDL00104A

DISH WIRELESS, LLC. SITE ADDRESS:

63 WOODLAND ST
GLASTONBURY, CT 06073

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 PLATEFROM AND H-FRAME DETAILS
A-4	EQUIPMENT DETAILS
A-5	EQUIPMENT DETAILS
A-6	EQUIPMENT DETAILS
E-1	ELECTRICAL 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

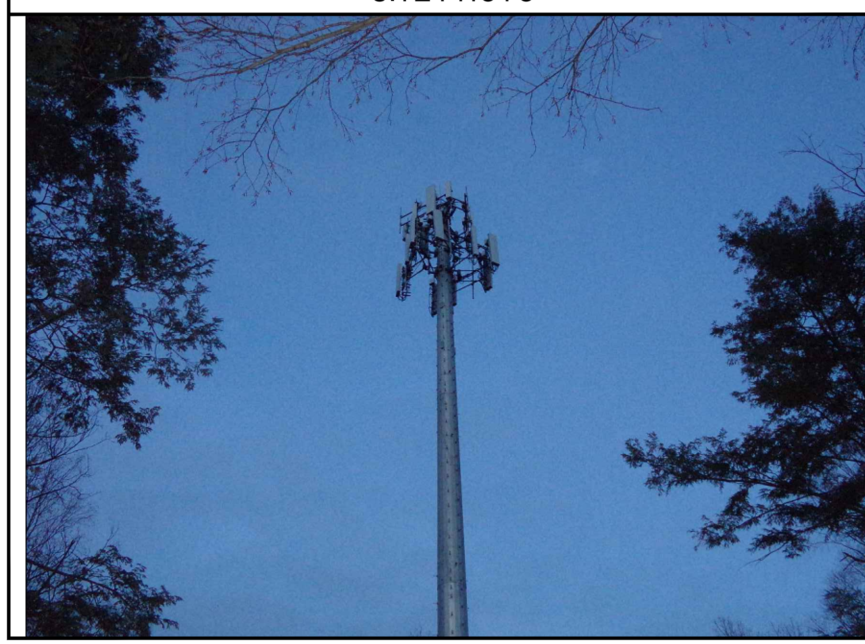
SCOPE OF WORK

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 PLATFORM
- 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

811

GENERAL NOTES

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

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

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

SITE INFORMATION

PROPERTY OWNER:	TBD
ADDRESS:	TBD
TOWER TYPE:	MONOPOLE
TOWER CO SITE ID:	BOBDL00104A
TOWER APP NUMBER:	TBD
COUNTY:	HARTFORD
LATITUDE (NAD 83):	41° 39' 38.9" N 41.6608 N
LONGITUDE (NAD 83):	-72° 34' 26.8" W -72.5741 W
ZONING JURISDICTION:	TBD
ZONING DISTRICT:	TBD
PARCEL NUMBER:	TBD
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	V-B
POWER COMPANY:	TBD
TELEPHONE COMPANY:	AT&T

PROJECT DIRECTORY

APPLICANT:	DISH WIRELESS, LLC. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	VERTICAL BRIDGE 750 PARK OF COMMERCE DR, BOCA RATON, FL 33487
SITE DESIGNER:	INFINIGY 1033 WATERVLIET SHAKER RD ALBANY, NY 12205 (518) 690-0790
SITE ACQUISITION:	APRIL PARROTT TBD
CONSTRUCTION MANAGER:	JAVIER SOTO TBD
RF ENGINEER:	TBD TBD

DIRECTIONS

DIRECTIONS FROM HARTFORD-BRAINARD AIRPORT:

DEPART AND HEAD TOWARD MAXIM RD, TURN LEFT ONTO MAXIM RD, BEAR RIGHT ONTO BRAINARD RD, TAKE THE RAMP ON THE RIGHT FOR US-5 N / CT-15 N / WILBUR CROSS HWY N, AT EXIT 90, HEAD RIGHT ON THE RAMP FOR CT-2 EAST TOWARD NORWICH, AT EXIT 7, HEAD LEFT ON THE RAMP FOR CT-17 SOUTH TOWARD PORTLAND, TURN LEFT ONTO HOPEWELL RD, ROAD NAME, CHANGES TO MATSON HILL RD, TURN RIGHT TO STAY ON MATSON HILL RD, TURN LEFT ONTO BLUEBERRY LN, ARRIVE AT, 63 WOODLAND ST. GLASTONBURY, CT 06073.

VICINITY MAP

NO SCALE

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
9/1/21
LICENSED PROFESSIONAL ENGINEER

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00104A

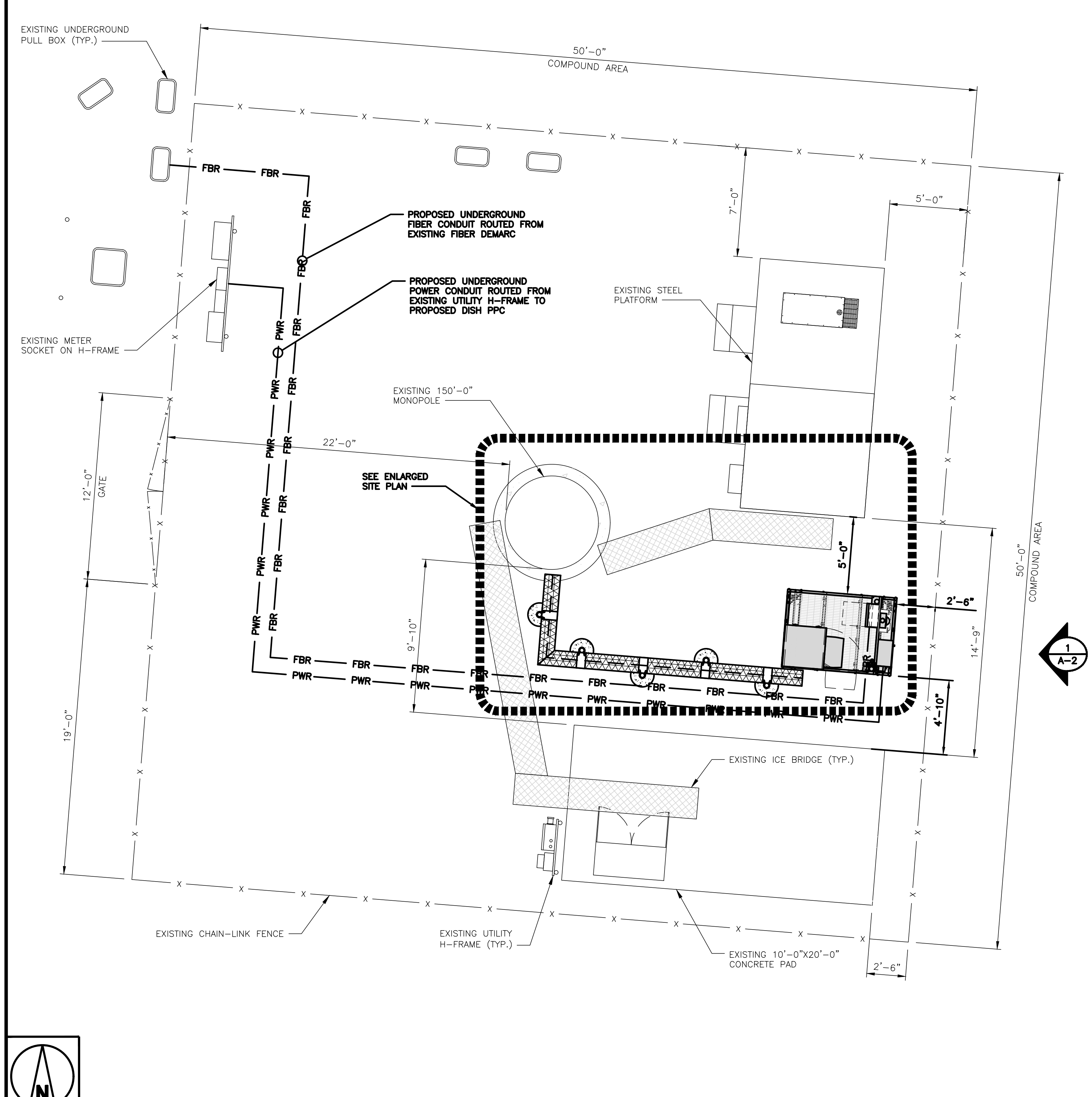
63 WOODLAND ST
GLASTONBURY, CT 06073

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

NOTES

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

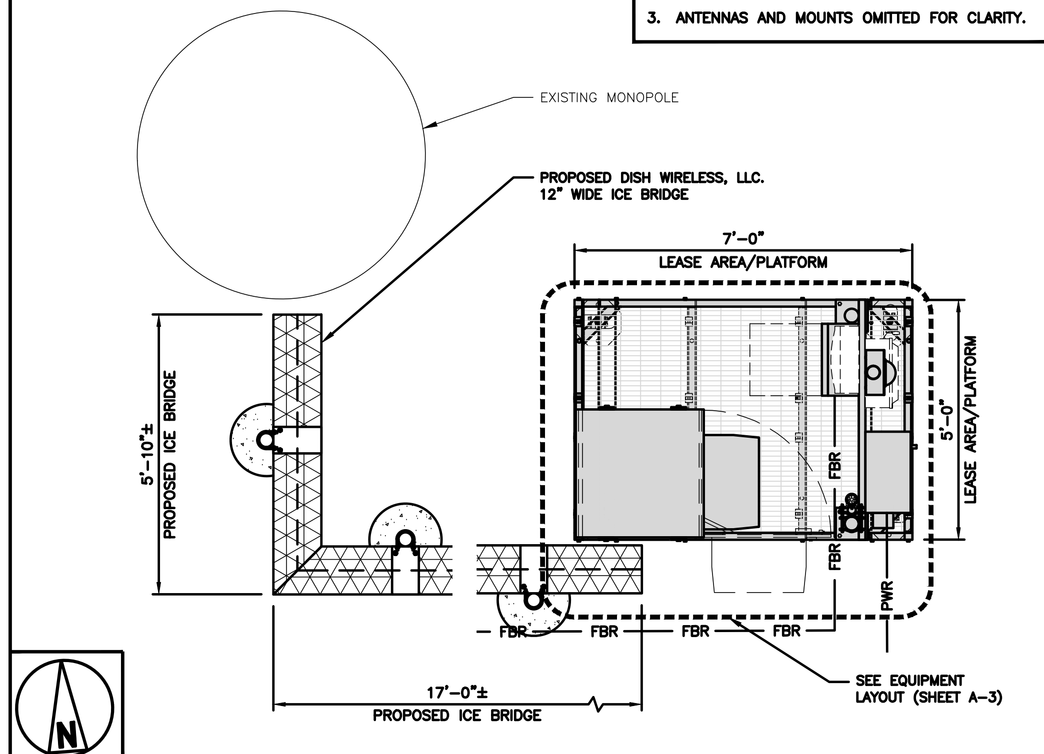


4' 2' 0 4' 8'
1/4"=1'-0"

COMPOUND PLAN 1

NOTES

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



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

ENLARGED SITE PLAN 2

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

SITE PLAN 3

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
9/1/21
LICENSED PROFESSIONAL ENGINEER

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

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00104A

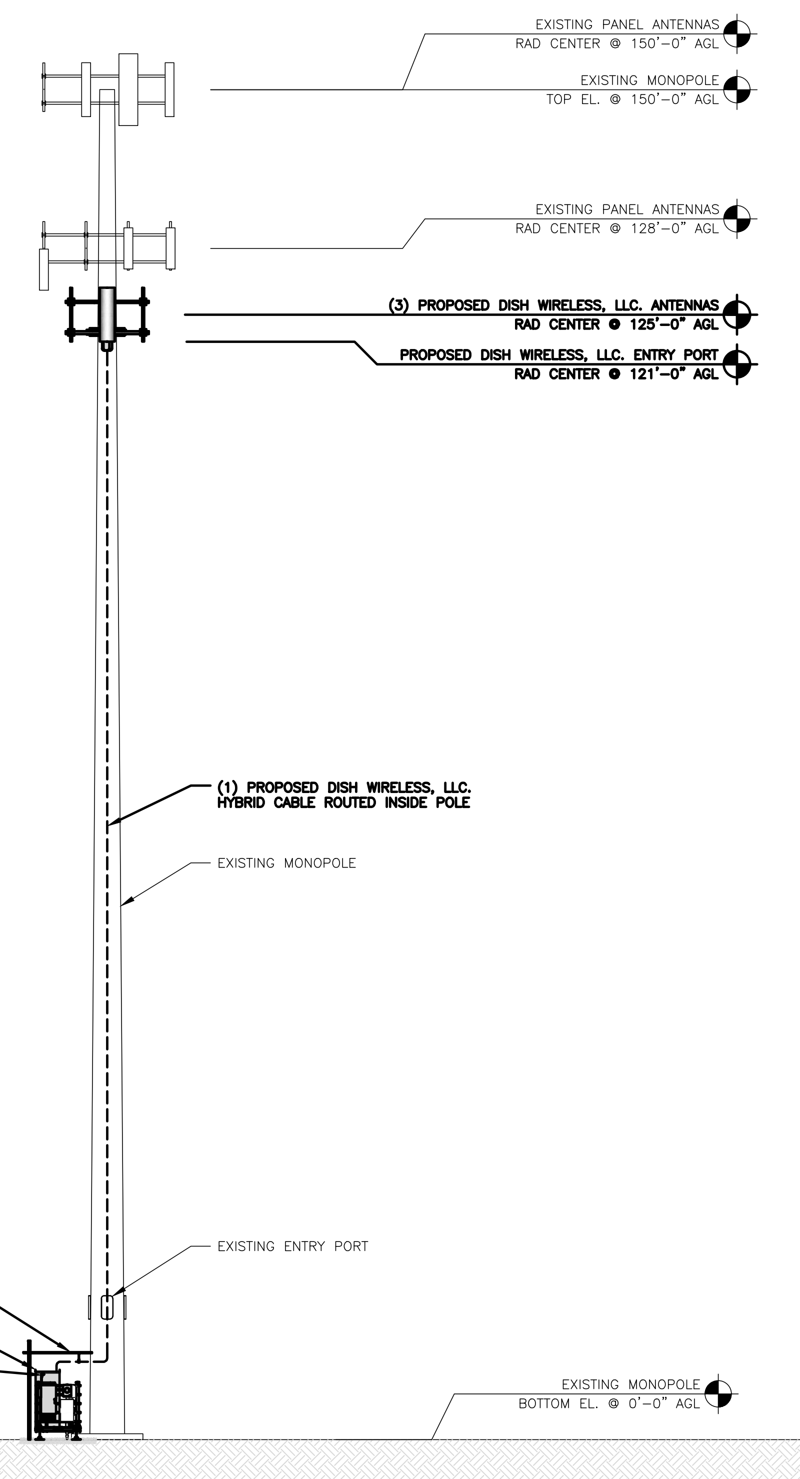
63 WOODLAND ST
GLASTONBURY, CT 06073

SHEET TITLE
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER
A-1

NOTES

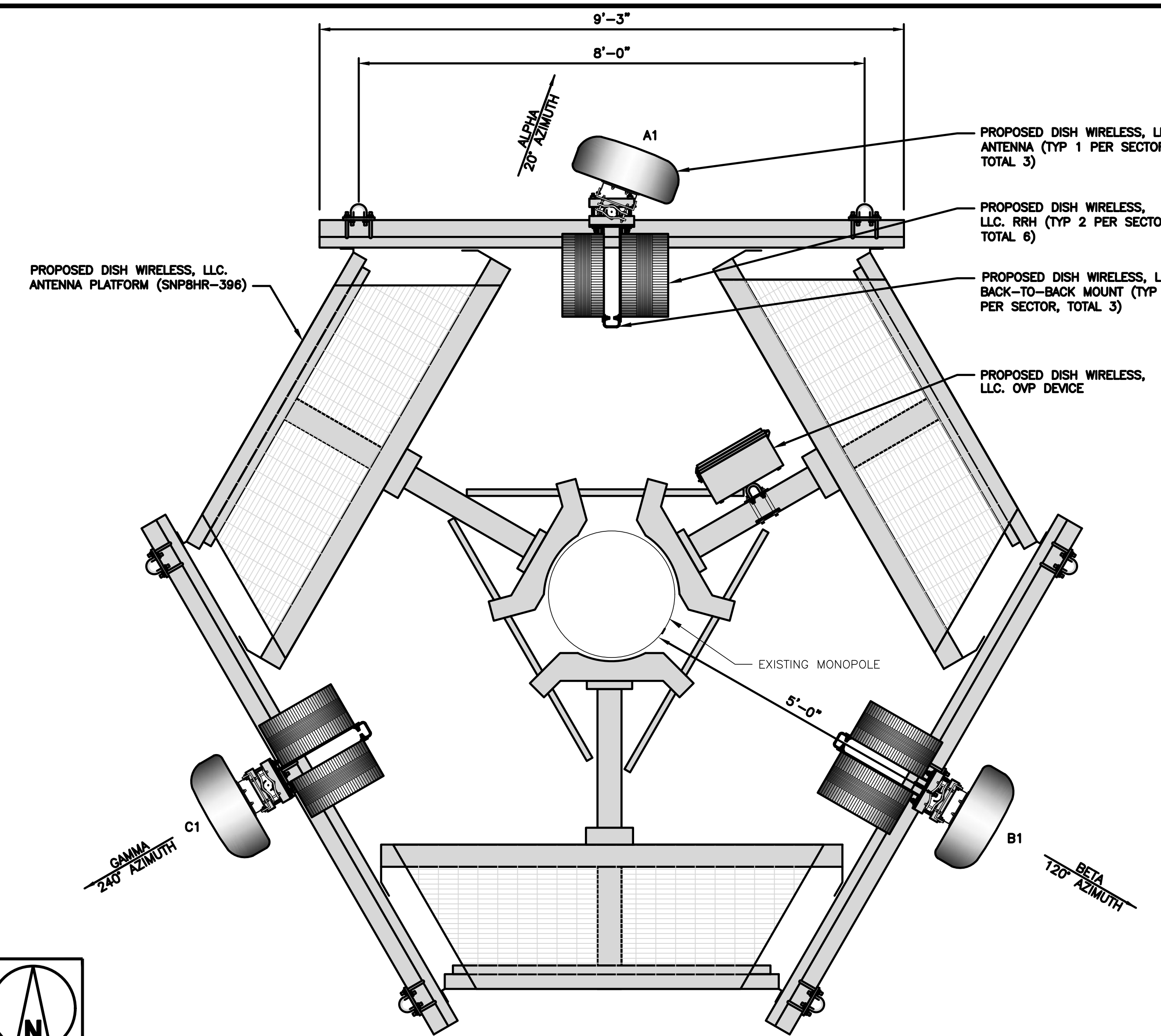
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.
4. BASED ON THE MOUNT ANALYSIS COMPLETED BY INFINIGY DATED 07/30/2021. THE EXISTING ANTENNA MOUNTS ARE CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION
5. FOR ADDITIONAL TOWER STRUCTURAL INFORMATION SEE STRUCTURAL ANALYSIS COMPLETED BY VERTICAL BRIDGE DATED: 05/20/21



PROPOSED EAST ELEVATION

12' 8' 4' 0 10' 20'
3/32"=1'–0"

1



ANTENNA LAYOUT

12" 6" 0 1' 2' 3'
3/4"=1'–0"

2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA WIRELESS – MX08FRO665–20	5G	72.0" x 20.0"	20°	125'–0"	(1) HIGH–CAPACITY HYBRID CABLE (155' LONG)
BETA	B1	PROPOSED	JMA WIRELESS – MX08FRO665–20	5G	72.0" x 20.0"	120°	125'–0"	
GAMMA	C1	PROPOSED	JMA WIRELESS – MX08FRO665–20	5G	72.0" x 20.0"	240°	125'–0"	

NOTES

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

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

NOTES

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

ANTENNA SCHEDULE

NO SCALE

3

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
9/1/21
LICENSED PROFESSIONAL ENGINEER

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

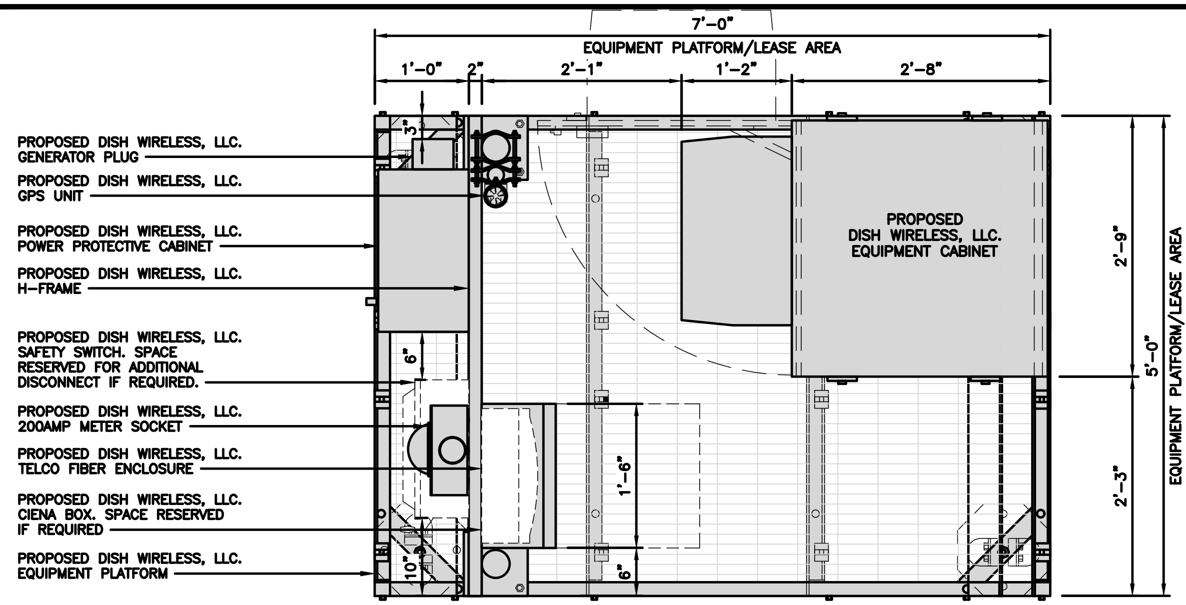
A&E PROJECT NUMBER
2039–Z5555C

DISH WIRELESS, LLC. PROJECT INFORMATION
BOBDL00104A

63 WOODLAND ST
GLASTONBURY, CT 06073

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2

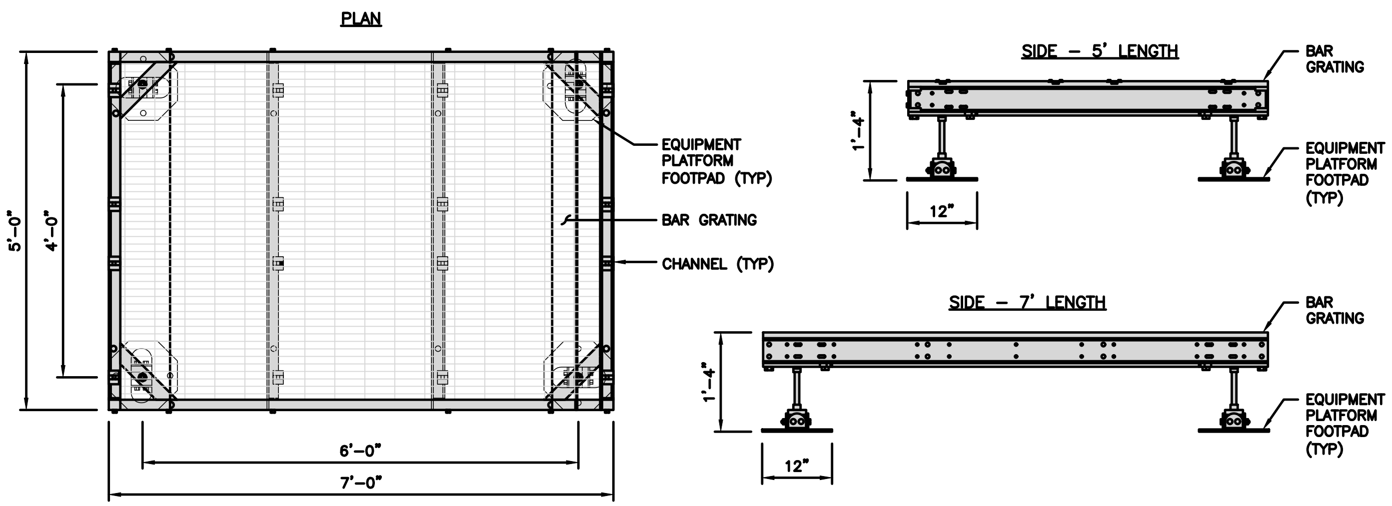


PLATFORM EQUIPMENT PLAN

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

1

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

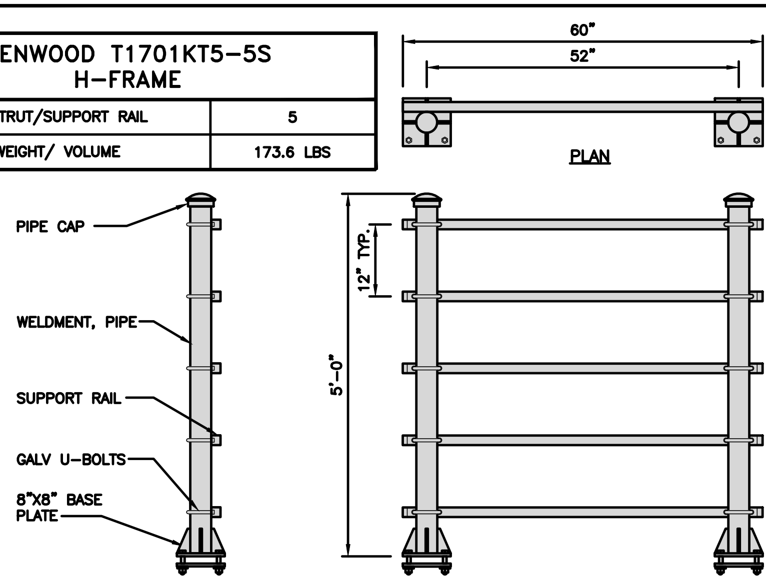


PLATFORM DETAIL

NO SCALE

2

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



H-FRAME DETAIL

NO SCALE

3

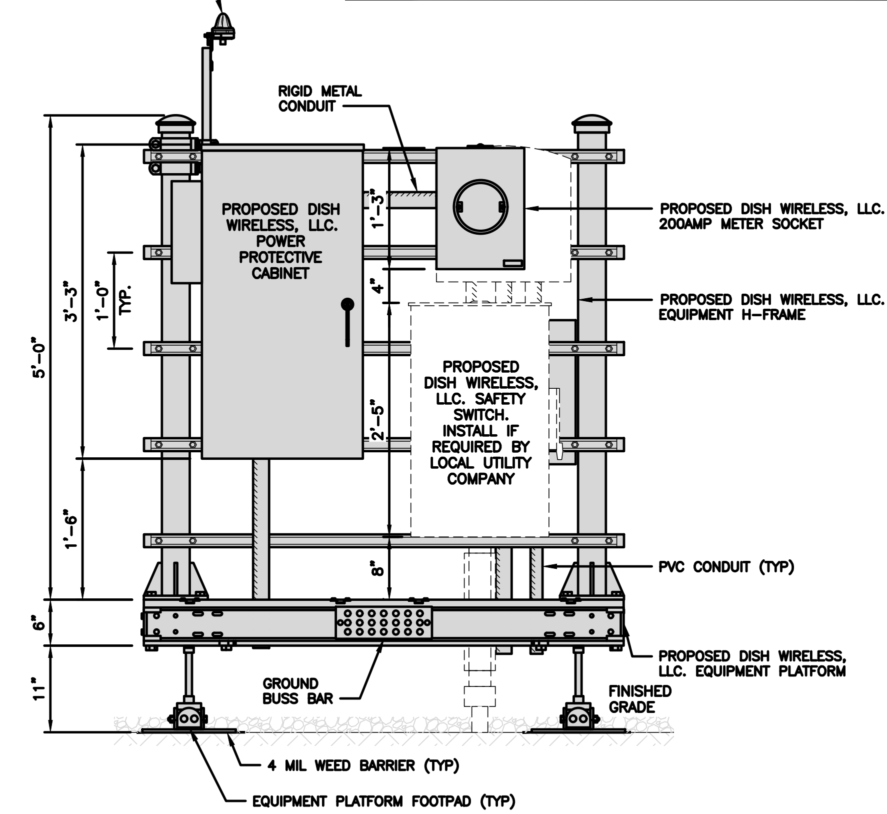
NOT USED

NO SCALE

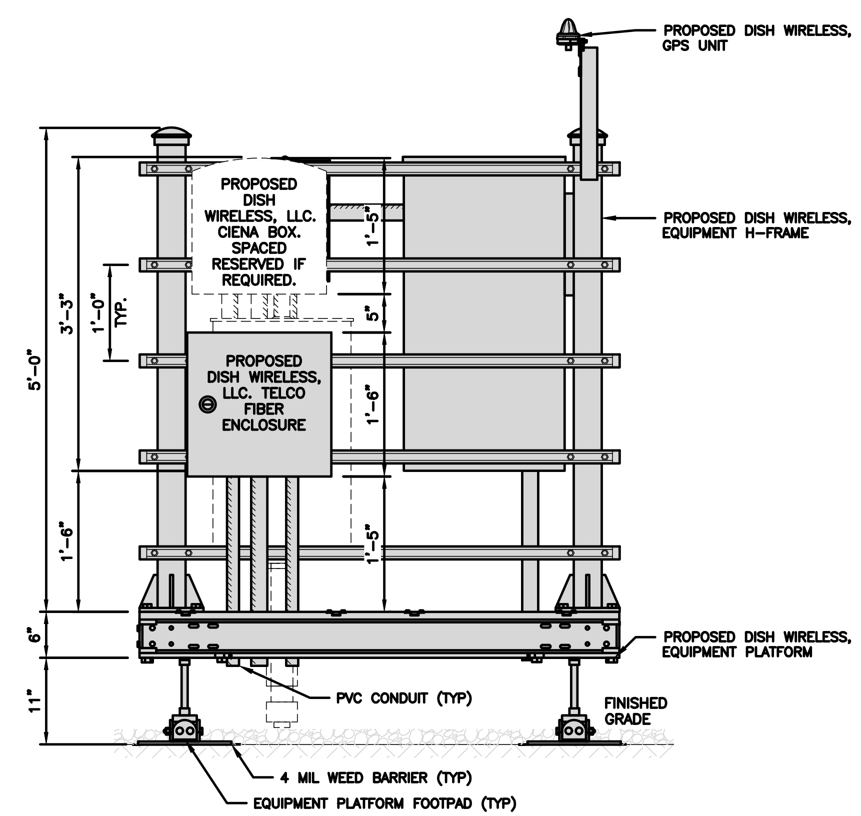
4

NOTES

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



FRONT ELEVATION



BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION

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

5

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
9/1/21
LICENSED
PROFESSIONAL ENGINEER

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
2039-Z5555C

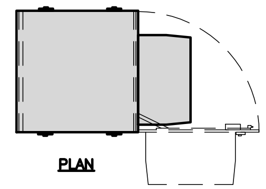
DISH WIRELESS, LLC. PROJECT INFORMATION
BOBDL00104A

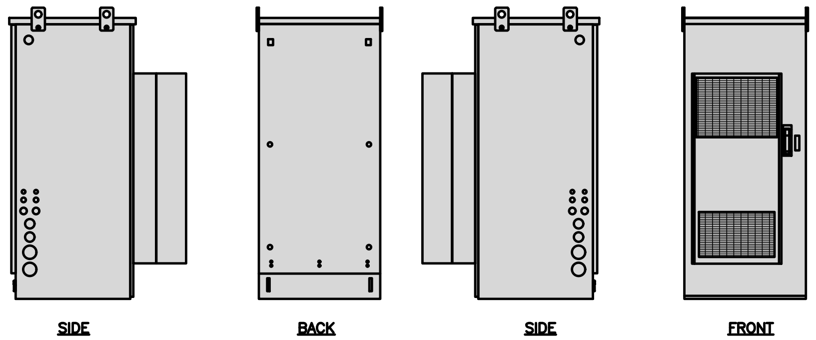
63 WOODLAND ST
GLASTONBURY, CT 06073

SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER
A-3

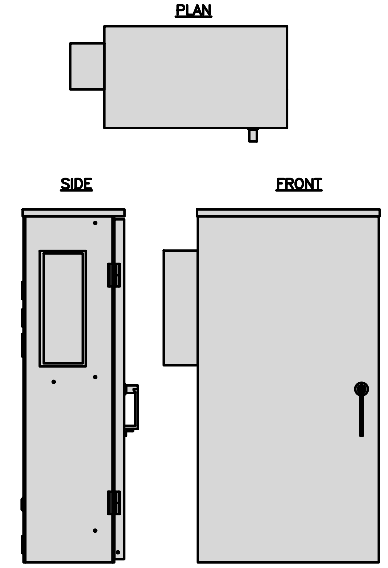
CHARLES INDUSTRY HEX CUBE–PM369155N4	
DIMENSIONS (HxWxD):	74"x32"x32"
POWER PLANT:	–48VDC ABB
TOTAL WEIGHT (EMPTY)	394 LBS





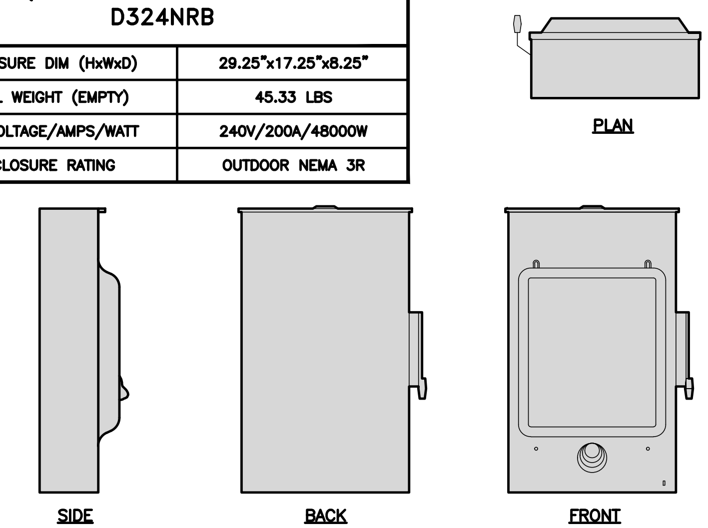
CABINET DETAIL | NO SCALE | 1

RAYCAP RDIAC–6512–P–240–MTS POWER & TELCO PROTECTION CABINET	
DIMENSIONS (HxWxD)	40"x20"x10"
WEIGHT/ VOLUME	124 LBS
MANUAL TRANSFER SWITCH	200A
LOAD CENTER	30 POSITION
MAIN BREAKER	200A, 65kA AIC
GENERATOR RECEPTACLE	CAMLOCK
NEMA RATING	3R POWDER COATED ALUMINUM
SURGE PROTECTION DEVICE	UL 1449 4TH EDITION LISTED



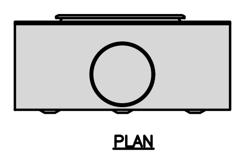
POWER PROTECTION CABINET (PPC) DETAIL | NO SCALE | 2

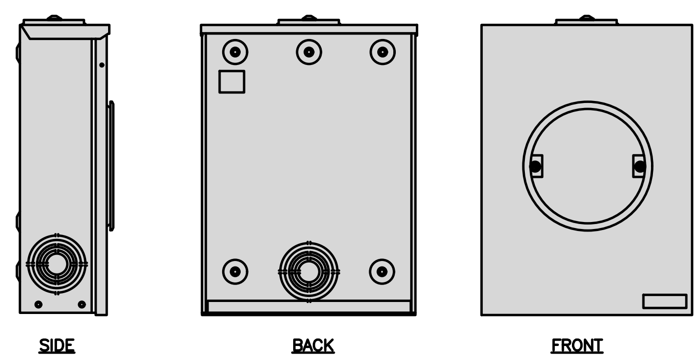
SQUARE D SAFETY SWITCH D324NRB	
ENCLOSURE DIM (HxWxD)	29.25"x17.25"x8.25"
TOTAL WEIGHT (EMPTY)	45.33 LBS
MAX VOLTAGE/AMPS/WATT	240V/200A/48000W
ENCLOSURE RATING	OUTDOOR NEMA 3R



SAFETY SWITCH | NO SCALE | 3

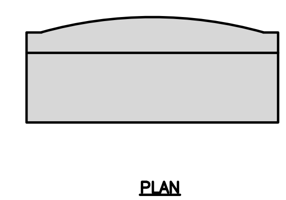
EATON METER SOCKET UNRRS213BEUSE	
METER SOCKET TYPE	RING
ENCLOSURE DIM (HxWxD)	16"x12"x6"
MAIN AMPERE RATING	200A
WEIGHT	18 LBS

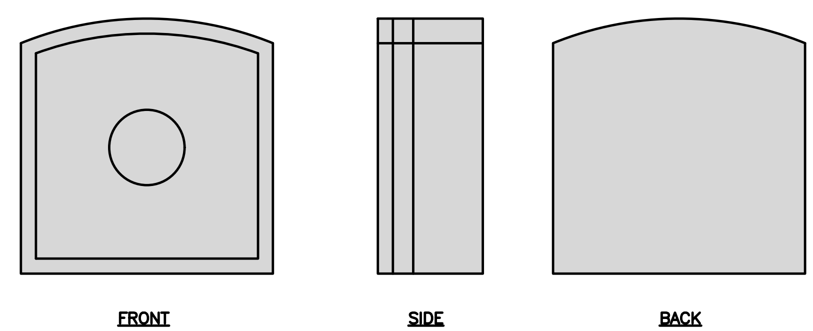




METER SOCKET DETAIL | NO SCALE | 4

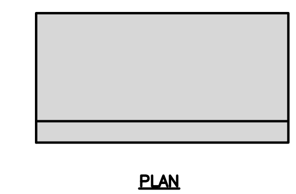
CIENA 3931 SERVICE DELIVERY SWITCH	
DIMENSIONS (HxWxD)	17.0"x16.8"x7.0" 431x427x178mm
WEIGHT	28.6 LBS/13.0 KG
POWER INPUT	60W MAX

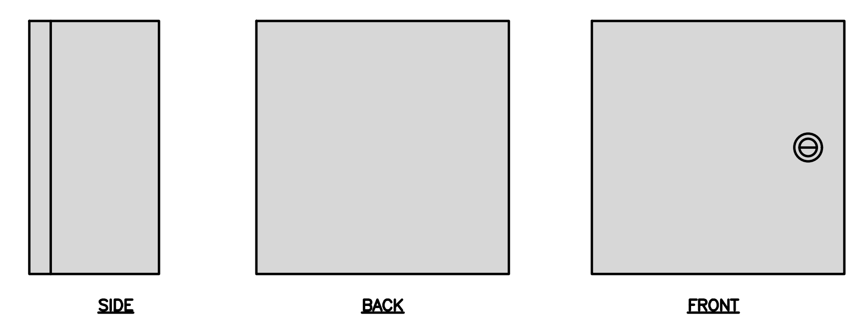




CIENA DETAIL | NO SCALE | 5

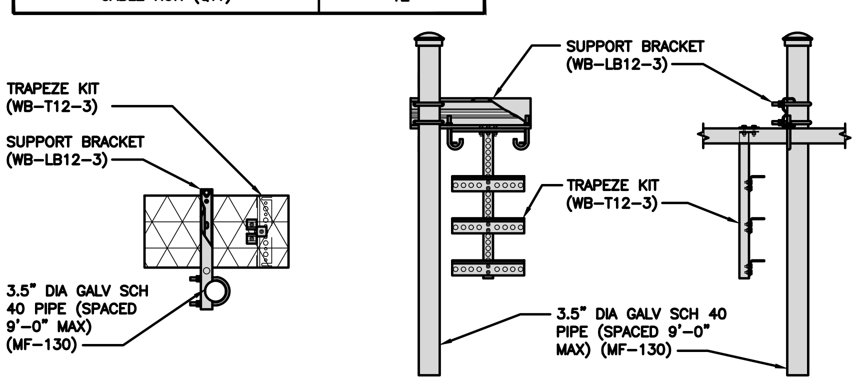
CHARLES FIBER TELCO ENCLOSURE CUBE–MP1818WB–A	
ENCLOSURE DIM (HxWxD)	18.0"x18.0"x9.25"
NEMA RATING	4X
THERMAL	SEALED
MOUNTING BACKBOARD	WOOD



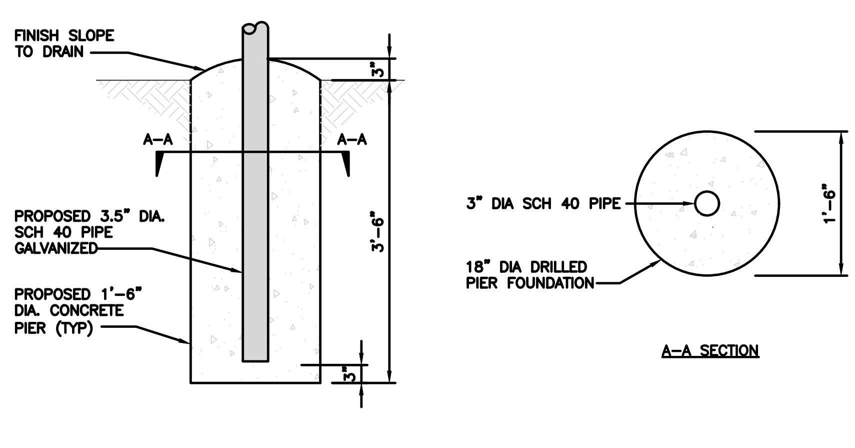


FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

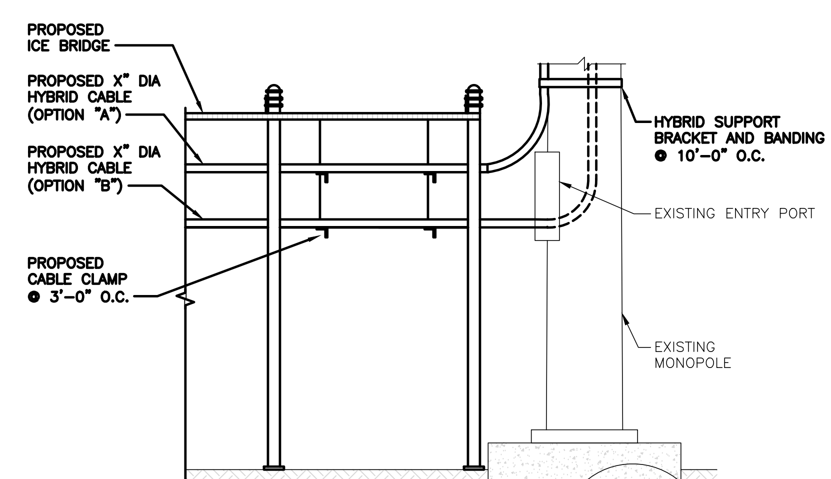
COMMSCOPE WB–K110–B WAVEGUIDE BRIDGE KIT		INCLUDED PRODUCTS:	WB–T12–3 TRAPEZE KIT, 3 RUNGS WB–LB12–3 SUPPORT BRACKET MF–130 DIRECT BURIAL PIPE COLUMN, 13'–4"
DIMENSIONS (HxL)	160"x10'		
WEIGHT/ VOLUME	325.0 LBS		
CABLE RUN (QTY)	12		



ICE BRIDGE DETAIL | NO SCALE | 7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL | NO SCALE | 8



HYBRID CABLE RUN | NO SCALE | 9

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
9/1/21
LICENSED
PROFESSIONAL ENGINEER

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

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
2039–Z5555C

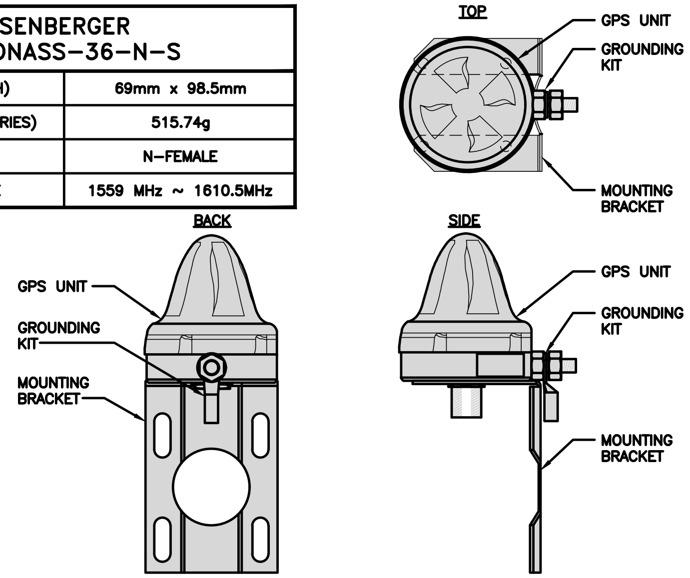
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00104A

63 WOODLAND ST
GLASTONBURY, CT 06073

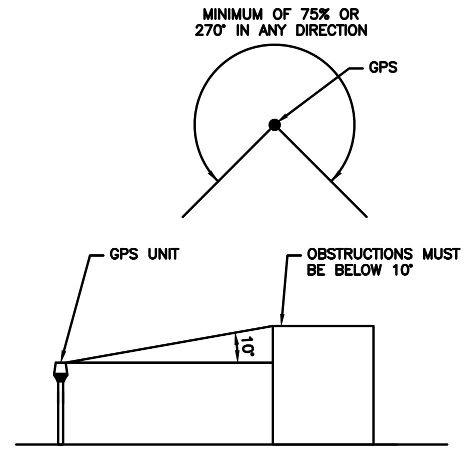
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

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



GPS ANTENNA DETAIL | NO SCALE | 1



GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 2

NOT USED | 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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
9/1/21
LICENSED
PROFESSIONAL ENGINEER

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00104A

63 WOODLAND ST
GLASTONBURY, CT 06073

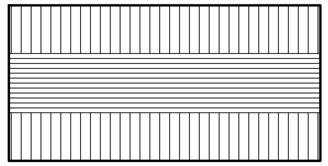
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

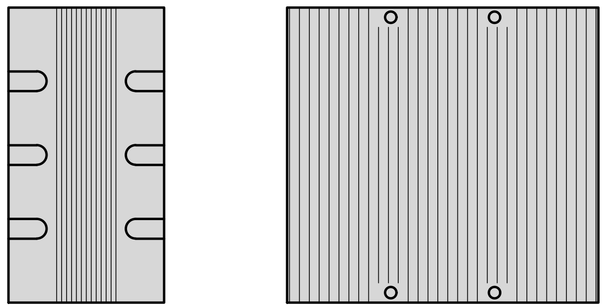
1 — REMOTE RADIO HEAD DETAIL (NO SCALE)

FUJITSU TA08025-B604 RRH

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



PLAN



SIDE FRONT

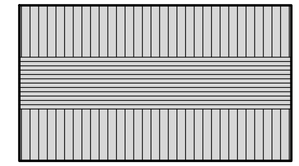
NOTES

FINAL RRH SPECIFICATIONS TO BE CONFIRMED BY GC

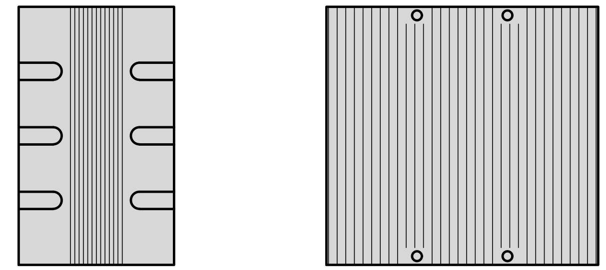
2 — REMOTE RADIO HEAD DETAIL (NO SCALE)

FUJITSU TA08025-B605 RRH

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



PLAN



SIDE FRONT

NOTES

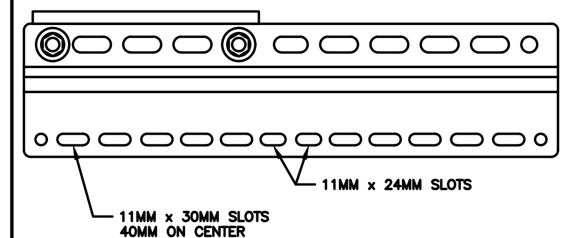
FINAL RRH SPECIFICATIONS TO BE CONFIRMED BY GC

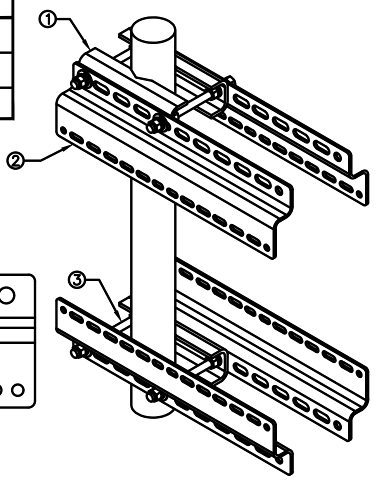
3 — REMOTE RADIO MOUNT DETAIL (NO SCALE)

SABRE INDUSTRIES RRU BRACKET MOUNT C10123155

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

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



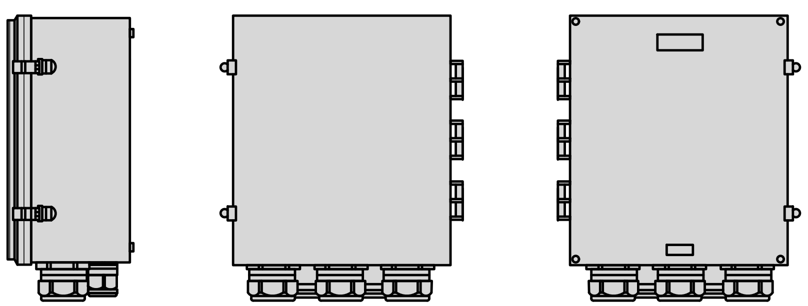


4 — SURGE SUPPRESSION DETAIL (NO SCALE)

RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION

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

PLAN



SIDE BACK FRONT

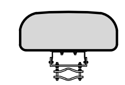
5 — ANTENNA DETAIL (NO SCALE)

JMA WIRELESS MX08FRO665-20 ANTENNA

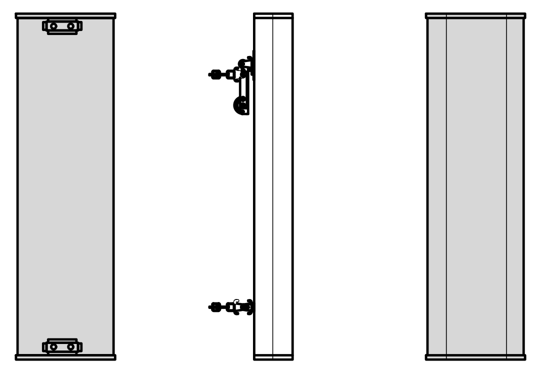
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	54 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE

NOTES

FINAL ANTENNA SPECIFICATIONS TO BE CONFIRMED BY GC



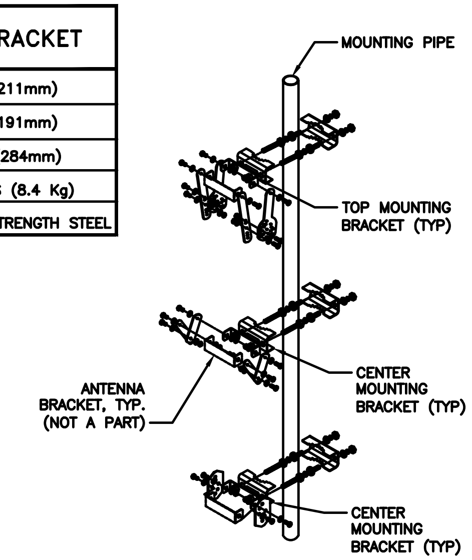
PLAN



6 — ANTENNA MOUNTING DETAIL (NO SCALE)

JMA 91900318 MOUNTING BRACKET

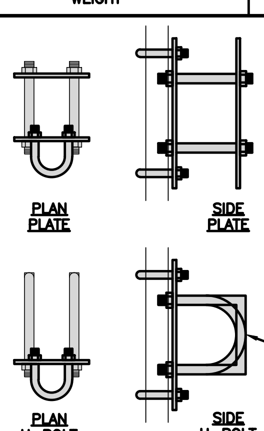
WIDTH	8.3" (211mm)
DEPTH	7.5" (191mm)
HEIGHT	11.2" (284mm)
TOTAL WEIGHT (WITH BRACKETS)	18.5 LBS (8.4 Kg)
HOUSING MATERIAL	GALV. HIGH STRENGTH STEEL

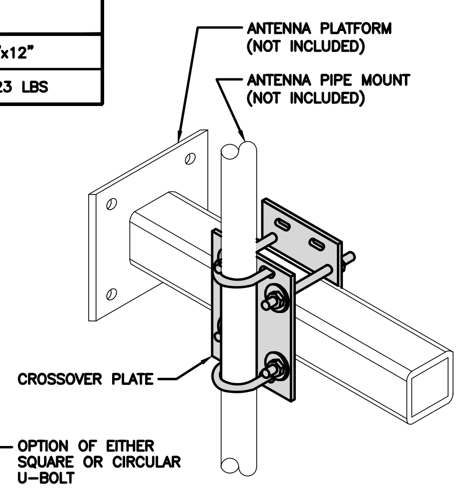


7 — RRH/OVP MOUNT DETAIL (NO SCALE)

COMMSCOPE XP-2040 CROSSOVER PLATE

DIMENSIONS (HxW)	10"x12"
WEIGHT	11.023 LBS

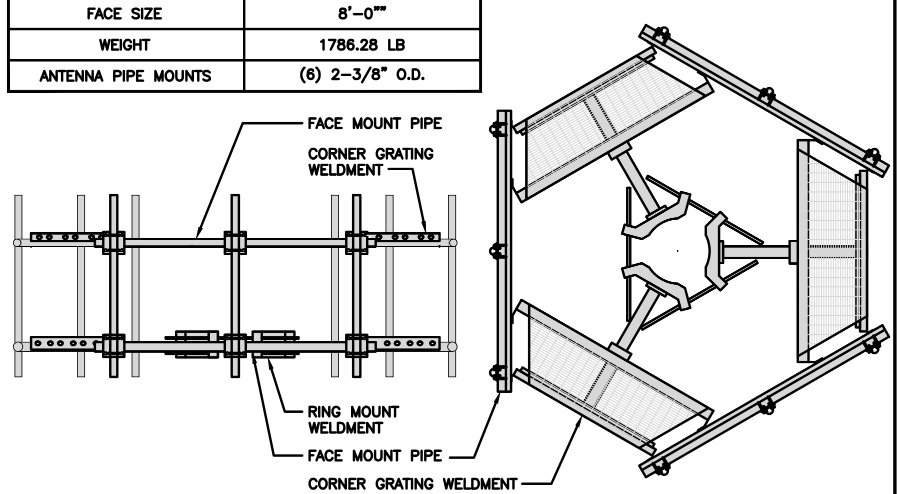




8 — ANTENNA PLATFORM DETAIL (NO SCALE)

SITEPRO1 SNP8HR-396 SNUB-NOSE PLATFORM

FACE SIZE	8'-0""
WEIGHT	1786.28 LB
ANTENNA PIPE MOUNTS	(6) 2-3/8" O.D.



9 — NOT USED (NO SCALE)

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
9/1/21
LICENSED
PROFESSIONAL ENGINEER

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00104A

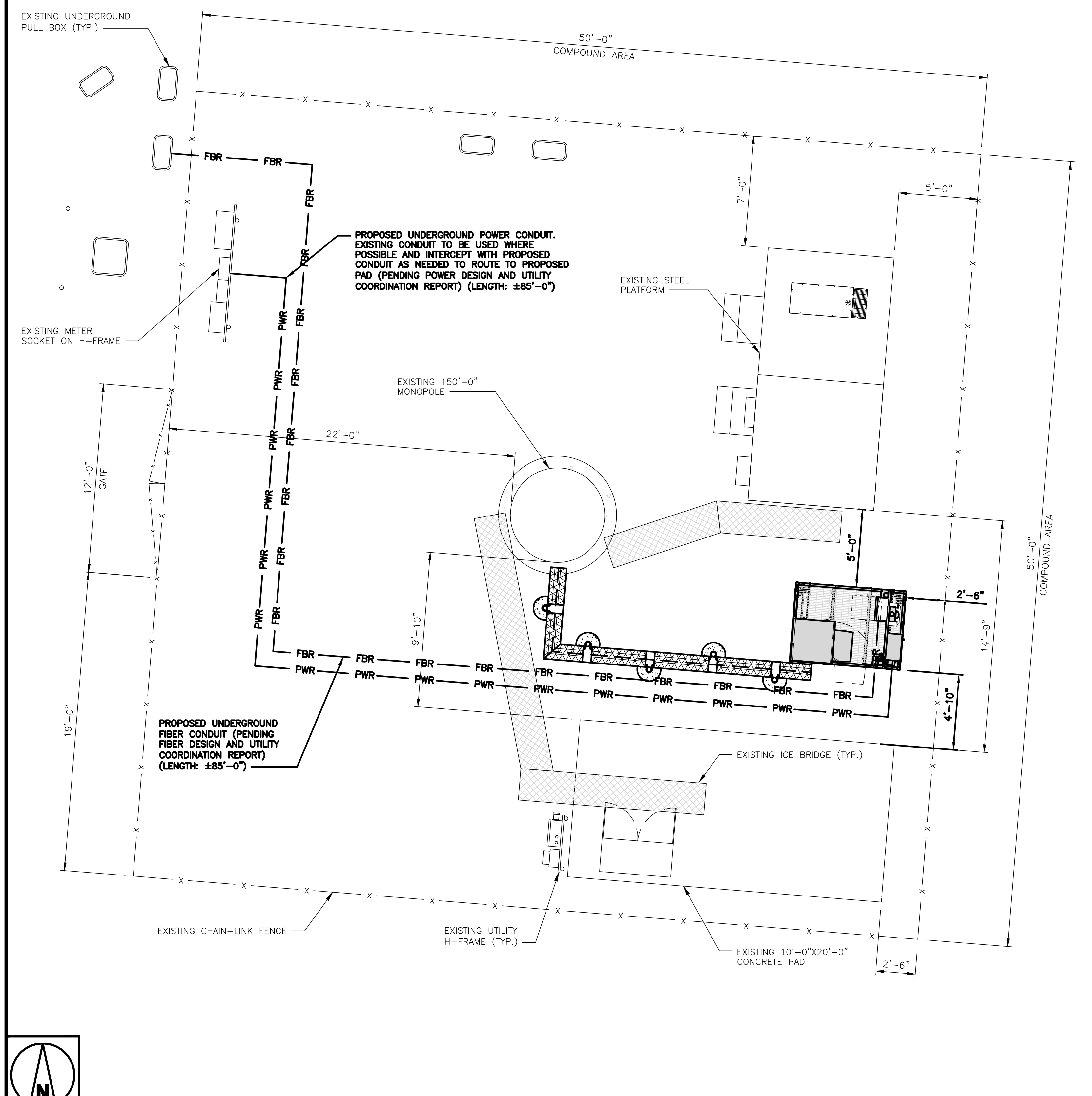
63 WOODLAND ST
GLASTONBURY, CT 06073

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-6

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



UTILITY ROUTE PLAN

12" 6" 0 1' 2' 3' 4' 5'

1/2"=1'-0"

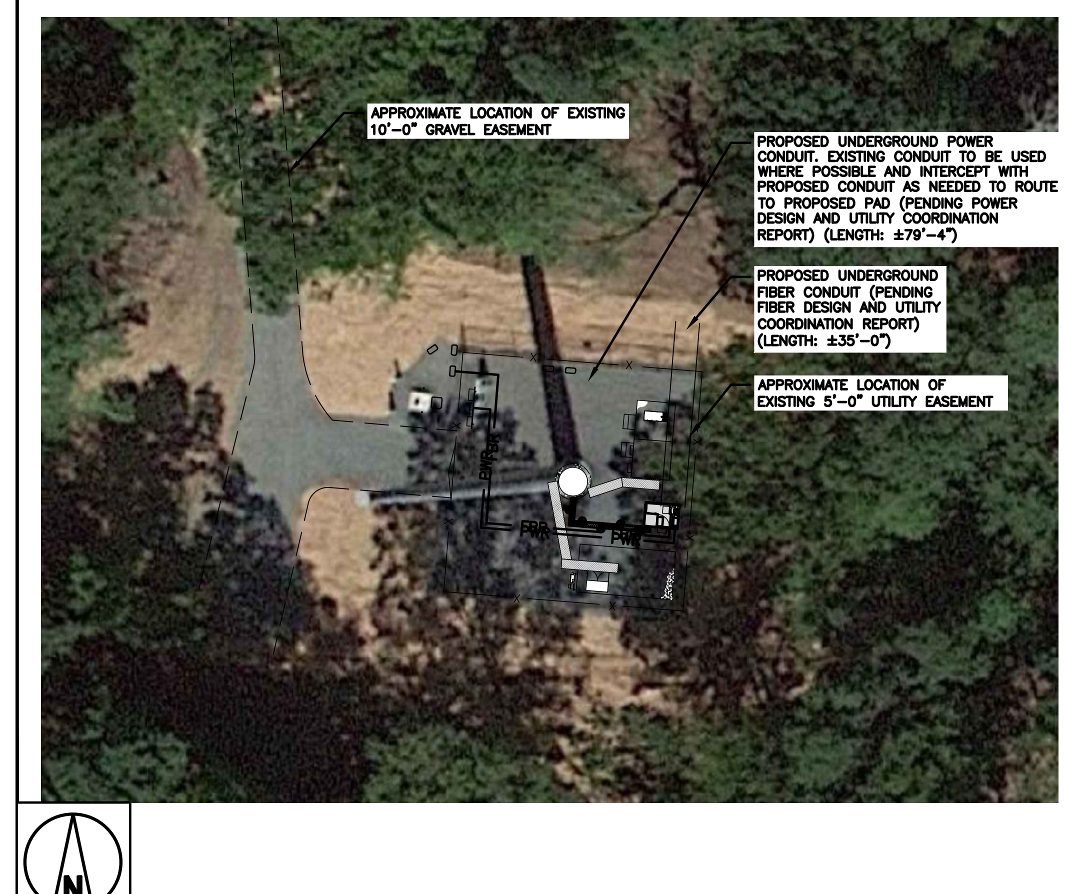
1

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

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

ELECTRICAL NOTES

2



OVERALL UTILITY ROUTE PLAN

100' 50' 0 100' 200'

1"=100'

3

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
LICENSED
PROFESSIONAL ENGINEER
9/1/21

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

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
2039-Z5555C

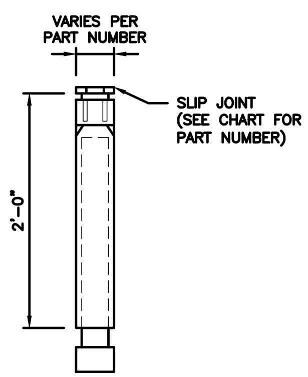
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00104A

63 WOODLAND ST
GLASTONBURY, CT 06073

SHEET TITLE
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

SHEET NUMBER
E-1

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

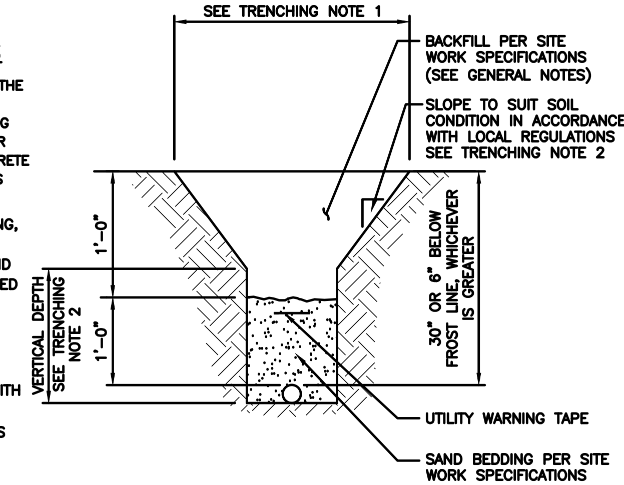


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

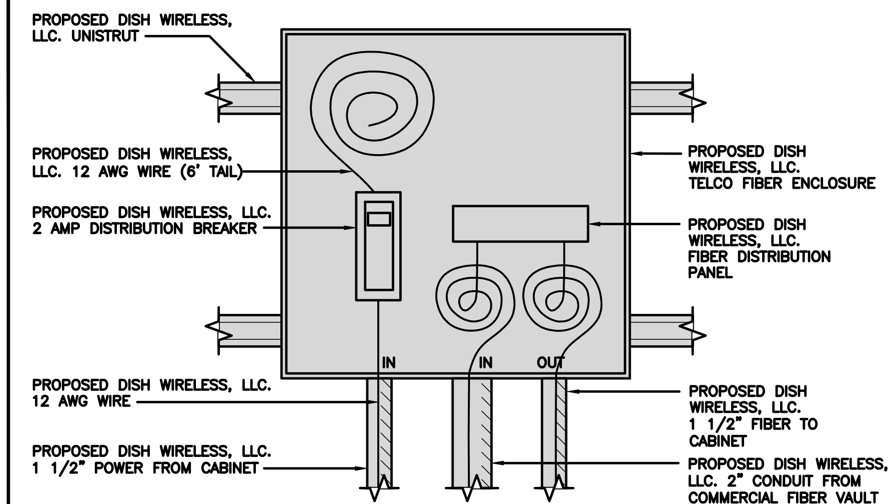
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

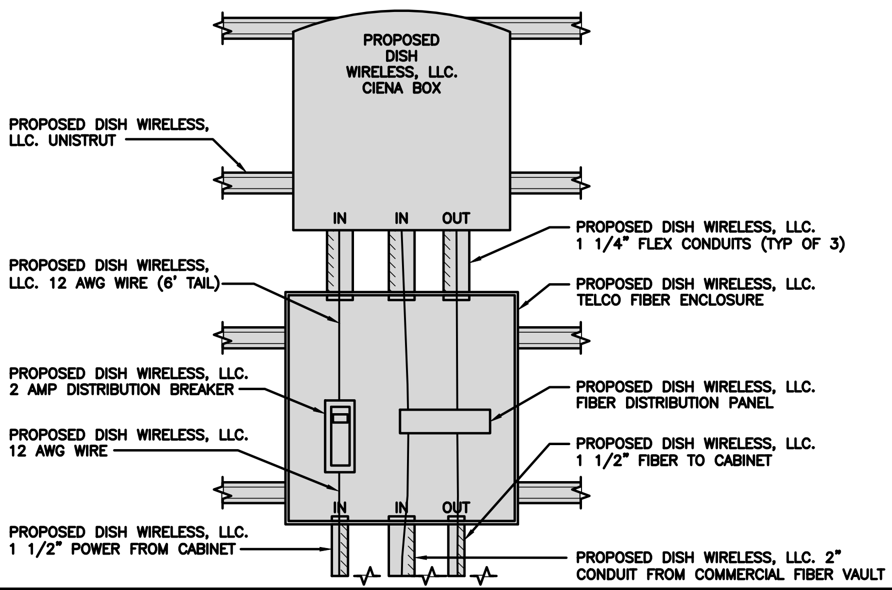
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT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



TYPICAL UNDERGROUND TRENCH DETAIL | NO SCALE | 2



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



LIT TELCO BOX – INTERIOR WIRING LAYOUT | 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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
9/1/21
LICENSED
PROFESSIONAL ENGINEER

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

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

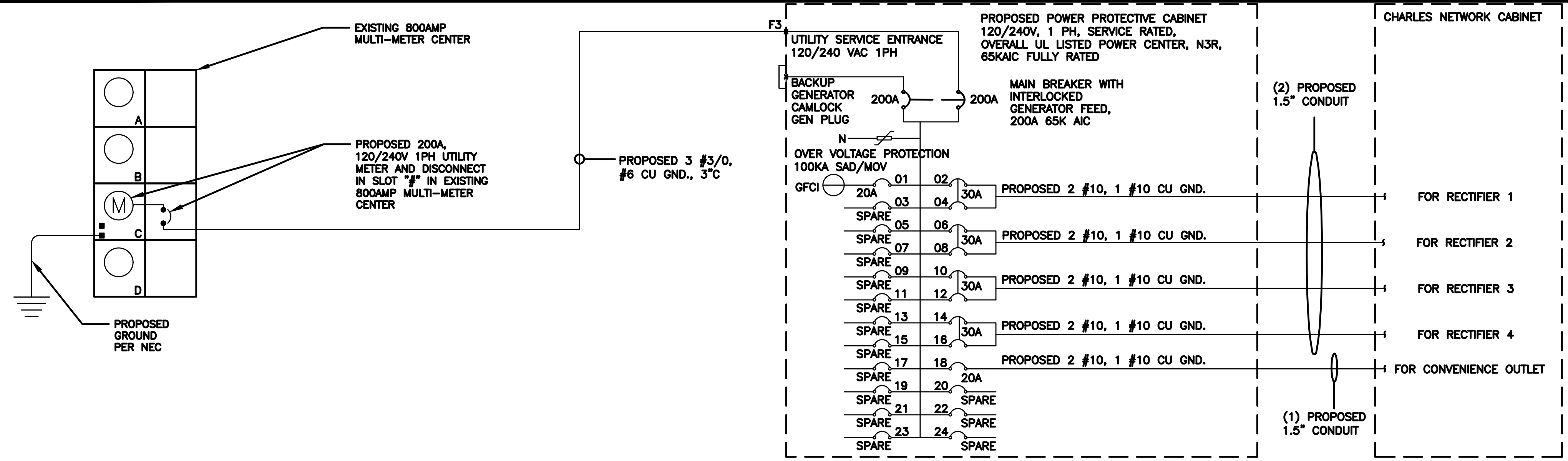
A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00104A

63 WOODLAND ST
GLASTONBURY, CT 06073

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-2



NOTES

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

#10 FOR 15A/1P BREAKER: 0.5 x 40A = 15.0A
#8 FOR 20A–25A/2P BREAKER: 0.5 x 55A = 27.5A

CONDUIT SIZING: ASSUME 1.5" EMT
AT 40% FILL PER NEC 358, TABLE 4 – 0.814A SQ. IN AREA
WIRES: USING THWN–2, CU. (INCLUDING 3 GROUND WIRES)
#6 – 0.0507 SQ. IN X 8 = 0.4056 SQ. IN
#8 – 0.0366 SQ. IN X 2 = 0.0732 SQ. IN
#10 – 0.0211 SQ. IN X 4 = 0.0844 SQ. IN <GROUND
#12 – 0.0133 SQ. IN X 1 = 0.0133 SQ. IN <GROUND
TOTAL = 0.5765 SQ. IN
1.5" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OR (15) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

CONDUIT SIZING: ASSUME 3.0" SCH 40 PVC
AT 40% FILL PER NEC 352,TABLE 4 – 1.216A SQ. IN AREA
WIRES: USING THHN, CU. (INCLUDING 2 GROUND WIRES)
#3/0 – 0.1318 SQ. IN X 3 = 0.3954 SQ. IN
#2 – 0.0521 SQ. IN X 1 = 0.0521 SQ. IN
TOTAL = 0.4475 SQ. IN
3.0" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OR (3) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

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

PROPOSED PANEL SCHEDULE

LOAD SERVED	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	LOAD SERVED
–SPARE–				1	A	2	30A	2880		ABB/GE INFINITY RECTIFIER 1
–SPARE–				3	B	4			2880	
–SPARE–				5	A	6	30A	2880		ABB/GE INFINITY RECTIFIER 2
–SPARE–				7	B	8			2880	
–SPARE–				9	A	10	30A	2880		ABB/GE INFINITY RECTIFIER 3
–SPARE–				11	B	12			2880	
–SPARE–				13	A	14	30A	2880		ABB/GE INFINITY RECTIFIER 4
–SPARE–				15	B	16			2880	
–SPARE–				17	A	18	20A	1920		CHARLES GFCI OUTLET
–SPARE–				19	B	20				–SPARE–
–SPARE–				21	A	22				–SPARE–
–SPARE–				23	B	24				–SPARE–
VOLT AMPS								13440	11520	

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

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

FAULT CURRENT CALCULATION (POINT TO POINT METHOD)

FAULT CURRENT AT METER/DISCONNECT PANEL		
AVAILABLE FAULT CURRENT FROM UTILITY COMPANY TRANSFORMER (ISca)**	38230	AMPS
CABLE LENGTH FROM TRANSFORMER TO NEW DISH WIRELESS, LLC. METER/DISCONNECT	200	FEET
TYPE OF CABLE ("Cu" FOR COPPER. "Alu" FOR ALUMINUM	CU	3 CORE CABLE
SYSTEM LINE–LINE VOLTAGE (E_{L-L})	480	VOLTS
VOLTAGE SYSTEM, NUMBER OF PHASES	3	
SYSTEM LINE–NEUTRAL VOLTAGE (E_{L-N})	277	VOLTS
NUMBER OF CONDUCTORS PER PHASE ("N")	3	
CABLE SIZE AWG***	#3/0	
TYPE OF RACEWAY***	MAGNETIC	
PHASE CONDUCTOR CONSTANT ("C_1")	12844	
NEUTRAL CONDUCTOR CONSTANT ("C_2")	12844	
F_{L-L} = (1.732 x L x 1Sca) / (N x C x E_{L-L})	0.7160	
F_{L-N} = (2 x L x 1Sca) / (N x C x E_{L-N})	1.4327	
M_{L-L} (M_{L-L} = 1(1+F_{L-L})	0.5827	
M_{L-N} (M_{L-N} = 1/(1+F_{L-N})	0.4111	
LINE–LINE FAULT CURRENT AT NEW DISH WIRELESS, LLC. METER/DISCONNECT: [2Sca=1Sca x M_{L-L}]	22278	AMPS
LINE–NEUTRAL FAULT CURRENT AT NEW DISH WIRELESS, LLC. METER/DISCONNECT: [2Sca=1Sca x M_{L-N}]	15715	AMPS
FAULT CURRENT AT NEW DISH WIRELESS, LLC. STEP DOWN TRANSFORMER		
CABLE LENGTH FROM NEW METER TO NEW STEP DOWN TRANSFORMER	15	FEET
TYPE OF CABLE ("Cu" FOR COPPER. "Alu" FOR ALUMINUM	CU	1 CORE CABLE
SYSTEM LINE–LINE VOLTAGE (E_{L-L})	480	VOLTS
VOLTAGE SYSTEM, NUMBER OF PHASES	3	
SYSTEM LINE–NEUTRAL VOLTAGE (E_{L-N})	277	VOLTS
NUMBER OF CONDUCTORS PER PHASE ("N")	3	
CABLE SIZE AWG***	#3/0	
TYPE OF RACEWAY***	MAGNETIC	
PHASE CONDUCTOR CONSTANT ("C_1")	12844	
NEUTRAL CONDUCTOR CONSTANT ("C_2")	12844	
F_{L-L} = (1.732 x L x 2Sca) / (N x C x E_{L-L})	0.0313	
F_{L-N} = (2 x L x 2Sca) / (N x C x E_{L-N})	0.0442	
M_{L-L} (M_{L-L} = 1(1+F_{L-L})	0.9697	
M_{L-N} (M_{L-N} = 1/(1+F_{L-N})	0.9577	
LINE–LINE FAULT CURRENT AT NEW DISH WIRELESS, LLC. STEP DOWN TRANSFORMER: [3Sca=2Sca x M_{L-L}]	21602	AMPS
LINE–NEUTRAL FAULT CURRENT AT NEW DISH WIRELESS, LLC. STEP DOWN TRANSFORMER: [3Sca=2Sca x M_{L-N}]	15050	AMPS
FAULT CURRENT AT TRANSFER SWITCH PANEL		
CABLE LENGTH FROM NEW DISH WIRELESS, LLC. TRANSFORMER TO TRANSFER SWITCH PANEL	10	FEET
TYPE OF CABLE ("Cu" FOR COPPER. "Alu" FOR ALUMINUM	CU	1 CORE CABLE
SYSTEM LINE–LINE VOLTAGE (E_{L-L})	240	VOLTS
VOLTAGE SYSTEM, NUMBER OF PHASES	1	
SYSTEM LINE–NEUTRAL VOLTAGE (E_{L-N})	120	VOLTS
NUMBER OF CONDUCTORS PER PHASE ("N")	3	
CABLE SIZE AWG***	#3/0	
TYPE OF RACEWAY***	MAGNETIC	
PHASE CONDUCTOR CONSTANT ("C_1")	12844	
NEUTRAL CONDUCTOR CONSTANT ("C_2")	12844	
F_{L-L} = (2 x L x 3Sca) / (N x C x E_{L-L})	0.1402	
F_{L-N} = (2 x L x 3Sca) / (N x C x E_{L-N})	0.0651	
M_{L-L} (M_{L-L} = 1(1+F_{L-L})	0.8771	
M_{L-N} (M_{L-N} = 1/(1+F_{L-N})	0.9389	
LINE–LINE FAULT CURRENT AT NEW DISH WIRELESS, LLC. TRANSFER SWITCH: [4Sca=3Sca x M_{L-L}]	18947	AMPS
LINE–NEUTRAL FAULT CURRENT AT NEW DISH WIRELESS, LLC. TRANSFER SWITCH: [4Sca=3Sca x M_{L-N}]	14130	AMPS

NOT USED — NO SCALE — 3

FAULT CALCULATIONS — NO SCALE — 4

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
9/1/21
LICENSED PROFESSIONAL ENGINEER

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

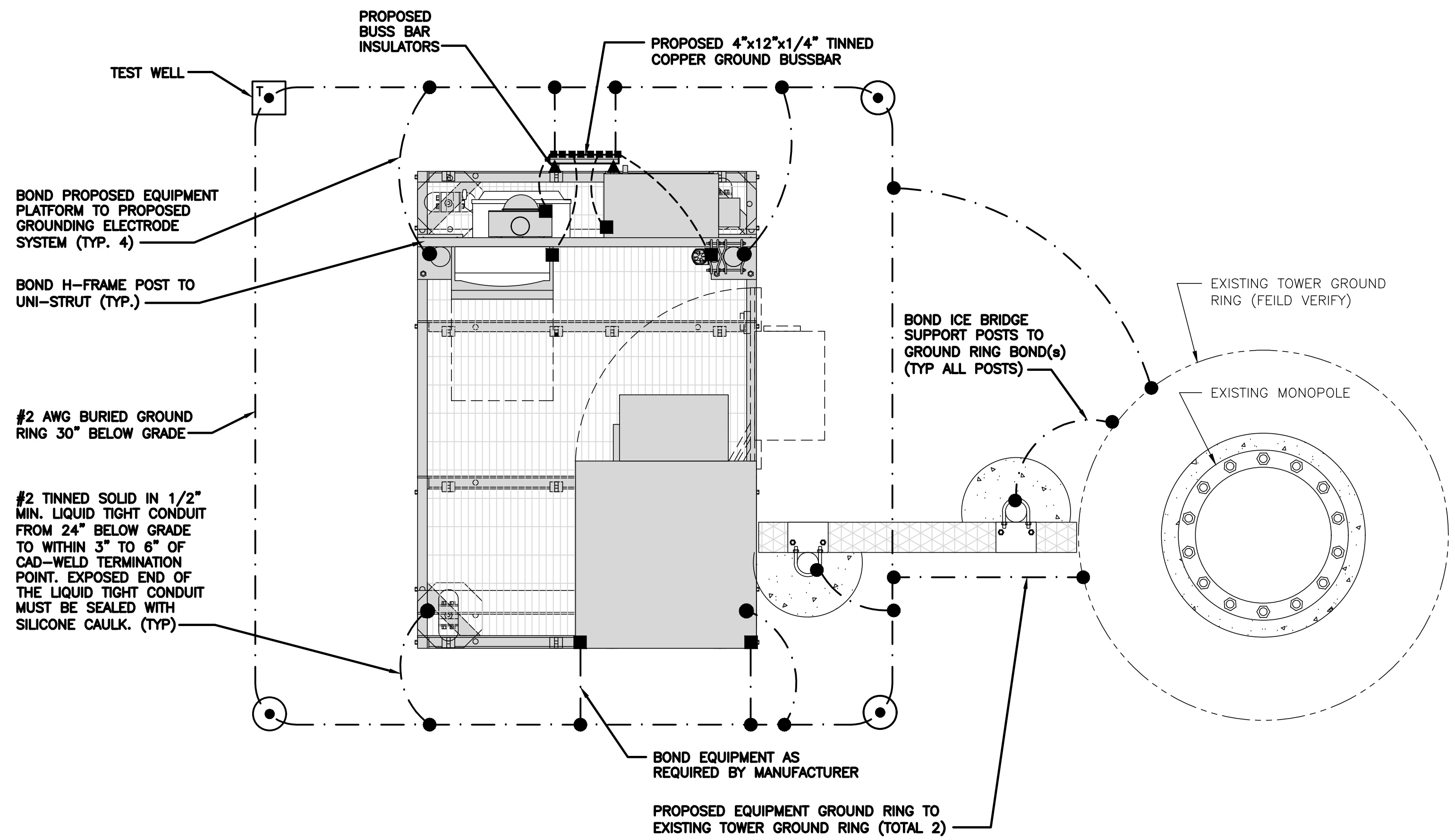
A&E PROJECT NUMBER
2039–Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00104A

63 WOODLAND ST
GLASTONBURY, CT 06073

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

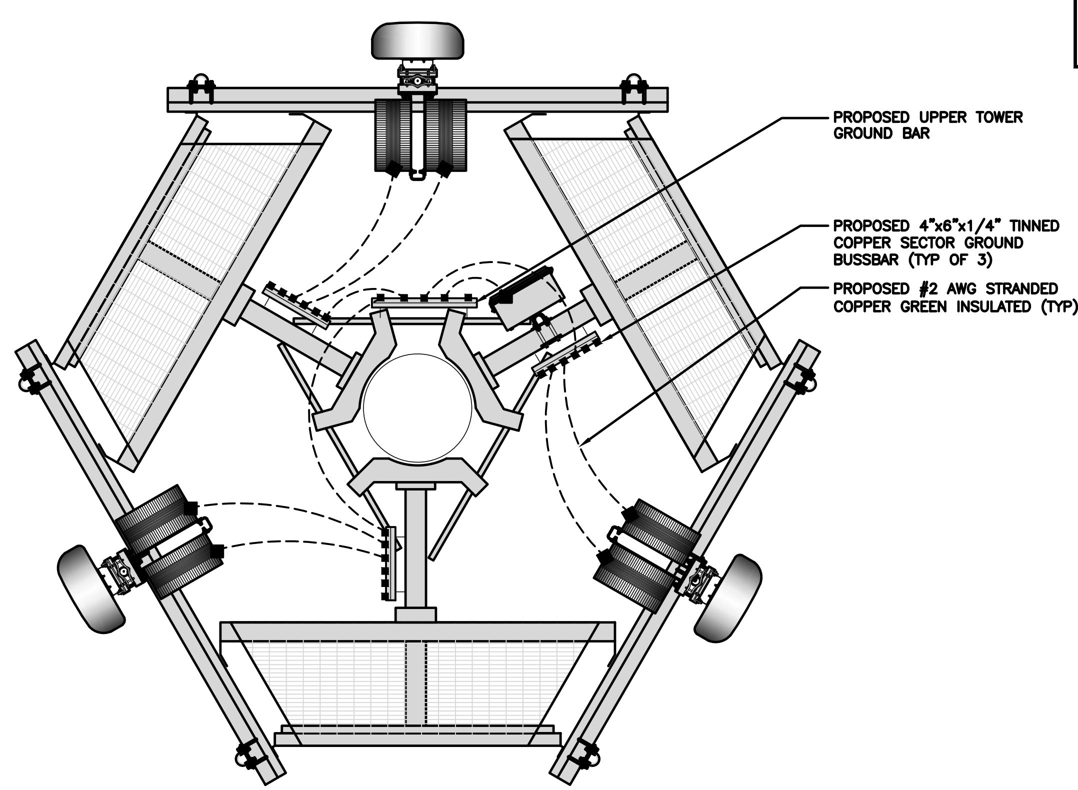
SHEET NUMBER
E-3



TYPICAL EQUIPMENT GROUNDING PLAN | NO SCALE | 1

NOTES

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



TYPICAL ANTENNA GROUNDING PLAN | NO SCALE | 2

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

GROUNDING LEGEND

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

GROUNDING KEY NOTES

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

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

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

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

(E) GROUND ROD: UL LISTED COPPER CLAD STEEL. MINIMUM 1/2" DIAMETER BY EIGHT FEET LONG. GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR.

(F) CELL REFERENCE GROUND BAR: POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 AWG UNLESS NOTED OTHERWISE STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUCTORS.

(G) HATCH PLATE GROUND BAR: BOND TO THE INTERIOR GROUND RING WITH TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A HATCH-PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CRGB MUST BE CONNECTED TO THE HATCH-PLATE AND TO THE INTERIOR GROUND RING USING (2) TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EACH.

(H) EXTERIOR CABLE ENTRY PORT GROUND BARS: LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE.

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

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

(L) INTERIOR UNIT BONDS: METAL FRAMES, CABINETS AND INDIVIDUAL METALLIC UNITS LOCATED WITH THE AREA OF THE INTERIOR GROUND RING REQUIRE A #6 AWG STRANDED GREEN INSULATED COPPER BOND TO THE INTERIOR GROUND RING.

(M) FENCE AND GATE GROUNDING: METAL FENCES WITHIN 7 FEET OF THE EXTERIOR GROUND RING OR OBJECTS BONDED TO THE EXTERIOR GROUND RING SHALL BE BONDED TO THE GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTOR AT AN INTERVAL NOT EXCEEDING 25 FEET. BONDS SHALL BE MADE AT EACH GATE POST AND ACROSS GATE OPENINGS.

(N) EXTERIOR UNIT BONDS: METALLIC OBJECTS, EXTERNAL TO OR MOUNTED TO THE BUILDING, SHALL BE BONDED TO THE EXTERIOR GROUND RING. USING #2 TINNED SOLID COPPER WIRE

(P) ICE BRIDGE SUPPORTS: EACH ICE BRIDGE LEG SHALL BE BONDED TO THE GROUND RING WITH #2 AWG BARE TINNED COPPER CONDUCTOR. PROVIDE EXOTHERMIC WELDS AT BOTH THE ICE BRIDGE LEG AND BURIED GROUND RING.

(Q) DURING ALL DC POWER SYSTEM CHANGES INCLUDING DC SYSTEM CHANGE OUTS, RECTIFIER REPLACEMENTS OR ADDITIONS, BREAKER DISTRIBUTION CHANGES, BATTERY ADDITIONS, BATTERY REPLACEMENTS AND INSTALLATIONS OR CHANGES TO DC CONVERTER SYSTEMS IT SHALL BE REQUIRED THAT SERVICE CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH A MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR

(R) TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO PROPOSED ANTENNA MOUNT COLLAR.

REFER TO DISH WIRELESS, LLC. GROUNDING NOTES.

GROUNDING KEY NOTES | NO SCALE | 3

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
9/1/21
LICENSED
PROFESSIONAL ENGINEER

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00104A

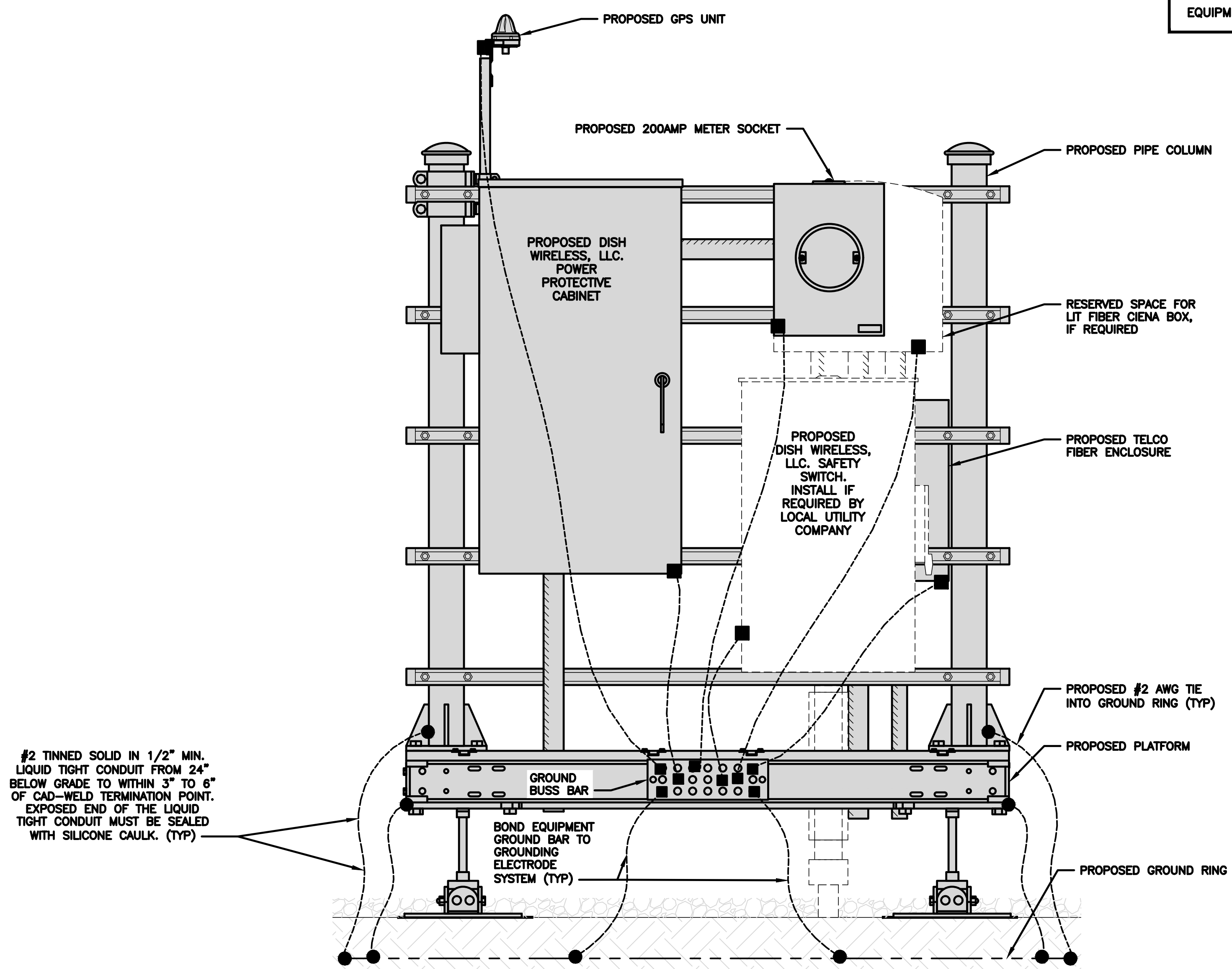
63 WOODLAND ST
GLASTONBURY, CT 06073

SHEET TITLE
GROUNDING PLANS AND NOTES

SHEET NUMBER
G-1

NOTES

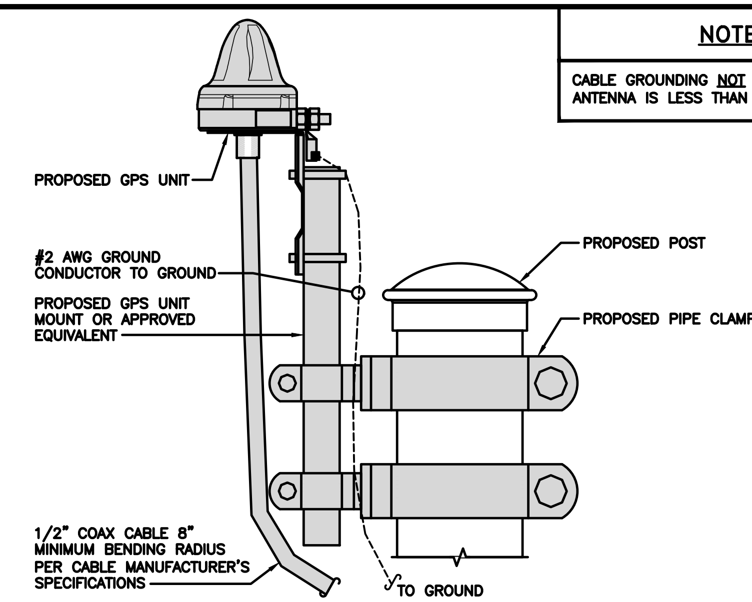
EQUIPMENT CABINET OMITTED FOR CLARITY



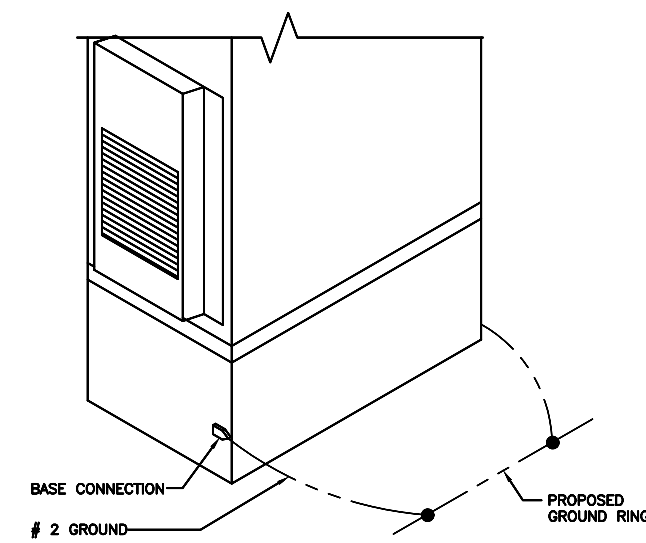
H-FRAME GROUNDING DETAIL — NO SCALE — 1

NOTES

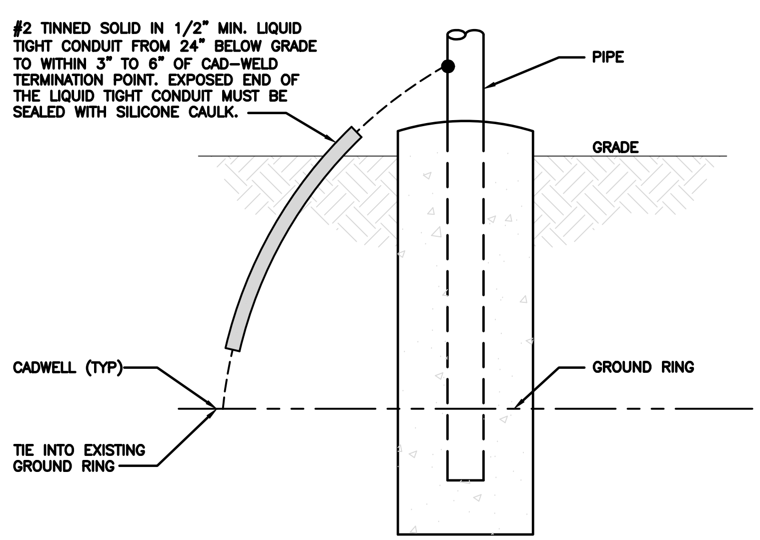
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



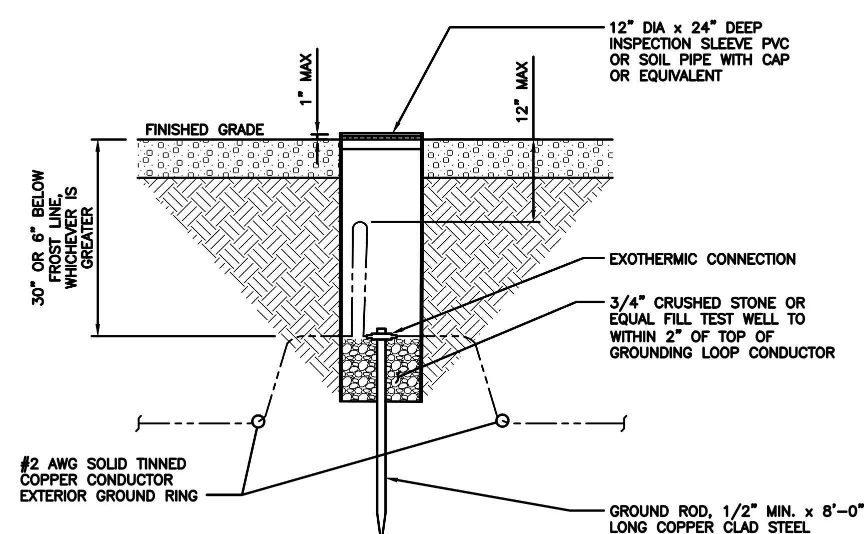
TYPICAL GPS UNIT GROUNDING — NO SCALE — 2



OUTDOOR CABINET GROUNDING — NO SCALE — 3



TRANSITIONING GROUND DETAIL — NO SCALE — 4



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

NOT USED — NO SCALE — 6

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
9/1/21
LICENSED PROFESSIONAL ENGINEER

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00104A

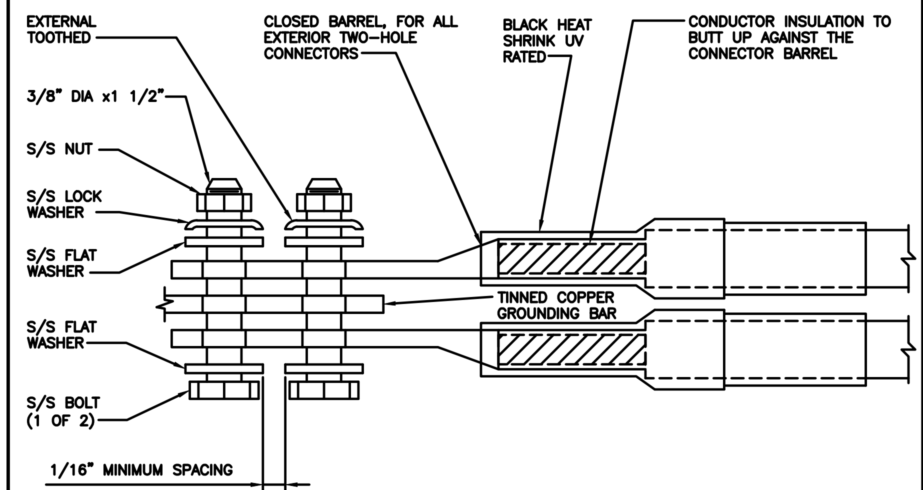
63 WOODLAND ST
GLASTONBURY, CT 06073

SHEET TITLE
GROUNDING DETAILS

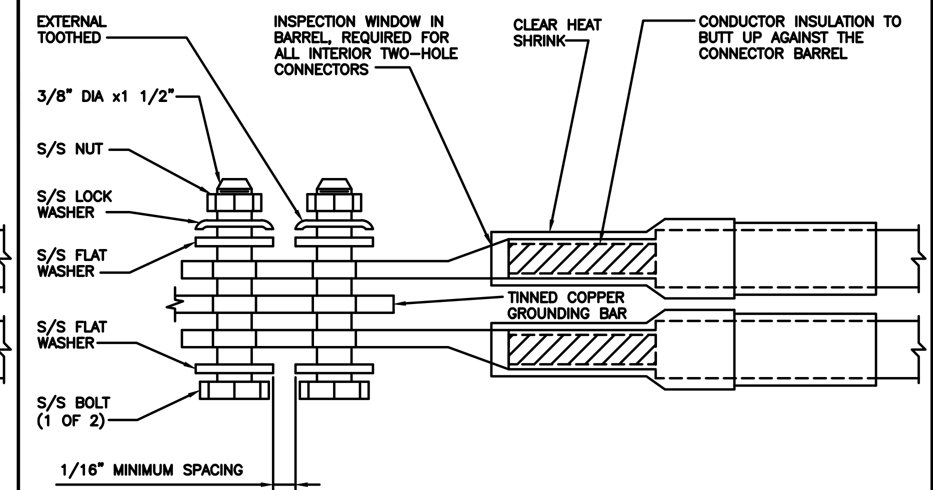
SHEET NUMBER
G-2

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

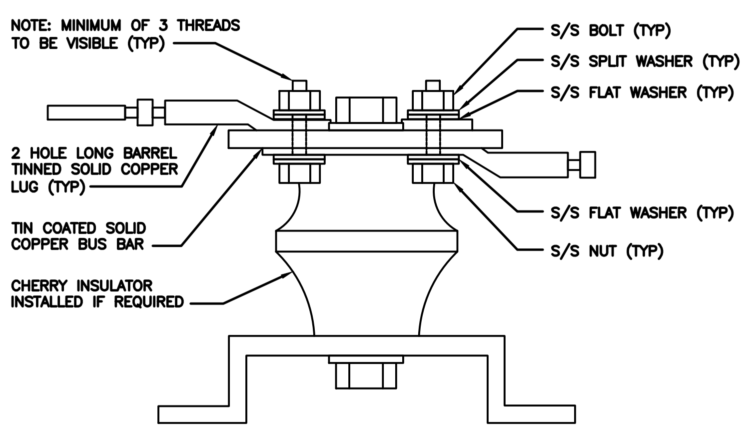
TYPICAL GROUNDING NOTES | NO SCALE | 1



TYPICAL EXTERIOR TWO HOLE LUG | NO SCALE | 2



TYPICAL INTERIOR TWO HOLE LUG | NO SCALE | 3



LUG DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
9/1/21
LICENSED PROFESSIONAL ENGINEER

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00104A

63 WOODLAND ST
GLASTONBURY, CT 06073

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
Band 1	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
Band 2	ORANGE	ORANGE	RED	RED	ORANGE	ORANGE	BLUE	BLUE	ORANGE	ORANGE	GREEN	GREEN
Band 3		WHITE (1) PORT	ORANGE	ORANGE		WHITE (1) PORT	ORANGE	ORANGE		WHITE (1) PORT	ORANGE	ORANGE
Band 4				WHITE (1) PORT				WHITE (1) PORT				WHITE (1) PORT

MID-BAND RRH – (AWS BANDS N66+N70)

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

	ALPHA P1	ALPHA P2	ALPHA P3	ALPHA P4	BETA P1	BETA P2	BETA P3	BETA P4	GAMMA P1	GAMMA P2	GAMMA P3	GAMMA P4
Band 1	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
Band 2	PURPLE	PURPLE	RED	RED	PURPLE	PURPLE	BLUE	BLUE	PURPLE	PURPLE	GREEN	GREEN
Band 3		WHITE (1) PORT	PURPLE	PURPLE		WHITE (1) PORT	PURPLE	PURPLE		WHITE (1) PORT	PURPLE	PURPLE
Band 4				WHITE (1) PORT				WHITE (1) PORT				WHITE (1) PORT

HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED AM LONG WITH FREQUENCY BANDS

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

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

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

HYBRID/DISCREET CABLES

LOW-BAND RRH FIBER CABLES HAVE SECTOR STRIPE ONLY

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

RET MOTORS AT ANTENNAS

PORT 1/ ANTENNA 1 "IN"	PORT 1/ ANTENNA 1 "IN"	PORT 1/ ANTENNA 1 "IN"
RED	BLUE	GREEN

MICROWAVE RADIO LINKS

LINKS WILL HAVE A 1.5–2 INCH WHITE WRAP WITH THE AZIMUTH COLOR OVERLAPPING IN THE MIDDLE. ADD ADDITIONAL SECTOR COLOR BANDS FOR EACH ADDITIONAL MW RADIO.

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

PRIMARY	SECONDARY
WHITE	WHITE
RED	RED
WHITE	WHITE
	RED
	WHITE

RF CABLE COLOR CODES — NO SCALE — 1

LOW BANDS (N71–N28) OPTIONAL – (N29)	AWS (N65+N70+H–BLOCK)
ORANGE	PURPLE

CBRS TECH (3 GHz)	NEGATIVE SLANT PORT ON ANTRRH
YELLOW	WHITE

ALPHA SECTOR	BETA SECTOR	GAMMA SECTOR
RED	BLUE	GREEN

COLOR IDENTIFIER — NO SCALE — 2

NOT USED — NO SCALE — 3

NOT USED — NO SCALE — 4

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
9/1/21
LICENSED PROFESSIONAL ENGINEER

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

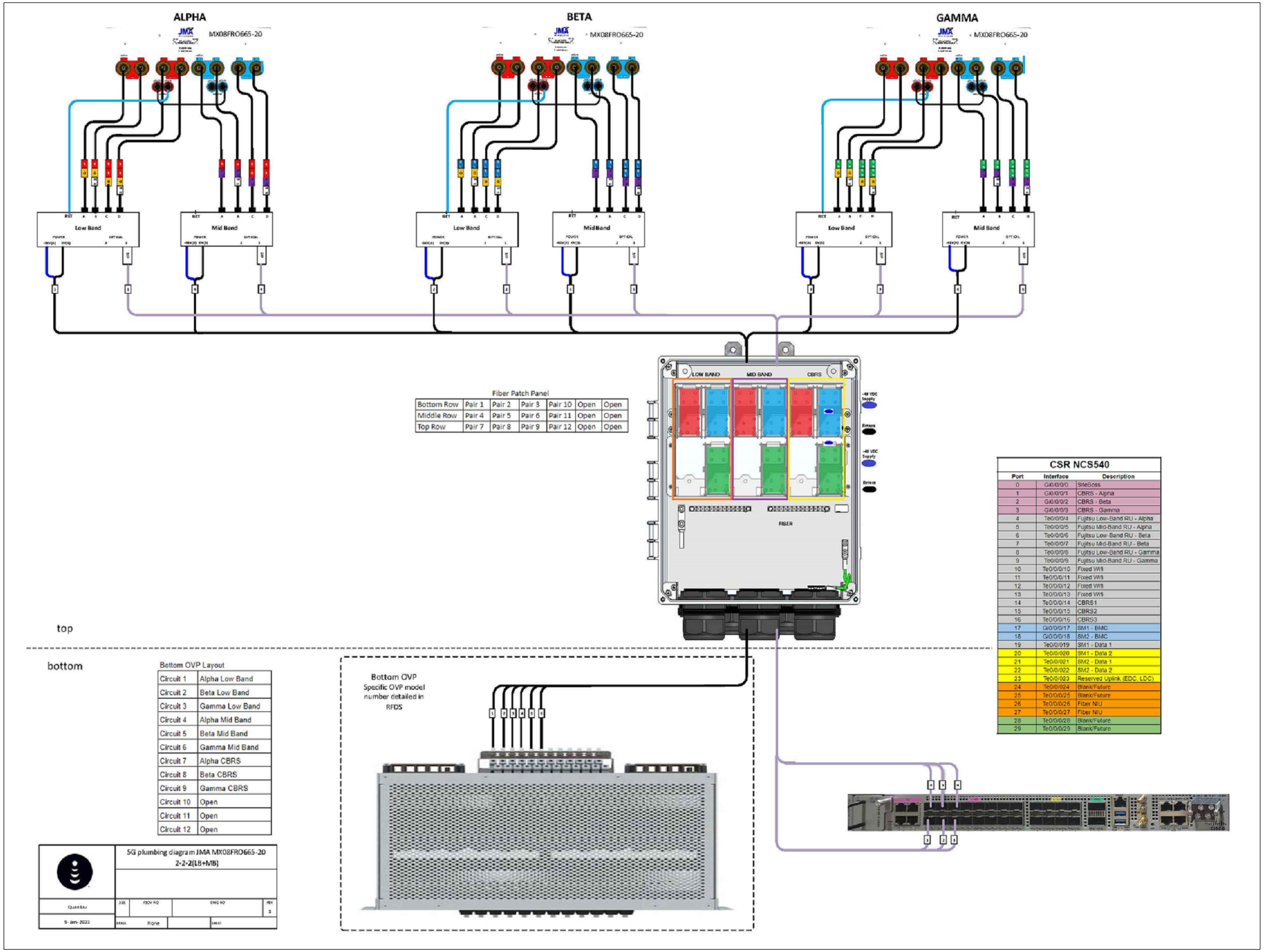
A&E PROJECT NUMBER
2039–Z5555C

DISH WIRELESS, LLC. PROJECT INFORMATION
BOBDL00104A

63 WOODLAND ST
GLASTONBURY, CT 06073

SHEET TITLE
RF CABLE COLOR CODES

SHEET NUMBER
RF-1



Fiber Patch Panel

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

Bottom OVP Layout

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

CSR NCS540

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

PLUMBING DIAGRAM

NO SCALE | 1

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
LICENSED
PROFESSIONAL ENGINEER
9/1/21

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00104A

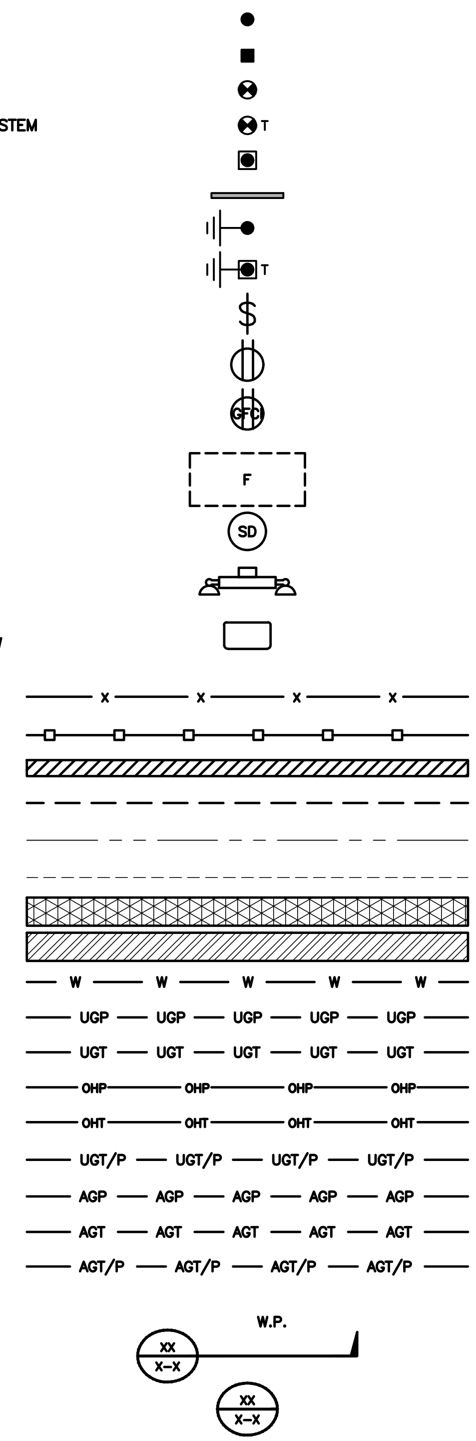
63 WOODLAND ST
GLASTONBURY, CT 06073

SHEET TITLE
RF
PLUMBING DIAGRAM

SHEET NUMBER
RF-2

LEGEND

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



ABBREVIATIONS

AB	ANCHOR BOLT
ABV	ABOVE
AC	ALTERNATING CURRENT
ADDL	ADDITIONAL
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AGL	ABOVE GROUND LEVEL
AIC	AMPERAGE INTERRUPTION CAPACITY
ALUM	ALUMINUM
ALT	ALTERNATE
ANT	ANTENNA
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BM	BEAM
BTC	BARE TINNED COPPER CONDUCTOR
BOF	BOTTOM OF FOOTING
CAB	CABINET
CANT	CANTILEVERED
CHG	CHARGING
CLG	CEILING
CLR	CLEAR
COL	COLUMN
COMM	COMMON
CONC	CONCRETE
CONSTR	CONSTRUCTION
DBL	DOUBLE
DC	DIRECT CURRENT
DEPT	DEPARTMENT
DF	DOUGLAS FIR
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DWG	DRAWING
DWL	DOWEL
EA	EACH
EC	ELECTRICAL CONDUCTOR
EL.	ELEVATION
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ENG	ENGINEER
EQ	EQUAL
EXP	EXPANSION
EXT	EXTERIOR
EW	EACH WAY
FAB	FABRICATION
FF	FINISH FLOOR
FG	FINISH GRADE
FIF	FACILITY INTERFACE FRAME
FIN	FINISH(ED)
FLR	FLOOR
FDN	FOUNDATION
FOC	FACE OF CONCRETE
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FOW	FACE OF WALL
FS	FINISH SURFACE
FT	FOOT
FTG	FOOTING
GA	GAUGE
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GLB	GLUE LAMINATED BEAM
GLV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
GSM	GLOBAL SYSTEM FOR MOBILE
HDG	HOT DIPPED GALVANIZED
HDR	HEADER
HGR	HANGER
HVAC	HEAT/VENTILATION/AIR CONDITIONING
HT	HEIGHT
IGR	INTERIOR GROUND RING

IN	INCH
INT	INTERIOR
LB(S)	POUND(S)
LF	LINEAR FEET
LTE	LONG TERM EVOLUTION
MAS	MASONRY
MAX	MAXIMUM
MB	MACHINE BOLT
MECH	MECHANICAL
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MISC	MISCELLANEOUS
MTL	METAL
MTS	MANUAL TRANSFER SWITCH
MW	MICROWAVE
NEC	NATIONAL ELECTRIC CODE
NM	NEWTON METERS
NO.	NUMBER
#	NUMBER
NTS	NOT TO SCALE
OC	ON–CENTER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OPNG	OPENING
P/C	PRECAST CONCRETE
PCS	PERSONAL COMMUNICATION SERVICES
PCU	PRIMARY CONTROL UNIT
PRC	PRIMARY RADIO CABINET
PP	POLARIZING PRESERVING
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
PWR	POWER CABINET
QTY	QUANTITY
RAD	RADIUS
RECT	RECTIFIER
REF	REFERENCE
REINF	REINFORCEMENT
REQ'D	REQUIRED
RET	REMOTE ELECTRIC TILT
RF	RADIO FREQUENCY
RMC	RIGID METALLIC CONDUIT
RRH	REMOTE RADIO HEAD
RRU	REMOTE RADIO UNIT
RWY	RACEWAY
SCH	SCHEDULE
SHT	SHEET
SIAD	SMART INTEGRATED ACCESS DEVICE
SIM	SIMILAR
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
TEMP	TEMPORARY
THK	THICKNESS
TMA	TOWER MOUNTED AMPLIFIER
TN	TOE NAIL
TOA	TOP OF ANTENNA
TOC	TOP OF CURB
TOF	TOP OF FOUNDATION
TOP	TOP OF PLATE (PARAPET)
TOS	TOP OF STEEL
TOW	TOP OF WALL
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
UPS	UNINTERRUPTIBLE POWER SYSTEM (DC POWER PLANT)
VIF	VERIFIED IN FIELD
W	WIDE
W/	WITH
WD	WOOD
WP	WEATHERPROOF
WT	WEIGHT

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
9/1/21
LICENSED
PROFESSIONAL ENGINEER

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

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
2039–Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00104A

63 WOODLAND ST
GLASTONBURY, CT 06073

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, LLC. AND TOWER OWNER NOC & THE DISH WIRELESS, LLC. AND TOWER OWNER CONSTRUCTION MANAGER.

2. "LOOK UP" – DISH WIRELESS, LLC. 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, LLC. AND DISH WIRELESS, LLC. 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, LLC. 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, LLC. AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH WIRELESS, LLC. 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, LLC. 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, LLC. 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, LLC.

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, LLC. AND TOWER OWNER

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

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

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
9/1/21
LICENSED
PROFESSIONAL ENGINEER

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

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00104A

63 WOODLAND ST
GLASTONBURY, CT 06073

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

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

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

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

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

#4 BARS AND SMALLER 40 ksi

#5 BARS AND LARGER 60 ksi

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

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

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

ELECTRICAL INSTALLATION NOTES:

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

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

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

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

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

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

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

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

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

8. TIE WRAPS ARE NOT ALLOWED.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR DISH WIRELESS, LLC. 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, LLC.".

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

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
LICENSED
PROFESSIONAL ENGINEER
9/1/21

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

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
2039–Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00104A

63 WOODLAND ST
GLASTONBURY, CT 06073

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-3

GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

2. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.

4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.

7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.

8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.

11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.

13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.

14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.

15. APPROVED ANTIOXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.

17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

18. BOND ALL METALLIC OBJECTS WITHIN 6 ft OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.

19. GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.

20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).

21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). DO NOT ATTACH GROUNDING TO FIRE SPRINKLER SYSTEM PIPES.

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
9/1/21
LICENSED
PROFESSIONAL ENGINEER

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	08/31/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00104A

63 WOODLAND ST
GLASTONBURY, CT 06073

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-4

Exhibit D

Structural Analysis Report

DISH Wireless LLC

Structural Analysis Report

Structure	: 150 Foot Monopole
VB Site Name	: Hopewell
VB Site Number	: US-CT-5018
Deal Number	: P-006914
Proposed Carrier	: DISH Wireless LLC
Carrier Site Name	: BOBDL00104A
Carrier Site Number	: BOBDL00104A
Site Location	: 63 Woodland St Glastonbury, CT 06073 (Hartford County) 41.6608, -72.5741
Date	: May 20, 2021
Max Member Stress Level	: 83% (Foundation) 82% (Tower Base Plate) 70% (Tower)
Result	: **PASS**

STATE OF CONNECTICUT
MICHAEL T. DE BOER
No. 18022
LICENSED
PROFESSIONAL ENGINEER

05/20/2021

Prepared by:

VERTICAL BRIDGE ENGINEERING, LLC

750 Park of Commerce Drive Suite 200 | Boca Raton, FL 33487 | 561-948-6367
VerticalBridge.com

Table of Contents

Introduction

We have completed our structural analysis of the proposed equipment installation on the foregoing tower to determine its ability to support the new loads proposed by **DISH Wireless.** The objective of the analysis was to determine if the tower meets the current structural codes and standards with the proposed equipment installation.

Existing Structural Information

The following documents for the existing structure were made available for our structural analysis.

Tower Information	Ehresmann Engineering, Inc., Job No. 102800, dated 12/17/2018
Foundation Information	Ehresmann Engineering, Inc., Job No. 102800, dated 12/17/2018
Geotechnical Information	FDH Velocitel., Project No. 18PGJC1600, dated 04/10/2018
Existing Equipment Information	Vertical Bridge Collocation Application Version 2.
Tower Reinforcement Information	Tower has not been previously reinforced.

Final Proposed Equipment Loading for DISH Wireless

The following proposed loading was obtained from the Vertical Bridge Collocation Application:

Antenna/Equipment					Coax	
Mount (ft)	RAD (ft)	Qty.	Antenna	Type	Qty.	Size/Type
125.0	-	**1**	**Platform with Handrails**	Mount	**1**	**1.6" Hybrid**
	125.0	**6**	**Fujitsu TA08025-B605**	RRU		
		3	**JMA MX08FRO665-20_V0F**	Panel		
		1	**Raycap RDIDC-9181-PF-48**	DC Box		

Note: Proposed equipment shown in bold.
Note: Other existing loading can be found on the tower profile attached.
Note: All proposed feedlines for DISH Wireless are to be placed inside the monopole tower.
Note: The remainder of 8,500 sq. in. for DISH Wireless have been included in this analysis.

Design Criteria

The tower was analyzed using tnxTower (Version 8.0.9.0) tower analysis software using the following design criteria.

State	Connecticut
City/County Building Code	Hartford County (IBC 2018)
TIA/EIA Standard Code	TIA-222-H
Basic Wind Speed	119 MPH (Vult)
Basic Wind Speed w/ Ice	50 MPH w/ 1.50" Ice
Steel Grade	65 ksi Pole / 50 ksi Base Plate / A615-75 Anchor Bolts
Exposure Category	C
Topographic Category (height)	1 (0.0 ft)
Risk Category	II
S_s	0.202
Seismic Design Category	B

Analysis Results

Based on the foregoing information, our structural analysis determined that **the existing tower is structurally capable of supporting the proposed equipment loads without modification.** The existing tower base plate, anchor rods, and foundation have also been evaluated and **were found to be structurally capable of supporting the proposed equipment loads.** A seismic analysis has been performed on this tower and does not control.

Assumptions

The below assumptions are true, complete, and accurate.

1. The existing tower has been maintained to manufacturer's specifications and is in good condition.
2. Foundations are considered to have been properly designed for the original design loads.
3. All member connections are considered to have been designed to meet the load carrying capacity of the connected member.
4. Antenna mount loads have been estimated based on generally accepted industry standards.
5. The mounts for the proposed antennas have been analyzed and designed by others.
6. See additional assumptions contained in the report attached.
7. Tower is within acceptable engineering tolerance at 105%.
8. Foundations are within acceptable engineering tolerance at 110%.

Conclusions

The existing tower described above **has sufficient capacity** to support the proposed loading based on the governing Building Code. The existing tower base plate, anchor rods, and foundation have also been evaluated and are acceptable. A seismic analysis has been performed on this tower and does not control.

We appreciate the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance, please call us anytime at 561-948-6367.

Sincerely,

Analysis by:

Gertha Wesh
Design Engineer II

Reviewed by:

05/20/2021

Michael T. De Boer, P.E.
Vice President of Structural Engineering

750 Park of Commerce Drive Suite 200 | Boca Raton, FL 33487 | 561-948-6367
VerticalBridge.com

Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but not necessarily limited, to:

- Information supplied by the client regarding the structure itself, the antenna and transmission line loading on the structure and its components, or relevant information.

- Information from drawings in possession of Vertical Bridge Engineering, LLC, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to Vertical Bridge Engineering, LLC and used in the performance of our engineering services is correct and complete. In the absence of information contrary, we consider that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated; and we, therefore consider that their capacity has not significantly changed from the original design condition.

All services will be performed to the codes and standards specified by the client, and we do not imply to meet any other code and standard requirements unless explicitly agreed to in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes and standards, the client shall specify the exact requirements. In the absence of information to the contrary, all work will be performed in accordance with the revision of ANSI/TIA/EIA-222-H requested.

All services are performed, results obtained, and recommendations made in accordance with the generally accepted engineering principles and practices. Vertical Bridge Engineering LLC, is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

Disclaimer of Warranties

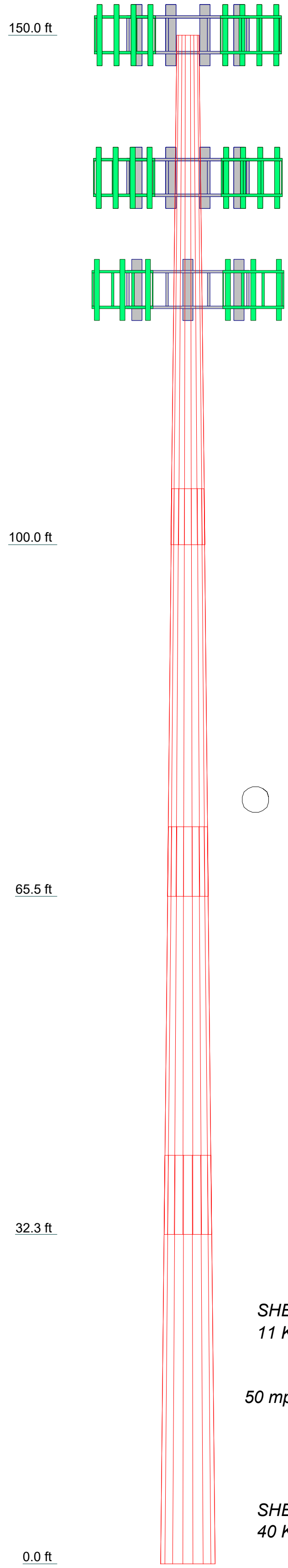
The engineering services by Vertical Bridge Engineering, LLC in connection with this Structural Analysis are limited to a computer analysis of the tower structure, size, and capacity of its members. Vertical Bridge Engineering, LLC does not analyze the fabrication, including welding, except as may be expressly included in this report.

The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines. Any mention of structural modifications are reasonable estimates and should not be used a precise construction document. Precise modification drawings are obtainable from Vertical Bridge Engineering, LLC but are beyond the scope of this report.

Vertical Bridge Engineering, LLC makes no warranties, express or implied, in connection with this report and disclaims any liability arising from material, fabrication and erection of this tower, or installation and compliance with legal and permitting requirements of the proposed equipment. Vertical Bridge Engineering, LLC will not be responsible whatsoever for or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of Vertical Bridge Engineering, LLC pursuant to this report will be limited to the total fee received for preparation of this report.

Attachment 1:
Calculations

Section	1	2	3	4	
Length (ft)	50.000	40.000	40.000	40.100	
Number of Sides	18	18	18	18	
Thickness (in)	0.3000	0.4000	0.4000	0.4000	
Socket Length (ft)	5.500	6.800	7.800		
Top Dia (in)	26.4000	37.5480	45.6722	53.4276	
Bot Dia (in)	39.6000	48.3000	56.3000	64.0000	
Grade	A572-65				
Weight (K)	5.3	7.3	8.7	10.1	31.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
AIR32 KRD901146-1_B66A-B2A w/ Mount Pipe	150	SM 602-1 (ATT-E)	136
AIR32 KRD901146-1_B66A-B2A w/ Mount Pipe	150	SM 602-1 (ATT-E)	136
AIR32 KRD901146-1_B66A-B2A w/ Mount Pipe	150	SM 602-1 (ATT-E)	136
LNX-6515DS-A1M	150	1/3 Remaining Reserved Rights (ATT - R)	136
LNX-6515DS-A1M	150	1/3 Remaining Reserved Rights (ATT - R)	136
LNX-6515DS-A1M	150	1/3 Remaining Reserved Rights (ATT - R)	136
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	150	(2) TPA65R-BU8D w/ Mount Pipe (ATT-E)	136
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	150	(2) TPA65R-BU8D w/ Mount Pipe (ATT-E)	136
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	150	(2) TPA65R-BU8D w/ Mount Pipe (ATT-E)	136
RRUS 11 B12	150	HPA65R-BU8A w/Mount Pipe (ATT-E)	136
RRUS 11 B12	150	HPA65R-BU8A w/Mount Pipe (ATT-E)	136
RRUS 11 B12	150	HPA65R-BU8A w/Mount Pipe (ATT-E)	136
RRUS 11 B4	150	4478 B14 RRUS (18.1x13.4x8.3x59.4lbs) (ATT-E)	136
RRUS 11 B4	150	4478 B14 RRUS (18.1x13.4x8.3x59.4lbs) (ATT-E)	136
RRUS 11 B4	150	8'x2" STD Pipe Mount (Dish Wireless - P)	125
IBR-1300	150	8'x2" STD Pipe Mount (Dish Wireless - P)	125
SM 602-1	150	8'x2" STD Pipe Mount (Dish Wireless - P)	125
SM 602-1	150	1/3 Remaining Reserved Rights (Dish Wireless - R)	125
SM 602-1	150	1/3 Remaining Reserved Rights (Dish Wireless - R)	125
1/3 Remaining Reserved Rights (TMO - R)	150	1/3 Remaining Reserved Rights (Dish Wireless - R)	125
1/3 Remaining Reserved Rights (TMO - R)	150	Platfrom w/Handrails (LP 716) (Dish Wireless - P)	125
1/3 Remaining Reserved Rights (TMO - R)	150	MX08FRO665-20_V0F w/ Mount Pipe (Dish Wireless - P)	125
4478 B14 RRUS (18.1x13.4x8.3x59.4lbs) (ATT-E)	136	MX08FRO665-20_V0F w/ Mount Pipe (Dish Wireless - P)	125
E2-700 (ATT-E)	136	MX08FRO665-20_V0F w/ Mount Pipe (Dish Wireless - P)	125
E2-700 (ATT-E)	136	(2) TA08025-B605 (14.96x15.75x9.06x75lbs) (Dish Wireless - P)	125
E2-700 (ATT-E)	136	(2) TA08025-B605 (14.96x15.75x9.06x75lbs) (Dish Wireless - P)	125
Radio 4415 B30 (16.5x13.4x5.9x46lbs) (ATT-E)	136	(2) TA08025-B605 (14.96x15.75x9.06x75lbs) (Dish Wireless - P)	125
Radio 4415 B30 (16.5x13.4x5.9x46lbs) (ATT-E)	136	RDIDC-9181-PF-48 (Dish Wireless - P)	125
Radio 4415 B30 (16.5x13.4x5.9x46lbs) (ATT-E)	136		
Radio 4449 (15.0x13.2x9.3x74lbs) (ATT-E)	136		
Radio 4449 (15.0x13.2x9.3x74lbs) (ATT-E)	136		
Radio 4449 (15.0x13.2x9.3x74lbs) (ATT-E)	136		
8843 (15x13.2x11.1x75lbs) (ATT-E)	136		
8843 (15x13.2x11.1x75lbs) (ATT-E)	136		
8843 (15x13.2x11.1x75lbs) (ATT-E)	136		
Unknown DC (ATT-E)	136		
Unknown DC (ATT-E)	136		
Unknown DC (ATT-E)	136		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

ALL REACTIO
ARE FACTOR

AXIAL
85 K
SHEAR
11 K
TORQUE 0 kip
50 mph WIND - 1.50

AXIAL
50 K
SHEAR
40 K
MOMENT
4455 kip-ft
TORQUE 0 kip-ft
REACTIONS - 119 mph WIND

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 119 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 69.5%

Vertical Bridge Engineering, LLC
750 Park of Commerce Drive, Suite 200
Boca Raton, FL 33487
Phone: 561-948-6367
FAX:

Job: ***US-CT-5018***		
Project: ***Monopole Structural Analysis***		
Client: DISH	Drawn by: GWesh	App'd:
Code: TIA-222-H	Date: 05/20/21	Scale: NTS
Path: C:\Users\gwesh\Documents\SA\US-CT-5018\tnx Files\US-CT-5018_SA_051921_DISH.er		Dwg No. E-1

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Tower base elevation above sea level: 310.000 ft.
Basic wind speed of 119 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.000 ft.
Nominal ice thickness of 1.5000 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
√ Use Code Stress Ratios
√ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile
Include Bolts In Member Capacity
√ Leg Bolts Are At Top Of Section
√ Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
√ SR Members Have Cut Ends
SR Members Are Concentric

Distribute Leg Loads As Uniform
Assume Legs Pinned
√ Assume Rigid Index Plate
√ Use Clear Spans For Wind Area
√ Use Clear Spans For KL/r
√ Retension Guys To Initial Tension
Bypass Mast Stability Checks
√ Use Azimuth Dish Coefficients
√ Project Wind Area of Appurt.
√ Autocalc Torque Arm Areas
Add IBC .6D+W Combination
√ Sort Capacity Reports By Component
√ Triangulate Diamond Inner Bracing
Treat Feed Line Bundles As Cylinder
Ignore KL/ry For 60 Deg. Angle Legs

Use ASCE 10 X-Brace Ly Rules
√ Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
SR Leg Bolts Resist Compression
√ All Leg Panels Have Same Allowable
Offset Girt At Foundation
√ Consider Feed Line Torque
Include Angle Block Shear Check
Use TIA-222-H Bracing Resist. Exemption
Use TIA-222-H Tension Splice Exemption

Poles

√ Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets
Pole Without Linear Attachments
Pole With Shroud Or No Appurtenances
Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.000-100.000	50.000	5.500	18	26.4000	39.6000	0.3000	1.0000	A572-65 (65 ksi)
L2	100.000-65.500	40.000	6.800	18	37.5480	48.3000	0.4000	1.5000	A572-65 (65 ksi)
L3	65.500-32.300	40.000	7.800	18	45.6722	56.3000	0.4000	1.8000	A572-65 (65 ksi)
L4	32.300-0.000	40.100		18	53.4276	64.0000	0.4000	1.8000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	26.7672	24.8524	2138.8836	9.2655	13.4112	159.4849	4280.5816	12.4286	4.1888	13.963
	40.1708	37.4215	7302.0244	13.9515	20.1168	362.9814	14613.6569	18.7143	6.5120	21.707
L2	39.5698	47.1631	8222.6286	13.1875	19.0744	431.0823	16456.0768	23.5860	5.9396	14.849
	48.9865	60.8138	17628.3191	17.0045	24.5364	718.4558	35279.8341	30.4127	7.8320	19.58
L3	48.1435	57.4775	14883.2580	16.0716	23.2015	641.4794	29786.0998	28.7442	7.2639	18.16
	57.1006	70.9706	28018.1714	19.8445	28.6004	979.6426	56073.2098	35.4921	9.1344	22.836
L4	56.2721	67.3238	23917.1577	18.8248	27.1412	881.2120	47865.7861	33.6683	8.6289	21.572
	64.9194	80.7466	41264.4167	22.5780	32.5120	1269.2057	82583.1303	40.3810	10.4896	26.224

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 150.000-100.000				1	1	1			
L2 100.000-65.500				1	1	1			
L3 65.500-32.300				1	1	1			
L4 32.300-0.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
***											

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight klf
***									
1.6" Hybrid (Dish - P)	C	No	No	Inside Pole	125.000 - 0.000	1	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
							2" Ice	0.000	0.000
***									
5/8" DC (ATT-E)	C	No	No	Inside Pole	136.000 - 0.000	6	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
							2" Ice	0.000	0.000
3/8" Fiber Cables (ATT-E)	C	No	No	Inside Pole	136.000 - 0.000	2	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
***									
6X12 Hybrid (TMO-E)	C	No	No	Inside Pole	150.000 - 0.000	3	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
							2" Ice	0.000	0.000
***									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	150.000-100.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.154
L2	100.000-65.500	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.145
L3	65.500-32.300	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.139
L4	32.300-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.136

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	150.000-100.000	A	1.712	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.154
L2	100.000-65.500	A	1.644	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.145
L3	65.500-32.300	A	1.560	0.000	0.000	0.000	0.000	0.000

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.139
L4	32.300-0.000	A	1.397	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.136

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.000-100.000	0.0000	0.0000	0.0000	0.0000
L2	100.000-65.500	0.0000	0.0000	0.0000	0.0000
L3	65.500-32.300	0.0000	0.0000	0.0000	0.0000
L4	32.300-0.000	0.0000	0.0000	0.0000	0.0000

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***									
LP 716	A	None		0.0000	125.000	No Ice	26.800	26.800	1.509
(Dish Wireless - P)						1/2" Ice	32.200	32.200	1.811
						1" Ice	37.600	37.600	2.113
						2" Ice	48.400	48.400	2.717
MX08FRO665-20_V0F w/	A	From Leg	3.000	0.0000	125.000	No Ice	12.964	7.767	0.083
Mount Pipe			0.000			1/2" Ice	13.668	9.053	0.178
(Dish Wireless - P)			0.000			1" Ice	14.340	10.191	0.282
						2" Ice	15.618	12.139	0.519
MX08FRO665-20_V0F w/	B	From Leg	3.000	0.0000	125.000	No Ice	12.964	7.767	0.083
Mount Pipe			0.000			1/2" Ice	13.668	9.053	0.178
(Dish Wireless - P)			0.000			1" Ice	14.340	10.191	0.282
						2" Ice	15.618	12.139	0.519
MX08FRO665-20_V0F w/	C	From Leg	3.000	0.0000	125.000	No Ice	12.964	7.767	0.083
Mount Pipe			0.000			1/2" Ice	13.668	9.053	0.178
(Dish Wireless - P)			0.000			1" Ice	14.340	10.191	0.282
						2" Ice	15.618	12.139	0.519
(2) TA08025-B605	A	From Leg	3.000	0.0000	125.000	No Ice	1.964	1.129	0.075
(14.96x15.75x9.06x75lbs)			0.000			1/2" Ice	2.138	1.267	0.093
(Dish Wireless - P)			0.000			1" Ice	2.320	1.411	0.114
						2" Ice	2.705	1.723	0.164
(2) TA08025-B605	B	From Leg	3.000	0.0000	125.000	No Ice	1.964	1.129	0.075
(14.96x15.75x9.06x75lbs)			0.000			1/2" Ice	2.138	1.267	0.093
(Dish Wireless - P)			0.000			1" Ice	2.320	1.411	0.114

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight K
						2" Ice	2.705	1.723	0.164
(2) TA08025-B605	C	From Leg	3.000	0.0000	125.000	No Ice	1.964	1.129	0.075
(14.96x15.75x9.06x75lbs)			0.000			1/2" Ice	2.138	1.267	0.093
(Dish Wireless - P)			0.000			1" Ice	2.320	1.411	0.114
						2" Ice	2.705	1.723	0.164
RDIDC-9181-PF-48	C	From Leg	3.000	0.0000	125.000	No Ice	2.561	1.342	0.022
(Dish Wireless - P)			0.000			1/2" Ice	2.760	1.498	0.043
			0.000			1" Ice	2.967	1.662	0.067
						2" Ice	3.402	2.012	0.125
8'x2" STD Pipe Mount	A	From Leg	3.000	0.0000	125.000	No Ice	1.900	1.900	0.029
(Dish Wireless - P)			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
8'x2" STD Pipe Mount	B	From Leg	3.000	0.0000	125.000	No Ice	1.900	1.900	0.029
(Dish Wireless - P)			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
8'x2" STD Pipe Mount	C	From Leg	3.000	0.0000	125.000	No Ice	1.900	1.900	0.029
(Dish Wireless - P)			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
1/3 Remaining Reserved	A	From Leg	3.000	0.0000	125.000	No Ice	5.885	5.885	0.063
Rights			0.000			1/2" Ice	6.905	6.905	0.094
(Dish Wireless - R)			0.000			1" Ice	7.925	7.925	0.126
						2" Ice	9.965	9.965	0.188
1/3 Remaining Reserved	B	From Leg	3.000	0.0000	125.000	No Ice	5.885	5.885	0.063
Rights			0.000			1/2" Ice	6.905	6.905	0.094
(Dish Wireless - R)			0.000			1" Ice	7.925	7.925	0.126
						2" Ice	9.965	9.965	0.188
1/3 Remaining Reserved	C	From Leg	3.000	0.0000	125.000	No Ice	5.885	5.885	0.063
Rights			0.000			1/2" Ice	6.905	6.905	0.094
(Dish Wireless - R)			0.000			1" Ice	7.925	7.925	0.126
						2" Ice	9.965	9.965	0.188
***									
(2) TPA65R-BU8D w/ Mount	A	From Leg	4.000	0.0000	136.000	No Ice	18.089	10.100	0.112
Pipe			0.000			1/2" Ice	18.722	11.522	0.232
(ATT-E)			0.000			1" Ice	19.362	12.796	0.362
						2" Ice	20.662	15.017	0.658
(2) TPA65R-BU8D w/ Mount	B	From Leg	4.000	0.0000	136.000	No Ice	18.089	10.100	0.112
Pipe			0.000			1/2" Ice	18.722	11.522	0.232
(ATT-E)			0.000			1" Ice	19.362	12.796	0.362
						2" Ice	20.662	15.017	0.658
(2) TPA65R-BU8D w/ Mount	C	From Leg	4.000	0.0000	136.000	No Ice	18.089	10.100	0.112
Pipe			0.000			1/2" Ice	18.722	11.522	0.232
(ATT-E)			0.000			1" Ice	19.362	12.796	0.362
						2" Ice	20.662	15.017	0.658
HPA65R-BU8A w/Mount	A	From Leg	0.000	0.0000	136.000	No Ice	18.564	10.575	0.094
Pipe			0.000			1/2" Ice	19.402	12.197	0.219
(ATT-E)			0.000			1" Ice	20.251	13.843	0.355
						2" Ice	21.844	16.531	0.665
HPA65R-BU8A w/Mount	B	From Leg	0.000	0.0000	136.000	No Ice	18.564	10.575	0.094
Pipe			0.000			1/2" Ice	19.402	12.197	0.219
(ATT-E)			0.000			1" Ice	20.251	13.843	0.355
						2" Ice	21.844	16.531	0.665
HPA65R-BU8A w/Mount	C	From Leg	0.000	0.0000	136.000	No Ice	18.564	10.575	0.094
Pipe			0.000			1/2" Ice	19.402	12.197	0.219
(ATT-E)			0.000			1" Ice	20.251	13.843	0.355

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	21.844	16.531	0.665
4478 B14 RRUS (18.1x13.4x8.3x59.4lbs) (ATT-E)	A	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.021 2.200 2.386 2.780	1.252 1.402 1.560 1.898	0.059 0.077 0.097 0.147
4478 B14 RRUS (18.1x13.4x8.3x59.4lbs) (ATT-E)	B	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.021 2.200 2.386 2.780	1.252 1.402 1.560 1.898	0.059 0.077 0.097 0.147
4478 B14 RRUS (18.1x13.4x8.3x59.4lbs) (ATT-E)	C	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.021 2.200 2.386 2.780	1.252 1.402 1.560 1.898	0.059 0.077 0.097 0.147
E2-700 (ATT-E)	A	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.083 3.301 3.526 3.998	1.243 1.392 1.553 1.901	0.052 0.075 0.101 0.163
E2-700 (ATT-E)	B	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.083 3.301 3.526 3.998	1.243 1.392 1.553 1.901	0.052 0.075 0.101 0.163
E2-700 (ATT-E)	C	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.083 3.301 3.526 3.998	1.243 1.392 1.553 1.901	0.052 0.075 0.101 0.163
Radio 4415 B30 (16.5x13.4x5.9x46lbs) (ATT-E)	A	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000
Radio 4415 B30 (16.5x13.4x5.9x46lbs) (ATT-E)	B	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000
Radio 4415 B30 (16.5x13.4x5.9x46lbs) (ATT-E)	C	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000
Radio 4449 (15.0x13.2x9.3x74lbs) (ATT-E)	A	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.650 1.810 1.978 2.336	1.163 1.301 1.447 1.762	0.074 0.090 0.109 0.155
Radio 4449 (15.0x13.2x9.3x74lbs) (ATT-E)	B	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.650 1.810 1.978 2.336	1.163 1.301 1.447 1.762	0.074 0.090 0.109 0.155
Radio 4449 (15.0x13.2x9.3x74lbs) (ATT-E)	C	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.650 1.810 1.978 2.336	1.163 1.301 1.447 1.762	0.074 0.090 0.109 0.155
8843 (15x13.2x11.1x75lbs) (ATT-E)	A	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.650 1.810 1.978 2.336	1.388 1.536 1.692 2.027	0.075 0.093 0.113 0.164
8843 (15x13.2x11.1x75lbs) (ATT-E)	B	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.650 1.810 1.978 2.336	1.388 1.536 1.692 2.027	0.075 0.093 0.113 0.164

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
8843 (15x13.2x11.1x75lbs) (ATT-E)	C	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.650 1.810 1.978 2.336	1.388 1.536 1.692 2.027	0.075 0.093 0.113 0.164
Unknown DC (ATT-E)	A	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.547 1.708 1.877 2.237	4.762 5.042 5.328 5.924	0.026 0.063 0.104 0.199
Unknown DC (ATT-E)	B	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.547 1.708 1.877 2.237	4.762 5.042 5.328 5.924	0.026 0.063 0.104 0.199
Unknown DC (ATT-E)	C	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.547 1.708 1.877 2.237	4.762 5.042 5.328 5.924	0.026 0.063 0.104 0.199
SM 602-1 (ATT-E)	A	None		0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	20.000 24.070 28.330 37.820	8.530 11.090 13.630 18.640	0.513 0.707 0.947 1.562
SM 602-1 (ATT-E)	B	None		0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	20.000 24.070 28.330 37.820	8.530 11.090 13.630 18.640	0.513 0.707 0.947 1.562
SM 602-1 (ATT-E)	C	None		0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	20.000 24.070 28.330 37.820	8.530 11.090 13.630 18.640	0.513 0.707 0.947 1.562
1/3 Remaining Reserved Rights (ATT - R)	A	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.149 1.300 1.451 1.753	1.149 1.300 1.451 1.753	0.012 0.018 0.024 0.035
1/3 Remaining Reserved Rights (ATT - R)	B	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.149 1.300 1.451 1.753	1.149 1.300 1.451 1.753	0.012 0.018 0.024 0.035
1/3 Remaining Reserved Rights (ATT - R)	C	From Leg	3.000 0.000 0.000	0.0000	136.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.149 1.300 1.451 1.753	1.149 1.300 1.451 1.753	0.012 0.018 0.024 0.035
***									
AIR32 KRD901146-1_B66A-B2A w/ Mount Pipe	A	From Leg	3.000 0.000 0.000	0.0000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.290 8.007 8.667 9.865	6.612 7.796 8.832 10.574	0.161 0.228 0.303 0.477
AIR32 KRD901146-1_B66A-B2A w/ Mount Pipe	B	From Leg	3.000 0.000 0.000	0.0000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.290 8.007 8.667 9.865	6.612 7.796 8.832 10.574	0.161 0.228 0.303 0.477
AIR32 KRD901146-1_B66A-B2A w/ Mount Pipe	C	From Leg	3.000 0.000 0.000	0.0000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.290 8.007 8.667 9.865	6.612 7.796 8.832 10.574	0.161 0.228 0.303 0.477
LNX-6515DS-A1M	A	From Leg	3.000 0.000 0.000	0.0000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice	11.912 12.733 13.564 15.104	10.071 11.692 13.337 16.021	0.087 0.179 0.281 0.521

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft ft ft*	*Azimuth Adjustment* °	*Placement* *ft*		*C_AA_A Front* *ft²*	*C_AA_A Side* *ft²*	*Weight* *K*
LNX-6515DS-A1M	B	From Leg	3.000	0.0000	150.000	No Ice	11.912	10.071	0.087
			0.000			1/2" Ice	12.733	11.692	0.179
			0.000			1" Ice	13.564	13.337	0.281
						2" Ice	15.104	16.021	0.521
LNX-6515DS-A1M	C	From Leg	3.000	0.0000	150.000	No Ice	11.912	10.071	0.087
			0.000			1/2" Ice	12.733	11.692	0.179
			0.000			1" Ice	13.564	13.337	0.281
						2" Ice	15.104	16.021	0.521
APX16DWV-16DWV-S-E-A	A	From Leg	3.000	0.0000	150.000	No Ice	9.055	6.507	0.083
20 w/ Mount Pipe			0.000			1/2" Ice	9.778	7.722	0.157
			0.000			1" Ice	10.449	8.776	0.239
						2" Ice	11.679	10.545	0.429
APX16DWV-16DWV-S-E-A	B	From Leg	3.000	0.0000	150.000	No Ice	9.055	6.507	0.083
20 w/ Mount Pipe			0.000			1/2" Ice	9.778	7.722	0.157
			0.000			1" Ice	10.449	8.776	0.239
						2" Ice	11.679	10.545	0.429
APX16DWV-16DWV-S-E-A	C	From Leg	3.000	0.0000	150.000	No Ice	9.055	6.507	0.083
20 w/ Mount Pipe			0.000			1/2" Ice	9.778	7.722	0.157
			0.000			1" Ice	10.449	8.776	0.239
						2" Ice	11.679	10.545	0.429
RRUS 11 B12	A	From Leg	3.000	0.0000	150.000	No Ice	2.833	1.182	0.051
			0.000			1/2" Ice	3.043	1.330	0.072
			0.000			1" Ice	3.259	1.485	0.095
						2" Ice	3.715	1.826	0.153
RRUS 11 B12	B	From Leg	3.000	0.0000	150.000	No Ice	2.833	1.182	0.051
			0.000			1/2" Ice	3.043	1.330	0.072
			0.000			1" Ice	3.259	1.485	0.095
						2" Ice	3.715	1.826	0.153
RRUS 11 B12	C	From Leg	3.000	0.0000	150.000	No Ice	2.833	1.182	0.051
			0.000			1/2" Ice	3.043	1.330	0.072
			0.000			1" Ice	3.259	1.485	0.095
						2" Ice	3.715	1.826	0.153
RRUS 11 B4	A	From Leg	3.000	0.0000	150.000	No Ice	2.784	1.187	0.051
			0.000			1/2" Ice	2.992	1.334	0.071
			0.000			1" Ice	3.207	1.490	0.095
						2" Ice	3.658	1.833	0.153
RRUS 11 B4	B	From Leg	3.000	0.0000	150.000	No Ice	2.784	1.187	0.051
			0.000			1/2" Ice	2.992	1.334	0.071
			0.000			1" Ice	3.207	1.490	0.095
						2" Ice	3.658	1.833	0.153
RRUS 11 B4	C	From Leg	3.000	0.0000	150.000	No Ice	2.784	1.187	0.051
			0.000			1/2" Ice	2.992	1.334	0.071
			0.000			1" Ice	3.207	1.490	0.095
						2" Ice	3.658	1.833	0.153
IBR-1300	B	From Leg	3.000	0.0000	150.000	No Ice	0.672	0.307	0.008
			0.000			1/2" Ice	0.776	0.384	0.013
			0.000			1" Ice	0.888	0.470	0.020
						2" Ice	1.133	0.668	0.040
SM 602-1	A	None		0.0000	150.000	No Ice	20.000	8.530	0.513
						1/2" Ice	24.070	11.090	0.707
						1" Ice	28.330	13.630	0.947
						2" Ice	37.820	18.640	1.562
SM 602-1	B	None		0.0000	150.000	No Ice	20.000	8.530	0.513
						1/2" Ice	24.070	11.090	0.707
						1" Ice	28.330	13.630	0.947
						2" Ice	37.820	18.640	1.562
SM 602-1	C	None		0.0000	150.000	No Ice	20.000	8.530	0.513

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1/2" Ice	24.070	11.090	0.707
						1" Ice	28.330	13.630	0.947
						2" Ice	37.820	18.640	1.562
1/3 Remaining Reserved Rights (TMO - R)	A	From Leg	3.000 0.000 0.000	0.0000	150.000	No Ice	22.346	22.346	0.257
						1/2" Ice	28.316	28.316	0.386
						1" Ice	34.287	34.287	0.515
						2" Ice	46.229	46.229	0.772
1/3 Remaining Reserved Rights (TMO - R)	B	From Leg	3.000 0.000 0.000	0.0000	150.000	No Ice	22.346	22.346	0.257
						1/2" Ice	28.316	28.316	0.386
						1" Ice	34.287	34.287	0.515
						2" Ice	46.229	46.229	0.772
1/3 Remaining Reserved Rights (TMO - R)	C	From Leg	3.000 0.000 0.000	0.0000	150.000	No Ice	22.346	22.346	0.257
						1/2" Ice	28.316	28.316	0.386
						1" Ice	34.287	34.287	0.515
						2" Ice	46.229	46.229	0.772
***									

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 150.000-100.000	123.592	1.323	0.045	139.454	A	0.000	139.454	139.454	100.00	0.000	0.000
					B	0.000	139.454		100.00	0.000	0.000
					C	0.000	139.454		100.00	0.000	0.000
L2 100.000-65.500	82.328	1.215	0.041	127.300	A	0.000	127.300	127.300	100.00	0.000	0.000
					B	0.000	127.300		100.00	0.000	0.000
					C	0.000	127.300		100.00	0.000	0.000
L3 65.500-32.300	48.729	1.088	0.037	145.588	A	0.000	145.588	145.588	100.00	0.000	0.000
					B	0.000	145.588		100.00	0.000	0.000
					C	0.000	145.588		100.00	0.000	0.000
L4 32.300-0.000	16.164	0.862	0.030	163.104	A	0.000	163.104	163.104	100.00	0.000	0.000
					B	0.000	163.104		100.00	0.000	0.000
					C	0.000	163.104		100.00	0.000	0.000

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1	123.592	1.323	0.008	1.7117	153.719	A	0.000	153.719	153.719	100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
150.000-100.000						B	0.000	153.719		100.00	0.000	0.000
						C	0.000	153.719		100.00	0.000	0.000
L2	82.328	1.215	0.007	1.6436	137.142	A	0.000	137.142	137.142	100.00	0.000	0.000
100.000-65.500						B	0.000	137.142		100.00	0.000	0.000
						C	0.000	137.142		100.00	0.000	0.000
L3	48.729	1.088	0.007	1.5596	154.682	A	0.000	154.682	154.682	100.00	0.000	0.000
65.500-32.300						B	0.000	154.682		100.00	0.000	0.000
						C	0.000	154.682		100.00	0.000	0.000
L4 32.300-0.000	16.164	0.862	0.005	1.3967	171.500	A	0.000	171.500	171.500	100.00	0.000	0.000
						B	0.000	171.500		100.00	0.000	0.000
						C	0.000	171.500		100.00	0.000	0.000

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	123.592	1.323	0.010	139.454	A	0.000	139.454	139.454	100.00	0.000	0.000
150.000-100.0					B	0.000	139.454		100.00	0.000	0.000
00					C	0.000	139.454		100.00	0.000	0.000
L2	82.328	1.215	0.009	127.300	A	0.000	127.300	127.300	100.00	0.000	0.000
100.000-65.50					B	0.000	127.300		100.00	0.000	0.000
0					C	0.000	127.300		100.00	0.000	0.000
L3	48.729	1.088	0.008	145.588	A	0.000	145.588	145.588	100.00	0.000	0.000
65.500-32.300					B	0.000	145.588		100.00	0.000	0.000
					C	0.000	145.588		100.00	0.000	0.000
L4	16.164	0.862	0.007	163.104	A	0.000	163.104	163.104	100.00	0.000	0.000
32.300-0.000					B	0.000	163.104		100.00	0.000	0.000
					C	0.000	163.104		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	0.154	5.298	A	1	0.73	0.045	1	1	139.454	5.040	0.101	C
150.000-100.0			B	1	0.73		1	1	139.454			
00			C	1	0.73		1	1	139.454			
L2	0.145	7.348	A	1	0.73	0.041	1	1	127.300	4.223	0.122	C
100.000-65.50			B	1	0.73		1	1	127.300			
0			C	1	0.73		1	1	127.300			
L3	0.139	8.742	A	1	0.73	0.037	1	1	145.588	4.315	0.130	C
65.500-32.300			B	1	0.73		1	1	145.588			
			C	1	0.73		1	1	145.588			
L4	0.136	10.102	A	1	0.73	0.030	1	1	163.104	3.981	0.123	C
32.300-0.000			B	1	0.73		1	1	163.104			
			C	1	0.73		1	1	163.104			
Sum Weight:	0.574	31.490						OTM	1245.225	17.559		

Section Elevation *ft*	*Add Weight* *K*	*Self Weight* *K*	*Face*	*e*	C_F	q_z *ksf*	D_F	D_R	A_E ft^2	*F* *K*	*w* *klf*	*Ctrl. Face*
									kip-ft			

Tower Forces - No Ice - Wind 60 To Face

Section Elevation *ft*	*Add Weight* *K*	*Self Weight* *K*	*Face*	*e*	C_F	q_z *ksf*	D_F	D_R	A_E ft^2	*F* *K*	*w* *klf*	*Ctrl. Face*
L1 150.000-100.000	0.154	5.298	A	1	0.73	0.045	1	1	139.454	5.040	0.101	C
			B	1	0.73		1	1	139.454			
			C	1	0.73		1	1	139.454			
L2 100.000-65.500	0.145	7.348	A	1	0.73	0.041	1	1	127.300	4.223	0.122	C
			B	1	0.73		1	1	127.300			
			C	1	0.73		1	1	127.300			
L3 65.500-32.300	0.139	8.742	A	1	0.73	0.037	1	1	145.588	4.315	0.130	C
			B	1	0.73		1	1	145.588			
			C	1	0.73		1	1	145.588			
L4 32.300-0.000	0.136	10.102	A	1	0.73	0.030	1	1	163.104	3.981	0.123	C
			B	1	0.73		1	1	163.104			
			C	1	0.73		1	1	163.104			
Sum Weight:	0.574	31.490						OTM	1245.225 kip-ft	17.559		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation *ft*	*Add Weight* *K*	*Self Weight* *K*	*Face*	*e*	C_F	q_z *ksf*	D_F	D_R	A_E ft^2	*F* *K*	*w* *klf*	*Ctrl. Face*
L1 150.000-100.000	0.154	5.298	A	1	0.73	0.045	1	1	139.454	5.040	0.101	C
			B	1	0.73		1	1	139.454			
			C	1	0.73		1	1	139.454			
L2 100.000-65.500	0.145	7.348	A	1	0.73	0.041	1	1	127.300	4.223	0.122	C
			B	1	0.73		1	1	127.300			
			C	1	0.73		1	1	127.300			
L3 65.500-32.300	0.139	8.742	A	1	0.73	0.037	1	1	145.588	4.315	0.130	C
			B	1	0.73		1	1	145.588			
			C	1	0.73		1	1	145.588			
L4 32.300-0.000	0.136	10.102	A	1	0.73	0.030	1	1	163.104	3.981	0.123	C
			B	1	0.73		1	1	163.104			
			C	1	0.73		1	1	163.104			
Sum Weight:	0.574	31.490						OTM	1245.225 kip-ft	17.559		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 150.000-100.000	0.154	8.965	A	1	1.2	0.008	1	1	153.719	1.612	0.032	C
			B	1	1.2		1	1	153.719			
			C	1	1.2		1	1	153.719			
L2 100.000-65.500	0.145	10.520	A	1	1.2	0.007	1	1	136.750	1.317	0.038	C
			B	1	1.2		1	1	136.750			
			C	1	1.2		1	1	136.750			
L3 65.500-32.300	0.139	12.158	A	1	1.2	0.007	1	1	154.218	1.326	0.040	C
			B	1	1.2		1	1	154.218			
			C	1	1.2		1	1	154.218			
L4 32.300-0.000	0.136	13.507	A	1	1.2	0.005	1	1	170.622	1.209	0.037	C
			B	1	1.2		1	1	170.622			
			C	1	1.2		1	1	170.622			
Sum Weight:	0.574	45.149						OTM	391.830 kip-ft	5.464		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 150.000-100.000	0.154	8.965	A	1	1.2	0.008	1	1	153.719	1.612	0.032	C
			B	1	1.2		1	1	153.719			
			C	1	1.2		1	1	153.719			
L2 100.000-65.500	0.145	10.520	A	1	1.2	0.007	1	1	136.750	1.317	0.038	C
			B	1	1.2		1	1	136.750			
			C	1	1.2		1	1	136.750			
L3 65.500-32.300	0.139	12.158	A	1	1.2	0.007	1	1	154.218	1.326	0.040	C
			B	1	1.2		1	1	154.218			
			C	1	1.2		1	1	154.218			
L4 32.300-0.000	0.136	13.507	A	1	1.2	0.005	1	1	170.622	1.209	0.037	C
			B	1	1.2		1	1	170.622			
			C	1	1.2		1	1	170.622			
Sum Weight:	0.574	45.149						OTM	391.830 kip-ft	5.464		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 150.000-100.000	0.154	8.965	A	1	1.2	0.008	1	1	153.719	1.612	0.032	C
			B	1	1.2		1	1	153.719			
			C	1	1.2		1	1	153.719			
L2	0.145	10.520	A	1	1.2	0.007	1	1	136.750	1.317	0.038	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
100.000-65.500			B	1	1.2		1	1	136.750			
			C	1	1.2		1	1	136.750			
L3 65.500-32.300	0.139	12.158	A	1	1.2	0.007	1	1	154.218	1.326	0.040	C
			B	1	1.2		1	1	154.218			
			C	1	1.2		1	1	154.218			
L4 32.300-0.000	0.136	13.507	A	1	1.2	0.005	1	1	170.622	1.209	0.037	C
			B	1	1.2		1	1	170.622			
			C	1	1.2		1	1	170.622			
Sum Weight:	0.574	45.149						OTM	391.830 kip-ft	5.464		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 150.000-100.000	0.154	5.298	A	1	0.73	0.010	1	1	139.454	1.146	0.023	C
			B	1	0.73		1	1	139.454			
			C	1	0.73		1	1	139.454			
L2 100.000-65.500	0.145	7.348	A	1	0.73	0.009	1	1	127.300	0.961	0.028	C
			B	1	0.73		1	1	127.300			
			C	1	0.73		1	1	127.300			
L3 65.500-32.300	0.139	8.742	A	1	0.73	0.008	1	1	145.588	0.981	0.030	C
			B	1	0.73		1	1	145.588			
			C	1	0.73		1	1	145.588			
L4 32.300-0.000	0.136	10.102	A	1	0.73	0.007	1	1	163.104	0.906	0.028	C
			B	1	0.73		1	1	163.104			
			C	1	0.73		1	1	163.104			
Sum Weight:	0.574	31.490						OTM	283.238 kip-ft	3.994		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 150.000-100.000	0.154	5.298	A	1	0.73	0.010	1	1	139.454	1.146	0.023	C
			B	1	0.73		1	1	139.454			
			C	1	0.73		1	1	139.454			
L2 100.000-65.500	0.145	7.348	A	1	0.73	0.009	1	1	127.300	0.961	0.028	C
			B	1	0.73		1	1	127.300			
			C	1	0.73		1	1	127.300			
L3 65.500-32.300	0.139	8.742	A	1	0.73	0.008	1	1	145.588	0.981	0.030	C
			B	1	0.73		1	1	145.588			
			C	1	0.73		1	1	145.588			
L4 32.300-0.000	0.136	10.102	A	1	0.73	0.007	1	1	163.104	0.906	0.028	C
			B	1	0.73		1	1	163.104			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
			C	1	0.73		1	1	163.104			
Sum Weight:	0.574	31.490						OTM	283.238 kip-ft	3.994		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 150.000-100.000	0.154	5.298	A	1	0.73	0.010	1	1	139.454	1.146	0.023	C
			B	1	0.73		1	1	139.454			
			C	1	0.73		1	1	139.454			
L2 100.000-65.500	0.145	7.348	A	1	0.73	0.009	1	1	127.300	0.961	0.028	C
			B	1	0.73		1	1	127.300			
			C	1	0.73		1	1	127.300			
L3 65.500-32.300	0.139	8.742	A	1	0.73	0.008	1	1	145.588	0.981	0.030	C
			B	1	0.73		1	1	145.588			
			C	1	0.73		1	1	145.588			
L4 32.300-0.000	0.136	10.102	A	1	0.73	0.007	1	1	163.104	0.906	0.028	C
			B	1	0.73		1	1	163.104			
			C	1	0.73		1	1	163.104			
Sum Weight:	0.574	31.490						OTM	283.238 kip-ft	3.994		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	31.490					
Bracing Weight	0.000					
Total Member Self-Weight	31.490			0.065	0.055	
Total Weight	41.578			0.065	0.055	
Wind 0 deg - No Ice		0.014	-39.657	-4341.758	-1.588	-0.157
Wind 90 deg - No Ice		39.689	-0.014	-1.579	-4345.926	0.143
Wind 180 deg - No Ice		-0.014	39.657	4341.887	1.698	0.157
Member Ice	13.659					
Total Weight Ice	74.196			0.309	0.286	
Wind 0 deg - Ice		0.003	-11.466	-1235.932	-0.017	-0.035
Wind 90 deg - Ice		11.473	-0.003	0.005	-1236.802	0.039
Wind 180 deg - Ice		-0.003	11.466	1236.550	0.590	0.035
Total Weight	41.578			0.065	0.055	
Wind 0 deg - Service		0.003	-9.020	-987.524	-0.319	-0.036
Wind 90 deg - Service		9.028	-0.003	-0.309	-988.479	0.032
Wind 180 deg - Service		-0.003	9.020	987.653	0.429	0.036

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 90 deg - No Ice
5	0.9 Dead+1.0 Wind 90 deg - No Ice
6	1.2 Dead+1.0 Wind 180 deg - No Ice
7	0.9 Dead+1.0 Wind 180 deg - No Ice
8	1.2 Dead+1.0 Ice+1.0 Temp
9	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
10	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
11	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
12	Dead+Wind 0 deg - Service
13	Dead+Wind 90 deg - Service
14	Dead+Wind 180 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 100	Pole	Max Tension	13	0.000	0.000	0.000
			Max. Compression	8	-39.336	0.297	-0.322
			Max. Mx	4	-15.584	-889.242	0.052
			Max. My	6	-15.587	0.190	-888.554
			Max. Vy	4	27.458	-889.242	0.052
			Max. Vx	6	27.425	0.190	-888.554
			Max. Torque	7			-0.154
L2	100 - 65.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	8	-50.938	0.297	-0.322
			Max. Mx	4	-24.069	-1867.185	0.540
			Max. My	6	-24.071	0.685	-1865.413
			Max. Vy	4	31.460	-1867.185	0.540
			Max. Vx	6	31.427	0.685	-1865.413
			Max. Torque	7			-0.153
L3	65.5 - 32.3	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	8	-64.966	0.297	-0.322
			Max. Mx	4	-34.613	-2945.175	1.014
			Max. My	6	-34.615	1.162	-2942.354
			Max. Vy	4	35.406	-2945.175	1.014
			Max. Vx	6	35.374	1.162	-2942.354
			Max. Torque	7			-0.153
L4	32.3 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	8	-84.539	0.297	-0.322
			Max. Mx	4	-49.875	-4455.377	1.600
			Max. My	6	-49.875	1.749	-4451.266
			Max. Vy	4	39.710	-4455.377	1.600
			Max. Vx	6	39.679	1.749	-4451.266
			Max. Torque	7			-0.153

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	8	84.539	0.000	0.000
	Max. H_x	7	37.420	0.014	-39.656
	Max. H_z	3	37.420	-0.014	39.656
	Max. M_x	2	4451.104	-0.014	39.656
	Max. M_z	4	4455.377	-39.688	0.014
	Max. Torsion	3	0.153	-0.014	39.656
	Min. Vert	5	37.420	-39.688	0.014
	Min. H_x	5	37.420	-39.688	0.014
	Min. H_z	7	37.420	0.014	-39.656
	Min. M_x	6	-4451.266	0.014	-39.656
	Min. M_z	6	-1.749	0.014	-39.656
	Min. Torsion	7	-0.153	0.014	-39.656

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	41.578	0.000	0.000	0.065	0.055	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	49.893	0.014	-39.656	-4451.104	-1.613	-0.151
0.9 Dead+1.0 Wind 0 deg - No Ice	37.420	0.014	-39.656	-4422.307	-1.620	-0.153
1.2 Dead+1.0 Wind 90 deg - No Ice	49.893	39.688	-0.014	-1.600	-4455.377	0.142
0.9 Dead+1.0 Wind 90 deg - No Ice	37.420	39.688	-0.014	-1.611	-4426.548	0.142
1.2 Dead+1.0 Wind 180 deg - No Ice	49.893	-0.014	39.656	4451.266	1.749	0.152
0.9 Dead+1.0 Wind 180 deg - No Ice	37.420	-0.014	39.656	4422.426	1.721	0.153
1.2 Dead+1.0 Ice+1.0 Temp	84.539	0.000	0.000	0.322	0.297	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	84.539	0.003	-11.466	-1306.226	0.010	-0.029
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	84.539	11.473	-0.003	0.039	-1307.152	0.039
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	84.539	-0.003	11.466	1306.941	0.648	0.029
Dead+Wind 0 deg - Service	41.578	0.003	-9.019	-1008.649	-0.324	-0.035
Dead+Wind 90 deg - Service	41.578	9.026	-0.003	-0.314	-1009.626	0.032
Dead+Wind 180 deg - Service	41.578	-0.003	9.019	1008.783	0.438	0.035

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-41.578	0.000	0.000	41.578	0.000	0.000%
2	0.014	-49.893	-39.657	-0.014	49.893	39.656	0.002%
3	0.014	-37.420	-39.657	-0.014	37.420	39.656	0.002%
4	39.689	-49.893	-0.014	-39.688	49.893	0.014	0.002%
5	39.689	-37.420	-0.014	-39.688	37.420	0.014	0.002%
6	-0.014	-49.893	39.657	0.014	49.893	-39.656	0.002%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
7	-0.014	-37.420	39.657	0.014	37.420	-39.656	0.002%
8	0.000	-84.539	0.000	0.000	84.539	0.000	0.000%
9	0.003	-84.539	-11.466	-0.003	84.539	11.466	0.000%
10	11.473	-84.539	-0.003	-11.473	84.539	0.003	0.000%
11	-0.003	-84.539	11.466	0.003	84.539	-11.466	0.000%
12	0.003	-41.578	-9.020	-0.003	41.578	9.019	0.003%
13	9.028	-41.578	-0.003	-9.026	41.578	0.003	0.003%
14	-0.003	-41.578	9.020	0.003	41.578	-9.019	0.003%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00005723
3	Yes	5	0.00000001	0.00004805
4	Yes	5	0.00000001	0.00005695
5	Yes	5	0.00000001	0.00004780
6	Yes	5	0.00000001	0.00006041
7	Yes	5	0.00000001	0.00005040
8	Yes	4	0.00000001	0.00000001
9	Yes	7	0.00000001	0.00008491
10	Yes	7	0.00000001	0.00008498
11	Yes	7	0.00000001	0.00008501
12	Yes	4	0.00000001	0.00009667
13	Yes	4	0.00000001	0.00009674
14	Yes	4	0.00000001	0.00009676

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 100	16.222	13	0.9439	0.0001
L2	105.5 - 65.5	8.129	13	0.7247	0.0001
L3	72.3 - 32.3	3.833	13	0.4929	0.0000
L4	40.1 - 0	1.203	13	0.2675	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.000	AIR32 KRD901146-1_B66A-B2A w/ Mount Pipe	13	16.222	0.9439	0.0001	61020
136.000	(2) TPA65R-BU8D w/ Mount Pipe	13	13.512	0.8827	0.0001	21792
125.000	LP 716	13	11.453	0.8313	0.0001	12203

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 100	71.591	4	4.1677	0.0005
L2	105.5 - 65.5	35.882	4	3.1999	0.0003
L3	72.3 - 32.3	16.919	4	2.1764	0.0001
L4	40.1 - 0	5.308	4	1.1811	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.000	AIR32 KRD901146-1_B66A-B2A w/ Mount Pipe	4	71.591	4.1677	0.0005	13946
136.000	(2) TPA65R-BU8D w/ Mount Pipe	4	59.635	3.8976	0.0004	4979
125.000	LP 716	4	50.551	3.6706	0.0004	2787

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 100 (1)	TP39.6x26.4x0.3	50.000	150.000	134.0	36.0389	-15.584	453.637	0.034
L2	100 - 65.5 (2)	TP48.3x37.548x0.4	40.000	150.000	110.1	58.4932	-24.069	1091.020	0.022
L3	65.5 - 32.3 (3)	TP56.3x45.6722x0.4	40.000	150.000	94.2	68.3395	-34.613	1720.030	0.020
L4	32.3 - 0 (4)	TP64x53.4276x0.4	40.100	150.000	79.7	80.7466	-49.875	2581.700	0.019

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 100 (1)	TP39.6x26.4x0.3	889.242	1921.217	0.463	0.000	1921.217	0.000
L2	100 - 65.5 (2)	TP48.3x37.548x0.4	1867.183	3906.250	0.478	0.000	3906.250	0.000
L3	65.5 - 32.3 (3)	TP56.3x45.6722x0.4	2945.175	5065.300	0.581	0.000	5065.300	0.000
L4	32.3 - 0 (4)	TP64x53.4276x0.4	4455.375	6598.100	0.675	0.000	6598.100	0.000

Pole Shear Design Data

Section No.	*Elevation* *ft*	*Size*	*Actual* V_u *K*	ϕV_n *K*	*Ratio* $\frac{V_u}{\phi V_n}$	*Actual* T_u *kip-ft*	ϕT_n *kip-ft*	*Ratio* $\frac{T_u}{\phi T_n}$
L1	150 - 100 (1)	TP39.6x26.4x0.3	27.458	632.482	0.043	0.142	2096.383	0.000
L2	100 - 65.5 (2)	TP48.3x37.548x0.4	31.460	1026.560	0.031	0.142	4141.917	0.000
L3	65.5 - 32.3 (3)	TP56.3x45.6722x0.4	35.406	1199.360	0.030	0.142	5653.708	0.000
L4	32.3 - 0 (4)	TP64x53.4276x0.4	39.710	1417.100	0.028	0.142	7892.933	0.000

Pole Interaction Design Data

Section No.	*Elevation* *ft*	*Ratio* $\frac{P_u}{\phi P_n}$	*Ratio* $\frac{M_{ux}}{\phi M_{nx}}$	*Ratio* $\frac{M_{uy}}{\phi M_{ny}}$	*Ratio* $\frac{V_u}{\phi V_n}$	*Ratio* $\frac{T_u}{\phi T_n}$	*Comb. Stress Ratio*	*Allow. Stress Ratio*	*Criteria*
L1	150 - 100 (1)	0.034	0.463	0.000	0.043	0.000	0.499	1.000	4.8.2
L2	100 - 65.5 (2)	0.022	0.478	0.000	0.031	0.000	0.501	1.000	4.8.2
L3	65.5 - 32.3 (3)	0.020	0.581	0.000	0.030	0.000	0.602	1.000	4.8.2
L4	32.3 - 0 (4)	0.019	0.675	0.000	0.028	0.000	0.695	1.000	4.8.2

Section Capacity Table

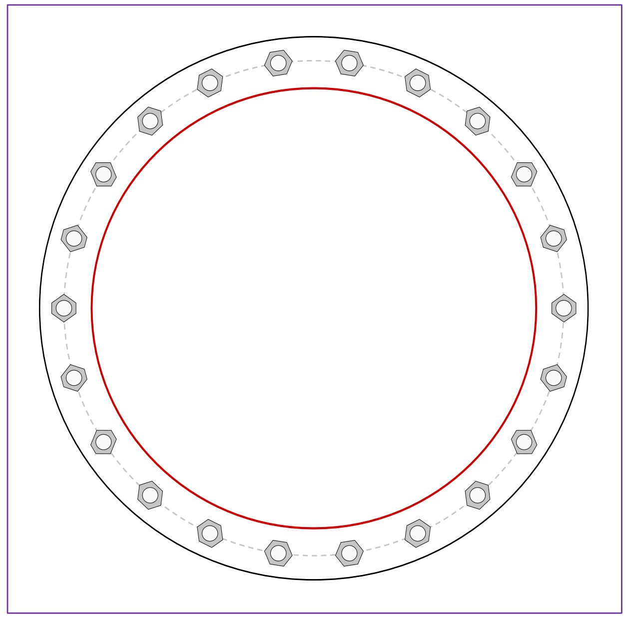
Section No.	*Elevation ft*	*Component Type*	*Size*	*Critical Element*	*P K*	$øP_{allow}$ *K*	*% Capacity*	*Pass Fail*
L1	150 - 100	Pole	TP39.6x26.4x0.3	1	-15.584	453.637	49.9	Pass
L2	100 - 65.5	Pole	TP48.3x37.548x0.4	2	-24.069	1091.020	50.1	Pass
L3	65.5 - 32.3	Pole	TP56.3x45.6722x0.4	3	-34.613	1720.030	60.2	Pass
L4	32.3 - 0	Pole	TP64x53.4276x0.4	4	-49.875	2581.700	69.5	Pass
							Summary	
						Pole (L4)	69.5	Pass
						RATING =	**69.5**	**Pass**

Monopole Base Plate Connection

Site Info	
BU #	US-CT-5018
Site Name	
Order #	

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
I_{ar} (in)	1

Applied Loads	
Moment (kip-ft)	4455.38
Axial Force (kips)	49.88
Shear Force (kips)	39.71



Connection Properties

Anchor Rod Data

(22) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 72" BC

Base Plate Data

79" OD x 2" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Stiffener Data

N/A

Pole Data

64" x 0.4" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_c = 137.22	ϕPn_c = 268.39	**Stress Rating**
Vu = 1.81	ϕVn = 120.77	**51.2%**
Mu = n/a	ϕMn = n/a	Pass

Base Plate Summary

Max Stress (ksi):	36.95	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	**82.1%**	Pass

Drilled Pier Foundation

BU # :	US-CT-5018
Site Name:	
Order Number:	

Report File:

TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	4455	
Axial Force (kips)	50	
Shear Force (kips)	40	

Material Properties		
Concrete Strength, f'c:	4.5	ksi
Rebar Strength, Fy:	60	ksi
Tie Yield Strength, Fyt:	60	ksi

Pier Design Data		
Depth	24	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 24' below grade		
Pier Diameter	8	ft
Rebar Quantity	38	
Rebar Size	10	
Clear Cover to Ties	3	in
Tie Size	5	
Tie Spacing	12	in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	7.90	-
Soil Safety Factor	5.49	-
Max Moment (kip-ft)	4917.17	-
Rating	*24.2%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	933.05	-
End Bearing (kips)	2365.56	-
Weight of Concrete (kips)	168.97	-
Total Capacity (kips)	3298.61	-
Axial (kips)	218.97	-
Rating	*6.6%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	7.45	-
Critical Moment (kip-ft)	4915.53	-
Critical Moment Capacity	9124.40	-
Rating	*53.9%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	19.49	-
Critical Shear (kip)	876.04	-
Critical Shear Capacity	1050.65	-
Rating	*83.4%*	-

Soil Interaction Rating	**24.2%**
Structural Foundation Rating	**83.4%**

Check Limitation	
Apply TIA-222-H Section 15.5:	☐
N/A	☐
Shear Design Options	
Check Shear along Depth of Pier:	☑
Utilize Shear-Friction Methodology:	☐
Override Critical Depth:	☐

Go to Soil Calculations

Soil Profile

Groundwater Depth	10	# of Layers	6

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Net Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	2	2	105	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	2	4	2	120	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
3	4	5	1	120	150	0	34	0.000	0.000	0.00	0.00			Cohesionless
4	5	10	5	130	150	0	38	0.000	0.000	1.50	1.50			Cohesionless
5	10	15	5	67.6	87.6	0	38	0.000	0.000	2.10	2.10			Cohesionless
6	15	24	9	97.6	87.6	15	0	6.750	6.750	3.50	3.50	60		Cohesive

Pier and Pad Foundation

BU # :	US-CT-5018
Site Name:	
App. Number:	

TIA-222 Revision:	H
Tower Type:	Monopole

Top & Bot. Pad Rein. Different?:	☐
Block Foundation?:	☐
Rectangular Pad?:	☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	50	kips
Base Shear, Vu_comp:	40	kips
Moment, M_u:	4455	ft-kips
Tower Height, **H**:	150	ft
BP Dist. Above Fdn, bp_{dist}:	0	in

Foundation Analysis Checks	Capacity	Demand	Rating	Check
Lateral (Sliding) (kips)	382.77	40.00	**10.5%**	**Pass**
Bearing Pressure (ksf)	22.50	2.14	**9.5%**	**Pass**
*Overturning (kip*ft)*	9475.38	4775.00	**50.4%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	8998.47	4655.00	**51.7%**	**Pass**
Pier Compression (kip)	35992.10	95.24	**0.3%**	**Pass**
*Pad Flexure (kip*ft)*	8139.63	1585.81	**19.5%**	**Pass**
Pad Shear - 1-way (kips)	1051.30	226.69	**21.6%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.201	0.039	**19.6%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	9891.57	2793.00	**28.2%**	**Pass**

Soil Rating:	**50.4%**
Structural Rating:	**51.7%**

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, **dpier**:	8	ft
Ext. Above Grade, **E**:	0.5	ft
Pier Rebar Size, **Sc**:	10	
Pier Rebar Quantity, **mc**:	38	
Pier Tie/Spiral Size, **St**:	5	
Pier Tie/Spiral Quantity, **mt**:	8	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	7.5	ft
Pad Width, W_1:	28	ft
Pad Thickness, **T**:	3	ft
Pad Rebar Size (Bottom dir. 2), Sp_2:	10	
Pad Rebar Quantity (Bottom dir. 2), mp_2:	48	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	5	ksi
Dry Concrete Density, **δc**:	150	pcf

Soil Properties			
Total Soil Unit Weight, **γ**:	105	pcf	
Ultimate Gross Bearing, Qult:	30.000	ksf	<--Toggle between Gross and Net
Cohesion, **Cu**:		ksf	
Friction Angle, **φ**:	38	degrees	
SPT Blow Count, N_{blows}:			
Base Friction, **μ**:	0.4		
Neglected Depth, **N**:	4.00	ft	
Foundation Bearing on Rock?	No		
Groundwater Depth, **gw**:	N/A	ft	

BU:	US-CT-2018	Structure:	A
WO:			
Order:		Rev:	

Location

	Decimal Degrees		Deg	Min	Sec
Lat:		+			
Long:		-			

Code and Site Parameters

Seismic Design Code:	TIA-222-H	
Site Soil:	D (Default)	Default
Risk Category:	II	

USGS Seismic Reference

S_S:	0.2020	g
S_1:	0.0560	g
T_L:	6	s

Seismic Design Category Determination

Importance Factor, I_e:	1	
Acceleration-based site coefficient, F_a:	1.6000	
Velocity-based site coefficient, F_v:	2.4000	
Design spectral response acceleration short period, S_{DS}:	0.2155	g
Design spectral response acceleration 1 s period, S_{D1}:	0.0896	g
Seismic Design Category Based on S_{DS}:	B	
Seismic Design Category Based on S_{D1}:	B	
Seismic Design Category Based on S_1:	N/A	
Controlling Seismic Design Category:	B	

CROWN CASTLE

BU:	US-CT-2018	Structure:	A
WO:			
Order:		Rev:	

Tower Details

Tower Type:	Tapered Monopole		
Height, h:	150	ft	
Effective Seismic Weight, W:	41.58	kips	
Amplification Factor, A_s:	1.0		2.7.8.1

Seismic Base Shear

Response Modification Factor, R:	1.5		
Discrete Appurtenance Weight in Top 1/3 of Structure, W_u:	9.513551	kips	
W_L:	32.06301589	kips	
E:	29000.0	ksi	
g:	386.088	in/s^2	
Average Moment of Inertia, I_{avg}:	16748.78545	in^4	
F_a:	0.378230463	hz	
Approximate Fundamental Period Monopole, T_a:	2.6439	s	2.7.7.1.3.3
Seismic Response Coefficient, C_s	0.1436		2.7.7.1.1
Seismic Response Coefficient Max 1, C_{smax}	0.0226		2.7.7.1.1
Seismic Response Coefficient Max 2, C_{smax}	N/A		2.7.7.1.1
Seismic Response Coefficient Min 1, C_{smin}	0.0300		2.7.7.1.1
Seismic Response Coefficient Min 2, C_{smin}	N/A		2.7.7.1.1
Controlling Seismic Response Coefficient, C_{sc}	0.0300		
Seismic Base Shear, V	1.247	kips	2.7.7.1.1

Vertical Distribution Factors

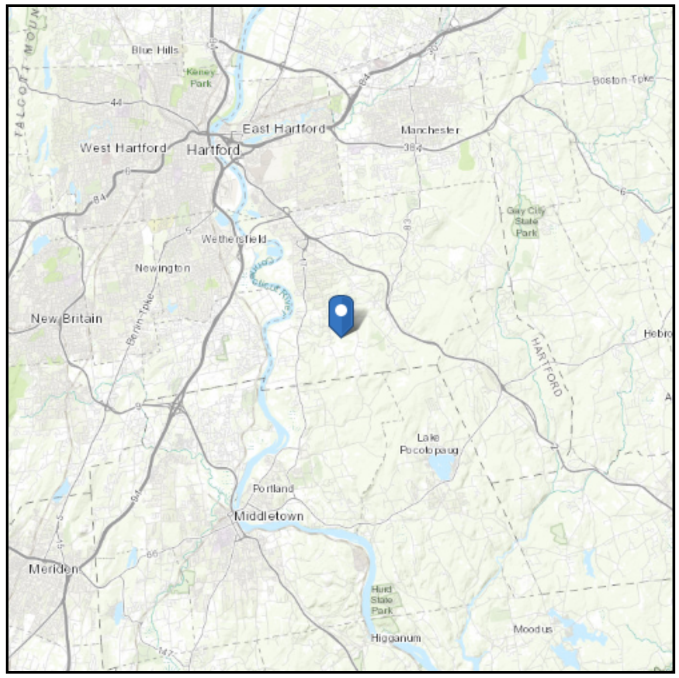
Period Related Exponent, k:	2.000	2.7.7.1.2
Sum of $w_i h_i^k$	351684.60	2.7.7.1.2

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Elevation: 310.29 ft (NAVD 88)
Latitude: 41.660792
Longitude: -72.574097



Wind

Results:

Wind Speed:	119 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	98 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Wed May 19 2021

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 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 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

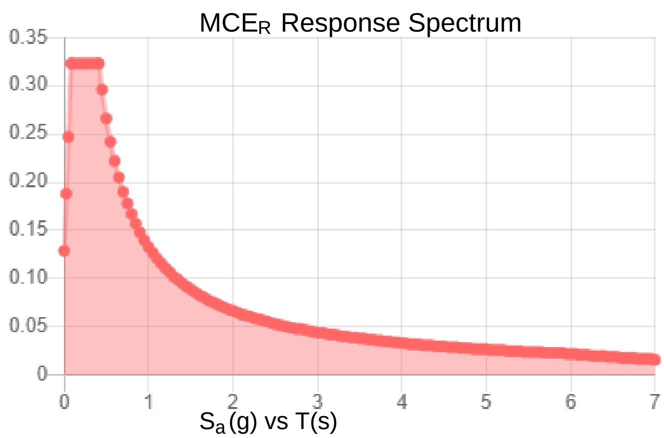
Seismic

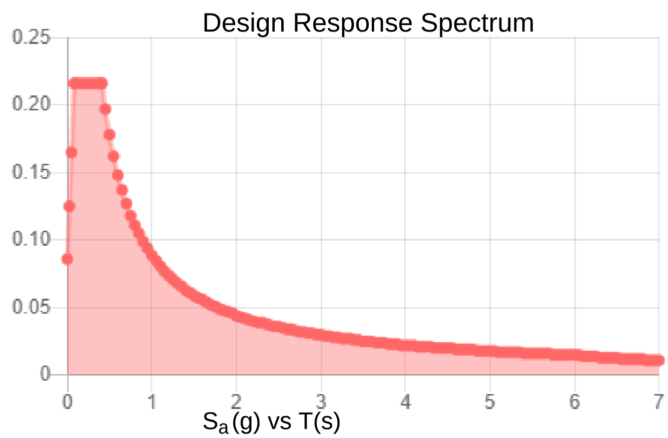
Site Soil Class: D - Default (see Section 11.4.3)

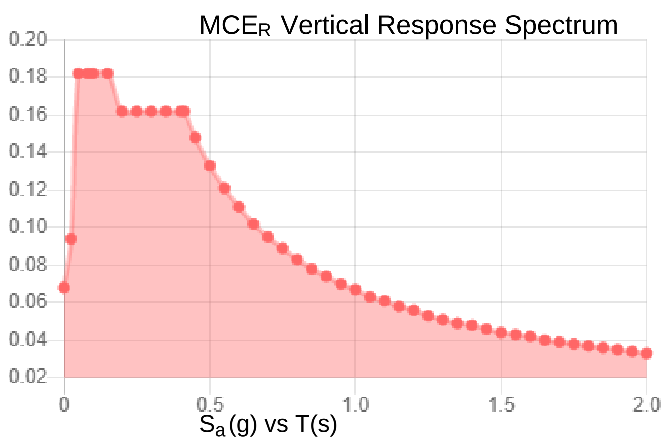
Results:

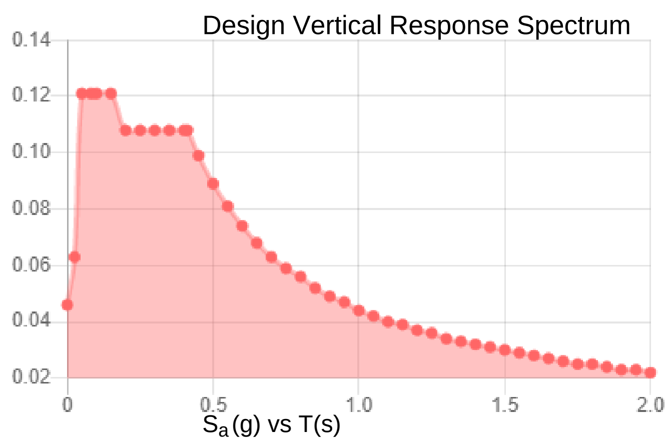
S_S :	0.202	S_{D1} :	0.089
S_1 :	0.056	T_L :	6
F_a :	1.6	PGA :	0.111
F_v :	2.4	PGA_M :	0.175
S_{MS} :	0.323	F_{PGA} :	1.578
S_{M1} :	0.133	I_e :	1
S_{DS} :	0.216	C_v :	0.704

Seismic Design Category B









Data Accessed: Wed May 19 2021

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Ice

Results:

Ice Thickness:	1.50 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Wed May 19 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 500-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.

Attachment 2:
Collocation Application

COLOCATION APPLICATION
US-CT-5018
Version 2
DISH Wireless L.L.C.

Vertical Bridge REIT, LLC.
750 Park of Commerce Drive
Suite 200
Boca Raton, FL 33487

SUMMARY

PRIMARY INFO

Application #: P-006914

Application Version: 2 (Submitted: 3/3/2021 10:12:00 PM)

Application Type: Broadband

Application Name: DISH Wireless BOBDL00104A

Lease Type: New Lease

Description:
Dish proposes to place 3 antennas, 6 RRUs, 1 junction box(s), and 1 cable(s) at the 125 foot RAD. Dish will require a 5' x 7' lease area for ground equipment

VERTICAL BRIDGE SITE INFO

VB Site #: US-CT-5018

VB Site Name: Hopewell

Latitude: 41.66079166

Longitude: -72.57409722

Structure Type: Monopole

Structure Height: 152.1600

Site Address: 63 Woodland St -
Glastonbury, CT 06073

VERTICAL BRIDGE DEAL TEAM

RLM: Floyd Jenkins
FJenkins@verticalbridge.com
(301) 667-0069

RLS: Sam Bowden
SBowden@verticalbridge.com

ROM: Joe Bascelli
JBascelli@verticalbridge.com
(484) 288-9586

TENANT LEGAL INFO

Tenant Legal Name: DISH Wireless L.L.C.

State of Registration: Colorado

Type of Entity: LLC

Carrier NOC #: 2039274317

Tenant Site #: BOBDL00104A

Tenant Site Name: BOBDL00104A

APPLICANT

Name: Mai Conaway

Address 1053 Farmington Avenue
Farmington, CT 06032

Phone Number:: (410) 409-3822

Email Address: mai@northeastsitesolutions.com

FINAL LEASED RIGHTS CONFIGURATION TOTALS

This is a summary of your remaining existing equipment plus the new equipment.

FINAL EQUIPMENT

Qty	Equipment Type
1	Junction Box
3	Panel
6	RRU

FINAL LINES

Qty	Line Type
1	Hybrid

Vertical Bridge REIT, LLC.
750 Park of Commerce Drive
Suite 200
Boca Raton, FL 33487

FREQUENCY & TECHNOLOGY INFO

Type of Technology: Broadband Wireless
Is TX Frequency Licensed: Yes
TX Frequency: 82.1884683
Is RX Frequency Licensed: Yes
RX Frequency: 9085.919815

MOUNT & STRUCTURAL ANALYSIS

MOUNT ANALYSIS

Provided by Tenant: No
To Be Run by VB: Yes
Include Mount Mapping: Yes

STRUCTURAL HARD COPIES

Required: No
Number of Hard Copies

CONTACTS

INVOICE CONTACT

Attention To	Name	Address	Phone Number 1	Phone Number 2	Email 1	Email 2
Real Estate	Jeanne Cottrell	5701 South Sante Fe Blvd Littleton, CO 80120	(203) 927-4317		jean.cottrell@dish.com	

PO CONTACT

Name	Phone Number	Email
Jeanne Cottrell	(203) 927-4317	jean.cottrell@dish.com

LEASING CONTACT

Name	Phone Number	Email
Mai Conaway	(410) 409-3822	mai@northeastsitesolutions.com

RF CONTACT

Name	Phone Number	Email
Jared Robinson	(978) 855-5870	jared.robinson@dish.com

TENANT CONSTRUCTION MANAGER CONTACT

Name	Phone Number	Email
Javier Soto	(617) 839-6514	javier.soto@dish.com

LINE & EQUIPMENT

Vertical Bridge REIT, LLC.
750 Park of Commerce Drive
Suite 200
Boca Raton, FL 33487

NEW LINE(S)

Qty	Line Type	Line Size(in.)	Line Location	Comments
1	Hybrid	1.6	Interior	

NEW EQUIPMENT

Qty	Equipment Type	RAD Height	Mount (H')	Mount Type	Manufacturer	Model Number	Dimensions (H"xW"xD")	Weight (Lbs.)	Azimuth	Comments
3	Panel	125.00	125.00	Platform	JMA	MX08F RO665-20_V0F	72.00 x 20.00 x 8.00	54.00	0,120,240	
1	Junction Box	125.00	125.00	Platform	Raycap	RDIDC-9181-PF-48	16.00 x 14.00 x 8.00	21.85	na	
6	RRU	125.00	125.00	Platform	Fujitsu	TA08025-B605	15.75 x 14.96 x 9.06	74.95	0, 120, 240	

NEW EQUIPMENT CABINET(S)

Quantity of Cabinets	Cabinet Dimensions (H x W x D)	Manufacturer	Comments
1	32.00 x 32.00 x 74.00	Charles(Amphenol) -H/EX	

ADDITIONAL SITE REQUIREMENTS

GROUND & INTERIOR SPACE REQUIREMENTS

Requirement Type	Total Lease Area (L x W)	Cabinet Required	Cabinet Area (L x W)	Shelter Required	Shelter Pad (L x W)	Comments
New	5.00 x 7.00	No	x		x	

GENERATOR REQUIREMENTS

Requirement Type	Fuel Type	Kilowatt Size	Pad Dimensions (L x D)	Generator Manufacturer	Fuel Tank Manufacturer	Comments
Not Required			x			

AC POWER REQUIREMENTS

Meter Type	Additional Details	Comments
New Tenant Meter		

BACKHAUL REQUIREMENTS

Requirement Type	Cable Type	Number Of Points Of Entry	Riser Size (Inches)	Comments
New	Fiber	1		

Exhibit E

Mount Analysis

INFINIGY

FROM ZERO TO INFINIGY

the solutions are endless

1033 WATERVLIET SHAKER RD ALBANY, NY 12205

Mount Analysis Report

July 30, 2021

Dish Wireless Site Number	BOBDL00104A
Infinigy Job Number	2039-Z5555C
Client	Crown Castle
Carrier	Dish Wireless
Site Location	63 Woodland Street, Glastonbury, CT 06073 41.6608 N NAD83 72.5741 W NAD83
Mount Centerline EL.	125 ft
Mount Classification	Platform
Structural Usage Ratio	**66%**
Overall Result	**Pass**

Upon reviewing the results of this analysis, it is our opinion that the structure meets the specified TIA and ASCE code requirements. The proposed platform for the proposed carrier is therefore deemed **adequate** to support the final loading configuration as listed in this report.

STATE OF CONNECTICUT
DMITRIY V. ALBUL
No. 26725
LICENSED
PROFESSIONAL ENGINEER

07-30-21

Dmitriy Albul, P.E.
Engineering Consultant to Infinigy

Contents

Introduction

Infinigy Engineering has been requested to perform a mount analysis of proposed antenna mount from the Dish Wireless equipment. All supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The mount was analyzed using RISA-3D Version 19.0.3 analysis software.

Supporting Documentation

Platform Drawings	SitePro1 Assembly Drawings No. SNP8HR-3XX
Construction Drawings	Infinigy Engineering PLLC, Job No. 2039-Z5555C, dated June 7, 2021
RF Design Sheet	Dish Wireless, dated February 15, 2021

Analysis Code Requirements

Wind Speed	125 mph (3-second Gust, Vult.)
Wind Speed w/ ice	50 mph (3-Second Gust) w/ 1" ice
TIA Revision	ANSI/TIA-222-G
TIA Revision	2018 Connecticut Building Code (2015 IBC)
Structure Class	II
Exposure Category	C
Topographic Method	Method 2
Topographic Category	1
Spectral Response	S_s=0.181, S_1=0.064
Site Class	D – Stiff Soil (Assumed)
HMSL	310.29 ft.

Conclusion

Upon reviewing the results of this analysis, it is our opinion that the structure meets the specified TIA code requirements. The proposed platform is therefore deemed adequate to support the final loading configuration as listed in this report.

If you have any questions, require additional information, or actual conditions differ from those as detailed in this report please contact me via the information below:

Dmitriy Albul, P.E.
Professional Engineer | Engineering Consultant to Infinigy
1033 Watervliet Shaker Road, Albany, NY 12205
(O) (518) 690-0790 | (M) (518) 699-4428
www.infinigy.com

Final Configuration Loading

Mount CL (ft)	Rad. HT (ft)	Vert. O/S (ft)	Horiz. O/S (ft)*	Qty	Appurtenance	Carrier
125.0	125.0	-	4	3	JMA MX08FRO665-20	Dish Wireless
			4	3	Fujitsu TA08025-B605	
			4	3	Fujitsu TA08025-B604	
			-	1	Raycap RDIDC-9181-PF-48	

***Horizontal Offset is defined as the distance from the left most edge of the mount face horizontal when viewed facing the tower.**

Structure Usages

Plates	66%	Pass
Cross Arms	55%	Pass
Mount Pipes	52%	Pass
Arms	40%	Pass
Connections	33%	Pass
Handrails	22%	Pass
Frame Rails	18%	Pass
Rating	**66%**	Pass

Assumptions and Limitations

Our structural calculations are completed assuming all information provided to Infinigy Engineering is accurate and applicable to this site. For the purposes of calculations, we assume an overall structure condition of “like new” 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 Engineering should be notified immediately to complete a revised evaluation.

Our evaluation is completed using standard TIA, AISC, ACI, and ASCE methods and procedures. Our structural results are proprietary and should not be used by others as their own. Infinigy Engineering is not responsible for decisions made by others that are or are not based on our supplied assumptions and conclusions.

This report is an evaluation of the proposed carriers mount structure only and does not reflect adequacy of the existing tower, other mounts, or coax mounting attachments. These elements are assumed to be adequate for the purposes of this analysis and are assumed to have been installed per their manufacturer requirements.

INFINIGY

FROM ZERO TO INFINIGY

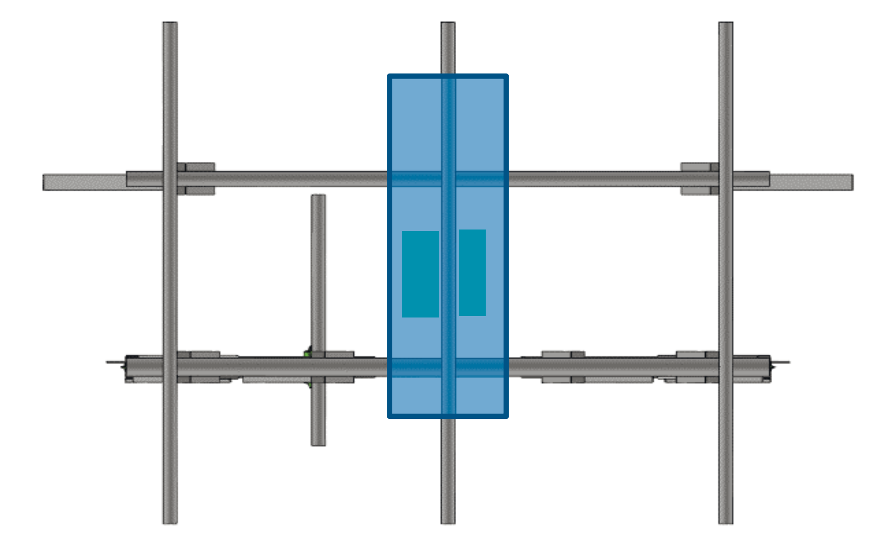
the solutions are endless

Date:	7/30/2021	
Site Name:	BOBDL00104A	
Project Engineer:	DVA	
Project No:	2039-Z5555C	
Customer:	Northeast Site Solutions	
Carrier:	Dish Wireless	

Building Code:	2015	
ASCE Standard:	ASCE 7-10	
TIA Standard:	G	
Mount Type:	Platform	
Mount Centerline:	125	ft
Superstructure Height:	150	ft
Structure Type:	Tower	

Site Information		
Exposure Category:	C	
Risk Category:	II	
Ultimate Wind Speed:	125	mph
Design Wind Speed:	97	mph
Ice Thickness:	1.00	in
Ice Wind Speed:	50.0	mph
Escalated Ice Thickness:	2.28	in
Topographic Method:	2	
Topographic Category:	1	

ELEVATION VIEW



Factors	
Gh:	1.000
K_{zmin}:	0.850
K_z:	1.326
K_d:	0.950
K_{zt}:	1.000
Ka:	0.900
I wind:	1.000
I ice:	1.000

q_z:	30.24	psf
Surface Wind Pressure:	0.00	psf

Run Seismic?	Yes	
Site Soil:	D (Default)	
Short-Period Accel. (Ss):	0.1800	
1-Second Accel. (S1):	0.0630	
Short-Period Design (SDS):	0.1920	
1-Second Design (SD1):	0.1010	
Short-Period Coeff. (Fa):	1.6000	
1-Second Coeff. (Fv):	2.4000	
Cs	0.0960	
Cs min	0.0300	
Amplification Factor (ap):	1.00	
Response Mod. (Rp):	2.50	
Overstrength (Ωo):	1.00	
Service Wind:	30.0	mph
Lm (man live load) =	500.0	lb
Lv (man live load) =	250.0	lb

PLAN VIEW

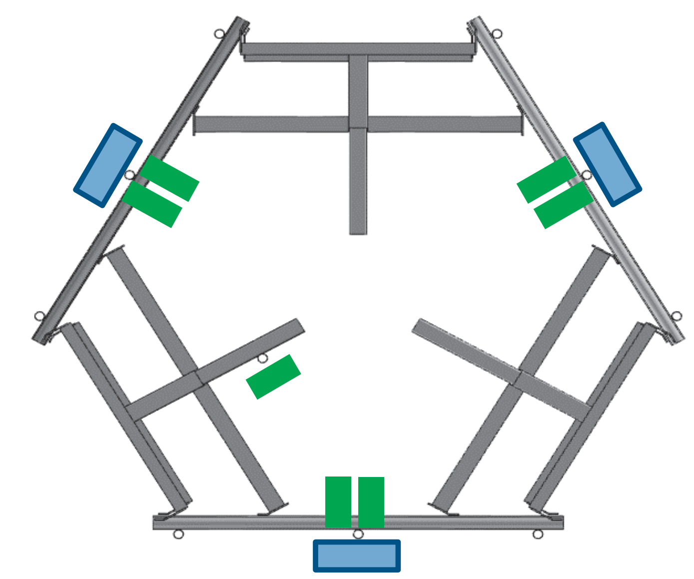


Table 1. Equipment Specifications and Wind Pressure

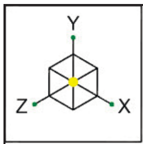
Manufacturer	Model	Elevation	Pipe Label	Weight (lb)	Height (in)	Width (in)	Depth (in)	EPA_N	EPA_T	$EPA_{N\ w/\ ice}$	$EPA_{T\ w/\ ice}$	q_z:	$q_{z\ ice}$:	$q_{z\ live}$:
JMA	MX08FRO665-20	125	4, 74, 42	54.00	72	20	8	8.01	3.21	9.08	4.15	30.24	8.07	2.90
Fujitsu	TA08025-B605	125	4, 74, 42	74.90	14.9	15.7	9	1.84	1.08	3.10	2.11	30.24	8.07	2.90
Fujitsu	TA08025-B604	125	4, 74, 42	63.90	14.9	15.7	7.8	1.84	0.95	3.10	1.94	30.24	8.07	2.90
Raycap	RDIDC-9181-PF-48	125	125	21.82	18.98	14.39	8.15	2.18	1.28	3.55	2.44	30.24	8.07	2.90

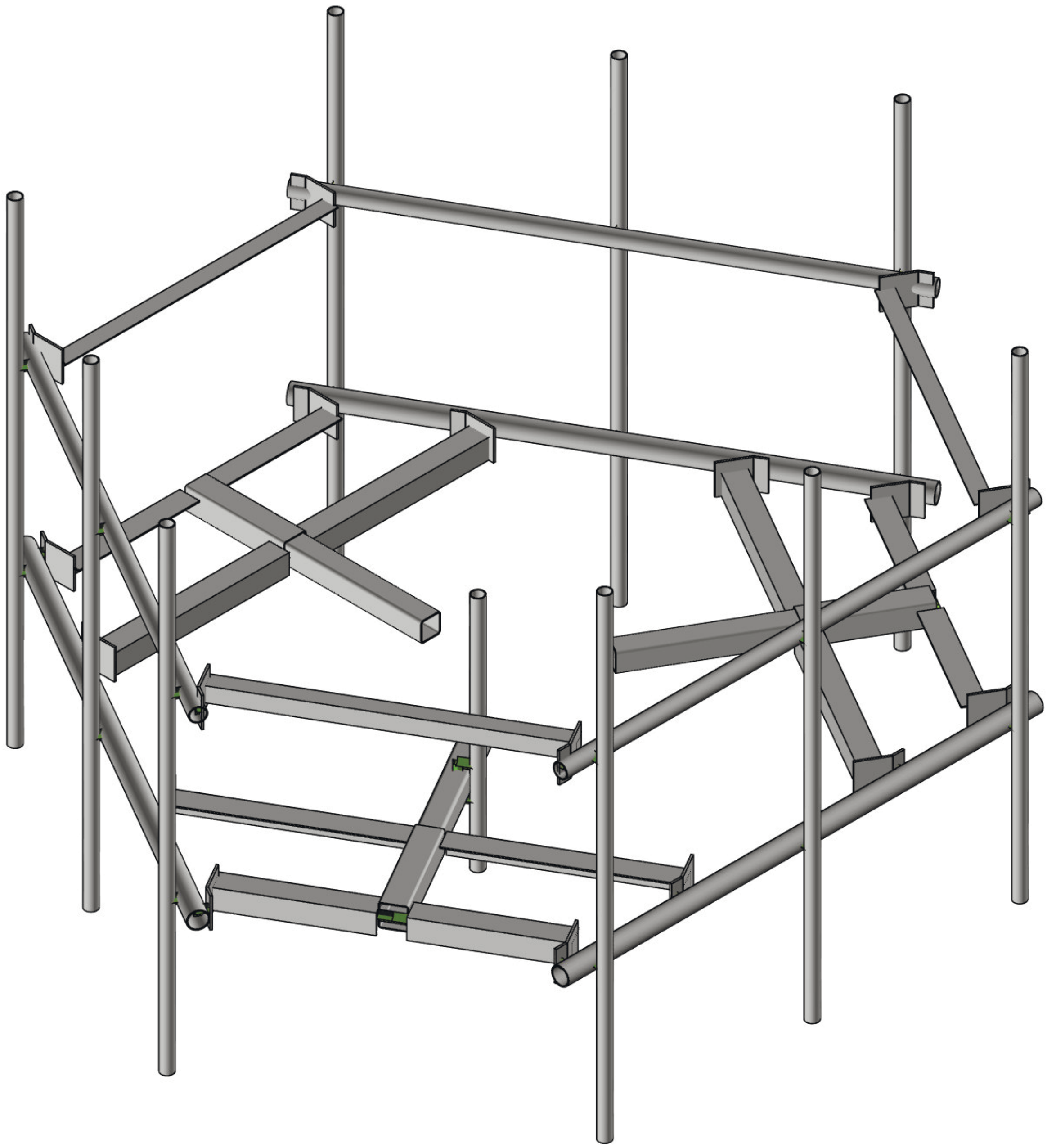
Table 2. Equipment Wind and Seismic Loads

Manufacturer	Model	Wind Load (F_A), lb		Wind Load Ice Case (F_A), lb			Wind Load Service Case (F_A),		Seismic Load,
JMA	MX08FRO665-20	218	87	66	30	408	21	8	5.2
Fujitsu	TA08025-B605	50	29	23	15	72	5	3	7.2
Fujitsu	TA08025-B604	50	26	23	14	70	5	2	6.1
Raycap	RDIDC-9181-PF-48	59	35	26	18	85	6	3	2.1

Table 3. Member Capacities

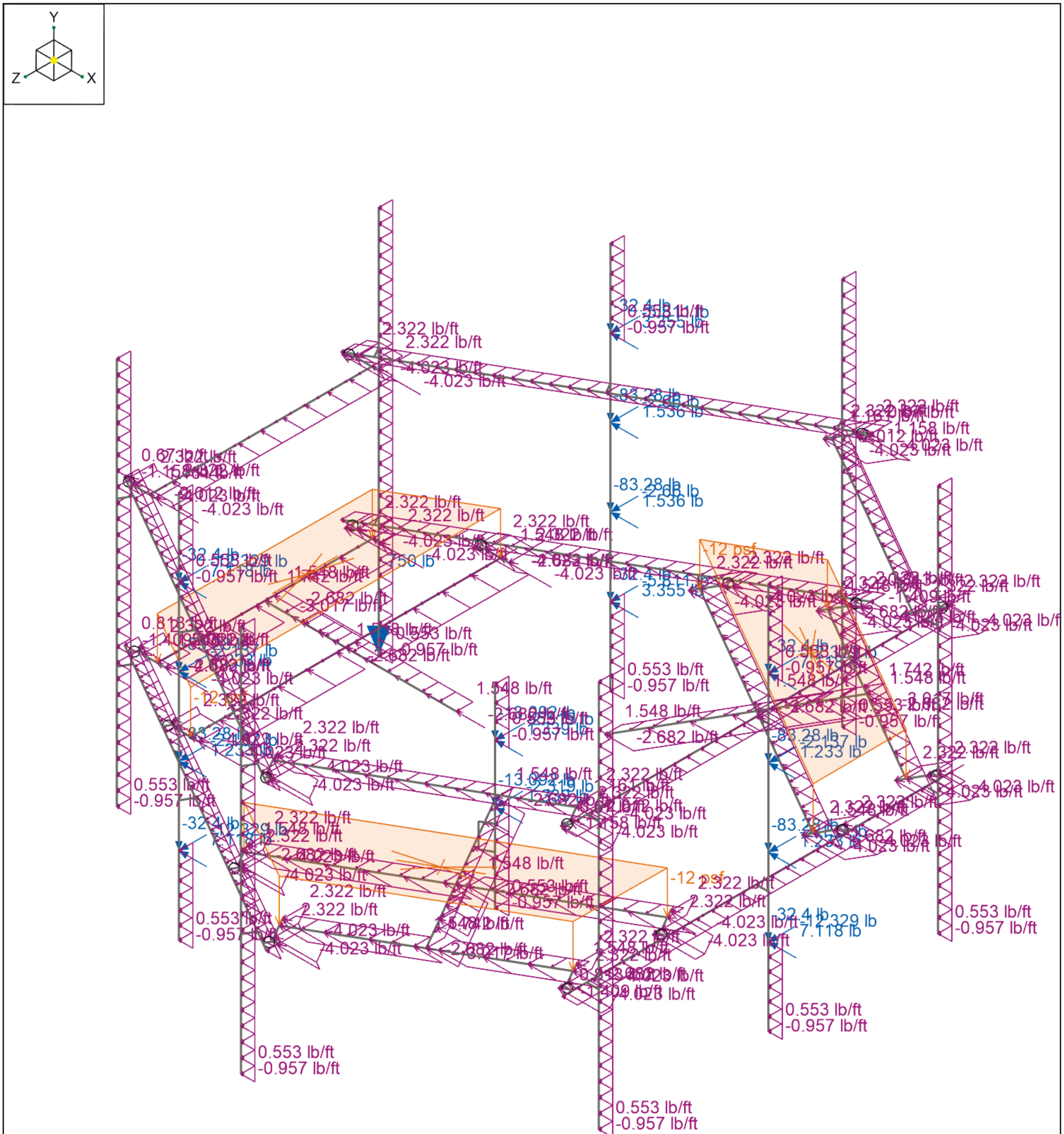
Member Name	Member Shape	Wind load (plf)	Wind Load Ice (plf)	Weight Ice (plf)	Bending Check	Shear Check	Total Capacity	Controlling Capacity
Arm	**HSS4x4x4**	**20.16**	**5.38**	**2.04**	**40%**	**18%**	**40%**	**66%**
Arm 2	**HSS4.5x4.5x3**	**22.68**	**6.05**	**2.16**	**7%**	**16%**	**16%**	
Cross Arm	**L4x4x4**	**20.16**	**5.38**	**2.04**	**55%**	**12%**	**55%**	
Frame Rail	**PIPE_3.0**	**10.59**	**2.82**	**1.92**	**12%**	**18%**	**18%**	
Handrail	**PIPE_2.5**	**8.71**	**2.32**	**1.77**	**15%**	**22%**	**22%**	
Mount Pipe	**PIPE_2.0**	**7.20**	**1.92**	**1.65**	**52%**	**22%**	**52%**	
Plate	**6"x0.375" Plate**	**30.24**	**8.07**	**2.51**	**61%**	**66%**	**66%**	
Angle	**L3x3x3**	**15.12**	**4.03**	**1.80**	**34%**	**4%**	**34%**	





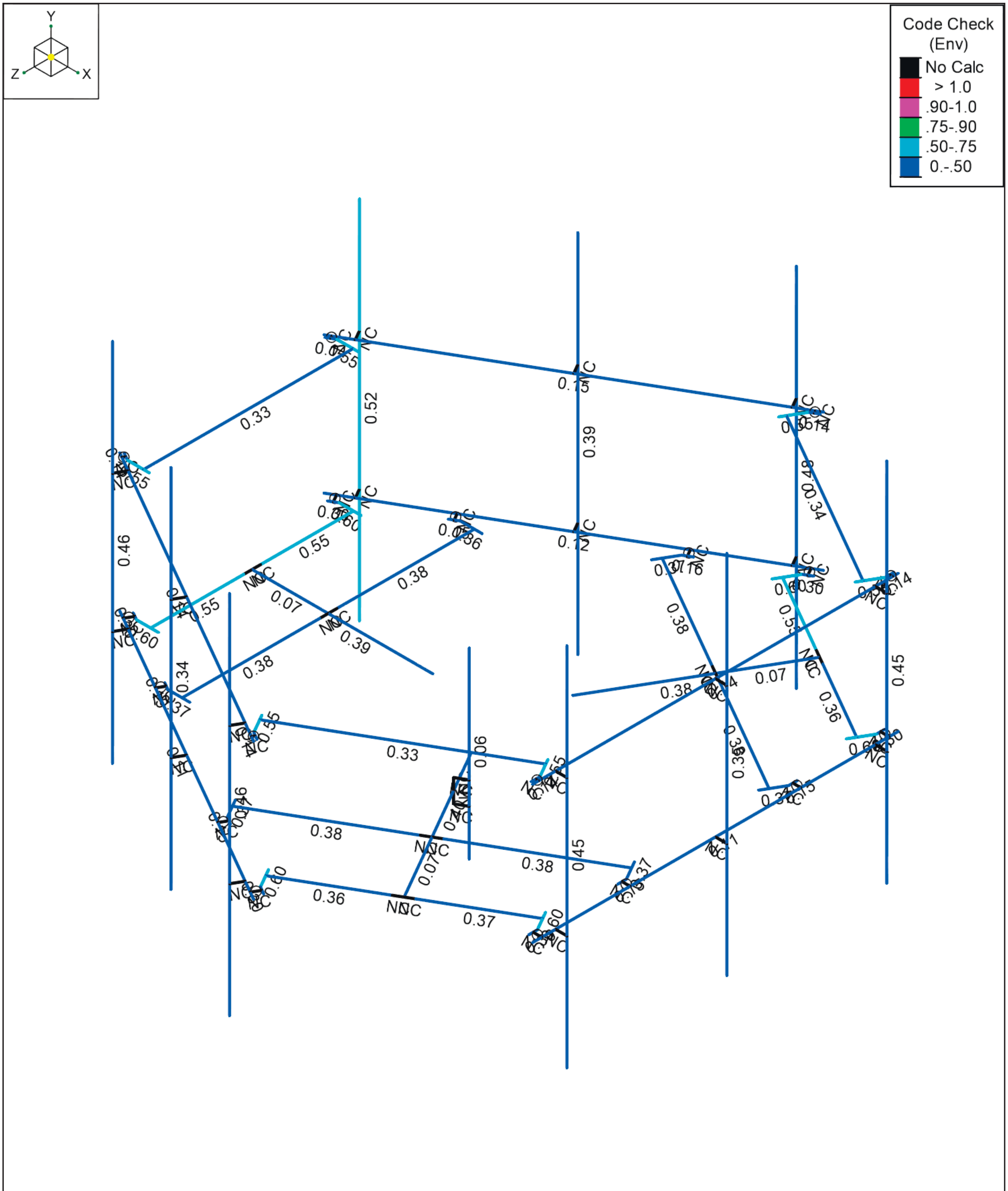
Envelope Only Solution

Infinigy Engineering, PLLC	BOBDL00104A	SK-1
DVA		Jul 28, 2021
2039-Z5555C	Proposed Configuration Model	BOBDL00104A.R3D



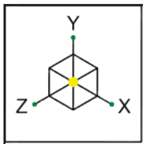
Loads: LC 110, 1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 330
Envelope Only Solution

Infinigy Engineering, PLLC	BOBDL00104A	SK-2
DVA		Jul 28, 2021
2039-Z5555C	Controlling Load Case	BOBDL00104A.R3D



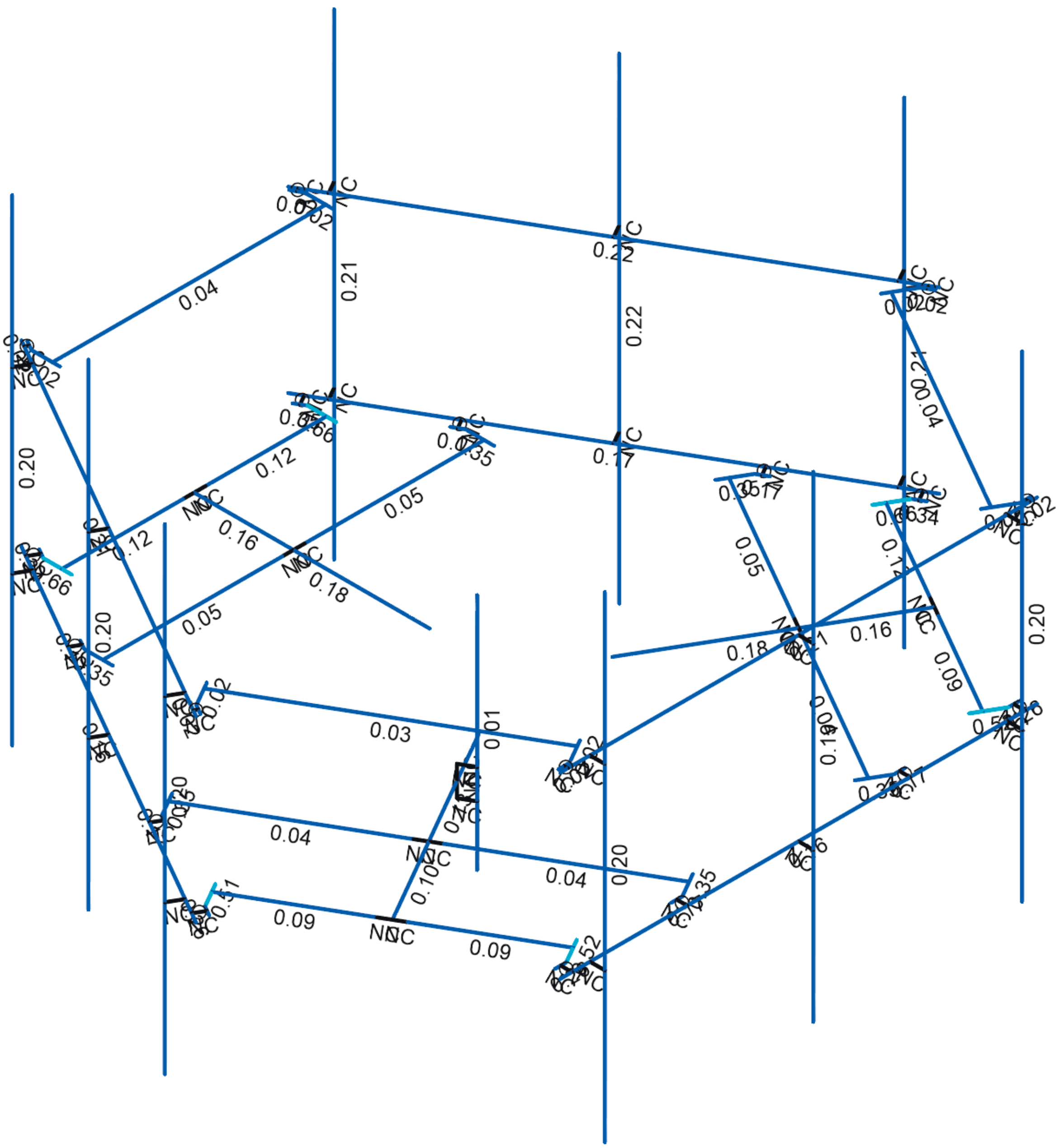
Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Infinigy Engineering, PLLC	BOBDL00104A	SK-3
DVA		Jul 28, 2021
2039-Z5555C	Member Bending Check	BOBDL00104A.R3D



Shear Check (Env)

- No Calc
- > 1.0
- .90-1.0
- .75-.90
- .50-.75
- 0.-.50



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Infinigy Engineering, PLLC	BOBDL00104A	SK-4
DVA		Jul 28, 2021
2039-Z5555C	Member Shear Check	BOBDL00104A.R3D

Model Settings

Solution

Members

Number of Reported Sections	5
Number of Internal Sections	100
Member Area Load Mesh Size (in^2)	144
Consider Shear Deformation	Yes
Consider Torsional Warping	Yes

Wall Panels

Approximate Mesh Size (in)	12
Transfer Forces Between Intersecting Wood Walls	Yes
Increase Wood Wall Nailing Capacity for Wind Loads	Yes
Include P-Delta for Walls	Yes
Optimize Masonry and Wood Walls	Yes
Maximum Number of Iterations	3

Processor Core Utilization

Single	No
Multiple (Optimum)	Yes
Maximum	No

Axis

Vertical Global Axis

Global Axis corresponding to vertical direction	Y
Convert Existing Data	Yes

Default Member Orientation

Default Global Plane for z-axis	XZ

Plate Axis

Plate Local Axis Orientation	Nodal

Codes

Hot Rolled Steel	AISC 14th (360-10): LRFD
Stiffness Adjustment	Yes (Iterative)
Notional Annex	None
Connections	AISC 14th (360-10): LRFD
Cold Formed Steel	AISI S100-12: LRFD
Stiffness Adjustment	Yes (Iterative)
Wood	AWC NDS-12: ASD
Temperature	< 100F
Concrete	ACI 318-11
Masonry	ACI 530-11: Strength
Aluminum	AA ADM1-10: LRFD
Structure Type	Building
Stiffness Adjustment	Yes (Iterative)
Stainless	AISC 14th (360-10): LRFD
Stiffness Adjustment	Yes (Iterative)

Concrete

Column Design

Analysis Methodology	Exact Integration Method
Parme Beta Factor	0.65

Compression Stress Block	Rectangular Stress Block
Analyze using Cracked Sections	Yes
Leave room for horizontal rebar splices (2*d bar spacing)	No

Model Settings (Continued)

List forces which were ignored for design in the Detail Report	Yes

Rebar

Column Min Steel	1
Column Max Steel	8
Rebar Material Spec	ASTM A615
Warn if beam-column framing arrangement is not understood	No

Shear Reinforcement

Number of Shear Regions	4
Region 2 & 3 Spacing Increase Increment (in)	4

Seismic

RISA-3D Seismic Load Options

Code	ASCE 7-10
Risk Category	I or II
Drift Cat	Other
Base Elevation (ft)	
Include the weight of the structure in base shear calcs	Yes

Site Parameters

S_1 (g)	1
SD_1 (g)	1
SD_S (g)	1
T_L (sec)	5

Structure Characteristics

T Z (sec)	
T X (sec)	
C_tX	0.02
C_tExp. Z	0.75
C_tExp. X	0.75
R Z	3
R X	3
Ω_0Z	1
Ω_0X	1
C_dZ	4
C_dX	4
ρ Z	1
ρ X	1

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N1	N2		Arm	Beam	Tube	A500 Gr.B Rect	Typical
2	M2	N5	N6		Frame Rail	Beam	Pipe	A53 Gr.B	Typical
3	M3	N7	N8		Handrail	HBrace	Pipe	A53 Gr.B	Typical
4	M4	N10	N11		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
5	M5	N4	N3		Arm 2	Beam	Tube	A500 Gr.B Rect	Typical
6	M6	N15	N35	90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
7	M7	N33	N13	90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
8	M8	N12	N34	90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
9	M9	N36	N14	90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
10	M10	N18	N20		Plate	Beam	BAR	A36 Gr.36	Typical
11	M11	N17	N19		Plate	Beam	BAR	A36 Gr.36	Typical
12	M12	N21	N22		Plate	Beam	BAR	A36 Gr.36	Typical
13	M13	N23	N24		Plate	Beam	BAR	A36 Gr.36	Typical
14	M14	N28	N25	90	Angle	HBrace	Single Angle	A36 Gr.36	Typical
15	M15	N26	N27		Plate	Beam	BAR	A36 Gr.36	Typical
16	M16	N29	N30		Plate	Beam	BAR	A36 Gr.36	Typical
17	M17	N31	N9		RIGID	None	None	RIGID	Typical
18	M18	N32	N16		RIGID	None	None	RIGID	Typical
19	M19	N4	N35		RIGID	None	None	RIGID	Typical
20	M20	N4	N33		RIGID	None	None	RIGID	Typical
21	M21	N3	N34		RIGID	None	None	RIGID	Typical
22	M22	N36	N3		RIGID	None	None	RIGID	Typical
23	M23	N19	N37		Plate	Beam	BAR	A36 Gr.36	Typical
24	M24	N22	N38		Plate	Beam	BAR	A36 Gr.36	Typical
25	M25	N39	N41		RIGID	None	None	RIGID	Typical
26	M26	N40	N42		RIGID	None	None	RIGID	Typical
27	M27	N27	N43		Plate	Beam	BAR	A36 Gr.36	Typical
28	M28	N44	N45		RIGID	None	None	RIGID	Typical
29	M29	N20	N46		Plate	Beam	BAR	A36 Gr.36	Typical
30	M30	N24	N47		Plate	Beam	BAR	A36 Gr.36	Typical
31	M31	N48	N50		RIGID	None	None	RIGID	Typical
32	M32	N49	N51		RIGID	None	None	RIGID	Typical
33	M33	N30	N52		Plate	Beam	BAR	A36 Gr.36	Typical
34	M34	N53	N54		RIGID	None	None	RIGID	Typical
35	M35	N56	N57		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
36	M36	N59	N55		RIGID	None	None	RIGID	Typical
37	M37	N60	N58		RIGID	None	None	RIGID	Typical
38	M38	N62	N63		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
39	M39	N65	N61		RIGID	None	None	RIGID	Typical
40	M40	N66	N64		RIGID	None	None	RIGID	Typical
41	M41	N67	N68		Arm	Beam	Tube	A500 Gr.B Rect	Typical
42	M42	N72	N73		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
43	M43	N70	N69		Arm 2	Beam	Tube	A500 Gr.B Rect	Typical
44	M44	N77	N97	90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
45	M45	N95	N75	90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
46	M46	N74	N96	90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
47	M47	N98	N76	90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
48	M48	N80	N82		Plate	Beam	BAR	A36 Gr.36	Typical
49	M49	N79	N81		Plate	Beam	BAR	A36 Gr.36	Typical
50	M50	N83	N84		Plate	Beam	BAR	A36 Gr.36	Typical
51	M51	N85	N86		Plate	Beam	BAR	A36 Gr.36	Typical
52	M52	N90	N87	90	Angle	HBrace	Single Angle	A36 Gr.36	Typical
53	M53	N88	N89		Plate	Beam	BAR	A36 Gr.36	Typical
54	M54	N91	N92		Plate	Beam	BAR	A36 Gr.36	Typical
55	M55	N93	N71		RIGID	None	None	RIGID	Typical
56	M56	N94	N78		RIGID	None	None	RIGID	Typical
57	M57	N70	N97		RIGID	None	None	RIGID	Typical
58	M58	N70	N95		RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
59	M59	N69	N96		RIGID	None	None	RIGID	Typical
60	M60	N98	N69		RIGID	None	None	RIGID	Typical
61	M61	N81	N99		Plate	Beam	BAR	A36 Gr.36	Typical
62	M62	N84	N100		Plate	Beam	BAR	A36 Gr.36	Typical
63	M63	N101	N103		RIGID	None	None	RIGID	Typical
64	M64	N102	N104		RIGID	None	None	RIGID	Typical
65	M65	N89	N105		Plate	Beam	BAR	A36 Gr.36	Typical
66	M66	N106	N107		RIGID	None	None	RIGID	Typical
67	M67	N82	N108		Plate	Beam	BAR	A36 Gr.36	Typical
68	M68	N86	N109		Plate	Beam	BAR	A36 Gr.36	Typical
69	M69	N110	N112		RIGID	None	None	RIGID	Typical
70	M70	N111	N113		RIGID	None	None	RIGID	Typical
71	M71	N92	N114		Plate	Beam	BAR	A36 Gr.36	Typical
72	M72	N115	N116		RIGID	None	None	RIGID	Typical
73	M73	N117	N118		Arm	Beam	Tube	A500 Gr.B Rect	Typical
74	M74	N122	N123		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
75	M75	N120	N119		Arm 2	Beam	Tube	A500 Gr.B Rect	Typical
76	M76	N127	N147	90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
77	M77	N145	N125	90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
78	M78	N124	N146	90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
79	M79	N148	N126	90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
80	M80	N130	N132		Plate	Beam	BAR	A36 Gr.36	Typical
81	M81	N129	N131		Plate	Beam	BAR	A36 Gr.36	Typical
82	M82	N133	N134		Plate	Beam	BAR	A36 Gr.36	Typical
83	M83	N135	N136		Plate	Beam	BAR	A36 Gr.36	Typical
84	M84	N140	N137	90	Angle	HBrace	Single Angle	A36 Gr.36	Typical
85	M85	N138	N139		Plate	Beam	BAR	A36 Gr.36	Typical
86	M86	N141	N142		Plate	Beam	BAR	A36 Gr.36	Typical
87	M87	N143	N121		RIGID	None	None	RIGID	Typical
88	M88	N144	N128		RIGID	None	None	RIGID	Typical
89	M89	N120	N147		RIGID	None	None	RIGID	Typical
90	M90	N120	N145		RIGID	None	None	RIGID	Typical
91	M91	N119	N146		RIGID	None	None	RIGID	Typical
92	M92	N148	N119		RIGID	None	None	RIGID	Typical
93	M93	N131	N149		Plate	Beam	BAR	A36 Gr.36	Typical
94	M94	N134	N150		Plate	Beam	BAR	A36 Gr.36	Typical
95	M95	N151	N153		RIGID	None	None	RIGID	Typical
96	M96	N152	N154		RIGID	None	None	RIGID	Typical
97	M97	N139	N155		Plate	Beam	BAR	A36 Gr.36	Typical
98	M98	N156	N157		RIGID	None	None	RIGID	Typical
99	M99	N132	N158		Plate	Beam	BAR	A36 Gr.36	Typical
100	M100	N136	N159		Plate	Beam	BAR	A36 Gr.36	Typical
101	M101	N160	N162		RIGID	None	None	RIGID	Typical
102	M102	N161	N163		RIGID	None	None	RIGID	Typical
103	M103	N142	N164		Plate	Beam	BAR	A36 Gr.36	Typical
104	M104	N165	N166		RIGID	None	None	RIGID	Typical
105	M105	N167	N168		Frame Rail	Beam	Pipe	A53 Gr.B	Typical
106	M106	N169	N170		Handrail	HBrace	Pipe	A53 Gr.B	Typical
107	M107	N172	N173		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
108	M108	N175	N171		RIGID	None	None	RIGID	Typical
109	M109	N176	N174		RIGID	None	None	RIGID	Typical
110	M110	N178	N179		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
111	M111	N181	N177		RIGID	None	None	RIGID	Typical
112	M112	N182	N180		RIGID	None	None	RIGID	Typical
113	M113	N183	N184		Frame Rail	Beam	Pipe	A53 Gr.B	Typical
114	M114	N185	N186		Handrail	HBrace	Pipe	A53 Gr.B	Typical
115	M115	N188	N189		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
116	M116	N191	N187		RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
117	M117	N192	N190		RIGID	None	None	RIGID	Typical
118	M118	N194	N195		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
119	M119	N197	N193		RIGID	None	None	RIGID	Typical
120	M120	N198	N196		RIGID	None	None	RIGID	Typical
121	M121	N199	N200		RIGID	None	None	RIGID	Typical
122	M122	N201	N199		RIGID	None	None	RIGID	Typical
123	M123	N200	N202		RIGID	None	None	RIGID	Typical
124	M124	N201	N203		RIGID	None	None	RIGID	Typical
125	M125	N204	N205		Mount Pipe	Column	Pipe	A53 Gr.B	Typical

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [lb/ft³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	490	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	490	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	490	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	0.3	0.65	527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	0.3	0.65	490	35	1.6	60	1.2
7	A1085	29000	11154	0.3	0.65	490	50	1.4	65	1.3

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Point	Distributed	Area(Member)
1	Self Weight	DL		-1		20		3
2	Wind Load AZI 0	WLX				40	258	
3	Wind Load AZI 30	None				40	258	
4	Wind Load AZI 60	None				40	258	
5	Wind Load AZI 90	WLZ				40	258	
6	Wind Load AZI 120	None				40	258	
7	Wind Load AZI 150	None				40	258	
8	Wind Load AZI 180	None				40	258	
9	Wind Load AZI 210	None				40	258	
10	Wind Load AZI 240	None				40	258	
11	Wind Load AZI 270	None				40	258	
12	Wind Load AZI 300	None				40	258	
13	Wind Load AZI 330	None				40	258	
14	Ice Weight	OL1				20	125	3
15	Ice Wind Load AZI 0	OL2				40	258	
16	Ice Wind Load AZI 30	None				40	258	
17	Ice Wind Load AZI 60	None				40	258	
18	Ice Wind Load AZI 90	OL3				40	258	
19	Ice Wind Load AZI 120	None				40	258	
20	Ice Wind Load AZI 150	None				40	258	
21	Ice Wind Load AZI 180	None				40	258	
22	Ice Wind Load AZI 210	None				40	258	
23	Ice Wind Load AZI 240	None				40	258	
24	Ice Wind Load AZI 270	None				40	258	
25	Ice Wind Load AZI 300	None				40	258	
26	Ice Wind Load AZI 330	None				40	258	
27	Seismic Load X	ELX			-0.096	20		
28	Seismic Load Z	ELZ	-0.096			20		
29	Service Live Loads	LL						
30	Maintenance Load 1	LL				1		
31	Maintenance Load 2	LL				1		
32	Maintenance Load 3	LL				1		
33	Maintenance Load 4	LL				1		
34	Maintenance Load 5	LL				1		
35	Maintenance Load 6	LL				1		

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Point	Distributed	Area(Member)
36	Maintenance Load 7	LL				1		
37	Maintenance Load 8	LL				1		
38	Maintenance Load 9	LL				1		
39	Maintenance Load 10	LL				1		
40	Maintenance Load 11	LL				1		
41	Maintenance Load 12	LL				1		
42	Maintenance Load 13	LL				1		
43	Maintenance Load 14	LL				1		
44	Maintenance Load 15	LL				1		
45	Maintenance Load 16	LL				1		
46	Maintenance Load 17	LL				1		
47	Maintenance Load 18	LL				1		
52	BLC 1 Transient Area Loads	None					141	
53	BLC 14 Transient Area Loads	None					141	

Load Combinations

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4DL	Yes	Y	1	1.4				
2	1.2DL + 1.6WL AZI 0	Yes	Y	1	1.2	2	1.6		
3	1.2DL + 1.6WL AZI 30	Yes	Y	1	1.2	3	1.6		
4	1.2DL + 1.6WL AZI 60	Yes	Y	1	1.2	4	1.6		
5	1.2DL + 1.6WL AZI 90	Yes	Y	1	1.2	5	1.6		
6	1.2DL + 1.6WL AZI 120	Yes	Y	1	1.2	6	1.6		
7	1.2DL + 1.6WL AZI 150	Yes	Y	1	1.2	7	1.6		
8	1.2DL + 1.6WL AZI 180	Yes	Y	1	1.2	8	1.6		
9	1.2DL + 1.6WL AZI 210	Yes	Y	1	1.2	9	1.6		
10	1.2DL + 1.6WL AZI 240	Yes	Y	1	1.2	10	1.6		
11	1.2DL + 1.6WL AZI 270	Yes	Y	1	1.2	11	1.6		
12	1.2DL + 1.6WL AZI 300	Yes	Y	1	1.2	12	1.6		
13	1.2DL + 1.6WL AZI 330	Yes	Y	1	1.2	13	1.6		
14	0.9DL + 1.6WL AZI 0	Yes	Y	1	0.9	2	1.6		
15	0.9DL + 1.6WL AZI 30	Yes	Y	1	0.9	3	1.6		
16	0.9DL + 1.6WL AZI 60	Yes	Y	1	0.9	4	1.6		
17	0.9DL + 1.6WL AZI 90	Yes	Y	1	0.9	5	1.6		
18	0.9DL + 1.6WL AZI 120	Yes	Y	1	0.9	6	1.6		
19	0.9DL + 1.6WL AZI 150	Yes	Y	1	0.9	7	1.6		
20	0.9DL + 1.6WL AZI 180	Yes	Y	1	0.9	8	1.6		
21	0.9DL + 1.6WL AZI 210	Yes	Y	1	0.9	9	1.6		
22	0.9DL + 1.6WL AZI 240	Yes	Y	1	0.9	10	1.6		
23	0.9DL + 1.6WL AZI 270	Yes	Y	1	0.9	11	1.6		
24	0.9DL + 1.6WL AZI 300	Yes	Y	1	0.9	12	1.6		
25	0.9DL + 1.6WL AZI 330	Yes	Y	1	0.9	13	1.6		
26	1.2D + 1.0Di	Yes	Y	1	1.2	14	1		
27	1.2D + 1.0Di +1.0Wi AZI 0	Yes	Y	1	1.2	14	1	15	1
28	1.2D + 1.0Di +1.0Wi AZI 30	Yes	Y	1	1.2	14	1	16	1
29	1.2D + 1.0Di +1.0Wi AZI 60	Yes	Y	1	1.2	14	1	17	1
30	1.2D + 1.0Di +1.0Wi AZI 90	Yes	Y	1	1.2	14	1	18	1
31	1.2D + 1.0Di +1.0Wi AZI 120	Yes	Y	1	1.2	14	1	19	1
32	1.2D + 1.0Di +1.0Wi AZI 150	Yes	Y	1	1.2	14	1	20	1
33	1.2D + 1.0Di +1.0Wi AZI 180	Yes	Y	1	1.2	14	1	21	1
34	1.2D + 1.0Di +1.0Wi AZI 210	Yes	Y	1	1.2	14	1	22	1
35	1.2D + 1.0Di +1.0Wi AZI 240	Yes	Y	1	1.2	14	1	23	1
36	1.2D + 1.0Di +1.0Wi AZI 270	Yes	Y	1	1.2	14	1	24	1
37	1.2D + 1.0Di +1.0Wi AZI 300	Yes	Y	1	1.2	14	1	25	1
38	1.2D + 1.0Di +1.0Wi AZI 330	Yes	Y	1	1.2	14	1	26	1
39	(1.2 + 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	1.238	27	1	28	
40	(1.2 + 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	1.238	27	0.866	28	0.5
41	(1.2 + 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	1.238	27	0.5	28	0.866

Load Combinations (Continued)

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor
42	(1.2 + 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	1.238	27		28	1
43	(1.2 + 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	1.238	27	-0.5	28	0.866
44	(1.2 + 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	1.238	27	-0.866	28	0.5
45	(1.2 + 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	1.238	27	-1	28	
46	(1.2 + 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	1.238	27	-0.866	28	-0.5
47	(1.2 + 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	1.238	27	-0.5	28	-0.866
48	(1.2 + 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	1.238	27		28	-1
49	(1.2 + 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	1.238	27	0.5	28	-0.866
50	(1.2 + 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	1.238	27	0.866	28	-0.5
51	(0.9 - 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	0.862	27	1	28	
52	(0.9 - 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	0.862	27	0.866	28	0.5
53	(0.9 - 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	0.862	27	0.5	28	0.866
54	(0.9 - 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	0.862	27		28	1
55	(0.9 - 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	0.862	27	-0.5	28	0.866
56	(0.9 - 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	0.862	27	-0.866	28	0.5
57	(0.9 - 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	0.862	27	-1	28	
58	(0.9 - 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	0.862	27	-0.866	28	-0.5
59	(0.9 - 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	0.862	27	-0.5	28	-0.866
60	(0.9 - 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	0.862	27		28	-1
61	(0.9 - 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	0.862	27	0.5	28	-0.866
62	(0.9 - 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	0.862	27	0.866	28	-0.5
63	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 0	Yes	Y	1	1	2	0.096	29	1.5
64	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 30	Yes	Y	1	1	3	0.096	29	1.5
65	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 60	Yes	Y	1	1	4	0.096	29	1.5
66	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 90	Yes	Y	1	1	5	0.096	29	1.5
67	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 120	Yes	Y	1	1	6	0.096	29	1.5
68	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 150	Yes	Y	1	1	7	0.096	29	1.5
69	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 180	Yes	Y	1	1	8	0.096	29	1.5
70	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 210	Yes	Y	1	1	9	0.096	29	1.5
71	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 240	Yes	Y	1	1	10	0.096	29	1.5
72	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 270	Yes	Y	1	1	11	0.096	29	1.5
73	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 300	Yes	Y	1	1	12	0.096	29	1.5
74	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 330	Yes	Y	1	1	13	0.096	29	1.5
75	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	34	1.5	2	0.154
76	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	34	1.5	3	0.154
77	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	34	1.5	4	0.154
78	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	34	1.5	5	0.154
79	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	34	1.5	6	0.154
80	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	34	1.5	7	0.154
81	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	34	1.5	8	0.154
82	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	34	1.5	9	0.154
83	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	34	1.5	10	0.154
84	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	34	1.5	11	0.154
85	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	34	1.5	12	0.154
86	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	34	1.5	13	0.154
87	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	35	1.5	2	0.154
88	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	35	1.5	3	0.154
89	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	35	1.5	4	0.154
90	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	35	1.5	5	0.154
91	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	35	1.5	6	0.154
92	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	35	1.5	7	0.154
93	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	35	1.5	8	0.154
94	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	35	1.5	9	0.154
95	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	35	1.5	10	0.154
96	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	35	1.5	11	0.154
97	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	35	1.5	12	0.154
98	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	35	1.5	13	0.154
99	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	36	1.5	2	0.154

Load Combinations (Continued)

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor
100	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	36	1.5	3	0.154
101	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	36	1.5	4	0.154
102	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	36	1.5	5	0.154
103	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	36	1.5	6	0.154
104	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	36	1.5	7	0.154
105	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	36	1.5	8	0.154
106	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	36	1.5	9	0.154
107	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	36	1.5	10	0.154
108	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	36	1.5	11	0.154
109	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	36	1.5	12	0.154
110	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	36	1.5	13	0.154
111	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	37	1.5	2	0.154
112	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	37	1.5	3	0.154
113	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	37	1.5	4	0.154
114	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	37	1.5	5	0.154
115	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	37	1.5	6	0.154
116	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	37	1.5	7	0.154
117	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	37	1.5	8	0.154
118	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	37	1.5	9	0.154
119	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	37	1.5	10	0.154
120	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	37	1.5	11	0.154
121	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	37	1.5	12	0.154
122	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	37	1.5	13	0.154
123	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	38	1.5	2	0.154
124	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	38	1.5	3	0.154
125	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	38	1.5	4	0.154
126	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	38	1.5	5	0.154
127	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	38	1.5	6	0.154
128	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	38	1.5	7	0.154
129	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	38	1.5	8	0.154
130	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	38	1.5	9	0.154
131	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	38	1.5	10	0.154
132	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	38	1.5	11	0.154
133	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	38	1.5	12	0.154
134	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	38	1.5	13	0.154
135	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	39	1.5	2	0.154
136	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	39	1.5	3	0.154
137	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	39	1.5	4	0.154
138	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	39	1.5	5	0.154
139	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	39	1.5	6	0.154
140	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	39	1.5	7	0.154
141	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	39	1.5	8	0.154
142	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	39	1.5	9	0.154
143	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	39	1.5	10	0.154
144	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	39	1.5	11	0.154
145	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	39	1.5	12	0.154
146	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	39	1.5	13	0.154
147	1.2DL + 1.5LM7 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	40	1.5	2	0.154
148	1.2DL + 1.5LM7 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	40	1.5	3	0.154
149	1.2DL + 1.5LM7 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	40	1.5	4	0.154
150	1.2DL + 1.5LM7 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	40	1.5	5	0.154
151	1.2DL + 1.5LM7 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	40	1.5	6	0.154
152	1.2DL + 1.5LM7 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	40	1.5	7	0.154
153	1.2DL + 1.5LM7 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	40	1.5	8	0.154
154	1.2DL + 1.5LM7 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	40	1.5	9	0.154
155	1.2DL + 1.5LM7 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	40	1.5	10	0.154
156	1.2DL + 1.5LM7 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	40	1.5	11	0.154
157	1.2DL + 1.5LM7 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	40	1.5	12	0.154

Load Combinations (Continued)

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor
158	1.2DL + 1.5LM7 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	40	1.5	13	0.154
159	1.2DL + 1.5LM8 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	41	1.5	2	0.154
160	1.2DL + 1.5LM8 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	41	1.5	3	0.154
161	1.2DL + 1.5LM8 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	41	1.5	4	0.154
162	1.2DL + 1.5LM8 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	41	1.5	5	0.154
163	1.2DL + 1.5LM8 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	41	1.5	6	0.154
164	1.2DL + 1.5LM8 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	41	1.5	7	0.154
165	1.2DL + 1.5LM8 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	41	1.5	8	0.154
166	1.2DL + 1.5LM8 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	41	1.5	9	0.154
167	1.2DL + 1.5LM8 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	41	1.5	10	0.154
168	1.2DL + 1.5LM8 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	41	1.5	11	0.154
169	1.2DL + 1.5LM8 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	41	1.5	12	0.154
170	1.2DL + 1.5LM8 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	41	1.5	13	0.154
171	1.2DL + 1.5LM9 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	42	1.5	2	0.154
172	1.2DL + 1.5LM9 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	42	1.5	3	0.154
173	1.2DL + 1.5LM9 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	42	1.5	4	0.154
174	1.2DL + 1.5LM9 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	42	1.5	5	0.154
175	1.2DL + 1.5LM9 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	42	1.5	6	0.154
176	1.2DL + 1.5LM9 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	42	1.5	7	0.154
177	1.2DL + 1.5LM9 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	42	1.5	8	0.154
178	1.2DL + 1.5LM9 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	42	1.5	9	0.154
179	1.2DL + 1.5LM9 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	42	1.5	10	0.154
180	1.2DL + 1.5LM9 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	42	1.5	11	0.154
181	1.2DL + 1.5LM9 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	42	1.5	12	0.154
182	1.2DL + 1.5LM9 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	42	1.5	13	0.154
183	1.2DL + 1.5LM10 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	43	1.5	2	0.154
184	1.2DL + 1.5LM10 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	43	1.5	3	0.154
185	1.2DL + 1.5LM10 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	43	1.5	4	0.154
186	1.2DL + 1.5LM10 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	43	1.5	5	0.154
187	1.2DL + 1.5LM10 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	43	1.5	6	0.154
188	1.2DL + 1.5LM10 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	43	1.5	7	0.154
189	1.2DL + 1.5LM10 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	43	1.5	8	0.154
190	1.2DL + 1.5LM10 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	43	1.5	9	0.154
191	1.2DL + 1.5LM10 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	43	1.5	10	0.154
192	1.2DL + 1.5LM10 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	43	1.5	11	0.154
193	1.2DL + 1.5LM10 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	43	1.5	12	0.154
194	1.2DL + 1.5LM10 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	43	1.5	13	0.154
195	1.2DL + 1.5LM11 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	44	1.5	2	0.154
196	1.2DL + 1.5LM11 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	44	1.5	3	0.154
197	1.2DL + 1.5LM11 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	44	1.5	4	0.154
198	1.2DL + 1.5LM11 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	44	1.5	5	0.154
199	1.2DL + 1.5LM11 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	44	1.5	6	0.154
200	1.2DL + 1.5LM11 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	44	1.5	7	0.154
201	1.2DL + 1.5LM11 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	44	1.5	8	0.154
202	1.2DL + 1.5LM11 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	44	1.5	9	0.154
203	1.2DL + 1.5LM11 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	44	1.5	10	0.154
204	1.2DL + 1.5LM11 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	44	1.5	11	0.154
205	1.2DL + 1.5LM11 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	44	1.5	12	0.154
206	1.2DL + 1.5LM11 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	44	1.5	13	0.154
207	1.2DL + 1.5LM12 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	45	1.5	2	0.154
208	1.2DL + 1.5LM12 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	45	1.5	3	0.154
209	1.2DL + 1.5LM12 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	45	1.5	4	0.154
210	1.2DL + 1.5LM12 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	45	1.5	5	0.154
211	1.2DL + 1.5LM12 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	45	1.5	6	0.154
212	1.2DL + 1.5LM12 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	45	1.5	7	0.154
213	1.2DL + 1.5LM12 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	45	1.5	8	0.154
214	1.2DL + 1.5LM12 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	45	1.5	9	0.154
215	1.2DL + 1.5LM12 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	45	1.5	10	0.154

Load Combinations (Continued)

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor
216	1.2DL + 1.5LM12 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	45	1.5	11	0.154
217	1.2DL + 1.5LM12 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	45	1.5	12	0.154
218	1.2DL + 1.5LM12 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	45	1.5	13	0.154
219	1.2DL + 1.5LM13 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	46	1.5	2	0.154
220	1.2DL + 1.5LM13 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	46	1.5	3	0.154
221	1.2DL + 1.5LM13 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	46	1.5	4	0.154
222	1.2DL + 1.5LM13 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	46	1.5	5	0.154
223	1.2DL + 1.5LM13 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	46	1.5	6	0.154
224	1.2DL + 1.5LM13 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	46	1.5	7	0.154
225	1.2DL + 1.5LM13 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	46	1.5	8	0.154
226	1.2DL + 1.5LM13 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	46	1.5	9	0.154
227	1.2DL + 1.5LM13 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	46	1.5	10	0.154
228	1.2DL + 1.5LM13 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	46	1.5	11	0.154
229	1.2DL + 1.5LM13 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	46	1.5	12	0.154
230	1.2DL + 1.5LM13 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	46	1.5	13	0.154
231	1.2DL + 1.5LM14 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	47	1.5	2	0.154
232	1.2DL + 1.5LM14 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	47	1.5	3	0.154
233	1.2DL + 1.5LM14 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	47	1.5	4	0.154
234	1.2DL + 1.5LM14 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	47	1.5	5	0.154
235	1.2DL + 1.5LM14 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	47	1.5	6	0.154
236	1.2DL + 1.5LM14 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	47	1.5	7	0.154
237	1.2DL + 1.5LM14 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	47	1.5	8	0.154
238	1.2DL + 1.5LM14 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	47	1.5	9	0.154
239	1.2DL + 1.5LM14 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	47	1.5	10	0.154
240	1.2DL + 1.5LM14 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	47	1.5	11	0.154
241	1.2DL + 1.5LM14 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	47	1.5	12	0.154
242	1.2DL + 1.5LM14 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	47	1.5	13	0.154
243	1.2DL + 1.5LM15 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	48	1.5	2	0.154
244	1.2DL + 1.5LM15 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	48	1.5	3	0.154
245	1.2DL + 1.5LM15 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	48	1.5	4	0.154
246	1.2DL + 1.5LM15 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	48	1.5	5	0.154
247	1.2DL + 1.5LM15 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	48	1.5	6	0.154
248	1.2DL + 1.5LM15 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	48	1.5	7	0.154
249	1.2DL + 1.5LM15 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	48	1.5	8	0.154
250	1.2DL + 1.5LM15 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	48	1.5	9	0.154
251	1.2DL + 1.5LM15 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	48	1.5	10	0.154
252	1.2DL + 1.5LM15 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	48	1.5	11	0.154
253	1.2DL + 1.5LM15 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	48	1.5	12	0.154
254	1.2DL + 1.5LM15 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	48	1.5	13	0.154
255	1.2DL + 1.5LM16 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	49	1.5	2	0.154
256	1.2DL + 1.5LM16 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	49	1.5	3	0.154
257	1.2DL + 1.5LM16 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	49	1.5	4	0.154
258	1.2DL + 1.5LM16 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	49	1.5	5	0.154
259	1.2DL + 1.5LM16 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	49	1.5	6	0.154
260	1.2DL + 1.5LM16 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	49	1.5	7	0.154
261	1.2DL + 1.5LM16 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	49	1.5	8	0.154
262	1.2DL + 1.5LM16 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	49	1.5	9	0.154
263	1.2DL + 1.5LM16 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	49	1.5	10	0.154
264	1.2DL + 1.5LM16 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	49	1.5	11	0.154
265	1.2DL + 1.5LM16 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	49	1.5	12	0.154
266	1.2DL + 1.5LM16 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	49	1.5	13	0.154
267	1.2DL + 1.5LM17 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	50	1.5	2	0.154
268	1.2DL + 1.5LM17 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	50	1.5	3	0.154
269	1.2DL + 1.5LM17 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	50	1.5	4	0.154
270	1.2DL + 1.5LM17 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	50	1.5	5	0.154
271	1.2DL + 1.5LM17 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	50	1.5	6	0.154
272	1.2DL + 1.5LM17 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	50	1.5	7	0.154
273	1.2DL + 1.5LM17 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	50	1.5	8	0.154

Load Combinations (Continued)

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor
274	1.2DL + 1.5LM17 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	50	1.5	9	0.154
275	1.2DL + 1.5LM17 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	50	1.5	10	0.154
276	1.2DL + 1.5LM17 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	50	1.5	11	0.154
277	1.2DL + 1.5LM17 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	50	1.5	12	0.154
278	1.2DL + 1.5LM17 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	50	1.5	13	0.154
279	1.2DL + 1.5LM18 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	51	1.5	2	0.154
280	1.2DL + 1.5LM18 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	51	1.5	3	0.154
281	1.2DL + 1.5LM18 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	51	1.5	4	0.154
282	1.2DL + 1.5LM18 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	51	1.5	5	0.154
283	1.2DL + 1.5LM18 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	51	1.5	6	0.154
284	1.2DL + 1.5LM18 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	51	1.5	7	0.154
285	1.2DL + 1.5LM18 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	51	1.5	8	0.154
286	1.2DL + 1.5LM18 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	51	1.5	9	0.154
287	1.2DL + 1.5LM18 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	51	1.5	10	0.154
288	1.2DL + 1.5LM18 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	51	1.5	11	0.154
289	1.2DL + 1.5LM18 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	51	1.5	12	0.154
290	1.2DL + 1.5LM18 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	51	1.5	13	0.154

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-in]	LC	MY [lb-in]	LC	MZ [lb-in]	LC
1	N1	max	1329.767	25	1722.877	27	1293.144	6	23174.84	108	27189.445	6	21079.197	20
2		min	-1456.606	8	-198.177	20	-1294.11	12	-23162.683	90	-27467.341	12	-66649.248	2
3	N67	max	1662.784	2	1857.939	35	1528.917	5	19245.927	16	35008.981	13	34968.491	143
4		min	-1571.738	20	-164.019	16	-1380.866	24	-59380.677	10	-28600.827	6	-10983.775	16
5	N117	max	1565.311	2	1723.589	31	1279.79	16	66885.017	127	27704.97	10	34602.146	209
6		min	-1474.269	20	-218.015	24	-1487.207	12	-19286.117	24	-27447.646	4	-11147.264	24
7	Totals:	max	4478.45	14	4876.205	35	3923.808	16						
8		min	-4478.457	20	1679.354	52	-4140.921	24						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-in]	phi*Mn z-z [lb-in]	Cb	Eqn
1	M12	6"x0.375" Plate	0.602	2.036	2	0.664	2.036	y	110	62722.329	72900	6834.391	109350	2.529	H1-1b
2	M83	6"x0.375" Plate	0.605	2.036	6	0.661	2.036	y	127	62722.329	72900	6834.391	109350	2.527	H1-1b
3	M13	6"x0.375" Plate	0.602	2.036	2	0.661	2.036	y	87	62722.329	72900	6834.391	109350	2.527	H1-1b
4	M82	6"x0.375" Plate	0.597	2.036	6	0.516	2.036	y	6	62722.329	72900	6834.391	109350	2.527	H1-1b
5	M51	6"x0.375" Plate	0.595	2.036	10	0.515	2.036	y	10	62722.329	72900	6834.391	109350	2.525	H1-1b
6	M50	6"x0.375" Plate	0.604	2.036	10	0.515	2.036	y	10	62722.329	72900	6834.391	109350	2.528	H1-1b
7	M81	6"x0.375" Plate	0.372	2.036	10	0.353	2.036	y	37	62722.329	72900	6834.391	109350	2.19	H1-1b
8	M49	6"x0.375" Plate	0.367	2.036	2	0.352	2.036	y	29	62722.329	72900	6834.391	109350	2.187	H1-1b
9	M80	6"x0.375" Plate	0.374	2.036	13	0.351	2.036	y	37	62722.329	72900	6834.391	109350	2.24	H1-1b
10	M10	6"x0.375" Plate	0.365	2.036	10	0.351	2.036	y	33	62722.329	72900	6834.391	109350	2.187	H1-1b
11	M11	6"x0.375" Plate	0.365	2.036	6	0.351	2.036	y	33	62722.329	72900	6834.391	109350	2.187	H1-1b
12	M48	6"x0.375" Plate	0.371	2.036	6	0.35	2.036	y	29	62722.329	72900	6834.391	109350	2.188	H1-1b
13	M24	6"x0.375" Plate	0.304	0	2	0.347	0	y	110	71110.261	72900	6834.391	109350	1.353	H1-1b
14	M100	6"x0.375" Plate	0.305	0	6	0.345	0	y	127	71110.261	72900	6834.391	109350	1.353	H1-1b
15	M30	6"x0.375" Plate	0.304	0	2	0.345	0	y	87	71110.261	72900	6834.391	109350	1.353	H1-1b
16	M94	6"x0.375" Plate	0.301	0	6	0.265	0	y	6	71110.261	72900	6834.391	109350	1.353	H1-1b
17	M62	6"x0.375" Plate	0.305	0	10	0.264	0	y	10	71110.261	72900	6834.391	109350	1.353	H1-1b
18	M68	6"x0.375" Plate	0.3	0	10	0.264	0	y	10	71110.261	72900	6834.391	109350	1.353	H1-1b
19	M42	PIPE_2.0	0.386	30	13	0.22	38		13	14916.096	32130	22459.5	22459.5	3	H1-1b
20	M106	PIPE_2.5	0.152	90	13	0.219	6		13	30038.461	50715	43155	43155	1.782	H1-1b
21	M110	PIPE_2.0	0.483	30	25	0.212	30		13	14916.096	32130	22459.5	22459.5	3	H1-1b
22	M107	PIPE_2.0	0.516	30	13	0.211	30		13	14916.096	32130	22459.5	22459.5	2.556	H1-1b
23	M3	PIPE_2.5	0.139	90	6	0.207	6		10	30038.461	50715	43155	43155	1.792	H1-1b
24	M114	PIPE_2.5	0.139	6	2	0.207	90		10	30038.461	50715	43155	43155	1.792	H1-1b
25	M115	PIPE_2.0	0.456	30	9	0.202	30		4	14916.096	32130	22459.5	22459.5	3	H1-1b
26	M38	PIPE_2.0	0.454	30	10	0.202	30		4	14916.096	32130	22459.5	22459.5	3	H1-1b

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-in]	phi*Mn z-z [lb-in]	Cb	Eqn
27	M35	PIPE_2.0	0.454	30	6	0.202	30		12	14916.096	32130	22459.5	22459.5	3	H1-1b
28	M118	PIPE_2.0	0.457	30	3	0.202	30		8	14916.096	32130	22459.5	22459.5	2.216	H1-1b
29	M74	PIPE_2.0	0.342	30	8	0.195	38		3	14916.096	32130	22459.5	22459.5	3	H1-1b
30	M4	PIPE_2.0	0.35	30	12	0.193	38		12	14916.096	32130	22459.5	22459.5	2.263	H1-1b
31	M1	HSS4X4X4	0.395	0	13	0.184	0	y	109	133649.326	139518	194166	194166	1.659	H1-1b
32	M73	HSS4X4X4	0.383	0	4	0.184	0	y	129	133649.326	139518	194166	194166	1.703	H1-1b
33	M105	PIPE_3.0	0.121	90	13	0.175	90		13	60482.561	65205	68985	68985	1.767	H1-1b
34	M93	6"x0.375" Plate	0.154	0	12	0.167	0	y	37	71110.261	72900	6834.391	109350	1.351	H1-1b
35	M99	6"x0.375" Plate	0.157	0	13	0.166	0	y	37	71110.261	72900	6834.391	109350	1.35	H1-1b
36	M61	6"x0.375" Plate	0.153	0	4	0.166	0	y	29	71110.261	72900	6834.391	109350	1.351	H1-1b
37	M29	6"x0.375" Plate	0.154	0	8	0.166	0	y	33	71110.261	72900	6834.391	109350	1.351	H1-1b
38	M23	6"x0.375" Plate	0.154	0	8	0.166	0	y	33	71110.261	72900	6834.391	109350	1.351	H1-1b
39	M67	6"x0.375" Plate	0.154	0	4	0.166	0	y	29	71110.261	72900	6834.391	109350	1.351	H1-1b
40	M5	HSS4.5X4.5X3	0.069	20	2	0.159	8.958	y	109	120246.398	121302	194994	194994	1.494	H1-1b
41	M75	HSS4.5X4.5X3	0.069	20	6	0.158	8.958	y	129	120246.398	121302	194994	194994	1.494	H1-1b
42	M113	PIPE_3.0	0.114	48	75	0.157	6		3	60482.561	65205	68985	68985	1	H1-1b
43	M2	PIPE_3.0	0.112	90	6	0.157	90		6	60482.561	65205	68985	68985	1.786	H1-1b
44	M41	HSS4X4X4	0.397	0	12	0.131	12.017	z	13	133649.326	139518	194166	194166	1.717	H1-1b
45	M7	L4X4X4	0.549	0	110	0.124	0	z	109	54411.715	62532	37651.159	80578.632	1.5	H2-1
46	M6	L4X4X4	0.547	24.375	89	0.123	24.375	z	89	54411.715	62532	37651.159	80578.632	1.5	H2-1
47	M76	L4X4X4	0.547	24.375	129	0.123	24.375	z	129	54411.715	62532	37651.159	80578.632	1.5	H2-1
48	M43	HSS4.5X4.5X3	0.069	20	10	0.098	8.958	z	13	120246.398	121302	194994	194994	1.494	H1-1b
49	M44	L4X4X4	0.368	24.375	12	0.089	24.375	z	12	54411.715	62532	37651.159	80578.632	1.469	H2-1
50	M77	L4X4X4	0.363	0	4	0.089	24.375	z	10	54411.715	62532	37651.159	80578.632	1.468	H2-1
51	M45	L4X4X4	0.362	0	8	0.088	24.375	z	2	54411.715	62532	37651.159	80578.632	1.467	H2-1
52	M8	L4X4X4	0.378	36.125	30	0.055	36.125	z	109	51466.784	62532	37651.159	80578.632	1.5	H2-1
53	M79	L4X4X4	0.379	0	28	0.054	0	z	129	51466.784	62532	37651.159	80578.632	1.5	H2-1
54	M9	L4X4X4	0.379	0	36	0.054	0	z	89	51466.784	62532	37651.159	80578.632	1.5	H2-1
55	M47	L4X4X4	0.377	0	32	0.037	3.01	y	13	51466.784	62532	37651.159	80578.632	1.5	H2-1
56	M46	L4X4X4	0.38	36.125	38	0.036	36.125	z	225	51466.784	62532	37651.159	80578.632	1.5	H2-1
57	M78	L4X4X4	0.38	36.125	34	0.036	36.125	z	209	51466.784	62532	37651.159	80578.632	1.5	H2-1
58	M84	L3X3X3	0.34	27.5	12	0.036	55	z	130	21109.581	35316	15841.16	29030.935	1.018	H2-1
59	M14	L3X3X3	0.334	27.5	8	0.035	0	z	108	21109.581	35316	15841.16	29033.525	1.018	H2-1
60	M52	L3X3X3	0.334	27.5	4	0.033	0	y	13	21109.581	35316	15841.16	29033.512	1.018	H2-1
61	M15	6"x0.375" Plate	0.555	1.557	2	0.022	5.75	z	13	62722.329	72900	6834.391	109350	2.198	H1-1b
62	M53	6"x0.375" Plate	0.555	1.557	10	0.022	5.75	z	10	62722.329	72900	6834.391	109350	2.197	H1-1b
63	M86	6"x0.375" Plate	0.555	1.557	6	0.022	5.75	z	6	62722.329	72900	6834.391	109350	2.196	H1-1b
64	M54	6"x0.375" Plate	0.555	1.557	10	0.022	5.75	z	10	62722.329	72900	6834.391	109350	2.202	H1-1b
65	M85	6"x0.375" Plate	0.555	1.557	6	0.022	5.75	z	6	62722.329	72900	6834.391	109350	2.203	H1-1b
66	M16	6"x0.375" Plate	0.555	1.557	2	0.022	5.75	z	2	62722.329	72900	6834.391	109350	2.201	H1-1b
67	M65	6"x0.375" Plate	0.14	0	10	0.015	0	z	10	71110.261	72900	6834.391	109350	1.349	H1-1b
68	M71	6"x0.375" Plate	0.14	0	10	0.015	0	z	10	71110.261	72900	6834.391	109350	1.35	H1-1b
69	M103	6"x0.375" Plate	0.14	0	6	0.015	0	z	6	71110.261	72900	6834.391	109350	1.349	H1-1b
70	M97	6"x0.375" Plate	0.14	0	6	0.015	0	z	6	71110.261	72900	6834.391	109350	1.35	H1-1b
71	M27	6"x0.375" Plate	0.14	0	2	0.015	0	z	2	71110.261	72900	6834.391	109350	1.349	H1-1b
72	M33	6"x0.375" Plate	0.14	0	2	0.015	0	z	2	71110.261	72900	6834.391	109350	1.35	H1-1b
73	M125	PIPE_2.0	0.059	18	10	0.011	18		10	26521.424	32130	22459.5	22459.5	2.401	H1-1b

INFINIGY

FROM ZERO TO INFINIGY

the solutions are endless

BOLT CONNECTION CALCULATION

BOLT PROPERTIES

Date:	7/28/2021
Site:	*BOBDL00104A*
Engineer:	*DVA*
Infinigy Job No:	*2039-Z5555C*
Connection Location:	*Arm to Collar*

Bolt Capacity Equation	TIA-222-H	
Connection Type	Steel	
Bolt Size, **d**	5/8	in
Threads per Inch, **n**	11	
Steel Grade	A325	
Bolt Ultimate Tensile Stress, $\mathbf{F_u}$	120	ksi
Threads Exclusion	N	
Shear Plane	1	

Net Bolt Cross-Sectional Area, **An**	0.226	in^2
Gross Bolt Cross-Sectional Area, **Ag**	0.307	in^2
Tensile Steel Strength (per bolt), $\boldsymbol{\varphi R_{nt}}$	20340	lbs
Shear Steel Strength (per bolt), $\boldsymbol{\varphi R_{nv}}$	13806	lbs

INFINIGY

FROM ZERO TO INFINIGY

the solutions are endless

BOLT CONNECTION CALCULATION

BOLT GROUP CHECK

Date:	*7/28/2021*
Site:	*BOBDL00104A*
Engineer:	*DVA*
Infinigy Job No:	*2039-Z5555C*
Connection Location:	*Arm to Collar*

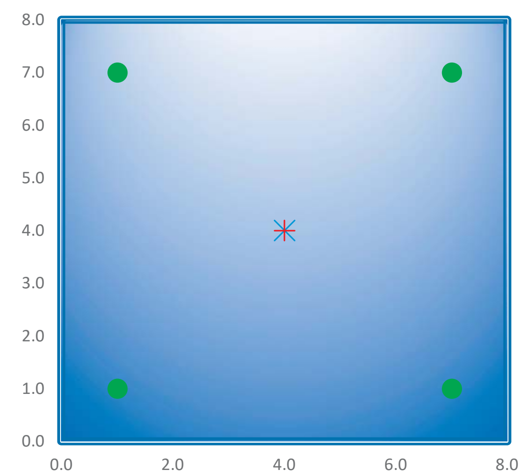
Loads Properties

Controlling LC:	13				
Load Point Number:	N1				
X-Coordinate (in.)	4.00				
Y-Coordinate (in.)	4.00				
Z-Coordinate (in.)	0.00				
Shear Load, Px (lbs)	-695.000	0	0	0	0
Shear Load, Py (lbs)	1455.000	0	0	0	0
Axial Load, Pz (lbs)	1305.000	0	0	0	0
Moment, Mx (lb-in)	62199.000	0	0	0	0
Moment, My (lb-in)	-13585.000	0	0	0	0
Moment, Mz (lb-in)	6724.000	0	0	0	0

Member Properties

	X	***Y***
Start Coordinates:	0.0	0.0
Dimentions:	8.0	8.0

Bolt Group Pattern



Number of Bolts: 4

		Bolt Coordinates		***Bolt Loads***			***Steel Bolt Usage***		
No.	***Bolt Type***	***Xo (in)***	***Yo (in)***	***Axial (lbs)***	***Shear (lbs)***	***Tension***	***Shear***	***Combined***	***Max. Capacity***
1	Main Type	1.0	1.0	-5989.08	787.83	0.0%	5.7%	5.7%	5.7%
2	Main Type	7.0	1.0	-3724.92	461.55	0.0%	3.3%	3.3%	3.3%
3	Main Type	1.0	7.0	4377.42	652.65	21.5%	4.7%	21.5%	21.5%
4	Main Type	7.0	7.0	6641.58	135.32	32.7%	1.0%	32.7%	32.7%

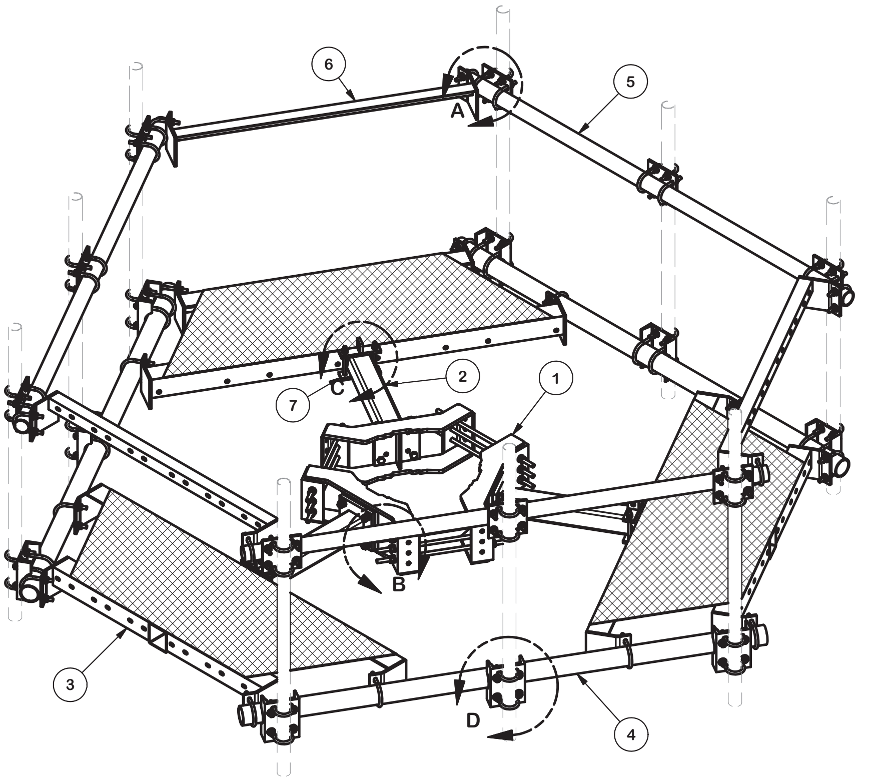
Bolt Group Properties:

Xc =	4.00	in.
Yc =	4.00	in.
Ic.y =	11.04	in.^2
Ic.x =	11.04	in.^2
Ic.xy =	22.09	in.^2

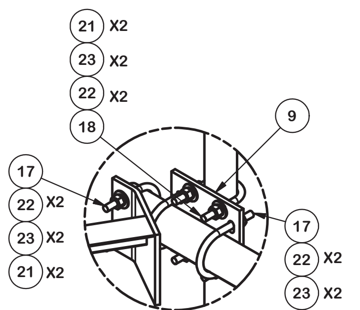
Loads at Center of Gravity of Bolt Group:

Pz =	1305.00	lbs
Px =	-695.00	lbs
Py =	1455.00	lbs
Mx =	62199.00	lb-in
My =	-13585.00	lb-in
Mz =	6724.00	lb-in

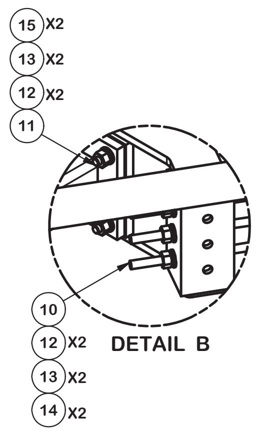
Total Capacity of Bolt Group: 32.7%



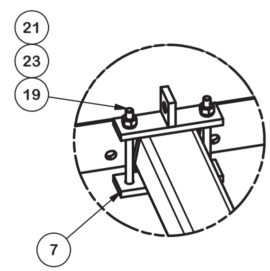
PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-LWRM	RING MOUNT WELDMENT		68.81	206.42
2	3	X-SNP-ST8	SNB8 TELESCOPING ARM FOR GRATING		60.39	181.16
3	3	X-SNPC	CORNER GRATING WELDMENT		194.33	582.99
4	3	P396	3" SCH. 40 PIPE (3.5" O.D. x 0.216" WALL) A500	96.000 in	60.75	182.25
5	3	P3096	2-7/8" OD X 96" Sch 40 Galvanized Pipe		46.45	139.36
6	3	X-SNP-HRA	CORNER BRACKET FOR SNPX PLATFORMS		25.95	77.86
7	3	X-SNPP1G	CLAMP PLATE	7.250 in	2.03	6.10
8	9	X-SP219	SMALL SUPPORT CROSS PLATE	8.250 in	8.61	77.50
9	9	SCX2	CROSSOVER PLATE	7.000 in	4.80	43.17
10	9	G58R-48	5/8" x 48" THREADED ROD (HDG.)		0.55	4.94
10	9	G58R-24	5/8" x 24" THREADED ROD (HDG.)		0.55	4.94
11	12	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2.75	0.36	4.27
12	30	A58FW	5/8" HDG A325 FLATWASHER		0.03	1.02
13	30	G58LW	5/8" HDG LOCKWASHER		0.03	0.78
14	18	A58NUT	5/8" HDG A325 HEX NUT		0.13	2.34
15	12	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	1.56
16	12	X-UB1358	1/2" X 3-5/8" X 5-1/2" X 3" U-BOLT (HDG.)		0.73	8.78
17	24	X-UB1300	1/2" X 3" X 5" X 2" U-BOLT (HDG.)		0.73	17.56
18	36	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.73	26.34
19	6	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	7-1/2	0.41	2.46
20	18	X-UB1306	1/2" X 3-5/8" X 6" X 3" U-BOLT (HDG.)		0.73	13.17
21	186	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	13.32
22	180	G12FW	1/2" HDG USS FLATWASHER		0.03	6.13
23	186	G12LW	1/2" HDG LOCKWASHER		0.01	2.59
24	9	A	2" SCH. 40 PIPE (2.375" O.D. x 0.154" WALL) A500	B	C	D



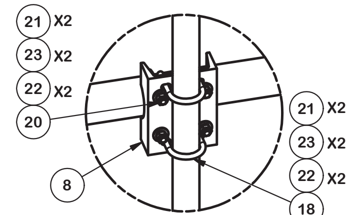
DETAIL A



DETAIL B



DETAIL C



DETAIL D

2-3/8" O.D. VERTICAL MOUNTING PIPES					
ASSEMBLY NO.	PART NO. "A"	LENGTH "B"	UNIT WEIGHT "C	NET WEIGHT "D"	TOTAL WEIGHT
SNP8HR-372	P272	6'-0"	23.07	207.63	1717.07
SNP8HR-384	P284	7'-0"	26.91	242.19	1751.63
SNP8HR-396	P296	8'-0"	30.76	276.84	1786.28
SNP8HR-3126	P2126	10'-6"	40.75	366.75	1876.19

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

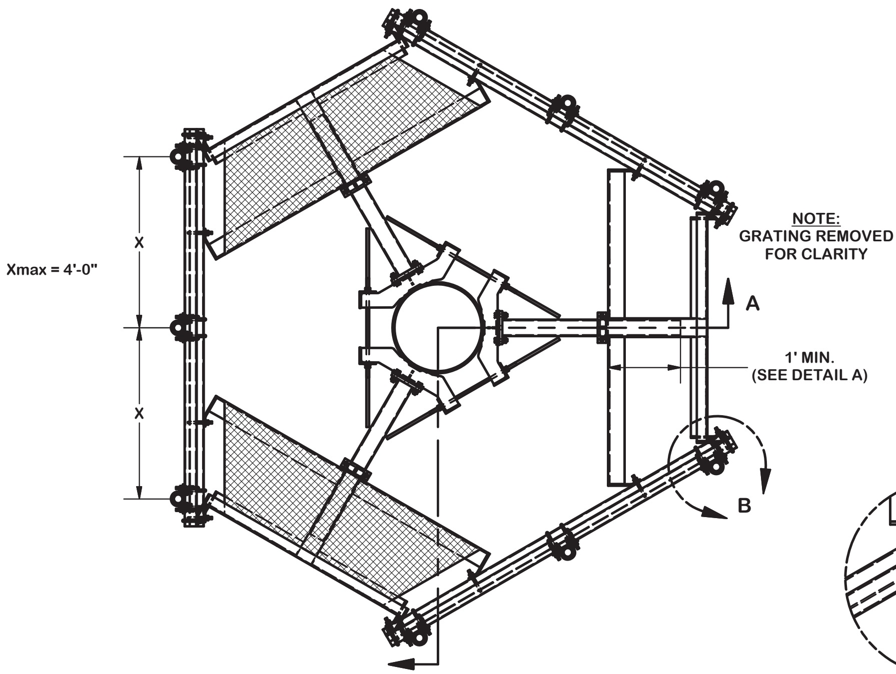
DESCRIPTION
8' SNUB NOSE
PLATFORM WITH
HANDRAIL

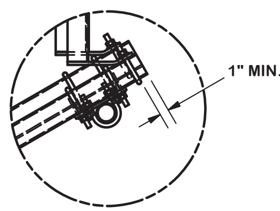
SITE PRO 1
A valmont COMPANY

Engineering Support Team: 1-888-753-7446

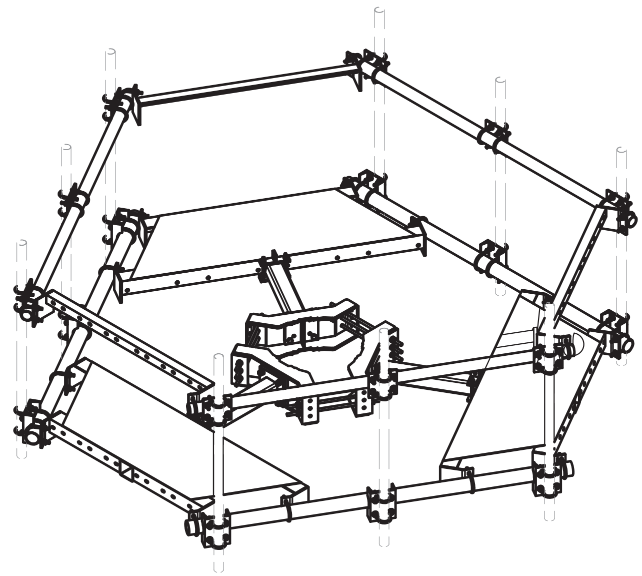
Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

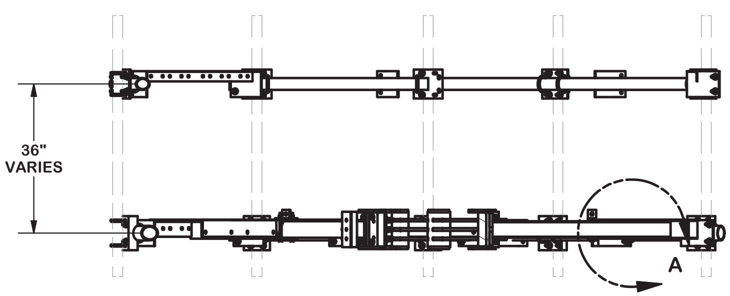
CPD NO.		DRAWN BY	ENG. APPROVAL	PART NO.
		CEK 11/19/2014		SEE ASSEMBLY NO.
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 11/21/2014	SNP8HR-3XX



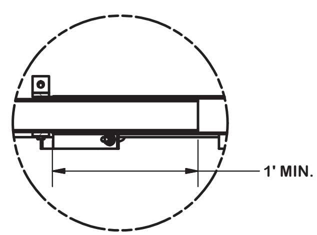


DETAIL B

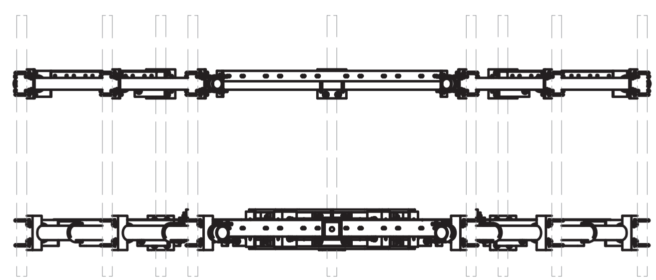




SECTION A-A



DETAIL A



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION
8' SNUB NOSE
PLATFORM WITH
HANDRAIL

SITE PRO 1
A valmont COMPANY
Engineering Support Team:
1-888-753-7446
Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.		DRAWN BY	ENG. APPROVAL	PART NO.
		CEK 11/19/2014		SEE ASSEMBLY NO.
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 11/21/2014	SNP8HR-3XX

Exhibit F

Power Density/RF Emissions Report

EBI Consulting

environmental | engineering | due diligence

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

Dish Wireless Existing Facility

Site ID: BOBDL00104A

63 Woodland Street
Glastonbury, Connecticut 06033

September 1, 2021

EBI Project Number: 6221004688

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**16.47%**

EBI Consulting

environmental | engineering | due diligence

September 1, 2021

Dish Wireless

Emissions Analysis for Site: BOBDL00104A

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **63 Woodland Street** in **Glastonbury, Connecticut** for the purpose of determining whether the emissions from the Proposed Dish Wireless Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed Dish Wireless Wireless antenna facility located at 63 Woodland Street in Glastonbury, 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 125 feet above ground level (AGL).

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

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

Dish Wireless Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21
Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz	Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz	Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz
Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd
Height (AGL):	125 feet	Height (AGL):	125 feet	Height (AGL):	125 feet
Channel Count:	12	Channel Count:	12	Channel Count:	12
Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts
ERP (W):	5,236.31	ERP (W):	5,236.31	ERP (W):	5,236.31
Antenna A1 MPE %:	**1.67%**	Antenna B1 MPE %:	**1.67%**	Antenna C1 MPE %:	**1.67%**

EBI Consulting

environmental | engineering | due diligence

Site Composite MPE %	
Carrier	**MPE %**
Dish Wireless (Max at Sector A):	1.67%
AT&T	10.06%
T-Mobile	4.74%
Site Total MPE % :	16.47%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	1.67%
Dish Wireless Sector B Total:	1.67%
Dish Wireless Sector C Total:	1.67%
Site Total MPE % :	16.47%

Dish Wireless Maximum MPE Power Values (Sector A)

Dish Wireless Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (µW/cm²)	Frequency (MHz)	Allowable MPE (µW/cm²)	Calculated % MPE
Dish Wireless 600 MHz n71	4	223.68	125.0	2.27	600 MHz n71	400	0.57%
Dish Wireless 1900 MHz n70	4	542.70	125.0	5.51	1900 MHz n70	1000	0.55%
Dish Wireless 2190 MHz n66	4	542.70	125.0	5.51	2190 MHz n66	1000	0.55%
						Total:	**1.67%**

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

EBI Consulting

environmental | engineering | due diligence

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:	1.67%
Sector B:	1.67%
Sector C:	1.67%
Dish Wireless Maximum MPE % (Sector A):	1.67%
Site Total:	16.47%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **16.47%** 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.

Exhibit G

Letter of Authorization

Eco-Site, LLC
750 Park of Commerce Drive, Suite 200
Boca Raton, FL 33487
Phone: 561.406.4076

Eco-Site, LLC - Letter of Authorization

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

Re: Tower Share Application
Eco-Site, LLC - telecommunications site at:
63 WOODLAND ST., GLASTONBURY, CT 06073

Eco-Site, LLC, a Delaware limited liability company, d/b/a Vertical Bridge ("Eco Site") hereby authorizes DISH Wireless LLC, including their Agent, to act as our Agent in the processing of all zoning applications, building permits and approvals through the CT - CONNECTICUT SITING COUNCIL for the existing wireless communications site described below:

Eco Site ID/Name: US-CT-5018/Hopewell
Customer Site ID: BOBDL00104A / ECO - Woodland St
Site Address: 63 WOODLAND ST., GLASTONBURY, CT 06073

Eco-Site, LLC

DocuSigned by:

By: Tim Tuck Date: 9/30/2021

6DCD673D644D4BD...

Name: Tim Tuck

Title: Vice President - Lease Administration

Exhibit H

Recipient Mailings

Click-N-Ship®

UNITED STATES POSTAL SERVICE®

P

usps.com
$7.95
US POSTAGE
Flat Rate Env

9405 5036 9930 0019 7586 94 0079 5000 0063 3487

US POSTAGE PAID

10/01/2021 Mailed from 06032

PRIORITY MAIL 2-DAY™

Expected Delivery Date: 10/04/21

CHUCK REGULBUTO
NORTHEAST SITE SOLUTIONS
1053 FARMINGTON AVE STE G
FARMINGTON CT 06032-1574

0004

C057

SHIP TO: VERTICAL BRIDGE, REIT, LLC, TOWER OWNER
750 PARK OF COMMERCE DR
STE 200
BOCA RATON FL 33487-3650

USPS TRACKING #

9405 5036 9930 0019 7586 94

Electronic Rate Approved #038555749

Cut on dotted line.

Instructions

1. Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.
2. Place your label so it does not wrap around the edge of the package.
3. Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
5. Mail your package on the "Ship Date" you selected when creating this label.

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0019 7586 94

Trans. #:	544897384	Priority Mail® Postage:	$7.95
Print Date:	09/30/2021	Total:	$7.95
Ship Date:	10/01/2021		
Expected Delivery Date:	10/04/2021		

From: CHUCK REGULBUTO
NORTHEAST SITE SOLUTIONS
1053 FARMINGTON AVE STE G
FARMINGTON CT 06032-1574

To: VERTICAL BRIDGE, REIT, LLC, TOWER OWNER
750 PARK OF COMMERCE DR
STE 200
BOCA RATON FL 33487-3650

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

UNITED STATES POSTAL SERVICE® *Thank you for shipping with the United States Postal Service!*
Check the status of your shipment on the USPS Tracking® page at usps.com

UNITED STATES POSTAL SERVICE® **Click-N-Ship®**

9405 5036 9930 0019 7408 42 0079 5000 0010 6033

usps.com
$7.95
US POSTAGE
Flat Rate Env

US POSTAGE PAID

P

10/01/2021 Mailed from 06032

PRIORITY MAIL 1-DAY™

Expected Delivery Date: 10/02/21

CHUCK REGULBUTO
NORTHEAST SITE SOLUTIONS
1053 FARMINGTON AVE STE G
FARMINGTON CT 06032-1574

0024

C002

SHIP TO: RICHARD J JOHNSON
TOWN MANAGER, TOWN OF GLASTONBURY
2155 MAIN ST
2
GLASTONBURY CT 06033-2282

USPS TRACKING #

9405 5036 9930 0019 7408 42

Electronic Rate Approved #038555749

Cut on dotted line.

Instructions

1. Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.
2. Place your label so it does not wrap around the edge of the package.
3. Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
5. Mail your package on the "Ship Date" you selected when creating this label.

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0019 7408 42

Trans. #:	544895944
Print Date:	09/30/2021
Ship Date:	10/01/2021
Expected Delivery Date:	10/02/2021

Priority Mail® Postage:	$7.95
Total:	$7.95

From: CHUCK REGULBUTO
NORTHEAST SITE SOLUTIONS
1053 FARMINGTON AVE STE G
FARMINGTON CT 06032-1574

To: RICHARD J JOHNSON
TOWN MANAGER, TOWN OF GLASTONBURY
2155 MAIN ST
2
GLASTONBURY CT 06033-2282

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

UNITED STATES POSTAL SERVICE® *Thank you for shipping with the United States Postal Service!*
Check the status of your shipment on the USPS Tracking® page at usps.com

UNITED STATES POSTAL SERVICE® **Click-N-Ship®**

P

usps.com
$7.95
US POSTAGE
Flat Rate Env

9405 5036 9930 0019 7408 59 0079 5000 0010 6033

US POSTAGE PAID

10/01/2021 Mailed from 06032

PRIORITY MAIL 1-DAY™

CHUCK REGULBUTO
NORTHEAST SITE SOLUTIONS
1053 FARMINGTON AVE STE G
FARMINGTON CT 06032-1574

Expected Delivery Date: 10/02/21

0024

C002

SHIP TO: REBECCA AUGUR
DIRECTOR OF PLANNING & LAND USE SERVICES
2155 MAIN ST
3
GLASTONBURY CT 06033-2282

USPS TRACKING #

9405 5036 9930 0019 7408 59

Electronic Rate Approved #038555749

Cut on dotted line.

Instructions

1. Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.
2. Place your label so it does not wrap around the edge of the package.
3. Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
5. Mail your package on the "Ship Date" you selected when creating this label.

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0019 7408 59

Trans. #:	544895944
Print Date:	09/30/2021
Ship Date:	10/01/2021
Expected Delivery Date:	10/02/2021

Priority Mail® Postage:	$7.95
Total:	$7.95

From: CHUCK REGULBUTO
NORTHEAST SITE SOLUTIONS
1053 FARMINGTON AVE STE G
FARMINGTON CT 06032-1574

To: REBECCA AUGUR
DIRECTOR OF PLANNING & LAND USE SERVICES
2155 MAIN ST
3
GLASTONBURY CT 06033-2282

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

UNITED STATES POSTAL SERVICE® *Thank you for shipping with the United States Postal Service!*
Check the status of your shipment on the USPS Tracking® page at usps.com

UNITED STATES POSTAL SERVICE® **Click-N-Ship®**

P

usps.com
$7.95
US POSTAGE
Flat Rate Env

9405 5036 9930 0019 7408 66 0079 5000 0010 6073

US POSTAGE PAID
click-n-ship

10/01/2021 Mailed from 06032

PRIORITY MAIL 1-DAY™

Expected Delivery Date: 10/02/21

CHUCK REGULBUTO
NORTHEAST SITE SOLUTIONS
1053 FARMINGTON AVE STE G
FARMINGTON CT 06032-1574

0024

R023

SHIP TO:
PAUL J CAVANNA
80 WOODLAND ST
S GLASTONBURY CT 06073-2715

USPS TRACKING #

9405 5036 9930 0019 7408 66

Electronic Rate Approved #038555749

Cut on dotted line.

Instructions

1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0019 7408 66

Trans. #:	544895944	Priority Mail® Postage:	$7.95
Print Date:	09/30/2021	Total:	$7.95
Ship Date:	10/01/2021		
Expected Delivery Date:	10/02/2021		

From: CHUCK REGULBUTO
NORTHEAST SITE SOLUTIONS
1053 FARMINGTON AVE STE G
FARMINGTON CT 06032-1574

To: PAUL J CAVANNA
80 WOODLAND ST
S GLASTONBURY CT 06073-2715

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

UNITED STATES POSTAL SERVICE® *Thank you for shipping with the United States Postal Service!*
Check the status of your shipment on the USPS Tracking® page at usps.com

BOBDL00104A
Dish

FARMINGTON
210 MAIN ST
FARMINGTON, CT 06032-9998
(800)275-8777

10/01/2021 02:04 PM

Product	Qty	Unit Price	Price
Prepaid Mail Glastonbury, CT 06033 Weight: 0 lb 11.00 oz Acceptance Date: Fri 10/01/2021 Tracking #: 9405 5036 9930 0019 7408 42	1		$0.00
Prepaid Mail Glastonbury, CT 06033 Weight: 0 lb 10.90 oz Acceptance Date: Fri 10/01/2021 Tracking #: 9405 5036 9930 0019 7408 59	1		$0.00
Prepaid Mail South Glastonbury, CT 06073 Weight: 0 lb 11.00 oz Acceptance Date: Fri 10/01/2021 Tracking #: 9405 5036 9930 0019 7408 66	1		$0.00
Prepaid Mail Boca Raton, FL 33487 Weight: 0 lb 2.10 oz Acceptance Date: Fri 10/01/2021 Tracking #: 9405 5036 9930 0019 7586 94	1		$0.00

Grand Total: $0.00