Northeast Site Solutions
Victoria Masse
420 Main St Unit 1 Box 2
Sturbridge, MA 01566
victoria@northeastsitesolutions.com

January 17, 2023

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

RE: Tower Share Application
12 Polly Lane, Bozrah CT 06336
Latitude: 41.573333 N
Longitude: -72.203333 W
Site#: BOBOS00038A

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Dish Wireless LLC. Dish Wireless LLC plans to install antennas and related equipment to the tower site located at 12 Polly Lane, Bozrah, Connecticut.

Dish Wireless LLC proposes to install three (3) 600 MHz antenna and six (6) RRUs, at the 127-foot level of the existing 187-foot guyed tower, one (1) Fiber cable will also be installed. Dish Wireless LLC equipment cabinets will be placed within 7x5 lease area. Included are plans by Infinigy, dated December 13, 2022, Exhibit C. Also included is a structural analysis prepared by Paul J Ford, dated December 13, 2022, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. This facility was approved by the Town of Bozrah, the original approved could not be located within the Town files. Please see attached Exhibit A.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of Dish Wireless LLC intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Glenn S. Pianka, First Selectman, John Herring, Zoning Officer, as well as the property owner and tower owner.

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

1. The proposed modifications will not result in an increase in the height of the existing structure. The top of the tower is 187-feet; Dish Wireless LLC proposed antennas will be located at a center line height of 127-feet.

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

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

4.The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached power density calculations, the combined site operations will result in a total density of 8.49% as evidenced by Exhibit F.

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

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

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

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of Dish Wireless LLC equipment at the 127-foot level of the existing 187-foot tower would have an insignificant visual impact on the area around the guyed tower. Dish Wireless LLC ground equipment would be installed within the existing facility compound. Dish Wireless LLC shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by Exhibit F, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

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

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

Sincerely,

Victoria Masse
Mobile: 860-306-2326
Fax: 413-521-0558
Office: 420 Main Street, Unit 1 Box 2, Sturbridge, MA 01566
Email: victoria@northeastsitesolutions.com

Attachments
Cc:
Glenn S. Pianka, First Selectman
Town of Bozrah
1 River Road
Bozrah, CT 06334

John Herring, Zoning Officer
Town of Bozrah
1 River Road
Bozrah, CT 06334

17 Mile Real Estate LLC, Property Owner
69 Harry Street
Conshocken, PA 19428

EIP Communications LLC, Tower Owner
Two Allegheny Center
Nova Tower 2, Suite 703
Pittsburgh, PA 15212

Exhibit A

Original Facility Approval

June 11, 2020

Memo: No Initial Zoning Decision Found:
EM-AT&T-013-200604 (Polly Lane, Bozrah)

No original facility approval for this tower could be found, despite consultation with Tom Weber, Building Official for the Town of Bozrah. The building official's phone number is 860.889.2689 Ext. 206.

Please contact me with any questions or concerns regarding this matter.

Best Regards,

Ryan Lynch
Real Estate Manager
Smartlink
781.392.4040
Ryan.Lynch@smartlinkgroup.com

Exhibit B

Property Card

All information is for assessment purposes only. Assessments are calculated at 70% of the estimated October 1, 2017 market value which was the date of the last revaluation as completed by eQuality Valuation Services, LLC.

Information on the Property Records for the Municipality of Bozrah was last updated on 8/3/2021.

Parcel Information

Location:	POLLY LA	Property Use:	Vacant Land	Primary Use:	Commercial Vacant Land
Unique ID:	00073200	Map Block Lot:	02/039	Acres:	8.40
490 Acres:	0.00	Zone:	I-80	Volume / Page:	107/ 483
Developers Map / Lot:		Census:	7131		

Value Information

	Appraised Value	Assessed Value
Land	149,520	104,660
Buildings	0	0
Detached Outbuildings	0	0

	Appraised Value	Assessed Value
Total	149,520	104,660

Owner's Information

Owner's Data
17 MILE REAL ESTATE LLC 69 HARRY STREET CONSHOCKEN, PA 19428

Owner History - Sales

Owner Name	Volume	Page	Sale Date	Deed Type	Sale Price
17 MILE REAL ESTATE LLC	0107	0483	01/02/2019	Warranty Deed	$1,141,162
MAYNARD LEONARD P	0084	0593	09/19/2006		$0
MAYNARD ALICE M	0021	0524			$0

Information Published With Permission From The Assessor

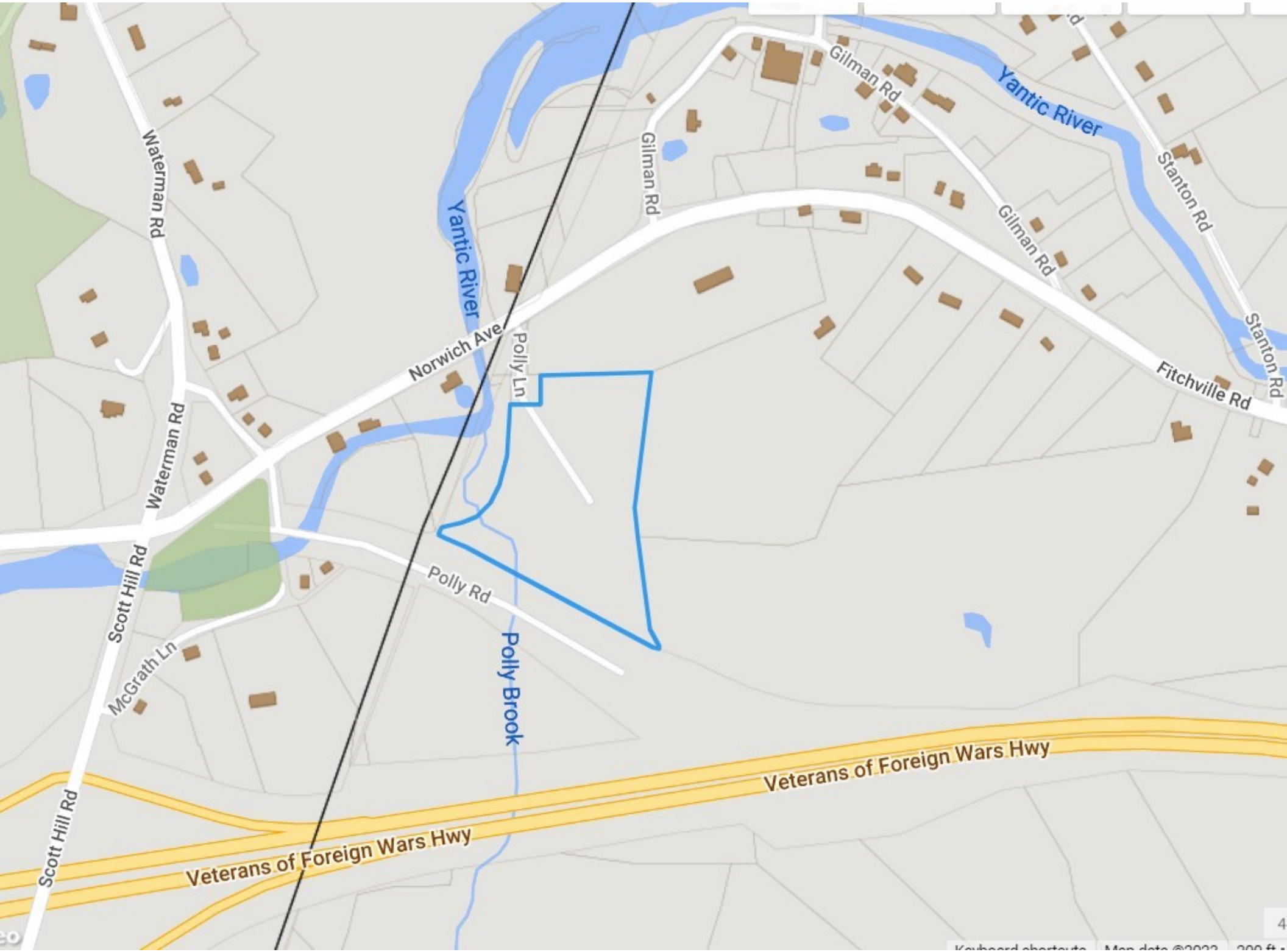

Gilman Rd
Yantic River
Waterman Rd
Gilman Rd
Stanton Rd
Yantic River
Gilman Rd
Norwich Ave
Polly Ln
Fitchville Rd
Stanton Rd
Waterman Rd
Scott Hill Rd
Polly Rd
McGrath Ln
Polly Brook
Veterans of Foreign Wars Hwy
Scott Hill Rd
Veterans of Foreign Wars Hwy

Exhibit C

Construction Drawings

DISH WIRELESS, LLC. SITE ID:

BOBOS00038A

DISH WIRELESS, LLC. SITE ADDRESS:

12 POLLY LANE
BOZRAH, CT 06336

CONNECTICUT CODE OF 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	2021 IBC W/ CT AMENDMENTS
MECHANICAL	2021 IMC W/ CT AMENDMENTS
ELECTRICAL	2020 NEC

SHEET INDEX

SCOPE OF WORK

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

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

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

SITE PHOTO

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

CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

811

GENERAL NOTES

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

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

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

SITE INFORMATION

PROPERTY OWNER:	17TH MILE REAL ESTATE LLC
ADDRESS:	69 HARRY STREET CONSHOCKEN, PA 19428
TOWER TYPE:	GUYED TOWER
TOWER CO SITE ID:	701695
TOWER APP NUMBER:	TBD
COUNTY:	NEW LONDON
LATITUDE (NAD 83):	41° 34' 27.34" N 41.574261 N
LONGITUDE (NAD 83):	-72° 12' 01.44" W -72.20040 W
ZONING JURISDICTION:	CT SITING COUNCIL
PARCEL NUMBER:	8.4
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	V-B
POWER COMPANY:	GROTON UTILITIES
TELEPHONE COMPANY:	AT&T

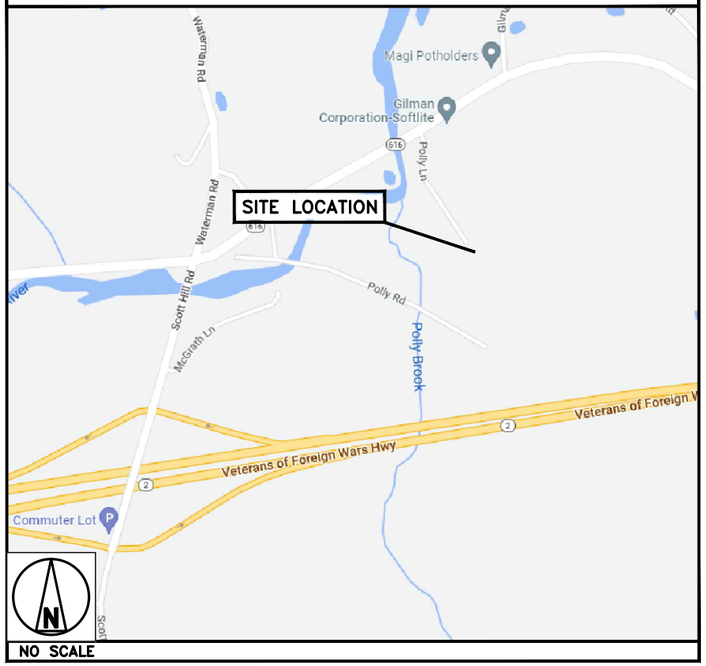
PROJECT DIRECTORY

APPLICANT:	DISH WIRELESS, LLC. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	EVEREST INFRASTRUCTURE PARTNERS 100 SUMMER ST SUITE 1600 BOSTON, MA 02110
SITE DESIGNER:	INFINIGY 500 WEST OFFICE CENTER DRIVE SUITE 150 FORT WASHINGTON, PA 19034
SITE ACQUISITION:	DAVID GOODFELLOW DAVID.GOODFELLOW@DISH.COM
CONSTRUCTION MANAGER:	CHAD WILCOX CHAD.WILCOX@DISH.COM
RF ENGINEER:	DIPESH PARIKH DIPESH.PARIKH@DISH.COM

DIRECTIONS

DIRECTIONS FROM CHESTER CHARTER, INC:
HEAD NORTHWEST ON CHESTER AIRPORT TOWARD CT-145 / WINTHROP RD, TURN RIGHT ONTO CT-145 / WINTHROP RD, TURN RIGHT ONTO CT-148 / W MAIN STM TAKE THE RAMP ON THE LEFT FOR CT-9 NORTH AND HEAD TOWARD MIDDLETOWN, AT EXIT 7, HEAD RIGHT ON THE RAMP FOR CT-82 TOWARD COLCHESTER / E HADDAM, TURN LEFT ONTO CT-82 / CT-154 / SAYBROOK RD, TURN RIGHT ONTO CT-82 / BRIDGE RD, MOBIL ON THE CORNER, KEEP RIGHT TO STAY ON CT-82 / NORWICH RD, TURN LEFT ONTO CT-151 / PRIVATE FIRST CLASS PETER P. GOLEC MEMORIAL HWY, TURN RIGHT ONTO CT-149 / FALLS RD, TURN RIGHT ONTO CT-16 / MIDDLETOWN RD, TAKE THE RAMP ON THE RIGHT FOR CT-2 EAST AND HEAD TOWARD NEW LONDON / NORWICH, AT EXIT 21, HEAD RIGHT ON THE RAMP FOR CHESTNUT HILL RD TOWARD COLCHESTER, TURN RIGHT ONTO CHESTNUT HILL RD TOWARD COLCHESTER / CHESTNUT HILL RD, TURN RIGHT ONTO NORWICH AVE, BEAR RIGHT ONTO NORWICH COLCHESTER RD, ARRIVE AT 12 POLLY LANE, BORZRAH, CT 6336 ON THE LEFT

VICINITY MAP



NO SCALE

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
certified WBENC

INFINIGY
500 WEST OFFICE CENTER DRIVE
SUITE 150
FORT WASHINGTON, PA 19034

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
1/16/23
LICENSED PROFESSIONAL ENGINEER

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

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
2	12/14/21	REVISED PER COMMENTS
3	12/29/21	REVISED PER COMMENTS
4	01/04/22	REVISED PER COMMENTS
5	03/03/22	REVISED PER COMMENTS
6	04/25/22	REVISED PER COMMENTS
7	06/13/22	REVISED PER COMMENTS
8	12/13/22	REVISED BLDG CODES

A&E PROJECT NUMBER
1197-F0001-C

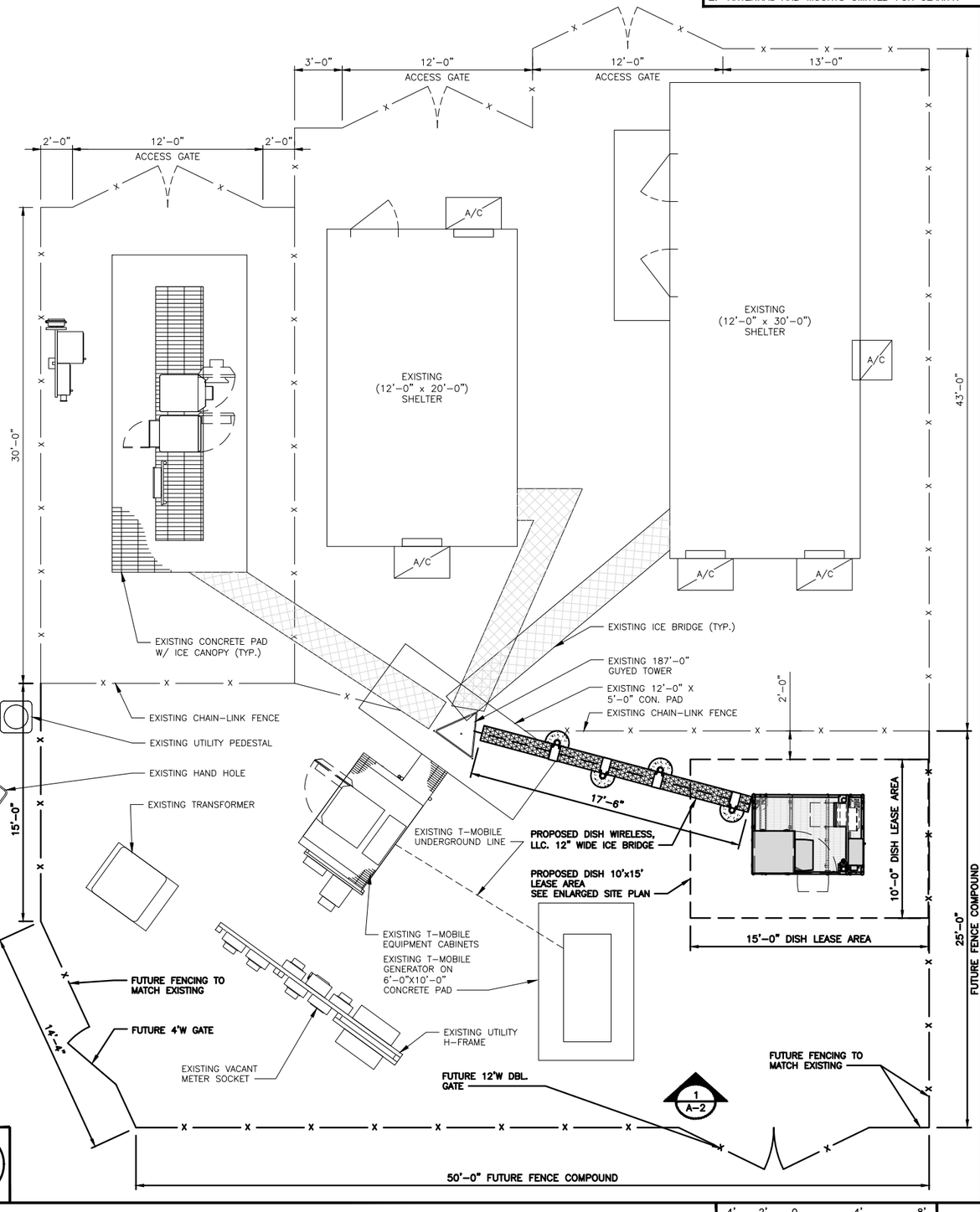
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBOS00038A
0
12 POLLY LANE
BOZRAH, CT 06336

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

NOTES

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



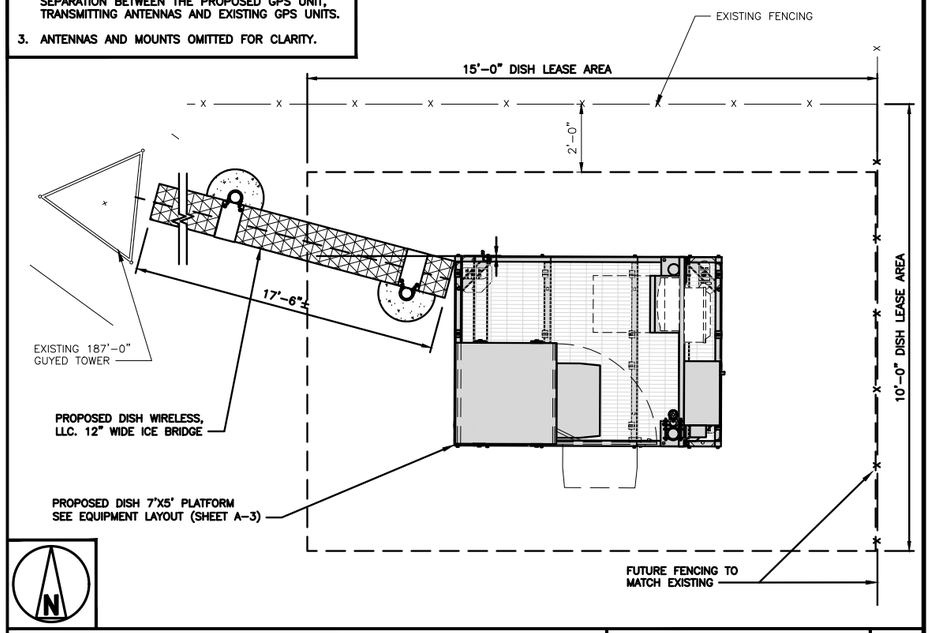
COMPOUND PLAN

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

1

NOTES

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



ENLARGED SITE PLAN

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

2

SITE PLAN

100' 50' 0 100' 200'
1"=100'

3

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
certified WBENC

INFINIGY
500 WEST OFFICE CENTER DRIVE
SUITE 150
FORT WASHINGTON, PA 19034

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
1/16/23
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RFDS REV #: N/A

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A&E PROJECT NUMBER

1197-F0001-C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBOS00038A
0
12 POLLY LANE
BOZRAH, CT 06336

SHEET TITLE

OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

A-1

NOTES

SITE PLAN

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

ABUTTERS LIST:

MAP/LOT	LOCATION	OWNER	ADDRESS
02/039 ZONE I-80	POLLY LA	MAYNARD LEONARD P MAYNARD ALICE M BARBARA A MAYNARD EXECUTRIC	17 MILE REAL ESTATE LLC 69 HARRY STREET CONSHOCKEN, PA 19428
02/037 ZONE I-80	FITCHVILLE RD	GILMAN RICHARD L	40 GILMAN RD, PO BOX 201 GILMAN, CT 06336
02/038 ZONE I-80	FITCHVILLE RD	PUHLICK MATTHEW P W & PUHLICK MICHELLE	11 NORWICH AVE LEBANON, CT 06249
02/040 ZONE I-80	1 POLLY LA	GILMAN RICHARD L	40 GILMAN RD, PO BOX 201 GILMAN, CT 06336
02/045-07 ZONE R-1	512 FITCHVILLE RD	TRACY RANDALL & TRACY JILL L	512 FITCHVILLE ROAD GILMAN, CT 06336
02/048 ZONE R-1	468 FITCHVILLE RD	SULLIVAN JOHN P	468 FITCHVILLE ROAD BOZRAH, CT 06334

ABUTTERS LIST

50' 25' 0 50' 100'
1"=50'

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NORTHEAST SITE SOLUTIONS
certified WBENC

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STATE OF CONNECTICUT
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1197-F0001-C

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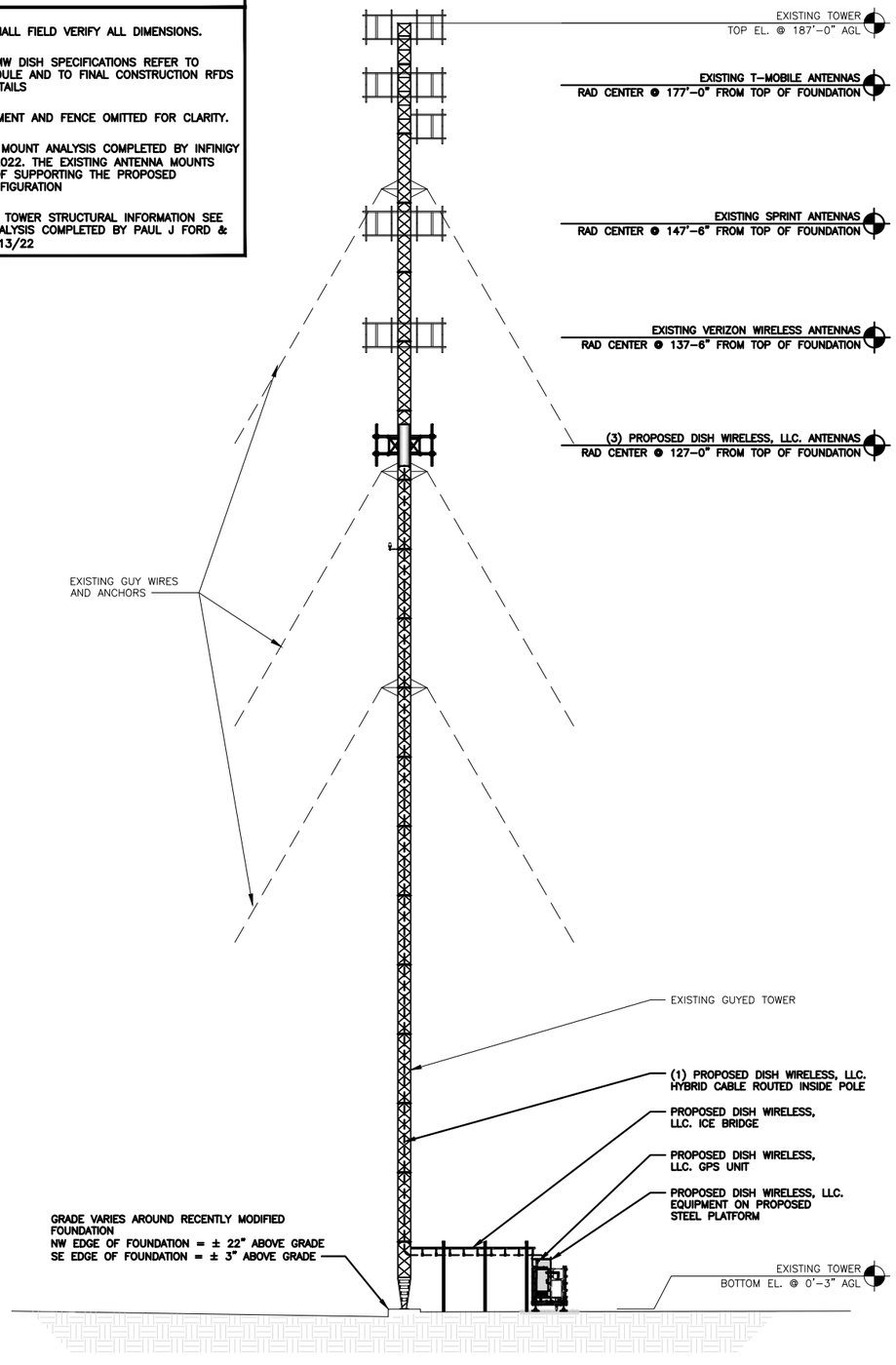
PROJECT INFORMATION
BOBOS00038A
0
12 POLLY LANE
BOZRAH, CT 06336

SHEET TITLE
SITE PLAN AND ABUTTERS

SHEET NUMBER
A-1.1

NOTES

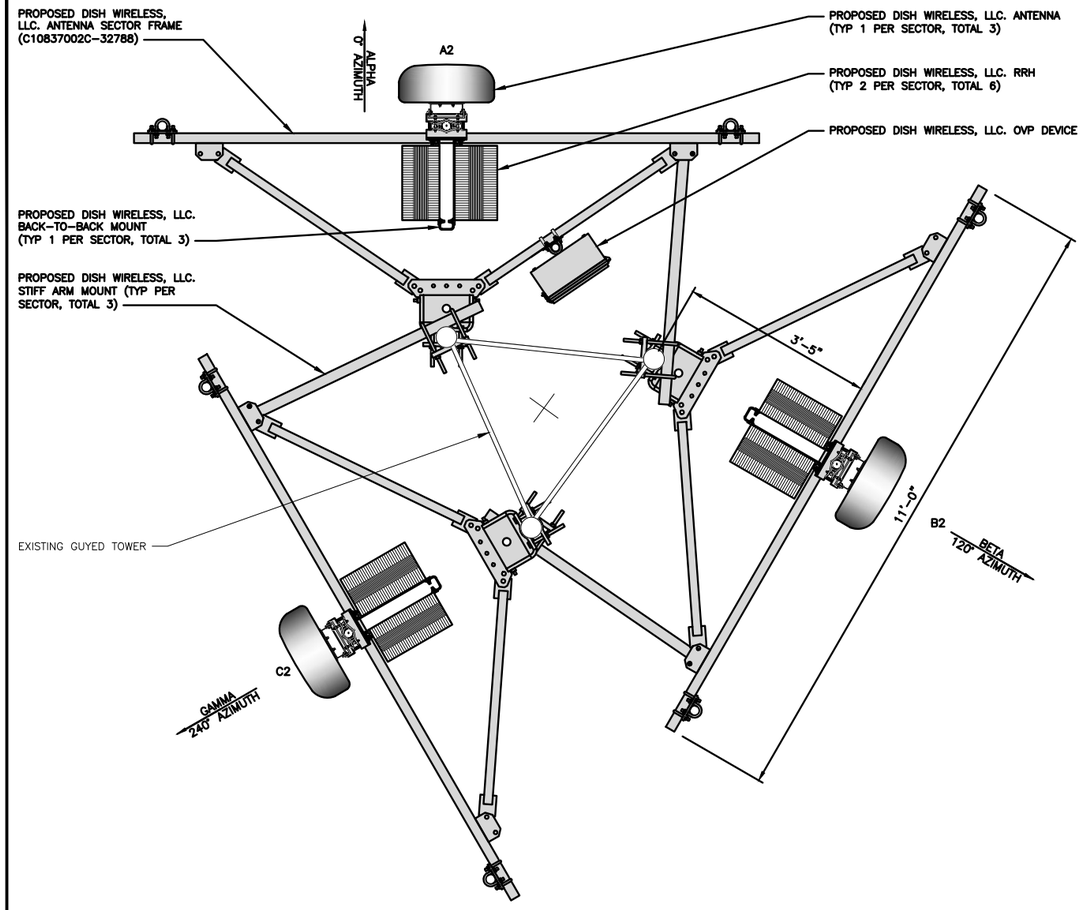
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.
4. BASED ON THE MOUNT ANALYSIS COMPLETED BY INFINIGY DATED 12/09/2022. THE EXISTING ANTENNA MOUNTS ARE CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION
5. FOR ADDITIONAL TOWER STRUCTURAL INFORMATION SEE STRUCTURAL ANALYSIS COMPLETED BY PAUL J FORD & CO DATED: 12/13/22



PROPOSED SOUTH ELEVATION

12' 8' 4' 0 10' 20'
3/32"=1'-0"

1



ANTENNA LAYOUT

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

2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZMUITH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A2	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	0°	127'-0"	(1) HIGH-CAPACITY HYBRID CABLE (155' LONG)
BETA	B2	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	120°	127'-0"	
GAMMA	C2	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	240°	127'-0"	

NOTES

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

SECTOR	POSITION	RRH	
		MANUFACTURER – MODEL NUMBER	TECHNOLOGY
ALPHA	A2	FUJITSU – TA08025-B604	5G
	A2	FUJITSU – TA08025-B605	5G
BETA	B2	FUJITSU – TA08025-B604	5G
	B2	FUJITSU – TA08025-B605	5G
GAMMA	C2	FUJITSU – TA08025-B604	5G
	C2	FUJITSU – TA08025-B605	5G

NOTES

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

ANTENNA SCHEDULE

NO SCALE

3

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
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INFINIGY
500 WEST OFFICE CENTER DRIVE
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STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
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LICENSED PROFESSIONAL ENGINEER

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
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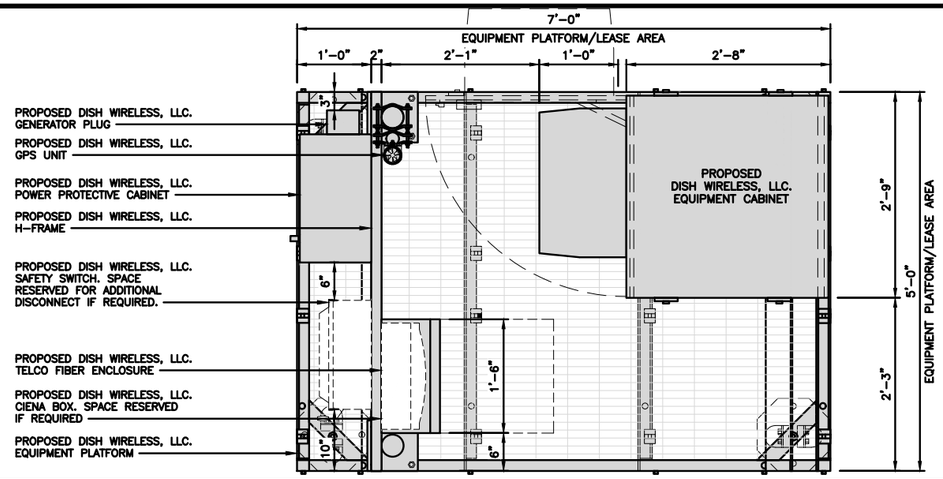
A&E PROJECT NUMBER
1197-F0001-C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBOS00038A
0
12 POLLY LANE
BOZRAH, CT 06336

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2



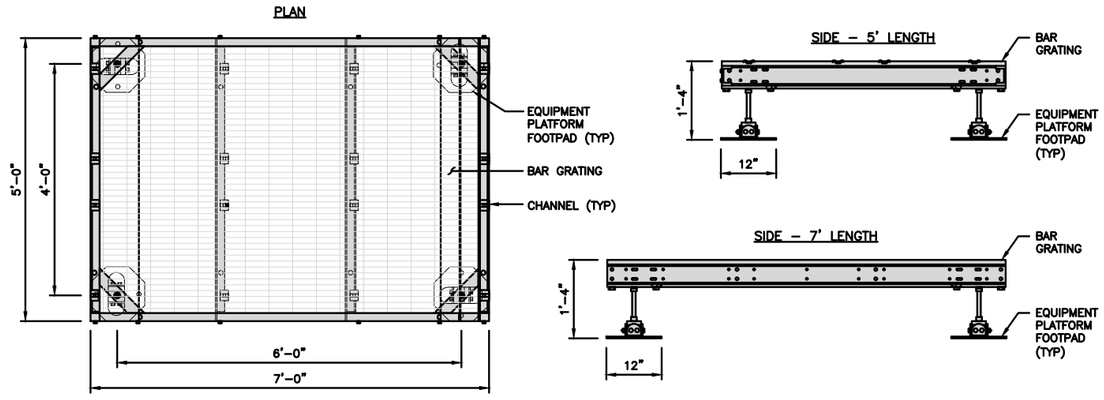
PLATFORM EQUIPMENT PLAN

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

1"=1'-0"

1

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

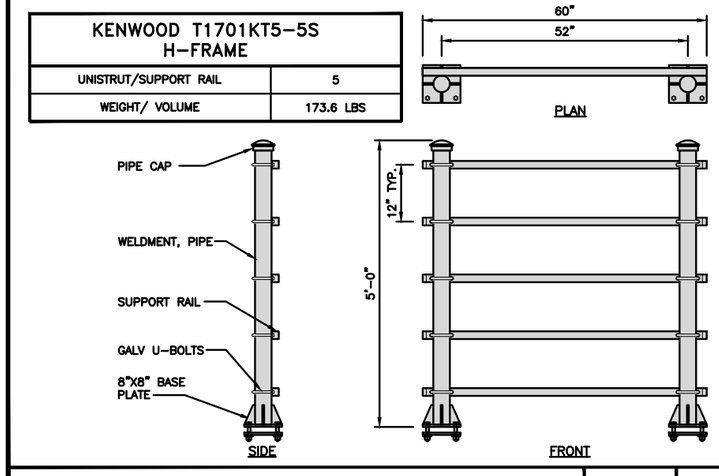


PLATFORM DETAIL

NO SCALE

2

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



H-FRAME DETAIL

NO SCALE

3

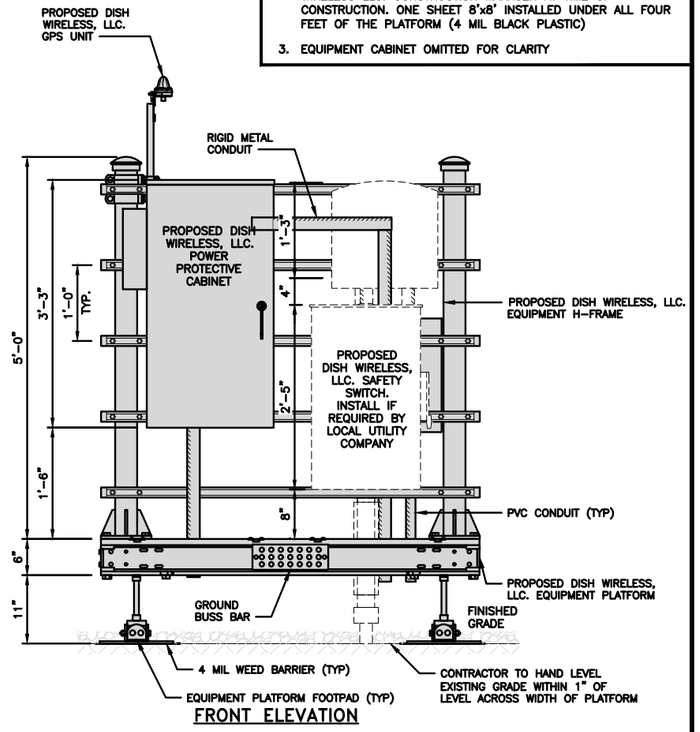
NOT USED

NO SCALE

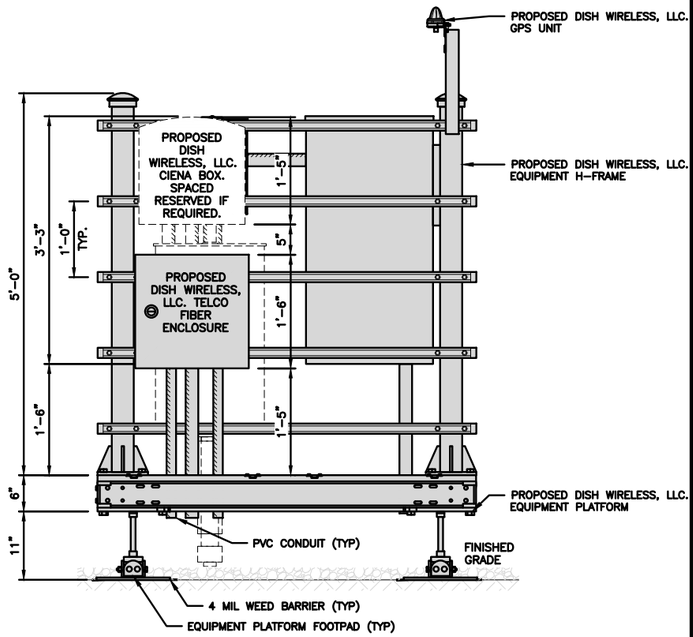
4

NOTES

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



FRONT ELEVATION



BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION

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

1"=1'-0"

5

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INFINIGY
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SUITE 150
FORT WASHINGTON, PA 19034

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
1/16/23
LICENSED PROFESSIONAL ENGINEER

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

RFDS REV #: N/A

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A&E PROJECT NUMBER

1197-F0001-C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBOS00038A
0
12 POLLY LANE
BOZRAH, CT 06336

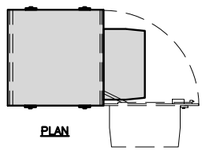
SHEET TITLE

EQUIPMENT PLATFORM AND H-FRAME DETAILS

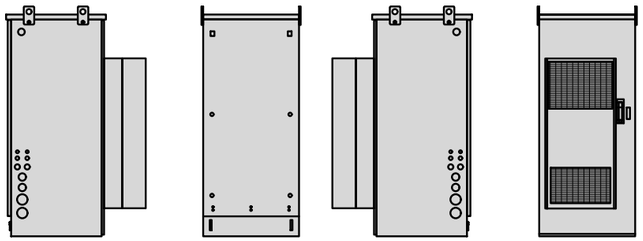
SHEET NUMBER

A-3

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



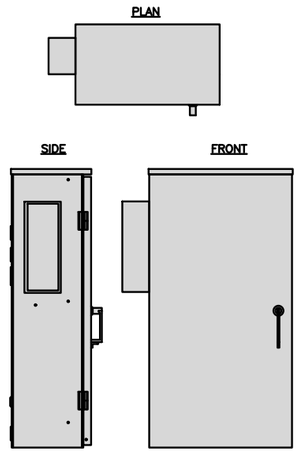
PLAN



SIDE BACK SIDE FRONT

CABINET DETAIL | NO SCALE | 1

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

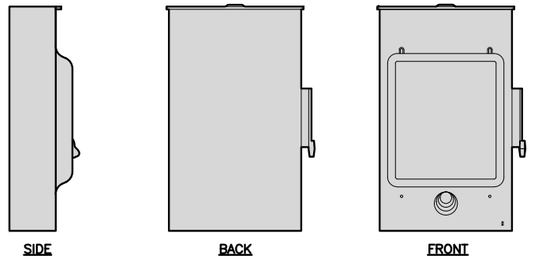


PLAN SIDE FRONT

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

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

PLAN



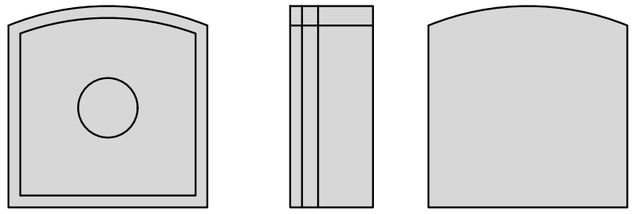
SIDE BACK FRONT

SAFETY SWITCH | NO SCALE | 3

NOT USED | NO SCALE | 4

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

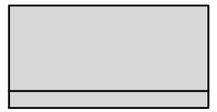
PLAN



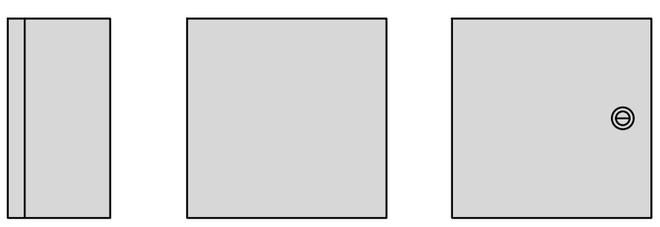
FRONT SIDE BACK

CIENA DETAIL | NO SCALE | 5

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



PLAN

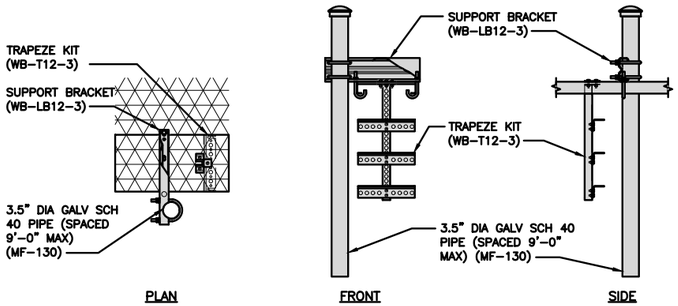


SIDE BACK FRONT

FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

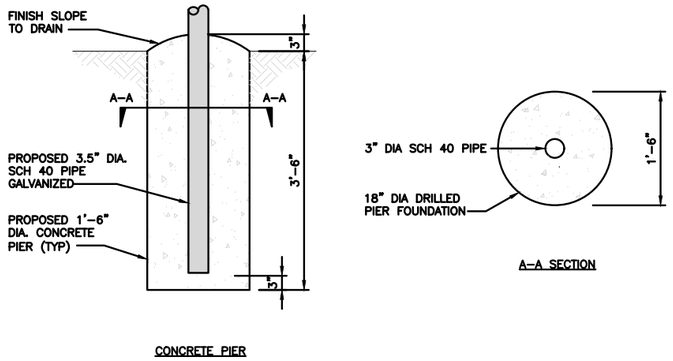
COMMSCOPE WB–K110–B WAVEGUIDE BRIDGE KIT	
DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

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



PLAN FRONT SIDE

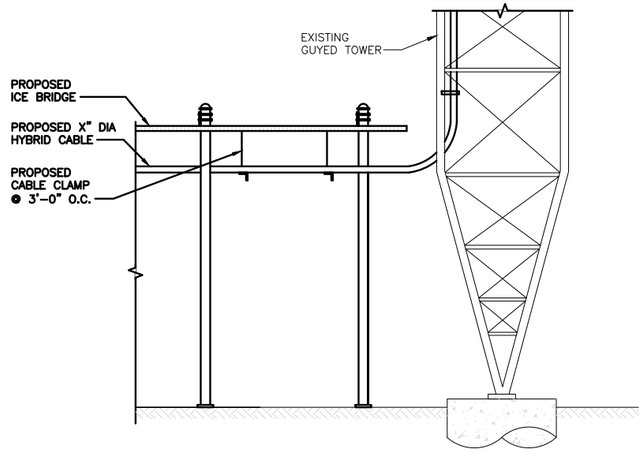
ICE BRIDGE DETAIL | NO SCALE | 7



CONCRETE PIER

A–A SECTION

TYPICAL ICE BRIDGE CONCRETE PIER DETAIL | NO SCALE | 8



HYBRID CABLE RUN | NO SCALE | 9

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A&E PROJECT NUMBER

1197–F0001–C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBOS00038A
0
12 POLLY LANE
BOZRAH, CT 06336

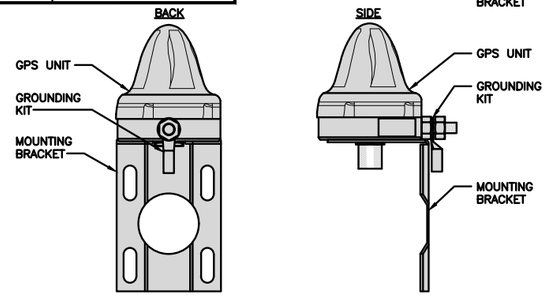
SHEET TITLE

EQUIPMENT DETAILS

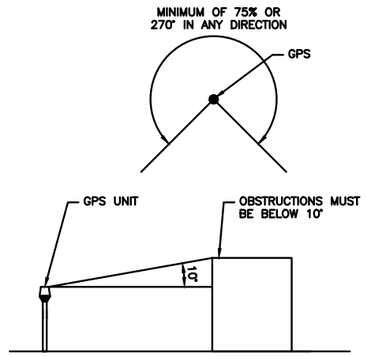
SHEET NUMBER

A-4

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

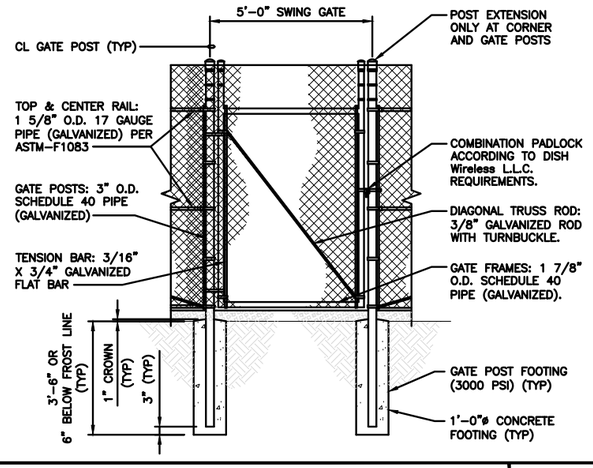


GPS ANTENNA DETAIL | NO SCALE | 1

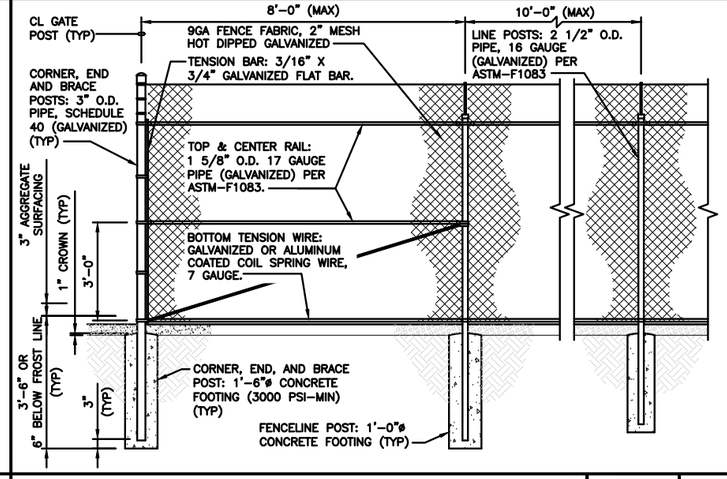


GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 2

NOT USED | NO SCALE | 3



TYPICAL MAN-GATE ELEVATION DETAIL | NO SCALE | 4



TYPICAL FENCE DETAIL | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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PROJECT INFORMATION
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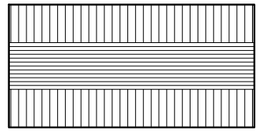
0
12 POLLY LANE
BOZRAH, CT 06336

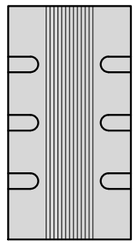
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

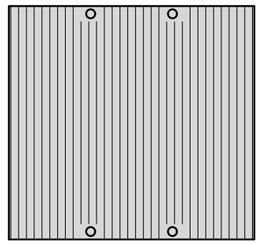
FUJITSU TA08025-B604 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-58~-36V



PLAN



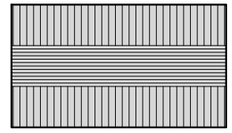
SIDE



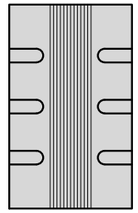
FRONT

REMOTE RADIO HEAD DETAIL | NO SCALE | 1

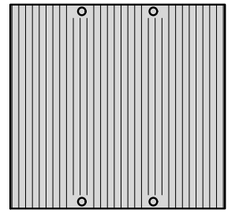
FUJITSU TA08025-B605 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x230/14.9"x15.7"x9.0"
WEIGHT(KG,LB)/ VOLUME	34kg,74.9lb/ 35L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE

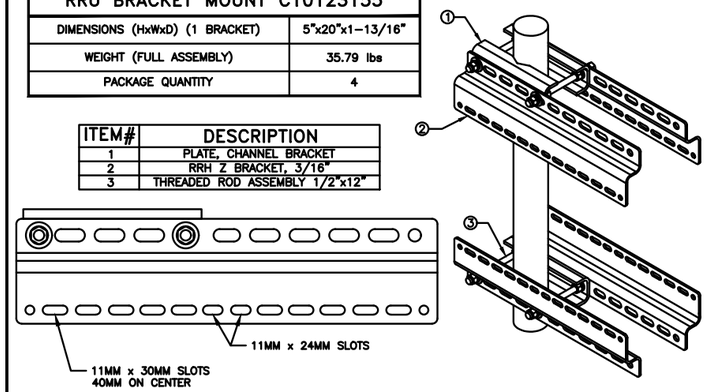


FRONT

REMOTE RADIO HEAD DETAIL | NO SCALE | 2

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

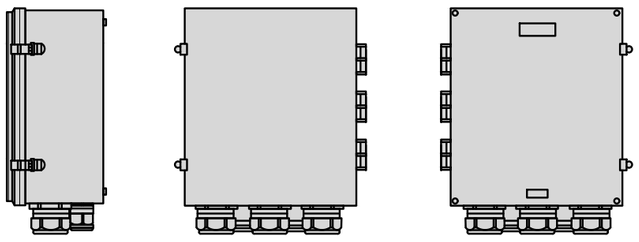
ITEM#	DESCRIPTION
1	PLATE, CHANNEL BRACKET
2	RRH Z BRACKET, 3/16"
3	THREADED ROD ASSEMBLY 1/2"x12"



REMOTE RADIO MOUNT DETAIL | NO SCALE | 3

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

PLAN

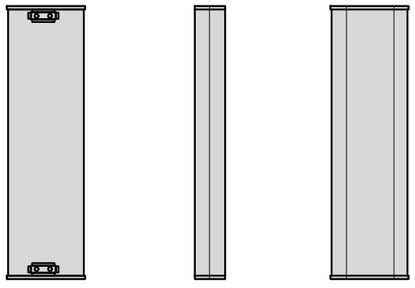


SIDE BACK FRONT

SURGE SUPPRESSION DETAIL | NO SCALE | 4

JMA WIRELESS MX08FRO665-21 ANTENNA	
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	64.5 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE

PLAN



BACK SIDE FRONT

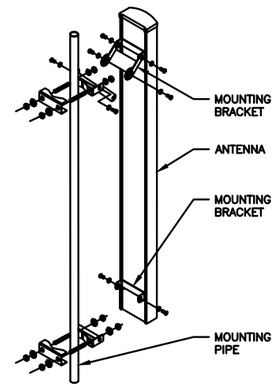
ANTENNA DETAIL | NO SCALE | 5

NOTES

FINAL ANTENNA SPECIFICATIONS TO BE CONFIRMED BY GC

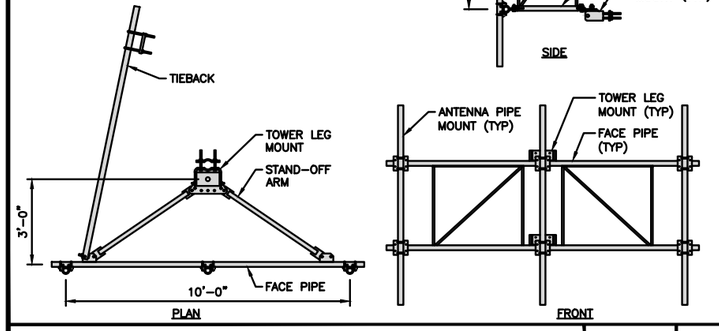
JMA MOUNTING BRACKET	
WIDTH	5"
DEPTH	2"
HEIGHT	8"
TOTAL WEIGHT	1.5 lbs
HOUSING MATERIAL	ASA/ABS/ALUMINUM
RADOME COLOR	LIGHT GRAY
CONNECTOR	1x8-PIN DAISY CHAIN

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



ANTENNA MOUNTING DETAIL | NO SCALE | 6

SABRE INDUSTRIES C10837002C-32788 HD V-BOOM ASSEMBLY WITH TIEBACK	
FACE SIZE	10'-0"
WEIGHT	676 LB
TOWER LEG SIZE	1-1/2" TO 5-9/16" DIA ROUND LEG



ANTENNA FRAME DETAIL | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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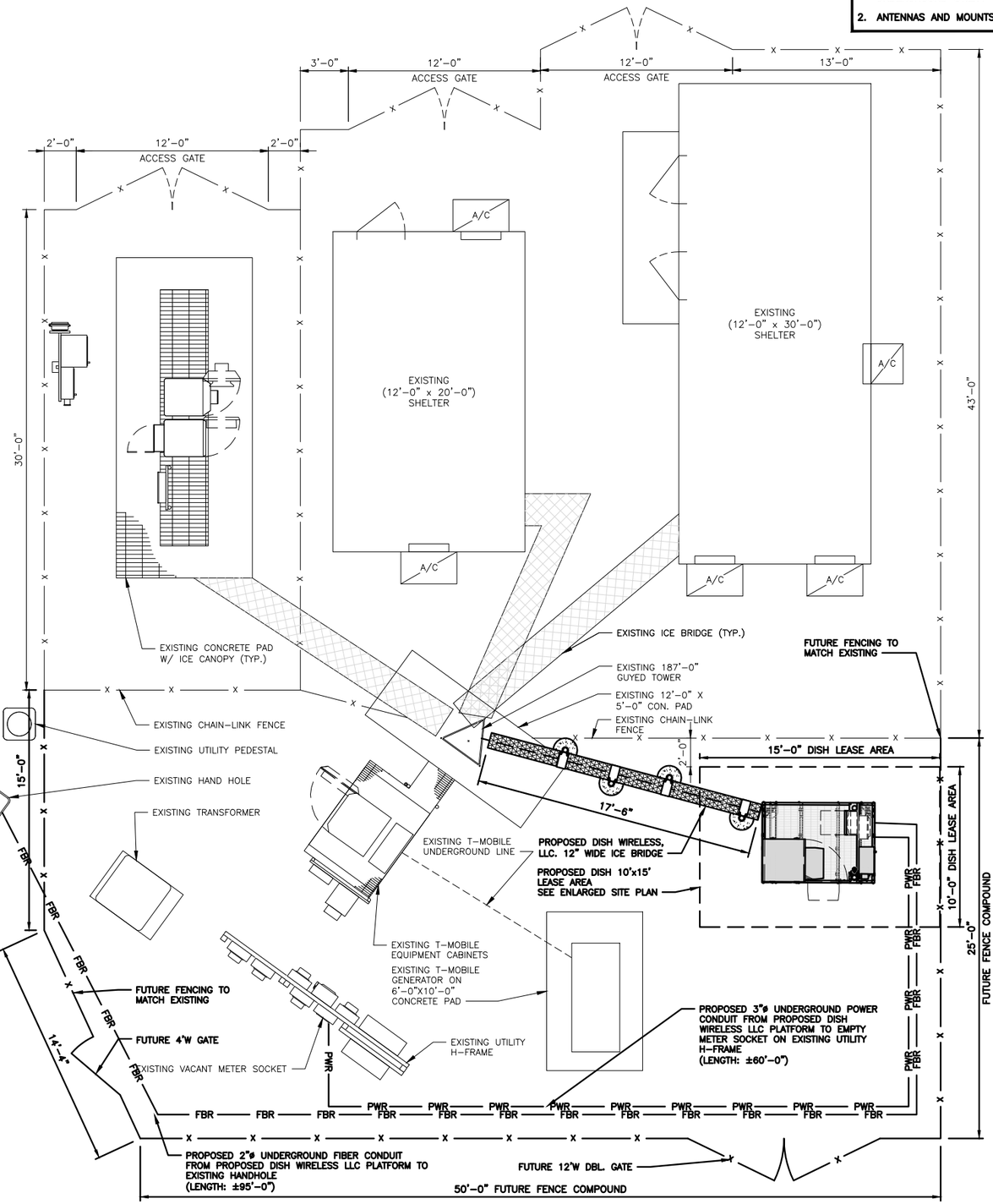
PROJECT INFORMATION
BOBOS00038A
0
12 POLLY LANE
BOZRAH, CT 06336

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-6

NOTES

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



UTILITY ROUTE PLAN

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

1

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

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

ELECTRICAL NOTES

2

OVERALL UTILITY ROUTE PLAN

50' 25' 0 50' 100'
1"=50'

3

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FORT WASHINGTON, PA 19034

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
1/16/23
LICENSED PROFESSIONAL ENGINEER

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RCD	SS	CJW

RFDS REV #: N/A

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A&E PROJECT NUMBER
1197-F0001-C

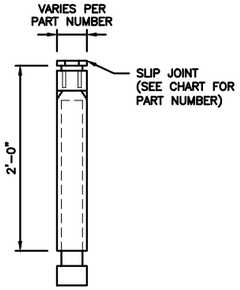
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBOS00038A
0
12 POLLY LANE
BOZRAH, CT 06336

SHEET TITLE
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

SHEET NUMBER
E-1

CARLON EXPANSION FITTINGS

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

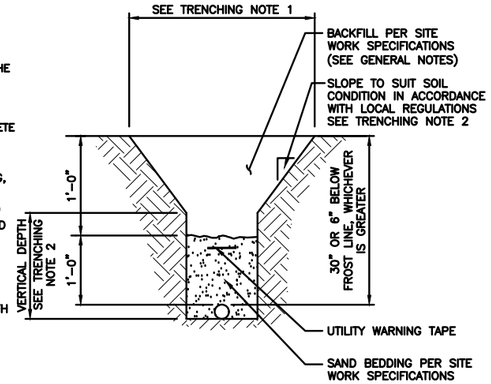


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

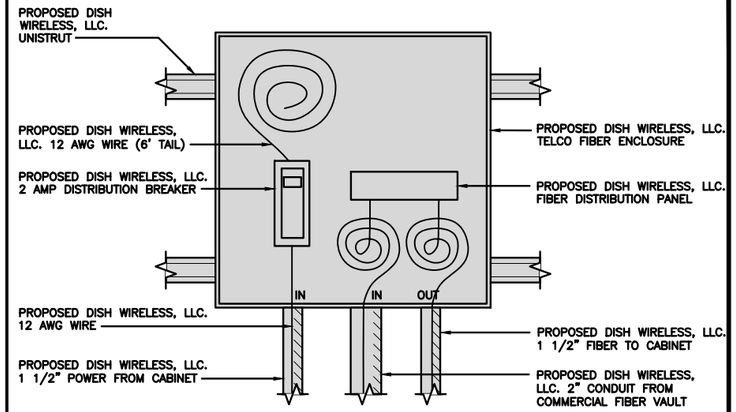
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

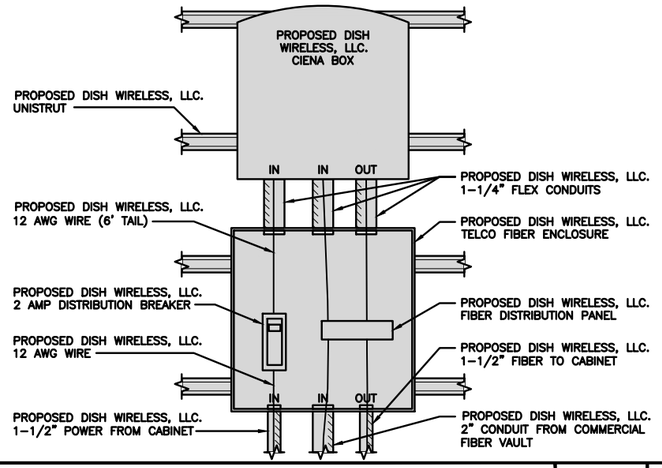
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT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



TYPICAL UNDERGROUND TRENCH DETAIL | NO SCALE | 2



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



LIT TELCO BOX – INTERIOR WIRING LAYOUT (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

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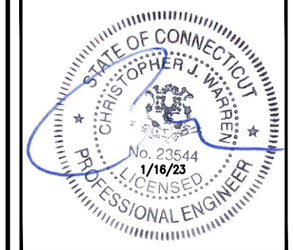

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PROJECT INFORMATION
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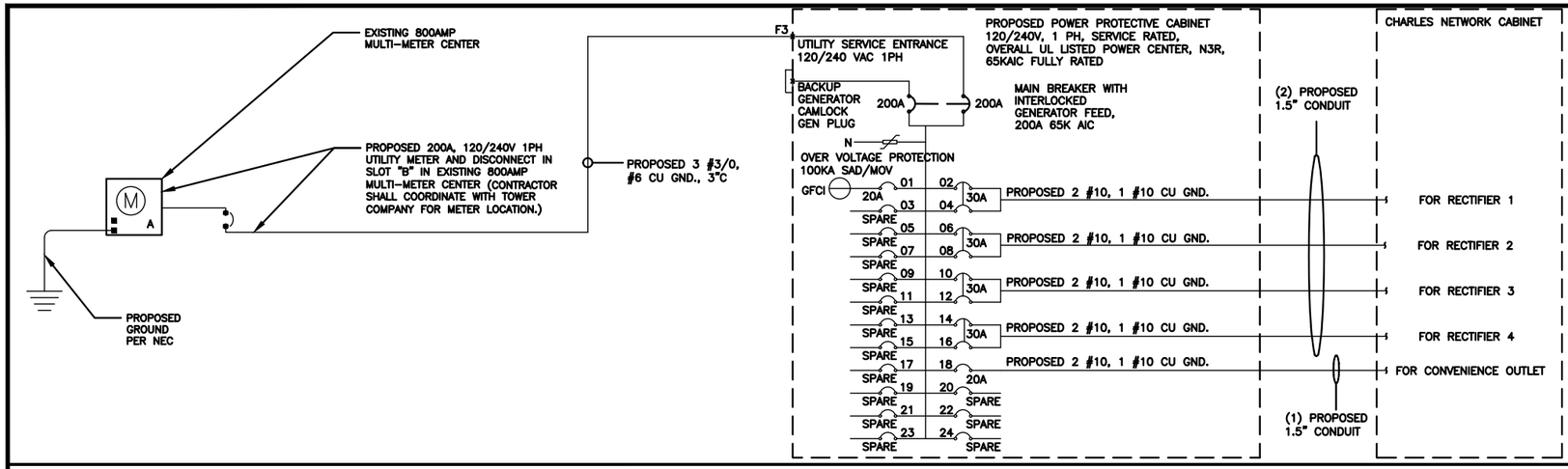
12 POLLY LANE
BOZRAH, CT 06336

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-2



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

NOTES

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

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

CONDUIT SIZING: ASSUME 1.5" EMT
AT 40% FILL PER NEC 358, TABLE 4 – 0.814A SQ. IN AREA

WIRES: USING THWN-2, CU. (INCLUDING 3 GROUND WIRES)

#6	– 0.0507 SQ. IN X 8	= 0.4056 SQ. IN
#8	– 0.0366 SQ. IN X 2	= 0.0732 SQ. IN
#10	– 0.0211 SQ. IN X 4	= 0.0844 SQ. IN <GROUND
#12	– 0.0133 SQ. IN X 1	= 0.0133 SQ. IN <GROUND
TOTAL		= 0.5765 SQ. IN

1.5" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OR (15) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

CONDUIT SIZING: ASSUME 3.0" SCH 40 PVC
AT 40% FILL PER NEC 352,TABLE 4 – 1.216A SQ. IN AREA

WIRES: USING THHN, CU. (INCLUDING 2 GROUND WIRES)

#3/0	– 0.1318 SQ. IN X 3	= 0.3954 SQ. IN
#2	– 0.0521 SQ. IN X 1	= 0.0521 SQ. IN
TOTAL		= 0.4475 SQ. IN

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

PROPOSED PANEL SCHEDULE

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

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

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

NOT USED | NO SCALE | 3

FAULT CALCULATIONS | NO SCALE | 4

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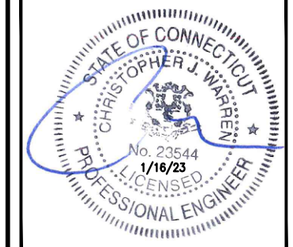

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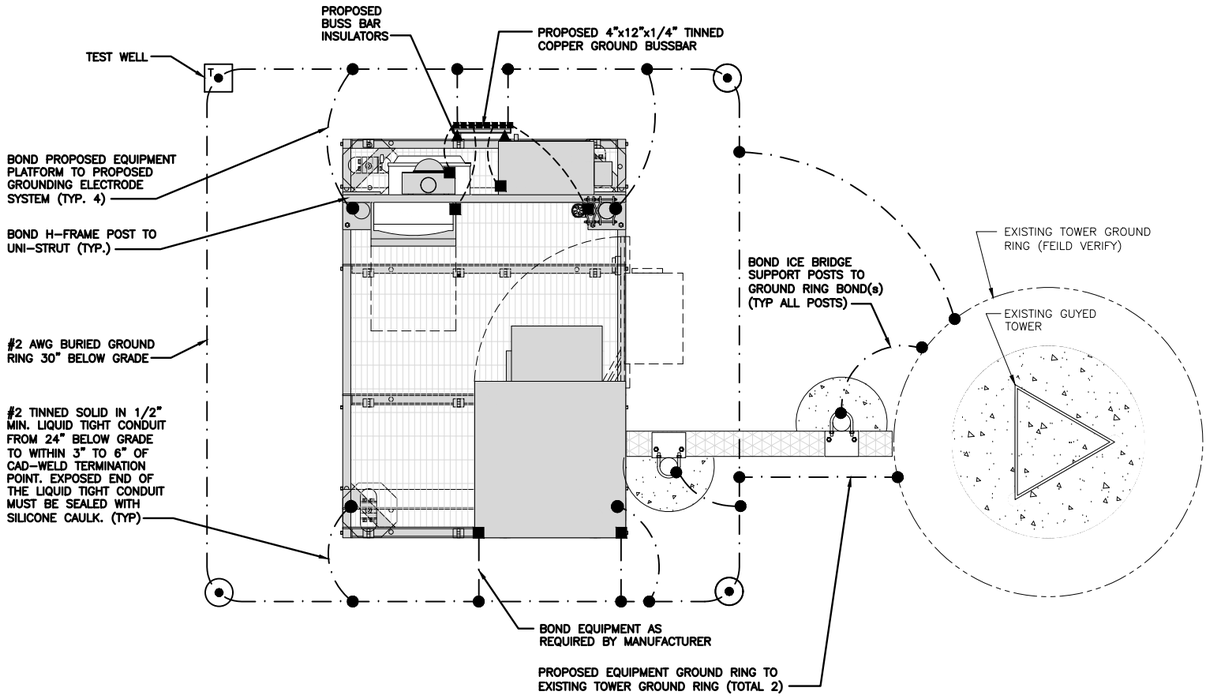
1197-F0001-C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBOS00038A
0
12 POLLY LANE
BOZRAH, CT 06336

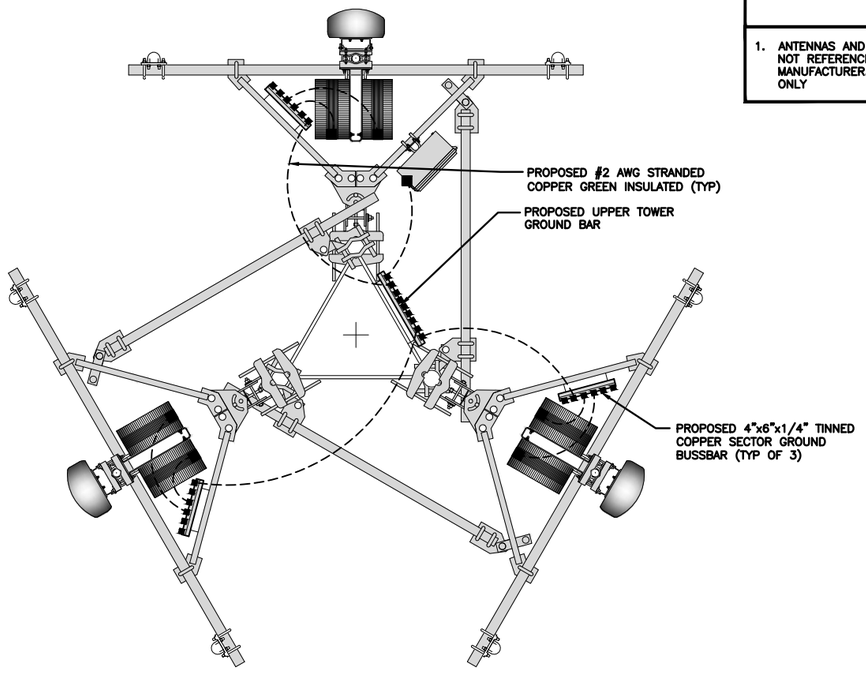
SHEET TITLE
ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3



TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE | 1



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE | 2

NOTES

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

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

GROUNDING LEGEND

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

GROUNDING KEY NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

REFER TO DISH WIRELESS, LLC. GROUNDING NOTES.

GROUNDING KEY NOTES

NO SCALE | 3

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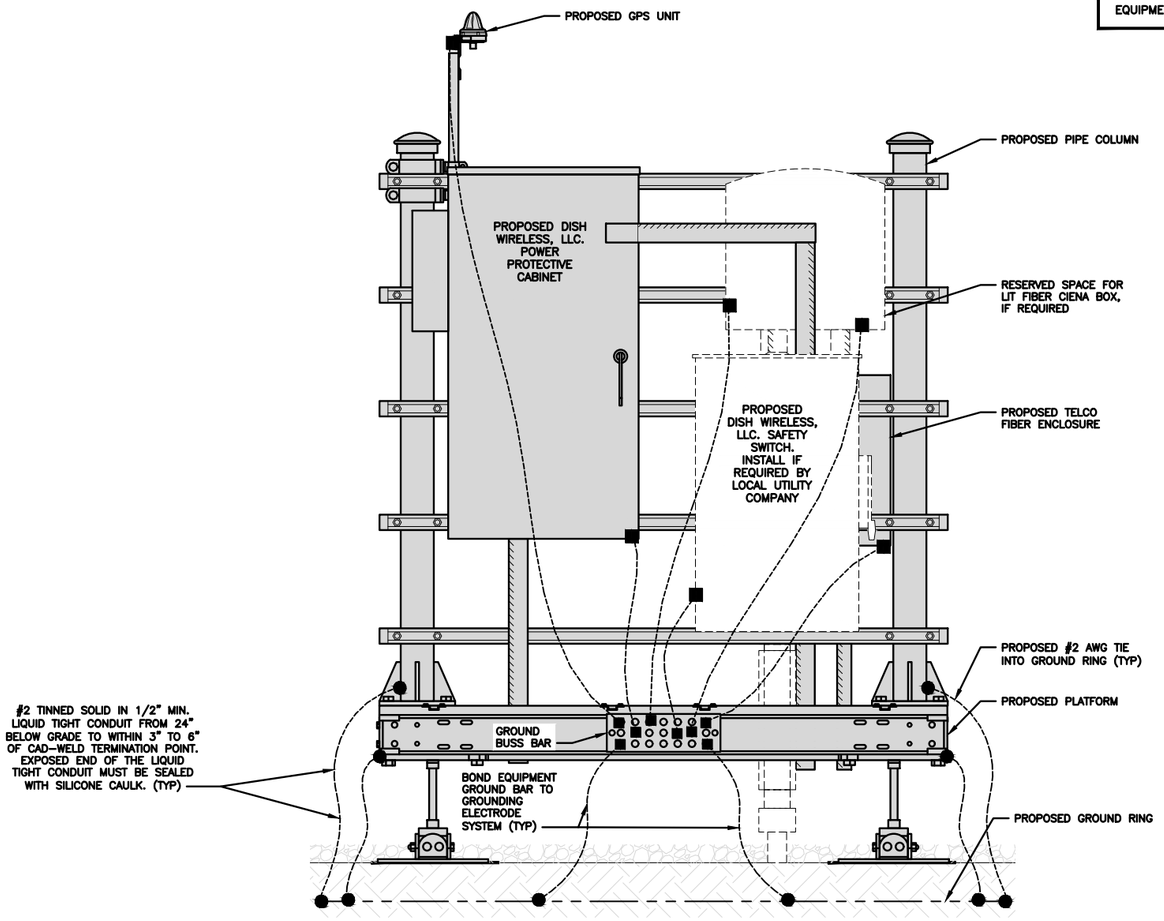
12 POLLY LANE
BOZRAH, CT 06336

SHEET TITLE
GROUNDING PLANS AND NOTES

SHEET NUMBER
G-1

NOTES

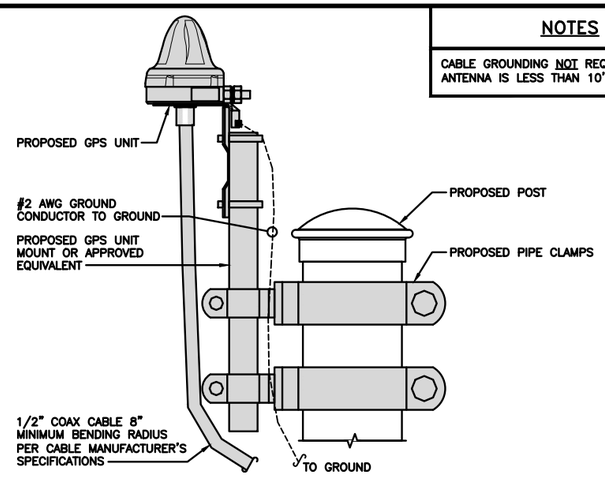
EQUIPMENT CABINET OMITTED FOR CLARITY



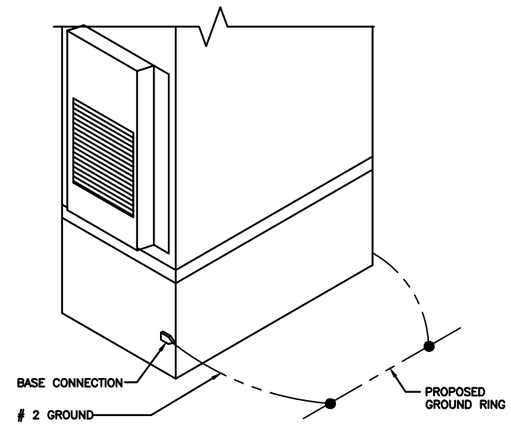
H-FRAME GROUNDING DETAIL | NO SCALE | 1

NOTES

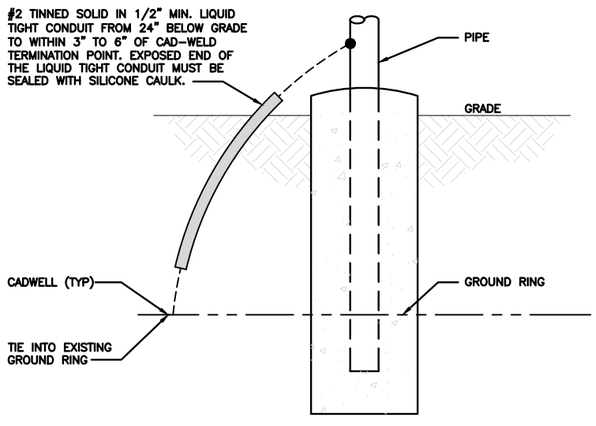
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



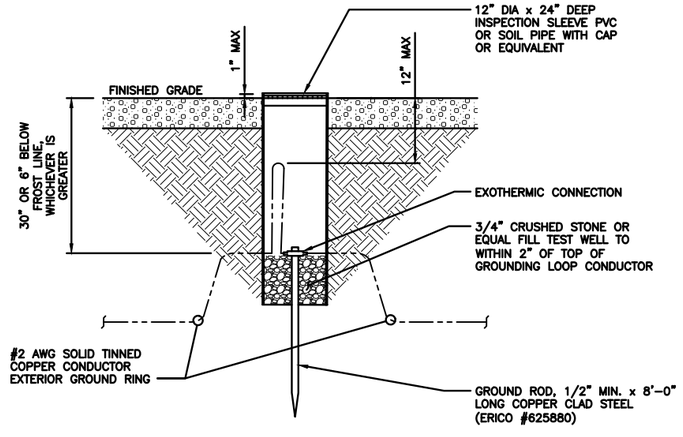
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



OUTDOOR CABINET GROUNDING | NO SCALE | 3



TRANSITIONING GROUND DETAIL | NO SCALE | 4



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

NOT USED | NO SCALE | 6

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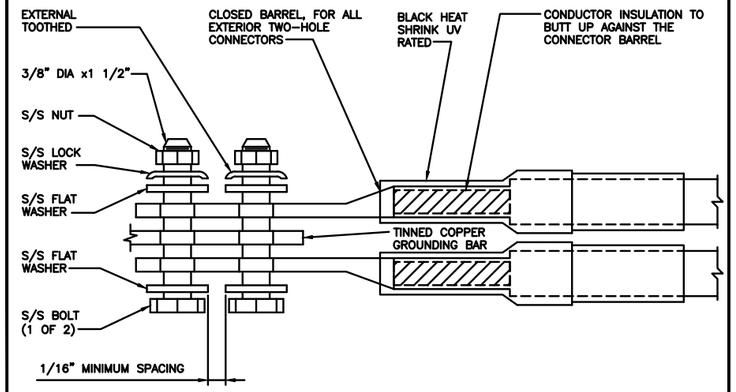
SHEET TITLE
GROUNDING DETAILS

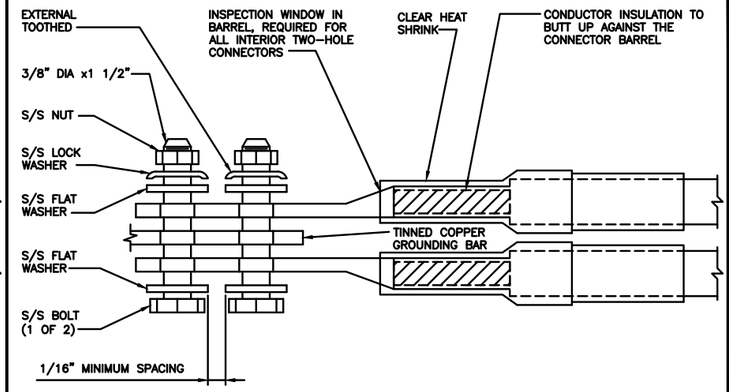
SHEET NUMBER
G-2

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

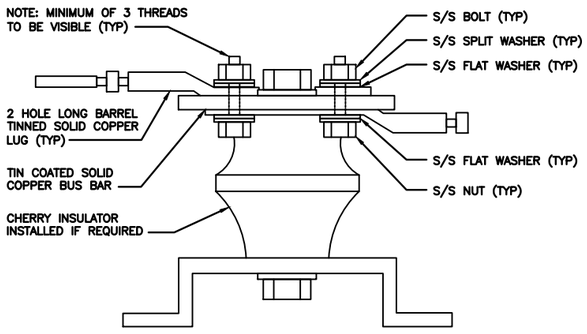
TYPICAL GROUNDING NOTES | NO SCALE | 1



TYPICAL EXTERIOR TWO HOLE LUG | NO SCALE | 2



TYPICAL INTERIOR TWO HOLE LUG | NO SCALE | 3



LUG DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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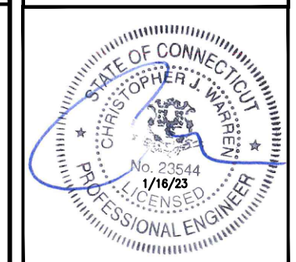
SUITE 150
FORT WASHINGTON, PA 19034



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RCD	SS	CJW

RFDS REV #: N/A

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A&E PROJECT NUMBER
1197-F0001-C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBOS00038A
0
12 POLLY LANE
BOZRAH, CT 06336

SHEET TITLE
GROUNDING DETAILS

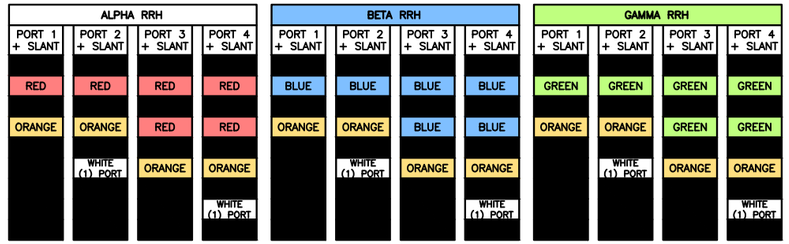
SHEET NUMBER
G-3

RF JUMPER COLOR CODING

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

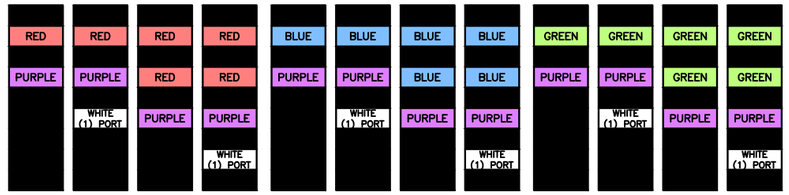
LOW-BAND RRH –
(600MHz N71 BASEBAND) +
(850MHz N26 BAND) +
(700MHz N29 BAND) – OPTIONAL PER MARKET

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



MID-BAND RRH –
(AWS BANDS N66+N70)

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

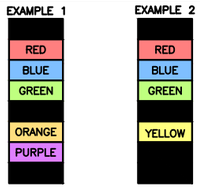


HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED AM LONG WITH FREQUENCY BANDS

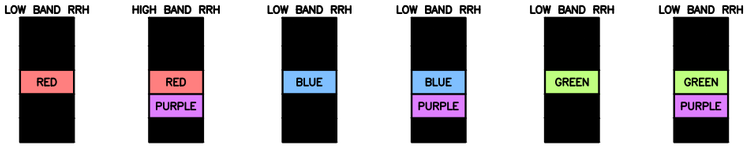
EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS

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



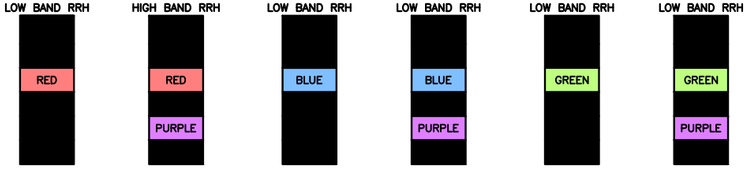
HYBRID/DISCREET CABLES

LOW-BAND RRH FIBER CABLES HAVE SECTOR STRIPE ONLY

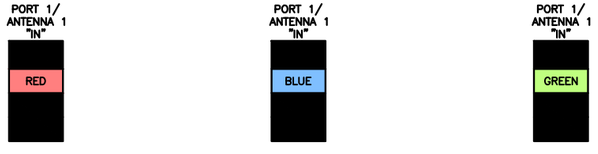


POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY



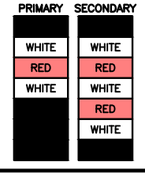
RET MOTORS AT ANTENNAS



MICROWAVE RADIO LINKS

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

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



RF CABLE COLOR CODES | NO SCALE | 1

LOW BANDS (N71-N28)
OPTIONAL – (N29)
ORANGE

AWS
(N65+N70+H-BLOCK)
PURPLE

CBRS TECH
(3 GHz)
YELLOW

NEGATIVE SLANT PORT
ON ANTRRH
WHITE

ALPHA SECTOR
RED

BETA SECTOR
BLUE

GAMMA SECTOR
GREEN

COLOR IDENTIFIER | NO SCALE | 2

NOT USED | NO SCALE | 3

NOT USED | NO SCALE | 4

dish wireless.
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LITTLETON, CO 80120

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SUITE 150
FORT WASHINGTON, PA 19034

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
1/16/23
LICENSED PROFESSIONAL ENGINEER

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A&E PROJECT NUMBER
1197-F0001-C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBOS00038A
0
12 POLLY LANE
BOZRAH, CT 06336

SHEET TITLE
RF
CABLE COLOR CODE

SHEET NUMBER
RF-1

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE

FLUORESCENT LIGHTING FIXTURE
(2) TWO LAMPS 48–T8

SMOKE DETECTION (DC)

EMERGENCY LIGHTING (DC)

SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW
LED–1–25A400/51K–SR4–120–PE–DDBTXD

CHAIN LINK FENCE

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE

UNDERGROUND POWER

UNDERGROUND TELCO

OVERHEAD POWER

OVERHEAD TELCO

UNDERGROUND TELCO/POWER

ABOVE GROUND POWER

ABOVE GROUND TELCO

ABOVE GROUND TELCO/POWER

WORKPOINT

SECTION REFERENCE

DETAIL REFERENCE

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	UNITERRUPTIBLE POWER SYSTEM (DC POWER PLANT)
VIF	VERIFIED IN FIELD
W	WIDE
W/	WITH
WD	WOOD
WP	WEATHERPROOF
WT	WEIGHT

ABBREVIATIONS

dish wireless.

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LITTLETON, CO 80120

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Turnkey Wireless Development
certified WBENC

INFINIGY
500 WEST OFFICE CENTER DRIVE
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A&E PROJECT NUMBER

1197–F0001–C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBOS00038A
0
12 POLLY LANE
BOZRAH, CT 06336

SHEET TITLE

LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SITE ACTIVITY REQUIREMENTS:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES:

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

CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION

CARRIER:DISH WIRELESS, LLC.

TOWER OWNER:TOWER OWNER

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

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

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

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

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

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

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

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

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

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

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

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

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

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STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
1/16/23
LICENSED PROFESSIONAL ENGINEER

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RCD	SS	CJW

RFDS REV #: N/A

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A&E PROJECT NUMBER

1197–F0001–C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBOS00038A
0
12 POLLY LANE
BOZRAH, CT 06336

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

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

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

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

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

#4 BARS AND SMALLER 40 ksi

#5 BARS AND LARGER 60 ksi

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

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

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

ELECTRICAL INSTALLATION NOTES:

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

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

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

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

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

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

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

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

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

8. TIE WRAPS ARE NOT ALLOWED.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR DISH WIRELESS, LLC. AND TOWER OWNER BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.

28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.

29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "DISH WIRELESS, LLC.".

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

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STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
1/16/23
LICENSED PROFESSIONAL ENGINEER

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RCD	SS	CJW

RFDS REV #: N/A

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A&E PROJECT NUMBER

1197-F0001-C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBOS00038A
0
12 POLLY LANE
BOZRAH, CT 06336

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-3

GROUNDING NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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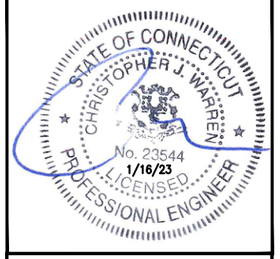

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RFDS REV #: N/A

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DISH WIRELESS, LLC.
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BOBOS00038A
0
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BOZRAH, CT 06336

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

Exhibit D

Structural Analysis Report

PAUL J. FORD & COMPANY

Report Date: December 13, 2022

Client: Everest Infrastructure Partners
ATTN: Andy Dykstra
Two Allegheny Center Nova Tower 2, Suite 1002
Pittsburgh, PA, 15212
Phone: (412) 489-0348
Email: andrew.dykstra@everestinfrastructure.com

Structure: 187ft Guyed Tower
Site Name: Bozrah Polly Lane
Site Reference #: 701695
Site Address: 3 Polly Lane
City, County, State: Bozrah, New London, CT
Latitude, Longitude: 41.573333, -72.203333

PJF Project Number: 13321-0017.003.8700 R1
(revised proposed antenna model)

Paul J. Ford and Company is pleased to submit this **Structural Analysis Report** to determine the tower stress level.

Analysis Criteria:
This analysis utilizes an ultimate 3-second gust wind speed of 123 mph as required by the 2022 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Proposed Appurtenance Loads:
The structure was analyzed with the antenna and cable configuration shown in Table 1 of this report.

Summary of Analysis Results:

Existing Structure:	Pass	73.7%
Existing Foundation:	Pass	70.1%

We at Paul J. Ford and Company appreciate the opportunity of providing our continuing professional services to you and Everest Infrastructure Partners. If you have any questions or need further assistance on this or any other projects, please give us a call.

Respectfully Submitted By:
Paul J. Ford and Company

Chris Sandlin, P.E.
Project Engineer 2
csandlin@pauljford.com

AKT

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER

12/13/2022

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 187 ft Guyed tower designed by Fred A. Nudd Corporation.

The tower has been modified per reinforcement drawings prepared by Paul J. Ford in March of 2020. Reinforcement consists of expanding the Base Foundation by adding concrete.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	123 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1 in
Ice Wind Speed:	50 mph
Service Wind Speed:	60 mph

Table 1 - Antenna Equipment and Cable Information

Status	Mount Level (ft)	Ant. CL (ft)	Qty.	Antenna Model	Mount Type	Feedline Qty.	Feedline Size (in)	Coax Location	Owner/ Tenant
Existing	177.0	177.0	3	APXVAALL24_43-U-NA20 w/ Mount Pipe	Sector Mount with mount mods			Face A	T-Mobile
			3	RADIO 4449 B71 B85A_T-MOBILE					
Reserved			3	VV-65B-R1_TMO w/ Mount Pipe		3	1-5/8		
			3	4460 B25/B66					
			3	AIR 6419 B41_TMO w/ Mount Pipe					
To Be Removed			3	4415 B25		3	1-3/8		
Existing	187.0	187.0	6	DMP65R-BU8D w/ Mount Pipe	Sector Mount	12 1 2	1-5/8 1-3/8 0.66	Face B	AT&T
			3	RRUS 4449 B5/B12					
			3	RRUS 4478 B14					
			3	RRUS 8843 B2/B66A					
			3	7770 w/ Mount Pipe					
			6	LGP 17201					
			2	DC6-48-60-18-8F					
	150.0	150.0	3	1900 MHz 4x45W RRH	Sector Mount	4	1-1/4	Face B	-
			3	RRH 8x20W + Solar Shield					
			6	RRH2x50-WCS					
			3	DT465B-2XR w/ Mount Pipe					
			3	APXV9ERR18-C-A20 w/ Mount Pipe					

Status	Mount Level (ft)	Ant. CL (ft)	Qty.	Antenna Model	Mount Type	Feedline Qty.	Feedline Size (in)	Coax Location	Owner/ Tenant
	136.0	136.0	3	BXA-70063/6CF w/ Mount Pipe	Sector Mount	10 2	1-5/8 6x12	Face A	Verizon
			3	BSAMNT-SBS-2-2 (Mount Bracket)					
			3	CBC78T-DS-43-2X					
			6	JAHH-65B-R3B w/ Mount Pipe					
			1	RVZDC-6627-PF-48					
			3	B2/B66A RRH-BR049 (RFV01U-D1A)					
			3	B5/B13 RRH-BR04C (RFV01U-D2A)					
			3	MT6407-77A w/ Mount Pipe					
Proposed	127.0	127.0	3	TA08025-B604	Sector Mount	1	1.6	Face C	Dish
			3	TA08025-B605					
			3	MX08FRO665-21 w/ Mount Pipe					
			1	RDIDC-9181-PF-48					

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference
Foundation Mapping Report	TEP, 11/20/2019	133845.318836
Geotechnical Report	TEP, 8/24/2009	080004.46E
Previous Structural Analysis	Fred A. Nudd Corporation, 12/28/2017	117-23243.4
Tower Modification Drawings	Paul J. Ford, 3/12/020	A00019-0431.002.8800_R1
PMI	Armor Tower Engineering, 8/18/2020	701695
Collocation Application	Dish, 10/12/2021	-

3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were maintained in accordance with the TIA-222 standard.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) The original guy anchor foundation drawings were not available at the time of analysis. Therefore, we have assumed the material grades, guy rod information, and reinforcing steel information provided in the previous structural analysis report, referenced in Table 3, are correct.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J. Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 3 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	187 - 180	Leg	P2.875"x0.203" (2.5 STD)	3	-15.47	78.46	19.7	Pass
T2	180 - 160	Leg	P2.875"x0.203" (2.5 STD)	27	-55.24	83.59	66.1	Pass
T3	160 - 140	Leg	P2.875"x0.203" (2.5 STD)	87	-60.91	83.59	72.9	Pass
T4	140 - 120	Leg	P2.875"x0.203" (2.5 STD)	147	-61.58	83.59	73.7	Pass
T5	120 - 100	Leg	P2.875"x0.203" (2.5 STD)	207	-59.51	83.59	71.2	Pass
T6	100 - 80	Leg	P2.875"x0.203" (2.5 STD)	267	-44.67	79.61	56.1	Pass
T7	80 - 60	Leg	P2.875"x0.203" (2.5 STD)	327	-46.48	79.61	58.4	Pass
T8	60 - 40	Leg	P2.875"x0.203" (2.5 STD)	387	-50.32	79.61	63.2	Pass
T9	40 - 20	Leg	P2.875"x0.203" (2.5 STD)	447	-54.41	83.59	65.1	Pass
T10	20 - 0	Leg	P2.875"x0.203" (2.5 STD)	505	-54.46	83.59	65.2	Pass
T1	187 - 180	Diagonal	5/8	13	7.23	10.44	69.2	Pass
T2	180 - 160	Diagonal	C3x4.1	39	-5.34	32.80	16.3	Pass
T3	160 - 140	Diagonal	5/8	142	6.60	10.44	63.2	Pass
T4	140 - 120	Diagonal	5/8	163	4.91	10.44	47.0	Pass
T5	120 - 100	Diagonal	5/8	262	5.02	10.44	48.1	Pass
T6	100 - 80	Diagonal	5/8	322	3.41	10.44	32.6	Pass
T7	80 - 60	Diagonal	5/8	336	3.92	10.44	37.6	Pass
T8	60 - 40	Diagonal	5/8	439	3.94	10.44	37.8	Pass
T9	40 - 20	Diagonal	5/8	458	3.23	10.44	30.9	Pass
T10	20 - 0	Diagonal	5/8	516	4.01	10.44	38.5	Pass
T1	187 - 180	Horizontal	L 1.5 x 1.5 x 3/16	16	-6.17	9.18	67.2	Pass
T2	180 - 160	Horizontal	L 1.5 x 1.5 x 3/16	67	-2.71	9.64	28.2	Pass
T3	160 - 140	Horizontal	L 1.5 x 1.5 x 3/16	137	-5.19	9.64	53.8	Pass
T4	140 - 120	Horizontal	L 1.5 x 1.5 x 3/16	179	-4.34	9.64	45.0	Pass
T5	120 - 100	Horizontal	L 1.5 x 1.5 x 3/16	257	-3.86	9.64	40.1	Pass
T6	100 - 80	Horizontal	L 1.5 x 1.5 x 3/16	282	-3.66	9.64	37.9	Pass
T7	80 - 60	Horizontal	L 1.5 x 1.5 x 3/16	378	-3.52	9.64	36.5	Pass
T8	60 - 40	Horizontal	L 1.5 x 1.5 x 3/16	437	-3.46	9.64	35.9	Pass
T9	40 - 20	Horizontal	L 1.5 x 1.5 x 3/16	462	-3.63	9.64	37.6	Pass
T10	20 - 0	Horizontal	L 1.5 x 1.5 x 3/16	558	-3.51	9.64	36.4	Pass
T1	187 - 180	Top Girt	L 1.5 x 1.5 x 3/16	4	-4.08	9.64	42.3	Pass
T2	180 - 160	Top Girt	L 1.5 x 1.5 x 3/16	30	-1.05	9.64	10.9	Pass
T3	160 - 140	Top Girt	L 1.5 x 1.5 x 3/16	89	-3.99	9.64	41.4	Pass
T4	140 - 120	Top Girt	L 1.5 x 1.5 x 3/16	149	-2.63	9.64	27.3	Pass
T5	120 - 100	Top Girt	L 1.5 x 1.5 x 3/16	209	-3.08	9.64	32.0	Pass
T6	100 - 80	Top Girt	L 1.5 x 1.5 x 3/16	269	-2.03	9.64	21.1	Pass
T7	80 - 60	Top Girt	L 1.5 x 1.5 x 3/16	330	-2.00	9.64	20.7	Pass
T9	40 - 20	Top Girt	L 1.5 x 1.5 x 3/16	448	-1.71	9.64	17.8	Pass
T10	20 - 0	Top Girt	L 1.5 x 1.5 x 3/16	510	-1.97	9.64	20.5	Pass
T1	187 - 180	Bottom Girt	L 1.5 x 1.5 x 3/16	7	-4.41	9.64	45.7	Pass
T2	180 - 160	Bottom Girt	L 1.5 x 1.5 x 3/16	33	5.46	17.94	30.4	Pass
T3	160 - 140	Bottom Girt	L 1.5 x 1.5 x 3/16	93	-2.26	9.64	23.4	Pass
T4	140 - 120	Bottom Girt	L 1.5 x 1.5 x 3/16	152	-4.05	9.64	42.0	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T5	120 - 100	Bottom Girt	L 1.5 x 1.5 x 3/16	213	-2.08	9.64	21.6	Pass
T6	100 - 80	Bottom Girt	L 1.5 x 1.5 x 3/16	271	-1.81	9.64	18.7	Pass
T7	80 - 60	Bottom Girt	L 1.5 x 1.5 x 3/16	332	-1.79	9.64	18.6	Pass
T8	60 - 40	Bottom Girt	L 1.5 x 1.5 x 3/16	393	-2.04	9.64	21.2	Pass
T9	40 - 20	Bottom Girt	L 1.5 x 1.5 x 3/16	453	-1.80	9.64	18.7	Pass
T10	20 - 0	Bottom Girt	L 1.5 x 1.5 x 3/16	512	-0.34	9.64	3.6	Pass
T2	180 - 160	Guy A@160.375	5/8	577	13.09	26.71	49.0	Pass
		Guy A@170	5/8	606	13.72	26.71	51.4	Pass
T4	140 - 120	Guy A@120.375	9/16	595	8.46	22.05	38.4	Pass
T8	60 - 40	Guy A@59.625	9/16	603	8.08	22.05	36.6	Pass
T2	180 - 160	Guy B@160.375	5/8	572	12.80	26.71	47.9	Pass
		Guy B@170	5/8	605	13.66	26.71	51.1	Pass
T4	140 - 120	Guy B@120.375	9/16	590	8.79	22.05	39.9	Pass
T8	60 - 40	Guy B@59.625	9/16	602	8.66	22.05	39.3	Pass
T2	180 - 160	Guy C@160.375	5/8	566	14.30	26.71	53.5	Pass
		Guy C@170	5/8	604	14.80	26.71	55.4	Pass
T4	140 - 120	Guy C@120.375	9/16	583	9.92	22.05	45.0	Pass
T8	60 - 40	Guy C@59.625	9/16	601	9.12	22.05	41.4	Pass
T2	180 - 160	Top Guy Pull-Off@160.375	L 2 x 2 x 5/16	41	9.78	30.03	32.6 40.9 (b)	Pass
		Top Guy Pull-Off@170	L 1.5 x 1.5 x 3/16	60	4.39	17.94	24.5	Pass
T4	140 - 120	Top Guy Pull-Off@120.375	L 2 x 2 x 5/16	162	-7.19	29.71	24.2	Pass
T8	60 - 40	Top Guy Pull-Off@59.625	L 1.5 x 1.5 x 3/16	388	-1.17	8.91	13.1	Pass
T2	180 - 160	Torque Arm Top@160.375	L 3 x 3 x 1/4	567	13.81	41.75	33.1 59.0 (b)	Pass
T4	140 - 120	Torque Arm Top@120.375	L 3 x 3 x 1/4	585	8.43	41.75	20.2 36.0 (b)	Pass
T2	180 - 160	Torque Arm Bottom@160.375	L 3 x 3 x 1/4	575	-11.83	46.33	25.5 28.3 (b)	Pass
T4	140 - 120	Torque Arm Bottom@120.375	L 3 x 3 x 1/4	593	-7.46	46.33	16.1 17.9 (b)	Pass
							Summary	
						Leg (T4)	73.7	Pass
						Diagonal (T1)	69.2	Pass
						Horizontal (T1)	67.2	Pass
						Top Girt (T1)	42.3	Pass
						Bottom Girt (T1)	45.7	Pass
						Guy A (T2)	51.4	Pass
						Guy B (T2)	51.1	Pass
						Guy C (T2)	55.4	Pass
						Top Guy Pull-Off (T2)	40.9	Pass
						Torque Arm Top (T2)	59.0	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
						Torque Arm Bottom (T2)	28.3	Pass
						Bolt Checks	59.0	Pass
						Rating =	73.7	Pass

Table 4 - Tower Component Stresses vs Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Base Foundation (Structure)	0	12.5	Pass
1	Base Foundation (Soil Interaction)	0	61.9	Pass
1	Guy Anchor Shaft	0	70.1	Pass
1	Guy Anchor Foundation Structural	0	31.9	Pass
1	Guy Anchor Foundation Soil Interaction	0	42.4	Pass

Structure Rating (max from all components) =	**73.7%**

Notes:

- All structural ratings are per TIA-222-H Section 15.5

1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The tower and its base and anchor foundations have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

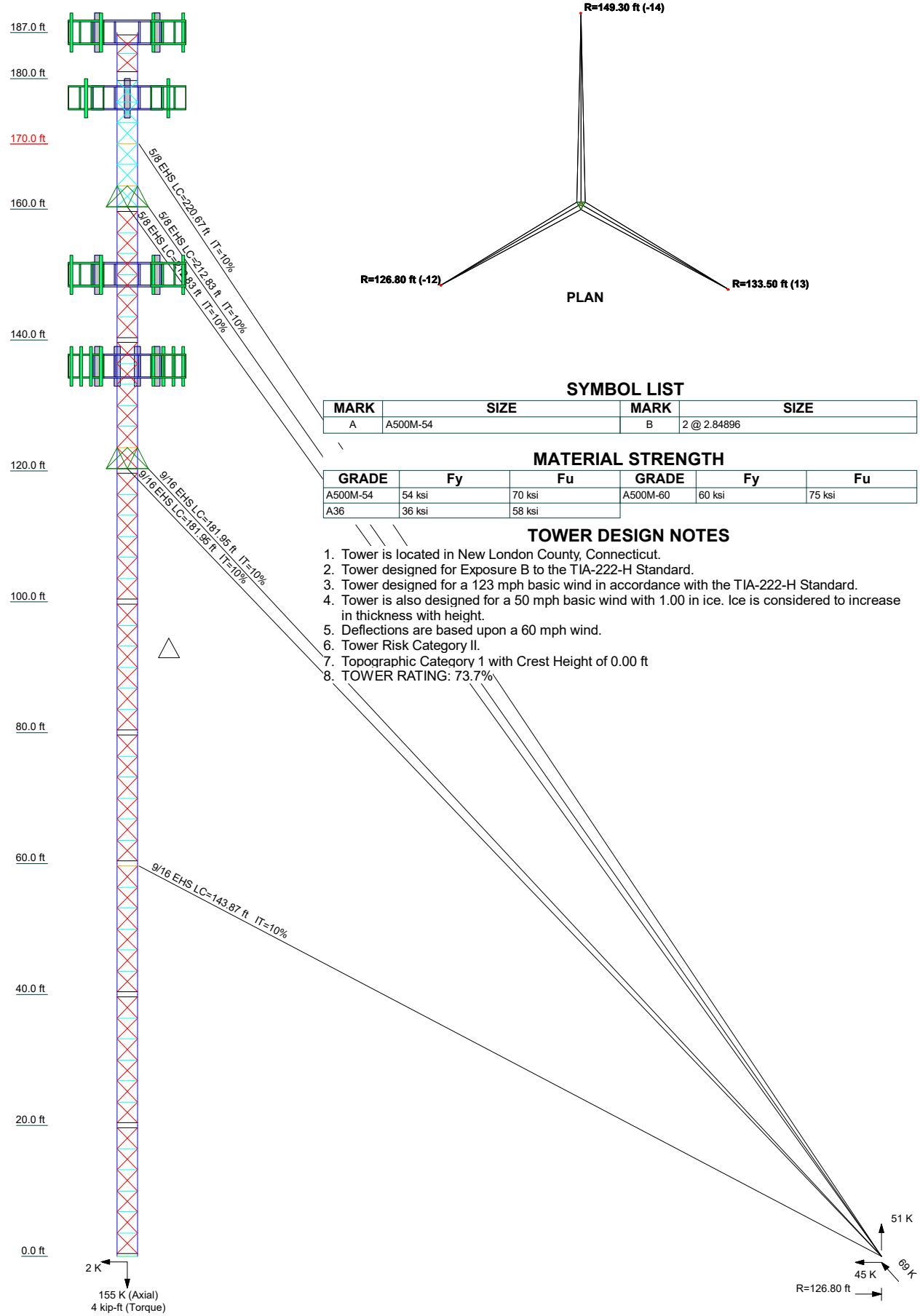
STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES BY PAUL J. FORD AND COMPANY

1) Paul J. Ford and Company has not made a field inspection to verify the tower member sizes or the antenna/coax loading. If the existing conditions are not as represented on these sketches, we should be contacted immediately to reevaluate any conclusions stated in this report.
2) No allowance was made for any damaged, missing, or rusted materials. The analysis of this structure assumes that no physical deterioration has occurred in any of the structural components of the tower and that all the structural members have the same load carrying capacity as the day the tower was erected.
3) It is not possible to have all the detailed information to perform a thorough analysis of every structural sub-component of an existing structure. The structural analysis provided by Paul J. Ford and Company verifies the adequacy of the main structural members of the tower. Paul J. Ford and Company provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc.

APPENDIX A

TNXTOWER OUTPUT

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	
Legs						P2.875"x0.203" (2.5 STD)					
Leg Grade						A500M-60					
Diagonals	A	C3x4.1				SR 5/8					
Diagonal Grade	SR 5/8					A36					
Top Girts				L 1.5 x 1.5 x 3/16				N.A.		L 1.5 x 1.5 x 3/16	
Bottom Girts						L 1.5 x 1.5 x 3/16					
Horizontals						L 1.5 x 1.5 x 3/16					
Top Guy Pull-Offs	N.A.	L 2 x 2 x 5/16	N.A.	L 2 x 2 x 5/16		N.A.		L 1.5 x 1.5 x 3/16		N.A.	
Face Width (ft)						3.5					
# Panels @ (ft)	B					55 @ 3.20833					
Weight (K)	0.2	1.5	0.7	1.0	0.7	0.7	0.7	0.7	0.7	0.7	7.6



PLAN

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	A500M-54	B	2 @ 2.84896

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500M-54	54 ksi	70 ksi	A500M-60	60 ksi	75 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 123 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 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. TOWER RATING: 73.7%

ALL REACTIONS ARE FACTORED

PJFLogo

Paul J. Ford and Company
250 East Broad Street, STE 600
Columbus, Ohio
Phone: 614-221-6679
FAX:

Job: ***187-ft GT; Bozrah Polly Lane, CT***			
Project: ***13321-0017.003.8700 R1***			
Client: Everest Infrastructure Partners	Drawn by: csandlin	App'd:	
Code: TIA-222-H	Date: 12/13/22	Scale: NTS	
Path: G:\TOWER\133_Everest Infrastructure Partners\2021\13321-0017_Bozrah, CT\13321-0017.003.8700_SA\tnx\13321-0017.003.8700.eri		Dwg No.	E-1

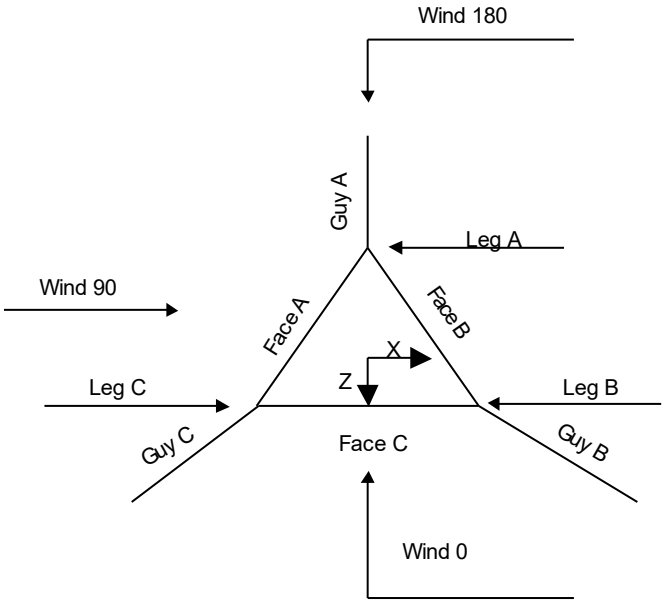
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 187.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.50 ft at the top and 3.50 ft at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

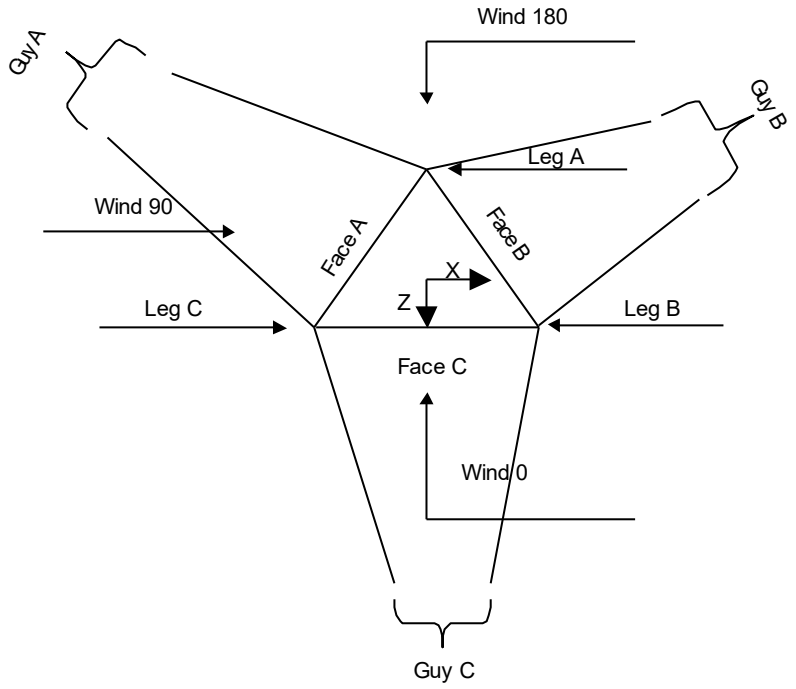
- Tower is located in New London County, Connecticut.
- Tower base elevation above sea level: 261.00 ft.
- Basic wind speed of 123 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.0000 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.
- Tension only take-up is 0.0313 in.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.05.
- Safety factor used in guy design is 0.9524.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned	√	Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
	Use Code Stress Ratios	√	Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
	Use Code Safety Factors - Guys	√	Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-H Bracing Resist. Exemption
√	Include Bolts In Member Capacity	√	Autocalc Torque Arm Areas		Use TIA-222-H Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
√	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)	√	Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known



Corner & Starmount Guyed Tower



Face Guyed

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	187.00-180.00			3.50	1	7.00
T2	180.00-160.00			3.50	1	20.00
T3	160.00-140.00			3.50	1	20.00
T4	140.00-120.00			3.50	1	20.00
T5-T6	120.00-80.00			3.50	2	20.00
T7	80.00-60.00			3.50	1	20.00
T8-T10	60.00-0.00			3.50	3	20.00

Tower Section Geometry *(cont'd)*

Tower Section	*Tower Elevation*	*Diagonal Spacing*	*Bracing Type*	*Has K Brace End Panels*	*Has Horizontals*	*Top Girt Offset*	*Bottom Girt Offset*
	ft	*ft*				*in*	*in*
T1	187.00-180.00	2.85	TX Brace	No	Yes	3.7500	11.8750
T2	180.00-160.00	3.21	X Brace	No	Yes	4.5000	4.5000
T3	160.00-140.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T4	140.00-120.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T5-T6	120.00-80.00	3.21	TX Brace	No	Yes	4.5000	4.5000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T7	80.00-60.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T8-T10	60.00-0.00	3.21	TX Brace	No	Yes	4.5000	4.5000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 187.00-180.00	Pipe	P2.875"x0.203" (2.5 STD)	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T2 180.00-160.00	Pipe	P2.875"x0.203" (2.5 STD)	A500M-60 (60 ksi)	Channel	C3x4.1	A36 (36 ksi)
T3 160.00-140.00	Pipe	P2.875"x0.203" (2.5 STD)	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T4 140.00-120.00	Pipe	P2.875"x0.203" (2.5 STD)	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T5-T6 120.00-80.00	Pipe	P2.875"x0.203" (2.5 STD)	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T7 80.00-60.00	Pipe	P2.875"x0.203" (2.5 STD)	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T8-T10 60.00-0.00	Pipe	P2.875"x0.203" (2.5 STD)	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 187.00-180.00	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T2 180.00-160.00	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T3 160.00-140.00	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T4 140.00-120.00	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T5-T6 120.00-80.00	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T7 80.00-60.00	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T8-T10 60.00-0.00	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 187.00-180.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T2 180.00-160.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T3 160.00-140.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T4 140.00-120.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T5-T6 120.00-80.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T7 80.00-60.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T8-T10 60.00-0.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

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
T1 187.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T2 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T3 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T4 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T5-T6 120.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T7 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T8-T10 60.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 187.00-180.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 180.00-160.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 160.00-140.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 140.00-120.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5-T6 120.00-80.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 80.00-60.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8-T10 60.00-0.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 187.00-180.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 180.00-160.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 160.00-140.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 140.00-120.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5-T6 120.00-80.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 80.00-60.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8-T10 60.00-0.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 187.00-180.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 180.00-160.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 160.00-140.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 140.00-120.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5-T6 120.00-80.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 80.00-60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8-T10 60.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 187.00-180.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 180.00-160.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 160.00-140.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 140.00-120.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5-T6 120.00-80.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T7 80.00-60.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8-T10 60.00-0.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
160.375	EHS	A	5/8	4.24	10%	23000	0.813	228.10	149.30	0.0000	-14.00	100%
		B	5/8	4.24	10%	23000	0.813	197.38	133.50	0.0000	13.00	100%
		C	5/8	4.24	10%	23000	0.813	212.66	126.80	0.0000	-12.00	100%
120.375	EHS	A	9/16	3.50	10%	23000	0.671	199.25	149.30	0.0000	-14.00	100%
		B	9/16	3.50	10%	23000	0.671	169.66	133.50	0.0000	13.00	100%
		C	9/16	3.50	10%	23000	0.671	181.81	126.80	0.0000	-12.00	100%
59.625	EHS	A	9/16	3.50	10%	23000	0.671	164.53	149.30	0.0000	-14.00	100%
		B	9/16	3.50	10%	23000	0.671	139.40	133.50	0.0000	13.00	100%
		C	9/16	3.50	10%	23000	0.671	143.76	126.80	0.0000	-12.00	100%
170	EHS	A	5/8	4.24	10%	23000	0.813	235.50	149.30	0.0000	-14.00	100%
		B	5/8	4.24	10%	23000	0.813	204.63	133.50	0.0000	13.00	100%
		C	5/8	4.24	10%	23000	0.813	220.50	126.80	0.0000	-12.00	100%

Guy Data *(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
160.375	Torque Arm	7.00	30.0000	Dog Ear	A36 (36 ksi)	Single Angle	L 3 x 3 x 1/4
120.375	Torque Arm	7.00	30.0000	Dog Ear	A36 (36 ksi)	Single Angle	L 3 x 3 x 1/4
59.625	Corner						
170	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
160.38	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L 2 x 2 x 5/16
120.38	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L 2 x 2 x 5/16
59.63	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16
170.00	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
160.375	0.19	0.16	0.17		4.91 3.8 sec/pulse	3.69 3.3 sec/pulse	4.27 3.6 sec/pulse	
120.375	0.13	0.11	0.12		3.76 3.3 sec/pulse	2.73 2.9 sec/pulse	3.13 3.1 sec/pulse	
59.625	0.11	0.09	0.10		2.58 2.8 sec/pulse	1.86 2.4 sec/pulse	1.97 2.4 sec/pulse	
170	0.19	0.17	0.18		5.23 3.9 sec/pulse	3.96 3.4 sec/pulse	4.59 3.7 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
160.375	No	No	1	1	1	1	1	1
120.375	No	No	1	1	1	1	1	1
59.625	No	No			1	1	1	1
170	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
160.375	0.7500 A325N	2	0.0000	0.75	0.7500 A325N	2	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
120.375	0.7500 A325N	2	0.0000	0.75	0.7500 A325N	2	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
59.625	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
170	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
160.375	A	73.19	29	5	1.0829
	B	86.69	31	5	1.1014
	C	74.19	30	5	1.0844
120.375	A	53.19	27	4	1.0489
	B	66.69	29	5	1.0729
	C	54.19	27	4	1.0508
59.625	A	22.81	23	4	0.9638

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
	B	36.31	24	4	1.0096
	C	23.81	23	4	0.9679
170	A	78.00	30	5	1.0898
	B	91.50	31	5	1.1074
	C	79.00	30	5	1.0912

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
FDH1206-24S50-xxM(1 5/8) (T-Mobile) *****	A	No	No	Ar (CaAa)	177.00 - 0.00	0.0000	0.1	3	3	1.4300	1.4300		1.63
FXL-1480(1-1/4) (Sprint)	B	No	No	Ar (CaAa)	150.00 - 0.00	0.0000	0.25	4	4	1.0000 1.5700	1.5700		0.45
AVA7-50(1-5/8) (AT&T)	B	No	No	Ar (CaAa)	187.00 - 0.00	0.0000	0.25	12	4	1.0000 2.0100	2.0100		0.70
AVA7-50(1-5/8) (Verizon/+2P)	A	No	No	Ar (CaAa)	136.00 - 0.00	0.0000	0.3	12	8	1.0000 2.0100	2.0100		0.70
.66" Fiber (AT&T)	B	No	No	Ar (CaAa)	187.00 - 0.00	0.0000	0.25	2	2	0.6600	0.6600		0.40
FDH1206-24S50-xxM(1-3/8) (AT&T)	B	No	No	Ar (CaAa)	187.00 - 0.00	0.0000	0.25	1	1	1.4300	1.4300		1.63
3" Conduit (2 1/2" EMT) (AT&T) *****	B	No	No	Ar (CaAa)	187.00 - 0.00	0.0000	0.25	1	1	2.8750	2.8750		2.16
Safety Line 3/8 *****	C	No	No	Ar (CaAa)	187.00 - 0.00	0.5000	0	1	1	0.3750	0.3750		0.22
AVA7-50(1-5/8) (DISH) *****	C	No	No	Ar (CaAa)	127.00 - 0.00	0.0000	0.4	1	1	1.0000 2.0100	2.0100		0.70

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C_AA_A ft^2/ft	Weight plf
*****								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	187.00-180.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	20.822	0.000	0.09
		C	0.000	0.000	0.263	0.000	0.00
T2	180.00-160.00	A	0.000	0.000	7.293	0.000	0.08
		B	0.000	0.000	59.490	0.000	0.26
		C	0.000	0.000	0.750	0.000	0.00
T3	160.00-140.00	A	0.000	0.000	8.580	0.000	0.10
		B	0.000	0.000	65.770	0.000	0.28
		C	0.000	0.000	0.750	0.000	0.00
T4	140.00-120.00	A	0.000	0.000	47.172	0.000	0.23
		B	0.000	0.000	72.050	0.000	0.30
		C	0.000	0.000	2.157	0.000	0.01
T5	120.00-100.00	A	0.000	0.000	56.820	0.000	0.27
		B	0.000	0.000	72.050	0.000	0.30
		C	0.000	0.000	4.770	0.000	0.02
T6	100.00-80.00	A	0.000	0.000	56.820	0.000	0.27
		B	0.000	0.000	72.050	0.000	0.30
		C	0.000	0.000	4.770	0.000	0.02
T7	80.00-60.00	A	0.000	0.000	56.820	0.000	0.27
		B	0.000	0.000	72.050	0.000	0.30
		C	0.000	0.000	4.770	0.000	0.02
T8	60.00-40.00	A	0.000	0.000	56.820	0.000	0.27
		B	0.000	0.000	72.050	0.000	0.30
		C	0.000	0.000	4.770	0.000	0.02
T9	40.00-20.00	A	0.000	0.000	56.820	0.000	0.27
		B	0.000	0.000	72.050	0.000	0.30
		C	0.000	0.000	4.770	0.000	0.02
T10	20.00-0.00	A	0.000	0.000	56.820	0.000	0.27
		B	0.000	0.000	72.050	0.000	0.30
		C	0.000	0.000	4.770	0.000	0.02

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_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	187.00-180.00	A	1.187	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	26.980	0.000	0.53
		C		0.000	0.000	1.925	0.000	0.02
T2	180.00-160.00	A	1.178	0.000	0.000	21.744	0.000	0.27
		B		0.000	0.000	76.887	0.000	1.50
		C		0.000	0.000	5.463	0.000	0.05
T3	160.00-140.00	A	1.163	0.000	0.000	25.486	0.000	0.31
		B		0.000	0.000	91.869	0.000	1.64
		C		0.000	0.000	5.404	0.000	0.05
T4	140.00-120.00	A	1.147	0.000	0.000	78.788	0.000	1.27
		B		0.000	0.000	106.705	0.000	1.77
		C		0.000	0.000	8.351	0.000	0.08
T5	120.00-100.00	A	1.128	0.000	0.000	91.897	0.000	1.49
		B		0.000	0.000	106.166	0.000	1.76
		C		0.000	0.000	13.794	0.000	0.15
T6	100.00-80.00	A	1.106	0.000	0.000	91.610	0.000	1.48
		B		0.000	0.000	105.531	0.000	1.74
		C		0.000	0.000	13.614	0.000	0.14
T7	80.00-60.00	A	1.078	0.000	0.000	91.260	0.000	1.46
		B		0.000	0.000	104.754	0.000	1.71
		C		0.000	0.000	13.395	0.000	0.14
T8	60.00-40.00	A	1.042	0.000	0.000	90.805	0.000	1.44
		B		0.000	0.000	103.744	0.000	1.68
		C		0.000	0.000	13.109	0.000	0.13
T9	40.00-20.00	A	0.991	0.000	0.000	90.144	0.000	1.19
		B		0.000	0.000	102.276	0.000	1.58
		C		0.000	0.000	12.694	0.000	0.12
T10	20.00-0.00	A	0.887	0.000	0.000	88.836	0.000	1.11
		B		0.000	0.000	99.365	0.000	1.46

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	11.870	0.000	0.11

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	187.00-180.00	8.5230	0.6394	6.4741	0.9644
T2	180.00-160.00	5.2089	-0.1801	3.6633	-0.0473
T3	160.00-140.00	7.7083	-0.1856	5.9162	-0.0593
T4	140.00-120.00	5.1917	-4.8222	4.4701	-2.8826
T5	120.00-100.00	4.2669	-5.3716	3.6643	-3.2031
T6	100.00-80.00	4.2669	-5.3716	3.6857	-3.2386
T7	80.00-60.00	4.2669	-5.3716	3.7116	-3.2824
T8	60.00-40.00	4.2669	-5.3716	3.7450	-3.3399
T9	40.00-20.00	4.2669	-5.3716	3.7927	-3.4247
T10	20.00-0.00	4.2669	-5.3716	3.8852	-3.5975

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	5	AVA7-50(1-5/8)	180.00 - 187.00	0.6000	0.5107
T1	7	.66" Fiber	180.00 - 187.00	0.6000	0.5107
T1	8	FDH1206-24S50-xxM(1-3/8)	180.00 - 187.00	0.6000	0.5107
T1	9	3" Conduit (2 1/2" EMT)	180.00 - 187.00	0.6000	0.5107
T1	11	Safety Line 3/8	180.00 - 187.00	0.6000	0.5107
T2	2	FDH1206-24S50-xxM(1 5/8)	160.00 - 177.00	0.6000	0.3826
T2	5	AVA7-50(1-5/8)	160.00 - 180.00	0.6000	0.3826
T2	7	.66" Fiber	160.00 - 180.00	0.6000	0.3826
T2	8	FDH1206-24S50-xxM(1-3/8)	160.00 - 180.00	0.6000	0.3826
T2	9	3" Conduit (2 1/2" EMT)	160.00 - 180.00	0.6000	0.3826
T2	11	Safety Line 3/8	160.00 - 180.00	0.6000	0.3826
T3	2	FDH1206-24S50-xxM(1 5/8)	140.00 - 160.00	0.6000	0.5211
T3	4	FXL-1480(1-1/4)	140.00 - 150.00	0.6000	0.5211
T3	5	AVA7-50(1-5/8)	140.00 - 160.00	0.6000	0.5211
T3	7	.66" Fiber	140.00 - 160.00	0.6000	0.5211
T3	8	FDH1206-24S50-xxM(1-3/8)	140.00 - 160.00	0.6000	0.5211
T3	9	3" Conduit (2 1/2" EMT)	140.00 - 160.00	0.6000	0.5211

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	11	Safety Line 3/8	140.00 - 160.00	0.6000	0.5211
T4	2	FDH1206-24S50-xxM(1 5/8)	120.00 - 140.00	0.6000	0.5231
T4	4	FXL-1480(1-1/4)	120.00 - 140.00	0.6000	0.5231
T4	5	AVA7-50(1-5/8)	120.00 - 140.00	0.6000	0.5231
T4	6	AVA7-50(1-5/8)	120.00 - 136.00	0.6000	0.5231
T4	7	.66" Fiber	120.00 - 140.00	0.6000	0.5231
T4	8	FDH1206-24S50-xxM(1-3/8)	120.00 - 140.00	0.6000	0.5231
T4	9	3" Conduit (2 1/2" EMT)	120.00 - 140.00	0.6000	0.5231
T4	11	Safety Line 3/8	120.00 - 140.00	0.6000	0.5231
T4	13	AVA7-50(1-5/8)	120.00 - 127.00	0.6000	0.5231
T5	2	FDH1206-24S50-xxM(1 5/8)	100.00 - 120.00	0.6000	0.5291
T5	4	FXL-1480(1-1/4)	100.00 - 120.00	0.6000	0.5291
T5	5	AVA7-50(1-5/8)	100.00 - 120.00	0.6000	0.5291
T5	6	AVA7-50(1-5/8)	100.00 - 120.00	0.6000	0.5291
T5	7	.66" Fiber	100.00 - 120.00	0.6000	0.5291
T5	8	FDH1206-24S50-xxM(1-3/8)	100.00 - 120.00	0.6000	0.5291
T5	9	3" Conduit (2 1/2" EMT)	100.00 - 120.00	0.6000	0.5291
T5	11	Safety Line 3/8	100.00 - 120.00	0.6000	0.5291
T5	13	AVA7-50(1-5/8)	100.00 - 120.00	0.6000	0.5291
T6	2	FDH1206-24S50-xxM(1 5/8)	80.00 - 100.00	0.6000	0.5342
T6	4	FXL-1480(1-1/4)	80.00 - 100.00	0.6000	0.5342
T6	5	AVA7-50(1-5/8)	80.00 - 100.00	0.6000	0.5342
T6	6	AVA7-50(1-5/8)	80.00 - 100.00	0.6000	0.5342
T6	7	.66" Fiber	80.00 - 100.00	0.6000	0.5342
T6	8	FDH1206-24S50-xxM(1-3/8)	80.00 - 100.00	0.6000	0.5342
T6	9	3" Conduit (2 1/2" EMT)	80.00 - 100.00	0.6000	0.5342
T6	11	Safety Line 3/8	80.00 - 100.00	0.6000	0.5342
T6	13	AVA7-50(1-5/8)	80.00 - 100.00	0.6000	0.5342
T7	2	FDH1206-24S50-xxM(1 5/8)	60.00 - 80.00	0.6000	0.5404
T7	4	FXL-1480(1-1/4)	60.00 - 80.00	0.6000	0.5404
T7	5	AVA7-50(1-5/8)	60.00 - 80.00	0.6000	0.5404
T7	6	AVA7-50(1-5/8)	60.00 - 80.00	0.6000	0.5404
T7	7	.66" Fiber	60.00 - 80.00	0.6000	0.5404
T7	8	FDH1206-24S50-xxM(1-3/8)	60.00 - 80.00	0.6000	0.5404

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	9	3" Conduit (2 1/2" EMT)	60.00 - 80.00	0.6000	0.5404
T7	11	Safety Line 3/8	60.00 - 80.00	0.6000	0.5404
T7	13	AVA7-50(1-5/8)	60.00 - 80.00	0.6000	0.5404
T8	2	FDH1206-24S50-xxM(1 5/8)	40.00 - 60.00	0.6000	0.5485
T8	4	FXL-1480(1-1/4)	40.00 - 60.00	0.6000	0.5485
T8	5	AVA7-50(1-5/8)	40.00 - 60.00	0.6000	0.5485
T8	6	AVA7-50(1-5/8)	40.00 - 60.00	0.6000	0.5485
T8	7	.66" Fiber	40.00 - 60.00	0.6000	0.5485
T8	8	FDH1206-24S50-xxM(1-3/8)	40.00 - 60.00	0.6000	0.5485
T8	9	3" Conduit (2 1/2" EMT)	40.00 - 60.00	0.6000	0.5485
T8	11	Safety Line 3/8	40.00 - 60.00	0.6000	0.5485
T8	13	AVA7-50(1-5/8)	40.00 - 60.00	0.6000	0.5485
T9	2	FDH1206-24S50-xxM(1 5/8)	20.00 - 40.00	0.6000	0.5603
T9	4	FXL-1480(1-1/4)	20.00 - 40.00	0.6000	0.5603
T9	5	AVA7-50(1-5/8)	20.00 - 40.00	0.6000	0.5603
T9	6	AVA7-50(1-5/8)	20.00 - 40.00	0.6000	0.5603
T9	7	.66" Fiber	20.00 - 40.00	0.6000	0.5603
T9	8	FDH1206-24S50-xxM(1-3/8)	20.00 - 40.00	0.6000	0.5603
T9	9	3" Conduit (2 1/2" EMT)	20.00 - 40.00	0.6000	0.5603
T9	11	Safety Line 3/8	20.00 - 40.00	0.6000	0.5603
T9	13	AVA7-50(1-5/8)	20.00 - 40.00	0.6000	0.5603
T10	2	FDH1206-24S50-xxM(1 5/8)	0.00 - 20.00	0.6000	0.5840
T10	4	FXL-1480(1-1/4)	0.00 - 20.00	0.6000	0.5840
T10	5	AVA7-50(1-5/8)	0.00 - 20.00	0.6000	0.5840
T10	6	AVA7-50(1-5/8)	0.00 - 20.00	0.6000	0.5840
T10	7	.66" Fiber	0.00 - 20.00	0.6000	0.5840
T10	8	FDH1206-24S50-xxM(1-3/8)	0.00 - 20.00	0.6000	0.5840
T10	9	3" Conduit (2 1/2" EMT)	0.00 - 20.00	0.6000	0.5840
T10	11	Safety Line 3/8	0.00 - 20.00	0.6000	0.5840
T10	13	AVA7-50(1-5/8)	0.00 - 20.00	0.6000	0.5840

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment ° t	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
187									
(2) DMP65R-BU8D_TIA w/ Mount Pipe (P - AT&T)	A	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	18.11 18.84 19.59	10.26 11.78 13.33	0.14 0.26 0.39
(2) DMP65R-BU8D_TIA w/ Mount Pipe (P - AT&T)	B	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	18.11 18.84 19.59	10.26 11.78 13.33	0.14 0.26 0.39
(2) DMP65R-BU8D_TIA w/ Mount Pipe (P - AT&T)	C	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	18.11 18.84 19.59	10.26 11.78 13.33	0.14 0.26 0.39
RRUS 4449 B5/B12 (P - AT&T)	A	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	1.97 2.14 2.33	1.41 1.56 1.73	0.07 0.09 0.11
RRUS 4449 B5/B12 (P - AT&T)	B	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	1.97 2.14 2.33	1.41 1.56 1.73	0.07 0.09 0.11
RRUS 4449 B5/B12 (P - AT&T)	C	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	1.97 2.14 2.33	1.41 1.56 1.73	0.07 0.09 0.11
RRUS 8843 B2/B66A (P - AT&T)	A	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	1.64 1.80 1.97	1.35 1.50 1.65	0.07 0.09 0.11
RRUS 8843 B2/B66A (P - AT&T)	B	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	1.64 1.80 1.97	1.35 1.50 1.65	0.07 0.09 0.11
RRUS 8843 B2/B66A (P - AT&T)	C	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	1.64 1.80 1.97	1.35 1.50 1.65	0.07 0.09 0.11
RRUS 4478 B14 (P - AT&T)	A	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	2.02 2.20 2.39	1.25 1.40 1.55	0.06 0.08 0.10
RRUS 4478 B14 (P - AT&T)	B	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	2.02 2.20 2.39	1.25 1.40 1.55	0.06 0.08 0.10
RRUS 4478 B14 (P - AT&T)	C	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	2.02 2.20 2.39	1.25 1.40 1.55	0.06 0.08 0.10
7770_TIA w/ Mount Pipe (E - AT&T)	A	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
7770_TIA w/ Mount Pipe (E - AT&T)	B	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
7770_TIA w/ Mount Pipe (E - AT&T)	C	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) LGP 17201 (E - AT&T)	A	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice	1.67 1.83 2.00	0.47 0.57 0.68	0.03 0.04 0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment ° °	Placement ft ft		C_AA_A Front ft^2 ft^2	C_AA_A Side ft^2 ft^2	Weight K K
						1" Ice			
(2) LGP 17201	B	From Leg	4.00	0.0000	187.00	No Ice	1.67	0.47	0.03
(E - AT&T)			0.00			1/2"	1.83	0.57	0.04
			0.00			Ice	2.00	0.68	0.06
						1" Ice			
(2) LGP 17201	C	From Leg	4.00	0.0000	187.00	No Ice	1.67	0.47	0.03
(E - AT&T)			0.00			1/2"	1.83	0.57	0.04
			0.00			Ice	2.00	0.68	0.06
						1" Ice			
(2) DC6-48-60-18-8F	A	From Leg	4.00	0.0000	187.00	No Ice	1.21	1.21	0.03
(E - AT&T)			0.00			1/2"	1.89	1.89	0.05
			0.00			Ice	2.11	2.11	0.08
						1" Ice			
Sector Mount [SM 801-3]	C	None		0.0000	187.00	No Ice	20.61	20.61	0.88
(E - AT&T)						1/2"	29.42	29.42	1.28
						Ice	38.23	38.23	1.82
						1" Ice			
mount mods	A	From Leg	2.00	0.0000	187.00	No Ice	4.16	8.47	0.24
			0.00			1/2"	5.29	10.84	0.27
			0.00			Ice	6.42	13.22	0.29
						1" Ice			
mount mods	B	From Leg	2.00	0.0000	187.00	No Ice	4.16	8.47	0.24
			0.00			1/2"	5.29	10.84	0.27
			0.00			Ice	6.42	13.22	0.29
						1" Ice			
mount mods	C	From Leg	2.00	0.0000	187.00	No Ice	4.16	8.47	0.24
			0.00			1/2"	5.29	10.84	0.27
			0.00			Ice	6.42	13.22	0.29
						1" Ice			
177									
APXVAALL24_43-U-NA20_TIA w/ Mount Pipe	A	From Leg	4.00	0.0000	177.00	No Ice	20.48	10.87	0.18
(TMO)			0.00			1/2"	21.23	12.39	0.32
			0.00			Ice	21.99	13.94	0.46
						1" Ice			
APXVAALL24_43-U-NA20_TIA w/ Mount Pipe	B	From Leg	4.00	0.0000	177.00	No Ice	20.48	10.87	0.18
(TMO)			0.00			1/2"	21.23	12.39	0.32
			0.00			Ice	21.99	13.94	0.46
						1" Ice			
APXVAALL24_43-U-NA20_TIA w/ Mount Pipe	C	From Leg	4.00	0.0000	177.00	No Ice	20.48	10.87	0.18
(TMO)			0.00			1/2"	21.23	12.39	0.32
			0.00			Ice	21.99	13.94	0.46
						1" Ice			
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.00	0.0000	177.00	No Ice	1.97	1.59	0.07
(TMO)			0.00			1/2"	2.15	1.75	0.09
			0.00			Ice	2.33	1.92	0.12
						1" Ice			
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.00	0.0000	177.00	No Ice	1.97	1.59	0.07
(TMO)			0.00			1/2"	2.15	1.75	0.09
			0.00			Ice	2.33	1.92	0.12
						1" Ice			
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.00	0.0000	177.00	No Ice	1.97	1.59	0.07
(TMO)			0.00			1/2"	2.15	1.75	0.09
			0.00			Ice	2.33	1.92	0.12
						1" Ice			
AIR 6419 B41_TMO_TIA w/ Mount Pipe	A	From Leg	4.00	0.0000	177.00	No Ice	6.53	3.75	0.11
(TMO - p)			0.00			1/2"	6.92	4.24	0.17
			0.00			Ice	7.31	4.75	0.23
						1" Ice			
AIR 6419 B41_TMO_TIA w/ Mount Pipe	B	From Leg	4.00	0.0000	177.00	No Ice	6.53	3.75	0.11
(TMO - p)			0.00			1/2"	6.92	4.24	0.17
			0.00			Ice	7.31	4.75	0.23
						1" Ice			
AIR 6419 B41_TMO_TIA w/ Mount Pipe	C	From Leg	4.00	0.0000	177.00	No Ice	6.53	3.75	0.11
			0.00				6.92	4.24	0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(TMO - p)			0.00			1/2" Ice	7.31	4.75	0.23
						1" Ice			
VV-65B-R1_TMO_TIA w/ Mount Pipe	A	From Leg	4.00	0.0000	177.00	No Ice	8.15	5.43	0.07
(TMO - p)			0.00			1/2" Ice	8.70	6.56	0.13
			0.00			1" Ice	9.22	7.41	0.20
VV-65B-R1_TMO_TIA w/ Mount Pipe	B	From Leg	4.00	0.0000	177.00	No Ice	8.15	5.43	0.07
(TMO - p)			0.00			1/2" Ice	8.70	6.56	0.13
			0.00			1" Ice	9.22	7.41	0.20
VV-65B-R1_TMO_TIA w/ Mount Pipe	C	From Leg	4.00	0.0000	177.00	No Ice	8.15	5.43	0.07
(TMO - p)			0.00			1/2" Ice	8.70	6.56	0.13
			0.00			1" Ice	9.22	7.41	0.20
4460 B25/B66	A	From Leg	4.00	0.0000	177.00	No Ice	2.57	1.97	0.11
(TMO - p)			0.00			1/2" Ice	2.77	2.15	0.13
			0.00			1" Ice	2.98	2.34	0.16
4460 B25/B66	B	From Leg	4.00	0.0000	177.00	No Ice	2.57	1.97	0.11
(TMO - p)			0.00			1/2" Ice	2.77	2.15	0.13
			0.00			1" Ice	2.98	2.34	0.16
4460 B25/B66	C	From Leg	4.00	0.0000	177.00	No Ice	2.57	1.97	0.11
(TMO - p)			0.00			1/2" Ice	2.77	2.15	0.13
			0.00			1" Ice	2.98	2.34	0.16
8' x 2" Sch 40 Pipe Mount	A	From Leg	4.00	0.0000	177.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
8' x 2" Sch 40 Pipe Mount	B	From Leg	4.00	0.0000	177.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
8' x 2" Sch 40 Pipe Mount	C	From Leg	4.00	0.0000	177.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
Sector Mount [SM 1305-3]	C	None		0.0000	177.00	No Ice	31.68	31.68	1.25
(TMO)						1/2" Ice	41.02	41.02	1.94
						1" Ice	50.37	50.37	2.79
173									
150									
APXV9ERR18-C-A20_TIA w/ Mount Pipe	A	From Leg	4.00	0.0000	150.00	No Ice	8.26	7.47	0.10
(Sprint)			0.00			1/2" Ice	8.82	8.66	0.17
			0.00			1" Ice	9.35	9.56	0.24
APXV9ERR18-C-A20_TIA w/ Mount Pipe	B	From Leg	4.00	0.0000	150.00	No Ice	8.26	7.47	0.10
(Sprint)			0.00			1/2" Ice	8.82	8.66	0.17
			0.00			1" Ice	9.35	9.56	0.24
APXV9ERR18-C-A20_TIA w/ Mount Pipe	C	From Leg	4.00	0.0000	150.00	No Ice	8.26	7.47	0.10
(Sprint)			0.00			1/2" Ice	8.82	8.66	0.17
			0.00			1" Ice	9.35	9.56	0.24
DT465B-2XR w/ Mount Pipe	A	From Leg	4.00	0.0000	150.00	No Ice	5.50	4.38	0.09
(Sprint)			0.00			1/2" Ice	5.97	4.84	0.16
			0.00			1" Ice	6.45	5.30	0.25
DT465B-2XR w/ Mount Pipe	B	From Leg	4.00	0.0000	150.00	No Ice	5.50	4.38	0.09
(Sprint)			0.00			1/2" Ice	5.97	4.84	0.16
			0.00			1" Ice	6.45	5.30	0.25

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
DT465B-2XR w/ Mount Pipe	C	From Leg	4.00	0.0000	150.00	No Ice	5.50	4.38	0.09
(Sprint)			0.00			1/2" Ice	5.97	4.84	0.16
			0.00			1" Ice	6.45	5.30	0.25
1900 MHz 4x45W RRH	A	From Leg	4.00	0.0000	150.00	No Ice	2.32	2.24	0.06
(Sprint)			0.00			1/2" Ice	2.53	2.44	0.08
			0.00			1" Ice	2.74	2.65	0.11
1900 MHz 4x45W RRH	B	From Leg	4.00	0.0000	150.00	No Ice	2.32	2.24	0.06
(Sprint)			0.00			1/2" Ice	2.53	2.44	0.08
			0.00			1" Ice	2.74	2.65	0.11
1900 MHz 4x45W RRH	C	From Leg	4.00	0.0000	150.00	No Ice	2.32	2.24	0.06
(Sprint)			0.00			1/2" Ice	2.53	2.44	0.08
			0.00			1" Ice	2.74	2.65	0.11
RRH 8x20W + Solar Shield	A	From Leg	4.00	0.0000	150.00	No Ice	4.05	1.53	0.07
(Sprint)			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
RRH 8x20W + Solar Shield	B	From Leg	4.00	0.0000	150.00	No Ice	4.05	1.53	0.07
(Sprint)			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
RRH 8x20W + Solar Shield	C	From Leg	4.00	0.0000	150.00	No Ice	4.05	1.53	0.07
(Sprint)			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
(2) RRH2x50-WCS	A	From Leg	4.00	0.0000	150.00	No Ice	4.91	2.70	0.08
(Sprint)			0.00			1/2" Ice	5.23	3.00	0.11
			0.00			1" Ice	5.55	3.30	0.14
(2) RRH2x50-WCS	B	From Leg	4.00	0.0000	150.00	No Ice	4.91	2.70	0.08
(Sprint)			0.00			1/2" Ice	5.23	3.00	0.11
			0.00			1" Ice	5.55	3.30	0.14
(2) RRH2x50-WCS	C	From Leg	4.00	0.0000	150.00	No Ice	4.91	2.70	0.08
(Sprint)			0.00			1/2" Ice	5.23	3.00	0.11
			0.00			1" Ice	5.55	3.30	0.14
Sector Mount [SM 502-3]	C	None		0.0000	150.00	No Ice	29.82	29.82	1.67
						1/2" Ice	42.21	42.21	2.27
						1" Ice	54.43	54.43	3.05
136									
BXA-70063/6CF_TIA w/ Mount Pipe	A	From Leg	4.00	0.0000	136.00	No Ice	7.87	6.27	0.06
(E-VZW)			0.00			1/2" Ice	8.42	7.43	0.12
			0.00			1" Ice	8.94	8.30	0.19
BXA-70063/6CF_TIA w/ Mount Pipe	B	From Leg	4.00	0.0000	136.00	No Ice	7.87	6.27	0.06
(E-VZW)			0.00			1/2" Ice	8.42	7.43	0.12
			0.00			1" Ice	8.94	8.30	0.19
BXA-70063/6CF_TIA w/ Mount Pipe	C	From Leg	4.00	0.0000	136.00	No Ice	7.87	6.27	0.06
(E-VZW)			0.00			1/2" Ice	8.42	7.43	0.12
			0.00			1" Ice	8.94	8.30	0.19
Sector Mount [SM 502-3]	C	None		0.0000	136.00	No Ice	29.82	29.82	1.67
(E-VZW)						1/2" Ice	42.21	42.21	2.27
						1" Ice	54.43	54.43	3.05
(2) JAHH-65B-R3B_TIA w/ Mount Pipe	A	From Leg	4.00	0.0000	136.00	No Ice	9.35	7.65	0.09
			0.00				9.92	8.83	0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(P-VZW)			0.00				1/2" Ice	10.46	9.73	0.25
							1" Ice			
(2) JAHH-65B-R3B_TIA w/ Mount Pipe	B	From Leg	4.00		0.0000	136.00	No Ice	9.35	7.65	0.09
			0.00				1/2" Ice	9.92	8.83	0.17
(P-VZW)			0.00				1" Ice	10.46	9.73	0.25
(2) JAHH-65B-R3B_TIA w/ Mount Pipe	C	From Leg	4.00		0.0000	136.00	No Ice	9.35	7.65	0.09
			0.00				1/2" Ice	9.92	8.83	0.17
(P-VZW)			0.00				1" Ice	10.46	9.73	0.25
MT6407-77A w/ Mount Pipe	A	From Leg	4.00		0.0000	136.00	No Ice	4.91	2.68	0.10
			0.00				1/2" Ice	5.26	3.14	0.14
(P-VZW)			0.00				1" Ice	5.61	3.62	0.18
MT6407-77A w/ Mount Pipe	B	From Leg	4.00		0.0000	136.00	No Ice	4.91	2.68	0.10
			0.00				1/2" Ice	5.26	3.14	0.14
(P-VZW)			0.00				1" Ice	5.61	3.62	0.18
MT6407-77A w/ Mount Pipe	C	From Leg	4.00		0.0000	136.00	No Ice	4.91	2.68	0.10
			0.00				1/2" Ice	5.26	3.14	0.14
(P-VZW)			0.00				1" Ice	5.61	3.62	0.18
B2/B66A RRH-BR049 (RFV01U-D1A)	A	From Leg	4.00		0.0000	136.00	No Ice	1.88	1.25	0.08
			0.00				1/2" Ice	2.05	1.39	0.10
(P-VZW)			0.00				1" Ice	2.22	1.54	0.12
B2/B66A RRH-BR049 (RFV01U-D1A)	B	From Leg	4.00		0.0000	136.00	No Ice	1.88	1.25	0.08
			0.00				1/2" Ice	2.05	1.39	0.10
(P-VZW)			0.00				1" Ice	2.22	1.54	0.12
B2/B66A RRH-BR049 (RFV01U-D1A)	C	From Leg	4.00		0.0000	136.00	No Ice	1.88	1.25	0.08
			0.00				1/2" Ice	2.05	1.39	0.10
(P-VZW)			0.00				1" Ice	2.22	1.54	0.12
B5/B13 RRH-BR04C (RFV01U-D2A)	A	From Leg	4.00		0.0000	136.00	No Ice	1.88	1.01	0.07
			0.00				1/2" Ice	2.05	1.14	0.09
(P-VZW)			0.00				1" Ice	2.22	1.28	0.11
B5/B13 RRH-BR04C (RFV01U-D2A)	B	From Leg	4.00		0.0000	136.00	No Ice	1.88	1.01	0.07
			0.00				1/2" Ice	2.05	1.14	0.09
(P-VZW)			0.00				1" Ice	2.22	1.28	0.11
B5/B13 RRH-BR04C (RFV01U-D2A)	C	From Leg	4.00		0.0000	136.00	No Ice	1.88	1.01	0.07
			0.00				1/2" Ice	2.05	1.14	0.09
(P-VZW)			0.00				1" Ice	2.22	1.28	0.11
RVZDC-6627-PF-48	C	From Leg	4.00		0.0000	136.00	No Ice	3.79	2.51	0.03
(P-VZW)			0.00				1/2" Ice	4.04	2.73	0.06
			0.00				1" Ice	4.30	2.95	0.10
CBC78T-DS-43-2X	A	From Leg	4.00		0.0000	136.00	No Ice	0.37	0.51	0.02
(P-VZW)			0.00				1/2" Ice	0.45	0.60	0.03
			0.00				1" Ice	0.53	0.70	0.04
CBC78T-DS-43-2X	B	From Leg	4.00		0.0000	136.00	No Ice	0.37	0.51	0.02
(P-VZW)			0.00				1/2" Ice	0.45	0.60	0.03
			0.00				1" Ice	0.53	0.70	0.04
CBC78T-DS-43-2X	C	From Leg	4.00		0.0000	136.00	No Ice	0.37	0.51	0.02
(P-VZW)			0.00				1/2" Ice	0.45	0.60	0.03
			0.00				1" Ice	0.53	0.70	0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment ° °	Placement ft ft		C_AA_A Front ft^2 ft^2	C_AA_A Side ft^2 ft^2	Weight K K
BSAMNT-SBS-2-2 (Mount Bracket) (P-VZW)	A	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.07 0.09 0.11
BSAMNT-SBS-2-2 (Mount Bracket) (P-VZW)	B	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.07 0.09 0.11
BSAMNT-SBS-2-2 (Mount Bracket) (P-VZW)	C	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.07 0.09 0.11
*****									
MX08FRO665-21_TIA w/ Mount Pipe (dish network)	A	From Leg	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	12.73 13.33 13.89	7.53 8.72 9.62	0.11 0.20 0.30
MX08FRO665-21_TIA w/ Mount Pipe (dish network)	B	From Leg	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	12.73 13.33 13.89	7.53 8.72 9.62	0.11 0.20 0.30
MX08FRO665-21_TIA w/ Mount Pipe (dish network)	C	From Leg	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	12.73 13.33 13.89	7.53 8.72 9.62	0.11 0.20 0.30
TA08025-B605 (dish network)	A	From Leg	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.13 1.27 1.41	0.08 0.09 0.11
TA08025-B605 (dish network)	B	From Leg	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.13 1.27 1.41	0.08 0.09 0.11
TA08025-B605 (dish network)	C	From Leg	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.13 1.27 1.41	0.08 0.09 0.11
TA08025-B604 (dish network)	A	From Leg	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	0.98 1.11 1.25	0.06 0.08 0.10
TA08025-B604 (dish network)	B	From Leg	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	0.98 1.11 1.25	0.06 0.08 0.10
TA08025-B604 (dish network)	C	From Leg	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	0.98 1.11 1.25	0.06 0.08 0.10
RDIDC-9181-PF-48 (dish network)	C	From Leg	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	2.01 2.19 2.37	1.17 1.31 1.46	0.02 0.04 0.06
Sabre_C10837002C-32788_Sector_(3)	C	None		0.0000	127.00	No Ice 1/2" Ice 1" Ice	18.52 28.00 37.48	18.52 28.00 37.48	2.03 3.07 4.11

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.0 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.0 Wind 60 deg - No Ice+1.0 Guy
5	1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.0 Wind 120 deg - No Ice+1.0 Guy
7	1.2 Dead+1.0 Wind 150 deg - No Ice+1.0 Guy
8	1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy
9	1.2 Dead+1.0 Wind 210 deg - No Ice+1.0 Guy
10	1.2 Dead+1.0 Wind 240 deg - No Ice+1.0 Guy
11	1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy
12	1.2 Dead+1.0 Wind 300 deg - No Ice+1.0 Guy
13	1.2 Dead+1.0 Wind 330 deg - No Ice+1.0 Guy
14	1.2 Dead+1.0 Ice+1.0 Temp+Guy
15	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy
16	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy
17	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy
18	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy
19	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy
20	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy
21	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy
22	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy
23	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy
24	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy
25	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy
26	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Guy C @ 126.8 ft Elev -12 ft Azimuth 240 deg	Max. Vert	10	-1.93	-1.20	0.69
	Max. H_x	10	-1.93	-1.20	0.69
	Max. H_z	5	-51.46	-39.63	22.36
	Min. Vert	5	-51.46	-39.63	22.36
	Min. H_x	5	-51.46	-39.63	22.36
	Min. H_z	10	-1.93	-1.20	0.69
Guy B @ 133.5 ft Elev 13 ft Azimuth 120 deg	Max. Vert	6	-0.75	0.67	0.39
	Max. H_x	12	-41.46	40.29	23.30
	Max. H_z	12	-41.46	40.29	23.30
	Min. Vert	12	-41.46	40.29	23.30
	Min. H_x	6	-0.75	0.67	0.39
	Min. H_z	6	-0.75	0.67	0.39
Guy A @ 149.3 ft Elev -14 ft	Max. Vert	2	-1.29	-0.00	-1.24

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Azimuth 0 deg					
	Max. H_x	11	-24.06	0.96	-24.51
	Max. H_z	2	-1.29	-0.00	-1.24
	Min. Vert	7	-43.02	-0.47	-43.97
	Min. H_x	5	-23.16	-0.99	-23.67
	Min. H_z	7	-43.02	-0.47	-43.97
Mast	Max. Vert	18	155.40	-0.33	-0.14
	Max. H_x	11	105.30	1.98	0.02
	Max. H_z	13	107.36	0.97	1.50
	Max. M_x	1	0.00	0.02	-0.02
	Max. M_z	1	0.00	0.02	-0.02
	Max. Torsion	6	3.73	-1.50	-0.93
	Min. Vert	33	78.40	0.02	-0.43
	Min. H_x	5	113.16	-1.80	0.02
	Min. H_z	8	96.61	0.01	-1.65
	Min. M_x	1	0.00	0.02	-0.02
	Min. M_z	1	0.00	0.02	-0.02
	Min. Torsion	12	-3.61	1.72	0.96

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	78.58	-0.02	0.02	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy	113.10	-0.06	-1.49	0.00	0.00	2.21
1.2 Dead+1.0 Wind 30 deg - No Ice+1.0 Guy	109.79	0.68	-1.13	0.00	0.00	2.35
1.2 Dead+1.0 Wind 60 deg - No Ice+1.0 Guy	102.30	1.40	-0.77	0.00	0.00	-0.06
1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy	113.16	1.80	-0.02	0.00	0.00	-3.32
1.2 Dead+1.0 Wind 120 deg - No Ice+1.0 Guy	117.75	1.50	0.93	0.00	0.00	-3.73
1.2 Dead+1.0 Wind 150 deg - No Ice+1.0 Guy	108.30	0.80	1.58	0.00	0.00	-2.61
1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy	96.61	-0.01	1.65	0.00	0.00	-2.26
1.2 Dead+1.0 Wind 210 deg - No Ice+1.0 Guy	103.59	-0.69	1.28	0.00	0.00	-2.34
1.2 Dead+1.0 Wind 240 deg - No Ice+1.0 Guy	109.46	-1.43	0.82	0.00	0.00	0.07
1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy	105.30	-1.98	-0.02	0.00	0.00	3.24
1.2 Dead+1.0 Wind 300 deg - No Ice+1.0 Guy	98.53	-1.72	-0.96	0.00	0.00	3.61
1.2 Dead+1.0 Wind 330 deg - No Ice+1.0 Guy	107.36	-0.97	-1.50	0.00	0.00	2.54
1.2 Dead+1.0 Ice+1.0 Temp+Guy	153.16	-0.12	0.12	0.00	0.00	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	155.12	-0.12	-0.27	0.00	0.00	0.49
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	155.21	0.05	-0.21	0.00	0.00	0.57
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	155.33	0.22	-0.07	0.00	0.00	0.13
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	155.40	0.33	0.14	0.00	0.00	-0.56

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	155.15	0.29	0.36	0.00	0.00	-0.74
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	154.30	0.11	0.47	0.00	0.00	-0.50
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	153.72	-0.11	0.48	0.00	0.00	-0.49
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	153.60	-0.31	0.43	0.00	0.00	-0.58
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	153.76	-0.48	0.33	0.00	0.00	-0.15
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	153.99	-0.57	0.13	0.00	0.00	0.54
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	154.23	-0.51	-0.11	0.00	0.00	0.72
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	154.59	-0.32	-0.25	0.00	0.00	0.49
Dead+Wind 0 deg - Service+Guy	79.29	-0.02	-0.40	0.00	0.00	0.50
Dead+Wind 30 deg - Service+Guy	79.18	0.16	-0.30	0.00	0.00	0.51
Dead+Wind 60 deg - Service+Guy	79.05	0.35	-0.19	0.00	0.00	-0.02
Dead+Wind 90 deg - Service+Guy	78.87	0.48	0.03	0.00	0.00	-0.74
Dead+Wind 120 deg - Service+Guy	78.63	0.41	0.28	0.00	0.00	-0.84
Dead+Wind 150 deg - Service+Guy	78.43	0.22	0.43	0.00	0.00	-0.59
Dead+Wind 180 deg - Service+Guy	78.40	-0.02	0.43	0.00	0.00	-0.50
Dead+Wind 210 deg - Service+Guy	78.51	-0.21	0.35	0.00	0.00	-0.52
Dead+Wind 240 deg - Service+Guy	78.71	-0.40	0.24	0.00	0.00	0.02
Dead+Wind 270 deg - Service+Guy	78.97	-0.52	0.02	0.00	0.00	0.74
Dead+Wind 300 deg - Service+Guy	79.19	-0.44	-0.22	0.00	0.00	0.83
Dead+Wind 330 deg - Service+Guy	79.28	-0.25	-0.38	0.00	0.00	0.59

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-30.79	0.00	0.00	30.79	0.00	0.005%
2	0.08	-36.54	-38.02	-0.08	36.54	38.02	0.002%
3	18.48	-36.39	-31.85	-18.48	36.39	31.85	0.003%
4	33.25	-36.26	-19.18	-33.25	36.26	19.19	0.001%
5	40.69	-36.46	-0.06	-40.69	36.46	0.06	0.003%
6	35.10	-36.67	20.15	-35.10	36.67	-20.16	0.004%
7	19.56	-36.50	33.85	-19.56	36.50	-33.85	0.003%
8	-0.08	-36.31	37.48	0.08	36.31	-37.48	0.000%
9	-18.48	-36.45	31.85	18.48	36.45	-31.85	0.002%
10	-33.72	-36.59	19.46	33.72	36.59	-19.46	0.004%
11	-40.69	-36.38	0.06	40.69	36.38	-0.06	0.003%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
12	-34.62	-36.18	-19.88	34.62	36.18	19.88	0.001%
13	-19.56	-36.35	-33.85	19.56	36.35	33.85	0.003%
14	-0.00	-96.41	0.00	0.00	96.41	-0.00	0.001%
15	0.06	-96.51	-11.01	-0.06	96.51	11.01	0.001%
16	5.56	-96.39	-9.54	-5.56	96.39	9.53	0.001%
17	9.87	-96.29	-5.70	-9.87	96.29	5.69	0.001%
18	11.73	-96.44	-0.04	-11.73	96.44	0.04	0.002%
19	10.17	-96.59	5.81	-10.17	96.59	-5.81	0.002%
20	5.64	-96.46	9.75	-5.63	96.46	-9.75	0.001%
21	-0.06	-96.32	10.94	0.06	96.32	-10.94	0.001%
22	-5.56	-96.44	9.54	5.56	96.44	-9.53	0.001%
23	-9.93	-96.54	5.73	9.93	96.54	-5.73	0.002%
24	-11.73	-96.39	0.04	11.73	96.39	-0.04	0.001%
25	-10.11	-96.24	-5.77	10.11	96.24	5.77	0.000%
26	-5.64	-96.36	-9.75	5.64	96.36	9.75	0.001%
27	0.02	-30.81	-9.05	-0.02	30.81	9.05	0.003%
28	4.40	-30.78	-7.58	-4.40	30.78	7.58	0.002%
29	7.91	-30.75	-4.57	-7.91	30.75	4.57	0.002%
30	9.69	-30.80	-0.01	-9.68	30.80	0.01	0.003%
31	8.35	-30.85	4.80	-8.35	30.85	-4.80	0.004%
32	4.66	-30.81	8.06	-4.66	30.81	-8.06	0.003%
33	-0.02	-30.76	8.92	0.02	30.76	-8.92	0.001%
34	-4.40	-30.80	7.58	4.40	30.80	-7.58	0.001%
35	-8.03	-30.83	4.63	8.02	30.83	-4.63	0.007%
36	-9.69	-30.78	0.01	9.68	30.78	-0.01	0.006%
37	-8.24	-30.73	-4.73	8.24	30.73	4.73	0.001%
38	-4.66	-30.77	-8.06	4.66	30.77	8.06	0.003%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	9	0.00000001	0.00009003
2	Yes	16	0.00000001	0.00004139
3	Yes	15	0.00000001	0.00008158
4	Yes	13	0.00000001	0.00004451
5	Yes	16	0.00000001	0.00005088
6	Yes	16	0.00000001	0.00006215
7	Yes	16	0.00000001	0.00004306
8	Yes	12	0.00000001	0.00006091
9	Yes	15	0.00000001	0.00004586
10	Yes	15	0.00000001	0.00006389
11	Yes	14	0.00000001	0.00009654
12	Yes	12	0.00000001	0.00005859
13	Yes	15	0.00000001	0.00005807
14	Yes	10	0.00000001	0.00005278
15	Yes	11	0.00000001	0.00006201
16	Yes	11	0.00000001	0.00006401
17	Yes	11	0.00000001	0.00006074
18	Yes	11	0.00000001	0.00004967
19	Yes	11	0.00000001	0.00004233
20	Yes	11	0.00000001	0.00003575
21	Yes	11	0.00000001	0.00003317
22	Yes	10	0.00000001	0.00006436
23	Yes	10	0.00000001	0.00003728
24	Yes	10	0.00000001	0.00007722
25	Yes	11	0.00000001	0.00003903
26	Yes	11	0.00000001	0.00004885
27	Yes	9	0.00000001	0.00004991
28	Yes	9	0.00000001	0.00005784
29	Yes	9	0.00000001	0.00005910
30	Yes	9	0.00000001	0.00004784
31	Yes	9	0.00000001	0.00004649
32	Yes	9	0.00000001	0.00003868
33	Yes	9	0.00000001	0.00003785
34	Yes	9	0.00000001	0.00003210
35	Yes	8	0.00000001	0.00008770
36	Yes	8	0.00000001	0.00008536
37	Yes	9	0.00000001	0.00003003
38	Yes	9	0.00000001	0.00004040

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	187 - 180	2.503	29	0.2107	0.0460
T2	180 - 160	2.177	29	0.2042	0.0410
T3	160 - 140	1.486	29	0.1203	0.0384
T4	140 - 120	1.149	29	0.0713	0.0482
T5	120 - 100	0.907	29	0.0419	0.0516
T6	100 - 80	0.852	30	0.0255	0.0857
T7	80 - 60	0.757	30	0.0331	0.1006
T8	60 - 40	0.607	30	0.0277	0.0971
T9	40 - 20	0.507	30	0.0330	0.0781
T10	20 - 0	0.314	30	0.0617	0.0441

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
187.00	(2) DMP65R-BU8D_TIA w/ Mount Pipe	29	2.503	0.2107	0.0460	18844
177.00	APXVAALL24_43-U-NA20_TIA w/ Mount Pipe	29	2.048	0.1964	0.0395	12595
170.00	Guy	29	1.780	0.1675	0.0381	11122
160.38	Guy	29	1.495	0.1218	0.0382	9515
150.00	APXV9ERR18-C-A20_TIA w/ Mount Pipe	29	1.291	0.0896	0.0438	19237
136.00	BXA-70063/6CF_TIA w/ Mount Pipe	29	1.095	0.0650	0.0483	175569
127.00	MX08FRO665-21_TIA w/ Mount Pipe	29	0.978	0.0514	0.0480	31544
120.38	Guy	29	0.910	0.0423	0.0513	21151
59.63	Guy	30	0.605	0.0276	0.0968	42819

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	187 - 180	17.426	6	1.2942	0.2584
T2	180 - 160	15.524	6	1.2682	0.2588
T3	160 - 140	11.096	6	0.9023	0.2546
T4	140 - 120	8.363	6	0.6260	0.2785
T5	120 - 100	6.364	6	0.3972	0.2957
T6	100 - 80	5.414	6	0.2283	0.4447
T7	80 - 60	4.617	6	0.2070	0.4888
T8	60 - 40	3.706	6	0.1912	0.4544
T9	40 - 20	2.948	6	0.2253	0.3593
T10	20 - 0	1.744	6	0.3572	0.2007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
187.00	(2) DMP65R-BU8D_TIA w/ Mount Pipe	6	17.426	1.2942	0.2584	4741
177.00	APXVAALL24_43-U-NA20_TIA w/ Mount Pipe	6	14.751	1.2355	0.2581	3100
170.00	Guy	6	13.087	1.1127	0.2554	2661
160.38	Guy	6	11.162	0.9095	0.2545	2310
150.00	APXV9ERR18-C-A20_TIA w/ Mount Pipe	6	9.585	0.7445	0.2613	4066
136.00	BXA-70063/6CF_TIA w/ Mount Pipe	6	7.904	0.5803	0.2802	9609
127.00	MX08FRO665-21_TIA w/ Mount Pipe	6	6.957	0.4766	0.2795	4395
120.38	Guy	6	6.391	0.4013	0.2941	3334
59.63	Guy	6	3.691	0.1907	0.4532	10391

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	187	Leg	A325N	0.7500	4	2.69	30.10	0.089	1.05	Bolt Tension
T2	180	Leg	A325N	0.7500	4	5.53	30.10	0.184	1.05	Bolt Tension
		Top Guy Pull-Off@160.375	A325N	0.7500	2	4.89	11.38	0.430	1.05	Member Block Shear
		Torque Arm Top@160.375	A325N	0.7500	2	6.90	11.15	0.619	1.05	Member Block Shear
		Torque Arm Bottom@160.375	A325N	0.7500	2	5.91	19.88	0.297	1.05	Bolt Shear
T3	160	Leg	A325N	0.7500	4	3.28	30.10	0.109	1.05	Bolt Tension
T4	140	Leg	A325N	0.7500	4	4.92	30.10	0.163	1.05	Bolt Tension
		Top Guy Pull-Off@120.375	A325N	0.7500	2	3.60	19.88	0.181	1.05	Bolt Shear
		Torque Arm Top@120.375	A325N	0.7500	2	4.22	11.15	0.378	1.05	Member Block Shear
		Torque Arm Bottom@120.375	A325N	0.7500	2	3.73	19.88	0.188	1.05	Bolt Shear
T5	120	Leg	A325N	0.7500	4	3.38	30.10	0.112	1	Bolt Tension
T6	100	Leg	A325N	0.7500	4	3.55	30.10	0.118	1	Bolt Tension
T7	80	Leg	A325N	0.7500	4	3.71	30.10	0.123	1	Bolt Tension
T8	60	Leg	A325N	0.7500	4	4.26	30.10	0.142	1.05	Bolt Tension
T9	40	Leg	A325N	0.7500	4	4.41	30.10	0.146	1.05	Bolt Tension
T10	20	Leg	A325N	0.7500	4	4.26	30.10	0.141	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
T2	160.38 (A) (577)	5/8 EHS	4.24	42.40	13.09	26.71	0.952	1.943
	160.38 (A) (578)	5/8 EHS	4.24	42.40	12.48	26.71	0.952	2.038
	160.38 (B) (571)	5/8 EHS	4.24	42.40	12.31	26.71	0.952	2.067
	160.38 (B) (572)	5/8 EHS	4.24	42.40	12.80	26.71	0.952	1.987
	160.38 (C) (565)	5/8 EHS	4.24	42.40	14.18	26.71	0.952	1.795
	160.38 (C) (566)	5/8 EHS	4.24	42.40	14.30	26.71	0.952	1.779
	170.00 (A) (606)	5/8 EHS	4.24	42.40	13.72	26.71	0.952	1.854
	170.00 (B) (605)	5/8 EHS	4.24	42.40	13.66	26.71	0.952	1.863
	170.00 (C) (604)	5/8 EHS	4.24	42.40	14.80	26.71	0.952	1.719
T4	120.38 (A) (595)	9/16 EHS	3.50	35.00	8.46	22.05	0.952	2.483
	120.38 (A) (596)	9/16 EHS	3.50	35.00	8.28	22.05	0.952	2.536
	120.38 (B) (589)	9/16 EHS	3.50	35.00	8.15	22.05	0.952	2.577
	120.38 (B) (590)	9/16 EHS	3.50	35.00	8.79	22.05	0.952	2.389
	120.38 (C) (583)	9/16 EHS	3.50	35.00	9.92	22.05	0.952	2.116
	120.38 (C) (584)	9/16 EHS	3.50	35.00	9.17	22.05	0.952	2.290
T8	59.63 (A) (603)	9/16 EHS	3.50	35.00	8.08	22.05	0.952	2.599

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
	59.63 (B) (602)	9/16 EHS	3.50	35.00	8.66	22.05	0.952	2.425
	59.63 (C) (601)	9/16 EHS	3.50	35.00	9.12	22.05	0.952	2.302

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	187 - 180	P2.875"x0.203" (2.5 STD)	7.00	2.85	36.1 K=1.00	1.7040	-15.47	74.72	0.207 [1]
T2	180 - 160	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6 K=1.00	1.7040	-55.24	79.61	0.694 [1]
T3	160 - 140	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6 K=1.00	1.7040	-60.91	79.61	0.765 [1]
T4	140 - 120	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6 K=1.00	1.7040	-61.58	79.61	0.774 [1]
T5	120 - 100	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6 K=1.00	1.7040	-59.51	79.61	0.748 [1]
T6	100 - 80	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6 K=1.00	1.7040	-44.67	79.61	0.561[*1]
T7	80 - 60	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6 K=1.00	1.7040	-46.48	79.61	0.584[*1]
T8	60 - 40	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6 K=1.00	1.7040	-50.32	79.61	0.632[*1]
T9	40 - 20	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6 K=1.00	1.7040	-54.41	79.61	0.683 [1]
T10	20 - 0	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6 K=1.00	1.7040	-54.46	79.61	0.684 [1]

[*] DL controls
[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	C3x4.1	4.75	2.21	65.7 K=1.00	1.2100	-5.34	31.24	0.171 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	187 - 180	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-6.17	9.18	0.672 *1
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.71	9.18	0.296 1
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-5.19	9.18	0.565 1
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-4.34	9.18	0.473 1
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.86	9.18	0.421 1
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.66	9.18	0.398 1
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.52	9.18	0.383 1
T8	60 - 40	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.46	9.18	0.377 1
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.63	9.18	0.395 1
T10	20 - 0	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.51	9.18	0.383 1

* DL controls
1 P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	187 - 180	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-4.08	9.18	0.444 1
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-1.05	9.18	0.115 1
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.99	9.18	0.435 1
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.63	9.18	0.286 1
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.08	9.18	0.336 1
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.03	9.18	0.222 1
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.00	9.18	0.218 1
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-1.71	9.18	0.187 1
T10	20 - 0	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-1.97	9.18	0.215 1

1 P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	187 - 180	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-4.41	9.18	0.480 1
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2	0.5273	-1.47	9.18	0.160 1

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.26	9.18	0.246 [1]
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-4.05	9.18	0.441 [1]
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.08	9.18	0.227 [1]
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-1.81	9.18	0.197 [1]
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-1.79	9.18	0.195 [1]
T8	60 - 40	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.04	9.18	0.222 [1]
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-1.80	9.18	0.196 [1]
T10	20 - 0	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-0.34	9.18	0.037 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	L 2 x 2 x 5/16	3.50	3.26	100.3 K=1.00	1.1500	-4.04	28.30	0.143 [1]
T4	140 - 120	L 2 x 2 x 5/16	3.50	3.26	100.3 K=1.00	1.1500	-7.19	28.30	0.254 [1]
T8	60 - 40	L 1.5 x 1.5 x 3/16	3.50	3.26	133.4 K=1.00	0.5273	-1.17	8.49	0.138 [1]

[1] P_u / ϕP_n controls

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160 (569)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-11.70	44.12	0.265 [1]
T2	180 - 160 (570)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-10.76	44.12	0.244 [1]
T2	180 - 160 (575)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-11.83	44.12	0.268 [1]
T2	180 - 160 (576)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-10.66	44.12	0.242 [1]
T2	180 - 160 (581)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-10.75	44.12	0.244 [1]
T2	180 - 160 (582)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-10.96	44.12	0.248 [1]
T4	140 - 120 (587)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-6.74	44.12	0.153 [1]
T4	140 - 120 (588)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-5.89	44.12	0.133 [1]
T4	140 - 120 (593)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-7.46	44.12	0.169 [1]
T4	140 - 120 (594)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-6.04	44.12	0.137 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T4	140 - 120 (599)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-6.31	44.12	0.143 [1]
T4	140 - 120 (600)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-6.81	44.12	0.154 [1]

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	187 - 180	P2.875"x0.203" (2.5 STD)	7.00	0.99	12.5	1.7040	10.76	82.82	0.130 [1]
T2	180 - 160	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6	1.7040	34.06	92.02	0.370 [1]
T3	160 - 140	P2.875"x0.203" (2.5 STD)	20.00	0.38	4.7	1.7040	22.11	92.02	0.240 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	187 - 180	5/8	4.51	4.20	322.9	0.3068	7.23	9.94	0.727 [1]
T2	180 - 160	C3x4.1	4.75	2.21	65.7	1.2100	5.97	39.20	0.152 [1]
T3	160 - 140	5/8	4.75	4.42	339.7	0.3068	6.60	9.94	0.664 [1]
T4	140 - 120	5/8	4.75	4.42	339.7	0.3068	4.91	9.94	0.494 [1]
T5	120 - 100	5/8	4.75	4.42	339.7	0.3068	5.02	9.94	0.505 [1]
T6	100 - 80	5/8	4.75	4.42	339.7	0.3068	3.41	9.94	0.343 [1]
T7	80 - 60	5/8	4.75	4.42	339.7	0.3068	3.92	9.94	0.395 [1]
T8	60 - 40	5/8	4.75	4.42	339.7	0.3068	3.94	9.94	0.397 [1]
T9	40 - 20	5/8	4.75	4.42	339.7	0.3068	3.23	9.94	0.325 [1]
T10	20 - 0	5/8	4.75	4.42	339.7	0.3068	4.01	9.94	0.404 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	187 - 180	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.27	17.09	0.016 [1]
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	4.44	17.09	0.260 [1]
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.05	17.09	0.062 [1]
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.07	17.09	0.062 [1]
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.03	17.09	0.060 [1]
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.77	17.09	0.045 [*1]
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.81	17.09	0.047 [*1]
T8	60 - 40	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.87	17.09	0.051 [*1]
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.94	17.09	0.055 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.91	17.09	0.053 *1

* DL controls
1 P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.05	17.09	0.062 1
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.05	17.09	0.062 1
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.07	17.09	0.062 1
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.03	17.09	0.060 1
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.77	17.09	0.045 *1
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.81	17.09	0.047 *1
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.94	17.09	0.055 1
T10	20 - 0	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.91	17.09	0.053 *1

* DL controls
1 P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	187 - 180	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.27	17.09	0.016 1
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	5.46	17.09	0.320 1
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.05	17.09	0.062 1
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.07	17.09	0.062 1
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.03	17.09	0.060 1
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.77	17.09	0.045 *1
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.81	17.09	0.047 *1
T8	60 - 40	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.87	17.09	0.051 *1
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.94	17.09	0.055 1
T10	20 - 0	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.37	17.09	0.022 1

* DL controls
1 P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	L 2 x 2 x 5/16	3.50	3.26	65.1	0.6574	9.78	28.60	0.342 1
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	4.39	17.09	0.257 1
T8	60 - 40	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.98	17.09	0.116 1

1 P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160 (567)	L 3 x 3 x 1/4	4.75	4.59	59.1	0.9141	13.81	39.76	0.347 [1]
T2	180 - 160 (568)	L 3 x 3 x 1/4	4.75	4.59	59.1	0.9141	13.67	39.76	0.344 [1]
T2	180 - 160 (573)	L 3 x 3 x 1/4	4.75	4.59	59.1	0.9141	13.41	39.76	0.337 [1]
T2	180 - 160 (574)	L 3 x 3 x 1/4	4.75	4.59	59.1	0.9141	13.72	39.76	0.345 [1]
T2	180 - 160 (579)	L 3 x 3 x 1/4	4.75	4.59	59.1	0.9141	12.68	39.76	0.319 [1]
T2	180 - 160 (580)	L 3 x 3 x 1/4	4.75	4.59	59.1	0.9141	12.78	39.76	0.321 [1]
T4	140 - 120 (585)	L 3 x 3 x 1/4	4.75	4.59	59.1	0.9141	8.43	39.76	0.212 [1]
T4	140 - 120 (586)	L 3 x 3 x 1/4	4.75	4.59	59.1	0.9141	8.19	39.76	0.206 [1]
T4	140 - 120 (591)	L 3 x 3 x 1/4	4.75	4.59	59.1	0.9141	7.19	39.76	0.181 [1]
T4	140 - 120 (592)	L 3 x 3 x 1/4	4.75	4.59	59.1	0.9141	7.68	39.76	0.193 [1]
T4	140 - 120 (597)	L 3 x 3 x 1/4	4.75	4.59	59.1	0.9141	6.90	39.76	0.173 [1]
T4	140 - 120 (598)	L 3 x 3 x 1/4	4.75	4.59	59.1	0.9141	7.11	39.76	0.179 [1]

[1] P_u / ϕP_n controls

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160 (569)	L 3 x 3 x 1/4	3.50	3.38	43.6	0.9141	4.38	39.76	0.110 [1]
T2	180 - 160 (570)	L 3 x 3 x 1/4	3.50	3.38	43.6	0.9141	3.87	39.76	0.097 [1]
T2	180 - 160 (575)	L 3 x 3 x 1/4	3.50	3.38	43.6	0.9141	4.63	39.76	0.116 [1]
T2	180 - 160 (576)	L 3 x 3 x 1/4	3.50	3.38	43.6	0.9141	4.02	39.76	0.101 [1]
T2	180 - 160 (581)	L 3 x 3 x 1/4	3.50	3.38	43.6	0.9141	4.67	39.76	0.117 [1]
T2	180 - 160 (582)	L 3 x 3 x 1/4	3.50	3.38	43.6	0.9141	4.76	39.76	0.120 [1]
T4	140 - 120 (587)	L 3 x 3 x 1/4	3.50	3.38	43.6	0.9141	3.25	39.76	0.082 [1]
T4	140 - 120 (588)	L 3 x 3 x 1/4	3.50	3.38	43.6	0.9141	3.04	39.76	0.076 [1]
T4	140 - 120 (593)	L 3 x 3 x 1/4	3.50	3.38	43.6	0.9141	3.47	39.76	0.087 [1]
T4	140 - 120 (594)	L 3 x 3 x 1/4	3.50	3.38	43.6	0.9141	3.37	39.76	0.085 [1]
T4	140 - 120 (599)	L 3 x 3 x 1/4	3.50	3.38	43.6	0.9141	3.80	39.76	0.096 [1]
T4	140 - 120 (600)	L 3 x 3 x 1/4	3.50	3.38	43.6	0.9141	3.74	39.76	0.094 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	øP$_{allow}$ K	% Capacity	Pass Fail
T1	187 - 180	Leg	P2.875"x0.203" (2.5 STD)	3	-15.47	78.46	19.7	Pass
T2	180 - 160	Leg	P2.875"x0.203" (2.5 STD)	27	-55.24	83.59	66.1	Pass
T3	160 - 140	Leg	P2.875"x0.203" (2.5 STD)	87	-60.91	83.59	72.9	Pass
T4	140 - 120	Leg	P2.875"x0.203" (2.5 STD)	147	-61.58	83.59	73.7	Pass
T5	120 - 100	Leg	P2.875"x0.203" (2.5 STD)	207	-59.51	83.59	71.2	Pass
T6	100 - 80	Leg	P2.875"x0.203" (2.5 STD)	267	-44.67	79.61	56.1	Pass
T7	80 - 60	Leg	P2.875"x0.203" (2.5 STD)	327	-46.48	79.61	58.4	Pass
T8	60 - 40	Leg	P2.875"x0.203" (2.5 STD)	387	-50.32	79.61	63.2	Pass
T9	40 - 20	Leg	P2.875"x0.203" (2.5 STD)	447	-54.41	83.59	65.1	Pass
T10	20 - 0	Leg	P2.875"x0.203" (2.5 STD)	505	-54.46	83.59	65.2	Pass
T1	187 - 180	Diagonal	5/8	13	7.23	10.44	69.2	Pass
T2	180 - 160	Diagonal	C3x4.1	39	-5.34	32.80	16.3	Pass
T3	160 - 140	Diagonal	5/8	142	6.60	10.44	63.2	Pass
T4	140 - 120	Diagonal	5/8	163	4.91	10.44	47.0	Pass
T5	120 - 100	Diagonal	5/8	262	5.02	10.44	48.1	Pass
T6	100 - 80	Diagonal	5/8	322	3.41	10.44	32.6	Pass
T7	80 - 60	Diagonal	5/8	336	3.92	10.44	37.6	Pass
T8	60 - 40	Diagonal	5/8	439	3.94	10.44	37.8	Pass
T9	40 - 20	Diagonal	5/8	458	3.23	10.44	30.9	Pass
T10	20 - 0	Diagonal	5/8	516	4.01	10.44	38.5	Pass
T1	187 - 180	Horizontal	L 1.5 x 1.5 x 3/16	16	-6.17	9.18	67.2	Pass
T2	180 - 160	Horizontal	L 1.5 x 1.5 x 3/16	67	-2.71	9.64	28.2	Pass
T3	160 - 140	Horizontal	L 1.5 x 1.5 x 3/16	137	-5.19	9.64	53.8	Pass
T4	140 - 120	Horizontal	L 1.5 x 1.5 x 3/16	179	-4.34	9.64	45.0	Pass
T5	120 - 100	Horizontal	L 1.5 x 1.5 x 3/16	257	-3.86	9.64	40.1	Pass
T6	100 - 80	Horizontal	L 1.5 x 1.5 x 3/16	282	-3.66	9.64	37.9	Pass
T7	80 - 60	Horizontal	L 1.5 x 1.5 x 3/16	378	-3.52	9.64	36.5	Pass
T8	60 - 40	Horizontal	L 1.5 x 1.5 x 3/16	437	-3.46	9.64	35.9	Pass
T9	40 - 20	Horizontal	L 1.5 x 1.5 x 3/16	462	-3.63	9.64	37.6	Pass
T10	20 - 0	Horizontal	L 1.5 x 1.5 x 3/16	558	-3.51	9.64	36.4	Pass
T1	187 - 180	Top Girt	L 1.5 x 1.5 x 3/16	4	-4.08	9.64	42.3	Pass
T2	180 - 160	Top Girt	L 1.5 x 1.5 x 3/16	30	-1.05	9.64	10.9	Pass
T3	160 - 140	Top Girt	L 1.5 x 1.5 x 3/16	89	-3.99	9.64	41.4	Pass
T4	140 - 120	Top Girt	L 1.5 x 1.5 x 3/16	149	-2.63	9.64	27.3	Pass
T5	120 - 100	Top Girt	L 1.5 x 1.5 x 3/16	209	-3.08	9.64	32.0	Pass
T6	100 - 80	Top Girt	L 1.5 x 1.5 x 3/16	269	-2.03	9.64	21.1	Pass
T7	80 - 60	Top Girt	L 1.5 x 1.5 x 3/16	330	-2.00	9.64	20.7	Pass
T9	40 - 20	Top Girt	L 1.5 x 1.5 x 3/16	448	-1.71	9.64	17.8	Pass
T10	20 - 0	Top Girt	L 1.5 x 1.5 x 3/16	510	-1.97	9.64	20.5	Pass
T1	187 - 180	Bottom Girt	L 1.5 x 1.5 x 3/16	7	-4.41	9.64	45.7	Pass
T2	180 - 160	Bottom Girt	L 1.5 x 1.5 x 3/16	33	5.46	17.94	30.4	Pass
T3	160 - 140	Bottom Girt	L 1.5 x 1.5 x 3/16	93	-2.26	9.64	23.4	Pass
T4	140 - 120	Bottom Girt	L 1.5 x 1.5 x 3/16	152	-4.05	9.64	42.0	Pass
T5	120 - 100	Bottom Girt	L 1.5 x 1.5 x 3/16	213	-2.08	9.64	21.6	Pass
T6	100 - 80	Bottom Girt	L 1.5 x 1.5 x 3/16	271	-1.81	9.64	18.7	Pass
T7	80 - 60	Bottom Girt	L 1.5 x 1.5 x 3/16	332	-1.79	9.64	18.6	Pass
T8	60 - 40	Bottom Girt	L 1.5 x 1.5 x 3/16	393	-2.04	9.64	21.2	Pass
T9	40 - 20	Bottom Girt	L 1.5 x 1.5 x 3/16	453	-1.80	9.64	18.7	Pass
T10	20 - 0	Bottom Girt	L 1.5 x 1.5 x 3/16	512	-0.34	9.64	3.6	Pass
T2	180 - 160	Guy A@160.375	5/8	577	13.09	26.71	49.0	Pass
		Guy A@170	5/8	606	13.72	26.71	51.4	Pass
T4	140 - 120	Guy A@120.375	9/16	595	8.46	22.05	38.4	Pass
T8	60 - 40	Guy A@59.625	9/16	603	8.08	22.05	36.6	Pass
T2	180 - 160	Guy B@160.375	5/8	572	12.80	26.71	47.9	Pass
		Guy B@170	5/8	605	13.66	26.71	51.1	Pass
T4	140 - 120	Guy B@120.375	9/16	590	8.79	22.05	39.9	Pass
T8	60 - 40	Guy B@59.625	9/16	602	8.66	22.05	39.3	Pass
T2	180 - 160	Guy C@160.375	5/8	566	14.30	26.71	53.5	Pass
		Guy C@170	5/8	604	14.80	26.71	55.4	Pass
T4	140 - 120	Guy C@120.375	9/16	583	9.92	22.05	45.0	Pass
T8	60 - 40	Guy C@59.625	9/16	601	9.12	22.05	41.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T2	180 - 160	Top Guy Pull-Off@160.375	L 2 x 2 x 5/16	41	9.78	30.03	32.6 40.9 (b)	Pass
		Top Guy Pull-Off@170	L 1.5 x 1.5 x 3/16	60	4.39	17.94	24.5	Pass
T4	140 - 120	Top Guy Pull-Off@120.375	L 2 x 2 x 5/16	162	-7.19	29.71	24.2	Pass
T8	60 - 40	Top Guy Pull-Off@59.625	L 1.5 x 1.5 x 3/16	388	-1.17	8.91	13.1	Pass
T2	180 - 160	Torque Arm Top@160.375	L 3 x 3 x 1/4	567	13.81	41.75	33.1 59.0 (b)	Pass
T4	140 - 120	Torque Arm Top@120.375	L 3 x 3 x 1/4	585	8.43	41.75	20.2 36.0 (b)	Pass
T2	180 - 160	Torque Arm Bottom@160.375	L 3 x 3 x 1/4	575	-11.83	46.33	25.5 28.3 (b)	Pass
T4	140 - 120	Torque Arm Bottom@120.375	L 3 x 3 x 1/4	593	-7.46	46.33	16.1 17.9 (b)	Pass
							Summary	
							Leg (T4) 73.7	Pass
							Diagonal (T1) 69.2	Pass
							Horizontal (T1) 67.2	Pass
							Top Girt (T1) 42.3	Pass
							Bottom Girt (T1) 45.7	Pass
							Guy A (T2) 51.4	Pass
							Guy B (T2) 51.1	Pass
							Guy C (T2) 55.4	Pass
							Top Guy Pull-Off (T2) 40.9	Pass
							Torque Arm Top (T2) 59.0	Pass
							Torque Arm Bottom (T2) 28.3	Pass
							Bolt Checks 59.0	Pass
							RATING = 73.7	**Pass**

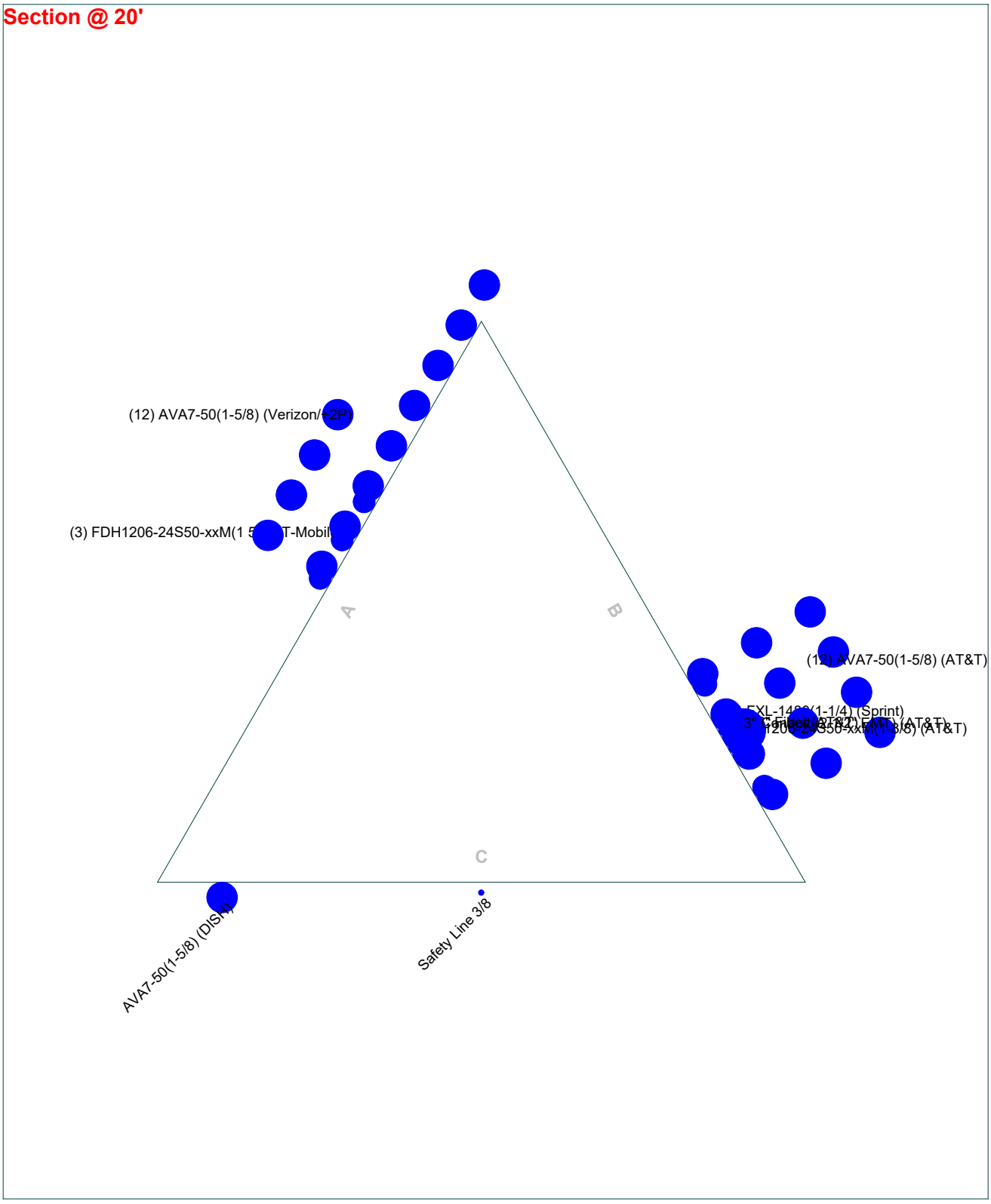
APPENDIX B

BASE LEVEL DRAWING

Feed Line Plan
20'

Round Flat App In Face App Out Face

Section @ 20'



PJFLogo

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Phone: 614-221-6679
FAX:

Job:	***187-ft GT; Bozrah Polly Lane, CT***		
Project:	***13321-0017.003.8700 R1***		
Client: Everest Infrastructure Partners		Drawn by: csandlin	App'd:
Code: TIA-222-H		Date: 12/13/22	Scale: NTS
Path: G:\TOWER\133_Everest Infrastructure Partners\2021\13321-0017_Bozrah_CT\13321-0017.003.8700_SA\tnx\13321-0017.003.8700.eri			Dwg No. E-7

APPENDIX C

ADDITIONAL CALCULATIONS

PAUL J. FORD & COMPANY

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Project Number:	13321-0017.003.8700 R1
Engineer:	CRS
Date:	12/13/2022
Site Name:	Bozrah Polly Lane
Site Number:	701695
Client Project:	
Client Project 1:	

BLOCK FOUNDATION

(Version v5.4 - Effective Date 10/26/2022)

STRUCTURE SETTINGS

TIA Standard:	TIA-222-H	
Capacity Normalization:	Yes	(TIA-222-H Section 15.5)
Foundation Type:	Block	
Structure Type:	GT w/ Pivot Base	
Structure Height:	187.00	ft
BP Dist. Above Fnd.:	0.00	in
Bolt Circle/Bearing Plate Width:	0.00	in

FACTORED FOUNDATION LOADS

Load Combo 1 = LC1 = 1.2D + 1.0Dg + 1.0Wo

Load Combo 2 = =

	Global	LC1 (+C)	LC2 (-T)	
Applied Axial:		155.00		kip
Applied Shear:		2.00		kip
Applied Moment:				kip-ft

Load Offset (Dir.1) (eB):	0.00	ft
Load Offset (Dir.2) (eL):	0.00	ft

PAD PROPERTIES

Pad Width (B):	15.00		ft
Pad Length (L):	4.95		ft (Rectangular)
Pad Thickness (T):	6.75		ft
Height Above Grade:	1.21		ft
Depth to Bottom of Pad (D):	5.54		ft
Top & Btm Pad Steel Different?	No		
	Dir.1	Dir.2	
Pad Clear Cover (Top) (C2):	3.00		in
Pad Rebar Size (Top):	9	9	# bar
Pad Rebar Quantity (Top):	9	18	
Pad Rebar Length:	14.50	4.45	ft
Pad Clear Cover (Bottom) (C3):			in
Pad Rebar Size (Bottom):			
Pad Rebar Quantity (Bottom):			
Pad Rebar Length:	14.50	4.45	ft

MATERIAL PROPERTIES

Concrete Strength, F'_c:	3.00	ksi
Concrete Density, γ_c:	150	pcf
Long. Rebar Strength, F_y:	60	ksi
Tie Rebar Strength, F_y:	60	ksi

SOIL PROPERTIES

Layer	Thickness (ft)	Soil Density (pcf)	Cohesion (ksf)	Friction Angle (deg)	Ultimate Net Bearing (ksf)	Depth (ft)
1	5.62	115.00	0.00	32.00	8.00	5.62
2						
3						
4						

Base Friction, μ:	0.40	
Groundwater Depth:	8.00	ft
Neglected Depth:	3.33	ft

RESULTS

		Demand	Capacity	Rating	
Pad Shear - 1-Way	(kip)	12.11	372.40	3.1%	Pass
Pad Shear - 2-Way (Comp)	(ksi)	0.000	0.164	0.0%	Pass
Flexural 2-Way (Comp) *	(kip-ft)	0.00	4599.98	0.0%	Pass
Pad Flexural*	(kip-ft)	296.36	2263.71	12.5%	Pass
Pad Shear - 2-Way (Uplift)	(ksi)	0.00	0.16	0.0%	Pass
Flexural 2-Way (Tension) *	(kip-ft)	0.00	4599.98	0.0%	Pass

*Capacity reduced per ACI 318-19 Section 9.6.1.3

		Demand	Capacity	Rating	
Lateral	(kip)	2.00	60.61	3.1%	Pass
Overturning		-	-	STABLE	Pass
Bearing Pressure	(ksf)	3.37	5.18	61.9%	Pass
Uplift	(kip)	0.00	0.00	0.0%	Pass

Structural Rating*:	12.5%	Pass
Soil Rating*:	61.9%	Pass

*Rating per TIA-222-H Section 15.5

ANALYSIS ASSUMPTIONS

1. PASSIVE PRESSURE: INCLUDED ON PAD AND PIER
2. SOIL WEDGES/COHESION PLANE: NOT INCLUDED

Guyed Anchor Block Foundation

Checks capacity of anchor blocks for a guyed tower.

Site Name:	Bozrah, CT
Location:	
TIA-222 Revision:	H

Design Reactions		
Shear, **S**:	45.00	kips
Uplift, **Ua**:	51.00	kips
Resultant Force, **Rf**:	68.01	kips
Tower Height, **H**:	187.00	ft
Guy Anchor Radius, **R**:	126.80	ft
Resultant Angle to Horizontal, **θ**:	48.6	deg

Guy Anchor Properties		
Depth to Bottom of Deadman, **Da**:	8.8	ft
Anchor Width, **Wa**:	5	ft
Anchor Thickness, **Ta**:	2.5	ft
Anchor Length, **La**:	9	ft
Concrete Volume, **Vc**:	4.2	yd^3
Toe Width, **toe**:	0	ft
Guyed Anchor Top Rebar Size, **Sat**:	4	
No. of Bars in Top of Block:	9	
Guyed Anchor Front Rebar Size, **Saf**:	4	
No. of Bars in Front of Block:	3	
Stirrup Size:	4	
Anchor Shaft Diameter, **ds**:	1.75	in
Anchor Shaft Quantity. **n**:	1	
Anchor Shaft Area Override:		in^2
Shear Lag Factor, **u**:	1	

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Strength, **F'c**:	3	ksi
Wt. Avg.Concrete Density, δ**x**:	0.150	kcf
Clear Cover, **cc**:	3	in
Anchor Shaft Grade, **Fy'**:	48	ksi
Anchor Shaft Ultimate Strength, **Fu'**:	62	ksi

Design Checks	Capacity	Demand	Rating*	Check
Lateral Capacity (kips):	102.28	45.00	**41.9%**	**Pass**
Uplift Capacity (kips):	114.69	51.00	**42.4%**	**Pass**
*Lateral Flexural Capacity (ft*kips):*	151.24	50.63	**31.9%**	**Pass**
*Uplift Flexural Capacity (ft*kips):*	209.77	57.38	**26.0%**	**Pass**
Anchor Shaft (kips):	92.36	68.01	**70.1%**	**Pass**

**Rating per TIA-222-H Section 15.5*

Anchor Shaft Rating:	**70.1%**
Structural Rating:	**31.9%**
Soil Rating:	**42.4%**

Neglect Depth, **Neg**:	3.33	ft
Groundwater Level, **gw**:	N/A	ft

Soil Properties: No. of Soil Layers: 3

Layer	φ, deg	cu, ksf	δ, pcf		Ultimate fs (ksf)	N (blows/ft)
1	29		110	2.50	1.000	
2	32		115	6.00	1.000	
3	36		120	8.80	1.000	

*key: φ = *Internal Angle of Friction*
cu = Cohesion / Undrained Shear Strength
δ = *Buoyant Soil Unit Weight*
d = Depth to Bottom of Layer
Ultimate fs = Geotechnical Report-provided skin friction / adhesion
N = SPT Blow Count

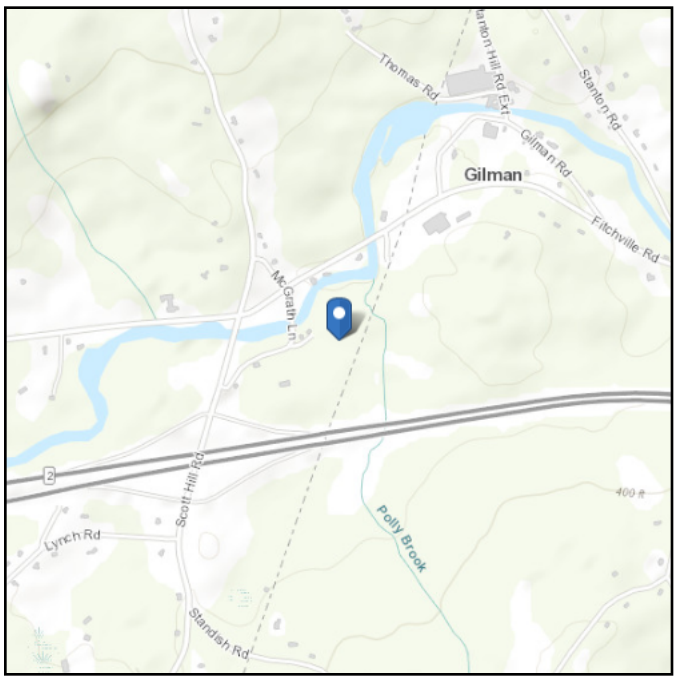
Version 4.0.0

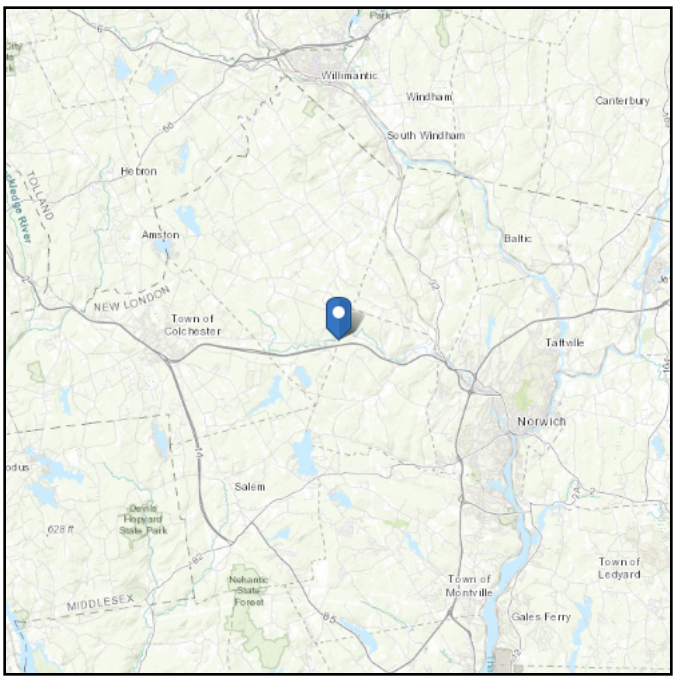
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Latitude: 41.573333
Longitude: -72.203333
Elevation: 260.65 ft (NAVD 88)





Wind

Results:

Wind Speed	123 Vmph
10-year MRI	75 Vmph
25-year MRI	85 Vmph
50-year MRI	95 Vmph
100-year MRI	100 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Tue Nov 29 2022

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Seismic

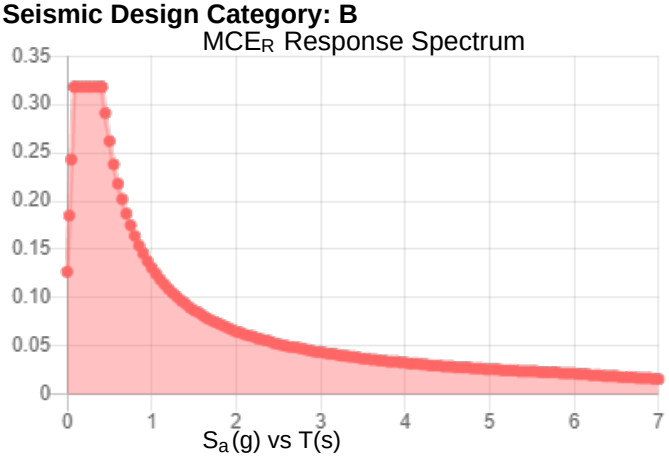
D - Default (see Section 11.4.3)

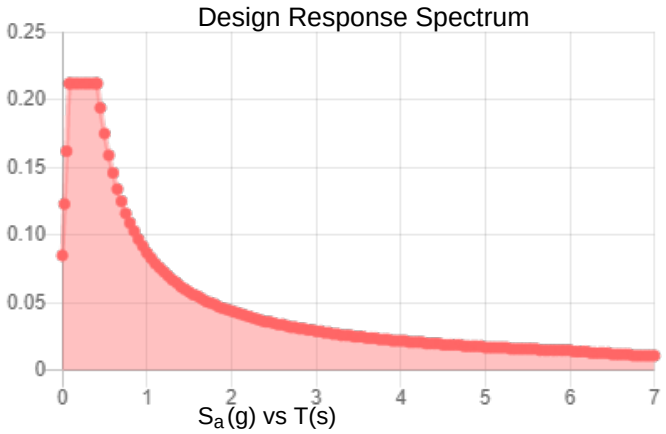
Site Soil Class:

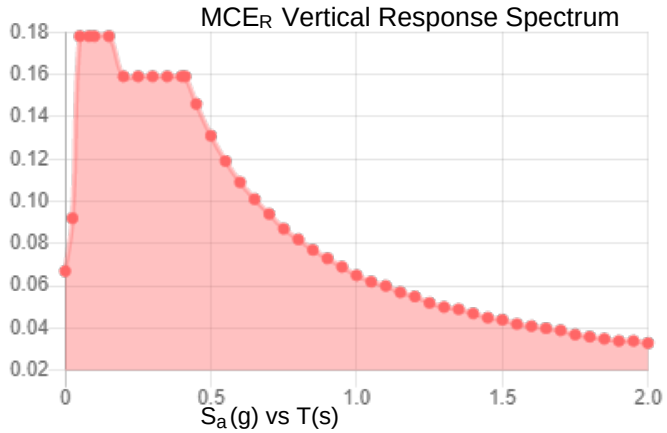
Results:

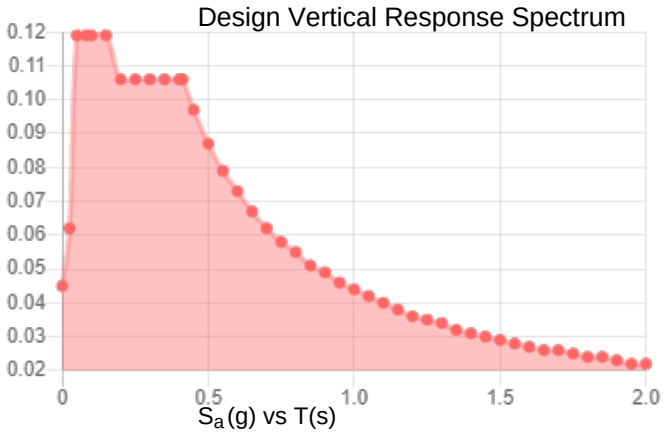
S_S :	0.199	S_{D1} :	0.087
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.11
F_v :	2.4	PGA_M :	0.173
S_{MS} :	0.318	F_{PGA} :	1.581
S_{M1} :	0.131	I_e :	1
S_{DS} :	0.212	C_v :	0.7

Seismic Design Category: B









Data Accessed: **Tue Nov 29 2022**

Date Source:

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

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Tue Nov 29 2022

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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.

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Exhibit E

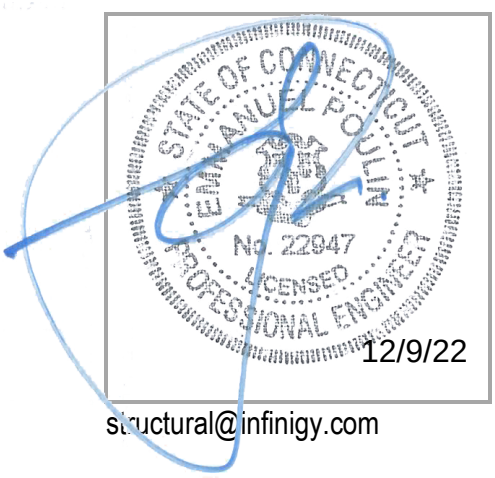
Mount Analysis

MOUNT ANALYSIS REPORT

December 8, 2022

Dish Wireless Site Name	BOBOS00038A
Infinigy Job Number	1197-F0001-B
Client	Northeast Site Solutions
Carrier	Dish Wireless
Site Location	12 Polly Lane, Borzrah, CT 6336 New London County 41° 19' 44.566" N NAD83 72° 7' 28.585" W NAD83
Structure Type	Monopole
Structure Height	187.0 ft
Mount Type	11.0 ft platform
Mount Elevation	127.0 ft AGL
Structural Usage Ratio	**33.7%**
Overall Result	**Pass**

The enclosed structural analysis has been performed in accordance with the 2022 Connecticut State Building Code based on an ultimate 3-second gust wind speed of 123 mph. The evaluation criteria and applicable standards are presented in the next section of this report.



structural@infinigy.com

CONTENTS

1. INTRODUCTION

Infinigy performed a structural analysis on the Dish Wireless existing 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 version 20.0.1 analysis software.

2. DESIGN/ANALYSIS PARAMETERS

Wind Speed	123 mph (3-Second Gust)
Wind Speed w/ ice	50 mph (3-Second Gust) w/ 1.0 ice
Adopted Code	2022 Connecticut State Building Code
Standard(s)	TIA-222-H
Risk Category	II
Exposure Category	B
Topographic Factor	1.0
Seismic Spectral Response	S_s = 0.171 g / S_1 = 0.061 g
Live Load Wind Speed	250 mph
Man Live Load at Mid/End Points	500 lbs
Man Live Load at Mount Pipes	500 lbs
Ground Elevation (HMSL)	252.95 ft

3. PROPOSED LOADING CONFIGURATION - 127.0 ft. AGL platform

Centerline (ft)	Qty.	Appurtenance Manufacturers	Appurtenance Models
127.0	3	JMA WIRELESS	MX08FRO665-21
	3	FUJITSU	TA08025-B604
	3	FUJITSU	TA08025-B605
	1	RAYCAP	RDIDC-9181-PF-48

4. SUPPORTING DOCUMENTATION

Construction Drawings	Infinigy Rev. 8 dated December 13, 2022
Dish Wireless Proposed Loading	RFDS Revision 3 Project # CT-EVE-T-701695 dated April 6, 2022
Previous Analysis Report	Infinigy dated August 3, 2021

5. RESULTS

Components	Capacity	Pass/Fail
Mount Pipe	24.8%	Pass
Horizontal	33.7%	Pass
Bracing	24.1%	Pass
Standoff	19.9%	Pass
Connection	15.5%	Pass
RATING =	**33.7%**	**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 platform at 127.0 ft. The installation shall be performed in accordance with the construction documents issued for this site.

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

Iker Moreno, E.I.T.
Project Engineer I | **INFINIGY**

7. ASSUMPTIONS

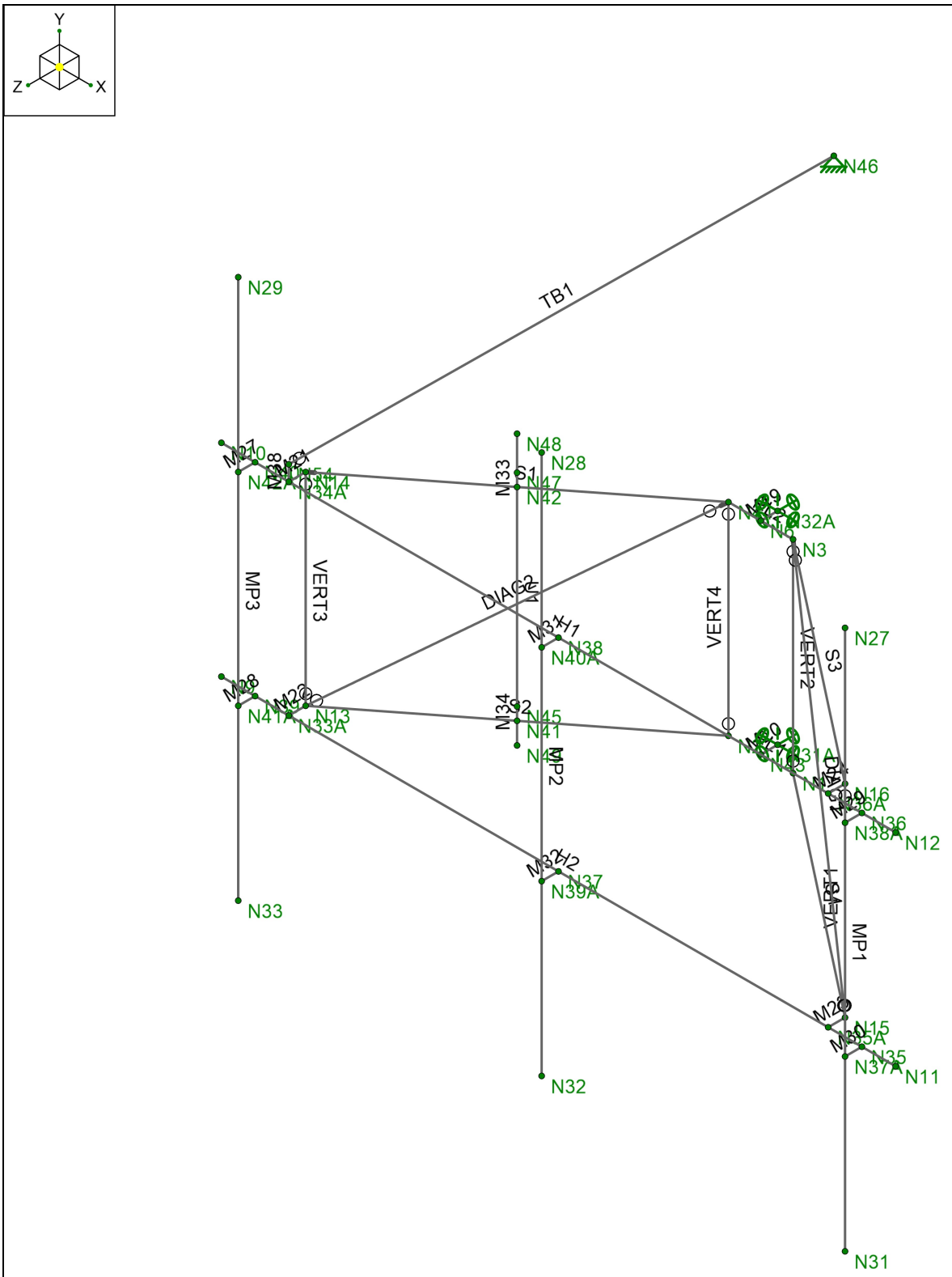
The antenna mounting system was properly fabricated, installed and maintained in accordance with its original design and manufacturer's specifications.
The configuration of antennas, mounts, and other appurtenances are as specified in the proposed loading configuration table.
All member connections are 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: Square/ Rectangle HSS Tube — ASTM A500 Gr. C Channel — ASTM A36 Angle — ASTM A572 Gr. 50 Pipe — ASTM A53 Gr. B Connection Bolts — ASTM A325 U-Bolts — ASTM A307
All bolted connections are pretensioned in accordance with Table 8.2 of the RCSC 2014 Standard.

8. LIABILITY WAIVER AND LIMITATIONS

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

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

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



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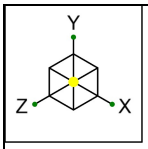
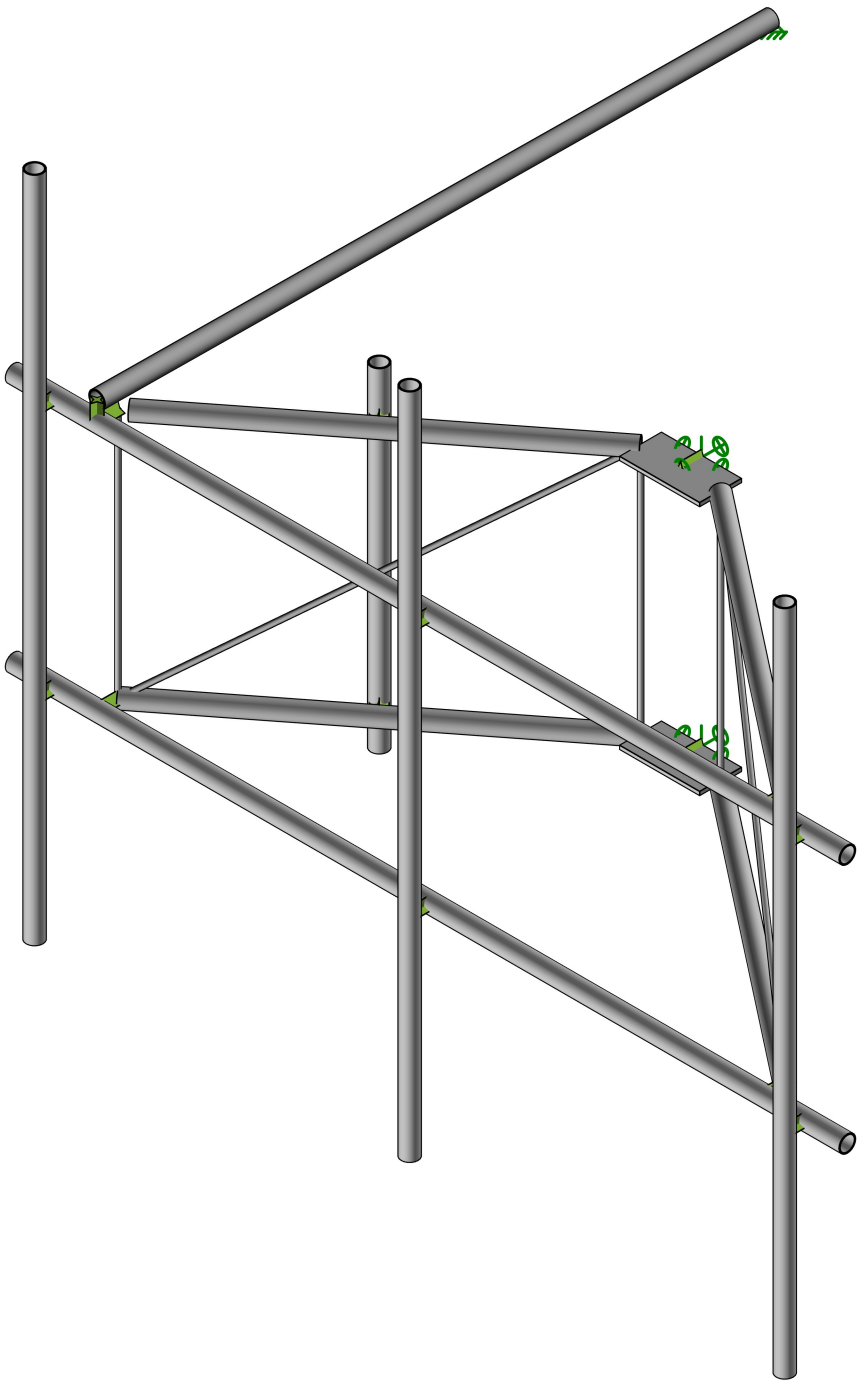




Infinigy	BOBOS00038A	Render2
IM		Dec 08, 2022
1197-F0001-B		C10837002C-32788_loaded_loa…

Program Inputs

INFINIGY

Infinigy Load Calculator V2.3.3

PROJECT INFORMATION	
Site Name:	BOBOS00038A
Carrier:	DISH Wireless
Engineer:	Iker Moreno

CODE STANDARDS		
Building Code:	2021 IBC	
TIA Standard:	TIA-222-H	
ASCE Standard:	ASCE 7-16	

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	B	
Topo Factor Procedure:	Method 1, Category 1	
Site Class:	D - Stiff Soil (Assumed)	
Ground Elevation:	252.95	ft *Rev H

WIND AND ICE DATA		
Ultimate Wind (V_{ult}):	123	mph
Design Wind (V):	N/A	mph
Ice Wind (V_{ice}):	50	mph
Base Ice Thickness (t_i):	1	in
Radial Ice Thickness (t_{iz}):	1.144	in
Flat Pressure:	77.151	psf
Round Pressure:	46.291	psf
Ice Wind Pressure:	7.649	psf

MOUNT INFORMATION		
Mount Type:	Sector Frame	
Num Sectors:	3	
Centerline AGL:	127.00	ft
Tower Height AGL:	183.00	ft

SEISMIC DATA		
Short-Period Accel. (S_s):	0.199	g
1-Second Accel. (S_1):	0.055	g
Short-Period Design (S_{DS}):	0.212	
1-Second Design (S_{D1}):	0.088	
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	
Seismic Importance (I_e):	1.000	
Seismic Response Co. (C_s):	0.106	
Total App. Weight:	225.210	lb
Total Shear Force (V_s):	23.902	lb
Hor. Seismic Load (E_h):	23.902	lb
Vert. Seismic Load (E_v):	9.561	lb *

*For reference only. Per TIA rev H section 16.7, Ev is not applicable to mounts

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

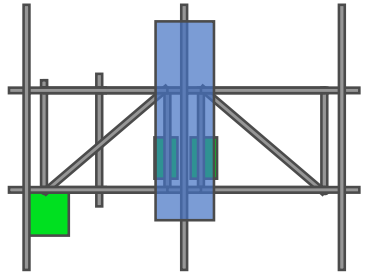
FACTORS		
Directionality Fact. (K_d):	0.950	
Ground Ele. Factor (K_e):	0.991	*Rev H Only
Rooftop Speed-Up (K_s):	1.000	*Rev H Only
Topographic Factor (K_{zt}):	1.000	
Height Esc. Fact. (K_{iz}):	1.144	
Gust Effect Factor (G_h):	1.000	
Shielding Factor (K_a):	0.900	
Velocity Pressure Co.(K_z):	1.058	(Mount Elev)

Program Inputs

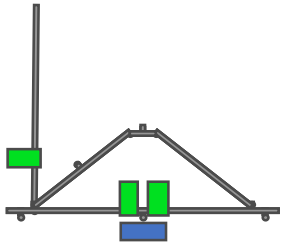
INFINIGY

Infinigy Load Calculator V2.3.3

ELEVATION VIEW



PLAN VIEW



APPURTENANCE INFORMATION

Appurtenance Name	Elevation	Qty.	Height (in)	Width (in)	Depth (in)	Weight (lbs)	EPA_N (ft^2)	EPA_T (ft^2)	Member (α sector)
JMA WIRELESS MX08FRO665-21	127.0	3	72.00	20.00	8.00	64.50	12.49	5.87	MP2
FUJITSU TA08025-B604	127.0	3	14.96	15.75	7.87	63.90	1.96	0.98	MP2
FUJITSU TA08025-B605	127.0	3	14.96	15.75	9.06	74.96	1.96	1.13	MP2
RAYCAP RDIDC-9181-PF-48	127.0	1	16.57	14.57	8.46	21.85	2.01	1.17	S2

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	MP1	N27	N31		MOUNT PIPE	Column	Pipe	A53 Gr.B	Typical
2	MP2	N28	N32		MOUNT PIPE	Column	Pipe	A53 Gr.B	Typical
3	MP3	N29	N33		MOUNT PIPE	Column	Pipe	A53 Gr.B	Typical
4	PL1	N2	N1	90	PLATE	Beam	RECT	A36 Gr.36	Typical
5	PL2	N44	N3	90	PLATE	Beam	RECT	A36 Gr.36	Typical
6	H1	N12	N10		HORIZONTAL	Beam	Pipe	A53 Gr.B	Typical
7	H2	N11	N9	90	HORIZONTAL	Beam	Pipe	A53 Gr.B	Typical
8	S1	N14	N44	90	STANDOFF	Beam	Pipe	A53 Gr.B	Typical
9	S2	N13	N2		STANDOFF	Beam	Pipe	A53 Gr.B	Typical
10	S3	N3	N16	90	STANDOFF	Beam	Pipe	A53 Gr.B	Typical
11	S4	N1	N15		STANDOFF	Beam	Pipe	A53 Gr.B	Typical
12	DIAG1	N3	N15		BRACING	VBrace	BAR	A36 Gr.36	Typical
13	DIAG2	N44	N13		BRACING	VBrace	BAR	A36 Gr.36	Typical
14	VERT1	N15	N16	51	BRACING	VBrace	BAR	A36 Gr.36	Typical
15	VERT3	N14	N13	51	BRACING	VBrace	BAR	A36 Gr.36	Typical
16	VERT2	N3	N1	129	BRACING	VBrace	BAR	A36 Gr.36	Typical
17	VERT4	N2	N44	129	BRACING	VBrace	BAR	A36 Gr.36	Typical
18	M19	N6	N32A		RIGID	None	None	RIGID	Typical
19	M20	N43	N31A		RIGID	None	None	RIGID	Typical
20	M21	N34A	N14		RIGID	None	None	RIGID	Typical
21	M22	N33A	N13		RIGID	None	None	RIGID	Typical
22	M23	N35A	N15		RIGID	None	None	RIGID	Typical
23	M24	N36A	N16		RIGID	None	None	RIGID	Typical
24	M27	N40	N42A		RIGID	None	None	RIGID	Typical
25	M28	N39	N41A		RIGID	None	None	RIGID	Typical
26	M29	N36	N38A		RIGID	None	None	RIGID	Typical
27	M30	N35	N37A		RIGID	None	None	RIGID	Typical
28	M31	N38	N40A		RIGID	None	None	RIGID	Typical
29	M32	N37	N39A		RIGID	None	None	RIGID	Typical
30	M38	N34A	N54		RIGID	None	None	RIGID	Typical
31	TB1	N54	N46		TIEBACK	Beam	Pipe	A53 Gr.B	Typical
32	M33	N42	N47		RIGID	None	None	RIGID	Typical
33	M34	N41	N45		RIGID	None	None	RIGID	Typical
34	U1	N48	N49		MOUNT PIPE	Column	Pipe	A53 Gr.B	Typical

Material Take-Off

	Material	Size	Pieces	Length[in]	Weight[K]
1	General Members				
2	RIGID		15	44.9	0
3	Total General		15	44.9	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	0.625"S.R.	6	270.8	0.024
7	A36 Gr.36	PL6X1/2"	2	23	0.02
8	A53 Gr.B	PIPE 2.0	11	885.3	0.256
9	Total HR Steel		19	1179	0.299

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed
1	Self Weight	DL		-1			5	
2	Wind Load AZI 0	WLZ					10	
3	Wind Load AZI 30	None					10	

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed
4	Wind Load AZI 60	None					10	
5	Wind Load AZI 90	WLX					10	
6	Wind Load AZI 120	None					10	
7	Wind Load AZI 150	None					10	
8	Wind Load AZI 180	None					10	
9	Wind Load AZI 210	None					10	
10	Wind Load AZI 240	None					10	
11	Wind Load AZI 270	None					10	
12	Wind Load AZI 300	None					10	
13	Wind Load AZI 330	None					10	
14	Distr. Wind Load Z	WLZ						34
15	Distr. Wind Load X	WLX						34
16	Ice Weight	OL1					5	34
17	Ice Wind Load AZI 0	OL2					10	
18	Ice Wind Load AZI 30	None					10	
19	Ice Wind Load AZI 60	None					10	
20	Ice Wind Load AZI 90	OL3					10	
21	Ice Wind Load AZI 120	None					10	
22	Ice Wind Load AZI 150	None					10	
23	Ice Wind Load AZI 180	None					10	
24	Ice Wind Load AZI 210	None					10	
25	Ice Wind Load AZI 240	None					10	
26	Ice Wind Load AZI 270	None					10	
27	Ice Wind Load AZI 300	None					10	
28	Ice Wind Load AZI 330	None					10	
29	Distr. Ice Wind Load Z	OL2						34
30	Distr. Ice Wind Load X	OL3						34
31	Seismic Load Z	ELZ			-0.318		5	
32	Seismic Load X	ELX	-0.318				5	
33	Service Live Loads	LL						
34	Maintenance Load Lm1	LL				1		
35	Maintenance Load Lm2	LL				1		
36	Maintenance Load Lm3	LL				1		

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4DL	Yes	Y	1	1.4								
2	1.2DL + 1WL AZI 0	Yes	Y	1	1.2	2	1	14	1	15			
3	1.2DL + 1WL AZI 30	Yes	Y	1	1.2	3	1	14	0.866	15	0.5		
4	1.2DL + 1WL AZI 60	Yes	Y	1	1.2	4	1	14	0.5	15	0.866		
5	1.2DL + 1WL AZI 90	Yes	Y	1	1.2	5	1	14		15	1		
6	1.2DL + 1WL AZI 120	Yes	Y	1	1.2	6	1	14	-0.5	15	0.866		
7	1.2DL + 1WL AZI 150	Yes	Y	1	1.2	7	1	14	-0.866	15	0.5		
8	1.2DL + 1WL AZI 180	Yes	Y	1	1.2	8	1	14	-1	15			
9	1.2DL + 1WL AZI 210	Yes	Y	1	1.2	9	1	14	-0.866	15	-0.5		
10	1.2DL + 1WL AZI 240	Yes	Y	1	1.2	10	1	14	-0.5	15	-0.866		
11	1.2DL + 1WL AZI 270	Yes	Y	1	1.2	11	1	14		15	-1		
12	1.2DL + 1WL AZI 300	Yes	Y	1	1.2	12	1	14	0.5	15	-0.866		
13	1.2DL + 1WL AZI 330	Yes	Y	1	1.2	13	1	14	0.866	15	-0.5		
14	0.9DL + 1WL AZI 0	Yes	Y	1	0.9	2	1	14	1	15			
15	0.9DL + 1WL AZI 30	Yes	Y	1	0.9	3	1	14	0.866	15	0.5		
16	0.9DL + 1WL AZI 60	Yes	Y	1	0.9	4	1	14	0.5	15	0.866		
17	0.9DL + 1WL AZI 90	Yes	Y	1	0.9	5	1	14		15	1		
18	0.9DL + 1WL AZI 120	Yes	Y	1	0.9	6	1	14	-0.5	15	0.866		
19	0.9DL + 1WL AZI 150	Yes	Y	1	0.9	7	1	14	-0.866	15	0.5		

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
20	0.9DL + 1WL AZI 180	Yes	Y	1	0.9	8	1	14	-1	15			
21	0.9DL + 1WL AZI 210	Yes	Y	1	0.9	9	1	14	-0.866	15	-0.5		
22	0.9DL + 1WL AZI 240	Yes	Y	1	0.9	10	1	14	-0.5	15	-0.866		
23	0.9DL + 1WL AZI 270	Yes	Y	1	0.9	11	1	14		15	-1		
24	0.9DL + 1WL AZI 300	Yes	Y	1	0.9	12	1	14	0.5	15	-0.866		
25	0.9DL + 1WL AZI 330	Yes	Y	1	0.9	13	1	14	0.866	15	-0.5		
26	1.2D + 1.0Di	Yes	Y	1	1.2	16	1						
27	1.2D + 1.0Di +1.0Wi AZI 0	Yes	Y	1	1.2	16	1	17	1	29	1	30	
28	1.2D + 1.0Di +1.0Wi AZI 30	Yes	Y	1	1.2	16	1	18	1	29	0.866	30	0.5
29	1.2D + 1.0Di +1.0Wi AZI 60	Yes	Y	1	1.2	16	1	19	1	29	0.5	30	0.866
30	1.2D + 1.0Di +1.0Wi AZI 90	Yes	Y	1	1.2	16	1	20	1	29		30	1
31	1.2D + 1.0Di +1.0Wi AZI 120	Yes	Y	1	1.2	16	1	21	1	29	-0.5	30	0.866
32	1.2D + 1.0Di +1.0Wi AZI 150	Yes	Y	1	1.2	16	1	22	1	29	-0.866	30	0.5
33	1.2D + 1.0Di +1.0Wi AZI 180	Yes	Y	1	1.2	16	1	23	1	29	-1	30	
34	1.2D + 1.0Di +1.0Wi AZI 210	Yes	Y	1	1.2	16	1	24	1	29	-0.866	30	-0.5
35	1.2D + 1.0Di +1.0Wi AZI 240	Yes	Y	1	1.2	16	1	25	1	29	-0.5	30	-0.866
36	1.2D + 1.0Di +1.0Wi AZI 270	Yes	Y	1	1.2	16	1	26	1	29		30	-1
37	1.2D + 1.0Di +1.0Wi AZI 300	Yes	Y	1	1.2	16	1	27	1	29	0.5	30	-0.866
38	1.2D + 1.0Di +1.0Wi AZI 330	Yes	Y	1	1.2	16	1	28	1	29	0.866	30	-0.5
39	(1.2 + 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	1.242	31	1	32					
40	(1.2 + 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	1.242	31	0.866	32	0.5				
41	(1.2 + 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	1.242	31	0.5	32	0.866				
42	(1.2 + 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	1.242	31		32	1				
43	(1.2 + 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	1.242	31	-0.5	32	0.866				
44	(1.2 + 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	1.242	31	-0.866	32	0.5				
45	(1.2 + 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	1.242	31	-1	32					
46	(1.2 + 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	1.242	31	-0.866	32	-0.5				
47	(1.2 + 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	1.242	31	-0.5	32	-0.866				
48	(1.2 + 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	1.242	31		32	-1				
49	(1.2 + 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	1.242	31	0.5	32	-0.866				
50	(1.2 + 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	1.242	31	0.866	32	-0.5				
51	(0.9 - 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	0.858	31	1	32					
52	(0.9 - 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	0.858	31	0.866	32	0.5				
53	(0.9 - 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	0.858	31	0.5	32	0.866				
54	(0.9 - 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	0.858	31		32	1				
55	(0.9 - 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	0.858	31	-0.5	32	0.866				
56	(0.9 - 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	0.858	31	-0.866	32	0.5				
57	(0.9 - 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	0.858	31	-1	32					
58	(0.9 - 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	0.858	31	-0.866	32	-0.5				
59	(0.9 - 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	0.858	31	-0.5	32	-0.866				
60	(0.9 - 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	0.858	31		32	-1				
61	(0.9 - 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	0.858	31	0.5	32	-0.866				
62	(0.9 - 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	0.858	31	0.866	32	-0.5				
63	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 0	Yes	Y	1	1	2	0.238	14	0.238	15		33	1.5
64	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 30	Yes	Y	1	1	3	0.238	14	0.206	15	0.119	33	1.5
65	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 60	Yes	Y	1	1	4	0.238	14	0.119	15	0.206	33	1.5
66	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 90	Yes	Y	1	1	5	0.238	14		15	0.238	33	1.5
67	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 120	Yes	Y	1	1	6	0.238	14	-0.119	15	0.206	33	1.5
68	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 150	Yes	Y	1	1	7	0.238	14	-0.206	15	0.119	33	1.5
69	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 180	Yes	Y	1	1	8	0.238	14	-0.238	15		33	1.5
70	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 210	Yes	Y	1	1	9	0.238	14	-0.206	15	-0.119	33	1.5
71	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 240	Yes	Y	1	1	10	0.238	14	-0.119	15	-0.206	33	1.5
72	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 270	Yes	Y	1	1	11	0.238	14		15	-0.238	33	1.5
73	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 300	Yes	Y	1	1	12	0.238	14	0.119	15	-0.206	33	1.5
74	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 330	Yes	Y	1	1	13	0.238	14	0.206	15	-0.119	33	1.5

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
75	1.2DL + 1.5LL	Yes	Y	1	1.2	33	1.5						
76	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	34	1.5	2	0.059	14	0.059	15	
77	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	34	1.5	3	0.059	14	0.052	15	0.03
78	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	34	1.5	4	0.059	14	0.03	15	0.052
79	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	34	1.5	5	0.059	14		15	0.059
80	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	34	1.5	6	0.059	14	-0.03	15	0.052
81	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	34	1.5	7	0.059	14	-0.052	15	0.03
82	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	34	1.5	8	0.059	14	-0.059	15	
83	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	34	1.5	9	0.059	14	-0.052	15	-0.03
84	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	34	1.5	10	0.059	14	-0.03	15	-0.052
85	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	34	1.5	11	0.059	14		15	-0.059
86	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	34	1.5	12	0.059	14	0.03	15	-0.052
87	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	34	1.5	13	0.059	14	0.052	15	-0.03
88	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	35	1.5	2	0.059	14	0.059	15	
89	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	35	1.5	3	0.059	14	0.052	15	0.03
90	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	35	1.5	4	0.059	14	0.03	15	0.052
91	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	35	1.5	5	0.059	14		15	0.059
92	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	35	1.5	6	0.059	14	-0.03	15	0.052
93	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	35	1.5	7	0.059	14	-0.052	15	0.03
94	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	35	1.5	8	0.059	14	-0.059	15	
95	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	35	1.5	9	0.059	14	-0.052	15	-0.03
96	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	35	1.5	10	0.059	14	-0.03	15	-0.052
97	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	35	1.5	11	0.059	14		15	-0.059
98	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	35	1.5	12	0.059	14	0.03	15	-0.052
99	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	35	1.5	13	0.059	14	0.052	15	-0.03
100	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	36	1.5	2	0.059	14	0.059	15	
101	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	36	1.5	3	0.059	14	0.052	15	0.03
102	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	36	1.5	4	0.059	14	0.03	15	0.052
103	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	36	1.5	5	0.059	14		15	0.059
104	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	36	1.5	6	0.059	14	-0.03	15	0.052
105	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	36	1.5	7	0.059	14	-0.052	15	0.03
106	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	36	1.5	8	0.059	14	-0.059	15	
107	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	36	1.5	9	0.059	14	-0.052	15	-0.03
108	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	36	1.5	10	0.059	14	-0.03	15	-0.052
109	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	36	1.5	11	0.059	14		15	-0.059
110	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	36	1.5	12	0.059	14	0.03	15	-0.052
111	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	36	1.5	13	0.059	14	0.052	15	-0.03

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N31A	max	1012.196	79	610.428	38	1316.593	76	-64.523	21	0	111	101.085	78
2		min	-1105.019	109	197.228	54	-130.734	20	-226.919	89	0	1	-122.405	108
3	N32A	max	1117.013	103	772.045	106	546.685	25	-67.843	24	0	111	127.218	78
4		min	-1024.157	85	238.954	60	-1461.233	7	-258.021	92	0	1	-155.916	108
5	N46	max	30.819	5	36.389	36	563.529	16	0	111	0	111	0	111
6		min	-30.929	11	11.891	54	-564.278	22	0	1	0	1	0	1
7	Totals:	max	785.717	17	1384.112	30	1253.042	14						
8		min	-785.717	23	449.695	60	-1253.043	8						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
1	H2	PIPE_2.0	0.337	60	90	0.129	108.98		107	26521.424	32130	1871.625	1871.625	1	H1-1b
2	H1	PIPE_2.0	0.324	60	91	0.087	107.755		8	26521.424	32130	1871.625	1871.625	1	H1-1b

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
3	MP2	PIPE_2.0	0.248	29.388	8	0.04	30.367		10	3485.189	32130	1871.625	1871.625	1	H1-1b
4	PL2	PL6X1/2"	0.241	5.75	106	0.07	5.75	y	95	84495.421	97200	1012.5	12150	1.45	H1-1b
5	PL1	PL6X1/2"	0.202	5.75	111	0.072	5.75	y	98	84495.421	97200	1012.5	12150	1.454	H1-1b
6	S3	PIPE_2.0	0.199	53.61	8	0.043	0		95	29040.313	32130	1871.625	1871.625	1	H1-1b
7	DIAG2	0.625"S.R.	0.19	0	108	0.009	63.389		38	931.515	9946.8	96.768	96.768	1	H1-1b*
8	S1	PIPE_2.0	0.189	0	8	0.063	25.142		92	29169.231	32130	1871.625	1871.625	1	H1-1b
9	DIAG1	0.625"S.R.	0.188	0	79	0.009	63.389		27	931.515	9946.8	96.768	96.768	1	H1-1b*
10	MP1	PIPE_2.0	0.178	30.367	92	0.036	65.633		99	3485.189	32130	1871.625	1871.625	1	H1-1b
11	MP3	PIPE_2.0	0.171	30.367	95	0.028	30.367		99	3485.189	32130	1871.625	1871.625	1	H1-1b
12	S4	PIPE_2.0	0.162	53.61	2	0.04	0		98	29040.313	32130	1871.625	1871.625	1	H1-1b
13	VERT2	0.625"S.R.	0.161	36	78	0.01	36		4	2888.06	9946.8	96.768	96.768	1	H1-1b*
14	VERT4	0.625"S.R.	0.152	0	107	0.011	36		4	2888.06	9946.8	96.768	96.768	1	H1-1b*
15	S2	PIPE_2.0	0.141	0	2	0.061	26.805		99	29040.313	32130	1871.625	1871.625	1	H1-1b
16	VERT1	0.625"S.R.	0.131	0	76	0.006	36		7	2888.06	9946.8	96.768	96.768	1	H1-1b*
17	VERT3	0.625"S.R.	0.12	36	110	0.004	36		8	2888.06	9946.8	96.768	96.768	1	H1-1b*
18	TB1	PIPE_2.0	0.062	48.003	5	0.004	96.005		11	14914.854	32130	1871.625	1871.625	1	H1-1b
19	U1	PIPE_2.0	0.04	6.367	96	0.024	41.633		11	26521.424	32130	1871.625	1871.625	1	H1-1b

INFINIGY

Bolt Calculation Tool, V1.6.2

PROJECT DATA	
Site Name:	BOBOS00038A
Site Number:	N/A
Connection Description:	Mount to Tower

ENVELOPE BOLT LOADS		
(LC108 M19) Bolt Tension:	487.14	lbs
(LC104 M19) Bolt Shear:	432.64	lbs

MAX BOLT USAGE LOADS[1]		
Bolt Tension:	473.35	lbs
Bolt Shear:	432.64	lbs

MAX CONNECTION SLIP USAGE LOADS[2]		
Sliding Force:	1461.23	lbs
Torsion About Leg:	5.10	lbs-ft

BOLT PROPERTIES		
Bolt Type:	Threaded Rod	-
Bolt Diameter:	0.5	in
Bolt Grade:	A307	-
# of Threaded Rods:	4	-
Leg Diameter:	3	in
Threads Excluded?	No	-

[1] *Max bolt usage loads correspond to Load combination #104 on member M19 in RISA-3D, which causes the maximum demand on the bolts.*

[2] *Max slip usage loads correspond to Load combination #7 on member M20 in RISA 3D, which causes the maximum slip demand on the connection.*

Member Information
J nodes of M19, M20,

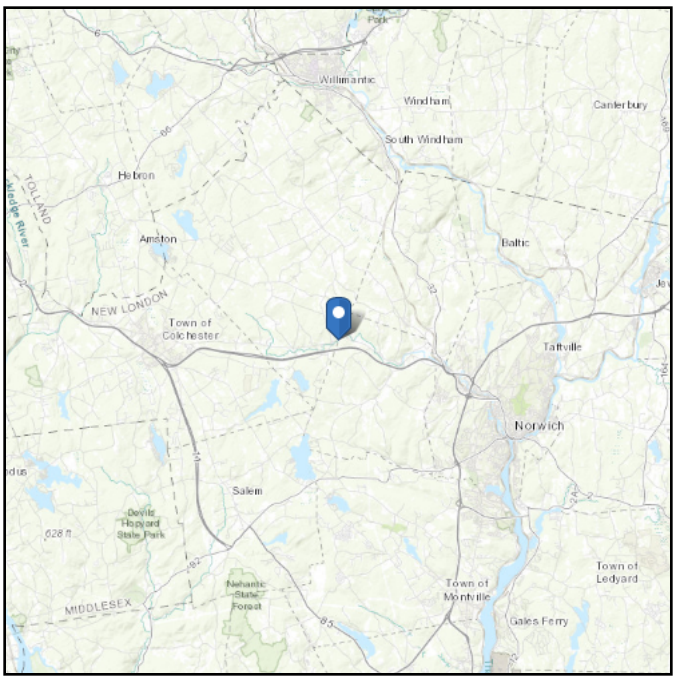
BOLT CHECK		
Tensile Strength	6385.43	
Shear Strength	4417.86	
Max Tensile Usage	7.6%	
Max Shear Usage	9.8%	
Interaction Check (Max Usage)	0.02	***≤1.05***
Result	Pass	

SLIP CHECK		
Torsional Slip Resistance	1178.10	
Sliding Resistance	9424.78	
Torsional Slip Usage	0.4%	
Sliding Usage	15.5%	
Interaction Check	0.02	***≤1.05***
Result	Pass	

ASCE 7 Hazards Report

Address:
12 Polly Ln
Lebanon, Connecticut
06249

Standard:	ASCE/SEI 7-16	**Latitude:**	41.575581
Risk Category:	II	**Longitude:**	-72.201699
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	252.95 ft (NAVD 88)



Wind

Results:

Wind Speed	123 Vmph
10-year MRI	75 Vmph
25-year MRI	85 Vmph
50-year MRI	95 Vmph
100-year MRI	100 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

Date Accessed: Thu Dec 08 2022

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Seismic

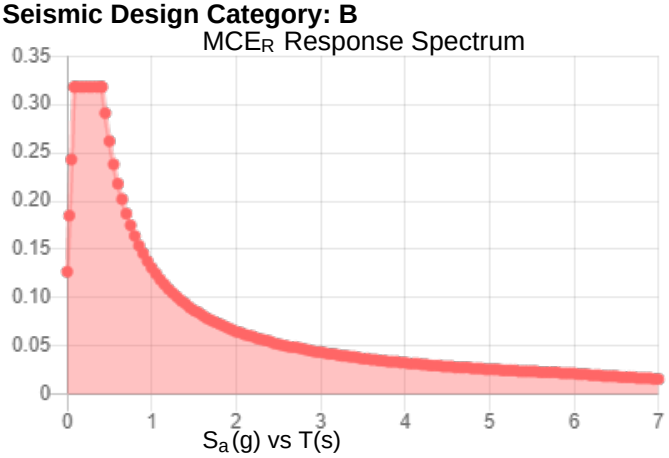
D - Default (see Section 11.4.3)

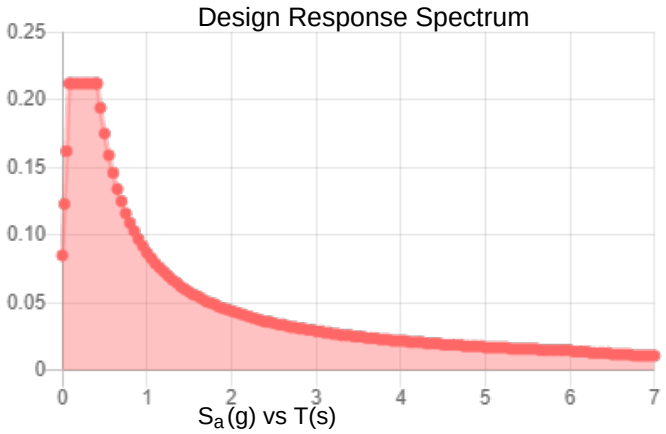
Site Soil Class:

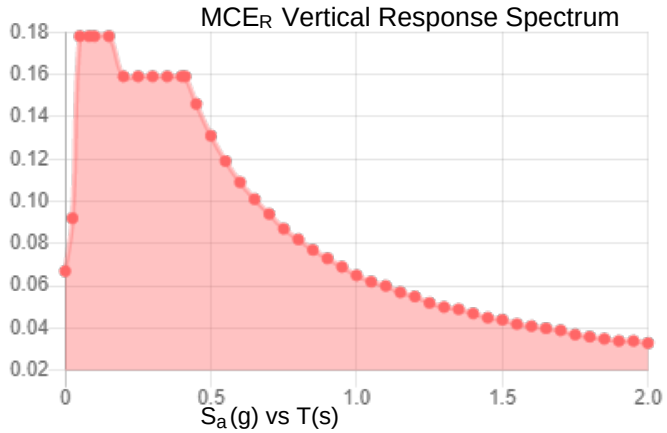
Results:

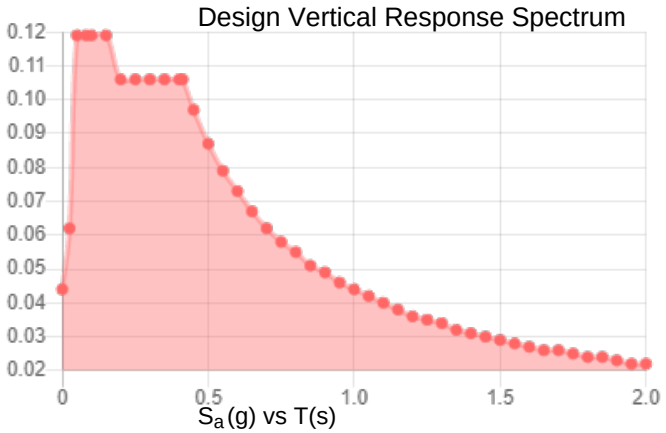
S_S :	0.199	S_{D1} :	0.087
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.109
F_v :	2.4	PGA_M :	0.173
S_{MS} :	0.318	F_{PGA} :	1.581
S_{M1} :	0.131	I_e :	1
S_{DS} :	0.212	C_v :	0.7

Seismic Design Category: B









Data Accessed: **Thu Dec 08 2022**

Date Source:

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

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Thu Dec 08 2022

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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.

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Exhibit F

Power Density/RF Emissions Report

Fox Hill Telecom

Radio Frequency Emissions Analysis Report

Site ID: BOBOS00038A

Everest Bozrah Polly Lane
12 Polly Lane
Bozrah, CT 06336

December 30, 2022

Fox Hill Telecom Project Number: 222143

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**8.49 %**

Fox Hill Telecom

December 30, 2022

Dish Wireless
5701 South Santa Fe Drive
Littleton, CO 80120

Emissions Analysis for Site: **BOBOS00038A – Everest Bozrah Polly Lane**

Fox Hill Telecom, Inc ("Fox Hill") was directed to analyze the proposed radio installation for Dish Wireless, LLC (Dish) facility located at **12 Polly Lane, Bozrah, CT**, for the purpose of determining whether the emissions from the Proposed Dish radio and antenna installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the 600 MHz band is approximately 400 $\mu W/cm^2$. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS / AWS-4) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed upgrades to the Dish Wireless antenna facility located at **12 Polly Lane, Bozrah, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65 for far field modeling calculations.

In OET-65, plane wave power densities in the Far Field of an antenna are calculated by considering antenna gain and reflective waves that would contribute to exposure.

Since the radiation pattern of an antenna has developed in the **Far Field** region the power gain in specific directions needs to be considered in exposure predictions to yield an Effective Radiated Power (ERP) in each specific direction from the antenna. Also, since the vertical radiation pattern of the antenna is considered, the exposure calculations would most likely be reduced significantly at ground level, resulting in a more realistic estimate of the actual exposure levels. To determine a worst-case scenario at each point along the calculation radials, each point was calculated using the antenna gain value at each angle of incident and compared against the result using an isotropic radiator at the antenna height with the greater of the two used to yield the more pessimistic far field value for each point along the calculation radial.

Additionally, to model a truly "worst case" prediction of exposure levels at or near a surface, such as at ground-level or on a rooftop, reflection off the surface of antenna radiation power can be assumed, resulting in a potential 1.6 times increase in power density in calculating far field power density values.

With these factors Considered, the worst case **Far Field prediction model** utilized in this analysis is determined by the following equation:

Equation 9 per FCC OET65 for Far Field Modeling

$$S = \frac{33.4\ ERP}{R^2}$$

S = Power Density (in μw/cm^2)
ERP = Effective Radiated Power from antenna (watts)
R = Distance from the antenna (meters)

Predicted far field power density values for all carriers identified in this report were calculated 6 feet above the ground level and are displayed as a percentage of the applicable FCC standards. All emissions values for other carriers were calculated using the same Far Field model outlined above, using industry standard radio configurations and frequency band selection based upon available licenses in this geographic area for emissions contribution estimates.

For each Dish sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
5G	n71 (600 MHz)	4	61.5
5G	n70 (AWS-4 / 1995-2020)	4	40
5G	n66 (AWS-4 / 2180-2200)	4	40

Table 1: Channel Data Table

The following **Dish** antennas listed in *Table 2* were used in the modeling for transmission in the 600 MHz (n71) frequency band and the 2100 MHz (AWS 4) frequency bands at 1995-2020 MHz (n70) and 2180-2200 MHz (n66). This is based on feedback from Dish regarding anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	JMA MX08FRO665-21	127
B	1	JMA MX08FRO665-21	127
C	1	JMA MX08FRO665-21	127

Table 2: Antenna Data

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

RESULTS

Per the calculations completed for the proposed **Dish** configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	JMA MX08FRO665-21	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	2.32
						Sector A Composite MPE%	**2.32**
Antenna B1	JMA MX08FRO665-21	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	2.32
						Sector B Composite MPE%	**2.32**
Antenna C1	JMA MX08FRO665-21	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	2.32
						Sector C Composite MPE%	**2.32**

Table 3: Dish Emissions Levels

The Following table (*Table 4*) shows all additional carriers on site and their emissions contribution estimates, along with the newly calculated **Dish** far field emissions contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site emissions values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each **Dish** Sector as well as the composite emissions value for the site.

Site Composite MPE%	
Carrier	**MPE%**
Dish – Max Per Sector Value	**2.32 %**
Sprint	0.82 %
Verizon Wireless	2.43 %
AT&T	1.96 %
T-Mobile	0.96 %
Site Total MPE %:	**8.49 %**

Table 4: All Carrier MPE Contributions

Dish Sector A Total:	2.32 %
Dish Sector B Total:	2.32 %
Dish Sector C Total:	2.32 %
Site Total:	8.49 %

Table 5: Site MPE Summary

Table 6 below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated **Dish** sector(s). For this site, the sector with the largest calculated MPE% is For this site, all three sectors have the same configuration yielding the same results on all three sectors.

Dish _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Dish n71 (600 MHz) 5G	4	858.77	127	6.16	n71 (600 MHz)	400	1.54%
Dish n70 (AWS-4 / 1995-2020) 5G	4	1,648.39	127	3.90	n70 (AWS-4 / 1995-2020)	1000	0.39%
Dish n66 (AWS-4 / 2180-2200) 5G	4	1,849.52	127	3.90	n66 (AWS-4 / 2180-2200)	1000	0.39%
						Total:	**2.32%**

Table 6: Dish Maximum Sector MPE Power Values

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 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 Sector	Power Density Value (%)
Sector A:	2.32 %
Sector B:	2.32 %
Sector C:	2.32 %
Dish Maximum Total (per sector):	2.32 %
Site Total:	8.49 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite emissions value for this site, assuming all carriers present, is **8.49 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon the far field calculations performed for all carriers identified in this report.

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.

Scott Heffernan
Principal RF Engineer
Fox Hill Telecom, Inc
Worcester, MA 01609
(978)660-3998

Exhibit G

Letter of Authorization

Everest Infrastructure Partners
Two Allegheny Center
Nova Tower 2, Suite 703
Pittsburgh, PA 15212

January 26, 2022

LETTER OF AUTHORIZATION

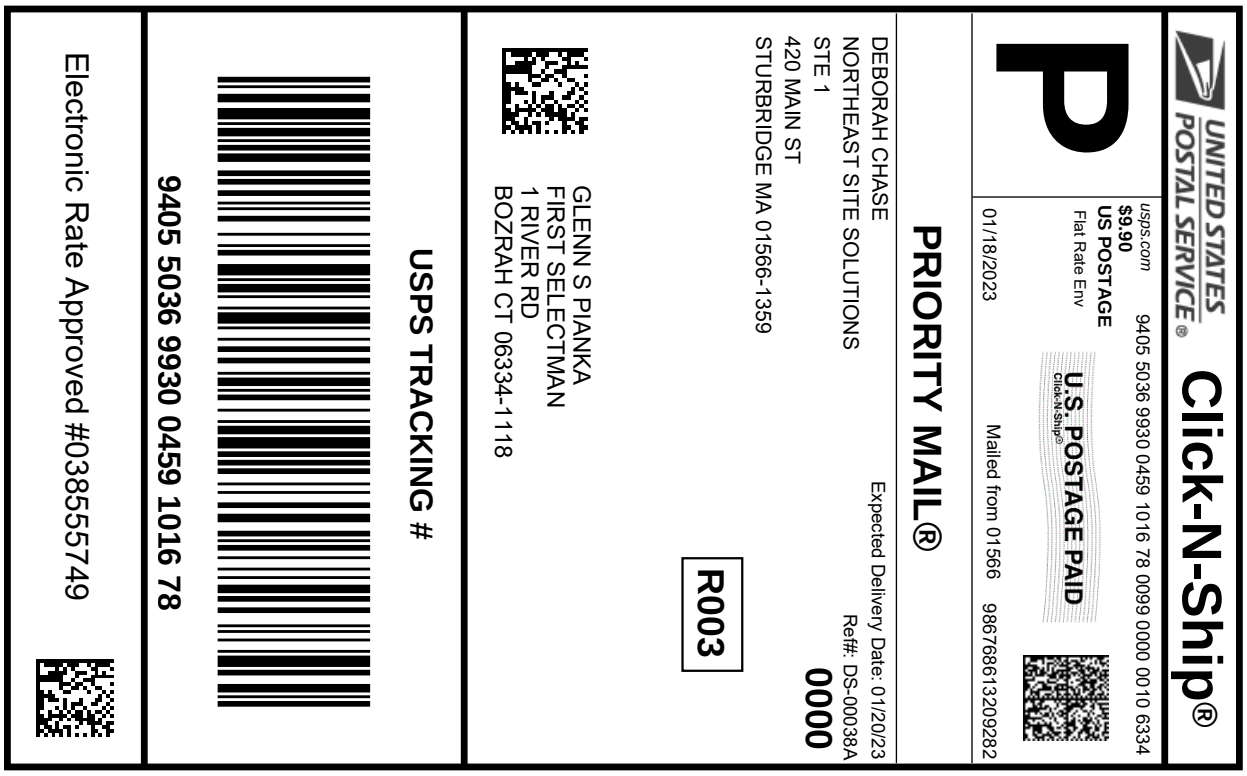
I, Michael Ashley Culbert, the owner representative for the telecommunications tower located at 3 Polly Lane, Bozrah, New London County, Connecticut 06336 (the "Property"), as evidenced by Easement Agreement recorded in the Land Records of Bozrah, Connecticut on January 2, 2019, Doc ID 211810010 at Book 107, Page 485-494; hereby authorize DISH Wireless L.L.C., through its designated agent, Northeast Site Solutions, to apply for all necessary municipal, state, federal and other permits necessary to accommodate the installation of Dish antennas and ancillary equipment on the subject tower and base station equipment at the Property.

EIP Communications I, LLC

Michael Ashley Culbert
Vice President of Leasing & Collocation

Exhibit H

Recipient Mailings



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Trans. #:	580788378
Print Date:	01/18/2023
Ship Date:	01/18/2023
Expected Delivery Date:	01/20/2023

Priority Mail® Postage:	**$9.90**
Total:	**$9.90**

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
STE 1
420 MAIN ST
STURBRIDGE MA 01566-1359

Ref#: DS-00038A

To: GLENN S PIANKA
FIRST SELECTMAN
1 RIVER RD
BOZRAH CT 06334-1118

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

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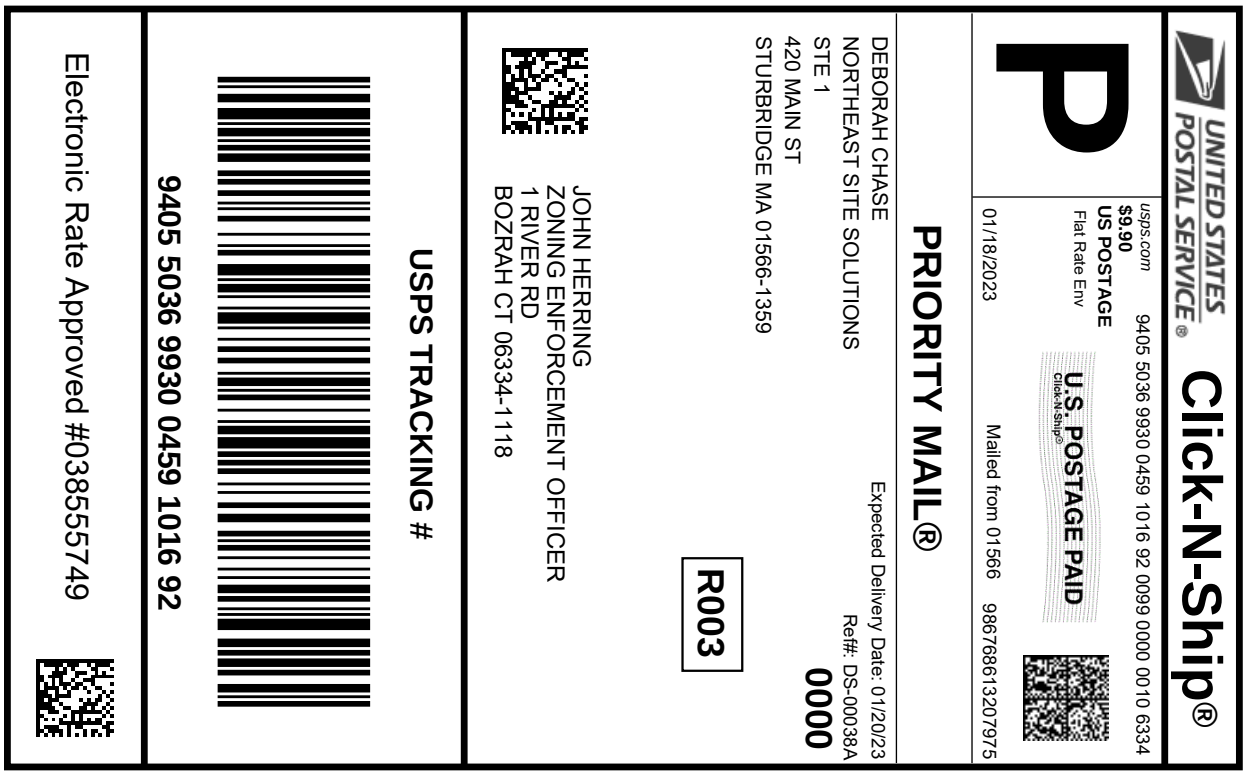

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Trans. #:	580788378
Print Date:	01/18/2023
Ship Date:	01/18/2023
Expected Delivery Date:	01/20/2023

Priority Mail® Postage:	**$9.90**
Total:	**$9.90**

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
STE 1
420 MAIN ST
STURBRIDGE MA 01566-1359

Ref#: DS-00038A

To: JOHN HERRING
ZONING ENFORCEMENT OFFICER
1 RIVER RD
BOZRAH CT 06334-1118

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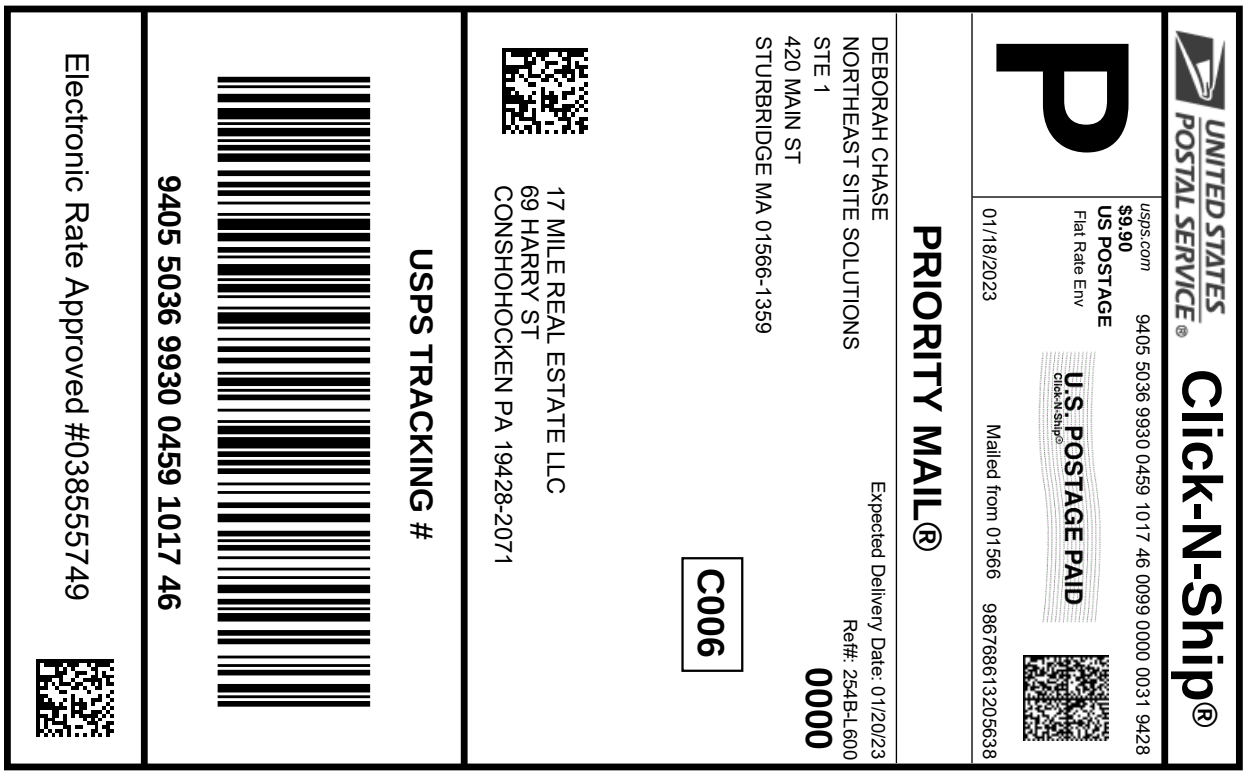

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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0459 1017 46

Trans. #:	580788378
Print Date:	01/18/2023
Ship Date:	01/18/2023
Expected Delivery Date:	01/20/2023

Priority Mail® Postage:	**$9.90**
Total:	**$9.90**

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
STE 1
420 MAIN ST
STURBRIDGE MA 01566-1359

Ref#: 254B-L600

To: 17 MILE REAL ESTATE LLC
69 HARRY ST
CONSHOHOCKEN PA 19428-2071

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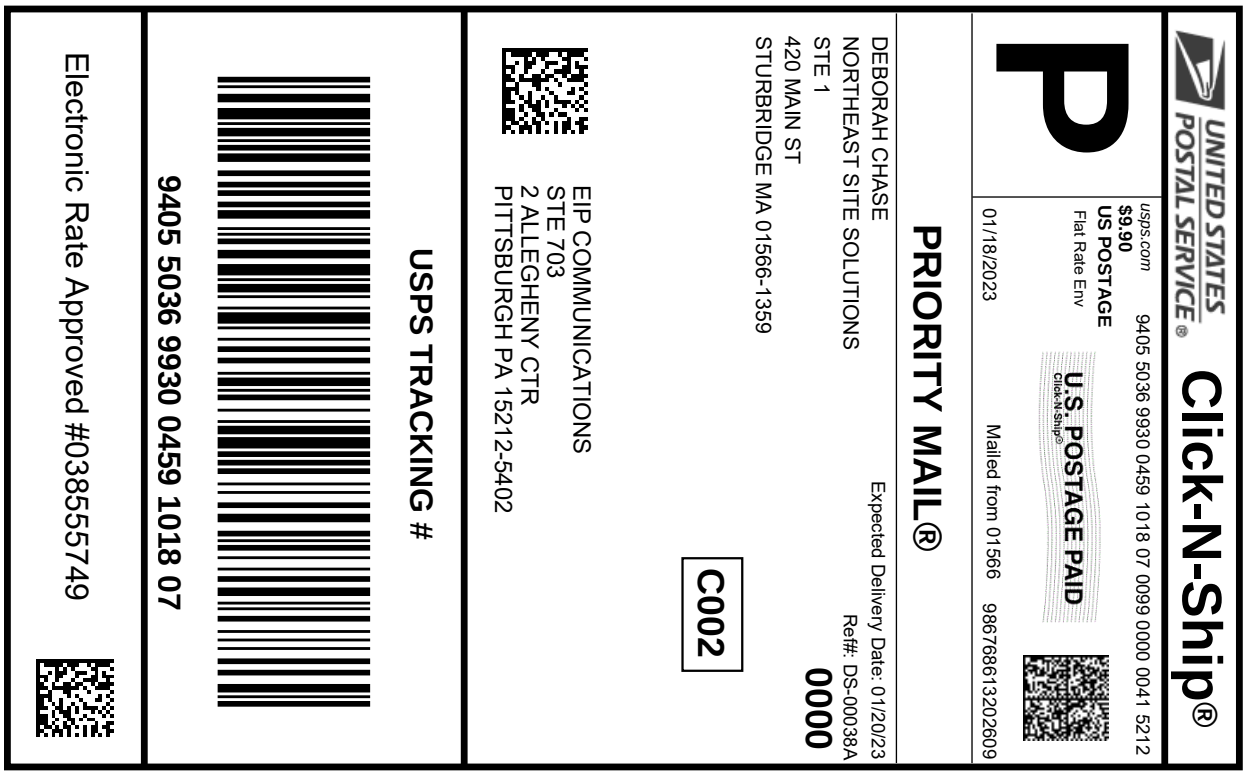

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Click-N-Ship® Label Record

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9405 5036 9930 0459 1018 07

Trans. #:	580788378
Print Date:	01/18/2023
Ship Date:	01/18/2023
Expected Delivery Date:	01/20/2023

Priority Mail® Postage:	**$9.90**
Total:	**$9.90**

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
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