STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

September 6, 2022

David Hoogasian
Project Manager
Network Building + Consulting, LLC
100 Apollo Drive, Suite 303
Chelmsford, MA 01824
dhoogasian@nbcllc.com

RE: **TS-DISH-117-220427 –** Dish Wireless, LLC request for an order to approve tower sharing at an existing telecommunications facility located at 100 Old Redding Road, Redding, Connecticut.

Dear Mr. Hoogasian:

The Connecticut Siting Council (Council) is in receipt of your correspondence of August 30, 2022 submitted in response to the Council's May 23, 2022 notification of an incomplete request for tower sharing with regard to the above-referenced matter.

The submission renders the request for tower sharing complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/IN/emr

From: David Hoogasian <dhoogasian@nbcllc.com>
Sent: Tuesday, August 30, 2022 4:11 PM
To: Robidoux, Evan <Evan.Robidoux@ct.gov>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: RE: Council 2nd Extension Letter for TS-DISH-117-220427 (100 Old Redding Road, Redding)

Good afternoon.

Apologies for the delay. Please accept this supplemental package for the above referenced DISH Tower Share Request. If you have any questions or comments please do not hesitate to contact me.

Thank you,

David Hoogasian
Project Manager

NETWORK BUILDING + CONSULTING
100 Apollo Drive | Suite 303 | Chelmsford, MA | 01824
M 508.344.3343

VIA ELECTRONIC MAIL

August 30, 2022

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

RE: TS-DISH-117-220427 - Dish Wireless LLC ("DISH") request for an order to approve tower sharing at an existing telecommunications facility located at 100 Old Redding Road, Redding, Connecticut.

Dear Ms. Bachman:

To supplement the above referenced Tower Share Request, enclosed please find the following four (4) documents to support a proposed antenna mounting height of 162'.

- Construction Drawings
- Structural Analysis
- Mount Analysis
- Radio Frequency Emissions Compliance Report

If you have any questions or need any additional information, please do not hesitate to contact me.

Sincerely,

David Hoogasian

David Hoogasian
Project Manager
M 508.344.3343
dhoogasian@nbcllc.com

DISH Wireless L.L.C. SITE ID:

NJJER01161A

DISH Wireless L.L.C. SITE ADDRESS:

100 OLD REDDING ROAD
REDDING, CT 06896

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

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:
- REMOVE ALL MOUNTS, ANTENNAS, PERIPHERALS AND CABLES @ 166.8' RAD CENTER
- REMOVE ALL MOUNTS, ANTENNAS, PERIPHERALS AND CABLES @ 156.1' RAD CENTER
- 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 FIBER NID (IF REQUIRED)
- INSTALL (1) PROPOSED METER SOCKET

NOTE: THE SCOPE OF THIS PROJECT DOES NOT INCLUDE MODIFICATIONS TO THE TOWER STRUCTURE OR FOUNDATION. A SEPARATE BUILDING PERMIT APPLICATION WILL BE SUBMITTED FOR ANY TOWER MODIFICATIONS.

SITE INFORMATION

PROPERTY OWNER:	KAUFMAN ROBERT J
ADDRESS:	100 OLD REDDING ROAD REDDING, CT 06896
TOWER TYPE:	SELF-SUPPORT TOWER
TOWER CO SITE ID:	302522
TOWER APP NUMBER:	13699598
COUNTY:	FAIRFIELD
LATITUDE (NAD 83):	41° 17' 13.50" N 41.28708333
LONGITUDE (NAD 83):	73° 26' 17.52" W -73.4381999999
ZONING JURISDICTION:	CONNECTICUT SITING COUNCIL
ZONING DISTRICT:	UNZONE
PARCEL NUMBER:	35-46
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	II-B
POWER COMPANY:	UNITED ILLUMINATING
TELEPHONE COMPANY:	FRONTIER COMMUNICATIONS

PROJECT DIRECTORY

APPLICANT:	DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	AMERICAN TOWER CORPORATION 10 PRESIDENTIAL WAY WOBURN, MA 01801 (781) 926-4500
SITE DESIGNER:	B+T GROUP 1717 S. BOULDER AVE, SUITE 300 TULSA, OK 74119 (918) 587-4630
SITE ACQUISITION:	WILLIAM SNIDER WILLIAM.SNIDER@DISH.COM
CONST.N MANAGER:	MICHAEL NARDUCCI MICHAEL.NARDUCCI@DISH.COM
RF ENGINEER:	MURUGABIRAN JAYAPAL MURUGABIRAN.JAYAPAL@DISH.COM

CONNECTICUT CODE COMPLIANCE

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

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

SITE PHOTO

DIRECTIONS

DIRECTIONS FROM 3 ADP BLVD, ROSELAND NJ, 07068:

TURN RIGHT ONTO CR-527 (LIVINGSTON AVE.), TAKE RAMP BEARING RIGHT ONTO I-280 (I-280 E), AT EXIT 17B STAY ON I-280 N (I-95/NJ TURNPIKE), TAKE RAMP ONTO I-95, STAY ON I-95 N, AT EXIT 73, STAY ON I-95 (NJ TURNPIKE E), STAY ON I-95 (US-1 E), AT EXIT 16, STAY ON I-95 (NEW ENGLAND THROUGHWAY), STAY ON I-95 (NEW ENGLAND THROUGHWAY N-E), TURN RIGHT ONTO EXIT 15 RAMP (RD. NAME CHANGES TO US-7), TURN RIGHT (EAST) ONTO US-7 (GRIST MILL RD), TURN LEFT ONTO US-7 (MAIN AVE), TURN LEFT ONTO US-7 (CT-33), TURN RIGHT ONTO OLD REDDING RD. ARRIVE AT 100 OLD REDDING RD, REDDING CT 06896. (NJJER01161A)

VICINITY MAP

NO SCALE

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
A-7	STIFF ARM LOCATION DETAIL
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

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

CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

GENERAL NOTES

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

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

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

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

AMERICAN TOWER
10 PRESIDENTIAL WAY
WOBURN, MA 01801

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

STATE OF CONNECTICUT
CHAD TYLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER

7/18/22

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/1/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
KAS	YMK	GLS

RFDS REV #: 1.0

CONSTRUCTION DOCUMENTS

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4	7/18/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

153701.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01161A
100 OLD REDDING ROAD
REDDING, CT 06896

SHEET TITLE

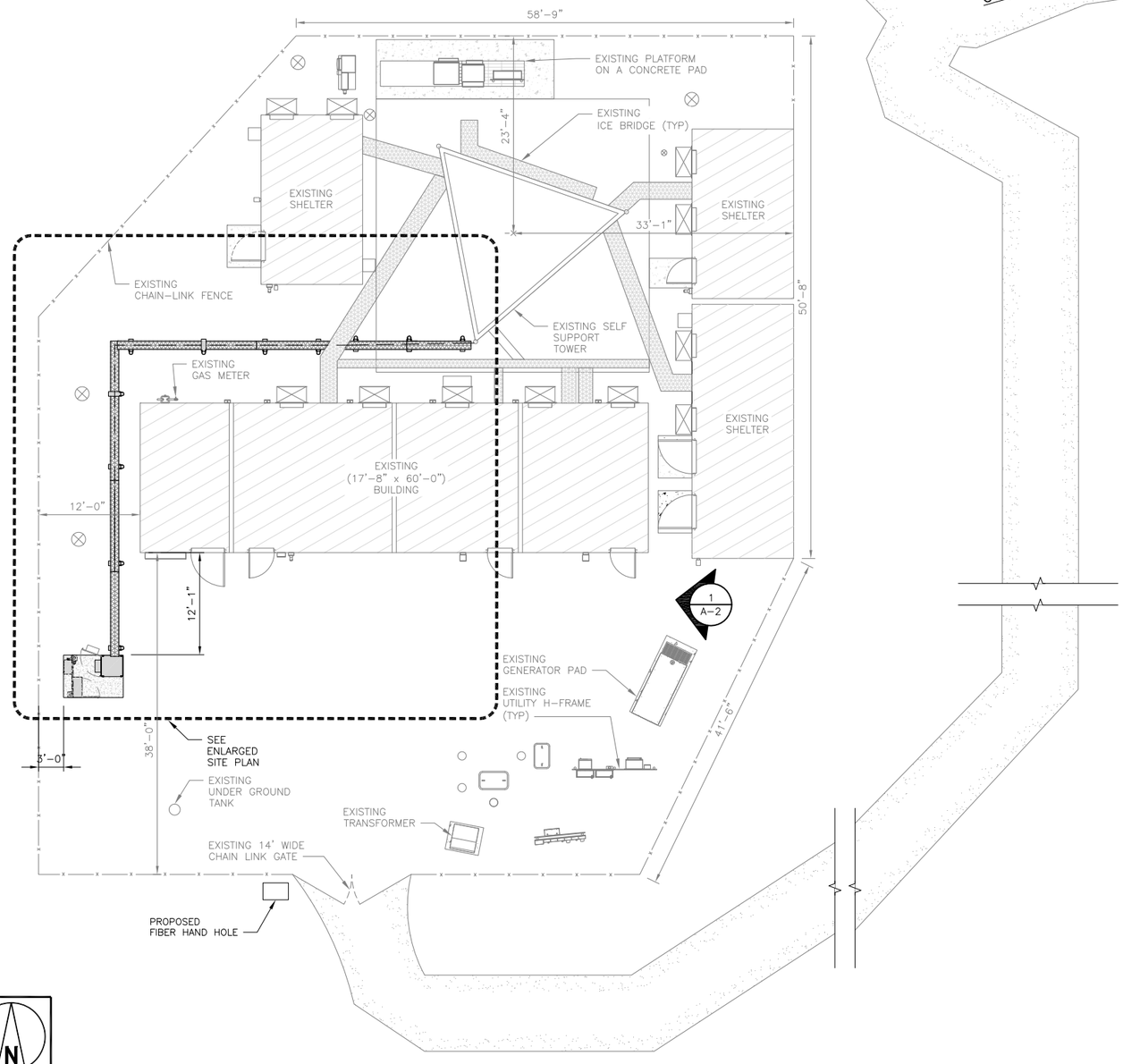
TITLE SHEET

SHEET NUMBER

T-1

NOTES

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



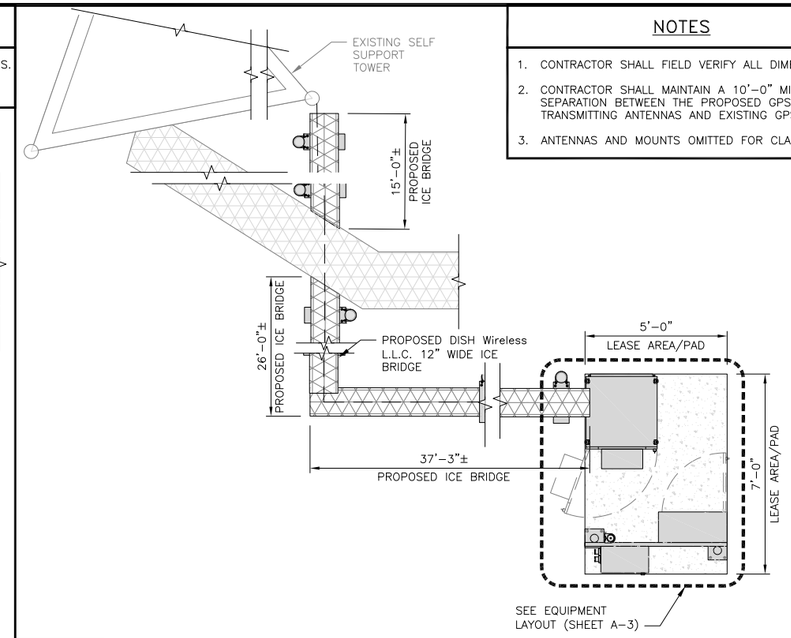
OVERALL SITE PLAN

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.



ENLARGED SITE PLAN

12" 6" 0 1' 2' 3' 4' 5' 6' 7'
3/8"=1'-0"

2

AN EXISTING CONDITIONS SURVEY WAS NOT AVAILABLE AT THE TIME THIS DRAWING'S CREATIONS.

AERIAL IMAGE

NO SCALE

3

dish wireless.

5701 SOUTH SANTA FE DRIVE
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DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01161A
100 OLD REDDING ROAD
REDDING, CT 06896

SHEET TITLE

OVERALL AND ENLARGED SITE PLAN

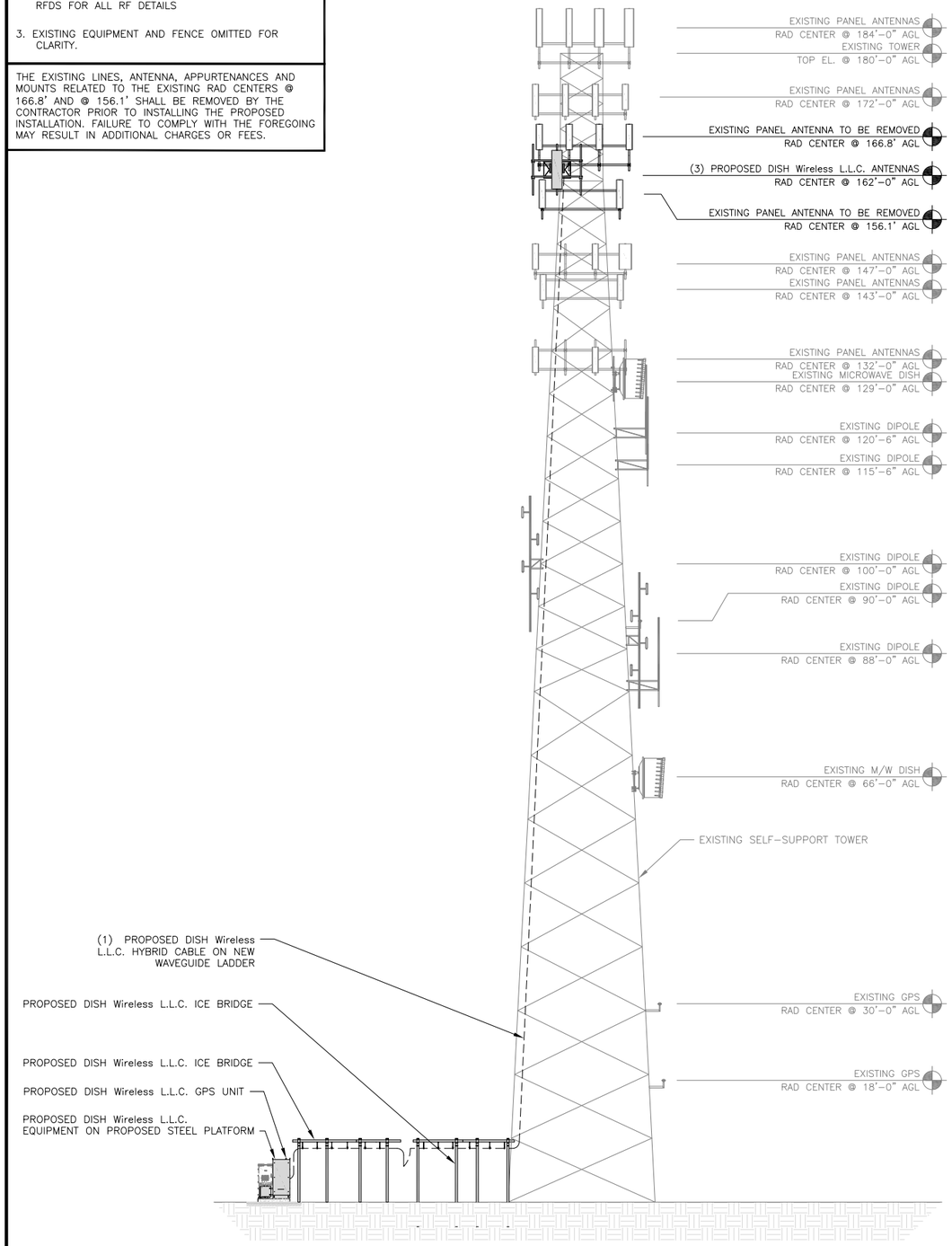
SHEET NUMBER

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.

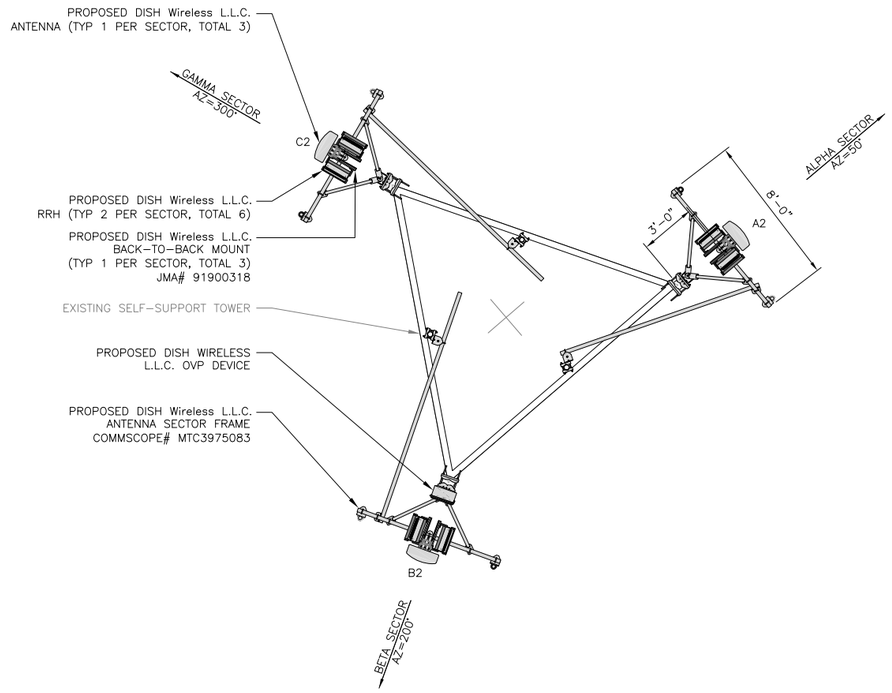
THE EXISTING LINES, ANTENNA, APPURTENANCES AND MOUNTS RELATED TO THE EXISTING RAD CENTERS @ 166.8' AND @ 156.1' SHALL BE REMOVED BY THE CONTRACTOR PRIOR TO INSTALLING THE PROPOSED INSTALLATION. FAILURE TO COMPLY WITH THE FOREGOING MAY RESULT IN ADDITIONAL CHARGES OR FEES.



PROPOSED EAST ELEVATION

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

1



AZIMUTHS ARE TENTATIVE, NEED TO CONFIRM BEFORE CONSTRUCTION STARTS

WIDTH OF TOWER FACE IS NOT TO BE CONSIDERED TO SCALE

ANTENNA LAYOUT

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

2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A2	PROPOSED	COMMSCOPE – FFVV-65B-R2	5G	72.0" x 20.0"	50°	162'-0"	(1) HIGH-CAPACITY HYBRID CABLE (280' LONG)
BETA	B2	PROPOSED	COMMSCOPE – FFVV-65B-R2	5G	72.0" x 20.0"	200°	162'-0"	
GAMMA	C2	PROPOSED	COMMSCOPE – FFVV-65B-R2	5G	72.0" x 20.0"	300°	162'-0"	

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

NOTES

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

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

ANTENNA SCHEDULE

NO SCALE

3

dish wireless.

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RFDS REV #: 1.0

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A&E PROJECT NUMBER

153701.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

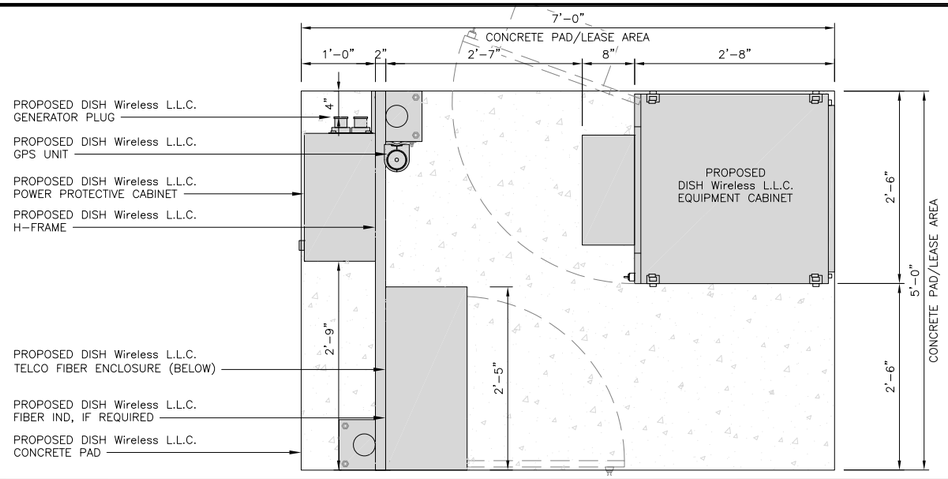
NJJER01161A
100 OLD REDDING ROAD
REDDING, CT 06896

SHEET TITLE

ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER

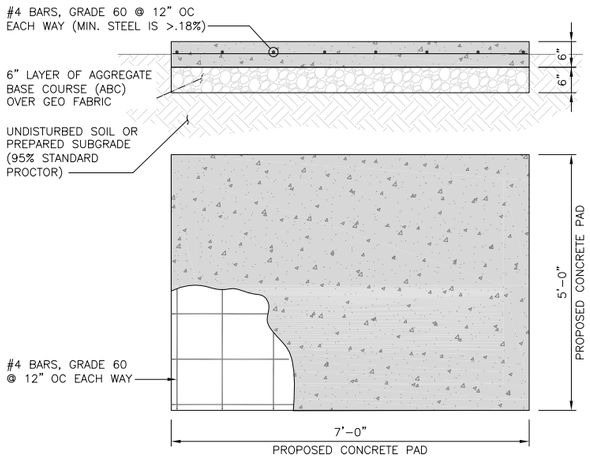
A-2



EQUIPMENT PLAN

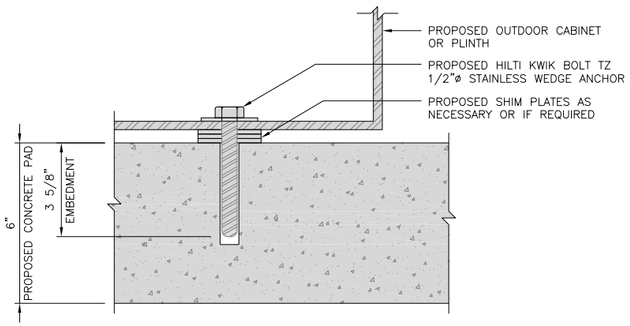
12" 9" 6" 3" 0 1' 2"
1"=1'-0"

1



TYPICAL CONCRETE PAD DETAIL

2A

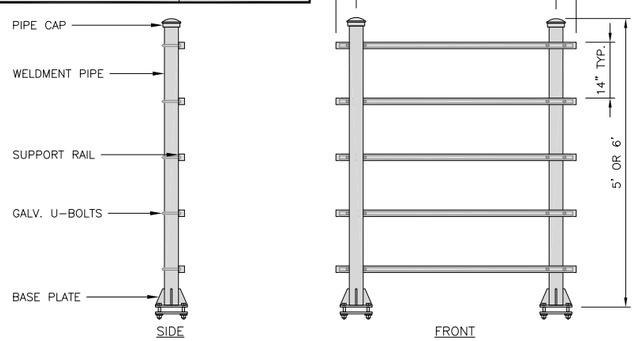


TYPICAL OUTDOOR EQUIPMENT TO CONCRETE SLAB ANCHORAGE

2B

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

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

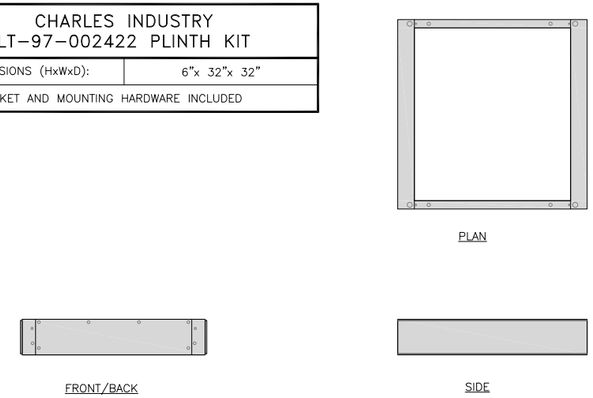


H-FRAME DETAIL

NO SCALE

3

CHARLES INDUSTRY LT-97-002422 PLINTH KIT	
DIMENSIONS (HxWxD):	6"x 32"x 32"
NOTE: GASKET AND MOUNTING HARDWARE INCLUDED	



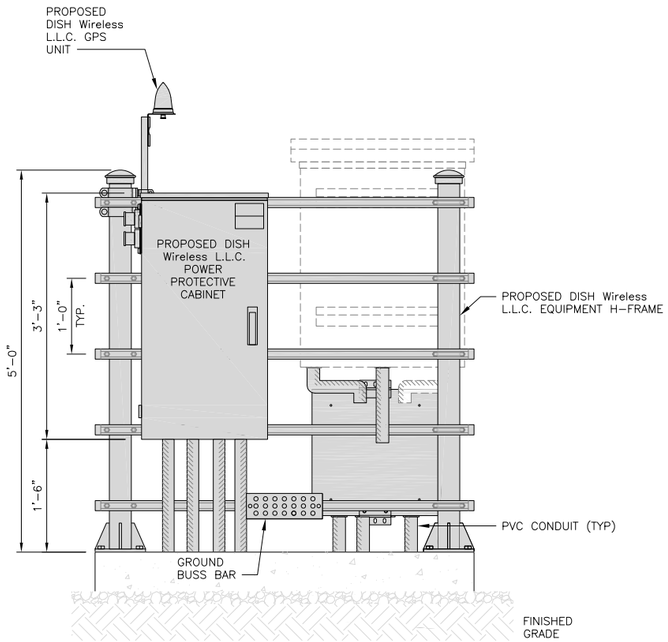
PLINTH DETAIL

NO SCALE

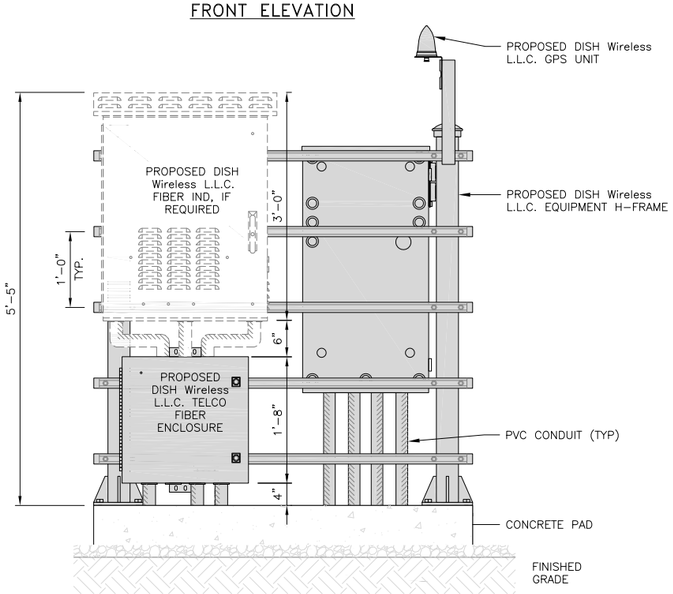
4

NOTES

1. EQUIPMENT CABINET OMITTED FOR CLARITY



FRONT ELEVATION



BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION

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

5

dish wireless.
5701 SOUTH SANTA FE DRIVE
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DISH Wireless L.L.C.
PROJECT INFORMATION

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100 OLD REDDING ROAD
REDDING, CT 06896

SHEET TITLE

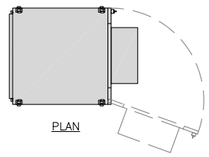
EQUIPMENT PLATFORM AND H-FRAME DETAILS

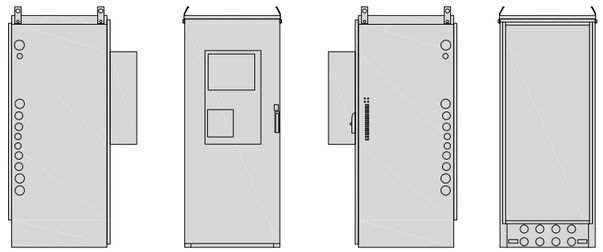
SHEET NUMBER

A-3

ENERSYS HVAC CABINET 2000005995

DIMENSIONS (HxWxD):	73"x30"x32"
WEIGHT EMPTY:	371 lbs
HVAC	600W
POWER SYSTEM	-48V ALPHA/600A


PLAN

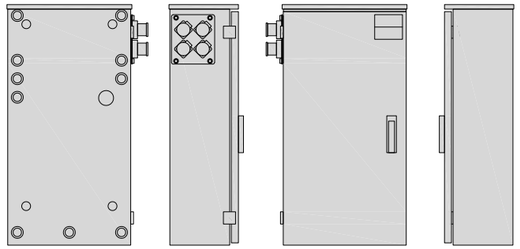

SIDE FRONT SIDE BACK

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

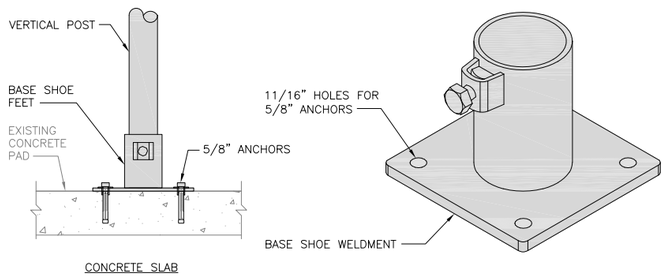

BACK SIDE FRONT SIDE

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

NOT USED | NO SCALE | 3

SITEPRO1 BSF35 BASE SHOE FEET

DIMENSIONS (HxWxL)	8"x8"x1/2"
WEIGHT	15.0 LBS
POST SIZE:	2-7/8" OR 3-1/2"

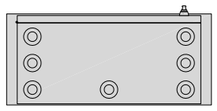


CONCRETE SLAB

ICE BRIDGE PIPE MOUNT DETAIL | NO SCALE | 4

ZAYO 5RU (LEFT SWING DOOR) FIBER NID ENCLOSURE

DIMENSIONS (HxWxD)	36.1"x29"x12.9"
WEIGHT	85 lbs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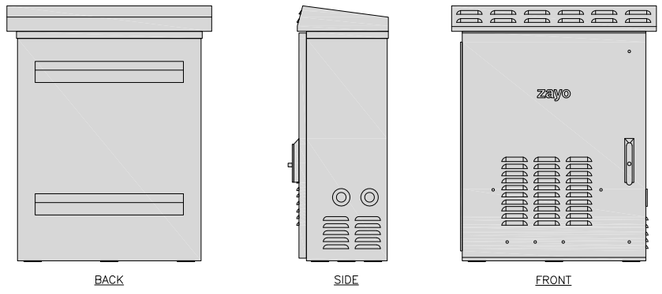
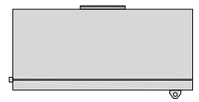


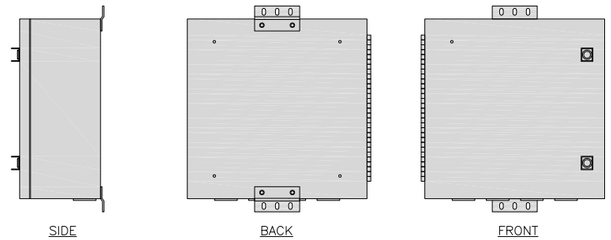
BACK SIDE FRONT

FIBER NID ENCLOSURE 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

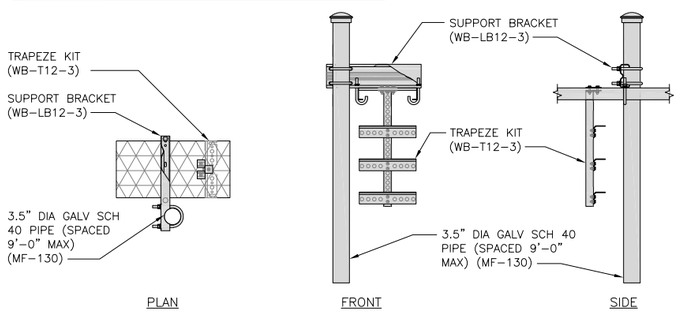

SIDE BACK FRONT

FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

COMMSCOPE WB-K110-B WAVEGUIDE BRIDGE KIT

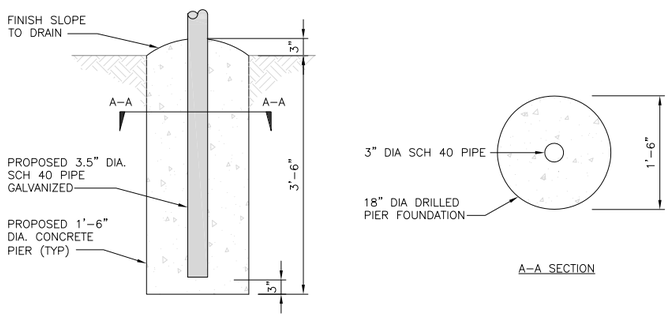
DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

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



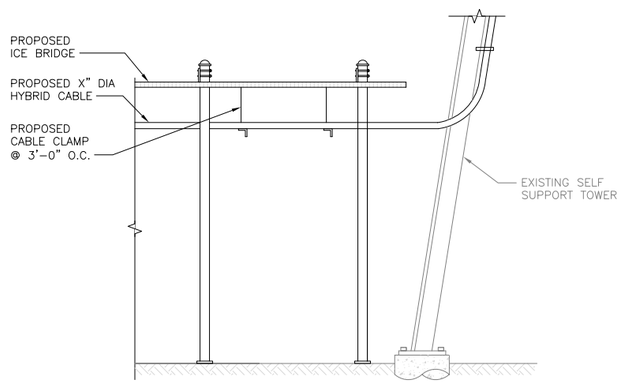
PLAN FRONT SIDE

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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7/18/22
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PEC.0001564
Expires 2/1/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
KAS	YMK	GLS

RFDS REV #: 1.0

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A&E PROJECT NUMBER

153701.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01161A
100 OLD REDDING ROAD
REDDING, CT 06896

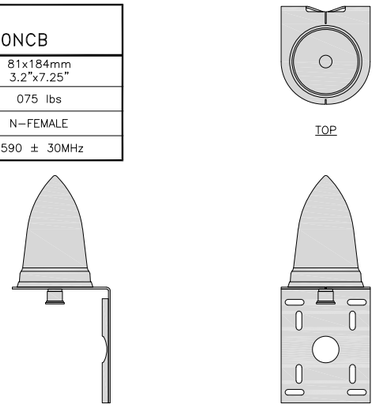
SHEET TITLE

EQUIPMENT DETAILS

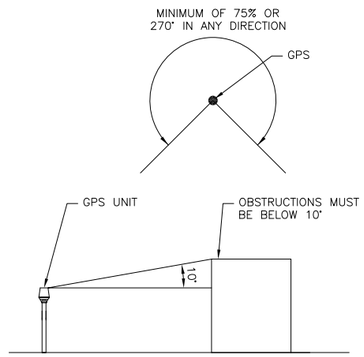
SHEET NUMBER

A-4

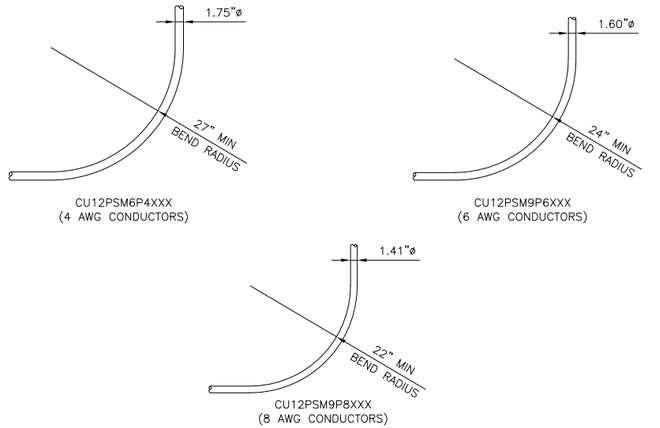
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



GPS DETAIL | NO SCALE | 1



GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 2



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

NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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100 OLD REDDING ROAD
REDDING, CT 06896

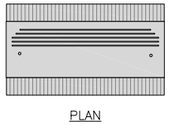
SHEET TITLE

EQUIPMENT DETAILS

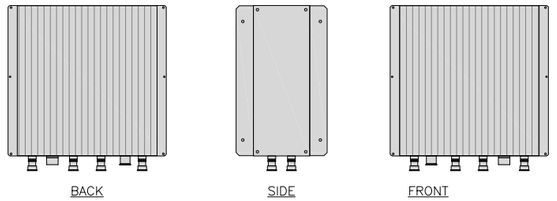
SHEET NUMBER

A-5

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



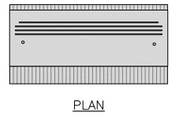
PLAN



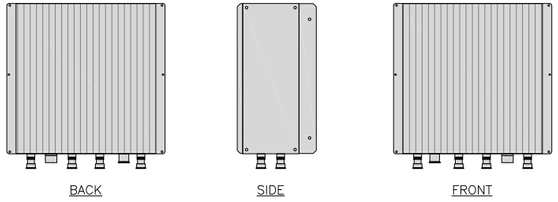
BACK SIDE FRONT

RRH DETAIL | NO SCALE | 1

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



PLAN

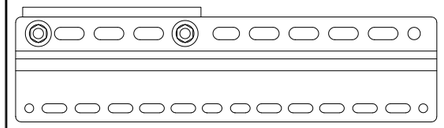


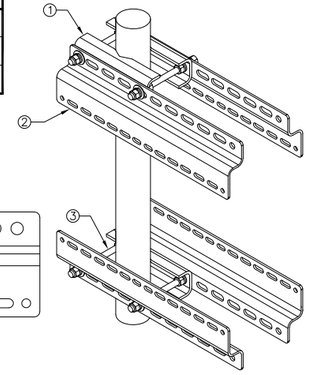
BACK SIDE FRONT

RRH DETAIL | NO SCALE | 2

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

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



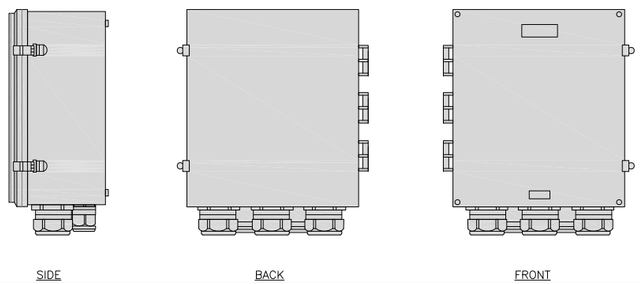


NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

RRH MOUNT DETAIL | NO SCALE | 3

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

PLAN

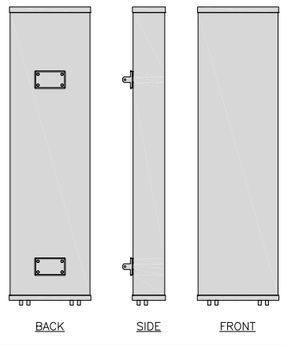


SIDE BACK FRONT

SURGE SUPPRESSION DETAIL (OVP) | NO SCALE | 4

COMMSCOPE FFVV-65B-R2	
DIMENSIONS (HxWxD)(MM/IN)	1828x498x197 72"x19.6"x7.8"
RF CONNECTOR INTERFACE	4.3-10 FEMALE
WEIGHT	70.8 lbs
WEIGHT WITH BRACKETS	98.1 lbs

PLAN



BACK SIDE FRONT

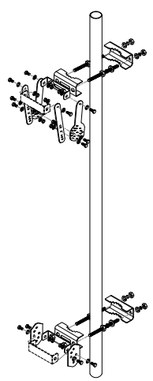
ANTENNA DETAIL | NO SCALE | 5

NOT USED | NO SCALE | 6

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

NOTE:
KIT #91900318: TOP AND BOTTOM BRACKETS FOR 4-,6-, AND 8-FOOT ANTENNAS

ANTENNA BRACKET NOT PART OF KIT

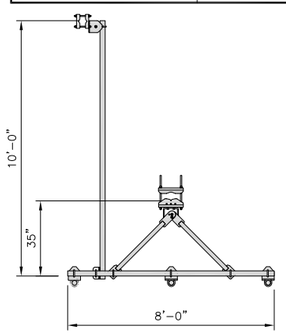


NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

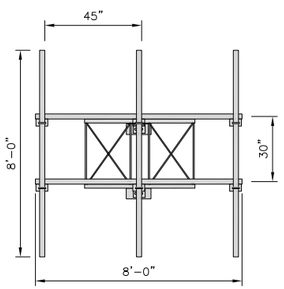
ANTENNA BRACKET DETAIL | NO SCALE | 7

COMMSCOPE V-FRAME MTC3975083	
FACE SIZE	8'-0"
WEIGHT	352.136 lbs

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



PLAN

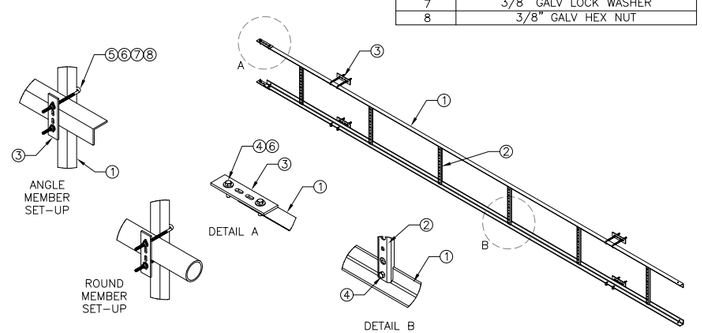


FRONT

ANTENNA FRAME DETAIL | NO SCALE | 8

COMMSCOPE 20' CABLE LADDER 6 HOLE RUNGS	
DIMENSIONS (WxL)	20.5"x240"
WEIGHT	84.94 lbs

ITEM#	DESCRIPTION
1	20' ANGLE SIDE RAIL
2	20" LADDER RUNG
3	BACKING PLATE
4	3/8"x1-1/2" GALV BOLT KIT
5	8" GALV J-BOLT KIT
6	3/8" GALV FLAT WASHER
7	3/8" GALV LOCK WASHER
8	3/8" GALV HEX NUT



CABLE LADDER DETAIL | NO SCALE | 9

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PROJECT INFORMATION

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100 OLD REDDING ROAD
REDDING, CT 06896

SHEET TITLE

EQUIPMENT DETAILS

SHEET NUMBER

A-6

STIFF ARM LOCATION NOTES:

- TIE BACK SHALL BE CONNECTED PER MANUFACTURER SPECIFICATIONS. IF THE ANGLE OF ATTACHMENT DEVIATES FROM THE MANUFACTURER RANGES, A SITE SPECIFIC ANALYSIS THAT CONSIDERS THESE EFFECTS ON BOTH THE TOWER AND THE MOUNT WILL BE NEEDED.
- ACCEPTABLE STIFF ARM TO TOWER MEMBER ATTACHMENT LOCATIONS:
  - A) INTERIOR BRACING MEMBERS:
    -WITHIN 25% OF EITHER END OF THE MEMBER'S LENGTH.
  - B) TOWER LEGS:
    -WITHIN 25% OF EITHER END OF THE MEMBER'S LENGTH. IF ATTACHMENT IS NOT WITHIN 25% OF EITHER END OF THE MEMBERS LENGTH THEN ADJUST ATTACHMENT POINT TO MINIMIZE DISTANCE TO END OF MEMBER WHILE FOLLOWING MANUFACTURERS SPECIFICATIONS.

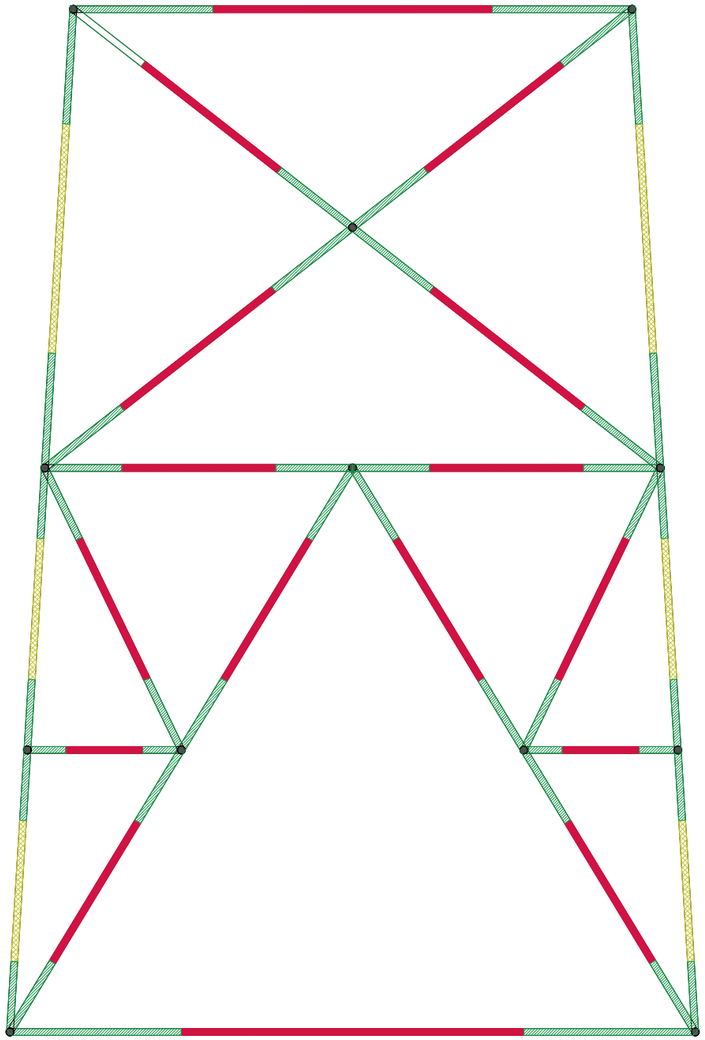
ACCEPTABLE ATTACHMENT REGION & FORCE

ACCEPTABLE ATTACHMENT REGION & FORCE

DO NOT ATTACH HERE

(DO NOT ATTACH HERE)

INTERIOR BRACING



TOWER LEG

TOWER SECTION

1 STIFF ARM LOCATIONS
SCALE: NOT TO SCALE

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100 OLD REDDING ROAD
REDDING, CT 06896

SHEET TITLE

STIFF ARM
LOCATION DETAIL

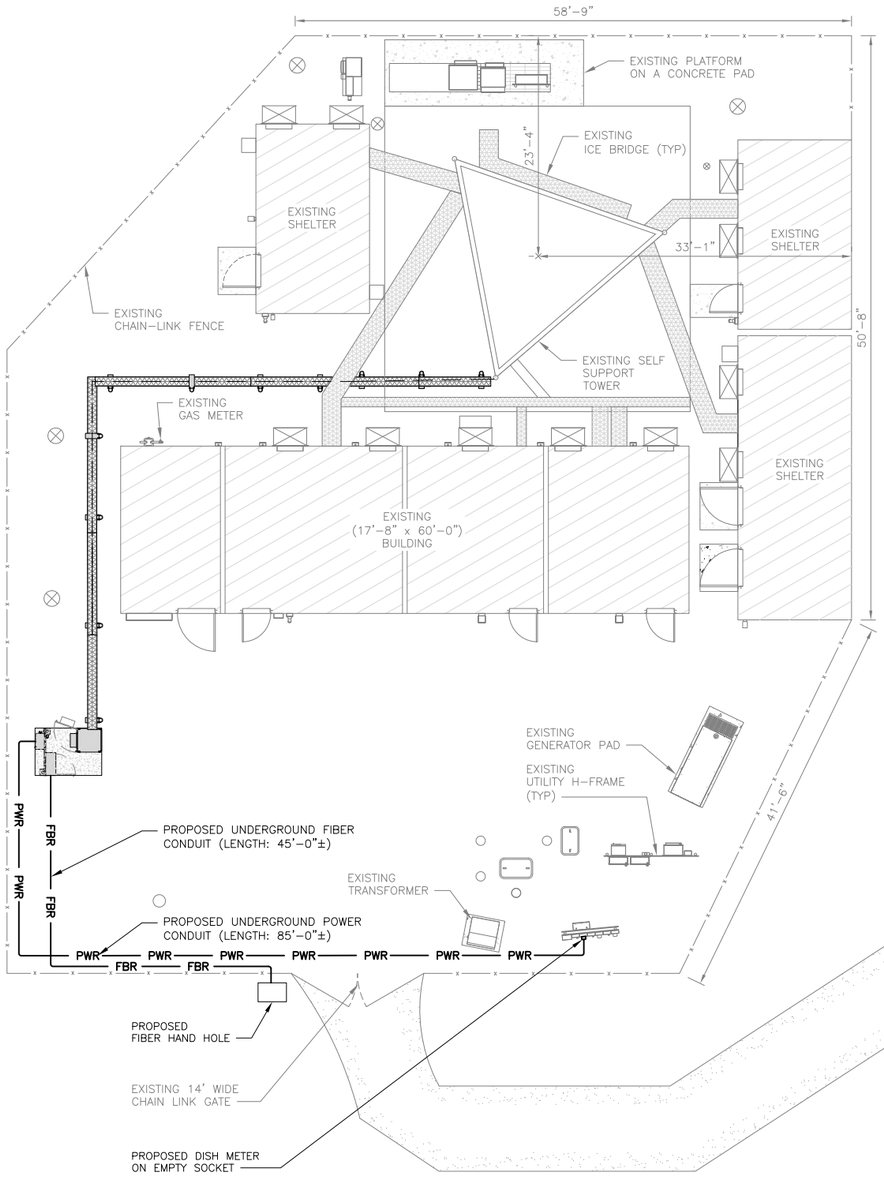
SHEET NUMBER

A-7

FINAL POWER OR FIBER DESIGN
NOT AVAILABLE AT TIME OF ISSUE

NOTES

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



UTILITY ROUTE PLAN

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

1

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

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

ELECTRICAL NOTES

NO SCALE

2

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PROJECT INFORMATION

NJJER01161A
100 OLD REDDING ROAD
REDDING, CT 06896

SHEET TITLE

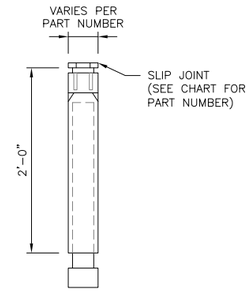
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

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"

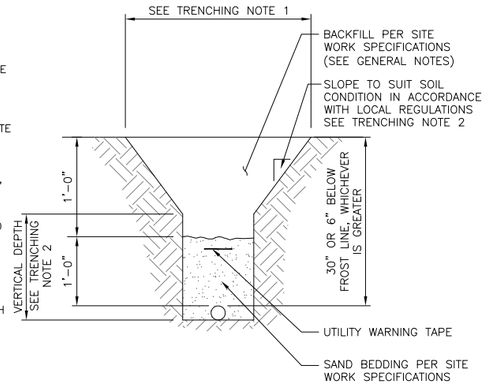


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

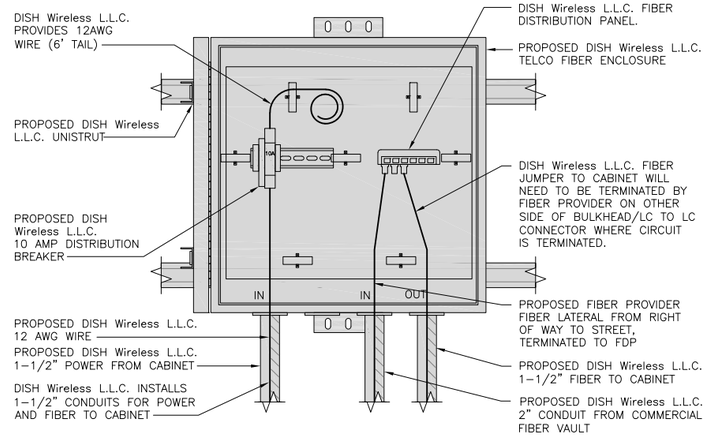
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

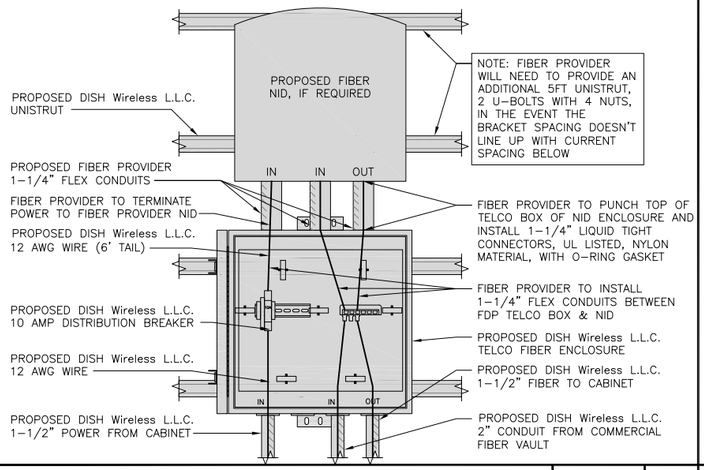
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT 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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LICENSED
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7/18/22

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/1/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
KAS	YMK	GLS

RFDS REV #: 1.0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
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4	7/18/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

153701.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

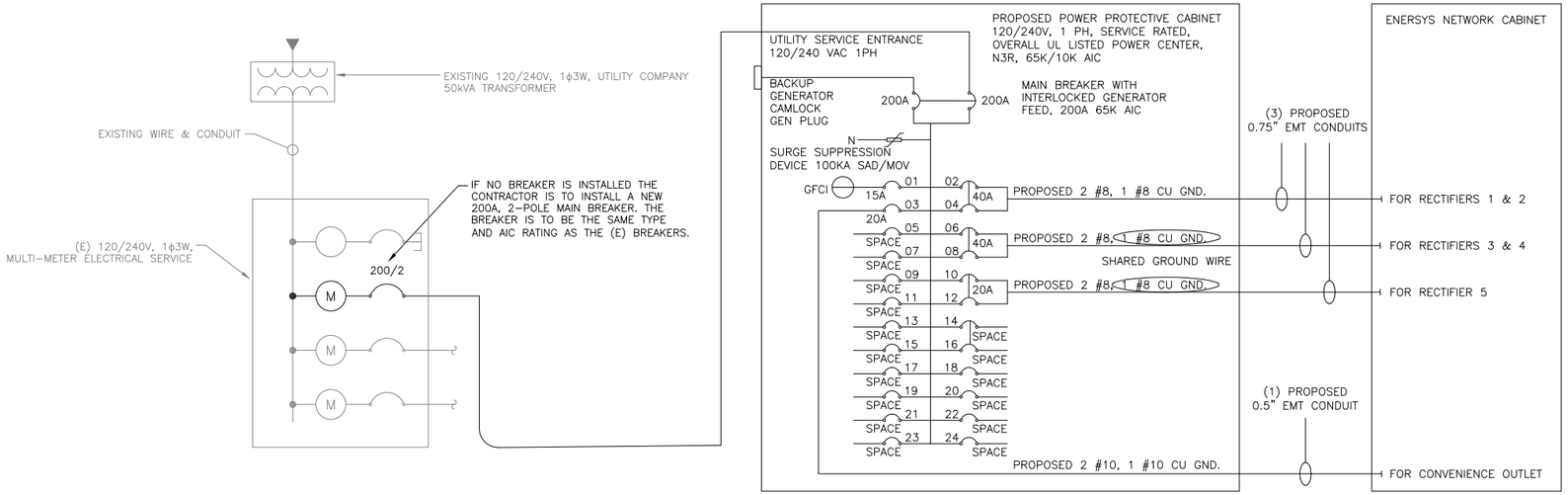
NJJER01161A
100 OLD REDDING ROAD
REDDING, CT 06896

SHEET TITLE

ELECTRICAL DETAILS

SHEET NUMBER

E-2



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

BREAKERS REQUIRED:
(2) 40A, 2P BREAKER - SQUARE D P/N:QO240
(1) 20A, 2P BREAKER - SQUARE D P/N:QO220
(1) 20A, 1P BREAKER - SQUARE D P/N:QO120

NOTES

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

CABINET CONVENIENCE OUTLET CONDUCTORS (1 CONDUIT): USING THWN-2, CU.

#10 - 0.0211 SQ. IN X 2 = 0.0422 SQ. IN
#10 - 0.0211 SQ. IN X 1 = 0.0211 SQ. IN <GROUND
TOTAL = 0.0633 SQ. IN

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

RECTIFIER CONDUCTORS (3 CONDUITS): USING UL1015, CU.

#8 - 0.0552 SQ. IN X 2 = 0.1103 SQ. IN
#8 - 0.0131 SQ. IN X 1 = 0.0131 SQ. IN <BARE GROUND
TOTAL = 0.1234 SQ. IN

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

PPC FEED CONDUCTORS (1 CONDUIT): USING THWN, CU.

3/0 - 0.2679 SQ. IN X 3 = 0.8037 SQ. IN
#6 - 0.0507 SQ. IN X 1 = 0.0507 SQ. IN <GROUND
TOTAL = 0.8544 SQ. IN

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

PPC ONE-LINE DIAGRAM

NO SCALE | 1

PROPOSED ENERSYS 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
PPC GFCI OUTLET	180		15A	1	A	2	40A	3840		ENERSYS ALPHA CORDEX RECTIFIERS 1 & 2
ENERSYS GFCI OUTLET		180	20A	3	B	4			3840	
-SPACE-				5	A	6	40A	3840		ENERSYS ALPHA CORDEX RECTIFIER 3 & 4
-SPACE-				7	B	8			3840	
-SPACE-				9	A	10	20A	1920		ENERSYS ALPHA CORDEX RECTIFIER 5
-SPACE-				11	B	12			1920	
-SPACE-				13	A	14				-SPACE-
-SPACE-				15	B	16				-SPACE-
-SPACE-				17	A	18				-SPACE-
-SPACE-				19	B	20				-SPACE-
-SPACE-				21	A	22				-SPACE-
-SPACE-				23	B	24				-SPACE-
VOLTAGE AMPS	180	180						9500	9500	
200A MCB, 1ϕ, 24 SPACE, 120/240V			L1		L2					
MB RATING: 65,000 AIC			9680		9680		VOLTAGE AMPS			
			81		81		AMPS			
			81				MAX AMPS			
			102				MAX 125%			

PANEL SCHEDULE | NO SCALE | 2

NOT USED | NO SCALE | 3

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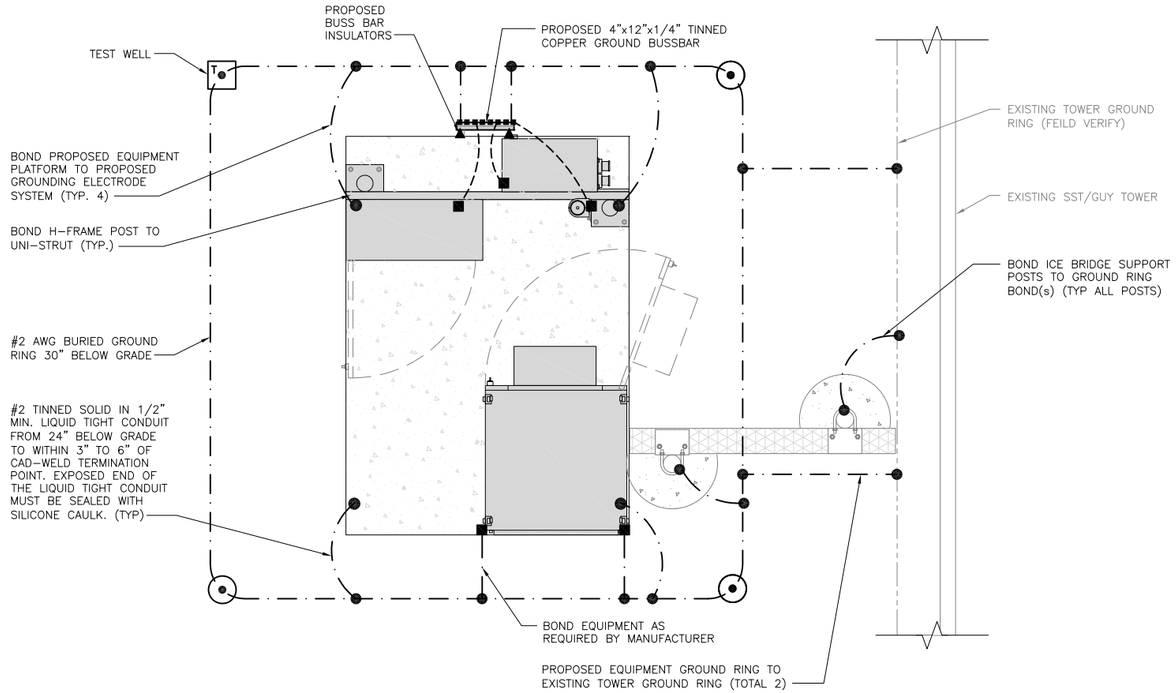
DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01161A
100 OLD REDDING ROAD
REDDING, CT 06896

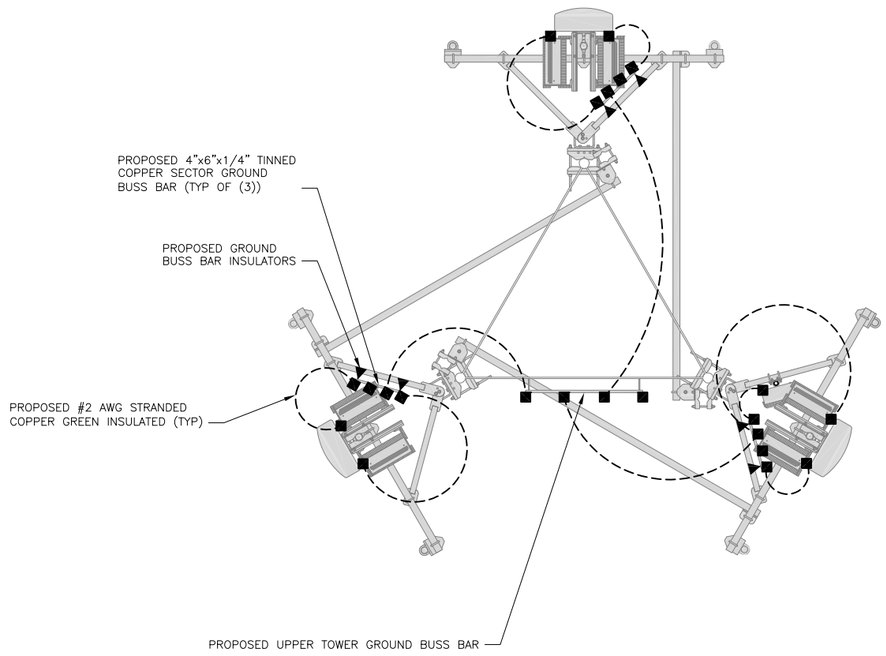
SHEET TITLE
ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3



TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE | 1



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE | 2

NOTES

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

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.

(Q) REFER TO DISH Wireless L.L.C. GROUNDING NOTES.

GROUNDING KEY NOTES

NO SCALE | 3

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RFDS REV #: 1.0

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DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01161A
100 OLD REDDING ROAD
REDDING, CT 06896

SHEET TITLE

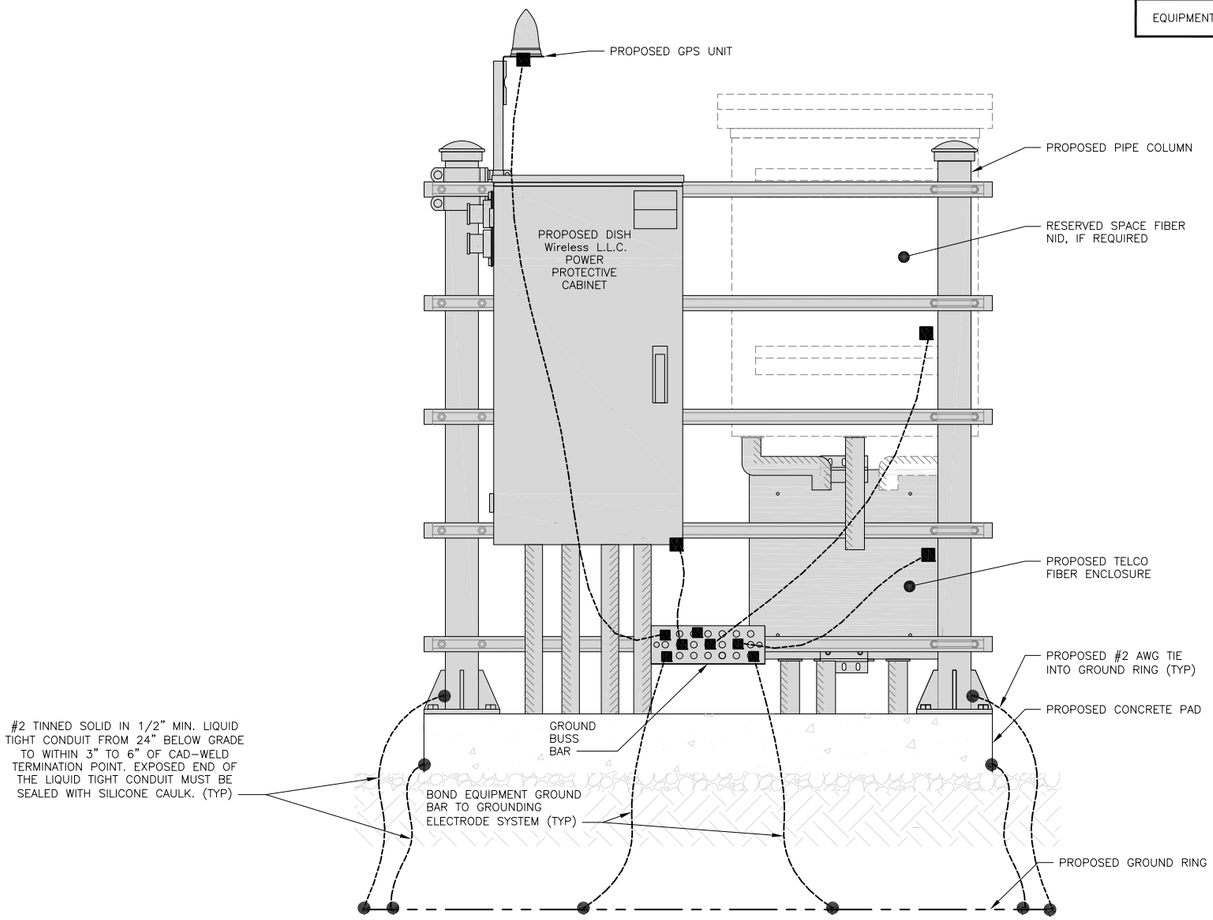
GROUNDING PLANS AND NOTES

SHEET NUMBER

G-1

NOTES

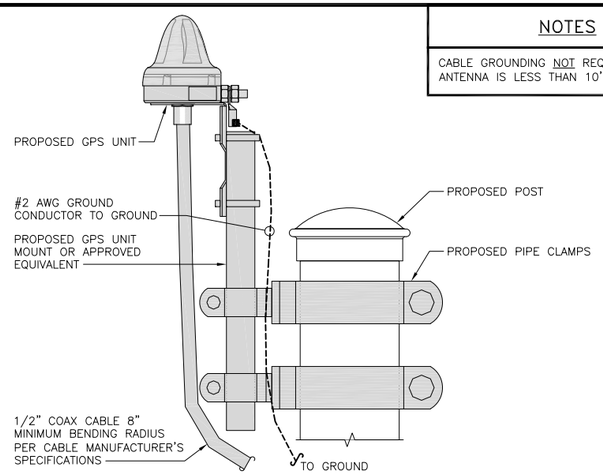
EQUIPMENT CABINET OMITTED FOR CLARITY



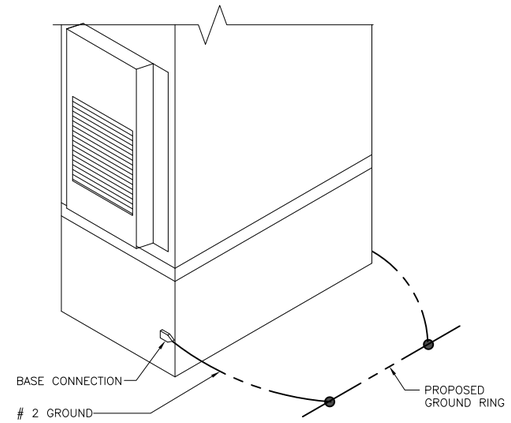
H-FRAME GROUNDING DETAIL | NO SCALE | 1

NOTES

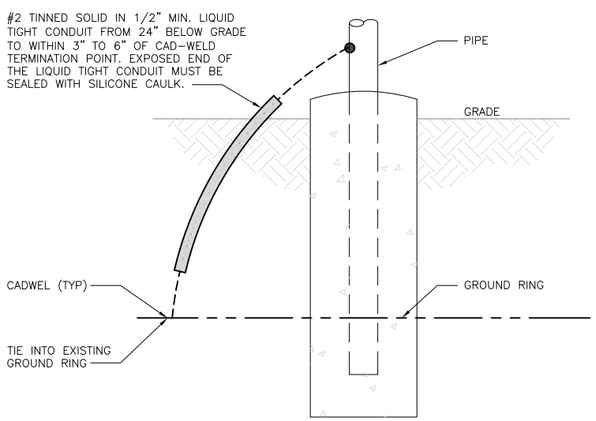
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



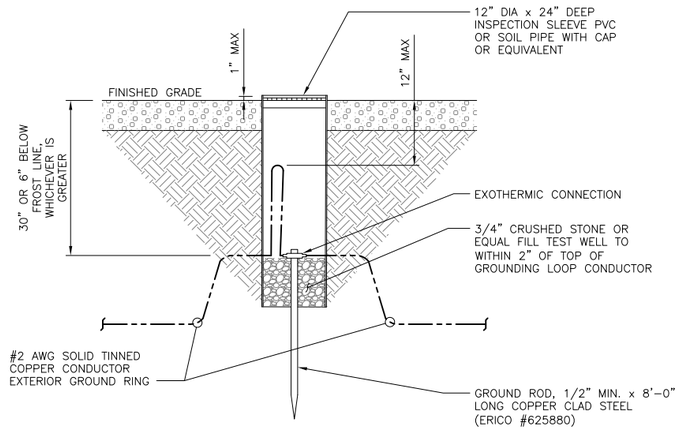
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



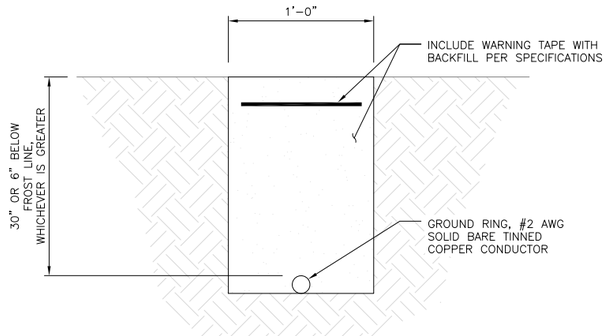
OUTDOOR CABINET GROUNDING | NO SCALE | 3



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

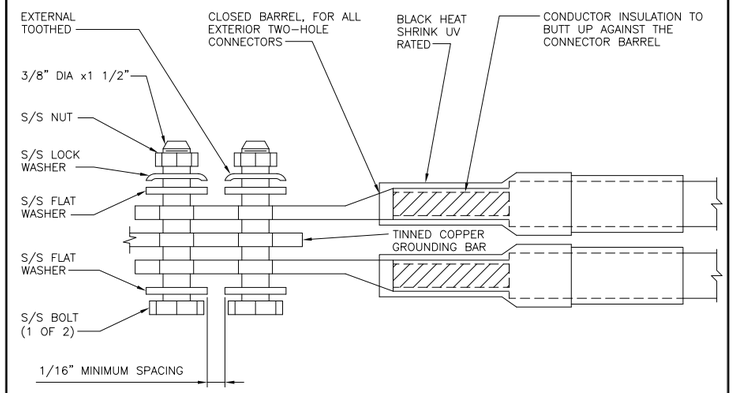
GROUNDING DETAILS

SHEET NUMBER

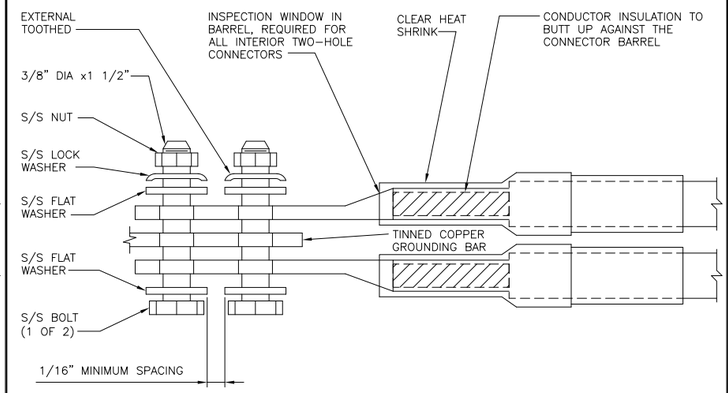
G-2

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).

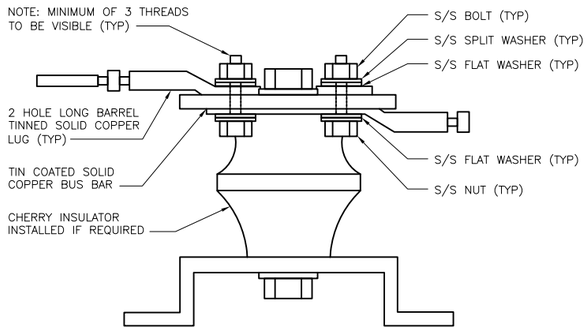
TYPICAL GROUNDING NOTES | NO SCALE | 1



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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7/18/22
B&T ENGINEERING, INC.
PEC.0001564
Expires 2/1/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
KAS	YMK	GLS

RFDS REV #: 1.0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	8/27/21	ISSUED FOR CONSTRUCTION
1	9/7/21	ISSUED FOR CONSTRUCTION
2	9/14/21	ISSUED FOR CONSTRUCTION
3	9/27/21	ISSUED FOR CONSTRUCTION
4	7/18/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

153701.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01161A
100 OLD REDDING ROAD
REDDING, CT 06896

SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

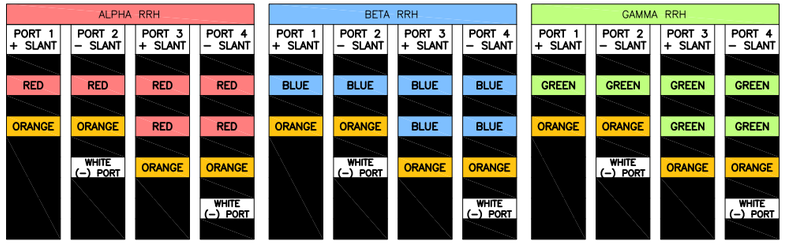
G-3

RF JUMPER COLOR CODING

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

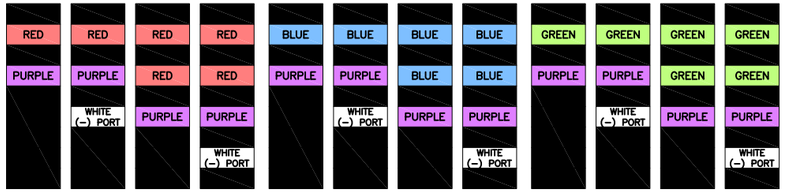
LOW-BAND RRH –
(600MHz N71 BASEBAND) +
(850MHz N26 BAND) +
(700MHz N29 BAND) – OPTIONAL PER MARKET

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)

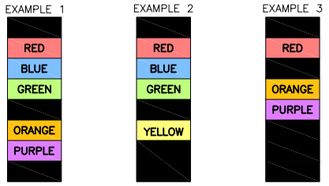


HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED
ALONG WITH FREQUENCY BANDS

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

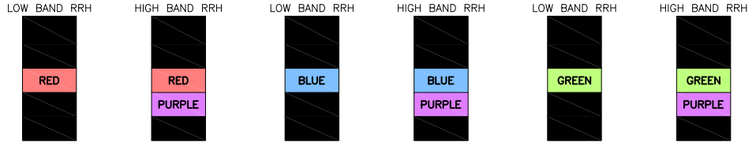
EXAMPLE 2 – HYBRID, OR DISCREET, SUPPORTS
CBRS ONLY, ALL SECTORS



CONTRACTOR TO REFER TO FINAL
CONSTRUCTION RFDS FOR ALL RD DETAILS.
FINAL RFDS IS IN NEXSYSONE.

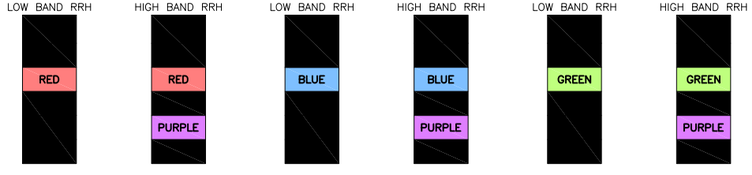
FIBER JUMPERS TO RRHs

LOW-BAND RRH FIBER CABLES HAVE SECTOR
STRIPE ONLY

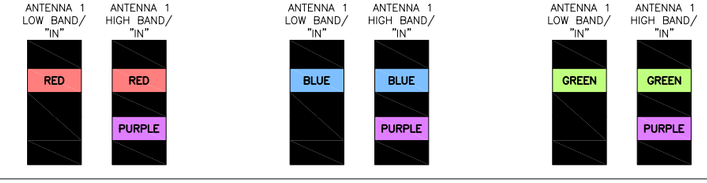


POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR
STRIPE ONLY



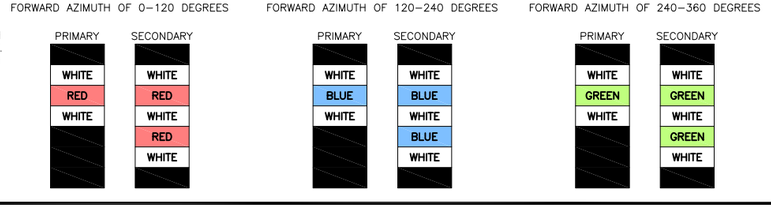
RET MOTORS AT ANTENNAS



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

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

AMERICAN TOWER
10 PRESIDENTIAL WAY
WOBURN, MA 01801

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1717 S. BOULDER
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100 OLD REDDING ROAD
REDDING, CT 06896

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

W.P.

SECTION REFERENCE

XX
X–X

DETAIL REFERENCE

XX
X–X

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.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

AMERICAN TOWER®
10 PRESIDENTIAL WAY
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SHEET TITLE

LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SITE ACTIVITY REQUIREMENTS:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES:

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

CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION

CARRIER:DISH Wireless L.L.C.

TOWER OWNER:TOWER OWNER

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

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

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

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

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

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

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

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

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

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

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

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

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

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STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER

7/18/22

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/1/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
KAS	YMK	GLS

RFDS REV #: 1.0

CONSTRUCTION DOCUMENTS

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A&E PROJECT NUMBER

153701.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01161A
100 OLD REDDING ROAD
REDDING, CT 06896

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

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

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

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

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

#4 BARS AND SMALLER 40 ksi

#5 BARS AND LARGER 60 ksi

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

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

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

ELECTRICAL INSTALLATION NOTES:

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

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

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

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

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

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

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

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

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

8. TIE WRAPS ARE NOT ALLOWED.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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7/18/22

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/1/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
KAS	YMK	GLS

RFDS REV #: 1.0

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A&E PROJECT NUMBER

153701.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01161A
100 OLD REDDING ROAD
REDDING, CT 06896

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-3

GROUNDING NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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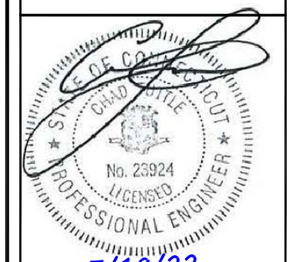

7/18/22

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/1/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
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RFDS REV #: 1.0

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A&E PROJECT NUMBER

153701.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01161A
100 OLD REDDING ROAD
REDDING, CT 06896

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**180 ft Self Support Tower**
ATC Site Name	:	**Redding, CT**
ATC Site Number	:	**302522**
Engineering Number	:	**14128720_C3_01**
Proposed Carrier	:	**DISH WIRELESS L.L.C.**
Carrier Site Name	:	**NJJER01161A**
Carrier Site Number	:	**NJJER01161A**
Site Location	:	**100 Old Redding Road** **Redding, CT 06896-2721** **41.2871, -73.4382**
County	:	**Fairfield**
Date	:	**July 14, 2022**
Max Usage	:	**84%**
Result	:	**Pass**

Prepared By:

Nathan Lyle
Structural Engineer

Nathan Lyle

Reviewed By:

COA : PEC.0001553

Table of Contents

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 180 ft Self Support tower to reflect the change in loading by DISH WIRELESS L.L.C..

Supporting Documents

Tower Drawings	Rohn Drawing #C951762, dated December 26, 1995
Foundation Drawing	Rohn Drawing #A953313-1, dated January 12, 1996
Geotechnical Report	SoilTesting Job #591, dated December 26, 1995

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	116 mph (3-second gust)
Basic Wind Speed w/ Ice:	50 mph (3-second gust) w/ 1.00" radial ice concurrent
Code:	ANSI/TIA-222-H / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	B
Risk Category:	II
Topographic Factor Procedure:	Method 1
Topographic Category:	1
Spectral Response:	Ss = 0.24, S_1 = 0.06
Site Class:	D - Stiff Soil - Default

Conclusion

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

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

Existing and Reserved Equipment

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
184.0	6	Kaelus DBC0061F1V51-2	Sector Frame	(3) 0.39" (10mm) Fiber Trunk (8) 0.78" (19.7mm) 8 AWG 6 (12) 1 1/4" Coax (2) 2" conduit	AT&T MOBILITY
	6	Powerwave Allgon LGP21401			
	1	CCI OPA65R-BU8D			
	1	CCI DMP65R-BU8D			
	1	CCI TPA-65R-LCUUUU-H8			
	2	CCI OPA65R-BU6D			
	2	CCI DMP65R-BU6DA			
	2	Quintel QS66512-2			
	3	Powerwave Allgon 7770.00			
	3	Ericsson RRUS 32 B2			
	3	Ericsson RRUS 32 B30 (53 lbs)			
	2	Raycap DC6-48-60-18-8C			
	3	Ericsson RRUS 4449 B5, B12			
	3	Ericsson RRUS 4478 B14			
	1	Raycap DC6-48-60-18-8F ("Squid")			
172.0	2	RFS APL868013-42T0	Sector Frame	(24) 1 5/8" Coax (2) 1 5/8" Hybriflex	VERIZON WIRELESS
	1	RFS DB-C1-12C-24AB-0Z			
	3	Commscope CBC78T-DS-43-2X			
	3	Samsung B5/B13 RRH-BR04C			
	3	Samsung B2/B66A RRH-BR049			
	6	Commscope JAHH-65B-R3B			
	3	Samsung MT6407-77A			
	4	Andrew DB844G65ZAXY			
148.0	3	RFS APXVAARR24_43-U-NA20	Sector Frame	(2) 1 1/4" Hybriflex Cable (2) 1.99" (50.7mm) Hybrid	T-MOBILE
	3	Ericsson AIR 6419 B41			
	3	Ericsson Radio 4449 B71 B85A			
	3	Ericsson 4460 BAND 2/25			
	3	Commscope VV-65A-R1B			
146.0	1	Sinclair SC479-HF1LDF	Side Arm	(2) 1 5/8" Coax (7) 1 5/8" Coax (1) 1/2" Coax (2) EW63 (1) 3/8" Coax	CONNECTICUT STATE POLICE DEPT OF PUBLIC
137.0	1	Andrew Microwaves DB810K-XT	Side Arm		
136.4	1	Amphenol Antel WPA-700120-4CF-EDIN-X			
135.0	1	Generic 24" x 24" Ice Shield	Leg		
134.8	1	Bird 432E-83I-01-T	Side Arm		
134.0	1	Generic 24" x 24" Ice Shield			
	2	Sinclair SE419-SF3P4LDF			
131.0	1	Morad VHF 156-DELUXE			
129.8	3	Sinclair SC479-HF1LDF			
129.0	1	RFS PA6-65AC	Leg		
128.0	1	RFS PA6-65AC			
127.0	1	Bird 432-83H-01-T	Side Arm		
	2	Allgon 7199 / M-1900-90-19.5I			
125.0	1	Sinclair SE419-SF3P4LDF			
120.5	1	Decibel DB586	Leg	(1) 7/8" Coax	EVERSOURCE ENERGY
117.0	-	-	-	(1) 1/2" Coax	CONNECTICUT STATE POLICE DEPT OF PUBLIC
116.8	1	Morad VHF 156-DELUXE	Side Arm		

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
115.5	1	Decibel DB586	Leg	(1) 7/8" Coax	EVERSOURCE ENERGY
102.5	1	Scala OGT9-840	Side Arm	-	CONNECTICUT STATE POLICE DEPT OF PUBLIC
97.0	1	Sinclair SD210D	Stand-Off	(2) 7/8" Coax	EVERSOURCE ENERGY
93.6	1	PCTEL GPS-TMG-HR-26N	Side Arm	(1) 1/2" Coax	SPRINT NEXTEL
92.2	1	Scala OGT9-840	Side Arm	-	CONNECTICUT STATE POLICE DEPT OF PUBLIC
77.6	1	Andrew DB264-A	Side Arm	(1) 7/8" Coax	
30.0	1	Generic 2" x 4" GPS	Leg	(1) 1/2" Coax	VERIZON WIRELESS
18.0	1	PCTEL GPS-TMG-HR-26N	Leg	-	AT&T MOBILITY

Equipment to be Removed

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
166.8	12	Decibel DB844H90E-XY	Sector Frame	-	SPRINT NEXTEL
160.7	3	Alcatel-Lucent RRH2x50-08	Sector Frame	(4) 1 1/4" Hybridflex Cable	
159.9	3	Alcatel-Lucent 800 MHz RRH			
158.6	3	Commscope DT465B-2XR			
158.5	3	RFS APXVSPP18-C-A20			
158.4	3	Alcatel-Lucent TD-RRH8x20-25 w/ Solar Shield			
156.1	3	Alcatel-Lucent 1900 MHz 4X45 RRH			
76.0	1	Commscope RDIDC-9181-PF-48	-	(1) 1.75" (44.5mm) Hybrid	DISH WIRELESS L.L.C.
	3	JMA Wireless MX08FRO665-21			
	3	Fujitsu TA08025-B605			
	3	Fujitsu TA08025-B604			

Proposed Equipment

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
162.0	1	Raycap RDIDC-9181-PF-48	Sector Frame	(1) 1.75" (44.5mm) Hybrid	DISH WIRELESS L.L.C.
	3	Fujitsu TA08025-B605			
	3	Fujitsu TA08025-B604			
	3	JMA Wireless MX08FRO665-21			

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

Install proposed lines in the place of the existing DISH WIRELESS L.L.C. lines.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Legs	84%	Pass
Diagonals	75%	Pass
Horizontals	25%	Pass
Anchor Bolts	54%	Pass
Leg Bolts	60%	Pass

Foundations

Reaction Component	Original Design Reactions	Factored Design Reactions*	Analysis Reactions	% of Design
Uplift (Kips)	287.6	388.3	287.0	74%
Axial (Kips)	321.3	433.8	333.6	77%
Moment (Kips-Ft)	6000.3	8100.4	6230.6	77%
Total Shear (Kips)	56.4	76.1	58.1	76%
* The design reactions are factored by 1.35 per ANSI/TIA-222-H, Sec. 15.6.2				

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

Deflection, Twist and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Twist (°)	Sway (Rotation) (°)
162.0	Fujitsu TA08025-B604	DISH WIRELESS L.L.C.	0.320	0.015	0.264
	Fujitsu TA08025-B605				
	JMA Wireless MX08FRO665-21				
	Raycap RDIDC-9181-PF-48				
129.0	RFS PA6-65AC	CONNECTICUT STATE POLICE DEPT OF PUBLIC	0.200	0.015	0.183
128.0	RFS PA6-65AC	CONNECTICUT STATE POLICE DEPT OF PUBLIC	0.200	0.015	0.183

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

Standard Conditions

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

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

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

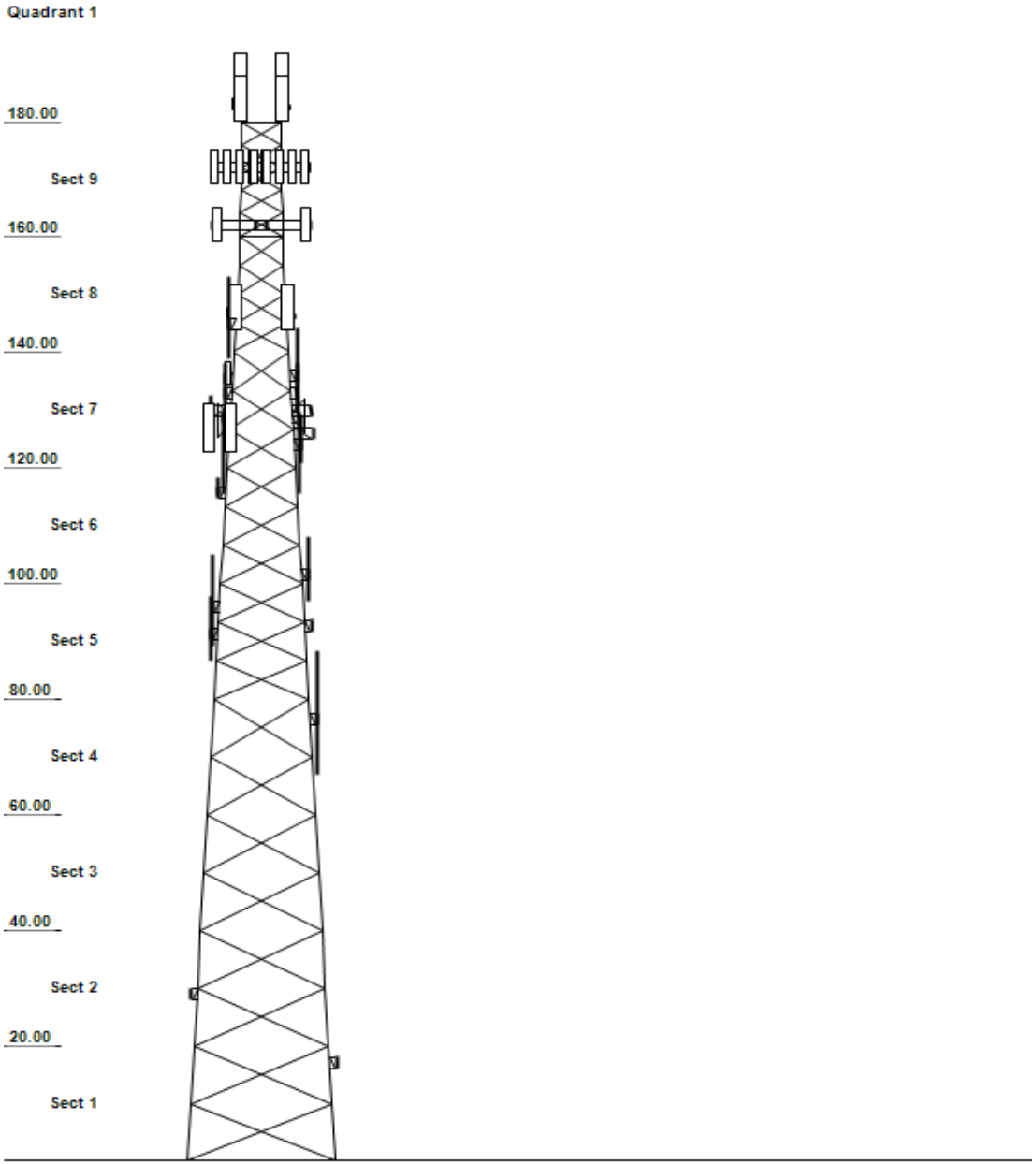
All assets of American Tower Corporation, its affiliates, and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with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

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

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

JOB INFORMATION

Asset:	302522, Redding	Height :	180 ft
Client	DISH WIRELESS L.L.C.	Base Width :	23 ft
Code:	ANSI/TIA-222-H	Shape :	Triangle



SITE PARAMETERS

Nominal Wind : 116 mph wind with no ice — Exposure : B — Site Class : D

Ice Wind: 50 mph wind with 1" radial — Topo Method: Method 1 — Risk Cat : II

Service Wind : 60 mph Serviceability — Topo Feature : — S_s : 0.235 — S_1 : 0.057

SECTION PROPERTIES

Section	Leg Members	Diagonal Members	Horizontal Members
1	PSP 50 ksi ROHN 8 EHS	SAE 50 ksi 4X4X0.3125	
2	PSP 50 ksi ROHN 8 EHS	SAE 50 ksi 4X4X0.25	
3	PX 50 ksi 6" DIA PIPE	SAE 50 ksi 4X4X0.25	
4	PX 50 ksi 6" DIA PIPE	SAE 50 ksi 3.5x3.5x0.25	
5 - 6	PX 50 ksi 5" DIA PIPE	SAE 50 ksi 3X3X0.25	
7	PX 50 ksi 4" DIA PIPE	SAE 36 ksi 2.5X2.5X0.25	
8	PST 50 ksi 3" DIA PIP	SAE 36 ksi 2X2X0.25	SAE 36 ksi 2X2X0.125
9	PST 50 ksi 2-1/2" DIA	SAE 36 ksi 1.75X1.75X0.1875	SAE 36 ksi 2X2X0.125

REDUNDANT SECONDARY BRACING

Section	Sub Diag 1	Sub Horiz 1	Sub Diag 2	Sub Horiz 2	Sub Diag 3	Sub Horiz 3
1 - 9	-	-	-	-	-	-

DISCRETE APPURTENANCE

Elev (ft)	Type	Qty	Description
184.00	BOB/SSB	1	Raycap DC6-48-60-18-8F ("Squid
184.00	BOB/SSB	2	Raycap DC6-48-60-18-8C
184.00	DIPLEXER/DUAL COUPLER	6	Kaelus DBC0061F1V51-2
184.00	PANEL	1	CCI OPA65R-BU8D
184.00	PANEL	1	CCI DMP65R-BU8D
184.00	PANEL	1	CCI TPA-65R-LCUUUU-H8
184.00	PANEL	2	Quintel QS66512-2
184.00	PANEL	2	CCI OPA65R-BU6D
184.00	PANEL	2	CCI DMP65R-BU6DA
184.00	PANEL	3	Powerwave Allgon 7770.00
184.00	RRU/RRH	3	Ericsson RRUS 32 B2
184.00	RRU/RRH	3	Ericsson RRUS 4449 B5, B12
184.00	RRU/RRH	3	Ericsson RRUS 32 B30 (53 lbs)
184.00	RRU/RRH	3	Ericsson RRUS 4478 B14
184.00	TTA	6	Powerwave Allgon LGP21401
180.00	Sector Frame	3	Generic Round Sector Frame
172.00	BOB/SSB	1	RFS DB-C1-12C-24AB-0Z
172.00	DIPLEXER/DUAL COUPLER	3	Commscope CBC78T-DS-43-2X
172.00	PANEL	2	RFS APL868013-42T0
172.00	PANEL	3	Samsung MT6407-77A
172.00	PANEL	4	Andrew DB844G65ZAXY
172.00	PANEL	6	Commscope JAHH-65B-R3B
172.00	RRU/RRH	3	Samsung B2/B66A RRH-BR049
172.00	RRU/RRH	3	Samsung B5/B13 RRH-BR04C
172.00	Sector Frame	3	Generic Round Sector Frame
162.00	BOB/SSB	1	Raycap RDIDC-9181-PF-48
162.00	PANEL	3	JMA Wireless MX08FRO665-21
162.00	RRU/RRH	3	Fujitsu TA08025-B604

JOB INFORMATION

Asset:	302522, Redding	Height :	180 ft
Client	DISH WIRELESS L.L.C.	Base Width :	23 ft
Code:	ANSI/TIA-222-H	Shape :	Triangle

DISCRETE APPURTENANCE

Elev (ft)	Type	Qty	Description
162.00	RRU/RRH	3	Fujitsu TA08025-B605
162.00	Sector Frame	3	Generic Round Sector Frame
148.00	PANEL	3	RFS APXVAARR24_43-U-NA20
148.00	PANEL	3	Ericsson AIR 6419 B41
148.00	PANEL	3	Commscope VV-65A-R1B
148.00	RRU/RRH	3	Ericsson Radio 4449 B71 B85A
148.00	Radio/ODU	3	Ericsson 4460 BAND 2/25
147.00	Sector Frame	3	Perfect Vision PV-SFA12-B Sect
146.00	OMNI	1	Sinclair SC479-HF1LDF
142.50	Side Arm	2	Generic Round Side Arm
137.00	OMNI	1	Andrew Microwaves DB810K-XT
136.40	PANEL	1	Amphenol Antel WPA-700120-4CF-
136.00	Sector Frame	2	Generic Round Sector Frame
135.00	ICE SHIELD	1	Generic 24" x 24" Ice Shield
134.80	TTA	1	Bird 432E-83I-01-T
134.00	DIPOLE	2	Sinclair SE419-SF3P4LDF
134.00	ICE SHIELD	1	Generic 24" x 24" Ice Shield
131.00	OMNI	1	Morad VHF 156-DELUXE
131.00	Side Arm	2	Generic Round Side Arm
129.80	OMNI	3	Sinclair SC479-HF1LDF
129.00	DISH-STANDARD	1	RFS PA6-65AC
128.00	DISH-STANDARD	1	RFS PA6-65AC
127.00	PANEL	2	Allgon 7199 / M-1900-90-19.5I
127.00	Side Arm	1	Generic Round Side Arm
127.00	TTA	1	Bird 432-83H-01-T
125.00	DIPOLE	1	Sinclair SE419-SF3P4LDF
121.00	Side Arm	1	Generic Round Side Arm
120.50	Other	1	Decibel DB586
120.50	Side Arm	1	Generic Round Side Arm
116.80	OMNI	1	Morad VHF 156-DELUXE
115.50	Other	1	Decibel DB586
115.00	Side Arm	2	Generic Round Side Arm
102.50	OMNI	1	Scala OGT9-840
100.00	Side Arm	1	Generic Round Side Arm
100.00	T-Arm	1	Generic Flat Stand-Off
97.00	DIPOLE	1	Sinclair SD210D
93.60	GPS	1	PCTEL GPS-TMG-HR-26N
92.20	OMNI	1	Scala OGT9-840
91.00	Side Arm	1	Generic Round Side Arm
86.00	Side Arm	1	Generic Round Side Arm
77.60	DIPOLE	1	Andrew DB264-A
30.00	GPS	1	Generic 2" x 4" GPS
18.00	GPS	1	PCTEL GPS-TMG-HR-26N

LINEAR APPURTENANCE

Elev (ft) From	To	Qty	Description
0.00	184.00	2	2" conduit
0.00	184.00	12	1 1/4" Coax
0.00	184.00	8	0.78" (19.7mm) 8 AWG 6
0.00	184.00	3	0.39" (10mm) Fiber Trunk
0.00	180.00	1	Waveguide
0.00	172.00	1	Waveguide
0.00	172.00	2	1 5/8" Hybriflex

JOB INFORMATION

Asset:	302522, Redding	Height :	180 ft
Client	DISH WIRELESS L.L.C.	Base Width :	23 ft
Code:	ANSI/TIA-222-H	Shape :	Triangle

LINEAR APPURTENANCE

Elev (ft) From	To	Qty	Description
0.00	172.00	24	1 5/8" Coax
0.00	162.00	1	Waveguide
0.00	162.00	1	1.75" (44.5mm) Hybrid
0.00	148.00	2	1.99" (50.7mm) Hybrid
0.00	148.00	2	1 1/4" Hybriflex Cable
0.00	147.00	1	Waveguide
0.00	143.00	2	1 5/8" Coax
0.00	142.50	1	Waveguide
0.00	137.00	1	1 5/8" Coax
0.00	135.00	1	1/2" Coax
0.00	134.00	2	1 5/8" Coax
0.00	129.00	1	EW63
0.00	128.00	1	EW63
0.00	127.00	1	3/8" Coax
0.00	125.00	1	1 5/8" Coax
0.00	122.00	3	1 5/8" Coax
0.00	120.50	1	7/8" Coax
0.00	117.00	1	1/2" Coax
0.00	115.50	1	7/8" Coax
0.00	97.00	2	7/8" Coax
0.00	94.00	1	1/2" Coax
0.00	78.00	1	7/8" Coax
0.00	30.00	1	1/2" Coax

GLOBAL BASE FOUNDATION DESIGN LOADS

Load Case	Moment (k-ft)	Vertical (kip)	Horizontal (kip)
DL+WL	6230.55	62.36	58.06
DL+WL+IL	1786.79	130.7	17.05

INDIVIDUAL BASE FOUNDATION DESIGN LOADS

	Vertical (kip)	Uplift (kip)	Horizontal (kip)
	333.59	287.05	35.97

JOB INFORMATION

Asset:	302522, Redding	Height :	180 ft
Client	DISH WIRELESS L.L.C.	Base Width :	23 ft
Code:	ANSI/TIA-222-H	Shape :	Triangle

ANALYSIS PARAMETERS

Location:	Fairfield County, CT	**Height:**	180 ft
Type and Shape:	Self Support, Triangle	**Base Elevation:**	0.00 ft
Manufacturer:	Rohn	**Bottom Face Width:**	23.00 ft
Kd	0.85	**Top Face Width:**	6.65 ft
Ke:	0.98	**Anchor Bolt Detail Type:**	c

ICE & WIND PARAMETERS

Exposure Category:	B	**Design Wind Speed Without Ice:**	116 mph
Risk Category:	II	**Design Wind Speed with Ice:**	50 mph
Topographic Factor Procedure:	Method 1	**Operational Windspeed:**	60 mph
Topographic Category:	Flat	**Design Ice Thickness:**	1.00 in
Crest Height:	0 ft	**HMSL:**	686 ft

SEISMIC PARAMETERS

Analysis Method:	Equivalent Lateral Force Method				
Site Class:	D - Stiff Soil			**Period Based on Rayleigh Method (sec):**	0.96
T_L (sec):	6	**P:**	1.3	**C_s:**	0.032
S_s:	0.235	**S_1:**	0.057	**C_s Max:**	0.032
F_a:	1.600	**F_v:**	2.400	**C_s Min:**	0.030
S_{ds}:	0.251	**S_{d1}:**	0.091		

LOAD CASES

1.2D + 1.0W Normal	116 mph wind with no ice
1.2D + 1.0W 60°	116 mph wind with no ice
1.2D + 1.0W 90°	116 mph wind with no ice
1.2D + 1.0W 120°	116 mph wind with no ice
1.2D + 1.0W 180°	116 mph wind with no ice
1.2D + 1.0W 210°	116 mph wind with no ice
1.2D + 1.0W 240°	116 mph wind with no ice
1.2D + 1.0W 300°	116 mph wind with no ice
1.2D + 1.0W 330°	116 mph wind with no ice
0.9D + 1.0W Normal	116 mph wind with no ice
0.9D + 1.0W 60°	116 mph wind with no ice
0.9D + 1.0W 90°	116 mph wind with no ice
0.9D + 1.0W 120°	116 mph wind with no ice
0.9D + 1.0W 180°	116 mph wind with no ice
0.9D + 1.0W 210°	116 mph wind with no ice
0.9D + 1.0W 240°	116 mph wind with no ice
0.9D + 1.0W 300°	116 mph wind with no ice
0.9D + 1.0W 330°	116 mph wind with no ice
1.2D + 1.0Di + 1.0Wi Normal	50 mph wind with 1" radial ice
1.2D + 1.0Di + 1.0Wi 60°	50 mph wind with 1" radial ice
1.2D + 1.0Di + 1.0Wi 90°	50 mph wind with 1" radial ice
1.2D + 1.0Di + 1.0Wi 120°	50 mph wind with 1" radial ice
1.2D + 1.0Di + 1.0Wi 180°	50 mph wind with 1" radial ice
1.2D + 1.0Di + 1.0Wi 210°	50 mph wind with 1" radial ice
1.2D + 1.0Di + 1.0Wi 240°	50 mph wind with 1" radial ice
1.2D + 1.0Di + 1.0Wi 300°	50 mph wind with 1" radial ice
1.2D + 1.0Di + 1.0Wi 330°	50 mph wind with 1" radial ice
1.2D + 1.0Ev + 1.0Eh Normal	Seismic
1.2D + 1.0Ev + 1.0Eh 60°	Seismic
1.2D + 1.0Ev + 1.0Eh 90°	Seismic
1.2D + 1.0Ev + 1.0Eh 120°	Seismic
1.2D + 1.0Ev + 1.0Eh 180°	Seismic
1.2D + 1.0Ev + 1.0Eh 210°	Seismic
1.2D + 1.0Ev + 1.0Eh 240°	Seismic

LOAD CASES

1.2D + 1.0Ev + 1.0Eh 300°	Seismic
1.2D + 1.0Ev + 1.0Eh 330°	Seismic
0.9D - 1.0Ev + 1.0Eh Normal	Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 60°	Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 90°	Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 120°	Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 180°	Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 210°	Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 240°	Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 300°	Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 330°	Seismic (Reduced DL)
1.0D + 1.0W Service Normal	60 mph Wind with No Ice
1.0D + 1.0W Service 60°	60 mph Wind with No Ice
1.0D + 1.0W Service 90°	60 mph Wind with No Ice
1.0D + 1.0W Service 120°	60 mph Wind with No Ice
1.0D + 1.0W Service 180°	60 mph Wind with No Ice
1.0D + 1.0W Service 210°	60 mph Wind with No Ice
1.0D + 1.0W Service 240°	60 mph Wind with No Ice
1.0D + 1.0W Service 300°	60 mph Wind with No Ice
1.0D + 1.0W Service 330°	60 mph Wind with No Ice

TOWER LOADING

Discrete Appurtenance Properties 1.2D + 1.0W

Elev (ft)	Description	Qty	Wt. (lb)	EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient Factor	Vert Ecc (ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
184.0	Kaelus DBC0061F1V51-2	6	26	0.4	0.7	6.5	6.2	0.80	0.50	1.0	29.72	33.65	30	184
184.0	Powerwave Allgon LGP21401	6	14	1.1	1.2	9.2	2.6	0.80	0.50	1.0	75.78	33.65	76	102
184.0	Raycap DC6-48-60-18-8F ("Squid	1	32	1.5	2.0	11.0	11.0	0.80	1.00	1.0	33.64	33.65	34	38
184.0	Ericsson RRUS 4478 B14	3	60	1.8	1.4	13.4	7.7	0.80	0.50	0.0	0.00	33.60	63	216
184.0	Ericsson RRUS 4449 B5, B12	3	71	2.0	1.5	13.2	9.4	0.80	0.50	0.0	0.00	33.60	67	256
184.0	Raycap DC6-48-60-18-8C	2	16	2.0	1.7	18.2	6.4	0.80	0.50	1.0	46.45	33.65	46	38
184.0	Ericsson RRUS 32 B30 (53 lbs)	3	53	2.7	2.3	12.1	7.0	0.80	0.50	1.0	94.15	33.65	94	191
184.0	Ericsson RRUS 32 B2	3	53	2.7	2.3	12.1	7.0	0.80	0.50	1.0	94.15	33.65	94	191
184.0	Powerwave Allgon 7770.00	3	35	5.5	4.6	11.0	5.0	0.80	0.65	2.0	492.29	33.70	246	126
184.0	Quintel QS66512-2	2	111	8.1	6.0	12.0	9.6	0.80	0.80	1.0	297.76	33.65	298	266
184.0	CCI DMP65R-BU6DA	2	79	12.7	5.9	20.7	7.7	0.80	0.72	0.0	0.00	33.60	418	191
184.0	CCI OPA65R-BU6D	2	63	12.9	5.9	21.0	7.8	0.80	0.72	0.0	0.00	33.60	423	152
184.0	CCI TPA-65R-LCUUUU-H8	1	82	13.3	8.0	14.4	8.6	0.80	0.80	1.0	243.43	33.65	243	98
184.0	CCI DMP65R-BU8D	1	96	17.9	8.0	20.7	7.7	0.80	0.80	0.0	0.00	33.60	327	115
184.0	CCI OPA65R-BU8D	1	77	18.1	8.0	21.0	7.8	0.80	0.80	0.0	0.00	33.60	331	92
180.0	Generic Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.67	0.0	0.00	33.39	616	1080
172.0	Commscope CBC78T-DS-43-2X	3	21	0.6	0.8	6.9	6.4	0.80	0.50	0.0	0.00	32.96	19	75
172.0	Samsung B5/B13 RRH-BR04C	3	70	1.9	1.3	15.0	8.1	0.80	0.50	0.0	0.00	32.96	63	253
172.0	Samsung B2/B66A RRH-BR049	3	84	1.9	1.3	15.0	10.0	0.80	0.50	0.0	0.00	32.96	63	304
172.0	RFS APL868013-42T0	2	6	3.6	4.0	6.0	8.0	0.80	0.79	0.0	0.00	32.96	128	15
172.0	RFS DB-C1-12C-24AB-0Z	1	32	4.1	2.5	16.5	12.6	0.80	1.00	0.0	0.00	32.96	91	38
172.0	Andrew DB844G65ZAXY	4	12	4.3	4.0	10.0	8.5	0.80	0.75	2.7	791.51	33.10	293	58
172.0	Samsung MT6407-77A	3	82	4.7	2.9	16.1	5.5	0.80	0.61	0.0	0.00	32.96	193	294
172.0	Commscope JAHH-65B-R3B	6	61	9.1	6.0	13.8	8.2	0.80	0.69	0.0	0.00	32.96	845	436
172.0	Generic Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.67	0.0	0.00	32.96	608	1080
162.0	Raycap RDIDC-9181-PF-48	1	22	1.9	1.3	14.0	8.0	0.80	1.00	0.0	0.00	32.40	41	26
162.0	Fujitsu TA08025-B605	3	75	2.0	1.3	15.0	9.1	0.80	0.50	0.0	0.00	32.40	65	270
162.0	Fujitsu TA08025-B604	3	64	2.0	1.3	15.0	7.9	0.80	0.50	0.0	0.00	32.40	65	230
162.0	JMA Wireless MX08FRO665-21	3	65	12.5	6.0	20.0	8.0	0.80	0.64	0.0	0.00	32.40	528	232
162.0	Generic Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.75	0.0	0.00	32.40	669	1080
148.0	Ericsson Radio 4449 B71 B85A	3	75	1.6	1.3	13.2	10.5	0.80	0.50	0.0	0.00	31.57	53	270
148.0	Ericsson 4460 BAND 2/25	3	109	2.6	1.6	15.7	12.1	0.80	0.50	0.0	0.00	31.57	83	392
148.0	Commscope VV-65A-R1B	3	25	5.9	4.6	12.0	4.6	0.80	0.63	0.0	0.00	31.57	239	89
148.0	Ericsson AIR 6419 B41	3	83	6.3	3.0	20.9	9.0	0.80	0.63	0.0	0.00	31.57	257	300
148.0	RFS APXVAARR24_43-U-NA20	3	128	20.2	8.0	24.0	8.7	0.80	0.63	0.0	0.00	31.57	821	460
147.0	Perfect Vision PV-SFA12-B Sect	3	592	18.2	0.0	0.0	0.0	0.75	0.67	0.0	0.00	31.51	735	2131
146.0	Sinclair SC479-HF1LDF	1	34	5.0	14.4	3.5	3.5	1.00	1.00	0.0	0.00	31.45	134	41
142.5	Generic Round Side Arm	2	188	5.2	0.0	0.0	0.0	1.00	0.90	0.0	0.00	31.23	248	450
137.0	Andrew Microwaves DB810K-XT	1	35	4.4	14.5	3.0	3.0	1.00	1.00	0.0	0.00	30.88	114	42
136.4	Amphenol Antel WPA-700120-4CF-	1	7	2.7	4.0	5.6	5.6	1.00	0.70	0.0	0.00	30.84	49	8
136.0	Generic Round Sector Frame	2	300	14.4	0.0	0.0	0.0	1.00	0.90	0.0	0.00	30.82	679	720
135.0	Generic 24" x 24" Ice Shield	1	50	0.8	0.3	24.0	24.0	1.00	1.00	-2.0	41.65	30.62	21	60
134.8	Bird 432E-83I-01-T	1	25	1.2	1.0	12.0	7.5	1.00	0.50	0.0	0.00	30.74	16	30
134.0	Generic 24" x 24" Ice Shield	1	50	0.8	0.3	24.0	24.0	1.00	1.00	-1.0	20.82	30.62	21	60
134.0	Sinclair SE419-SF3P4LDF	2	24	9.5	8.6	2.9	8.5	1.00	1.00	0.0	0.00	30.69	498	58
131.0	Morad VHF 156-DELUXE	1	1	0.3	3.3	0.8	0.8	1.00	1.00	0.0	0.00	30.49	7	1
131.0	Generic Round Side Arm	2	188	5.2	0.0	0.0	0.0	1.00	0.90	0.0	0.00	30.49	243	450
129.8	Sinclair SC479-HF1LDF	3	34	5.0	14.4	3.5	3.5	1.00	1.00	-4.0	1,546.31	30.14	387	122
129.0	RFS PA6-65AC	1	278	47.0	6.0	72.0	0.0	1.00	1.00	0.0	0.00	30.36	1214	334
128.0	RFS PA6-65AC	1	278	47.0	6.0	72.0	0.0	1.00	1.00	0.0	0.00	30.29	1211	334
127.0	Bird 432-83H-01-T	1	25	1.4	1.2	12.0	7.0	1.00	0.50	0.0	0.00	30.22	18	30
127.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	30.22	134	225
127.0	Allgon 7199 / M-1900-90-19.5I	2	18	6.6	8.5	5.0	3.1	1.00	0.78	0.0	0.00	30.22	263	42
125.0	Sinclair SE419-SF3P4LDF	1	24	9.5	8.6	2.9	8.5	1.00	1.00	0.0	0.00	30.08	244	29
121.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	29.81	132	225
120.5	Decibel DB586	1	59	0.7	0.0	0.0	0.0	0.90	0.90	0.0	0.00	29.77	15	71
120.5	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	0.90	0.90	0.0	0.00	29.77	107	225
116.8	Morad VHF 156-DELUXE	1	1	0.3	3.3	0.8	0.8	1.00	1.00	0.0	0.00	29.51	7	1
115.5	Decibel DB586	1	59	0.7	0.0	0.0	0.0	1.00	1.00	0.0	0.00	29.41	19	71
115.0	Generic Round Side Arm	2	188	5.2	0.0	0.0	0.0	1.00	0.90	0.0	0.00	29.38	234	450
102.5	Scala OGT9-840	1	19	2.3	11.4	2.0	2.0	1.00	1.00	0.0	0.00	28.43	55	22
100.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	28.23	125	225
100.0	Generic Flat Stand-Off	1	188	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	28.23	151	225
97.0	Sinclair SD210D	1	40	4.4	16.0	41.0	4.0	1.00	1.00	0.0	0.00	27.98	106	48
93.6	PCTEL GPS-TMG-HR-26N	1	1	0.1	0.4	3.2	3.2	1.00	1.00	2.0	4.26	27.87	2	1
92.2	Scala OGT9-840	1	19	2.3	11.4	2.0	2.0	1.00	1.00	0.0	0.00	27.58	53	22

Elev (ft)	Description	Qty	Wt. (lb)	EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient Factor	Vert Ecc (ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
91.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	27.48	121	225
86.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	27.04	119	225
77.6	Andrew DB264-A	1	36	5.9	21.5	0.0	0.0	1.00	1.00	0.0	0.00	26.25	132	43
30.0	Generic 2" x 4" GPS	1	5	0.0	0.2	4.0	2.0	1.00	0.50	0.0	0.00	20.01	0	6
18.0	PCTEL GPS-TMG-HR-26N	1	1	0.1	0.4	3.2	3.2	1.00	1.00	0.0	0.00	19.99	2	1
	Totals	144	13,741	913.4									16,145	16,489

TOWER LOADING

Discrete Appurtenance Properties 0.9D + 1.0W

Elev (ft)	Description	Qty	Wt. (lb)	EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient Factor	Vert Ecc (ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
184.0	Kaelus DBC0061F1V51-2	6	26	0.4	0.7	6.5	6.2	0.80	0.50	1.0	29.72	33.65	30	138
184.0	Powerwave Allgon LGP21401	6	14	1.1	1.2	9.2	2.6	0.80	0.50	1.0	75.78	33.65	76	76
184.0	Raycap DC6-48-60-18-8F ("Squid	1	32	1.5	2.0	11.0	11.0	0.80	1.00	1.0	33.64	33.65	34	29
184.0	Ericsson RRUS 4478 B14	3	60	1.8	1.4	13.4	7.7	0.80	0.50	0.0	0.00	33.60	63	162
184.0	Ericsson RRUS 4449 B5, B12	3	71	2.0	1.5	13.2	9.4	0.80	0.50	0.0	0.00	33.60	67	192
184.0	Raycap DC6-48-60-18-8C	2	16	2.0	1.7	18.2	6.4	0.80	0.50	1.0	46.45	33.65	46	29
184.0	Ericsson RRUS 32 B30 (53 lbs)	3	53	2.7	2.3	12.1	7.0	0.80	0.50	1.0	94.15	33.65	94	143
184.0	Ericsson RRUS 32 B2	3	53	2.7	2.3	12.1	7.0	0.80	0.50	1.0	94.15	33.65	94	143
184.0	Powerwave Allgon 7770.00	3	35	5.5	4.6	11.0	5.0	0.80	0.65	2.0	492.29	33.70	246	94
184.0	Quintel QS66512-2	2	111	8.1	6.0	12.0	9.6	0.80	0.80	1.0	297.76	33.65	298	200
184.0	CCI DMP65R-BU6DA	2	79	12.7	5.9	20.7	7.7	0.80	0.72	0.0	0.00	33.60	418	143
184.0	CCI OPA65R-BU6D	2	63	12.9	5.9	21.0	7.8	0.80	0.72	0.0	0.00	33.60	423	114
184.0	CCI TPA-65R-LCUUUU-H8	1	82	13.3	8.0	14.4	8.6	0.80	0.80	1.0	243.43	33.65	243	73
184.0	CCI DMP65R-BU8D	1	96	17.9	8.0	20.7	7.7	0.80	0.80	0.0	0.00	33.60	327	86
184.0	CCI OPA65R-BU8D	1	77	18.1	8.0	21.0	7.8	0.80	0.80	0.0	0.00	33.60	331	69
180.0	Generic Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.67	0.0	0.00	33.39	616	810
172.0	Commscope CBC78T-DS-43-2X	3	21	0.6	0.8	6.9	6.4	0.80	0.50	0.0	0.00	32.96	19	56
172.0	Samsung B5/B13 RRH-BR04C	3	70	1.9	1.3	15.0	8.1	0.80	0.50	0.0	0.00	32.96	63	190
172.0	Samsung B2/B66A RRH-BR049	3	84	1.9	1.3	15.0	10.0	0.80	0.50	0.0	0.00	32.96	63	228
172.0	RFS APL868013-42T0	2	6	3.6	4.0	6.0	8.0	0.80	0.79	0.0	0.00	32.96	128	11
172.0	RFS DB-C1-12C-24AB-0Z	1	32	4.1	2.5	16.5	12.6	0.80	1.00	0.0	0.00	32.96	91	29
172.0	Andrew DB844G65ZAXY	4	12	4.3	4.0	10.0	8.5	0.80	0.75	2.7	791.51	33.10	293	43
172.0	Samsung MT6407-77A	3	82	4.7	2.9	16.1	5.5	0.80	0.61	0.0	0.00	32.96	193	220
172.0	Commscope JAHH-65B-R3B	6	61	9.1	6.0	13.8	8.2	0.80	0.69	0.0	0.00	32.96	845	327
172.0	Generic Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.67	0.0	0.00	32.96	608	810
162.0	Raycap RDIDC-9181-PF-48	1	22	1.9	1.3	14.0	8.0	0.80	1.00	0.0	0.00	32.40	41	20
162.0	Fujitsu TA08025-B605	3	75	2.0	1.3	15.0	9.1	0.80	0.50	0.0	0.00	32.40	65	202
162.0	Fujitsu TA08025-B604	3	64	2.0	1.3	15.0	7.9	0.80	0.50	0.0	0.00	32.40	65	173
162.0	JMA Wireless MX08FRO665-21	3	65	12.5	6.0	20.0	8.0	0.80	0.64	0.0	0.00	32.40	528	174
162.0	Generic Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.75	0.0	0.00	32.40	669	810
148.0	Ericsson Radio 4449 B71 B85A	3	75	1.6	1.3	13.2	10.5	0.80	0.50	0.0	0.00	31.57	53	202
148.0	Ericsson 4460 BAND 2/25	3	109	2.6	1.6	15.7	12.1	0.80	0.50	0.0	0.00	31.57	83	294
148.0	Commscope VV-65A-R1B	3	25	5.9	4.6	12.0	4.6	0.80	0.63	0.0	0.00	31.57	239	67
148.0	Ericsson AIR 6419 B41	3	83	6.3	3.0	20.9	9.0	0.80	0.63	0.0	0.00	31.57	257	225
148.0	RFS APXVAARR24_43-U-NA20	3	128	20.2	8.0	24.0	8.7	0.80	0.63	0.0	0.00	31.57	821	345
147.0	Perfect Vision PV-SFA12-B Sect	3	592	18.2	0.0	0.0	0.0	0.75	0.67	0.0	0.00	31.51	735	1598
146.0	Sinclair SC479-HF1LDF	1	34	5.0	14.4	3.5	3.5	1.00	1.00	0.0	0.00	31.45	134	31
142.5	Generic Round Side Arm	2	188	5.2	0.0	0.0	0.0	1.00	0.90	0.0	0.00	31.23	248	338
137.0	Andrew Microwaves DB810K-XT	1	35	4.4	14.5	3.0	3.0	1.00	1.00	0.0	0.00	30.88	114	32
136.4	Amphenol Antel WPA-700120-4CF-	1	7	2.7	4.0	5.6	5.6	1.00	0.70	0.0	0.00	30.84	49	6
136.0	Generic Round Sector Frame	2	300	14.4	0.0	0.0	0.0	1.00	0.90	0.0	0.00	30.82	679	540
135.0	Generic 24" x 24" Ice Shield	1	50	0.8	0.3	24.0	24.0	1.00	1.00	-2.0	41.65	30.62	21	45
134.8	Bird 432E-83I-01-T	1	25	1.2	1.0	12.0	7.5	1.00	0.50	0.0	0.00	30.74	16	22
134.0	Generic 24" x 24" Ice Shield	1	50	0.8	0.3	24.0	24.0	1.00	1.00	-1.0	20.82	30.62	21	45
134.0	Sinclair SE419-SF3P4LDF	2	24	9.5	8.6	2.9	8.5	1.00	1.00	0.0	0.00	30.69	498	43
131.0	Morad VHF 156-DELUXE	1	1	0.3	3.3	0.8	0.8	1.00	1.00	0.0	0.00	30.49	7	1
131.0	Generic Round Side Arm	2	188	5.2	0.0	0.0	0.0	1.00	0.90	0.0	0.00	30.49	243	338
129.8	Sinclair SC479-HF1LDF	3	34	5.0	14.4	3.5	3.5	1.00	1.00	-4.0	1,546.31	30.14	387	92
129.0	RFS PA6-65AC	1	278	47.0	6.0	72.0	0.0	1.00	1.00	0.0	0.00	30.36	1214	250
128.0	RFS PA6-65AC	1	278	47.0	6.0	72.0	0.0	1.00	1.00	0.0	0.00	30.29	1211	250
127.0	Bird 432-83H-01-T	1	25	1.4	1.2	12.0	7.0	1.00	0.50	0.0	0.00	30.22	18	22
127.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	30.22	134	169
127.0	Allgon 7199 / M-1900-90-19.5I	2	18	6.6	8.5	5.0	3.1	1.00	0.78	0.0	0.00	30.22	263	32
125.0	Sinclair SE419-SF3P4LDF	1	24	9.5	8.6	2.9	8.5	1.00	1.00	0.0	0.00	30.08	244	22
121.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	29.81	132	169
120.5	Decibel DB586	1	59	0.7	0.0	0.0	0.0	0.90	0.90	0.0	0.00	29.77	15	53

Elev (ft)	Description	Qty	Wt. (lb)	EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient Factor	Vert E_{cc} (ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
120.5	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	0.90	0.90	0.0	0.00	29.77	107	169
116.8	Morad VHF 156-DELUXE	1	1	0.3	3.3	0.8	0.8	1.00	1.00	0.0	0.00	29.51	7	1
115.5	Decibel DB586	1	59	0.7	0.0	0.0	0.0	1.00	1.00	0.0	0.00	29.41	19	53
115.0	Generic Round Side Arm	2	188	5.2	0.0	0.0	0.0	1.00	0.90	0.0	0.00	29.38	234	338
102.5	Scala OGT9-840	1	19	2.3	11.4	2.0	2.0	1.00	1.00	0.0	0.00	28.43	55	17
100.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	28.23	125	169
100.0	Generic Flat Stand-Off	1	188	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	28.23	151	169
97.0	Sinclair SD210D	1	40	4.4	16.0	41.0	4.0	1.00	1.00	0.0	0.00	27.98	106	36
93.6	PCTEL GPS-TMG-HR-26N	1	1	0.1	0.4	3.2	3.2	1.00	1.00	2.0	4.26	27.87	2	1
92.2	Scala OGT9-840	1	19	2.3	11.4	2.0	2.0	1.00	1.00	0.0	0.00	27.58	53	17
91.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	27.48	121	169
86.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	27.04	119	169
77.6	Andrew DB264-A	1	36	5.9	21.5	0.0	0.0	1.00	1.00	0.0	0.00	26.25	132	32
30.0	Generic 2" x 4" GPS	1	5	0.0	0.2	4.0	2.0	1.00	0.50	0.0	0.00	20.01	0	4
18.0	PCTEL GPS-TMG-HR-26N	1	1	0.1	0.4	3.2	3.2	1.00	1.00	0.0	0.00	19.99	2	1
	Totals	144	13,741	913.4									16,145	12,367

TOWER LOADING

Discrete Appurtenance Properties 1.2D + 1.0Di + 1.0Wi

Elev (ft)	Description	Qty	Ice Wt (lb)	Ice EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient Factor	Vert E_{cc} (ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
184.0	Kaelus DBC0061F1V51-2	6	38	0.7	0.7	6.5	6.2	0.80	0.50	1.0	9.40	6.25	9	259
184.0	Powerwave Allgon LGP21401	6	31	1.6	1.2	9.2	2.6	0.80	0.50	1.0	20.24	6.25	20	203
184.0	Raycap DC6-48-60-18-8F ("Squid	1	74	1.9	2.0	11.0	11.0	0.80	1.00	1.0	8.26	6.25	8	80
184.0	Ericsson RRUS 4478 B14	3	97	2.4	1.4	13.4	7.7	0.80	0.50	0.0	0.00	6.24	16	328
184.0	Ericsson RRUS 4449 B5, B12	3	115	2.6	1.5	13.2	9.4	0.80	0.50	0.0	0.00	6.24	17	386
184.0	Raycap DC6-48-60-18-8C	2	55	2.5	1.7	18.2	6.4	0.80	0.50	1.0	10.81	6.25	11	117
184.0	Ericsson RRUS 32 B30 (53 lbs)	3	103	3.5	2.3	12.1	7.0	0.80	0.50	1.0	22.54	6.25	23	340
184.0	Ericsson RRUS 32 B2	3	103	3.5	2.3	12.1	7.0	0.80	0.50	1.0	22.54	6.25	23	340
184.0	Powerwave Allgon 7770.00	3	112	6.9	4.6	11.0	5.0	0.80	0.65	2.0	115.34	6.26	58	357
184.0	Quintel QS66512-2	2	246	10.0	6.0	12.0	9.6	0.80	0.80	1.0	68.15	6.25	68	536
184.0	CCI DMP65R-BU6DA	2	254	14.6	5.9	20.7	7.7	0.80	0.72	0.0	0.00	6.24	89	539
184.0	CCI OPA65R-BU6D	2	240	14.8	5.9	21.0	7.8	0.80	0.72	0.0	0.00	6.24	90	505
184.0	CCI TPA-65R-LCUUUU-H8	1	269	15.8	8.0	14.4	8.6	0.80	0.80	1.0	53.82	6.25	54	285
184.0	CCI DMP65R-BU8D	1	326	20.4	8.0	20.7	7.7	0.80	0.80	0.0	0.00	6.24	69	345
184.0	CCI OPA65R-BU8D	1	310	20.6	8.0	21.0	7.8	0.80	0.80	0.0	0.00	6.24	70	325
180.0	Generic Round Sector Frame	3	549	25.6	0.0	0.0	0.0	0.75	0.67	0.0	0.00	6.20	203	1826
172.0	Commscope CBC78T-DS-43-2X	3	36	0.9	0.8	6.9	6.4	0.80	0.50	0.0	0.00	6.12	6	119
172.0	Samsung B5/B13 RRH-BR04C	3	109	2.5	1.3	15.0	8.1	0.80	0.50	0.0	0.00	6.12	16	369
172.0	Samsung B2/B66A RRH-BR049	3	128	2.5	1.3	15.0	10.0	0.80	0.50	0.0	0.00	6.12	16	433
172.0	RFS APL868013-42T0	2	66	4.9	4.0	6.0	8.0	0.80	0.79	0.0	0.00	6.12	32	134
172.0	RFS DB-C1-12C-24AB-0Z	1	118	5.0	2.5	16.5	12.6	0.80	1.00	0.0	0.00	6.12	21	124
172.0	Andrew DB844G65ZAXY	4	99	5.0	4.0	10.0	8.5	0.80	0.75	2.7	168.00	6.15	62	404
172.0	Samsung MT6407-77A	3	151	5.7	2.9	16.1	5.5	0.80	0.61	0.0	0.00	6.12	44	501
172.0	Commscope JAHH-65B-R3B	6	197	11.0	6.0	13.8	8.2	0.80	0.69	0.0	0.00	6.12	189	1257
172.0	Generic Round Sector Frame	3	549	25.6	0.0	0.0	0.0	0.75	0.67	0.0	0.00	6.12	201	1826
162.0	Raycap RDIDC-9181-PF-48	1	60	2.5	1.3	14.0	8.0	0.80	1.00	0.0	0.00	6.02	10	65
162.0	Fujitsu TA08025-B605	3	117	2.6	1.3	15.0	9.1	0.80	0.50	0.0	0.00	6.02	16	397
162.0	Fujitsu TA08025-B604	3	103	2.6	1.3	15.0	7.9	0.80	0.50	0.0	0.00	6.02	16	348
162.0	JMA Wireless MX08FRO665-21	3	238	14.4	6.0	20.0	8.0	0.80	0.64	0.0	0.00	6.02	113	754
162.0	Generic Round Sector Frame	3	549	25.6	0.0	0.0	0.0	0.75	0.75	0.0	0.00	6.02	221	1826
148.0	Ericsson Radio 4449 B71 B85A	3	115	2.2	1.3	13.2	10.5	0.80	0.50	0.0	0.00	5.87	13	391
148.0	Ericsson 4460 BAND 2/25	3	168	3.3	1.6	15.7	12.1	0.80	0.50	0.0	0.00	5.87	20	570
148.0	Commscope VV-65A-R1B	3	103	7.3	4.6	12.0	4.6	0.80	0.63	0.0	0.00	5.87	55	323
148.0	Ericsson AIR 6419 B41	3	184	7.5	3.0	20.9	9.0	0.80	0.63	0.0	0.00	5.87	56	603
148.0	RFS APXVAARR24_43-U-NA20	3	390	22.7	8.0	24.0	8.7	0.80	0.63	0.0	0.00	5.87	171	1247
147.0	Perfect Vision PV-SFA12-B Sect	3	868	26.7	0.0	0.0	0.0	0.75	0.67	0.0	0.00	5.85	200	2958
146.0	Sinclair SC479-HF1LDF	1	117	8.5	14.4	3.5	3.5	1.00	1.00	0.0	0.00	5.84	42	124
142.5	Generic Round Side Arm	2	249	7.0	0.0	0.0	0.0	1.00	0.90	0.0	0.00	5.80	62	572
137.0	Andrew Microwaves DB810K-XT	1	107	7.8	14.5	3.0	3.0	1.00	1.00	0.0	0.00	5.74	38	114
136.4	Amphenol Antel WPA-700120-4CF-	1	53	3.7	4.0	5.6	5.6	1.00	0.70	0.0	0.00	5.73	13	54
136.0	Generic Round Sector Frame	2	542	25.3	0.0	0.0	0.0	1.00	0.90	0.0	0.00	5.73	222	1204
135.0	Generic 24" x 24" Ice Shield	1	111	1.4	0.3	24.0	24.0	1.00	1.00	-2.0	13.10	5.69	7	121
134.8	Bird 432E-83I-01-T	1	52	1.7	1.0	12.0	7.5	1.00	0.50	0.0	0.00	5.71	4	57
134.0	Generic 24" x 24" Ice Shield	1	111	1.4	0.3	24.0	24.0	1.00	1.00	-1.0	6.55	5.69	7	121
134.0	Sinclair SE419-SF3P4LDF	2	122	11.7	8.6	2.9	8.5	1.00	1.00	0.0	0.00	5.70	114	253

Elev (ft)	Description	Qty	Ice Wt (lb)	Ice EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient Factor	Vert Ecc (ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
131.0	Morad VHF 156-DELUXE	1	13	0.8	3.3	0.8	0.8	1.00	1.00	0.0	0.00	5.66	4	13
131.0	Generic Round Side Arm	2	248	7.0	0.0	0.0	0.0	1.00	0.90	0.0	0.00	5.66	61	570
129.8	Sinclair SC479-HF1LDF	3	116	8.4	14.4	3.5	3.5	1.00	1.00	-4.0	480.51	5.60	120	368
129.0	RFS PA6-65AC	1	589	50.1	6.0	72.0	0.0	1.00	1.00	0.0	0.00	5.64	240	645
128.0	RFS PA6-65AC	1	589	50.1	6.0	72.0	0.0	1.00	1.00	0.0	0.00	5.63	240	645
127.0	Bird 432-83H-01-T	1	54	1.9	1.2	12.0	7.0	1.00	0.50	0.0	0.00	5.61	5	59
127.0	Generic Round Side Arm	1	248	7.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	5.61	33	285
127.0	Allgon 7199 / M-1900-90-19.5I	2	100	7.5	8.5	5.0	3.1	1.00	0.78	0.0	0.00	5.61	56	206
125.0	Sinclair SE419-SF3P4LDF	1	122	11.7	8.6	2.9	8.5	1.00	1.00	0.0	0.00	5.59	56	126
121.0	Generic Round Side Arm	1	247	7.0	0.0	0.0	0.0	1.00	1.00	0.0	0.00	5.54	33	284
120.5	Decibel DB586	1	86	1.1	0.0	0.0	0.0	0.90	0.90	0.0	0.00	5.53	4	97
120.5	Generic Round Side Arm	1	247	7.0	0.0	0.0	0.0	0.90	0.90	0.0	0.00	5.53	27	284
116.8	Morad VHF 156-DELUXE	1	13	0.8	3.3	0.8	0.8	1.00	1.00	0.0	0.00	5.48	4	13
115.5	Decibel DB586	1	86	1.1	0.0	0.0	0.0	1.00	1.00	0.0	0.00	5.46	5	97
115.0	Generic Round Side Arm	2	247	7.0	0.0	0.0	0.0	1.00	0.90	0.0	0.00	5.46	58	568
102.5	Scala OGT9-840	1	80	4.9	11.4	2.0	2.0	1.00	1.00	0.0	0.00	5.28	22	84
100.0	Generic Round Side Arm	1	246	6.9	0.0	0.0	0.0	1.00	1.00	0.0	0.00	5.24	31	283
100.0	Generic Flat Stand-Off	1	272	8.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	5.24	37	310
97.0	Sinclair SD210D	1	122	11.4	16.0	41.0	4.0	1.00	1.00	0.0	0.00	5.20	51	130
93.6	PCTEL GPS-TMG-HR-26N	1	4	0.2	0.4	3.2	3.2	1.00	1.00	2.0	1.80	5.18	1	4
92.2	Scala OGT9-840	1	80	4.9	11.4	2.0	2.0	1.00	1.00	0.0	0.00	5.12	21	84
91.0	Generic Round Side Arm	1	246	6.9	0.0	0.0	0.0	1.00	1.00	0.0	0.00	5.10	30	283
86.0	Generic Round Side Arm	1	246	6.9	0.0	0.0	0.0	1.00	1.00	0.0	0.00	5.02	30	283
77.6	Andrew DB264-A	1	150	17.7	21.5	0.0	0.0	1.00	1.00	0.0	0.00	4.88	73	158
30.0	Generic 2" x 4" GPS	1	6	0.1	0.2	4.0	2.0	1.00	0.50	0.0	0.00	3.72	0	7
18.0	PCTEL GPS-TMG-HR-26N	1	3	0.2	0.4	3.2	3.2	1.00	1.00	0.0	0.00	3.71	1	3
	Totals	144	27,185	1237.0									4052	29,933

TOWER LOADING

Discrete Appurtenance Properties 1.0D + 1.0W Service

Elev (ft)	Description	Qty	Wt. (lb)	EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient Factor	Vert Ecc (ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
184.0	Kaelus DBC0061F1V51-2	6	26	0.4	0.7	6.5	6.2	0.80	0.50	1.0	7.95	9.00	8	153
184.0	Powerwave Allgon LGP21401	6	14	1.1	1.2	9.2	2.6	0.80	0.50	1.0	20.28	9.00	20	85
184.0	Raycap DC6-48-60-18-8F ("Squid	1	32	1.5	2.0	11.0	11.0	0.80	1.00	1.0	9.00	9.00	9	32
184.0	Ericsson RRUS 4478 B14	3	60	1.8	1.4	13.4	7.7	0.80	0.50	0.0	0.00	8.99	17	180
184.0	Ericsson RRUS 4449 B5, B12	3	71	2.0	1.5	13.2	9.4	0.80	0.50	0.0	0.00	8.99	18	213
184.0	Raycap DC6-48-60-18-8C	2	16	2.0	1.7	18.2	6.4	0.80	0.50	1.0	12.43	9.00	12	32
184.0	Ericsson RRUS 32 B30 (53 lbs)	3	53	2.7	2.3	12.1	7.0	0.80	0.50	1.0	25.19	9.00	25	159
184.0	Ericsson RRUS 32 B2	3	53	2.7	2.3	12.1	7.0	0.80	0.50	1.0	25.19	9.00	25	159
184.0	Powerwave Allgon 7770.00	3	35	5.5	4.6	11.0	5.0	0.80	0.65	2.0	131.71	9.02	66	105
184.0	Quintel QS66512-2	2	111	8.1	6.0	12.0	9.6	0.80	0.80	1.0	79.66	9.00	80	222
184.0	CCI DMP65R-BU6DA	2	79	12.7	5.9	20.7	7.7	0.80	0.72	0.0	0.00	8.99	112	159
184.0	CCI OPA65R-BU6D	2	63	12.9	5.9	21.0	7.8	0.80	0.72	0.0	0.00	8.99	113	126
184.0	CCI TPA-65R-LCUUUU-H8	1	82	13.3	8.0	14.4	8.6	0.80	0.80	1.0	65.13	9.00	65	82
184.0	CCI DMP65R-BU8D	1	96	17.9	8.0	20.7	7.7	0.80	0.80	0.0	0.00	8.99	87	96
184.0	CCI OPA65R-BU8D	1	77	18.1	8.0	21.0	7.8	0.80	0.80	0.0	0.00	8.99	88	76
180.0	Generic Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.67	0.0	0.00	8.93	165	900
172.0	Commscope CBC78T-DS-43-2X	3	21	0.6	0.8	6.9	6.4	0.80	0.50	0.0	0.00	8.82	5	62
172.0	Samsung B5/B13 RRH-BR04C	3	70	1.9	1.3	15.0	8.1	0.80	0.50	0.0	0.00	8.82	17	211
172.0	Samsung B2/B66A RRH-BR049	3	84	1.9	1.3	15.0	10.0	0.80	0.50	0.0	0.00	8.82	17	253
172.0	RFS APL868013-42T0	2	6	3.6	4.0	6.0	8.0	0.80	0.79	0.0	0.00	8.82	34	13
172.0	RFS DB-C1-12C-24AB-0Z	1	32	4.1	2.5	16.5	12.6	0.80	1.00	0.0	0.00	8.82	24	32
172.0	Andrew DB844G65ZAXY	4	12	4.3	4.0	10.0	8.5	0.80	0.75	2.7	211.76	8.86	78	48
172.0	Samsung MT6407-77A	3	82	4.7	2.9	16.1	5.5	0.80	0.61	0.0	0.00	8.82	52	245
172.0	Commscope JAHH-65B-R3B	6	61	9.1	6.0	13.8	8.2	0.80	0.69	0.0	0.00	8.82	226	364
172.0	Generic Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.67	0.0	0.00	8.82	163	900
162.0	Raycap RDIDC-9181-PF-48	1	22	1.9	1.3	14.0	8.0	0.80	1.00	0.0	0.00	8.67	11	22
162.0	Fujitsu TA08025-B605	3	75	2.0	1.3	15.0	9.1	0.80	0.50	0.0	0.00	8.67	17	225
162.0	Fujitsu TA08025-B604	3	64	2.0	1.3	15.0	7.9	0.80	0.50	0.0	0.00	8.67	17	192
162.0	JMA Wireless MX08FRO665-21	3	65	12.5	6.0	20.0	8.0	0.80	0.64	0.0	0.00	8.67	141	194
162.0	Generic Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.75	0.0	0.00	8.67	179	900
148.0	Ericsson Radio 4449 B71 B85A	3	75	1.6	1.3	13.2	10.5	0.80	0.50	0.0	0.00	8.45	14	225
148.0	Ericsson 4460 BAND 2/25	3	109	2.6	1.6	15.7	12.1	0.80	0.50	0.0	0.00	8.45	22	327
148.0	Commscope VV-65A-R1B	3	25	5.9	4.6	12.0	4.6	0.80	0.63	0.0	0.00	8.45	64	74

Elev (ft)	Description	Qty	Wt. (lb)	EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient Factor	Vert Ecc (ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
148.0	Ericsson AIR 6419 B41	3	83	6.3	3.0	20.9	9.0	0.80	0.63	0.0	0.00	8.45	69	250
148.0	RFS APXVAARR24_43-U-NA20	3	128	20.2	8.0	24.0	8.7	0.80	0.63	0.0	0.00	8.45	220	384
147.0	Perfect Vision PV-SFA12-B Sect	3	592	18.2	0.0	0.0	0.0	0.75	0.67	0.0	0.00	8.43	197	1776
146.0	Sinclair SC479-HF1LDF	1	34	5.0	14.4	3.5	3.5	1.00	1.00	0.0	0.00	8.41	36	34
142.5	Generic Round Side Arm	2	188	5.2	0.0	0.0	0.0	1.00	0.90	0.0	0.00	8.36	66	375
137.0	Andrew Microwaves DB810K-XT	1	35	4.4	14.5	3.0	3.0	1.00	1.00	0.0	0.00	8.26	31	35
136.4	Amphenol Antel WPA-700120-4CF-	1	7	2.7	4.0	5.6	5.6	1.00	0.70	0.0	0.00	8.25	13	7
136.0	Generic Round Sector Frame	2	300	14.4	0.0	0.0	0.0	1.00	0.90	0.0	0.00	8.24	182	600
135.0	Generic 24" x 24" Ice Shield	1	50	0.8	0.3	24.0	24.0	1.00	1.00	-2.0	11.14	8.19	6	50
134.8	Bird 432E-83I-01-T	1	25	1.2	1.0	12.0	7.5	1.00	0.50	0.0	0.00	8.22	4	25
134.0	Generic 24" x 24" Ice Shield	1	50	0.8	0.3	24.0	24.0	1.00	1.00	-1.0	5.57	8.19	6	50
134.0	Sinclair SE419-SF3P4LDF	2	24	9.5	8.6	2.9	8.5	1.00	1.00	0.0	0.00	8.21	133	48
131.0	Morad VHF 156-DELUXE	1	1	0.3	3.3	0.8	0.8	1.00	1.00	0.0	0.00	8.16	2	1
131.0	Generic Round Side Arm	2	188	5.2	0.0	0.0	0.0	1.00	0.90	0.0	0.00	8.16	65	375
129.8	Sinclair SC479-HF1LDF	3	34	5.0	14.4	3.5	3.5	1.00	1.00	-4.0	413.70	8.06	103	102
129.0	RFS PA6-65AC	1	278	47.0	6.0	72.0	0.0	1.00	1.00	0.0	0.00	8.12	325	278
128.0	RFS PA6-65AC	1	278	47.0	6.0	72.0	0.0	1.00	1.00	0.0	0.00	8.10	324	278
127.0	Bird 432-83H-01-T	1	25	1.4	1.2	12.0	7.0	1.00	0.50	0.0	0.00	8.09	5	25
127.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	8.09	36	188
127.0	Allgon 7199 / M-1900-90-19.5I	2	18	6.6	8.5	5.0	3.1	1.00	0.78	0.0	0.00	8.09	70	35
125.0	Sinclair SE419-SF3P4LDF	1	24	9.5	8.6	2.9	8.5	1.00	1.00	0.0	0.00	8.05	65	24
121.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	7.97	35	188
120.5	Decibel DB586	1	59	0.7	0.0	0.0	0.0	0.90	0.90	0.0	0.00	7.96	4	59
120.5	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	0.90	0.90	0.0	0.00	7.96	29	188
116.8	Morad VHF 156-DELUXE	1	1	0.3	3.3	0.8	0.8	1.00	1.00	0.0	0.00	7.89	2	1
115.5	Decibel DB586	1	59	0.7	0.0	0.0	0.0	1.00	1.00	0.0	0.00	7.87	5	59
115.0	Generic Round Side Arm	2	188	5.2	0.0	0.0	0.0	1.00	0.90	0.0	0.00	7.86	63	375
102.5	Scala OGT9-840	1	19	2.3	11.4	2.0	2.0	1.00	1.00	0.0	0.00	7.60	15	18
100.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	7.55	33	188
100.0	Generic Flat Stand-Off	1	188	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.00	7.55	40	188
97.0	Sinclair SD210D	1	40	4.4	16.0	41.0	4.0	1.00	1.00	0.0	0.00	7.49	28	40
93.6	PCTEL GPS-TMG-HR-26N	1	1	0.1	0.4	3.2	3.2	1.00	1.00	2.0	1.14	7.46	1	1
92.2	Scala OGT9-840	1	19	2.3	11.4	2.0	2.0	1.00	1.00	0.0	0.00	7.38	14	18
91.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	7.35	32	188
86.0	Generic Round Side Arm	1	188	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.00	7.23	32	188
77.6	Andrew DB264-A	1	36	5.9	21.5	0.0	0.0	1.00	1.00	0.0	0.00	7.02	35	36
30.0	Generic 2" x 4" GPS	1	5	0.0	0.2	4.0	2.0	1.00	0.50	0.0	0.00	5.35	0	5
18.0	PCTEL GPS-TMG-HR-26N	1	1	0.1	0.4	3.2	3.2	1.00	1.00	0.0	0.00	5.35	0	1
	Totals	144	13,741	913.4									4,320	13,741

TOWER LOADING

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	% In Wind	Spread On Faces	Bundling	Cluster Dia (in)	Out of Zone	Spacing (in)	Orient Factor	K_a Override
0.0	184.0	2" conduit	2	2.38	3.65	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	184.0	0.78" (19.7mm) 8 AWG 6	2	0.78	0.59	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	184.0	0.39" (10mm) Fiber Trunk	3	0.39	0.06	100	1	Individual	0.00	N	1.00	1.00	0.01
0.0	184.0	0.78" (19.7mm) 8 AWG 6	4	0.78	0.59	50	1	Block	0.00	N	1.00	1.00	0.01
0.0	184.0	0.78" (19.7mm) 8 AWG 6	2	0.78	0.59	100	1	Individual	0.00	N	1.00	1.00	0.01
0.0	184.0	1 1/4" Coax	12	1.55	0.63	50	1	Block	0.00	N	1.00	1.00	0.00
0.0	180.0	Waveguide	1	2.00	6.00	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	172.0	1 5/8" Coax	6	1.98	0.82	50	3	Block	0.00	N	1.00	1.00	0.00
0.0	172.0	1 5/8" Coax	12	1.98	0.82	50	3	Block	0.00	N	1.00	1.00	0.00
0.0	172.0	Waveguide	1	2.00	6.00	100	3	Individual	0.00	N	1.00	1.00	0.00
0.0	172.0	1 5/8" Hybriflex	2	1.98	1.30	100	3	Individual	0.00	N	1.00	1.00	0.00
0.0	172.0	1 5/8" Coax	6	1.98	0.82	50	3	Block	0.00	N	1.00	1.00	0.00
0.0	162.0	Waveguide	1	2.00	6.00	100	2	Individual	0.00	N	1.00	1.00	0.00
0.0	162.0	1.75" (44.5mm) Hybrid	1	1.75	2.72	100	2	Individual	0.00	N	1.00	1.00	0.00
0.0	148.0	1 1/4" Hybriflex Cable	2	1.54	1.00	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	148.0	1.99" (50.7mm) Hybrid	2	1.99	1.90	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	147.0	Waveguide	1	2.00	6.00	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	143.0	1 5/8" Coax	2	1.98	0.82	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	142.5	Waveguide	1	2.00	6.00	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	137.0	1 5/8" Coax	1	1.98	0.82	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	135.0	1/2" Coax	1	0.63	0.15	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	134.0	1 5/8" Coax	2	1.98	0.82	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	129.0	EW63	1	2.01	0.51	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	128.0	EW63	1	2.01	0.51	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	127.0	3/8" Coax	1	0.44	0.08	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	125.0	1 5/8" Coax	1	1.98	0.82	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	122.0	1 5/8" Coax	3	1.98	0.82	100	1	Individual	0.00	N	1.00	1.00	0.01
0.0	120.5	7/8" Coax	1	1.09	0.33	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	117.0	1/2" Coax	1	0.63	0.15	100	1	Individual	0.00	N	1.00	1.00	0.01
0.0	115.5	7/8" Coax	1	1.09	0.33	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	97.0	7/8" Coax	2	1.09	0.33	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	94.0	1/2" Coax	1	0.63	0.15	100	2	Individual	0.00	N	1.00	1.00	0.00
0.0	78.0	7/8" Coax	1	1.09	0.33	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	30.0	1/2" Coax	1	0.63	0.15	100	3	Individual	0.00	N	1.00	1.00	0.00

SECTION FORCES

1.2D + 1.0W Normal — Gust Response Factor (Gh): 0.85
116 mph wind with no ice — Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	1.00	1.00	0.0	17.47	48.00	0.00	2094	0	1340	1912	3252
8	150	31.69	12.895	11.688	0.00	0.153	2.76	1.00	1.00	0.0	19.53	53.89	0.00	3065	0	1452	2779	4230
7	130	30.42	14.333	15.027	0.00	0.144	2.79	1.00	1.00	0.0	22.57	63.03	0.00	4172	0	1630	3288	4918
6	110	29.01	19.684	18.574	0.00	0.156	2.75	1.00	1.00	0.0	29.28	80.56	0.00	5094	0	1986	3364	5350
5	90	27.39	22.335	18.575	0.00	0.143	2.80	1.00	1.00	0.0	32.01	89.55	0.00	5301	0	2085	3247	5332
4	70	25.49	21.229	22.120	0.00	0.132	2.84	1.00	1.00	0.0	32.10	91.10	0.00	5813	0	1974	3061	5035
3	50	23.15	26.584	22.126	0.00	0.132	2.84	1.00	1.00	0.0	37.81	107.37	0.00	6200	0	2113	2783	4896
2	30	20.01	28.860	28.798	0.00	0.139	2.81	1.00	1.00	0.0	41.69	117.24	0.00	6700	0	1994	2412	4406
1	10	19.99	31.267	28.798	0.00	0.132	2.84	1.00	1.00	0.0	43.07	122.24	0.00	7430	0	2077	2416	4493
														45,869	0			41,913

1.2D + 1.0W 60° — Gust Response Factor (Gh): 0.85
116 mph wind with no ice — Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	0.80	1.00	0.0	15.06	41.39	0.00	2094	0	1156	1912	3068
8	150	31.69	12.895	11.688	0.00	0.153	2.76	0.80	1.00	0.0	16.95	46.78	0.00	3065	0	1260	2779	4039
7	130	30.42	14.333	15.027	0.00	0.144	2.79	0.80	1.00	0.0	19.70	55.03	0.00	4172	0	1423	3288	4711
6	110	29.01	19.684	18.574	0.00	0.156	2.75	0.80	1.00	0.0	25.35	69.73	0.00	5094	0	1719	3364	5083
5	90	27.39	22.335	18.575	0.00	0.143	2.80	0.80	1.00	0.0	27.54	77.06	0.00	5301	0	1794	3247	5041
4	70	25.49	21.229	22.120	0.00	0.132	2.84	0.80	1.00	0.0	27.85	79.05	0.00	5813	0	1713	3061	4774
3	50	23.15	26.584	22.126	0.00	0.132	2.84	0.80	1.00	0.0	32.49	92.27	0.00	6200	0	1816	2783	4599
2	30	20.01	28.860	28.798	0.00	0.139	2.81	0.80	1.00	0.0	35.92	101.01	0.00	6700	0	1718	2412	4130
1	10	19.99	31.267	28.798	0.00	0.132	2.84	0.80	1.00	0.0	37.77	107.19	0.00	7430	0	1822	2416	4238
														45,869	0			39,682

1.2D + 1.0W 90° — Gust Response Factor (Gh): 0.85
116 mph wind with no ice — Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	0.85	1.00	0.0	15.66	43.04	0.00	2094	0	1202	1912	3114
8	150	31.69	12.895	11.688	0.00	0.153	2.76	0.85	1.00	0.0	17.60	48.56	0.00	3065	0	1308	2779	4087
7	130	30.42	14.333	15.027	0.00	0.144	2.79	0.85	1.00	0.0	20.42	57.03	0.00	4172	0	1475	3288	4763
6	110	29.01	19.684	18.574	0.00	0.156	2.75	0.85	1.00	0.0	26.33	72.44	0.00	5094	0	1786	3364	5150
5	90	27.39	22.335	18.575	0.00	0.143	2.80	0.85	1.00	0.0	28.66	80.18	0.00	5301	0	1867	3247	5114
4	70	25.49	21.229	22.120	0.00	0.132	2.84	0.85	1.00	0.0	28.91	82.06	0.00	5813	0	1778	3061	4839
3	50	23.15	26.584	22.126	0.00	0.132	2.84	0.85	1.00	0.0	33.82	96.04	0.00	6200	0	1890	2783	4673
2	30	20.01	28.860	28.798	0.00	0.139	2.81	0.85	1.00	0.0	37.36	105.06	0.00	6700	0	1787	2412	4199
1	10	19.99	31.267	28.798	0.00	0.132	2.84	0.85	1.00	0.0	39.33	111.62	0.00	7430	0	1897	2416	4313
														45,869	0			40,251

1.2D + 1.0W 120° — Gust Response Factor (Gh): 0.85
116 mph wind with no ice — Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	1.00	1.00	0.0	17.47	48.00	0.00	2094	0	1340	1912	3252
8	150	31.69	12.895	11.688	0.00	0.153	2.76	1.00	1.00	0.0	19.53	53.89	0.00	3065	0	1452	2779	4230
7	130	30.42	14.333	15.027	0.00	0.144	2.79	1.00	1.00	0.0	22.57	63.03	0.00	4172	0	1630	3288	4918
6	110	29.01	19.684	18.574	0.00	0.156	2.75	1.00	1.00	0.0	29.28	80.56	0.00	5094	0	1986	3364	5350
5	90	27.39	22.335	18.575	0.00	0.143	2.80	1.00	1.00	0.0	32.01	89.55	0.00	5301	0	2085	3247	5332

SECTION FORCES

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
4	70	25.49	21.229	22.120	0.00	0.132	2.84	1.00	1.00	0.0	32.10	91.10	0.00	5813	0	1974	3061	5035
3	50	23.15	26.584	22.126	0.00	0.132	2.84	1.00	1.00	0.0	37.81	107.37	0.00	6200	0	2113	2783	4896
2	30	20.01	28.860	28.798	0.00	0.139	2.81	1.00	1.00	0.0	41.69	117.24	0.00	6700	0	1994	2412	4406
1	10	19.99	31.267	28.798	0.00	0.132	2.84	1.00	1.00	0.0	44.02	124.93	0.00	7430	0	2123	2416	4539
														45,869	0			41,959

1.2D + 1.0W 180° Gust Response Factor (Gh): 0.85
116 mph wind with no ice Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	0.80	1.00	0.0	15.06	41.39	0.00	2094	0	1156	1912	3068
8	150	31.69	12.895	11.688	0.00	0.153	2.76	0.80	1.00	0.0	16.95	46.78	0.00	3065	0	1260	2779	4039
7	130	30.42	14.333	15.027	0.00	0.144	2.79	0.80	1.00	0.0	19.70	55.03	0.00	4172	0	1423	3288	4711
6	110	29.01	19.684	18.574	0.00	0.156	2.75	0.80	1.00	0.0	25.35	69.73	0.00	5094	0	1719	3364	5083
5	90	27.39	22.335	18.575	0.00	0.143	2.80	0.80	1.00	0.0	27.54	77.06	0.00	5301	0	1794	3247	5041
4	70	25.49	21.229	22.120	0.00	0.132	2.84	0.80	1.00	0.0	27.85	79.05	0.00	5813	0	1713	3061	4774
3	50	23.15	26.584	22.126	0.00	0.132	2.84	0.80	1.00	0.0	32.49	92.27	0.00	6200	0	1816	2783	4599
2	30	20.01	28.860	28.798	0.00	0.139	2.81	0.80	1.00	0.0	35.92	101.01	0.00	6700	0	1718	2412	4130
1	10	19.99	31.267	28.798	0.00	0.132	2.84	0.80	1.00	0.0	37.77	107.19	0.00	7430	0	1822	2416	4238
														45,869	0			39,682

1.2D + 1.0W 210° Gust Response Factor (Gh): 0.85
116 mph wind with no ice Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	0.85	1.00	0.0	15.66	43.04	0.00	2094	0	1202	1912	3114
8	150	31.69	12.895	11.688	0.00	0.153	2.76	0.85	1.00	0.0	17.60	48.56	0.00	3065	0	1308	2779	4087
7	130	30.42	14.333	15.027	0.00	0.144	2.79	0.85	1.00	0.0	20.42	57.03	0.00	4172	0	1475	3288	4763
6	110	29.01	19.684	18.574	0.00	0.156	2.75	0.85	1.00	0.0	26.33	72.44	0.00	5094	0	1786	3364	5150
5	90	27.39	22.335	18.575	0.00	0.143	2.80	0.85	1.00	0.0	28.66	80.18	0.00	5301	0	1867	3247	5114
4	70	25.49	21.229	22.120	0.00	0.132	2.84	0.85	1.00	0.0	28.91	82.06	0.00	5813	0	1778	3061	4839
3	50	23.15	26.584	22.126	0.00	0.132	2.84	0.85	1.00	0.0	33.82	96.04	0.00	6200	0	1890	2783	4673
2	30	20.01	28.860	28.798	0.00	0.139	2.81	0.85	1.00	0.0	37.36	105.06	0.00	6700	0	1787	2412	4199
1	10	19.99	31.267	28.798	0.00	0.132	2.84	0.85	1.00	0.0	39.33	111.62	0.00	7430	0	1897	2416	4313
														45,869	0			40,251

1.2D + 1.0W 240° Gust Response Factor (Gh): 0.85
116 mph wind with no ice Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	1.00	1.00	0.0	17.47	48.00	0.00	2094	0	1340	1912	3252
8	150	31.69	12.895	11.688	0.00	0.153	2.76	1.00	1.00	0.0	19.53	53.89	0.00	3065	0	1452	2779	4230
7	130	30.42	14.333	15.027	0.00	0.144	2.79	1.00	1.00	0.0	22.57	63.03	0.00	4172	0	1630	3288	4918
6	110	29.01	19.684	18.574	0.00	0.156	2.75	1.00	1.00	0.0	29.28	80.56	0.00	5094	0	1986	3364	5350
5	90	27.39	22.335	18.575	0.00	0.143	2.80	1.00	1.00	0.0	32.01	89.55	0.00	5301	0	2085	3247	5332
4	70	25.49	21.229	22.120	0.00	0.132	2.84	1.00	1.00	0.0	32.10	91.10	0.00	5813	0	1974	3061	5035
3	50	23.15	26.584	22.126	0.00	0.132	2.84	1.00	1.00	0.0	37.81	107.37	0.00	6200	0	2113	2783	4896
2	30	20.01	28.860	28.798	0.00	0.139	2.81	1.00	1.00	0.0	41.69	117.24	0.00	6700	0	1994	2412	4406
1	10	19.99	31.267	28.798	0.00	0.132	2.84	1.00	1.00	0.0	44.02	124.93	0.00	7430	0	2123	2416	4539
														45,869	0			41,959

1.2D + 1.0W 300° Gust Response Factor (Gh): 0.85
116 mph wind with no ice Wind Importance Factor (Iw): 1.00

SECTION FORCES

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	0.80	1.00	0.0	15.06	41.39	0.00	2094	0	1156	1912	3068
8	150	31.69	12.895	11.688	0.00	0.153	2.76	0.80	1.00	0.0	16.95	46.78	0.00	3065	0	1260	2779	4039
7	130	30.42	14.333	15.027	0.00	0.144	2.79	0.80	1.00	0.0	19.70	55.03	0.00	4172	0	1423	3288	4711
6	110	29.01	19.684	18.574	0.00	0.156	2.75	0.80	1.00	0.0	25.35	69.73	0.00	5094	0	1719	3364	5083
5	90	27.39	22.335	18.575	0.00	0.143	2.80	0.80	1.00	0.0	27.54	77.06	0.00	5301	0	1794	3247	5041
4	70	25.49	21.229	22.120	0.00	0.132	2.84	0.80	1.00	0.0	27.85	79.05	0.00	5813	0	1713	3061	4774
3	50	23.15	26.584	22.126	0.00	0.132	2.84	0.80	1.00	0.0	32.49	92.27	0.00	6200	0	1816	2783	4599
2	30	20.01	28.860	28.798	0.00	0.139	2.81	0.80	1.00	0.0	35.92	101.01	0.00	6700	0	1718	2412	4130
1	10	19.99	31.267	28.798	0.00	0.132	2.84	0.80	1.00	0.0	37.77	107.19	0.00	7430	0	1822	2416	4238
														45,869	0			39,682

1.2D + 1.0W 330° Gust Response Factor (Gh): 0.85
116 mph wind with no ice Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	0.85	1.00	0.0	15.66	43.04	0.00	2094	0	1202	1912	3114
8	150	31.69	12.895	11.688	0.00	0.153	2.76	0.85	1.00	0.0	17.60	48.56	0.00	3065	0	1308	2779	4087
7	130	30.42	14.333	15.027	0.00	0.144	2.79	0.85	1.00	0.0	20.42	57.03	0.00	4172	0	1475	3288	4763
6	110	29.01	19.684	18.574	0.00	0.156	2.75	0.85	1.00	0.0	26.33	72.44	0.00	5094	0	1786	3364	5150
5	90	27.39	22.335	18.575	0.00	0.143	2.80	0.85	1.00	0.0	28.66	80.18	0.00	5301	0	1867	3247	5114
4	70	25.49	21.229	22.120	0.00	0.132	2.84	0.85	1.00	0.0	28.91	82.06	0.00	5813	0	1778	3061	4839
3	50	23.15	26.584	22.126	0.00	0.132	2.84	0.85	1.00	0.0	33.82	96.04	0.00	6200	0	1890	2783	4673
2	30	20.01	28.860	28.798	0.00	0.139	2.81	0.85	1.00	0.0	37.36	105.06	0.00	6700	0	1787	2412	4199
1	10	19.99	31.267	28.798	0.00	0.132	2.84	0.85	1.00	0.0	39.33	111.62	0.00	7430	0	1897	2416	4313
														45,869	0			40,251

0.9D + 1.0W Normal Gust Response Factor (Gh): 0.85
116 mph wind with no ice Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	1.00	1.00	0.0	17.47	48.00	0.00	1571	0	1340	1912	3252
8	150	31.69	12.895	11.688	0.00	0.153	2.76	1.00	1.00	0.0	19.53	53.89	0.00	2298	0	1452	2779	4230
7	130	30.42	14.333	15.027	0.00	0.144	2.79	1.00	1.00	0.0	22.57	63.03	0.00	3129	0	1630	3288	4918
6	110	29.01	19.684	18.574	0.00	0.156	2.75	1.00	1.00	0.0	29.28	80.56	0.00	3821	0	1986	3364	5350
5	90	27.39	22.335	18.575	0.00	0.143	2.80	1.00	1.00	0.0	32.01	89.55	0.00	3976	0	2085	3247	5332
4	70	25.49	21.229	22.120	0.00	0.132	2.84	1.00	1.00	0.0	32.10	91.10	0.00	4360	0	1974	3061	5035
3	50	23.15	26.584	22.126	0.00	0.132	2.84	1.00	1.00	0.0	37.81	107.37	0.00	4650	0	2113	2783	4896
2	30	20.01	28.860	28.798	0.00	0.139	2.81	1.00	1.00	0.0	41.69	117.24	0.00	5025	0	1994	2412	4406
1	10	19.99	31.267	28.798	0.00	0.132	2.84	1.00	1.00	0.0	44.02	124.93	0.00	5572	0	2123	2416	4539
														34,401	0			41,959

0.9D + 1.0W 60° Gust Response Factor (Gh): 0.85
116 mph wind with no ice Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	0.80	1.00	0.0	15.06	41.39	0.00	1571	0	1156	1912	3068
8	150	31.69	12.895	11.688	0.00	0.153	2.76	0.80	1.00	0.0	16.95	46.78	0.00	2298	0	1260	2779	4039
7	130	30.42	14.333	15.027	0.00	0.144	2.79	0.80	1.00	0.0	19.70	55.03	0.00	3129	0	1423	3288	4711
6	110	29.01	19.684	18.574	0.00	0.156	2.75	0.80	1.00	0.0	25.35	69.73	0.00	3821	0	1719	3364	5083
5	90	27.39	22.335	18.575	0.00	0.143	2.80	0.80	1.00	0.0	27.54	77.06	0.00	3976	0	1794	3247	5041
4	70	25.49	21.229	22.120	0.00	0.132	2.84	0.80	1.00	0.0	27.85	79.05	0.00	4360	0	1713	3061	4774
3	50	23.15	26.584	22.126	0.00	0.132	2.84	0.80	1.00	0.0	32.49	92.27	0.00	4650	0	1816	2783	4599
2	30	20.01	28.860	28.798	0.00	0.139	2.81	0.80	1.00	0.0	35.92	101.01	0.00	5025	0	1718	2412	4130
1	10	19.99	31.267	28.798	0.00	0.132	2.84	0.80	1.00	0.0	37.77	107.19	0.00	5572	0	1822	2416	4238
														34,401	0			39,682

0.9D + 1.0W 90° Gust Response Factor (Gh): 0.85

SECTION FORCES

116 mph wind with no ice Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	0.85	1.00	0.0	15.66	43.04	0.00	1571	0	1202	1912	3114
8	150	31.69	12.895	11.688	0.00	0.153	2.76	0.85	1.00	0.0	17.60	48.56	0.00	2298	0	1308	2779	4087
7	130	30.42	14.333	15.027	0.00	0.144	2.79	0.85	1.00	0.0	20.42	57.03	0.00	3129	0	1475	3288	4763
6	110	29.01	19.684	18.574	0.00	0.156	2.75	0.85	1.00	0.0	26.33	72.44	0.00	3821	0	1786	3364	5150
5	90	27.39	22.335	18.575	0.00	0.143	2.80	0.85	1.00	0.0	28.66	80.18	0.00	3976	0	1867	3247	5114
4	70	25.49	21.229	22.120	0.00	0.132	2.84	0.85	1.00	0.0	28.91	82.06	0.00	4360	0	1778	3061	4839
3	50	23.15	26.584	22.126	0.00	0.132	2.84	0.85	1.00	0.0	33.82	96.04	0.00	4650	0	1890	2783	4673
2	30	20.01	28.860	28.798	0.00	0.139	2.81	0.85	1.00	0.0	37.36	105.06	0.00	5025	0	1787	2412	4199
1	10	19.99	31.267	28.798	0.00	0.132	2.84	0.85	1.00	0.0	39.33	111.62	0.00	5572	0	1897	2416	4313
														34,401	0			40,251

0.9D + 1.0W 120° Gust Response Factor (Gh): 0.85
116 mph wind with no ice Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	1.00	1.00	0.0	17.47	48.00	0.00	1571	0	1340	1912	3252
8	150	31.69	12.895	11.688	0.00	0.153	2.76	1.00	1.00	0.0	19.53	53.89	0.00	2298	0	1452	2779	4230
7	130	30.42	14.333	15.027	0.00	0.144	2.79	1.00	1.00	0.0	22.57	63.03	0.00	3129	0	1630	3288	4918
6	110	29.01	19.684	18.574	0.00	0.156	2.75	1.00	1.00	0.0	29.28	80.56	0.00	3821	0	1986	3364	5350
5	90	27.39	22.335	18.575	0.00	0.143	2.80	1.00	1.00	0.0	32.01	89.55	0.00	3976	0	2085	3247	5332
4	70	25.49	21.229	22.120	0.00	0.132	2.84	1.00	1.00	0.0	32.10	91.10	0.00	4360	0	1974	3061	5035
3	50	23.15	26.584	22.126	0.00	0.132	2.84	1.00	1.00	0.0	37.81	107.37	0.00	4650	0	2113	2783	4896
2	30	20.01	28.860	28.798	0.00	0.139	2.81	1.00	1.00	0.0	41.69	117.24	0.00	5025	0	1994	2412	4406
1	10	19.99	31.267	28.798	0.00	0.132	2.84	1.00	1.00	0.0	44.02	124.93	0.00	5572	0	2123	2416	4539
														34,401	0			41,959

0.9D + 1.0W 180° Gust Response Factor (Gh): 0.85
116 mph wind with no ice Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	0.80	1.00	0.0	15.06	41.39	0.00	1571	0	1156	1912	3068
8	150	31.69	12.895	11.688	0.00	0.153	2.76	0.80	1.00	0.0	16.95	46.78	0.00	2298	0	1260	2779	4039
7	130	30.42	14.333	15.027	0.00	0.144	2.79	0.80	1.00	0.0	19.70	55.03	0.00	3129	0	1423	3288	4711
6	110	29.01	19.684	18.574	0.00	0.156	2.75	0.80	1.00	0.0	25.35	69.73	0.00	3821	0	1719	3364	5083
5	90	27.39	22.335	18.575	0.00	0.143	2.80	0.80	1.00	0.0	27.54	77.06	0.00	3976	0	1794	3247	5041
4	70	25.49	21.229	22.120	0.00	0.132	2.84	0.80	1.00	0.0	27.85	79.05	0.00	4360	0	1713	3061	4774
3	50	23.15	26.584	22.126	0.00	0.132	2.84	0.80	1.00	0.0	32.49	92.27	0.00	4650	0	1816	2783	4599
2	30	20.01	28.860	28.798	0.00	0.139	2.81	0.80	1.00	0.0	35.92	101.01	0.00	5025	0	1718	2412	4130
1	10	19.99	31.267	28.798	0.00	0.132	2.84	0.80	1.00	0.0	37.77	107.19	0.00	5572	0	1822	2416	4238
														34,401	0			39,682

0.9D + 1.0W 210° Gust Response Factor (Gh): 0.85
116 mph wind with no ice Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	0.85	1.00	0.0	15.66	43.04	0.00	1571	0	1202	1912	3114
8	150	31.69	12.895	11.688	0.00	0.153	2.76	0.85	1.00	0.0	17.60	48.56	0.00	2298	0	1308	2779	4087
7	130	30.42	14.333	15.027	0.00	0.144	2.79	0.85	1.00	0.0	20.42	57.03	0.00	3129	0	1475	3288	4763
6	110	29.01	19.684	18.574	0.00	0.156	2.75	0.85	1.00	0.0	26.33	72.44	0.00	3821	0	1786	3364	5150
5	90	27.39	22.335	18.575	0.00	0.143	2.80	0.85	1.00	0.0	28.66	80.18	0.00	3976	0	1867	3247	5114
4	70	25.49	21.229	22.120	0.00	0.132	2.84	0.85	1.00	0.0	28.91	82.06	0.00	4360	0	1778	3061	4839
3	50	23.15	26.584	22.126	0.00	0.132	2.84	0.85	1.00	0.0	33.82	96.04	0.00	4650	0	1890	2783	4673
2	30	20.01	28.860	28.798	0.00	0.139	2.81	0.85	1.00	0.0	37.36	105.06	0.00	5025	0	1787	2412	4199

SECTION FORCES

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
1	10	19.99	31.267	28.798	0.00	0.132	2.84	0.85	1.00	0.0	39.33	111.62	0.00	5572	0	1897	2416	4313
														34,401	0			40,251

0.9D + 1.0W 240° — Gust Response Factor (Gh): 0.85
116 mph wind with no ice — Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	1.00	1.00	0.0	17.47	48.00	0.00	1571	0	1340	1912	3252
8	150	31.69	12.895	11.688	0.00	0.153	2.76	1.00	1.00	0.0	19.53	53.89	0.00	2298	0	1452	2779	4230
7	130	30.42	14.333	15.027	0.00	0.144	2.79	1.00	1.00	0.0	22.57	63.03	0.00	3129	0	1630	3288	4918
6	110	29.01	19.684	18.574	0.00	0.156	2.75	1.00	1.00	0.0	29.28	80.56	0.00	3821	0	1986	3364	5350
5	90	27.39	22.335	18.575	0.00	0.143	2.80	1.00	1.00	0.0	32.01	89.55	0.00	3976	0	2085	3247	5332
4	70	25.49	21.229	22.120	0.00	0.132	2.84	1.00	1.00	0.0	32.10	91.10	0.00	4360	0	1974	3061	5035
3	50	23.15	26.584	22.126	0.00	0.132	2.84	1.00	1.00	0.0	37.81	107.37	0.00	4650	0	2113	2783	4896
2	30	20.01	28.860	28.798	0.00	0.139	2.81	1.00	1.00	0.0	41.69	117.24	0.00	5025	0	1994	2412	4406
1	10	19.99	31.267	28.798	0.00	0.132	2.84	1.00	1.00	0.0	44.02	124.93	0.00	5572	0	2123	2416	4539
														34,401	0			41,959

0.9D + 1.0W 300° — Gust Response Factor (Gh): 0.85
116 mph wind with no ice — Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	0.80	1.00	0.0	15.06	41.39	0.00	1571	0	1156	1912	3068
8	150	31.69	12.895	11.688	0.00	0.153	2.76	0.80	1.00	0.0	16.95	46.78	0.00	2298	0	1260	2779	4039
7	130	30.42	14.333	15.027	0.00	0.144	2.79	0.80	1.00	0.0	19.70	55.03	0.00	3129	0	1423	3288	4711
6	110	29.01	19.684	18.574	0.00	0.156	2.75	0.80	1.00	0.0	25.35	69.73	0.00	3821	0	1719	3364	5083
5	90	27.39	22.335	18.575	0.00	0.143	2.80	0.80	1.00	0.0	27.54	77.06	0.00	3976	0	1794	3247	5041
4	70	25.49	21.229	22.120	0.00	0.132	2.84	0.80	1.00	0.0	27.85	79.05	0.00	4360	0	1713	3061	4774
3	50	23.15	26.584	22.126	0.00	0.132	2.84	0.80	1.00	0.0	32.49	92.27	0.00	4650	0	1816	2783	4599
2	30	20.01	28.860	28.798	0.00	0.139	2.81	0.80	1.00	0.0	35.92	101.01	0.00	5025	0	1718	2412	4130
1	10	19.99	31.267	28.798	0.00	0.132	2.84	0.80	1.00	0.0	37.77	107.19	0.00	5572	0	1822	2416	4238
														34,401	0			39,682

0.9D + 1.0W 330° — Gust Response Factor (Gh): 0.85
116 mph wind with no ice — Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	32.85	12.020	9.583	0.00	0.156	2.75	0.85	1.00	0.0	15.66	43.04	0.00	1571	0	1202	1912	3114
8	150	31.69	12.895	11.688	0.00	0.153	2.76	0.85	1.00	0.0	17.60	48.56	0.00	2298	0	1308	2779	4087
7	130	30.42	14.333	15.027	0.00	0.144	2.79	0.85	1.00	0.0	20.42	57.03	0.00	3129	0	1475	3288	4763
6	110	29.01	19.684	18.574	0.00	0.156	2.75	0.85	1.00	0.0	26.33	72.44	0.00	3821	0	1786	3364	5150
5	90	27.39	22.335	18.575	0.00	0.143	2.80	0.85	1.00	0.0	28.66	80.18	0.00	3976	0	1867	3247	5114
4	70	25.49	21.229	22.120	0.00	0.132	2.84	0.85	1.00	0.0	28.91	82.06	0.00	4360	0	1778	3061	4839
3	50	23.15	26.584	22.126	0.00	0.132	2.84	0.85	1.00	0.0	33.82	96.04	0.00	4650	0	1890	2783	4673
2	30	20.01	28.860	28.798	0.00	0.139	2.81	0.85	1.00	0.0	37.36	105.06	0.00	5025	0	1787	2412	4199
1	10	19.99	31.267	28.798	0.00	0.132	2.84	0.85	1.00	0.0	39.33	111.62	0.00	5572	0	1897	2416	4313
														34,401	0			40,251

1.2D + 1.0Di + 1.0Wi Normal — Gust Response Factor (Gh): 0.85 — Ice Importance Factor: 1.00
50 mph wind with 1" radial ice — Wind Importance Factor (Iw): 1.00 — Ice Dead Load Factor: 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	6.10	12.020	33.960	24.38	0.324	2.24	1.00	1.00	1.2	32.62	72.91	24.38	5869	3775	378	544	923
8	150	5.89	12.895	34.970	23.28	0.292	2.32	1.00	1.00	1.2	33.75	78.26	23.28	7900	4836	392	832	1224
7	130	5.65	14.333	36.285	21.26	0.244	2.45	1.00	1.00	1.1	35.51	87.17	21.26	9939	5767	419	1125	1544

SECTION FORCES

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
6	110	5.39	19.684	41.431	22.86	0.245	2.45	1.00	1.00	1.1	43.87	107.62	22.86	11871	6776	493	1202	1695
5	90	5.09	22.335	42.948	24.37	0.225	2.51	1.00	1.00	1.1	47.22	118.70	24.37	12273	6971	513	1196	1709
4	70	4.74	21.229	42.794	20.67	0.193	2.62	1.00	1.00	1.1	45.76	119.88	20.67	12633	6820	483	1156	1639
3	50	4.30	26.584	43.357	21.23	0.188	2.64	1.00	1.00	1.0	51.40	135.61	21.23	13108	6908	496	1041	1536
2	30	3.72	28.860	50.180	21.38	0.189	2.63	1.00	1.00	1.0	57.60	151.61	21.38	13538	6839	479	885	1364
1	10	3.71	31.267	49.023	20.23	0.176	2.68	1.00	1.00	0.9	59.24	158.75	20.23	13638	6208	501	859	1360
														100,769	54,901			12,995

1.2D + 1.0Di + 1.0Wi 60° — Gust Response Factor (Gh): 0.85 — Ice Importance Factor: 1.00
50 mph wind with 1" radial ice — Wind Importance Factor (Iw): 1.00 — Ice Dead Load Factor: 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	6.10	12.020	33.960	24.38	0.324	2.24	0.80	1.00	1.2	30.22	67.54	24.38	5869	3775	350	544	895
8	150	5.89	12.895	34.970	23.28	0.292	2.32	0.80	1.00	1.2	31.17	72.28	23.28	7900	4836	362	832	1194
7	130	5.65	14.333	36.285	21.26	0.244	2.45	0.80	1.00	1.1	32.64	80.14	21.26	9939	5767	385	1125	1510
6	110	5.39	19.684	41.431	22.86	0.245	2.45	0.80	1.00	1.1	39.93	97.97	22.86	11871	6776	449	1202	1651
5	90	5.09	22.335	42.948	24.37	0.225	2.51	0.80	1.00	1.1	42.75	107.47	24.37	12273	6971	465	1196	1661
4	70	4.74	21.229	42.794	20.67	0.193	2.62	0.80	1.00	1.1	41.52	108.75	20.67	12633	6820	438	1156	1594
3	50	4.30	26.584	43.357	21.23	0.188	2.64	0.80	1.00	1.0	46.08	121.59	21.23	13108	6908	445	1041	1485
2	30	3.72	28.860	50.180	21.38	0.189	2.63	0.80	1.00	1.0	51.82	136.42	21.38	13538	6839	431	885	1316
1	10	3.71	31.267	49.023	20.23	0.176	2.68	0.80	1.00	0.9	52.99	141.99	20.23	13638	6208	448	859	1307
														100,769	54,901			12,613

1.2D + 1.0Di + 1.0Wi 90° — Gust Response Factor (Gh): 0.85 — Ice Importance Factor: 1.00
50 mph wind with 1" radial ice — Wind Importance Factor (Iw): 1.00 — Ice Dead Load Factor: 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	6.10	12.020	33.960	24.38	0.324	2.24	0.85	1.00	1.2	30.82	68.88	24.38	5869	3775	357	544	902
8	150	5.89	12.895	34.970	23.28	0.292	2.32	0.85	1.00	1.2	31.81	73.77	23.28	7900	4836	369	832	1201
7	130	5.65	14.333	36.285	21.26	0.244	2.45	0.85	1.00	1.1	33.36	81.89	21.26	9939	5767	393	1125	1519
6	110	5.39	19.684	41.431	22.86	0.245	2.45	0.85	1.00	1.1	40.92	100.38	22.86	11871	6776	460	1202	1662
5	90	5.09	22.335	42.948	24.37	0.225	2.51	0.85	1.00	1.1	43.87	110.27	24.37	12273	6971	477	1196	1673
4	70	4.74	21.229	42.794	20.67	0.193	2.62	0.85	1.00	1.1	42.58	111.53	20.67	12633	6820	449	1156	1605
3	50	4.30	26.584	43.357	21.23	0.188	2.64	0.85	1.00	1.0	47.41	125.09	21.23	13108	6908	457	1041	1498
2	30	3.72	28.860	50.180	21.38	0.189	2.63	0.85	1.00	1.0	53.27	140.22	21.38	13538	6839	443	885	1328
1	10	3.71	31.267	49.023	20.23	0.176	2.68	0.85	1.00	0.9	54.55	146.18	20.23	13638	6208	462	859	1321
														100,769	54,901			12,709

1.2D + 1.0Di + 1.0Wi 120° — Gust Response Factor (Gh): 0.85 — Ice Importance Factor: 1.00
50 mph wind with 1" radial ice — Wind Importance Factor (Iw): 1.00 — Ice Dead Load Factor: 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	6.10	12.020	33.960	24.38	0.324	2.24	1.00	1.00	1.2	32.62	72.91	24.38	5869	3775	378	544	923
8	150	5.89	12.895	34.970	23.28	0.292	2.32	1.00	1.00	1.2	33.75	78.26	23.28	7900	4836	392	832	1224
7	130	5.65	14.333	36.285	21.26	0.244	2.45	1.00	1.00	1.1	35.51	87.17	21.26	9939	5767	419	1125	1544
6	110	5.39	19.684	41.431	22.86	0.245	2.45	1.00	1.00	1.1	43.87	107.62	22.86	11871	6776	493	1202	1695
5	90	5.09	22.335	42.948	24.37	0.225	2.51	1.00	1.00	1.1	47.22	118.70	24.37	12273	6971	513	1196	1709
4	70	4.74	21.229	42.794	20.67	0.193	2.62	1.00	1.00	1.1	45.76	119.88	20.67	12633	6820	483	1156	1639
3	50	4.30	26.584	43.357	21.23	0.188	2.64	1.00	1.00	1.0	51.40	135.61	21.23	13108	6908	496	1041	1536
2	30	3.72	28.860	50.180	21.38	0.189	2.63	1.00	1.00	1.0	57.60	151.61	21.38	13538	6839	479	885	1364
1	10	3.71	31.267	49.023	20.23	0.176	2.68	1.00	1.00	0.9	59.24	158.75	20.23	13638	6208	501	859	1360
														100,769	54,901			12,995

1.2D + 1.0Di + 1.0Wi 180° — Gust Response Factor (Gh): 0.85 — Ice Importance Factor: 1.00
50 mph wind with 1" radial ice — Wind Importance Factor (Iw): 1.00 — Ice Dead Load Factor: 1.00

SECTION FORCES

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	6.10	12.020	33.960	24.38	0.324	2.24	0.80	1.00	1.2	30.22	67.54	24.38	5869	3775	350	544	895
8	150	5.89	12.895	34.970	23.28	0.292	2.32	0.80	1.00	1.2	31.17	72.28	23.28	7900	4836	362	832	1194
7	130	5.65	14.333	36.285	21.26	0.244	2.45	0.80	1.00	1.1	32.64	80.14	21.26	9939	5767	385	1125	1510
6	110	5.39	19.684	41.431	22.86	0.245	2.45	0.80	1.00	1.1	39.93	97.97	22.86	11871	6776	449	1202	1651
5	90	5.09	22.335	42.948	24.37	0.225	2.51	0.80	1.00	1.1	42.75	107.47	24.37	12273	6971	465	1196	1661
4	70	4.74	21.229	42.794	20.67	0.193	2.62	0.80	1.00	1.1	41.52	108.75	20.67	12633	6820	438	1156	1594
3	50	4.30	26.584	43.357	21.23	0.188	2.64	0.80	1.00	1.0	46.08	121.59	21.23	13108	6908	445	1041	1485
2	30	3.72	28.860	50.180	21.38	0.189	2.63	0.80	1.00	1.0	51.82	136.42	21.38	13538	6839	431	885	1316
1	10	3.71	31.267	49.023	20.23	0.176	2.68	0.80	1.00	0.9	52.99	141.99	20.23	13638	6208	448	859	1307
														100,769	54,901			12,613

1.2D + 1.0Di + 1.0Wi 210° — Gust Response Factor (Gh): 0.85 — Ice Importance Factor: 1.00
50 mph wind with 1" radial ice — Wind Importance Factor (Iw): 1.00 — Ice Dead Load Factor: 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	6.10	12.020	33.960	24.38	0.324	2.24	0.85	1.00	1.2	30.82	68.88	24.38	5869	3775	357	544	902
8	150	5.89	12.895	34.970	23.28	0.292	2.32	0.85	1.00	1.2	31.81	73.77	23.28	7900	4836	369	832	1201
7	130	5.65	14.333	36.285	21.26	0.244	2.45	0.85	1.00	1.1	33.36	81.89	21.26	9939	5767	393	1125	1519
6	110	5.39	19.684	41.431	22.86	0.245	2.45	0.85	1.00	1.1	40.92	100.38	22.86	11871	6776	460	1202	1662
5	90	5.09	22.335	42.948	24.37	0.225	2.51	0.85	1.00	1.1	43.87	110.27	24.37	12273	6971	477	1196	1673
4	70	4.74	21.229	42.794	20.67	0.193	2.62	0.85	1.00	1.1	42.58	111.53	20.67	12633	6820	449	1156	1605
3	50	4.30	26.584	43.357	21.23	0.188	2.64	0.85	1.00	1.0	47.41	125.09	21.23	13108	6908	457	1041	1498
2	30	3.72	28.860	50.180	21.38	0.189	2.63	0.85	1.00	1.0	53.27	140.22	21.38	13538	6839	443	885	1328
1	10	3.71	31.267	49.023	20.23	0.176	2.68	0.85	1.00	0.9	54.55	146.18	20.23	13638	6208	462	859	1321
														100,769	54,901			12,709

1.2D + 1.0Di + 1.0Wi 240° — Gust Response Factor (Gh): 0.85 — Ice Importance Factor: 1.00
50 mph wind with 1" radial ice — Wind Importance Factor (Iw): 1.00 — Ice Dead Load Factor: 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	6.10	12.020	33.960	24.38	0.324	2.24	1.00	1.00	1.2	32.62	72.91	24.38	5869	3775	378	544	923
8	150	5.89	12.895	34.970	23.28	0.292	2.32	1.00	1.00	1.2	33.75	78.26	23.28	7900	4836	392	832	1224
7	130	5.65	14.333	36.285	21.26	0.244	2.45	1.00	1.00	1.1	35.51	87.17	21.26	9939	5767	419	1125	1544
6	110	5.39	19.684	41.431	22.86	0.245	2.45	1.00	1.00	1.1	43.87	107.62	22.86	11871	6776	493	1202	1695
5	90	5.09	22.335	42.948	24.37	0.225	2.51	1.00	1.00	1.1	47.22	118.70	24.37	12273	6971	513	1196	1709
4	70	4.74	21.229	42.794	20.67	0.193	2.62	1.00	1.00	1.1	45.76	119.88	20.67	12633	6820	483	1156	1639
3	50	4.30	26.584	43.357	21.23	0.188	2.64	1.00	1.00	1.0	51.40	135.61	21.23	13108	6908	496	1041	1536
2	30	3.72	28.860	50.180	21.38	0.189	2.63	1.00	1.00	1.0	57.60	151.61	21.38	13538	6839	479	885	1364
1	10	3.71	31.267	49.023	20.23	0.176	2.68	1.00	1.00	0.9	59.24	158.75	20.23	13638	6208	501	859	1360
														100,769	54,901			12,995

1.2D + 1.0Di + 1.0Wi 300° — Gust Response Factor (Gh): 0.85 — Ice Importance Factor: 1.00
50 mph wind with 1" radial ice — Wind Importance Factor (Iw): 1.00 — Ice Dead Load Factor: 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	6.10	12.020	33.960	24.38	0.324	2.24	0.80	1.00	1.2	30.22	67.54	24.38	5869	3775	350	544	895
8	150	5.89	12.895	34.970	23.28	0.292	2.32	0.80	1.00	1.2	31.17	72.28	23.28	7900	4836	362	832	1194
7	130	5.65	14.333	36.285	21.26	0.244	2.45	0.80	1.00	1.1	32.64	80.14	21.26	9939	5767	385	1125	1510
6	110	5.39	19.684	41.431	22.86	0.245	2.45	0.80	1.00	1.1	39.93	97.97	22.86	11871	6776	449	1202	1651
5	90	5.09	22.335	42.948	24.37	0.225	2.51	0.80	1.00	1.1	42.75	107.47	24.37	12273	6971	465	1196	1661
4	70	4.74	21.229	42.794	20.67	0.193	2.62	0.80	1.00	1.1	41.52	108.75	20.67	12633	6820	438	1156	1594
3	50	4.30	26.584	43.357	21.23	0.188	2.64	0.80	1.00	1.0	46.08	121.59	21.23	13108	6908	445	1041	1485
2	30	3.72	28.860	50.180	21.38	0.189	2.63	0.80	1.00	1.0	51.82	136.42	21.38	13538	6839	431	885	1316
1	10	3.71	31.267	49.023	20.23	0.176	2.68	0.80	1.00	0.9	52.99	141.99	20.23	13638	6208	448	859	1307
														100,769	54,901			12,613

1.2D + 1.0Di + 1.0Wi 330° — Gust Response Factor (Gh): 0.85 — Ice Importance Factor: 1.00

SECTION FORCES

50 mph wind with 1" radial ice — Wind Importance Factor (Iw): 1.00 — Ice Dead Load Factor: 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	6.10	12.020	33.960	24.38	0.324	2.24	0.85	1.00	1.2	30.82	68.88	24.38	5869	3775	357	544	902
8	150	5.89	12.895	34.970	23.28	0.292	2.32	0.85	1.00	1.2	31.81	73.77	23.28	7900	4836	369	832	1201
7	130	5.65	14.333	36.285	21.26	0.244	2.45	0.85	1.00	1.1	33.36	81.89	21.26	9939	5767	393	1125	1519
6	110	5.39	19.684	41.431	22.86	0.245	2.45	0.85	1.00	1.1	40.92	100.38	22.86	11871	6776	460	1202	1662
5	90	5.09	22.335	42.948	24.37	0.225	2.51	0.85	1.00	1.1	43.87	110.27	24.37	12273	6971	477	1196	1673
4	70	4.74	21.229	42.794	20.67	0.193	2.62	0.85	1.00	1.1	42.58	111.53	20.67	12633	6820	449	1156	1605
3	50	4.30	26.584	43.357	21.23	0.188	2.64	0.85	1.00	1.0	47.41	125.09	21.23	13108	6908	457	1041	1498
2	30	3.72	28.860	50.180	21.38	0.189	2.63	0.85	1.00	1.0	53.27	140.22	21.38	13538	6839	443	885	1328
1	10	3.71	31.267	49.023	20.23	0.176	2.68	0.85	1.00	0.9	54.55	146.18	20.23	13638	6208	462	859	1321
														100,769	54,901			12,709

1.0D + 1.0W Service Normal — Gust Response Factor (Gh): 0.85
60 mph Wind with No Ice — Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	8.79	12.020	9.583	0.00	0.156	2.75	1.00	1.00	0.0	17.47	48.00	0.00	1745	0	359	512	870
8	150	8.48	12.895	11.688	0.00	0.153	2.76	1.00	1.00	0.0	19.53	53.89	0.00	2554	0	388	743	1132
7	130	8.14	14.333	15.027	0.00	0.144	2.79	1.00	1.00	0.0	22.85	63.82	0.00	3477	0	442	880	1321
6	110	7.76	19.684	18.574	0.00	0.156	2.75	1.00	1.00	0.0	30.24	83.18	0.00	4245	0	549	900	1449
5	90	7.33	22.335	18.575	0.00	0.143	2.80	1.00	1.00	0.0	32.86	91.94	0.00	4418	0	573	869	1441
4	70	6.82	21.229	22.120	0.00	0.132	2.84	1.00	1.00	0.0	33.75	95.79	0.00	4844	0	555	819	1374
3	50	6.19	26.584	22.126	0.00	0.132	2.84	1.00	1.00	0.0	39.11	111.04	0.00	5166	0	585	745	1329
2	30	5.35	28.860	28.798	0.00	0.139	2.81	1.00	1.00	0.0	45.17	127.02	0.00	5583	0	578	645	1223
1	10	5.35	31.267	28.798	0.00	0.132	2.84	1.00	1.00	0.0	47.57	135.00	0.00	6192	0	614	646	1260
														38,224	0			11,400

1.0D + 1.0W Service 60° — Gust Response Factor (Gh): 0.85
60 mph Wind with No Ice — Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	8.79	12.020	9.583	0.00	0.156	2.75	0.80	1.00	0.0	15.06	41.39	0.00	1745	0	309	512	821
8	150	8.48	12.895	11.688	0.00	0.153	2.76	0.80	1.00	0.0	16.95	46.78	0.00	2554	0	337	743	1081
7	130	8.14	14.333	15.027	0.00	0.144	2.79	0.80	1.00	0.0	19.99	55.81	0.00	3477	0	386	880	1266
6	110	7.76	19.684	18.574	0.00	0.156	2.75	0.80	1.00	0.0	26.30	72.35	0.00	4245	0	477	900	1377
5	90	7.33	22.335	18.575	0.00	0.143	2.80	0.80	1.00	0.0	28.40	79.44	0.00	4418	0	495	869	1364
4	70	6.82	21.229	22.120	0.00	0.132	2.84	0.80	1.00	0.0	29.50	83.74	0.00	4844	0	485	819	1304
3	50	6.19	26.584	22.126	0.00	0.132	2.84	0.80	1.00	0.0	33.79	95.95	0.00	5166	0	505	745	1250
2	30	5.35	28.860	28.798	0.00	0.139	2.81	0.80	1.00	0.0	39.40	110.79	0.00	5583	0	504	645	1149
1	10	5.35	31.267	28.798	0.00	0.132	2.84	0.80	1.00	0.0	41.31	117.25	0.00	6192	0	533	646	1179
														38,224	0			10,791

1.0D + 1.0W Service 90° — Gust Response Factor (Gh): 0.85
60 mph Wind with No Ice — Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	8.79	12.020	9.583	0.00	0.156	2.75	0.85	1.00	0.0	15.66	43.04	0.00	1745	0	322	512	833
8	150	8.48	12.895	11.688	0.00	0.153	2.76	0.85	1.00	0.0	17.60	48.56	0.00	2554	0	350	743	1093
7	130	8.14	14.333	15.027	0.00	0.144	2.79	0.85	1.00	0.0	20.70	57.81	0.00	3477	0	400	880	1280
6	110	7.76	19.684	18.574	0.00	0.156	2.75	0.85	1.00	0.0	27.28	75.06	0.00	4245	0	495	900	1395
5	90	7.33	22.335	18.575	0.00	0.143	2.80	0.85	1.00	0.0	29.51	82.57	0.00	4418	0	514	869	1383
4	70	6.82	21.229	22.120	0.00	0.132	2.84	0.85	1.00	0.0	30.56	86.75	0.00	4844	0	503	819	1322
3	50	6.19	26.584	22.126	0.00	0.132	2.84	0.85	1.00	0.0	35.12	99.72	0.00	5166	0	525	745	1270
2	30	5.35	28.860	28.798	0.00	0.139	2.81	0.85	1.00	0.0	40.85	114.85	0.00	5583	0	523	645	1168

SECTION FORCES

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
1	10	5.35	31.267	28.798	0.00	0.132	2.84	0.85	1.00	0.0	42.88	121.69	0.00	6192	0	553	646	1200
														38,224	0			10,943

1.0D + 1.0W Service 120° Gust Response Factor (Gh): 0.85
60 mph Wind with No Ice Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	8.79	12.020	9.583	0.00	0.156	2.75	1.00	1.00	0.0	17.47	48.00	0.00	1745	0	359	512	870
8	150	8.48	12.895	11.688	0.00	0.153	2.76	1.00	1.00	0.0	19.53	53.89	0.00	2554	0	388	743	1132
7	130	8.14	14.333	15.027	0.00	0.144	2.79	1.00	1.00	0.0	22.85	63.82	0.00	3477	0	442	880	1321
6	110	7.76	19.684	18.574	0.00	0.156	2.75	1.00	1.00	0.0	30.24	83.18	0.00	4245	0	549	900	1449
5	90	7.33	22.335	18.575	0.00	0.143	2.80	1.00	1.00	0.0	32.86	91.94	0.00	4418	0	573	869	1441
4	70	6.82	21.229	22.120	0.00	0.132	2.84	1.00	1.00	0.0	33.75	95.79	0.00	4844	0	555	819	1374
3	50	6.19	26.584	22.126	0.00	0.132	2.84	1.00	1.00	0.0	39.11	111.04	0.00	5166	0	585	745	1329
2	30	5.35	28.860	28.798	0.00	0.139	2.81	1.00	1.00	0.0	45.17	127.02	0.00	5583	0	578	645	1223
1	10	5.35	31.267	28.798	0.00	0.132	2.84	1.00	1.00	0.0	47.57	135.00	0.00	6192	0	614	646	1260
														38,224	0			11,400

1.0D + 1.0W Service 180° Gust Response Factor (Gh): 0.85
60 mph Wind with No Ice Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	8.79	12.020	9.583	0.00	0.156	2.75	0.80	1.00	0.0	15.06	41.39	0.00	1745	0	309	512	821
8	150	8.48	12.895	11.688	0.00	0.153	2.76	0.80	1.00	0.0	16.95	46.78	0.00	2554	0	337	743	1081
7	130	8.14	14.333	15.027	0.00	0.144	2.79	0.80	1.00	0.0	19.99	55.81	0.00	3477	0	386	880	1266
6	110	7.76	19.684	18.574	0.00	0.156	2.75	0.80	1.00	0.0	26.30	72.35	0.00	4245	0	477	900	1377
5	90	7.33	22.335	18.575	0.00	0.143	2.80	0.80	1.00	0.0	28.40	79.44	0.00	4418	0	495	869	1364
4	70	6.82	21.229	22.120	0.00	0.132	2.84	0.80	1.00	0.0	29.50	83.74	0.00	4844	0	485	819	1304
3	50	6.19	26.584	22.126	0.00	0.132	2.84	0.80	1.00	0.0	33.79	95.95	0.00	5166	0	505	745	1250
2	30	5.35	28.860	28.798	0.00	0.139	2.81	0.80	1.00	0.0	39.40	110.79	0.00	5583	0	504	645	1149
1	10	5.35	31.267	28.798	0.00	0.132	2.84	0.80	1.00	0.0	41.31	117.25	0.00	6192	0	533	646	1179
														38,224	0			10,791

1.0D + 1.0W Service 210° Gust Response Factor (Gh): 0.85
60 mph Wind with No Ice Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	8.79	12.020	9.583	0.00	0.156	2.75	0.85	1.00	0.0	15.66	43.04	0.00	1745	0	322	512	833
8	150	8.48	12.895	11.688	0.00	0.153	2.76	0.85	1.00	0.0	17.60	48.56	0.00	2554	0	350	743	1093
7	130	8.14	14.333	15.027	0.00	0.144	2.79	0.85	1.00	0.0	20.70	57.81	0.00	3477	0	400	880	1280
6	110	7.76	19.684	18.574	0.00	0.156	2.75	0.85	1.00	0.0	27.28	75.06	0.00	4245	0	495	900	1395
5	90	7.33	22.335	18.575	0.00	0.143	2.80	0.85	1.00	0.0	29.51	82.57	0.00	4418	0	514	869	1383
4	70	6.82	21.229	22.120	0.00	0.132	2.84	0.85	1.00	0.0	30.56	86.75	0.00	4844	0	503	819	1322
3	50	6.19	26.584	22.126	0.00	0.132	2.84	0.85	1.00	0.0	35.12	99.72	0.00	5166	0	525	745	1270
2	30	5.35	28.860	28.798	0.00	0.139	2.81	0.85	1.00	0.0	40.85	114.85	0.00	5583	0	523	645	1168
1	10	5.35	31.267	28.798	0.00	0.132	2.84	0.85	1.00	0.0	42.88	121.69	0.00	6192	0	553	646	1200
														38,224	0			10,943

1.0D + 1.0W Service 240° Gust Response Factor (Gh): 0.85
60 mph Wind with No Ice Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	8.79	12.020	9.583	0.00	0.156	2.75	1.00	1.00	0.0	17.47	48.00	0.00	1745	0	359	512	870
8	150	8.48	12.895	11.688	0.00	0.153	2.76	1.00	1.00	0.0	19.53	53.89	0.00	2554	0	388	743	1132
7	130	8.14	14.333	15.027	0.00	0.144	2.79	1.00	1.00	0.0	22.85	63.82	0.00	3477	0	442	880	1321

SECTION FORCES

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
6	110	7.76	19.684	18.574	0.00	0.156	2.75	1.00	1.00	0.0	30.24	83.18	0.00	4245	0	549	900	1449
5	90	7.33	22.335	18.575	0.00	0.143	2.80	1.00	1.00	0.0	32.86	91.94	0.00	4418	0	573	869	1441
4	70	6.82	21.229	22.120	0.00	0.132	2.84	1.00	1.00	0.0	33.75	95.79	0.00	4844	0	555	819	1374
3	50	6.19	26.584	22.126	0.00	0.132	2.84	1.00	1.00	0.0	39.11	111.04	0.00	5166	0	585	745	1329
2	30	5.35	28.860	28.798	0.00	0.139	2.81	1.00	1.00	0.0	45.17	127.02	0.00	5583	0	578	645	1223
1	10	5.35	31.267	28.798	0.00	0.132	2.84	1.00	1.00	0.0	47.57	135.00	0.00	6192	0	614	646	1260
														38,224	0			11,400

1.0D + 1.0W Service 300° Gust Response Factor (Gh): 0.85
60 mph Wind with No Ice Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	8.79	12.020	9.583	0.00	0.156	2.75	0.80	1.00	0.0	15.06	41.39	0.00	1745	0	309	512	821
8	150	8.48	12.895	11.688	0.00	0.153	2.76	0.80	1.00	0.0	16.95	46.78	0.00	2554	0	337	743	1081
7	130	8.14	14.333	15.027	0.00	0.144	2.79	0.80	1.00	0.0	19.99	55.81	0.00	3477	0	386	880	1266
6	110	7.76	19.684	18.574	0.00	0.156	2.75	0.80	1.00	0.0	26.30	72.35	0.00	4245	0	477	900	1377
5	90	7.33	22.335	18.575	0.00	0.143	2.80	0.80	1.00	0.0	28.40	79.44	0.00	4418	0	495	869	1364
4	70	6.82	21.229	22.120	0.00	0.132	2.84	0.80	1.00	0.0	29.50	83.74	0.00	4844	0	485	819	1304
3	50	6.19	26.584	22.126	0.00	0.132	2.84	0.80	1.00	0.0	33.79	95.95	0.00	5166	0	505	745	1250
2	30	5.35	28.860	28.798	0.00	0.139	2.81	0.80	1.00	0.0	39.40	110.79	0.00	5583	0	504	645	1149
1	10	5.35	31.267	28.798	0.00	0.132	2.84	0.80	1.00	0.0	41.31	117.25	0.00	6192	0	533	646	1179
														38,224	0			10,791

1.0D + 1.0W Service 330° Gust Response Factor (Gh): 0.85
60 mph Wind with No Ice Wind Importance Factor (Iw): 1.00

Sect #	Elev (ft)	Q_Z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt. (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	8.79	12.020	9.583	0.00	0.156	2.75	0.85	1.00	0.0	15.66	43.04	0.00	1745	0	322	512	833
8	150	8.48	12.895	11.688	0.00	0.153	2.76	0.85	1.00	0.0	17.60	48.56	0.00	2554	0	350	743	1093
7	130	8.14	14.333	15.027	0.00	0.144	2.79	0.85	1.00	0.0	20.70	57.81	0.00	3477	0	400	880	1280
6	110	7.76	19.684	18.574	0.00	0.156	2.75	0.85	1.00	0.0	27.28	75.06	0.00	4245	0	495	900	1395
5	90	7.33	22.335	18.575	0.00	0.143	2.80	0.85	1.00	0.0	29.51	82.57	0.00	4418	0	514	869	1383
4	70	6.82	21.229	22.120	0.00	0.132	2.84	0.85	1.00	0.0	30.56	86.75	0.00	4844	0	503	819	1322
3	50	6.19	26.584	22.126	0.00	0.132	2.84	0.85	1.00	0.0	35.12	99.72	0.00	5166	0	525	745	1270
2	30	5.35	28.860	28.798	0.00	0.139	2.81	0.85	1.00	0.0	40.85	114.85	0.00	5583	0	523	645	1168
1	10	5.35	31.267	28.798	0.00	0.132	2.84	0.85	1.00	0.0	42.88	121.69	0.00	6192	0	553	646	1200
														38,224	0			10,943

EQUIVALENT LATERAL FORCE METHOD

Spectral Response Acceleration for Short Period (S_S):	0.24
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.06
Long-Period Transition Period (T_L – Seconds):	6
Importance Factor (I_e):	1.00
Site Coefficient F_a:	1.60
Site Coefficient F_v:	2.40
Response Modification Coefficient (R):	3.00
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.25
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.09
Seismic Response Coefficient (C_s):	0.03
Upper Limit C_S:	0.03
Lower Limit C_S:	0.03
Period based on Rayleigh Method (sec):	0.96
Redundancy Factor (p):	1.30
Seismic Force Distribution Exponent (k):	1.23
Total Unfactored Dead Load:	51.96 k
Seismic Base Shear (E):	2.13 k

SEISMIC

Load Case: 0.9D - 1.0Ev + 1.0Eh Seismic

Section	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	Cvx	Horizontal Force (lb)	Vertical Force (lb)
9	170.00	1,745	974,831	0.066	140	1,483
8	150.00	2,554	1,222,707	0.082	176	2,170
7	130.00	3,477	1,395,708	0.094	201	2,955
6	110.00	4,245	1,387,212	0.094	200	3,608
5	90.00	4,418	1,127,465	0.076	162	3,754
4	70.00	4,844	907,173	0.061	131	4,117
3	50.00	5,166	639,277	0.043	92	4,391
2	30.00	5,583	368,244	0.025	53	4,745
1	10.00	6,192	105,542	0.007	15	5,262
Kaelus DBC0061F1V51-2	180.00	153	91,697	0.006	13	130
Powerwave Allgon LGP21401	180.00	85	50,703	0.003	7	72
Raycap DC6-48-60-18-8F ("Squid")	180.00	32	19,059	0.001	3	27
Ericsson RRUS 4478 B14	180.00	180	107,699	0.007	15	153
Ericsson RRUS 4449 B5, B12	180.00	213	127,656	0.009	18	181
Raycap DC6-48-60-18-8C	180.00	32	19,178	0.001	3	27
Ericsson RRUS 32 B30 (53 lbs)	180.00	159	95,293	0.006	14	135
Ericsson RRUS 32 B2	180.00	159	95,293	0.006	14	135
Powerwave Allgon 7770.00	180.00	105	62,929	0.004	9	89
Quintel QS66512-2	180.00	222	133,050	0.009	19	189
CCI DMP65R-BU6DA	180.00	159	95,173	0.006	14	135
CCI OPA65R-BU6D	180.00	126	75,755	0.005	11	107
CCI TPA-65R-LCUUUU-H8	180.00	82	48,905	0.003	7	69
CCI DMP65R-BU8D	180.00	96	57,355	0.004	8	81
CCI OPA65R-BU8D	180.00	76	45,848	0.003	7	65
Generic Round Sector Frame	180.00	900	539,393	0.036	78	765
Commscope CBC78T-DS-43-2X	172.00	62	35,191	0.002	5	53
Samsung B5/B13 RRH-BR04C	172.00	211	119,515	0.008	17	179
Samsung B2/B66A RRH-BR049	172.00	253	143,486	0.010	21	215
RFS APL868013-42T0	172.00	13	7,140	0.000	1	11
RFS DB-C1-12C-24AB-0Z	172.00	32	18,134	0.001	3	27
Andrew DB844G65ZAXY	172.00	48	27,201	0.002	4	41

Samsung MT6407-77A	172.00	245	138,726	0.009	20	208
Commscope JAHH-65B-R3B	172.00	364	206,048	0.014	30	309
Generic Round Sector Frame	172.00	900	510,020	0.034	73	765
Raycap RDIDC-9181-PF-48	162.00	22	11,528	0.001	2	19
Fujitsu TA08025-B605	162.00	225	118,437	0.008	17	191
Fujitsu TA08025-B604	162.00	192	100,909	0.007	15	163
JMA Wireless MX08FRO665-21	162.00	194	101,856	0.007	15	164
Generic Round Sector Frame	162.00	900	473,749	0.032	68	765
Ericsson Radio 4449 B71 B85A	148.00	225	105,960	0.007	15	191
Ericsson 4460 BAND 2/25	148.00	327	153,996	0.010	22	278
Commscope VV-65A-R1B	148.00	74	34,896	0.002	5	63
Ericsson AIR 6419 B41	148.00	250	117,687	0.008	17	212
RFS APXVAARR24_43-U-NA20	148.00	384	180,698	0.012	26	326
Perfect Vision PV-SFA12-B Sector Frames	147.00	1,776	829,425	0.056	119	1,509
Sinclair SC479-HF1LDF	146.00	34	15,746	0.001	2	29
Generic Round Side Arm	142.50	375	168,553	0.011	24	319
Andrew Microwaves DB810K-XT	137.00	35	14,987	0.001	2	30
Amphenol Antel WPA-700120-4CF-EDIN-X	136.40	7	2,896	0.000	0	6
Generic Round Sector Frame	136.00	600	254,614	0.017	37	510
Generic 24" x 24" Ice Shield	135.00	50	21,026	0.001	3	42
Bird 432E-83I-01-T	134.80	25	10,494	0.001	2	21
Generic 24" x 24" Ice Shield	134.00	50	20,834	0.001	3	42
Sinclair SE419-SF3P4LDF	134.00	48	20,001	0.001	3	41
Morad VHF 156-DELUXE	131.00	1	365	0.000	0	1
Generic Round Side Arm	131.00	375	151,959	0.010	22	319
Sinclair SC479-HF1LDF	129.80	102	40,867	0.003	6	87
RFS PA6-65AC	129.00	278	110,538	0.008	16	236
RFS PA6-65AC	128.00	278	109,484	0.007	16	236
Bird 432-83H-01-T	127.00	25	9,751	0.001	1	21
Generic Round Side Arm	127.00	188	73,132	0.005	11	159
Allgon 7199 / M-1900-90-19.5I	127.00	35	13,729	0.001	2	30
Sinclair SE419-SF3P4LDF	125.00	24	9,180	0.001	1	20
Generic Round Side Arm	121.00	188	68,901	0.005	10	159
Decibel DB586	120.50	59	21,570	0.002	3	50
Generic Round Side Arm	120.50	188	68,550	0.005	10	159
Morad VHF 156-DELUXE	116.80	1	317	0.000	0	1
Decibel DB586	115.50	59	20,473	0.001	3	50
Generic Round Side Arm	115.00	375	129,434	0.009	19	319
Scala OGT9-840	102.50	18	5,542	0.000	1	16
Generic Round Side Arm	100.00	188	54,483	0.004	8	159
Generic Flat Stand-Off	100.00	188	54,483	0.004	8	159
Sinclair SD210D	97.00	40	11,195	0.001	2	34
PCTEL GPS-TMG-HR-26N	93.60	1	161	0.000	0	1
Scala OGT9-840	92.20	18	4,864	0.000	1	16
Generic Round Side Arm	91.00	188	48,508	0.003	7	159
Generic Round Side Arm	86.00	188	45,247	0.003	7	159
Andrew DB264-A	77.60	36	7,654	0.000	1	31
Generic 2" x 4" GPS	30.00	5	330	0.000	0	4
PCTEL GPS-TMG-HR-26N	18.00	1	21	0.000	0	1
Totals		51,964	14,817,636	1.000	2,132	44,163

SEISMIC

Load Case: 1.2D + 1.0Ev + 1.0Eh

Seismic

Section	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	Cvx	Horizontal Force (lb)	Vertical Force (lb)
9	170.00	1,745	974,831	0.066	140	2,182
8	150.00	2,554	1,222,707	0.082	176	3,193
7	130.00	3,477	1,395,708	0.094	201	4,347
6	110.00	4,245	1,387,212	0.094	200	5,307
5	90.00	4,418	1,127,465	0.076	162	5,523
4	70.00	4,844	907,173	0.061	131	6,056
3	50.00	5,166	639,277	0.043	92	6,459
2	30.00	5,583	368,244	0.025	53	6,980
1	10.00	6,192	105,542	0.007	15	7,740
Kaelus DBC0061F1V51-2	180.00	153	91,697	0.006	13	191
Powerwave Allgon LGP21401	180.00	85	50,703	0.003	7	106
Raycap DC6-48-60-18-8F ("Squid")	180.00	32	19,059	0.001	3	40
Ericsson RRUS 4478 B14	180.00	180	107,699	0.007	15	225

Ericsson RRUS 4449 B5, B12	180.00	213	127,656	0.009	18	266
Raycap DC6-48-60-18-8C	180.00	32	19,178	0.001	3	40
Ericsson RRUS 32 B30 (53 lbs)	180.00	159	95,293	0.006	14	199
Ericsson RRUS 32 B2	180.00	159	95,293	0.006	14	199
Powerwave Allgon 7770.00	180.00	105	62,929	0.004	9	131
Quintel QS66512-2	180.00	222	133,050	0.009	19	278
CCI DMP65R-BU6DA	180.00	159	95,173	0.006	14	199
CCI OPA65R-BU6D	180.00	126	75,755	0.005	11	158
CCI TPA-65R-LCUUUU-H8	180.00	82	48,905	0.003	7	102
CCI DMP65R-BU8D	180.00	96	57,355	0.004	8	120
CCI OPA65R-BU8D	180.00	76	45,848	0.003	7	96
Generic Round Sector Frame	180.00	900	539,393	0.036	78	1,125
Commscope CBC78T-DS-43-2X	172.00	62	35,191	0.002	5	78
Samsung B5/B13 RRH-BR04C	172.00	211	119,515	0.008	17	264
Samsung B2/B66A RRH-BR049	172.00	253	143,486	0.010	21	317
RFS APL868013-42T0	172.00	13	7,140	0.000	1	16
RFS DB-C1-12C-24AB-0Z	172.00	32	18,134	0.001	3	40
Andrew DB844G65ZAXY	172.00	48	27,201	0.002	4	60
Samsung MT6407-77A	172.00	245	138,726	0.009	20	306
Commscope JAHH-65B-R3B	172.00	364	206,048	0.014	30	455
Generic Round Sector Frame	172.00	900	510,020	0.034	73	1,125
Raycap RDIDC-9181-PF-48	162.00	22	11,528	0.001	2	27
Fujitsu TA08025-B605	162.00	225	118,437	0.008	17	281
Fujitsu TA08025-B604	162.00	192	100,909	0.007	15	240
JMA Wireless MX08FRO665-21	162.00	194	101,856	0.007	15	242
Generic Round Sector Frame	162.00	900	473,749	0.032	68	1,125
Ericsson Radio 4449 B71 B85A	148.00	225	105,960	0.007	15	281
Ericsson 4460 BAND 2/25	148.00	327	153,996	0.010	22	409
Commscope VV-65A-R1B	148.00	74	34,896	0.002	5	93
Ericsson AIR 6419 B41	148.00	250	117,687	0.008	17	312
RFS APXVAARR24_43-U-NA20	148.00	384	180,698	0.012	26	480
Perfect Vision PV-SFA12-B Sector Frames	147.00	1,776	829,425	0.056	119	2,220
Sinclair SC479-HF1LDF	146.00	34	15,746	0.001	2	43
Generic Round Side Arm	142.50	375	168,553	0.011	24	469
Andrew Microwaves DB810K-XT	137.00	35	14,987	0.001	2	44
Amphenol Antel WPA-700120-4CF-EDIN-X	136.40	7	2,896	0.000	0	9
Generic Round Sector Frame	136.00	600	254,614	0.017	37	750
Generic 24" x 24" Ice Shield	135.00	50	21,026	0.001	3	63
Bird 432E-83I-01-T	134.80	25	10,494	0.001	2	31
Generic 24" x 24" Ice Shield	134.00	50	20,834	0.001	3	63
Sinclair SE419-SF3P4LDF	134.00	48	20,001	0.001	3	60
Morad VHF 156-DELUXE	131.00	1	365	0.000	0	1
Generic Round Side Arm	131.00	375	151,959	0.010	22	469
Sinclair SC479-HF1LDF	129.80	102	40,867	0.003	6	128
RFS PA6-65AC	129.00	278	110,538	0.008	16	348
RFS PA6-65AC	128.00	278	109,484	0.007	16	348
Bird 432-83H-01-T	127.00	25	9,751	0.001	1	31
Generic Round Side Arm	127.00	188	73,132	0.005	11	234
Allgon 7199 / M-1900-90-19.5I	127.00	35	13,729	0.001	2	44
Sinclair SE419-SF3P4LDF	125.00	24	9,180	0.001	1	30
Generic Round Side Arm	121.00	188	68,901	0.005	10	234
Decibel DB586	120.50	59	21,570	0.002	3	74
Generic Round Side Arm	120.50	188	68,550	0.005	10	234
Morad VHF 156-DELUXE	116.80	1	317	0.000	0	1
Decibel DB586	115.50	59	20,473	0.001	3	74
Generic Round Side Arm	115.00	375	129,434	0.009	19	469
Scala OGT9-840	102.50	18	5,542	0.000	1	23
Generic Round Side Arm	100.00	188	54,483	0.004	8	234
Generic Flat Stand-Off	100.00	188	54,483	0.004	8	234
Sinclair SD210D	97.00	40	11,195	0.001	2	50
PCTEL GPS-TMG-HR-26N	93.60	1	161	0.000	0	1
Scala OGT9-840	92.20	18	4,864	0.000	1	23
Generic Round Side Arm	91.00	188	48,508	0.003	7	234
Generic Round Side Arm	86.00	188	45,247	0.003	7	234
Andrew DB264-A	77.60	36	7,654	0.000	1	45
Generic 2" x 4" GPS	30.00	5	330	0.000	0	6
PCTEL GPS-TMG-HR-26N	18.00	1	21	0.000	0	1
Totals		51,964	14,817,636	1.000	2,132	64,962

FORCE/STRESS SUMMARY

Section 1 – Base 0.0 (ft) and Height 20.00 (ft)

Max Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'_y (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	# Bolt	# Hole	Use %	Controls
L PSP - ROHN 8 EHS	-324.87	1.2D + 1.0W N	10.017	100	100	100	41.16	50.0	386.43	0.00	0.00	0	0	84	Member X
D SAE - 4X4X0.3125	-10.76	1.2D + 1.0W 90°	24.624	50	50	50	189.17	50.0	19.20	19.88	29.25	1	1	56	Member Z

Max Tension Member	Pu (kip)	Load Case	F_y (ksi)	F_u (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	Blk Shear $\Phi_t P_n$ (kip)	# Bolt	# Hole	Use %	Controls
L PSP - ROHN 8 EHS	280.38	0.9D + 1.0W 60°	50.0	65	437.40	0.00	0.00		0	0	64	Member
D SAE - 4X4X0.3125	10.64	1.2D + 1.0W 90°	50.0	65	78.47	19.88	17.67	22.47	1	1	60	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	ΦR_{nt} (kip)	Use %	Num Bolts	Bolt Type
Top Tension	257.84	0.9D + 1.0W 180°	0.00	0	0	
Bot Tension	289.04	0.9D + 1.0W 180°	567.88	26	10	1" A354-BC
Bot Compression	334.24	1.2D + 1.0W N	660.26	54	0	

Section 2 – Base 20.0 (ft) and Height 20.00 (ft)

Max Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'_y (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	# Bolt	# Hole	Use %	Controls
L PSP - ROHN 8 EHS	-291.19	1.2D + 1.0W N	10.017	100	100	100	41.16	50.0	386.43	0.00	0.00	0	0	75	Member X
D SAE - 4X4X0.25	-10.96	1.2D + 1.0W 90°	22.811	50	50	50	172.16	43.5	18.73	19.88	23.40	1	1	58	Member Z

Max Tension Member	Pu (kip)	Load Case	F_y (ksi)	F_u (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	Blk Shear $\Phi_t P_n$ (kip)	# Bolt	# Hole	Use %	Controls
L PSP - ROHN 8 EHS	250.95	0.9D + 1.0W 60°	50.0	65	437.40	0.00	0.00		0	0	57	Member
D SAE - 4X4X0.25	10.63	1.2D + 1.0W 90°	50.0	65	63.50	19.88	14.14	17.98	1	1	75	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	ΦR_{nt} (kip)	Use %	Num Bolts	Bolt Type
Top Tension	226.54	0.9D + 1.0W 180°	0.00	0	0	
Bot Tension	257.84	0.9D + 1.0W 180°	436.14	59	8	1 A325

Section 3 – Base 40.0 (ft) and Height 20.00 (ft)

Max Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'_y (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	# Bolt	# Hole	Use %	Controls
L PX - 6" DIA PIPE	-255.00	1.2D + 1.0W N	10.019	100	100	100	54.77	50.0	303.54	0.00	0.00	0	0	84	Member X
D SAE - 4X4X0.25	-10.08	1.2D + 1.0W 90°	21	50	50	50	158.49	43.5	22.11	19.88	23.40	1	1	50	Bolt Shear

Max Tension Member	Pu (kip)	Load Case	F_y (ksi)	F_u (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	Blk Shear $\Phi_t P_n$ (kip)	# Bolt	# Hole	Use %	Controls
L PX - 6" DIA PIPE	220.04	0.9D + 1.0W 60°	50.0	65	378.00	0.00	0.00		0	0	58	Member
D SAE - 4X4X0.25	9.89	1.2D + 1.0W 90°	50.0	65	63.50	19.88	14.14	17.98	1	1	69	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	ΦR_{nt} (kip)	Use %	Num Bolts	Bolt Type
Top Tension	195.10	0.9D + 1.0W 180°	0.00	0	0	
Bot Tension	226.54	0.9D + 1.0W 180°	436.14	52	8	1 A325

Section 4 – Base 60.0 (ft) and Height 20.00 (ft)

FORCE/STRESS SUMMARY

Max Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'_y (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	# Bolt	# Hole	Use %	Controls
L PX - 6" DIA PIPE	-217.23	1.2D + 1.0W N	10.017	100	100	100	54.76	50.0	303.58	0.00	0.00	0	0	71	Member X
D SAE - 3.5x3.5x0.25	-10.34	1.2D + 1.0W 90°	19.171	50	50	50	167.19	50.0	17.30	19.88	23.40	1	1	59	Member Z

Max Tension Member	Pu (kip)	Load Case	F_y (ksi)	F_u (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	Blk Shear $\Phi_t P_n$ (kip)	# Bolt	# Hole	Use %	Controls
L PX - 6" DIA PIPE	187.32	0.9D + 1.0W 60°	50.0	65	378.00	0.00	0.00		0	0	49	Member
D SAE - 3.5x3.5x0.25	10.14	1.2D + 1.0W 90°	50.0	65	54.36	19.88	14.14	17.98	1	1	71	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	ΦR_{nt} (kip)	Use %	Num Bolts	Bolt Type
Top Tension	159.34	0.9D + 1.0W 180°	0.00	0	0	
Bot Tension	195.10	0.9D + 1.0W 180°	327.10	60	6	1 A325

Section 5 – Base 80.0 (ft) and Height 20.00 (ft)

Max Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'_y (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	# Bolt	# Hole	Use %	Controls
L PX - 5" DIA PIPE	-179.73	1.2D + 1.0W N	6.678	100	100	100	43.55	50.0	238.95	0.00	0.00	0	0	75	Member X
D SAE - 3X3X0.25	-8.86	1.2D + 1.0W 90°	15.976	50	50	50	161.92	50.0	15.72	19.88	23.40	1	1	56	Member Z

Max Tension Member	Pu (kip)	Load Case	F_y (ksi)	F_u (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	Blk Shear $\Phi_t P_n$ (kip)	# Bolt	# Hole	Use %	Controls
L PX - 5" DIA PIPE	154.39	0.9D + 1.0W 60°	50.0	65	274.50	0.00	0.00		0	0	56	Member
D SAE - 3X3X0.25	8.73	1.2D + 1.0W 90°	50.0	65	45.22	19.88	14.14	14.93	1	1	61	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	ΦR_{nt} (kip)	Use %	Num Bolts	Bolt Type
Top Tension	122.45	0.9D + 1.0W 180°	0.00	0	0	
Bot Tension	159.34	0.9D + 1.0W 180°	327.10	49	6	1 A325

Section 6 – Base 100.0 (ft) and Height 20.00 (ft)

Max Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'_y (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	# Bolt	# Hole	Use %	Controls
L PX - 5" DIA PIPE	-137.23	1.2D + 1.0W N	6.678	100	100	100	43.55	50.0	238.95	0.00	0.00	0	0	57	Member X
D SAE - 3X3X0.25	-8.31	1.2D + 1.0W 90°	14.168	50	50	50	143.59	50.0	19.99	19.88	23.40	1	1	41	Bolt Shear

Max Tension Member	Pu (kip)	Load Case	F_y (ksi)	F_u (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	Blk Shear $\Phi_t P_n$ (kip)	# Bolt	# Hole	Use %	Controls
L PX - 5" DIA PIPE	116.83	0.9D + 1.0W 60°	50.0	65	274.50	0.00	0.00		0	0	42	Member
D SAE - 3X3X0.25	8.22	1.2D + 1.0W 90°	50.0	65	45.22	19.88	14.14	14.93	1	1	58	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	ΦR_{nt} (kip)	Use %	Num Bolts	Bolt Type
Top Tension	82.86	0.9D + 1.0W 180°	0.00	0	0	
Bot Tension	122.45	0.9D + 1.0W 180°	327.10	37	6	1 A325

Section 7 – Base 120.0 (ft) and Height 20.00 (ft)

Max Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'_y (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	# Bolt	# Hole	Use %	Controls
L PX - 4" DIA PIPE	-92.22	1.2D + 1.0W N	6.679	100	100	100	54.15	50.0	160.15	0.00	0.00	0	0	57	Member X
D SAE - 2.5X2.5X0.25	-7.79	1.2D + 1.0W 90°	12.429	50	50	50	151.88	36.0	14.76	19.88	20.88	1	1	52	Member Z

FORCE/STRESS SUMMARY

Max Tension Member	Pu (kip)	Load Case	F_y (ksi)	F_u (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	Blk Shear $\Phi_t P_n$ (kip)	# Bolt	# Hole	Use %	Controls
L PX - 4" DIA PIPE	76.52	0.9D + 1.0W 60°	50.0	65	198.45	0.00	0.00		0	0	38	Member
D SAE - 2.5X2.5X0.25	7.68	1.2D + 1.0W 90°	36.0	58	32.20	19.88	12.62	11.96	1	1	64	Blk Shear

Max Splice Forces	Pu (kip)	Load Case	ΦR_{nt} (kip)	Use %	Num Bolts	Bolt Type
Top Tension	47.14	0.9D + 1.0W 180°	0.00	0	0	
Bot Tension	82.86	0.9D + 1.0W 180°	218.07	38	4	1 A325

Section 8 – Base 140.0 (ft) and Height 20.00 (ft)

Max Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'_y (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	# Bolt	# Hole	Use %	Controls
L PST - 3" DIA PIPE	-54.35	1.2D + 1.0W N	4.946	100	100	100	51.17	50.0	82.87	0.00	0.00	0	0	65	Member X
H SAE - 2X2X0.125	-0.32	1.2D + 1.0W 60°	6.689	100	100	100	201.66	36.0	3.38	13.81	8.70	1	1	9	Member Z
D SAE - 2X2X0.25	-4.62	1.2D + 1.0W 90°	9.813	50	50	50	150.58	36.0	11.87	13.81	17.40	1	1	38	Member Z

Max Tension Member	Pu (kip)	Load Case	F_y (ksi)	F_u (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	Blk Shear $\Phi_t P_n$ (kip)	# Bolt	# Hole	Use %	Controls
L PST - 3" DIA PIPE	48.25	0.9D + 1.0W 180°	50.0	65	100.35	0.00	0.00		0	0	48	Member
H SAE - 2X2X0.125	0.27	1.2D + 1.0W 120°	36.0	58	12.86	13.81	5.22	4.55	1	1	6	Blk Shear
D SAE - 2X2X0.25	4.61	1.2D + 1.0W 90°	36.0	58	25.06	13.81	10.44	9.11	1	1	50	Blk Shear

Max Splice Forces	Pu (kip)	Load Case	ΦR_{nt} (kip)	Use %	Num Bolts	Bolt Type
Top Tension	19.56	0.9D + 1.0W 180°	0.00	0	0	
Bot Tension	47.14	0.9D + 1.0W 180°	166.22	28	4	0.875" A325

Section 9 – Base 160.0 (ft) and Height 20.00 (ft)

Max Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'_y (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	# Bolt	# Hole	Use %	Controls
L PST - 2-1/2" DIA PIPE	-21.97	1.2D + 1.0W N	3.95	100	100	100	50.05	50.0	63.85	0.00	0.00	0	0	34	Member X
H SAE - 2X2X0.125	-0.87	1.2D + 1.0W 180°	6.647	100	100	100	200.41	36.0	3.42	13.81	8.70	1	1	25	Member Z
D SAE - 1.75X1.75X0.1875	-3.41	1.2D + 1.0W 90°	7.764	50	50	50	135.81	36.0	9.64	13.81	13.05	1	1	35	Member Z

Max Tension Member	Pu (kip)	Load Case	F_y (ksi)	F_u (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	Blk Shear $\Phi_t P_n$ (kip)	# Bolt	# Hole	Use %	Controls
L PST - 2-1/2" DIA PIPE	19.94	0.9D + 1.0W 180°	50.0	65	76.68	0.00	0.00		0	0	26	Member
H SAE - 2X2X0.125	0.93	1.2D + 1.0W N	36.0	58	12.86	13.81	5.22	4.55	1	1	20	Blk Shear
D SAE - 1.75X1.75X0.1875	3.33	1.2D + 1.0W 90°	36.0	58	16.05	13.81	7.83	5.81	1	1	57	Blk Shear

Max Splice Forces	Pu (kip)	Load Case	ΦR_{nt} (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	19.56	0.9D + 1.0W 180°	120.41	16	4	0.75" A325

DETAILED REACTIONS

Load Case	Radius (ft)	Elevation (ft)	Azimuth (deg)	Node	*(-) Uplift and (+) Down *F_X (kip)	*F_Y (kip)	*F_Z (kip)
1.2D + 1.0W Normal	13.28	0.00	0	1	0.00	333.59	-35.96
	13.28	0.00	120	1a	12.10	-135.61	-11.05
	13.28	0.00	240	1b	-12.10	-135.61	-11.05
1.2D + 1.0W 60°	13.28	0.00	0	1	-3.29	172.32	-18.04
	13.28	0.00	120	1a	-17.26	172.28	6.17
	13.28	0.00	240	1b	-27.79	-282.24	-16.04
1.2D + 1.0W 90°	13.28	0.00	0	1	-3.89	20.79	-1.35
	13.28	0.00	120	1a	-27.37	285.31	13.59
	13.28	0.00	240	1b	-25.14	-243.74	-12.24
1.2D + 1.0W 120°	13.28	0.00	0	1	-3.53	-135.63	16.02
	13.28	0.00	120	1a	-31.16	333.56	17.99
	13.28	0.00	240	1b	-15.63	-135.58	-4.95
1.2D + 1.0W 180°	13.28	0.00	0	1	0.00	-282.29	32.10
	13.28	0.00	120	1a	-13.97	172.32	11.86
	13.28	0.00	240	1b	13.97	172.32	11.86
1.2D + 1.0W 210°	13.28	0.00	0	1	1.97	-243.79	27.89
	13.28	0.00	120	1a	0.77	20.82	4.04
	13.28	0.00	240	1b	25.46	285.34	16.91
1.2D + 1.0W 240°	13.28	0.00	0	1	3.53	-135.63	16.02
	13.28	0.00	120	1a	15.63	-135.58	-4.95
	13.28	0.00	240	1b	31.16	333.56	17.99
1.2D + 1.0W 300°	13.28	0.00	0	1	3.29	172.32	-18.04
	13.28	0.00	120	1a	27.79	-282.24	-16.04
	13.28	0.00	240	1b	17.26	172.28	6.17
1.2D + 1.0W 330°	13.28	0.00	0	1	1.92	285.36	-30.51
	13.28	0.00	120	1a	23.17	-243.77	-15.65
	13.28	0.00	240	1b	3.11	20.76	-2.69
0.9D + 1.0W Normal	13.28	0.00	0	1	0.00	327.97	-35.62
	13.28	0.00	120	1a	12.40	-140.60	-11.24
	13.28	0.00	240	1b	-12.40	-140.60	-11.24
0.9D + 1.0W 60°	13.28	0.00	0	1	-3.30	166.91	-17.68
	13.28	0.00	120	1a	-16.95	166.86	5.98
	13.28	0.00	240	1b	-28.10	-287.00	-16.22
0.9D + 1.0W 90°	13.28	0.00	0	1	-3.89	15.59	-1.00
	13.28	0.00	120	1a	-27.06	279.73	13.41
	13.28	0.00	240	1b	-25.44	-248.56	-12.41
0.9D + 1.0W 120°	13.28	0.00	0	1	-3.54	-140.60	16.37
	13.28	0.00	120	1a	-30.84	327.92	17.80
	13.28	0.00	240	1b	-15.94	-140.55	-5.12
0.9D + 1.0W 180°	13.28	0.00	0	1	0.00	-287.05	32.45
	13.28	0.00	120	1a	-13.66	166.91	11.69
	13.28	0.00	240	1b	13.66	166.91	11.69
0.9D + 1.0W 210°	13.28	0.00	0	1	1.97	-248.61	28.25
	13.28	0.00	120	1a	1.08	15.62	3.87
	13.28	0.00	240	1b	25.14	279.76	16.73
0.9D + 1.0W 240°	13.28	0.00	0	1	3.54	-140.60	16.37
	13.28	0.00	120	1a	15.94	-140.55	-5.12
	13.28	0.00	240	1b	30.84	327.92	17.80
0.9D + 1.0W 300°	13.28	0.00	0	1	3.30	166.91	-17.68
	13.28	0.00	120	1a	28.10	-287.00	-16.22
	13.28	0.00	240	1b	16.95	166.86	5.98
0.9D + 1.0W 330°	13.28	0.00	0	1	1.92	279.79	-30.15
	13.28	0.00	120	1a	23.47	-248.59	-15.82
	13.28	0.00	240	1b	2.81	15.57	-2.87
1.2D + 1.0Di + 1.0Wi Normal	13.28	0.00	0	1	0.00	133.23	-9.82
	13.28	0.00	120	1a	4.15	-1.27	-3.61
	13.28	0.00	240	1b	-4.15	-1.27	-3.61
1.2D + 1.0Di + 1.0Wi 60°	13.28	0.00	0	1	-1.02	87.62	-4.64
	13.28	0.00	120	1a	-4.53	87.62	1.44
	13.28	0.00	240	1b	-8.89	-44.53	-5.13
1.2D + 1.0Di + 1.0Wi 90°	13.28	0.00	0	1	-1.19	43.57	0.33
	13.28	0.00	120	1a	-7.50	120.21	3.65
	13.28	0.00	240	1b	-8.08	-33.08	-3.98
1.2D + 1.0Di + 1.0Wi 120°	13.28	0.00	0	1	-1.05	-1.29	5.41
	13.28	0.00	120	1a	-8.50	133.27	4.91
	13.28	0.00	240	1b	-5.21	-1.28	-1.79
1.2D + 1.0Di + 1.0Wi 180°	13.28	0.00	0	1	0.00	-44.50	10.27
	13.28	0.00	120	1a	-3.51	87.60	3.20

DETAILED REACTIONS

Load Case	Radius (ft)	Elevation (ft)	Azimuth (deg)	Node	*(-) Uplift and (+) Down *F_X (kip)	*F_Y (kip)	*F_Z (kip)
	13.28	0.00	240	1b	3.51	87.60	3.20
1.2D + 1.0Di + 1.0Wi 210°	13.28	0.00	0	1	0.60	-33.08	8.98
	13.28	0.00	120	1a	0.88	43.57	0.86
	13.28	0.00	240	1b	6.91	120.21	4.67
1.2D + 1.0Di + 1.0Wi 240°	13.28	0.00	0	1	1.05	-1.29	5.41
	13.28	0.00	120	1a	5.21	-1.28	-1.79
	13.28	0.00	240	1b	8.50	133.27	4.91
1.2D + 1.0Di + 1.0Wi 300°	13.28	0.00	0	1	1.02	87.62	-4.64
	13.28	0.00	120	1a	8.89	-44.53	-5.13
	13.28	0.00	240	1b	4.53	87.62	1.44
1.2D + 1.0Di + 1.0Wi 330°	13.28	0.00	0	1	0.59	120.21	-8.32
	13.28	0.00	120	1a	7.48	-33.08	-5.01
	13.28	0.00	240	1b	0.31	43.57	-1.19
1.2D + 1.0Ev + 1.0Eh Normal	13.28	0.00	0	1	0.00	34.81	-2.80
	13.28	0.00	120	1a	-0.76	13.79	0.35
	13.28	0.00	240	1b	0.76	13.79	0.35
1.2D + 1.0Ev + 1.0Eh 60°	13.28	0.00	0	1	-0.07	27.80	-2.14
	13.28	0.00	120	1a	-1.89	27.80	1.01
	13.28	0.00	240	1b	0.15	6.78	0.09
1.2D + 1.0Ev + 1.0Eh 90°	13.28	0.00	0	1	-0.09	20.79	-1.49
	13.28	0.00	120	1a	-2.30	32.93	1.28
	13.28	0.00	240	1b	0.28	8.66	0.21
1.2D + 1.0Ev + 1.0Eh 120°	13.28	0.00	0	1	-0.07	13.79	-0.83
	13.28	0.00	120	1a	-2.43	34.81	1.40
	13.28	0.00	240	1b	0.68	13.79	0.48
1.2D + 1.0Ev + 1.0Eh 180°	13.28	0.00	0	1	0.00	6.78	-0.17
	13.28	0.00	120	1a	-1.82	27.80	1.14
	13.28	0.00	240	1b	1.82	27.80	1.14
1.2D + 1.0Ev + 1.0Eh 210°	13.28	0.00	0	1	0.04	8.66	-0.35
	13.28	0.00	120	1a	-1.25	20.79	0.82
	13.28	0.00	240	1b	2.25	32.93	1.35
1.2D + 1.0Ev + 1.0Eh 240°	13.28	0.00	0	1	0.07	13.79	-0.83
	13.28	0.00	120	1a	-0.68	13.79	0.48
	13.28	0.00	240	1b	2.43	34.81	1.40
1.2D + 1.0Ev + 1.0Eh 300°	13.28	0.00	0	1	0.07	27.80	-2.14
	13.28	0.00	120	1a	-0.15	6.78	0.09
	13.28	0.00	240	1b	1.89	27.80	1.01
1.2D + 1.0Ev + 1.0Eh 330°	13.28	0.00	0	1	0.04	32.93	-2.63
	13.28	0.00	120	1a	-0.32	8.66	0.14
	13.28	0.00	240	1b	1.33	20.79	0.67
0.9D - 1.0Ev + 1.0Eh Normal	13.28	0.00	0	1	0.00	28.12	-2.33
	13.28	0.00	120	1a	-0.34	7.14	0.11
	13.28	0.00	240	1b	0.34	7.14	0.11
0.9D - 1.0Ev + 1.0Eh 60°	13.28	0.00	0	1	-0.07	21.13	-1.67
	13.28	0.00	120	1a	-1.48	21.13	0.77
	13.28	0.00	240	1b	-0.26	0.15	-0.15
0.9D - 1.0Ev + 1.0Eh 90°	13.28	0.00	0	1	-0.09	14.14	-1.01
	13.28	0.00	120	1a	-1.88	26.25	1.04
	13.28	0.00	240	1b	-0.13	2.03	-0.03
0.9D - 1.0Ev + 1.0Eh 120°	13.28	0.00	0	1	-0.07	7.14	-0.35
	13.28	0.00	120	1a	-2.01	28.12	1.16
	13.28	0.00	240	1b	0.27	7.14	0.24
0.9D - 1.0Ev + 1.0Eh 180°	13.28	0.00	0	1	0.00	0.15	0.30
	13.28	0.00	120	1a	-1.41	21.13	0.90
	13.28	0.00	240	1b	1.41	21.13	0.90
0.9D - 1.0Ev + 1.0Eh 210°	13.28	0.00	0	1	0.04	2.03	0.13
	13.28	0.00	120	1a	-0.83	14.14	0.58
	13.28	0.00	240	1b	1.84	26.25	1.11
0.9D - 1.0Ev + 1.0Eh 240°	13.28	0.00	0	1	0.07	7.14	-0.35
	13.28	0.00	120	1a	-0.27	7.14	0.24
	13.28	0.00	240	1b	2.01	28.12	1.16
0.9D - 1.0Ev + 1.0Eh 300°	13.28	0.00	0	1	0.07	21.13	-1.67
	13.28	0.00	120	1a	0.26	0.15	-0.15
	13.28	0.00	240	1b	1.48	21.13	0.77
0.9D - 1.0Ev + 1.0Eh 330°	13.28	0.00	0	1	0.04	26.25	-2.15
	13.28	0.00	120	1a	0.09	2.03	-0.10
	13.28	0.00	240	1b	0.92	14.14	0.43
1.0D + 1.0W Service Normal	13.28	0.00	0	1	0.00	101.30	-10.55

DETAILED REACTIONS

*(-) Uplift and (+) Down

Load Case	Radius (ft)	Elevation (ft)	Azimuth (deg)	Node	*Fx (kip)	*Fy (kip)	*Fz (kip)
	13.28	0.00	120	1a	2.55	-24.67	-2.58
	13.28	0.00	240	1b	-2.55	-24.67	-2.58
1.0D + 1.0W Service 60°	13.28	0.00	0	1	-0.91	58.06	-5.70
	13.28	0.00	120	1a	-5.39	58.04	2.06
	13.28	0.00	240	1b	-6.79	-64.14	-3.92
1.0D + 1.0W Service 90°	13.28	0.00	0	1	-1.06	17.32	-1.18
	13.28	0.00	120	1a	-8.12	88.43	4.08
	13.28	0.00	240	1b	-6.08	-53.78	-2.89
1.0D + 1.0W Service 120°	13.28	0.00	0	1	-0.96	-24.72	3.50
	13.28	0.00	120	1a	-9.14	101.39	5.28
	13.28	0.00	240	1b	-3.51	-24.70	-0.92
1.0D + 1.0W Service 180°	13.28	0.00	0	1	0.00	-64.06	7.84
	13.28	0.00	120	1a	-4.48	58.01	3.63
	13.28	0.00	240	1b	4.48	58.01	3.63
1.0D + 1.0W Service 210°	13.28	0.00	0	1	0.53	-53.79	6.71
	13.28	0.00	120	1a	-0.49	17.33	1.51
	13.28	0.00	240	1b	7.59	88.43	4.99
1.0D + 1.0W Service 240°	13.28	0.00	0	1	0.96	-24.72	3.50
	13.28	0.00	120	1a	3.51	-24.70	-0.92
	13.28	0.00	240	1b	9.14	101.39	5.28
1.0D + 1.0W Service 300°	13.28	0.00	0	1	0.91	58.06	-5.70
	13.28	0.00	120	1a	6.79	-64.14	-3.92
	13.28	0.00	240	1b	5.39	58.04	2.06
1.0D + 1.0W Service 330°	13.28	0.00	0	1	0.53	88.44	-9.07
	13.28	0.00	120	1a	5.54	-53.79	-3.82
	13.28	0.00	240	1b	1.56	17.31	-0.33

Max Uplift:	287.05 (kip)	Moment Ice:	1786.79 (kip-ft)	Moment:	6230.55 (kip-ft)
Max Down:	333.59 (kip)	Total Down Ice:	130.7 (kip)	Total Down:	62.36 (kip)
Max Shear:	35.97 (kip)	Total Shear Ice:	17.05 (kip)	Total Shear:	58.06(kip)

1.2D + 1.0W Normal

DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
1.2D + 1.0W Normal 116 mph wind with no ice	20.00	0.0251	0.0077	0.1218	0.122
1.2D + 1.0W Normal 116 mph wind with no ice	30.00	0.0505	0.0104	0.1674	0.1674
1.2D + 1.0W Normal 116 mph wind with no ice	80.00	0.2995	0.0293	0.4120	0.413
1.2D + 1.0W Normal 116 mph wind with no ice	86.67	0.35	0.0331	0.4549	0.4561
1.2D + 1.0W Normal 116 mph wind with no ice	93.33	0.4054	0.0368	0.4923	0.4937
1.2D + 1.0W Normal 116 mph wind with no ice	100.00	0.465	0.0404	0.5291	0.5306
1.2D + 1.0W Normal 116 mph wind with no ice	113.33	0.5967	0.0474	0.5979	0.5987
1.2D + 1.0W Normal 116 mph wind with no ice	120.00	0.6685	0.0508	0.6314	0.6314
1.2D + 1.0W Normal 116 mph wind with no ice	126.67	0.7445	0.0559	0.6600	0.6601
1.2D + 1.0W Normal 116 mph wind with no ice	133.33	0.8245	0.0550	0.6953	0.6975
1.2D + 1.0W Normal 116 mph wind with no ice	140.00	0.9078	0.0541	0.7894	0.7894
1.2D + 1.0W Normal 116 mph wind with no ice	140.25	0.9114	0.0538	0.8003	0.8003
1.2D + 1.0W Normal 116 mph wind with no ice	145.19	0.9772	0.0468	0.7708	0.7722
1.2D + 1.0W Normal 116 mph wind with no ice	150.13	1.0458	0.0404	0.8254	0.8254
1.2D + 1.0W Normal 116 mph wind with no ice	160.25	1.196	0.0290	0.9880	0.988
1.2D + 1.0W Normal 116 mph wind with no ice	172.10	1.3851	0.0275	0.9617	0.9617
1.2D + 1.0W Normal 116 mph wind with no ice	180.00	1.513	0.0269	1.0495	1.0498
1.2D + 1.0W 60° 116 mph wind with no ice	20.00	0.0241	0.0054	0.1177	0.1177
1.2D + 1.0W 60° 116 mph wind with no ice	30.00	0.0485	0.0070	0.1618	0.1618
1.2D + 1.0W 60° 116 mph wind with no ice	80.00	0.2908	0.0162	0.4016	0.4016
1.2D + 1.0W 60° 116 mph wind with no ice	86.67	0.3401	0.0173	0.4445	0.4446
1.2D + 1.0W 60° 116 mph wind with no ice	93.33	0.394	0.0182	0.4814	0.4815
1.2D + 1.0W 60° 116 mph wind with no ice	100.00	0.4521	-0.0203	0.5176	0.5178
1.2D + 1.0W 60° 116 mph wind with no ice	113.33	0.5805	-0.0257	0.5855	0.5858
1.2D + 1.0W 60° 116 mph wind with no ice	120.00	0.6505	-0.0286	0.6119	0.6123
1.2D + 1.0W 60° 116 mph wind with no ice	126.67	0.7246	-0.0332	0.6679	0.6687
1.2D + 1.0W 60° 116 mph wind with no ice	133.33	0.8027	0.0371	0.6770	0.678
1.2D + 1.0W 60° 116 mph wind with no ice	140.00	0.884	0.0391	0.7712	0.7718
1.2D + 1.0W 60° 116 mph wind with no ice	140.25	0.8875	0.0395	0.7811	0.7817
1.2D + 1.0W 60° 116 mph wind with no ice	145.19	0.9515	0.0522	0.7554	0.7572
1.2D + 1.0W 60° 116 mph wind with no ice	150.13	1.0184	0.0631	0.8040	0.8048
1.2D + 1.0W 60° 116 mph wind with no ice	160.25	1.1646	0.0840	0.9612	0.9612
1.2D + 1.0W 60° 116 mph wind with no ice	172.10	1.3482	0.1105	0.8836	0.8905
1.2D + 1.0W 60° 116 mph wind with no ice	180.00	1.4725	0.1211	0.8688	0.8712
1.2D + 1.0W 90° 116 mph wind with no ice	20.00	0.024	-0.0031	0.1220	0.122
1.2D + 1.0W 90° 116 mph wind with no ice	30.00	0.0486	-0.0034	0.1628	0.1628
1.2D + 1.0W 90° 116 mph wind with no ice	80.00	0.2925	0.0006	0.4077	0.4077
1.2D + 1.0W 90° 116 mph wind with no ice	86.67	0.3422	0.0036	0.4479	0.448
1.2D + 1.0W 90° 116 mph wind with no ice	93.33	0.3964	0.0068	0.4854	0.4855
1.2D + 1.0W 90° 116 mph wind with no ice	100.00	0.455	0.0100	0.5215	0.5216
1.2D + 1.0W 90° 116 mph wind with no ice	113.33	0.5842	0.0168	0.5898	0.59
1.2D + 1.0W 90° 116 mph wind with no ice	120.00	0.6545	0.0208	0.6145	0.6146
1.2D + 1.0W 90° 116 mph wind with no ice	126.67	0.7292	0.0286	0.6794	0.68
1.2D + 1.0W 90° 116 mph wind with no ice	133.33	0.8076	0.0322	0.6825	0.6833
1.2D + 1.0W 90° 116 mph wind with no ice	140.00	0.8896	0.0318	0.7692	0.7694
1.2D + 1.0W 90° 116 mph wind with no ice	140.25	0.8931	0.0321	0.7777	0.7779
1.2D + 1.0W 90° 116 mph wind with no ice	145.19	0.9573	0.0396	0.7643	0.7653
1.2D + 1.0W 90° 116 mph wind with no ice	150.13	1.0248	0.0455	0.8078	0.8081
1.2D + 1.0W 90° 116 mph wind with no ice	160.25	1.1718	0.0558	0.9546	0.9551
1.2D + 1.0W 90° 116 mph wind with no ice	172.10	1.3562	0.0534	0.8686	0.8697
1.2D + 1.0W 90° 116 mph wind with no ice	180.00	1.4809	0.0524	0.8133	0.815
1.2D + 1.0W 120° 116 mph wind with no ice	20.00	0.0251	0.0048	0.1220	0.1221
1.2D + 1.0W 120° 116 mph wind with no ice	30.00	0.0505	0.0061	0.1674	0.1675
1.2D + 1.0W 120° 116 mph wind with no ice	80.00	0.2995	-0.0170	0.4132	0.4133
1.2D + 1.0W 120° 116 mph wind with no ice	86.67	0.35	-0.0208	0.4564	0.4564
1.2D + 1.0W 120° 116 mph wind with no ice	93.33	0.4053	-0.0245	0.4942	0.4942
1.2D + 1.0W 120° 116 mph wind with no ice	100.00	0.4649	-0.0282	0.5311	0.5311
1.2D + 1.0W 120° 116 mph wind with no ice	113.33	0.5965	-0.0357	0.6002	0.6003
1.2D + 1.0W 120° 116 mph wind with no ice	120.00	0.6684	-0.0396	0.6277	0.6289
1.2D + 1.0W 120° 116 mph wind with no ice	126.67	0.7443	-0.0468	0.6838	0.684
1.2D + 1.0W 120° 116 mph wind with no ice	133.33	0.8244	-0.0500	0.6934	0.6936
1.2D + 1.0W 120° 116 mph wind with no ice	140.00	0.9076	-0.0521	0.7906	0.7924
1.2D + 1.0W 120° 116 mph wind with no ice	140.25	0.9112	-0.0524	0.8012	0.8029
1.2D + 1.0W 120° 116 mph wind with no ice	145.19	0.9768	-0.0579	0.7727	0.7728

DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
1.2D + 1.0W 120° 116 mph wind with no ice	150.13	1.0454	-0.0633	0.8240	0.8264
1.2D + 1.0W 120° 116 mph wind with no ice	160.25	1.1952	-0.0748	0.9857	0.9885
1.2D + 1.0W 120° 116 mph wind with no ice	172.10	1.3834	-0.1014	0.9043	0.91
1.2D + 1.0W 120° 116 mph wind with no ice	180.00	1.5105	-0.1120	0.8895	0.894
1.2D + 1.0W 180° 116 mph wind with no ice	20.00	0.0241	0.0074	0.1174	0.1177
1.2D + 1.0W 180° 116 mph wind with no ice	30.00	0.0485	0.0100	0.1618	0.1618
1.2D + 1.0W 180° 116 mph wind with no ice	80.00	0.2909	0.0285	0.4000	0.401
1.2D + 1.0W 180° 116 mph wind with no ice	86.67	0.3401	0.0323	0.4427	0.4439
1.2D + 1.0W 180° 116 mph wind with no ice	93.33	0.3941	0.0359	0.4792	0.4805
1.2D + 1.0W 180° 116 mph wind with no ice	100.00	0.4522	0.0395	0.5158	0.5168
1.2D + 1.0W 180° 116 mph wind with no ice	113.33	0.5807	0.0464	0.5833	0.5834
1.2D + 1.0W 180° 116 mph wind with no ice	120.00	0.6507	0.0497	0.6152	0.6152
1.2D + 1.0W 180° 116 mph wind with no ice	126.67	0.7247	0.0548	0.6439	0.6439
1.2D + 1.0W 180° 116 mph wind with no ice	133.33	0.8029	0.0535	0.6780	0.6801
1.2D + 1.0W 180° 116 mph wind with no ice	140.00	0.8843	0.0531	0.7699	0.7699
1.2D + 1.0W 180° 116 mph wind with no ice	140.25	0.8877	0.0529	0.7802	0.7802
1.2D + 1.0W 180° 116 mph wind with no ice	145.19	0.9519	0.0449	0.7517	0.7531
1.2D + 1.0W 180° 116 mph wind with no ice	150.13	1.0188	0.0387	0.8054	0.8054
1.2D + 1.0W 180° 116 mph wind with no ice	160.25	1.1655	0.0277	0.9635	0.9635
1.2D + 1.0W 180° 116 mph wind with no ice	172.10	1.3498	0.0249	0.9410	0.941
1.2D + 1.0W 180° 116 mph wind with no ice	180.00	1.475	0.0237	1.0288	1.0291
1.2D + 1.0W 210° 116 mph wind with no ice	20.00	0.024	-0.0069	0.1218	0.122
1.2D + 1.0W 210° 116 mph wind with no ice	30.00	0.0486	-0.0090	0.1626	0.1628
1.2D + 1.0W 210° 116 mph wind with no ice	80.00	0.2925	0.0273	0.4064	0.407
1.2D + 1.0W 210° 116 mph wind with no ice	86.67	0.3423	0.0319	0.4465	0.4471
1.2D + 1.0W 210° 116 mph wind with no ice	93.33	0.3965	0.0363	0.4836	0.4843
1.2D + 1.0W 210° 116 mph wind with no ice	100.00	0.455	0.0408	0.5196	0.5203
1.2D + 1.0W 210° 116 mph wind with no ice	113.33	0.5844	0.0495	0.5875	0.5878
1.2D + 1.0W 210° 116 mph wind with no ice	120.00	0.6546	0.0538	0.6175	0.619
1.2D + 1.0W 210° 116 mph wind with no ice	126.67	0.7294	0.0614	0.6557	0.6558
1.2D + 1.0W 210° 116 mph wind with no ice	133.33	0.8078	0.0634	0.6846	0.6852
1.2D + 1.0W 210° 116 mph wind with no ice	140.00	0.8899	0.0655	0.7673	0.7685
1.2D + 1.0W 210° 116 mph wind with no ice	140.25	0.8933	0.0657	0.7758	0.7772
1.2D + 1.0W 210° 116 mph wind with no ice	145.19	0.9576	0.0665	0.7626	0.7627
1.2D + 1.0W 210° 116 mph wind with no ice	150.13	1.0252	0.0685	0.8078	0.8095
1.2D + 1.0W 210° 116 mph wind with no ice	160.25	1.1726	0.0740	0.9554	0.9583
1.2D + 1.0W 210° 116 mph wind with no ice	172.10	1.358	0.0993	0.9273	0.9326
1.2D + 1.0W 210° 116 mph wind with no ice	180.00	1.4834	0.1094	0.9891	0.9915
1.2D + 1.0W 240° 116 mph wind with no ice	20.00	0.0251	-0.0048	0.1220	0.1221
1.2D + 1.0W 240° 116 mph wind with no ice	30.00	0.0505	-0.0061	0.1674	0.1675
1.2D + 1.0W 240° 116 mph wind with no ice	80.00	0.2995	0.0170	0.4132	0.4133
1.2D + 1.0W 240° 116 mph wind with no ice	86.67	0.35	0.0208	0.4564	0.4564
1.2D + 1.0W 240° 116 mph wind with no ice	93.33	0.4053	0.0245	0.4942	0.4942
1.2D + 1.0W 240° 116 mph wind with no ice	100.00	0.4649	0.0282	0.5311	0.5311
1.2D + 1.0W 240° 116 mph wind with no ice	113.33	0.5965	0.0357	0.6002	0.6003
1.2D + 1.0W 240° 116 mph wind with no ice	120.00	0.6684	0.0396	0.6277	0.6289
1.2D + 1.0W 240° 116 mph wind with no ice	126.67	0.7443	0.0468	0.6838	0.684
1.2D + 1.0W 240° 116 mph wind with no ice	133.33	0.8244	0.0500	0.6934	0.6936
1.2D + 1.0W 240° 116 mph wind with no ice	140.00	0.9076	0.0521	0.7906	0.7924
1.2D + 1.0W 240° 116 mph wind with no ice	140.25	0.9112	0.0524	0.8012	0.8029
1.2D + 1.0W 240° 116 mph wind with no ice	145.19	0.9768	0.0579	0.7727	0.7728
1.2D + 1.0W 240° 116 mph wind with no ice	150.13	1.0454	0.0633	0.8240	0.8264
1.2D + 1.0W 240° 116 mph wind with no ice	160.25	1.1952	0.0748	0.9857	0.9885
1.2D + 1.0W 240° 116 mph wind with no ice	172.10	1.3834	0.1014	0.9043	0.91
1.2D + 1.0W 240° 116 mph wind with no ice	180.00	1.5105	0.1120	0.8895	0.894
1.2D + 1.0W 300° 116 mph wind with no ice	20.00	0.0241	-0.0054	0.1177	0.1177
1.2D + 1.0W 300° 116 mph wind with no ice	30.00	0.0485	-0.0070	0.1618	0.1618
1.2D + 1.0W 300° 116 mph wind with no ice	80.00	0.2908	-0.0162	0.4016	0.4016
1.2D + 1.0W 300° 116 mph wind with no ice	86.67	0.3401	-0.0173	0.4445	0.4446
1.2D + 1.0W 300° 116 mph wind with no ice	93.33	0.394	-0.0182	0.4814	0.4815
1.2D + 1.0W 300° 116 mph wind with no ice	100.00	0.4521	0.0203	0.5176	0.5178
1.2D + 1.0W 300° 116 mph wind with no ice	113.33	0.5805	0.0257	0.5855	0.5858
1.2D + 1.0W 300° 116 mph wind with no ice	120.00	0.6505	0.0286	0.6119	0.6123
1.2D + 1.0W 300° 116 mph wind with no ice	126.67	0.7246	0.0332	0.6679	0.6687
1.2D + 1.0W 300° 116 mph wind with no ice	133.33	0.8027	-0.0371	0.6770	0.678
1.2D + 1.0W 300° 116 mph wind with no ice	140.00	0.884	-0.0391	0.7712	0.7718
1.2D + 1.0W 300° 116 mph wind with no ice	140.25	0.8875	-0.0395	0.7811	0.7817
1.2D + 1.0W 300° 116 mph wind with no ice	145.19	0.9515	-0.0522	0.7554	0.7572

DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
1.2D + 1.0W 300° 116 mph wind with no ice	150.13	1.0184	-0.0631	0.8040	0.8048
1.2D + 1.0W 300° 116 mph wind with no ice	160.25	1.1646	-0.0840	0.9612	0.9612
1.2D + 1.0W 300° 116 mph wind with no ice	172.10	1.3482	-0.1105	0.8836	0.8905
1.2D + 1.0W 300° 116 mph wind with no ice	180.00	1.4725	-0.1211	0.8688	0.8712
1.2D + 1.0W 330° 116 mph wind with no ice	20.00	0.024	-0.0077	0.1218	0.122
1.2D + 1.0W 330° 116 mph wind with no ice	30.00	0.0486	-0.0102	0.1628	0.1628
1.2D + 1.0W 330° 116 mph wind with no ice	80.00	0.2925	-0.0272	0.4061	0.407
1.2D + 1.0W 330° 116 mph wind with no ice	86.67	0.3423	-0.0303	0.4462	0.4471
1.2D + 1.0W 330° 116 mph wind with no ice	93.33	0.3965	-0.0331	0.4832	0.4843
1.2D + 1.0W 330° 116 mph wind with no ice	100.00	0.455	-0.0360	0.5196	0.5203
1.2D + 1.0W 330° 116 mph wind with no ice	113.33	0.5844	-0.0414	0.5874	0.5877
1.2D + 1.0W 330° 116 mph wind with no ice	120.00	0.6546	-0.0438	0.6184	0.6186
1.2D + 1.0W 330° 116 mph wind with no ice	126.67	0.7293	0.0483	0.6558	0.6562
1.2D + 1.0W 330° 116 mph wind with no ice	133.33	0.8078	-0.0479	0.6834	0.6851
1.2D + 1.0W 330° 116 mph wind with no ice	140.00	0.8899	-0.0500	0.7683	0.7687
1.2D + 1.0W 330° 116 mph wind with no ice	140.25	0.8933	-0.0500	0.7771	0.7776
1.2D + 1.0W 330° 116 mph wind with no ice	145.19	0.9576	-0.0476	0.7604	0.7619
1.2D + 1.0W 330° 116 mph wind with no ice	150.13	1.0252	-0.0467	0.8098	0.8112
1.2D + 1.0W 330° 116 mph wind with no ice	160.25	1.1726	-0.0633	0.9576	0.9597
1.2D + 1.0W 330° 116 mph wind with no ice	172.10	1.358	-0.0908	0.9275	0.932
1.2D + 1.0W 330° 116 mph wind with no ice	180.00	1.4835	-0.1018	0.9889	0.9926
0.9D + 1.0W Normal 116 mph wind with no ice	20.00	0.0251	0.0077	0.1216	0.1218
0.9D + 1.0W Normal 116 mph wind with no ice	30.00	0.0504	0.0104	0.1672	0.1672
0.9D + 1.0W Normal 116 mph wind with no ice	80.00	0.299	0.0292	0.4110	0.4121
0.9D + 1.0W Normal 116 mph wind with no ice	86.67	0.3494	0.0331	0.4540	0.4552
0.9D + 1.0W Normal 116 mph wind with no ice	93.33	0.4047	0.0368	0.4912	0.4926
0.9D + 1.0W Normal 116 mph wind with no ice	100.00	0.4641	0.0404	0.5281	0.5295
0.9D + 1.0W Normal 116 mph wind with no ice	113.33	0.5956	0.0474	0.5966	0.5973
0.9D + 1.0W Normal 116 mph wind with no ice	120.00	0.6672	0.0508	0.6299	0.6299
0.9D + 1.0W Normal 116 mph wind with no ice	126.67	0.743	0.0559	0.6585	0.6585
0.9D + 1.0W Normal 116 mph wind with no ice	133.33	0.8229	0.0550	0.6936	0.6958
0.9D + 1.0W Normal 116 mph wind with no ice	140.00	0.906	0.0541	0.7875	0.7875
0.9D + 1.0W Normal 116 mph wind with no ice	140.25	0.9096	0.0538	0.7983	0.7983
0.9D + 1.0W Normal 116 mph wind with no ice	145.19	0.9751	0.0468	0.7688	0.7702
0.9D + 1.0W Normal 116 mph wind with no ice	150.13	1.0436	0.0404	0.8232	0.8232
0.9D + 1.0W Normal 116 mph wind with no ice	160.25	1.1935	0.0291	0.9852	0.9852
0.9D + 1.0W Normal 116 mph wind with no ice	172.10	1.3821	0.0276	0.9592	0.9592
0.9D + 1.0W Normal 116 mph wind with no ice	180.00	1.5096	0.0270	1.0469	1.0472
0.9D + 1.0W 60° 116 mph wind with no ice	20.00	0.0241	0.0054	0.1176	0.1176
0.9D + 1.0W 60° 116 mph wind with no ice	30.00	0.0485	0.0070	0.1616	0.1616
0.9D + 1.0W 60° 116 mph wind with no ice	80.00	0.2904	0.0162	0.4009	0.4009
0.9D + 1.0W 60° 116 mph wind with no ice	86.67	0.3396	0.0173	0.4437	0.4437
0.9D + 1.0W 60° 116 mph wind with no ice	93.33	0.3934	0.0182	0.4804	0.4805
0.9D + 1.0W 60° 116 mph wind with no ice	100.00	0.4513	-0.0203	0.5166	0.5167
0.9D + 1.0W 60° 116 mph wind with no ice	113.33	0.5795	-0.0257	0.5842	0.5845
0.9D + 1.0W 60° 116 mph wind with no ice	120.00	0.6493	-0.0286	0.6105	0.6109
0.9D + 1.0W 60° 116 mph wind with no ice	126.67	0.7232	-0.0333	0.6664	0.6672
0.9D + 1.0W 60° 116 mph wind with no ice	133.33	0.8012	0.0371	0.6754	0.6764
0.9D + 1.0W 60° 116 mph wind with no ice	140.00	0.8823	0.0390	0.7692	0.7698
0.9D + 1.0W 60° 116 mph wind with no ice	140.25	0.8858	0.0395	0.7791	0.7797
0.9D + 1.0W 60° 116 mph wind with no ice	145.19	0.9496	0.0521	0.7537	0.7555
0.9D + 1.0W 60° 116 mph wind with no ice	150.13	1.0163	0.0630	0.8020	0.8028
0.9D + 1.0W 60° 116 mph wind with no ice	160.25	1.1622	0.0839	0.9587	0.9587
0.9D + 1.0W 60° 116 mph wind with no ice	172.10	1.3453	0.1103	0.8812	0.888
0.9D + 1.0W 60° 116 mph wind with no ice	180.00	1.4693	0.1208	0.8664	0.8688
0.9D + 1.0W 90° 116 mph wind with no ice	20.00	0.0239	-0.0031	0.1219	0.1219
0.9D + 1.0W 90° 116 mph wind with no ice	30.00	0.0485	-0.0034	0.1625	0.1625
0.9D + 1.0W 90° 116 mph wind with no ice	80.00	0.2921	0.0006	0.4069	0.4069
0.9D + 1.0W 90° 116 mph wind with no ice	86.67	0.3417	0.0036	0.4471	0.4471
0.9D + 1.0W 90° 116 mph wind with no ice	93.33	0.3957	0.0068	0.4844	0.4845
0.9D + 1.0W 90° 116 mph wind with no ice	100.00	0.4542	0.0101	0.5204	0.5205
0.9D + 1.0W 90° 116 mph wind with no ice	113.33	0.5832	0.0168	0.5885	0.5887
0.9D + 1.0W 90° 116 mph wind with no ice	120.00	0.6533	0.0208	0.6130	0.6131
0.9D + 1.0W 90° 116 mph wind with no ice	126.67	0.7278	0.0286	0.6779	0.6785
0.9D + 1.0W 90° 116 mph wind with no ice	133.33	0.8061	0.0322	0.6809	0.6817
0.9D + 1.0W 90° 116 mph wind with no ice	140.00	0.8879	0.0318	0.7674	0.7676
0.9D + 1.0W 90° 116 mph wind with no ice	140.25	0.8913	0.0321	0.7758	0.776
0.9D + 1.0W 90° 116 mph wind with no ice	145.19	0.9554	0.0395	0.7624	0.7634

DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
0.9D + 1.0W 90° 116 mph wind with no ice	150.13	1.0227	0.0455	0.8057	0.806
0.9D + 1.0W 90° 116 mph wind with no ice	160.25	1.1693	0.0557	0.9519	0.9523
0.9D + 1.0W 90° 116 mph wind with no ice	172.10	1.3533	0.0533	0.8661	0.8673
0.9D + 1.0W 90° 116 mph wind with no ice	180.00	1.4776	0.0523	0.8108	0.8125
0.9D + 1.0W 120° 116 mph wind with no ice	20.00	0.0251	0.0048	0.1218	0.1218
0.9D + 1.0W 120° 116 mph wind with no ice	30.00	0.0504	0.0061	0.1671	0.1672
0.9D + 1.0W 120° 116 mph wind with no ice	80.00	0.299	-0.0170	0.4123	0.4123
0.9D + 1.0W 120° 116 mph wind with no ice	86.67	0.3494	-0.0207	0.4555	0.4555
0.9D + 1.0W 120° 116 mph wind with no ice	93.33	0.4046	-0.0245	0.4931	0.4931
0.9D + 1.0W 120° 116 mph wind with no ice	100.00	0.4641	-0.0282	0.5299	0.5299
0.9D + 1.0W 120° 116 mph wind with no ice	113.33	0.5954	-0.0357	0.5989	0.599
0.9D + 1.0W 120° 116 mph wind with no ice	120.00	0.6671	-0.0396	0.6262	0.6274
0.9D + 1.0W 120° 116 mph wind with no ice	126.67	0.7429	-0.0468	0.6822	0.6824
0.9D + 1.0W 120° 116 mph wind with no ice	133.33	0.8227	-0.0500	0.6917	0.692
0.9D + 1.0W 120° 116 mph wind with no ice	140.00	0.9058	-0.0521	0.7888	0.7905
0.9D + 1.0W 120° 116 mph wind with no ice	140.25	0.9093	-0.0524	0.7993	0.801
0.9D + 1.0W 120° 116 mph wind with no ice	145.19	0.9748	-0.0579	0.7707	0.7708
0.9D + 1.0W 120° 116 mph wind with no ice	150.13	1.0432	-0.0633	0.8218	0.8242
0.9D + 1.0W 120° 116 mph wind with no ice	160.25	1.1927	-0.0747	0.9828	0.9856
0.9D + 1.0W 120° 116 mph wind with no ice	172.10	1.3804	-0.1012	0.9018	0.9074
0.9D + 1.0W 120° 116 mph wind with no ice	180.00	1.5071	-0.1118	0.8870	0.8914
0.9D + 1.0W 180° 116 mph wind with no ice	20.00	0.0241	0.0074	0.1174	0.1176
0.9D + 1.0W 180° 116 mph wind with no ice	30.00	0.0485	0.0100	0.1616	0.1616
0.9D + 1.0W 180° 116 mph wind with no ice	80.00	0.2905	0.0285	0.3994	0.4004
0.9D + 1.0W 180° 116 mph wind with no ice	86.67	0.3396	0.0323	0.4419	0.443
0.9D + 1.0W 180° 116 mph wind with no ice	93.33	0.3934	0.0359	0.4782	0.4795
0.9D + 1.0W 180° 116 mph wind with no ice	100.00	0.4514	0.0395	0.5146	0.5157
0.9D + 1.0W 180° 116 mph wind with no ice	113.33	0.5796	0.0464	0.5820	0.5821
0.9D + 1.0W 180° 116 mph wind with no ice	120.00	0.6495	0.0497	0.6139	0.6139
0.9D + 1.0W 180° 116 mph wind with no ice	126.67	0.7234	0.0548	0.6423	0.6423
0.9D + 1.0W 180° 116 mph wind with no ice	133.33	0.8014	0.0535	0.6764	0.6785
0.9D + 1.0W 180° 116 mph wind with no ice	140.00	0.8825	0.0531	0.7679	0.7679
0.9D + 1.0W 180° 116 mph wind with no ice	140.25	0.886	0.0529	0.7782	0.7782
0.9D + 1.0W 180° 116 mph wind with no ice	145.19	0.95	0.0450	0.7500	0.7513
0.9D + 1.0W 180° 116 mph wind with no ice	150.13	1.0167	0.0388	0.8034	0.8034
0.9D + 1.0W 180° 116 mph wind with no ice	160.25	1.163	0.0278	0.9610	0.961
0.9D + 1.0W 180° 116 mph wind with no ice	172.10	1.3469	0.0249	0.9386	0.9386
0.9D + 1.0W 180° 116 mph wind with no ice	180.00	1.4717	0.0238	1.0264	1.0267
0.9D + 1.0W 210° 116 mph wind with no ice	20.00	0.0239	-0.0069	0.1217	0.1219
0.9D + 1.0W 210° 116 mph wind with no ice	30.00	0.0485	-0.0090	0.1623	0.1625
0.9D + 1.0W 210° 116 mph wind with no ice	80.00	0.2921	0.0273	0.4056	0.4062
0.9D + 1.0W 210° 116 mph wind with no ice	86.67	0.3417	0.0318	0.4456	0.4462
0.9D + 1.0W 210° 116 mph wind with no ice	93.33	0.3958	0.0363	0.4826	0.4833
0.9D + 1.0W 210° 116 mph wind with no ice	100.00	0.4543	0.0407	0.5185	0.5192
0.9D + 1.0W 210° 116 mph wind with no ice	113.33	0.5833	0.0494	0.5862	0.5865
0.9D + 1.0W 210° 116 mph wind with no ice	120.00	0.6534	0.0538	0.6162	0.6175
0.9D + 1.0W 210° 116 mph wind with no ice	126.67	0.728	0.0614	0.6541	0.6543
0.9D + 1.0W 210° 116 mph wind with no ice	133.33	0.8063	0.0634	0.6829	0.6836
0.9D + 1.0W 210° 116 mph wind with no ice	140.00	0.8881	0.0655	0.7653	0.7667
0.9D + 1.0W 210° 116 mph wind with no ice	140.25	0.8916	0.0657	0.7738	0.7753
0.9D + 1.0W 210° 116 mph wind with no ice	145.19	0.9557	0.0665	0.7607	0.7608
0.9D + 1.0W 210° 116 mph wind with no ice	150.13	1.0231	0.0685	0.8058	0.8074
0.9D + 1.0W 210° 116 mph wind with no ice	160.25	1.1701	0.0739	0.9527	0.9555
0.9D + 1.0W 210° 116 mph wind with no ice	172.10	1.355	0.0992	0.9248	0.9301
0.9D + 1.0W 210° 116 mph wind with no ice	180.00	1.4801	0.1092	0.9866	0.989
0.9D + 1.0W 240° 116 mph wind with no ice	20.00	0.0251	-0.0048	0.1218	0.1218
0.9D + 1.0W 240° 116 mph wind with no ice	30.00	0.0504	-0.0061	0.1671	0.1672
0.9D + 1.0W 240° 116 mph wind with no ice	80.00	0.299	0.0170	0.4123	0.4123
0.9D + 1.0W 240° 116 mph wind with no ice	86.67	0.3494	0.0207	0.4555	0.4555
0.9D + 1.0W 240° 116 mph wind with no ice	93.33	0.4046	0.0245	0.4931	0.4931
0.9D + 1.0W 240° 116 mph wind with no ice	100.00	0.4641	0.0282	0.5299	0.5299
0.9D + 1.0W 240° 116 mph wind with no ice	113.33	0.5954	0.0357	0.5989	0.599
0.9D + 1.0W 240° 116 mph wind with no ice	120.00	0.6671	0.0396	0.6262	0.6274
0.9D + 1.0W 240° 116 mph wind with no ice	126.67	0.7429	0.0468	0.6822	0.6824
0.9D + 1.0W 240° 116 mph wind with no ice	133.33	0.8227	0.0500	0.6917	0.692
0.9D + 1.0W 240° 116 mph wind with no ice	140.00	0.9058	0.0521	0.7888	0.7905
0.9D + 1.0W 240° 116 mph wind with no ice	140.25	0.9093	0.0524	0.7993	0.801
0.9D + 1.0W 240° 116 mph wind with no ice	145.19	0.9748	0.0579	0.7707	0.7708

DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
0.9D + 1.0W 240° 116 mph wind with no ice	150.13	1.0432	0.0633	0.8218	0.8242
0.9D + 1.0W 240° 116 mph wind with no ice	160.25	1.1927	0.0747	0.9828	0.9856
0.9D + 1.0W 240° 116 mph wind with no ice	172.10	1.3804	0.1012	0.9018	0.9074
0.9D + 1.0W 240° 116 mph wind with no ice	180.00	1.5071	0.1118	0.8870	0.8914
0.9D + 1.0W 300° 116 mph wind with no ice	20.00	0.0241	-0.0054	0.1176	0.1176
0.9D + 1.0W 300° 116 mph wind with no ice	30.00	0.0485	-0.0070	0.1616	0.1616
0.9D + 1.0W 300° 116 mph wind with no ice	80.00	0.2904	-0.0162	0.4009	0.4009
0.9D + 1.0W 300° 116 mph wind with no ice	86.67	0.3396	-0.0173	0.4437	0.4437
0.9D + 1.0W 300° 116 mph wind with no ice	93.33	0.3934	-0.0182	0.4804	0.4805
0.9D + 1.0W 300° 116 mph wind with no ice	100.00	0.4513	0.0203	0.5166	0.5167
0.9D + 1.0W 300° 116 mph wind with no ice	113.33	0.5795	0.0257	0.5842	0.5845
0.9D + 1.0W 300° 116 mph wind with no ice	120.00	0.6493	0.0286	0.6105	0.6109
0.9D + 1.0W 300° 116 mph wind with no ice	126.67	0.7232	0.0333	0.6664	0.6672
0.9D + 1.0W 300° 116 mph wind with no ice	133.33	0.8012	-0.0371	0.6754	0.6764
0.9D + 1.0W 300° 116 mph wind with no ice	140.00	0.8823	-0.0390	0.7692	0.7698
0.9D + 1.0W 300° 116 mph wind with no ice	140.25	0.8858	-0.0395	0.7791	0.7797
0.9D + 1.0W 300° 116 mph wind with no ice	145.19	0.9496	-0.0521	0.7537	0.7555
0.9D + 1.0W 300° 116 mph wind with no ice	150.13	1.0163	-0.0630	0.8020	0.8028
0.9D + 1.0W 300° 116 mph wind with no ice	160.25	1.1622	-0.0839	0.9587	0.9587
0.9D + 1.0W 300° 116 mph wind with no ice	172.10	1.3453	-0.1103	0.8812	0.888
0.9D + 1.0W 300° 116 mph wind with no ice	180.00	1.4693	-0.1208	0.8664	0.8688
0.9D + 1.0W 330° 116 mph wind with no ice	20.00	0.0239	-0.0077	0.1216	0.1219
0.9D + 1.0W 330° 116 mph wind with no ice	30.00	0.0485	-0.0102	0.1625	0.1625
0.9D + 1.0W 330° 116 mph wind with no ice	80.00	0.2921	-0.0271	0.4053	0.4062
0.9D + 1.0W 330° 116 mph wind with no ice	86.67	0.3417	-0.0302	0.4454	0.4463
0.9D + 1.0W 330° 116 mph wind with no ice	93.33	0.3958	-0.0331	0.4822	0.4833
0.9D + 1.0W 330° 116 mph wind with no ice	100.00	0.4543	-0.0360	0.5185	0.5192
0.9D + 1.0W 330° 116 mph wind with no ice	113.33	0.5833	-0.0413	0.5862	0.5864
0.9D + 1.0W 330° 116 mph wind with no ice	120.00	0.6534	-0.0437	0.6169	0.6171
0.9D + 1.0W 330° 116 mph wind with no ice	126.67	0.728	0.0483	0.6543	0.6547
0.9D + 1.0W 330° 116 mph wind with no ice	133.33	0.8062	-0.0479	0.6818	0.6835
0.9D + 1.0W 330° 116 mph wind with no ice	140.00	0.8881	-0.0500	0.7664	0.7669
0.9D + 1.0W 330° 116 mph wind with no ice	140.25	0.8916	-0.0500	0.7752	0.7757
0.9D + 1.0W 330° 116 mph wind with no ice	145.19	0.9557	-0.0476	0.7585	0.76
0.9D + 1.0W 330° 116 mph wind with no ice	150.13	1.0231	-0.0467	0.8077	0.809
0.9D + 1.0W 330° 116 mph wind with no ice	160.25	1.1701	-0.0632	0.9549	0.957
0.9D + 1.0W 330° 116 mph wind with no ice	172.10	1.355	-0.0906	0.9251	0.9295
0.9D + 1.0W 330° 116 mph wind with no ice	180.00	1.4802	-0.1016	0.9864	0.9901
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	20.00	0.0074	0.0023	0.0380	0.038
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	30.00	0.0153	0.0031	0.0505	0.0506
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	80.00	0.0858	0.0087	0.1173	0.1176
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	86.67	0.1003	0.0098	0.1286	0.129
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	93.33	0.1157	0.0109	0.1386	0.1391
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	100.00	0.1326	0.0120	0.1487	0.1492
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	113.33	0.1694	0.0141	0.1670	0.1676
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	120.00	0.1892	0.0152	0.1769	0.1769
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	126.67	0.2105	0.0168	0.1828	0.1835
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	133.33	0.2326	0.0165	0.1938	0.1945
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	140.00	0.256	0.0162	0.2175	0.2175
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	140.25	0.2569	0.0161	0.2208	0.2208
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	145.19	0.2748	0.0140	0.2138	0.2143
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	150.13	0.2941	0.0122	0.2280	0.228
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	160.25	0.3354	0.0090	0.2717	0.2717
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	172.10	0.3872	0.0084	0.2619	0.2619
1.2D + 1.0Di + 1.0Wi Normal 50 mph wind with 1" radial ice	180.00	0.4223	0.0081	0.2831	0.2832
1.2D + 1.0Di + 1.0Wi 60° 50 mph wind with 1" radial ice	20.00	0.0081	0.0015	0.0376	0.0376
1.2D + 1.0Di + 1.0Wi 60° 50 mph wind with 1" radial ice	30.00	0.0165	0.0020	0.0528	0.0528
1.2D + 1.0Di + 1.0Wi 60° 50 mph wind with 1" radial ice	80.00	0.0854	-0.0045	0.1143	0.1143
1.2D + 1.0Di + 1.0Wi 60° 50 mph wind with 1" radial ice	86.67	0.0996	-0.0055	0.1270	0.1272
1.2D + 1.0Di + 1.0Wi 60° 50 mph wind with 1" radial ice	93.33	0.1147	-0.0064	0.1370	0.137
1.2D + 1.0Di + 1.0Wi 60° 50 mph wind with 1" radial ice	100.00	0.1313	-0.0074	0.1470	0.1472
1.2D + 1.0Di + 1.0Wi 60° 50 mph wind with 1" radial ice	113.33	0.1675	-0.0094	0.1655	0.1658
1.2D + 1.0Di + 1.0Wi 60° 50 mph wind with 1" radial ice	120.00	0.1871	-0.0104	0.1729	0.173
1.2D + 1.0Di + 1.0Wi 60° 50 mph wind with 1" radial ice	126.67	0.2079	-0.0122	0.1881	0.1885
1.2D + 1.0Di + 1.0Wi 60° 50 mph wind with 1" radial ice	133.33	0.2297	-0.0124	0.1901	0.1903
1.2D + 1.0Di + 1.0Wi 60° 50 mph wind with 1" radial ice	140.00	0.2526	-0.0121	0.2172	0.2175
1.2D + 1.0Di + 1.0Wi 60° 50 mph wind with 1" radial ice	140.25	0.2536	-0.0121	0.2194	0.2197
1.2D + 1.0Di + 1.0Wi 60° 50 mph wind with 1" radial ice	145.19	0.2713	-0.0116	0.2103	0.2106

DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
1.2D + 1.0Di + 1.0Wi 60° 50 mph wind with 1" radial ice	150.13	0.2901	0.0130	0.2240	0.2243
1.2D + 1.0Di + 1.0Wi 60° 50 mph wind with 1" radial ice	160.25	0.3308	0.0160	0.2653	0.2655
1.2D + 1.0Di + 1.0Wi 60° 50 mph wind with 1" radial ice	172.10	0.3816	0.0171	0.2459	0.2465
1.2D + 1.0Di + 1.0Wi 60° 50 mph wind with 1" radial ice	180.00	0.4161	0.0176	0.2416	0.2416
1.2D + 1.0Di + 1.0Wi 90° 50 mph wind with 1" radial ice	20.00	0.0079	-0.0009	0.0378	0.0378
1.2D + 1.0Di + 1.0Wi 90° 50 mph wind with 1" radial ice	30.00	0.0162	-0.0010	0.0522	0.0522
1.2D + 1.0Di + 1.0Wi 90° 50 mph wind with 1" radial ice	80.00	0.0854	0.0004	0.1165	0.1165
1.2D + 1.0Di + 1.0Wi 90° 50 mph wind with 1" radial ice	86.67	0.0997	0.0014	0.1276	0.1276
1.2D + 1.0Di + 1.0Wi 90° 50 mph wind with 1" radial ice	93.33	0.115	0.0024	0.1380	0.138
1.2D + 1.0Di + 1.0Wi 90° 50 mph wind with 1" radial ice	100.00	0.1316	0.0034	0.1478	0.1478
1.2D + 1.0Di + 1.0Wi 90° 50 mph wind with 1" radial ice	113.33	0.168	0.0055	0.1664	0.1665
1.2D + 1.0Di + 1.0Wi 90° 50 mph wind with 1" radial ice	120.00	0.1876	0.0068	0.1735	0.1735
1.2D + 1.0Di + 1.0Wi 90° 50 mph wind with 1" radial ice	126.67	0.2085	0.0092	0.1913	0.1915
1.2D + 1.0Di + 1.0Wi 90° 50 mph wind with 1" radial ice	133.33	0.2305	0.0102	0.1917	0.1919
1.2D + 1.0Di + 1.0Wi 90° 50 mph wind with 1" radial ice	140.00	0.2535	0.0101	0.2159	0.216
1.2D + 1.0Di + 1.0Wi 90° 50 mph wind with 1" radial ice	140.25	0.2544	0.0101	0.2177	0.2178
1.2D + 1.0Di + 1.0Wi 90° 50 mph wind with 1" radial ice	145.19	0.2721	0.0121	0.2132	0.2136
1.2D + 1.0Di + 1.0Wi 90° 50 mph wind with 1" radial ice	150.13	0.2911	0.0137	0.2251	0.2252
1.2D + 1.0Di + 1.0Wi 90° 50 mph wind with 1" radial ice	160.25	0.332	0.0165	0.2648	0.2649
1.2D + 1.0Di + 1.0Wi 90° 50 mph wind with 1" radial ice	172.10	0.3829	0.0158	0.2426	0.2428
1.2D + 1.0Di + 1.0Wi 90° 50 mph wind with 1" radial ice	180.00	0.4174	0.0155	0.2289	0.2294
1.2D + 1.0Di + 1.0Wi 120° 50 mph wind with 1" radial ice	20.00	0.0074	0.0015	0.0381	0.0381
1.2D + 1.0Di + 1.0Wi 120° 50 mph wind with 1" radial ice	30.00	0.0153	0.0020	0.0506	0.0506
1.2D + 1.0Di + 1.0Wi 120° 50 mph wind with 1" radial ice	80.00	0.0858	-0.0046	0.1178	0.1178
1.2D + 1.0Di + 1.0Wi 120° 50 mph wind with 1" radial ice	86.67	0.1003	-0.0056	0.1292	0.1292
1.2D + 1.0Di + 1.0Wi 120° 50 mph wind with 1" radial ice	93.33	0.1158	-0.0066	0.1394	0.1394
1.2D + 1.0Di + 1.0Wi 120° 50 mph wind with 1" radial ice	100.00	0.1326	-0.0076	0.1495	0.1496
1.2D + 1.0Di + 1.0Wi 120° 50 mph wind with 1" radial ice	113.33	0.1695	-0.0096	0.1683	0.1683
1.2D + 1.0Di + 1.0Wi 120° 50 mph wind with 1" radial ice	120.00	0.1893	-0.0106	0.1759	0.1762
1.2D + 1.0Di + 1.0Wi 120° 50 mph wind with 1" radial ice	126.67	0.2106	-0.0125	0.1912	0.1913
1.2D + 1.0Di + 1.0Wi 120° 50 mph wind with 1" radial ice	133.33	0.2327	-0.0129	0.1936	0.1937
1.2D + 1.0Di + 1.0Wi 120° 50 mph wind with 1" radial ice	140.00	0.2561	-0.0129	0.2181	0.2185
1.2D + 1.0Di + 1.0Wi 120° 50 mph wind with 1" radial ice	140.25	0.257	-0.0130	0.2214	0.2218
1.2D + 1.0Di + 1.0Wi 120° 50 mph wind with 1" radial ice	145.19	0.275	-0.0131	0.2149	0.2151
1.2D + 1.0Di + 1.0Wi 120° 50 mph wind with 1" radial ice	150.13	0.2942	-0.0133	0.2279	0.2283
1.2D + 1.0Di + 1.0Wi 120° 50 mph wind with 1" radial ice	160.25	0.3355	-0.0137	0.2714	0.2718
1.2D + 1.0Di + 1.0Wi 120° 50 mph wind with 1" radial ice	172.10	0.3871	-0.0148	0.2495	0.25
1.2D + 1.0Di + 1.0Wi 120° 50 mph wind with 1" radial ice	180.00	0.422	-0.0153	0.2455	0.2456
1.2D + 1.0Di + 1.0Wi 180° 50 mph wind with 1" radial ice	20.00	0.0081	0.0022	0.0375	0.0376
1.2D + 1.0Di + 1.0Wi 180° 50 mph wind with 1" radial ice	30.00	0.0165	0.0030	0.0528	0.0528
1.2D + 1.0Di + 1.0Wi 180° 50 mph wind with 1" radial ice	80.00	0.0853	0.0086	0.1141	0.1141
1.2D + 1.0Di + 1.0Wi 180° 50 mph wind with 1" radial ice	86.67	0.0995	0.0097	0.1270	0.127
1.2D + 1.0Di + 1.0Wi 180° 50 mph wind with 1" radial ice	93.33	0.1147	0.0108	0.1364	0.1367
1.2D + 1.0Di + 1.0Wi 180° 50 mph wind with 1" radial ice	100.00	0.1312	0.0119	0.1469	0.1469
1.2D + 1.0Di + 1.0Wi 180° 50 mph wind with 1" radial ice	113.33	0.1674	0.0140	0.1651	0.1651
1.2D + 1.0Di + 1.0Wi 180° 50 mph wind with 1" radial ice	120.00	0.187	0.0150	0.1730	0.1737
1.2D + 1.0Di + 1.0Wi 180° 50 mph wind with 1" radial ice	126.67	0.2078	0.0166	0.1812	0.1812
1.2D + 1.0Di + 1.0Wi 180° 50 mph wind with 1" radial ice	133.33	0.2296	0.0163	0.1904	0.1911
1.2D + 1.0Di + 1.0Wi 180° 50 mph wind with 1" radial ice	140.00	0.2525	0.0161	0.2165	0.2165
1.2D + 1.0Di + 1.0Wi 180° 50 mph wind with 1" radial ice	140.25	0.2534	0.0160	0.2189	0.2189
1.2D + 1.0Di + 1.0Wi 180° 50 mph wind with 1" radial ice	145.19	0.2711	0.0139	0.2091	0.2096
1.2D + 1.0Di + 1.0Wi 180° 50 mph wind with 1" radial ice	150.13	0.29	0.0121	0.2241	0.2241
1.2D + 1.0Di + 1.0Wi 180° 50 mph wind with 1" radial ice	160.25	0.3308	0.0089	0.2656	0.2656
1.2D + 1.0Di + 1.0Wi 180° 50 mph wind with 1" radial ice	172.10	0.3817	0.0082	0.2581	0.2582
1.2D + 1.0Di + 1.0Wi 180° 50 mph wind with 1" radial ice	180.00	0.4163	0.0079	0.2790	0.2791
1.2D + 1.0Di + 1.0Wi 210° 50 mph wind with 1" radial ice	20.00	0.0079	-0.0022	0.0378	0.0378
1.2D + 1.0Di + 1.0Wi 210° 50 mph wind with 1" radial ice	30.00	0.0162	-0.0029	0.0522	0.0522
1.2D + 1.0Di + 1.0Wi 210° 50 mph wind with 1" radial ice	80.00	0.0854	0.0076	0.1160	0.1162
1.2D + 1.0Di + 1.0Wi 210° 50 mph wind with 1" radial ice	86.67	0.0997	0.0089	0.1276	0.1276
1.2D + 1.0Di + 1.0Wi 210° 50 mph wind with 1" radial ice	93.33	0.1149	0.0101	0.1373	0.1376
1.2D + 1.0Di + 1.0Wi 210° 50 mph wind with 1" radial ice	100.00	0.1316	0.0113	0.1476	0.1476
1.2D + 1.0Di + 1.0Wi 210° 50 mph wind with 1" radial ice	113.33	0.168	0.0137	0.1660	0.1661
1.2D + 1.0Di + 1.0Wi 210° 50 mph wind with 1" radial ice	120.00	0.1876	0.0149	0.1741	0.1748
1.2D + 1.0Di + 1.0Wi 210° 50 mph wind with 1" radial ice	126.67	0.2085	0.0169	0.1844	0.1844
1.2D + 1.0Di + 1.0Wi 210° 50 mph wind with 1" radial ice	133.33	0.2304	0.0170	0.1920	0.1924
1.2D + 1.0Di + 1.0Wi 210° 50 mph wind with 1" radial ice	140.00	0.2534	0.0170	0.2154	0.2154
1.2D + 1.0Di + 1.0Wi 210° 50 mph wind with 1" radial ice	140.25	0.2544	0.0169	0.2173	0.2173
1.2D + 1.0Di + 1.0Wi 210° 50 mph wind with 1" radial ice	145.19	0.2722	0.0159	0.2122	0.2124

DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
1.2D + 1.0Di + 1.0Wi 210° 50 mph wind with 1" radial ice	150.13	0.2911	0.0152	0.2248	0.2253
1.2D + 1.0Di + 1.0Wi 210° 50 mph wind with 1" radial ice	160.25	0.3321	0.0139	0.2650	0.2654
1.2D + 1.0Di + 1.0Wi 210° 50 mph wind with 1" radial ice	172.10	0.3831	0.0148	0.2553	0.2557
1.2D + 1.0Di + 1.0Wi 210° 50 mph wind with 1" radial ice	180.00	0.4179	0.0152	0.2697	0.2697
1.2D + 1.0Di + 1.0Wi 240° 50 mph wind with 1" radial ice	20.00	0.0074	-0.0015	0.0381	0.0381
1.2D + 1.0Di + 1.0Wi 240° 50 mph wind with 1" radial ice	30.00	0.0153	-0.0020	0.0506	0.0506
1.2D + 1.0Di + 1.0Wi 240° 50 mph wind with 1" radial ice	80.00	0.0858	0.0046	0.1178	0.1178
1.2D + 1.0Di + 1.0Wi 240° 50 mph wind with 1" radial ice	86.67	0.1003	0.0056	0.1292	0.1292
1.2D + 1.0Di + 1.0Wi 240° 50 mph wind with 1" radial ice	93.33	0.1158	0.0066	0.1394	0.1394
1.2D + 1.0Di + 1.0Wi 240° 50 mph wind with 1" radial ice	100.00	0.1326	0.0076	0.1495	0.1496
1.2D + 1.0Di + 1.0Wi 240° 50 mph wind with 1" radial ice	113.33	0.1695	0.0096	0.1683	0.1683
1.2D + 1.0Di + 1.0Wi 240° 50 mph wind with 1" radial ice	120.00	0.1893	0.0106	0.1759	0.1762
1.2D + 1.0Di + 1.0Wi 240° 50 mph wind with 1" radial ice	126.67	0.2106	0.0125	0.1912	0.1913
1.2D + 1.0Di + 1.0Wi 240° 50 mph wind with 1" radial ice	133.33	0.2327	0.0129	0.1936	0.1937
1.2D + 1.0Di + 1.0Wi 240° 50 mph wind with 1" radial ice	140.00	0.2561	0.0129	0.2181	0.2185
1.2D + 1.0Di + 1.0Wi 240° 50 mph wind with 1" radial ice	140.25	0.257	0.0130	0.2214	0.2218
1.2D + 1.0Di + 1.0Wi 240° 50 mph wind with 1" radial ice	145.19	0.275	0.0131	0.2149	0.2151
1.2D + 1.0Di + 1.0Wi 240° 50 mph wind with 1" radial ice	150.13	0.2942	0.0133	0.2279	0.2283
1.2D + 1.0Di + 1.0Wi 240° 50 mph wind with 1" radial ice	160.25	0.3355	0.0137	0.2714	0.2718
1.2D + 1.0Di + 1.0Wi 240° 50 mph wind with 1" radial ice	172.10	0.3871	0.0148	0.2495	0.25
1.2D + 1.0Di + 1.0Wi 240° 50 mph wind with 1" radial ice	180.00	0.422	0.0153	0.2455	0.2456
1.2D + 1.0Di + 1.0Wi 300° 50 mph wind with 1" radial ice	20.00	0.0081	-0.0015	0.0376	0.0376
1.2D + 1.0Di + 1.0Wi 300° 50 mph wind with 1" radial ice	30.00	0.0165	-0.0020	0.0528	0.0528
1.2D + 1.0Di + 1.0Wi 300° 50 mph wind with 1" radial ice	80.00	0.0854	0.0045	0.1143	0.1143
1.2D + 1.0Di + 1.0Wi 300° 50 mph wind with 1" radial ice	86.67	0.0996	0.0055	0.1270	0.1272
1.2D + 1.0Di + 1.0Wi 300° 50 mph wind with 1" radial ice	93.33	0.1147	0.0064	0.1370	0.137
1.2D + 1.0Di + 1.0Wi 300° 50 mph wind with 1" radial ice	100.00	0.1313	0.0074	0.1470	0.1472
1.2D + 1.0Di + 1.0Wi 300° 50 mph wind with 1" radial ice	113.33	0.1675	0.0094	0.1655	0.1658
1.2D + 1.0Di + 1.0Wi 300° 50 mph wind with 1" radial ice	120.00	0.1871	0.0104	0.1729	0.173
1.2D + 1.0Di + 1.0Wi 300° 50 mph wind with 1" radial ice	126.67	0.2079	0.0122	0.1881	0.1885
1.2D + 1.0Di + 1.0Wi 300° 50 mph wind with 1" radial ice	133.33	0.2297	0.0124	0.1901	0.1903
1.2D + 1.0Di + 1.0Wi 300° 50 mph wind with 1" radial ice	140.00	0.2526	0.0121	0.2172	0.2175
1.2D + 1.0Di + 1.0Wi 300° 50 mph wind with 1" radial ice	140.25	0.2536	0.0121	0.2194	0.2197
1.2D + 1.0Di + 1.0Wi 300° 50 mph wind with 1" radial ice	145.19	0.2713	0.0116	0.2103	0.2106
1.2D + 1.0Di + 1.0Wi 300° 50 mph wind with 1" radial ice	150.13	0.2901	-0.0130	0.2240	0.2243
1.2D + 1.0Di + 1.0Wi 300° 50 mph wind with 1" radial ice	160.25	0.3308	-0.0160	0.2653	0.2655
1.2D + 1.0Di + 1.0Wi 300° 50 mph wind with 1" radial ice	172.10	0.3816	-0.0171	0.2459	0.2465
1.2D + 1.0Di + 1.0Wi 300° 50 mph wind with 1" radial ice	180.00	0.4161	-0.0176	0.2416	0.2416
1.2D + 1.0Di + 1.0Wi 330° 50 mph wind with 1" radial ice	20.00	0.0079	-0.0022	0.0378	0.0378
1.2D + 1.0Di + 1.0Wi 330° 50 mph wind with 1" radial ice	30.00	0.0162	-0.0029	0.0521	0.0522
1.2D + 1.0Di + 1.0Wi 330° 50 mph wind with 1" radial ice	80.00	0.0854	0.0076	0.1160	0.1162
1.2D + 1.0Di + 1.0Wi 330° 50 mph wind with 1" radial ice	86.67	0.0997	0.0088	0.1273	0.1276
1.2D + 1.0Di + 1.0Wi 330° 50 mph wind with 1" radial ice	93.33	0.115	0.0100	0.1373	0.1376
1.2D + 1.0Di + 1.0Wi 330° 50 mph wind with 1" radial ice	100.00	0.1316	0.0112	0.1473	0.1477
1.2D + 1.0Di + 1.0Wi 330° 50 mph wind with 1" radial ice	113.33	0.168	0.0136	0.1656	0.1661
1.2D + 1.0Di + 1.0Wi 330° 50 mph wind with 1" radial ice	120.00	0.1876	0.0147	0.1746	0.1746
1.2D + 1.0Di + 1.0Wi 330° 50 mph wind with 1" radial ice	126.67	0.2085	0.0167	0.1837	0.1844
1.2D + 1.0Di + 1.0Wi 330° 50 mph wind with 1" radial ice	133.33	0.2304	0.0166	0.1920	0.1924
1.2D + 1.0Di + 1.0Wi 330° 50 mph wind with 1" radial ice	140.00	0.2535	0.0162	0.2148	0.2154
1.2D + 1.0Di + 1.0Wi 330° 50 mph wind with 1" radial ice	140.25	0.2544	0.0162	0.2167	0.2173
1.2D + 1.0Di + 1.0Wi 330° 50 mph wind with 1" radial ice	145.19	0.2721	0.0146	0.2121	0.2124
1.2D + 1.0Di + 1.0Wi 330° 50 mph wind with 1" radial ice	150.13	0.2912	0.0131	0.2254	0.2255
1.2D + 1.0Di + 1.0Wi 330° 50 mph wind with 1" radial ice	160.25	0.3321	0.0104	0.2653	0.2655
1.2D + 1.0Di + 1.0Wi 330° 50 mph wind with 1" radial ice	172.10	0.3832	-0.0112	0.2553	0.2556
1.2D + 1.0Di + 1.0Wi 330° 50 mph wind with 1" radial ice	180.00	0.4179	-0.0117	0.2699	0.27
1.2D + 1.0Ev + 1.0Eh Normal Seismic	20.00	0.0011	0.0002	0.0057	0.0057
1.2D + 1.0Ev + 1.0Eh Normal Seismic	30.00	0.0023	0.0003	0.0076	0.0076
1.2D + 1.0Ev + 1.0Eh Normal Seismic	80.00	0.0139	0.0007	0.0204	0.0204
1.2D + 1.0Ev + 1.0Eh Normal Seismic	86.67	0.0163	0.0008	0.0222	0.0222
1.2D + 1.0Ev + 1.0Eh Normal Seismic	93.33	0.0191	0.0008	0.0243	0.0243
1.2D + 1.0Ev + 1.0Eh Normal Seismic	100.00	0.022	0.0009	0.0264	0.0264
1.2D + 1.0Ev + 1.0Eh Normal Seismic	113.33	0.0286	0.0009	0.0303	0.0303
1.2D + 1.0Ev + 1.0Eh Normal Seismic	120.00	0.0323	0.0009	0.0323	0.0323
1.2D + 1.0Ev + 1.0Eh Normal Seismic	126.67	0.0361	0.0009	0.0348	0.0348
1.2D + 1.0Ev + 1.0Eh Normal Seismic	133.33	0.0403	0.0009	0.0364	0.0364
1.2D + 1.0Ev + 1.0Eh Normal Seismic	140.00	0.0446	0.0009	0.0413	0.0413
1.2D + 1.0Ev + 1.0Eh Normal Seismic	140.25	0.0448	0.0009	0.0423	0.0423
1.2D + 1.0Ev + 1.0Eh Normal Seismic	145.19	0.0484	0.0005	0.0410	0.041

DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
1.2D + 1.0Ev + 1.0Eh Normal Seismic	150.13	0.0519	0.0003	0.0443	0.0443
1.2D + 1.0Ev + 1.0Eh Normal Seismic	160.25	0.0598	0.0003	0.0544	0.0544
1.2D + 1.0Ev + 1.0Eh Normal Seismic	172.10	0.0699	0.0001	0.0490	0.049
1.2D + 1.0Ev + 1.0Eh Normal Seismic	180.00	0.0765	0.0000	0.0486	0.0486
1.2D + 1.0Ev + 1.0Eh 60° Seismic	20.00	0.001	0.0002	0.0056	0.0056
1.2D + 1.0Ev + 1.0Eh 60° Seismic	30.00	0.0022	0.0003	0.0074	0.0074
1.2D + 1.0Ev + 1.0Eh 60° Seismic	80.00	0.0138	0.0007	0.0205	0.0205
1.2D + 1.0Ev + 1.0Eh 60° Seismic	86.67	0.0162	0.0008	0.0222	0.0222
1.2D + 1.0Ev + 1.0Eh 60° Seismic	93.33	0.0189	0.0008	0.0244	0.0244
1.2D + 1.0Ev + 1.0Eh 60° Seismic	100.00	0.0219	0.0009	0.0264	0.0264
1.2D + 1.0Ev + 1.0Eh 60° Seismic	113.33	0.0285	0.0009	0.0304	0.0304
1.2D + 1.0Ev + 1.0Eh 60° Seismic	120.00	0.0321	0.0009	0.0320	0.032
1.2D + 1.0Ev + 1.0Eh 60° Seismic	126.67	0.036	0.0009	0.0350	0.035
1.2D + 1.0Ev + 1.0Eh 60° Seismic	133.33	0.0402	0.0009	0.0361	0.0361
1.2D + 1.0Ev + 1.0Eh 60° Seismic	140.00	0.0445	0.0009	0.0429	0.0429
1.2D + 1.0Ev + 1.0Eh 60° Seismic	140.25	0.0447	0.0009	0.0433	0.0433
1.2D + 1.0Ev + 1.0Eh 60° Seismic	145.19	0.0482	0.0005	0.0406	0.0406
1.2D + 1.0Ev + 1.0Eh 60° Seismic	150.13	0.0518	0.0002	0.0439	0.0439
1.2D + 1.0Ev + 1.0Eh 60° Seismic	160.25	0.0598	0.0003	0.0532	0.0532
1.2D + 1.0Ev + 1.0Eh 60° Seismic	172.10	0.0699	0.0001	0.0488	0.0488
1.2D + 1.0Ev + 1.0Eh 60° Seismic	180.00	0.0765	0.0001	0.0484	0.0484
1.2D + 1.0Ev + 1.0Eh 90° Seismic	20.00	0.0011	-0.0003	0.0057	0.0057
1.2D + 1.0Ev + 1.0Eh 90° Seismic	30.00	0.0023	-0.0003	0.0075	0.0075
1.2D + 1.0Ev + 1.0Eh 90° Seismic	80.00	0.0139	-0.0008	0.0205	0.0205
1.2D + 1.0Ev + 1.0Eh 90° Seismic	86.67	0.0163	-0.0009	0.0222	0.0222
1.2D + 1.0Ev + 1.0Eh 90° Seismic	93.33	0.019	-0.0009	0.0244	0.0244
1.2D + 1.0Ev + 1.0Eh 90° Seismic	100.00	0.0219	-0.0010	0.0264	0.0264
1.2D + 1.0Ev + 1.0Eh 90° Seismic	113.33	0.0285	-0.0011	0.0304	0.0304
1.2D + 1.0Ev + 1.0Eh 90° Seismic	120.00	0.0322	-0.0011	0.0322	0.0322
1.2D + 1.0Ev + 1.0Eh 90° Seismic	126.67	0.0361	-0.0011	0.0350	0.035
1.2D + 1.0Ev + 1.0Eh 90° Seismic	133.33	0.0403	-0.0010	0.0365	0.0365
1.2D + 1.0Ev + 1.0Eh 90° Seismic	140.00	0.0446	-0.0010	0.0423	0.0423
1.2D + 1.0Ev + 1.0Eh 90° Seismic	140.25	0.0448	-0.0010	0.0426	0.0426
1.2D + 1.0Ev + 1.0Eh 90° Seismic	145.19	0.0483	-0.0006	0.0410	0.041
1.2D + 1.0Ev + 1.0Eh 90° Seismic	150.13	0.0519	-0.0003	0.0442	0.0442
1.2D + 1.0Ev + 1.0Eh 90° Seismic	160.25	0.0598	0.0004	0.0534	0.0534
1.2D + 1.0Ev + 1.0Eh 90° Seismic	172.10	0.0699	0.0001	0.0490	0.049
1.2D + 1.0Ev + 1.0Eh 90° Seismic	180.00	0.0765	0.0001	0.0485	0.0485
1.2D + 1.0Ev + 1.0Eh 120° Seismic	20.00	0.0011	0.0002	0.0057	0.0057
1.2D + 1.0Ev + 1.0Eh 120° Seismic	30.00	0.0023	0.0003	0.0076	0.0076
1.2D + 1.0Ev + 1.0Eh 120° Seismic	80.00	0.0139	0.0007	0.0204	0.0204
1.2D + 1.0Ev + 1.0Eh 120° Seismic	86.67	0.0163	0.0008	0.0222	0.0222
1.2D + 1.0Ev + 1.0Eh 120° Seismic	93.33	0.0191	0.0008	0.0243	0.0243
1.2D + 1.0Ev + 1.0Eh 120° Seismic	100.00	0.022	0.0009	0.0264	0.0264
1.2D + 1.0Ev + 1.0Eh 120° Seismic	113.33	0.0286	0.0009	0.0303	0.0303
1.2D + 1.0Ev + 1.0Eh 120° Seismic	120.00	0.0323	0.0009	0.0323	0.0323
1.2D + 1.0Ev + 1.0Eh 120° Seismic	126.67	0.0361	0.0009	0.0348	0.0348
1.2D + 1.0Ev + 1.0Eh 120° Seismic	133.33	0.0403	0.0009	0.0364	0.0364
1.2D + 1.0Ev + 1.0Eh 120° Seismic	140.00	0.0446	0.0009	0.0413	0.0413
1.2D + 1.0Ev + 1.0Eh 120° Seismic	140.25	0.0448	0.0009	0.0423	0.0423
1.2D + 1.0Ev + 1.0Eh 120° Seismic	145.19	0.0484	0.0005	0.0410	0.041
1.2D + 1.0Ev + 1.0Eh 120° Seismic	150.13	0.0519	0.0002	0.0443	0.0443
1.2D + 1.0Ev + 1.0Eh 120° Seismic	160.25	0.0598	0.0003	0.0544	0.0544
1.2D + 1.0Ev + 1.0Eh 120° Seismic	172.10	0.0699	0.0001	0.0490	0.049
1.2D + 1.0Ev + 1.0Eh 120° Seismic	180.00	0.0765	0.0001	0.0486	0.0486
1.2D + 1.0Ev + 1.0Eh 180° Seismic	20.00	0.001	0.0002	0.0056	0.0056
1.2D + 1.0Ev + 1.0Eh 180° Seismic	30.00	0.0022	0.0003	0.0074	0.0074
1.2D + 1.0Ev + 1.0Eh 180° Seismic	80.00	0.0138	0.0007	0.0205	0.0205
1.2D + 1.0Ev + 1.0Eh 180° Seismic	86.67	0.0162	0.0008	0.0222	0.0222
1.2D + 1.0Ev + 1.0Eh 180° Seismic	93.33	0.0189	0.0008	0.0244	0.0244
1.2D + 1.0Ev + 1.0Eh 180° Seismic	100.00	0.0219	0.0009	0.0264	0.0264
1.2D + 1.0Ev + 1.0Eh 180° Seismic	113.33	0.0285	0.0009	0.0304	0.0304
1.2D + 1.0Ev + 1.0Eh 180° Seismic	120.00	0.0321	0.0009	0.0320	0.032
1.2D + 1.0Ev + 1.0Eh 180° Seismic	126.67	0.036	0.0009	0.0350	0.035
1.2D + 1.0Ev + 1.0Eh 180° Seismic	133.33	0.0402	0.0009	0.0361	0.0361
1.2D + 1.0Ev + 1.0Eh 180° Seismic	140.00	0.0445	0.0009	0.0429	0.0429
1.2D + 1.0Ev + 1.0Eh 180° Seismic	140.25	0.0447	0.0009	0.0433	0.0433
1.2D + 1.0Ev + 1.0Eh 180° Seismic	145.19	0.0482	0.0005	0.0406	0.0406

DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
1.2D + 1.0Ev + 1.0Eh 180° Seismic	150.13	0.0518	0.0002	0.0439	0.0439
1.2D + 1.0Ev + 1.0Eh 180° Seismic	160.25	0.0598	0.0003	0.0532	0.0532
1.2D + 1.0Ev + 1.0Eh 180° Seismic	172.10	0.0699	0.0001	0.0488	0.0488
1.2D + 1.0Ev + 1.0Eh 180° Seismic	180.00	0.0765	0.0000	0.0484	0.0484
1.2D + 1.0Ev + 1.0Eh 210° Seismic	20.00	0.0011	-0.0003	0.0057	0.0057
1.2D + 1.0Ev + 1.0Eh 210° Seismic	30.00	0.0023	-0.0003	0.0075	0.0075
1.2D + 1.0Ev + 1.0Eh 210° Seismic	80.00	0.0139	-0.0008	0.0205	0.0205
1.2D + 1.0Ev + 1.0Eh 210° Seismic	86.67	0.0163	-0.0009	0.0222	0.0222
1.2D + 1.0Ev + 1.0Eh 210° Seismic	93.33	0.019	-0.0009	0.0244	0.0244
1.2D + 1.0Ev + 1.0Eh 210° Seismic	100.00	0.0219	-0.0010	0.0264	0.0264
1.2D + 1.0Ev + 1.0Eh 210° Seismic	113.33	0.0285	-0.0011	0.0304	0.0304
1.2D + 1.0Ev + 1.0Eh 210° Seismic	120.00	0.0322	-0.0011	0.0322	0.0322
1.2D + 1.0Ev + 1.0Eh 210° Seismic	126.67	0.0361	-0.0011	0.0350	0.035
1.2D + 1.0Ev + 1.0Eh 210° Seismic	133.33	0.0403	-0.0010	0.0365	0.0365
1.2D + 1.0Ev + 1.0Eh 210° Seismic	140.00	0.0446	-0.0010	0.0423	0.0423
1.2D + 1.0Ev + 1.0Eh 210° Seismic	140.25	0.0448	-0.0010	0.0426	0.0426
1.2D + 1.0Ev + 1.0Eh 210° Seismic	145.19	0.0483	-0.0006	0.0410	0.041
1.2D + 1.0Ev + 1.0Eh 210° Seismic	150.13	0.0519	-0.0003	0.0442	0.0442
1.2D + 1.0Ev + 1.0Eh 210° Seismic	160.25	0.0598	0.0004	0.0534	0.0534
1.2D + 1.0Ev + 1.0Eh 210° Seismic	172.10	0.0699	0.0001	0.0490	0.049
1.2D + 1.0Ev + 1.0Eh 210° Seismic	180.00	0.0765	0.0001	0.0485	0.0485
1.2D + 1.0Ev + 1.0Eh 240° Seismic	20.00	0.0011	0.0002	0.0057	0.0057
1.2D + 1.0Ev + 1.0Eh 240° Seismic	30.00	0.0023	0.0003	0.0076	0.0076
1.2D + 1.0Ev + 1.0Eh 240° Seismic	80.00	0.0139	0.0007	0.0204	0.0204
1.2D + 1.0Ev + 1.0Eh 240° Seismic	86.67	0.0163	0.0008	0.0222	0.0222
1.2D + 1.0Ev + 1.0Eh 240° Seismic	93.33	0.0191	0.0008	0.0243	0.0243
1.2D + 1.0Ev + 1.0Eh 240° Seismic	100.00	0.022	0.0009	0.0264	0.0264
1.2D + 1.0Ev + 1.0Eh 240° Seismic	113.33	0.0286	0.0009	0.0303	0.0303
1.2D + 1.0Ev + 1.0Eh 240° Seismic	120.00	0.0323	0.0009	0.0323	0.0323
1.2D + 1.0Ev + 1.0Eh 240° Seismic	126.67	0.0361	0.0009	0.0348	0.0348
1.2D + 1.0Ev + 1.0Eh 240° Seismic	133.33	0.0403	0.0009	0.0364	0.0364
1.2D + 1.0Ev + 1.0Eh 240° Seismic	140.00	0.0446	0.0009	0.0413	0.0413
1.2D + 1.0Ev + 1.0Eh 240° Seismic	140.25	0.0448	0.0009	0.0423	0.0423
1.2D + 1.0Ev + 1.0Eh 240° Seismic	145.19	0.0484	0.0005	0.0410	0.041
1.2D + 1.0Ev + 1.0Eh 240° Seismic	150.13	0.0519	0.0002	0.0443	0.0443
1.2D + 1.0Ev + 1.0Eh 240° Seismic	160.25	0.0598	0.0003	0.0544	0.0544
1.2D + 1.0Ev + 1.0Eh 240° Seismic	172.10	0.0699	0.0001	0.0490	0.049
1.2D + 1.0Ev + 1.0Eh 240° Seismic	180.00	0.0765	0.0001	0.0486	0.0486
1.2D + 1.0Ev + 1.0Eh 300° Seismic	20.00	0.001	0.0002	0.0056	0.0056
1.2D + 1.0Ev + 1.0Eh 300° Seismic	30.00	0.0022	0.0003	0.0074	0.0074
1.2D + 1.0Ev + 1.0Eh 300° Seismic	80.00	0.0138	0.0007	0.0205	0.0205
1.2D + 1.0Ev + 1.0Eh 300° Seismic	86.67	0.0162	0.0008	0.0222	0.0222
1.2D + 1.0Ev + 1.0Eh 300° Seismic	93.33	0.0189	0.0008	0.0244	0.0244
1.2D + 1.0Ev + 1.0Eh 300° Seismic	100.00	0.0219	0.0009	0.0264	0.0264
1.2D + 1.0Ev + 1.0Eh 300° Seismic	113.33	0.0285	0.0009	0.0304	0.0304
1.2D + 1.0Ev + 1.0Eh 300° Seismic	120.00	0.0321	0.0009	0.0320	0.032
1.2D + 1.0Ev + 1.0Eh 300° Seismic	126.67	0.036	0.0009	0.0350	0.035
1.2D + 1.0Ev + 1.0Eh 300° Seismic	133.33	0.0402	0.0009	0.0361	0.0361
1.2D + 1.0Ev + 1.0Eh 300° Seismic	140.00	0.0445	0.0009	0.0429	0.0429
1.2D + 1.0Ev + 1.0Eh 300° Seismic	140.25	0.0447	0.0009	0.0433	0.0433
1.2D + 1.0Ev + 1.0Eh 300° Seismic	145.19	0.0482	0.0005	0.0406	0.0406
1.2D + 1.0Ev + 1.0Eh 300° Seismic	150.13	0.0518	0.0002	0.0439	0.0439
1.2D + 1.0Ev + 1.0Eh 300° Seismic	160.25	0.0598	0.0003	0.0532	0.0532
1.2D + 1.0Ev + 1.0Eh 300° Seismic	172.10	0.0699	0.0001	0.0488	0.0488
1.2D + 1.0Ev + 1.0Eh 300° Seismic	180.00	0.0765	0.0001	0.0484	0.0484
1.2D + 1.0Ev + 1.0Eh 330° Seismic	20.00	0.0011	-0.0003	0.0057	0.0057
1.2D + 1.0Ev + 1.0Eh 330° Seismic	30.00	0.0023	-0.0003	0.0075	0.0075
1.2D + 1.0Ev + 1.0Eh 330° Seismic	80.00	0.0139	-0.0009	0.0205	0.0205
1.2D + 1.0Ev + 1.0Eh 330° Seismic	86.67	0.0163	-0.0009	0.0222	0.0222
1.2D + 1.0Ev + 1.0Eh 330° Seismic	93.33	0.019	-0.0009	0.0244	0.0244
1.2D + 1.0Ev + 1.0Eh 330° Seismic	100.00	0.0219	-0.0010	0.0264	0.0264
1.2D + 1.0Ev + 1.0Eh 330° Seismic	113.33	0.0285	-0.0011	0.0304	0.0304
1.2D + 1.0Ev + 1.0Eh 330° Seismic	120.00	0.0322	-0.0011	0.0322	0.0322
1.2D + 1.0Ev + 1.0Eh 330° Seismic	126.67	0.0361	-0.0011	0.0350	0.035
1.2D + 1.0Ev + 1.0Eh 330° Seismic	133.33	0.0403	-0.0010	0.0365	0.0365
1.2D + 1.0Ev + 1.0Eh 330° Seismic	140.00	0.0446	-0.0010	0.0423	0.0423
1.2D + 1.0Ev + 1.0Eh 330° Seismic	140.25	0.0448	-0.0010	0.0426	0.0426
1.2D + 1.0Ev + 1.0Eh 330° Seismic	145.19	0.0483	-0.0006	0.0410	0.041

DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
1.2D + 1.0Ev + 1.0Eh 330° Seismic	150.13	0.0519	-0.0003	0.0442	0.0442
1.2D + 1.0Ev + 1.0Eh 330° Seismic	160.25	0.0598	0.0004	0.0534	0.0534
1.2D + 1.0Ev + 1.0Eh 330° Seismic	172.10	0.0699	0.0001	0.0490	0.049
1.2D + 1.0Ev + 1.0Eh 330° Seismic	180.00	0.0765	0.0001	0.0485	0.0485
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	20.00	0.0011	0.0002	0.0055	0.0055
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	30.00	0.0023	0.0003	0.0075	0.0075
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	80.00	0.0139	0.0007	0.0202	0.0202
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	86.67	0.0163	0.0008	0.0221	0.0222
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	93.33	0.019	0.0008	0.0242	0.0242
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	100.00	0.0219	0.0009	0.0263	0.0263
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	113.33	0.0285	0.0009	0.0302	0.0302
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	120.00	0.0321	0.0009	0.0321	0.0321
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	126.67	0.036	0.0009	0.0347	0.0347
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	133.33	0.0402	0.0009	0.0363	0.0363
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	140.00	0.0445	0.0009	0.0415	0.0415
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	140.25	0.0447	0.0009	0.0423	0.0423
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	145.19	0.0482	0.0005	0.0408	0.0408
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	150.13	0.0517	0.0003	0.0441	0.0441
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	160.25	0.0597	0.0003	0.0541	0.0541
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	172.10	0.0697	0.0001	0.0487	0.0487
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	180.00	0.0763	0.0000	0.0484	0.0484
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	20.00	0.001	0.0002	0.0054	0.0054
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	30.00	0.0021	0.0003	0.0073	0.0073
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	80.00	0.0137	0.0007	0.0201	0.0201
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	86.67	0.0162	0.0008	0.0221	0.0221
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	93.33	0.0189	0.0008	0.0243	0.0243
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	100.00	0.0218	0.0009	0.0263	0.0263
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	113.33	0.0284	0.0009	0.0302	0.0302
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	120.00	0.032	0.0009	0.0319	0.0319
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	126.67	0.0359	0.0009	0.0349	0.0349
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	133.33	0.04	0.0009	0.0360	0.036
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	140.00	0.0444	0.0009	0.0426	0.0426
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	140.25	0.0446	0.0009	0.0430	0.043
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	145.19	0.0481	0.0005	0.0404	0.0404
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	150.13	0.0517	0.0002	0.0438	0.0438
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	160.25	0.0597	0.0003	0.0533	0.0533
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	172.10	0.0697	0.0001	0.0486	0.0486
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	180.00	0.0763	0.0001	0.0482	0.0482
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	20.00	0.0011	-0.0003	0.0054	0.0054
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	30.00	0.0022	-0.0003	0.0075	0.0075
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	80.00	0.0138	-0.0008	0.0202	0.0202
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	86.67	0.0162	-0.0009	0.0222	0.0222
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	93.33	0.019	-0.0009	0.0242	0.0242
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	100.00	0.0219	-0.0010	0.0263	0.0263
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	113.33	0.0284	-0.0011	0.0302	0.0302
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	120.00	0.0321	-0.0011	0.0320	0.032
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	126.67	0.036	-0.0011	0.0348	0.0348
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	133.33	0.0401	-0.0010	0.0364	0.0364
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	140.00	0.0444	-0.0010	0.0420	0.042
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	140.25	0.0446	-0.0010	0.0423	0.0423
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	145.19	0.0481	-0.0006	0.0409	0.0409
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	150.13	0.0517	-0.0003	0.0440	0.044
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	160.25	0.0597	0.0004	0.0531	0.0531
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	172.10	0.0697	0.0001	0.0487	0.0487
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	180.00	0.0763	0.0001	0.0483	0.0483
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	20.00	0.0011	0.0002	0.0055	0.0055
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	30.00	0.0023	0.0003	0.0075	0.0075
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	80.00	0.0139	0.0007	0.0202	0.0202
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	86.67	0.0163	0.0008	0.0221	0.0222
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	93.33	0.019	0.0008	0.0242	0.0242
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	100.00	0.0219	0.0009	0.0263	0.0263
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	113.33	0.0285	0.0009	0.0302	0.0302
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	120.00	0.0321	0.0009	0.0321	0.0321
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	126.67	0.036	0.0009	0.0347	0.0347
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	133.33	0.0402	0.0009	0.0363	0.0363
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	140.00	0.0445	0.0009	0.0415	0.0415
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	140.25	0.0447	0.0009	0.0423	0.0423
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	145.19	0.0482	0.0005	0.0408	0.0408

DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	150.13	0.0517	0.0002	0.0441	0.0441
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	160.25	0.0597	0.0003	0.0541	0.0541
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	172.10	0.0697	0.0001	0.0487	0.0487
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	180.00	0.0763	0.0001	0.0484	0.0484
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	20.00	0.001	0.0002	0.0054	0.0054
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	30.00	0.0021	0.0003	0.0073	0.0073
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	80.00	0.0137	0.0007	0.0201	0.0201
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	86.67	0.0162	0.0008	0.0221	0.0221
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	93.33	0.0189	0.0008	0.0243	0.0243
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	100.00	0.0218	0.0009	0.0263	0.0263
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	113.33	0.0284	0.0009	0.0302	0.0302
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	120.00	0.032	0.0009	0.0319	0.0319
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	126.67	0.0359	0.0009	0.0349	0.0349
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	133.33	0.04	0.0009	0.0360	0.036
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	140.00	0.0444	0.0009	0.0426	0.0426
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	140.25	0.0446	0.0009	0.0430	0.043
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	145.19	0.0481	0.0005	0.0404	0.0404
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	150.13	0.0517	0.0003	0.0438	0.0438
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	160.25	0.0597	0.0003	0.0533	0.0533
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	172.10	0.0697	0.0001	0.0486	0.0486
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	180.00	0.0763	0.0000	0.0482	0.0482
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	20.00	0.0011	-0.0003	0.0054	0.0054
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	30.00	0.0022	-0.0003	0.0075	0.0075
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	80.00	0.0138	-0.0008	0.0202	0.0202
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	86.67	0.0162	-0.0009	0.0222	0.0222
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	93.33	0.019	-0.0009	0.0242	0.0242
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	100.00	0.0219	-0.0010	0.0263	0.0263
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	113.33	0.0284	-0.0011	0.0302	0.0302
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	120.00	0.0321	-0.0011	0.0320	0.032
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	126.67	0.036	-0.0011	0.0348	0.0348
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	133.33	0.0401	-0.0010	0.0364	0.0364
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	140.00	0.0444	-0.0010	0.0420	0.042
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	140.25	0.0446	-0.0010	0.0423	0.0423
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	145.19	0.0481	-0.0006	0.0409	0.0409
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	150.13	0.0517	-0.0003	0.0440	0.044
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	160.25	0.0597	0.0004	0.0531	0.0531
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	172.10	0.0697	0.0001	0.0487	0.0487
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	180.00	0.0763	0.0001	0.0483	0.0483
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	20.00	0.0011	0.0002	0.0055	0.0055
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	30.00	0.0023	0.0003	0.0075	0.0075
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	80.00	0.0139	0.0007	0.0202	0.0202
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	86.67	0.0163	0.0008	0.0221	0.0222
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	93.33	0.019	0.0008	0.0242	0.0242
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	100.00	0.0219	0.0009	0.0263	0.0263
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	113.33	0.0285	0.0009	0.0302	0.0302
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	120.00	0.0321	0.0009	0.0321	0.0321
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	126.67	0.036	0.0009	0.0347	0.0347
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	133.33	0.0402	0.0009	0.0363	0.0363
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	140.00	0.0445	0.0009	0.0415	0.0415
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	140.25	0.0447	0.0009	0.0423	0.0423
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	145.19	0.0482	0.0005	0.0408	0.0408
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	150.13	0.0517	0.0002	0.0441	0.0441
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	160.25	0.0597	0.0003	0.0541	0.0541
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	172.10	0.0697	0.0001	0.0487	0.0487
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	180.00	0.0763	0.0001	0.0484	0.0484
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	20.00	0.001	0.0002	0.0054	0.0054
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	30.00	0.0021	0.0003	0.0073	0.0073
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	80.00	0.0137	0.0007	0.0201	0.0201
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	86.67	0.0162	0.0008	0.0221	0.0221
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	93.33	0.0189	0.0008	0.0243	0.0243
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	100.00	0.0218	0.0009	0.0263	0.0263
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	113.33	0.0284	0.0009	0.0302	0.0302
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	120.00	0.032	0.0009	0.0319	0.0319
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	126.67	0.0359	0.0009	0.0349	0.0349
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	133.33	0.04	0.0009	0.0360	0.036
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	140.00	0.0444	0.0009	0.0426	0.0426
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	140.25	0.0446	0.0009	0.0430	0.043
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	145.19	0.0481	0.0005	0.0404	0.0404

DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	150.13	0.0517	0.0002	0.0438	0.0438
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	160.25	0.0597	0.0003	0.0533	0.0533
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	172.10	0.0697	0.0001	0.0486	0.0486
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	180.00	0.0763	0.0001	0.0482	0.0482
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	20.00	0.0011	-0.0003	0.0054	0.0054
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	30.00	0.0022	-0.0003	0.0075	0.0075
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	80.00	0.0138	-0.0008	0.0202	0.0202
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	86.67	0.0162	-0.0009	0.0222	0.0222
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	93.33	0.019	-0.0009	0.0242	0.0242
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	100.00	0.0219	-0.0010	0.0263	0.0263
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	113.33	0.0284	-0.0011	0.0302	0.0302
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	120.00	0.0321	-0.0011	0.0320	0.032
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	126.67	0.036	-0.0011	0.0348	0.0348
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	133.33	0.0401	-0.0010	0.0364	0.0364
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	140.00	0.0444	-0.0010	0.0420	0.042
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	140.25	0.0446	-0.0010	0.0423	0.0423
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	145.19	0.0481	-0.0006	0.0409	0.0409
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	150.13	0.0517	-0.0003	0.0440	0.044
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	160.25	0.0597	0.0004	0.0531	0.0531
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	172.10	0.0697	0.0001	0.0487	0.0487
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	180.00	0.0763	0.0001	0.0483	0.0483
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	20.00	0.0068	0.0020	0.0330	0.0331
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	30.00	0.0137	0.0028	0.0451	0.0451
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	80.00	0.0805	0.0078	0.1107	0.111
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	86.67	0.094	0.0088	0.1219	0.1222
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	93.33	0.1089	0.0097	0.1319	0.1322
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	100.00	0.1248	0.0107	0.1417	0.1421
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	113.33	0.16	0.0125	0.1598	0.1603
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	120.00	0.1793	0.0134	0.1691	0.1691
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	126.67	0.1996	0.0148	0.1763	0.1766
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	133.33	0.221	0.0144	0.1860	0.1866
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	140.00	0.2433	0.0142	0.2107	0.2107
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	140.25	0.2442	0.0142	0.2136	0.2136
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	145.19	0.2618	0.0121	0.2063	0.2067
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	150.13	0.28	0.0104	0.2207	0.2207
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	160.25	0.3201	0.0073	0.2641	0.2641
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	172.10	0.3706	0.0065	0.2571	0.2571
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	180.00	0.4048	0.0063	0.2806	0.2806
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	20.00	0.0064	0.0014	0.0314	0.0314
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	30.00	0.0129	0.0018	0.0434	0.0434
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	80.00	0.078	0.0039	0.1073	0.1073
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	86.67	0.0912	-0.0046	0.1191	0.1191
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	93.33	0.1056	-0.0054	0.1289	0.1289
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	100.00	0.1212	-0.0062	0.1386	0.1386
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	113.33	0.1556	-0.0078	0.1567	0.1568
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	120.00	0.1743	-0.0087	0.1639	0.164
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	126.67	0.1941	-0.0102	0.1786	0.1788
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	133.33	0.215	-0.0103	0.1810	0.1812
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	140.00	0.2368	-0.0100	0.2067	0.2069
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	140.25	0.2378	-0.0100	0.2093	0.2095
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	145.19	0.2548	0.0100	0.2017	0.2019
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	150.13	0.2728	0.0117	0.2150	0.2152
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	160.25	0.312	0.0148	0.2569	0.257
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	172.10	0.3611	0.0161	0.2363	0.2369
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	180.00	0.3943	0.0166	0.2322	0.2322
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	20.00	0.0065	-0.0009	0.0328	0.0329
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	30.00	0.0132	-0.0010	0.0439	0.0439
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	80.00	0.0786	-0.0001	0.1093	0.1093
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	86.67	0.0919	0.0008	0.1201	0.1201
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	93.33	0.1065	0.0016	0.1301	0.1301
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	100.00	0.1221	0.0025	0.1397	0.1398
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	113.33	0.1567	0.0043	0.1580	0.158
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	120.00	0.1756	0.0053	0.1648	0.1648
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	126.67	0.1956	0.0074	0.1819	0.1821
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	133.33	0.2166	0.0083	0.1827	0.1829
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	140.00	0.2385	0.0082	0.2061	0.2061
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	140.25	0.2394	0.0082	0.2082	0.2082
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	145.19	0.2567	0.0101	0.2045	0.2048

DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	150.13	0.2746	0.0116	0.2163	0.2164
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	160.25	0.314	0.0142	0.2555	0.2556
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	172.10	0.3634	0.0134	0.2325	0.2326
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	180.00	0.3967	0.0131	0.2176	0.218
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	20.00	0.0068	0.0014	0.0331	0.0331
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	30.00	0.0137	0.0018	0.0451	0.0451
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	80.00	0.0806	-0.0040	0.1112	0.1112
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	86.67	0.0941	-0.0049	0.1224	0.1224
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	93.33	0.109	-0.0058	0.1326	0.1326
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	100.00	0.1249	-0.0067	0.1424	0.1424
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	113.33	0.1602	-0.0084	0.1609	0.161
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	120.00	0.1795	-0.0094	0.1684	0.1686
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	126.67	0.1998	-0.0110	0.1833	0.1834
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	133.33	0.2213	-0.0114	0.1859	0.186
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	140.00	0.2435	-0.0114	0.2113	0.2116
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	140.25	0.2445	-0.0115	0.2142	0.2145
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	145.19	0.2621	-0.0117	0.2073	0.2074
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	150.13	0.2803	-0.0119	0.2207	0.221
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	160.25	0.3203	-0.0125	0.2639	0.2642
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	172.10	0.3707	-0.0137	0.2421	0.2425
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	180.00	0.4047	-0.0143	0.2380	0.2381
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	20.00	0.0064	0.0020	0.0313	0.0314
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	30.00	0.0129	0.0027	0.0433	0.0433
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	80.00	0.0779	0.0076	0.1068	0.1071
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	86.67	0.0911	0.0086	0.1185	0.1188
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	93.33	0.1055	0.0096	0.1282	0.1285
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	100.00	0.1211	0.0105	0.1381	0.1382
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	113.33	0.1554	0.0124	0.1561	0.1561
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	120.00	0.1741	0.0132	0.1643	0.1644
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	126.67	0.1939	0.0146	0.1723	0.1723
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	133.33	0.2148	0.0142	0.1811	0.1817
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	140.00	0.2366	0.0141	0.2060	0.206
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	140.25	0.2375	0.0140	0.2087	0.2087
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	145.19	0.2546	0.0119	0.2006	0.2009
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	150.13	0.2726	0.0102	0.2150	0.215
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	160.25	0.3118	0.0072	0.2571	0.2571
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	172.10	0.3611	0.0063	0.2513	0.2513
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	180.00	0.3945	0.0061	0.2747	0.2747
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	20.00	0.0065	-0.0019	0.0328	0.0328
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	30.00	0.0132	-0.0026	0.0438	0.0439
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	80.00	0.0786	0.0067	0.1089	0.1091
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	86.67	0.0919	0.0078	0.1196	0.1199
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	93.33	0.1065	0.0089	0.1296	0.1298
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	100.00	0.1221	0.0099	0.1393	0.1394
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	113.33	0.1568	0.0120	0.1575	0.1575
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	120.00	0.1756	0.0131	0.1654	0.1659
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	126.67	0.1956	0.0148	0.1758	0.1758
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	133.33	0.2166	0.0149	0.1831	0.1834
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	140.00	0.2386	0.0149	0.2057	0.2057
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	140.25	0.2395	0.0148	0.2079	0.2079
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	145.19	0.2567	0.0139	0.2038	0.204
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	150.13	0.2747	0.0131	0.2162	0.2165
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	160.25	0.3142	0.0120	0.2559	0.2561
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	172.10	0.3638	0.0130	0.2481	0.2485
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	180.00	0.3974	0.0134	0.2645	0.2645
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	20.00	0.0068	-0.0014	0.0331	0.0331
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	30.00	0.0137	-0.0018	0.0451	0.0451
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	80.00	0.0806	0.0040	0.1112	0.1112
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	86.67	0.0941	0.0049	0.1224	0.1224
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	93.33	0.109	0.0058	0.1326	0.1326
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	100.00	0.1249	0.0067	0.1424	0.1424
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	113.33	0.1602	0.0084	0.1609	0.161
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	120.00	0.1795	0.0094	0.1684	0.1686
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	126.67	0.1998	0.0110	0.1833	0.1834
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	133.33	0.2213	0.0114	0.1859	0.186
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	140.00	0.2435	0.0114	0.2113	0.2116
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	140.25	0.2445	0.0115	0.2142	0.2145
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	145.19	0.2621	0.0117	0.2073	0.2074

DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	150.13	0.2803	0.0119	0.2207	0.221
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	160.25	0.3203	0.0125	0.2639	0.2642
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	172.10	0.3707	0.0137	0.2421	0.2425
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	180.00	0.4047	0.0143	0.2380	0.2381
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	20.00	0.0064	-0.0014	0.0314	0.0314
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	30.00	0.0129	-0.0018	0.0434	0.0434
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	80.00	0.078	-0.0039	0.1073	0.1073
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	86.67	0.0912	0.0046	0.1191	0.1191
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	93.33	0.1056	0.0054	0.1289	0.1289
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	100.00	0.1212	0.0062	0.1386	0.1386
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	113.33	0.1556	0.0078	0.1567	0.1568
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	120.00	0.1743	0.0087	0.1639	0.164
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	126.67	0.1941	0.0102	0.1786	0.1788
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	133.33	0.215	0.0103	0.1810	0.1812
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	140.00	0.2368	0.0100	0.2067	0.2069
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	140.25	0.2378	0.0100	0.2093	0.2095
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	145.19	0.2548	-0.0100	0.2017	0.2019
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	150.13	0.2728	-0.0117	0.2150	0.2152
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	160.25	0.312	-0.0148	0.2569	0.257
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	172.10	0.3611	-0.0161	0.2363	0.2369
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	180.00	0.3943	-0.0166	0.2322	0.2322
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	20.00	0.0065	-0.0020	0.0328	0.0328
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	30.00	0.0132	-0.0026	0.0439	0.0439
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	80.00	0.0786	-0.0068	0.1089	0.1091
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	86.67	0.0919	0.0076	0.1196	0.1199
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	93.33	0.1065	0.0086	0.1295	0.1298
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	100.00	0.1221	0.0096	0.1391	0.1394
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	113.33	0.1568	0.0116	0.1572	0.1576
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	120.00	0.1756	0.0126	0.1658	0.1658
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	126.67	0.1956	0.0142	0.1754	0.1757
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	133.33	0.2166	0.0140	0.1831	0.1834
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	140.00	0.2386	0.0137	0.2053	0.2057
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	140.25	0.2395	0.0136	0.2077	0.2079
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	145.19	0.2568	0.0120	0.2037	0.2039
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	150.13	0.2747	0.0105	0.2167	0.2168
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	160.25	0.3142	-0.0090	0.2562	0.2564
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	172.10	0.3638	-0.0105	0.2482	0.2484
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	180.00	0.3974	-0.0111	0.2645	0.2646

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Mount Analysis Report

ATC Site Name	:	**Redding, CT**
ATC Site Number	:	**302522**
Engineering Number	:	**13699598_C8_07**
Mount Elevation	:	**162 ft**
Carrier	:	**Dish Wireless L.L.C.**
Carrier Site Name	:	**NJJER01161A**
Carrier Site Number	:	**NJJER01161A**
Site Location	:	**100 Old Redding Road** **Redding, CT 06896-2721** **41.2871128 , -73.43820646**
County	:	**Fairfield**
Date	:	**July 21, 2022**
Max Usage	:	**76%**
Result	:	**Pass**

Prepared By:
Brittany Hucks
Structural Engineer I

Brittany Hucks

Reviewed By:

COA: PEC.0001553

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Table of Contents

Introduction

The purpose of this report is to summarize results of the mount analysis performed for Dish Wireless L.L.C. at 162 ft.

Supporting Documents

Specifications Sheet	Commscope MTC3975083, dated March 17, 2021
Radio Frequency Data Sheet	RFDS ID #NJJER01161A, dated February 10, 2021
Reference Photos	Site photos from 2021

Analysis

This mount was analyzed using American Tower Corporation's Mount Analysis Program and RISA-3D

Basic Wind Speed:	116 mph (3-Second Gust)
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 1.00'' radial ice concurrent
Codes:	ANSI/TIA-222-H
Exposure Category:	B
Risk Category:	II
Topographic Factor Procedure:	Method 2
Feature:	Flat
Crest Height (H):	0 ft
Crest Length (L):	0 ft
Spectral Response:	Ss = 0.235, S1 = 0.057
Site Class:	D - Stiff Soil - Default
Live Loads:	Lm = 500 lbs, Lv = 250 lbs

Conclusion

Based on the analysis results, the antenna mount meets the requirements per the applicable codes listed above. The mount can support the equipment as described in this report.

- Analysis based on new installation of Commscope MTC3975083 V-Frame(s) (M4800R(8700)-6[6]).

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

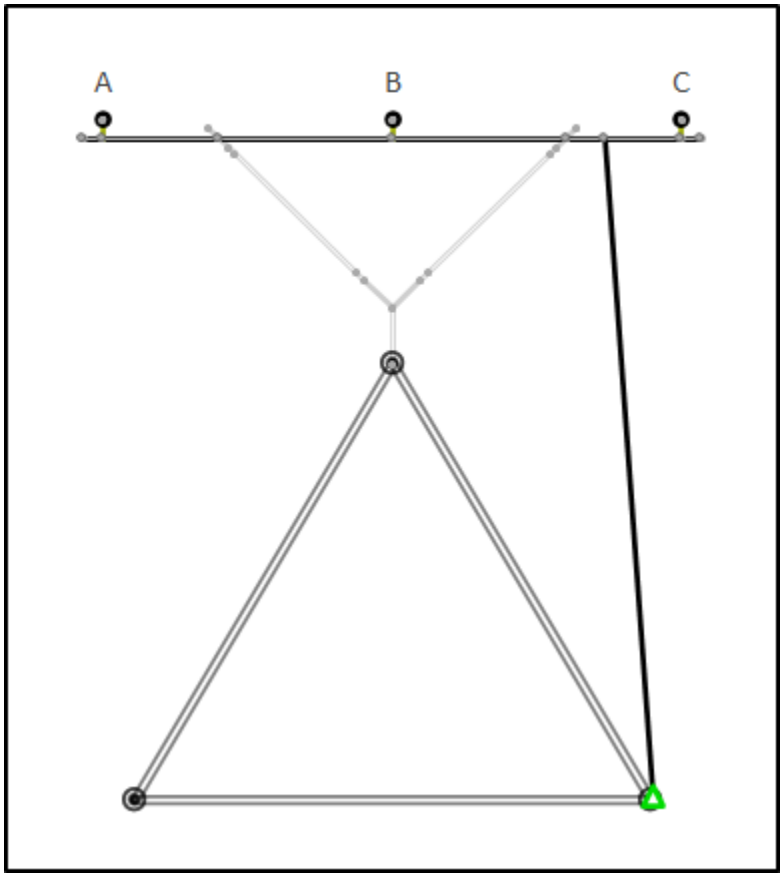
Application Loading

Mount Centerline (ft)	Equipment Centerline (ft)	Qty	Equipment Manufacturer & Model
162.0	162.0	3	JMA Wireless MX08FRO665-21
		1	Raycap RDIDC-9181-PF-48
		3	Fujitsu TA08025-B605
		3	Fujitsu TA08025-B604

Structure Usages

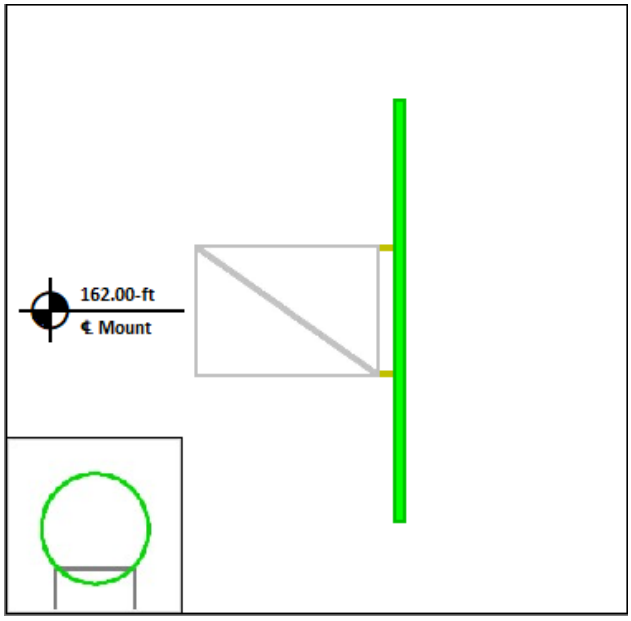
Structural Component	Controlling Usage	Pass/Fail
Horizontals	68%	Pass
Verticals	76%	Pass
Diagonals	23%	Pass
Tie-Backs	6%	Pass
Mount Pipes	8%	Pass

Mount Layout

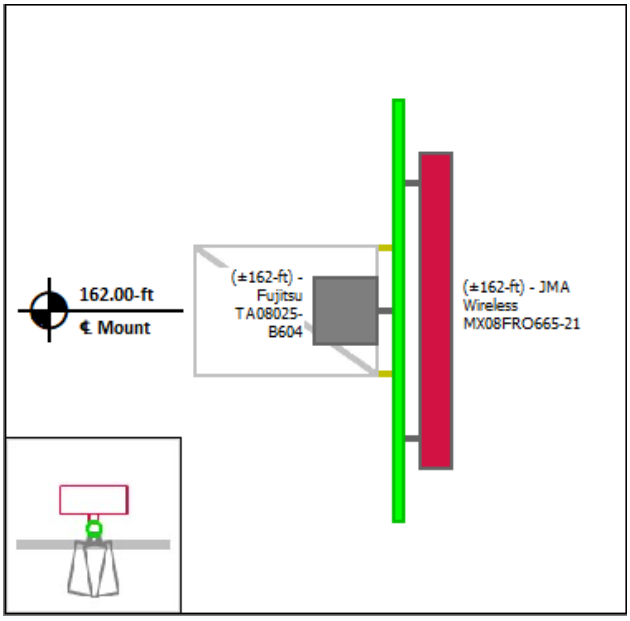


Equipment Layout

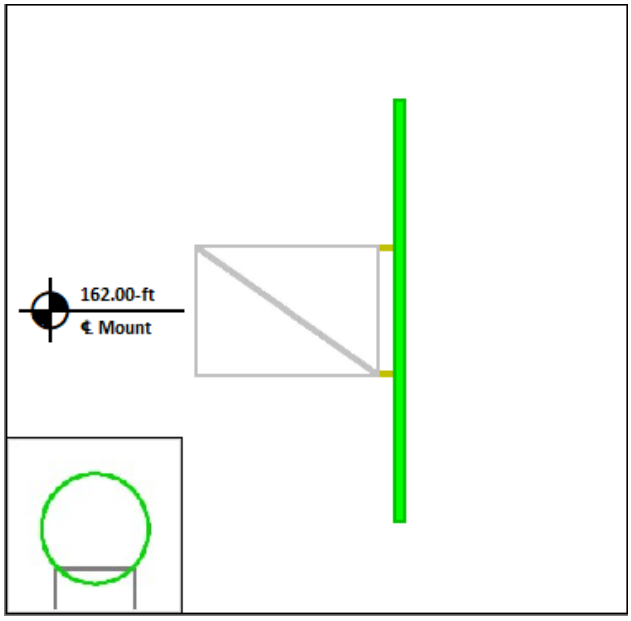
Mount Pipe A



Mount Pipe B



Mount Pipe C



Standard Conditions

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

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

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

American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

All connections are to be verified for condition and tightness by the installation contractor preceding any changes to the appurtenance mounting system and/or equipment attached to it.

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

Installation of all equipment and steel should be confirmed not to cause tower conflicts nor impede the tower climbing pegs.

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

AMERICAN TOWER®
CORPORATION

Site Number:	*302522*
Project Number:	*13699598_C8_07*
Carrier:	*Dish Wireless L.L.C.*
Mount Elevation:	*162 ft*
Date:	7/21/2022

Mount Analysis Force Calculations

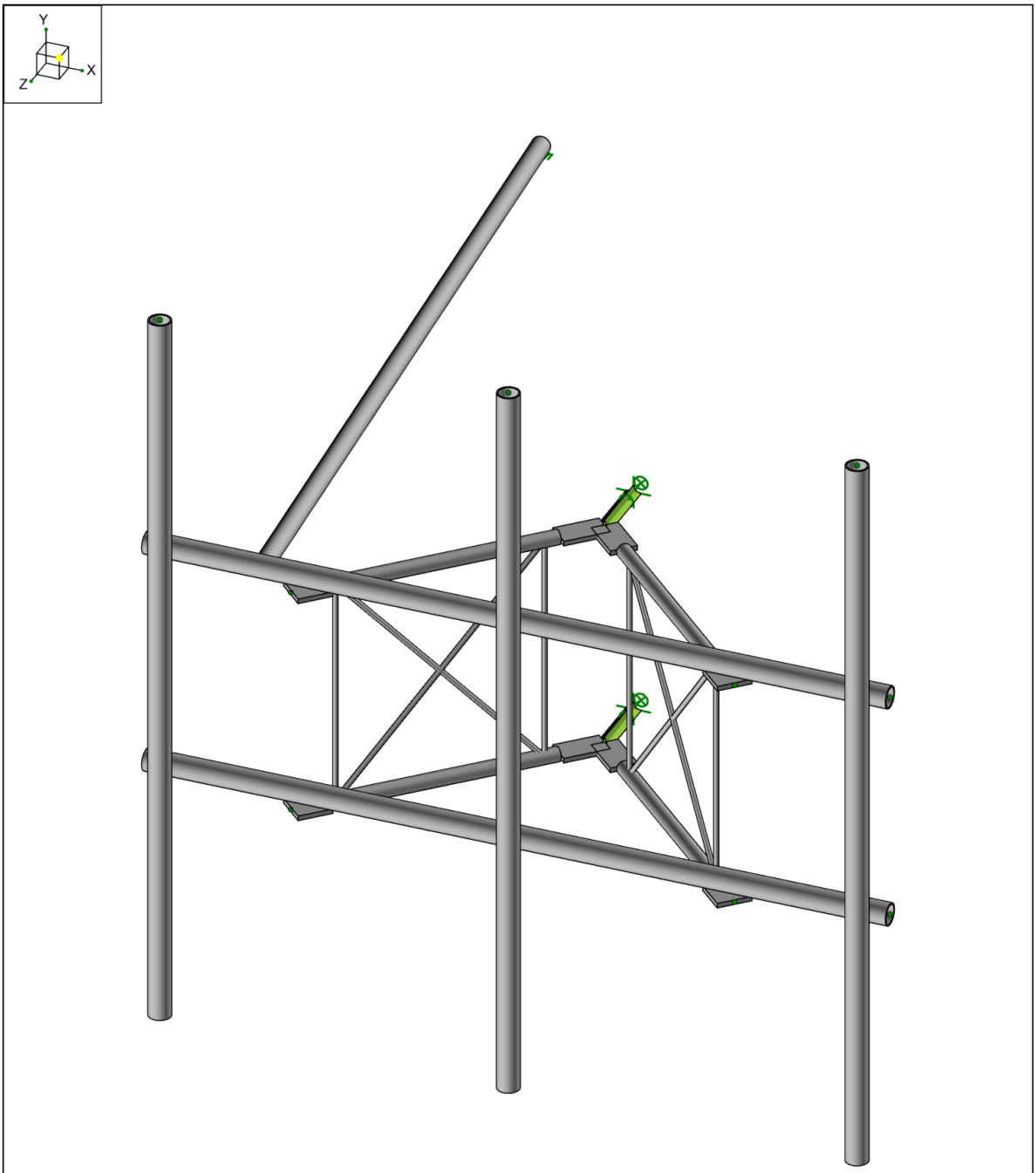
Wind & Ice Load Calculations			
Velocity Pressure Coefficient	K_z	1.13	
Topographic Factor	K_{zt}	1.00	
Rooftop Wind Speed-up Factor	K_s	1.00	
Shielding Factor	K_a	0.90	
Ground Elevation Factor	K_e	0.98	
Wind Direction Probability Factor	K_d	0.95	
Basic Wind Speed	V	116	mph
Velocity Pressure	q_z	36.2	psf
Height Escalation Factor	K_{iz}	1.17	
Thickness of Radial Glaze Ice	T_{iz}	1.17	in

Seismic Load Calculations			
Short Period DSRAP	S_{DS}	0.188	
1 Second DSRAP	S_{D1}	0.091	
Importance Factor	I	1.0	
Response Modification Coefficient	R	2.0	
Seismic Response Coefficient	C_S	0.094	
Amplification Factor	A	1.0	
Total Weight	W	553.1	lbs
Total Shear Force	V_S	52.0	lbs
Horizontal Seismic Load	Eh	52.0	lbs
Vertical Seismic Load	Ev	20.8	lbs

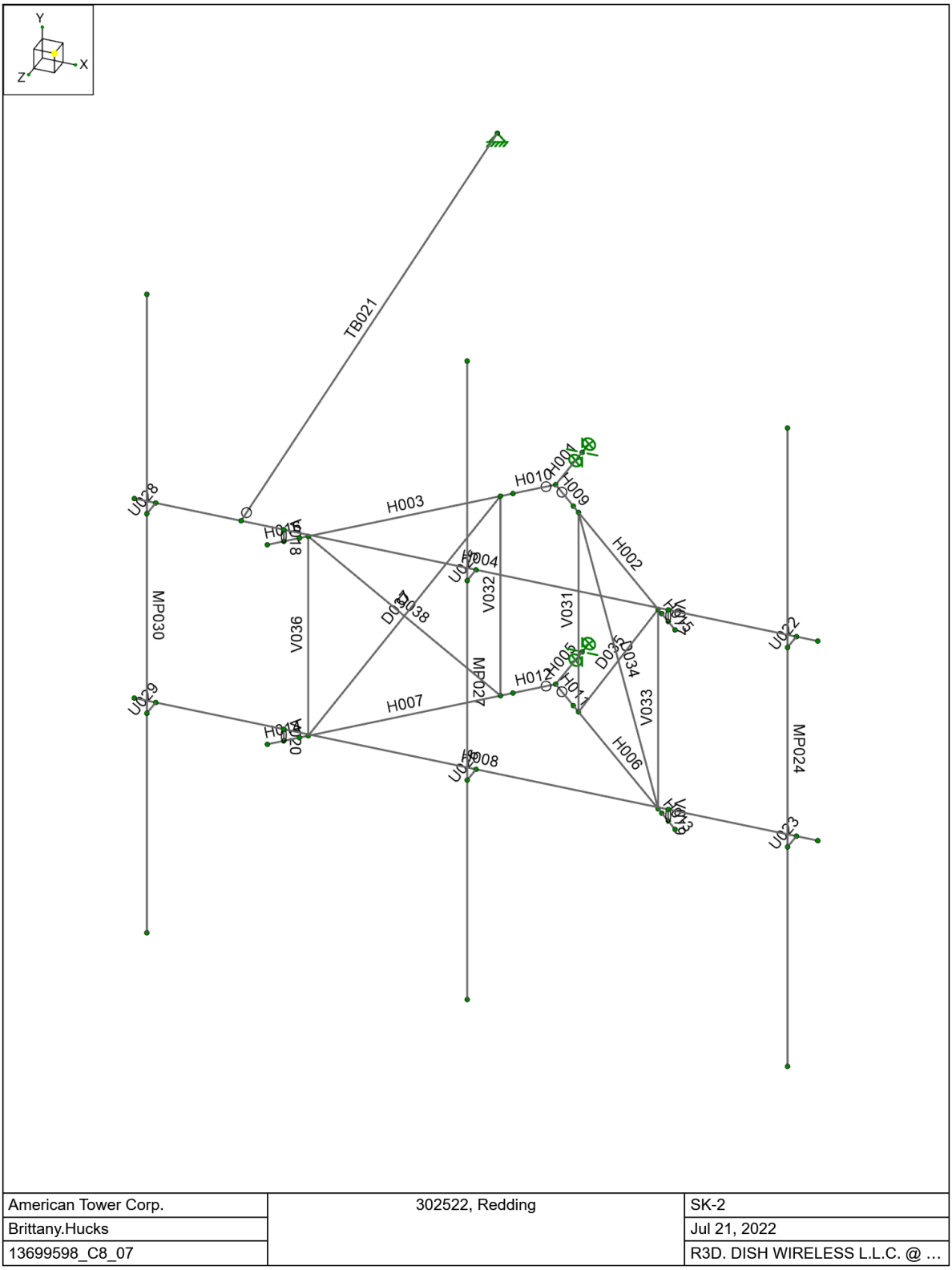
Antenna Calculations (Elevations per Application/RFDS)*

Equipment	Height	Width	Depth	Weight	EPA_N	EPA_T	EPA_{Ni}	EPA_{Ti}
Model #	in	in	in	lbs	sqft	sqft	sqft	sqft
JMA Wireless MX08FRO665-21	72.0	20.0	8.0	64.5	12.49	2.40	14.41	3.20
Raycap RDIDC-9181-PF-48	16.0	14.0	8.0	21.9	N/A	N/A	N/A	N/A
Fujitsu TA08025-B605	15.7	15.0	9.1	75.0	1.96	1.19	2.61	1.72
Fujitsu TA08025-B604	15.7	15.0	7.9	63.9	1.96	1.03	2.61	1.54

**** Equipment with EPA values N/A were not considered in the mount analysis***



American Tower Corp.	302522, Redding	SK-1
Brittany.Hucks		Jul 21, 2022
13699598_C8_07		R3D. DISH WIRELESS L.L.C. @ …



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Brittany.Hucks		Jul 21, 2022
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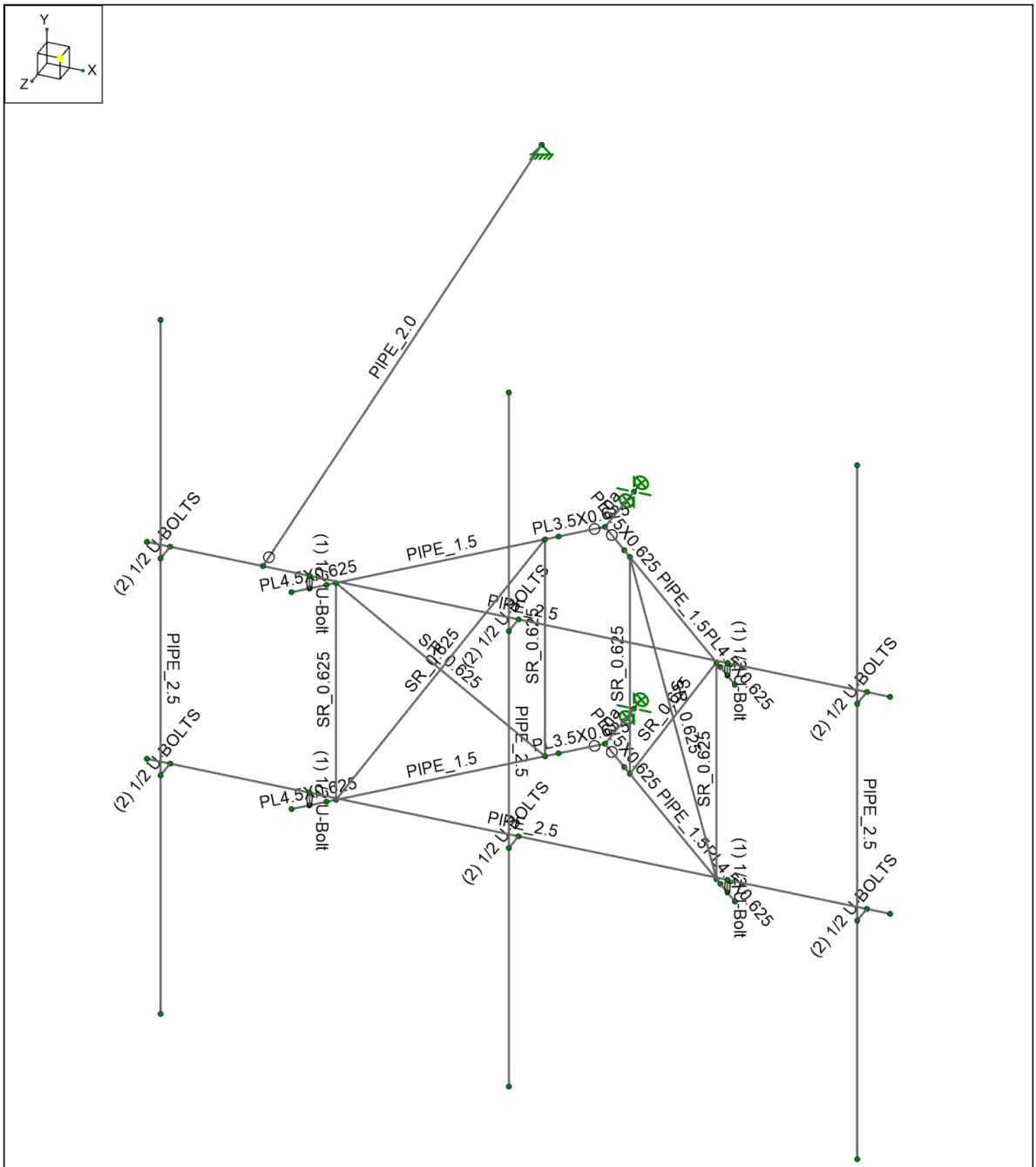

American Tower Corp.	302522, Redding	SK-3
Brittany.Hucks		Jul 21, 2022
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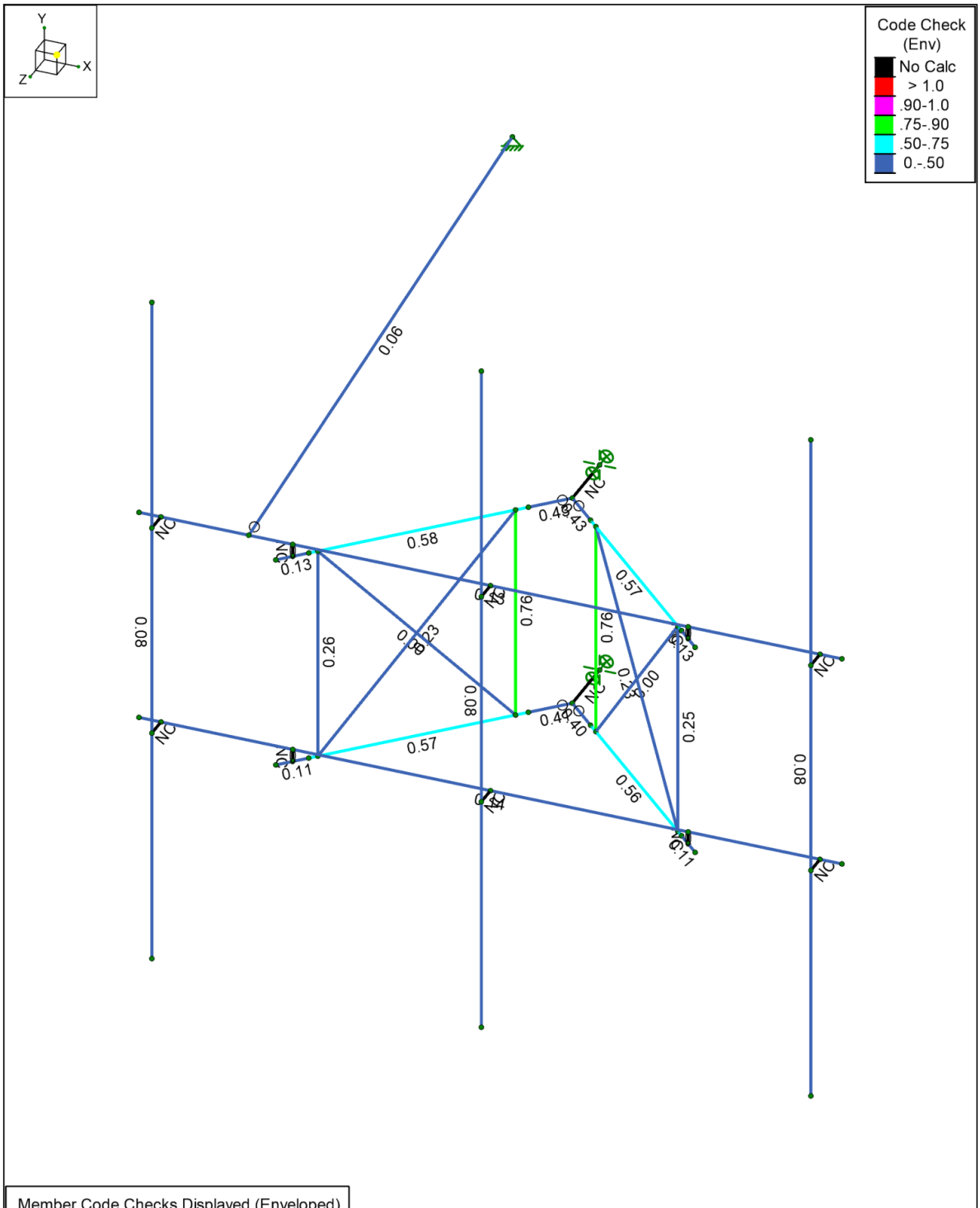
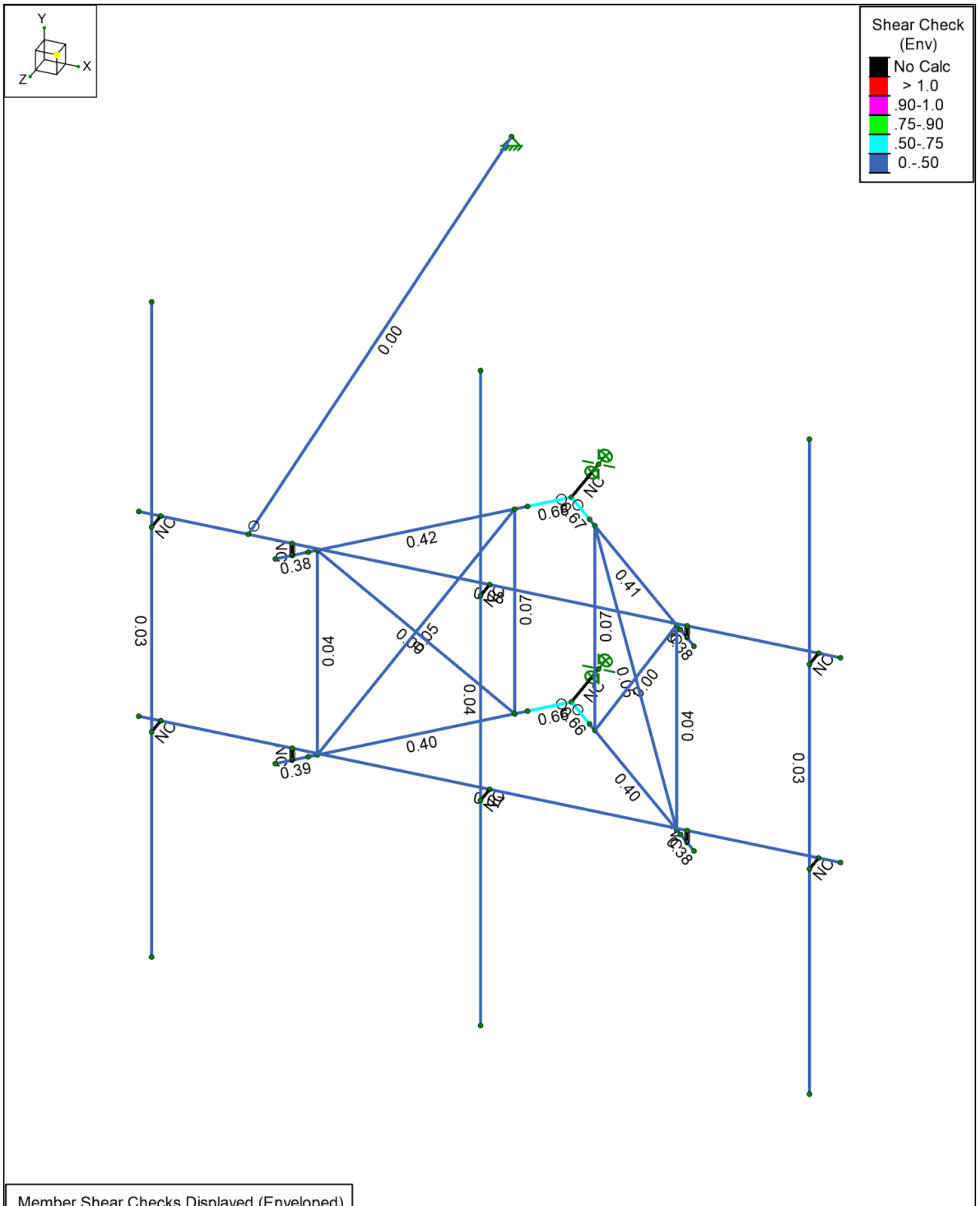


Member Code Checks Displayed (Enveloped)

American Tower Corp.	302522, Redding	SK-4
Brittany.Hucks		Jul 21, 2022
13699598_C8_07		R3D. DISH WIRELESS L.L.C. @ …



Member Shear Checks Displayed (Enveloped)

American Tower Corp.	302522, Redding	SK-5
Brittany.Hucks		Jul 21, 2022
13699598_C8_07		R3D. DISH WIRELESS L.L.C. @ …

Basic Load Cases

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed
1	D	DL	-1		4	
2	Di	IL			4	26
3	W 0	WL			4	37
4	W 30	WL			8	73
5	W 60	WL			8	73
6	W 90	WL			4	38
7	W 120	WL			8	73
8	W 150	WL			8	73
9	W 180	WL			4	37
10	W 210	WL			8	73
11	W 240	WL			8	73
12	W 270	WL			4	38
13	W 300	WL			8	73
14	W 330	WL			8	73
15	Wi 0	WL			4	37
16	Wi 30	WL			8	73
17	Wi 60	WL			8	73
18	Wi 90	WL			4	38
19	Wi 120	WL			8	73
20	Wi 150	WL			8	73
21	Wi 180	WL			4	37
22	Wi 210	WL			8	73
23	Wi 240	WL			8	73
24	Wi 270	WL			4	38
25	Wi 300	WL			8	73
26	Wi 330	WL			8	73
27	Ws 0	WL			4	37
28	Ws 30	WL			8	73
29	Ws 60	WL			8	73
30	Ws 90	WL			4	38
31	Ws 120	WL			8	73
32	Ws 150	WL			8	73
33	Ws 180	WL			4	37
34	Ws 210	WL			8	73
35	Ws 240	WL			8	73
36	Ws 270	WL			4	38
37	Ws 300	WL			8	73
38	Ws 330	WL			8	73
39	Ev -Y	ELY				26
40	Eh -Z	ELZ				26
41	Eh -X	ELX				26
42	Lv (1)	LL			1	
43	Lv (2)	LL			1	
44	Lv (3)	LL			1	
45	Lv (4)	LL			1	
46	Lv (5)	LL			1	
47	Lv (6)	LL			1	
48	Lv (7)	LL			1	
49	Lv (8)	LL			1	
50	Lv (9)	LL			1	
51	Lv (10)	LL			1	
52	Lv (11)	LL		1		
53	Lv (12)	LL		1		
54	Lv (13)	LL		1		
55	Lm (1)	LL		1		

Basic Load Cases (Continued)

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed
56	Lm (2)	LL		1		
57	Lm (3)	LL		1		

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4D	Yes	Y	DL	1.4						
2	1.2D + 1.0W [0°]	Yes	Y	DL	1.2	3	1				
3	1.2D + 1.0W [30°]	Yes	Y	DL	1.2	4	1				
4	1.2D + 1.0W [60°]	Yes	Y	DL	1.2	5	1				
5	1.2D + 1.0W [90°]	Yes	Y	DL	1.2	6	1				
6	1.2D + 1.0W [120°]	Yes	Y	DL	1.2	7	1				
7	1.2D + 1.0W [150°]	Yes	Y	DL	1.2	8	1				
8	1.2D + 1.0W [180°]	Yes	Y	DL	1.2	9	1				
9	1.2D + 1.0W [210°]	Yes	Y	DL	1.2	10	1				
10	1.2D + 1.0W [240°]	Yes	Y	DL	1.2	11	1				
11	1.2D + 1.0W [270°]	Yes	Y	DL	1.2	12	1				
12	1.2D + 1.0W [300°]	Yes	Y	DL	1.2	13	1				
13	1.2D + 1.0W [330°]	Yes	Y	DL	1.2	14	1				
14	0.9D + 1.0W [0°]	Yes	Y	DL	0.9	3	1				
15	0.9D + 1.0W [30°]	Yes	Y	DL	0.9	4	1				
16	0.9D + 1.0W [60°]	Yes	Y	DL	0.9	5	1				
17	0.9D + 1.0W [90°]	Yes	Y	DL	0.9	6	1				
18	0.9D + 1.0W [120°]	Yes	Y	DL	0.9	7	1				
19	0.9D + 1.0W [150°]	Yes	Y	DL	0.9	8	1				
20	0.9D + 1.0W [180°]	Yes	Y	DL	0.9	9	1				
21	0.9D + 1.0W [210°]	Yes	Y	DL	0.9	10	1				
22	0.9D + 1.0W [240°]	Yes	Y	DL	0.9	11	1				
23	0.9D + 1.0W [270°]	Yes	Y	DL	0.9	12	1				
24	0.9D + 1.0W [300°]	Yes	Y	DL	0.9	13	1				
25	0.9D + 1.0W [330°]	Yes	Y	DL	0.9	14	1				
26	1.2D + 1.0Di + 1.0Wi [0°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	15	1		
27	1.2D + 1.0Di + 1.0Wi [30°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	16	1		
28	1.2D + 1.0Di + 1.0Wi [60°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	17	1		
29	1.2D + 1.0Di + 1.0Wi [90°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	18	1		
30	1.2D + 1.0Di + 1.0Wi [120°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	19	1		
31	1.2D + 1.0Di + 1.0Wi [150°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	20	1		
32	1.2D + 1.0Di + 1.0Wi [180°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	21	1		
33	1.2D + 1.0Di + 1.0Wi [210°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	22	1		
34	1.2D + 1.0Di + 1.0Wi [240°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	23	1		
35	1.2D + 1.0Di + 1.0Wi [270°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	24	1		
36	1.2D + 1.0Di + 1.0Wi [300°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	25	1		
37	1.2D + 1.0Di + 1.0Wi [330°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	26	1		
38	1.2D + 1.0Ev + 1.0Eh [0°]	Yes	Y	DL	1.2	ELY	1	ELZ	1	ELX	0.001
39	1.2D + 1.0Ev + 1.0Eh [30°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.866	ELX	0.5
40	1.2D + 1.0Ev + 1.0Eh [60°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.5	ELX	0.866
41	1.2D + 1.0Ev + 1.0Eh [90°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.001	ELX	1
42	1.2D + 1.0Ev + 1.0Eh [120°]	Yes	Y	DL	1.2	ELY	1	ELZ	-0.5	ELX	0.866
43	1.2D + 1.0Ev + 1.0Eh [150°]	Yes	Y	DL	1.2	ELY	1	ELZ	-0.866	ELX	0.5
44	1.2D + 1.0Ev + 1.0Eh [180°]	Yes	Y	DL	1.2	ELY	1	ELZ	-1	ELX	0.001
45	1.2D + 1.0Ev + 1.0Eh [210°]	Yes	Y	DL	1.2	ELY	1	ELZ	-0.866	ELX	-0.5
46	1.2D + 1.0Ev + 1.0Eh [240°]	Yes	Y	DL	1.2	ELY	1	ELZ	-0.5	ELX	-0.866
47	1.2D + 1.0Ev + 1.0Eh [270°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.001	ELX	-1
48	1.2D + 1.0Ev + 1.0Eh [300°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.5	ELX	-0.866
49	1.2D + 1.0Ev + 1.0Eh [330°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.866	ELX	-0.5
50	0.9D + 1.0Ev + 1.0Eh [0°]	Yes	Y	DL	0.9	ELY	1	ELZ	1	ELX	0.001

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
51	0.9D + 1.0Ev + 1.0Eh [30°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.866	ELX	0.5
52	0.9D + 1.0Ev + 1.0Eh [60°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.5	ELX	0.866
53	0.9D + 1.0Ev + 1.0Eh [90°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.001	ELX	1
54	0.9D + 1.0Ev + 1.0Eh [120°]	Yes	Y	DL	0.9	ELY	1	ELZ	-0.5	ELX	0.866
55	0.9D + 1.0Ev + 1.0Eh [150°]	Yes	Y	DL	0.9	ELY	1	ELZ	-0.866	ELX	0.5
56	0.9D + 1.0Ev + 1.0Eh [180°]	Yes	Y	DL	0.9	ELY	1	ELZ	-1	ELX	0.001
57	0.9D + 1.0Ev + 1.0Eh [210°]	Yes	Y	DL	0.9	ELY	1	ELZ	-0.866	ELX	-0.5
58	0.9D + 1.0Ev + 1.0Eh [240°]	Yes	Y	DL	0.9	ELY	1	ELZ	-0.5	ELX	-0.866
59	0.9D + 1.0Ev + 1.0Eh [270°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.001	ELX	-1
60	0.9D + 1.0Ev + 1.0Eh [300°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.5	ELX	-0.866
61	0.9D + 1.0Ev + 1.0Eh [330°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.866	ELX	-0.5
62	1.2D + 1.5Lv(1)	Yes	Y	DL	1.2	42	1.5				
63	1.2D + 1.5Lv(2)	Yes	Y	DL	1.2	43	1.5				
64	1.2D + 1.5Lv(3)	Yes	Y	DL	1.2	44	1.5				
65	1.2D + 1.5Lv(4)	Yes	Y	DL	1.2	45	1.5				
66	1.2D + 1.5Lv(5)	Yes	Y	DL	1.2	46	1.5				
67	1.2D + 1.5Lv(6)	Yes	Y	DL	1.2	47	1.5				
68	1.2D + 1.5Lv(7)	Yes	Y	DL	1.2	48	1.5				
69	1.2D + 1.5Lv(8)	Yes	Y	DL	1.2	49	1.5				
70	1.2D + 1.5Lv(9)	Yes	Y	DL	1.2	50	1.5				
71	1.2D + 1.5Lv(10)	Yes	Y	DL	1.2	51	1.5				
72	1.2D + 1.5Lv(11)	Yes	Y	DL	1.2	52	1.5				
73	1.2D + 1.5Lv(12)	Yes	Y	DL	1.2	53	1.5				
74	1.2D + 1.5Lv(13)	Yes	Y	DL	1.2	54	1.5				
75	1.2D + 1.5Lm(1) + 1.0Wm [0°]	Yes	Y	DL	1.2	55	1.5	27	1		
76	1.2D + 1.5Lm(1) + 1.0Wm [30°]	Yes	Y	DL	1.2	55	1.5	28	1		
77	1.2D + 1.5Lm(1) + 1.0Wm [60°]	Yes	Y	DL	1.2	55	1.5	29	1		
78	1.2D + 1.5Lm(1) + 1.0Wm [90°]	Yes	Y	DL	1.2	55	1.5	30	1		
79	1.2D + 1.5Lm(1) + 1.0Wm [120°]	Yes	Y	DL	1.2	55	1.5	31	1		
80	1.2D + 1.5Lm(1) + 1.0Wm [150°]	Yes	Y	DL	1.2	55	1.5	32	1		
81	1.2D + 1.5Lm(1) + 1.0Wm [180°]	Yes	Y	DL	1.2	55	1.5	33	1		
82	1.2D + 1.5Lm(1) + 1.0Wm [210°]	Yes	Y	DL	1.2	55	1.5	34	1		
83	1.2D + 1.5Lm(1) + 1.0Wm [240°]	Yes	Y	DL	1.2	55	1.5	35	1		
84	1.2D + 1.5Lm(1) + 1.0Wm [270°]	Yes	Y	DL	1.2	55	1.5	36	1		
85	1.2D + 1.5Lm(1) + 1.0Wm [300°]	Yes	Y	DL	1.2	55	1.5	37	1		
86	1.2D + 1.5Lm(1) + 1.0Wm [330°]	Yes	Y	DL	1.2	55	1.5	38	1		
87	1.2D + 1.5Lm(2) + 1.0Wm [0°]	Yes	Y	DL	1.2	56	1.5	27	1		
88	1.2D + 1.5Lm(2) + 1.0Wm [30°]	Yes	Y	DL	1.2	56	1.5	28	1		
89	1.2D + 1.5Lm(2) + 1.0Wm [60°]	Yes	Y	DL	1.2	56	1.5	29	1		
90	1.2D + 1.5Lm(2) + 1.0Wm [90°]	Yes	Y	DL	1.2	56	1.5	30	1		
91	1.2D + 1.5Lm(2) + 1.0Wm [120°]	Yes	Y	DL	1.2	56	1.5	31	1		
92	1.2D + 1.5Lm(2) + 1.0Wm [150°]	Yes	Y	DL	1.2	56	1.5	32	1		
93	1.2D + 1.5Lm(2) + 1.0Wm [180°]	Yes	Y	DL	1.2	56	1.5	33	1		
94	1.2D + 1.5Lm(2) + 1.0Wm [210°]	Yes	Y	DL	1.2	56	1.5	34	1		
95	1.2D + 1.5Lm(2) + 1.0Wm [240°]	Yes	Y	DL	1.2	56	1.5	35	1		
96	1.2D + 1.5Lm(2) + 1.0Wm [270°]	Yes	Y	DL	1.2	56	1.5	36	1		
97	1.2D + 1.5Lm(2) + 1.0Wm [300°]	Yes	Y	DL	1.2	56	1.5	37	1		
98	1.2D + 1.5Lm(2) + 1.0Wm [330°]	Yes	Y	DL	1.2	56	1.5	38	1		
99	1.2D + 1.5Lm(3) + 1.0Wm [0°]	Yes	Y	DL	1.2	57	1.5	27	1		
100	1.2D + 1.5Lm(3) + 1.0Wm [30°]	Yes	Y	DL	1.2	57	1.5	28	1		
101	1.2D + 1.5Lm(3) + 1.0Wm [60°]	Yes	Y	DL	1.2	57	1.5	29	1		
102	1.2D + 1.5Lm(3) + 1.0Wm [90°]	Yes	Y	DL	1.2	57	1.5	30	1		
103	1.2D + 1.5Lm(3) + 1.0Wm [120°]	Yes	Y	DL	1.2	57	1.5	31	1		
104	1.2D + 1.5Lm(3) + 1.0Wm [150°]	Yes	Y	DL	1.2	57	1.5	32	1		
105	1.2D + 1.5Lm(3) + 1.0Wm [180°]	Yes	Y	DL	1.2	57	1.5	33	1		

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
106	1.2D + 1.5Lm(3) + 1.0Wm [210°]	Yes	Y	DL	1.2	57	1.5	34	1		
107	1.2D + 1.5Lm(3) + 1.0Wm [240°]	Yes	Y	DL	1.2	57	1.5	35	1		
108	1.2D + 1.5Lm(3) + 1.0Wm [270°]	Yes	Y	DL	1.2	57	1.5	36	1		
109	1.2D + 1.5Lm(3) + 1.0Wm [300°]	Yes	Y	DL	1.2	57	1.5	37	1		
110	1.2D + 1.5Lm(3) + 1.0Wm [330°]	Yes	Y	DL	1.2	57	1.5	38	1		

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	H001	N001	N002		RIGID	None	None	RIGID	Typical
2	H002	N019	N022		PIPE_1.5	Beam	None	A500 Gr. C	Typical
3	H003	N013	N016		PIPE_1.5	Beam	None	A500 Gr. C	Typical
4	H004	N005	N006		PIPE_2.5	Beam	None	A500 Gr. C	Typical
5	H005	N007	N008		RIGID	None	None	RIGID	Typical
6	H006	N020	N021		PIPE_1.5	Beam	None	A500 Gr. C	Typical
7	H007	N014	N015		PIPE_1.5	Beam	None	A500 Gr. C	Typical
8	H008	N011	N012		PIPE_2.5	Beam	None	A500 Gr. C	Typical
9	H009	N002	N019	90	PL3.5X0.625	Beam	None	A36	Typical
10	H010	N002	N013	90	PL3.5X0.625	Beam	None	A36	Typical
11	H011	N008	N020	90	PL3.5X0.625	Beam	None	A36	Typical
12	H012	N008	N014	90	PL3.5X0.625	Beam	None	A36	Typical
13	H013	N021	N024	90	PL4.5X0.625	Beam	None	A36	Typical
14	H014	N015	N018	90	PL4.5X0.625	Beam	None	A36	Typical
15	H015	N022	N023	90	PL4.5X0.625	Beam	None	A36	Typical
16	H016	N016	N017	90	PL4.5X0.625	Beam	None	A36	Typical
17	V017	N025	N003		(1) 1/2 U-Bolt	Column	None	A36	Typical
18	V018	N026	N004		(1) 1/2 U-Bolt	Column	None	A36	Typical
19	V019	N027	N009		(1) 1/2 U-Bolt	Column	None	A36	Typical
20	V020	N028	N010		(1) 1/2 U-Bolt	Column	None	A36	Typical
21	TB021	N030	N029		PIPE_2.0	Beam	None	A500 Gr. C	Typical
22	U022	N031	N034		(2) 1/2 U-BOLTS	Beam	None	A36	Typical
23	U023	N035	N036		(2) 1/2 U-BOLTS	Beam	None	A36	Typical
24	MP024	N037	N038		PIPE_2.5	Column	None	A500 Gr. C	Typical
25	U025	N033	N039		(2) 1/2 U-BOLTS	Beam	None	A36	Typical
26	U026	N040	N041		(2) 1/2 U-BOLTS	Beam	None	A36	Typical
27	MP027	N042	N043		PIPE_2.5	Column	None	A500 Gr. C	Typical
28	U028	N032	N044		(2) 1/2 U-BOLTS	Beam	None	A36	Typical
29	U029	N045	N046		(2) 1/2 U-BOLTS	Beam	None	A36	Typical
30	MP030	N047	N048		PIPE_2.5	Column	None	A500 Gr. C	Typical
31	V031	N050	N049		SR_0.625	Column	None	A36	Typical
32	V032	N052	N051		SR_0.625	Column	None	A36	Typical
33	V033	N053	N054		SR_0.625	Column	None	A36	Typical
34	D034	N053	N049		SR_0.625	Column	None	A36	Typical
35	D035	N050	N054		SR_0.625	Column	None	A36	Typical
36	V036	N056	N055		SR_0.625	Column	None	A36	Typical
37	D037	N056	N051		SR_0.625	Column	None	A36	Typical
38	D038	N052	N055		SR_0.625	Column	None	A36	Typical

Hot Rolled Steel Design Parameters

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Lcomp top [in]	L-Torque [in]	K y-y	K z-z	Function
1	H002	PIPE_1.5	30			Lbyy		0.8	1	Lateral
2	H003	PIPE_1.5	30			Lbyy		0.8	1	Lateral
3	H004	PIPE_2.5	96			Lbyy		1	1	Lateral
4	H006	PIPE_1.5	30			Lbyy		0.8	1	Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Lcomp top [in]	L-Torque [in]	K y-y	K z-z	Function
5	H007	PIPE_1.5	30			Lbyy		0.8	1	Lateral
6	H008	PIPE_2.5	96			Lbyy		1	1	Lateral
7	H009	PL3.5X0.625	6			Lbyy		2.1	2.1	Lateral
8	H010	PL3.5X0.625	6			Lbyy		2.1	2.1	Lateral
9	H011	PL3.5X0.625	6			Lbyy		2.1	2.1	Lateral
10	H012	PL3.5X0.625	6			Lbyy		2.1	2.1	Lateral
11	H013	PL4.5X0.625	4.5			Lbyy		2.1	2.1	Lateral
12	H014	PL4.5X0.625	4.5			Lbyy		2.1	2.1	Lateral
13	H015	PL4.5X0.625	4.5			Lbyy		2.1	2.1	Lateral
14	H016	PL4.5X0.625	4.5			Lbyy		2.1	2.1	Lateral
15	V017	(1) 1/2 U-Bolt	1.75			Lbyy		0.65	0.65	Lateral
16	V018	(1) 1/2 U-Bolt	1.75			Lbyy		0.65	0.65	Lateral
17	V019	(1) 1/2 U-Bolt	1.75			Lbyy		0.65	0.65	Lateral
18	V020	(1) 1/2 U-Bolt	1.75			Lbyy		0.65	0.65	Lateral
19	TB021	PIPE_2.0	105.268			Lbyy		1	1	Lateral
20	U022	(2) 1/2 U-BOLTS	3			Lbyy		0.5	0.5	Lateral
21	U023	(2) 1/2 U-BOLTS	3			Lbyy		0.5	0.5	Lateral
22	MP024	PIPE_2.5	96	Segment	Segment	Lbyy	Segment	2.1	2.1	Lateral
23	U025	(2) 1/2 U-BOLTS	3			Lbyy		0.5	0.5	Lateral
24	U026	(2) 1/2 U-BOLTS	3			Lbyy		0.5	0.5	Lateral
25	MP027	PIPE_2.5	96	Segment	Segment	Lbyy	Segment	2.1	2.1	Lateral
26	U028	(2) 1/2 U-BOLTS	3			Lbyy		0.5	0.5	Lateral
27	U029	(2) 1/2 U-BOLTS	3			Lbyy		0.5	0.5	Lateral
28	MP030	PIPE_2.5	96	Segment	Segment	Lbyy	Segment	2.1	2.1	Lateral
29	V031	SR_0.625	30			Lbyy		0.65	0.65	Lateral
30	V032	SR_0.625	30			Lbyy		0.65	0.65	Lateral
31	V033	SR_0.625	30			Lbyy		0.65	0.65	Lateral
32	D034	SR_0.625	40.361			Lbyy		0.65	0.65	Lateral
33	D035	SR_0.625	40.361			Lbyy		0.65	0.65	Lateral
34	V036	SR_0.625	30			Lbyy		0.65	0.65	Lateral
35	D037	SR_0.625	40.361			Lbyy		0.65	0.65	Lateral
36	D038	SR_0.625	40.361			Lbyy		0.65	0.65	Lateral

Node Boundary Conditions

	Node Label	X [lb/in]	Y [lb/in]	Z [lb/in]	Z Rot [k-in/rad]
1	N001	Reaction	Reaction	Reaction	Reaction
2	N007	Reaction	Reaction	Reaction	Reaction
3	N030	Reaction	Reaction	Reaction	

Member Advanced Data

	Label	I Release	J Release	T/C Only	Physical	Deflection Ratio Options	Activation	Seismic DR
1	H001				Yes	** NA **		None
2	H002				Yes	N/A		None
3	H003				Yes	N/A		None
4	H004				Yes	N/A		None
5	H005				Yes	** NA **		None
6	H006				Yes	N/A		None
7	H007				Yes	N/A		None
8	H008				Yes	N/A		None
9	H009	OOOOXO			Yes	Default		None
10	H010	OOOOXO			Yes	Default		None
11	H011	OOOOXO			Yes	Default		None
12	H012	OOOOXO			Yes	Default		None

Member Advanced Data (Continued)

	Label	I Release	J Release	T/C Only	Physical	Deflection Ratio Options	Activation	Seismic DR
13	H013				Yes	N/A		None
14	H014				Yes	N/A		None
15	H015				Yes	N/A		None
16	H016				Yes	N/A		None
17	V017	OOOXOO			Yes	** NA **	Exclude	None
18	V018	OOOXOO			Yes	** NA **	Exclude	None
19	V019	OOOXOO			Yes	** NA **	Exclude	None
20	V020	OOOXOO			Yes	** NA **	Exclude	None
21	TB021		BenPIN		Yes	N/A		None
22	U022				Yes	N/A	Exclude	None
23	U023				Yes	N/A	Exclude	None
24	MP024				Yes	** NA **		None
25	U025				Yes	N/A	Exclude	None
26	U026				Yes	N/A	Exclude	None
27	MP027				Yes	** NA **		None
28	U028				Yes	N/A	Exclude	None
29	U029				Yes	N/A	Exclude	None
30	MP030				Yes	** NA **		None
31	V031				Yes	** NA **		None
32	V032				Yes	** NA **		None
33	V033				Yes	** NA **		None
34	D034			Tension Only	Yes	** NA **		None
35	D035			Tension Only	Yes	** NA **		None
36	V036				Yes	** NA **		None
37	D037			Tension Only	Yes	** NA **		None
38	D038			Tension Only	Yes	** NA **		None

Hot Rolled Steel Properties

	Label	E [psi]	G [psi]	Nu	Therm. Coeff. [1e^{5}°F^{-1}]	Density [lb/ft^{3}]	Yield [psi]	Ry	Fu [psi]	Rt
1	A36	2.9e+07	1.115e+07	0.3	0.65	490	36000	1.5	58000	1.2
2	A500 Gr. C	2.9e+07	1.115e+07	0.3	0.65	490	46000	1.4	62000	1.3
3	A53 Gr. B	2.9e+07	1.115e+07	0.3	0.65	490	35000	1.6	60000	1.2

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N001	max	1098.994	103	770.864	89	447.775	24	0	110	0	110	94.895	77
2		min	-1060.543	85	241.18	24	-1825.888	30	0	1	0	1	-98.311	109
3	N007	max	1054.719	79	610.058	83	1754.601	87	0	110	0	110	91.803	77
4		min	-1092.661	109	219.369	15	164.448	20	0	1	0	1	-95.063	109
5	N030	max	79.328	18	41.476	34	783.329	4	0	110	0	110	0	110
6		min	-80.005	24	12.694	16	-783.357	10	0	1	0	1	0	1
7	Totals:	max	746.737	18	1394.333	103	916.742	14						
8		min	-746.737	24	483.249	16	-916.742	8						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
1	H002	PIPE_1.5	0.569	1.563	83	0.413	0		76	26562.555	31008.6	1452.45	1452.45	2.095	H3-6
2	H003	PIPE_1.5	0.583	1.563	103	0.417	0		109	26562.555	31008.6	1452.45	1452.45	2.096	H3-6
3	H004	PIPE_2.5	0.131	48	95	0.079	75		6	33487.322	66654	4726.5	4726.5	1.739	H1-1b
4	H006	PIPE_1.5	0.556	1.563	77	0.397	0		76	26562.555	31008.6	1452.45	1452.45	2.076	H3-6
5	H007	PIPE_1.5	0.568	1.563	109	0.401	0		109	26562.555	31008.6	1452.45	1452.45	2.076	H3-6
6	H008	PIPE_2.5	0.135	48	89	0.07	75		107	33487.322	66654	4726.5	4726.5	1.786	H1-1b

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
7	H009	PL3.5X0.625	0.425	6	83	0.672	6	y	76	54826.037	70875	922.852	5167.969	1.101	H1-1b
8	H010	PL3.5X0.625	0.434	6	103	0.677	0.187	y	109	54826.037	70875	922.852	5167.969	1.1	H1-1b
9	H011	PL3.5X0.625	0.399	6	77	0.658	0.187	y	76	54826.037	70875	922.852	5167.969	1.086	H1-1b
10	H012	PL3.5X0.625	0.407	6	109	0.663	6	y	109	54826.037	70875	922.852	5167.969	1.085	H1-1b
11	H013	PL4.5X0.625	0.107	0	83	0.382	0.281	y	76	78870.627	91125	1186.523	8542.969	3	H1-1b
12	H014	PL4.5X0.625	0.109	0	103	0.385	2.156	y	109	78870.627	91125	1186.523	8542.969	3	H1-1b
13	H015	PL4.5X0.625	0.126	0	81	0.379	2.156	y	75	78870.627	91125	1186.523	8542.969	3	H1-1b
14	H016	PL4.5X0.625	0.13	0	103	0.381	2.156	y	110	78870.627	91125	1186.523	8542.969	3	H1-1b
15	TB021	PIPE_2.0	0.062	0	4	0.003	105.268		35	12782.583	42228	2459.85	2459.85	1.136	H1-1b*
16	MP024	PIPE_2.5	0.079	33	80	0.026	33		80	46563.382	66654	4726.5	4726.5	3	H1-1b
17	MP027	PIPE_2.5	0.078	33	7	0.043	33		107	46563.382	66654	4726.5	4726.5	3	H1-1b
18	MP030	PIPE_2.5	0.08	33	106	0.026	33		103	46563.382	66654	4726.5	4726.5	3	H1-1b
19	V031	SR_0.625	0.758	0	75	0.07	30		77	4378.243	9940.196	103.544	103.544	2.269	H1-1b
20	V032	SR_0.625	0.765	0	110	0.073	30		107	4378.243	9940.196	103.544	103.544	2.268	H1-1b
21	V033	SR_0.625	0.253	30	79	0.038	30		103	4378.243	9940.196	103.544	103.544	2.278	H1-1b
22	D034	SR_0.625	0.23	40.361	79	0.049	0		77	2458.567	9940.196	103.544	103.544	1.981	H1-1a*
23	D035	SR_0.625	0	40.361	110	0	40.361		110	2458.567	9940.196	103.544	103.544	1	H1-1a
24	V036	SR_0.625	0.257	30	107	0.038	0		101	4378.243	9940.196	103.544	103.544	2.278	H1-1b
25	D037	SR_0.625	0.234	40.361	107	0.05	0		109	2458.567	9940.196	103.544	103.544	1.983	H1-1a*
26	D038	SR_0.625	0	40.361	110	0	40.361		110	2458.567	9940.196	103.544	103.544	1	H1-1a

APPROVED
By Pawan Madahar at 5:20 pm, Jul 26, 2022

Pinnacle Telecom Group

Professional and Technical Services

Antenna Site FCC RF Compliance Assessment and Report for Municipal Submission

Prepared for:	DISH Wireless, LLC
Site ID:	NJJER01161A
Site Address:	100 Old Redding Road Redding, CT
Latitude:	N 41.28708333
Longitude:	W 73.4381999999
Structure type:	Lattice Tower
Report date:	July 26, 2022
Compliance Conclusion:	DISH Wireless, LLC will be in compliance with the rules and regulations as described in OET Bulletin 65, following the implementation of the proposed mitigation as detailed in the report.

14 Ridgedale Avenue - Suite 260 • Cedar Knolls, NJ 07927 • 973-451-1630

Contents

Introduction and Summary

At the request of DISH Wireless, LLC ("DISH"), Pinnacle Telecom Group has performed an independent expert assessment of radiofrequency (RF) levels and related FCC compliance for proposed wireless base station antenna operations on an existing lattice tower located at 100 Old Redding Road in Redding, CT. DISH refers to the antenna site by the code "NJJER01161A", and its proposed operation involves directional panel antennas and transmission in the 600 MHz, 2000 MHz and 2100 MHz frequency bands licensed to it by the FCC.

The FCC requires all wireless antenna operators to perform an assessment of potential human exposure to radiofrequency (RF) fields emanating from all the transmitting antennas at a site whenever antenna operations are added or modified, and to ensure compliance with the Maximum Permissible Exposure (MPE) limit in the FCC's regulations. In this case, the compliance assessment needs to take into account the RF effects of other existing antenna operations at the site by AT&T, Sprint, T-Mobile, Verizon Wireless, State of Connecticut, Eversource Energy Service Company, Northwest Connecticut Public Safey Comm. Center, Inc., Redding Police Department and the Town of Redding Police. Note that FCC regulations require any future antenna collocators to assess and assure continuing compliance based on the cumulative effects of all then-proposed and then-existing antennas at the site.

This report describes a mathematical analysis of RF levels resulting around the site in areas of unrestricted public access, that is, at street level around the site. The compliance analysis employs a standard FCC formula for calculating the effects of the antennas in a very conservative manner, in order to overstate the RF levels and to ensure "safe-side" conclusions regarding compliance with the FCC limit for safe continuous exposure of the general public.

The results of a compliance assessment can be described in layman's terms by expressing the calculated RF levels as simple percentages of the FCC MPE limit. If the normalized reference for that limit is 100 percent, then calculated RF levels higher than 100 percent indicate the MPE limit is exceeded and there is a need to mitigate the potential exposure. On the other hand, calculated RF levels

consistently below 100 percent serve as a clear and sufficient demonstration of compliance with the MPE limit. We can (and will) also describe the overall worst-case result via the “plain-English” equivalent “times-below-the-limit” factor.

The result of the RF compliance assessment in this case is as follows:

- At street level, the conservatively calculated maximum RF level from the combination of proposed and existing antenna operations at the site is 6.5844 percent of the FCC general population MPE limit – well below the 100-percent reference for compliance. In other words, the worst-case calculated RF level – intentionally and significantly overstated by the calculations – is still more than 15 times below the FCC limit for safe, continuous exposure of the general public.
- A supplemental analysis of the RF levels at the same height as the DISH antennas indicate that the FCC MPE limit is potentially exceeded. Therefore, it is recommended that three Caution signs be installed at the base of the tower. In addition, a NOC Information sign is to be installed at the base of the lattice tower.
- The results of the calculations, along with the proposed mitigation, combine to satisfy the FCC requirements and associated guidelines on RF compliance at street level around the site and on the subject roof. Moreover, because of the significant conservatism incorporated in the analysis, RF levels actually caused by the antennas will be lower than these calculations indicate.

The remainder of this report provides the following:

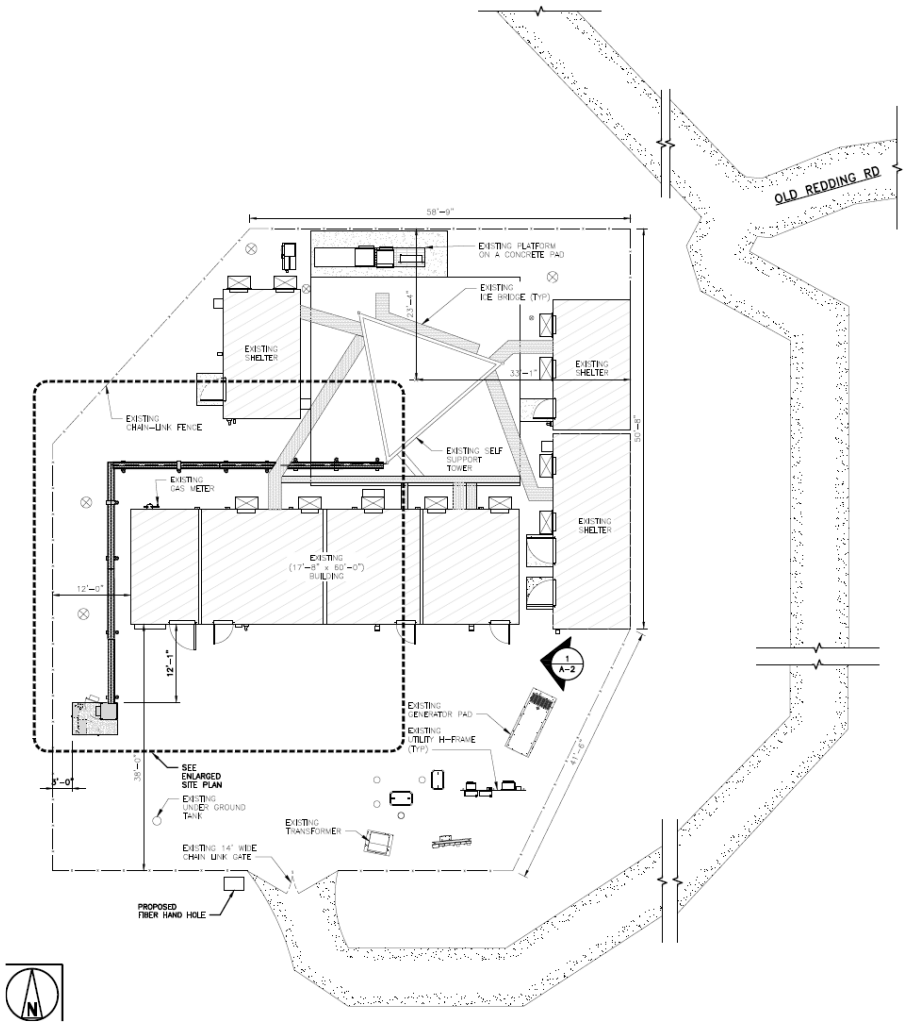
- relevant technical data on the proposed DISH antenna operations at the site, as well as on the other existing antenna operations;
- a description of the applicable FCC mathematical model for calculating RF levels, and application of the relevant technical data to that model;
- analysis of the results of the calculations against the FCC MPE limit, and the compliance conclusion for the site.

In addition, four Appendices are included. Appendix A provides information on the documents used to prepare the analysis. Appendix B provides background on the FCC MPE limit. Appendix C details the proposed mitigation to satisfy the FCC requirements and associated guidelines on RF compliance. Appendix D provides a summary of the qualifications of the expert certifying FCC compliance for this site.

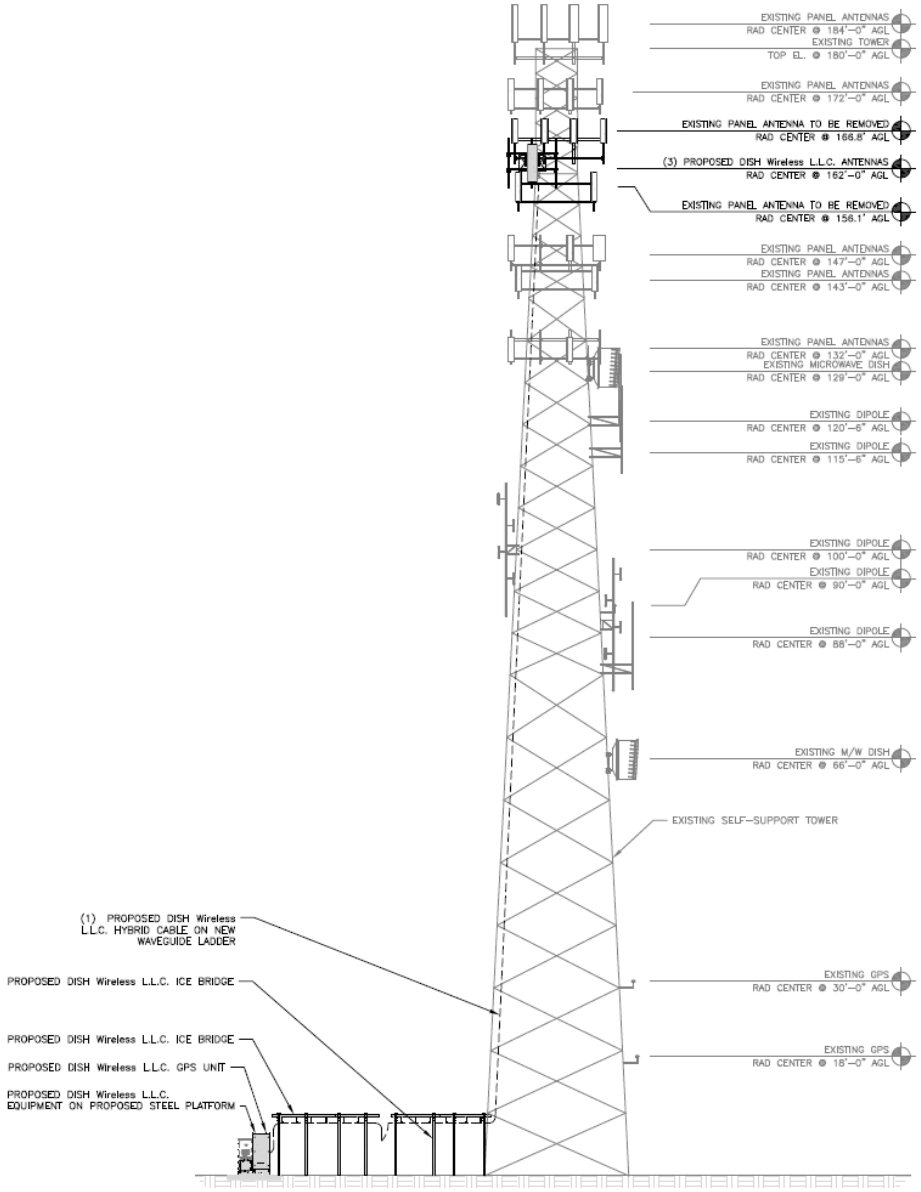
Antenna and Transmission Data

The plan and elevation views that follow, extracted from the site drawings, illustrate the mounting positions of the DISH antennas at the site.

Plan View:



Elevation View:



The table that follows summarizes the relevant data for the proposed DISH antenna operations. Note that the "Z" height references the centerline of the antenna.

Ant. ID	Carrier	Antenna Manufacturer	Antenna Model	Type	Freq (MHz)	Ant. Dim. (ft.)	Total Input Power (watts)	Total ERP (watts)	Z AGL (ft)	Ant. Gain (dBd)	B/W	Azimuth	EDT	MDT
❶	DISH	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	162	12.46	64	50	2	0
❶	DISH	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	162	16.66	67	50	2	0
❶	DISH	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	162	16.66	67	50	2	0
❷	DISH	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	162	12.46	64	200	2	0
❷	DISH	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	162	16.66	67	200	2	0
❷	DISH	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	162	16.66	67	200	2	0
❸	DISH	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	162	12.46	64	300	2	0
❸	DISH	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	162	16.66	67	300	2	0
❸	DISH	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	162	16.66	67	300	2	0

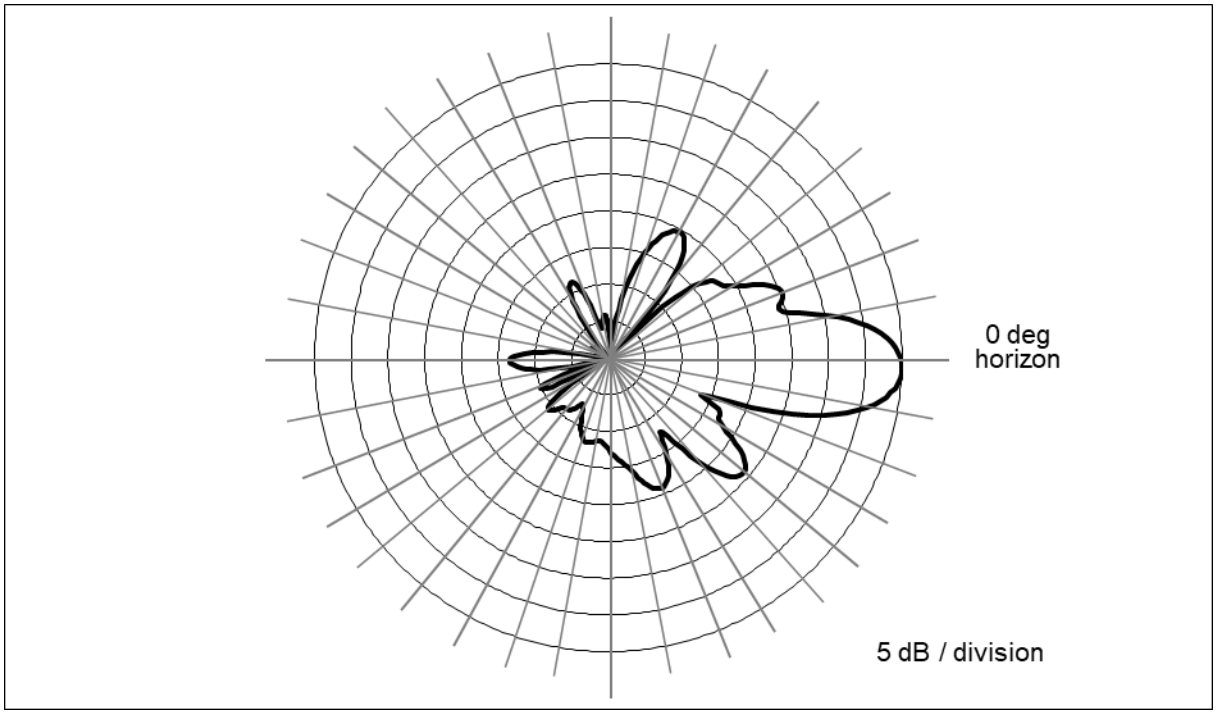
The area below the antennas, at street level, is of interest in terms of potential "uncontrolled" exposure of the general public, so the antenna's vertical-plane emission characteristic is used in the calculations, as it is a key determinant of the relative amount of RF emissions in the "downward" direction.

By way of illustration, Figure 1 that follows shows the vertical-plane radiation pattern of the proposed antenna model in the 600 MHz frequency band. In this type of antenna radiation pattern diagram, the antenna is effectively pointed at the three o'clock position (the horizon) and the relative strength of the pattern at different angles is described using decibel units.

Note that the use of a decibel scale to describe the relative pattern at different angles actually serves to significantly understate the actual focusing effects of the antenna. Where the antenna pattern reads 20 dB the relative RF energy emitted at the corresponding downward angle is 1/100th of the maximum that occurs in the main beam (at 0 degrees); at 30 dB, the energy is only 1/1000th of the maximum.

Finally, note that the automatic pattern-scaling feature of our internal software may skew side-by-side visual comparisons of different antenna models, or even different parties' depictions of the same antenna model.

Figure 1. Commscope FFVV-65B-R2 – 600 MHz Vertical-plane Pattern



As noted at the outset, there are existing antenna operations to include in the compliance assessment. For each of the wireless operators, we will conservatively assume operation with maximum channel capacity and at maximum transmitter power per channel to be used by each wireless operator in each of their respective FCC-licensed frequency bands. For each of the other operators, we will rely on the transmission parameters in their respective FCC licenses.

The table that follows summarizes the relevant data for the collocated antenna operations.

Carrier	*Antenna Manufacturer*	*Antenna Model*	*Type*	*Freq (MHz)*	*Total ERP (watts)*	*Ant. Gain (dBd)*	*Azimuth*
AT&T	Generic	Generic	Panel	700	4945	11.26	N/A
AT&T	Generic	Generic	Panel	850	2400	11.76	N/A
AT&T	Generic	Generic	Panel	1900	5756	15.56	N/A
AT&T	Generic	Generic	Panel	2100	5890	15.66	N/A
AT&T	Generic	Generic	Panel	2300	4131	16.16	N/A
Sprint	Generic	Generic	Panel	800	2168	13.36	N/A
Sprint	Generic	Generic	Panel	1900	6168	15.86	N/A
Sprint	Generic	Generic	Panel	2500	4669	15.90	N/A
T-Mobile	Generic	Generic	Panel	600	3163	12.96	N/A
T-Mobile	Generic	Generic	Panel	700	867	13.36	N/A
T-Mobile	Generic	Generic	Panel	1900	4123	15.36	N/A
T-Mobile	Generic	Generic	Panel	1900	1452	15.60	N/A
T-Mobile	Generic	Generic	Panel	2100	4626	15.86	N/A
T-Mobile	Generic	Generic	Panel	1900	1419	15.50	N/A
T-Mobile	Generic	Generic	Panel	2500	12804	22.35	N/A
Verizon Wireless	Generic	Generic	Panel	746	2400	11.76	N/A
Verizon Wireless	Generic	Generic	Panel	869	5166	12.36	N/A
Verizon Wireless	Generic	Generic	Panel	1900	5372	15.26	N/A
Verizon Wireless	Generic	Generic	Panel	2100	5625	15.46	N/A
State of Connecticut	Generic	Generic	DISH	6000	299	37.76	N/A
State of Connecticut	Generic	Generic	DISH	6000	119	37.76	N/A
State of Connecticut	Generic	Generic	DISH	6000	825	36.86	N/A
State of Connecticut	Generic	Generic	DISH	6000	1015	37.76	N/A
State of Connecticut	Generic	Generic	Panel	859	200	6.86	N/A
State of Connecticut	Generic	Generic	Panel	851	174	6.86	N/A
State of Connecticut	Generic	Generic	Panel	853	174	6.86	N/A
State of Connecticut	Generic	Generic	Panel	806	35	7.86	N/A
State of Connecticut	Generic	Generic	Panel	851	174	8.36	N/A
State of Connecticut	Generic	Generic	Panel	851	174	8.36	N/A
State of Connecticut	Generic	Generic	Panel	769	174	7.86	N/A
State of Connecticut	Generic	Generic	Panel	769	100	8.36	N/A
Eversource Energy	Generic	Generic	Omni	37	370	0.0	N/A
Eversource Energy	Generic	Generic	Omni	937	240	9.0	N/A
Northwest CT Public Safety Comm Ctr.	Generic	Generic	Omni	462	315	3.0	N/A

Carrier	*Antenna Manufacturer*	*Antenna Model*	*Type*	*Freq (MHz)*	*Total ERP (watts)*	*Ant. Gain (dBd)*	*Azimuth*
Redding Police Department	Generic	Generic	Omni	156	35	0.0	N/A
Town of Redding Police	Generic	Generic	Omni	154	16.5	0.0	N/A

Compliance Analysis

FCC Office of Engineering and Technology Bulletin 65 ("OET Bulletin 65") provides guidelines for mathematical models to calculate the RF levels at various points around transmitting antennas. Different models apply in different areas around antennas. We will address each area of interest in turn in the subsections that follow.

Street Level Analysis

At street-level around an antenna site (in what is called the "far field" of the antennas), the RF levels are directly proportional to the total antenna input power and the relative antenna gain in the downward direction of interest – and the levels are otherwise inversely proportional to the square of the straight-line distance to the antenna.

Conservative calculations also assume the potential RF exposure is enhanced by reflection of the RF energy from the intervening ground. Our calculations will assume a 100% "perfect", mirror-like reflection, which is the absolute worst-case scenario.

The formula for street-level compliance assessment for any given wireless antenna operation is as follows:

$$MPE\% = (100 * Chans * TxPower * 10^{(Gmax-Vdisc/10)} * 4) / (MPE * 4\pi * R^2)$$

where

MPE%	=	RF level, expressed as a percentage of the MPE limit applicable to continuous exposure of the general public
100	=	factor to convert the raw result to a percentage
Chans	=	maximum number of RF channels per sector
TxPower	=	maximum transmitter power per channel, in milliwatts

$10^{(Gmax-Vdisc/10)}$	=	numeric equivalent of the relative antenna gain in the downward direction of interest; data on the antenna vertical-plane pattern is taken from manufacturer specifications
4	=	factor to account for a 100-percent-efficient energy reflection from the ground, and the squared relationship between RF field strength and power density ($2^2 = 4$)
MPE	=	FCC general population MPE limit
R	=	straight-line distance from the RF source to the point of interest, centimeters

The MPE% calculations are performed out to a distance of 500 feet from the facility to points 6.5 feet (approximately two meters, the FCC-recommended standing height) off the ground, as illustrated in Figure 2, below.

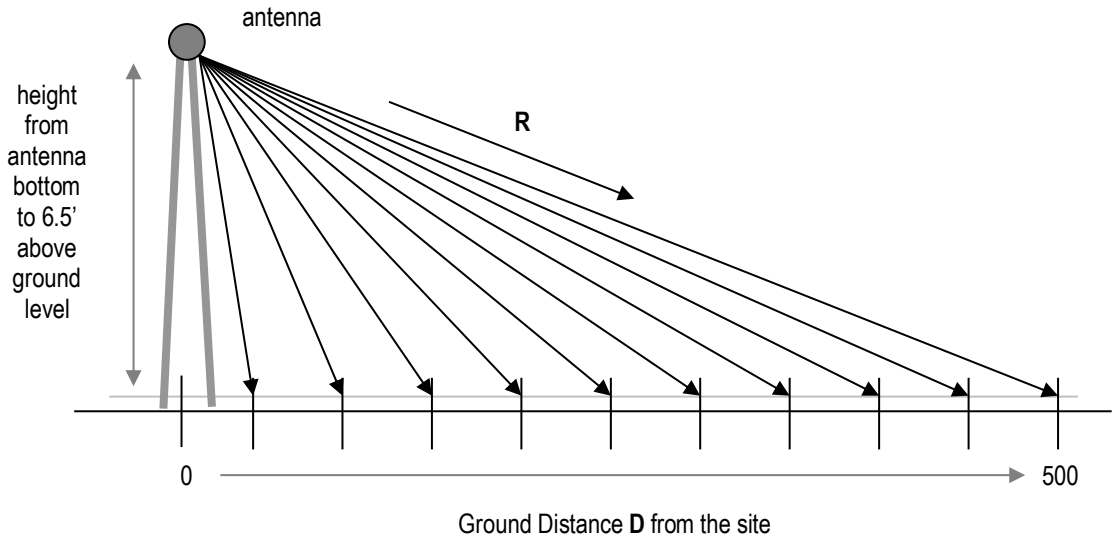


Figure 2. Street-level MPE% Calculation Geometry

It is popularly understood that the farther away one is from an antenna, the lower the RF level – which is generally but not universally correct. The results of MPE% calculations fairly close to the site will reflect the variations in the vertical-plane antenna pattern as well as the variation in straight-line distance to the antenna.

Therefore, RF levels may actually increase slightly with increasing distance within

the range of zero to 500 feet from the site. As the distance approaches 500 feet and beyond, though, the antenna pattern factor becomes less significant, the RF levels become primarily distance-controlled and, as a result, the RF levels generally decrease with increasing distance. In any case, the RF levels more than 500 feet from a wireless antenna site are well understood to be sufficiently low to be comfortably in compliance.

According to the FCC, when directional antennas (such as panels) are used, compliance assessments are based on the RF effect of a single (facing) antenna sector, as the effects of directional antennas pointed away from the point(s) of interest are considered insignificant. If the different parameters apply in the different sectors, compliance is based on the worst-case parameters.

Street level FCC compliance for a collocated antenna site is assessed in the following manner. At each distance point along the ground, an MPE% calculation is made for each antenna operation (including each frequency band), and the sum of the individual MPE% contributions at each point is compared to 100 percent, the normalized reference for compliance with the MPE limit. We refer to the sum of the individual MPE% contributions as “total MPE%”, and any calculated total MPE% result exceeding 100 percent is, by definition, higher than the FCC limit and represents non-compliance and a need to mitigate the potential exposure. If all results are consistently below 100 percent, on the other hand, that set of results serves as a clear and sufficient demonstration of compliance with the MPE limit.

Note that the following conservative methodology and assumptions are incorporated into the MPE% calculations on a general basis:

1. The antennas are assumed to be operating continuously at maximum power and maximum channel capacity.
2. The power-attenuation effects of shadowing or other obstructions to the line-of-sight path from the antenna to the point of interest are ignored.
3. The calculations intentionally minimize the distance factor (R) by assuming a 6’6” human and performing the calculations from the bottom (rather than the centerline) of each operator’s lowest-mounted antenna, as applicable.

4. The calculations also conservatively take into account, when applicable, the different technical characteristics and related RF effects of the use of multiple antennas for transmission in the same frequency band.
5. The RF exposure at ground level is assumed to be 100-percent enhanced (increased) via a “perfect” field reflection from the intervening ground.

The net result of these assumptions is to intentionally and significantly overstate the calculated RF levels relative to the levels that will actually result from the antenna operations – and the purpose of this conservatism is to allow very “safe-side” conclusions about compliance.

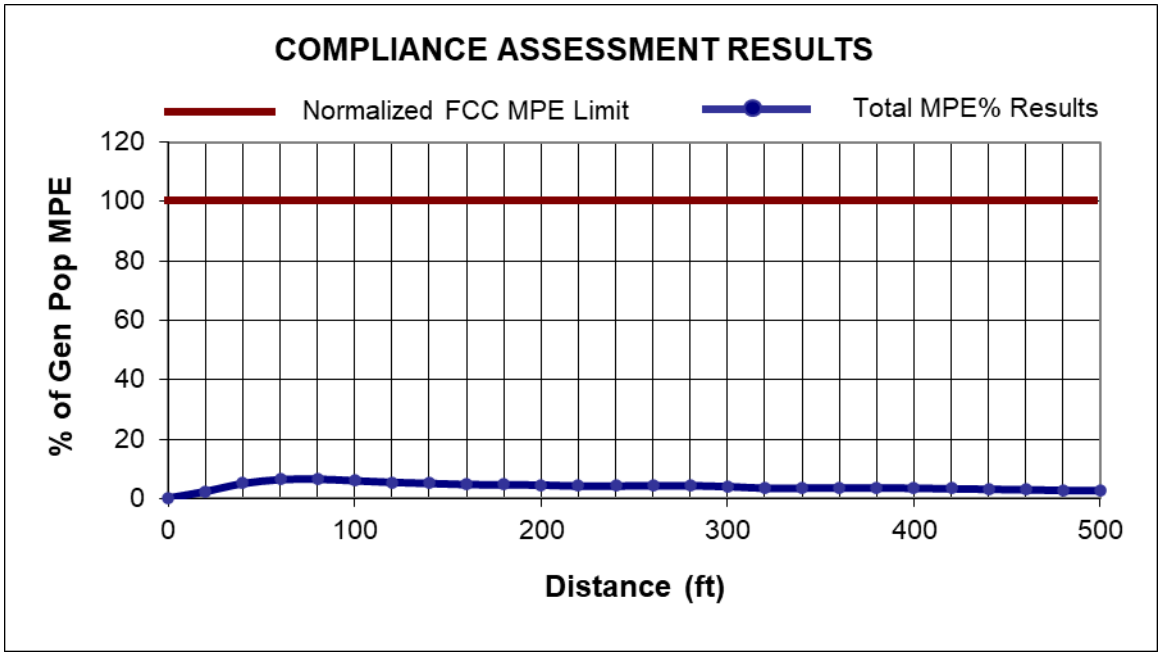
The tables that follow provide the results of the MPE% calculations for each antenna operation, with the overall worst-case calculated result highlighted in bold in the last column of the last table. Note that the transmission parameters for each DISH antenna sector are identical, and the calculations reflect the worst-case result for any/all sectors.

Ground Distance (ft)	DISH 600 MHz MPE%	DISH 2000 MHz MPE%	DISH 2100 MHz MPE%	AT&T MPE%	Sprint MPE%	T-Mobile MPE%	Verizon Wireless MPE%	Subtotal MPE%
0	0.0209	0.0010	0.0002	0.0384	0.0181	0.2118	0.0127	0.3031
20	0.0331	0.0008	0.0008	0.0331	0.0111	0.3070	0.0146	0.4005
40	0.0597	0.0054	0.0105	0.0641	0.0083	0.4592	0.0239	0.6311
60	0.0852	0.0094	0.0152	0.0899	0.0096	0.7391	0.0566	1.0050
80	0.0519	0.0348	0.0261	0.1271	0.0288	0.6329	0.0835	0.9851
100	0.0156	0.0084	0.0305	0.1571	0.0251	0.4566	0.0910	0.7843
120	0.0292	0.1167	0.0539	0.2071	0.0472	0.2819	0.0879	0.8239
140	0.0815	0.0916	0.1773	0.2069	0.0401	0.3349	0.0674	0.9997
160	0.1335	0.0966	0.1432	0.1914	0.0421	0.4228	0.1034	1.1330
180	0.1306	0.1187	0.1453	0.2682	0.0616	0.6162	0.1629	1.5035
200	0.0930	0.0562	0.1215	0.3762	0.1112	0.8671	0.1628	1.7880
220	0.0481	0.0051	0.0130	0.3901	0.0915	1.0983	0.1466	1.7927
240	0.0268	0.0160	0.0115	0.3677	0.0550	1.3793	0.1806	2.0369
260	0.0170	0.0019	0.0299	0.4164	0.0292	1.6421	0.2335	2.3700
280	0.0140	0.0164	0.0088	0.4264	0.0238	1.8744	0.2688	2.6326
300	0.0121	0.0471	0.0394	0.4849	0.0302	1.6818	0.2595	2.5550
320	0.0099	0.0346	0.0590	0.4695	0.0445	1.3338	0.2270	2.1783
340	0.0075	0.0144	0.0557	0.4019	0.0474	1.6371	0.1716	2.3356
360	0.0042	0.0168	0.0115	0.2929	0.0507	2.0194	0.1317	2.5272
380	0.0047	0.0398	0.0111	0.2229	0.0550	2.2386	0.0925	2.6646
400	0.0084	0.0537	0.0323	0.1736	0.0561	2.2635	0.0579	2.6455
420	0.0163	0.0470	0.0534	0.1536	0.0486	2.2284	0.0306	2.5779
440	0.0150	0.0433	0.0492	0.1409	0.0325	2.1745	0.0154	2.4708
460	0.0274	0.0248	0.0507	0.1274	0.0157	2.1149	0.0161	2.3770
480	0.0456	0.0081	0.0347	0.1182	0.0145	1.9513	0.0303	2.2027
500	0.0700	0.0022	0.0158	0.1346	0.0100	1.9197	0.0281	2.1804

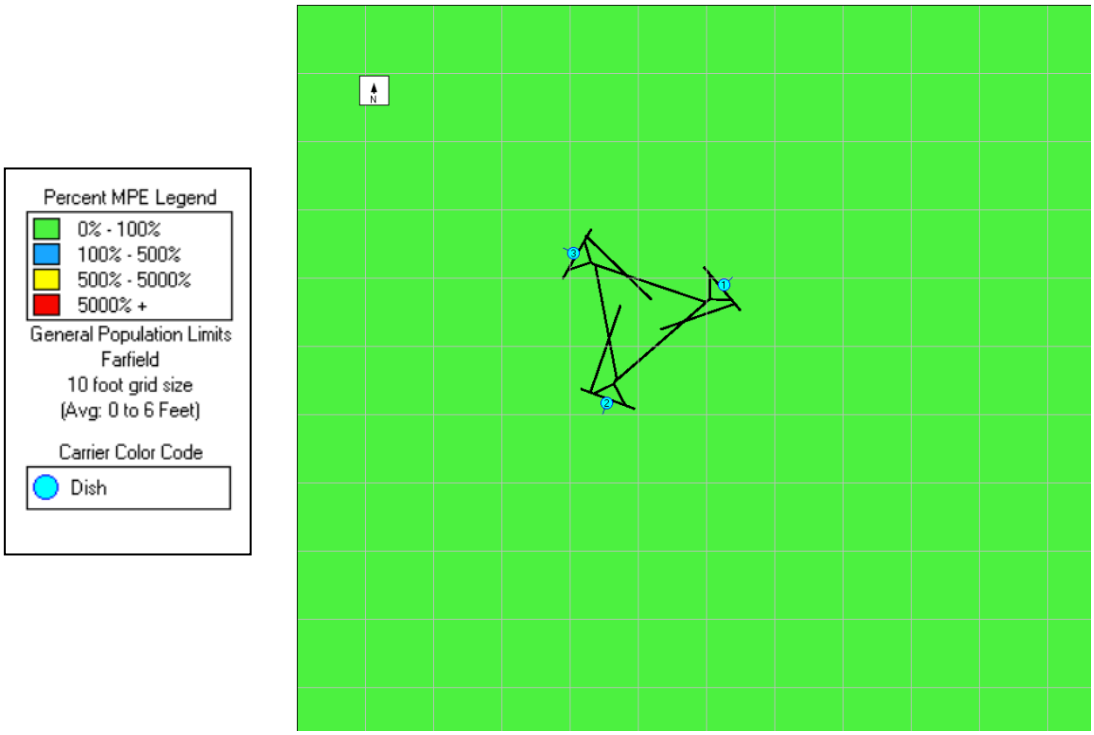
Ground Distance (ft)	**Subtotal MPE%**	**State of CT MPE%**	**Eversource Energy MPE%**	**Northwest CT Public Safety MPE%**	**Redding PD MPE%**	**Town of Redding Police MPE%**	**Total MPE%**
0	0.3031	0.0073	0.0151	0.0050	0.0004	0.0002	0.3311
20	0.4005	0.0128	1.4049	0.5674	0.0870	0.0410	2.5136
40	0.6311	0.0150	3.7129	0.4451	0.2365	0.1115	5.1521
60	1.0050	0.0100	4.9120	0.0176	0.3424	0.1614	6.4484
80	**0.9851**	**0.0037**	**4.9154**	**0.1294**	**0.3743**	**0.1765**	**6.5844**
100	0.7843	0.0040	4.4380	0.3450	0.3536	0.1667	6.0916
120	0.8239	0.0145	3.7575	0.5077	0.3128	0.1475	5.5639
140	0.9997	0.0269	3.1599	0.6096	0.2667	0.1257	5.1885
160	1.1330	0.0215	2.6259	0.6997	0.2299	0.1084	4.8184
180	1.5035	0.0265	2.2147	0.7142	0.1960	0.0924	4.7473
200	1.7880	0.0494	1.8551	0.7088	0.1691	0.0797	4.6501
220	1.7927	0.0941	1.5729	0.6515	0.1441	0.0679	4.3232
240	2.0369	0.1202	1.3785	0.6355	0.1240	0.0584	4.3535
260	2.3700	0.1289	1.1921	0.5988	0.1102	0.0519	4.4519
280	2.6326	0.1171	1.0405	0.5444	0.0965	0.0455	4.4766
300	2.5550	0.0921	0.9166	0.4769	0.0851	0.0401	4.1658
320	2.1783	0.0694	0.8149	0.4512	0.0756	0.0356	3.6250
340	2.3356	0.0475	0.7299	0.4201	0.0675	0.0318	3.6324
360	2.5272	0.0280	0.6727	0.3759	0.0607	0.0286	3.6931
380	2.6646	0.0129	0.6068	0.3543	0.0548	0.0258	3.7192
400	2.6455	0.0037	0.5509	0.3205	0.0509	0.0240	3.5955
420	2.5779	0.0015	0.5007	0.2913	0.0464	0.0219	3.4397
440	2.4708	0.0041	0.4577	0.2720	0.0424	0.0200	3.2670
460	2.3770	0.0069	0.4199	0.2493	0.0389	0.0184	3.1104
480	2.2027	0.0191	0.3850	0.2293	0.0359	0.0169	2.8889
500	2.1804	0.0177	0.3556	0.2215	0.0331	0.0156	2.8239

As indicated, the maximum calculated overall RF level is 6.5844 percent of the FCC MPE limit – well below the 100-percent reference for compliance.

A graph of the overall calculation results, shown below, perhaps provides a clearer *visual* illustration of the relative compliance of the calculated RF levels. The line representing the overall calculation results shows an obviously clear, consistent margin to the FCC MPE limit.



The graphic output for the areas at street level surrounding the site is reproduced on the next page.

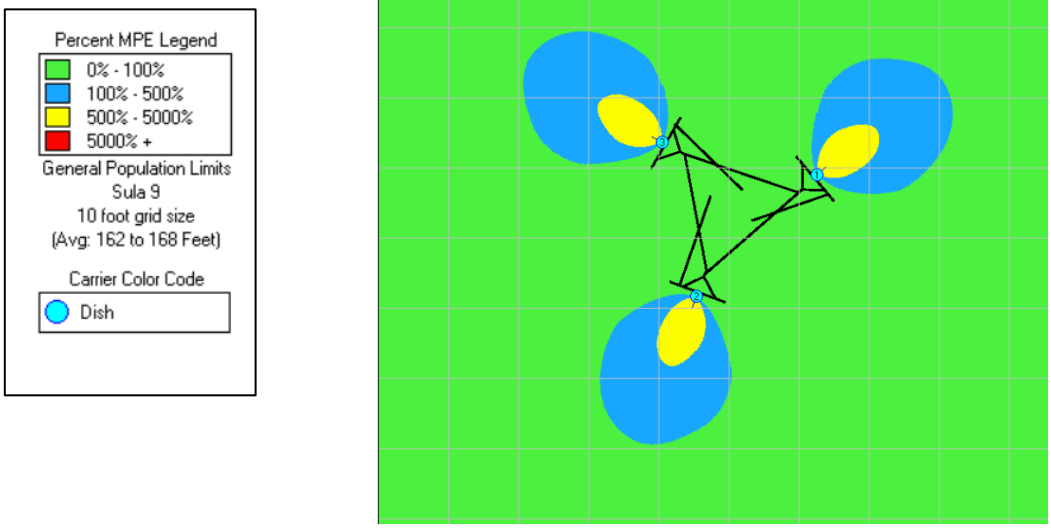


Near-field Analysis

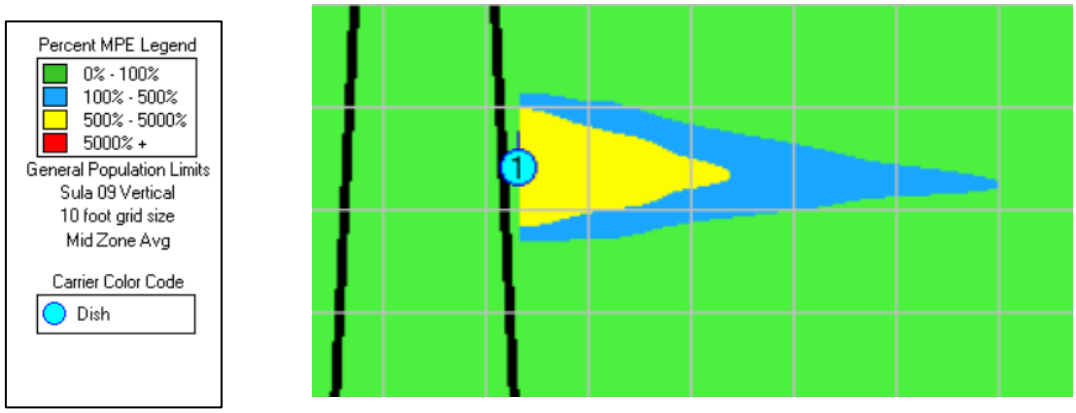
The compliance analysis for the same height as the antennas is performed using the RoofMaster program by Waterford Consultants.

RF levels in the near field of an antenna depend on the power input to the antenna, the antenna's length and horizontal beamwidth, the mounting height of the antenna above nearby roof, and one's position and distance from the antenna. RF levels in front of a directional antenna are higher than they are to the sides or rear, and in any given horizontal direction are inversely proportional to the straight-line distance to the antenna.

The RoofMaster graphic outputs for the same height as the DISH antennas are reproduced on the next page.



RoofMaster – Same Height as the Antennas – Alpha / Beta / Gamma sectors



RoofMaster – Same Height as the Antennas – Alpha / Beta / Gamma sectors

Compliance Conclusion

According to the FCC, the MPE limit has been constructed in such a manner that continuous human exposure to RF fields up to and including 100 percent of the MPE limit is acceptable and safe.

The conservative analysis in this case shows that the maximum calculated RF level from the combination of proposed and existing antenna operations at street level around the site is 6.5844 percent of the FCC general population MPE limit. At the same height as the antennas, the analysis shows that the calculated RF levels potentially exceed the FCC MPE limit. Per DISH guidelines, and consistent with FCC guidance on compliance, it is recommended that three Caution signs be installed at the base of the tower. In addition, a NOC Information sign is to be installed at the base of the lattice tower.

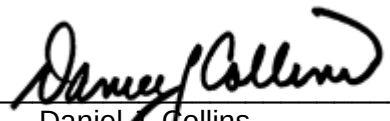
The results of the calculations, along with the described RF mitigation, combine to satisfy the FCC's RF compliance requirements and associated guidelines on compliance.

Moreover, because of the extremely conservative calculation methodology and operational assumptions we applied in the analysis, RF levels actually caused by the antennas will be significantly lower than the calculation results here indicate.

Certification

It is the policy of Pinnacle Telecom Group that all FCC RF compliance assessments are reviewed, approved, and signed by the firm's Chief Technical Officer who certifies as follows:

1. I have read and fully understand the FCC regulations concerning RF safety and the control of human exposure to RF fields (47 CFR 1.1301 *et seq*).
2. To the best of my knowledge, the statements and information disclosed in this report are true, complete and accurate.
3. The analysis of site RF compliance provided herein is consistent with the applicable FCC regulations, additional guidelines issued by the FCC, and industry practice.
4. The results of the analysis indicate that the subject antenna operations will be in compliance with the FCC regulations concerning the control of potential human exposure to the RF emissions from antennas.



7/26/22

Daniel J. Collins
Chief Technical Officer
Pinnacle Telecom Group, LLC

Date

Appendix A. Documents Used to Prepare the Analysis

RFDS: RFDS-NJJER01161A-Final-20220722-v.0_20220722071504

CD: DISHNJJER01161AATC302522(13699598)AE(CD)REV4

Appendix B. Background on the FCC MPE Limit

As directed by the Telecommunications Act of 1996, the FCC has established limits for maximum continuous human exposure to RF fields.

The FCC maximum permissible exposure (MPE) limits represent the consensus of federal agencies and independent experts responsible for RF safety matters. Those agencies include the National Council on Radiation Protection and Measurements (NCRP), the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), the American National Standards Institute (ANSI), the Environmental Protection Agency (EPA), and the Food and Drug Administration (FDA). In formulating its guidelines, the FCC also considered input from the public and technical community – notably the Institute of Electrical and Electronics Engineers (IEEE).

The FCC's RF exposure guidelines are incorporated in Section 1.301 *et seq* of its Rules and Regulations (47 CFR 1.1301-1.1310). Those guidelines specify MPE limits for both occupational and general population exposure.

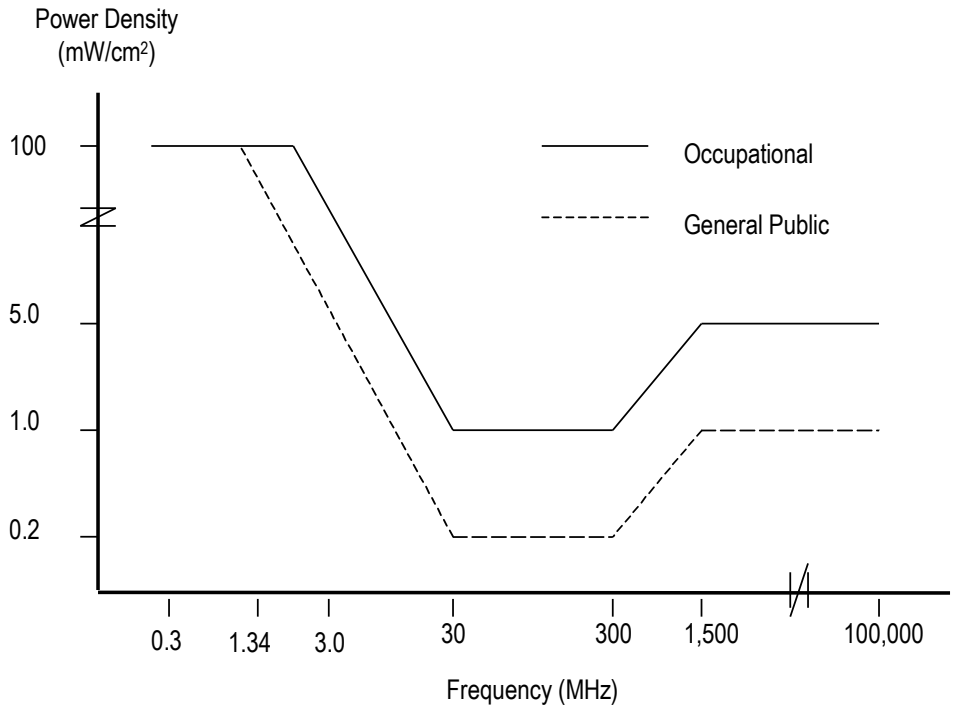
The specified continuous exposure MPE limits are based on known variation of human body susceptibility in different frequency ranges, and a Specific Absorption Rate (SAR) of 4 watts per kilogram, which is universally considered to accurately represent human capacity to dissipate incident RF energy (in the form of heat). The occupational MPE guidelines incorporate a safety factor of 10 or greater with respect to RF levels known to represent a health hazard, and an additional safety factor of five is applied to the MPE limits for general population exposure. Thus, the general population MPE limit has a built-in safety factor of more than 50. The limits were constructed to appropriately protect humans of both sexes and all ages and sizes and under all conditions – and continuous exposure at levels equal to or below the applicable MPE limits is considered to result in no adverse health effects or even health risk.

The reason for *two* tiers of MPE limits is based on an understanding and assumption that members of the general public are unlikely to have had appropriate RF safety training and may not be aware of the exposures they receive; occupational exposure in controlled environments, on the other hand, is assumed to involve individuals who have had such training, are aware of the exposures, and know how to maintain a safe personal work environment.

The FCC's RF exposure limits are expressed in two equivalent forms, using alternative units of field strength (expressed in volts per meter, or V/m), and power density (expressed in milliwatts per square centimeter, or mW/cm^2). The table on the next page lists the FCC limits for both occupational and general population exposures, using the mW/cm^2 reference, for the different radio frequency ranges.

Frequency Range (F) (MHz)	Occupational Exposure (mW/cm^2)	General Public Exposure (mW/cm^2)
0.3 - 1.34	100	100
1.34 - 3.0	100	$180 / F^2$
3.0 - 30	$900 / F^2$	$180 / F^2$
30 - 300	1.0	0.2
300 - 1,500	F / 300	F / 1500
1,500 - 100,000	5.0	1.0

The diagram below provides a graphical illustration of both the FCC's occupational and general population MPE limits.



Because the FCC's RF exposure limits are frequency-shaped, the exact MPE limits applicable to the instant situation depend on the frequency range used by the systems of interest.

The most appropriate method of determining RF compliance is to calculate the RF power density attributable to a particular system and compare that to the MPE limit applicable to the operating frequency in question. The result is usually expressed as a percentage of the MPE limit.

For potential exposure from multiple systems, the respective percentages of the MPE limits are added, and the total percentage compared to 100 (percent of the limit). If the result is less than 100, the total exposure is in compliance; if it is more than 100, exposure mitigation measures are necessary to achieve compliance.

Note that the FCC "categorically excludes" all "non-building-mounted" wireless antenna operations whose mounting heights are more than 10 meters (32.8 feet) from the routine requirement to demonstrate compliance with the MPE limit, because such operations "are deemed, individually and cumulatively, to have no significant effect on the human environment". The categorical exclusion also applies to *all* point-to-point antenna operations, regardless of the type of structure they're mounted on. Note that the FCC considers any facility qualifying for the categorical exclusion to be automatically in compliance.

In addition, FCC Rules and Regulations Section 1.1307(b)(3) describes a provision known in the industry as "the 5% rule". It describes that when a specific location – like a spot on a rooftop – is subject to an overall exposure level exceeding the applicable MPE limit, operators with antennas whose MPE% contributions at the point of interest are less than 5% are exempted from the obligation otherwise shared by all operators to bring the site into compliance, and those antennas are automatically deemed by the FCC to satisfy the rooftop compliance requirement.

FCC References on RF Compliance

47 CFR, FCC Rules and Regulations, Part 1 (Practice and Procedure), Section 1.1310 (Radiofrequency radiation exposure limits).

FCC Second Memorandum Opinion and Order and Notice of Proposed Rulemaking (FCC 97-303), *In the Matter of Procedures for Reviewing Requests for Relief From State and Local Regulations Pursuant to Section 332(c)(7)(B)(v) of the Communications Act of 1934 (WT Docket 97-192), Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation (ET Docket 93-62), and Petition for Rulemaking of the Cellular Telecommunications Industry Association Concerning Amendment of the Commission's Rules to Preempt State and Local Regulation of Commercial Mobile Radio Service Transmitting Facilities*, released August 25, 1997.

FCC First Memorandum Opinion and Order, ET Docket 93-62, *In the Matter of Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, released December 24, 1996.

FCC Report and Order, ET Docket 93-62, *In the Matter of Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, released August 1, 1996.

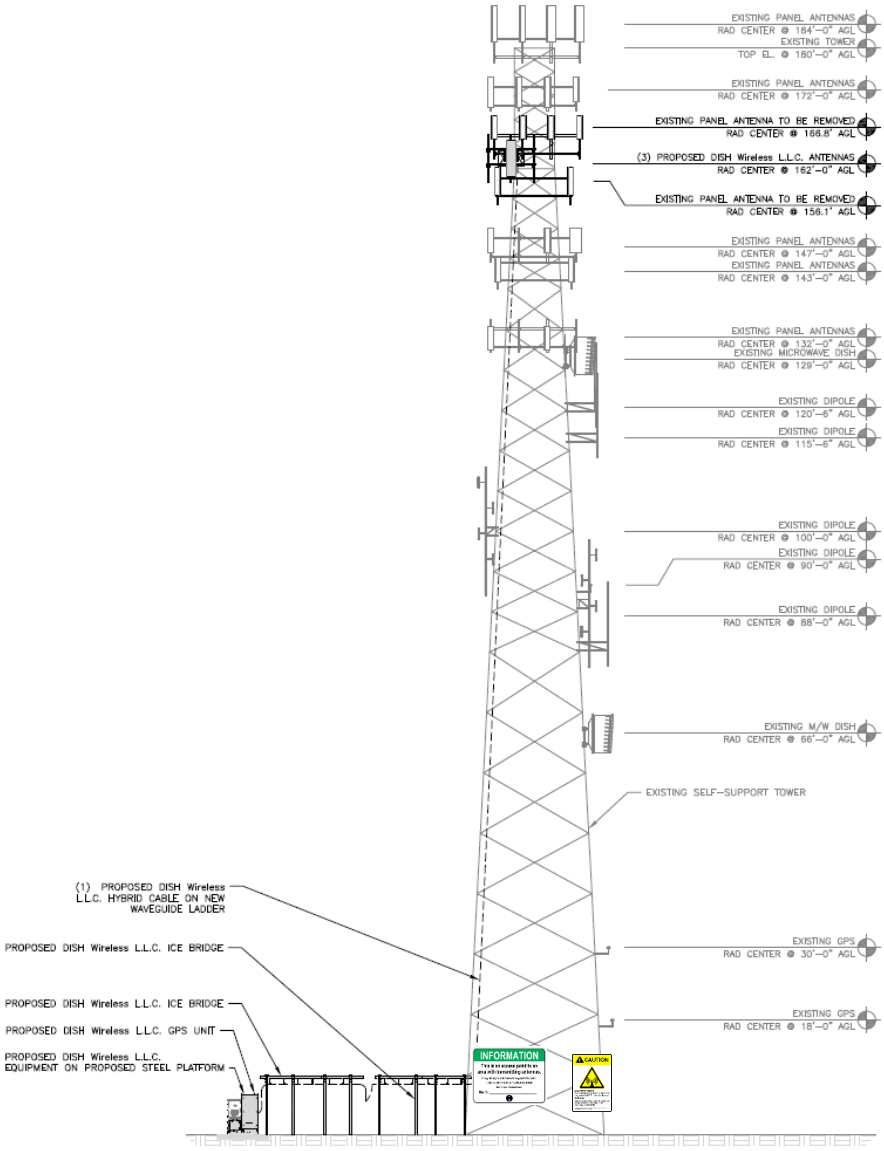
FCC Report and Order, Notice of Proposed Rulemaking, Memorandum Opinion and Order (FCC 19-126), *Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields; Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies,* released December 4, 2019.

FCC Office of Engineering and Technology (OET) Bulletin 65, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields”, Edition 97-01, August 1997.

FCC Office of Engineering and Technology (OET) Bulletin 56, “Questions and Answers About Biological Effects and Potential Hazards of RF Radiation”, edition 4, August 1999.

Appendix C. Proposed Signage

Final Compliance Configuration							
	GUIDELINES	NOTICE	CAUTION	WARNING	NOC INFO	BARRIER/MARKER	
Access Point(s)	0	0	0	0	1	0	
Alpha	0	0	1	0	0	0	
Beta	0	0	1	0	0	0	
Gamma	0	0	1	0	0	0	



Appendix D. Summary of Expert Qualifications

Daniel J. Collins, Chief Technical Officer, Pinnacle Telecom Group, LLC

Synopsis:	• 40+ years of experience in all aspects of wireless system engineering, related regulation, and RF exposure • Has performed or led RF exposure compliance assessments on more than 20,000 antenna sites since the latest FCC regulations went into effect in 1997 • Has provided testimony as an RF compliance expert more than 1,500 times since 1997 • Have been accepted as an FCC compliance expert in New York, New Jersey, Connecticut, Pennsylvania and more than 40 other states, as well as by the FCC
Education:	• B.E.E., City College of New York (Sch. Of Eng.), 1971 • M.B.A., 1982, Fairleigh Dickinson University, 1982 • Bronx High School of Science, 1966
Current Responsibilities:	• Leads all PTG staff work involving RF safety and FCC compliance, microwave and satellite system engineering, and consulting on wireless technology and regulation
Prior Experience:	• Edwards & Kelcey, VP – RF Engineering and Chief Information Technology Officer, 1996-99 • Bellcore (a Bell Labs offshoot after AT&T's 1984 divestiture), Executive Director – Regulation and Public Policy, 1983-96 • AT&T (Corp. HQ), Division Manager – RF Engineering, and Director – Radio Spectrum Management, 1977-83 • AT&T Long Lines, Group Supervisor – Microwave Radio System Design, 1972-77
Specific RF Safety / Compliance Experience:	• Involved in RF exposure matters since 1972 • Have had lead corporate responsibility for RF safety and compliance at AT&T, Bellcore, Edwards & Kelcey, and PTG • While at AT&T, helped develop the mathematical models for calculating RF exposure levels • Have been relied on for compliance by all major wireless carriers, as well as by the federal government, several state and local governments, equipment manufacturers, system integrators, and other consulting / engineering firms
Other Background:	• Author, *Microwave System Engineering* (AT&T, 1974) • Co-author and executive editor, *A Guide to New Technologies and Services* (Bellcore, 1993) • National Spectrum Management Association (NSMA) – former three-term President and Chairman of the Board of Directors; was founding member, twice-elected Vice President, long-time member of the Board, and was named an NSMA Fellow in 1991 • Have published more than 35 articles in industry magazines