Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Tectonic Engineering
Theresa Ranciato-Viele
63-3 N. Branford Road
Branford, CT 06405
Tranciato@Tectonicengineering.com
203-606-5127

September 19, 2022

Ms. Melanie Bachman, Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: **Notice of Tower Share to an existing 152' self support tower located at 366 Old Long Ridge Road, Stamford, Connecticut**

Latitude: 41.153110 / Longitude: -73.5927

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Dish Wireless, LLC ("Dish"). Dish plans to install antennas and related equipment to the tower site at the existing 152'self support tower facility located at 366 Old Long Ridge Road, Stamford, Connecticut. The facility was originally approved by the City of Stamford (See Exhibit A). The property is owned by Long Ridge Fire Company, Inc. (See Stamford Assessor Property Card attached hereto as Exhibit B).

Dish proposes to install three (3) 600/1900/2100 MHz JMA – MX08Fr0665-21 antennas and six (6) FUJITSU TA08025 RRUs on the tower at the two hundred foot (200') centerline AGL. Dish further proposes to install one (1) 1.5" Hybrid Cable. Dish will also install its equipment cabinets on a 5' X 7' platform within its 10' X 15' lease area. The installation is shown on plans completed by Tectonic Engineering, dated September 8, 2022, and attached hereto as Exhibit C.

Dish requests that the Connecticut Siting Council ("Council") find that the proposed shared use of this Facility satisfies the criteria of C.G.S. sec. 16-50aa and accordingly issue an order approving the proposed shared use. This proposed installation constitutes an exempt modification pursuant to R.C.S.A. 16-50j-89. Pursuant to R.C.S.A. 16-50j-73, Dish is providing notice to Caroline Simmons, Mayor of the City of Stamford, Ralph Blessing, Land Use Bureau Chief for the City of Stamford, and the property owner, Long Ridge Fire Company, Inc.

Under the Council's regulations, Dish's plans do not constitute a modification subject to the Council's review in that:

Dish will not change the existing 152' height of the Tower as the Dish antennas will be installed at a height of 108'.

The proposed installation will not extend the existing boundaries of the approved fenced compound as depicted in Exhibit B;

The proposed installation will not increase the noise levels at the facility by six (6) decibels or more, or to levels that exceed local and state criteria; and

The proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. The attached Exhibit F indicates that the combined site operations will result in a total power density of 4.8610%.

Tower

The Facility consists of a one hundred fifty two foot (152') lattice tower located at 366 Old Long Ridge Road, Stamford, Connecticut. As indicated above, the tower is owned by Long Ridge Fire Company, Inc. The tower currently supports AT&T at the one hundred forty five foot (145') centerline AGL, Sprint at the one hundred thirty one foot (131') centerline AGL, T-Mobile at the one hundred eighteen foot (118') centerline AGL and Verizon Wireless at the ninety eight foot (98') centerline AGL. The antenna locations are set forth on Sheet A-2 of the attached drawings in Exhibit C.

A. TECHNICAL FEASIBILTY

The existing monopole has been deemed structurally capable of supporting the proposed Dish loading. The structural and mount analyses are attached hereto as Exhibit D.

B. LEGAL FEASIBILITY

C.G.S. Se. 16-50aa authorizes the Council to issue orders approving the shared use of existing towers such as the above referenced tower. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit Dish to obtain a building permit from the Town of Stamford to proceed with the proposed installation. Additionally, a copy of the Lease Agreement is attached as Exhibit E, granting Dish the authority from the tower owner to proceed with this application for shared use.

C. ENVIRONMENTAL FEASIBILITY

The proposed shared use of this Facility would have a minimal environmental impact. The installation of the Dish equipment at the 108' level of the existing tower would have an insignificant visual impact on the area surrounding the

tower. The proposed Dish ground equipment would be installed within the existing Facility compound. The Dish installation would not cause any significant alteration to the physical or environmental characteristics of the existing Facility. Additionally, as evidenced by Exhibit F, the proposed antennas would not increase the radio frequency emissions to a level at or above the Federal Communications Commission safety standards.

D. ECONOMIC FEASIBILTY

Dish has entered into a Lease Agreement (Exhibit E) with the Facility owner for the proposed colocation. Therefore, this shared use is economically feasible.

E. PUBLIC SAFETY CONCERNS

As set forth above, the tower is structurally capable of supporting the proposed Dish loading. Dish is not aware of any public safety concerns relative to the proposed sharing of the existing tower.

For the reasons set forth herein, the proposed shared use of the existing tower at 366 Old Long Ridge Road, Stamford, satisfies the criteria stated in C.G.S. sec. 16-50aa, and supports the general goal of preventing the unnecessary proliferation of tower sites in Connecticut. Dish respectfully requests the Council issue an order approving the proposed shared use.

Respectfully submitted,
Dish Wireless, LLC

By _____
Theresa Ranciato-Viele, consultant
63-3 N. Branford Road
Branford, CT 06405
Tranciato@Tectonicengineering.com
203-606-5127

cc: Stamford Mayor, Honorable Caroline Simmons
888 Washington Ave., 10th Fl.
Stamford, CT 06901

Stamford Land Use Bureau Chief, Ralph Blessing
888 Washington Ave., 7th Fl.
Stamford, CT 06901

Tectonic

PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Property Owner: Long Ridge Fire Company, Inc.
366 Old Long Ridge Road
Stamford, CT 06903

Exhibit A

Original Facility Approval

Original Zoning Approval, 1988

400

ZONING APPEALS BOARD CERTIFICATE VOL 3356 PAGE 1

20110

I, LEONARD DIFRETA, zoning enforcement officer for the City of Stamford, in compliance with Special Act No. 379 of the 1951 General Assembly, hereby certify that on November 9, 1988 a hearing was held by the Zoning Appeals Board on the application of:

LONG RIDGE FIRE CO., INC. Appl. #119-88

for a Special Exception as authorized by Section 19-3.2.a. for a replacement radio antenna tower, 150 feet in height, to be constructed on the Long Ridge Fire Company property located on the west side of Old Long Ridge Road, in an RA-2 zone, and is known as 366 Old Long Ridge Road.

and that the land affected is owned by and located on the following records:

NAME	LOCATION
Long Ridge Fire Co., Inc.	366 Old Long Ridge Road

and that the following is a statement of its findings and approval or rejection.

November 16, 1988

The Board approves this Special Exception as authorized by Section 19-3.2.a. for a replacement radio antenna tower, 150 feet in height, to be constructed on the Long Ridge Fire Company property, subject to the following restriction:

The applicant must adhere to the approved plan which has been signed by Raymond D. Sanborne, Chairman of the Zoning Board of Appeals, and Michael D. Macri, Deputy Zoning Enforcement Officer. Said plan is on file in the office of the Zoning Board of Appeals and is referred to as Proposed Replacement of Radio Antenna Tower, dated 9/12/88.

In rendering the above decision, the Board finds that the proposed use or structure or the proposed extension or alteration of an existing use or structure is in accord with the public convenience and welfare after taking into account, where appropriate:

(1) the location and nature of the proposed site including its size and configuration, the proposed size, scale and arrangement of structures, drives and parking areas and the proximity of existing dwellings and other structures.
(2) the nature and intensity of the proposed use in relation to its site and the surrounding area. Operations in connection with special exception uses shall not be injurious to the neighborhood, shall be in harmony with the general purpose and intent of the Zoning Regulations, and shall not be more objectionable to nearby properties by reason of noise, fumes, vibration, artificial lighting or other potential disturbances to the health, safety or peaceful enjoyment of property than the public necessity demands.
(3) the resulting traffic patterns, the adequacy of existing streets to accommodate the traffic associated with the proposed use, the adequacy of proposed off-street parking and loading, and the extent to which proposed driveways may cause a safety hazard or traffic nuisance.
(4) the nature of the surrounding area and the extent to which the proposed use or feature might impair its present and future development.
(5) the Master Plan of the City of Stamford and all statements of the purpose and intent of these regulations.

The applicant(s) is/are allowed one year from the effective date of this decision in which to obtain a building permit.

Dated at Stamford, Connecticut, this 1st day of December, 1988.

Raymond D. Sanborne
Chairman; Zoning Board of Appeals

Leonard DiPreta
Zoning Enforcing Officer of the City of Stamford

The land hereby affected lies in block 400

THE LAND AFFECTED HEREBY LIES IN BLOCK 400
OF THE STAMFORD BLOCK MAP. RECEIVED FOR RECORD
AT STAMFORD ON 12-12-88 AT 9:53 A.M.
ATTEST: LOIS POTTEBAUM, TOWN AND CITY CLERK

Exhibit B

Property Card

366 OLD LONG RIDGE ROAD

Location	366 OLD LONG RIDGE ROAD	**Mblu**	002/ 6549/ / /
Acct#	002-6549	**Owner**	LONG RIDGE FIRE CO INC
Assessment	$1,496,530	**Appraisal**	$2,137,900
PID	24275	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2021	$1,817,440	$320,460	$2,137,900
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2021	$1,272,210	$224,320	$1,496,530

Owner of Record

Owner	LONG RIDGE FIRE CO INC	**Sale Price**	$0
Co-Owner		**Book & Page**	0686/0581
Address	366 OLD LONG RIDGE RD STAMFORD, CT 06903-1133	**Sale Date**	01/14/1953
		Instrument	25

Ownership History

Ownership History				
Owner	**Sale Price**	**Book & Page**	**Instrument**	**Sale Date**
LONG RIDGE FIRE CO INC	$0	0686/0581	25	01/14/1953

Building Information

Building 1 : Section 1

Year Built: 1956
Living Area: 8,569

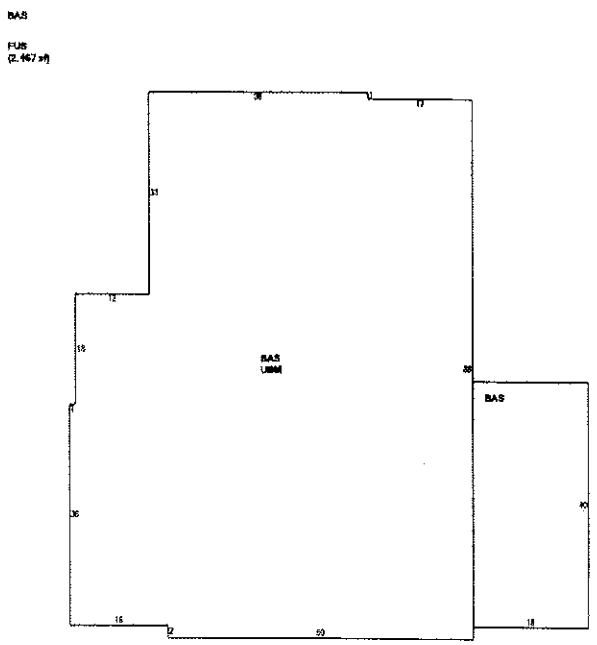
Building Attributes	
Field	**Description**
STYLE	Fire Station
MODEL	Ind/Comm

Grade	B
Stories:	1
Occupancy	1.00
Exterior Wall 1	Brick/Masonry
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Asph/F Gls/Cmp
Interior Wall 1	Minimum
Interior Wall 2	Drywall/Plaste
Interior Floor 1	Concrete Slab
Interior Floor 2	Vinyl/Asphalt
Heating Fuel	Oil
Heating Type	Forced Air-Duc
AC Type	Partial A/C
Struct Class	
Bldg Use	Exmpt Comm MDL-94
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	902C
Heat/AC	Heat/AC Pkgs
Frame Type	FireProofSteel
Baths/Plumbing	Average
Ceiling/Wall	Ceil & Mn Wall
Rooms/Prtns	Average
Wall Height	11.00
% Comn Wall	

Building Photo

(https://images.vgsi.com/photos/StamfordCTPhotos/\00\07\72\71.jpg)

Building Layout



(ParcelSketch.ashx?pid=24275&bid=24275)

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	6,102	6,102
FUS	Upper Story, Finished	2,467	2,467
UBM	Basement, Unfinished	5,378	0
		13,947	8,569

Extra Features

Extra Features				Legend
Code	Description	Size	Value	Bldg #
OH1	Door Overhd Co	4.00 UNITS	$11,100	1
H04	Air Con/Sfla	9620.00 S.F	$18,040	1

Land

Land Use

Use Code	902C
Description	Exmpt Comm MDL-94
Zone	RA2
Neighborhood	0100
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0.49
Depth	
Assessed Value	$224,320
Appraised Value	$320,460

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
LP6	Patio Asphlt			480.00 S.F.	$1,310	1
FC1	Shed Wood			108.00 S.F.	$1,300	1
FC1	Shed Wood			560.00 S.F.	$6,720	1
RG4	Gar 1.0 Det			1008.00 S.F.	$39,690	1
CEL1	Cell Tower			3.00 SITES	$438,750	1
CSHD	Cell Equipment			56.00 S.F.	$2,020	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2021	$1,817,440	$320,460	$2,137,900
2020	$1,817,440	$320,460	$2,137,900
2019	$1,817,440	$320,460	$2,137,900

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2021	$1,272,210	$224,320	$1,496,530
2020	$1,272,210	$224,320	$1,496,530
2019	$1,272,210	$224,320	$1,496,530

Exhibit C

Project Plans

dish wireless.

Dish Wireless L.L.C. SITE ID:

NJJER01110A

Dish Wireless L.L.C. SITE ADDRESS:

366 OLD LONG RIDGE ROAD
STAMFORD, CT 06903

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:

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

EQUIPMENT SCOPE OF WORK:
- INSTALL (1) PROPOSED FPC CABINET
- INSTALL (1) PROPOSED EQUIPMENT CABINET
- INSTALL (1) PROPOSED TELCO-FIBER BOX
- INSTALL (1) PROPOSED GPS UNIT
- INSTALL (1) PROPOSED SAFETY SWITCH (IF REQUIRED)
- INSTALL (1) PROPOSED CIENA BOX (IF REQUIRED)

SITE INFORMATION

PROPERTY OWNER:	THE LONG RIDGE FIRE CO.,INC.
ADDRESS:	366 OLD LONG RIDGE RD. STAMFORD, CT 06903
TOWER TYPE:	N/A
TOWER CO SITE ID:	002-6549
COUNTY:	FAIRFIELD
LATITUDE (NAD 83):	41° 09' 11.18" N 41.153108 N
LONGITUDE (NAD 83):	73° 35' 33.71" W 73.592697 W
ZONING JURISDICTION:	CITY OF STAMFORD/CT SITING COUNCIL
ZONING DISTRICT:	RA-2
PARCEL NUMBER:	002-6549
POWER COMPANY:	EVERSOURCE CT ELECTRIC
TELEPHONE COMPANY:	T.B.D.

PROJECT DIRECTORY

APPLICANT:	Dish Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	THE LONG RIDGE FIRE CO.,INC. 366 OLD LONG RIDGE RD. STAMFORD, CT 06903
SITE DESIGNER:	TECTONIC ENGINEERING CONSULTANTS GEOLOGISTS, SURVEYORS D.P.C., INC. 1279 ROUTE 300 NEWBURGH, NY 10953 (845) 567-6656
SITE ACQUISITION:	TECTONIC ENGINEERING CONSULTANTS GEOLOGISTS, SURVEYORS D.P.C., INC. 1279 ROUTE 300 NEWBURGH, NY 10953 (845) 567-6656
CONSTRUCTION MANAGER:	RAFAL ROSOLOWSKI RAFAL.ROSOLOWSKI@DISH.COM
RF ENGINEER:	PAWAN MADAHAR PAWAN.MADAHAR@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

SHEET INDEX

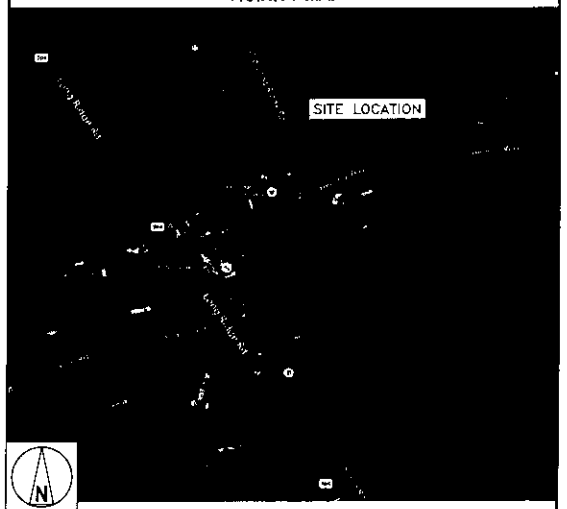
SHEET NO.	SHEET TITLE
T-1	TITLE SHEET
SP-1	OVERALL SITE PLAN
A-1	ENLARGED SITE & EQUIPMENT PLAN
A-2	ELEVATION, ANTENNA LAYOUT & SCHEDULE
A-3	EQUIPMENT DETAILS
A-4	EQUIPMENT DETAILS
GN-1	LEGEND AND ABBREVIATIONS
GN-2	GENERAL NOTES

SITE PHOTO

DIRECTIONS

DIRECTIONS FROM 3 ADP BOULEVARD, ROSELAND, NJ 07068:
HEAD EAST ON ADP BLVD. TOWARD CHOCTAW WAY. TURN RIGHT ONTO LIVINGSTON AVE/COUNTY HWY-527. TAKE THE RAMP ON THE RIGHT AND FOLLOW SIGNS FOR I-280 E. AT EXIT 15X, 16E, HEAD RIGHT ON THE RAMP FOR I-95 N TOWARD LINCOLN TUNNEL. AT EXIT 7, HEAD RIGHT ON THE RAMP FOR NY-95 TOWARD H HUDSON PKWY/W178 ST. KEEP STRAIGHT TO STAY ON HENRY HUDSON PKWY. TAKE THE RAMP ON THE LEFT FOR SAW MILL RIVER PKWY. AT EXIT 4 HEAD RIGHT ON THE RAMP FOR CROSS COUNTY PKWY TOWARD HUTCHINSON PKWY. ROAD NAME CHANGES TO CT-15 N (ENTERING CONNECTICUT). AT EXIT 34, HEAD RIGHT ON THE RAMP AND FOLLOW SIGNS FOR CT-104, TURN LEFT ONTO CT-104/LONG RIDGE RD, TURN RIGHT ONTO ERSKINE RD, THEN TURN LEFT ONTO OLD LONG RIDGE ROAD.

VICINITY MAP



NO SCALE

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

811

GENERAL NOTES

THIS 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.

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Tectonic

STATE OF CONNECTICUT
DONALD A. GUASTELLA
PEN.0025406
LICENSED PROFESSIONAL ENGINEER
9/14/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
NM	JQ	MP

RFDS REV #: 1

ZONING DOCUMENTS

SUBMITTALS

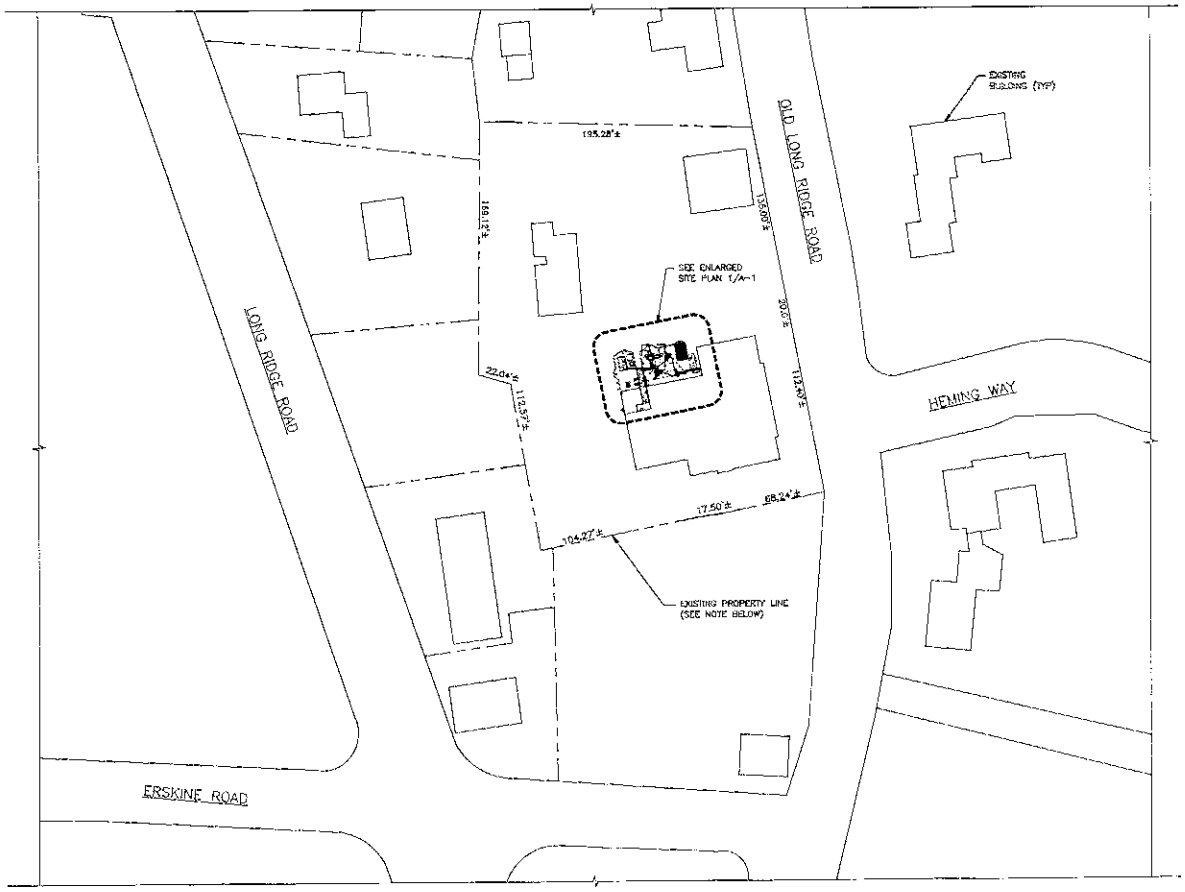
REV	DATE	DESCRIPTION
0	09/08/22	ISSUED FOR ZONING

A&E PROJECT NUMBER
10710.NJJER01110A

Dish Wireless L.L.C. PROJECT INFORMATION
NJJER01110A
366 OLD LONG RIDGE ROAD
STAMFORD, CT 06903

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1



NOTE: FOR SITE PLAN SHOWN REFERENCE "SITE SURVEY PLAN BY L-C ASSOCIATES INC. DATED 10/1/2002".

OVERALL SITE PLAN

40' 20' 0 40' 80'
1"=40'

1

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Tectonic

PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., Inc.
Empire Connect Info
1279 Route 300
Newburgh, NY 12550

Phone: (845) 567-4858
(800) 838-0231
www.tectonicengineering.com

STATE OF CONNECTICUT
ANTONIO A. GUALTIERI
PEN.0025406
LICENSED PROFESSIONAL ENGINEER
9/14/22

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
NM	JQ	MP

RFDS REV #: 1

ZONING DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	09/09/22	ISSUED FOR ZONING

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10710.NJJER01110A

Dish Wireless L.L.C. PROJECT INFORMATION

NJJER01110A

366 OLD LONG RIDGE ROAD
STAMFORD, CT 06903

SHEET TITLE

OVERALL SITE PLAN

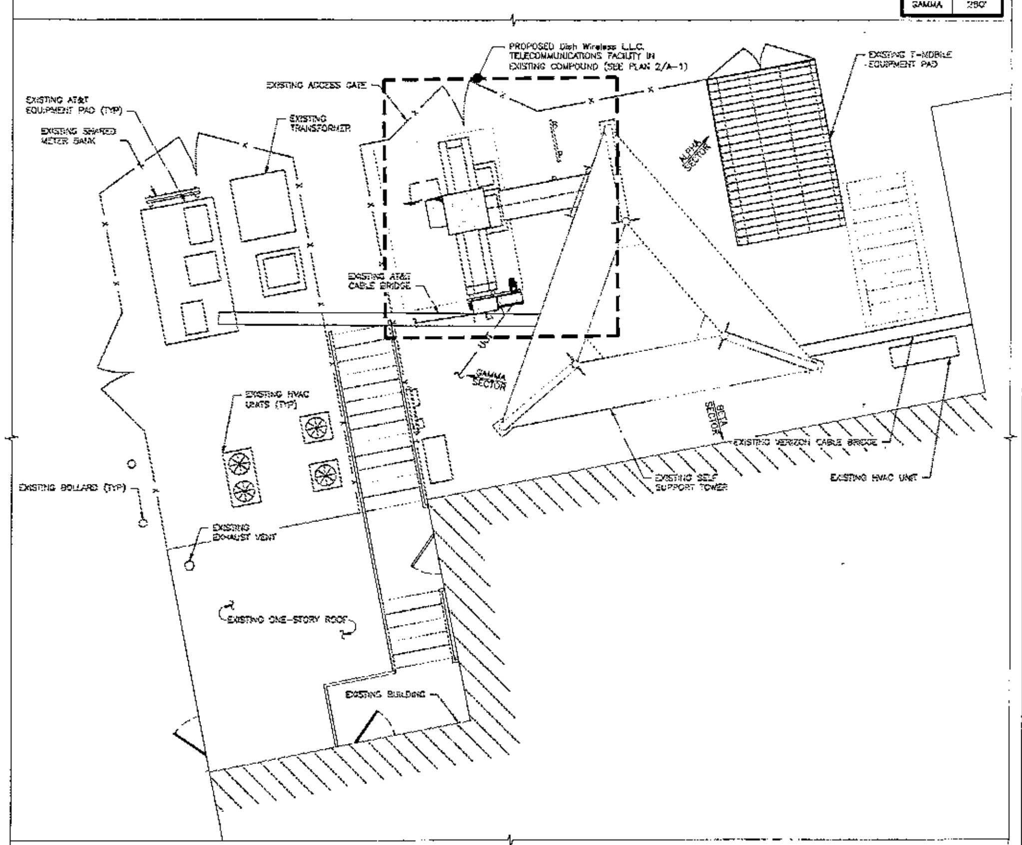
SHEET NUMBER

SP-1

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
3. REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING DATED 09/03/21
4. REFER TO THE MOUNT ANALYSIS REPORT BY TECTONIC DATED 08/24/22

ANTENNA AZIMUTHS	
ALPHA	40°
BETA	160°
GAMMA	280°

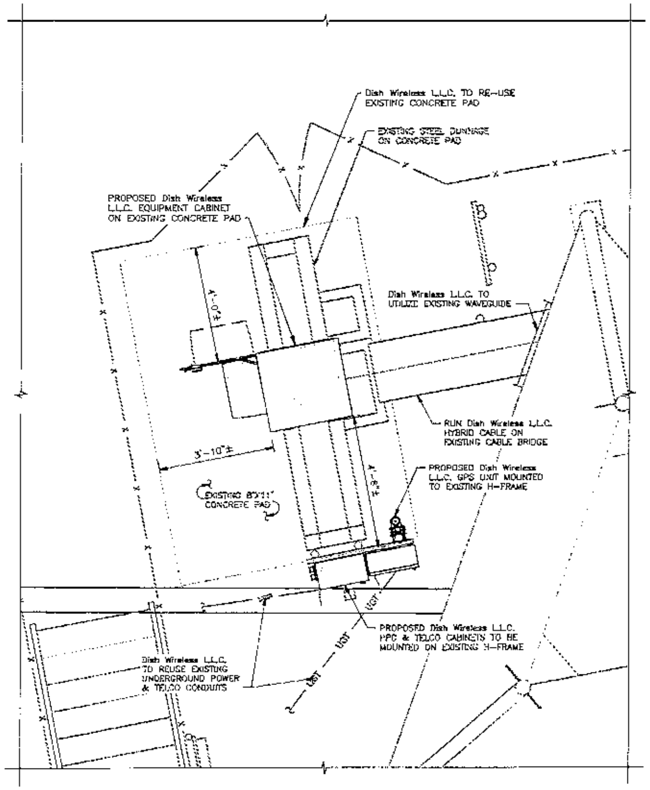


ENLARGED SITE PLAN

1/4"=1'-0" — 1

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
4. REFER TO STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING DATED 09/03/21
5. REFER TO THE MOUNT ANALYSIS REPORT BY TECTONIC ENGINEERING DATED 08/24/22



EQUIPMENT PLAN

1/2"=1'-0" — 2

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Tectonic

STATE OF CONNECTICUT — ANTONIO A. GUALTIERI — PEN.0025406 — LICENSED PROFESSIONAL ENGINEER — 1/14/22

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
NM	JQ	MP

RFDS REV #: 1

ZONING DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	09/08/22	ISSUED FOR ZONING

A&E PROJECT NUMBER
10710.NJJER01110A

Dish Wireless L.L.C. PROJECT INFORMATION
NJJER01110A

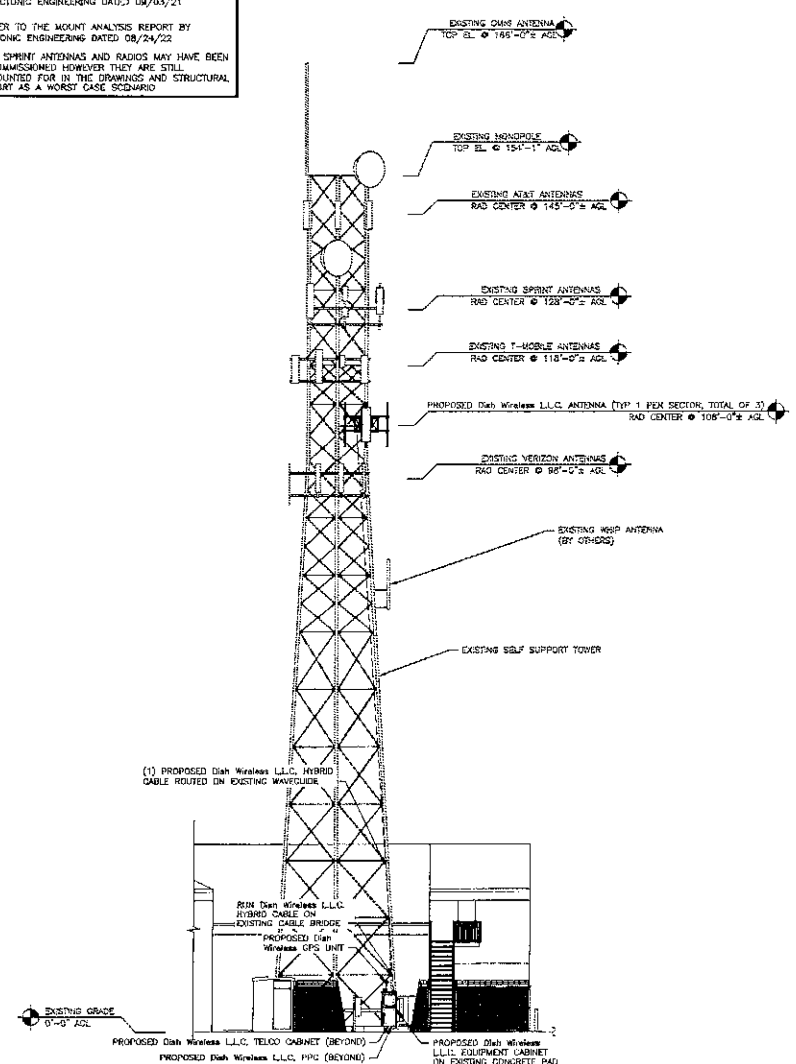
366 OLD LONG RIDGE ROAD
STAMFORD, CT 06903

SHEET TITLE
ENLARGED SITE & EQUIPMENT PLAN

SHEET NUMBER
A-1

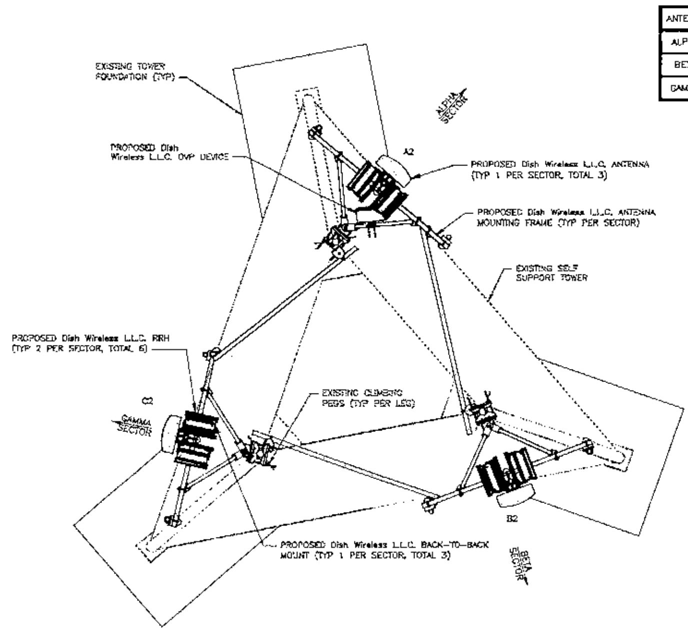
NOTES

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. REFER TO THE STRUCTURAL ANALYSIS REPORT BYTECTONIC ENGINEERING DATED 08/03/21
4. REFER TO THE MOUNT ANALYSIS REPORT BY TECTONIC ENGINEERING DATED 08/24/22
5. THE SPRINT ANTENNAS AND RADIOS MAY HAVE BEEN DECOMMISSIONED HOWEVER THEY ARE STILL ACCOUNTED FOR IN THE DRAWINGS AND STRUCTURAL REPORT AS A WORST CASE SCENARIO



NORTH ELEVATION — 3/32"=1'-0" — 1

ANTENNA AZIMUTHS	
ALPHA	40°
BETA	160°
GAMMA	280°



ANTENNA LAYOUT — 1/2"=1'-0" — 2

SECTOR POS.	ANTENNA: EXISTING OR PROPOSED	ANTENNA: MANUFACTURER – MODEL NUMBER	ANTENNA: TECH	ANTENNA: AZIMUTH	ANTENNA: RAD CENTER	TRANSMISSION CABLE: FEED LINE TYPE AND LENGTH	RRH: MANUFACTURER – MODEL NUMBER	RRH: TECH	RRH: POS.	OVP: MANUFACTURER MODEL
A2	PROPOSED	JMA – MX08FRO665-21	5G	40°	108'-0"	(1) HIGH-CAPACITY HYBRID CABLE (129' LONG)	FUJITSU – TA08025-B604	5G	A2	RAYCAP – RDIDC-9181-PF-48
							FUJITSU – TA08025-B605	5G	A2	
B2	PROPOSED	JMA – MX08FRO665-21	5G	160°	108'-0"	SHARED W/ALPHA	FUJITSU – TA08025-B604	5G	B2	SHARED W/ALPHA
							FUJITSU – TA08025-B605	5G	B2	
C2	PROPOSED	JMA – MX08FRO665-21	5G	280°	108'-0"	SHARED W/ALPHA	FUJITSU – TA08025-B604	5G	C2	SHARED W/ALPHA
							FUJITSU – TA08025-B605	5G	C2	

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.
3. AZIMUTHS ARE SUBJECT TO CHANGE AND NEED TO BE CONFIRMED WITH THE LATEST RFDS PRIOR TO THE START OF CONSTRUCTION.

ANTENNA SCHEDULE — 3

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LITTLETON, CO 80120

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STATE OF CONNECTICUT — ANTONIO A. GUALTIERI — PEN.0025406 — LICENSED PROFESSIONAL ENGINEER — 9/14/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
NM	JQ	MP

RFDS REV #: 1

ZONING DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	09/08/22	ISSUED FOR ZONING

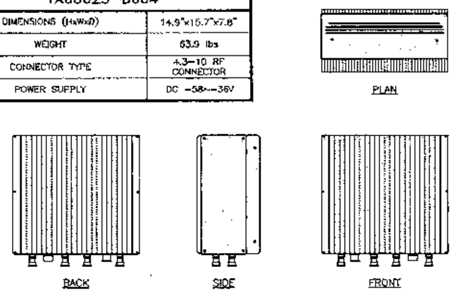
A&E PROJECT NUMBER
10710.NJJER01110A

Dish Wireless L.L.C. PROJECT INFORMATION
NJJER01110A
366 OLD LONG RIDGE ROAD
STAMFORD, CT 06903

SHEET TITLE
ELEVATION, ANTENNA LAYOUT PLAN & SCHEDULE

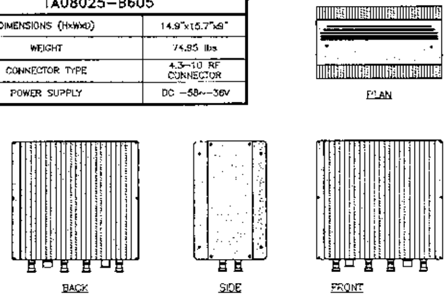
SHEET NUMBER
A-2

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



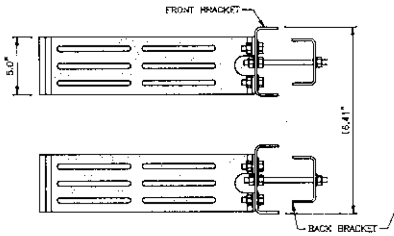
RRH DETAIL — NO SCALE — 1

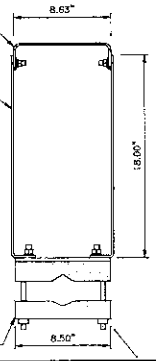
FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



RRH DETAIL — NO SCALE — 2

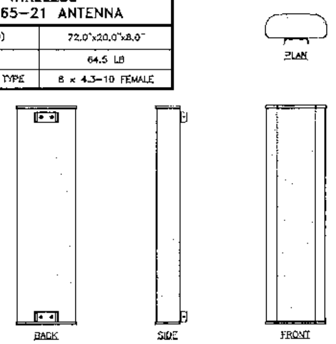
COMMSCOPE BACK-TO-BACK MOUNT RR-FA2	
DIMENSIONS (HxWxD)	16.41"x18.0"x3.0"
WEIGHT	39.22 lb
PACKAGE QUANTITY	2





REMOTE RADIO MOUNT DETAIL — NO SCALE — 3

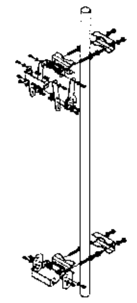
JMA WIRELESS MX08FRO665-21 ANTENNA	
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	64.5 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE



ANTENNA DETAIL — NO SCALE — 4

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

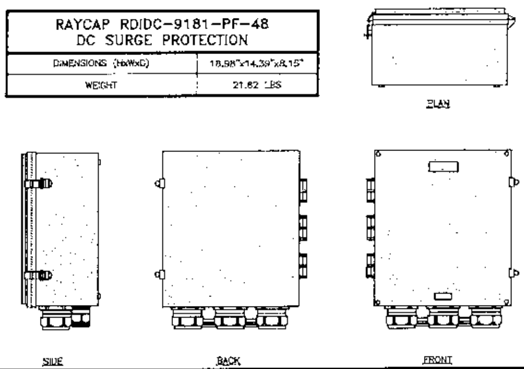
NOTE:
KIT #91900318: TOP AND BOTTOM BRACKETS FOR 4-, 6-, AND 8-FOOT ANTENNAS
ANTENNA BRACKET NOT PART OF KIT



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

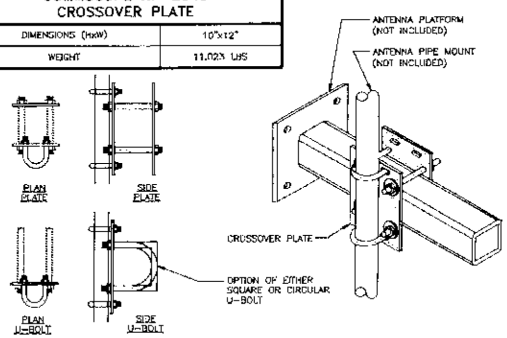
ANTENNA BRACKET DETAIL — NO SCALE — 5

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



SURGE SUPPRESSION DETAIL — NO SCALE — 6

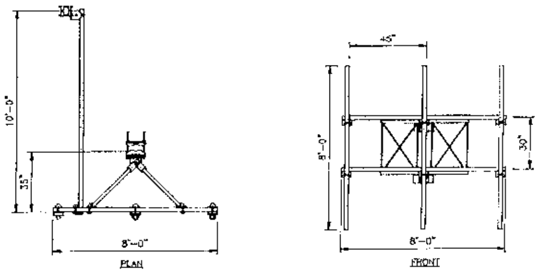
COMMSCOPE XP-2040 CROSSOVER PLATE	
DIMENSIONS (HxW)	10"x12"
WEIGHT	11.023 LBS



RRH/OVP MOUNT 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



ANTENNA FRAME DETAIL — NO SCALE — 8

NOT USED — NO SCALE — 9

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9/14/22

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ZONING DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
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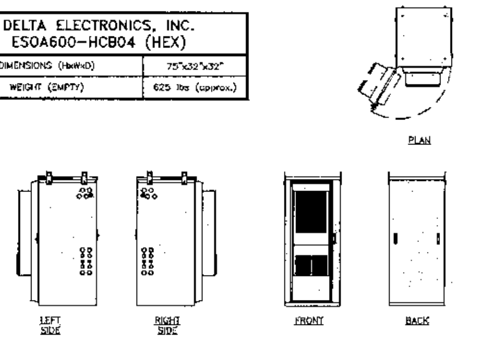
A&E PROJECT NUMBER
10710.NJJER01110A

Dish Wireless L.L.C. PROJECT INFORMATION
NJJER01110A
366 OLD LONG RIDGE ROAD
STAMFORD, CT 06903

SHEET TITLE
EQUIPMENT DETAILS

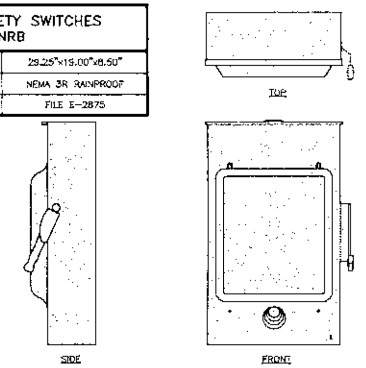
SHEET NUMBER
A-3

DELTA ELECTRONICS, INC. ESOA600-HCB04 (HEX)	
DIMENSIONS (HxWxD)	75"x32"x32"
WEIGHT (EMPTY)	625 lbs (approx.)



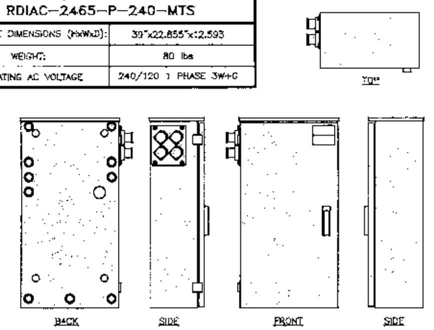
CABINET DETAIL — NO SCALE — 1

SQUARE D SAFETY SWITCHES D224NRB	
ENCLOSURE DIM (HxWxD)	29.25"x15.00"x8.50"
ENCLOSURE TYPE	NEMA 3R RAINPROOF
UL LISTED	FILE E-2875



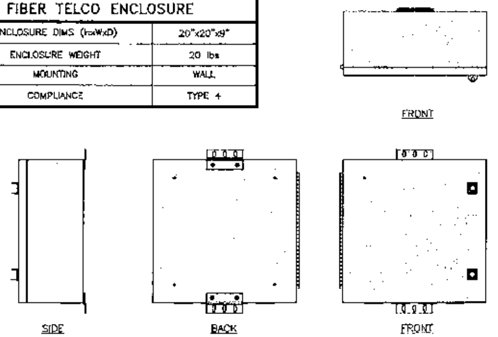
SAFETY SWITCH DETAIL — NO SCALE — 2

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

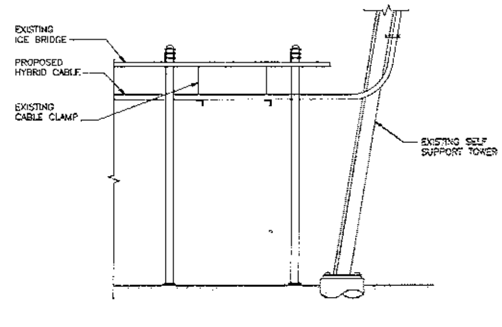


CABINET DETAIL — NO SCALE — 3

CHARLES CFIT-PF2020DSH1 FIBER TELCO ENCLOSURE	
ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4

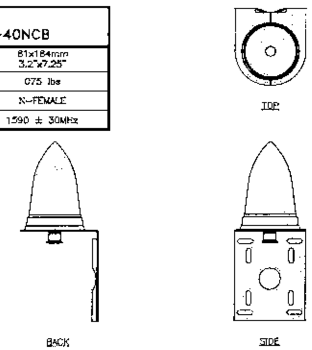


FIBER TELCO ENCLOSURE DETAIL — NO SCALE — 4

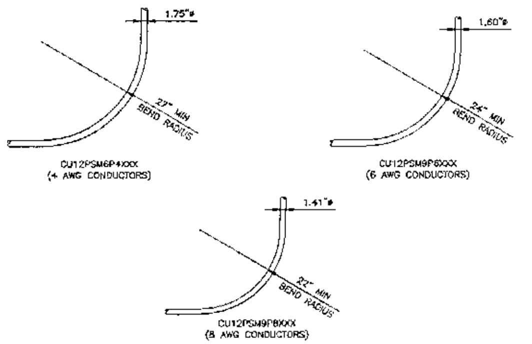


HYBRID CABLE RUN — NO SCALE — 5

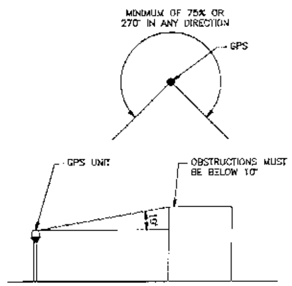
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



GPS DETAIL — NO SCALE — 6



CABLES UNLIMITED HYBRID CABLE MINIMUM BEND RADIUSES — NO SCALE — 7



GPS MINIMUM SKY VIEW REQUIREMENTS — NO SCALE — 8

NOT USED — NO SCALE — 9

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1/14/22

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NM	JQ	MP

RFDS REV #: 1

ZONING DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	09/08/22	ISSUED FOR ZONING

A&E PROJECT NUMBER
10710.NJJER01110A

Dish Wireless L.L.C. PROJECT INFORMATION
NJJER01110A
366 OLD LONG RIDGE ROAD
STAMFORD, CT 06903

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

LEGEND

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLOX GFCI RECEPTACLE

FLUORESCENT LIGHTING FIXTURE
(2) TWO LAMPS 48-T8

SMOKE DETECTION (DC)

EMERGENCY LIGHTING (DC)

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

CHAIN LINK FENCE

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE

UNDERGROUND POWER

UNDERGROUND TELCO

OVERHEAD POWER

OVERHEAD TELCO

UNDERGROUND TELCO/POWER

ABOVE GROUND POWER

ABOVE GROUND TELCO

ABOVE GROUND TELCO/POWER

WORKPOINT

SECTION REFERENCE

DETAIL REFERENCE

ABBREVIATIONS

AB	ANCHOR BOLT
ABV	ABOVE
AC	ALTERNATING CURRENT
ADDL	ADDITIONAL
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AGL	ABOVE GROUND LEVEL
AIC	AMPERAGE INTERRUPTION CAPACITY
ALUM	ALUMINUM
ALT	ALTERNATE
ANT	ANTENNA
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BM	BEAM
BTC	BARE TINNED COPPER CONDUCTOR
BOF	BOTTOM OF FOOTING
CAB	CABINET
CANT	CANTILEVERED
CHG	CHARGING
CLG	CEILING
CLR	CLEAR
COL	COLUMN
COMM	COMMON
CONC	CONCRETE
CONSTR	CONSTRUCTION
DBL	DOUBLE
DC	DIRECT CURRENT
DEPT	DEPARTMENT
DF	DOUGLAS FIR
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DWG	DRAWING
DWL	DOWEL
EA	EACH
EC	ELECTRICAL CONDUCTOR
EL	ELEVATION
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ENG	ENGINEER
EQ	EQUAL
EXP	EXPANSION
EXT	EXTERIOR
EW	EACH WAY
FAB	FABRICATION
FF	FINISH FLOOR
FG	FINISH GRADE
FIF	FACILITY INTERFACE FRAME
FIN	FINISH(ED)
FLR	FLOOR
FDN	FOUNDATION
FOC	FACE OF CONCRETE
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FOW	FACE OF WALL
FS	FINISH SURFACE
FT	FOOT
FTG	FOOTING
GA	GAUGE
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GLB	GLUE LAMINATED BEAM
GLV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
GSM	GLOBAL SYSTEM FOR MOBILE
HDG	HOT DIPPED GALVANIZED
HDR	HEADER
HGR	HANGER
HVAC	HEAT/VENTILATION/AIR CONDITIONING
HT	HEIGHT
IGR	INTERIOR GROUND RING
IN	INCH
INT	INTERIOR
LB(S)	POUND(S)
LF	LINEAR FEET
LTE	LONG TERM EVOLUTION
MAS	MASONRY
MAX	MAXIMUM
MB	MACHINE BOLT
MECH	MECHANICAL
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MISC	MISCELLANEOUS
MTL	METAL
MTS	MANUAL TRANSFER SWITCH
MW	MICROWAVE
NEC	NATIONAL ELECTRIC CODE
NM	NEWTON METERS
NO.	NUMBER
#	NUMBER
NTS	NOT TO SCALE
OC	ON-CENTER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OPNG	OPENING
P/C	PRECAST CONCRETE
PCS	PERSONAL COMMUNICATION SERVICES
PCU	PRIMARY CONTROL UNIT
PRC	PRIMARY RADIO CABINET
PP	POLARIZING PRESERVING
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
PWR	POWER CABINET
QTY	QUANTITY
RAD	RADIUS
RECT	RECTIFIER
REF	REFERENCE
REINF	REINFORCEMENT
REQ'D	REQUIRED
RET	REMOTE ELECTRIC TILT
RF	RADIO FREQUENCY
RMC	RIGID METALLIC CONDUIT
RRH	REMOTE RADIO HEAD
RRU	REMOTE RADIO UNIT
RWY	RACEWAY
SCH	SCHEDULE
SHT	SHEET
SIAD	SMART INTEGRATED ACCESS DEVICE
SIM	SIMILAR
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
TEMP	TEMPORARY
THK	THICKNESS
TMA	TOWER MOUNTED AMPLIFIER
TN	TOE NAIL
TOA	TOP OF ANTENNA
TOC	TOP OF CURB
TOF	TOP OF FOUNDATION
TOP	TOP OF PLATE (PARAPET)
TOS	TOP OF STEEL
TOW	TOP OF WALL
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
UPS	UNINTERRUPTIBLE POWER SYSTEM (DC POWER PLANT)
VIF	VERIFIED IN FIELD
W	WIDE
W/	WITH
WD	WOOD
WP	WEATHERPROOF
WT	WEIGHT

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STATE OF CONNECTICUT
TONIO A. GUAITOLI
PEN.0025406
LICENSED
PROFESSIONAL ENGINEER
5/11/22

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NM	JO	MP

RFDS REV #: 1

ZONING DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	05/06/22	ISSUED FOR ZONING

A&E PROJECT NUMBER

10710.NJJER01110A

Dish Wireless L.L.C. PROJECT INFORMATION

NJJER01110A

366 OLD LONG RIDGE ROAD
STAMFORD, CT 06903

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

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

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 AND TOWER OWNER

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

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

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Tectonic

STATE OF CONNECTICUT
ANTONIO A. GUALTIERI
PEN.0025406
LICENSED
PROFESSIONAL ENGINEER
9/14/22

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
NM	JQ	MP

RFDS REV #: 1

ZONING DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	09/06/22	ISSUED FOR ZONING

A&E PROJECT NUMBER
10710.NJJER01110A

Dish Wireless L.L.C. PROJECT INFORMATION
NJJER01110A
366 OLD LONG RIDGE ROAD
STAMFORD, CT 06903

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-2

Exhibit D

Structural Analysis

Tectonic

PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Date: **September 3, 2021**

Structural Analysis Report

Carrier: DISH

Site Number: NJJER01110A
Site Data: 366 Old Long Ridge Rd, Stamford, Fairfield County, CT 06903
Latitude *41.153110°*, Longitude *-73.5927°*
152 Foot – Self-Support Tower

Tectonic Project Number: 10710.NJJER01110A

Tectonic Engineering & Surveying Consultants P.C. is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation to be:

Structure:	**Sufficient**
Foundation:	**Sufficient**
Mount:	**Sufficient**

This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 120 mph converted to a nominal 3-second gust wind speed of 93 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a maximum topographic factor, Kzt, of 1.0 and Risk Category II were used in this analysis.

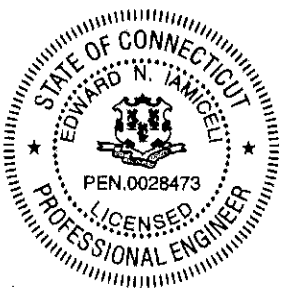
All modifications and equipment proposed in this report shall be installed in accordance with this analysis for the determined available structural capacity to be effective.

We at Tectonic appreciate the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Ian Marinaccio / John-Fritz Julien

Respectfully submitted by:
Tectonic Engineering & Surveying Consultants P.C.

Edward N. Iamiceli, P.E.
Managing Director - Structural



Project Contact Info

1279 Route 300 | Newburgh, NY 12550
845.567.6656 Tel | 845.567.8703 Fax

tectonicengineering.com
Equal Opportunity Employer

1) INTRODUCTION

This tower is a 152 ft Self Support tower designed by Rohn in May of 1989. The tower was previously reinforced multiple times with leg modifications and rock anchors.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-G
Risk Category:	II
Wind Speed:	93 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	0.75 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Carrier	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
108.0	DISH	3	commscope	MTC3975083 Sector Frame	1	Hybrid	-
		3	fujitsu	TA08025-B604			
		3	fujitsu	TA08025-B605			
		3	jma wireless	MX08FRO665-21			
		1	raycap	RDIDC-9181-PF-48			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Carrier	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
152.0	-	1	antennae	20' 4-Bay Dipole	1 1	7/8 EW180	1
		1	-	4' Dish			
		1	-	TMA			
150.0	-	1	decibel	DB563K-CT w/Mount Pipe	1	1/2	1
		1	tower mounts	3' Standoff			
145.0	AT&T	6	kaelus	TMA2117F00V1-1	12	1-5/8	1
		3	quintel technology	QS66512-2			
		1	tower mounts	2' Standoffs			
140.0	-	1	-	4' Dish	1	EW180	1
135.0	-	1	-	6' x 3" Dia Omni	2	1-5/8	1
		1	decibel	DB254-A			
		2	tower mounts	3' Standoff			
131.0	Sprint	3	alcatel lucent	RRH2X50-800	3 1	1-1/4 7/8	1
		3	alcatel lucent	RRH4X45-19			
		3	alcatel lucent	TD-RRH8x20			
		3	rfs celwave	APXVSPP18-C-A20			
		3	rfs celwave	APXVTM14-ALU-I20			
		3	tower mounts	12' Sector Frames			

TABLE OF CONTENTS

Mounting Level (ft)	Carrier	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
118.0	T-Mobile	3	andrew	LNX-6515DS-A1M	1 1	1-5/8 1-1/4	1
		1	ericsson	AIR 32			
		2	ericsson	AIR 32			
		3	ericsson	RRUS 11			
		3	ericsson	RRUS 32			
		3	rfs celwave	APX16DWV-16DWV-S-E-A20			
		3	tower mounts	12' Sector Frames			
98.0	Verizon Wireless	3	commscope	BSAMNT-SBS-1-2	3 1	1-5/8 1/2	1
		3	commscope	CBC78T-DS-43-2X			
		9	commscope	JAHH-65B-R3B			
		1	gps	GPS_A			
		3	rfs celwave	DB-T1-6Z-8AB-0Z			
		3	samsung telecommunications	B2/B66 RRH-BR049			
		3	samsung telecommunications	B5/B13 RRH-BR04C			
		3	samsung telecommunications	CBRS RRH-RT4401-48A			
		3	samsung telecommunications	XXDWMM-12.5-65-8T-CBRS			
		3	sitepro1	VFA12-HD			
74.0	-	1	-	8' 4-Bay Dipole	1	7/8	1
		1	tower mounts	3' Standoff			
58.0	-	1	gps	GPS_A	1	1/2	1
		1	tower mounts	3' Standoff			

Note:
1) Existing Equipment to Remain

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Dated
Structural Analysis Report	Centek Engineering, Inc.	02/28/17
Structural Analysis Report	Paul J. Ford and Company	10/25/19
Mount Analysis Report	CommScope Sector Frame P/N MTC3975083	02/10/21
RFDS	DISH	06/09/21
Site Inspection	Tectonic	08/18/21

3.1) Analysis Method

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

tnxTower was used to determine the loads on the modified structure. Additional calculations were performed to determine the stresses in the reinforced leg sections. These calculations are presented in Appendix C.

3.2) Assumptions

1) Tower and structures were built and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2.
3) The tower is considered to be used for non-emergency services. Therefore, Risk Category II has been used for the analysis.
4) Original design documentation was not available at the time of this analysis. Therefore, the tower geometry, foundation information, and existing load configurations are based solely on the previous tower analysis report by Paul J. Ford and Company, referenced above.

This analysis is solely for the supporting tower structure, and it may be affected if any assumptions are not valid or have been made in error. Tectonic should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	152 - 140	Leg	ROHN 2 STD	1	-5.56	36.84	15.1	Pass
T2	140 - 135	Leg	ROHN 2.5 STD	25	-8.54	57.14	14.9	Pass
T3	135 - 130	Leg	ROHN 2.5 STD	37	-13.17	57.14	23.0	Pass
T4	130 - 125	Leg	ROHN 2.5 STD	46	-17.82	57.14	31.2	Pass
T5	125 - 120	Leg	ROHN 2.5 STD	55	-23.10	57.14	40.4	Pass
T6	120 - 100	Leg	ROHN 2.5 X-STR	64	-48.80	58.52	83.4	Pass
T7	100 - 93.3333	Leg	ROHN 2.5XS w/ 1/3 HSS 3.5x.3	85	-60.11	126.03	47.7	Pass
T8	93.3333 - 86.6667	Leg	ROHN 2.5XS w/ 1/3 HSS 3.5x.3	97	-70.96	126.10	56.3	Pass
T9	86.6667 - 80	Leg	ROHN 2.5XS w/ 1/3 HSS 3.5x.3	109	-81.53	126.16	64.6	Pass
T10	80 - 73.3333	Leg	ROHN 3XS w/ 1/3 HSS4x.25	121	-92.00	162.65	56.6	Pass
T11	73.3333 - 66.6667	Leg	ROHN 3XS w/ 1/3 HSS4x.25	133	-101.94	162.69	62.7	Pass
T12	66.6667 - 60	Leg	ROHN 3XS w/ 1/3 HSS4x.25	145	-111.82	162.73	68.7	Pass
T13	60 - 50	Leg	ROHN 4 X-STR	157	-123.92	174.29	71.1	Pass
T14	50 - 40	Leg	ROHN 4 X-STR	169	-138.05	174.38	79.2	Pass
T15	40 - 30	Leg	ROHN 4XS w/ 1/3 HSS5x.25	181	-152.24	222.03	68.6	Pass
T16	30 - 20	Leg	ROHN 4XS w/ 1/3 HSS5x.25	193	-165.21	246.29	67.1	Pass
T17	20 - 15	Leg	ROHN 5STD w/ 1/3 HSS6x.25	235	-178.51	255.97	69.7	Pass
T18	15 - 10	Leg	ROHN 5STD w/ (3) 1.5x0.5 PL	259	-179.86	275.15	65.4	Pass
T19	10 - 0	Leg	ROHN 5STD w/ (3) 1.5x0.5 PL	268	-192.51	223.83	86.0	Pass
T1	152 - 140	Diagonal	L1 1/2x1 1/2x1/8	11	-1.65	3.77	43.7	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
							51.3 (b)	
T2	140 - 135	Diagonal	L1 1/2x1 1/2x3/16	36	-1.59	4.18	38.0	Pass
T3	135 - 130	Diagonal	L1 1/2x1 1/2x3/16	45	-2.10	3.79	55.3	Pass
T4	130 - 125	Diagonal	L1 1/2x1 1/2x1/4	54	-2.85	4.46	63.8	Pass
T5	125 - 120	Diagonal	L1 1/2x1 1/2x1/4	63	-2.59	4.07	63.6	Pass
T6	120 - 100	Diagonal	L2x2x1/4	72	-4.78	6.13	78.0	Pass
T7	100 - 93.3333	Diagonal	L 2 1/2x 2 1/2x 1/4	93	-5.98	11.18	53.5 70.8 (b)	Pass
T8	93.3333 - 86.6667	Diagonal	L 2 1/2x 2 1/2x 1/4	105	-5.90	10.22	57.8 69.3 (b)	Pass
T9	86.6667 - 80	Diagonal	L 2 1/2x 2 1/2x 1/4	117	-5.94	9.36	63.4 69.6 (b)	Pass
T10	80 - 73.3333	Diagonal	L 2 1/2x 2 1/2x 1/4	129	-5.96	8.65	68.8 69.6 (b)	Pass
T11	73.3333 - 66.6667	Diagonal	L2 1/2x2 1/2x5/16	141	-6.15	9.67	63.6	Pass
T12	66.6667 - 60	Diagonal	L2 1/2x2 1/2x5/16	153	-6.19	8.91	69.5	Pass
T13	60 - 50	Diagonal	L3x3x1/4	165	-7.04	9.66	72.9	Pass
T14	50 - 40	Diagonal	L3x3x5/16	177	-7.28	10.80	67.5	Pass
T15	40 - 30	Diagonal	L3x3x3/8	189	-7.26	11.59	62.6	Pass
T16	30 - 20	Diagonal	L3x3x5/16	197	-8.21	21.85	37.6 57.1 (b)	Pass
T17	20 - 15	Diagonal	L3 1/2x3 /12x1/4	253	-6.95	27.02	25.7 67.7 (b)	Pass
T18	15 - 10	Diagonal	L3 1/2x3 /12x1/4	267	-7.12	11.08	64.3 66.4 (b)	Pass
T19	10 - 0	Diagonal	L3 1/2x3 1/2x5/16	271	-7.87	12.65	62.3	Pass
T16	30 - 20	Horizontal	L3x3x1/4	210	-2.87	9.09	31.5	Pass
T18	15 - 10	Horizontal	L2 1/2x2 1/2x3/16	252	-3.12	3.79	82.4	Pass
T7	100 - 93.3333	Secondary Horizontal	L2 1/2x2 1/2x1/4	96	-1.04	12.75	8.2	Pass
T8	93.3333 - 86.6667	Secondary Horizontal	L2 1/2x2 1/2x1/4	108	-1.23	11.67	10.5	Pass
T9	86.6667 - 80	Secondary Horizontal	L2 1/2x2 1/2x1/4	120	-1.41	10.73	13.2	Pass
T10	80 - 73.3333	Secondary Horizontal	L2 1/2x2 1/2x1/4	132	-1.60	9.57	16.7	Pass
T11	73.3333 - 66.6667	Secondary Horizontal	L2 1/2x2 1/2x1/4	144	-1.77	9.18	19.3	Pass
T12	66.6667 - 60	Secondary Horizontal	L2 1/2x2 1/2x1/4	156	-1.94	8.50	22.8	Pass
T13	60 - 50	Secondary Horizontal	L2 1/2x2 1/2x1/4	168	-2.15	7.58	28.3	Pass
T14	50 - 40	Secondary Horizontal	L 3x3x1/4	180	-2.39	11.38	21.0	Pass
T15	40 - 30	Secondary Horizontal	L 3x3x1/4	192	-2.64	10.36	25.5	Pass
T1	152 - 140	Top Girt	L2x2x1/8	5	-0.08	4.09	2.1	Pass
T2	140 - 135	Top Girt	L2x2x1/8	29	-0.17	4.09	4.1	Pass
T16	30 - 20	Redund Horz 1 Bracing	L2x2x1/4	198	-2.87	11.75	24.4	Pass
T17	20 - 15	Redund Horz 1 Bracing	L2x2x1/4	240	-3.10	10.69	28.9	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T16	30 - 20	Redund Diag 1 Bracing	L2x2x1/4	219	-1.67	8.64	19.3	Pass
T17	20 - 15	Redund Diag 1 Bracing	L2x2x1/4	258	-1.79	8.07	22.2	Pass
							Summary	
						Leg (T19)	92.4	Pass[1]
						Diagonal (T6)	78.0	Pass
						Horizontal (T18)	82.4	Pass
						Secondary Horizontal (T13)	28.3	Pass
						Top Girt (T2)	4.1	Pass
						Redund Horz 1 Bracing (T17)	28.9	Pass
						Redund Diag 1 Bracing (T17)	22.2	Pass
						Bolt Checks	70.8	Pass
						Rating =	92.4	Pass[1]

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	82.7	Pass
1	Base Foundation (Soil Interaction)	0	94.8	Pass
1	Base Foundation (Structure)	0	19.5	Pass

Structure Rating (max from all components) =	94.8%

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

4.1) Recommendations

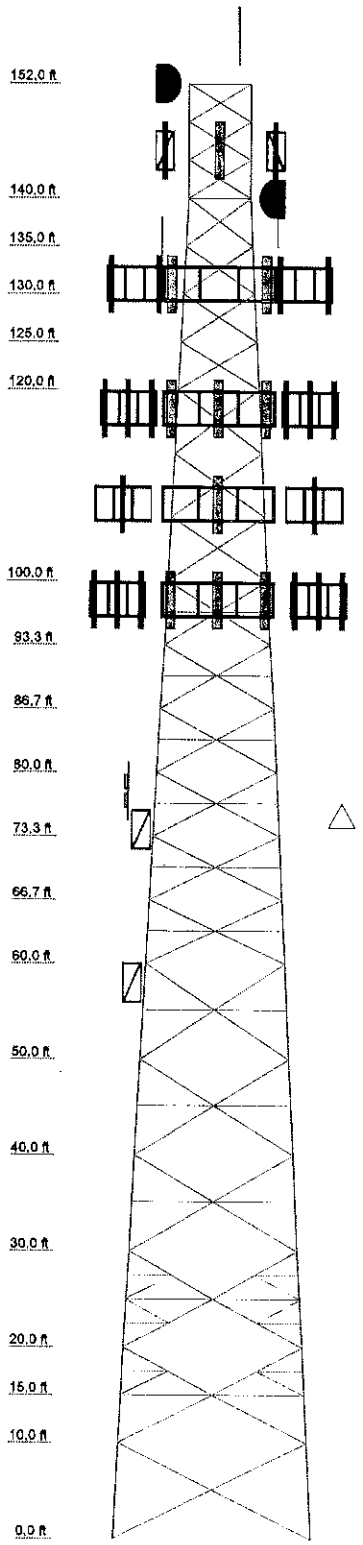
The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time. The proposed CommScope sector frame, P/N MTC3975083, is adequate to support the new Dish installation as indicated in the mount structural analysis report dated 02/10/21, referenced above.

Contractor shall field verify existing conditions and recommendations as noted on the construction drawings and notify the design engineer of any discrepancies prior to construction. Any further changes to the antenna and/or appurtenance configuration should be reviewed with respect to their effect on structural loads prior to implementation.

APPENDIX A

TNXTOWER OUTPUT

Section	T19	T18	T17	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	C		B		ROHN 4XS w/ 1/3 HSS5x.25		ROHN 4 X-STR		ROHN 3XS w/ 1/3 HSS4x.25		A		ROHN 2.5 X-STR		ROHN 2.5 STD		ROHN 2 STD	
Leg Grade	A572-50																		
Diagonals	G		F		L3x3x5/16		L3x3x5/16		L3x3x1/4		L2 1/2x2 1/2x1/4		L2x2x1/4		E		D		L1 1/2x1 1/2x1/8
Diagonal Grade	A36																		
Top Girts	N.A.														L2x2x1/8				
Horizontals	N.A.		H		N.A.		L3x3x1/4		N.A.				8.5625	8.0625	7.5625	7.0625	6.5625		6.52083
Sec. Horizontals			N.A.				L3x3x1/4		L2 1/2x2 1/2x1/4					N.A.					
Red. Horizontals	N.A.				L2x2x1/4														
Red. Diagonals	N.A.				L2x2x1/4						N.A.								
Face Width (ft)	20.7813		19.7761	19.2734	18.7708		17.7343		16.6979		15.6979	14.6979	13.3021	12.6042	11.9236	11.2431	10.5625		
#Panels @ (ft)	1 @ 10		4 @ 5								3 @ 10				9 @ 6.66667		4 @ 5		3 @ 4
Weight (K)	17.4	1.7		0.9	0.8	2.1		1.5		1.4		1.2		1.2		0.7		0.2	0.3



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' 4-Bay Dipole	152	RRUS 11	118
TMA	152	RRUS 11	118
6' x 4" Mount Pipe	152	RRUS 11	118
4' Dish	152	RRUS 32	118
3' Standoff	150	RRUS 32	118
4'x4" Pipe Mount	150	RRUS 32	118
DB563K-CT w/Mount Pipe	150	12' Sector Frames	118
QS66512-2_TIA w/ Mount Pipe	145	AIR 32 w/ Mount Pipe	118
QS66512-2_TIA w/ Mount Pipe	145	AIR 32 w/ Mount Pipe	118
(2) TMA2117F00V1-1	145	MX08FRO665-21 w/ Mount Pipe	108
(2) TMA2117F00V1-1	145	TA08025-B604	108
(2) TMA2117F00V1-1	145	TA08025-B604	108
2' Standoffs	145	TA08025-B604	108
QS66512-2_TIA w/ Mount Pipe	145	TA08025-B605	108
4'x4" Pipe Mount	140	TA08025-B605	108
4' Dish	140	TA08025-B605	108
DB254-A	135	RDIDC-9181-PF-48	108
3' Standoff	135	MTC3975083	108
6' x 3" Dia Omni	135	MX08FRO665-21 w/ Mount Pipe	108
3' Standoff	135	MX08FRO665-21 w/ Mount Pipe	108
APXVSPP18-C-A20_TIA w/ Mount Pipe	131	(3) JAHH-65B-R3B_TIA w/ Mount Pipe	98
		BSAMNT-SBS-1-2	98
RRH2X50-800	131	BSAMNT-SBS-1-2	98
RRH2X50-800	131	BSAMNT-SBS-1-2	98
RRH2X50-800	131	XXDWMM-12.5-65-8T-CBRS	98
RRH4X45-19	131	XXDWMM-12.5-65-8T-CBRS	98
RRH4X45-19	131	XXDWMM-12.5-65-8T-CBRS	98
RRH4X45-19	131	CBRS RRH-RT4401-48A	98
APXVTM14-ALU-I20_TIA w/ Mount Pipe	131	CBRS RRH-RT4401-48A	98
		CBRS RRH-RT4401-48A	98
APXVTM14-ALU-I20_TIA w/ Mount Pipe	131	B2/B66 RRH-BR049	98
APXVTM14-ALU-I20_TIA w/ Mount Pipe	131	B2/B66 RRH-BR049	98
		B2/B66 RRH-BR049	98
TD-RRH8x20	131	B5/B13 RRH-BR04C	98
TD-RRH8x20	131	B5/B13 RRH-BR04C	98
TD-RRH8x20	131	B5/B13 RRH-BR04C	98
12' Sector Frames	131	CBC78T-DS-43-2X	98
APXVSPP18-C-A20_TIA w/ Mount Pipe	131	CBC78T-DS-43-2X	98
		CBC78T-DS-43-2X	98
APXVSPP18-C-A20_TIA w/ Mount Pipe	131	VFA12-HD	98
		VFA12-HD	98
AIR 32 w/ Mount Pipe	118	VFA12-HD	98
LNX-6515DS-A1M_TIA w/ Mount Pipe	118	GPS_A	98
LNX-6515DS-A1M_TIA w/ Mount Pipe	118	DB-T1-6Z-8AB-0Z	98
LNX-6515DS-A1M_TIA w/ Mount Pipe	118	DB-T1-6Z-8AB-0Z	98
APX16DWV-16DWV-S-E-A20_TIA w/ Mount Pipe	118	DB-T1-6Z-8AB-0Z	98
		(3) JAHH-65B-R3B_TIA w/ Mount Pipe	98
APX16DWV-16DWV-S-E-A20_TIA w/ Mount Pipe	118	(3) JAHH-65B-R3B_TIA w/ Mount Pipe	98
APX16DWV-16DWV-S-E-A20_TIA w/ Mount Pipe	118	8' 4-Bay Dipole	74
		3' Standoff	74
		GPS_A	58
		3' Standoff	58

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2.5XS w/ 1/3 HSS 3.5x.3	E	L1 1/2x1 1/2x1/4
B	ROHN 5STD w/ 1/3 HSS5x.25	F	L3 1/2x3 /12x1/4
C	ROHN 5STD w/ (3) 1.5x0.5 PL	G	L3 1/2x3 1/2x5/16
D	L1 1/2x1 1/2x3/16	H	L2 1/2x2 1/2x3/16

MATERIAL STRENGTH

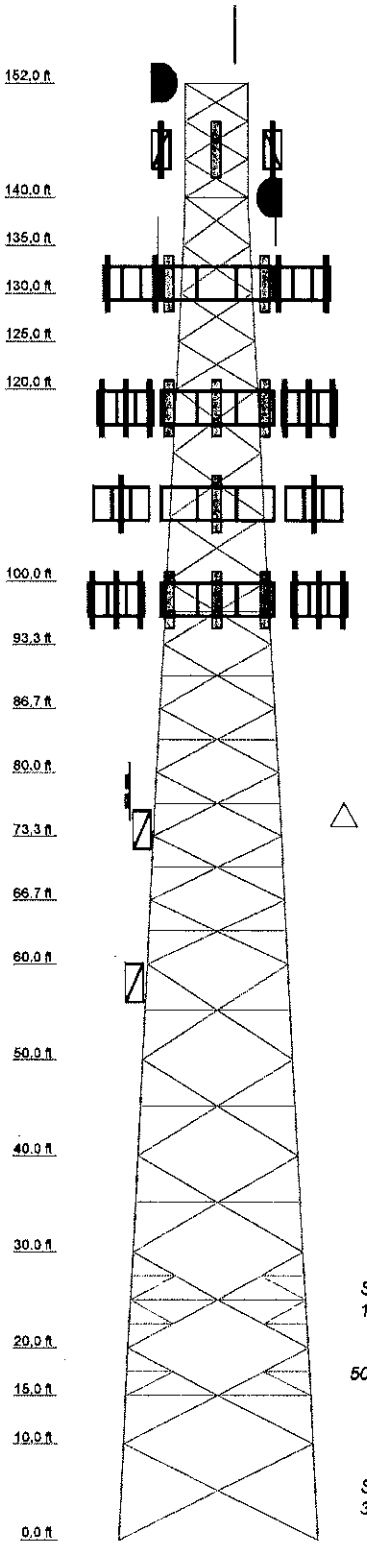
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

Tectonic

Tectonic
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
FAX: (845) 567-8703

Job: *152' Self-Support Tower*		
Project: *10710.NJJER01110A*		
Client: DISH	Drawn by: Ian Marinaccio	App'd:
Code: TIA-222-G	Date: 09/01/21	Scale: NTS
Path:		Dwg No. E-1

Section	T19	T18	T17	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	C		B	ROHN 4XS w/ 1/3 HSS5x.25		ROHN 4 X-STR		ROHN 3XS w/ 1/3 HSS4x.25			A		ROHN 2.5 X-STR		ROHN 2.5 STD			ROHN 2 STD
Leg Grade	A572-50																		
Diagonals	G	F	L3x3x5/16	L3x3x3/8	L3x3x5/16	L3x3x1/4	L2 1/2x2 1/2x5/16			L 2 1/2x 2 1/2x 1/4				L2x2x1/4		E		D	L1 1/2x1 1/2x1/8
Diagonal Grade	A36																		
Top Girts	N.A.																		L2x2x1/8
Horizontals	N.A.	H	N.A.	L3x3x1/4							N.A.								
Sec. Horizontals	N.A.			L 3x3x1/4				L2 1/2x2 1/2x1/4						N.A.					
Red. Horizontals	N.A.			L2x2x1/4							N.A.								
Red. Diagonals	N.A.			L2x2x1/4							N.A.								
Face Width (ft)	20.7813	19.7761	19.2734	18.7708	17.7343	16.6979	15.6979	14.6979	14	13.3021	12.6042	11.9236	11.2431	10.5625	8.5625	8.0625	7.5625	7.0625	6.5625	6.52083
# Panels @ (ft)	1 @ 10			4 @ 5		3 @ 10					9 @ 6.66667					4 @ 5			3 @ 4
Weight (K)	17.4	1.7	0.9	0.9	2.1	1.8	1.4	1.2	1.0	0.9	0.8	0.7	0.7	1.2	0.2	0.2	0.2	0.2	0.3



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2.5XS w/ 1/3 HSS 3.5x.3	E	L1 1/2x1 1/2x1/4
B	ROHN 5STD w/ 1/3 HSS6x.25	F	L3 1/2x3 /12x1/4
C	ROHN 5STD w/ (3) 1.5x0.5 PL	G	L3 1/2x3 1/2x5/16
D	L1 1/2x1 1/2x3/16	H	L2 1/2x2 1/2x3/16

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

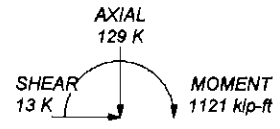
TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in Ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 86%

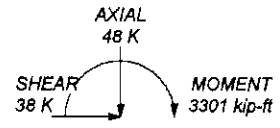
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 199 K
SHEAR: 24 K

UPLIFT: -164 K
SHEAR: 20 K



TORQUE 3 kip-ft
50 mph WIND - 0.7500 in ICE



TORQUE 10 kip-ft
REACTIONS - 93 mph WIND

Tectonic
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
FAX: (845) 567-8703

Job:	152' Self-Support Tower		
Project:	10710.NJJER01110A		
Client:	DISH	Drawn by: Ian Marinaccio	App'd:
Code:	TIA-222-G	Date: 09/01/21	Scale: NTS
Path:			Dwg No. E-1

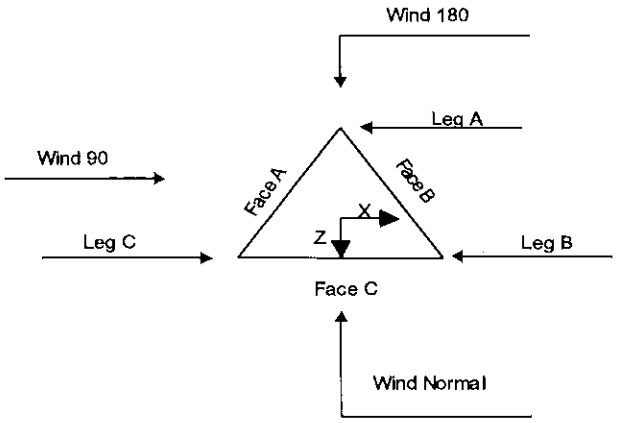
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 152.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 6.52 ft at the top and 20.78 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

- Tower is located in Fairfield County, Connecticut.
- Basic wind speed of 93 mph.
- Structure Class II.
- Exposure Category B.
- Topographic Category 1.
- Crest Height 0.00 ft.
- Nominal ice thickness of 0.7500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	152.00-140.00			6.52	1	12.00
T2	140.00-135.00			6.56	1	5.00
T3	135.00-130.00			7.06	1	5.00
T4	130.00-125.00			7.56	1	5.00
T5	125.00-120.00			8.06	1	5.00
T6	120.00-100.00			8.56	1	20.00
T7	100.00-93.33			10.56	1	6.67
T8	93.33-86.67			11.24	1	6.67
T9	86.67-80.00			11.92	1	6.67
T10	80.00-73.33			12.60	1	6.67
T11	73.33-66.67			13.30	1	6.67
T12	66.67-60.00			14.00	1	6.67
T13	60.00-50.00			14.70	1	10.00
T14	50.00-40.00			15.70	1	10.00
T15	40.00-30.00			16.70	1	10.00
T16	30.00-20.00			17.73	1	10.00
T17	20.00-15.00			18.77	1	5.00
T18	15.00-10.00			19.27	1	5.00
T19	10.00-0.00			19.78	1	10.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	152.00-140.00	4.00	X Brace	No	No	0.0000	0.0000
T2	140.00-135.00	5.00	X Brace	No	No	0.0000	0.0000
T3	135.00-130.00	5.00	X Brace	No	No	0.0000	0.0000
T4	130.00-125.00	5.00	X Brace	No	No	0.0000	0.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T5	125.00-120.00	5.00	X Brace	No	No	0.0000	0.0000
T6	120.00-100.00	6.67	X Brace	No	No	0.0000	0.0000
T7	100.00-93.33	6.67	X Brace	No	Yes	0.0000	0.0000
T8	93.33-86.67	6.67	X Brace	No	Yes	0.0000	0.0000
T9	86.67-80.00	6.67	X Brace	No	Yes	0.0000	0.0000
T10	80.00-73.33	6.67	X Brace	No	Yes	0.0000	0.0000
T11	73.33-66.67	6.67	X Brace	No	Yes	0.0000	0.0000
T12	66.67-60.00	6.67	X Brace	No	Yes	0.0000	0.0000
T13	60.00-50.00	10.00	X Brace	No	Yes	0.0000	0.0000
T14	50.00-40.00	10.00	X Brace	No	Yes	0.0000	0.0000
T15	40.00-30.00	10.00	X Brace	No	Yes	0.0000	0.0000
T16	30.00-20.00	5.00	Double K1	No	Yes	0.0000	0.0000
T17	20.00-15.00	5.00	K1 Up	No	Yes	0.0000	0.0000
T18	15.00-10.00	5.00	K Brace Down	No	Yes	0.0000	0.0000
T19	10.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 152.00-140.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Single Angle	L1 1/2x1 1/2x1/8	A36 (36 ksi)
T2 140.00-135.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T3 135.00-130.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T4 130.00-125.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Single Angle	L1 1/2x1 1/2x1/4	A36 (36 ksi)
T5 125.00-120.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Single Angle	L1 1/2x1 1/2x1/4	A36 (36 ksi)
T6 120.00-100.00	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T7 100.00-93.33	Arbitrary Shape	ROHN 2.5XS w/ 1/3 HSS 3.5x.3	A572-50 (50 ksi)	Single Angle	L 2 1/2x 2 1/2x 1/4	A36 (36 ksi)
T8 93.33-86.67	Arbitrary Shape	ROHN 2.5XS w/ 1/3 HSS 3.5x.3	A572-50 (50 ksi)	Single Angle	L 2 1/2x 2 1/2x 1/4	A36 (36 ksi)
T9 86.67-80.00	Arbitrary Shape	ROHN 2.5XS w/ 1/3 HSS 3.5x.3	A572-50 (50 ksi)	Single Angle	L 2 1/2x 2 1/2x 1/4	A36 (36 ksi)
T10 80.00-73.33	Arbitrary Shape	ROHN 3XS w/ 1/3 HSS4x.25	A572-50 (50 ksi)	Single Angle	L 2 1/2x 2 1/2x 1/4	A36 (36 ksi)
T11 73.33-66.67	Arbitrary Shape	ROHN 3XS w/ 1/3 HSS4x.25	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x5/16	A36 (36 ksi)
T12 66.67-60.00	Arbitrary Shape	ROHN 3XS w/ 1/3 HSS4x.25	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x5/16	A36 (36 ksi)
T13 60.00-50.00	Pipe	ROHN 4 X-STR	A572-50 (50 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T14 50.00-40.00	Pipe	ROHN 4 X-STR	A572-50 (50 ksi)	Single Angle	L3x3x5/16	A36 (36 ksi)
T15 40.00-30.00	Arbitrary Shape	ROHN 4XS w/ 1/3 HSS5x.25	A572-50 (50 ksi)	Single Angle	L3x3x3/8	A36 (36 ksi)
T16 30.00-20.00	Arbitrary Shape	ROHN 4XS w/ 1/3 HSS5x.25	A572-50 (50 ksi)	Single Angle	L3x3x5/16	A36 (36 ksi)
T17 20.00-15.00	Arbitrary Shape	ROHN 5STD w/ 1/3 HSS6x.25	A572-50 (50 ksi)	Single Angle	L3 1/2x3 /12x1/4	A36 (36 ksi)
T18 15.00-10.00	Arbitrary Shape	ROHN 5STD w/ (3) 1.5x0.5 PL	A572-50 (50 ksi)	Single Angle	L3 1/2x3 /12x1/4	A36 (36 ksi)
T19 10.00-0.00	Arbitrary Shape	ROHN 5STD w/ (3) 1.5x0.5 PL	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 152.00-140.00	Single Angle	L2x2x1/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T2 140.00-135.00	Single Angle	L2x2x1/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T16 30.00-20.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T17 20.00-15.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T18 15.00-10.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T7 100.00-93.33	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T8 93.33-86.67	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T9 86.67-80.00	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T10 80.00-73.33	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T11 73.33-66.67	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T12 66.67-60.00	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T13 60.00-50.00	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T14 50.00-40.00	Single Angle	L 3x3x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T15 40.00-30.00	Single Angle	L 3x3x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T16 30.00-20.00	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x1/4	1
		Diagonal (1)	Single Angle	L2x2x1/4	1
T17 20.00-	A36	Horizontal (1)	Single Angle	L2x2x1/4	1

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
15.00	(36 ksi)	Diagonal (1)	Single Angle	L2x2x1/4	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 152.00-140.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T2 140.00-135.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T3 135.00-130.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T4 130.00-125.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T5 125.00-120.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T6 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T7 100.00-93.33	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T8 93.33-86.67	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T9 86.67-80.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T10 80.00-73.33	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T11 73.33-66.67	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T12 66.67-60.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T13 60.00-50.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T14 50.00-40.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T15 40.00-30.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T16 30.00-20.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T17 20.00-15.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T18 15.00-10.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T19 10.00-0.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 152.00-140.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 140.00-135.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 135.00-	Yes	No	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
130.00				1	1	1	1	1	1	1
T4 130.00-125.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T5 125.00-120.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T6 120.00-100.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T7 100.00-93.33	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T8 93.33-86.67	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T9 86.67-80.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 80.00-73.33	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T11 73.33-66.67	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T12 66.67-60.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T13 60.00-50.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T14 50.00-40.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T15 40.00-30.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T16 30.00-20.00	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	0.82	1	1
T17 20.00-15.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T18 15.00-10.00	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	0.77	1	1
T19 10.00-0.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 152.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 140.00-135.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 135.00-130.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 130.00-125.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 125.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 100.00-93.33	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 93.33-86.67	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T9 86.67-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 80.00-73.33	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 73.33-66.67	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 66.67-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 60.00-50.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 50.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 40.00-30.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 30.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T17 20.00-15.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T18 15.00-10.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T19 10.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 152.00-140.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 140.00-135.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 135.00-130.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 130.00-125.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 125.00-120.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 120.00-100.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 100.00-93.33	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 93.33-86.67	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 86.67-80.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 80.00-73.33	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 73.33-66.67	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 66.67-60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 60.00-50.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 50.00-40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 40.00-30.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 30.00-20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T17 20.00-15.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T18 15.00-10.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T19 10.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 152.00-140.00	Flange	0.7500 A325N	0	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 140.00-135.00	Flange	0.6250 A325N	4	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 135.00-130.00	Flange	0.7500 A325N	0	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 130.00-125.00	Flange	0.7500 A325N	0	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 125.00-120.00	Flange	0.7500 A325N	0	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 120.00-100.00	Flange	0.6250 A325N	4	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 100.00-93.33	Flange	0.7500 A325N	4	0.5000 A325X	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	2 *
T8 93.33-86.67	Flange	0.7500 A325N	0	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	2 *
T9 86.67-80.00	Flange	0.7500 A325N	0	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	2 *
T10 80.00-73.33	Flange	0.8750 A325N	4	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0 *
T11 73.33-66.67	Flange	0.7500 A325N	0	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	2 *
T12 66.67-60.00	Flange	0.7500 A325N	0	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	2 *
T13 60.00-50.00	Flange	0.8750 A325N	4	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0 *
T14 50.00-40.00	Flange	0.7500 A325N	0	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	2 *
T15 40.00-30.00	Flange	1.0000 A325N	4	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	2 *
T16 30.00-20.00	Flange	0.7500 A325N	0	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	2 *	0.6250 A325N	0
T17 20.00-15.00	Flange	1.0000 A325N	4	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0 *	0.6250 A325N	0
T18 15.00-10.00	Flange	0.7500 A325N	0	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T19 10.00-0.00	Flange	0.7500 A325N	0	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

* Out-of-plane partial restraint assumed

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset In	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing In	Width or Diameter In	Perimeter In	Weight plf
LDF5-50A(7/8)	A	No	No	Ar (CaAa)	152.00 - 0.00	0.0000	-0.05	1	1	1.0300	1.0300		0.33
LDF4-50A(1/2)	A	No	No	Ar (CaAa)	150.00 - 0.00	0.0000	-0.03	1	1	0.6250	0.6250		0.15
Feedline Ladder (Af) *	A	No	No	Af (CaAa)	152.00 - 0.00	0.0000	0	1	1	3.0000	3.0000		8.40
LDF7-50A(1-5/8)	B	No	No	Ar (CaAa)	145.00 - 0.00	0.0000	0	12	12	1.0000 0.5000	1.9800		0.82
Feedline Ladder (Af) *	B	No	No	Af (CaAa)	152.00 - 0.00	0.0000	0	1	1	3.0000	3.0000		8.40
EW180(ELLIPTICAL)	B	No	No	Ar (CaAa)	152.00 - 0.00	0.0000	0.25	1	1	0.7900	0.7900		0.15
EW180(ELLIPTICAL)	B	No	No	Ar (CaAa)	140.00 - 0.00	0.0000	0.22	1	1	0.7900	0.7900		0.15
LDF7-50A(1-5/8)	B	No	No	Ar (CaAa)	135.00 - 0.00	0.0000	0.2	2	2	1.0000 0.5000	1.9800		0.82
LDF7-50A(1-5/8)	B	No	No	Ar (CaAa)	98.00 - 0.00	0.0000	0.18	1	1	1.0000 0.5000	1.9800		0.82
LDF4-50A(1/2)	B	No	No	Ar (CaAa)	98.00 - 0.00	0.0000	0.17	1	1	0.6250	0.6250		0.15
LDF5-50A(7/8)	B	No	No	Ar (CaAa)	78.00 - 0.00	0.0000	0.15	1	1	1.0300	1.0300		0.33
Feedline Ladder (Af) *	B	No	No	Af (CaAa)	152.00 - 0.00	0.0000	0.2	1	1	3.0000	3.0000		8.40
LDF6-50A(1-1/4)	C	No	No	Ar (CaAa)	131.00 - 0.00	0.0000	0.25	3	3	1.5500	1.5500		0.60
LDF5-50A(7/8)	C	No	No	Ar (CaAa)	131.00 - 0.00	0.0000	0.23	1	1	1.0300	1.0300		0.33
LDF4-50A(1/2)	C	No	No	Ar (CaAa)	58.00 - 0.00	0.0000	0.27	1	1	0.6250	0.6250		0.15
LDF7-50A(1-5/8)	C	No	No	Ar (CaAa)	118.00 - 0.00	0.0000	0.15	1	1	1.0000 0.5000	1.9800		0.82
LDF6-50A(1-1/4)	C	No	No	Ar (CaAa)	118.00 - 0.00	0.0000	0.17	1	1	1.5500	1.5500		0.60
Feedline Ladder (Af) *	C	No	No	Af (CaAa)	152.00 - 0.00	0.0000	0.2	1	1	3.0000	3.0000		8.40
Safety Line 3/8	A	No	No	Ar (CaAa)	152.00 - 0.00	0.0000	0.5	1	1	0.3750	0.3750		0.22
Step Bolts	A	No	No	Ar (CaAa)	152.00 - 0.00	0.0000	0.5	1	1	0.3750	0.3750		2.00
Step Bolts	B	No	No	Ar (CaAa)	60.00 - 0.00	0.0000	0.5	1	1	0.3750	0.3750		2.00
Step Bolts *	C	No	No	Ar (CaAa)	60.00 - 0.00	0.0000	0.5	1	1	0.3750	0.3750		2.00
Hybrid	A	No	No	Ar (CaAa)	108.00 - 0.00	0.0000	0	1	1	1.6000	1.6000		2.35

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	152.00-140.00	A	0.000	0.000	8.761	0.000	0.13
		B	0.000	0.000	24.828	0.000	0.25
		C	0.000	0.000	6.000	0.000	0.10
T2	140.00-135.00	A	0.000	0.000	3.702	0.000	0.06
		B	0.000	0.000	17.670	0.000	0.13
		C	0.000	0.000	2.500	0.000	0.04

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T3	135.00-130.00	A	0.000	0.000	3.702	0.000	0.06
		B	0.000	0.000	19.650	0.000	0.14
		C	0.000	0.000	3.068	0.000	0.04
T4	130.00-125.00	A	0.000	0.000	3.702	0.000	0.06
		B	0.000	0.000	19.650	0.000	0.14
		C	0.000	0.000	5.340	0.000	0.05
T5	125.00-120.00	A	0.000	0.000	3.702	0.000	0.06
		B	0.000	0.000	19.650	0.000	0.14
		C	0.000	0.000	5.340	0.000	0.05
T6	120.00-100.00	A	0.000	0.000	16.090	0.000	0.24
		B	0.000	0.000	78.600	0.000	0.57
		C	0.000	0.000	27.714	0.000	0.24
T7	100.00-93.33	A	0.000	0.000	6.003	0.000	0.09
		B	0.000	0.000	27.416	0.000	0.20
		C	0.000	0.000	9.473	0.000	0.08
T8	93.33-86.67	A	0.000	0.000	6.003	0.000	0.09
		B	0.000	0.000	27.937	0.000	0.20
		C	0.000	0.000	9.473	0.000	0.08
T9	86.67-80.00	A	0.000	0.000	6.003	0.000	0.09
		B	0.000	0.000	27.937	0.000	0.20
		C	0.000	0.000	9.473	0.000	0.08
T10	80.00-73.33	A	0.000	0.000	6.003	0.000	0.09
		B	0.000	0.000	28.417	0.000	0.20
		C	0.000	0.000	9.473	0.000	0.08
T11	73.33-66.67	A	0.000	0.000	6.003	0.000	0.09
		B	0.000	0.000	28.623	0.000	0.20
		C	0.000	0.000	9.473	0.000	0.08
T12	66.67-60.00	A	0.000	0.000	6.003	0.000	0.09
		B	0.000	0.000	28.623	0.000	0.20
		C	0.000	0.000	9.473	0.000	0.08
T13	60.00-50.00	A	0.000	0.000	9.005	0.000	0.13
		B	0.000	0.000	43.310	0.000	0.32
		C	0.000	0.000	15.085	0.000	0.14
T14	50.00-40.00	A	0.000	0.000	9.005	0.000	0.13
		B	0.000	0.000	43.310	0.000	0.32
		C	0.000	0.000	15.210	0.000	0.14
T15	40.00-30.00	A	0.000	0.000	9.005	0.000	0.13
		B	0.000	0.000	43.310	0.000	0.32
		C	0.000	0.000	15.210	0.000	0.14
T16	30.00-20.00	A	0.000	0.000	9.005	0.000	0.13
		B	0.000	0.000	43.310	0.000	0.32
		C	0.000	0.000	15.210	0.000	0.14
T17	20.00-15.00	A	0.000	0.000	4.503	0.000	0.07
		B	0.000	0.000	21.655	0.000	0.16
		C	0.000	0.000	7.605	0.000	0.07
T18	15.00-10.00	A	0.000	0.000	4.503	0.000	0.07
		B	0.000	0.000	21.655	0.000	0.16
		C	0.000	0.000	7.605	0.000	0.07
T19	10.00-0.00	A	0.000	0.000	9.005	0.000	0.13
		B	0.000	0.000	43.310	0.000	0.32
		C	0.000	0.000	15.210	0.000	0.14

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	152.00-140.00	A	1.741	0.000	0.000	28.951	0.000	0.51
		B		0.000	0.000	49.623	0.000	0.94
		C		0.000	0.000	10.177	0.000	0.25
T2	140.00-135.00	A	1.730	0.000	0.000	12.353	0.000	0.22
		B		0.000	0.000	36.839	0.000	0.63
		C		0.000	0.000	4.230	0.000	0.10
T3	135.00-130.00	A	1.724	0.000	0.000	12.321	0.000	0.22
		B		0.000	0.000	43.059	0.000	0.70
		C		0.000	0.000	6.204	0.000	0.13

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T4	130.00-125.00	A	1.717	0.000	0.000	12.288	0.000	0.21
		B		0.000	0.000	43.011	0.000	0.70
		C		0.000	0.000	14.102	0.000	0.23
T5	125.00-120.00	A	1.710	0.000	0.000	12.254	0.000	0.21
		B		0.000	0.000	42.962	0.000	0.70
		C		0.000	0.000	14.077	0.000	0.23
T6	120.00-100.00	A	1.692	0.000	0.000	52.635	0.000	0.92
		B		0.000	0.000	171.326	0.000	2.77
		C		0.000	0.000	74.576	0.000	1.19
T7	100.00-93.33	A	1.670	0.000	0.000	19.365	0.000	0.34
		B		0.000	0.000	61.235	0.000	0.97
		C		0.000	0.000	25.382	0.000	0.40
T8	93.33-86.67	A	1.658	0.000	0.000	19.270	0.000	0.33
		B		0.000	0.000	62.948	0.000	0.99
		C		0.000	0.000	25.292	0.000	0.40
T9	86.67-80.00	A	1.646	0.000	0.000	19.168	0.000	0.33
		B		0.000	0.000	62.793	0.000	0.99
		C		0.000	0.000	25.196	0.000	0.40
T10	80.00-73.33	A	1.632	0.000	0.000	19.059	0.000	0.33
		B		0.000	0.000	64.630	0.000	1.01
		C		0.000	0.000	25.094	0.000	0.39
T11	73.33-66.67	A	1.617	0.000	0.000	18.941	0.000	0.32
		B		0.000	0.000	65.289	0.000	1.01
		C		0.000	0.000	24.982	0.000	0.39
T12	66.67-60.00	A	1.601	0.000	0.000	18.812	0.000	0.32
		B		0.000	0.000	65.072	0.000	1.00
		C		0.000	0.000	24.861	0.000	0.38
T13	60.00-50.00	A	1.579	0.000	0.000	27.948	0.000	0.47
		B		0.000	0.000	100.685	0.000	1.54
		C		0.000	0.000	43.596	0.000	0.66
T14	50.00-40.00	A	1.547	0.000	0.000	27.572	0.000	0.46
		B		0.000	0.000	99.987	0.000	1.51
		C		0.000	0.000	43.874	0.000	0.66
T15	40.00-30.00	A	1.509	0.000	0.000	27.111	0.000	0.45
		B		0.000	0.000	99.133	0.000	1.48
		C		0.000	0.000	43.287	0.000	0.64
T16	30.00-20.00	A	1.459	0.000	0.000	26.512	0.000	0.44
		B		0.000	0.000	98.022	0.000	1.43
		C		0.000	0.000	42.524	0.000	0.62
T17	20.00-15.00	A	1.408	0.000	0.000	12.949	0.000	0.21
		B		0.000	0.000	48.442	0.000	0.69
		C		0.000	0.000	20.872	0.000	0.30
T18	15.00-10.00	A	1.361	0.000	0.000	12.670	0.000	0.20
		B		0.000	0.000	47.925	0.000	0.68
		C		0.000	0.000	20.516	0.000	0.29
T19	10.00-0.00	A	1.242	0.000	0.000	23.910	0.000	0.37
		B		0.000	0.000	93.201	0.000	1.25
		C		0.000	0.000	39.215	0.000	0.53

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	152.00-140.00	2.4148	-2.5117	1.5986	-4.2318
T2	140.00-135.00	4.4801	-4.0786	3.5483	-5.0497
T3	135.00-130.00	6.1623	-4.1642	4.9298	-4.9678
T4	130.00-125.00	4.7134	-3.4526	2.6839	-3.6488
T5	125.00-120.00	4.9184	-3.6139	2.8033	-3.8254
T6	120.00-100.00	4.1436	-2.6938	1.6549	-2.5988
T7	100.00-93.33	3.9297	-2.4339	2.3331	-2.5322
T8	93.33-86.67	4.3361	-2.4994	2.9551	-2.6018
T9	86.67-80.00	4.4656	-2.5826	3.0582	-2.7061
T10	80.00-73.33	4.7866	-2.6219	3.7383	-2.7865
T11	73.33-66.67	5.0253	-2.6992	4.1073	-2.8857

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T12	66.67-60.00	5.1487	-2.7734	4.2242	-2.9841
T13	60.00-50.00	5.4261	-2.4870	3.8634	-1.0647
T14	50.00-40.00	5.4549	-2.4863	3.8215	-0.9739
T15	40.00-30.00	5.5992	-2.5588	3.9524	-1.0536
T16	30.00-20.00	4.8917	-2.2916	3.5823	-1.0241
T17	20.00-15.00	5.2563	-2.4435	3.8195	-1.1523
T18	15.00-10.00	5.1040	-2.3792	3.7592	-1.1973
T19	10.00-0.00	6.4446	-2.9230	4.4889	-1.5979

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	LDF5-50A(7/8)	140.00 - 152.00	0.6000	0.5970
T1	2	LDF4-50A(1/2)	140.00 - 150.00	0.6000	0.5970
T1	3	Feedline Ladder (Af)	140.00 - 152.00	0.6000	0.5970
T1	5	LDF7-50A(1-5/8)	140.00 - 145.00	0.6000	0.5970
T1	6	Feedline Ladder (Af)	140.00 - 152.00	0.6000	0.5970
T1	8	EW180(ELLIPTICAL)	140.00 - 152.00	0.6000	0.5970
T1	14	Feedline Ladder (Af)	140.00 - 152.00	0.6000	0.5970
T1	21	Feedline Ladder (Af)	140.00 - 152.00	0.6000	0.5970
T1	23	Safety Line 3/8	140.00 - 152.00	0.6000	0.5970
T1	24	Step Bolts	140.00 - 152.00	0.6000	0.5970
T2	1	LDF5-50A(7/8)	135.00 - 140.00	0.6000	0.5816
T2	2	LDF4-50A(1/2)	135.00 - 140.00	0.6000	0.5816
T2	3	Feedline Ladder (Af)	135.00 - 140.00	0.6000	0.5816
T2	5	LDF7-50A(1-5/8)	135.00 - 140.00	0.6000	0.5816
T2	6	Feedline Ladder (Af)	135.00 - 140.00	0.6000	0.5816
T2	8	EW180(ELLIPTICAL)	135.00 - 140.00	0.6000	0.5816
T2	9	EW180(ELLIPTICAL)	135.00 - 140.00	0.6000	0.5816
T2	14	Feedline Ladder (Af)	135.00 - 140.00	0.6000	0.5816
T2	21	Feedline Ladder (Af)	135.00 - 140.00	0.6000	0.5816
T2	23	Safety Line 3/8	135.00 - 140.00	0.6000	0.5816
T2	24	Step Bolts	135.00 - 140.00	0.6000	0.5816
T3	1	LDF5-50A(7/8)	130.00 - 135.00	0.6000	0.6000
T3	2	LDF4-50A(1/2)	130.00 - 135.00	0.6000	0.6000
T3	3	Feedline Ladder (Af)	130.00 - 135.00	0.6000	0.6000
T3	5	LDF7-50A(1-5/8)	130.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	6	Feedline Ladder (Af)	135.00 - 130.00	0.6000	0.6000
T3	8	EW180(ELLIPTICAL)	135.00 - 130.00	0.6000	0.6000
T3	9	EW180(ELLIPTICAL)	135.00 - 130.00	0.6000	0.6000
T3	10	LDF7-50A(1-5/8)	135.00 - 130.00	0.6000	0.6000
T3	14	Feedline Ladder (Af)	135.00 - 130.00	0.6000	0.6000
T3	16	LDF6-50A(1-1/4)	135.00 - 130.00	0.6000	0.6000
T3	17	LDF5-50A(7/8)	131.00 - 130.00	0.6000	0.6000
T3	21	Feedline Ladder (Af)	131.00 - 130.00	0.6000	0.6000
T3	23	Safety Line 3/8	135.00 - 130.00	0.6000	0.6000
T3	24	Step Bolts	135.00 - 130.00	0.6000	0.6000
T4	1	LDF5-50A(7/8)	135.00 - 130.00	0.6000	0.6000
T4	2	LDF4-50A(1/2)	130.00 - 125.00	0.6000	0.6000
T4	3	Feedline Ladder (Af)	130.00 - 125.00	0.6000	0.6000
T4	5	LDF7-50A(1-5/8)	130.00 - 125.00	0.6000	0.6000
T4	6	Feedline Ladder (Af)	130.00 - 125.00	0.6000	0.6000
T4	8	EW180(ELLIPTICAL)	130.00 - 125.00	0.6000	0.6000
T4	9	EW180(ELLIPTICAL)	130.00 - 125.00	0.6000	0.6000
T4	10	LDF7-50A(1-5/8)	130.00 - 125.00	0.6000	0.6000
T4	14	Feedline Ladder (Af)	130.00 - 125.00	0.6000	0.6000
T4	16	LDF6-50A(1-1/4)	130.00 - 125.00	0.6000	0.6000
T4	17	LDF5-50A(7/8)	130.00 - 125.00	0.6000	0.6000
T4	21	Feedline Ladder (Af)	130.00 - 125.00	0.6000	0.6000
T4	23	Safety Line 3/8	130.00 - 125.00	0.6000	0.6000
T4	24	Step Bolts	130.00 - 125.00	0.6000	0.6000
T5	1	LDF5-50A(7/8)	125.00 - 120.00	0.6000	0.6000
T5	2	LDF4-50A(1/2)	125.00 - 120.00	0.6000	0.6000
T5	3	Feedline Ladder (Af)	125.00 - 120.00	0.6000	0.6000
T5	5	LDF7-50A(1-5/8)	125.00 - 120.00	0.6000	0.6000
T5	6	Feedline Ladder (Af)	125.00 - 120.00	0.6000	0.6000
T5	8	EW180(ELLIPTICAL)	125.00 - 120.00	0.6000	0.6000
T5	9	EW180(ELLIPTICAL)	125.00 - 120.00	0.6000	0.6000
T5	10	LDF7-50A(1-5/8)	125.00 - 120.00	0.6000	0.6000
T5	14	Feedline Ladder (Af)	125.00 - 120.00	0.6000	0.6000
T5	16	LDF6-50A(1-1/4)	125.00 - 120.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	17	LDF5-50A(7/8)	120.00 - 125.00	0.6000	0.6000
T5	21	Feedline Ladder (Af)	120.00 - 125.00	0.6000	0.6000
T5	23	Safety Line 3/8	120.00 - 125.00	0.6000	0.6000
T5	24	Step Bolts	120.00 - 125.00	0.6000	0.6000
T6	1	LDF5-50A(7/8)	100.00 - 120.00	0.6000	0.6000
T6	2	LDF4-50A(1/2)	100.00 - 120.00	0.6000	0.6000
T6	3	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T6	5	LDF7-50A(1-5/8)	100.00 - 120.00	0.6000	0.6000
T6	6	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T6	8	EW180(ELLIPTICAL)	100.00 - 120.00	0.6000	0.6000
T6	9	EW180(ELLIPTICAL)	100.00 - 120.00	0.6000	0.6000
T6	10	LDF7-50A(1-5/8)	100.00 - 120.00	0.6000	0.6000
T6	14	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T6	16	LDF6-50A(1-1/4)	100.00 - 120.00	0.6000	0.6000
T6	17	LDF5-50A(7/8)	100.00 - 120.00	0.6000	0.6000
T6	19	LDF7-50A(1-5/8)	100.00 - 118.00	0.6000	0.6000
T6	20	LDF6-50A(1-1/4)	100.00 - 118.00	0.6000	0.6000
T6	21	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T6	23	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T6	24	Step Bolts	100.00 - 120.00	0.6000	0.6000
T6	28	Hybrid	100.00 - 108.00	0.6000	0.6000
T7	1	LDF5-50A(7/8)	93.33 - 100.00	0.6000	0.6000
T7	2	LDF4-50A(1/2)	93.33 - 100.00	0.6000	0.6000
T7	3	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T7	5	LDF7-50A(1-5/8)	93.33 - 100.00	0.6000	0.6000
T7	6	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T7	8	EW180(ELLIPTICAL)	93.33 - 100.00	0.6000	0.6000
T7	9	EW180(ELLIPTICAL)	93.33 - 100.00	0.6000	0.6000
T7	10	LDF7-50A(1-5/8)	93.33 - 100.00	0.6000	0.6000
T7	11	LDF7-50A(1-5/8)	93.33 - 98.00	0.6000	0.6000
T7	12	LDF4-50A(1/2)	93.33 - 98.00	0.6000	0.6000
T7	14	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T7	16	LDF6-50A(1-1/4)	93.33 - 100.00	0.6000	0.6000
T7	17	LDF5-50A(7/8)	93.33 - 100.00	0.6000	0.6000
T7	19	LDF7-50A(1-5/8)	93.33 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	20	LDF6-50A(1-1/4)	100.00 - 93.33	0.6000	0.6000
T7	21	Feedline Ladder (Af)	100.00 - 93.33	0.6000	0.6000
T7	23	Safety Line 3/8	100.00 - 93.33	0.6000	0.6000
T7	24	Step Bolts	100.00 - 93.33	0.6000	0.6000
T7	28	Hybrid	100.00 - 93.33	0.6000	0.6000
T8	1	LDF5-50A(7/8)	100.00 - 86.67	0.6000	0.6000
T8	2	LDF4-50A(1/2)	93.33 - 86.67	0.6000	0.6000
T8	3	Feedline Ladder (Af)	93.33 - 86.67	0.6000	0.6000
T8	5	LDF7-50A(1-5/8)	93.33 - 86.67	0.6000	0.6000
T8	6	Feedline Ladder (Af)	93.33 - 86.67	0.6000	0.6000
T8	8	EW180(ELLIPTICAL)	93.33 - 86.67	0.6000	0.6000
T8	9	EW180(ELLIPTICAL)	93.33 - 86.67	0.6000	0.6000
T8	10	LDF7-50A(1-5/8)	93.33 - 86.67	0.6000	0.6000
T8	11	LDF7-50A(1-5/8)	93.33 - 86.67	0.6000	0.6000
T8	12	LDF4-50A(1/2)	93.33 - 86.67	0.6000	0.6000
T8	14	Feedline Ladder (Af)	93.33 - 86.67	0.6000	0.6000
T8	16	LDF6-50A(1-1/4)	93.33 - 86.67	0.6000	0.6000
T8	17	LDF5-50A(7/8)	93.33 - 86.67	0.6000	0.6000
T8	19	LDF7-50A(1-5/8)	93.33 - 86.67	0.6000	0.6000
T8	20	LDF6-50A(1-1/4)	93.33 - 86.67	0.6000	0.6000
T8	21	Feedline Ladder (Af)	93.33 - 86.67	0.6000	0.6000
T8	23	Safety Line 3/8	93.33 - 86.67	0.6000	0.6000
T8	24	Step Bolts	93.33 - 86.67	0.6000	0.6000
T8	28	Hybrid	93.33 - 86.67	0.6000	0.6000
T9	1	LDF5-50A(7/8)	86.67 - 80.00	0.6000	0.6000
T9	2	LDF4-50A(1/2)	86.67 - 80.00	0.6000	0.6000
T9	3	Feedline Ladder (Af)	86.67 - 80.00	0.6000	0.6000
T9	5	LDF7-50A(1-5/8)	86.67 - 80.00	0.6000	0.6000
T9	6	Feedline Ladder (Af)	86.67 - 80.00	0.6000	0.6000
T9	8	EW180(ELLIPTICAL)	86.67 - 80.00	0.6000	0.6000
T9	9	EW180(ELLIPTICAL)	86.67 - 80.00	0.6000	0.6000
T9	10	LDF7-50A(1-5/8)	86.67 - 80.00	0.6000	0.6000
T9	11	LDF7-50A(1-5/8)	86.67 - 80.00	0.6000	0.6000
T9	12	LDF4-50A(1/2)	86.67 - 80.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	14	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T9	16	LDF6-50A(1-1/4)	80.00 - 86.67	0.6000	0.6000
T9	17	LDF5-50A(7/8)	80.00 - 86.67	0.6000	0.6000
T9	19	LDF7-50A(1-5/8)	80.00 - 86.67	0.6000	0.6000
T9	20	LDF6-50A(1-1/4)	80.00 - 86.67	0.6000	0.6000
T9	21	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T9	23	Safety Line 3/8	80.00 - 86.67	0.6000	0.6000
T9	24	Step Bolts	80.00 - 86.67	0.6000	0.6000
T9	28	Hybrid	80.00 - 86.67	0.6000	0.6000
T10	1	LDF5-50A(7/8)	73.33 - 80.00	0.6000	0.6000
T10	2	LDF4-50A(1/2)	73.33 - 80.00	0.6000	0.6000
T10	3	Feedline Ladder (Af)	73.33 - 80.00	0.6000	0.6000
T10	5	LDF7-50A(1-5/8)	73.33 - 80.00	0.6000	0.6000
T10	6	Feedline Ladder (Af)	73.33 - 80.00	0.6000	0.6000
T10	8	EW180(ELLIPTICAL)	73.33 - 80.00	0.6000	0.6000
T10	9	EW180(ELLIPTICAL)	73.33 - 80.00	0.6000	0.6000
T10	10	LDF7-50A(1-5/8)	73.33 - 80.00	0.6000	0.6000
T10	11	LDF7-50A(1-5/8)	73.33 - 80.00	0.6000	0.6000
T10	12	LDF4-50A(1/2)	73.33 - 80.00	0.6000	0.6000
T10	13	LDF5-50A(7/8)	73.33 - 78.00	0.6000	0.6000
T10	14	Feedline Ladder (Af)	73.33 - 80.00	0.6000	0.6000
T10	16	LDF6-50A(1-1/4)	73.33 - 80.00	0.6000	0.6000
T10	17	LDF5-50A(7/8)	73.33 - 80.00	0.6000	0.6000
T10	19	LDF7-50A(1-5/8)	73.33 - 80.00	0.6000	0.6000
T10	20	LDF6-50A(1-1/4)	73.33 - 80.00	0.6000	0.6000
T10	21	Feedline Ladder (Af)	73.33 - 80.00	0.6000	0.6000
T10	23	Safety Line 3/8	73.33 - 80.00	0.6000	0.6000
T10	24	Step Bolts	73.33 - 80.00	0.6000	0.6000
T10	28	Hybrid	73.33 - 80.00	0.6000	0.6000
T11	1	LDF5-50A(7/8)	66.67 - 73.33	0.6000	0.6000
T11	2	LDF4-50A(1/2)	66.67 - 73.33	0.6000	0.6000
T11	3	Feedline Ladder (Af)	66.67 - 73.33	0.6000	0.6000
T11	5	LDF7-50A(1-5/8)	66.67 - 73.33	0.6000	0.6000
T11	6	Feedline Ladder (Af)	66.67 - 73.33	0.6000	0.6000
T11	8	EW180(ELLIPTICAL)	66.67 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T11	9	EW180(ELLIPTICAL)	66.67 - 73.33	0.6000	0.6000
T11	10	LDF7-50A(1-5/8)	66.67 - 73.33	0.6000	0.6000
T11	11	LDF7-50A(1-5/8)	66.67 - 73.33	0.6000	0.6000
T11	12	LDF4-50A(1/2)	66.67 - 73.33	0.6000	0.6000
T11	13	LDF5-50A(7/8)	66.67 - 73.33	0.6000	0.6000
T11	14	Feedline Ladder (Af)	66.67 - 73.33	0.6000	0.6000
T11	16	LDF6-50A(1-1/4)	66.67 - 73.33	0.6000	0.6000
T11	17	LDF5-50A(7/8)	66.67 - 73.33	0.6000	0.6000
T11	19	LDF7-50A(1-5/8)	66.67 - 73.33	0.6000	0.6000
T11	20	LDF6-50A(1-1/4)	66.67 - 73.33	0.6000	0.6000
T11	21	Feedline Ladder (Af)	66.67 - 73.33	0.6000	0.6000
T11	23	Safety Line 3/8	66.67 - 73.33	0.6000	0.6000
T11	24	Step Bolts	66.67 - 73.33	0.6000	0.6000
T11	28	Hybrid	66.67 - 73.33	0.6000	0.6000
T12	1	LDF5-50A(7/8)	60.00 - 66.67	0.6000	0.6000
T12	2	LDF4-50A(1/2)	60.00 - 66.67	0.6000	0.6000
T12	3	Feedline Ladder (Af)	60.00 - 66.67	0.6000	0.6000
T12	5	LDF7-50A(1-5/8)	60.00 - 66.67	0.6000	0.6000
T12	6	Feedline Ladder (Af)	60.00 - 66.67	0.6000	0.6000
T12	8	EW180(ELLIPTICAL)	60.00 - 66.67	0.6000	0.6000
T12	9	EW180(ELLIPTICAL)	60.00 - 66.67	0.6000	0.6000
T12	10	LDF7-50A(1-5/8)	60.00 - 66.67	0.6000	0.6000
T12	11	LDF7-50A(1-5/8)	60.00 - 66.67	0.6000	0.6000
T12	12	LDF4-50A(1/2)	60.00 - 66.67	0.6000	0.6000
T12	13	LDF5-50A(7/8)	60.00 - 66.67	0.6000	0.6000
T12	14	Feedline Ladder (Af)	60.00 - 66.67	0.6000	0.6000
T12	16	LDF6-50A(1-1/4)	60.00 - 66.67	0.6000	0.6000
T12	17	LDF5-50A(7/8)	60.00 - 66.67	0.6000	0.6000
T12	19	LDF7-50A(1-5/8)	60.00 - 66.67	0.6000	0.6000
T12	20	LDF6-50A(1-1/4)	60.00 - 66.67	0.6000	0.6000
T12	21	Feedline Ladder (Af)	60.00 - 66.67	0.6000	0.6000
T12	23	Safety Line 3/8	60.00 - 66.67	0.6000	0.6000
T12	24	Step Bolts	60.00 - 66.67	0.6000	0.6000
T12	28	Hybrid	60.00 - 66.67	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T13	1	LDF5-50A(7/8)	50.00 - 60.00	0.6000	0.6000
T13	2	LDF4-50A(1/2)	50.00 - 60.00	0.6000	0.6000
T13	3	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T13	5	LDF7-50A(1-5/8)	50.00 - 60.00	0.6000	0.6000
T13	6	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T13	8	EW180(ELLIPTICAL)	50.00 - 60.00	0.6000	0.6000
T13	9	EW180(ELLIPTICAL)	50.00 - 60.00	0.6000	0.6000
T13	10	LDF7-50A(1-5/8)	50.00 - 60.00	0.6000	0.6000
T13	11	LDF7-50A(1-5/8)	50.00 - 60.00	0.6000	0.6000
T13	12	LDF4-50A(1/2)	50.00 - 60.00	0.6000	0.6000
T13	13	LDF5-50A(7/8)	50.00 - 60.00	0.6000	0.6000
T13	14	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T13	16	LDF6-50A(1-1/4)	50.00 - 60.00	0.6000	0.6000
T13	17	LDF5-50A(7/8)	50.00 - 60.00	0.6000	0.6000
T13	18	LDF4-50A(1/2)	50.00 - 58.00	0.6000	0.6000
T13	19	LDF7-50A(1-5/8)	50.00 - 60.00	0.6000	0.6000
T13	20	LDF6-50A(1-1/4)	50.00 - 60.00	0.6000	0.6000
T13	21	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T13	23	Safety Line 3/8	50.00 - 60.00	0.6000	0.6000
T13	24	Step Bolts	50.00 - 60.00	0.6000	0.6000
T13	25	Step Bolts	50.00 - 60.00	0.6000	0.6000
T13	26	Step Bolts	50.00 - 60.00	0.6000	0.6000
T13	28	Hybrid	50.00 - 60.00	0.6000	0.6000
T14	1	LDF5-50A(7/8)	40.00 - 50.00	0.6000	0.6000
T14	2	LDF4-50A(1/2)	40.00 - 50.00	0.6000	0.6000
T14	3	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T14	5	LDF7-50A(1-5/8)	40.00 - 50.00	0.6000	0.6000
T14	6	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T14	8	EW180(ELLIPTICAL)	40.00 - 50.00	0.6000	0.6000
T14	9	EW180(ELLIPTICAL)	40.00 - 50.00	0.6000	0.6000
T14	10	LDF7-50A(1-5/8)	40.00 - 50.00	0.6000	0.6000
T14	11	LDF7-50A(1-5/8)	40.00 - 50.00	0.6000	0.6000
T14	12	LDF4-50A(1/2)	40.00 - 50.00	0.6000	0.6000
T14	13	LDF5-50A(7/8)	40.00 - 50.00	0.6000	0.6000
T14	14	Feedline Ladder (Af)	40.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T14	16	LDF6-50A(1-1/4)	50.00 40.00 - 50.00	0.6000	0.6000
T14	17	LDF5-50A(7/8)	40.00 - 50.00	0.6000	0.6000
T14	18	LDF4-50A(1/2)	40.00 - 50.00	0.6000	0.6000
T14	19	LDF7-50A(1-5/8)	40.00 - 50.00	0.6000	0.6000
T14	20	LDF6-50A(1-1/4)	40.00 - 50.00	0.6000	0.6000
T14	21	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T14	23	Safety Line 3/8	40.00 - 50.00	0.6000	0.6000
T14	24	Step Bolts	40.00 - 50.00	0.6000	0.6000
T14	25	Step Bolts	40.00 - 50.00	0.6000	0.6000
T14	26	Step Bolts	40.00 - 50.00	0.6000	0.6000
T14	28	Hybrid	40.00 - 50.00	0.6000	0.6000
T15	1	LDF5-50A(7/8)	30.00 - 40.00	0.6000	0.6000
T15	2	LDF4-50A(1/2)	30.00 - 40.00	0.6000	0.6000
T15	3	Feedline Ladder (Af)	30.00 - 40.00	0.6000	0.6000
T15	5	LDF7-50A(1-5/8)	30.00 - 40.00	0.6000	0.6000
T15	6	Feedline Ladder (Af)	30.00 - 40.00	0.6000	0.6000
T15	8	EW180(ELLIPTICAL)	30.00 - 40.00	0.6000	0.6000
T15	9	EW180(ELLIPTICAL)	30.00 - 40.00	0.6000	0.6000
T15	10	LDF7-50A(1-5/8)	30.00 - 40.00	0.6000	0.6000
T15	11	LDF7-50A(1-5/8)	30.00 - 40.00	0.6000	0.6000
T15	12	LDF4-50A(1/2)	30.00 - 40.00	0.6000	0.6000
T15	13	LDF5-50A(7/8)	30.00 - 40.00	0.6000	0.6000
T15	14	Feedline Ladder (Af)	30.00 - 40.00	0.6000	0.6000
T15	16	LDF6-50A(1-1/4)	30.00 - 40.00	0.6000	0.6000
T15	17	LDF5-50A(7/8)	30.00 - 40.00	0.6000	0.6000
T15	18	LDF4-50A(1/2)	30.00 - 40.00	0.6000	0.6000
T15	19	LDF7-50A(1-5/8)	30.00 - 40.00	0.6000	0.6000
T15	20	LDF6-50A(1-1/4)	30.00 - 40.00	0.6000	0.6000
T15	21	Feedline Ladder (Af)	30.00 - 40.00	0.6000	0.6000
T15	23	Safety Line 3/8	30.00 - 40.00	0.6000	0.6000
T15	24	Step Bolts	30.00 - 40.00	0.6000	0.6000
T15	25	Step Bolts	30.00 - 40.00	0.6000	0.6000
T15	26	Step Bolts	30.00 - 40.00	0.6000	0.6000
T15	28	Hybrid	30.00 - 40.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T16	1	LDF5-50A(7/8)	20.00 - 30.00	0.6000	0.6000
T16	2	LDF4-50A(1/2)	20.00 - 30.00	0.6000	0.6000
T16	3	Feedline Ladder (Af)	20.00 - 30.00	0.6000	0.6000
T16	5	LDF7-50A(1-5/8)	20.00 - 30.00	0.6000	0.6000
T16	6	Feedline Ladder (Af)	20.00 - 30.00	0.6000	0.6000
T16	8	EW180(ELLIPTICAL)	20.00 - 30.00	0.6000	0.6000
T16	9	EW180(ELLIPTICAL)	20.00 - 30.00	0.6000	0.6000
T16	10	LDF7-50A(1-5/8)	20.00 - 30.00	0.6000	0.6000
T16	11	LDF7-50A(1-5/8)	20.00 - 30.00	0.6000	0.6000
T16	12	LDF4-50A(1/2)	20.00 - 30.00	0.6000	0.6000
T16	13	LDF5-50A(7/8)	20.00 - 30.00	0.6000	0.6000
T16	14	Feedline Ladder (Af)	20.00 - 30.00	0.6000	0.6000
T16	16	LDF6-50A(1-1/4)	20.00 - 30.00	0.6000	0.6000
T16	17	LDF5-50A(7/8)	20.00 - 30.00	0.6000	0.6000
T16	18	LDF4-50A(1/2)	20.00 - 30.00	0.6000	0.6000
T16	19	LDF7-50A(1-5/8)	20.00 - 30.00	0.6000	0.6000
T16	20	LDF6-50A(1-1/4)	20.00 - 30.00	0.6000	0.6000
T16	21	Feedline Ladder (Af)	20.00 - 30.00	0.6000	0.6000
T16	23	Safety Line 3/8	20.00 - 30.00	0.6000	0.6000
T16	24	Step Bolts	20.00 - 30.00	0.6000	0.6000
T16	25	Step Bolts	20.00 - 30.00	0.6000	0.6000
T16	26	Step Bolts	20.00 - 30.00	0.6000	0.6000
T16	28	Hybrid	20.00 - 30.00	0.6000	0.6000
T17	1	LDF5-50A(7/8)	15.00 - 20.00	0.6000	0.6000
T17	2	LDF4-50A(1/2)	15.00 - 20.00	0.6000	0.6000
T17	3	Feedline Ladder (Af)	15.00 - 20.00	0.6000	0.6000
T17	5	LDF7-50A(1-5/8)	15.00 - 20.00	0.6000	0.6000
T17	6	Feedline Ladder (Af)	15.00 - 20.00	0.6000	0.6000
T17	8	EW180(ELLIPTICAL)	15.00 - 20.00	0.6000	0.6000
T17	9	EW180(ELLIPTICAL)	15.00 - 20.00	0.6000	0.6000
T17	10	LDF7-50A(1-5/8)	15.00 - 20.00	0.6000	0.6000
T17	11	LDF7-50A(1-5/8)	15.00 - 20.00	0.6000	0.6000
T17	12	LDF4-50A(1/2)	15.00 - 20.00	0.6000	0.6000
T17	13	LDF5-50A(7/8)	15.00 - 20.00	0.6000	0.6000
T17	14	Feedline Ladder (Af)	15.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_e No Ice	K_a Ice
T17	16	LDF6-50A(1-1/4)	20.00 - 15.00	0.6000	0.6000
T17	17	LDF5-50A(7/8)	20.00 - 15.00	0.6000	0.6000
T17	18	LDF4-50A(1/2)	20.00 - 15.00	0.6000	0.6000
T17	19	LDF7-50A(1-5/8)	20.00 - 15.00	0.6000	0.6000
T17	20	LDF6-50A(1-1/4)	20.00 - 15.00	0.6000	0.6000
T17	21	Feedline Ladder (Af)	20.00 - 15.00	0.6000	0.6000
T17	23	Safety Line 3/8	20.00 - 15.00	0.6000	0.6000
T17	24	Step Bolts	20.00 - 15.00	0.6000	0.6000
T17	25	Step Bolts	20.00 - 15.00	0.6000	0.6000
T17	26	Step Bolts	20.00 - 15.00	0.6000	0.6000
T17	28	Hybrid	20.00 - 15.00	0.6000	0.6000
T18	1	LDF5-50A(7/8)	15.00 - 10.00	0.6000	0.6000
T18	2	LDF4-50A(1/2)	15.00 - 10.00	0.6000	0.6000
T18	3	Feedline Ladder (Af)	15.00 - 10.00	0.6000	0.6000
T18	5	LDF7-50A(1-5/8)	15.00 - 10.00	0.6000	0.6000
T18	6	Feedline Ladder (Af)	15.00 - 10.00	0.6000	0.6000
T18	8	EW180(ELLIPTICAL)	15.00 - 10.00	0.6000	0.6000
T18	9	EW180(ELLIPTICAL)	15.00 - 10.00	0.6000	0.6000
T18	10	LDF7-50A(1-5/8)	15.00 - 10.00	0.6000	0.6000
T18	11	LDF7-50A(1-5/8)	15.00 - 10.00	0.6000	0.6000
T18	12	LDF4-50A(1/2)	15.00 - 10.00	0.6000	0.6000
T18	13	LDF5-50A(7/8)	15.00 - 10.00	0.6000	0.6000
T18	14	Feedline Ladder (Af)	15.00 - 10.00	0.6000	0.6000
T18	16	LDF6-50A(1-1/4)	15.00 - 10.00	0.6000	0.6000
T18	17	LDF5-50A(7/8)	15.00 - 10.00	0.6000	0.6000
T18	18	LDF4-50A(1/2)	15.00 - 10.00	0.6000	0.6000
T18	19	LDF7-50A(1-5/8)	15.00 - 10.00	0.6000	0.6000
T18	20	LDF6-50A(1-1/4)	15.00 - 10.00	0.6000	0.6000
T18	21	Feedline Ladder (Af)	15.00 - 10.00	0.6000	0.6000
T18	23	Safety Line 3/8	15.00 - 10.00	0.6000	0.6000
T18	24	Step Bolts	15.00 - 10.00	0.6000	0.6000
T18	25	Step Bolts	15.00 - 10.00	0.6000	0.6000
T18	26	Step Bolts	15.00 - 10.00	0.6000	0.6000
T18	28	Hybrid	15.00 - 10.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T19	1	LDF5-50A(7/8)	0.00 - 10.00	0.6000	0.6000
T19	2	LDF4-50A(1/2)	0.00 - 10.00	0.6000	0.6000
T19	3	Feedline Ladder (Af)	0.00 - 10.00	0.6000	0.6000
T19	5	LDF7-50A(1-5/8)	0.00 - 10.00	0.6000	0.6000
T19	6	Feedline Ladder (Af)	0.00 - 10.00	0.6000	0.6000
T19	8	EW180(ELLIPTICAL)	0.00 - 10.00	0.6000	0.6000
T19	9	EW180(ELLIPTICAL)	0.00 - 10.00	0.6000	0.6000
T19	10	LDF7-50A(1-5/8)	0.00 - 10.00	0.6000	0.6000
T19	11	LDF7-50A(1-5/8)	0.00 - 10.00	0.6000	0.6000
T19	12	LDF4-50A(1/2)	0.00 - 10.00	0.6000	0.6000
T19	13	LDF5-50A(7/8)	0.00 - 10.00	0.6000	0.6000
T19	14	Feedline Ladder (Af)	0.00 - 10.00	0.6000	0.6000
T19	16	LDF6-50A(1-1/4)	0.00 - 10.00	0.6000	0.6000
T19	17	LDF5-50A(7/8)	0.00 - 10.00	0.6000	0.6000
T19	18	LDF4-50A(1/2)	0.00 - 10.00	0.6000	0.6000
T19	19	LDF7-50A(1-5/8)	0.00 - 10.00	0.6000	0.6000
T19	20	LDF6-50A(1-1/4)	0.00 - 10.00	0.6000	0.6000
T19	21	Feedline Ladder (Af)	0.00 - 10.00	0.6000	0.6000
T19	23	Safety Line 3/8	0.00 - 10.00	0.6000	0.6000
T19	24	Step Bolts	0.00 - 10.00	0.6000	0.6000
T19	25	Step Bolts	0.00 - 10.00	0.6000	0.6000
T19	26	Step Bolts	0.00 - 10.00	0.6000	0.6000
T19	28	Hybrid	0.00 - 10.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
*									
20' 4-Bay Dipole	C	From Face	1.00 0.00 10.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice	4.00 6.00 8.00	4.00 6.00 8.00	0.06 0.10 0.14
TMA	C	From Leg	0.50 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice	1.05 1.18 1.32	0.55 0.65 0.75	0.02 0.03 0.04
6' x 4" Mount Pipe	C	From Leg	0.50 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice	2.05 2.46 2.83	2.05 2.46 2.83	0.04 0.06 0.08
*									
DB563K-CT w/Mount Pipe	A	From Leg	3.00 0.00 7.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	19.19 20.22 21.27	23.04 25.45 27.88	0.13 0.29 0.46
3' Standoff	A	From Leg	1.50 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	1.78 2.24 2.75	3.79 4.47 5.21	0.13 0.15 0.19
4'x4" Pipe Mount	C	From Leg	0.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	1.22 1.58 1.84	1.22 1.58 1.84	0.04 0.06 0.07
*									
QS66512-2_TIA w/ Mount Pipe	A	From Leg	3.00 0.00	0.0000	145.00	No Ice 1/2"	8.37 8.93	8.46 9.66	0.14 0.21

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			Ice 1" Ice	9.46	10.55	0.30
QS66512-2_TIA w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice	8.37 8.93 9.46	8.46 9.66 10.55	0.14 0.21 0.30
QS66512-2_TIA w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice	8.37 8.93 9.46	8.46 9.66 10.55	0.14 0.21 0.30
(2) TMA2117F00V1-1	A	From Leg	3.00 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice	0.30 0.37 0.45	0.83 0.95 1.07	0.02 0.02 0.03
(2) TMA2117F00V1-1	B	From Leg	3.00 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice	0.30 0.37 0.45	0.83 0.95 1.07	0.02 0.02 0.03
(2) TMA2117F00V1-1	C	From Leg	3.00 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice	0.30 0.37 0.45	0.83 0.95 1.07	0.02 0.02 0.03
2' Standoffs	C	None		0.0000	145.00	No Ice 1/2" Ice 1" Ice	5.70 6.97 8.33	5.70 6.97 8.33	0.33 0.40 0.49
*									
4'x4" Pipe Mount	B	From Leg	0.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	1.23 1.58 1.84	1.23 1.58 1.84	0.04 0.06 0.07
*									
6' x 3" Dia Omni	B	From Leg	3.00 0.00 3.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00
3' Standoff	A	From Leg	1.50 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	1.78 2.24 2.75	3.79 4.47 5.21	0.13 0.15 0.19
*									
DB254-A	C	From Leg	3.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	1.10 1.98 2.86	1.10 1.98 2.86	0.01 0.01 0.02
3' Standoff	C	From Leg	1.50 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	1.78 2.24 2.75	3.79 4.47 5.21	0.13 0.15 0.19
*									
APXVSPP18-C-A20_TIA w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	7.47 8.66 9.56	0.10 0.17 0.24
APXVSPP18-C-A20_TIA w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	7.47 8.66 9.56	0.10 0.17 0.24
APXVSPP18-C-A20_TIA w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	7.47 8.66 9.56	0.10 0.17 0.24
RRH2X50-800	A	From Leg	4.00 0.00 0.00	0.0000	131.00	No Ice 1/2" Ice	1.70 1.86 2.03	1.28 1.43 1.58	0.05 0.07 0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
RRH2X50-800	B	From Leg	4.00	0.0000	131.00	No Ice	1.70	1.28	0.05
			0.00			1/2"	1.86	1.43	0.07
			0.00			Ice	2.03	1.58	0.09
						1" Ice			
RRH2X50-800	C	From Leg	4.00	0.0000	131.00	No Ice	1.70	1.28	0.05
			0.00			1/2"	1.86	1.43	0.07
			0.00			Ice	2.03	1.58	0.09
						1" Ice			
RRH4X45-19	A	From Leg	4.00	0.0000	131.00	No Ice	2.31	2.38	0.09
			0.00			1/2"	2.52	2.58	0.11
			0.00			Ice	2.73	2.79	0.14
						1" Ice			
RRH4X45-19	B	From Leg	4.00	0.0000	131.00	No Ice	2.31	2.38	0.09
			0.00			1/2"	2.52	2.58	0.11
			0.00			Ice	2.73	2.79	0.14
						1" Ice			
RRH4X45-19	C	From Leg	4.00	0.0000	131.00	No Ice	2.31	2.38	0.09
			0.00			1/2"	2.52	2.58	0.11
			0.00			Ice	2.73	2.79	0.14
						1" Ice			
APXVTM14-ALU-I20_TIA w/ Mount Pipe	A	From Leg	4.00	0.0000	131.00	No Ice	6.58	4.96	0.08
			0.00			1/2"	7.03	5.75	0.13
			0.00			Ice	7.47	6.47	0.19
						1" Ice			
APXVTM14-ALU-I20_TIA w/ Mount Pipe	B	From Leg	4.00	0.0000	131.00	No Ice	6.58	4.96	0.08
			0.00			1/2"	7.03	5.75	0.13
			0.00			Ice	7.47	6.47	0.19
						1" Ice			
APXVTM14-ALU-I20_TIA w/ Mount Pipe	C	From Leg	4.00	0.0000	131.00	No Ice	6.58	4.96	0.08
			0.00			1/2"	7.03	5.75	0.13
			0.00			Ice	7.47	6.47	0.19
						1" Ice			
TD-RRH8x20	A	From Leg	4.00	0.0000	131.00	No Ice	3.70	1.29	0.07
			0.00			1/2"	3.95	1.46	0.09
			0.00			Ice	4.20	1.64	0.12
						1" Ice			
TD-RRH8x20	B	From Leg	4.00	0.0000	131.00	No Ice	3.70	1.29	0.07
			0.00			1/2"	3.95	1.46	0.09
			0.00			Ice	4.20	1.64	0.12
						1" Ice			
TD-RRH8x20	C	From Leg	4.00	0.0000	131.00	No Ice	3.70	1.29	0.07
			0.00			1/2"	3.95	1.46	0.09
			0.00			Ice	4.20	1.64	0.12
						1" Ice			
12' Sector Frames	C	None		0.0000	131.00	No Ice	29.82	29.82	1.67
						1/2"	42.21	42.21	2.27
						Ice	54.43	54.43	3.05
						1" Ice			
AIR 32 w/ Mount Pipe	A	From Leg	4.00	0.0000	118.00	No Ice	6.04	5.72	0.13
			0.00			1/2"	6.47	6.46	0.19
			0.00			Ice	6.90	7.15	0.25
						1" Ice			
AIR 32 w/ Mount Pipe	B	From Leg	4.00	0.0000	118.00	No Ice	6.04	5.72	0.13
			0.00			1/2"	6.47	6.46	0.19
			0.00			Ice	6.90	7.15	0.25
						1" Ice			
AIR 32 w/ Mount Pipe	C	From Leg	4.00	0.0000	118.00	No Ice	6.04	5.72	0.13
			0.00			1/2"	6.47	6.46	0.19
			0.00			Ice	6.90	7.15	0.25
						1" Ice			
LNX-6515DS-A1M_TIA w/ Mount Pipe	A	From Leg	4.00	0.0000	118.00	No Ice	11.71	9.87	0.08
			0.00			1/2"	12.43	11.39	0.17
			0.00			Ice	13.17	12.94	0.27

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
							1" Ice			
LNX-6515DS-A1M_TIA w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	118.00	No Ice	11.71	9.87	0.08
			0.00				1/2" Ice	12.43	11.39	0.17
			0.00				1" Ice	13.17	12.94	0.27
LNX-6515DS-A1M_TIA w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	118.00	No Ice	11.71	9.87	0.08
			0.00				1/2" Ice	12.43	11.39	0.17
			0.00				1" Ice	13.17	12.94	0.27
APX16DWV-16DWV-S-E-A20_TIA w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	118.00	No Ice	6.82	3.52	0.06
			0.00				1/2" Ice	7.28	4.29	0.11
			0.00				1" Ice	7.72	4.98	0.17
APX16DWV-16DWV-S-E-A20_TIA w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	118.00	No Ice	6.82	3.52	0.06
			0.00				1/2" Ice	7.28	4.29	0.11
			0.00				1" Ice	7.72	4.98	0.17
APX16DWV-16DWV-S-E-A20_TIA w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	118.00	No Ice	6.82	3.52	0.06
			0.00				1/2" Ice	7.28	4.29	0.11
			0.00				1" Ice	7.72	4.98	0.17
RRUS 11	A	From Leg	4.00	0.00	0.0000	118.00	No Ice	2.78	1.19	0.05
			0.00				1/2" Ice	2.99	1.33	0.07
			0.00				1" Ice	3.21	1.49	0.10
RRUS 11	B	From Leg	4.00	0.00	0.0000	118.00	No Ice	2.78	1.19	0.05
			0.00				1/2" Ice	2.99	1.33	0.07
			0.00				1" Ice	3.21	1.49	0.10
RRUS 11	C	From Leg	4.00	0.00	0.0000	118.00	No Ice	2.78	1.19	0.05
			0.00				1/2" Ice	2.99	1.33	0.07
			0.00				1" Ice	3.21	1.49	0.10
RRUS 32	A	From Leg	4.00	0.00	0.0000	118.00	No Ice	2.73	1.67	0.05
			0.00				1/2" Ice	2.95	1.86	0.07
			0.00				1" Ice	3.18	2.05	0.10
RRUS 32	B	From Leg	4.00	0.00	0.0000	118.00	No Ice	2.73	1.67	0.05
			0.00				1/2" Ice	2.95	1.86	0.07
			0.00				1" Ice	3.18	2.05	0.10
RRUS 32	C	From Leg	4.00	0.00	0.0000	118.00	No Ice	2.73	1.67	0.05
			0.00				1/2" Ice	2.95	1.86	0.07
			0.00				1" Ice	3.18	2.05	0.10
12' Sector Frames	C	None			0.0000	118.00	No Ice	29.82	29.82	1.67
							1/2" Ice	42.21	42.21	2.27
							1" Ice	54.43	54.43	3.05
*										
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	108.00	No Ice	12.96	7.77	0.09
			0.00				1/2" Ice	13.67	9.05	0.19
			0.00				1" Ice	14.34	10.19	0.29
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	108.00	No Ice	12.96	7.77	0.09
			0.00				1/2" Ice	13.67	9.05	0.19
			0.00				1" Ice	14.34	10.19	0.29
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	108.00	No Ice	12.96	7.77	0.09
			0.00				1/2" Ice	13.67	9.05	0.19
			0.00				1" Ice	14.34	10.19	0.29
TA08025-B604	A	From Leg	4.00	0.00	0.0000	108.00	No Ice	1.96	1.03	0.06
			0.00				1/2" Ice	2.14	1.17	0.08
			0.00				1" Ice	2.32	1.31	0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
TA08025-B604	B	From Leg	4.00	0.0000	108.00	No Ice	1.96	1.03	0.06
			0.00			1/2"	2.14	1.17	0.08
			0.00			Ice	2.32	1.31	0.10
						1" Ice			
TA08025-B604	C	From Leg	4.00	0.0000	108.00	No Ice	1.96	1.03	0.06
			0.00			1/2"	2.14	1.17	0.08
			0.00			Ice	2.32	1.31	0.10
						1" Ice			
TA08025-B605	A	From Leg	4.00	0.0000	108.00	No Ice	1.96	1.19	0.07
			0.00			1/2"	2.14	1.33	0.09
			0.00			Ice	2.32	1.48	0.11
						1" Ice			
TA08025-B605	B	From Leg	4.00	0.0000	108.00	No Ice	1.96	1.19	0.07
			0.00			1/2"	2.14	1.33	0.09
			0.00			Ice	2.32	1.48	0.11
						1" Ice			
TA08025-B605	C	From Leg	4.00	0.0000	108.00	No Ice	1.96	1.19	0.07
			0.00			1/2"	2.14	1.33	0.09
			0.00			Ice	2.32	1.48	0.11
						1" Ice			
RDIDC-9181-PF-48	C	From Leg	4.00	0.0000	108.00	No Ice	1.87	1.07	0.02
			0.00			1/2"	2.04	1.20	0.04
			0.00			Ice	2.21	1.35	0.06
						1" Ice			
MTC3975083	C	None		0.0000	108.00	No Ice	29.82	29.82	1.67
						1/2"	42.21	42.21	2.27
						Ice	54.43	54.43	3.05
						1" Ice			
*									
(3) JAHH-65B-R3B_TIA w/ Mount Pipe	A	From Leg	4.00	0.0000	98.00	No Ice	9.35	7.65	0.09
			0.00			1/2"	9.92	8.83	0.17
			0.00			Ice	10.46	9.73	0.25
						1" Ice			
(3) JAHH-65B-R3B_TIA w/ Mount Pipe	B	From Leg	4.00	0.0000	98.00	No Ice	9.35	7.65	0.09
			0.00			1/2"	9.92	8.83	0.17
			0.00			Ice	10.46	9.73	0.25
						1" Ice			
(3) JAHH-65B-R3B_TIA w/ Mount Pipe	C	From Leg	4.00	0.0000	98.00	No Ice	9.35	7.65	0.09
			0.00			1/2"	9.92	8.83	0.17
			0.00			Ice	10.46	9.73	0.25
						1" Ice			
BSAMNT-SBS-1-2	A	From Leg	4.00	0.0000	98.00	No Ice	2.12	2.12	0.07
			0.00			1/2"	2.62	2.62	0.09
			0.00			Ice	3.00	3.00	0.11
						1" Ice			
BSAMNT-SBS-1-2	B	From Leg	4.00	0.0000	98.00	No Ice	2.12	2.12	0.07
			0.00			1/2"	2.62	2.62	0.09
			0.00			Ice	3.00	3.00	0.11
						1" Ice			
BSAMNT-SBS-1-2	C	From Leg	4.00	0.0000	98.00	No Ice	2.12	2.12	0.07
			0.00			1/2"	2.62	2.62	0.09
			0.00			Ice	3.00	3.00	0.11
						1" Ice			
XXDWMM-12.5-65-8T-CBRS	A	From Leg	4.00	0.0000	98.00	No Ice	0.52	1.53	0.02
			0.00			1/2"	0.61	1.69	0.04
			0.00			Ice	0.72	1.85	0.05
						1" Ice			
XXDWMM-12.5-65-8T-CBRS	B	From Leg	4.00	0.0000	98.00	No Ice	0.52	1.53	0.02
			0.00			1/2"	0.61	1.69	0.04
			0.00			Ice	0.72	1.85	0.05
						1" Ice			
XXDWMM-12.5-65-8T-CBRS	C	From Leg	4.00	0.0000	98.00	No Ice	0.52	1.53	0.02
			0.00			1/2"	0.61	1.69	0.04
			0.00			Ice	0.72	1.85	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
							1" Ice			
CBRS RRH-RT4401-48A	A	From Leg	4.00	0.00	0.0000	98.00	No Ice	1.54	0.75	0.02
							1/2" Ice	1.70	0.87	0.04
							1" Ice	1.86	0.99	0.05
CBRS RRH-RT4401-48A	B	From Leg	4.00	0.00	0.0000	98.00	No Ice	1.54	0.75	0.02
							1/2" Ice	1.70	0.87	0.04
							1" Ice	1.86	0.99	0.05
CBRS RRH-RT4401-48A	C	From Leg	4.00	0.00	0.0000	98.00	No Ice	1.54	0.75	0.02
							1/2" Ice	1.70	0.87	0.04
							1" Ice	1.86	0.99	0.05
B2/B66 RRH-BR049	A	From Leg	4.00	0.00	0.0000	98.00	No Ice	1.88	1.25	0.08
							1/2" Ice	2.05	1.39	0.10
							1" Ice	2.22	1.54	0.12
B2/B66 RRH-BR049	B	From Leg	4.00	0.00	0.0000	98.00	No Ice	1.88	1.25	0.08
							1/2" Ice	2.05	1.39	0.10
							1" Ice	2.22	1.54	0.12
B2/B66 RRH-BR049	C	From Leg	4.00	0.00	0.0000	98.00	No Ice	1.88	1.25	0.08
							1/2" Ice	2.05	1.39	0.10
							1" Ice	2.22	1.54	0.12
B5/B13 RRH-BR04C	A	From Leg	4.00	0.00	0.0000	98.00	No Ice	1.88	1.01	0.07
							1/2" Ice	2.05	1.14	0.09
							1" Ice	2.22	1.28	0.11
B5/B13 RRH-BR04C	B	From Leg	4.00	0.00	0.0000	98.00	No Ice	1.88	1.01	0.07
							1/2" Ice	2.05	1.14	0.09
							1" Ice	2.22	1.28	0.11
B5/B13 RRH-BR04C	C	From Leg	4.00	0.00	0.0000	98.00	No Ice	1.88	1.01	0.07
							1/2" Ice	2.05	1.14	0.09
							1" Ice	2.22	1.28	0.11
CBC78T-DS-43-2X	A	From Leg	4.00	0.00	0.0000	98.00	No Ice	0.37	0.51	0.02
							1/2" Ice	0.45	0.60	0.03
							1" Ice	0.53	0.70	0.04
CBC78T-DS-43-2X	B	From Leg	4.00	0.00	0.0000	98.00	No Ice	0.37	0.51	0.02
							1/2" Ice	0.45	0.60	0.03
							1" Ice	0.53	0.70	0.04
CBC78T-DS-43-2X	C	From Leg	4.00	0.00	0.0000	98.00	No Ice	0.37	0.51	0.02
							1/2" Ice	0.45	0.60	0.03
							1" Ice	0.53	0.70	0.04
VFA12-HD	A	From Leg	2.00	0.00	0.0000	98.00	No Ice	13.20	9.20	0.66
							1/2" Ice	19.50	14.60	0.80
							1" Ice	25.80	20.00	0.95
VFA12-HD	B	From Leg	2.00	0.00	0.0000	98.00	No Ice	13.20	9.20	0.66
							1/2" Ice	19.50	14.60	0.80
							1" Ice	25.80	20.00	0.95
VFA12-HD	C	From Leg	2.00	0.00	0.0000	98.00	No Ice	13.20	9.20	0.66
							1/2" Ice	19.50	14.60	0.80
							1" Ice	25.80	20.00	0.95
GPS_A	B	From Leg	4.00	0.00	0.0000	98.00	No Ice	0.26	0.26	0.00
							1/2" Ice	0.32	0.32	0.00
							1" Ice	0.39	0.39	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
DB-T1-6Z-8AB-0Z	A	From Leg	4.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	4.80 5.07 5.35	2.00 2.19 2.39	0.04 0.08 0.12
DB-T1-6Z-8AB-0Z	B	From Leg	4.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	4.80 5.07 5.35	2.00 2.19 2.39	0.04 0.08 0.12
DB-T1-6Z-8AB-0Z	C	From Leg	4.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	4.80 5.07 5.35	2.00 2.19 2.39	0.04 0.08 0.12
* 8' 4-Bay Dipole	C	From Leg	3.00 0.00 4.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice	4.00 6.00 8.00	4.00 6.00 8.00	0.06 0.10 0.14
3' Standoff	C	From Leg	1.50 0.00 0.00	0.0000	74.00	No Ice 1/2" Ice 1" Ice	1.78 2.24 2.75	3.79 4.47 5.21	0.13 0.15 0.19
* GPS_A	C	From Leg	3.00 0.00 0.00	0.0000	58.00	No Ice 1/2" Ice 1" Ice	0.26 0.32 0.39	0.26 0.32 0.39	0.00 0.00 0.01
3' Standoff	C	From Leg	1.50 0.00 0.00	0.0000	58.00	No Ice 1/2" Ice 1" Ice	1.78 2.24 2.75	3.79 4.47 5.21	0.13 0.15 0.19

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
4' Dish	C	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	Worst		152.00	4.00	No Ice 1/2" Ice 1" Ice	12.57 13.10 13.62	0.23 0.29 0.36
4' Dish	B	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	Worst		140.00	4.00	No Ice 1/2" Ice 1" Ice	12.57 13.10 13.62	0.23 0.29 0.36

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice

Comb. No.	Description
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	152 - 140	Leg	Max Tension	23	3.98	-0.07	0.03
			Max. Compression	18	-5.56	0.01	-0.02
			Max. Mx	11	-1.32	-0.19	0.14
			Max. My	8	-0.46	0.00	-0.57
			Max. Vy	6	-0.32	0.00	0.00
			Max. Vx	12	-0.45	0.00	0.00
		Diagonal	Max Tension	17	1.60	0.00	0.00
			Max. Compression	4	-1.65	0.00	0.00
			Max. Mx	27	0.31	0.02	-0.00
			Max. My	6	-1.17	0.00	0.00
			Max. Vy	27	-0.02	0.02	-0.00
			Max. Vx	6	-0.00	0.00	0.00
		Top Girt	Max Tension	2	0.10	0.00	0.00
			Max. Compression	7	-0.08	0.00	0.00
			Max. Mx	26	-0.00	-0.06	0.00
			Max. My	26	-0.00	0.00	0.00
			Max. Vy	26	0.04	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T2	140 - 135	Leg	Max Tension	7	6.43	0.01	0.02
			Max. Compression	18	-8.54	0.10	0.01
			Max. Mx	22	5.94	-0.13	-0.00
			Max. My	4	-1.37	-0.02	-0.22
			Max. Vy	14	0.05	-0.13	0.01
			Max. Vx	4	0.08	-0.02	-0.22
		Diagonal	Max Tension	5	1.56	0.00	0.00
			Max. Compression	16	-1.59	0.00	0.00
			Max. Mx	28	0.14	0.02	0.00
			Max. My	29	-0.43	0.02	0.00
			Max. Vy	28	0.02	0.02	0.00
			Max. Vx	29	-0.00	0.00	0.00
		Top Girt	Max Tension	19	0.15	0.00	0.00
			Max. Compression	6	-0.17	0.00	0.00
			Max. Mx	26	-0.04	-0.06	0.00
			Max. My	26	-0.04	0.00	0.00
			Max. Vy	26	0.04	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
T3	135 - 130	Leg	Max Tension	7	9.21	-0.13	-0.01
			Max. Compression	18	-13.17	0.32	0.00
			Max. Mx	22	7.59	-0.35	-0.01
			Max. My	16	-0.97	-0.02	-0.38
			Max. Vy	22	0.68	-0.35	-0.01
			Max. Vx	20	0.60	-0.02	-0.22
		Diagonal	Max Tension	7	2.01	0.00	0.00
			Max. Compression	18	-2.10	0.00	0.00
			Max. Mx	27	0.28	0.02	0.00
			Max. My	30	0.48	0.02	0.00
			Max. Vy	27	0.02	0.02	0.00
			Max. Vx	30	-0.00	0.00	0.00
T4	130 - 125	Leg	Max Tension	7	12.70	-0.35	0.00
			Max. Compression	18	-17.82	-0.16	0.00
			Max. Mx	22	11.69	-0.35	-0.01
			Max. My	20	-2.80	-0.02	-0.22
			Max. Vy	22	-0.13	-0.35	-0.01
			Max. Vx	16	0.08	-0.02	0.22
		Diagonal	Max Tension	17	2.78	0.00	0.00
			Max. Compression	16	-2.85	0.00	0.00
			Max. Mx	30	0.44	0.03	-0.00
			Max. My	28	-0.90	0.02	0.00
			Max. Vy	30	0.03	0.03	-0.00
			Max. Vx	28	-0.00	0.00	0.00
T5	125 - 120	Leg	Max Tension	7	17.43	0.18	-0.00
			Max. Compression	18	-23.10	0.50	0.00
			Max. Mx	22	16.04	-0.55	-0.01
			Max. My	4	-3.26	-0.03	-0.42
			Max. Vy	22	0.17	-0.55	-0.01
			Max. Vx	16	-0.12	-0.03	0.42
		Diagonal	Max Tension	16	2.65	0.00	0.00
			Max. Compression	17	-2.59	0.00	0.00
			Max. Mx	28	0.47	0.03	0.00
			Max. My	30	0.75	0.03	0.00
			Max. Vy	30	0.03	0.03	0.00
			Max. Vx	30	-0.00	0.00	0.00
T6	120 - 100	Leg	Max Tension	7	37.72	-0.26	-0.01
			Max. Compression	18	-48.80	0.02	0.01
			Max. Mx	14	20.41	0.75	0.01
			Max. My	16	-3.79	-0.04	-0.75
			Max. Vy	22	-0.66	-0.55	-0.01
			Max. Vx	16	0.60	-0.03	0.42
		Diagonal	Max Tension	17	4.65	0.00	0.00
			Max. Compression	16	-4.78	0.00	0.00
			Max. Mx	27	1.13	0.06	-0.01
			Max. My	31	-1.53	0.05	0.01
			Max. Vy	29	0.04	0.05	-0.01
			Max. Vx	31	-0.00	0.00	0.00
T7	100 - 93.3333	Leg	Max Tension	7	46.58	-0.05	-0.01
			Max. Compression	18	-60.12	0.55	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	18	-60.12	0.55	0.00
			Max. My	16	-5.62	-0.02	-0.55
			Max. Vy	6	0.80	-0.50	-0.00
			Max. Vx	16	-0.60	0.02	0.18
		Diagonal	Max Tension	17	5.85	0.03	0.00
			Max. Compression	16	-5.98	0.00	0.00
			Max. Mx	27	1.41	0.09	0.01
			Max. My	30	1.61	0.09	0.01
			Max. Vy	29	0.06	0.08	-0.01
			Max. Vx	30	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	15	0.84	0.01	-0.00
			Max. Compression	18	-0.87	0.03	0.01
			Max. Mx	30	-0.22	0.07	0.01
			Max. My	30	-0.28	0.07	0.01
			Max. Vy	30	-0.06	0.07	0.01
			Max. Vx	30	0.00	0.00	0.00
T8	93.3333 - 86.6667	Leg	Max Tension	7	55.36	0.20	-0.00
			Max. Compression	18	-70.96	-0.32	0.00
			Max. Mx	18	-70.93	0.42	0.00
			Max. My	8	-8.25	-0.07	0.24
			Max. Vy	18	0.23	0.42	0.00
			Max. Vx	4	0.11	-0.07	-0.24
		Diagonal	Max Tension	17	5.73	0.03	-0.00
			Max. Compression	16	-5.90	0.00	0.00
			Max. Mx	27	1.62	0.08	-0.01
			Max. My	31	-1.92	0.06	0.01
			Max. Vy	29	0.06	0.07	0.01
			Max. Vx	31	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	4	0.29	0.00	0.00
			Max. Compression	17	-0.23	0.02	0.01
			Max. Mx	29	0.03	0.06	0.01
			Max. My	29	0.03	0.06	0.01
			Max. Vy	29	-0.06	0.06	0.01
			Max. Vx	29	0.00	0.00	0.00
T9	86.6667 - 80	Leg	Max Tension	7	64.87	0.19	-0.00
			Max. Compression	18	-81.53	-0.32	0.00
			Max. Mx	18	-81.50	0.46	0.00
			Max. My	8	-8.57	-0.07	0.24
			Max. Vy	18	-0.25	0.46	0.00
			Max. Vx	4	-0.12	-0.07	-0.24
		Diagonal	Max Tension	17	5.75	0.04	0.00
			Max. Compression	16	-5.94	0.00	0.00
			Max. Mx	27	1.54	0.11	0.01
			Max. My	30	1.78	0.10	0.01
			Max. Vy	29	0.06	0.10	-0.01
			Max. Vx	30	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	4	0.33	0.00	0.00
			Max. Compression	17	-0.26	0.02	0.01
			Max. Mx	30	0.16	0.09	0.01
			Max. My	29	0.02	0.08	0.01
			Max. Vy	30	-0.06	0.09	0.01
			Max. Vx	29	0.00	0.00	0.00
T10	80 - 73.3333	Leg	Max Tension	7	73.95	0.21	-0.00
			Max. Compression	18	-92.00	-0.40	0.00
			Max. Mx	18	-91.67	0.63	-0.00
			Max. My	8	-9.15	-0.09	0.36
			Max. Vy	18	0.32	0.63	-0.00
			Max. Vx	24	-0.25	-0.09	0.34
		Diagonal	Max Tension	17	5.75	0.04	0.00
			Max. Compression	16	-5.96	0.00	0.00
			Max. Mx	35	1.90	0.09	-0.01
			Max. My	31	-1.93	0.07	0.01
			Max. Vy	29	0.06	0.09	0.01
			Max. Vx	31	0.00	0.00	0.00
		Secondary	Max Tension	4	0.40	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Horizontal					
			Max. Compression	17	-0.32	0.02	0.01
			Max. Mx	34	0.11	0.07	0.01
			Max. My	29	0.05	0.07	0.01
			Max. Vy	34	0.06	0.07	0.01
			Max. Vx	29	0.00	0.00	0.00
T11	73.3333 - 66.6667	Leg	Max Tension	7	82.54	0.23	-0.00
			Max. Compression	18	-101.94	-0.44	0.00
			Max. Mx	18	-101.89	0.68	-0.00
			Max. My	8	-9.49	-0.09	0.36
			Max. Vy	18	-0.35	0.68	-0.00
			Max. Vx	4	-0.16	-0.09	-0.36
		Diagonal	Max Tension	17	5.88	0.05	0.00
			Max. Compression	16	-6.15	0.00	0.00
			Max. Mx	35	1.64	0.13	0.01
			Max. My	30	-1.79	0.11	0.01
			Max. Vy	29	0.07	0.12	-0.01
			Max. Vx	30	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	16	0.47	0.03	0.00
			Max. Compression	17	-0.37	0.02	0.01
			Max. Mx	31	0.15	0.10	0.01
			Max. My	29	0.02	0.10	0.01
			Max. Vy	31	-0.07	0.10	0.01
			Max. Vx	29	0.00	0.00	0.00
T12	66.6667 - 60	Leg	Max Tension	7	91.10	0.30	-0.00
			Max. Compression	18	-111.82	-0.57	0.01
			Max. Mx	18	-111.78	0.75	-0.00
			Max. My	4	-10.77	-0.11	-0.41
			Max. Vy	18	0.40	0.75	-0.00
			Max. Vx	4	0.18	-0.11	-0.41
		Diagonal	Max Tension	17	5.97	0.05	0.00
			Max. Compression	16	-6.19	0.00	0.00
			Max. Mx	35	2.22	0.11	-0.01
			Max. My	31	-1.84	0.09	0.02
			Max. Vy	29	0.07	0.11	0.01
			Max. Vx	31	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	16	0.52	0.03	0.00
			Max. Compression	5	-0.42	0.00	0.00
			Max. Mx	29	0.05	0.08	0.01
			Max. My	29	0.05	0.08	0.01
			Max. Vy	29	0.07	0.08	0.01
			Max. Vx	29	0.00	0.00	0.00
T13	60 - 50	Leg	Max Tension	7	101.44	0.37	-0.01
			Max. Compression	18	-123.92	-0.88	0.01
			Max. Mx	18	-123.85	1.19	0.00
			Max. My	16	-10.28	-0.17	0.97
			Max. Vy	18	0.43	1.19	0.00
			Max. Vx	4	0.27	-0.17	-0.96
		Diagonal	Max Tension	17	6.85	0.07	-0.00
			Max. Compression	16	-7.04	0.00	0.00
			Max. Mx	35	1.80	0.18	0.02
			Max. My	35	-2.92	0.14	-0.02
			Max. Vy	29	0.09	0.17	-0.02
			Max. Vx	35	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	4	0.57	0.00	0.00
			Max. Compression	17	-0.47	0.03	0.01
			Max. Mx	36	-0.01	0.12	0.02
			Max. My	29	0.01	0.12	0.02
			Max. Vy	36	0.07	0.12	0.02
			Max. Vx	29	0.00	0.00	0.00
T14	50 - 40	Leg	Max Tension	7	113.63	0.56	-0.01
			Max. Compression	18	-138.05	-0.75	0.01
			Max. Mx	18	-137.99	1.27	0.00
			Max. My	16	-10.75	-0.17	0.97
			Max. Vy	18	-0.47	1.27	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	16	0.28	-0.17	0.97
		Diagonal	Max Tension	5	6.88	0.10	-0.01
			Max. Compression	16	-7.28	0.00	0.00
			Max. Mx	35	2.45	0.19	0.02
			Max. My	35	2.45	0.19	-0.02
			Max. Vy	29	0.10	0.18	0.02
			Max. Vx	35	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	4	0.62	0.00	0.00
			Max. Compression	17	-0.52	0.03	0.02
			Max. Mx	28	0.30	0.13	0.02
			Max. My	29	0.04	0.12	0.03
			Max. Vy	28	0.09	0.13	0.02
			Max. Vx	29	0.01	0.00	0.00
T15	40 - 30	Leg	Max Tension	7	125.49	0.55	-0.01
			Max. Compression	18	-152.24	-2.08	0.01
			Max. Mx	18	-152.24	-2.08	0.01
			Max. My	4	-13.22	-0.28	-0.84
			Max. Vy	18	0.76	1.67	0.00
			Max. Vx	4	0.25	-0.28	-0.84
		Diagonal	Max Tension	17	6.95	0.11	-0.00
			Max. Compression	16	-7.26	0.00	0.00
			Max. Mx	29	1.32	0.25	-0.02
			Max. My	35	-3.23	0.22	0.03
			Max. Vy	29	0.11	0.25	-0.02
			Max. Vx	35	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	4	0.80	0.00	0.00
			Max. Compression	17	-0.67	0.05	0.02
			Max. Mx	34	-0.09	0.18	0.03
			Max. My	29	-0.08	0.18	0.03
			Max. Vy	34	-0.09	0.18	0.03
			Max. Vx	29	0.01	0.00	0.00
T16	30 - 20	Leg	Max Tension	7	136.13	1.54	-0.01
			Max. Compression	18	-165.21	1.68	-0.01
			Max. Mx	35	-87.06	-3.20	0.00
			Max. My	4	-13.71	-0.28	-0.84
			Max. Vy	18	-1.86	2.53	0.00
			Max. Vx	4	0.28	-0.27	-0.36
		Diagonal	Max Tension	5	7.46	0.05	-0.00
			Max. Compression	18	-8.21	0.00	0.00
			Max. Mx	18	5.18	0.13	-0.00
			Max. My	35	0.54	0.05	-0.01
			Max. Vy	35	0.06	0.10	-0.01
			Max. Vx	29	-0.00	0.00	0.00
		Horizontal	Max Tension	4	0.54	0.00	0.00
			Max. Compression	17	-0.47	0.04	0.03
			Max. Mx	29	0.36	0.15	0.09
			Max. My	29	0.36	0.15	0.09
			Max. Vy	29	-0.09	0.15	0.09
			Max. Vx	29	-0.01	0.00	0.00
		Redund Horz 1 Bracing	Max Tension	18	1.81	0.00	0.00
			Max. Compression	7	-1.47	0.00	0.00
			Max. Mx	26	0.93	-0.03	0.00
			Max. My	26	0.90	0.00	0.00
			Max. Vy	26	0.03	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	7	0.85	0.00	0.00
			Max. Compression	18	-1.18	0.00	0.00
			Max. Mx	26	-0.30	-0.04	0.00
			Max. My	26	-0.29	0.00	0.00
			Max. Vy	26	0.03	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
T17	20 - 15	Leg	Max Tension	7	147.12	2.26	-0.01
			Max. Compression	18	-178.51	3.46	0.01
			Max. Mx	18	-178.31	3.46	0.01
			Max. My	4	-15.04	0.08	0.49

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	18	-2.52	3.46	0.01
			Max. Vx	16	0.39	0.21	0.45
		Diagonal	Max Tension	16	7.06	0.15	0.00
			Max. Compression	17	-6.95	0.00	0.00
			Max. Mx	18	5.54	0.16	-0.00
			Max. My	35	-1.07	0.05	-0.01
			Max. Vy	35	0.06	0.11	-0.01
			Max. Vx	35	0.00	0.00	0.00
		Redund Horz 1 Bracing	Max Tension	18	2.20	0.00	0.00
			Max. Compression	7	-1.86	0.00	0.00
			Max. Mx	26	0.90	-0.03	0.00
			Max. My	26	0.88	0.00	0.00
			Max. Vy	26	0.03	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	7	1.07	0.00	0.00
			Max. Compression	18	-1.41	0.00	0.00
			Max. Mx	26	-0.70	-0.04	0.00
			Max. My	26	-0.69	0.00	0.00
			Max. Vy	26	-0.03	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
T18	15 - 10	Leg	Max Tension	7	147.83	-0.20	0.01
			Max. Compression	18	-179.86	0.13	0.02
			Max. Mx	35	-93.12	1.09	0.00
			Max. My	4	-15.40	-0.14	-1.80
			Max. Vy	29	-0.28	-0.38	0.00
			Max. Vx	4	0.50	-0.14	-1.80
		Diagonal	Max Tension	17	6.93	0.00	0.00
			Max. Compression	16	-7.12	0.00	0.00
			Max. Mx	26	-1.33	-0.24	0.00
			Max. My	26	-1.40	0.00	0.01
			Max. Vy	26	0.09	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Horizontal	Max Tension	6	0.78	0.00	0.00
			Max. Compression	19	-0.59	0.04	0.02
			Max. Mx	35	0.02	0.15	0.08
			Max. My	29	0.48	0.15	0.08
			Max. Vy	35	0.07	0.15	0.08
			Max. Vx	29	0.01	0.00	0.00
T19	10 - 0	Leg	Max Tension	7	158.43	-0.34	-0.02
			Max. Compression	18	-192.52	0.00	0.00
			Max. Mx	35	-100.91	1.09	0.00
			Max. My	4	-15.92	-0.14	-1.80
			Max. Vy	37	0.13	0.00	0.00
			Max. Vx	4	-0.27	-0.14	-1.80
		Diagonal	Max Tension	20	7.57	0.00	0.00
			Max. Compression	18	-7.87	0.00	0.00
			Max. Mx	30	2.52	0.22	-0.04
			Max. My	28	3.49	0.21	-0.04
			Max. Vy	30	0.11	0.21	0.04
			Max. Vx	28	0.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	199.27	20.46	-11.72
	Max. H_x	18	199.27	20.46	-11.72
	Max. H_z	7	-163.89	-17.45	9.98
	Min. Vert	7	-163.89	-17.45	9.98
	Min. H_x	7	-163.89	-17.45	9.98
	Min. H_z	18	199.27	20.46	-11.72
Leg B	Max. Vert	10	190.04	-19.27	-11.27

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg A	Max. H_x	23	-154.02	16.25	9.51
	Max. H_z	23	-154.02	16.25	9.51
	Min. Vert	23	-154.02	16.25	9.51
	Min. H_x	10	190.04	-19.27	-11.27
	Min. H_z	10	190.04	-19.27	-11.27
	Max. Vert	2	189.11	0.18	22.29
	Max. H_x	20	16.19	3.00	1.32
	Max. H_z	2	189.11	0.18	22.29
	Min. Vert	15	-153.22	-0.17	-18.79
	Min. H_x	9	11.75	-3.00	0.94
	Min. H_z	15	-153.22	-0.17	-18.79

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	39.74	0.00	0.00	-1.08	-3.20	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	47.68	-0.05	-35.74	-3117.33	0.26	6.13
0.9 Dead+1.6 Wind 0 deg - No Ice	35.76	-0.05	-35.74	-3117.00	1.22	6.13
1.2 Dead+1.6 Wind 30 deg - No Ice	47.68	18.23	-31.49	-2760.60	-1608.91	9.62
0.9 Dead+1.6 Wind 30 deg - No Ice	35.76	18.23	-31.49	-2760.28	-1607.95	9.62
1.2 Dead+1.6 Wind 60 deg - No Ice	47.68	31.04	-17.81	-1569.34	-2748.74	2.71
0.9 Dead+1.6 Wind 60 deg - No Ice	35.76	31.04	-17.81	-1569.02	-2747.78	2.71
1.2 Dead+1.6 Wind 90 deg - No Ice	47.68	36.08	0.05	2.81	-3187.54	-6.39
0.9 Dead+1.6 Wind 90 deg - No Ice	35.76	36.08	0.05	3.13	-3186.58	-6.39
1.2 Dead+1.6 Wind 120 deg - No Ice	47.68	31.01	17.85	1555.48	-2721.02	-4.14
0.9 Dead+1.6 Wind 120 deg - No Ice	35.76	31.01	17.85	1555.80	-2720.05	-4.14
1.2 Dead+1.6 Wind 150 deg - No Ice	47.68	16.08	27.66	2457.19	-1439.98	2.75
0.9 Dead+1.6 Wind 150 deg - No Ice	35.76	16.08	27.66	2457.52	-1439.02	2.75
1.2 Dead+1.6 Wind 180 deg - No Ice	47.68	0.05	33.56	2971.72	-7.95	-6.13
0.9 Dead+1.6 Wind 180 deg - No Ice	35.76	0.05	33.56	2972.04	-6.99	-6.13
1.2 Dead+1.6 Wind 210 deg - No Ice	47.68	-18.23	31.49	2758.01	1601.22	-9.62
0.9 Dead+1.6 Wind 210 deg - No Ice	35.76	-18.23	31.49	2758.33	1602.18	-9.62
1.2 Dead+1.6 Wind 240 deg - No Ice	47.68	-32.93	18.90	1638.26	2864.91	-2.71
0.9 Dead+1.6 Wind 240 deg - No Ice	35.76	-32.93	18.90	1638.58	2865.87	-2.71
1.2 Dead+1.6 Wind 270 deg - No Ice	47.68	-36.08	-0.05	-5.40	3179.85	6.39
0.9 Dead+1.6 Wind 270 deg - No Ice	35.76	-36.08	-0.05	-5.08	3180.81	6.39
1.2 Dead+1.6 Wind 300 deg - No Ice	47.68	-29.12	-16.76	-1486.57	2589.47	4.14
0.9 Dead+1.6 Wind 300 deg - No Ice	35.76	-29.12	-16.76	-1486.24	2590.43	4.14
1.2 Dead+1.6 Wind 330 deg - No Ice	47.68	-16.08	-27.66	-2459.79	1432.29	-2.75
0.9 Dead+1.6 Wind 330 deg	35.76	-16.08	-27.66	-2459.46	1433.25	-2.75

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
- No Ice						
1.2 Dead+1.0 Ice+1.0 Temp	128.96	0.00	0.00	-8.09	-31.25	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	128.96	-0.01	-11.70	-1032.03	-30.17	0.97
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	128.96	6.11	-10.55	-930.77	-568.29	2.82
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	128.96	10.77	-6.18	-548.77	-977.37	0.92
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	128.96	12.06	0.01	-7.02	-1094.19	-1.74
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	128.96	10.03	5.77	498.31	-915.86	-0.91
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	128.96	5.54	9.53	834.98	-523.56	0.65
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	128.96	0.01	11.38	994.95	-32.32	-0.97
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	128.96	-6.11	10.55	914.59	505.79	-2.82
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	128.96	-11.05	6.34	543.04	932.97	-0.92
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	128.96	-12.06	-0.01	-9.16	1031.70	1.74
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	128.96	-9.75	-5.61	-504.05	835.26	0.91
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	128.96	-5.54	-9.53	-851.17	461.07	-0.65
Dead+Wind 0 deg - Service	39.74	-0.01	-9.32	-812.32	-2.14	1.59
Dead+Wind 30 deg - Service	39.74	4.76	-8.21	-719.44	-421.07	2.50
Dead+Wind 60 deg - Service	39.74	8.10	-4.65	-409.31	-717.82	0.71
Dead+Wind 90 deg - Service	39.74	9.41	0.01	-0.01	-832.05	-1.66
Dead+Wind 120 deg - Service	39.74	8.09	4.66	404.22	-710.60	-1.07
Dead+Wind 150 deg - Service	39.74	4.20	7.22	639.02	-377.12	0.72
Dead+Wind 180 deg - Service	39.74	0.01	8.76	772.96	-4.27	-1.59
Dead+Wind 210 deg - Service	39.74	-4.76	8.21	717.28	414.66	-2.50
Dead+Wind 240 deg - Service	39.74	-8.59	4.93	425.75	743.63	-0.71
Dead+Wind 270 deg - Service	39.74	-9.41	-0.01	-2.15	825.64	1.66
Dead+Wind 300 deg - Service	39.74	-7.60	-4.37	-387.78	671.97	1.07
Dead+Wind 330 deg - Service	39.74	-4.20	-7.22	-641.19	370.71	-0.72

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-39.74	0.00	0.00	39.74	0.00	0.000%
2	-0.05	-47.68	-35.74	0.05	47.68	35.74	0.000%
3	-0.05	-35.76	-35.74	0.05	35.76	35.74	0.000%
4	18.23	-47.68	-31.49	-18.23	47.68	31.49	0.000%
5	18.23	-35.76	-31.49	-18.23	35.76	31.49	0.000%
6	31.04	-47.68	-17.81	-31.04	47.68	17.81	0.000%
7	31.04	-35.76	-17.81	-31.04	35.76	17.81	0.000%
8	36.08	-47.68	0.05	-36.08	47.68	-0.05	0.000%
9	36.08	-35.76	0.05	-36.08	35.76	-0.05	0.000%
10	31.01	-47.68	17.85	-31.01	47.68	-17.85	0.000%
11	31.01	-35.76	17.85	-31.01	35.76	-17.85	0.000%
12	16.08	-47.68	27.66	-16.08	47.68	-27.66	0.000%
13	16.08	-35.76	27.66	-16.08	35.76	-27.66	0.000%
14	0.05	-47.68	33.56	-0.05	47.68	-33.56	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
15	0.05	-35.76	33.56	-0.05	35.76	-33.56	0.000%
16	-18.23	-47.68	31.49	18.23	47.68	-31.49	0.000%
17	-18.23	-35.76	31.49	18.23	35.76	-31.49	0.000%
18	-32.93	-47.68	18.90	32.93	47.68	-18.90	0.000%
19	-32.93	-35.76	18.90	32.93	35.76	-18.90	0.000%
20	-36.08	-47.68	-0.05	36.08	47.68	0.05	0.000%
21	-36.08	-35.76	-0.05	36.08	35.76	0.05	0.000%
22	-29.12	-47.68	-16.76	29.12	47.68	16.76	0.000%
23	-29.12	-35.76	-16.76	29.12	35.76	16.76	0.000%
24	-16.08	-47.68	-27.66	16.08	47.68	27.66	0.000%
25	-16.08	-35.76	-27.66	16.08	35.76	27.66	0.000%
26	0.00	-128.96	0.00	0.00	128.96	0.00	0.000%
27	-0.01	-128.96	-11.70	0.01	128.96	11.70	0.000%
28	6.11	-128.96	-10.55	-6.11	128.96	10.55	0.000%
29	10.77	-128.96	-6.18	-10.77	128.96	6.18	0.000%
30	12.06	-128.96	0.01	-12.06	128.96	-0.01	0.000%
31	10.03	-128.96	5.77	-10.03	128.96	-5.77	0.000%
32	5.54	-128.96	9.53	-5.54	128.96	-9.53	0.000%
33	0.01	-128.96	11.38	-0.01	128.96	-11.38	0.000%
34	-6.11	-128.96	10.55	6.11	128.96	-10.55	0.000%
35	-11.05	-128.96	6.34	11.05	128.96	-6.34	0.000%
36	-12.06	-128.96	-0.01	12.06	128.96	0.01	0.000%
37	-9.75	-128.96	-5.61	9.75	128.96	5.61	0.000%
38	-5.54	-128.96	-9.53	5.54	128.96	9.53	0.000%
39	-0.01	-39.74	-9.32	0.01	39.74	9.32	0.000%
40	4.76	-39.74	-8.21	-4.76	39.74	8.21	0.000%
41	8.10	-39.74	-4.65	-8.10	39.74	4.65	0.000%
42	9.41	-39.74	0.01	-9.41	39.74	-0.01	0.000%
43	8.09	-39.74	4.66	-8.09	39.74	-4.66	0.000%
44	4.20	-39.74	7.22	-4.20	39.74	-7.22	0.000%
45	0.01	-39.74	8.76	-0.01	39.74	-8.76	0.000%
46	-4.76	-39.74	8.21	4.76	39.74	-8.21	0.000%
47	-8.59	-39.74	4.93	8.59	39.74	-4.93	0.000%
48	-9.41	-39.74	-0.01	9.41	39.74	0.01	0.000%
49	-7.60	-39.74	-4.37	7.60	39.74	4.37	0.000%
50	-4.20	-39.74	-7.22	4.20	39.74	7.22	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	152 - 140	3.367	47	0.1861	0.0172
T2	140 - 135	2.897	47	0.1812	0.0116
T3	135 - 130	2.705	47	0.1786	0.0101
T4	130 - 125	2.516	47	0.1751	0.0086
T5	125 - 120	2.329	47	0.1702	0.0076
T6	120 - 100	2.151	47	0.1642	0.0066
T7	100 - 93.3333	1.493	47	0.1369	0.0042
T8	93.3333 - 86.6667	1.301	47	0.1286	0.0036
T9	86.6667 - 80	1.119	47	0.1190	0.0031
T10	80 - 73.3333	0.953	47	0.1086	0.0027
T11	73.3333 - 66.6667	0.798	47	0.0994	0.0022
T12	66.6667 - 60	0.659	47	0.0896	0.0020
T13	60 - 50	0.532	47	0.0793	0.0018
T14	50 - 40	0.368	47	0.0646	0.0015
T15	40 - 30	0.242	47	0.0491	0.0012
T16	30 - 20	0.142	47	0.0365	0.0010
T17	20 - 15	0.070	47	0.0237	0.0007
T18	15 - 10	0.040	47	0.0173	0.0005
T19	10 - 0	0.019	47	0.0116	0.0003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.00	4' Dish	47	3.367	0.1861	0.0172	288096
150.00	DB563K-CT w/Mount Pipe	47	3.288	0.1854	0.0162	288096
145.00	QS66512-2_TIA w/ Mount Pipe	47	3.092	0.1834	0.0136	205782
140.00	4' Dish	47	2.897	0.1812	0.0116	98833
135.00	6' x 3" Dia Omni	47	2.705	0.1786	0.0101	70383
131.00	APXVSPP18-C-A20_TIA w/ Mount Pipe	47	2.554	0.1759	0.0089	487052
118.00	AIR 32 w/ Mount Pipe	47	2.081	0.1616	0.0062	73049
108.00	MX08FRO665-21 w/ Mount Pipe	47	1.744	0.1478	0.0049	42529
98.00	(3) JAHH-65B-R3B_TIA w/ Mount Pipe	47	1.434	0.1344	0.0040	38667
74.00	8' 4-Bay Dipole	47	0.813	0.1003	0.0022	35511
58.00	GPS_A	47	0.497	0.0764	0.0017	40138

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	152 - 140	12.967	19	0.7149	0.0664
T2	140 - 135	11.158	19	0.6986	0.0446
T3	135 - 130	10.417	19	0.6882	0.0389
T4	130 - 125	9.692	19	0.6750	0.0333
T5	125 - 120	8.969	19	0.6560	0.0293
T6	120 - 100	8.283	19	0.6331	0.0255
T7	100 - 93.3333	5.749	19	0.5276	0.0161
T8	93.3333 - 86.6667	5.008	19	0.4953	0.0141
T9	86.6667 - 80	4.308	19	0.4583	0.0121
T10	80 - 73.3333	3.666	19	0.4179	0.0102
T11	73.3333 - 66.6667	3.072	19	0.3826	0.0084
T12	66.6667 - 60	2.535	19	0.3449	0.0076
T13	60 - 50	2.049	19	0.3053	0.0068
T14	50 - 40	1.416	19	0.2484	0.0057
T15	40 - 30	0.930	19	0.1890	0.0047
T16	30 - 20	0.546	19	0.1404	0.0037
T17	20 - 15	0.271	19	0.0913	0.0025
T18	15 - 10	0.155	19	0.0667	0.0019
T19	10 - 0	0.073	19	0.0445	0.0012

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.00	4' Dish	19	12.967	0.7149	0.0664	89326
150.00	DB563K-CT w/Mount Pipe	19	12.665	0.7126	0.0623	89326
145.00	QS66512-2_TIA w/ Mount Pipe	19	11.909	0.7065	0.0526	63804
140.00	4' Dish	19	11.158	0.6986	0.0446	28442
135.00	6' x 3" Dia Omni	19	10.417	0.6882	0.0389	18451
131.00	APXVSPP18-C-A20_TIA w/ Mount Pipe	19	9.836	0.6781	0.0344	146021
118.00	AIR 32 w/ Mount Pipe	19	8.014	0.6231	0.0241	18896
108.00	MX08FRO665-21 w/ Mount Pipe	19	6.713	0.5695	0.0190	10997

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
98.00	(3) JAHH-65B-R3B_TIA w/ Mount Pipe	19	5.521	0.5179	0.0155	10004
74.00	8' 4-Bay Dipole	19	3.129	0.3861	0.0086	9198
58.00	GPS_A	19	1.912	0.2939	0.0066	10412

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	152	Diagonal	A325X	0.5000	1	1.60	3.13	0.513 ✔	1	Member Block Shear
T2	140	Leg	A325N	0.6250	4	1.61	20.71	0.078 ✔	1	Bolt Tension
		Diagonal	A325X	0.5000	1	1.56	4.69	0.333 ✔	1	Member Block Shear
T3	135	Diagonal	A325X	0.5000	1	2.01	4.69	0.428 ✔	1	Member Block Shear
T4	130	Diagonal	A325X	0.5000	1	2.78	6.25	0.444 ✔	1	Member Block Shear
T5	125	Diagonal	A325X	0.5000	1	2.65	6.25	0.424 ✔	1	Member Block Shear
T6	120	Leg	A325N	0.6250	4	9.43	20.71	0.455 ✔	1	Bolt Tension
		Diagonal	A325X	0.5000	1	4.65	8.27	0.562 ✔	1	Member Bearing
T7	100	Leg	A325N	0.7500	4	11.35	29.82	0.381 ✔	1	Bolt Tension
		Diagonal	A325X	0.5000	1	5.85	8.27	0.708 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.5000	2	0.52	7.95	0.066 ✔	1	Bolt Shear
T8	93.3333	Diagonal	A325X	0.5000	1	5.73	8.27	0.693 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.5000	2	0.62	7.95	0.077 ✔	1	Bolt Shear
T9	86.6667	Diagonal	A325X	0.5000	1	5.75	8.27	0.696 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.5000	2	0.71	7.95	0.089 ✔	1	Bolt Shear
T10	80	Leg	A325N	0.8750	4	18.47	40.59	0.455 ✔	1	Bolt Tension
		Diagonal	A325X	0.5000	1	5.75	8.27	0.696 ✔	1	Member Bearing
T11	73.3333	Diagonal	A325X	0.5000	1	6.15	9.72	0.633 ✔	1	Bolt Shear
		Secondary Horizontal	A325N	0.5000	2	0.88	7.95	0.111 ✔	1	Bolt Shear
T12	66.6667	Diagonal	A325X	0.5000	1	6.19	9.72	0.637 ✔	1	Bolt Shear
		Secondary Horizontal	A325N	0.5000	2	0.97	7.95	0.122 ✔	1	Bolt Shear
T13	60	Leg	A325N	0.8750	4	25.30	40.59	0.623 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	6.85	10.44	0.656 ✔	1	Member Bearing
T14	50	Diagonal	A325X	0.6250	1	6.88	13.05	0.527 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.5000	2	1.20	7.95	0.151 ✔	1	Bolt Shear
T15	40	Leg	A325N	1.0000	4	31.33	53.01	0.591 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	7.26	15.19	0.478 ✔	1	Bolt Shear
		Secondary Horizontal	A325N	0.5000	2	1.32	7.95	0.166 ✔	1	Bolt Shear
T16	30	Diagonal	A325X	0.6250	1	7.46	13.05	0.571 ✔	1	Member Bearing

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Horizontal	A325N	0.5000	2	1.43	7.95	0.180 ✔	1	Bolt Shear
T17	20	Leg	A325N	1.0000	4	36.72	53.01	0.693 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	7.06	10.44	0.677 ✔	1	Member Bearing
T18	15	Diagonal	A325X	0.6250	1	6.93	10.44	0.664 ✔	1	Member Bearing
		Horizontal	A325N	0.6250	1	3.12	7.83	0.398 ✔	1	Member Bearing
T19	10	Diagonal	A325X	0.6250	1	7.57	13.05	0.580 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	152 - 140	ROHN 2 STD	12.00	4.00	61.0 K=1.00	1.0745	-5.56	36.84	0.151 [1] ✔
T2	140 - 135	ROHN 2.5 STD	5.01	5.01	63.4 K=1.00	1.7040	-8.54	57.14	0.149 [1] ✔
T3	135 - 130	ROHN 2.5 STD	5.01	5.01	63.4 K=1.00	1.7040	-13.17	57.14	0.230 [1] ✔
T4	130 - 125	ROHN 2.5 STD	5.01	5.01	63.4 K=1.00	1.7040	-17.82	57.14	0.312 [1] ✔
T5	125 - 120	ROHN 2.5 STD	5.01	5.01	63.4 K=1.00	1.7040	-23.10	57.14	0.404 [1] ✔
T6	120 - 100	ROHN 2.5 X-STR	20.03	6.68	86.7 K=1.00	2.2535	-48.80	58.52	0.834 [1] ✔
T7	100 - 93.3333	ROHN 2.5XS w/ 1/3 HSS 3.5x.3	6.68	3.44	45.5 K=1.00	3.2588	-60.11	126.03	0.477 [1] ✔
T8	93.3333 - 86.6667	ROHN 2.5XS w/ 1/3 HSS 3.5x.3	6.68	3.44	45.4 K=1.00	3.2588	-70.96	126.10	0.563 [1] ✔
T9	86.6667 - 80	ROHN 2.5XS w/ 1/3 HSS 3.5x.3	6.68	3.43	45.4 K=1.00	3.2588	-81.53	126.16	0.646 [1] ✔
T10	80 - 73.3333	ROHN 3XS w/ 1/3 HSS4x.25	6.68	3.43	37.1 K=1.00	3.9977	-92.00	162.65	0.566 [1] ✔
T11	73.3333 - 66.6667	ROHN 3XS w/ 1/3 HSS4x.25	6.68	3.42	37.1 K=1.00	3.9977	-101.94	162.69	0.627 [1] ✔
T12	66.6667 - 60	ROHN 3XS w/ 1/3 HSS4x.25	6.68	3.42	37.0 K=1.00	3.9977	-111.82	162.73	0.687 [1] ✔
T13	60 - 50	ROHN 4 X-STR	10.02	5.17	42.0 K=1.00	4.4074	-123.92	174.29	0.711 [1] ✔
T14	50 - 40	ROHN 4 X-STR	10.02	5.16	42.0 K=1.00	4.4074	-138.05	174.38	0.792 [1] ✔
T15	40 - 30	ROHN 4XS w/ 1/3 HSS5x.25	10.02	5.16	43.1 K=1.00	5.6510	-152.24	222.03	0.686 [1] ✔
T16	30 - 20	ROHN 4XS w/ 1/3 HSS5x.25	10.02	2.50	20.9 K=1.00	5.6510	-165.21	246.29	0.671 [1] ✔
T17	20 - 15	ROHN 5STD w/ 1/3 HSS6x.25	5.01	2.50	16.7 K=1.00	5.8052	-178.51	255.97	0.697 [1] ✔
T18	15 - 10	ROHN 5STD w/ (3)	5.01	5.01	30.7	6.5499	-179.86	275.15	0.654 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T19	10 - 0	1.5x0.5 PL ROHN 5STD w/ (3) 1.5x0.5 PL	10.02	10.02	K=1.00 61.4 K=1.00	6.5499	-192.51	223.83	0.860 [1]

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	152 - 140	L1 1/2x1 1/2x1/8	7.68	3.62	146.8 K=1.00	0.3594	-1.65	3.77	0.437 [1]
T2	140 - 135	L1 1/2x1 1/2x3/16	8.45	4.13	168.9 K=1.00	0.5273	-1.59	4.18	0.380 [1]
T3	135 - 130	L1 1/2x1 1/2x3/16	8.86	4.33	177.2 K=1.00	0.5273	-2.10	3.79	0.553 [1]
T4	130 - 125	L1 1/2x1 1/2x1/4	9.28	4.54	186.6 K=1.00	0.6875	-2.85	4.46	0.638 [1]
T5	125 - 120	L1 1/2x1 1/2x1/4	9.70	4.75	195.3 K=1.00	0.6875	-2.59	4.07	0.636 [1]
T6	120 - 100	L2x2x1/4	12.21	6.06	185.9 K=1.00	0.9380	-4.78	6.13	0.780 [1]
T7	100 - 93.3333	L 2 1/2x 2 1/2x 1/4	12.78	6.35	155.1 K=1.00	1.1900	-5.98	11.18	0.535 [1]
T8	93.3333 - 86.6667	L 2 1/2x 2 1/2x 1/4	13.37	6.64	162.2 K=1.00	1.1900	-5.90	10.22	0.578 [1]
T9	86.6667 - 80	L 2 1/2x 2 1/2x 1/4	13.96	6.93	169.5 K=1.00	1.1900	-5.94	9.36	0.634 [1]
T10	80 - 73.3333	L 2 1/2x 2 1/2x 1/4	14.57	7.21	176.3 K=1.00	1.1900	-5.96	8.65	0.688 [1]
T11	73.3333 - 66.6667	L2 1/2x2 1/2x5/16	15.19	7.52	184.6 K=1.00	1.4600	-6.15	9.67	0.636 [1]
T12	66.6667 - 60	L2 1/2x2 1/2x5/16	15.82	7.84	192.4 K=1.00	1.4600	-6.19	8.91	0.695 [1]
T13	60 - 50	L3x3x1/4	18.19	9.05	183.5 K=1.00	1.4400	-7.04	9.66	0.729 [1]
T14	50 - 40	L3x3x5/16	19.04	9.47	193.0 K=1.00	1.7800	-7.28	10.80	0.675 [1]
T15	40 - 30	L3x3x3/8	19.91	9.92	202.8 K=1.00	2.1100	-7.26	11.59	0.626 [1]
T16	30 - 20	KL/R > 200 (C) - 189 L3x3x5/16	10.64	10.42	135.7 K=1.00	1.7800	-8.21	21.85	0.376 [1]
T17	20 - 15	L3 1/2x3 /12x1/4	10.64	10.13	115.7 K=1.04	1.6875	-6.95	27.02	0.257 [1]
T18	15 - 10	L3 1/2x3 /12x1/4	11.08	10.72	185.5 K=1.00	1.6875	-7.12	11.08	0.643 [1]
T19	10 - 0	L3 1/2x3 1/2x5/16	22.61	11.11	193.2 K=1.00	2.0900	-7.87	12.65	0.623 [1]

[1] $P_u / \phi P_n$ controls

Horizontal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T16	30 - 20	L3x3x1/4	18.25	8.94	189.2 K=1.00	1.4400	-2.87	9.09	0.315 [1] ✔
T18	15 - 10	L2 1/2x2 1/2x3/16	19.27	9.32	232.0 K=1.00	0.9020	-3.12	3.79	0.824 [1] ✔
		KL/R > 200 (C) - 252							

[1] $P_u / \phi P_n$ controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T7	100 - 93.3333	L2 1/2x2 1/2x1/4	10.89	10.32	145.2 K=0.90	1.1900	-1.04	12.75	0.082 [1] ✔
T8	93.3333 - 86.6667	L2 1/2x2 1/2x1/4	11.57	11.00	151.8 K=0.88	1.1900	-1.23	11.67	0.105 [1] ✔
T9	86.6667 - 80	L2 1/2x2 1/2x1/4	12.25	11.68	158.3 K=0.87	1.1900	-1.41	10.73	0.132 [1] ✔
T10	80 - 73.3333	L2 1/2x2 1/2x1/4	12.94	12.65	167.6 K=0.85	1.1900	-1.60	9.57	0.167 [1] ✔
T11	73.3333 - 66.6667	L2 1/2x2 1/2x1/4	13.64	13.02	171.1 K=0.84	1.1900	-1.77	9.18	0.193 [1] ✔
T12	66.6667 - 60	L2 1/2x2 1/2x1/4	14.34	13.72	177.8 K=0.83	1.1900	-1.94	8.50	0.228 [1] ✔
T13	60 - 50	L2 1/2x2 1/2x1/4	15.18	14.81	188.3 K=0.81	1.1900	-2.15	7.58	0.283 [1] ✔
T14	50 - 40	L 3x3x1/4	16.18	15.47	168.9 K=0.85	1.4375	-2.39	11.38	0.210 [1] ✔
T15	40 - 30	L 3x3x1/4	17.20	16.49	177.0 K=0.83	1.4375	-2.64	10.36	0.255 [1] ✔

[1] $P_u / \phi P_n$ controls

Top Girt Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	152 - 140	L2x2x1/8	6.52	6.32	163.6 K=0.86	0.4844	-0.08	4.09	0.021 [1] ✔
T2	140 - 135	L2x2x1/8	6.56	6.32	163.6 K=0.86	0.4844	-0.17	4.09	0.041 [1] ✔

[1] $P_u / \phi P_n$ controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T16	30 - 20	L2x2x1/4	4.56	4.38	134.3 K=1.00	0.9380	-2.87	11.75	0.244 [1] ✔
T17	20 - 15	L2x2x1/4	4.82	4.59	140.8 K=1.00	0.9380	-3.10	10.69	0.289 [1] ✔

[1] $P_u / \phi P_n$ controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T16	30 - 20	L2x2x1/4	5.32	5.10	156.6 K=1.00	0.9380	-1.67	8.64	0.193 [1] ✔
T17	20 - 15	L2x2x1/4	5.54	5.28	162.1 K=1.00	0.9380	-1.79	8.07	0.222 [1] ✔

[1] $P_u / \phi P_n$ controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	152 - 140	ROHN 2 STD	12.00	4.00	61.0	1.0745	3.98	48.35	0.082 [1] ✔
T2	140 - 135	ROHN 2.5 STD	5.01	5.01	63.4	1.7040	6.43	76.68	0.084 [1] ✔
T3	135 - 130	ROHN 2.5 STD	5.01	5.01	63.4	1.7040	9.21	76.68	0.120 [1] ✔
T4	130 - 125	ROHN 2.5 STD	5.01	5.01	63.4	1.7040	12.70	76.68	0.166 [1] ✔
T5	125 - 120	ROHN 2.5 STD	5.01	5.01	63.4	1.7040	17.43	76.68	0.227 [1] ✔
T6	120 - 100	ROHN 2.5 X-STR	20.03	6.68	86.7	2.2535	37.72	101.41	0.372 [1] ✔
T7	100 - 93.3333	ROHN 2.5XS w/ 1/3 HSS 3.5x.3	6.68	3.23	42.8	3.2588	46.58	146.65	0.318 [1] ✔
T8	93.3333 - 86.6667	ROHN 2.5XS w/ 1/3 HSS 3.5x.3	6.68	3.24	42.8	3.2588	55.36	146.65	0.378 [1] ✔
T9	86.6667 - 80	ROHN 2.5XS w/ 1/3 HSS 3.5x.3	6.68	3.25	42.9	3.2588	64.87	146.65	0.442 [1] ✔
T10	80 - 73.3333	ROHN 3XS w/ 1/3 HSS4x.25	6.68	3.25	35.2	3.9977	73.95	179.90	0.411 [1] ✔
T11	73.3333 - 66.6667	ROHN 3XS w/ 1/3 HSS4x.25	6.68	3.25	35.2	3.9977	82.54	179.90	0.459 [1] ✔
T12	66.6667 - 60	ROHN 3XS w/ 1/3 HSS4x.25	6.68	3.26	35.3	3.9977	91.10	179.90	0.506 [1] ✔
T13	60 - 50	ROHN 4 X-STR	10.02	4.84	39.4	4.4074	101.44	198.34	0.511 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T14	50 - 40	ROHN 4 X-STR	10.02	4.85	39.4	4.4074	113.64	198.34	0.573 [1]
T15	40 - 30	ROHN 4XS w/ 1/3 HSS5x.25	10.02	4.86	40.6	5.6510	125.49	254.29	0.493 [1]
T16	30 - 20	ROHN 4XS w/ 1/3 HSS5x.25	10.02	2.50	20.9	5.6510	136.13	254.29	0.535 [1]
T17	20 - 15	ROHN 5STD w/ 1/3 HSS6x.25	5.01	2.50	16.7	5.8052	147.12	261.23	0.563 [1]
T18	15 - 10	ROHN 5STD w/ (3) 1.5x0.5 PL	5.01	5.01	30.7	6.5499	147.83	294.75	0.502 [1]
T19	10 - 0	ROHN 5STD w/ (3) 1.5x0.5 PL	10.02	10.02	61.4	6.5499	158.43	294.75	0.537 [1]

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	152 - 140	L1 1/2x1 1/2x1/8	7.68	3.62	96.2	0.2109	1.60	9.18	0.175 [1]
T2	140 - 135	L1 1/2x1 1/2x3/16	8.45	4.13	111.2	0.3076	1.56	13.38	0.117 [1]
T3	135 - 130	L1 1/2x1 1/2x3/16	8.86	4.33	116.6	0.3076	2.01	13.38	0.150 [1]
T4	130 - 125	L1 1/2x1 1/2x1/4	9.28	4.54	124.2	0.3984	2.78	17.33	0.160 [1]
T5	125 - 120	L1 1/2x1 1/2x1/4	9.70	4.75	129.8	0.3984	2.65	17.33	0.153 [1]
T6	120 - 100	L2x2x1/4	12.21	6.06	121.4	0.5863	4.65	25.50	0.182 [1]
T7	100 - 93.3333	L 2 1/2x 2 1/2x 1/4	12.78	6.35	100.7	0.7753	5.85	33.73	0.174 [1]
T8	93.3333 - 86.6667	L 2 1/2x 2 1/2x 1/4	13.37	6.64	105.3	0.7753	5.73	33.73	0.170 [1]
T9	86.6667 - 80	L 2 1/2x 2 1/2x 1/4	13.96	6.93	109.9	0.7753	5.75	33.73	0.171 [1]
T10	80 - 73.3333	L 2 1/2x 2 1/2x 1/4	14.57	7.21	114.2	0.7753	5.75	33.73	0.171 [1]
T11	73.3333 - 66.6667	L2 1/2x2 1/2x5/16	15.19	7.52	120.3	0.9485	5.88	41.26	0.143 [1]
T12	66.6667 - 60	L2 1/2x2 1/2x5/16	15.82	7.84	125.3	0.9485	5.97	41.26	0.145 [1]
T13	60 - 50	L3x3x1/4	18.19	9.05	118.4	0.9394	6.85	40.86	0.168 [1]
T14	50 - 40	L3x3x5/16	19.04	9.47	124.8	1.1592	6.88	50.43	0.136 [1]
T15	40 - 30	L3x3x3/8	19.91	9.92	131.9	1.3716	6.95	59.66	0.117 [1]
T16	30 - 20	L3x3x5/16	10.64	10.42	135.7	1.1592	7.46	50.43	0.148 [1]
T17	20 - 15	L3 1/2x3 /12x1/4	10.64	10.13	114.1	1.1250	7.06	48.94	0.144 [1]
T18	15 - 10	L3 1/2x3 /12x1/4	11.08	10.72	117.9	1.1250	6.93	48.94	0.142 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T19	10 - 0	L3 1/2x3 1/2x5/16	22.61	11.11	124.8	1.3917	7.57	60.54	0.125 [1]

[1] $P_u / \phi P_n$ controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T16	30 - 20	L3x3x1/4	18.25	8.94	173.0	0.9628	2.87	41.88	0.068 [1]
T18	15 - 10	L2 1/2x2 1/2x3/16	19.27	9.32	217.5	0.5710	3.12	24.84	0.126 [1]

[1] $P_u / \phi P_n$ controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	100 - 93.3333	L2 1/2x2 1/2x1/4	10.89	10.32	166.2	0.7753	1.04	33.73	0.031 [1]
T8	93.3333 - 86.6667	L2 1/2x2 1/2x1/4	11.57	11.00	176.9	0.7753	1.23	33.73	0.036 [1]
T9	86.6667 - 80	L2 1/2x2 1/2x1/4	12.25	11.68	187.5	0.7753	1.41	33.73	0.042 [1]
T10	80 - 73.3333	L2 1/2x2 1/2x1/4	12.94	12.65	197.4	1.1900	1.60	38.56	0.041 [1]
T11	73.3333 - 66.6667	L2 1/2x2 1/2x1/4	13.64	13.02	208.3	0.7753	1.77	33.73	0.052 [1]
T12	66.6667 - 60	L2 1/2x2 1/2x1/4	14.34	13.72	219.2	0.7753	1.94	33.73	0.058 [1]
T13	60 - 50	L2 1/2x2 1/2x1/4	15.18	14.81	231.1	1.1900	2.15	38.56	0.056 [1]
T14	50 - 40	L 3x3x1/4	16.18	15.47	203.9	0.9609	2.39	41.80	0.057 [1]
T15	40 - 30	L 3x3x1/4	17.20	16.49	217.0	0.9609	2.64	41.80	0.063 [1]

[1] $P_u / \phi P_n$ controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	152 - 140	L2x2x1/8	6.52	6.32	121.2	0.4844	0.10	15.69	0.006 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	140 - 135	L2x2x1/8	6.56	6.32	121.2	0.4844	0.15	15.69	0.010 [1]

[1] $P_u / \phi P_n$ controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T16	30 - 20	L2x2x1/4	4.56	4.38	86.2	0.9380	2.87	30.39	0.094 [1]
T17	20 - 15	L2x2x1/4	4.82	4.59	90.4	0.9380	3.10	30.39	0.102 [1]

[1] $P_u / \phi P_n$ controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T16	30 - 20	L2x2x1/4	5.32	5.10	100.5	0.9380	1.67	30.39	0.055 [1]
T17	20 - 15	L2x2x1/4	5.54	5.28	104.1	0.9380	1.79	30.39	0.059 [1]

[1] $P_u / \phi P_n$ controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	152 - 140	Leg	ROHN 2 STD	1	-5.56	36.84	15.1	Pass
T2	140 - 135	Leg	ROHN 2.5 STD	25	-8.54	57.14	14.9	Pass
T3	135 - 130	Leg	ROHN 2.5 STD	37	-13.17	57.14	23.0	Pass
T4	130 - 125	Leg	ROHN 2.5 STD	46	-17.82	57.14	31.2	Pass
T5	125 - 120	Leg	ROHN 2.5 STD	55	-23.10	57.14	40.4	Pass
T6	120 - 100	Leg	ROHN 2.5 X-STR	64	-48.80	58.52	83.4	Pass
T7	100 - 93.3333	Leg	ROHN 2.5XS w/ 1/3 HSS 3.5x.3	85	-60.11	126.03	47.7	Pass
T8	93.3333 - 86.6667	Leg	ROHN 2.5XS w/ 1/3 HSS 3.5x.3	97	-70.96	126.10	56.3	Pass
T9	86.6667 - 80	Leg	ROHN 2.5XS w/ 1/3 HSS 3.5x.3	109	-81.53	126.16	64.6	Pass
T10	80 - 73.3333	Leg	ROHN 3XS w/ 1/3 HSS4x.25	121	-92.00	162.65	56.6	Pass
T11	73.3333 - 66.6667	Leg	ROHN 3XS w/ 1/3 HSS4x.25	133	-101.94	162.69	62.7	Pass
T12	66.6667 - 60	Leg	ROHN 3XS w/ 1/3 HSS4x.25	145	-111.82	162.73	68.7	Pass
T13	60 - 50	Leg	ROHN 4 X-STR	157	-123.92	174.29	71.1	Pass
T14	50 - 40	Leg	ROHN 4 X-STR	169	-138.05	174.38	79.2	Pass
T15	40 - 30	Leg	ROHN 4XS w/ 1/3 HSS5x.25	181	-152.24	222.03	68.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T16	30 - 20	Leg	ROHN 4XS w/ 1/3 HSS5x.25	193	-165.21	246.29	67.1	Pass
T17	20 - 15	Leg	ROHN 5STD w/ 1/3 HSS6x.25	235	-178.51	255.97	69.7	Pass
T18	15 - 10	Leg	ROHN 5STD w/ (3) 1.5x0.5 PL	259	-179.86	275.15	65.4	Pass
T19	10 - 0	Leg	ROHN 5STD w/ (3) 1.5x0.5 PL	268	-192.51	223.83	86.0	Pass
T1	152 - 140	Diagonal	L1 1/2x1 1/2x1/8	11	-1.65	3.77	43.7 51.3 (b)	Pass
T2	140 - 135	Diagonal	L1 1/2x1 1/2x3/16	36	-1.59	4.18	38.0	Pass
T3	135 - 130	Diagonal	L1 1/2x1 1/2x3/16	45	-2.10	3.79	55.3	Pass
T4	130 - 125	Diagonal	L1 1/2x1 1/2x1/4	54	-2.85	4.46	63.8	Pass
T5	125 - 120	Diagonal	L1 1/2x1 1/2x1/4	63	-2.59	4.07	63.6	Pass
T6	120 - 100	Diagonal	L2x2x1/4	72	-4.78	6.13	78.0	Pass
T7	100 - 93.3333	Diagonal	L 2 1/2x 2 1/2x 1/4	93	-5.98	11.18	53.5 70.8 (b)	Pass
T8	93.3333 - 86.6667	Diagonal	L 2 1/2x 2 1/2x 1/4	105	-5.90	10.22	57.8 69.3 (b)	Pass
T9	86.6667 - 80	Diagonal	L 2 1/2x 2 1/2x 1/4	117	-5.94	9.36	63.4 69.6 (b)	Pass
T10	80 - 73.3333	Diagonal	L 2 1/2x 2 1/2x 1/4	129	-5.96	8.65	68.8 69.6 (b)	Pass
T11	73.3333 - 66.6667	Diagonal	L2 1/2x2 1/2x5/16	141	-6.15	9.67	63.6	Pass
T12	66.6667 - 60	Diagonal	L2 1/2x2 1/2x5/16	153	-6.19	8.91	69.5	Pass
T13	60 - 50	Diagonal	L3x3x1/4	165	-7.04	9.66	72.9	Pass
T14	50 - 40	Diagonal	L3x3x5/16	177	-7.28	10.80	67.5	Pass
T15	40 - 30	Diagonal	L3x3x3/8	189	-7.26	11.59	62.6	Pass
T16	30 - 20	Diagonal	L3x3x5/16	197	-8.21	21.85	37.6 57.1 (b)	Pass
T17	20 - 15	Diagonal	L3 1/2x3 /12x1/4	253	-6.95	27.02	25.7 67.7 (b)	Pass
T18	15 - 10	Diagonal	L3 1/2x3 /12x1/4	267	-7.12	11.08	64.3 66.4 (b)	Pass
T19	10 - 0	Diagonal	L3 1/2x3 1/2x5/16	271	-7.87	12.65	62.3	Pass
T16	30 - 20	Horizontal	L3x3x1/4	210	-2.87	9.09	31.5	Pass
T18	15 - 10	Horizontal	L2 1/2x2 1/2x3/16	252	-3.12	3.79	82.4	Pass
T7	100 - 93.3333	Secondary Horizontal	L2 1/2x2 1/2x1/4	96	-1.04	12.75	8.2	Pass
T8	93.3333 - 86.6667	Secondary Horizontal	L2 1/2x2 1/2x1/4	108	-1.23	11.67	10.5	Pass
T9	86.6667 - 80	Secondary Horizontal	L2 1/2x2 1/2x1/4	120	-1.41	10.73	13.2	Pass
T10	80 - 73.3333	Secondary Horizontal	L2 1/2x2 1/2x1/4	132	-1.60	9.57	16.7	Pass
T11	73.3333 - 66.6667	Secondary Horizontal	L2 1/2x2 1/2x1/4	144	-1.77	9.18	19.3	Pass
T12	66.6667 - 60	Secondary Horizontal	L2 1/2x2 1/2x1/4	156	-1.94	8.50	22.8	Pass
T13	60 - 50	Secondary Horizontal	L2 1/2x2 1/2x1/4	168	-2.15	7.58	28.3	Pass
T14	50 - 40	Secondary Horizontal	L 3x3x1/4	180	-2.39	11.38	21.0	Pass
T15	40 - 30	Secondary Horizontal	L 3x3x1/4	192	-2.64	10.36	25.5	Pass
T1	152 - 140	Top Girt	L2x2x1/8	5	-0.08	4.09	2.1	Pass
T2	140 - 135	Top Girt	L2x2x1/8	29	-0.17	4.09	4.1	Pass
T16	30 - 20	Redund Horz 1 Bracing	L2x2x1/4	198	-2.87	11.75	24.4	Pass
T17	20 - 15	Redund Horz 1 Bracing	L2x2x1/4	240	-3.10	10.69	28.9	Pass
T16	30 - 20	Redund Diag 1 Bracing	L2x2x1/4	219	-1.67	8.64	19.3	Pass
T17	20 - 15	Redund Diag 1 Bracing	L2x2x1/4	258	-1.79	8.07	22.2	Pass
							Summary	
						Leg (T19)	86.0	Pass
						Diagonal (T6)	78.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
						Horizontal (T18)	82.4	Pass
						Secondary Horizontal (T13)	28.3	Pass
						Top Girt (T2)	4.1	Pass
						Redund Horz 1 Bracing (T17)	28.9	Pass
						Redund Diag 1 Bracing (T17)	22.2	Pass
						Bolt Checks	70.8	Pass
						RATING =	**86.0**	**Pass**

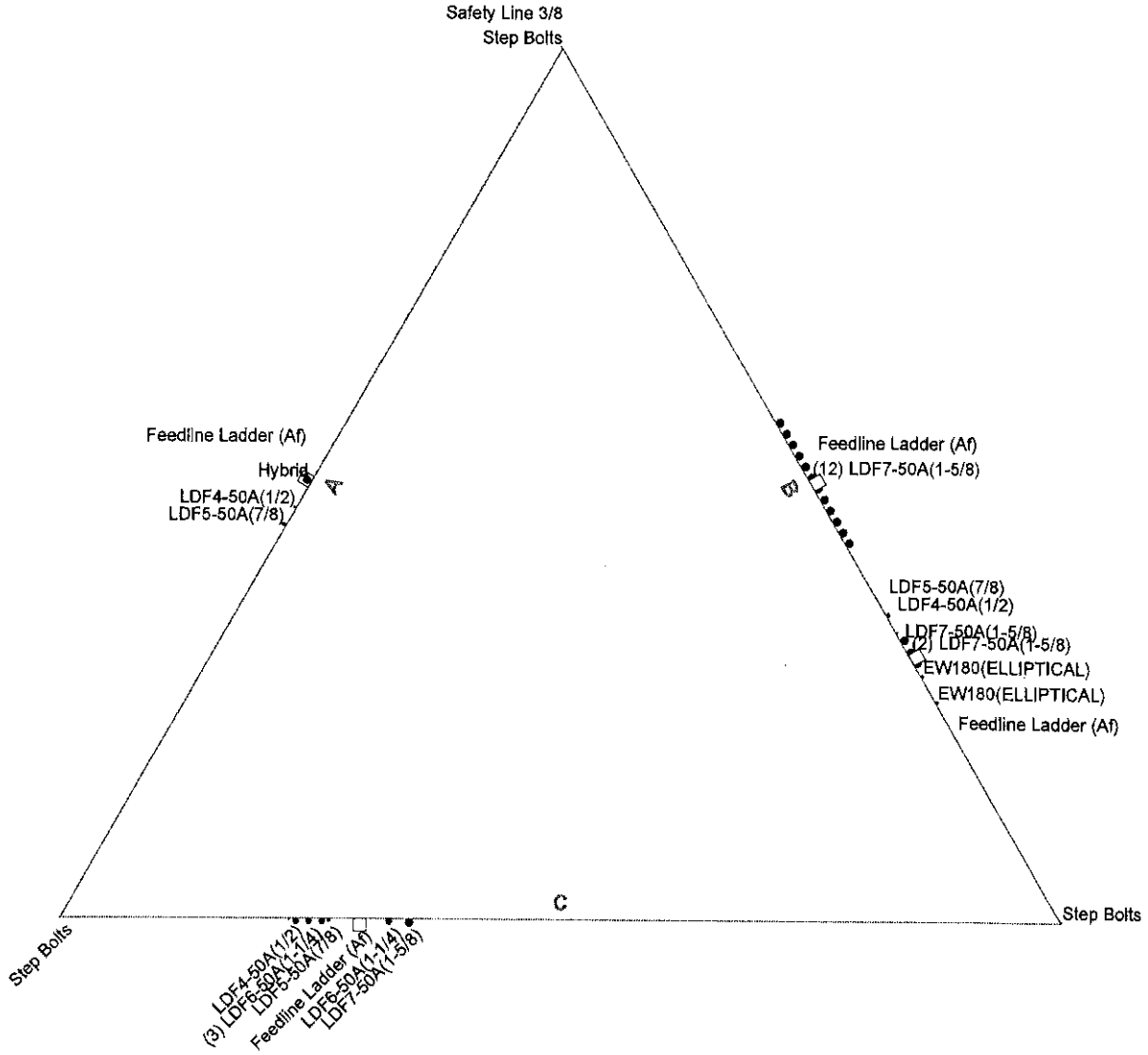
***NOTE: Above stress ratios for reinforced sections are approximate. More exact calculations are presented in Appendix C.**

APPENDIX B

BASE LEVEL DRAWING

Feed Line Plan

_____ Round _____ Flat _____ App In Face _____ App Out Face



Tectonic	*Tectonic* 1279 Route 300 Newburgh, NY 12550 Phone: (845) 567-6656 FAX: (845) 567-8703	Job: ***152' Self-Support Tower***	
		Project: ***10710.NJJER01110A***	
		Client: DISH	Drawn by: Ian Marinaccio / App'd:
		Code: TIA-222-G	Date: 09/03/21 / Scale: NTS
		Path:	Dwg No. E-7

APPENDIX C

ADDITIONAL CALCULATIONS

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Job No.:	10710.NJJER0110A		
Sheet No.:	1	of	4
Calculated By:	IM	Date :	09/01/21
Checked By:	JJ	Date :	09/01/21

Reinforcement Capacity Check - LRFD (AISC 14th Edition)

Section:	0'-15'	5STD w/ (3) 1.5x0.5 PL

Leg Pipe

E=	29000	ksi	D_p/t_p =	21.55	
F_y =	50	ksi	0.114 E/F_y =	66.12	
F_U =	65	ksi	$D_p/t_p \le 0.114\ E/F_y$		
A_p =	4.3000	in^2	F'_y =	50	ksi
D_p =	5.560	in	KL/r =	63.83	
t_p =	0.258	in	λ_c =	0.84	
$r_x = r_y$	1.8800	in	F_{cr} =	37.12	ksi
L_p =	120	in	Section Capacity =	143.65	kips
K =	1				

Flat Plates

F_y =	50	ksi	D_{sp}/t_{sp} =	3.00	
A_{sp} =	2.2500	in^2	0.114 E/F_y =	66.12	
D_{sp} =	1.500	in	$D_{sp}/t_{sp} \le 0.114\ E/F_y$		
t_{sp} =	0.500	in	F'_y =	50	ksi
r_x =	3.5579	in	KL/r =	33.26	
r_y =	0.1443	in	λ_c =	0.44	
Spacing =	6	in	F_{cr} =	46.11	ksi
Int. Conn. =	Welded		Section Capacity =	93.38	kips
K =	0.8	Stitch Welded			

Modified Section

A_c =	6.5500	in^2	F'_y =	50	ksi
r_x =	2.1196	in	KL/r =	63.5552607	
r_y =	2.1196	in	λ_c =	0.84	
L_c =	120	in	F_{cr} =	37.21	ksi
KL/r =	Modified		Section Capacity =	219.38	kips
Leg Crushing =	No				
K =	1				

Connection

Welded			Weld Capacity		
Length	12	in	Fw =	42	ksi
Weld Size	0.1875	in	Aw =	3.5	in^2
F_{EXX}	70	ksi	Phi * Rn =	110.1	kips

Max Load per TNX (Compression)

With wind and Reinf. =	192.51	kips
Force in Leg =	126.38	kips
Force in Reinf. =	66.13	kips

Capacity

Spacing Required =	OK		
Existing Leg (Pipe) =	143.65	kips	88.0%
Reinforcing Half Pipe =	93.38	kips	70.8%
Modified Section =	219.38	kips	87.8%
Leg Crushing =	N/A	kips	N/A
Weld =	110.1	kips	60.1%

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Job No.:	10710.NJJER0110A		
Sheet No.:	1	of	4
Calculated By:	IM	Date :	09/01/21
Checked By:	JJ	Date :	09/01/21

Reinforcement Capacity Check - LRFD (AISC 14th Edition)

Section:	15'-20'	5STD w/ 1/3 HSS6x.25

Leg Pipe

E=	29000	ksi	D_p/t_p =	21.55	
F_y =	50	ksi	0.114 E/F_y =	66.12	
F_U =	65	ksi	$D_p/t_p \le 0.114\ E/F_y$		
A_p =	4.3000	in^2	F'_y =	50	ksi
D_p =	5.560	in	KL/r =	15.96	
t_p =	0.258	in	λ_c =	0.21	
$r_x = r_y$	1.8800	in	F_{cr} =	49.08	ksi
L_p =	30	in	Section Capacity =	189.93	kips
K =	1				

120 Deg. Split Pipe

F_y =	50	ksi	D_{sp}/t_{sp} =	24.00	
A_{sp} =	1.5053	in^2	0.114 E/F_y =	66.12	
D_{sp} =	6.000	in	$D_{sp}/t_{sp} \le 0.114\ E/F_y$		
t_{sp} =	0.250	in	F'_y =	50	ksi
r_x =	2.4192	in	KL/r =	11.55	
r_y =	1.5584	in	λ_c =	0.15	
Spacing =	18	in	F_{cr} =	49.51	ksi
Int. Conn. =	Bolted		Section Capacity =	67.08	kips
K =	1	U-Bolted			

Modified Section

A_c =	5.8053	in^2	F'_y =	50	ksi
r_x =	2.0323	in	KL/r =	20.2747128	
r_y =	1.8004	in	λ_c =	0.27	
L_c =	30	in	F_{cr} =	48.52	ksi
KL/r =	Modified		Section Capacity =	253.50	kips
Leg Crushing =	Yes				
K =	1				

Connection

Welded			Weld Capacity		
Length	6	in	Fw =	42	ksi
Weld Size	0.1875	in	Aw =	1.6	in^2
F_{EXX}	70	ksi	Phi * Rn =	50.1	kips

Max Load per TNX (Compression)

With wind and Reinf. =	178.51	kips
Force in Leg =	132.22	kips
Force in Reinf. =	46.29	kips

Capacity

Spacing Required =	OK		
Existing Leg (Pipe) =	189.93	kips	69.6%
Reinforcing Half Pipe =	50.12	kips	92.4%
Modified Section =	253.50	kips	70.4%
Leg Crushing =	193.50	kips	92.3%
Weld =	50.1	kips	92.4%

Tectonic

PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Job No.:	10710.NJJER0110A		
Sheet No.:	1	of	4
Calculated By:	IM	Date :	09/01/21
Checked By:	JJ	Date :	09/01/21

Reinforcement Capacity Check - LRFD (AISC 14th Edition)

Section: 20'-40' — **4XS w/ 1/3 HSS5x.25**

Leg Pipe

E=	29000	ksi	D_p/t_p =	13.35	
F_y =	50	ksi	0.114 E/F_y =	66.12	
F_U =	65	ksi	$D_p/t_p \le 0.114\ E/F_y$		
A_p =	4.4074	in^2	F'_y =	50	ksi
D_p =	4.500	in	KL/r =	40.54	
t_p =	0.337	in	λ_c =	0.54	
$r_x = r_y$	1.4800	in	F_{cr} =	44.34	ksi
L_p =	60	in	Section Capacity =	175.88	kips
K =	1				

120 Deg. Split Pipe

F_y =	50	ksi	D_{sp}/t_{sp} =	20.00	
A_{sp} =	1.2435	in^2	0.114 E/F_y =	66.12	
D_{sp} =	5.000	in	$D_{sp}/t_{sp} \le 0.114\ E/F_y$		
t_{sp} =	0.250	in	F'_y =	50	ksi
r_x =	1.9994	in	KL/r =	13.98	
r_y =	1.2879	in	λ_c =	0.18	
Spacing =	18	in	F_{cr} =	49.29	ksi
Int. Conn. =	Bolted		Section Capacity =	55.16	kips
K =	1	U-Bolted			

Modified Section

A_c =	5.6509	in^2	F'_y =	50	ksi
r_x =	1.6064	in	KL/r =	44.0224395	
r_y =	1.4373	in	λ_c =	0.58	
L_c =	60	in	F_{cr} =	43.39	ksi
KL/r =	Modified		Section Capacity =	220.69	kips
Leg Crushing =	Yes				
K =	1				

Connection

Welded			Weld Capacity		
Length	6	in	Fw =	42	ksi
Weld Size	0.1875	in	Aw =	1.6	in^2
F_{EXX}	70	ksi	Phi * Rn =	50.1	kips

Max Load per TNX (Compression)

With wind and Reinf. =	165.21	kips
Force in Leg =	128.85	kips
Force in Reinf. =	36.36	kips

Capacity

Spacing Required =	OK		
Existing Leg (Pipe) =	175.88	kips	73.3%
Reinforcing Half Pipe =	50.12	kips	72.5%
Modified Section =	220.69	kips	74.9%
Leg Crushing =	198.33	kips	83.3%
Weld =	50.1	kips	72.5%

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Job No.:	10710.NJJER0110A		
Sheet No.:	1	of	4
Calculated By:	IM	Date :	09/01/21
Checked By:	JJ	Date :	09/01/21

Reinforcement Capacity Check - LRFD (AISC 14th Edition)

Section:	60'-80'	3XS w/ 1/3 HSS4x.25

Leg Pipe

E=	29000	ksi	D_p/t_p =	11.67	
F_y =	50	ksi	0.114 E/F_y =	66.12	
F_U =	65	ksi	$D_p/t_p \le 0.114\ E/F_y$		
A_p =	3.0159	in^2	F'_y =	50	ksi
D_p =	3.500	in	KL/r =	36.00	
t_p =	0.300	in	λ_c =	0.48	
$r_x = r_y$	1.1400	in	F_{cr} =	45.48	ksi
L_p =	41.04	in	Section Capacity =	123.45	kips
K =	1				

120 Deg. Split Pipe

F_y =	50	ksi	D_{sp}/t_{sp} =	16.00	
A_{sp} =	0.9817	in^2	0.114 E/F_y =	66.12	
D_{sp} =	4.000	in	$D_{sp}/t_{sp} \le 0.114\ E/F_y$		
t_{sp} =	0.250	in	F'_y =	50	ksi
r_x =	1.5798	in	KL/r =	17.69	
r_y =	1.0176	in	λ_c =	0.23	
Spacing =	18	in	F_{cr} =	48.87	ksi
Int. Conn. =	Bolted		Section Capacity =	43.18	kips
K =	1	U-Bolted			

Modified Section

A_c =	3.9976	in^2	F'_y =	50	ksi
r_x =	1.2598	in	KL/r =	41.034614	
r_y =	1.1084	in	λ_c =	0.54	
L_c =	41.04	in	F_{cr} =	44.21	ksi
KL/r =	Modified		Section Capacity =	159.05	kips
Leg Crushing =	Yes				
K =	1				

Connection

Welded			Weld Capacity		
Length	6	in	Fw =	42	ksi
Weld Size	0.1875	in	Aw =	1.6	in^2
F_{EXX}	70	ksi	Phi * Rn =	50.1	kips

Max Load per TNX (Compression)

With wind and Reinf. =	123.92	kips
Force in Leg =	93.49	kips
Force in Reinf. =	30.43	kips

Capacity

Spacing Required =		OK	
Existing Leg (Pipe) =	123.45	kips	75.7%
Reinforcing Half Pipe =	43.18	kips	70.5%
Modified Section =	159.05	kips	77.9%
Leg Crushing =	135.72	kips	91.3%
Weld =	50.1	kips	60.7%

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Job No.:	10710.NJJER0110A		
Sheet No.:	1	of	4
Calculated By:	IM	Date :	09/01/21
Checked By:	JJ	Date :	09/01/21

Reinforcement Capacity Check - LRFD (AISC 14th Edition)

Section: 80'-100' — 2.5XS w/ 1/3 HSS 3.5x.3

Leg Pipe

E=	29000	ksi	D_p/t_p =	10.76		
F_y =	50	ksi	0.114 E/F_y =	66.12		
F_U =	65	ksi	$D_p/t_p \le 0.114\ E/F_y$			
A_p =	2.2535	in^2	F'_y =	50	ksi	
D_p =	2.873	in	KL/r =	44.26		
t_p =	0.267	in	λ_c =	0.58		
$r_x = r_y$	0.9300	in	F_{cr} =	43.33	ksi	
L_p =	41.16	in	Section Capacity =	87.88	kips	
K =	1					

120 Deg. Split Pipe

F_y =	50	ksi	D_{sp}/t_{sp} =	11.67		
A_{sp} =	1.0053	in^2	0.114 E/F_y =	66.12		
D_{sp} =	3.500	in	$D_{sp}/t_{sp} \le 0.114\ E/F_y$			
t_{sp} =	0.300	in	F'_y =	50	ksi	
r_x =	1.3387	in	KL/r =	20.68		
r_y =	0.8702	in	λ_c =	0.27		
Spacing =	18	in	F_{cr} =	48.46	ksi	
Int. Conn. =	Bolted		Section Capacity =	43.85	kips	
K =	1	U-Bolted				

Modified Section

A_c =	3.2588	in^2	F'_y =	50	ksi	
r_x =	0.5541	in	KL/r =	77.1088373		
r_y =	0.6534	in	λ_c =	1.02		
L_c =	41.16	in	F_{cr} =	32.37	ksi	
KL/r =	Modified		Section Capacity =	94.94	kips	
Leg Crushing =	Yes					
K =	1					

Connection

Welded			Weld Capacity		
Length	6	in	Fw =	42	ksi
Weld Size	0.1875	in	Aw =	1.6	in^2
F_{EXX}	70	ksi	Phi * Rn =	50.1	kips

Max Load per TNX (Compression)

With wind and Reinf. =	81.53	kips
Force in Leg =	56.38	kips
Force in Reinf. =	25.15	kips

Capacity

Spacing Required =	OK		
Existing Leg (Pipe) =	87.88	kips	64.2%
Reinforcing Half Pipe =	43.85	kips	57.4%
Modified Section =	94.94	kips	85.9%
Leg Crushing =	101.41	kips	80.4%
Weld =	50.1	kips	50.2%

Self Support Anchor Rod Capacity

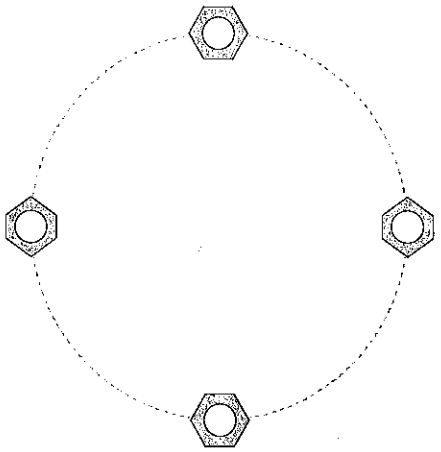
Site Info	
WO #	10710.NJER01110A
Site ID	NJER01110A

Analysis Considerations	
TIA-222 Revision	G
Grout Considered:	Yes
Eta Factor, η	0.55

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	199.00	164.00
Shear Force (kips)	24.00	20.00

Considered Eccentricity	
Leg Mod Eccentricity (in)	0.000
Anchor Rod N.A Shift (in)	0.000
Total Eccentricity (in)	0.000

**Anchor Rod Eccentricity Applied*



Connection Properties

Anchor Rod Data

(4) 1" ø bolts (F1554-105 N; Fy=105 ksi, Fu=125 ksi)

l_{ar} (in): 0

Analysis Results

Anchor Rod Summary		*(units of kips, kip-in)*
Pu_t = 41	ϕPn_t = 60.6	**Stress Rating**
Vu = 5	ϕVn = n/a	**82.7%**
Mu = n/a	ϕMn = n/a	Pass

Drilled Pier Foundation

WO # :	10710:NJJER01110A
Site Name:	NJJER01110A
TIA-222 Revison:	G
Tower Type:	Self Support

Applied Loads	Comp.	Uplift
Moment (kip-ft)	0	0
Axial Force (kips)	199	164
Shear Force (kips)	24	20

Material Properties		
Concrete Strength, f'c:	3	ksi
Rebar Strength, Fy:	60	ksi
Tie Yield Strength, Fyt:	40	ksi

Pier Design Data		
Depth	21	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 21' below grade		
Pier Diameter	4.5	ft
Rebar Quantity	15	
Rebar Size	8	
Clear Cover to Ties	3	in
Tie Size	4	
Tie Spacing	12	in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
D_{req} (ft from TOC)	11.69	11.69
Soil Safety Factor	10.15	12.18
Max Moment (kip-ft)	215.00	179.17
Rating	*13.1%*	*10.9%*
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	139.11	139.11
End Bearing (kips)	119.28	-
Weight of Concrete (kips)	46.06	34.54
Total Capacity (kips)	258.39	173.65
Axial (kips)	245.06	164.00
Rating	*94.8%*	*94.4%*
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	11.96	11.13
Critical Moment (kip-ft)	214.80	178.47
Critical Moment Capacity	1412.26	1033.44
Rating	*15.2%*	*17.3%*
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	17.51	17.51
Critical Shear (kip)	46.59	38.82
Critical Shear Capacity	341.14	199.52
Rating	*13.7%*	*19.5%*

Soil Interaction Rating	**94.8%**
Structural Foundation Rating	**19.5%**

Soil Profile

Groundwater Depth	8	# of Layers	4

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{wet} (pcf)	$\gamma_{saturated}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	5	5	120	150		0	0.000	0.000					Cohesionless
2	5	8	3	120	150		30	0.000	0.000	0.82	0.82			Cohesionless
3	8	13.5	5.5	120	87.6		30	0.000	0.000	0.82	0.82			Cohesionless
4	13.5	21	7.5	120	87.6		36	0.000	0.000	0.82	0.82	10		Cohesionless

CONNECTICUT DESIGN CRITERIA - STATE

Revison:

CT is NOT a Home Rule State; Tab added only for Design Criteria

(APPENDIX N) MUNICIPALITY - SPECIFIC STRUCTURAL DESIGN PARAMETERS

Municipality	Ground Snow Load	MCE Spectral Accelerations (%g)		*Wind Design Parameters* Ultimate Design Wind Speeds, V_{ult} (mph)			Nominal Design Wind Speeds, V_{asd} (mph)		
		S_s	S_1	Risk Cat.I	Risk Cat.II	Risk Cat III-IV	Risk Cat. I	Risk Cat. II	Risk Cat. III-IV
Salisbury	40	0.173	0.065	105	115	120	81	89	93
Scotland	30	0.172	0.061	120	130	140	93	101	108
Seymour	30	0.194	0.064	115	125	135	89	97	105
Sharon	40	0.179	0.065	105	115	120	81	89	93
Shelton	30	0.199	0.064	115	125	135	89	97	105
Sherman	35	0.202	0.066	105	115	120	81	89	93
Simsbury	35	0.179	0.064	110	120	130	85	93	101
Somers	35	0.174	0.064	115	125	135	89	97	105
Southbury	35	0.198	0.065	110	120	130	85	93	101
Southington	30	0.185	0.064	115	125	135	89	97	105
South Windsor	30	0.178	0.064	115	125	135	89	97	105
Sprague	30	0.171	0.061	120	130	140	93	101	108
Stafford	35	0.173	0.064	115	125	135	89	97	105
Stamford	30	0.249	0.069	110	120	130	85	93	101
Sterling	35	0.170	0.061	125	135	145	97	105	112
Stonington	30	0.159	0.058	125	140	150	97	108	116
Stratford	30	0.201	0.064	115	125	135	89	97	105
Suffield	35	0.176	0.065	110	120	130	85	93	101
Thomaston	35	0.186	0.064	110	120	130	85	93	101
Thompson	40	0.172	0.063	120	130	140	93	101	108
Tolland	35	0.175	0.064	115	125	135	89	97	105
Torrington	40	0.182	0.065	110	120	125	85	93	97
Trumbull	30	0.207	0.065	115	125	135	89	97	105
Union	40	0.172	0.064	115	125	135	89	97	105
Vernon	30	0.177	0.064	115	125	135	89	97	105
Voluntown	30	0.168	0.060	125	135	145	97	105	112
Wallingford	30	0.183	0.063	115	125	135	89	97	105
Warren	40	0.186	0.065	105	115	125	81	89	97
Washington	35	0.192	0.065	105	120	125	81	93	97
Waterbury	35	0.189	0.064	110	125	130	85	97	101
Waterford	30	0.161	0.058	125	135	145	97	105	112
Watertown	35	0.189	0.064	110	120	130	85	93	101
Westbrook	30	0.167	0.059	120	135	145	93	105	112
West Hartford	30	0.181	0.064	115	125	135	89	97	105
West Haven	30	0.188	0.062	115	125	135	89	97	105
Weston	30	0.224	0.067	110	120	130	85	93	101
Westport	30	0.226	0.067	110	120	130	85	93	101
Wethersfield	30	0.181	0.064	115	125	135	89	97	105
Willington	35	0.174	0.063	115	125	135	89	97	105
Wilton	30	0.231	0.068	110	120	130	85	93	101
Winchester	40	0.177	0.065	105	120	125	81	93	97
Windham	30	0.173	0.062	120	130	140	93	101	108

Exhibit E

Lease Agreement

SITE LEASE AGREEMENT

This Site Lease Agreement (the "**Agreement**") is made and effective as of the date the last Party executes this Agreement (the "**Effective Date**"), by and between LONG RIDGE FIRE COMPANY, INC., a Connecticut Corporation having a place of business at 366 Old Long Ridge Road, Stamford, CT 06903 ("**Landlord**"), and DISH Wireless L.L.C., a Colorado limited liability company having a place of business at 9601 S. Meridian Blvd., Englewood, Colorado 80112 ("**Tenant**," and together with Landlord, the "**Parties**," each a "**Party**").

WITNESSETH:

1. Definitions.

"**Affiliate(s)**" means, with respect to a Party, any person or entity, directly or indirectly, controlling, controlled by, or under common control with such Party, in each case for so long as such control continues. For purposes of this definition, "control" shall mean (i) the ownership, directly or indirectly, or at least fifty percent (50%) of either: (a) the voting rights attached to issued voting shares; or (b) the power to elect fifty percent (50%) of the directors of such entity, or (ii) the ability to direct the actions of the entity. Notwithstanding the preceding, for purposes of this Agreement, EchoStar Corporation and its direct and indirect subsidiaries shall not be deemed to be "Affiliates" of Tenant unless after the Effective Date any such entity qualifies as a direct or indirect subsidiary of DISH Network Corporation.

"**Applicable Law**" means any applicable federal, state or local act, law, statute, ordinance, building code, rule, regulation or permit, or any order, judgment, consent or approval of any Governmental Authority having jurisdiction over the Parties or this Agreement.

"**Governmental Authority**" means any: (i) federal, state, county, municipal, tribal or other local government and any political subdivision thereof having jurisdiction over the Parties or this Agreement; (ii) any court or administrative tribunal exercising proper jurisdiction; or (iii) any other governmental, quasi-governmental, self-regulatory, judicial, public or statutory instrumentality, authority, body, agency, bureau or entity of competent jurisdiction.

"**Installation**" means the installation of Tenant's Equipment at the Premises.

"**Permitted Modifications**" means adding, replacing, or modifying Tenant's Equipment within the Premises.

"**Property**" means that certain parcel of real property upon which the Structure is located.

"**Structure**" means that certain structure of which the Premises are a part.

2. Premises, Term, Rent and Contingencies.

2.1 Premises. Landlord is the owner of the Property located at 366 Old Long Ridge Road, Stamford, CT 06903, as more particularly described in Exhibit A. Landlord leases to Tenant approximately 100 square feet of space for the use and operation of its facilities as such are initially described in Exhibit B, collectively referred to as the "**Premises**". Landlord also grants to Tenant: (a) the right to use any available electrical systems and/or fiber installed at the Property to support Tenant's Installation: and (b) any easements on, over, under, and across the Property for utilities, fiber and access to the Premises. Landlord agrees that providers of utility or fiber services may use such easement(s) and/or available conduit(s) for the installation of any equipment necessary to provide utility or fiber service. If the existing utility or fiber sources located within the Premises or on the Property are insufficient for Tenant's Permitted Use, Landlord agrees to grant Tenant and/or the applicable third party utility

or fiber provider the right, at Tenant's sole cost and expense, to install such utilities or fiber on, over and/or under the Property as is necessary for Tenant's Permitted Use; provided that Landlord and Tenant shall mutually agree on the location of such installation(s).

2.2 Term. This Agreement shall be effective as of the Effective Date. The initial term of this Agreement (the "**Initial Term**") will commence on the earlier of the first day of the month following the: (i) first (1st) day of the month following the commencement of Tenant's Installation or (ii) nine (9) months from the Effective Date (the "**Commencement Date**"), and will expire on the last day of the month that is sixty (60) months after the Commencement Date unless terminated sooner, renewed or extended in accordance with this Agreement. The Initial Term shall automatically renew for up to four (4) additional terms of sixty (60) months each (each, a "**Renewal Term**" and together with the Initial Term, the "**Term**"). However, Tenant may, in Tenant's sole and absolute discretion, elect not to renew the lease at the end of the then-current Term by giving Landlord written Notice at least ninety (90) days prior to the end of the then-current Term. The Parties agree that, subject to the Contingencies, this Agreement constitutes a binding and valid obligation on each Party and that each Party has vested rights in this Agreement as of the Effective Date.

2.3 Rent. Beginning on the Commencement Date and continuing through the term of this Agreement, Tenant shall pay Landlord rent for the Premises ("**Rent**") in the amount of Three Thousand Three Hundred and 00/100 Dollars ($3,300.00) per month. The first Rent payment shall be made within twenty (20) business days of the Commencement Date, with subsequent rent payable by the fifth day of each month. On each, anniversary of the Commencement Date, the Rent shall be automatically increase to One Hundred Three percent (103%) of the then-current Rent. In the event Tenant installs additional antennas not shown on Exhibit B of this Agreement, Tenant agrees to pay additional monthly Rent of $50.00 per additional antenna. Said additional Rent shall be subject to the increases set forth above. Payments shall be delivered to the address designated by Landlord in Section 12.11, or by electronic payment. All payments for any fractional month shall be prorated based upon the number of days during such month that the payment obligation was in force ("**Payment Terms**"). Tenant shall require receipt of a validly completed IRS approved W-9 form (or its equivalent) prior to paying any Rent or any other amount(s) due under this Agreement.

In addition, Tenant shall pay Landlord, as additional rent, a one-time signing bonus in the amount of Three Thousand Three Hundred and 00/100 Dollars ($3,300.00) (the "**Additional Rental Payment**"). This Additional Rental Payment shall be paid within ninety (90) days of full execution of this Agreement.

2.4 Contingencies. The Parties acknowledge and agree that Tenant's ability to lawfully use the Premises is contingent upon Tenant obtaining all certificates, permits, approvals and other authorizations that may be required by any Governmental Authority in accordance with Applicable Law (collectively, the "**Governmental Approvals**"). Tenant will endeavor to obtain all such Governmental Approvals promptly. Landlord hereby authorizes Tenant, at Tenant's sole cost and expense, to file and submit for Governmental Approvals. Landlord shall: (a) cooperate with Tenant in Tenant's efforts to obtain such Governmental Approvals; (b) promptly execute and deliver all documents necessary to obtain and maintain the Government Approvals; and (c) not take any action that would adversely affect Tenant's ability to obtain and/or maintain the Governmental Approvals. If: (i) any application for Governmental Approvals is rejected, conditioned, materially delayed or otherwise not approved for any or no reason; or (ii) Tenant determines, in Tenant's sole and absolute discretion, that such Governmental Approvals cannot be obtained in a timely and commercially reasonable manner (clauses (i) and (ii) collectively, the "**Contingencies**"), then, Tenant shall have the right in its sole and absolute discretion to terminate this Agreement immediately upon Notice to Landlord, without penalty or further obligation to Landlord (or Landlord's affiliates, employees, officers, agents or lenders). If, following the Commencement Date, and through no fault of Tenant, any Governmental Approval issued to Tenant is canceled, expires, lapses or is otherwise withdrawn or terminated by the applicable Governmental Authority, then Tenant shall have the right in its sole and absolute discretion to terminate this Agreement upon ninety (90) days' Notice to Landlord without penalty

or further obligation to Landlord (or Landlord's affiliates, employees, officers, agents or lenders). If this Agreement is terminated, this Agreement shall be of no further force or effect (except as set forth to the contrary herein).

3. Use, Access and Modifications to Tenant's Equipment.

3.1 Tenant's Permitted Use. Landlord agrees that Tenant may use the Premises for the purpose of the installation, operation, maintenance and management of a telecommunications facility (including, without limitation, equipment designed to transmit and receive radio frequency signals) (collectively, "**Tenant's Equipment**"), which shall include the right to replace, repair, add, or otherwise modify any or all of Tenant's Equipment and the frequencies over which Tenant's Equipment operates ("**Tenant's Permitted Use**"). Landlord acknowledges and agrees that if radio frequency signage and/or barricades are required by Applicable Law, Tenant shall have the right to install the same on the Property.

3.2 Access. Commencing on the Effective Date and continuing throughout the Term, Tenant, its employees, agents and contractors shall have unrestricted access to the Premises 24 hours per day, 7 days per week and at no additional cost or expense to Tenant. Further, Landlord grants to Tenant the right of ingress and egress to the Structure and the Premises. Other than in the case of Emergency, Tenant shall provide Landlord with no less than forty-eight (48) hours' notice of Tenant's intention to enter the Premises for Tenant's Permitted Use. If known at the time of notice, Tenant shall further notify Landlord of the name of the agent or contractor who will be entering the Premises and shall provide Landlord with a certificate of insurance for Tenant or any contractor entering the Premises to perform service to Tenant's Equipment.

3.3 Modifications to Tenant's Equipment. After Tenant's initial Installation, Tenant may make Permitted Modifications, including those which allow Tenant to: (i) modify existing technologies; and (ii) modify existing equipment within the Premises without incurring any increase in the then current Rent, or other modification of the terms and conditions set forth in this Agreement. For any future modification or addition that is not a Permitted Modification, Tenant shall seek Landlord's approval of Tenant's installation plans and specifications prior to commencing any such addition or modification. Landlord's approval of Tenant's installation plans and specifications shall not be unreasonably withheld, conditioned or delayed, and in no event delayed beyond five (5) business days from the date of Landlord's receipt of Tenant's installation plans and specifications. In the event Landlord fails to provide written comments to Tenant within: (a) ten (10) business days after Landlord's initial receipt of the installation plans and specifications, or (b) five (5) business days after Landlord's receipt of the installation plans and specifications as revised by Tenant after Tenant's receipt of Landlord's written comments, the installation plans and specifications shall be deemed approved and accepted by Landlord provided, however, that any modification of the Premises not deemed to be a Permitted Modification may require an increase of Rent.

4. Utilities, Liens and Taxes.

4.1 Utilities. Tenant may have its own utility meter installed in a mutually agreed upon location. Landlord shall not require Tenant to pay any additional charge, fee or other amount for use of such electricity or the facilities associated therewith. Tenant agrees to obtain Landlord's prior consent, which consent shall not be unreasonably withheld, delayed or conditioned, for any material modifications to the Structure's electrical system utilized by Tenant for the Premises. In the event Landlord has failed to respond within ten (10) days to Tenant's request for consent, said consent shall be deemed to have been granted by Landlord.

4.2 Liens. Tenant will use commercially reasonable efforts to prevent any lien from attaching to the Structure or any part thereof. If any lien is filed purporting to be for labor or material furnished or to be furnished at the request of Tenant, then Tenant shall do all acts necessary to discharge such lien by payment, satisfaction or posting of bond within ninety (90) days of receipt of Notice of the same from Landlord; provided, that Tenant may

contest any such lien if Tenant provides Landlord with cash or a letter of credit in the amount of said lien as security for its payment within such ninety (90) day period, and thereafter diligently contests such lien. In the event Tenant fails to deposit the aforementioned security with Landlord and fails to pay any lien claim after entry of final judgment in favor of the claimant, then Landlord shall have the right to expend all sums reasonably necessary to discharge the lien claim.

4.3 Taxes. Landlord shall pay all taxes that accrue against the Structure during the Term. If any such tax or excise is levied or assessed directly against Tenant, then Tenant shall be responsible for and shall pay the taxing authority. Tenant shall be liable for all taxes against Tenant's personal property or Tenant's fixtures placed in the Premises, whether levied or assessed against Landlord or Tenant. Landlord shall reasonably cooperate with Tenant, at Tenant's expense, in any appeal or challenge to Taxes. If, as a result of any appeal or challenge by Tenant, there is a reduction, credit or repayment received by Landlord for any Taxes previously paid by Tenant, Landlord agrees to promptly reimburse to Tenant the amount of said reduction, credit or repayment. If Tenant does not have the standing rights to pursue a good faith and reasonable dispute of any Taxes under this section, Landlord will pursue such dispute at Tenant's sole cost and expense upon written request of Tenant.

5. Interference and Relocation of Tenant's Equipment.

5.1 Interference. Tenant agrees to use commercially reasonable efforts to ensure that Tenant's Equipment does not cause measurable Interference (as defined below) with any equipment installed at the Structure as of the Effective Date. Following the Effective Date, Landlord agrees not to install or to permit others to install any structure or equipment which could block or otherwise interfere with any transmission or reception by Tenant's Equipment ("**Interference**"). If Interference continues for a period more than forty-eight (48) hours following a Party's receipt of notification thereof, Landlord shall cause any interfering party to cease operating, and/or relocate, the source of Interference, or to reduce the power sufficiently to minimize the Interference until such Interference can be remedied.

5.2 Relocation of Tenant's Equipment. Following Tenant's receipt of a written Notice from Landlord, Tenant agrees to temporarily relocate its equipment to a mutually agreed upon location on the Property (a "**Temporary Location**") to facilitate Landlord's performance of maintenance, repair or similar work at the Property or in or on the Structure, provided that: (a) Landlord pays all costs incurred by Tenant for relocating Tenant's Equipment to the Temporary Location as well as back to the original location; (b) Landlord gives Tenant at least six (6) months prior written Notice, except in the case of a bona fide emergency which is reasonably likely to result in damage or injury to persons, the Structure or the Property (an "**Emergency**"), in which event Landlord will provide the greatest amount of notice possible under the circumstances; and (c) except for an Emergency Tenant shall not be required to relocate its equipment to a Temporary Location more than one (1) time within any five (5) year period. If Tenant's use of the Temporary Location requires Tenant to undergo re-zoning or re-permitting, Landlord shall not require Tenant to relocate Tenant's Equipment, absent an Emergency, until Tenant's receipt of all Governmental Approvals applicable to Tenant's use of the Temporary Location.

6. Maintenance and Repair Obligations.

6.1 Landlord Maintenance of the Structure. Landlord represents and warrants that, as of the Effective Date, the Structure, the Structure's systems and all structural elements of the Structure are in compliance with Applicable Law. Throughout the term of this Agreement, Landlord shall maintain, at its sole cost and expense, the Structure and the Property (but not Tenant's Equipment located thereon) in good operating condition. Landlord shall not have any obligation to maintain, repair or replace Tenant's Equipment except to the extent required due to the acts and/or omissions of Landlord, Landlord's agents, contractors or other tenants of the Structure. Landlord agrees to safeguard Tenant's Equipment with the same standard of care it uses to protect

its own property, but in no event less than reasonable care. In addition, Tenant may take all actions necessary, in Tenant's reasonable discretion, to secure and/or restrict access to Tenant's Equipment.

6.2 Tenant Maintenance of Tenant's Equipment. Tenant assumes sole responsibility for the maintenance, repair and/or replacement of Tenant's Equipment, except as set forth in Section 6.1. Tenant agrees to perform all maintenance, repair or replacement of Tenant's Equipment ("**Tenant Maintenance**") in accordance with Applicable Law, and in a good and workmanlike manner. Tenant shall not be permitted to conduct Tenant Maintenance in a manner that would materially increase the size of the Premises.

7. Surrender and Hold Over.

7.1 Surrender. Except as set forth to the contrary herein, within ninety (90) days following the expiration or termination of this Agreement (the "**Equipment Removal Period**"), in accordance with the terms of this Agreement, Tenant will surrender the Premises to Landlord in a condition similar to that which existed immediately prior to Tenant's Installation together with any additions, alteration and improvements to the Premises, in either case, normal wear and tear excepted. The Parties acknowledge and agree that Rent will not accrue during the Equipment Removal Period. However, if Tenant's Equipment is not removed during the Equipment Removal Period, Tenant will be deemed to be in Hold Over (as defined in Section 7.2 below) until Tenant's Equipment is removed from the Premises. Tenant shall have the right to access the Premises or remove any or all of Tenant's Equipment from the Premises at any time during the Term or the Equipment Removal Period.

7.2 Hold Over. If Tenant occupies the Premises beyond the Equipment Removal Period without Landlord's written consent ("**Hold Over**"), Tenant will be deemed to occupy the Premises on a month-to-month basis, terminable by either Party on thirty (30) days' written Notice to the other Party. All of the terms and provisions of this Agreement shall be applicable during that period, except that Tenant shall pay Landlord a rental fee equal to the then current monthly Rent applicable at the expiration or termination of the Agreement, prorated for the number of days of such hold over.

8. Default, Remedies and Termination.

8.1 Default. If any of the following events occur during the Term (each a "Default"), then the non-Defaulting Party may elect one or more of the remedies set forth below in this Section 8 or seek any other remedy available: (a) Tenant's failure to make any payment required by this Agreement within thirty (30) days after receipt of written Notice from the Landlord of such failure to pay; (b) failure by either Party to observe or perform any provision of this Agreement where such failure: (1) continues for a period of thirty (30) days after written Notice thereof from the non-Defaulting Party and the Defaulting Party has failed to cure or commenced the cure of such Default; and/or (2) based upon Tenant's reasonable determination, materially affects Tenant's ability to transmit or receive wireless communications signals to or from the Premises; (c) either Party files a petition in bankruptcy or insolvency or for reorganization or arrangement under the bankruptcy laws or under any insolvency act of any state, or admits the material allegations of any such petition by answer or otherwise, or is dissolved or makes an assignment for the benefit of creditors; and/or (d) involuntary proceedings under any such bankruptcy law or insolvency act or for the dissolution of either Party are instituted against either Party, or a receiver or trustee is appointed for all or substantially all of the property of either Party, and such proceeding is not dismissed, or such receivership or trusteeship vacated within sixty (60) days after such institution or appointment.

8.2 Remedies. Upon the occurrence of any uncured Default, the non-Defaulting Party may thereafter terminate this Agreement immediately upon written Notice to the other Party without prejudice to any other remedies the non-Defaulting Party may have at law or in equity.

8.3 Termination. Tenant shall have the right to terminate this Agreement without further liability upon thirty (30) days prior written Notice to Landlord due to any one or more of the following: (i) changes in Applicable Law which prohibit or adversely affect Tenant's ability to operate Tenant's Equipment at the Premises; (ii) Tenant, in its sole discretion, determines that Tenant's Permitted Use of the Premises is obsolete or unnecessary; (iii) Landlord or a third party installs any structure, equipment, or other item which blocks, hinders, limits, or prevents Tenant from being able to use the Tenant Equipment for Tenant's Permitted Use.

9. Limitation of Liability and Indemnification.

9.1 Limitation of Liability. EXCEPT FOR EACH PARTY'S INDEMNIFICATION OBLIGATIONS SET FORTH BELOW IN THIS SECTION 9, NEITHER PARTY NOR ANY OF ITS AGENTS, CONTRACTORS OR EMPLOYEES, SHALL BE LIABLE TO THE OTHER PARTY OR ANY PERSON CLAIMING THROUGH THAT PARTY FOR ANY EXEMPLARY, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR ANY CAUSE WHATSOEVER, INCLUDING, WITHOUT LIMITATION, CLAIMS CAUSED BY OR RESULTING FROM THE NEGLIGENCE, GROSS NEGLIGENCE OR WILLFUL MISCONDUCT OF THAT PARTY, ITS AGENTS, CONTRACTORS OR EMPLOYEES.

9.2 Tenant's Indemnity. Except to the extent caused by the breach of this Agreement by Landlord or the acts or omissions of Landlord, its officers, agents, employees, contractors, or any other person or entity for whom Landlord is legally responsible, Tenant shall defend, indemnify and hold Landlord and its officers, directors, shareholders, employees, agents and representatives ("**Landlord's Representatives**") harmless from and against any and all claims, demands, litigation, settlements, judgments, damages, liabilities, costs and expenses (including, without limitation, reasonable attorneys' fees) (individually or collectively, a "**Claim**") arising directly or indirectly out of: (i) any act or omission of Tenant, its officers, agents, employees, contractors, or any other person or entity for whom Tenant is legally responsible ("**Tenant's Representatives**"); or (ii) a breach of any representation, warranty or covenant of Tenant contained or incorporated in this Agreement. Tenant's obligations under this Section 9.2 shall survive the expiration or earlier termination of this Agreement for two (2) years.

9.3 Landlord's Indemnity. Except to the extent caused by the breach of this Agreement by Tenant or the acts or omissions of Tenant or Tenant's Representatives, Landlord shall defend, indemnify and hold Tenant, its officers, directors, shareholders, employees, agents and representatives harmless from and against any and all Claims arising directly or indirectly out of: (i) any act or omission of Landlord, its officers, agents, employees, contractors or any other person or entity for whom Landlord is legally responsible; (ii) a breach of any representation, warranty or covenant of Landlord contained or incorporated in this Agreement; and/or (iii) the generation, possession, use, storage, presence, release, spill, treatment, transportation, manufacture, refinement, handling, production and/or disposal of Hazardous Substances in, on, about, adjacent to, under or near the Premises, the Structure and/or the Property, and/or any contamination of the Premises, the Structure and/or the Property by any Hazardous Substance, but only to the extent not caused by Tenant or Tenant's Representatives. Landlord's obligations under this Section 9.3 shall survive the expiration or earlier termination of this Agreement for two (2) years.

9.4 Indemnification Procedure. The Party seeking indemnification (the "**Indemnified Party**") shall promptly send Notice to the Party from whom indemnification is being sought (the "**Indemnifying Party**") of the claim or suit for which indemnification is sought. The Indemnified Party shall not make any admission as to liability or agree to any settlement of or compromise any claim without the prior written consent of the Indemnifying Party. The Indemnified Party shall, at the Indemnifying Party request and expense, give the Indemnifying Party all reasonable assistance in connection with those negotiations and litigation.

10. Insurance.

10.1 Landlord Obligations. Throughout the Term, Landlord shall maintain, at Landlord's sole cost and expense, the following insurance coverage Commercial General Liability of not less than $1,000,000 per occurrence and $2,000,000 aggregate. All such policies shall be endorsed to include Tenant as an additional insured. Subject to the policy minimums set forth above in this Section 10.1, the insurance required of Landlord hereunder may be maintained by a blanket or master policy that includes properties other than the Property.

10.2 Tenant Obligations. Throughout the Term, Tenant shall maintain, at Tenant's sole cost and expense, the following insurance coverage: (i) workers' compensation insurance with no less than the minimum limits required by Applicable Law; (ii) employer's liability insurance with such limits as required by Applicable Law; and (iii) Commercial General Liability with a minimum limit of $1,000,000 per occurrence and $2,000,000 aggregate. All such policies shall be endorsed to include Landlord as additional insured.

10.3 Insurance Requirements. All policies required by this Section 10 shall be issued by insurers that are (1) licensed to do business in the state in which the Property and/or Structure are located, and (2) rated A- or better by Best's Key Rating Guide.

10.4 Waiver of Subrogation. To the fullest extent permitted by law, Landlord and Tenant for themselves and any and all parties claiming under or through them, including, without limitation, their respective insurers, hereby mutually release and discharge each other and the other's Affiliates, and their respective officers, directors, shareholders, agents, employees, contractors, and/or any other person or entity for whom a Party is legally responsible from any claims for damage to any person or to the Premises or any other real or personal property that are or are claimed to have been caused by or result from risks insured against under any insurance policies carried by the waiving party and in force at the time of such damage and hereby waive any right of subrogation that might otherwise exist in or accrue to any person on account thereof. All policies required to be carried by either Party herein shall contain an endorsement in favor of the other Party waiving the insurance company's right of subrogation against such other Party. THIS RELEASE SHALL APPLY EVEN IF THE LOSS OR DAMAGE IS CAUSED BY THE FAULT OR NEGLIGENCE OF A PARTY HERETO OR BY ANY PERSON FOR WHICH SUCH PARTY IS RESPONSIBLE. EACH PARTY AGREES TO NOTIFY ITS INSURANCE CARRIER(S) OF THIS PROVISION.

11. Representations and Warranties.

11.1 Representations and Warranties. Landlord represents, warrants and covenants that: (a) Landlord has the right and authority to execute and perform this Agreement; (b) there are no liens, judgments or other title matters materially and adversely affecting Landlord's title to the Property; (c) there are no covenants, easements or restrictions that prevent the use of the Premises for Tenant's Permitted Use; (d) the Structure and the Premises are in good repair and suitable for Tenant's Permitted Use; (e) Landlord will comply with all federal, state, and local laws in connection with any substances brought on to the Property and/or Structure that are identified as toxic or hazardous by any Applicable Law, ordinance or regulation ("**Hazardous Substance**"); and (f) Tenant's use and quiet enjoyment of the Premises shall not be disturbed. Landlord is responsible for any loss or damage, including remediation, with respect to Hazardous Substances as per Applicable Law. Landlord understands and agrees that notwithstanding anything contained in this Agreement to the contrary, in no event shall Tenant have any liability whatsoever with respect to any Hazardous Substance that was on, about, adjacent to, under or near the Structure prior to the Effective Date, or that was generated, possessed, used, stored, released, spilled, treated, transported, manufactured, refined, handled, produced or disposed of on, about, adjacent to, under or near the Property and/or Structure by: (1) Landlord, its agents, employees, contractors or invitees; or (2) any third party who is not an employee, agent, contractor or invitee of Tenant.

12. Miscellaneous.

12.1 Assignment. Neither Party may assign or otherwise transfer any of its rights or obligations under this Agreement to any third party without the prior written approval of the other Party, which consent shall not be unreasonably withheld, conditioned or delayed. Notwithstanding the foregoing, either Party may assign or transfer some or all of its rights and/or obligations under the Agreement to: (i) an Affiliate; (ii) a successor entity to its business, whether by merger, consolidation, reorganization, or by sale of all or substantially all of its assets or stock; (iii) any entity in which a Party or its Affiliates have any direct or indirect equity investment; and/or (iv) any other entity directly or indirectly controlling, controlled by or under common control with any of the foregoing, and in each case, such assignment, transfer or other such transaction shall not be considered an assignment under this Section 12.1 requiring consent and the non-assigning Party shall have no right to delay, alter or impede such assignment or transfer.

12.2 Rights Upon Sale of Property or Structure. Should Landlord, at any time during the Term, sell or transfer all or any part of the Property or the Structure to a purchaser other than Tenant, such transfer shall be subject to this Agreement and Landlord shall require any such purchaser or transferee to recognize Tenant's rights under the terms of this Agreement in a written instrument signed by Landlord and the third party transferee. If Landlord completes any such transfer without executing such a written instrument, then Landlord shall not be released from its obligations to Tenant under this Agreement, and Tenant shall have the right to look to Landlord and the third party for the full performance of this Agreement. In addition to, and not in limitation of the preceding, in the event the Landlord sells or transfers either its rights in all or any portion of the Premises or Landlord's right to the receive the Rent (and other payments) derived from the Premises under this Agreement, in either case separate from the underlying Structure and/or Property, to any third party who is not an Affiliate of Landlord, then prior to any such sale or transfer Landlord shall first provide Tenant with a right of first refusal ("**ROFR**") to acquire such right(s). In order to evaluate the terms and conditions offered to Landlord by such third party Landlord shall provide Tenant with a full, complete and unredacted copy thereof and Tenant shall have thirty (30) days from receipt thereof to elect to exercise its ROFR; provided that Tenant's exercise of the ROFR shall be on the same terms and conditions as offered to Landlord by such third party (except as may be mutually agreed upon to the contrary).

12.3 Subordination and Non-Disturbance. This Agreement shall be subordinate to any mortgage, deed of trust, or other security agreement (each a "**Mortgage**") by Landlord which, from time to time, may encumber all or part of the Property; provided, however, the lender under every such Mortgage shall, in the event of a foreclosure of Landlord's interest, recognize the validity of this Agreement and Tenant's right to remain in occupancy of and have access to the Premises, as long as no Default by Tenant exists under this Agreement. If the Property is encumbered by a Mortgage, then Landlord shall, promptly following Tenant's request, obtain and furnish to Tenant a non-disturbance agreement, in recordable form, for each such Mortgage.

12.4 Condemnation. If all or any portion of the Premises is condemned, taken by a Governmental Authority or otherwise appropriated by the exercise of the right of eminent domain or a deed or conveyance in lieu of eminent domain (each, a "**Taking**"), either Party hereto shall have the right to terminate this Agreement immediately upon Notice to the other Party. If either Party elects to terminate this Agreement, the Rent set forth herein shall be abated, and Tenant's liability therefor will cease as of the date of such Taking, this Agreement shall terminate as of such date, and any prepaid rent shall be returned to Tenant. If this Agreement is not terminated as herein provided, then it shall continue in full force and effect, and Landlord shall, within a reasonable time after possession is physically taken by the condemning authority restore the remaining portion of the Premises to render it reasonably suitable for the uses permitted by this Agreement and the Rent shall be proportionately and equitably reduced. Notwithstanding the foregoing, Landlord shall not be obligated to expend an amount greater than the proceeds received from the condemning authority less all expenses reasonably incurred in connection therewith (including attorneys' fees) for the restoration. All compensation awarded in connection with a Taking

shall be the property of Landlord, provided that if allowed under Applicable Law, Tenant may apply for and keep as its property a separate award for (i) the value of Tenant's leasehold interest; (ii) the value of Tenant's Equipment or other personal property of Tenant; (iii) Tenant's relocation expenses; and (iv) damages to Tenant's business incurred as a result of such Taking.

12.5 Recording. If requested by Tenant, Landlord and Tenant agree to execute a Memorandum of Lease that Tenant may record at Tenant's sole cost and expense. The date set forth in the Memorandum of Lease is for recording purposes only, and bears no reference to commencement of the Term or rent payments of any kind.

12.6 Force Majeure. Notwithstanding anything to the contrary in this Agreement, neither Party shall be liable to the other Party for nonperformance or delay in performance of any of its obligations under this Agreement due to causes beyond its reasonable control, including, without limitation, strikes, lockouts, pandemics, labor troubles, acts of God, accidents, technical failure governmental restrictions, insurrections, riots, enemy act, war, civil commotion, fire, explosion, flood, windstorm, earthquake, natural disaster or other casualty ("**Force Majeure**"). Upon the occurrence of a Force Majeure condition, the affected Party shall immediately notify the other Party with as much detail as possible and shall promptly inform the other Party of any further developments. Immediately after the Force Majeure event is removed or abates, the affected Party shall perform such obligations with all due speed. Neither Party shall be deemed in default of this Agreement to the extent that a delay or other breach is due to or related to a Force Majeure event. A proportion of the Rent herein reserved, according to the extent that such Force Majeure event shall interfere with the full enjoyment and use of the Premises, shall be suspended and abated from the date of commencement of such Force Majeure event until the date that such Force Majeure event subsides. If such Force Majeure event prevents the affected Party from performing its obligations under this Agreement, in whole or in part, for a period of forty-five (45) or more days, then the other Party may terminate this Agreement immediately upon Notice to the affected Party.

12.7 Successors and Assigns. The respective rights and obligations provided in this Agreement shall bind and shall continue to apply for the benefit of the Parties hereto, their legal representative, heirs, successors and permitted assigns. No rights however, shall continue to apply for the benefit of any assignee, unless such assignment was made in accordance with Section 12.1 of this Agreement.

12.8 Governing Law and Construction. This Agreement shall be construed, governed and enforced in accordance with the laws of the state in which the Premises is located. The section and paragraph headings contained in this Agreement are solely for reference purposes, and shall not affect in any way the meaning or interpretation of this Agreement.

12.9 Severability. Each provision of this Agreement shall be construed as separable and divisible from every other provision and the enforceability of any one provision shall not limit the enforceability, in whole or in part, of any other provision. If a court or administrative body of competent jurisdiction holds any provision of this Agreement to be invalid, illegal, void or less than fully enforceable as to time, scope or otherwise, such provision shall be construed by limiting and reducing it so that such provision is valid, legal and fully enforceable while preserving to the greatest extent permissible the original intent of the parties; the remaining terms and conditions of this Agreement shall not be affected by such alteration, and shall remain in full force and effect.

12.10 Waiver; Remedies. It is agreed that, except as expressly set forth in this Agreement, the rights and remedies herein provided in case of Default or breach by either Landlord or Tenant are cumulative and shall not affect in any manner any other remedies that the non-breaching Party may have by reason of such default or breach. The exercise of any right or remedy herein provided shall be without prejudice to the right to exercise any other right or remedy provided herein, at law, in equity or otherwise. In addition to, and not in limitation of, the preceding, the Parties acknowledge and agree that there will not be an adequate remedy at law for

noncompliance with the provisions of Section 5, and therefore either Party shall have the right to equitable remedies, including, without limitation, injunctive relief and specific performance.

12.11 Notice. All notices or requests that are required or permitted to be given pursuant to this Agreement must be given in writing by certified US mail (postage pre-paid) with return receipt requested or by courier service (charges prepaid), or solely in the case of notice to Landlord by email, to the party to be notified, addressed to such party at the address(es) or email address(es) set forth below, or such other address(es), email address(es) or fax number(s) as such Party may have substituted by written notice (given in accordance with this Section 12.11) to the other Party ("**Notice**"). The sending of such Notice to the proper email address (in the case of email transmission) or the receipt of such Notice (in the case of delivery by first-class certified mail or by courier service) will constitute the giving thereof.

If to be given to Landlord:
Long Ridge Fire Company, Inc.
Attn: Stuart Teitelbaum

If by courier service:
366 Old Long Ridge Road
Stamford, CT 06903
If by first-class certified mail:
366 Old Long Ridge Road
Stamford, CT 06903

If by email:

Stugae1.US

If to be given to Tenant:
DISH Wireless L.L.C.
Attn: Lease Administration
5701 South Santa Fe Blvd.
Littleton, Colorado 80120

12.12 Entire Agreement. This Agreement sets forth the entire, final and complete understanding between the Parties hereto regarding the subject matter of this Agreement, and it supersedes and replaces all previous understandings or agreements, written, oral, or implied, regarding the subject matter of this Agreement made or existing before the date of this Agreement. Except as expressly provided by this Agreement, no waiver or modification of any of the terms or conditions of this Agreement shall be effective unless in writing and signed by both Parties. Any provision of this Agreement that logically would be expected to survive termination or expiration, shall survive for a reasonable time period under the circumstances, whether or not specifically provided in this Agreement.

12.13 Compliance with Law. Each Party shall, with respect to its actions and/or inactions pursuant to and in connection with this Agreement, comply with all applicable statutes, laws, rules, ordinances, codes and governmental or quasi-governmental orders or regulations (in each case, whether federal, state, local or otherwise) and all amendments thereto, now enacted or hereafter promulgated and in force during the term of this Agreement, a Renewal Term or any extension of either of the foregoing.

12.14 Counterparts. This Agreement may be executed in any number of identical counterparts and, if so executed, shall constitute one agreement, binding on all the Parties hereto, notwithstanding that all the Parties are not signatories to the original or the same counterpart. Execution of this Agreement by facsimile or electronic signature shall be effective to create a binding agreement and, if requested, Landlord and Tenant agree to exchange original signed counterparts in their possession.

12.15 Attorneys' Fees. If an action is brought by either Party for breach of any covenant and/or to enforce or interpret any provision of this Agreement, the prevailing Party shall be entitled to recover its costs, expenses and reasonable attorneys' fees, both at trial and on appeal, in addition to all other sums allowed by law.

12.16 Incorporation of Exhibits. All exhibits referenced herein and attached hereto are hereby incorporated herein in their entirety by this reference.

[*Remainder of page intentionally left blank. Signature page follows.*]

IN WITNESS WHEREOF, the Parties have caused their duly authorized representatives to execute this Agreement as of the Effective Date.

LANDLORD:

LONG RIDGE FIRE COMPANY, INC.

By: DocuSigned by: Stuart Teitelbaum 25BEE5EB22A643F...

Name: Stuart Teitelbaum

Its: Assistant Chief - Tower Manager

Date: 6/9/2022

TENANT:

DISH WIRELESS L.L.C.

By: DocuSigned by: David Mayo F0DA1A105A684B7...

Name: David Mayo

Its: EVP

Date: 6/13/2022

EXHIBIT A

LEGAL DESCRIPTION OF PROPERTY

Northerly by land formerly of Lynda Lounsbury, et al, and land of the City of Stamford, now land of the grantee; Easterly by land formerly of the City of Stamford and Old Long Ridge Road; Southerly by Erskine Road and Westerly by land now or formerly of Bonfelio Preli.

Excepting therefrom, however, so much thereof as was conveyed in a Warranty Deed from Anna B. Timothy to Bonfelio Preli dated April 18, 1938, and recorded in the Stamford Land Records in Book 469 at Page 248.

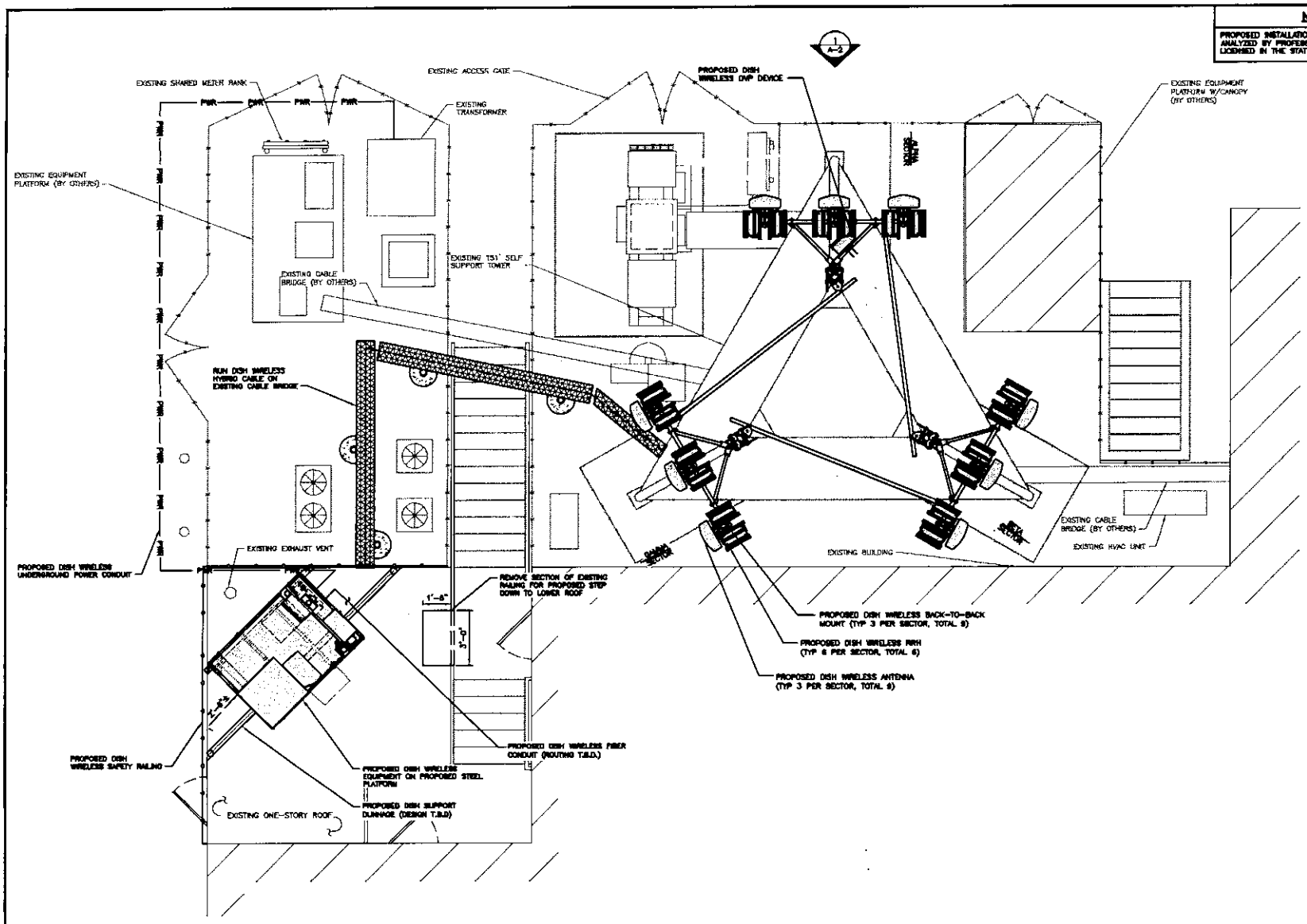
Being all the land of Anna B. Timothy located on Old Long Ridge Road and Erskine Road in the City of Stamford.

Said premises are conveyed subject to the zoning and planning rules and regulations of the City of Stamford, any municipal assessments now or hereafter placed on said premises, taxes of the City of Stamford on the List of September 1, 1971, and any facts disclosed by a reasonable survey.

EXHIBIT B

SITE PLAN

"TENANT" IS REFERRED TO THROUGHOUT THIS EXHIBIT AS *"DISH WIRELESS"*



NOTE

PROPOSED INSTALLATION TO BE STRUCTURALLY ANALYZED BY PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNETICUT.

ENLARGED BUILDING PLAN

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

1

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Tectonic

Tectonic Engineering & Surveying Consultants P.C.

DRAWN BY:	CHECKED BY:	APPROVED BY:
PG	JG	MP

RFDS REV #: ---

LEASE EXHIBIT

SUBMITTALS

REV	DATE	DESCRIPTION
A	09/01/21	ISSUED FOR REVIEW
B	09/07/21	GENERAL REVISIONS
C	10/01/21	PER CLIENT COMMENTS

A&E PROJECT NUMBER

10710.NJJER0111OA

DISH WIRELESS PROJECT INFORMATION

NJJER0111OA

366 OLD LONG RIDGE ROAD
STAMFORD, CT 06903

SHEET TITLE

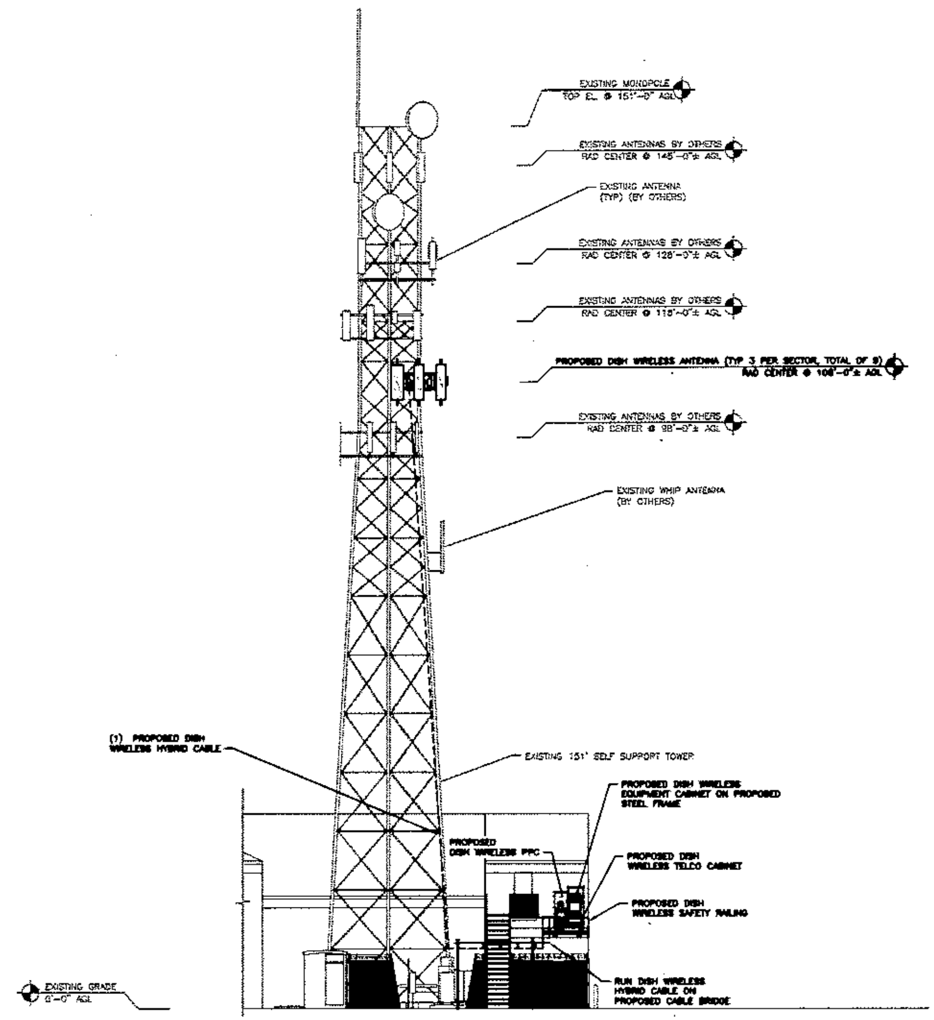
ENLARGED BUILDING PLAN

SHEET NUMBER

A-1

NOTE

PROPOSED INSTALLATION TO BE STRUCTURALLY ANALYZED BY PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT.



BUILDING NORTH ELEVATION

1/4"=1'-0"

1

dish wireless

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Tectonic

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
PG	JO	MP

RFDS REV #: ---

LEASE EXHIBIT

SUBMITTALS

REV	DATE	DESCRIPTION
A	[illegible]	ISSUED FOR REVIEW
B	[illegible]	GENERAL REVISIONS
C	[illegible]	PER CLIENT COMMENTS

A&E PROJECT NUMBER
10710.NJJER01110A

DISH WIRELESS PROJECT INFORMATION
NJJER01110A

366 OLD LONG RIDGE ROAD
STAMFORD, CT 06903

SHEET TITLE
ELEVATION

SHEET NUMBER
A-2

Exhibit F

Emissions Report

APPROVED
By Pawan Madahar at 3:57 pm, Aug 18, 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:	NJJER01110A
Site Address:	366 Old Long Ridge Road Stamford, CT
Latitude:	N 41.153106
Longitude:	W 73.592697
Structure type:	Lattice tower
Report date:	August 12, 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 366 Old Long Ridge Road in Stamford, CT. DISH refers to the antenna site by the code "NJJER01110A", 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, the City of Stamford, Long Ridge Fire Company and Southwestern Regional Communications Center. 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 4.8610 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 20 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 and NOC Information signs be installed at the base of the 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.

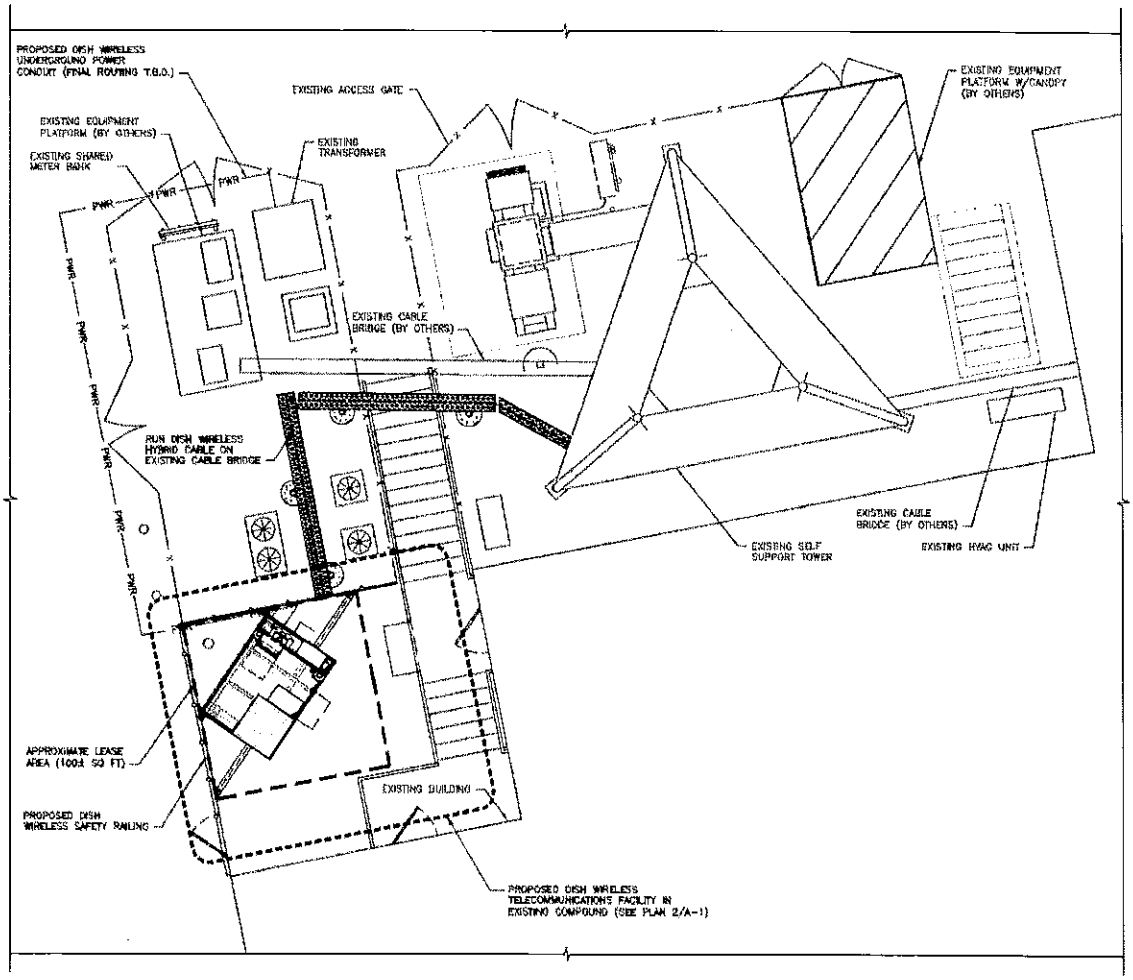
In addition, four Appendices are included. Appendix A provides information on the documents used to prepare the analysis. Appendix B provides background on the

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.

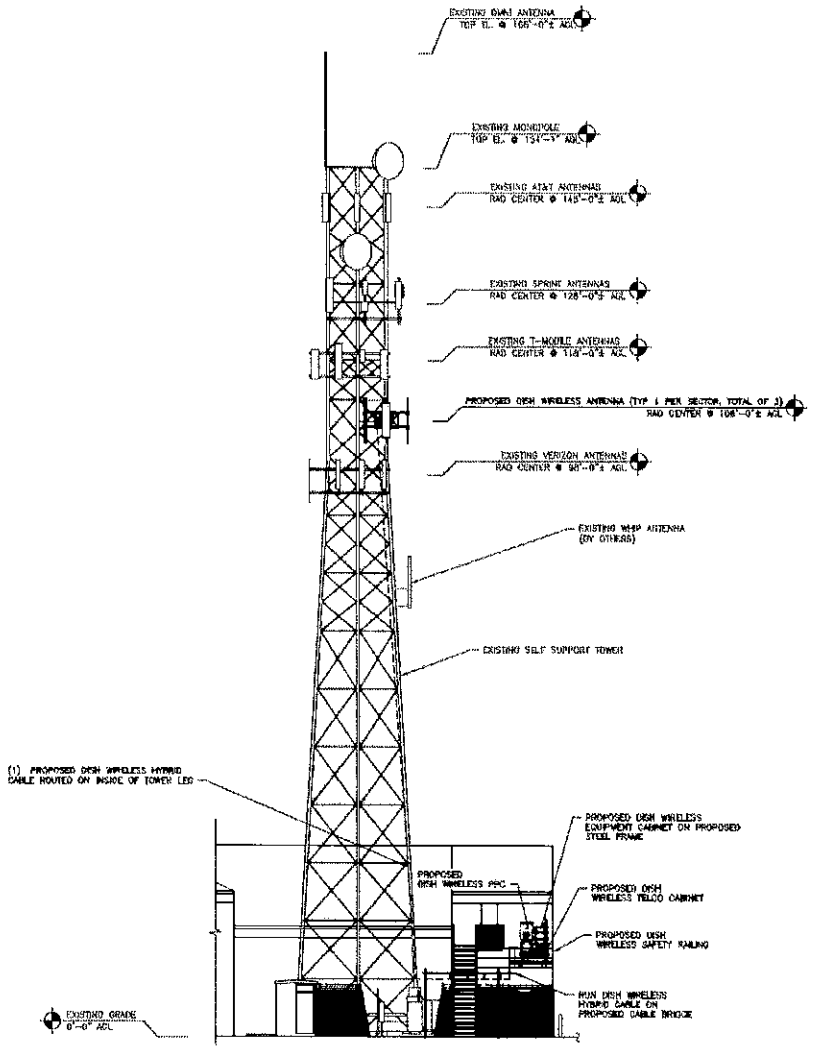
Antenna and Transmission Data

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	JMA Wireless	MX08FRO665-21	Panel	600	6	120	1637	108.0	11.46	68	40	2	0
❶	DISH	JMA Wireless	MX08FRO665-21	Panel	2000	6	160	6011	108.0	16.16	62	40	2	0
❶	DISH	JMA Wireless	MX08FRO665-21	Panel	2100	6	160	7567	108.0	16.66	64	40	2	0
❷	DISH	JMA Wireless	MX08FRO665-21	Panel	600	6	120	1637	108.0	11.46	68	160	2	0
❷	DISH	JMA Wireless	MX08FRO665-21	Panel	2000	6	160	6011	108.0	16.16	62	160	2	0
❷	DISH	JMA Wireless	MX08FRO665-21	Panel	2100	6	160	7567	108.0	16.66	64	160	2	0
❸	DISH	JMA Wireless	MX08FRO665-21	Panel	600	6	120	1637	108.0	11.46	68	280	2	0
❸	DISH	JMA Wireless	MX08FRO665-21	Panel	2000	6	160	6011	108.0	16.16	62	280	2	0
❸	DISH	JMA Wireless	MX08FRO665-21	Panel	2100	6	160	7567	108.0	16.66	64	280	2	0

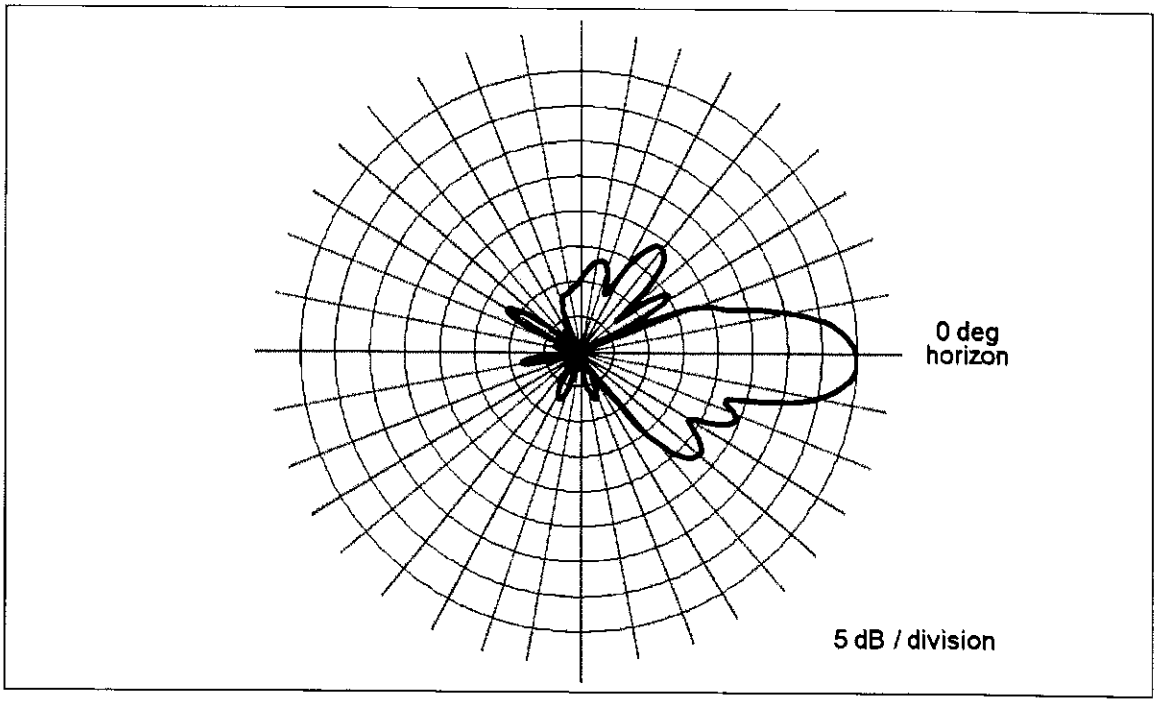
The area below the antennas, at street level, is of interest in terms of potential "uncontrolled" exposure of the general public, so the antenna's vertical-plane emission characteristic is used in the calculations, as it is a key determinant of the relative amount of RF emissions in the "downward" direction.

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. JMA Wireless MX08FRO665-21– 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
City of Stamford	Generic	Generic	Dish	11000	212	38.26	N/A
City of Stamford	Generic	Generic	Dish	11000	164	38.26	N/A
City of Stamford	Generic	Generic	Dish	11000	250	37.96	N/A
City of Stamford	Generic	Generic	Dish	11000	269	37.96	N/A
City of Stamford	Generic	Generic	Omnidirectional	851	89	6.86	N/A
Long Ridge Fire Co.	Generic	Generic	Omnidirectional	154	60	0.00	N/A
Southwestern Regional Comm. Ctr.	Generic	Generic	Omnidirectional	453	85	3.00	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, with one model applying to street level around a site, and another applying to the rooftop near the 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.

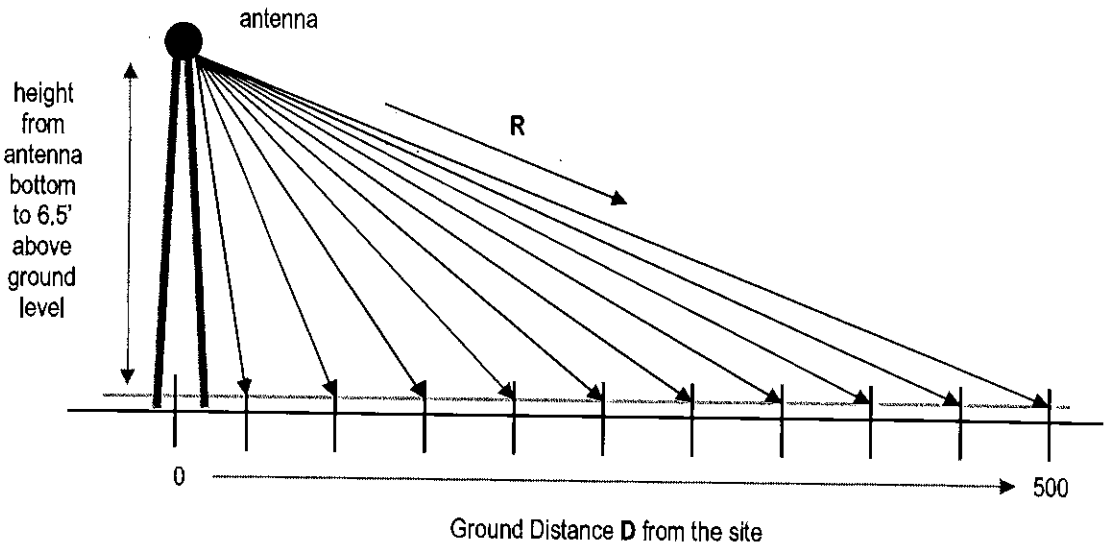


Figure 2. Street-level MPE% Calculation Geometry

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.

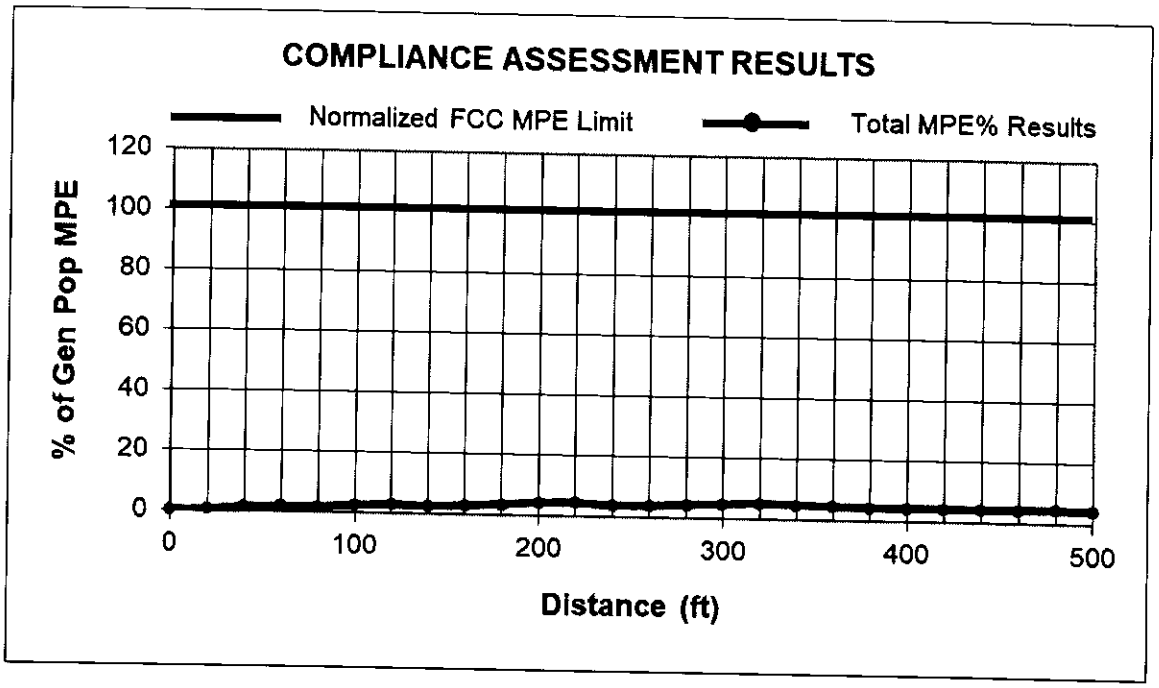
The tables that follow provides the results of the MPE% calculations for each antenna operation, with the overall worst-case calculated result highlighted in bold in the last column of the last table. Note that the transmission parameters for each DISH antenna sector are identical, and the calculations 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	0.0015	0.0019	0.0000	0.0601	0.0280	0.3381	0.0342	0.4638
20	0.0060	0.0106	0.0051	0.0611	0.0121	0.4942	0.0574	0.6465
40	0.0087	0.0217	0.0109	0.1294	0.0120	1.0016	0.2406	1.4249
60	0.0029	0.0189	0.0343	0.1820	0.0367	1.0433	0.2843	1.6024
80	0.0521	0.0116	0.0877	0.3140	0.0427	0.7234	0.1873	1.4188
100	0.1655	0.0243	0.4220	0.3436	0.0712	0.4396	0.5735	2.0397
120	0.1627	0.4244	0.5102	0.2444	0.0655	0.6081	0.4369	2.4522
140	0.0844	0.2415	0.1455	0.1486	0.0754	0.8164	0.6402	2.1520
160	0.0463	0.0156	0.0318	0.2148	0.1733	1.3758	0.6824	2.5400
180	0.0757	0.0227	0.0026	0.3744	0.1382	2.0018	0.4846	3.1000
200	0.0971	0.1080	0.0392	0.5544	0.0634	2.7379	0.2883	3.8883
220	0.1021	0.0805	0.0557	0.6475	0.0352	3.0339	0.1197	4.0746
240	0.0842	0.0034	0.0115	0.5868	0.0471	2.6376	0.0312	3.4018
260	0.0556	0.0459	0.0480	0.5067	0.0676	2.7519	0.0909	3.5666
280	0.0415	0.0531	0.0507	0.4404	0.0942	3.2536	0.1677	4.1012
300	0.0367	0.0390	0.0303	0.3722	0.0878	3.5896	0.2646	4.4202
320	0.0430	0.0263	0.0162	0.3146	0.0875	3.8090	0.3838	4.6804
340	0.0610	0.0318	0.0283	0.1802	0.0743	3.6256	0.5153	4.5165
360	0.0932	0.0442	0.0532	0.1106	0.0487	3.2275	0.6657	4.2431
380	0.1366	0.0400	0.0565	0.0834	0.0231	3.1135	0.6010	4.0541
400	0.1922	0.0174	0.0309	0.1189	0.0157	3.0041	0.7428	4.1220
420	0.1752	0.0159	0.0282	0.2032	0.0304	2.9224	0.6767	4.0520
440	0.2319	0.0009	0.0042	0.1868	0.0279	2.7413	0.8184	4.0114
460	0.2130	0.0008	0.0038	0.2997	0.0515	2.6413	0.9529	4.1630
480	0.2773	0.0040	0.0020	0.4255	0.0702	2.5976	0.8777	4.2543
500	0.2564	0.0037	0.0019	0.3945	0.0650	2.4034	0.8111	3.9360

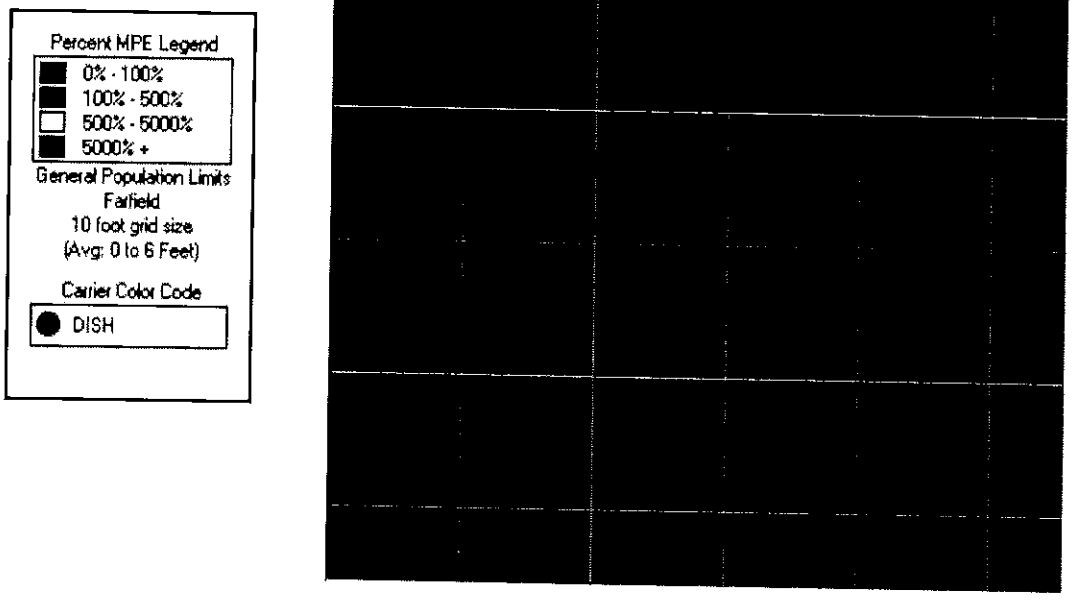
Ground Distance (ft)	Subtotal MPE%	City of Stamford MPE%	Long Ridge Fire Co. MPE%	Southwestern Regional Comm. Ctr. MPE%	Total MPE%
0	0.4638	0.0017	0.0004	0.0004	0.4663
20	0.6465	0.0164	0.0391	0.0230	0.7250
40	1.4249	0.0117	0.1294	0.0547	1.6207
60	1.6024	0.0101	0.2270	0.0518	1.8913
80	1.4188	0.0034	0.2945	0.0218	1.7385
100	2.0397	0.0101	0.3202	0.0041	2.3741
120	2.4522	0.0010	0.3300	0.0015	2.7847
140	2.1520	0.0013	0.3095	0.0116	2.4744
160	2.5400	0.0040	0.2843	0.0193	2.8476
180	3.1000	0.0031	0.2562	0.0296	3.3889
200	3.8883	0.0008	0.2321	0.0418	4.1630
220	4.0746	0.0022	0.2067	0.0484	4.3319
240	3.4018	0.0025	0.1810	0.0566	3.6419
260	3.5666	0.0010	0.1632	0.0636	3.7944
280	4.1012	0.0002	0.1479	0.0628	4.3121
300	4.4202	0.0002	0.1318	0.0623	4.6145
320	**4.6804**	**0.0003**	**0.1180**	**0.0623**	**4.8610**
340	4.5165	0.0004	0.1062	0.0612	4.6843
360	4.2431	0.0005	0.0983	0.0604	4.4023
380	4.0541	0.0004	0.0892	0.0599	4.2036
400	4.1220	0.0002	0.0813	0.0583	4.2618
420	4.0520	0.0002	0.0744	0.0532	4.1798
440	4.0114	0.0001	0.0683	0.0523	4.1321
460	4.1630	0.0003	0.0629	0.0527	4.2789
480	4.2543	0.0005	0.0581	0.0486	4.3615
500	3.9360	0.0008	0.0539	0.0470	4.0377

As indicated, the maximum calculated overall RF level is 4.8610 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 below.

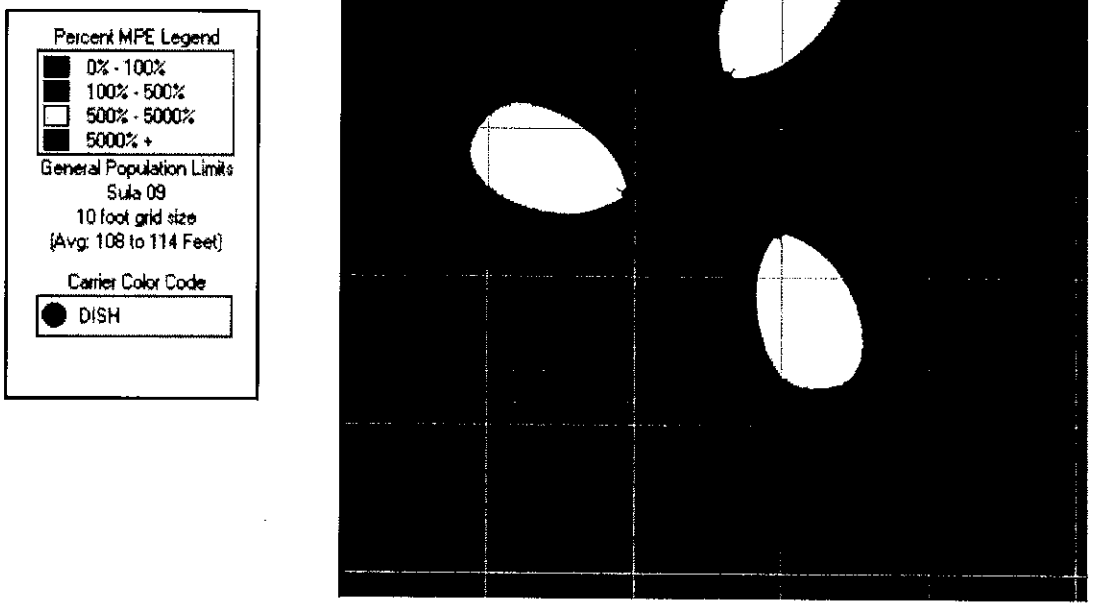


Near-field Analysis

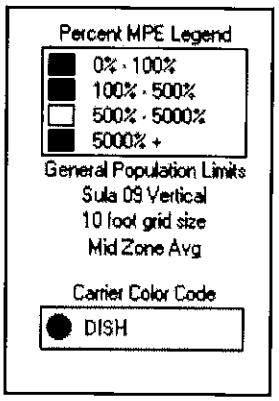
The compliance analysis for the same height as the antennas is performed using the RoofMaster program by Waterford Consultants.

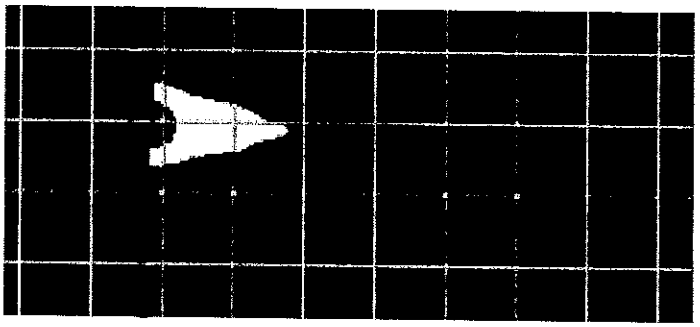
RF levels in the near field of an antenna depend on the power input to the antenna, the antenna's length and horizontal beamwidth, the mounting height of the antenna above nearby roof, and one's position and distance from the antenna. RF levels in front of a directional antenna are higher than they are 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 below and 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 4.8610 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 and NOC Information signs be installed at the base of the 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.

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

8/12/22
Date

Appendix A. Documents Used to Prepare the Analysis

RFDS: RFDS-NJJER01110A-Preliminary-20220429-v.1_20220429111152

CD: NJJER01110A_ZD_20220426122604

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.

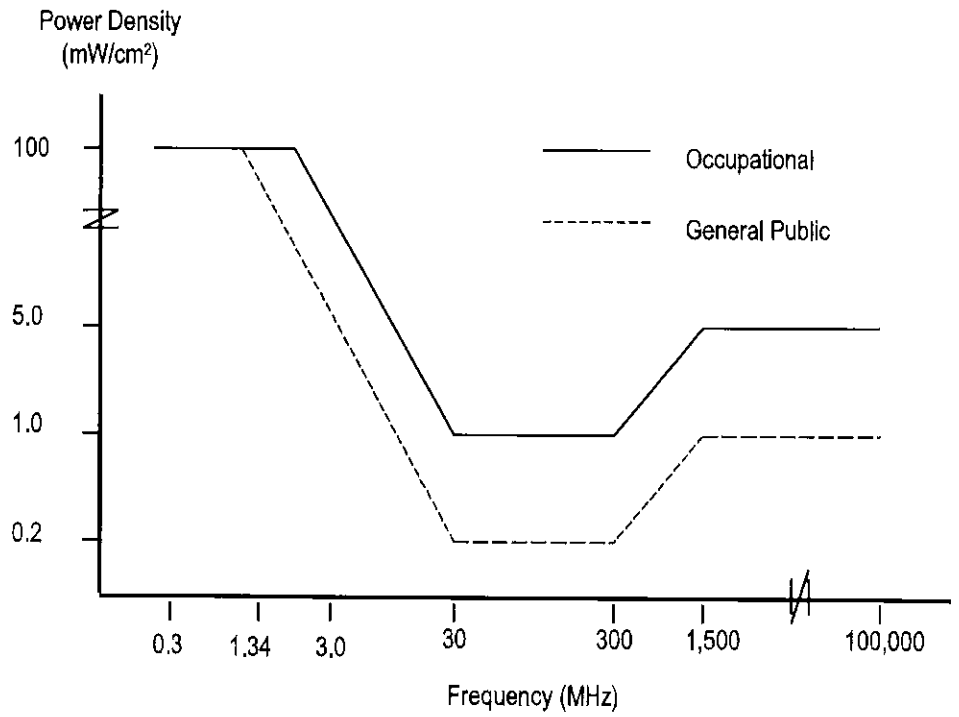
The specified continuous exposure MPE limits are based on known variation of human body susceptibility in different frequency ranges, and a Specific Absorption Rate (SAR) of 4 watts per kilogram, which is universally considered to accurately represent human capacity to dissipate incident RF energy (in 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.

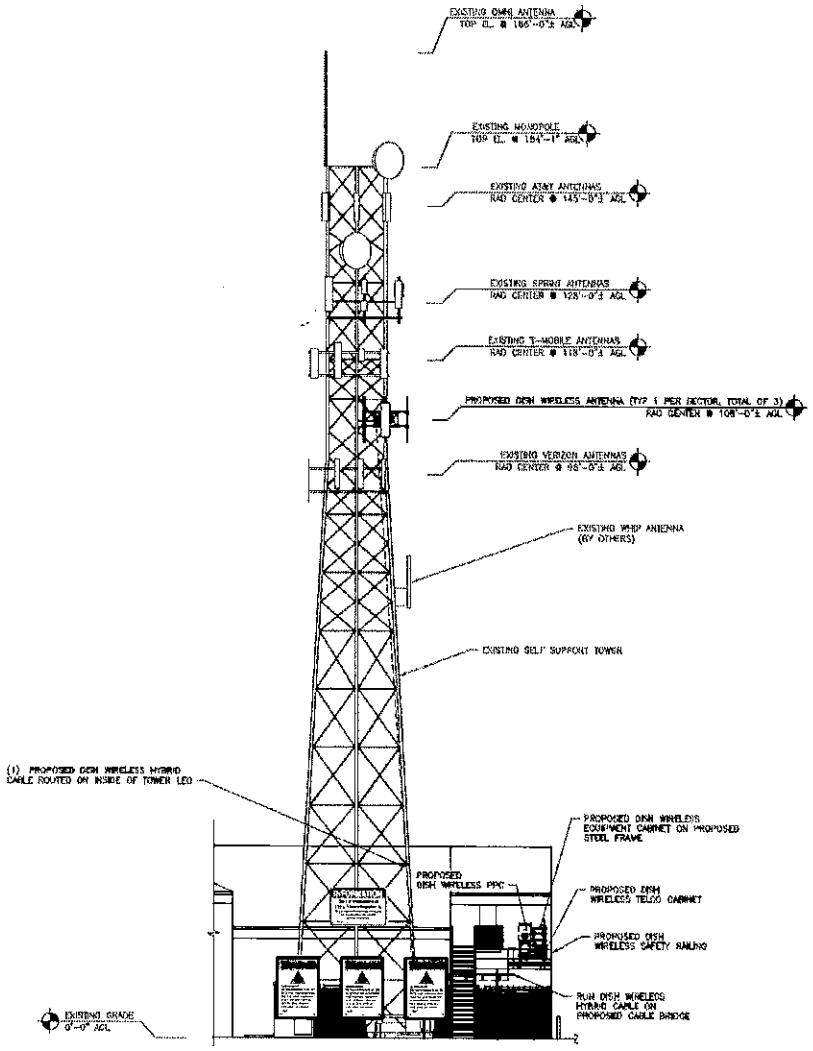
FCC Report and Order, Notice of Proposed Rulemaking, Memorandum Opinion and Order (FCC 19-126), *Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields; Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies,* 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	3	0	1	0	
Alpha	0	0	0	0	0	0	
Beta	0	0	0	0	0	0	
Gamma	0	0	0	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

Exhibit G

Mailing Receipts

LTR 1 OF 1

FROM:
LEV MAYZLER
(203) 488-0712
CONSTRUCTION SERVICES OF BRANF
63-3 NORTH BRANFORD ROAD
BRANFORD CT 06405-2848

SHIP TO:

STAMFORD LAND USE
MR. RALPH BLESSING
7TH FL
888 WASHINGTON AVE.
STAMFORD CT 06901

CT 069 9-01

UPS 2ND DAY AIR **2**
TRACKING #: 1Z E05 345 02 6373 3945

BILLING: P/P

WS 22.0.17 SHARP MX-3070 39.0A 09/2022

Fold here and place in label pouch

Proof of Delivery

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

Tracking Number

1ZE053450263733945

Service

UPS 2nd Day Air®

Delivered On

09/23/2022 10:32 A.M.

Delivered To

CITY OF STAMFORD
888 WASHINGTON BLVD
STAMFORD, CT, 06901, US

Left At

Met Customer

Thank you for giving us this opportunity to serve you. Details are only available for shipments delivered within the last 120 days. Please print for your records if you require this information after 120 days.

Sincerely,

UPS

Tracking results provided by UPS: 09/26/2022 8:21 A.M. EST

LTR 1 OF 1

FROM:
LEV MAYZLER
(203) 488-0712
CONSTRUCTION SERVICES OF BRANF
63-3 NORTH BRANFORD ROAD
BRANFORD CT 06405-2848

SHIP TO:

LONG RIDGE FIRE COMPAMNY, INC.
366 OLD LONG RIDGE RD.
STAMFORD CT 06903

CT 069 9-01

UPS 2ND DAY AIR **2**
TRACKING #: 1Z E05 345 02 6188 5357

BILLING: P/P

WS 22.0.17 SHARP MX-3070 39.0A 09/2022

Fold here and place in label pouch

Proof of Delivery

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

Tracking Number
1ZE053450261885357

Service

UPS 2nd Day Air®

Delivered On

09/23/2022 1:37 P.M.

Delivered To

STAMFORD, CT, US
Received By

NAU

Left At
Residential

Thank you for giving us this opportunity to serve you. Details are only available for shipments delivered within the last 120 days. Please print for your records if you require this information after 120 days.

Sincerely,

UPS

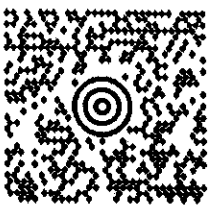
Tracking results provided by UPS: 09/26/2022 8:19 A.M. EST

LTR 1 OF 1

FROM:
LEV MAYZLER
(203) 488-0712
CONSTRUCTION SERVICES OF BRANF
63-3 NORTH BRANFORD ROAD
BRANFORD CT 06405-2848

SHIP TO:

HONORABLE CAROLINE SIMMONS
10TH FL
888 WASHINGTON AVE.
STAMFORD CT 06901



CT 069 9-01

UPS 2ND DAY AIR **2**
TRACKING #: 1Z E05 345 02 6194 5336

BILLING: P/P

WS 22.0.17 SHARP MX-3070 39.0A 09/2022

Fold here and place in label pouch

Proof of Delivery

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

Tracking Number

1ZE053450261945336

Service

UPS 2nd Day Air®

Delivered On

09/23/2022 10:32 A.M.

Delivered To

CITY OF STAMFORD
888 WASHINGTON BLVD
STAMFORD, CT, 06901, US

Left At

Met Customer

Thank you for giving us this opportunity to serve you. Details are only available for shipments delivered within the last 120 days. Please print for your records if you require this information after 120 days.

Sincerely,

UPS

Tracking results provided by UPS: 09/26/2022 8:22 A.M. EST