

PROJECT NARRATIVE

November 4, 2021

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

Re: Request of DISH Wireless LLC for an Order to Approve the Shared Use of an Existing Tower
286 Beckley Road Berlin, CT 06037
Latitude: 41°37'54.2" / Longitude: -72°43'47.64"

Dear Ms. Bachman:

Pursuant to Connecticut General Statutes ("C.G.S.") §16-50aa, as amended, DISH Wireless LLC ("DISH") hereby requests an order from the Connecticut Siting Council ("Council") to approve the shared use by DISH of an existing telecommunication tower at 286 Beckley Road in Berlin (the "Property"). The existing 151.5-foot monopole tower is owned by American Tower Corporation ("ATC"). The underlying property is owned by John & Elaine Matulis. DISH requests that the Council find that the proposed shared use of the ATC tower satisfies the criteria of C.G.S. §16-50aa and issue an order approving the proposed shared use. A copy of this filing is being sent to Arosha Jayawickrema, Town Manager for the Town of Berlin, Frank Van Linter, Town of Berlin Building Official and John & Elaine Matulis as the property owner.

Background

The existing ATC facility consists of a 151.5-foot monopole tower located within an existing leased area. AT&T Mobility currently maintains antennas at the 151.5-foot level. T-Mobile currently maintains antennas at the 142-foot level. Sprint Nextel currently maintains antennas at the 132.7-foot level and 127-foot level. Verizon Wireless currently maintains antennas at the 116-foot level. Equipment associated with these antennas are located at various positions within the tower and compound.

DISH is licensed by the Federal Communications Commission ("FCC") to provide wireless services throughout the State of Connecticut. DISH and Crown Castle have agreed to the proposed shared use of the 286 Beckley Road tower pursuant to mutually acceptable terms and conditions. Likewise, DISH and ATC have agreed to the proposed installation of equipment cabinets on the ground on the south side of the tower within the existing compound. ATC has authorized DISH to apply for all necessary permits and approvals that may be required to share the existing tower. (See attached Letter of Authorization)

DISH proposes to install three (3) antennas, (1) Tower platform mount, (6) Remote radio units at the 105-foot level along with, (1) over voltage protection device (OVP) and (1) Hybrid cable. DISH will install an equipment cabinet on a 5'x7' equipment platform. DISH's Construction Drawings provide project specifications for all proposed site improvement locations.

The construction drawings also include specifications for DISH's proposed antenna and groundwork.

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

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

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

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

1. The proposed installation will have no visual impact on the area of the tower. DISH's equipment cabinet would be installed within the existing facility compound. DISH's shared use of this tower therefore will not cause any significant change or alteration in the physical or environmental characteristics of the existing site.
2. Operation of DISH's antennas at this site would not exceed the RF emissions standard adopted by the Federal Communications Commission ("FCC"). Included in the EME report of this filing are the approximation tables that demonstrate that DISH's proposed facility will operate well within the FCC RF emissions safety standards.
3. Under ordinary operating conditions, the proposed installation would not require the use of any water or sanitary facilities and would not generate air emissions or discharges to water bodies or sanitary facilities. After construction is complete the proposed installations would not generate any increased traffic to the ATC facility other than periodic maintenance. The proposed shared use of the ATC tower, would, therefore, have a minimal environmental effect, and is environmentally feasible.

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

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

Conclusion

For the reasons discussed above, the proposed shared use of the existing ATC tower at 286 Beckley Road satisfies the criteria stated in C.G.S. §16-50aa and advances the Council's goal of preventing the unnecessary proliferation of towers in Connecticut. The Applicant, therefore, respectfully requests that the Council issue an order approving the proposed shared use.

Sincerely,

David Hoogasian

David Hoogasian
Project Manager

LETTER OF AUTHORIZATION



AMERICAN TOWER®
CORPORATION

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

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

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

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

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



AMERICAN TOWER®
CORPORATION

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

Signature:

Print Name: Margaret Robinson
Senior Counsel
American Tower*



AMERICAN TOWER®
CORPORATION

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

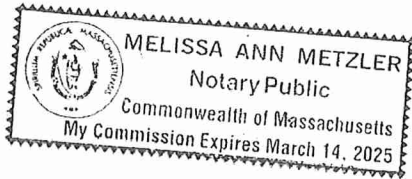
NOTARY BLOCK


Commonwealth of MASSACHUSETTS
County of Middlesex

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

WITNESS my hand and official seal, this 10th day of September 2021.

NOTARY SEAL



Notary Public 
My Commission Expires: March 14, 2025

ENGINEERING DRAWINGS



DISH Wireless L.L.C. SITE ID:

BOBDL00013A

DISH Wireless L.L.C. SITE ADDRESS:

**286 BECKLEY ROAD
BERLIN, CT 06037**

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:	
<ul style="list-style-type: none"> • INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR) • INSTALL (1) PROPOSED TOWER PLATFORM MOUNT • INSTALL PROPOSED JUMPERS • INSTALL (6) PROPOSED RRU's (2 PER SECTOR) • INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP) • INSTALL (1) PROPOSED HYBRID CABLE 	
GROUND SCOPE OF WORK:	
<ul style="list-style-type: none"> • INSTALL (1) PROPOSED METAL PLATFORM • INSTALL (1) PROPOSED ICE BRIDGE • INSTALL (1) PROPOSED PPC CABINET • INSTALL (1) PROPOSED EQUIPMENT CABINET • INSTALL (1) PROPOSED POWER CONDUIT • INSTALL (1) PROPOSED TELCO CONDUIT • INSTALL (1) PROPOSED TELCO-FIBER BOX • INSTALL (1) PROPOSED GPS UNIT • INSTALL (1) PROPOSED SAFETY SWITCH (IF REQUIRED) • INSTALL (1) PROPOSED FIBER NID (IF REQUIRED) • INSTALL (1) PROPOSED METER SOCKET • INSTALL (1) PROPOSED FIBER HAND HOLE 	

SITE INFORMATION	PROJECT DIRECTORY
PROPERTY OWNER: MATULIS ELAINE E & JOHN C JR ADDRESS: 280 BECKLEY RD. BERLIN, CT 06037	APPLICANT: DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER TYPE: MONOPOLE	TOWER OWNER: AMERICAN TOWER CORPORATION 10 PRESIDENTIAL WAY WOBURN, MA 01801 (781) 926-4500
TOWER CO SITE ID: 302483	SITE DESIGNER: B+T GROUP 1717 S. BOULDER AVE, SUITE 300 TULSA, OK 74119 (918) 587-4630
TOWER APP NUMBER: 13683513	SITE ACQUISITION: KENNETH R. BRADBURY II (781) 926-4770
COUNTY: HARTFORD	CONSTRUCTION MANAGER: JAVIER SOTO javier.soto@dish.com
LATITUDE (NAD 83): 41° 37' 54.2" N 41.631722 N	RF ENGINEER: BOSSENER CHARLES bossener.charles@dish.com
LONGITUDE (NAD 83): 72° 43' 47.64" W 72.7299 W	
ZONING JURISDICTION: HARTFORD COUNTY	
ZONING DISTRICT: R	
PARCEL NUMBER: 09003007-11-3-132-7-3877	
OCCUPANCY GROUP: U	
CONSTRUCTION TYPE: II-B	
POWER COMPANY: SENTINEL POWER SERVICES	
TELEPHONE COMPANY: T.B.D.	



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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

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

DRAWN BY: DAS	CHECKED BY: DAS	APPROVED BY: RCM
---------------	-----------------	------------------

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
153455.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00013A
286 BECKLEY ROAD
BERLIN, CT 06037

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

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

SITE PHOTO



DIRECTIONS

DIRECTIONS FROM ROBERTSON AIRPORT:
GET ON CT-72 E FROM JOHNSON AVE AND CT-177 S, HEAD NORTH, TURN LEFT ONTO JOHNSON AVE, TURN LEFT ONTO CT-177 S, TURN LEFT TO MERGE WITH CT-72 E TOWARD I-84/NEW BRITAIN, CONTINUE ON CT-72 E. TAKE CT-9 S TO CT-15 N/US-5 N IN BERLIN. TAKE EXIT 21 FROM CT-9 S, MERGE WITH CT-72 E, USE THE LEFT 2 LANES TO MERGE WITH CT-72 E/I-84 E TOWARD NEW BRITAIN/HARTFORD, CONTINUE TO FOLLOW I-84 E, USE THE LEFT 2 LANES TO TAKE EXIT 35 FOR CT-72 E TOWARD CT-9/NEW BRITAIN, CONTINUE ONTO CT-72 E, USE THE RIGHT 2 LANES TO MERGE WITH CT-9 S TOWARD MIDDLETOWN, TAKE EXIT 21 TO MERGE WITH CT-15 N/US-5 N TOWARD HARTFORD, CONTINUE ON CT-15 N/US-5 N. TAKE MILDNUM RD TO LEDGE DR, MERGE WITH CT-15 N/US-5 N, TURN RIGHT ONTO WOODRUFF CIR, TURN LEFT ONTO MILDNUM RD, TURN LEFT ONTO LEDGE DR, TURN RIGHT ONTO ACCESS ROAD, ARRIVE AT BOBDL00013A.

VICINITY MAP



UNDERGROUND SERVICE ALERT CBYD 811
UTILITY NOTIFICATION CENTER OF CONNECTICUT
(800) 922-4455
WWW.CBYD.COM
CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION



GENERAL NOTES

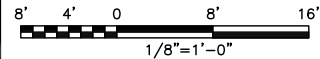
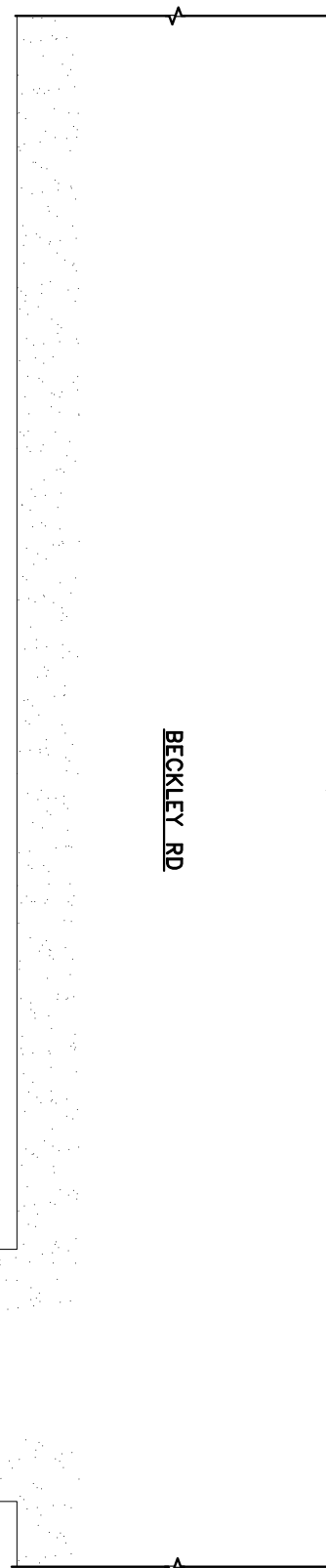
THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE, NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE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

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

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

NOTES

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

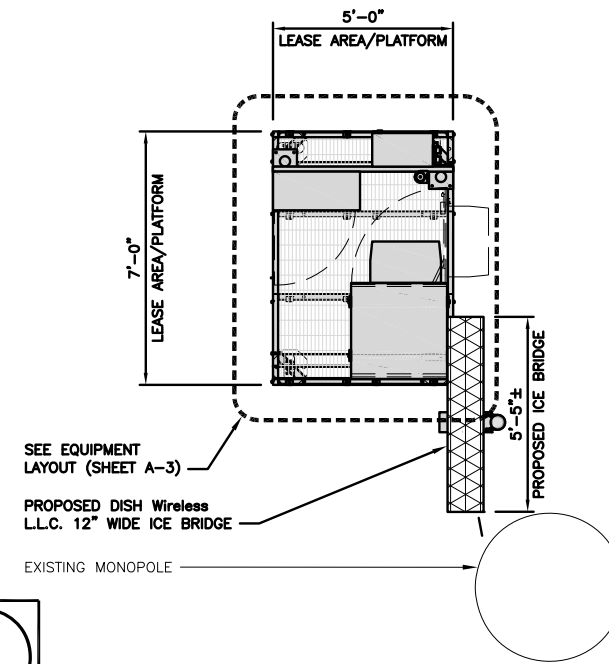


OVERALL SITE PLAN

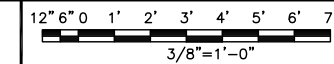
1

NOTES

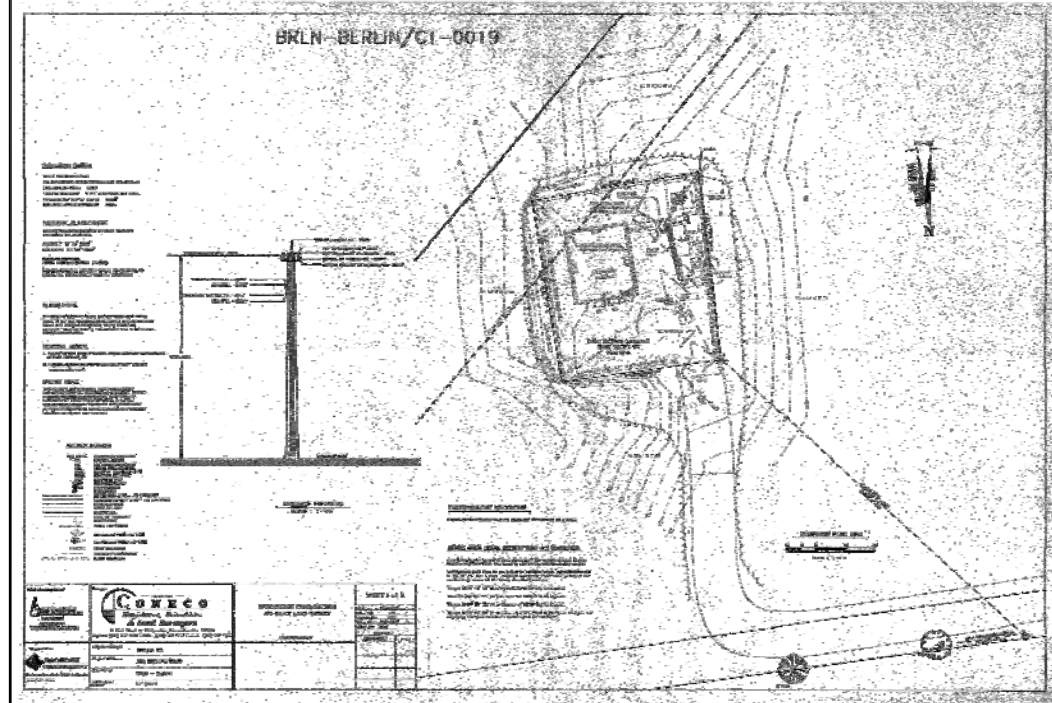
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



ENLARGED SITE PLAN



2



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

SURVEY

NO SCALE

3



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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

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

DRAWN BY: CHECKED BY: APPROVED BY:
DAS DAS RCM

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
153455.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00013A
286 BECKLEY ROAD
BERLIN, CT 06037

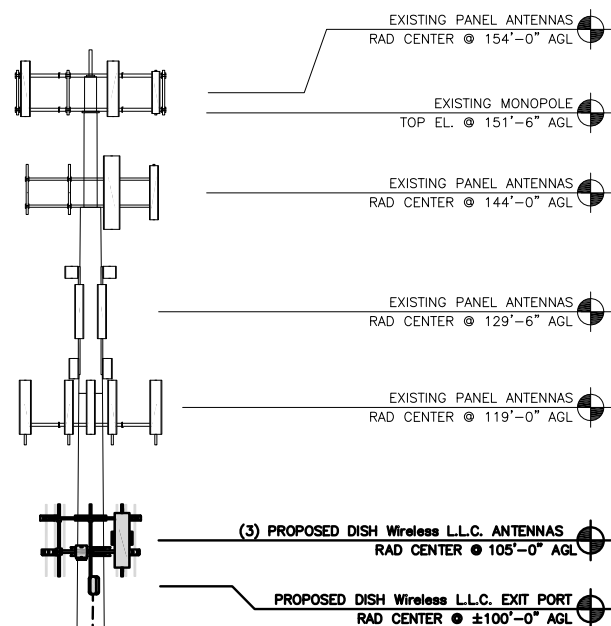
SHEET TITLE
OVERALL AND ENLARGED
SITE PLAN

SHEET NUMBER

A-1

NOTES

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



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

PROPOSED DISH Wireless L.L.C. ICE BRIDGE

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

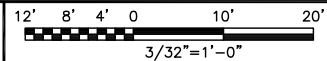
PROPOSED DISH Wireless L.L.C. GPS UNIT

EXISTING MONOPOLE

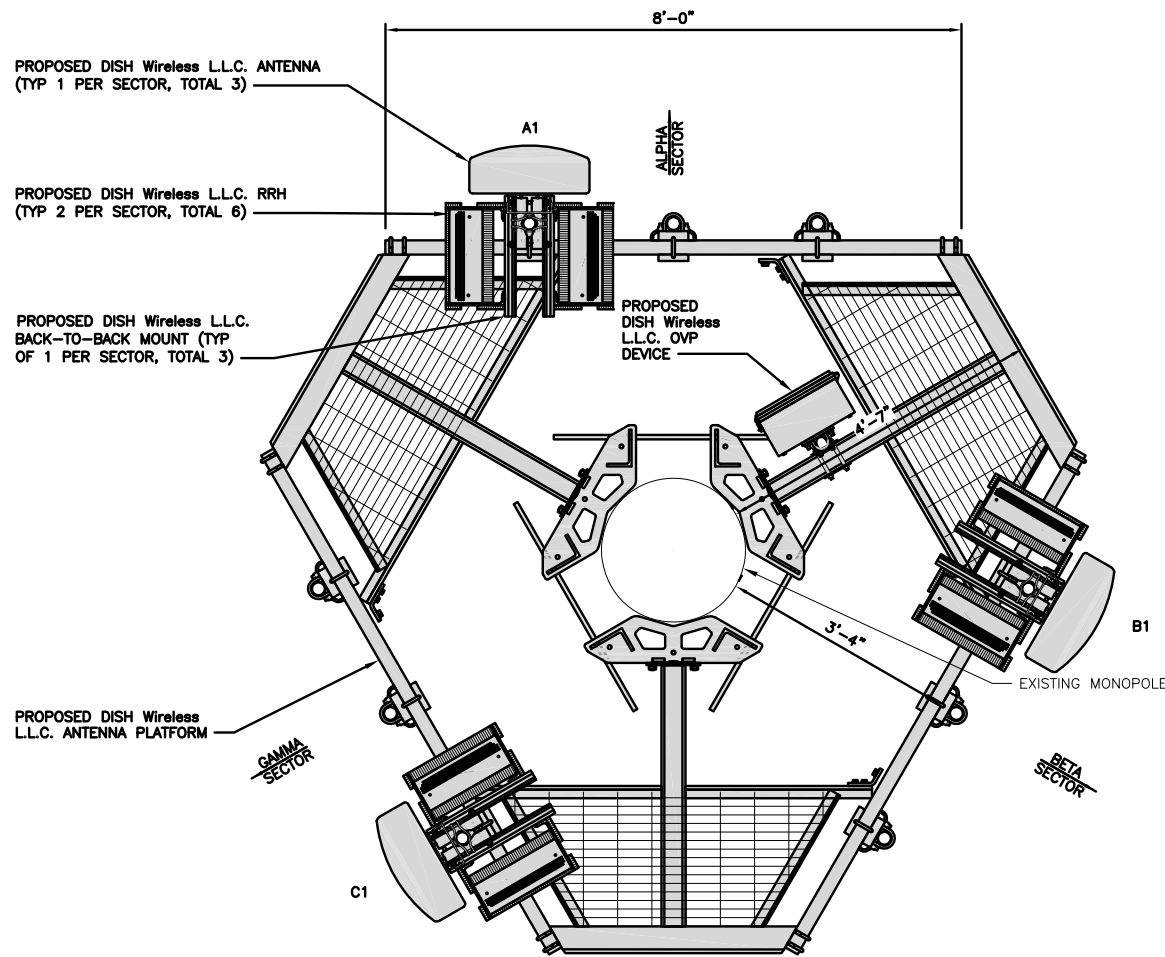
EXISTING ENTRY PORT

EXISTING MONOPOLE
BOTTOM EL. @ 6" AGL

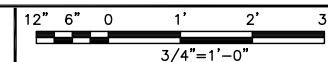
PROPOSED WEST ELEVATION



1



ANTENNA LAYOUT



2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA WIRELESS - MX08FR0665-21	5G	72.0" x 20.0"	0°	105'-0"	(1) HIGH-CAPACITY HYBRID CABLE (135' LONG)
BETA	B1	PROPOSED	JMA WIRELESS - MX08FR0665-21	5G	72.0" x 20.0"	120°	105'-0"	
GAMMA	C1	PROPOSED	JMA WIRELESS - MX08FR0665-21	5G	72.0" x 20.0"	240°	105'-0"	

SECTOR	POSITION	RRH		NOTES
		MANUFACTURER - MODEL NUMBER	TECHNOLOGY	
ALPHA	A1	FUJITSU - TA08025-B604	5G	1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS. 2. ANTENNA AND RRH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. ALL EQUIPMENT CHANGES MUST BE APPROVED AND REMAIN IN COMPLIANCE WITH THE PROPOSED DESIGN AND STRUCTURAL ANALYSES.
	A1	FUJITSU - TA08025-B605	5G	
BETA	B1	FUJITSU - TA08025-B604	5G	
	B1	FUJITSU - TA08025-B605	5G	
GAMMA	C1	FUJITSU - TA08025-B604	5G	
	C1	FUJITSU - TA08025-B605	5G	

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

ANTENNA SCHEDULE

NO SCALE

3



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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

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

DRAWN BY: CHECKED BY: APPROVED BY:
DAS DAS RCM

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
153455.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00013A
286 BECKLEY ROAD
BERLIN, CT 06037

SHEET TITLE
ELEVATION, ANTENNA
LAYOUT AND SCHEDULE

SHEET NUMBER

A-2



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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

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

DRAWN BY: CHECKED BY: APPROVED BY:
DAS DAS RCM

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
153455.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00013A
286 BECKLEY ROAD
BERLIN, CT 06037

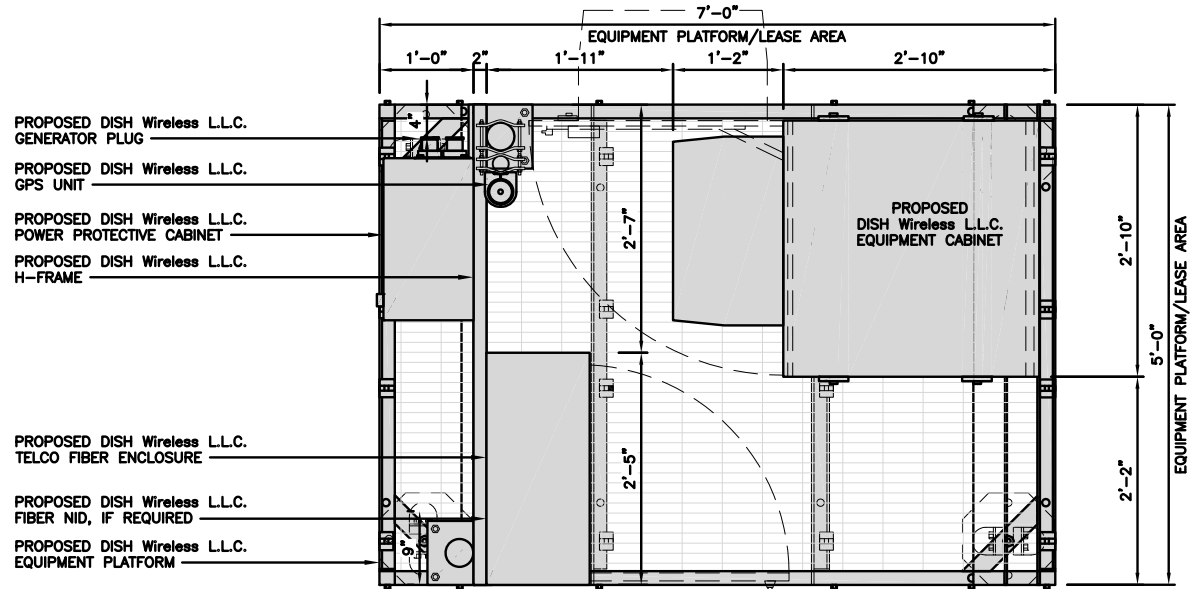
SHEET TITLE
EQUIPMENT PLATFORM AND
H-FRAME DETAILS

SHEET NUMBER

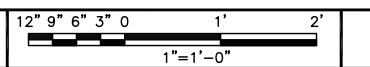
A-3

NOTES

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

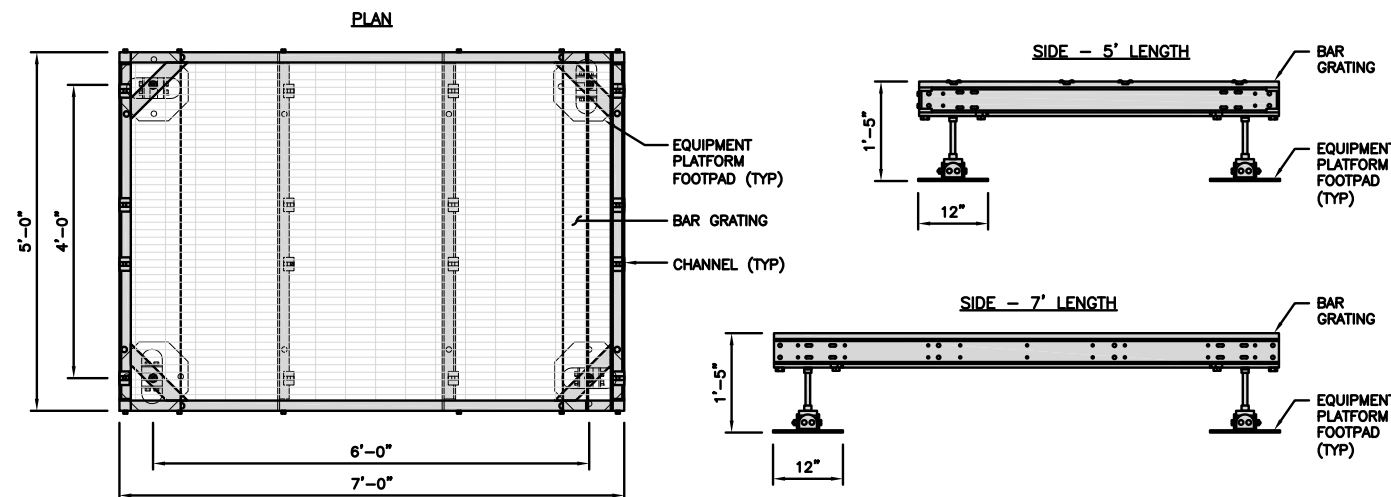


PLATFORM EQUIPMENT PLAN



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

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

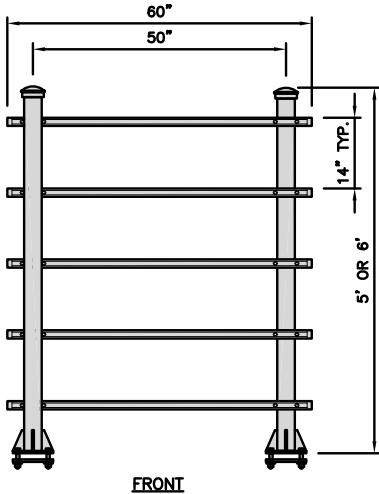
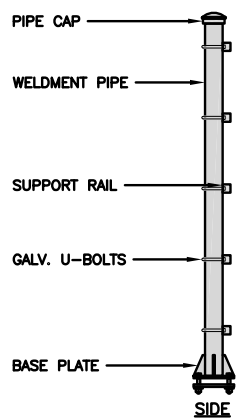


PLATFORM DETAIL

NO SCALE 2

COMMSCOPE MTC4045HFLD H-FRAME	
UNISTRUT/SUPPORT RAILS QTY	5
WEIGHT	59.74 lbs

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

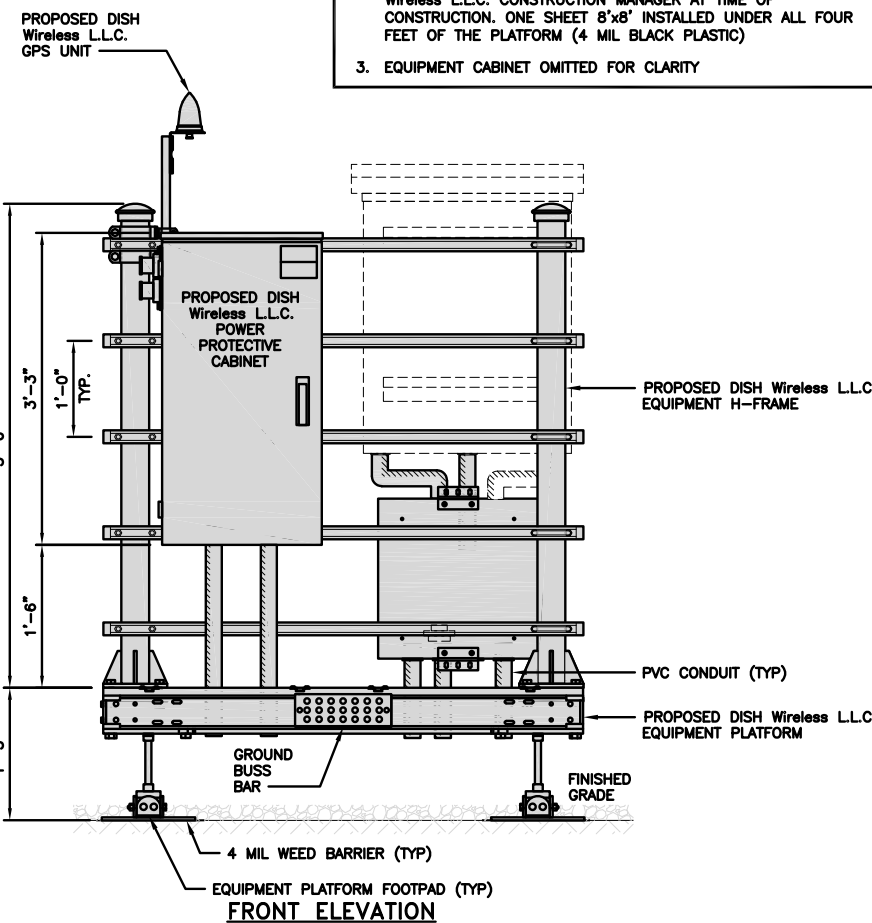


H-FRAME DETAIL

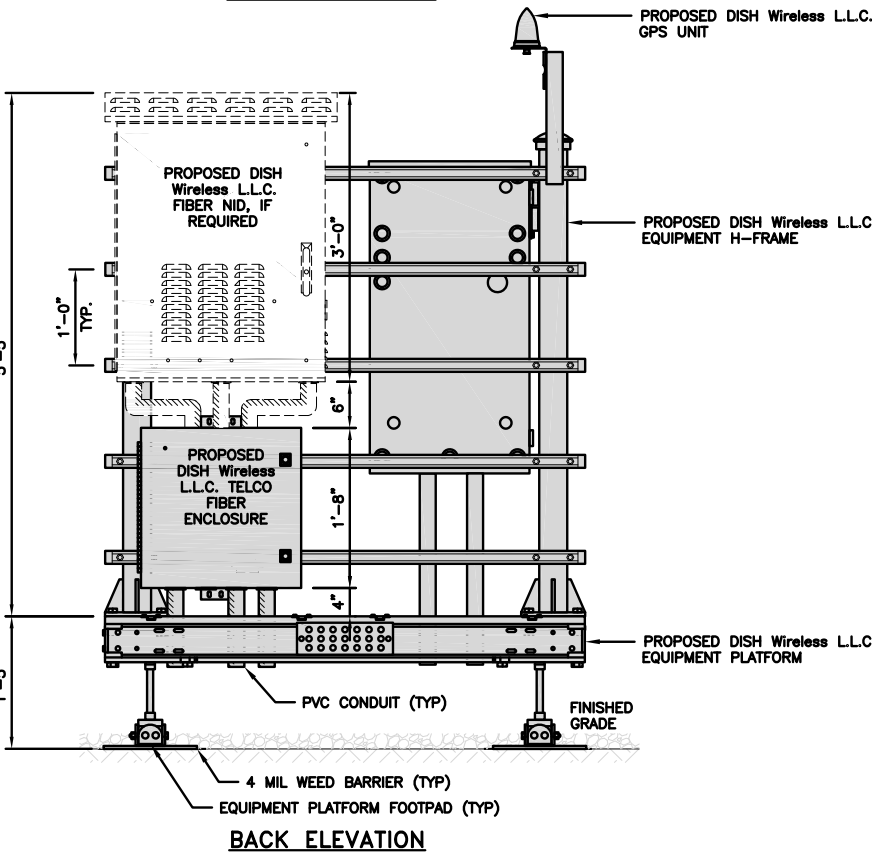
NO SCALE 3

NOT USED

NO SCALE 4

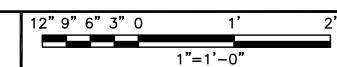


FRONT ELEVATION

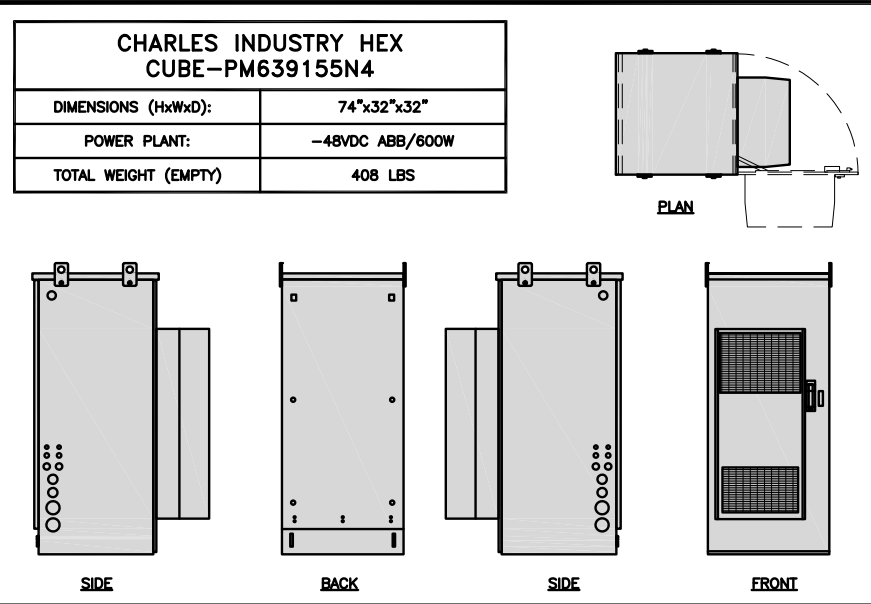


BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION



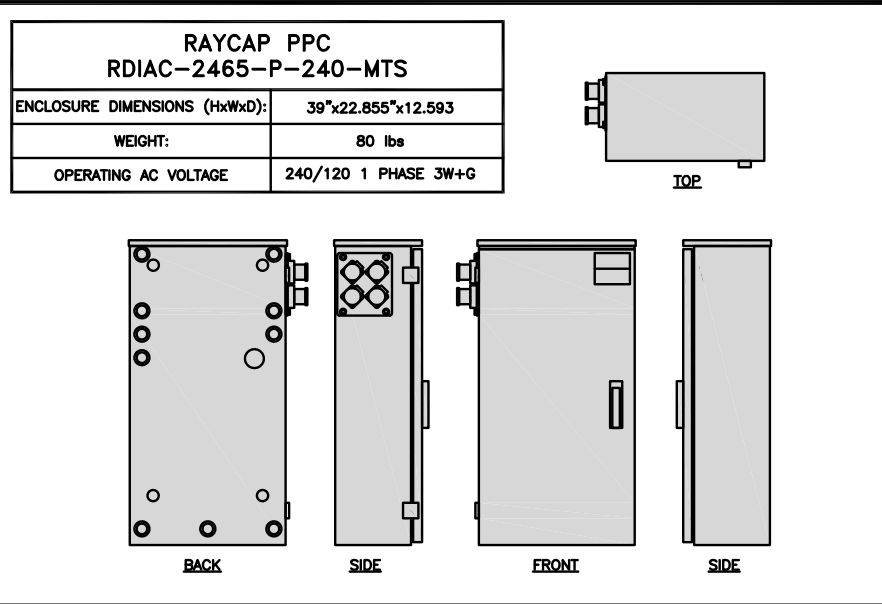
5



CABINET DETAIL

NO SCALE

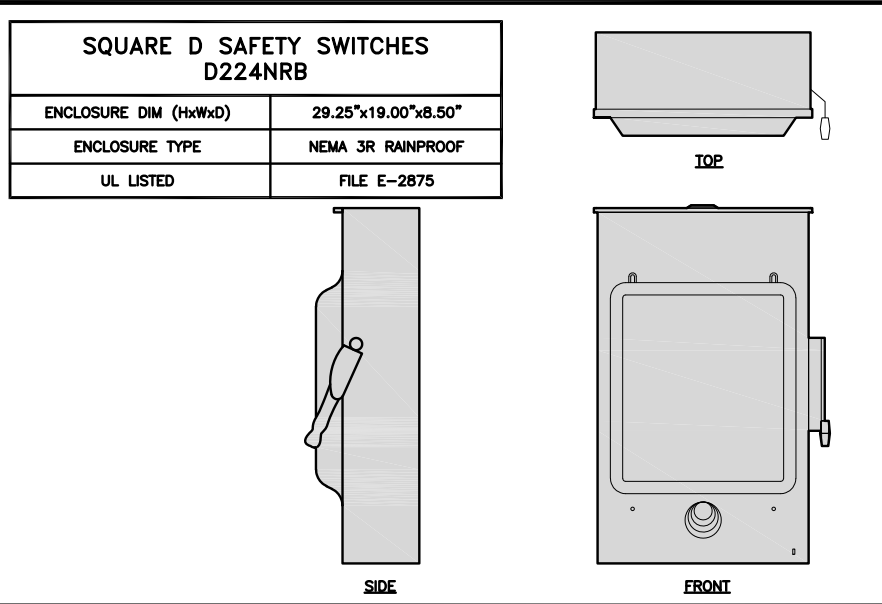
1



POWER PROTECTION CABINET (PPC) DETAIL

NO SCALE

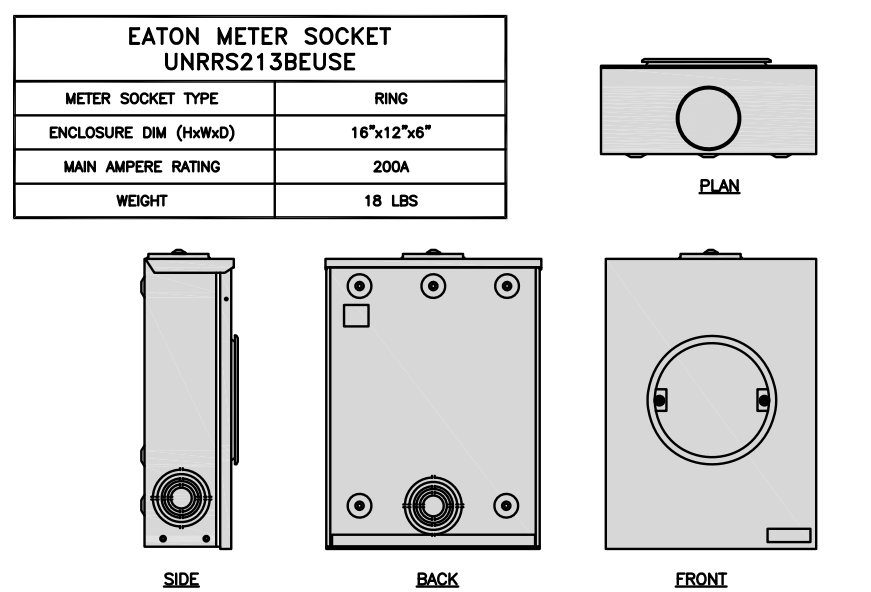
2



SAFETY SWITCH DETAIL

NO SCALE

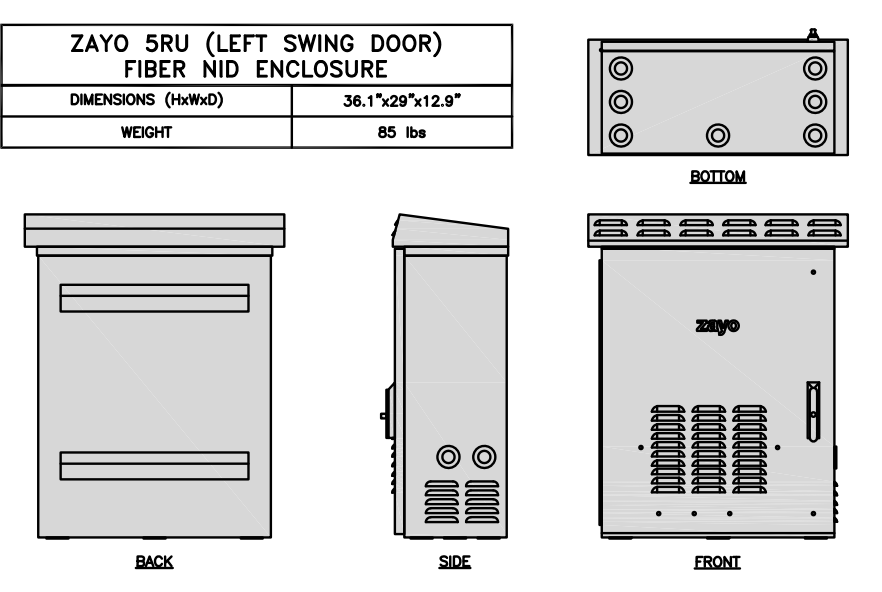
3



METER SOCKET DETAIL

NO SCALE

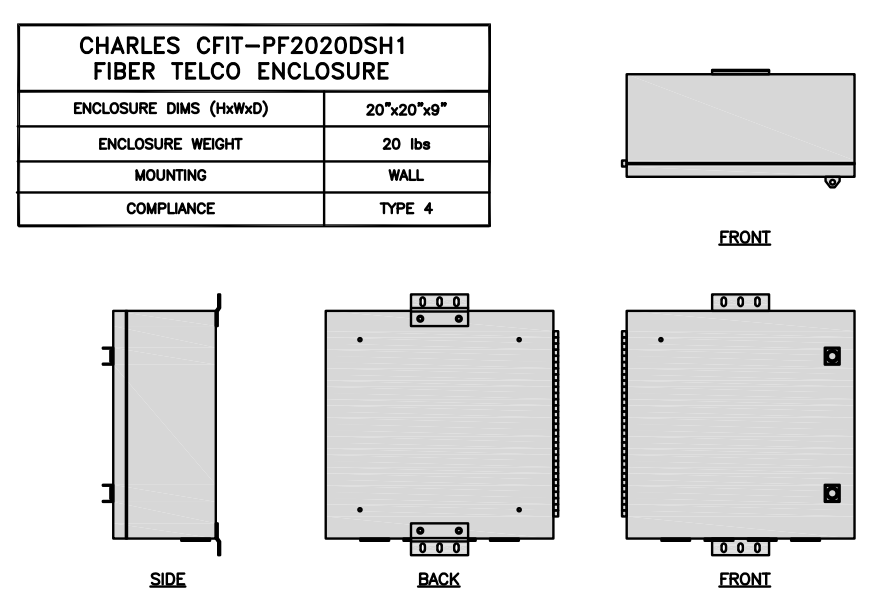
4



FIBER NID ENCLOSURE DETAIL

NO SCALE

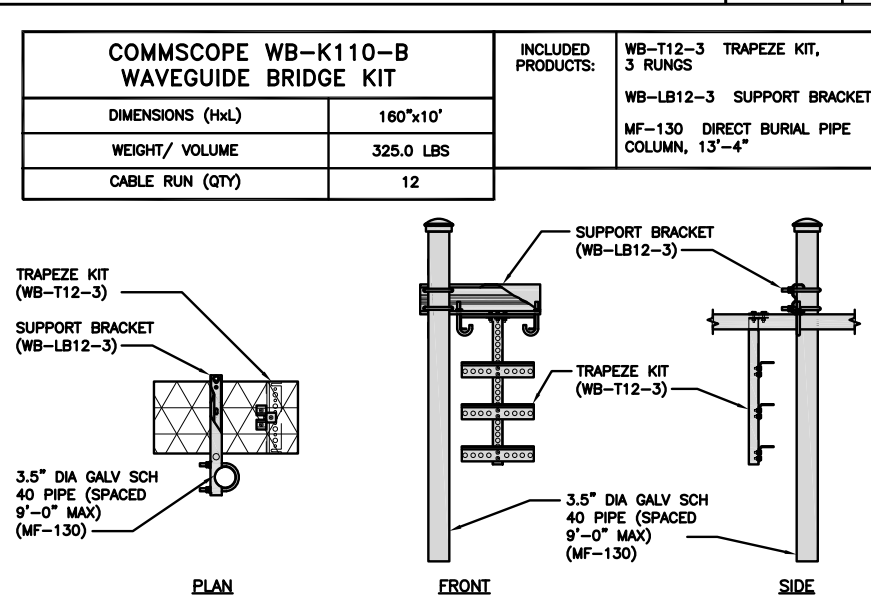
5



FIBER TELCO ENCLOSURE DETAIL

NO SCALE

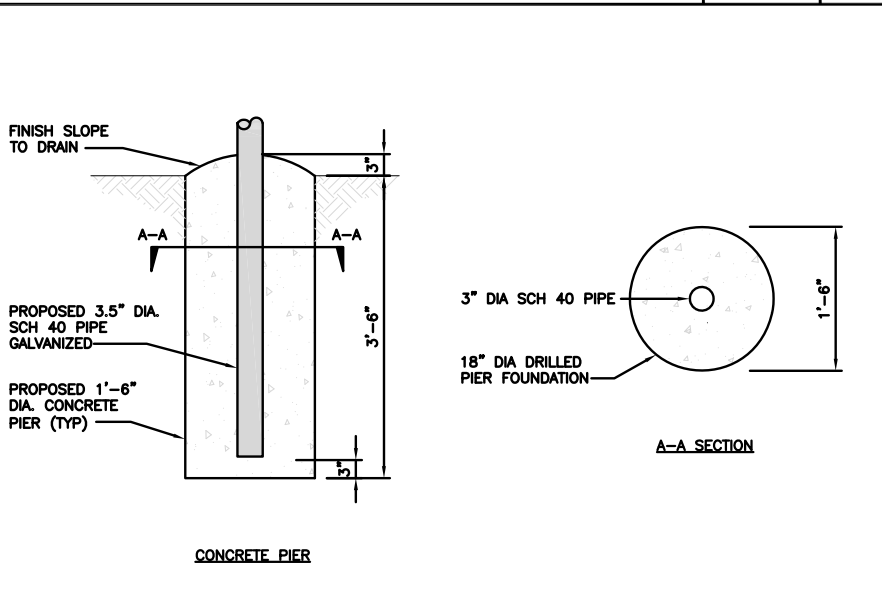
6



ICE BRIDGE DETAIL

NO SCALE

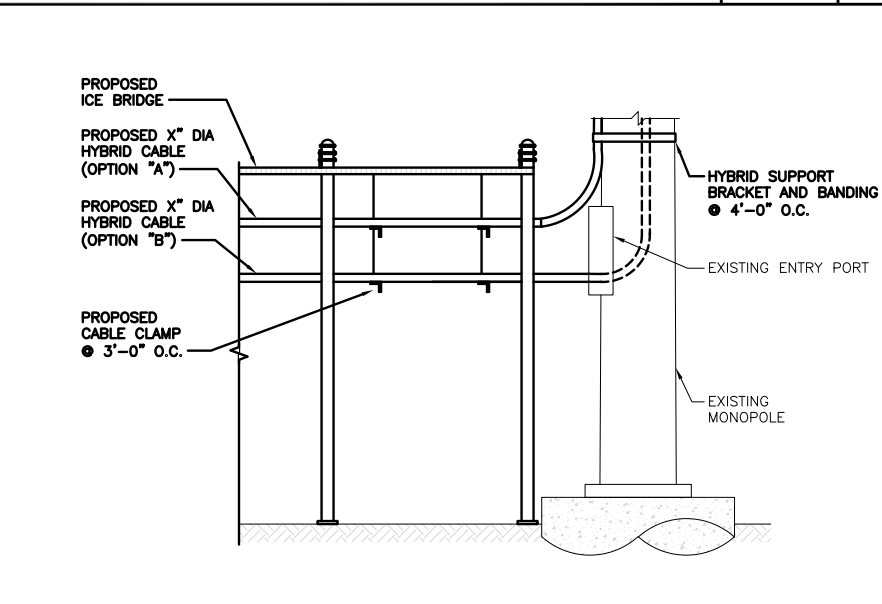
7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL

NO SCALE

8



HYBRID CABLE RUN

NO SCALE

9

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

10 PRESIDENTIAL WAY
WOBURN, MA 01801

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

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

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
DAS	DAS	RCM

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
153455.001.01

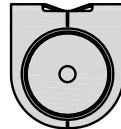
DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL0013A
286 BECKLEY ROAD
BERLIN, CT 06037

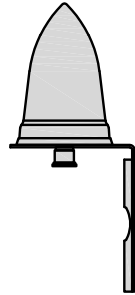
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

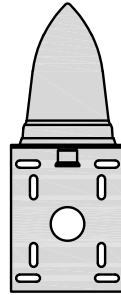
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



TOP



BACK

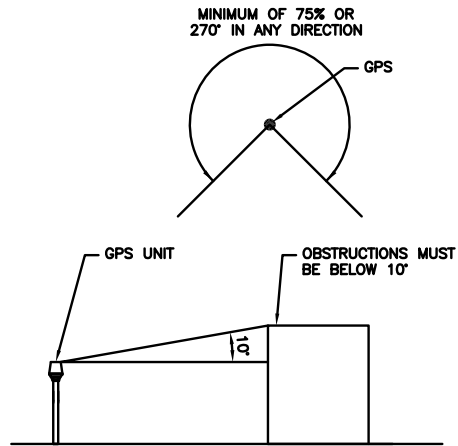


SIDE

GPS DETAIL

NO SCALE

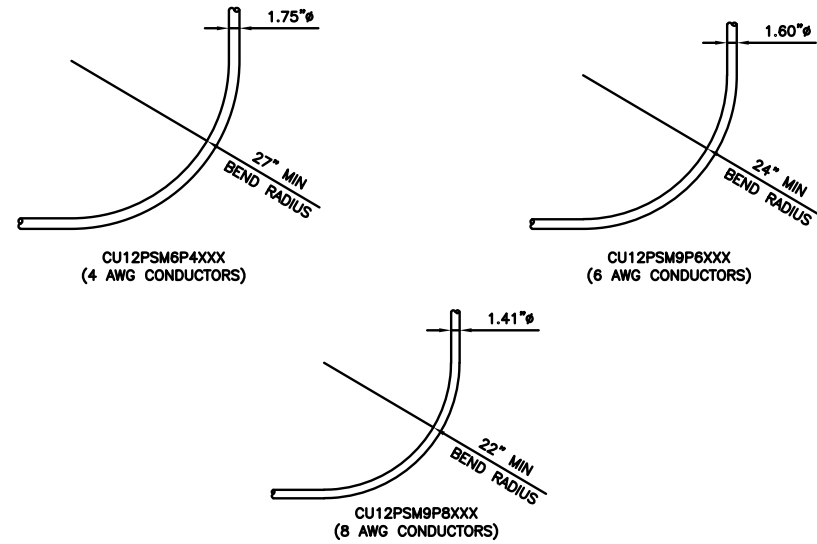
1



GPS MINIMUM SKY VIEW REQUIREMENTS

NO SCALE

2



CABLES UNLIMITED HYBRID CABLE
MINIMUM BEND RADIUS

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

AMERICAN TOWER
10 PRESIDENTIAL WAY
WOBBURN, MA 01801

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



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

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
DAS	DAS	RCM

RFDS REV #: 1

**CONSTRUCTION
DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
153455.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

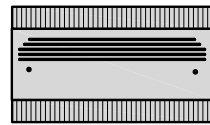
BOBDL00013A
286 BECKLEY ROAD
BERLIN, CT 06037

SHEET TITLE
EQUIPMENT DETAILS

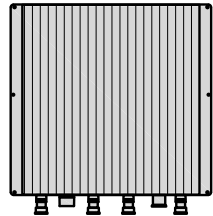
SHEET NUMBER

A-5

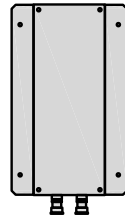
FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



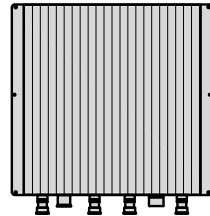
PLAN



BACK



SIDE



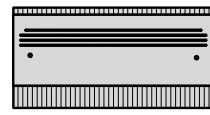
FRONT

RRH DETAIL

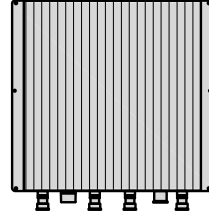
NO SCALE

1

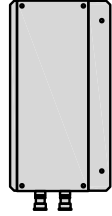
FUJITSU DUAL BAND TA08025-B604	
DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



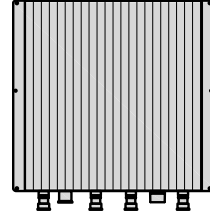
PLAN



BACK



SIDE



FRONT

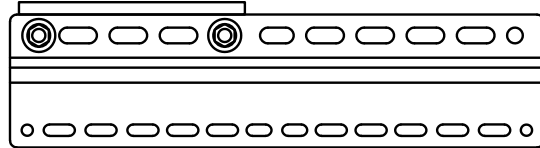
RRH DETAIL

NO SCALE

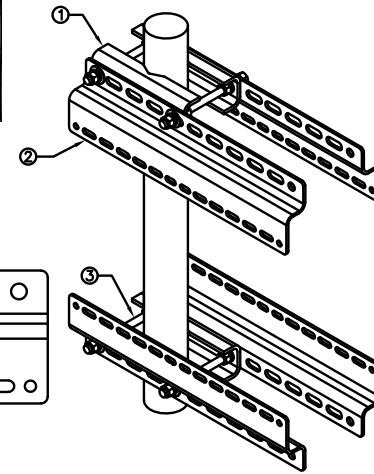
2

SABRE DOUBLE Z-BRACKET C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

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



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

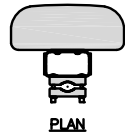


RRH MOUNT DETAIL

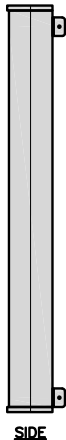
NO SCALE

3

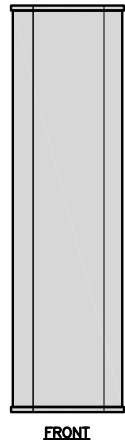
JMA MX08FRO665-21	
DIMENSIONS (HxWxD)	72"x20.0"x8.0"
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE
WEIGHT	64.5 lbs
WEIGHT WITH BRACKETS	82.5 lbs



PLAN



SIDE



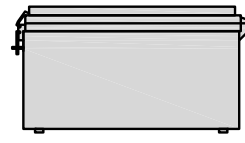
FRONT

ANTENNA DETAIL

NO SCALE

4

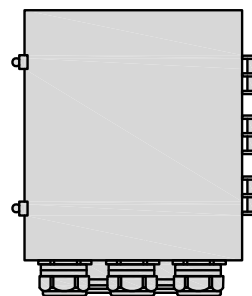
RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



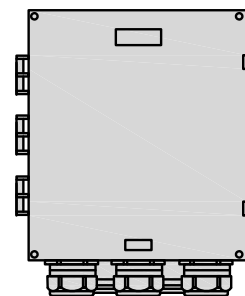
PLAN



SIDE



BACK



FRONT

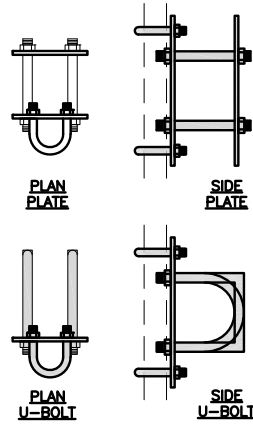
SURGE SUPPRESSION DETAIL (OVP)

NO SCALE

7

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

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

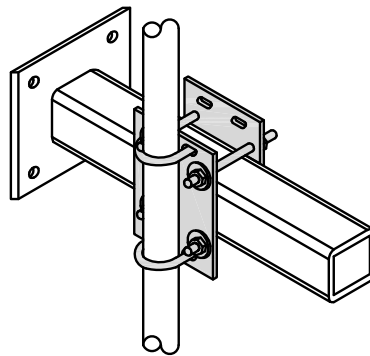


PLAN
U-BOLT

SIDE
U-BOLT

PLAN
PLATE

SIDE
PLATE



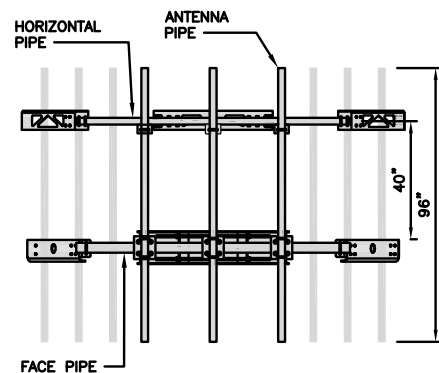
RRH/OVP MOUNT DETAIL

NO SCALE

8

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

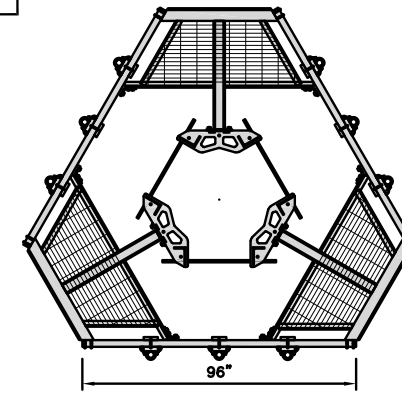
NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT



HORIZONTAL
PIPE

ANTENNA
PIPE

FACE PIPE



ANTENNA PLATFORM DETAIL

NO SCALE

9



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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

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

DRAWN BY: CHECKED BY: APPROVED BY:
DAS DAS RCM

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
153455.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00013A
286 BECKLEY ROAD
BERLIN, CT 06037

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-6

FINAL POWER OR FIBER DESIGN
NOT AVAILABLE AT TIME OF ISSUE

NOTES

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

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

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



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
DAS	DAS	RCM

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
153455.001.01

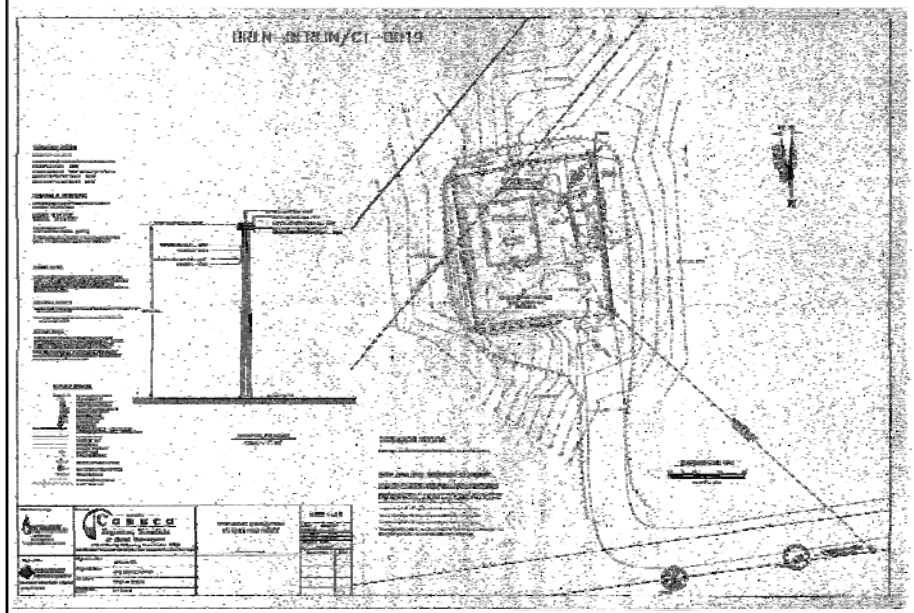
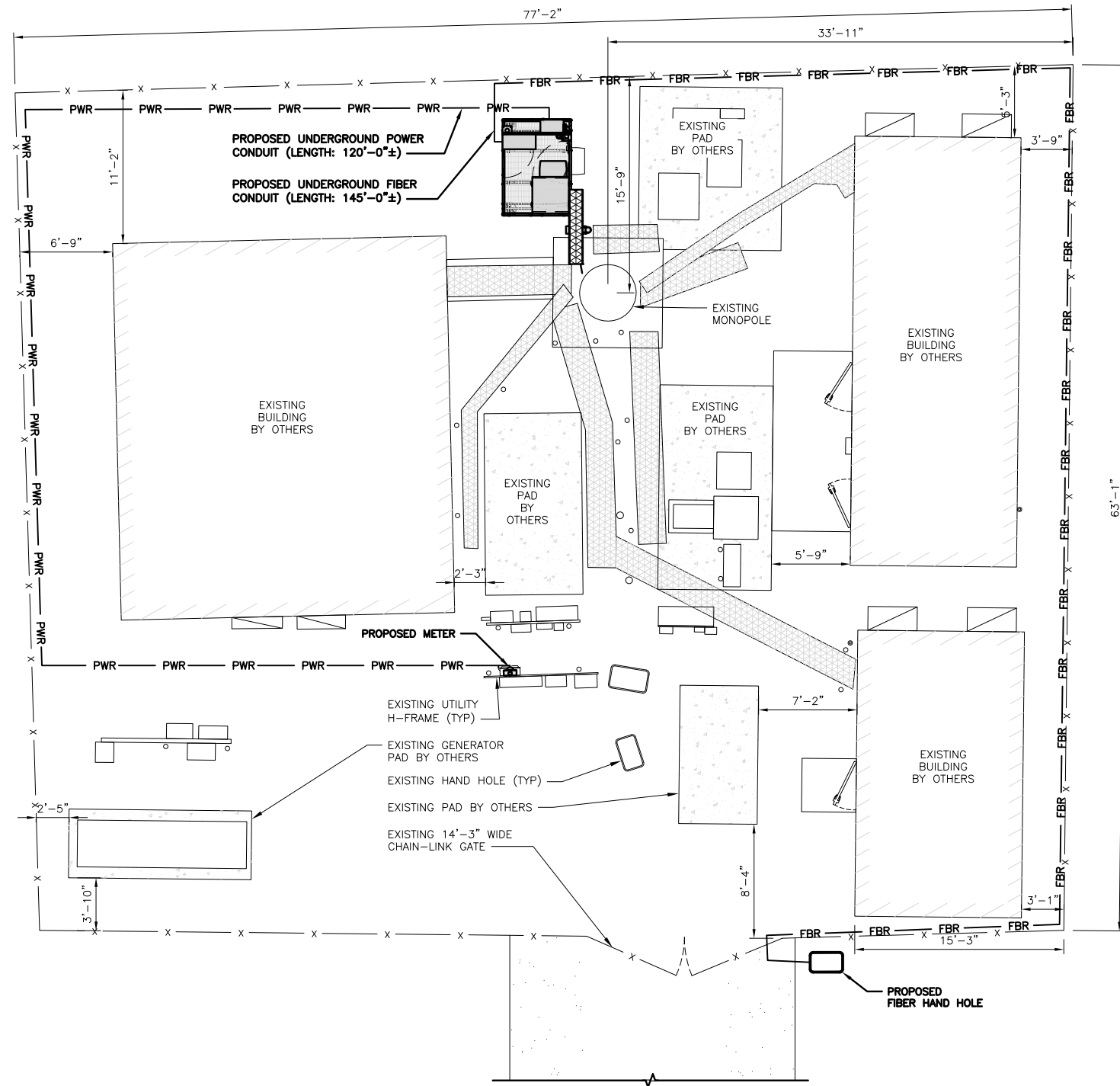
DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00013A
286 BECKLEY ROAD
BERLIN, CT 06037

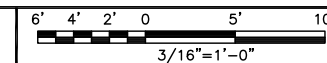
SHEET TITLE
ELECTRICAL/FIBER ROUTE
PLAN AND NOTES

SHEET NUMBER

E-1



UTILITY ROUTE PLAN



1

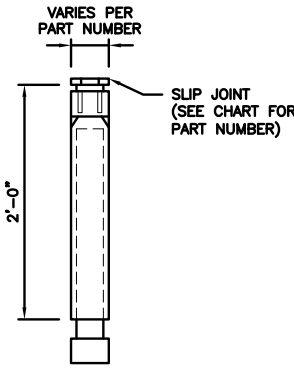
ELECTRICAL NOTES

NO SCALE

2

CARLON EXPANSION FITTINGS

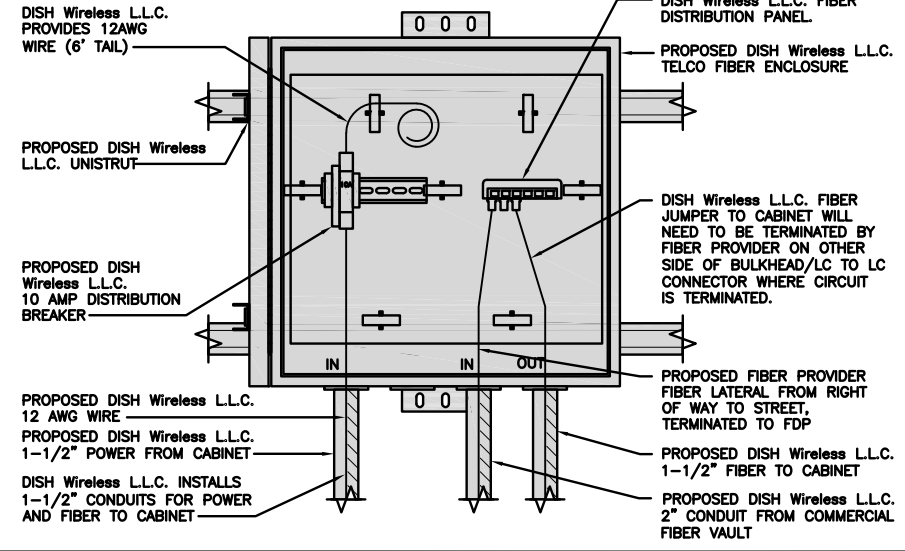
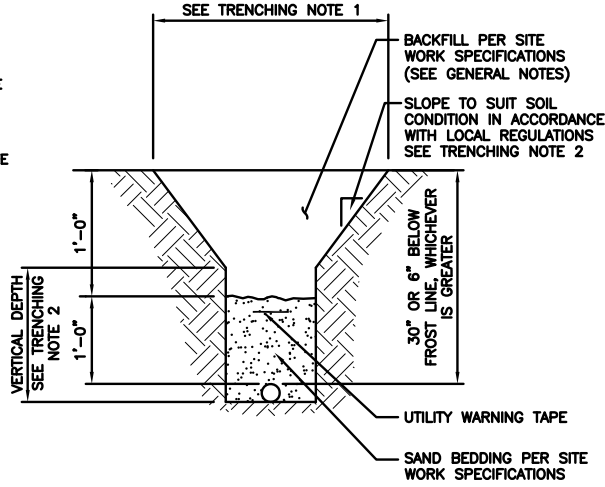
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
E945M	E945MX	3 1/2"	5	8"
E945N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



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

TRENCHING NOTES

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



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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



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

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

DRAWN BY: CHECKED BY: APPROVED BY:
DAS DAS RCM

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
153455.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00013A
286 BECKLEY ROAD
BERLIN, CT 06037

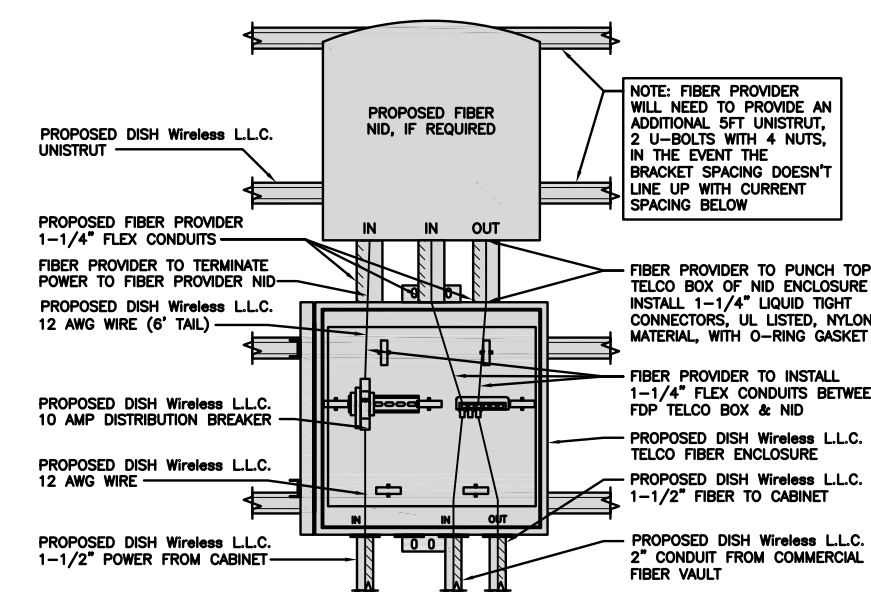
SHEET TITLE
ELECTRICAL
DETAILS

SHEET NUMBER
E-2

EXPANSION JOINT DETAIL NO SCALE 1

TYPICAL UNDERGROUND TRENCH DETAIL NO SCALE 2

DARK TELCO BOX – INTERIOR WIRING LAYOUT NO SCALE 3



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

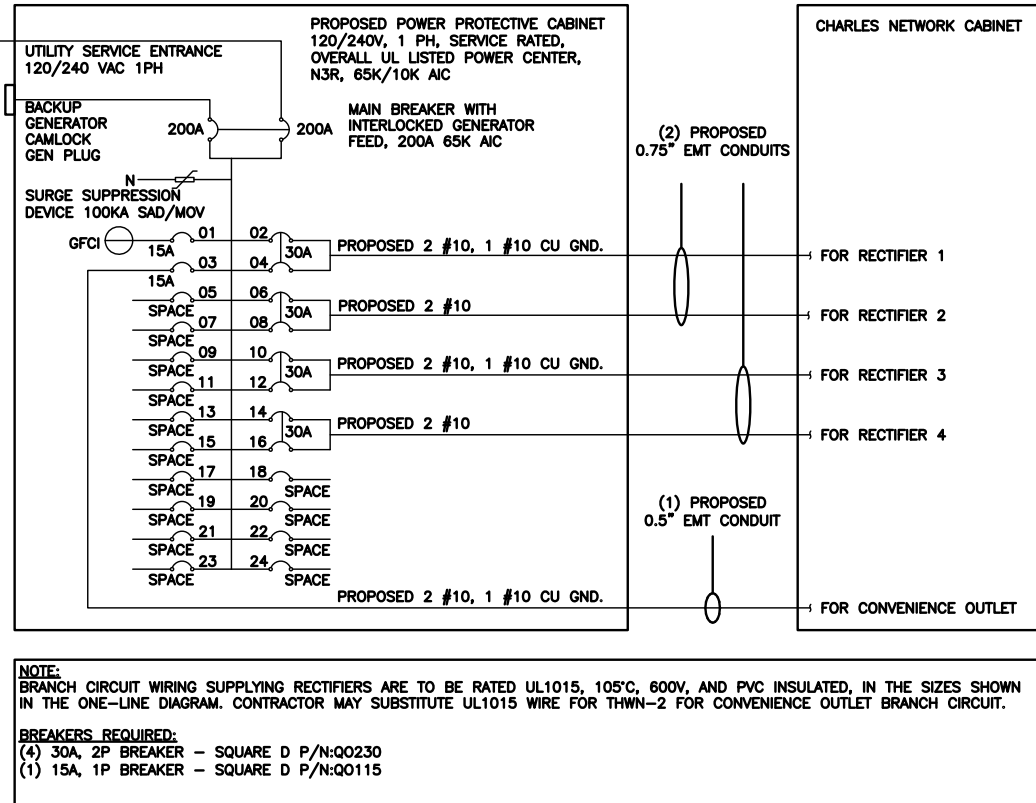
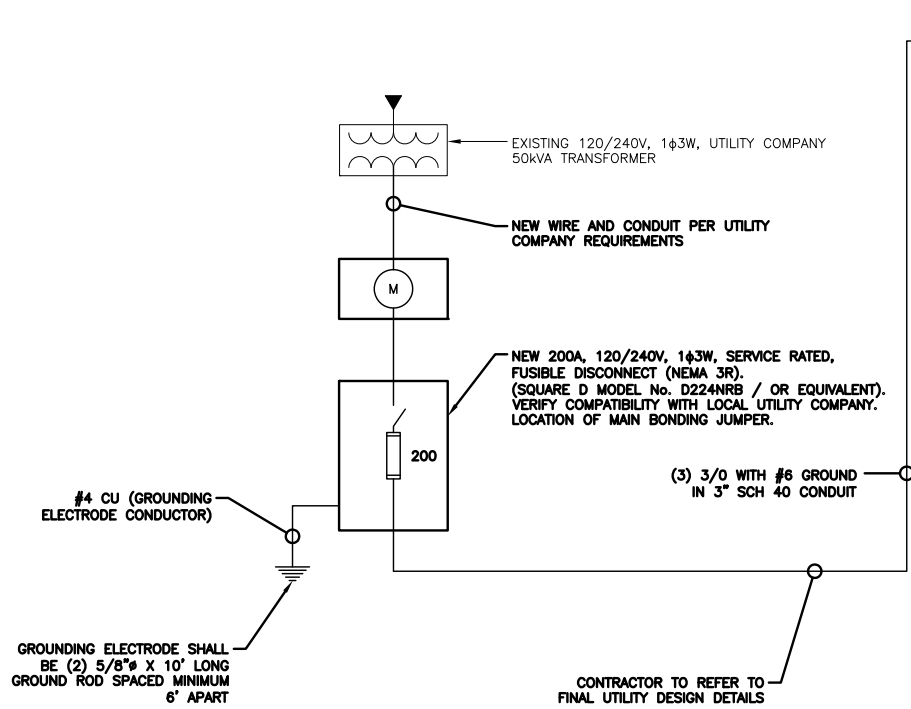
NOT USED NO SCALE 5

NOT USED NO SCALE 6

NOT USED NO SCALE 7

NOT USED NO SCALE 8

NOT USED NO SCALE 9



NOTES

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

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

CONDUIT SIZING: AT 40% FILL PER NEC CHAPTER 9, TABLE 4, ARTICLE 358.
 0.5" CONDUIT - 0.122 SQ. IN AREA
 0.75" CONDUIT - 0.213 SQ. IN AREA
 2.0" CONDUIT - 1.316 SQ. IN AREA
 3.0" CONDUIT - 2.907 SQ. IN AREA

CABINET CONVENIENCE OUTLET CONDUCTORS (1 CONDUIT): USING THWN-2, CU.
 #10 - 0.0211 SQ. IN X 2 = 0.0422 SQ. IN
 #10 - 0.0211 SQ. IN X 1 = 0.0211 SQ. IN <GROUND
 TOTAL = 0.0633 SQ. IN

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

RECTIFIER CONDUCTORS (2 CONDUITS): USING UL1015, CU.
 #10 - 0.0266 SQ. IN X 4 = 0.1064 SQ. IN
 #10 - 0.0082 SQ. IN X 1 = 0.0082 SQ. IN <BARE GROUND
 TOTAL = 0.1146 SQ. IN

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

PPC FEED CONDUCTORS (1 CONDUIT): USING THWN, CU.
 3/0 - 0.2679 SQ. IN X 3 = 0.8037 SQ. IN
 #6 - 0.0507 SQ. IN X 1 = 0.0507 SQ. IN <GROUND
 TOTAL = 0.8544 SQ. IN

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

PPC ONE-LINE DIAGRAM

NO SCALE 1

PROPOSED CHARLES PANEL SCHEDULE										
LOAD SERVED	VOLT AMPS (WATTS)		TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS)		LOAD SERVED
	L1	L2						L1	L2	
PPC GFCI OUTLET	180	180	15A	1	A	2	30A	2880	2880	ABB/GE INFINITY RECTIFIER 1
CHARLES GFCI OUTLET		180	15A	3	B	4	30A	2880	2880	ABB/GE INFINITY RECTIFIER 2
-SPACE-				5	A	6	30A	2880	2880	ABB/GE INFINITY RECTIFIER 3
-SPACE-				7	B	8	30A	2880	2880	ABB/GE INFINITY RECTIFIER 4
-SPACE-				9	A	10				-SPACE-
-SPACE-				11	B	12				-SPACE-
-SPACE-				13	A	14				-SPACE-
-SPACE-				15	B	16				-SPACE-
-SPACE-				17	A	18				-SPACE-
-SPACE-				19	B	20				-SPACE-
-SPACE-				21	A	22				-SPACE-
-SPACE-				23	B	24				-SPACE-
VOLTAGE AMPS	180	180						11520	11520	
200A MCB, 1ϕ, 24 SPACE, 120/240V				L1	L2					
MB RATING: 65,000 AIC				11700	11700					
				98	98					
				98						
				123						

PANEL SCHEDULE

NO SCALE 2

NOT USED

NO SCALE 3



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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

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

DRAWN BY: CHECKED BY: APPROVED BY:
DAS DAS RCM

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

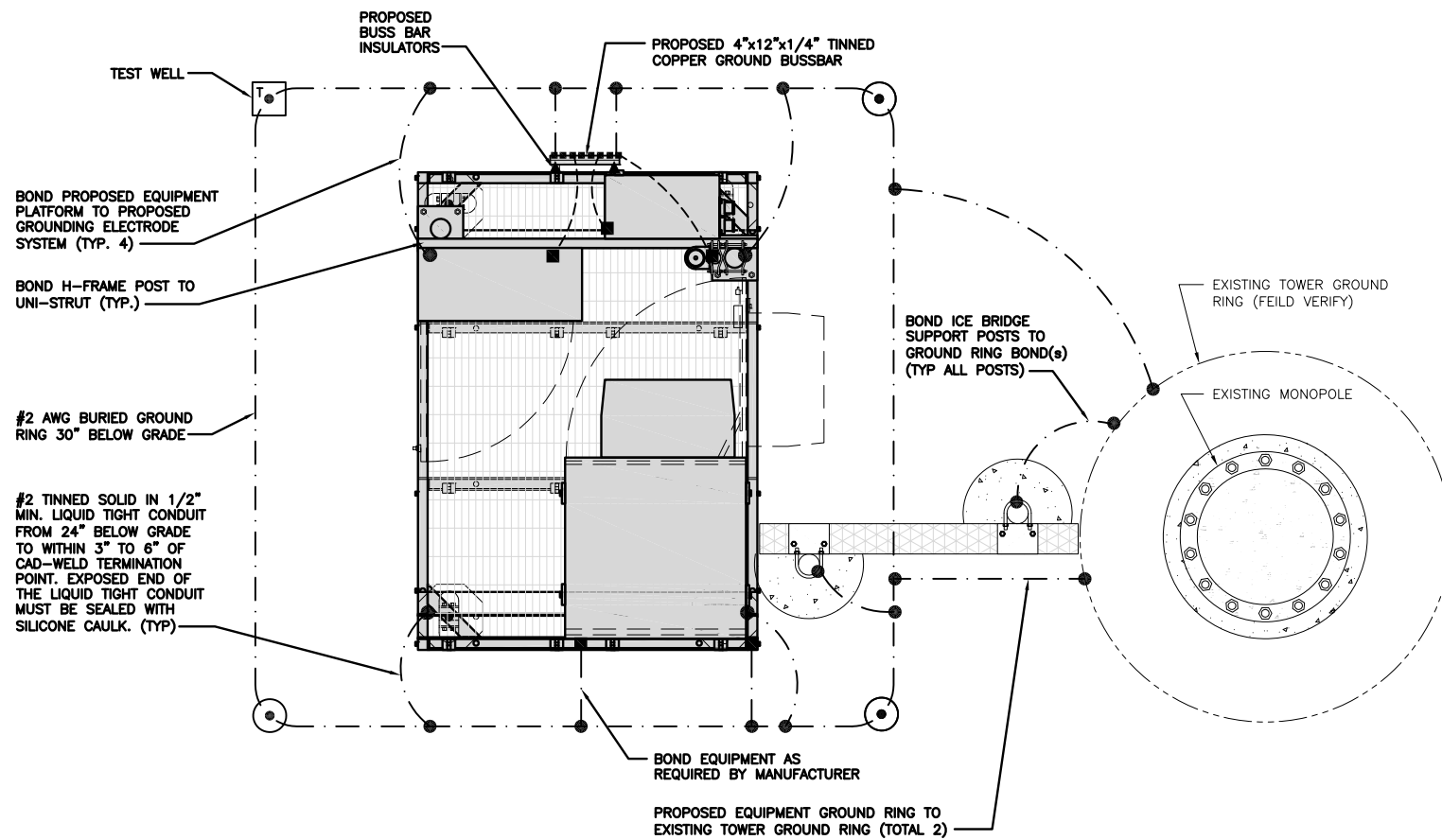
SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
153455.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00013A
286 BECKLEY ROAD
BERLIN, CT 06037

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

SHEET NUMBER
E-3

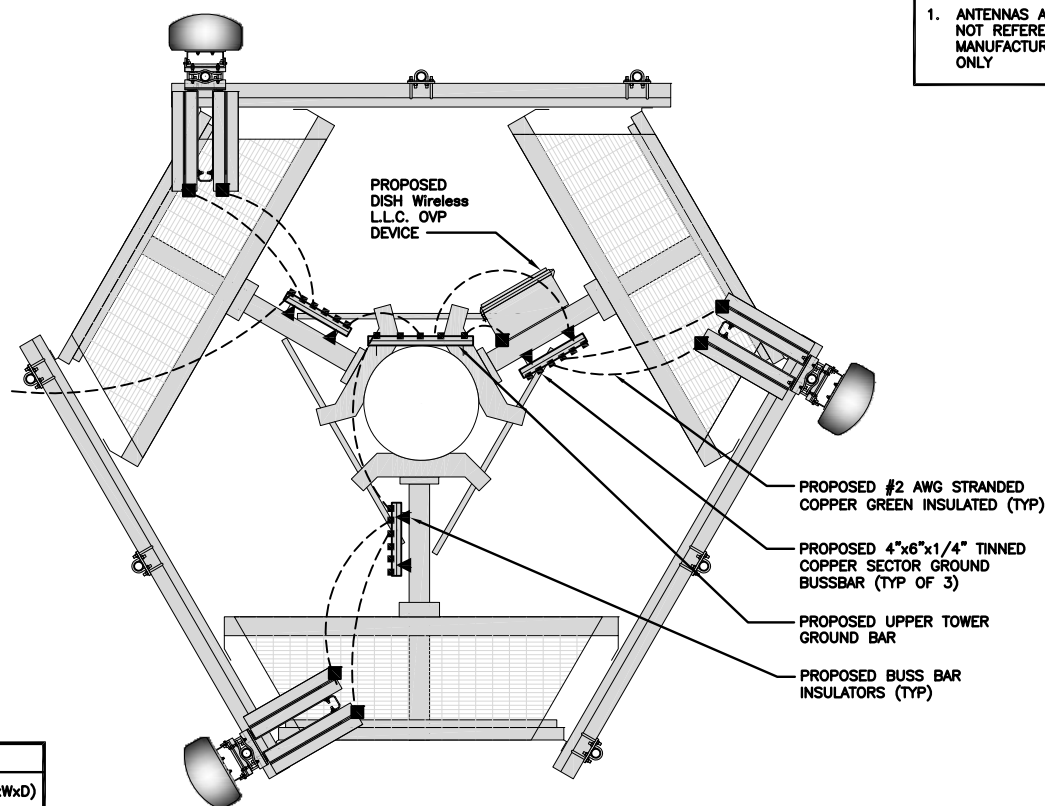


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1

NOTES

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



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2

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

GROUNDING LEGEND

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

GROUNDING KEY NOTES

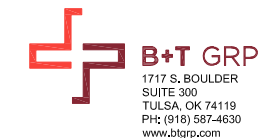
- (A) EXTERIOR GROUND RING: #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.
- (B) TOWER GROUND RING: THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.
- (C) INTERIOR GROUND RING: #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUNDED TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.
- (D) BOND TO INTERIOR GROUND RING: #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING.
- (E) GROUND ROD: UL LISTED COPPER CLAD STEEL MINIMUM 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.
- (I) TELCO GROUND BAR: BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.
- (J) FRAME BONDING: THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.
- (K) 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.
- (L) 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.
- (M) 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
- (N) 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.
- (O) 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
- (P) TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO PROPOSED ANTENNA MOUNT COLLAR. REFER TO DISH Wireless L.L.C. GROUNDING NOTES.

GROUNDING KEY NOTES

NO SCALE 3



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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

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

DRAWN BY: CHECKED BY: APPROVED BY:
DAS DAS RCM

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
153455.001.01

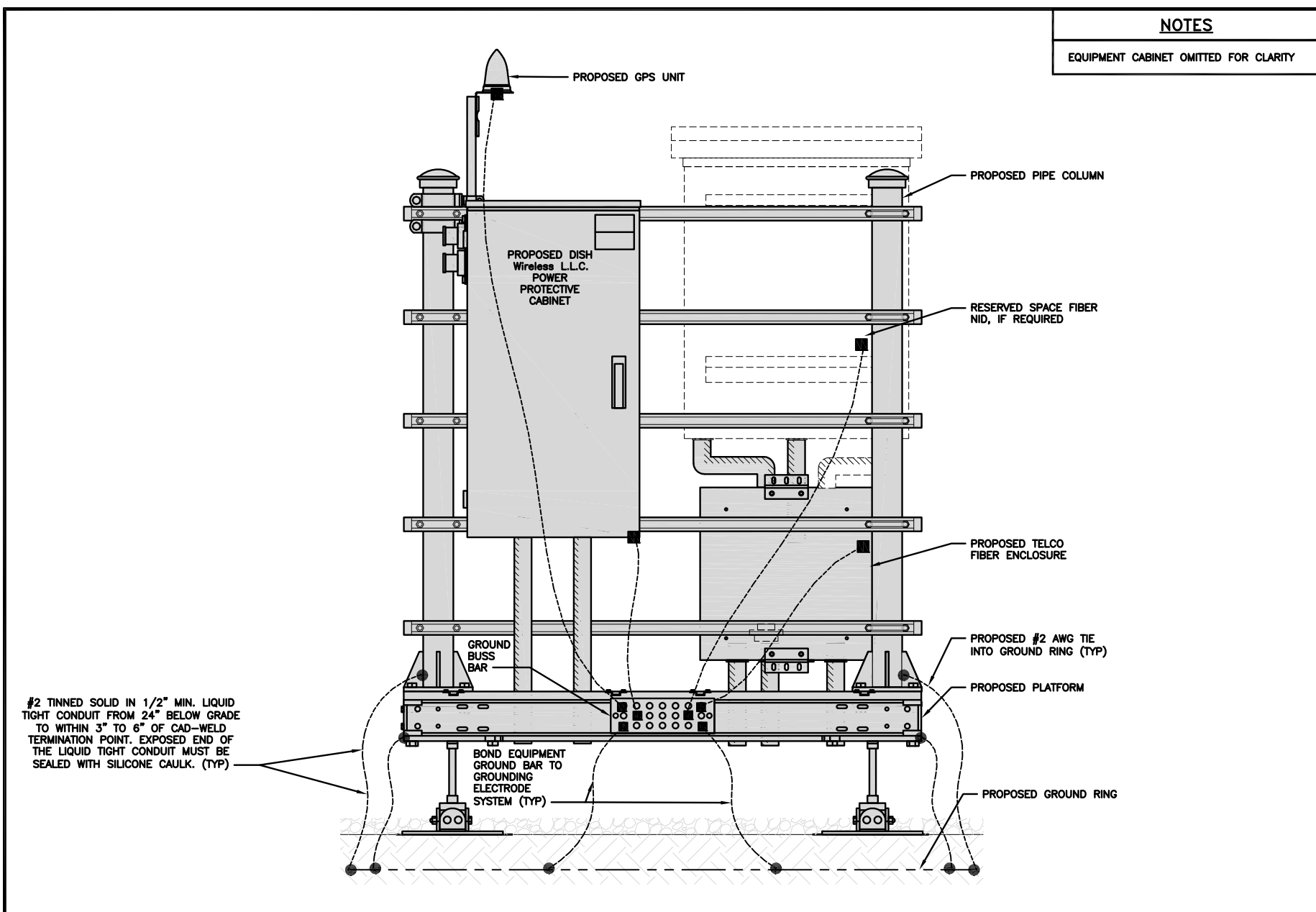
DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00013A
286 BECKLEY ROAD
BERLIN, CT 06037

SHEET TITLE
GROUNDING PLANS
AND NOTES

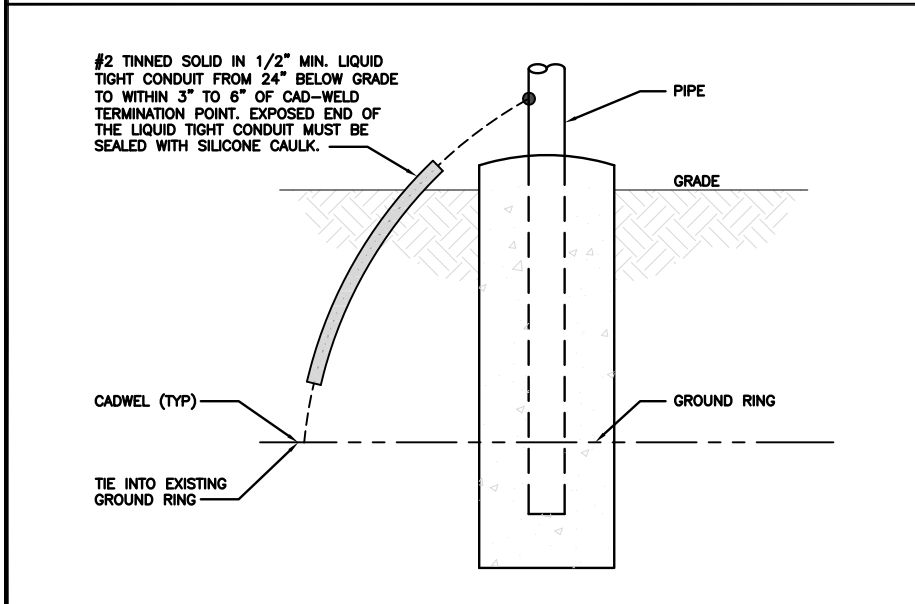
SHEET NUMBER

G-1

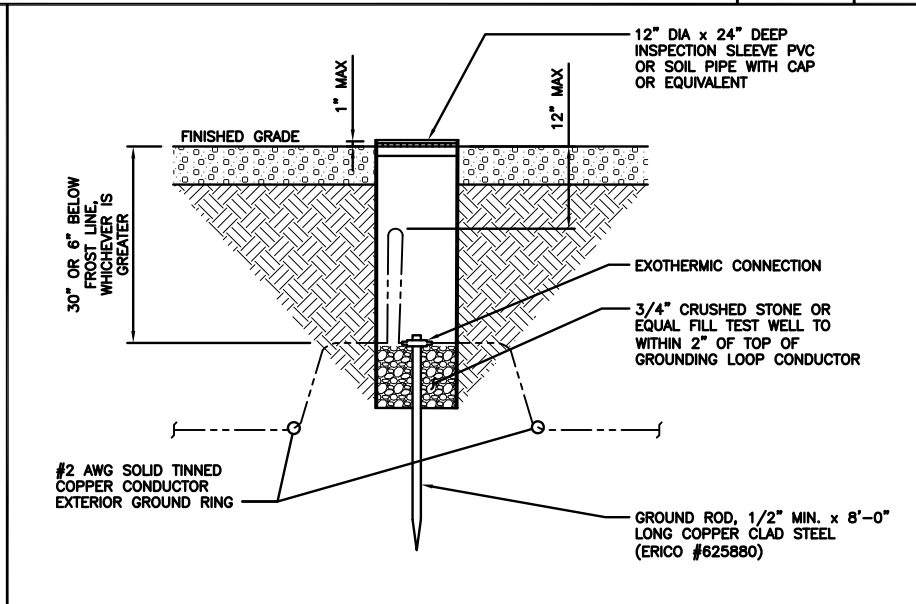


NOTES
EQUIPMENT CABINET OMITTED FOR CLARITY

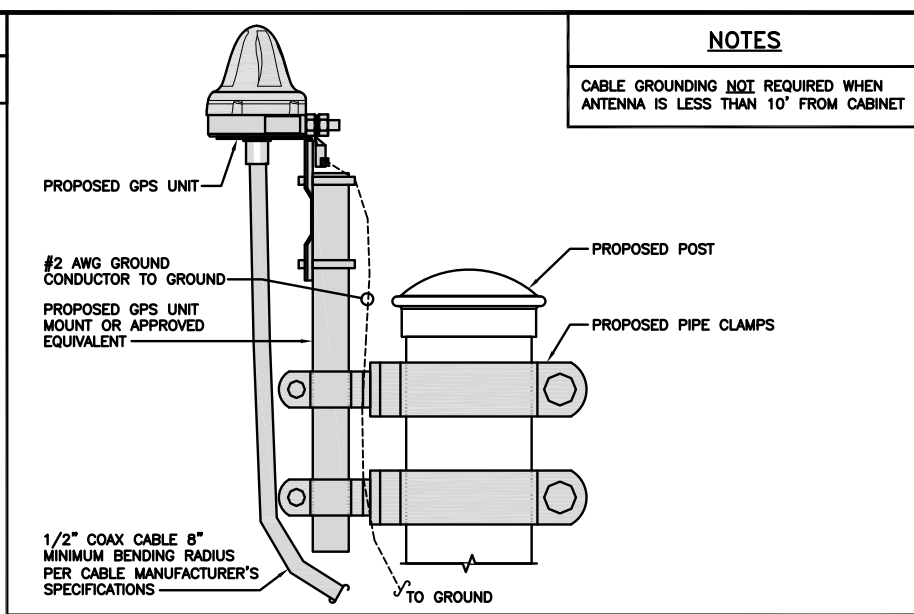
H-FRAME GROUNDING DETAIL NO SCALE 1



TRANSITIONING GROUND DETAIL NO SCALE 4

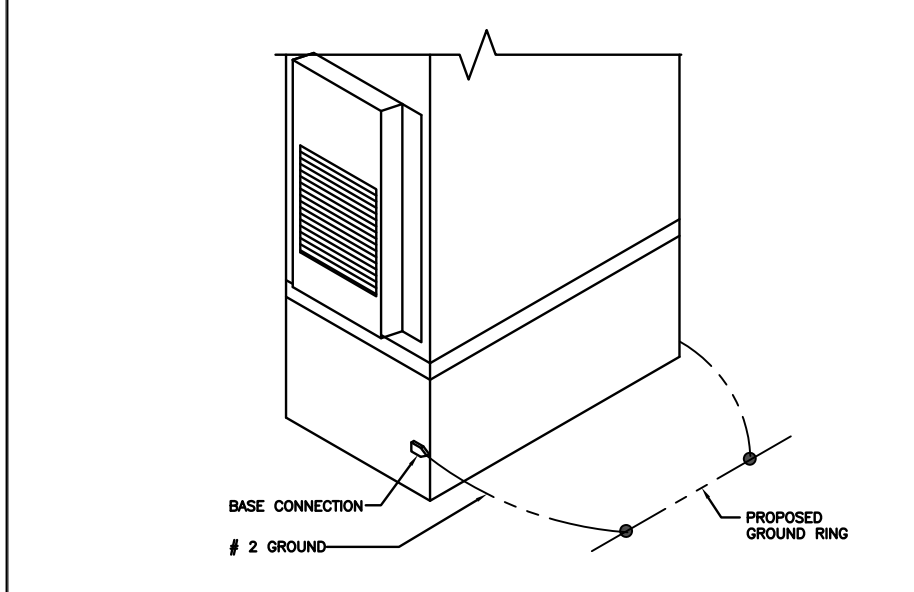


TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE NO SCALE 5

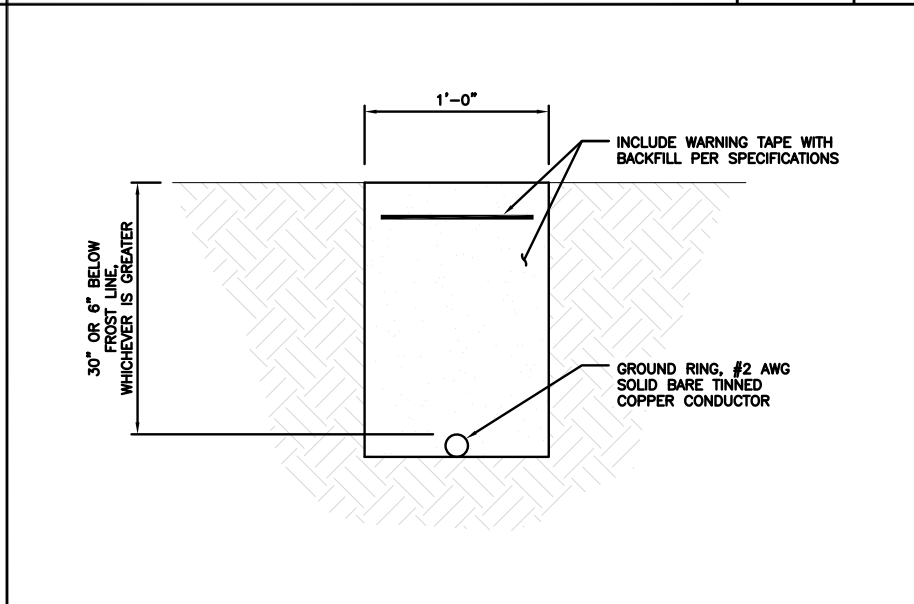


NOTES
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET

TYPICAL GPS UNIT GROUNDING NO SCALE 2



OUTDOOR CABINET GROUNDING NO SCALE 3



TYPICAL GROUND RING TRENCH NO SCALE 6

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

AMERICAN TOWER
10 PRESIDENTIAL WAY
WOBURN, MA 01801

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

(Professional Engineer Seal)
8/3/21

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

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

DRAWN BY: CHECKED BY: APPROVED BY:
DAS DAS RCM

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

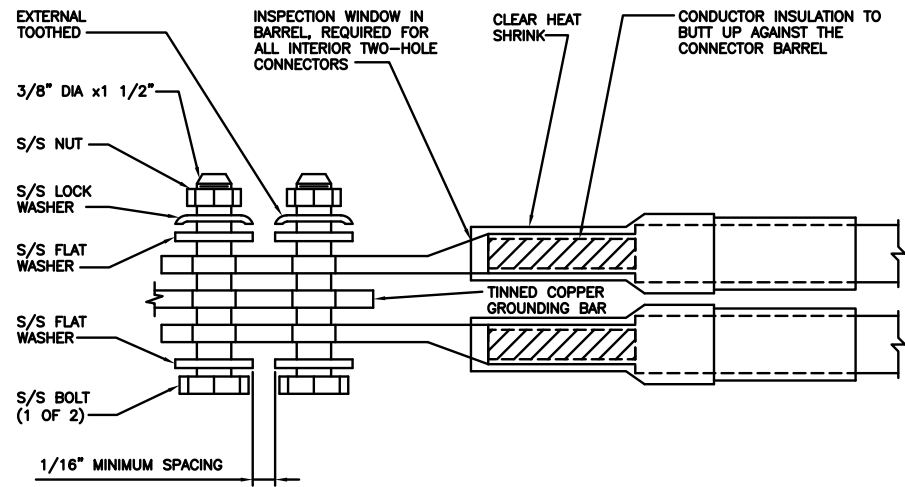
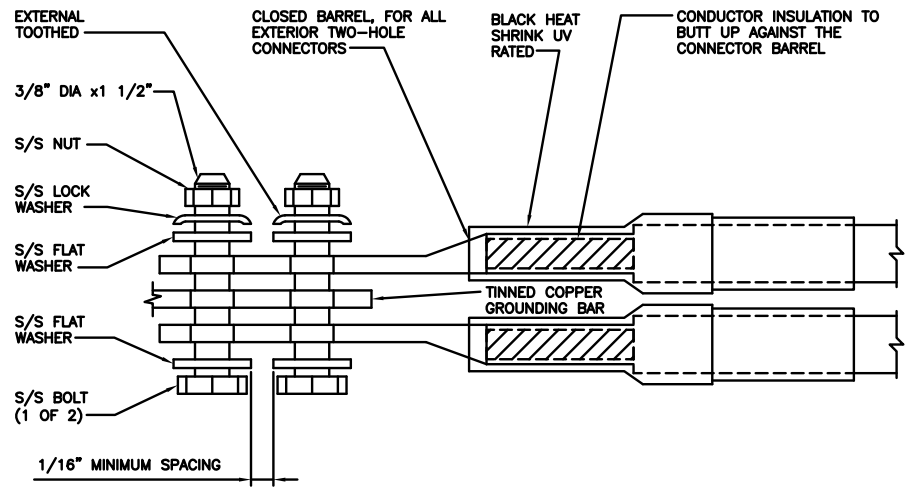
A&E PROJECT NUMBER
153455.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00013A
286 BECKLEY ROAD
BERLIN, CT 06037

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-2

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



TYPICAL GROUNDING NOTES

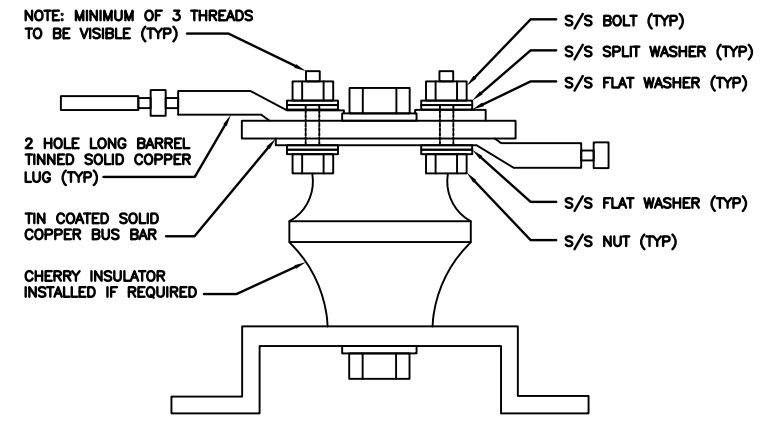
NO SCALE 1

TYPICAL EXTERIOR TWO HOLE LUG

NO SCALE 2

TYPICAL INTERIOR TWO HOLE LUG

NO SCALE 3



LUG DETAIL

NO SCALE 4

NOT USED

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 7

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
DAS	DAS	RCM

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
153455.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00013A
286 BECKLEY ROAD
BERLIN, CT 06037

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-3

RF JUMPER COLOR CODING

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

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

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

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

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

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

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

HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED
ALONG WITH FREQUENCY BANDS

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

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

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

FIBER JUMPERS TO RRHs

LOW-BAND RRH FIBER CABLES HAVE SECTOR
STRIPE ONLY

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

POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR
STRIPE ONLY

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

RET MOTORS AT ANTENNAS

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

MICROWAVE RADIO LINKS

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

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

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

RF CABLE COLOR CODES

NO SCALE

1

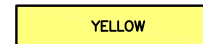
LOW BANDS (N71+N26)
OPTIONAL - (N29)



AWS
(N66+N70+H-BLOCK)



CBRS TECH
(3 GHz)



NEGATIVE SLANT PORT
ON ANT/RRH



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR



COLOR IDENTIFIER

NO SCALE

2

NOT USED

NO SCALE

3

NOT USED

NO SCALE

4



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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

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

DRAWN BY: CHECKED BY: APPROVED BY:
DAS DAS RCM

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

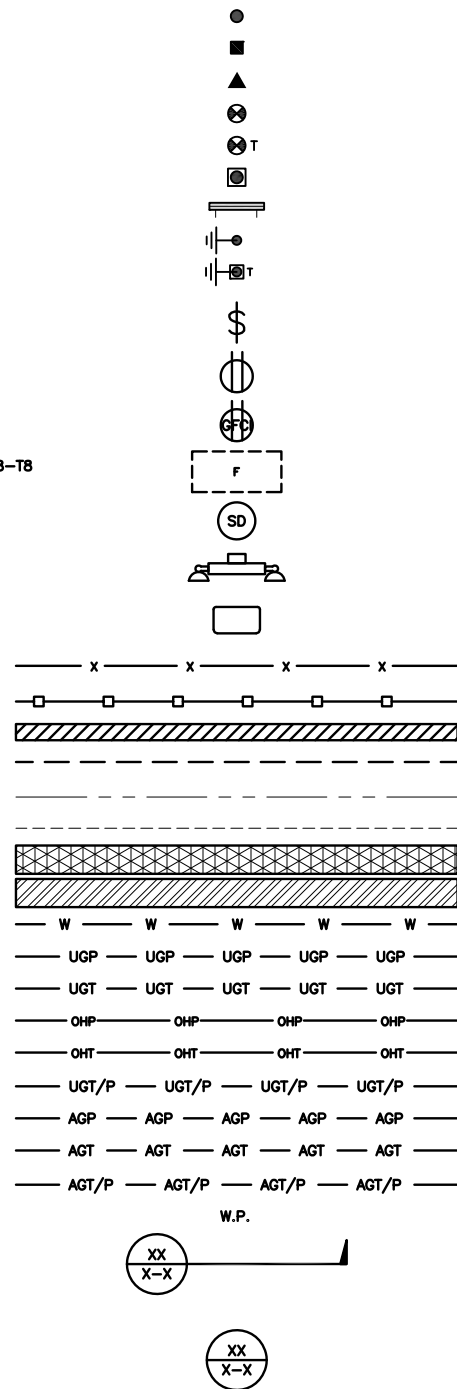
A&E PROJECT NUMBER
153455.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL0013A
286 BECKLEY ROAD
BERLIN, CT 06037

SHEET TITLE
RF
CABLE COLOR CODES

SHEET NUMBER
RF-1

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



LEGEND

AB ANCHOR BOLT
 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

ABBREVIATIONS



5701 SOUTH SANTA FE DRIVE
 LITTLETON, CO 80120



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

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

DRAWN BY: CHECKED BY: APPROVED BY:
 DAS DAS RCM

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
 153455.001.01

DISH Wireless L.L.C.
 PROJECT INFORMATION
 BOBDL00013A
 286 BECKLEY ROAD
 BERLIN, CT 06037

SHEET TITLE
 LEGEND AND ABBREVIATIONS

SHEET NUMBER
GN-1

SITE ACTIVITY REQUIREMENTS:

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

GENERAL NOTES:

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



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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

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:
DAS	DAS	RCM

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
153455.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00013A
286 BECKLEY ROAD
BERLIN, CT 06037

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
2. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°f AT TIME OF PLACEMENT.
4. CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER-TO-CEMENT RATIO (W/C) OF 0.45.
5. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
 #4 BARS AND SMALLER 40 ksi
 #5 BARS AND LARGER 60 ksi
6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
 - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"
 - CONCRETE EXPOSED TO EARTH OR WEATHER:
 - #6 BARS AND LARGER 2"
 - #5 BARS AND SMALLER 1-1/2"
 - CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
 - SLAB AND WALLS 3/4"
 - BEAMS AND COLUMNS 1-1/2"
7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
- 4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
- 4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. TIE WRAPS ARE NOT ALLOWED.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER-ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3 (OR BETTER) FOR EXTERIOR LOCATIONS.
25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR DISH Wireless L.L.C. AND TOWER OWNER BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "DISH Wireless L.L.C.".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
DAS	DAS	RCM

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
153455.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00013A
286 BECKLEY ROAD
BERLIN, CT 06037

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.



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



AMERICAN TOWER®
10 PRESIDENTIAL WAY
WOBURN, MA 01801



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



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

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
DAS	DAS	RCM

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	7/25/21	ISSUED FOR REVIEW
0	8/3/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
153455.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00013A
286 BECKLEY ROAD
BERLIN, CT 06037

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-4

ENGINEERING:
STRUCTURAL ANALYSIS
MOUNT ANALYSIS



AMERICAN TOWER®
CORPORATION

This report was prepared for American Tower Corporation by

CLS ENGINEERING
PLLC

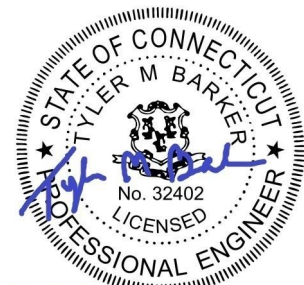
Structural Analysis Report

Structure : 151.5 ft Monopole
ATC Site Name : Brln - Berlin,CT
ATC Site Number : 302483
Engineering Number : 13683513_C3_02
Proposed Carrier : DISH WIRELESS L.L.C.
Carrier Site Name : BOBDL00013A
Carrier Site Number : BOBDL00013A
Site Location : 286 Beckley Road
Berlin, CT 06037-2419
41.63171802, -72.72991843
County : Hartford
Date : August 27, 2021
Max Usage : 86%
Result : Pass

Prepared By:

Sreenivasa Kailasa
CLS

Reviewed By:



Tyler M. Barker
CLS Engineering PLLC
PE # 32402 Exp. 1/31/2022
COA # PEC.001833 Exp. 8/14/2022
08/27/2021

Table of Contents

Introduction.....3
Supporting Documents3
Analysis3
Conclusion3
Existing and Reserved Equipment.....4
Equipment to be Removed4
Proposed Equipment5
Structure Usages.....5
Foundations5
Deflection and Sway*5
Standard Conditions6
CalculationsAttached

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 151.5 ft Monopole to reflect the change in loading by DISH WIRELESS L.L.C..

Supporting Documents

Tower Drawings	ITT Meyer Type "B", dated July 21, 2001 Mapping by Smith Cullum Acq. #CT-0019, dated July 21, 2001 Mapping by ATC Report #0682, dated January 7, 2016
Foundation Drawing	SpectraSite Project #CT-0019, dated May 29, 2003
Geotechnical Report	Daniel G. Loucks Project #CT-0019, dated December 21, 2001
Modifications	Scientel Project #Berlin-CT0019, dated July 30, 2002 ATC Project #11912109_P5_02, dated October 3, 2017

Analysis

The tower was analyzed using tnxTower 8.1.1. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	118 mph (3-second gust)
Basic Wind Speed w/ Ice:	50 mph (3-second gust) w/ 1.50" radial ice concurrent
Code:	ANSI/TIA-222-H / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	B
Risk Category:	II
Topographic Factor Procedure:	Method 1
Topographic Category:	1
Crest Height (H):	0 ft
Crest Length (L):	0 ft
Spectral Response:	$S_s = 0.20, S_i = 0.06$
Site Class:	D - Stiff Soil - Default

Conclusion

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

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

Existing and Reserved Equipment

Elev. ¹ (ft)	Qty	Equipment	Mount Type	Lines	Carrier
151.5	2	Raycap DC6-48-60-18-8F(32.8 lbs)	Triangular Platform with Handrails	(2) 0.39" (10mm) Fiber Trunk (4) 0.78" (19.7mm) 8 AWG 6 (12) 1 1/4" Coax (1) 3" conduit	AT&T MOBILITY
	3	Ericsson RRUS 32 (50.8 lbs)			
	3	Ericsson RRUS 32 B2			
	3	Ericsson RRUS 4426 B66			
	3	Ericsson RRUS 11 (Band 12) (55 lb)			
	3	Quintel QS66512-2			
	3	CCI OPA-65R-LCUU-H6			
	3	Powerwave Allgon LGP21401			
	3	Powerwave Allgon 7770.00			
	3	Powerwave Allgon LGP21401			
142.0	3	RFS APXVAARR24_43-U-NA20	Triangular Platform with Handrails	(2) 1 1/4" (1.25"-31.8mm) Fiber (1) 1 5/8" Hybriflex	T-MOBILE
	3	Ericsson AIR32 B66Aa/B2a			
	3	Ericsson Radio 4460 B25+B66			
	3	Ericsson Air6449 B41			
127.0	3	Alcatel-Lucent 800 MHz 2X50W RRH w/ Filter	Triangular Platform with Handrails	(4) 1 1/4" Hybriflex Cable	SPRINT NEXTEL
	3	Alcatel-Lucent RRH2x50-08			
	3	Alcatel-Lucent 4x40W RRH (88 lb)			
	3	Alcatel-Lucent TD-RRH8x20			
	2	RFS APXVSP18-C-A20			
	1	RFS APXV9ERR18-C-A20			
119.7	3	Commscope DT465B-2XR	Triangular Low Profile Platform	(2) 1 5/8" (1.63"-41.3mm) Fiber (12) 1 5/8" Coax	VERIZON WIRELESS
	3	Alcatel-Lucent RRH2x60			
116.0	3	Samsung Outdoor CBRS 20W RRH –Clip-on Antenna	Triangular Low Profile Platform	(2) 1 5/8" (1.63"-41.3mm) Fiber (12) 1 5/8" Coax	VERIZON WIRELESS
	3	Samsung RT4401-48A			
	3	Samsung B2/B66A RRH-BR049			
	3	Samsung B5/B13 RRH-BR04C			
	2	Raycap RRFDC-3315-PF-48 (32lbs)			
	3	Amphenol Antel BXA-70080-6CF-EDIN-4			
	3	Samsung MT6407-77A			
115.0	6	Commscope SBNHH-1D65B	Triangular Low Profile Platform	(2) 1 5/8" (1.63"-41.3mm) Fiber (12) 1 5/8" Coax	VERIZON WIRELESS
	6	Commscope SBNHH-1D65B			

Equipment to be Removed

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

Proposed Equipment

Elev. ¹ (ft)	Qty	Equipment	Mount Type	Lines	Carrier
105.0	1	Commscope RDIDC-9181-PF-48	Triangular Platform with Handrails	(1) 1.60" (40.6mm) Hybrid	DISH WIRELESS L.L.C.
	3	Fujitsu TA08025-B604			
	3	Fujitsu TA08025-B605			
	3	JMA Wireless MX08FRO665-21			

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

Install proposed lines inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	86%	Pass
Shaft	70%	Pass
Base Plate	19%	Pass

Foundation

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	3636.4	84%
Shear (Kips)	34.0	2%

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

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
105.0	Commscope RDIDC-9181-PF-48	DISH WIRELESS L.L.C.	0.940	1.010
	Fujitsu TA08025-B604			
	Fujitsu TA08025-B605			
	JMA Wireless MX08FRO665-21			

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

Standard Conditions

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

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

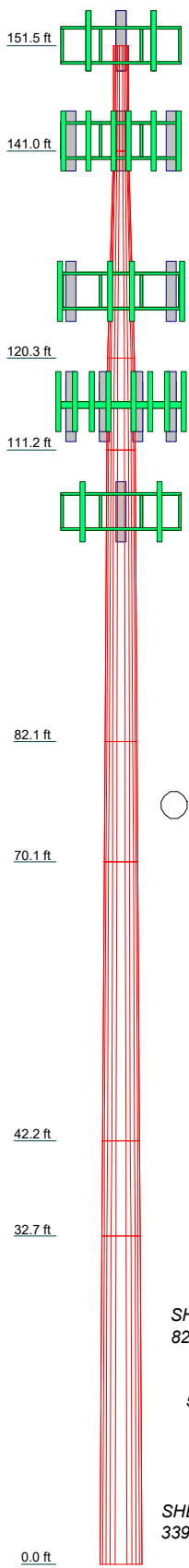
It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

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

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

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

Section	1	2	3	4	5	6	7	8
Length (ft)	10.50	20.67	9.14	29.11	12.02	27.82	9.53	32.71
Number of Sides	12	12	12	12	12	12	12	12
Thickness (in)	0.2400	0.3059	0.3063	0.3141	0.3804	0.4014	0.4706	0.4906
Top Dia (in)	17.1872	17.7841	31.5570	33.0280	38.3470	39.7110	43.9500	45.0640
Bot Dia (in)	17.7841	31.5570	33.0280	38.3470	39.7110	43.9500	45.0640	49.5520
Grade				A572-65				
Weight (lb)	476.2	1688.0	981.2	3543.9	1936.3	5089.1	2164.0	8232.0
								24090.6



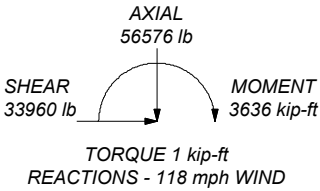
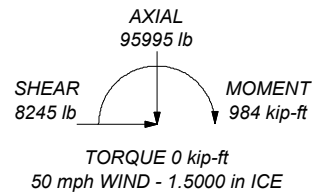
MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 118 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 0.00 ft
8. Combined pole and wrap structure.
9. Sections modeled to have equivalent inertia to pole and wrap combined.
10. TOWER RATING: 69.5%

ALL REACTIONS
ARE FACTORED




Telamon CLS
 319 Chapanoke Road, Suite 118
 Raleigh, NC 27603
 Phone: (405) 348-5460
 FAX: (405) 341-6334

Job: Brln-Berlin (302483)		
Project: 13683513_C3_02		
Client: Dish Wireless LLC	Drawn by: Sreenivasa.Kailasa	App'd:
Code: TIA-222-H	Date: 08/27/21	Scale: NTS
Path:		Dwg No. E-1

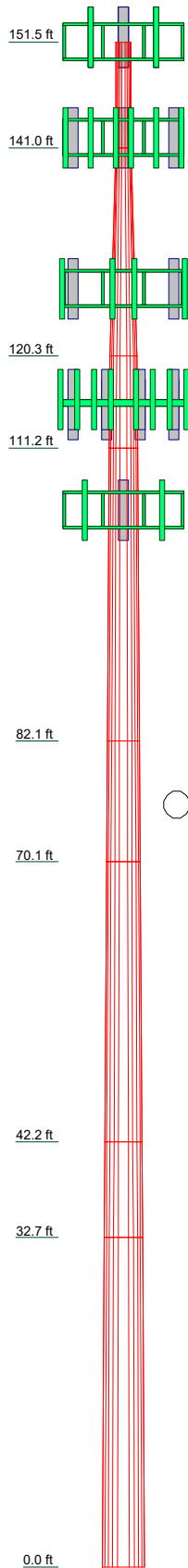
X:\A-Brln-Berlin, CT (302483)\13683513 DISH WIRELESS L.L.C\302483_02_CUST_STRUTTING\302483 Brln-Berlin, CT.dwg

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) TPX-070821	151.5	RRH2x50-08	127
(2) TPX-070821	151.5	(2) 4x40W RRH (88 lb)	127
(2) TPX-070821	151.5	(2) 4x40W RRH (88 lb)	127
(2) LGP21401	151.5	(2) 4x40W RRH (88 lb)	127
(2) LGP21401	151.5	TD-RRH8x20	127
(2) LGP21401	151.5	TD-RRH8x20	127
DC6-48-60-18-8F(32.8 lbs)	151.5	TD-RRH8x20	127
DC6-48-60-18-8F(32.8 lbs)	151.5	APXVSP18-C-A20	127
RRUS 4426 B66	151.5	APXVSP18-C-A20	127
RRUS 4426 B66	151.5	APXV9ERR18-C-A20	127
RRUS 4426 B66	151.5	DT465B-2XR	127
RRUS 11 (Band 12) (55 lb)	151.5	DT465B-2XR	127
RRUS 11 (Band 12) (55 lb)	151.5	DT465B-2XR	127
RRUS 11 (Band 12) (55 lb)	151.5	Round Platform w/ Handrails	127
RRUS 32 (50.8 lbs)	151.5	RRH2X60	119.7
RRUS 32 (50.8 lbs)	151.5	RRH2X60	119.7
RRUS 32 (50.8 lbs)	151.5	RRH2X60	119.7
RRUS 32 B2	151.5	Outdoor CBRS 20W rRH - Clip on Antenna	116
RRUS 32 B2	151.5	Outdoor CBRS 20W rRH - Clip on Antenna	116
RRUS 32 B2	151.5	Outdoor CBRS 20W rRH - Clip on Antenna	116
7770.00	151.5	Outdoor CBRS 20W rRH - Clip on Antenna	116
7770.00	151.5	Outdoor CBRS 20W rRH - Clip on Antenna	116
7770.00	151.5	Outdoor CBRS 20W rRH - Clip on Antenna	116
QS66512-2	151.5	RT4401-48A	116
QS66512-2	151.5	RT4401-48A	116
QS66512-2	151.5	RT4401-48A	116
OPA-65R-LCUU-H6	151.5	(2) SBNHH-1D65B	116
OPA-65R-LCUU-H6	151.5	(2) SBNHH-1D65B	116
OPA-65R-LCUU-H6	151.5	(2) SBNHH-1D65B	116
OPA-65R-LCUU-H6	151.5	B2/B66A RRH-BR049	116
CBC23SR-43	151.5	B2/B66A RRH-BR049	116
CBC23SR-43	151.5	B2/B66A RRH-BR049	116
CBC23SR-43	151.5	B5/B13 RRH-BR04C	116
DC6-48-60-0-8C-EV	151.5	B5/B13 RRH-BR04C	116
ION-M23 SDARS	151.5	B5/B13 RRH-BR04C	116
ION-M23 SDARS	151.5	RRFDC-3315-PF-48	116
ION-M23 SDARS	151.5	RRFDC-3315-PF-48	116
Flat Platform w/ Handrails	151.5	MT6407-77A	116
RADIO 4449 B71/B85A	142	MT6407-77A	116
RADIO 4449 B71/B85A	142	MT6407-77A	116
RADIO 4449 B71/B85A	142	MT6407-77A	116
RADIO 4460 B2/B25 B66	142	BXA-70080-6CF-EDIN-4	116
RADIO 4460 B2/B25 B66	142	BXA-70080-6CF-EDIN-4	116
RADIO 4460 B2/B25 B66	142	BXA-70080-6CF-EDIN-4	116
AIR 6449 B41	142	Round Low Profile Platform	116
AIR 6449 B41	142	(2) SBNHH-1D65B	115
AIR 6449 B41	142	(2) SBNHH-1D65B	115
AIR 6449 B41	142	(2) SBNHH-1D65B	115
AIR32 B66Aa/B2a	142	Flat Platform w/ Handrails	105
AIR32 B66Aa/B2a	142	MX08FRO665-21	105
AIR32 B66Aa/B2a	142	MX08FRO665-21	105
APXVAARR24_43-U-NA20	142	MX08FRO665-21	105
APXVAARR24_43-U-NA20	142	TA08025-B604	105
APXVAARR24_43-U-NA20	142	TA08025-B604	105
Round Platform w/ Handrails	142	TA08025-B604	105
800 MHz 2X50W RRH w/ Filter	132.7	TA08025-B605	105
800 MHz 2X50W RRH w/ Filter	132.7	TA08025-B605	105
800 MHz 2X50W RRH w/ Filter	132.7	TA08025-B605	105
RRH2x50-08	127	RDIDC-9181-PF-48	105
RRH2x50-08	127		

MATERIAL STRENGTH

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



Section	Length (ft)	Number of Sides	Thickness (in)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	10.50	12	0.2400	17.1872	17.7841	A572-65	476.2
2	20.67	12	0.3059	17.7841	31.5570	A572-65	1688.0
3	9.14	12	0.3063	31.5570	33.0280	A572-65	981.2
4	29.11	12	0.3141	33.0280	38.3470	A572-65	3543.9
5	12.02	12	0.3804	38.3470	39.7110	A572-65	1936.3
6	27.82	12	0.4014	39.7110	43.9500	A572-65	5069.1
7	9.53	12	0.4706	43.9500	45.0640	A572-65	2164.0
8	32.71	12	0.4906	45.0640	49.5520	A572-65	8232.0
							24090.6


Telamon CLS
 319 Chapanoke Road, Suite 118
 Raleigh, NC 27603
 Phone: (405) 348-5460
 FAX: (405) 341-6334

Job: **Brln-Berlin (302483)**
 Project: **13683513_C3_02**
 Client: Dish Wireless LLC
 Code: TIA-222-H
 Path: K:\A-Brln-Berlin, CT (302483)\13683513 DISH WIRELESS L.L.C\13683513_02_CUST_5767170\302483_Brln-Berlin, CT.mxd
 Drawn by: Sreenivasa.Kailasa
 Date: 08/27/21
 App'd:
 Scale: NTS
 Dwg No. E-1

tnxTower Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334	Job	Brln-Berlin (302483)	Page	1 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

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: 196.00 ft.
- Basic wind speed of 118 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.5000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- Combined pole and wrap structure..
- Sections modeled to have equivalent inertia to pole and wrap combined..
- 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

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 <li style="text-align: center;">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

<p>tnxTower</p> <p>Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334</p>	<p>Job</p> <p>Brln-Berlin (302483)</p>	<p>Page</p> <p>2 of 35</p>
	<p>Project</p> <p>13683513_C3_02</p>	<p>Date</p> <p>10:33:29 08/27/21</p>
	<p>Client</p> <p>Dish Wireless LLC</p>	<p>Designed by</p> <p>Sreenivasa.Kailasa</p>

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	151.50-141.00	10.50	0.00	12	17.1872	17.7841	0.2400	0.9600	A572-65 (65 ksi)
L2	141.00-120.33	20.67	0.00	12	17.7841	31.5570	0.3059	2.0000	A572-65 (65 ksi)
L3	120.33-111.19	9.14	0.00	12	31.5570	33.0280	0.3063	2.0000	A572-65 (65 ksi)
L4	111.19-82.08	29.11	0.00	12	33.0280	38.3470	0.3141	2.2000	A572-65 (65 ksi)
L5	82.08-70.06	12.02	0.00	12	38.3470	39.7110	0.3804	2.4000	A572-65 (65 ksi)
L6	70.06-42.24	27.82	0.00	12	39.7110	43.9500	0.4014	2.6000	A572-65 (65 ksi)
L7	42.24-32.71	9.53	0.00	12	43.9500	45.0640	0.4706	2.8000	A572-65 (65 ksi)
L8	32.71-0.00	32.71		12	45.0640	49.5520	0.4906	3.0000	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	I/Q in ²	w in	w/t
L1	17.7088	13.0968	480.1168	6.0671	8.9030	53.9277	972.8469	6.4458	3.9630	16.512
L2	18.3268	13.5581	532.6554	6.2808	9.2122	57.8209	1079.3043	6.6729	4.1229	17.179
L3	18.2488	17.2160	671.2919	6.2572	9.2122	72.8702	1360.2194	8.4732	3.5302	11.54
L4	32.5075	30.7823	3837.2246	11.1879	16.3465	234.7425	7775.2574	15.1501	7.2213	23.607
L5	32.5075	30.8221	3842.0947	11.1878	16.3465	235.0404	7785.1256	15.1697	7.2211	23.575
L6	34.0304	32.2730	4410.5870	11.7144	17.1085	257.8009	8937.0451	15.8838	7.6153	24.862
L7	34.0157	33.0869	4519.6700	11.7116	17.1085	264.1768	9158.0767	16.2844	7.5039	23.89
L8	39.5224	38.4666	7102.1213	13.6158	19.8637	357.5419	14390.8231	18.9321	8.9294	28.429
L9	39.5036	46.5048	8556.3285	13.5920	19.8637	430.7510	17337.4413	22.8883	8.7867	23.099
L10	40.9157	48.1756	9512.0483	14.0804	20.5703	462.4166	19273.9886	23.7106	9.1523	24.06
L11	40.9001	50.8080	10021.0923	14.0728	20.5703	487.1632	20305.4499	25.0061	9.0338	22.506
L12	45.2886	56.2869	13625.1654	15.5904	22.7661	598.4848	27608.2791	27.7027	10.1698	25.336
L13	45.2696	65.8857	15898.0688	15.5656	22.7661	698.3220	32213.7975	32.4270	10.0256	21.304
L14	46.4229	67.5738	17151.6341	15.9644	23.3432	734.7608	34753.8607	33.2578	10.3241	21.938
L15	46.4074	70.4140	17856.5130	15.9573	23.3432	764.9572	36182.1365	34.6556	10.2062	20.803
L16	51.0537	77.5039	23811.6328	17.5640	25.6679	927.6801	48248.8237	38.1450	11.4090	23.255

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 151.50-141.00				1	1	1			
L2 141.00-120.33				1	1	1			
L3 120.33-111.19				1	1	1			
L4 111.19-82.08				1	1	1			
L5 82.08-70.06				1	1	1			
L6 70.06-42.24				1	1	1			
L7 42.24-32.71				1	1	1			

tnxTower Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334	Job	Brln-Berlin (302483)	Page	3 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in
L8 32.71-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf

1 5/8" Coax	B	No	Surface Ar (CaAa)	116.00 - 5.00	12	12	0.100 0.500	1.9800		0.82
1 5/8" (1.63"-41.3mm) Fiber	B	No	Surface Ar (CaAa)	116.00 - 5.00	2	2	0.000 0.100	1.6300		1.61

4" Wrap Seams	A	No	Surface Ar (CaAa)	141.00 - 5.00	1	1	0.000 0.000	4.0000		0.00
4" Wrap Seams	B	No	Surface Ar (CaAa)	141.00 - 5.00	1	1	0.000 0.000	4.0000		0.00
4" Wrap Seams	C	No	Surface Ar (CaAa)	141.00 - 5.00	1	1	0.000 0.000	4.0000		0.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
1 1/4" Coax	C	No	No	Inside Pole	151.50 - 5.00	12	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.66 0.66 0.66 0.66
0.39" (10mm) Fiber Trunk	C	No	No	Inside Pole	151.50 - 5.00	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.06 0.06 0.06 0.06
0.78" (19.7mm) 8 AWG 6	C	No	No	Inside Pole	151.50 - 5.00	4	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.59 0.59 0.59 0.59
3" conduit	C	No	No	Inside Pole	151.50 - 5.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	1.78 1.78 1.78 1.78

1 5/8" Hybriflex	C	No	No	Inside Pole	142.00 - 5.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	1.61 1.61 1.61 1.61
1 1/4" (1.25"-31.8mm) Fiber	C	No	No	Inside Pole	142.00 - 5.00	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	1.05 1.05 1.05 1.05

tnxTower Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334	Job Brln-Berlin (302483)	Page 4 of 35
	Project 13683513_C3_02	Date 10:33:29 08/27/21
	Client Dish Wireless LLC	Designed by Sreenivasa.Kailasa

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf

1 1/4" Hybriflex	C	No	No	Inside Pole	127.00 - 5.00	4	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
							2" Ice	0.00	0.66

0.82" (20.8mm) 8 AWG 6	C	No	No	Inside Pole	151.50 - 0.00	2	No Ice	0.00	0.62
							1/2" Ice	0.00	0.62
							1" Ice	0.00	0.62
							2" Ice	0.00	0.62
1.6" (40.6mm) Hybrid	A	No	No	Inside Pole	105.00 - 5.00	1	No Ice	0.00	0.56
							1/2" Ice	0.00	0.56
							1" Ice	0.00	0.56
							2" Ice	0.00	0.56

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
L1	151.50-141.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	144.62
L2	141.00-120.33	A	0.000	0.000	8.268	0.000	0.00
		B	0.000	0.000	8.268	0.000	0.00
		C	0.000	0.000	8.268	0.000	371.69
L3	120.33-111.19	A	0.000	0.000	3.656	0.000	0.00
		B	0.000	0.000	16.653	0.000	62.82
		C	0.000	0.000	3.656	0.000	180.70
L4	111.19-82.08	A	0.000	0.000	11.644	0.000	12.84
		B	0.000	0.000	90.299	0.000	380.18
		C	0.000	0.000	11.644	0.000	575.50
L5	82.08-70.06	A	0.000	0.000	4.808	0.000	6.73
		B	0.000	0.000	37.286	0.000	156.98
		C	0.000	0.000	4.808	0.000	237.64
L6	70.06-42.24	A	0.000	0.000	11.128	0.000	15.58
		B	0.000	0.000	86.298	0.000	363.33
		C	0.000	0.000	11.128	0.000	550.00
L7	42.24-32.71	A	0.000	0.000	3.812	0.000	5.34
		B	0.000	0.000	29.562	0.000	124.46
		C	0.000	0.000	3.812	0.000	188.41
L8	32.71-0.00	A	0.000	0.000	11.084	0.000	15.52
		B	0.000	0.000	85.956	0.000	361.89
		C	0.000	0.000	11.084	0.000	554.03

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
L1	151.50-141.00	A	1.741	0.000	0.000	0.000	0.000	0.00

tnxTower Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334	Job	Brln-Berlin (302483)	Page	5 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	144.62
L2	141.00-120.33	A	1.720	0.000	0.000	15.379	0.000	248.46
		B		0.000	0.000	15.379	0.000	248.46
		C		0.000	0.000	15.379	0.000	620.14
L3	120.33-111.19	A	1.701	0.000	0.000	6.765	0.000	108.25
		B		0.000	0.000	27.100	0.000	408.44
		C		0.000	0.000	6.765	0.000	288.95
L4	111.19-82.08	A	1.670	0.000	0.000	21.364	0.000	349.47
		B		0.000	0.000	143.983	0.000	2125.52
		C		0.000	0.000	21.364	0.000	912.14
L5	82.08-70.06	A	1.631	0.000	0.000	8.728	0.000	141.56
		B		0.000	0.000	59.125	0.000	859.13
		C		0.000	0.000	8.728	0.000	372.46
L6	70.06-42.24	A	1.581	0.000	0.000	19.926	0.000	315.53
		B		0.000	0.000	135.883	0.000	1934.50
		C		0.000	0.000	19.926	0.000	849.96
L7	42.24-32.71	A	1.519	0.000	0.000	6.707	0.000	102.95
		B		0.000	0.000	46.134	0.000	639.68
		C		0.000	0.000	6.707	0.000	286.03
L8	32.71-0.00	A	1.396	0.000	0.000	18.821	0.000	270.55
		B		0.000	0.000	131.754	0.000	1729.76
		C		0.000	0.000	18.821	0.000	809.06

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	151.50-141.00	0.0000	0.0000	0.0000	0.0000
L2	141.00-120.33	0.0000	0.0000	0.0000	0.0000
L3	120.33-111.19	4.6067	0.2030	4.2762	0.0203
L4	111.19-82.08	7.2224	0.3179	6.6185	0.0349
L5	82.08-70.06	7.6533	0.3365	7.0103	0.0416
L6	70.06-42.24	7.9623	0.3499	7.3250	0.0501
L7	42.24-32.71	8.2048	0.3603	7.6147	0.0609
L8	32.71-0.00	7.6945	0.3378	7.3118	0.0760

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L2	15	4" Wrap Seams	120.33 - 141.00	1.0000	1.0000
L2	16	4" Wrap Seams	120.33 - 141.00	1.0000	1.0000
L2	17	4" Wrap Seams	120.33 -	1.0000	1.0000

<p>tnxTower</p> <p>Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334</p>	<p>Job</p> <p>Brln-Berlin (302483)</p>	<p>Page</p> <p>6 of 35</p>
	<p>Project</p> <p>13683513_C3_02</p>	<p>Date</p> <p>10:33:29 08/27/21</p>
	<p>Client</p> <p>Dish Wireless LLC</p>	<p>Designed by</p> <p>Sreenivasa.Kailasa</p>

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L3	12	1 5/8" Coax	141.00 111.19 - 116.00	1.0000	1.0000
L3	13	1 5/8" (1.63"-41.3mm) Fiber	111.19 - 116.00	1.0000	1.0000
L3	15	4" Wrap Seams	111.19 - 120.33	1.0000	1.0000
L3	16	4" Wrap Seams	111.19 - 120.33	1.0000	1.0000
L3	17	4" Wrap Seams	111.19 - 120.33	1.0000	1.0000
L4	12	1 5/8" Coax	82.08 - 111.19	1.0000	1.0000
L4	13	1 5/8" (1.63"-41.3mm) Fiber	82.08 - 111.19	1.0000	1.0000
L4	15	4" Wrap Seams	82.08 - 111.19	1.0000	1.0000
L4	16	4" Wrap Seams	82.08 - 111.19	1.0000	1.0000
L4	17	4" Wrap Seams	82.08 - 111.19	1.0000	1.0000
L5	12	1 5/8" Coax	70.06 - 82.08	1.0000	1.0000
L5	13	1 5/8" (1.63"-41.3mm) Fiber	70.06 - 82.08	1.0000	1.0000
L5	15	4" Wrap Seams	70.06 - 82.08	1.0000	1.0000
L5	16	4" Wrap Seams	70.06 - 82.08	1.0000	1.0000
L5	17	4" Wrap Seams	70.06 - 82.08	1.0000	1.0000
L6	12	1 5/8" Coax	42.24 - 70.06	1.0000	1.0000
L6	13	1 5/8" (1.63"-41.3mm) Fiber	42.24 - 70.06	1.0000	1.0000
L6	15	4" Wrap Seams	42.24 - 70.06	1.0000	1.0000
L6	16	4" Wrap Seams	42.24 - 70.06	1.0000	1.0000
L6	17	4" Wrap Seams	42.24 - 70.06	1.0000	1.0000
L7	12	1 5/8" Coax	32.71 - 42.24	1.0000	1.0000
L7	13	1 5/8" (1.63"-41.3mm) Fiber	32.71 - 42.24	1.0000	1.0000
L7	15	4" Wrap Seams	32.71 - 42.24	1.0000	1.0000
L7	16	4" Wrap Seams	32.71 - 42.24	1.0000	1.0000
L7	17	4" Wrap Seams	32.71 - 42.24	1.0000	1.0000
L8	12	1 5/8" Coax	5.00 - 32.71	1.0000	1.0000
L8	13	1 5/8" (1.63"-41.3mm) Fiber	5.00 - 32.71	1.0000	1.0000
L8	15	4" Wrap Seams	5.00 - 32.71	1.0000	1.0000
L8	16	4" Wrap Seams	5.00 - 32.71	1.0000	1.0000
L8	17	4" Wrap Seams	5.00 - 32.71	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb	
(2) TPX-070821	A	From Leg	3.00	0.0000	151.50	No Ice	0.00	0.18	7.50
						1/2" Ice	0.00	0.25	10.98
						1" Ice	0.00	0.32	15.80
						2" Ice	0.00	0.49	30.21
(2) TPX-070821	B	From Leg	3.00	0.0000	151.50	No Ice	0.00	0.18	7.50
						1/2" Ice	0.00	0.25	10.98
						1" Ice	0.00	0.32	15.80
						2" Ice	0.00	0.49	30.21
(2) TPX-070821	C	From Leg	3.00	0.0000	151.50	No Ice	0.00	0.18	7.50

tnxTower Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334	Job	Brln-Berlin (302483)	Page	7 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	lb
			0.00			1/2" Ice	0.00	0.25	10.98
			0.50			1" Ice	0.00	0.32	15.80
						2" Ice	0.00	0.49	30.21
(2) LGP21401	A	From Leg	3.00	0.0000	151.50	No Ice	0.00	0.36	10.00
			0.00			1/2" Ice	1.45	0.48	21.26
			0.50			1" Ice	1.61	0.60	30.32
						2" Ice	1.97	0.87	54.89
(2) LGP21401	B	From Leg	3.00	0.0000	151.50	No Ice	0.00	0.36	10.00
			0.00			1/2" Ice	1.45	0.48	21.26
			0.50			1" Ice	1.61	0.60	30.32
						2" Ice	1.97	0.87	54.89
(2) LGP21401	C	From Leg	3.00	0.0000	151.50	No Ice	0.00	0.36	10.00
			0.00			1/2" Ice	1.45	0.48	21.26
			0.50			1" Ice	1.61	0.60	30.32
						2" Ice	1.97	0.87	54.89
DC6-48-60-18-8F(32.8 lbs)	B	From Leg	0.50	0.0000	151.50	No Ice	1.28	0.79	20.00
			0.00			1/2" Ice	1.27	1.27	35.12
			0.50			1" Ice	1.45	1.45	52.57
						2" Ice	1.83	1.83	95.09
DC6-48-60-18-8F(32.8 lbs)	C	From Leg	0.50	0.0000	151.50	No Ice	1.28	0.79	20.00
			0.00			1/2" Ice	1.27	1.27	35.12
			0.50			1" Ice	1.45	1.45	52.57
						2" Ice	1.83	1.83	95.09
RRUS 4426 B66	A	From Leg	3.00	0.0000	151.50	No Ice	1.64	0.73	48.40
			0.00			1/2" Ice	1.80	0.84	61.22
			0.50			1" Ice	1.97	0.97	76.43
						2" Ice	2.33	1.24	114.82
RRUS 4426 B66	B	From Leg	3.00	0.0000	151.50	No Ice	1.64	0.73	48.40
			0.00			1/2" Ice	1.80	0.84	61.22
			0.50			1" Ice	1.97	0.97	76.43
						2" Ice	2.33	1.24	114.82
RRUS 4426 B66	C	From Leg	3.00	0.0000	151.50	No Ice	1.64	0.73	48.40
			0.00			1/2" Ice	1.80	0.84	61.22
			0.50			1" Ice	1.97	0.97	76.43
						2" Ice	2.33	1.24	114.82
RRUS 11 (Band 12) (55 lb)	A	From Leg	3.00	0.0000	151.50	No Ice	0.00	1.07	60.00
			0.00			1/2" Ice	2.72	1.21	74.32
			0.50			1" Ice	2.92	1.36	96.56
						2" Ice	3.35	1.68	150.56
RRUS 11 (Band 12) (55 lb)	B	From Leg	3.00	0.0000	151.50	No Ice	0.00	1.07	60.00
			0.00			1/2" Ice	2.72	1.21	74.32
			0.50			1" Ice	2.92	1.36	96.56
						2" Ice	3.35	1.68	150.56
RRUS 11 (Band 12) (55 lb)	C	From Leg	3.00	0.0000	151.50	No Ice	0.00	1.07	60.00
			0.00			1/2" Ice	2.72	1.21	74.32
			0.50			1" Ice	2.92	1.36	96.56
						2" Ice	3.35	1.68	150.56
RRUS 32 (50.8 lbs)	A	From Leg	3.00	0.0000	151.50	No Ice	0.00	2.42	80.00
			0.00			1/2" Ice	0.00	2.64	104.93
			0.50			1" Ice	0.00	2.86	136.47
						2" Ice	0.00	3.32	211.15
RRUS 32 (50.8 lbs)	B	From Leg	3.00	0.0000	151.50	No Ice	0.00	2.42	80.00
			0.00			1/2" Ice	0.00	2.64	104.93
			0.50			1" Ice	0.00	2.86	136.47
						2" Ice	0.00	3.32	211.15
RRUS 32 (50.8 lbs)	C	From Leg	3.00	0.0000	151.50	No Ice	0.00	2.42	80.00
			0.00			1/2" Ice	0.00	2.64	104.93

<p>tnxTower</p> <p>Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334</p>	Job		Brln-Berlin (302483)		Page		8 of 35	
	Project		13683513_C3_02		Date		10:33:29 08/27/21	
	Client		Dish Wireless LLC		Designed by		Sreenivasa.Kailasa	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Lateral					
			0.50						
						1" Ice	0.00	2.86	136.47
						2" Ice	0.00	3.32	211.15
RRUS 32 B2	A	From Leg	3.00	0.0000	151.50	No Ice	0.00	1.67	50.00
			0.00			1/2" Ice	0.00	1.86	74.11
			0.50			1" Ice	0.00	2.05	98.42
						2" Ice	0.00	2.46	157.41
RRUS 32 B2	A	From Leg	3.00	0.0000	151.50	No Ice	0.00	1.67	50.00
			0.00			1/2" Ice	0.00	1.86	74.11
			0.50			1" Ice	0.00	2.05	98.42
						2" Ice	0.00	2.46	157.41
RRUS 32 B2	C	From Leg	3.00	0.0000	151.50	No Ice	0.00	1.67	50.00
			0.00			1/2" Ice	0.00	1.86	74.11
			0.50			1" Ice	0.00	2.05	98.42
						2" Ice	0.00	2.46	157.41
7770.00	A	From Leg	3.00	0.0000	151.50	No Ice	5.51	2.93	40.00
			0.00			1/2" Ice	6.31	3.27	67.63
			0.50			1" Ice	6.75	3.63	105.07
						2" Ice	7.66	4.35	195.09
7770.00	B	From Leg	3.00	0.0000	151.50	No Ice	5.51	2.93	40.00
			0.00			1/2" Ice	6.31	3.27	67.63
			0.50			1" Ice	6.75	3.63	105.07
						2" Ice	7.66	4.35	195.09
7770.00	C	From Leg	3.00	0.0000	151.50	No Ice	5.51	2.93	40.00
			0.00			1/2" Ice	6.31	3.27	67.63
			0.50			1" Ice	6.75	3.63	105.07
						2" Ice	7.66	4.35	195.09
QS66512-2	A	From Leg	3.00	0.0000	151.50	No Ice	8.13	5.00	111.00
			0.00			1/2" Ice	9.23	5.80	168.00
			0.50			1" Ice	10.33	6.60	225.00
						2" Ice	12.53	8.20	339.00
QS66512-2	B	From Leg	3.00	0.0000	151.50	No Ice	8.13	5.00	111.00
			0.00			1/2" Ice	9.23	5.80	168.00
			0.50			1" Ice	10.33	6.60	225.00
						2" Ice	12.53	8.20	339.00
QS66512-2	C	From Leg	3.00	0.0000	151.50	No Ice	8.13	5.00	111.00
			0.00			1/2" Ice	9.23	5.80	168.00
			0.50			1" Ice	10.33	6.60	225.00
						2" Ice	12.53	8.20	339.00
OPA-65R-LCUU-H6	A	From Leg	3.00	0.0000	151.50	No Ice	9.66	5.52	70.00
			0.00			1/2" Ice	10.13	5.97	131.43
			0.50			1" Ice	10.61	6.43	196.17
						2" Ice	11.58	7.38	345.32
OPA-65R-LCUU-H6	B	From Leg	3.00	0.0000	151.50	No Ice	9.66	5.52	70.00
			0.00			1/2" Ice	10.13	5.97	131.43
			0.50			1" Ice	10.61	6.43	196.17
						2" Ice	11.58	7.38	345.32
OPA-65R-LCUU-H6	C	From Leg	3.00	0.0000	151.50	No Ice	9.66	5.52	70.00
			0.00			1/2" Ice	10.13	5.97	131.43
			0.50			1" Ice	10.61	6.43	196.17
						2" Ice	11.58	7.38	345.32
CBC23SR-43	A	From Leg	3.00	0.0000	151.50	No Ice	0.00	0.15	10.00
			0.00			1/2" Ice	0.00	0.17	10.00
			0.50			1" Ice	0.54	0.19	10.00
						2" Ice	0.66	0.23	10.00
CBC23SR-43	B	From Leg	3.00	0.0000	151.50	No Ice	0.00	0.15	10.00
			0.00			1/2" Ice	0.00	0.17	10.00
			0.50			1" Ice	0.54	0.19	10.00

<p>tnxTower</p> <p>Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334</p>	Job	Brln-Berlin (302483)	Page	9 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	lb
CBC23SR-43	C	From Leg	3.00	0.0000	151.50	2" Ice	0.66	0.23	10.00
			0.00	No Ice		0.00	0.15	10.00	
			0.50	1/2" Ice		0.00	0.17	10.00	
				1" Ice		0.54	0.19	10.00	
DC6-48-60-0-8C-EV	A	From Leg	3.00	0.0000	151.50	2" Ice	0.66	0.23	10.00
			0.00	No Ice		1.02	1.02	20.00	
			0.50	1/2" Ice		1.10	1.10	20.00	
				1" Ice		1.18	1.18	20.00	
ION-M23 SDARS	A	From Leg	3.00	0.0000	151.50	2" Ice	1.34	1.34	20.00
			0.00	No Ice		1.84	1.76	50.00	
			0.50	1/2" Ice		2.02	1.94	60.00	
				1" Ice		2.20	2.12	70.00	
ION-M23 SDARS	B	From Leg	3.00	0.0000	151.50	2" Ice	2.56	2.48	90.00
			0.00	No Ice		1.84	1.76	50.00	
			0.50	1/2" Ice		2.02	1.94	60.00	
				1" Ice		2.20	2.12	70.00	
ION-M23 SDARS	C	From Leg	3.00	0.0000	151.50	2" Ice	2.56	2.48	90.00
			0.00	No Ice		1.84	1.76	50.00	
			0.00	1/2" Ice		2.02	1.94	60.00	
				1" Ice		2.20	2.12	70.00	
Flat Platform w/ Handrails	C	None		0.0000	151.50	2" Ice	2.56	2.48	90.00
				No Ice		42.40	42.40	2500.00	
				1/2" Ice		48.40	48.40	2450.00	
				1" Ice		54.40	54.40	2900.00	
					2" Ice	66.40	66.40	3800.00	

RADIO 4449 B71/B85A	A	From Leg	3.00	0.0000	142.00	No Ice	1.65	1.31	75.00
			0.00	1/2" Ice		1.80	1.46	92.22	
			0.00	1" Ice		1.97	1.61	112.19	
				2" Ice		2.33	1.94	161.00	
RADIO 4449 B71/B85A	B	From Leg	3.00	0.0000	142.00	No Ice	1.65	1.31	75.00
			0.00	1/2" Ice		1.80	1.46	92.22	
			0.00	1" Ice		1.97	1.61	112.19	
				2" Ice		2.33	1.94	161.00	
RADIO 4449 B71/B85A	C	From Leg	3.00	0.0000	142.00	No Ice	1.65	1.31	75.00
			0.00	1/2" Ice		1.80	1.46	92.22	
			0.00	1" Ice		1.97	1.61	112.19	
				2" Ice		2.33	1.94	161.00	
RADIO 4460 B2/B25 B66	A	From Leg	3.00	0.0000	142.00	No Ice	2.56	1.61	109.00
			0.00	1/2" Ice		2.95	1.85	131.16	
			0.00	1" Ice		3.33	2.02	156.36	
				2" Ice		4.10	2.39	216.68	
RADIO 4460 B2/B25 B66	B	From Leg	3.00	0.0000	142.00	No Ice	2.56	1.61	109.00
			0.00	1/2" Ice		2.95	1.85	131.16	
			0.00	1" Ice		3.33	2.02	156.36	
				2" Ice		4.10	2.39	216.68	
RADIO 4460 B2/B25 B66	C	From Leg	3.00	0.0000	142.00	No Ice	2.56	1.61	109.00
			0.00	1/2" Ice		2.95	1.85	131.16	
			0.00	1" Ice		3.33	2.02	156.36	
				2" Ice		4.10	2.39	216.68	
AIR 6449 B41	A	From Leg	3.00	0.0000	142.00	No Ice	5.68	2.48	104.00
			0.00	1/2" Ice		5.96	2.70	153.54	
			0.00	1" Ice		6.27	2.94	196.67	
				2" Ice		6.91	3.43	296.37	
AIR 6449 B41	B	From Leg	3.00	0.0000	142.00	No Ice	5.68	2.48	104.00
			0.00	1/2" Ice		5.96	2.70	153.54	
			0.00	1" Ice		6.27	2.94	196.67	
				2" Ice		6.91	3.43	296.37	

tnxTower Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334	Job	Brln-Berlin (302483)	Page	10 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	lb
AIR 6449 B41	C	From Leg	3.00	0.0000	142.00	2" Ice	6.91	3.43	296.37
			0.00	No Ice		5.68	2.48	104.00	
			0.00	1/2" Ice		5.96	2.70	153.54	
				1" Ice		6.27	2.94	196.67	
AIR32 B66Aa/B2a	A	From Leg	3.00	0.0000	142.00	2" Ice	6.91	3.43	296.37
			0.00	No Ice		6.51	2.70	132.20	
			0.00	1/2" Ice		7.78	3.22	178.00	
				1" Ice		9.05	3.74	223.80	
AIR32 B66Aa/B2a	B	From Leg	3.00	0.0000	142.00	2" Ice	11.59	4.78	315.40
			0.00	No Ice		6.51	2.70	132.20	
			0.00	1/2" Ice		7.78	3.22	178.00	
				1" Ice		9.05	3.74	223.80	
AIR32 B66Aa/B2a	C	From Leg	3.00	0.0000	142.00	2" Ice	11.59	4.78	315.40
			0.00	No Ice		6.51	2.70	132.20	
			0.00	1/2" Ice		7.78	3.22	178.00	
				1" Ice		9.05	3.74	223.80	
APXVAARR24_43-U-NA20	A	From Leg	3.00	0.0000	142.00	2" Ice	11.59	4.78	315.40
			0.00	No Ice		20.24	5.15	127.90	
			0.00	1/2" Ice		23.53	5.99	240.00	
				1" Ice		26.82	6.83	352.10	
APXVAARR24_43-U-NA20	B	From Leg	3.00	0.0000	142.00	2" Ice	33.40	8.51	576.30
			0.00	No Ice		20.24	5.15	127.90	
			0.00	1/2" Ice		23.53	5.99	240.00	
				1" Ice		26.82	6.83	352.10	
APXVAARR24_43-U-NA20	C	From Leg	3.00	0.0000	142.00	2" Ice	33.40	8.51	576.30
			0.00	No Ice		20.24	5.15	127.90	
			0.00	1/2" Ice		23.53	5.99	240.00	
				1" Ice		26.82	6.83	352.10	
Round Platform w/ Handrails	C	None		0.0000	142.00	2" Ice	33.40	8.51	576.30
				No Ice		27.20	27.20	2500.00	
				1/2" Ice		34.20	34.20	2400.00	
				1" Ice		41.20	41.20	2800.00	
*** RRH2x50-08	A	From Face	3.00	0.0000	127.00	2" Ice	55.20	55.20	3600.00
			0.00	No Ice		1.70	1.10	52.90	
			0.00	1/2" Ice		2.27	1.80	69.90	
				1" Ice		2.84	2.50	86.90	
RRH2x50-08	B	From Face	3.00	0.0000	127.00	2" Ice	3.98	3.90	120.90
			0.00	No Ice		1.70	1.10	52.90	
			0.00	1/2" Ice		2.27	1.80	69.90	
				1" Ice		2.84	2.50	86.90	
RRH2x50-08	C	From Face	3.00	0.0000	127.00	2" Ice	3.98	3.90	120.90
			0.00	No Ice		1.70	1.10	52.90	
			0.00	1/2" Ice		2.27	1.80	69.90	
				1" Ice		2.84	2.50	86.90	
800 MHz 2X50W RRH w/ Filter	A	From Leg	3.00	0.0000	132.70	2" Ice	3.98	3.90	120.90
			0.00	No Ice		0.00	1.93	60.00	
			0.00	1/2" Ice		2.24	2.11	86.12	
				1" Ice		2.43	2.29	111.30	
800 MHz 2X50W RRH w/ Filter	B	From Leg	3.00	0.0000	132.70	2" Ice	2.83	2.68	171.62
			0.00	No Ice		0.00	1.93	60.00	
			0.00	1/2" Ice		2.24	2.11	86.12	
				1" Ice		2.43	2.29	111.30	
800 MHz 2X50W RRH w/ Filter	C	From Leg	3.00	0.0000	132.70	2" Ice	2.83	2.68	171.62
			0.00	No Ice		0.00	1.93	60.00	
			0.00	1/2" Ice		2.24	2.11	86.12	
				1" Ice		2.43	2.29	111.30	

tnxTower Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334	Job	Brln-Berlin (302483)	Page	12 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	lb
RRH2X60	C	From Leg	3.00	0.0000	119.70	No Ice	3.50	1.82	60.00
			0.00			1/2" Ice	3.76	2.05	82.72
			0.00			1" Ice	4.03	2.29	109.06
						2" Ice	4.58	2.79	173.43
Round Platform w/ Handrails	C	None		0.0000	127.00	No Ice	27.20	27.20	2500.00
						1/2" Ice	34.20	34.20	2400.00
						1" Ice	41.20	41.20	2800.00
						2" Ice	55.20	55.20	3600.00
**									
Outdoor CBRS 20W rRH - Clip on Antenna	A	From Leg	3.00	0.0000	116.00	No Ice	0.89	0.75	4.40
			0.00			1/2" Ice	1.03	0.87	5.06
			0.00			1" Ice	1.16	0.99	5.72
						2" Ice	1.43	1.27	7.04
Outdoor CBRS 20W rRH - Clip on Antenna	B	From Leg	3.00	0.0000	116.00	No Ice	0.89	0.75	4.40
			0.00			1/2" Ice	1.03	0.87	5.06
			0.00			1" Ice	1.16	0.99	5.72
						2" Ice	1.43	1.27	7.04
Outdoor CBRS 20W rRH - Clip on Antenna	C	From Leg	3.00	0.0000	116.00	No Ice	0.89	0.75	4.40
			0.00			1/2" Ice	1.03	0.87	5.06
			0.00			1" Ice	1.16	0.99	5.72
						2" Ice	1.43	1.27	7.04
RT4401-48A	A	From Leg	3.00	0.0000	116.00	No Ice	1.00	1.00	18.60
			0.00			1/2" Ice	1.15	1.15	21.39
			0.00			1" Ice	1.29	1.29	24.18
						2" Ice	1.59	1.59	29.76
RT4401-48A	B	From Leg	3.00	0.0000	116.00	No Ice	1.00	1.00	18.60
			0.00			1/2" Ice	1.15	1.15	21.39
			0.00			1" Ice	1.29	1.29	24.18
						2" Ice	1.59	1.59	29.76
RT4401-48A	C	From Leg	3.00	0.0000	116.00	No Ice	1.00	1.00	18.60
			0.00			1/2" Ice	1.15	1.15	21.39
			0.00			1" Ice	1.29	1.29	24.18
						2" Ice	1.59	1.59	29.76
(2) SBNHH-1D65B	A	From Leg	3.00	0.0000	116.00	No Ice	4.16	2.49	40.60
			0.00			1/2" Ice	4.57	2.88	91.24
			0.00			1" Ice	4.99	3.27	148.02
						2" Ice	5.85	4.09	280.83
(2) SBNHH-1D65B	B	From Leg	3.00	0.0000	116.00	No Ice	4.16	2.49	40.60
			0.00			1/2" Ice	4.57	2.88	91.24
			0.00			1" Ice	4.99	3.27	148.02
						2" Ice	5.85	4.09	280.83
(2) SBNHH-1D65B	C	From Leg	3.00	0.0000	116.00	No Ice	4.16	2.49	40.60
			0.00			1/2" Ice	4.57	2.88	91.24
			0.00			1" Ice	4.99	3.27	148.02
						2" Ice	5.85	4.09	280.83
(2) SBNHH-1D65B	A	From Leg	3.00	0.0000	115.00	No Ice	4.16	2.49	40.60
			0.00			1/2" Ice	4.57	2.88	91.24
			0.00			1" Ice	4.99	3.27	148.02
						2" Ice	5.85	4.09	280.83
(2) SBNHH-1D65B	B	From Leg	3.00	0.0000	115.00	No Ice	4.16	2.49	40.60
			0.00			1/2" Ice	4.57	2.88	91.24
			0.00			1" Ice	4.99	3.27	148.02
						2" Ice	5.85	4.09	280.83
(2) SBNHH-1D65B	C	From Leg	3.00	0.0000	115.00	No Ice	4.16	2.49	40.60
			0.00			1/2" Ice	4.57	2.88	91.24
			0.00			1" Ice	4.99	3.27	148.02
						2" Ice	5.85	4.09	280.83

<p>tnxTower</p> <p>Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334</p>	Job	Brln-Berlin (302483)	Page	13 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Lateral					
B2/B66A RRH-BR049	A	From Leg	3.00	0.0000	116.00	No Ice	2.05	1.54	38.30
			0.00	0.00		1/2" Ice	2.23	1.70	59.84
			0.00	0.00		1" Ice	2.41	1.86	84.37
			0.00	0.00		2" Ice	2.81	2.21	143.23
B2/B66A RRH-BR049	B	From Leg	3.00	0.0000	116.00	No Ice	2.05	1.54	38.30
			0.00	0.00		1/2" Ice	2.23	1.70	59.84
			0.00	0.00		1" Ice	2.41	1.86	84.37
			0.00	0.00		2" Ice	2.81	2.21	143.23
B2/B66A RRH-BR049	C	From Leg	3.00	0.0000	116.00	No Ice	2.05	1.54	38.30
			0.00	0.00		1/2" Ice	2.23	1.70	59.84
			0.00	0.00		1" Ice	2.41	1.86	84.37
			0.00	0.00		2" Ice	2.81	2.21	143.23
B5/B13 RRH-BR04C	A	From Leg	3.00	0.0000	116.00	No Ice	1.88	1.01	70.30
			0.00	0.00		1/2" Ice	2.05	1.14	86.73
			0.00	0.00		1" Ice	2.22	1.28	105.83
			0.00	0.00		2" Ice	2.60	1.59	152.80
B5/B13 RRH-BR04C	B	From Leg	3.00	0.0000	116.00	No Ice	1.88	1.01	70.30
			0.00	0.00		1/2" Ice	2.05	1.14	86.73
			0.00	0.00		1" Ice	2.22	1.28	105.83
			0.00	0.00		2" Ice	2.60	1.59	152.80
B5/B13 RRH-BR04C	C	From Leg	3.00	0.0000	116.00	No Ice	1.88	1.01	70.30
			0.00	0.00		1/2" Ice	2.05	1.14	86.73
			0.00	0.00		1" Ice	2.22	1.28	105.83
			0.00	0.00		2" Ice	2.60	1.59	152.80
RRFDC-3315-PF-48	A	From Leg	3.00	0.0000	116.00	No Ice	2.80	2.19	32.00
			0.00	0.00		1/2" Ice	3.60	2.39	49.94
			0.00	0.00		1" Ice	3.84	2.61	82.01
			0.00	0.00		2" Ice	4.34	3.05	157.57
RRFDC-3315-PF-48	B	From Leg	3.00	0.0000	116.00	No Ice	2.80	2.19	32.00
			0.00	0.00		1/2" Ice	3.60	2.39	49.94
			0.00	0.00		1" Ice	3.84	2.61	82.01
			0.00	0.00		2" Ice	4.34	3.05	157.57
MT6407-77A	A	From Leg	3.00	0.0000	116.00	No Ice	4.71	1.84	81.57
			0.00	0.00		1/2" Ice	4.98	2.06	110.81
			0.00	0.00		1" Ice	5.28	2.29	143.92
			0.00	0.00		2" Ice	5.89	2.77	222.51
MT6407-77A	B	From Leg	3.00	0.0000	116.00	No Ice	4.71	1.84	81.57
			0.00	0.00		1/2" Ice	4.98	2.06	110.81
			0.00	0.00		1" Ice	5.28	2.29	143.92
			0.00	0.00		2" Ice	5.89	2.77	222.51
MT6407-77A	C	From Leg	3.00	0.0000	116.00	No Ice	4.71	1.84	81.57
			0.00	0.00		1/2" Ice	4.98	2.06	110.81
			0.00	0.00		1" Ice	5.28	2.29	143.92
			0.00	0.00		2" Ice	5.89	2.77	222.51
BXA-70080-6CF-EDIN-4	A	From Leg	3.00	0.0000	116.00	No Ice	5.77	4.56	18.00
			0.00	0.00		1/2" Ice	5.76	5.00	54.30
			0.00	0.00		1" Ice	6.68	5.45	96.29
			0.00	0.00		2" Ice	7.62	6.37	198.15
BXA-70080-6CF-EDIN-4	B	From Leg	3.00	0.0000	116.00	No Ice	5.77	4.56	18.00
			0.00	0.00		1/2" Ice	5.76	5.00	54.30
			0.00	0.00		1" Ice	6.68	5.45	96.29
			0.00	0.00		2" Ice	7.62	6.37	198.15
BXA-70080-6CF-EDIN-4	C	From Leg	3.00	0.0000	116.00	No Ice	5.77	4.56	18.00
			0.00	0.00		1/2" Ice	5.76	5.00	54.30
			0.00	0.00		1" Ice	6.68	5.45	96.29
			0.00	0.00		2" Ice	7.62	6.37	198.15
Round Low Profile Platform	C	None		0.0000	116.00	No Ice	21.70	21.70	1875.00

tnxTower Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334	Job	Brln-Berlin (302483)	Page	14 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Lateral Vert					
			ft	ft	°	ft	ft ²	ft ²	lb
						1/2" Ice	27.20	27.20	1700.00
						1" Ice	32.70	32.70	1900.00
						2" Ice	43.70	43.70	2300.00
**									
Flat Platform w/ Handrails	C	None			0.0000	105.00	No Ice	42.40	2500.00
							1/2" Ice	48.40	2450.00
							1" Ice	54.40	2900.00
							2" Ice	66.40	3800.00
MX08FRO665-21	A	From Leg	3.00		0.0000	105.00	No Ice	12.49	64.50
			0.00				1/2" Ice	12.99	138.29
			0.00				1" Ice	13.49	218.76
							2" Ice	14.52	400.50
MX08FRO665-21	B	From Leg	3.00		0.0000	105.00	No Ice	12.49	64.50
			0.00				1/2" Ice	12.99	138.29
			0.00				1" Ice	13.49	218.76
							2" Ice	14.52	400.50
MX08FRO665-21	C	From Leg	3.00		0.0000	105.00	No Ice	12.49	64.50
			0.00				1/2" Ice	12.99	138.29
			0.00				1" Ice	13.49	218.76
							2" Ice	14.52	400.50
TA08025-B604	A	From Leg	3.00		0.0000	105.00	No Ice	1.96	63.93
			0.00				1/2" Ice	2.14	80.68
			0.00				1" Ice	2.32	100.13
							2" Ice	2.71	147.88
TA08025-B604	B	From Leg	3.00		0.0000	105.00	No Ice	1.96	63.93
			0.00				1/2" Ice	2.14	80.68
			0.00				1" Ice	2.32	100.13
							2" Ice	2.71	147.88
TA08025-B604	C	From Leg	3.00		0.0000	105.00	No Ice	1.96	63.93
			0.00				1/2" Ice	2.14	80.68
			0.00				1" Ice	2.32	100.13
							2" Ice	2.71	147.88
TA08025-B605	A	From Leg	3.00		0.0000	105.00	No Ice	2.23	74.95
			0.00				1/2" Ice	2.41	94.60
			0.00				1" Ice	2.60	117.15
							2" Ice	3.01	171.73
TA08025-B605	B	From Leg	3.00		0.0000	105.00	No Ice	2.23	74.95
			0.00				1/2" Ice	2.41	94.60
			0.00				1" Ice	2.60	117.15
							2" Ice	3.01	171.73
TA08025-B605	C	From Leg	3.00		0.0000	105.00	No Ice	2.23	74.95
			0.00				1/2" Ice	2.41	94.60
			0.00				1" Ice	2.60	117.15
							2" Ice	3.01	171.73
RDIDC-9181-PF-48	A	From Leg	1.50		0.0000	105.00	No Ice	1.87	21.85
			0.00				1/2" Ice	2.19	39.53
			0.00				1" Ice	2.37	59.97
							2" Ice	2.76	109.90
**									

Tower Pressures - No Ice

tnxTower Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334	Job	Brln-Berlin (302483)	Page	15 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

$$G_H = 1.100$$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face	C _A A _A Out Face
ft	ft		psf	ft ²	e	ft ²	ft ²	ft ²		ft ²	ft ²
L1 151.50-141.00	146.22	1.102	37	15.766	A	0.000	15.766	15.766	100.00	0.000	0.000
					B	0.000	15.766		100.00	0.000	0.000
					C	0.000	15.766		100.00	0.000	0.000
L2 141.00-120.33	129.70	1.064	36	43.714	A	0.000	43.714	43.714	100.00	8.268	0.000
					B	0.000	43.714		100.00	8.268	0.000
					C	0.000	43.714		100.00	8.268	0.000
L3 120.33-111.19	115.73	1.03	35	25.340	A	0.000	25.340	25.340	100.00	3.656	0.000
					B	0.000	25.340		100.00	16.653	0.000
					C	0.000	25.340		100.00	3.656	0.000
L4 111.19-82.08	96.27	0.978	33	89.196	A	0.000	89.196	89.196	100.00	11.644	0.000
					B	0.000	89.196		100.00	90.299	0.000
					C	0.000	89.196		100.00	11.644	0.000
L5 82.08-70.06	76.03	0.914	31	40.277	A	0.000	40.277	40.277	100.00	4.808	0.000
					B	0.000	40.277		100.00	37.286	0.000
					C	0.000	40.277		100.00	4.808	0.000
L6 70.06-42.24	55.92	0.837	28	99.907	A	0.000	99.907	99.907	100.00	11.128	0.000
					B	0.000	99.907		100.00	86.298	0.000
					C	0.000	99.907		100.00	11.128	0.000
L7 42.24-32.71	37.46	0.746	25	36.410	A	0.000	36.410	36.410	100.00	3.812	0.000
					B	0.000	36.410		100.00	29.562	0.000
					C	0.000	36.410		100.00	3.812	0.000
L8 32.71-0.00	16.10	0.7	24	132.831	A	0.000	132.831	132.831	100.00	11.084	0.000
					B	0.000	132.831		100.00	85.956	0.000
					C	0.000	132.831		100.00	11.084	0.000

Tower Pressure - With Ice

$$G_H = 1.100$$

Section Elevation	z	K _Z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face	C _A A _A Out Face
ft	ft		psf	in	ft ²	e	ft ²	ft ²	ft ²		ft ²	ft ²
L1 151.50-141.00	146.22	1.102	7	1.7408	18.812	A	0.000	18.812	18.812	100.00	0.000	0.000
						B	0.000	18.812		100.00	0.000	0.000
						C	0.000	18.812		100.00	0.000	0.000
L2 141.00-120.33	129.70	1.064	6	1.7200	49.639	A	0.000	49.639	49.639	100.00	15.379	0.000
						B	0.000	49.639		100.00	15.379	0.000
						C	0.000	49.639		100.00	15.379	0.000
L3 120.33-111.19	115.73	1.03	6	1.7005	27.930	A	0.000	27.930	27.930	100.00	6.765	0.000
						B	0.000	27.930		100.00	27.100	0.000
						C	0.000	27.930		100.00	6.765	0.000
L4 111.19-82.08	96.27	0.978	6	1.6695	97.296	A	0.000	97.296	97.296	100.00	21.364	0.000
						B	0.000	97.296		100.00	143.983	0.000
						C	0.000	97.296		100.00	21.364	0.000
L5 82.08-70.06	76.03	0.914	6	1.6306	43.543	A	0.000	43.543	43.543	100.00	8.728	0.000
						B	0.000	43.543		100.00	59.125	0.000
						C	0.000	43.543		100.00	8.728	0.000
L6 70.06-42.24	55.92	0.837	5	1.5812	107.239	A	0.000	107.239	107.239	100.00	19.926	0.000
						B	0.000	107.239		100.00	135.883	0.000
						C	0.000	107.239		100.00	19.926	0.000
L7 42.24-32.71	37.46	0.746	5	1.5191	38.822	A	0.000	38.822	38.822	100.00	6.707	0.000
						B	0.000	38.822		100.00	46.134	0.000

tnxTower Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334	Job	Brln-Berlin (302483)	Page	16 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Section Elevation	z	K _Z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	in	ft ²		ft ²	ft ²	ft ²			
L8 32.71-0.00	16.10	0.7	4	1.3961	140.442	C	0.000	38.822		100.00	6.707	0.000
						A	0.000	140.442	140.442	100.00	18.821	0.000
						B	0.000	140.442		100.00	131.754	0.000
						C	0.000	140.442		100.00	18.821	0.000

Tower Pressure - Service

$G_H = 1.100$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			
L1 151.50-141.00	146.22	1.102	9	15.766	A	0.000	15.766	15.766	100.00	0.000	0.000
					B	0.000	15.766		100.00	0.000	0.000
					C	0.000	15.766		100.00	0.000	0.000
L2 141.00-120.33	129.70	1.064	8	43.714	A	0.000	43.714	43.714	100.00	8.268	0.000
					B	0.000	43.714		100.00	8.268	0.000
					C	0.000	43.714		100.00	8.268	0.000
L3 120.33-111.19	115.73	1.03	8	25.340	A	0.000	25.340	25.340	100.00	3.656	0.000
					B	0.000	25.340		100.00	16.653	0.000
					C	0.000	25.340		100.00	3.656	0.000
L4 111.19-82.08	96.27	0.978	8	89.196	A	0.000	89.196	89.196	100.00	11.644	0.000
					B	0.000	89.196		100.00	90.299	0.000
					C	0.000	89.196		100.00	11.644	0.000
L5 82.08-70.06	76.03	0.914	7	40.277	A	0.000	40.277	40.277	100.00	4.808	0.000
					B	0.000	40.277		100.00	37.286	0.000
					C	0.000	40.277		100.00	4.808	0.000
L6 70.06-42.24	55.92	0.837	7	99.907	A	0.000	99.907	99.907	100.00	11.128	0.000
					B	0.000	99.907		100.00	86.298	0.000
					C	0.000	99.907		100.00	11.128	0.000
L7 42.24-32.71	37.46	0.746	6	36.410	A	0.000	36.410	36.410	100.00	3.812	0.000
					B	0.000	36.410		100.00	29.562	0.000
					C	0.000	36.410		100.00	3.812	0.000
L8 32.71-0.00	16.10	0.7	5	132.831	A	0.000	132.831	132.831	100.00	11.084	0.000
					B	0.000	132.831		100.00	85.956	0.000
					C	0.000	132.831		100.00	11.084	0.000

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 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334</p>	Job	Brln-Berlin (302483)	Page	17 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

<i>Comb. No.</i>	<i>Description</i>
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

<i>Section No.</i>	<i>Elevation ft</i>	<i>Horz. Deflection ft</i>	<i>Gov. Load Comb.</i>	<i>Tilt °</i>	<i>Twist °</i>
L1	151.5 - 141	1.874	50	1.2566	0.0017
L2	141 - 120.33	1.646	50	1.2193	0.0011
L3	120.33 - 111.19	1.228	50	1.1055	0.0006
L4	111.19 - 82.08	1.055	50	1.0539	0.0005
L5	82.08 - 70.06	0.578	50	0.8044	0.0003
L6	70.06 - 42.24	0.421	50	0.6927	0.0002
L7	42.24 - 32.71	0.152	50	0.4083	0.0001
L8	32.71 - 0	0.092	50	0.3176	0.0001

tnxTower Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334	Job	Brln-Berlin (302483)	Page	18 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Critical Deflections and Radius of Curvature - Service Wind

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load</i>	<i>Deflection</i>	<i>Tilt</i>	<i>Twist</i>	<i>Radius of Curvature</i>
<i>ft</i>		<i>Comb.</i>	<i>ft</i>	<i>°</i>	<i>°</i>	<i>ft</i>
151.50	(2) TPX-070821	50	1.874	1.2566	0.0018	18662
142.00	RADIO 4449 B71/B85A	50	1.668	1.2235	0.0011	10352
132.70	800 MHz 2X50W RRH w/ Filter	50	1.473	1.1772	0.0008	9978
127.00	RRH2x50-08	50	1.358	1.1441	0.0007	10889
119.70	RRH2X60	50	1.216	1.1021	0.0006	11392
116.00	Outdoor CBRS 20W rRH - Clip on Antenna	50	1.145	1.0819	0.0006	10070
115.00	(2) SBNHH-1D65B	50	1.126	1.0764	0.0006	9694
105.00	Flat Platform w/ Handrails	50	0.944	1.0104	0.0005	7690

Maximum Tower Deflections - Design Wind

<i>Section No.</i>	<i>Elevation</i>	<i>Horz. Deflection</i>	<i>Gov. Load</i>	<i>Tilt</i>	<i>Twist</i>
	<i>ft</i>	<i>ft</i>	<i>Comb.</i>	<i>°</i>	<i>°</i>
L1	151.5 - 141	8.177	24	5.4853	0.0074
L2	141 - 120.33	7.185	24	5.3286	0.0045
L3	120.33 - 111.19	5.359	24	4.8339	0.0027
L4	111.19 - 82.08	4.606	24	4.6082	0.0023
L5	82.08 - 70.06	2.524	24	3.5157	0.0013
L6	70.06 - 42.24	1.837	24	3.0266	0.0010
L7	42.24 - 32.71	0.663	24	1.7825	0.0005
L8	32.71 - 0	0.400	24	1.3862	0.0004

Critical Deflections and Radius of Curvature - Design Wind

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load</i>	<i>Deflection</i>	<i>Tilt</i>	<i>Twist</i>	<i>Radius of Curvature</i>
<i>ft</i>		<i>Comb.</i>	<i>ft</i>	<i>°</i>	<i>°</i>	<i>ft</i>
151.50	(2) TPX-070821	24	8.177	5.4853	0.0080	4410
142.00	RADIO 4449 B71/B85A	24	7.278	5.3466	0.0050	2444
132.70	800 MHz 2X50W RRH w/ Filter	24	6.430	5.1469	0.0035	2333
127.00	RRH2x50-08	24	5.929	5.0026	0.0031	2527
119.70	RRH2X60	24	5.306	4.8187	0.0028	2629
116.00	Outdoor CBRS 20W rRH - Clip on Antenna	24	4.998	4.7305	0.0026	2324
115.00	(2) SBNHH-1D65B	24	4.916	4.7063	0.0026	2237
105.00	Flat Platform w/ Handrails	24	4.120	4.4175	0.0022	1780

Compression Checks

Pole Design Data

Job	Brln-Berlin (302483)	Page	19 of 35
Project	13683513_C3_02	Date	10:33:29 08/27/21
Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	151.5 - 150.45	TP17.7841x17.1872x0.24	10.50	0.00	0.0	13.1429	-4719.05	768861.00	0.006
	150.45 - 149.4					13.1891	-4798.19	771560.00	0.006
	149.4 - 148.35					13.2352	-4866.88	774258.00	0.006
	148.35 - 147.3					13.2813	-4936.01	776957.00	0.006
	147.3 - 146.25					13.3274	-5005.60	779655.00	0.006
	146.25 - 145.2					13.3736	-5075.64	782354.00	0.006
	145.2 - 144.15					13.4197	-5146.16	785052.00	0.007
	144.15 - 143.1					13.4658	-5217.15	787751.00	0.007
	143.1 - 142.05					13.5120	-5288.64	790449.00	0.007
	142.05 - 141					13.5581	-10011.10	793148.00	0.013
L2	141 - 139.967	TP31.557x17.7841x0.3059	20.67	0.00	0.0	17.8943	-10106.10	1046820.00	0.010
	139.967 - 138.933					18.5726	-10189.80	1086500.00	0.009
	138.933 - 137.899					19.2509	-10289.00	1126180.00	0.009
	137.899 - 136.866					19.9292	-10390.90	1165860.00	0.009
	136.866 - 135.833					20.6076	-10495.50	1205540.00	0.009
	135.833 - 134.799					21.2859	-10602.80	1245220.00	0.009
	134.799 - 133.766					21.9642	-10712.80	1284910.00	0.008
	133.766 - 132.732					22.6425	-10825.40	1324590.00	0.008
	132.732 - 131.699					23.3208	-11148.40	1364270.00	0.008
	131.699 - 130.665					23.9991	-11266.30	1403950.00	0.008
	130.665 - 129.631					24.6774	-11386.90	1443630.00	0.008
	129.631 - 128.598					25.3558	-11510.20	1483310.00	0.008
	128.598 - 127.565					26.0341	-11636.00	1522990.00	0.008
	127.565 - 126.531					26.7124	-16030.10	1562670.00	0.010
	126.531 - 125.498					27.3907	-16162.50	1602360.00	0.010
	125.498 - 124.464					28.0690	-16297.70	1642040.00	0.010
	124.464 - 123.43					28.7473	-16435.50	1681720.00	0.010
	123.43 - 122.397					29.4256	-16576.00	1721400.00	0.010
	122.397 - 121.364					30.1040	-16719.10	1761080.00	0.009
	121.364 - 120.33					30.7823	-16864.90	1800760.00	0.009
L3	120.33 - 119.314	TP33.028x31.557x0.3063	9.14	0.00	0.0	30.9833	-17218.30	1812520.00	0.009
	119.314 - 118.299					31.1445	-17376.10	1821960.00	0.010
	118.299 - 117.283					31.3057	-17534.80	1831390.00	0.010
	117.283 - 116.268					31.4669	-17694.40	1840820.00	0.010
	116.268 - 115.252					31.6281	-21066.50	1850250.00	0.011
	115.252 -					31.7893	-21472.10	1859680.00	0.012

<p>tnxTower</p> <p>Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334</p>	Job	Brln-Berlin (302483)	Page	20 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
	114.237								
	114.237 - 113.221					31.9505	-21636.20	1869110.00	0.012
	113.221 - 112.206					32.1118	-21756.10	1878540.00	0.012
	112.206 - 111.19					32.2730	-21921.00	1887970.00	0.012
L4	111.19 - 109.735	TP38.347x33.028x0.3141	29.11	0.00	0.0	33.3559	-22173.20	1951320.00	0.011
	109.735 - 108.279					33.6249	-22429.70	1967050.00	0.011
	108.279 - 106.824					33.8939	-22688.50	1982790.00	0.011
	106.824 - 105.368					34.1628	-22949.50	1998530.00	0.011
	105.368 - 103.912					34.4318	-26756.30	2014260.00	0.013
	103.912 - 102.457					34.7008	-27024.50	2030000.00	0.013
	102.457 - 101.001					34.9698	-27295.10	2045730.00	0.013
	101.001 - 99.546					35.2388	-27568.30	2061470.00	0.013
	99.546 - 98.0905					35.5077	-27843.90	2077200.00	0.013
	98.0905 - 96.635					35.7767	-28121.90	2092940.00	0.013
	96.635 - 95.1795					36.0457	-28402.40	2108670.00	0.013
	95.1795 - 93.724					36.3147	-28685.40	2124410.00	0.014
	93.724 - 92.2685					36.5837	-28970.70	2140150.00	0.014
	92.2685 - 90.813					36.8527	-29258.50	2155880.00	0.014
	90.813 - 89.3575					37.1216	-29548.70	2171620.00	0.014
	89.3575 - 87.902					37.3906	-29841.30	2187350.00	0.014
	87.902 - 86.4465					37.6596	-30136.20	2203090.00	0.014
	86.4465 - 84.991					37.9286	-30433.60	2218820.00	0.014
	84.991 - 83.5355					38.1976	-30733.40	2234560.00	0.014
	83.5355 - 82.08					38.4666	-31035.50	2250290.00	0.014
L5	82.08 - 81.0783	TP39.711x38.347x0.3804	12.02	0.00	0.0	46.6441	-31281.50	2728680.00	0.011
	81.0783 - 80.0767					46.7833	-31522.00	2736820.00	0.012
	80.0767 - 79.075					46.9225	-31763.40	2744970.00	0.012
	79.075 - 78.0733					47.0617	-32005.80	2753110.00	0.012
	78.0733 - 77.0717					47.2010	-32249.10	2761260.00	0.012
	77.0717 - 76.07					47.3402	-32493.40	2769400.00	0.012
	76.07 -					47.4794	-32738.70	2777550.00	0.012

Job	Brln-Berlin (302483)	Page	21 of 35
Project	13683513_C3_02	Date	10:33:29 08/27/21
Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
	75.0683								
	75.0683 -					47.6187	-32985.00	2785690.00	0.012
	74.0667								
	74.0667 -					47.7579	-33232.20	2793840.00	0.012
	73.065								
	73.065 -					47.8971	-33480.40	2801980.00	0.012
	72.0633								
	72.0633 -					48.0364	-33729.60	2810130.00	0.012
	71.0617								
	71.0617 -					48.1756	-33979.80	2818270.00	0.012
	70.06								
L6	70.06 - 68.669	TP43.95x39.711x0.4014	27.82	0.00	0.0	51.0819	-34340.10	2988290.00	0.011
	68.669 -					51.3559	-34705.80	3004320.00	0.012
	67.278								
	67.278 -					51.6298	-35073.80	3020340.00	0.012
	65.887								
	65.887 -					51.9038	-35443.80	3036370.00	0.012
	64.496								
	64.496 -					52.1777	-35815.90	3052400.00	0.012
	63.105								
	63.105 -					52.4517	-36190.20	3068420.00	0.012
	61.714								
	61.714 -					52.7256	-36566.60	3084450.00	0.012
	60.323								
	60.323 -					52.9995	-36945.00	3100470.00	0.012
	58.932								
	58.932 -					53.2735	-37325.60	3116500.00	0.012
	57.541								
	57.541 - 56.15					53.5474	-37708.30	3132530.00	0.012
	56.15 - 54.759					53.8214	-38093.10	3148550.00	0.012
	54.759 -					54.0953	-38480.00	3164580.00	0.012
	53.368								
	53.368 -					54.3693	-38869.00	3180600.00	0.012
	51.977								
	51.977 -					54.6432	-39260.00	3196630.00	0.012
	50.586								
	50.586 -					54.9172	-39653.20	3212660.00	0.012
	49.195								
	49.195 -					55.1911	-40048.40	3228680.00	0.012
	47.804								
	47.804 -					55.4651	-40445.80	3244710.00	0.012
	46.413								
	46.413 -					55.7390	-40845.20	3260730.00	0.013
	45.022								
	45.022 -					56.0130	-41246.70	3276760.00	0.013
	43.631								
	43.631 - 42.24					56.2869	-41650.20	3292780.00	0.013
L7	42.24 -	TP45.064x43.95x0.4706	9.53	0.00	0.0	66.0733	-42003.20	3865290.00	0.011
	41.1811								
	41.1811 -					66.2609	-42351.10	3876260.00	0.011
	40.1222								
	40.1222 -					66.4484	-42700.10	3887230.00	0.011
	39.0633								
	39.0633 -					66.6360	-43050.20	3898210.00	0.011
	38.0044								
	38.0044 -					66.8235	-43401.40	3909180.00	0.011
	36.9456								
	36.9456 -					67.0111	-43753.70	3920150.00	0.011
	35.8867								
	35.8867 -					67.1987	-44107.20	3931120.00	0.011

tnxTower Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334	Job	Brln-Berlin (302483)	Page	22 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Section No.	Elevation ft	Size	L ft	L _u ft	KL/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$				
L8	34.8278	TP49.552x45.064x0.4906	32.71	0.00	0.0	70.7685	-45371.30	4139960.00	0.011				
	34.8278 - 33.7689									67.3862	-44461.70	3942100.00	
	33.7689 - 32.71									67.5738	-44817.30	3953070.00	0.011
	32.71 - 31.0745									70.7685	-45371.30	4139960.00	0.011
	31.0745 - 29.439									71.1230	-45934.20	4160700.00	0.011
	29.439 - 27.8035									71.4775	-46500.00	4181430.00	0.011
	27.8035 - 26.168									71.8320	-47068.70	4202170.00	0.011
	26.168 - 24.5325									72.1865	-47640.20	4222910.00	0.011
	24.5325 - 22.897									72.5410	-48214.60	4243650.00	0.011
	22.897 - 21.2615									72.8955	-48791.90	4264390.00	0.011
	21.2615 - 19.626									73.2500	-49372.00	4285120.00	0.012
	19.626 - 17.9905									73.6045	-49955.00	4305860.00	0.012
	17.9905 - 16.355									73.9589	-50540.90	4326600.00	0.012
	16.355 - 14.7195									74.3134	-51129.50	4347340.00	0.012
	14.7195 - 13.084									74.6679	-51721.10	4368070.00	0.012
	13.084 - 11.4485									75.0224	-52315.40	4388810.00	0.012
	11.4485 - 9.813									75.3769	-52912.60	4409550.00	0.012
	9.813 - 8.1775									75.7314	-53512.60	4430290.00	0.012
	8.1775 - 6.542									76.0859	-54115.50	4451030.00	0.012
	6.542 - 4.9065									76.4404	-54721.10	4471760.00	0.012
4.9065 - 3.271	76.7949	-55329.60	4492500.00	0.012									
3.271 - 1.6355	77.1494	-55940.90	4513240.00	0.012									
1.6355 - 0	77.5039	-56555.00	4533980.00	0.012									

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	151.5 - 150.45	TP17.7841x17.1872x0.24	6.438	333.605	0.019	0.000	333.605	0.000
	150.45 - 149.4		11.365	335.967	0.034	0.000	335.967	0.000
	149.4 - 148.35		16.379	338.337	0.048	0.000	338.337	0.000
	148.35 - 147.3		21.462	340.717	0.063	0.000	340.717	0.000
	147.3 - 146.25		26.616	343.103	0.078	0.000	343.103	0.000
	146.25 - 145.2		31.839	345.499	0.092	0.000	345.499	0.000
	145.2 - 144.15		37.131	347.903	0.107	0.000	347.903	0.000
	144.15 - 143.1		42.493	350.315	0.121	0.000	350.315	0.000
	143.1 - 142.05		47.925	352.736	0.136	0.000	352.736	0.000
	142.05 - 141		57.224	355.165	0.161	0.000	355.165	0.000
L2	141 - 139.967	TP31.557x17.7841x0.3059	66.631	483.887	0.138	0.000	483.887	0.000

Job	Brln-Berlin (302483)	Page	23 of 35
Project	13683513_C3_02	Date	10:33:29 08/27/21
Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{rx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{rx}}$	M_{uy} kip-ft	ϕM_{ry} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ry}}$
	139.967 - 138.933		76.104	521.582	0.146	0.000	521.582	0.000
	138.933 - 137.899		85.692	560.693	0.153	0.000	560.693	0.000
	137.899 - 136.866		95.364	601.217	0.159	0.000	601.217	0.000
	136.866 - 135.833		105.123	643.154	0.163	0.000	643.154	0.000
	135.833 - 134.799		114.973	686.507	0.167	0.000	686.507	0.000
	134.799 - 133.766		124.914	731.273	0.171	0.000	731.273	0.000
	133.766 - 132.732		134.952	777.452	0.174	0.000	777.452	0.000
	132.732 - 131.699		145.193	825.047	0.176	0.000	825.047	0.000
	131.699 - 130.665		155.539	874.058	0.178	0.000	874.058	0.000
	130.665 - 129.631		165.990	924.475	0.180	0.000	924.475	0.000
	129.631 - 128.598		176.548	969.008	0.182	0.000	969.008	0.000
	128.598 - 127.565		187.218	1013.583	0.185	0.000	1013.583	0.000
	127.565 - 126.531		199.506	1058.692	0.188	0.000	1058.692	0.000
	126.531 - 125.498		213.722	1104.283	0.194	0.000	1104.283	0.000
	125.498 - 124.464		228.055	1150.333	0.198	0.000	1150.333	0.000
	124.464 - 123.43		242.509	1196.808	0.203	0.000	1196.808	0.000
	123.43 - 122.397		257.087	1243.675	0.207	0.000	1243.675	0.000
	122.397 - 121.364		271.791	1290.892	0.211	0.000	1290.892	0.000
	121.364 - 120.33		286.625	1338.433	0.214	0.000	1338.433	0.000
L3	120.33 - 119.314	TP33.028x31.557x0.3063	301.408	1352.175	0.223	0.000	1352.175	0.000
	119.314 - 118.299		316.460	1363.550	0.232	0.000	1363.550	0.000
	118.299 - 117.283		331.627	1374.933	0.241	0.000	1374.933	0.000
	117.283 - 116.268		346.908	1386.325	0.250	0.000	1386.325	0.000
	116.268 - 115.252		364.512	1397.742	0.261	0.000	1397.742	0.000
	115.252 - 114.237		383.660	1409.167	0.272	0.000	1409.167	0.000
	114.237 - 113.221		403.080	1420.608	0.284	0.000	1420.608	0.000
	113.221 - 112.206		422.670	1432.058	0.295	0.000	1432.058	0.000
	112.206 - 111.19		442.455	1443.525	0.307	0.000	1443.525	0.000
L4	111.19 - 109.735	TP38.347x33.028x0.3141	471.038	1514.267	0.311	0.000	1514.267	0.000
	109.735 - 108.279		499.887	1533.842	0.326	0.000	1533.842	0.000

<p>tnxTower</p> <p>Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334</p>	Job	Brln-Berlin (302483)	Page	24 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{rx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{rx}}$	M_{uy} kip-ft	ϕM_{ry} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ry}}$
	108.279 - 106.824		529.007	1553.450	0.341	0.000	1553.450	0.000
	106.824 - 105.368		558.396	1573.092	0.355	0.000	1573.092	0.000
	105.368 - 103.912		591.309	1592.758	0.371	0.000	1592.758	0.000
	103.912 - 102.457		625.503	1612.458	0.388	0.000	1612.458	0.000
	102.457 - 101.001		659.965	1632.192	0.404	0.000	1632.192	0.000
	101.001 - 99.546		694.695	1651.942	0.421	0.000	1651.942	0.000
	99.546 - 98.0905		729.693	1671.725	0.436	0.000	1671.725	0.000
	98.0905 - 96.635		764.961	1691.525	0.452	0.000	1691.525	0.000
	96.635 - 95.1795		800.497	1711.342	0.468	0.000	1711.342	0.000
	95.1795 - 93.724		836.308	1731.175	0.483	0.000	1731.175	0.000
	93.724 - 92.2685		872.383	1751.033	0.498	0.000	1751.033	0.000
	92.2685 - 90.813		908.733	1770.892	0.513	0.000	1770.892	0.000
	90.813 - 89.3575		945.358	1790.775	0.528	0.000	1790.775	0.000
	89.3575 - 87.902		982.250	1810.658	0.542	0.000	1810.658	0.000
	87.902 - 86.4465		1019.417	1830.558	0.557	0.000	1830.558	0.000
	86.4465 - 84.991		1056.858	1850.458	0.571	0.000	1850.458	0.000
	84.991 - 83.5355		1094.575	1870.367	0.585	0.000	1870.367	0.000
	83.5355 - 82.08		1132.558	1890.267	0.599	0.000	1890.267	0.000
L5	82.08 - 81.0783	TP39.711x38.347x0.3804	1158.867	2490.342	0.465	0.000	2490.342	0.000
	81.0783 - 80.0767		1185.292	2502.450	0.474	0.000	2502.450	0.000
	80.0767 - 79.075		1211.842	2514.567	0.482	0.000	2514.567	0.000
	79.075 - 78.0733		1238.508	2526.700	0.490	0.000	2526.700	0.000
	78.0733 - 77.0717		1265.308	2538.833	0.498	0.000	2538.833	0.000
	77.0717 - 76.07		1292.225	2550.983	0.507	0.000	2550.983	0.000
	76.07 - 75.0683		1319.267	2563.142	0.515	0.000	2563.142	0.000
	75.0683 - 74.0667		1346.433	2575.308	0.523	0.000	2575.308	0.000
	74.0667 - 73.065		1373.717	2587.492	0.531	0.000	2587.492	0.000
	73.065 - 72.0633		1401.125	2599.675	0.539	0.000	2599.675	0.000
	72.0633 - 71.0617		1428.658	2611.875	0.547	0.000	2611.875	0.000
	71.0617 - 70.06		1456.308	2624.083	0.555	0.000	2624.083	0.000

tnxTower

Telamon CLS
 319 Chapanoke Road, Suite 118
 Raleigh, NC 27603
 Phone: (405) 348-5460
 FAX: (405) 341-6334

Job	Brln-Berlin (302483)	Page	25 of 35
Project	13683513_C3_02	Date	10:33:29 08/27/21
Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Section No.	Elevation ft	Size	M_{ux}	ϕM_{rx}	Ratio	M_{uy}	ϕM_{ry}	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{rx}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{ry}}$
L6	70.06 - 68.669	TP43.95x39.711x0.4014	1494.900	2847.817	0.525	0.000	2847.817	0.000
	68.669 - 67.278		1533.700	2872.833	0.534	0.000	2872.833	0.000
	67.278 - 65.887		1572.708	2897.892	0.543	0.000	2897.892	0.000
	65.887 - 64.496		1611.925	2923.000	0.551	0.000	2923.000	0.000
	64.496 - 63.105		1651.350	2948.133	0.560	0.000	2948.133	0.000
	63.105 - 61.714		1690.992	2973.317	0.569	0.000	2973.317	0.000
	61.714 - 60.323		1730.833	2998.533	0.577	0.000	2998.533	0.000
	60.323 - 58.932		1770.883	3023.792	0.586	0.000	3023.792	0.000
	58.932 - 57.541		1811.142	3049.075	0.594	0.000	3049.075	0.000
	57.541 - 56.15		1851.617	3074.400	0.602	0.000	3074.400	0.000
	56.15 - 54.759		1892.292	3099.758	0.610	0.000	3099.758	0.000
	54.759 - 53.368		1933.175	3125.150	0.619	0.000	3125.150	0.000
	53.368 - 51.977		1974.275	3150.575	0.627	0.000	3150.575	0.000
	51.977 - 50.586		2015.575	3176.025	0.635	0.000	3176.025	0.000
	50.586 - 49.195		2057.083	3201.508	0.643	0.000	3201.508	0.000
	49.195 - 47.804		2098.792	3227.017	0.650	0.000	3227.017	0.000
	47.804 - 46.413		2140.717	3252.558	0.658	0.000	3252.558	0.000
	46.413 - 45.022		2182.842	3278.125	0.666	0.000	3278.125	0.000
	45.022 - 43.631		2225.183	3303.717	0.674	0.000	3303.717	0.000
	43.631 - 42.24		2267.725	3329.325	0.681	0.000	3329.325	0.000
L7	42.24 - 41.1811	TP45.064x43.95x0.4706	2300.242	4150.825	0.554	0.000	4150.825	0.000
	41.1811 - 40.1222		2332.858	4170.475	0.559	0.000	4170.475	0.000
	40.1222 - 39.0633		2365.592	4190.150	0.565	0.000	4190.150	0.000
	39.0633 - 38.0044		2398.425	4209.850	0.570	0.000	4209.850	0.000
	38.0044 - 36.9456		2431.367	4229.567	0.575	0.000	4229.567	0.000
	36.9456 - 35.8867		2464.417	4249.300	0.580	0.000	4249.300	0.000
	35.8867 - 34.8278		2497.567	4269.058	0.585	0.000	4269.058	0.000
	34.8278 - 33.7689		2530.825	4288.833	0.590	0.000	4288.833	0.000
	33.7689 - 32.71		2564.183	4308.633	0.595	0.000	4308.633	0.000
	32.71 - 31.0745		2615.892	4589.608	0.570	0.000	4589.608	0.000
L8	31.0745 - 29.439	TP49.552x45.064x0.4906	2667.808	4628.125	0.576	0.000	4628.125	0.000
	29.439 - 27.8035		2719.933	4666.725	0.583	0.000	4666.725	0.000

Job	Brln-Berlin (302483)	Page	26 of 35
Project	13683513_C3_02	Date	10:33:29 08/27/21
Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{rx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{rx}}$	M_{uy} kip-ft	ϕM_{ry} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ry}}$
	27.8035 - 26.168		2772.258	4705.392	0.589	0.000	4705.392	0.000
	26.168 - 24.5325		2824.783	4744.133	0.595	0.000	4744.133	0.000
	24.5325 - 22.897		2877.517	4782.950	0.602	0.000	4782.950	0.000
	22.897 - 21.2615		2930.458	4821.833	0.608	0.000	4821.833	0.000
	21.2615 - 19.626		2983.592	4860.792	0.614	0.000	4860.792	0.000
	19.626 - 17.9905		3036.925	4899.817	0.620	0.000	4899.817	0.000
	17.9905 - 16.355		3090.458	4938.908	0.626	0.000	4938.908	0.000
	16.355 - 14.7195		3144.183	4978.058	0.632	0.000	4978.058	0.000
	14.7195 - 13.084		3198.108	5017.283	0.637	0.000	5017.283	0.000
	13.084 - 11.4485		3252.225	5056.567	0.643	0.000	5056.567	0.000
	11.4485 - 9.813		3306.542	5095.917	0.649	0.000	5095.917	0.000
	9.813 - 8.1775		3361.042	5135.325	0.654	0.000	5135.325	0.000
	8.1775 - 6.542		3415.742	5174.800	0.660	0.000	5174.800	0.000
	6.542 - 4.9065		3470.625	5214.325	0.666	0.000	5214.325	0.000
	4.9065 - 3.271		3525.700	5253.917	0.671	0.000	5253.917	0.000
	3.271 - 1.6355		3580.958	5293.558	0.676	0.000	5293.558	0.000
	1.6355 - 0		3636.408	5333.258	0.682	0.000	5333.258	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	151.5 - 150.45	TP17.7841x17.1872x0.24	4646.54	230658.00	0.020	0.045	345.059	0.000
	150.45 - 149.4		4743.35	231468.00	0.020	0.262	347.486	0.001
	149.4 - 148.35		4809.84	232277.00	0.021	0.262	349.921	0.001
	148.35 - 147.3		4876.27	233087.00	0.021	0.262	352.364	0.001
	147.3 - 146.25		4942.66	233897.00	0.021	0.262	354.816	0.001
	146.25 - 145.2		5008.98	234706.00	0.021	0.262	357.277	0.001
	145.2 - 144.15		5075.22	235516.00	0.022	0.262	359.745	0.001
	144.15 - 143.1		5141.38	236325.00	0.022	0.262	362.223	0.001
	143.1 - 142.05		5207.45	237135.00	0.022	0.262	364.708	0.001
	142.05 - 141		9073.34	237944.00	0.038	0.262	367.203	0.001
L2	141 - 139.967	TP31.557x17.7841x0.3059	9137.18	314045.00	0.029	0.262	501.847	0.001
	139.967 - 138.933		9240.31	325949.00	0.028	0.411	540.615	0.001
	138.933 - 137.899		9320.26	337854.00	0.028	0.411	580.825	0.001
	137.899 - 136.866		9402.99	349758.00	0.027	0.411	622.477	0.001
	136.866 - 135.833		9488.53	361663.00	0.026	0.411	665.572	0.001
	135.833 - 134.799		9576.91	373567.00	0.026	0.411	710.108	0.001
	134.799 - 134.799		9668.14	385472.00	0.025	0.411	756.087	0.001

Job	Brln-Berlin (302483)	Page	27 of 35
Project	13683513_C3_02	Date	10:33:29 08/27/21
Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	133.766							
	133.766 - 132.732		9762.25	397376.00	0.025	0.411	803.508	0.001
	132.732 - 131.699		9963.82	409280.00	0.024	0.411	852.375	0.000
	131.699 - 130.665		10063.60	421185.00	0.024	0.411	902.675	0.000
	130.665 - 129.631		10166.30	433089.00	0.023	0.410	954.425	0.000
	129.631 - 128.598		10271.90	444994.00	0.023	0.410	1007.617	0.000
	128.598 - 127.565		10380.40	456898.00	0.023	0.410	1062.250	0.000
	127.565 - 126.531		13702.40	468802.00	0.029	0.410	1118.325	0.000
	126.531 - 125.498		13814.90	480707.00	0.029	0.379	1175.842	0.000
	125.498 - 124.464		13930.30	492611.00	0.028	0.379	1234.800	0.000
	124.464 - 123.43		14048.50	504516.00	0.028	0.379	1295.200	0.000
	123.43 - 122.397		14169.60	516420.00	0.027	0.379	1357.042	0.000
	122.397 - 121.364		14293.60	528324.00	0.027	0.379	1420.325	0.000
	121.364 - 120.33		14420.40	540229.00	0.027	0.379	1485.058	0.000
L3	120.33 - 119.314	TP33.028x31.557x0.3063	14779.80	543757.00	0.027	0.379	1502.558	0.000
	119.314 - 118.299		14892.30	546587.00	0.027	0.379	1518.233	0.000
	118.299 - 117.283		15005.20	549416.00	0.027	0.379	1533.992	0.000
	117.283 - 116.268		15118.30	552245.00	0.027	0.379	1549.825	0.000
	116.268 - 115.252		18321.10	555074.00	0.033	0.521	1565.750	0.000
	115.252 - 114.237		19061.80	557903.00	0.034	0.521	1581.750	0.000
	114.237 - 113.221		19173.90	560732.00	0.034	0.520	1597.833	0.000
	113.221 - 112.206		19427.40	563561.00	0.034	0.268	1613.992	0.000
	112.206 - 111.19		19555.40	566390.00	0.035	0.268	1630.242	0.000
L4	111.19 - 109.735	TP38.347x33.028x0.3141	19739.70	585396.00	0.034	0.268	1698.233	0.000
	109.735 - 108.279		19924.40	590116.00	0.034	0.268	1725.733	0.000
	108.279 - 106.824		20109.80	594837.00	0.034	0.268	1753.458	0.000
	106.824 - 105.368		20295.70	599558.00	0.034	0.268	1781.400	0.000
	105.368 - 103.912		23414.60	604278.00	0.039	0.315	1809.558	0.000
	103.912 - 102.457		23598.60	608999.00	0.039	0.315	1837.942	0.000
	102.457 - 101.001		23783.00	613720.00	0.039	0.315	1866.550	0.000
	101.001 -		23967.80	618440.00	0.039	0.315	1895.375	0.000

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334</p>	Job	Brln-Berlin (302483)	Page	28 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	99.546							
	99.546 - 98.0905		24152.90	623161.00	0.039	0.315	1924.417	0.000
	98.0905 - 96.635		24338.40	627882.00	0.039	0.315	1953.683	0.000
	96.635 - 95.1795		24524.30	632602.00	0.039	0.315	1983.175	0.000
	95.1795 - 93.724		24710.60	637323.00	0.039	0.314	2012.883	0.000
	93.724 - 92.2685		24897.20	642044.00	0.039	0.314	2042.808	0.000
	92.2685 - 90.813		25084.30	646764.00	0.039	0.314	2072.958	0.000
	90.813 - 89.3575		25271.70	651485.00	0.039	0.314	2103.333	0.000
	89.3575 - 87.902		25459.50	656205.00	0.039	0.314	2133.925	0.000
	87.902 - 86.4465		25647.80	660926.00	0.039	0.314	2164.733	0.000
	86.4465 - 84.991		25836.40	665647.00	0.039	0.314	2195.767	0.000
	84.991 - 83.5355		26025.50	670367.00	0.039	0.314	2227.025	0.000
	83.5355 - 82.08		26215.00	675088.00	0.039	0.314	2258.500	0.000
L5	82.08 - 81.0783	TP39.711x38.347x0.3804	26333.20	818603.00	0.032	0.314	2742.033	0.000
	81.0783 - 80.0767		26456.80	821047.00	0.032	0.314	2758.433	0.000
	80.0767 - 79.075		26580.30	823490.00	0.032	0.314	2774.875	0.000
	79.075 - 78.0733		26703.60	825934.00	0.032	0.314	2791.367	0.000
	78.0733 - 77.0717		26826.70	828377.00	0.032	0.314	2807.908	0.000
	77.0717 - 76.07		26949.60	830821.00	0.032	0.314	2824.492	0.000
	76.07 - 75.0683		27072.30	833264.00	0.032	0.314	2841.133	0.000
	75.0683 - 74.0667		27194.90	835708.00	0.033	0.314	2857.825	0.000
	74.0667 - 73.065		27317.20	838151.00	0.033	0.314	2874.558	0.000
	73.065 - 72.0633		27439.30	840595.00	0.033	0.314	2891.342	0.000
	72.0633 - 71.0617		27561.20	843038.00	0.033	0.314	2908.175	0.000
	71.0617 - 70.06		27682.90	845481.00	0.033	0.314	2925.058	0.000
L6	70.06 - 68.669	TP43.95x39.711x0.4014	27836.70	896488.00	0.031	0.314	3116.575	0.000
	68.669 - 67.278		27987.50	901295.00	0.031	0.314	3150.100	0.000
	67.278 - 65.887		28138.10	906103.00	0.031	0.314	3183.792	0.000
	65.887 - 64.496		28288.70	910911.00	0.031	0.314	3217.667	0.000
	64.496 - 63.105		28439.10	915719.00	0.031	0.314	3251.725	0.000
	63.105 - 61.714		28589.50	920527.00	0.031	0.314	3285.958	0.000

Job	Brln-Berlin (302483)	Page	29 of 35
Project	13683513_C3_02	Date	10:33:29 08/27/21
Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	61.714 - 60.323		28739.70	925334.00	0.031	0.314	3320.375	0.000
	60.323 - 58.932		28889.90	930142.00	0.031	0.314	3354.967	0.000
	58.932 - 57.541		29039.90	934950.00	0.031	0.314	3389.742	0.000
	57.541 - 56.15		29189.80	939758.00	0.031	0.314	3424.692	0.000
	56.15 - 54.759		29339.70	944565.00	0.031	0.313	3459.817	0.000
	54.759 - 53.368		29489.30	949373.00	0.031	0.313	3495.133	0.000
	53.368 - 51.977		29638.90	954181.00	0.031	0.313	3530.617	0.000
	51.977 - 50.586		29788.30	958989.00	0.031	0.313	3566.292	0.000
	50.586 - 49.195		29937.60	963797.00	0.031	0.313	3602.133	0.000
	49.195 - 47.804		30086.80	968604.00	0.031	0.313	3638.167	0.000
	47.804 - 46.413		30235.80	973412.00	0.031	0.313	3674.367	0.000
	46.413 - 45.022		30384.70	978220.00	0.031	0.313	3710.758	0.000
	45.022 - 43.631		30533.40	983028.00	0.031	0.313	3747.325	0.000
L7	43.631 - 42.24	TP45.064x43.95x0.4706	30682.00	987835.00	0.031	0.313	3784.067	0.000
	42.24 - 41.1811		30775.00	1159590.00	0.027	0.313	4447.550	0.000
	41.1811 - 40.1222		30875.80	1162880.00	0.027	0.313	4472.842	0.000
	40.1222 - 39.0633		30976.20	1166170.00	0.027	0.313	4498.200	0.000
	39.0633 - 38.0044		31076.20	1169460.00	0.027	0.313	4523.625	0.000
	38.0044 - 36.9456		31176.00	1172750.00	0.027	0.313	4549.125	0.000
	36.9456 - 35.8867		31275.40	1176050.00	0.027	0.313	4574.700	0.000
	35.8867 - 34.8278		31374.50	1179340.00	0.027	0.313	4600.350	0.000
	34.8278 - 33.7689		31473.30	1182630.00	0.027	0.313	4626.067	0.000
	33.7689 - 32.71		31571.70	1185920.00	0.027	0.313	4651.850	0.000
L8	32.71 - 31.0745	TP49.552x45.064x0.4906	31707.20	1241990.00	0.026	0.313	4894.108	0.000
	31.0745 - 29.439		31833.70	1248210.00	0.026	0.313	4943.267	0.000
	29.439 - 27.8035		31959.60	1254430.00	0.025	0.313	4992.667	0.000
	27.8035 - 26.168		32084.80	1260650.00	0.025	0.313	5042.308	0.000
	26.168 - 24.5325		32209.40	1266870.00	0.025	0.313	5092.200	0.000
	24.5325 - 22.897		32333.30	1273090.00	0.025	0.313	5142.333	0.000
	22.897 - 21.2615		32456.50	1279320.00	0.025	0.313	5192.717	0.000
	21.2615 - 19.626		32579.10	1285540.00	0.025	0.313	5243.342	0.000
	19.626 -		32700.90	1291760.00	0.025	0.313	5294.217	0.000

Job	Brln-Berlin (302483)	Page	30 of 35
Project	13683513_C3_02	Date	10:33:29 08/27/21
Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	17.9905							
	17.9905 - 16.355		32822.10	1297980.00	0.025	0.313	5345.333	0.000
	16.355 - 14.7195		32942.60	1304200.00	0.025	0.313	5396.700	0.000
	14.7195 - 13.084		33062.40	1310420.00	0.025	0.313	5448.308	0.000
	13.084 - 11.4485		33181.40	1316640.00	0.025	0.313	5500.167	0.000
	11.4485 - 9.813		33299.80	1322860.00	0.025	0.313	5552.267	0.000
	9.813 - 8.1775		33417.40	1329090.00	0.025	0.313	5604.608	0.000
	8.1775 - 6.542		33534.40	1335310.00	0.025	0.313	5657.208	0.000
	6.542 - 4.9065		33650.60	1341530.00	0.025	0.313	5710.041	0.000
	4.9065 - 3.271		33766.00	1347750.00	0.025	0.313	5763.125	0.000
	3.271 - 1.6355		33880.70	1353970.00	0.025	0.313	5816.458	0.000
	1.6355 - 0		33994.70	1360190.00	0.025	0.313	5870.033	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u ϕP_n	Ratio M_{ux} ϕM_{nx}	Ratio M_{uy} ϕM_{ny}	Ratio V_u ϕV_n	Ratio T_u ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	151.5 - 150.45	0.006	0.019	0.000	0.020	0.000	0.026	1.000	4.8.2 ✓
	150.45 - 149.4	0.006	0.034	0.000	0.020	0.001	0.040	1.000	4.8.2 ✓
	149.4 - 148.35	0.006	0.048	0.000	0.021	0.001	0.055	1.000	4.8.2 ✓
	148.35 - 147.3	0.006	0.063	0.000	0.021	0.001	0.070	1.000	4.8.2 ✓
	147.3 - 146.25	0.006	0.078	0.000	0.021	0.001	0.084	1.000	4.8.2 ✓
	146.25 - 145.2	0.006	0.092	0.000	0.021	0.001	0.099	1.000	4.8.2 ✓
	145.2 - 144.15	0.007	0.107	0.000	0.022	0.001	0.114	1.000	4.8.2 ✓
	144.15 - 143.1	0.007	0.121	0.000	0.022	0.001	0.128	1.000	4.8.2 ✓
	143.1 - 142.05	0.007	0.136	0.000	0.022	0.001	0.143	1.000	4.8.2 ✓
	142.05 - 141	0.013	0.161	0.000	0.038	0.001	0.175	1.000	4.8.2 ✓
L2	141 - 139.967	0.010	0.138	0.000	0.029	0.001	0.148	1.000	4.8.2 ✓
	139.967 - 138.933	0.009	0.146	0.000	0.028	0.001	0.156	1.000	4.8.2 ✓
	138.933 - 137.899	0.009	0.153	0.000	0.028	0.001	0.163	1.000	4.8.2 ✓
	137.899 - 136.866	0.009	0.159	0.000	0.027	0.001	0.168	1.000	4.8.2 ✓

Job	Brln-Berlin (302483)	Page	31 of 35
Project	13683513_C3_02	Date	10:33:29 08/27/21
Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_u	M_{ux}	M_{uy}	V_u	T_u			
L3	136.866 - 135.833	0.009	0.163	0.000	0.026	0.001	0.173	1.000	4.8.2 ✓
	135.833 - 134.799	0.009	0.167	0.000	0.026	0.001	0.177	1.000	4.8.2 ✓
	134.799 - 133.766	0.008	0.171	0.000	0.025	0.001	0.180	1.000	4.8.2 ✓
	133.766 - 132.732	0.008	0.174	0.000	0.025	0.001	0.182	1.000	4.8.2 ✓
	132.732 - 131.699	0.008	0.176	0.000	0.024	0.000	0.185	1.000	4.8.2 ✓
	131.699 - 130.665	0.008	0.178	0.000	0.024	0.000	0.187	1.000	4.8.2 ✓
	130.665 - 129.631	0.008	0.180	0.000	0.023	0.000	0.188	1.000	4.8.2 ✓
	129.631 - 128.598	0.008	0.182	0.000	0.023	0.000	0.191	1.000	4.8.2 ✓
	128.598 - 127.565	0.008	0.185	0.000	0.023	0.000	0.193	1.000	4.8.2 ✓
	127.565 - 126.531	0.010	0.188	0.000	0.029	0.000	0.200	1.000	4.8.2 ✓
	126.531 - 125.498	0.010	0.194	0.000	0.029	0.000	0.204	1.000	4.8.2 ✓
	125.498 - 124.464	0.010	0.198	0.000	0.028	0.000	0.209	1.000	4.8.2 ✓
	124.464 - 123.43	0.010	0.203	0.000	0.028	0.000	0.213	1.000	4.8.2 ✓
	123.43 - 122.397	0.010	0.207	0.000	0.027	0.000	0.217	1.000	4.8.2 ✓
	122.397 - 121.364	0.009	0.211	0.000	0.027	0.000	0.221	1.000	4.8.2 ✓
	121.364 - 120.33	0.009	0.214	0.000	0.027	0.000	0.224	1.000	4.8.2 ✓
	120.33 - 119.314	0.009	0.223	0.000	0.027	0.000	0.233	1.000	4.8.2 ✓
	119.314 - 118.299	0.010	0.232	0.000	0.027	0.000	0.242	1.000	4.8.2 ✓
	118.299 - 117.283	0.010	0.241	0.000	0.027	0.000	0.252	1.000	4.8.2 ✓
	117.283 - 116.268	0.010	0.250	0.000	0.027	0.000	0.261	1.000	4.8.2 ✓
116.268 - 115.252	0.011	0.261	0.000	0.033	0.000	0.273	1.000	4.8.2 ✓	
115.252 - 114.237	0.012	0.272	0.000	0.034	0.000	0.285	1.000	4.8.2 ✓	
114.237 - 113.221	0.012	0.284	0.000	0.034	0.000	0.297	1.000	4.8.2 ✓	
113.221 - 112.206	0.012	0.295	0.000	0.034	0.000	0.308	1.000	4.8.2 ✓	
112.206 - 111.19	0.012	0.307	0.000	0.035	0.000	0.319	1.000	4.8.2 ✓	
L4	111.19 - 109.735	0.011	0.311	0.000	0.034	0.000	0.324	1.000	4.8.2 ✓

Job	Brln-Berlin (302483)	Page	32 of 35
Project	13683513_C3_02	Date	10:33:29 08/27/21
Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_u	M_{ux}	M_{uy}	V_u	T_u			
	109.735 - 108.279	0.011	0.326	0.000	0.034	0.000	0.338	1.000	4.8.2 ✓
	108.279 - 106.824	0.011	0.341	0.000	0.034	0.000	0.353	1.000	4.8.2 ✓
	106.824 - 105.368	0.011	0.355	0.000	0.034	0.000	0.368	1.000	4.8.2 ✓
	105.368 - 103.912	0.013	0.371	0.000	0.039	0.000	0.386	1.000	4.8.2 ✓
	103.912 - 102.457	0.013	0.388	0.000	0.039	0.000	0.403	1.000	4.8.2 ✓
	102.457 - 101.001	0.013	0.404	0.000	0.039	0.000	0.419	1.000	4.8.2 ✓
	101.001 - 99.546	0.013	0.421	0.000	0.039	0.000	0.435	1.000	4.8.2 ✓
	99.546 - 98.0905	0.013	0.436	0.000	0.039	0.000	0.451	1.000	4.8.2 ✓
	98.0905 - 96.635	0.013	0.452	0.000	0.039	0.000	0.467	1.000	4.8.2 ✓
	96.635 - 95.1795	0.013	0.468	0.000	0.039	0.000	0.483	1.000	4.8.2 ✓
	95.1795 - 93.724	0.014	0.483	0.000	0.039	0.000	0.498	1.000	4.8.2 ✓
	93.724 - 92.2685	0.014	0.498	0.000	0.039	0.000	0.513	1.000	4.8.2 ✓
	92.2685 - 90.813	0.014	0.513	0.000	0.039	0.000	0.528	1.000	4.8.2 ✓
	90.813 - 89.3575	0.014	0.528	0.000	0.039	0.000	0.543	1.000	4.8.2 ✓
	89.3575 - 87.902	0.014	0.542	0.000	0.039	0.000	0.558	1.000	4.8.2 ✓
	87.902 - 86.4465	0.014	0.557	0.000	0.039	0.000	0.572	1.000	4.8.2 ✓
	86.4465 - 84.991	0.014	0.571	0.000	0.039	0.000	0.586	1.000	4.8.2 ✓
	84.991 - 83.5355	0.014	0.585	0.000	0.039	0.000	0.600	1.000	4.8.2 ✓
	83.5355 - 82.08	0.014	0.599	0.000	0.039	0.000	0.614	1.000	4.8.2 ✓
L5	82.08 - 81.0783	0.011	0.465	0.000	0.032	0.000	0.478	1.000	4.8.2 ✓
	81.0783 - 80.0767	0.012	0.474	0.000	0.032	0.000	0.486	1.000	4.8.2 ✓
	80.0767 - 79.075	0.012	0.482	0.000	0.032	0.000	0.495	1.000	4.8.2 ✓
	79.075 - 78.0733	0.012	0.490	0.000	0.032	0.000	0.503	1.000	4.8.2 ✓
	78.0733 - 77.0717	0.012	0.498	0.000	0.032	0.000	0.511	1.000	4.8.2 ✓
	77.0717 - 76.07	0.012	0.507	0.000	0.032	0.000	0.519	1.000	4.8.2 ✓
	76.07 - 75.0683	0.012	0.515	0.000	0.032	0.000	0.528	1.000	4.8.2 ✓

tnxTower

Telamon CLS
 319 Chapanoke Road, Suite 118
 Raleigh, NC 27603
 Phone: (405) 348-5460
 FAX: (405) 341-6334

Job	Brln-Berlin (302483)	Page	33 of 35
Project	13683513_C3_02	Date	10:33:29 08/27/21
Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_u	M_{ux}	M_{uy}	V_u	T_u			
	75.0683 - 74.0667	0.012	0.523	0.000	0.033	0.000	0.536	1.000	4.8.2 ✓
	74.0667 - 73.065	0.012	0.531	0.000	0.033	0.000	0.544	1.000	4.8.2 ✓
	73.065 - 72.0633	0.012	0.539	0.000	0.033	0.000	0.552	1.000	4.8.2 ✓
	72.0633 - 71.0617	0.012	0.547	0.000	0.033	0.000	0.560	1.000	4.8.2 ✓
	71.0617 - 70.06	0.012	0.555	0.000	0.033	0.000	0.568	1.000	4.8.2 ✓
L6	70.06 - 68.669	0.011	0.525	0.000	0.031	0.000	0.537	1.000	4.8.2 ✓
	68.669 - 67.278	0.012	0.534	0.000	0.031	0.000	0.546	1.000	4.8.2 ✓
	67.278 - 65.887	0.012	0.543	0.000	0.031	0.000	0.555	1.000	4.8.2 ✓
	65.887 - 64.496	0.012	0.551	0.000	0.031	0.000	0.564	1.000	4.8.2 ✓
	64.496 - 63.105	0.012	0.560	0.000	0.031	0.000	0.573	1.000	4.8.2 ✓
	63.105 - 61.714	0.012	0.569	0.000	0.031	0.000	0.581	1.000	4.8.2 ✓
	61.714 - 60.323	0.012	0.577	0.000	0.031	0.000	0.590	1.000	4.8.2 ✓
	60.323 - 58.932	0.012	0.586	0.000	0.031	0.000	0.599	1.000	4.8.2 ✓
	58.932 - 57.541	0.012	0.594	0.000	0.031	0.000	0.607	1.000	4.8.2 ✓
	57.541 - 56.15	0.012	0.602	0.000	0.031	0.000	0.615	1.000	4.8.2 ✓
	56.15 - 54.759	0.012	0.610	0.000	0.031	0.000	0.624	1.000	4.8.2 ✓
	54.759 - 53.368	0.012	0.619	0.000	0.031	0.000	0.632	1.000	4.8.2 ✓
	53.368 - 51.977	0.012	0.627	0.000	0.031	0.000	0.640	1.000	4.8.2 ✓
	51.977 - 50.586	0.012	0.635	0.000	0.031	0.000	0.648	1.000	4.8.2 ✓
	50.586 - 49.195	0.012	0.643	0.000	0.031	0.000	0.656	1.000	4.8.2 ✓
	49.195 - 47.804	0.012	0.650	0.000	0.031	0.000	0.664	1.000	4.8.2 ✓
	47.804 - 46.413	0.012	0.658	0.000	0.031	0.000	0.672	1.000	4.8.2 ✓
	46.413 - 45.022	0.013	0.666	0.000	0.031	0.000	0.679	1.000	4.8.2 ✓
	45.022 - 43.631	0.013	0.674	0.000	0.031	0.000	0.687	1.000	4.8.2 ✓
	43.631 - 42.24	0.013	0.681	0.000	0.031	0.000	0.695	1.000	4.8.2 ✓
L7	42.24 - 41.1811	0.011	0.554	0.000	0.027	0.000	0.566	1.000	4.8.2 ✓

<p>tnxTower</p> <p>Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334</p>	<p>Job</p> <p>Brln-Berlin (302483)</p>	<p>Page</p> <p>34 of 35</p>
	<p>Project</p> <p>13683513_C3_02</p>	<p>Date</p> <p>10:33:29 08/27/21</p>
	<p>Client</p> <p>Dish Wireless LLC</p>	<p>Designed by</p> <p>Sreenivasa.Kailasa</p>

Section No.	Elevation ft	Ratio P_u ϕP_n	Ratio M_{ux} ϕM_{nx}	Ratio M_{uy} ϕM_{ny}	Ratio V_u ϕV_n	Ratio T_u ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	41.1811 - 40.1222	0.011	0.559	0.000	0.027	0.000	0.571	1.000	4.8.2 ✓
	40.1222 - 39.0633	0.011	0.565	0.000	0.027	0.000	0.576	1.000	4.8.2 ✓
	39.0633 - 38.0044	0.011	0.570	0.000	0.027	0.000	0.581	1.000	4.8.2 ✓
	38.0044 - 36.9456	0.011	0.575	0.000	0.027	0.000	0.587	1.000	4.8.2 ✓
	36.9456 - 35.8867	0.011	0.580	0.000	0.027	0.000	0.592	1.000	4.8.2 ✓
	35.8867 - 34.8278	0.011	0.585	0.000	0.027	0.000	0.597	1.000	4.8.2 ✓
	34.8278 - 33.7689	0.011	0.590	0.000	0.027	0.000	0.602	1.000	4.8.2 ✓
	33.7689 - 32.71	0.011	0.595	0.000	0.027	0.000	0.607	1.000	4.8.2 ✓
L8	32.71 - 31.0745	0.011	0.570	0.000	0.026	0.000	0.582	1.000	4.8.2 ✓
	31.0745 - 29.439	0.011	0.576	0.000	0.026	0.000	0.588	1.000	4.8.2 ✓
	29.439 - 27.8035	0.011	0.583	0.000	0.025	0.000	0.595	1.000	4.8.2 ✓
	27.8035 - 26.168	0.011	0.589	0.000	0.025	0.000	0.601	1.000	4.8.2 ✓
	26.168 - 24.5325	0.011	0.595	0.000	0.025	0.000	0.607	1.000	4.8.2 ✓
	24.5325 - 22.897	0.011	0.602	0.000	0.025	0.000	0.614	1.000	4.8.2 ✓
	22.897 - 21.2615	0.011	0.608	0.000	0.025	0.000	0.620	1.000	4.8.2 ✓
	21.2615 - 19.626	0.012	0.614	0.000	0.025	0.000	0.626	1.000	4.8.2 ✓
	19.626 - 17.9905	0.012	0.620	0.000	0.025	0.000	0.632	1.000	4.8.2 ✓
	17.9905 - 16.355	0.012	0.626	0.000	0.025	0.000	0.638	1.000	4.8.2 ✓
	16.355 - 14.7195	0.012	0.632	0.000	0.025	0.000	0.644	1.000	4.8.2 ✓
	14.7195 - 13.084	0.012	0.637	0.000	0.025	0.000	0.650	1.000	4.8.2 ✓
	13.084 - 11.4485	0.012	0.643	0.000	0.025	0.000	0.656	1.000	4.8.2 ✓
	11.4485 - 9.813	0.012	0.649	0.000	0.025	0.000	0.661	1.000	4.8.2 ✓
	9.813 - 8.1775	0.012	0.654	0.000	0.025	0.000	0.667	1.000	4.8.2 ✓
	8.1775 - 6.542	0.012	0.660	0.000	0.025	0.000	0.673	1.000	4.8.2 ✓
	6.542 - 4.9065	0.012	0.666	0.000	0.025	0.000	0.678	1.000	4.8.2 ✓
	4.9065 - 3.271	0.012	0.671	0.000	0.025	0.000	0.684	1.000	4.8.2 ✓

tnxTower Telamon CLS 319 Chapanoke Road, Suite 118 Raleigh, NC 27603 Phone: (405) 348-5460 FAX: (405) 341-6334	Job	Brln-Berlin (302483)	Page	35 of 35
	Project	13683513_C3_02	Date	10:33:29 08/27/21
	Client	Dish Wireless LLC	Designed by	Sreenivasa.Kailasa

Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	3.271 - 1.6355	0.012	0.676	0.000	0.025	0.000	0.689	1.000	4.8.2 ✓
	1.6355 - 0	0.012	0.682	0.000	0.025	0.000	0.695	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail	
L1	151.5 - 141	Pole	TP17.7841x17.1872x0.24	1	-10011.10	793148.00	17.5	Pass	
L2	141 - 120.33	Pole	TP31.557x17.7841x0.3059	2	-16864.90	1800760.00	22.4	Pass	
L3	120.33 - 111.19	Pole	TP33.028x31.557x0.3063	3	-21921.00	1887970.00	31.9	Pass	
L4	111.19 - 82.08	Pole	TP38.347x33.028x0.3141	4	-31035.50	2250290.00	61.4	Pass	
L5	82.08 - 70.06	Pole	TP39.711x38.347x0.3804	5	-33979.80	2818270.00	56.8	Pass	
L6	70.06 - 42.24	Pole	TP43.95x39.711x0.4014	6	-41650.20	3292780.00	69.5	Pass	
L7	42.24 - 32.71	Pole	TP45.064x43.95x0.4706	7	-44817.30	3953070.00	60.7	Pass	
L8	32.71 - 0	Pole	TP49.552x45.064x0.4906	8	-56555.00	4533980.00	69.5	Pass	
							Summary		
							Pole (L8)	69.5	Pass
							RATING =	69.5	Pass



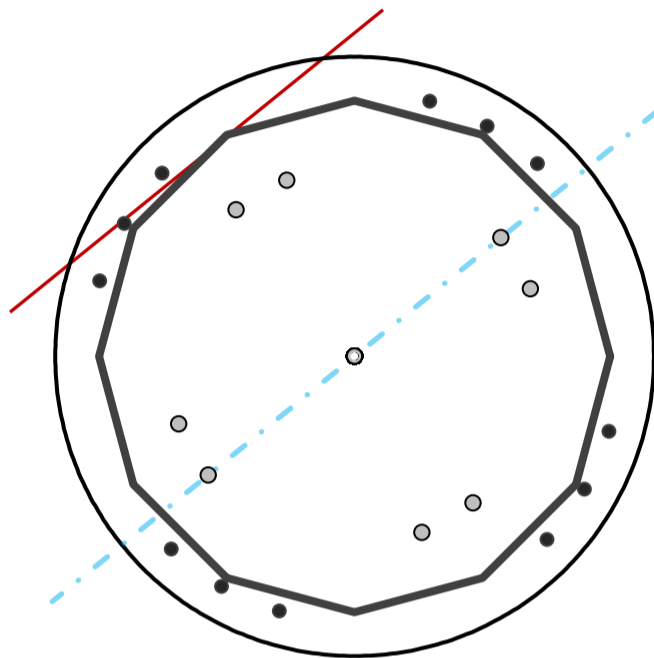
Base Plate & Anchor Rod Analysis

Pole Dimensions		
Number of Sides	12	-
Diameter	51	in
Thickness	3/4	in
Orientation Offset	0	°

Base Reactions		
Moment, Mu	3,636.4	k-ft
Axial, Pu	56.6	k
Shear, Vu	34.0	k
Neutral Axis	39	°

Report Capacities		
Component	Capacity	Result
Base Plate	19%	Pass
Anchor Rods	86%	Pass
Dwyidag	-	-

Base Plate		
Shape	Round	-
Diameter, ϕ	62	in
Thickness	2	in
Grade	A572-60	
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	75	ksi
Clip	N/A	in
Orientation Offset		°
Anchor Rod Detail	c	$\eta=0.55$
Clear Distance	N/A	in
Applied Moment, Mu	304.6	k
Bending Stress, ϕMn	1577.0	k



Original Anchor Rods		
Arrangement	Cluster	-
Quantity	12	-
Diameter, ϕ	1 3/4	in
Bolt Circle	55	in
Grade	Other	
Yield Strength, Fy	128	ksi
Tensile Strength, Fu	150	ksi
Spacing	6.5	in
Orientation Offset	15	°
Applied Force, Pu	168.3	k
Anchor Rods, ϕPn	213.7	k

Additional Anchor Rods		
Quantity	8	-
Diameter, ϕ	2 1/4	in
Bolt Circle	39	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Bypass Base?	No	
Orientation Offset		°
Applied Force, Pu	204.7	k
Additional Rod, ϕPn	243.6	k

Calculations for Monopole Base Plate & Anchor Rod Analysis

Reaction Distribution

Reaction	Shear Vu	Moment Mu	Factor
-	k	k-ft	-
Base Forces	34.0	3636.0	1.00
Anchor Rod Forces	30.7	2310.5	0.64
Additional Bolt (Grp1) Forces	3.3	1325.5	0.36
Additional Bolt (Grp2) Forces	0.0	0.0	0.00
Dywidag Forces	0.0	0.0	0.00
Stiffener Forces	0.0	0.0	0.00

Geometric Properties

Section	Gross Area	Net Area	Individual Inertia	Threads per Inch	Moment of Inertia
-	in ²	in ²	in ⁴	#	in ⁴
Pole	117.0509	9.7542	1.8426		36967.22
Bolt	2.4053	1.8995	0.2871	5	8622.24
Bolt1	3.9761	3.2477	0.8393	4.5	4946.45
Bolt2	0.0000	0.0000	0.0000	0	0.00
Dywidag	0.0000	0.0000	0.0000		0.00
Stiffener	0.0000	0.0000	0.0000		0.00

Base Plate

Shape	Round	-
Diameter, D	62	in
Thickness, t	2	in
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	75	ksi
Base Plate Chord	35.256	in
Detail Type	c	-
Detail Factor	0.55	-
Clear Distance	N/A	-

Anchor Rods

Anchor Rod Quantity, N	12	-
Rod Diameter, d	1.75	in
Bolt Circle, BC	55	in
Yield Strength, Fy	127.7	ksi
Tensile Strength, Fu	150	ksi
Applied Axial, Pu	168.3	k
Applied Shear, Vu	0.5	k
Compressive Capacity, φPn	213.7	k
Tensile Capacity, φRnt	0.788	OK
Interaction Capacity	0.792	OK

External Base Plate

Chord Length AA	25.204	in
Additional AA	4.000	in
Section Modulus, Z	29.204	in ³
Applied Moment, Mu	304.6	k-ft
Bending Capacity, φMn	1577.0	k-ft
Capacity, Mu/φMn	0.193	OK
Chord Length AB	21.156	in
Additional AB	4.000	in
Section Modulus, Z	25.156	in ³
Applied Moment, Mu	135.2	k-ft
Bending Capacity, φMn	1358.4	k-ft
Capacity, Mu/φMn	0.100	OK
Bend Line Length	0.000	in
Additional Bend Line	0.000	in
Section Modulus, Z	0.000	in ³
Applied Moment, Mu	#N/A	k-ft
Bending Capacity, φMn	0.0	k-ft
Capacity, Mu/φMn		

Additional Bolt Group 1

Bolt Quantity, N	8	-
Bolt Diameter, d	2.25	in
Bolt Circle, BC	39	in
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	204.7	k
Applied Shear, Vu	2.1	k
Compressive Capacity, φPn	243.6	k
Compressive Capacity, φPn	0.840	OK
Interaction Capacity	0.856	OK

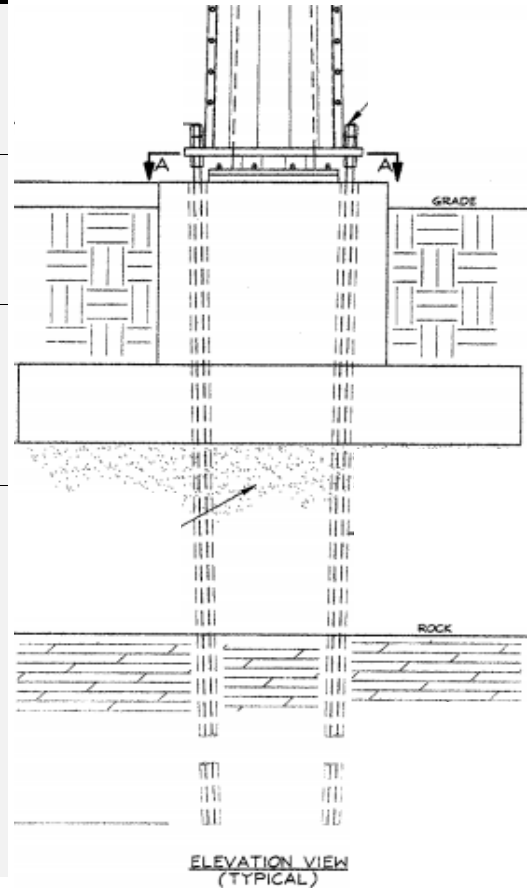
Internal Base Plate

Arc Length	0.000	in
Section Modulus, Z	0.000	in ³
Moment Arm	0.000	in
Applied Moment, Mu	0.0	k-ft
Bending Capacity, φMn	0.0	k-ft
Capacity, Mu/φMn		

Site Name: Brln-Berlin, CT
Site Number: 302483
Date: 8/27/2021

Rock Anchor Group Foundation Analysis

Foundation Parameters		
Foundation Mapped:	Y	
Moment (Overturning) (M_u):	3636.4	k-ft
Shear/Leg (V_u):	34.0	k
Compression/Leg (P_u):	56.6	k
Tower Type (GT / SST / MP):	MP	
Length / Width of Block:	11.0	ft
Pier Width	8.0	ft
Height of Block:	8.58	ft
Mat Thickness	2.58	ft
Block Height Above Ground:	0.83	ft
Depth Below Ground Surface to Water Table (w):	99.0	ft
Unit Weight of Concrete:	150	pcf
Unit Weight of Soil:	135	pcf
Unit Weight of Water:	62.4	pcf
Ultimate Compressive Bearing Pressure:	26,000	psf
Pullout Angle:	40	°
Rod Diameter:	1.75	in
Rod Ultimate Strength:	150	ksi
Rod Net Area:	2.60	in ²
Number of Rods:	12	
Diameter of Cored Hole:	3.63	in
Ultimate Grout / Rock Interface Bond Strength:	150	psi
Ultimate Grout / Rock Anchor Interface Bond Strength:	300	psi
Overall Rod Embedment Length:	386.0	in
Rod Embedment Circle:	54.6	in
Free Stress Length:	182	in
Soil / Concrete Friction Coefficient:	0.25	
Rock Anchor Design Plastic or Elastic:	Elastic	
Ignore Pullout Weight Resistance (Y/N):	N	



Governing Strengths		
Total Pullout Weight:	3490.8	k
Total Rock / Grout Bond Strength:	4187.5	k
Total Grout / Rod Bond Strength:	4037.6	k
Total Rod Mechanical Strength:	4680.0	k
Pullout Weight / Rod:	290.9	k
Rock / Grout Bond Strength / Rod:	349.0	k
Grout / Rod Bond Strength / Rod:	336.5	k
Rod Mechanical Strength / Rod:	390.0	k

Capacities & Results		
Soil Strength Reduction Factor (ϕ_s):	0.75	
Factored Nominal Moment Capacity per Leg ($\phi_s M_n$):	4692.4	k
Factored Nominal Uplift Capacity per Leg ($\phi_s T_n$):	2738.9	k
Factored Nominal Compressive Capacity per Leg ($\phi_s P_n$):	1853.1	k
Factored Nominal Shear Capacity per Leg ($\phi_s V_n$):	2106.0	k
$T_u / \phi_s T_n + M_u / \phi_s M_n$:	84%	Result: OK
$P_u / \phi_s P_n$:	4%	Result: OK
$V_u / \phi_s V_n$:	2%	Result: OK

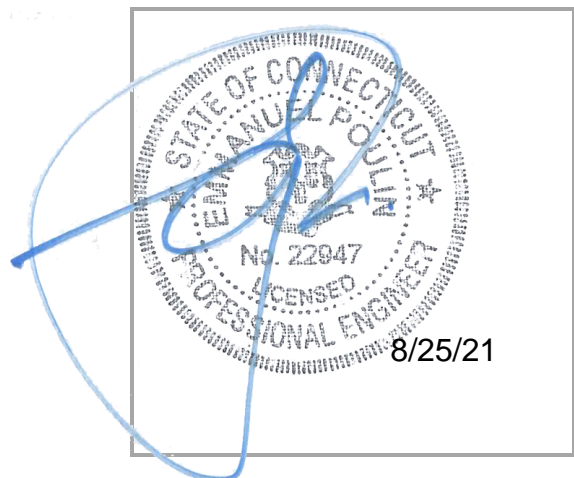
INFINIGY8

MOUNT ANALYSIS REPORT

August 25, 2021

Dish Wireless Site Name	0
Dish Wireless Site Number	BOBDL00013A
ATC Site Name	-
ATC Site Number	302483
Infinigy Job Number	1197-F0001-C
Client	ATC
Carrier	Dish Wireless
Site Location	286 Beckley Road Berlin, CT 06037 Hartford County 41.631722 N NAD83 72.729900 W NAD83
Mount Type	8.0 ft Platform
Mount Elevation	105.0 ft AGL
Structural Usage Ratio	43.4
Overall Result	Pass

The enclosed mount structural analysis has been performed in accordance with the 2018 Connecticut State Building Code (2015 IBC) based on an ultimate 3-second gust wind speed of 125 mph. The evaluation criteria and applicable codes are presented in the next section of this report.



CONTENTS

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

1. INTRODUCTION

Infinigy performed a structural analysis on the Dish Wireless proposed telecommunication equipment supporting Platform mounted to the existing structure located at the aforementioned address. All referenced supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The mount was analyzed using Risa-3D version 17.0.4 analysis software.

2. DESIGN/ANALYSIS PARAMETERS

Wind Speed	125 mph (3-Second Gust)
Wind Speed w/ ice	50 mph (3-Second Gust) w/ 2.0" ice
Code / Standard	TIA-222-H
Adopted Code	2018 Connecticut State Building Code (2015 IBC)
Risk Category	II
Exposure Category	C
Topographic Category	1
Calculated Crest Height	0 ft.
Seismic Spectral Response	$S_s = 0.183 \text{ g} / S_1 = 0.063 \text{ g}$
Live Load Wind Speed	60 mph
Man Live Load at Mid/End Points	250 lbs
Man Live Load at Mount Pipes	500 lbs

3. PROPOSED LOADING CONFIGURATION - 105.0 ft. AGL Platform

Antenna Centerline (ft)	Qty.	Appurtenance Manufacturers	Appurtenance Models
105.0	3	JMA WIRELESS	MX08FRO665-21
	3	FUJITSU	TA08025-B605
	3	FUJITSU	TA08025-B604
	1	RAYCAP	RDIDC-9181-PF-48

4. SUPPORTING DOCUMENTATION

Proposed Loading	Dish Wireless Asset ID CT-ATC-T-302483 Rev 1, Site #BOBDL00013A, dated June 14, 2021
Mount Manufacturer Drawings	Commscope Document # MC-PK8-DSH, dated March 08, 2021

5. RESULTS

Components	Capacity	Pass/Fail
Mount Pipes	23.9%	Pass
Horizontals	14.7%	Pass
Standoffs	35.3%	Pass
Handrails	29.3%	Pass
Connections	43.4%	Pass
MOUNT RATING =	43.4 %	Pass

Notes:

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

6. RECOMMENDATIONS

Infinigy recommends installing Dish Wireless’s proposed equipment loading configuration on the mount at 105.0 ft. The installation shall be performed in accordance with the construction documents issued for this site.

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

7. ASSUMPTIONS

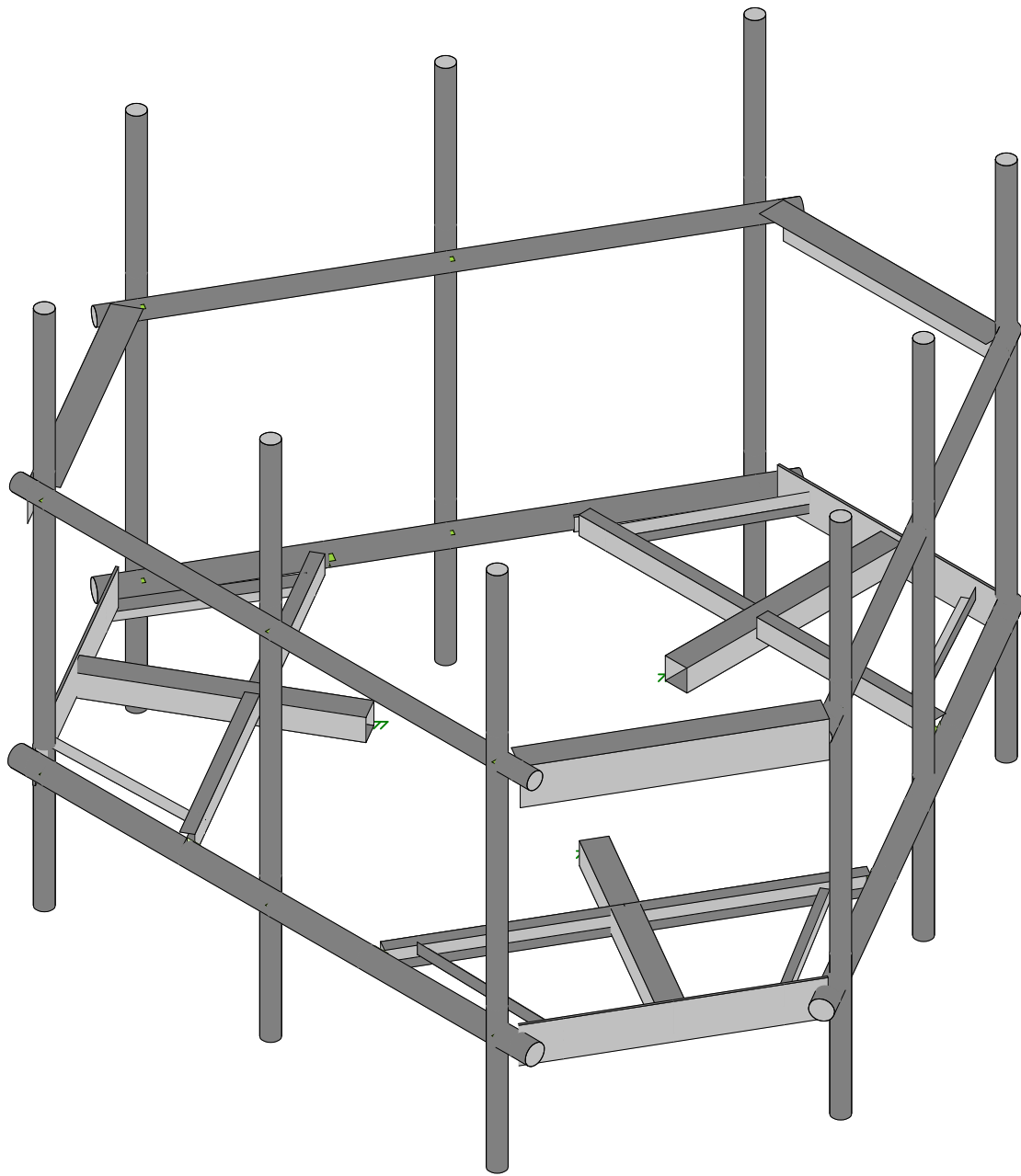
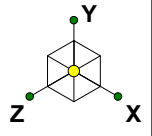
The antenna mounting system was properly fabricated, installed and maintained in accordance with its original design and manufacturer's specifications.	
The configuration of antennas, mounts, and other appurtenances are as specified in the proposed loading configuration table.	
All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.	
The analysis will require revisions if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.	
Steel grades have been assumed as follows, unless noted otherwise:	
Channel, Solid Round, Plate, Built-up Angle	ASTM A1011 36 KSI
Structural Angle	ASTM A529 Gr. 50
HSS (Rectangular)	ASTM A500-B GR 46
HSS (Circular)	ASTM A500-B GR 42
Pipe	ASTM A500 Gr C
Connection Bolts	ASTM A325
U-Bolts	ASTM A307
All bolted connections are pretensioned in accordance with Table 8.2 of the RCSC 2014 Standard	

8. LIABILITY WAIVER AND LIMITATIONS

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

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

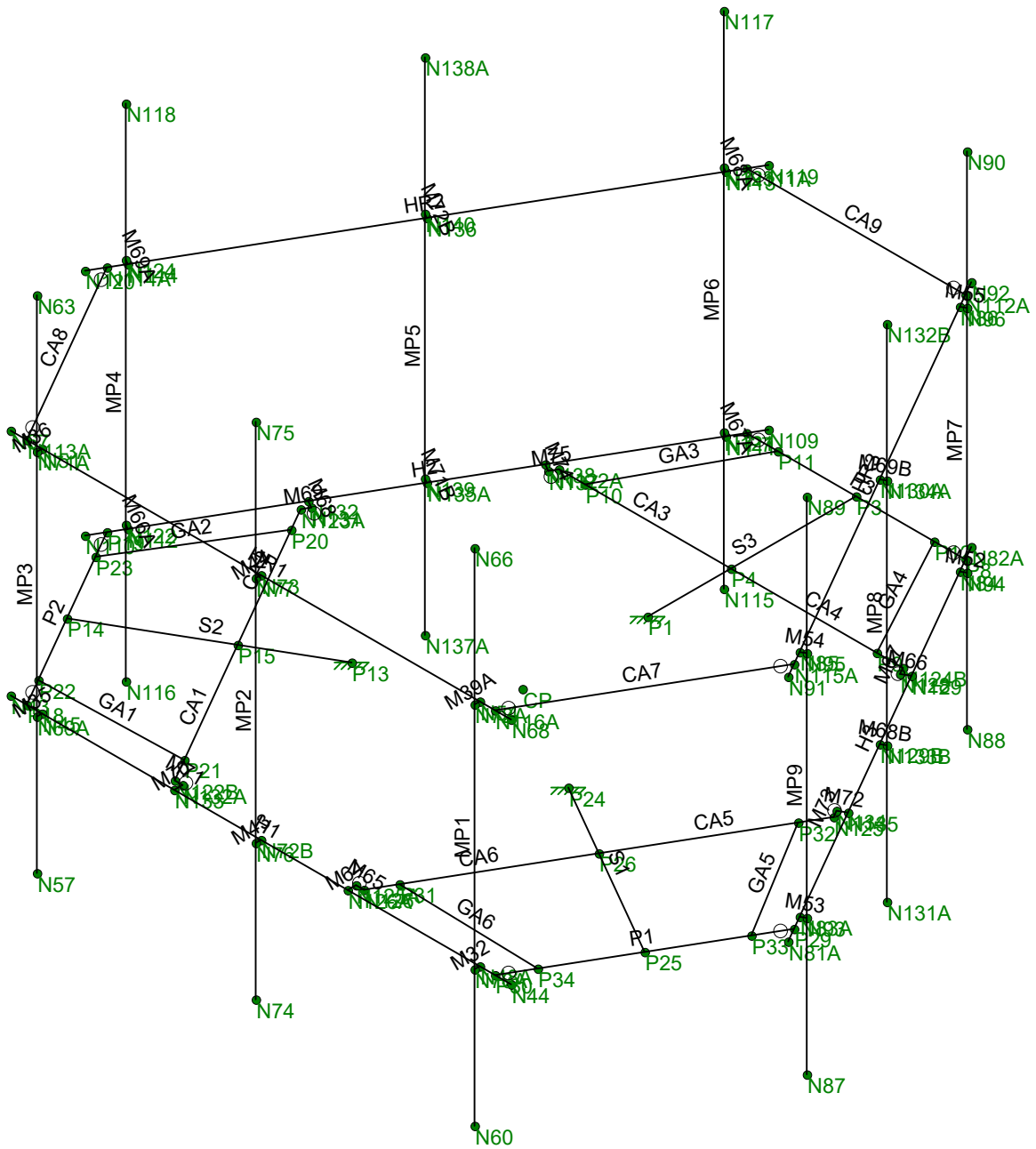
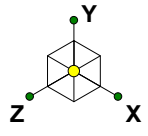
This report is an evaluation of the mount structure only and does not determine the adequacy of the supporting structure, other carrier mounts or cable mounting attachments. The analysis of these elements is outside the scope of this analysis, are assumed to be adequate for the purpose of this report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



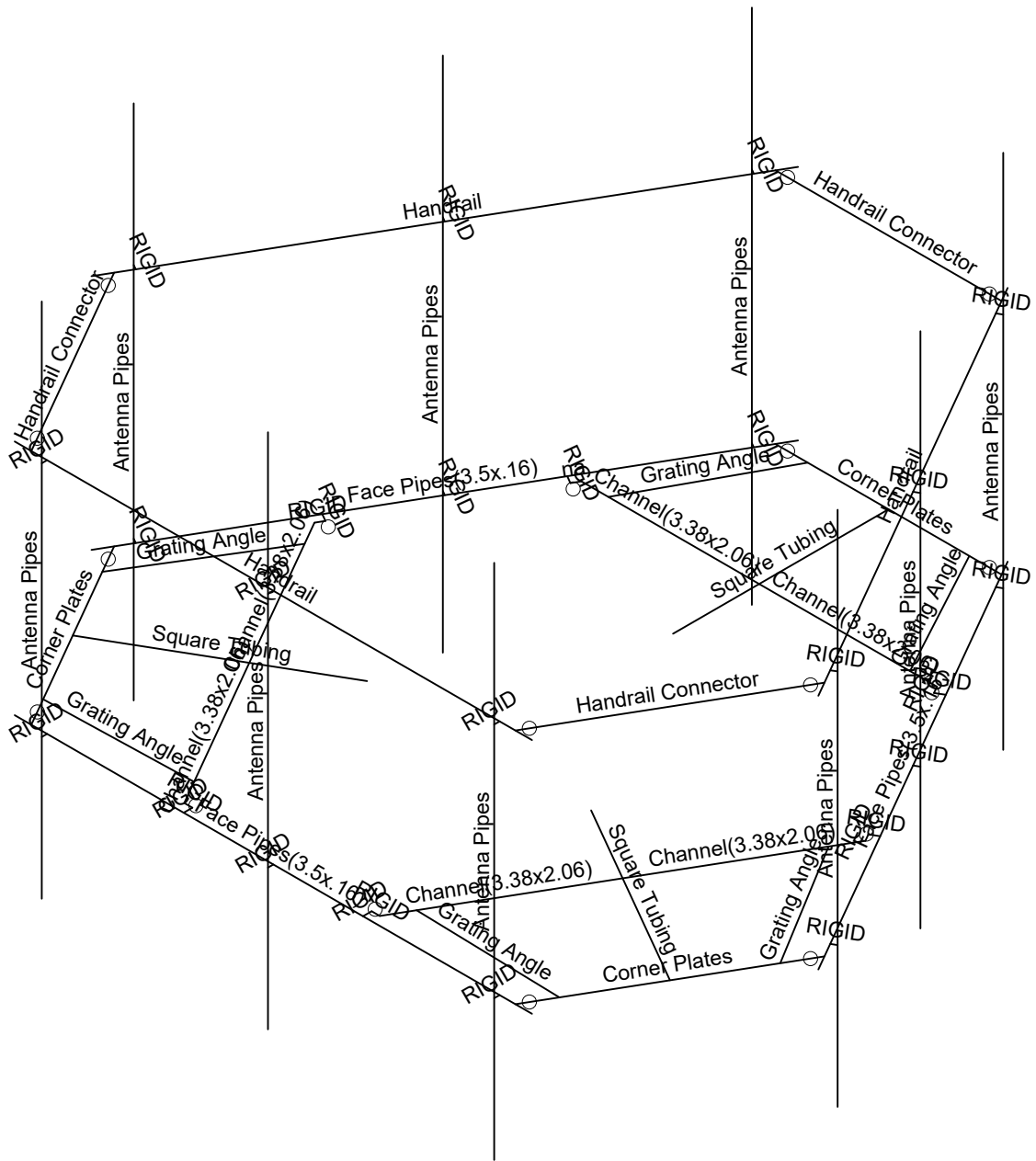
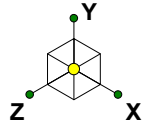
Infinigy Engineering, PLLC
PSM
1197-F0001-C

BOBDL00013A

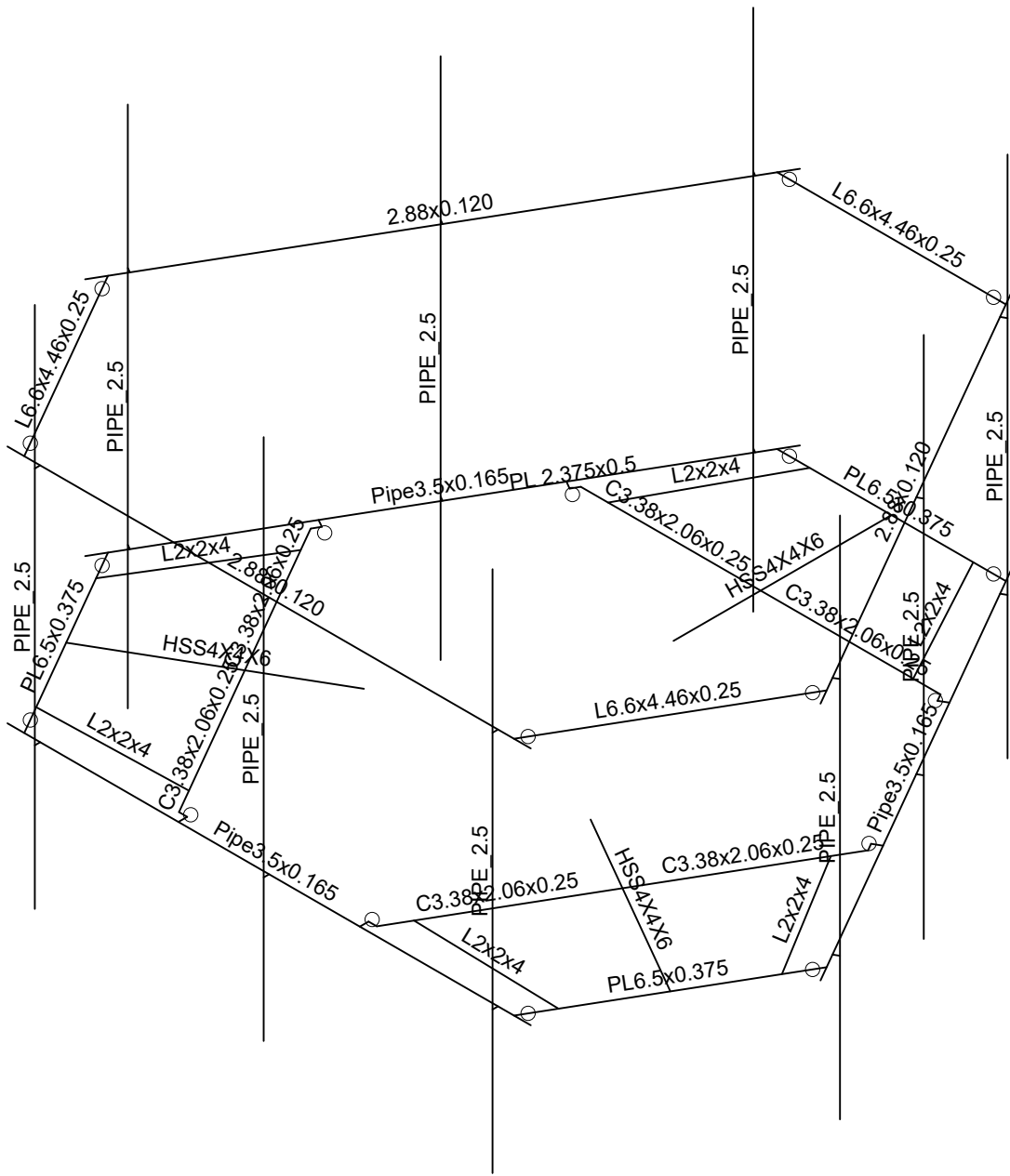
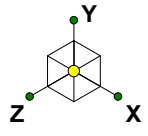
Rendered
Aug 25, 2021 at 3:20 PM
BOBDL00013A_loaded.r3d



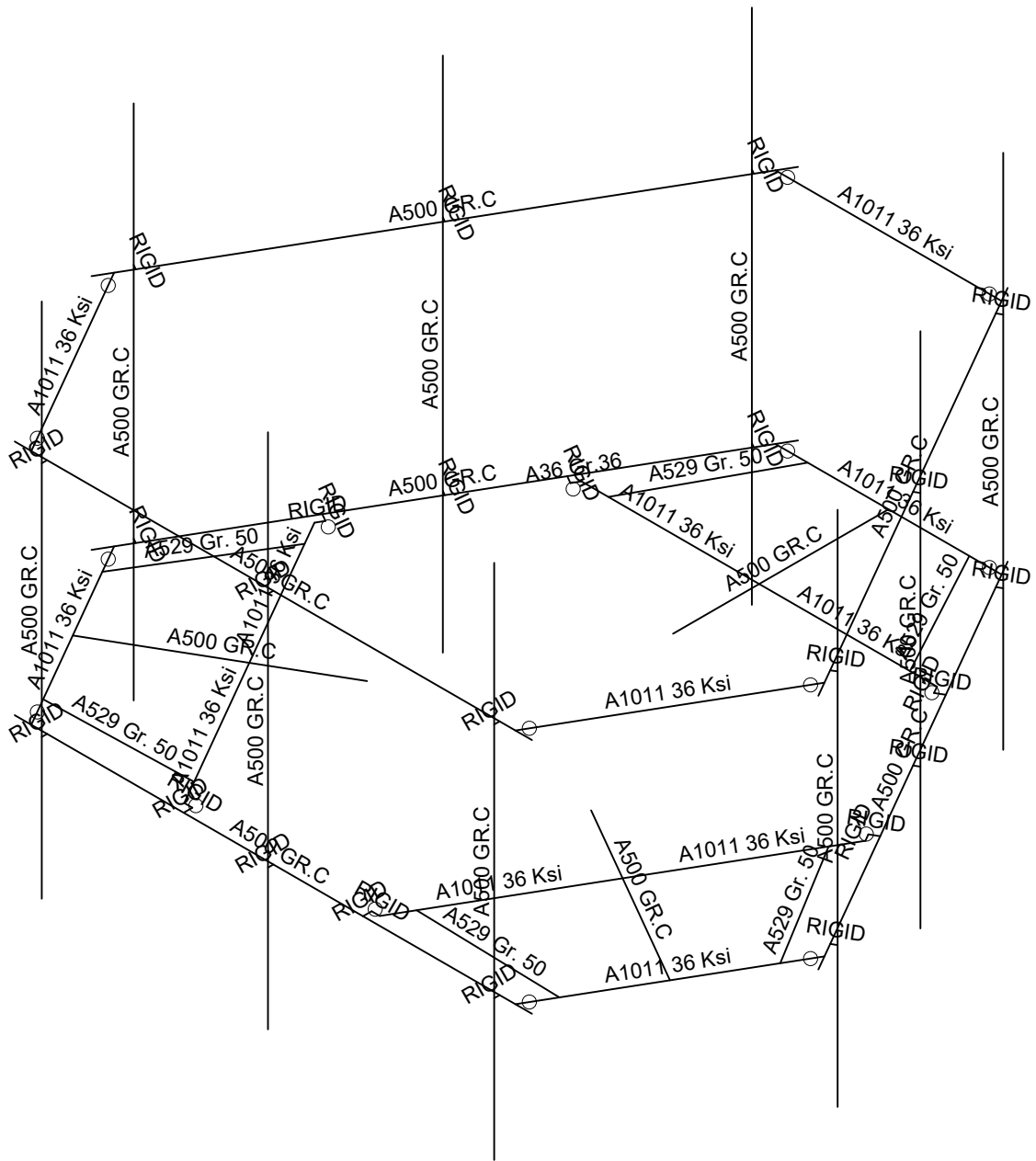
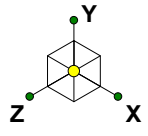
Infinigy Engineering, PLLC	BOBDL00013A	WireFrame
PSM		Aug 25, 2021 at 3:21 PM
1197-F0001-C		BOBDL00013A_loaded.r3d



Infinigy Engineering, PLLC	BOBDL00013A	Section Sets
PSM		Aug 25, 2021 at 3:21 PM
1197-F0001-C		BOBDL00013A_loaded.r3d



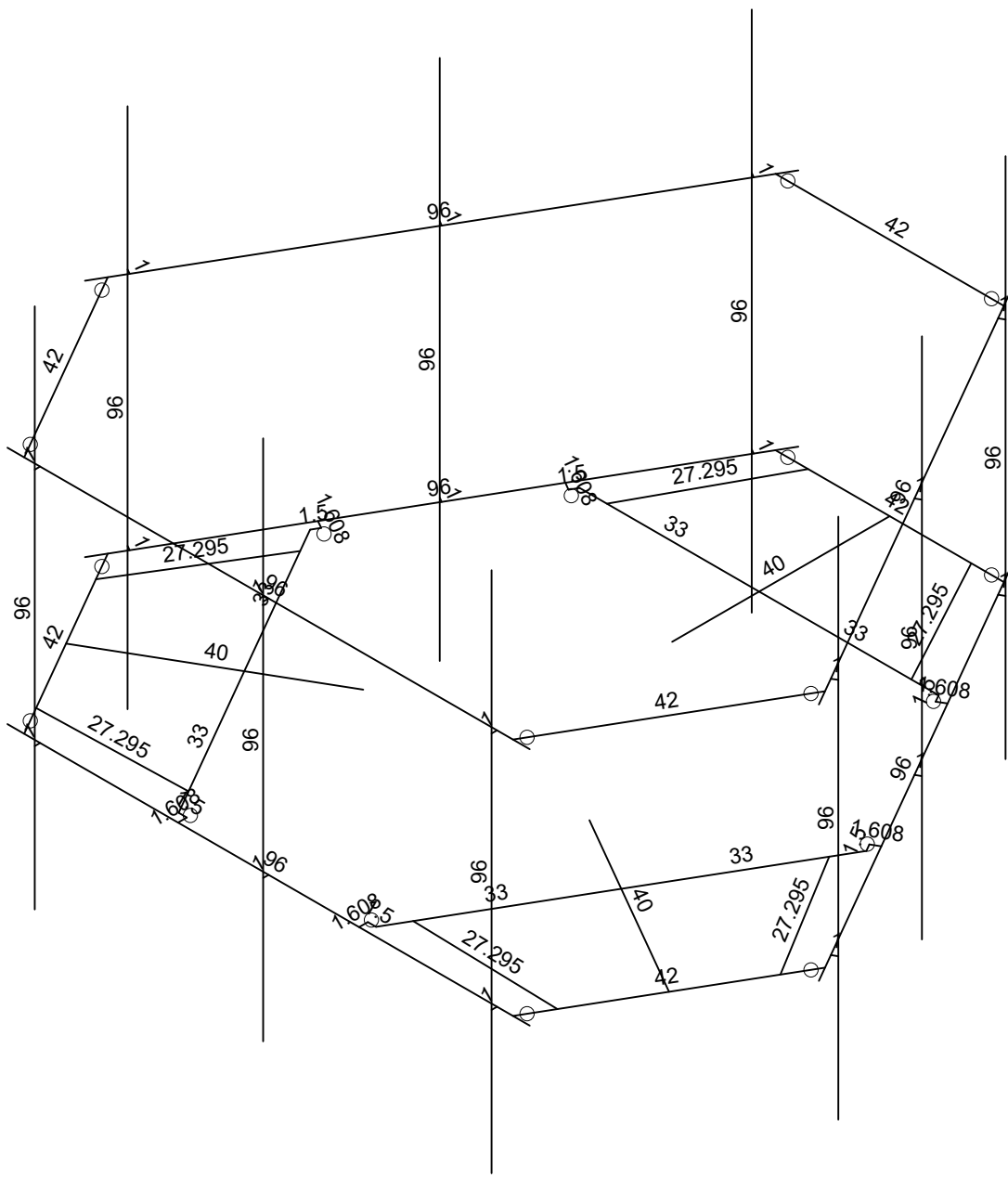
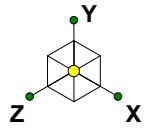
Infinigy Engineering, PLLC	BOBDL00013A	Member Shapes
PSM		Aug 25, 2021 at 3:21 PM
1197-F0001-C		BOBDL00013A_loaded.r3d



Infinigy Engineering, PLLC
 PSM
 1197-F0001-C

BOBDL00013A

Material Sets
 Aug 25, 2021 at 3:21 PM
 BOBDL00013A_loaded.r3d



Member Length (in) Displayed

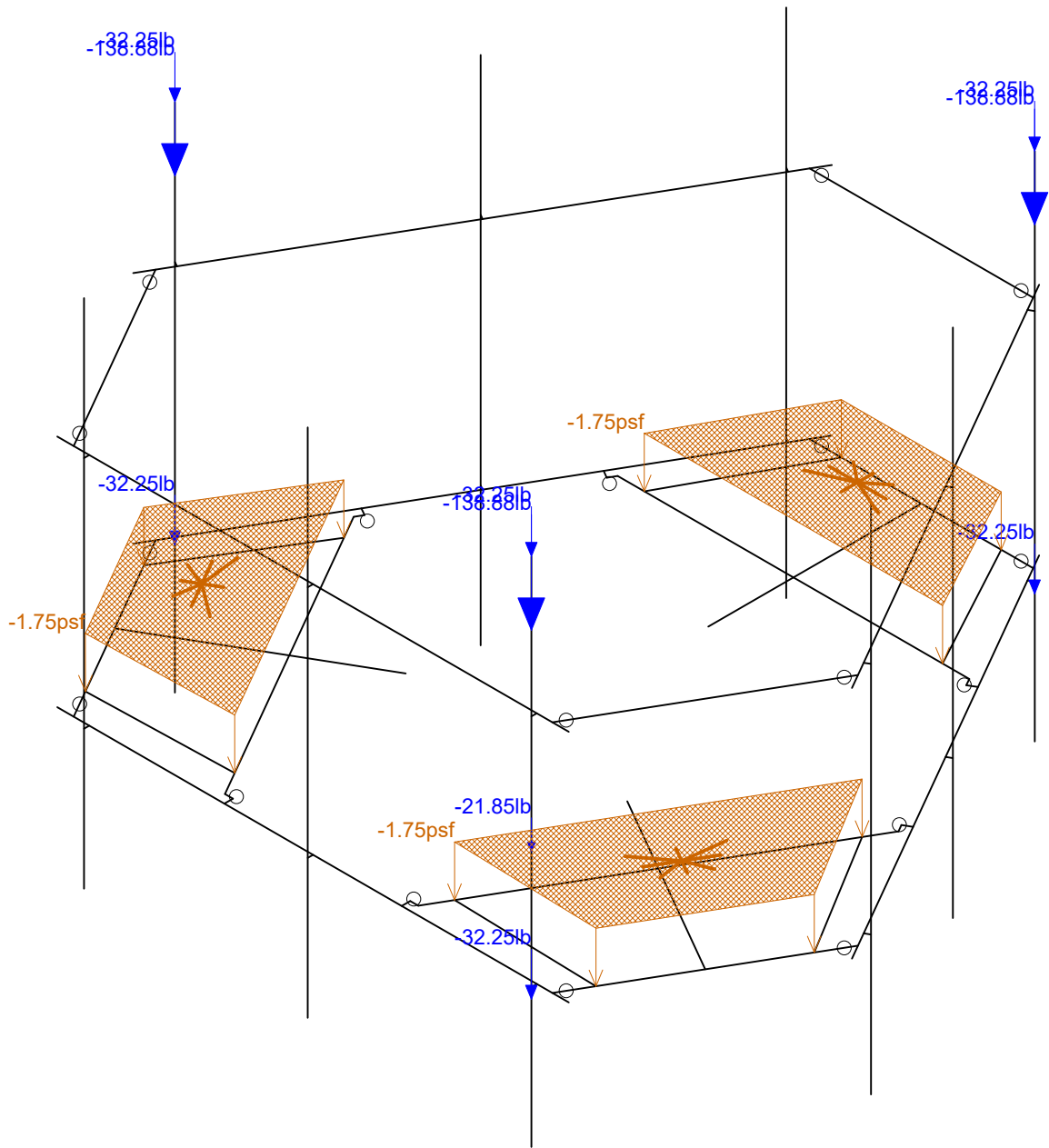
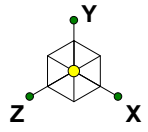
Infinigy Engineering, PLLC
 PSM
 1197-F0001-C

BOBDL00013A

Member Lengths

Aug 25, 2021 at 3:22 PM

BOBDL00013A_loaded.r3d



Loads: BLC 1, Self Weight

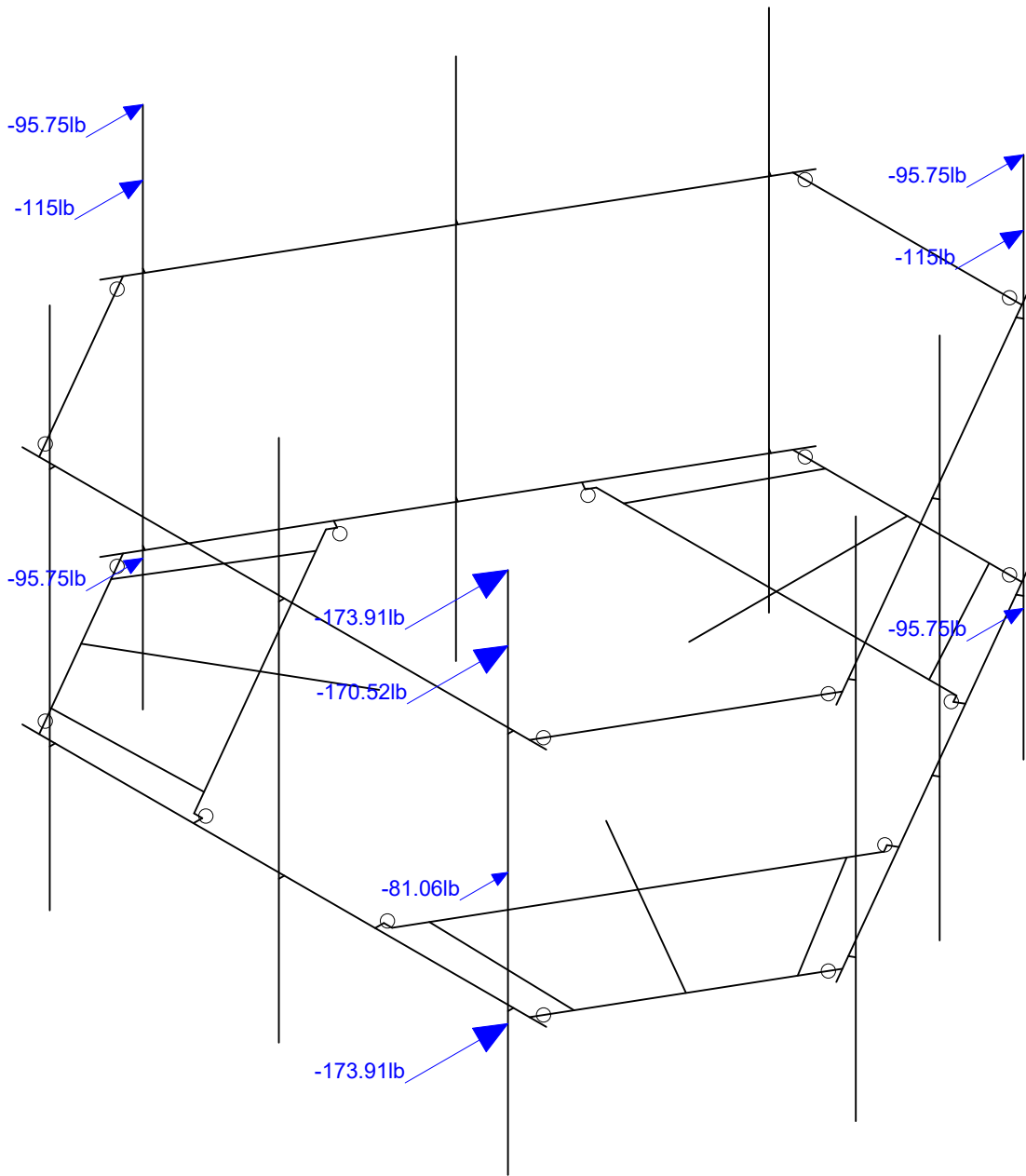
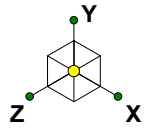
Infinigy Engineering, PLLC
 PSM
 1197-F0001-C

BOBDL00013A

Self Weight

Aug 25, 2021 at 3:22 PM

BOBDL00013A_loaded.r3d



Loads: BLC 2, Wind Load AZI 0

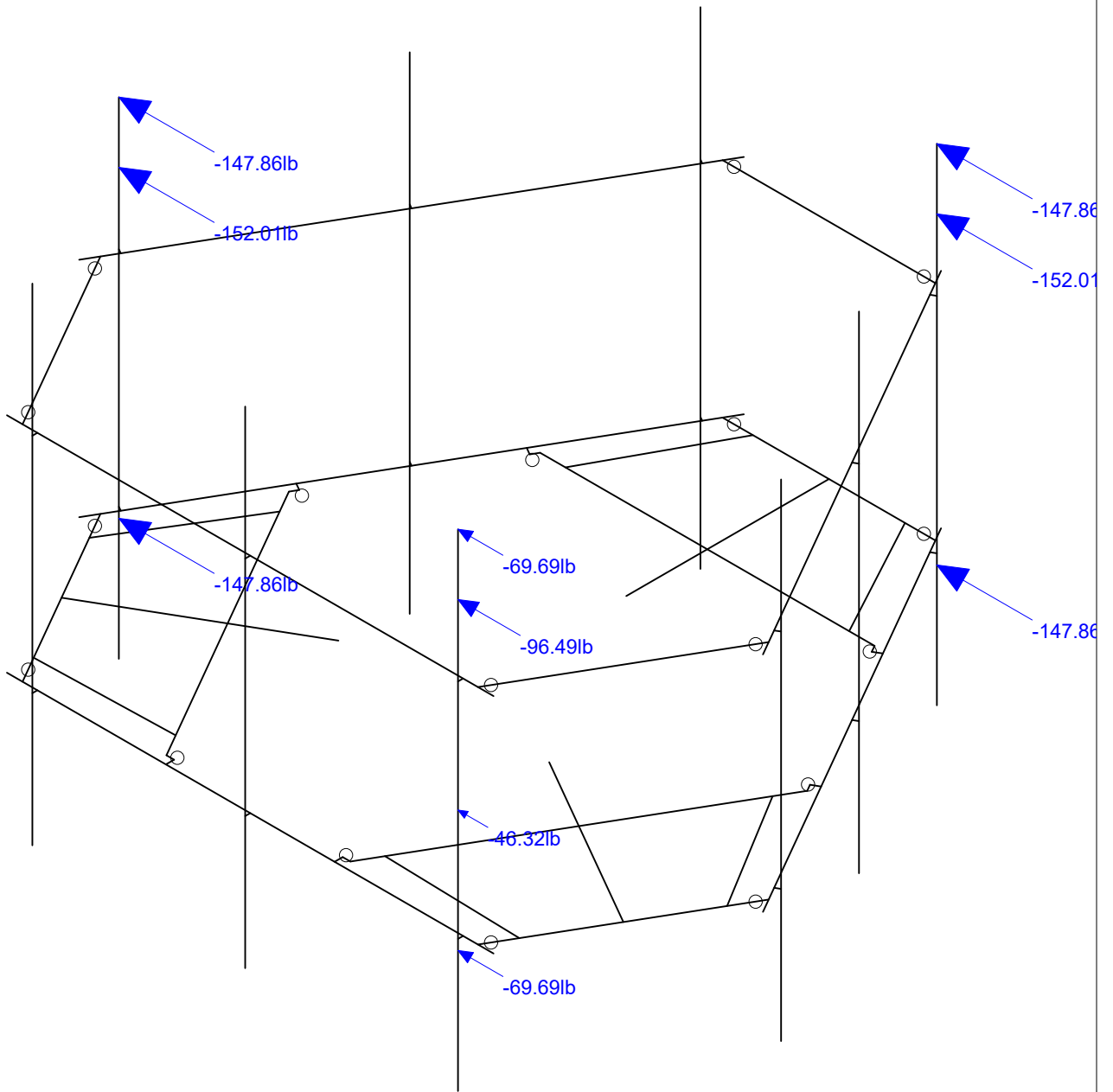
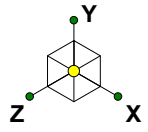
Infinigy Engineering, PLLC
PSM
1197-F0001-C

BOBDL00013A

Wind Load AZI 000

Aug 25, 2021 at 3:22 PM

BOBDL00013A_loaded.r3d

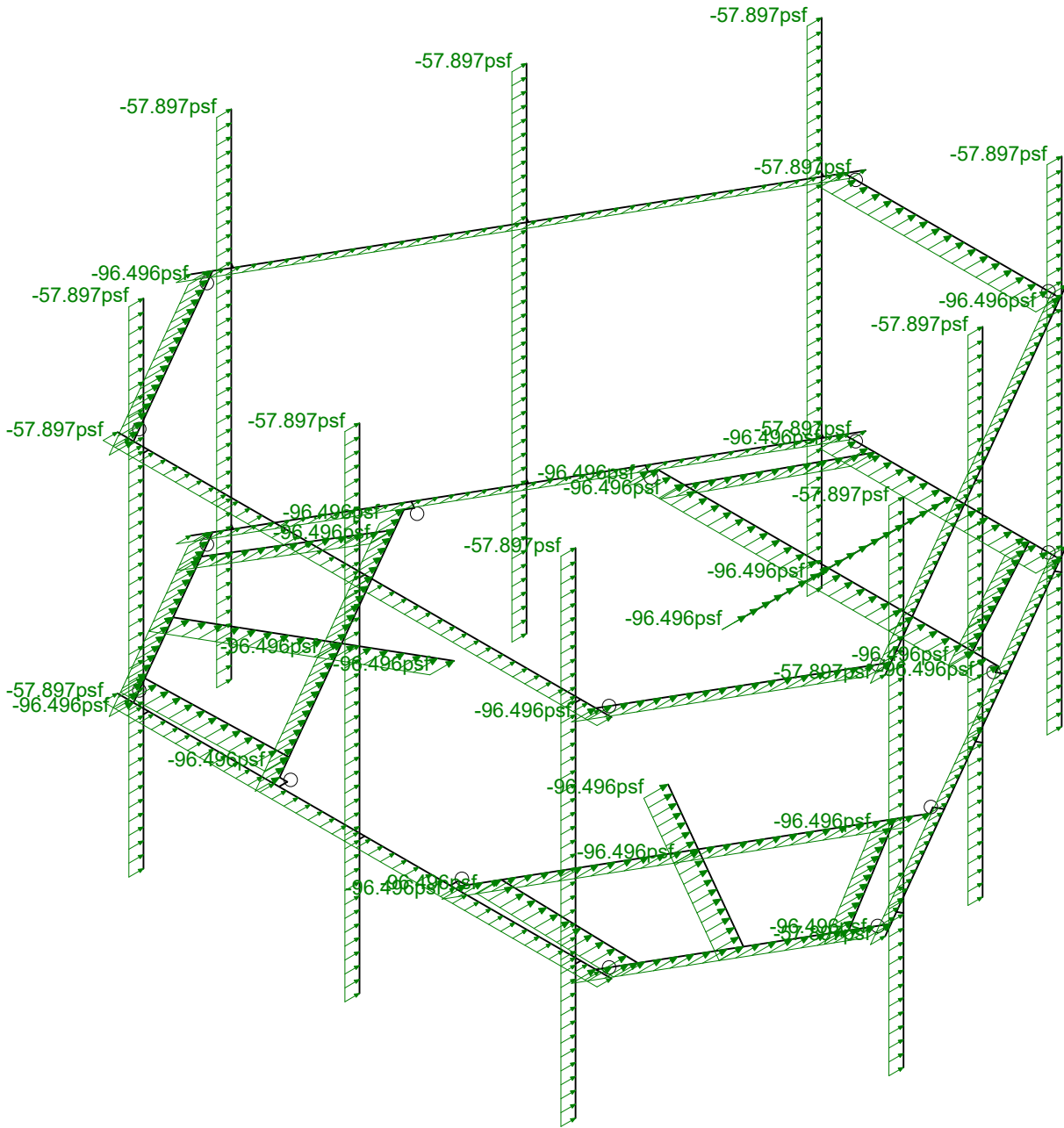
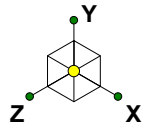


Loads: BLC 5, Wind Load AZI 90

Infinigy Engineering, PLLC
PSM
1197-F0001-C

BOBDL00013A

Wind Load AZI 090
Aug 25, 2021 at 3:22 PM
BOBDL00013A_loaded.r3d



Loads: BLC 14, Distr. Wind Load Z

Infinigy Engineering, PLLC

PSM

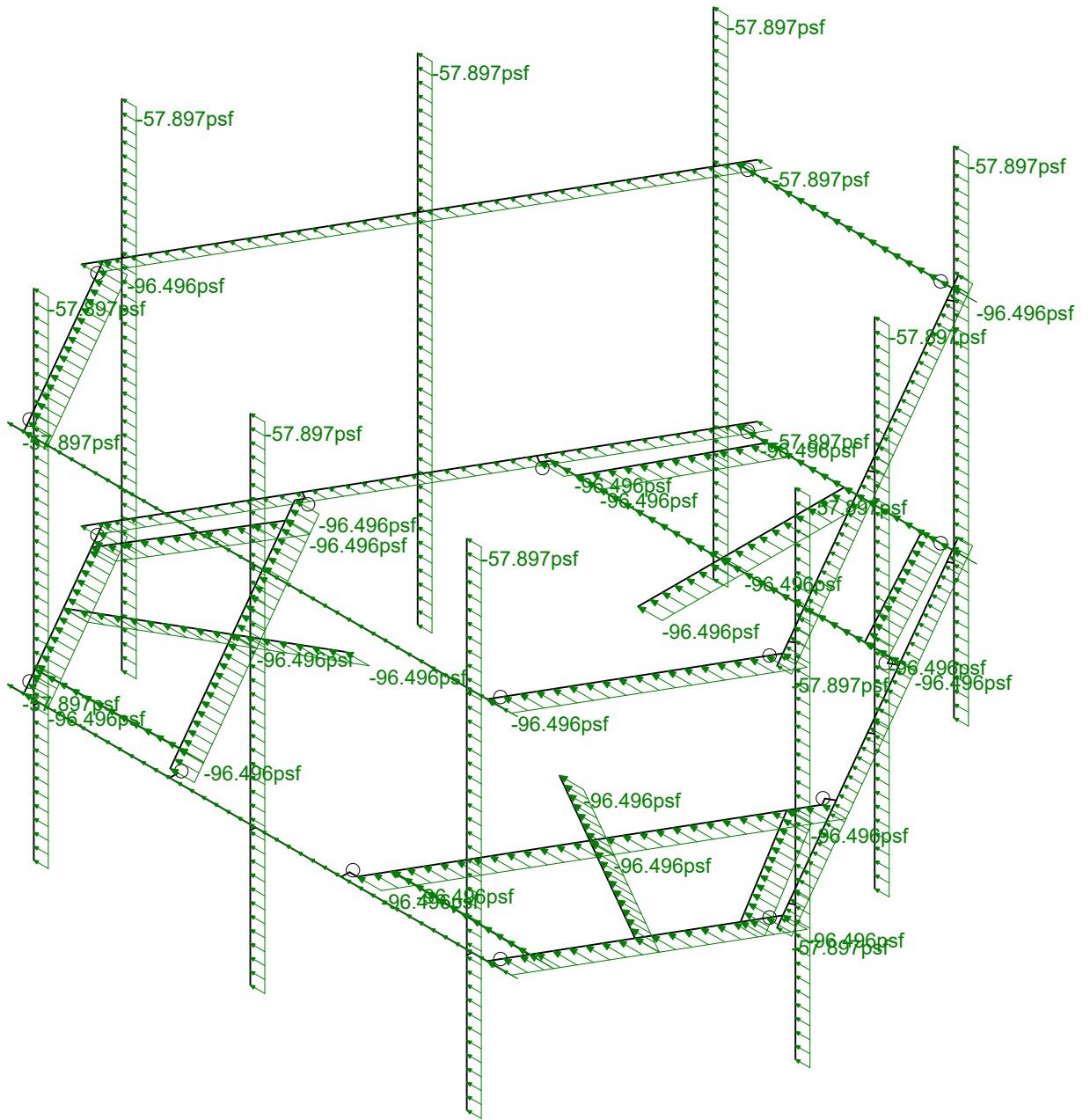
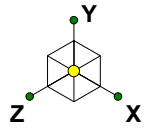
1197-F0001-C

BOBDL00013A

Distr Wind Load AZI 000

Aug 25, 2021 at 3:23 PM

BOBDL00013A_loaded.r3d

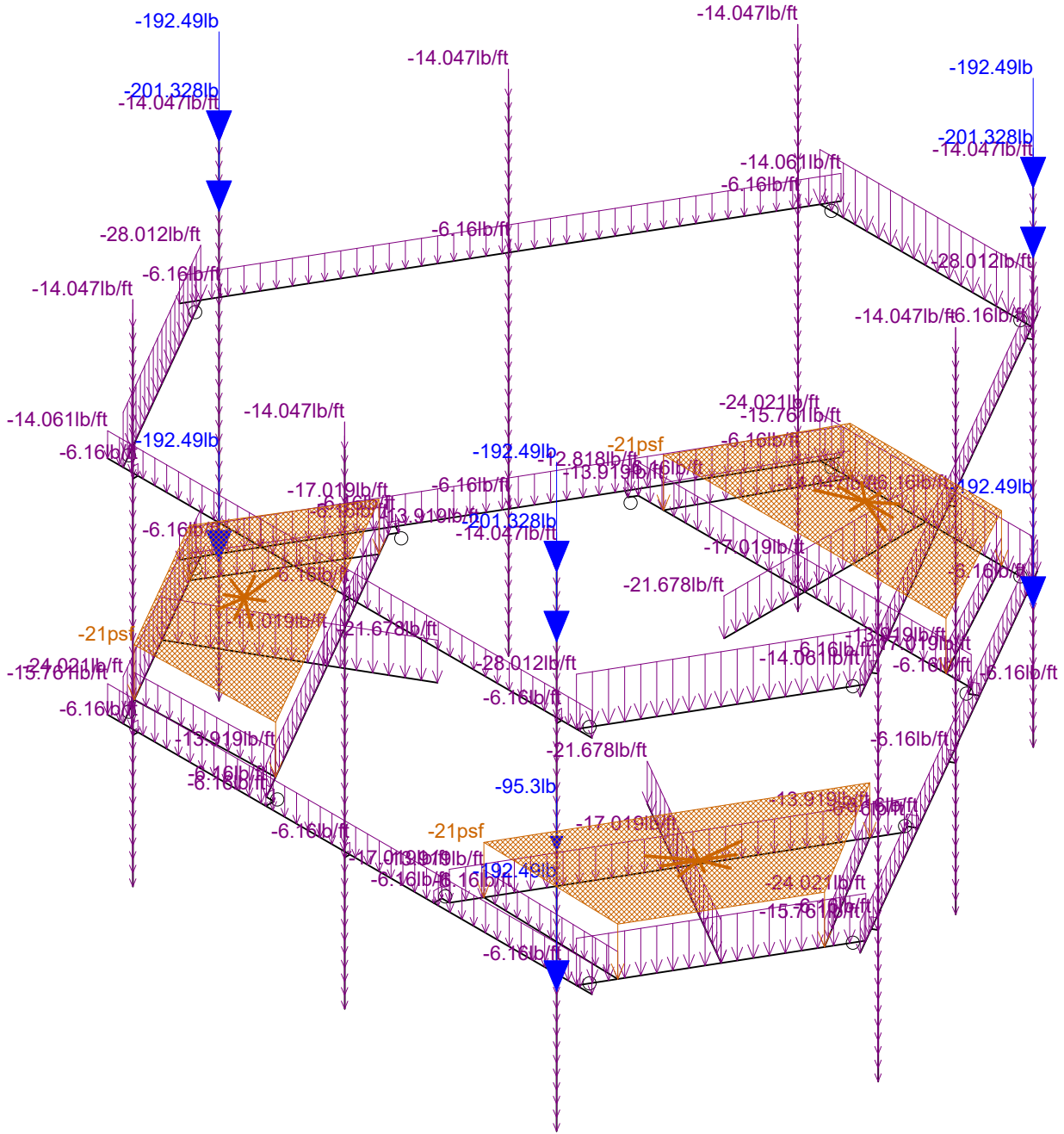
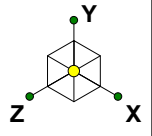


Loads: BLC 15, Distr. Wind Load X

Infinigy Engineering, PLLC
PSM
1197-F0001-C

BOBDL00013A

Distr Wind Load AZI 090
Aug 25, 2021 at 3:23 PM
BOBDL00013A_loaded.r3d



Loads: BLC 16, Ice Weight

Infinigy Engineering, PLLC

PSM

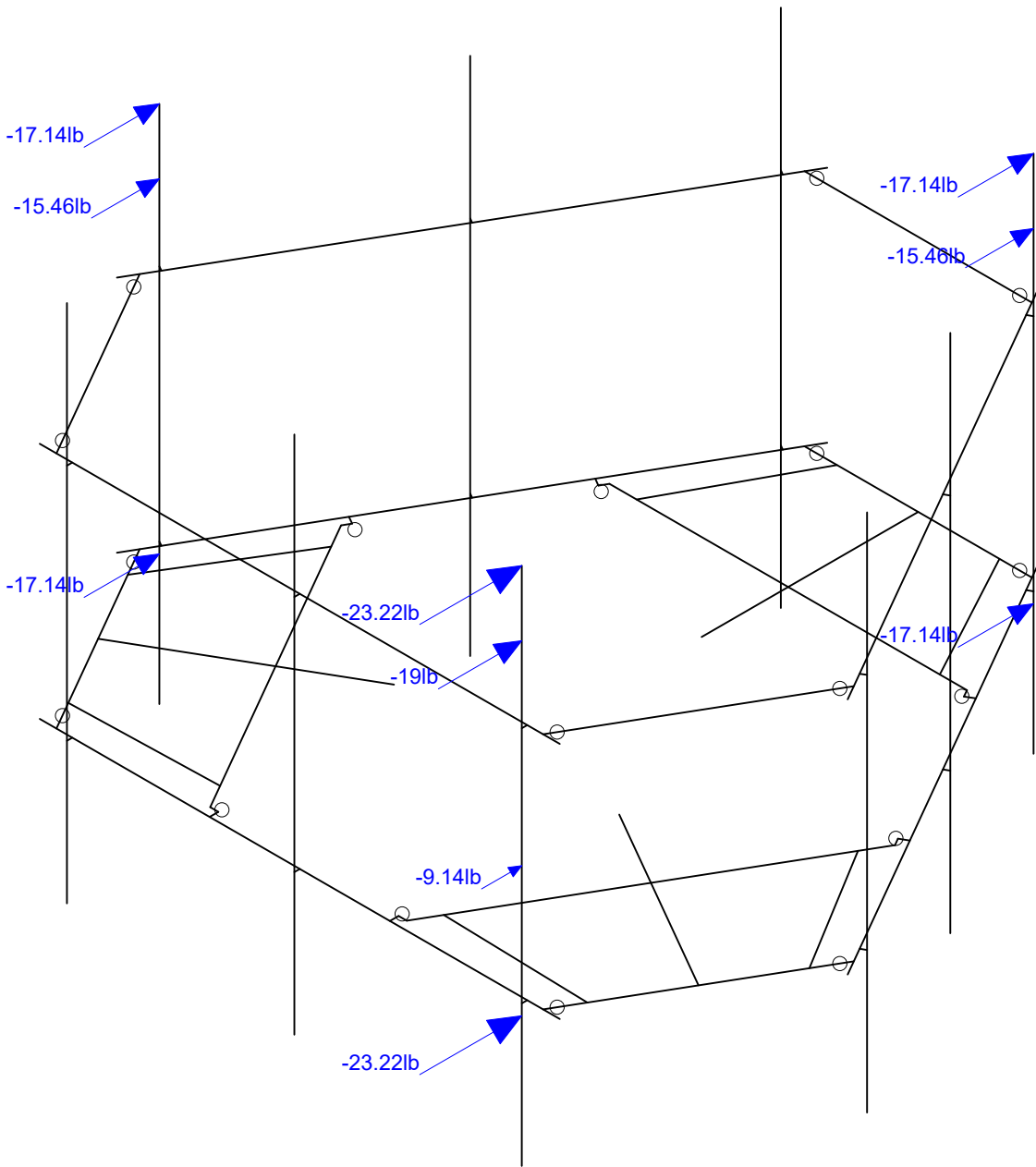
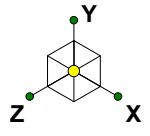
1197-F0001-C

BOBDL00013A

Ice Weight

Aug 25, 2021 at 3:23 PM

BOBDL00013A_loaded.r3d

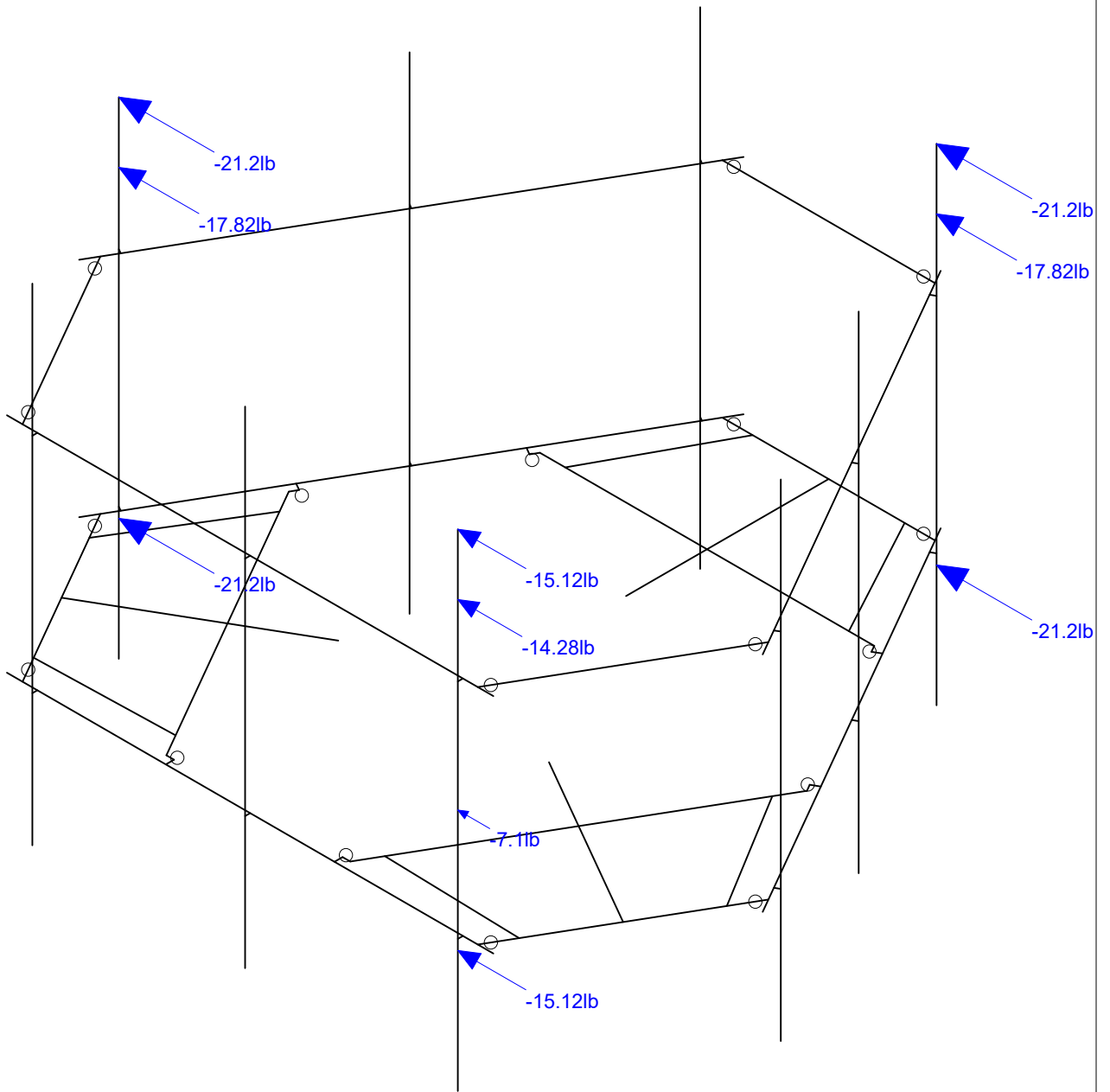
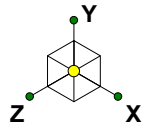


Loads: BLC 17, Ice Wind Load AZI 0

Infinigy Engineering, PLLC
PSM
1197-F0001-C

BOBDL00013A

Ice + Wind Load AZI 000
Aug 25, 2021 at 3:23 PM
BOBDL00013A_loaded.r3d

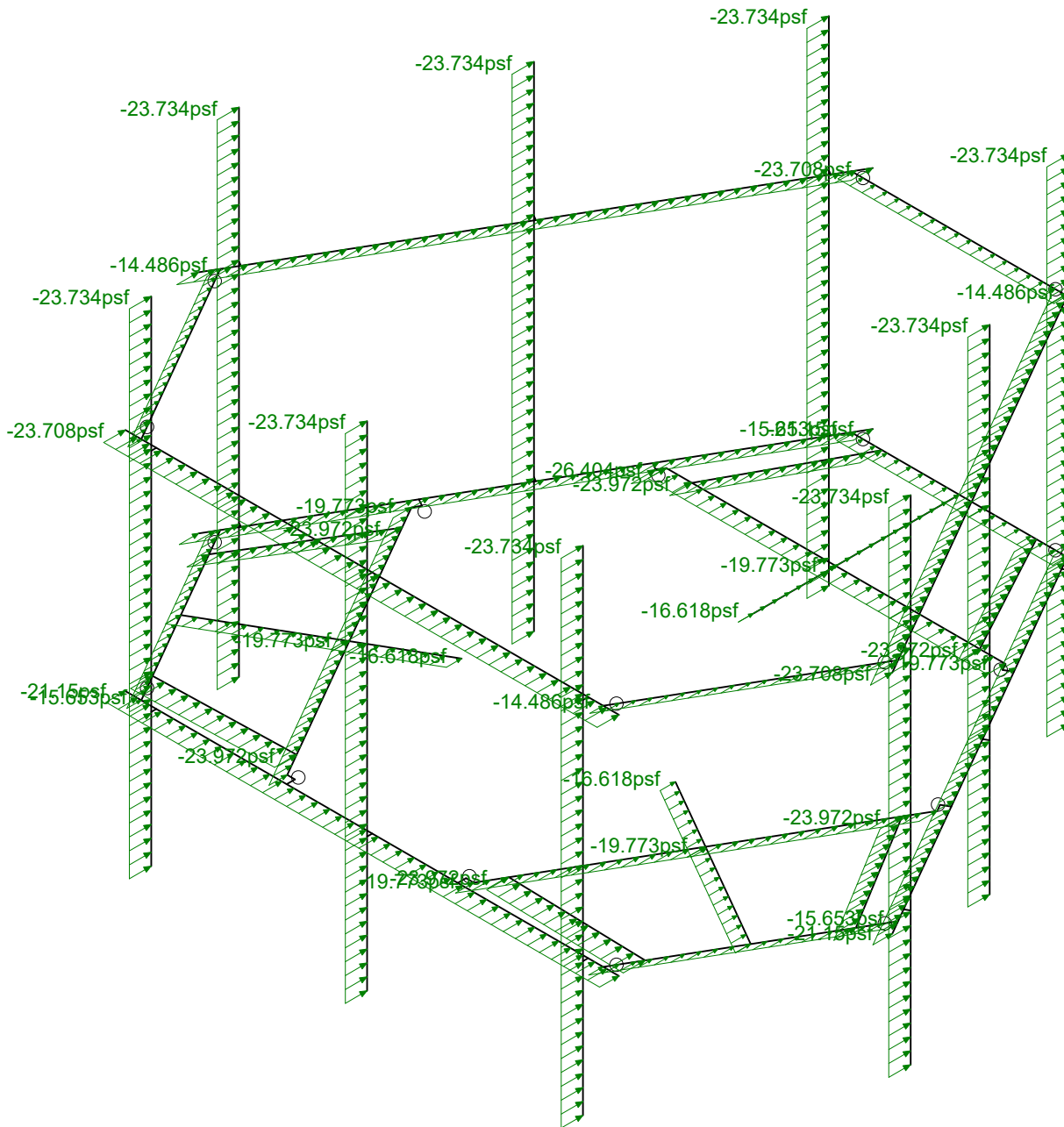
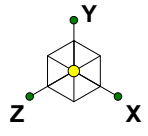


Loads: BLC 20, Ice Wind Load AZI 90

Infinigy Engineering, PLLC
PSM
1197-F0001-C

BOBDL00013A

Ice + Wind Load AZI 090
Aug 25, 2021 at 3:24 PM
BOBDL00013A_loaded.r3d

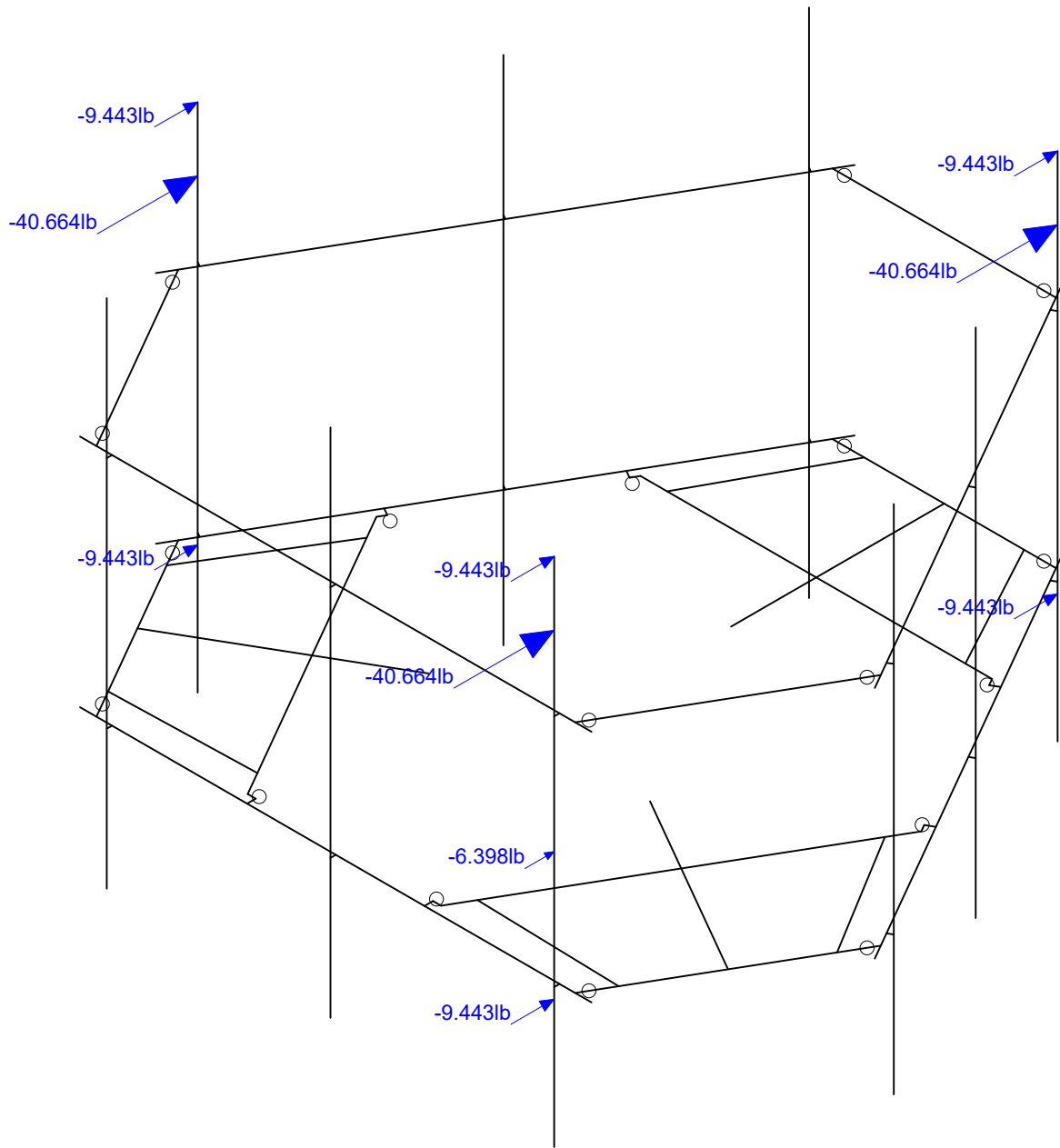
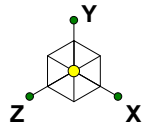


Loads: BLC 29, Distr. Ice Wind Load Z

Infinigy Engineering, PLLC
 PSM
 1197-F0001-C

BOBDL00013A

Distr Ice + Wind Load AZI 000
 Aug 25, 2021 at 3:24 PM
 BOBDL00013A_loaded.r3d

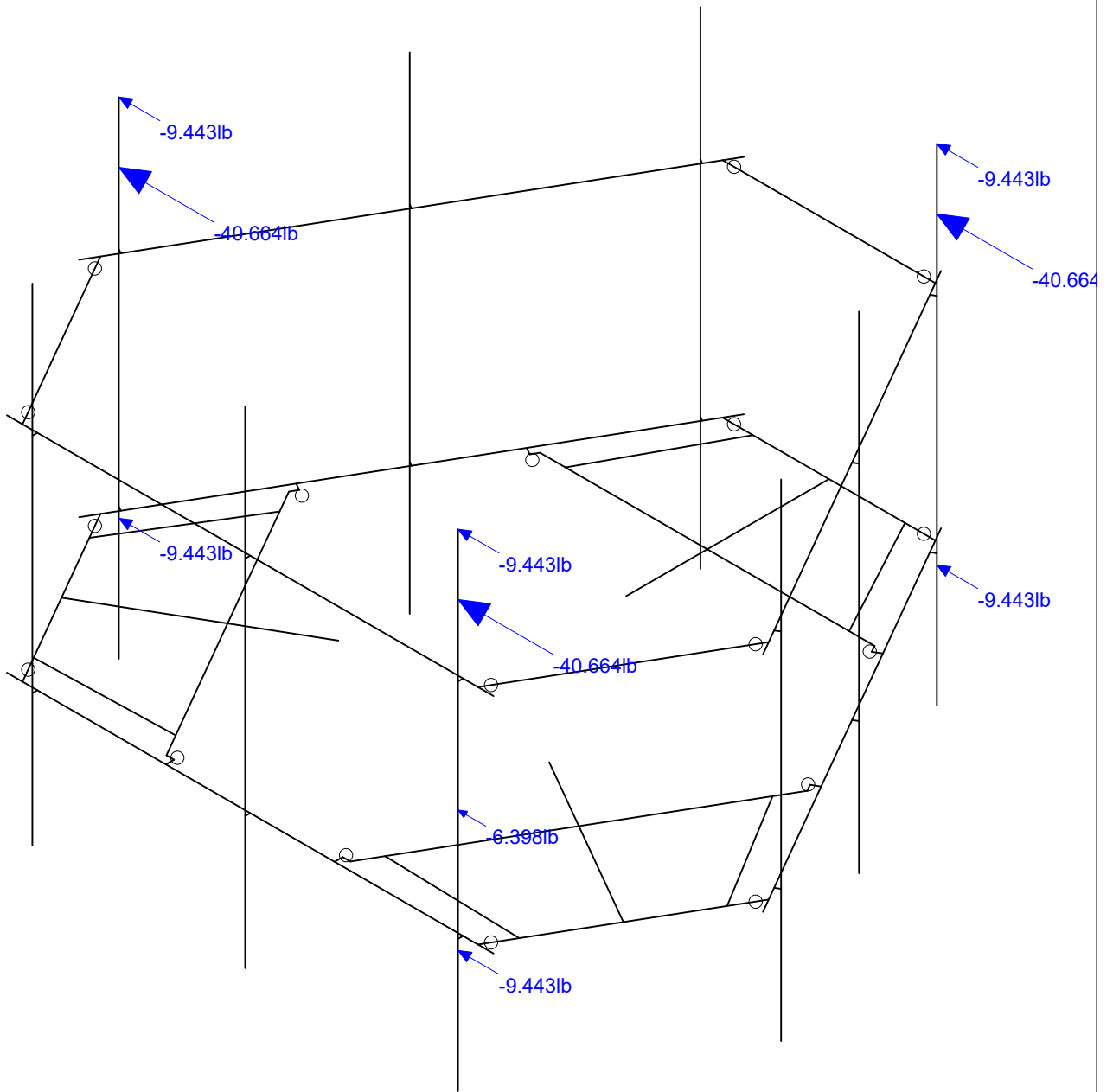
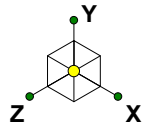


Loads: BLC 31, Seismic Load Z

Infinigy Engineering, PLLC
PSM
1197-F0001-C

BOBDL00013A

Seismic Load AZI 000
Aug 25, 2021 at 3:24 PM
BOBDL00013A_loaded.r3d

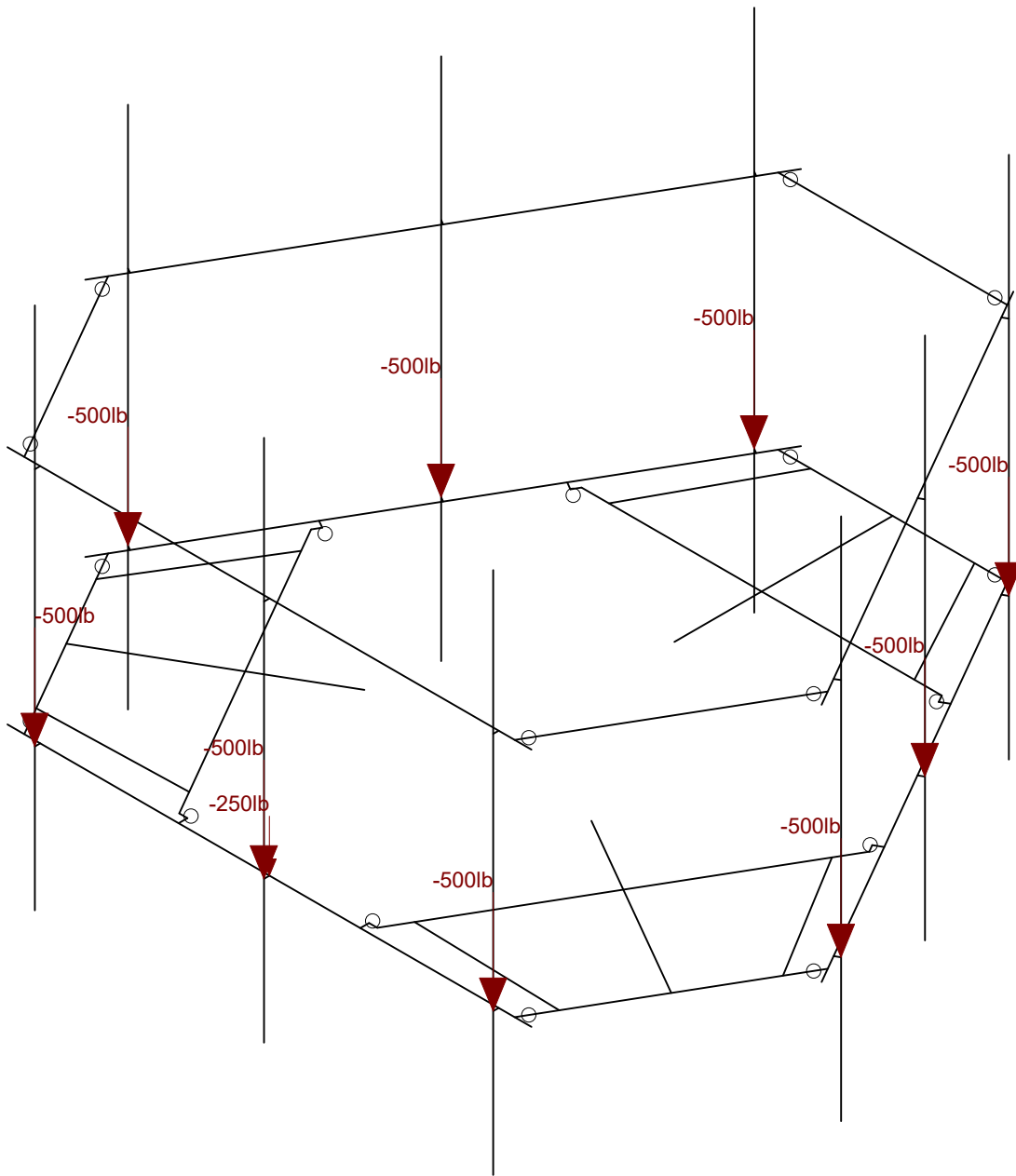
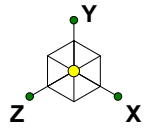


Loads: BLC 32, Seismic Load X

Infinigy Engineering, PLLC
PSM
1197-F0001-C

BOBDL00013A

Seismic Load AZI 090
Aug 25, 2021 at 3:25 PM
BOBDL00013A_loaded.r3d

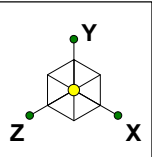


Loads: LL - Live Load

Infinigy Engineering, PLLC
PSM
1197-F0001-C

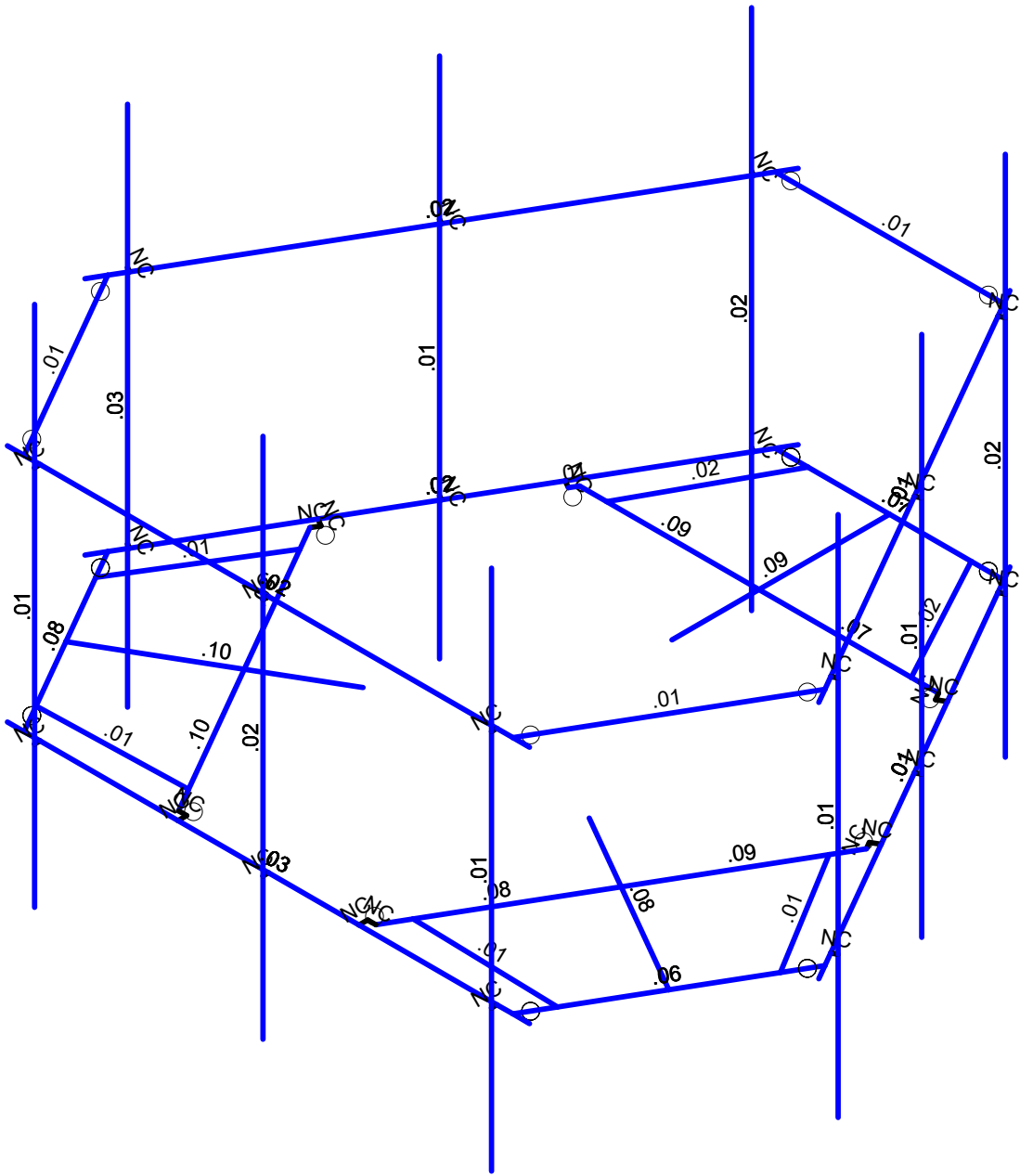
BOBDL00013A

Non-concurrent Live Loads
Aug 25, 2021 at 3:25 PM
BOBDL00013A_loaded.r3d



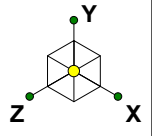
Code Check
(LC 1)

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



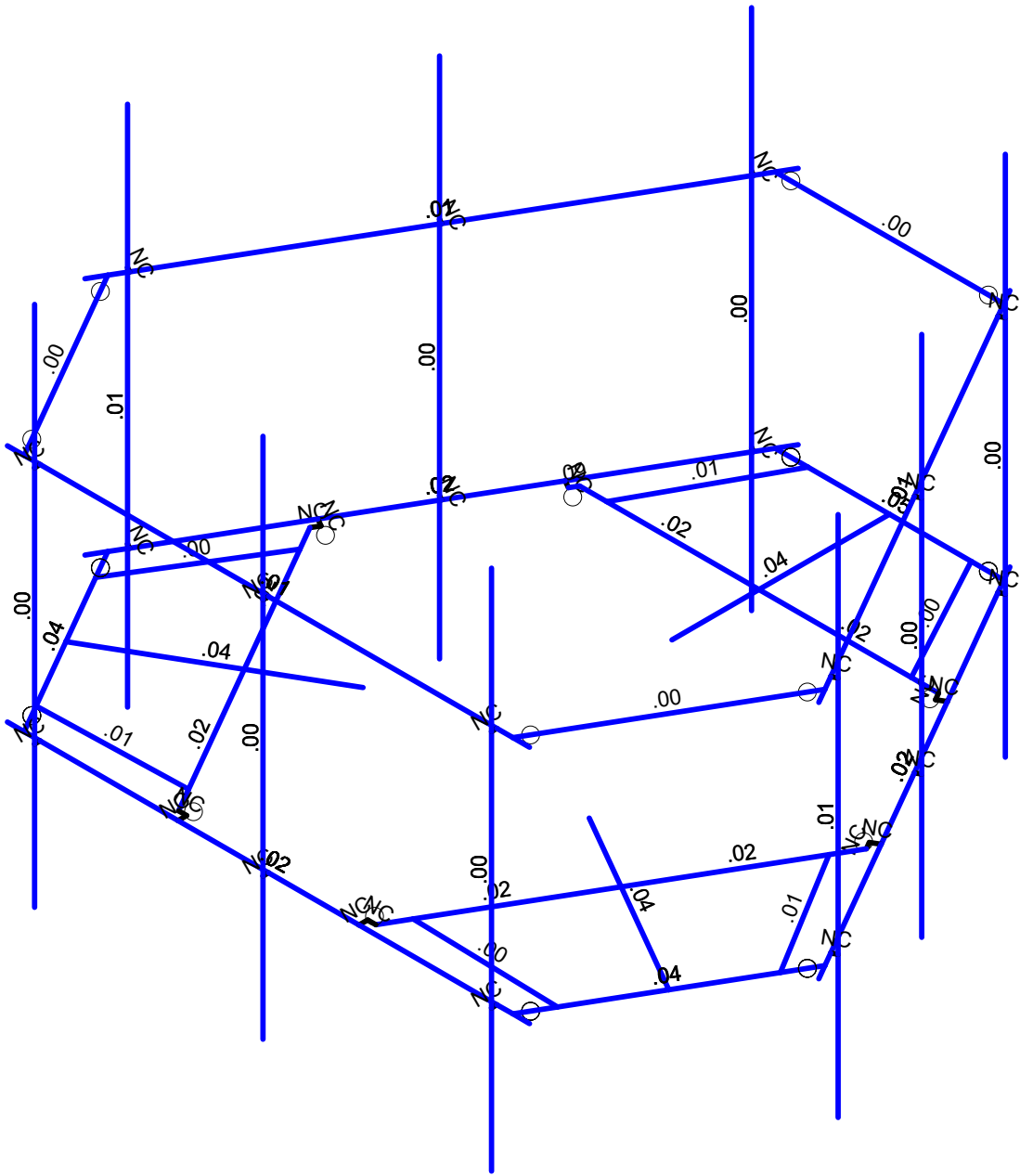
Member Code Checks Displayed
Results for LC 1, 1.4DL

Infinigy Engineering, PLLC	BOBDL00013A	Bending Check
PSM		Aug 25, 2021 at 3:25 PM
1197-F0001-C		BOBDL00013A_loaded.r3d



Shear Check
(LC 1)

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



Member Shear Checks Displayed
Results for LC 1, 1.4DL

Infinigy Engineering, PLLC	BOBDL00013A	Shear Check
PSM		Aug 25, 2021 at 3:26 PM
1197-F0001-C		BOBDL00013A_loaded.r3d

Program Inputs

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

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	C	
Topo Factor Procedure:	Method 1, Category 1	
Site Class:	D - Stiff Soil (Assumed)	
Ground Elevation:	195.28	ft *Rev H

MOUNT INFORMATION		
Mount Type:	Platform	
Num Sectors:	3	
Centerline AGL:	105.00	ft
Tower Height AGL:	151.50	ft

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

FACTORS		
Directionality Fact. (K_d):	0.950	
Ground Ele. Factor (K_e):	0.993	*Rev H Only
Rooftop Speed-Up (K_s):	1.000	*Rev H Only
Topographic Factor (K_{zt}):	1.000	
Gust Effect Factor (G_h):	1.000	

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

WIND AND ICE DATA		
Ultimate Wind (V_{ult}):	125	mph
Design Wind (V):	N/A	mph
Ice Wind (V_{ice}):	50	mph
Base Ice Thickness (t_i):	2	in
Flat Pressure:	96.496	psf
Round Pressure:	57.897	psf
Ice Wind Pressure:	9.264	psf

SEISMIC DATA		
Short-Period Accel. (S_s):	0.183	g
1-Second Accel. (S_1):	0.063	g
Short-Period Design (S_{DS}):	0.195	
1-Second Design (S_{D1}):	0.101	
Short-Period Coeff. (F_a):	1.600	
1-Second Coeff. (F_v):	2.400	
Amplification Factor (A_s):	3.000	
Response Mod. Coeff. (R):	2.000	



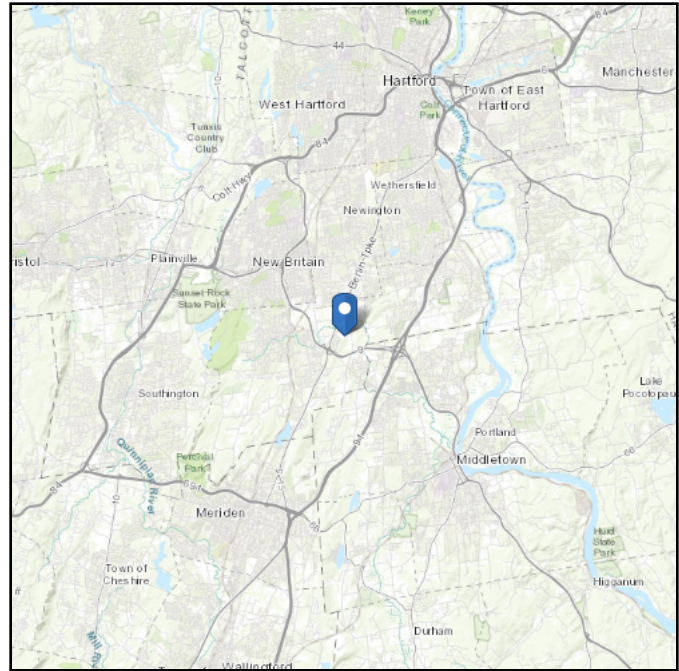
Infinigy Load Calculator V2.1.7

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 195.28 ft (NAVD 88)
Latitude: 41.631722
Longitude: -72.7299



Wind

Results:

Wind Speed:	125 mph per Berlin City Requirements in WSEL
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	93 Vmph
100-year MRI	100 Vmph

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

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

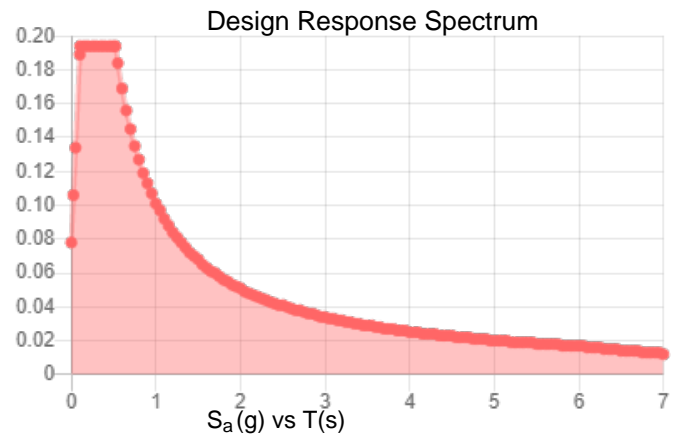
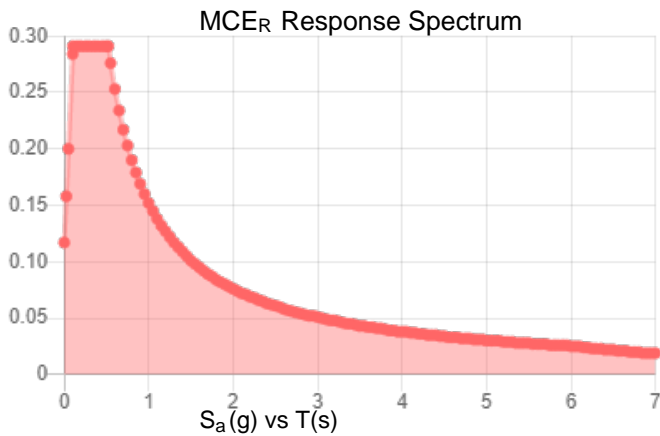
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.183	S_{DS} :	0.194
S_1 :	0.063	S_{D1} :	0.101
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.093
S_{MS} :	0.291	PGA _M :	0.148
S_{M1} :	0.152	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Wed Aug 25 2021

Date Source:

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

Ice

Results:

Ice Thickness: 1.00 in.

Concurrent Temperature: 5 F

Gust Speed: 50 mph

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

Date Accessed: Wed Aug 25 2021

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

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

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

Member Primary Data

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



Member Primary Data (Continued)

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

Material Takeoff

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



Company : Infinigy Engineering, PLLC
 Designer : PSM
 Job Number : 1197-F0001-C
 Model Name : BOBDL00013A

Aug 25, 2021
 3:20 PM
 Checked By: _____

Material Takeoff (Continued)

	Material	Size	Pieces	Length[in]	Weight[LB]
14	A529 Gr. 50	L2x2x4	6	163.8	43.838
15	Total HR Steel		37	2175.3	1109.525

Basic Load Cases

	BLC Description	Category	X Gr...	Y Gr...	Z Gr...	Joint	Point	Distributed	Area(Memb...	Surface(Plate/Wall)
1	Self Weight	DL		-1			13		3	
2	Wind Load AZI 0	WLZ					26			
3	Wind Load AZI 30	None					26			
4	Wind Load AZI 60	None					26			
5	Wind Load AZI 90	WLX					26			
6	Wind Load AZI 1...	None					26			
7	Wind Load AZI 1...	None					26			
8	Wind Load AZI 1...	None					26			
9	Wind Load AZI 2...	None					26			
10	Wind Load AZI 2...	None					26			
11	Wind Load AZI 2...	None					26			
12	Wind Load AZI 3...	None					26			
13	Wind Load AZI 3...	None					26			
14	Distr. Wind Load Z	WLZ						66		
15	Distr. Wind Load X	WLX						66		
16	Ice Weight	OL1					13	66	3	
17	Ice Wind Load A...	OL2					26			
18	Ice Wind Load A...	None					26			
19	Ice Wind Load A...	None					26			
20	Ice Wind Load A...	OL3					26			
21	Ice Wind Load A...	None					26			
22	Ice Wind Load A...	None					26			
23	Ice Wind Load A...	None					26			
24	Ice Wind Load A...	None					26			
25	Ice Wind Load A...	None					26			
26	Ice Wind Load A...	None					26			
27	Ice Wind Load A...	None					26			
28	Ice Wind Load A...	None					26			
29	Distr. Ice Wind L...	OL2						66		
30	Distr. Ice Wind L...	OL3						66		
31	Seismic Load Z	ELZ			-.293		13			
32	Seismic Load X	ELX	-.293				13			
33	Service Live Loa...	LL				1				
34	Maintenance Loa...	LL				1				
35	Maintenance Loa...	LL				1				
36	Maintenance Loa...	LL				1				



Load Combinations (Continued)

	Description	S...	P...	S...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...
73	1.0DL + 1.5LL + 1.0SWL (60 ...	Y...	Y	1	1	12	.23	14	.115	15	-.2	33	1.5						
74	1.0DL + 1.5LL + 1.0SWL (60 ...	Y...	Y	1	1	13	.23	14	.2	15	-.1	33	1.5						
75	1.2DL + 1.5LL	Y...	Y	1	1.2	33	1.5												
76	1.2DL + 1.5LM-MP1 + 1SWL (...Y...	Y...	Y	1	1.2	34	1.5	2	.058	14	.058	15							
77	1.2DL + 1.5LM-MP1 + 1SWL (...Y...	Y...	Y	1	1.2	34	1.5	3	.058	14	.05	15	.029						
78	1.2DL + 1.5LM-MP1 + 1SWL (...Y...	Y...	Y	1	1.2	34	1.5	4	.058	14	.029	15	.05						
79	1.2DL + 1.5LM-MP1 + 1SWL (...Y...	Y...	Y	1	1.2	34	1.5	5	.058	14		15	.058						
80	1.2DL + 1.5LM-MP1 + 1SWL (...Y...	Y...	Y	1	1.2	34	1.5	6	.058	14	-.0	15	.05						
81	1.2DL + 1.5LM-MP1 + 1SWL (...Y...	Y...	Y	1	1.2	34	1.5	7	.058	14	-.05	15	.029						
82	1.2DL + 1.5LM-MP1 + 1SWL (...Y...	Y...	Y	1	1.2	34	1.5	8	.058	14	-.0	15							
83	1.2DL + 1.5LM-MP1 + 1SWL (...Y...	Y...	Y	1	1.2	34	1.5	9	.058	14	-.05	15	-.0						
84	1.2DL + 1.5LM-MP1 + 1SWL (...Y...	Y...	Y	1	1.2	34	1.5	10	.058	14	-.0	15	-.05						
85	1.2DL + 1.5LM-MP1 + 1SWL (...Y...	Y...	Y	1	1.2	34	1.5	11	.058	14		15	-.0						
86	1.2DL + 1.5LM-MP1 + 1SWL (...Y...	Y...	Y	1	1.2	34	1.5	12	.058	14	.029	15	-.05						
87	1.2DL + 1.5LM-MP1 + 1SWL (...Y...	Y...	Y	1	1.2	34	1.5	13	.058	14	.05	15	-.0						
88	1.2DL + 1.5LM-MP2 + 1SWL (...Y...	Y...	Y	1	1.2	35	1.5	2	.058	14	.058	15							
89	1.2DL + 1.5LM-MP2 + 1SWL (...Y...	Y...	Y	1	1.2	35	1.5	3	.058	14	.05	15	.029						
90	1.2DL + 1.5LM-MP2 + 1SWL (...Y...	Y...	Y	1	1.2	35	1.5	4	.058	14	.029	15	.05						
91	1.2DL + 1.5LM-MP2 + 1SWL (...Y...	Y...	Y	1	1.2	35	1.5	5	.058	14		15	.058						
92	1.2DL + 1.5LM-MP2 + 1SWL (...Y...	Y...	Y	1	1.2	35	1.5	6	.058	14	-.0	15	.05						
93	1.2DL + 1.5LM-MP2 + 1SWL (...Y...	Y...	Y	1	1.2	35	1.5	7	.058	14	-.05	15	.029						
94	1.2DL + 1.5LM-MP2 + 1SWL (...Y...	Y...	Y	1	1.2	35	1.5	8	.058	14	-.0	15							
95	1.2DL + 1.5LM-MP2 + 1SWL (...Y...	Y...	Y	1	1.2	35	1.5	9	.058	14	-.05	15	-.0						
96	1.2DL + 1.5LM-MP2 + 1SWL (...Y...	Y...	Y	1	1.2	35	1.5	10	.058	14	-.0	15	-.05						
97	1.2DL + 1.5LM-MP2 + 1SWL (...Y...	Y...	Y	1	1.2	35	1.5	11	.058	14		15	-.0						
98	1.2DL + 1.5LM-MP2 + 1SWL (...Y...	Y...	Y	1	1.2	35	1.5	12	.058	14	.029	15	-.05						
99	1.2DL + 1.5LM-MP2 + 1SWL (...Y...	Y...	Y	1	1.2	35	1.5	13	.058	14	.05	15	-.0						
100	1.2DL + 1.5LM-MP3 + 1SWL (...Y...	Y...	Y	1	1.2	36	1.5	2	.058	14	.058	15							
101	1.2DL + 1.5LM-MP3 + 1SWL (...Y...	Y...	Y	1	1.2	36	1.5	3	.058	14	.05	15	.029						
102	1.2DL + 1.5LM-MP3 + 1SWL (...Y...	Y...	Y	1	1.2	36	1.5	4	.058	14	.029	15	.05						
103	1.2DL + 1.5LM-MP3 + 1SWL (...Y...	Y...	Y	1	1.2	36	1.5	5	.058	14		15	.058						
104	1.2DL + 1.5LM-MP3 + 1SWL (...Y...	Y...	Y	1	1.2	36	1.5	6	.058	14	-.0	15	.05						
105	1.2DL + 1.5LM-MP3 + 1SWL (...Y...	Y...	Y	1	1.2	36	1.5	7	.058	14	-.05	15	.029						
106	1.2DL + 1.5LM-MP3 + 1SWL (...Y...	Y...	Y	1	1.2	36	1.5	8	.058	14	-.0	15							
107	1.2DL + 1.5LM-MP3 + 1SWL (...Y...	Y...	Y	1	1.2	36	1.5	9	.058	14	-.05	15	-.0						
108	1.2DL + 1.5LM-MP3 + 1SWL (...Y...	Y...	Y	1	1.2	36	1.5	10	.058	14	-.0	15	-.05						
109	1.2DL + 1.5LM-MP3 + 1SWL (...Y...	Y...	Y	1	1.2	36	1.5	11	.058	14		15	-.0						
110	1.2DL + 1.5LM-MP3 + 1SWL (...Y...	Y...	Y	1	1.2	36	1.5	12	.058	14	.029	15	-.05						
111	1.2DL + 1.5LM-MP3 + 1SWL (...Y...	Y...	Y	1	1.2	36	1.5	13	.058	14	.05	15	-.0						
112	1.2DL + 1.5LM-MP4 + 1SWL (...Y...	Y...	Y	1	1.2	37	1.5	2	.058	14	.058	15							
113	1.2DL + 1.5LM-MP4 + 1SWL (...Y...	Y...	Y	1	1.2	37	1.5	3	.058	14	.05	15	.029						
114	1.2DL + 1.5LM-MP4 + 1SWL (...Y...	Y...	Y	1	1.2	37	1.5	4	.058	14	.029	15	.05						



Load Combinations (Continued)

	Description	S...	P...	S...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...
115	1.2DL + 1.5LM-MP4 + 1SWL (...Y...)	Y		1	1.2	37	1.5	5	.058	14		15	.058						
116	1.2DL + 1.5LM-MP4 + 1SWL (...Y...)	Y		1	1.2	37	1.5	6	.058	14	-0...	15	.05						
117	1.2DL + 1.5LM-MP4 + 1SWL (...Y...)	Y		1	1.2	37	1.5	7	.058	14	-05	15	.029						
118	1.2DL + 1.5LM-MP4 + 1SWL (...Y...)	Y		1	1.2	37	1.5	8	.058	14	-0...	15							
119	1.2DL + 1.5LM-MP4 + 1SWL (...Y...)	Y		1	1.2	37	1.5	9	.058	14	-05	15	-0...						
120	1.2DL + 1.5LM-MP4 + 1SWL (...Y...)	Y		1	1.2	37	1.5	10	.058	14	-0...	15	-05						
121	1.2DL + 1.5LM-MP4 + 1SWL (...Y...)	Y		1	1.2	37	1.5	11	.058	14		15	-0...						
122	1.2DL + 1.5LM-MP4 + 1SWL (...Y...)	Y		1	1.2	37	1.5	12	.058	14	.029	15	-05						
123	1.2DL + 1.5LM-MP4 + 1SWL (...Y...)	Y		1	1.2	37	1.5	13	.058	14	.05	15	-0...						
124	1.2DL + 1.5LM-MP5 + 1SWL (...Y...)	Y		1	1.2	38	1.5	2	.058	14	.058	15							
125	1.2DL + 1.5LM-MP5 + 1SWL (...Y...)	Y		1	1.2	38	1.5	3	.058	14	.05	15	.029						
126	1.2DL + 1.5LM-MP5 + 1SWL (...Y...)	Y		1	1.2	38	1.5	4	.058	14	.029	15	.05						
127	1.2DL + 1.5LM-MP5 + 1SWL (...Y...)	Y		1	1.2	38	1.5	5	.058	14		15	.058						
128	1.2DL + 1.5LM-MP5 + 1SWL (...Y...)	Y		1	1.2	38	1.5	6	.058	14	-0...	15	.05						
129	1.2DL + 1.5LM-MP5 + 1SWL (...Y...)	Y		1	1.2	38	1.5	7	.058	14	-05	15	.029						
130	1.2DL + 1.5LM-MP5 + 1SWL (...Y...)	Y		1	1.2	38	1.5	8	.058	14	-0...	15							
131	1.2DL + 1.5LM-MP5 + 1SWL (...Y...)	Y		1	1.2	38	1.5	9	.058	14	-05	15	-0...						
132	1.2DL + 1.5LM-MP5 + 1SWL (...Y...)	Y		1	1.2	38	1.5	10	.058	14	-0...	15	-05						
133	1.2DL + 1.5LM-MP5 + 1SWL (...Y...)	Y		1	1.2	38	1.5	11	.058	14		15	-0...						
134	1.2DL + 1.5LM-MP5 + 1SWL (...Y...)	Y		1	1.2	38	1.5	12	.058	14	.029	15	-05						
135	1.2DL + 1.5LM-MP5 + 1SWL (...Y...)	Y		1	1.2	38	1.5	13	.058	14	.05	15	-0...						
136	1.2DL + 1.5LM-MP6 + 1SWL (...Y...)	Y		1	1.2	39	1.5	2	.058	14	.058	15							
137	1.2DL + 1.5LM-MP6 + 1SWL (...Y...)	Y		1	1.2	39	1.5	3	.058	14	.05	15	.029						
138	1.2DL + 1.5LM-MP6 + 1SWL (...Y...)	Y		1	1.2	39	1.5	4	.058	14	.029	15	.05						
139	1.2DL + 1.5LM-MP6 + 1SWL (...Y...)	Y		1	1.2	39	1.5	5	.058	14		15	.058						
140	1.2DL + 1.5LM-MP6 + 1SWL (...Y...)	Y		1	1.2	39	1.5	6	.058	14	-0...	15	.05						
141	1.2DL + 1.5LM-MP6 + 1SWL (...Y...)	Y		1	1.2	39	1.5	7	.058	14	-05	15	.029						
142	1.2DL + 1.5LM-MP6 + 1SWL (...Y...)	Y		1	1.2	39	1.5	8	.058	14	-0...	15							
143	1.2DL + 1.5LM-MP6 + 1SWL (...Y...)	Y		1	1.2	39	1.5	9	.058	14	-05	15	-0...						
144	1.2DL + 1.5LM-MP6 + 1SWL (...Y...)	Y		1	1.2	39	1.5	10	.058	14	-0...	15	-05						
145	1.2DL + 1.5LM-MP6 + 1SWL (...Y...)	Y		1	1.2	39	1.5	11	.058	14		15	-0...						
146	1.2DL + 1.5LM-MP6 + 1SWL (...Y...)	Y		1	1.2	39	1.5	12	.058	14	.029	15	-05						
147	1.2DL + 1.5LM-MP6 + 1SWL (...Y...)	Y		1	1.2	39	1.5	13	.058	14	.05	15	-0...						
148	1.2DL + 1.5LM-MP7 + 1SWL (...Y...)	Y		1	1.2	40	1.5	2	.058	14	.058	15							
149	1.2DL + 1.5LM-MP7 + 1SWL (...Y...)	Y		1	1.2	40	1.5	3	.058	14	.05	15	.029						
150	1.2DL + 1.5LM-MP7 + 1SWL (...Y...)	Y		1	1.2	40	1.5	4	.058	14	.029	15	.05						
151	1.2DL + 1.5LM-MP7 + 1SWL (...Y...)	Y		1	1.2	40	1.5	5	.058	14		15	.058						
152	1.2DL + 1.5LM-MP7 + 1SWL (...Y...)	Y		1	1.2	40	1.5	6	.058	14	-0...	15	.05						
153	1.2DL + 1.5LM-MP7 + 1SWL (...Y...)	Y		1	1.2	40	1.5	7	.058	14	-05	15	.029						
154	1.2DL + 1.5LM-MP7 + 1SWL (...Y...)	Y		1	1.2	40	1.5	8	.058	14	-0...	15							
155	1.2DL + 1.5LM-MP7 + 1SWL (...Y...)	Y		1	1.2	40	1.5	9	.058	14	-05	15	-0...						
156	1.2DL + 1.5LM-MP7 + 1SWL (...Y...)	Y		1	1.2	40	1.5	10	.058	14	-0...	15	-05						

Load Combinations (Continued)

	Description	S...	P...	S...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...	Fa...B...
157	1.2DL + 1.5LM-MP7 + 1SWL (...Y...Y		Y	1	1.2	40	1.5	11	.058	14		15	-0...					
158	1.2DL + 1.5LM-MP7 + 1SWL (...Y...Y		Y	1	1.2	40	1.5	12	.058	14	.029	15	-05					
159	1.2DL + 1.5LM-MP7 + 1SWL (...Y...Y		Y	1	1.2	40	1.5	13	.058	14	.05	15	-0...					
160	1.2DL + 1.5LM-MP8 + 1SWL (...Y...Y		Y	1	1.2	41	1.5	2	.058	14	.058	15						
161	1.2DL + 1.5LM-MP8 + 1SWL (...Y...Y		Y	1	1.2	41	1.5	3	.058	14	.05	15	.029					
162	1.2DL + 1.5LM-MP8 + 1SWL (...Y...Y		Y	1	1.2	41	1.5	4	.058	14	.029	15	.05					
163	1.2DL + 1.5LM-MP8 + 1SWL (...Y...Y		Y	1	1.2	41	1.5	5	.058	14		15	.058					
164	1.2DL + 1.5LM-MP8 + 1SWL (...Y...Y		Y	1	1.2	41	1.5	6	.058	14	-0...	15	.05					
165	1.2DL + 1.5LM-MP8 + 1SWL (...Y...Y		Y	1	1.2	41	1.5	7	.058	14	-05	15	.029					
166	1.2DL + 1.5LM-MP8 + 1SWL (...Y...Y		Y	1	1.2	41	1.5	8	.058	14	-0...	15						
167	1.2DL + 1.5LM-MP8 + 1SWL (...Y...Y		Y	1	1.2	41	1.5	9	.058	14	-05	15	-0...					
168	1.2DL + 1.5LM-MP8 + 1SWL (...Y...Y		Y	1	1.2	41	1.5	10	.058	14	-0...	15	-05					
169	1.2DL + 1.5LM-MP8 + 1SWL (...Y...Y		Y	1	1.2	41	1.5	11	.058	14		15	-0...					
170	1.2DL + 1.5LM-MP8 + 1SWL (...Y...Y		Y	1	1.2	41	1.5	12	.058	14	.029	15	-05					
171	1.2DL + 1.5LM-MP8 + 1SWL (...Y...Y		Y	1	1.2	41	1.5	13	.058	14	.05	15	-0...					
172	1.2DL + 1.5LM-MP9 + 1SWL (...Y...Y		Y	1	1.2	42	1.5	2	.058	14	.058	15						
173	1.2DL + 1.5LM-MP9 + 1SWL (...Y...Y		Y	1	1.2	42	1.5	3	.058	14	.05	15	.029					
174	1.2DL + 1.5LM-MP9 + 1SWL (...Y...Y		Y	1	1.2	42	1.5	4	.058	14	.029	15	.05					
175	1.2DL + 1.5LM-MP9 + 1SWL (...Y...Y		Y	1	1.2	42	1.5	5	.058	14		15	.058					
176	1.2DL + 1.5LM-MP9 + 1SWL (...Y...Y		Y	1	1.2	42	1.5	6	.058	14	-0...	15	.05					
177	1.2DL + 1.5LM-MP9 + 1SWL (...Y...Y		Y	1	1.2	42	1.5	7	.058	14	-05	15	.029					
178	1.2DL + 1.5LM-MP9 + 1SWL (...Y...Y		Y	1	1.2	42	1.5	8	.058	14	-0...	15						
179	1.2DL + 1.5LM-MP9 + 1SWL (...Y...Y		Y	1	1.2	42	1.5	9	.058	14	-05	15	-0...					
180	1.2DL + 1.5LM-MP9 + 1SWL (...Y...Y		Y	1	1.2	42	1.5	10	.058	14	-0...	15	-05					
181	1.2DL + 1.5LM-MP9 + 1SWL (...Y...Y		Y	1	1.2	42	1.5	11	.058	14		15	-0...					
182	1.2DL + 1.5LM-MP9 + 1SWL (...Y...Y		Y	1	1.2	42	1.5	12	.058	14	.029	15	-05					

Envelope Joint Reactions

	Joint	X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	P24	1097.115	6	2640.04	35	1686.7...	13	1144.3...	16	2155.489	19	4725.006	35
2		-1078.757	24	-632.56	16	-1678.9...	19	-4201.3...	35	-2171.243	13	-1989.474	16
3	P13	1280.245	4	2897.4...	31	1675.8...	15	1108.1...	24	2282.597	15	1869.524	24
4		-1279.589	22	-575.9...	24	-1682.1...	9	-2820.5...	92	-2327.727	9	-6642.13	31
5	P1	1672.561	17	2687.6...	27	871.068	2	6479.7...	27	1894.204	11	1583.55	115
6		-1691.725	11	-652.7...	20	-878.812	8	-2358.1...	20	-1842.615	17	-865.338	157
7	Totals:	3845.683	5	7421.1...	34	4073.2...	14						
8		-3845.675	23	1531.7...	53	-4073.2...	8						



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

Member	Shape	Code Check	Loc[in]	LC	She...	Loc[in]	Dir	LC	phi*P...	phi*P...	phi*M...	phi*Mn z-z [lb...	Cb	Eqn	
1	CA1	C3.38x2.06...	.353	0	31	.060	28.188	y	36	4776...	56700	2202...	5751.945	1....	H1-1b
2	P3	PL6.5x0.375	.349	21	2	.172	36.312	y	30	3658...	78975	616.9...	7931.024	1....	H1-1b
3	P2	PL6.5x0.375	.339	21	6	.150	36.312	y	10	3658...	78975	616.9...	7906.153	1....	H1-1b
4	S2	HSS4X4X6	.332	0	32	.115	0	y	32	1882...	1978...	2204...	22045.5	1.92	H1-1b
5	P1	PL6.5x0.375	.325	21	10	.167	36.312	y	2	3658...	78975	616.9...	7965.429	1....	H1-1b
6	CA5	C3.38x2.06...	.321	0	35	.057	28.187	y	28	4776...	56700	2202...	5751.945	1....	H1-1b
7	CA4	C3.38x2.06...	.318	33	2	.047	33	y	31	4776...	56700	2202...	5751.945	1....	H1-1b
8	CA3	C3.38x2.06...	.314	0	27	.056	28.188	y	32	4776...	56700	2202...	5751.945	1....	H1-1b
9	S3	HSS4X4X6	.306	0	38	.118	0	y	29	1882...	1978...	2204...	22045.5	1....	H1-1b
10	CA6	C3.38x2.06...	.302	33	10	.050	33	y	38	4776...	56700	2202...	5751.945	1....	H1-1b
11	CA2	C3.38x2.06...	.299	33	6	.048	33	y	34	4776...	56700	2202...	5751.945	1.62	H1-1b
12	CA7	L6.6x4.46x0...	.299	41.562	3	.039	42	z	8	5117...	87561	2464...	7125.374	1....	H2-1
13	CA8	L6.6x4.46x0...	.295	41.562	22	.041	42	z	4	5117...	87561	2464...	7125.374	1....	H2-1
14	HR3	2.88x0.120	.293	6	2	.132	92		6	2249...	4307...	3155...	3155.674	1....	H1-1b
15	M75	PL 2.375x0.5	.292	1.5	12	.270	0	y	28	3825...	38475	400.7...	1903.711	2....	H1-1b
16	S1	HSS4X4X6	.288	0	36	.119	0	y	37	1882...	1978...	2204...	22045.5	1....	H1-1b
17	HR2	2.88x0.120	.287	90	3	.142	92		4	2249...	4307...	3155...	3155.674	1.66	H1-1b
18	HR1	2.88x0.120	.273	6	4	.124	6		4	2249...	4307...	3155...	3155.674	1....	H1-1b
19	CA9	L6.6x4.46x0...	.263	41.562	6	.037	42	z	12	5117...	87561	2464...	7125.374	1....	H2-1
20	MP2	PIPE 2.5	.239	70	5	.086	70		5	3348...	66654	4726.5	4726.5	4....	H1-1b
21	MP5	PIPE 2.5	.235	70	7	.073	70		7	3348...	66654	4726.5	4726.5	4....	H1-1b
22	GA4	L2x2x4	.221	0	2	.016	27.295	y	9	2952...	42480	959.63	2190.068	2....	H2-1
23	MP8	PIPE 2.5	.212	70	9	.091	70		3	3348...	66654	4726.5	4726.5	4.1	H1-1b
24	GA5	L2x2x4	.209	0	9	.026	27.295	y	38	2952...	42480	959.63	2190.068	2....	H2-1
25	GA2	L2x2x4	.203	0	12	.016	0	y	12	2952...	42480	959.63	2190.068	2....	H2-1
26	GA6	L2x2x4	.195	0	4	.016	0	y	4	2952...	42480	959.63	2190.068	2....	H2-1
27	GA1	L2x2x4	.192	0	5	.027	27.295	y	34	2952...	42480	959.63	2190.068	2....	H2-1
28	MP9	PIPE 2.5	.189	70	2	.086	70		7	3348...	66654	4726.5	4726.5	3....	H1-1b
29	GA3	L2x2x4	.188	0	7	.027	27.295	y	30	2952...	42480	959.63	2190.068	2....	H2-1
30	MP1	PIPE 2.5	.172	70	11	.104	26		8	3348...	66654	4726.5	4726.5	2....	H1-1b
31	MP6	PIPE 2.5	.170	70	7	.091	70		6	3348...	66654	4726.5	4726.5	4....	H1-1b
32	MP3	PIPE 2.5	.166	70	5	.094	70		3	3348...	66654	4726.5	4726.5	4....	H1-1b
33	MP4	PIPE 2.5	.160	70	7	.092	26		4	3348...	66654	4726.5	4726.5	1....	H1-1b
34	MP7	PIPE 2.5	.158	70	9	.084	26		6	3348...	66654	4726.5	4726.5	3.43	H1-1b
35	H3	Pipe3.5x0.1...	.147	31	2	.089	90		2	4587...	7158...	6337...	6337.65	1.91	H1-1b
36	H1	Pipe3.5x0.1...	.142	31	10	.079	48		4	4587...	7158...	6337...	6337.65	2....	H1-1b
37	H2	Pipe3.5x0.1...	.136	31	6	.063	48		12	4587...	7158...	6337...	6337.65	1....	H1-1b

Hot Rolled Steel Section Sets

Label	Shape	Type	Design List	Material	Design...	A [in ²]	Iyy [in ⁴]	Izz [in ⁴]	J [in ⁴]
1	Corner Plates	Beam	None	A1011 ...	Typical	2.438	.029	8.582	.11
2	6"x0.37" Plate	Beam	None	A1011 ...	Typical	2.22	.025	6.66	.097
3	Grating Angle	Beam	None	A529 G...	Typical	.944	.346	.346	.021
4	Face Pipes(3.5x.1...	Beam	None	A500 G...	Typical	1.729	2.409	2.409	4.819
5	Antenna Pipes	Beam	None	A500 G...	Typical	1.61	1.45	1.45	2.89
6	Channel(3.38x2.06)	Beam	None	A1011 ...	Typical	1.75	.715	3.026	.034
7	Square Tubing	Beam	None	A500 G...	Typical	4.78	10.3	10.3	17.5
8	Handrail Connector	Beam	None	A1011 ...	Typical	2.703	4.759	12.473	.055
9	Handrail	Beam	None	A500 G...	Typical	1.04	.993	.993	1.985

Joint Boundary Conditions

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

Member Advanced Data

Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical Defl Ra..	Analysis ...	Inactive	Seismi...
1	S3					Yes			None
2	GA4					Yes			None
3	GA3					Yes			None
4	P3	BenPIN	BenPIN			Yes	Default		None
5	S2					Yes			None
6	GA2					Yes			None
7	GA1					Yes			None
8	P2	BenPIN	BenPIN			Yes	Default		None
9	S1					Yes	Default		None
10	GA6					Yes			None
11	GA5					Yes			None
12	P1	BenPIN	BenPIN			Yes	Default		None
13	H1					Yes			None
14	MP1					Yes	+y+3		None
15	MP3					Yes	+y+3		None
16	HR1					Yes			None
17	CA8	00000X	00000X			Yes			None
18	CA9	00000X	00000X			Yes			None
19	CA7	00000X	00000X			Yes	Default		None
20	M32					Yes	** NA **		None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Ra..	Analysis ...	Inactive	Seismi...
21	M35						Yes	** NA **			None
22	M36						Yes	** NA **			None
23	M39A						Yes	** NA **			None
24	CA3						Yes	Default			None
25	CA4						Yes	Default			None
26	CA1						Yes	Default			None
27	CA2						Yes	Default			None
28	CA5						Yes	Default			None
29	CA6						Yes	Default			None
30	M64	BenPIN					Yes	** NA **			None
31	M65						Yes	** NA **			None
32	M66	BenPIN					Yes	** NA **			None
33	M67						Yes	** NA **			None
34	M68	BenPIN					Yes	** NA **			None
35	M69						Yes	** NA **			None
36	M70	BenPIN					Yes	** NA **			None
37	M71						Yes	** NA **			None
38	M72	BenPIN					Yes	** NA **			None
39	M73						Yes	** NA **			None
40	M74	BenPIN					Yes	** NA **			None
41	M75						Yes	** NA **			None
42	MP2						Yes		+y+3		None
43	M43						Yes	** NA **			None
44	M44						Yes	** NA **			None
45	H3						Yes				None
46	MP7						Yes		+y+3		None
47	MP9						Yes		+y+3		None
48	HR3						Yes				None
49	M52						Yes	** NA **			None
50	M53						Yes	** NA **			None
51	M54						Yes	** NA **			None
52	M55						Yes	** NA **			None
53	H2						Yes				None
54	MP4						Yes		+y+3		None
55	MP6						Yes		+y+3		None
56	HR2						Yes				None
57	M66A						Yes	** NA **			None
58	M67A						Yes	** NA **			None
59	M68A						Yes	** NA **			None
60	M69A						Yes	** NA **			None
61	MP8						Yes		+y+3		None
62	M68B						Yes	** NA **			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical Defl Ra..	Analysis ...	Inactive	Seismi...
63	M69B						Yes	** NA **		None
64	MP5						Yes	+y+3		None
65	M71B						Yes	** NA **		None
66	M72B						Yes	** NA **		None

Hot Rolled Steel Design Parameters

	Label	Shape	Lengt...	Lbyy[in]	Lbzz[in]	Lcomp t...	Lcomp b..	L-tor...	Kyy	Kzz	Cb	Func...
1	S3	Square Tubing	40			Lbyy						Late...
2	GA4	Grating Angle	27.295			Lbyy						Late...
3	GA3	Grating Angle	27.295			Lbyy						Late...
4	P3	Corner Plates	42			Lbyy						Late...
5	S2	Square Tubing	40			Lbyy						Late...
6	GA2	Grating Angle	27.295			Lbyy						Late...
7	GA1	Grating Angle	27.295			Lbyy						Late...
8	P2	Corner Plates	42			Lbyy						Late...
9	S1	Square Tubing	40			Lbyy						Late...
10	GA6	Grating Angle	27.295			Lbyy						Late...
11	GA5	Grating Angle	27.295			Lbyy						Late...
12	P1	Corner Plates	42			Lbyy						Late...
13	H1	Face Pipes(3.5x.16)	96			Lbyy						Late...
14	MP1	Antenna Pipes	96			Lbyy						Late...
15	MP3	Antenna Pipes	96			Lbyy						Late...
16	HR1	Handrail	96			Lbyy						Late...
17	CA8	Handrail Connector	42			Lbyy						Late...
18	CA9	Handrail Connector	42			Lbyy						Late...
19	CA7	Handrail Connector	42			Lbyy						Late...
20	CA3	Channel(3.38x2.06)	33			Lbyy						Late...
21	CA4	Channel(3.38x2.06)	33			Lbyy						Late...
22	CA1	Channel(3.38x2.06)	33			Lbyy						Late...
23	CA2	Channel(3.38x2.06)	33			Lbyy						Late...
24	CA5	Channel(3.38x2.06)	33			Lbyy						Late...
25	CA6	Channel(3.38x2.06)	33			Lbyy						Late...
26	M75	PL 2.375x0.5	1.5			Lbyy						Late...
27	MP2	Antenna Pipes	96			Lbyy						Late...
28	H3	Face Pipes(3.5x.16)	96			Lbyy						Late...
29	MP7	Antenna Pipes	96			Lbyy						Late...
30	MP9	Antenna Pipes	96			Lbyy						Late...
31	HR3	Handrail	96			Lbyy						Late...
32	H2	Face Pipes(3.5x.16)	96			Lbyy						Late...
33	MP4	Antenna Pipes	96			Lbyy						Late...
34	MP6	Antenna Pipes	96			Lbyy						Late...

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Lengt...	Lbyy[in]	Lbzz[in]	Lcomp t...	Lcomp b...	L-tor...	Kyy	Kzz	Cb	Func...
35	HR2	Handrail	96			Lbyy						Late...
36	MP8	Antenna Pipes	96			Lbyy						Late...
37	MP5	Antenna Pipes	96			Lbyy						Late...

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

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N72B	L	Y	-250

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Member Point Loads (BLC 1 : Self Weight)

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

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	0	0
2	MP1	Z	-173.91	0
3	MP1	X	0	72
4	MP1	Z	-173.91	72
5	MP1	X	0	12
6	MP1	Z	-85.26	12
7	MP1	X	0	12
8	MP1	Z	-85.26	12
9	MP1	X	0	48
10	MP1	Z	-81.06	48
11	MP4	X	0	0
12	MP4	Z	-95.75	0
13	MP4	X	0	72
14	MP4	Z	-95.75	72
15	MP4	X	0	12
16	MP4	Z	-60.04	12



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
17	MP4	X	0	12
18	MP4	Z	-54.96	12
19	MP7	X	0	0
20	MP7	Z	-95.75	0
21	MP7	X	0	72
22	MP7	Z	-95.75	72
23	MP7	X	0	12
24	MP7	Z	-60.04	12
25	MP7	X	0	12
26	MP7	Z	-54.96	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-73.93	0
2	MP1	Z	-128.05	0
3	MP1	X	-73.93	72
4	MP1	Z	-128.05	72
5	MP1	X	-38.43	12
6	MP1	Z	-66.56	12
7	MP1	X	-37.58	12
8	MP1	Z	-65.09	12
9	MP1	X	-36.19	48
10	MP1	Z	-62.68	48
11	MP4	X	-73.93	0
12	MP4	Z	-128.05	0
13	MP4	X	-73.93	72
14	MP4	Z	-128.05	72
15	MP4	X	-38.43	12
16	MP4	Z	-66.56	12
17	MP4	X	-37.58	12
18	MP4	Z	-65.09	12
19	MP7	X	-34.85	0
20	MP7	Z	-60.36	0
21	MP7	X	-34.85	72
22	MP7	Z	-60.36	72
23	MP7	X	-25.82	12
24	MP7	Z	-44.72	12
25	MP7	X	-22.43	12
26	MP7	Z	-38.84	12

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

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



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	X	-82.92	0
2	MP1	Z	-47.87	0
3	MP1	X	-82.92	72
4	MP1	Z	-47.87	72
5	MP1	X	-52	12
6	MP1	Z	-30.02	12
7	MP1	X	-47.59	12
8	MP1	Z	-27.48	12
9	MP1	X	-47.63	48
10	MP1	Z	-27.5	48
11	MP4	X	-150.61	0
12	MP4	Z	-86.95	0
13	MP4	X	-150.61	72
14	MP4	Z	-86.95	72
15	MP4	X	-73.84	12
16	MP4	Z	-42.63	12
17	MP4	X	-73.84	12
18	MP4	Z	-42.63	12
19	MP7	X	-82.92	0
20	MP7	Z	-47.87	0
21	MP7	X	-82.92	72
22	MP7	Z	-47.87	72
23	MP7	X	-52	12
24	MP7	Z	-30.02	12
25	MP7	X	-47.59	12
26	MP7	Z	-27.48	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	X	-69.69	0
2	MP1	Z	0	0
3	MP1	X	-69.69	72
4	MP1	Z	0	72
5	MP1	X	-51.64	12
6	MP1	Z	0	12
7	MP1	X	-44.85	12
8	MP1	Z	0	12
9	MP1	X	-46.32	48
10	MP1	Z	0	48
11	MP4	X	-147.86	0
12	MP4	Z	0	0
13	MP4	X	-147.86	72



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
14	MP4	Z	0	72
15	MP4	X	-76.85	12
16	MP4	Z	0	12
17	MP4	X	-75.16	12
18	MP4	Z	0	12
19	MP7	X	-147.86	0
20	MP7	Z	0	0
21	MP7	X	-147.86	72
22	MP7	Z	0	72
23	MP7	X	-76.85	12
24	MP7	Z	0	12
25	MP7	X	-75.16	12
26	MP7	Z	0	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-82.92	0
2	MP1	Z	47.87	0
3	MP1	X	-82.92	72
4	MP1	Z	47.87	72
5	MP1	X	-52	12
6	MP1	Z	30.02	12
7	MP1	X	-47.59	12
8	MP1	Z	27.48	12
9	MP1	X	-47.63	48
10	MP1	Z	27.5	48
11	MP4	X	-82.92	0
12	MP4	Z	47.87	0
13	MP4	X	-82.92	72
14	MP4	Z	47.87	72
15	MP4	X	-52	12
16	MP4	Z	30.02	12
17	MP4	X	-47.59	12
18	MP4	Z	27.48	12
19	MP7	X	-150.61	0
20	MP7	Z	86.95	0
21	MP7	X	-150.61	72
22	MP7	Z	86.95	72
23	MP7	X	-73.84	12
24	MP7	Z	42.63	12
25	MP7	X	-73.84	12
26	MP7	Z	42.63	12



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-73.93	0
2	MP1	Z	128.05	0
3	MP1	X	-73.93	72
4	MP1	Z	128.05	72
5	MP1	X	-38.43	12
6	MP1	Z	66.56	12
7	MP1	X	-37.58	12
8	MP1	Z	65.09	12
9	MP1	X	-36.19	48
10	MP1	Z	62.68	48
11	MP4	X	-34.85	0
12	MP4	Z	60.36	0
13	MP4	X	-34.85	72
14	MP4	Z	60.36	72
15	MP4	X	-25.82	12
16	MP4	Z	44.72	12
17	MP4	X	-22.43	12
18	MP4	Z	38.84	12
19	MP7	X	-73.93	0
20	MP7	Z	128.05	0
21	MP7	X	-73.93	72
22	MP7	Z	128.05	72
23	MP7	X	-38.43	12
24	MP7	Z	66.56	12
25	MP7	X	-37.58	12
26	MP7	Z	65.09	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	0	0
2	MP1	Z	173.91	0
3	MP1	X	0	72
4	MP1	Z	173.91	72
5	MP1	X	0	12
6	MP1	Z	85.26	12
7	MP1	X	0	12
8	MP1	Z	85.26	12
9	MP1	X	0	48
10	MP1	Z	81.06	48
11	MP4	X	0	0
12	MP4	Z	95.75	0
13	MP4	X	0	72



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
14	MP4	Z	95.75	72
15	MP4	X	0	12
16	MP4	Z	60.04	12
17	MP4	X	0	12
18	MP4	Z	54.96	12
19	MP7	X	0	0
20	MP7	Z	95.75	0
21	MP7	X	0	72
22	MP7	Z	95.75	72
23	MP7	X	0	12
24	MP7	Z	60.04	12
25	MP7	X	0	12
26	MP7	Z	54.96	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	73.93	0
2	MP1	Z	128.05	0
3	MP1	X	73.93	72
4	MP1	Z	128.05	72
5	MP1	X	38.43	12
6	MP1	Z	66.56	12
7	MP1	X	37.58	12
8	MP1	Z	65.09	12
9	MP1	X	36.19	48
10	MP1	Z	62.68	48
11	MP4	X	73.93	0
12	MP4	Z	128.05	0
13	MP4	X	73.93	72
14	MP4	Z	128.05	72
15	MP4	X	38.43	12
16	MP4	Z	66.56	12
17	MP4	X	37.58	12
18	MP4	Z	65.09	12
19	MP7	X	34.85	0
20	MP7	Z	60.36	0
21	MP7	X	34.85	72
22	MP7	Z	60.36	72
23	MP7	X	25.82	12
24	MP7	Z	44.72	12
25	MP7	X	22.43	12
26	MP7	Z	38.84	12



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	82.92	0
2	MP1	Z	47.87	0
3	MP1	X	82.92	72
4	MP1	Z	47.87	72
5	MP1	X	52	12
6	MP1	Z	30.02	12
7	MP1	X	47.59	12
8	MP1	Z	27.48	12
9	MP1	X	47.63	48
10	MP1	Z	27.5	48
11	MP4	X	150.61	0
12	MP4	Z	86.95	0
13	MP4	X	150.61	72
14	MP4	Z	86.95	72
15	MP4	X	73.84	12
16	MP4	Z	42.63	12
17	MP4	X	73.84	12
18	MP4	Z	42.63	12
19	MP7	X	82.92	0
20	MP7	Z	47.87	0
21	MP7	X	82.92	72
22	MP7	Z	47.87	72
23	MP7	X	52	12
24	MP7	Z	30.02	12
25	MP7	X	47.59	12
26	MP7	Z	27.48	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	69.69	0
2	MP1	Z	0	0
3	MP1	X	69.69	72
4	MP1	Z	0	72
5	MP1	X	51.64	12
6	MP1	Z	0	12
7	MP1	X	44.85	12
8	MP1	Z	0	12
9	MP1	X	46.32	48
10	MP1	Z	0	48
11	MP4	X	147.86	0
12	MP4	Z	0	0
13	MP4	X	147.86	72



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
14	MP4	Z	0	72
15	MP4	X	76.85	12
16	MP4	Z	0	12
17	MP4	X	75.16	12
18	MP4	Z	0	12
19	MP7	X	147.86	0
20	MP7	Z	0	0
21	MP7	X	147.86	72
22	MP7	Z	0	72
23	MP7	X	76.85	12
24	MP7	Z	0	12
25	MP7	X	75.16	12
26	MP7	Z	0	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	82.92	0
2	MP1	Z	-47.87	0
3	MP1	X	82.92	72
4	MP1	Z	-47.87	72
5	MP1	X	52	12
6	MP1	Z	-30.02	12
7	MP1	X	47.59	12
8	MP1	Z	-27.48	12
9	MP1	X	47.63	48
10	MP1	Z	-27.5	48
11	MP4	X	82.92	0
12	MP4	Z	-47.87	0
13	MP4	X	82.92	72
14	MP4	Z	-47.87	72
15	MP4	X	52	12
16	MP4	Z	-30.02	12
17	MP4	X	47.59	12
18	MP4	Z	-27.48	12
19	MP7	X	150.61	0
20	MP7	Z	-86.95	0
21	MP7	X	150.61	72
22	MP7	Z	-86.95	72
23	MP7	X	73.84	12
24	MP7	Z	-42.63	12
25	MP7	X	73.84	12
26	MP7	Z	-42.63	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	73.93	0
2	MP1	Z	-128.05	0
3	MP1	X	73.93	72
4	MP1	Z	-128.05	72
5	MP1	X	38.43	12
6	MP1	Z	-66.56	12
7	MP1	X	37.58	12
8	MP1	Z	-65.09	12
9	MP1	X	36.19	48
10	MP1	Z	-62.68	48
11	MP4	X	34.85	0
12	MP4	Z	-60.36	0
13	MP4	X	34.85	72
14	MP4	Z	-60.36	72
15	MP4	X	25.82	12
16	MP4	Z	-44.72	12
17	MP4	X	22.43	12
18	MP4	Z	-38.84	12
19	MP7	X	73.93	0
20	MP7	Z	-128.05	0
21	MP7	X	73.93	72
22	MP7	Z	-128.05	72
23	MP7	X	38.43	12
24	MP7	Z	-66.56	12
25	MP7	X	37.58	12
26	MP7	Z	-65.09	12

Member Point Loads (BLC 16 : Ice Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Y	-192.49	0
2	MP1	Y	-192.49	72
3	MP1	Y	-103.712	12
4	MP1	Y	-97.616	12
5	MP1	Y	-95.3	48
6	MP4	Y	-192.49	0
7	MP4	Y	-192.49	72
8	MP4	Y	-103.712	12
9	MP4	Y	-97.616	12
10	MP7	Y	-192.49	0
11	MP7	Y	-192.49	72
12	MP7	Y	-103.712	12
13	MP7	Y	-97.616	12



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	0	0
2	MP1	Z	-23.22	0
3	MP1	X	0	72
4	MP1	Z	-23.22	72
5	MP1	X	0	12
6	MP1	Z	-9.5	12
7	MP1	X	0	12
8	MP1	Z	-9.5	12
9	MP1	X	0	48
10	MP1	Z	-9.14	48
11	MP4	X	0	0
12	MP4	Z	-17.14	0
13	MP4	X	0	72
14	MP4	Z	-17.14	72
15	MP4	X	0	12
16	MP4	Z	-7.86	12
17	MP4	X	0	12
18	MP4	Z	-7.6	12
19	MP7	X	0	0
20	MP7	Z	-17.14	0
21	MP7	X	0	72
22	MP7	Z	-17.14	72
23	MP7	X	0	12
24	MP7	Z	-7.86	12
25	MP7	X	0	12
26	MP7	Z	-7.6	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-10.6	0
2	MP1	Z	-18.36	0
3	MP1	X	-10.6	72
4	MP1	Z	-18.36	72
5	MP1	X	-4.48	12
6	MP1	Z	-7.75	12
7	MP1	X	-4.43	12
8	MP1	Z	-7.68	12
9	MP1	X	-4.31	48
10	MP1	Z	-7.47	48
11	MP4	X	-10.6	0
12	MP4	Z	-18.36	0
13	MP4	X	-10.6	72



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
14	MP4	Z	-18.36	72
15	MP4	X	-4.48	12
16	MP4	Z	-7.75	12
17	MP4	X	-4.43	12
18	MP4	Z	-7.68	12
19	MP7	X	-7.56	0
20	MP7	Z	-13.09	0
21	MP7	X	-7.56	72
22	MP7	Z	-13.09	72
23	MP7	X	-3.66	12
24	MP7	Z	-6.33	12
25	MP7	X	-3.49	12
26	MP7	Z	-6.04	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	X	-14.85	0
2	MP1	Z	-8.57	0
3	MP1	X	-14.85	72
4	MP1	Z	-8.57	72
5	MP1	X	-6.8	12
6	MP1	Z	-3.93	12
7	MP1	X	-6.58	12
8	MP1	Z	-3.8	12
9	MP1	X	-6.59	48
10	MP1	Z	-3.8	48
11	MP4	X	-20.11	0
12	MP4	Z	-11.61	0
13	MP4	X	-20.11	72
14	MP4	Z	-11.61	72
15	MP4	X	-8.23	12
16	MP4	Z	-4.75	12
17	MP4	X	-8.23	12
18	MP4	Z	-4.75	12
19	MP7	X	-14.85	0
20	MP7	Z	-8.57	0
21	MP7	X	-14.85	72
22	MP7	Z	-8.57	72
23	MP7	X	-6.8	12
24	MP7	Z	-3.93	12
25	MP7	X	-6.58	12
26	MP7	Z	-3.8	12



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-15.12	0
2	MP1	Z	0	0
3	MP1	X	-15.12	72
4	MP1	Z	0	72
5	MP1	X	-7.31	12
6	MP1	Z	0	12
7	MP1	X	-6.97	12
8	MP1	Z	0	12
9	MP1	X	-7.1	48
10	MP1	Z	0	48
11	MP4	X	-21.2	0
12	MP4	Z	0	0
13	MP4	X	-21.2	72
14	MP4	Z	0	72
15	MP4	X	-8.95	12
16	MP4	Z	0	12
17	MP4	X	-8.87	12
18	MP4	Z	0	12
19	MP7	X	-21.2	0
20	MP7	Z	0	0
21	MP7	X	-21.2	72
22	MP7	Z	0	72
23	MP7	X	-8.95	12
24	MP7	Z	0	12
25	MP7	X	-8.87	12
26	MP7	Z	0	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-14.85	0
2	MP1	Z	8.57	0
3	MP1	X	-14.85	72
4	MP1	Z	8.57	72
5	MP1	X	-6.8	12
6	MP1	Z	3.93	12
7	MP1	X	-6.58	12
8	MP1	Z	3.8	12
9	MP1	X	-6.59	48
10	MP1	Z	3.8	48
11	MP4	X	-14.85	0
12	MP4	Z	8.57	0
13	MP4	X	-14.85	72



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
14	MP4	Z	8.57	72
15	MP4	X	-6.8	12
16	MP4	Z	3.93	12
17	MP4	X	-6.58	12
18	MP4	Z	3.8	12
19	MP7	X	-20.11	0
20	MP7	Z	11.61	0
21	MP7	X	-20.11	72
22	MP7	Z	11.61	72
23	MP7	X	-8.23	12
24	MP7	Z	4.75	12
25	MP7	X	-8.23	12
26	MP7	Z	4.75	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	X	-10.6	0
2	MP1	Z	18.36	0
3	MP1	X	-10.6	72
4	MP1	Z	18.36	72
5	MP1	X	-4.48	12
6	MP1	Z	7.75	12
7	MP1	X	-4.43	12
8	MP1	Z	7.68	12
9	MP1	X	-4.31	48
10	MP1	Z	7.47	48
11	MP4	X	-7.56	0
12	MP4	Z	13.09	0
13	MP4	X	-7.56	72
14	MP4	Z	13.09	72
15	MP4	X	-3.66	12
16	MP4	Z	6.33	12
17	MP4	X	-3.49	12
18	MP4	Z	6.04	12
19	MP7	X	-10.6	0
20	MP7	Z	18.36	0
21	MP7	X	-10.6	72
22	MP7	Z	18.36	72
23	MP7	X	-4.48	12
24	MP7	Z	7.75	12
25	MP7	X	-4.43	12
26	MP7	Z	7.68	12



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	0	0
2	MP1	Z	23.22	0
3	MP1	X	0	72
4	MP1	Z	23.22	72
5	MP1	X	0	12
6	MP1	Z	9.5	12
7	MP1	X	0	12
8	MP1	Z	9.5	12
9	MP1	X	0	48
10	MP1	Z	9.14	48
11	MP4	X	0	0
12	MP4	Z	17.14	0
13	MP4	X	0	72
14	MP4	Z	17.14	72
15	MP4	X	0	12
16	MP4	Z	7.86	12
17	MP4	X	0	12
18	MP4	Z	7.6	12
19	MP7	X	0	0
20	MP7	Z	17.14	0
21	MP7	X	0	72
22	MP7	Z	17.14	72
23	MP7	X	0	12
24	MP7	Z	7.86	12
25	MP7	X	0	12
26	MP7	Z	7.6	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	10.6	0
2	MP1	Z	18.36	0
3	MP1	X	10.6	72
4	MP1	Z	18.36	72
5	MP1	X	4.48	12
6	MP1	Z	7.75	12
7	MP1	X	4.43	12
8	MP1	Z	7.68	12
9	MP1	X	4.31	48
10	MP1	Z	7.47	48
11	MP4	X	10.6	0
12	MP4	Z	18.36	0
13	MP4	X	10.6	72



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
14	MP4	Z	18.36	72
15	MP4	X	4.48	12
16	MP4	Z	7.75	12
17	MP4	X	4.43	12
18	MP4	Z	7.68	12
19	MP7	X	7.56	0
20	MP7	Z	13.09	0
21	MP7	X	7.56	72
22	MP7	Z	13.09	72
23	MP7	X	3.66	12
24	MP7	Z	6.33	12
25	MP7	X	3.49	12
26	MP7	Z	6.04	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	X	14.85	0
2	MP1	Z	8.57	0
3	MP1	X	14.85	72
4	MP1	Z	8.57	72
5	MP1	X	6.8	12
6	MP1	Z	3.93	12
7	MP1	X	6.58	12
8	MP1	Z	3.8	12
9	MP1	X	6.59	48
10	MP1	Z	3.8	48
11	MP4	X	20.11	0
12	MP4	Z	11.61	0
13	MP4	X	20.11	72
14	MP4	Z	11.61	72
15	MP4	X	8.23	12
16	MP4	Z	4.75	12
17	MP4	X	8.23	12
18	MP4	Z	4.75	12
19	MP7	X	14.85	0
20	MP7	Z	8.57	0
21	MP7	X	14.85	72
22	MP7	Z	8.57	72
23	MP7	X	6.8	12
24	MP7	Z	3.93	12
25	MP7	X	6.58	12
26	MP7	Z	3.8	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	X	15.12	0
2	MP1	Z	0	0
3	MP1	X	15.12	72
4	MP1	Z	0	72
5	MP1	X	7.31	12
6	MP1	Z	0	12
7	MP1	X	6.97	12
8	MP1	Z	0	12
9	MP1	X	7.1	48
10	MP1	Z	0	48
11	MP4	X	21.2	0
12	MP4	Z	0	0
13	MP4	X	21.2	72
14	MP4	Z	0	72
15	MP4	X	8.95	12
16	MP4	Z	0	12
17	MP4	X	8.87	12
18	MP4	Z	0	12
19	MP7	X	21.2	0
20	MP7	Z	0	0
21	MP7	X	21.2	72
22	MP7	Z	0	72
23	MP7	X	8.95	12
24	MP7	Z	0	12
25	MP7	X	8.87	12
26	MP7	Z	0	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	X	14.85	0
2	MP1	Z	-8.57	0
3	MP1	X	14.85	72
4	MP1	Z	-8.57	72
5	MP1	X	6.8	12
6	MP1	Z	-3.93	12
7	MP1	X	6.58	12
8	MP1	Z	-3.8	12
9	MP1	X	6.59	48
10	MP1	Z	-3.8	48
11	MP4	X	14.85	0
12	MP4	Z	-8.57	0
13	MP4	X	14.85	72



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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
14	MP4	Z	-8.57	72
15	MP4	X	6.8	12
16	MP4	Z	-3.93	12
17	MP4	X	6.58	12
18	MP4	Z	-3.8	12
19	MP7	X	20.11	0
20	MP7	Z	-11.61	0
21	MP7	X	20.11	72
22	MP7	Z	-11.61	72
23	MP7	X	8.23	12
24	MP7	Z	-4.75	12
25	MP7	X	8.23	12
26	MP7	Z	-4.75	12

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	X	10.6	0
2	MP1	Z	-18.36	0
3	MP1	X	10.6	72
4	MP1	Z	-18.36	72
5	MP1	X	4.48	12
6	MP1	Z	-7.75	12
7	MP1	X	4.43	12
8	MP1	Z	-7.68	12
9	MP1	X	4.31	48
10	MP1	Z	-7.47	48
11	MP4	X	7.56	0
12	MP4	Z	-13.09	0
13	MP4	X	7.56	72
14	MP4	Z	-13.09	72
15	MP4	X	3.66	12
16	MP4	Z	-6.33	12
17	MP4	X	3.49	12
18	MP4	Z	-6.04	12
19	MP7	X	10.6	0
20	MP7	Z	-18.36	0
21	MP7	X	10.6	72
22	MP7	Z	-18.36	72
23	MP7	X	4.48	12
24	MP7	Z	-7.75	12
25	MP7	X	4.43	12
26	MP7	Z	-7.68	12

Member Point Loads (BLC 31 : Seismic Load Z)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Z	-9.443	0
2	MP1	Z	-9.443	72
3	MP1	Z	-21.945	12
4	MP1	Z	-18.719	12
5	MP1	Z	-6.398	48
6	MP4	Z	-9.443	0
7	MP4	Z	-9.443	72
8	MP4	Z	-21.945	12
9	MP4	Z	-18.719	12
10	MP7	Z	-9.443	0
11	MP7	Z	-9.443	72
12	MP7	Z	-21.945	12
13	MP7	Z	-18.719	12

Member Point Loads (BLC 32 : Seismic Load X)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-9.443	0
2	MP1	X	-9.443	72
3	MP1	X	-21.945	12
4	MP1	X	-18.719	12
5	MP1	X	-6.398	48
6	MP4	X	-9.443	0
7	MP4	X	-9.443	72
8	MP4	X	-21.945	12
9	MP4	X	-18.719	12
10	MP7	X	-9.443	0
11	MP7	X	-9.443	72
12	MP7	X	-21.945	12
13	MP7	X	-18.719	12

Member Area Loads (BLC 1 : Self Weight)

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

Member Area Loads (BLC 16 : Ice Weight)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	P22	P21	P20	P23	Y	Two Way	-21
2	P10	P11	P12	P9	Y	Two Way	-21



Company : Infinigy Engineering, PLLC
Designer : PSM
Job Number : 1197-F0001-C
Model Name : BOBDL00013A

Aug 25, 2021
3:20 PM
Checked By: _____

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

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
3	P31	P34	P33	P32	Y	Two Way	-21

Bolt Calculation Tool, V1.5.1

PROJECT DATA	
Site Name:	
Site Number:	BOBDL00013A
Connection Description:	Platform to Monopole

MAXIMUM BOLT LOADS		
Bolt Tension:	8829.71	lbs
Bolt Shear:	1704.01	lbs

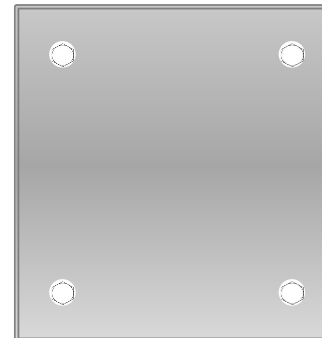
WORST CASE BOLT LOADS ¹		
Bolt Tension:	8829.71	lbs
Bolt Shear:	1522.75	lbs

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

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

Member Information
I nodes of S3, S2, S1

BOLT CHECK		
Tensile Strength	20340.15	
Shear Strength	13805.83	
Max Tensile Usage	43.4%	
Max Shear Usage	12.3%	
Interaction Check (Worst Case)	0.20	≤1.05
Result	Pass	



POWER DENSITY STUDY

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

Dish Wireless Existing Facility

Site ID: BOBDL00013A

BOBDL00013A
286 Beckley Road
Berlin, Connecticut 06037

October 21, 2021

EBI Project Number: 6221003973

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	32.16%

October 21, 2021

Dish Wireless

Emissions Analysis for Site: BOBDL00013A - BOBDL00013A

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **286 Beckley Road in Berlin, Connecticut** for the purpose of determining whether the emissions from the Proposed Dish Wireless Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed Dish Wireless antenna facility located at 286 Beckley Road in Berlin, 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 105 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):	105 feet	Height (AGL):	105 feet	Height (AGL):	105 feet
Channel Count:	12	Channel Count:	12	Channel Count:	12
Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts
ERP (W):	5,236.31	ERP (W):	5,236.31	ERP (W):	5,236.31
Antenna AI MPE %:	2.41%	Antenna BI MPE %:	2.41%	Antenna CI MPE %:	2.41%

Site Composite MPE %	
Carrier	MPE %
Dish Wireless (Max at Sector A):	2.41%
AT&T	4.65%
Metro PCS	0.66%
Berlin FD	0.02%
Verizon	7.17%
T-Mobile	12.81%
Sprint	3.36%
Nextel	1.08%
Site Total MPE % :	32.16%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	2.41%
Dish Wireless Sector B Total:	2.41%
Dish Wireless Sector C Total:	2.41%
Site Total MPE % :	32.16%

Dish Wireless Maximum MPE Power Values (Sector A)							
Dish Wireless Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
Dish Wireless 600 MHz n71	4	223.68	105.0	3.28	600 MHz n71	400	0.82%
Dish Wireless 1900 MHz n70	4	542.70	105.0	7.96	1900 MHz n70	1000	0.80%
Dish Wireless 2190 MHz n66	4	542.70	105.0	7.96	2190 MHz n66	1000	0.80%
						Total:	2.41%

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

Summary

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

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

Dish Wireless Sector	Power Density Value (%)
Sector A:	2.41%
Sector B:	2.41%
Sector C:	2.41%
Dish Wireless Maximum MPE % (Sector A):	2.41%
Site Total:	32.16%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **32.16%** 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.



November 09, 2021

Dear Customer,

The following is the proof-of-delivery for tracking number: 775120996920

Delivery Information:

Status:	Delivered	Delivered To:	Receptionist/Front Desk
Signed for by:	B.BUILDING	Delivery Location:	240 KENSINGTON RD
Service type:	FedEx 2Day		
Special Handling:	Deliver Weekday		BERLIN, CT, 06037
		Delivery date:	Nov 9, 2021 11:16

Shipping Information:

Tracking number:	775120996920	Ship Date:	Nov 5, 2021
		Weight:	1.0 LB/0.45 KG

Recipient:
Frank Van Linter- Building Official,
240 Kensington Road
BERLIN, CT, US, 06037

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

Reference 100814

Thank you for choosing FedEx



November 10, 2021

Dear Customer,

The following is the proof-of-delivery for tracking number: 775121023580

Delivery Information:

Status:	Delivered	Delivered To:	Residence
Signed for by:	Signature not required	Delivery Location:	260 BECKLEY ROAD
Service type:	FedEx 2Day		
Special Handling:	Deliver Weekday; Residential Delivery		BERLIN, CT, 06037
		Delivery date:	Nov 9, 2021 15:47

Shipping Information:

Tracking number:	775121023580	Ship Date:	Nov 5, 2021
		Weight:	1.0 LB/0.45 KG

Recipient:
John & Elaine Matulis - Owner,
260 Beckley Road
BERLIN, CT, US, 06037

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

Reference 100814

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

Thank you for choosing FedEx



November 09, 2021

Dear Customer,

The following is the proof-of-delivery for tracking number: 775120958230

Delivery Information:

Status:	Delivered	Delivered To:	Receptionist/Front Desk
Signed for by:	B.TM	Delivery Location:	240 KENSINGTON RD
Service type:	FedEx 2Day		
Special Handling:	Deliver Weekday		BERLIN, CT, 06037
		Delivery date:	Nov 9, 2021 11:15

Shipping Information:

Tracking number:	775120958230	Ship Date:	Nov 5, 2021
		Weight:	1.0 LB/0.45 KG

Recipient:
Arosha Jayawickrema - Town Manager,
240 Kensington Road
BERLIN, CT, US, 06037

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

Reference 100814

Thank you for choosing FedEx