

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

May 3, 2023

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

RE: **Notice of Exempt Modification to an existing 145' monopole
located at 100 Reef Road, Fairfield, Connecticut**

Latitude: 41° 8' 22.45" / Longitude: -73° 15' 26.45"

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 145' monopole tower facility located at 100 Reef Road, Fairfield, Connecticut (See Original Facility Approval attached as Exhibit A) ("Facility"). The property and tower are owned by The Town of Fairfield (See Fairfield Vision Appraisal information 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 one hundred eighteen foot (118') 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 April 26, 2023 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 Brenda L. Kupchick, First Selectwoman of the Town of Fairfield, Jim Wendt, Planning Director, and the property and tower owner, Town of Fairfield.

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 145' height of the Tower as the Dish antennas will be installed at a height of 118'.

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

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 7.6885%.

Tower

The Facility consists of a One hundred forty five foot (145') monopole tower located at 100 Reef Road Road, Fairfield, Connecticut. As indicated above, the property and tower are owned by the Town of Fairfield. The tower currently supports Town of Fairfield antennas at the one hundred forty five foot (145') and ninety three foot (93') centerlines AGL, T-Mobile at the one hundred thirty five foot (135') centerline AGL, AT&T antennas at the one hundred thirty foot (130') foot centerline AGL, and Sprint at the one hundred ten foot (110') AGL, and. The antenna locations are set forth on Sheet A-2 of the attached drawings in Exhibit C.

A. TECHNICAL FEASIBILITY

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

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 Fairfield to proceed with the proposed installation. Additionally, a Site Lease Agreement is attached as Exhibit G, 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 118' 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 FEASIBILITY

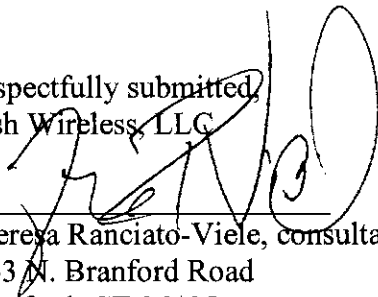
Dish has entered into a Lease Agreement (Exhibit G) with the Facility owner for the proposed colocation. Therefore, this shared use is economically feasible.

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 100 Reef Road, Fairfield, 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

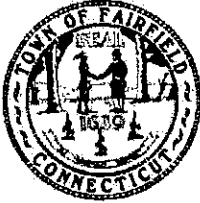
By 
Theresa Ranciato-Viele, consultant
63-3 N. Branford Road
Branford, CT 06405
Tranciato@Tectonicengineering.com
203-606-5127

cc: Fairfield First Selectwoman, Brenda L. Kupchick
Sullivan Independence Hall
725 Old Post Road
Fairfield, CT 06824

Fairfield Planning Director, Jim Wendt
Sullivan Independence Hall
725 Old Post Road
Fairfield, CT 06824

Exhibit A

Original Facility Approval



Town of Fairfield Building Department

725 Old Post Road · Fairfield, CT 06824 · 203.256.3036

PERM# 23003 TYPE BUI MAP/LOT/EX 122 670

HSE#/STREET/UNIT/UN 0100 REEF ROAD 0000

OWNER NAME: TOWN OF FFLD/POLICE DEPARTMENT
ADDRESS: 725 OLD POST ROAD

FAIRFIELD CT 06430

PHONE: 000 2563000

CONTRACTOR NAME: NEXTEL
ADDRESS: 575 CORPORATE DR SUITE 402

PHONE: 201 5290013

LICENSE#: 00000000 0

DESCRIPTION 10 X 30 EQUIP SHELTER & 150 FT ANTENNA*****CO # 10921 ISSUED
19/29/94*****

DATE ENTERED 25May1994 ISSUED 25May1994 EXPIRED 21Nov1994

COST \$80,000.00 RECEIPT 00000 FEE \$0.00 PEN \$0.00

BPERM# 00000 CTYPE ADD OCCUP COMM

Exhibit B
Property Card

100 REEF ROAD

Location 100 REEF ROAD

Mblu 182/ 670/ / /

Acct# 05288

Owner FAIRFIELD TOWN OF

Assessment \$5,634,300

Appraisal \$8,049,000

PID 16390

Building Count 2

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2022	\$6,569,900	\$1,479,100	\$8,049,000

Assessment			
Valuation Year	Improvements	Land	Total
2022	\$4,598,930	\$1,035,370	\$5,634,300

Owner of Record

Owner FAIRFIELD TOWN OF
Co-Owner
Care Of
Address 725 OLD POST ROAD
FAIRFIELD, CT 06824

Sale Price \$0
Certificate
Book & Page 0137/0640
Sale Date 01/01/1800
Qualified U

Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
FAIRFIELD TOWN OF	\$0		0137/0640	01/01/1800

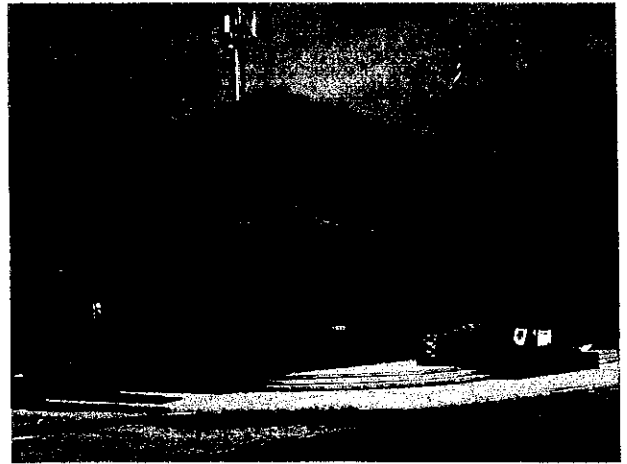
Building Information

Building 1 : Section 1

Year Built: 1975
Living Area: 24,580
Replacement Cost: \$6,121,929
Building Percent Good: 89
Replacement Cost
Less Depreciation: \$5,448,500

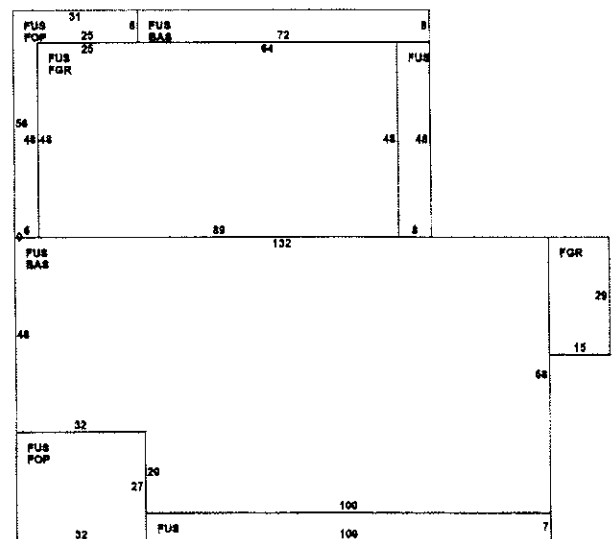
Building Attributes	
Field	Description
Style:	Police Station
Model	Ind/Comm
Grade	Average Plus
Stories:	2
Occupancy	1.00
Exterior Wall 1	Brick/Masonry
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Rolled Compos
Interior Wall 1	Minim/Masonry
Interior Wall 2	Drywall
Interior Floor 1	Vinyl/Asphalt
Interior Floor 2	Carpet
Heating Fuel	Gas
Heating Type	Hot Water
AC Type	Central
Struct Class	
Bldg Use	Police Dept
Total Rooms	
Total Bedrms	00
Total Baths	0
Liv Area	
Effect Area	
1st Floor Use:	9031
Heat/AC	Heat/AC Split
Frame Type	Fireprf Steel
Baths/Plumbing	Average
Ceiling/Wall	Sus-Ceil/Mn WI
Rooms/Prtns	Average
Wall Height	14.00
% Comn Wall	0.00

Building Photo



(https://images.vgsi.com/photos2/FairfieldCTPhotos/A0075\IMG_6365_755)

Building Layout



(ParcelSketch.ashx?pid=16390&bid=14800)

Building Sub-Areas (sq ft)			
Code	Description	Gross Area	Living Area
FUS	Upper Story, Finished	15,668	15,668
BAS	First Floor	8,912	8,912
FGR	Garage	4,707	0
FOP	Porch, Open, Finished	1,400	0
		30,687	24,580

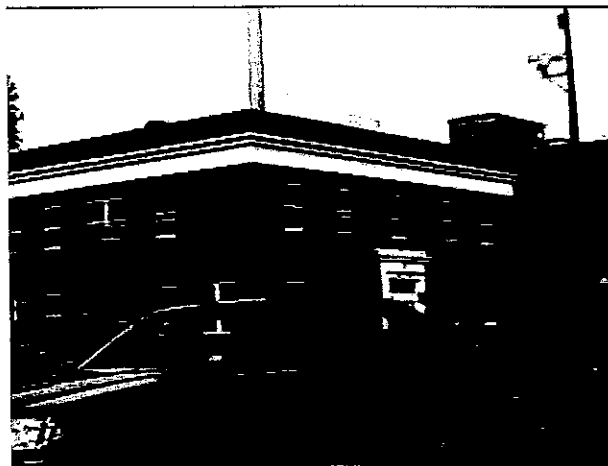
Building 2 : Section 1

Year Built: 1953
Living Area: 8,000
Replacement Cost: \$1,332,640
Building Percent Good: 56
Replacement Cost
Less Depreciation: \$746,300

Building Attributes : Bldg 2 of 2

Field	Description
Style:	Office
Model	Ind/Comm
Grade	Average
Stories:	2
Occupancy	1.00
Exterior Wall 1	Brick/Masonry
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Rolled Compos
Interior Wall 1	Plastered
Interior Wall 2	Minim/Masonry
Interior Floor 1	Vinyl/Asphalt
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Hot Water
AC Type	Central
Struct Class	
Bldg Use	Police Dept
Total Rooms	
Total Bedrms	00
Total Baths	0
Liv Area	
Effect Area	
1st Floor Use:	9031
Heat/AC	None
Frame Type	Masonry
Baths/Plumbing	Average
Ceiling/Wall	Ceil & Min Wl
Rooms/Prtns	Average
Wall Height	10.00
% Comn Wall	0.00

Building Photo



(<https://images.vgsi.com/photos2/FairfieldCTPhotos/A00\00\14\66.jpg>)

Building Layout

Building Layout (ParcelSketch.ashx?pid=16390&bid=14801)

Building Sub-Areas (sq ft)			
Code	Description	Gross Area	Living Area
BAS	First Floor	4,000	4,000
FUS	Upper Story, Finished	4,000	4,000
		8,000	8,000

Extra Features

Extra Features				
Code	Description	Size	Value	Bldg #
MEZ1	MEZZANINE-UNF	1760.00 S.F.	\$37,600	1
SPR1	SPRINKLERS-WET	8000.00 S.F.	\$10,800	2
ELV1	PASS ELEV	2.00 STOPS	\$41,400	2
VLT1	VAULT-AVG	84.00 S.F.	\$24,700	1

ELV1	PASS ELEV	2.00 STOPS	\$65,900	1
ELV2	FREIGHT ELEV	2.00 STOPS	\$47,200	1
SPAN	SOLAR PANELS	80.00 UNITS	\$0	1

Land

Land Use

Land Line Valuation

Use Code 9031
Description Police Dept
Zone A
Neighborhood C3
Alt Land Appr No
Category

Size (Sqr Feet) 65200
Depth 0
Assessed Value \$1,035,370
Appraised Value \$1,479,100

Outbuildings

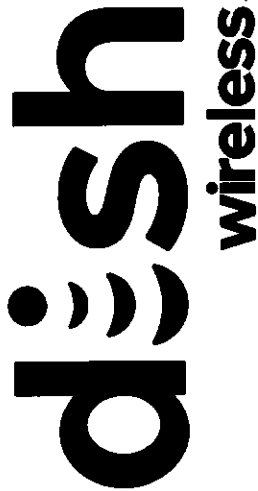
Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
LT1	LIGHTS-IN W/PL			9.00 UNITS	\$6,800	1
FN3	FENCE-6' CHAIN			300.00 L.F.	\$2,800	1
PAV1	PAVING-ASPHALT			40000.00 S.F.	\$133,200	1
SHD2	W/LIGHTS ETC			300.00 S.F.	\$4,700	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2021	\$6,569,900	\$1,479,100	\$8,049,000
2020	\$6,569,900	\$1,479,100	\$8,049,000
2019	\$4,826,700	\$1,531,000	\$6,357,700

Assessment			
Valuation Year	Improvements	Land	Total
2021	\$4,598,930	\$1,035,370	\$5,634,300
2020	\$4,598,930	\$1,035,370	\$5,634,300
2019	\$3,378,690	\$1,071,700	\$4,450,390

Exhibit C
Project Plans



DISH Wireless L.L.C. SITE ID:
NJER01114A

DISH Wireless L.L.C. SITE ADDRESS:
**100 REEF ROAD
FAIRFIELD, CT 06824**

CONNECTICUT CODE OF COMPLIANCE

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITY, NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:
 2022 CT STATE BUILDING CODE/2021 IBC w/ CT AMENDMENTS
 2022 CT STATE BUILDING CODE/2021 IBC w/ CT AMENDMENTS
 2022 CT STATE BUILDING CODE/2020 NEC w/ CT AMENDMENTS
 ELECTRICAL

SHEET INDEX

SHEET NO.	SHEET TITLE
T-1	TITLE SHEET
A-1	OVERALL SITE PLAN
A-2	OVERALL EQUIP. PLAN & ENHANCED EQUIPMENT PLAN
A-3	ELEVATION
A-3a	ANTENNA LAYOUT AND SCHEDULE
A-4	EQUIPMENT DETAILS
A-5	EQUIPMENT DETAILS
A-6	EQUIPMENT DETAILS
SM-1	MODIFICATION INSPECTION CHECKLIST & NOTES
SM-2	REINFORCEMENT NOTES
SD-1	MONOPOLE REINFORCEMENT ELEVATION, SCHEDULE, & NOTES
SD-2	MONOPOLE REINFORCEMENT PLAN
SD-3	MONOPOLE REINFORCEMENT PLATE DETAILS
E-1	ELECTRICAL/FIBER ROUTE PLAN AND NOTES
E-2	ELECTRICAL DETAILS
E-3	ELECTRICAL ONE-LINE & PANEL SCHEDULE
E-4	PPC NEUTRAL-TO-GROUND SCHEMATIC
G-1	GROUNDING PLANS AND NOTES
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS
RF-1	RF CABLE COLOR CODE
RF-2	RF SHIELDING AND AMBROSCIOSIS
RF-3	RF SHIELDING
RF-4	GENERAL NOTES
RF-5	GENERAL NOTES
RF-6	GENERAL NOTES
RF-7	GENERAL NOTES

MONOPOLE SCOPE OF WORK

TOWER SCOPE OF WORK:
 * TO BE STRUCTURALLY MODIFIED PRIOR TO THE INSTALLATION OF PROPOSED EQUIPMENT EXISTING MONOPOLE (REFER TO SHEETS SM-1, SM-2, SD-1, SD-2, SD-3)

SCOPE OF WORK

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

- TOWER SCOPE OF WORK:
- INSTALL (1) PROPOSED PANEL ANTENNA (1 PER SECTION)
- INSTALL (1) PROPOSED TOWER SHIELD
- INSTALL (1) PROPOSED LAMP
- INSTALL (1) PROPOSED PROTECTION DEVICE (OPP)
- INSTALL (1) PROPOSED HYDRIC CABLE
- GRADE SURFACE OF WORK:
- REMOVE (1) EXISTING METAL PLATFORM
- INSTALL (1) PROPOSED CABLE TRAY
- INSTALL (1) PROPOSED PFC CABLE CABINET
- REMOVE (1) EXISTING POWER CABINET
- INSTALL (1) PROPOSED TELLER CABINET
- INSTALL (1) PROPOSED TELLER CABINET
- INSTALL (1) PROPOSED TELLER CABINET
- INSTALL (1) PROPOSED SAFETY SWITCH (IF REQUIRED)
- INSTALL (1) PROPOSED FIBER (IF REQUIRED)
- INSTALL (1) EXISTING METER BOX (OLD METERBOX LOCATED)

SITE PHOTO



UNDERGROUND SERVICE ALERT (CITY) 811
 UTILITY NOTIFICATION CENTER OF CONNECTICUT
 (800) 832-4485
 14744.CD10.COM
 CALL 3 BEFORE ANY UTILITY APPROXIMATE AREA TO CONSTRUCTION

GENERAL NOTES

THE FACILITY IS UNLICENSED AND NOT FOR HUMAN habitation. A TOWER SHALL NOT BE USED FOR STORAGE OR STORAGE. NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SERVICE IS PROVIDED.

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

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

SITE INFORMATION

PROPERTY OWNER: TOWN OF FAIRFIELD
 ADDRESS: 100 REEF ROAD
 FAIRFIELD, CT 06824

TOWER TYPE: MONOPOLE

TOWER CO SITE ID: N/A

TOWER APP NUMBER: N/A

COUNTY: FAIRFIELD COUNTY

LATITUDE (NAD 83): 41° 0' 22.45" N

LONGITUDE (NAD 83): 72° 15' 24.45" W

ZONING JURISDICTION: CT STATE COUNCIL
 TOWN OF FAIRFIELD

ZONING DISTRICT: A

PANEL NUMBER: 102-616

OCCUPANCY GROUP: AU

CONSTRUCTION TYPE: I-8

POWER COMPANY: UNITED ILLUMINATING CO.

TELEPHONE COMPANY: TELS.

PROJECT DIRECTORY

APPLICANT: DISH WIRELESS L.L.C.
 5701 SOUTH SHAWA FE DRIVE
 LITTLETON, CO 80120

TOWER OWNER: TOWN OF FAIRFIELD
 728 OLD FORT ROAD
 FAIRFIELD, CT 06824

SITE DESIGNER: TECTONIC ENGINEERING
 CONSULTANTS, GEOLGISTS &
 LAND SURVEYORS, D.P.C., INC
 1278 ROUTE 300
 NEWBRIDGE, NJ 07090

SITE ACQUISITION: TECTONIC ENGINEERING
 CONSULTANTS, GEOLGISTS &
 LAND SURVEYORS, D.P.C., INC
 1278 ROUTE 300
 NEWBRIDGE, NJ 07090

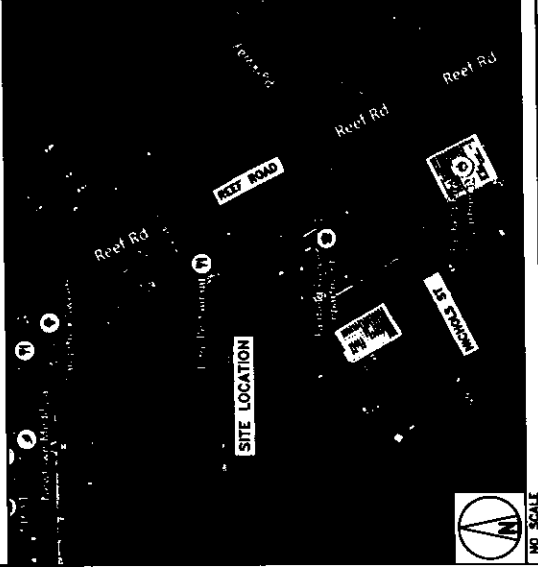
CONSTRUCTION MANAGER: MAIL, INSOLGERS
 MAIL,INSOLGERS@GMAIL.COM

RF ENGINEER: PHILIP MCGUIRE
 PHILIP.MCGUIRE@AOL.COM

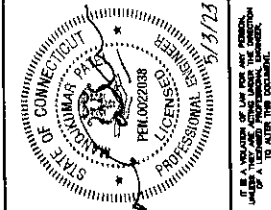
DIRECTIONS

DIRECTIONS FROM 5 ADP BOULEVARD, ROSELAND, NJ:
 TURN RIGHT ON DIXON AND GO WEST UNTIL YOU REACH THE FIRST LIGHT RAIL STATION. TURN LEFT ON DIXON AND GO WEST UNTIL YOU REACH THE SECOND LIGHT RAIL STATION. TURN RIGHT ON DIXON AND GO WEST UNTIL YOU REACH THE THIRD LIGHT RAIL STATION. TURN LEFT ON DIXON AND GO WEST UNTIL YOU REACH THE FOURTH LIGHT RAIL STATION. TURN RIGHT ON DIXON AND GO WEST UNTIL YOU REACH THE FIFTH LIGHT RAIL STATION. TURN LEFT ON DIXON AND GO WEST UNTIL YOU REACH THE SIXTH LIGHT RAIL STATION. TURN RIGHT ON DIXON AND GO WEST UNTIL YOU REACH THE SEVENTH LIGHT RAIL STATION. TURN LEFT ON DIXON AND GO WEST UNTIL YOU REACH THE EIGHTH LIGHT RAIL STATION. TURN RIGHT ON DIXON AND GO WEST UNTIL YOU REACH THE NINTH LIGHT RAIL STATION. TURN LEFT ON DIXON AND GO WEST UNTIL YOU REACH THE TENTH LIGHT RAIL STATION. TURN RIGHT ON DIXON AND GO WEST UNTIL YOU REACH THE ELEVENTH LIGHT RAIL STATION. TURN LEFT ON DIXON AND GO WEST UNTIL YOU REACH THE TWELFTH LIGHT RAIL STATION. TURN RIGHT ON DIXON AND GO WEST UNTIL YOU REACH THE THIRTEENTH LIGHT RAIL STATION. TURN LEFT ON DIXON AND GO WEST UNTIL YOU REACH THE FOURTEENTH LIGHT RAIL STATION. TURN RIGHT ON DIXON AND GO WEST UNTIL YOU REACH THE FIFTEENTH LIGHT RAIL STATION. TURN LEFT ON DIXON AND GO WEST UNTIL YOU REACH THE SIXTEENTH LIGHT RAIL STATION. TURN RIGHT ON DIXON AND GO WEST UNTIL YOU REACH THE SEVENTEENTH LIGHT RAIL STATION. TURN LEFT ON DIXON AND GO WEST UNTIL YOU REACH THE EIGHTEENTH LIGHT RAIL STATION. TURN RIGHT ON DIXON AND GO WEST UNTIL YOU REACH THE NINETEENTH LIGHT RAIL STATION. TURN LEFT ON DIXON AND GO WEST UNTIL YOU REACH THE TWENTIETH LIGHT RAIL STATION.

VICINITY MAP



5701 SOUTH SHAWA FE DRIVE
 LITTLETON, CO 80120



DRAIN BY: CHECKED BY: APPROVED BY:
 VM JQ

REDS REV #:

CONSTRUCTION DOCUMENTS

REV #	DATE	DESCRIPTION
1	04/27/2024	ISSUED FOR I.L. MARK
1	04/27/2024	ISSUED FOR PLAN

ARE PROJECT NUMBER: 10770.NJER01114A

DISH WIRELESS L.L.C.
 PROJECT INFORMATION
 NJER01114A
 100 REEF ROAD
 FAIRFIELD, CT 06824

SHEET TITLE: TITLE SHEET

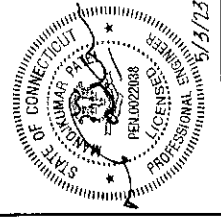
SHEET NUMBER: T-1



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



100 REEF ROAD
FAIRFIELD, CT 06424
PHONE: (860) 241-2322
FAX: (860) 241-2323
WWW.TECTONIC-CT.COM



IT IS A VIOLATION OF LAW TO REPRODUCE OR TRANSMIT THIS DOCUMENT IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER.

DRAWN BY: [] CHECKED BY: APPROVED BY: []

DATE: 03/27/2023

PROJECT NO: 10710.NJ.JER01114A

PROJECT NAME: DISH WIRELESS LLC

PROJECT ADDRESS: 100 REEF ROAD, FAIRFIELD, CT 06424

PROJECT DESCRIPTION: []

DATE: []

BY: []

FOR: []

SCALE: []

DATE: []

BY: []

FOR: []

SCALE: []

DATE: []

BY: []

FOR: []

SCALE: []

DATE: []

BY: []

FOR: []

SCALE: []

DATE: []

BY: []

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV. DATE DESCRIPTION

A 12/27/2022 ISSUED FOR PERMITS

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A&E PROJECT NUMBER
10710.NJ.JER01114A

DISH WIRELESS LLC
PROJECT INFORMATION

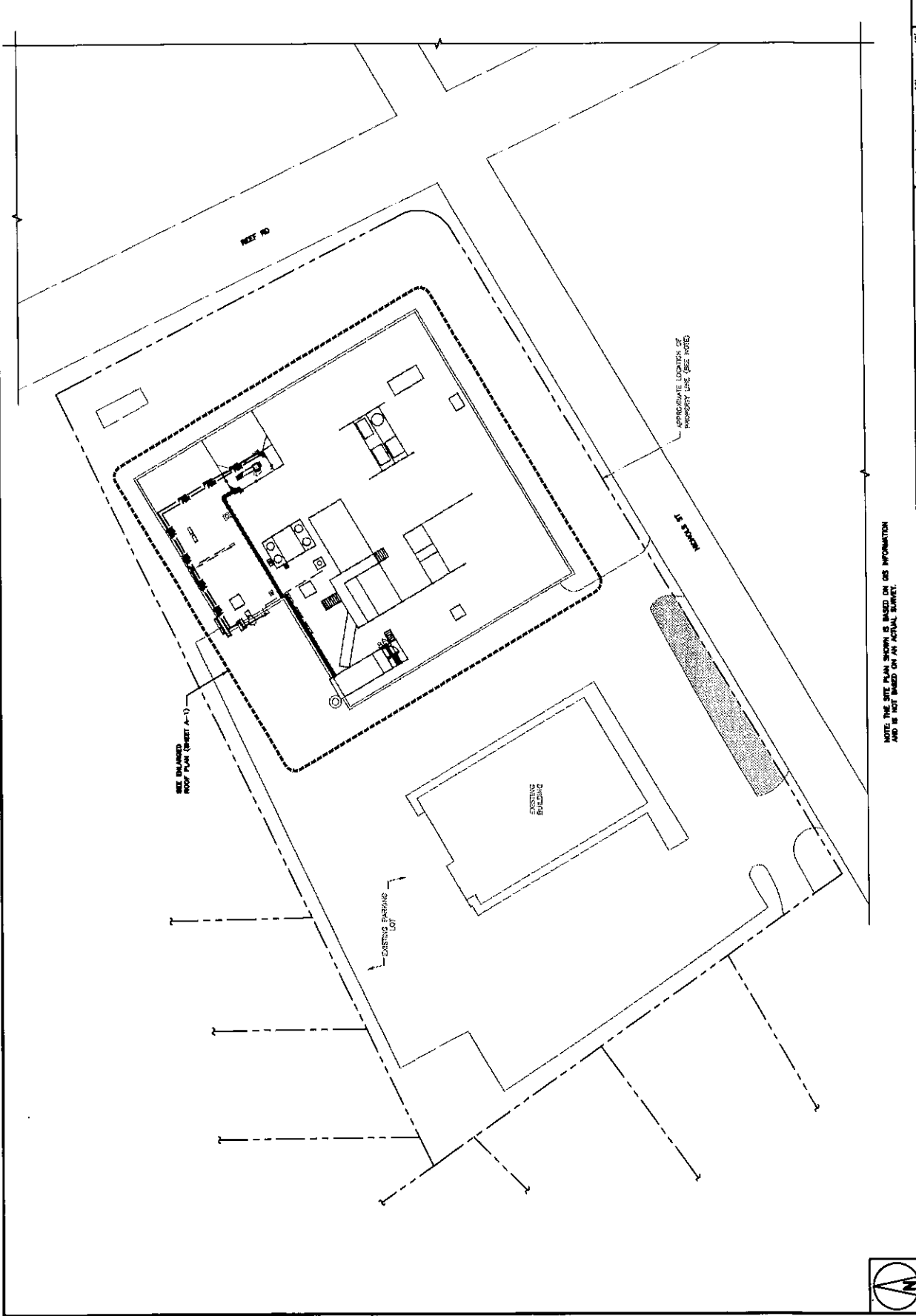
NJ.JER01114A

100 REEF ROAD

FAIRFIELD, CT 06424

SHEET TITLE
OVERALL SITE PLAN

SHEET NUMBER
A-1



NOTE: THE SITE PLAN SHOWN IS BASED ON GIS INFORMATION AND IS NOT BASED ON AN ACTUAL SURVEY.

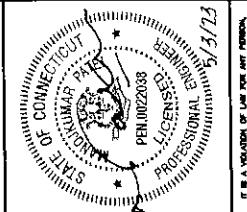
OVERALL SITE PLAN



1



5701 SPURD, SANTA FE DRIVE
LITTLETON, CO 80120



IT IS A VIOLATION OF LAW TO REPRODUCE OR TRANSMIT THIS DOCUMENT WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER.

DRAWN BY: CHECKED BY: APPROVED BY:

DATE: 12/27/2021

PROJECT NUMBER: 10770.NJER01114A

PROJECT INFORMATION: DISH WIRELESS LLC, NJER01114A, 100 REEF ROAD, FAIRFIELD, CT 06824

SHEET TITLE: OVERALL ROOF PLAN AND ENLARGED EQUIPMENT PLAN

SHEET NUMBER: A-2

CONSTRUCTION DOCUMENTS

DATE: 12/27/2021

REVISIONS:

NO. DATE DESCRIPTION

1 12/27/2021 ISSUED FOR PERMIT

DATE: 12/27/2021

PROJECT NUMBER: 10770.NJER01114A

PROJECT INFORMATION: DISH WIRELESS LLC

NJER01114A

100 REEF ROAD

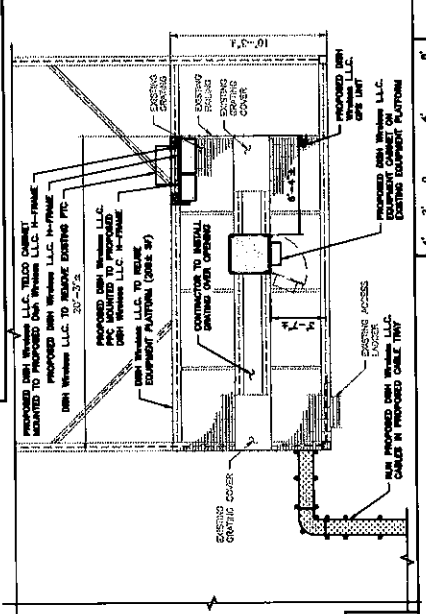
FAIRFIELD, CT 06824

SHEET TITLE: OVERALL ROOF PLAN AND ENLARGED EQUIPMENT PLAN

SHEET NUMBER: A-2

- NOTES**
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS.
 - CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED OPS UNIT, TRANSMITTING ANTENNAS AND EXISTING OPS UNIT.
 - ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
 - REFER TO STRUCTURAL NOTIFICATION ANALYSIS REPORT BY TECTONIC DATED 03/10/23.
 - REFER TO MOUNT ANALYSIS REPORT BY TECTONIC DATED 01/04/23.
 - REFER TO STRUCTURAL OPINION LETTER BY TECTONIC DATED 06/29/22.

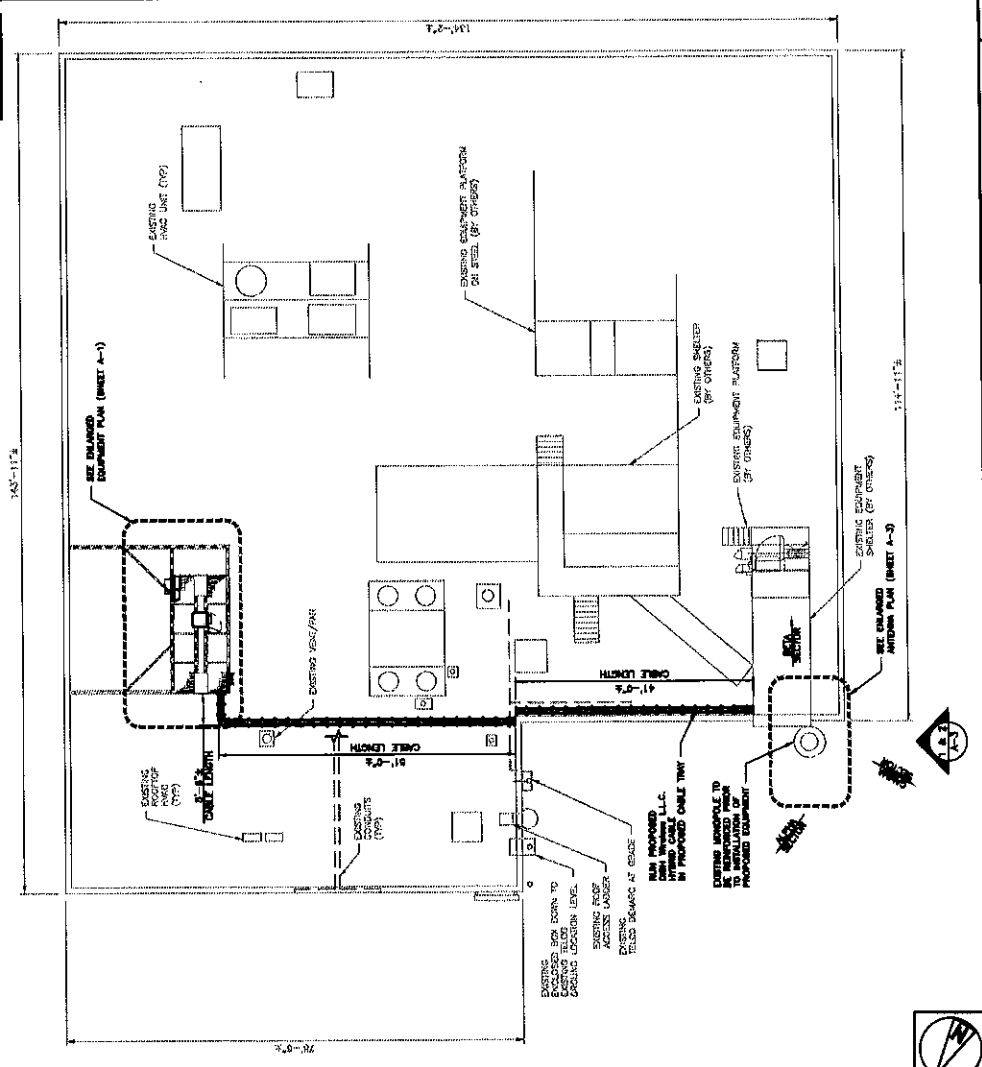
LEASE AREA: 20'6" x 10'-3"



ENLARGED EQUIPMENT PLAN

- NOTES**
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS.
 - ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
 - REFER TO STRUCTURAL NOTIFICATION ANALYSIS REPORT BY TECTONIC DATED 03/10/23.
 - REFER TO MOUNT ANALYSIS REPORT BY TECTONIC DATED 01/09/23.

ANTENNA AZIMUTHS	
ALPHA	70°
BETA	180°
GAMMA	330°



OVERALL ROOF PLAN

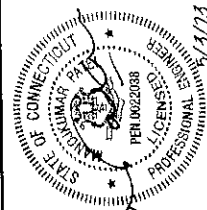
NO SCALE

NOT USED

12" 8" 4" 0" 10' 20'

1:16"=1'-0"

1:16"=1'-0"



IF A REVISION OF THE PER HAS OCCURRED,
PLEASE PRINT THE DATE AND THE REVISION
NUMBER AND THE DATE OF THE REVISION
TO THIS DOCUMENT.

DRAWN BY:	MA	JO	3
REVIS REV #:			

CONSTRUCTION DOCUMENTS

REV	DATE	DESCRIPTION
0	04/24/2018	ISSUED FOR I.L. REVIEW
1	04/24/2018	ISSUED FOR PERMITS

PROJECT NUMBER
107710.NJLJERO1114A

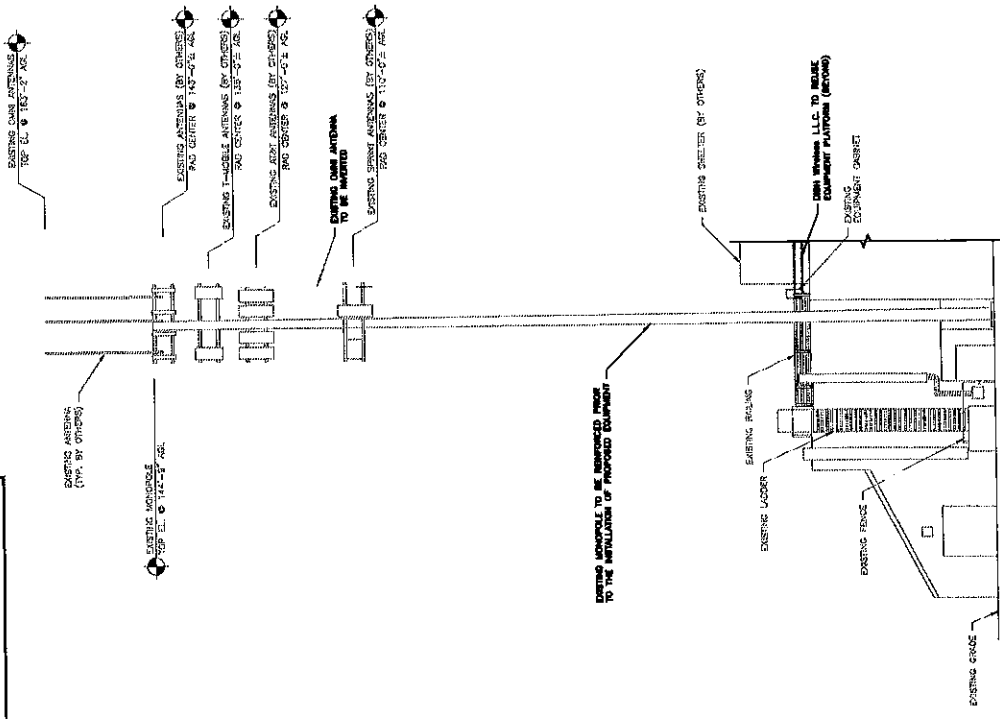
PROJECT INFORMATION
DISH Wireless, LLC.
NJLJERO1114A
100 REEF ROAD
FAIRFIELD, CT 06824

SHEET TITLE
ELEVATIONS
LAYOUT AND SCHEDULE

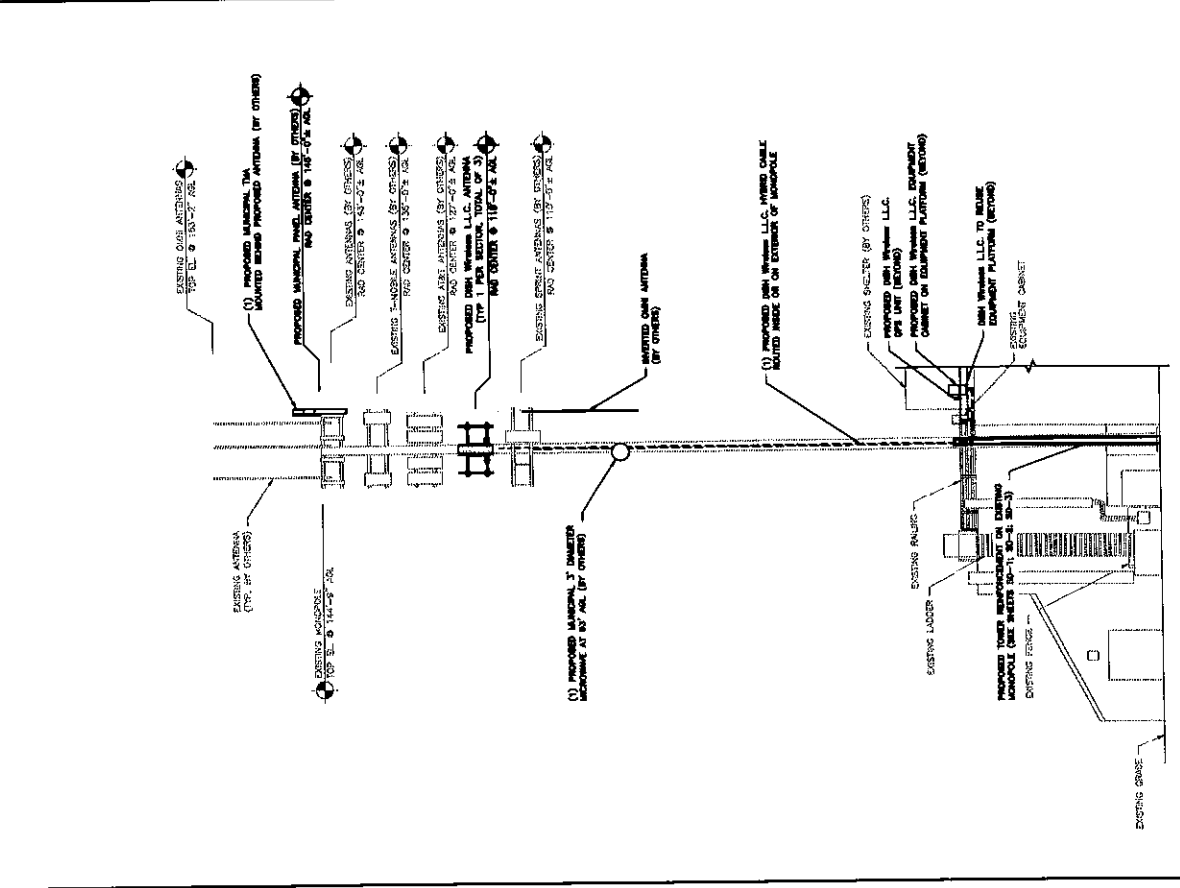
SHEET NUMBER
A-3

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MOUNT SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION PDS FOR ALL RF DETAILS.
3. REFER TO STRUCTURAL WORKSHEET ANALYSIS REPORT BY TECTONIC DATED 05/10/18.
4. REFER TO MECHANICAL ANALYSIS REPORT BY TECTONIC DATED 07/04/18.



EXIST WEST ELEVATION

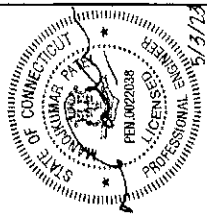


PROPOSED WEST ELEVATION





5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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DRAWN BY: CHECKED BY: APPROVED BY:
DATE: 05/13/23

CONSTRUCTION DOCUMENTS

REV	DATE	DESCRIPTION
1	05/13/23	ISSUED FOR PERMITS
2	05/13/23	ISSUED FOR PERMITS

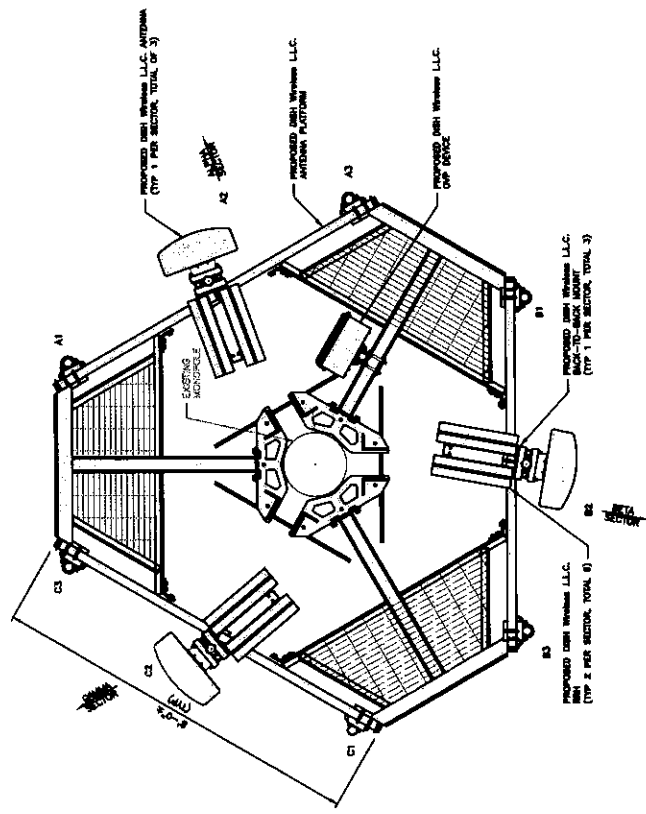
ABLE PROJECT NUMBER
10710.NJNER01144A

DISH WIRELESS LLC
PROJECT INFORMATION
NJNER01144A
100 REEF ROAD
FAIRFIELD, CT 06824

SHEET TITLE
ANTENNA
LAYOUT AND SCHEDULE

SHEET NUMBER
A-3

- NOTES**
- CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
 - ANTENNA AND WIRE DISH SPECIFICATIONS REFER TO THE PROPOSED DESIGN AND CONSTRUCTION REPORT FOR ALL RF DETAILS.
 - REFER TO MOUNT ANALYSIS REPORT BY TECTONIC DATED 01/07/23.



ANTENNA LAYOUT



SECTOR POLE	ANTENNA MANUFACTURER - MODEL NUMBER	TECH	HEIGHT	RIS CENTER	TRANSMISSION CABLE TYPE, LENGTH AND LOSS	MANUFACTURER - MODEL NUMBER	FEED POINT	TECH	MANUFACTURER MODEL
A2	COMSCOPE - P7V-438-R2	5G	70'	118'-0"	(1) HIGH-CAPACITY FIBER CABLE (200' LONG)	FLUTSU - TORQZS-8004	A2	5G	RAYCAP R03C-1181-PP-18
B2	COMSCOPE - P7V-438-R2	5G	180'	118'-0"	SHARED W/ALPHA	FLUTSU - TORQZS-8004	B2	5G	SHARED W/ALPHA
C2	COMSCOPE - P7V-438-R2	5G	330'	118'-0"	SHARED W/ALPHA	FLUTSU - TORQZS-8004	C2	5G	SHARED W/ALPHA

- NOTES**
- CONTRACTOR TO REFER TO FINAL CONSTRUCTION NOTES FOR ALL RF DETAILS.
 - ANTENNA AND WIRE DISH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. THE CONTRACTOR SHALL VERIFY THE MODELS AND SPECIFICATIONS WITH THE PROPOSED DESIGN AND STRUCTURAL ANALYSIS.
 - ANTENNAS ARE SUBJECT TO CHANGE AND NEED TO BE CONFIRMED WITH THE LATEST NOTES PRIOR TO THE START OF CONSTRUCTION.

ANTENNA SCHEDULE

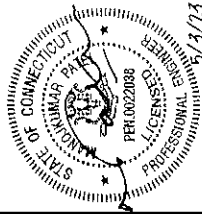
NO SCALE

2

1



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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DRAWN BY: CHECKED BY: APPROVED BY:
DATE: 11/11/14

RFDS REV # 3

CONSTRUCTION DOCUMENTS

REV	DATE	DESCRIPTION
0		ISSUED FOR PERMITS
1		ISSUED FOR PERMITS

A&E PROJECT NUMBER
10710-NJER01114A

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
NJJER01114A
100 REEF ROAD
FAIRFIELD, CT 06824

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

RAYCAP PPC
RDIAC-2485-P-240-MTS

ENCLOSURE DIMENSIONS (MIN/MAX):	36"X22.860"X12.883
WEIGHT:	80 LBS
OPERATING AC VOLTAGE:	240/120 V PHASE 3W-4Q

FRONT SIDE BACK

POWER PROTECTION CABINET (PPC) DETAIL

MINIMUM OF 75% OR 270° IN ANY DIRECTION

UPS UNIT

CONSTRUCTIONS MUST BE BELOW UPS

NO SCALE

SQUARE D SAFETY SWITCHES
D224NRB

ENCLOSURE DIM (MIN/MAX)	28.25"X18.00"X8.50"
ENCLOSURE TYPE	AREA 3R RAINPROOF
UL LISTED	FILE E-2875

FRONT SIDE

SAFETY SWITCH DETAIL

PCTEL	GPSOL-TMG-SPI-40NCB
DIMENSIONS (MIN/MAX) H/W/HXHT	8.125/8.000 X 3.5/3.250"
WEIGHT W/ACCESSORIES	075 LBS
CONNECTOR	M-FEMALE
FREQUENCY RANGE	1480 & 3. SURGE

FRONT SIDE

DELTA ELECTRONICS, INC.
ES0AB00-H3B04 (HEX)

DIMENSIONS (MIN/MAX)	16"X12"X12"
WEIGHT (GROSS)	625 LBS (approx)

FRONT SIDE

CABINET DETAIL

CHARLES CFTI-PF2020DSH1
FIBER TELCO ENCLOSURE

ENCLOSURE DIMS (MIN/MAX)	30"X30"X48"
ENCLOSURE WEIGHT	20 LBS
MOUNTING	WALL
COMPLIANCE	TYPE 4

FRONT SIDE BACK

GPS MINIMUM SKY VIEW REQUIREMENTS

1/2" DIA U-BOLTS (TYP)

PROPOSED LIGHTNING ROD WITHIN L.L.C. PERIOD PPC

NO SCALE

GPS DETAIL

CONIMSCOPE MTC-40-4SHFLD
H-FRAME

WEIGHT	28.74 LBS
LIMITS/SUPPORT INLS QTY	5

PIPE CAP

WELDMENT PIPE

SUPPORT RAIL

ONLY U-BOLTS

BASE PLATE

NO SCALE

FIBER TELCO ENCLOSURE DETAIL

1.767'

1.457'

OUTERSPANNOR (6 ANG CONDUCTORS)

24" MIN BEND RADIUS

NO SCALE

PPC AND TELCO CONNECTION DETAIL

NO SCALE

H-FRAME DETAIL

30"

20"

NO SCALE

CABLES UNLIMITED HYBRID CABLE
MINIMUM BEND RADIIUSES

1.767'

1.457'

OUTERSPANNOR (6 ANG CONDUCTORS)

24" MIN BEND RADIUS

NO SCALE

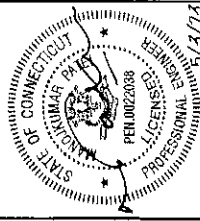
dish

wireless

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Tectonic

TECHNOLOGICAL SERVICES, INC.
1000 WEST 10TH AVENUE, SUITE 100
DENVER, CO 80202
TEL: 303.733.1100
WWW.TECTONICS.COM



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DRAWN BY: CHECKED BY: APPROVED BY:
DATE: 01/11/2023

RFDS REV #:

CONSTRUCTION DOCUMENTS

REV	DATE	DESCRIPTION
0	10/20/2022	ISSUED FOR ILL REVIEW
1	10/20/2022	ISSUED FOR PURCH

AME PROJECT NUMBER
10710-NJJC01114A

DISH WIRELESS, LLC
PROJECT INFORMATION
NJJC01114A
100 REEF ROAD
FAIRFIELD, CT 06824

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

COMSCOPE BACK-TO-BACK MOUNT RR-F42	
DIMENSIONS (HxWxD)	18.41" x 18.73" x 3.00"
WEIGHT	38.22 LB
PACKAGE QUANTITY	2

REMOTE RADIO MOUNT DETAIL	
DIMENSIONS (HxWxD)	18.49" x 14.39" x 24.11"
WEIGHT	21.82 LBS

SURGE SUPPRESSION DETAIL (OVP)	
DIMENSIONS (HxWxD)	18.49" x 14.39" x 24.11"
WEIGHT	21.82 LBS

FUJITSU DUAL BAND TA08023-8004	
DIMENSIONS (HxWxD)	14.8" x 15.7" x 7.8"
WEIGHT	43.8 LB
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -18V-30W

RRH DETAIL	
DIAMETER COMPATIBILITY	2.302" - 4.525"
NET WIDTH	13.499 IN

ANTENNA BRACKET DETAIL	
DIMENSIONS (HxWxD)	18.41" x 18.73" x 3.00"
WEIGHT	38.22 LB

FUJITSU TRIPLE BAND TA08023-8005	
DIMENSIONS (HxWxD)	14.8" x 15.7" x 7.8"
WEIGHT	74.08 LB
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -18V-30W

RRH DETAIL	
DIMENSIONS (HxWxD)	18.41" x 18.73" x 3.00"
WEIGHT	74.08 LB

ANTENNA DETAIL	
DIMENSIONS (HxWxD)	10" x 12"
WEIGHT	11 LB

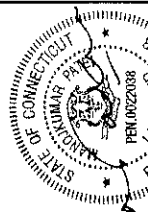
COMSCOPE XP-2040 CROSSOVER PLATE	
DIMENSIONS (HxWxD)	10" x 12"
WEIGHT	11 LB

ANTENNA PLATFORM DETAIL	
DIMENSIONS (HxWxD)	18" x 18" x 18"
WEIGHT	137.08 LB

RRH/OVP MOUNT DETAIL	
DIMENSIONS (HxWxD)	18" x 18" x 18"
WEIGHT	137.08 LB



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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DATE: _____

RFDS REV #:

3

CONSTRUCTION DOCUMENTS

REV	DATE	DESCRIPTION
0		ISSUED FOR PERMITS
1		ISSUED FOR PERMITS

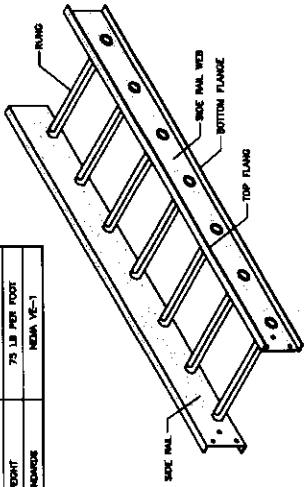
AGE PROJECT NUMBER
10710.NJER01114A

PROJECT INFORMATION
NJER01114A
100 REEF ROAD
FAIRFIELD, CT 06824

EQUIPMENT DETAILS
SHEET TITLE

SHEET NUMBER
A-6

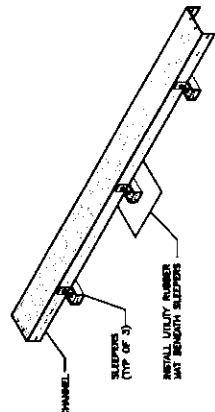
COPE 1848-1251-12-09 ROOFTOP LADDER TRAY	
DIMENSIONS (INCH)	48"X12"X12"
WEIGHT	75 LB PER FOOT
STANDARD	NSA VE-1



ROOFTOP LADDER TRAY DETAIL NO SCALE 3

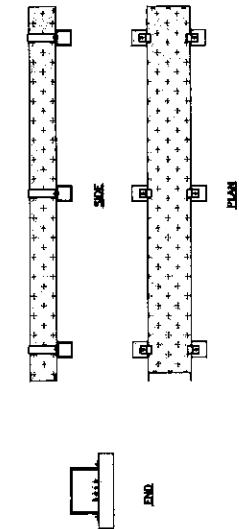
COMSCOPE MT-F1843 ROOFTOP CABLE BRIDGE KIT	
DIMENSIONS (INCH)	7"X30"X8"
WEIGHT	112.3 LB
CABLE RAIL QUANTITY	8

NOTE: THIS KIT INCLUDES 12- GAUGE STEEL AND 1/2" DIAMETER GALV. INCLUDES CHANNEL, HARDWARE AND (8) SLEEPERS



WALL MOUNTED CABLE TRAY DETAIL NO SCALE 2

COMSCOPE RT-C840 ROOFTOP COVER KIT	
DIMENSIONS (INCH)	7"X 11.25"X 8"
WEIGHT / VOLUME	85.5 LB / 1.1
CABLE RAIL (RT)	4

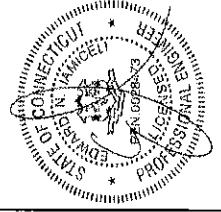


ROOFTOP CABLE TRAY DETAIL NO SCALE 1

NO SCALE	NO SCALE	NO SCALE	NO SCALE
4	5	6	9



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



THIS IS A NOTATION OF LAW FOR ANY REVISIONS TO THIS DOCUMENT.
DRAWN BY: CHECKED BY: APPROVED BY: DATE: 04/27/2011

CONSTRUCTION DOCUMENTS

REV	DATE	DESCRIPTION
1	04/27/2011	ISSUED FOR CONSTRUCTION

AME PROJECT NUMBER
10710.NJER01114A

ISSA WILKINS, LLC
PROJECT INFORMATION
NJER01114A
100 REEF ROAD
FAIRFIELD, CT 06824

SHEET TITLE
MODIFICATION INSPECTION CHECKLIST & NOTES

SHEET NUMBER
SN-1

MODIFICATION INSPECTION NOTES

GENERAL
THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF MONOPOLE MODIFICATIONS AND A REVIEW OF CONSTRUCTION DOCUMENTS. THE MI IS TO BE CONDUCTED IN CONJUNCTION WITH THE CONSTRUCTION DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).
THE MI IS TO VERIFY INSTALLATION CONFORMANCE AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF. WORK DONE BY THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY REMAINS WITH THE EOR AT ALL TIMES.
ALL MIs SHALL BE CONDUCTED BY AN OWNER APPROVED ENGINEERING VENDOR THAT IS APPROVED TO PERFORM ELEVATED WORK FOR THE OWNER.
TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AS SOON AS A PURCHASE ORDER (PO) IS RECEIVED. IT IS EXPECTED THAT THE MI INSPECTOR WILL BE CONTACTED BY THE GC TO DISCUSS THE MI INSPECTION. CONTACT INFORMATION IS NOT GIVEN, REFER TO THE PROJECT DOCUMENTS, CONSULTING THE INSTALLED INSPECTIONS, AND SUBMITTING THE MI REPORT TO THE OWNER.

MI INSPECTOR
THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:
• REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
• WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GC INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR COMPLIANCE TO THE CONTRACT DOCUMENTS, CONSULTING THE INSTALLED INSPECTIONS, AND SUBMITTING THE MI REPORT TO THE OWNER.

GENERAL CONTRACTOR
THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:
• REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
• WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
• BE SURE TO UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS
• BE SURE TO UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS
THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST.

RECOMMENDATIONS
THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF CONDUCTING AN MI INSPECTION:
• IT IS RECOMMENDED THAT THE GC PROVIDE A MINIMUM OF FIVE (5) BUSINESS DAYS NOTICE, PREFERABLY TEN (10), TO THE MI INSPECTOR TO ALLOW SUFFICIENT TIME TO SCHEDULE THE MI INSPECTION.
• THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
• TYPING OR RE-TRAINING OPERATIONS THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY CUT WIRE.
• IT MAY BE BENEFICIAL TO INSTALL ALL MONOPOLE MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS.
• WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO MAKE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON-SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI
IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, THE OWNER SHALL NOT BE RESPONSIBLE FOR ANY DELAYS OR CANCELS. THE GC SHALL BE RESPONSIBLE FOR KEEPING EQUIPMENT ON-SITE, ETC., IF THE OWNER CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MIs
IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI (FAILED MIs), THE GC SHALL WORK WITH THE OWNER TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:
• CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND OR, WITH THE OWNER'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

MI VERIFICATION INSPECTIONS
THE OWNER RESERVES THE RIGHT TO CONDUCT AN MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTIONS ON MONOPOLE MODIFICATION PROJECTS.
ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS.
CONSTRUCTION INSPECTIONS MAY BE CONDUCTED BY AN INSPECTION FIRM AFTER A VERIFICATION INSPECTION REPORT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED PASSING MI OR PASS AS NOTED IN REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS
BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:
1. PRE-CONSTRUCTION GENERAL SITE CONDITION
2. PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
• PHOTOS OF ALL CRITICAL DETAILS
• WELD PREPARATION
• WELDING POSITION
• SURFACE COATING REPAIR
3. POST CONSTRUCTION PHOTOGRAPHS
• FINAL IN FIELD CONDITION
PHOTOS OF ELEVATED MODIFICATIONS TAKEN ONLY FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

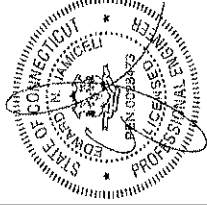
MODIFICATION INSPECTION (MI) CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWING
X	EOR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
X	FABRICATION CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (UTR)
NA	FABRICATION NDE INSPECTION
X	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	GENERAL CONSTRUCTION INSPECTION
X	SPECIAL INSPECTION OF STRUCTURAL STEEL ERECTION & BOLTING
X	SPECIAL INSPECTION OF FIELD WELDING
NA	CONTINUOUS FOUNDATION INSPECTIONS
NA	CONCRETE COMPRESSIVE STRENGTH AND SLUMP TESTS
NA	GROUT COMPRESSIVE STRENGTH TESTS (ASTM C942)
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION AND NDE REPORTS
NA	EARTHWORK LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUT WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
NA	NON-TENSION CONTROLLED BOLT INSPECTION (AS REQUIRED)
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR SIGNATURE OR RECORD DRAWINGS
X	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT REQUIRED FOR THE MI REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



DATE: 03/17/2012
TIME: 10:43:01 AM
USER: EJVARKEL
PROJECT: MONOPOLE REINFORCEMENT

DRAWN BY: [] IN: []

CONSTRUCTION DOCUMENTS

REV	DATE	DESCRIPTION
A	03/17/2012	ISSUED FOR CONSTRUCTION

AME PROJECT NUMBER
10710.NJ.JER01114A

DISH Wireless LLC
PROJECT INFORMATION
NJ.JER01114A
100 REEF ROAD
FAIRFIELD, CT 06824

SHEET TITLE
**MONOPOLE REINFORCEMENT
ELEVATION, SCHEDULE & NOTES**

SHEET NUMBER
SD-1

MONOPOLE MODIFICATION SCHEDULE

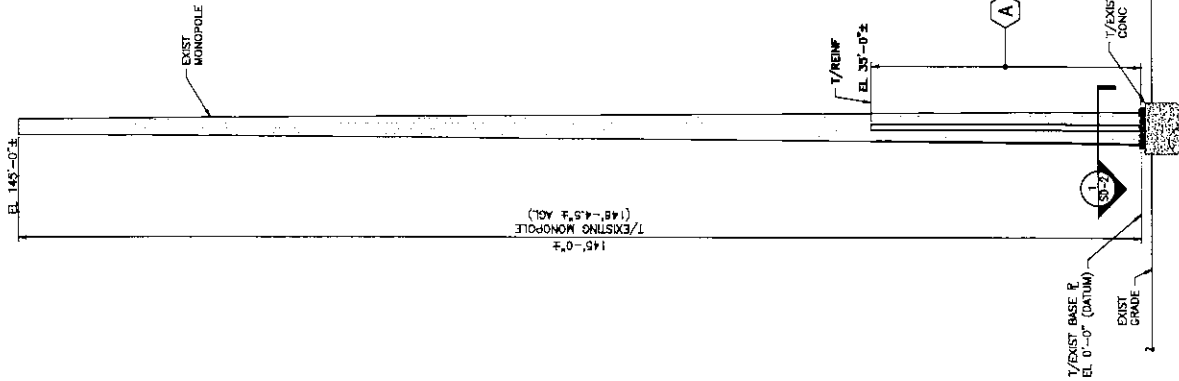
SECTION	ELEVATION	COMPONENT TYPE	EXISTING COMPONENT	REINFORCING MEMBER	DESCRIPTION
A	0'-0"± TO 35'-0"±	POLE SHAFT	48.98" O.D. X 2.5" DIA. (12 SCHED) POLE	(5) 2 1/2" X 5.5" X 5'-0"	INSTALL REINFORCING PLATES ON POLE. SEE PLAN 1/SD-2, AND DETAIL 1/SD-3.

MONOPOLE MODIFICATION NOTES

1. THE PROPOSED POLE REINFORCEMENT CONNECTION DETAILS AS SHOWN ARE TYPICAL. CONTRACTOR SHALL COORDINATE FINAL INSTALLATION METHOD AND PROCEDURE WITH FABRICATOR.
2. THE PLACEMENT OF REINFORCING MEMBERS IS BASED ON A LIMITED VISUAL INSPECTION. FINAL LOCATION OF PROPOSED REINFORCEMENT SHALL BE VERIFIED IN FIELD PRIOR TO FABRICATION.
3. THIS IS A CONCEPTUAL REINFORCEMENT DESIGN AND ASSUMES THAT THE PROPOSED REINFORCEMENT CAN BE INSTALLED SYMMETRICALLY AROUND THE POLE SHAFT AS DETAILED ON THIS SHEET. CONTRACTOR SHALL CONDUCT A FIELD SURVEY TO VERIFY THE LOCATION AND CONDITION OF EXISTING POLE AND REINFORCEMENT. FIELD INVESTIGATION IS REQUIRED PRIOR TO FABRICATION/BIDDING OF THE PROJECT AND SHALL BE APPROVED BY THE ENGINEER OF RECORD.
4. REMOVE AND REPLACE EXISTING STEP BOLTS, CLIMBING RINGS/FEES, SURROUNDING LOG ANGLES, AND GROUND LEADS AS REQUIRED TO ALLOW FOR INSTALLATION OF THE PROPOSED REINFORCEMENT. SOME EXISTING POLE HARDWARE ITEMS HAVE BEEN IDENTIFIED FOR CLARITY.
5. REINFORCING PLATES SHALL BE FABRICATED WITH **MINIMUM 85 MI NOT-DIP GALVANIZED STEEL** CONFORMING TO ASTM A572, HIGH-STRENGTH LOW-ALLOY COLUMBIUM-VANADIUM STEEL, PER ASTM A572. SHOP DRAWINGS DETAILING THE PROPOSED REINFORCEMENT SHALL BE SUPPLIED TO THE CONTRACTOR BY THE FABRICATOR AND SUBMITTED TO TECTONIC FOR FINAL APPROVAL.
6. ALL FIELD WELDING AND STRUCTURAL STEEL ERECTION/BOLTING WORK, INCLUDING ANCHOR BOLT MODIFICATIONS AND BUM BOLT FASTENING, SHALL BE SUBJECT TO SPECIAL INSPECTIONS DURING CONSTRUCTION AS INDICATED. SEE ASSOCIATION INSPECTOR (AI) SHEET(S).

ELEVATION NOTES:

1. REINFORCEMENT OF THE EXISTING MONOPOLE HAS BEEN DESIGNED TO SUPPORT THE ANTENNAS AND CABLES LISTED IN THE STRUCTURAL MODIFICATION ANALYSIS REPORT BY TECTONIC, DATED 3/10/23. CONTRACTOR SHALL VERIFY THE LOCATION AND CONDITION OF EXISTING ANTENNAS AND CABLES PRIOR TO FABRICATION OF STEEL OR ORDERING OF ANY PRODUCTS.
2. EXISTING STEP BOLTS, ANTENNAS, CABLES, WAVEGUIDE SHIELDS, AND OTHER APPURTENANCES ARE NOT SHOWN FOR CLARITY. CONTRACTOR SHALL IDENTIFY TO THE OWNER'S REPRESENTATIVE ALL EXISTING WAVEGUIDES, CABLES, CABLE ATTACHMENTS, SHIELDS AND OTHER APPURTENANCES REQUIRED FOR INSTALLATION OF PROPOSED REINFORCEMENT. CONTRACTOR SHALL PLAN AND COORDINATE ALL TEMPORARY REMOVAL AND/OR PERMANENT RELOCATION DIRECTLY WITH THE OWNER'S REPRESENTATIVE AND OBTAIN WRITTEN PERMISSION FROM THE REPRESENTATIVE PRIOR TO ALTERATION OF ANY EXISTING WAVEGUIDES, CABLES, ANTENNAS, OR OTHER APPURTENANCES. MAINTAIN EXISTING ANTENNA AZIMUTHS.
3. EXISTING SHELTERS, EQUIPMENT, FENCE, AND OTHER SITE FEATURES ARE NOT SHOWN FOR CLARITY.



MONOPOLE REINFORCEMENT PARTIAL ELEVATION

SCALE: 1/8" = 1'-0" (22x34 SIZE)
1/16" = 1'-0" (11x17 SIZE)

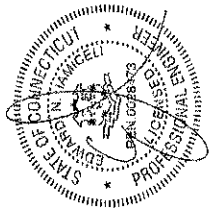
SD-1



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



1000 WEST 10TH AVENUE, SUITE 100
DENVER, CO 80202
TEL: 303.733.1000
WWW.TECTONIC.COM



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DATE: [] IN: []

CONSTRUCTION DOCUMENTS

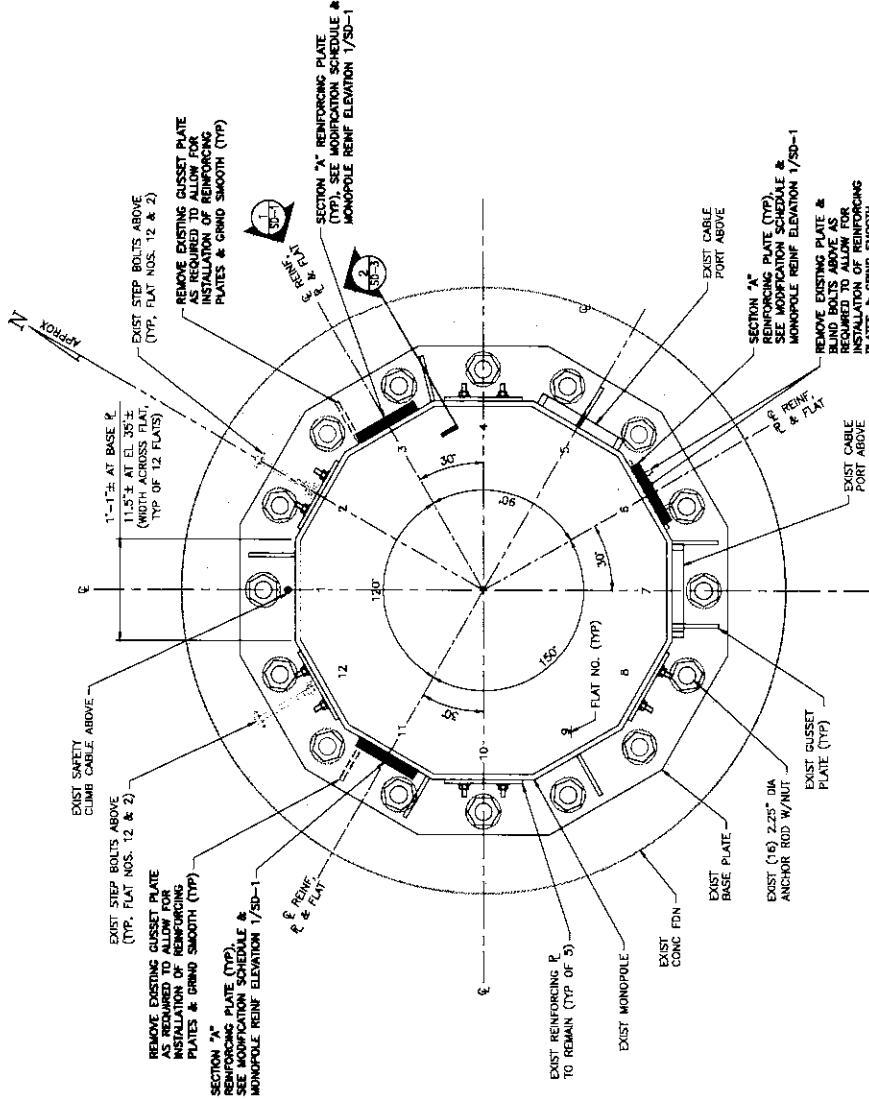
REV	DATE	DESCRIPTION
A	10/17/2003	ISSUED FOR CONSTRUCTION

AGE PROJECT NUMBER
10710.NJHER01114A

PROJECT INFORMATION
NJHER01114A
100 REEF ROAD
FAIRFIELD, CT 06824

SHEET TITLE
MONOPOLE REINFORCEMENT PLANS

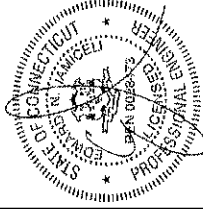
SHEET NUMBER
SD-2



MONOPOLE REINFORCEMENT PLAN AT BASE PLATE
(PLAN ROTATED FOR CLARITY)

FOR ALL WELDING AND ALL OTHER STEEL WORK, THE WELDER SHALL BE A LICENSED WELDER. THE WELDED REINFORCING MEMBERS AROUND THE POLE SHAFT AS DETAILED ON THIS DRAWING IS BASED ON A LIMITED VISUAL INSPECTION. THE LOCATION OF WELDED REINFORCING SHALL BE AS SHOWN AND DURING A DETAILED WALKTHROUGH BY THE CONTRACTOR IN FIELD PRIOR TO FABRICATION, AND ANY ADJUSTMENTS TO THE WELDED REINFORCING SHALL BE APPROVED BY THE ENGINEER OF RECORD. SHOP DRAWINGS DETAILING THE PROPOSED REINFORCING SHALL BE SUPPLIED TO THE CONTRACTOR BY THE MANUFACTURER AND APPROVAL PRIOR TO INSTALLATION. SEE MONOPOLE MODIFICATION NOTES ON SHEET BS-1 FOR ADDITIONAL INFORMATION.

- NOTES:**
1. REMOVE AND REPLACE EXISTING STEP BOLTS, GROUNDING LUG ANGLES, AND GROUND LEADS AS REQUIRED TO ALLOW FOR INSTALLATION OF THE PROPOSED REINFORCEMENT. SOME EXISTING POLE HARDWARE ITEMS HAVE BEEN OMITTED FOR CLARITY.
 2. EXISTING SAFETY CLIMB CABLE/RUNGS SHALL BE TEMPORARILY REMOVED AS REQUIRED TO ALLOW FOR REINFORCEMENT.
 3. WHEN WELDING OVER PRE-EXISTING WELDS, THE PRE-EXISTING WELDS SHALL BE INSPECTED BY A CERTIFIED WELDING INSPECTOR FOR DISCONTINUITIES BY VISUAL INSPECTION. IT IS RECOMMENDED THAT THE PRE-EXISTING WELDS ARE ALSO INSPECTED USING MAGNETIC PARTICLE TESTING, BUT THIS OPTION MAY BE WAIVED BY THE MONOPOLE OWNER. THE VISUAL INSPECTION DOES NOT REVEAL ANY POTENTIAL DISCONTINUITIES OF THE WELDS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT THE PRE-EXISTING WELDS DO NOT CONTAIN DISCONTINUITIES THAT MAY IMPACT THE CONNECTION CAPACITY.
 4. EXISTING ANTENNA CABLES, CABLE ATTACHMENTS, WAVEGUIDE SHIELD, AND OTHER APPURTENANCES NOT SHOWN FOR CLARITY.



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CHECKED BY: APPROVED BY: _____
DATE: _____

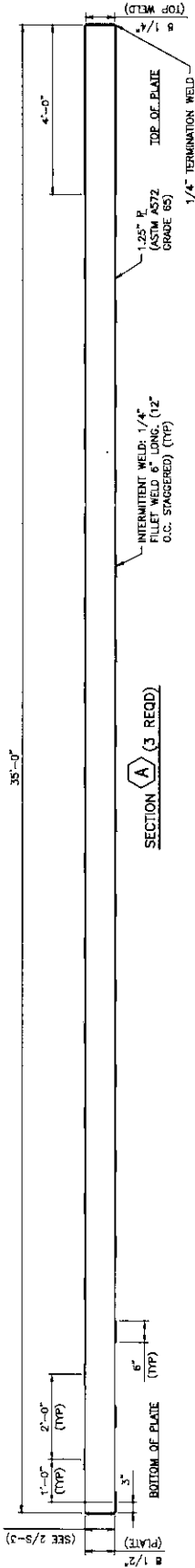
CONSTRUCTION DOCUMENTS

REV	DATE	DESCRIPTION
A	02/07/2023	ISSUED FOR CONSTRUCTION

AME PROJECT NUMBER
10710-NJERD1114A

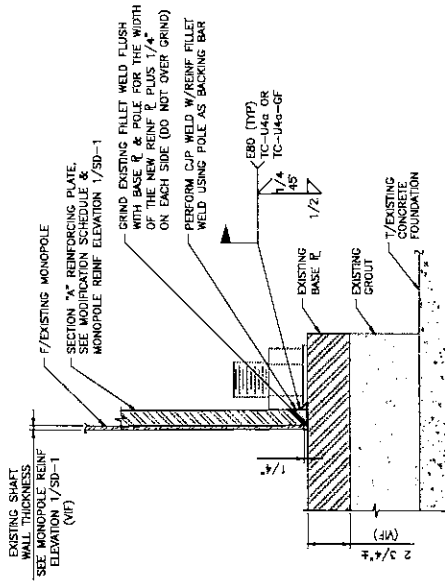
ISSUED BY: TECTONIC, L.L.C.
PROJECT INFORMATION
NJERD1114A
100 REEF ROAD
FAIRFIELD, CT 06824

SHEET TITLE
MONOPOLE REINFORCEMENT
PLATE DETAILS
SHEET NUMBER
SD-3



1 MONOPOLE REINFORCEMENT PLATE DETAIL

SCALE: 3/4" = 1'-0" (22x34 SIZE)
3/8" = 1'-0" (11x17 SIZE)



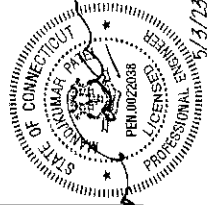
2 TYP REINFORCEMENT AT BASE PLATE DETAIL

SCALE: 3/4" = 1'-0" (22x34 SIZE)
6" = 1'-0" (11x17 SIZE)

dish
wireless

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Tectonic
ELECTRICAL ENGINEERING & CONSULTING
10000 E. WILSON AVENUE, SUITE 100
DENVER, CO 80231
TEL: 303.751.1100 FAX: 303.751.1101
WWW.TECTONICELECTRICAL.COM



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DATE: []

REVISIONS: []

DATE: []

DESCRIPTION: []

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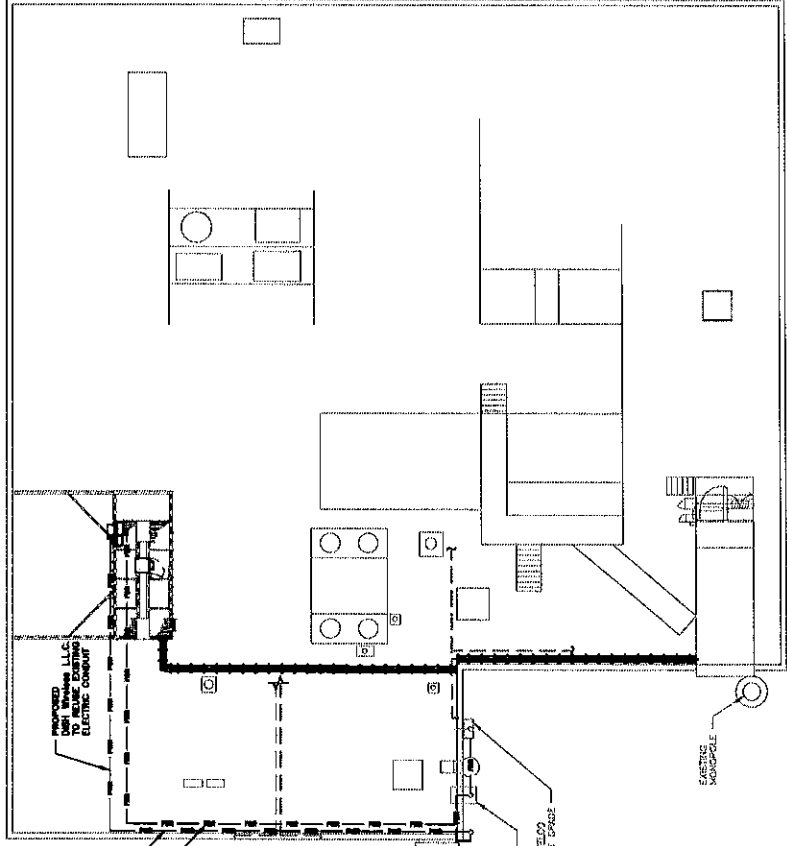
DATE: []

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

- CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING A BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARD TO THE CONTRACTOR'S FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CONSIDERATION, NOT AFTER THE CONTRACT HAS BEEN AWARDED.
- ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH CURRENT NATIONAL ELECTRICAL CODES AND ALL APPLICABLE LOCAL, STATE, AND FEDERAL CODES AND ORDINANCES. PROVIDE ALL COMPONENTS AND WIRING SIZES AS REQUIRED TO MEET NEC STANDARDS.
- LOCATION OF EQUIPMENT, CONDUIT AND DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SHALL BE COORDINATED WITH FIELD CONDITIONS PRIOR TO CONSTRUCTION.
- CONDUIT ROUTING SHALL BE COORDINATED WITH THE MECHANICAL EQUIPMENT TO AVOID LOCATION CONFLICTS. VERIFY WITH THE MECHANICAL EQUIPMENT CONTRACTOR AND COMPANY AS REQUIRED.
- CONTRACTOR SHALL PROVIDE ALL BREAKERS, CONDUITS AND CIRCUITS AS REQUIRED FOR A COMPLETE SYSTEM.
- CONTRACTOR SHALL PROVIDE ALL STRAIN RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES.
- INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
- ALL DISCONNECTS AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED PANEL IDENTIFIERS INDICATING EQUIPMENT CONTROLLED. BRANCH CIRCUITS IDENTIFIED ON PANEL FIELD LOCATIONS PER PANEL.
- INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS PER THE SPECIFICATIONS AND NEC 250. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BUNDLED AT ALL JUNCTION BOXES, PULL BOXES, AND ALL DISCONNECT, SWITCHES, AND EQUIPMENT CONDUITS.
- ALL NEW MATERIAL SHALL HAVE A U.L. LABEL.
- PANEL SCHEDULE LOADING AND CIRCUIT ARRANGEMENTS REFLECT POST-CONSTRUCTION EQUIPMENT.
- CONTRACTOR SHALL BE RESPONSIBLE FOR AS-BUILT PANEL SCHEDULE AND SITE DRAWINGS.
- ALL TRENCHES IN COMPOUND TO BE 18" WIDE DUG.

NOTES

- CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
- ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
- FOR UTILITY EASEMENT RIGHTS SPECIFIED IN THE GROUND LEASE, CUSTOMER MAY INSTALL EQUIPMENT WITHIN SPECIFIED UTILITY EASEMENT AREA. THIS AND THIS PATH OF THE UTILITY EASEMENT RIGHTS SPECIFIED IN THE GROUND LEASE SHALL BE FIELD VERIFIED PRIOR TO CONSTRUCTION. PROVIDE PROJECT DOCUMENTATION AND OTHER NECESSARY INFORMATION TO THE UTILITY PROVIDER PRIOR TO INSTALLATION. WHEN INSTALLING THE UTILITIES PLEASE LOCATE AND FOLLOW EXISTING PATH. IF EXISTING PATH IS MATERIALLY INCONGRUENT WITH THIS AND THIS PATH DEPICTED ON A-1 AND A-1 AND THIS DRAWING IS NOT NOTED ON OR, PLEASE NOTIFY TOWER OWNER AS FURNISHER COORDINATION MAY BE NEEDED.



ELECTRICAL NOTES

NO SCALE



1

2

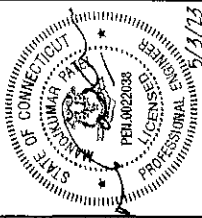
UTILITY ROUTE PLAN

E-1

10/13/23



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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DRAWN BY: []
CHECKED BY: []
DATE: []

CONSTRUCTION DOCUMENTS

REV	DATE	DESCRIPTION
0		ISSUED FOR I.L. REVIEW
1		ISSUED FOR PERMITS

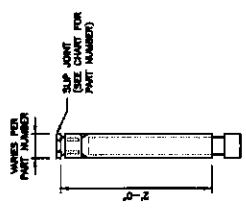
AAE PROJECT NUMBER
10710-NJ0101114A

DISH WIRELESS LLC
PROJECT INFORMATION
NJ0101114A
100 REEF ROAD
FAIRFIELD, CT 06824

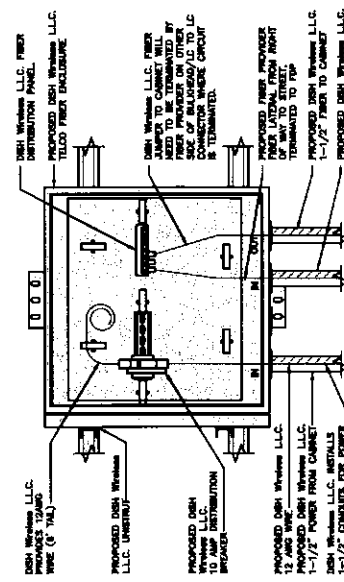
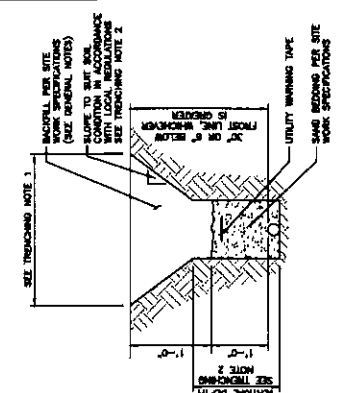
SHEET TITLE
ELECTRICAL
DETAILS

SHEET NUMBER
E-2

CARLON PART NUMBER	SIZE	QTY.	TRAVEL LENGTH
EM40	1/2"	30	4"
EM42	3/4"	15	4"
EM44	1"	10	4"
EM46	1 1/4"	5	4"
EM48	1 1/2"	5	4"
EM50	2"	15	8"
EM52	2 1/2"	10	8"
EM54	3"	10	8"
EM56	3 1/2"	5	8"
EM58	4"	5	8"
EM60	5"	1	8"
EM62	6"	1	8"



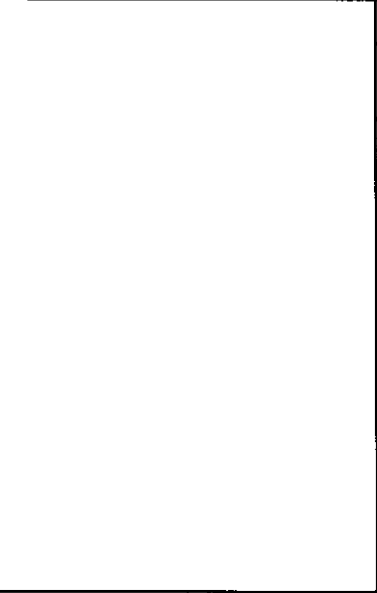
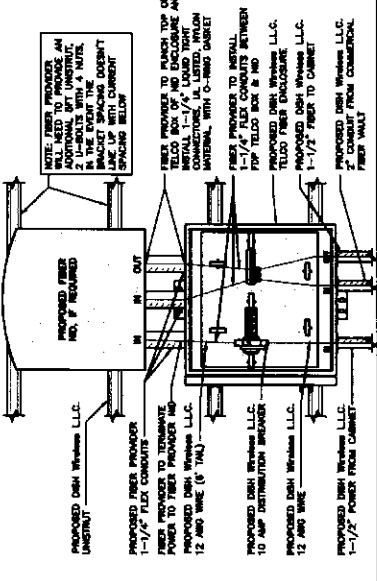
- TRENCHING NOTES**
- CONTRACTOR SHALL RESTORE THE EXISTING SURFACE TO ORIGINAL CONDITION BY EITHER BEDDING OR BACKFILLING WITH LOCAL REGULATION REPAIRING ASPHALT OR CONCRETE TO ITS ORIGINAL CROSS SECTION.
 - TRENCHING SAFETY, INCLUDING, BUT NOT LIMITED TO, SOIL CLASSIFICATION, SHIELDING, AND SHORING, SHALL BE COVERED BY THE CONTRACTOR IN ACCORDANCE WITH ALL APPLICABLE SAFETY STANDARDS.
 - ALL CONDUITS SHALL BE INSTALLED IN COMPLIANCE WITH THE CURRENT NATIONAL ELECTRIC CODE (NEC) OR AS APPROVED BY THE LOCAL AUTHORITY HAVING JURISDICTION. THE MOST STRINGENT SHALL APPLY.



DARK TELCO BOX - INTERIOR WIRING LAYOUT NO SCALE 3

TYPICAL UNDERGROUND TRENCH DETAIL NO SCALE 2

EXPANSION JOINT DETAIL NO SCALE 1



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

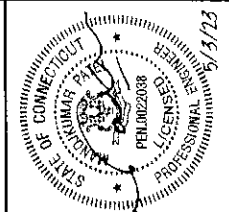
TYPICAL UNDERGROUND TRENCH DETAIL NO SCALE 2

DARK TELCO BOX - INTERIOR WIRING LAYOUT NO SCALE 3

NO.	SCALE	DESCRIPTION	NO.	SCALE	DESCRIPTION
5	NO SCALE	NOT USED	6	NO SCALE	NOT USED
7	NO SCALE	NOT USED	8	NO SCALE	NOT USED
9	NO SCALE	NOT USED	10	NO SCALE	NOT USED



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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DRAWN BY: CHECKED BY: APPROVED BY:

DATE: 04-23-23

REVISIONS: 3

CONSTRUCTION DOCUMENTS

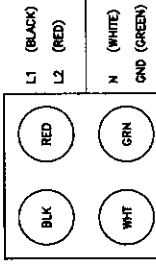
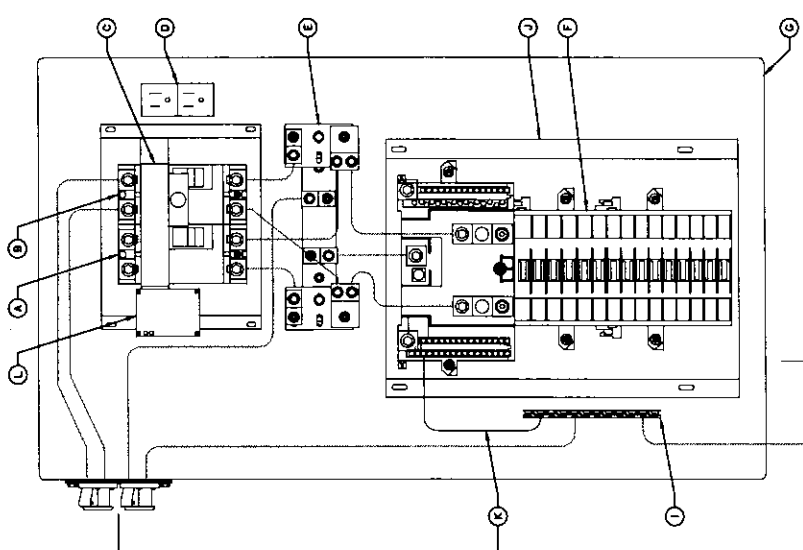
REV.	DATE	DESCRIPTION
1		ISSUED FOR PERMITS
2		ISSUED FOR BIDDING
3		ISSUED FOR CONSTRUCTION

AGE PROJECT NUMBER
10710.NJER01114A

PROJECT INFORMATION
DISI-WH-006 LLC
NJJER01114A
100 REEF ROAD
FAIRFIELD, CT 06824

SHEET TITLE
PPC NEUTRAL-TO-GROUND SCHEMATIC

SHEET NUMBER
E-4



CAUTION:
HAZARD OF ELECTRICAL SHOCK OR BURN. TURN OFF POWER SUPPLYING THIS EQUIPMENT BEFORE WORKING INSIDE.

RAYCAP CUSTOMER SERVICE
(800) 890-2549

NEUTRAL-TO-GROUND NOTES:

- WHEN THE PPC IS USED AS THE SERVICE ENTRANCE DEVICE, THE NEUTRAL TO GROUND BOND NEEDS TO BE ESTABLISHED IN THE PPC.
- WHEN THE SERVICE ENTRY DEVICE IS A MULTI-WIRE CENTER POINT SYSTEM, THE NEUTRAL TO GROUND BOND MUST BE ESTABLISHED IN THE PPC.
- THE GREEN AS WIRE IS PROVIDED WITH THE PPC CABINET AS A SEPARATE UNINSTALLED PART TO BE INSTALLED BY CONTRACTOR IF NEEDED.

NEUTRAL-TO-GROUND GROUNDING JUMPER

INSTALLATION INSTRUCTIONS:

- IF REQUIRED, THE #4-0 BONDING KIT SHOULD BE INSTALLED BY QUALIFIED PERSONNEL.
- ENSURE THE MAIN BREAKERS ARE OFF.
- USE THE GREEN AS WIRE PROVIDED WITH THE PPC.
- INSTALL THE JUMPER AS SHOWN IN THE WIRING DIAGRAM.
- TIGHTEN TERMINALS TO TORQUE VALUE SHOWN IN TORQUE TABLE.
- PLACE THE PROVIDED "SERVICE LABEL" IN THE SPACE BELOW THE WORDS "AC POWER" LOCATED ABOVE THE MAIN CIRCUIT BREAKERS IN THE UPPER PORTION OF THE BOND POINT.

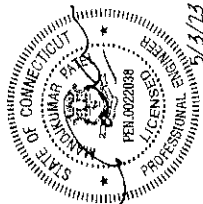
- NOTES:**
- HAZARD OF ELECTRICAL SHOCK OR BURN. TURN OFF POWER SUPPLYING THIS EQUIPMENT BEFORE WORKING INSIDE.
 - 100 OR 200 AMP, 240 VOLTS, SINGLE PHASE ALTERNATING CURRENT CIRCUIT ONLY
 - GENERATOR SHORT CIRCUIT RATINGS: 10,000 / 20,000 AMPS RMS SYMMETRICAL, AMPERES AT 240 VOLTS
 - UTILITY SHORT CIRCUIT RATINGS: 65,000 AMPS RMS SYMMETRICAL, AMPERES AT 240 VOLTS
 - SUITABLE FOR USE AS SERVICE EQUIPMENT
 - SUITABLE FOR USE IN ACCORDANCE WITH ARTICLE 702 OF THE NATIONAL ELECTRIC CODE (NEC) AND NFPA 70
 - BONDED NEUTRAL WHEN INSTALLED AS SHOWN IN WIRING DIAGRAM
 - RAIN PROOF TYPE 3R
 - USE CU-AL WIRE 60-75 °C
 - EQUIPPED WITH SLIDE BAR MECHANICAL INTERLOCK
 - INTERLOCK PROHIBITS BOTH POWER SOURCES FROM BEING IN THE ON POSITION SIMULTANEOUSLY
 - EQUIPPED WITH SQUARE D BREAKERS OR ALTERNATIVE MANUFACTURER EQUIVALENT
 - WHEN REPLACE LOAD CENTER BREAKERS, USE ONLY SQUARE D (OO TYPE) OF THE SAME RATING OR EQUIVALENT
 - WHEN RESETTING BREAKERS TURN TO OFF POSITION, THEN TO ON POSITION
 - WARNING: MAKE CONTINUITY CHECK WITH OHM METER TO VERIFY CORRECT PHASING AND GROUNDING CONNECTIONS BEFORE POWER UP
 - VERIFY PIN OUT CONFIGURATION OF GENERATOR PRIOR TO USE.
 - RISK OF ELECTRIC SHOCK BOTH ENDS OF DISCONNECTING MEANS MAY BE ENERGIZED. TEST BEFORE SERVICING
 - THIS SWITCH BOARD MAY CONTAIN A TAP ON THE SERVICE SIDE OF THE MAIN POWER DISCONNECT FOR REMOTE MONITORING OF UTILITY/STANDBY POWER
 - THE NORMAL AC POWER MONITORING CIRCUIT MUST UTILIZE A DISCONNECTING MEANS WITH A SHORT CIRCUIT RATING GREATER THAN THE AVAILABLE ANTICIPATING CURRENT
 - A RED PUSH-TO-TRIP BUTTON PROVIDES A MEANS TO MECHANICALLY TRIP THE CIRCUIT BREAKER. THIS ACTION EXERCISES THE TRIPPING PORTION OF THE MECHANISM AND ALLOWS MAINTENANCE CHECK ON THE BREAKER

- CAUTION:**
- THE OPERATING HANDLE ASSUMES A CENTER POSITION WHEN THE CIRCUIT BREAKER IS TRIPPED
 - THE BREAKER CAN BE RESET BY OPERATING THE HANDLE TO THE EXTREME OFF POSITION AND THEN TO ON
 - SLIDE BAR MECHANICAL INTERLOCK TRANSMITS NORMAL AC POWER TO GENERATOR POWER. THE SLIDE BAR MECHANICAL INTERLOCK PROHIBITS BOTH POWER SOURCES FROM BEING IN THE ON POSITION SIMULTANEOUSLY
 - TO TRANSFER FROM ON POWER SOURCE TO THE OTHER POWER SOURCE, SWITCH THE HANDLE TO THE OFF POSITION, THEN TO THE OTHER POSITION AND THE SWITCH THE OTHER BREAKER TO THE ON POSITION
- SUITABLE FOR USE AS SERVICE EQUIPMENT**
- | |
|---|
| ELECTRICAL RATING 120/240 VOLTS SINGLE PHASE 50 % |
| NORMAL AC POWER (GENERATOR POWER) |
| 20000 |
| 20000 |
- LOAD SIZE CIRCUIT BREAKERS**
- | MFR. | TYPE | POLES | AMP RATING | TRIP TYPE | TRIP SETTING | LOAD SIZE MAIN CIRCUIT BREAKER | VOLTS AC | PHASES | |
|------|------|-------|------------|-----------|--------------|--------------------------------|----------|--------|---|
| SO-D | OO | 2 | 15-100A | 90-D | OO | 200A | 65,000A | 240V | 2 |
- LOAD SIZE MAIN CIRCUIT BREAKER**
- | MFR. | TYPE | POLES | AMP RATING | TRIP TYPE | TRIP SETTING | LOAD SIZE MAIN CIRCUIT BREAKER | VOLTS AC | PHASES | |
|------|------|-------|------------|-----------|--------------|--------------------------------|----------|--------|---|
| SO-D | OO | 2 | 15-100A | 90-D | OO | 200A | 65,000A | 240V | 2 |
- WARNING:** MAKE CONTINUITY CHECK WITH OHM METER TO VERIFY CORRECT PHASING AND GROUNDING CONNECTIONS BEFORE POWER UP
- NEUTRAL-TO-GROUND GROUNDING JUMPER**
- INSTALLATION INSTRUCTIONS:**
- IF REQUIRED, THE #4-0 BONDING KIT SHOULD BE INSTALLED BY QUALIFIED PERSONNEL.
 - ENSURE THE MAIN BREAKERS ARE OFF.
 - USE THE GREEN AS WIRE PROVIDED WITH THE PPC.
 - INSTALL THE JUMPER AS SHOWN IN THE WIRING DIAGRAM.
 - TIGHTEN TERMINALS TO TORQUE VALUE SHOWN IN TORQUE TABLE.
 - PLACE THE PROVIDED "SERVICE LABEL" IN THE SPACE BELOW THE WORDS "AC POWER" LOCATED ABOVE THE MAIN CIRCUIT BREAKERS IN THE UPPER PORTION OF THE BOND POINT.
- WARNING:** CONTINUOUS LOADS NOT TO EXCEED 80% OF THE OVER-CURRENT PROTECTIVE DEVICE (OCPD) RATING. THE OCPD RATING MUST BE 125% OF THE LOAD. FOR THOSE CIRCUITS EXCEEDING CIRCUIT BREAKER RATING, MARKED AS SUITABLE FOR CONTINUOUS OPERATION AT 100% OF THEIR RATING, CONDUCTORS ARE NOT TO EXCEED OR LEAVE THE ENCLOSURE DIRECTLY OPPOSITE THE BOND TERMINAL.

THIS SWITCHBOARD UTILITY MAIN BREAKER IS SUITABLE FOR 60,000 RMS SYMMETRICAL AMPS, 240 VOLTS MAXIMUM.

THIS SWITCHBOARD GENERATOR POWER CIRCUIT IS SUITABLE FOR 20,000 RMS SYMMETRICAL AMPS, 240 VOLTS MAXIMUM.

WARNING: CONTINUOUS LOADS NOT TO EXCEED 80% OF THE OVER-CURRENT PROTECTIVE DEVICE (OCPD) RATING. THE OCPD RATING MUST BE 125% OF THE LOAD. FOR THOSE CIRCUITS EXCEEDING CIRCUIT BREAKER RATING, MARKED AS SUITABLE FOR CONTINUOUS OPERATION AT 100% OF THEIR RATING, CONDUCTORS ARE NOT TO EXCEED OR LEAVE THE ENCLOSURE DIRECTLY OPPOSITE THE BOND TERMINAL.



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DRAWN BY: CHECKED BY: APPROVED BY:

DATE: 05/13

PROJECT NUMBER: 10710-NJHER01114A

PROJECT INFORMATION: NJHER01114A
100 REEF ROAD
FAIRFIELD, CT 06824

SHEET TITLE: GROUNDING PLANS AND NOTES

SHEET NUMBER: G-1

CONSTRUCTION DOCUMENTS

REV. DATE DESCRIPTION

1 05/13/13 ISSUED FOR PERMITS

2 05/13/13 ISSUED FOR PERMITS

3 05/13/13 ISSUED FOR PERMITS

4 05/13/13 ISSUED FOR PERMITS

5 05/13/13 ISSUED FOR PERMITS

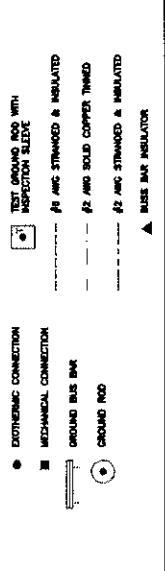
6 05/13/13 ISSUED FOR PERMITS

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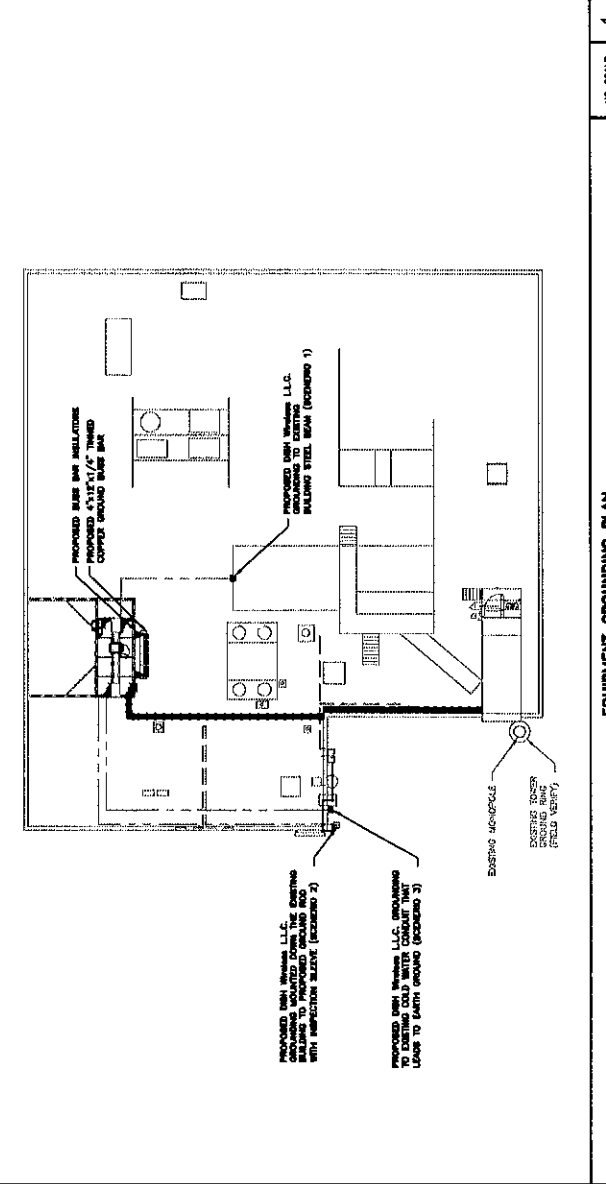


GROUNDING LEGEND

- GROUNDING IS SHOWN DIMENSIONALLY ONLY.
- CONTRACTOR SHALL OBTAIN ALL EQUIPMENT AS A COMPLETE SYSTEM. GROUNDING SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S AND DISH WIRELESS L.L.C. GROUNDING AND BONDING REQUIREMENTS AND MANUFACTURER'S SPECIFICATIONS.
- ALL GROUND CONDUCTORS SHALL BE COPPER. NO ALUMINUM CONDUCTORS SHALL BE USED.

GROUNDING KEY NOTES

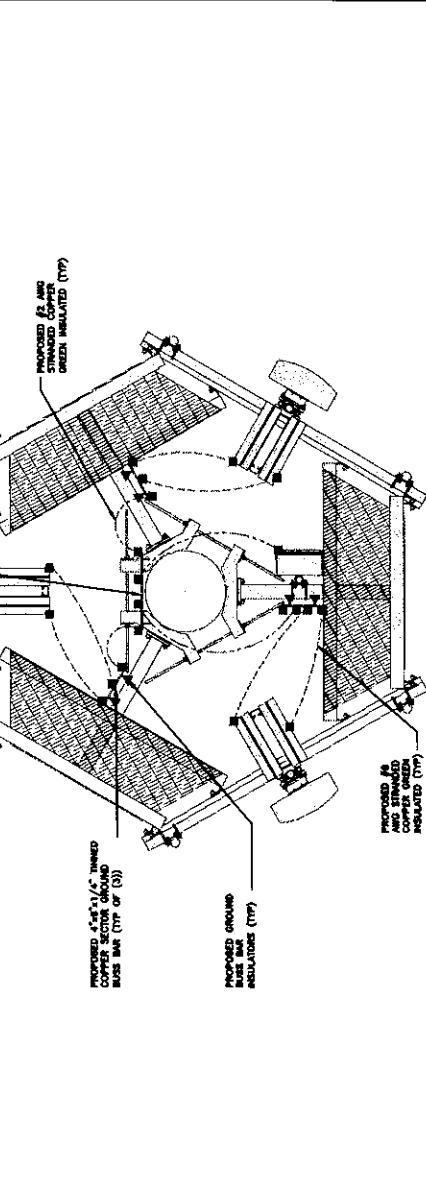
- EXTERIOR GROUNDING: #2 AWG SOLID COPPER, BARED AT A DEPTH OF AT LEAST 30 INCHES BELOW THE FINISH GRADE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.
- INNER GROUNDING: THE GROUNDING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS. THE GROUNDING SYSTEM SHALL BE INSTALLED AROUND THE TOWER AND THE BUILDING. AT LEAST TWO BARS SHALL BE MADE BETWEEN THE TOWER AND THE BUILDING GROUNDING SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.
- INTERIOR GROUNDING: #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EXTENDED AROUND THE PERIMETER OF THE CELL. ALL NON-ELECTRICAL-RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUND TO THE INTERIOR GROUNDING WITH #4 AWG STRANDED GREEN INSULATED CONDUCTOR.
- ROAD TO EXTERIOR GROUNDING: #2 AWG SOLID THINWALL COPPER WIRE PRIMARY BOND SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUNDING RING, LOCATED AT THE CORNERS OF THE BUILDING.
- GROUNDING: U.S. LISTED COPPER CLAD STEEL, MINIMUM 1/2" DIAMETER BY 600T FEET LEVEL GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUNDING RING CONDUCTOR.
- CELL REFERENCE GROUND: POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BARS ARE MADE WITH #2 AWG UNLESS NOTED OTHERWISE STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID THINWALL COPPER CONDUCTORS.
- METAL PLATE GROUNDING: BOND TO THE INTERIOR GROUNDING RING WITH TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A METAL PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CELL MUST BE CONNECTED TO THE METAL PLATE AND TO THE EXTERIOR GROUNDING USING (2) TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EACH.
- EXTERIOR CABLE ENTRY: EXISTING GROUNDING: #2 AWG SOLID THINWALL COPPER CONDUCTORS WITH AN EXTERIOR GROUNDING INSPECTION SLEEVE.
- TELECOM GROUNDING: BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUNDING RING.
- FRAMES: THE FRAMES FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUNDING BAR THAT IS BOND TO THE EQUIPMENT METAL FRAMEWORK.
- EXTERIOR METAL OBJECTS: METAL FRAMES, CABINETS AND INDIVIDUAL METALLIC UNITS LOCATED WITHIN THE AREA OF THE GROUNDING RING SHALL BE BOND TO THE GROUNDING RING WITH #4 AWG STRANDED GREEN INSULATED COPPER BOND TO THE INTERIOR GROUNDING RING.
- CELL REFERENCE GROUNDING: METAL FRAMES WITHIN 7 FEET OF THE EXTERIOR GROUNDING RING OR OBJECTS LOCATED WITHIN 7 FEET OF THE EXTERIOR GROUNDING RING SHALL BE BOND TO THE GROUNDING RING WITH #4 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR AT AN INTERVAL NOT EXCEEDING 25 FEET. BOND SHALL BE MADE AT EACH DATE POST AND APPROX DATE OPENING.
- EXTERIOR METAL OBJECTS: METALLIC OBJECTS, EXTERNAL TO OR MOUNTED TO THE BUILDING, SHALL BE BOND TO THE EXTERIOR GROUNDING RING USING #2 THINWALL SOLID COPPER WIRE.
- EXTERIOR METAL OBJECTS: EACH ICE STORAGE LID SHALL BE BOND TO THE GROUNDING RING WITH #2 AWG STRANDED GREEN INSULATED COPPER. PROVIDE EXTERIOR METAL WELLS AT BOTH THE ICE STORAGE LID AND BOND TO THE GROUNDING RING.
- BUILDING ALL DC POWER SYSTEMS INCLUDING DC POWER SYSTEMS, BATTERY RECHARGERS, BATTERY RECHARGERS, INVERTERS OR CHARGERS TO DC CONVERTER SYSTEMS. IT SHALL BE REQUIRED THAT SERVICE CONDUCTORS AND CHARGERS TO DC CONVERTER SYSTEMS AND BATTERY RECHARGERS AND BATTERY RECHARGERS SHALL BE BOND TO THE EXTERIOR GROUNDING RING. POWER SYSTEMS SHALL BE BOND TO THE EXTERIOR GROUNDING RING.
- TOWER TOP COLLECTOR BARS: BARS SHALL BE MECHANICALLY BOND TO PROPOSED ANTENNA MOUNT COLLAR. REFER TO DISH WIRELESS L.L.C. GROUNDING NOTES.



EQUIPMENT GROUNDING PLAN

NO SCALE 1

NOTES:
ANTENNA AND OPT. SHOWN ARE DIMENSIONS AND NOT REFERENCING TO A SPECIFIC MANUFACTURER. THIS IS FOR REFERENCE PURPOSES ONLY.



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2

NO SCALE 3

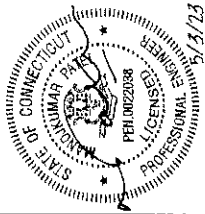
GROUNDING KEY NOTES

dish
wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Tectonic

Professional Engineer
No. PE-0002038
State of Connecticut
Professional Engineer
No. PE-0002038



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DRAWN BY: CHECKED BY: APPROVED BY:

DATE: 04/20/23

REFS REV #:

3

CONSTRUCTION DOCUMENTS

REV / DATE / DESCRIPTION

0 / 04/20/23 / ISSUED FOR U.L. REVIEW

1 / 04/20/23 / ISSUED FOR TAKE OFF

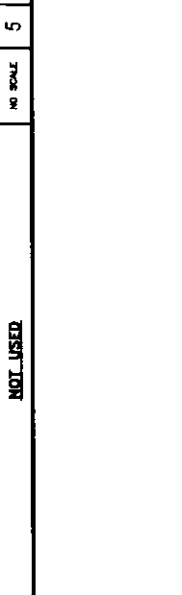
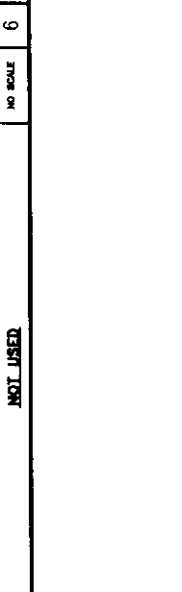
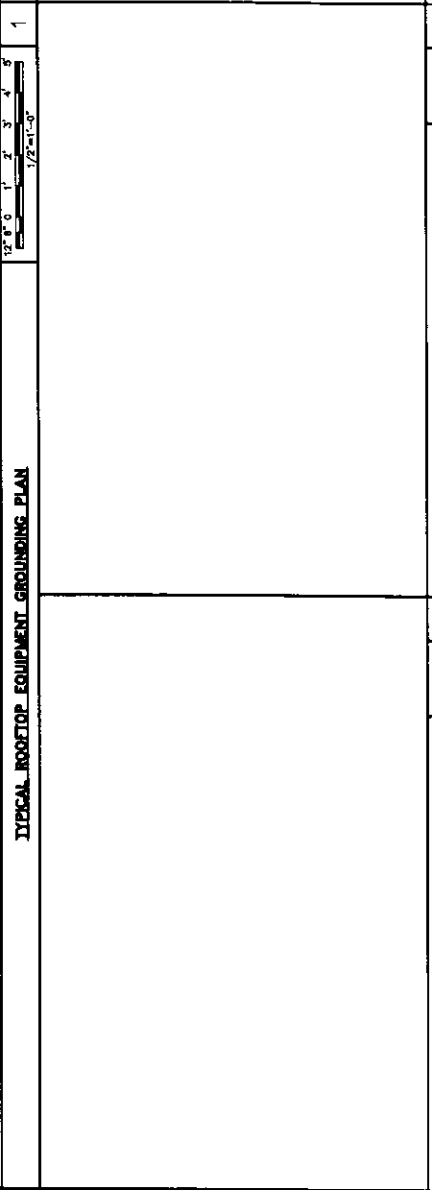
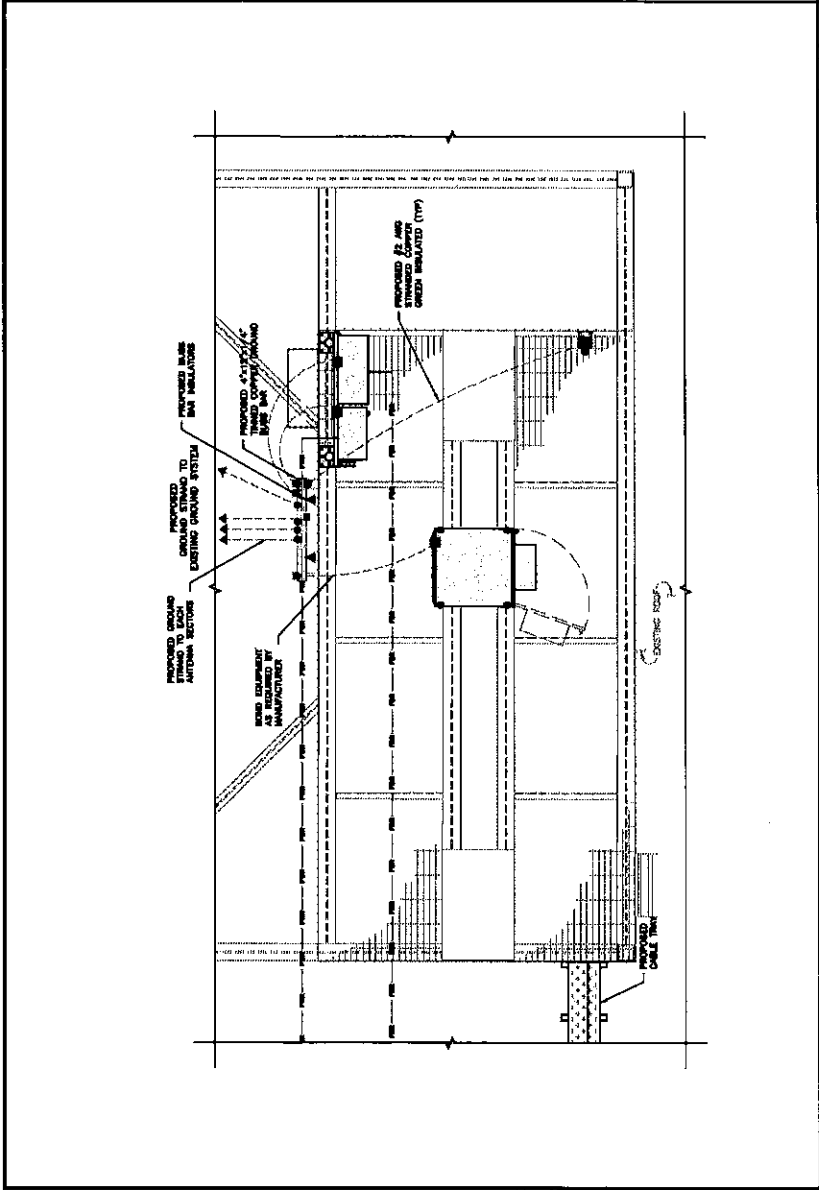
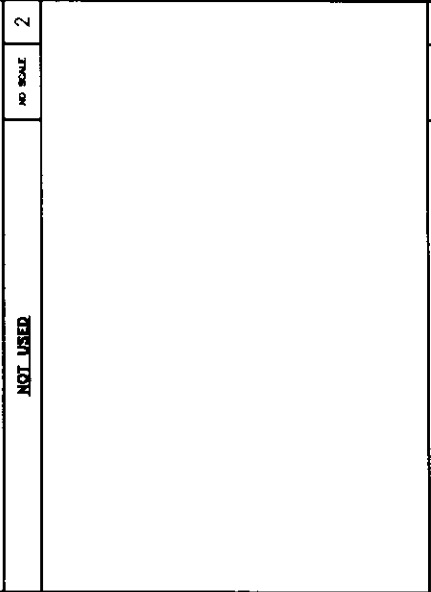
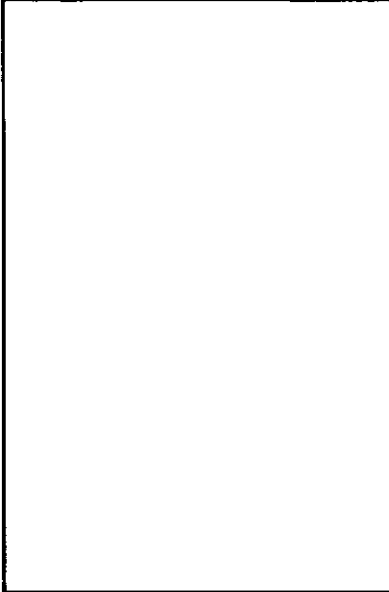
A&E PROJECT NUMBER
10770.NJ.JERO1114A

DISH Wireless LLC
PROJECT INFORMATION

NJ.JERO1114A
100 REEF ROAD
FAIRFIELD, CT 06824

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-2



CONSTRUCTION DOCUMENTS

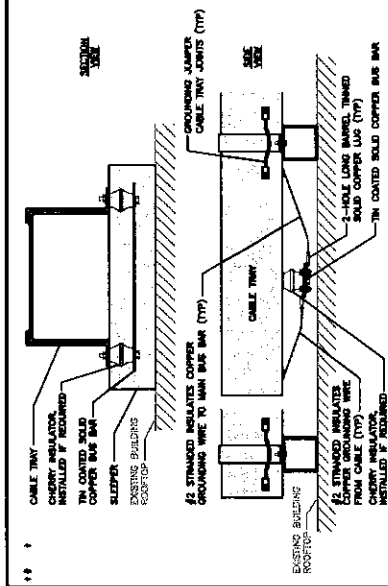
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1	02/20/13	ISSUED FOR PERMITS

AME PROJECT NUMBER
10710-NJER01114A

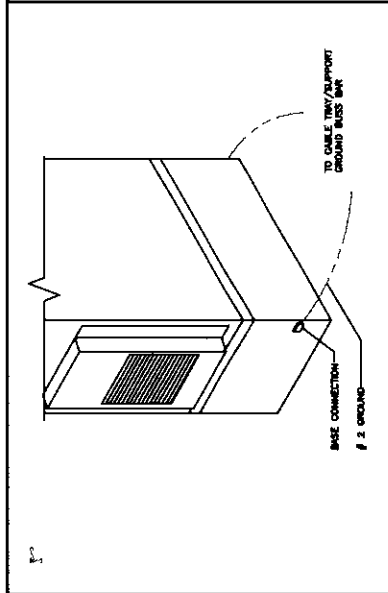
DISH WIRELESS
PROJECT INFORMATION
NJER01114A
100 REEF ROAD
FAIRFIELD, CT 06824

SHEET TITLE
GROUNDING DETAILS

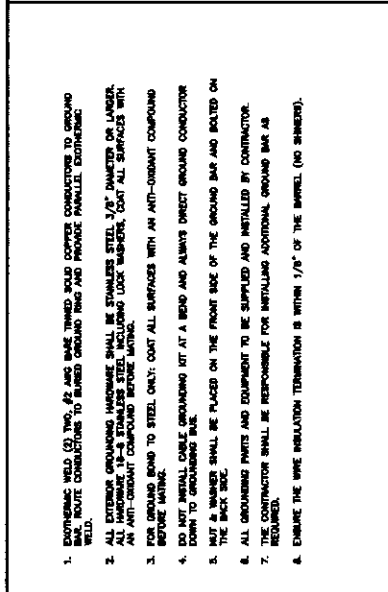
SHEET NUMBER
G-3



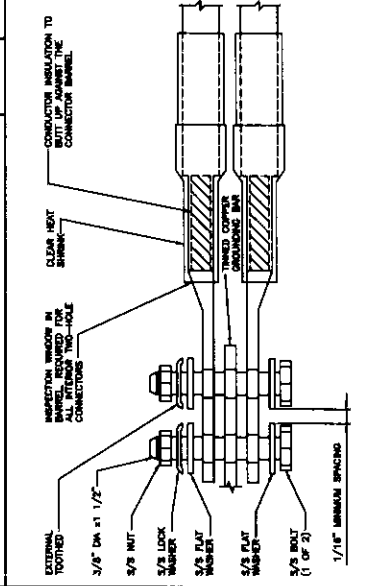
1 TYPICAL CABLE TRAY GROUND BUSS BAR NO SCALE 3



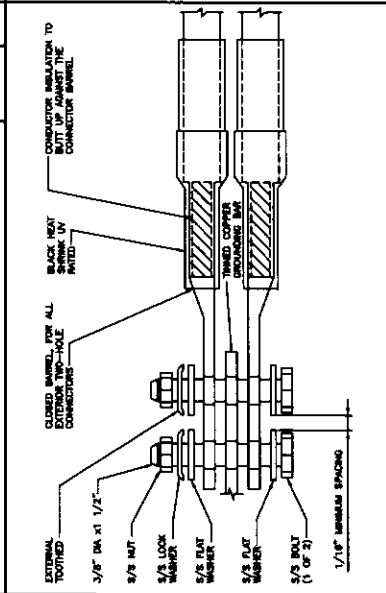
2 OUTDOOR CABINET GROUNDING NO SCALE 2



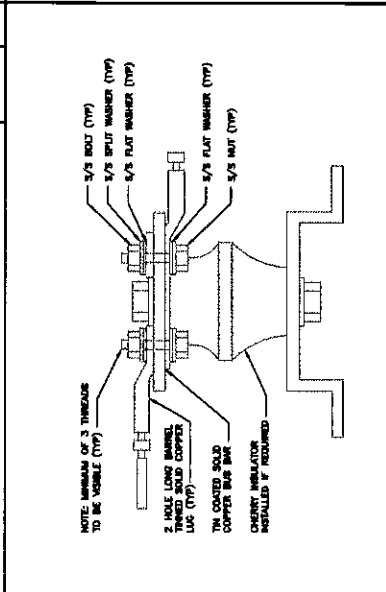
3 TYPICAL GROUNDING NOTES NO SCALE 1



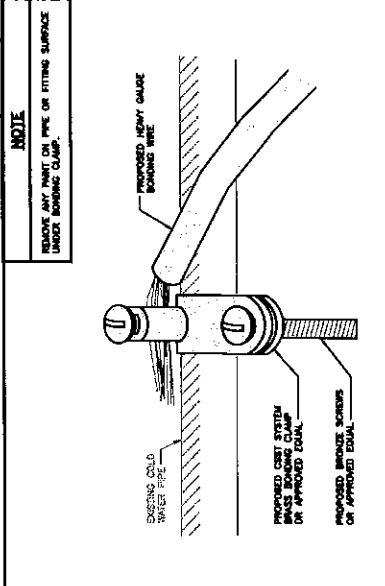
4 TYPICAL INTERIOR TWO-HOLE LUG NO SCALE 6



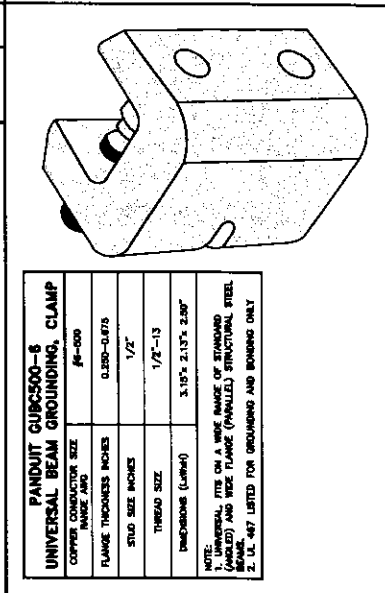
5 TYPICAL EXTERIOR TWO-HOLE LUG NO SCALE 5



6 LUG DETAIL NO SCALE 4



7 TYPICAL COLD WATER CONDUIT GROUNDING DETAIL NO SCALE 9



8 BUILDING STEEL GROUNDING DETAIL NO SCALE 8

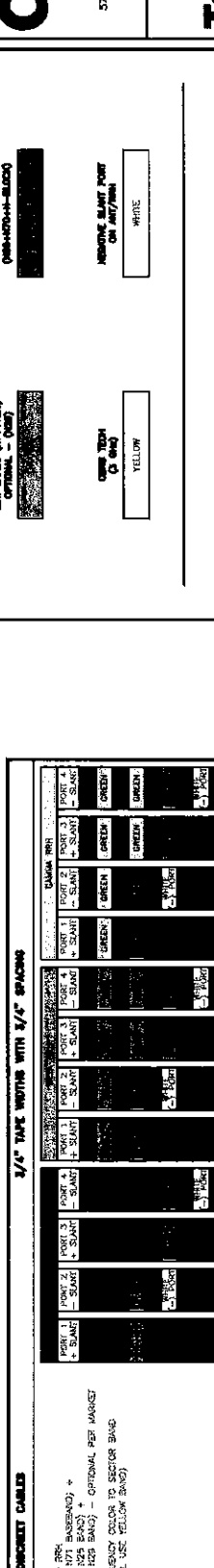
1. EXOTHERMIC WELD (2) TWO-#2 AND MAKE TINED SOLID COPPER CONDUCTORS TO GROUND BAR. ROUTE CONDUCTORS TO BURED GROUND TRAY AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. ALL EXTERIOR GROUNDING HARDWARE SHALL BE STAINLESS STEEL 3/8\"/>

CABLE GROUNDING LUGS REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET

1/2\"/>

HYBRID/MICROFIT CABLES

LOW-BAND RFR (100 MHz BAND) + MID-BAND RFR (100-300 MHz BAND) = OPTIONAL REF MARKER (700 MHz BAND) - ADD FREQUENCY COLOR TO SECTOR BAND (COSRS WILL USE YELLOW BAND)



LOW-BAND RFR (100 MHz BAND) + MID-BAND RFR (100-300 MHz BAND) + HIGH-BAND RFR (700 MHz BAND) - ADD FREQUENCY COLOR TO SECTOR BAND (COSRS WILL USE YELLOW BANDS)



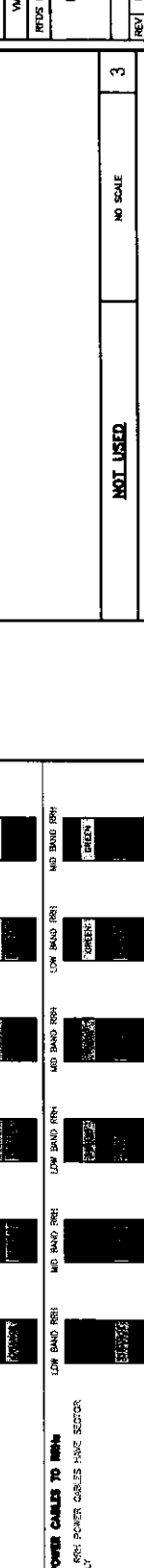
HYBRID/MICROFIT CABLES

USE SECTOR BANDS SUPPORTED WITH FREQUENCY BANDS. ALL SECTORS SUPPORT LOW-BANDS AND MID-BANDS. EXAMPLE 2 - INBAND, OR DISCRETE, SUPPORTS COSRS ONLY. ALL SECTORS. EXAMPLE 3 - MAIN COAX WITH GROUND SECURED WRS.

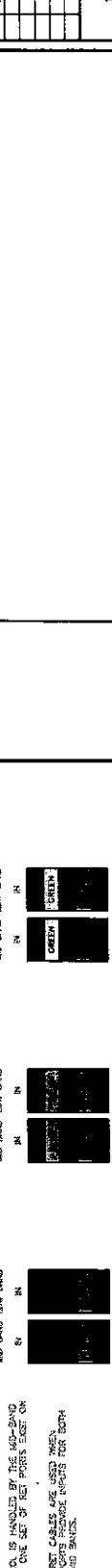
FIBER JUMPERS TO WRS



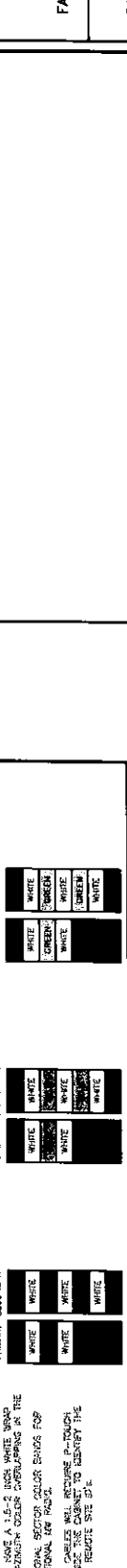
POWER CABLES TO WRS



NET MOTORS AT ANTENNAS

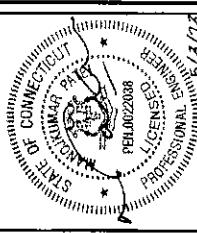


MICROWAVE BAND LINKS



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

Tectonic
Professional Engineering Services, Inc.
4000 E. Harvard Ave., Suite 200
Denver, CO 80231
Tel: 303.755.1000
Fax: 303.755.1001
www.tectonics.com



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REVISED BY: 3

CONSTRUCTION DOCUMENTS

REV	DATE	DESCRIPTION
1		ISSUED FOR PERMITS
2		ISSUED FOR PERMITS
3		ISSUED FOR PERMITS

446 PROJECT NUMBER
10710-NJER0114A

DISA WIRELESS LLC
PROJECT INFORMATION
NJER0114A
100 REEF ROAD
FAIRFIELD, CT 06824

SHEET TITLE
RF
CABLE COLOR CODES

SHEET NUMBER
RF-1

LOW BAND (0-100 MHz) OPTIONAL - (GRAY)

ALPHA SECTOR (NO SCALE)

BETA SECTOR (NO SCALE)

GAMMA SECTOR (NO SCALE)

COLOR IDENTIFIER

NO SCALE

NOT USED

NO SCALE

NOT USED

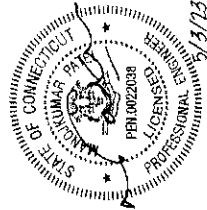
NO SCALE

RF CABLE COLOR CODES

1	NO SCALE	2	NO SCALE	3	NO SCALE	4	NO SCALE
LOW BAND RFR (100 MHz BAND) + MID-BAND RFR (100-300 MHz BAND) = OPTIONAL REF MARKER (700 MHz BAND) - ADD FREQUENCY COLOR TO SECTOR BAND (COSRS WILL USE YELLOW BAND)	ALPHA SECTOR (NO SCALE)	BETA SECTOR (NO SCALE)	GAMMA SECTOR (NO SCALE)	LOW BAND RFR (100 MHz BAND) + MID-BAND RFR (100-300 MHz BAND) + HIGH-BAND RFR (700 MHz BAND) - ADD FREQUENCY COLOR TO SECTOR BAND (COSRS WILL USE YELLOW BANDS)	ALPHA SECTOR (NO SCALE)	BETA SECTOR (NO SCALE)	GAMMA SECTOR (NO SCALE)
HYBRID/MICROFIT CABLES	ALPHA SECTOR (NO SCALE)	BETA SECTOR (NO SCALE)	GAMMA SECTOR (NO SCALE)	HYBRID/MICROFIT CABLES	ALPHA SECTOR (NO SCALE)	BETA SECTOR (NO SCALE)	GAMMA SECTOR (NO SCALE)
USE SECTOR BANDS SUPPORTED WITH FREQUENCY BANDS. ALL SECTORS SUPPORT LOW-BANDS AND MID-BANDS. EXAMPLE 2 - INBAND, OR DISCRETE, SUPPORTS COSRS ONLY. ALL SECTORS. EXAMPLE 3 - MAIN COAX WITH GROUND SECURED WRS.	ALPHA SECTOR (NO SCALE)	BETA SECTOR (NO SCALE)	GAMMA SECTOR (NO SCALE)	USE SECTOR BANDS SUPPORTED WITH FREQUENCY BANDS. ALL SECTORS SUPPORT LOW-BANDS AND MID-BANDS. EXAMPLE 2 - INBAND, OR DISCRETE, SUPPORTS COSRS ONLY. ALL SECTORS. EXAMPLE 3 - MAIN COAX WITH GROUND SECURED WRS.	ALPHA SECTOR (NO SCALE)	BETA SECTOR (NO SCALE)	GAMMA SECTOR (NO SCALE)
FIBER JUMPERS TO WRS	ALPHA SECTOR (NO SCALE)	BETA SECTOR (NO SCALE)	GAMMA SECTOR (NO SCALE)	FIBER JUMPERS TO WRS	ALPHA SECTOR (NO SCALE)	BETA SECTOR (NO SCALE)	GAMMA SECTOR (NO SCALE)
POWER CABLES TO WRS	ALPHA SECTOR (NO SCALE)	BETA SECTOR (NO SCALE)	GAMMA SECTOR (NO SCALE)	POWER CABLES TO WRS	ALPHA SECTOR (NO SCALE)	BETA SECTOR (NO SCALE)	GAMMA SECTOR (NO SCALE)
NET MOTORS AT ANTENNAS	ALPHA SECTOR (NO SCALE)	BETA SECTOR (NO SCALE)	GAMMA SECTOR (NO SCALE)	NET MOTORS AT ANTENNAS	ALPHA SECTOR (NO SCALE)	BETA SECTOR (NO SCALE)	GAMMA SECTOR (NO SCALE)
MICROWAVE BAND LINKS	ALPHA SECTOR (NO SCALE)	BETA SECTOR (NO SCALE)	GAMMA SECTOR (NO SCALE)	MICROWAVE BAND LINKS	ALPHA SECTOR (NO SCALE)	BETA SECTOR (NO SCALE)	GAMMA SECTOR (NO SCALE)



5791 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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DATE: _____

RFDS REV # _____

DATE: _____

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DATE: _____

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DATE: _____

DATE: _____

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	04/27/2011	ISSUED FOR U.L. REVIEW
1	04/27/2011	ISSUED FOR PERMITS

AME PROJECT NUMBER
10710-NAJER01114A

DISH WIRELESS, LLC
PROJECT INFORMATION
NAJER01114A
100 REEF ROAD
FAIRFIELD, CT 06824

SHEET TITLE

RF SIGNAGE

SHEET NUMBER

GN-2

INFORMATION

This is an access point to an area with transmitting antennas.

Obey all signs and barriers beyond this point.
Call the DISH Wireless L.L.C. NOC at 1-866-624-6874

Site ID: _____

THIS SIGN IS FOR REFERENCE PURPOSES ONLY



SIGN TYPES

TYPE	COLOR	CODE	PURPOSE
INFORMATION	GREEN		INFORMATIONAL SIGN TO NOTIFY OWNERS OF SITE OPERATIONS & CONTACT NUMBER AND INITIALS OF OPERATOR.
NOTICE	BLUE		NOTICE SIGN TO NOTIFY OWNERS OF SITE OPERATIONS & CONTACT NUMBER AND INITIALS OF OPERATOR. MUST EXCEED THE PORTED RANGE AND SITE GUIDELINES FOR WORKING IN AN ENVIRONMENT. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(f)
CAUTION	YELLOW		"CAUTION BEYOND THIS POINT" RF FIELD BEYOND THIS POINT MAY EXCEED THE FCC GENERAL PUBLIC EXPOSURE LIMIT. OBEY ALL SIGNS AND SITE GUIDELINES FOR WORKING IN AN ENVIRONMENT. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(f)
WARNING	ORANGE/RED		"WARNING BEYOND THIS POINT" RF FIELD AT THIS SITE EXCEEDS FCC RULES FOR HUMAN EXPOSURE. FAILURE TO OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN AN ENVIRONMENT COULD RESULT IN SERIOUS INJURY. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(f)

SIGN PLACEMENT:

- RF SIGNAGE PLACEMENT SHALL FOLLOW THE RECOMMENDATIONS OF AN EXISTING USE REPORT, CHECKED BY A THIRD PARTY PREVIOUSLY AUTHORIZED BY DISH WIRELESS, LLC.
- INFORMATION SIGN (GREEN) SHALL BE LOCATED ON EXISTING DISH WIRELESS LLC EQUIPMENT.
- IF THE INFORMATION SIGN IS A SIGN, IT SHALL BE PLACED ON EXISTING DISH WIRELESS LLC EQUIPMENT CABINET.
- IF THE INFORMATION SIGN IS A METAL SIGN IT SHALL BE PLACED ON EXISTING DISH WIRELESS LLC EQUIPMENT WITH A SECURE ATTACH METHOD.
- FURTHER INSTRUCTION ON HOW TO PROCEED.

NOTES:

1. FOR DISH WIRELESS, LLC LOGO, SEE DISH WIRELESS, LLC DESIGN SPECIFICATIONS (PROVIDED BY DISH WIRELESS, LLC)
2. SITE ID SHALL BE APPLIED TO SIGNS USING "LASER ENGRAVING" OR ANY OTHER WEATHER RESISTANT METHOD (DISH WIRELESS, LLC APPROVAL REQUIRED)
3. TEXT FOR SIGNS SHALL INDICATE CORRECT SITE NAME AND NUMBER AS PER DISH WIRELESS, LLC CONSTRUCTION MANAGER RECOMMENDATIONS.
4. CABINET/SHELTER MOUNTING APPLICATION REQUIRES ANOTHER PLATE APPLIED TO THE FACE OF THE CABINET WITH WATER PROOF POLYURETHANE ADHESIVE
5. ALL SIGNS WILL BE SECURED WITH EITHER STAINLESS STEEL ZIP TIES OR STAINLESS STEEL TECH SCORNS
6. ALL SIGNS TO BE 6.5"X11" AND MADE WITH 0.04" OF ALUMINUM MATERIAL.

NOTICE



Transmitting Antennae(s)

Radio frequency fields beyond this point MAY EXCEED the FCC Occupational exposure limit.

Obey all posted signs and site guidelines for working in radio frequency environments.

Call the DISH Wireless L.L.C. NOC at 1-866-624-6874 prior to working beyond this point.

Site ID: _____



THIS SIGN IS FOR REFERENCE PURPOSES ONLY

CAUTION



Transmitting Antennae(s)

Radio frequency fields beyond this point MAY EXCEED the FCC Occupational exposure limit.

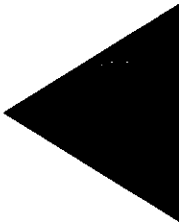
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Call the DISH Wireless L.L.C. NOC at 1-866-624-6874 prior to working beyond this point.

Site ID: _____



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Transmitting Antennae(s)

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Obey all posted signs and site guidelines for working in radio frequency environments.

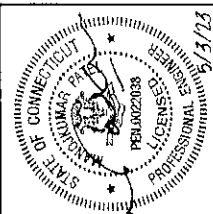
Call the DISH Wireless L.L.C. NOC at 1-866-624-6874 prior to working beyond this point.

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RF SIGNAGE



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DATE: _____
 DRAWN BY: CHECKED BY: APPROVED BY: _____

CONSTRUCTION DOCUMENTS

REV.	DATE	DESCRIPTION
0		ISSUANCE
1		REVISED
2		REVISED
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GENERAL NOTES

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

CONTRACTOR-GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION

CARRIER-DISH Wireless L.L.C.

TOWER OWNER-TOWER OWNER

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

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

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

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

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

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

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

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

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

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

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

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

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

SITE ACTIVITY REQUIREMENTS.

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

2. "LOCK UP" - DISH Wireless L.L.C. AND TOWER OWNER SAFETY CLIMB REQUIREMENT:

THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MAJOR 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 EXISTING TOWER. ANY WORK PERFORMED SHALL BE COMPLETED IN SUCH A MANNER AS TO NOT CAUSE FRICTION, WEAR, IMPACT TO THE SUPPORTS, IMPACT ON OR TO WEAR HOPE WHICH MAY CAUSE FRICTION, WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY OR TO IMPEDER/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR DISH Wireless L.L.C. AND DISH Wireless L.L.C. AND TOWER OWNER POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.

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

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

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

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

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

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

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

10. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK SHALL BE IDENTIFIED AND PROTECTED. THE RESPONSIBILITY FOR THE PROTECTION OF THE WORK SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PILES 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, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.

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

14. THE CONTRACTOR SHALL PROVIDE SITE SEWAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SEWAGE 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 REGULATIONS 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.

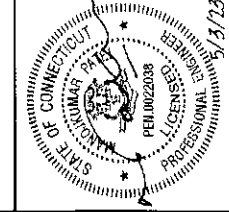
20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS AND RADARS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

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.



5701 SOUTH SANTA FE DRIVE
JURINEON, CO 80120



THIS IS A VALIDATION OF THE PROFESSIONAL ENGINEER'S LICENSE UNDER THE AUTHORITY OF THE STATE OF CONNECTICUT TO SIGN AND SEAL THIS DOCUMENT.

DATE	01/11/2008
DRAWN BY	JG
CHECKED BY	JG
DATE	01/11/2008

PROJECT NO: 10710.N.JJERO1114A

PROJECT INFORMATION
DISH WIRELESS U.S.C.
NJJERO1114A
100 REEF ROAD
FAIRFIELD, CT 06824

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-4

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

- ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 308, ACI 318, ACI 338, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
- UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'_c) OF 3000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°F AT TIME OF PLACEMENT.
- CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADJUSTURES, AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER-TO-CEMENT RATIO (W/C) OF 0.45.
- ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WFW) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (F_y) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
 #4 BARS AND SMALLER 40 ksi
 #5 BARS AND LARGER 60 ksi
- THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
 • CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"
 • CONCRETE EXPOSED TO EARTH OR WEATHER:
 • #8 BARS AND LARGER 2"
 • #5 BARS AND SMALLER 1-1/2"
 • CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
 • SLAB AND WALLS 3/4"
 • BEAMS AND COLUMNS 1-1/2"
- A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

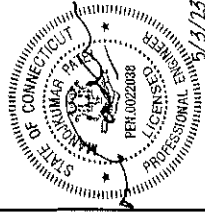
- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
- CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
-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

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

dish
wireless

5701 SOUTH SAWTA FE DRIVE
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IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

DRAWN BY: CHECKED BY: APPROVED BY:

DATE: _____

RFDS REV #:

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	06/29/2023	ISSUED FOR U.L. REVIEW
1	06/29/2023	ISSUED FOR PLAN

A/E PROJECT NUMBER
10710-NJER01114A

DISH WIRELESS, LLC
PROJECT INFORMATION
NJER01114A
100 REEF ROAD
FAIRFIELD, CT 06824

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

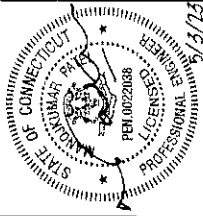
GN-5

GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GSES) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE CONTRACTOR SHALL PERFORM IEEE FALL-OFF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
4. METAL CONDUIT AND TRAY SHALL BE GROUNDING AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BITS EQUIPMENT.
6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #4 STRANDED COPPER OR LARGER FOR INDOOR BITS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BITS.
7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
15. APPROVED ANTIOXIDANT COATINGS (i.e., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
18. BOND ALL METALLIC OBJECTS WITHIN 6 FT. OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
19. GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS, WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS. NON-METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE USED, WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE). THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 5" TO 6" OF C&W-TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).
21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM. THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). DO NOT ATTACH GROUNDING TO FIRE SPRINKLER SYSTEM PIPES.



9701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



IT IS A VIOLATION OF LAW FOR ANY PERSON TO REPRODUCE OR TRANSMIT THIS DOCUMENT WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER.

DRAWN BY: JO
CHECKED BY: APPROVED BY:

DATE: 3
RDS REV #:

CONSTRUCTION DOCUMENTS

REV	DATE	DESCRIPTION
0	02/28/2008	ISSUED FOR I.L. REVIEW
1	04/29/2008	ISSUED FOR PERMITS

PROJECT NUMBER
10710-NJERO1114A

DISH Wireless, L.L.C.
PROJECT INFORMATION
NJERO1114A
100 REEF ROAD
FAIRFIELD, CT 06824

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-6

- STRUCTURAL STEEL NOTES:**
- DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN.
 - STRUCTURAL STEEL WIDE FLANGE SHAPES SHALL CONFORM TO ASTM A992. STEEL FOR STRUCTURAL SHAPES FOR USE IN BUILDING FRAMING, GRADE 50, UNLESS OTHERWISE INDICATED. IF THE MEMBER SIZES INDICATED ARE NOT AVAILABLE IN THIS GRADE, ASTM A572 "HIGH-STRENGTH LOW-ALLOY COLUMBIUM-VANADIUM STRUCTURAL STEEL", GRADE 50, MAY BE SUBSTITUTED.
 - HOLLOW STRUCTURAL SECTIONS (HSS) SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING IN ROUNDS AND SHAPES", GRADE C. SUBSTITUTION WITH ASTM A53 PIPE IS NOT ACCEPTABLE.
 - FIELD WELDING IS NOT PERMITTED, UNLESS SPECIFICALLY INDICATED OTHERWISE ON THESE DRAWINGS.
 - ALL FITTED WELDS SHALL BE MADE USING THE SHIELDED METAL ARC WELDING (SMAW) PROCESS WITH E70XX ELECTRODES UNLESS OTHERWISE NOTED.
 - MISCELLANEOUS STEEL, INCLUDING THREADED RODS, CHANNELS, ANGLES, PLATES, AND BARS SHALL CONFORM TO ASTM A36 "CARBON STRUCTURAL STEEL", UNLESS OTHERWISE INDICATED.
 - U-BOLTS SHALL CONFORM TO ASTM A38 OR A307 "CARBON STEEL BOLTS, STUDS, AND THREADED ROD 60000 PSI TENSILE STRENGTH". ALL U-BOLTS SHALL BE 1/2" DIAMETER IN 9/16" HOLES, UNLESS OTHERWISE NOTED. INSTALL DOUBLE NUTS ON ALL CONNECTIONS.
 - ANCHOR BOLTS SHALL CONFORM TO ASTM F1554 "ANCHOR BOLTS, STEEL, 36, 55, AND 105-KSI YIELD STRENGTH", GRADE 36.
 - STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS CONFORMING TO ASTM A325 "STRUCTURAL BOLTS, STEEL, HEAT TREATED, 120/105 KSI MINIMUM TENSILE STRENGTH". BOLTS SHALL BE 3/4" INCH DIAMETER, TYPE X, UNLESS OTHERWISE NOTED.
 - WATCHING NUTS SHALL BE HEAVY HEX TYPE, CONFORMING TO ASTM A543 "CARBON AND ALLOY STEEL NUTS", WASHERS, WHERE REQUIRED, SHALL CONFORM TO ASTM F438 "HARDENED STEEL WASHERS".
 - FIELD CONNECTIONS SHALL BE BOLTED UNLESS OTHERWISE INDICATED. ALL BOLTED CONNECTIONS SHALL BE MADE WITH NOT LESS THAN TWO (2) HIGH STRENGTH BOLTS, OR EQUIVALENT WELD.
 - ALL STEEL SUPPORTS SHALL BE INSTALLED WITH DOUBLE NUTS AND SHALL BE INSTALLED SNUG TIGHT.
 - STRUCTURAL CONNECTIONS SHALL BE SNUG TIGHT IN ACCORDANCE WITH THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS, UNLESS OTHERWISE NOTED.
 - BOLTS IN SLIP-CRITICAL CONNECTIONS SHALL BE FULLY PRETENSIONED BY THE TURN-OF-NUT METHOD IN ACCORDANCE WITH THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS.
 - ANCHOR BOLTS SHALL BE TENSIONED BY THE TURN-OF-NUT METHOD AFTER GROUTING OF BASE PLATES.
 - ALL HOLES FOR BOLTS SHALL BE 1/16" INCH LARGER THAN THE BOLT DIAMETER WITH AN EDGE DISTANCE OF AT LEAST 1 1/2 TIMES THE BOLT DIAMETER AND A SPACING OF AT LEAST 3 TIMES THE BOLT DIAMETER. ALL BOLTS SHALL BE PROVIDED WITH PALNUTS OR LOCK NUTS.
 - CONTRACTOR SHALL COMPLY WITH AWS D1.1 "STRUCTURAL WELDING CODE - STEEL" FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES".
 - METAL DECK SHALL BE FORMED STEEL DECK AS MANUFACTURED BY VULCRAFT, INC. OR APPROVED EQUAL. DECK SHALL BE FABRICATED FROM GALVANIZED STEEL CONFORMING TO ASTM A653, STEEL SHEET, ZINC-COATED (GALVANIZED) OR ZINC-IRON ALLOY-COATED (GALVANNEAL) BY THE HOT-DIP PROCESS. STRUCTURAL QUALITY COATING SHALL CONFORM TO CLASSIFICATION 880.
 - ALL OPENINGS REQUIRED IN THE DECK WHICH ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE CUT IN THE FIELD ONLY AS APPROVED BY THE ENGINEER.
 - GRATING SHALL BE TYPE "OM" GALVANIZED WELDED STEEL BAR GRATING AS MANUFACTURED BY MCNICHOLS, OR APPROVED EQUAL. BEARING BARS SHALL BE AS FOLLOWS:
 EXTERIOR GRATING 1 1/4" X 3/16" SERRATED (UON)
 INTERIOR GRATING 1 1/4" X 3/16" PLAIN (UON)
 ALUMINUM 1 1/4"x3/16" GAL SERIES (UON)
 - BAND ALL EDGES, AND ATTACH TO SUPPORTING MEMBERS AT 18" ON CENTER WITH MODEL 06 GALVANIZED G-CUPS AS MANUFACTURED BY GRATING PASTERNS INC.
 - EXPANSION ANCHORS SHALL BE HILT KWIK BOLT T2Z OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE 4-3/4" UNLESS OTHERWISE NOTED.
 - ADHESIVE ANCHOR ASSEMBLIES SHALL BE AS MANUFACTURED BY HULTI OR ENGINEER APPROVED EQUAL, AS FOLLOWS:
 BASE MATERIAL ANCHOR SYSTEM
 HOLLOW CMU OR BRCK HIT HY-270
 CONCRETE HIT HY-200
- INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
24. ALL INTERIOR STRUCTURAL STEEL SHALL BE SHOP PRIME COATED WITH A MUST-INHIBITIVE PRIMER EXCEPT AREAS TO BE FIREPROOFED. NEED NOT BE PAINTED. SURFACE PREPARATION SHALL BE IN ACCORDANCE WITH THE PAINT MANUFACTURER'S RECOMMENDATIONS. AREAS WHICH MAY BE INACCESSIBLE AFTER INSTALLATION SHALL RECEIVE TWO (2) COATS OF PRIMER. FINISH PAINT AS DIRECTED BY OWNER/DARRIER.
 25. FIELD CONNECTIONS AND DAMAGED OR ABRASSED AREAS OF SHOP PRIME COAT SHALL BE TOUCH-UP PAINTED WITH COMPATIBLE FIELD PRIMER.
 26. ALL EXTERIOR STEEL SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
 27. ALL EXTERIOR BOLTS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
 28. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A770. REPAIR OF DAMAGED AND UNPAINTED AREAS TO BE GALVANIZED SURFACES SHALL BE MANUFACTURED BY ZINCO-USA OR ZINC NOTE, OR ENGINEER APPROVED EQUAL. WITH MINIMUM METALLIC ZINC CONTENT OF 85% BY WEIGHT IN DRY FILM. DRY FINISHED COATING THICKNESS SHALL BE 3 MILS MINIMUM. DAMAGED AREAS OF STEEL SHALL BE REPAINTED TO MATCH ANY EXISTING FINISH (IF APPLICABLE).
 29. STEEL WORK SHALL BE SUBJECT TO SPECIAL INSPECTIONS DURING CONSTRUCTION AS REQUIRED BY THE CODE.
 30. CONTRACTOR TO REMOVE MASTIC ON THE EXISTING WALL/PARAPET AT EVERY STEEL SUPPORT ATTACHMENT AND REPOINT MASONRY AS REQUIRED. A BED OF SILICONE SHALL BE APPLIED ALL AROUND THE STEEL SUPPORT ATTACHMENT TO MAKE IT WEATHERPROOF.
 31. ALL HOLES TO BE ADDED IN THE FIELD SHALL BE PUNCHED OR DRILLED. NO HOLE BURNING SHALL BE ALLOWED. REPAIR GALVANIZING IN ACCORDANCE WITH ASTM A780.
 32. THE NOTES CONTAINED HEREIN ARE NOT PROJECT SPECIFIC. THE CONTRACTOR SHALL UTILIZE ALL NOTES WHICH SOLELY PERTAIN TO THE WORK DEPICTED ON THESE DRAWINGS.

Exhibit D
Structural Analysis

Date: **March 10, 2023**

Structural Modification Analysis Report

Carrier: Dish Wireless

Site ID: NJJER01114A
Site Data: 100 Reef Road, Fairfield, Fairfield County, CT 06824
Latitude 41° 08' 22.89", Longitude -73° 15' 28.08"
145 ft Monopole

Tectonic Project Number: 10710.NJJER01114A

Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., Inc. is pleased to submit this "**Structural Modification 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 upon the installation of the proposed modifications. Based on our analysis we have determined the tower stress level for the structure and foundation to be:

Structure: **Sufficient – 98.2%**
Foundation: **Sufficient – 86.0%**

This analysis has been performed in accordance with the 2022 Connecticut State Building Code and the 2021 International Building Code based upon an ultimate 3-second gust wind speed of 130 mph per Appendix P as required for use in the ANSI/TIA-222-H-1-2019 Standard. Exposure Category B with a maximum topographic factor, Kzt, of 1.0 and Risk Category III were used in this analysis.

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

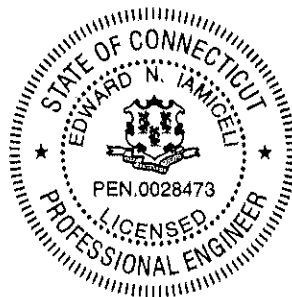
We at Tectonic appreciate the opportunity of providing our continuing professional services to you and Dish Wireless. If you have any questions or need further assistance on this or any other projects please give us a call.

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

Respectfully submitted by:
Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., Inc.



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



Project Contact Info

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tectonicengineering.com
Equal Opportunity Employer

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tnxTower Output

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1) INTRODUCTION

This tower is a 145 ft modified monopole tower previously analyzed by Hudson Design Group LLC. in May of 2022. Based on the previous evaluation by Tectonic, this tower has insufficient capacity to support the proposed Dish Wireless load configurations as such a tower modification analysis has been performed to bring the tower to an acceptable stress level. In addition, this tower has been evaluated under Risk Category III provisions because it is believed to be carrying police and emergency equipment.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	III
Wind Speed:	130 mph ultimate 3-second gust per the town of Fairfield, CT
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.0 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph
Seismic S₁ / S_s:	0.218 / 0.055

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Notes
118.0	Dish Wireless	3	CommScope	FFVV-65B-R2	1	Hybrid	-
		1	CommScope	8' Platform Mount w/ Top Rail (MC-PK8-DSH)			
		3	Fujitsu	TA08025-B604			
		3	Fujitsu	TA08025-B605			
		1	Raycap	RDIDC-9181-PF-48			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Notes
145.0		1	TX RX Systems	TTA	-	-	2
		1	RFI	BPA7496-180-14			
143.0	Municipal	2	-	10' x 1.5" Dia Dipole	3	1-1/4	1
		1	-	12' x 3" Dia Omni			
		3	Tower Mount	T-Arm Mount			
	Nextel	9	-	5' Panel Antenna	12	1-1/4	3
135.0	Municipal	1	-	10' x 1.5" Dia Dipole	1	7/8	1
	T-Mobile	3	Ericsson	AIR 21 B2A B4P	6 1	1-5/8 Hybrid	1
		3	RFS Celwave	ATMAA1412D-1A20			
		3	Tower Mount	T-Arm Mount			
		3	Perfect10	Stabilizer Kit, Perfect10-P/N: VSK-M			
3	Ericsson	AIR 32 B2a/B66Aa					

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Notes
135.0	T-Mobile	3	Ericsson	AIR 6449 B41	-	-	2
		3	Ericsson	RADIO 4449 B71+B85			
		3	Ericsson	RRUS 4415 B25			
		3	RFS Celwave	APXVAARR24_43-U-NA20			
130.0	AT&T	3	SitePro1	VFA14-H10-2120	1 1	Fiber DC	2
		3	Quintel Technology	QD6616-7			
		3	CCI Antenna	DMP65R-BU6D			
		3	Ericson	AIR6449 B77D + AIR6419 B77G			
		3	Ericson	4415 B25	6 6 2	1-1/4 DC Fiber	1
		3	Ericson	4449 B5/B12			
		1	Raycap	DC9-48-60-24-8C-EV			
		3	Ericsson	RRUS 32 B30			
		3	Ericsson	RRUS 4426 B66			
		3	Ericsson	RRUS 4478 B14			
110.0	Sprint	3	Alcatel Lucent	FD-RRH-4X45-1900	4	1-5/8	1
		1	Tower Mount	Platform Mount			
		6	Alcatel Lucent	FD-RRH-2x50-800			
		3	CommScope	NNVV-65B-R4			
		3	Nokia	AAHC			
	1	-	12' x 3" Dia Inverted Omni				
93.0	Municipal	1	RFS Celwave	SC3-W1000AC	1	EW90	2
		1	-	Dish Mount			

- Notes:
 1) Existing equipment
 2) Reserved equipment by others
 3) Existing equipment to be removed prior to installation.

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Dated
Structural Analysis Report	FDH Engineering, Inc.	03/23/2009
Structural Analysis Report	Destek Engineering, LLC	01/13/2017
Structural Analysis Report	Centek Engineering, Inc.	06/15/2020
Structural Analysis Report	Hudson Design Group LLC	05/16/2022
Construction Drawings	Tectonic	09/28/2022
Mount Analysis Report	Tectonic	01/06/2023
Structural Analysis Report (Rev 2)	Tectonic	01/06/2023

3.1) Analysis Method

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

3.2) Assumptions

- 1) Tower and structures were 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 geometry and material grades are based on the previous structural analysis report by FDH Engineering, Inc., referenced above.
- 4) Original design information of the existing modifications was not available at the time of this analysis. The existing flat plate shaft reinforcement by others from 0 – 66 ft are based solely on the previous structural analysis report by Destek Engineering, LLC in 2016. Based on our analysis, the shaft reinforcement is structurally ineffective and has not been considered for the design strength of the pole. It has been included in this analysis for wind area and weight only.
- 5) The existing and reserved T-Mobile equipment are based on the most recent structural analysis report by Centek Engineering, Inc., referenced above.
- 6) The existing and reserved AT&T equipment are based on the most recent structural analysis report by Hudson Design Group LLC., 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
L1	145 - 140	Pole	TP24.521x23.61x0.281	1	-1.45	1283.07	1.6	Pass
L2	140 - 135	Pole	TP25.432x24.521x0.281	2	-1.88	1331.29	3.3	Pass
L3	135 - 130	Pole	TP26.3431x25.432x0.281	3	-5.95	1379.52	8.8	Pass
L4	130 - 125	Pole	TP27.2541x26.3431x0.281	4	-10.34	1427.74	17.9	Pass
L5	125 - 120	Pole	TP28.1651x27.2541x0.281	5	-11.00	1475.96	26.1	Pass
L6	120 - 115	Pole	TP29.0761x28.1651x0.281	6	-14.21	1524.18	35.0	Pass
L7	115 - 110	Pole	TP29.9871x29.0761x0.281	7	-14.96	1572.40	43.8	Pass
L8	110 - 105	Pole	TP30.8982x29.9871x0.281	8	-19.39	1620.63	54.1	Pass
L9	105 - 100	Pole	TP31.8092x30.8982x0.281	9	-20.25	1668.85	63.4	Pass
L10	100 - 90.83	Pole	TP33.48x31.8092x0.281	10	-20.97	1707.43	70.4	Pass
L11	90.83 - 89.83	Pole	TP33.0974x31.976x0.375	11	-22.99	2311.47	56.1	Pass
L12	89.83 - 84.83	Pole	TP34.0062x33.0974x0.375	12	-24.13	2375.67	61.4	Pass
L13	84.83 - 79.83	Pole	TP34.915x34.0062x0.375	13	-25.17	2439.86	66.5	Pass
L14	79.83 - 76	Pole	TP35.6111x34.915x0.375	14	-26.08	2489.04	70.3	Pass
L15	76 - 71	Pole	TP36.5199x35.6111x0.375	15	-27.31	2553.23	75.0	Pass
L16	71 - 66	Pole	TP37.4287x36.5199x0.375	16	-28.57	2617.43	79.5	Pass
L17	66 - 61	Pole	TP38.3375x37.4287x0.375	17	-29.86	2681.62	83.9	Pass
L18	61 - 56	Pole	TP39.2463x38.3375x0.375	18	-31.18	2745.82	88.1	Pass
L19	56 - 51	Pole	TP40.155x39.2463x0.375	19	-32.55	2810.01	92.3	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L20	51 - 42.83	Pole	TP41.64x40.155x0.375	20	-33.11	2835.69	93.9	Pass
L21	42.83 - 41.83	Pole	TP41.074x39.7686x0.4375	21	-36.44	3348.93	83.3	Pass
L22	41.83 - 36.83	Pole	TP41.9844x41.074x0.4375	22	-38.04	3423.95	86.3	Pass
L23	36.83 - 35	Pole	TP42.3175x41.9844x0.4375	23	-38.62	3451.41	87.4	Pass
L24	35 - 34.75	Pole	TP42.3631x42.3175x0.7	24	-38.77	5493.65	53.0	Pass
L25	34.75 - 29.75	Pole	TP43.2734x42.3631x0.7	25	-40.97	5613.69	54.3	Pass
L26	29.75 - 29	Pole	TP43.41x43.2734x0.7	26	-41.31	5631.69	54.5	Pass
L27	29 - 24	Pole	TP44.3203x43.41x0.6875	27	-43.56	5650.64	56.8	Pass
L28	24 - 19	Pole	TP45.2307x44.3203x0.6875	28	-45.86	5768.54	58.0	Pass
L29	19 - 14	Pole	TP46.141x45.2307x0.675	29	-48.19	5780.99	60.2	Pass
L30	14 - 9	Pole	TP47.0514x46.141x0.675	30	-50.43	5896.74	61.3	Pass
L31	9 - 4	Pole	TP47.9617x47.0514x0.6625	31	-52.62	5902.71	63.5	Pass
L32	4 - 0	Pole	TP48.69x47.9617x0.6625	32	-54.39	5993.60	64.3	Pass
							Summary	
						Pole (L20)	93.9*	Pass
						Rating =	93.9*	Pass

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

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	98.2	Pass
1	Base Plate	0	63.6	Pass
1	Base Foundation (Structure)	0	66.3	Pass
1	Base Foundation (Soil Interaction)	0	86.0	Pass

Structure Rating (max from all components) =	98.2%
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Note:

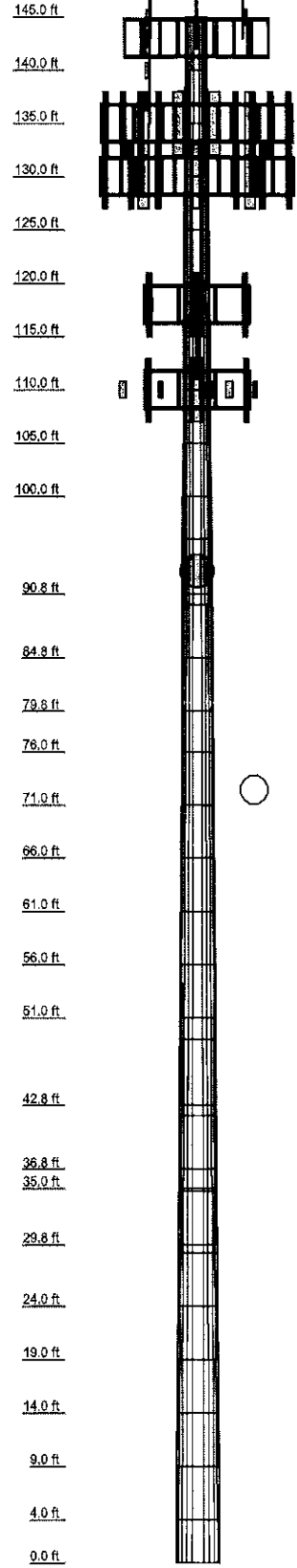
- 1) See additional documentation in "Appendix B - Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Result / conclusion

The tower and its foundation will have sufficient capacity to support the proposed Dish Wireless load configurations and existing/reserved load once the proposed modifications detailed in the report below have been installed. No further modifications required.

APPENDIX A
TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	12	0.2810				0.4	
2	5.00	12	0.2810				0.4	
3	5.00	12	0.2810				0.4	
4	5.00	12	0.2810				0.4	
5	5.00	12	0.2810				0.4	
6	5.00	12	0.2810				0.4	
7	5.00	12	0.2810				0.4	
8	5.00	12	0.2810				0.4	
9	5.00	12	0.2810				0.4	
10	5.00	12	0.2810				0.4	
11	5.00	12	0.2810				0.4	
12	5.00	12	0.2810				0.4	
13	5.00	12	0.2810				0.4	
14	5.00	12	0.2810				0.4	
15	5.00	12	0.2810				0.4	
16	5.00	12	0.2810				0.4	
17	5.00	12	0.2810				0.4	
18	5.00	12	0.2810				0.4	
19	5.00	12	0.2810				0.4	
20	5.00	12	0.2810				0.4	
21	5.00	12	0.2810				0.4	
22	5.00	12	0.2810				0.4	
23	5.00	12	0.2810				0.4	
24	5.00	12	0.2810				0.4	
25	5.00	12	0.2810				0.4	
26	5.00	12	0.2810				0.4	
27	5.00	12	0.2810				0.4	
28	5.00	12	0.2810				0.4	
29	5.00	12	0.2810				0.4	
30	5.00	12	0.2810				0.4	
31	5.00	12	0.2810				0.4	
32	5.00	12	0.2810				0.4	
33	5.00	12	0.2810				0.4	
34	5.00	12	0.2810				0.4	



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
BPA7496-180-14 w/ Mount Pipe	145	(2) MM01	130
432F-83W TTA	145	Connecting Pipe	130
10' x 1.5" Dia Dipole	143	Connecting Pipe	130
10' x 1.5" Dia Dipole	143	Connecting Pipe	130
12' x 3" Dia Omni	143	VFA14-H10-2120	130
T-Arm Mount	143	RRUS 32	130
2" STD Pipe (2.375 OD)x6'-0"	143	RRUS 32	130
2" STD Pipe (2.375 OD)x6'-0"	143	RRUS 32	130
2" STD Pipe (2.375 OD)x6'-0"	143	RRUS 4478 B14	130
8' Lightning Rod	143	RRUS 4478 B14	130
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	135	RRUS 4478 B14	130
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	135	RRUS 4426 B66	130
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	135	RRUS 4426 B66	130
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	135	RRUS 4426 B66	130
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	135	DC6-48-60-18-8F	130
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	135	DC6-48-60-18-8F	130
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	135	DC6-48-60-18-8F	130
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	135	DC6-48-60-18-8F	130
AIR 32 B2a/B66Aa w/ Mount Pipe	135	QD6616-7	130
AIR 32 B2a/B66Aa w/ Mount Pipe	135	QD6616-7	130
AIR 32 B2a/B66Aa w/ Mount Pipe	135	QD6616-7	130
AIR 6449 B41 w/ Mount Pipe	135	DMP65R-BU6D	130
AIR 6449 B41 w/ Mount Pipe	135	DMP65R-BU6D	130
AIR 6449 B41 w/ Mount Pipe	135	FFV-65B-R2 w/ Mount Pipe	118
AIR 6449 B41 w/ Mount Pipe	135	FFV-65B-R2 w/ Mount Pipe	118
RRUS 4415 B25	135	TA08025-B605	118
RRUS 4415 B25	135	TA08025-B605	118
RRUS 4415 B25	135	TA08025-B604	118
RRUS 4415 B25	135	TA08025-B604	118
RADIO 4448 B71+B85	135	TA08025-B604	118
RADIO 4449 B71+B85	135	RDIC-9181-PF-48	118
RADIO 4449 B71+B85	135	(2) 8' x 2" STD Pipe	118
ATMAA1412D-1A20	135	(2) 8' x 2" STD Pipe	118
ATMAA1412D-1A20	135	8' Platform Mount (MC-PK8-DSH)	118
ATMAA1412D-1A20	135	Top Rail	118
10' x 1.5" Dia Dipole	135	FFV-65B-R2 w/ Mount Pipe	118
Stabilizer Kit, Perfect10-P/N: VSK-M	135	FD-RRH-4X45-1900	110
T-Arm Mount	135	12' x 3" Dia Omni	110
DMP65R-BU6D	130	Platform Mount	110
AIR6449 B77D + AIR6419 B77G	130	FD-RRH-4X45-1900	110
AIR6449 B77D + AIR6419 B77G	130	NNV-65B-R4_TIA w/ Mount Pipe	110
AIR6449 B77D + AIR6419 B77G	130	AAHC w/ Mount Pipe	110
RRUS 4415 B25	130	AAHC w/ Mount Pipe	110
RRUS 4415 B25	130	AAHC w/ Mount Pipe	110
RRUS 4449 B5/B12	130	(2) FD-RRH-2x50-800	110
RRUS 4449 B5/B12	130	(2) FD-RRH-2x50-800	110
RRUS 4449 B5/B12	130	(2) FD-RRH-2x50-800	110
RRUS 4449 B5/B12	130	FD-RRH-4X45-1900	110
DC9-48-60-24-3C-EV	130	FD-RRH-4X45-1900	110
(2) MM01	130	NNV-65B-R4_TIA w/ Mount Pipe	110
(2) MM01	130	NNV-65B-R4_TIA w/ Mount Pipe	110
		Dish Mount	93
		SC3-W100AC	93

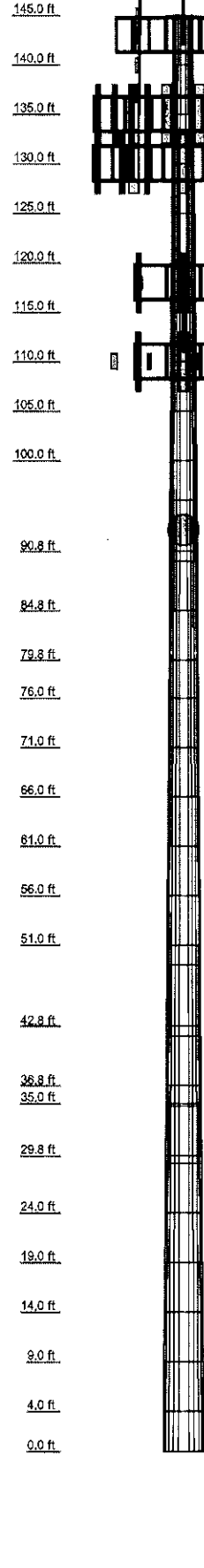
MATERIAL STRENGTH

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

Tectonic
1279 Route 30
Newburgh, NY 12550
Phone: (845) 567-6656
FAX: (845) 567-8703

Job: **10710.NJER0114A - Structural Modification Analy**
 Project: **145' Monopole**
 Client: **Dish Wireless** Drawn by: **John-Fritz Julien** App'd:
 Code: **TIA-222-H** Date: **03/10/23** Scale: **NTS**
 Path: _____ Dwg No. **E-1**

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	12	0.2810				0.4	
2	5.00	12	0.2810				0.4	
3	5.00	12	0.2810				0.4	
4	5.00	12	0.2810				0.4	
5	5.00	12	0.2810				0.4	
6	5.00	12	0.2810				0.4	
7	5.00	12	0.2810				0.5	
8	5.00	12	0.2810				0.5	
9	5.00	12	0.2810				0.5	
10	5.00	12	0.2810				0.9	
11	5.00	12	0.3750				0.7	
12	5.00	12	0.3750				0.7	
13	5.00	12	0.3750				0.5	
14	5.00	12	0.3750				0.7	
15	5.00	12	0.3750				0.7	
16	5.00	12	0.3750				0.8	
17	5.00	12	0.3750				0.8	
18	5.00	12	0.3750				0.8	
19	5.00	12	0.3750				0.8	
20	5.00	12	0.3750				1.4	
21	5.00	12	0.3750				1.4	
22	5.00	12	0.3750				1.0	
23	5.00	12	0.3750				1.6	
24	5.00	12	0.3750				1.6	
25	5.00	12	0.6750				1.6	
26	5.00	12	0.6750				1.6	
27	5.00	12	0.6750				1.6	
28	5.00	12	0.6750				1.6	
29	5.00	12	0.6750				1.6	
30	5.00	12	0.6750				1.6	
31	5.00	12	0.6750				1.6	
32	5.00	12	0.6750				1.7	
33	5.00	12	0.6625				1.3	
34	4.00	12	0.6625				26.7	



Height (ft)	Grade	Weight (K)
145.0	A572-65	0.4
140.0	A572-65	0.4
135.0	A572-65	0.4
130.0	A572-65	0.4
125.0	A572-65	0.4
120.0	A572-65	0.4
115.0	A572-65	0.4
110.0	A572-65	0.5
105.0	A572-65	0.5
100.0	A572-65	0.5
90.8	A572-65	0.9
84.8	A572-65	0.7
79.8	A572-65	0.7
76.0	A572-65	0.5
71.0	A572-65	0.7
66.0	A572-65	0.8
61.0	A572-65	0.8
56.0	A572-65	0.8
51.0	A572-65	0.8
42.8	A572-65	1.4
38.8	A572-65	1.4
35.0	A572-65	1.0
29.8	A572-65	1.6
24.0	A572-65	1.6
19.0	A572-65	1.6
14.0	A572-65	1.6
9.0	A572-65	1.6
4.0	A572-65	1.7
0.0	A572-65	1.3

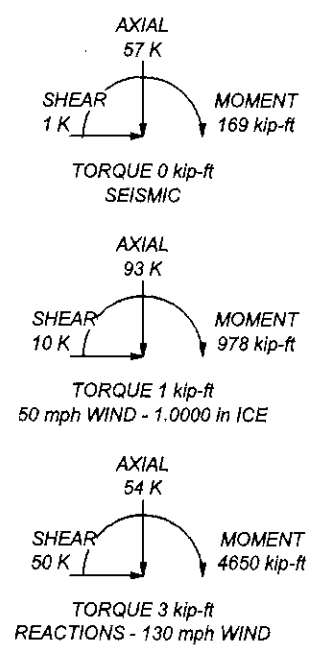
MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for Exposure B to the TIA-222-H Standard.
2. Tower designed for a 130 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category III.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. Seismic loads generated by Spreadsheet
8. Seismic calculations are in accordance with TIA-222-H-1
9. TOWER RATING: 93.9%

ALL REACTIONS ARE FACTORED



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

Job: **10710.NJER01114A - Structural Modification Analy**
 Project: **145' Monopole**
 Client: **Dish Wireless** | Drawn by: **John-Fritz Julien** | App'd:
 Code: **TIA-222-H** | Date: **03/10/23** | Scale: **NT**
 Path: | Dwg No. **E**

Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

- Tower base elevation above sea level: 11.69 ft.
- Basic wind speed of 130 mph.
- Risk Category III.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.0000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- Seismic loads generated by Spreadsheet.
- Seismic calculations are in accordance with TIA-222-H-1.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|--|---|--|
| Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
✓ Use Code Stress Ratios
Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile

Include Bolts In Member Capacity

Leg Bolts Are At Top Of Section
Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
SR Members Have Cut Ends
SR Members Are Concentric | Distribute Leg Loads As Uniform
Assume Legs Pinned
✓ Assume Rigid Index Plate
✓ Use Clear Spans For Wind Area
✓ Use Clear Spans For KL/r
Retension Guys To Initial Tension
✓ Bypass Mast Stability Checks
✓ Use Azimuth Dish Coefficients
✓ Project Wind Area of Appurt.

Autocalc Torque Arm Areas

Add IBC .6D+W Combination
✓ Sort Capacity Reports By Component
Triangulate Diamond Inner Bracing
Treat Feed Line Bundles As Cylinder
Ignore KL/ry For 60 Deg. Angle Legs | Use ASCE 10 X-Brace Ly Rules
Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
SR Leg Bolts Resist Compression
All Leg Panels Have Same Allowable
Offset Girt At Foundation
✓ Consider Feed Line Torque
Include Angle Block Shear Check
Use TIA-222-H Bracing Resist.
Exemption
Use TIA-222-H Tension Splice
Exemption

<div style="text-align: center;">Poles</div> ✓ Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets
Pole Without Linear Attachments
Pole With Shroud Or No
Appurtenances
Outside and Inside Corner Radii Are
Known |
|--|---|--|

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	145.00-140.00	5.00	0.00	12	23.6100	24.5210	0.2810	1.1240	A572-65 (65 ksi)
L2	140.00-135.00	5.00	0.00	12	24.5210	25.4320	0.2810	1.1240	A572-65 (65 ksi)
L3	135.00-130.00	5.00	0.00	12	25.4320	26.3431	0.2810	1.1240	A572-65 (65 ksi)
L4	130.00-125.00	5.00	0.00	12	26.3431	27.2541	0.2810	1.1240	A572-65 (65 ksi)
L5	125.00-120.00	5.00	0.00	12	27.2541	28.1651	0.2810	1.1240	A572-65 (65 ksi)
L6	120.00-115.00	5.00	0.00	12	28.1651	29.0761	0.2810	1.1240	A572-65 (65 ksi)
L7	115.00-110.00	5.00	0.00	12	29.0761	29.9871	0.2810	1.1240	A572-65 (65 ksi)
L8	110.00-105.00	5.00	0.00	12	29.9871	30.8982	0.2810	1.1240	A572-65 (65 ksi)
L9	105.00-100.00	5.00	0.00	12	30.8982	31.8092	0.2810	1.1240	A572-65 (65 ksi)
L10	100.00-90.83	9.17	5.17	12	31.8092	33.4800	0.2810	1.1240	A572-65 (65 ksi)
L11	90.83-89.83	6.17	0.00	12	31.9760	33.0974	0.3750	1.5000	A572-65 (65 ksi)
L12	89.83-84.83	5.00	0.00	12	33.0974	34.0062	0.3750	1.5000	A572-65 (65 ksi)
L13	84.83-79.83	5.00	0.00	12	34.0062	34.9150	0.3750	1.5000	A572-65 (65 ksi)
L14	79.83-76.00	3.83	0.00	12	34.9150	35.6111	0.3750	1.5000	A572-65 (65 ksi)
L15	76.00-71.00	5.00	0.00	12	35.6111	36.5199	0.3750	1.5000	A572-65 (65 ksi)
L16	71.00-66.00	5.00	0.00	12	36.5199	37.4287	0.3750	1.5000	A572-65 (65 ksi)
L17	66.00-61.00	5.00	0.00	12	37.4287	38.3375	0.3750	1.5000	A572-65 (65 ksi)
L18	61.00-56.00	5.00	0.00	12	38.3375	39.2463	0.3750	1.5000	A572-65 (65 ksi)
L19	56.00-51.00	5.00	0.00	12	39.2463	40.1550	0.3750	1.5000	A572-65 (65 ksi)
L20	51.00-42.83	8.17	6.17	12	40.1550	41.6400	0.3750	1.5000	A572-65 (65 ksi)
L21	42.83-41.83	7.17	0.00	12	39.7686	41.0740	0.4375	1.7500	A572-65 (65 ksi)
L22	41.83-36.83	5.00	0.00	12	41.0740	41.9844	0.4375	1.7500	A572-65 (65 ksi)
L23	36.83-35.00	1.83	0.00	12	41.9844	42.3175	0.4375	1.7500	A572-65 (65 ksi)
L24	35.00-34.75	0.25	0.00	12	42.3175	42.3631	0.7000	2.8000	A572-65 (65 ksi)
L25	34.75-29.75	5.00	0.00	12	42.3631	43.2734	0.7000	2.8000	A572-65 (65 ksi)
L26	29.75-29.00	0.75	0.00	12	43.2734	43.4100	0.7000	2.8000	A572-65 (65 ksi)
L27	29.00-24.00	5.00	0.00	12	43.4100	44.3203	0.6875	2.7500	A572-65 (65 ksi)
L28	24.00-19.00	5.00	0.00	12	44.3203	45.2307	0.6875	2.7500	A572-65 (65 ksi)
L29	19.00-14.00	5.00	0.00	12	45.2307	46.1410	0.6750	2.7000	A572-65 (65 ksi)
L30	14.00-9.00	5.00	0.00	12	46.1410	47.0514	0.6750	2.7000	A572-65 (65 ksi)
L31	9.00-4.00	5.00	0.00	12	47.0514	47.9617	0.6625	2.6500	A572-65 (65 ksi)
L32	4.00-0.00	4.00		12	47.9617	48.6900	0.6625	2.6500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	24.3437	21.1085	1466.3462	8.3518	12.2300	119.8977	2971.2149	10.3890	5.5744	19.838
	25.2869	21.9329	1644.9288	8.6779	12.7019	129.5027	3333.0718	10.7947	5.8186	20.707
L2	25.2869	21.9329	1644.9288	8.6779	12.7019	129.5027	3333.0718	10.7947	5.8186	20.707
	26.2301	22.7572	1837.4524	9.0041	13.1738	139.4778	3723.1767	11.2004	6.0627	21.575
L3	26.2301	22.7572	1837.4524	9.0041	13.1738	139.4778	3723.1767	11.2004	6.0627	21.575
	27.1732	23.5815	2044.4404	9.3302	13.6457	149.8230	4142.5906	11.6061	6.3069	22.444
L4	27.1732	23.5815	2044.4404	9.3302	13.6457	149.8230	4142.5906	11.6061	6.3069	22.444
	28.1164	24.4058	2266.4175	9.6564	14.1176	160.5383	4592.3762	12.0118	6.5510	23.313
L5	28.1164	24.4058	2266.4175	9.6564	14.1176	160.5383	4592.3762	12.0118	6.5510	23.313
	29.0595	25.2301	2503.9072	9.9825	14.5895	171.6236	5073.5948	12.4175	6.7952	24.182
L6	29.0595	25.2301	2503.9072	9.9825	14.5895	171.6236	5073.5948	12.4175	6.7952	24.182
	30.0027	26.0544	2757.4335	10.3087	15.0614	183.0791	5587.3078	12.8232	7.0393	25.051
L7	30.0027	26.0544	2757.4335	10.3087	15.0614	183.0791	5587.3078	12.8232	7.0393	25.051
	30.9459	26.8787	3027.5204	10.6348	15.5333	194.9046	6134.5771	13.2289	7.2835	25.92
L8	30.9459	26.8787	3027.5204	10.6348	15.5333	194.9046	6134.5771	13.2289	7.2835	25.92
	31.8890	27.7030	3314.6918	10.9609	16.0053	207.1003	6716.4642	13.6346	7.5276	26.789
L9	31.8890	27.7030	3314.6918	10.9609	16.0053	207.1003	6716.4642	13.6346	7.5276	26.789
	32.8322	28.5273	3619.4716	11.2871	16.4772	219.6660	7334.0308	14.0403	7.7718	27.658
L10	32.8322	28.5273	3619.4716	11.2871	16.4772	219.6660	7334.0308	14.0403	7.7718	27.658
	34.5619	30.0391	4225.9383	11.8852	17.3426	243.6733	8562.8966	14.7843	8.2196	29.251
L11	33.9445	38.1582	4863.8003	11.3132	16.5636	293.6444	9855.3780	18.7803	7.5646	20.172
	34.1327	39.5123	5400.2045	11.7146	17.1445	314.9822	10942.278	19.4468	7.8651	20.974
L12	34.1327	39.5123	5400.2045	11.7146	17.1445	314.9822	10942.278	19.4468	7.8651	20.974
	35.0735	40.6097	5862.7469	12.0400	17.6152	332.8227	11879.514	19.9869	8.1087	21.623
L13	35.0735	40.6097	5862.7469	12.0400	17.6152	332.8227	11879.514	19.9869	8.1087	21.623
	36.0144	41.7071	6350.9748	12.3653	18.0860	351.1547	12868.796	20.5269	8.3522	22.273
L14	36.0144	41.7071	6350.9748	12.3653	18.0860	351.1547	12868.796	20.5269	8.3522	22.273
	36.7351	42.5476	6742.7628	12.6145	18.4466	365.5294	13662.665	20.9407	8.5388	22.77
L15	36.7351	42.5476	6742.7628	12.6145	18.4466	365.5294	13662.665	20.9407	8.5388	22.77
	37.6759	43.6450	7278.0464	12.9399	18.9173	384.7293	14747.295	21.4807	8.7823	23.42
L16	37.6759	43.6450	7278.0464	12.9399	18.9173	384.7293	14747.295	21.4807	8.7823	23.42
	38.6168	44.7423	7840.9346	13.2652	19.3881	404.4207	15887.859	22.0208	9.0259	24.069
L17	38.6168	44.7423	7840.9346	13.2652	19.3881	404.4207	15887.859	22.0208	9.0259	24.069
	39.5576	45.8397	8432.1228	13.5906	19.8588	424.6035	17085.766	22.5609	9.2694	24.719
L18	39.5576	45.8397	8432.1228	13.5906	19.8588	424.6035	17085.766	22.5609	9.2694	24.719
	40.4984	46.9371	9052.3043	13.9159	20.3296	445.2778	18342.422	23.1010	9.5130	25.368
L19	40.4984	46.9371	9052.3043	13.9159	20.3296	445.2778	18342.422	23.1010	9.5130	25.368
	41.4393	48.0344	9702.1734	14.2413	20.8003	466.4436	19659.233	23.6411	9.7566	26.017
L20	41.4393	48.0344	9702.1734	14.2413	20.8003	466.4436	19659.233	23.6411	9.7566	26.017
	42.9766	49.8275	10829.755	14.7729	21.5695	502.0861	21944.020	24.5236	10.1545	27.079
L21	42.1801	55.4076	10940.241	14.0805	20.6001	531.0767	22167.894	27.2700	9.4855	21.681
	42.3686	57.2467	12066.155	14.5479	21.2763	567.1163	24449.302	28.1751	9.8353	22.481
L22	42.3686	57.2467	12066.155	14.5479	21.2763	567.1163	24449.302	28.1751	9.8353	22.481
	43.3111	58.5291	12895.386	14.8738	21.7479	592.9487	26129.549	28.8063	10.0793	23.038

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L23	43.3111	58.5291	12895.386 8	14.8738	21.7479	592.9487	26129.549 8	28.8063	10.0793	23.038
	43.6560	58.9985	13208.127 9	14.9931	21.9205	602.5472	26763.248 1	29.0373	10.1686	23.243
L24	43.5634	93.8059	20738.111 4	14.8991	21.9205	946.0607	42021.036 2	46.1684	9.4651	13.522
	43.6105	93.9085	20806.231 0	14.9154	21.9441	948.1484	42159.064 9	46.2189	9.4773	13.539
L25	43.6105	93.9085	20806.231 0	14.9154	21.9441	948.1484	42159.064 9	46.2189	9.4773	13.539
	44.5530	95.9605	22200.115 5	15.2413	22.4156	990.3856	44983.452 8	47.2288	9.7213	13.888
L26	44.5530	95.9605	22200.115 5	15.2413	22.4156	990.3856	44983.452 8	47.2288	9.7213	13.888
	44.6944	96.2683	22414.420 2	15.2902	22.4864	996.8007	45417.692 1	47.3803	9.7579	13.94
L27	44.6988	94.5769	22033.497 1	15.2946	22.4864	979.8605	44645.838 7	46.5479	9.7914	14.242
	45.6412	96.5921	23472.224 6	15.6205	22.9579	1022.4019	47561.090 7	47.5397	10.0353	14.597
L28	45.6412	96.5921	23472.224 6	15.6205	22.9579	1022.4019	47561.090 7	47.5397	10.0353	14.597
	46.5837	98.6074	24972.257 3	15.9465	23.4295	1065.8474	50600.563 5	48.5316	10.2793	14.952
L29	46.5881	96.8417	24538.863 4	15.9509	23.4295	1047.3496	49722.390 1	47.6626	10.3128	15.278
	47.5306	98.8204	26073.921 5	16.2768	23.9010	1090.9113	52832.833 9	48.6364	10.5568	15.64
L30	47.5306	98.8204	26073.921 5	16.2768	23.9010	1090.9113	52832.833 9	48.6364	10.5568	15.64
	48.4730	100.7990	27671.698 9	16.8027	24.3726	1135.3605	56070.364 1	49.6102	10.8008	16.001
L31	48.4775	98.9591	27181.227 0	16.8072	24.3726	1115.2366	55076.535 0	48.7046	10.8343	16.354
	49.4199	100.9011	28813.077 1	16.9331	24.8442	1159.7520	58383.105 8	49.6604	11.0782	16.722
L32	49.4199	100.9011	28813.077 1	16.9331	24.8442	1159.7520	58383.105 8	49.6604	11.0782	16.722
	50.1739	102.4547	30164.605 3	17.1938	25.2214	1195.9916	61121.668 3	50.4251	11.2734	17.016

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in
L1 145.00-140.00				1	1	1			
L2 140.00-135.00				1	1	1			
L3 135.00-130.00				1	1	1			
L4 130.00-125.00				1	1	1			
L5 125.00-120.00				1	1	1			
L6 120.00-115.00				1	1	1			
L7 115.00-110.00				1	1	1			
L8 110.00-105.00				1	1	1			
L9 105.00-100.00				1	1	1			
L10 100.00-90.83				1	1	1			
L11 90.83-89.83				1	1	1			
L12 89.83-				1	1	1			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in
84.83									
L13 84.83-79.83				1	1	1			
L14 79.83-76.00				1	1	1			
L15 76.00-71.00				1	1	1			
L16 71.00-66.00				1	1	1			
L17 66.00-61.00				1	1	1			
L18 61.00-56.00				1	1	1			
L19 56.00-51.00				1	1	1			
L20 51.00-42.83				1	1	1			
L21 42.83-41.83				1	1	1			
L22 41.83-36.83				1	1	1			
L23 36.83-35.00				1	1	1			
L24 35.00-34.75				1	1	0.96885			
L25 34.75-29.75				1	1	0.961498			
L26 29.75-29.00				1	1	0.960422			
L27 29.00-24.00				1	1	0.970479			
L28 24.00-19.00				1	1	0.96365			
L29 19.00-14.00				1	1	0.974551			
L30 14.00-9.00				1	1	0.968144			
L31 9.00-4.00				1	1	0.979875			
L32 4.00-0.00				1	1	0.97503			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
LDF7-50A(1-5/8)	C	No	Surface Ar (CaAa)	135.00 - 12.00	6	3	0.000 0.200	1.9800		0.82
LDF7-50A(1-5/8)	C	No	Surface Ar (CaAa)	135.00 - 12.00	9	9	0.300 0.300	1.9800		0.82
FLC 114-50J(1-1/4")	C	No	Surface Ar (CaAa)	110.00 - 12.00	4	4	0.000 0.000	1.5800		0.70
** Step Bolts	C	No	Surface Ar (CaAa)	145.00 - 5.00	1	1	0.000 0.000	0.3750		2.00
Safety Line 3/8	C	No	Surface Ar (CaAa)	145.00 - 5.00	1	1	0.000 0.000	0.3750		0.22
** PL7x5/8	A	No	Surface Ar (CaAa)	66.00 - 47.75	1	1	0.500 0.500	7.0000		0.00
PL7x5/8	B	No	Surface Ar (CaAa)	66.00 - 47.75	1	1	0.500 0.500	7.0000		0.00
PL7x5/8	C	No	Surface Ar	66.00 -	1	1	0.500	7.0000		0.00

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
			(CaAa)	47.75			0.500			
PL7x5/8	A	No	Surface Ar (CaAa)	66.00 - 37.92	1	1	0.000	7.0000		0.00
PL7x5/8	B	No	Surface Ar (CaAa)	66.00 - 37.92	1	1	0.000	7.0000		0.00
PL7x5/8	C	No	Surface Ar (CaAa)	66.00 - 37.92	1	1	0.000	7.0000		0.00
PL10x5/8	A	No	Surface Ar (CaAa)	47.75 - 0.00	1	1	0.500	10.0000		0.00
PL10x5/8	B	No	Surface Ar (CaAa)	47.75 - 0.00	1	1	0.500	10.0000		0.00
PL10x5/8	C	No	Surface Ar (CaAa)	47.75 - 0.00	1	1	0.500	10.0000		0.00
**										
PL8.5x1.25	A	No	Surface Ar (CaAa)	35.00 - 0.00	1	1	0.000	8.5000		0.00
PL8.5x1.25	B	No	Surface Ar (CaAa)	35.00 - 0.00	1	1	0.000	8.5000		0.00
PL8.5x1.25	C	No	Surface Ar (CaAa)	35.00 - 0.00	1	1	0.000	8.5000		0.00
**										
CU12PSM9P6XXX_6A WG	C	No	Surface Ar (CaAa)	118.00 - 12.00	1	1	0.000	1.6000		2.35
EW90(ELLIPTICAL)	B	No	Surface Ar (CaAa)	93.00 - 0.00	1	1	0.000	1.2800		0.32

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf

FLC 114-50J(1-1/4)	C	No	No	Inside Pole	143.00 - 12.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.70 0.70 0.70
**									
AVA5-50(7/8")	C	No	No	Inside Pole	135.00 - 12.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.30 0.30 0.30
**									
LCF114-50J(1-1/4)	A	No	No	Inside Pole	130.00 - 12.00	6	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.70 0.70 0.70
DC Trunk	A	No	No	Inside Pole	130.00 - 12.00	6	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.16 1.16 1.16
DC Trunk	A	No	No	Inside Pole	130.00 - 12.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.16 1.16 1.16
Fiber Trunk	A	No	No	Inside Pole	130.00 - 12.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.80 0.80 0.80
Fiber Trunk	A	No	No	Inside Pole	130.00 - 12.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.80 0.80 0.80
**									
FLC78-50J(7/8")	C	No	No	Inside Pole	110.00 - 12.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.40 0.40 0.40

Feed Line/Linear Appurtenances Section Areas

Tower Sectio n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	145.00-140.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.375	0.000	0.02
L2	140.00-135.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.375	0.000	0.02
L3	135.00-130.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	12.255	0.000	0.08
L4	130.00-125.00	A	0.000	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	12.255	0.000	0.08
L5	125.00-120.00	A	0.000	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	12.255	0.000	0.08
L6	120.00-115.00	A	0.000	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	12.735	0.000	0.09
L7	115.00-110.00	A	0.000	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	13.055	0.000	0.10
L8	110.00-105.00	A	0.000	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	16.215	0.000	0.11
L9	105.00-100.00	A	0.000	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	16.215	0.000	0.11
L10	100.00-90.83	A	0.000	0.000	0.000	0.000	0.13
		B	0.000	0.000	0.278	0.000	0.00
		C	0.000	0.000	29.738	0.000	0.21
L11	90.83-89.83	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.128	0.000	0.00
		C	0.000	0.000	3.243	0.000	0.02
L12	89.83-84.83	A	0.000	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.640	0.000	0.00
		C	0.000	0.000	16.215	0.000	0.11
L13	84.83-79.83	A	0.000	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.640	0.000	0.00
		C	0.000	0.000	16.215	0.000	0.11
L14	79.83-76.00	A	0.000	0.000	0.000	0.000	0.06
		B	0.000	0.000	0.490	0.000	0.00
		C	0.000	0.000	12.421	0.000	0.09
L15	76.00-71.00	A	0.000	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.640	0.000	0.00
		C	0.000	0.000	16.215	0.000	0.11
L16	71.00-66.00	A	0.000	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.640	0.000	0.00
		C	0.000	0.000	16.215	0.000	0.11
L17	66.00-61.00	A	0.000	0.000	7.000	0.000	0.07
		B	0.000	0.000	7.640	0.000	0.00
		C	0.000	0.000	23.215	0.000	0.11
L18	61.00-56.00	A	0.000	0.000	7.000	0.000	0.07
		B	0.000	0.000	7.640	0.000	0.00
		C	0.000	0.000	23.215	0.000	0.11
L19	56.00-51.00	A	0.000	0.000	7.000	0.000	0.07
		B	0.000	0.000	7.640	0.000	0.00
		C	0.000	0.000	23.215	0.000	0.11
L20	51.00-42.83	A	0.000	0.000	12.914	0.000	0.12
		B	0.000	0.000	13.960	0.000	0.00
		C	0.000	0.000	39.409	0.000	0.18
L21	42.83-41.83	A	0.000	0.000	1.700	0.000	0.01
		B	0.000	0.000	1.828	0.000	0.00
		C	0.000	0.000	4.943	0.000	0.02
L22	41.83-36.83	A	0.000	0.000	7.737	0.000	0.07
		B	0.000	0.000	8.377	0.000	0.00

Tower Section n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L23	36.83-35.00	C	0.000	0.000	23.952	0.000	0.11
		A	0.000	0.000	1.830	0.000	0.03
		B	0.000	0.000	2.064	0.000	0.00
L24	35.00-34.75	C	0.000	0.000	7.765	0.000	0.04
		A	0.000	0.000	0.462	0.000	0.00
		B	0.000	0.000	0.495	0.000	0.00
L25	34.75-29.75	C	0.000	0.000	1.273	0.000	0.01
		A	0.000	0.000	9.250	0.000	0.07
		B	0.000	0.000	9.890	0.000	0.00
L26	29.75-29.00	C	0.000	0.000	25.465	0.000	0.11
		A	0.000	0.000	1.388	0.000	0.01
		B	0.000	0.000	1.484	0.000	0.00
L27	29.00-24.00	C	0.000	0.000	3.820	0.000	0.02
		A	0.000	0.000	9.250	0.000	0.07
		B	0.000	0.000	9.890	0.000	0.00
L28	24.00-19.00	C	0.000	0.000	25.465	0.000	0.11
		A	0.000	0.000	9.250	0.000	0.07
		B	0.000	0.000	9.890	0.000	0.00
L29	19.00-14.00	C	0.000	0.000	25.465	0.000	0.11
		A	0.000	0.000	9.250	0.000	0.07
		B	0.000	0.000	9.890	0.000	0.00
L30	14.00-9.00	C	0.000	0.000	25.465	0.000	0.11
		A	0.000	0.000	9.250	0.000	0.03
		B	0.000	0.000	9.890	0.000	0.00
L31	9.00-4.00	C	0.000	0.000	15.961	0.000	0.05
		A	0.000	0.000	9.250	0.000	0.00
		B	0.000	0.000	9.890	0.000	0.00
L32	4.00-0.00	C	0.000	0.000	9.550	0.000	0.01
		A	0.000	0.000	7.400	0.000	0.00
		B	0.000	0.000	7.912	0.000	0.00
		C	0.000	0.000	7.400	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	145.00-140.00	A	1.331	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	3.037	0.000	0.05
L2	140.00-135.00	A	1.326	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	3.028	0.000	0.05
L3	135.00-130.00	A	1.321	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	21.172	0.000	0.30
L4	130.00-125.00	A	1.316	0.000	0.000	0.000	0.000	0.07
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	21.149	0.000	0.30
L5	125.00-120.00	A	1.311	0.000	0.000	0.000	0.000	0.07
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	21.125	0.000	0.30
L6	120.00-115.00	A	1.306	0.000	0.000	0.000	0.000	0.07
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	22.364	0.000	0.32
L7	115.00-110.00	A	1.300	0.000	0.000	0.000	0.000	0.07
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	23.175	0.000	0.33
L8	110.00-105.00	A	1.294	0.000	0.000	0.000	0.000	0.07
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	28.710	0.000	0.39
L9	105.00-100.00	A	1.288	0.000	0.000	0.000	0.000	0.07
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	28.669	0.000	0.39
L10	100.00-90.83	A	1.279	0.000	0.000	0.000	0.000	0.13
		B		0.000	0.000	0.833	0.000	0.01

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L11	90.83-89.83	C		0.000	0.000	52.465	0.000	0.72
		A	1.272	0.000	0.000	0.000	0.000	0.01
		B		0.000	0.000	0.384	0.000	0.00
		C		0.000	0.000	5.721	0.000	0.08
L12	89.83-84.83	A	1.268	0.000	0.000	0.000	0.000	0.07
		B		0.000	0.000	1.908	0.000	0.02
		C		0.000	0.000	28.531	0.000	0.39
L13	84.83-79.83	A	1.260	0.000	0.000	0.000	0.000	0.07
		B		0.000	0.000	1.900	0.000	0.02
		C		0.000	0.000	28.481	0.000	0.39
L14	79.83-76.00	A	1.253	0.000	0.000	0.000	0.000	0.06
		B		0.000	0.000	1.450	0.000	0.02
		C		0.000	0.000	21.780	0.000	0.29
L15	76.00-71.00	A	1.246	0.000	0.000	0.000	0.000	0.07
		B		0.000	0.000	1.886	0.000	0.02
		C		0.000	0.000	28.385	0.000	0.38
L16	71.00-66.00	A	1.237	0.000	0.000	0.000	0.000	0.07
		B		0.000	0.000	1.877	0.000	0.02
		C		0.000	0.000	28.326	0.000	0.38
L17	66.00-61.00	A	1.228	0.000	0.000	9.456	0.000	0.20
		B		0.000	0.000	11.323	0.000	0.14
		C		0.000	0.000	37.718	0.000	0.50
L18	61.00-56.00	A	1.218	0.000	0.000	9.435	0.000	0.20
		B		0.000	0.000	11.293	0.000	0.14
		C		0.000	0.000	37.630	0.000	0.50
L19	56.00-51.00	A	1.207	0.000	0.000	9.414	0.000	0.19
		B		0.000	0.000	11.261	0.000	0.14
		C		0.000	0.000	37.535	0.000	0.49
L20	51.00-42.83	A	1.191	0.000	0.000	16.807	0.000	0.34
		B		0.000	0.000	19.799	0.000	0.25
		C		0.000	0.000	62.583	0.000	0.82
L21	42.83-41.83	A	1.179	0.000	0.000	2.176	0.000	0.04
		B		0.000	0.000	2.543	0.000	0.03
		C		0.000	0.000	7.779	0.000	0.10
L22	41.83-36.83	A	1.170	0.000	0.000	9.823	0.000	0.20
		B		0.000	0.000	11.633	0.000	0.14
		C		0.000	0.000	37.697	0.000	0.49
L23	36.83-35.00	A	1.160	0.000	0.000	2.254	0.000	0.06
		B		0.000	0.000	2.913	0.000	0.04
		C		0.000	0.000	12.431	0.000	0.16
L24	35.00-34.75	A	1.156	0.000	0.000	0.578	0.000	0.01
		B		0.000	0.000	0.668	0.000	0.01
		C		0.000	0.000	1.967	0.000	0.03
L25	34.75-29.75	A	1.147	0.000	0.000	11.545	0.000	0.22
		B		0.000	0.000	13.332	0.000	0.16
		C		0.000	0.000	39.264	0.000	0.50
L26	29.75-29.00	A	1.137	0.000	0.000	1.729	0.000	0.03
		B		0.000	0.000	1.995	0.000	0.02
		C		0.000	0.000	5.876	0.000	0.08
L27	29.00-24.00	A	1.125	0.000	0.000	11.500	0.000	0.22
		B		0.000	0.000	13.265	0.000	0.16
		C		0.000	0.000	39.069	0.000	0.50
L28	24.00-19.00	A	1.102	0.000	0.000	11.453	0.000	0.21
		B		0.000	0.000	13.195	0.000	0.16
		C		0.000	0.000	38.865	0.000	0.49
L29	19.00-14.00	A	1.073	0.000	0.000	11.396	0.000	0.21
		B		0.000	0.000	13.109	0.000	0.15
		C		0.000	0.000	38.613	0.000	0.48
L30	14.00-9.00	A	1.035	0.000	0.000	11.320	0.000	0.16
		B		0.000	0.000	12.995	0.000	0.15
		C		0.000	0.000	23.571	0.000	0.28
L31	9.00-4.00	A	0.977	0.000	0.000	11.205	0.000	0.12
		B		0.000	0.000	12.822	0.000	0.14
		C		0.000	0.000	13.069	0.000	0.14
L32	4.00-0.00	A	0.869	0.000	0.000	8.790	0.000	0.09
		B		0.000	0.000	9.997	0.000	0.10
		C		0.000	0.000	8.790	0.000	0.09

Feed Line Center of Pressure

Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L1	145.00-140.00	0.0000	0.4494	0.0000	2.2125
L2	140.00-135.00	0.0000	0.4497	0.0000	2.2270
L3	135.00-130.00	-3.6009	6.5158	-2.9164	6.2972
L4	130.00-125.00	-3.6579	6.6169	-2.9783	6.4270
L5	125.00-120.00	-3.7131	6.7148	-3.0388	6.5536
L6	120.00-115.00	-3.6926	6.9745	-3.0095	6.9210
L7	115.00-110.00	-3.6968	7.1775	-3.0102	7.2030
L8	110.00-105.00	-3.3340	8.2377	-2.6024	7.8722
L9	105.00-100.00	-3.3830	8.3585	-2.6533	8.0210
L10	100.00-90.83	-3.3564	8.4369	-2.5793	8.0888
L11	90.83-89.83	-3.0838	8.2119	-2.1529	7.7212
L12	89.83-84.83	-3.1085	8.2779	-2.1798	7.8000
L13	84.83-79.83	-3.1490	8.3858	-2.2198	7.9323
L14	79.83-76.00	-3.1839	8.4790	-2.2548	8.0471
L15	76.00-71.00	-3.2181	8.5702	-2.2896	8.1600
L16	71.00-66.00	-3.2559	8.6712	-2.3287	8.2855
L17	66.00-61.00	-1.8546	4.9392	-1.5986	5.6774
L18	61.00-56.00	-1.8811	5.0100	-1.6289	5.7736
L19	56.00-51.00	-1.9072	5.0797	-1.6593	5.8684
L20	51.00-42.83	-1.8557	4.9425	-1.6488	5.8126
L21	42.83-41.83	-1.8060	4.8101	-1.6198	5.7104
L22	41.83-36.83	-1.8885	5.0298	-1.6970	5.9557
L23	36.83-35.00	-2.1972	5.8521	-1.9563	6.8507
L24	35.00-34.75	-1.7811	4.7440	-1.6292	5.7009
L25	34.75-29.75	-1.7935	4.7770	-1.6448	5.7447
L26	29.75-29.00	-1.8070	4.8129	-1.6622	5.7920
L27	29.00-24.00	-1.8203	4.8484	-1.6798	5.8384
L28	24.00-19.00	-1.8433	4.9097	-1.7112	5.9174
L29	19.00-14.00	-1.8659	4.9699	-1.7442	5.9931
L30	14.00-9.00	-0.7366	2.3340	-0.6108	3.3166
L31	9.00-4.00	0.2543	-0.0120	0.5463	0.3967
L32	4.00-0.00	0.2580	-0.1489	0.5380	-0.3106

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L1	18	Step Bolts	140.00 - 145.00	1.0000	1.0000
L1	19	Safety Line 3/8	140.00 - 145.00	1.0000	1.0000
L2	18	Step Bolts	135.00 - 140.00	1.0000	1.0000
L2	19	Safety Line 3/8	135.00 - 140.00	1.0000	1.0000
L3	6	LDF7-50A(1-5/8)	130.00 - 135.00	1.0000	1.0000
L3	7	LDF7-50A(1-5/8)	130.00 - 135.00	1.0000	1.0000
L3	18	Step Bolts	130.00 - 135.00	1.0000	1.0000
L3	19	Safety Line 3/8	130.00 - 135.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L4	6	LDF7-50A(1-5/8)	125.00 - 130.00	1.0000	1.0000
L4	7	LDF7-50A(1-5/8)	125.00 - 130.00	1.0000	1.0000
L4	18	Step Bolts	125.00 - 130.00	1.0000	1.0000
L4	19	Safety Line 3/8	125.00 - 130.00	1.0000	1.0000
L5	6	LDF7-50A(1-5/8)	120.00 - 125.00	1.0000	1.0000
L5	7	LDF7-50A(1-5/8)	120.00 - 125.00	1.0000	1.0000
L5	18	Step Bolts	120.00 - 125.00	1.0000	1.0000
L5	19	Safety Line 3/8	120.00 - 125.00	1.0000	1.0000
L6	6	LDF7-50A(1-5/8)	115.00 - 120.00	1.0000	1.0000
L6	7	LDF7-50A(1-5/8)	115.00 - 120.00	1.0000	1.0000
L6	18	Step Bolts	115.00 - 120.00	1.0000	1.0000
L6	19	Safety Line 3/8	115.00 - 120.00	1.0000	1.0000
L6	38	CU12PSM9P6XXX_6AWG	115.00 - 118.00	1.0000	1.0000
L7	6	LDF7-50A(1-5/8)	110.00 - 115.00	1.0000	1.0000
L7	7	LDF7-50A(1-5/8)	110.00 - 115.00	1.0000	1.0000
L7	18	Step Bolts	110.00 - 115.00	1.0000	1.0000
L7	19	Safety Line 3/8	110.00 - 115.00	1.0000	1.0000
L7	38	CU12PSM9P6XXX_6AWG	110.00 - 115.00	1.0000	1.0000
L8	6	LDF7-50A(1-5/8)	105.00 - 110.00	1.0000	1.0000
L8	7	LDF7-50A(1-5/8)	105.00 - 110.00	1.0000	1.0000
L8	16	FLC 114-50J(1-1/4")	105.00 - 110.00	1.0000	1.0000
L8	18	Step Bolts	105.00 - 110.00	1.0000	1.0000
L8	19	Safety Line 3/8	105.00 - 110.00	1.0000	1.0000
L8	38	CU12PSM9P6XXX_6AWG	105.00 - 110.00	1.0000	1.0000
L9	6	LDF7-50A(1-5/8)	100.00 - 105.00	1.0000	1.0000
L9	7	LDF7-50A(1-5/8)	100.00 - 105.00	1.0000	1.0000
L9	16	FLC 114-50J(1-1/4")	100.00 - 105.00	1.0000	1.0000
L9	18	Step Bolts	100.00 - 105.00	1.0000	1.0000
L9	19	Safety Line 3/8	100.00 - 105.00	1.0000	1.0000
L9	38	CU12PSM9P6XXX_6AWG	100.00 - 105.00	1.0000	1.0000
L10	6	LDF7-50A(1-5/8)	90.83 - 100.00	1.0000	1.0000
L10	7	LDF7-50A(1-5/8)	90.83 - 100.00	1.0000	1.0000
L10	16	FLC 114-50J(1-1/4")	90.83 - 100.00	1.0000	1.0000
L10	18	Step Bolts	90.83 - 100.00	1.0000	1.0000
L10	19	Safety Line 3/8	90.83 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L10	38	CU12PSM9P6XXX_6AWG	100.00 90.83 -	1.0000	1.0000
L10	40	EW90(ELLIPTICAL)	100.00 90.83 -	1.0000	1.0000
L11	6	LDF7-50A(1-5/8)	93.00 89.83 -	1.0000	1.0000
L11	7	LDF7-50A(1-5/8)	90.83 89.83 -	1.0000	1.0000
L11	16	FLC 114-50J(1-1/4")	90.83 89.83 -	1.0000	1.0000
L11	18	Step Bolts	90.83 89.83 -	1.0000	1.0000
L11	19	Safety Line 3/8	90.83 89.83 -	1.0000	1.0000
L11	38	CU12PSM9P6XXX_6AWG	90.83 89.83 -	1.0000	1.0000
L11	40	EW90(ELLIPTICAL)	90.83 89.83 -	1.0000	1.0000
L12	6	LDF7-50A(1-5/8)	84.83 89.83 -	1.0000	1.0000
L12	7	LDF7-50A(1-5/8)	84.83 89.83 -	1.0000	1.0000
L12	16	FLC 114-50J(1-1/4")	84.83 89.83 -	1.0000	1.0000
L12	18	Step Bolts	84.83 89.83 -	1.0000	1.0000
L12	19	Safety Line 3/8	84.83 89.83 -	1.0000	1.0000
L12	38	CU12PSM9P6XXX_6AWG	84.83 89.83 -	1.0000	1.0000
L12	40	EW90(ELLIPTICAL)	84.83 89.83 -	1.0000	1.0000
L13	6	LDF7-50A(1-5/8)	79.83 84.83 -	1.0000	1.0000
L13	7	LDF7-50A(1-5/8)	79.83 84.83 -	1.0000	1.0000
L13	16	FLC 114-50J(1-1/4")	79.83 84.83 -	1.0000	1.0000
L13	18	Step Bolts	79.83 84.83 -	1.0000	1.0000
L13	19	Safety Line 3/8	79.83 84.83 -	1.0000	1.0000
L13	38	CU12PSM9P6XXX_6AWG	79.83 84.83 -	1.0000	1.0000
L13	40	EW90(ELLIPTICAL)	79.83 84.83 -	1.0000	1.0000
L14	6	LDF7-50A(1-5/8)	76.00 79.83 -	1.0000	1.0000
L14	7	LDF7-50A(1-5/8)	76.00 79.83 -	1.0000	1.0000
L14	16	FLC 114-50J(1-1/4")	76.00 79.83 -	1.0000	1.0000
L14	18	Step Bolts	76.00 79.83 -	1.0000	1.0000
L14	19	Safety Line 3/8	76.00 79.83 -	1.0000	1.0000
L14	38	CU12PSM9P6XXX_6AWG	76.00 79.83 -	1.0000	1.0000
L14	40	EW90(ELLIPTICAL)	76.00 79.83 -	1.0000	1.0000
L15	6	LDF7-50A(1-5/8)	71.00 76.00 -	1.0000	1.0000
L15	7	LDF7-50A(1-5/8)	71.00 76.00 -	1.0000	1.0000
L15	16	FLC 114-50J(1-1/4")	71.00 76.00 -	1.0000	1.0000
L15	18	Step Bolts	71.00 76.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L15	19	Safety Line 3/8	71.00 - 76.00	1.0000	1.0000
L15	38	CU12PSM9P6XXX_6AWG	71.00 - 76.00	1.0000	1.0000
L15	40	EW90(ELLIPTICAL)	71.00 - 76.00	1.0000	1.0000
L16	6	LDF7-50A(1-5/8)	66.00 - 71.00	1.0000	1.0000
L16	7	LDF7-50A(1-5/8)	66.00 - 71.00	1.0000	1.0000
L16	16	FLC 114-50J(1-1/4")	66.00 - 71.00	1.0000	1.0000
L16	18	Step Bolts	66.00 - 71.00	1.0000	1.0000
L16	19	Safety Line 3/8	66.00 - 71.00	1.0000	1.0000
L16	38	CU12PSM9P6XXX_6AWG	66.00 - 71.00	1.0000	1.0000
L16	40	EW90(ELLIPTICAL)	66.00 - 71.00	1.0000	1.0000
L17	6	LDF7-50A(1-5/8)	61.00 - 66.00	1.0000	1.0000
L17	7	LDF7-50A(1-5/8)	61.00 - 66.00	1.0000	1.0000
L17	16	FLC 114-50J(1-1/4")	61.00 - 66.00	1.0000	1.0000
L17	18	Step Bolts	61.00 - 66.00	1.0000	1.0000
L17	19	Safety Line 3/8	61.00 - 66.00	1.0000	1.0000
L17	21	PL7x5/8	61.00 - 66.00	1.0000	1.0000
L17	22	PL7x5/8	61.00 - 66.00	1.0000	1.0000
L17	23	PL7x5/8	61.00 - 66.00	1.0000	1.0000
L17	24	PL7x5/8	61.00 - 66.00	1.0000	1.0000
L17	25	PL7x5/8	61.00 - 66.00	1.0000	1.0000
L17	26	PL7x5/8	61.00 - 66.00	1.0000	1.0000
L17	38	CU12PSM9P6XXX_6AWG	61.00 - 66.00	1.0000	1.0000
L17	40	EW90(ELLIPTICAL)	61.00 - 66.00	1.0000	1.0000
L18	6	LDF7-50A(1-5/8)	56.00 - 61.00	1.0000	1.0000
L18	7	LDF7-50A(1-5/8)	56.00 - 61.00	1.0000	1.0000
L18	16	FLC 114-50J(1-1/4")	56.00 - 61.00	1.0000	1.0000
L18	18	Step Bolts	56.00 - 61.00	1.0000	1.0000
L18	19	Safety Line 3/8	56.00 - 61.00	1.0000	1.0000
L18	21	PL7x5/8	56.00 - 61.00	1.0000	1.0000
L18	22	PL7x5/8	56.00 - 61.00	1.0000	1.0000
L18	23	PL7x5/8	56.00 - 61.00	1.0000	1.0000
L18	24	PL7x5/8	56.00 - 61.00	1.0000	1.0000
L18	25	PL7x5/8	56.00 - 61.00	1.0000	1.0000
L18	26	PL7x5/8	56.00 - 61.00	1.0000	1.0000
L18	38	CU12PSM9P6XXX_6AWG	56.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
			61.00		
L18	40	EW90(ELLIPTICAL)	56.00 -	1.0000	1.0000
			61.00		
L19	6	LDF7-50A(1-5/8)	51.00 -	1.0000	1.0000
			56.00		
L19	7	LDF7-50A(1-5/8)	51.00 -	1.0000	1.0000
			56.00		
L19	16	FLC 114-50J(1-1/4")	51.00 -	1.0000	1.0000
			56.00		
L19	18	Step Bolts	51.00 -	1.0000	1.0000
			56.00		
L19	19	Safety Line 3/8	51.00 -	1.0000	1.0000
			56.00		
L19	21	PL7x5/8	51.00 -	1.0000	1.0000
			56.00		
L19	22	PL7x5/8	51.00 -	1.0000	1.0000
			56.00		
L19	23	PL7x5/8	51.00 -	1.0000	1.0000
			56.00		
L19	24	PL7x5/8	51.00 -	1.0000	1.0000
			56.00		
L19	25	PL7x5/8	51.00 -	1.0000	1.0000
			56.00		
L19	26	PL7x5/8	51.00 -	1.0000	1.0000
			56.00		
L19	38	CU12PSM9P6XXX_6AWG	51.00 -	1.0000	1.0000
			56.00		
L19	40	EW90(ELLIPTICAL)	51.00 -	1.0000	1.0000
			56.00		
L20	6	LDF7-50A(1-5/8)	42.83 -	1.0000	1.0000
			51.00		
L20	7	LDF7-50A(1-5/8)	42.83 -	1.0000	1.0000
			51.00		
L20	16	FLC 114-50J(1-1/4")	42.83 -	1.0000	1.0000
			51.00		
L20	18	Step Bolts	42.83 -	1.0000	1.0000
			51.00		
L20	19	Safety Line 3/8	42.83 -	1.0000	1.0000
			51.00		
L20	21	PL7x5/8	47.75 -	1.0000	1.0000
			51.00		
L20	22	PL7x5/8	47.75 -	1.0000	1.0000
			51.00		
L20	23	PL7x5/8	47.75 -	1.0000	1.0000
			51.00		
L20	24	PL7x5/8	42.83 -	1.0000	1.0000
			51.00		
L20	25	PL7x5/8	42.83 -	1.0000	1.0000
			51.00		
L20	26	PL7x5/8	42.83 -	1.0000	1.0000
			51.00		
L20	27	PL10x5/8	42.83 -	1.0000	1.0000
			47.75		
L20	28	PL10x5/8	42.83 -	1.0000	1.0000
			47.75		
L20	29	PL10x5/8	42.83 -	1.0000	1.0000
			47.75		
L20	38	CU12PSM9P6XXX_6AWG	42.83 -	1.0000	1.0000
			51.00		
L20	40	EW90(ELLIPTICAL)	42.83 -	1.0000	1.0000
			51.00		
L21	6	LDF7-50A(1-5/8)	41.83 -	1.0000	1.0000
			42.83		
L21	7	LDF7-50A(1-5/8)	41.83 -	1.0000	1.0000
			42.83		
L21	16	FLC 114-50J(1-1/4")	41.83 -	1.0000	1.0000
			42.83		
L21	18	Step Bolts	41.83 -	1.0000	1.0000
			42.83		

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L21	19	Safety Line 3/8	41.83 - 42.83	1.0000	1.0000
L21	24	PL7x5/8	41.83 - 42.83	1.0000	1.0000
L21	25	PL7x5/8	41.83 - 42.83	1.0000	1.0000
L21	26	PL7x5/8	41.83 - 42.83	1.0000	1.0000
L21	27	PL10x5/8	41.83 - 42.83	1.0000	1.0000
L21	28	PL10x5/8	41.83 - 42.83	1.0000	1.0000
L21	29	PL10x5/8	41.83 - 42.83	1.0000	1.0000
L21	38	CU12PSM9P6XXX_6AWG	41.83 - 42.83	1.0000	1.0000
L21	40	EW90(ELLIPTICAL)	41.83 - 42.83	1.0000	1.0000
L22	6	LDF7-50A(1-5/8)	36.83 - 41.83	1.0000	1.0000
L22	7	LDF7-50A(1-5/8)	36.83 - 41.83	1.0000	1.0000
L22	16	FLC 114-50J(1-1/4")	36.83 - 41.83	1.0000	1.0000
L22	18	Step Bolts	36.83 - 41.83	1.0000	1.0000
L22	19	Safety Line 3/8	36.83 - 41.83	1.0000	1.0000
L22	24	PL7x5/8	37.92 - 41.83	1.0000	1.0000
L22	25	PL7x5/8	37.92 - 41.83	1.0000	1.0000
L22	26	PL7x5/8	37.92 - 41.83	1.0000	1.0000
L22	27	PL10x5/8	36.83 - 41.83	1.0000	1.0000
L22	28	PL10x5/8	36.83 - 41.83	1.0000	1.0000
L22	29	PL10x5/8	36.83 - 41.83	1.0000	1.0000
L22	38	CU12PSM9P6XXX_6AWG	36.83 - 41.83	1.0000	1.0000
L22	40	EW90(ELLIPTICAL)	36.83 - 41.83	1.0000	1.0000
L23	6	LDF7-50A(1-5/8)	35.00 - 36.83	1.0000	1.0000
L23	7	LDF7-50A(1-5/8)	35.00 - 36.83	1.0000	1.0000
L23	16	FLC 114-50J(1-1/4")	35.00 - 36.83	1.0000	1.0000
L23	18	Step Bolts	35.00 - 36.83	1.0000	1.0000
L23	19	Safety Line 3/8	35.00 - 36.83	1.0000	1.0000
L23	27	PL10x5/8	35.00 - 36.83	1.0000	1.0000
L23	28	PL10x5/8	35.00 - 36.83	1.0000	1.0000
L23	29	PL10x5/8	35.00 - 36.83	1.0000	1.0000
L23	38	CU12PSM9P6XXX_6AWG	35.00 - 36.83	1.0000	1.0000
L23	40	EW90(ELLIPTICAL)	35.00 - 36.83	1.0000	1.0000
L24	6	LDF7-50A(1-5/8)	34.75 - 35.00	1.0000	1.0000
L24	7	LDF7-50A(1-5/8)	34.75 - 35.00	1.0000	1.0000
L24	16	FLC 114-50J(1-1/4")	34.75 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
			35.00		
L24	18	Step Bolts	34.75 -	1.0000	1.0000
			35.00		
L24	19	Safety Line 3/8	34.75 -	1.0000	1.0000
			35.00		
L24	27	PL10x5/8	34.75 -	1.0000	1.0000
			35.00		
L24	28	PL10x5/8	34.75 -	1.0000	1.0000
			35.00		
L24	29	PL10x5/8	34.75 -	1.0000	1.0000
			35.00		
L24	34	PL8.5x1.25	34.75 -	1.0000	1.0000
			35.00		
L24	35	PL8.5x1.25	34.75 -	1.0000	1.0000
			35.00		
L24	36	PL8.5x1.25	34.75 -	1.0000	1.0000
			35.00		
L24	38	CU12PSM9P6XXX_6AWG	34.75 -	1.0000	1.0000
			35.00		
L24	40	EW90(ELLIPTICAL)	34.75 -	1.0000	1.0000
			35.00		
L25	6	LDF7-50A(1-5/8)	29.75 -	1.0000	1.0000
			34.75		
L25	7	LDF7-50A(1-5/8)	29.75 -	1.0000	1.0000
			34.75		
L25	16	FLC 114-50J(1-1/4")	29.75 -	1.0000	1.0000
			34.75		
L25	18	Step Bolts	29.75 -	1.0000	1.0000
			34.75		
L25	19	Safety Line 3/8	29.75 -	1.0000	1.0000
			34.75		
L25	27	PL10x5/8	29.75 -	1.0000	1.0000
			34.75		
L25	28	PL10x5/8	29.75 -	1.0000	1.0000
			34.75		
L25	29	PL10x5/8	29.75 -	1.0000	1.0000
			34.75		
L25	34	PL8.5x1.25	29.75 -	1.0000	1.0000
			34.75		
L25	35	PL8.5x1.25	29.75 -	1.0000	1.0000
			34.75		
L25	36	PL8.5x1.25	29.75 -	1.0000	1.0000
			34.75		
L25	38	CU12PSM9P6XXX_6AWG	29.75 -	1.0000	1.0000
			34.75		
L25	40	EW90(ELLIPTICAL)	29.75 -	1.0000	1.0000
			34.75		
L26	6	LDF7-50A(1-5/8)	29.00 -	1.0000	1.0000
			29.75		
L26	7	LDF7-50A(1-5/8)	29.00 -	1.0000	1.0000
			29.75		
L26	16	FLC 114-50J(1-1/4")	29.00 -	1.0000	1.0000
			29.75		
L26	18	Step Bolts	29.00 -	1.0000	1.0000
			29.75		
L26	19	Safety Line 3/8	29.00 -	1.0000	1.0000
			29.75		
L26	27	PL10x5/8	29.00 -	1.0000	1.0000
			29.75		
L26	28	PL10x5/8	29.00 -	1.0000	1.0000
			29.75		
L26	29	PL10x5/8	29.00 -	1.0000	1.0000
			29.75		
L26	34	PL8.5x1.25	29.00 -	1.0000	1.0000
			29.75		
L26	35	PL8.5x1.25	29.00 -	1.0000	1.0000
			29.75		
L26	36	PL8.5x1.25	29.00 -	1.0000	1.0000
			29.75		

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L26	38	CU12PSM9P6XXX_6AWG	29.00 - 29.75	1.0000	1.0000
L26	40	EW90(ELLIPTICAL)	29.00 - 29.75	1.0000	1.0000
L27	6	LDF7-50A(1-5/8)	24.00 - 29.00	1.0000	1.0000
L27	7	LDF7-50A(1-5/8)	24.00 - 29.00	1.0000	1.0000
L27	16	FLC 114-50J(1-1/4")	24.00 - 29.00	1.0000	1.0000
L27	18	Step Bolts	24.00 - 29.00	1.0000	1.0000
L27	19	Safety Line 3/8	24.00 - 29.00	1.0000	1.0000
L27	27	PL10x5/8	24.00 - 29.00	1.0000	1.0000
L27	28	PL10x5/8	24.00 - 29.00	1.0000	1.0000
L27	29	PL10x5/8	24.00 - 29.00	1.0000	1.0000
L27	34	PL8.5x1.25	24.00 - 29.00	1.0000	1.0000
L27	35	PL8.5x1.25	24.00 - 29.00	1.0000	1.0000
L27	36	PL8.5x1.25	24.00 - 29.00	1.0000	1.0000
L27	38	CU12PSM9P6XXX_6AWG	24.00 - 29.00	1.0000	1.0000
L27	40	EW90(ELLIPTICAL)	24.00 - 29.00	1.0000	1.0000
L28	6	LDF7-50A(1-5/8)	19.00 - 24.00	1.0000	1.0000
L28	7	LDF7-50A(1-5/8)	19.00 - 24.00	1.0000	1.0000
L28	16	FLC 114-50J(1-1/4")	19.00 - 24.00	1.0000	1.0000
L28	18	Step Bolts	19.00 - 24.00	1.0000	1.0000
L28	19	Safety Line 3/8	19.00 - 24.00	1.0000	1.0000
L28	27	PL10x5/8	19.00 - 24.00	1.0000	1.0000
L28	28	PL10x5/8	19.00 - 24.00	1.0000	1.0000
L28	29	PL10x5/8	19.00 - 24.00	1.0000	1.0000
L28	34	PL8.5x1.25	19.00 - 24.00	1.0000	1.0000
L28	35	PL8.5x1.25	19.00 - 24.00	1.0000	1.0000
L28	36	PL8.5x1.25	19.00 - 24.00	1.0000	1.0000
L28	38	CU12PSM9P6XXX_6AWG	19.00 - 24.00	1.0000	1.0000
L28	40	EW90(ELLIPTICAL)	19.00 - 24.00	1.0000	1.0000
L29	6	LDF7-50A(1-5/8)	14.00 - 19.00	1.0000	1.0000
L29	7	LDF7-50A(1-5/8)	14.00 - 19.00	1.0000	1.0000
L29	16	FLC 114-50J(1-1/4")	14.00 - 19.00	1.0000	1.0000
L29	18	Step Bolts	14.00 - 19.00	1.0000	1.0000
L29	19	Safety Line 3/8	14.00 - 19.00	1.0000	1.0000
L29	27	PL10x5/8	14.00 - 19.00	1.0000	1.0000
L29	28	PL10x5/8	14.00 - 19.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L29	29	PL10x5/8	19.00 14.00 -	1.0000	1.0000
L29	34	PL8.5x1.25	19.00 14.00 -	1.0000	1.0000
L29	35	PL8.5x1.25	19.00 14.00 -	1.0000	1.0000
L29	36	PL8.5x1.25	19.00 14.00 -	1.0000	1.0000
L29	38	CU12PSM9P6XXX_6AWG	19.00 14.00 -	1.0000	1.0000
L29	40	EW90(ELLIPTICAL)	19.00 14.00 -	1.0000	1.0000
L30	6	LDF7-50A(1-5/8)	19.00 12.00 -	1.0000	1.0000
L30	7	LDF7-50A(1-5/8)	14.00 12.00 -	1.0000	1.0000
L30	16	FLC 114-50J(1-1/4")	14.00 12.00 -	1.0000	1.0000
L30	18	Step Bolts	14.00 9.00 - 14.00	1.0000	1.0000
L30	19	Safety Line 3/8	9.00 - 14.00	1.0000	1.0000
L30	27	PL10x5/8	9.00 - 14.00	1.0000	1.0000
L30	28	PL10x5/8	9.00 - 14.00	1.0000	1.0000
L30	29	PL10x5/8	9.00 - 14.00	1.0000	1.0000
L30	34	PL8.5x1.25	9.00 - 14.00	1.0000	1.0000
L30	35	PL8.5x1.25	9.00 - 14.00	1.0000	1.0000
L30	36	PL8.5x1.25	9.00 - 14.00	1.0000	1.0000
L30	38	CU12PSM9P6XXX_6AWG	14.00 12.00 -	1.0000	1.0000
L30	40	EW90(ELLIPTICAL)	14.00 9.00 - 14.00	1.0000	1.0000
L31	18	Step Bolts	9.00 - 14.00 5.00 - 9.00	1.0000	1.0000
L31	19	Safety Line 3/8	5.00 - 9.00	1.0000	1.0000
L31	27	PL10x5/8	4.00 - 9.00	1.0000	1.0000
L31	28	PL10x5/8	4.00 - 9.00	1.0000	1.0000
L31	29	PL10x5/8	4.00 - 9.00	1.0000	1.0000
L31	34	PL8.5x1.25	4.00 - 9.00	1.0000	1.0000
L31	35	PL8.5x1.25	4.00 - 9.00	1.0000	1.0000
L31	36	PL8.5x1.25	4.00 - 9.00	1.0000	1.0000
L31	40	EW90(ELLIPTICAL)	4.00 - 9.00	1.0000	1.0000
L32	27	PL10x5/8	0.00 - 4.00	1.0000	1.0000
L32	28	PL10x5/8	0.00 - 4.00	1.0000	1.0000
L32	29	PL10x5/8	0.00 - 4.00	1.0000	1.0000
L32	34	PL8.5x1.25	0.00 - 4.00	1.0000	1.0000
L32	35	PL8.5x1.25	0.00 - 4.00	1.0000	1.0000
L32	36	PL8.5x1.25	0.00 - 4.00	1.0000	1.0000
L32	40	EW90(ELLIPTICAL)	0.00 - 4.00	1.0000	1.0000

User Defined Loads - Seismic

Description	Elevation	Offset From Centroid	Azimuth Angle	E _v	E _{hx}	E _{hz}	E _h
	ft	ft	°	K	K	K	K
CCISeismic Tower Section 1 - 1	142.50	0.00	0.0000	0.02	0.00	0.00	0.03
CCISeismic Tower Section 2 - 1	137.50	0.00	0.0000	0.02	0.00	0.00	0.03
CCISeismic Tower Section 3 - 1	132.50	0.00	0.0000	0.02	0.00	0.00	0.03
CCISeismic Tower Section 4 - 1	127.50	0.00	0.0000	0.02	0.00	0.00	0.02
CCISeismic Tower Section 5 -	122.50	0.00	0.0000	0.02	0.00	0.00	0.02

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
1 CCISeismic Tower Section 6 -	117.50	0.00	0.0000	0.02	0.00	0.00	0.02
1 CCISeismic Tower Section 7 -	112.50	0.00	0.0000	0.02	0.00	0.00	0.02
1 CCISeismic Tower Section 8 -	107.50	0.00	0.0000	0.02	0.00	0.00	0.02
1 CCISeismic Tower Section 9 -	102.50	0.00	0.0000	0.02	0.00	0.00	0.02
1 CCISeismic Tower Section 10	95.42	0.00	0.0000	0.04	0.00	0.00	0.03
-1 CCISeismic Tower Section 11	92.92	0.00	0.0000	0.04	0.00	0.00	0.03
-1 CCISeismic Tower Section 12	87.33	0.00	0.0000	0.03	0.00	0.00	0.02
-1 CCISeismic Tower Section 13	82.33	0.00	0.0000	0.03	0.00	0.00	0.02
-1 CCISeismic Tower Section 14	77.92	0.00	0.0000	0.03	0.00	0.00	0.01
-1 CCISeismic Tower Section 15	73.50	0.00	0.0000	0.03	0.00	0.00	0.01
-1 CCISeismic Tower Section 16	68.50	0.00	0.0000	0.04	0.00	0.00	0.01
-1 CCISeismic Tower Section 17	63.50	0.00	0.0000	0.04	0.00	0.00	0.01
-1 CCISeismic Tower Section 18	58.50	0.00	0.0000	0.04	0.00	0.00	0.01
-1 CCISeismic Tower Section 19	53.50	0.00	0.0000	0.04	0.00	0.00	0.01
-1 CCISeismic Tower Section 20	46.92	0.00	0.0000	0.06	0.00	0.00	0.01
-1 CCISeismic Tower Section 21	45.42	0.00	0.0000	0.06	0.00	0.00	0.01
-1 CCISeismic Tower Section 22	39.33	0.00	0.0000	0.05	0.00	0.00	0.01
-1 CCISeismic Tower Section 23	35.92	0.00	0.0000	0.02	0.00	0.00	0.00
-1 CCISeismic Tower Section 24	34.88	0.00	0.0000	0.00	0.00	0.00	0.00
-1 CCISeismic Tower Section 25	32.25	0.00	0.0000	0.07	0.00	0.00	0.01
-1 CCISeismic Tower Section 26	29.38	0.00	0.0000	0.01	0.00	0.00	0.00
-1 CCISeismic Tower Section 27	26.50	0.00	0.0000	0.07	0.00	0.00	0.00
-1 CCISeismic Tower Section 28	21.50	0.00	0.0000	0.07	0.00	0.00	0.00
-1 CCISeismic Tower Section 29	16.50	0.00	0.0000	0.08	0.00	0.00	0.00
-1 CCISeismic Tower Section 30	11.50	0.00	0.0000	0.08	0.00	0.00	0.00
-1 CCISeismic Tower Section 31	6.50	0.00	0.0000	0.08	0.00	0.00	0.00
-1 CCISeismic Tower Section 32	2.00	0.00	0.0000	0.06	0.00	0.00	0.00
CCISeismic commscope NNVV-65B-R4_TIA w/ Mount Pipe	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic commscope NNVV-65B-R4_TIA w/ Mount Pipe	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic commscope NNVV-65B-R4_TIA w/ Mount Pipe	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic nokia AAHC w/ Mount Pipe	110.00	0.00	0.0000	0.01	0.00	0.00	0.01
CCISeismic nokia AAHC w/ Mount Pipe	110.00	0.00	0.0000	0.01	0.00	0.00	0.01

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
CCISeismic nokia AAHC w/ Mount Pipe	110.00	0.00	0.0000	0.01	0.00	0.00	0.01
CCISeismic (2) alcatel lucent FD-RRH-2x50-800	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) alcatel lucent FD-RRH-2x50-800	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) alcatel lucent FD-RRH-2x50-800	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic FD-RRH-4X45- 1900	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic FD-RRH-4X45- 1900	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic FD-RRH-4X45- 1900	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic misc 12' x 3" Dia Omni	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic Platform Mount	110.00	0.00	0.0000	0.10	0.00	0.00	0.09
CCISeismic commscope	118.00	0.00	0.0000	0.00	0.00	0.00	0.01
FFVV-65B-R2 w/ Mount Pipe							
CCISeismic commscope	118.00	0.00	0.0000	0.00	0.00	0.00	0.01
FFVV-65B-R2 w/ Mount Pipe							
CCISeismic commscope	118.00	0.00	0.0000	0.00	0.00	0.00	0.01
FFVV-65B-R2 w/ Mount Pipe							
CCISeismic fujitsu TA08025- B605	118.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic fujitsu TA08025- B605	118.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic fujitsu TA08025- B605	118.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic fujitsu TA08025- B604	118.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic fujitsu TA08025- B604	118.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic fujitsu TA08025- B604	118.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic raycap RDIDC- 9181-PF-48	118.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) mount pipes 8' x 2" STD Pipe	118.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) mount pipes 8' x 2" STD Pipe	118.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) mount pipes 8' x 2" STD Pipe	118.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic 8' Platform Mount (MC-PK8-DSH)	118.00	0.00	0.0000	0.06	0.00	0.00	0.06
CCISeismic Top Rail	118.00	0.00	0.0000	0.01	0.00	0.00	0.01
CCISeismic quintel technology QD6616-7	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic quintel technology QD6616-7	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic quintel technology QD6616-7	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic cci antennas DMP65R-BU6D	130.00	0.00	0.0000	0.00	0.00	0.00	0.01
CCISeismic cci antennas DMP65R-BU6D	130.00	0.00	0.0000	0.00	0.00	0.00	0.01
CCISeismic cci antennas DMP65R-BU6D	130.00	0.00	0.0000	0.00	0.00	0.00	0.01
CCISeismic ericsson AIR6449 B77D + AIR6419 B77G	130.00	0.00	0.0000	0.01	0.00	0.00	0.01
CCISeismic ericsson AIR6449 B77D + AIR6419 B77G	130.00	0.00	0.0000	0.01	0.00	0.00	0.01
CCISeismic ericsson AIR6449 B77D + AIR6419 B77G	130.00	0.00	0.0000	0.01	0.00	0.00	0.01
CCISeismic ericsson RRUS 4415 B25	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RRUS 4415 B25	130.00	0.00	0.0000	0.00	0.00	0.00	0.00

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
CCISeismic ericsson RRUS 4415 B25	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RRUS 4449 B5/B12	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RRUS 4449 B5/B12	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RRUS 4449 B5/B12	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic raycap DC9-48-60-24-8C-EV	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) misc MM01	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) misc MM01	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) misc MM01	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic Connecting Pipe	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic Connecting Pipe	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic Connecting Pipe	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic VFA14-H10-2120	130.00	0.00	0.0000	0.09	0.00	0.00	0.12
CCISeismic ericsson RRUS 32	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RRUS 32	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RRUS 32	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RRUS 4478 B14	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RRUS 4478 B14	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RRUS 4478 B14	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RRUS 4426 B66	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RRUS 4426 B66	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RRUS 4426 B66	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic raycap DC6-48-60-18-8F	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic raycap DC6-48-60-18-8F	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson ERICSSON AIR 21 B2A B4P w/ Mount Pipe	135.00	0.00	0.0000	0.01	0.00	0.00	0.01
CCISeismic ericsson ERICSSON AIR 21 B2A B4P w/ Mount Pipe	135.00	0.00	0.0000	0.01	0.00	0.00	0.01
CCISeismic ericsson ERICSSON AIR 21 B2A B4P w/ Mount Pipe	135.00	0.00	0.0000	0.01	0.00	0.00	0.01
CCISeismic rfs celwave APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	135.00	0.00	0.0000	0.01	0.00	0.00	0.01
CCISeismic rfs celwave APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	135.00	0.00	0.0000	0.01	0.00	0.00	0.01
CCISeismic rfs celwave APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	135.00	0.00	0.0000	0.01	0.00	0.00	0.01
CCISeismic ericsson AIR 32 B2a/B66Aa w/ Mount Pipe	135.00	0.00	0.0000	0.01	0.00	0.00	0.01
CCISeismic ericsson AIR 32 B2a/B66Aa w/ Mount Pipe	135.00	0.00	0.0000	0.01	0.00	0.00	0.01
CCISeismic ericsson AIR 32 B2a/B66Aa w/ Mount Pipe	135.00	0.00	0.0000	0.01	0.00	0.00	0.01
CCISeismic ericsson AIR 6449 B41 w/ Mount Pipe	135.00	0.00	0.0000	0.01	0.00	0.00	0.01
CCISeismic ericsson AIR 6449 B41 w/ Mount Pipe	135.00	0.00	0.0000	0.01	0.00	0.00	0.01

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
CCISeismic ericsson AIR 6449 B41 w/ Mount Pipe	135.00	0.00	0.0000	0.01	0.00	0.00	0.01
CCISeismic ericsson RRUS 4415 B25	135.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RRUS 4415 B25	135.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RRUS 4415 B25	135.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RADIO 4449 B71+B85	135.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RADIO 4449 B71+B85	135.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RADIO 4449 B71+B85	135.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic rfs celwave ATMAA1412D-1A20	135.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic rfs celwave ATMAA1412D-1A20	135.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic rfs celwave ATMAA1412D-1A20	135.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic 10' x 1.5" Dia Dipole	135.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic Stabilizer Kit, Perfect10-P/N: VSK-M	135.00	0.00	0.0000	0.03	0.00	0.00	0.04
CCISeismic T-Arm Mount	135.00	0.00	0.0000	0.04	0.00	0.00	0.05
CCISeismic 10' x 1.5" Dia Dipole	143.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic 10' x 1.5" Dia Dipole	143.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic misc 12' x 3" Dia Omni	143.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic T-Arm Mount	143.00	0.00	0.0000	0.04	0.00	0.00	0.06
CCISeismic pipe mounts 2" STD Pipe (2.375 OD)x6'-0"	143.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic pipe mounts 2" STD Pipe (2.375 OD)x6'-0"	143.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic pipe mounts 2" STD Pipe (2.375 OD)x6'-0"	143.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic misc 8' Lightning Rod	143.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic rfi antennas BPA7496-180-14 w/ Mount Pipe	145.00	0.00	0.0000	0.00	0.00	0.00	0.01
CCISeismic tx rx systems 432F-83W TTA	145.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic Dish Mount	93.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic rfs celwave SC3- W100AC	93.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (135ft to143ft)	139.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (125ft to135ft)	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (115ft to125ft)	120.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (105ft to115ft)	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (95ft to105ft)	100.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (85ft to95ft)	90.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12	80.00	0.00	0.0000	0.00	0.00	0.00	0.00

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
to 143 (75ft to85ft)							
CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (65ft to75ft)	70.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (55ft to65ft)	60.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (45ft to55ft)	50.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (35ft to45ft)	40.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (25ft to35ft)	30.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (15ft to25ft)	20.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (12ft to15ft)	13.50	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew AVA5-50(7/8") From 12 to 135 (125ft to135ft)	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew AVA5-50(7/8") From 12 to 135 (115ft to125ft)	120.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew AVA5-50(7/8") From 12 to 135 (105ft to115ft)	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew AVA5-50(7/8") From 12 to 135 (95ft to105ft)	100.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew AVA5-50(7/8") From 12 to 135 (85ft to95ft)	90.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew AVA5-50(7/8") From 12 to 135 (75ft to85ft)	80.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew AVA5-50(7/8") From 12 to 135 (65ft to75ft)	70.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew AVA5-50(7/8") From 12 to 135 (55ft to65ft)	60.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew AVA5-50(7/8") From 12 to 135 (45ft to55ft)	50.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew AVA5-50(7/8") From 12 to 135 (35ft to45ft)	40.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew AVA5-50(7/8") From 12 to 135 (25ft to35ft)	30.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew AVA5-50(7/8") From 12 to 135 (15ft to25ft)	20.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) andrew LDF7- 50A(1-5/8) From 12 to 135 (125ft to135ft)	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) andrew LDF7- 50A(1-5/8) From 12 to 135 (115ft to125ft)	120.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) andrew LDF7- 50A(1-5/8) From 12 to 135 (105ft to115ft)	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) andrew LDF7-	100.00	0.00	0.0000	0.00	0.00	0.00	0.00

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
50A(1-5/8) From 12 to 135 (95ft to105ft)							
CCISeismic (6) andrew LDF7- 50A(1-5/8) From 12 to 135 (85ft to95ft)	90.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) andrew LDF7- 50A(1-5/8) From 12 to 135 (75ft to85ft)	80.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) andrew LDF7- 50A(1-5/8) From 12 to 135 (65ft to75ft)	70.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) andrew LDF7- 50A(1-5/8) From 12 to 135 (55ft to65ft)	60.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) andrew LDF7- 50A(1-5/8) From 12 to 135 (45ft to55ft)	50.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) andrew LDF7- 50A(1-5/8) From 12 to 135 (35ft to45ft)	40.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) andrew LDF7- 50A(1-5/8) From 12 to 135 (25ft to35ft)	30.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) andrew LDF7- 50A(1-5/8) From 12 to 135 (15ft to25ft)	20.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) andrew LDF7- 50A(1-5/8) From 12 to 135 (12ft to15ft)	13.50	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (9) andrew LDF7- 50A(1-5/8) From 12 to 135 (125ft to135ft)	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (9) andrew LDF7- 50A(1-5/8) From 12 to 135 (115ft to125ft)	120.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (9) andrew LDF7- 50A(1-5/8) From 12 to 135 (105ft to115ft)	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (9) andrew LDF7- 50A(1-5/8) From 12 to 135 (95ft to105ft)	100.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (9) andrew LDF7- 50A(1-5/8) From 12 to 135 (85ft to95ft)	90.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (9) andrew LDF7- 50A(1-5/8) From 12 to 135 (75ft to85ft)	80.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (9) andrew LDF7- 50A(1-5/8) From 12 to 135 (65ft to75ft)	70.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (9) andrew LDF7- 50A(1-5/8) From 12 to 135 (55ft to65ft)	60.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (9) andrew LDF7- 50A(1-5/8) From 12 to 135 (45ft to55ft)	50.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (9) andrew LDF7- 50A(1-5/8) From 12 to 135 (35ft to45ft)	40.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (9) andrew LDF7- 50A(1-5/8) From 12 to 135 (25ft to35ft)	30.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (9) andrew LDF7- 50A(1-5/8) From 12 to 135 (15ft to25ft)	20.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (9) andrew LDF7- 50A(1-5/8) From 12 to 135 (12ft to15ft)	13.50	0.00	0.0000	0.00	0.00	0.00	0.00

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
CCISeismic (6) rfs celwave LCF114-50J(1-1/4) From 12 to 130 (125ft to130ft)	127.50	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) rfs celwave LCF114-50J(1-1/4) From 12 to 130 (115ft to125ft)	120.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) rfs celwave LCF114-50J(1-1/4) From 12 to 130 (105ft to115ft)	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) rfs celwave LCF114-50J(1-1/4) From 12 to 130 (95ft to105ft)	100.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) rfs celwave LCF114-50J(1-1/4) From 12 to 130 (85ft to95ft)	90.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) rfs celwave LCF114-50J(1-1/4) From 12 to 130 (75ft to85ft)	80.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) rfs celwave LCF114-50J(1-1/4) From 12 to 130 (65ft to75ft)	70.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) rfs celwave LCF114-50J(1-1/4) From 12 to 130 (55ft to65ft)	60.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) rfs celwave LCF114-50J(1-1/4) From 12 to 130 (45ft to55ft)	50.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) rfs celwave LCF114-50J(1-1/4) From 12 to 130 (35ft to45ft)	40.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) rfs celwave LCF114-50J(1-1/4) From 12 to 130 (25ft to35ft)	30.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) rfs celwave LCF114-50J(1-1/4) From 12 to 130 (15ft to25ft)	20.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) rfs celwave LCF114-50J(1-1/4) From 12 to 130 (12ft to15ft)	13.50	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) DC Trunk From 12 to 130 (125ft to130ft)	127.50	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) DC Trunk From 12 to 130 (115ft to125ft)	120.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) DC Trunk From 12 to 130 (105ft to115ft)	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) DC Trunk From 12 to 130 (95ft to105ft)	100.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) DC Trunk From 12 to 130 (85ft to95ft)	90.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) DC Trunk From 12 to 130 (75ft to85ft)	80.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) DC Trunk From 12 to 130 (65ft to75ft)	70.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) DC Trunk From 12 to 130 (55ft to65ft)	60.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) DC Trunk From 12 to 130 (45ft to55ft)	50.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) DC Trunk From 12 to 130 (35ft to45ft)	40.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) DC Trunk From 12 to 130 (25ft to35ft)	30.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) DC Trunk From 12 to 130 (15ft to25ft)	20.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (6) DC Trunk From 12 to 130 (12ft to15ft)	13.50	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic DC Trunk From 12 to 130 (125ft to130ft)	127.50	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic DC Trunk From	120.00	0.00	0.0000	0.00	0.00	0.00	0.00

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
12 to 130 (115ft to125ft)							
CCISeismic DC Trunk From 12 to 130 (105ft to115ft)	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic DC Trunk From 12 to 130 (95ft to105ft)	100.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic DC Trunk From 12 to 130 (85ft to95ft)	90.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic DC Trunk From 12 to 130 (75ft to85ft)	80.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic DC Trunk From 12 to 130 (65ft to75ft)	70.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic DC Trunk From 12 to 130 (55ft to65ft)	60.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic DC Trunk From 12 to 130 (45ft to55ft)	50.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic DC Trunk From 12 to 130 (35ft to45ft)	40.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic DC Trunk From 12 to 130 (25ft to35ft)	30.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic DC Trunk From 12 to 130 (15ft to25ft)	20.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic DC Trunk From 12 to 130 (12ft to15ft)	13.50	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) Fiber Trunk From 12 to 130 (125ft to130ft)	127.50	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) Fiber Trunk From 12 to 130 (115ft to125ft)	120.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) Fiber Trunk From 12 to 130 (105ft to115ft)	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) Fiber Trunk From 12 to 130 (95ft to105ft)	100.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) Fiber Trunk From 12 to 130 (85ft to95ft)	90.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) Fiber Trunk From 12 to 130 (75ft to85ft)	80.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) Fiber Trunk From 12 to 130 (65ft to75ft)	70.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) Fiber Trunk From 12 to 130 (55ft to65ft)	60.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) Fiber Trunk From 12 to 130 (45ft to55ft)	50.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) Fiber Trunk From 12 to 130 (35ft to45ft)	40.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) Fiber Trunk From 12 to 130 (25ft to35ft)	30.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) Fiber Trunk From 12 to 130 (15ft to25ft)	20.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) Fiber Trunk From 12 to 130 (12ft to15ft)	13.50	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic Fiber Trunk From 12 to 130 (125ft to130ft)	127.50	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic Fiber Trunk From 12 to 130 (115ft to125ft)	120.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic Fiber Trunk From 12 to 130 (105ft to115ft)	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic Fiber Trunk From 12 to 130 (95ft to105ft)	100.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic Fiber Trunk From 12 to 130 (85ft to95ft)	90.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic Fiber Trunk From 12 to 130 (75ft to85ft)	80.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic Fiber Trunk From 12 to 130 (65ft to75ft)	70.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic Fiber Trunk From 12 to 130 (55ft to65ft)	60.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic Fiber Trunk From 12 to 130 (45ft to55ft)	50.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic Fiber Trunk	40.00	0.00	0.0000	0.00	0.00	0.00	0.00

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
From 12 to 130 (35ft to45ft) CCISeismic Fiber Trunk	30.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 12 to 130 (25ft to35ft) CCISeismic Fiber Trunk	20.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 12 to 130 (15ft to25ft) CCISeismic Fiber Trunk	13.50	0.00	0.0000	0.00	0.00	0.00	0.00
From 12 to 130 (12ft to15ft) CCISeismic rfs celwave FLC78-50J(7/8") From 12 to 110 (105ft to110ft)	107.50	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic rfs celwave FLC78-50J(7/8") From 12 to 110 (95ft to105ft)	100.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic rfs celwave FLC78-50J(7/8") From 12 to 110 (85ft to95ft)	90.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic rfs celwave FLC78-50J(7/8") From 12 to 110 (75ft to85ft)	80.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic rfs celwave FLC78-50J(7/8") From 12 to 110 (65ft to75ft)	70.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic rfs celwave FLC78-50J(7/8") From 12 to 110 (55ft to65ft)	60.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic rfs celwave FLC78-50J(7/8") From 12 to 110 (45ft to55ft)	50.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic rfs celwave FLC78-50J(7/8") From 12 to 110 (35ft to45ft)	40.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic rfs celwave FLC78-50J(7/8") From 12 to 110 (25ft to35ft)	30.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic rfs celwave FLC78-50J(7/8") From 12 to 110 (15ft to25ft)	20.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (4) rfs celwave FLC 114-50J(1-1/4") From 12 to 110 (105ft to110ft)	107.50	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (4) rfs celwave FLC 114-50J(1-1/4") From 12 to 110 (95ft to105ft)	100.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (4) rfs celwave FLC 114-50J(1-1/4") From 12 to 110 (85ft to95ft)	90.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (4) rfs celwave FLC 114-50J(1-1/4") From 12 to 110 (75ft to85ft)	80.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (4) rfs celwave FLC 114-50J(1-1/4") From 12 to 110 (65ft to75ft)	70.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (4) rfs celwave FLC 114-50J(1-1/4") From 12 to 110 (55ft to65ft)	60.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (4) rfs celwave FLC 114-50J(1-1/4") From 12 to 110 (45ft to55ft)	50.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (4) rfs celwave FLC 114-50J(1-1/4") From 12 to 110 (35ft to45ft)	40.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (4) rfs celwave FLC 114-50J(1-1/4") From 12 to 110 (25ft to35ft)	30.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic (4) rfs celwave	20.00	0.00	0.0000	0.00	0.00	0.00	0.00

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
FLC 114-50J(1-1/4") From 12 to 110 (15ft to25ft)							
CCISeismic (4) rfs celwave	13.50	0.00	0.0000	0.00	0.00	0.00	0.00
FLC 114-50J(1-1/4") From 12 to 110 (12ft to15ft)							
CCISeismic miscl Step Bolts From 5 to 145 (135ft to145ft)	140.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Step Bolts From 5 to 145 (125ft to135ft)	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Step Bolts From 5 to 145 (115ft to125ft)	120.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Step Bolts From 5 to 145 (105ft to115ft)	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Step Bolts From 5 to 145 (95ft to105ft)	100.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Step Bolts From 5 to 145 (85ft to95ft)	90.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Step Bolts From 5 to 145 (75ft to85ft)	80.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Step Bolts From 5 to 145 (65ft to75ft)	70.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Step Bolts From 5 to 145 (55ft to65ft)	60.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Step Bolts From 5 to 145 (45ft to55ft)	50.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Step Bolts From 5 to 145 (35ft to45ft)	40.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Step Bolts From 5 to 145 (25ft to35ft)	30.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Step Bolts From 5 to 145 (15ft to25ft)	20.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Step Bolts From 5 to 145 (5ft to15ft)	10.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Safety Line 3/8 From 5 to 145 (135ft to145ft)	140.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Safety Line 3/8 From 5 to 145 (125ft to135ft)	130.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Safety Line 3/8 From 5 to 145 (115ft to125ft)	120.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Safety Line 3/8 From 5 to 145 (105ft to115ft)	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Safety Line 3/8 From 5 to 145 (95ft to105ft)	100.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Safety Line 3/8 From 5 to 145 (85ft to95ft)	90.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Safety Line 3/8 From 5 to 145 (75ft to85ft)	80.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Safety Line 3/8 From 5 to 145 (65ft to75ft)	70.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Safety Line 3/8 From 5 to 145 (55ft to65ft)	60.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Safety Line 3/8 From 5 to 145 (45ft to55ft)	50.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Safety Line 3/8 From 5 to 145 (35ft to45ft)	40.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Safety Line 3/8 From 5 to 145 (25ft to35ft)	30.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Safety Line 3/8 From 5 to 145 (15ft to25ft)	20.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscl Safety Line 3/8 From 5 to 145 (5ft to15ft)	10.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic	116.50	0.00	0.0000	0.00	0.00	0.00	0.00
CU12PSM9P6XXX_6AWG							

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
From 12 to 118 (115ft to118ft) CCISeismic CU12PSM9P6XXX_6AWG	110.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 12 to 118 (105ft to115ft) CCISeismic CU12PSM9P6XXX_6AWG	100.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 12 to 118 (95ft to105ft) CCISeismic CU12PSM9P6XXX_6AWG	90.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 12 to 118 (85ft to95ft) CCISeismic CU12PSM9P6XXX_6AWG	80.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 12 to 118 (75ft to85ft) CCISeismic CU12PSM9P6XXX_6AWG	70.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 12 to 118 (65ft to75ft) CCISeismic CU12PSM9P6XXX_6AWG	60.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 12 to 118 (55ft to65ft) CCISeismic CU12PSM9P6XXX_6AWG	50.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 12 to 118 (45ft to55ft) CCISeismic CU12PSM9P6XXX_6AWG	40.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 12 to 118 (35ft to45ft) CCISeismic CU12PSM9P6XXX_6AWG	30.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 12 to 118 (25ft to35ft) CCISeismic CU12PSM9P6XXX_6AWG	20.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 12 to 118 (15ft to25ft) CCISeismic CU12PSM9P6XXX_6AWG	13.50	0.00	0.0000	0.00	0.00	0.00	0.00
From 12 to 118 (12ft to15ft) CCISeismic andrew EW90(ELLIPTICAL) From 0 to 93 (85ft to93ft)	89.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew EW90(ELLIPTICAL) From 0 to 93 (75ft to85ft)	80.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew EW90(ELLIPTICAL) From 0 to 93 (65ft to75ft)	70.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew EW90(ELLIPTICAL) From 0 to 93 (55ft to65ft)	60.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew EW90(ELLIPTICAL) From 0 to 93 (45ft to55ft)	50.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew EW90(ELLIPTICAL) From 0 to 93 (35ft to45ft)	40.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew EW90(ELLIPTICAL) From 0 to 93 (25ft to35ft)	30.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew EW90(ELLIPTICAL) From 0 to 93 (15ft to25ft)	20.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew EW90(ELLIPTICAL) From 0 to 93 (5ft to15ft)	10.00	0.00	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew EW90(ELLIPTICAL) From 0 to 93 (0ft to5ft)	2.50	0.00	0.0000	0.00	0.00	0.00	0.00

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	K
**									
NNVV-65B-R4_TIA w/ Mount Pipe	A	From Leg	4.00	0.0000	110.00	No Ice	12.51	7.41	0.10
			0.00			1/2" Ice	13.11	8.60	0.19
			0.00			1" Ice	13.67	9.50	0.29
NNVV-65B-R4_TIA w/ Mount Pipe	B	From Leg	4.00	0.0000	110.00	No Ice	12.51	7.41	0.10
			0.00			1/2" Ice	13.11	8.60	0.19
			0.00			1" Ice	13.67	9.50	0.29
NNVV-65B-R4_TIA w/ Mount Pipe	C	From Leg	4.00	0.0000	110.00	No Ice	12.51	7.41	0.10
			0.00			1/2" Ice	13.11	8.60	0.19
			0.00			1" Ice	13.67	9.50	0.29
AAHC w/ Mount Pipe	A	From Leg	4.00	0.0000	110.00	No Ice	4.41	2.69	0.12
			0.00			1/2" Ice	4.73	3.08	0.16
			0.00			1" Ice	5.06	3.49	0.20
AAHC w/ Mount Pipe	B	From Leg	4.00	0.0000	110.00	No Ice	4.41	2.69	0.12
			0.00			1/2" Ice	4.73	3.08	0.16
			0.00			1" Ice	5.06	3.49	0.20
AAHC w/ Mount Pipe	C	From Leg	4.00	0.0000	110.00	No Ice	4.41	2.69	0.12
			0.00			1/2" Ice	4.73	3.08	0.16
			0.00			1" Ice	5.06	3.49	0.20
(2) FD-RRH-2x50-800	A	From Leg	1.00	0.0000	110.00	No Ice	1.36	3.01	0.05
			-2.00			1/2" Ice	1.52	3.22	0.08
			0.00			1" Ice	1.68	3.45	0.10
(2) FD-RRH-2x50-800	B	From Leg	1.00	0.0000	110.00	No Ice	1.36	3.01	0.05
			-2.00			1/2" Ice	1.52	3.22	0.08
			0.00			1" Ice	1.68	3.45	0.10
(2) FD-RRH-2x50-800	C	From Leg	1.00	0.0000	110.00	No Ice	1.36	3.01	0.05
			-2.00			1/2" Ice	1.52	3.22	0.08
			0.00			1" Ice	1.68	3.45	0.10
FD-RRH-4X45-1900	A	From Leg	1.00	0.0000	110.00	No Ice	2.31	2.38	0.09
			-3.00			1/2" Ice	2.52	2.58	0.11
			0.00			1" Ice	2.73	2.79	0.14
FD-RRH-4X45-1900	B	From Leg	1.00	0.0000	110.00	No Ice	2.31	2.38	0.09
			-3.00			1/2" Ice	2.52	2.58	0.11
			0.00			1" Ice	2.73	2.79	0.14
FD-RRH-4X45-1900	C	From Leg	1.00	0.0000	110.00	No Ice	2.31	2.38	0.09
			-3.00			1/2" Ice	2.52	2.58	0.11
			0.00			1" Ice	2.73	2.79	0.14
12' x 3" Dia Omni	A	From Leg	4.00	0.0000	110.00	No Ice	3.60	3.60	0.04
			0.00			1/2" Ice	4.83	4.83	0.07
			6.00			1" Ice	6.08	6.08	0.10
Platform Mount	C	None		0.0000	110.00	No Ice	25.33	25.33	2.06
						1/2" Ice	33.79	33.79	2.63
						1" Ice	42.16	42.16	3.36

FFVV-65B-R2 w/ Mount Pipe	A	From Leg	4.00	0.0000	118.00	No Ice	12.74	7.62	0.10
			0.00			1/2" Ice	13.45	8.91	0.19
			0.00			1" Ice	14.12	10.04	0.29

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz Lateral	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
FFV-65B-R2 w/ Mount Pipe	B	From Leg	4.00	0.0000	118.00	No Ice	12.74	7.62	0.10
			0.00			1/2"	13.45	8.91	0.19
			0.00			Ice	14.12	10.04	0.29
						1" Ice			
FFV-65B-R2 w/ Mount Pipe	C	From Leg	4.00	0.0000	118.00	No Ice	12.74	7.62	0.10
			0.00			1/2"	13.45	8.91	0.19
			0.00			Ice	14.12	10.04	0.29
						1" Ice			
TA08025-B605	A	From Leg	4.00	0.0000	118.00	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	118.00	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	118.00	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-B604	A	From Leg	4.00	0.0000	118.00	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	B	From Leg	4.00	0.0000	118.00	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	118.00	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			
RDIDC-9181-PF-48	C	From Face	4.00	0.0000	118.00	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			
(2) 8' x 2" STD Pipe	A	From Leg	4.00	0.0000	118.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice			
(2) 8' x 2" STD Pipe	B	From Leg	4.00	0.0000	118.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice			
(2) 8' x 2" STD Pipe	C	From Leg	4.00	0.0000	118.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice			
8' Platform Mount (MC-PK8-DSH)	C	None		0.0000	118.00	No Ice	19.42	18.40	1.24
						1/2"	22.01	20.72	1.62
						Ice	24.63	23.22	2.06
						1" Ice			
Top Rail	C	None		0.0000	118.00	No Ice	4.56	4.56	0.25
						1/2"	6.39	6.39	0.31
						Ice	8.18	8.18	0.40
						1" Ice			
***** QD6616-7	A	From Leg	4.00	0.0000	130.00	No Ice	13.58	6.80	0.06
			0.00			1/2"	14.08	7.27	0.14
			0.00			Ice	14.60	7.72	0.23
						1" Ice			
QD6616-7	B	From Leg	4.00	0.0000	130.00	No Ice	13.58	6.80	0.06
			0.00			1/2"	14.08	7.27	0.14
			0.00			Ice	14.60	7.72	0.23
						1" Ice			

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz	Lateral	Vert					
QD6616-7	C	From Leg	4.00	0.0000	130.00	No Ice	13.58	6.80	0.06	
			0.00			1/2"	14.08	7.27	0.14	
			0.00			Ice	14.60	7.72	0.23	
DMP65R-BU6D	A	From Leg	4.00	0.0000	130.00	1" Ice	12.71	5.62	0.08	
			0.00			No Ice	12.71	5.62	0.08	
			0.00			1/2"	13.21	6.07	0.15	
DMP65R-BU6D	B	From Leg	4.00	0.0000	130.00	Ice	13.71	6.53	0.23	
			0.00			1" Ice	12.71	5.62	0.08	
			0.00			No Ice	12.71	5.62	0.08	
DMP65R-BU6D	C	From Leg	4.00	0.0000	130.00	1/2"	13.21	6.07	0.15	
			0.00			Ice	13.71	6.53	0.23	
			0.00			1" Ice	12.71	5.62	0.08	
AIR6449 B77D + AIR6419 B77G	A	From Leg	4.00	0.0000	130.00	No Ice	8.45	4.85	0.16	
			0.00			1/2"	8.87	5.24	0.22	
			0.00			Ice	9.29	5.62	0.28	
AIR6449 B77D + AIR6419 B77G	B	From Leg	4.00	0.0000	130.00	1" Ice	8.45	4.85	0.16	
			0.00			No Ice	8.45	4.85	0.16	
			0.00			1/2"	8.87	5.24	0.22	
AIR6449 B77D + AIR6419 B77G	C	From Leg	4.00	0.0000	130.00	Ice	9.29	5.62	0.28	
			0.00			1" Ice	8.45	4.85	0.16	
			0.00			No Ice	8.45	4.85	0.16	
RRUS 4415 B25	A	From Leg	4.00	0.0000	130.00	1/2"	8.87	5.24	0.22	
			0.00			Ice	9.29	5.62	0.28	
			0.00			1" Ice	8.45	4.85	0.16	
RRUS 4415 B25	B	From Leg	4.00	0.0000	130.00	No Ice	8.45	4.85	0.16	
			0.00			1/2"	8.87	5.24	0.22	
			0.00			Ice	9.29	5.62	0.28	
RRUS 4415 B25	C	From Leg	4.00	0.0000	130.00	1" Ice	8.45	4.85	0.16	
			0.00			No Ice	8.45	4.85	0.16	
			0.00			1/2"	8.87	5.24	0.22	
RRUS 4449 B5/B12	A	From Leg	4.00	0.0000	130.00	Ice	9.29	5.62	0.28	
			0.00			1" Ice	8.45	4.85	0.16	
			0.00			No Ice	8.45	4.85	0.16	
RRUS 4449 B5/B12	B	From Leg	4.00	0.0000	130.00	1/2"	8.87	5.24	0.22	
			0.00			Ice	9.29	5.62	0.28	
			0.00			1" Ice	8.45	4.85	0.16	
RRUS 4449 B5/B12	C	From Leg	4.00	0.0000	130.00	No Ice	8.45	4.85	0.16	
			0.00			1/2"	8.87	5.24	0.22	
			0.00			Ice	9.29	5.62	0.28	
DC9-48-60-24-8C-EV	A	From Leg	4.00	0.0000	130.00	1" Ice	1.64	0.68	0.04	
			0.00			No Ice	1.64	0.68	0.04	
			0.00			1/2"	1.80	0.79	0.06	
(2) MM01	A	From Leg	4.00	0.0000	130.00	Ice	1.97	0.91	0.07	
			0.00			1" Ice	1.64	0.68	0.04	
			0.00			No Ice	1.64	0.68	0.04	
(2) MM01	B	From Leg	4.00	0.0000	130.00	1/2"	1.80	0.79	0.06	
			0.00			Ice	1.97	0.91	0.07	
			0.00			1" Ice	1.64	0.68	0.04	
(2) MM01	C	From Leg	4.00	0.0000	130.00	No Ice	1.64	0.68	0.04	
			0.00			1/2"	1.80	0.79	0.06	
			0.00			Ice	1.97	0.91	0.07	
(2) MM01	A	From Leg	4.00	0.0000	130.00	1" Ice	1.97	1.41	0.07	
			0.00			No Ice	1.97	1.41	0.07	
			0.00			1/2"	2.14	1.56	0.09	
(2) MM01	B	From Leg	4.00	0.0000	130.00	Ice	2.33	1.73	0.11	
			0.00			1" Ice	1.97	1.41	0.07	
			0.00			No Ice	1.97	1.41	0.07	
(2) MM01	C	From Leg	4.00	0.0000	130.00	1/2"	2.14	1.56	0.09	
			0.00			Ice	2.33	1.73	0.11	
			0.00			1" Ice	1.97	1.41	0.07	
(2) MM01	A	From Leg	4.00	0.0000	130.00	No Ice	1.97	1.41	0.07	
			0.00			1/2"	2.14	1.56	0.09	
			0.00			Ice	2.33	1.73	0.11	
(2) MM01	B	From Leg	4.00	0.0000	130.00	1" Ice	2.74	4.78	0.03	
			0.00			No Ice	2.74	4.78	0.03	
			0.00			1/2"	2.96	5.06	0.06	
(2) MM01	C	From Leg	4.00	0.0000	130.00	Ice	3.20	5.35	0.10	
			0.00			1" Ice	2.74	4.78	0.03	
			0.00			No Ice	2.74	4.78	0.03	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz	Lateral					
							ft ²	ft ²	K
			0.00				0.26	0.19	0.01
			0.00			1/2" Ice	0.34	0.29	0.02
Connecting Pipe	A	From Leg	4.00	0.0000	130.00	1" Ice			
			0.00			No Ice	1.33	1.33	0.03
			0.00			1/2" Ice	1.63	1.63	0.04
			0.00			Ice	1.95	1.95	0.05
Connecting Pipe	B	From Leg	4.00	0.0000	130.00	1" Ice			
			0.00			No Ice	1.33	1.33	0.03
			0.00			1/2" Ice	1.63	1.63	0.04
			0.00			Ice	1.95	1.95	0.05
Connecting Pipe	C	From Leg	4.00	0.0000	130.00	1" Ice			
			0.00			No Ice	1.33	1.33	0.03
			0.00			1/2" Ice	1.63	1.63	0.04
			0.00			Ice	1.95	1.95	0.05
VFA14-H10-2120	C	None		0.0000	130.00	1" Ice			
						No Ice	39.83	39.83	1.88
						1/2" Ice	56.05	56.05	2.65
						Ice	71.96	71.96	3.66
RRUS 32	A	From Leg	4.00	0.0000	130.00	1" Ice			
			0.00			No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			0.00			Ice	3.18	2.05	0.10
RRUS 32	B	From Leg	4.00	0.0000	130.00	1" Ice			
			0.00			No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			0.00			Ice	3.18	2.05	0.10
RRUS 32	C	From Leg	4.00	0.0000	130.00	1" Ice			
			0.00			No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			0.00			Ice	3.18	2.05	0.10
RRUS 4478 B14	A	From Leg	4.00	0.0000	130.00	1" Ice			
			0.00			No Ice	1.84	1.06	0.06
			0.00			1/2" Ice	2.01	1.20	0.08
			0.00			Ice	2.19	1.34	0.09
RRUS 4478 B14	B	From Leg	4.00	0.0000	130.00	1" Ice			
			0.00			No Ice	1.84	1.06	0.06
			0.00			1/2" Ice	2.01	1.20	0.08
			0.00			Ice	2.19	1.34	0.09
RRUS 4478 B14	C	From Leg	4.00	0.0000	130.00	1" Ice			
			0.00			No Ice	1.84	1.06	0.06
			0.00			1/2" Ice	2.01	1.20	0.08
			0.00			Ice	2.19	1.34	0.09
RRUS 4426 B66	A	From Leg	4.00	0.0000	130.00	1" Ice			
			0.00			No Ice	1.64	0.73	0.05
			0.00			1/2" Ice	1.80	0.84	0.06
			0.00			Ice	1.97	0.97	0.08
RRUS 4426 B66	B	From Leg	4.00	0.0000	130.00	1" Ice			
			0.00			No Ice	1.64	0.73	0.05
			0.00			1/2" Ice	1.80	0.84	0.06
			0.00			Ice	1.97	0.97	0.08
RRUS 4426 B66	C	From Leg	4.00	0.0000	130.00	1" Ice			
			0.00			No Ice	1.64	0.73	0.05
			0.00			1/2" Ice	1.80	0.84	0.06
			0.00			Ice	1.97	0.97	0.08
DC6-48-60-18-8F	B	From Leg	4.00	0.0000	130.00	1" Ice			
			0.00			No Ice	0.92	0.92	0.02
			0.00			1/2" Ice	1.46	1.46	0.04
			0.00			Ice	1.64	1.64	0.06
DC6-48-60-18-8F	C	From Leg	4.00	0.0000	130.00	1" Ice			
			0.00			No Ice	0.92	0.92	0.02
			0.00			1/2" Ice	1.46	1.46	0.04
			0.00			Ice	1.64	1.64	0.06
						1" Ice			
* ERICSSON AIR 21 B2A	A	From Leg	4.00	0.0000	135.00	No Ice	6.33	5.64	0.11

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustmen t	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K				
			Horz Lateral ft ft ft	Vert ft									
B4P w/ Mount Pipe									0.00				
									0.00	1/2"	6.78	6.43	0.17
									0.00	Ice	7.21	7.13	0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00	0.0000	135.00				0.00				
									0.00	1/2"	6.33	5.64	0.11
									0.00	Ice	6.78	6.43	0.17
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00	0.0000	135.00				0.00				
									0.00	1/2"	6.33	5.64	0.11
									0.00	Ice	6.78	6.43	0.17
APXVAARR24_43-U- NA20_TIA w/ Mount Pipe	A	From Leg	4.00	0.0000	135.00				0.00				
									0.00	1/2"	20.48	11.02	0.19
									0.00	Ice	21.23	12.55	0.32
APXVAARR24_43-U- NA20_TIA w/ Mount Pipe	B	From Leg	4.00	0.0000	135.00				0.00				
									0.00	1/2"	21.23	12.55	0.32
									0.00	Ice	21.99	14.10	0.47
APXVAARR24_43-U- NA20_TIA w/ Mount Pipe	C	From Leg	4.00	0.0000	135.00				0.00				
									0.00	1/2"	20.48	11.02	0.19
									0.00	Ice	21.23	12.55	0.32
AIR 32 B2a/B66Aa w/ Mount Pipe	A	From Leg	4.00	0.0000	135.00				0.00				
									0.00	1/2"	6.75	6.07	0.15
									0.00	Ice	7.20	6.87	0.21
AIR 32 B2a/B66Aa w/ Mount Pipe	B	From Leg	4.00	0.0000	135.00				0.00				
									0.00	1/2"	6.75	6.07	0.15
									0.00	Ice	7.20	6.87	0.21
AIR 32 B2a/B66Aa w/ Mount Pipe	C	From Leg	4.00	0.0000	135.00				0.00				
									0.00	1/2"	6.75	6.07	0.15
									0.00	Ice	7.20	6.87	0.21
AIR 6449 B41 w/ Mount Pipe	A	From Leg	4.00	0.0000	135.00				0.00				
									0.00	1/2"	6.90	4.32	0.13
									0.00	Ice	7.74	5.37	0.19
AIR 6449 B41 w/ Mount Pipe	B	From Leg	4.00	0.0000	135.00				0.00				
									0.00	1/2"	6.90	4.32	0.13
									0.00	Ice	7.74	5.37	0.19
AIR 6449 B41 w/ Mount Pipe	C	From Leg	4.00	0.0000	135.00				0.00				
									0.00	1/2"	6.90	4.32	0.13
									0.00	Ice	7.74	5.37	0.19
RRUS 4415 B25	A	From Leg	4.00	0.0000	135.00				0.00				
									0.00	1/2"	1.64	0.68	0.04
									0.00	Ice	1.80	0.79	0.06
RRUS 4415 B25	B	From Leg	4.00	0.0000	135.00				0.00				
									0.00	1/2"	1.64	0.68	0.04
									0.00	Ice	1.80	0.79	0.06
RRUS 4415 B25	C	From Leg	4.00	0.0000	135.00				0.00				
									0.00	1/2"	1.64	0.68	0.04
									0.00	Ice	1.80	0.79	0.06
RADIO 4449 B71+B85	A	From Leg	4.00	0.0000	135.00				0.00				
									0.00	1/2"	1.64	1.31	0.07
									0.00	Ice	1.80	1.46	0.09
RADIO 4449 B71+B85	B	From Leg	4.00	0.0000	135.00				0.00				
									0.00	1/2"	1.64	1.31	0.07
									0.00	Ice	1.80	1.46	0.09

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _d A _A Front	C _d A _A Side	Weight
			Horz	Lateral	Vert					
			0.00							
RADIO 4449 B71+B85	C	From Leg	4.00	0.0000	135.00	Ice	1.97	1.61	0.11	
			0.00			1" Ice	1.64	1.31	0.07	
			0.00			No Ice	1.80	1.46	0.09	
			0.00			1/2"	1.97	1.61	0.11	
ATMAA1412D-1A20	A	From Leg	4.00	0.0000	135.00	1" Ice	0.41	1.00	0.01	
			0.00			No Ice	0.50	1.13	0.02	
			0.00			1/2"	0.59	1.26	0.03	
			0.00			Ice	0.59	1.26	0.03	
ATMAA1412D-1A20	B	From Leg	4.00	0.0000	135.00	1" Ice	0.41	1.00	0.01	
			0.00			No Ice	0.50	1.13	0.02	
			0.00			1/2"	0.59	1.26	0.03	
			0.00			Ice	0.59	1.26	0.03	
ATMAA1412D-1A20	C	From Leg	4.00	0.0000	135.00	1" Ice	0.41	1.00	0.01	
			0.00			No Ice	0.50	1.13	0.02	
			0.00			1/2"	0.59	1.26	0.03	
			0.00			Ice	0.59	1.26	0.03	
10' x 1.5" Dia Dipole	C	From Leg	4.00	0.0000	135.00	1" Ice	2.00	2.00	0.02	
			0.00			No Ice	3.02	3.02	0.04	
			5.00			1/2"	4.07	4.07	0.06	
						Ice	4.07	4.07	0.06	
Stabilizer Kit, Perfect10-P/N: VSK-M	C	None		0.0000	135.00	1" Ice	10.62	10.62	0.56	
						No Ice	13.64	13.64	0.72	
						1/2"	16.86	16.86	0.92	
						Ice	16.86	16.86	0.92	
T-Arm Mount	C	None		0.0000	135.00	1" Ice	13.40	13.40	0.77	
						No Ice	16.44	16.44	1.00	
						1/2"	19.70	19.70	1.29	
						Ice	19.70	19.70	1.29	

10' x 1.5" Dia Dipole	B	From Leg	4.00	0.0000	143.00	1" Ice	2.00	2.00	0.02	
			0.00			No Ice	3.02	3.02	0.04	
			5.00			1/2"	4.07	4.07	0.06	
						Ice	4.07	4.07	0.06	
10' x 1.5" Dia Dipole	C	From Leg	4.00	0.0000	143.00	1" Ice	2.00	2.00	0.02	
			0.00			No Ice	3.02	3.02	0.04	
			5.00			1/2"	4.07	4.07	0.06	
						Ice	4.07	4.07	0.06	
12' x 3" Dia Omni	A	From Leg	4.00	0.0000	143.00	1" Ice	3.60	3.60	0.04	
			0.00			No Ice	4.83	4.83	0.07	
			5.00			1/2"	6.08	6.08	0.10	
						Ice	6.08	6.08	0.10	
T-Arm Mount	C	None		0.0000	143.00	1" Ice	13.40	13.40	0.77	
						No Ice	16.44	16.44	1.00	
						1/2"	19.70	19.70	1.29	
						Ice	19.70	19.70	1.29	
2" STD Pipe (2.375 OD)x6'-0"	A	From Leg	4.00	0.0000	143.00	1" Ice	1.43	1.43	0.02	
			0.00			No Ice	1.92	1.92	0.03	
			0.00			1/2"	2.29	2.29	0.05	
						Ice	2.29	2.29	0.05	
2" STD Pipe (2.375 OD)x6'-0"	B	From Leg	4.00	0.0000	143.00	1" Ice	1.43	1.43	0.02	
			0.00			No Ice	1.92	1.92	0.03	
			0.00			1/2"	2.29	2.29	0.05	
						Ice	2.29	2.29	0.05	
2" STD Pipe (2.375 OD)x6'-0"	C	From Leg	4.00	0.0000	143.00	1" Ice	1.43	1.43	0.02	
			0.00			No Ice	1.92	1.92	0.03	
			0.00			1/2"	2.29	2.29	0.05	
						Ice	2.29	2.29	0.05	
8' Lightning Rod	A	From Leg	4.00	0.0000	143.00	1" Ice	0.50	0.50	0.02	
			0.00			No Ice	1.31	1.31	0.02	
			4.00			1/2"	2.14	2.14	0.03	
						Ice	2.14	2.14	0.03	
**										
BPA7496-180-14 w/ Mount	A	From Leg	0.00	0.0000	145.00	No Ice	14.16	12.40	0.10	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz Lateral	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
Pipe			0.00			1/2"	15.70	14.85	0.21
			0.00			Ice	17.24	17.32	0.34
						1" Ice			
432F-83W TTA	A	From Leg	0.00		0.0000	No Ice	1.50	0.94	0.02
			0.00			1/2"	1.65	1.07	0.03
			0.00			Ice	1.81	1.20	0.05
						1" Ice			
*									
Dish Mount	A	From Leg	0.00		0.0000	No Ice	2.50	2.50	0.08
			0.00			1/2"	3.21	3.21	0.10
			0.00			Ice	3.64	3.64	0.12
						1" Ice			

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight	
				Horz Lateral	Vert							
				ft	ft	°	°	ft	ft	ft ²	K	
SC3-W100AC	A	Paraboloid w/o Radome	From Leg	1.00		0.0000		93.00	3.29	No Ice	8.51	0.05
				0.00						1/2" Ice	8.95	0.09
				0.00						1" Ice	9.38	0.14

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
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
51	1.2 Dead+1.0 Ev+1.0 Eh 0 deg
52	0.9 Dead-1.0 Ev+1.0 Eh 0 deg
53	1.2 Dead+1.0 Ev+1.0 Eh 30 deg
54	0.9 Dead-1.0 Ev+1.0 Eh 30 deg
55	1.2 Dead+1.0 Ev+1.0 Eh 60 deg
56	0.9 Dead-1.0 Ev+1.0 Eh 60 deg
57	1.2 Dead+1.0 Ev+1.0 Eh 90 deg
58	0.9 Dead-1.0 Ev+1.0 Eh 90 deg
59	1.2 Dead+1.0 Ev+1.0 Eh 120 deg
60	0.9 Dead-1.0 Ev+1.0 Eh 120 deg
61	1.2 Dead+1.0 Ev+1.0 Eh 150 deg
62	0.9 Dead-1.0 Ev+1.0 Eh 150 deg
63	1.2 Dead+1.0 Ev+1.0 Eh 180 deg
64	0.9 Dead-1.0 Ev+1.0 Eh 180 deg
65	1.2 Dead+1.0 Ev+1.0 Eh 210 deg
66	0.9 Dead-1.0 Ev+1.0 Eh 210 deg
67	1.2 Dead+1.0 Ev+1.0 Eh 240 deg
68	0.9 Dead-1.0 Ev+1.0 Eh 240 deg
69	1.2 Dead+1.0 Ev+1.0 Eh 270 deg
70	0.9 Dead-1.0 Ev+1.0 Eh 270 deg
71	1.2 Dead+1.0 Ev+1.0 Eh 300 deg
72	0.9 Dead-1.0 Ev+1.0 Eh 300 deg
73	1.2 Dead+1.0 Ev+1.0 Eh 330 deg
74	0.9 Dead-1.0 Ev+1.0 Eh 330 deg

Maximum Member Forces

Sectio n No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	145 - 140	Pole	Max Tension	48	0.00	-0.00	-0.00
			Max. Compression	26	-3.47	0.00	0.98
			Max. Mx	20	-1.45	10.76	0.24
			Max. My	2	-1.45	0.00	11.67
			Max. Vy	20	-2.56	10.76	0.24
			Max. Vx	14	2.67	0.00	-10.94
			Max. Torque	20			-1.21
L2	140 - 135	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-4.20	0.00	0.93
			Max. Mx	20	-1.87	24.93	0.22
			Max. My	2	-1.88	0.00	26.35
			Max. Vy	20	-3.11	24.93	0.22
			Max. Vx	14	3.21	0.00	-25.65
			Max. Torque	20			-1.21
L3	135 - 130	Pole	Max Tension	1	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
L4	130 - 125	Pole	Max. Compression	26	-13.88	0.36	0.35
			Max. Mx	20	-5.88	72.72	0.09
			Max. My	2	-5.95	0.07	73.97
			Max. Vy	20	-9.80	72.72	0.09
			Max. Vx	14	9.77	0.07	-73.61
			Max. Torque	20			-1.21
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25.21	0.37	0.27
			Max. Mx	20	-10.36	157.04	-0.04
			Max. My	2	-10.49	0.08	157.25
L5	125 - 120	Pole	Max. Vy	20	-17.21	157.04	-0.04
			Max. Vx	14	16.96	0.08	-157.00
			Max. Torque	20			-1.77
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.36	0.37	-0.14
			Max. Mx	20	-11.02	244.82	-0.15
			Max. My	2	-11.16	0.08	243.36
			Max. Vy	20	-17.90	244.82	-0.15
			Max. Vx	14	17.54	0.08	-243.35
			Max. Torque	20			-1.77
L6	120 - 115	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.28	0.38	-1.00
			Max. Mx	20	-14.22	346.23	-0.37
			Max. My	14	-14.40	0.09	-342.89
			Max. Vy	20	-22.00	346.23	-0.37
			Max. Vx	14	21.50	0.09	-342.89
			Max. Torque	20			-1.77
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.51	0.38	-1.49
			Max. Mx	20	-14.95	458.46	-0.49
L7	115 - 110	Pole	Max. My	14	-15.16	0.09	-451.96
			Max. Vy	20	-22.91	458.46	-0.49
			Max. Vx	14	22.08	0.09	-451.96
			Max. Torque	20			-1.55
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.55	0.38	-1.39
			Max. Mx	20	-19.36	595.65	-0.45
			Max. My	14	-19.62	0.09	-583.89
			Max. Vy	20	-27.75	595.65	-0.45
			Max. Vx	14	26.53	0.09	-583.89
L8	110 - 105	Pole	Max. Torque	18			-2.15
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.89	0.38	-2.01
			Max. Mx	20	-20.19	736.68	-0.60
			Max. My	14	-20.49	0.10	-718.04
			Max. Vy	20	-28.68	736.68	-0.60
			Max. Vx	14	27.08	0.10	-718.04
			Max. Torque	18			-2.15
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.99	0.38	-2.52
L9	105 - 100	Pole	Max. Mx	20	-20.89	852.82	-0.72
			Max. My	14	-21.20	0.10	-827.34
			Max. Vy	20	-29.41	852.82	-0.72
			Max. Vx	14	27.52	0.10	-827.34
			Max. Torque	18			-2.15
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.15	0.37	-2.70
			Max. Mx	20	-22.91	1038.97	-0.68
			Max. My	14	-23.22	0.11	-1001.73
			Max. Vy	20	-30.93	1038.97	-0.68
L10	100 - 90.83	Pole	Max. Vx	14	29.02	0.11	-1001.73
			Max. Torque	6			2.84
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.77	0.35	-3.33
			Max. Mx	20	-24.02	1195.87	-0.82
			Max. My	14	-24.35	0.11	-1148.32
			Max. Vy	20	-31.85	1195.87	-0.82
			Max. Torque	18			-2.15
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.99	0.38	-2.52
L11	90.83 - 89.83	Pole	Max. Mx	20	-20.89	852.82	-0.72
			Max. My	14	-21.20	0.10	-827.34
			Max. Vy	20	-29.41	852.82	-0.72
			Max. Vx	14	27.52	0.10	-827.34
			Max. Torque	18			-2.15
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.15	0.37	-2.70
			Max. Mx	20	-22.91	1038.97	-0.68
			Max. My	14	-23.22	0.11	-1001.73
			Max. Vy	20	-30.93	1038.97	-0.68
L12	89.83 - 84.83	Pole	Max. Vx	14	29.02	0.11	-1001.73
			Max. Torque	6			2.84
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.77	0.35	-3.33
			Max. Mx	20	-24.02	1195.87	-0.82
			Max. My	14	-24.35	0.11	-1148.32
			Max. Vy	20	-31.85	1195.87	-0.82
			Max. Torque	18			-2.15
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.99	0.38	-2.52

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft			
L13	84.83 - 79.83	Pole	Max. Vx	14	29.57	0.11	-1148.32			
			Max. Torque	6			2.84			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-52.41	0.32	-3.98			
			Max. Mx	20	-25.17	1357.35	-0.97			
			Max. My	14	-25.52	0.11	-1297.66			
			Max. Vy	20	-32.77	1357.35	-0.97			
			Max. Vx	14	30.12	0.11	-1297.66			
			Max. Torque	6			2.84			
			Max Tension	1	0.00	0.00	0.00			
L14	79.83 - 76	Pole	Max. Compression	26	-53.68	0.30	-4.48			
			Max. Mx	20	-26.08	1484.11	-1.09			
			Max. My	14	-26.43	0.11	-1413.89			
			Max. Vy	20	-33.46	1484.11	-1.09			
			Max. Vx	14	30.53	0.11	-1413.89			
			Max. Torque	6			2.84			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-55.37	0.27	-5.14			
			Max. Mx	20	-27.31	1653.52	-1.25			
			Max. My	14	-27.66	0.11	-1567.98			
L15	76 - 71	Pole	Max. Vy	20	-34.34	1653.52	-1.25			
			Max. Vx	14	31.06	0.11	-1567.98			
			Max. Torque	6			2.83			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-57.08	0.24	-5.81			
			Max. Mx	20	-28.57	1827.33	-1.41			
			Max. My	14	-28.92	0.11	-1724.68			
			Max. Vy	20	-35.21	1827.33	-1.41			
			Max. Vx	14	31.58	0.11	-1724.68			
			Max. Torque	6			2.83			
L16	71 - 66	Pole	Max. Torque	6			2.83			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-59.18	0.21	-6.49			
			Max. Mx	20	-29.86	2006.30	-1.58			
			Max. My	14	-30.19	0.10	-1885.16			
			Max. Vy	20	-36.41	2006.30	-1.58			
			Max. Vx	14	32.57	0.10	-1885.16			
			Max. Torque	6			2.83			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-61.31	0.18	-7.17			
L17	66 - 61	Pole	Max. Mx	20	-31.18	2191.17	-1.76			
			Max. My	14	-31.49	0.10	-2050.57			
			Max. Vy	20	-37.58	2191.17	-1.76			
			Max. Vx	14	33.55	0.10	-2050.57			
			Max. Torque	6			2.68			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-63.45	0.16	-7.86			
			Max. Mx	20	-32.55	2381.79	-1.93			
			Max. My	14	-32.83	0.10	-2220.80			
			Max. Vy	20	-38.71	2381.79	-1.93			
L18	61 - 56	Pole	Max. Vx	14	34.50	0.10	-2220.80			
			Max. Torque	6			2.53			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-64.33	0.14	-8.13			
			Max. Mx	20	-33.11	2459.62	-2.01			
			Max. My	14	-33.38	0.09	-2290.23			
			Max. Vy	20	-39.16	2459.62	-2.01			
			Max. Vx	14	34.89	0.09	-2290.23			
			Max. Torque	6			2.37			
			Max Tension	1	0.00	0.00	0.00			
L19	56 - 51	Pole	Max. Compression	26	-69.34	0.10	-9.13			
			Max. Mx	20	-36.44	2746.84	-2.28			
			Max. My	14	-36.69	0.09	-2546.26			
			Max. Vy	20	-40.97	2746.84	-2.28			
			Max. Vx	14	36.46	0.09	-2546.26			
			Max. Torque	6			2.10			
			Max Tension	1	0.00	0.00	0.00			
			L20	51 - 42.83	Pole	Max. Compression	26	-69.34	0.10	-9.13
						Max. Mx	20	-36.44	2746.84	-2.28
						Max. My	14	-36.69	0.09	-2546.26
Max. Vy	20	-40.97				2746.84	-2.28			
Max. Vx	14	36.46				0.09	-2546.26			
Max. Torque	6						2.10			
Max Tension	1	0.00				0.00	0.00			
L21	42.83 - 41.83	Pole				Max. Compression	26	-69.34	0.10	-9.13
						Max. Mx	20	-36.44	2746.84	-2.28
						Max. My	14	-36.69	0.09	-2546.26
			Max. Vy	20	-40.97	2746.84	-2.28			
			Max. Vx	14	36.46	0.09	-2546.26			
			Max. Torque	6			2.10			
			Max Tension	1	0.00	0.00	0.00			
			L22	41.83 - 36.83	Pole	Max. Compression	26	-69.34	0.10	-9.13
						Max. Mx	20	-36.44	2746.84	-2.28
						Max. My	14	-36.69	0.09	-2546.26
Max. Vy	20	-40.97				2746.84	-2.28			
Max. Vx	14	36.46				0.09	-2546.26			
Max. Torque	6						2.10			
Max Tension	1	0.00				0.00	0.00			

Sectio n No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L23	36.83 - 35	Pole	Max. Compression	26	-71.71	0.07	-9.80
			Max. Mx	20	-38.04	2954.24	-2.47
			Max. My	14	-38.26	0.08	-2731.01
			Max. Vy	20	-42.04	2954.24	-2.47
			Max. Vx	14	37.39	0.08	-2731.01
			Max. Torque	6			2.07
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-72.53	0.06	-10.04
			Max. Mx	20	-38.62	3031.43	-2.54
			Max. My	14	-38.83	0.08	-2799.75
L24	35 - 34.75	Pole	Max. Vy	20	-42.39	3031.43	-2.54
			Max. Vx	14	37.70	0.08	-2799.75
			Max. Torque	6			1.90
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-72.68	0.06	-10.08
			Max. Mx	20	-38.77	3042.03	-2.55
			Max. My	14	-38.97	0.08	-2809.18
			Max. Vy	20	-42.41	3042.03	-2.55
			Max. Vx	14	37.72	0.08	-2809.18
			Max. Torque	6			1.85
L25	34.75 - 29.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-75.79	0.03	-10.74
			Max. Mx	20	-40.97	3256.94	-2.74
			Max. My	14	-41.15	0.08	-3000.56
			Max. Vy	20	-43.57	3256.94	-2.74
			Max. Vx	14	38.76	0.08	-3000.56
			Max. Torque	9			-2.10
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-76.26	0.02	-10.84
			Max. Mx	20	-41.31	3289.67	-2.77
L26	29.75 - 29	Pole	Max. My	14	-41.49	0.08	-3029.71
			Max. Vy	20	-43.74	3289.67	-2.77
			Max. Vx	14	38.91	0.08	-3029.71
			Max. Torque	9			-2.15
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-79.38	-0.01	-11.51
			Max. Mx	20	-43.56	3511.11	-2.97
			Max. My	14	-43.72	0.07	-3226.93
			Max. Vy	20	-44.87	3511.11	-2.97
			Max. Vx	14	39.92	0.07	-3226.93
L27	29 - 24	Pole	Max. Torque	9			-2.46
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-82.51	-0.04	-12.19
			Max. Mx	20	-45.86	3738.15	-3.18
			Max. My	14	-45.98	0.07	-3429.17
			Max. Vy	20	-45.99	3738.15	-3.18
			Max. Vx	14	40.92	0.07	-3429.17
			Max. Torque	9			-2.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-85.65	-0.07	-12.86
L28	24 - 19	Pole	Max. Mx	20	-48.19	3970.77	-3.39
			Max. My	14	-48.28	0.06	-3636.43
			Max. Vy	20	-47.10	3970.77	-3.39
			Max. Vx	14	41.92	0.06	-3636.43
			Max. Torque	9			-3.12
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-88.53	-0.10	-13.16
			Max. Mx	20	-50.43	4208.76	-3.48
			Max. My	14	-50.49	0.06	-3848.57
			Max. Vy	20	-48.13	4208.76	-3.48
L29	19 - 14	Pole	Max. Vx	14	42.92	0.06	-3848.57
			Max. Torque	9			-3.26
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-91.23	-0.12	-13.19
			Max. Mx	20	-52.62	4451.73	-3.47
			Max. My	14	-52.65	0.06	-4065.61
			Max. Vy	20	-49.10	4451.73	-3.47
			Max. Vx	14	43.92	0.06	-4065.61
			Max. Torque	9			-3.26
			Max Tension	1	0.00	0.00	0.00
L30	14 - 9	Pole	Max. Compression	26	-91.23	-0.12	-13.19
			Max. Mx	20	-52.62	4451.73	-3.47
			Max. My	14	-52.65	0.06	-4065.61
			Max. Vy	20	-49.10	4451.73	-3.47
			Max. Vx	14	43.92	0.06	-4065.61
			Max. Torque	9			-3.26
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-91.23	-0.12	-13.19
			Max. Mx	20	-52.62	4451.73	-3.47
			Max. My	14	-52.65	0.06	-4065.61
L31	9 - 4	Pole	Max. Vy	20	-49.10	4451.73	-3.47
			Max. Vx	14	43.92	0.06	-4065.61
			Max. Torque	9			-3.26
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-91.23	-0.12	-13.19
			Max. Mx	20	-52.62	4451.73	-3.47
			Max. My	14	-52.65	0.06	-4065.61
			Max. Vy	20	-49.10	4451.73	-3.47
			Max. Vx	14	43.92	0.06	-4065.61
			Max. Torque	9			-3.26

Sectio n No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L32	4 - 0	Pole	Max. Torque	9			-3.26
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-93.33	-0.14	-13.18
			Max. Mx	20	-54.39	4649.55	-3.45
			Max. My	14	-54.39	0.05	-4242.83
			Max. Vy	20	-49.86	4649.55	-3.45
			Max. Vx	14	44.72	0.05	-4242.83
			Max. Torque	9			-3.26

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	93.33	0.00	-0.00
	Max. H _x	20	54.41	49.84	0.00
	Max. H _z	2	54.41	0.00	44.52
	Max. M _x	2	4217.38	0.00	44.52
	Max. M _z	8	4649.44	-49.84	0.00
	Max. Torsion	21	3.25	49.84	0.00
	Min. Vert	64	38.69	0.00	-1.36
	Min. H _x	8	54.41	-49.84	0.00
	Min. H _z	14	54.41	0.00	-44.70
	Min. M _x	14	-4242.83	0.00	-44.70
	Min. M _z	20	-4649.55	49.84	0.00
	Min. Torsion	9	-3.25	-49.84	0.00

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
Dead Only	45.34	0.00	0.00	3.10	0.04	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	54.41	-0.00	-44.52	-4217.38	0.05	-1.25
0.9 Dead+1.0 Wind 0 deg - No Ice	40.81	0.00	-44.52	-4172.32	0.04	-1.25
1.2 Dead+1.0 Wind 30 deg - No Ice	54.41	22.05	-38.29	-3642.68	-2098.02	-1.53
0.9 Dead+1.0 Wind 30 deg - No Ice	40.81	22.05	-38.29	-3603.84	-2075.12	-1.52
1.2 Dead+1.0 Wind 60 deg - No Ice	54.41	38.53	-22.35	-2109.07	-3638.59	-1.02
0.9 Dead+1.0 Wind 60 deg - No Ice	40.81	38.53	-22.35	-2087.04	-3598.95	-1.01
1.2 Dead+1.0 Wind 90 deg - No Ice	54.41	49.84	-0.00	3.45	-4649.44	3.24
0.9 Dead+1.0 Wind 90 deg - No Ice	40.81	49.84	-0.00	2.46	-4599.80	3.25
1.2 Dead+1.0 Wind 120 deg - No Ice	54.41	41.18	24.37	2296.53	-3868.19	1.87
0.9 Dead+1.0 Wind 120 deg - No Ice	40.81	41.18	24.37	2270.81	-3826.36	1.88
1.2 Dead+1.0 Wind 150 deg - No Ice	54.41	22.10	38.94	3691.30	-2090.32	1.31
0.9 Dead+1.0 Wind 150 deg - No Ice	40.81	22.10	38.94	3650.16	-2067.54	1.31
1.2 Dead+1.0 Wind 180 deg - No Ice	54.41	-0.00	44.70	4242.83	0.05	1.25
0.9 Dead+1.0 Wind 180 deg - No Ice	40.81	0.00	44.70	4195.62	0.04	1.25

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 210 deg - No Ice	54.41	-21.90	38.58	3678.37	2082.96	0.98
0.9 Dead+1.0 Wind 210 deg - No Ice	40.81	-21.90	38.58	3637.29	2060.18	0.97
1.2 Dead+1.0 Wind 240 deg - No Ice	54.41	-38.45	22.80	2159.51	3630.94	0.55
0.9 Dead+1.0 Wind 240 deg - No Ice	40.81	-38.45	22.80	2135.10	3591.35	0.54
1.2 Dead+1.0 Wind 270 deg - No Ice	54.41	-49.84	-0.00	3.45	4649.55	-3.24
0.9 Dead+1.0 Wind 270 deg - No Ice	40.81	-49.84	-0.00	2.46	4599.88	-3.25
1.2 Dead+1.0 Wind 300 deg - No Ice	54.41	-41.26	-23.93	-2246.12	3876.06	-1.40
0.9 Dead+1.0 Wind 300 deg - No Ice	40.81	-41.26	-23.93	-2222.78	3834.12	-1.41
1.2 Dead+1.0 Wind 330 deg - No Ice	54.41	-22.26	-38.65	-3655.61	2105.60	-0.75
0.9 Dead+1.0 Wind 330 deg - No Ice	40.81	-22.26	-38.65	-3616.72	2082.64	-0.76
1.2 Dead+1.0 Ice+1.0 Temp	93.33	-0.00	0.00	13.18	-0.14	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	93.33	-0.00	-8.69	-898.08	-0.14	-0.20
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	93.33	4.29	-7.43	-772.34	-454.03	-0.31
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	93.33	7.56	-4.37	-443.40	-790.26	-0.23
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	93.33	9.58	-0.00	13.26	-978.27	0.64
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	93.33	7.79	4.59	486.98	-805.62	0.27
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	93.33	4.35	7.62	809.46	-454.73	0.19
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	93.33	-0.00	8.72	927.77	-0.14	0.20
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	93.33	-4.26	7.47	803.78	451.16	0.22
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	93.33	-7.55	4.45	477.35	788.65	0.15
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	93.33	-9.58	-0.00	13.26	977.99	-0.64
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	93.33	-7.81	-4.52	-453.03	806.65	-0.19
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	93.33	-4.37	-7.57	-778.02	457.03	-0.09
Dead+Wind 0 deg - Service	45.34	0.00	-8.49	-797.01	0.05	-0.24
Dead+Wind 30 deg - Service	45.34	4.20	-7.30	-688.06	-397.68	-0.29
Dead+Wind 60 deg - Service	45.34	7.35	-4.26	-397.34	-689.73	-0.19
Dead+Wind 90 deg - Service	45.34	9.50	-0.00	3.13	-881.61	0.62
Dead+Wind 120 deg - Service	45.34	7.85	4.65	437.91	-733.40	0.36
Dead+Wind 150 deg - Service	45.34	4.21	7.42	702.25	-396.23	0.25
Dead+Wind 180 deg - Service	45.34	0.00	8.52	806.80	0.05	0.24
Dead+Wind 210 deg - Service	45.34	-4.17	7.36	699.79	394.91	0.19
Dead+Wind 240 deg - Service	45.34	-7.33	4.35	411.86	688.36	0.10
Dead+Wind 270 deg - Service	45.34	-9.50	-0.00	3.13	881.71	-0.62
Dead+Wind 300 deg - Service	45.34	-7.87	-4.56	-423.40	734.96	-0.27
Dead+Wind 330 deg - Service	45.34	-4.24	-7.37	-690.52	399.20	-0.14
1.2 Dead+1.0 Ev+1.0 Eh 0 deg	56.53	0.00	-1.36	-161.25	0.06	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 0 deg	38.69	0.00	-1.36	-159.73	0.04	-0.00

Load Combination	Vertical	Shear _x	Shear _z	Overturing Moment, M _x	Overturing Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Ev+1.0 Eh 30 deg	56.53	0.68	-1.18	-139.13	-82.51	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 30 deg	38.69	0.68	-1.18	-137.95	-81.26	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 60 deg	56.53	1.18	-0.68	-78.68	-142.95	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 60 deg	38.69	1.18	-0.68	-78.43	-140.78	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 90 deg	56.53	1.36	0.00	3.89	-165.08	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 90 deg	38.69	1.36	0.00	2.87	-162.56	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 120 deg	56.53	1.18	0.68	86.46	-142.95	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 120 deg	38.69	1.18	0.68	84.18	-140.78	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 150 deg	56.53	0.68	1.18	146.90	-82.51	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 150 deg	38.69	0.68	1.18	143.69	-81.26	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 180 deg	56.53	0.00	1.36	169.03	0.06	0.00
0.9 Dead-1.0 Ev+1.0 Eh 180 deg	38.69	0.00	1.36	165.48	0.04	0.00
1.2 Dead+1.0 Ev+1.0 Eh 210 deg	56.53	-0.68	1.18	146.90	82.63	0.00
0.9 Dead-1.0 Ev+1.0 Eh 210 deg	38.69	-0.68	1.18	143.69	81.35	0.00
1.2 Dead+1.0 Ev+1.0 Eh 240 deg	56.53	-1.18	0.68	86.46	143.07	0.00
0.9 Dead-1.0 Ev+1.0 Eh 240 deg	38.69	-1.18	0.68	84.18	140.86	0.00
1.2 Dead+1.0 Ev+1.0 Eh 270 deg	56.53	-1.36	0.00	3.89	165.20	0.00
0.9 Dead-1.0 Ev+1.0 Eh 270 deg	38.69	-1.36	0.00	2.87	162.65	0.00
1.2 Dead+1.0 Ev+1.0 Eh 300 deg	56.53	-1.18	-0.68	-78.68	143.07	0.00
0.9 Dead-1.0 Ev+1.0 Eh 300 deg	38.69	-1.18	-0.68	-78.43	140.86	0.00
1.2 Dead+1.0 Ev+1.0 Eh 330 deg	56.53	-0.68	-1.18	-139.13	82.63	0.00
0.9 Dead-1.0 Ev+1.0 Eh 330 deg	38.69	-0.68	-1.18	-137.95	81.35	0.00

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-45.34	0.00	0.00	45.34	0.00	0.000%
2	0.00	-54.41	-44.52	0.00	54.41	44.52	0.000%
3	0.00	-40.81	-44.52	0.00	40.81	44.52	0.000%
4	22.05	-54.41	-38.29	-22.05	54.41	38.29	0.000%
5	22.05	-40.81	-38.29	-22.05	40.81	38.29	0.000%
6	38.53	-54.41	-22.35	-38.53	54.41	22.35	0.000%
7	38.53	-40.81	-22.35	-38.53	40.81	22.35	0.000%
8	49.84	-54.41	-0.00	-49.84	54.41	0.00	0.000%
9	49.84	-40.81	-0.00	-49.84	40.81	0.00	0.000%
10	41.18	-54.41	24.37	-41.18	54.41	-24.37	0.000%
11	41.18	-40.81	24.37	-41.18	40.81	-24.37	0.000%
12	22.10	-54.41	38.94	-22.10	54.41	-38.94	0.000%
13	22.10	-40.81	38.94	-22.10	40.81	-38.94	0.000%
14	0.00	-54.41	44.70	0.00	54.41	-44.70	0.000%
15	0.00	-40.81	44.70	0.00	40.81	-44.70	0.000%
16	-21.90	-54.41	38.58	21.90	54.41	-38.58	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
17	-21.90	-40.81	38.58	21.90	40.81	-38.58	0.000%
18	-38.45	-54.41	22.80	38.45	54.41	-22.80	0.000%
19	-38.45	-40.81	22.80	38.45	40.81	-22.80	0.000%
20	-49.84	-54.41	-0.00	49.84	54.41	0.00	0.000%
21	-49.84	-40.81	-0.00	49.84	40.81	0.00	0.000%
22	-41.26	-54.41	-23.93	41.26	54.41	23.93	0.000%
23	-41.26	-40.81	-23.93	41.26	40.81	23.93	0.000%
24	-22.26	-54.41	-38.65	22.26	54.41	38.65	0.000%
25	-22.26	-40.81	-38.65	22.26	40.81	38.65	0.000%
26	0.00	-93.33	0.00	0.00	93.33	-0.00	0.000%
27	0.00	-93.33	-8.69	0.00	93.33	8.69	0.000%
28	4.29	-93.33	-7.43	-4.29	93.33	7.43	0.000%
29	7.56	-93.33	-4.37	-7.56	93.33	4.37	0.000%
30	9.58	-93.33	-0.00	-9.58	93.33	0.00	0.000%
31	7.79	-93.33	4.59	-7.79	93.33	-4.59	0.000%
32	4.35	-93.33	7.62	-4.35	93.33	-7.62	0.000%
33	0.00	-93.33	8.72	0.00	93.33	-8.72	0.000%
34	-4.26	-93.33	7.47	4.26	93.33	-7.47	0.000%
35	-7.55	-93.33	4.45	7.55	93.33	-4.45	0.000%
36	-9.58	-93.33	-0.00	9.58	93.33	0.00	0.000%
37	-7.81	-93.33	-4.52	7.81	93.33	4.52	0.000%
38	-4.37	-93.33	-7.57	4.37	93.33	7.57	0.000%
39	0.00	-45.34	-8.49	0.00	45.34	8.49	0.000%
40	4.20	-45.34	-7.30	-4.20	45.34	7.30	0.000%
41	7.35	-45.34	-4.26	-7.35	45.34	4.26	0.000%
42	9.50	-45.34	-0.00	-9.50	45.34	0.00	0.000%
43	7.85	-45.34	4.65	-7.85	45.34	-4.65	0.000%
44	4.21	-45.34	7.42	-4.21	45.34	-7.42	0.000%
45	0.00	-45.34	8.52	0.00	45.34	-8.52	0.000%
46	-4.17	-45.34	7.36	4.17	45.34	-7.36	0.000%
47	-7.33	-45.34	4.35	7.33	45.34	-4.35	0.000%
48	-9.50	-45.34	-0.00	9.50	45.34	0.00	0.000%
49	-7.87	-45.34	-4.56	7.87	45.34	4.56	0.000%
50	-4.24	-45.34	-7.37	4.24	45.34	7.37	0.000%
51	0.00	-56.53	-1.36	0.00	56.53	1.36	0.000%
52	0.00	-38.69	-1.36	0.00	38.69	1.36	0.000%
53	0.68	-56.53	-1.18	-0.68	56.53	1.18	0.000%
54	0.68	-38.69	-1.18	-0.68	38.69	1.18	0.000%
55	1.18	-56.53	-0.68	-1.18	56.53	0.68	0.000%
56	1.18	-38.69	-0.68	-1.18	38.69	0.68	0.000%
57	1.36	-56.53	0.00	-1.36	56.53	-0.00	0.000%
58	1.36	-38.69	0.00	-1.36	38.69	-0.00	0.000%
59	1.18	-56.53	0.68	-1.18	56.53	-0.68	0.000%
60	1.18	-38.69	0.68	-1.18	38.69	-0.68	0.000%
61	0.68	-56.53	1.18	-0.68	56.53	-1.18	0.000%
62	0.68	-38.69	1.18	-0.68	38.69	-1.18	0.000%
63	0.00	-56.53	1.36	0.00	56.53	-1.36	0.000%
64	0.00	-38.69	1.36	0.00	38.69	-1.36	0.000%
65	-0.68	-56.53	1.18	0.68	56.53	-1.18	0.000%
66	-0.68	-38.69	1.18	0.68	38.69	-1.18	0.000%
67	-1.18	-56.53	0.68	1.18	56.53	-0.68	0.000%
68	-1.18	-38.69	0.68	1.18	38.69	-0.68	0.000%
69	-1.36	-56.53	0.00	1.36	56.53	-0.00	0.000%
70	-1.36	-38.69	0.00	1.36	38.69	-0.00	0.000%
71	-1.18	-56.53	-0.68	1.18	56.53	0.68	0.000%
72	-1.18	-38.69	-0.68	1.18	38.69	0.68	0.000%
73	-0.68	-56.53	-1.18	0.68	56.53	1.18	0.000%
74	-0.68	-38.69	-1.18	0.68	38.69	1.18	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00012480

3	Yes	5	0.00000001	0.00005073
4	Yes	6	0.00000001	0.00031129
5	Yes	6	0.00000001	0.00009504
6	Yes	6	0.00000001	0.00032972
7	Yes	6	0.00000001	0.00010158
8	Yes	5	0.00000001	0.00019117
9	Yes	5	0.00000001	0.00008189
10	Yes	6	0.00000001	0.00034517
11	Yes	6	0.00000001	0.00010256
12	Yes	6	0.00000001	0.00032166
13	Yes	6	0.00000001	0.00009842
14	Yes	5	0.00000001	0.00012490
15	Yes	5	0.00000001	0.00005069
16	Yes	6	0.00000001	0.00032668
17	Yes	6	0.00000001	0.00010026
18	Yes	6	0.00000001	0.00031443
19	Yes	6	0.00000001	0.00009568
20	Yes	5	0.00000001	0.00019119
21	Yes	5	0.00000001	0.00008189
22	Yes	6	0.00000001	0.00035008
23	Yes	6	0.00000001	0.00010478
24	Yes	6	0.00000001	0.00031596
25	Yes	6	0.00000001	0.00009660
26	Yes	4	0.00000001	0.00033252
27	Yes	6	0.00000001	0.00030178
28	Yes	6	0.00000001	0.00032885
29	Yes	6	0.00000001	0.00033202
30	Yes	6	0.00000001	0.00032017
31	Yes	6	0.00000001	0.00034543
32	Yes	6	0.00000001	0.00034028
33	Yes	6	0.00000001	0.00031144
34	Yes	6	0.00000001	0.00034026
35	Yes	6	0.00000001	0.00033916
36	Yes	6	0.00000001	0.00032054
37	Yes	6	0.00000001	0.00033814
38	Yes	6	0.00000001	0.00033026
39	Yes	4	0.00000001	0.00032179
40	Yes	5	0.00000001	0.00005692
41	Yes	5	0.00000001	0.00006749
42	Yes	4	0.00000001	0.00036781
43	Yes	5	0.00000001	0.00006978
44	Yes	5	0.00000001	0.00006271
45	Yes	4	0.00000001	0.00032524
46	Yes	5	0.00000001	0.00006572
47	Yes	5	0.00000001	0.00005859
48	Yes	4	0.00000001	0.00036798
49	Yes	5	0.00000001	0.00007302
50	Yes	5	0.00000001	0.00005907
51	Yes	4	0.00000001	0.00010652
52	Yes	4	0.00000001	0.00005123
53	Yes	4	0.00000001	0.00011414
54	Yes	4	0.00000001	0.00005649
55	Yes	4	0.00000001	0.00011468
56	Yes	4	0.00000001	0.00005665
57	Yes	4	0.00000001	0.00010871
58	Yes	4	0.00000001	0.00005202
59	Yes	4	0.00000001	0.00011809
60	Yes	4	0.00000001	0.00005804
61	Yes	4	0.00000001	0.00011865
62	Yes	4	0.00000001	0.00005820
63	Yes	4	0.00000001	0.00011110
64	Yes	4	0.00000001	0.00005287
65	Yes	4	0.00000001	0.00011887
66	Yes	4	0.00000001	0.00005830
67	Yes	4	0.00000001	0.00011836
68	Yes	4	0.00000001	0.00005815
69	Yes	4	0.00000001	0.00010899
70	Yes	4	0.00000001	0.00005212
71	Yes	4	0.00000001	0.00011495
72	Yes	4	0.00000001	0.00005675
73	Yes	4	0.00000001	0.00011435
74	Yes	4	0.00000001	0.00005658

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	145 - 140	20.812	48	1.2121	0.0032
L2	140 - 135	19.543	48	1.2113	0.0030
L3	135 - 130	18.276	48	1.2086	0.0028
L4	130 - 125	17.013	48	1.2018	0.0026
L5	125 - 120	15.762	48	1.1875	0.0024
L6	120 - 115	14.529	48	1.1649	0.0021
L7	115 - 110	13.325	48	1.1349	0.0019
L8	110 - 105	12.155	48	1.0975	0.0017
L9	105 - 100	11.029	48	1.0528	0.0015
L10	100 - 90.83	9.953	48	1.0011	0.0013
L11	96 - 89.83	9.133	48	0.9555	0.0012
L12	89.83 - 84.83	7.920	48	0.9169	0.0010
L13	84.83 - 79.83	6.988	48	0.8636	0.0009
L14	79.83 - 76	6.113	48	0.8073	0.0008
L15	76 - 71	5.483	48	0.7626	0.0007
L16	71 - 66	4.716	48	0.7024	0.0006
L17	66 - 61	4.012	48	0.6405	0.0005
L18	61 - 56	3.375	48	0.5771	0.0004
L19	56 - 51	2.804	48	0.5125	0.0004
L20	51 - 42.83	2.302	48	0.4469	0.0004
L21	49 - 41.83	2.120	48	0.4204	0.0004
L22	41.83 - 36.83	1.523	48	0.3688	0.0003
L23	36.83 - 35	1.169	48	0.3073	0.0003
L24	35 - 34.75	1.056	48	0.2850	0.0003
L25	34.75 - 29.75	1.041	48	0.2830	0.0003
L26	29.75 - 29	0.765	48	0.2436	0.0002
L27	29 - 24	0.727	48	0.2377	0.0002
L28	24 - 19	0.499	48	0.1974	0.0002
L29	19 - 14	0.314	48	0.1571	0.0002
L30	14 - 9	0.171	48	0.1160	0.0001
L31	9 - 4	0.071	48	0.0750	0.0001
L32	4 - 0	0.014	48	0.0333	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
145.00	BPA7496-180-14 w/ Mount Pipe	48	20.812	1.2121	0.0035	137207
143.00	10' x 1.5" Dia Dipole	48	20.304	1.2119	0.0034	137207
142.50	CCISeismic Tower Section 1 - 1	48	20.177	1.2118	0.0034	137207
140.00	CCISeismic miscel Step Bolts From 5 to 145 (135ft to145ft)	48	19.543	1.2113	0.0033	137207
139.00	CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (135ft to143ft)	48	19.289	1.2110	0.0033	114642
137.50	CCISeismic Tower Section 2 - 1	48	18.909	1.2103	0.0032	90212
135.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	48	18.276	1.2086	0.0031	60524
132.50	CCISeismic Tower Section 3 - 1	48	17.644	1.2060	0.0030	39989
130.00	QD6616-7	48	17.013	1.2018	0.0029	27380
127.50	CCISeismic Tower Section 4 - 1	48	16.386	1.1957	0.0028	19702
122.50	CCISeismic Tower Section 5 - 1	48	15.143	1.1772	0.0025	12500
120.00	CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (115ft to125ft)	48	14.529	1.1649	0.0024	10710
118.00	FFVV-65B-R2 w/ Mount Pipe	48	14.044	1.1538	0.0023	9627
117.50	CCISeismic Tower Section 6 - 1	48	13.923	1.1508	0.0023	9391

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
116.50	CCISeismic CU12PSM9P6XXX_6AWG From 12 to 118 (115ft to118ft)	48	13.683	1.1447	0.0023	8950
112.50	CCISeismic Tower Section 7 - 1	48	12.735	1.1172	0.0021	7517
110.00	NNVV-65B-R4_TIA w/ Mount Pipe	48	12.155	1.0975	0.0020	6877
107.50	CCISeismic Tower Section 8 - 1	48	11.586	1.0759	0.0019	6380
102.50	CCISeismic Tower Section 9 - 1	48	10.484	1.0285	0.0017	5340
100.00	CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (95ft to105ft)	48	9.953	1.0011	0.0016	5348
95.42	CCISeismic Tower Section 10 - 1	48	9.015	0.9506	0.0014	7177
93.00	SC3-W100AC	48	8.536	0.9358	0.0014	7371
92.92	CCISeismic Tower Section 11 - 1	48	8.519	0.9353	0.0014	7359
90.00	CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (85ft to95ft)	48	7.953	0.9182	0.0013	6593
89.00	CCISeismic andrew EW90(ELLIPTICAL) From 0 to 93 (85ft to93ft)	48	7.762	0.9098	0.0013	6269
87.33	CCISeismic Tower Section 12 - 1	48	7.447	0.8926	0.0012	5754
82.33	CCISeismic Tower Section 13 - 1	48	6.543	0.8352	0.0011	5039
80.00	CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (75ft to85ft)	48	6.141	0.8093	0.0010	4993
77.92	CCISeismic Tower Section 14 - 1	48	5.793	0.7852	0.0009	4926
73.50	CCISeismic Tower Section 15 - 1	48	5.091	0.7327	0.0008	4758
70.00	CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (65ft to75ft)	48	4.570	0.6902	0.0007	4666
68.50	CCISeismic Tower Section 16 - 1	48	4.356	0.6716	0.0007	4631
63.50	CCISeismic Tower Section 17 - 1	48	3.685	0.6090	0.0005	4514
60.00	CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (55ft to65ft)	48	3.255	0.5642	0.0005	4472
58.50	CCISeismic Tower Section 18 - 1	48	3.081	0.5448	0.0004	4464
53.50	CCISeismic Tower Section 19 - 1	48	2.544	0.4803	0.0004	4369
50.00	CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (45ft to55ft)	48	2.210	0.4331	0.0004	5496
46.92	CCISeismic Tower Section 20 - 1	48	1.938	0.4016	0.0003	7027
45.42	CCISeismic Tower Section 21 - 1	48	1.811	0.3922	0.0003	6916
40.00	CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (35ft to45ft)	48	1.387	0.3497	0.0003	5138
39.33	CCISeismic Tower Section 22 - 1	48	1.339	0.3414	0.0003	5008
35.92	CCISeismic Tower Section 23 - 1	48	1.111	0.2949	0.0003	5267
34.88	CCISeismic Tower Section 24 - 1	48	1.048	0.2840	0.0003	5697
32.25	CCISeismic Tower Section 25 - 1	48	0.898	0.2635	0.0002	6870
30.00	CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (25ft to35ft)	48	0.778	0.2456	0.0002	7216
29.38	CCISeismic Tower Section 26 - 1	48	0.746	0.2406	0.0002	7198
26.50	CCISeismic Tower Section 27 - 1	48	0.608	0.2177	0.0002	7135
21.50	CCISeismic Tower Section 28 - 1	48	0.401	0.1773	0.0002	7086
20.00	CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (15ft to25ft)	48	0.347	0.1652	0.0002	7062
16.50	CCISeismic Tower Section 29 - 1	48	0.237	0.1366	0.0001	6974
13.50	CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (12ft to15ft)	48	0.159	0.1119	0.0001	6998
11.50	CCISeismic Tower Section 30 - 1	48	0.115	0.0956	0.0001	7079
10.00	CCISeismic miscel Step Bolts From 5 to 145 (5ft to15ft)	48	0.087	0.0833	0.0001	7044
6.50	CCISeismic Tower Section 31 - 1	48	0.036	0.0542	0.0001	6520
2.50	CCISeismic andrew EW90(ELLIPTICAL) From 0 to 93 (0ft to5ft)	48	0.007	0.0208	0.0000	6736

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
2.00	CCISeismic Tower Section 32 - 1	48	0.005	0.0166	0.0000	6736

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	145 - 140	109.801	20	6.4036	0.0160
L2	140 - 135	103.110	20	6.3995	0.0150
L3	135 - 130	96.429	20	6.3852	0.0139
L4	130 - 125	89.772	20	6.3497	0.0129
L5	125 - 120	83.171	20	6.2744	0.0115
L6	120 - 115	76.673	20	6.1550	0.0103
L7	115 - 110	70.319	20	5.9967	0.0093
L8	110 - 105	64.150	20	5.7992	0.0084
L9	105 - 100	58.207	20	5.5630	0.0073
L10	100 - 90.83	52.530	20	5.2899	0.0064
L11	96 - 89.83	48.204	20	5.0487	0.0057
L12	89.83 - 84.83	41.804	20	4.8447	0.0052
L13	84.83 - 79.83	36.882	20	4.5625	0.0045
L14	79.83 - 76	32.264	20	4.2652	0.0039
L15	76 - 71	28.939	20	4.0288	0.0035
L16	71 - 66	24.889	20	3.7105	0.0029
L17	66 - 61	21.177	20	3.3830	0.0024
L18	61 - 56	17.811	20	3.0479	0.0020
L19	56 - 51	14.799	20	2.7064	0.0020
L20	51 - 42.83	12.147	20	2.3596	0.0019
L21	49 - 41.83	11.188	20	2.2195	0.0018
L22	41.83 - 36.83	8.038	20	1.9471	0.0017
L23	36.83 - 35	6.169	20	1.6222	0.0015
L24	35 - 34.75	5.570	20	1.5043	0.0014
L25	34.75 - 29.75	5.491	20	1.4939	0.0014
L26	29.75 - 29	4.036	20	1.2855	0.0012
L27	29 - 24	3.837	20	1.2543	0.0012
L28	24 - 19	2.634	20	1.0417	0.0010
L29	19 - 14	1.655	20	0.8289	0.0008
L30	14 - 9	0.900	20	0.6122	0.0006
L31	9 - 4	0.373	20	0.3957	0.0004
L32	4 - 0	0.074	20	0.1756	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
145.00	BPA7496-180-14 w/ Mount Pipe	20	109.801	6.4036	0.0184	29306
143.00	10' x 1.5" Dia Dipole	20	107.124	6.4026	0.0180	29306
142.50	CCISeismic Tower Section 1 - 1	20	106.455	6.4022	0.0179	29306
140.00	CCISeismic miscl Step Bolts From 5 to 145 (135ft to 145ft)	20	103.110	6.3995	0.0174	29306
139.00	CCISeismic (3) rfs celwave FLC 114-50J(1-1/4) From 12 to 143 (135ft to 143ft)	20	101.773	6.3978	0.0172	24155
137.50	CCISeismic Tower Section 2 - 1	20	99.768	6.3942	0.0169	18598
135.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	20	96.429	6.3852	0.0164	12105
132.50	CCISeismic Tower Section 3 - 1	20	93.096	6.3713	0.0159	7865
130.00	QD6616-7	20	89.772	6.3497	0.0155	5341
127.50	CCISeismic Tower Section 4 - 1	20	86.462	6.3177	0.0148	3851
122.50	CCISeismic Tower Section 5 - 1	20	79.906	6.2199	0.0134	2433
120.00	CCISeismic (3) rfs celwave FLC	20	76.673	6.1550	0.0128	2082

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
	114-50J(1-1/4) From 12 to 143 (115ft to125ft)					
118.00	FFVV-65B-R2 w/ Mount Pipe	20	74.111	6.0962	0.0124	1869
117.50	CCISeismic Tower Section 6 - 1	20	73.475	6.0806	0.0122	1823
116.50	CCISeismic	20	72.207	6.0482	0.0120	1736
	CU12PSM9P6XXX_6AWG From 12 to 118 (115ft to118ft)					
112.50	CCISeismic Tower Section 7 - 1	20	67.208	5.9031	0.0113	1457
110.00	NNVV-65B-R4_TIA w/ Mount Pipe	20	64.150	5.7992	0.0108	1331
107.50	CCISeismic Tower Section 8 - 1	20	61.148	5.6849	0.0102	1234
102.50	CCISeismic Tower Section 9 - 1	20	55.332	5.4343	0.0090	1031
100.00	CCISeismic (3) rfs celwave FLC	20	52.530	5.2899	0.0085	1031
	114-50J(1-1/4) From 12 to 143 (95ft to105ft)					
95.42	CCISeismic Tower Section 10 - 1	20	47.584	5.0230	0.0075	1382
93.00	SC3-W100AC	20	45.052	4.9444	0.0073	1418
92.92	CCISeismic Tower Section 11 - 1	20	44.964	4.9421	0.0073	1416
90.00	CCISeismic (3) rfs celwave FLC	20	41.976	4.8515	0.0070	1267
	114-50J(1-1/4) From 12 to 143 (85ft to95ft)					
89.00	CCISeismic andrew EW90(ELLIPTICAL) From 0 to 93 (85ft to93ft)	20	40.968	4.8071	0.0068	1204
87.33	CCISeismic Tower Section 12 - 1	20	39.309	4.7162	0.0065	1105
82.33	CCISeismic Tower Section 13 - 1	20	34.534	4.4128	0.0056	964
80.00	CCISeismic (3) rfs celwave FLC	20	32.415	4.2754	0.0052	954
	114-50J(1-1/4) From 12 to 143 (75ft to85ft)					
77.92	CCISeismic Tower Section 14 - 1	20	30.578	4.1484	0.0049	941
73.50	CCISeismic Tower Section 15 - 1	20	26.873	3.8707	0.0042	908
70.00	CCISeismic (3) rfs celwave FLC	20	24.120	3.6457	0.0037	889
	114-50J(1-1/4) From 12 to 143 (65ft to75ft)					
68.50	CCISeismic Tower Section 16 - 1	20	22.990	3.5478	0.0035	882
63.50	CCISeismic Tower Section 17 - 1	20	19.450	3.2165	0.0028	859
60.00	CCISeismic (3) rfs celwave FLC	20	17.180	2.9798	0.0024	850
	114-50J(1-1/4) From 12 to 143 (55ft to65ft)					
58.50	CCISeismic Tower Section 18 - 1	20	16.260	2.8772	0.0023	849
53.50	CCISeismic Tower Section 19 - 1	20	13.426	2.5364	0.0019	830
50.00	CCISeismic (3) rfs celwave FLC	20	11.661	2.2864	0.0019	1043
	114-50J(1-1/4) From 12 to 143 (45ft to55ft)					
46.92	CCISeismic Tower Section 20 - 1	20	10.225	2.1200	0.0018	1333
45.42	CCISeismic Tower Section 21 - 1	20	9.554	2.0704	0.0018	1312
40.00	CCISeismic (3) rfs celwave FLC	20	7.317	1.8459	0.0016	974
	114-50J(1-1/4) From 12 to 143 (35ft to45ft)					
39.33	CCISeismic Tower Section 22 - 1	20	7.063	1.8022	0.0016	950
35.92	CCISeismic Tower Section 23 - 1	20	5.864	1.5563	0.0014	999
34.88	CCISeismic Tower Section 24 - 1	20	5.530	1.4989	0.0014	1080
32.25	CCISeismic Tower Section 25 - 1	20	4.737	1.3906	0.0013	1302
30.00	CCISeismic (3) rfs celwave FLC	20	4.104	1.2959	0.0012	1368
	114-50J(1-1/4) From 12 to 143 (25ft to35ft)					
29.38	CCISeismic Tower Section 26 - 1	20	3.936	1.2699	0.0012	1364
26.50	CCISeismic Tower Section 27 - 1	20	3.208	1.1487	0.0011	1352
21.50	CCISeismic Tower Section 28 - 1	20	2.117	0.9355	0.0009	1343
20.00	CCISeismic (3) rfs celwave FLC	20	1.833	0.8716	0.0008	1338
	114-50J(1-1/4) From 12 to 143 (15ft to25ft)					
16.50	CCISeismic Tower Section 29 - 1	20	1.249	0.7208	0.0007	1322
13.50	CCISeismic (3) rfs celwave FLC	20	0.838	0.5905	0.0006	1326
	114-50J(1-1/4) From 12 to 143 (12ft to15ft)					
11.50	CCISeismic Tower Section 30 - 1	20	0.609	0.5041	0.0005	1342
10.00	CCISeismic miscel Step Bolts From 5 to 145 (5ft to15ft)	20	0.461	0.4392	0.0004	1335

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
6.50	CCISeismic Tower Section 31 - 1	20	0.192	0.2859	0.0003	1236
2.50	CCISeismic andrew EW90(ELLIPTICAL) From 0 to 93 (0ft to5ft)	20	0.034	0.1097	0.0001	1277
2.00	CCISeismic Tower Section 32 - 1	20	0.025	0.0877	0.0001	1277

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L1	145 - 140 (1)	TP24.521x23.61x0.281	5.00	0.00	0.0	21.932 9	-1.45	1283.07	0.001
L2	140 - 135 (2)	TP25.432x24.521x0.281	5.00	0.00	0.0	22.757 2	-1.88	1331.29	0.001
L3	135 - 130 (3)	TP26.3431x25.432x0.281	5.00	0.00	0.0	23.581 5	-5.95	1379.52	0.004
L4	130 - 125 (4)	TP27.2541x26.3431x0.28 1	5.00	0.00	0.0	24.405 8	-10.34	1427.74	0.007
L5	125 - 120 (5)	TP28.1651x27.2541x0.28 1	5.00	0.00	0.0	25.230 1	-11.00	1475.96	0.007
L6	120 - 115 (6)	TP29.0761x28.1651x0.28 1	5.00	0.00	0.0	26.054 4	-14.21	1524.18	0.009
L7	115 - 110 (7)	TP29.9871x29.0761x0.28 1	5.00	0.00	0.0	26.878 7	-14.96	1572.40	0.010
L8	110 - 105 (8)	TP30.8982x29.9871x0.28 1	5.00	0.00	0.0	27.703 0	-19.39	1620.63	0.012
L9	105 - 100 (9)	TP31.8092x30.8982x0.28 1	5.00	0.00	0.0	28.527 3	-20.25	1668.85	0.012
L10	100 - 90.83 (10)	TP33.48x31.8092x0.281	9.17	0.00	0.0	29.186 8	-20.97	1707.43	0.012
L11	90.83 - 89.83 (11)	TP33.0974x31.976x0.375	6.17	0.00	0.0	39.512 3	-22.99	2311.47	0.010
L12	89.83 - 84.83 (12)	TP34.0062x33.0974x0.37 5	5.00	0.00	0.0	40.609 7	-24.13	2375.67	0.010
L13	84.83 - 79.83 (13)	TP34.915x34.0062x0.375	5.00	0.00	0.0	41.707 1	-25.17	2439.86	0.010
L14	79.83 - 76 (14)	TP35.6111x34.915x0.375	3.83	0.00	0.0	42.547 6	-26.08	2489.04	0.010
L15	76 - 71 (15)	TP36.5199x35.6111x0.37 5	5.00	0.00	0.0	43.645 0	-27.31	2553.23	0.011
L16	71 - 66 (16)	TP37.4287x36.5199x0.37 5	5.00	0.00	0.0	44.742 3	-28.57	2617.43	0.011
L17	66 - 61 (17)	TP38.3375x37.4287x0.37 5	5.00	0.00	0.0	45.839 7	-29.86	2681.62	0.011
L18	61 - 56 (18)	TP39.2463x38.3375x0.37 5	5.00	0.00	0.0	46.937 1	-31.18	2745.82	0.011
L19	56 - 51 (19)	TP40.155x39.2463x0.375	5.00	0.00	0.0	48.034 4	-32.55	2810.01	0.012
L20	51 - 42.83 (20)	TP41.64x40.155x0.375	8.17	0.00	0.0	48.473 4	-33.11	2835.69	0.012
L21	42.83 - 41.83 (21)	TP41.074x39.7686x0.437 5	7.17	0.00	0.0	57.246 7	-36.44	3348.93	0.011
L22	41.83 - 36.83 (22)	TP41.9844x41.074x0.437 5	5.00	0.00	0.0	58.529 1	-38.04	3423.95	0.011
L23	36.83 - 35 (23)	TP42.3175x41.9844x0.43 75	1.83	0.00	0.0	58.998 5	-38.62	3451.41	0.011
L24	35 - 34.75 (24)	TP42.3631x42.3175x0.7	0.25	0.00	0.0	93.908 5	-38.77	5493.65	0.007
L25	34.75 - 29.75	TP43.2734x42.3631x0.7	5.00	0.00	0.0	95.960	-40.97	5613.69	0.007

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L26	29.75 - 29 (25)	TP43.41x43.2734x0.7	0.75	0.00	0.0	5 96.268	-41.31	5631.69	0.007
L27	29 - 24 (27) (26)	TP44.3203x43.41x0.6875	5.00	0.00	0.0	3 96.592	-43.56	5650.64	0.008
L28	24 - 19 (28)	TP45.2307x44.3203x0.6875	5.00	0.00	0.0	1 98.607	-45.86	5768.54	0.008
L29	19 - 14 (29)	TP46.141x45.2307x0.675	5.00	0.00	0.0	4 98.820	-48.19	5780.99	0.008
L30	14 - 9 (30)	TP47.0514x46.141x0.675	5.00	0.00	0.0	4 100.79	-50.43	5896.74	0.009
L31	9 - 4 (31)	TP47.9617x47.0514x0.6625	5.00	0.00	0.0	90 100.90	-52.62	5902.71	0.009
L32	4 - 0 (32)	TP48.69x47.9617x0.6625	4.00	0.00	0.0	10 102.45 50	-54.39	5993.60	0.009

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M _{uy} kip-ft	φM _{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	145 - 140 (1)	TP24.521x23.61x0.281	11.67	783.52	0.015	0.00	783.52	0.000
L2	140 - 135 (2)	TP25.432x24.521x0.281	26.35	833.96	0.032	0.00	833.96	0.000
L3	135 - 130 (3)	TP26.3431x25.432x0.281	73.97	885.17	0.084	0.00	885.17	0.000
L4	130 - 125 (4)	TP27.2541x26.3431x0.281	159.35	937.07	0.170	0.00	937.07	0.000
L5	125 - 120 (5)	TP28.1651x27.2541x0.281	249.05	989.57	0.252	0.00	989.57	0.000
L6	120 - 115 (6)	TP29.0761x28.1651x0.281	352.51	1042.61	0.338	0.00	1042.61	0.000
L7	115 - 110 (7)	TP29.9871x29.0761x0.281	466.45	1096.10	0.426	0.00	1096.10	0.000
L8	110 - 105 (8)	TP30.8982x29.9871x0.281	604.16	1149.97	0.525	0.00	1149.97	0.000
L9	105 - 100 (9)	TP31.8092x30.8982x0.281	744.65	1204.13	0.618	0.00	1204.13	0.000
L10	100 - 90.83 (10)	TP33.48x31.8092x0.281	859.48	1247.62	0.689	0.00	1247.62	0.000
L11	90.83 - 89.83 (11)	TP33.0974x31.976x0.375	1042.71	1898.83	0.549	0.00	1898.83	0.000
L12	89.83 - 84.83 (12)	TP34.0062x33.0974x0.375	1196.58	1988.70	0.602	0.00	1988.70	0.000
L13	84.83 - 79.83 (13)	TP34.915x34.0062x0.375	1357.35	2079.58	0.653	0.00	2079.58	0.000
L14	79.83 - 76 (14)	TP35.6111x34.915x0.375	1484.11	2149.83	0.690	0.00	2149.83	0.000
L15	76 - 71 (15)	TP36.5199x35.6111x0.375	1653.53	2242.32	0.737	0.00	2242.32	0.000
L16	71 - 66 (16)	TP37.4287x36.5199x0.375	1827.33	2335.60	0.782	0.00	2335.60	0.000
L17	66 - 61 (17)	TP38.3375x37.4287x0.375	2006.30	2429.60	0.826	0.00	2429.60	0.000
L18	61 - 56 (18)	TP39.2463x38.3375x0.375	2191.17	2524.25	0.868	0.00	2524.25	0.000
L19	56 - 51 (19)	TP40.155x39.2463x0.375	2381.79	2619.45	0.909	0.00	2619.45	0.000
L20	51 - 42.83 (20)	TP41.64x40.155x0.375	2459.63	2657.68	0.925	0.00	2657.68	0.000
L21	42.83 - 41.83 (21)	TP41.074x39.7686x0.4375	2746.84	3348.88	0.820	0.00	3348.88	0.000
L22	41.83 - 36.83 (22)	TP41.9844x41.074x0.4375	2954.24	3474.38	0.850	0.00	3474.38	0.000
L23	36.83 - 35 (23)	TP42.3175x41.9844x0.4375	3031.43	3520.56	0.861	0.00	3520.56	0.000
L24	35 - 34.75 (24)	TP42.3631x42.3175x0.7	3042.03	5824.00	0.522	0.00	5824.00	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L25	34.75 - 29.75 (25)	TP43.2734x42.3631x0.7	3256.94	6083.44	0.535	0.00	6083.44	0.000
L26	29.75 - 29 (26)	TP43.41x43.2734x0.7	3289.68	6122.85	0.537	0.00	6122.85	0.000
L27	29 - 24 (27)	TP44.3203x43.41x0.6875	3511.11	6280.10	0.559	0.00	6280.10	0.000
L28	24 - 19 (28)	TP45.2307x44.3203x0.6875	3738.15	6546.97	0.571	0.00	6546.97	0.000
L29	19 - 14 (29)	TP46.141x45.2307x0.675	3970.78	6700.92	0.593	0.00	6700.92	0.000
L30	14 - 9 (30)	TP47.0514x46.141x0.675	4208.76	6973.95	0.603	0.00	6973.95	0.000
L31	9 - 4 (31)	TP47.9617x47.0514x0.6625	4451.73	7123.77	0.625	0.00	7123.77	0.000
L32	4 - 0 (32)	TP48.69x47.9617x0.6625	4649.55	7346.37	0.633	0.00	7346.37	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	145 - 140 (1)	TP24.521x23.61x0.281	2.67	384.92	0.007	0.00	820.74	0.000
L2	140 - 135 (2)	TP25.432x24.521x0.281	3.21	399.39	0.008	0.00	883.59	0.000
L3	135 - 130 (3)	TP26.3431x25.432x0.281	9.76	413.86	0.024	0.35	948.76	0.000
L4	130 - 125 (4)	TP27.2541x26.3431x0.281	17.59	428.32	0.041	0.99	1016.25	0.001
L5	125 - 120 (5)	TP28.1651x27.2541x0.281	18.32	442.79	0.041	0.95	1086.06	0.001
L6	120 - 115 (6)	TP29.0761x28.1651x0.281	22.42	457.26	0.049	0.76	1158.18	0.001
L7	115 - 110 (7)	TP29.9871x29.0761x0.281	23.14	471.72	0.049	0.76	1232.63	0.001
L8	110 - 105 (8)	TP30.8982x29.9871x0.281	27.75	486.19	0.057	1.39	1309.39	0.001
L9	105 - 100 (9)	TP31.8092x30.8982x0.281	28.44	500.65	0.057	1.39	1388.47	0.001
L10	100 - 90.83 (10)	TP33.48x31.8092x0.281	28.97	512.23	0.057	1.39	1453.41	0.001
L11	90.83 - 89.83 (11)	TP33.0974x31.976x0.375	30.43	693.44	0.044	1.61	1995.97	0.001
L12	89.83 - 84.83 (12)	TP34.0062x33.0974x0.375	31.10	712.70	0.044	1.61	2108.38	0.001
L13	84.83 - 79.83 (13)	TP34.915x34.0062x0.375	32.77	731.96	0.045	1.08	2223.87	0.000
L14	79.83 - 76 (14)	TP35.6111x34.915x0.375	33.46	746.71	0.045	0.89	2314.41	0.000
L15	76 - 71 (15)	TP36.5199x35.6111x0.375	34.34	765.97	0.045	0.61	2435.33	0.000
L16	71 - 66 (16)	TP37.4287x36.5199x0.375	35.21	785.23	0.045	0.34	2559.33	0.000
L17	66 - 61 (17)	TP38.3375x37.4287x0.375	36.41	804.49	0.045	0.05	2686.42	0.000
L18	61 - 56 (18)	TP39.2463x38.3375x0.375	37.58	823.75	0.046	0.38	2816.57	0.000
L19	56 - 51 (19)	TP40.155x39.2463x0.375	38.71	843.00	0.046	0.71	2949.82	0.000
L20	51 - 42.83 (20)	TP41.64x40.155x0.375	39.16	850.71	0.046	0.84	3003.97	0.000
L21	42.83 - 41.83 (21)	TP41.074x39.7686x0.4375	40.97	1004.68	0.041	1.32	3591.23	0.000
L22	41.83 - 36.83 (22)	TP41.9844x41.074x0.4375	42.03	1027.19	0.041	1.64	3753.94	0.000
L23	36.83 - 35 (23)	TP42.3175x41.9844x0.4375	42.39	1035.42	0.041	1.75	3814.39	0.000
L24	35 - 34.75 (24)	TP42.3631x42.3175x0.7	42.41	1648.09	0.026	1.77	6039.95	0.000
L25	34.75 - 29.75 (25)	TP43.2734x42.3631x0.7	43.57	1684.11	0.026	2.09	6306.78	0.000
L26	29.75 - 29	TP43.41x43.2734x0.7	43.74	1689.51	0.026	2.13	6347.30	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	(26)							
L27	29 - 24 (27)	TP44.3203x43.41x0.6875	44.87	1695.19	0.026	2.45	6506.27	0.000
L28	24 - 19 (28)	TP45.2307x44.3203x0.6875	45.99	1730.56	0.027	2.77	6780.59	0.000
L29	19 - 14 (29)	TP46.141x45.2307x0.675	47.10	1734.30	0.027	3.10	6936.02	0.000
L30	14 - 9 (30)	TP47.0514x46.141x0.675	48.13	1769.02	0.027	3.25	7216.56	0.000
L31	9 - 4 (31)	TP47.9617x47.0514x0.6625	49.10	1770.81	0.028	3.25	7367.61	0.000
L32	4 - 0 (32)	TP48.69x47.9617x0.6625	49.86	1798.08	0.028	3.24	7596.24	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	145 - 140 (1)	0.001	0.015	0.000	0.007	0.000	0.016	1.000	4.8.2
L2	140 - 135 (2)	0.001	0.032	0.000	0.008	0.000	0.033	1.000	4.8.2
L3	135 - 130 (3)	0.004	0.084	0.000	0.024	0.000	0.088	1.000	4.8.2
L4	130 - 125 (4)	0.007	0.170	0.000	0.041	0.001	0.179	1.000	4.8.2
L5	125 - 120 (5)	0.007	0.252	0.000	0.041	0.001	0.261	1.000	4.8.2
L6	120 - 115 (6)	0.009	0.338	0.000	0.049	0.001	0.350	1.000	4.8.2
L7	115 - 110 (7)	0.010	0.426	0.000	0.049	0.001	0.438	1.000	4.8.2
L8	110 - 105 (8)	0.012	0.525	0.000	0.057	0.001	0.541	1.000	4.8.2
L9	105 - 100 (9)	0.012	0.618	0.000	0.057	0.001	0.634	1.000	4.8.2
L10	100 - 90.83 (10)	0.012	0.689	0.000	0.057	0.001	0.704	1.000	4.8.2
L11	90.83 - 89.83 (11)	0.010	0.549	0.000	0.044	0.001	0.561	1.000	4.8.2
L12	89.83 - 84.83 (12)	0.010	0.602	0.000	0.044	0.001	0.614	1.000	4.8.2
L13	84.83 - 79.83 (13)	0.010	0.653	0.000	0.045	0.000	0.665	1.000	4.8.2
L14	79.83 - 76 (14)	0.010	0.690	0.000	0.045	0.000	0.703	1.000	4.8.2
L15	76 - 71 (15)	0.011	0.737	0.000	0.045	0.000	0.750	1.000	4.8.2
L16	71 - 66 (16)	0.011	0.782	0.000	0.045	0.000	0.795	1.000	4.8.2
L17	66 - 61 (17)	0.011	0.826	0.000	0.045	0.000	0.839	1.000	4.8.2
L18	61 - 56 (18)	0.011	0.868	0.000	0.046	0.000	0.881	1.000	4.8.2
L19	56 - 51 (19)	0.012	0.909	0.000	0.046	0.000	0.923	1.000	4.8.2
L20	51 - 42.83 (20)	0.012	0.925	0.000	0.046	0.000	0.939	1.000	4.8.2
L21	42.83 - 41.83 (21)	0.011	0.820	0.000	0.041	0.000	0.833	1.000	4.8.2
L22	41.83 - 36.83 (22)	0.011	0.850	0.000	0.041	0.000	0.863	1.000	4.8.2
L23	36.83 - 35 (23)	0.011	0.861	0.000	0.041	0.000	0.874	1.000	4.8.2
L24	35 - 34.75 (24)	0.007	0.522	0.000	0.026	0.000	0.530	1.000	4.8.2
L25	34.75 - 29.75 (25)	0.007	0.535	0.000	0.026	0.000	0.543	1.000	4.8.2
L26	29.75 - 29 (26)	0.007	0.537	0.000	0.026	0.000	0.545	1.000	4.8.2
L27	29 - 24 (27)	0.008	0.559	0.000	0.026	0.000	0.568	1.000	4.8.2
L28	24 - 19 (28)	0.008	0.571	0.000	0.027	0.000	0.580	1.000	4.8.2
L29	19 - 14 (29)	0.008	0.593	0.000	0.027	0.000	0.602	1.000	4.8.2
L30	14 - 9 (30)	0.009	0.603	0.000	0.027	0.000	0.613	1.000	4.8.2
L31	9 - 4 (31)	0.009	0.625	0.000	0.028	0.000	0.635	1.000	4.8.2
L32	4 - 0 (32)	0.009	0.633	0.000	0.028	0.000	0.643	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	dP_{allow} K	% Capacity	Pass Fail	
L1	145 - 140	Pole	TP24.521x23.61x0.281	1	-1.45	1283.07	1.6	Pass	
L2	140 - 135	Pole	TP25.432x24.521x0.281	2	-1.88	1331.29	3.3	Pass	
L3	135 - 130	Pole	TP26.3431x25.432x0.281	3	-5.95	1379.52	8.8	Pass	
L4	130 - 125	Pole	TP27.2541x26.3431x0.281	4	-10.34	1427.74	17.9	Pass	
L5	125 - 120	Pole	TP28.1651x27.2541x0.281	5	-11.00	1475.96	26.1	Pass	
L6	120 - 115	Pole	TP29.0761x28.1651x0.281	6	-14.21	1524.18	35.0	Pass	
L7	115 - 110	Pole	TP29.9871x29.0761x0.281	7	-14.96	1572.40	43.8	Pass	
L8	110 - 105	Pole	TP30.8982x29.9871x0.281	8	-19.39	1620.63	54.1	Pass	
L9	105 - 100	Pole	TP31.8092x30.8982x0.281	9	-20.25	1668.85	63.4	Pass	
L10	100 - 90.83	Pole	TP33.48x31.8092x0.281	10	-20.97	1707.43	70.4	Pass	
L11	90.83 - 89.83	Pole	TP33.0974x31.976x0.375	11	-22.99	2311.47	56.1	Pass	
L12	89.83 - 84.83	Pole	TP34.0062x33.0974x0.375	12	-24.13	2375.67	61.4	Pass	
L13	84.83 - 79.83	Pole	TP34.915x34.0062x0.375	13	-25.17	2439.86	66.5	Pass	
L14	79.83 - 76	Pole	TP35.6111x34.915x0.375	14	-26.08	2489.04	70.3	Pass	
L15	76 - 71	Pole	TP36.5199x35.6111x0.375	15	-27.31	2553.23	75.0	Pass	
L16	71 - 66	Pole	TP37.4287x36.5199x0.375	16	-28.57	2617.43	79.5	Pass	
L17	66 - 61	Pole	TP38.3375x37.4287x0.375	17	-29.86	2681.62	83.9	Pass	
L18	61 - 56	Pole	TP39.2463x38.3375x0.375	18	-31.18	2745.82	88.1	Pass	
L19	56 - 51	Pole	TP40.155x39.2463x0.375	19	-32.55	2810.01	92.3	Pass	
L20	51 - 42.83	Pole	TP41.64x40.155x0.375	20	-33.11	2835.69	93.9	Pass	
L21	42.83 - 41.83	Pole	TP41.074x39.7686x0.4375	21	-36.44	3348.93	83.3	Pass	
L22	41.83 - 36.83	Pole	TP41.9844x41.074x0.4375	22	-38.04	3423.95	86.3	Pass	
L23	36.83 - 35	Pole	TP42.3175x41.9844x0.4375	23	-38.62	3451.41	87.4	Pass	
L24	35 - 34.75	Pole	TP42.3631x42.3175x0.7	24	-38.77	5493.65	53.0	Pass	
L25	34.75 - 29.75	Pole	TP43.2734x42.3631x0.7	25	-40.97	5613.69	54.3	Pass	
L26	29.75 - 29	Pole	TP43.41x43.2734x0.7	26	-41.31	5631.69	54.5	Pass	
L27	29 - 24	Pole	TP44.3203x43.41x0.6875	27	-43.56	5650.64	56.8	Pass	
L28	24 - 19	Pole	TP45.2307x44.3203x0.6875	28	-45.86	5768.54	58.0	Pass	
L29	19 - 14	Pole	TP46.141x45.2307x0.675	29	-48.19	5780.99	60.2	Pass	
L30	14 - 9	Pole	TP47.0514x46.141x0.675	30	-50.43	5896.74	61.3	Pass	
L31	9 - 4	Pole	TP47.9617x47.0514x0.6625	31	-52.62	5902.71	63.5	Pass	
L32	4 - 0	Pole	TP48.69x47.9617x0.6625	32	-54.39	5993.60	64.3	Pass	
							Summary		
							Pole (L20)	93.9	Pass
							RATING =	93.9	Pass

APPENDIX B
ADDITIONAL CALCULATIONS

Reinforcement Calculations

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	145	20	0	12	23.61	27.254083	0.281	Auto	A572-65
2	125	20	0	12	27.25	30.898167	0.281	Auto	A572-65
3	105	14.17	5.17	12	30.90	33.48	0.281	Auto	A572-65
4	96	20	0	12	31.98	35.611135	0.375	Auto	A572-65
5	76	20	0	12	35.61	39.246266	0.375	Auto	A572-65
6	56	13.17	6.17	12	39.25	41.64	0.375	Auto	A572-65
7	49	20	0	12	39.77	43.409965	0.4375	Auto	A572-65
8	29	20	0	12	43.41	47.051369	0.4375	Auto	A572-65
9	9	9	0	12	47.05	48.69	0.4375	Auto	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number																			
						1	2	3	4	5	6	7	8	9	10	11	12							
1	0	35	plate	PL8-1/2x 1-1/4	3																			
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								

Reinforcement Details

	B (in)	H (in)	Gross Area (in ²)	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in ²)	Bolt Hole Size (in)	Reinforcement Material
1	8.5	1.25	10.625	0.625	Welded	n/a	Welded	n/a	18.000	10.625	0.0000	A572-65

Connection Details for Custom Reinforcements

Reinforcement	End	# Bolts	N or X	Bolt Spacing (in)	Edge Dist (in)	Weld Grade (ksi)	Transverse (Horiz.) Weld Type	Horiz. Weld Length (in)	Horiz. Groove Depth (in)	Horiz. Groove Angle (deg)	Horiz. Fillet Size (in)	Vertical Weld Length (in)	Vertical Fillet Size (in)	Rev H Connection Capacity (kip)
PL8-1/2x 1-1/4	Top	-	-	-	-	70	Fillet	8.25	-	-	0.25	48	0.250	-
	Bottom	-	-	-	-	70	CJP Groove	8.5	1.25	45	0.5	-	-	-

TNX Geometry Input

Increment (ft): Export to TNX

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	145 - 140	5		12	23.610	24.521	0.281	A572-65	1.000
2	140 - 135	5		12	24.521	25.432	0.281	A572-65	1.000
3	135 - 130	5		12	25.432	26.343	0.281	A572-65	1.000
4	130 - 125	5	0	12	26.343	27.254	0.281	A572-65	1.000
5	125 - 120	5		12	27.254	28.165	0.281	A572-65	1.000
6	120 - 115	5		12	28.165	29.076	0.281	A572-65	1.000
7	115 - 110	5		12	29.076	29.987	0.281	A572-65	1.000
8	110 - 105	5	0	12	29.987	30.898	0.281	A572-65	1.000
9	105 - 100	5		12	30.898	31.809	0.281	A572-65	1.000
10	100 - 96	9.17	5.17	12	31.809	33.480	0.281	A572-65	1.000
11	96 - 89.83	6.17		12	31.976	33.097	0.375	A572-65	1.000
12	89.83 - 84.83	5		12	33.097	34.006	0.375	A572-65	1.000
13	84.83 - 79.83	5		12	34.006	34.915	0.375	A572-65	1.000
14	79.83 - 76	3.83	0	12	34.915	35.611	0.375	A572-65	1.000
15	76 - 71	5		12	35.611	36.520	0.375	A572-65	1.000
16	71 - 66	5		12	36.520	37.429	0.375	A572-65	1.000
17	66 - 61	5		12	37.429	38.337	0.375	A572-65	1.000
18	61 - 56	5	0	12	38.337	39.246	0.375	A572-65	1.000
19	56 - 51	5		12	39.246	40.155	0.375	A572-65	1.000
20	51 - 49	8.17	6.17	12	40.155	41.640	0.375	A572-65	1.000
21	49 - 41.83	7.17		12	39.769	41.074	0.4375	A572-65	1.000
22	41.83 - 36.83	5		12	41.074	41.984	0.4375	A572-65	1.000
23	36.83 - 35	1.83		12	41.984	42.318	0.4375	A572-65	1.000
24	35 - 34.75	0.25		12	42.318	42.363	0.7	A572-65	0.969
25	34.75 - 29.75	5		12	42.363	43.273	0.7	A572-65	0.961
26	29.75 - 29	0.75	0	12	43.273	43.410	0.7	A572-65	0.960
27	29 - 24	5		12	43.410	44.320	0.6875	A572-65	0.970
28	24 - 19	5		12	44.320	45.231	0.6875	A572-65	0.964
29	19 - 14	5		12	45.231	46.141	0.675	A572-65	0.975
30	14 - 9	5	0	12	46.141	47.051	0.675	A572-65	0.968
31	9 - 4	5		12	47.051	47.962	0.6625	A572-65	0.980
32	4 - 0	4		12	47.962	48.690	0.6625	A572-65	0.975

TNX Section Forces

Increment (ft):		TNX Output			
	5	Section Height (ft)	P _u (K)	M _{ux} (kip-ft)	V _u (K)
1		145 - 140	1.45	11.67	2.67
2		140 - 135	1.88	26.35	3.21
3		135 - 130	5.95	73.97	9.76
4		130 - 125	10.34	159.35	17.59
5		125 - 120	11.00	249.05	18.32
6		120 - 115	14.21	352.51	22.42
7		115 - 110	14.96	466.45	23.14
8		110 - 105	19.39	604.16	27.75
9		105 - 100	20.25	744.65	28.44
10		100 - 96	20.97	859.48	28.97
11		96 - 89.83	22.99	1042.71	30.43
12		89.83 - 84.83	24.13	1196.57	31.10
13		84.83 - 79.83	25.17	1357.35	32.77
14		79.83 - 76	26.08	1484.11	33.46
15		76 - 71	27.31	1653.52	34.34
16		71 - 66	28.57	1827.33	35.21
17		66 - 61	29.86	2006.30	36.41
18		61 - 56	31.18	2191.17	37.58
19		56 - 51	32.55	2381.79	38.71
20		51 - 49	33.11	2459.62	39.16
21		49 - 41.83	36.44	2746.84	40.97
22		41.83 - 36.83	38.04	2954.24	42.04
23		36.83 - 35	38.62	3031.43	42.39
24		35 - 34.75	38.77	3042.03	42.41
25		34.75 - 29.75	40.97	3256.94	43.57
26		29.75 - 29	41.31	3289.67	43.74
27		29 - 24	43.56	3511.11	44.87
28		24 - 19	45.86	3738.15	45.99
29		19 - 14	48.19	3970.78	47.10
30		14 - 9	50.43	4208.76	48.13
31		9 - 4	52.62	4451.73	49.10
32		4 - 0	54.39	4649.55	49.86

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in ⁴)			Area (in ²)			% Capacity	
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1
145 - 140	1647	n/a	1647	21.90	n/a	21.90	1.6%	
140 - 135	1840	n/a	1840	22.72	n/a	22.72	3.3%	
135 - 130	2047	n/a	2047	23.55	n/a	23.55	8.8%	
130 - 125	2269	n/a	2269	24.37	n/a	24.37	17.9%	
125 - 120	2507	n/a	2507	25.19	n/a	25.19	26.0%	
120 - 115	2761	n/a	2761	26.02	n/a	26.02	34.9%	
115 - 110	3032	n/a	3032	26.84	n/a	26.84	43.6%	
110 - 105	3319	n/a	3319	27.66	n/a	27.66	53.9%	
105 - 100	3624	n/a	3624	28.49	n/a	28.49	63.2%	
100 - 96	3882	n/a	3882	29.14	n/a	29.14	70.3%	
96 - 89.83	5408	n/a	5408	39.46	n/a	39.46	55.9%	
89.83 - 84.83	5871	n/a	5871	40.55	n/a	40.55	61.2%	
84.83 - 79.83	6360	n/a	6360	41.65	n/a	41.65	66.3%	
79.83 - 76	6752	n/a	6752	42.49	n/a	42.49	70.1%	
76 - 71	7288	n/a	7288	43.58	n/a	43.58	74.8%	
71 - 66	7852	n/a	7852	44.68	n/a	44.68	79.3%	
66 - 61	8444	n/a	8444	45.77	n/a	45.77	83.7%	
61 - 56	9065	n/a	9065	46.87	n/a	46.87	87.9%	
56 - 51	9715	n/a	9715	47.97	n/a	47.97	92.0%	
51 - 49	9984	n/a	9984	48.40	n/a	48.40	93.7%	
49 - 41.83	12083	n/a	12083	57.16	n/a	57.16	83.0%	
41.83 - 36.83	12913	n/a	12913	58.45	n/a	58.45	86.1%	
36.83 - 35	13226	n/a	13226	58.91	n/a	58.91	87.2%	
35 - 34.75	13269	7677	20946	58.98	31.88	90.85	53.5%	76.4%
34.75 - 29.75	14152	7996	22149	60.26	31.88	92.13	55.7%	79.0%
29.75 - 29	14288	8045	22333	60.45	31.88	92.33	56.1%	79.4%
29 - 24	15216	8372	23588	61.73	31.88	93.61	58.3%	81.8%
24 - 19	16182	8706	24888	63.01	31.88	94.89	60.5%	84.2%
19 - 14	17189	9047	26236	64.29	31.88	96.17	62.7%	86.5%
14 - 9	18237	9394	27631	65.57	31.88	97.45	64.9%	88.8%
9 - 4	19326	9747	29074	66.85	31.88	98.73	67.0%	90.9%
4 - 0	20229	10035	30264	67.88	31.88	99.75	68.7%	92.6%

Note: Section capacity checked using 5 degree increments.

Analysis Results

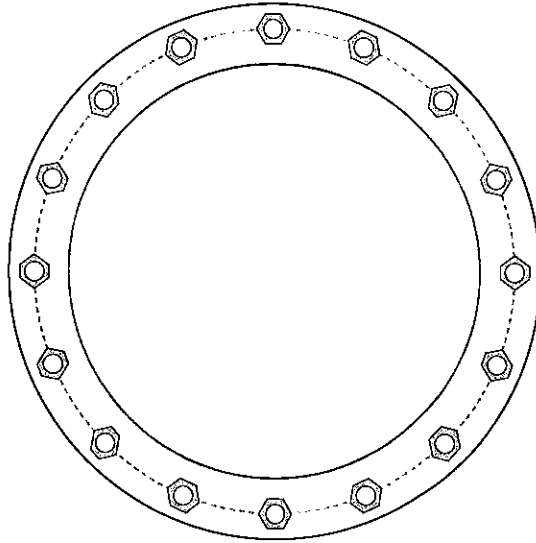
Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
145 - 140	Pole	TP24.521x23.61x0.281	Pole	1.6%	Pass
140 - 135	Pole	TP25.432x24.521x0.281	Pole	3.3%	Pass
135 - 130	Pole	TP26.343x25.432x0.281	Pole	8.8%	Pass
130 - 125	Pole	TP27.254x26.343x0.281	Pole	17.9%	Pass
125 - 120	Pole	TP28.165x27.254x0.281	Pole	26.0%	Pass
120 - 115	Pole	TP29.076x28.165x0.281	Pole	34.9%	Pass
115 - 110	Pole	TP29.987x29.076x0.281	Pole	43.6%	Pass
110 - 105	Pole	TP30.898x29.987x0.281	Pole	53.9%	Pass
105 - 100	Pole	TP31.809x30.898x0.281	Pole	63.2%	Pass
100 - 96	Pole	TP33.48x31.809x0.281	Pole	70.3%	Pass
96 - 89.83	Pole	TP33.097x31.976x0.375	Pole	55.9%	Pass
89.83 - 84.83	Pole	TP34.006x33.097x0.375	Pole	61.2%	Pass
84.83 - 79.83	Pole	TP34.915x34.006x0.375	Pole	66.3%	Pass
79.83 - 76	Pole	TP35.611x34.915x0.375	Pole	70.1%	Pass
76 - 71	Pole	TP36.52x35.611x0.375	Pole	74.8%	Pass
71 - 66	Pole	TP37.429x36.52x0.375	Pole	79.3%	Pass
66 - 61	Pole	TP38.337x37.429x0.375	Pole	83.7%	Pass
61 - 56	Pole	TP39.246x38.337x0.375	Pole	87.9%	Pass
56 - 51	Pole	TP40.155x39.246x0.375	Pole	92.0%	Pass
51 - 49	Pole	TP41.64x40.155x0.375	Pole	93.7%	Pass
49 - 41.83	Pole	TP41.074x39.769x0.4375	Pole	83.0%	Pass
41.83 - 36.83	Pole	TP41.984x41.074x0.4375	Pole	86.1%	Pass
36.83 - 35	Pole	TP42.318x41.984x0.4375	Pole	87.2%	Pass
35 - 34.75	Pole + Reinf.	TP42.363x42.318x0.7	Reinf. 1 Compression	76.4%	Pass
34.75 - 29.75	Pole + Reinf.	TP43.273x42.363x0.7	Reinf. 1 Compression	79.0%	Pass
29.75 - 29	Pole + Reinf.	TP43.41x43.273x0.7	Reinf. 1 Compression	79.4%	Pass
29 - 24	Pole + Reinf.	TP44.32x43.41x0.6875	Reinf. 1 Compression	81.8%	Pass
24 - 19	Pole + Reinf.	TP45.231x44.32x0.6875	Reinf. 1 Compression	84.2%	Pass
19 - 14	Pole + Reinf.	TP46.141x45.231x0.675	Reinf. 1 Compression	86.5%	Pass
14 - 9	Pole + Reinf.	TP47.051x46.141x0.675	Reinf. 1 Compression	88.8%	Pass
9 - 4	Pole + Reinf.	TP47.962x47.051x0.6625	Reinf. 1 Compression	90.9%	Pass
4 - 0	Pole + Reinf.	TP48.69x47.962x0.6625	Reinf. 1 Compression	92.6%	Pass
				Summary	
			Pole	93.7%	Pass
			Reinforcement	92.6%	Pass
			Overall	93.7%	Pass

Monopole Base Plate Connection

Site Info	
Work Order #:	10710.NJER01114A
Site Name:	NJER01114A

Analysis Considerations	
TIA-222 Revision:	H
Grout Considered:	No
l_{ar} (in):	0

Applied Loads	
Moment (kip-ft):	4650
Axial Force (kips):	54
Shear Force (kips):	50



Connection Properties		Analysis Results	
Anchor Rod Data		Anchor Rod Summary	<i>(units of kips, kip-in)</i>
(16) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 56.91" BC		$P_{u,t} = 241.54$	$\phi P_{n,t} = 243.75$ Stress Rating
Base Plate Data		$V_u = 3.12$	$\phi V_n = 149.1$ 98.2%
62.9" OD x 2.75" Plate (A633 Gr. E; $F_y=60$ ksi, $F_u=75$ ksi)		$M_u = n/a$	$\phi M_n = n/a$ Pass
Stiffener Data		Base Plate Summary	
N/A		Max Stress (ksi):	34.36 (Flexural)
Pole Data		Allowable Stress (ksi):	54
48.69" x 0.675" 12-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)		Stress Rating:	63.6% Pass

Drilled Pier Foundation

WO #: 10710.NJER01114A
 Site Name: NJJER01114A

TIA-222 Revision: H
 Tower Type: Monopole

Applied Loads	
Comp.	Uplift
Moment (kip-ft)	4649.55
Axial Force (kips)	54.41
Shear Force (kips)	49.84

Material Properties	
Concrete Strength, f _c	3 ksi
Rebar Strength, F _y	60 ksi
Tie Yield Strength, F _y	40 ksi

Pier Design Data	
Depth	24 ft
Ext. Above Grade	1 ft
Pier Section 1	
<i>From 1' above grade to 24' below grade</i>	
Pier Diameter	6.5 ft
Rebar Quantity	34
Rebar Size	11
Clear Cover to Ties	3 in
Tie Size	4
Tie Spacing	in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results

Soil Lateral Check		
	Compression	Uplift
D ₅₀ (ft from TOC)	5.80	-
Soil Safety Factor	1.55	-
Max Moment (kip-ft)	4860.25	-
Rating	86.0%	-
Soil Vertical Check		
	Compression	Uplift
Skin Friction (kips)	0.00	-
End Bearing (kips)	289.19	-
Weight of Concrete (kips)	114.54	-
Total Capacity (kips)	289.19	-
Axial (kips)	168.95	-
Rating	58.4%	-
Reinforced Concrete Flexure		
	Compression	Uplift
Critical Depth (ft from TOC)	5.55	-
Critical Moment (kip-ft)	4859.61	-
Critical Moment Capacity	7326.50	-
Rating	66.3%	-
Reinforced Concrete Shear		
	Compression	Uplift
Critical Depth (ft from TOC)	0.00	-
Critical Shear (kip)	49.84	-
Critical Shear Capacity	358.76	-
Rating	13.9%	-
Soil Interaction Rating	86.0%	
Structural Foundation Rating	66.3%	

Soil Profile

of Layers: 4

Groundwater Depth: 10

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	V _{soil} (pcf)	V _{concrete} (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	3.33	3.33	125	150	0	28	0.000	0.000	0.00	0.00			Cohesionless
2	3.33	10	6.67	125	150	0	28	0.000	0.000	0.00	0.00			Cohesionless
3	10	10.5	0.5	63	87.6	0	28	0.000	0.000	0.00	0.00			Cohesionless
4	10.5	24	13.5	58	87.6	0	32	0.000	0.000	0.00	0.00	11.62		Cohesionless

Seismic Calculations

Work Order #: **10710.NIJER01114A**

Site Name: **NIJER01114A**

Rev: **0**

Location				
	Decimal Degrees	Deg	Min	Sec
Lat:	41.139692	+	41	8
Long:	-73.257800	-	73	15
				22.89
				28.08

Code and Site Parameters			
Seismic Design Code:	TIA-222-H-1		
Site Soil:	D (Default)	Stiff Soil (Default)	
Risk Category:	III		
<u>USGS Seismic Reference</u>	S _s :	0.2190	g
	S ₁ :	0.0550	g
	T ₀ :	6	s

Seismic Design Category Determination	
Importance Factor, I _e :	1.25
Acceleration-based site coefficient, F _a :	1.6000
Velocity-based site coefficient, F _v :	2.4000
Design spectral response acceleration short period, S _{DS} :	0.2336 g
Design spectral response acceleration 1 s period, S _{D1} :	0.0880 g
T _g :	0.3767
Seismic Design Category Based on S _{DS} :	B
Seismic Design Category Based on S _{D1} :	B
Seismic Design Category Based on S ₁ :	N/A
Controlling Seismic Design Category:	B

Work Order #: 10710.NJER01114A
 Site Name: NJER01114A

Rev: 0

Tower Details

Tower Type:	Tapered Monopole	
Height, h:	145	ft
Effective Seismic Weight, W:	45.30	kips
Amplification Factor, A _s :	1.0	2.7.8.1

Seismic Base Shear

Response Modification Factor, R:	1.5	
Discrete Appurtenance Weight In Top 1/3 of Structure, W _d :	14.02248	kips
W _l :	31.2809103	kips
E:	29000.0	ksi
G:	386.088	in/s ²
Average Moment of Inertia, I _{avg} :	10255.93842	in ⁴
F _a :	0.278183526	hz
Approximate Fundamental Period Monopole, T _a :	3.5947	s
		2.7.7.1.3.3
Seismic Response Coefficient, C _s :	0.1947	2.7.7.1.1
Seismic Response Coefficient Max 1, C _{smax} :	0.0204	2.7.7.1.1
Seismic Response Coefficient Max 2, C _{smax} :	N/A	2.7.7.1.1
Seismic Response Coefficient Min 1, C _{smin} :	0.0300	2.7.7.1.1
Seismic Response Coefficient Min 2, C _{smin} :	N/A	2.7.7.1.1
Controlling Seismic Response Coefficient, C _{sc} :	0.0300	
Seismic Base Shear, V:		kips
		2.7.7.1.1

Vertical Distribution Factors

Period Related Exponent, k:	2.000
Sum of w _l h _l ^k :	364647.35

Section Number	Length	Top Height	Mid Height, h _m	Section Weight w _s	w _s h _m	C ₁	F ₁	F ₂
2 - 1	5.00	140.00	137.50	0.3796	7177.40	0.0197	0.0268	0.0177
4 - 1	5.00	130.00	127.50	0.4076	6626.71	0.0182	0.0247	0.0190
6 - 1	5.00	120.00	117.50	0.4356	6014.69	0.0165	0.0224	0.0204
8 - 1	5.00	110.00	107.50	0.4637	5358.16	0.0147	0.0200	0.0217
10 - 1	9.17	100.00	95.42	0.9124	8306.79	0.0228	0.0310	0.0426
12 - 1	5.00	89.83	87.33	0.6806	5190.75	0.0142	0.0193	0.0318
14 - 1	3.83	79.83	77.92	0.5482	3328.25	0.0091	0.0124	0.0256
16 - 1	5.00	71.00	68.50	0.7508	3523.08	0.0097	0.0131	0.0351
18 - 1	5.00	61.00	58.50	0.7881	2697.13	0.0074	0.0101	0.0368
20 - 1	8.17	51.00	46.92	1.3584	2989.79	0.0082	0.0111	0.0635
22 - 1	5.00	41.83	39.33	0.9835	1521.31	0.0042	0.0057	0.0459
24 - 1	0.25	35.00	34.88	0.0772	93.95	0.0003	0.0004	0.0036
26 - 1	0.75	29.75	29.38	0.2352	202.99	0.0006	0.0008	0.0110
28 - 1	5.00	24.00	21.50	1.5979	738.63	0.0020	0.0028	0.0747
30 - 1	5.00	14.00	11.50	1.6417	217.12	0.0006	0.0008	0.0767
32 - 1	4.00	4.00	2.00	1.3475	5.39	0.0000	0.0000	0.0630
Sum								

Name	h ₁	w ₁	w ₁ h ₁	C ₁	F ₁	F ₂
commscope NNVV-65B-R4 TIA w/ Mount Pipe	110.00	0.1000	1210.00	0.0033	0.0045	0.0047
nokia AAHC w/ Mount Pipe	110.00	0.1200	1452.00	0.0040	0.0054	0.0056
nokia AAHC w/ Mount Pipe	110.00	0.1200	1452.00	0.0040	0.0054	0.0056
(2) alcatel lucent FD-RRH-2x50-800	110.00	0.1000	1210.00	0.0033	0.0045	0.0047
FD-RRH-4X45-1900	110.00	0.0900	1089.00	0.0030	0.0041	0.0042
FD-RRH-4X45-1900	110.00	0.0900	1089.00	0.0030	0.0041	0.0042
Platform Mount	110.00	2.0557	24873.97	0.0682	0.0927	0.0950
commscope FFVV-65B-R2 w/ Mount Pipe	118.00	0.1000	1392.40	0.0038	0.0052	0.0047
fujitsu TA08025-B605	118.00	0.0700	974.68	0.0027	0.0036	0.0033
fujitsu TA08025-B605	118.00	0.0700	974.68	0.0027	0.0036	0.0033
fujitsu TA08025-B604	118.00	0.0600	835.44	0.0023	0.0031	0.0028
raycap RDIDC-9181-PF-48	118.00	0.0200	278.48	0.0008	0.0010	0.0009
(2) mount pipes 8' x 2' STD Pipe	118.00	0.0600	835.44	0.0023	0.0031	0.0028
8' Platform Mount (MC-PK8-DSH)	118.00	1.2405	17272.17	0.0474	0.0644	0.0580
quintel technology QD6616-7	130.00	0.0600	1014.00	0.0028	0.0038	0.0028
quintel technology QD6616-7	130.00	0.0600	1014.00	0.0028	0.0038	0.0028
ccf antennas DMP65R-8U6D	130.00	0.0800	1352.00	0.0037	0.0050	0.0037
ericsson AIR6449 B77D + AIR6419 B77G	130.00	0.1600	2704.00	0.0074	0.0101	0.0075
ericsson AIR6449 B77D + AIR6419 B77G	130.00	0.1600	2704.00	0.0074	0.0101	0.0075
ericsson RRUS 4415 B25	130.00	0.0400	676.00	0.0019	0.0025	0.0019
ericsson RRUS 4449 B5/B12	130.00	0.0700	1183.00	0.0032	0.0044	0.0033
ericsson RRUS 4449 B5/B12	130.00	0.0700	1183.00	0.0032	0.0044	0.0033
(2) misc MM01	130.00	0.0200	338.00	0.0009	0.0013	0.0009
(2) misc MM01	130.00	0.0200	338.00	0.0009	0.0013	0.0009
Connecting Pipe	130.00	0.0300	507.00	0.0014	0.0019	0.0014
VFA14-H10-2120	130.00	1.8795	31763.55	0.0871	0.1184	0.0878
ericsson RRUS 32	130.00	0.0500	845.00	0.0023	0.0031	0.0023
ericsson RRUS 4478 B14	130.00	0.0600	1014.00	0.0028	0.0038	0.0028
ericsson RRUS 4478 B14	130.00	0.0600	1014.00	0.0028	0.0038	0.0028
ericsson RRUS 4426 B66	130.00	0.0500	845.00	0.0023	0.0031	0.0023
ericsson RRUS 4426 B66	130.00	0.0500	845.00	0.0023	0.0031	0.0023
raycap DC6-48-60-18-8F	130.00	0.0200	338.00	0.0009	0.0013	0.0009
raycap DC6-48-60-18-8F	130.00	0.0200	338.00	0.0009	0.0013	0.0009
ericsson ERICSSON AIR 21 B2A B4P w/ Mount Pipe	135.00	0.1100	2004.75	0.0055	0.0075	0.0051
ericsson ERICSSON AIR 21 B2A B4P w/ Mount Pipe	135.00	0.1100	2004.75	0.0055	0.0075	0.0051
ericsson ERICSSON AIR 21 B2A B4P w/ Mount Pipe	135.00	0.1100	2004.75	0.0055	0.0075	0.0051
rfc celwave APXVAARR24 43-U-NA20 TIA w/ Mount Pipe	135.00	0.1300	2462.75	0.0055	0.0075	0.0051
rfc celwave APXVAARR24 43-U-NA20 TIA w/ Mount Pipe	135.00	0.1300	2462.75	0.0055	0.0075	0.0051
ericsson AIR 32 B2a/B66Aa w/ Mount Pipe	135.00	0.1500	2733.75	0.0075	0.0102	0.0070
ericsson AIR 32 B2a/B66Aa w/ Mount Pipe	135.00	0.1500	2733.75	0.0075	0.0102	0.0070
ericsson AIR 32 B2a/B66Aa w/ Mount Pipe	135.00	0.1500	2733.75	0.0075	0.0102	0.0070
ericsson AIR 6449 B41 w/ Mount Pipe	135.00	0.1300	2369.25	0.0065	0.0088	0.0061
ericsson AIR 6449 B41 w/ Mount Pipe	135.00	0.1300	2369.25	0.0065	0.0088	0.0061
ericsson AIR 6449 B41 w/ Mount Pipe	135.00	0.1300	2369.25	0.0065	0.0088	0.0061
ericsson RRUS 4415 B25	135.00	0.0400	729.00	0.0020	0.0027	0.0019
ericsson RRUS 4415 B25	135.00	0.0400	729.00	0.0020	0.0027	0.0019
ericsson RRUS 4415 B25	135.00	0.0400	729.00	0.0020	0.0027	0.0019
ericsson RADIO 4449 B71+B85	135.00	0.0700	1275.75	0.0035	0.0048	0.0033
ericsson RADIO 4449 B71+B85	135.00	0.0700	1275.75	0.0035	0.0048	0.0033
ericsson RADIO 4449 B71+B85	135.00	0.0700	1275.75	0.0035	0.0048	0.0033

rfs celwave ATMAA1412D-1A20	135.00	0.0100	182.25	0.0005	0.0007	0.0005
rfs celwave ATMAA1412D-1A20	135.00	0.0100	182.25	0.0005	0.0007	0.0005
rfs celwave ATMAA1412D-1A20	135.00	0.0100	182.25	0.0005	0.0007	0.0005
Stabilizer Kit, Perfect10-P/N: VSK-M	135.00	0.5632	10264.68	0.0281	0.0383	0.0263
10' x 1.5" Dia Dipole	143.00	0.0200	408.98	0.0011	0.0015	0.0009
misc 12' x 3" Dia Omni	143.00	0.0400	817.96	0.0022	0.0030	0.0019
pipe mounts 2" STD Pipe (2.375 OD)x6'-0"	143.00	0.0200	408.98	0.0011	0.0015	0.0009
pipe mounts 2" STD Pipe (2.375 OD)x6'-0"	143.00	0.0200	408.98	0.0011	0.0015	0.0009
rfl antennas BPA7496-180-14 w/ Mount Pipe	145.00	0.1000	2102.50	0.0058	0.0078	0.0047
Dish Mount	93.00	0.0800	691.92	0.0019	0.0026	0.0037

Sum

Name	Start Height	End Height	h _c	w _c	w/h _c	C _v	F _v	F _h
(3) rfs celwave FLC 114-50(1-1/4) From 12 to 143	125.00	135.00	130.00	0.0210	354.90	0.0010	0.0013	0.0010
(3) rfs celwave FLC 114-50(1-1/4) From 12 to 143	105.00	115.00	110.00	0.0210	254.10	0.0007	0.0009	0.0010
(3) rfs celwave FLC 114-50(1-1/4) From 12 to 143	85.00	95.00	90.00	0.0210	170.10	0.0005	0.0006	0.0010
(3) rfs celwave FLC 114-50(1-1/4) From 12 to 143	65.00	75.00	70.00	0.0210	102.90	0.0003	0.0004	0.0010
(3) rfs celwave FLC 114-50(1-1/4) From 12 to 143	45.00	55.00	50.00	0.0210	52.50	0.0001	0.0002	0.0010
(3) rfs celwave FLC 114-50(1-1/4) From 12 to 143	25.00	35.00	30.00	0.0210	18.90	0.0001	0.0001	0.0010
(3) rfs celwave FLC 114-50(1-1/4) From 12 to 143	12.00	15.00	13.50	0.0063	1.15	0.0000	0.0000	0.0003
andrew AVA5-50(7/8") From 12 to 135	115.00	125.00	120.00	0.0030	43.20	0.0001	0.0002	0.0001
andrew AVA5-50(7/8") From 12 to 135	95.00	105.00	100.00	0.0030	30.00	0.0001	0.0001	0.0001
andrew AVA5-50(7/8") From 12 to 135	75.00	85.00	80.00	0.0030	19.20	0.0001	0.0001	0.0001
andrew AVA5-50(7/8") From 12 to 135	55.00	65.00	60.00	0.0030	10.80	0.0000	0.0000	0.0001
andrew AVA5-50(7/8") From 12 to 135	35.00	45.00	40.00	0.0030	4.80	0.0000	0.0000	0.0001
andrew AVA5-50(7/8") From 12 to 135	15.00	25.00	20.00	0.0030	1.20	0.0000	0.0000	0.0001
(6) andrew LDF7-50A(1-5/8) From 12 to 135	125.00	135.00	130.00	0.0492	831.48	0.0023	0.0031	0.0023
(6) andrew LDF7-50A(1-5/8) From 12 to 135	105.00	115.00	110.00	0.0492	595.32	0.0016	0.0022	0.0023
(6) andrew LDF7-50A(1-5/8) From 12 to 135	85.00	95.00	90.00	0.0492	398.52	0.0011	0.0015	0.0023
(6) andrew LDF7-50A(1-5/8) From 12 to 135	65.00	75.00	70.00	0.0492	241.08	0.0007	0.0009	0.0023
(6) andrew LDF7-50A(1-5/8) From 12 to 135	45.00	55.00	50.00	0.0492	123.00	0.0003	0.0005	0.0023
(6) andrew LDF7-50A(1-5/8) From 12 to 135	25.00	35.00	30.00	0.0492	44.28	0.0001	0.0002	0.0023
(6) andrew LDF7-50A(1-5/8) From 12 to 135	12.00	15.00	13.50	0.0148	2.69	0.0000	0.0000	0.0007
(9) andrew LDF7-50A(1-5/8) From 12 to 135	115.00	125.00	120.00	0.0738	1062.72	0.0029	0.0040	0.0034
(9) andrew LDF7-50A(1-5/8) From 12 to 135	95.00	105.00	100.00	0.0738	738.00	0.0020	0.0028	0.0034
(9) andrew LDF7-50A(1-5/8) From 12 to 135	75.00	85.00	80.00	0.0738	472.32	0.0013	0.0018	0.0034
(9) andrew LDF7-50A(1-5/8) From 12 to 135	55.00	65.00	60.00	0.0738	265.68	0.0007	0.0010	0.0034
(9) andrew LDF7-50A(1-5/8) From 12 to 135	35.00	45.00	40.00	0.0738	118.08	0.0003	0.0004	0.0034
(9) andrew LDF7-50A(1-5/8) From 12 to 135	15.00	25.00	20.00	0.0738	29.52	0.0001	0.0001	0.0034
(6) rfs celwave LCF114-50(1-1/4) From 12 to 130	125.00	130.00	127.50	0.0210	341.38	0.0009	0.0013	0.0010
(6) rfs celwave LCF114-50(1-1/4) From 12 to 130	105.00	115.00	110.00	0.0420	508.20	0.0014	0.0019	0.0020
(6) rfs celwave LCF114-50(1-1/4) From 12 to 130	85.00	95.00	90.00	0.0420	340.20	0.0009	0.0013	0.0020
(6) rfs celwave LCF114-50(1-1/4) From 12 to 130	65.00	75.00	70.00	0.0420	205.80	0.0006	0.0008	0.0020
(6) rfs celwave LCF114-50(1-1/4) From 12 to 130	45.00	55.00	50.00	0.0420	151.20	0.0004	0.0006	0.0020
(6) rfs celwave LCF114-50(1-1/4) From 12 to 130	25.00	35.00	30.00	0.0420	67.20	0.0002	0.0003	0.0020
(6) rfs celwave LCF114-50(1-1/4) From 12 to 130	12.00	15.00	13.50	0.0126	2.30	0.0000	0.0000	0.0006
(6) DC Trunk From 12 to 130	125.00	130.00	127.50	0.0696	565.72	0.0016	0.0022	0.0016
(6) DC Trunk From 12 to 130	115.00	125.00	120.00	0.0696	1002.24	0.0027	0.0037	0.0033
(6) DC Trunk From 12 to 130	105.00	115.00	110.00	0.0696	642.16	0.0013	0.0019	0.0033
(6) DC Trunk From 12 to 130	95.00	105.00	100.00	0.0696	696.00	0.0019	0.0026	0.0033
(6) DC Trunk From 12 to 130	85.00	95.00	90.00	0.0696	563.76	0.0015	0.0021	0.0033
(6) DC Trunk From 12 to 130	75.00	85.00	80.00	0.0696	445.44	0.0012	0.0017	0.0033
(6) DC Trunk From 12 to 130	65.00	75.00	70.00	0.0696	341.04	0.0009	0.0013	0.0033
(6) DC Trunk From 12 to 130	55.00	65.00	60.00	0.0696	250.56	0.0007	0.0009	0.0033
(6) DC Trunk From 12 to 130	45.00	55.00	50.00	0.0696	174.00	0.0005	0.0006	0.0033
(6) DC Trunk From 12 to 130	35.00	45.00	40.00	0.0696	111.36	0.0003	0.0004	0.0033
(6) DC Trunk From 12 to 130	25.00	35.00	30.00	0.0696	67.20	0.0002	0.0003	0.0033
(6) DC Trunk From 12 to 130	15.00	25.00	20.00	0.0696	27.84	0.0001	0.0001	0.0033
(6) DC Trunk From 12 to 130	12.00	15.00	13.50	0.0209	3.81	0.0000	0.0000	0.0010
DC Trunk From 12 to 130	125.00	130.00	127.50	0.0058	94.29	0.0003	0.0004	0.0003
DC Trunk From 12 to 130	115.00	125.00	120.00	0.0116	167.04	0.0005	0.0006	0.0005

DC Trunk From 12 to 130	105.00	115.00	110.00	0.0116	140.36	0.0004	0.0005	0.0005
DC Trunk From 12 to 130	85.00	95.00	90.00	0.0116	93.96	0.0003	0.0004	0.0005
DC Trunk From 12 to 130	65.00	75.00	70.00	0.0116	56.84	0.0002	0.0002	0.0005
DC Trunk From 12 to 130	45.00	55.00	50.00	0.0116	29.00	0.0001	0.0001	0.0005
DC Trunk From 12 to 130	25.00	35.00	30.00	0.0116	10.44	0.0000	0.0000	0.0005
DC Trunk From 12 to 130	12.00	15.00	13.50	0.0035	0.63	0.0000	0.0000	0.0002
(2) Fiber Trunk From 12 to 130	115.00	125.00	120.00	0.0160	230.40	0.0006	0.0009	0.0007
(2) Fiber Trunk From 12 to 130	95.00	105.00	100.00	0.0160	180.00	0.0004	0.0006	0.0007
(2) Fiber Trunk From 12 to 130	75.00	85.00	80.00	0.0160	102.40	0.0003	0.0004	0.0007
(2) Fiber Trunk From 12 to 130	55.00	65.00	60.00	0.0160	57.60	0.0002	0.0002	0.0007
(2) Fiber Trunk From 12 to 130	35.00	45.00	40.00	0.0160	25.60	0.0001	0.0001	0.0007
(2) Fiber Trunk From 12 to 130	15.00	25.00	20.00	0.0160	6.40	0.0000	0.0000	0.0007
Fiber Trunk From 12 to 130	125.00	130.00	127.50	0.0040	65.03	0.0002	0.0002	0.0002
Fiber Trunk From 12 to 130	105.00	115.00	110.00	0.0080	96.80	0.0003	0.0004	0.0004
Fiber Trunk From 12 to 130	85.00	95.00	90.00	0.0080	64.80	0.0002	0.0002	0.0004
Fiber Trunk From 12 to 130	65.00	75.00	70.00	0.0080	39.20	0.0001	0.0001	0.0004
Fiber Trunk From 12 to 130	45.00	55.00	50.00	0.0080	20.00	0.0001	0.0001	0.0004
Fiber Trunk From 12 to 130	25.00	35.00	30.00	0.0080	7.20	0.0000	0.0000	0.0004
Fiber Trunk From 12 to 130	12.00	15.00	13.50	0.0024	0.44	0.0000	0.0000	0.0001
rfs celwave FLC78-50(7/8") From 12 to 110	95.00	105.00	100.00	0.0040	40.00	0.0001	0.0001	0.0002
rfs celwave FLC78-50(7/8") From 12 to 110	75.00	85.00	80.00	0.0040	25.60	0.0001	0.0001	0.0002
rfs celwave FLC78-50(7/8") From 12 to 110	55.00	65.00	60.00	0.0040	14.40	0.0000	0.0001	0.0002
rfs celwave FLC78-50(7/8") From 12 to 110	35.00	45.00	40.00	0.0040	6.40	0.0000	0.0000	0.0002
rfs celwave FLC78-50(7/8") From 12 to 110	15.00	25.00	20.00	0.0040	1.60	0.0000	0.0000	0.0002
(4) rfs celwave FLC 114-50(1-1/4") From 12 to 110	105.00	110.00	107.50	0.0140	161.79	0.0004	0.0006	0.0007
(4) rfs celwave FLC 114-50(1-1/4") From 12 to 110	85.00	95.00	90.00	0.0280	226.80	0.0006	0.0008	0.0013
(4) rfs celwave FLC 114-50(1-1/4") From 12 to 110	65.00	75.00	70.00	0.0280	137.20	0.0004	0.0005	0.0013
(4) rfs celwave FLC 114-50(1-1/4") From 12 to 110	45.00	55.00	50.00	0.0280	70.00	0.0002	0.0003	0.0013
(4) rfs celwave FLC 114-50(1-1/4") From 12 to 110	25.00	35.00	30.00	0.0280	25.20	0.0001	0.0001	0.0013
(4) rfs celwave FLC 114-50(1-1/4") From 12 to 110	12.00	15.00	13.50	0.0084	1.53	0.0000	0.0000	0.0004
misc Step Bolts From 5 to 145	125.00	135.00	130.00	0.0200	338.00	0.0009	0.0013	0.0009
misc Step Bolts From 5 to 145	105.00	115.00	110.00	0.0200	242.00	0.0007	0.0009	0.0009
misc Step Bolts From 5 to 145	85.00	95.00	90.00	0.0200	162.00	0.0004	0.0006	0.0009
misc Step Bolts From 5 to 145	65.00	75.00	70.00	0.0200	98.00	0.0003	0.0004	0.0009
misc Step Bolts From 5 to 145	45.00	55.00	50.00	0.0200	50.00	0.0001	0.0002	0.0009
misc Step Bolts From 5 to 145	25.00	35.00	30.00	0.0200	18.00	0.0000	0.0001	0.0009
misc Step Bolts From 5 to 145	5.00	15.00	10.00	0.0200	2.00	0.0000	0.0000	0.0009
misc Safety Line 3/8 From 5 to 145	135.00	145.00	140.00	0.0022	43.12	0.0001	0.0002	0.0001
misc Safety Line 3/8 From 5 to 145	125.00	135.00	130.00	0.0022	37.18	0.0001	0.0001	0.0001
misc Safety Line 3/8 From 5 to 145	115.00	125.00	120.00	0.0022	31.68	0.0001	0.0001	0.0001
misc Safety Line 3/8 From 5 to 145	105.00	115.00	110.00	0.0022	26.62	0.0001	0.0001	0.0001
misc Safety Line 3/8 From 5 to 145	95.00	105.00	100.00	0.0022	22.00	0.0001	0.0001	0.0001
misc Safety Line 3/8 From 5 to 145	85.00	95.00	90.00	0.0022	17.82	0.0000	0.0001	0.0001
misc Safety Line 3/8 From 5 to 145	75.00	85.00	80.00	0.0022	14.08	0.0000	0.0001	0.0001
misc Safety Line 3/8 From 5 to 145	65.00	75.00	70.00	0.0022	10.78	0.0000	0.0000	0.0001
misc Safety Line 3/8 From 5 to 145	55.00	65.00	60.00	0.0022	7.92	0.0000	0.0000	0.0001
misc Safety Line 3/8 From 5 to 145	45.00	55.00	50.00	0.0022	5.50	0.0000	0.0000	0.0001
misc Safety Line 3/8 From 5 to 145	35.00	45.00	40.00	0.0022	3.52	0.0000	0.0000	0.0001
misc Safety Line 3/8 From 5 to 145	25.00	35.00	30.00	0.0022	1.98	0.0000	0.0000	0.0001

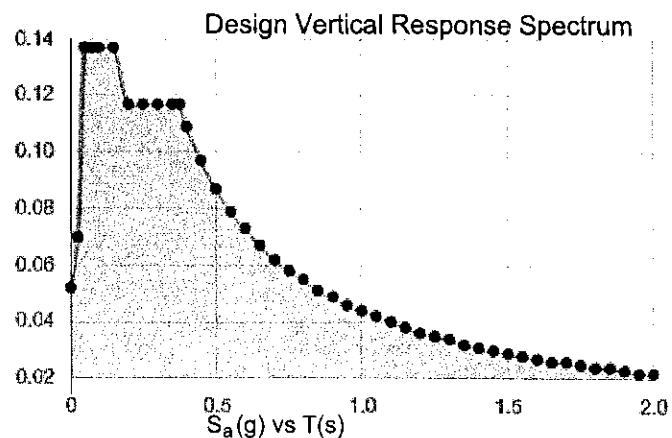
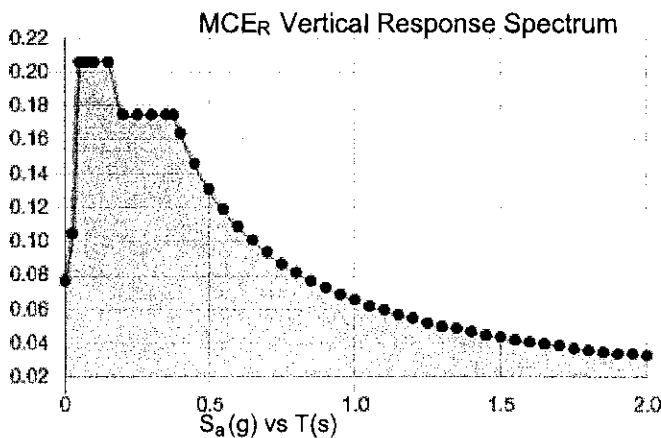
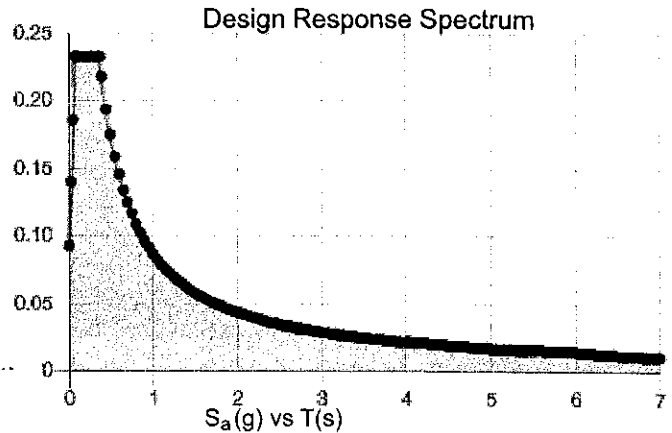
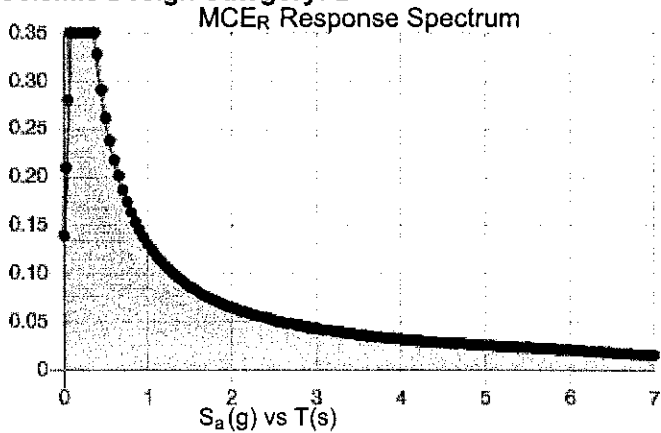
Municipality	Basic Design Wind Speeds, V (mph)				Allowable Stress Design Wind Speeds, V_{asd} (mph)				Ground Snow Load P_g (psf)	MCE Ground Accelerations		Wind-Borne Debris Region ¹		Hurricane- Prone Region
	Risk Cat. I	Risk Cat. II	Risk Cat. III	Risk Cat. IV	Risk Cat. I	Risk Cat. II	Risk Cat. III	Risk Cat. IV		S_S (g)	S_I (g)	Risk Cat. III Occup. I-2	Risk Cat. IV	
Cornwall	105	115	125	130	81	89	97	101	40	0.172	0.054			
Coventry	110	120	130	135	85	93	101	105	30	0.188	0.055		Yes	
Cromwell	110	120	130	135	85	93	101	105	30	0.207	0.056		Yes	
Danbury	110	120	125	130	85	93	97	101	30	0.225	0.056		Yes	
Darien	110	120	130	135	85	93	101	105	30	0.250	0.057	Type B	Yes	
Deep River	115	125	135	140	89	97	105	108	30	0.210	0.054		Yes	
Derby	110	120	130	135	85	93	101	105	30	0.202	0.054		Yes	
Durham	110	120	130	135	85	93	101	105	30	0.211	0.055		Yes	
East Granby	110	120	125	130	85	93	97	101	35	0.173	0.054		Yes	
East Haddam	115	125	135	135	89	97	105	105	30	0.214	0.056		Yes	
East Hampton	110	125	130	135	85	97	101	105	30	0.210	0.056		Yes	
East Hartford	110	120	130	135	85	93	101	105	30	0.191	0.055		Yes	
East Haven	110	125	135	135	85	97	105	105	30	0.200	0.053	Type B	Yes	
East Lyme	120	130	135	140	93	101	105	108	30	0.198	0.053	Type B	Yes	
East Windsor	110	120	130	135	85	93	101	105	30	0.177	0.055		Yes	
Eastford	110	120	130	135	85	93	101	105	40	0.180	0.055		Yes	
Easton	110	120	130	135	85	93	101	105	30	0.218	0.055		Yes	
Ellington	110	120	130	135	85	93	101	105	35	0.178	0.055		Yes	
Enfield	110	120	125	130	85	93	97	101	35	0.172	0.055		Yes	
Essex	115	125	135	140	89	97	105	108	30	0.207	0.054		Yes	
Fairfield	110	120	130	135	85	93	101	105	30	0.219	0.055	Type B	Yes	
Farmington	110	120	130	135	85	93	101	105	35	0.188	0.055		Yes	
Franklin	115	125	135	140	89	97	105	108	30	0.195	0.054		Yes	
Glastonbury	110	120	130	135	85	93	101	105	30	0.200	0.055		Yes	
Goshen	110	115	125	130	85	89	97	101	40	0.172	0.054			
Granby	110	120	125	130	85	93	97	101	35	0.171	0.054		Yes	
Greenwich	110	120	130	135	85	93	101	105	30	0.274	0.059	Type B	Yes	
Griswold	120	125	135	140	93	97	105	108	30	0.189	0.054		Yes	
Groton	120	130	140	140	93	101	108	108	30	0.190	0.052	Type B	Yes	
Guilford	115	125	135	140	89	97	105	108	30	0.204	0.054	Type B	Yes	
Haddam	115	125	135	135	89	97	105	105	30	0.214	0.055		Yes	
Hamden	110	120	130	135	85	93	101	105	30	0.202	0.054		Yes	

Site Soil Class:

Results:

S_s :	0.218	S_{D1} :	0.087
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.126
F_v :	2.4	PGA _M :	0.195
S_{MS} :	0.35	F_{PGA} :	1.549
S_{M1} :	0.131	I_e :	1.25
S_{DS} :	0.233	C_v :	0.737

Seismic Design Category: B



Data Accessed:

Thu Jan 05 2023

Date Source:

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

Results:

Ice Thickness: 1.00 in.
Concurrent Temperature: 15 F
Gust Speed 50 mph

Data Source: Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

Date Accessed: Thu Jan 05 2023

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

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

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Date: **January 5, 2023**

Structural Opinion Letter – Rev 1

Project Information:

Carrier: Dish Wireless
Scope of Work: "New Site Build"
Site Name: NJJERO1114A
Site Address: 100 Reef Road, Fairfield, CT 06824
Site Type: Rooftop Mounted Antennas

Tectonic Project Number: 10710.NJJERO1114A

Tectonic Engineering Consultants, Geologists & Land Surveyors, DPC Inc., is pleased to submit this "**Structural Opinion Letter**" to determine the structural integrity of the above-mentioned building structure. Tectonic performed a limited visual inspection of the existing rooftop structure on May 5, 2021. In addition, the following documents were assessed for the purpose of this letter:

- Limited visual inspection photos by Tectonic Engineering Consultants, Geologists & Land Surveyors, DPC Inc, dated 04/10/2012.
- RFDS by Dish Wireless, dated 01/19/2021.
- Construction Drawings by Tectonic Engineering Consultants, Geologists & Land Surveyors, DPC Inc., dated 09/28/2022.

Proposed Equipment Layout

Centerline (ft)	Carrier Designation	Quantity	Equipment Manufacturer	Equipment Model	Mount Type	Note
31.66	Dish Wireless	1	Delta Electronics, Inc	ESOA600-HCB04	Existing Platform	1

Note:

- 1) Proposed equipment to be mounted on existing platform.

The proposed equipment is to be installed onto the existing equipment platform. Additionally, the proposed equipment weighs less than the original configuration, therefore the existing structure is adequate to support the proposed installation.

This structural opinion is based on a limited visual inspection and information provided by the client. We assume the equipment platform were designed in accordance with ASCE 7-16, and the 2022 CT Building Code. We assume that the building and its foundation were constructed in accordance with the approved design drawings, the building structure has been properly maintained in accordance with the applicable building codes, and all existing members and connections are intact. 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 equipment configuration should be reviewed with respect to their effect on the structural loads prior to implementation.

Project Contact Info

1279 Route 300 | Newburgh, NY 12550
 845.567.8656 Tel | 845.567.8703 Fax

tectonicengineering.com
 Equal Opportunity Employer

Rooftop Structural Opinion Letter
Project Number: 10710.NJJER1114A

January 5, 2023

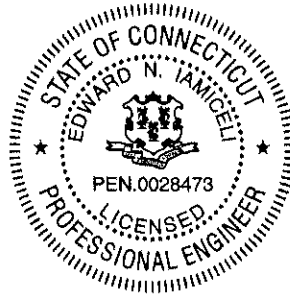
We at Tectonic appreciate the opportunity of providing our continuing professional services to you and Dish Wireless. If you have any questions or need further assistance on this or any other projects, please give us a call.

Respectfully submitted by:

Tectonic Engineering Consultants, Geologists & Land Surveyors, DPC Inc.,



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



Rooftop Structural Opinion Letter
Project Number: 10710.NJJER1114A

January 5, 2023

APPENDIX A



PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Job No. 10710.N3JER01114A

Sheet No. 1

Calculated By RTK

Checked By

of 1

Date :

Date :

Equipment Loads

1 - Original Cabinet Dead Load

Number of Units	Cabinet Type	Weight (lbs)	Total Weight
1	EZBFO Single stack Battery	1132	1132 lbs
1	Modcell 4.0B Cabinet	790	790 lbs
Total Weight = 1922			lbs

2 - Proposed Cabinet Dead Load

Number of Units	Cabinet Type	Weight (lbs)	Total Weight
1	(P) Delta Electronics, Inc. ESOA600-HCB04	975	975 lbs
Total Weight = 975			lbs

Original Cabinet Weight = 1922, Final Weight = 975, Overall Decrease in Weight

Per the limited visual inspection by Tectonic Engineering Consultants, Geologists & Land Surveyors, DPC Inc. dated 04/10/12, the platform is able to sustain 1922 lbs. Under the proposed equipment configuration, the total equipment weight will be approximately 975 lbs, which creates a 947 lb decrease in loading. Therefore, the existing equipment platform will be adequate to support the proposed installation.

Exhibit E
Mount Analysis

Date: January 6, 2023

Proposed Mount Analysis Report

Project Information:

Carrier: Dish Wireless
Site Number: NJJERO1114A
Site Address: 100 Reef Road, Fairfield, Fairfield County, CT 06824
Site Type: Platform w/ Railing Mount on Monopole

Tectonic Project Number: 10710.NJJERO1114A

Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., Inc. is pleased to submit this "Mount Analysis Report" to determine the structural integrity of the above-mentioned proposed mount.

The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

Mount: **Sufficient – 31%**

This analysis has been performed in accordance with the 2022 Connecticut State Building Code and the 2021 International Building Code based upon an ultimate 3-second gust wind speed of 130 mph per Appendix P as required for use in the ANSI/TIA-222-H-1-2019 Standard. Exposure Category B with a maximum topographic factor, Kzt, of 1.0 and Risk Category III was used in this analysis.

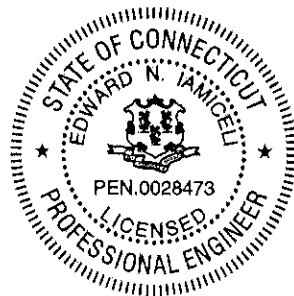
We at Tectonic appreciate the opportunity of providing our continuing professional services to you and Dish Wireless. If you have any questions or need further assistance on this or any other projects, please give us a call.

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

Respectfully submitted by:
Tectonic Engineering Consultants, Geologists & Land Surveyors D.P.C., Inc.



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



Project Contact Info

1279 Route 300 | Newburgh, NY 12550
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tectonicengineering.com
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Additional Calculations

1) INTRODUCTION

Analysis of the proposed antenna mounts due to the loading of the proposed antennas, equipment, and related appurtenances. The proposed mount is a platform mount manufactured by CommScope, P/N: MC-PK8-DSH with a handrail.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	III
Wind Speed:	130 mph
Exposure Category:	B
Topographic Factor:	1.0
Ice Thickness:	1.0 in
Wind Speed with Ice:	50 mph
Maintenance Load:	30 mph
Seismic S_s / S_1:	0.218 / 0.055

Table 1 - Proposed Equipment Loading Information

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Proposed Mount Type	Note
118.0	Dish Wireless	3	JMA	FFVV-65B-R2	CommScope MC-PK8-DSH w/ HR	1
		3	Fujitsu	TA08025-B604 RRH		
		3	Fujitsu	TA08025-B605 RRH		
		1	Raycap	RDIDC-9181-PF-48		

Note:
 1) Proposed equipment to be installed on the proposed mounts.

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Dated
Mount Assembly Drawings	CommScope, P/N: MC-PK8- DSH	03/17/2021
Field Notes & Photos	Tectonic	05/05/2021
RFDS	Dish Wireless	01/19/2022
Construction Drawings	Tectonic	09/28/2022

3.1) Analysis Method

A tool internally developed, using Microsoft Excel, was used to calculate wind loading on all appurtenances and mount members. This information was then used in conjunction with another program, RISA-3D, which is a commercially available analysis software package, used to check the antenna mounting system and calculate member stresses for various loading cases. The selected output from the analysis is included in Appendices B and C.

3.2) Assumptions

- 1) The antenna mounting system was properly fabricated, installed, and maintained in good condition in accordance with its original design, TIA Standards, and/or manufacturer's specifications.
- 2) The configuration of antennas, mounts, and other appurtenances are as specified in Tables 1 and 2.
- 3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.

- 4) Member length and sizes are based solely on the assembly drawing by CommScope, referenced above.
- 5) Steel grades have been assumed as follows, unless noted otherwise:
 - Channel, Solid Round, Angle, Plate ASTM A36 (GR 36)
 - HSS (Rectangular) ASTM 500 (GR B-46)
 - Pipe ASTM A53 (GR 35)
 - Connection Bolts ASTM A325

This analysis 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 mount.

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity

Notes	Component	Mount Centerline (ft)	% Capacity	Pass / Fail
1	Standoff End Plate	118.0	28	Pass
	Grating Support Angle		13	Pass
	Face Horizontal		20	Pass
	Mount Pipe		25	Pass
	Standoff Channel		30	Pass
	Standoff		26	Pass
	Rail Connector		20	Pass
	Railing		20	Pass
2	Collar Connection		31	Pass
Structure Rating (max from all components) =				31 %

Notes:

- 1) See additional documentation in "Appendix C - Analysis Output" for calculations supporting the % capacity consumed.
- 2) See additional documentation in "Appendix D - Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Result / Conclusions

The proposed platform mount has adequate capacity to support the proposed antenna and equipment installation as detailed in the following report.

This structural analysis only includes evaluation of the antenna mounts and not the monopole. The monopole has been analyzed under a separate structural analysis by Tectonic 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
SOFTWARE INPUT CALCULATIONS

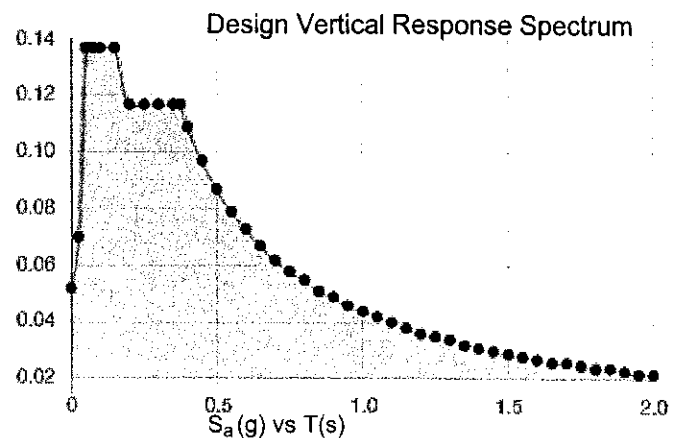
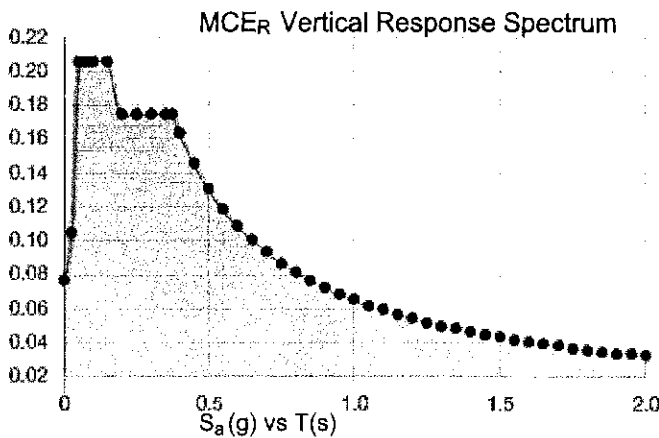
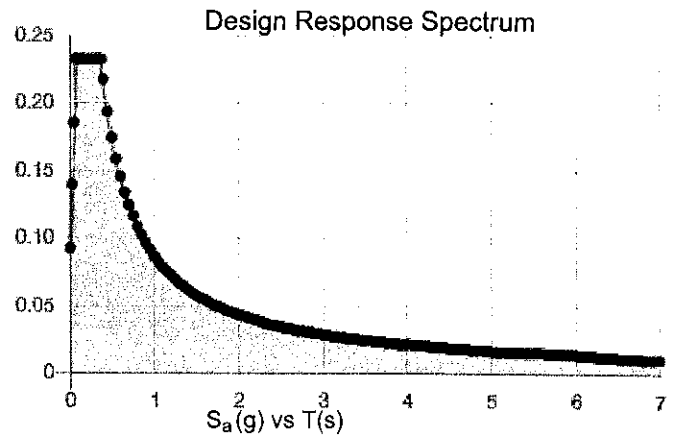
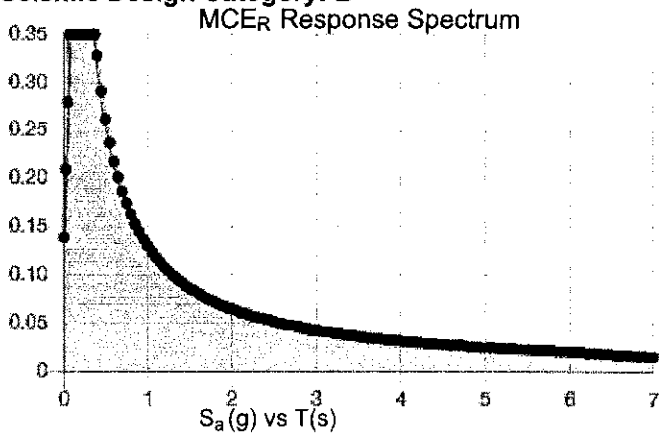
Municipality	Basic Design Wind Speeds, V (mph)				Allowable Stress Design Wind Speeds, V_{ast} (mph)				Ground Snow Load P_g (psf)	MCE Ground Accelerations		Wind-Borne Debris Region ¹		Hurricane- Prone Region
	Risk Cat. I	Risk Cat. II	Risk Cat. III	Risk Cat. IV	Risk Cat. I	Risk Cat. II	Risk Cat. III	Risk Cat. IV		S_S (g)	S_T (g)	Risk Cat. III Occup. I-2	Risk Cat. IV	
Cornwall	105	115	125	130	81	89	97	101	40	0.172	0.054			
Coventry	110	120	130	135	85	93	101	105	30	0.188	0.055		Yes	
Cromwell	110	120	130	135	85	93	101	105	30	0.207	0.056		Yes	
Danbury	110	120	125	130	85	93	97	101	30	0.225	0.056		Yes	
Darien	110	120	130	135	85	93	101	105	30	0.250	0.057	Type B	Yes	
Deep River	115	125	135	140	89	97	105	108	30	0.210	0.054		Yes	
Derby	110	120	130	135	85	93	101	105	30	0.202	0.054		Yes	
Durham	110	120	130	135	85	93	101	105	30	0.211	0.055		Yes	
East Granby	110	120	125	130	85	93	97	101	35	0.173	0.054		Yes	
East Haddam	115	125	135	135	89	97	105	105	30	0.214	0.056		Yes	
East Hampton	110	125	130	135	85	97	101	105	30	0.210	0.056		Yes	
East Hartford	110	120	130	135	85	93	101	105	30	0.191	0.055		Yes	
East Haven	110	125	135	135	85	97	105	105	30	0.200	0.053	Type B	Yes	
East Lyme	120	130	135	140	93	101	105	108	30	0.198	0.053	Type B	Yes	
East Windsor	110	120	130	135	85	93	101	105	30	0.177	0.055		Yes	
Eastford	110	120	130	135	85	93	101	105	40	0.180	0.055		Yes	
Easton	110	120	130	135	85	93	101	105	30	0.218	0.055		Yes	
Ellington	110	120	130	135	85	93	101	105	35	0.178	0.055		Yes	
Enfield	110	120	125	130	85	93	97	101	35	0.172	0.055		Yes	
Essex	115	125	135	140	89	97	105	108	30	0.207	0.054		Yes	
Fairfield	110	120	130	135	85	93	101	105	30	0.219	0.055	Type B	Yes	
Farmington	110	120	130	135	85	93	101	105	35	0.188	0.055		Yes	
Franklin	115	125	135	140	89	97	105	108	30	0.195	0.054		Yes	
Glastonbury	110	120	130	135	85	93	101	105	30	0.200	0.055		Yes	
Goshen	110	115	125	130	85	89	97	101	40	0.172	0.054		Yes	
Granby	110	120	125	130	85	93	97	101	35	0.171	0.054		Yes	
Greenwich	110	120	130	135	85	93	101	105	30	0.274	0.059	Type B	Yes	
Griswold	120	125	135	140	93	97	105	108	30	0.189	0.054		Yes	
Groton	120	130	140	140	93	101	108	108	30	0.190	0.052	Type B	Yes	
Guilford	115	125	135	140	89	97	105	108	30	0.204	0.054	Type B	Yes	
Haddam	115	125	135	135	89	97	105	105	30	0.214	0.055		Yes	
Hamden	110	120	130	135	85	93	101	105	30	0.202	0.054		Yes	

Site Soil Class:

Results:

S_s :	0.218	S_{D1} :	0.087
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.126
F_v :	2.4	PGA _M :	0.195
S_{MS} :	0.35	F_{PGA} :	1.549
S_{M1} :	0.131	I_e :	1.25
S_{DS} :	0.233	C_v :	0.737

Seismic Design Category: B



Data Accessed:

Thu Jan 05 2023

Date Source:

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

Ice

Results:

Ice Thickness: 1.00 in.
Concurrent Temperature: 15 F
Gust Speed 50 mph

Data Source: Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

Date Accessed: Thu Jan 05 2023

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

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

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WIND AND ICE LOADS PER TIA-222-H

Work Order #:	10710.NJJER01114A
Site Name:	NJJER01114A
Location:	100 Reed Road, Fairfield, CT 06424
County:	Fairfield

Tower Type	MB	Monopole
Structure Height	125	ft
Supporting Str Height	GM	Ground Mounted
Risk Category	III	Substantial risk
Exposure Category	B	Suburban/wooded/obstructed
Topo Category	1	Flat or rolling terrain
Height of crest	0	ft
Mean elevation (zs)	1139	ft

Basic Wind Speed (3-sec gust):		
Without ice	130	mph*
With ice	30	mph
Maintenance Wind	30	mph
Ice thickness	1.00	in

Importance Factor	
Ice thickness	1.15
Earthquake	1.25
Supporting Data:	
K _s	1.00
K _e	1.00
K _c	0.90
K _t	N/A
f	N/A
z _g	1200
α	7
K _{z,min}	0.7
K _d	0.95
G _h	1.00

Height	z (ft)	MB
	Kh	N/A
	Kzt	1.00
	Kz	1.04
	Kiz	1.14
Wind Pressure, qz (psf)	No Ice	42.57
	With Ice	6.30
(tiz)	Service	2.27
	Ice Thk	1.42
Appurtenances (qzGh)	No Ice	42.57
	With Ice	6.30
	Service	2.27

Note : *Ultimate 3-second gust wind speed of 130 mph per Appendix P.

Equipment Information

Shielding factor, Ka												Section 16.6					
Antenna Configuration	(E) or (P)	Qty	z (ft)	Length or Diameter (ft)	Width (in)	Depth (in)	Flat or Cylindrical?	Antenna (Ca)N	Antenna (Ca)T	Face Normal (Aa)N (ft²)	Windward Face Normal (CaAa)N (ft²)	Side Face (As)T (ft²)	Windward Side Face (CaAs)T (ft²)	Normal Antenna Wind Load Each (lb)	Transverse Antenna Wind Load Each (lb)	Antenna Weight (lb)	Total Weight (lb)
FFVV-65B-R2	P	3	118	6.00	19.60	7.80		1.25	1.47	9.80	33.13	3.90	15.53	470	220	70.8	212.4
TA08025-B604-RRH	P	3	118	1.24	15.70	7.80		1.20	1.20	1.62	5.26	0.81	2.61	75	37	63.9	191.7
TA08025-B605-RRH	P	3	118	1.24	15.70	9.00		1.20	1.20	1.62	5.26	0.93	3.02	75	43	74.9	224.7
RDIDC-9181-PF-48	P	1	118	1.58	14.39	8.15		1.20	1.20	1.90	2.05	1.07	1.16	87	49	21.3	21.3
										Σ (CaAA)N	45.71	Σ (CaAA)T	22.32				650

WIND WITH ICE Ice Thk = 1.42 in

Antenna Configuration	(E) or (P)	Qty	z (ft)	Length or Diameter (ft)	Width (in)	Depth (in)	Flat or Cylindrical?	Antenna (Ca)N	Antenna (Ca)T	Face Normal (Aa)N (ft²)	Windward Face Normal (CaAa)N (ft²)	Side Face (As)T (ft²)	Windward Side Face (CaAs)T (ft²)	Normal Antenna Wind Load Each (lb)	Transverse Antenna Wind Load Each (lb)	Ice Area for Weight (ft²)	Ice Weight Alone (lbs)
FFVV-65B-R2	P	3	118	6.24	22.44	10.64	Cylindrical	0.72	0.72	11.66	22.63	5.53	10.73	47	23	27.4	181.6
TA08025-B604-RRH	P	3	118	1.48	18.54	10.64	Cylindrical	0.7	0.7	2.28	4.32	1.31	2.48	9	5	4.9	32.2
TA08025-B605-RRH	P	3	118	1.48	18.54	11.84	Cylindrical	0.7	0.7	2.28	4.32	1.46	2.76	9	6	5.1	33.9
RDIDC-9181-PF-48	P	1	118	1.82	17.23	10.99	Cylindrical	0.7	0.7	2.61	1.84	1.87	1.05	10	7	5.9	39.4
										Σ (CaAA)N	32.90	Σ (CaAA)T	17.01				287

MAINTENANCE WIND

Antenna Configuration	(E) or (P)	Qty	z (ft)	Length or Diameter (ft)	Width (in)	Depth (in)	Flat or Cylindrical?	Antenna (Ca)N	Antenna (Ca)T	Face Normal (Aa)N (ft²)	Windward Face Normal (CaAa)N (ft²)	Side Face (As)T (ft²)	Windward Side Face (CaAs)T (ft²)	Normal Antenna Wind Load Each (lb)	Transverse Antenna Wind Load Each (lb)
FFVV-65B-R2	P	3	118	6.00	19.60	7.80	Flat	1.25	1.47	9.80	33.13	3.90	15.53	25	12
TA08025-B604-RRH	P	3	118	1.24	15.70	7.80	Flat	1.20	1.20	1.62	5.26	0.81	2.61	4	2
TA08025-B605-RRH	P	3	118	1.24	15.70	9.00	Flat	1.20	1.20	1.62	5.26	0.93	3.02	4	2
RDIDC-9181-PF-48	P	1	118	1.58	14.39	8.15	Flat	1.20	1.20	1.90	2.05	1.07	1.16	5	3
										Σ (CaAA)N	45.71	Σ (CaAA)T	22.32		

Mounting System Information

Mount Center Line: 118 ft

Mount Part	Quantity	Length (ft)	Projected Width (in)	Depth (in)	Flat or Cylindrical?	Force Coefficient	Projected Area (ft ²)	Wind Force (lbs/ft)	Reduction Factor =			Section 16.6	
									Ice Weight Area (ft ²)	Ice Weight (lbs/ft)	Projected Area with Ice (ft ²)	Wind Force Ice (lbs/ft)	Maintenance Wind Force (lbs/ft)
6"x36" Plate	3	3.00	3.00	3.00		2	9.75	46.1	10.31	7.6	14.01	9.8	2.5
6"x36" Plate	6	0.50	0.50	0.50		2	3.00	42.6	3.19	7.0	4.42	9.3	2.3
12"x24" HA	6	2.50	2.50	2.50		2	5.00	14.2	10.00	4.4	12.10	5.1	0.8
Horizontal Pipe 3.5"dia x 16	3	5.00	5.00	5.00		1.2	8.40	14.9	21.98	6.1	15.22	4.0	0.8
2.5 Std Mount Pipe	9	5.00	5.00	5.00		1.2	20.70	12.2	54.17	5.0	41.15	3.6	0.7
Channel 3.5"x2.06	6	2.75	2.75	2.75		2	9.30	24.0	14.96	6.0	17.10	6.5	1.3
HSS 4x4x0.75	3	3.50	3.50	3.50		2	6.84	28.4	13.68	8.8	11.70	7.2	1.5
Rail Connector LB 9x4.45x1/4	3	3.50	3.50	3.50		2	9.90	46.8	16.58	12.2	14.16	9.9	2.5
2.5 Std Pipe Rail	3	10.00	2.38	2.38		1.2	8.63	12.2	22.57	5.0	17.14	3.6	0.7

Note: The member sizes are based on the assembly drawings by Commscope, date 03/17/21

Seismic Check

Tower Information

Tower Type:	MP	
Structure Height	145	ft
Supporting Structure Height	GM	ft
Mount Height	118	ft

Geographic Information

City:	Tainia	
State:	Connecticut	
County:	Tainia	
Latitude:	41.3957	Longitude: 73.2547

Seismic Information

Risk Category	III
Importance Factor	1.25
Site Soil Classification	D
S _s	0.213
S ₁	0.075
F _a	1.0
F _v	2.1
S _{DS}	0.233
S _{D1}	0.088
R	2.00
A _s	1.00
C _s	0.15

Table 2-10
<https://asce7hazardtool.online/>

(Table 2-11, interpolation allowed)
 (Table 2-12, interpolation allowed)
 Section 2.7.5

Section 16.7
 Section 16.7 & 2.7.8
 > 0.03

Equivalent Lateral Force Procedure

Equipment (Discrete Appurtenances)

Antenna Configuration	(E) or (P)	Qty	z (ft)	Antenna Weight (lb)	Shear V _s = C _s *W (lbs)	Vert. Seismic load (E _v , lbs)	Seismic load (E _h , lbs)
FFVV-65B-R2	P	3	118	71	11	3	11
TA08025-B604-RRH	P	3	118	64	10	3	10
TA08025-B605-RRH	P	3	118	75	11	3	11
RDIDC-9181-PF-48	P	1	118	21	3	1	3

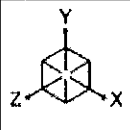
Mounting System (Discrete Appurtenances)

E _v = 0.2S _{DS} * D	0.0466 x D	"D" is the dead weight of the mount members.
E _h = rho * Q _E	0.15 x W	"W" total weight of structure above ground

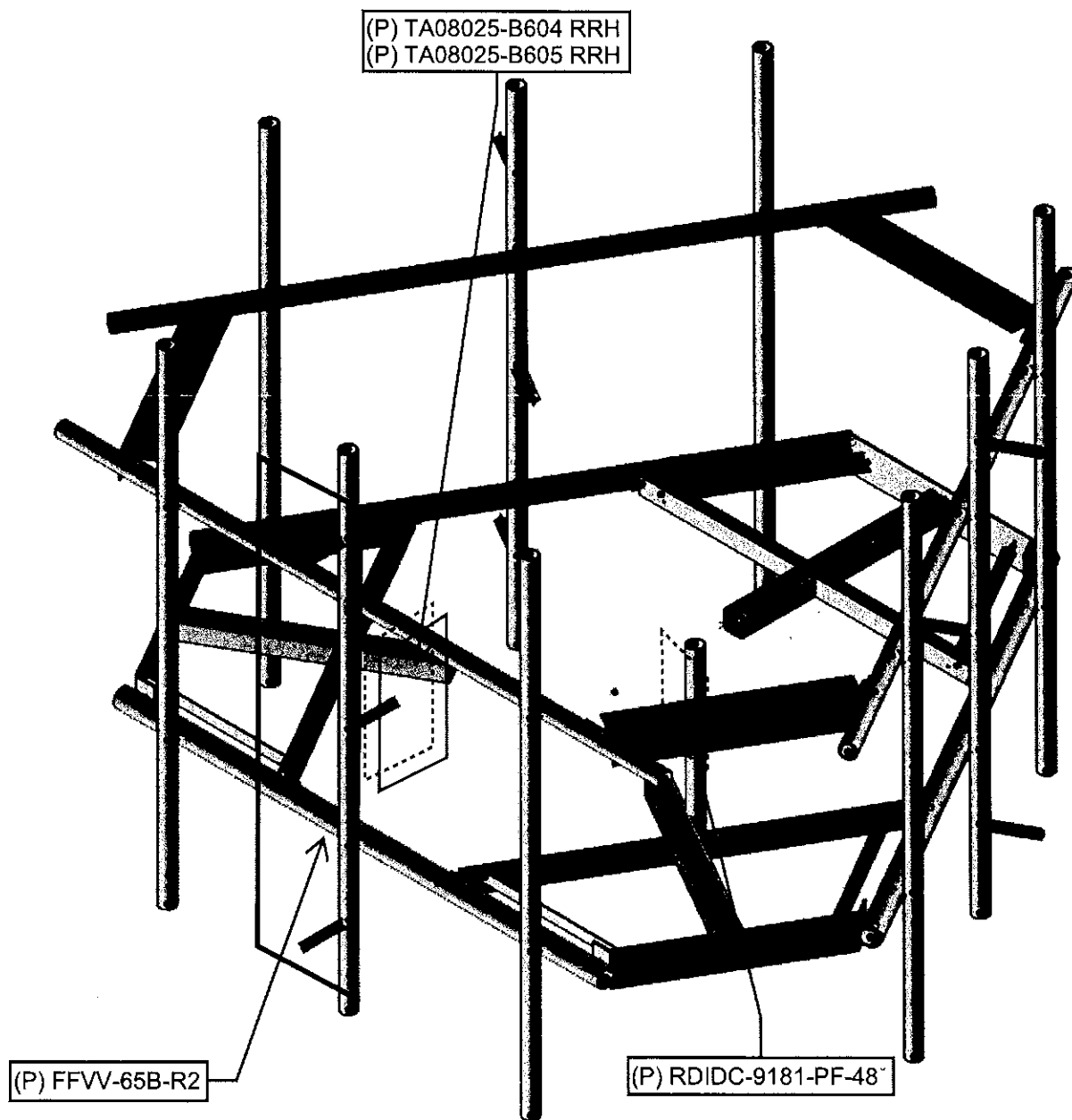
Notes:

1. Wind loads govern over seismic loads

APPENDIX B
WIRE FRAME AND RENDERED MODELS

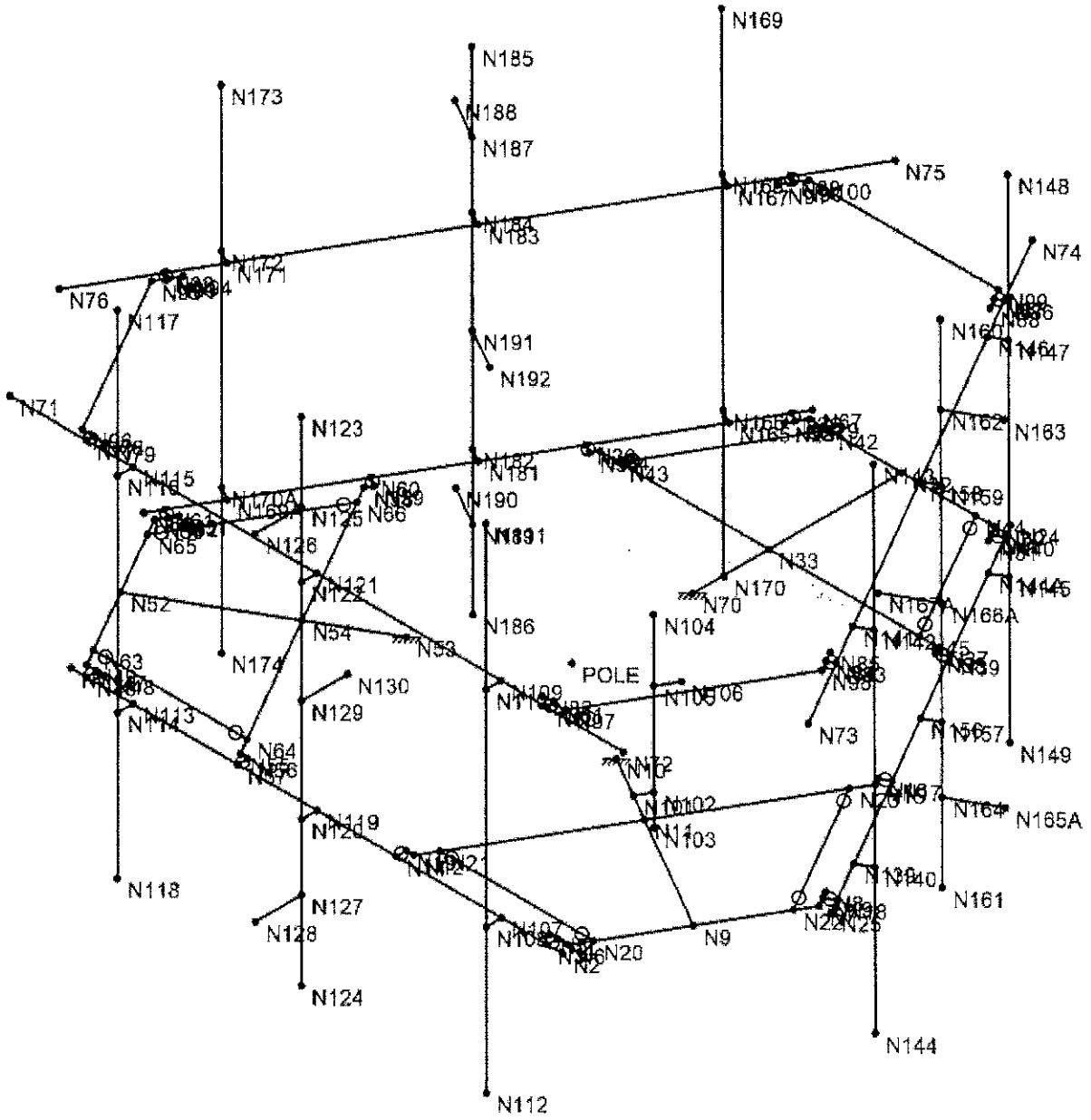
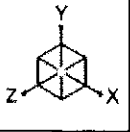


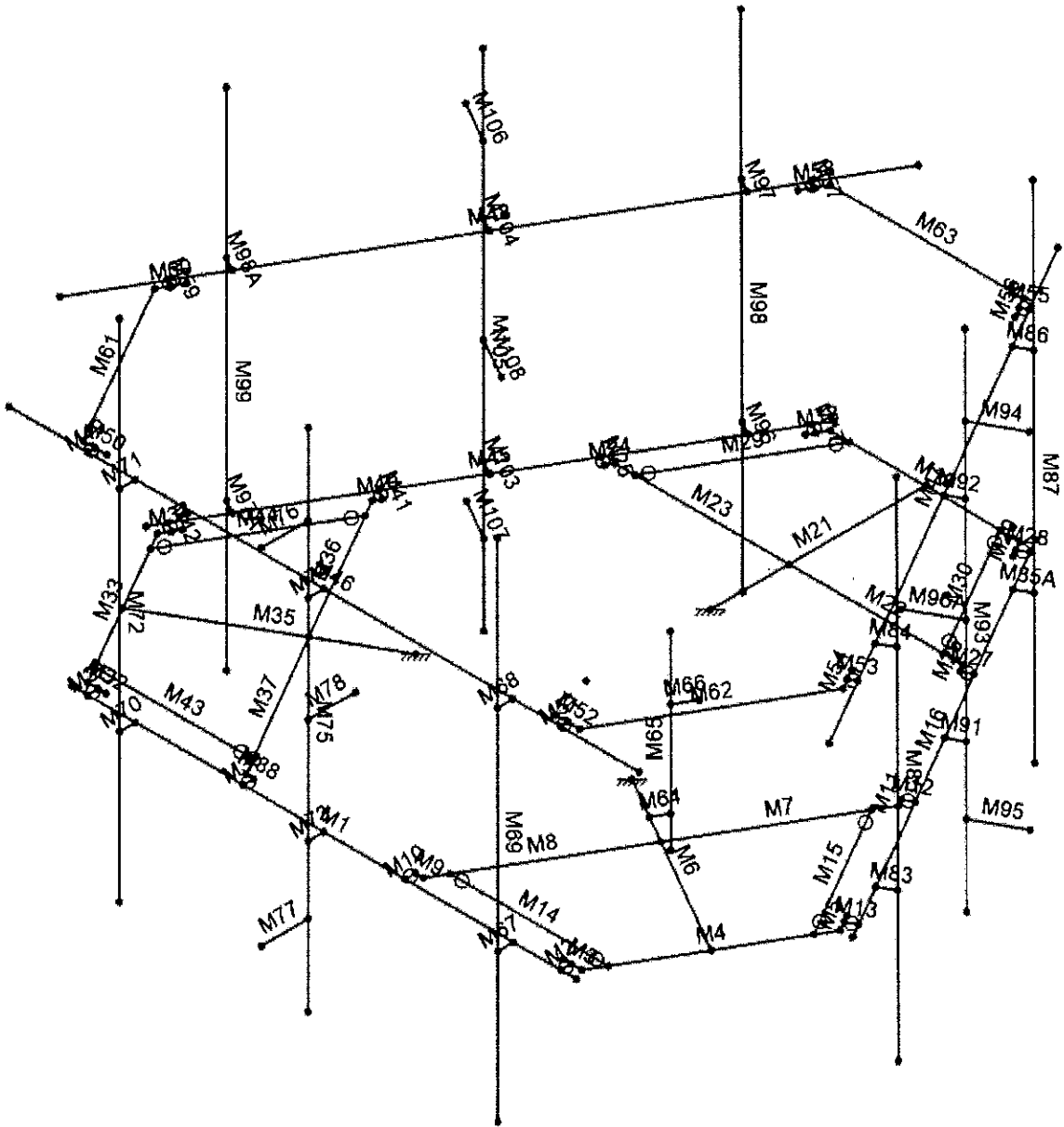
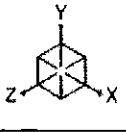
Proposed Platform Mount

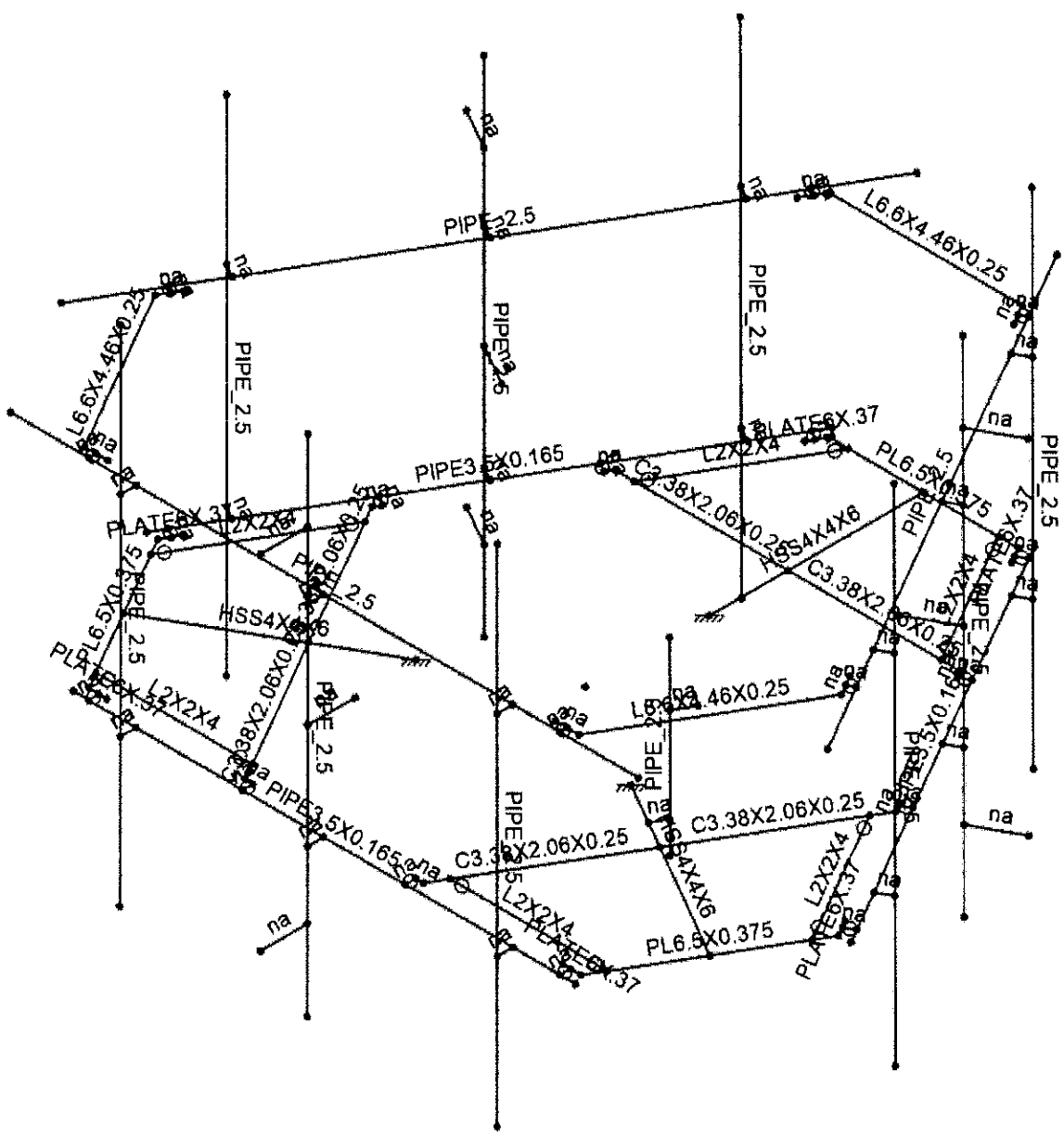
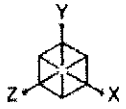


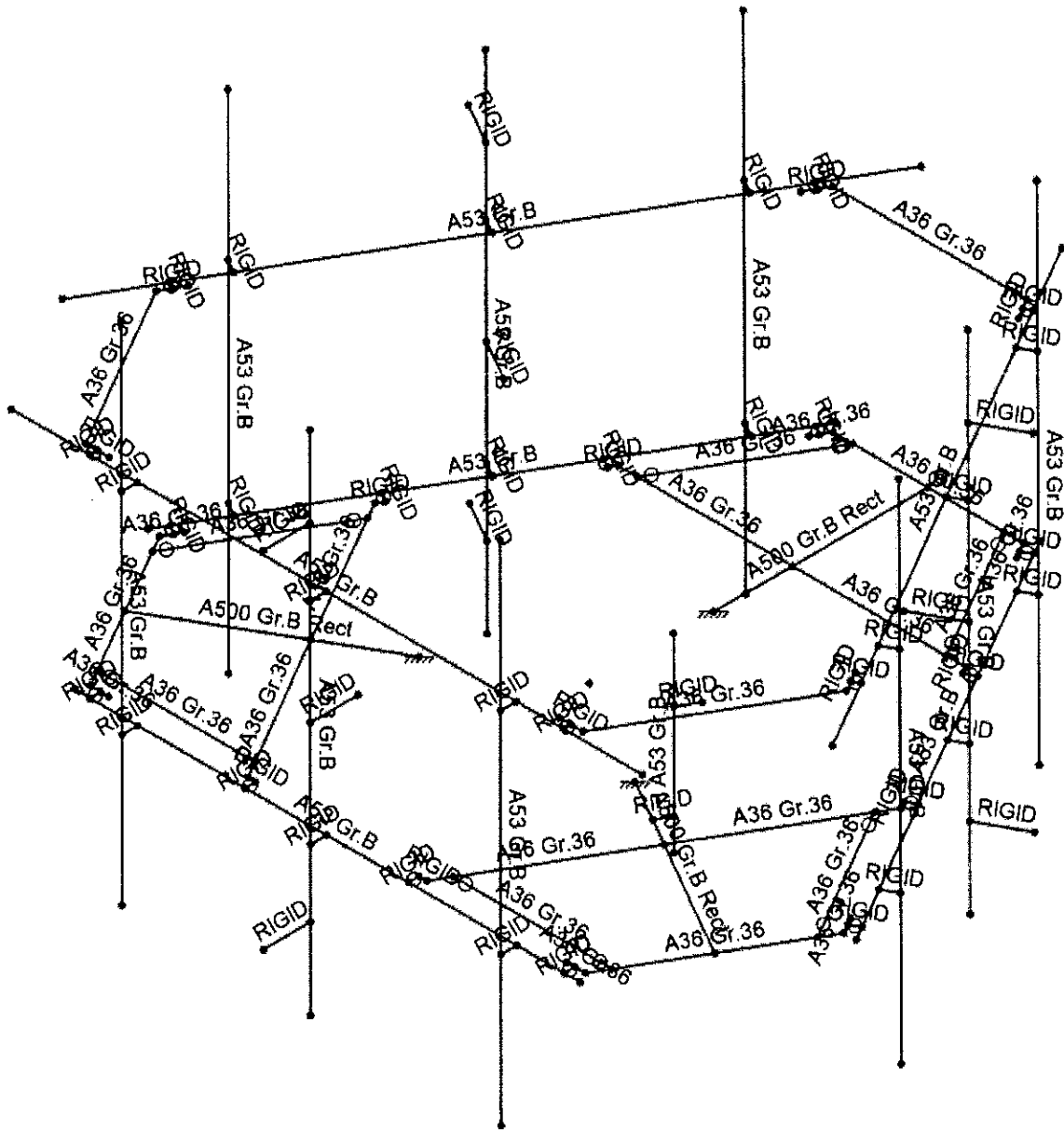
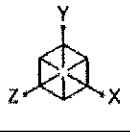
NOTES:
1) PROPOSED ANTENNAS AND MOUNTING PIPES HAVE BEEN VERTICALLY CENTERED ALONG THE EXISTING MOUNT (NO OFFSET).
2) LISTED PROPOSED APPURTENANCES ABOVE ARE TYPICAL FOR ALL SECTORS.

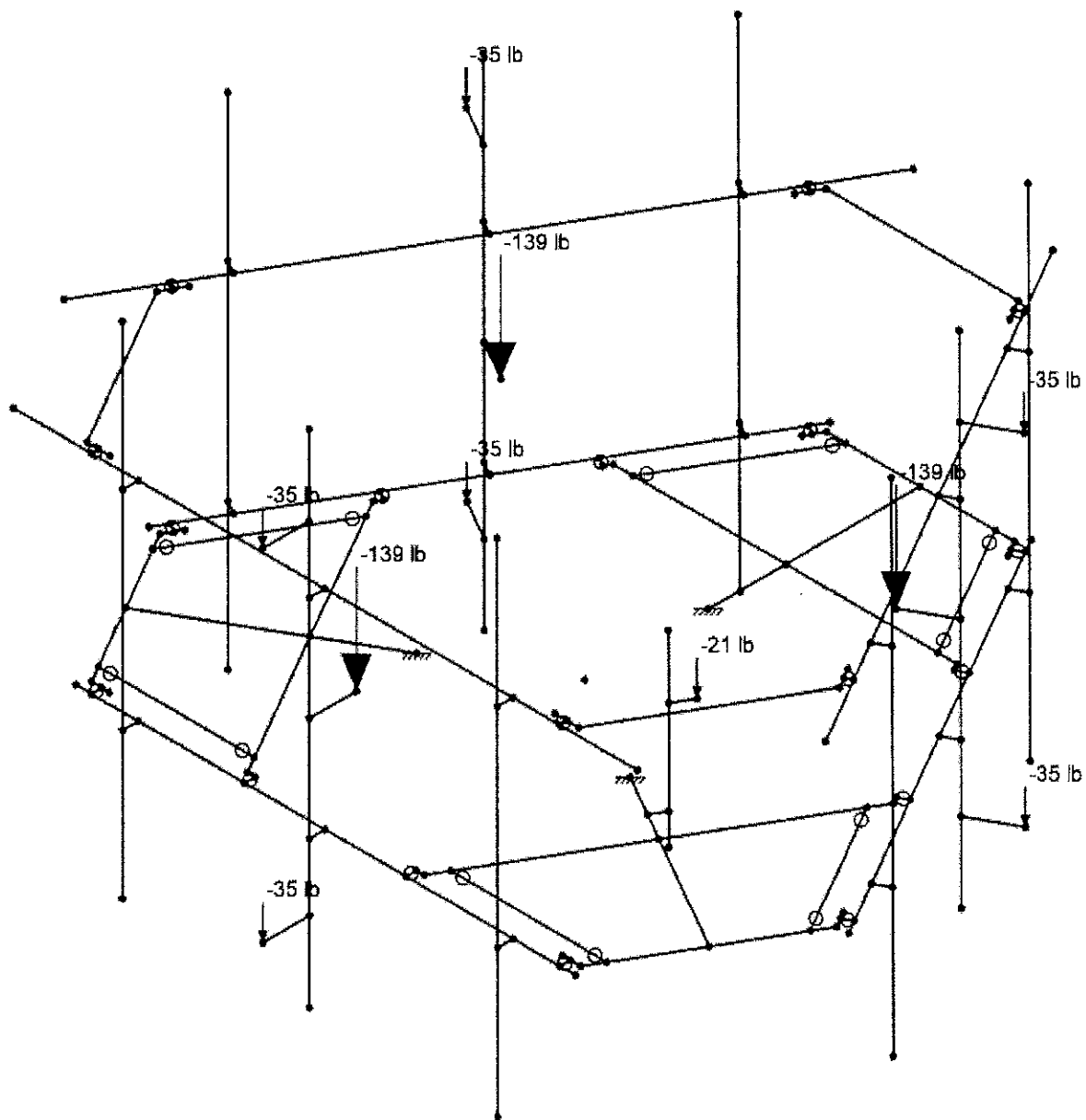
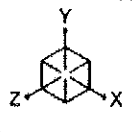
(P) PROPOSED



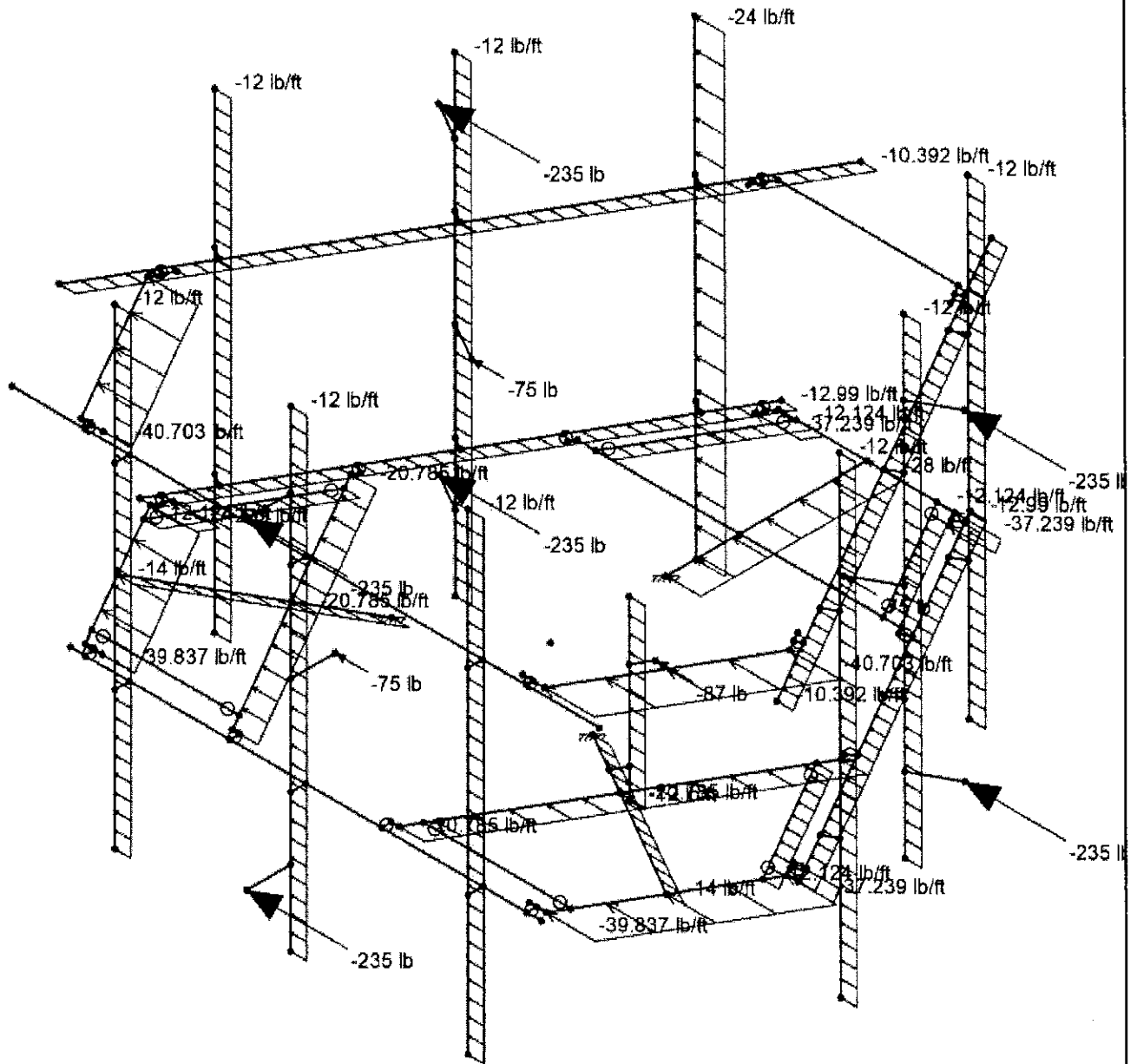
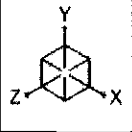




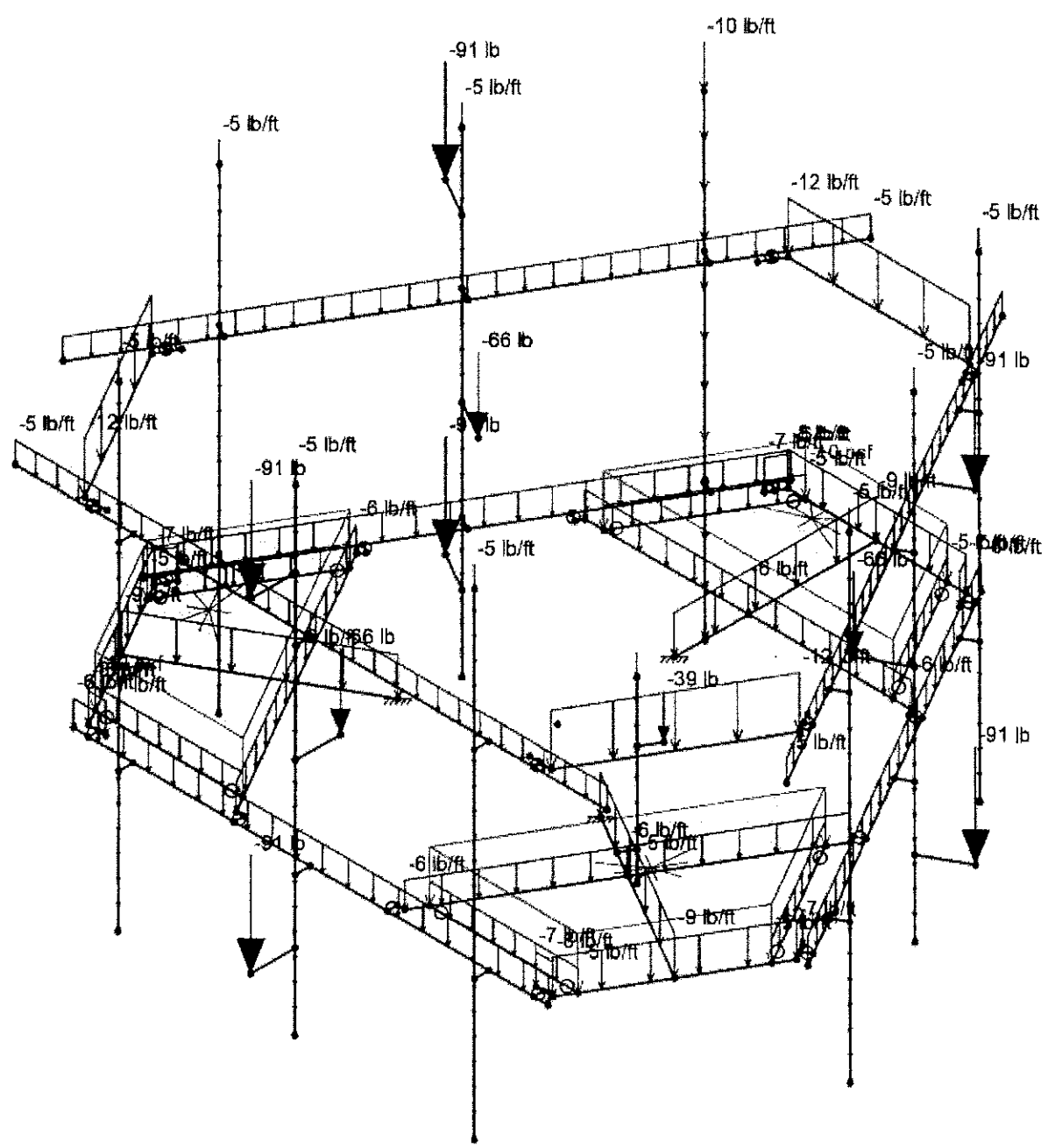
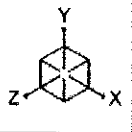




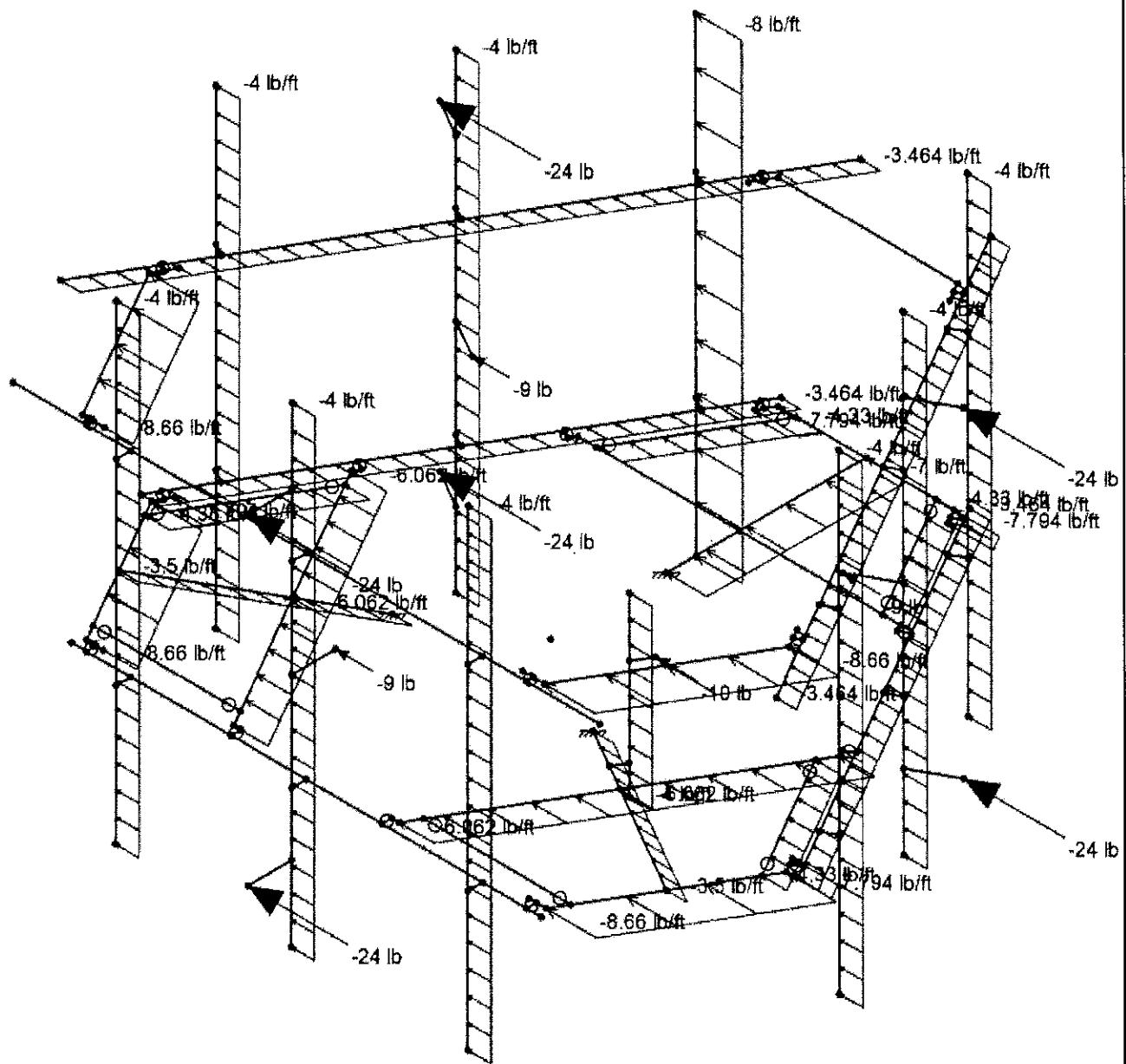
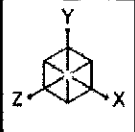
Loads: BLC 1, DL



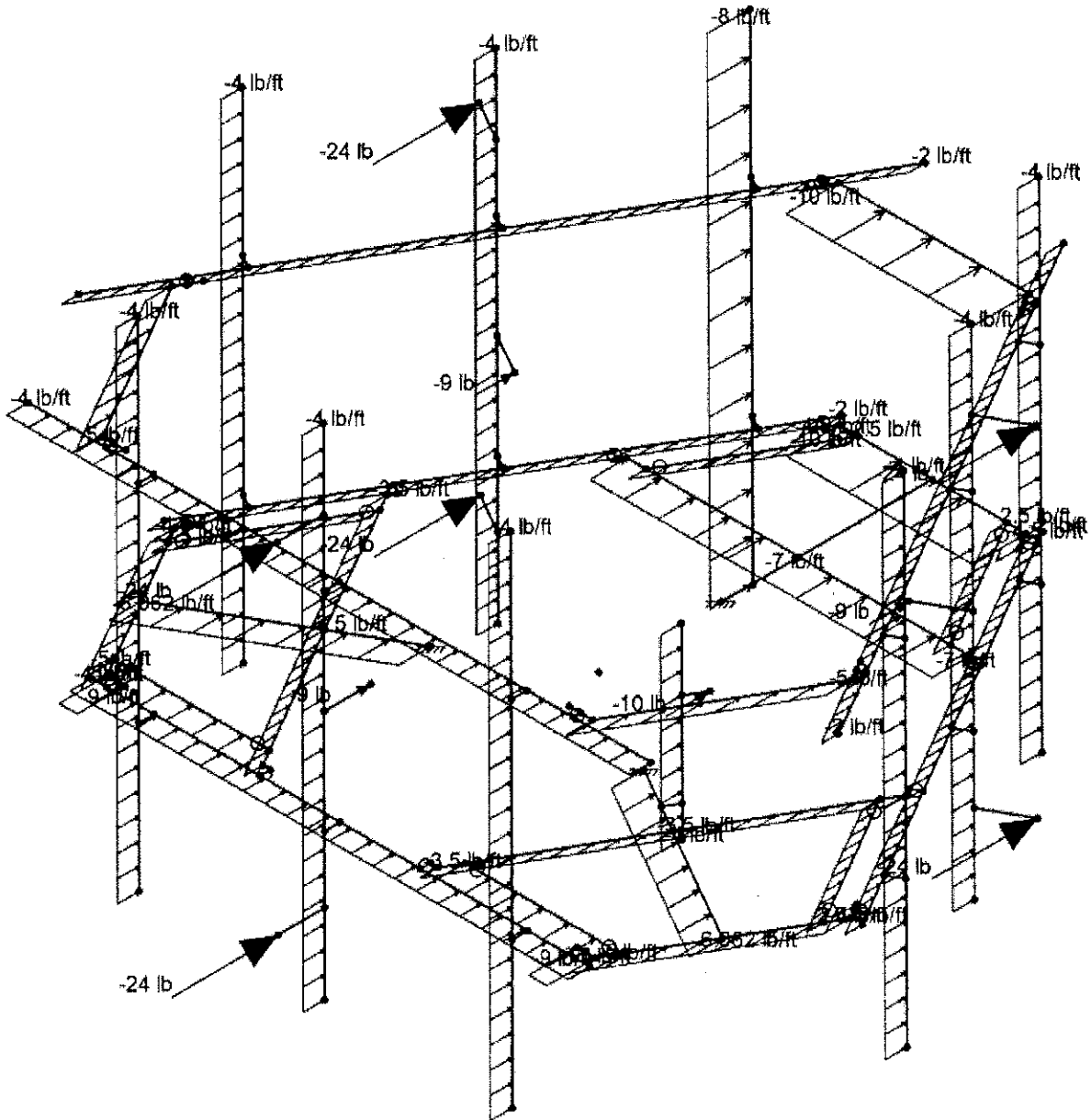
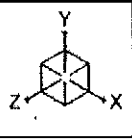
Loads: BLC 2, WLX



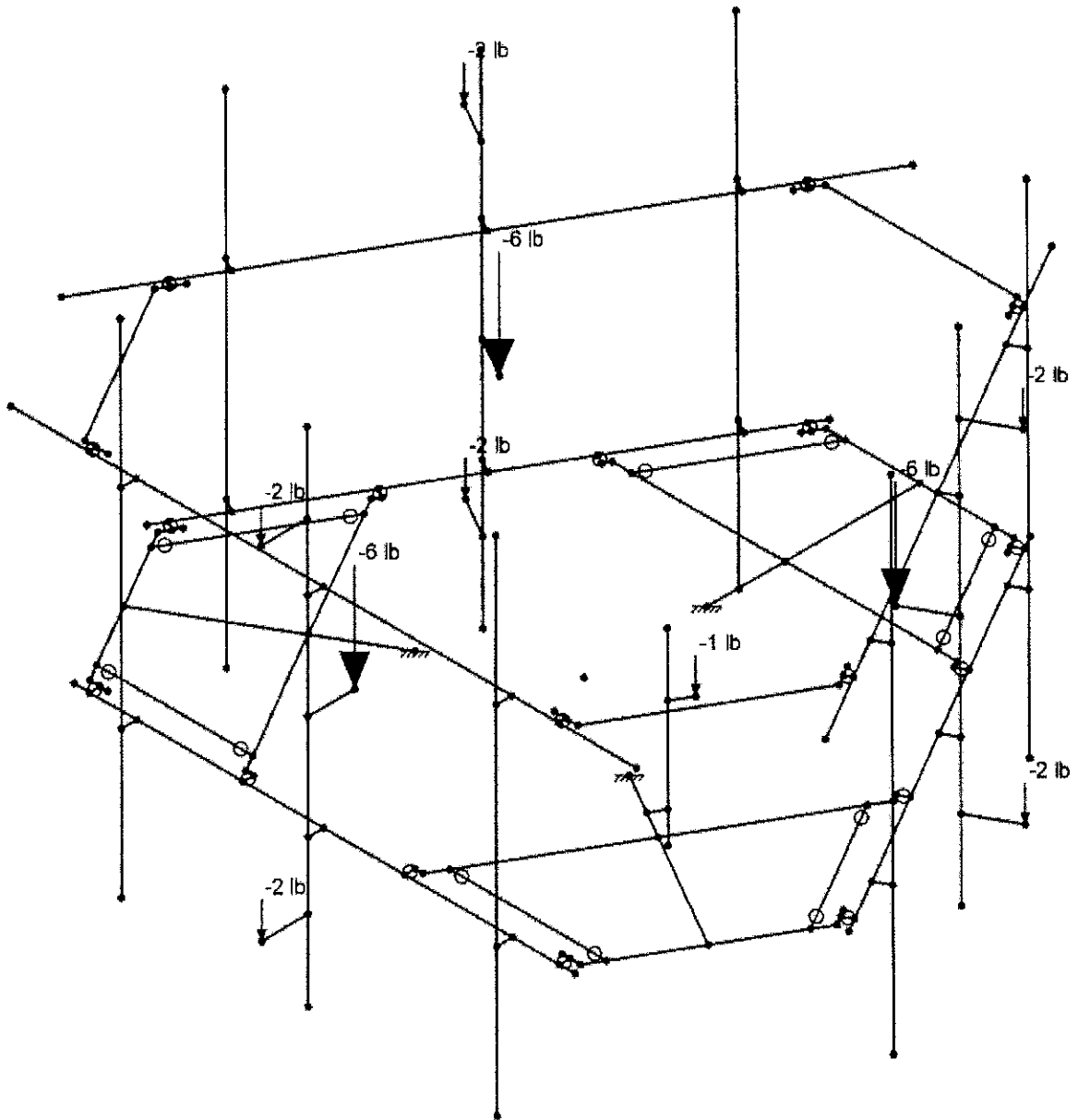
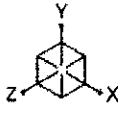
Loads: BLC 4, DLI



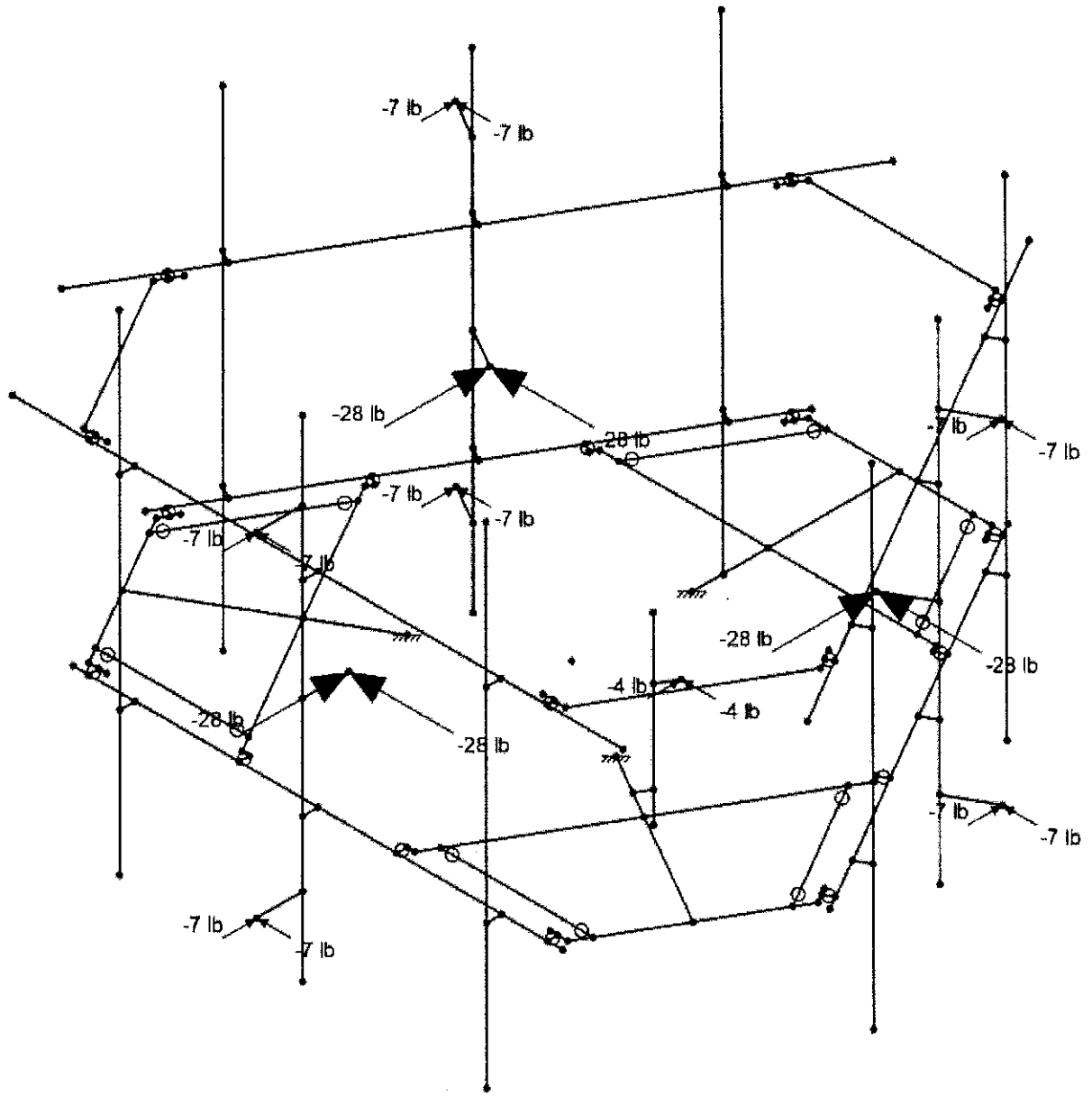
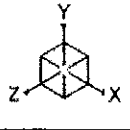
Loads: BLC 5, WLXI



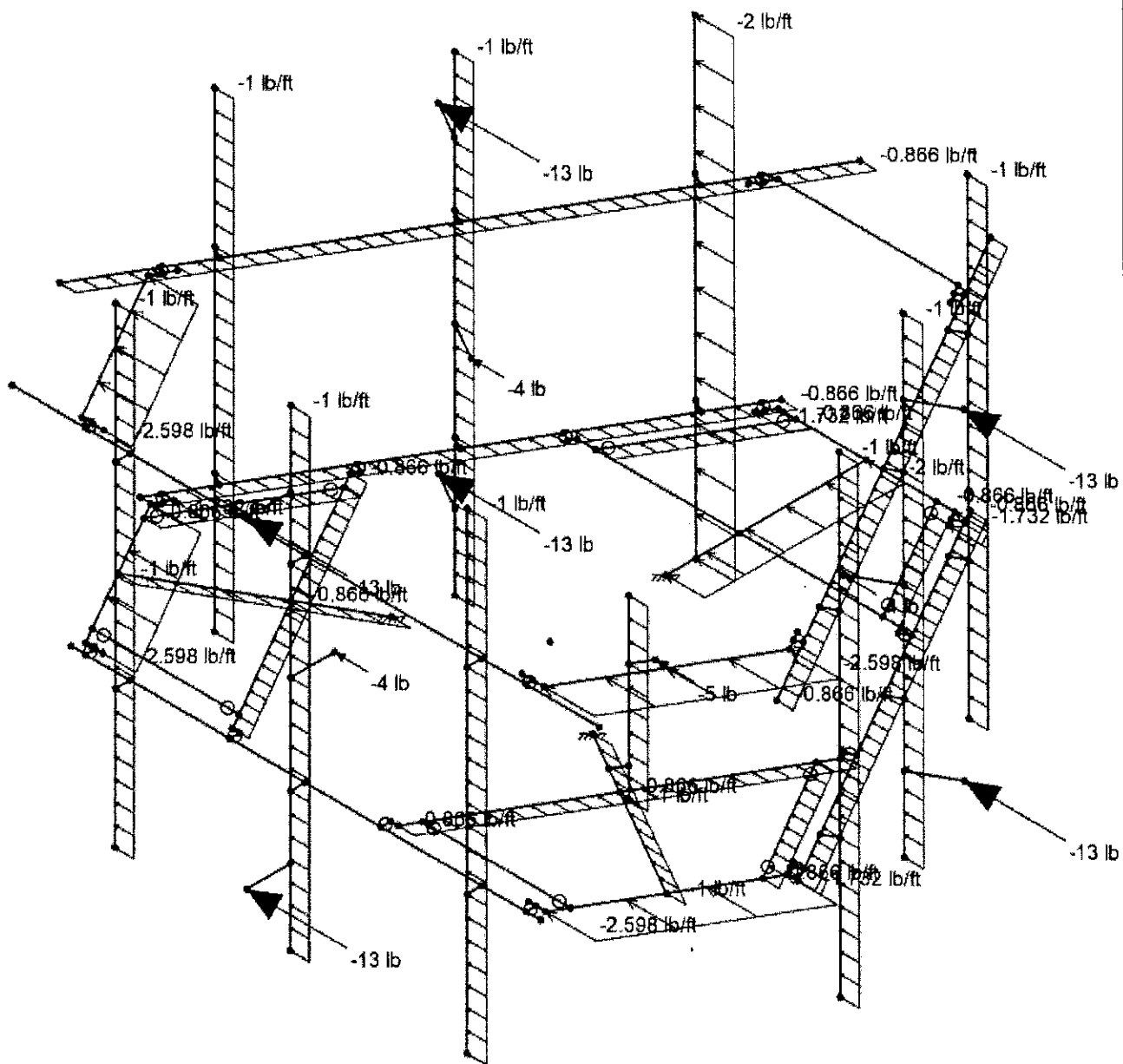
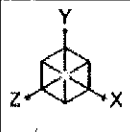
Loads: BLC 8, WLZI



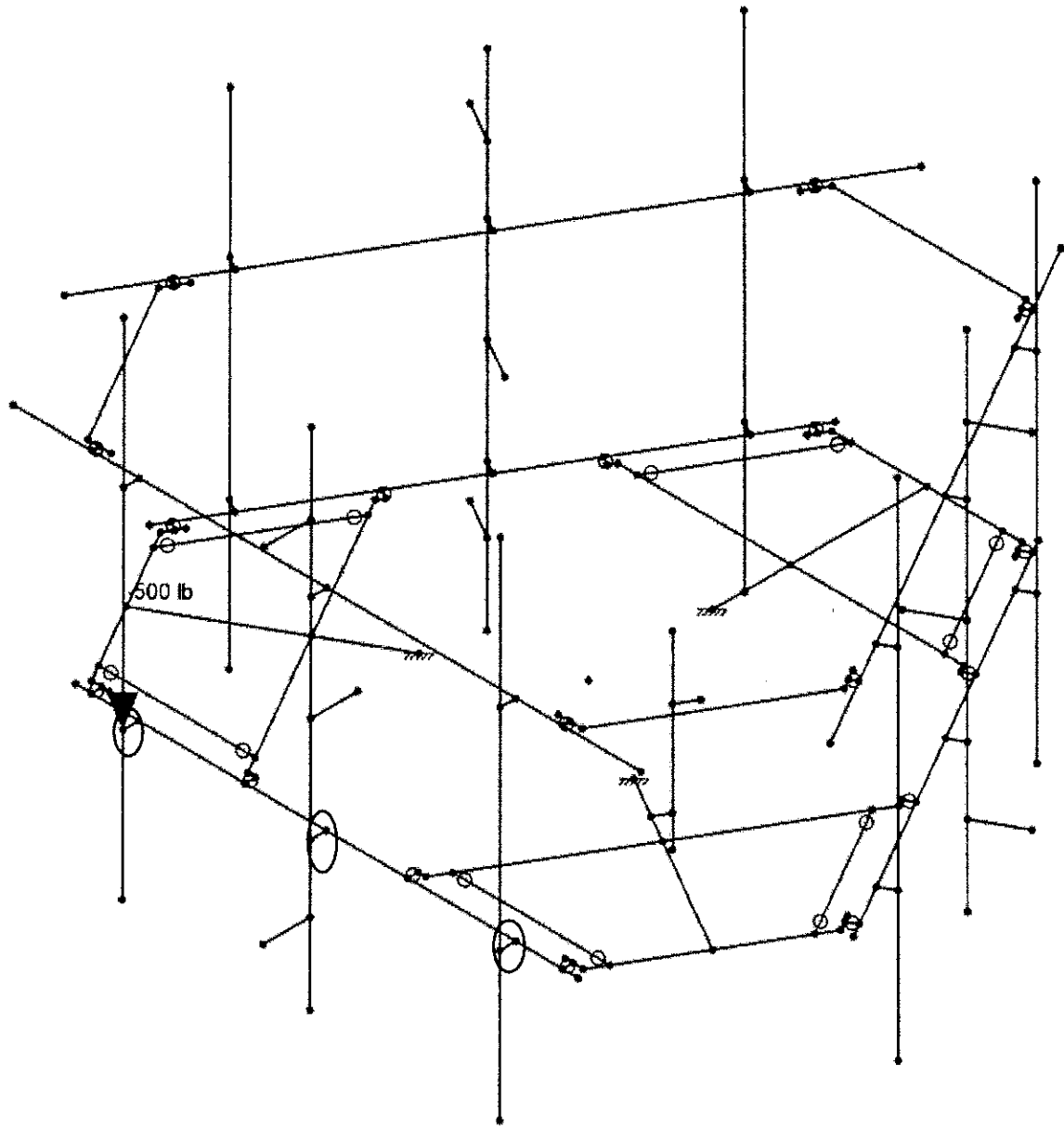
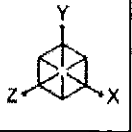
Loads: BLC 7, ELv



Loads: BLC 8, ELh

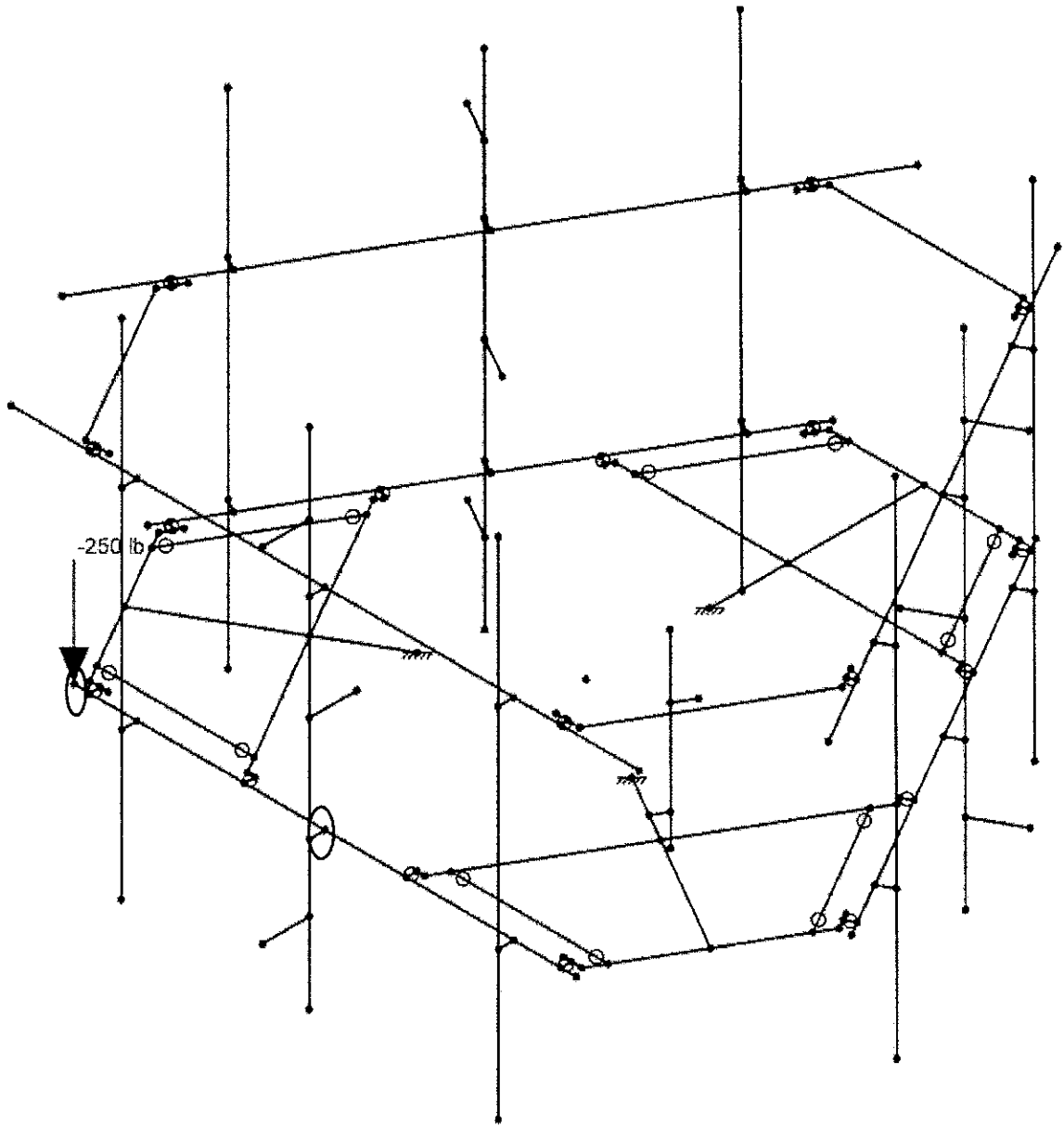
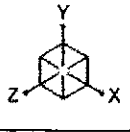


Loads: BLC 9, WLX (MAINT)



*500 lbs man load, typ of 3

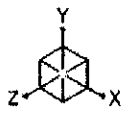
Loads: BLC 11, Lm1



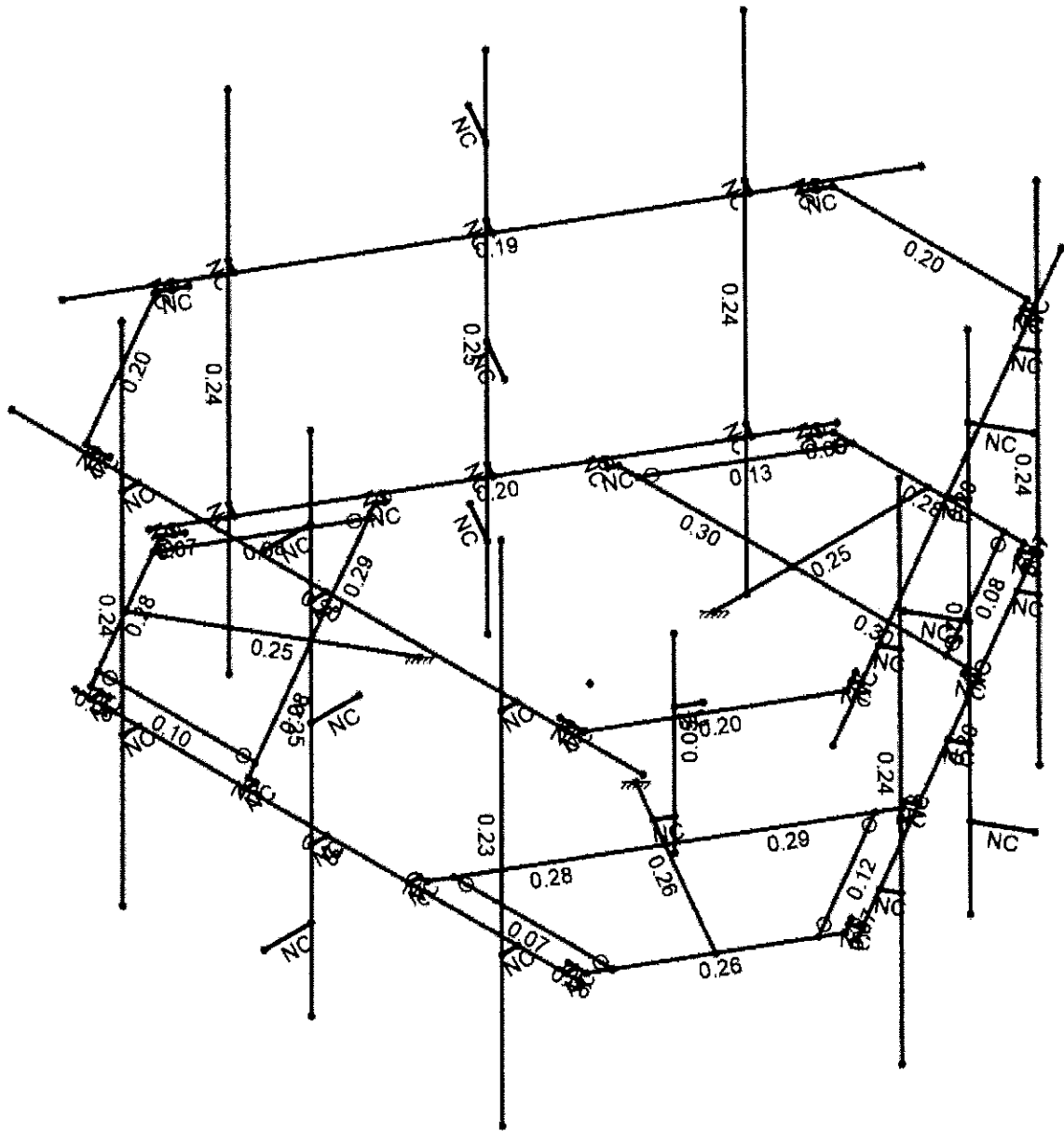
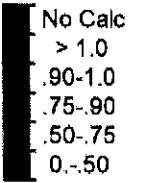
*250 lbs vertical load, typ of 2

Loads: BLC 14, Lv1

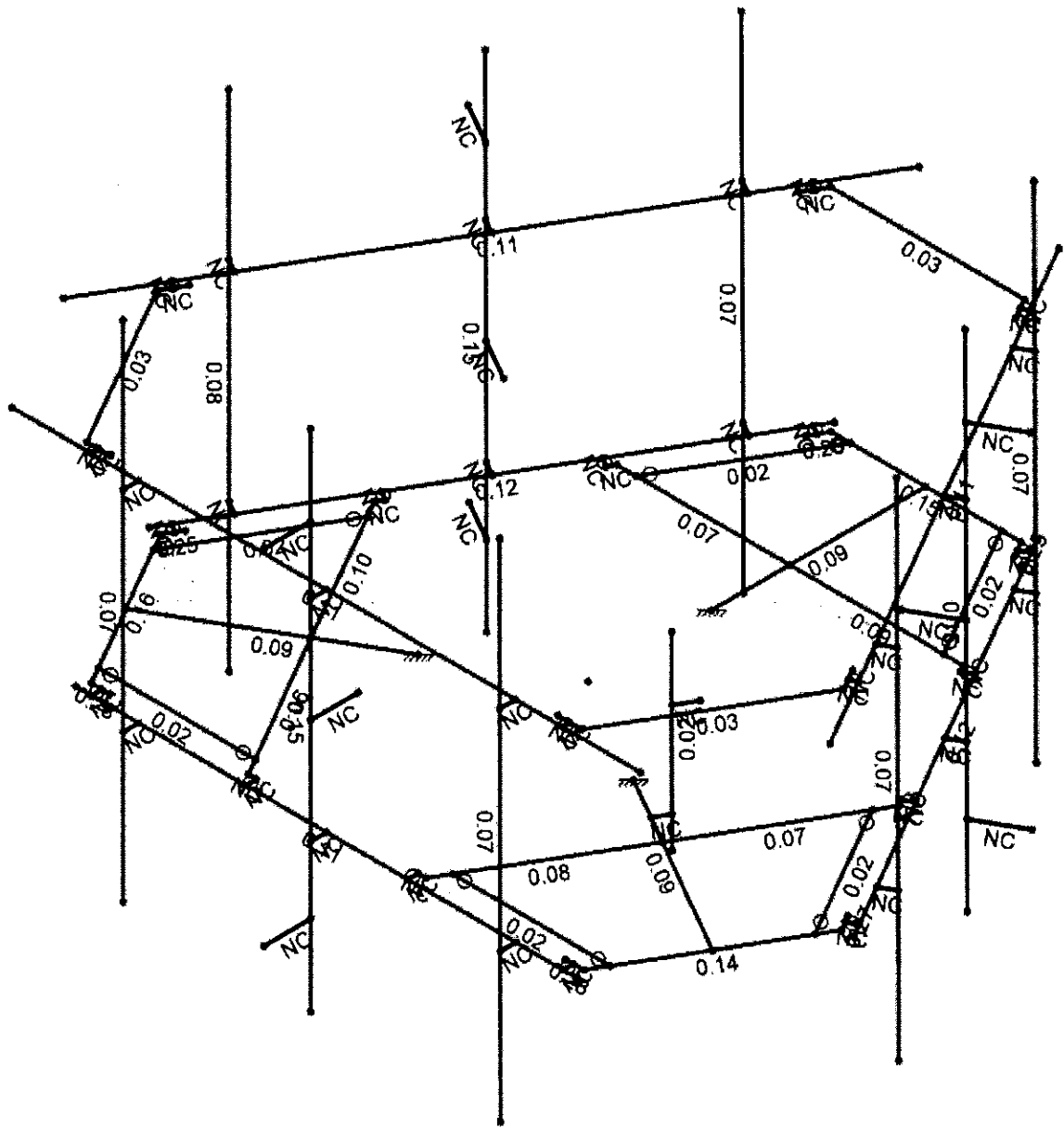
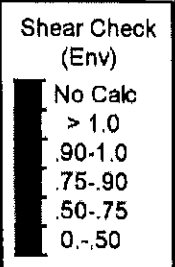
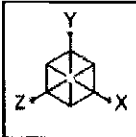
APPENDIX C
SOFTWARE ANALYSIS OUTPUT



Code Check (Env)



Member Code Checks Displayed (Enveloped)
Envelope Only Solution



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [$1e^{-5}F^{-1}$]	Density [k/ft ³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
7	A1085	29000	11154	0.3	0.65	0.49	50	1.4	65	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in ²]	Iyy [in ⁴]	Izz [in ⁴]	J [in ⁴]
1	Standoff End Plate 6.5"	PL6.5X0.375	Beam	RECT	A36 Gr.36	Typical	2.438	0.029	8.582	0.11
2	Standoff End Plate 6"	PLATE6X.37	Beam	RECT	A36 Gr.36	Typical	2.22	0.025	6.66	0.097
3	Grating Support Angle	L2X2X4	Beam	Single Angle	A36 Gr.36	Typical	0.944	0.346	0.346	0.021
4	Face Horizontal	PIPE3.5X0.165	Beam	Pipe	A53 Gr.B	Typical	1.729	2.409	2.409	4.819
5	Mount Pipe	PIPE 2.5	Column	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
6	Standoff Channel	C3.38X2.06X0.25	Beam	Channel	A36 Gr.36	Typical	1.75	0.715	3.026	0.034
7	Standoff	HSS4X4X6	Beam	SquareTube	A500 Gr.B Rect	Typical	4.78	10.3	10.3	17.5
8	Rail Connector	L6.6X4.46X0.25	Beam	Single Angle	A36 Gr.36	Typical	2.703	4.759	12.473	0.055
9	Railing	PIPE 2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
10	OVP Pipe	PIPE 2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Member)
1	DL	DL				10			
2	WLX	WLX				10		44	
3	WLZ	WLZ				10		44	
4	DLi	OL1				10		44	3
5	WLXi	WLX				10		44	
6	WLZi	WLZ				10		44	
7	ELv	ELY		-0.047		10			
8	ELh	ELZ	-0.2		-0.2	20			
9	WLX (MAINT)	WL+X				10		44	
10	WLZ (MAINT)	WL+Z				10		44	
11	Lm1	OL1				1			
12	Lm2	OL2				1			
13	Lm3	OL3				1			
14	Lv1	OL4					1		
15	Lv2	OL5					1		
16	DL (Strd)	OL6		-1.05					3
17	BLC 4 Transient Area Loads	None						18	
18	BLC 16 Transient Area Loads	None						18	

Load Combinations

	Description	Solve P-Delta	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor
1	**LRFD**								
2	1.4D	Yes	Y	1	1.4	16	1.4		
3	1.2D+(WLX+WLZ) - 0 Deg	Yes	Y	1	1.2	2	1	16	1.2
4	1.2D+(WLX+WLZ) - 30 Deg	Yes	Y	1	1.2	2	0.866	3	0.5
5	1.2D+(WLX+WLZ) - 60 Deg	Yes	Y	1	1.2	2	0.5	3	0.866
6	1.2D+(WLX+WLZ) - 90 Deg	Yes	Y	1	1.2	2		3	1
7	1.2D+(WLX+WLZ) - 120 Deg	Yes	Y	1	1.2	2	-0.5	3	0.866

Load Combinations (Continued)

Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
8 1.2D+(WLX+WLZ) - 150 Deg	Yes	Y	1	1.2	2	-0.866	3	0.5	16	1.2		
9 1.2D+(WLX+WLZ) - 180 Deg	Yes	Y	1	1.2	2	-1	3		16	1.2		
10 1.2D+(WLX+WLZ) - 210 Deg	Yes	Y	1	1.2	2	-0.866	3	-0.5	16	1.2		
11 1.2D+(WLX+WLZ) - 240 Deg	Yes	Y	1	1.2	2	-0.5	3	-0.866	16	1.2		
12 1.2D+(WLX+WLZ) - 270 Deg	Yes	Y	1	1.2	2		3	-1	16	1.2		
13 1.2D+(WLX+WLZ) - 300 Deg	Yes	Y	1	1.2	2	0.5	3	-0.866	16	1.2		
14 1.2D+(WLX+WLZ) - 330 Deg	Yes	Y	1	1.2	2	0.866	3	-0.5	16	1.2		
15 **Wind Load with Ice**												
16 1.2D+1.0Di+1.0(WLXi+WLZi) - 0 Deg	Yes	Y	1	1.2	4	1	5	1	6		16	1.2
17 1.2D+1.0Di+1.0(WLXi+WLZi) - 30 Deg	Yes	Y	1	1.2	4	1	5	0.866	6	0.5	16	1.2
18 1.2D+1.0Di+1.0(WLXi+WLZi) - 60 Deg	Yes	Y	1	1.2	4	1	5	0.5	6	0.866	16	1.2
19 1.2D+1.0Di+1.0(WLXi+WLZi) - 90 Deg	Yes	Y	1	1.2	4	1	5		6	1	16	1.2
20 1.2D+1.0Di+1.0(WLXi+WLZi) - 120 Deg	Yes	Y	1	1.2	4	1	5	-0.5	6	0.866	16	1.2
21 1.2D+1.0Di+1.0(WLXi+WLZi) - 150 Deg	Yes	Y	1	1.2	4	1	5	-0.866	6	0.5	16	1.2
22 1.2D+1.0Di+1.0(WLXi+WLZi) - 180 Deg	Yes	Y	1	1.2	4	1	5	-1	6		16	1.2
23 1.2D+1.0Di+1.0(WLXi+WLZi) - 210 Deg	Yes	Y	1	1.2	4	1	5	-0.866	6	-0.5	16	1.2
24 1.2D+1.0Di+1.0(WLXi+WLZi) - 240 Deg	Yes	Y	1	1.2	4	1	5	-0.5	6	-0.866	16	1.2
25 1.2D+1.0Di+1.0(WLXi+WLZi) - 270 Deg	Yes	Y	1	1.2	4	1	5		6	-1	16	1.2
26 1.2D+1.0Di+1.0(WLXi+WLZi) - 300 Deg	Yes	Y	1	1.2	4	1	5	0.5	6	-0.866	16	1.2
27 1.2D+1.0Di+1.0(WLXi+WLZi) - 330 Deg	Yes	Y	1	1.2	4	1	5	0.866	6	-0.5	16	1.2
28 **Seismic Load**												
29 1.2D+ELv+ELh	Yes	Y	1	1.2	7	1	8	1	16	1.2		
30 **Maintenance Load (With Service Load)** Location 1												
31 1.2D+1.5Lm1+1.0WLX (service)	Yes	Y	1	1.2	11	1.5	9	1	10		16	1.2
32 1.2D+1.5Lm1+1.0WLZ (service)	Yes	Y	1	1.2	11	1.5	9		10	1	16	1.2
33 1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 0 Deg	Yes	Y	1	1.2	11	1.5	9	1	10		16	1.2
34 1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 30 Deg	Yes	Y	1	1.2	11	1.5	9	0.87	10	0.5	16	1.2
35 1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 60 Deg	Yes	Y	1	1.2	11	1.5	9	0.5	10	0.87	16	1.2
36 1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 90 Deg	Yes	Y	1	1.2	11	1.5	9		10	1	16	1.2
37 1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 120 Deg	Yes	Y	1	1.2	11	1.5	9	-0.5	10	0.87	16	1.2
38 1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 150 Deg	Yes	Y	1	1.2	11	1.5	9	-0.87	10	0.5	16	1.2
39 1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 180 Deg	Yes	Y	1	1.2	11	1.5	9	-1	10		16	1.2
40 1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 210 Deg	Yes	Y	1	1.2	11	1.5	9	-0.87	10	-0.5	16	1.2
41 1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 240 Deg	Yes	Y	1	1.2	11	1.5	9	-0.5	10	-0.87	16	1.2
42 1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 270 Deg	Yes	Y	1	1.2	11	1.5	9		10	-1	16	1.2
43 1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 300 Deg	Yes	Y	1	1.2	11	1.5	9	0.5	10	-0.87	16	1.2
44 1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 330 Deg	Yes	Y	1	1.2	11	1.5	9	0.87	10	-0.5	16	1.2
45 **Maintenance Load (With Service Load)** Location 2												
46 1.2D+1.5Lm2+1.0WLX (service)	Yes	Y	1	1.2	12	1.5	9	1	10		16	1.2
47 1.2D+1.5Lm2+1.0WLZ (service)	Yes	Y	1	1.2	12	1.5	9		10	1	16	1.2
48 1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 0 Deg	Yes	Y	1	1.2	12	1.5	9	1	10		16	1.2
49 1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 30 Deg	Yes	Y	1	1.2	12	1.5	9	0.87	10	0.5	16	1.2
50 1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 60 Deg	Yes	Y	1	1.2	12	1.5	9	0.5	10	0.87	16	1.2
51 1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 90 Deg	Yes	Y	1	1.2	12	1.5	9		10	1	16	1.2
52 1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 120 Deg	Yes	Y	1	1.2	12	1.5	9	-0.5	10	0.87	16	1.2
53 1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 150 Deg	Yes	Y	1	1.2	12	1.5	9	-0.87	10	0.5	16	1.2
54 1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 180 Deg	Yes	Y	1	1.2	12	1.5	9	-1	10		16	1.2
55 1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 210 Deg	Yes	Y	1	1.2	12	1.5	9	-0.87	10	-0.5	16	1.2
56 1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 240 Deg	Yes	Y	1	1.2	12	1.5	9	-0.5	10	-0.87	16	1.2
57 1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 270 Deg	Yes	Y	1	1.2	12	1.5	9		10	-1	16	1.2
58 1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 300 Deg	Yes	Y	1	1.2	12	1.5	9	0.5	10	-0.87	16	1.2
59 1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 330 Deg	Yes	Y	1	1.2	12	1.5	9	0.87	10	-0.5	16	1.2
60 **Maintenance Load (With Service Load)** Location 3												
61 1.2D+1.5Lm3+1.0WLX (service)	Yes	Y	1	1.2	13	1.5	9	1	10		16	1.2
62 1.2D+1.5Lm3+1.0WLZ (service)	Yes	Y	1	1.2	13	1.5	9		10	1	16	1.2

Load Combinations (Continued)

Description	Solve	P-Delta	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor
63 1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 0 Deg	Yes	Y	1	1.2	13	1.5	9	1	10		16	1.2
64 1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 30 Deg	Yes	Y	1	1.2	13	1.5	9	0.87	10	0.5	16	1.2
65 1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 60 Deg	Yes	Y	1	1.2	13	1.5	9	0.5	10	0.87	16	1.2
66 1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 90 Deg	Yes	Y	1	1.2	13	1.5	9		10	1	16	1.2
67 1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 120 Deg	Yes	Y	1	1.2	13	1.5	9	-0.5	10	0.87	16	1.2
68 1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 150 Deg	Yes	Y	1	1.2	13	1.5	9	-0.87	10	0.5	16	1.2
69 1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 180 Deg	Yes	Y	1	1.2	13	1.5	9	-1	10		16	1.2
70 1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 210 Deg	Yes	Y	1	1.2	13	1.5	9	-0.87	10	-0.5	16	1.2
71 1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 240 Deg	Yes	Y	1	1.2	13	1.5	9	-0.5	10	-0.87	16	1.2
72 1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 270 Deg	Yes	Y	1	1.2	13	1.5	9		10	-1	16	1.2
73 1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 300 Deg	Yes	Y	1	1.2	13	1.5	9	0.5	10	-0.87	16	1.2
74 1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 330 Deg	Yes	Y	1	1.2	13	1.5	9	0.87	10	-0.5	16	1.2
75 ***Man Vertical Load***		Y										
76 1.2D+1.5Lv1	Yes	Y	1	1.2	14	1.5	16	1.2				
77 1.2D+1.5Lv2	Yes	Y	1	1.2	15	1.5	16	1.2				

Envelope Node Reactions

Node Label	X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1 N10 max	1304.112	14	1841.761	23	1970.382	7	0.758	3	2.284	13	4.261	10
2 N10 min	-1300.275	8	-47.267	4	-1966.343	13	-2.918	69	-2.279	7	-1.133	4
3 N53 max	1177.598	4	1793.199	14	1919.472	5	0.769	9	2.256	5	1.035	8
4 N53 min	-1184.492	10	-96.199	8	-1920.474	11	-2.918	31	-2.251	11	-4.085	14
5 N70 max	2135.521	3	1822.031	6	615.57	6	4.801	6	2.147	9	0.841	3
6 N70 min	-2132.638	9	-124.051	12	-627.493	12	-1.279	12	-2.142	3	-0.841	9
7 Totals max	4206.706	3	4780.337	26	4381.792	6						
8 Totals min	-4206.707	9	2591.363	7	-4381.791	12						

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

Member	Shape	Code Check	Loc [ft]	LC	Shear	Check	Loc [ft]	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1 M23	C3.38X2.06X0.25	0.303	0	6	0.073	2.464	z	7	47760.074	56700	2.203	5.752	1.675	H1-1b
2 M22	C3.38X2.06X0.25	0.295	2.75	6	0.093	0.286	z	11	47760.074	56700	2.203	5.752	1.611	H1-1b
3 M36	C3.38X2.06X0.25	0.294	2.75	14	0.097	0.286	z	7	47760.074	56700	2.203	5.752	1.609	H1-1b
4 M7	C3.38X2.06X0.25	0.292	0	10	0.069	2.464	z	11	47760.074	56700	2.203	5.752	1.674	H1-1b
5 M37	C3.38X2.06X0.25	0.279	0	14	0.063	2.464	z	14	47760.074	56700	2.203	5.752	1.672	H1-1b
6 M8	C3.38X2.06X0.25	0.278	2.75	10	0.084	0.286	z	3	47760.074	56700	2.203	5.752	1.614	H1-1b
7 M33	PL6.5X0.375	0.277	1.5	13	0.159	3	y	7	4979.135	78975	0.617	9.063	1.382	H1-1b
8 M19	PL6.5X0.375	0.275	1.5	7	0.153	3	y	11	4979.135	78975	0.617	8.993	1.371	H1-1b
9 M4	PL6.5X0.375	0.263	1.5	11	0.139	0	y	3	4979.135	78975	0.617	9.022	1.376	H1-1b
10 M6	HSS4X4X6	0.259	3.417	11	0.091	2.634	y	68	187775.062	197892	22.046	22.046	1.902	H1-1b
11 M105	PIPE 2.5	0.254	5.667	13	0.155	4	y	13	30038.461	50715	3.596	3.596	1	H1-1b
12 M35	HSS4X4X6	0.254	3.417	13	0.091	3.417	y	34	187775.062	197892	22.046	22.046	1.853	H1-1b
13 M93	PIPE 2.5	0.253	5.667	5	0.154	4	y	5	30038.461	50715	3.596	3.596	1	H1-1b
14 M21	HSS4X4X6	0.251	3.417	5	0.085	3.417	z	3	187775.062	197892	22.046	22.046	1.851	H1-1b
15 M75	PIPE 2.5	0.248	5.667	9	0.15	4	y	9	30038.461	50715	3.596	3.596	1	H1-1b
16 M98	PIPE 2.5	0.244	5.667	7	0.074	5.667	y	9	30038.461	50715	3.596	3.596	1	H1-1b
17 M99	PIPE 2.5	0.241	5.667	13	0.076	5.667	y	11	30038.461	50715	3.596	3.596	1	H1-1b
18 M85	PIPE 2.5	0.239	5.667	11	0.074	5.667	y	13	30038.461	50715	3.596	3.596	1	H1-1b
19 M87	PIPE 2.5	0.238	5.667	5	0.072	5.667	y	3	30038.461	50715	3.596	3.596	1	H1-1b
20 M72	PIPE 2.5	0.235	5.667	3	0.074	5.667	y	5	30038.461	50715	3.596	3.596	1	H1-1b
21 M69	PIPE 2.5	0.234	5.667	9	0.075	5.667	y	7	30038.461	50715	3.596	3.596	1	H1-1b
22 M45	PIPE3.5X0.165	0.204	5.333	7	0.122	2.75	y	7	38821.879	54463.5	4.822	4.822	1	H1-1b
23 M62	L6.6X4.46X0.25	0.204	3.06	3	0.03	3.06	y	13	51620.642	87561	2.465	7.125	1.334	H2-1
24 M61	L6.6X4.46X0.25	0.203	0	9	0.031	0	y	5	51620.642	87561	2.465	7.125	1.33	H2-1



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

Member	Shape	Code	Check	Loc[ft]	LC	Shear	Check	Loc[ft]	Dir	LC	phi*	Pnc [lb]	phi*	Pnt [lb]	phi*	Mn y-y [k-ft]	phi*	Mn z-z [k-ft]	Cb	Eqn
25	M63	L6.6X4.46X0.25	0.198	3.06	11	0.029	3.06	y	9	51620.642	87561	2.465	7.125	1.318	H2-1					
26	M16	PIPE3.5X0.165	0.197	2.667	11	0.12	5.25	11	38821.879	54463.5	4.822	4.822	1	H1-1b						
27	M46	PIPE 2.5	0.197	2.083	3	0.112	7.917	10	22373.407	50715	3.596	3.596	1	H1-1b						
28	M47	PIPE 2.5	0.196	7.917	5	0.114	2.083	10	22373.407	50715	3.596	3.596	1	H1-1b						
29	M48	PIPE 2.5	0.193	2.083	7	0.113	2.083	6	22373.407	50715	3.596	3.596	1	H1-1b						
30	M1	PIPE3.5X0.165	0.18	5.333	3	0.115	5.25	9	38821.879	54463.5	4.822	4.822	1	H1-1b						
31	M29	L2X2X4	0.126	0	13	0.018	0	z	16	22280.388	30585.6	0.691	1.577	1.17	H2-1					
32	M15	L2X2X4	0.117	0	5	0.019	2.502	z	69	22280.388	30585.6	0.691	1.577	1.158	H2-1					
33	M43	L2X2X4	0.105	0	9	0.018	0	z	24	22280.388	30585.6	0.691	1.577	1.163	H2-1					
34	M44	L2X2X4	0.083	0	13	0.022	2.502	y	6	22280.388	30585.6	0.691	1.577	1.5	H2-1					
35	M30	L2X2X4	0.08	0	5	0.022	2.502	y	10	22280.388	30585.6	0.691	1.577	1.5	H2-1					
36	M34	PLATE6X.37	0.071	0.164	6	0.247	0	y	13	67974.739	71928	0.554	8.991	1.495	H1-1b					
37	M14	L2X2X4	0.07	0	9	0.021	2.502	y	14	22280.388	30585.6	0.691	1.577	1.5	H2-1					
38	M5	PLATE6X.37	0.067	0.164	6	0.275	0	y	11	67974.739	71928	0.554	8.991	2.914	H1-1b					
39	M20	PLATE6X.37	0.066	0.164	10	0.246	0	y	5	67974.739	71928	0.554	8.991	1.495	H1-1b					
40	M18	PLATE6X.37	0.063	0.128	14	0.277	0.292	y	7	67974.739	71928	0.554	8.991	3	H1-1b					
41	M32	PLATE6X.37	0.06	0.128	10	0.28	0.292	y	33	67974.739	71928	0.554	8.991	2.713	H1-1b					
42	M3	PLATE6X.37	0.06	0.128	14	0.28	0.292	y	69	67974.739	71928	0.554	8.991	1.513	H1-1b					
43	M65	PIPE 2.5	0.049	0.5	7	0.017	0.5	10	47114.007	50715	3.596	3.596	1	H1-1b						

The maximum member stress is at 30% of its capacity, therefore the proposed mount will have sufficient capacity to support the proposed load configurations upon installations.

APPENDIX D
ADDITIONAL CALCULATIONS

Connection Details	
Bolt Details	
Bolt Quantity =	4
Bolt Diameter =	0.875 in
Vertical Spacing =	2 in
Horizontal Spacing =	2 in
Bolt Grade =	A325
Bolt F _u , if "Other" =	58 ksi

Loading Details	
Node N70, LC5	
Shear, X =	1.054 k
Shear, Y =	1.057 k
Tension, Z =	0.71 k
Mx =	0.48 k-ft
My =	0.105 k-ft
Torsion, Mz =	0.00 k-ft

1 - Tensile Capacity

$$R_{nt} = F_{nt} A_b \quad \text{AISC [Eqn. J3-1]}$$

$\Phi =$	0.75
$F_{nt} =$	90 ksi
$A_b =$	0.307 in ²
$\Phi R_{nt} =$	20.72 k
$T_{max} =$	4.85 k

AISC [Table J3.2]

$\Phi R_{nt} > T_{max}$

23%

OK

2 - Shear Capacity

$$R_{nv} = F_{nv} A_b \quad \text{AISC [Eqn. J3-1]}$$

$\Phi =$	0.75
$F_{nv} =$	54 ksi
$A_b =$	0.307 in ²
$\Phi R_{nv} =$	12.43 k
$V_{max} =$	0.75 k

AISC [Table J3.2]

$\Phi R_{nv} > V_{max}$

23%

OK

3 - Combined Tension and Shear Capacity

$$R'_{nt} = F'_{nt} A_b \quad \text{AISC [Eqn. J3-2]}$$

$$F'_{nt} = 1.3F_{nt} - \frac{F_{nt}}{\Phi F_{nv}} f_{rv} \leq F_{nt} \quad \text{AISC [Eqn. J3-3a]}$$

$\Phi =$	0.75
$F'_{nt} =$	90 ksi
$A_b =$	0.307 in ²
$\Phi R'_{nt} =$	20.72 k
$T_{max} =$	4.85 k

$\Phi R'_{nt} > T_{max}$

23%

OK

Connection Details	
Weld Details	
Weld Type	E7018
# of Sides	2
Electrodes	XX
Size of Weld =	0.25 in
HSS Height =	0.875 in
HSS Width =	0.75 in
HSS Thickness =	0.093 in
Plate Details	
Height/Width =	0.80 in
Thickness =	0.125 in
F _y =	50 ksi

4 - Weld Capacity

$$F_{nw} = 0.6F_{EXX}$$

$\Phi =$	0.75
$\Phi F_{nw} =$	63.00 ksi
$f_{v,max} =$	1.220 ksi
$f_{b,max} =$	15.19 ksi

AISC [Table J2.5]

$$\text{Min}(\Phi F_{nw}, \Phi F_{nbm}) > \sqrt{(f_{v,max} + f_{m,max})}$$

19.3

OK

5 - Plate Capacity

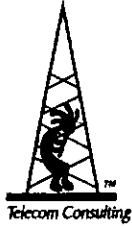
$\Phi =$	0.9
$\Phi F_{byy} =$	45.00 ksi
$f_b =$	14.07 ksi

$$\Phi F_{byy} > F_b$$

19.3

OK

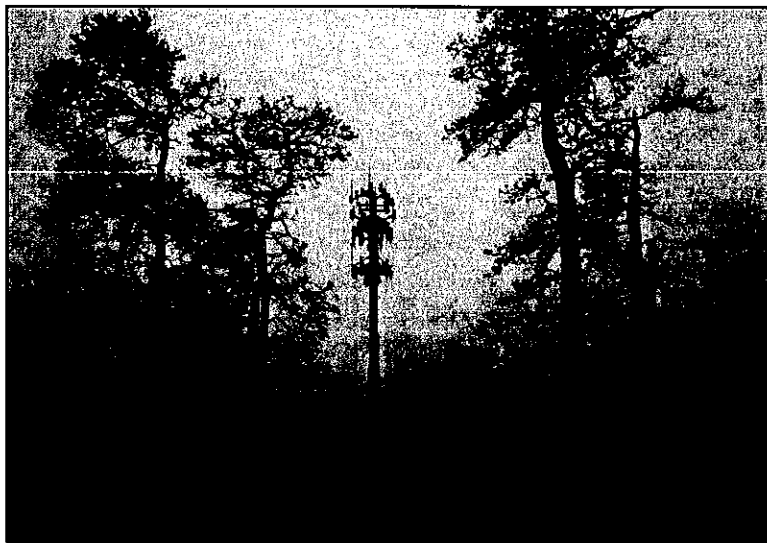
Exhibit F
Emissions Report



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: NJJER01114A

SITE ADDRESS: 100 REEF ROAD
FAIRFIELD, CT

LATITUDE: N 41.139569

LONGITUDE: W 73.257347

STRUCTURE TYPE: Rooftop

REPORT DATE: April 17, 2023

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

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INTRODUCTION AND SUMMARY	3
ANTENNA AND TRANSMISSION DATA	5
COMPLIANCE ANALYSIS	11
COMPLIANCE CONCLUSION	19

CERTIFICATION

APPENDIX A. DOCUMENTS USED TO PREPARE THE ANALYSIS

APPENDIX B. BACKGROUND ON THE FCC MPE LIMIT

APPENDIX C. PROPOSED SIGNAGE

APPENDIX D. SUMMARY OF EXPERT QUALIFICATIONS

INTRODUCTION AND SUMMARY

At the request of DISH Wireless LLC (“DISH”), Pinnacle Telecom Group has performed an independent assessment of radiofrequency (RF) levels and related FCC compliance for proposed wireless base station antenna operations on an existing monopole located at 100 Reef Road in Fairfield, CT. DISH refers to the antenna site by the code “NJJER01114A”, 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 wireless system 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 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 and the Town of Fairfield. 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 mathematical analyses of potential RF exposure levels associated with the antennas. The analyses both at street level and on the adjacent roof employ standard FCC mathematical models 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 around the site, the conservatively calculated maximum RF level from the combination of proposed and existing antenna operations is 7.6885 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 – even intentionally and significantly overstated by the calculations – is still more than 13 times below the FCC limit for safe, continuous exposure of the general public.
- A supplemental analysis of the RF levels on the subject rooftop in the vicinity of the DISH antennas yields a worst-case result of 0.09 percent of the FCC general population MPE limit.
- Calculated RF levels in front of the DISH antennas, at the same height as the antennas, indicate that the FCC MPE limit is exceeded. The maximum calculated RF level at the same height as the antennas is 3,005.11 percent of the FCC general population MPE limit.
- Per DISH guidelines and consistent with FCC guidance on rooftop compliance, three Caution signs and NOC Information signs are to be installed at the base of the monopole. In addition, NOC Information signs and Guidelines signs are to be installed at the roof access point(s).
- 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 existing antenna operations;

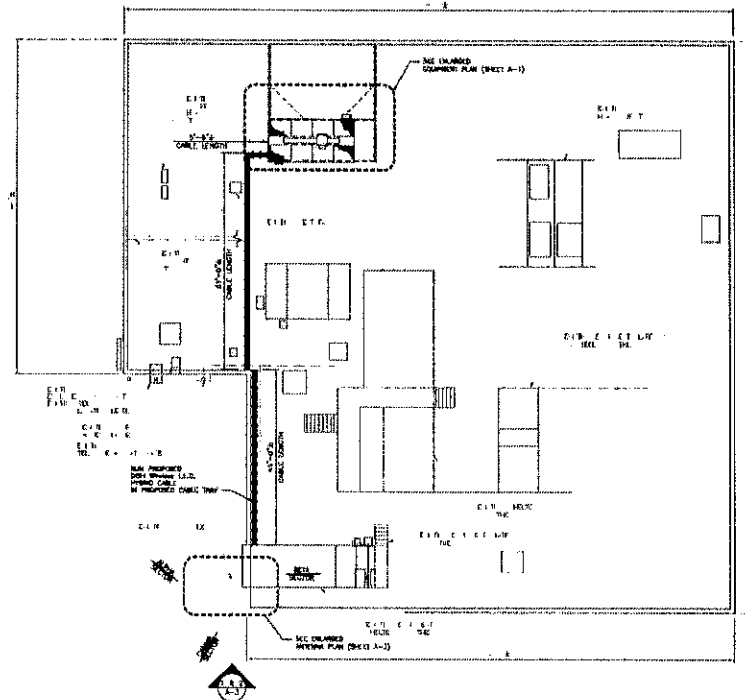
- a description of the applicable FCC mathematical model for calculating RF levels, and application of the relevant technical data to that model;
- analysis of the results of the calculations against the FCC MPE limit, and the compliance conclusion for the site.

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.

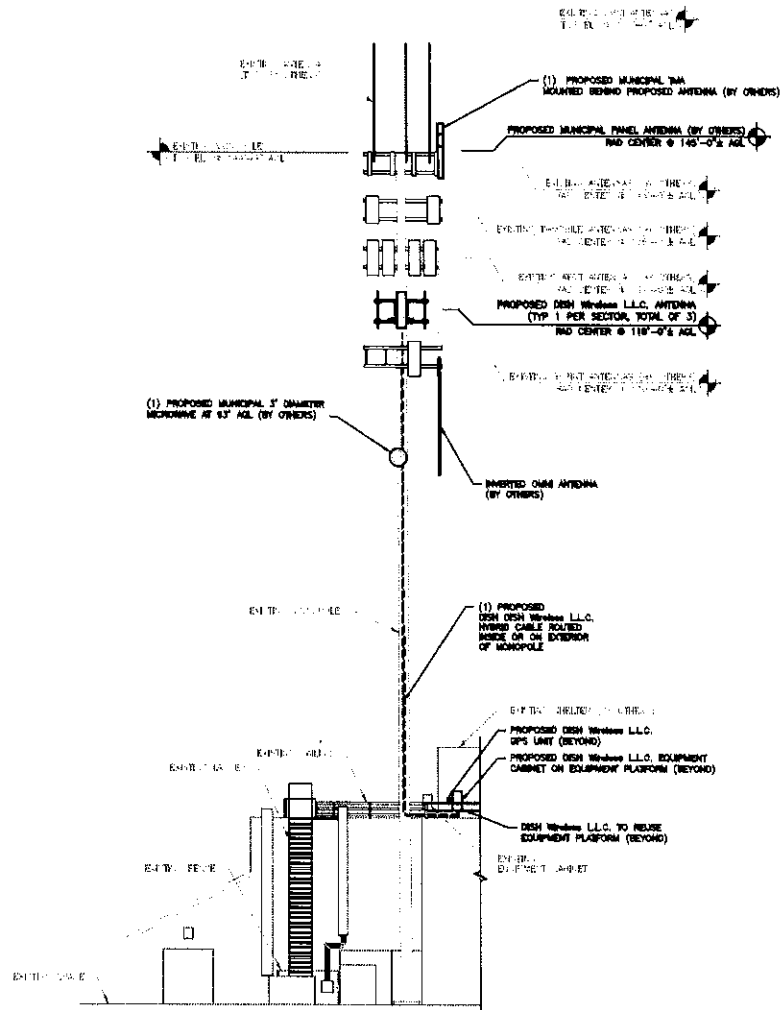
ANTENNA AND TRANSMISSION DATA

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 (m)	Ant. Gain (dBi)	BW	Azimuth	EDT	MDT
1	DISH	Commscope	FFV-65B-R2	Panel	600	6	120	2110	118.0	12.46	64	70	10	0
2	DISH	Commscope	FFV-65B-R2	Panel	2000	6	160	7396	118.0	16.66	67	70	2	0
3	DISH	Commscope	FFV-65B-R2	Panel	2100	6	160	7396	118.0	16.66	67	70	2	0
4	DISH	Commscope	FFV-65B-R2	Panel	600	6	120	2110	118.0	12.46	64	190	8.5	0
5	DISH	Commscope	FFV-65B-R2	Panel	2000	6	160	7396	118.0	16.66	67	190	3	0
6	DISH	Commscope	FFV-65B-R2	Panel	2100	6	160	7396	118.0	16.66	67	190	3	0
7	DISH	Commscope	FFV-65B-R2	Panel	600	6	120	2110	118.0	12.46	64	330	7.5	0
8	DISH	Commscope	FFV-65B-R2	Panel	2000	6	160	7396	118.0	16.66	67	330	3	0
9	DISH	Commscope	FFV-65B-R2	Panel	2100	6	160	7396	118.0	16.66	67	330	3	0

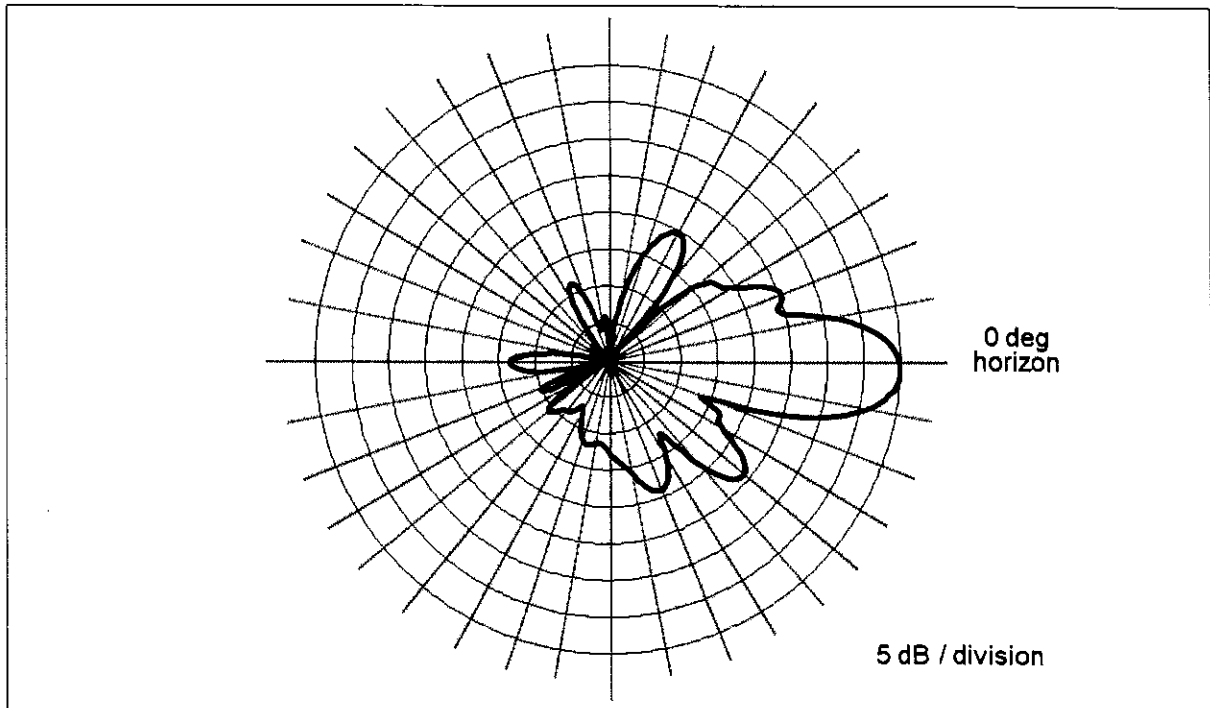
The area below the antennas, at street level, is of interest in terms of potential “uncontrolled” exposure of the general public, so the antenna’s vertical-plane emission characteristic is used in the calculations, as it is a key determinant of the relative amount of RF emissions in the “downward” direction.

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

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

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

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



As noted at the outset, there are existing antenna operations to include in the compliance assessment. For each of the wireless operators, we will conservatively assume operation with maximum channel capacity and at maximum transmitter power per channel to be used by each wireless operator in each of their respective FCC-licensed frequency bands. For the other operator, we will rely on the transmission parameters in its associated 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 (dBi)	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
Town of Fairfield	Generic	Generic	Omnidirectional	46	92	0.00	N/A
Town of Fairfield	Generic	Generic	Omnidirectional	460	125	3.00	N/A
Town of Fairfield	Generic	Generic	Omnidirectional	470	100	3.00	N/A
Town of Fairfield	Generic	Generic	Omnidirectional	853	63	9.00	N/A

*Generic antenna patterns have been used from a library of panel, omnidirectional, microwave and broadcast patterns that are representative of the actual antenna.

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 MPE compliance calculations from any given wireless antenna operation is as follows:

$$\text{MPE\%} = (100 * \text{TxPower} * 10^{(G_{\text{max}} - V_{\text{disc}})/10} * 4) / (\text{MPE} * 4\pi * R^2)$$

where

MPE%	=	RF level, expressed as a percentage of the FCC general population MPE limit
100	=	factor to convert the raw result to percentage form
TxPower	=	maximum net power into antenna sector, in milliwatts, a function of the number of channels per sector, the transmitter power per channel, and line loss

- $10^{(G_{max}-V_{disc})/10}$ = numeric equivalent of the relative antenna gain in the downward direction of interest, referenced to any applied antenna mechanical downtilt
- 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.

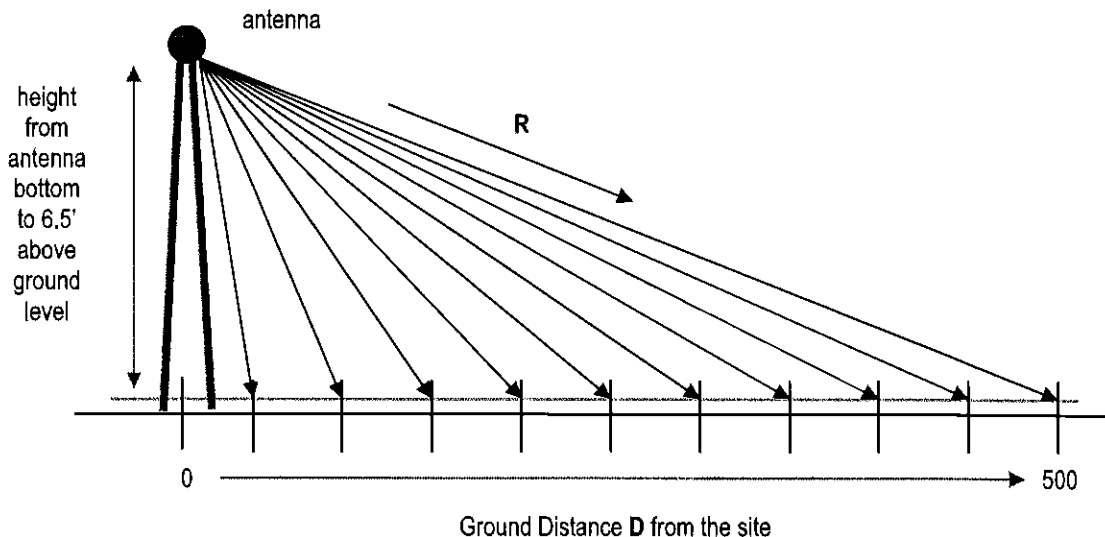


Figure 2. Street-level MPE% Calculation Geometry

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, 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.

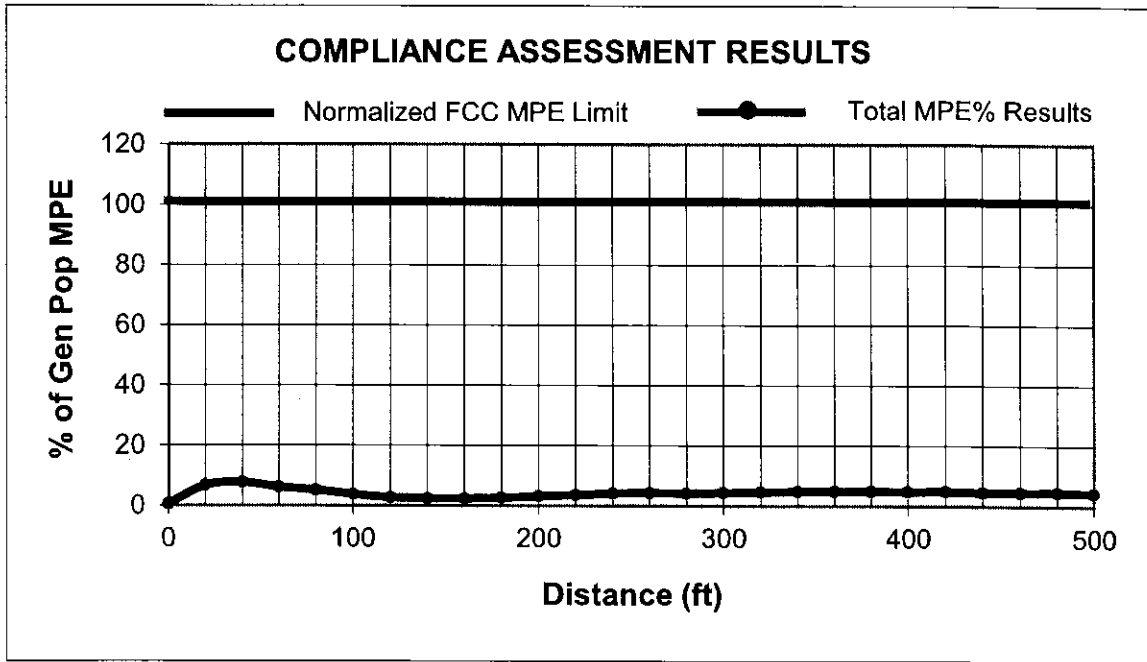
The net result of these assumptions is to intentionally and significantly overstate the calculated RF levels relative to the levels that will actually result from the antenna operations – and the purpose of this conservatism is to allow very “safe-side” conclusions about compliance.

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

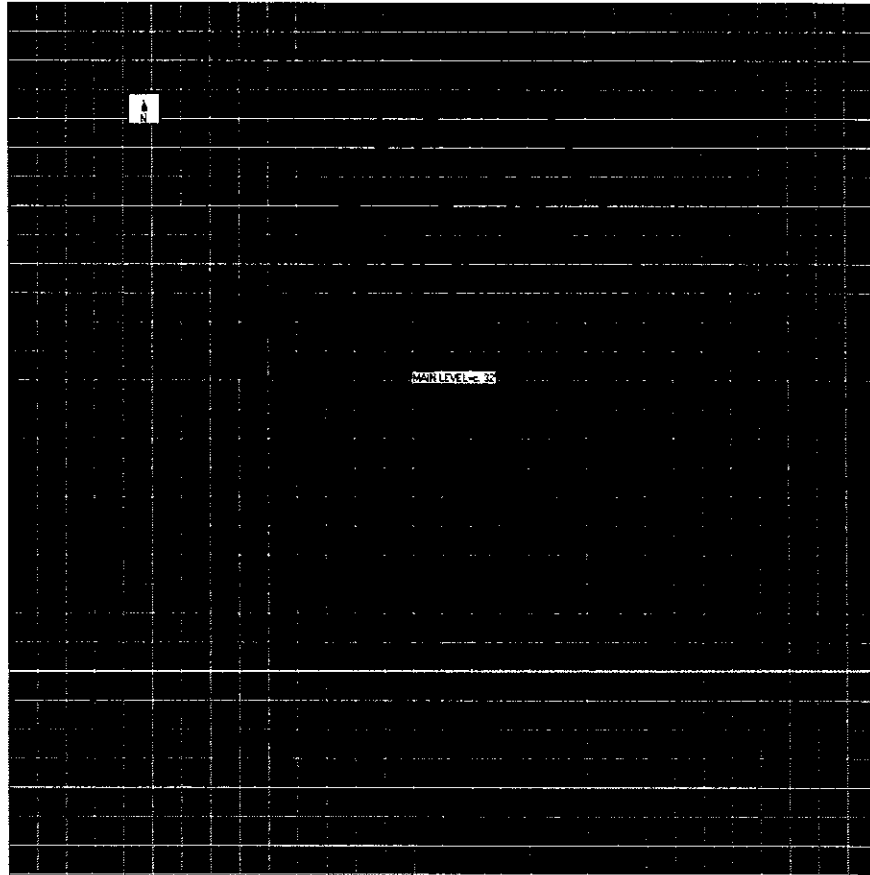
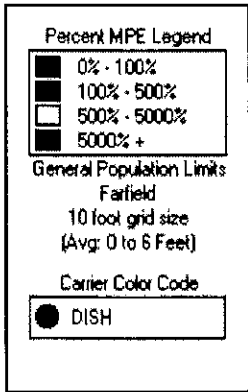
Ground Distance (ft)	DISH 600 MHz MPE%	DISH 2000 MHz MPE%	DISH 2100 MHz MPE%	AT&T MPE%	Sprint MPE%	T-Mobile MPE%	Town of Fairfield MPE%	Total MPE%
0	0.0096	0.0023	0.0005	0.0797	0.0389	0.2537	0.0096	0.3943
20	0.0043	0.0017	0.0059	0.0901	0.0143	0.3662	6.1931	6.6756
40	0.0580	0.0139	0.0159	0.1873	0.0176	0.6108	6.7850	7.6885
60	0.3294	0.0166	0.0966	0.2985	0.0554	0.8683	4.4253	6.0901
80	0.7112	0.1522	0.0517	0.4823	0.1009	0.6715	2.9348	5.1046
100	0.5695	0.1030	0.2128	0.3721	0.0857	0.3976	2.0265	3.7672
120	0.2464	0.1663	0.1936	0.1998	0.1221	0.3472	1.4414	2.7168
140	0.0748	0.0552	0.1792	0.2826	0.2482	0.4505	1.0678	2.3583
160	0.0741	0.0150	0.0044	0.5824	0.1519	0.6594	0.8460	2.3332
180	0.1328	0.0056	0.0548	0.7975	0.0614	0.8991	0.6819	2.6331
200	0.2893	0.0415	0.0313	0.8253	0.0673	1.3251	0.5671	3.1469
220	0.4635	0.0336	0.0793	0.7128	0.0944	1.6441	0.4929	3.5206
240	0.7067	0.0127	0.0439	0.5949	0.1134	2.2097	0.4286	4.1099
260	1.0086	0.0996	0.0317	0.4953	0.1176	2.1797	0.3821	4.3146
280	1.0998	0.1201	0.0679	0.3496	0.1089	1.9494	0.3461	4.0418
300	1.4085	0.0652	0.1000	0.2325	0.0698	2.0667	0.3156	4.2583
320	1.4650	0.0257	0.0650	0.1408	0.0325	2.4843	0.2972	4.5105
340	1.5008	0.0101	0.0294	0.1049	0.0217	2.7464	0.2793	4.6926
360	1.5172	0.0098	0.0095	0.1479	0.0414	2.7777	0.2599	4.7634
380	1.5094	0.0110	0.0031	0.2502	0.0751	2.7169	0.2434	4.8091
400	1.3723	0.0100	0.0028	0.3964	0.0682	2.6288	0.2307	4.7092
420	1.3485	0.0133	0.0048	0.5564	0.0920	2.5366	0.2185	4.7701
440	1.2998	0.0295	0.0201	0.5103	0.1061	2.3191	0.2084	4.4933
460	1.1950	0.0271	0.0185	0.6507	0.0974	2.2703	0.1961	4.4551
480	1.1357	0.0535	0.0494	0.7868	0.1194	2.2345	0.1844	4.5637
500	1.0507	0.0495	0.0457	0.7284	0.1104	2.0780	0.1741	4.2368

As indicated, the maximum calculated overall RF level is 7.6885 percent of the FCC MPE limit – well below the 100-percent reference for compliance.

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



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



RoofMaster – Alpha / Beta / Gamma sectors

Rooftop Analysis

The compliance analysis for the rooftop 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 areas surrounding the DISH antennas are reproduced on the pages that follow.

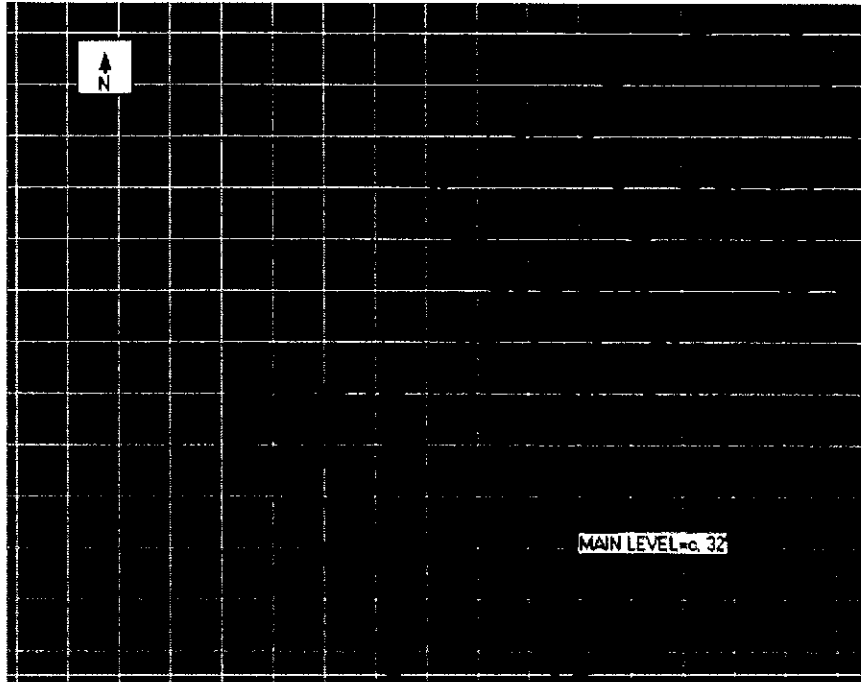
Percent MPE Legend

■	0% - 100%
■	100% - 500%
■	500% - 5000%
■	5000% +

General Population Limits
Sula 9
10 foot grid size
(Avg: 0 to 6 Feet)

Carrier Color Code

●	DISH
---	------



RoofMaster – Main Roof – Alpha / Beta / Gamma sectors

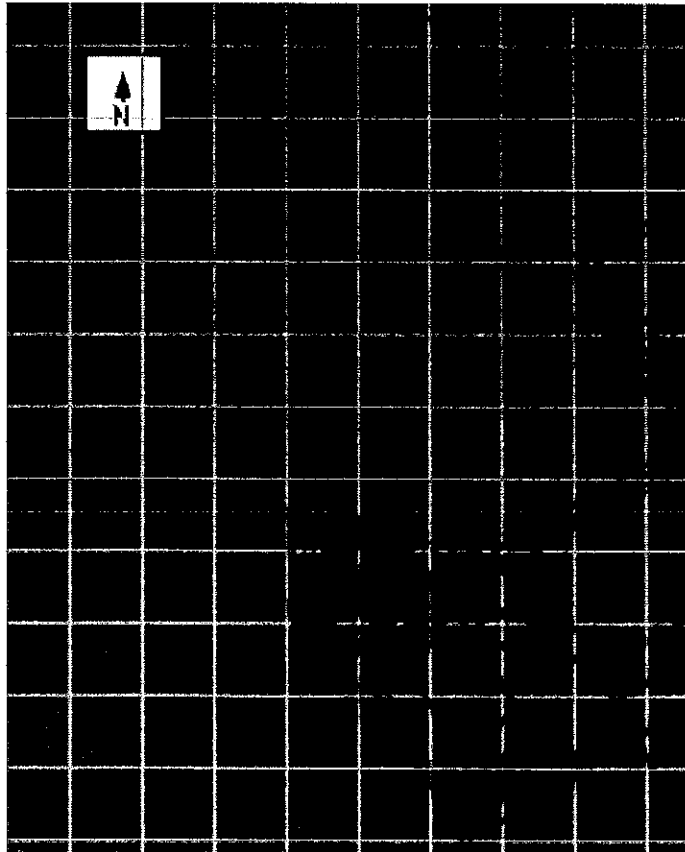
Percent MPE Legend

■	0% - 100%
■	100% - 500%
■	500% - 5000%
■	5000% +

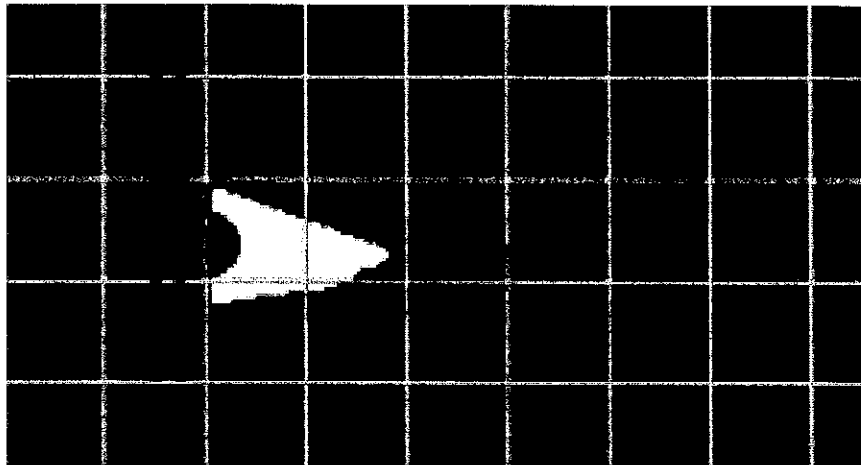
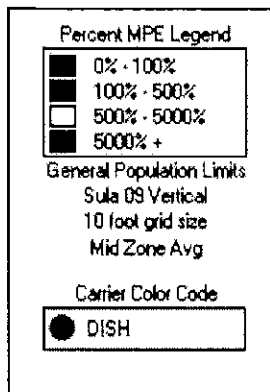
General Population Limits
Sula 09
10 foot grid size
(Avg: 89 to 95 Feet)

Carrier Color Code

●	DISH
---	------



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



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

As indicated by the color coding of the main roof, the calculated RF levels satisfy the FCC general population MPE limit. The maximum RF level in any accessible area near the DISH antennas is 0.09 percent of the FCC general population MPE limit. Emissions from the proposed DISH antenna operations do not contribute more than 5% to any other antenna operations at the site where the FCC MPE limit may be exceeded.

At the same height as the DISH antennas, the FCC general population is potentially exceeded. The maximum calculated RF level at the same height as the DISH antennas is 3,005.11 percent of the FCC general population MPE limit.

Per DISH guidelines and consistent with FCC guidance on rooftop compliance, three Caution signs and NOC Information signs are to be installed at the base of the monopole. In addition, NOC Information signs and Guidelines signs are to be installed at the roof access point(s).

Compliance Conclusion

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

The street-level analysis in this case shows a maximum RF level of 7.6885 percent of the applicable FCC general population MPE limit. The analyses indicate that the calculated RF levels at each of the DISH antennas potentially exceeds the FCC MPE limit. Per DISH guidelines and consistent with FCC guidance on rooftop compliance, three Caution signs and NOC Information signs are to be installed at the base of the monopole. In addition, NOC Information signs and Guidelines signs are to be installed at the roof access point(s).

The results of the calculations, along with the proposed RF mitigation, combine to satisfy the FCC's RF compliance requirements and associated guidelines at street level around the site and on the subject roof.

Moreover, because of the conservative calculation methodology and operational assumptions we applied in the analysis, RF levels actually caused by the antennas will be even less significant 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

4/17/23

Date

Appendix A. DOCUMENTS Used TO PREPARE THE ANALYSIS

RFDS: NJJER01114A_RFDS

CD: NJJER01114A_CDs

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.

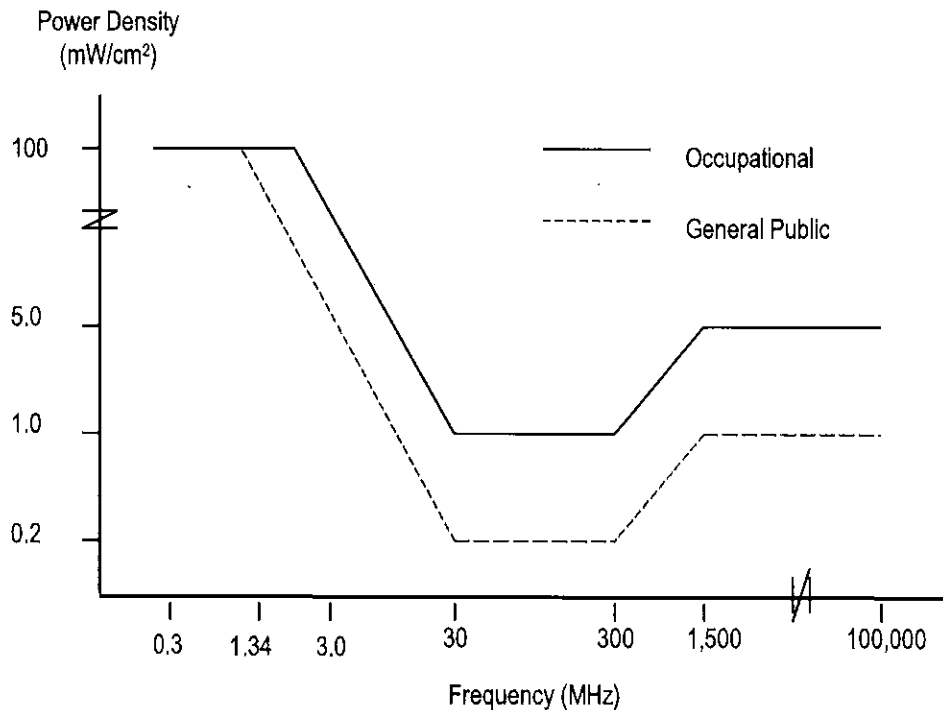
The specified continuous exposure MPE limits are based on known variation of human body susceptibility in different frequency ranges, and a Specific Absorption Rate (SAR) of 4 watts per kilogram, which is universally considered to accurately represent human capacity to dissipate incident RF energy (in 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/cm²). The table on the next page lists the FCC limits for both occupational and general population exposures, using the mW/cm² reference, for the different radio frequency ranges.

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

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



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

The most appropriate method of determining RF compliance is to calculate the RF power density attributable to a particular system and compare that to the MPE limit

applicable to the operating frequency in question. The result is usually expressed as a percentage of the MPE limit.

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

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

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

FCC References on RF Compliance

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

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

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

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







FCC Report and Order, Notice of Proposed Rulemaking, Memorandum Opinion and Order (FCC 19-126), *Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields*;

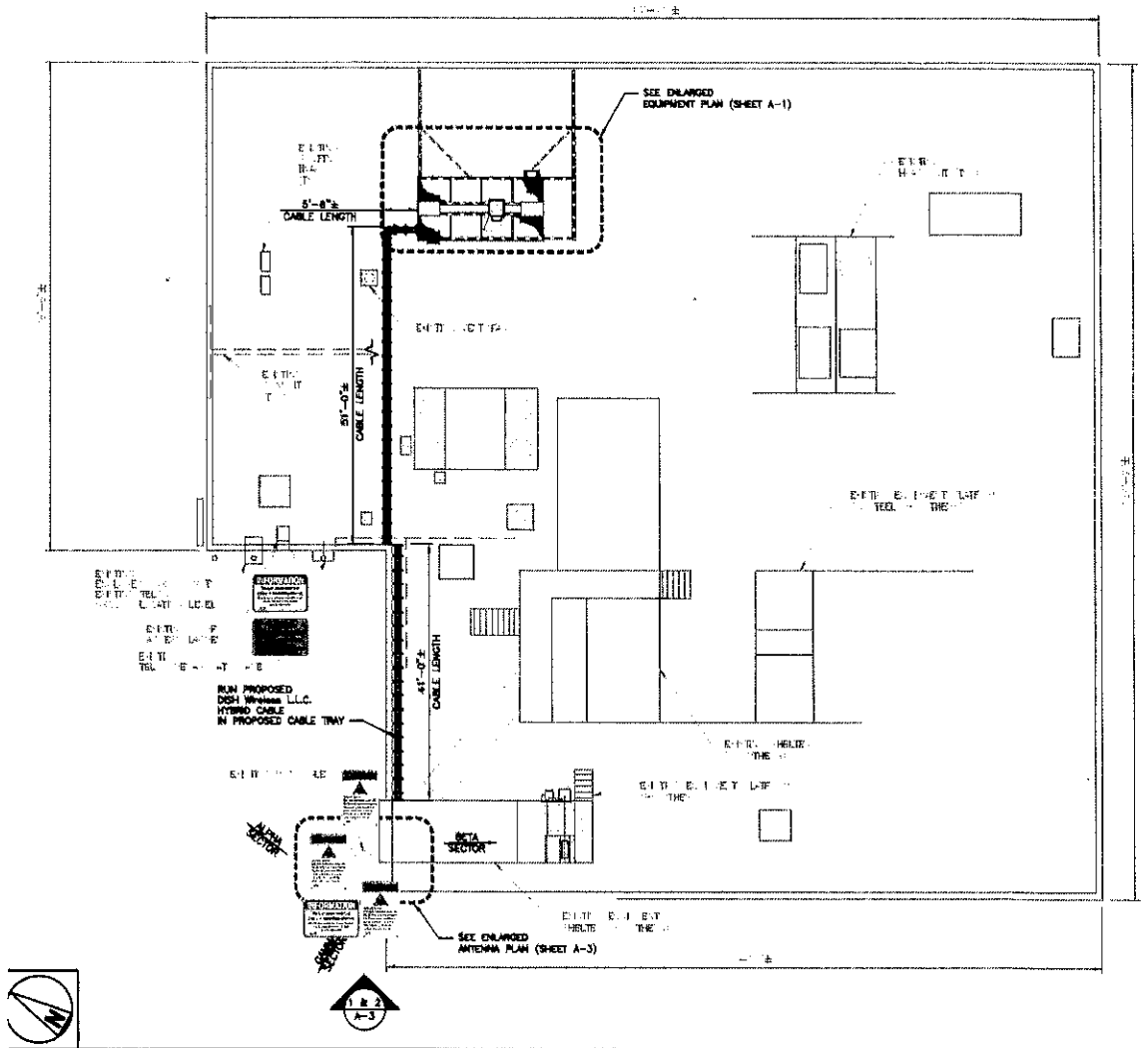
Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies, released December 4, 2019.

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

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

Appendix C. Proposed Signage

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



Appendix D. SUMMARY of EXPERT QUALIFICATIONS

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

Synopsis:	<ul style="list-style-type: none"> • 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:	<ul style="list-style-type: none"> • 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:	<ul style="list-style-type: none"> • 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:	<ul style="list-style-type: none"> • 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:	<ul style="list-style-type: none"> • 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:	<ul style="list-style-type: none"> • Author, <i>Microwave System Engineering</i> (AT&T, 1974) • Co-author and executive editor, <i>A Guide to New Technologies and Services</i> (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
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 the TOWN OF FAIRFIELD, a Connecticut municipal corporation, with an address of 611 Old Post Road, Fairfield, CT 06824 ("**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**").

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 managers 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.

"**Equipment**" means and includes the antennas, cables, wires, conduits, fasteners, connectors, cabinets and the like designed to transmit and receive radio frequency signals and customarily associated with a cellular telecommunications tower.

"**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.

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

"**Tower**" means that certain monopole tower located on the Property.

"**Upgrade Protocol**" means the Landlord's Telecommunications Facility Upgrade Protocol, a copy of which is attached as Exhibit C.

2. Premises, Term, Rent and Contingencies.

2.1 Premises. Landlord is the owner of the Property located at 100 Reef Road, Fairfield, CT 06824, as more particularly described in Exhibit A. Landlord leases to Tenant approximately four hundred (400) square feet of space for Tenant's Equipment in connection with 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 later of sixty (60) days after the Effective Date or first (1st) day of the month following the commencement of Tenant's Installation (the "**Commencement Date**") and will expire on the last day of the month that is one hundred eighty (180) months after the Commencement Date unless terminated sooner, renewed or extended in accordance with this Agreement. The Initial Term shall automatically renew for one (1) additional term of sixty (60) months (the "**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 Initial Term by giving Landlord written Notice at least ninety (90) days prior to the end of the Initial 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 Eighty-Two Thousand Three Hundred and 00/100 Dollars (\$82,300.00) per year. The first Rent payment shall be made within sixty (60) days of the Commencement Date, with subsequent payments due on each anniversary of the Commencement Date. On each anniversary of the Commencement Date, the Rent shall be automatically increased by three percent (3%) of the then-current Rent. Payments shall be delivered to the address designated by Landlord in Section 12.10, 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. Tenant will pay Landlord a fee of Fifty and 00/100 Dollars (\$50.00) for any check returned for any reason by Landlord's bank. If the Tenant fails to pay all Rent due and owing by the tenth (10th) day following each successive anniversary of the Commencement Date during the Term, then after five (5) days' notice from Landlord to Tenant without cure, Landlord may impose a late fee equal to five percent (5%) of any amounts more than fifteen (15) days overdue in order to reimburse Landlord for the extra administrative time involved in collecting such amounts, and any payment more than fifteen (15) days overdue will bear interest from the date due to the date of actual payment at the lesser of eighteen percent (18%) per annum or the highest lawful rate permitted by state or federal law.

2.4 Rent Guarantee. All Rent due for the Initial Term and, unless Tenant elects not to renew this Agreement, the Renewal Term, is guaranteed by Tenant to Landlord, meaning that Tenant will not be released from its payment obligations under this Agreement if Tenant terminates this Agreement except if the reason for the termination is: (a) that Tenant is unable to operate the Installation due an event described in Section 8.4, Force Majeure (Section 12.5), or (c) Taking (Section 12.3); or (b) an event of Landlord's default (Section 8.2) which remains uncured beyond all applicable cure and grace periods.

2.5 Site Development Fee. Tenant shall pay Landlord a one (1) time fee in the amount of Five Thousand and 00/100 Dollars (\$5,000.00) to defray Landlord's costs associated with engineering and legal review fees, which is a condition precedent to Tenant's use of the Premises ("**Site Development Fee**"). Tenant shall pay the Site Development Fee to Landlord within sixty (60) days following the Effective Date. The Site Development Fee shall be non-refundable.

2.6 Tower Modification Costs. Tenant shall pay Landlord a one (1) time fee in the amount of Thirteen Thousand Seven Hundred Seventy-Six and 00/100 Dollars (\$13,776.00) to defray Landlord's costs associated with Tower modifications which shall include installing a new climb system. Tenant shall pay such cost to Landlord within sixty (60) days receipt of an invoice and supporting documentation.

2.7 Contingencies. 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 Governmental Approvals promptly. Landlord hereby authorizes Tenant, at Tenant's sole cost and expense, to file and submit for the Governmental Approvals. Landlord shall: (a) cooperate with Tenant in Tenant's efforts to obtain the 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 any application for a Governmental Approval is rejected, conditioned, materially delayed or otherwise not approved for any or no reason ("**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, related to this Premises, 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. Tenant shall have the right to use the Premises for the purpose of the installation, operation, maintenance and management of a telecommunications facility (including, without limitation, installation of Tenant's Equipment) ("**Tenant's Permitted Use**"). Subject to Tenant's compliance with the Upgrade Protocol, Tenant's Permitted Use includes the right to replace, repair, upgrade, or otherwise modify any or all of Tenant's Equipment and the frequencies over which Tenant's Equipment operates. If radio frequency signage and/or barricades are required by Applicable Law, then 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 and subject to Section 6.3, Tenant, its employees, agents and contractors shall have unrestricted access to the Premises. Further, Landlord grants to Tenant the right of ingress and egress to the Tower and the Premises.

3.3 Maintenance, Repairs, Modifications and Upgrades. The drawings and descriptions indicated on Exhibit B specifically describe the quantity of Equipment, the numbers, and locations of

antennas, and the locations of cables to be installed within the Premises. In the event of a conflict between the general description set forth above, and the specific descriptions drawn and depicted on Exhibit B, then Exhibit B shall govern. The descriptions and depictions indicated on Exhibit B are specific to the equipment and specifications on Exhibit B. Tenant has no future right to modify Exhibit B after the Effective Date without a duly executed written amendment to this Agreement. Tenant shall have the right to complete the installation of the Equipment indicated on Exhibit B and to maintain and repair the Equipment indicated on Exhibit B without Landlord's consent. All modifications and upgrades of Tenant's Equipment are subject to the Upgrade Protocol attached as Exhibit C. Tenant shall not attempt to circumvent the Upgrade Protocol or commence modification or upgrade work unless and until Tenant has fully complied with the Upgrade Protocol.

4. Utilities, Liens and Taxes.

4.1 Utilities. Tenant shall furnish and install an electrical meter at the Premises for the measurement of electrical power used by Tenant at the Premises and Tenant shall pay the utility company directly. So long as this Agreement remains in effect, Landlord at all times shall provide Tenant with access to the utilities at the Property so that the Premises shall have electrical, gas and telephone service. In connection with the electric, gas and telephone utility sources located on the Property that is/are necessary for Tenant to operate its Installation, Landlord agrees to grant the local utility provider the right to install its equipment or other improvements on, over and/or under the Property and Landlord shall cooperate in connection therewith, including without limitation, executing any documents, permitting any testing and performing any work such utility provider requires in connection with same.

4.2 Liens. Tenant will use commercially reasonable efforts to prevent any lien from attaching to the Tower, Premises or the Property. 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 the lien as security for its payment within the ninety (90) day period, and thereafter diligently contests such lien. If Tenant fails to deposit the 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 acknowledges that the Property and the Tower are at present exempt from real property taxation because Landlord is a municipality. Tenant shall be liable for all taxes against Tenant's Equipment, personal property or 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 the 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 shall not cause Interference (as defined below) with any other equipment installed on the Tower as of the Effective Date. Following the Effective Date, Landlord shall not 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 the 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 Tenant's 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 on the Tower, provided that: (a) Tenant shall pay the costs of the Temporary Relocation of Tenant's Equipment and receive a rental abatement until Tenant recoups all of the cost of the Temporary Relocation of Tenant's Equipment as well as the costs incurred by Tenant in moving Tenant's Equipment 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 Tower 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 Tenant's 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's Maintenance of the Tower. Landlord represents and warrants that, as of the Effective Date, the Tower, the Tower's systems and all structural elements of the Tower are in compliance with Applicable Law. Throughout the term of this Agreement, Landlord shall maintain, at its sole cost and expense, the Tower 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 or contractors. 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.

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 shall perform all maintenance, repair or replacement of Tenant's Equipment ("**Tenant Maintenance**") in accordance with Applicable Law, and in a good and workmanlike manner.

6.3 Access to Premises. Landlord shall allow Tenant access to the Premises during ordinary business hours (8:00 a.m. – 4:30 p.m., Monday through Friday) for regular or routine maintenance and repairs, and twenty-four (24) hours a day, seven (7) days a week for unscheduled repairs and other emergency purposes. If Tenant needs access after ordinary business hours, Tenant will endeavor to give Landlord prior notice, if feasible. Except for emergency access, prior to access to the Property, Tenant shall provide a minimum of twenty-four (24) hours' prior e-mail and telephone notice to the Landlord's Designated Site Representative so that arrangements can be made for an employee or consultant of the Landlord to accompany the contractors or technicians. As of the Effective Date, the "**Designated Site Representative**" is Jared Schmitt, Chief Fiscal Officer, (203) 256-3032, JSchmitt@fairfieldcdt.org. Landlord reserves the right to change the name and/or contact information of the Designated Site Representative upon written notice to the Tenant. All contractors and technicians must carry and provide proper

identification at all times. If, after Tenant's initial installation as indicated on Exhibit B, Tenant's presence at the Property exceeds three one-half days per calendar month, Tenant shall reimburse the Landlord to cover the actual commercially reasonable costs associated with having an employee or consultant on site beyond the three one-half days. A half day shall be calculated as any time beyond four (4) hours. Any time beyond four (4) hours on any given day shall be counted as a second 1/2 day. Except in the event of an emergency, no work shall be permitted on weekends or holidays unless specifically authorized by the Designated Site Representative. Landlord shall permit emergency work or a project having extenuating circumstances on weekends, holidays or outside ordinary 8:00 a.m. to 4:30 p.m. business hours, provided Tenant agrees to reimbursement of the Landlord's employee or consultant, at an hourly rate of One Hundred Fifty and 00/100 Dollars (\$150.00) per hour. In order for any inspection, repair, maintenance, modification or upgrade work to be performed which will include the need for any climbing on the Tower, the following information/documentation will be required: (a) a letter describing the scope of work to be done; (b) letter indicating that the contractor or contractors, is/are authorized to perform the work on behalf of the Tenant; (c) photo ID for each technician who will be on site; (d) a climbing certificate/certification for each technician who will be climbing the Tower; and (e) an insurance certificate or certificates indicating that each firm employing the technician or technicians has current insurance coverage with limits at least as high as those described in Section 10.2 and including the Landlord as certificate holder and additional insured.

6.4 Inspections. Landlord has the right to retain an independent engineering firm to conduct annual structural and safety inspections of the Premises and the Tower. Tenant will pay its proportionate share (i. e., 1/3 or ¼, depending on the number of carriers co-locating on the Tower) of the cost of each annual inspection within sixty (60) days of receipt of an invoice from Landlord. Landlord will deliver to Tenant a copy of each inspection report upon request. If an inspection report commissioned by Landlord contains a recommendation by the engineering firm for repair or improvement of Tenant's Installation or a recommendation that Tenant modify Tenant's Equipment for the safety and integrity of, then Tenant shall comply with the recommendation within a commercially reasonable period of time, not to exceed sixty (60) days, at Tenant's sole cost and expense.

6.5 Construction. Tenant shall cause all construction to occur lien-free and in compliance with all applicable laws and ordinances. Landlord acknowledges that it shall neither interfere with any aspects of construction nor attempt to direct construction personnel as to the location of or method of construction of the Installation. The Tenant's Installation shall remain the exclusive property of Tenant and shall not be considered fixtures.

7. Surrender and Hold Over.

7.1 Surrender. Within ninety (90) days following the expiration or termination of this Agreement (the "**Equipment Removal Period**"), 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, alterations and improvements to the Premises, in either case, normal wear and tear excepted. Rent will accrue during the Equipment Removal Period. If Tenant's Equipment is not removed prior to the expiration of the Equipment Removal Period, Tenant will be deemed to be in Hold Over (as defined in Section 7.2) 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. Tenant will, at Tenant's expense, promptly repair any and all damage to the Tower and the Premises caused by Tenant's contractors and technicians while removing Tenant's Equipment. If Tenant fails to promptly repair any damage to the Tower caused by Tenant's contractors

and technicians while removing Tenant's Equipment, Landlord may, but shall have no obligation to, repair the damage and forward an invoice or invoices and supporting documentation to Tenant for payment. Tenant will pay any invoices delivered by Landlord pursuant to the immediately preceding sentence within sixty (60) days of receipt.

7.2 Hold Over. If Tenant occupies the Premises beyond the Equipment Removal Period or any period upon lease expiration, 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 the Hold Over period, except that Tenant shall pay Landlord a rental fee at the rate of one hundred fifty percent (150%) of the Rent applicable at the expiration or termination of the Agreement. Tenant's payments shall be paid on the first day of each month in advance for the duration of the Hold Over.

8. Default, Remedies and Termination.

8.1 Default By Tenant. If there is a breach by Tenant with respect to any of the provisions of this Agreement or Tenant's obligations under this Agreement, including, without limitation, the timely payment of Rent, Landlord shall give Tenant written notice of the breach. After receipt of written notice, Tenant shall have thirty (30) days in which to cure any monetary breach and thirty (30) days in which to cure any non-monetary breach, provided that Tenant shall have such extended period as may be required beyond the thirty (30) days if the nature of the cure is such that it reasonably requires more than thirty (30) days, and Tenant commences the cure within the thirty (30) day period and thereafter continuously and diligently pursues the cure to completion. Landlord may not maintain any action or effect any remedies for default against Tenant unless and until Tenant has failed to cure the breach within the time periods provided in this Section.

8.2 Default By Landlord. If there is a breach by Landlord with respect to any of the provisions of this Agreement or Landlord's obligations under this Agreement, Tenant shall give Landlord written notice of the breach. After receipt of the written notice, Landlord shall have thirty (30) days in which to cure the breach, provided that Landlord shall have such extended period as may be required beyond the thirty (30) days if the nature of the cure is such that it reasonably requires more than thirty (30) days and Landlord commences the cure within the thirty (30) day period and thereafter continuously and diligently pursues the cure to completion. Tenant may not maintain any action or effect any remedies for default against Landlord unless and until Landlord has failed to cure the breach within the time periods provided in this Section. Notwithstanding the foregoing to the contrary, it shall be a default under this Agreement if Landlord fails, within five (5) days after receipt of written notice of breach, to perform an obligation required to be performed by Landlord if the failure to perform the obligation interferes with Tenant's ability to conduct its business at the Property; provided, however, that if the nature of Landlord's obligation is such that more than five (5) days after such notice is reasonably required for its performance, then it shall not be a default under this Agreement if performance is commenced within the five (5) day period and thereafter diligently pursued to completion.

8.3 Remedies. Upon a default beyond all applicable notice and cure periods, the non-defaulting Party may at its option (but without obligation to do so), perform the defaulting Party's duty or obligation on the defaulting Party's behalf, including but not limited to the obtaining of reasonably required insurance policies. The costs and expenses of any such performance by the non-defaulting Party shall be due and payable by the defaulting Party upon invoice therefor. In the event of a default beyond

all applicable notice and cure periods, by either Party with respect to a material provision of this Agreement, without limiting the non-defaulting Party in the exercise of any right or remedy which the non-defaulting Party may have by reason of such default, the non-defaulting Party may terminate this Agreement immediately upon written Notice to the other Party.

8.4 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) 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 agents, employees, contractors, or any other person or entity for whom Landlord is legally responsible, Tenant shall defend, indemnify and hold Landlord and its elected and appointed officials, 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.

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 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 Tower and/or the Property, and/or any contamination of the Premises, the Tower 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.

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, from a company or companies with an A.M. Best rating of A (VII) or better 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 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 coverages from a company or companies with an A.M. Best rating of A- (VII) or better. The insurance shall protect the Landlord from claims that may arise out of or result from the Tenant’s obligations under this Agreement or from the obligations of any contractor or any other person or entity directly or indirectly employed by Tenant or by anyone for whose acts Tenant may be liable. For each policy required by this Agreement, Tenant shall, before the execution of this Agreement by the Landlord, provide the Landlord with certificates of insurance. Tenant shall provide updated certificates of insurance at least ten (10) days before any renewal of any such coverage. The certificates shall require notice of cancellation to the Landlord according to policy provisions.

A. Workers Compensation:

Tenant shall provide workers compensation insurance required by law with employer’s liability limits for at least the amounts of liability for bodily injury by accident of \$500,000 each accident and bodily injury by disease of \$500,000 including a waiver of subrogation.

B. Commercial General Liability Insurance:

Tenant shall provide commercial general liability insurance including products and completed operations and including XCU coverage if applicable. Limits shall be at least: Bodily injury & property damage coverage with an occurrence limit of \$1,000,000; Personal & advertising injury limit of \$1,000,000 per occurrence; General aggregate limit of \$2,000,000 (other than products and completed operations); Products and completed operations aggregate limit of \$2,000,000.

- The policy shall name the Town as an additional insured and include ISO Form CG 2010 (04/13) and CG 2037 (04/13) or equivalent.
- Coverage will be provided on an occurrence basis and shall be primary and shall not contribute in any way to any insurance or self-insured retention carried by the Landlord.
- Coverage shall contain a broad form contractual liability endorsement or wording within the policy form to comply with the hold harmless and indemnity provision(s) of all agreements between the Landlord and the Tenant.

- Deductible and self-insured retentions shall be declared and are subject to the approval of the Landlord.

C. Commercial Automobile Insurance:

Tenant shall provide commercial automobile insurance for any owned, non-owned or hired autos, in the amount of \$1,000,000 each accident covering bodily injury and property damage on a combined single limit basis. The policy shall name the Landlord as an additional insured and provide a waiver of subrogation.

D. Umbrella or Excess Liability Insurance:

Tenant shall provide an umbrella or excess liability policy in excess (without restriction or limitation) of those limits and coverages described in items (A) through (C). The policy shall contain limits of liability in the amount of \$5,000,000 each occurrence and \$5,000,000 in the aggregate.

10.3 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 and has taken all necessary action to approve this Agreement which would include having this agreement approved by the Landlord's Board of Selectwomen; (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 Tower 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 Tower 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. In no event shall Tenant have any liability with respect to any Hazardous Substance that was on, about, adjacent to, under or near the Tower 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 Tower by: (i) Landlord, its agents, employees, contractors or invitees; or (ii) 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 Tower. Should Landlord, at any time during the Term, sell or transfer all or any part of the Property or the Tower 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

12.3 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.

12.4 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.

12.5 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, acts of God, accidents, technical failure governmental restrictions, insurrections, riots, enemy act, war, 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.

12.6 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.

12.7 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.

12.8 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.

12.9 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.

12.10 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 12.10) 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:

Town of Fairfield
Attn: First Selectwoman
611 Old Post Road
Fairfield, CT 06824

If to be given to Tenant:

DISH Wireless L.L.C.
Attn: Lease Administration
5701 South Santa Fe Drive
Littleton, Colorado 80120

12.11 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.

12.12 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.

12.13 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.

12.14 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.

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

{This space intentionally left blank. The next page is the signature page.}

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

LANDLORD:

TENANT:

TOWN OF FAIRFIELD

DISH WIRELESS L.L.C.

By: DocuSigned by:
Thomas R. Bremer
40D2910F700415C...
Name: Thomas R. Bremer
Its: Chief Administrative Officer

By: DocuSigned by:
Dave Mayo
F0DAAA105A681B7...
Name: Dave Mayo
Its: EVP

DocuSigned by:
Mike Fox
ECM47339249846B...
3/22/2023

{Signature page to Site Lease Agreement}

EXHIBIT A

LEGAL DESCRIPTION OF PROPERTY

All that certain piece or parcel of land situated in the Town of Fairfield, County of Fairfield and the State of Connecticut, bounded and described as follows:

Easterly by Highway known as Reef Road, 429.50 feet, more or less;

Southerly by land now or formerly of Henry B. Nicholas, 298.50 feet, more or less;

Westerly by land now or formerly of John Kruzaliak, 535.25 feet, more or less;

Northerly by land now or formerly of Frank Judd and others, 368.70 feet, more or less.

EXHIBIT B

SITE PLAN

[Attached]

NOTE
 PROPOSED INSTALLATION TO BE STRUCTURALLY
 VERIFIED BY A LICENSED PROFESSIONAL ENGINEER
 LICENSED IN THE STATE OF CONNECTICUT.

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

Tectonic
 2000 Park Street, Suite 200
 Wallingford, CT 06495
 Tel: 203.261.1111
 Fax: 203.261.1112
 www.tectonicinc.com

IT IS A VIOLATION OF LAW FOR ANY PERSON
 OTHER THAN THE DESIGNER TO REPRODUCE
 OR TRANSMIT THIS DOCUMENT OR TO
 ALTER THIS DOCUMENT.

DRAWN BY: CHECKED BY: APPROVED BY:
 TU JQ MP

**LEASE
 EXHIBIT**

SUBMITTALS

REV	DATE	DESCRIPTION
A	08/26/21	ISSUED FOR PERMIT
B	10/26/21	ISSUED FOR DC

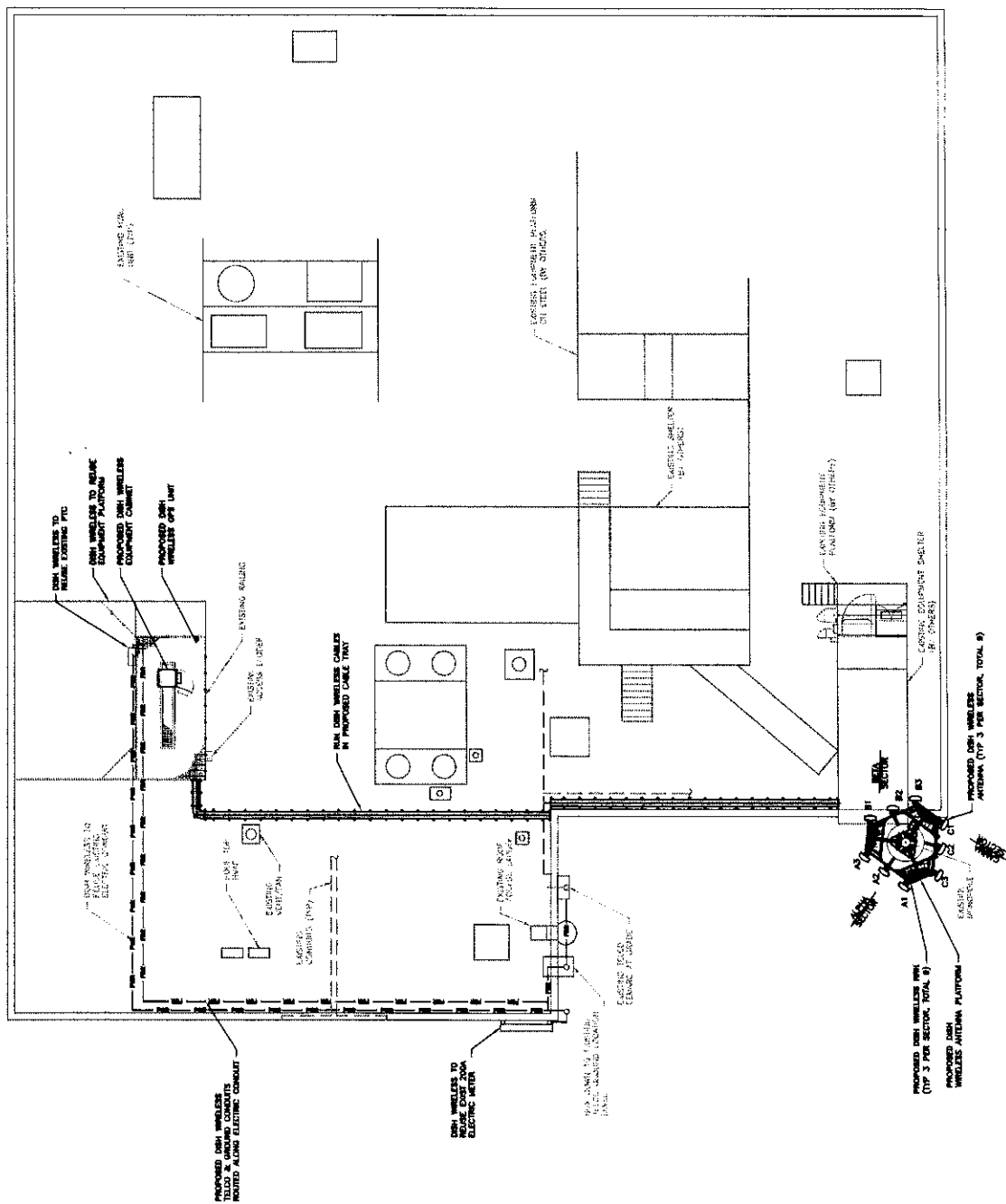
AME PROJECT NUMBER
 10710.NJER011144

DISH WIRELESS PROJECT INFORMATION
 NJER011144

100 REEF ROAD
 FAIRFIELD, CT 06824

SHEET TITLE
 ENLARGED SITE
 PLAN

SHEET NUMBER
 A-1 HS4



ENLARGED SITE PLAN

EXHIBIT C

THE TOWN OF FAIRFIELD

TELECOMMUNICATIONS FACILITY UPGRADE PROTOCOL

- A. All equipment upgrade submissions must comply with all applicable ordinances and regulations of the Town of Fairfield and all applicable regulations, rules, standards, requirements and conditions of the Connecticut Siting Council.
- B. Initial written submission of Tenant's proposed equipment upgrades must be delivered to Town of Fairfield, 611 Old Post Road, Fairfield, CT 06824, Attention: Chief Financial Officer. The initial submission ("Initial Submission") must include:
- (1) Copy of existing As-Built on file with Tenant, encompassing the telecommunications equipment that will be upgraded or changed in some manner;
 - (2) Drawings showing proposed equipment upgrades or changes and a detailed written scope of work including plans and specifications describing the proposed equipment upgrades or changes ("Scope of Work"); and
 - (3) Estimated construction schedule, detailing length of time for Tenant to perform construction work.
- C. Upon review of the Initial Submission, the Landlord may make reasonable written requests for additional related documentation and/or modifications.
- D. Upon receipt of a request under Paragraph C, Tenant shall supply the additional related documentation and/or make modifications to the Initial Submission, as reasonably requested by the Landlord.
- E. A "Final Submittal" shall be made by the Tenant to the Landlord in the same manner described for the Initial Submission in Paragraph B. The Final Submittal shall include the following:
- (1) Final plans and specifications for the proposed equipment changes, and a revised Scope of Work, if different from what was provided in the Initial Submission.
 - (2) A Radio-frequency (RF) emissions report by a licensed engineer or other qualified professional, if Tenant's proposed upgrades or changes include the addition of new antennas, to show compliance with any existing equipment and FCC regulations regarding RF emissions.
 - (3) Final construction schedule, detailing the length of time for Tenant to perform the proposed work ("Construction Schedule").

- (4) A deposit, in an amount not to exceed \$5,000.00, to cover all reasonable costs incurred by Landlord related to the proposed work, including, but not limited to, expenses incurred by the Landlord for the review of the drawings and Scope of Work by Landlord's staff or Landlord's outside engineering firm and any related supervision or inspection fees, regardless of whether the proposed upgrades or changes will involve work on the Tower, the ground, a roof or all of the above. Landlord shall access the deposit only pursuant to the terms set forth in Paragraph Q below.
- (5) If, after review, Landlord determines that the proposed upgrade will impact the structural integrity of the Tower or building, an appropriate engineering study will be undertaken. Landlord will provide Tenant with a written explanation of the reasons for the structural integrity study. The actual costs of the structural integrity study shall be paid by the Tenant. The study shall be performed by an engineer selected by the Landlord. Tenant will be responsible for the cost of any and all structural modifications or reinforcements of the Tower or the building that may be required in order to accommodate any new or modified equipment added by Tenant in connection with an upgrade. Tenant shall include any and all structural modifications and reinforcements in the Scope of Work and the Construction Schedule. Landlord shall have the right to deny authorization for any modifications to the building or Property that will, in the Landlord's judgment, materially interfere with operations of the Fairfield Police Department or diminish the usable space within the building.
- (6) If the proposed upgrades require additional ground space, rooftop space or Tower space or additional antennae or any other equipment to be added, the Landlord will be entitled to a reasonable increase in the rental fee due under the Lease. Tenant shall not start work until the Landlord and Tenant have agreed upon the amount of the rental fee increase. If the Landlord and Tenant are unable to reach agreement upon the amount of the rental fee increase, then Tenant shall not start work until the amount of the rental fee increase has been determined pursuant to Paragraph R.
- F. Following the Final Submittal, the Landlord and Tenant will cooperate with each other in finalizing any further changes or modifications agreed upon by both parties.
- G. Landlord's consent and/or approval of the proposed equipment upgrades or changes shall not be unreasonably withheld, conditioned, delayed or denied.
- H. When the Final Submission is approved by the Landlord, the Landlord will deliver a written Notice to Proceed delineating the approved Scope of Work and Construction Schedule. The Notice to Proceed will set forth the name, phone number and email address of the agent or representative of the Landlord who Tenant should contact to coordinate the approved work and access to the site.
- I. Tenant shall confirm the date and time that Tenant and its agents and representatives will

perform the upgrade work and the names of the Tenant agents and/or representatives who will be entering the property to perform/supervise the work. Prior to accessing the Property to perform the upgrade work the Tenant shall provide a minimum of 48 hours' prior notice, by contacting the Landlord agent/representative referenced in Paragraph H, at the phone number and email address provided. The Landlord agent/representative will be reasonably available by phone during normal business hours and will not unreasonably delay Tenant's ability to access the property to perform the upgrade work. Once Tenant has notified the Landlord as indicated above, the Landlord will provide access to Tenant in furtherance of the Notice to Proceed, within 48 hours.

- J. The Landlord, its engineer and/or inspector may be on site to inspect the work and confirm compliance with the Notice to Proceed. Actual costs of inspection shall be paid by the Tenant within sixty (60) days of receipt of an invoice together with reasonable supporting documentation evidencing the costs.
- K. The upgrade work shall take place during normal business hours (Monday through Friday 8:00 a.m. to 4:30 p.m.). No upgrade work shall be permitted on weekends or holidays recognized by the Town of Fairfield. Notwithstanding the foregoing, the Landlord will consider permitting work on weekends, holidays or outside of the aforementioned normal business hours, provided Tenant agrees to the full reimbursement for any actual, reasonable expenses associated with the time spent by Landlord's engineer or inspector monitoring the work, such expenses to be paid within sixty (60) days of receipt of an invoice together with reasonable supporting documentation evidencing the expenses.
- L. Absent unforeseen and/or extenuating circumstances, Tenant shall have sixty (60) calendar days to complete construction/upgrades after the work has started. Construction will be deemed started when physical work at the site begins by Tenant.
- M. Upon substantial completion of the work, Tenant shall submit to Landlord written notice indicating the substantial completion of the upgrades or changes to allow the Landlord to schedule an engineering inspection. Within thirty (30) days of the Landlord's receipt of Tenant's written notice of substantial completion, the Landlord shall submit to Tenant a written acceptance of the work or a reasonable punch list of items to be completed and/or addressed. Punch list items must be directly related to the Tenant's recently performed upgrades or changes and construction shall be deemed complete if a punch list is not submitted within the thirty (30) day period. Tenant shall use reasonable efforts to complete all punch list items within thirty (30) days of the receipt of the punch list. If the items on the punch list are not completed within said thirty (30) days, Landlord shall, upon ten (10) days' notice to Tenant, have the option of completing such items at Tenant's expense, provided that Landlord itemizes to Tenant all reasonable expenditures incurred and Tenant has not completed same following the ten (10) days' notice.
- N. Once all work has been approved by Landlord or its engineer, Tenant shall submit at its cost and expense: (1) New As-Built drawings by an engineer or architect licensed in Connecticut, if the upgrade modifications are substantial, or new As-Built addendum report by an engineer or architect licensed in Connecticut to reflect minor upgrade

modifications; and (2) Color photographs of the completed work.

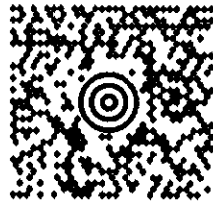
- O. The Landlord shall submit a final, detailed bill to Tenant detailing the time and work reasonably performed, within sixty (60) days after Tenant's completion of the work. Landlord may use the Deposit to pay such final bill. If the bill exceeds the Deposit, Tenant shall pay the excess within sixty (60) days after receipt of the bill. If the bill is less than the Deposit, a refund shall be made within sixty (60) days thereafter.
- P. This Upgrade Protocol is applicable only to work where Tenant seeks to upgrade or modify its existing equipment installation. It does not apply to: (1) maintenance or repair of any existing equipment; and (2) replacement of broken or non-functioning equipment with like kind or similar equipment.
- Q. To the extent that any proposed upgrade work at the site is relatively minor and has little impact on the site, the Lessor may waive some or all of the formalities of this Upgrade Protocol provided that any such waiver must be in writing.
- R. If Landlord and Tenant are unable to reach agreement upon the amount of a rental fee increase due under Paragraph E(6), then the amount of the rental fee increase shall be determined as follows.
- (1) Negotiation. First, representatives of Tenant and Landlord shall meet either alone or together with their respective advisors, in the spirit of good faith, to attempt to negotiate a resolution of the dispute by mutual agreement in writing.
 - (2) Arbitration. If Landlord and Tenant are unable to resolve the dispute by mutual agreement under Paragraph R(1) within two (2) weeks following the initiation of negotiations between the parties thereunder, then, upon demand of either Landlord or Tenant, the dispute shall be submitted to binding arbitration in accordance with the Commercial Arbitration Rules of the American Arbitration Association (the "Commercial Arbitration Rules"). The parties may agree upon one (1) arbitrator. If they cannot so agree within two (2) weeks following demand for arbitration, then each party shall select an arbitrator, and the arbitrators so selected shall select a third arbitrator (the "Deciding Arbitrator"), and the decision of the Deciding Arbitrator shall be binding and conclusive. If either party refuses or fails to join in the appointment of an arbitrator, an arbitrator shall be appointed in accordance with the Commercial Arbitration Rules. All arbitration hearings shall take place in Fairfield County, Connecticut.
 - (3) Controls Over Statutes and Regulations. Landlord and Tenant agree that the method of determining the rental fee increase under this Paragraph R shall apply as between them in lieu of any applicable mechanism prescribed under the statutes or regulations of the State of Connecticut, including, without limitation CGS Section 16-50aa(d)(1). Landlord and Tenant waive the right to proceed under CGS Section 16-50aa(d)(1) in connection with the determination of the rental fee increase due under Paragraph E(6).

Exhibit H

Mailing Receipts

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

LTR 1 OF 1



CT 066 9-06



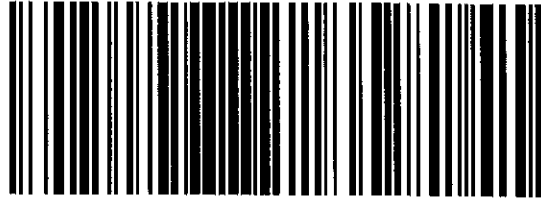
SHIP TO:

SULLIVAN INDEPRENDENCE HALL
HON. BRENDA L. KUPCHICK
725 OLD POST RD.
FAIRFIELD CT 06824

UPS 2ND DAY AIR

TRACKING #: 1Z E05 345 02 6647 0929

2



BILLING: P/P

WS 26.0.6 SHARP MX-4070 18.0A 04/2023

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

1ZE053450266470929

Service

UPS 2nd Day Air®

Delivered On

05/08/2023 10:24 A.M.

Delivered To

725 OLD POST RD
FAIRFIELD, CT, 06824, US

Received By

JENFIER

Left At

Office

Please print for your records as photo and details are only available for a limited time.

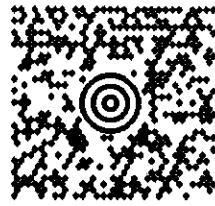
Sincerely,

UPS

Tracking results provided by UPS: 05/09/2023 7:19 A.M. EST

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

LTR 1 OF 1



CT 066 9-06



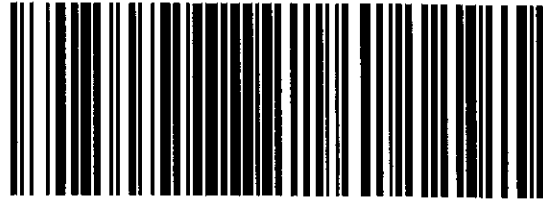
SHIP TO:

SULLIVAN INDEPENDENCE HALL
MR. JIM WENDT
725 OLD POST RD.
FAIRFIELD CT 06824

UPS 2ND DAY AIR

TRACKING #: 1Z E05 345 02 6529 3131

2



BILLING: P/P

WS 26.0.6 SHARP MX-4070 18.0A 04/2023

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

1ZE053450265293131

Service

UPS 2nd Day Air®

Delivered On

05/08/2023 10:24 A.M.

Delivered To

725 OLD POST RD
FAIRFIELD, CT, 06824, US

Received By

PLAN ZONE

Left At

Office

Please print for your records as photo and details are only available for a limited time.

Sincerely,

UPS

Tracking results provided by UPS: 05/09/2023 7:20 A.M. EST