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

February 4, 2022

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

RE: Tower Share Application
2 Hinkley Road, Norwich, CT
Latitude: 41.514880 N
Longitude: -72.061674 W
Site#: BOBOS00070B

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 2 Hinkley Road, Norwich, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900/2100 5G MHz antenna and six (6) RRUs, at the 105-foot level of the existing 150-foot self-support 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 October 28, 2021, Exhibit C. Also included is a structural analysis prepared by Paul J. Ford, dated February 3, 2022 confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. This facility was approved by the City of Norwich on September 22, 1999. A 10-foot extension was approved in Petition No. 579 dated September 5, 2002. 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 Peter Albert Nystrom, Mayor for the Town of Norwich, Deanna Rhodes, City Planner for the Town of Norwich, as well as the property owner 17 Mile Real Estate LLC and EIP Holdings II LLC, tower owner.

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

1. The proposed modifications will not result in an increase in the height of the existing structure. The top of the tower is 150-feet; Dish Wireless LLC proposed antennas will be located at a center line height of 105-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 23.65% 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 self-support 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 self-support in Norwich. 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 105-foot level of the existing 150-foot tower would have an insignificant visual impact on the area around the self-support 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 Norwich.

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:
Peter Albert Nystrom, Mayor
Town of Norwich
100 Broadway
Norwich, CT 06360

Deanna Rhodes, Town Planner
Town of Norwich
100 Broadway
Norwich, CT 06360

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

EIP Holdings II LLC, Tower Owner
100 Summet Street, Suite 1600
Boston, MA 02110

Exhibit A

Original Facility Approval

FILE COPY

CITY OF NORWICH
CONNECTICUT

CERTIFIED MAIL
#Z149574215

SITE PLAN APPROVAL

Date: Sept. 22, 1999

Site Development Plan #805 - Cordless Data Transfer, Inc.; construction of 140-ft. wireless communications tower & equipment pad.

Name: Cordless Data Transfer, Inc.
Box 363
17 Ridgewood Drive
Marlborough, CT 06447

Location: in the Town of Norwich off 2 Hinckley Hill, Preston.

The final plan of Site Development Plan # 805 as referenced above was considered at the regular meeting of the Commission on the City Plan held on Sept. 21, 1999.

After careful consideration the Commission voted unanimously to approve the site plan.

A coastal site plan review was not required in accordance with Chapter 444 of the Connecticut General Statutes. After careful consideration the Commission on the City Plan voted n/a to n/a the coastal site plan application.

The approval of the above referenced site plan is subject to the following conditions and/or modifications:

1. Bond in the amount of $25,000.00 for site work shall be posted prior to endorsement of the plan;
2. Bond in the amount of $12,000.00 for removal of the facility in the event it is abandoned shall be posted prior to endorsement of the plan;
3. Pursuant to Sec. 7.5.6(a) of the Zoning Regulations, the fifty (50) foot buffer around the tower shall be provided in perpetuity and noted on the plan prior to endorsement of the plan;
4. The Memorandum of Management Agreement shall be filed with the City Clerk prior to endorsement of the plan.

Please provide the following plans, bond, and deeds to the Planning Department, 23 Union Street, within 60 days after the date of approval.

1. Two sets of mylars and six sets of prints of the final site plan; one set of the mylars shall be produced by one of the following processes: wash-off photographic polyester film; fixed line photographic polyester film; original ink drawing on polyester film or linen. All modifications of approval shall be incorporated into the final plan.

2. All R.O.W. and/or easement deeds associated with the site plan.

3. Post a passbook or surety bond with the Commission on the City Plan in a form acceptable to the Corporation Counsel and in the amount approved by the Director of Public Works.

The Chairperson of the Commission on the City Plan must endorse the site plans prior to filing the approved plans with the City Clerk and prior to the issuance of a zoning compliance permit and a building permit.

The Planning Department will contact you after the site plan has been endorsed by the chairperson. You are responsible for filing the plan with the City Clerk within 90 days after approval by the Commission; provided acceptable plans and bond are submitted by the applicant. If an acceptable plan is not filed with the clerk within the 90 day period, the Commission's approval is invalid.

CHANGES TO THE APPROVED PLAN: All site activities shall be constructed in accordance with the approved plans, specifications and documents of record. Any change to the plans must be approved by the Commission on the City Plan.

EROSION AND SEDIMENT CONTROL: The erosion and sediment control measures shall be installed in accordance with the Connecticut Guidelines for Erosion and Sediment Control; such measures shall be installed prior to site disturbance. Additional erosion and sediment control measures shall be provided if determined to be necessary by a representative of the Planning Department or Public Works Department.

PRE-CONSTRUCTION CONFERENCE: It is the responsibility of the permittee or the contractor to schedule a pre-construction conference with the Planning Department for the purpose of inspecting the installation of the erosion and sediment control measures, and Public Works to set up an inspection schedule for road, drainage and sidewalk construction. City Hall telephone number: Planning Department, (860) 823-3766; Public Works Department, (860) 823-3798.

PUBLIC UTILITIES: Contact the Department of Public Utilities for an inspection of the sewer, water, electric and gas lines installation.

TIME PERIODS: Site plan approval is valid for one year, however, an extension to such approval may be granted by the Commission. In addition, all construction in the approved site plan must be completed within 5 years, based on Section 8.3.i of the Connecticut General Statutes.

CONSTRUCTION REQUIREMENTS: The following conditions shall be a requirement of the approval:

1. Unsuitable material in the pavement areas must be removed and replaced with suitable material as directed by the City Road Inspector.

2. If blasting is required for construction, a pre-blast survey shall be conducted prior to blasting. Contact the Fire Marshal, telephone (860) 887-2780.

ZONING PERMIT: After the plan has been filed, a zoning permit can be applied for through the zoning enforcement officer: telephone (860) 823-3766.

BUILDING PERMIT: For any building construction, please submit building plans and separate application to the building inspector.

CERTIFICATE OF COMPLIANCE will be issued after all parking, sidewalks, recreation area (for multi-family development) and public safety concerns are addressed in accordance with the approved site plan.

CERTIFICATE OF OCCUPANCY is issued by the building inspector. Certificate of Compliance must be obtained prior to the issuance of a Certificate of Occupancy.

AS-BUILT DRAWING may be required by the Commission prior to the final release of the bond.

Congratulations on the successful completion of your application.

Peter W. Davis
Planning Director

cc-Director of Public Works
-City Engineer
-Building Inspector
-John F. Bilda, Engineer, Public Utilities Dept.

Memorandum of Management Agreement

This memorandum evidences that a Management Agreement was made and entered into by a written Agreement dated July 1, 1997 by and between Mr. James C. Irwin and Mrs. LaVerne G. Irwin, jointly, as individuals (Owners) and owners of property located in the City of Norwich, Connecticut located on assessors map # 27 Block 1 lot 6A, and Cordless Data Transfer, Incorporated, a Connecticut corporation (CDT) maintaining an office at 17 Ridgewood Drive Marlborough, Connecticut 06447.

Such Agreement provides in part that Owners grant CDT unrestricted access to the proposed tower site on the property for the installation, operation and maintenance of driveways, electric and telephone service and the tower structure and equipment and facilities located thereon.

The term of this agreement is for a period of five years with three five year, automatic extension periods at the option of the Owners.

CDT and the Owners hereby acknowledge that the City of Norwich has a rule or regulation requiring that the tower structure be removed should it become abandoned or cease to be used as a licensed communications facility. Should the tower become abandoned and it is not removed as per the City's regulations, then, the Owners and CDT grant to the City of Norwich permission to enter the property and remove the tower structure.

Complete copies of this Management Agreement are on file at the office of Cordless Data Transfer, Inc. at 17 Ridgewood Drive, Marlborough, Connecticut 06447.

In witness whereof the parties have executed this Memorandum as of the date below.

Cordless Data Transfer, Inc. (CDT)

Robert J. Francis, President

9/15/99
Date

James C. Irwin

James C. Irwin

15 Sept 1999
Date

LaVerne G. Irwin

LaVerne G. Irwin

15 Sept 1999
Date

APPROVED AS TO FORM
And Legality On 10/20/99
Corporation Counsel
City of Norwich, Conn.

RECEIVED FOR RECORD AT NORWICH, CONN.
ON 10-20-99 AT 4:15 P M.
Attest Beverly C. Muldoon, Town Clerk

294593

Received for Record in Norwich, CT
Oct 20 1999 at 4:15 PM, and
Recorded in Norwich Land Records in
Vol 1463 at Page 219
Beverly C. MacDonald Town Clerk

My neighbor - Lot 10 - Frances

Bd 10 -

June 26, 2000

Sandy M. Carter
Manager-Regulatory
Verizon Wireless
20 Alexander Drive
P.O. Box 5029
Wallingford, CT 06492-2430

RE: TS-BAM-104-000607 - Cellco Partnership d/b/a Verizon Wireless request for an order to approve tower sharing at an existing telecommunications facility located at 2 Hinckley Hill Road in Norwich, Connecticut.

Dear Ms. Carter:

At a public meeting held June 20, 2000, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Any additional change to this facility may require an explicit request to this agency pursuant to General Statutes § 16-50aa or notice pursuant to Regulations of Connecticut State Agencies Section 16-50j-73, as applicable. Such request or notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

This decision applies only to this request for tower sharing and is not applicable to any other request or construction. The proposed shared use is to be implemented as specified in your letter dated June 6, 2000.

Thank you for your attention and cooperation.

Very truly yours,

Mortimer A. Gelston
Chairman

MAG/PMA/grg

c: Honorable Richard J. Abele, President City Council, City of Norwich

Petition No. 579
Cordless Data Transfer
Norwich, Connecticut
Staff Report
September 5, 2002

On August 27, 2002, Connecticut Siting Council member Gerald Heffernan and staff Robert Mercier conducted an inspection of an existing 140-foot lattice tower owned and operated by Cordless Data Transfer and located at 2 Hinckley Hill Road in Norwich, Connecticut. T-Mobile is petitioning the Council for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) is required for a proposed 10- foot tower extension.

T-Mobile proposes to install twelve panel antennas at the top of the proposed 10-foot extension. The total height of the structure would be 153 feet above ground level including antennas. Three cabinets would be placed within the existing compound. Locating antennas at the 150-foot level will provide T-Mobile with adequate coverage on Route 12 and would allow call handoff to an existing facility at the Preston Town Hall.

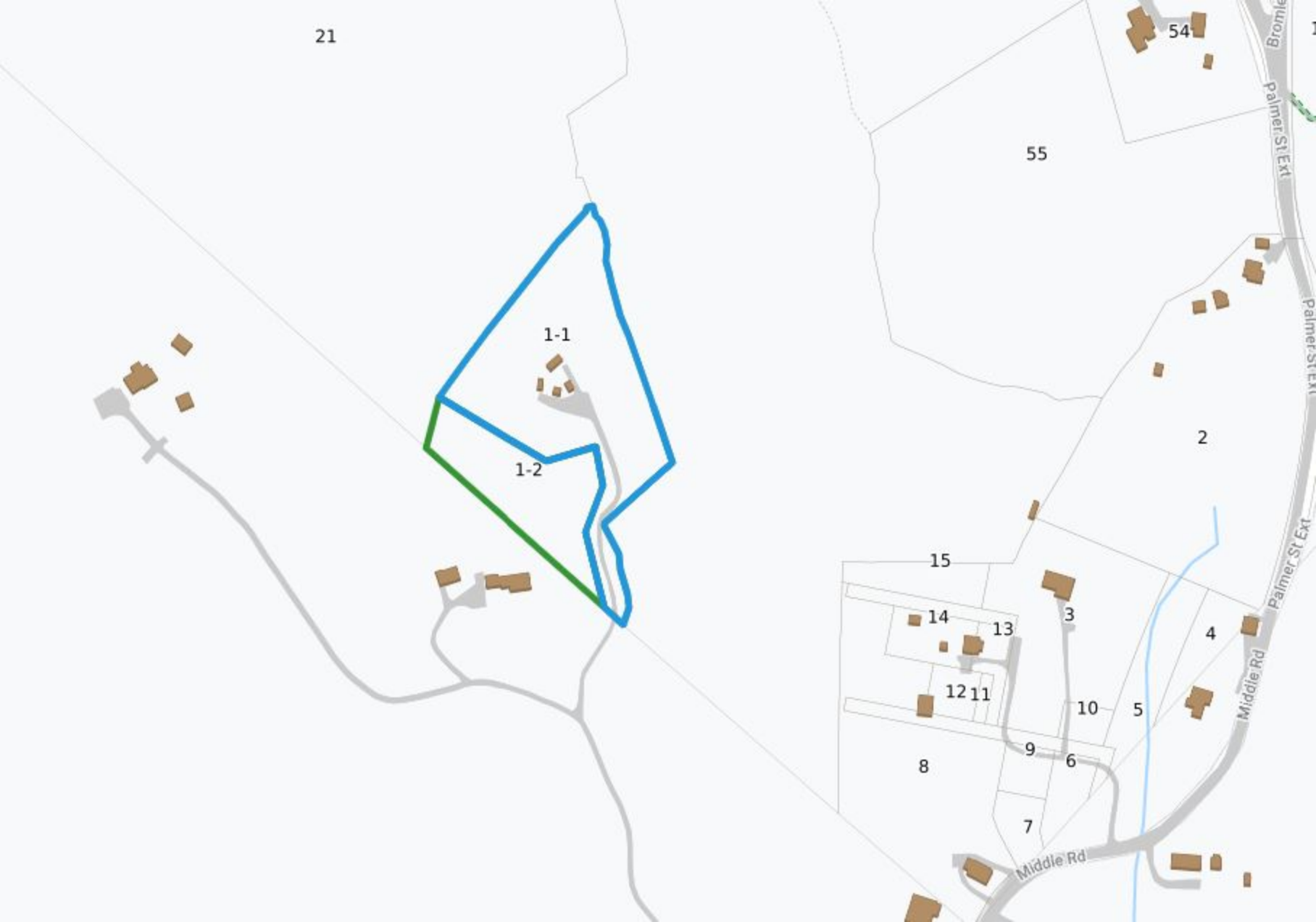
The proposed site is located on a wooded ridge and is screened from surrounding residential areas by existing vegetation.

A structural analysis of the existing 140-foot tower performed by a professional engineer from Fred A. Nudd Corporation indicates that the tower and foundation can support the proposed modifications. The worst-case power density for the telecommunications operations at the site has been calculated to be 3.7% of the applicable standard for uncontrolled environments.

T-Mobile contends that the proposed extension of the structure would not cause a substantial adverse environmental effect, and therefore, a certificate would not be required.

Exhibit B

Property Card


21
54
55
Palmer St Ext
1-1
1-2
2
15
14
13
3
4
12
11
10
5
9
6
8
7
Middle Rd
Middle Rd
Palmer St Ext

NORWICH,CT

2 HINCKLEY HILL RD REAR

Location
2 HINCKLEY HILL RD REAR
Mblu
119/ 1/ 1/ 1/
Acct#
0052410001
Owner
17 MILE REAL ESTATE LLC
Assessment
$847,500
Appraisal
$1,210,700
PID
5166
Building Count
1

Current Value

Appraisal

Valuation Year	Improvements	Land	Total
2018	$1,043,100	$167,600	$1,210,700

Assessment

Valuation Year	Improvements	Land	Total
2018	$730,200	$117,300	$847,500

Parcel Addreses

Additional Addresses

No Additional Addresses available for this parcel

Owner of Record

Owner 17 MILE REAL ESTATE LLC

Address 69 HARRY ST
CONSHOHOCKEN, PA 19428

Sale Price $1,803,750

Certificate

Book & Page 3118/0239

Sale Date 04/30/2019

Instrument 00

Ownership History

Ownership History

Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
17 MILE REAL ESTATE LLC	$1,803,750		3118/0239	00	04/30/2019
IRWIN LAVERNE G	$0		3118/0227	1S	04/30/2019
IRWIN JAMES C +	$0		2379/0094	1A	05/08/2007
IRWIN JAMES C + LAVERENE G	$0		0532/0280	1A	05/01/1980

Building Information

Building 1 : Section 1

Year Built:

Living Area: 0

Replacement Cost: $0

Building Percent Good:

Replacement Cost Less Depreciation: $0

Building Attributes

Field	Description
Style	Outbuildings
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Num Kitchens	
Fireplace (s)	
Whirlpool	

FPLG Gas	
FPLW Wood	
FPO	
Usrfld 107	
park	
Fireplaces	
Usrfld 108	
Usrfld 101	
Usrfld 102	
Usrfld 100	
Usrfld 300	
Usrfld 301	

Building Photo

Building Layout

Building Sub-Areas (sq ft) Legend

No Data for Building Sub-Areas

Extra Features

Extra Features Legend

No Data for Extra Features

Land

Land Use

Use Code	431V
Description	TEL REL TW M-00
Zone	R40
Neighborhood	
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	3.59
Frontage	0
Depth	0
Assessed Value	$117,300
Appraised Value	$167,600

Outbuildings

Outbuildings Legend

Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
SHD4	Shed Comm. Wd.			128.00 S.F.	$1,300	1
SHD5	Shed Comm Mas			360.00 S.F.	$4,500	1
TWR	CELL TOWER			150.00 UNITS	$101,300	1
MSC5	ARRAYS			4.00 UNIT	$936,000	1

Valuation History

Appraisal

Valuation Year	Improvements	Land	Total
2020	$1,043,100	$167,600	$1,210,700
2019	$1,043,100	$167,600	$1,210,700
2018	$1,043,100	$167,600	$1,210,700

Assessment

Valuation Year	Improvements	Land	Total
2020	$730,200	$117,300	$847,500
2019	$730,200	$117,300	$847,500
2018	$730,200	$117,300	$847,500

closecloseclose

Exhibit C

Construction Drawings

DISH Wireless L.L.C. SITE ID:

BOBOS00070B

DISH Wireless L.L.C. SITE ADDRESS:

2 HINKLEY ROAD
NORWICH, CT 06365

CONNECTICUT CODE COMPLIANCE

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

CODE TYPE	CODE
BUILDING	2018 CT STATE BUILDING CODE/2015 IBC W/ CT AMENDMENTS
MECHANICAL	2018 CT STATE BUILDING CODE/2015 IMC W/ CT AMENDMENTS
ELECTRICAL	2018 CT STATE BUILDING CODE/2017 NEC W/ CT AMENDMENTS

SHEET INDEX

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

SCOPE OF WORK

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

TOWER SCOPE OF WORK:
- INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR)
- INSTALL (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:	EVEREST
ADDRESS:	2 HINKLEY ROAD NORWICH, CT 06365
TOWER TYPE:	SELF SUPPORT TOWER
TOWER CO SITE ID:	TBD
TOWER APP NUMBER:	TBD
COUNTY:	NEW LONDON
LATITUDE (NAD 83):	41° 30' 53.6" N 41.514880 N
LONGITUDE (NAD 83):	-72° 03' 42.0" W -72.061674 W
ZONING JURISDICTION:	CONNECTICUT SITING COUNCIL
ZONING DISTRICT:	TBD
PARCEL NUMBER:	TBD
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	V-B
POWER COMPANY:	TBD
TELEPHONE COMPANY:	AT&T

PROJECT DIRECTORY

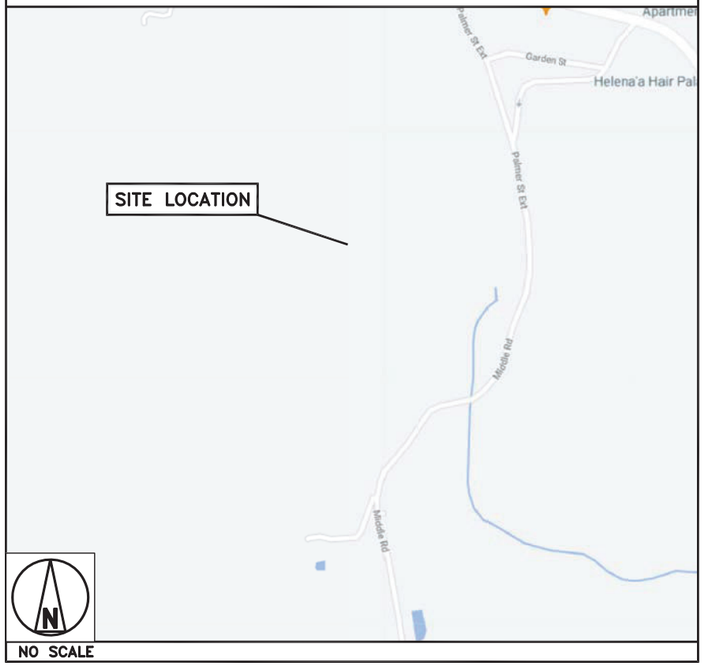
APPLICANT:	DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	EVEREST 100 SUMMER ST SUITE 1600 BOSTON, MA 02110
SITE DESIGNER:	INFINIGY 1033 WATERVLIET SHAKER RD ALBANY, NY 12205 (518) 690-0790
SITE ACQUISITION:	APRIL PARROTT (203) 927-4317
CONSTRUCTION MANAGER:	JAVIER SOTO (617) 839-6514
RF ENGINEER:	BOSSENER CHARLES (917) 567-9837

DIRECTIONS

DIRECTIONS FROM WINDHAM AIRPORT:

HEAD SOUTHEAST ON AIRPORT RD TOWARD MARK DR, TURN RIGHT ONTO US-6 W / BOSTON POST RD KEEP STRAIGHT TO GET ONTO CT-66 / BOSTON POST RD, TURN LEFT ONTO TUCKIE RD, THEN IMMEDIATELY TURN RIGHT ONTO GREEN LN, TURN RIGHT ONTO TUCKIE RD, TURN LEFT ONTO CT-14 / BRICK TOP RD KEEP STRAIGHT TO GET ONTO CT-203 / CT-14 / NORTH RD, TURN LEFT ONTO CT-32 / WINDHAM RD TAKE THE RAMP ON THE RIGHT FOR CT-32 SOUTH / CT-2 EAST AND HEAD TOWARD NORWICH, TURN RIGHT ONTO CT-32 / CT-2 / WASHINGTON ST, THEN KEEP STRAIGHT TO STAY ON CT-2 / WASHINGTON ST, TURN RIGHT ONTO WATER ST, BEAR RIGHT ONTO TALMAN ST, BEAR RIGHT ONTO HINCKLEY ST, ROAD NAME CHANGES TO HINCKLEY HILL RD, ARRIVE AT, 2 HINKLEY ROAD, NORWICH, CT 06365.

VICINITY MAP



NO SCALE

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

STATE OF CONNECTICUT · SUHEL SAKANI · 34916 · LICENSED PROFESSIONAL ENGINEER
10/28/21

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	10/28/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
1197-F0001-C

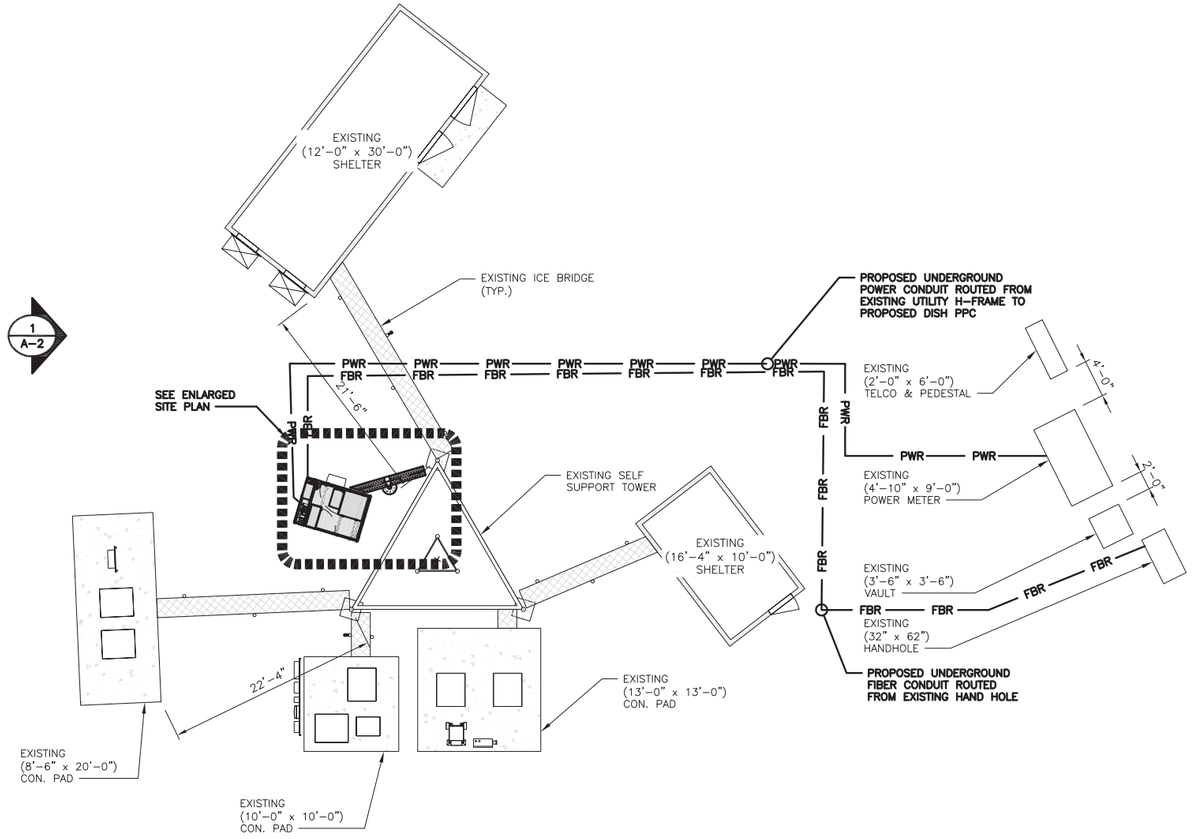
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00070B
TBD
2 HINKLEY ROAD
NORWICH, CT 06365

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

NOTES

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



1
A-2

N

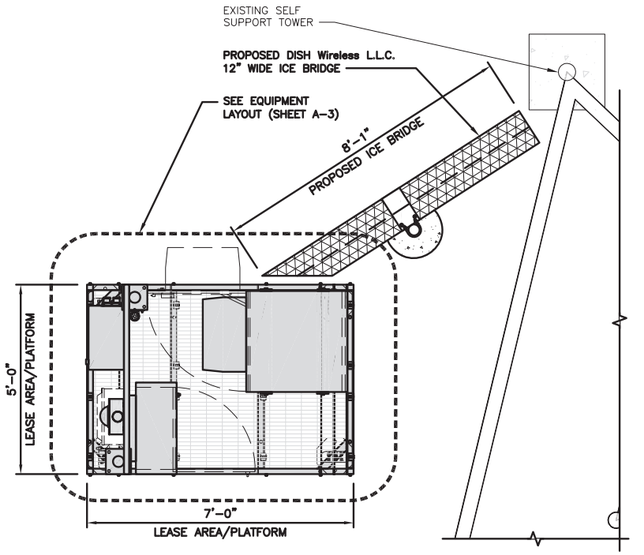
COMPOUND PLAN

8' 4' 0 8' 16'
1/8"=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.

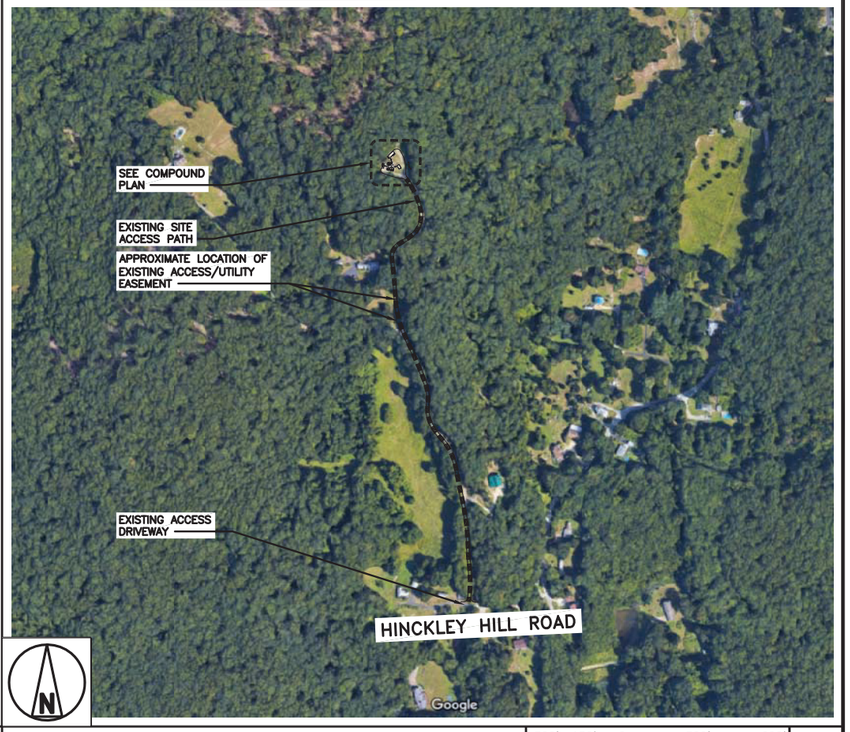


N

ENLARGED SITE PLAN

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

2



N

SITE PLAN

300' 150' 0 300' 600'
1"=300'

3

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STATE OF CONNECTICUT
SUHEI SAKANO
34916
LICENSED
PROFESSIONAL ENGINEER
10/28/21

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	10/28/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
1197-F0001-C

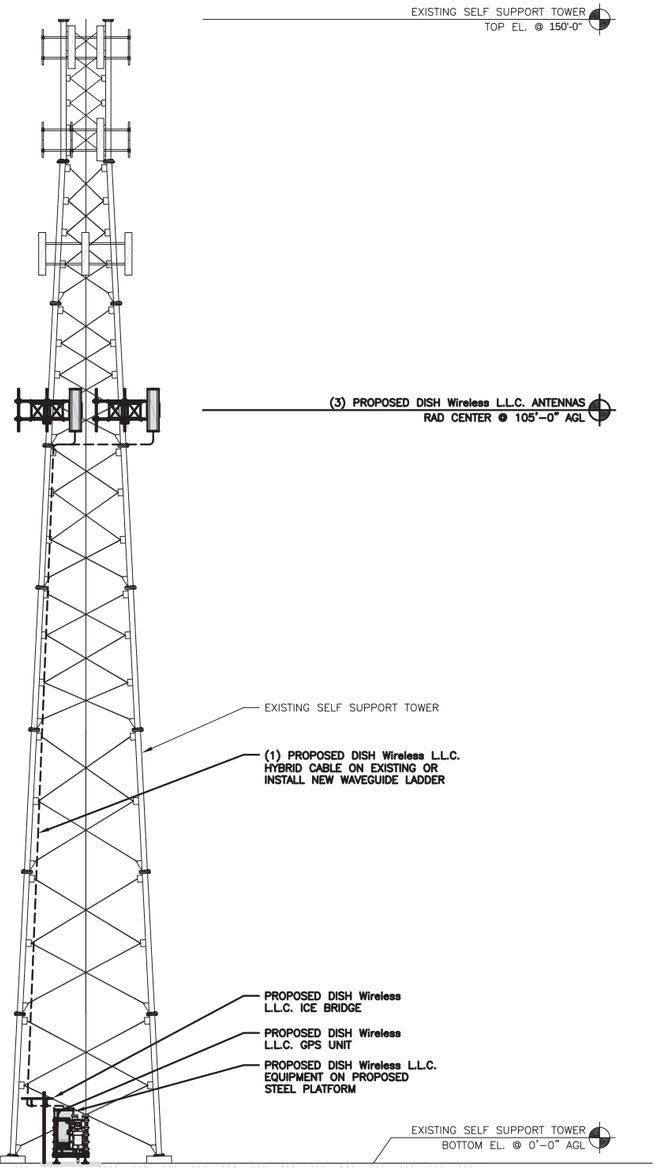
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00070B
TBD
2 HINKLEY ROAD
NORWICH, CT 06365

SHEET TITLE
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER
A-1

NOTES

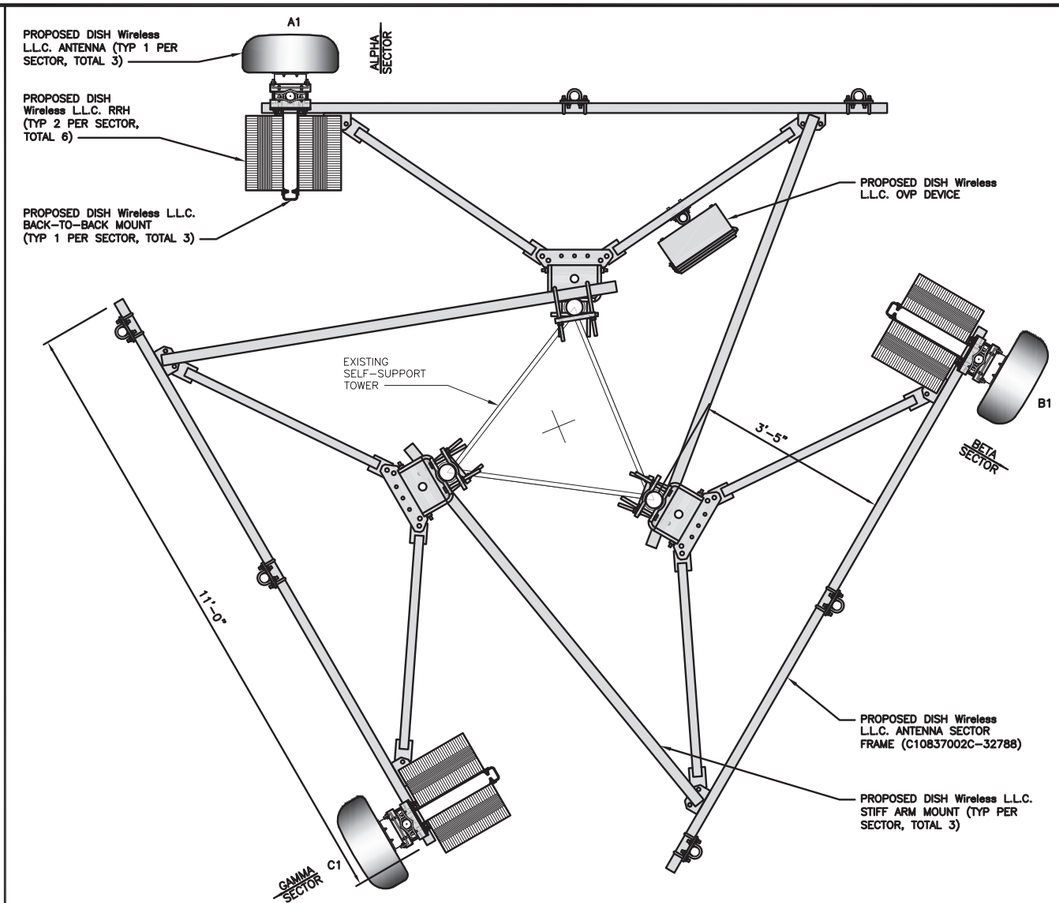
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.
4. INFINIGY HAS NOT EVALUATED THE TOWER OR MOUNT STRUCTURE AND ASSUMES NO RESPONSIBILITY FOR THEIR STRUCTURAL INTEGRITY REGARDING PROPOSED LOADINGS. FINAL INSTALLATION SHALL COMPLY WITH RESULTS OF PASSING STRUCTURAL ANALYSES PERFORMED BY OTHERS.



PROPOSED NORTHWEST 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	A1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	0°	105'-0"	(1) HIGH-CAPACITY HYBRID CABLE (150' LONG)
BETA	B1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	120°	105'-0"	
GAMMA	C1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	240°	105'-0"	

NOTES

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

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

NOTES

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

ANTENNA SCHEDULE

NO SCALE

3

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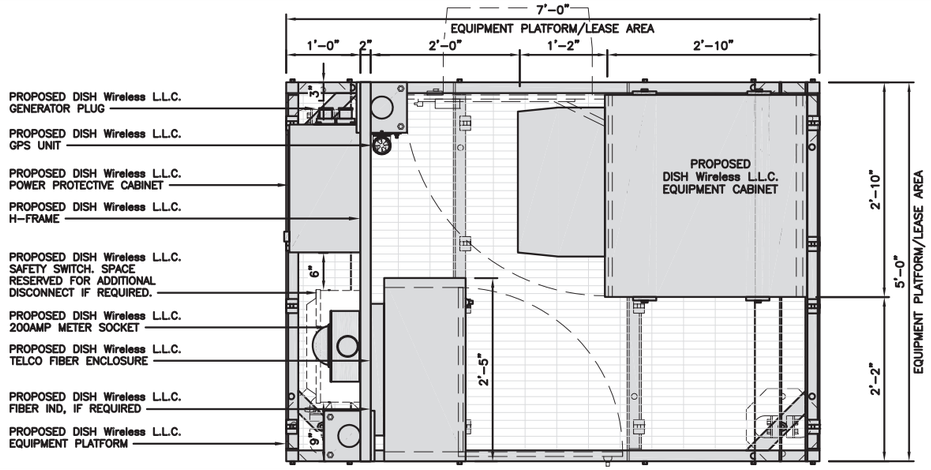
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00070B
TBD
2 HINKLEY ROAD
NORWICH, CT 06365

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2



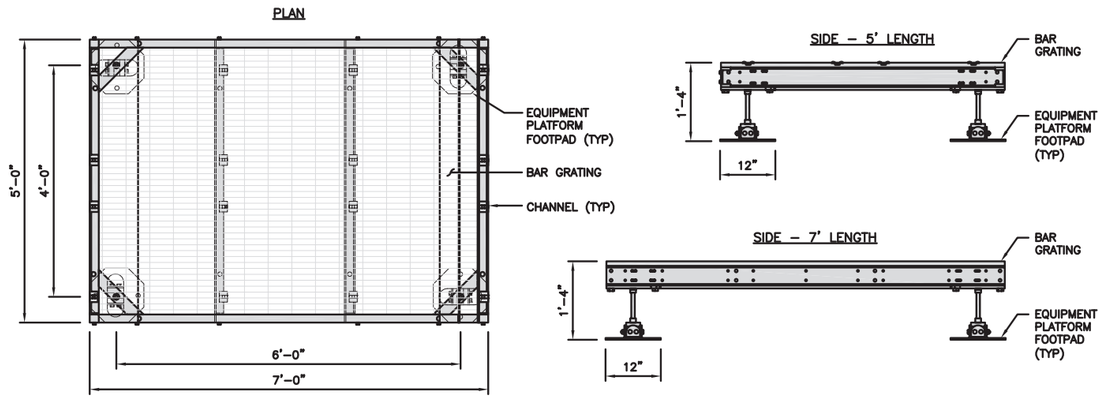
PLATFORM EQUIPMENT PLAN

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

1

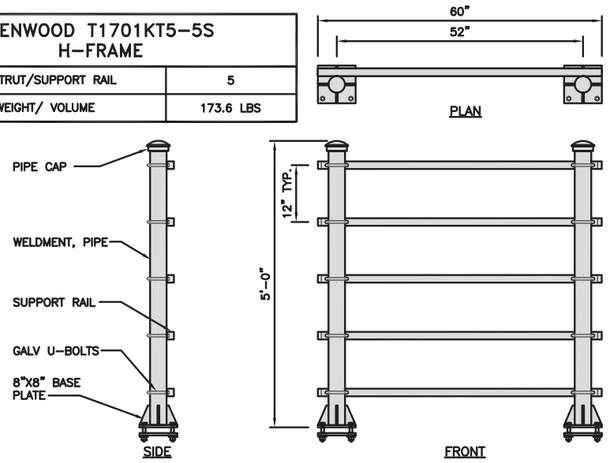
COMMSCOPE MTC4045LP 5X7 PLATFORM	
DIMENSIONS (HxWxD)	16"x84"x60"
TOTAL WEIGHT	423 LBS

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



PLATFORM DETAIL | NO SCALE | 2

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

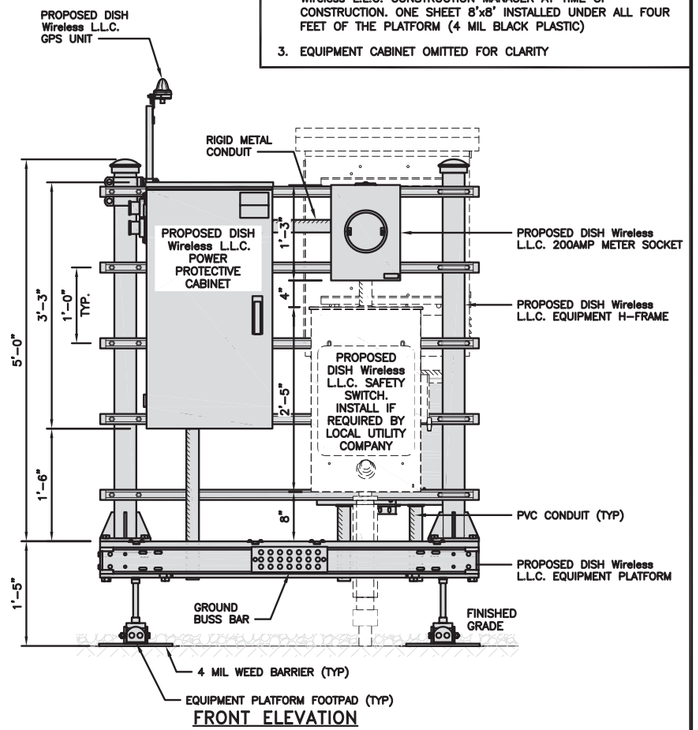


H-FRAME DETAIL | NO SCALE | 3

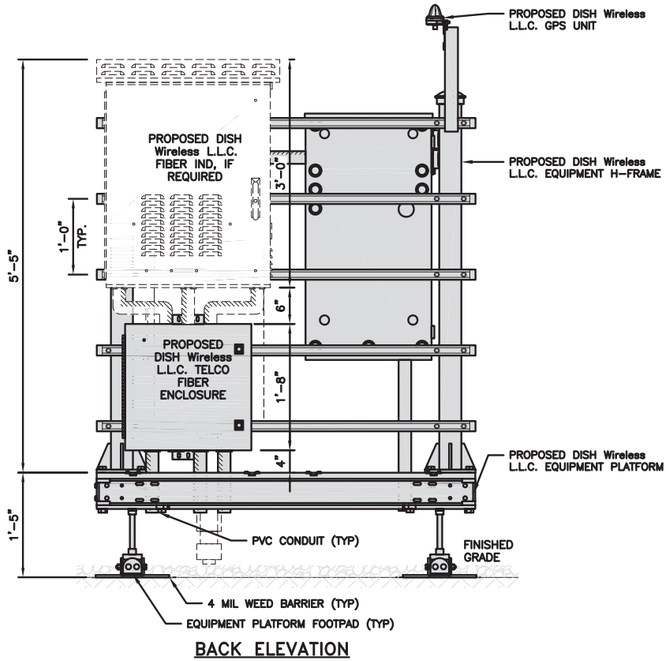
NOT USED | NO SCALE | 4

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 L.L.C. CONSTRUCTION MANAGER AT TIME OF CONSTRUCTION. ONE SHEET 8'x8' INSTALLED UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)
3. EQUIPMENT CABINET OMITTED FOR CLARITY



FRONT ELEVATION



BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION | 12" 9" 6" 3" 0 1' 2" 1"=1'-0" | 5

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10/28/21

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1197-F0001-C

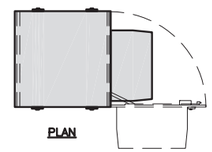
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00070B
TBD
2 HINKLEY ROAD
NORWICH, CT 06365

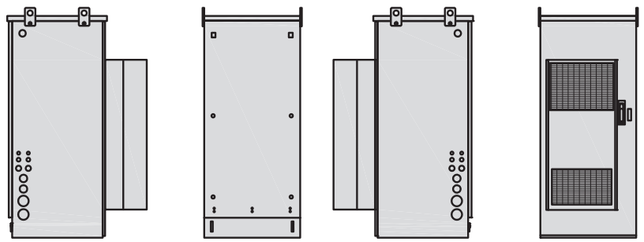
SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER
A-3

CHARLES INDUSTRY HEX CUBE–PM639155N4

DIMENSIONS (HxWxD):	74"x32"x32"
POWER PLANT:	–48VDC ABB/600W
TOTAL WEIGHT (EMPTY)	408 LBS


PLAN

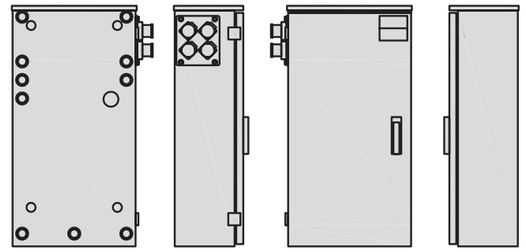

SIDE BACK SIDE FRONT

CABINET DETAIL | NO SCALE | 1

RAYCAP PPC RDIAC–2465–P–240–MTS

ENCLOSURE DIMENSIONS (HxWxD):	39"x22.855"x12.593
WEIGHT:	80 lbs
OPERATING AC VOLTAGE	240/120 1 PHASE 3W+G


TOP

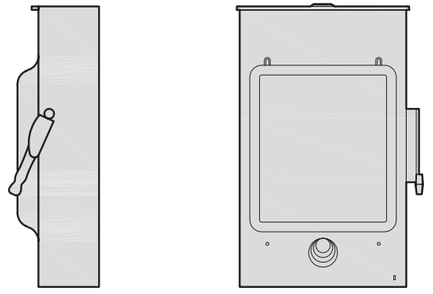

BACK SIDE FRONT SIDE

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

SQUARE D SAFETY SWITCHES D224NRB

ENCLOSURE DIM (HxWxD)	29.25"x19.00"x8.50"
ENCLOSURE TYPE	NEMA 3R RAINPROOF
UL LISTED	FILE E–2875


TOP

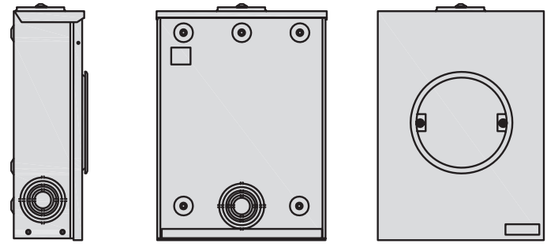

SIDE FRONT

SAFETY SWITCH DETAIL | NO SCALE | 3

EATON METER SOCKET UNRRS213BEUSE

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


PLAN

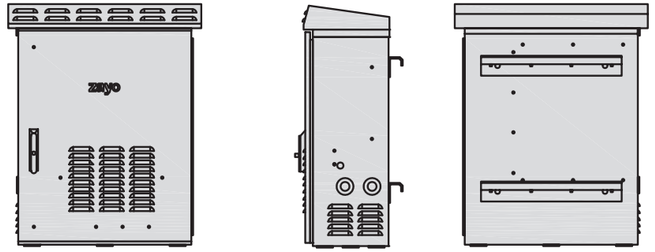

SIDE BACK FRONT

METER SOCKET DETAIL | NO SCALE | 4

ZAYO 5RU CABINET ("LIT" SITES)

DIMENSIONS (HxWxD)	36.115"x29"x12.9"
WEIGHT	85 LBS
POWER INPUT	20A, –48VDC


PLAN

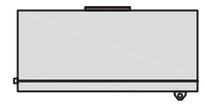


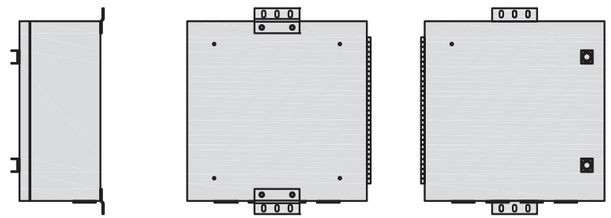
FRONT SIDE BACK

NETWORK INTERFACE UNIT DETAIL | NO SCALE | 5

CHARLES CFIT–PF2020DSH1 FIBER TELCO ENCLOSURE

ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4


FRONT

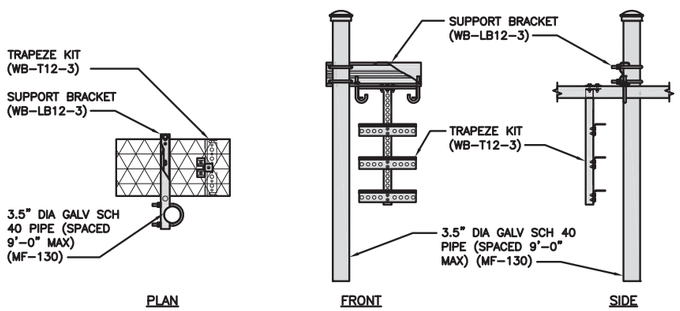

SIDE BACK FRONT

FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

COMMSCOPE WB–K110–B WAVEGUIDE BRIDGE KIT

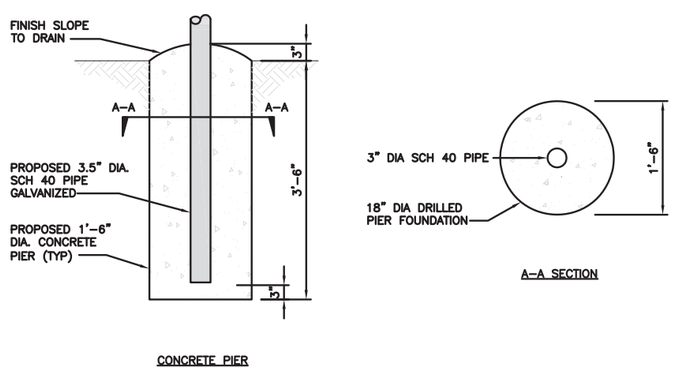
DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

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

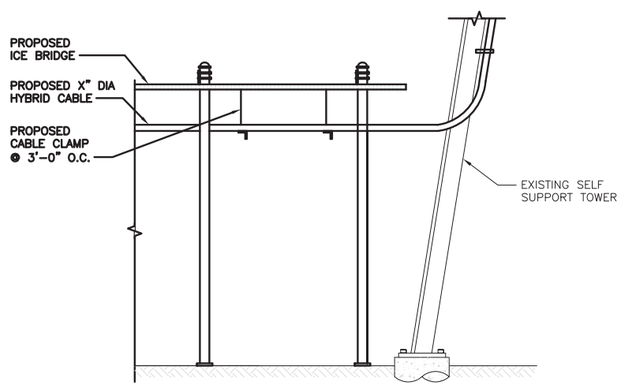
ICE BRIDGE DETAIL | NO SCALE | 7



CONCRETE PIER

A–A SECTION

TYPICAL ICE BRIDGE CONCRETE PIER DETAIL | NO SCALE | 8



HYBRID CABLE RUN | NO SCALE | 9

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RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

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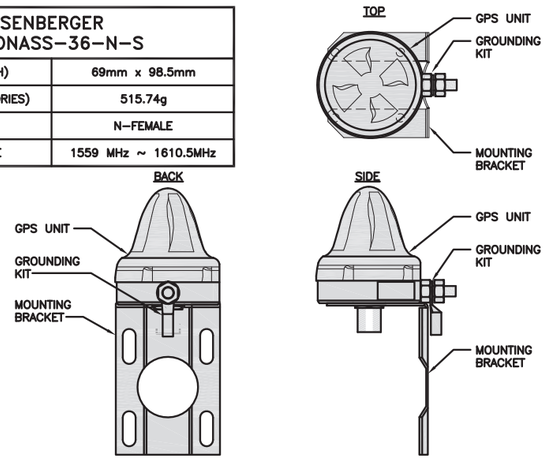
BOBOS00070B
TBD
2 HINKLEY ROAD
NORWICH, CT 06365

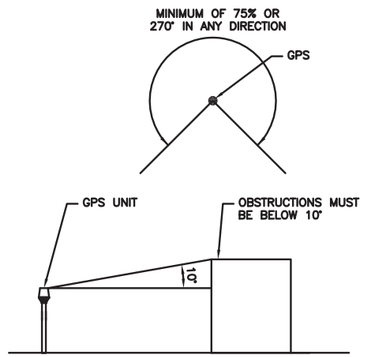
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

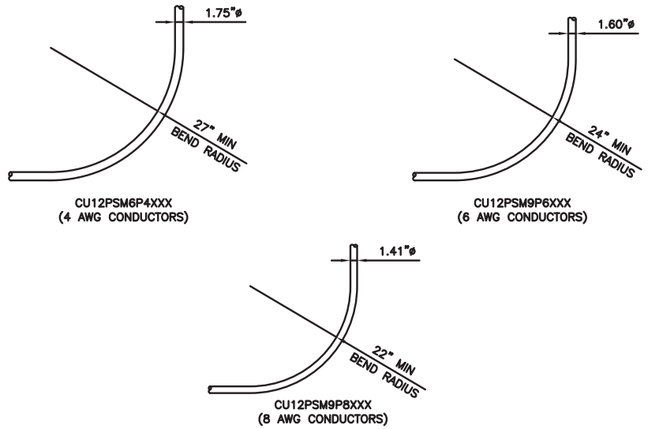
ROSENBERGER GPSGLONASS-36-N-S	
DIMENSION (DIA x H)	69mm x 98.5mm
WEIGHT (WITH ACCESSORIES)	515.74g
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1559 MHz ~ 1610.5MHz



GPS ANTENNA DETAIL | NO SCALE | 1



GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 2



CABLES UNLIMITED HYBRID CABLE MINIMUM BEND RADIUSES | NO SCALE | 3

NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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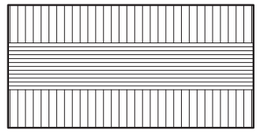
TBD
2 HINKLEY ROAD
NORWICH, CT 06365

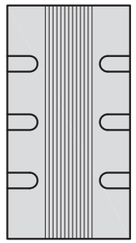
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

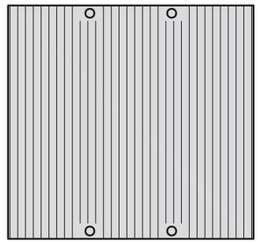
FUJITSU TA08025-B604 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-58~-36V



PLAN



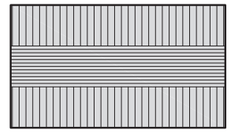
SIDE



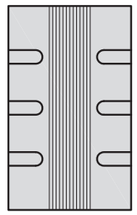
FRONT

REMOTE RADIO HEAD DETAIL | NO SCALE | 1

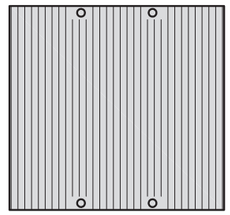
FUJITSU TA08025-B605 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x230/14.9"x15.7"x9.0"
WEIGHT(KG,LB)/ VOLUME	34kg,74.9lb/ 35L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE

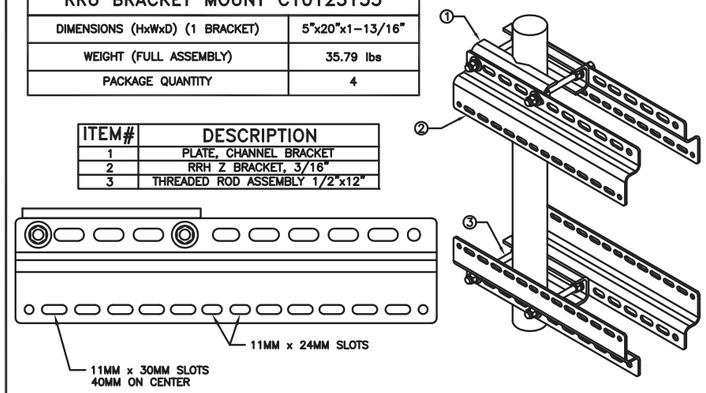


FRONT

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

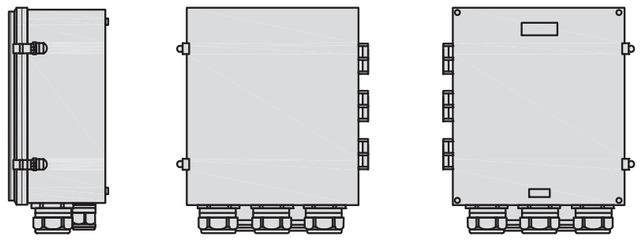
ITEM#	DESCRIPTION
1	PLATE, CHANNEL BRACKET
2	RRH Z BRACKET, 3/16"
3	THREADED ROD ASSEMBLY 1/2"x12"



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

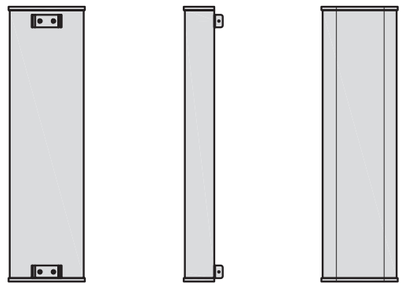


SIDE BACK FRONT

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



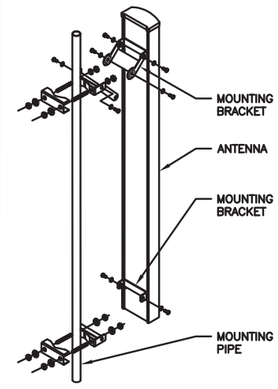
BACK SIDE FRONT

NOTES
FINAL ANTENNA SPECIFICATIONS TO BE CONFIRMED BY GC

ANTENNA DETAIL | NO SCALE | 5

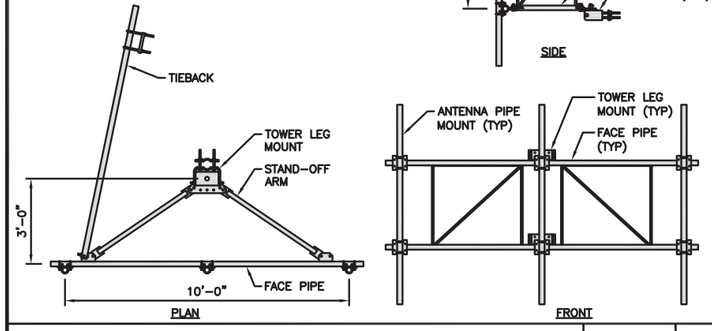
JMA MOUNTING BRACKET	
WIDTH	5"
DEPTH	2"
HEIGHT	8"
TOTAL WEIGHT	1.5 lbs
HOUSING MATERIAL	ASA/ABS/ALUMINUM
RADOME COLOR	LIGHT GRAY
CONNECTOR	1x8-PIN DAISY CHAIN

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



ANTENNA MOUNTING DETAIL | NO SCALE | 6

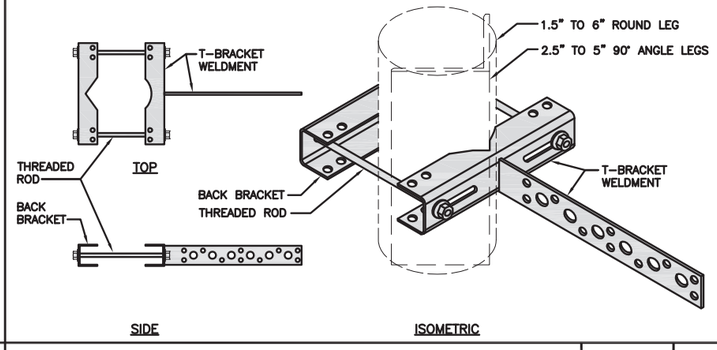
SABRE INDUSTRIES C10837002C-32788 HD V-BOOM ASSEMBLY WITH TIEBACK	
FACE SIZE	10'-0"
WEIGHT	676 LB
TOWER LEG SIZE	1-1/2" TO 5-9/16" DIA ROUND LEG



ANTENNA FRAME DETAIL | NO SCALE | 7

SITEPRO1 T600 UNIVERSAL T-BRACKET	
DIMENSIONS (HxWxL)	2.25"x10.0"x15.25"
WEIGHT/ VOLUME	5.60 LBS

VERIFY WITH LANDLORD TO USE EXISTING VERTICAL CABLE SUPPORT (DELETE THIS NOTE & DETAIL IF NOT NEEDED)



VERTICAL CABLE SUPPORT DETAIL | NO SCALE | 8

NOT USED | NO SCALE | 9

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10/28/21

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	10/28/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
1197-F0001-C

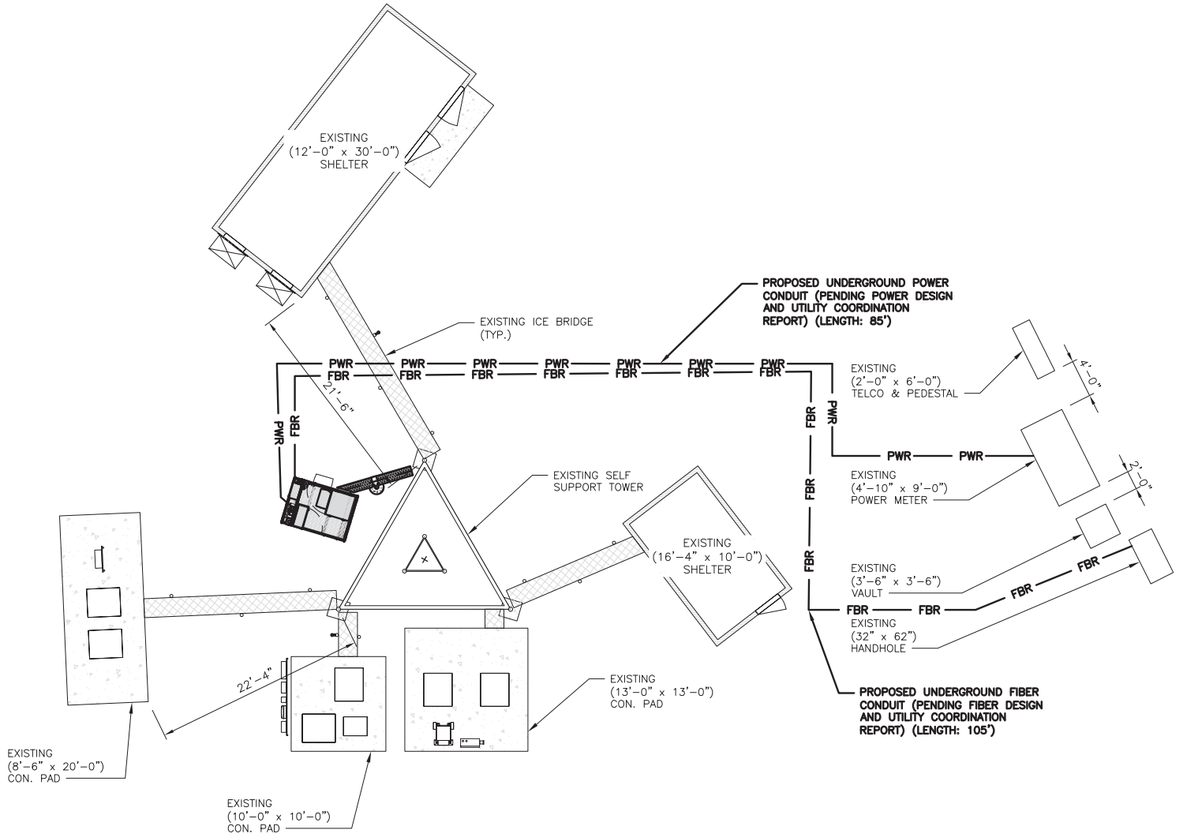
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00070B
TBD
2 HINKLEY ROAD
NORWICH, CT 06365

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-6

NOTES

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

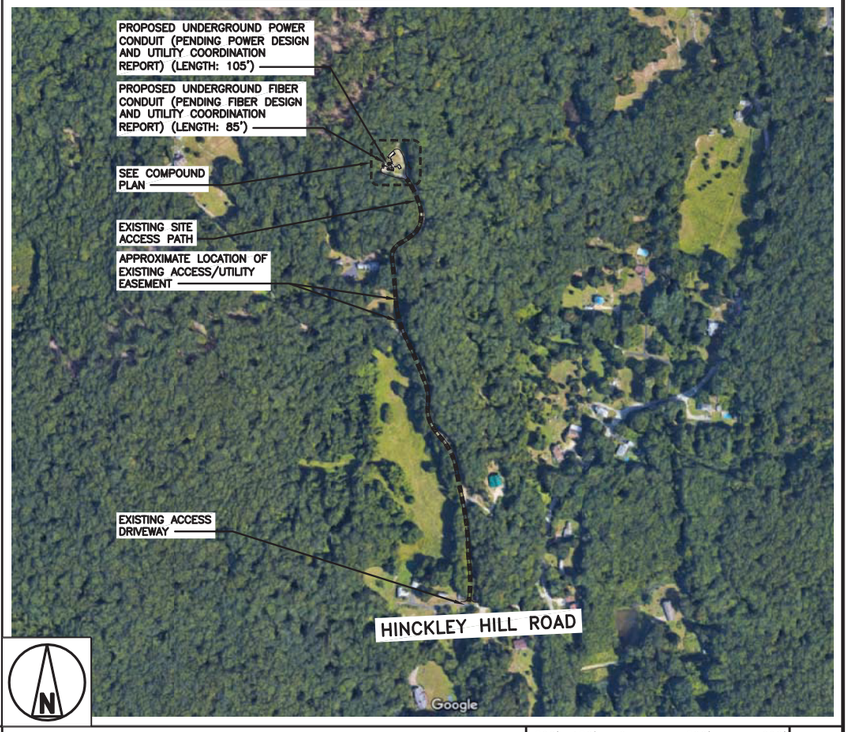


DC POWER WIRING SHALL BE COLOR CODED AT EACH END FOR IDENTIFYING +24V AND -48V CONDUCTORS. RED MARKINGS SHALL IDENTIFY +24V AND BLUE MARKINGS SHALL IDENTIFY -48V.

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

ELECTRICAL NOTES

2



UTILITY ROUTE PLAN

8' 4' 0 8' 16'
1/8"=1'-0"

1

OVERALL UTILITY ROUTE PLAN

300' 150' 0 300' 600'
1"=300'

3

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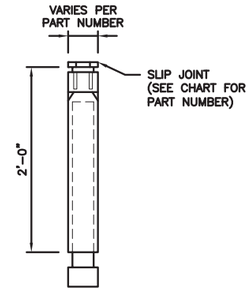
PROJECT INFORMATION
BOBOS00070B
TBD
2 HINKLEY ROAD
NORWICH, CT 06365

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"

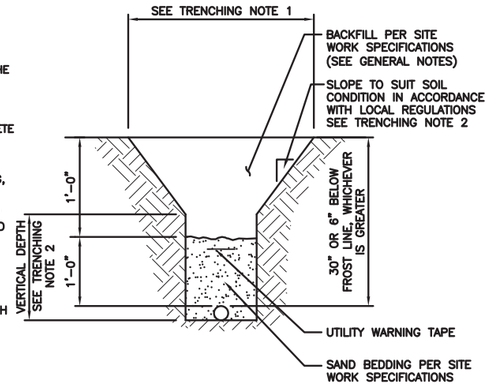


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

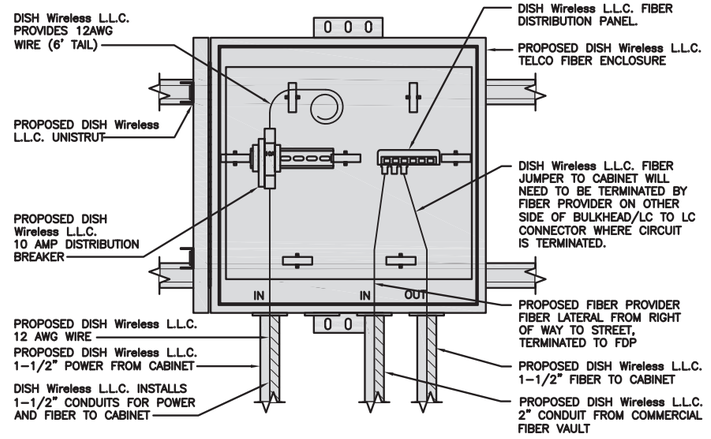
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

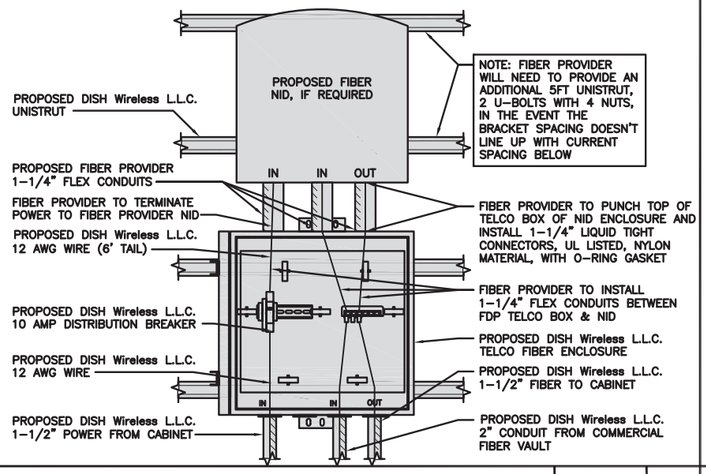
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT 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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DISH Wireless L.L.C.
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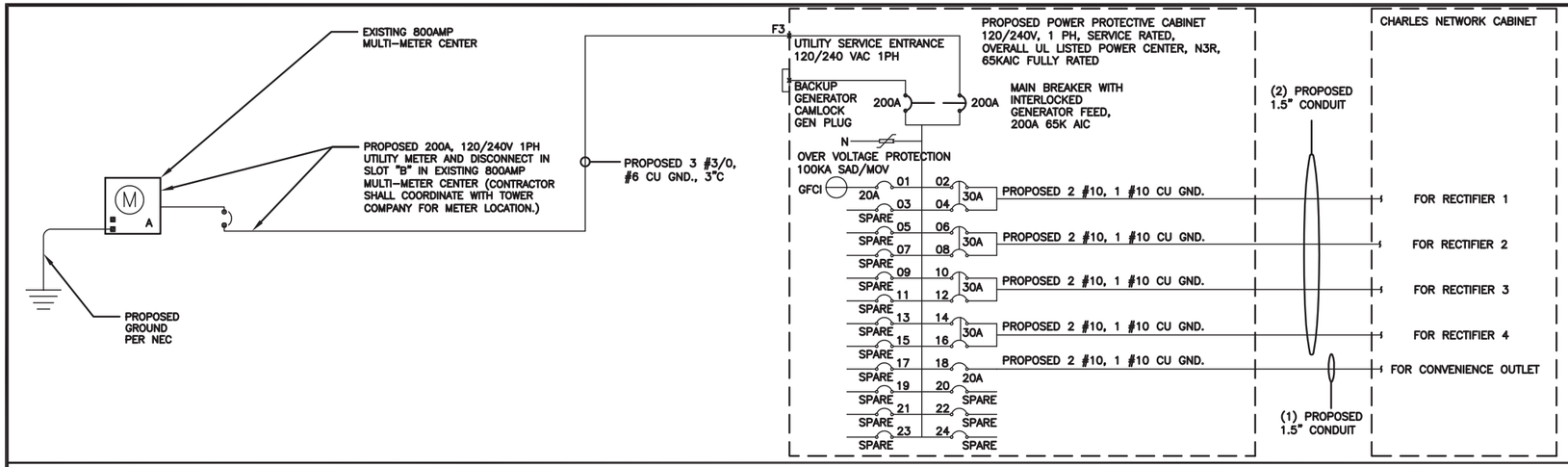
BOBOS00070B
TBD
2 HINKLEY ROAD
NORWICH, CT 06365

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	30A	2880		ABB/GE INFINITY RECTIFIER 1
–SPARE–				3	B	4			2880	
–SPARE–				5	A	6	30A	2880		ABB/GE INFINITY RECTIFIER 2
–SPARE–				7	B	8			2880	
–SPARE–				9	A	10	30A	2880		ABB/GE INFINITY RECTIFIER 3
–SPARE–				11	B	12			2880	
–SPARE–				13	A	14	30A	2880		ABB/GE INFINITY RECTIFIER 4
–SPARE–				15	B	16			2880	
–SPARE–				17	A	18	20A	1920		CHARLES GFCI OUTLET
–SPARE–				19	B	20				–SPARE–
–SPARE–				21	A	22				–SPARE–
–SPARE–				23	B	24				–SPARE–
VOLT AMPS								13440	11520	

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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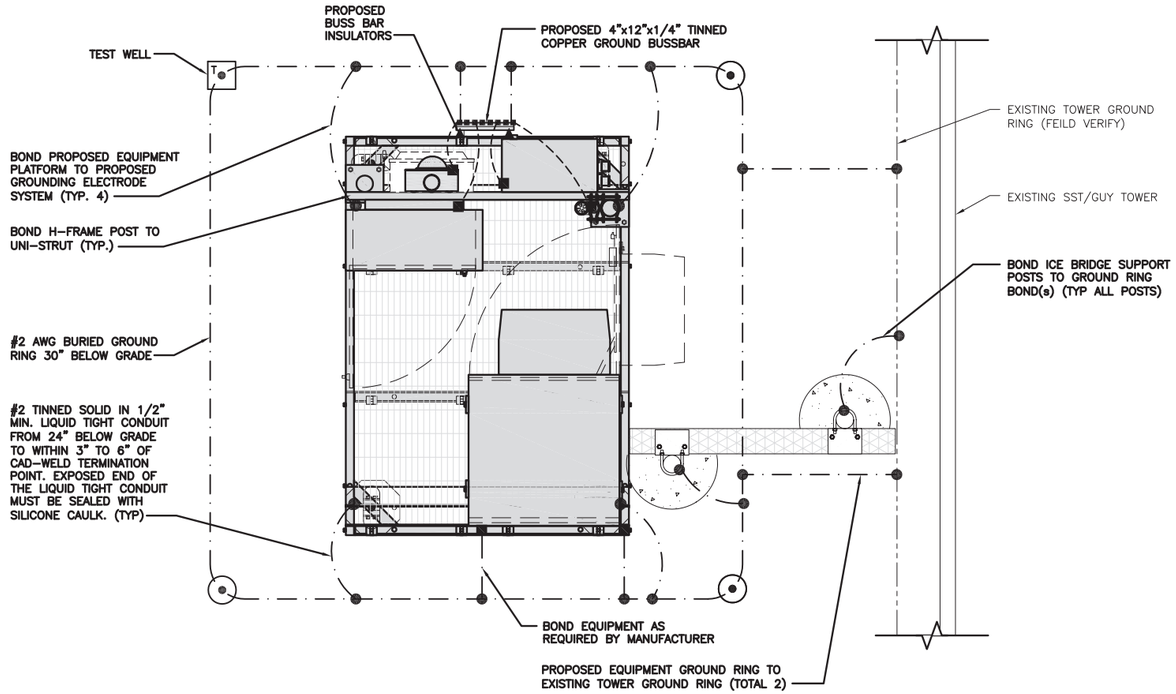
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00070B
TBD
2 HINKLEY ROAD
NORWICH, CT 06365

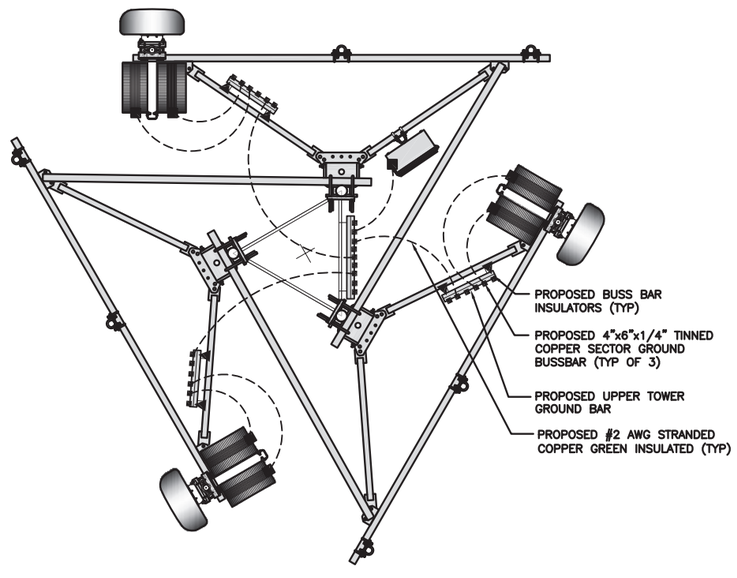
SHEET TITLE
ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3



TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE | 1



NO SCALE | 2

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

GROUNDING LEGEND

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

GROUNDING KEY NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(P) TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO TOWER STEEL.

REFER TO DISH Wireless L.L.C. GROUNDING NOTES.

GROUNDING KEY NOTES

NO SCALE | 3

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STATE OF CONNECTICUT
MICHEL SAKANOU
34916
LICENSED PROFESSIONAL ENGINEER
10/28/21

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	10/28/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER
1197-F0001-C

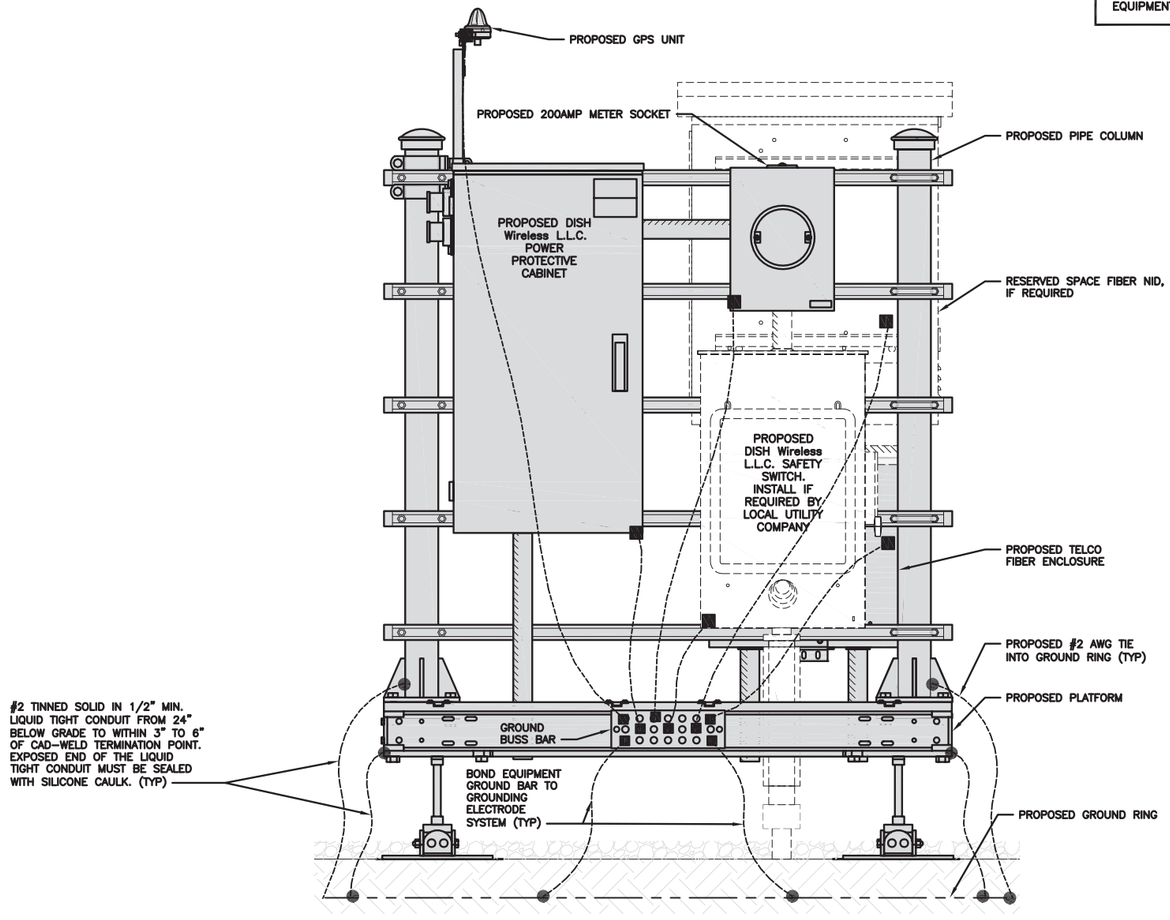
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00070B
TBD
2 HINKLEY ROAD
NORWICH, CT 06365

SHEET TITLE
GROUNDING PLANS AND NOTES

SHEET NUMBER
G-1

NOTES

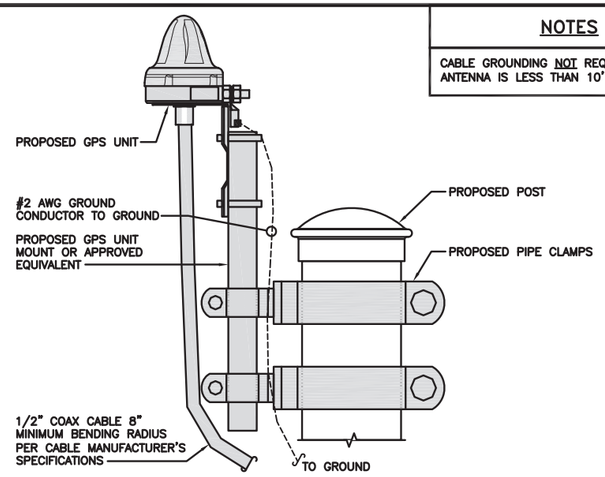
EQUIPMENT CABINET OMITTED FOR CLARITY



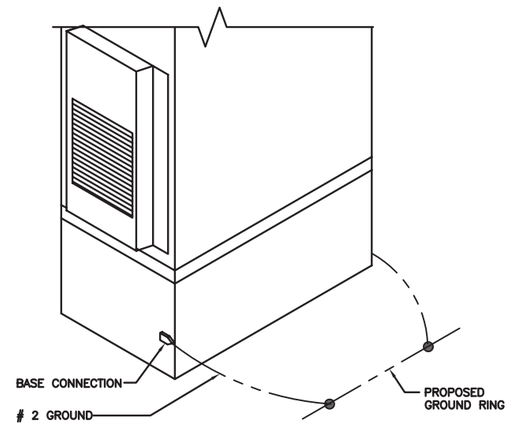
H-FRAME GROUNDING DETAIL | NO SCALE | 1

NOTES

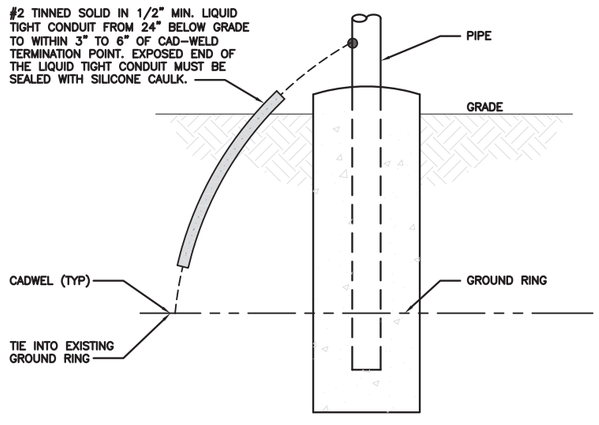
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



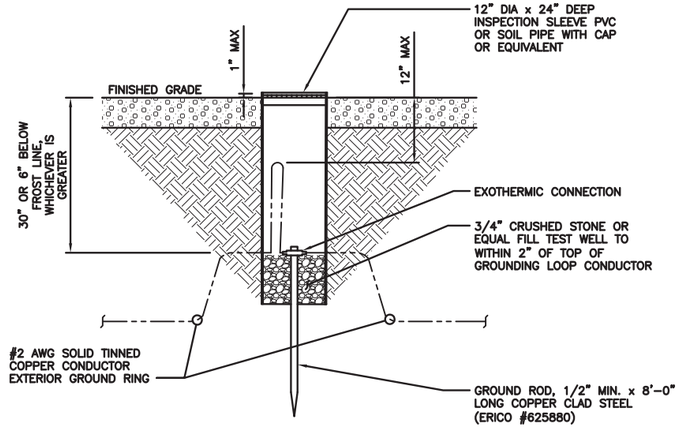
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



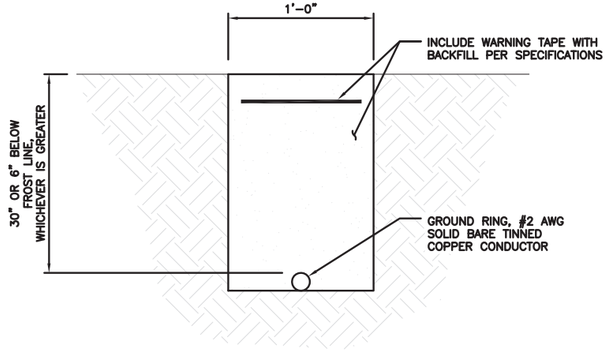
OUTDOOR CABINET GROUNDING | NO SCALE | 3



TRANSITIONING GROUND DETAIL | NO SCALE | 4



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



TYPICAL GROUND RING TRENCH | NO SCALE | 6

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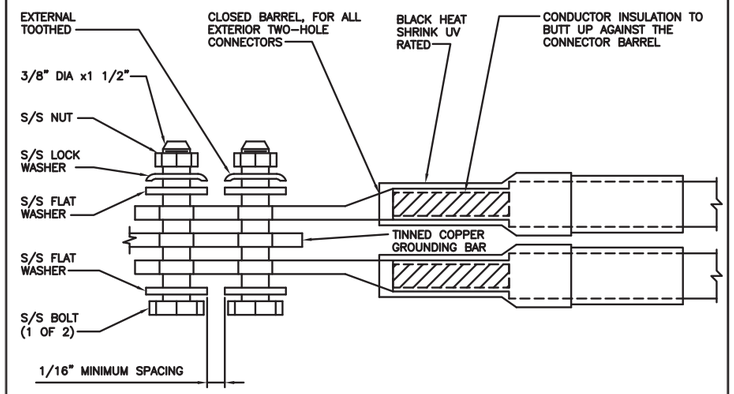
SHEET TITLE
GROUNDING DETAILS

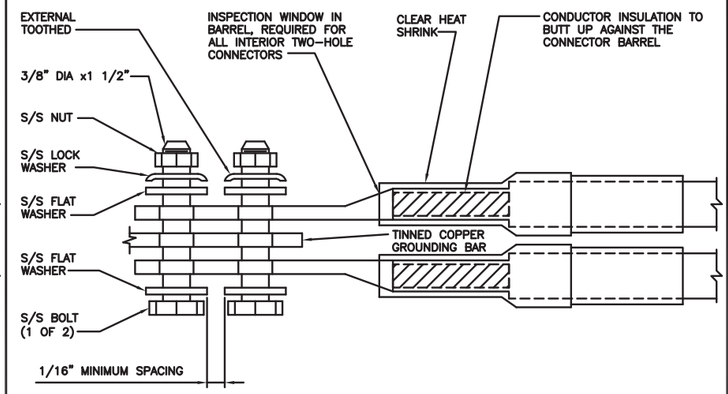
SHEET NUMBER
G-2

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).

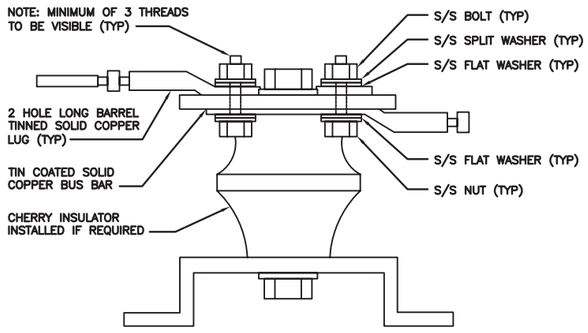
TYPICAL GROUNDING NOTES | NO SCALE | 1



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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2 HINKLEY ROAD
NORWICH, CT 06365

SHEET TITLE
GROUNDING DETAILS

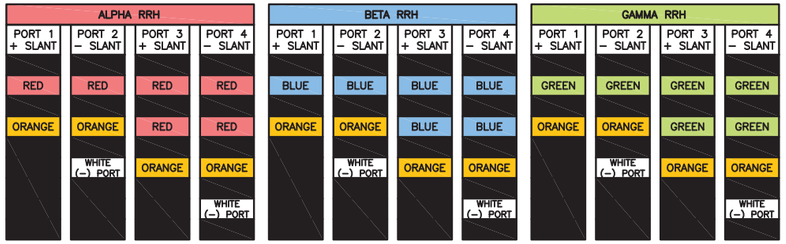
SHEET NUMBER
G-3

RF JUMPER COLOR CODING

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

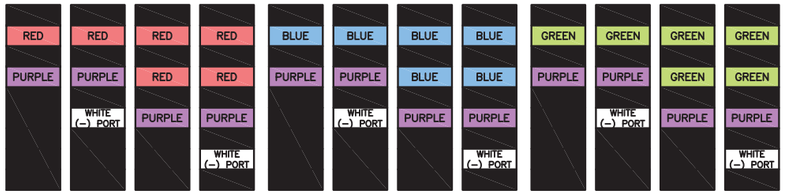
LOW-BAND RRH –
(600MHz N71 BASEBAND) +
(850MHz N26 BAND) +
(700MHz N29 BAND) – OPTIONAL PER MARKET

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)

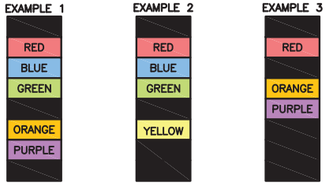


HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED
ALONG WITH FREQUENCY BANDS

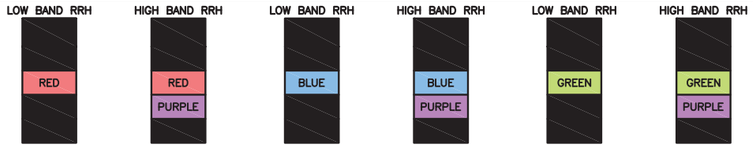
EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS
ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS

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



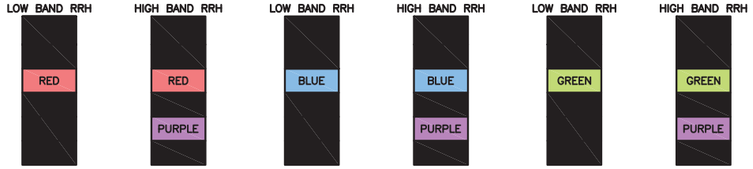
FIBER JUMPERS TO RRHs

LOW-BAND RRH FIBER CABLES HAVE SECTOR
STRIPE ONLY

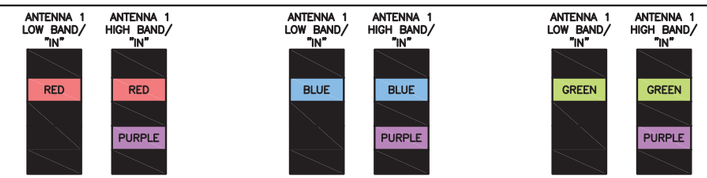


POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR
STRIPE ONLY



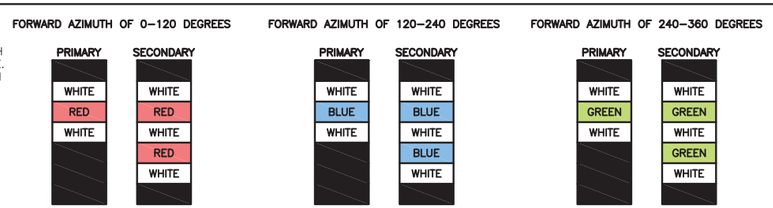
RET MOTORS AT ANTENNAS



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 CABLES 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+N26)
OPTIONAL – (N29)
ORANGE

AWS
(N66+N70+H-BLOCK)
PURPLE

CBRS TECH
(3 GHz)
YELLOW

NEGATIVE SLANT PORT
ON ANT/RRH
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

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DISH Wireless L.L.C.
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BOBOS00070B
TBD
2 HINKLEY ROAD
NORWICH, CT 06365

SHEET TITLE
RF
CABLE COLOR CODE

SHEET NUMBER
RF-1

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

BUSS BAR INSULATOR

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE

FLUORESCENT LIGHTING FIXTURE
(2) TWO LAMPS 48–T8

SMOKE DETECTION (DC)

EMERGENCY LIGHTING (DC)

SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW
LED–1–25A400/51K–SR4–120–PE–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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TBD
2 HINKLEY ROAD
NORWICH, CT 06365

SHEET TITLE

LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SITE ACTIVITY REQUIREMENTS:

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

2. "LOOK UP" – DISH Wireless L.L.C. AND TOWER OWNER SAFETY CLIMB REQUIREMENT:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES:

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

CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION

CARRIER:DISH Wireless L.L.C.

TOWER OWNER:TOWER OWNER

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

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

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

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

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

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

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

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

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

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

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

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

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

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STATE OF CONNECTICUT
SUJHEI SAKANO
34916
LICENSED PROFESSIONAL ENGINEER
10/28/21

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	10/28/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER

1197–F0001–C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00070B
TBD
2 HINKLEY ROAD
NORWICH, CT 06365

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. VERYIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.

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

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

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

8. TIE WRAPS ARE NOT ALLOWED.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "DISH Wireless L.L.C.".

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

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STATE OF CONNECTICUT
SUHEL SAKANG
34916
LICENSED PROFESSIONAL ENGINEER
10/28/21

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	10/28/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER

1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00070B
TBD
2 HINKLEY ROAD
NORWICH, CT 06365

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-POTENTAL 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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LICENSED PROFESSIONAL ENGINEER
10/28/21

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	10/28/21	ISSUED FOR PERMIT

A&E PROJECT NUMBER

1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00070B
TBD
2 HINKLEY ROAD
NORWICH, CT 06365

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

Exhibit D

Structural Analysis Report

PAUL J. FORD & COMPANY

Report Date: February 3, 2022

Client: Everest Infrastructure Partners
Two Allegheny Center
Pittsburgh, PA 15212
Attn: Thomas Rigg
(603) 498-7462
tom.rigg@everestinfrastructure.com

Structure: Existing 150-ft Self Support Tower
Site Name: Norwich CDT
Site Reference #: BOBOS00070B
Site Address: 2 Hinkley Hill Rd
City, County, State: Norwich, New London County, CT
Latitude, Longitude: 41.514847°, -72.061689°

PJF Project: A13321-0008.003.8700

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 135 mph (converted to an equivalent 105 mph nominal 3-second gust wind speed per Section 1609.3.1 for use with TIA-222 G) as required by the 2018 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 proposed loading configuration shown in Table 1 combined with the other considered equipment shown in Table 2 of this report.

Summary of Analysis Results:
Existing Structure: Pass – 85.3%
Existing Foundation: Pass – 92.8%

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

Anna Trudo, E.I.
Structural Designer
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STATE OF CONNECTICUT
JAMES R. ANTOSZEWSKI
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LICENSED
PROFESSIONAL ENGINEER

02/03/2022

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1) INTRODUCTION

This tower is a 150 ft Self Support tower designed by Fred A Nudd Corporation in July of 1999. All tower geometry and foundation information were taken from a previous structural analysis by Fred Nudd Corp dated 6/11/2018.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-G
Risk Category:	II
Wind Speed:	105 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	0.75 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
105.0	105.0	3	fujitsu	TA08025-B604	1	1-5/8
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-20_V0F w/ Mount Pipe		
		1	mounts	Sabre_C10837002C-32788_Sector_(3)		
		1	raycap	RDIDC-9181-PF-48		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
150.0	150.0	3	ericsson	AIR 32 B66AA B2P_T-MOBILE w/ Mount Pipe	6 3	1-5/8 1-1/4
		3	ericsson	AIR 6449 B41 w/ Mount Pipe		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	ericsson	RRUS 4415 B25		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		3	tower mounts	Site Pro 1 VFA12-HD		
140.0	140.0	6	alcatel lucent	1900 MHz 4x45W RRH	4	1-1/4
		6	alcatel lucent	RRH2X50-800		
		3	alcatel lucent	TD-RRH8x20-25		
		3	commscope	DT465B-2XR w/ Mount Pipe		
		3	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe		
		1	tower mounts	Sector Mount [SM 802-3]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
126.0	127.5	3	commscope	CBC78T-DS-43-2X	12 2	1-5/8 Hybrid
		6	commscope	JAHH-65B-R3B w/ Mount Pipe		
		1	raycap	DB-B1-6C-12AB-0Z		
		1	raycap	RRFDC-3315-PF-48		
		2	rfs celwave	APL866513 w/ Mount Pipe		
		4	rfs celwave	APL868013 w/ Mount Pipe		
		3	samsung telecommunications	64T64R w/ Mount Pipe		
		3	samsung telecommunications	B2/B66A RRH-BR049		
		3	samsung telecommunications	B5/B13 RRH-BR04C		
	126.0	3	commscope	BSAMNT-SBS-2-2 (Mount Bracket)		
		1	tower mounts	Sector Mount [SM 802-3]		
115.0	115.0	2	cci antennas	DMP65R-BU6D w/ Mount Pipe	6 8 2	1-1/4 DC cable fiber
		1	cci antennas	DMP65R-BU8D w/ Mount Pipe		
		2	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe		
		1	cci antennas	OPA-65R-LCUU-H8 w/ Mount Pipe		
		3	ericsson	RRUS 32 B2		
		3	ericsson	RRUS 32 B30		
		3	ericsson	RRUS 32 B66A		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14		
		3	ericsson	RRUS E2 B29		
		2	kmw communications	EPBQ-654L8H6-L2 w/ Mount Pipe		
		1	kmw communications	EPBQ-654L8H8-L2 w/ Mount Pipe		
		3	powerwave technologies	7770 w/ Mount Pipe		
		6	powerwave technologies	LGP21401		
		4	raycap	DC6-48-60-18-8F		
		3	tower mounts	Site Pro 1 VFA12-HD		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Source
Tower Structural Analysis	Nudd Corp #118-23067 dated 6/11/2018	on file

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) All tower geometry and foundation information were taken from a previous structural analysis by Fred Nudd Corp dated 6/11/2018.
4) The antenna feedlines are assumed to be placed as indicated in Appendix B.

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 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T1	150 - 140	Leg	Pipe 2.875" x 0.203" (2.5 STD)	2	-11649	82352	14.1	Pass
T2	140 - 120	Leg	Pipe 2.875" x 0.203" (2.5 STD)	21	-51730	62849	82.3	Pass
T3	120 - 100	Leg	Pipe 4.5" x 0.237" (4 STD)	48	-108815	138323	78.7	Pass
T4	100 - 80	Leg	Pipe 5.563" x 0.258" (5 STD)	75	-156683	184163	85.1	Pass
T5	80 - 60	Leg	Pipe 6.625" x 0.280" (6 STD)	94	-200371	248307	80.7	Pass
T6	60 - 40	Leg	Pipe 8.625" x 0.322" (8 STD)	115	-240478	387660	62.0	Pass
T7	40 - 20	Leg	Pipe 8.625" x 0.50" (8 XS)	136	-275341	550137	50.0	Pass
T8	20 - 0	Leg	Pipe 8.625" x 0.50" (8 XS)	151	-310195	550137	56.4	Pass
T1	150 - 140	Diagonal	L 1.5 x 1.5 x 3/16	9	-2659	6096	43.6	Pass
T2	140 - 120	Diagonal	L 2 x 2 x 3/16	24	-7248	12216	59.3 74.7 (b)	Pass
T3	120 - 100	Diagonal	L 2 x 2 x 3/16	54	-7722	9453	81.7	Pass
T4	100 - 80	Diagonal	L 2.5 x 2.5 x 3/16	81	-7950	11411	69.7 85.0 (b)	Pass
T5	80 - 60	Diagonal	L 3 x 3 x 3/16	101	-7983	14952	53.4 82.7 (b)	Pass
T6	60 - 40	Diagonal	L 3 x 3 x 3/16	122	-8500	11937	71.2 85.3 (b)	Pass
T7	40 - 20	Diagonal	L 3.5 x 3.5 x 1/4	143	-9216	16716	55.1 63.2 (b)	Pass
T8	20 - 0	Diagonal	L 3.5 x 3.5 x 1/4	158	-9767	13815	70.7	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T1	150 - 140	Top Girt	L 3 x 3 x 1/4	5	-717	23047	3.1 9.0 (b)	Pass
							Summary	
						Leg (T4)	85.1	Pass
						Diagonal (T6)	85.3	Pass
						Top Girt (T1)	9.0	Pass
						Bolt Checks	85.3	Pass
						Rating =	85.3	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	86.5	Pass
1	Base Foundation (Soil Interaction)	0	92.8	Pass

Structure Rating (max from all components) =	92.8%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.

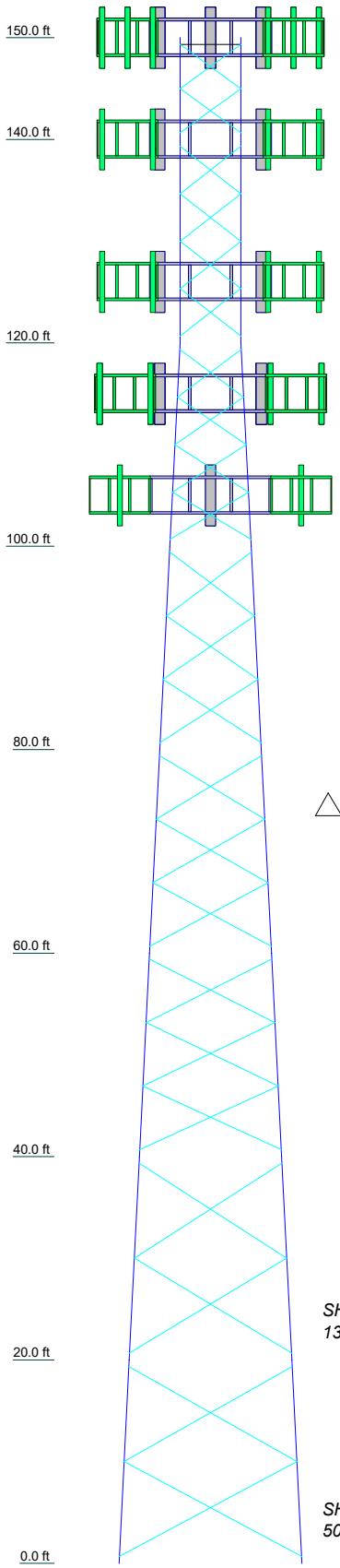
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	T1	T2	T3	T4	T5	T6	T7	T8
Legs		Pipe 2.875" x 0.203" (2.5 STD)	Pipe 4.5" x 0.237" (4 STD)	Pipe 5.563" x 0.258" (5 STD)	Pipe 6.625" x 0.280" (6 STD)	Pipe 8.625" x 0.322" (8 STD)	Pipe 8.625" x 0.50" (8 XS)	
Leg Grade	A500M-54							
Diagonals	A	L 2 x 2 x 3/16		L 2.5 x 2.5 x 3/16	L 3 x 3 x 3/16		L 3.5 x 3.5 x 1/4	
Diagonal Grade	A36							
Top Girts	L 3 x 3 x 1/4				N.A.			
Face Width (ft)	6	8 @ 4.66667		8	10	12	14	16
# Panels @ (ft)	2 @ 4.33333				9 @ 6.25		4 @ 9.33333	
Weight (lb) 17912.3	463.5	870.9	1254.8	1633.5	2184.8	2948.8	4212.4	4343.5



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L 1.5 x 1.5 x 3/16		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500M-54	54 ksi	70 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-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 85.3%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 318745 lb
SHEAR: 31175 lb

UPLIFT: -281892 lb
SHEAR: 28582 lb

AXIAL 139632 lb
SHEAR 13151 lb
MOMENT 1231333 lb-ft
TORQUE 7370 lb-ft
50 mph WIND - 0.750 in ICE

AXIAL 48137 lb
SHEAR 50847 lb
MOMENT 4718632 lb-ft
TORQUE 18690 lb-ft
REACTIONS - 105 mph WIND

Paul J. Ford and Company
250 East Broad St., Suite 600
Columbus, OH 43215
Phone: 614-221-6679
FAX:

Job:	150-ft Norwich, CT S/S Tower
Project:	PJF 13321-0008
Client: Everest Infrastructure Partners	Drawn by: Anna Trudo / App'd:
Code: TIA-222-G	Date: 08/25/21 / Scale: NTS
Path:	Dwg No. E-1

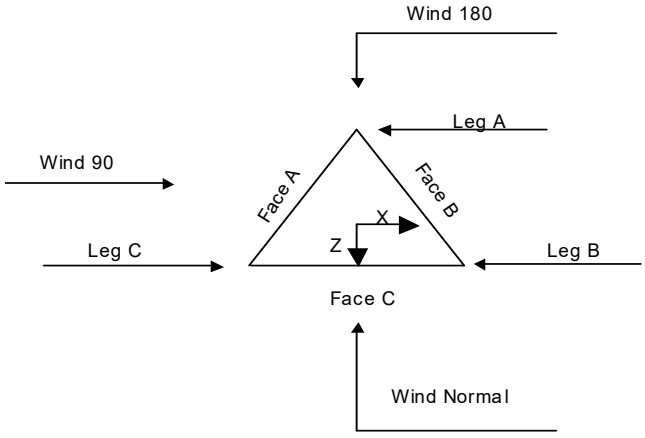
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 150.00 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 6.00 ft at the top and 18.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

- Tower is located in New London County, Connecticut.
- ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
- Basic wind speed of 105 mph.
- Structure Class II.
- Exposure Category B.
- Topographic Category 1.
- Crest Height 0.00 ft.
- Nominal ice thickness of 0.750 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.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.
- 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-G Bracing Resist. Exemption
√	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G 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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	150.00-140.00			6.00	1	10.00
T2	140.00-120.00			6.00	1	20.00
T3	120.00-100.00			6.00	1	20.00
T4	100.00-80.00			8.00	1	20.00
T5	80.00-60.00			10.00	1	20.00
T6	60.00-40.00			12.00	1	20.00
T7	40.00-20.00			14.00	1	20.00
T8	20.00-0.00			16.00	1	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	150.00-140.00	4.33	X Brace	No	No	8.000	8.000
T2	140.00-120.00	4.67	X Brace	No	No	8.000	8.000
T3	120.00-100.00	4.67	X Brace	No	No	8.000	8.000
T4	100.00-80.00	6.25	X Brace	No	No	7.500	7.500
T5	80.00-60.00	6.25	X Brace	No	No	7.500	7.500
T6	60.00-40.00	6.25	X Brace	No	No	7.500	7.500
T7	40.00-20.00	9.33	X Brace	No	No	8.000	8.000
T8	20.00-0.00	9.33	X Brace	No	No	8.000	8.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 150.00-140.00	Pipe	Pipe 2.875" x 0.203" (2.5 STD)	A500M-54 (54 ksi)	Single Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T2 140.00-120.00	Pipe	Pipe 2.875" x 0.203" (2.5 STD)	A500M-54 (54 ksi)	Single Angle	L 2 x 2 x 3/16	A36 (36 ksi)
T3 120.00-100.00	Pipe	Pipe 4.5" x 0.237" (4 STD)	A500M-54 (54 ksi)	Single Angle	L 2 x 2 x 3/16	A36 (36 ksi)
T4 100.00-80.00	Pipe	Pipe 5.563" x 0.258" (5 STD)	A500M-54 (54 ksi)	Single Angle	L 2.5 x 2.5 x 3/16	A36 (36 ksi)
T5 80.00-60.00	Pipe	Pipe 6.625" x 0.280" (6 STD)	A500M-54 (54 ksi)	Single Angle	L 3 x 3 x 3/16	A36 (36 ksi)
T6 60.00-40.00	Pipe	Pipe 8.625" x 0.322" (8 STD)	A500M-54 (54 ksi)	Single Angle	L 3 x 3 x 3/16	A36 (36 ksi)
T7 40.00-20.00	Pipe	Pipe 8.625" x 0.50" (8 XS)	A500M-54 (54 ksi)	Single Angle	L 3.5 x 3.5 x 1/4	A36 (36 ksi)
T8 20.00-0.00	Pipe	Pipe 8.625" x 0.50" (8 XS)	A500M-54 (54 ksi)	Single Angle	L 3.5 x 3.5 x 1/4	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 150.00-140.00	Single Angle	L 3 x 3 x 1/4	A36 (36 ksi)	Single Angle		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 150.00-140.00	0.00	0.000	A36 (36 ksi)	1.03	1	1.1	0.000	0.000	36.000
T2 140.00-120.00	0.00	0.000	A36 (36 ksi)	1.03	1	1.1	0.000	0.000	36.000
T3 120.00-100.00	0.00	0.000	A36 (36 ksi)	1.03	1	1.1	0.000	0.000	36.000
T4 100.00-80.00	0.00	0.000	A36 (36 ksi)	1.03	1	1.1	0.000	0.000	36.000
T5 80.00-60.00	0.00	0.000	A36 (36 ksi)	1.03	1	1.1	0.000	0.000	36.000
T6 60.00-40.00	0.00	0.000	A36 (36 ksi)	1.03	1	1.1	0.000	0.000	36.000
T7 40.00-20.00	0.00	0.000	A36 (36 ksi)	1.03	1	1.1	0.000	0.000	36.000
T8 20.00-0.00	0.00	0.000	A36 (36 ksi)	1.03	1	1.1	0.000	0.000	36.000

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 150.00-140.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 140.00-120.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 120.00-100.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 100.00-80.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 80.00-60.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 60.00-40.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 40.00-20.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 20.00-0.00	Yes	No	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 Net Width Deduct in	U	Diagonal Net Width Deduct in	U	Top Girt Net Width Deduct in	U	Bottom Girt Net Width Deduct in	U	Mid Girt Net Width Deduct in	U	Long Horizontal Net Width Deduct in	U	Short Horizontal Net Width Deduct in	U
T1 150.00-140.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 140.00-120.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 120.00-100.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 100.00-80.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 80.00-60.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 60.00-40.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 40.00-20.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 20.00-0.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Elevation ft	Redundant Horizontal Net Width Deduct in	U	Redundant Diagonal Net Width Deduct in	U	Redundant Sub-Diagonal Net Width Deduct in	U	Redundant Sub-Horizontal Net Width Deduct in	U	Redundant Vertical Net Width Deduct in	U	Redundant Hip Net Width Deduct in	U	Redundant Hip Diagonal Net Width Deduct in	U
T1 150.00-140.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 140.00-120.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 120.00-100.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 100.00-80.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	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
T5 80.00-60.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 60.00-40.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 40.00-20.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 20.00-0.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	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 150.00-140.00	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T2 140.00-120.00	Flange	1.000 A325N	4	0.625 A325N	1	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T3 120.00-100.00	Flange	1.000 A325N	6	0.625 A325N	1	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T4 100.00-80.00	Flange	1.000 A325N	8	0.625 A325N	1	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T5 80.00-60.00	Flange	1.250 A325N	8	0.625 A325N	1	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T6 60.00-40.00	Flange	1.250 A325N	8	0.625 A325N	1	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T7 40.00-20.00	Flange	1.250 A325N	8	0.750 A325N	1	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T8 20.00-0.00	Flange	1.500 A325N	0	0.750 A325N	1	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0

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
Safety Line 3/8	C	No	No	Ar (CaAa)	150.00 - 0.00	0.000	-0.5	1	1	0.375	0.375		0.22
1.5" flat Cable Ladder Rail	C	No	No	Af (CaAa)	150.00 - 0.00	0.000	-0.25	2	2	30.000 1.500	1.500		1.80
LDF7-50A(1-5/8")	C	No	No	Ar (CaAa)	150.00 - 0.00	0.000	-0.25	6	6	1.980	1.980		0.82
AVA6-50(1-1/4") **	C	No	No	Ar (CaAa)	150.00 - 0.00	0.000	-0.25	3	3	1.560	1.560		0.45
1.5" flat Cable Ladder Rail	A	No	No	Af (CaAa)	140.00 - 0.00	0.000	-0.25	2	2	30.000 1.500	1.500		1.80
AVA6-50(1-1/4") **	A	No	No	Ar (CaAa)	140.00 - 0.00	0.000	-0.25	4	4	1.560	1.560		0.45
1.5" flat Cable Ladder Rail	B	No	No	Af (CaAa)	127.50 - 0.00	0.000	-0.25	2	2	30.000 1.500	1.500		1.80

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
LDF7-50A(1-5/8") **	B	No	No	Ar (CaAa)	127.50 - 0.00	0.000	-0.25	14	14	1.000 1.980	1.980		0.82
1.5" flat Cable Ladder Rail	C	No	No	Af (CaAa)	115.00 - 0.00	0.000	0.25	2	2	30.000 1.500	1.500		1.80
AVA6-50(1-1/4")	C	No	No	Ar (CaAa)	115.00 - 0.00	0.000	0.25	6	6	1.560	1.560		0.45
DC (3/4")	C	No	No	Ar (CaAa)	115.00 - 0.00	0.000	0.25	2	2	1.090	0.750		0.33
DC (3/4")	C	No	No	Ar (CaAa)	115.00 - 0.00	0.000	0.25	6	6	1.090	0.001		0.33
Fiber (3/8")	C	No	No	Ar (CaAa)	115.00 - 0.00	0.000	0.25	2	1	1.090	0.001		0.33
3" (Nominal) Conduit **	C	No	No	Ar (CaAa)	115.00 - 0.00	0.000	0.25	1	1	3.500	3.500		1.49
HB158-21U6S12-XXXM-01(1-5/8)	A	No	No	Ar (CaAa)	105.00 - 0.00	0.000	-0.2	1	1	1.990	1.990		1.90

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 lb
T1	150.00-140.00	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	0.000	0.000	0
		C	0.000	0.000	21.935	0.000	101
T2	140.00-120.00	A	0.000	0.000	22.480	0.000	108
		B	0.000	0.000	24.540	0.000	113
		C	0.000	0.000	43.870	0.000	202
T3	120.00-100.00	A	0.000	0.000	23.475	0.000	118
		B	0.000	0.000	65.440	0.000	302
		C	0.000	0.000	72.922	0.000	368
T4	100.00-80.00	A	0.000	0.000	26.460	0.000	146
		B	0.000	0.000	65.440	0.000	302
		C	0.000	0.000	82.606	0.000	424
T5	80.00-60.00	A	0.000	0.000	26.460	0.000	146
		B	0.000	0.000	65.440	0.000	302
		C	0.000	0.000	82.606	0.000	424
T6	60.00-40.00	A	0.000	0.000	26.460	0.000	146
		B	0.000	0.000	65.440	0.000	302
		C	0.000	0.000	82.606	0.000	424
T7	40.00-20.00	A	0.000	0.000	26.460	0.000	146
		B	0.000	0.000	65.440	0.000	302
		C	0.000	0.000	82.606	0.000	424
T8	20.00-0.00	A	0.000	0.000	26.460	0.000	146
		B	0.000	0.000	65.440	0.000	302
		C	0.000	0.000	82.606	0.000	424

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 lb
T1	150.00-140.00	A	1.739	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	0.000	0.000	0
		C		0.000	0.000	63.554	0.000	933
T2	140.00-120.00	A	1.720	0.000	0.000	61.780	0.000	900

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 lb
		B		0.000	0.000	50.623	0.000	793
		C		0.000	0.000	126.645	0.000	1846
T3	120.00-100.00	A	1.692	0.000	0.000	64.058	0.000	932
		B		0.000	0.000	134.607	0.000	2085
		C		0.000	0.000	235.433	0.000	3266
T4	100.00-80.00	A	1.658	0.000	0.000	71.501	0.000	1051
		B		0.000	0.000	134.151	0.000	2050
		C		0.000	0.000	269.813	0.000	3672
T5	80.00-60.00	A	1.617	0.000	0.000	70.746	0.000	1023
		B		0.000	0.000	133.593	0.000	2008
		C		0.000	0.000	267.224	0.000	3577
T6	60.00-40.00	A	1.564	0.000	0.000	69.765	0.000	988
		B		0.000	0.000	132.868	0.000	1954
		C		0.000	0.000	263.861	0.000	3456
T7	40.00-20.00	A	1.486	0.000	0.000	68.339	0.000	937
		B		0.000	0.000	131.814	0.000	1877
		C		0.000	0.000	258.974	0.000	3284
T8	20.00-0.00	A	1.331	0.000	0.000	65.513	0.000	839
		B		0.000	0.000	129.725	0.000	1725
		C		0.000	0.000	249.297	0.000	2954

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	150.00-140.00	6.944	3.692	9.464	5.993
T2	140.00-120.00	2.688	-2.033	4.572	0.624
T3	120.00-100.00	0.365	-6.372	-0.457	-1.523
T4	100.00-80.00	-1.000	-6.714	-2.604	-0.691
T5	80.00-60.00	-1.113	-7.373	-2.954	-0.921
T6	60.00-40.00	-1.238	-8.101	-3.253	-1.215
T7	40.00-20.00	-1.437	-9.338	-3.676	-1.740
T8	20.00-0.00	-1.574	-10.193	-3.839	-2.671

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	Safety Line 3/8	140.00 - 150.00	0.6000	0.6000
T1	2	1.5" flat Cable Ladder Rail	140.00 - 150.00	0.6000	0.6000
T1	3	LDF7-50A(1-5/8")	140.00 - 150.00	0.6000	0.6000
T1	4	AVA6-50(1-1/4")	140.00 - 150.00	0.6000	0.6000
T2	1	Safety Line 3/8	120.00 - 140.00	0.6000	0.6000
T2	2	1.5" flat Cable Ladder Rail	120.00 - 140.00	0.6000	0.6000
T2	3	LDF7-50A(1-5/8")	120.00 - 140.00	0.6000	0.6000
T2	4	AVA6-50(1-1/4")	120.00 - 140.00	0.6000	0.6000
T2	6	1.5" flat Cable Ladder Rail	120.00 - 140.00	0.6000	0.6000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T2	7	AVA6-50(1-1/4")	120.00 - 140.00	0.6000	0.6000
T2	9	1.5" flat Cable Ladder Rail	120.00 - 127.50	0.6000	0.6000
T2	10	LDF7-50A(1-5/8")	120.00 - 127.50	0.6000	0.6000
T3	1	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T3	2	1.5" flat Cable Ladder Rail	100.00 - 120.00	0.6000	0.6000
T3	3	LDF7-50A(1-5/8")	100.00 - 120.00	0.6000	0.6000
T3	4	AVA6-50(1-1/4")	100.00 - 120.00	0.6000	0.6000
T3	6	1.5" flat Cable Ladder Rail	100.00 - 120.00	0.6000	0.6000
T3	7	AVA6-50(1-1/4")	100.00 - 120.00	0.6000	0.6000
T3	9	1.5" flat Cable Ladder Rail	100.00 - 120.00	0.6000	0.6000
T3	10	LDF7-50A(1-5/8")	100.00 - 120.00	0.6000	0.6000
T3	13	1.5" flat Cable Ladder Rail	100.00 - 115.00	0.6000	0.6000
T3	14	AVA6-50(1-1/4")	100.00 - 115.00	0.6000	0.6000
T3	15	DC (3/4")	100.00 - 115.00	0.6000	0.6000
T3	16	DC (3/4")	100.00 - 115.00	0.6000	0.6000
T3	17	Fiber (3/8")	100.00 - 115.00	0.6000	0.6000
T3	18	3" (Nominal) Conduit	100.00 - 115.00	0.6000	0.6000
T3	20	HB158-21U6S12-XXXM-01(1-5/8)	100.00 - 105.00	0.6000	0.6000
T4	1	Safety Line 3/8	80.00 - 100.00	0.6000	0.6000
T4	2	1.5" flat Cable Ladder Rail	80.00 - 100.00	0.6000	0.6000
T4	3	LDF7-50A(1-5/8")	80.00 - 100.00	0.6000	0.6000
T4	4	AVA6-50(1-1/4")	80.00 - 100.00	0.6000	0.6000
T4	6	1.5" flat Cable Ladder Rail	80.00 - 100.00	0.6000	0.6000
T4	7	AVA6-50(1-1/4")	80.00 - 100.00	0.6000	0.6000
T4	9	1.5" flat Cable Ladder Rail	80.00 - 100.00	0.6000	0.6000
T4	10	LDF7-50A(1-5/8")	80.00 - 100.00	0.6000	0.6000
T4	13	1.5" flat Cable Ladder Rail	80.00 - 100.00	0.6000	0.6000
T4	14	AVA6-50(1-1/4")	80.00 - 100.00	0.6000	0.6000
T4	15	DC (3/4")	80.00 - 100.00	0.6000	0.6000
T4	16	DC (3/4")	80.00 - 100.00	0.6000	0.6000
T4	17	Fiber (3/8")	80.00 - 100.00	0.6000	0.6000
T4	18	3" (Nominal) Conduit	80.00 - 100.00	0.6000	0.6000
T4	20	HB158-21U6S12-XXXM-01(1-5/8)	80.00 - 100.00	0.6000	0.6000
T5	1	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T5	2	1.5" flat Cable Ladder Rail	60.00 - 80.00	0.6000	0.6000
T5	3	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.6000
T5	4	AVA6-50(1-1/4")	60.00 - 80.00	0.6000	0.6000
T5	6	1.5" flat Cable Ladder Rail	60.00 - 80.00	0.6000	0.6000
T5	7	AVA6-50(1-1/4")	60.00 - 80.00	0.6000	0.6000
T5	9	1.5" flat Cable Ladder Rail	60.00 - 80.00	0.6000	0.6000
T5	10	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.6000
T5	13	1.5" flat Cable Ladder Rail	60.00 - 80.00	0.6000	0.6000
T5	14	AVA6-50(1-1/4")	60.00 - 80.00	0.6000	0.6000
T5	15	DC (3/4")	60.00 - 80.00	0.6000	0.6000
T5	16	DC (3/4")	60.00 - 80.00	0.6000	0.6000
T5	17	Fiber (3/8")	60.00 - 80.00	0.6000	0.6000
T5	18	3" (Nominal) Conduit	60.00 - 80.00	0.6000	0.6000
T5	20	HB158-21U6S12-XXXM-01(1-5/8)	60.00 - 80.00	0.6000	0.6000
T6	1	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T6	2	1.5" flat Cable Ladder Rail	40.00 - 60.00	0.6000	0.6000
T6	3	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.6000
T6	4	AVA6-50(1-1/4")	40.00 - 60.00	0.6000	0.6000
T6	6	1.5" flat Cable Ladder Rail	40.00 - 60.00	0.6000	0.6000
T6	7	AVA6-50(1-1/4")	40.00 - 60.00	0.6000	0.6000
T6	9	1.5" flat Cable Ladder Rail	40.00 - 60.00	0.6000	0.6000
T6	10	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.6000
T6	13	1.5" flat Cable Ladder Rail	40.00 - 60.00	0.6000	0.6000
T6	14	AVA6-50(1-1/4")	40.00 - 60.00	0.6000	0.6000
T6	15	DC (3/4")	40.00 - 60.00	0.6000	0.6000
T6	16	DC (3/4")	40.00 - 60.00	0.6000	0.6000
T6	17	Fiber (3/8")	40.00 - 60.00	0.6000	0.6000
T6	18	3" (Nominal) Conduit	40.00 - 60.00	0.6000	0.6000
T6	20	HB158-21U6S12-XXXM-01(1-5/8)	40.00 - 60.00	0.6000	0.6000
T7	1	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T7	2	1.5" flat Cable Ladder Rail	20.00 - 40.00	0.6000	0.6000
T7	3	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T7	4	AVA6-50(1-1/4")	20.00 - 40.00	0.6000	0.6000
T7	6	1.5" flat Cable Ladder Rail	20.00 - 40.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	7	AVA6-50(1-1/4")	20.00 - 40.00	0.6000	0.6000
T7	9	1.5" flat Cable Ladder Rail	20.00 - 40.00	0.6000	0.6000
T7	10	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T7	13	1.5" flat Cable Ladder Rail	20.00 - 40.00	0.6000	0.6000
T7	14	AVA6-50(1-1/4")	20.00 - 40.00	0.6000	0.6000
T7	15	DC (3/4")	20.00 - 40.00	0.6000	0.6000
T7	16	DC (3/4")	20.00 - 40.00	0.6000	0.6000
T7	17	Fiber (3/8")	20.00 - 40.00	0.6000	0.6000
T7	18	3" (Nominal) Conduit	20.00 - 40.00	0.6000	0.6000
T7	20	HB158-21U6S12-XXXM-01(1-5/8)	20.00 - 40.00	0.6000	0.6000
T8	1	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T8	2	1.5" flat Cable Ladder Rail	0.00 - 20.00	0.6000	0.6000
T8	3	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T8	4	AVA6-50(1-1/4")	0.00 - 20.00	0.6000	0.6000
T8	6	1.5" flat Cable Ladder Rail	0.00 - 20.00	0.6000	0.6000
T8	7	AVA6-50(1-1/4")	0.00 - 20.00	0.6000	0.6000
T8	9	1.5" flat Cable Ladder Rail	0.00 - 20.00	0.6000	0.6000
T8	10	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T8	13	1.5" flat Cable Ladder Rail	0.00 - 20.00	0.6000	0.6000
T8	14	AVA6-50(1-1/4")	0.00 - 20.00	0.6000	0.6000
T8	15	DC (3/4")	0.00 - 20.00	0.6000	0.6000
T8	16	DC (3/4")	0.00 - 20.00	0.6000	0.6000
T8	17	Fiber (3/8")	0.00 - 20.00	0.6000	0.6000
T8	18	3" (Nominal) Conduit	0.00 - 20.00	0.6000	0.6000
T8	20	HB158-21U6S12-XXXM-01(1-5/8)	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Site Pro 1 VFA12-HD	A	From Leg	2.00 0 0	0.000	150.00	No Ice 1/2" Ice 1" Ice	13.20 19.50 25.80	9.20 14.60 19.50	658 804 1015
Site Pro 1 VFA12-HD	B	From Leg	2.00 0 0	0.000	150.00	No Ice 1/2" Ice 1" Ice	13.20 19.50 25.80	9.20 14.60 19.50	658 804 1015
Site Pro 1 VFA12-HD	C	From Leg	2.00 0 0	0.000	150.00	No Ice 1/2" Ice 1" Ice	13.20 19.50 25.80	9.20 14.60 19.50	658 804 1015
8' x 2" Sch 40 Pipe Mount	A	From Leg	4.00 0 0	0.000	150.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	29 44 63
8' x 2" Sch 40 Pipe Mount	B	From Leg	4.00	0.000	150.00	No Ice	1.90	1.90	29

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* *lb*
			0			1/2"	2.73	2.73	44
			0			Ice	3.40	3.40	63
						1" Ice			
8' x 2" Sch 40 Pipe Mount	C	From Leg	4.00	0.000	150.00	No Ice	1.90	1.90	29
			0			1/2"	2.73	2.73	44
			0			Ice	3.40	3.40	63
						1" Ice			
AIR 32 B66AA B2P_T-MOBILE_TIA w/ Mount Pipe	A	From Leg	4.00	0.000	150.00	No Ice	7.09	6.39	158
			0			1/2"	7.56	7.25	222
			0			Ice	8.02	7.99	292
						1" Ice			
AIR 32 B66AA B2P_T-MOBILE_TIA w/ Mount Pipe	B	From Leg	4.00	0.000	150.00	No Ice	7.09	6.39	158
			0			1/2"	7.56	7.25	222
			0			Ice	8.02	7.99	292
						1" Ice			
AIR 32 B66AA B2P_T-MOBILE_TIA w/ Mount Pipe	C	From Leg	4.00	0.000	150.00	No Ice	7.09	6.39	158
			0			1/2"	7.56	7.25	222
			0			Ice	8.02	7.99	292
						1" Ice			
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	A	From Leg	4.00	0.000	150.00	No Ice	20.48	11.02	186
			0			1/2"	21.23	12.55	322
			0			Ice	21.99	14.10	469
						1" Ice			
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	B	From Leg	4.00	0.000	150.00	No Ice	20.48	11.02	186
			0			1/2"	21.23	12.55	322
			0			Ice	21.99	14.10	469
						1" Ice			
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	C	From Leg	4.00	0.000	150.00	No Ice	20.48	11.02	186
			0			1/2"	21.23	12.55	322
			0			Ice	21.99	14.10	469
						1" Ice			
AIR 6449 B41_TIA w/ Mount Pipe	A	From Leg	4.00	0.000	150.00	No Ice	5.87	3.27	128
			0			1/2"	6.23	3.73	177
			0			Ice	6.61	4.20	232
						1" Ice			
AIR 6449 B41_TIA w/ Mount Pipe	B	From Leg	4.00	0.000	150.00	No Ice	5.87	3.27	128
			0			1/2"	6.23	3.73	177
			0			Ice	6.61	4.20	232
						1" Ice			
AIR 6449 B41_TIA w/ Mount Pipe	C	From Leg	4.00	0.000	150.00	No Ice	5.87	3.27	128
			0			1/2"	6.23	3.73	177
			0			Ice	6.61	4.20	232
						1" Ice			
RRUS 4415 B25	A	From Leg	4.00	0.000	150.00	No Ice	1.64	0.68	44
			0			1/2"	1.80	0.79	56
			0			Ice	1.97	0.91	71
						1" Ice			
RRUS 4415 B25	B	From Leg	4.00	0.000	150.00	No Ice	1.64	0.68	44
			0			1/2"	1.80	0.79	56
			0			Ice	1.97	0.91	71
						1" Ice			
RRUS 4415 B25	C	From Leg	4.00	0.000	150.00	No Ice	1.64	0.68	44
			0			1/2"	1.80	0.79	56
			0			Ice	1.97	0.91	71
						1" Ice			
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.00	0.000	150.00	No Ice	1.97	1.59	73
			0			1/2"	2.15	1.75	93
			0			Ice	2.33	1.92	116
						1" Ice			
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.00	0.000	150.00	No Ice	1.97	1.59	73
			0			1/2"	2.15	1.75	93
			0			Ice	2.33	1.92	116
						1" Ice			
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.00	0.000	150.00	No Ice	1.97	1.59	73
			0				2.15	1.75	93

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* *lb*
			0			1/2" Ice	2.33	1.92	116
						1" Ice			
**									
Sector Mount [SM 802-3]	C	None		0.000	140.00	No Ice	25.34	25.34	930
						1/2" Ice	33.44	33.44	1388
						1" Ice	41.56	41.56	1977
DT465B-2XR_TIA w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	140.00	No Ice	9.34	7.63	84
						1/2" Ice	9.91	8.82	160
						1" Ice	10.44	9.72	245
DT465B-2XR_TIA w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	140.00	No Ice	9.34	7.63	84
						1/2" Ice	9.91	8.82	160
						1" Ice	10.44	9.72	245
DT465B-2XR_TIA w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	140.00	No Ice	9.34	7.63	84
						1/2" Ice	9.91	8.82	160
						1" Ice	10.44	9.72	245
TD-RRH8x20-25	A	From Leg	4.00 0 0	0.000	140.00	No Ice	4.05	1.53	70
						1/2" Ice	4.30	1.71	97
						1" Ice	4.56	1.90	128
TD-RRH8x20-25	B	From Leg	4.00 0 0	0.000	140.00	No Ice	4.05	1.53	70
						1/2" Ice	4.30	1.71	97
						1" Ice	4.56	1.90	128
TD-RRH8x20-25	C	From Leg	4.00 0 0	0.000	140.00	No Ice	4.05	1.53	70
						1/2" Ice	4.30	1.71	97
						1" Ice	4.56	1.90	128
(2) 1900 MHz 4x45W RRH	A	From Leg	4.00 0 0	0.000	140.00	No Ice	2.32	2.24	60
						1/2" Ice	2.53	2.44	83
						1" Ice	2.74	2.65	110
(2) 1900 MHz 4x45W RRH	B	From Leg	4.00 0 0	0.000	140.00	No Ice	2.32	2.24	60
						1/2" Ice	2.53	2.44	83
						1" Ice	2.74	2.65	110
(2) 1900 MHz 4x45W RRH	C	From Leg	4.00 0 0	0.000	140.00	No Ice	2.32	2.24	60
						1/2" Ice	2.53	2.44	83
						1" Ice	2.74	2.65	110
APXV9ERR18-C-A20_TIA w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	140.00	No Ice	8.26	7.47	95
						1/2" Ice	8.82	8.66	166
						1" Ice	9.35	9.56	244
APXV9ERR18-C-A20_TIA w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	140.00	No Ice	8.26	7.47	95
						1/2" Ice	8.82	8.66	166
						1" Ice	9.35	9.56	244
APXV9ERR18-C-A20_TIA w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	140.00	No Ice	8.26	7.47	95
						1/2" Ice	8.82	8.66	166
						1" Ice	9.35	9.56	244
(2) RRH2X50-800	A	From Leg	4.00 0 0	0.000	140.00	No Ice	1.70	1.28	53
						1/2" Ice	1.86	1.43	70
						1" Ice	2.03	1.58	90
(2) RRH2X50-800	B	From Leg	4.00 0 0	0.000	140.00	No Ice	1.70	1.28	53
						1/2" Ice	1.86	1.43	70
						1" Ice	2.03	1.58	90
(2) RRH2X50-800	C	From Leg	4.00	0.000	140.00	No Ice	1.70	1.28	53

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert*	*Azimuth Adjustment*	*Placement*		C_AA_A *Front*	C_AA_A *Side*	*Weight*
			ft	°	*ft*		ft^2	ft^2	*lb*
			0			1/2" Ice	1.86	1.43	70
			0			1" Ice	2.03	1.58	90
**									
Sector Mount [SM 802-3]	C	None		0.000	126.00	No Ice	25.34	25.34	930
						1/2" Ice	33.44	33.44	1388
						1" Ice	41.56	41.56	1977
BSAMNT-SBS-2-2 (Mount Bracket)	A	From Leg	4.00	0.000	126.00	No Ice	0.00	0.00	67
			0			1/2" Ice	0.00	0.00	88
			0			1" Ice	0.00	0.00	108
BSAMNT-SBS-2-2 (Mount Bracket)	B	From Leg	4.00	0.000	126.00	No Ice	0.00	0.00	67
			0			1/2" Ice	0.00	0.00	88
			0			1" Ice	0.00	0.00	108
BSAMNT-SBS-2-2 (Mount Bracket)	C	From Leg	4.00	0.000	126.00	No Ice	0.00	0.00	67
			0			1/2" Ice	0.00	0.00	88
			0			1" Ice	0.00	0.00	108
Miscellaneous [NA 509-1]	A	From Leg	2.00	0.000	126.00	No Ice	6.32	4.85	275
			0			1/2" Ice	7.79	6.36	417
			0			1" Ice	9.36	7.94	598
Miscellaneous [NA 509-1]	B	From Leg	2.00	0.000	126.00	No Ice	6.32	4.85	275
			0			1/2" Ice	7.79	6.36	417
			0			1" Ice	9.36	7.94	598
Miscellaneous [NA 509-1]	C	From Leg	2.00	0.000	126.00	No Ice	6.32	4.85	275
			0			1/2" Ice	7.79	6.36	417
			0			1" Ice	9.36	7.94	598
12.5' x 2.375" Pipe (Hoirz)	A	From Leg	4.00	0.000	126.00	No Ice	2.97	1.07	30
			0			1/2" Ice	4.25	1.54	52
			0			1" Ice	5.54	2.01	83
12.5' x 2.375" Pipe (Hoirz)	B	From Leg	4.00	0.000	126.00	No Ice	2.97	1.07	30
			0			1/2" Ice	4.25	1.54	52
			0			1" Ice	5.54	2.01	83
12.5' x 2.375" Pipe (Hoirz)	C	From Leg	4.00	0.000	126.00	No Ice	2.97	1.07	30
			0			1/2" Ice	4.25	1.54	52
			0			1" Ice	5.54	2.01	83
64T64R w/ Mount Pipe	A	From Leg	4.00	0.000	126.00	No Ice	4.70	1.99	87
			0			1/2" Ice	5.03	2.39	123
			2			1" Ice	5.37	2.80	164
64T64R w/ Mount Pipe	B	From Leg	4.00	0.000	126.00	No Ice	4.70	1.99	87
			0			1/2" Ice	5.03	2.39	123
			2			1" Ice	5.37	2.80	164
64T64R w/ Mount Pipe	C	From Leg	4.00	0.000	126.00	No Ice	4.70	1.99	87
			0			1/2" Ice	5.03	2.39	123
			2			1" Ice	5.37	2.80	164
(2) JAHH-65B-R3B_TIA w/ Mount Pipe	A	From Leg	4.00	0.000	126.00	No Ice	9.35	7.65	89
			0			1/2" Ice	9.92	8.83	165
			2			1" Ice	10.46	9.73	250
(2) JAHH-65B-R3B_TIA w/ Mount Pipe	B	From Leg	4.00	0.000	126.00	No Ice	9.35	7.65	89
			0			1/2" Ice	9.92	8.83	165
			2			1" Ice	10.46	9.73	250

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		C_AA_A *Front* *ft²*	C_AA_A *Side* *ft²*	*Weight* *lb*
(2) JAHH-65B-R3B_TIA w/ Mount Pipe	C	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	9.35 9.92 10.46	7.65 8.83 9.73	89 165 250
APL866513_TIA w/ Mount Pipe	A	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	4.29 4.66 5.04	4.80 5.42 6.04	34 79 129
APL866513_TIA w/ Mount Pipe	B	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	4.29 4.66 5.04	4.80 5.42 6.04	34 79 129
APL868013_TIA w/ Mount Pipe	A	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	3.10 3.48 3.85	4.80 5.42 6.04	30 69 113
APL868013_TIA w/ Mount Pipe	B	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	3.10 3.48 3.85	4.80 5.42 6.04	30 69 113
(2) APL868013_TIA w/ Mount Pipe	C	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	3.10 3.48 3.85	4.80 5.42 6.04	30 69 113
B2/B66A RRH-BR049	A	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.01 1.14 1.28	70 87 106
B2/B66A RRH-BR049	B	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.01 1.14 1.28	70 87 106
B2/B66A RRH-BR049	C	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.01 1.14 1.28	70 87 106
B5/B13 RRH-BR04C	A	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.01 1.14 1.28	70 87 106
B5/B13 RRH-BR04C	B	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.01 1.14 1.28	70 87 106
B5/B13 RRH-BR04C	C	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.01 1.14 1.28	70 87 106
CBC78T-DS-43-2X	A	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	0.37 0.45 0.53	0.51 0.60 0.70	21 27 35
CBC78T-DS-43-2X	B	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	0.37 0.45 0.53	0.51 0.60 0.70	21 27 35
CBC78T-DS-43-2X	C	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	0.37 0.45 0.53	0.51 0.60 0.70	21 27 35
RRFDC-3315-PF-48	A	From Leg	4.00 0 2	0.000	126.00	No Ice 1/2" Ice 1" Ice	3.36 3.60 3.84	2.19 2.39 2.61	32 61 93
DB-B1-6C-12AB-0Z	B	From Leg	4.00	0.000	126.00	No Ice	2.60	2.08	55

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0 2			1/2" Ice 1" Ice	2.81 3.04	2.27 2.47	78 105
**									
Site Pro 1 VFA12-HD	A	From Leg	2.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	13.20 19.50 25.80	9.20 14.60 19.50	658 804 1015
Site Pro 1 VFA12-HD	B	From Leg	2.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	13.20 19.50 25.80	9.20 14.60 19.50	658 804 1015
Site Pro 1 VFA12-HD	C	From Leg	2.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	13.20 19.50 25.80	9.20 14.60 19.50	658 804 1015
7770_TIA w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	55 103 157
7770_TIA w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	55 103 157
7770_TIA w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	55 103 157
OPA-65R-LCUU-H8_TIA w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	13.00 13.69 14.38	9.56 11.03 12.49	103 198 303
OPA-65R-LCUU-H6_TIA w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	9.68 10.25 10.79	7.12 8.30 9.20	106 181 265
OPA-65R-LCUU-H6_TIA w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	9.68 10.25 10.79	7.12 8.30 9.20	106 181 265
EPBQ-654L8H8-L2_TIA w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	18.33 19.06 19.81	9.17 10.68 12.22	119 236 363
EPBQ-654L8H6-L2_TIA w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	13.47 14.09 14.66	6.64 7.83 8.75	110 201 300
EPBQ-654L8H6-L2_TIA w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	13.47 14.09 14.66	6.64 7.83 8.75	110 201 300
DMP65R-BU8D_TIA w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	18.11 18.84 19.59	10.26 11.78 13.33	138 260 392
DMP65R-BU6D_TIA w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	12.95 13.55 14.11	7.26 8.43 9.31	115 207 308
DMP65R-BU6D_TIA w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	115.00	No Ice 1/2" Ice 1" Ice	12.95 13.55 14.11	7.26 8.43 9.31	115 207 308
RRUS E2 B29	A	From Leg	4.00	0.000	115.00	No Ice	3.15	1.29	60

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* *lb*
			0			1/2" Ice	3.36	1.44	83
			0			1" Ice	3.59	1.60	110
RRUS E2 B29	B	From Leg	4.00	0.000	115.00	No Ice	3.15	1.29	60
			0			1/2" Ice	3.36	1.44	83
			0			1" Ice	3.59	1.60	110
RRUS E2 B29	C	From Leg	4.00	0.000	115.00	No Ice	3.15	1.29	60
			0			1/2" Ice	3.36	1.44	83
			0			1" Ice	3.59	1.60	110
RRUS 4449 B5/B12	A	From Leg	4.00	0.000	115.00	No Ice	1.97	1.41	71
			0			1/2" Ice	2.14	1.56	90
			0			1" Ice	2.33	1.73	111
RRUS 4449 B5/B12	B	From Leg	4.00	0.000	115.00	No Ice	1.97	1.41	71
			0			1/2" Ice	2.14	1.56	90
			0			1" Ice	2.33	1.73	111
RRUS 4449 B5/B12	C	From Leg	4.00	0.000	115.00	No Ice	1.97	1.41	71
			0			1/2" Ice	2.14	1.56	90
			0			1" Ice	2.33	1.73	111
RRUS 4478 B14	A	From Leg	4.00	0.000	115.00	No Ice	2.02	1.25	59
			0			1/2" Ice	2.20	1.40	77
			0			1" Ice	2.39	1.55	97
RRUS 4478 B14	B	From Leg	4.00	0.000	115.00	No Ice	2.02	1.25	59
			0			1/2" Ice	2.20	1.40	77
			0			1" Ice	2.39	1.55	97
RRUS 4478 B14	C	From Leg	4.00	0.000	115.00	No Ice	2.02	1.25	59
			0			1/2" Ice	2.20	1.40	77
			0			1" Ice	2.39	1.55	97
RRUS 32 B66A	A	From Leg	4.00	0.000	115.00	No Ice	2.86	1.78	55
			0			1/2" Ice	3.09	1.97	77
			0			1" Ice	3.32	2.17	103
RRUS 32 B66A	B	From Leg	4.00	0.000	115.00	No Ice	2.86	1.78	55
			0			1/2" Ice	3.09	1.97	77
			0			1" Ice	3.32	2.17	103
RRUS 32 B66A	C	From Leg	4.00	0.000	115.00	No Ice	2.86	1.78	55
			0			1/2" Ice	3.09	1.97	77
			0			1" Ice	3.32	2.17	103
RRUS 32 B30	A	From Leg	4.00	0.000	115.00	No Ice	2.74	1.67	53
			0			1/2" Ice	2.96	1.86	74
			0			1" Ice	3.19	2.05	98
RRUS 32 B30	B	From Leg	4.00	0.000	115.00	No Ice	2.74	1.67	53
			0			1/2" Ice	2.96	1.86	74
			0			1" Ice	3.19	2.05	98
RRUS 32 B30	C	From Leg	4.00	0.000	115.00	No Ice	2.74	1.67	53
			0			1/2" Ice	2.96	1.86	74
			0			1" Ice	3.19	2.05	98
RRUS 32 B2	A	From Leg	4.00	0.000	115.00	No Ice	2.74	1.67	53
			0			1/2" Ice	2.96	1.86	74
			0			1" Ice	3.19	2.05	98
RRUS 32 B2	B	From Leg	4.00	0.000	115.00	No Ice	2.74	1.67	53
			0				2.96	1.86	74

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert*	*Azimuth Adjustment*	*Placement*		C_AA_A *Front*	C_AA_A *Side*	*Weight*
			ft	°	*ft*		ft^2	ft^2	*lb*
			0			1/2" Ice	3.19	2.05	98
						1" Ice			
RRUS 32 B2	C	From Leg	4.00	0.000	115.00	No Ice	2.74	1.67	53
			0			1/2" Ice	2.96	1.86	74
			0			1" Ice	3.19	2.05	98
(2) DC6-48-60-18-8F	A	From Leg	0.00	0.000	115.00	No Ice	1.21	1.21	33
			0			1/2" Ice	1.89	1.89	55
			0			1" Ice	2.11	2.11	80
DC6-48-60-18-8F	B	From Leg	0.00	0.000	115.00	No Ice	1.21	1.21	33
			0			1/2" Ice	1.89	1.89	55
			0			1" Ice	2.11	2.11	80
DC6-48-60-18-8F	C	From Leg	0.00	0.000	115.00	No Ice	1.21	1.21	33
			0			1/2" Ice	1.89	1.89	55
			0			1" Ice	2.11	2.11	80
(2) LGP21401	A	From Leg	4.00	0.000	115.00	No Ice	1.10	0.35	14
			0			1/2" Ice	1.24	0.44	21
			0			1" Ice	1.38	0.54	30
(2) LGP21401	B	From Leg	4.00	0.000	115.00	No Ice	1.10	0.35	14
			0			1/2" Ice	1.24	0.44	21
			0			1" Ice	1.38	0.54	30
(2) LGP21401	C	From Leg	4.00	0.000	115.00	No Ice	1.10	0.35	14
			0			1/2" Ice	1.24	0.44	21
			0			1" Ice	1.38	0.54	30
**									
TA08025-B604	A	From Leg	4.00	0.000	105.00	No Ice	1.96	0.98	0
			0			1/2" Ice	2.14	1.11	0
			0			1" Ice	2.32	1.25	0
TA08025-B605	A	From Leg	4.00	0.000	105.00	No Ice	1.96	1.13	0
			0			1/2" Ice	2.14	1.27	0
			0			1" Ice	2.32	1.41	0
RDIDC-9181-PF-48	A	From Leg	4.00	0.000	105.00	No Ice	2.01	1.17	0
			0			1/2" Ice	2.19	1.31	0
			0			1" Ice	2.37	1.46	0
TA08025-B604	B	From Leg	4.00	0.000	105.00	No Ice	1.96	0.98	0
			0			1/2" Ice	2.14	1.11	0
			0			1" Ice	2.32	1.25	0
TA08025-B605	B	From Leg	4.00	0.000	105.00	No Ice	1.96	1.13	0
			0			1/2" Ice	2.14	1.27	0
			0			1" Ice	2.32	1.41	0
TA08025-B604	C	From Leg	4.00	0.000	105.00	No Ice	1.96	0.98	0
			0			1/2" Ice	2.14	1.11	0
			0			1" Ice	2.32	1.25	0
TA08025-B605	C	From Leg	4.00	0.000	105.00	No Ice	1.96	1.13	0
			0			1/2" Ice	2.14	1.27	0
			0			1" Ice	2.32	1.41	0
MX08FRO665-20_TIA w/ Mount Pipe	A	From Leg	4.00	0.000	105.00	No Ice	12.73	7.53	98
			0			1/2" Ice	13.33	8.72	190
			0			1" Ice	13.89	9.62	291

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
MX08FRO665-20_TIA w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	105.00	No Ice 1/2" Ice 1" Ice	12.73 13.33 13.89	7.53 8.72 9.62	98 190 291
MX08FRO665-20_TIA w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	105.00	No Ice 1/2" Ice 1" Ice	12.73 13.33 13.89	7.53 8.72 9.62	98 190 291
Sabre_C10837002C-32788_Sector_(3)	A	None		0.000	105.00	No Ice 1/2" Ice 1" Ice	18.52 28.00 37.48	18.52 28.00 37.48	2028 3067 4106
**									

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service

Comb. No.	Description
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	318745	26967	-15641
	Max. H_x	18	318745	26967	-15641
	Max. H_z	7	-281892	-24719	14350
	Min. Vert	7	-281892	-24719	14350
	Min. H_x	7	-281892	-24719	14350
	Min. H_z	18	318745	26967	-15641
Leg B	Max. Vert	10	307953	-25944	-14676
	Max. H_x	23	-271232	23669	13351
	Max. H_z	23	-271232	23669	13351
	Min. Vert	23	-271232	23669	13351
	Min. H_x	10	307953	-25944	-14676
	Min. H_z	10	307953	-25944	-14676
Leg A	Max. Vert	2	314674	-14	30567
	Max. H_x	21	12118	3679	796
	Max. H_z	2	314674	-14	30567
	Min. Vert	15	-278190	13	-27962
	Min. H_x	9	11782	-3680	770
	Min. H_z	15	-278190	13	-27962

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	40114	0	0	1510	525	0
1.2 Dead+1.6 Wind 0 deg - No Ice	48137	-20	-49729	-4655151	3235	-420
0.9 Dead+1.6 Wind 0 deg - No Ice	36103	-20	-49729	-4648648	3077	-423
1.2 Dead+1.6 Wind 30 deg - No Ice	48137	24735	-43043	-4021271	-2308464	8344
0.9 Dead+1.6 Wind 30 deg - No Ice	36103	24735	-43043	-4015721	-2305170	8341
1.2 Dead+1.6 Wind 60 deg - No Ice	48137	42403	-24574	-2301082	-3969648	-1909
0.9 Dead+1.6 Wind 60 deg - No Ice	36103	42403	-24574	-2298095	-3963866	-1912
1.2 Dead+1.6 Wind 90 deg - No Ice	48137	45193	20	4386	-4298392	-17890
0.9 Dead+1.6 Wind 90 deg - No Ice	36103	45193	20	3926	-4292043	-17892
1.2 Dead+1.6 Wind 120 deg - No Ice	48137	41859	24283	2287104	-3933870	8467
0.9 Dead+1.6 Wind 120 deg - No Ice	36103	41859	24283	2283220	-3928124	8466
1.2 Dead+1.6 Wind 150 deg - No Ice	48137	22620	39339	3777637	-2168642	18689

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
0.9 Dead+1.6 Wind 150 deg - No Ice	36103	22620	39339	3771428	-2165490	18690
1.2 Dead+1.6 Wind 180 deg - No Ice	48137	20	47891	4531419	-2012	419
0.9 Dead+1.6 Wind 180 deg - No Ice	36103	20	47891	4524141	-2161	422
1.2 Dead+1.6 Wind 210 deg - No Ice	48137	-24735	43043	4024945	2309644	-8346
0.9 Dead+1.6 Wind 210 deg - No Ice	36103	-24735	43043	4018481	2306044	-8343
1.2 Dead+1.6 Wind 240 deg - No Ice	48137	-43995	25492	2368395	4081200	1909
0.9 Dead+1.6 Wind 240 deg - No Ice	36103	-43995	25492	2364429	4074993	1912
1.2 Dead+1.6 Wind 270 deg - No Ice	48137	-45193	-20	-863	4299634	17891
0.9 Dead+1.6 Wind 270 deg - No Ice	36103	-45193	-20	-1313	4292978	17893
1.2 Dead+1.6 Wind 300 deg - No Ice	48137	-40268	-23364	-2219755	3824819	-8465
0.9 Dead+1.6 Wind 300 deg - No Ice	36103	-40268	-23364	-2216853	3818885	-8465
1.2 Dead+1.6 Wind 330 deg - No Ice	48137	-22620	-39339	-3773957	2169957	-18689
0.9 Dead+1.6 Wind 330 deg - No Ice	36103	-22620	-39339	-3768661	2166497	-18690
1.2 Dead+1.0 Ice+1.0 Temp	139632	0	-1	25105	2953	0
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	139632	-3	-13151	-1195475	3257	-1008
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	139632	6461	-11212	-1015694	-596764	3034
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	139632	10874	-6287	-561144	-1011359	-47
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	139632	11609	3	25828	-1098340	-1023
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	139632	10373	6001	592866	-977410	5514
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	139632	6074	10536	1022034	-571513	7370
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	139632	3	12929	1231331	2462	1008
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	139632	-6461	11212	1066559	602478	-3034
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	139632	-11067	6398	619509	1030073	46
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	139632	-11609	-3	25031	1104060	1023
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	139632	-10181	-5890	-534496	970137	-5513
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	139632	-6074	-10536	-971168	577240	-7370
Dead+Wind 0 deg - Service	40114	-4	-10354	-957684	1053	-86
Dead+Wind 30 deg - Service	40114	5151	-8962	-827148	-475121	1697
Dead+Wind 60 deg - Service	40114	8832	-5118	-472866	-817370	-392
Dead+Wind 90 deg - Service	40114	9429	4	2048	-885684	-3649
Dead+Wind 120 deg - Service	40114	8721	5059	472302	-810074	1726
Dead+Wind 150 deg - Service	40114	4719	8206	779739	-446614	3809
Dead+Wind 180 deg - Service	40114	4	9979	934736	-17	86
Dead+Wind 210 deg - Service	40114	-5151	8962	830179	476155	-1697
Dead+Wind 240 deg - Service	40114	-9157	5305	488885	840904	391
Dead+Wind 270 deg - Service	40114	-9429	-4	978	886721	3649
Dead+Wind 300 deg - Service	40114	-8396	-4871	-456282	788614	-1726

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead+Wind 330 deg - Service	40114	-4719	-8206	-776708	447654	-3809

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	lb	lb	lb	lb	lb	lb	
1	0	-40114	0	0	40114	0	0.000%
2	-20	-48137	-49729	20	48137	49729	0.001%
3	-20	-36103	-49729	20	36103	49729	0.001%
4	24735	-48137	-43043	-24735	48137	43043	0.001%
5	24735	-36103	-43043	-24735	36103	43043	0.001%
6	42404	-48137	-24574	-42403	48137	24574	0.001%
7	42404	-36103	-24574	-42403	36103	24574	0.001%
8	45194	-48137	20	-45193	48137	-20	0.001%
9	45194	-36103	20	-45193	36103	-20	0.001%
10	41860	-48137	24283	-41859	48137	-24283	0.001%
11	41860	-36103	24283	-41859	36103	-24283	0.001%
12	22620	-48137	39339	-22620	48137	-39339	0.001%
13	22620	-36103	39339	-22620	36103	-39339	0.001%
14	20	-48137	47892	-20	48137	-47891	0.001%
15	20	-36103	47892	-20	36103	-47891	0.001%
16	-24735	-48137	43043	24735	48137	-43043	0.001%
17	-24735	-36103	43043	24735	36103	-43043	0.001%
18	-43995	-48137	25493	43995	48137	-25492	0.001%
19	-43995	-36103	25493	43995	36103	-25492	0.001%
20	-45194	-48137	-20	45193	48137	20	0.001%
21	-45194	-36103	-20	45193	36103	20	0.001%
22	-40268	-48137	-23365	40268	48137	23364	0.001%
23	-40268	-36103	-23365	40268	36103	23364	0.001%
24	-22620	-48137	-39339	22620	48137	39339	0.001%
25	-22620	-36103	-39339	22620	36103	39339	0.001%
26	0	-139632	0	0	139632	1	0.001%
27	-3	-139632	-13152	3	139632	13151	0.000%
28	6461	-139632	-11212	-6461	139632	11212	0.000%
29	10875	-139632	-6287	-10874	139632	6287	0.000%
30	11609	-139632	3	-11609	139632	-3	0.000%
31	10373	-139632	6001	-10373	139632	-6001	0.000%
32	6075	-139632	10536	-6074	139632	-10536	0.000%
33	3	-139632	12930	-3	139632	-12929	0.000%
34	-6461	-139632	11212	6461	139632	-11212	0.000%
35	-11067	-139632	6398	11067	139632	-6398	0.000%
36	-11609	-139632	-3	11609	139632	3	0.000%
37	-10181	-139632	-5890	10181	139632	5890	0.000%
38	-6075	-139632	-10536	6074	139632	10536	0.000%
39	-4	-40114	-10354	4	40114	10354	0.000%
40	5151	-40114	-8962	-5151	40114	8962	0.000%
41	8832	-40114	-5118	-8832	40114	5118	0.000%
42	9429	-40114	4	-9429	40114	-4	0.000%
43	8721	-40114	5059	-8721	40114	-5059	0.000%
44	4719	-40114	8206	-4719	40114	-8206	0.000%
45	4	-40114	9979	-4	40114	-9979	0.000%
46	-5151	-40114	8962	5151	40114	-8962	0.000%
47	-9157	-40114	5305	9157	40114	-5305	0.000%
48	-9429	-40114	-4	9429	40114	4	0.000%
49	-8396	-40114	-4871	8396	40114	4871	0.000%
50	-4719	-40114	-8206	4719	40114	8206	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	10	0.00000001	0.00007081
3	Yes	10	0.00000001	0.00005187
4	Yes	10	0.00000001	0.00007221
5	Yes	10	0.00000001	0.00005324
6	Yes	10	0.00000001	0.00007377
7	Yes	10	0.00000001	0.00005472
8	Yes	10	0.00000001	0.00007276
9	Yes	10	0.00000001	0.00005366
10	Yes	10	0.00000001	0.00007101
11	Yes	10	0.00000001	0.00005202
12	Yes	10	0.00000001	0.00007311
13	Yes	10	0.00000001	0.00005392
14	Yes	10	0.00000001	0.00007407
15	Yes	10	0.00000001	0.00005495
16	Yes	10	0.00000001	0.00007222
17	Yes	10	0.00000001	0.00005325
18	Yes	10	0.00000001	0.00007047
19	Yes	10	0.00000001	0.00005161
20	Yes	10	0.00000001	0.00007272
21	Yes	10	0.00000001	0.00005364
22	Yes	10	0.00000001	0.00007417
23	Yes	10	0.00000001	0.00005502
24	Yes	10	0.00000001	0.00007307
25	Yes	10	0.00000001	0.00005388
26	Yes	6	0.00000001	0.00008419
27	Yes	11	0.00000001	0.00004705
28	Yes	11	0.00000001	0.00004702
29	Yes	11	0.00000001	0.00004696
30	Yes	11	0.00000001	0.00004630
31	Yes	11	0.00000001	0.00004694
32	Yes	11	0.00000001	0.00004743
33	Yes	11	0.00000001	0.00004794
34	Yes	11	0.00000001	0.00004736
35	Yes	11	0.00000001	0.00004665
36	Yes	11	0.00000001	0.00004549
37	Yes	11	0.00000001	0.00004583
38	Yes	11	0.00000001	0.00004628
39	Yes	10	0.00000001	0.00005656
40	Yes	10	0.00000001	0.00005674
41	Yes	10	0.00000001	0.00005704
42	Yes	10	0.00000001	0.00005684
43	Yes	10	0.00000001	0.00005665
44	Yes	10	0.00000001	0.00005719
45	Yes	10	0.00000001	0.00005718
46	Yes	10	0.00000001	0.00005667
47	Yes	10	0.00000001	0.00005628
48	Yes	10	0.00000001	0.00005667
49	Yes	10	0.00000001	0.00005711
50	Yes	10	0.00000001	0.00005709

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	150 - 140	3.64	47	0.236	0.018
T2	140 - 120	3.12	47	0.233	0.017
T3	120 - 100	2.15	47	0.193	0.017
T4	100 - 80	1.38	47	0.147	0.013
T5	80 - 60	0.82	47	0.101	0.009
T6	60 - 40	0.44	47	0.062	0.006
T7	40 - 20	0.20	47	0.036	0.003
T8	20 - 0	0.06	47	0.018	0.002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	Site Pro 1 VFA12-HD	47	3.64	0.236	0.018	104208
140.00	Sector Mount [SM 802-3]	47	3.12	0.233	0.017	53347
126.00	Sector Mount [SM 802-3]	47	2.43	0.208	0.017	25863
115.00	Site Pro 1 VFA12-HD	47	1.94	0.181	0.016	21714
105.00	TA08025-B604	47	1.56	0.158	0.014	22573

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	150 - 140	17.83	18	1.160	0.087
T2	140 - 120	15.26	18	1.144	0.081
T3	120 - 100	10.51	18	0.945	0.083
T4	100 - 80	6.74	18	0.717	0.065
T5	80 - 60	3.98	18	0.494	0.046
T6	60 - 40	2.15	18	0.303	0.031
T7	40 - 20	0.97	18	0.174	0.017
T8	20 - 0	0.31	18	0.087	0.008

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	Site Pro 1 VFA12-HD	18	17.83	1.160	0.087	21458
140.00	Sector Mount [SM 802-3]	18	15.26	1.144	0.081	10981
126.00	Sector Mount [SM 802-3]	18	11.85	1.018	0.084	5291
115.00	Site Pro 1 VFA12-HD	18	9.47	0.886	0.080	4422
105.00	TA08025-B604	18	7.58	0.773	0.070	4594

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	150	Leg	A325N	0.750	4	2154	29821	0.072 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	2775	6986	0.397 ✔	1	Member Block Shear
		Top Girt	A325N	0.500	1	717	7952	0.090 ✔	1	Bolt Shear
T2	140	Leg	A325N	1.000	4	12646	53014	0.239 ✔	1	Bolt Tension
		Diagonal	A325N	0.625	1	7310	9788	0.747 ✔	1	Member Bearing
T3	120	Leg	A325N	1.000	6	16721	53014	0.315 ✔	1	Bolt Tension
		Diagonal	A325N	0.625	1	7773	9788	0.794 ✔	1	Member Bearing
T4	100	Leg	A325N	1.000	8	18286	53014	0.345 ✔	1	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Diagonal	A325N	0.625	1	8317	9788	0.850 ✔	1	Member Bearing
T5	80	Leg	A325N	1.250	8	23195	82835	0.280 ✔	1	Bolt Tension
		Diagonal	A325N	0.625	1	8092	9788	0.827 ✔	1	Member Bearing
T6	60	Leg	A325N	1.250	8	27631	82835	0.334 ✔	1	Bolt Tension
		Diagonal	A325N	0.625	1	8347	9788	0.853 ✔	1	Member Bearing
T7	40	Leg	A325N	1.250	8	31655	82835	0.382 ✔	1	Bolt Tension
		Diagonal	A325N	0.750	1	9071	14355	0.632 ✔	1	Member Bearing
T8	20	Diagonal	A325N	0.750	1	9542	14355	0.665 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	Pipe 2.875" x 0.203" (2.5 STD)	10.00	0.67	8.4 K=1.00	1.704	-11649	82352	0.141 [1] ✔
T2	140 - 120	Pipe 2.875" x 0.203" (2.5 STD)	20.00	4.67	59.1 K=1.00	1.704	-51730	62849	0.823 [1] ✔
T3	120 - 100	Pipe 4.5" x 0.237" (4 STD)	20.03	4.67	37.2 K=1.00	3.174	-108815	138323	0.787 [1] ✔
T4	100 - 80	Pipe 5.563" x 0.258" (5 STD)	20.03	6.26	40.0 K=1.00	4.300	-156683	184163	0.851 [1] ✔
T5	80 - 60	Pipe 6.625" x 0.280" (6 STD)	20.03	6.26	33.5 K=1.00	5.581	-200371	248307	0.807 [1] ✔
T6	60 - 40	Pipe 8.625" x 0.322" (8 STD)	20.03	6.26	25.6 K=1.00	8.399	-240478	387660	0.620 [1] ✔
T7	40 - 20	Pipe 8.625" x 0.50" (8 XS)	20.03	9.35	39.0 K=1.00	12.763	-275341	550137	0.500 [1] ✔
T8	20 - 0	Pipe 8.625" x 0.50" (8 XS)	20.03	9.35	39.0 K=1.00	12.763	-310195	550137	0.564 [1] ✔

[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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	L 1.5 x 1.5 x 3/16	7.40	3.42	139.8 K=1.00	0.527	-2659	6096	0.436 [1] ✔
T2	140 - 120	L 2 x 2 x 3/16	7.60	3.51	110.3 K=1.03	0.715	-7248	12216	0.593 [1] ✔
T3	120 - 100	L 2 x 2 x 3/16	9.00	4.28	130.5 K=1.00	0.715	-7722	9453	0.817 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	100 - 80	L 2.5 x 2.5 x 3/16	11.48	5.51	133.7 K=1.00	0.902	-7950	11411	0.697 [1] ✔
T5	80 - 60	L 3 x 3 x 3/16	13.20	6.33	127.4 K=1.00	1.090	-7983	14952	0.534 [1] ✔
T6	60 - 40	L 3 x 3 x 3/16	14.99	7.14	143.6 K=1.00	1.090	-8500	11937	0.712 [1] ✔
T7	40 - 20	L 3.5 x 3.5 x 1/4	18.07	8.74	151.1 K=1.00	1.690	-9216	16716	0.551 [1] ✔
T8	20 - 0	L 3.5 x 3.5 x 1/4	19.81	9.61	166.2 K=1.00	1.690	-9767	13815	0.707 [1] ✔

[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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	L 3 x 3 x 1/4	6.00	5.49	115.6 K=1.04	1.438	-717	23047	0.031 [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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	Pipe 2.875" x 0.203" (2.5 STD)	10.00	0.67	8.4	1.704	8615	82817	0.104 [1] ✔
T2	140 - 120	Pipe 2.875" x 0.203" (2.5 STD)	20.00	0.67	8.4	1.704	50583	82817	0.611 [1] ✔
T3	120 - 100	Pipe 4.5" x 0.237" (4 STD)	20.03	0.67	5.3	3.174	100327	154259	0.650 [1] ✔
T4	100 - 80	Pipe 5.563" x 0.258" (5 STD)	20.03	0.63	4.0	4.300	146290	208974	0.700 [1] ✔
T5	80 - 60	Pipe 6.625" x 0.280" (6 STD)	20.03	0.63	3.3	5.581	185557	271254	0.684 [1] ✔
T6	60 - 40	Pipe 8.625" x 0.322" (8 STD)	20.03	0.63	2.6	8.399	221045	408204	0.542 [1] ✔
T7	40 - 20	Pipe 8.625" x 0.50" (8 XS)	20.03	0.67	2.8	12.763	253242	620268	0.408 [1] ✔
T8	20 - 0	Pipe 8.625" x 0.50" (8 XS)	20.03	0.67	2.8	12.763	283123	620268	0.456 [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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	L 1.5 x 1.5 x 3/16	7.40	3.42	93.4	0.308	2775	13381	0.207 [1] ✔
T2	140 - 120	L 2 x 2 x 3/16	7.60	3.51	71.0	0.431	7310	18739	0.390 [1] ✔
T3	120 - 100	L 2 x 2 x 3/16	9.00	4.28	86.0	0.431	7773	18739	0.415 [1] ✔
T4	100 - 80	L 2.5 x 2.5 x 3/16	10.45	5.01	79.3	0.571	8317	24840	0.335 [1] ✔
T5	80 - 60	L 3 x 3 x 3/16	12.11	5.79	75.7	0.712	8092	30968	0.261 [1] ✔
T6	60 - 40	L 3 x 3 x 3/16	14.99	7.14	92.9	0.712	8347	30968	0.270 [1] ✔
T7	40 - 20	L 3.5 x 3.5 x 1/4	18.07	8.74	97.8	1.103	9071	48000	0.189 [1] ✔
T8	20 - 0	L 3.5 x 3.5 x 1/4	19.81	9.61	107.4	1.103	9542	48000	0.199 [1] ✔

[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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	L 3 x 3 x 1/4	6.00	5.49	74.3	0.961	691	41801	0.017 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	150 - 140	Leg	Pipe 2.875" x 0.203" (2.5 STD)	2	-11649	82352	14.1	Pass
T2	140 - 120	Leg	Pipe 2.875" x 0.203" (2.5 STD)	21	-51730	62849	82.3	Pass
T3	120 - 100	Leg	Pipe 4.5" x 0.237" (4 STD)	48	-108815	138323	78.7	Pass
T4	100 - 80	Leg	Pipe 5.563" x 0.258" (5 STD)	75	-156683	184163	85.1	Pass
T5	80 - 60	Leg	Pipe 6.625" x 0.280" (6 STD)	94	-200371	248307	80.7	Pass
T6	60 - 40	Leg	Pipe 8.625" x 0.322" (8 STD)	115	-240478	387660	62.0	Pass
T7	40 - 20	Leg	Pipe 8.625" x 0.50" (8 XS)	136	-275341	550137	50.0	Pass
T8	20 - 0	Leg	Pipe 8.625" x 0.50" (8 XS)	151	-310195	550137	56.4	Pass
T1	150 - 140	Diagonal	L 1.5 x 1.5 x 3/16	9	-2659	6096	43.6	Pass
T2	140 - 120	Diagonal	L 2 x 2 x 3/16	24	-7248	12216	59.3 74.7 (b)	Pass
T3	120 - 100	Diagonal	L 2 x 2 x 3/16	54	-7722	9453	81.7	Pass
T4	100 - 80	Diagonal	L 2.5 x 2.5 x 3/16	81	-7950	11411	69.7 85.0 (b)	Pass
T5	80 - 60	Diagonal	L 3 x 3 x 3/16	101	-7983	14952	53.4 82.7 (b)	Pass
T6	60 - 40	Diagonal	L 3 x 3 x 3/16	122	-8500	11937	71.2 85.3 (b)	Pass
T7	40 - 20	Diagonal	L 3.5 x 3.5 x 1/4	143	-9216	16716	55.1	Pass

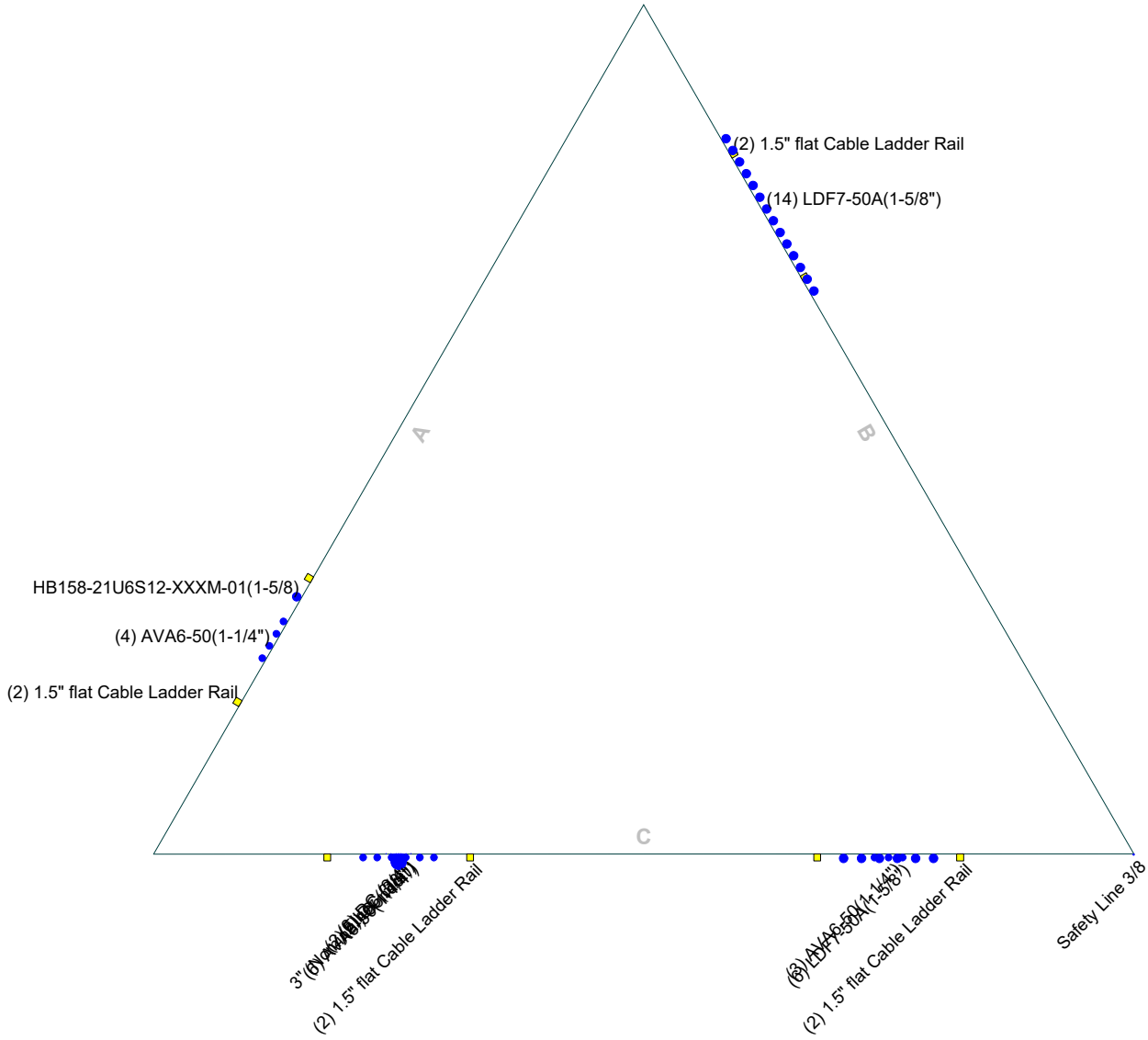
Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
							63.2 (b)	
T8	20 - 0	Diagonal	L 3.5 x 3.5 x 1/4	158	-9767	13815	70.7	Pass
T1	150 - 140	Top Girt	L 3 x 3 x 1/4	5	-717	23047	3.1	Pass
							9.0 (b)	
							Summary	
							Leg (T4) 85.1	Pass
							Diagonal (T6) 85.3	Pass
							Top Girt (T1) 9.0	Pass
							Bolt Checks 85.3	Pass
							RATING = **85.3**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

Feed Line Plan

Round Flat App In Face App Out Face



Paul J. Ford and Company
250 East Broad St., Suite 600
Columbus, OH 43215
Phone: 614-221-6679
FAX:

Job:	***150-ft Norwich, CT S/S Tower***		
Project:	***PJF 13321-0008***		
Client: Everest Infrastructure Partners		Drawn by: Anna Trudo	App'd:
Code: TIA-222-G		Date: 08/25/21	Scale: NTS
Path:			Dwg No. E-7

APPENDIX C

ADDITIONAL CALCULATIONS

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

Page	1	of	1
By	AKT	Date	8/25/2021
Project #	13321-0008.003.8700		

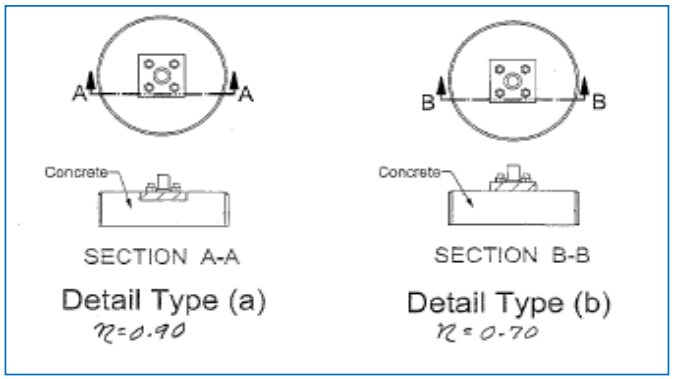
Self-Support Tower Anchor Rod Capacity - TIA-G

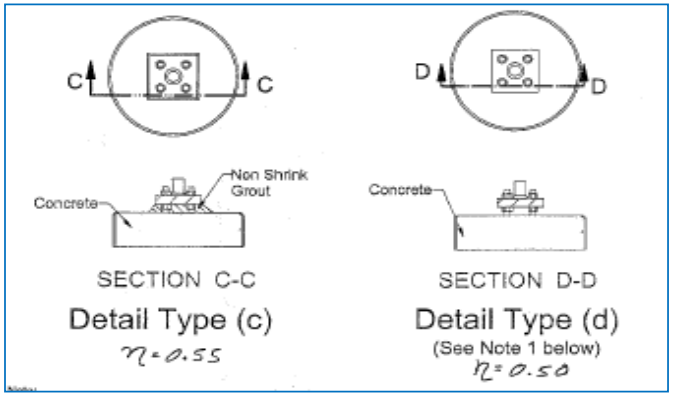
Loads

Compression :	318.7	kips	Tension :	281.9	kips	Code:	TIA-G
Comp. Shear :	31.2	kips	Ten.Shear :	28.6	kips	Maximum Ratio:	1.00

Existing Anchor Rods

Anchor Rod Condition (n) :	0.5				
Anchor Rod ø :	1 1/2	in	l_{ar} :	1.5	inches
Anchor Rod Quantity :	8		Comp. M_u :	30.42	k-in
Anchor Rod Grade :	F1554 Gr. 36				
F_y :	36	ksi	ϕ_v :	0.75	
F_u :	58	ksi	ϕ_f :	0.90	
Threads per Inch	6		$\phi_v R_{nv}$:	276.74	kips
Net Tensile Area	1.41	in^2	$\phi_f R_{nm}$:	97.44	k-in
ϕ_t :	0.80				
$\phi_t R_{nt}$:	521.63	kip			
Anchor Rod Ratio :	0.865				





PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

Job Number: 13321-0008.003.8700
Site Number: CTL06458
Site Name: Norwich, CT
By: AKT
Date: 8/25/2021

Version 1.3a, Effective 07/03/2019

DRILLED PIER STEEL ANALYSIS - STEEL CALCULATIONS - TIA-222-G

BASED ON ACI 318-05, SECTIONS 9 & 10 (ASSUMING TIE REINFORCEMENT)

ROCK ANCHOR CHECK - TOWER COMPRESSION LEG

Factored Internal Loads from Analysis

Reference Standard =	TIA-222-G	
ACI Code =	ACI 318-05	
Maximum Ratio =	100.0%	
Axial Load, Pu =	318.7	kips, (+Comp, -Tension)
Moment, Mu =	134.2	k-ft (Must be Positive)
Depth to Analysis Section =	3.80	ft, from Grade

Factored Internal Loads

Load Factor =	1.0	
Axial Load, Pu = ΦPn =	318.7	kips
Moment, Mu =	134.2	k-ft

Drilled Pier Geometry and Concrete Specifications

Diameter =	42	in
fc' =	0.416	ksi
εc =	0.003	in/in
β1 =	0.85	
Ag =	1385.4	in^2
Height Above Grade =	0.5	ft
Depth Below Grade =	3.8	ft

Nominal Axial Load and Moment

ΦPn(max) =	488.4	kips
ΦPn(min) =	-406.4	kips
ΦPn =	318.7	kips
Φ =	0.650	
ΦMn (Resultant) =	190.5	k-ft
at θ =	180.00	degrees
NA Depth =	30.59	in

Rebar Size and Specifications

	Existing	Bar Circle 2	
Bar Size =	#10		
Override Bar Diameter =			in
Bar Diameter =	1.2700	0.0000	in
Bar Area =	1.2700	0.0000	in^2
Effective Bar Area =	1.2700	0.0000	in^2
Number Bars =	5		
Spacing =	Symmetric		
fy =	71.1111111		ksi
Es =	29000	29000	ksi
εy =	0.00245	0.00000	in/in
Tie Size =	#4		
Clear Cover to Ties =	6.865		in
Bar Circle =	26		in
Adjust =	18.0000		
% of Area Effective =	100.0%	100.0%	
Include in Calcs =	Yes	Yes	
Bar Circle Valid =	Yes	No	

AXIAL RATIO = 65.3% OK

MOMENT RATIO = 70.4% OK

Minimum Required Steel

Seismic Design Category =	D		
As(min) =	3.90	sq in	ACI Section 10.5.1 & 10.5.3
As =	6.35	sq in	
Stl Area Reduction Factor =	1.00		

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

Job Number: 13321-0008.003.8700
Site Number: CTL06458
Site Name: Norwich, CT
By: AKT
Date: 8/25/2021

Version 1.3a, Effective 07/03/2019

DRILLED PIER STEEL ANALYSIS - STEEL CALCULATIONS - TIA-222-G

BASED ON ACI 318-05, SECTIONS 9 & 10 (ASSUMING TIE REINFORCEMENT)

ROCK ANCHOR CHECK - TOWER UPLIFT LEG

Factored Internal Loads from Analysis

Reference Standard =	TIA-222-G	
ACI Code =	ACI 318-05	
Maximum Ratio =	100.0%	
Axial Load, Pu =	-281.9	kips, (+Comp, -Tension)
Moment, Mu =	123.0	k-ft (Must be Positive)
Depth to Analysis Section =	3.80	ft, from Grade

Factored Internal Loads

Load Factor =	1.0	
Axial Load, Pu = ΦPn =	-281.9	kips
Moment, Mu =	123.0	k-ft

Drilled Pier Geometry and Concrete Specifications

Diameter =	42	in
fc' =	0.416	ksi
εc =	0.003	in/in
β1 =	0.85	
Ag =	1385.4	in^2
Height Above Grade =	0.5	ft
Depth Below Grade =	3.8	ft

Nominal Axial Load and Moment

ΦPn(max) =	488.4	kips
ΦPn(min) =	-406.4	kips
ΦPn =	-281.9	kips
Φ =	0.900	
ΦMn (Resultant) =	132.6	k-ft
at θ =	0.00	degrees
NA Depth =	7.47	in

Rebar Size and Specifications

	Existing	Bar Circle 2	
Bar Size =	#10		
Override Bar Diameter =			in
Bar Diameter =	1.2700	0.0000	in
Bar Area =	1.2700	0.0000	in^2
Effective Bar Area =	1.2700	0.0000	in^2
Number Bars =	5		
Spacing =	Symmetric		
fy =	71.1111111		ksi
Es =	29000	29000	ksi
εy =	0.00245	0.00000	in/in
Tie Size =	#4		
Clear Cover to Ties =	6.865		in
Bar Circle =	26		in
Adjust =	18.0000		
% of Area Effective =	100.0%	100.0%	
Include in Calcs =	Yes	Yes	
Bar Circle Valid =	Yes	No	

AXIAL RATIO = 69.4% OK

MOMENT RATIO = 92.8% OK

Minimum Required Steel

Seismic Design Category =	D		
As(min) =	3.90	sq in	ACI Section 10.5.1 & 10.5.3
As =	6.35	sq in	
Stl Area Reduction Factor =	1.00		

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 drawings, we should be contacted immediately to evaluate the significance of the deviation.

2) No allowance was made for any damaged, missing, or rusted members. The analysis of this tower assumes that no physical deterioration has occurred in any of the structural components of the tower and that all the tower 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 tower. The structural analysis 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.

4) The structural integrity of the existing tower foundation can only be verified if exact foundation sizes and soil conditions are known. Paul J. Ford and Company will not accept any responsibility for the adequacy of the existing foundations unless the foundation sizes and a soils report are provided.

5) This tower has been analyzed according to the minimum design wind loads recommended by the Telecommunications Industry Association Standard ANSI/TIA-222-G. If the owner or local or state agencies require a higher design wind load, Paul J. Ford and Company should be made aware of this requirement.

6) The enclosed sketches are a schematic representation of the tower that we have analyzed. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions and for the proper fit and clearance in the field.

7) Miscellaneous items such as antenna mounts etc. have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Exhibit E

Mount Analysis

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

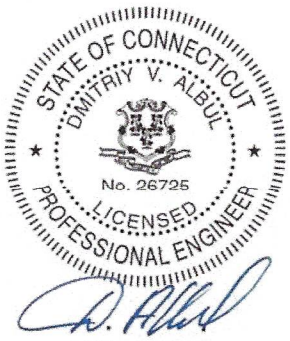
1033 WATERVLIET SHAKER RD ALBANY, NY 12205

Mount Analysis Report

August 3, 2021

Dish Wireless Site Number	BOBOS00070B
Infinigy Job Number	2039-Z5555-C
Client	Northeast Site Solution
Carrier	Dish Wireless
Site Location	2 Hinkley Road, Norwich, CT 06365 41.514880 N NAD83 72.061674 W NAD83
Mount Centerline EL.	105 ft
Mount Classification	Sector Frame
Structural Usage Ratio	**15%**
Overall Result	**Pass**

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



08-03-21
Dmitriy Albul, P.E.
Engineering Consultant to Infinigy

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Introduction..... 3

Supporting Documentation..... 3

Analysis Code Requirements..... 3

Conclusion..... 3

Final Configuration Loading..... 4

Structure Usages..... 4

Assumptions and Limitations..... 4

Calculations..... Appended

Introduction

Infinigy Engineering has been requested to perform a mount analysis of proposed antenna mount from the Dish Wireless equipment. All supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The mount was analyzed using RISA-3D Version 19.0.1 analysis software.

Supporting Documentation

Mount Details	Mount Specification Sabre Industries C10837002C-32788
Construction Drawings	Infinigy Engineering PLLC, Job No. 2039-Z5555-C, dated June 8, 2021
RF Design Sheet	Dish Wireless, dated June 3, 2021

Analysis Code Requirements

Wind Speed	135 mph (3-second Gust, Vult.)
Wind Speed w/ ice	50 mph (3-Second Gust) w/ 0.75" ice
TIA Revision	ANSI/TIA-222-G
Adopted IBC	2018 Connecticut Building Code (2015 IBC)
Structure Class	II
Exposure Category	B
Topographic Method	Method 2
Topographic Category	1
Spectral Response	S_s=0.161, S_1=0.058
Site Class	D – Stiff Soil (Assumed)
HMSL	183.32 ft.

Conclusion

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

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

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

Final Configuration Loading

Mount CL (ft)	Rad. HT (ft)	Vert. O/S (ft)	Horiz. O/S (ft)*	Qty	Appurtenance	Carrier
105.0	105.0	-	9.5	3	JMA MX08FRO665-21	Dish Wireless
			9.5	3	Fujitsu TA08025-B605	
			9.5	3	Fujitsu TA08025-B604	
			-	1	Raycap RDIDC-9181-PF-48	

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

Structure Usages

Bracing	8%	Pass
Frame Rails	9%	Pass
Plates	15%	Pass
Arms	5%	Pass
Mount Pipes	11%	Pass
Stabilizer	4%	Pass
Bolts	14%	Pass
Rating	**15%**	Pass

Assumptions and Limitations

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

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

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

INFINIGY

FROM ZERO TO INFINIGY

the solutions are endless

Date:	7/30/2021
Site Name:	BOBOS00070B
Project Engineer:	DVA
Project No:	2039-Z5555C
Customer:	Northeast Site Solution
Carrier:	Dish Wireless

Building Code:	2015	
ASCE Standard:	ASCE 7-10	
TIA Standard:	G	
Mount Type:	Sector Frame	
Mount Centerline:	105	ft
Superstructure Height:	n/a	ft
Structure Type:	Tower	

Factors	
Gh:	1.000
K_{zmin}:	0.700
K_z:	1.002
K_d:	0.950
K_{zt}:	1.000
Ka:	0.900
I wind:	1.000
I ice:	1.000

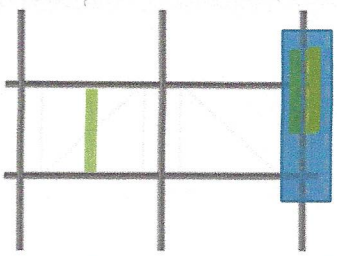
q_z:	26.65	psf
Surface Wind Pressure:	0.00	psf

Site Information		
Exposure Category:	B	
Risk Category:	II	
Ultimate Wind Speed:	135	mph
Design Wind Speed:	105	mph
Ice Thickness:	0.75	in
Ice Wind Speed:	50.0	mph
Escalated Ice Thickness:	1.68	in
Topographic Method:	2	
Topographic Category:	1	

Run Seismic?	Yes
Site Soil:	D (Default)
Short-Period Accel. (Ss):	0.1610
1-Second Accel. (S1):	0.0580
Short-Period Design (SDS):	0.1780
1-Second Design (SD1):	0.0960
Short-Period Coeff. (Fa):	1.6000
1-Second Coeff. (Fv):	2.4000
Cs	0.0890
Cs min	0.0300
Amplification Factor (ap):	1.00
Response Mod. (Rp):	2.50
Overstrength (Ωo):	1.00

Service Wind:	30.0	mph
Lm (man live load) =	500.0	lb
Lv (man live load) =	250.0	lb

ELEVATION VIEW



PLAN VIEW

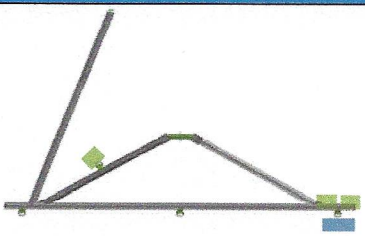


Table 1. Equipment Specifications and Wind Pressure

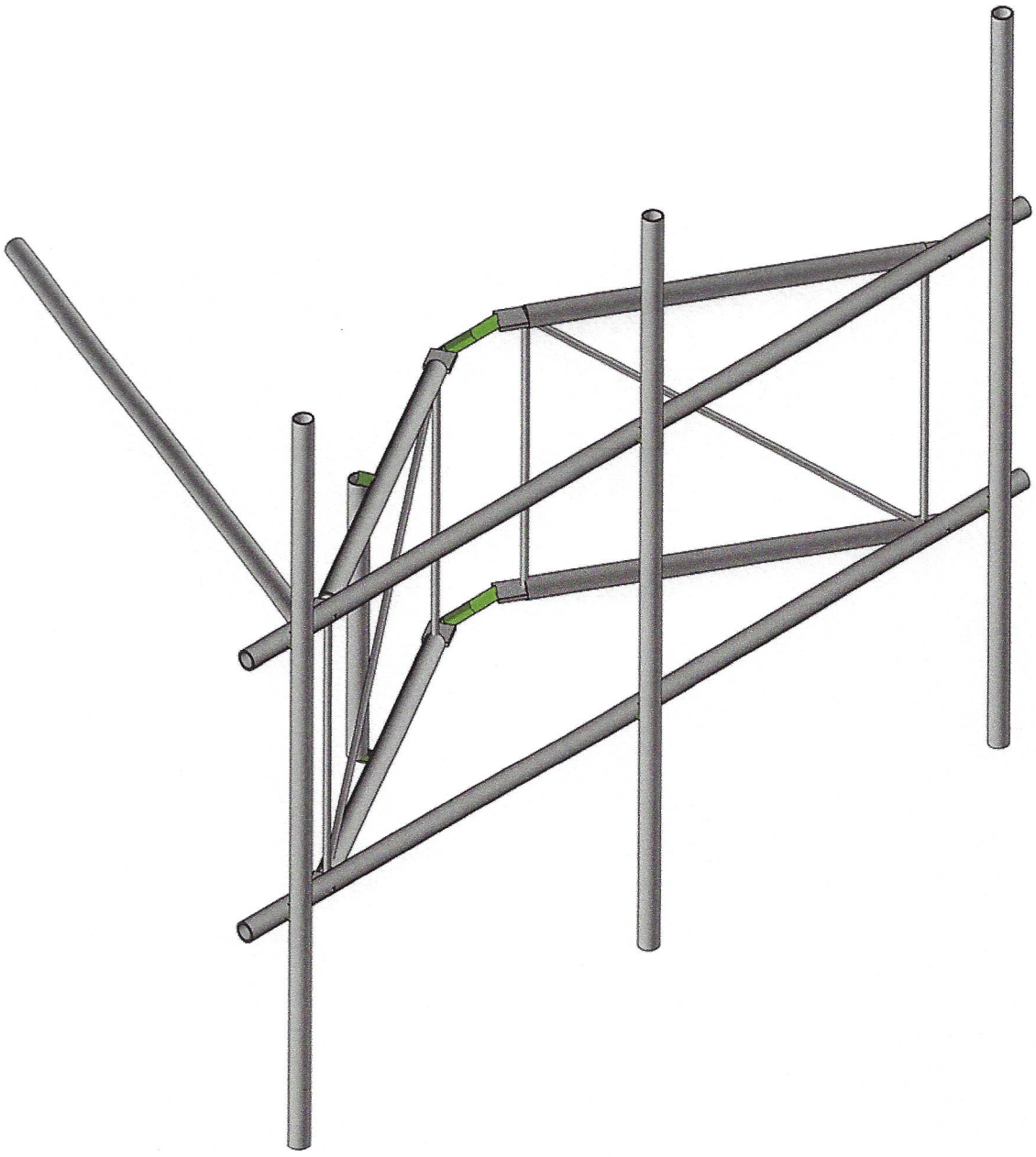
Manufacturer	Model	Elevation	Pipe Label	Weight (lb)	Height (in)	Width (in)	Depth (in)	EPA_{n}	EPA_{t}	$EPA_{n\ w/\ ice}$	$EPA_{t\ w/\ ice}$	q_z:	$q_{z\ ice}$:	$q_{z\ live}$:
JMA WIRELESS	MX08FRO665-21	105	29	64.50	72	20	8	8.01	3.21	8.80	3.90	26.65	6.09	2.19
Fujitsu	TA08025-B605	105	29	74.95	15.75	14.96	9.06	1.86	1.16	2.76	1.91	26.65	6.09	2.19
Fujitsu	TA08025-B604	105	29	63.93	15.75	14.96	7.87	1.86	1.01	2.76	1.74	26.65	6.09	2.19
RAYCAP	RDIDC-9181-PF-48	105	38	21.85	16	14	8	1.77	1.05	2.66	1.78	26.65	6.09	2.19

Table 2. Equipment Wind and Seismic Loads

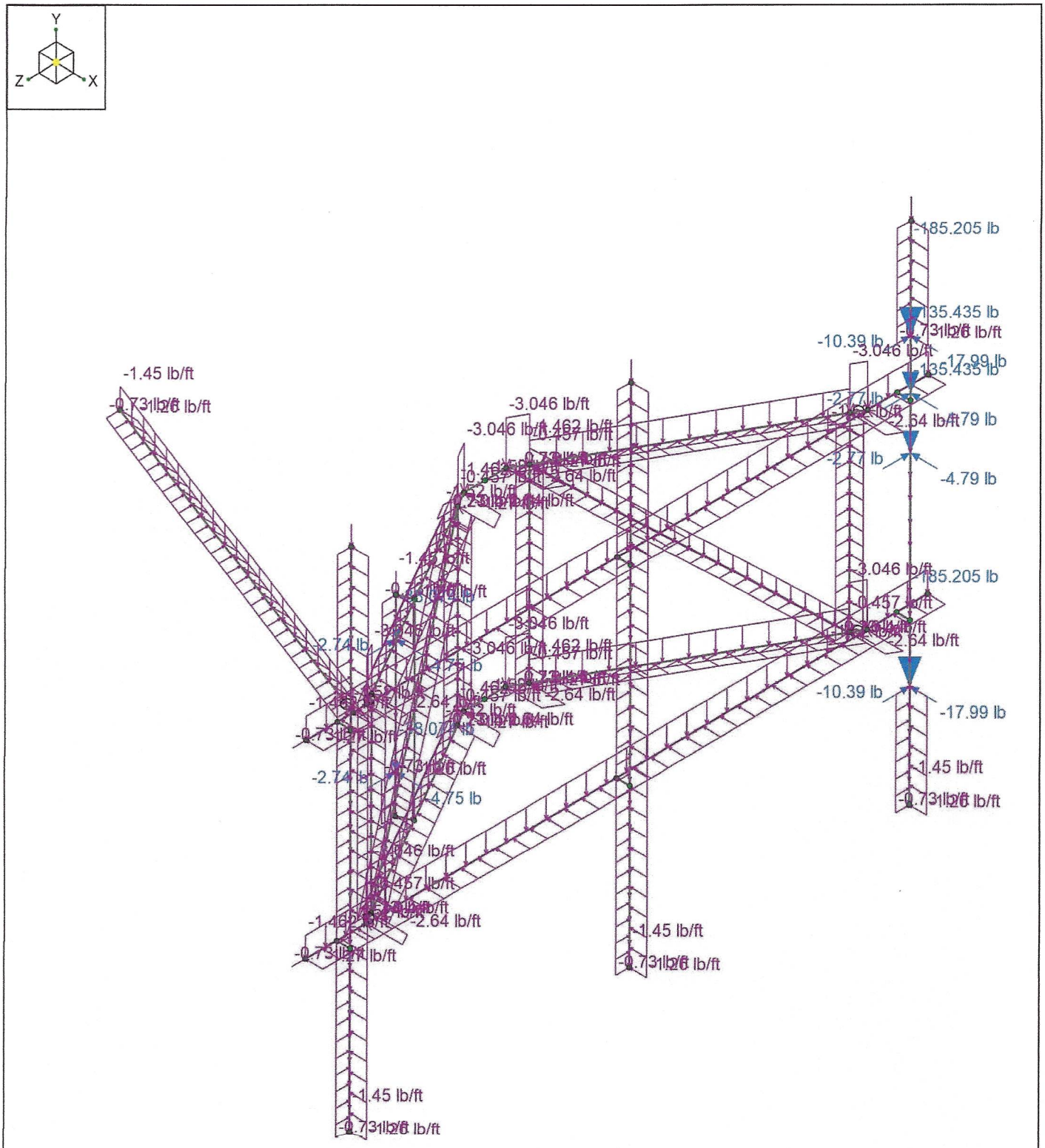
Manufacturer	Model	Wind Load (F_A) lb		Wind Load Ice Case (F_A) lb			Wind Load Service Case		Seismic
JMA WIRELESS	MX08FRO665-21	192	77	48	21	293	16	6	5.7
Fujitsu	TA08025-B605	45	28	15	10	53	4	2	6.7
Fujitsu	TA08025-B604	45	24	15	10	51	4	2	5.7
RAYCAP	RDIDC-9181-PF-48	43	25	15	10	50	3	2	1.9

Table 3. Member Capacities

Member Name	Member Shape	Wind load (plf)	Wind Load Ice (plf)	Weight Ice (plf)	Bending Check	Shear Check	Total Capacity	Controlling Capacity
Mount Pipes	PIPE_2.0_HRA	6.34	1.45	1.01	11%	3%	11%	15%
Stabilizer	PIPE_2.0_HRA	6.34	1.45	1.01	4%	0%	4%	
Bracing	0.75" SR	2.00	0.46	0.72	8%	1%	8%	
Arm	PIPE_2.0X	6.40	1.46	1.01	5%	1%	5%	
Frame Rail	PIPE_2.0X	6.40	1.46	1.01	9%	5%	9%	
Plate	3"x.5"	13.32	3.05	1.12	15%	6%	15%	

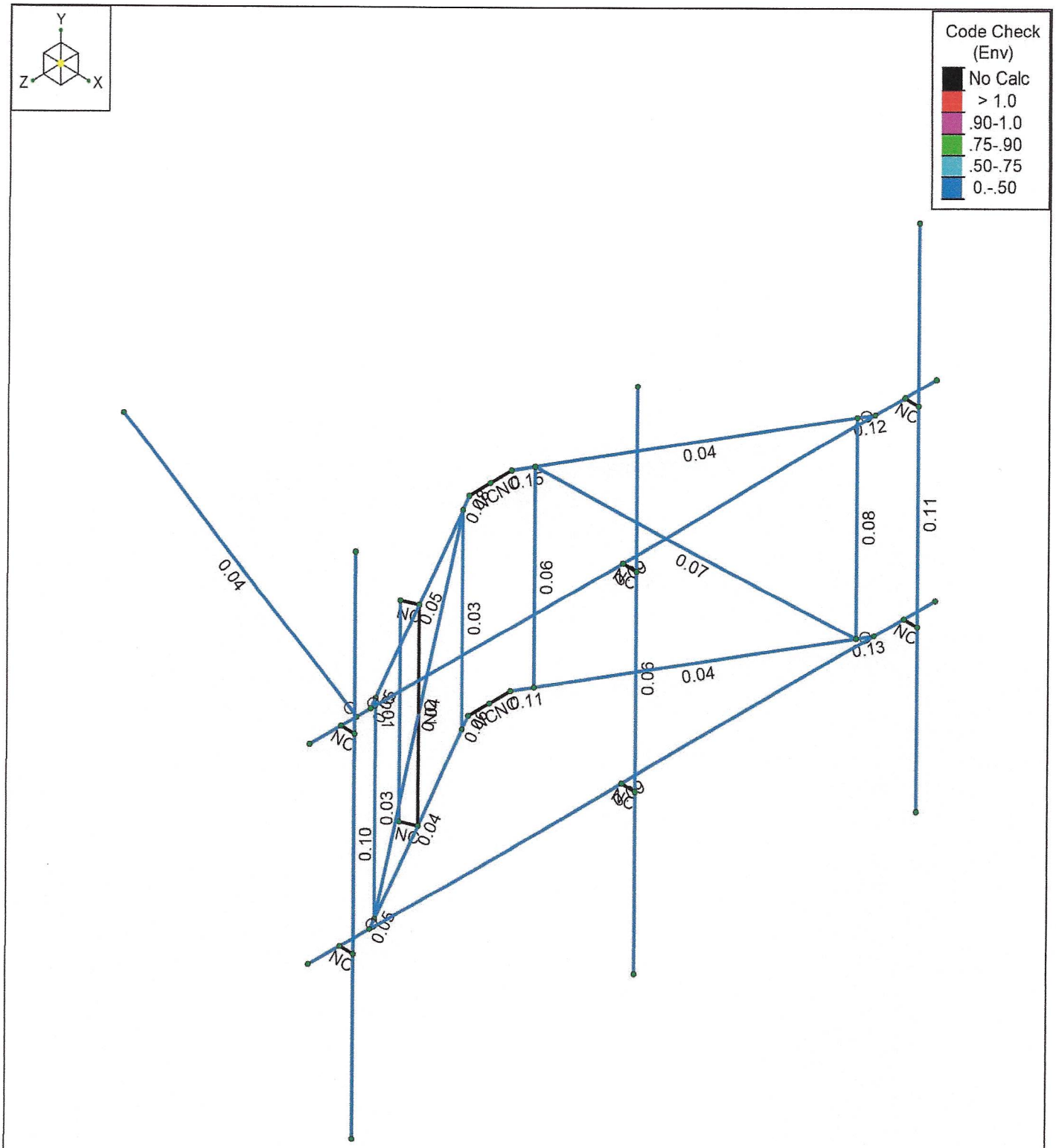


Infinigy Engineering, PLLC	BOBOS00070B	SK-1
DVA		Jul 30, 2021
2039-Z5555C	Proposed Configuration Model	BOBOS00070B.R3D



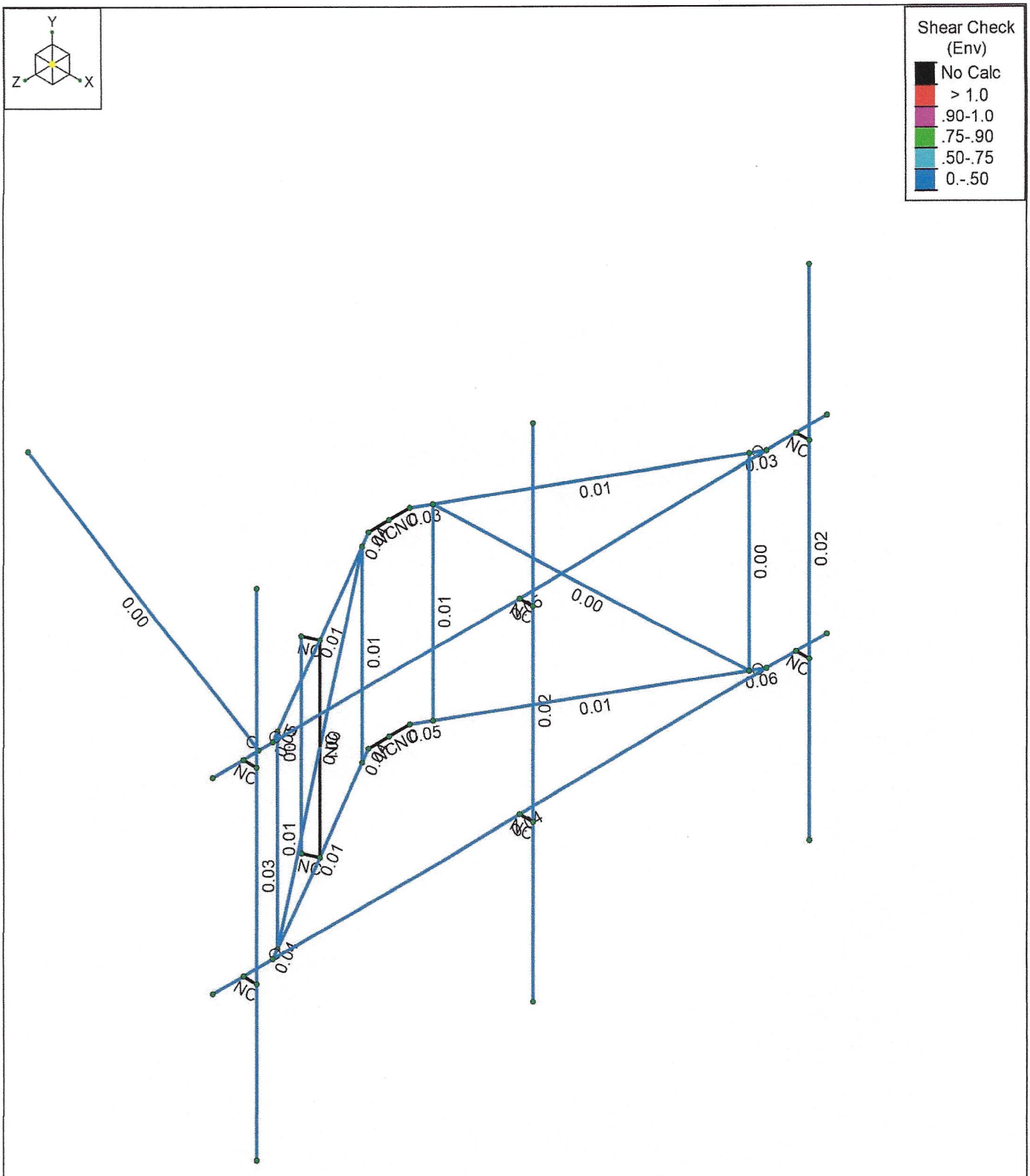
Loads: LC 28, 1.2D + 1.0Di +1.0Wi AZI 30
Envelope Only Solution

Infinigy Engineering, PLLC	BOBOS00070B	SK-2
DVA		Jul 30, 2021
2039-Z5555C	Controlling Load Case	BOBOS00070B.R3D



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Infinigy Engineering, PLLC	BOBOS00070B	SK-3
DVA		Jul 30, 2021
2039-Z5555C	Member Bending Check	BOBOS00070B.R3D



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Infinigy Engineering, PLLC	BOBOS00070B	SK-4
DVA		Jul 30, 2021
2039-Z5555C	Member Shear Check	BOBOS00070B.R3D

Model Settings

Solution

Members

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

Wall Panels

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

Processor Core Utilization

Single	No
Multiple (Optimum)	Yes
Maximum	No

Axis

Vertical Global Axis

Global Axis corresponding to vertical direction	Y
Convert Existing Data	Yes

Default Member Orientation

Default Global Plane for z-axis	XZ

Plate Axis

Plate Local Axis Orientation	Nodal

Codes

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

Concrete

Column Design

Analysis Methodology	Exact Integration Method
Parme Beta Factor	0.65

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

Model Settings (Continued)

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

Rebar

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

Shear Reinforcement

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

Seismic

RISA-3D Seismic Load Options

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

Site Parameters

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

Structure Characteristics

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

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N1	N3		RIGID	None	None	RIGID	Typical
2	M2	N5	N8		Arm	Beam	Pipe	A500 Gr.C	Typical
3	M3	N2	N4		RIGID	None	None	RIGID	Typical
4	M4	N6	N7		Arm	Beam	Pipe	A500 Gr.C	Typical
5	M5	N8	N7		Bracing	VBrace	BAR	A572 Gr.50	Typical
6	M6	N5	N6		Bracing	VBrace	BAR	A572 Gr.50	Typical
7	M7	N6	N8		Bracing	VBrace	BAR	A572 Gr.50	Typical
8	M8	N1	N9		RIGID	None	None	RIGID	Typical
9	M9	N2	N10		RIGID	None	None	RIGID	Typical
10	M10	N16	N12		Frame Rail	Beam	Pipe	A500 Gr.C	Typical
11	M11	N15	N11		Frame Rail	Beam	Pipe	A500 Gr.C	Typical
12	M12	N7	N19	90	Plate	Beam	BAR	A572 Gr.50	Typical
13	M13	N8	N20	90	Plate	Beam	BAR	A572 Gr.50	Typical
14	M14	N4	N6	90	Plate	Beam	BAR	A572 Gr.50	Typical
15	M15	N3	N5	90	Plate	Beam	BAR	A572 Gr.50	Typical
16	M16	N21	N24		Arm	Beam	Pipe	A500 Gr.C	Typical
17	M17	N22	N23		Arm	Beam	Pipe	A500 Gr.C	Typical
18	M18	N24	N23		Bracing	VBrace	BAR	A572 Gr.50	Typical
19	M19	N21	N22		Bracing	VBrace	BAR	A572 Gr.50	Typical
20	M20	N22	N24		Bracing	VBrace	BAR	A572 Gr.50	Typical
21	M21	N23	N25	90	Plate	Beam	BAR	A572 Gr.50	Typical
22	M22	N24	N26	90	Plate	Beam	BAR	A572 Gr.50	Typical
23	M23	N10	N22	90	Plate	Beam	BAR	A572 Gr.50	Typical
24	M24	N9	N21	90	Plate	Beam	BAR	A572 Gr.50	Typical
25	M25	N28	N27		Stabilizer	HBrace	Pipe	A53 Gr.B	Typical
26	M26	N29	N30	24.12	RIGID	None	None	RIGID	Typical
27	M27	N32	N30		RIGID	None	None	RIGID	Typical
28	M28	N29	N31		RIGID	None	None	RIGID	Typical
29	M29	N37	N38		Mount Pipes	Column	Pipe	A53 Gr.B	Typical
30	M30	N41	N42		Mount Pipes	Column	Pipe	A53 Gr.B	Typical
31	M31	N45	N46		Mount Pipes	Column	Pipe	A53 Gr.B	Typical
32	M32	N17	N39		RIGID	None	None	RIGID	Typical
33	M33	N18	N40		RIGID	None	None	RIGID	Typical
34	M34	N34	N44		RIGID	None	None	RIGID	Typical
35	M35	N33	N43		RIGID	None	None	RIGID	Typical
36	M36	N14	N36		RIGID	None	None	RIGID	Typical
37	M37	N13	N35		RIGID	None	None	RIGID	Typical
38	M38	N32	N31		Mount Pipes	Column	Pipe	A53 Gr.B	Typical

Material Take-Off

	Material	Size	Pieces	Length[in]	Weight[K]
1	General Members				
2	RIGID		13	73.3	0
3	Total General		13	73.3	0
4					
5	Hot Rolled Steel				
6	A500 Gr.C	PIPE_2.0X	6	421	0.18
7	A53 Gr.B	PIPE_2.0_HRA_HRA	5	401	0.116
8	A572 Gr.50	0.75" SR	6	259.6	0.033
9	A572 Gr.50	3"x.5"	8	23.2	0.01
10	Total HR Steel		25	1104.9	0.338

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Point	Distributed
1	Self Weight	DL		-1		8	
2	Wind Load AZI 0	WLX				16	80
3	Wind Load AZI 30	None				16	80
4	Wind Load AZI 60	None				16	80
5	Wind Load AZI 90	WLZ				16	80
6	Wind Load AZI 120	None				16	80
7	Wind Load AZI 150	None				16	80
8	Wind Load AZI 180	None				16	80
9	Wind Load AZI 210	None				16	80
10	Wind Load AZI 240	None				16	80
11	Wind Load AZI 270	None				16	80
12	Wind Load AZI 300	None				16	80
13	Wind Load AZI 330	None				16	80
14	Ice Weight	OL1				8	38
15	Ice Wind Load AZI 0	OL2				16	80
16	Ice Wind Load AZI 30	None				16	80
17	Ice Wind Load AZI 60	None				16	80
18	Ice Wind Load AZI 90	OL3				16	80
19	Ice Wind Load AZI 120	None				16	80
20	Ice Wind Load AZI 150	None				16	80
21	Ice Wind Load AZI 180	None				16	80
22	Ice Wind Load AZI 210	None				16	80
23	Ice Wind Load AZI 240	None				16	80
24	Ice Wind Load AZI 270	None				16	80
25	Ice Wind Load AZI 300	None				16	80
26	Ice Wind Load AZI 330	None				16	80
27	Seismic Load X	ELX			-0.089	8	
28	Seismic Load Z	ELZ	-0.089			8	
29	Service Live Loads	LL					
30	Maintenance Load 1	LL				1	
31	Maintenance Load 2	LL				1	
32	Maintenance Load 3	LL				1	
33	Maintenance Load 4	LL				1	
34	Maintenance Load 5	LL				1	
35	Maintenance Load 6	LL				1	

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4DL	Yes	Y	1	1.4				
2	1.2DL + 1.6WL AZI 0	Yes	Y	1	1.2	2	1.6		
3	1.2DL + 1.6WL AZI 30	Yes	Y	1	1.2	3	1.6		
4	1.2DL + 1.6WL AZI 60	Yes	Y	1	1.2	4	1.6		
5	1.2DL + 1.6WL AZI 90	Yes	Y	1	1.2	5	1.6		
6	1.2DL + 1.6WL AZI 120	Yes	Y	1	1.2	6	1.6		
7	1.2DL + 1.6WL AZI 150	Yes	Y	1	1.2	7	1.6		
8	1.2DL + 1.6WL AZI 180	Yes	Y	1	1.2	8	1.6		
9	1.2DL + 1.6WL AZI 210	Yes	Y	1	1.2	9	1.6		
10	1.2DL + 1.6WL AZI 240	Yes	Y	1	1.2	10	1.6		
11	1.2DL + 1.6WL AZI 270	Yes	Y	1	1.2	11	1.6		
12	1.2DL + 1.6WL AZI 300	Yes	Y	1	1.2	12	1.6		
13	1.2DL + 1.6WL AZI 330	Yes	Y	1	1.2	13	1.6		
14	0.9DL + 1.6WL AZI 0	Yes	Y	1	0.9	2	1.6		
15	0.9DL + 1.6WL AZI 30	Yes	Y	1	0.9	3	1.6		
16	0.9DL + 1.6WL AZI 60	Yes	Y	1	0.9	4	1.6		
17	0.9DL + 1.6WL AZI 90	Yes	Y	1	0.9	5	1.6		
18	0.9DL + 1.6WL AZI 120	Yes	Y	1	0.9	6	1.6		
19	0.9DL + 1.6WL AZI 150	Yes	Y	1	0.9	7	1.6		

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
20	0.9DL + 1.6WL AZI 180	Yes	Y	1	0.9	8	1.6		
21	0.9DL + 1.6WL AZI 210	Yes	Y	1	0.9	9	1.6		
22	0.9DL + 1.6WL AZI 240	Yes	Y	1	0.9	10	1.6		
23	0.9DL + 1.6WL AZI 270	Yes	Y	1	0.9	11	1.6		
24	0.9DL + 1.6WL AZI 300	Yes	Y	1	0.9	12	1.6		
25	0.9DL + 1.6WL AZI 330	Yes	Y	1	0.9	13	1.6		
26	1.2D + 1.0Di	Yes	Y	1	1.2	14	1		
27	1.2D + 1.0Di +1.0Wi AZI 0	Yes	Y	1	1.2	14	1	15	1
28	1.2D + 1.0Di +1.0Wi AZI 30	Yes	Y	1	1.2	14	1	16	1
29	1.2D + 1.0Di +1.0Wi AZI 60	Yes	Y	1	1.2	14	1	17	1
30	1.2D + 1.0Di +1.0Wi AZI 90	Yes	Y	1	1.2	14	1	18	1
31	1.2D + 1.0Di +1.0Wi AZI 120	Yes	Y	1	1.2	14	1	19	1
32	1.2D + 1.0Di +1.0Wi AZI 150	Yes	Y	1	1.2	14	1	20	1
33	1.2D + 1.0Di +1.0Wi AZI 180	Yes	Y	1	1.2	14	1	21	1
34	1.2D + 1.0Di +1.0Wi AZI 210	Yes	Y	1	1.2	14	1	22	1
35	1.2D + 1.0Di +1.0Wi AZI 240	Yes	Y	1	1.2	14	1	23	1
36	1.2D + 1.0Di +1.0Wi AZI 270	Yes	Y	1	1.2	14	1	24	1
37	1.2D + 1.0Di +1.0Wi AZI 300	Yes	Y	1	1.2	14	1	25	1
38	1.2D + 1.0Di +1.0Wi AZI 330	Yes	Y	1	1.2	14	1	26	1
39	(1.2 + 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	1.236	27	1	28	
40	(1.2 + 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	1.236	27	0.866	28	0.5
41	(1.2 + 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	1.236	27	0.5	28	0.866
42	(1.2 + 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	1.236	27		28	1
43	(1.2 + 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	1.236	27	-0.5	28	0.866
44	(1.2 + 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	1.236	27	-0.866	28	0.5
45	(1.2 + 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	1.236	27	-1	28	
46	(1.2 + 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	1.236	27	-0.866	28	-0.5
47	(1.2 + 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	1.236	27	-0.5	28	-0.866
48	(1.2 + 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	1.236	27		28	-1
49	(1.2 + 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	1.236	27	0.5	28	-0.866
50	(1.2 + 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	1.236	27	0.866	28	-0.5
51	(0.9 - 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	0.864	27	1	28	
52	(0.9 - 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	0.864	27	0.866	28	0.5
53	(0.9 - 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	0.864	27	0.5	28	0.866
54	(0.9 - 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	0.864	27		28	1
55	(0.9 - 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	0.864	27	-0.5	28	0.866
56	(0.9 - 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	0.864	27	-0.866	28	0.5
57	(0.9 - 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	0.864	27	-1	28	
58	(0.9 - 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	0.864	27	-0.866	28	-0.5
59	(0.9 - 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	0.864	27	-0.5	28	-0.866
60	(0.9 - 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	0.864	27		28	-1
61	(0.9 - 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	0.864	27	0.5	28	-0.866
62	(0.9 - 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	0.864	27	0.866	28	-0.5
63	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 0	Yes	Y	1	1	2	0.082	29	1.5
64	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 30	Yes	Y	1	1	3	0.082	29	1.5
65	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 60	Yes	Y	1	1	4	0.082	29	1.5
66	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 90	Yes	Y	1	1	5	0.082	29	1.5
67	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 120	Yes	Y	1	1	6	0.082	29	1.5
68	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 150	Yes	Y	1	1	7	0.082	29	1.5
69	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 180	Yes	Y	1	1	8	0.082	29	1.5
70	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 210	Yes	Y	1	1	9	0.082	29	1.5
71	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 240	Yes	Y	1	1	10	0.082	29	1.5
72	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 270	Yes	Y	1	1	11	0.082	29	1.5
73	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 300	Yes	Y	1	1	12	0.082	29	1.5
74	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 330	Yes	Y	1	1	13	0.082	29	1.5
75	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	34	1.5	2	0.132
76	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	34	1.5	3	0.132
77	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	34	1.5	4	0.132

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
78	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	34	1.5	5	0.132
79	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	34	1.5	6	0.132
80	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	34	1.5	7	0.132
81	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	34	1.5	8	0.132
82	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	34	1.5	9	0.132
83	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	34	1.5	10	0.132
84	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	34	1.5	11	0.132
85	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	34	1.5	12	0.132
86	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	34	1.5	13	0.132
87	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	35	1.5	2	0.132
88	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	35	1.5	3	0.132
89	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	35	1.5	4	0.132
90	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	35	1.5	5	0.132
91	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	35	1.5	6	0.132
92	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	35	1.5	7	0.132
93	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	35	1.5	8	0.132
94	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	35	1.5	9	0.132
95	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	35	1.5	10	0.132
96	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	35	1.5	11	0.132
97	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	35	1.5	12	0.132
98	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	35	1.5	13	0.132
99	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	36	1.5	2	0.132
100	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	36	1.5	3	0.132
101	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	36	1.5	4	0.132
102	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	36	1.5	5	0.132
103	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	36	1.5	6	0.132
104	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	36	1.5	7	0.132
105	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	36	1.5	8	0.132
106	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	36	1.5	9	0.132
107	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	36	1.5	10	0.132
108	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	36	1.5	11	0.132
109	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	36	1.5	12	0.132
110	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	36	1.5	13	0.132
111	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	37	1.5	2	0.132
112	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	37	1.5	3	0.132
113	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	37	1.5	4	0.132
114	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	37	1.5	5	0.132
115	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	37	1.5	6	0.132
116	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	37	1.5	7	0.132
117	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	37	1.5	8	0.132
118	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	37	1.5	9	0.132
119	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	37	1.5	10	0.132
120	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	37	1.5	11	0.132
121	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	37	1.5	12	0.132
122	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	37	1.5	13	0.132
123	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	38	1.5	2	0.132
124	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	38	1.5	3	0.132
125	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	38	1.5	4	0.132
126	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	38	1.5	5	0.132
127	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	38	1.5	6	0.132
128	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	38	1.5	7	0.132
129	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	38	1.5	8	0.132
130	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	38	1.5	9	0.132
131	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	38	1.5	10	0.132
132	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	38	1.5	11	0.132
133	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	38	1.5	12	0.132
134	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	38	1.5	13	0.132
135	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	39	1.5	2	0.132

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
136	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	39	1.5	3	0.132
137	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	39	1.5	4	0.132
138	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	39	1.5	5	0.132
139	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	39	1.5	6	0.132
140	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	39	1.5	7	0.132
141	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	39	1.5	8	0.132
142	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	39	1.5	9	0.132
143	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	39	1.5	10	0.132
144	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	39	1.5	11	0.132
145	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	39	1.5	12	0.132
146	1.2DL + 1.5LM6 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	39	1.5	13	0.132

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-in]	LC	MY [lb-in]	LC	MZ [lb-in]	LC
1	N2	max	695.469	15	741.615	38	900.394	89	2061.433	95	0	146	706.919	82
2		min	-1411.72	9	281.896	19	-379.092	24	-4.281	16	0	1	181.024	15
3	N1	max	939.198	2	484.542	32	124.357	18	1293.899	94	0	146	477.619	86
4		min	-222.574	20	180.221	25	-882.278	97	-197.224	15	0	1	132.856	19
5	N28	max	485.909	9	18.017	28	176.272	9	0	146	0	146	0	146
6		min	-486.393	3	9.624	57	-176.354	3	0	1	0	1	0	1
7	Totals:	max	1171.344	14	1238.777	34	788.023	6						
8		min	-1171.345	8	487.001	51	-854.872	24						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-in]	phi*Mn z-z [lb-in]	Cb	Eqn
1	M14	3"x.5"	0.149	0	28	0.027	0.863	y	6	64929.826	67500	8460	50625	1.036	H1-1b
2	M13	3"x.5"	0.129	0	32	0.06	2.5	y	3	66023.816	67500	8460	50625	1.673	H1-1b
3	M12	3"x.5"	0.12	0	98	0.033	2.5	y	8	66023.816	67500	8460	50625	1.67	H1-1b
4	M29	PIPE_2.0_HRA_HRA	0.107	30	87	0.022	66		2	14916.096	32130	22459.5	22459.5	2.475	H1-1b
5	M15	3"x.5"	0.105	0	34	0.046	0	y	3	64929.826	67500	8460	50625	1.034	H1-1b
6	M30	PIPE_2.0_HRA_HRA	0.095	66	77	0.029	66		3	14916.096	32130	22459.5	22459.5	3	H1-1b
7	M10	PIPE_2.0X	0.086	60	77	0.037	108.75		3	12974.268	57960	39909.6	39909.6	1.865	H1-1b
8	M11	PIPE_2.0X	0.085	60	81	0.047	11.25		9	12974.268	57960	39909.6	39909.6	1.894	H1-1b
9	M5	0.75" SR	0.081	0	98	0.004	36		9	5691.919	19890	3072	3072	1.758	H1-1b*
10	M23	3"x.5"	0.078	0	32	0.042	0	y	3	64929.826	67500	8460	50625	1.052	H1-1b
11	M7	0.75" SR	0.073	0	34	0.002	57.824		13	2206.248	19890	3072	3072	2.627	H1-1b*
12	M24	3"x.5"	0.065	0	38	0.043	3.313	y	3	64929.826	67500	8460	50625	1.052	H1-1b
13	M31	PIPE_2.0_HRA_HRA	0.064	66	3	0.024	66		3	14916.096	32130	22459.5	22459.5	1.748	H1-1b
14	M6	0.75" SR	0.063	0	33	0.008	0		3	5691.919	19890	3072	3072	2.799	H1-1b*
15	M22	3"x.5"	0.055	0	81	0.04	0	y	85	66023.816	67500	8460	50625	1.659	H1-1b
16	M17	PIPE_2.0X	0.049	22.625	3	0.011	0		3	45905.544	57960	39909.6	39909.6	1.348	H1-1b
17	M21	3"x.5"	0.046	0	3	0.046	0	y	82	66023.816	67500	8460	50625	1.703	H1-1b
18	M16	PIPE_2.0X	0.043	22.625	9	0.011	0		6	45905.544	57960	39909.6	39909.6	1.374	H1-1b
19	M25	PIPE_2.0_HRA_HRA	0.04	38.498	12	0.004	76.996		12	19612.716	32130	22459.5	22459.5	1.136	H1-1b
20	M20	0.75" SR	0.039	0	6	0.003	57.824		3	2206.248	19890	3072	3072	2.196	H1-1b
21	M2	PIPE_2.0X	0.037	45.25	32	0.01	45.25		3	45905.544	57960	39909.6	39909.6	2.439	H1-1b
22	M4	PIPE_2.0X	0.035	0	3	0.006	45.25		80	45905.544	57960	39909.6	39909.6	2.333	H1-1b
23	M18	0.75" SR	0.03	0	76	0.007	0		9	5691.919	19890	3072	3072	2.246	H1-1b*
24	M19	0.75" SR	0.027	0	4	0.008	0		3	5691.919	19890	3072	3072	2.532	H1-1b
25	M38	PIPE_2.0_HRA_HRA	0.01	36	7	0.004	36		13	28843.414	32130	22459.5	22459.5	2.543	H1-1b

INFINIGY

FROM ZERO TO INFINIGY

the solutions are endless

BOLT CONNECTION CALCULATION

BOLT PROPERTIES

Date:	7/30/2021
Site:	*BOBOS00070B*
Engineer:	*DVA*
Project No:	*2039-Z5555C*
Connection Location:	*Arm to Tower*

Bolt Capacity Equation	TIA-222-G	
Connection Type	Steel	
Bolt Size, **d**	1/2	in
Threads per Inch, **n**	13	
Steel Grade	A307	
Bolt Ultimate Tensile Stress, F_u	60	ksi
Threads Exclusion	N	
Shear Plane	1	

Net Bolt Cross-Sectional Area, **An**	0.142	in^2
Gross Bolt Cross-Sectional Area, **Ag**	0.196	in^2
Tensile Steel Strength (per bolt), φR_{nt}	6385	lbs
Shear Steel Strength (per bolt), φR_{nv}	3976	lbs

INFINIGY

FROM ZERO TO INFINIGY

the solutions are endless

BOLT CONNECTION CALCULATION

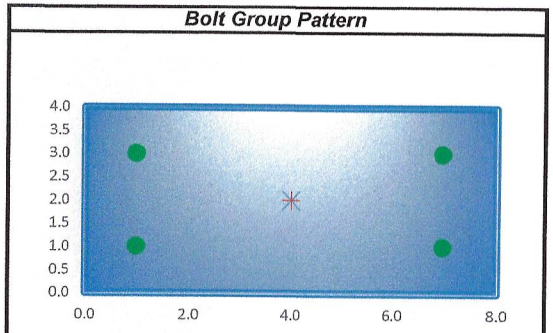
BOLT GROUP CHECK

Date:	*7/30/2021*
Contractor:	*Infinigy Engineering, PLLC*
Site:	*BOBOS00070B*
Engineer:	*DVA*
Project No:	*2039-Z5555C*
Connection Location:	*Arm to Tower*

Loads Properties					
Controlling LC:	34				
Load Point Number:	N2				
X-Coordinate (in.)	4.00				
Y-Coordinate (in.)	2.00				
Z-Coordinate (in.)	0.00				
Shear Load, Px (lbs)	-1410.000	0	0	0	0
Shear Load, Py (lbs)	-1195.000	0	0	0	0
Axial Load, Pz (lbs)	-598.000	0	0	0	0
Moment, Mx (lb-in)	-187.000	0	0	0	0
Moment, My (lb-in)	0.000	0	0	0	0
Moment, Mz (lb-in)	-1306.000	0	0	0	0

Member Properties	***X***	***Y***
Start Coordinates:	0.0	0.0
Dimentions:	8.0	4.0

Bolt Group Pattern



Number of Bolts: 4

		Bolt Coordinates		***Bolt Loads***			***Steel Bolt Usage***		
No.	***Bolt Type***	***Xo (in)***	***Yo (in)***	***Axial (lbs)***	***Shear (lbs)***	***Tension***	***Shear***	***Combined***	***Max. Capacity***
1	Main Type	1.00	1.00	-102.75	509.58	0.0%	12.8%	12.8%	12.8%
2	Main Type	7.00	3.00	-196.25	434.35	0.0%	10.9%	10.9%	10.9%
3	Main Type	1.00	3.0	-196.25	552.91	0.0%	13.9%	13.9%	13.9%
4	Main Type	7.00	1.0	-102.75	377.66	0.0%	9.5%	9.5%	9.5%

Bolt Group Properties:

Xc =	4.00	in.
Yc =	2.00	in.
Ic.y =	7.07	in.^2
Ic.x =	0.79	in.^2
Ic.xy =	7.85	in.^2

Loads at Center of Gravity of Bolt Group:

Pz =	-598.00	lbs
Px =	-1410.00	lbs
Py =	-1195.00	lbs
Mx =	-187.00	lb-in
My =	0.00	lb-in
Mz =	-1306.00	lb-in

Total Capacity of Bolt Group: 13.9%

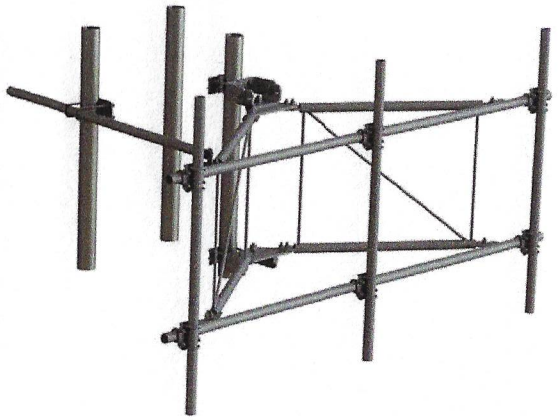
U-bolt Connection: No

dish wireless

Sabre Industries™

THD 10' V-Boom Assembly with Tieback (Tier 1, 2, 3)

C10837002C



Sector Frame Option 2- This is a secondary approved mount if the primary is not available

- **C10837002C-32788 V-Boom Sector Frame**
- 10' THD V-Boom Sector Mount with Tieback
- Face Width = 10', Stiff Arm = 1
- Includes (3) 2-7/8" OD x 8' Antenna
- Mounting Pipes and all associated hardware
- Kit weight – 610 lbs

 | Wednesday, March 11th, 2020

Exhibit F

Power Density/RF Emissions Report

Fox Hill Telecom

Radio Frequency Emissions Analysis Report

Site ID: BOBOS00070B

Norwich CDT
2 Hinkley Road
Norwich, CT 06365

October 11, 2021

Fox Hill Telecom Project Number: 210620

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**23.65 %**

Fox Hill Telecom

October 11, 2021

Dish Wireless
5701 South Santa Fe Drive
Littleton, CO 80120

Emissions Analysis for Site: **BOBOS00070B – Norwich CDT**

Fox Hill Telecom, Inc ("Fox Hill") was directed to analyze the proposed radio installation for Dish Wireless, LLC (Dish) facility located at **2 Hinkley Road, Norwich, 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 limits for the 600 MHz & 700 MHz bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) 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 radio system installation for **Dish** on the subject site located at **2 Hinkley Road, Norwich, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since **Dish** is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each 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	600 MHz	4	61.5
5G	1900 MHz (PCS)	4	40
5G	2100 MHz (AWS)	4	40

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 600 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	JMA MX08FRO665-21	105
B	1	JMA MX08FRO665-21	105
C	1	JMA MX08FRO665-21	105

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	600 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	11.45 / 16.15 / 16.65	12	566	17,426.72	8.28
						Sector A Composite MPE%	**8.28**
Antenna B1	JMA MX08FRO665-21	600 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	11.45 / 16.15 / 16.65	12	566	17,426.72	8.28
						Sector B Composite MPE%	**8.28**
Antenna C1	JMA MX08FRO665-21	600 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	11.45 / 16.15 / 16.65	12	566	17,426.72	8.28
						Sector C Composite MPE%	**8.28**

Table 3: Dish Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum **Dish** MPE 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 MPE 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 MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
Dish – Max Per Sector Value	**8.28 %**
Sprint	2.74 %
T-Mobile	3.38 %
Verizon Wireless	0.43 %
AT&T	8.44 %
TSR Paging	0.20 %
Aquis Paging	0.18 %
Site Total MPE %:	**23.65 %**

Table 4: All Carrier MPE Contributions

Dish Sector A Total:	8.28 %
Dish Sector B Total:	8.28 %
Dish Sector C Total:	8.28 %
Site Total:	23.65 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *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, 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 600 MHz 5G	4	858.77	105	12.60	600 MHz	400	3.15%
Dish 1900 MHz (PCS) 5G	4	1,648.39	105	24.19	1900 MHz (PCS)	1000	2.42%
Dish 2100 MHz (AWS) 5G	4	1,849.52	105	27.14	2100 MHz (AWS)	1000	2.71%
						Total:	8.28%

Table 6: Dish Maximum Sector MPE Power Values

Fox Hill Telecom

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:	8.28 %
Sector B:	8.28 %
Sector C:	8.28 %
Dish Maximum Total (per sector):	8.28 %
Site Total:	23.65 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **23.65 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Scott Heffernan
Principal RF Engineer
Fox Hill Telecom, Inc
Holden, MA 01520
(978)660-3998

Exhibit G

Letter of Authorization

LETTER OF AUTHORIZATION

I, Michael Ashley Culbert, the owner representative for the telecommunications tower located at 2 Hinckley Rd, Preston, New London County, Connecticut, as evidenced by the Easement Agreement recorded with the Norwich, Connecticut Recorder of Deeds on 8/26/2021, Instrument Number 2019001512.

As owner of the above-referenced telecommunications tower, I 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 Wireless L.L.C.'s antennas and ancillary equipment on the subject tower and base station equipment on the ground on our leasehold property.

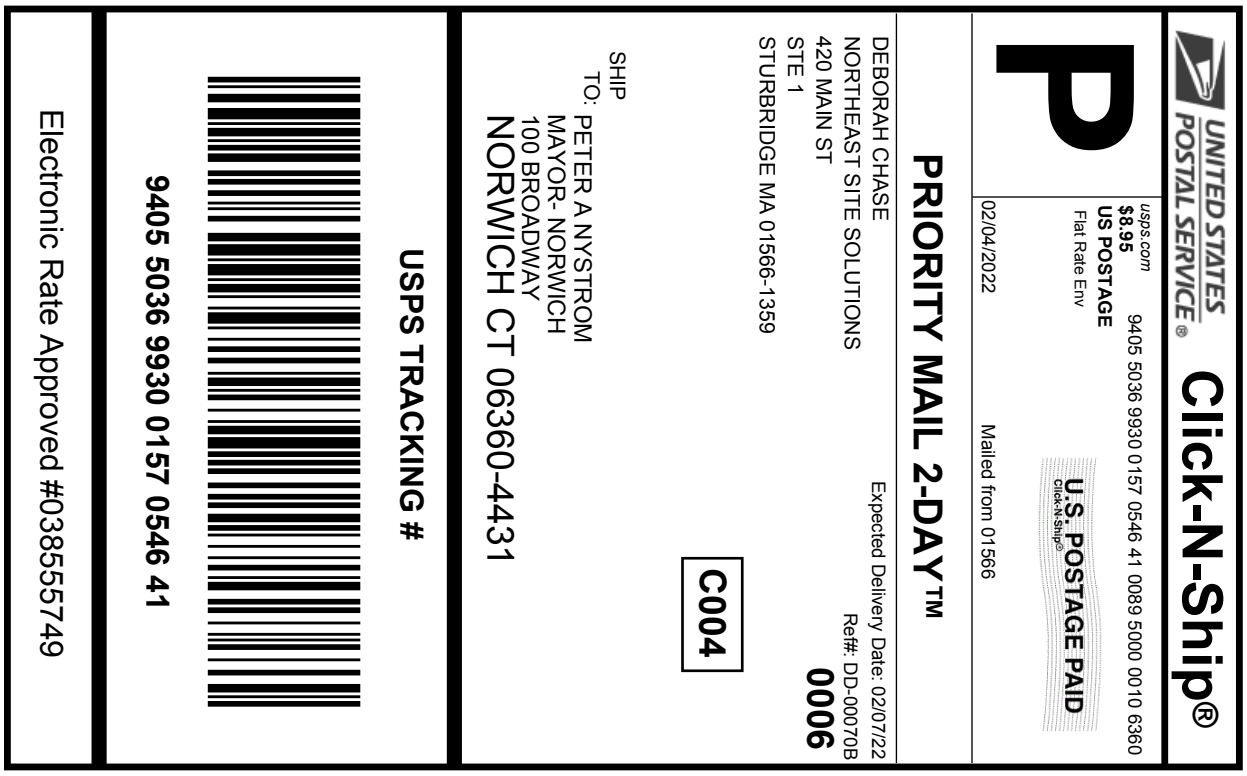
EIP Holdings II, LLC

Michael Ashley Culbert

Michael Ashley Culbert
Vice President of Site Development
Date: December 21, 2021

Exhibit H

Recipient Mailings



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NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: DD-00070B

To: PETER A NYSTROM
MAYOR- NORWICH
100 BROADWAY
NORWICH CT 06360-4431

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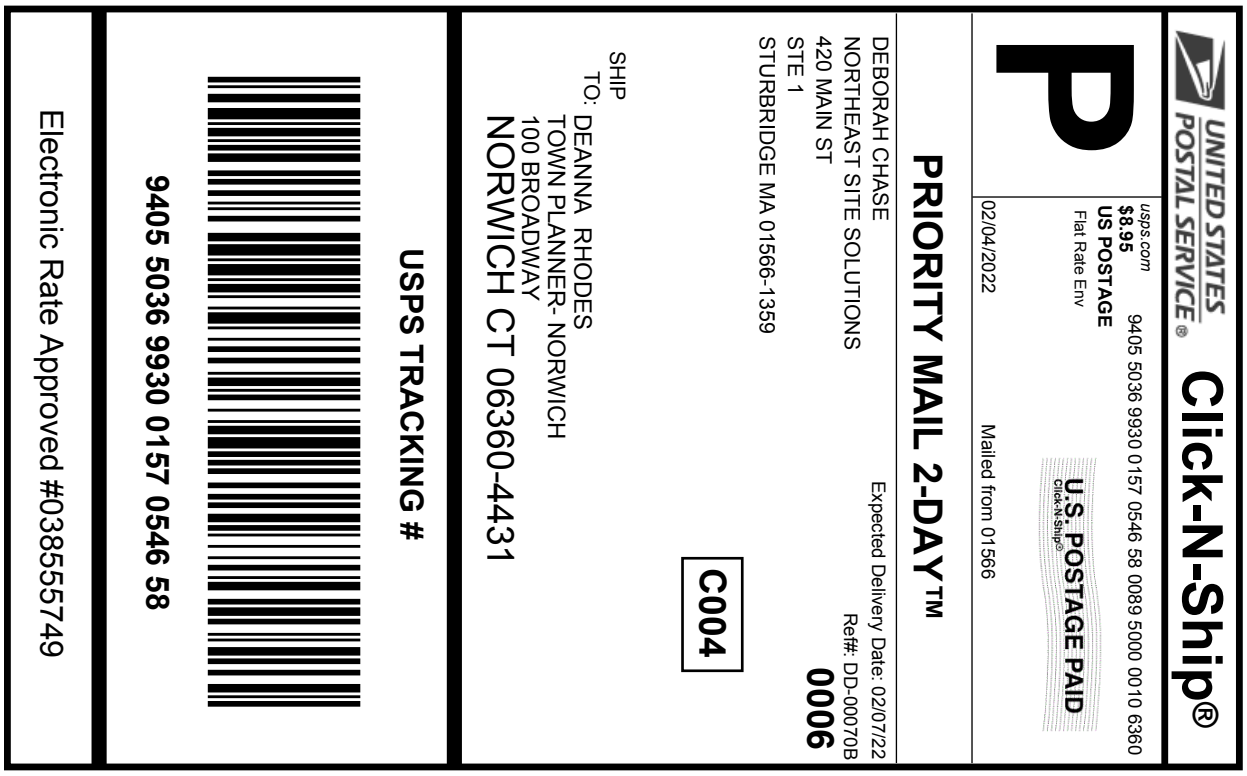

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Ship Date:	02/04/2022
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NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: DD-00070B

To: DEANNA RHODES
TOWN PLANNER- NORWICH
100 BROADWAY
NORWICH CT 06360-4431

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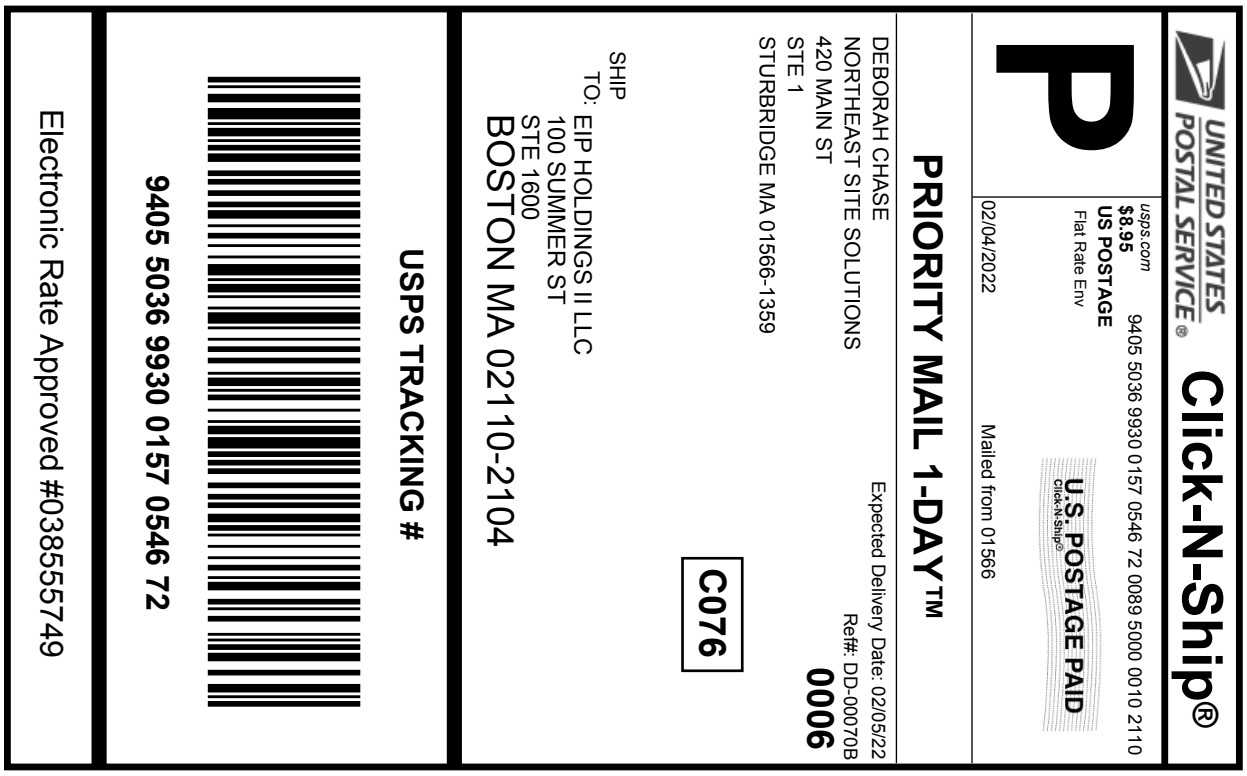

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Ship Date:	02/04/2022
Expected Delivery Date:	02/05/2022

Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

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

Ref#: DD-00070B

To: EIP HOLDINGS II LLC
100 SUMMER ST
STE 1600
BOSTON MA 02110-2104

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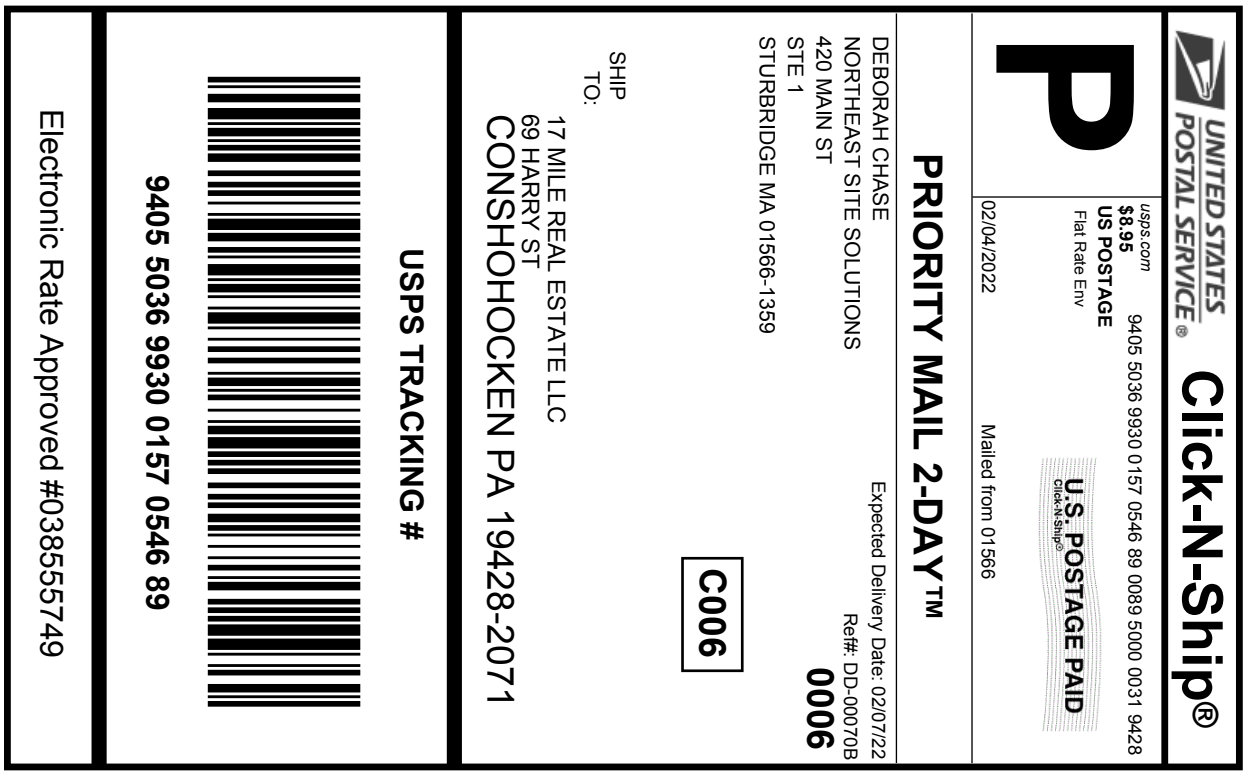

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Ship Date:	02/04/2022
Expected Delivery Date:	02/07/2022

Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

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

Ref#: DD-00070B

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

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