



Northeast Site Solutions
Denise Sabo
4 Angela's Way, Burlington CT 06013
203-435-3640
denise@northeastsitesolutions.com

September 7, 2021

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

RE: Exempt Modification Application
1394 Meriden Waterbury Turnpike, Southington CT 06489
Latitude: 41.386139
Longitude: -72.604056
Site#: 876313_Crown_DISH

Dear Ms. Bachman:

Based on the 2020 merger between T-Mobile and Sprint, and as part of the agreement, the DOJ required T-Mobile to divest some sites to Dish in order to create an additional wireless provider. This site is part of the agreement.

Dish Wireless LLC is requesting to file an exempt modification for an existing tower located at 1394 Meriden Waterbury Turnpike, Southington CT 06489. Dish Wireless LLC proposes to install three (3) antennas at the 119-foot level of the existing 160-foot tower. The property and the tower are both owned by Crown Castle. This modification includes hardware that is 5G capable.

Dish Wireless LLC Planned Modifications:

Remove:
Antenna mount
(3) HBX-6516DS-VTM Antenna
(7) Coax Lines

Remove and Replace: NONE

Install New:
Commscope Mount
(3) JMA MX08FRO665-20 Antenna
(3) TA08025-B604 RRU
(3) TA08025-B605 RRU
(1) Raycap
(1) 1-1/2" Hybrid

Existing to Remain:
NONE



Ground Work: (within existing compound)

New H-Frame
Equipment Cabinet
Power/Telco Cabinet
Ice Bridge
7'x5' Steel Platform

Please note requests have been made to the Town of Southing Planning and Zoning for original zoning documentation. At this time, nothing has been made available.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-SOj-73, a copy of this letter is being sent to Mr. Mark J Sciota- Town Manager, and Matthew A. Reimondo- Zoning Enforcement Officer, for the Town of Southington. A copy is also being sent to the tower owner, and property owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, DISH Wireless LLC respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Denise Sabo

Denise Sabo
Mobile: 203-435-3640
Fax: 413-521-0558
Office: 4 Angela's Way, Burlington CT 06013
Email: denise@northeastsitesolutions.com



NSS **NORTHEAST**
SITE SOLUTIONS
Turnkey Wireless Development

Attachments

cc: Mr. Mark J Sciota- Town Manager
Town of Southington
75 Main Street Southington, CT 06489

Matthew A. Reimondo- Zoning Enforcement Officer
Town of Southington
75 Main Street Southington, CT 06489

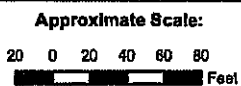
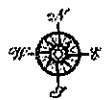
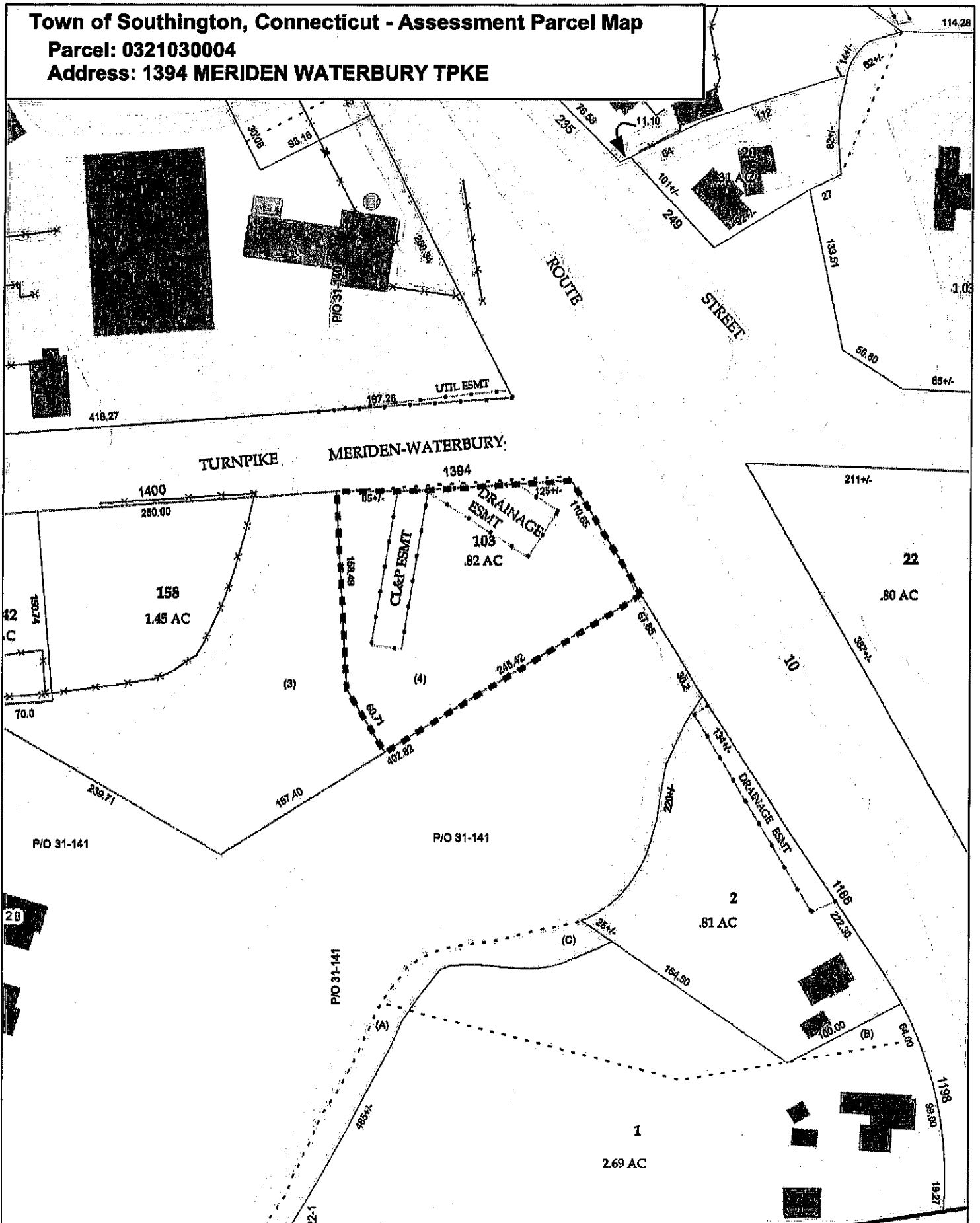
Crown Castle, Property and Tower Owner

Exhibit A

Town of Southington, Connecticut - Assessment Parcel Map

Parcel: 0321030004

Address: 1394 MERIDEN WATERBURY TPKE



Disclaimer: This map is for informational purposes only.
All information is subject to verification by any user.
The Town of Southington and its mapping contractors
assume no legal responsibility for the information contained herein.

Map Produced November 2016



Property Information

Property Location	1394 MERIDEN WATERBURY TPKE
Owner	SOUTHINGTON TOWER DEVELOPMENT LLC
Co-Owner	%GLOBAL SIGNAL
Mailing Address	PMB331 CANONSBURG PA 15317-252
Land Use	391 Vac Com Lnd wAcc
Land Class	C
Water Service	

Sewer Service	
Census Tract	4303
Neighborhood	1135
Zoning Code	B
Acreage	0.83
Book / Page	997/1112
Lot Setting/Desc	Level
Trash Day	

Photo

No Photo Available

Sketch

Primary Construction Details

Year Built	
Stories	
Building Style	
Building Use	
Building Condition	
Floors	
Total Rooms	

Bedrooms	0
Full Bathrooms	
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	
Roof Cover	

Exterior Walls	
Interior Walls	
Heating Type	
Heating Fuel	
AC Type	
Gross Bldg Area	0
Total Living Area	0



Valuation Summary (Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings		0
Outbuildings	0	0
Improvements	0	0
Extras	0	0
Land	204320	143020
Total	204320	143020

Outbuilding and Extra Items

Type	Description

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area	0	0

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
SOUTHINGTON TOWER DEVELOPMENT LLC	997/1112	2005-01-18	90000

Exhibit B



DISH WIRELESS L.L.C. SITE ID:

BOBDL00077A

DISH WIRELESS L.L.C. SITE ADDRESS:

**1394 MERIDEN WATERBURY TPK
SOUTHINGTON, CT 06489**

SCOPE OF WORK	
THIS IS NOT AN ALL INCLUSIVE LIST. CONTRACTOR SHALL UTILIZE SPECIFIED EQUIPMENT PART OR ENGINEER APPROVED EQUIVALENT. CONTRACTOR SHALL VERIFY ALL NEEDED EQUIPMENT TO PROVIDE A FUNCTIONAL SITE. THE PROJECT GENERALLY CONSISTS OF THE FOLLOWING:	
TOWER SCOPE OF WORK:	
<ul style="list-style-type: none"> • REMOVE EXISTING ANTENNAS AND MOUNT • INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR) • INSTALL (1) PROPOSED TOWER PLATFORM MOUNT • INSTALL PROPOSED JUMPERS • INSTALL (6) PROPOSED RRUs (2 PER SECTOR) • INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP) • INSTALL (1) PROPOSED HYBRID CABLE 	
GROUND SCOPE OF WORK:	
<ul style="list-style-type: none"> • INSTALL (1) PROPOSED METAL PLATFORM • INSTALL (1) PROPOSED ICE BRIDGE • INSTALL (1) PROPOSED PPC CABINET • INSTALL (1) PROPOSED EQUIPMENT CABINET • INSTALL (1) PROPOSED POWER CONDUIT • INSTALL (1) PROPOSED TELCO CONDUIT • INSTALL (1) PROPOSED TELCO-FIBER BOX • INSTALL (1) PROPOSED GPS UNIT • INSTALL (1) PROPOSED SAFETY SWITCH (IF REQUIRED) • INSTALL (1) PROPOSED FIBER NID (IF REQUIRED) • INSTALL (1) PROPOSED METER WITH EXISTING SOCKET F 	

SITE INFORMATION	PROJECT DIRECTORY
PROPERTY OWNER: SOUTHINGTON TOWER DEVELOPMENT LLC ADDRESS: 575 MOROSGO DR STE# 12 ATLANTA GA 30324	APPLICANT: DISH WIRELESS L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER TYPE: MONOPOLE	TOWER OWNER: CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317 (877) 486-9377
TOWER CO SITE ID: 876313	SITE DESIGNER: B+T GROUP 1717 S. BOULDER AVE, SUITE 300 TULSA, OK 74119 (918) 587-4630
TOWER APP NUMBER: 556616	SITE ACQUISITION: NICHOLAS CURRY NICHOLAS.CURRY@CROWNCastle.COM
COUNTY: HARTFORD	CONSTRUCTION MANAGER: JAVIER SOTO JAVIER.SOTO@DISH.COM
LATITUDE (NAD 83): 41° 33' 51.39" N 41.564275 N	RF ENGINEER: BOSSENER CHARLES BOSSENER.CHARLES@DISH.COM
LONGITUDE (NAD 83): 72° 53' 30.70" W 72.8918611099 W	
ZONING JURISDICTION: CT SITING COUNCIL, ENTITY OF CT	
ZONING DISTRICT: B	
PARCEL NUMBER: 0321030004	
OCCUPANCY GROUP: U	
CONSTRUCTION TYPE: V-B	
POWER COMPANY: EVERSOURCE	
TELEPHONE COMPANY: CLEARWIRE PHONE	



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



2000 CORPORATE DRIVE
CANONSBURG, PA 15317



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



B&T ENGINEERING, INC.
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APPROVED BY: MP

RFDS REV #: 0

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SOUTHINGTON, CT 06489

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1



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

GENERAL NOTES

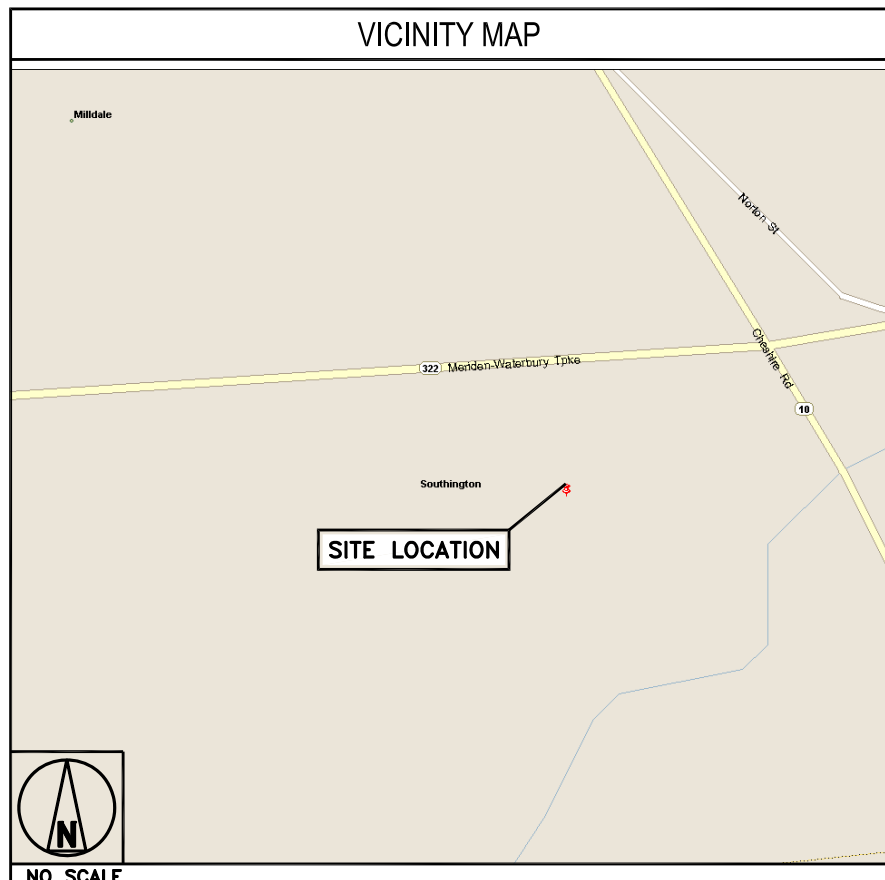
THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE, NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE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

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

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

DIRECTIONS

DIRECTIONS FROM BRADLEY INTERNATIONAL AIRPORT:
DEPART BRADLEY INTERNATIONAL AIRPORT ON TERMINAL RD. ROAD NAME CHANGES TO BRADLEY FIELD CONNECTOR. ROAD NAME CHANGES TO CT-20 [BRADLEY FIELD CONNECTOR]. TAKE RAMP (RIGHT) ONTO I-91 [RICHARD P HORAN MEMORIAL HWY]. AT EXIT 18, TAKE RAMP (RIGHT) ONTO I-691. AT EXIT 3, TURN RIGHT ONTO RAMP. TURN RIGHT ONTO CT-10 [HIGHLAND AVE]. KEEP RIGHT ONTO OLD TURNPIKE RD. TURN LEFT ONTO CT-322 [MERIDEN WATERBURY TPKE]. TURN LEFT ONTO LOCAL ROAD(S). ARRIVE AT SITE.



CONNECTICUT CODE COMPLIANCE

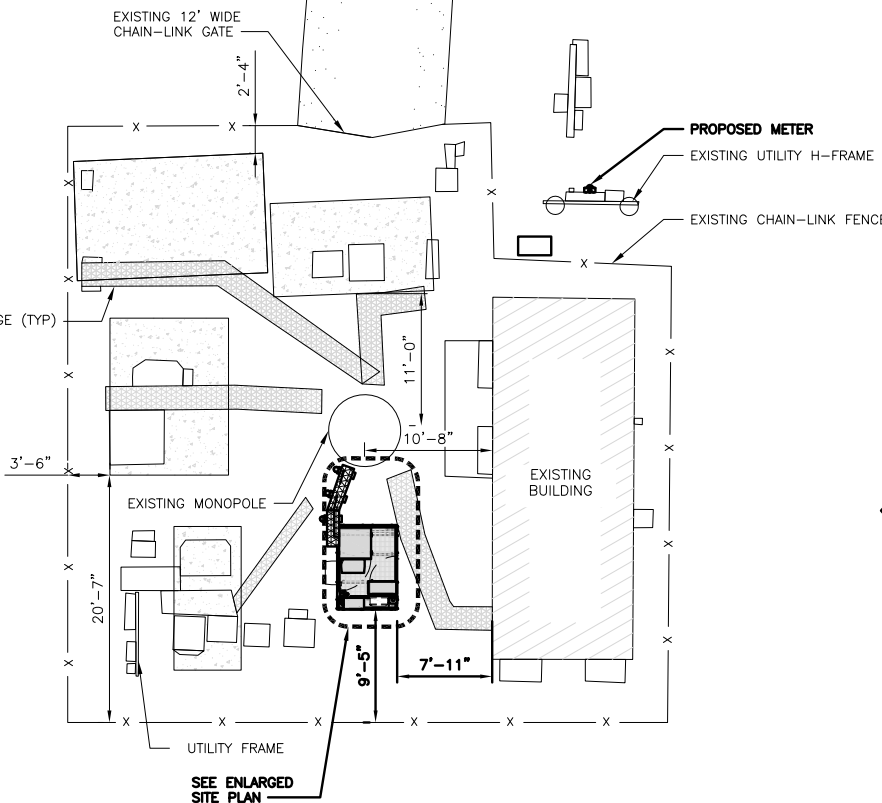
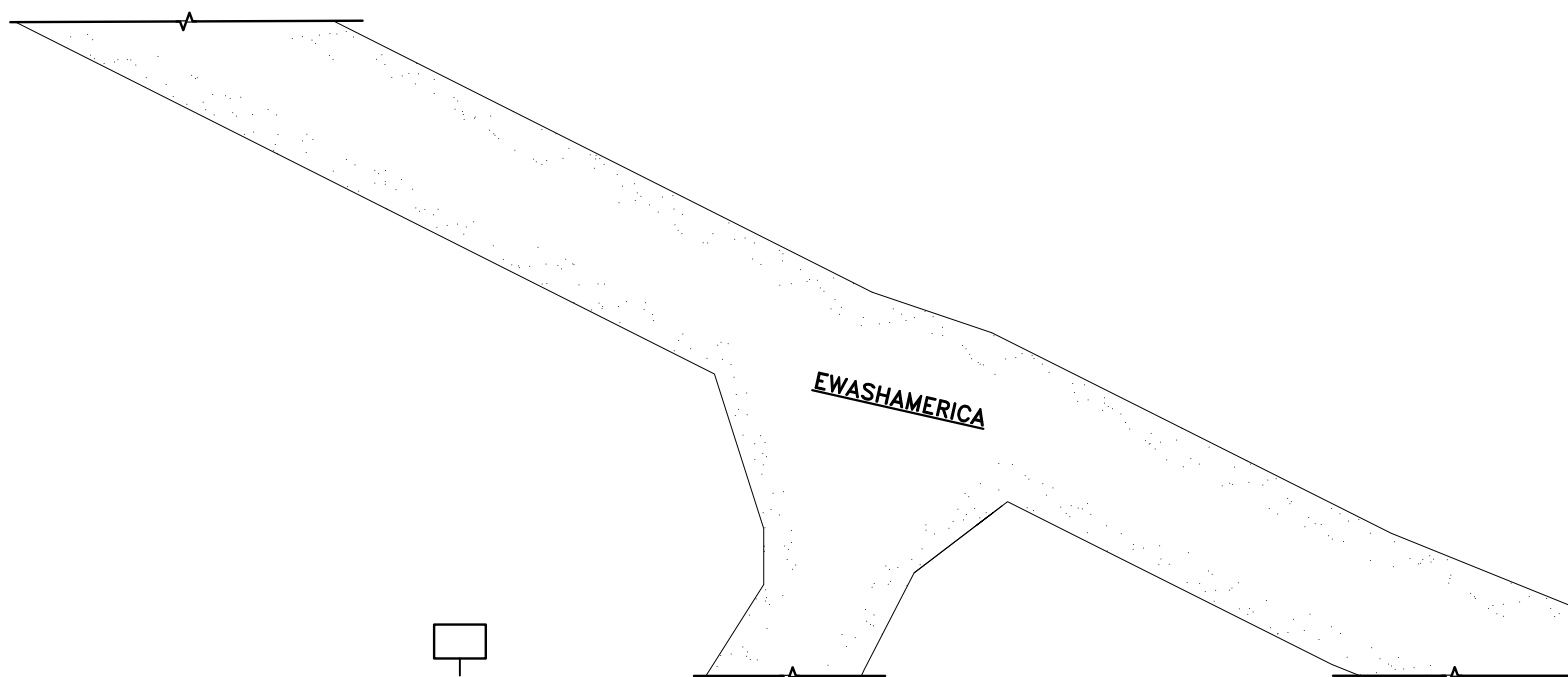
ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

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

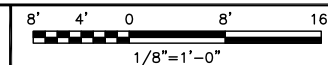
SHEET INDEX	
SHEET NO.	SHEET TITLE
T-1	TITLE SHEET
A-1	OVERALL AND ENLARGED SITE PLAN
A-2	ELEVATION, ANTENNA LAYOUT AND SCHEDULE
A-3	EQUIPMENT PLATFORM AND H-FRAME DETAILS
A-4	EQUIPMENT DETAILS
A-5	EQUIPMENT DETAILS
A-6	EQUIPMENT DETAILS
E-1	ELECTRICAL/FIBER ROUTE PLAN AND NOTES
E-2	ELECTRICAL DETAILS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

NOTES

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



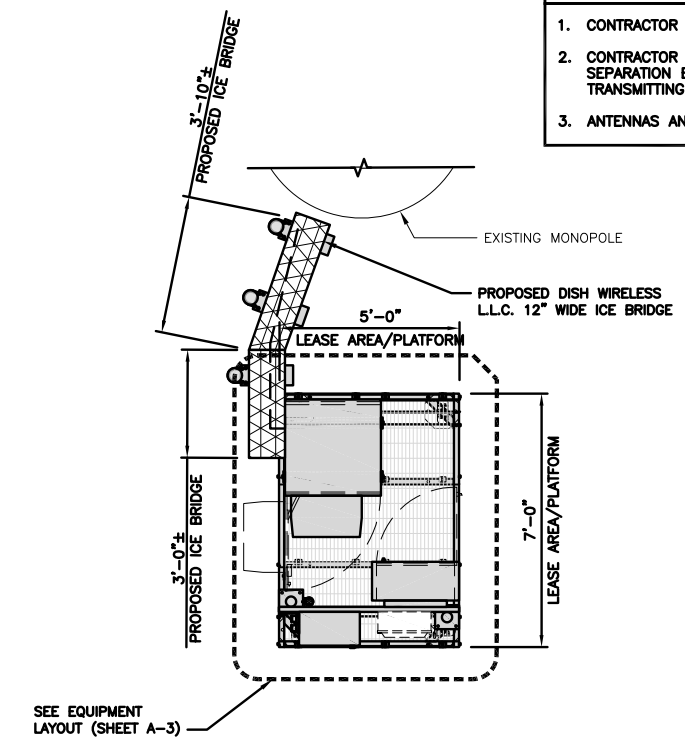
OVERALL SITE PLAN



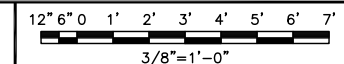
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NOTES

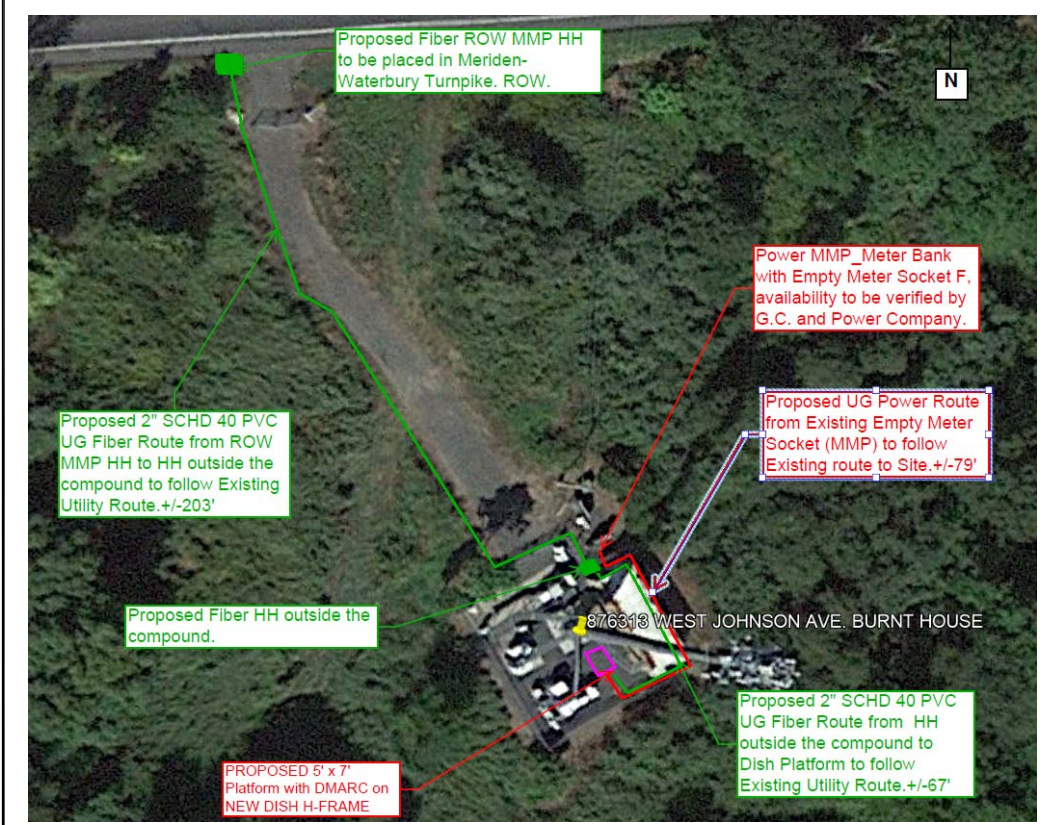
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



ENLARGED SITE PLAN



2



SITE PLAN

3



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



2000 CORPORATE DRIVE
CANONSBURG, PA 15317



1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.blgrp.com



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APPROVED BY: MP

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
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137177.003.01

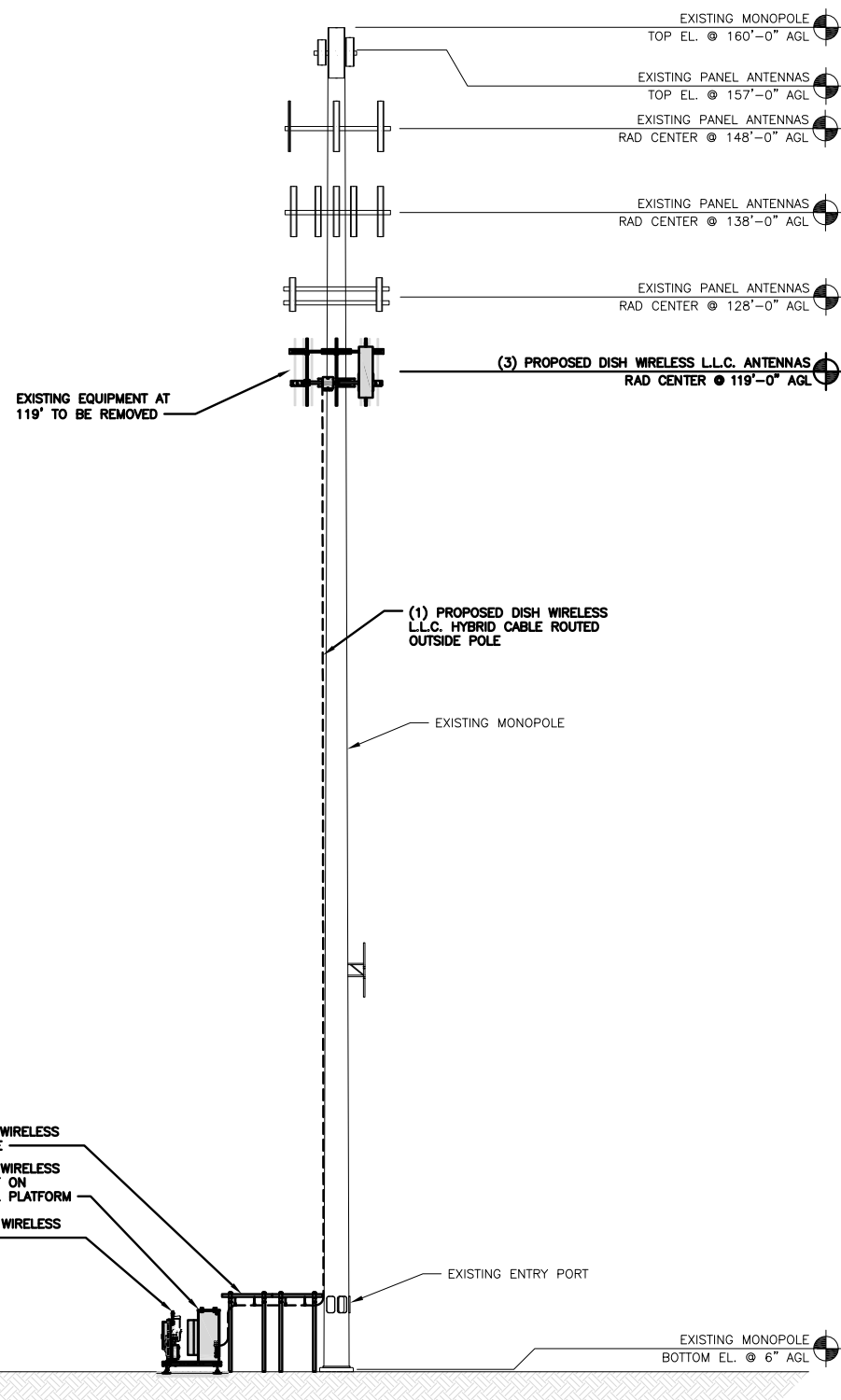
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SHEET TITLE
OVERALL AND ENLARGED SITE PLAN

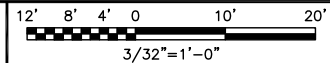
SHEET NUMBER
A-1

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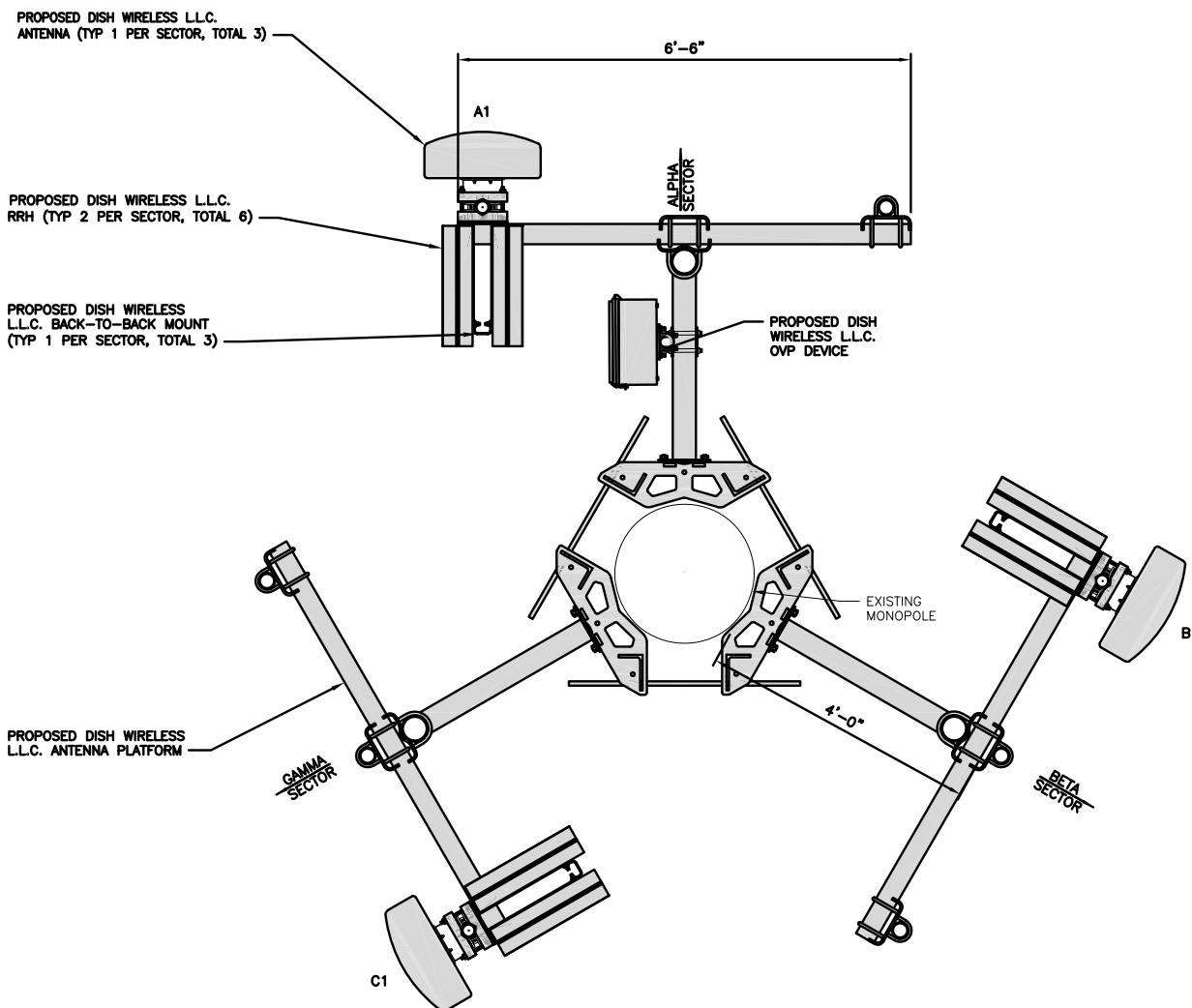
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



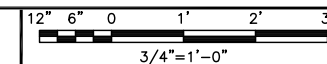
PROPOSED NORTHEAST ELEVATION



1



ANTENNA LAYOUT



2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA - MX08FRO665-21	5G	72.0" x 20.0"	0°	119'-0"	(1) HIGH-CAPACITY HYBRID CABLE (150' LONG)
BETA	B1	PROPOSED	JMA - MX08FRO665-21	5G	72.0" x 20.0"	120°	119'-0"	
GAMMA	C1	PROPOSED	JMA - MX08FRO665-21	5G	72.0" x 20.0"	240°	119'-0"	

SECTOR	POSITION	RRH		NOTES
		MANUFACTURER - MODEL NUMBER	TECHNOLOGY	
ALPHA	A1	FUJITSU - TA08025-B605	5G	1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS. 2. ANTENNA AND RRH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. ALL EQUIPMENT CHANGES MUST BE APPROVED AND REMAIN IN COMPLIANCE WITH THE PROPOSED DESIGN AND STRUCTURAL ANALYSES.
	A1	FUJITSU - TA08025-B604	5G	
BETA	B1	FUJITSU - TA08025-B605	5G	
	B1	FUJITSU - TA08025-B604	5G	
GAMMA	C1	FUJITSU - TA08025-B605	5G	
	C1	FUJITSU - TA08025-B604	5G	

ANTENNA SCHEDULE

NO SCALE

3



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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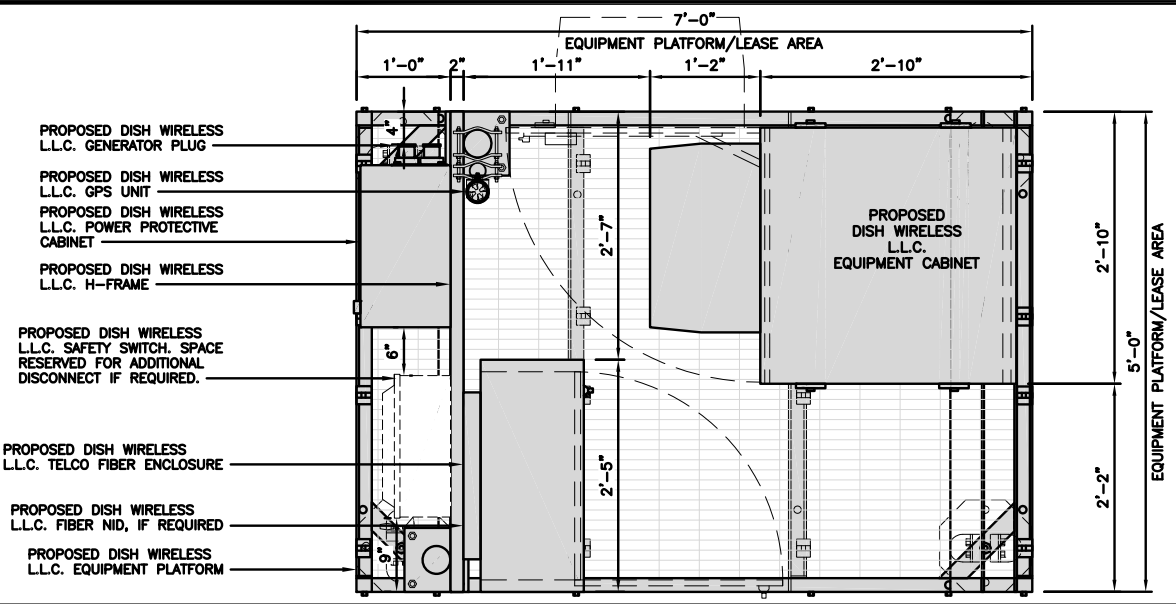
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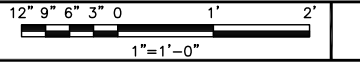
SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER

A-2



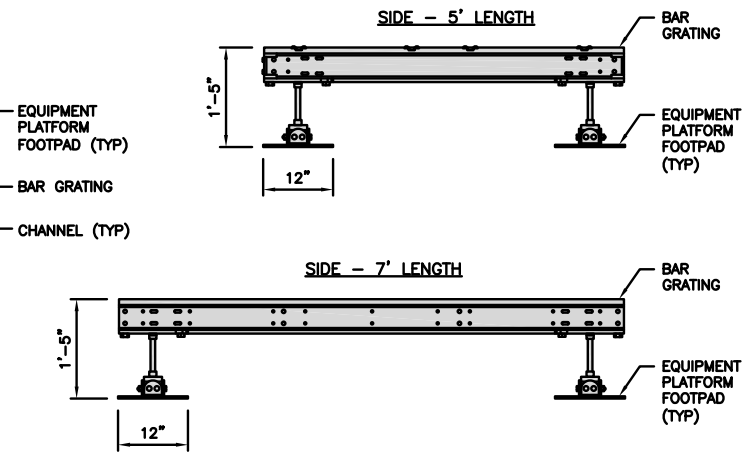
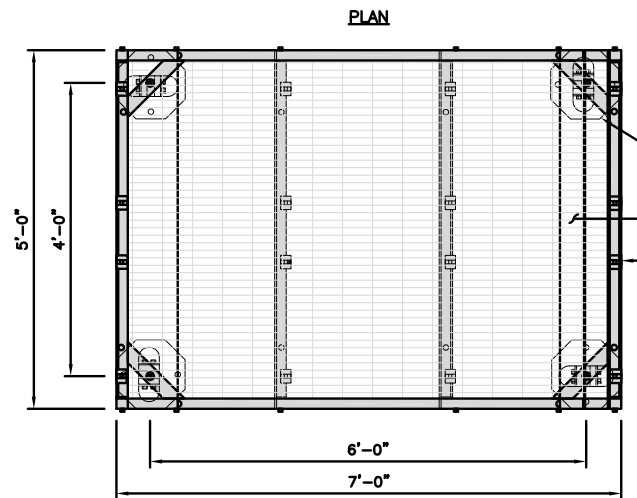
PLATFORM EQUIPMENT PLAN



1

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

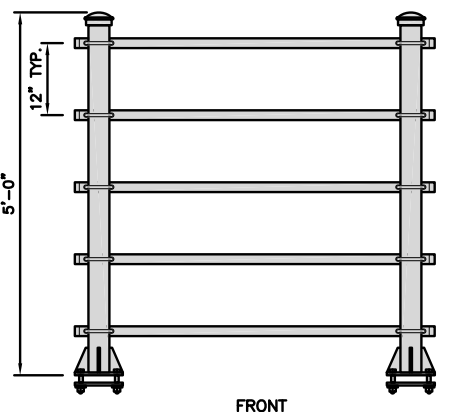
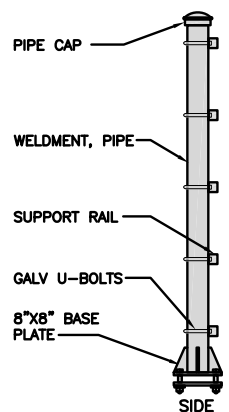
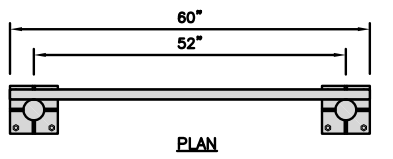
NOTE:
GC TO PROVIDE EXTENDED
THREAD FOR PLATFORM IF
REQUIRED HEIGHT EXCEEDS 17"



PLATFORM DETAIL

NO SCALE 2

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



H-FRAME DETAIL

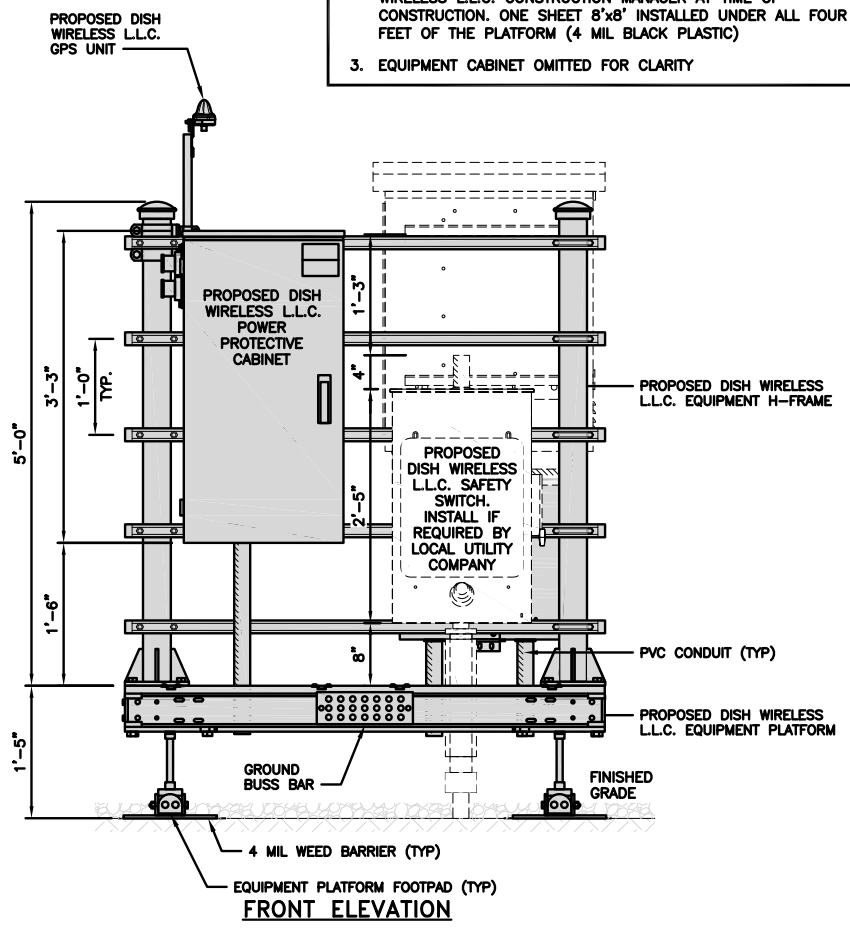
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NOT USED

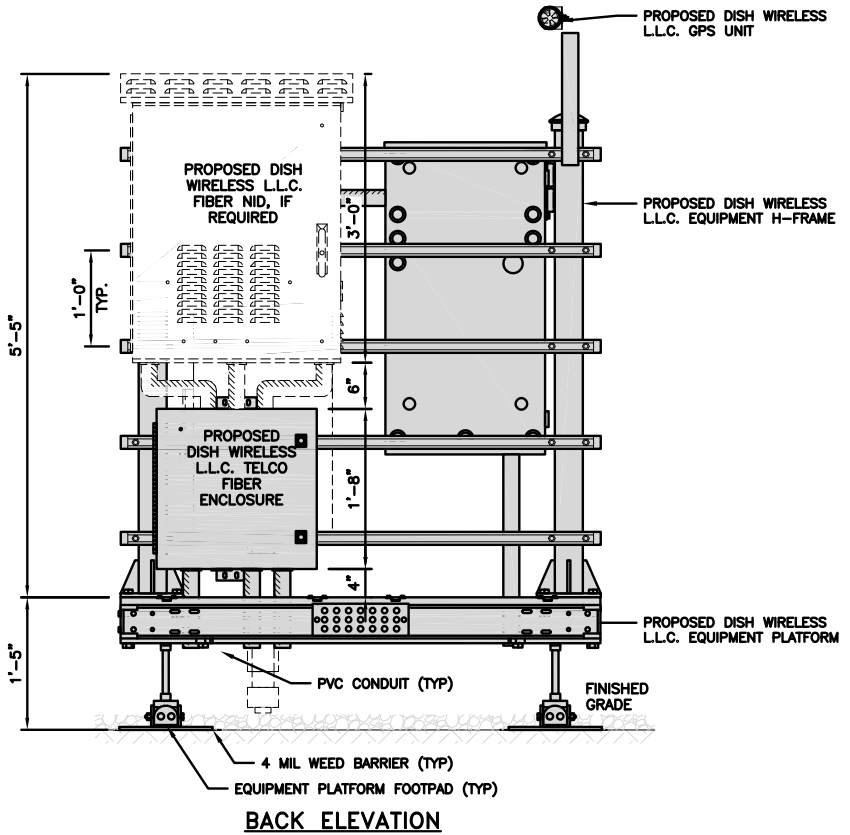
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NOTES

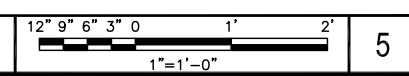
- CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
- WEED BARRIER FABRIC TO BE ADDED AT DISCRETION OF DISH WIRELESS L.L.C. CONSTRUCTION MANAGER AT TIME OF CONSTRUCTION. ONE SHEET 8'x8' INSTALLED UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)
- EQUIPMENT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



FRONT ELEVATION



BACK ELEVATION



5

H-FRAME EQUIPMENT ELEVATION



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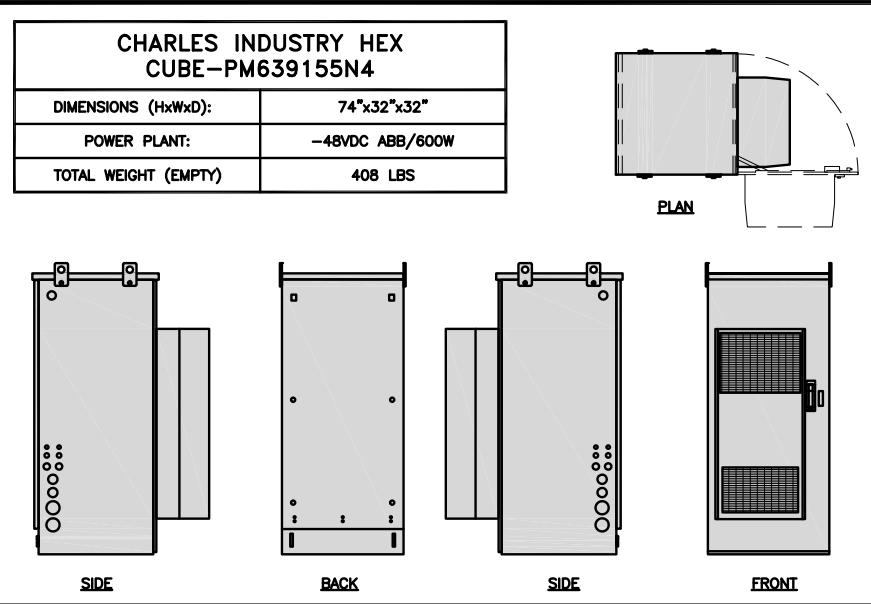
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EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER

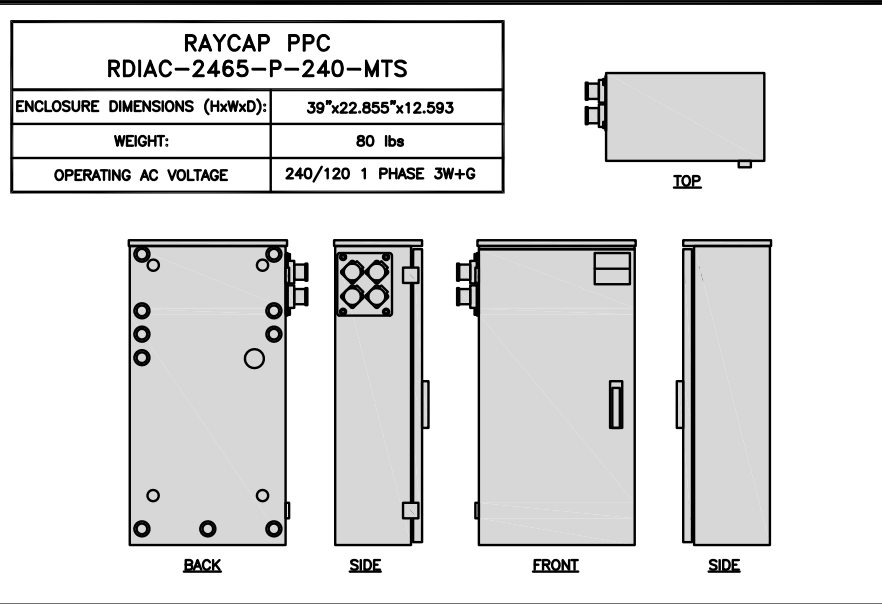
A-3



CABINET DETAIL

NO SCALE

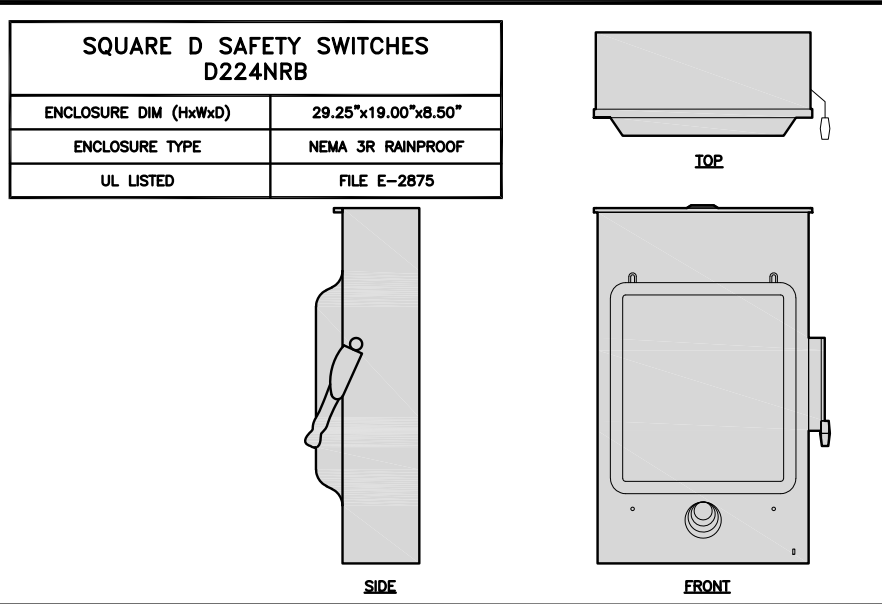
1



POWER PROTECTION CABINET (PPC) DETAIL

NO SCALE

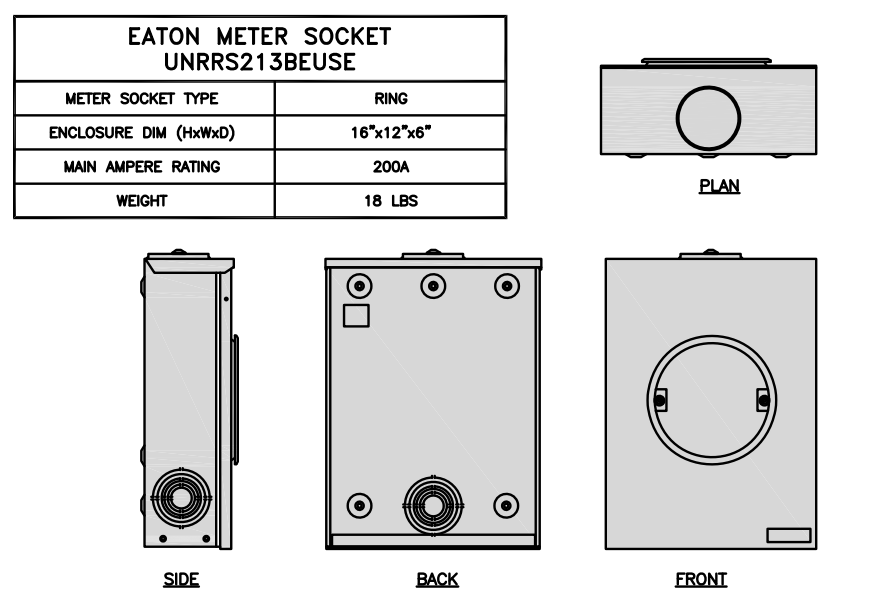
2



SAFETY SWITCH DETAIL

NO SCALE

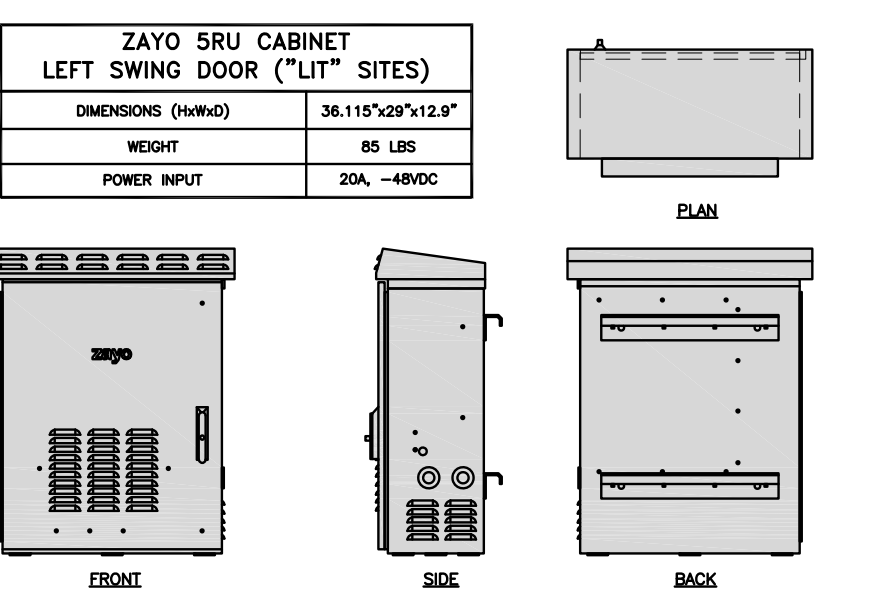
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METER SOCKET DETAIL

NO SCALE

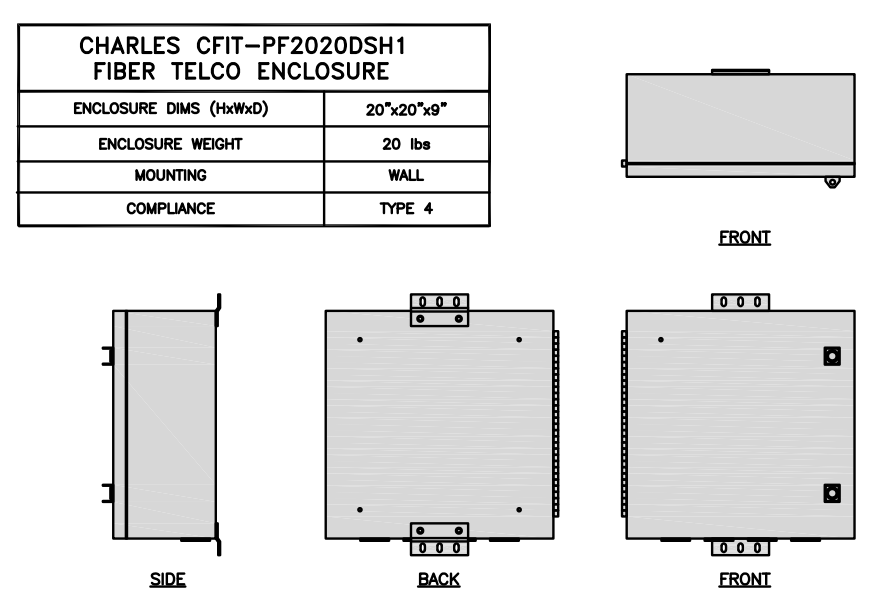
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NETWORK INTERFACE UNIT DETAIL

NO SCALE

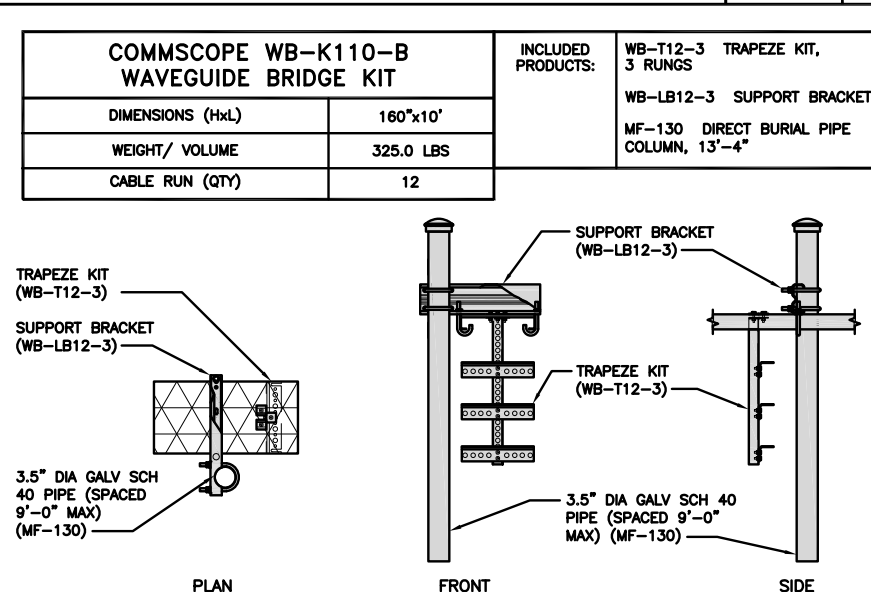
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FIBER TELCO ENCLOSURE DETAIL

NO SCALE

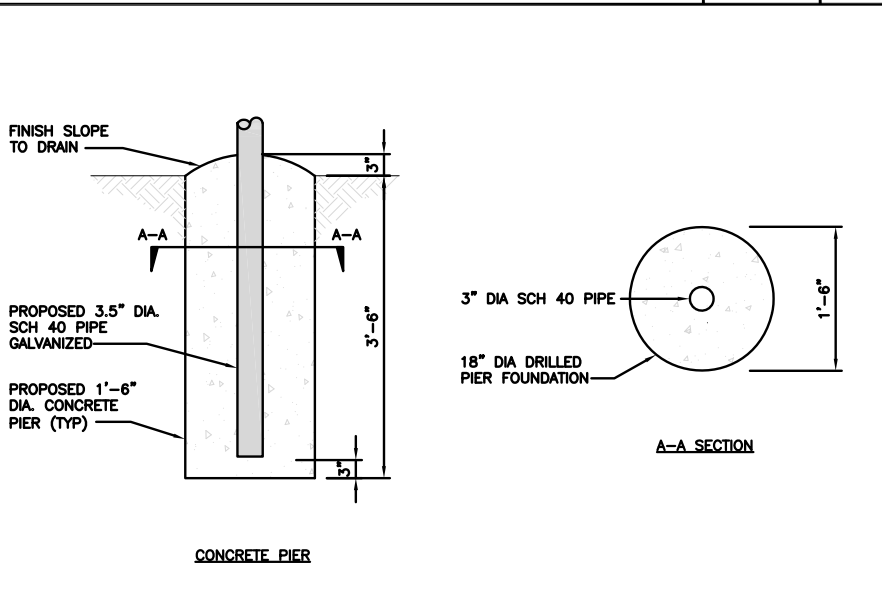
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ICE BRIDGE DETAIL

NO SCALE

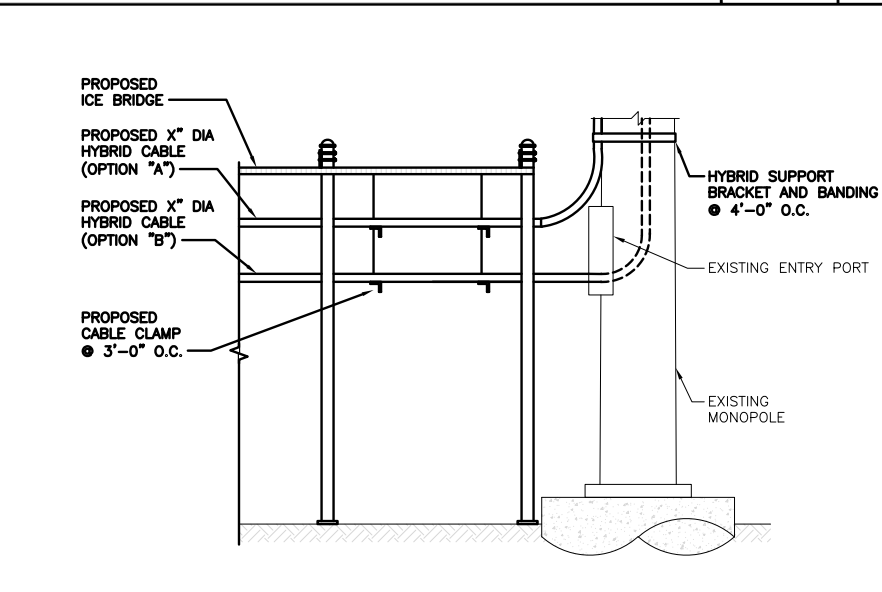
7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL

NO SCALE

8



HYBRID CABLE RUN

NO SCALE

9

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

2000 CORPORATE DRIVE
CANONSBURG, PA 15317

1717 S. BOULDER
SUITE 300
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PH: (918) 587-4630
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CONSTRUCTION DOCUMENTS

SUBMITTALS		
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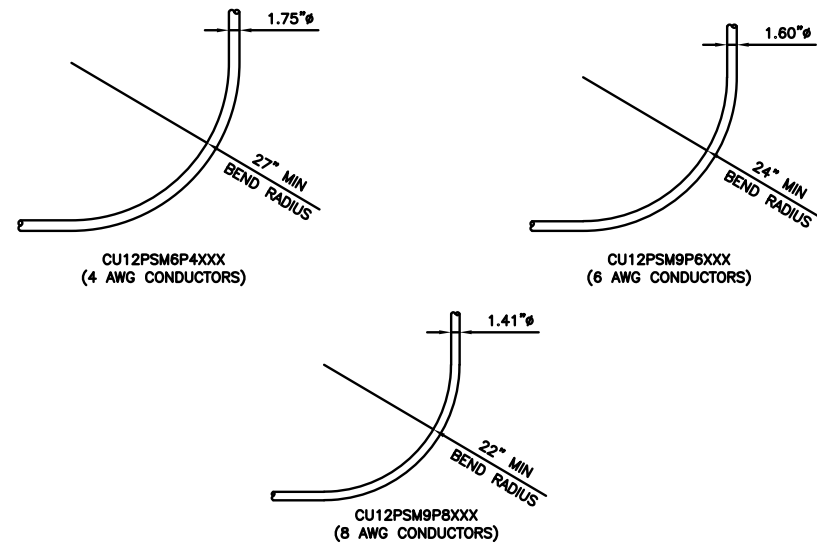
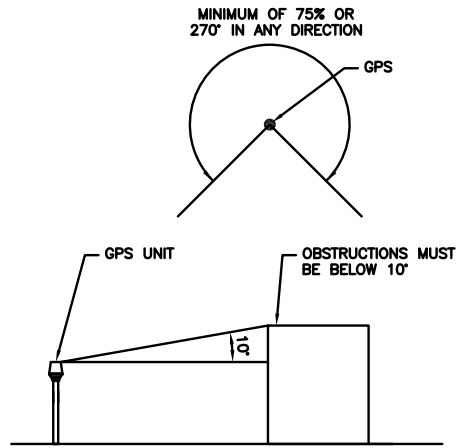
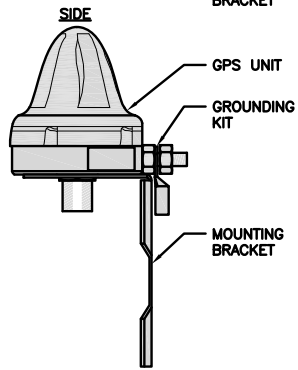
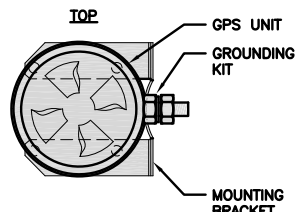
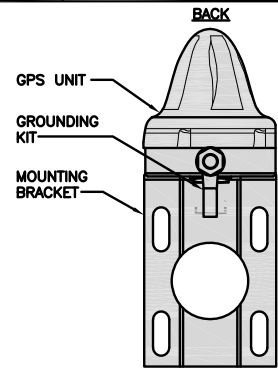
A&E PROJECT NUMBER
137177.003.01

DISH WIRELESS L.L.C.
PROJECT INFORMATION
BOBDL00077A
1394 MERIDEN WATERBURY TPK
SOUTHINGTON, CT 06489

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

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



GPS ANTENNA DETAIL

NO SCALE 1

GPS MINIMUM SKY VIEW REQUIREMENTS

NO SCALE 2

CABLES UNLIMITED HYBRID CABLE
MINIMUM BEND RADIUS

NO SCALE 3

NOT USED

NO SCALE 4

NOT USED

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 7

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9



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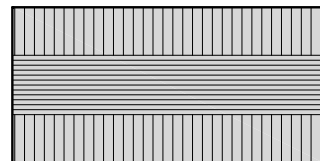
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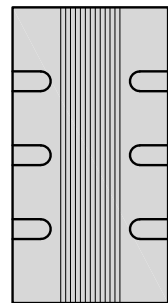
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

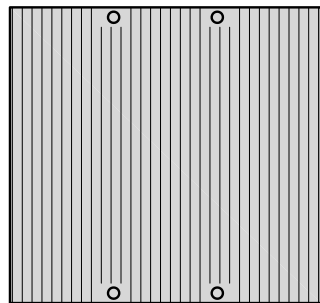
FUJITSU TA08025-B604 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



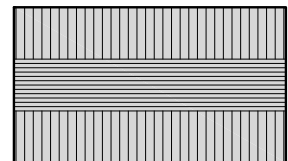
FRONT

REMOTE RADIO HEAD DETAIL

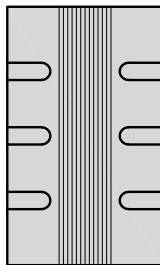
NO SCALE

1

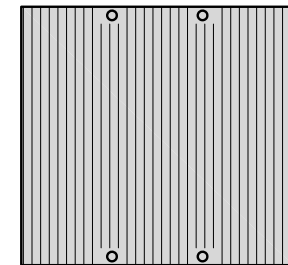
FUJITSU TA08025-B605 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x230/14.9"x15.7"x9.0"
WEIGHT(KG,LB)/ VOLUME	34kg,74.9lb/ 35L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



FRONT

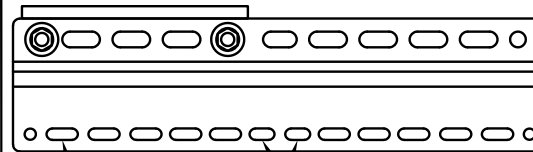
REMOTE RADIO HEAD DETAIL

NO SCALE

2

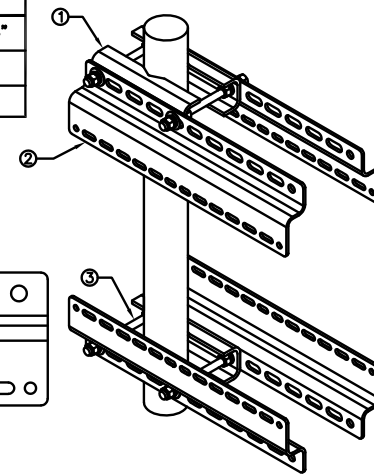
SABRE INDUSTRIES RRU BRACKET MOUNT C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

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



11MM x 30MM SLOTS
40MM ON CENTER

11MM x 24MM SLOTS



REMOTE RADIO MOUNT DETAIL

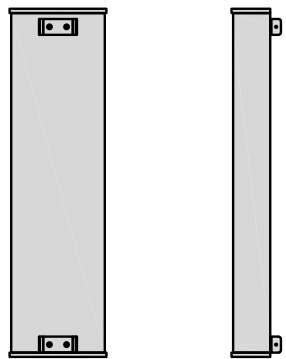
NO SCALE

3

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

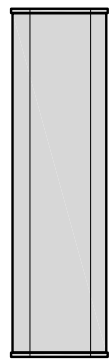


PLAN



BACK

SIDE



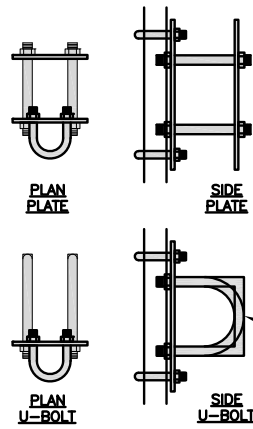
FRONT

ANTENNA DETAIL

NO SCALE

4

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

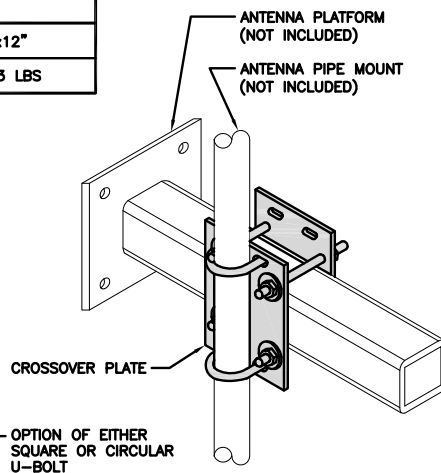


PLAN PLATE

SIDE PLATE

PLAN U-BOLT

SIDE U-BOLT



CROSSOVER PLATE

OPTION OF EITHER SQUARE OR CIRCULAR U-BOLT

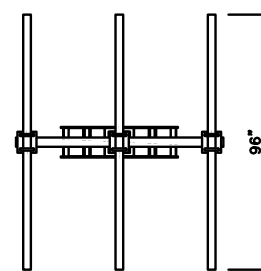
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NO SCALE

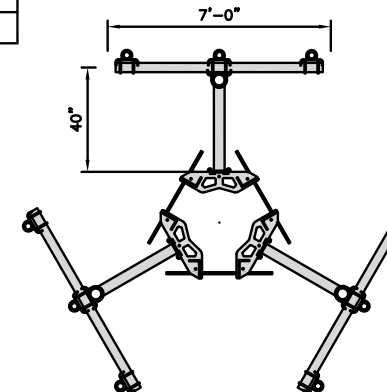
5

COMMSCOPE MC-K6MHDX-9-96	
FACE WIDTH	7'-0"
WEIGHT	1203.31 lbs
NOTE: 15" TO 50" O.D.	

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



96"



7'-0"

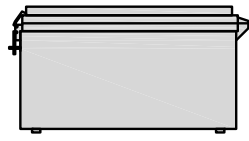
40"

ANTENNA MOUNTING DETAIL

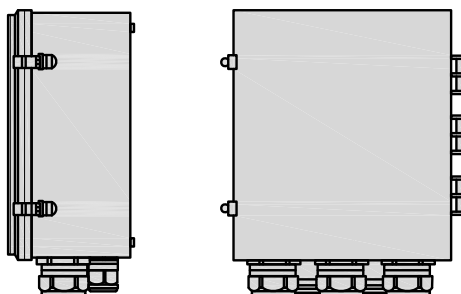
NO SCALE

6

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

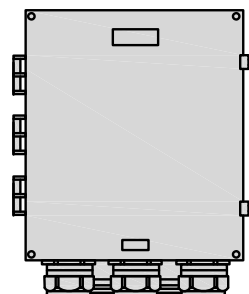


PLAN



SIDE

BACK



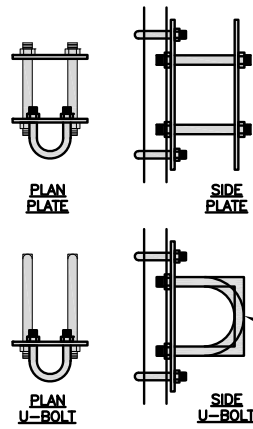
FRONT

SURGE SUPPRESSION DETAIL (OVP)

NO SCALE

7

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

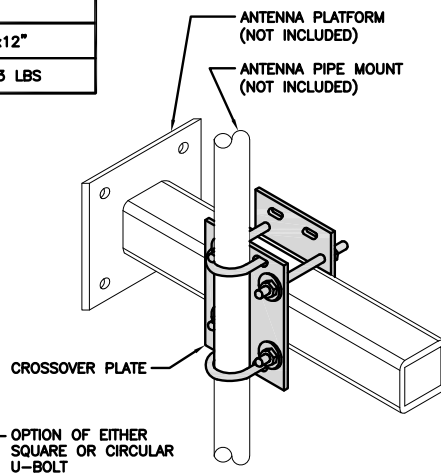


PLAN PLATE

SIDE PLATE

PLAN U-BOLT

SIDE U-BOLT



CROSSOVER PLATE

OPTION OF EITHER SQUARE OR CIRCULAR U-BOLT

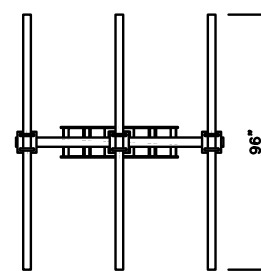
RRH/OVP MOUNT DETAIL

NO SCALE

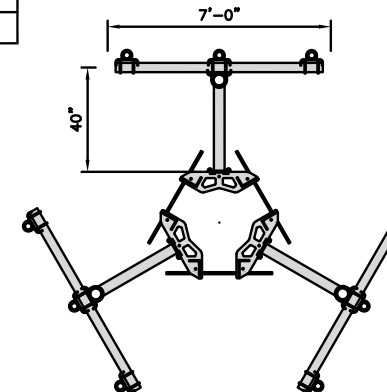
8

COMMSCOPE MC-K6MHDX-9-96	
FACE WIDTH	7'-0"
WEIGHT	1203.31 lbs
NOTE: 15" TO 50" O.D.	

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



96"



7'-0"

40"

T-ARM MOUNT DETAIL

NO SCALE

9

dish
wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

**CROWN
CASTLE**

2000 CORPORATE DRIVE
CANONSBURG, PA 15317

B+T GRP

1717 S. BOULDER
SUITE 300
TULSA, OK 74119
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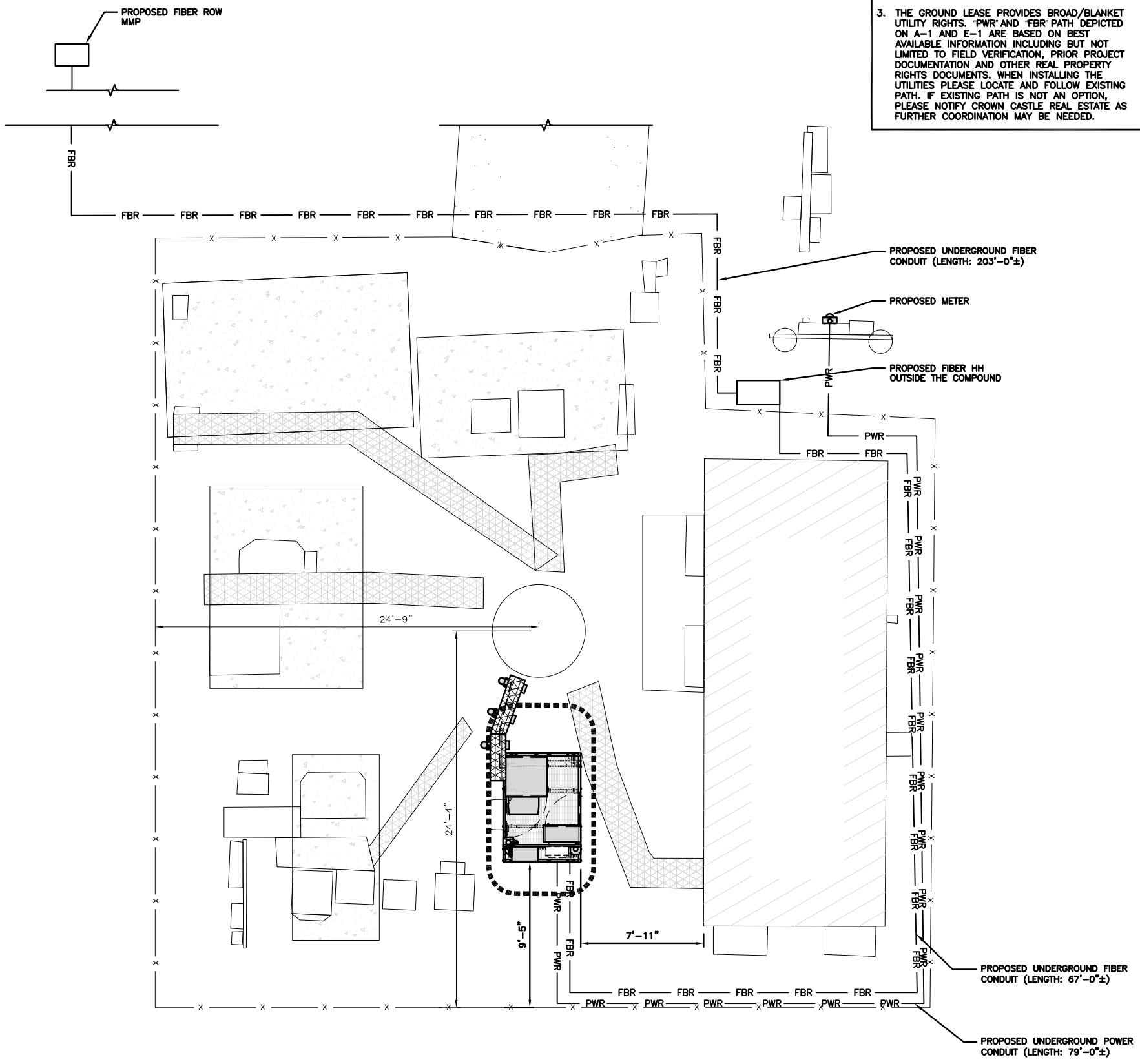
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DISH WIRELESS L.L.C.
PROJECT INFORMATION
BOBDL00077A
1394 MERIDEN WATERBURY
TPK
SOUTHINGTON, CT 06489

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER

A-6

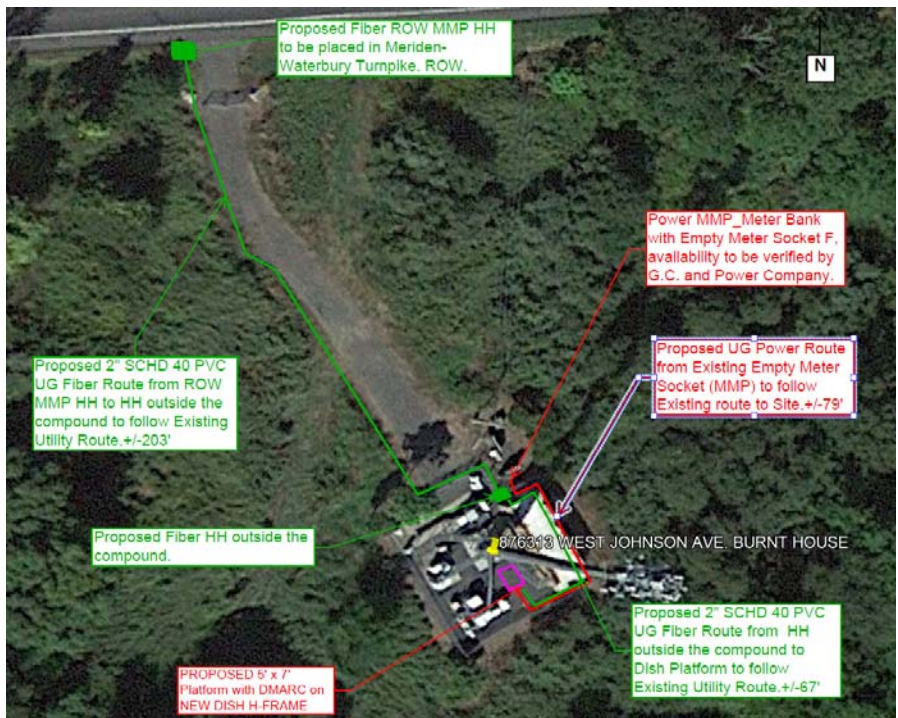


NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
3. THE GROUND LEASE PROVIDES BROAD/BLANKET UTILITY RIGHTS. PWR AND FBR PATH DEPICTED ON A-1 AND E-1 ARE BASED ON BEST AVAILABLE INFORMATION INCLUDING BUT NOT LIMITED TO FIELD VERIFICATION, PRIOR PROJECT DOCUMENTATION AND OTHER REAL PROPERTY RIGHTS DOCUMENTS. WHEN INSTALLING THE UTILITIES PLEASE LOCATE AND FOLLOW EXISTING PATH. IF EXISTING PATH IS NOT AN OPTION, PLEASE NOTIFY CROWN CASTLE REAL ESTATE AS FURTHER COORDINATION MAY BE NEEDED.

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

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



UTILITY ROUTE PLAN

ELECTRICAL NOTES



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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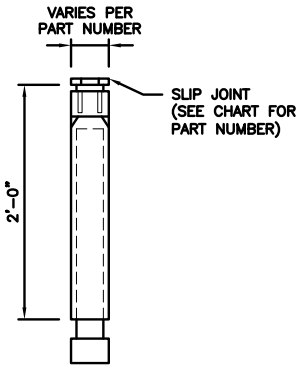
SHEET TITLE
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

SHEET NUMBER
E-1

NO SCALE 2

CARLON EXPANSION FITTINGS

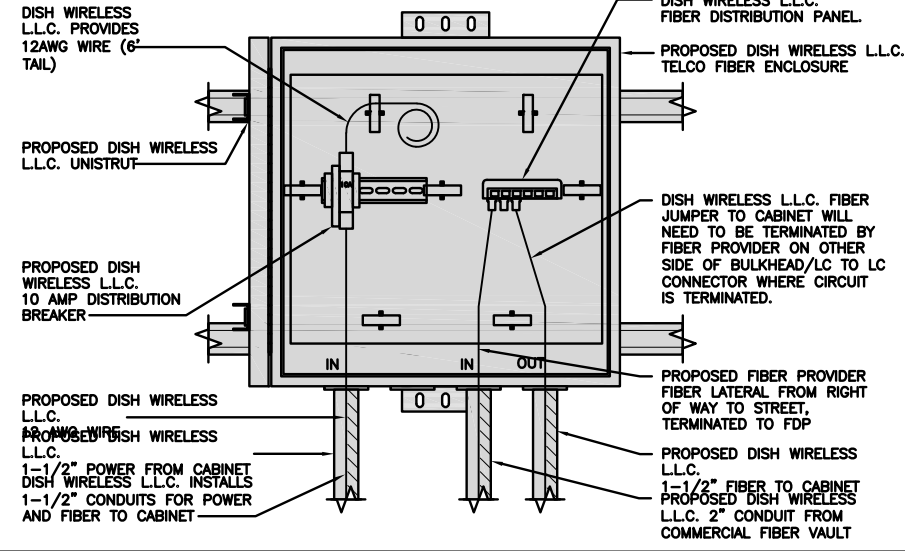
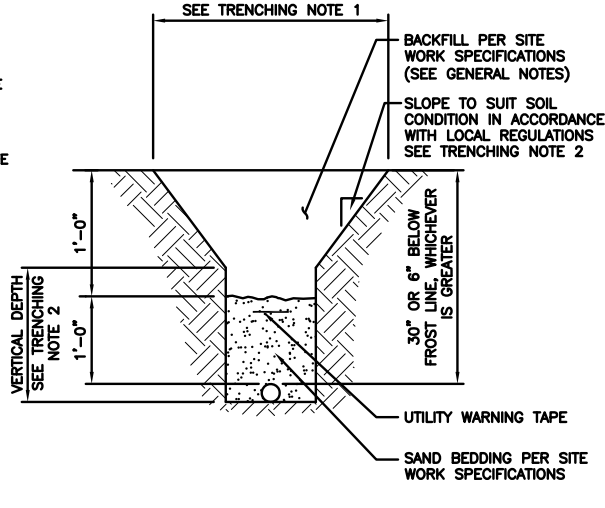
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
E945M	E945MX	3 1/2"	5	8"
E945N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



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

TRENCHING NOTES

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



EXPANSION JOINT DETAIL

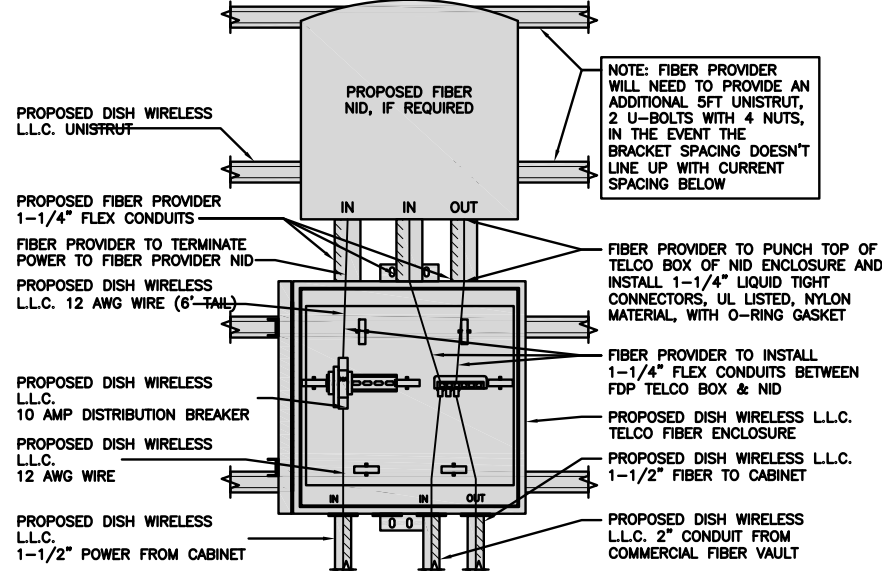
NO SCALE 1

TYPICAL UNDERGROUND TRENCH DETAIL

NO SCALE 2

DARK TELCO BOX – INTERIOR WIRING LAYOUT

NO SCALE 3



LIT TELCO BOX – INTERIOR WIRING LAYOUT (OPTIONAL)

NO SCALE 4

NOT USED

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9



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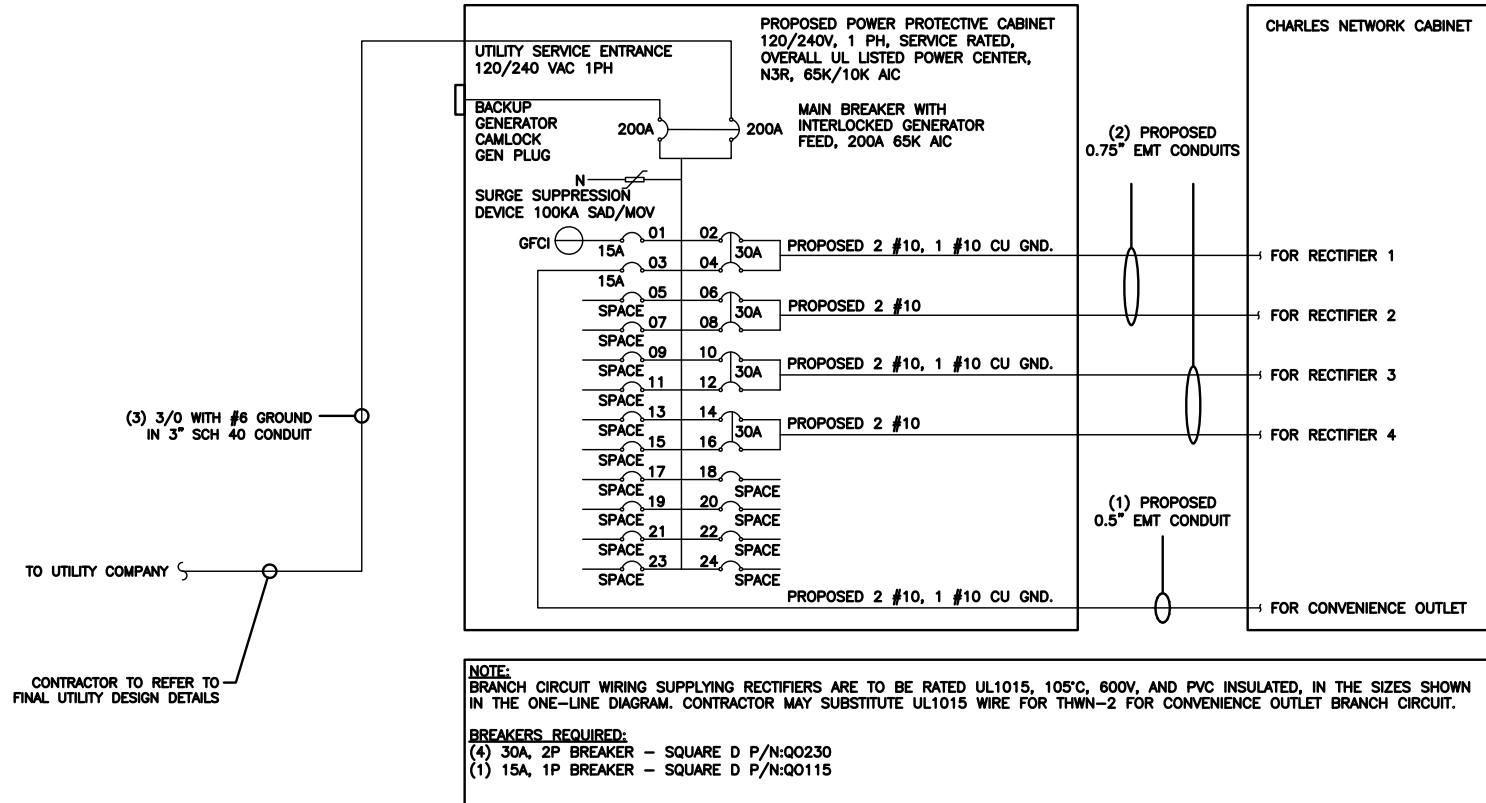
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BOBDL00077A
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SOUTHINGTON, CT 06489

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER

E-2



NOTES

THE (2) CONDUITS WITH (4) CURRENT CARRYING CONDUCTORS EACH, SHALL APPLY THE ADJUSTMENT FACTOR OF 80% PER 2014/17 NEC TABLE 310.15(B)(3)(g) OR 2020 NEC TABLE 310.15(C)(1) FOR UL1015 WIRE.

#12 FOR 15A-20A/1P BREAKER: 0.8 x 30A = 24.0A
 #10 FOR 25A-30A/2P BREAKER: 0.8 x 40A = 32.0A
 #8 FOR 35A-40A/2P BREAKER: 0.8 x 55A = 44.0A
 #6 FOR 45A-60A/2P BREAKER: 0.8 x 75A = 60.0A

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

CABINET CONVENIENCE OUTLET CONDUCTORS (1 CONDUIT): USING THWN-2, CU.
 #10 - 0.0211 SQ. IN X 2 = 0.0422 SQ. IN
 #10 - 0.0211 SQ. IN X 1 = 0.0211 SQ. IN <GROUND
 TOTAL = 0.0633 SQ. IN

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

RECTIFIER CONDUCTORS (2 CONDUITS): USING UL1015, CU.
 #10 - 0.0266 SQ. IN X 4 = 0.1064 SQ. IN
 #10 - 0.0082 SQ. IN X 1 = 0.0082 SQ. IN <BARE GROUND
 TOTAL = 0.1146 SQ. IN

0.75" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (5) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

PPC FEED CONDUCTORS (1 CONDUIT): USING THWN, CU.
 3/0 - 0.2679 SQ. IN X 3 = 0.8037 SQ. IN
 #6 - 0.0507 SQ. IN X 1 = 0.0507 SQ. IN <GROUND
 TOTAL = 0.8544 SQ. IN

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

dish wireless.

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CROWN CASTLE

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Professional Engineer Seal
 No. 23824
 LICENSED PROFESSIONAL ENGINEER
 6/30/2021

PPC ONE-LINE DIAGRAM

NO SCALE 1

PROPOSED CHARLES PANEL SCHEDULE

LOAD SERVED	VOLT AMPS (WATTS)		TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS)		LOAD SERVED	
	L1	L2						L1	L2		
PPC GFCI OUTLET	180	180	15A	1	A	2	30A	2880	2880	ABB/GE INFINITY RECTIFIER 1	
CHARLES GFCI OUTLET			15A	3	B	4	30A	2880	2880	ABB/GE INFINITY RECTIFIER 2	
-SPACE-				5	A	6	30A	2880	2880	ABB/GE INFINITY RECTIFIER 3	
-SPACE-				7	B	8	30A	2880	2880	ABB/GE INFINITY RECTIFIER 4	
-SPACE-				9	A	10				-SPACE-	
-SPACE-				11	B	12				-SPACE-	
-SPACE-				13	A	14				-SPACE-	
-SPACE-				15	B	16				-SPACE-	
-SPACE-				17	A	18				-SPACE-	
-SPACE-				19	B	20				-SPACE-	
-SPACE-				21	A	22				-SPACE-	
-SPACE-				23	B	24				-SPACE-	
VOLTAGE AMPS			180	180			11520	11520			
200A MCB, 1φ, 24 SPACE, 120/240V			L1		L2		VOLTAGE AMPS				
MB RATING: 65,000 AIC			11700	11700			AMPS				
			98	98			MAX AMPS				
			98	123			MAX 125%				

PANEL SCHEDULE

NO SCALE 2

NOT USED

NO SCALE 3

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RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS

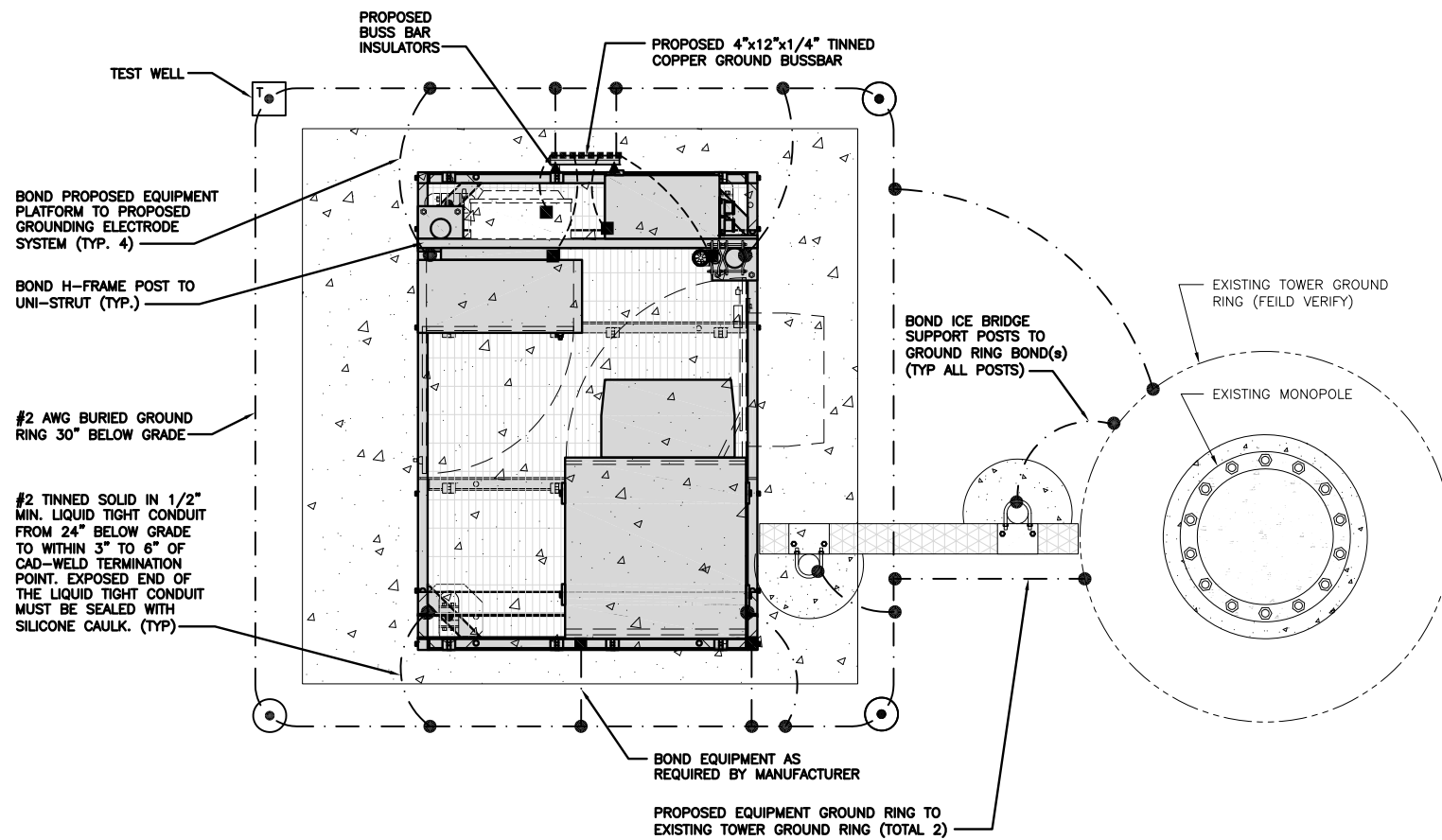
REV	DATE	DESCRIPTION
A	5/21/21	ISSUED FOR REVIEW
0	6/30/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
137177.003.01

DISH WIRELESS L.L.C.
 PROJECT INFORMATION
 BOBDL00077A
 1394 MERIDEN WATERBURY TPK
 SOUTHTON, CT 06489

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

SHEET NUMBER
E-3

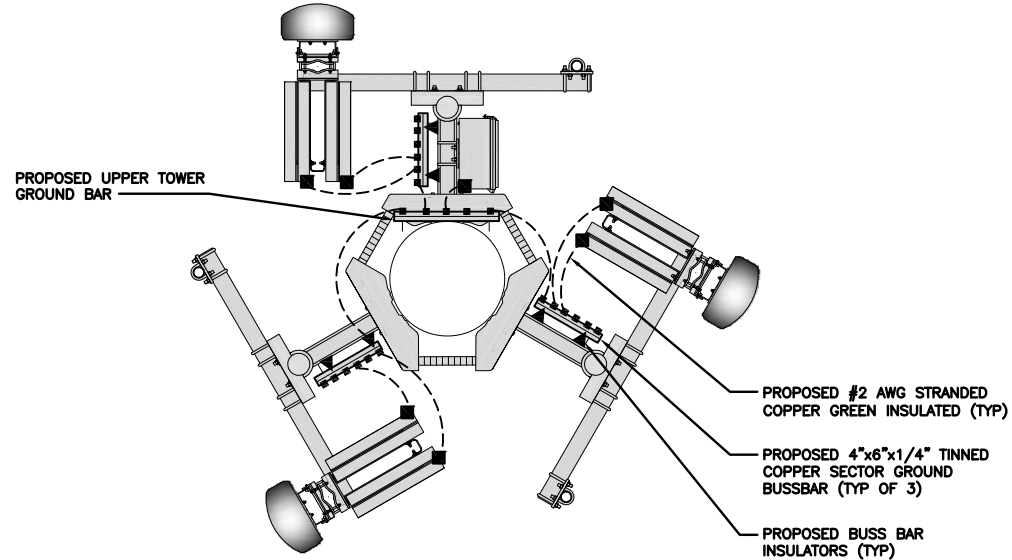


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1

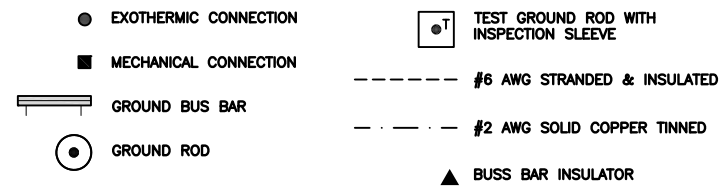
NOTES

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



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2



GROUNDING LEGEND

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

GROUNDING KEY NOTES

- (A) EXTERIOR GROUND RING: #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.
- (B) TOWER GROUND RING: THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.
- (C) INTERIOR GROUND RING: #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUNDED TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.
- (D) BOND TO INTERIOR GROUND RING: #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING.
- (E) GROUND ROD: UL LISTED COPPER CLAD STEEL MINIMUM 1/2" DIAMETER BY EIGHT FEET LONG. GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR.
- (F) CELL REFERENCE GROUND BAR: POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 AWG UNLESS NOTED OTHERWISE STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUCTORS.
- (G) HATCH PLATE GROUND BAR: BOND TO THE INTERIOR GROUND RING WITH TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A HATCH-PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CRGB MUST BE CONNECTED TO THE HATCH-PLATE AND TO THE INTERIOR GROUND RING USING (2) TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EACH.
- (H) EXTERIOR CABLE ENTRY PORT GROUND BARS: LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE.
- (I) TELCO GROUND BAR: BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.
- (J) FRAME BONDING: THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.
- (K) INTERIOR UNIT BONDS: METAL FRAMES, CABINETS AND INDIVIDUAL METALLIC UNITS LOCATED WITH THE AREA OF THE INTERIOR GROUND RING REQUIRE A #6 AWG STRANDED GREEN INSULATED COPPER BOND TO THE INTERIOR GROUND RING.
- (L) FENCE AND GATE GROUNDING: METAL FENCES WITHIN 7 FEET OF THE EXTERIOR GROUND RING OR OBJECTS BONDED TO THE EXTERIOR GROUND RING SHALL BE BONDED TO THE GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTOR AT AN INTERVAL NOT EXCEEDING 25 FEET. BONDS SHALL BE MADE AT EACH GATE POST AND ACROSS GATE OPENINGS.
- (M) EXTERIOR UNIT BONDS: METALLIC OBJECTS, EXTERNAL TO OR MOUNTED TO THE BUILDING, SHALL BE BONDED TO THE EXTERIOR GROUND RING. USING #2 TINNED SOLID COPPER WIRE
- (N) ICE BRIDGE SUPPORTS: EACH ICE BRIDGE LEG SHALL BE BONDED TO THE GROUND RING WITH #2 AWG BARE TINNED COPPER CONDUCTOR. PROVIDE EXOTHERMIC WELDS AT BOTH THE ICE BRIDGE LEG AND BURIED GROUND RING.
- (O) DURING ALL DC POWER SYSTEM CHANGES INCLUDING DC SYSTEM CHANGE OUTS, RECTIFIER REPLACEMENTS OR ADDITIONS, BREAKER DISTRIBUTION CHANGES, BATTERY ADDITIONS, BATTERY REPLACEMENTS AND INSTALLATIONS OR CHANGES TO DC CONVERTER SYSTEMS IT SHALL BE REQUIRED THAT SERVICE CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH A MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR
- (P) TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO PROPOSED ANTENNA MOUNT COLLAR. REFER TO DISH WIRELESS L.L.C. GROUNDING NOTES.

GROUNDING KEY NOTES

NO SCALE 3



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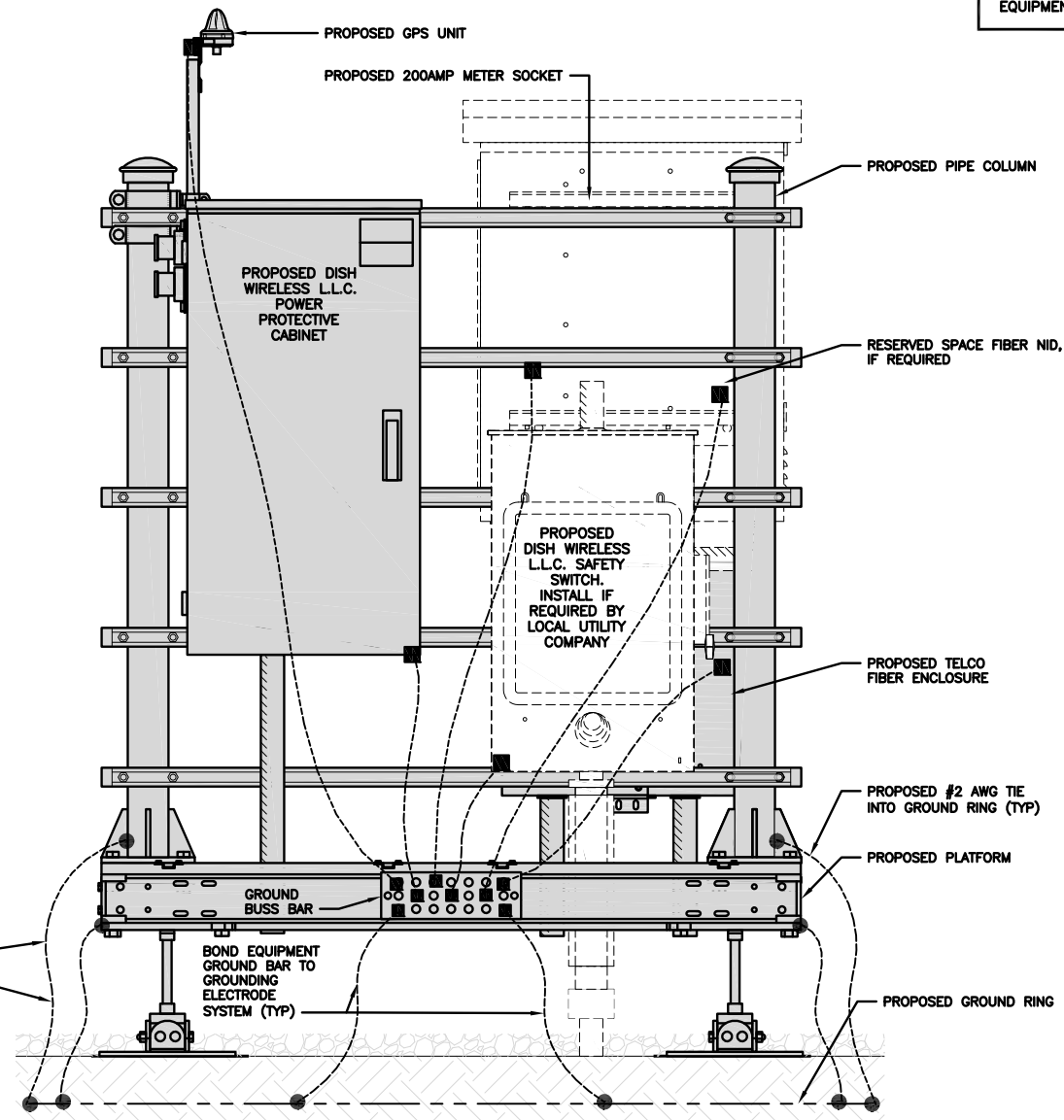
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PROJECT INFORMATION
BOBDL00077A
1394 MERIDEN WATERBURY
TPK
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SHEET TITLE
GROUNDING PLANS
AND NOTES

SHEET NUMBER

G-1

NOTES
EQUIPMENT CABINET OMITTED FOR CLARITY

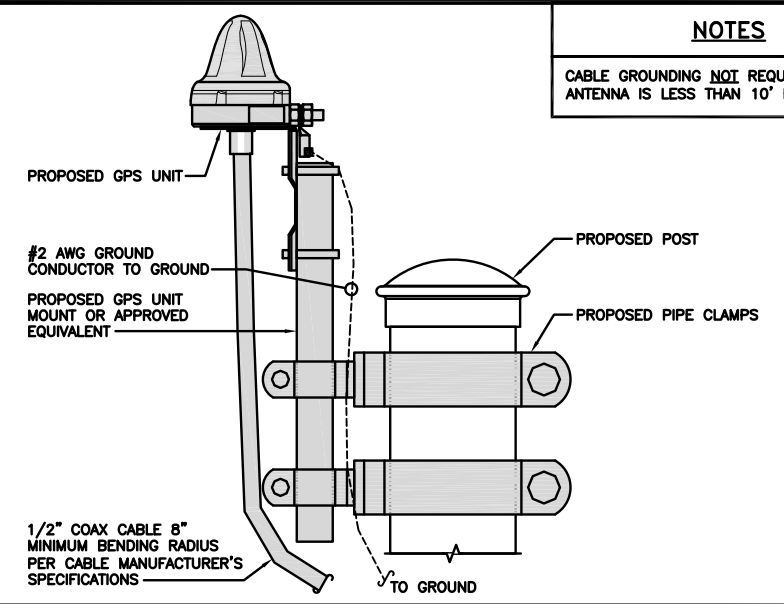


#2 TINNED SOLID IN 1/2" MIN. LIQUID TIGHT CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. EXPOSED END OF THE LIQUID TIGHT CONDUIT MUST BE SEALED WITH SILICONE CAULK. (TYP)

H-FRAME GROUNDING DETAIL

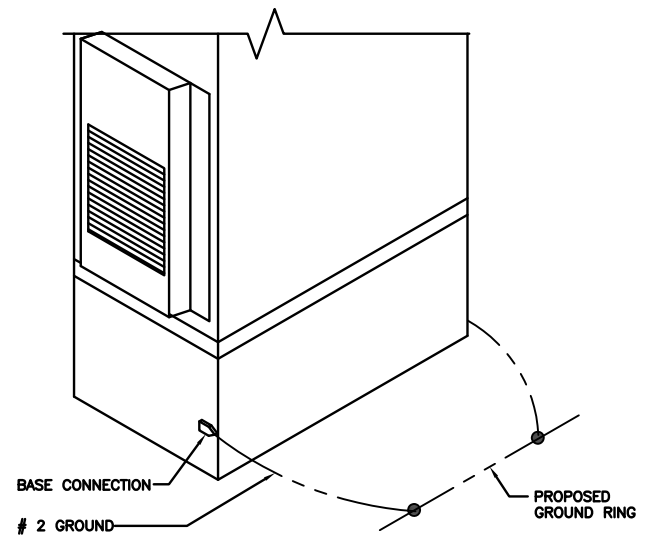
NO SCALE 1

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



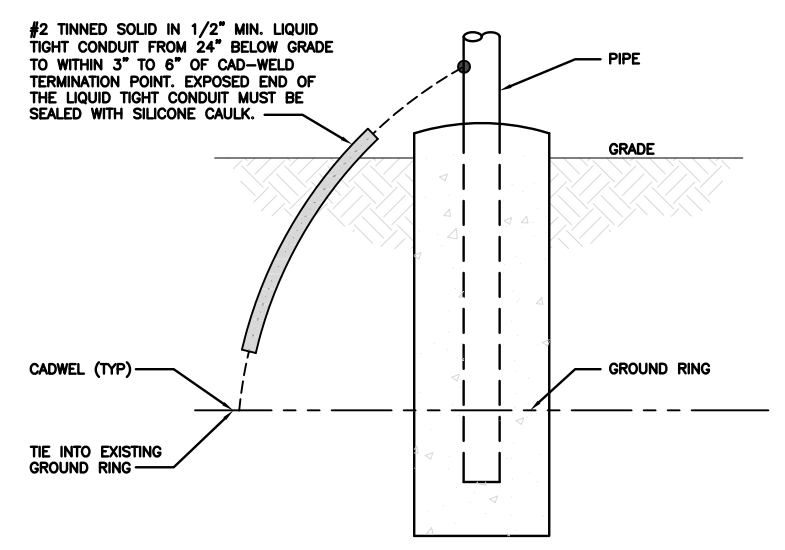
TYPICAL GPS UNIT GROUNDING

NO SCALE 2



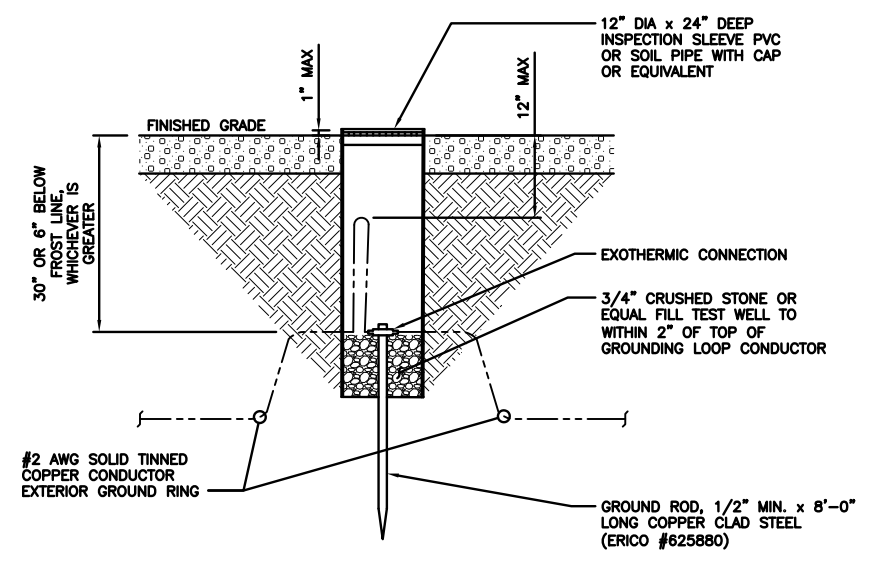
OUTDOOR CABINET GROUNDING

NO SCALE 3



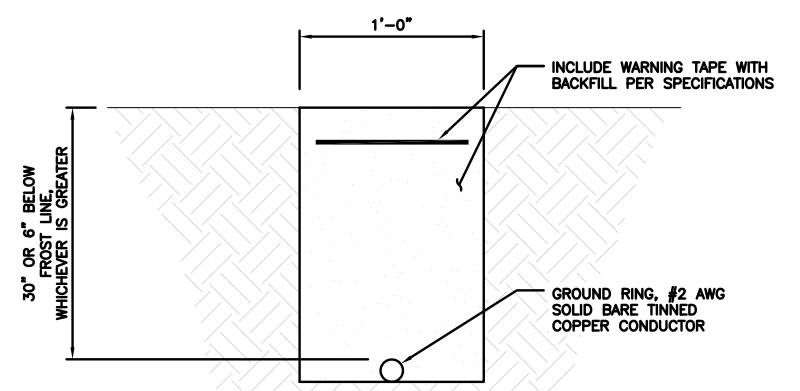
TRANSITIONING GROUND DETAIL

NO SCALE 4



TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE

NO SCALE 5



TYPICAL GROUND RING TRENCH

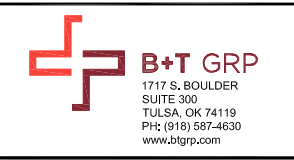
NO SCALE 6



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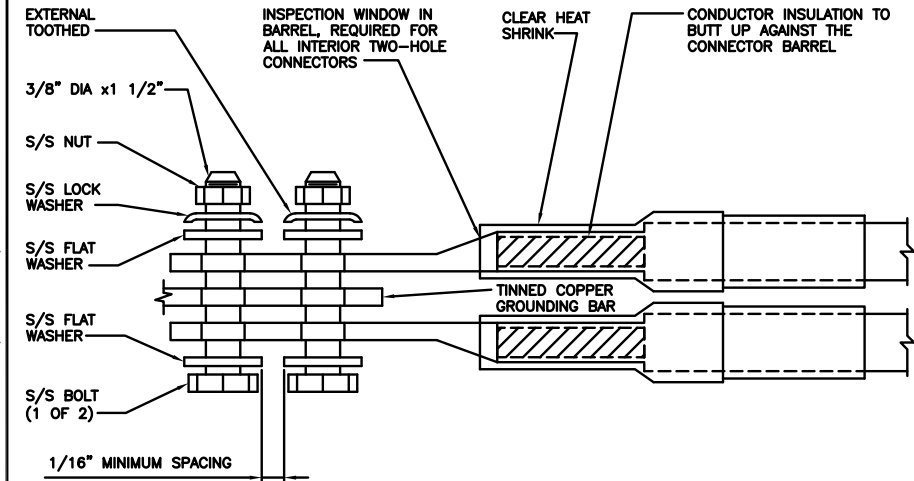
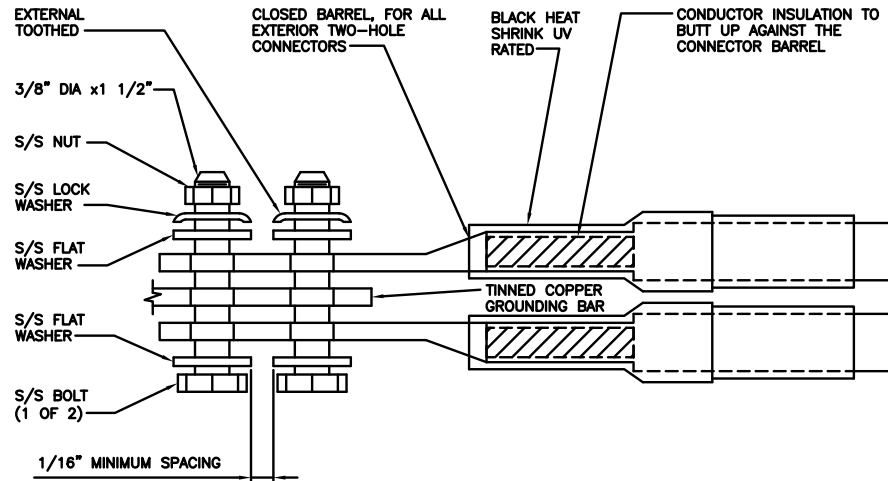
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SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-2

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



TYPICAL GROUNDING NOTES

NO SCALE

1

TYPICAL EXTERIOR TWO HOLE LUG

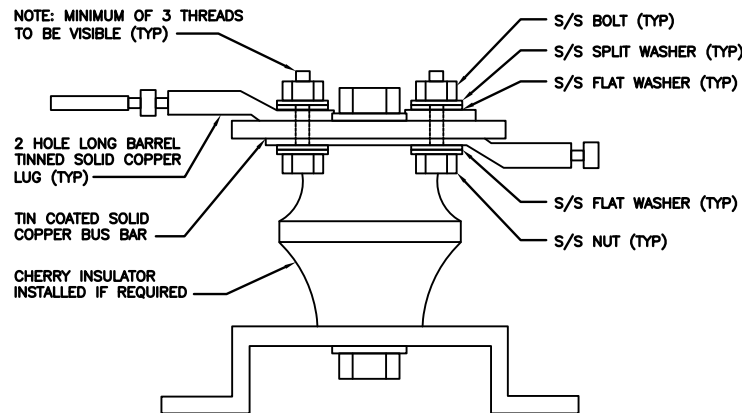
NO SCALE

2

TYPICAL INTERIOR TWO HOLE LUG

NO SCALE

3



LUG DETAIL

NO SCALE

4

NOT USED

NO SCALE

5

NOT USED

NO SCALE

6

NOT USED

NO SCALE

7

NOT USED

NO SCALE

8

NOT USED

NO SCALE

9

dish
wireless.

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CASTLE

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GROUNDING DETAILS

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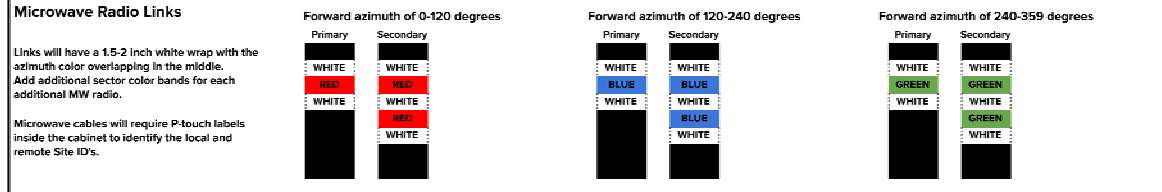
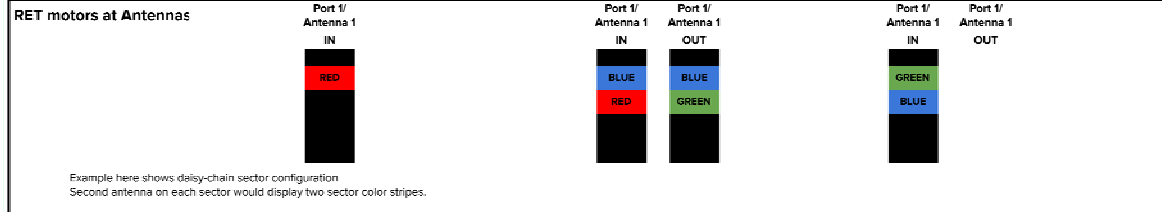
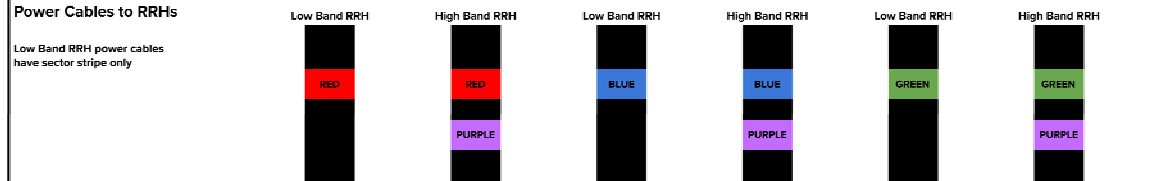
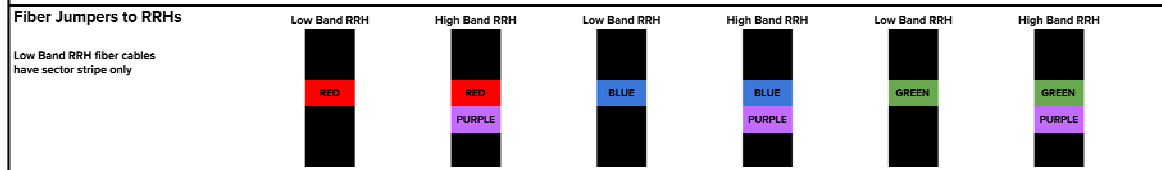
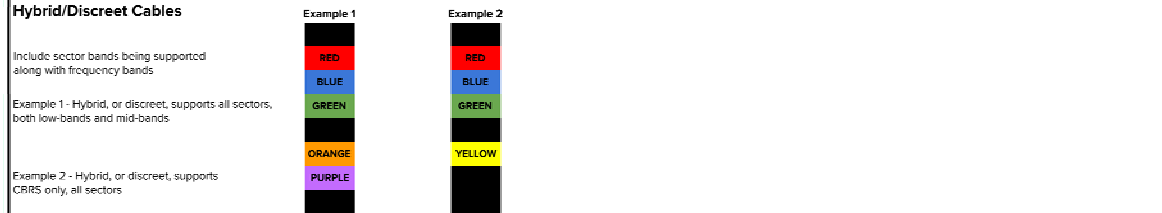
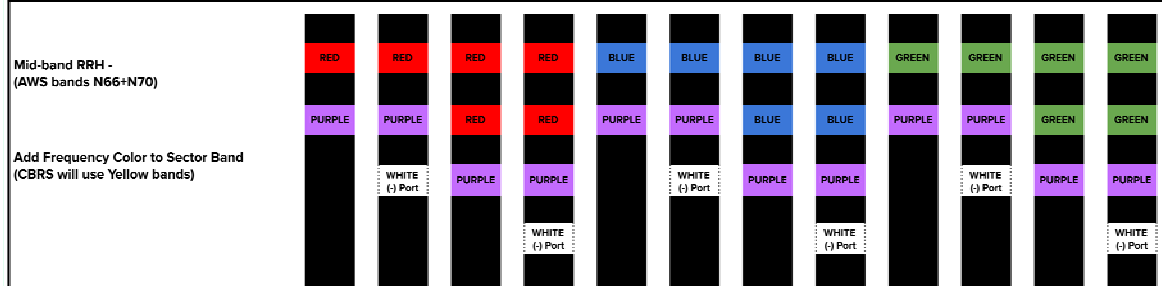
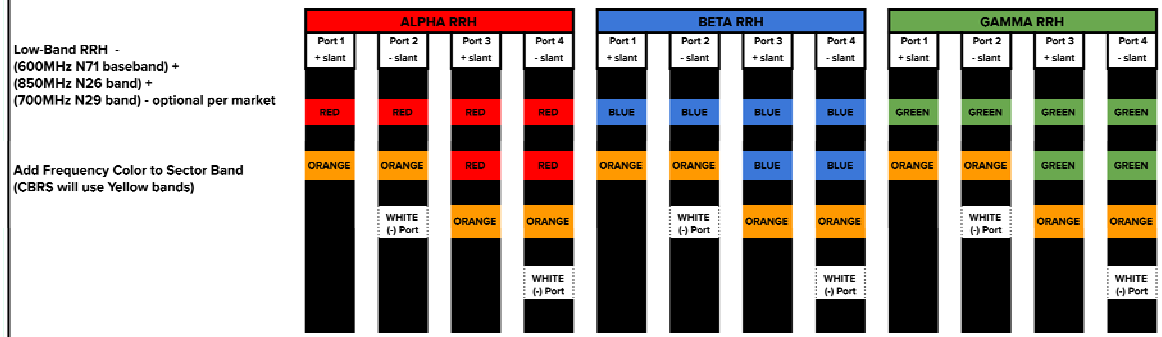
G-3

RF Cable Color Codes



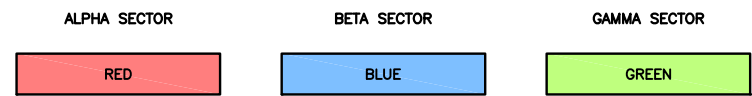
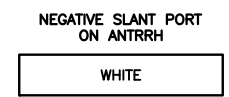
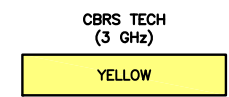
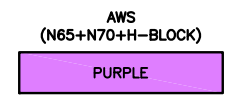
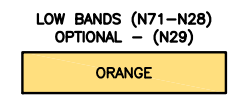
RF Jumper Color Coding

3/4" tape widths with 3/4" spacing



NOTES

1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS. FINAL RFDS IS IN NEXYSONE.



COLOR IDENTIFIER

NO SCALE 2

NOT USED

NO SCALE 3

NOT USED

NO SCALE 4

RF CABLE COLOR CODES

NO SCALE 1



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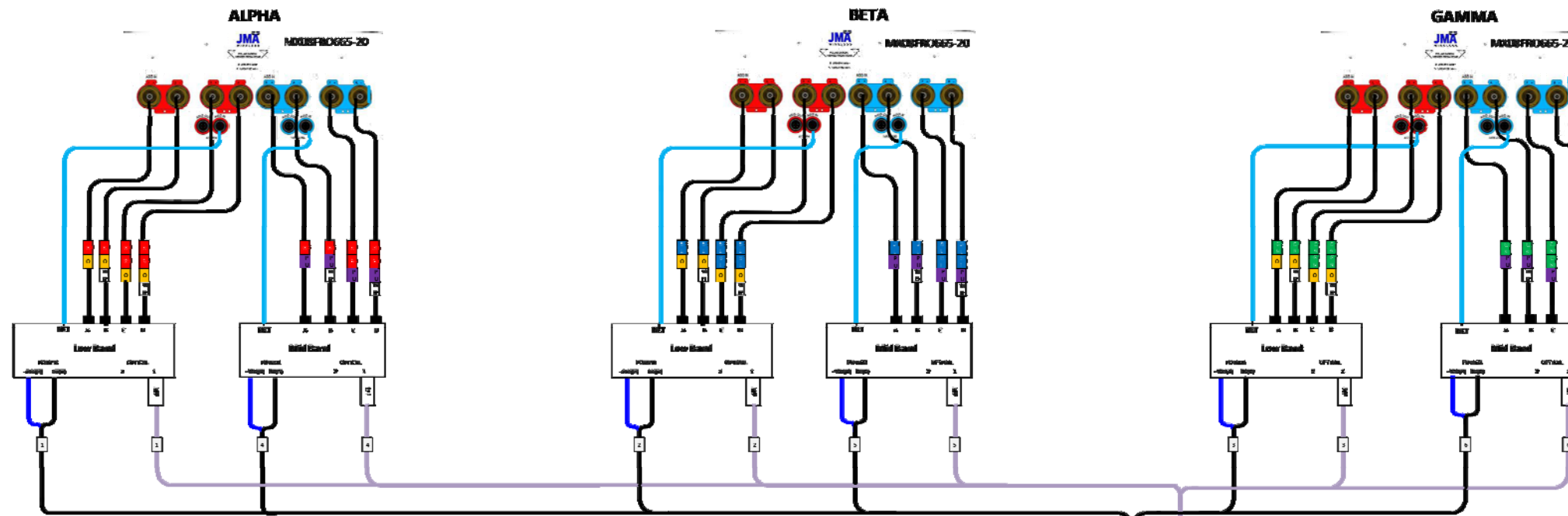
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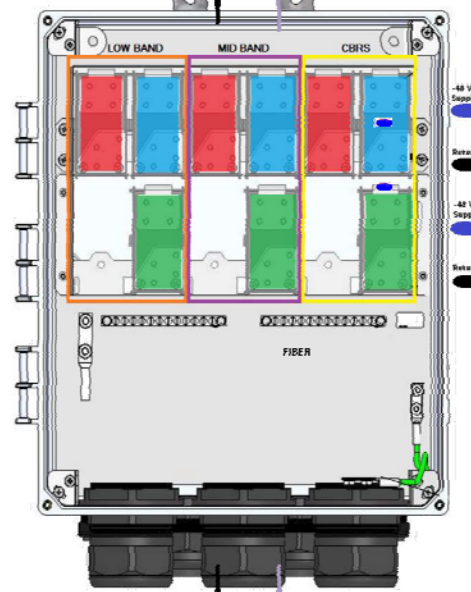
SHEET TITLE
RF
CABLE COLOR CODES

SHEET NUMBER
RF-1



Fiber Patch Panel

Bottom Row	Pair 1	Pair 2	Pair 3	Pair 10	Open	Open
Middle Row	Pair 4	Pair 5	Pair 6	Pair 11	Open	Open
Top Row	Pair 7	Pair 8	Pair 9	Pair 12	Open	Open



C8R NC6540

Port	Interface	Description
0	C0/0/0/0	SilicBus
1	G0/0/0/1	CHRS - Alpha
2	G0/0/0/2	CDRS - Beta
3	C0/0/0/3	CDRS - Gamma
4	T0/0/0/4	Fujitsu Low-Band RU - Alpha
5	T0/0/0/5	Fujitsu Mid-Band RU - Alpha
6	T0/0/0/6	Fujitsu Low-Band RU - Beta
7	T0/0/0/7	Fujitsu Mid-Band RU - Beta
8	T0/0/0/8	Fujitsu Low-Band RU - Gamma
9	T0/0/0/9	Fujitsu Mid-Band RU - Gamma
10	T0/0/0/10	Fixed With
11	T0/0/0/11	Fixed With
12	T0/0/0/12	Fixed With
13	T0/0/0/13	Fixed With
14	T0/0/0/14	CDRS1
15	T0/0/0/15	CHRS2
16	T0/0/0/16	CDRS3
17	C0/0/0/17	SM1 - BMC
18	T0/0/0/18	SM2 - HMC
19	T0/0/0/19	SM1 - Data 1
20	T0/0/0/20	SM1 - Data 2
21	T0/0/0/21	SM2 - Data 1
22	T0/0/0/22	SM2 - Data 2
23	T0/0/0/23	Reserved Uplink (EDC, LDC)
24	T0/0/0/24	Blank/Future
25	T0/0/0/25	Blank/Future
26	T0/0/0/26	Fiber NIU
27	T0/0/0/27	Fiber NIU
28	T0/0/0/28	Blank/Future
29	T0/0/0/29	Blank/Future

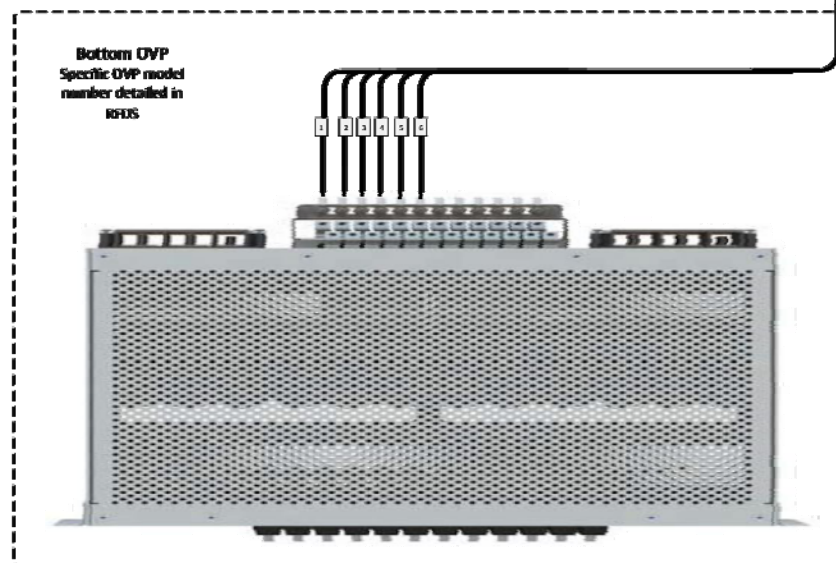
top

bottom

Bottom OVP Layout

Circuit 1	Alpha Low Band
Circuit 2	Beta Low Band
Circuit 3	Gamma Low Band
Circuit 4	Alpha Mid Band
Circuit 5	Beta Mid Band
Circuit 6	Gamma Mid Band
Circuit 7	Alpha CDRS
Circuit 8	Beta CDRS
Circuit 9	Gamma CDRS
Circuit 10	Open
Circuit 11	Open
Circuit 12	Open

Bottom OVP
Specific OVP model
number detailed in
NOTES



56 plumbing diagram JMA MNU5FR0665-20
2-2-2(LB+MB)

Client Use	DATE	VERSION	REVISION	REV
				3
Author	DATE	VERSION	REVISION	



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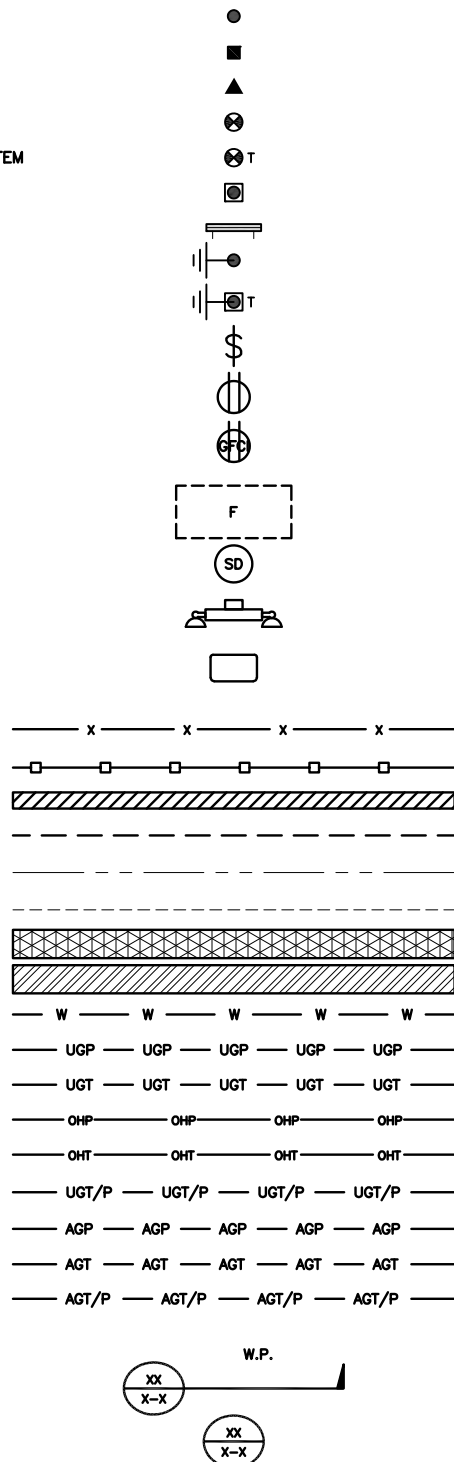
A&E PROJECT NUMBER
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DISH WIRELESS L.L.C.
PROJECT INFORMATION
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1394 MERIDEN WATERBURY
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SOUTHINGTON, CT 06489

SHEET TITLE
RF
PLUMBING DIAGRAM

SHEET NUMBER
RF-2

EXOTHERMIC CONNECTION
 MECHANICAL CONNECTION
 BUSS BAR INSULATOR
 CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
 TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
 EXOTHERMIC WITH INSPECTION SLEEVE
 GROUNDING BAR
 GROUND ROD
 TEST GROUND ROD WITH INSPECTION SLEEVE
 SINGLE POLE SWITCH
 DUPLEX RECEPTACLE
 DUPLEX GFCI RECEPTACLE
 FLUORESCENT LIGHTING FIXTURE
 (2) TWO LAMPS 48-T8
 SMOKE DETECTION (DC)
 EMERGENCY LIGHTING (DC)
 SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW
 LED-1-25A400/51K-SR4-120-PE-DBTDX



SECTION REFERENCE
 DETAIL REFERENCE

LEGEND

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

ABBREVIATIONS



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SHEET TITLE
 LEGEND AND ABBREVIATIONS

SHEET NUMBER

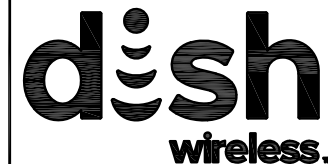
GN-1

SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED – NO WORK SHALL COMMENCE PRIOR TO CONTRACTOR RECEIVING A WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE DISH WIRELESS L.L.C. AND TOWER OWNER NOC & THE DISH WIRELESS L.L.C. AND TOWER OWNER CONSTRUCTION MANAGER.
2. "LOOK UP" – DISH WIRELESS L.L.C. AND TOWER OWNER SAFETY CLIMB REQUIREMENT:
THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR DISH WIRELESS L.L.C. AND DISH WIRELESS L.L.C. AND TOWER OWNER POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND DISH WIRELESS L.L.C. AND TOWER OWNER STANDARDS, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA-322 (LATEST EDITION).
5. ALL SITE WORK TO COMPLY WITH DISH WIRELESS L.L.C. AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH WIRELESS L.L.C. AND TOWER OWNER TOWER SITE AND LATEST VERSION OF ANSI/TIA-1019-A-2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY DISH WIRELESS L.L.C. AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES INCLUDING PRIVATE LOCATES SERVICES PRIOR TO THE START OF CONSTRUCTION.
10. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.
11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND DISH PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
13. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF DISH WIRELESS L.L.C. AND TOWER OWNER, AND/OR LOCAL UTILITIES.
14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
17. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
18. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS AND RADIOS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
22. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION
CARRIER: DISH WIRELESS L.L.C.
TOWER OWNER: TOWER OWNER
2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.
4. NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.
5. SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.
6. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CARRIER POC AND TOWER OWNER.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
10. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION, BEFORE SUBMITTING BIDS, TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.
12. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF DISH WIRELESS L.L.C. AND TOWER OWNER
13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
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BLJ BLJ MP

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PROJECT INFORMATION
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1394 MERIDEN WATERBURY
TPK
SOUTHINGTON, CT 06489

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
2. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°F AT TIME OF PLACEMENT.
4. CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER-TO-CEMENT RATIO (W/C) OF 0.45.
5. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
 #4 BARS AND SMALLER 40 ksi
 #5 BARS AND LARGER 60 ksi
6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
 - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"
 - CONCRETE EXPOSED TO EARTH OR WEATHER:
 - #6 BARS AND LARGER 2"
 - #5 BARS AND SMALLER 1-1/2"
 - CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
 - SLAB AND WALLS 3/4"
 - BEAMS AND COLUMNS 1-1/2"
7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
- 4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
- 4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. TIE WRAPS ARE NOT ALLOWED.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

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



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BLJ	BLJ	MP

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	5/21/21	ISSUED FOR REVIEW
0	6/30/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
137177.003.01

DISH WIRELESS L.L.C.
PROJECT INFORMATION
BOBDL00077A
1394 MERIDEN WATERBURY
TPK
SOUTHINGTON, CT 06489

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-3

GROUNDING NOTES:

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



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DISH WIRELESS L.L.C.
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1394 MERIDEN WATERBURY
TPK
SOUTHINGTON, CT 06489

SHEET TITLE
GENERAL NOTES

SHEET NUMBER

GN-4

Exhibit C

Date: **May 26, 2021**



Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject: **Structural Analysis Report**

Carrier Designation: **DISH Network Co-Locate**
Site Number: BOBDL00077A
Site Name: CT-CCI-T-876313

Crown Castle Designation: **BU Number:** 876313
Site Name: WEST JOHNSON AVE. BURNT HOUSE
JDE Job Number: 650067
Work Order Number: 1966750
Order Number: 556616 Rev. 0

Engineering Firm Designation: **Crown Castle Project Number:** 1966750

Site Data: **1394 Meriden Waterbury Tpk, Southington, Hartford County, CT**
Latitude 41° 33' 51.39", Longitude -72° 53' 30.7"
160 Foot - Monopole Tower

Crown Castle is pleased to submit this “**Structural Analysis Report**” to determine the structural integrity of the above-mentioned tower.

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

LC5: Proposed Equipment Configuration

Sufficient Capacity – 99.9%

The structure has sufficient capacity once the loading changes, described in the Recommendations section of this report, are completed.

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - "Analysis Criteria".

Structural analysis prepared by: Steven Hu

Respectfully submitted by:

Maribel Dentinger
Maribel Dentinger, P.E.
Senior Project Engineer

Maribel Dentinger, P.E.
Professional Engineer License: #24GE04572800
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Certificate of Authorization: #24GA28140300

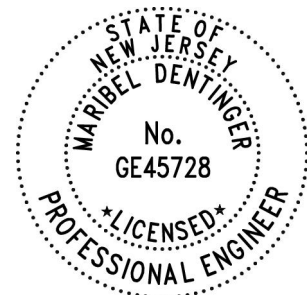


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1) INTRODUCTION

This tower is a 160 ft Monopole tower designed by Summit. The tower has been modified multiple times to accommodate additional loading.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
119.0	119.0	3	fujitsu	TA08025-B604	1	1-1/2
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-21 w/ Mount Pipe		
		1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Commscope MC-K6MHDX-9-96 (3)		

Table 2 – Non-Carrier Equipment to be Conditionally Removed

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
119.0	119.0	3	andrew	HBX-6516DS-VTM w/ Mount Pipe	6	1-5/8
		1	tower mounts	T-Arm Mount [TA 601-3]	1	3/8

Table 3 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
157.0	158.0	3	cci antennas	HPA-85R-BUU-H8 w/ Mount Pipe	3 8 6	3/8 3/4 1-5/8
		3	cci antennas	TPA-65R-LCUUUU-H8-K w/ Mount Pipe		
		3	ericsson	RRUS 32		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14		
		3	ericsson	RRUS 8843 B2/B66A		
		3	ericsson	RRUS-11		
		3	kathrein	800 10121 w/ Mount Pipe		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		3	kathrein	80010966 w/ Mount Pipe		
		6	powerwave technologies	LGP21401		
		4	raycap	DC6-48-60-18-8F		
	157.0	3	sitepro1	VFA12-SD		
150.0	150.0	1	tower mounts	Side Arm Mount [SO 103-3]	-	-
	148.0	3	alcatel lucent	800MHZ 2X50W RRH W/FILTER		
		3	alcatel lucent	PCS 1900MHZ 4X45W-65MHZ		
148.0	148.0	3	alcatel lucent	TD-RRH8X20-25	4	1-1/4
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe		
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe		
		3	rfs celwave	IBC1900BB-1		
		3	rfs celwave	IBC1900HG-2A		
		1	tower mounts	Miscellaneous [NA 510-1]		
		1	tower mounts	Platform Mount [LP 1201-1]		
138.0	142.0	1	lucent	KS24019-L112A	1 6 1	1/2 1-5/8 2-1/4
	138.0	6	antel	LPA-80063-6CF-EDIN-2 w/ Mount Pipe		
		6	commscope	NNHH-65B-R4 w/ Mount Pipe		
		1	raycap	RVZDC-6627-PF-48		
		3	samsung telecommunications	RFV01U-D1A		
		3	samsung telecommunications	RFV01U-D2A		
		1	tower mounts	Platform Mount [LP 303-1_KCKR-HR-1]		
127.0	129.0	3	commscope	LNx-6515DS-VTM w/ Mount Pipe	1 6	1-1/4 1-5/8
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe		
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RRUS 11 B12		
	127.0	1	tower mounts	Platform Mount [LP 1201-1]		
48.0	50.0	1	lucent	KS24019-L112A	1	1/2
	48.0	1	tower mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	5939573	CCISITES
4-POST-MODIFICATION INSPECTION	5617077	CCISITES
4-POST-MODIFICATION INSPECTION	5380973	CCISITES
4-POST-MODIFICATION INSPECTION	4600286	CCISITES
4-POST-MODIFICATION INSPECTION	4077468	CCISITES
4-POST-MODIFICATION INSPECTION	3846956	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	1633746	CCISITES
4-TOWER MANUFACTURER DRAWINGS	2134246	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	5266558	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	5105790	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	4094328	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	4077469	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	3348783	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.9.0), 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. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

tnxTower was used to determine the loads on the modified structure. Additional calculations were performed to determine the stresses in the pole and in the reinforcing elements. These calculations are included in Appendix C.

3.2) Assumptions

- 1) Tower and structures were maintained in accordance with the TIA-222 Standard.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
160 - 155	Pole	TP10.75x10.75x0.349	Pole	21.0%	Pass
155 - 150	Pole	TP10.75x10.75x0.349	Pole	58.0%	Pass
150 - 148	Pole	TP10.75x10.75x0.349	Pole	74.6%	Pass
148 - 143	Pole	TP23.81x23x0.25	Pole	22.3%	Pass
143 - 138	Pole	TP24.62x23.81x0.25	Pole	30.4%	Pass

138 - 133	Pole	TP25.43x24.62x0.25	Pole	42.1%	Pass
133 - 128	Pole	TP26.24x25.43x0.25	Pole	52.3%	Pass
128 - 123	Pole	TP27.05x26.24x0.25	Pole	63.6%	Pass
123 - 118	Pole	TP27.86x27.05x0.25	Pole	74.0%	Pass
118 - 114.75	Pole	TP28.994x27.86x0.25	Pole	80.8%	Pass
114.75 - 109.75	Pole	TP28.696x27.887x0.3125	Pole	72.3%	Pass
109.75 - 105.33	Pole	TP29.412x28.696x0.3125	Pole	78.0%	Pass
105.33 - 105.08	Pole + Reinf.	TP29.453x29.412x0.4688	Reinf. 5 Tension Rupture	74.2%	Pass
105.08 - 100.08	Pole + Reinf.	TP30.263x29.453x0.4625	Reinf. 5 Tension Rupture	80.5%	Pass
100.08 - 95.08	Pole + Reinf.	TP31.073x30.263x0.4625	Reinf. 5 Tension Rupture	86.2%	Pass
95.08 - 90.08	Pole + Reinf.	TP31.883x31.073x0.45	Reinf. 5 Tension Rupture	91.4%	Pass
90.08 - 85.08	Pole + Reinf.	TP32.693x31.883x0.45	Reinf. 5 Tension Rupture	96.3%	Pass
85.08 - 81	Pole + Reinf.	TP34.042x32.693x0.45	Reinf. 5 Tension Rupture	99.9%	Pass
81 - 75.75	Pole	TP33.579x32.729x0.375	Pole	84.3%	Pass
75.75 - 70.75	Pole	TP34.389x33.579x0.375	Pole	86.8%	Pass
70.75 - 70.58	Pole	TP34.416x34.389x0.375	Pole	86.9%	Pass
70.58 - 70.33	Pole + Reinf.	TP34.457x34.416x0.675	Reinf. 4 Tension Rupture	76.0%	Pass
70.33 - 70	Pole + Reinf.	TP34.51x34.457x0.675	Reinf. 4 Tension Rupture	76.2%	Pass
70 - 69.75	Pole	TP34.551x34.51x0.375	Pole	87.2%	Pass
69.75 - 64.75	Pole	TP35.361x34.551x0.375	Pole	89.4%	Pass
64.75 - 59.75	Pole	TP36.171x35.361x0.375	Pole	91.4%	Pass
59.75 - 54.75	Pole	TP36.981x36.171x0.375	Pole	93.5%	Pass
54.75 - 49.75	Pole	TP37.791x36.981x0.375	Pole	95.5%	Pass
49.75 - 48	Pole	TP38.884x37.791x0.375	Pole	96.2%	Pass
48 - 42	Pole	TP38.296x37.324x0.4375	Pole	86.3%	Pass
42 - 37	Pole	TP39.106x38.296x0.4375	Pole	87.2%	Pass
37 - 32	Pole	TP39.916x39.106x0.4375	Pole	88.0%	Pass
32 - 27.91	Pole	TP40.579x39.916x0.4375	Pole	88.5%	Pass
27.91 - 27.66	Pole + Reinf.	TP40.619x40.579x0.675	Reinf. 6 Tension Rupture	86.4%	Pass
27.66 - 27.25	Pole + Reinf.	TP40.686x40.619x0.675	Reinf. 6 Tension Rupture	86.5%	Pass
27.25 - 26.98	Pole + Reinf.	TP40.729x40.686x0.675	Reinf. 1 Tension Rupture	84.6%	Pass
26.98 - 26.83	Pole + Reinf.	TP40.754x40.729x0.6625	Reinf. 1 Tension Rupture	84.7%	Pass
26.83 - 21.83	Pole + Reinf.	TP41.564x40.754x0.6625	Reinf. 1 Tension Rupture	85.8%	Pass
21.83 - 16.83	Pole + Reinf.	TP42.374x41.564x0.6625	Reinf. 1 Tension Rupture	86.8%	Pass
16.83 - 16	Pole + Reinf.	TP42.508x42.374x0.6625	Reinf. 1 Tension Rupture	86.9%	Pass
16 - 15.75	Pole + Reinf.	TP42.549x42.508x0.8125	Reinf. 7 Tension Rupture	77.9%	Pass
15.75 - 14.75	Pole + Reinf.	TP42.711x42.549x0.8125	Reinf. 7 Tension Rupture	78.1%	Pass
14.75 - 14.5	Pole + Reinf.	TP42.751x42.711x0.4875	Pole	88.7%	Pass
14.5 - 12.08	Pole + Reinf.	TP43.143x42.751x0.4875	Pole	89.1%	Pass

12.08 - 11.83	Pole + Reinf.	TP43.184x43.143x0.7375	Reinf. 1 Tension Rupture	79.8%	Pass
11.83 - 10	Pole + Reinf.	TP43.48x43.184x0.7375	Reinf. 1 Tension Rupture	80.1%	Pass
10 - 9.75	Pole + Reinf.	TP43.521x43.48x0.7375	Reinf. 1 Tension Rupture	80.1%	Pass
9.75 - 4.75	Pole + Reinf.	TP44.331x43.521x0.725	Reinf. 1 Tension Rupture	81.0%	Pass
4.75 - 0	Pole + Reinf.	TP45.1x44.331x0.7125	Reinf. 1 Tension Rupture	81.7%	Pass
				Summary	
			Pole	96.2%	Pass
			Reinforcement	99.9%	Pass
			Overall	99.9%	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Extension Connection	148	56.2	Pass
1	Anchor Rods	0	74.6	Pass
1	Base Plate	0	61.2	Pass
1	Base Foundation (Structure)	0	77.6	Pass
1	Base Foundation (Soil Interaction)	0	70.2	Pass

Structure Rating (max from all components) =	99.9%
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Notes:

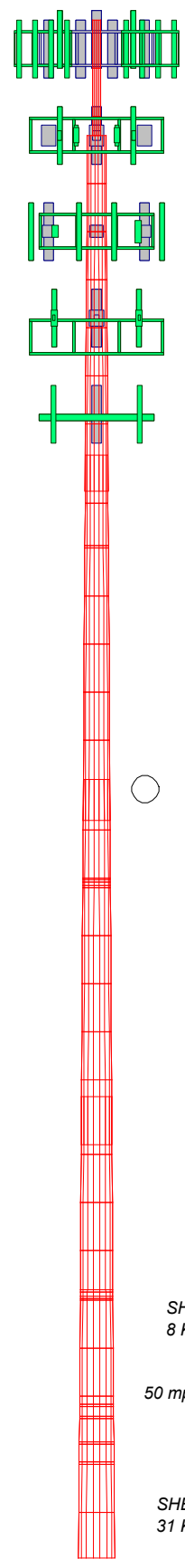
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

Once the equipment in Table 2 is removed, the tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A
TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.2
2	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.2
3	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.1
4	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.3
5	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.3
6	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.3
7	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.3
8	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.4
9	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.4
10	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.4
11	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.5
12	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.5
13	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.4
14	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.4
15	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.7
16	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.7
17	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.7
18	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.7
19	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.3
20	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.7
21	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.7
22	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.7
23	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.7
24	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.7
25	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.7
26	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.7
27	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.7
28	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.7
29	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.0
30	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.1
31	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.9
32	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.9
33	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	0.8
34	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.4
35	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.4
36	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.4
37	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.4
38	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.4
39	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.4
40	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.4
41	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.4
42	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.4
43	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.4
44	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.4
45	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.5
46	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.5
47	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.5
48	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.5
49	5.00	0	0	3.75	27.0500	27.8600	A53-B-35	1.5



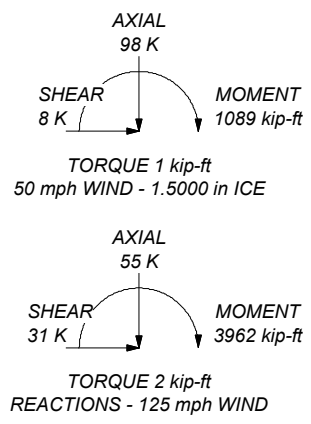
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	60 ksi	A607-65	65 ksi	80 ksi
A607-60	60 ksi	75 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 99.9%

ALL REACTIONS ARE FACTORED



Crown Castle
 2000 Corporate Drive
 Canonsburg, PA 15317
 The Pathway to Possible Phone: (724) 416-2000 FAX: (724) 416-4623

Job: 876313			
Project:			
Client: Crown Castle	Drawn by: Steven Hu	App'd:	
Code: TIA-222-H	Date: 05/26/21	Scale: NTS	
Path:	Dwg No. E-1		

Tower Input Data

The tower is a monopole.
 This tower is designed using the TIA-222-H standard.
 The following design criteria apply:

- Tower is located in Hartford County, Connecticut.
- Tower base elevation above sea level: 133.00 ft.
- Basic wind speed of 125 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.5000 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.
- TOWER RATING: 99.9%.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- Maximum demand-capacity ratio is: 1.05.
- 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; background-color: #e0e0e0; padding: 2px;">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
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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	160.00-155.00	5.00	0.00	Round	10.7500	10.7500	0.3490		A53-B-35 (35 ksi)
L2	155.00-150.00	5.00	0.00	Round	10.7500	10.7500	0.3490		A53-B-35 (35 ksi)
L3	150.00-148.00	2.00	0.00	Round	10.7500	10.7500	0.3490		A53-B-35 (35 ksi)
L4	148.00-143.00	5.00	0.00	18	23.0000	23.8100	0.2500	1.0000	A607-60 (60 ksi)
L5	143.00-138.00	5.00	0.00	18	23.8100	24.6200	0.2500	1.0000	A607-60 (60 ksi)
L6	138.00-133.00	5.00	0.00	18	24.6200	25.4300	0.2500	1.0000	A607-60 (60 ksi)
L7	133.00-128.00	5.00	0.00	18	25.4300	26.2400	0.2500	1.0000	A607-60 (60 ksi)
L8	128.00-123.00	5.00	0.00	18	26.2400	27.0500	0.2500	1.0000	A607-60 (60 ksi)
L9	123.00-118.00	5.00	0.00	18	27.0500	27.8600	0.2500	1.0000	A607-60 (60 ksi)
L10	118.00-111.00	7.00	3.75	18	27.8600	28.9940	0.2500	1.0000	A607-60 (60 ksi)
L11	111.00-109.75	5.00	0.00	18	27.8865	28.6964	0.3125	1.2500	A607-60 (60 ksi)
L12	109.75-105.33	4.42	0.00	18	28.6964	29.4124	0.3125	1.2500	A607-60 (60 ksi)
L13	105.33-105.08	0.25	0.00	18	29.4124	29.4529	0.4688	1.8750	A607-60 (60 ksi)
L14	105.08-100.08	5.00	0.00	18	29.4529	30.2628	0.4625	1.8500	A607-60 (60 ksi)
L15	100.08-95.08	5.00	0.00	18	30.2628	31.0728	0.4625	1.8500	A607-60 (60 ksi)
L16	95.08-90.08	5.00	0.00	18	31.0728	31.8827	0.4500	1.8000	A607-60 (60 ksi)
L17	90.08-85.08	5.00	0.00	18	31.8827	32.6926	0.4500	1.8000	A607-60 (60 ksi)
L18	85.08-76.75	8.33	4.25	18	32.6926	34.0420	0.4500	1.8000	A607-60 (60 ksi)
L19	76.75-75.75	5.25	0.00	18	32.7286	33.5790	0.3750	1.5000	A607-65 (65 ksi)
L20	75.75-70.75	5.00	0.00	18	33.5790	34.3889	0.3750	1.5000	A607-65 (65 ksi)
L21	70.75-70.58	0.17	0.00	18	34.3889	34.4164	0.3750	1.5000	A607-65 (65 ksi)
L22	70.58-70.33	0.25	0.00	18	34.4164	34.4569	0.6750	2.7000	A607-65 (65 ksi)
L23	70.33-70.00	0.33	0.00	18	34.4569	34.5104	0.6750	2.7000	A607-65 (65 ksi)
L24	70.00-69.75	0.25	0.00	18	34.5104	34.5509	0.3750	1.5000	A607-65 (65 ksi)
L25	69.75-64.75	5.00	0.00	18	34.5509	35.3608	0.3750	1.5000	A607-65 (65 ksi)
L26	64.75-59.75	5.00	0.00	18	35.3608	36.1707	0.3750	1.5000	A607-65 (65 ksi)
L27	59.75-54.75	5.00	0.00	18	36.1707	36.9807	0.3750	1.5000	A607-65 (65 ksi)
L28	54.75-49.75	5.00	0.00	18	36.9807	37.7906	0.3750	1.5000	A607-65 (65 ksi)
L29	49.75-43.00	6.75	5.00	18	37.7906	38.8840	0.3750	1.5000	A607-65 (65 ksi)
L30	43.00-42.00	6.00	0.00	18	37.3241	38.2961	0.4375	1.7500	A607-65 (65 ksi)
L31	42.00-37.00	5.00	0.00	18	38.2961	39.1061	0.4375	1.7500	A607-65 (65 ksi)
L32	37.00-32.00	5.00	0.00	18	39.1061	39.9160	0.4375	1.7500	A607-65 (65 ksi)
L33	32.00-27.91	4.09	0.00	18	39.9160	40.5786	0.4375	1.7500	A607-65 (65 ksi)
L34	27.91-27.66	0.25	0.00	18	40.5786	40.6191	0.6750	2.7000	A607-65 (65 ksi)
L35	27.66-27.25	0.41	0.00	18	40.6191	40.6855	0.6750	2.7000	A607-65

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
L36	27.25-26.98	0.27	0.00	18	40.6855	40.7293	0.6750	2.7000	(65 ksi) A607-65
L37	26.98-26.83	0.15	0.00	18	40.7293	40.7536	0.6625	2.6500	(65 ksi) A607-65
L38	26.83-21.83	5.00	0.00	18	40.7536	41.5636	0.6625	2.6500	(65 ksi) A607-65
L39	21.83-16.83	5.00	0.00	18	41.5636	42.3736	0.6625	2.6500	(65 ksi) A607-65
L40	16.83-16.00	0.83	0.00	18	42.3736	42.5080	0.6625	2.6500	(65 ksi) A607-65
L41	16.00-15.75	0.25	0.00	18	42.5080	42.5485	0.8125	3.2500	(65 ksi) A607-65
L42	15.75-14.75	1.00	0.00	18	42.5485	42.7105	0.8125	3.2500	(65 ksi) A607-65
L43	14.75-14.50	0.25	0.00	18	42.7105	42.7510	0.4875	1.9500	(65 ksi) A607-65
L44	14.50-12.08	2.42	0.00	18	42.7510	43.1431	0.4875	1.9500	(65 ksi) A607-65
L45	12.08-11.83	0.25	0.00	18	43.1431	43.1836	0.7375	2.9500	(65 ksi) A607-65
L46	11.83-10.00	1.83	0.00	18	43.1836	43.4800	0.7375	2.9500	(65 ksi) A607-65
L47	10.00-9.75	0.25	0.00	18	43.4800	43.5205	0.7375	2.9500	(65 ksi) A607-65
L48	9.75-4.75	5.00	0.00	18	43.5205	44.3305	0.7250	2.9000	(65 ksi) A607-65
L49	4.75-0.00	4.75		18	44.3305	45.1000	0.7125	2.8500	(65 ksi) A607-65

Tapered Pole Properties

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
L1	10.7500	11.4038	154.3829	3.6794	5.3750	28.7224	308.7659	5.6985	0.0000	0
L2	10.7500	11.4038	154.3829	3.6794	5.3750	28.7224	308.7659	5.6985	0.0000	0
L3	10.7500	11.4038	154.3829	3.6794	5.3750	28.7224	308.7659	5.6985	0.0000	0
L4	23.3162	18.0521	1180.3983	8.0762	11.6840	101.0269	2362.3498	9.0278	3.6080	14.432
L5	24.1387	18.6949	1311.0228	8.3638	12.0955	108.3895	2623.7706	9.3492	3.7506	15.002
L6	24.9612	19.3376	1450.9451	8.6514	12.5070	116.0110	2903.7993	9.6706	3.8931	15.572
L7	25.7837	19.9803	1600.4848	8.9389	12.9184	123.8915	3203.0756	9.9921	4.0357	16.143
L8	26.6062	20.6231	1759.9617	9.2264	13.3299	132.0309	3522.2392	10.3135	4.1782	16.713
L9	27.4287	21.2658	1929.6954	9.5140	13.7414	140.4293	3861.9300	10.6349	4.3208	17.283
L10	28.2512	21.9085	2110.0056	9.8016	14.1529	149.0867	4222.7875	10.9563	4.4634	17.853
L11	29.0909	22.8084	2380.8169	10.2041	14.7290	161.6420	4764.7665	11.4063	4.6629	18.652
L12	29.8179	23.5000	2627.2035	9.7888	14.1663	185.4539	5257.8639	13.6776	4.3580	13.946
L13	29.8350	28.1533	2865.5776	10.0763	14.5778	196.5715	5734.9257	14.0793	4.5006	14.402
L14	29.8350	28.8635	3087.9453	10.3305	14.9415	206.6689	6179.9539	14.4345	4.6266	14.805
L15	30.6584	43.0627	4557.7056	10.2750	14.9415	305.0365	9121.4084	21.5355	4.3516	9.283
	30.6584	43.1230	4576.8632	10.2894	14.9621	305.8975	9159.7488	21.5656	4.3587	9.299
	30.6584	42.5572	4518.7603	10.2916	14.9621	302.0142	9043.4665	21.2826	4.3697	9.448
	30.6584	43.7462	4908.1754	10.5791	15.3735	319.2615	9822.8090	21.8772	4.5123	9.756
	31.4808	43.7462	4908.1754	10.5791	15.3735	319.2615	9822.8090	21.8772	4.5123	9.756
	31.4808	44.9351	5319.3439	10.8666	15.7850	336.9878	10645.687	22.4718	4.6548	10.064

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
L16	31.4827	43.7385	5181.9209	10.8711	15.7850	328.2819	10370.660	21.8734	4.6768	10.393
	32.3051	44.8953	5604.0576	11.1586	16.1964	346.0060	11215.489	22.4519	4.8194	10.71
L17	32.3051	44.8953	5604.0576	11.1586	16.1964	346.0060	11215.489	22.4519	4.8194	10.71
	33.1276	46.0522	6048.5191	11.4461	16.6079	364.1960	12104.997	23.0305	4.9619	11.026
L18	33.1276	46.0522	6048.5191	11.4461	16.6079	364.1960	12104.997	23.0305	4.9619	11.026
	34.4977	47.9795	6840.1318	11.9252	17.2933	395.5357	13689.264	23.9943	5.1994	11.554
L19	33.8747	38.5088	5092.6250	11.4855	16.6261	306.3029	10191.951	19.2581	5.1002	13.601
	34.0391	39.5210	5504.8569	11.7874	17.0581	322.7118	11016.957	19.7643	5.2499	14
L20	34.0391	39.5210	5504.8569	11.7874	17.0581	322.7118	11016.957	19.7643	5.2499	14
	34.8616	40.4851	5917.5939	12.0749	17.4696	338.7374	11842.974	20.2464	5.3924	14.38
L21	34.8616	40.4851	5917.5939	12.0749	17.4696	338.7374	11842.974	20.2464	5.3924	14.38
	34.8895	40.5178	5931.9782	12.0847	17.4836	339.2890	11871.761	20.2628	5.3973	14.393
L22	34.8432	72.2894	10397.744	11.9782	17.4836	594.7157	20809.169	36.1515	4.8693	7.214
	34.8844	72.3761	10435.226	11.9926	17.5041	596.1581	20884.184	36.1949	4.8764	7.224
L23	34.8844	72.3761	10435.226	11.9926	17.5041	596.1581	20884.184	36.1949	4.8764	7.224
	34.9386	72.4906	10484.842	12.0116	17.5313	598.0648	20983.480	36.2522	4.8858	7.238
L24	34.9849	40.6297	5981.2291	12.1181	17.5313	341.1747	11970.328	20.3187	5.4138	14.437
	35.0260	40.6779	6002.5418	12.1324	17.5519	341.9891	12012.981	20.3428	5.4210	14.456
L25	35.0260	40.6779	6002.5418	12.1324	17.5519	341.9891	12012.981	20.3428	5.4210	14.456
	35.8485	41.6419	6439.4940	12.4200	17.9633	358.4807	12887.461	20.8249	5.5635	14.836
L26	35.8485	41.6419	6439.4940	12.4200	17.9633	358.4807	12887.461	20.8249	5.5635	14.836
	36.6709	42.6059	6897.1530	12.7075	18.3747	375.3606	13803.381	21.3070	5.7061	15.216
L27	36.6709	42.6059	6897.1530	12.7075	18.3747	375.3606	13803.381	21.3070	5.7061	15.216
	37.4933	43.5699	7375.9980	12.9950	18.7862	392.6289	14761.701	21.7891	5.8486	15.596
L28	37.4933	43.5699	7375.9980	12.9950	18.7862	392.6289	14761.701	21.7891	5.8486	15.596
	38.3157	44.5339	7876.5084	13.2825	19.1976	410.2856	15763.380	22.2712	5.9911	15.976
L29	38.3157	44.5339	7876.5084	13.2825	19.1976	410.2856	15763.380	22.2712	5.9911	15.976
	39.4260	45.8353	8587.4133	13.6707	19.7531	434.7381	17186.126	22.9220	6.1836	16.49
L30	38.6549	51.2216	8804.9595	13.0947	18.9606	464.3812	17621.504	25.6157	5.7990	13.255
	38.8194	52.5713	9519.5154	13.4398	19.4544	489.3245	19051.556	26.2907	5.9701	13.646
L31	38.8194	52.5713	9519.5154	13.4398	19.4544	489.3245	19051.556	26.2907	5.9701	13.646
	39.6418	53.6961	10143.697	13.7273	19.8659	510.6091	20300.743	26.8532	6.1127	13.972
L32	39.6418	53.6961	10143.697	13.7273	19.8659	510.6091	20300.743	26.8532	6.1127	13.972
	40.4643	54.8209	10794.585	14.0149	20.2774	532.3469	21603.374	27.4157	6.2552	14.298
L33	40.4643	54.8209	10794.585	14.0149	20.2774	532.3469	21603.374	27.4157	6.2552	14.298

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
	41.1371	55.7410	11347.2590	14.2501	20.6139	550.4653	22709.4491	27.8758	6.3718	14.564
L34	41.1005	85.4915	17198.2840	14.1658	20.6139	834.3036	34419.1979	42.7539	5.9538	8.821
	41.1416	85.5783	17250.7026	14.1802	20.6345	836.0121	34524.1042	42.7973	5.9610	8.831
L35	41.1416	85.5783	17250.7026	14.1802	20.6345	836.0121	34524.1042	42.7973	5.9610	8.831
	41.2091	85.7206	17336.8996	14.2037	20.6683	838.8178	34696.6115	42.8684	5.9727	8.848
L36	41.2091	85.7206	17336.8996	14.2037	20.6683	838.8178	34696.6115	42.8684	5.9727	8.848
	41.2535	85.8143	17393.8199	14.2193	20.6905	840.6680	34810.5271	42.9153	5.9804	8.86
L37	41.2554	84.2514	17087.7002	14.2237	20.6905	825.8728	34197.8848	42.1337	6.0024	9.06
	41.2801	84.3025	17118.8092	14.2323	20.7028	826.8830	34260.1437	42.1593	6.0066	9.067
L38	41.2801	84.3025	17118.8092	14.2323	20.7028	826.8830	34260.1437	42.1593	6.0066	9.067
	42.1026	86.0058	18177.5090	14.5199	21.1143	860.9101	36378.9364	43.0110	6.1492	9.282
L39	42.1026	86.0058	18177.5090	14.5199	21.1143	860.9101	36378.9364	43.0110	6.1492	9.282
	42.9250	87.7090	19278.9826	14.8074	21.5258	895.6233	38583.3330	43.8628	6.2917	9.497
L40	42.9250	87.7090	19278.9826	14.8074	21.5258	895.6233	38583.3330	43.8628	6.2917	9.497
	43.0616	87.9917	19466.0260	14.8552	21.5941	901.4521	38957.6659	44.0042	6.3154	9.533
L41	43.0384	107.5275	23617.6163	14.8019	21.5941	1093.7081	47266.3093	53.7740	6.0514	7.448
	43.0796	107.6320	23686.5038	14.8163	21.6147	1095.8541	47404.1750	53.8262	6.0585	7.457
L42	43.0796	107.6320	23686.5038	14.8163	21.6147	1095.8541	47404.1750	53.8262	6.0585	7.457
	43.2441	108.0498	23963.3935	14.8738	21.6969	1104.4593	47958.3186	54.0351	6.0871	7.492
L43	43.2942	65.3327	14715.2264	14.9892	21.6969	678.2165	29449.8155	32.6726	6.6591	13.66
	43.3353	65.3954	14757.6108	15.0036	21.7175	679.5256	29534.6401	32.7039	6.6662	13.674
L44	43.3353	65.3954	14757.6108	15.0036	21.7175	679.5256	29534.6401	32.7039	6.6662	13.674
	43.7334	66.0020	15172.1067	15.1427	21.9167	692.2632	30364.1772	33.0073	6.7352	13.816
L45	43.6948	99.2640	22551.4648	15.0540	21.9167	1028.9638	45132.6035	49.6414	6.2952	8.536
	43.7360	99.3588	22616.1402	15.0684	21.9372	1030.9470	45262.0393	49.6888	6.3023	8.545
L46	43.7360	99.3588	22616.1402	15.0684	21.9372	1030.9470	45262.0393	49.6888	6.3023	8.545
	44.0370	100.0527	23093.3333	15.1736	22.0878	1045.5221	46217.0533	50.0359	6.3545	8.616
L47	44.0370	100.0527	23093.3333	15.1736	22.0878	1045.5221	46217.0533	50.0359	6.3545	8.616
	44.0781	100.1476	23159.0400	15.1880	22.1084	1047.5212	46348.5533	50.0833	6.3616	8.626
L48	44.0800	98.4789	22786.4750	15.1924	22.1084	1030.6695	45602.9330	49.2488	6.3836	8.805
	44.9025	100.3428	24104.9596	15.4800	22.5199	1070.3850	48241.6371	50.1809	6.5262	9.002
L49	44.9045	98.6410	23709.7351	15.4844	22.5199	1052.8349	47450.6681	49.3299	6.5482	9.19
	45.6858	100.3812	24986.8378	15.7576	22.9108	1090.6139	50006.5539	50.2001	6.6836	9.38

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 in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
L1 160.00-155.00				1	1	1			
L2 155.00-150.00				1	1	1			
L3 150.00-148.00				1	1	1			
L4 148.00-143.00				1	1	1			
L5 143.00-138.00				1	1	1			
L6 138.00-133.00				1	1	1			
L7 133.00-128.00				1	1	1			
L8 128.00-123.00				1	1	1			
L9 123.00-118.00				1	1	1			
L10 118.00-111.00				1	1	1			
L11 111.00-109.75				1	1	1			
L12 109.75-105.33				1	1	1			
L13 105.33-105.08				1	1	0.957589			
L14 105.08-100.08				1	1	0.962312			
L15 100.08-95.08				1	1	0.954727			
L16 95.08-90.08				1	1	0.973467			
L17 90.08-85.08				1	1	0.966458			
L18 85.08-76.75				1	1	0.960995			
L19 76.75-75.75				1	1	1			
L20 75.75-70.75				1	1	1			
L21 70.75-70.58				1	1	1			
L22 70.58-70.33				1	1	1.0434			
L23 70.33-70.00				1	1	1.04263			
L24 70.00-69.75				1	1	1			
L25 69.75-64.75				1	1	1			
L26 64.75-59.75				1	1	1			
L27 59.75-54.75				1	1	1			
L28 54.75-49.75				1	1	1			
L29 49.75-43.00				1	1	1			
L30 43.00-42.00				1	1	1			
L31 42.00-37.00				1	1	1			
L32 37.00-32.00				1	1	1			
L33 32.00-27.91				1	1	1			
L34 27.91-				1	1	1.03582			

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 in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
L35 27.66-27.25				1	1	1.03517			
L36 27.25-26.98				1	1	0.948106			
L37 26.98-26.83				1	1	0.965509			
L38 26.83-21.83				1	1	0.959466			
L39 21.83-16.83				1	1	0.953658			
L40 16.83-16.00				1	1	0.952716			
L41 16.00-15.75				1	1	0.946633			
L42 15.75-14.75				1	1	0.945055			
L43 14.75-14.50				1	1	1.15755			
L44 14.50-12.08				1	1	1.15516			
L45 12.08-11.83				1	1	0.938412			
L46 11.83-10.00				1	1	0.936018			
L47 10.00-9.75				1	1	0.935693			
L48 9.75-4.75				1	1	0.945082			
L49 4.75-0.00				1	1	0.955365			

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
127* LDF7-50A(1-5/8)	A	No	Surface Ar (CaAa)	127.00 - 0.00	6	6	0.280 - 0.450	1.9800		0.82
** **										
MP306	A	No	Surface Af (CaAa)	30.50 - 0.50	1	1	0.330 - 0.330	6.8900	19.0000	0.00
MP306	C	No	Surface Af (CaAa)	30.50 - 0.50	1	1	0.330 - 0.330	6.8900	19.0000	0.00
MP306	B	No	Surface Af (CaAa)	15.50 - 0.50	1	1	0.000 - 0.000	6.8900	19.0000	0.00
MP306	C	No	Surface Af (CaAa)	15.50 - 0.50	1	1	-0.330 - -0.330	6.8900	19.0000	0.00
MP306	B	No	Surface Af (CaAa)	31.33 - 11.33	1	1	0.330 - 0.330	6.8900	19.0000	0.00
MP305	A	No	Surface Af (CaAa)	73.00 - 43.00	1	1	0.330 - 0.330	5.3300	14.8400	0.00
MP305	B	No	Surface Af (CaAa)	73.00 - 43.00	1	1	0.330 - 0.330	5.3300	14.8400	0.00
MP305	C	No	Surface Af (CaAa)	73.00 - 43.00	1	1	0.330 - 0.330	5.3300	14.8400	0.00
MP304	A	No	Surface Af (CaAa)	106.75 - 76.75	1	1	0.330 - 0.330	4.7800	12.7800	0.00
MP304	B	No	Surface Af (CaAa)	106.75 - 76.75	1	1	0.330 - 0.330	4.7800	12.7800	0.00
MP304	C	No	Surface Af (CaAa)	106.75 - 76.75	1	1	0.330 - 0.330	4.7800	12.7800	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
6.5"x1.25" Flat Reinforcement	A	No	Surface Af (CaAa)	49.50 - 24.50	1	1	-0.167 -0.167	6.5000	15.5000	0.00
6.5"x1.25" Flat Reinforcement	B	No	Surface Af (CaAa)	49.50 - 24.50	1	1	-0.167 -0.167	6.5000	15.5000	0.00
6.5"x1.25" Flat Reinforcement	C	No	Surface Af (CaAa)	49.50 - 24.50	1	1	-0.167 -0.167	6.5000	15.5000	0.00
6"x1" Flat Reinforcement	A	No	Surface Af (CaAa)	18.00 - 8.00	1	1	-0.167 -0.167	6.0000	14.0000	0.00
6"x1" Flat Reinforcement	B	No	Surface Af (CaAa)	18.00 - 8.00	1	1	-0.167 -0.167	6.0000	14.0000	0.00
6"x1" Flat Reinforcement	C	No	Surface Af (CaAa)	18.00 - 8.00	1	1	-0.167 -0.167	6.0000	14.0000	0.00
6"x1" Flat Reinforcement	A	No	Surface Af (CaAa)	82.50 - 67.50	1	1	-0.330 -0.330	6.0000	14.0000	0.00
6"x1" Flat Reinforcement	B	No	Surface Af (CaAa)	82.50 - 67.50	1	1	0.000 0.000	6.0000	14.0000	0.00
6"x1" Flat Reinforcement	C	No	Surface Af (CaAa)	82.50 - 67.50	1	1	-0.330 -0.330	6.0000	14.0000	0.00
HSS6x6	A	No	Surface Af (CaAa)	155.50 - 140.00	1	1	0.000 0.000	6.0000	24.0000	0.00
HSS6x6	B	No	Surface Af (CaAa)	155.50 - 140.00	1	1	0.000 0.000	6.0000	24.0000	0.00
HSS6x6	C	No	Surface Af (CaAa)	155.50 - 140.00	1	1	0.000 0.000	6.0000	24.0000	0.00
CU12PSM9P6XXX(1-1/2)	B	No	Surface Ar (CaAa)	119.00 - 0.00	1	1	0.000 0.000	1.6000		2.35

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	CAAA	Weight
							ft ² /ft	plf
157								
LDF7-50A(1-5/8)	A	No	No	Inside Pole	157.00 - 0.00	6	No Ice 1/2" Ice 1" Ice 2" Ice	0.82 0.82 0.82 0.82
FB-L98B-002-75000(3/8)	A	No	No	Inside Pole	157.00 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.06 0.06 0.06 0.06
FB-L98B-034-XXX(3/8)	A	No	No	Inside Pole	157.00 - 0.00	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.06 0.06 0.06 0.06
WR-VG86ST-BRD(3/4)	A	No	No	Inside Pole	157.00 - 0.00	8	No Ice 1/2" Ice 1" Ice 2" Ice	0.58 0.58 0.58 0.58
2" (Nominal) Conduit	A	No	No	Inside Pole	157.00 - 0.00	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.72 0.72 0.72 0.72
148								
HB114-1-08U4-M5J(1-1/4)	B	No	No	Inside Pole	148.00 - 0.00	3	No Ice 1/2" Ice 1" Ice 2" Ice	1.08 1.08 1.08 1.08
HB114-21U3M12-XXXF(1-1/4)	B	No	No	Inside Pole	148.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	1.22 1.22 1.22

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
							2" Ice	0.00	1.22
138 AL7-50(1-5/8)	B	No	No	Inside Pole	138.00 - 0.00	6	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.52 0.52 0.52 0.52
LCF214-50JA(2-1/4)	B	No	No	Inside Pole	138.00 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	1.14 1.14 1.14 1.14
LDF4-50A(1/2)	B	No	No	Inside Pole	138.00 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.15 0.15 0.15 0.15
LDF7-50A(1-5/8)	A	No	No	Inside Pole	127.00 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.82 0.82 0.82 0.82
48 LDF4-50A(1/2)	B	No	No	Inside Pole	48.00 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.15 0.15 0.15 0.15
**									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	160.00-155.00	A	0.000	0.000	0.474	0.000	0.02
		B	0.000	0.000	0.474	0.000	0.00
		C	0.000	0.000	0.474	0.000	0.00
L2	155.00-150.00	A	0.000	0.000	4.743	0.000	0.06
		B	0.000	0.000	4.743	0.000	0.00
		C	0.000	0.000	4.743	0.000	0.00
L3	150.00-148.00	A	0.000	0.000	1.897	0.000	0.02
		B	0.000	0.000	1.897	0.000	0.00
		C	0.000	0.000	1.897	0.000	0.00
L4	148.00-143.00	A	0.000	0.000	4.743	0.000	0.06
		B	0.000	0.000	4.743	0.000	0.02
		C	0.000	0.000	4.743	0.000	0.00
L5	143.00-138.00	A	0.000	0.000	2.846	0.000	0.06
		B	0.000	0.000	2.846	0.000	0.02
		C	0.000	0.000	2.846	0.000	0.00
L6	138.00-133.00	A	0.000	0.000	0.000	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.00
L7	133.00-128.00	A	0.000	0.000	0.000	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.00
L8	128.00-123.00	A	0.000	0.000	4.752	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.00
L9	123.00-118.00	A	0.000	0.000	5.940	0.000	0.08
		B	0.000	0.000	0.160	0.000	0.05
		C	0.000	0.000	0.000	0.000	0.00
L10	118.00-111.00	A	0.000	0.000	8.316	0.000	0.12
		B	0.000	0.000	1.120	0.000	0.08
		C	0.000	0.000	0.000	0.000	0.00
L11	111.00-109.75	A	0.000	0.000	1.485	0.000	0.02
		B	0.000	0.000	0.200	0.000	0.01

Tower Sectio n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L12	109.75-105.33	C	0.000	0.000	0.000	0.000	0.00
		A	0.000	0.000	6.382	0.000	0.07
		B	0.000	0.000	1.838	0.000	0.05
L13	105.33-105.08	C	0.000	0.000	1.131	0.000	0.00
		A	0.000	0.000	0.496	0.000	0.00
		B	0.000	0.000	0.239	0.000	0.00
		C	0.000	0.000	0.199	0.000	0.00
L14	105.08-100.08	A	0.000	0.000	9.923	0.000	0.08
		B	0.000	0.000	4.783	0.000	0.06
		C	0.000	0.000	3.983	0.000	0.00
L15	100.08-95.08	A	0.000	0.000	9.923	0.000	0.08
		B	0.000	0.000	4.783	0.000	0.06
		C	0.000	0.000	3.983	0.000	0.00
L16	95.08-90.08	A	0.000	0.000	9.923	0.000	0.08
		B	0.000	0.000	4.783	0.000	0.06
		C	0.000	0.000	3.983	0.000	0.00
L17	90.08-85.08	A	0.000	0.000	9.923	0.000	0.08
		B	0.000	0.000	4.783	0.000	0.06
		C	0.000	0.000	3.983	0.000	0.00
L18	85.08-76.75	A	0.000	0.000	22.282	0.000	0.14
		B	0.000	0.000	13.719	0.000	0.09
		C	0.000	0.000	12.386	0.000	0.00
L19	76.75-75.75	A	0.000	0.000	2.188	0.000	0.02
		B	0.000	0.000	1.160	0.000	0.01
		C	0.000	0.000	1.000	0.000	0.00
L20	75.75-70.75	A	0.000	0.000	12.939	0.000	0.08
		B	0.000	0.000	7.799	0.000	0.06
		C	0.000	0.000	6.999	0.000	0.00
L21	70.75-70.58	A	0.000	0.000	0.523	0.000	0.00
		B	0.000	0.000	0.348	0.000	0.00
		C	0.000	0.000	0.321	0.000	0.00
L22	70.58-70.33	A	0.000	0.000	0.769	0.000	0.00
		B	0.000	0.000	0.512	0.000	0.00
		C	0.000	0.000	0.472	0.000	0.00
L23	70.33-70.00	A	0.000	0.000	1.015	0.000	0.01
		B	0.000	0.000	0.676	0.000	0.00
		C	0.000	0.000	0.623	0.000	0.00
L24	70.00-69.75	A	0.000	0.000	0.769	0.000	0.00
		B	0.000	0.000	0.512	0.000	0.00
		C	0.000	0.000	0.472	0.000	0.00
L25	69.75-64.75	A	0.000	0.000	12.632	0.000	0.08
		B	0.000	0.000	7.492	0.000	0.06
		C	0.000	0.000	6.692	0.000	0.00
L26	64.75-59.75	A	0.000	0.000	10.382	0.000	0.08
		B	0.000	0.000	5.242	0.000	0.06
		C	0.000	0.000	4.442	0.000	0.00
L27	59.75-54.75	A	0.000	0.000	10.382	0.000	0.08
		B	0.000	0.000	5.242	0.000	0.06
		C	0.000	0.000	4.442	0.000	0.00
L28	54.75-49.75	A	0.000	0.000	10.382	0.000	0.08
		B	0.000	0.000	5.242	0.000	0.06
		C	0.000	0.000	4.442	0.000	0.00
L29	49.75-43.00	A	0.000	0.000	21.057	0.000	0.11
		B	0.000	0.000	14.118	0.000	0.08
		C	0.000	0.000	13.038	0.000	0.00
L30	43.00-42.00	A	0.000	0.000	2.271	0.000	0.02
		B	0.000	0.000	1.243	0.000	0.01
		C	0.000	0.000	1.083	0.000	0.00
L31	42.00-37.00	A	0.000	0.000	11.357	0.000	0.08
		B	0.000	0.000	6.217	0.000	0.06
		C	0.000	0.000	5.417	0.000	0.00
L32	37.00-32.00	A	0.000	0.000	11.357	0.000	0.08
		B	0.000	0.000	6.217	0.000	0.06
		C	0.000	0.000	5.417	0.000	0.00
L33	32.00-27.91	A	0.000	0.000	12.264	0.000	0.07
		B	0.000	0.000	9.013	0.000	0.05
		C	0.000	0.000	7.405	0.000	0.00
L34	27.91-27.66	A	0.000	0.000	0.855	0.000	0.00
		B	0.000	0.000	0.598	0.000	0.00

Tower Section	Tower Elevation	Face	A _R	A _F	C _A A _A In Face	C _A A _A Out Face	Weight
n	ft		ft ²	ft ²	ft ²	ft ²	K
L35	27.66-27.25	C	0.000	0.000	0.558	0.000	0.00
		A	0.000	0.000	1.402	0.000	0.01
		B	0.000	0.000	0.981	0.000	0.00
L36	27.25-26.98	C	0.000	0.000	0.915	0.000	0.00
		A	0.000	0.000	0.923	0.000	0.00
		B	0.000	0.000	0.646	0.000	0.00
L37	26.98-26.83	C	0.000	0.000	0.603	0.000	0.00
		A	0.000	0.000	0.513	0.000	0.00
		B	0.000	0.000	0.359	0.000	0.00
L38	26.83-21.83	C	0.000	0.000	0.335	0.000	0.00
		A	0.000	0.000	14.206	0.000	0.08
		B	0.000	0.000	9.066	0.000	0.06
L39	21.83-16.83	C	0.000	0.000	8.266	0.000	0.00
		A	0.000	0.000	12.749	0.000	0.08
		B	0.000	0.000	7.609	0.000	0.06
L40	16.83-16.00	C	0.000	0.000	6.809	0.000	0.00
		A	0.000	0.000	2.696	0.000	0.01
		B	0.000	0.000	1.843	0.000	0.01
L41	16.00-15.75	C	0.000	0.000	1.710	0.000	0.00
		A	0.000	0.000	0.812	0.000	0.00
		B	0.000	0.000	0.555	0.000	0.00
L42	15.75-14.75	C	0.000	0.000	0.515	0.000	0.00
		A	0.000	0.000	3.248	0.000	0.02
		B	0.000	0.000	3.074	0.000	0.01
L43	14.75-14.50	C	0.000	0.000	2.914	0.000	0.00
		A	0.000	0.000	0.812	0.000	0.00
		B	0.000	0.000	0.839	0.000	0.00
L44	14.50-12.08	C	0.000	0.000	0.799	0.000	0.00
		A	0.000	0.000	7.861	0.000	0.04
		B	0.000	0.000	8.126	0.000	0.03
L45	12.08-11.83	C	0.000	0.000	7.739	0.000	0.00
		A	0.000	0.000	0.812	0.000	0.00
		B	0.000	0.000	0.839	0.000	0.00
L46	11.83-10.00	C	0.000	0.000	0.799	0.000	0.00
		A	0.000	0.000	5.945	0.000	0.03
		B	0.000	0.000	4.618	0.000	0.02
L47	10.00-9.75	C	0.000	0.000	5.852	0.000	0.00
		A	0.000	0.000	0.812	0.000	0.00
		B	0.000	0.000	0.552	0.000	0.00
L48	9.75-4.75	C	0.000	0.000	0.799	0.000	0.00
		A	0.000	0.000	13.278	0.000	0.08
		B	0.000	0.000	8.083	0.000	0.06
L49	4.75-0.00	C	0.000	0.000	13.025	0.000	0.00
		A	0.000	0.000	10.523	0.000	0.08
		B	0.000	0.000	5.594	0.000	0.05
		C	0.000	0.000	9.715	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	A _R	A _F	C _A A _A In Face	C _A A _A Out Face	Weight
n	ft		in	ft ²	ft ²	ft ²	ft ²	K
L1	160.00-155.00	A	1.491	0.000	0.000	0.567	0.000	0.03
		B		0.000	0.000	0.567	0.000	0.01
		C		0.000	0.000	0.567	0.000	0.01
L2	155.00-150.00	A	1.486	0.000	0.000	5.665	0.000	0.14
		B		0.000	0.000	5.665	0.000	0.09
		C		0.000	0.000	5.665	0.000	0.09
L3	150.00-148.00	A	1.482	0.000	0.000	2.265	0.000	0.06
		B		0.000	0.000	2.265	0.000	0.03
		C		0.000	0.000	2.265	0.000	0.03
L4	148.00-143.00	A	1.479	0.000	0.000	5.661	0.000	0.14
		B		0.000	0.000	5.661	0.000	0.11
		C		0.000	0.000	5.661	0.000	0.09
L5	143.00-138.00	A	1.474	0.000	0.000	3.395	0.000	0.11
		B		0.000	0.000	3.395	0.000	0.07

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
L6	138.00-133.00	C	1.468	0.000	0.000	3.395	0.000	0.05
		A		0.000	0.000	0.000	0.000	0.06
		B		0.000	0.000	0.000	0.000	0.04
L7	133.00-128.00	C	1.463	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	0.000	0.000	0.06
		B		0.000	0.000	0.000	0.000	0.04
L8	128.00-123.00	C	1.457	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	7.397	0.000	0.15
		B		0.000	0.000	0.000	0.000	0.04
L9	123.00-118.00	C	1.451	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	9.239	0.000	0.18
		B		0.000	0.000	0.450	0.000	0.05
L10	118.00-111.00	C	1.444	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	12.922	0.000	0.25
		B		0.000	0.000	3.141	0.000	0.12
L11	111.00-109.75	C	1.439	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	2.307	0.000	0.04
		B		0.000	0.000	0.561	0.000	0.02
L12	109.75-105.33	C	1.435	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	9.688	0.000	0.17
		B		0.000	0.000	3.514	0.000	0.09
L13	105.33-105.08	C	1.432	0.000	0.000	1.539	0.000	0.01
		A		0.000	0.000	0.731	0.000	0.01
		B		0.000	0.000	0.382	0.000	0.01
L14	105.08-100.08	C	1.428	0.000	0.000	0.271	0.000	0.00
		A		0.000	0.000	14.622	0.000	0.23
		B		0.000	0.000	7.640	0.000	0.13
L15	100.08-95.08	C	1.421	0.000	0.000	5.411	0.000	0.05
		A		0.000	0.000	14.606	0.000	0.23
		B		0.000	0.000	7.625	0.000	0.13
L16	95.08-90.08	C	1.414	0.000	0.000	5.404	0.000	0.05
		A		0.000	0.000	14.589	0.000	0.23
		B		0.000	0.000	7.610	0.000	0.13
L17	90.08-85.08	C	1.406	0.000	0.000	5.397	0.000	0.05
		A		0.000	0.000	14.571	0.000	0.23
		B		0.000	0.000	7.595	0.000	0.13
L18	85.08-76.75	C	1.395	0.000	0.000	5.389	0.000	0.05
		A		0.000	0.000	31.256	0.000	0.43
		B		0.000	0.000	19.638	0.000	0.28
L19	76.75-75.75	C	1.386	0.000	0.000	15.981	0.000	0.14
		A		0.000	0.000	3.056	0.000	0.05
		B		0.000	0.000	1.661	0.000	0.03
L20	75.75-70.75	C	1.381	0.000	0.000	1.222	0.000	0.01
		A		0.000	0.000	17.870	0.000	0.25
		B		0.000	0.000	10.900	0.000	0.16
L21	70.75-70.58	C	1.376	0.000	0.000	8.719	0.000	0.08
		A		0.000	0.000	0.716	0.000	0.01
		B		0.000	0.000	0.479	0.000	0.01
L22	70.58-70.33	C	1.375	0.000	0.000	0.405	0.000	0.00
		A		0.000	0.000	1.053	0.000	0.01
		B		0.000	0.000	0.704	0.000	0.01
L23	70.33-70.00	C	1.375	0.000	0.000	0.596	0.000	0.01
		A		0.000	0.000	1.390	0.000	0.02
		B		0.000	0.000	0.930	0.000	0.01
L24	70.00-69.75	C	1.374	0.000	0.000	0.786	0.000	0.01
		A		0.000	0.000	1.053	0.000	0.01
		B		0.000	0.000	0.704	0.000	0.01
L25	69.75-64.75	C	1.369	0.000	0.000	0.596	0.000	0.01
		A		0.000	0.000	17.689	0.000	0.25
		B		0.000	0.000	10.722	0.000	0.16
L26	64.75-59.75	C	1.359	0.000	0.000	8.553	0.000	0.08
		A		0.000	0.000	14.923	0.000	0.23
		B		0.000	0.000	7.959	0.000	0.13
L27	59.75-54.75	C	1.347	0.000	0.000	5.800	0.000	0.05
		A		0.000	0.000	14.898	0.000	0.22
		B		0.000	0.000	7.936	0.000	0.13
L28	54.75-49.75	C	1.335	0.000	0.000	5.789	0.000	0.05
		A		0.000	0.000	14.870	0.000	0.22
		B		0.000	0.000	7.912	0.000	0.13

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
L29	49.75-43.00	C	1.319	0.000	0.000	5.777	0.000	0.05
		A		0.000	0.000	28.783	0.000	0.37
		B		0.000	0.000	19.394	0.000	0.25
L30	43.00-42.00	C	1.308	0.000	0.000	16.533	0.000	0.14
		A		0.000	0.000	3.162	0.000	0.04
		B		0.000	0.000	1.771	0.000	0.03
L31	42.00-37.00	C	1.298	0.000	0.000	1.347	0.000	0.01
		A		0.000	0.000	15.762	0.000	0.22
		B		0.000	0.000	8.813	0.000	0.13
L32	37.00-32.00	C	1.281	0.000	0.000	6.715	0.000	0.05
		A		0.000	0.000	15.723	0.000	0.22
		B		0.000	0.000	8.778	0.000	0.13
L33	32.00-27.91	C	1.263	0.000	0.000	6.697	0.000	0.05
		A		0.000	0.000	16.457	0.000	0.21
		B		0.000	0.000	11.934	0.000	0.15
L34	27.91-27.66	C	1.253	0.000	0.000	9.092	0.000	0.07
		A		0.000	0.000	1.133	0.000	0.01
		B		0.000	0.000	0.785	0.000	0.01
L35	27.66-27.25	C	1.252	0.000	0.000	0.683	0.000	0.01
		A		0.000	0.000	1.857	0.000	0.02
		B		0.000	0.000	1.288	0.000	0.02
L36	27.25-26.98	C	1.250	0.000	0.000	1.120	0.000	0.01
		A		0.000	0.000	1.223	0.000	0.01
		B		0.000	0.000	0.848	0.000	0.01
L37	26.98-26.83	C	1.249	0.000	0.000	0.738	0.000	0.01
		A		0.000	0.000	0.679	0.000	0.01
		B		0.000	0.000	0.471	0.000	0.01
L38	26.83-21.83	C	1.237	0.000	0.000	0.410	0.000	0.00
		A		0.000	0.000	19.050	0.000	0.24
		B		0.000	0.000	12.107	0.000	0.16
L39	21.83-16.83	C	1.209	0.000	0.000	10.079	0.000	0.08
		A		0.000	0.000	17.104	0.000	0.23
		B		0.000	0.000	10.172	0.000	0.14
L40	16.83-16.00	C	1.189	0.000	0.000	8.168	0.000	0.07
		A		0.000	0.000	3.492	0.000	0.04
		B		0.000	0.000	2.343	0.000	0.03
L41	16.00-15.75	C	1.185	0.000	0.000	2.013	0.000	0.02
		A		0.000	0.000	1.051	0.000	0.01
		B		0.000	0.000	0.705	0.000	0.01
L42	15.75-14.75	C	1.180	0.000	0.000	0.606	0.000	0.00
		A		0.000	0.000	4.203	0.000	0.05
		B		0.000	0.000	3.769	0.000	0.04
L43	14.75-14.50	C	1.175	0.000	0.000	3.373	0.000	0.03
		A		0.000	0.000	1.050	0.000	0.01
		B		0.000	0.000	1.021	0.000	0.01
L44	14.50-12.08	C	1.164	0.000	0.000	0.922	0.000	0.01
		A		0.000	0.000	10.149	0.000	0.12
		B		0.000	0.000	9.864	0.000	0.11
L45	12.08-11.83	C	1.152	0.000	0.000	8.913	0.000	0.07
		A		0.000	0.000	1.047	0.000	0.01
		B		0.000	0.000	1.017	0.000	0.01
L46	11.83-10.00	C	1.141	0.000	0.000	0.920	0.000	0.01
		A		0.000	0.000	7.651	0.000	0.09
		B		0.000	0.000	5.603	0.000	0.07
L47	10.00-9.75	C	1.130	0.000	0.000	6.723	0.000	0.05
		A		0.000	0.000	1.044	0.000	0.01
		B		0.000	0.000	0.670	0.000	0.01
L48	9.75-4.75	C	1.096	0.000	0.000	0.917	0.000	0.01
		A		0.000	0.000	17.433	0.000	0.22
		B		0.000	0.000	9.988	0.000	0.14
L49	4.75-0.00	C	0.980	0.000	0.000	14.930	0.000	0.11
		A		0.000	0.000	13.930	0.000	0.18
		B		0.000	0.000	6.986	0.000	0.11
		C		0.000	0.000	11.008	0.000	0.07

Feed Line Center of Pressure

Section	Elevation	CP _x	CP _z	CP _x	CP _z
	ft	in	in	Ice in	Ice in
L1	160.00-155.00	0.0000	0.0000	0.0000	0.0000
L2	155.00-150.00	0.0000	0.0000	0.0000	0.0000
L3	150.00-148.00	0.0000	0.0000	0.0000	0.0000
L4	148.00-143.00	0.0000	0.0000	0.0000	0.0000
L5	143.00-138.00	0.0000	0.0000	0.0000	0.0000
L6	138.00-133.00	0.0000	0.0000	0.0000	0.0000
L7	133.00-128.00	0.0000	0.0000	0.0000	0.0000
L8	128.00-123.00	-1.4672	-5.0500	-1.1939	-4.1094
L9	123.00-118.00	-1.5345	-5.8434	-1.1457	-4.7625
L10	118.00-111.00	-0.9539	-5.9793	-0.3284	-4.9912
L11	111.00-109.75	-0.9561	-5.9935	-0.3293	-5.0064
L12	109.75-105.33	-0.7727	-4.8440	-0.2856	-4.3072
L13	105.33-105.08	-0.5504	-3.4511	-0.2208	-3.3214
L14	105.08-100.08	-0.5552	-3.4814	-0.2234	-3.3508
L15	100.08-95.08	-0.5641	-3.5382	-0.2284	-3.4062
L16	95.08-90.08	-0.5729	-3.5941	-0.2334	-3.4605
L17	90.08-85.08	-0.5815	-3.6490	-0.2386	-3.5138
L18	85.08-76.75	1.2597	-1.7388	1.1315	-2.0619
L19	76.75-75.75	2.4695	-1.5974	2.0732	-2.0733
L20	75.75-70.75	2.1023	-1.3581	1.8119	-1.8105
L21	70.75-70.58	1.7806	-1.1490	1.5722	-1.5693
L22	70.58-70.33	1.7825	-1.1501	1.5739	-1.5708
L23	70.33-70.00	1.7844	-1.1512	1.5754	-1.5721
L24	70.00-69.75	1.7857	-1.1519	1.5765	-1.5729
L25	69.75-64.75	0.7190	-2.2899	0.7130	-2.5335
L26	64.75-59.75	-0.5896	-3.7025	-0.2566	-3.6298
L27	59.75-54.75	-0.5973	-3.7519	-0.2624	-3.6771
L28	54.75-49.75	-0.6050	-3.8004	-0.2685	-3.7234
L29	49.75-43.00	-0.4117	-2.5870	-0.2010	-2.7497
L30	43.00-42.00	-0.5612	-3.5258	-0.2610	-3.5699
L31	42.00-37.00	-0.5655	-3.5532	-0.2675	-3.5934
L32	37.00-32.00	-0.5726	-3.5982	-0.2747	-3.6354
L33	32.00-27.91	0.0309	-2.3056	0.1558	-2.5701
L34	27.91-27.66	-0.3919	-2.4634	-0.2098	-2.6832
L35	27.66-27.25	-0.3923	-2.4657	-0.2102	-2.6854
L36	27.25-26.98	-0.3927	-2.4681	-0.2106	-2.6877
L37	26.98-26.83	-0.3929	-2.4696	-0.2109	-2.6891
L38	26.83-21.83	-0.4734	-2.9758	-0.2486	-3.1425
L39	21.83-16.83	-0.5318	-3.3433	-0.2801	-3.4707
L40	16.83-16.00	-0.4249	-2.6713	-0.2386	-2.9169
L41	16.00-15.75	-0.4255	-2.6755	-0.2396	-2.9206
L42	15.75-14.75	2.8620	-2.4994	2.3812	-2.7509
L43	14.75-14.50	3.7614	-2.4539	3.1281	-2.7046
L44	14.50-12.08	3.7755	-2.4634	3.1390	-2.7125
L45	12.08-11.83	3.7904	-2.4733	3.1503	-2.7210
L46	11.83-10.00	2.6196	-3.9453	2.0921	-4.0145
L47	10.00-9.75	2.1383	-4.5632	1.6620	-4.5494
L48	9.75-4.75	2.5534	-5.4493	1.9190	-5.2446
L49	4.75-0.00	2.6582	-6.1668	1.9329	-5.7359

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	49	HSS6x6	155.00 - 155.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L1	50	HSS6x6	155.00 - 155.50	1.0000	1.0000
L1	51	HSS6x6	155.00 - 155.50	1.0000	1.0000
L2	49	HSS6x6	150.00 - 155.00	1.0000	1.0000
L2	50	HSS6x6	150.00 - 155.00	1.0000	1.0000
L2	51	HSS6x6	150.00 - 155.00	1.0000	1.0000
L3	49	HSS6x6	148.00 - 150.00	1.0000	1.0000
L3	50	HSS6x6	148.00 - 150.00	1.0000	1.0000
L3	51	HSS6x6	148.00 - 150.00	1.0000	1.0000
L4	49	HSS6x6	143.00 - 148.00	1.0000	1.0000
L4	50	HSS6x6	143.00 - 148.00	1.0000	1.0000
L4	51	HSS6x6	143.00 - 148.00	1.0000	1.0000
L5	49	HSS6x6	140.00 - 143.00	1.0000	1.0000
L5	50	HSS6x6	140.00 - 143.00	1.0000	1.0000
L5	51	HSS6x6	140.00 - 143.00	1.0000	1.0000
L8	18	LDF7-50A(1-5/8)	123.00 - 127.00	1.0000	1.0000
L9	18	LDF7-50A(1-5/8)	118.00 - 123.00	1.0000	1.0000
L9	53	CU12PSM9P6XXX(1-1/2)	118.00 - 119.00	1.0000	1.0000
L10	18	LDF7-50A(1-5/8)	111.00 - 118.00	1.0000	1.0000
L10	53	CU12PSM9P6XXX(1-1/2)	111.00 - 118.00	1.0000	1.0000
L11	18	LDF7-50A(1-5/8)	109.75 - 111.00	1.0000	1.0000
L11	53	CU12PSM9P6XXX(1-1/2)	109.75 - 111.00	1.0000	1.0000
L12	18	LDF7-50A(1-5/8)	105.33 - 109.75	1.0000	1.0000
L12	36	MP304	105.33 - 106.75	1.0000	1.0000
L12	37	MP304	105.33 - 106.75	1.0000	1.0000
L12	38	MP304	105.33 - 106.75	1.0000	1.0000
L12	53	CU12PSM9P6XXX(1-1/2)	105.33 - 109.75	1.0000	1.0000
L13	18	LDF7-50A(1-5/8)	105.08 - 105.33	1.0000	1.0000
L13	36	MP304	105.08 - 105.33	1.0000	1.0000
L13	37	MP304	105.08 - 105.33	1.0000	1.0000
L13	38	MP304	105.08 - 105.33	1.0000	1.0000
L13	53	CU12PSM9P6XXX(1-1/2)	105.08 - 105.33	1.0000	1.0000
L14	18	LDF7-50A(1-5/8)	100.08 - 105.08	1.0000	1.0000
L14	36	MP304	100.08 - 105.08	1.0000	1.0000
L14	37	MP304	100.08 - 105.08	1.0000	1.0000
L14	38	MP304	100.08 - 105.08	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L14	53	CU12PSM9P6XXX(1-1/2)	105.08 100.08 - 105.08	1.0000	1.0000
L15	18	LDF7-50A(1-5/8)	95.08 - 100.08	1.0000	1.0000
L15	36	MP304	95.08 - 100.08	1.0000	1.0000
L15	37	MP304	95.08 - 100.08	1.0000	1.0000
L15	38	MP304	95.08 - 100.08	1.0000	1.0000
L15	53	CU12PSM9P6XXX(1-1/2)	95.08 - 100.08	1.0000	1.0000
L16	18	LDF7-50A(1-5/8)	90.08 - 95.08	1.0000	1.0000
L16	36	MP304	90.08 - 95.08	1.0000	1.0000
L16	37	MP304	90.08 - 95.08	1.0000	1.0000
L16	38	MP304	90.08 - 95.08	1.0000	1.0000
L16	53	CU12PSM9P6XXX(1-1/2)	90.08 - 95.08	1.0000	1.0000
L17	18	LDF7-50A(1-5/8)	85.08 - 90.08	1.0000	1.0000
L17	36	MP304	85.08 - 90.08	1.0000	1.0000
L17	37	MP304	85.08 - 90.08	1.0000	1.0000
L17	38	MP304	85.08 - 90.08	1.0000	1.0000
L17	53	CU12PSM9P6XXX(1-1/2)	85.08 - 90.08	1.0000	1.0000
L18	18	LDF7-50A(1-5/8)	76.75 - 85.08	1.0000	1.0000
L18	36	MP304	76.75 - 85.08	1.0000	1.0000
L18	37	MP304	76.75 - 85.08	1.0000	1.0000
L18	38	MP304	76.75 - 85.08	1.0000	1.0000
L18	45	6"x1" Flat Reinforcement	76.75 - 82.50	1.0000	1.0000
L18	46	6"x1" Flat Reinforcement	76.75 - 82.50	1.0000	1.0000
L18	47	6"x1" Flat Reinforcement	76.75 - 82.50	1.0000	1.0000
L18	53	CU12PSM9P6XXX(1-1/2)	76.75 - 85.08	1.0000	1.0000
L19	18	LDF7-50A(1-5/8)	75.75 - 76.75	1.0000	1.0000
L19	45	6"x1" Flat Reinforcement	75.75 - 76.75	1.0000	1.0000
L19	46	6"x1" Flat Reinforcement	75.75 - 76.75	1.0000	1.0000
L19	47	6"x1" Flat Reinforcement	75.75 - 76.75	1.0000	1.0000
L19	53	CU12PSM9P6XXX(1-1/2)	75.75 - 76.75	1.0000	1.0000
L20	18	LDF7-50A(1-5/8)	70.75 - 75.75	1.0000	1.0000
L20	33	MP305	70.75 - 73.00	1.0000	1.0000
L20	34	MP305	70.75 - 73.00	1.0000	1.0000
L20	35	MP305	70.75 - 73.00	1.0000	1.0000
L20	45	6"x1" Flat Reinforcement	70.75 - 75.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L20	46	6"x1" Flat Reinforcement	70.75 - 75.75	1.0000	1.0000
L20	47	6"x1" Flat Reinforcement	70.75 - 75.75	1.0000	1.0000
L20	53	CU12PSM9P6XXX(1-1/2)	70.75 - 75.75	1.0000	1.0000
L21	18	LDF7-50A(1-5/8)	70.58 - 70.75	1.0000	1.0000
L21	33	MP305	70.58 - 70.75	1.0000	1.0000
L21	34	MP305	70.58 - 70.75	1.0000	1.0000
L21	35	MP305	70.58 - 70.75	1.0000	1.0000
L21	45	6"x1" Flat Reinforcement	70.58 - 70.75	1.0000	1.0000
L21	46	6"x1" Flat Reinforcement	70.58 - 70.75	1.0000	1.0000
L21	47	6"x1" Flat Reinforcement	70.58 - 70.75	1.0000	1.0000
L21	53	CU12PSM9P6XXX(1-1/2)	70.58 - 70.75	1.0000	1.0000
L22	18	LDF7-50A(1-5/8)	70.33 - 70.58	1.0000	1.0000
L22	33	MP305	70.33 - 70.58	1.0000	1.0000
L22	34	MP305	70.33 - 70.58	1.0000	1.0000
L22	35	MP305	70.33 - 70.58	1.0000	1.0000
L22	45	6"x1" Flat Reinforcement	70.33 - 70.58	1.0000	1.0000
L22	46	6"x1" Flat Reinforcement	70.33 - 70.58	1.0000	1.0000
L22	47	6"x1" Flat Reinforcement	70.33 - 70.58	1.0000	1.0000
L22	53	CU12PSM9P6XXX(1-1/2)	70.33 - 70.58	1.0000	1.0000
L23	18	LDF7-50A(1-5/8)	70.00 - 70.33	1.0000	1.0000
L23	33	MP305	70.00 - 70.33	1.0000	1.0000
L23	34	MP305	70.00 - 70.33	1.0000	1.0000
L23	35	MP305	70.00 - 70.33	1.0000	1.0000
L23	45	6"x1" Flat Reinforcement	70.00 - 70.33	1.0000	1.0000
L23	46	6"x1" Flat Reinforcement	70.00 - 70.33	1.0000	1.0000
L23	47	6"x1" Flat Reinforcement	70.00 - 70.33	1.0000	1.0000
L23	53	CU12PSM9P6XXX(1-1/2)	70.00 - 70.33	1.0000	1.0000
L24	18	LDF7-50A(1-5/8)	69.75 - 70.00	1.0000	1.0000
L24	33	MP305	69.75 - 70.00	1.0000	1.0000
L24	34	MP305	69.75 - 70.00	1.0000	1.0000
L24	35	MP305	69.75 - 70.00	1.0000	1.0000
L24	45	6"x1" Flat Reinforcement	69.75 - 70.00	1.0000	1.0000
L24	46	6"x1" Flat Reinforcement	69.75 - 70.00	1.0000	1.0000
L24	47	6"x1" Flat Reinforcement	69.75 - 70.00	1.0000	1.0000
L24	53	CU12PSM9P6XXX(1-1/2)	69.75 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
			70.00		
L25	18	LDF7-50A(1-5/8)	64.75 - 69.75	1.0000	1.0000
L25	33	MP305	64.75 - 69.75	1.0000	1.0000
L25	34	MP305	64.75 - 69.75	1.0000	1.0000
L25	35	MP305	64.75 - 69.75	1.0000	1.0000
L25	45	6"x1" Flat Reinforcement	67.50 - 69.75	1.0000	1.0000
L25	46	6"x1" Flat Reinforcement	67.50 - 69.75	1.0000	1.0000
L25	47	6"x1" Flat Reinforcement	67.50 - 69.75	1.0000	1.0000
L25	53	CU12PSM9P6XXX(1-1/2)	64.75 - 69.75	1.0000	1.0000
L26	18	LDF7-50A(1-5/8)	59.75 - 64.75	1.0000	1.0000
L26	33	MP305	59.75 - 64.75	1.0000	1.0000
L26	34	MP305	59.75 - 64.75	1.0000	1.0000
L26	35	MP305	59.75 - 64.75	1.0000	1.0000
L26	53	CU12PSM9P6XXX(1-1/2)	59.75 - 64.75	1.0000	1.0000
L27	18	LDF7-50A(1-5/8)	54.75 - 59.75	1.0000	1.0000
L27	33	MP305	54.75 - 59.75	1.0000	1.0000
L27	34	MP305	54.75 - 59.75	1.0000	1.0000
L27	35	MP305	54.75 - 59.75	1.0000	1.0000
L27	53	CU12PSM9P6XXX(1-1/2)	54.75 - 59.75	1.0000	1.0000
L28	18	LDF7-50A(1-5/8)	49.75 - 54.75	1.0000	1.0000
L28	33	MP305	49.75 - 54.75	1.0000	1.0000
L28	34	MP305	49.75 - 54.75	1.0000	1.0000
L28	35	MP305	49.75 - 54.75	1.0000	1.0000
L28	53	CU12PSM9P6XXX(1-1/2)	49.75 - 54.75	1.0000	1.0000
L29	18	LDF7-50A(1-5/8)	43.00 - 49.75	1.0000	1.0000
L29	33	MP305	43.00 - 49.75	1.0000	1.0000
L29	34	MP305	43.00 - 49.75	1.0000	1.0000
L29	35	MP305	43.00 - 49.75	1.0000	1.0000
L29	39	6.5"x1.25" Flat Reinforcement	43.00 - 49.50	1.0000	1.0000
L29	40	6.5"x1.25" Flat Reinforcement	43.00 - 49.50	1.0000	1.0000
L29	41	6.5"x1.25" Flat Reinforcement	43.00 - 49.50	1.0000	1.0000
L29	53	CU12PSM9P6XXX(1-1/2)	43.00 - 49.75	1.0000	1.0000
L30	18	LDF7-50A(1-5/8)	42.00 - 43.00	1.0000	1.0000
L30	39	6.5"x1.25" Flat Reinforcement	42.00 - 43.00	1.0000	1.0000
L30	40	6.5"x1.25" Flat Reinforcement	42.00 - 43.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L30	41	6.5"x1.25" Flat Reinforcement	42.00 - 43.00	1.0000	1.0000
L30	53	CU12PSM9P6XXX(1-1/2)	42.00 - 43.00	1.0000	1.0000
L31	18	LDF7-50A(1-5/8)	37.00 - 42.00	1.0000	1.0000
L31	39	6.5"x1.25" Flat Reinforcement	37.00 - 42.00	1.0000	1.0000
L31	40	6.5"x1.25" Flat Reinforcement	37.00 - 42.00	1.0000	1.0000
L31	41	6.5"x1.25" Flat Reinforcement	37.00 - 42.00	1.0000	1.0000
L31	53	CU12PSM9P6XXX(1-1/2)	37.00 - 42.00	1.0000	1.0000
L32	18	LDF7-50A(1-5/8)	32.00 - 37.00	1.0000	1.0000
L32	39	6.5"x1.25" Flat Reinforcement	32.00 - 37.00	1.0000	1.0000
L32	40	6.5"x1.25" Flat Reinforcement	32.00 - 37.00	1.0000	1.0000
L32	41	6.5"x1.25" Flat Reinforcement	32.00 - 37.00	1.0000	1.0000
L32	53	CU12PSM9P6XXX(1-1/2)	32.00 - 37.00	1.0000	1.0000
L33	18	LDF7-50A(1-5/8)	27.91 - 32.00	1.0000	1.0000
L33	28	MP306	27.91 - 30.50	1.0000	1.0000
L33	29	MP306	27.91 - 30.50	1.0000	1.0000
L33	32	MP306	27.91 - 31.33	1.0000	1.0000
L33	39	6.5"x1.25" Flat Reinforcement	27.91 - 32.00	1.0000	1.0000
L33	40	6.5"x1.25" Flat Reinforcement	27.91 - 32.00	1.0000	1.0000
L33	41	6.5"x1.25" Flat Reinforcement	27.91 - 32.00	1.0000	1.0000
L33	53	CU12PSM9P6XXX(1-1/2)	27.91 - 32.00	1.0000	1.0000
L34	18	LDF7-50A(1-5/8)	27.66 - 27.91	1.0000	1.0000
L34	28	MP306	27.66 - 27.91	1.0000	1.0000
L34	29	MP306	27.66 - 27.91	1.0000	1.0000
L34	32	MP306	27.66 - 27.91	1.0000	1.0000
L34	39	6.5"x1.25" Flat Reinforcement	27.66 - 27.91	1.0000	1.0000
L34	40	6.5"x1.25" Flat Reinforcement	27.66 - 27.91	1.0000	1.0000
L34	41	6.5"x1.25" Flat Reinforcement	27.66 - 27.91	1.0000	1.0000
L34	53	CU12PSM9P6XXX(1-1/2)	27.66 - 27.91	1.0000	1.0000
L35	18	LDF7-50A(1-5/8)	27.25 - 27.66	1.0000	1.0000
L35	28	MP306	27.25 - 27.66	1.0000	1.0000
L35	29	MP306	27.25 - 27.66	1.0000	1.0000
L35	32	MP306	27.25 - 27.66	1.0000	1.0000
L35	39	6.5"x1.25" Flat Reinforcement	27.25 - 27.66	1.0000	1.0000
L35	40	6.5"x1.25" Flat Reinforcement	27.25 - 27.66	1.0000	1.0000
L35	41	6.5"x1.25" Flat Reinforcement	27.25 - 27.66	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L35	53	Reinforcement CU12PSM9P6XXX(1-1/2)	27.66 27.25 - 27.66	1.0000	1.0000
L36	18	LDF7-50A(1-5/8)	26.98 - 27.25	1.0000	1.0000
L36	28	MP306	26.98 - 27.25	1.0000	1.0000
L36	29	MP306	26.98 - 27.25	1.0000	1.0000
L36	32	MP306	26.98 - 27.25	1.0000	1.0000
L36	39	6.5"x1.25" Flat Reinforcement	26.98 - 27.25	1.0000	1.0000
L36	40	6.5"x1.25" Flat Reinforcement	26.98 - 27.25	1.0000	1.0000
L36	41	6.5"x1.25" Flat Reinforcement	26.98 - 27.25	1.0000	1.0000
L36	53	CU12PSM9P6XXX(1-1/2)	26.98 - 27.25	1.0000	1.0000
L37	18	LDF7-50A(1-5/8)	26.83 - 26.98	1.0000	1.0000
L37	28	MP306	26.83 - 26.98	1.0000	1.0000
L37	29	MP306	26.83 - 26.98	1.0000	1.0000
L37	32	MP306	26.83 - 26.98	1.0000	1.0000
L37	39	6.5"x1.25" Flat Reinforcement	26.83 - 26.98	1.0000	1.0000
L37	40	6.5"x1.25" Flat Reinforcement	26.83 - 26.98	1.0000	1.0000
L37	41	6.5"x1.25" Flat Reinforcement	26.83 - 26.98	1.0000	1.0000
L37	53	CU12PSM9P6XXX(1-1/2)	26.83 - 26.98	1.0000	1.0000
L38	18	LDF7-50A(1-5/8)	21.83 - 26.83	1.0000	1.0000
L38	28	MP306	21.83 - 26.83	1.0000	1.0000
L38	29	MP306	21.83 - 26.83	1.0000	1.0000
L38	32	MP306	21.83 - 26.83	1.0000	1.0000
L38	39	6.5"x1.25" Flat Reinforcement	24.50 - 26.83	1.0000	1.0000
L38	40	6.5"x1.25" Flat Reinforcement	24.50 - 26.83	1.0000	1.0000
L38	41	6.5"x1.25" Flat Reinforcement	24.50 - 26.83	1.0000	1.0000
L38	53	CU12PSM9P6XXX(1-1/2)	21.83 - 26.83	1.0000	1.0000
L39	18	LDF7-50A(1-5/8)	16.83 - 21.83	1.0000	1.0000
L39	28	MP306	16.83 - 21.83	1.0000	1.0000
L39	29	MP306	16.83 - 21.83	1.0000	1.0000
L39	32	MP306	16.83 - 21.83	1.0000	1.0000
L39	42	6"x1" Flat Reinforcement	16.83 - 18.00	1.0000	1.0000
L39	43	6"x1" Flat Reinforcement	16.83 - 18.00	1.0000	1.0000
L39	44	6"x1" Flat Reinforcement	16.83 - 18.00	1.0000	1.0000
L39	53	CU12PSM9P6XXX(1-1/2)	16.83 - 21.83	1.0000	1.0000
L40	18	LDF7-50A(1-5/8)	16.00 - 16.83	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L40	28	MP306	16.00 - 16.83	1.0000	1.0000
L40	29	MP306	16.00 - 16.83	1.0000	1.0000
L40	32	MP306	16.00 - 16.83	1.0000	1.0000
L40	42	6"x1" Flat Reinforcement	16.00 - 16.83	1.0000	1.0000
L40	43	6"x1" Flat Reinforcement	16.00 - 16.83	1.0000	1.0000
L40	44	6"x1" Flat Reinforcement	16.00 - 16.83	1.0000	1.0000
L40	53	CU12PSM9P6XXX(1-1/2)	16.00 - 16.83	1.0000	1.0000
L41	18	LDF7-50A(1-5/8)	15.75 - 16.00	1.0000	1.0000
L41	28	MP306	15.75 - 16.00	1.0000	1.0000
L41	29	MP306	15.75 - 16.00	1.0000	1.0000
L41	32	MP306	15.75 - 16.00	1.0000	1.0000
L41	42	6"x1" Flat Reinforcement	15.75 - 16.00	1.0000	1.0000
L41	43	6"x1" Flat Reinforcement	15.75 - 16.00	1.0000	1.0000
L41	44	6"x1" Flat Reinforcement	15.75 - 16.00	1.0000	1.0000
L41	53	CU12PSM9P6XXX(1-1/2)	15.75 - 16.00	1.0000	1.0000
L42	18	LDF7-50A(1-5/8)	14.75 - 15.75	1.0000	1.0000
L42	28	MP306	14.75 - 15.75	1.0000	1.0000
L42	29	MP306	14.75 - 15.75	1.0000	1.0000
L42	30	MP306	14.75 - 15.50	1.0000	1.0000
L42	31	MP306	14.75 - 15.50	1.0000	1.0000
L42	32	MP306	14.75 - 15.75	1.0000	1.0000
L42	42	6"x1" Flat Reinforcement	14.75 - 15.75	1.0000	1.0000
L42	43	6"x1" Flat Reinforcement	14.75 - 15.75	1.0000	1.0000
L42	44	6"x1" Flat Reinforcement	14.75 - 15.75	1.0000	1.0000
L42	53	CU12PSM9P6XXX(1-1/2)	14.75 - 15.75	1.0000	1.0000
L43	18	LDF7-50A(1-5/8)	14.50 - 14.75	1.0000	1.0000
L43	28	MP306	14.50 - 14.75	1.0000	1.0000
L43	29	MP306	14.50 - 14.75	1.0000	1.0000
L43	30	MP306	14.50 - 14.75	1.0000	1.0000
L43	31	MP306	14.50 - 14.75	1.0000	1.0000
L43	32	MP306	14.50 - 14.75	1.0000	1.0000
L43	42	6"x1" Flat Reinforcement	14.50 - 14.75	1.0000	1.0000
L43	43	6"x1" Flat Reinforcement	14.50 - 14.75	1.0000	1.0000
L43	44	6"x1" Flat Reinforcement	14.50 - 14.75	1.0000	1.0000
L43	53	CU12PSM9P6XXX(1-1/2)	14.50 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L44	18	LDF7-50A(1-5/8)	14.75 12.08 - 14.50	1.0000	1.0000
L44	28	MP306	12.08 - 14.50	1.0000	1.0000
L44	29	MP306	12.08 - 14.50	1.0000	1.0000
L44	30	MP306	12.08 - 14.50	1.0000	1.0000
L44	31	MP306	12.08 - 14.50	1.0000	1.0000
L44	32	MP306	12.08 - 14.50	1.0000	1.0000
L44	42	6"x1" Flat Reinforcement	12.08 - 14.50	1.0000	1.0000
L44	43	6"x1" Flat Reinforcement	12.08 - 14.50	1.0000	1.0000
L44	44	6"x1" Flat Reinforcement	12.08 - 14.50	1.0000	1.0000
L44	53	CU12PSM9P6XXX(1-1/2)	12.08 - 14.50	1.0000	1.0000
L45	18	LDF7-50A(1-5/8)	11.83 - 12.08	1.0000	1.0000
L45	28	MP306	11.83 - 12.08	1.0000	1.0000
L45	29	MP306	11.83 - 12.08	1.0000	1.0000
L45	30	MP306	11.83 - 12.08	1.0000	1.0000
L45	31	MP306	11.83 - 12.08	1.0000	1.0000
L45	32	MP306	11.83 - 12.08	1.0000	1.0000
L45	42	6"x1" Flat Reinforcement	11.83 - 12.08	1.0000	1.0000
L45	43	6"x1" Flat Reinforcement	11.83 - 12.08	1.0000	1.0000
L45	44	6"x1" Flat Reinforcement	11.83 - 12.08	1.0000	1.0000
L45	53	CU12PSM9P6XXX(1-1/2)	11.83 - 12.08	1.0000	1.0000
L46	18	LDF7-50A(1-5/8)	10.00 - 11.83	1.0000	1.0000
L46	28	MP306	10.00 - 11.83	1.0000	1.0000
L46	29	MP306	10.00 - 11.83	1.0000	1.0000
L46	30	MP306	10.00 - 11.83	1.0000	1.0000
L46	31	MP306	10.00 - 11.83	1.0000	1.0000
L46	32	MP306	11.33 - 11.83	1.0000	1.0000
L46	42	6"x1" Flat Reinforcement	10.00 - 11.83	1.0000	1.0000
L46	43	6"x1" Flat Reinforcement	10.00 - 11.83	1.0000	1.0000
L46	44	6"x1" Flat Reinforcement	10.00 - 11.83	1.0000	1.0000
L46	53	CU12PSM9P6XXX(1-1/2)	10.00 - 11.83	1.0000	1.0000
L47	18	LDF7-50A(1-5/8)	9.75 - 10.00	1.0000	1.0000
L47	28	MP306	9.75 - 10.00	1.0000	1.0000
L47	29	MP306	9.75 - 10.00	1.0000	1.0000
L47	30	MP306	9.75 - 10.00	1.0000	1.0000
L47	31	MP306	9.75 - 10.00	1.0000	1.0000
L47	42	6"x1" Flat Reinforcement	9.75 - 10.00	1.0000	1.0000
L47	43	6"x1" Flat Reinforcement	9.75 - 10.00	1.0000	1.0000
L47	44	6"x1" Flat Reinforcement	9.75 - 10.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L47	53	CU12PSM9P6XXX(1-1/2)	9.75 - 10.00	1.0000	1.0000
L48	18	LDF7-50A(1-5/8)	4.75 - 9.75	1.0000	1.0000
L48	28	MP306	4.75 - 9.75	1.0000	1.0000
L48	29	MP306	4.75 - 9.75	1.0000	1.0000
L48	30	MP306	4.75 - 9.75	1.0000	1.0000
L48	31	MP306	4.75 - 9.75	1.0000	1.0000
L48	42	6"x1" Flat Reinforcement	8.00 - 9.75	1.0000	1.0000
L48	43	6"x1" Flat Reinforcement	8.00 - 9.75	1.0000	1.0000
L48	44	6"x1" Flat Reinforcement	8.00 - 9.75	1.0000	1.0000
L48	53	CU12PSM9P6XXX(1-1/2)	4.75 - 9.75	1.0000	1.0000
L49	18	LDF7-50A(1-5/8)	0.00 - 4.75	1.0000	1.0000
L49	28	MP306	0.50 - 4.75	1.0000	1.0000
L49	29	MP306	0.50 - 4.75	1.0000	1.0000
L49	30	MP306	0.50 - 4.75	1.0000	1.0000
L49	31	MP306	0.50 - 4.75	1.0000	1.0000
L49	53	CU12PSM9P6XXX(1-1/2)	0.00 - 4.75	1.0000	1.0000

Effective Width of Flat Linear Attachments / Feed Lines

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L1	49	HSS6x6	155.00 - 155.50	Auto	1.0000
L1	50	HSS6x6	155.00 - 155.50	Auto	1.0000
L1	51	HSS6x6	155.00 - 155.50	Auto	1.0000
L2	49	HSS6x6	150.00 - 155.00	Auto	1.0000
L2	50	HSS6x6	150.00 - 155.00	Auto	1.0000
L2	51	HSS6x6	150.00 - 155.00	Auto	1.0000
L3	49	HSS6x6	148.00 - 150.00	Auto	1.0000
L3	50	HSS6x6	148.00 - 150.00	Auto	1.0000
L3	51	HSS6x6	148.00 - 150.00	Auto	1.0000
L4	49	HSS6x6	143.00 - 148.00	Auto	0.3868
L4	50	HSS6x6	143.00 - 148.00	Auto	0.3868
L4	51	HSS6x6	143.00 - 148.00	Auto	0.3868
L5	49	HSS6x6	140.00 - 143.00	Auto	0.3678
L5	50	HSS6x6	140.00 - 143.00	Auto	0.3678
L5	51	HSS6x6	140.00 - 143.00	Auto	0.3678
L12	36	MP304	105.33 - 106.75	Auto	0.0363
L12	37	MP304	105.33 - 106.75	Auto	0.0363
L12	38	MP304	105.33 - 106.75	Auto	0.0363
L13	36	MP304	105.08 - 105.33	Auto	0.0889

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L13	37	MP304	105.08 - 105.33	Auto	0.0889
L13	38	MP304	105.08 - 105.33	Auto	0.0889
L14	36	MP304	100.08 - 105.08	Auto	0.0709
L14	37	MP304	100.08 - 105.08	Auto	0.0709
L14	38	MP304	100.08 - 105.08	Auto	0.0709
L15	36	MP304	95.08 - 100.08	Auto	0.0411
L15	37	MP304	95.08 - 100.08	Auto	0.0411
L15	38	MP304	95.08 - 100.08	Auto	0.0411
L16	36	MP304	90.08 - 95.08	Auto	0.0078
L16	37	MP304	90.08 - 95.08	Auto	0.0078
L16	38	MP304	90.08 - 95.08	Auto	0.0078
L17	36	MP304	85.08 - 90.08	Auto	0.0000
L17	37	MP304	85.08 - 90.08	Auto	0.0000
L17	38	MP304	85.08 - 90.08	Auto	0.0000
L18	36	MP304	76.75 - 85.08	Auto	0.0000
L18	37	MP304	76.75 - 85.08	Auto	0.0000
L18	38	MP304	76.75 - 85.08	Auto	0.0000
L18	45	6"x1" Flat Reinforcement	76.75 - 82.50	Auto	0.1471
L18	46	6"x1" Flat Reinforcement	76.75 - 82.50	Auto	0.1471
L18	47	6"x1" Flat Reinforcement	76.75 - 82.50	Auto	0.1471
L19	45	6"x1" Flat Reinforcement	75.75 - 76.75	Auto	0.1274
L19	46	6"x1" Flat Reinforcement	75.75 - 76.75	Auto	0.1274
L19	47	6"x1" Flat Reinforcement	75.75 - 76.75	Auto	0.1274
L20	33	MP305	70.75 - 73.00	Auto	0.0000
L20	34	MP305	70.75 - 73.00	Auto	0.0000
L20	35	MP305	70.75 - 73.00	Auto	0.0000
L20	45	6"x1" Flat Reinforcement	70.75 - 75.75	Auto	0.1131
L20	46	6"x1" Flat Reinforcement	70.75 - 75.75	Auto	0.1131
L20	47	6"x1" Flat Reinforcement	70.75 - 75.75	Auto	0.1131
L21	33	MP305	70.58 - 70.75	Auto	0.0000
L21	34	MP305	70.58 - 70.75	Auto	0.0000
L21	35	MP305	70.58 - 70.75	Auto	0.0000
L21	45	6"x1" Flat Reinforcement	70.58 - 70.75	Auto	0.1009
L21	46	6"x1" Flat Reinforcement	70.58 - 70.75	Auto	0.1009

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L21	47	6"x1" Flat Reinforcement	70.58 - 70.75	Auto	0.1009
L22	33	MP305	70.33 - 70.58	Auto	0.0858
L22	34	MP305	70.33 - 70.58	Auto	0.0858
L22	35	MP305	70.33 - 70.58	Auto	0.0858
L22	45	6"x1" Flat Reinforcement	70.33 - 70.58	Auto	0.1879
L22	46	6"x1" Flat Reinforcement	70.33 - 70.58	Auto	0.1879
L22	47	6"x1" Flat Reinforcement	70.33 - 70.58	Auto	0.1879
L23	33	MP305	70.00 - 70.33	Auto	0.0842
L23	34	MP305	70.00 - 70.33	Auto	0.0842
L23	35	MP305	70.00 - 70.33	Auto	0.0842
L23	45	6"x1" Flat Reinforcement	70.00 - 70.33	Auto	0.1865
L23	46	6"x1" Flat Reinforcement	70.00 - 70.33	Auto	0.1865
L23	47	6"x1" Flat Reinforcement	70.00 - 70.33	Auto	0.1865
L24	33	MP305	69.75 - 70.00	Auto	0.0000
L24	34	MP305	69.75 - 70.00	Auto	0.0000
L24	35	MP305	69.75 - 70.00	Auto	0.0000
L24	45	6"x1" Flat Reinforcement	69.75 - 70.00	Auto	0.0971
L24	46	6"x1" Flat Reinforcement	69.75 - 70.00	Auto	0.0971
L24	47	6"x1" Flat Reinforcement	69.75 - 70.00	Auto	0.0971
L25	33	MP305	64.75 - 69.75	Auto	0.0000
L25	34	MP305	64.75 - 69.75	Auto	0.0000
L25	35	MP305	64.75 - 69.75	Auto	0.0000
L25	45	6"x1" Flat Reinforcement	67.50 - 69.75	Auto	0.0912
L25	46	6"x1" Flat Reinforcement	67.50 - 69.75	Auto	0.0912
L25	47	6"x1" Flat Reinforcement	67.50 - 69.75	Auto	0.0912
L26	33	MP305	59.75 - 64.75	Auto	0.0000
L26	34	MP305	59.75 - 64.75	Auto	0.0000
L26	35	MP305	59.75 - 64.75	Auto	0.0000
L27	33	MP305	54.75 - 59.75	Auto	0.0000
L27	34	MP305	54.75 - 59.75	Auto	0.0000
L27	35	MP305	54.75 - 59.75	Auto	0.0000
L28	33	MP305	49.75 - 54.75	Auto	0.0000
L28	34	MP305	49.75 - 54.75	Auto	0.0000
L28	35	MP305	49.75 - 54.75	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L29	33	MP305	43.00 - 49.75	Auto	0.0000
L29	34	MP305	43.00 - 49.75	Auto	0.0000
L29	35	MP305	43.00 - 49.75	Auto	0.0000
L29	39	6.5"x1.25" Flat Reinforcement	43.00 - 49.50	Auto	0.0629
L29	40	6.5"x1.25" Flat Reinforcement	43.00 - 49.50	Auto	0.0629
L29	41	6.5"x1.25" Flat Reinforcement	43.00 - 49.50	Auto	0.0629
L30	39	6.5"x1.25" Flat Reinforcement	42.00 - 43.00	Auto	0.0837
L30	40	6.5"x1.25" Flat Reinforcement	42.00 - 43.00	Auto	0.0837
L30	41	6.5"x1.25" Flat Reinforcement	42.00 - 43.00	Auto	0.0837
L31	39	6.5"x1.25" Flat Reinforcement	37.00 - 42.00	Auto	0.0706
L31	40	6.5"x1.25" Flat Reinforcement	37.00 - 42.00	Auto	0.0706
L31	41	6.5"x1.25" Flat Reinforcement	37.00 - 42.00	Auto	0.0706
L32	39	6.5"x1.25" Flat Reinforcement	32.00 - 37.00	Auto	0.0486
L32	40	6.5"x1.25" Flat Reinforcement	32.00 - 37.00	Auto	0.0486
L32	41	6.5"x1.25" Flat Reinforcement	32.00 - 37.00	Auto	0.0486
L33	28	MP306	27.91 - 30.50	Auto	0.0806
L33	29	MP306	27.91 - 30.50	Auto	0.0806
L33	32	MP306	27.91 - 31.33	Auto	0.0823
L33	39	6.5"x1.25" Flat Reinforcement	27.91 - 32.00	Auto	0.0287
L33	40	6.5"x1.25" Flat Reinforcement	27.91 - 32.00	Auto	0.0287
L33	41	6.5"x1.25" Flat Reinforcement	27.91 - 32.00	Auto	0.0287
L34	28	MP306	27.66 - 27.91	Auto	0.1354
L34	29	MP306	27.66 - 27.91	Auto	0.1354
L34	32	MP306	27.66 - 27.91	Auto	0.1354
L34	39	6.5"x1.25" Flat Reinforcement	27.66 - 27.91	Auto	0.0835
L34	40	6.5"x1.25" Flat Reinforcement	27.66 - 27.91	Auto	0.0835
L34	41	6.5"x1.25" Flat Reinforcement	27.66 - 27.91	Auto	0.0835
L35	28	MP306	27.25 - 27.66	Auto	0.1340
L35	29	MP306	27.25 - 27.66	Auto	0.1340
L35	32	MP306	27.25 - 27.66	Auto	0.1340
L35	39	6.5"x1.25" Flat Reinforcement	27.25 - 27.66	Auto	0.0820
L35	40	6.5"x1.25" Flat Reinforcement	27.25 - 27.66	Auto	0.0820
L35	41	6.5"x1.25" Flat Reinforcement	27.25 - 27.66	Auto	0.0820
L36	28	MP306	26.98 - 27.25	Auto	0.1326

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L36	29	MP306	26.98 - 27.25	Auto	0.1326
L36	32	MP306	26.98 - 27.25	Auto	0.1326
L36	39	6.5"x1.25" Flat Reinforcement	26.98 - 27.25	Auto	0.0805
L36	40	6.5"x1.25" Flat Reinforcement	26.98 - 27.25	Auto	0.0805
L36	41	6.5"x1.25" Flat Reinforcement	26.98 - 27.25	Auto	0.0805
L37	28	MP306	26.83 - 26.98	Auto	0.1285
L37	29	MP306	26.83 - 26.98	Auto	0.1285
L37	32	MP306	26.83 - 26.98	Auto	0.1285
L37	39	6.5"x1.25" Flat Reinforcement	26.83 - 26.98	Auto	0.0762
L37	40	6.5"x1.25" Flat Reinforcement	26.83 - 26.98	Auto	0.0762
L37	41	6.5"x1.25" Flat Reinforcement	26.83 - 26.98	Auto	0.0762
L38	28	MP306	21.83 - 26.83	Auto	0.1179
L38	29	MP306	21.83 - 26.83	Auto	0.1179
L38	32	MP306	21.83 - 26.83	Auto	0.1179
L38	39	6.5"x1.25" Flat Reinforcement	24.50 - 26.83	Auto	0.0708
L38	40	6.5"x1.25" Flat Reinforcement	24.50 - 26.83	Auto	0.0708
L38	41	6.5"x1.25" Flat Reinforcement	24.50 - 26.83	Auto	0.0708
L39	28	MP306	16.83 - 21.83	Auto	0.0972
L39	29	MP306	16.83 - 21.83	Auto	0.0972
L39	32	MP306	16.83 - 21.83	Auto	0.0972
L39	42	6"x1" Flat Reinforcement	16.83 - 18.00	Auto	0.0000
L39	43	6"x1" Flat Reinforcement	16.83 - 18.00	Auto	0.0000
L39	44	6"x1" Flat Reinforcement	16.83 - 18.00	Auto	0.0000
L40	28	MP306	16.00 - 16.83	Auto	0.0851
L40	29	MP306	16.00 - 16.83	Auto	0.0851
L40	32	MP306	16.00 - 16.83	Auto	0.0851
L40	42	6"x1" Flat Reinforcement	16.00 - 16.83	Auto	0.0000
L40	43	6"x1" Flat Reinforcement	16.00 - 16.83	Auto	0.0000
L40	44	6"x1" Flat Reinforcement	16.00 - 16.83	Auto	0.0000
L41	28	MP306	15.75 - 16.00	Auto	0.1212
L41	29	MP306	15.75 - 16.00	Auto	0.1212
L41	32	MP306	15.75 - 16.00	Auto	0.1212
L41	42	6"x1" Flat Reinforcement	15.75 - 16.00	Auto	0.0000
L41	43	6"x1" Flat Reinforcement	15.75 - 16.00	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L41	44	6"x1" Flat Reinforcement	15.75 - 16.00	Auto	0.0000
L42	28	MP306	14.75 - 15.75	Auto	0.1186
L42	29	MP306	14.75 - 15.75	Auto	0.1186
L42	30	MP306	14.75 - 15.50	Auto	0.1181
L42	31	MP306	14.75 - 15.50	Auto	0.1181
L42	32	MP306	14.75 - 15.75	Auto	0.1186
L42	42	6"x1" Flat Reinforcement	14.75 - 15.75	Auto	0.0000
L42	43	6"x1" Flat Reinforcement	14.75 - 15.75	Auto	0.0000
L42	44	6"x1" Flat Reinforcement	14.75 - 15.75	Auto	0.0000
L43	28	MP306	14.50 - 14.75	Auto	0.0330
L43	29	MP306	14.50 - 14.75	Auto	0.0330
L43	30	MP306	14.50 - 14.75	Auto	0.0330
L43	31	MP306	14.50 - 14.75	Auto	0.0330
L43	32	MP306	14.50 - 14.75	Auto	0.0330
L43	42	6"x1" Flat Reinforcement	14.50 - 14.75	Auto	0.0000
L43	43	6"x1" Flat Reinforcement	14.50 - 14.75	Auto	0.0000
L43	44	6"x1" Flat Reinforcement	14.50 - 14.75	Auto	0.0000
L44	28	MP306	12.08 - 14.50	Auto	0.0275
L44	29	MP306	12.08 - 14.50	Auto	0.0275
L44	30	MP306	12.08 - 14.50	Auto	0.0275
L44	31	MP306	12.08 - 14.50	Auto	0.0275
L44	32	MP306	12.08 - 14.50	Auto	0.0275
L44	42	6"x1" Flat Reinforcement	12.08 - 14.50	Auto	0.0000
L44	43	6"x1" Flat Reinforcement	12.08 - 14.50	Auto	0.0000
L44	44	6"x1" Flat Reinforcement	12.08 - 14.50	Auto	0.0000
L45	28	MP306	11.83 - 12.08	Auto	0.0858
L45	29	MP306	11.83 - 12.08	Auto	0.0858
L45	30	MP306	11.83 - 12.08	Auto	0.0858
L45	31	MP306	11.83 - 12.08	Auto	0.0858
L45	32	MP306	11.83 - 12.08	Auto	0.0858
L45	42	6"x1" Flat Reinforcement	11.83 - 12.08	Auto	0.0000
L45	43	6"x1" Flat Reinforcement	11.83 - 12.08	Auto	0.0000
L45	44	6"x1" Flat Reinforcement	11.83 - 12.08	Auto	0.0000
L46	28	MP306	10.00 - 11.83	Auto	0.0815

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L46	29	MP306	10.00 - 11.83	Auto	0.0815
L46	30	MP306	10.00 - 11.83	Auto	0.0815
L46	31	MP306	10.00 - 11.83	Auto	0.0815
L46	32	MP306	11.33 - 11.83	Auto	0.0843
L46	42	6"x1" Flat Reinforcement	10.00 - 11.83	Auto	0.0000
L46	43	6"x1" Flat Reinforcement	10.00 - 11.83	Auto	0.0000
L46	44	6"x1" Flat Reinforcement	10.00 - 11.83	Auto	0.0000
L47	28	MP306	9.75 - 10.00	Auto	0.0772
L47	29	MP306	9.75 - 10.00	Auto	0.0772
L47	30	MP306	9.75 - 10.00	Auto	0.0772
L47	31	MP306	9.75 - 10.00	Auto	0.0772
L47	42	6"x1" Flat Reinforcement	9.75 - 10.00	Auto	0.0000
L47	43	6"x1" Flat Reinforcement	9.75 - 10.00	Auto	0.0000
L47	44	6"x1" Flat Reinforcement	9.75 - 10.00	Auto	0.0000
L48	28	MP306	4.75 - 9.75	Auto	0.0632
L48	29	MP306	4.75 - 9.75	Auto	0.0632
L48	30	MP306	4.75 - 9.75	Auto	0.0632
L48	31	MP306	4.75 - 9.75	Auto	0.0632
L48	42	6"x1" Flat Reinforcement	8.00 - 9.75	Auto	0.0000
L48	43	6"x1" Flat Reinforcement	8.00 - 9.75	Auto	0.0000
L48	44	6"x1" Flat Reinforcement	8.00 - 9.75	Auto	0.0000
L49	28	MP306	0.50 - 4.75	Auto	0.0408
L49	29	MP306	0.50 - 4.75	Auto	0.0408
L49	30	MP306	0.50 - 4.75	Auto	0.0408
L49	31	MP306	0.50 - 4.75	Auto	0.0408

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	CA _{AA} Front ft ²	CA _{AA} Side ft ²	Weight K	
157									
800 10121 w/ Mount Pipe	A	From Leg	4.00	0.0000	157.00	No Ice	3.60	2.95	0.07
			0.00			1/2"	4.00	3.34	0.11
			1.00			Ice	4.42	3.74	0.17
						1" Ice	5.29	4.59	0.30
						2" Ice			
800 10121 w/ Mount Pipe	B	From Leg	4.00	0.0000	157.00	No Ice	3.60	2.95	0.07
			0.00			1/2"	4.00	3.34	0.11
			1.00			Ice	4.42	3.74	0.17
						1" Ice	5.29	4.59	0.30
						2" Ice			
800 10121 w/ Mount Pipe	C	From Leg	4.00	0.0000	157.00	No Ice	3.60	2.95	0.07
			0.00			1/2"	4.00	3.34	0.11
			1.00			Ice	4.42	3.74	0.17
						1" Ice	5.29	4.59	0.30
						2" Ice			
HPA-85R-BUU-H8 w/ Mount Pipe	A	From Leg	4.00	0.0000	157.00	No Ice	12.04	8.13	0.10
			0.00			1/2"	12.99	9.04	0.19
			1.00			Ice	13.97	9.97	0.29

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz Lateral	Vert					
						1" Ice	15.96	11.88	0.53
						2" Ice			
HPA-85R-BUU-H8 w/ Mount Pipe	B	From Leg	4.00	0.0000	157.00	No Ice	12.04	8.13	0.10
						1/2" Ice	12.99	9.04	0.19
						1.00	13.97	9.97	0.29
						1" Ice	15.96	11.88	0.53
						2" Ice			
HPA-85R-BUU-H8 w/ Mount Pipe	C	From Leg	4.00	0.0000	157.00	No Ice	12.04	8.13	0.10
						1/2" Ice	12.99	9.04	0.19
						1.00	13.97	9.97	0.29
						1" Ice	15.96	11.88	0.53
						2" Ice			
TPA-65R-LCUUUU-H8-K w/ Mount Pipe	A	From Leg	4.00	0.0000	157.00	No Ice	11.85	8.99	0.13
						1/2" Ice	12.77	9.88	0.22
						1.00	13.71	10.79	0.33
						1" Ice	15.64	12.66	0.59
						2" Ice			
TPA-65R-LCUUUU-H8-K w/ Mount Pipe	B	From Leg	4.00	0.0000	157.00	No Ice	11.85	8.99	0.13
						1/2" Ice	12.77	9.88	0.22
						1.00	13.71	10.79	0.33
						1" Ice	15.64	12.66	0.59
						2" Ice			
TPA-65R-LCUUUU-H8-K w/ Mount Pipe	C	From Leg	4.00	0.0000	157.00	No Ice	11.85	8.99	0.13
						1/2" Ice	12.77	9.88	0.22
						1.00	13.71	10.79	0.33
						1" Ice	15.64	12.66	0.59
						2" Ice			
80010966 w/ Mount Pipe	A	From Leg	4.00	0.0000	157.00	No Ice	14.61	6.84	0.16
						1/2" Ice	15.47	7.63	0.27
						1.00	16.35	8.42	0.39
						1" Ice	18.14	10.06	0.68
						2" Ice			
80010966 w/ Mount Pipe	B	From Leg	4.00	0.0000	157.00	No Ice	14.61	6.84	0.16
						1/2" Ice	15.47	7.63	0.27
						1.00	16.35	8.42	0.39
						1" Ice	18.14	10.06	0.68
						2" Ice			
80010966 w/ Mount Pipe	C	From Leg	4.00	0.0000	157.00	No Ice	14.61	6.84	0.16
						1/2" Ice	15.47	7.63	0.27
						1.00	16.35	8.42	0.39
						1" Ice	18.14	10.06	0.68
						2" Ice			
(2) LGP21401	A	From Leg	4.00	0.0000	157.00	No Ice	1.10	0.21	0.01
						1/2" Ice	1.24	0.27	0.02
						1.00	1.38	0.35	0.03
						1" Ice	1.69	0.52	0.05
						2" Ice			
(4) LGP21401	B	From Leg	4.00	0.0000	157.00	No Ice	1.10	0.21	0.01
						1/2" Ice	1.24	0.27	0.02
						1.00	1.38	0.35	0.03
						1" Ice	1.69	0.52	0.05
						2" Ice			
(2) DC6-48-60-18-8F	A	From Leg	4.00	0.0000	157.00	No Ice	1.21	1.21	0.02
						1/2" Ice	1.89	1.89	0.04
						1.00	2.11	2.11	0.07
						1" Ice	2.57	2.57	0.13
						2" Ice			
(2) DC6-48-60-18-8F	C	From Leg	4.00	0.0000	157.00	No Ice	1.21	1.21	0.02
						1/2" Ice	1.89	1.89	0.04
						1.00	2.11	2.11	0.07
						1" Ice	2.57	2.57	0.13
						2" Ice			
RRUS 32	A	From Leg	4.00	0.0000	157.00	No Ice	2.86	1.78	0.06
						1/2" Ice	3.08	1.97	0.08
						1.00	3.32	2.17	0.10

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						ft
							ft ²	ft ²	K	
RRUS 32	B	From Leg	4.00	0.00	0.0000	157.00	1" Ice	3.81	2.58	0.16
							2" Ice			
							No Ice	2.86	1.78	0.06
							1/2" Ice	3.08	1.97	0.08
RRUS 32	C	From Leg	4.00	0.00	0.0000	157.00	1" Ice	3.32	2.17	0.10
							2" Ice	3.81	2.58	0.16
							No Ice	2.86	1.78	0.06
							1/2" Ice	3.08	1.97	0.08
RRUS-11	A	From Leg	4.00	0.00	0.0000	157.00	Ice	3.32	2.17	0.10
							1" Ice	3.81	2.58	0.16
							2" Ice			
							No Ice	2.78	1.19	0.05
RRUS-11	B	From Leg	4.00	0.00	0.0000	157.00	1/2" Ice	2.99	1.33	0.07
							Ice	3.21	1.49	0.09
							1" Ice	3.66	1.83	0.15
							2" Ice			
RRUS-11	C	From Leg	4.00	0.00	0.0000	157.00	No Ice	2.78	1.19	0.05
							1/2" Ice	2.99	1.33	0.07
							Ice	3.21	1.49	0.09
							1" Ice	3.66	1.83	0.15
RRUS 4449 B5/B12	A	From Leg	4.00	0.00	0.0000	157.00	2" Ice			
							No Ice	1.97	1.41	0.07
							1/2" Ice	2.14	1.56	0.09
							Ice	2.33	1.73	0.11
RRUS 4449 B5/B12	B	From Leg	4.00	0.00	0.0000	157.00	1" Ice	2.72	2.07	0.16
							2" Ice			
							No Ice	1.97	1.41	0.07
							1/2" Ice	2.14	1.56	0.09
RRUS 4449 B5/B12	C	From Leg	4.00	0.00	0.0000	157.00	Ice	2.33	1.73	0.11
							1" Ice	2.72	2.07	0.16
							2" Ice			
							No Ice	1.97	1.41	0.07
RRUS 4478 B14	A	From Leg	4.00	0.00	0.0000	157.00	1/2" Ice	2.14	1.56	0.09
							Ice	2.33	1.73	0.11
							1" Ice	2.72	2.07	0.16
							2" Ice			
RRUS 4478 B14	B	From Leg	4.00	0.00	0.0000	157.00	No Ice	0.00	1.06	0.06
							1/2" Ice	0.00	1.20	0.08
							Ice	0.00	1.34	0.09
							1" Ice	0.00	1.66	0.14
RRUS 4478 B14	C	From Leg	4.00	0.00	0.0000	157.00	2" Ice			
							No Ice	0.00	1.06	0.06
							1/2" Ice	0.00	1.20	0.08
							Ice	0.00	1.34	0.09
RRUS 8843 B2/B66A	A	From Leg	4.00	0.00	0.0000	157.00	1" Ice	0.00	1.66	0.14
							2" Ice			
							No Ice	1.64	1.35	0.07
							1/2" Ice	1.80	1.50	0.09
RRUS 8843 B2/B66A	B	From Leg	4.00	0.00	0.0000	157.00	Ice	1.97	1.65	0.11
							1" Ice	2.32	1.99	0.16
							2" Ice			
							No Ice	1.64	1.35	0.07
RRUS 8843 B2/B66A	B	From Leg	4.00	0.00	0.0000	157.00	1/2" Ice	1.80	1.50	0.09
							Ice	1.97	1.65	0.11
							1" Ice	2.32	1.99	0.16

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	CA _{AA} Front ft ²	CA _{AA} Side ft ²	Weight K	
						1" Ice	2.32	1.99	0.16
						2" Ice			
RRUS 8843 B2/B66A	C	From Leg	4.00	0.0000	157.00	No Ice	1.64	1.35	0.07
			0.00			1/2"	1.80	1.50	0.09
			1.00			Ice	1.97	1.65	0.11
						1" Ice	2.32	1.99	0.16
						2" Ice			
VFA12-SD	C	None		0.0000	157.00	No Ice	11.50	8.60	0.51
						1/2"	17.20	13.30	0.64
						Ice	22.60	17.70	0.83
						1" Ice	34.30	26.50	1.21
						2" Ice			
VFA12-SD	C	None		0.0000	157.00	No Ice	11.50	8.60	0.51
						1/2"	17.20	13.30	0.64
						Ice	22.60	17.70	0.83
						1" Ice	34.30	26.50	1.21
						2" Ice			
VFA12-SD	C	None		0.0000	157.00	No Ice	11.50	8.60	0.51
						1/2"	17.20	13.30	0.64
						Ice	22.60	17.70	0.83
						1" Ice	34.30	26.50	1.21
						2" Ice			
150						No Ice	2.32	2.24	0.06
PCS 1900MHZ 4X45W-65MHZ	A	From Leg	2.00	0.0000	150.00	1/2"	2.53	2.44	0.08
			0.00			Ice	2.74	2.65	0.11
			-2.00			1" Ice	3.19	3.09	0.17
						2" Ice			
PCS 1900MHZ 4X45W-65MHZ	B	From Leg	2.00	0.0000	150.00	No Ice	2.32	2.24	0.06
			0.00			1/2"	2.53	2.44	0.08
			-2.00			Ice	2.74	2.65	0.11
						1" Ice	3.19	3.09	0.17
						2" Ice			
PCS 1900MHZ 4X45W-65MHZ	C	From Leg	2.00	0.0000	150.00	No Ice	2.32	2.24	0.06
			0.00			1/2"	2.53	2.44	0.08
			-2.00			Ice	2.74	2.65	0.11
						1" Ice	3.19	3.09	0.17
						2" Ice			
800MHZ 2X50W RRH W/FILTER	A	From Leg	2.00	0.0000	150.00	No Ice	2.06	1.93	0.06
			0.00			1/2"	2.24	2.11	0.09
			-2.00			Ice	2.43	2.29	0.11
						1" Ice	2.83	2.68	0.17
						2" Ice			
800MHZ 2X50W RRH W/FILTER	B	From Leg	2.00	0.0000	150.00	No Ice	2.06	1.93	0.06
			0.00			1/2"	2.24	2.11	0.09
			-2.00			Ice	2.43	2.29	0.11
						1" Ice	2.83	2.68	0.17
						2" Ice			
800MHZ 2X50W RRH W/FILTER	C	From Leg	2.00	0.0000	150.00	No Ice	2.06	1.93	0.06
			0.00			1/2"	2.24	2.11	0.09
			-2.00			Ice	2.43	2.29	0.11
						1" Ice	2.83	2.68	0.17
						2" Ice			
Side Arm Mount [SO 103-3]	C	None		0.0000	150.00	No Ice	7.64	7.64	0.23
						1/2"	8.80	8.80	0.36
						Ice	10.16	10.16	0.52
						1" Ice	13.36	13.36	0.94
						2" Ice			
148						No Ice	4.09	2.86	0.08
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00	0.0000	148.00	1/2"	4.48	3.23	0.13
			0.00			Ice	4.88	3.61	0.19
			0.00			1" Ice	5.71	4.40	0.33
						2" Ice			
APXVTM14-C-120 w/	B	From Leg	4.00	0.0000	148.00	No Ice	4.09	2.86	0.08

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						ft
			ft	ft	°	ft	ft ²	ft ²	K	
Mount Pipe			0.00			1/2"	4.48	3.23	0.13	
			0.00			Ice	4.88	3.61	0.19	
						1" Ice	5.71	4.40	0.33	
						2" Ice				
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00		0.0000	148.00	No Ice	4.09	2.86	0.08
			0.00				1/2"	4.48	3.23	0.13
			0.00				Ice	4.88	3.61	0.19
							1" Ice	5.71	4.40	0.33
APXVSP18-C-A20 w/ Mount Pipe	A	From Leg	4.00		0.0000	148.00	No Ice	4.60	4.01	0.10
			0.00				1/2"	5.05	4.45	0.16
			0.00				Ice	5.50	4.89	0.23
							1" Ice	6.44	5.82	0.42
APXVSP18-C-A20 w/ Mount Pipe	B	From Leg	4.00		0.0000	148.00	No Ice	4.60	4.01	0.10
			0.00				1/2"	5.05	4.45	0.16
			0.00				Ice	5.50	4.89	0.23
							1" Ice	6.44	5.82	0.42
APXVSP18-C-A20 w/ Mount Pipe	C	From Leg	4.00		0.0000	148.00	No Ice	4.60	4.01	0.10
			0.00				1/2"	5.05	4.45	0.16
			0.00				Ice	5.50	4.89	0.23
							1" Ice	6.44	5.82	0.42
(3) TD-RRH8X20-25	A	From Leg	4.00		0.0000	148.00	No Ice	4.05	1.53	0.07
			0.00				1/2"	4.30	1.71	0.10
			0.00				Ice	4.56	1.90	0.13
							1" Ice	5.10	2.30	0.20
IBC1900BB-1	A	From Leg	4.00		0.0000	148.00	No Ice	0.97	0.46	0.02
			0.00				1/2"	1.09	0.56	0.03
			0.00				Ice	1.22	0.66	0.04
							1" Ice	1.51	0.89	0.06
IBC1900BB-1	B	From Leg	4.00		0.0000	148.00	No Ice	0.97	0.46	0.02
			0.00				1/2"	1.09	0.56	0.03
			0.00				Ice	1.22	0.66	0.04
							1" Ice	1.51	0.89	0.06
IBC1900BB-1	C	From Leg	4.00		0.0000	148.00	No Ice	0.97	0.46	0.02
			0.00				1/2"	1.09	0.56	0.03
			0.00				Ice	1.22	0.66	0.04
							1" Ice	1.51	0.89	0.06
IBC1900HG-2A	A	From Leg	4.00		0.0000	148.00	No Ice	0.97	0.46	0.02
			0.00				1/2"	1.09	0.56	0.03
			0.00				Ice	1.22	0.66	0.04
							1" Ice	1.51	0.89	0.06
IBC1900HG-2A	B	From Leg	4.00		0.0000	148.00	No Ice	0.97	0.46	0.02
			0.00				1/2"	1.09	0.56	0.03
			0.00				Ice	1.22	0.66	0.04
							1" Ice	1.51	0.89	0.06
IBC1900HG-2A	C	From Leg	4.00		0.0000	148.00	No Ice	0.97	0.46	0.02
			0.00				1/2"	1.09	0.56	0.03
			0.00				Ice	1.22	0.66	0.04
							1" Ice	1.51	0.89	0.06
Platform Mount [LP 1201-1]	C	None			0.0000	148.00	No Ice	18.38	18.38	2.10
							1/2"	22.11	22.11	2.65
							Ice	25.87	25.87	3.26
							1" Ice	33.47	33.47	4.66
Miscellaneous [NA 510-1]	C	None			0.0000	148.00	No Ice	6.36	6.36	0.26
							2" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						ft
							1/2"	8.52	8.52	0.34
							Ice	10.62	10.62	0.46
							1" Ice	14.64	14.64	0.77
							2" Ice			
5'-P2x0.154	A	From Leg	4.00	0.0000	148.00	No Ice	1.19	1.19	0.02	
			0.00			1/2"	1.50	1.50	0.03	
			0.00			Ice	1.81	1.81	0.04	
						1" Ice	2.46	2.46	0.08	
						2" Ice				
5'-P2x0.154	B	From Leg	4.00	0.0000	148.00	No Ice	1.19	1.19	0.02	
			0.00			1/2"	1.50	1.50	0.03	
			0.00			Ice	1.81	1.81	0.04	
						1" Ice	2.46	2.46	0.08	
						2" Ice				
5'-P2x0.154	C	From Leg	4.00	0.0000	148.00	No Ice	1.19	1.19	0.02	
			0.00			1/2"	1.50	1.50	0.03	
			0.00			Ice	1.81	1.81	0.04	
						1" Ice	2.46	2.46	0.08	
						2" Ice				
138										
(2) LPA-80063-6CF-EDIN-2 w/ Mount Pipe	A	From Leg	4.00	0.0000	138.00	No Ice	9.97	10.25	0.05	
			0.00			1/2"	10.54	11.42	0.15	
			0.00			Ice	11.08	12.31	0.25	
						1" Ice	12.17	14.13	0.48	
						2" Ice				
(2) LPA-80063-6CF-EDIN-2 w/ Mount Pipe	B	From Leg	4.00	0.0000	138.00	No Ice	9.97	10.25	0.05	
			0.00			1/2"	10.54	11.42	0.15	
			0.00			Ice	11.08	12.31	0.25	
						1" Ice	12.17	14.13	0.48	
						2" Ice				
(2) LPA-80063-6CF-EDIN-2 w/ Mount Pipe	C	From Leg	4.00	0.0000	138.00	No Ice	9.97	10.25	0.05	
			0.00			1/2"	10.54	11.42	0.15	
			0.00			Ice	11.08	12.31	0.25	
						1" Ice	12.17	14.13	0.48	
						2" Ice				
(2) NNHH-65B-R4 w/ Mount Pipe	A	From Leg	4.00	0.0000	138.00	No Ice	7.55	4.23	0.11	
			0.00			1/2"	8.04	4.67	0.20	
			0.00			Ice	8.53	5.12	0.30	
						1" Ice	9.56	6.05	0.53	
						2" Ice				
(2) NNHH-65B-R4 w/ Mount Pipe	B	From Leg	4.00	0.0000	138.00	No Ice	7.55	4.23	0.11	
			0.00			1/2"	8.04	4.67	0.20	
			0.00			Ice	8.53	5.12	0.30	
						1" Ice	9.56	6.05	0.53	
						2" Ice				
(2) NNHH-65B-R4 w/ Mount Pipe	C	From Leg	4.00	0.0000	138.00	No Ice	7.55	4.23	0.11	
			0.00			1/2"	8.04	4.67	0.20	
			0.00			Ice	8.53	5.12	0.30	
						1" Ice	9.56	6.05	0.53	
						2" Ice				
KS24019-L112A	C	From Leg	4.00	0.0000	138.00	No Ice	0.10	0.10	0.01	
			0.00			1/2"	0.18	0.18	0.01	
			4.00			Ice	0.26	0.26	0.01	
						1" Ice	0.42	0.42	0.01	
						2" Ice				
(3) RFV01U-D2A	A	From Leg	4.00	0.0000	138.00	No Ice	1.88	1.01	0.07	
			0.00			1/2"	2.05	1.14	0.09	
			0.00			Ice	2.22	1.28	0.11	
						1" Ice	2.60	1.59	0.15	
						2" Ice				
RFV01U-D1A	A	From Leg	4.00	0.0000	138.00	No Ice	1.88	1.25	0.08	
			0.00			1/2"	2.05	1.39	0.10	
			0.00			Ice	2.22	1.54	0.12	
						1" Ice	2.60	1.86	0.18	
						2" Ice				

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	K
RFV01U-D1A	B	From Leg	4.00	0.0000	138.00	No Ice	1.88	1.25	0.08
			0.00			1/2"	2.05	1.39	0.10
			0.00			Ice	2.22	1.54	0.12
						1" Ice	2.60	1.86	0.18
RFV01U-D1A	C	From Leg	4.00	0.0000	138.00	No Ice	1.88	1.25	0.08
			0.00			1/2"	2.05	1.39	0.10
			0.00			Ice	2.22	1.54	0.12
						1" Ice	2.60	1.86	0.18
RVZDC-6627-PF-48	B	From Leg	4.00	0.0000	138.00	No Ice	3.79	2.51	0.03
			0.00			1/2"	4.04	2.73	0.06
			0.00			Ice	4.30	2.95	0.10
						1" Ice	4.84	3.42	0.18
Platform Mount [LP 303-1_KCKR-HR-1]	C	None		0.0000	138.00	No Ice	28.31	28.31	1.77
						1/2"	35.69	35.69	2.30
						Ice	43.11	43.11	2.94
						1" Ice	58.21	58.21	4.60
127 LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00	0.0000	127.00	No Ice	5.31	4.27	0.08
			0.00			1/2"	5.80	4.75	0.17
			2.00			Ice	6.30	5.24	0.26
						1" Ice	7.33	6.24	0.49
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00	0.0000	127.00	No Ice	5.31	4.27	0.08
			0.00			1/2"	5.80	4.75	0.17
			2.00			Ice	6.30	5.24	0.26
						1" Ice	7.33	6.24	0.49
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00	0.0000	127.00	No Ice	5.31	4.27	0.08
			0.00			1/2"	5.80	4.75	0.17
			2.00			Ice	6.30	5.24	0.26
						1" Ice	7.33	6.24	0.49
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00	0.0000	127.00	No Ice	3.14	2.59	0.11
			0.00			1/2"	3.45	2.88	0.16
			2.00			Ice	3.77	3.19	0.22
						1" Ice	4.43	3.84	0.37
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00	0.0000	127.00	No Ice	3.14	2.59	0.11
			0.00			1/2"	3.45	2.88	0.16
			2.00			Ice	3.77	3.19	0.22
						1" Ice	4.43	3.84	0.37
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00	0.0000	127.00	No Ice	3.14	2.59	0.11
			0.00			1/2"	3.45	2.88	0.16
			2.00			Ice	3.77	3.19	0.22
						1" Ice	4.43	3.84	0.37
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00	0.0000	127.00	No Ice	3.14	2.59	0.11
			0.00			1/2"	3.45	2.88	0.16
			2.00			Ice	3.77	3.19	0.23
						1" Ice	4.43	3.84	0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00	0.0000	127.00	No Ice	3.14	2.59	0.11
			0.00			1/2"	3.45	2.88	0.16
			2.00			Ice	3.77	3.19	0.23
						1" Ice	4.43	3.84	0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00	0.0000	127.00	No Ice	3.14	2.59	0.11
			0.00			1/2"	3.45	2.88	0.16
			2.00			Ice	3.77	3.19	0.23
						1" Ice	4.43	3.84	0.38

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
RRUS 11 B12	A	From Leg	4.00	0.0000	127.00	2" Ice			
			0.00			No Ice	2.83	1.18	0.05
			2.00			1/2"	3.04	1.33	0.07
						Ice	3.26	1.48	0.10
						1" Ice	3.71	1.83	0.15
RRUS 11 B12	B	From Leg	4.00	0.0000	127.00	2" Ice			
			0.00			No Ice	2.83	1.18	0.05
			2.00			1/2"	3.04	1.33	0.07
						Ice	3.26	1.48	0.10
						1" Ice	3.71	1.83	0.15
RRUS 11 B12	C	From Leg	4.00	0.0000	127.00	2" Ice			
			0.00			No Ice	2.83	1.18	0.05
			2.00			1/2"	3.04	1.33	0.07
						Ice	3.26	1.48	0.10
						1" Ice	3.71	1.83	0.15
KRY 112 144/1	A	From Leg	4.00	0.0000	127.00	2" Ice			
			0.00			No Ice	0.35	0.17	0.01
			2.00			1/2"	0.43	0.23	0.01
						Ice	0.51	0.30	0.02
						1" Ice	0.70	0.46	0.03
KRY 112 144/1	B	From Leg	4.00	0.0000	127.00	2" Ice			
			0.00			No Ice	0.35	0.17	0.01
			2.00			1/2"	0.43	0.23	0.01
						Ice	0.51	0.30	0.02
						1" Ice	0.70	0.46	0.03
KRY 112 144/1	C	From Leg	4.00	0.0000	127.00	2" Ice			
			0.00			No Ice	0.35	0.17	0.01
			2.00			1/2"	0.43	0.23	0.01
						Ice	0.51	0.30	0.02
						1" Ice	0.70	0.46	0.03
Platform Mount [LP 1201-1]	C	None		0.0000	127.00	2" Ice			
						No Ice	18.38	18.38	2.10
						1/2"	22.11	22.11	2.65
						Ice	25.87	25.87	3.26
						1" Ice	33.47	33.47	4.66
119									
**									
KS24019-L112A	A	From Leg	4.00	0.0000	48.00	2" Ice			
			0.00			No Ice	0.10	0.10	0.01
			2.00			1/2"	0.18	0.18	0.01
						Ice	0.26	0.26	0.01
						1" Ice	0.42	0.42	0.01
2'-P2x0.154	A	From Leg	4.00	0.0000	48.00	2" Ice			
			0.00			No Ice	0.34	0.34	0.01
			0.00			1/2"	0.47	0.47	0.01
						Ice	0.61	0.61	0.02
						1" Ice	0.92	0.92	0.03
Side Arm Mount [SO 701-1]	A	From Leg	0.50	0.0000	48.00	2" Ice			
			0.00			No Ice	0.85	1.67	0.07
			0.00			1/2"	1.14	2.34	0.08
						Ice	1.43	3.01	0.09
						1" Ice	2.01	4.35	0.12
**									
**									
**									
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00	0.0000	119.00	2" Ice			
			0.00			No Ice	8.01	4.23	0.11
			0.00			1/2"	8.52	4.69	0.19
						Ice	9.04	5.16	0.29
						1" Ice	10.11	6.12	0.52
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00	0.0000	119.00	2" Ice			
			0.00			No Ice	8.01	4.23	0.11
			0.00			1/2"	8.52	4.69	0.19
						Ice	9.04	5.16	0.29
						1" Ice	10.11	6.12	0.52

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral	Vert						ft
			ft	ft	ft	°	ft	ft ²	ft ²	K	
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00	0.00	0.00	0.0000	119.00	2" Ice			
								No Ice	8.01	4.23	0.11
								1/2"	8.52	4.69	0.19
								Ice	9.04	5.16	0.29
TA08025-B604	A	From Leg	4.00	0.00	0.00	0.0000	119.00	1" Ice	10.11	6.12	0.52
								2" Ice			
								No Ice	0.00	0.98	0.06
								1/2"	0.00	1.11	0.08
TA08025-B604	B	From Leg	4.00	0.00	0.00	0.0000	119.00	Ice	0.00	1.25	0.10
								1" Ice	0.00	1.55	0.15
								2" Ice			
								No Ice	0.00	0.98	0.06
TA08025-B604	C	From Leg	4.00	0.00	0.00	0.0000	119.00	1/2"	0.00	1.11	0.08
								Ice	0.00	1.25	0.10
								1" Ice	0.00	1.55	0.15
								2" Ice			
TA08025-B605	A	From Leg	4.00	0.00	0.00	0.0000	119.00	No Ice	0.00	1.13	0.08
								1/2"	0.00	1.27	0.09
								Ice	0.00	1.41	0.11
								1" Ice	0.00	1.72	0.16
TA08025-B605	B	From Leg	4.00	0.00	0.00	0.0000	119.00	2" Ice			
								No Ice	0.00	1.13	0.08
								1/2"	0.00	1.27	0.09
								Ice	0.00	1.41	0.11
TA08025-B605	C	From Leg	4.00	0.00	0.00	0.0000	119.00	1" Ice	0.00	1.72	0.16
								2" Ice			
								No Ice	0.00	1.13	0.08
								1/2"	0.00	1.27	0.09
RDIDC-9181-PF-48	A	From Leg	4.00	0.00	0.00	0.0000	119.00	Ice	0.00	1.41	0.11
								1" Ice	0.00	1.72	0.16
								2" Ice			
								No Ice	2.31	1.29	0.02
Commscope MC-K6MHDX-9-96 (3)	C	None				0.0000	119.00	1/2"	2.50	1.45	0.04
								Ice	2.70	1.61	0.06
								1" Ice	3.12	1.96	0.12
								2" Ice			
(2) 8' x 2" Mount Pipe	A	From Leg	4.00	0.00	0.00	0.0000	119.00	No Ice	15.30	15.30	1.19
								1/2"	20.48	20.48	1.71
								Ice	25.66	25.66	2.22
								1" Ice	36.02	36.02	3.25
(2) 8' x 2" Mount Pipe	B	From Leg	4.00	0.00	0.00	0.0000	119.00	2" Ice			
								No Ice	1.90	1.90	0.03
								1/2"	2.73	2.73	0.04
								Ice	3.40	3.40	0.06
(2) 8' x 2" Mount Pipe	C	From Leg	4.00	0.00	0.00	0.0000	119.00	1" Ice	4.40	4.40	0.12
								2" Ice			
								No Ice	1.90	1.90	0.03
								1/2"	2.73	2.73	0.04
(2) 8' x 2" Mount Pipe	A	From Leg	4.00	0.00	0.00	0.0000	119.00	Ice	3.40	3.40	0.06
								1" Ice	4.40	4.40	0.12
								2" Ice			
								No Ice	1.90	1.90	0.03
(2) 8' x 2" Mount Pipe	B	From Leg	4.00	0.00	0.00	0.0000	119.00	1/2"	2.73	2.73	0.04
								Ice	3.40	3.40	0.06
								1" Ice	4.40	4.40	0.12
								2" Ice			
(2) 8' x 2" Mount Pipe	C	From Leg	4.00	0.00	0.00	0.0000	119.00	No Ice	1.90	1.90	0.03
								1/2"	2.73	2.73	0.04
								Ice	3.40	3.40	0.06
								1" Ice	4.40	4.40	0.12
(2) 8' x 2" Mount Pipe	A	From Leg	4.00	0.00	0.00	0.0000	119.00	2" Ice			
								No Ice	1.90	1.90	0.03
								1/2"	2.73	2.73	0.04
								Ice	3.40	3.40	0.06
(2) 8' x 2" Mount Pipe	B	From Leg	4.00	0.00	0.00	0.0000	119.00	1" Ice	4.40	4.40	0.12
								2" Ice			
								No Ice	1.90	1.90	0.03
								1/2"	2.73	2.73	0.04
(2) 8' x 2" Mount Pipe	C	From Leg	4.00	0.00	0.00	0.0000	119.00	Ice	3.40	3.40	0.06
								1" Ice	4.40	4.40	0.12
								2" Ice			
								No Ice	1.90	1.90	0.03

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
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	160 - 155	Pole	Max Tension	39	0.00	-0.00	-0.00
			Max. Compression	26	-11.68	0.09	0.47
			Max. Mx	20	-3.80	20.12	0.26
			Max. My	2	-3.77	0.13	20.26
			Max. Vy	8	7.36	-20.12	-0.09
			Max. Vx	2	-7.38	0.13	20.26
			Max. Torque	18			-0.29

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L2	155 - 150	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-12.34	0.09	0.54
			Max. Mx	20	-4.06	58.09	0.57
			Max. My	2	-4.03	0.43	58.35
			Max. Vy	20	-7.83	58.09	0.57
			Max. Vx	14	7.89	-0.50	-58.21
			Max. Torque	18			-0.29
L3	150 - 148	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-14.29	0.09	0.57
			Max. Mx	20	-4.75	74.80	0.70
			Max. My	2	-4.71	0.54	75.15
			Max. Vy	20	-8.90	74.80	0.70
			Max. Vx	14	8.98	-0.62	-75.07
			Max. Torque	18			-0.29
L4	148 - 143	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.15	0.09	3.05
			Max. Mx	20	-8.62	135.78	2.03
			Max. My	2	-8.51	0.85	138.93
			Max. Vy	20	-12.56	135.78	2.03
			Max. Vx	14	12.97	-0.93	-136.85
			Max. Torque	20			-1.10
L5	143 - 138	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24.01	0.10	3.16
			Max. Mx	20	-9.07	199.62	2.37
			Max. My	2	-8.96	1.16	204.61
			Max. Vy	20	-12.98	199.62	2.37
			Max. Vx	14	13.42	-1.24	-202.79
			Max. Torque	20			-1.10
L6	138 - 133	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.70	-0.48	5.07
			Max. Mx	8	-12.64	-292.72	0.71
			Max. My	2	-12.50	1.50	301.06
			Max. Vy	20	-18.78	292.46	3.93
			Max. Vx	14	19.29	-1.72	-297.18
			Max. Torque	20			-1.58
L7	133 - 128	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.48	-0.47	5.22
			Max. Mx	8	-13.21	-387.44	0.34
			Max. My	2	-13.08	1.91	398.10
			Max. Vy	20	-19.13	387.18	4.39
			Max. Vx	14	19.64	-2.14	-394.48
			Max. Torque	20			-1.58
L8	128 - 123	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.24	-0.36	5.44
			Max. Mx	8	-17.34	-496.85	-0.02
			Max. My	2	-17.21	2.35	509.91
			Max. Vy	20	-22.06	496.64	4.87
			Max. Vx	14	22.59	-2.54	-506.52
			Max. Torque	20			-1.58
L9	123 - 118	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.88	-0.22	6.15
			Max. Mx	8	-20.33	-609.95	-0.29
			Max. My	2	-20.19	2.80	625.59
			Max. Vy	20	-24.46	609.80	5.45
			Max. Vx	14	25.03	-2.93	-622.19
			Max. Torque	20			-1.81
L10	118 - 111	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.53	-0.15	6.32
			Max. Mx	8	-20.81	-689.69	-0.52
			Max. My	2	-20.68	3.09	707.04
			Max. Vy	20	-24.65	689.57	5.77
			Max. Vx	14	25.22	-3.20	-703.77
			Max. Torque	20			-1.81
L11	111 - 109.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.20	-0.05	6.58
			Max. Mx	8	-21.95	-813.90	-0.88
			Max. My	2	-21.82	3.54	833.86
			Max. Vy	20	-25.05	813.82	6.27
			Max. Vx	14	25.62	-3.61	-830.81

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L12	109.75 - 105.33	Pole	Max. Torque	20			-1.80
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.25	0.05	6.81
			Max. Mx	8	-22.73	-925.09	-1.20
			Max. My	2	-22.60	3.93	947.36
			Max. Vy	20	-25.30	925.04	6.70
			Max. Vx	14	25.87	-3.97	-944.50
L13	105.33 - 105.08	Pole	Max. Torque	20			-1.80
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.33	0.05	6.82
			Max. Mx	8	-22.80	-931.41	-1.21
			Max. My	2	-22.68	3.95	953.82
			Max. Vy	8	25.31	-931.41	-1.21
			Max. Vx	14	25.89	-4.00	-950.97
L14	105.08 - 100.08	Pole	Max. Torque	20			-1.80
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.89	0.16	7.06
			Max. Mx	8	-23.89	-1058.81	-1.57
			Max. My	2	-23.77	4.39	1083.83
			Max. Vy	20	-25.67	1058.80	7.22
			Max. Vx	14	26.24	-4.40	-1081.19
L15	100.08 - 95.08	Pole	Max. Torque	20			-1.80
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.48	0.28	7.31
			Max. Mx	20	-25.01	1188.00	7.71
			Max. My	2	-24.90	4.84	1215.61
			Max. Vy	20	-26.02	1188.00	7.71
			Max. Vx	14	26.59	-4.80	-1213.18
L16	95.08 - 90.08	Pole	Max. Torque	20			-1.80
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-59.08	0.39	7.54
			Max. Mx	20	-26.17	1318.90	8.19
			Max. My	2	-26.06	5.28	1349.09
			Max. Vy	20	-26.36	1318.90	8.19
			Max. Vx	14	26.93	-5.21	-1346.88
L17	90.08 - 85.08	Pole	Max. Torque	20			-1.80
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.71	0.51	7.78
			Max. Mx	20	-27.35	1451.46	8.68
			Max. My	2	-27.24	5.72	1484.21
			Max. Vy	20	-26.68	1451.46	8.68
			Max. Vx	14	27.25	-5.61	-1482.22
L18	85.08 - 76.75	Pole	Max. Torque	20			-1.80
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.14	0.59	7.94
			Max. Mx	20	-28.33	1560.80	9.07
			Max. My	2	-28.23	6.08	1595.65
			Max. Vy	20	-26.94	1560.80	9.07
			Max. Vx	14	27.51	-5.94	-1593.83
L19	76.75 - 75.75	Pole	Max. Torque	20			-1.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.88	0.70	8.15
			Max. Mx	20	-30.20	1703.40	9.58
			Max. My	2	-30.11	6.54	1740.95
			Max. Vy	20	-27.38	1703.40	9.58
			Max. Vx	14	27.95	-6.36	-1739.36
L20	75.75 - 70.75	Pole	Max. Torque	20			-1.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.51	0.79	8.33
			Max. Mx	20	-31.36	1840.76	10.05

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L21	70.75 - 70.58	Pole	Max. My	2	-31.28	6.99	1880.88
			Max. Vy	20	-27.60	1840.76	10.05
			Max. Vx	14	28.17	-6.76	-1879.50
			Max. Torque	20			-1.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.57	0.79	8.34
			Max. Mx	20	-31.42	1845.45	10.07
			Max. My	2	-31.34	7.00	1885.66
			Max. Vy	8	27.61	-1845.22	-3.70
			Max. Vx	14	28.20	-6.77	-1884.28
L22	70.58 - 70.33	Pole	Max. Torque	20			-1.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.69	0.80	8.35
			Max. Mx	20	-31.51	1852.35	10.10
			Max. My	2	-31.43	7.02	1892.68
			Max. Vy	8	27.62	-1852.11	-3.72
			Max. Vx	14	28.19	-6.79	-1891.32
			Max. Torque	20			-1.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.85	0.81	8.36
L23	70.33 - 70	Pole	Max. Mx	20	-31.63	1861.47	10.13
			Max. My	2	-31.54	7.05	1901.97
			Max. Vy	8	27.64	-1861.23	-3.75
			Max. Vx	14	28.21	-6.82	-1900.62
			Max. Torque	20			-1.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.94	0.81	8.37
			Max. Mx	20	-31.69	1868.38	10.15
			Max. My	2	-31.60	7.07	1909.00
			Max. Vy	8	27.65	-1868.13	-3.76
L24	70 - 69.75	Pole	Max. Vx	14	28.23	-6.84	-1907.67
			Max. Torque	20			-1.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.60	0.92	8.56
			Max. Mx	20	-32.86	2007.10	10.62
			Max. My	2	-32.78	7.51	2050.28
			Max. Vy	20	-27.87	2007.10	10.62
			Max. Vx	14	28.43	-7.23	-2049.15
			Max. Torque	20			-1.79
			Max Tension	1	0.00	0.00	0.00
L25	69.75 - 64.75	Pole	Max. Compression	26	-70.21	1.04	8.77
			Max. Mx	20	-34.08	2146.81	11.09
			Max. My	2	-34.01	7.95	2192.52
			Max. Vy	20	-28.06	2146.81	11.09
			Max. Vx	14	28.62	-7.62	-2191.61
			Max. Torque	20			-1.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-71.84	1.16	8.96
			Max. Mx	20	-35.32	2287.42	11.55
			Max. My	2	-35.26	8.38	2335.64
L26	64.75 - 59.75	Pole	Max. Vy	20	-28.23	2287.42	11.55
			Max. Vx	14	28.79	-8.01	-2334.94
			Max. Torque	20			-1.78
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-73.49	1.29	9.16
			Max. Mx	20	-36.58	2428.85	12.00
			Max. My	2	-36.53	8.81	2479.56
			Max. Vy	20	-28.39	2428.85	12.00
			Max. Vx	14	28.94	-8.39	-2479.07
			Max. Torque	20			-1.78
L27	59.75 - 54.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.13	1.33	9.22
			Max. Mx	20	-37.01	2478.53	12.16
			Max. My	2			
			Max. Vy	20			
			Max. Vx	14			
			Max. Torque	20			
			Max Tension	1			
			Max. Compression	26			
			Max. Mx	20			
L28	54.75 - 49.75	Pole	Max. My	2			
			Max. Vy	20			
			Max. Vx	14			
			Max. Torque	20			
			Max Tension	1			
			Max. Compression	26			
			Max. Mx	20			
			Max. My	2			
			Max. Vy	20			
			Max. Vx	14			
L29	49.75 - 43	Pole	Max. Torque	20			
			Max Tension	1			
			Max. Compression	26			
			Max. Mx	20			
			Max. My	2			
			Max. Vy	20			
			Max. Vx	14			
			Max. Torque	20			
			Max Tension	1			
			Max. Compression	26			

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L30	43 - 42	Pole	Max. My	2	-36.96	8.95	2530.11
			Max. Vy	20	-28.46	2478.53	12.16
			Max. Vx	14	29.01	-8.52	-2529.69
			Max. Torque	20			-1.78
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-77.85	1.48	9.87
			Max. Mx	20	-39.64	2650.62	12.94
			Max. My	2	-39.60	9.46	2705.26
			Max. Vy	20	-28.87	2650.62	12.94
			Max. Vx	14	29.39	-8.98	-2704.60
L31	42 - 37	Pole	Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-79.69	1.60	10.05
			Max. Mx	20	-41.08	2795.16	13.38
			Max. My	2	-41.04	9.89	2852.13
			Max. Vy	20	-29.00	2795.16	13.38
			Max. Vx	14	29.51	-9.35	-2851.68
			Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-81.55	1.72	10.21
L32	37 - 32	Pole	Max. Mx	20	-42.54	2940.30	13.82
			Max. My	2	-42.51	10.30	2999.57
			Max. Vy	20	-29.11	2940.30	13.82
			Max. Vx	14	29.62	-9.72	-2999.33
			Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-83.18	1.79	10.31
			Max. Mx	20	-43.76	3059.39	14.18
			Max. My	2	-43.73	10.64	3120.52
			Max. Vy	20	-29.18	3059.39	14.18
L33	32 - 27.91	Pole	Max. Vx	14	29.69	-10.02	-3120.45
			Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-83.32	1.80	10.32
			Max. Mx	20	-43.88	3066.68	14.20
			Max. My	2	-43.86	10.67	3127.92
			Max. Vy	8	29.17	-3066.03	-6.51
			Max. Vx	14	29.68	-10.04	-3127.86
			Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
L34	27.91 - 27.66	Pole	Max. Compression	26	-83.54	1.81	10.33
			Max. Mx	20	-44.05	3078.64	14.24
			Max. My	2	-44.03	10.70	3140.07
			Max. Vy	8	29.18	-3077.99	-6.54
			Max. Vx	14	29.69	-10.07	-3140.03
			Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-83.68	1.81	10.34
			Max. Mx	20	-44.16	3086.52	14.26
			Max. My	2	-44.13	10.72	3148.07
L35	27.66 - 27.25	Pole	Max. Vy	8	29.19	-3085.87	-6.56
			Max. Vx	14	29.71	-10.09	-3148.04
			Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-83.76	1.82	10.34
			Max. Mx	20	-44.22	3090.90	14.27
			Max. My	2	-44.19	10.73	3152.52
			Max. Vy	8	29.21	-3090.24	-6.57
			Max. Vx	14	29.73	-10.10	-3152.49
			Max. Torque	20			-1.98
L36	27.25 - 26.98	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-86.26	1.93	10.47
			Max. Mx	20	-46.17	3237.34	14.70
			Max. My	14	-46.15	-10.46	-3301.41
			Max. Vy	8	29.21	-3090.24	-6.57
			Max. Vx	14	29.73	-10.10	-3152.49
			Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-86.26	1.93	10.47
			Max. Mx	20	-46.17	3237.34	14.70
L37	26.98 - 26.83	Pole	Max. My	14	-46.15	-10.46	-3301.41
			Max. Vy	8	29.21	-3090.24	-6.57
			Max. Vx	14	29.73	-10.10	-3152.49
			Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-86.26	1.93	10.47
			Max. Mx	20	-46.17	3237.34	14.70
			Max. My	14	-46.15	-10.46	-3301.41
			Max. Vy	8	29.21	-3090.24	-6.57
			Max. Vx	14	29.73	-10.10	-3152.49
L38	26.83 - 21.83	Pole	Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-86.26	1.93	10.47
			Max. Mx	20	-46.17	3237.34	14.70
			Max. My	14	-46.15	-10.46	-3301.41
			Max. Vy	8	29.21	-3090.24	-6.57
			Max. Vx	14	29.73	-10.10	-3152.49
			Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-86.26	1.93	10.47

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L39	21.83 - 16.83	Pole	Max. Vy	20	-29.40	3237.34	14.70
			Max. Vx	14	29.90	-10.46	-3301.41
			Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-88.74	2.05	10.60
L40	16.83 - 16	Pole	Max. Mx	20	-48.15	3384.71	15.13
			Max. My	14	-48.14	-10.82	-3451.22
			Max. Vy	20	-29.58	3384.71	15.13
			Max. Vx	14	30.08	-10.82	-3451.22
			Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-89.17	2.07	10.62
			Max. Mx	20	-48.49	3409.26	15.20
			Max. My	14	-48.47	-10.88	-3476.18
			Max. Vy	20	-29.61	3409.26	15.20
L41	16 - 15.75	Pole	Max. Vx	14	30.11	-10.88	-3476.18
			Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-89.32	2.07	10.63
			Max. Mx	20	-48.61	3416.66	15.22
			Max. My	14	-48.60	-10.90	-3483.70
			Max. Vy	8	29.61	-3415.89	-7.32
			Max. Vx	14	30.11	-10.90	-3483.70
			Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
L42	15.75 - 14.75	Pole	Max. Compression	26	-89.92	2.08	10.64
			Max. Mx	20	-49.07	3446.29	15.31
			Max. My	14	-49.06	-10.97	-3513.81
			Max. Vy	20	-29.66	3446.29	15.31
			Max. Vx	14	30.16	-10.97	-3513.81
			Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-90.05	2.07	10.65
			Max. Mx	20	-49.17	3453.70	15.33
			Max. My	14	-49.16	-10.99	-3521.34
L43	14.75 - 14.5	Pole	Max. Vy	8	29.66	-3452.92	-7.41
			Max. Vx	14	30.16	-10.99	-3521.34
			Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-91.27	2.06	10.68
			Max. Mx	20	-50.07	3525.52	15.53
			Max. My	14	-50.06	-11.16	-3594.33
			Max. Vy	20	-29.73	3525.52	15.53
			Max. Vx	14	30.23	-11.16	-3594.33
			Max. Torque	20			-1.98
L44	14.5 - 12.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-91.41	2.06	10.69
			Max. Mx	20	-50.20	3532.94	15.55
			Max. My	14	-50.19	-11.18	-3601.88
			Max. Vy	8	29.71	-3532.13	-7.59
			Max. Vx	14	30.21	-11.18	-3601.88
			Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-92.45	2.07	10.72
			Max. Mx	20	-50.98	3587.37	15.71
L45	12.08 - 11.83	Pole	Max. My	14	-50.97	-11.30	-3657.20
			Max. Vy	20	-29.81	3587.37	15.71
			Max. Vx	14	30.31	-11.30	-3657.20
			Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-92.59	2.08	10.72
			Max. Mx	20	-51.11	3594.82	15.73
			Max. My	14	-51.10	-11.32	-3664.77
			Max. Vy	8	29.79	-3593.99	-7.73
			Max. Vx	14	30.29	-11.32	-3664.77
L46	11.83 - 10	Pole	Max. Torque	20			-1.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-92.59	2.08	10.72
			Max. Mx	20	-51.11	3594.82	15.73
			Max. My	14	-51.10	-11.32	-3664.77
L47	10 - 9.75	Pole	Max. Vy	8	29.79	-3593.99	-7.73
			Max. Vx	14	30.29	-11.32	-3664.77
			Max. Torque	20			-1.98

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L48	9.75 - 4.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-95.31	2.16	10.80
			Max. Mx	20	-53.30	3744.23	16.15
			Max. My	14	-53.30	-11.67	-3816.58
			Max. Vy	20	-29.99	3744.23	16.15
			Max. Vx	14	30.48	-11.67	-3816.58
			Max. Torque	20			-1.98
L49	4.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-97.80	2.24	10.88
			Max. Mx	20	-55.42	3887.00	16.54
			Max. My	14	-55.41	-12.00	-3961.60
			Max. Vy	20	-30.16	3887.00	16.54
			Max. Vx	14	30.65	-12.00	-3961.60
			Max. Torque	20			-1.98

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	97.80	-0.00	-0.00
	Max. H _x	21	41.57	30.13	0.07
	Max. H _z	3	41.57	0.07	30.56
	Max. M _x	2	3960.55	0.07	30.56
	Max. M _z	8	3886.06	-30.13	-0.07
	Max. Torsion	8	1.96	-30.13	-0.07
	Min. Vert	3	41.57	0.07	30.56
	Min. H _x	9	41.57	-30.13	-0.07
	Min. H _z	15	41.57	-0.07	-30.62
	Min. M _x	14	-3961.60	-0.07	-30.62
	Min. M _z	20	-3887.00	30.13	0.07
	Min. Torsion	20	-1.98	30.13	0.07

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overtuning Moment, M _x kip-ft	Overtuning Moment, M _z kip-ft	Torque kip-ft
Dead Only	46.19	0.00	0.00	-3.18	0.36	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	55.43	-0.07	-30.56	-3960.55	12.91	0.15
0.9 Dead+1.0 Wind 0 deg - No Ice	41.57	-0.07	-30.56	-3871.01	12.48	0.15
1.2 Dead+1.0 Wind 30 deg - No Ice	55.43	15.00	-26.35	-3411.69	-1931.91	-0.84
0.9 Dead+1.0 Wind 30 deg - No Ice	41.57	15.00	-26.35	-3334.42	-1888.91	-0.79
1.2 Dead+1.0 Wind 60 deg - No Ice	55.43	26.46	-15.40	-1981.68	-3389.11	-1.62
0.9 Dead+1.0 Wind 60 deg - No Ice	41.57	26.46	-15.40	-1936.42	-3313.63	-1.53
1.2 Dead+1.0 Wind 90 deg - No Ice	55.43	30.13	0.07	8.38	-3886.06	-1.96
0.9 Dead+1.0 Wind 90 deg - No Ice	41.57	30.13	0.07	9.19	-3799.39	-1.86
1.2 Dead+1.0 Wind 120 deg - No Ice	55.43	26.22	15.35	1985.23	-3384.47	-1.79
0.9 Dead+1.0 Wind 120 deg - No Ice	41.57	26.22	15.35	1941.86	-3308.99	-1.69
1.2 Dead+1.0 Wind 150 deg - No Ice	55.43	15.16	26.47	3416.23	-1953.63	-1.13

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
0.9 Dead+1.0 Wind 150 deg - No Ice	41.57	15.16	26.48	3340.91	-1910.10	-1.07
1.2 Dead+1.0 Wind 180 deg - No Ice	55.43	0.07	30.62	3961.60	-12.00	-0.17
0.9 Dead+1.0 Wind 180 deg - No Ice	41.57	0.07	30.62	3874.09	-11.81	-0.16
1.2 Dead+1.0 Wind 210 deg - No Ice	55.43	-15.00	26.35	3403.53	1932.81	0.85
0.9 Dead+1.0 Wind 210 deg - No Ice	41.57	-15.00	26.35	3328.51	1889.58	0.80
1.2 Dead+1.0 Wind 240 deg - No Ice	55.43	-26.41	15.37	1968.91	3382.03	1.64
0.9 Dead+1.0 Wind 240 deg - No Ice	41.57	-26.41	15.37	1926.01	3306.51	1.55
1.2 Dead+1.0 Wind 270 deg - No Ice	55.43	-30.13	-0.07	-16.54	3887.00	1.98
0.9 Dead+1.0 Wind 270 deg - No Ice	41.57	-30.13	-0.07	-15.10	3800.09	1.87
1.2 Dead+1.0 Wind 300 deg - No Ice	55.43	-26.26	-15.38	-1997.99	3393.35	1.78
0.9 Dead+1.0 Wind 300 deg - No Ice	41.57	-26.26	-15.38	-1952.25	3317.44	1.69
1.2 Dead+1.0 Wind 330 deg - No Ice	55.43	-15.16	-26.47	-3424.38	1954.53	1.11
0.9 Dead+1.0 Wind 330 deg - No Ice	41.57	-15.16	-26.48	-3346.81	1910.77	1.05
1.2 Dead+1.0 Ice+1.0 Temp	97.80	0.00	0.00	-10.88	2.24	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	97.80	-0.01	-7.65	-1089.36	4.97	0.03
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	97.80	3.78	-6.60	-940.25	-527.24	-0.29
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	97.80	6.58	-3.82	-548.92	-922.72	-0.53
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	97.80	7.58	0.01	-8.33	-1061.43	-0.63
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	97.80	6.59	3.84	530.48	-923.59	-0.56
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	97.80	3.80	6.62	920.88	-531.92	-0.34
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	97.80	0.01	7.66	1069.40	-0.44	-0.03
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	97.80	-3.78	6.60	918.17	531.78	0.29
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	97.80	-6.57	3.81	525.80	925.43	0.54
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	97.80	-7.58	-0.01	-13.74	1065.96	0.63
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	97.80	-6.60	-3.84	-553.61	929.96	0.56
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	97.80	-3.80	-6.62	-942.95	536.46	0.34
Dead+Wind 0 deg - Service	46.19	-0.02	-6.65	-854.98	3.04	0.02
Dead+Wind 30 deg - Service	46.19	3.26	-5.73	-736.98	-415.66	-0.19
Dead+Wind 60 deg - Service	46.19	5.75	-3.35	-429.13	-729.39	-0.36
Dead+Wind 90 deg - Service	46.19	6.55	0.02	-0.70	-836.17	-0.43
Dead+Wind 120 deg - Service	46.19	5.70	3.34	424.88	-728.38	-0.38
Dead+Wind 150 deg - Service	46.19	3.30	5.76	733.01	-420.35	-0.24
Dead+Wind 180 deg - Service	46.19	0.02	6.66	850.23	-2.30	-0.02
Dead+Wind 210 deg - Service	46.19	-3.26	5.73	730.24	416.42	0.19
Dead+Wind 240 deg - Service	46.19	-5.74	3.34	421.37	728.39	0.36
Dead+Wind 270 deg - Service	46.19	-6.55	-0.02	-6.04	836.92	0.43
Dead+Wind 300 deg - Service	46.19	-5.71	-3.34	-432.64	730.88	0.38

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead+Wind 330 deg - Service	46.19	-3.30	-5.76	-739.76	421.10	0.24

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	-46.19	0.00	-0.00	46.19	-0.00	0.002%
2	-0.07	-55.43	-30.57	0.07	55.43	30.56	0.003%
3	-0.07	-41.57	-30.57	0.07	41.57	30.56	0.004%
4	15.00	-55.43	-26.35	-15.00	55.43	26.35	0.000%
5	15.00	-41.57	-26.35	-15.00	41.57	26.35	0.000%
6	26.46	-55.43	-15.40	-26.46	55.43	15.40	0.000%
7	26.46	-41.57	-15.40	-26.46	41.57	15.40	0.000%
8	30.13	-55.43	0.07	-30.13	55.43	-0.07	0.001%
9	30.13	-41.57	0.07	-30.13	41.57	-0.07	0.001%
10	26.22	-55.43	15.35	-26.22	55.43	-15.35	0.000%
11	26.22	-41.57	15.35	-26.22	41.57	-15.35	0.000%
12	15.16	-55.43	26.48	-15.16	55.43	-26.47	0.000%
13	15.16	-41.57	26.48	-15.16	41.57	-26.48	0.000%
14	0.07	-55.43	30.62	-0.07	55.43	-30.62	0.003%
15	0.07	-41.57	30.62	-0.07	41.57	-30.62	0.004%
16	-15.00	-55.43	26.35	15.00	55.43	-26.35	0.000%
17	-15.00	-41.57	26.35	15.00	41.57	-26.35	0.000%
18	-26.41	-55.43	15.37	26.41	55.43	-15.37	0.000%
19	-26.41	-41.57	15.37	26.41	41.57	-15.37	0.000%
20	-30.13	-55.43	-0.07	30.13	55.43	0.07	0.001%
21	-30.13	-41.57	-0.07	30.13	41.57	0.07	0.001%
22	-26.26	-55.43	-15.38	26.26	55.43	15.38	0.000%
23	-26.26	-41.57	-15.38	26.26	41.57	15.38	0.000%
24	-15.16	-55.43	-26.48	15.16	55.43	26.47	0.000%
25	-15.16	-41.57	-26.48	15.16	41.57	26.48	0.000%
26	0.00	-97.80	0.00	-0.00	97.80	-0.00	0.000%
27	-0.01	-97.80	-7.65	0.01	97.80	7.65	0.000%
28	3.78	-97.80	-6.60	-3.78	97.80	6.60	0.000%
29	6.58	-97.80	-3.82	-6.58	97.80	3.82	0.000%
30	7.58	-97.80	0.01	-7.58	97.80	-0.01	0.000%
31	6.59	-97.80	3.84	-6.59	97.80	-3.84	0.000%
32	3.80	-97.80	6.62	-3.80	97.80	-6.62	0.000%
33	0.01	-97.80	7.66	-0.01	97.80	-7.66	0.000%
34	-3.78	-97.80	6.60	3.78	97.80	-6.60	0.000%
35	-6.57	-97.80	3.81	6.57	97.80	-3.81	0.000%
36	-7.58	-97.80	-0.01	7.58	97.80	0.01	0.000%
37	-6.60	-97.80	-3.84	6.60	97.80	3.84	0.000%
38	-3.80	-97.80	-6.62	3.80	97.80	6.62	0.000%
39	-0.02	-46.19	-6.65	0.02	46.19	6.65	0.005%
40	3.26	-46.19	-5.73	-3.26	46.19	5.73	0.001%
41	5.75	-46.19	-3.35	-5.75	46.19	3.35	0.000%
42	6.55	-46.19	0.02	-6.55	46.19	-0.02	0.003%
43	5.70	-46.19	3.34	-5.70	46.19	-3.34	0.001%
44	3.30	-46.19	5.76	-3.30	46.19	-5.76	0.000%
45	0.02	-46.19	6.66	-0.02	46.19	-6.66	0.005%
46	-3.26	-46.19	5.73	3.26	46.19	-5.73	0.000%
47	-5.74	-46.19	3.34	5.74	46.19	-3.34	0.001%
48	-6.55	-46.19	-0.02	6.55	46.19	0.02	0.003%
49	-5.71	-46.19	-3.34	5.71	46.19	3.34	0.000%
50	-3.30	-46.19	-5.76	3.30	46.19	5.76	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	11	0.00000001	0.00001493
2	Yes	24	0.00002568	0.00010844
3	Yes	23	0.00002471	0.00010521
4	Yes	31	0.00000001	0.00000000
5	Yes	30	0.00000001	0.00000000
6	Yes	31	0.00000001	0.00000000
7	Yes	30	0.00000001	0.00000000
8	Yes	26	0.00000001	0.00009448
9	Yes	25	0.00000001	0.00009619
10	Yes	31	0.00000001	0.00000000
11	Yes	30	0.00000001	0.00000000
12	Yes	31	0.00000001	0.00000000
13	Yes	30	0.00000001	0.00000000
14	Yes	24	0.00002567	0.00014157
15	Yes	23	0.00002470	0.00014746
16	Yes	31	0.00000001	0.00000000
17	Yes	30	0.00000001	0.00000000
18	Yes	31	0.00000001	0.00000000
19	Yes	30	0.00000001	0.00000000
20	Yes	27	0.00000001	0.00010122
21	Yes	26	0.00000001	0.00010431
22	Yes	31	0.00000001	0.00000000
23	Yes	30	0.00000001	0.00000000
24	Yes	31	0.00000001	0.00000000
25	Yes	30	0.00000001	0.00000000
26	Yes	20	0.00000001	0.00009599
27	Yes	30	0.00000001	0.00012529
28	Yes	31	0.00000001	0.00012344
29	Yes	31	0.00000001	0.00012614
30	Yes	30	0.00000001	0.00012174
31	Yes	31	0.00000001	0.00012006
32	Yes	31	0.00000001	0.00012137
33	Yes	30	0.00000001	0.00012162
34	Yes	31	0.00000001	0.00012062
35	Yes	31	0.00000001	0.00011931
36	Yes	30	0.00000001	0.00012222
37	Yes	31	0.00000001	0.00012794
38	Yes	31	0.00000001	0.00012521
39	Yes	20	0.00014355	0.00011469
40	Yes	24	0.00000001	0.00014871
41	Yes	25	0.00000001	0.00010029
42	Yes	21	0.00008953	0.00009773
43	Yes	24	0.00000001	0.00014614
44	Yes	25	0.00000001	0.00009703
45	Yes	20	0.00014343	0.00011408
46	Yes	25	0.00000001	0.00009468
47	Yes	24	0.00000001	0.00014391
48	Yes	21	0.00008952	0.00010402
49	Yes	25	0.00000001	0.00010236
50	Yes	25	0.00000001	0.00009422

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 155	38.392	39	2.2369	0.0053
L2	155 - 150	36.052	39	2.2262	0.0050
L3	150 - 148	33.756	39	2.1471	0.0044
L4	148 - 143	32.867	39	2.0937	0.0042
L5	143 - 138	30.689	39	2.0663	0.0039
L6	138 - 133	28.545	39	2.0273	0.0036
L7	133 - 128	26.448	39	1.9749	0.0032
L8	128 - 123	24.414	39	1.9098	0.0029
L9	123 - 118	22.453	39	1.8332	0.0026
L10	118 - 111	20.579	39	1.7461	0.0023

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L11	114.75 - 109.75	19.411	39	1.6843	0.0021
L12	109.75 - 105.33	17.673	39	1.6272	0.0020
L13	105.33 - 105.08	16.204	39	1.5455	0.0018
L14	105.08 - 100.08	16.124	39	1.5423	0.0018
L15	100.08 - 95.08	14.543	39	1.4757	0.0016
L16	95.08 - 90.08	13.034	39	1.4064	0.0015
L17	90.08 - 85.08	11.600	39	1.3332	0.0014
L18	85.08 - 76.75	10.243	39	1.2585	0.0012
L19	81 - 75.75	9.194	39	1.1966	0.0012
L20	75.75 - 70.75	7.904	39	1.1409	0.0011
L21	70.75 - 70.58	6.760	39	1.0435	0.0010
L22	70.58 - 70.33	6.723	39	1.0402	0.0009
L23	70.33 - 70	6.669	39	1.0375	0.0009
L24	70 - 69.75	6.597	39	1.0338	0.0009
L25	69.75 - 64.75	6.543	39	1.0289	0.0009
L26	64.75 - 59.75	5.517	39	0.9313	0.0008
L27	59.75 - 54.75	4.593	39	0.8337	0.0007
L28	54.75 - 49.75	3.771	39	0.7364	0.0006
L29	49.75 - 43	3.050	39	0.6396	0.0005
L30	48 - 42	2.822	39	0.6058	0.0005
L31	42 - 37	2.096	39	0.5426	0.0004
L32	37 - 32	1.573	39	0.4559	0.0004
L33	32 - 27.91	1.141	39	0.3701	0.0003
L34	27.91 - 27.66	0.853	39	0.3008	0.0002
L35	27.66 - 27.25	0.838	39	0.2980	0.0002
L36	27.25 - 26.98	0.812	39	0.2935	0.0002
L37	26.98 - 26.83	0.796	39	0.2905	0.0002
L38	26.83 - 21.83	0.787	39	0.2888	0.0002
L39	21.83 - 16.83	0.514	39	0.2327	0.0002
L40	16.83 - 16	0.299	39	0.1773	0.0001
L41	16 - 15.75	0.269	39	0.1683	0.0001
L42	15.75 - 14.75	0.260	39	0.1660	0.0001
L43	14.75 - 14.5	0.227	39	0.1571	0.0001
L44	14.5 - 12.08	0.218	39	0.1534	0.0001
L45	12.08 - 11.83	0.150	39	0.1181	0.0001
L46	11.83 - 10	0.144	39	0.1157	0.0001
L47	10 - 9.75	0.103	39	0.0980	0.0001
L48	9.75 - 4.75	0.098	39	0.0956	0.0001
L49	4.75 - 0	0.023	39	0.0466	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
157.00	800 10121 w/ Mount Pipe	39	36.986	2.2349	0.0052	6797
150.00	PCS 1900MHZ 4X45W-65MHZ	39	33.756	2.1471	0.0045	3148
148.00	APXVTM14-C-120 w/ Mount Pipe	39	32.867	2.0937	0.0042	3874
138.00	(2) LPA-80063-6CF-EDIN-2 w/ Mount Pipe	39	28.545	2.0273	0.0036	6324
127.00	LNx-6515DS-VTM w/ Mount Pipe	39	24.015	1.8952	0.0029	3938
119.00	MX08FRO665-21 w/ Mount Pipe	39	20.946	1.7654	0.0024	3219
48.00	KS24019-L112A	39	2.822	0.6058	0.0005	4112

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 155	177.166	2	10.3152	0.0227
L2	155 - 150	166.431	2	10.2673	0.0218
L3	150 - 148	155.892	2	9.9070	0.0195
L4	148 - 143	151.811	2	9.6628	0.0187
L5	143 - 138	141.798	2	9.5407	0.0173
L6	138 - 133	131.940	2	9.3642	0.0160
L7	133 - 128	122.294	2	9.1285	0.0144
L8	128 - 123	112.923	2	8.8329	0.0130
L9	123 - 118	103.886	2	8.4834	0.0117
L10	118 - 111	95.238	2	8.0844	0.0104
L11	114.75 - 109.75	89.848	2	7.8007	0.0095
L12	109.75 - 105.33	81.820	2	7.5379	0.0089
L13	105.33 - 105.08	75.034	2	7.1617	0.0080
L14	105.08 - 100.08	74.660	2	7.1469	0.0079
L15	100.08 - 95.08	67.354	2	6.8394	0.0073
L16	95.08 - 90.08	60.374	2	6.5196	0.0067
L17	90.08 - 85.08	53.737	2	6.1813	0.0062
L18	85.08 - 76.75	47.456	2	5.8354	0.0056
L19	81 - 75.75	42.599	2	5.5488	0.0052
L20	75.75 - 70.75	36.626	2	5.2907	0.0049
L21	70.75 - 70.58	31.328	2	4.8396	0.0043
L22	70.58 - 70.33	31.157	2	4.8242	0.0043
L23	70.33 - 70	30.905	2	4.8113	0.0043
L24	70 - 69.75	30.573	2	4.7943	0.0043
L25	69.75 - 64.75	30.323	2	4.7718	0.0043
L26	64.75 - 59.75	25.568	14	4.3190	0.0038
L27	59.75 - 54.75	21.287	14	3.8663	0.0033
L28	54.75 - 49.75	17.477	14	3.4149	0.0028
L29	49.75 - 43	14.138	14	2.9657	0.0024
L30	48 - 42	13.081	14	2.8092	0.0023
L31	42 - 37	9.715	14	2.5157	0.0020
L32	37 - 32	7.292	14	2.1137	0.0016
L33	32 - 27.91	5.288	14	1.7160	0.0013
L34	27.91 - 27.66	3.956	14	1.3944	0.0010
L35	27.66 - 27.25	3.883	14	1.3815	0.0010
L36	27.25 - 26.98	3.765	14	1.3604	0.0010
L37	26.98 - 26.83	3.689	14	1.3465	0.0010
L38	26.83 - 21.83	3.647	14	1.3387	0.0010
L39	21.83 - 16.83	2.381	14	1.0785	0.0008
L40	16.83 - 16	1.387	14	0.8220	0.0006
L41	16 - 15.75	1.247	14	0.7799	0.0005
L42	15.75 - 14.75	1.207	14	0.7695	0.0005
L43	14.75 - 14.5	1.050	14	0.7280	0.0005
L44	14.5 - 12.08	1.012	14	0.7110	0.0005
L45	12.08 - 11.83	0.693	14	0.5473	0.0004
L46	11.83 - 10	0.665	14	0.5360	0.0004
L47	10 - 9.75	0.475	14	0.4542	0.0003
L48	9.75 - 4.75	0.452	14	0.4429	0.0003
L49	4.75 - 0	0.107	14	0.2159	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
157.00	800 10121 w/ Mount Pipe	2	170.716	10.3068	0.0240	1597
150.00	PCS 1900MHZ 4X45W-65MHZ	2	155.892	9.9070	0.0208	733
148.00	APXVTM14-C-120 w/ Mount Pipe	2	151.811	9.6628	0.0197	902
138.00	(2) LPA-80063-6CF-EDIN-2 w/ Mount Pipe	2	131.940	9.3642	0.0168	1474
127.00	LNx-6515DS-VTM w/ Mount Pipe	2	111.088	8.7662	0.0133	903
119.00	MX08FRO665-21 w/ Mount Pipe	2	96.932	8.1727	0.0111	730
48.00	KS24019-L112A	14	13.081	2.8092	0.0023	891

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L1	160 - 155 (1)	TP10.75x10.75x0.349	5.00	0.00	0.0	11.403	-3.77	359.22	0.010
L2	155 - 150 (2)	TP10.75x10.75x0.349	5.00	0.00	0.0	11.403	-4.02	359.22	0.011
L3	150 - 148 (3)	TP10.75x10.75x0.349	2.00	0.00	0.0	11.403	-4.71	359.22	0.013
L4	148 - 143 (4)	TP23.81x23x0.25	5.00	0.00	0.0	18.694	-8.51	1009.52	0.008
L5	143 - 138 (5)	TP24.62x23.81x0.25	5.00	0.00	0.0	19.337	-8.96	1044.23	0.009
L6	138 - 133 (6)	TP25.43x24.62x0.25	5.00	0.00	0.0	19.980	-12.50	1078.94	0.012
L7	133 - 128 (7)	TP26.24x25.43x0.25	5.00	0.00	0.0	20.623	-13.08	1113.65	0.012
L8	128 - 123 (8)	TP27.05x26.24x0.25	5.00	0.00	0.0	21.265	-17.21	1148.35	0.015
L9	123 - 118 (9)	TP27.86x27.05x0.25	5.00	0.00	0.0	21.908	-20.19	1183.06	0.017
L10	118 - 111 (10)	TP28.994x27.86x0.25	7.00	0.00	0.0	22.326	-20.68	1205.62	0.017
L11	111 - 109.75 (11)	TP28.6964x27.8865x0.31	5.00	0.00	0.0	28.153	-21.82	1520.28	0.014
L12	109.75 - 105.33 (12)	TP29.4124x28.6964x0.31	4.42	0.00	0.0	28.863	-22.60	1558.63	0.015
L13	105.33 - 105.08 (13)	TP29.4529x29.4124x0.46	0.25	0.00	0.0	43.123	-22.68	2328.64	0.010
L14	105.08 - 100.08 (14)	TP30.2628x29.4529x0.46	5.00	0.00	0.0	43.746	-23.77	2362.29	0.010
L15	100.08 - 95.08 (15)	TP31.0728x30.2628x0.46	5.00	0.00	0.0	44.935	-24.90	2426.50	0.010
L16	95.08 - 90.08 (16)	TP31.8827x31.0728x0.45	5.00	0.00	0.0	44.895	-26.06	2424.35	0.011
L17	90.08 - 85.08 (17)	TP32.6926x31.8827x0.45	5.00	0.00	0.0	46.052	-27.24	2486.82	0.011
L18	85.08 - 76.75 (18)	TP34.042x32.6926x0.45	8.33	0.00	0.0	46.996	-28.23	2537.79	0.011
L19	76.75 - 75.75 (19)	TP33.579x32.7286x0.375	5.25	0.00	0.0	39.521	-30.11	2311.98	0.013
L20	75.75 - 70.75 (20)	TP34.3889x33.579x0.375	5.00	0.00	0.0	40.485	-31.28	2368.38	0.013
L21	70.75 - 70.58 (21)	TP34.4164x34.3889x0.37	0.17	0.00	0.0	40.517	-31.34	2370.29	0.013
L22	70.58 - 70.33 (22)	TP34.4569x34.4164x0.67	0.25	0.00	0.0	72.376	-31.43	4234.00	0.007
L23	70.33 - 70 (23)	TP34.5104x34.4569x0.67	0.33	0.00	0.0	72.490	-31.54	4240.70	0.007
L24	70 - 69.75 (24)	TP34.5509x34.5104x0.37	0.25	0.00	0.0	40.677	-31.60	2379.65	0.013
L25	69.75 - 64.75 (25)	TP35.3608x34.5509x0.37	5.00	0.00	0.0	41.641	-32.78	2436.05	0.013
L26	64.75 - 59.75 (26)	TP36.1707x35.3608x0.37	5.00	0.00	0.0	42.605	-34.01	2492.44	0.014
L27	59.75 - 54.75 (27)	TP36.9807x36.1707x0.37	5.00	0.00	0.0	43.569	-35.26	2548.84	0.014
L28	54.75 - 49.75 (28)	TP37.7906x36.9807x0.37	5.00	0.00	0.0	44.533	-36.53	2605.23	0.014
L29	49.75 - 43 (29)	TP38.884x37.7906x0.375	6.75	0.00	0.0	44.871	-36.96	2624.97	0.014

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u φP _n
L30	43 - 42 (30)	TP38.2961x37.3241x0.43 75	6.00	0.00	0.0	52.571 4	-39.60	3075.42	0.013
L31	42 - 37 (31)	TP39.1061x38.2961x0.43 75	5.00	0.00	0.0	53.696 1	-41.04	3141.22	0.013
L32	37 - 32 (32)	TP39.916x39.1061x0.437 5	5.00	0.00	0.0	54.820 9	-42.51	3207.02	0.013
L33	32 - 27.91 (33)	TP40.5786x39.916x0.437 5	4.09	0.00	0.0	55.741 0	-43.73	3260.85	0.013
L34	27.91 - 27.66 (34)	TP40.6191x40.5786x0.67 5	0.25	0.00	0.0	85.578 3	-43.86	5006.33	0.009
L35	27.66 - 27.25 (35)	TP40.6855x40.6191x0.67 5	0.41	0.00	0.0	85.720 6	-44.03	5014.65	0.009
L36	27.25 - 26.98 (36)	TP40.7293x40.6855x0.67 5	0.27	0.00	0.0	85.814 3	-44.13	5020.14	0.009
L37	26.98 - 26.83 (37)	TP40.7536x40.7293x0.66 25	0.15	0.00	0.0	84.302 5	-44.19	4931.70	0.009
L38	26.83 - 21.83 (38)	TP41.5636x40.7536x0.66 25	5.00	0.00	0.0	86.005 8	-46.15	5031.34	0.009
L39	21.83 - 16.83 (39)	TP42.3736x41.5636x0.66 25	5.00	0.00	0.0	87.709 0	-48.14	5130.98	0.009
L40	16.83 - 16 (40)	TP42.508x42.3736x0.662 5	0.83	0.00	0.0	87.991 7	-48.47	5147.52	0.009
L41	16 - 15.75 (41)	TP42.5485x42.508x0.812 5	0.25	0.00	0.0	107.63 20	-48.60	6296.47	0.008
L42	15.75 - 14.75 (42)	TP42.7105x42.5485x0.81 25	1.00	0.00	0.0	108.05 00	-49.06	6320.91	0.008
L43	14.75 - 14.5 (43)	TP42.751x42.7105x0.487 5	0.25	0.00	0.0	65.395 4	-49.16	3825.63	0.013
L44	14.5 - 12.08 (44)	TP43.1431x42.751x0.487 5	2.42	0.00	0.0	66.002 0	-50.06	3861.12	0.013
L45	12.08 - 11.83 (45)	TP43.1836x43.1431x0.73 75	0.25	0.00	0.0	99.358 8	-50.19	5812.49	0.009
L46	11.83 - 10 (46)	TP43.48x43.1836x0.7375	1.83	0.00	0.0	100.05 30	-50.97	5853.09	0.009
L47	10 - 9.75 (47)	TP43.5205x43.48x0.7375	0.25	0.00	0.0	100.14 80	-51.10	5858.63	0.009
L48	9.75 - 4.75 (48)	TP44.3305x43.5205x0.72 5	5.00	0.00	0.0	100.34 30	-53.30	5870.05	0.009
L49	4.75 - 0 (49)	TP45.1x44.3305x0.7125	4.75	0.00	0.0	100.38 10	-55.41	5872.30	0.009

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{nx} kip-ft	Ratio M _{ux} φM _{nx}	M _{uy} kip-ft	φM _{ny} kip-ft	Ratio M _{uy} φM _{ny}
L1	160 - 155 (1)	TP10.75x10.75x0.349	20.38	99.14	0.206	0.00	99.14	0.000
L2	155 - 150 (2)	TP10.75x10.75x0.349	58.73	99.14	0.592	0.00	99.14	0.000
L3	150 - 148 (3)	TP10.75x10.75x0.349	75.69	99.14	0.763	0.00	99.14	0.000
L4	148 - 143 (4)	TP23.81x23x0.25	138.93	619.45	0.224	0.00	619.45	0.000
L5	143 - 138 (5)	TP24.62x23.81x0.25	204.61	663.00	0.309	0.00	663.00	0.000
L6	138 - 133 (6)	TP25.43x24.62x0.25	301.06	704.73	0.427	0.00	704.73	0.000
L7	133 - 128 (7)	TP26.24x25.43x0.25	398.10	745.14	0.534	0.00	745.14	0.000
L8	128 - 123 (8)	TP27.05x26.24x0.25	509.91	786.27	0.649	0.00	786.27	0.000
L9	123 - 118 (9)	TP27.86x27.05x0.25	625.60	828.10	0.755	0.00	828.10	0.000
L10	118 - 111 (10)	TP28.994x27.86x0.25	707.05	855.63	0.826	0.00	855.63	0.000
L11	111 - 109.75 (11)	TP28.6964x27.8865x0.31 25	833.88	1123.41	0.742	0.00	1123.41	0.000
L12	109.75 - 105.33 (12)	TP29.4124x28.6964x0.31 25	947.38	1181.12	0.802	0.00	1181.12	0.000
L13	105.33 - 105.08 (13)	TP29.4529x29.4124x0.46 88	953.83	1748.21	0.546	0.00	1748.21	0.000
L14	105.08 - 100.08 (14)	TP30.2628x29.4529x0.46 25	1083.84	1824.58	0.594	0.00	1824.58	0.000
L15	100.08 -	TP31.0728x30.2628x0.46	1215.62	1925.88	0.631	0.00	1925.88	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 $\frac{M_{uy}}{\phi M_{ny}}$
L16	95.08 (15) 95.08 - 90.08 (16)	25 TP31.8827x31.0728x0.45	1349.10	1977.43	0.682	0.00	1977.43	0.000
L17	90.08 - 85.08 (17)	TP32.6926x31.8827x0.45	1484.22	2081.38	0.713	0.00	2081.38	0.000
L18	85.08 - 76.75 (18)	TP34.042x32.6926x0.45	1595.66	2168.18	0.736	0.00	2168.18	0.000
L19	76.75 - 75.75 (19)	TP33.579x32.7286x0.375	1740.97	1997.99	0.871	0.00	1997.99	0.000
L20	75.75 - 70.75 (20)	TP34.3889x33.579x0.375	1880.89	2097.21	0.897	0.00	2097.21	0.000
L21	70.75 - 70.58 (21)	TP34.4164x34.3889x0.375	1885.67	2100.63	0.898	0.00	2100.63	0.000
L22	70.58 - 70.33 (22)	TP34.4569x34.4164x0.675	1892.70	3690.97	0.513	0.00	3690.97	0.000
L23	70.33 - 70 (23)	TP34.5104x34.4569x0.675	1901.98	3702.77	0.514	0.00	3702.77	0.000
L24	70 - 69.75 (24)	TP34.5509x34.5104x0.375	1909.02	2117.34	0.902	0.00	2117.34	0.000
L25	69.75 - 64.75 (25)	TP35.3608x34.5509x0.375	2050.29	2219.44	0.924	0.00	2219.44	0.000
L26	64.75 - 59.75 (26)	TP36.1707x35.3608x0.375	2192.53	2321.66	0.944	0.00	2321.66	0.000
L27	59.75 - 54.75 (27)	TP36.9807x36.1707x0.375	2335.66	2415.30	0.967	0.00	2415.30	0.000
L28	54.75 - 49.75 (28)	TP37.7906x36.9807x0.375	2479.58	2510.16	0.988	0.00	2510.16	0.000
L29	49.75 - 43 (29)	TP38.884x37.7906x0.375	2530.13	2543.64	0.995	0.00	2543.64	0.000
L30	43 - 42 (30)	TP38.2961x37.3241x0.4375	2705.28	3029.53	0.893	0.00	3029.53	0.000
L31	42 - 37 (31)	TP39.1061x38.2961x0.4375	2852.14	3161.31	0.902	0.00	3161.31	0.000
L32	37 - 32 (32)	TP39.916x39.1061x0.4375	2999.58	3295.89	0.910	0.00	3295.89	0.000
L33	32 - 27.91 (33)	TP40.5786x39.916x0.4375	3120.54	3408.07	0.916	0.00	3408.07	0.000
L34	27.91 - 27.66 (34)	TP40.6191x40.5786x0.675	3127.94	5175.96	0.604	0.00	5175.96	0.000
L35	27.66 - 27.25 (35)	TP40.6855x40.6191x0.675	3140.09	5193.33	0.605	0.00	5193.33	0.000
L36	27.25 - 26.98 (36)	TP40.7293x40.6855x0.675	3148.09	5204.78	0.605	0.00	5204.78	0.000
L37	26.98 - 26.83 (37)	TP40.7536x40.7293x0.6625	3152.54	5119.44	0.616	0.00	5119.44	0.000
L38	26.83 - 21.83 (38)	TP41.5636x40.7536x0.6625	3301.43	5330.11	0.619	0.00	5330.11	0.000
L39	21.83 - 16.83 (39)	TP42.3736x41.5636x0.6625	3451.24	5545.02	0.622	0.00	5545.02	0.000
L40	16.83 - 16 (40)	TP42.508x42.3736x0.6625	3476.19	5581.12	0.623	0.00	5581.12	0.000
L41	16 - 15.75 (41)	TP42.5485x42.508x0.8125	3483.72	6784.71	0.513	0.00	6784.71	0.000
L42	15.75 - 14.75 (42)	TP42.7105x42.5485x0.8125	3513.82	6837.98	0.514	0.00	6837.98	0.000
L43	14.75 - 14.5 (43)	TP42.751x42.7105x0.4875	3521.36	4207.12	0.837	0.00	4207.12	0.000
L44	14.5 - 12.08 (44)	TP43.1431x42.751x0.4875	3594.35	4285.98	0.839	0.00	4285.98	0.000
L45	12.08 - 11.83 (45)	TP43.1836x43.1431x0.7375	3601.90	6382.85	0.564	0.00	6382.85	0.000
L46	11.83 - 10 (46)	TP43.48x43.1836x0.7375	3657.22	6473.09	0.565	0.00	6473.09	0.000
L47	10 - 9.75 (47)	TP43.5205x43.48x0.7375	3664.78	6485.47	0.565	0.00	6485.47	0.000
L48	9.75 - 4.75 (48)	TP44.3305x43.5205x0.725	3816.59	6627.02	0.576	0.00	6627.02	0.000
L49	4.75 - 0 (49)	TP45.1x44.3305x0.7125	3961.62	6752.27	0.587	0.00	6752.27	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	160 - 155 (1)	TP10.75x10.75x0.349	7.42	107.77	0.069	0.09	98.55	0.001
L2	155 - 150 (2)	TP10.75x10.75x0.349	7.94	107.77	0.074	0.07	98.55	0.001
L3	150 - 148 (3)	TP10.75x10.75x0.349	9.03	107.77	0.084	0.07	98.55	0.001
L4	148 - 143 (4)	TP23.81x23x0.25	12.92	302.86	0.043	0.22	624.87	0.000
L5	143 - 138 (5)	TP24.62x23.81x0.25	13.36	313.27	0.043	0.22	668.58	0.000
L6	138 - 133 (6)	TP25.43x24.62x0.25	19.24	323.68	0.059	0.16	713.76	0.000
L7	133 - 128 (7)	TP26.24x25.43x0.25	19.59	334.09	0.059	0.16	760.42	0.000
L8	128 - 123 (8)	TP27.05x26.24x0.25	22.54	344.51	0.065	0.16	808.56	0.000
L9	123 - 118 (9)	TP27.86x27.05x0.25	24.98	354.92	0.070	0.16	858.17	0.000
L10	118 - 111 (10)	TP28.994x27.86x0.25	25.16	361.69	0.070	0.16	891.22	0.000
L11	111 - 109.75 (11)	TP28.6964x27.8865x0.31 25	25.57	456.08	0.056	0.16	1133.70	0.000
L12	109.75 - 105.33 (12)	TP29.4124x28.6964x0.31 25	25.82	467.59	0.055	0.16	1191.62	0.000
L13	105.33 - 105.08 (13)	TP29.4529x29.4124x0.46 88	25.84	698.59	0.037	0.16	1773.22	0.000
L14	105.08 - 100.08 (14)	TP30.2628x29.4529x0.46 25	26.19	708.69	0.037	0.16	1849.51	0.000
L15	100.08 - 95.08 (15)	TP31.0728x30.2628x0.46 25	26.54	727.95	0.036	0.16	1951.41	0.000
L16	95.08 - 90.08 (16)	TP31.8827x31.0728x0.45	26.87	727.30	0.037	0.16	2002.07	0.000
L17	90.08 - 85.08 (17)	TP32.6926x31.8827x0.45	27.20	746.04	0.036	0.16	2106.57	0.000
L18	85.08 - 76.75 (18)	TP34.042x32.6926x0.45	27.45	761.34	0.036	0.16	2193.82	0.000
L19	76.75 - 75.75 (19)	TP33.579x32.7286x0.375	27.89	693.59	0.040	0.16	2016.86	0.000
L20	75.75 - 70.75 (20)	TP34.3889x33.579x0.375	28.11	710.51	0.040	0.15	2116.45	0.000
L21	70.75 - 70.58 (21)	TP34.4164x34.3889x0.37 5	28.15	711.09	0.040	0.15	2119.88	0.000
L22	70.58 - 70.33 (22)	TP34.4569x34.4164x0.67 5	28.14	1270.20	0.022	0.15	3757.82	0.000
L23	70.33 - 70 (23)	TP34.5104x34.4569x0.67 5	28.15	1272.21	0.022	0.15	3769.73	0.000
L24	70 - 69.75 (24)	TP34.5509x34.5104x0.37 5	28.18	713.90	0.039	0.15	2136.66	0.000
L25	69.75 - 64.75 (25)	TP35.3608x34.5509x0.37 5	28.38	730.82	0.039	0.15	2239.13	0.000
L26	64.75 - 59.75 (26)	TP36.1707x35.3608x0.37 5	28.56	747.73	0.038	0.15	2344.00	0.000
L27	59.75 - 54.75 (27)	TP36.9807x36.1707x0.37 5	28.73	764.65	0.038	0.15	2451.28	0.000
L28	54.75 - 49.75 (28)	TP37.7906x36.9807x0.37 5	28.88	781.57	0.037	0.15	2560.95	0.000
L29	49.75 - 43 (29)	TP38.884x37.7906x0.375	28.95	787.49	0.037	0.15	2599.90	0.000
L30	43 - 42 (30)	TP38.2961x37.3241x0.43 75	29.33	922.63	0.032	0.15	3058.93	0.000
L31	42 - 37 (31)	TP39.1061x38.2961x0.43 75	29.46	942.37	0.031	0.15	3191.23	0.000
L32	37 - 32 (32)	TP39.916x39.1061x0.437 5	29.56	962.11	0.031	0.15	3326.32	0.000
L33	32 - 27.91 (33)	TP40.5786x39.916x0.437 5	29.63	978.25	0.030	0.15	3438.92	0.000
L34	27.91 - 27.66 (34)	TP40.6191x40.5786x0.67 5	29.63	1501.90	0.020	0.15	5253.80	0.000
L35	27.66 - 27.25 (35)	TP40.6855x40.6191x0.67 5	29.64	1504.40	0.020	0.15	5271.28	0.000
L36	27.25 - 26.98 (36)	TP40.7293x40.6855x0.67 5	29.65	1506.04	0.020	0.15	5282.82	0.000
L37	26.98 - 26.83	TP40.7536x40.7293x0.66	29.68	1479.51	0.020	0.15	5194.52	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 $\frac{T_u}{\phi T_n}$
L38	(37) 26.83 - 21.83	25 TP41.5636x40.7536x0.66	29.90	1509.40	0.020	0.17	5406.54	0.000
L39	(38) 21.83 - 16.83	25 TP42.3736x41.5636x0.66	30.08	1539.29	0.020	0.17	5622.80	0.000
L40	(39) 16.83 - 16	25 TP42.508x42.3736x0.662	30.11	1544.25	0.019	0.17	5659.11	0.000
L41	(40) 16 - 15.75	5 TP42.5485x42.508x0.812	30.11	1888.94	0.016	0.17	6904.14	0.000
L42	(41) 15.75 - 14.75	5 TP42.7105x42.5485x0.81	30.16	1896.27	0.016	0.17	6957.84	0.000
L43	(42) 14.75 - 14.5	25 TP42.751x42.7105x0.487	30.16	1147.69	0.026	0.17	4247.86	0.000
L44	(43) 14.5 - 12.08	5 TP43.1431x42.751x0.487	30.23	1158.34	0.026	0.17	4327.03	0.000
L45	(44) 12.08 - 11.83	5 TP43.1836x43.1431x0.73	30.21	1743.75	0.017	0.17	6481.87	0.000
L46	(45) 11.83 - 10	75 TP43.48x43.1836x0.7375	30.31	1755.93	0.017	0.17	6572.73	0.000
L47	(46) 10 - 9.75	(47) TP43.5205x43.48x0.7375	30.29	1757.59	0.017	0.17	6585.20	0.000
L48	(48) 9.75 - 4.75	5 TP44.3305x43.5205x0.72	30.48	1761.02	0.017	0.17	6724.88	0.000
L49	(49) 4.75 - 0	TP45.1x44.3305x0.7125	30.65	1761.69	0.017	0.17	6848.10	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		ϕP_n	ϕM_{nx}	ϕM_{ny}	ϕV_n	ϕT_n			
L1	160 - 155 (1)	0.010	0.206	0.000	0.069	0.001	0.221	1.050	4.8.2
L2	155 - 150 (2)	0.011	0.592	0.000	0.074	0.001	0.609	1.050	4.8.2
L3	150 - 148 (3)	0.013	0.763	0.000	0.084	0.001	0.784	1.050	4.8.2
L4	148 - 143 (4)	0.008	0.224	0.000	0.043	0.000	0.235	1.050	4.8.2
L5	143 - 138 (5)	0.009	0.309	0.000	0.043	0.000	0.319	1.050	4.8.2
L6	138 - 133 (6)	0.012	0.427	0.000	0.059	0.000	0.442	1.050	4.8.2
L7	133 - 128 (7)	0.012	0.534	0.000	0.059	0.000	0.549	1.050	4.8.2
L8	128 - 123 (8)	0.015	0.649	0.000	0.065	0.000	0.668	1.050	4.8.2
L9	123 - 118 (9)	0.017	0.755	0.000	0.070	0.000	0.778	1.050	4.8.2
L10	118 - 111 (10)	0.017	0.826	0.000	0.070	0.000	0.848	1.050	4.8.2
L11	111 - 109.75 (11)	0.014	0.742	0.000	0.056	0.000	0.760	1.050	4.8.2
L12	109.75 - 105.33 (12)	0.015	0.802	0.000	0.055	0.000	0.820	1.050	4.8.2
L13	105.33 - 105.08 (13)	0.010	0.546	0.000	0.037	0.000	0.557	1.050	4.8.2
L14	105.08 - 100.08 (14)	0.010	0.594	0.000	0.037	0.000	0.605	1.050	4.8.2
L15	100.08 - 95.08 (15)	0.010	0.631	0.000	0.036	0.000	0.643	1.050	4.8.2
L16	95.08 - 90.08 (16)	0.011	0.682	0.000	0.037	0.000	0.694	1.050	4.8.2
L17	90.08 - 85.08 (17)	0.011	0.713	0.000	0.036	0.000	0.725	1.050	4.8.2
L18	85.08 - 76.75 (18)	0.011	0.736	0.000	0.036	0.000	0.748	1.050	4.8.2
L19	76.75 - 75.75 (19)	0.013	0.871	0.000	0.040	0.000	0.886	1.050	4.8.2
L20	75.75 - 70.75 (20)	0.013	0.897	0.000	0.040	0.000	0.912	1.050	4.8.2
L21	70.75 - 70.58 (21)	0.013	0.898	0.000	0.040	0.000	0.912	1.050	4.8.2
L22	70.58 - 70.33 (22)	0.007	0.513	0.000	0.022	0.000	0.521	1.050	4.8.2

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_u	M_{ux}	M_{uy}	V_u	T_u			
L23	70.33 - 70 (23)	0.007	0.514	0.000	0.022	0.000	0.522	1.050	4.8.2
L24	70 - 69.75 (24)	0.013	0.902	0.000	0.039	0.000	0.916	1.050	4.8.2
L25	69.75 - 64.75 (25)	0.013	0.924	0.000	0.039	0.000	0.939	1.050	4.8.2
L26	64.75 - 59.75 (26)	0.014	0.944	0.000	0.038	0.000	0.959	1.050	4.8.2
L27	59.75 - 54.75 (27)	0.014	0.967	0.000	0.038	0.000	0.982	1.050	4.8.2
L28	54.75 - 49.75 (28)	0.014	0.988	0.000	0.037	0.000	1.003	1.050	4.8.2
L29	49.75 - 43 (29)	0.014	0.995	0.000	0.037	0.000	1.010	1.050	4.8.2
L30	43 - 42 (30)	0.013	0.893	0.000	0.032	0.000	0.907	1.050	4.8.2
L31	42 - 37 (31)	0.013	0.902	0.000	0.031	0.000	0.916	1.050	4.8.2
L32	37 - 32 (32)	0.013	0.910	0.000	0.031	0.000	0.924	1.050	4.8.2
L33	32 - 27.91 (33)	0.013	0.916	0.000	0.030	0.000	0.930	1.050	4.8.2
L34	27.91 - 27.66 (34)	0.009	0.604	0.000	0.020	0.000	0.613	1.050	4.8.2
L35	27.66 - 27.25 (35)	0.009	0.605	0.000	0.020	0.000	0.614	1.050	4.8.2
L36	27.25 - 26.98 (36)	0.009	0.605	0.000	0.020	0.000	0.614	1.050	4.8.2
L37	26.98 - 26.83 (37)	0.009	0.616	0.000	0.020	0.000	0.625	1.050	4.8.2
L38	26.83 - 21.83 (38)	0.009	0.619	0.000	0.020	0.000	0.629	1.050	4.8.2
L39	21.83 - 16.83 (39)	0.009	0.622	0.000	0.020	0.000	0.632	1.050	4.8.2
L40	16.83 - 16 (40)	0.009	0.623	0.000	0.019	0.000	0.633	1.050	4.8.2
L41	16 - 15.75 (41)	0.008	0.513	0.000	0.016	0.000	0.521	1.050	4.8.2
L42	15.75 - 14.75 (42)	0.008	0.514	0.000	0.016	0.000	0.522	1.050	4.8.2
L43	14.75 - 14.5 (43)	0.013	0.837	0.000	0.026	0.000	0.851	1.050	4.8.2
L44	14.5 - 12.08 (44)	0.013	0.839	0.000	0.026	0.000	0.852	1.050	4.8.2
L45	12.08 - 11.83 (45)	0.009	0.564	0.000	0.017	0.000	0.573	1.050	4.8.2
L46	11.83 - 10 (46)	0.009	0.565	0.000	0.017	0.000	0.574	1.050	4.8.2
L47	10 - 9.75 (47)	0.009	0.565	0.000	0.017	0.000	0.574	1.050	4.8.2
L48	9.75 - 4.75 (48)	0.009	0.576	0.000	0.017	0.000	0.585	1.050	4.8.2
L49	4.75 - 0 (49)	0.009	0.587	0.000	0.017	0.000	0.596	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	160 - 155	Pole	TP10.75x10.75x0.349	1	-3.77	377.18	21.0	Pass
L2	155 - 150	Pole	TP10.75x10.75x0.349	2	-4.02	377.18	58.0	Pass
L3	150 - 148	Pole	TP10.75x10.75x0.349	3	-4.71	377.18	74.6	Pass
L4	148 - 143	Pole	TP23.81x23x0.25	4	-8.51	1060.00	22.3	Pass
L5	143 - 138	Pole	TP24.62x23.81x0.25	5	-8.96	1096.44	30.4	Pass
L6	138 - 133	Pole	TP25.43x24.62x0.25	6	-12.50	1132.89	42.1	Pass
L7	133 - 128	Pole	TP26.24x25.43x0.25	7	-13.08	1169.33	52.3	Pass
L8	128 - 123	Pole	TP27.05x26.24x0.25	8	-17.21	1205.77	63.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\sigma_{P_{allow}}$ K	% Capacity	Pass Fail	
L9	123 - 118	Pole	TP27.86x27.05x0.25	9	-20.19	1242.21	74.0	Pass	
L10	118 - 111	Pole	TP28.994x27.86x0.25	10	-20.68	1265.90	80.8	Pass	
L11	111 - 109.75	Pole	TP28.6964x27.8865x0.3125	11	-21.82	1596.29	72.4	Pass	
L12	109.75 - 105.33	Pole	TP29.4124x28.6964x0.3125	12	-22.60	1636.56	78.1	Pass	
L13	105.33 - 105.08	Pole	TP29.4529x29.4124x0.4688	13	-22.68	2445.07	53.0	Pass	
L14	105.08 - 100.08	Pole	TP30.2628x29.4529x0.4625	14	-23.77	2480.40	57.7	Pass	
L15	100.08 - 95.08	Pole	TP31.0728x30.2628x0.4625	15	-24.90	2547.82	61.2	Pass	
L16	95.08 - 90.08	Pole	TP31.8827x31.0728x0.45	16	-26.06	2545.57	66.1	Pass	
L17	90.08 - 85.08	Pole	TP32.6926x31.8827x0.45	17	-27.24	2611.16	69.1	Pass	
L18	85.08 - 76.75	Pole	TP34.042x32.6926x0.45	18	-28.23	2664.68	71.3	Pass	
L19	76.75 - 75.75	Pole	TP33.579x32.7286x0.375	19	-30.11	2427.58	84.4	Pass	
L20	75.75 - 70.75	Pole	TP34.3889x33.579x0.375	20	-31.28	2486.80	86.8	Pass	
L21	70.75 - 70.58	Pole	TP34.4164x34.3889x0.375	21	-31.34	2488.80	86.9	Pass	
L22	70.58 - 70.33	Pole	TP34.4569x34.4164x0.675	22	-31.43	4445.70	49.6	Pass	
L23	70.33 - 70	Pole	TP34.5104x34.4569x0.675	23	-31.54	4452.73	49.7	Pass	
L24	70 - 69.75	Pole	TP34.5509x34.5104x0.375	24	-31.60	2498.63	87.3	Pass	
L25	69.75 - 64.75	Pole	TP35.3608x34.5509x0.375	25	-32.78	2557.85	89.4	Pass	
L26	64.75 - 59.75	Pole	TP36.1707x35.3608x0.375	26	-34.01	2617.06	91.4	Pass	
L27	59.75 - 54.75	Pole	TP36.9807x36.1707x0.375	27	-35.26	2676.28	93.5	Pass	
L28	54.75 - 49.75	Pole	TP37.7906x36.9807x0.375	28	-36.53	2735.49	95.5	Pass	
L29	49.75 - 43	Pole	TP38.884x37.7906x0.375	29	-36.96	2756.22	96.2	Pass	
L30	43 - 42	Pole	TP38.2961x37.3241x0.4375	30	-39.60	3229.19	86.4	Pass	
L31	42 - 37	Pole	TP39.1061x38.2961x0.4375	31	-41.04	3298.28	87.3	Pass	
L32	37 - 32	Pole	TP39.916x39.1061x0.4375	32	-42.51	3367.37	88.0	Pass	
L33	32 - 27.91	Pole	TP40.5786x39.916x0.4375	33	-43.73	3423.89	88.6	Pass	
L34	27.91 - 27.66	Pole	TP40.6191x40.5786x0.675	34	-43.86	5256.65	58.4	Pass	
L35	27.66 - 27.25	Pole	TP40.6855x40.6191x0.675	35	-44.03	5265.38	58.5	Pass	
L36	27.25 - 26.98	Pole	TP40.7293x40.6855x0.675	36	-44.13	5271.15	58.5	Pass	
L37	26.98 - 26.83	Pole	TP40.7536x40.7293x0.6625	37	-44.19	5178.28	59.5	Pass	
L38	26.83 - 21.83	Pole	TP41.5636x40.7536x0.6625	38	-46.15	5282.91	59.9	Pass	
L39	21.83 - 16.83	Pole	TP42.3736x41.5636x0.6625	39	-48.14	5387.53	60.2	Pass	
L40	16.83 - 16	Pole	TP42.508x42.3736x0.6625	40	-48.47	5404.90	60.3	Pass	
L41	16 - 15.75	Pole	TP42.5485x42.508x0.8125	41	-48.60	6611.29	49.7	Pass	
L42	15.75 - 14.75	Pole	TP42.7105x42.5485x0.8125	42	-49.06	6636.96	49.7	Pass	
L43	14.75 - 14.5	Pole	TP42.751x42.7105x0.4875	43	-49.16	4016.91	81.0	Pass	
L44	14.5 - 12.08	Pole	TP43.1431x42.751x0.4875	44	-50.06	4054.18	81.2	Pass	
L45	12.08 - 11.83	Pole	TP43.1836x43.1431x0.7375	45	-50.19	6103.11	54.6	Pass	
L46	11.83 - 10	Pole	TP43.48x43.1836x0.7375	46	-50.97	6145.74	54.7	Pass	
L47	10 - 9.75	Pole	TP43.5205x43.48x0.7375	47	-51.10	6151.56	54.7	Pass	
L48	9.75 - 4.75	Pole	TP44.3305x43.5205x0.725	48	-53.30	6163.55	55.7	Pass	
L49	4.75 - 0	Pole	TP45.1x44.3305x0.7125	49	-55.41	6165.91	56.8	Pass	
							Summary		
							Pole (L29)	96.2	Pass
							RATING =	96.2	Pass

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

APPENDIX B
BASE LEVEL DRAWING

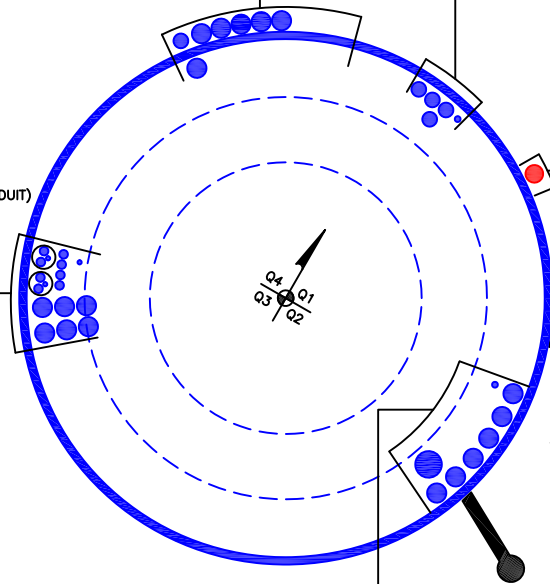


(OTHER CONSIDERED EQUIPMENT)
(1) 1-1/4" TO 127 FT LEVEL
(6) 1-5/8" TO 127 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 48 FT LEVEL
(4) 1-1/4" TO 148 FT LEVEL

(OTHER CONSIDERED EQUIPMENT—IN CONDUIT)
(2) 3/8" TO 157 FT LEVEL
(4) 3/4" TO 157 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 3/8" TO 157 FT LEVEL
(4) 3/4" TO 157 FT LEVEL
(6) 1-5/8" TO 157 FT LEVEL

(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1-1/2" TO 119 FT LEVEL



CLIMBING PEGS
W/ SAFETY CLIMB

(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 138 FT LEVEL
(6) 1-5/8" TO 138 FT LEVEL
(1) 2-1/4" TO 138 FT LEVEL

APPENDIX C
ADDITIONAL CALCULATIONS

Site BU: 876313
Work Order: 1966750



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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	160	12	0	0	10.75	10.75	0.349		A53-B-35
2	148	37	3.75	18	23.00	28.994	0.25	Auto	A607-60
3	114.75	38	4.25	18	27.89	34.042	0.3125	Auto	A607-60
4	81	38	5	18	32.73	38.884	0.375	Auto	A607-65
5	48	48	0	18	37.32	45.1	0.4375	Auto	A607-65

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	13	14	15	16	17	18	
1	0	27.08	channel	MP3-06 (1.1875in)	2			x						x										
2	0	12.08	channel	MP3-06 (1.1875in)	2												x					x		
3	14.75	27.91	channel	MP3-06 (1.1875in)	1															x				
4	45.42	70.58	channel	MP3-05 (1.1875in)	3			x						x						x				
5	78.17	105.33	channel	MP3-04 (1.1875in)	3			x						x						x				
6	27.25	46.75	plate	CCI-SFP-065125	3						x						x						x	
7	10	16	plate	CCI-SFP-060100	3						x						x						x	
8	70	80	plate	CCI-AFP-060100	3	x							x				x							
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	6.89	2.61	8.47	0.93	PC 8.8 - M20 (100)	41	PC 8.8 - M20 (100)	41.000	24.000	7.670	1.1875	A572-65
2	6.89	2.61	8.47	0.93	PC 8.8 - M20 (100)	41	PC 8.8 - M20 (100)	41.000	24.000	7.670	1.1875	A572-65
3	6.89	2.61	8.47	0.93	PC 8.8 - M20 (100)	41	PC 8.8 - M20 (100)	41.000	24.000	7.670	1.1875	A572-65
4	5.33	2.09	5.65	0.79	PC 8.8 - M20 (100)	29	PC 8.8 - M20 (100)	29.000	18.000	5.025	1.1875	A572-65
5	4.78	1.61	4.13	0.61	PC 8.8 - M20 (100)	17	PC 8.8 - M20 (100)	17.000	18.000	3.593	1.1875	A572-65
6	6.5	1.25	8.125	0.625	PC 8.8 - M20 (100)	33	PC 8.8 - M20 (100)	33.000	19.000	6.563	1.1875	A572-65
7	6	1	6	0.5	PC 8.8 - M20 (100)	24	PC 8.8 - M20 (100)	24.000	16.000	4.750	1.1875	A572-65
8	6	1	6	0.5	PC 8.8 - M20 (100)	30	PC 8.8 - M20 (100)	30.000	16.000	4.750	1.1875	A572-65

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	160 - 155	5		0	10.750	10.750	0.349	A53-B-35	1.000
2	155 - 150	5		0	10.750	10.750	0.349	A53-B-35	1.000
3	150 - 148	2	0	0	10.750	10.750	0.349	A53-B-35	1.000
4	148 - 143	5		18	23.000	23.810	0.25	A607-60	1.000
5	143 - 138	5		18	23.810	24.620	0.25	A607-60	1.000
6	138 - 133	5		18	24.620	25.430	0.25	A607-60	1.000
7	133 - 128	5		18	25.430	26.240	0.25	A607-60	1.000
8	128 - 123	5		18	26.240	27.050	0.25	A607-60	1.000
9	123 - 118	5		18	27.050	27.860	0.25	A607-60	1.000
10	118 - 114.75	7	3.75	18	27.860	28.994	0.25	A607-60	1.000
11	114.75 - 109.75	5		18	27.887	28.696	0.3125	A607-60	1.000
12	109.75 - 105.33	4.42		18	28.696	29.412	0.3125	A607-60	1.000
13	105.33 - 105.08	0.25		18	29.412	29.453	0.46875	A607-60	0.958
14	105.08 - 100.08	5		18	29.453	30.263	0.4625	A607-60	0.962
15	100.08 - 95.08	5		18	30.263	31.073	0.4625	A607-60	0.955
16	95.08 - 90.08	5		18	31.073	31.883	0.45	A607-60	0.973
17	90.08 - 85.08	5		18	31.883	32.693	0.45	A607-60	0.966
18	85.08 - 81	8.33	4.25	18	32.693	34.042	0.45	A607-60	0.961
19	81 - 75.75	5.25		18	32.729	33.579	0.375	A607-65	1.000
20	75.75 - 70.75	5		18	33.579	34.389	0.375	A607-65	1.000
21	70.75 - 70.58	0.17		18	34.389	34.416	0.375	A607-65	1.000
22	70.58 - 70.33	0.25		18	34.416	34.457	0.675	A607-65	1.043
23	70.33 - 70	0.33		18	34.457	34.510	0.675	A607-65	1.043
24	70 - 69.75	0.25		18	34.510	34.551	0.375	A607-65	1.000
25	69.75 - 64.75	5		18	34.551	35.361	0.375	A607-65	1.000
26	64.75 - 59.75	5		18	35.361	36.171	0.375	A607-65	1.000
27	59.75 - 54.75	5		18	36.171	36.981	0.375	A607-65	1.000
28	54.75 - 49.75	5		18	36.981	37.791	0.375	A607-65	1.000
29	49.75 - 48	6.75	5	18	37.791	38.884	0.375	A607-65	1.000
30	48 - 42	6		18	37.324	38.296	0.4375	A607-65	1.000
31	42 - 37	5		18	38.296	39.106	0.4375	A607-65	1.000
32	37 - 32	5		18	39.106	39.916	0.4375	A607-65	1.000
33	32 - 27.91	4.09		18	39.916	40.579	0.4375	A607-65	1.000
34	27.91 - 27.66	0.25		18	40.579	40.619	0.675	A607-65	1.036
35	27.66 - 27.25	0.41		18	40.619	40.686	0.675	A607-65	1.035
36	27.25 - 26.98	0.27		18	40.686	40.729	0.675	A607-65	0.948
37	26.98 - 26.83	0.15		18	40.729	40.754	0.6625	A607-65	0.966
38	26.83 - 21.83	5		18	40.754	41.564	0.6625	A607-65	0.959
39	21.83 - 16.83	5		18	41.564	42.374	0.6625	A607-65	0.954
40	16.83 - 16	0.83		18	42.374	42.508	0.6625	A607-65	0.953
41	16 - 15.75	0.25		18	42.508	42.549	0.8125	A607-65	0.947
42	15.75 - 14.75	1		18	42.549	42.711	0.8125	A607-65	0.945
43	14.75 - 14.5	0.25		18	42.711	42.751	0.4875	A607-65	1.158
44	14.5 - 12.08	2.42		18	42.751	43.143	0.4875	A607-65	1.155
45	12.08 - 11.83	0.25		18	43.143	43.184	0.7375	A607-65	0.938
46	11.83 - 10	1.83		18	43.184	43.480	0.7375	A607-65	0.936
47	10 - 9.75	0.25		18	43.480	43.521	0.7375	A607-65	0.936
48	9.75 - 4.75	5		18	43.521	44.331	0.725	A607-65	0.945
49	4.75 - 0	4.75		18	44.331	45.100	0.7125	A607-65	0.955

TNX Section Forces

Increment (ft):		TNX Output			
	5	Section Height (ft)	P _u (K)	M _{ux} (kip-ft)	V _u (K)
1	160 - 155		3.77	20.38	7.42
2	155 - 150		4.02	58.73	7.94
3	150 - 148		4.71	75.69	9.03
4	148 - 143		8.51	138.93	12.92
5	143 - 138		8.96	204.61	13.36
6	138 - 133		12.50	301.06	19.24
7	133 - 128		13.08	398.10	19.59
8	128 - 123		17.21	509.91	22.54
9	123 - 118		20.19	625.60	24.98
10	118 - 114.75		20.68	707.05	25.16
11	114.75 - 109.75		21.82	833.87	25.57
12	109.75 - 105.33		22.60	947.37	25.82
13	105.33 - 105.08		22.68	953.83	25.84
14	105.08 - 100.08		23.77	1083.84	26.19
15	100.08 - 95.08		24.90	1215.62	26.54
16	95.08 - 90.08		26.06	1349.10	26.87
17	90.08 - 85.08		27.24	1484.23	27.20
18	85.08 - 81		28.23	1595.66	27.45
19	81 - 75.75		30.11	1740.96	27.89
20	75.75 - 70.75		31.28	1880.89	28.11
21	70.75 - 70.58		31.34	1885.67	28.15
22	70.58 - 70.33		31.43	1892.70	28.14
23	70.33 - 70		31.54	1901.98	28.15
24	70 - 69.75		31.60	1909.02	28.18
25	69.75 - 64.75		32.78	2050.29	28.38
26	64.75 - 59.75		34.01	2192.53	28.56
27	59.75 - 54.75		35.26	2335.66	28.73
28	54.75 - 49.75		36.53	2479.58	28.88
29	49.75 - 48		36.96	2530.13	28.95
30	48 - 42		39.60	2705.27	29.33
31	42 - 37		41.04	2852.14	29.46
32	37 - 32		42.51	2999.58	29.56
33	32 - 27.91		43.73	3120.54	29.63
34	27.91 - 27.66		43.86	3127.94	29.63
35	27.66 - 27.25		44.03	3140.09	29.64
36	27.25 - 26.98		44.13	3148.09	29.65
37	26.98 - 26.83		44.19	3152.54	29.68
38	26.83 - 21.83		46.15	3301.42	29.90
39	21.83 - 16.83		48.14	3451.24	30.08
40	16.83 - 16		48.47	3476.19	30.11
41	16 - 15.75		48.60	3483.72	30.11
42	15.75 - 14.75		49.06	3513.83	30.16
43	14.75 - 14.5		49.16	3521.36	30.16
44	14.5 - 12.08		50.06	3594.35	30.23
45	12.08 - 11.83		50.19	3601.90	30.21
46	11.83 - 10		50.97	3657.22	30.31
47	10 - 9.75		51.10	3664.78	30.29
48	9.75 - 4.75		53.30	3816.59	30.48
49	4.75 - 0		55.41	3961.62	30.65

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
160 - 155	Pole	TP10.75x10.75x0.349	Pole	21.0%	Pass
155 - 150	Pole	TP10.75x10.75x0.349	Pole	58.0%	Pass
150 - 148	Pole	TP10.75x10.75x0.349	Pole	74.6%	Pass
148 - 143	Pole	TP23.81x23x0.25	Pole	22.3%	Pass
143 - 138	Pole	TP24.62x23.81x0.25	Pole	30.4%	Pass
138 - 133	Pole	TP25.43x24.62x0.25	Pole	42.1%	Pass
133 - 128	Pole	TP26.24x25.43x0.25	Pole	52.3%	Pass
128 - 123	Pole	TP27.05x26.24x0.25	Pole	63.6%	Pass
123 - 118	Pole	TP27.86x27.05x0.25	Pole	74.0%	Pass
118 - 114.75	Pole	TP28.994x27.86x0.25	Pole	80.8%	Pass
114.75 - 109.75	Pole	TP28.696x27.887x0.3125	Pole	72.3%	Pass
109.75 - 105.33	Pole	TP29.412x28.696x0.3125	Pole	78.0%	Pass
105.33 - 105.08	Pole + Reinf.	TP29.453x29.412x0.4688	Reinf. 5 Tension Rupture	74.2%	Pass
105.08 - 100.08	Pole + Reinf.	TP30.263x29.453x0.4625	Reinf. 5 Tension Rupture	80.5%	Pass
100.08 - 95.08	Pole + Reinf.	TP31.073x30.263x0.4625	Reinf. 5 Tension Rupture	86.2%	Pass
95.08 - 90.08	Pole + Reinf.	TP31.883x31.073x0.45	Reinf. 5 Tension Rupture	91.4%	Pass
90.08 - 85.08	Pole + Reinf.	TP32.693x31.883x0.45	Reinf. 5 Tension Rupture	96.3%	Pass
85.08 - 81	Pole + Reinf.	TP34.042x32.693x0.45	Reinf. 5 Tension Rupture	99.9%	Pass
81 - 75.75	Pole	TP33.579x32.729x0.375	Pole	84.3%	Pass
75.75 - 70.75	Pole	TP34.389x33.579x0.375	Pole	86.8%	Pass
70.75 - 70.58	Pole	TP34.416x34.389x0.375	Pole	86.9%	Pass
70.58 - 70.33	Pole + Reinf.	TP34.457x34.416x0.675	Reinf. 4 Tension Rupture	76.0%	Pass
70.33 - 70	Pole + Reinf.	TP34.51x34.457x0.675	Reinf. 4 Tension Rupture	76.2%	Pass
70 - 69.75	Pole	TP34.551x34.51x0.375	Pole	87.2%	Pass
69.75 - 64.75	Pole	TP35.361x34.551x0.375	Pole	89.4%	Pass
64.75 - 59.75	Pole	TP36.171x35.361x0.375	Pole	91.4%	Pass
59.75 - 54.75	Pole	TP36.981x36.171x0.375	Pole	93.5%	Pass
54.75 - 49.75	Pole	TP37.791x36.981x0.375	Pole	95.5%	Pass
49.75 - 48	Pole	TP38.884x37.791x0.375	Pole	96.2%	Pass
48 - 42	Pole	TP38.296x37.324x0.4375	Pole	86.3%	Pass
42 - 37	Pole	TP39.106x38.296x0.4375	Pole	87.2%	Pass
37 - 32	Pole	TP39.916x39.106x0.4375	Pole	88.0%	Pass
32 - 27.91	Pole	TP40.579x39.916x0.4375	Pole	88.5%	Pass
27.91 - 27.66	Pole + Reinf.	TP40.619x40.579x0.675	Reinf. 6 Tension Rupture	86.4%	Pass
27.66 - 27.25	Pole + Reinf.	TP40.686x40.619x0.675	Reinf. 6 Tension Rupture	86.5%	Pass
27.25 - 26.98	Pole + Reinf.	TP40.729x40.686x0.675	Reinf. 1 Tension Rupture	84.6%	Pass
26.98 - 26.83	Pole + Reinf.	TP40.754x40.729x0.6625	Reinf. 1 Tension Rupture	84.7%	Pass
26.83 - 21.83	Pole + Reinf.	TP41.564x40.754x0.6625	Reinf. 1 Tension Rupture	85.8%	Pass
21.83 - 16.83	Pole + Reinf.	TP42.374x41.564x0.6625	Reinf. 1 Tension Rupture	86.8%	Pass
16.83 - 16	Pole + Reinf.	TP42.508x42.374x0.6625	Reinf. 1 Tension Rupture	86.9%	Pass
16 - 15.75	Pole + Reinf.	TP42.549x42.508x0.8125	Reinf. 7 Tension Rupture	77.9%	Pass
15.75 - 14.75	Pole + Reinf.	TP42.711x42.549x0.8125	Reinf. 7 Tension Rupture	78.1%	Pass
14.75 - 14.5	Pole + Reinf.	TP42.751x42.711x0.4875	Pole	88.7%	Pass
14.5 - 12.08	Pole + Reinf.	TP43.143x42.751x0.4875	Pole	89.1%	Pass
12.08 - 11.83	Pole + Reinf.	TP43.184x43.143x0.7375	Reinf. 1 Tension Rupture	79.8%	Pass
11.83 - 10	Pole + Reinf.	TP43.48x43.184x0.7375	Reinf. 1 Tension Rupture	80.1%	Pass
10 - 9.75	Pole + Reinf.	TP43.521x43.48x0.7375	Reinf. 1 Tension Rupture	80.1%	Pass
9.75 - 4.75	Pole + Reinf.	TP44.331x43.521x0.725	Reinf. 1 Tension Rupture	81.0%	Pass
4.75 - 0	Pole + Reinf.	TP45.1x44.331x0.7125	Reinf. 1 Tension Rupture	81.7%	Pass
				Summary	
			Pole	96.2%	Pass
			Reinforcement	99.9%	Pass
			Overall	99.9%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in ⁴)			Area (in ²)			% Capacity*								
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8
160 - 155	154	n/a	154	11.40	n/a	11.40	21.0%								
155 - 150	154	n/a	154	11.40	n/a	11.40	58.0%								
150 - 148	154	n/a	154	11.40	n/a	11.40	74.6%								
148 - 143	1311	n/a	1311	18.69	n/a	18.69	22.3%								
143 - 138	1450	n/a	1450	19.34	n/a	19.34	30.4%								
138 - 133	1600	n/a	1600	19.98	n/a	19.98	42.1%								
133 - 128	1759	n/a	1759	20.62	n/a	20.62	52.3%								
128 - 123	1929	n/a	1929	21.27	n/a	21.27	63.6%								
123 - 118	2109	n/a	2109	21.91	n/a	21.91	74.0%								
118 - 114.75	2232	n/a	2232	22.33	n/a	22.33	80.8%								
114.75 - 109.75	2865	n/a	2865	28.15	n/a	28.15	72.3%								
109.75 - 105.33	3087	n/a	3087	28.86	n/a	28.86	78.0%								
105.33 - 105.08	3100	1464	4564	28.90	12.39	41.29	52.4%					74.2%			
105.08 - 100.08	3366	1542	4907	29.71	12.39	42.10	56.8%					80.5%			
100.08 - 95.08	3646	1622	5268	30.51	12.39	42.90	60.9%					86.2%			
95.08 - 90.08	3942	1704	5645	31.31	12.39	43.70	65.0%					91.4%			
90.08 - 85.08	4253	1788	6041	32.12	12.39	44.51	68.9%					96.3%			
85.08 - 81	4519	1858	6377	32.77	12.39	45.16	72.0%					99.9%			
81 - 75.75	5503	n/a	5503	39.52	n/a	39.52	84.3%								
75.75 - 70.75	5916	n/a	5916	40.48	n/a	40.48	86.8%								
70.75 - 70.58	5930	n/a	5930	40.52	n/a	40.52	86.9%								
70.58 - 70.33	5976	4418	10394	40.56	34.95	75.51	51.8%				76.0%				71.0%
70.33 - 70	6005	4431	10436	40.63	34.95	75.58	51.9%				76.2%				71.1%
70 - 69.75	6000	n/a	6000	40.68	n/a	40.68	87.2%								
69.75 - 64.75	6437	n/a	6437	41.64	n/a	41.64	89.4%								
64.75 - 59.75	6895	n/a	6895	42.60	n/a	42.60	91.4%								
59.75 - 54.75	7373	n/a	7373	43.57	n/a	43.57	93.5%								
54.75 - 49.75	7874	n/a	7874	44.53	n/a	44.53	95.5%								
49.75 - 48	8054	n/a	8054	44.87	n/a	44.87	96.2%								
48 - 42	9516	n/a	9516	52.57	n/a	52.57	86.3%								
42 - 37	10140	n/a	10140	53.69	n/a	53.69	87.2%								
37 - 32	10791	n/a	10791	54.82	n/a	54.82	88.0%								
32 - 27.91	11343	n/a	11343	55.74	n/a	55.74	88.5%								
27.91 - 27.66	11405	5776	17181	55.80	32.85	88.64	60.6%			64.9%			86.4%		
27.66 - 27.25	11461	5795	17256	55.89	32.85	88.73	60.6%			65.0%			86.5%		
27.25 - 26.98	11472	5787	17258	55.95	25.41	81.36	58.1%	84.6%		84.6%					
26.98 - 26.83	11492	5793	17286	55.98	25.41	81.39	58.1%	84.7%		84.7%					
26.83 - 21.83	12199	6015	18214	57.11	25.41	82.52	58.9%	85.8%		85.8%					
21.83 - 16.83	12934	6240	19174	58.23	25.41	83.64	59.8%	86.8%		86.8%					
16.83 - 16	13059	6278	19337	58.42	25.41	83.83	60.0%	86.9%		86.9%					
16 - 15.75	13097	10584	23681	58.47	43.41	101.88	49.1%	71.2%		71.2%				77.9%	
15.75 - 14.75	13248	10662	23910	58.70	43.41	102.11	49.3%	71.4%		71.4%				78.1%	
14.75 - 14.5	13650	1331	14981	58.76	16.94	75.70	88.7%	88.5%							
14.5 - 12.08	14027	1359	15386	59.30	16.94	76.24	89.1%	88.9%							
12.08 - 11.83	13727	8795	22522	59.36	33.88	93.24	57.0%	79.8%		77.7%					
11.83 - 10	14014	8911	22925	59.77	33.88	93.65	57.3%	80.1%		78.0%					
10 - 9.75	14054	8927	22981	59.82	33.88	93.70	57.3%	80.1%		78.1%					
9.75 - 4.75	14861	9248	24108	60.95	33.88	94.83	58.3%	81.0%		78.9%					
4.75 - 0	15655	9558	25213	62.02	33.88	95.90	59.1%	81.7%		79.7%					

Note: Section capacity checked using 5 degree increments.
Rating per TIA-222-H Section 15.5.

Bolted Extension Connection

TIA Rev. H



1. PARAMETERS

Elevation: 148'

1.1 tnxTower Reactions

Apply TIA-222-H Section 15.5?

No
Yes

Moment: $M := 75.69 \text{ kip}\cdot\text{ft}$

Axial Load: $P := 4.71 \text{ kip}$

Shear Load: $V := 9.03 \text{ kip}$

1.2 HSS Jump Properties

HSS Member: **6x6x1/2**

Number of HSS: $N_{\text{exist}} := 3$

HSS Grade: $F_{y_{\text{Ex}}} := 46 \text{ ksi}$ $F_{u_{\text{Ex}}} := 62 \text{ ksi}$

Diameter to the centroid of HSS: $BC_{\text{exist}} := 39.5 \text{ in}$

Thickness of HSS: $t_{\text{exist}} := 0.465 \text{ in}$

HSS Width: $w_{\text{exist}} := 6 \text{ in}$

Gross Area of One HSS: $A_{g_{\text{exist}}} := 9.74 \text{ in}^2$

Radius of Gyration of HSS: $r_{x2} := 2.23 \text{ in}$

Plastic Modulus: $Z_{\text{HSS}} := 19.8 \text{ in}^3$

Moment of Inertia of HSS: $I_{\text{exist}} := \frac{N_{\text{exist}} \cdot BC_{\text{exist}}^2 \cdot A_{g_{\text{exist}}}}{8} = 5698.81 \cdot \text{in}^4$

1.3 Reactions to HSS

(HSS Group to take full load)

Moment Reaction to HSS Group: $M_{\text{exist}} := M = 75.69 \cdot \text{kip}\cdot\text{ft}$

Axial Reaction to HSS Group: $P_{\text{exist}} := P = 4.71 \cdot \text{kip}$

Shear Reaction HSS Group: $V_{\text{exist}} := V = 9.03 \cdot \text{kip}$

2. HSS Checks

2.1 Maximum Axial Forces in Single HSS

Outer Radius of HSS Circle: $C := \frac{BC_{\text{exist}}}{2} = 19.75 \cdot \text{in}$

Critical Compression Bending Stress: $P_{\text{comp}} := \frac{M_{\text{exist}} \cdot C}{I_{\text{exist}}} \cdot A_{g_{\text{exist}}} + \frac{P_{\text{exist}}}{N_{\text{exist}}} = 32.23 \cdot \text{kip}$

Critical Tension Bending Stress: $P_{\text{tens}} := \frac{M_{\text{exist}} \cdot C}{I_{\text{exist}}} \cdot A_{g_{\text{exist}}} - \frac{P_{\text{exist}}}{N_{\text{exist}}} = 29.09 \cdot \text{kip}$

2.2 Available Compression Strength

[AISC 15th Edition E3-1]

Resistance Factor: $\phi_c := 0.9$

Unbraced Length: $L_u := 94 \text{in}$

Effective Length Factor: $K := 1.0$

Effective Length of Member: $L_c := K \cdot L_u = 94 \cdot \text{in}$ [AISC 15th Edition E3-2]

Strength of Bridge Stiffener: $F_{y_{EX}} = 46 \cdot \text{ksi}$ $F_{u_{EX}} = 62 \cdot \text{ksi}$

Elastic Buckling Stress: $F_e := \frac{\pi^2 \cdot 29000 \text{ksi}}{\left(\frac{L_c}{r_{x2}}\right)^2} = 161.08 \cdot \text{ksi}$
[AISC 15th Ed., Eq. E3-4]

Determination of Critical Stress: $F_{cr} := \begin{cases} \left(0.658 \frac{F_{y_{EX}}}{F_e}\right) \cdot F_{y_{EX}} & \text{if } 4.71 \cdot \sqrt{\frac{E}{F_{y_{EX}}}} \geq \frac{L_c}{r_{x2}} \\ (0.877 \cdot F_e) & \text{otherwise} \end{cases}$
[AISC 15th Ed., Eqs. E3-2 and E3-3]

$F_{cr} = 40.82 \cdot \text{ksi}$

Allowable Compressive Strength: $\phi P_n := \begin{cases} (\phi_c \cdot F_{y_{EX}} \cdot A_{g_{\text{exist}}}) & \text{if } \frac{L_c}{r_{x2}} \leq 25 \\ (\phi_c \cdot F_{cr} \cdot A_{g_{\text{exist}}}) & \text{otherwise} \end{cases}$
[AISC 15th Ed., Eqs. J4-6 and E3-1]

$\phi P_n = 357.81 \cdot \text{kip}$

Check Compressive Strength:
$$\text{Capacity}_{\text{comp}} := \begin{cases} \frac{P_{\text{comp}}}{\phi P_n} & \text{if } S15\text{Allowable} = \text{"No"} \\ \frac{P_{\text{comp}}}{\phi P_n} \cdot \left(\frac{1}{1.05}\right) & \text{if } S15\text{Allowable} = \text{"Yes"} \end{cases} = 8.58\%$$

$$\text{Capacity}_{\text{comp}} = 8.58\%$$

2.3 Available Tension Strength

Gross Section Yield

[AISC 15th Edition Ch. D2]

Available Tension Yield Strength:
$$\phi P_{ty} := 0.9 \cdot F_{yEX} \cdot A_{g_exist} = 403.24 \cdot \text{kip}$$

Net Section Fracture

Bolt Hole Diameter:
$$BH := 1.0625 \text{in}$$

Thickness:
$$T := t_{\text{exist}} = 0.47 \cdot \text{in}$$

Net Area:
$$A_{\text{net}} := A_{g_exist} - 2 \left(BH + \frac{1}{16} \text{in} \right) \cdot T = 8.69 \cdot \text{in}^2$$

Net Area Limitation:
$$A_e := A_{\text{net}} = 8.69 \cdot \text{in}^2$$

Available Fractile Strength:
$$\phi P_{tr} := 0.75 \cdot F_{uEX} \cdot A_e = 404.26 \cdot \text{kip}$$

Tension Check

Controlling Mode of Failure:
$$\text{Check}_{\text{mode}} := \begin{cases} \text{"Fracture Controls"} & \text{if } \frac{P_{\text{tens}}}{\phi P_{tr}} > \frac{P_{\text{tens}}}{\phi P_{ty}} \\ \text{"Yield Controls"} & \text{otherwise} \end{cases}$$

$$\text{Check}_{\text{mode}} = \text{"Yield Controls"}$$

$$\phi P_{nt} := \begin{cases} \phi P_{tr} & \text{if } \text{Check}_{\text{mode}} = \text{"Fracture Controls"} \\ \phi P_{ty} & \text{otherwise} \end{cases}$$

Controlling Tension Mode Check:
$$\text{Capacity}_{\text{tension}} := \begin{cases} \frac{P_{\text{tens}}}{\phi P_{nt}} & \text{if } S15\text{Allowable} = \text{"No"} \\ \frac{P_{\text{tens}}}{\phi P_{nt}} \cdot \left(\frac{1}{1.05}\right) & \text{if } S15\text{Allowable} = \text{"Yes"} \end{cases} = 6.87\%$$

$$\text{Capacity}_{\text{tension}} = 6.87\%$$

2.4 Available Shear Strength

[AISC 15th Edition Ch. G]

Resistance Factor: $\phi_V := 0.9$

Width Resisting Shear Load: $h_{inner} := w_{exist} - 3 \cdot t_{exist} = 4.6 \cdot \text{in}$

Design Wall Thickness: $t_w := 0.93 \cdot t_{exist} = 0.432 \cdot \text{in}$

Effective Shear Area: $A_w := 2 \cdot h_{inner} \cdot t_w = 3.98 \cdot \text{in}^2$

Shear Buckling Coefficient: $k_V := 5$

$$\frac{h_{inner}}{t_w} = 10.65 < 1.1 \cdot \sqrt{\frac{k_V \cdot E}{F_{yEX}}} = 61.76 \rightarrow C_V := 1.0$$

Available Shear Strength: $\phi V_n := \phi_V \cdot 0.6 \cdot F_{yEX} \cdot A_w \cdot C_V = 98.93 \cdot \text{kip}$

Shear Load Per HSS: $V_u := \frac{V_{exist}}{N_{exist}} = 3.01 \cdot \text{kip}$

Check Shear Strength:

$$\text{Capacity}_{\text{shear}} := \begin{cases} \frac{V_u}{\phi V_n} & \text{if S15Allowable} = \text{"No"} \\ \frac{V_u}{\phi V_n} \cdot \left(\frac{1}{1.05}\right) & \text{if S15Allowable} = \text{"Yes"} \end{cases} = 2.9\%$$

Capacity_{shear} = 2.9%

2.4 Available Flexural Strength

[AISC 15th Edition Ch. F7]

Resistance Factor: $\phi_f := 0.9$

$$\frac{h_{inner}}{t_w} = 10.65 < 1.12 \cdot \sqrt{\frac{E}{F_{yEX}}} = 28.12 \rightarrow \text{Compact}$$

Available Flexural Strength: $\phi M_n := \phi_f \cdot F_{yEX} \cdot Z_{HSS} = 68.31 \cdot \text{ft} \cdot \text{kip}$

Flexural Load Per HSS: $M_u := V_u \cdot (L_u + 42 \text{in}) = 34.11 \cdot \text{ft} \cdot \text{kip}$

Check Flexural Strength:

$$\text{Capacity}_{\text{flexure}} := \begin{cases} \frac{M_u}{\phi M_n} & \text{if S15Allowable} = \text{"No"} \\ \frac{M_u}{\phi M_n} \cdot \left(\frac{1}{1.05}\right) & \text{if S15Allowable} = \text{"Yes"} \end{cases} = 47.56\%$$

Capacity_{flexure} = 47.56%

2.5 Combined Stresses

[AISC 15th Edition Ch. H]

Combined Flexure and Compression:

$$\text{Combined}_1 := \left[\begin{array}{l} \left[\frac{P_{\text{comp}}}{\phi P_n} + \frac{8}{9} \left(\frac{M_u}{\phi M_n} \right) \right] \text{ if } \frac{P_{\text{comp}}}{\phi P_n} \geq 0.2 \\ \left(\frac{P_{\text{comp}}}{2 \cdot \phi P_n} + \frac{M_u}{\phi M_n} \right) \text{ otherwise} \end{array} \right]$$

$$\text{Combined}_{\text{flex_comp}} := \left| \begin{array}{l} \text{Combined}_1 \text{ if S15Allowable} = \text{"No"} \\ \text{Combined}_1 \cdot \left(\frac{1}{1.05} \right) \text{ if S15Allowable} = \text{"Yes"} \end{array} \right| = 51.85\%$$

Combined_{flex_comp} = 51.85%

Combined Flexure and Tension:

$$\text{Combined}_2 := \left[\begin{array}{l} \left[\frac{P_{\text{tens}}}{\phi P_{nt}} + \frac{8}{9} \left(\frac{M_u}{\phi M_n} \right) \right] \text{ if } \frac{P_{\text{tens}}}{\phi P_{nt}} \geq 0.2 \\ \left(\frac{P_{\text{tens}}}{2 \cdot \phi P_{nt}} + \frac{M_u}{\phi M_n} \right) \text{ otherwise} \end{array} \right]$$

$$\text{Combined}_{\text{flex_tens}} := \left| \begin{array}{l} \text{Combined}_2 \text{ if S15Allowable} = \text{"No"} \\ \text{Combined}_2 \cdot \left(\frac{1}{1.05} \right) \text{ if S15Allowable} = \text{"Yes"} \end{array} \right| = 51\%$$

Combined_{flex_tens} = 51%

Combined Flexure, Compression, Shear:

$$\text{Combined}_3 := \left[\begin{array}{l} \frac{P_{\text{comp}}}{\phi P_n} + \frac{M_u}{\phi M_n} + \left(\frac{V_u}{\phi V_n} \right)^2 \text{ if S15Allowable} = \text{"No"} \\ \left[\frac{P_{\text{comp}}}{\phi P_n} + \frac{M_u}{\phi M_n} + \left(\frac{V_u}{\phi V_n} \right)^2 \right] \cdot \left(\frac{1}{1.05} \right) \text{ if S15Allowable} = \text{"Yes"} \end{array} \right]$$

Combined₃ = 56.23%

Combined Flexure, Tension, Shear:

$$\text{Combined}_4 := \left[\begin{array}{l} \frac{P_{\text{tens}}}{\phi P_{nt}} + \frac{M_u}{\phi M_n} + \left(\frac{V_u}{\phi V_n} \right)^2 \text{ if S15Allowable} = \text{"No"} \\ \left[\frac{P_{\text{tens}}}{\phi P_{nt}} + \frac{M_u}{\phi M_n} + \left(\frac{V_u}{\phi V_n} \right)^2 \right] \cdot \left(\frac{1}{1.05} \right) \text{ if S15Allowable} = \text{"Yes"} \end{array} \right]$$

Combined₄ = 54.52%

Monopole Base Plate Connection

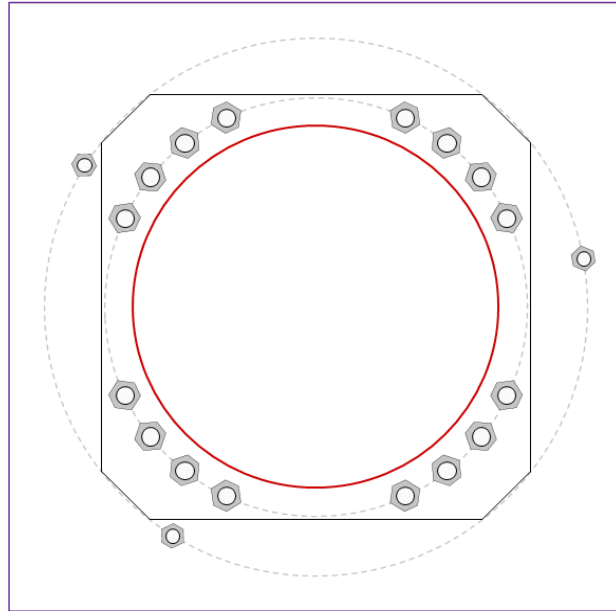


Site Info	
BU #	876313
Site Name	OHNSON AVE. BURNT
Order #	556616 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	See Custom Sheet
I_{ar} (in)	See Custom Sheet

Applied Loads	
Moment (kip-ft)	3961.62
Axial Force (kips)	55.41
Shear Force (kips)	30.65

*TIA-222-H Section 15.5 Applied



Connection Properties		Analysis Results	
Anchor Rod Data		Anchor Rod Summary <i>(units of kips, kip-in)</i>	
GROUP 1: (16) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 52" BC <i>Anchor Spacing: 6 in</i>		GROUP 1:	
GROUP 2: (3) 1-3/4" ϕ bolts (Williams R71 N; $F_y=120$ ksi, $F_u=125$ ksi) on 67.1" BC <i>pos. (deg): 10.3, 148.3, 238.3</i>		$Pu_t = 190.9$	$\phi Pn_t = 243.75$ Stress Rating
		$Vu = 1.92$	$\phi Vn = 149.1$ 74.6%
		$Mu = n/a$	$\phi Mn = n/a$ Pass
Base Plate Data		GROUP 2:	
53" W x 3" Plate (A572-50; $F_y=50$ ksi, $F_u=65$ ksi); Clip: 6 in		$Pu_t = 189.2$	$\phi Pn_t = 243.75$ Stress Rating
Stiffener Data		$Vu = 0$	$\phi Vn = 121.88$ 73.9%
N/A		$Mu = n/a$	$\phi Mn = n/a$ Pass
Pole Data		Base Plate Summary	
45.1" x 0.4375" 18-sided pole (A607-65; $F_y=65$ ksi, $F_u=80$ ksi)		Max Stress (ksi):	28.92 (Flexural)
		Allowable Stress (ksi):	45
		Stress Rating:	61.2% Pass

CCIplate

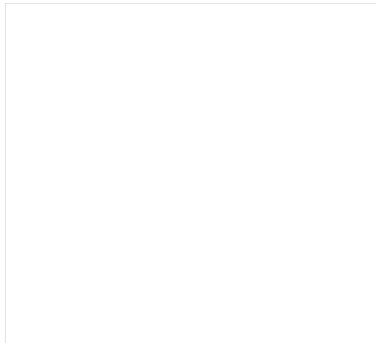
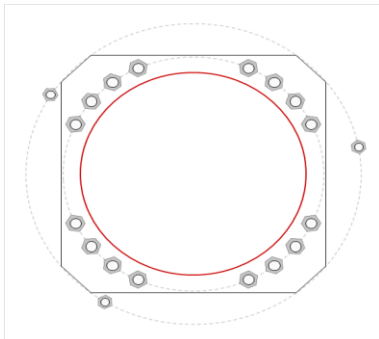
Elevation (ft) 0 (Base)

note: Bending interaction not considered when Grout Considered = "Yes"

Bolt Group	Resist Axial	Resist Shear	Induce Plate Bending	Grout Considered	Apply at BARB Elevation	BARB CL Elevation (ft)
1	Yes	Yes	Yes	No	No	
2	No	No	No	No	No	

Custom Bolt Connection										
Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, η	l_{ar} (in):	Thread Type	Area Override, in ²	Tension Only
1	1	25.1225713	2.25	A615-75	52	0.5	2.25	N-Included		No
2	1	38.3741904	2.25	A615-75	52	0.5	2.25	N-Included		No
3	1	51.6258096	2.25	A615-75	52	0.5	2.25	N-Included		No
4	1	64.8774287	2.25	A615-75	52	0.5	2.25	N-Included		No
5	1	115.122571	2.25	A615-75	52	0.5	2.25	N-Included		No
6	1	128.37419	2.25	A615-75	52	0.5	2.25	N-Included		No
7	1	141.62581	2.25	A615-75	52	0.5	2.25	N-Included		No
8	1	154.877429	2.25	A615-75	52	0.5	2.25	N-Included		No
9	1	205.122571	2.25	A615-75	52	0.5	2.25	N-Included		No
10	1	218.37419	2.25	A615-75	52	0.5	2.25	N-Included		No
11	1	231.62581	2.25	A615-75	52	0.5	2.25	N-Included		No
12	1	244.877429	2.25	A615-75	52	0.5	2.25	N-Included		No
13	1	295.122571	2.25	A615-75	52	0.5	2.25	N-Included		No
14	1	308.37419	2.25	A615-75	52	0.5	2.25	N-Included		No
15	1	321.62581	2.25	A615-75	52	0.5	2.25	N-Included		No
16	1	334.877429	2.25	A615-75	52	0.5	2.25	N-Included		No
17	2	10.3	1.75	Williams R71	67.1	0.5	0	N-Included	2.6	No
18	2	148.3	1.75	Williams R71	67.1	0.5	0	N-Included	2.6	No
19	2	238.3	1.75	Williams R71	67.1	0.5	0	N-Included	2.6	No

Plot Graphic



Drilled Pier Foundation

BU # :	876313
Site Name:	WEST JOHNSON AVE. BU
Order Number:	556616 Rev. 0
TIA-222 Revision:	H
Tower Type:	Monopole



Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	3961.62	
Axial Force (kips)	55.43	
Shear Force (kips)	30.62	

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

Pier Design Data	
Depth	25.5 ft
Ext. Above Grade	0.5 ft
Pier Section 1	
<i>From 0.5' above grade to 6.5' below grade</i>	
Pier Diameter	11 ft
Rebar Quantity	20
Rebar Size	11
Rebar Cage Diameter	73.34 in
Tie Size	5
Tie Spacing	18 in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Pier Section 2	
<i>From 6.5' below grade to 25.5' below grade</i>	
Pier Diameter	7 ft
Rebar Quantity	20
Rebar Size	11
Clear Cover to Ties	4 in
Tie Size	5
Tie Spacing	18 in

Analysis Results		
Soil Lateral Check		
	Compression	Uplift
D _{req} (ft from TOC)	5.21	-
Soil Safety Factor	1.80	-
Max Moment (kip-ft)	4118.33	-
Rating*	70.2%	-
Soil Vertical Check		
	Compression	Uplift
Skin Friction (kips)	236.44	-
End Bearing (kips)	123.82	-
Weight of Concrete (kips)	206.61	-
Total Capacity (kips)	360.27	-
Axial (kips)	262.04	-
Rating*	69.3%	-
Reinforced Concrete Flexure		
	Compression	Uplift
Critical Depth (ft from TOC)	7.01	-
Critical Moment (kip-ft)	4060.16	-
Critical Moment Capacity	5109.78	-
Rating*	75.7%	-
Reinforced Concrete Shear		
	Compression	Uplift
Critical Depth (ft from TOC)	12.75	-
Critical Shear (kip)	407.09	-
Critical Shear Capacity	499.81	-
Rating*	77.6%	-

Structural Foundation Rating*	77.6%
Soil Interaction Rating*	70.2%

*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	<input checked="" type="checkbox"/>
N/A	<input type="checkbox"/>
Additional Longitudinal Rebar	
Input Effective Depths (else Actual):	<input type="checkbox"/>
Shear Design Options	
Check Shear along Depth of Pier:	<input checked="" type="checkbox"/>
Utilize Shear-Friction Methodology:	<input type="checkbox"/>
Override Critical Depth:	<input type="checkbox"/>

[Go to Soil Calculations](#)

Soil Profile			
Groundwater Depth	10	# of Layers	10

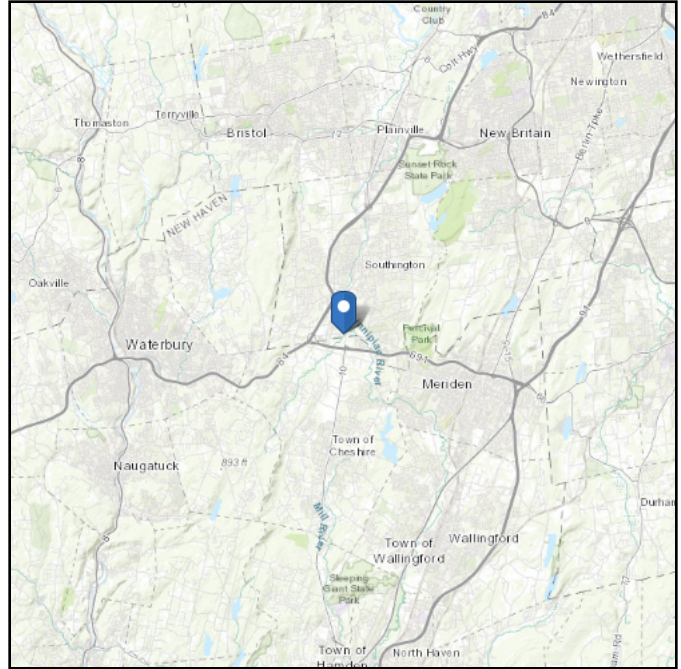
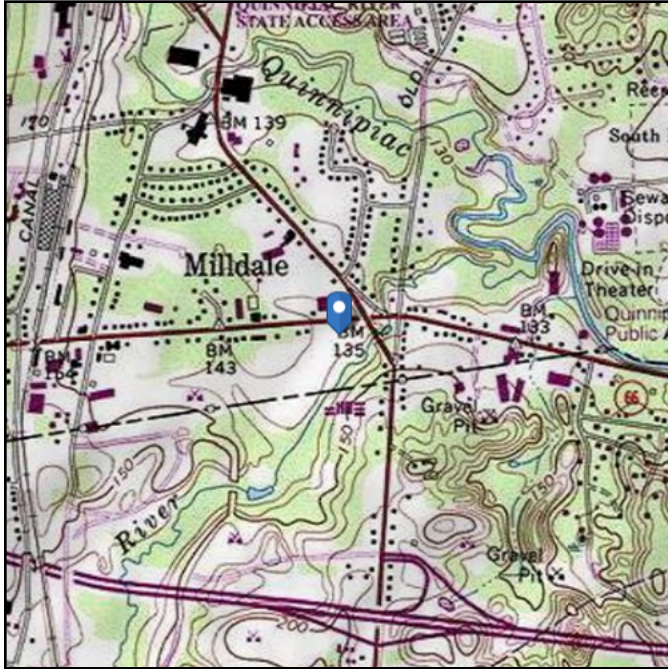
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ _{soil} (pcf)	γ _{concrete} (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	2	2	105	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	2	3.5	1.5	110	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
3	3.5	4	0.5	110	150	0	31	0.000	0.000	0.00	0.00			Cohesionless
4	4	4.7	0.7	110	150	0	31	0.000	0.000	0.00	0.00			Cohesionless
5	4.7	6	1.3	110	150	0	31	0.000	0.000	0.10	0.80			Cohesionless
6	6	8	2	120	150	2.5	0	1.375	1.375	1.48	1.48			Cohesive
7	8	10	2	115	150	2.25	0	1.24	1.24	1.23	1.23			Cohesive
8	10	15	5	48	87.6	1	0	0.55	0.55	0.55	0.55			Cohesive
9	15	20	5	48	87.6	1.25	0	0.69	0.69	0.66	0.66			Cohesive
10	20	25.5	5.5	43	87.6	0.75	0	0.41	0.41	0.41	0.41	4.29		Cohesive

ASCE 7 Hazards Report

Address:
No Address at This
Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 133.13 ft (NAVD 88)
Latitude: 41.564275
Longitude: -72.891861

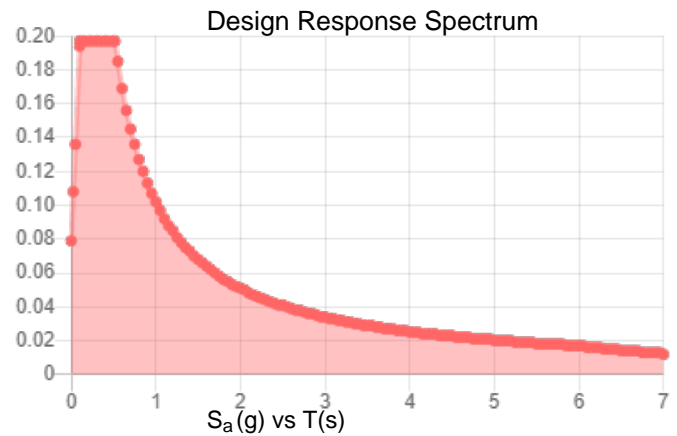
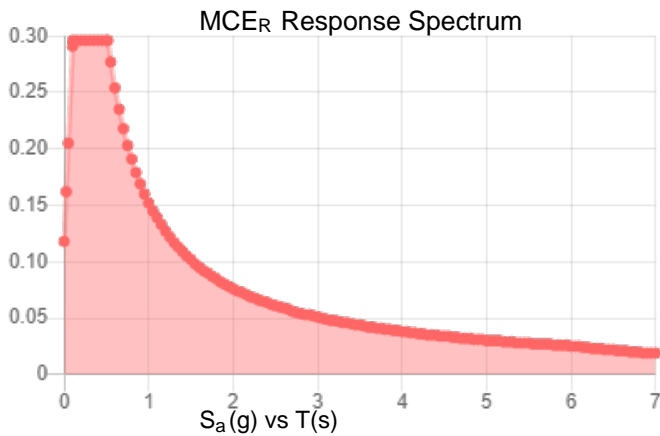


Site Soil Class: D - Stiff Soil

Results:

S_s :	0.185	S_{DS} :	0.197
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.095
S_{MS} :	0.296	PGA _M :	0.152
S_{M1} :	0.152	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Tue May 04 2021

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness: 0.75 in.

Concurrent Temperature: 15 F

Gust Speed: 50 mph

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

Date Accessed: Tue May 04 2021

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 50-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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Exhibit D

Date: **August 2, 2021**

Darcy Tarr
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6589



Trylon
1825 W. Walnut Hill Lane,
Suite 302
Irving, TX 75038
214-930-1730

Subject: **Mount Replacement Analysis Report**

Carrier Designation: **Dish Network Equipment Change Out**
Carrier Site Number: BOBDL00077A
Carrier Site Name: CT-CCI-T-876313

Crown Castle Designation: **Crown Castle BU Number:** 876313
Crown Castle Site Name: West Johnson Ave. Burnt House
Crown Castle JDE Job Number: 650067
Crown Castle Order Number: 556616 Rev. 0

Engineering Firm Designation: **Trylon Report Designation:** 189055

Site Data: **1394 Meriden Waterbury Tpk, Southington, Hartford County, CT, 06489**
Latitude 41°33'51.39" Longitude -72°53'30.70"

Structure Information: **Tower Height & Type:** **160.0 ft Monopole**
Mount Elevation: **119.0 ft**
Mount Type: **8.0 ft Platform**

Dear Darcy Tarr,

Trylon is pleased to submit this "**Mount Replacement Analysis Report**" to determine the structural integrity of Dish Network's antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

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:

Platform **Sufficient**
***Sufficient upon completion of the changes listed in the 'Recommendations' section of this report.**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Bryan P. Mawhinney

Respectfully Submitted by:
Cliff Abernathy, P.E.



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Supplemental Drawings

1) INTRODUCTION

This is a proposed 3 sector 8.0 ft Platform, designed by Commscope.

2) ANALYSIS CRITERIA

Building Code:	2015 IBC / 2018 CTSCB
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	125 mph
Exposure Category:	B
Topographic Factor at Base:	1.0
Topographic Factor at Mount:	1.0
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.185
Seismic S₁:	0.064
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
62.0	62.0	3	JMA WIRELESS	MX08FRO665-21	8.0 ft Platform [Commscope MC-PK8-DSH]
		3	FUJITSU	TA08025-B604	
		3	FUJITSU	TA08025-B605	
		1	RAYCAP	RDIDC-9181-PF-48	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	Dish Network Application	556616 Rev. 0	CCI Sites
Tower Structural Analysis Reports	Crown Castle	9791165	CCI Sites
Mount Manufacturer Drawings	Commscope	MC-PK8-DSH	TSA

3.1) Analysis Method

RISA-3D (Version 17.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

A tool internally developed, using Microsoft Excel, by Trylon was used to calculate wind loading on all appurtenances, dishes, and mount members for various load cases. Selected output from the analysis is included in Appendix B.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis* (Revision B).

3.2) Assumptions

- 1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
- 2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
- 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) The analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.
- 5) Prior structural modifications to the tower mounting system are assumed to be installed as shown per available data.
- 6) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A500 (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. Tylon should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity (Platform, All Sectors)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1, 2	Mount Pipe(s)	MP2	70.0	27.8	Pass
	Horizontal(s)	H1		11.2	Pass
	Standoff(s)	M12		47.7	Pass
	Handrail(s)	M19		10.8	Pass
	Mount Connection(s)	--		24.7	Pass

Structure Rating (max from all components) =	47.7%
---	--------------

Notes:

- 1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
- 2) Rating per TIA-222-H, Section 15.5

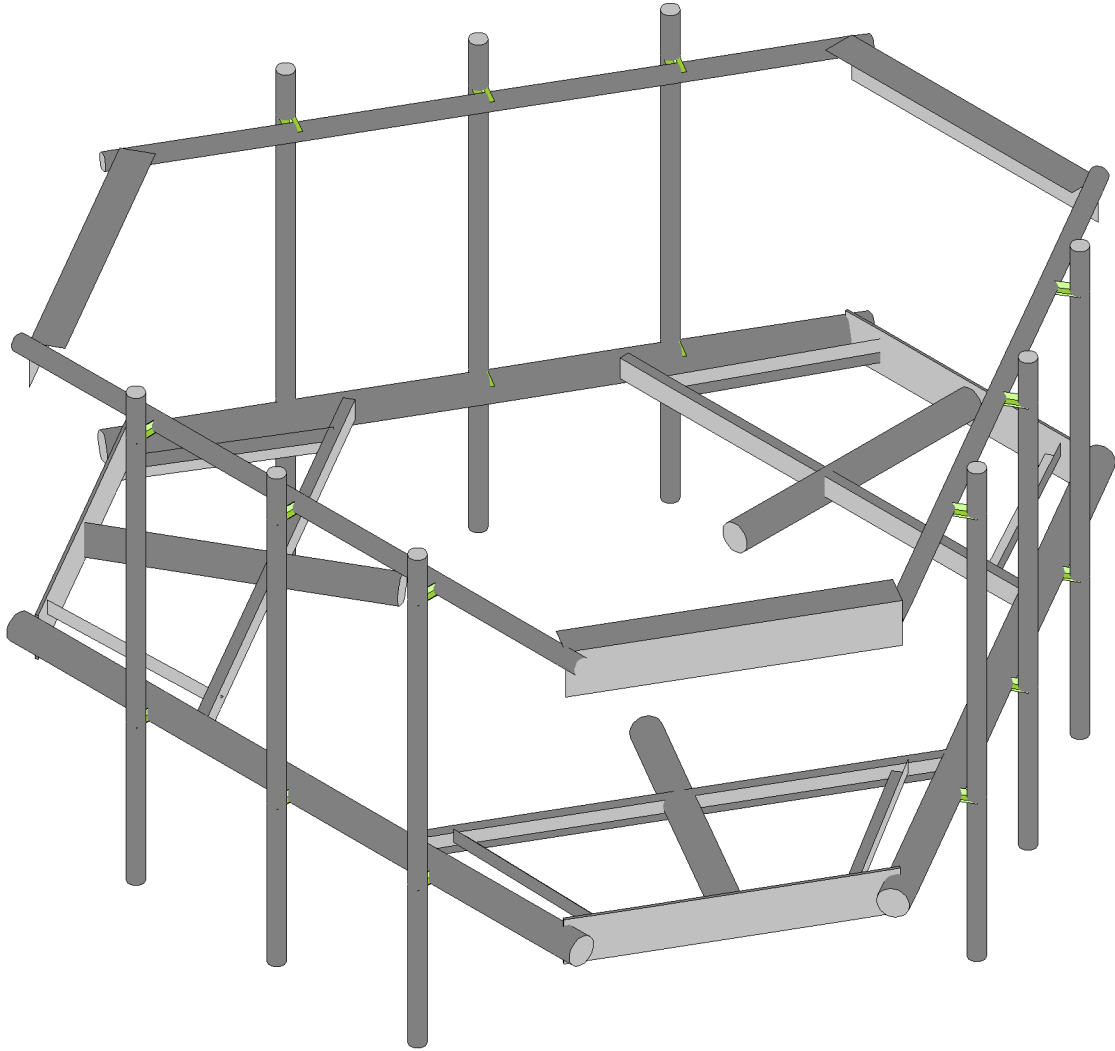
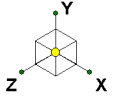
4.1) Recommendations

The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the proposed mount listed below must be installed.

1. Commscope MC-PK8-DSH.

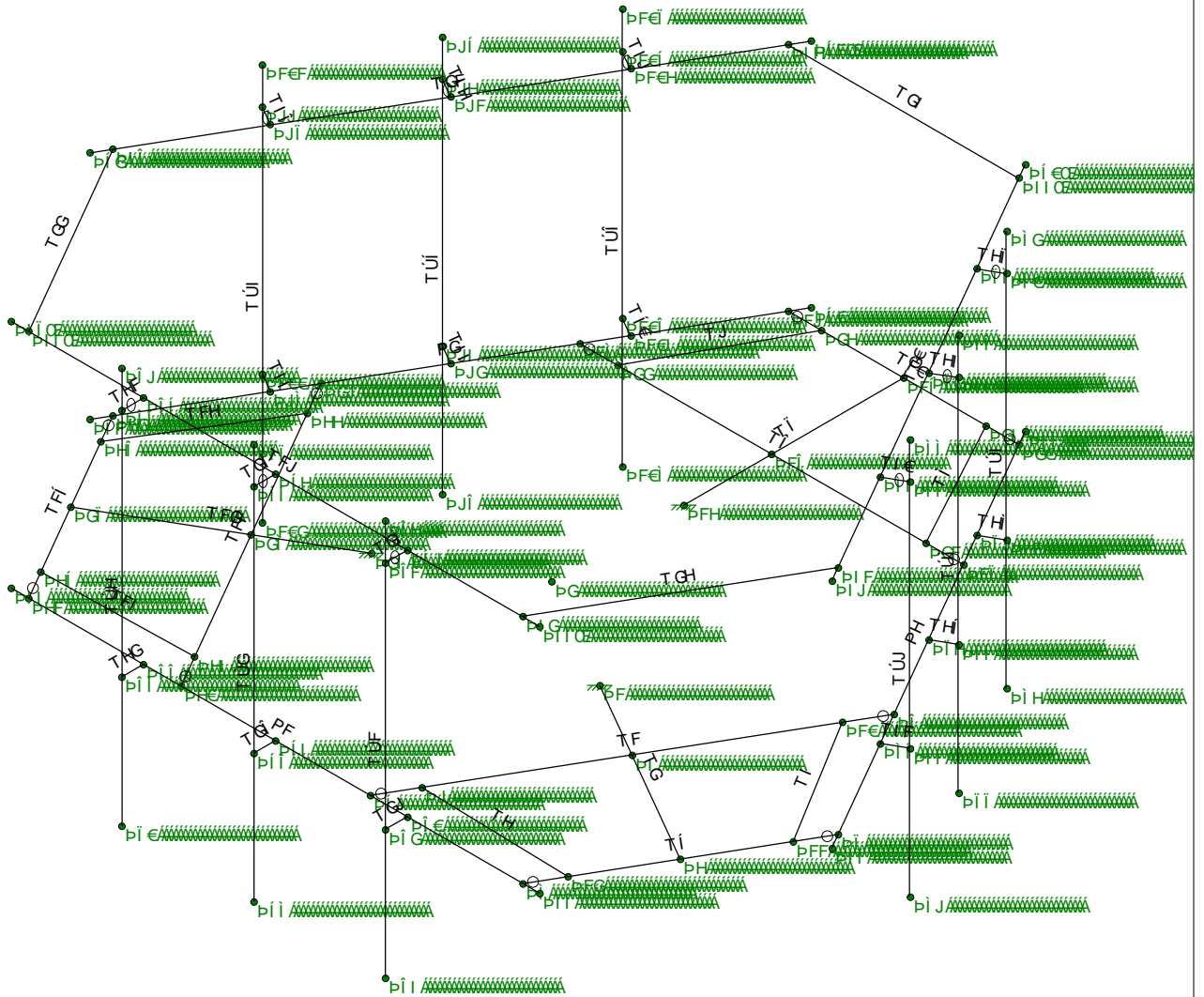
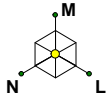
No structural modifications are required at this time, provided that the above-listed changes are implemented.

APPENDIX A
WIRE FRAME AND RENDERED MODELS



MC-PK8-C

SK - 1
Aug 2, 2021 at 11:16 AM
MC-PK8-C_loaded.r3d



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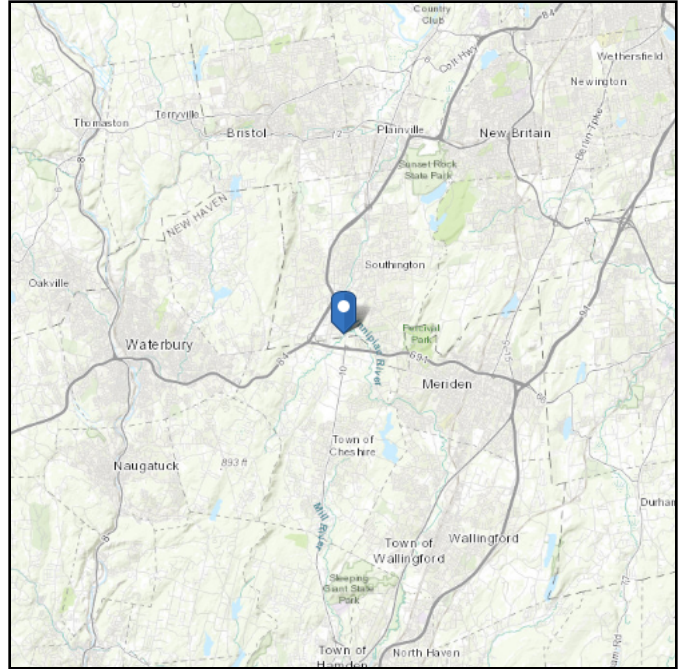
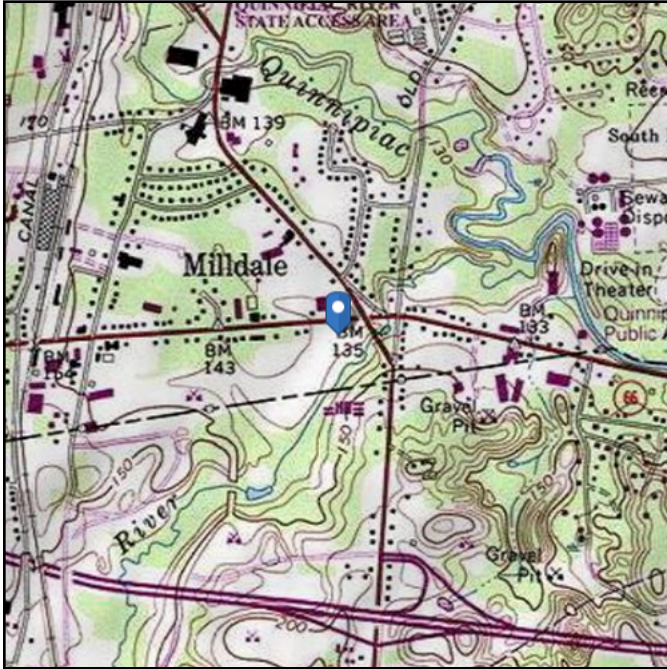
APPENDIX B
SOFTWARE INPUT CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This
Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 133.13 ft (NAVD 88)
Latitude: 41.564275
Longitude: -72.891861

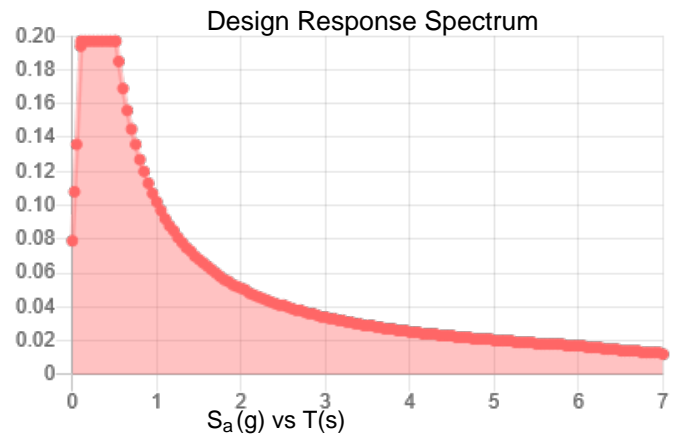
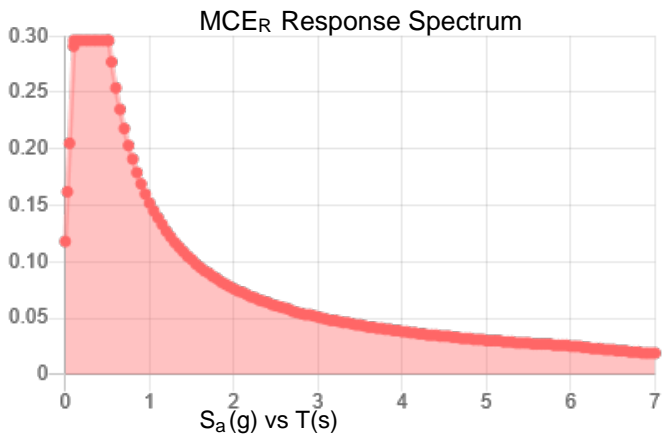


Site Soil Class: D - Stiff Soil

Results:

S_S :	0.185	S_{DS} :	0.197
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.095
S_{MS} :	0.296	PGA _M :	0.152
S_{M1} :	0.152	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Mon Aug 02 2021

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness: 0.75 in.

Concurrent Temperature: 15 F

Gust Speed: 50 mph

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

Date Accessed: Mon Aug 02 2021

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

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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Trylon

1825 W. Walnut Hill Lane Suite 120
Irving, TX 75038

TIA LOAD CALCULATOR 2.0

PROJECT DATA	
Job Code:	189055
Carrier Site ID:	BOBDL00077A
Carrier Site Name:	CT-CCI-T-876313

CODES AND STANDARDS	
Building Code:	2015 IBC
Local Building Code:	2018 CTSCB
Design Standard:	TIA-222-H

STRUCTURE DETAILS		
Mount Type:	Platform	--
Mount Elevation:	119.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	160.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	B	--
Site Class:	D - Default	--
Ground Elevation:	133	ft.

TOPOGRAPHIC DATA		
Topographic Category:	1.00	--
Topographic Feature:	N/A	--
Crest Point Elevation:	0.00	ft.
Base Point Elevation:	0.00	ft.
Crest to Mid-Height (L/2):	0.00	ft.
Distance from Crest (x):	0.00	ft.
Base Topo Factor (K_{zt}):	1.00	--
Mount Topo Factor (K_{zt}):	1.00	--

WIND PARAMETERS		
Design Wind Speed:	125	mph
Wind Escalation Factor (K_s):	1.00	--
Velocity Coefficient (K_z):	1.04	--
Directionality Factor (K_d):	0.95	--
Gust Effect Factor (G _h):	1.00	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	39.28	psf

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness (t_i):	1.50	in
Importance Factor (I_i):	1.00	--
Ice Velocity Pressure (q_{iz}):	39.28	psf
Mount Ice Thickness (t_{iz}):	1.71	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	70.70	psf
Round Member Pressure:	42.42	psf
Ice Wind Pressure:	7.43	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel. (S_s):	0.19	g
1 Second Accel. (S_1):	0.06	g
Short Period Des. (S_{DS}):	0.20	g
1 Second Des. (S_{D1}):	0.10	g
Short Period Coeff. (F_a):	1.60	--
1 Second Coeff. (F_v):	2.40	--
Response Coefficient (C_s):	0.10	--
Amplification Factor (A_S):	1.20	--

LOAD COMBINATIONS [LRFD]

#	Description
1	1.4DL
2	1.2DL + 1WL 0 AZI
3	1.2DL + 1WL 30 AZI
4	1.2DL + 1WL 45 AZI
5	1.2DL + 1WL 60 AZI
6	1.2DL + 1WL 90 AZI
7	1.2DL + 1WL 120 AZI
8	1.2DL + 1WL 135 AZI
9	1.2DL + 1WL 150 AZI
10	1.2DL + 1WL 180 AZI
11	1.2DL + 1WL 210 AZI
12	1.2DL + 1WL 225 AZI
13	1.2DL + 1WL 240 AZI
14	1.2DL + 1WL 270 AZI
15	1.2DL + 1WL 300 AZI
16	1.2DL + 1WL 315 AZI
17	1.2DL + 1WL 330 AZI
18	0.9DL + 1WL 0 AZI
19	0.9DL + 1WL 30 AZI
20	0.9DL + 1WL 45 AZI
21	0.9DL + 1WL 60 AZI
22	0.9DL + 1WL 90 AZI
23	0.9DL + 1WL 120 AZI
24	0.9DL + 1WL 135 AZI
25	0.9DL + 1WL 150 AZI
26	0.9DL + 1WL 180 AZI
27	0.9DL + 1WL 210 AZI
28	0.9DL + 1WL 225 AZI
29	0.9DL + 1WL 240 AZI
30	0.9DL + 1WL 270 AZI
31	0.9DL + 1WL 300 AZI
32	0.9DL + 1WL 315 AZI
33	0.9DL + 1WL 330 AZI
34	1.2DL + 1DLi + 1WLi 0 AZI
35	1.2DL + 1DLi + 1WLi 30 AZI
36	1.2DL + 1DLi + 1WLi 45 AZI
37	1.2DL + 1DLi + 1WLi 60 AZI
38	1.2DL + 1DLi + 1WLi 90 AZI
39	1.2DL + 1DLi + 1WLi 120 AZI
40	1.2DL + 1DLi + 1WLi 135 AZI
41	1.2DL + 1DLi + 1WLi 150 AZI

#	Description
42	1.2DL + 1DLi + 1WLi 180 AZI
43	1.2DL + 1DLi + 1WLi 210 AZI
44	1.2DL + 1DLi + 1WLi 225 AZI
45	1.2DL + 1DLi + 1WLi 240 AZI
46	1.2DL + 1DLi + 1WLi 270 AZI
47	1.2DL + 1DLi + 1WLi 300 AZI
48	1.2DL + 1DLi + 1WLi 315 AZI
49	1.2DL + 1DLi + 1WLi 330 AZI
50	(1.2+0.2Sds) + 1.0E 0 AZI
51	(1.2+0.2Sds) + 1.0E 30 AZI
52	(1.2+0.2Sds) + 1.0E 45 AZI
53	(1.2+0.2Sds) + 1.0E 60 AZI
54	(1.2+0.2Sds) + 1.0E 90 AZI
55	(1.2+0.2Sds) + 1.0E 120 AZI
56	(1.2+0.2Sds) + 1.0E 135 AZI
57	(1.2+0.2Sds) + 1.0E 150 AZI
58	(1.2+0.2Sds) + 1.0E 180 AZI
59	(1.2+0.2Sds) + 1.0E 210 AZI
60	(1.2+0.2Sds) + 1.0E 225 AZI
61	(1.2+0.2Sds) + 1.0E 240 AZI
62	(1.2+0.2Sds) + 1.0E 270 AZI
63	(1.2+0.2Sds) + 1.0E 300 AZI
64	(1.2+0.2Sds) + 1.0E 315 AZI
65	(1.2+0.2Sds) + 1.0E 330 AZI
66	(0.9-0.2Sds) + 1.0E 0 AZI
67	(0.9-0.2Sds) + 1.0E 30 AZI
68	(0.9-0.2Sds) + 1.0E 45 AZI
69	(0.9-0.2Sds) + 1.0E 60 AZI
70	(0.9-0.2Sds) + 1.0E 90 AZI
71	(0.9-0.2Sds) + 1.0E 120 AZI
72	(0.9-0.2Sds) + 1.0E 135 AZI
73	(0.9-0.2Sds) + 1.0E 150 AZI
74	(0.9-0.2Sds) + 1.0E 180 AZI
75	(0.9-0.2Sds) + 1.0E 210 AZI
76	(0.9-0.2Sds) + 1.0E 225 AZI
77	(0.9-0.2Sds) + 1.0E 240 AZI
78	(0.9-0.2Sds) + 1.0E 270 AZI
79	(0.9-0.2Sds) + 1.0E 300 AZI
80	(0.9-0.2Sds) + 1.0E 315 AZI
81	(0.9-0.2Sds) + 1.0E 330 AZI
82-88	1.2D + 1.5 Lv1

#	Description
89	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP1
90	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP1
91	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP1
92	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP1
93	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP1
94	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP1
95	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP1
96	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP1
97	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP1
98	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP1
99	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP1
100	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP1
101	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP1
102	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP1
103	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP1
104	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP1
105	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP2
106	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP2
107	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP2
108	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP2
109	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP2
110	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP2
111	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP2
112	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP2
113	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP2
114	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP2
115	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP2
116	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP2
117	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP2
118	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP2
119	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP2
120	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP2

#	Description
121	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP3
122	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP3
123	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP3
124	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP3
125	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP3
126	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP3
127	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP3
128	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP3
129	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP3
130	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP3
131	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP3
132	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP3
133	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP3
134	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP3
135	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP3
136	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP3
137	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP4
138	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP4
139	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP4
140	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP4
141	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP4
142	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP4
143	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP4
144	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP4
145	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP4
146	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP4
147	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP4
148	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP4
149	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP4
150	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP4
151	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP4
152	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP4

*This page shows an example of maintenance loads for (4) pipes, the number of mount pipe LCs may vary per site

EQUIPMENT LOADING [CONT.]

<i>Appurtenance Name/Location</i>	<i>Qty.</i>	<i>Elevation [ft]</i>	<i>--</i>	<i>EPA_N (ft²)</i>	<i>EPA_T (ft²)</i>	<i>Weight (lbs)</i>
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
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			No Ice			
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			No Ice			
--	--	--	w/ Ice			

EQUIPMENT LATERAL WIND FORCE CALCULATIONS

Appurtenance Name	Qty.	--	0° 180°	30° 210°	60° 240°	90° 270°	120° 300°	150° 330°
MX08FRO665-21	3	No Ice	441.47	265.90	382.95	207.38	382.95	265.90
MP2/MP5/MP8, 0/120/240	--	w/ Ice	77.46	48.95	67.96	39.45	67.96	48.95
TA08025-B604	3	No Ice	69.41	43.36	60.73	34.68	60.73	43.36
MP2/MP5/MP8, 0/120/240	--	w/ Ice	13.47	8.90	11.94	7.38	11.94	8.90
TA08025-B605	3	No Ice	69.41	47.30	62.04	39.93	62.04	47.30
MP2/MP5/MP8, 0/120/240	--	w/ Ice	13.47	9.59	12.17	8.30	12.17	9.59
RDIDC-9181-PF-48	1	No Ice	71.12	48.75	63.66	41.29	63.66	48.75
MP2, 0	--	w/ Ice	13.77	9.89	12.48	8.60	12.48	9.89
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
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		No Ice						
--	--	w/ Ice						

EQUIPMENT LATERAL WIND FORCE CALCULATIONS [CONT.]

<i>Appurtenance Name</i>	<i>Qty.</i>	--	<i>0° 180°</i>	<i>30° 210°</i>	<i>60° 240°</i>	<i>90° 270°</i>	<i>120° 300°</i>	<i>150° 330°</i>
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
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		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						

EQUIPMENT SEISMIC FORCE CALCULATIONS

<i>Appurtenance Name</i>	<i>Qty.</i>	<i>Elevation [ft]</i>	<i>Weight [lbs]</i>	<i>F_p [lbs]</i>
MX08FRO665-21	3	119	82.5	9.77
TA08025-B604	3	119	63.9	7.57
TA08025-B605	3	119	75	8.88
RDIDC-9181-PF-48	1	119	21.85	2.59

APPENDIX C
SOFTWARE ANALYSIS OUTPUT

>c]bh7ccfX]bUHyg'UbX'HYa dYfUi fYg'f7 cb]bi YXL

	Šcã\]	ÝÄá	ÝÄá	ZÄá	V\]Äá	Öcæ&@[] { Äæ] Æ
ÍG	ÞÍG	G	€	HÆÍÍÍH	€	
ÍH	ÞÍH	G	ÍÍÈG	HÆÍÍÍH	€	
ÍI	ÞÍI	G	ÈGÈÍ	HÆÍÍÍH	€	
ÍÍ	ÞÍÍ	ÈG	IG	GÈÍÍÍH	€	
ÍÏ	ÞÍÏ	ÈG	€	GÈÍÍÍH	€	
ÍÌ	ÞÍÌ	ÈG	IG	HÆÍÍÍH	€	
ÍÎ	ÞÍÎ	ÈG	€	HÆÍÍÍH	€	
ÍJ	ÞÍJ	ÈG	ÍÍÈG	HÆÍÍÍH	€	
Í€	ÞÍ€	ÈG	ÈGÈÍ	HÆÍÍÍH	€	
ÏF	ÞÍG	ÍÈÍGÈFH	IG	ÈJÈJHGÍ	€	
ÏG	ÞÍH	ÍÈÍGÈFH	€	ÈJÈJHGÍ	€	
ÏH	ÞÍI	ÍÍÈGJFÍ	IG	ÈFÈJHGÍ	€	
ÏI	ÞÍÍ	ÍÍÈGJFÍ	€	ÈFÈJHGÍ	€	
ÏÍ	ÞÍÏ	ÍÍÈGJFÍ	ÍÍÈG	ÈFÈJHGÍ	€	
ÏÏ	ÞÍÏ	ÍÍÈGJFÍ	ÈGÈÍ	ÈFÈJHGÍ	€	
ÏÌ	ÞÍÌ	HÈÍGÈFH	IG	ÈJÈÍÍÍÍ	€	
ÏÎ	ÞÍJ	HÈÍGÈFH	€	ÈJÈÍÍÍÍ	€	
ÏJ	ÞÍ€	HÈÍGJFÍ	IG	ÈFÈÍÍÍÍ	€	
Ï€	ÞÍF	HÈÍGJFÍ	€	ÈFÈÍÍÍÍ	€	
ÏF	ÞÍG	HÈÍGJFÍ	ÍÍÈG	ÈFÈÍÍÍÍ	€	
ÏG	ÞÍH	HÈÍGJFÍ	ÈGÈÍ	ÈFÈÍÍÍÍ	€	
ÏH	ÞÍI	ÍÍÈÍGÈFH	IG	ÈGÈÈÍÍÍ	€	
ÏI	ÞÍÍ	ÍÍÈÍGÈFH	€	ÈGÈÈÍÍÍ	€	
ÏÍ	ÞÍÏ	ÍÍÈGJFÍ	IG	ÈÈÈÈÍÍÍ	€	
ÏÏ	ÞÍÏ	ÍÍÈGJFÍ	€	ÈÈÈÈÍÍÍ	€	
ÏÌ	ÞÍÌ	ÍÍÈGJFÍ	ÍÍÈG	ÈÈÈÈÍÍÍ	€	
ÏÎ	ÞÍJ	ÍÍÈGJFÍ	ÈGÈÍ	ÈÈÈÈÍÍÍ	€	
ÏJ	ÞJF	ÈÈÍGÈFH	IG	ÈJÈJHGÍ	€	
J€	ÞJG	ÈÈÍGÈFH	€	ÈJÈJHGÍ	€	
JF	ÞJH	ÈÍÈGJFÍ	IG	ÈFÈJHGÍ	€	
JG	ÞJI	ÈÍÈGJFÍ	€	ÈFÈJHGÍ	€	
JH	ÞJÍ	ÈÍÈGJFÍ	ÍÍÈG	ÈFÈJHGÍ	€	
JI	ÞJÍ	ÈÍÈGJFÍ	ÈGÈÍ	ÈFÈJHGÍ	€	
JÍ	ÞJÍ	ÈÍÈÍGÈFH	IG	ÈGÈÈÍÍÍ	€	
JÌ	ÞJÌ	ÈÍÈÍGÈFH	€	ÈGÈÈÍÍÍ	€	
JÎ	ÞJJ	ÈÍÈGJFÍ	IG	ÈÈÈÈÍÍÍ	€	
JÏ	ÞF€€	ÈÍÈGJFÍ	€	ÈÈÈÈÍÍÍ	€	
JJ	ÞF€F	ÈÍÈGJFÍ	ÍÍÈG	ÈÈÈÈÍÍÍ	€	
F€€	ÞF€G	ÈÍÈGJFÍ	ÈGÈÍ	ÈÈÈÈÍÍÍ	€	
F€F	ÞF€H	ÈÈÈÍGÈFH	IG	ÈJÈÍÍÍÍ	€	
F€G	ÞF€I	ÈÈÈÍGÈFH	€	ÈJÈÍÍÍÍ	€	
F€H	ÞF€Í	ÈÈÈGJFÍ	IG	ÈFÈÍÍÍÍ	€	
F€I	ÞF€Ï	ÈÈÈGJFÍ	€	ÈFÈÍÍÍÍ	€	
F€Í	ÞF€Ï	ÈÈÈGJFÍ	ÍÍÈG	ÈFÈÍÍÍÍ	€	
F€Ï	ÞF€Ì	ÈÈÈGJFÍ	ÈGÈÍ	ÈFÈÍÍÍÍ	€	

A Ya Vyf'DfJa Ufm8UU

	Šcã\]	ÖRãc	Rããc	Sããc	ÜcæG^Æ	Úã] Æ	V^] ^	Ö•ã} Áãc	Tæ: Æ	Ö•ã} ÁÜ Æ
F	TF	ÞÍ	ÞÍ			Ucæ] Æ ~ Ö:ãã *	Ö^æ	Ö@] ^	ÖÍ Ö: ÈÍ	V^] Ææ
G	TG	ÞH	ÞF			Ucæ] Æ ~	Ö^æ	Uã ^	ÖÍ HÖ: ÈÖ	V^] Ææ

<chFc``YX`GhYY`DfcdYfHjYg

	Šaa\]	ÒĀ•ă	ÕĀ•ă	Þ`	V@!\ (ÄÞÖĒĒ^)	•ă Ž ĐăĒ Ĩă\ăž •ă	Ů`	ø ž •ă	Ůc	
F	ŌEJG	GĴĴĴ	FFFÍ	ĚĤ	ĚÍ	ĚJ	ÍĴĴĴ	FĚ	ÍĴĴĴ	FĚ
G	ŌĤÍ ÁÓ\ ĚÍ	GĴĴĴ	FFFÍ	ĚĤ	ĚÍ	ĚJ	HÍĴĴ	FĚ	ÍĴĴĴ	FĚ
H	ŌĤ Í G Ó\ ĚÉ	GĴĴĴ	FFFÍ	ĚĤ	ĚÍ	ĚJ	ÍĴĴĴ	FĚ	ÍĴĴĴ	FĚ
I	ŌĤ ĴĴ Á Ó\ ĚÄ Þ Ö	GĴĴĴ	FFFÍ	ĚĤ	ĚÍ	ĚĴ	ÍĴĴĴ	FĚ	ÍĴĴĴ	FĚ
Í	ŌĤ ĴĴ Á Ó\ ĚÄ ^ &c	GĴĴĴ	FFFÍ	ĚĤ	ĚÍ	ĚĴ	ÍĴĴĴ	FĚ	ÍĴĴĴ	FĚ
Î	ŌĤ H Ó\ ĚÖ	GĴĴĴ	FFFÍ	ĚĤ	ĚÍ	ĚJ	HÍĴĴ	FĚ	ÍĴĴĴ	FĚ
İ	ŌĤ Ě Í	GĴĴĴ	FFFÍ	ĚĤ	ĚÍ	ĚJ	ÍĴĴĴ	FĚ	ÍĴĴĴ	FĚ

A Ya Vyf Dc]bh @ UXg f6 @ % ' GYZK YJ \ H

	T^(à\ Šaa\]	Ōă^ &ă)	Tæ) æ à žă\ăĚă	Š &ă) žă Ěă
F	T ÚG	Ÿ	Ě ĚĴ	€
G	T ÚG	Ÿ	Ě ĚĴ	ĴG
H	T ÚG	Ÿ	Ě ĚĴ	ĂĴ
I	T ÚG	Ÿ	Ě Í	ĂĴ
Í	T ÚG	Ÿ	Ě ĚÍ	ĂĴ
Î	T ÚÍ	Ÿ	Ě ĚĴ	€
İ	T ÚÍ	Ÿ	Ě ĚĴ	ĴG
Ì	T ÚÍ	Ÿ	Ě ĚĴ	ĂĴ
J	T ÚÍ	Ÿ	Ě Í	ĂĴ
F€	T Úİ	Ÿ	Ě ĚĴ	€
FF	T Úİ	Ÿ	Ě ĚĴ	ĴG
FG	T Úİ	Ÿ	Ě ĚĴ	ĂĴ
FH	T Úİ	Ÿ	Ě Í	ĂĴ

A Ya Vyf Dc]bh @ UXg f6 @ (: ' K jX @ UX \$ 5 N

	T^(à\ Šaa\]	Ōă^ &ă)	Tæ) æ à žă\ăĚă	Š &ă) žă Ěă
F	T ÚG	Z	ĚĴĚĴ Ĥ	€
G	T ÚG	Z	ĚĴĚĴ Ĥ	ĴG
H	T ÚG	Z	Ě ĴĚ Ě	ĂĴ
I	T ÚG	Z	Ě ĴĚ Ě	ĂĴ
Í	T ÚG	Z	Ě ĴĴĴ	ĂĴ
Î	T ÚÍ	Z	Ě ĤĴĴ ĴG	€
İ	T ÚÍ	Z	Ě ĤĴĴ ĴG	ĴG
Ì	T ÚÍ	Z	Ě ĤĤ Ĥ	ĂĴ
J	T ÚÍ	Z	Ě ĤĴĴ	ĂĴ
F€	T Úİ	Z	Ě ĤĴĴ ĴG	€
FF	T Úİ	Z	Ě ĤĴĴ ĴG	ĴG
FG	T Úİ	Z	Ě ĤĤ Ĥ	ĂĴ
FH	T Úİ	Z	Ě ĤĴĴ	ĂĴ
FI	T ÚG	Ÿ	€	€
FÍ	T ÚG	Ÿ	€	ĴG
Fİ	T ÚG	Ÿ	€	ĂĴ
FÎ	T ÚG	Ÿ	€	ĂĴ
Fİ	T ÚG	Ÿ	€	ĂĴ
FJ	T ÚÍ	Ÿ	€	€
G€	T Úİ	Ÿ	€	ĴG
Gf	T Úİ	Ÿ	€	ĂĴ
GG	T Úİ	Ÿ	€	ĂĴ
GH	T Úİ	Ÿ	€	€

A Ya Vyf'Dc]bhi@UXg f6 @ '%\$. 'K]bX'@UX%) '5N4f7 cb]bi YXL

	T ^{ à^! / à^æ ^}	Öä^&ç}	T æ } æ à^ } à^æ ^	Š &ç } Ž Æ á
H	T ÚG	Z	H Í È €F	Á Í €
I	T ÚG	Z	H Í È Í	Á Í €
Í	T ÚG	Z	H Ú È I I	Á Ğ
Î	T ÚÍ	Z	Ï È Í Í	€
Ï	T ÚÍ	Z	Ï È Í Í	Ï Ğ
Ì	T ÚÍ	Z	Ĝ È Í J	Á Í €
J	T ÚÍ	Z	Ĝ È Ĝ Ĝ	Á Í €
F€	T ÚÌ	Z	F Í € È I	€
FF	T ÚÌ	Z	F Í € È I	Ï Ğ
FG	T ÚÌ	Z	I Ï È H	Á Í €
FH	T ÚÌ	Z	I Ï È I Ğ	Á Í €
FI	T ÚG	Ý	È F Í È € Ğ	€
FÍ	T ÚG	Ý	È F Í È € Ğ	Ï Ğ
FÎ	T ÚG	Ý	È Í È € F	Á Í €
FÏ	T ÚG	Ý	È Í È Í Í	Á Í €
FÌ	T ÚG	Ý	È Ú È I I	Á Ğ
FJ	T ÚÍ	Ý	È Í È Í Í	€
GE	T ÚÍ	Ý	È Í È Í Í	Ï Ğ
GF	T ÚÍ	Ý	È Ĝ È Í J	Á Í €
GG	T ÚÍ	Ý	È Ĝ È Ĝ Ĝ	Á Í €
GH	T ÚÍ	Ý	È F Í € È I	€
G	T ÚÍ	Ý	È F Í € È I	Ï Ğ
Ĝ	T ÚÍ	Ý	È Í È H	Á Í €
Ĝ	T ÚÍ	Ý	È Í È I Ğ	Á Í €

A Ya Vyf'Dc]bhi@UXg f6 @ '%%. 'K]bX'@UX%) \$'5N4

	T ^{ à^! / à^æ ^}	Öä^&ç}	T æ } æ à^ } à^æ ^	Š &ç } Ž Æ á
F	T ÚG	Z	F Í Í È Ğ Ğ	€
G	T ÚG	Z	F Í Í È Ğ Ğ	Ï Ğ
H	T ÚG	Z	Í Ğ È J F	Á Í €
I	T ÚG	Z	Í Ğ È Ĝ	Á Í €
Í	T ÚG	Z	Í Í È H H	Á Ğ
Î	T ÚÍ	Z	Ì J È J J	€
Ï	T ÚÍ	Z	Ì J È J J	Ï Ğ
Ì	T ÚÍ	Z	H È È Í	Á Í €
J	T ÚÍ	Z	H Í È Í	Á Í €
F€	T ÚÌ	Z	F Í Í È Ğ Ğ	€
FF	T ÚÌ	Z	F Í Í È Ğ Ğ	Ï Ğ
FG	T ÚÌ	Z	Í Ğ È J F	Á Í €
FH	T ÚÌ	Z	Í Ğ È Ĝ	Á Í €
FI	T ÚG	Ý	È Í È H	€
FÍ	T ÚG	Ý	È Í È H	Ï Ğ
FÎ	T ÚG	Ý	È H È Í H	Á Í €
FÏ	T ÚG	Ý	È F È F J	Á Í €
FÌ	T ÚG	Ý	È F È H F	Á Ğ
FJ	T ÚÍ	Ý	È F È Í Í	€
GE	T ÚÍ	Ý	È F È Í Í	Ï Ğ
GF	T ÚÍ	Ý	È F Í È H F	Á Í €
GG	T ÚÍ	Ý	È F J È Í H	Á Í €
GH	T ÚÍ	Ý	È Í È H	€
G	T ÚÍ	Ý	È Í È H	Ï Ğ

A Ya Vyf'Dc]bhi@UXg'f6 @ '&' : 'GYga JW@UX'NL'ff'cb]bi YXL

	T^{ à!;Çæ^!}	Öä^&çā}	Tæ} æ^ à^ Ža]PaEca	Š &çā} ŽĀ á
G	T ÚG	Z	Ě Ě Ĩ Ĩ	Ī G
H	T ÚG	Z	Ě Ě Ĩ Ĩ	Ā Ī €
I	T ÚG	Z	Ě Ě Ĩ	Ā Ī €
Í	T ÚG	Z	Ě Ě Ĩ Ĩ	Ā Ī
Î	T ÚĪ	Z	Ě Ě Ĩ Ĩ	€
İ	T ÚĪ	Z	Ě Ě Ĩ Ĩ	Ī G
Ī	T ÚĪ	Z	Ě Ě Ĩ Ĩ	Ā Ī €
J	T ÚĪ	Z	Ě Ě Ĩ	Ā Ī €
F€	T ÚÏ	Z	Ě Ě Ĩ Ĩ	€
FF	T ÚÏ	Z	Ě Ě Ĩ Ĩ	Ī G
FG	T ÚÏ	Z	Ě Ě Ĩ Ĩ	Ā Ī €
FH	T ÚÏ	Z	Ě Ě Ĩ	Ā Ī €

A Ya Vyf'Dc]bhi@UXg'f6 @ '&' : 'GYga JW@UX'LL

	T^{ à!;Çæ^!}	Öä^&çā}	Tæ} æ^ à^ Ža]PaEca	Š &çā} ŽĀ á
F	T ÚG	Ÿ	Ě Ě Ĩ Ĩ	€
G	T ÚG	Ÿ	Ě Ě Ĩ Ĩ	Ī G
H	T ÚG	Ÿ	Ě Ě Ĩ Ĩ	Ā Ī €
I	T ÚG	Ÿ	Ě Ě Ĩ	Ā Ī €
Í	T ÚG	Ÿ	Ě Ě Ĩ Ĩ	Ā Ī
Î	T ÚĪ	Ÿ	Ě Ě Ĩ Ĩ	€
İ	T ÚĪ	Ÿ	Ě Ě Ĩ Ĩ	Ī G
Ī	T ÚĪ	Ÿ	Ě Ě Ĩ Ĩ	Ā Ī €
J	T ÚĪ	Ÿ	Ě Ě Ĩ	Ā Ī €
F€	T ÚÏ	Ÿ	Ě Ě Ĩ Ĩ	€
FF	T ÚÏ	Ÿ	Ě Ě Ĩ Ĩ	Ī G
FG	T ÚÏ	Ÿ	Ě Ě Ĩ Ĩ	Ā Ī €
FH	T ÚÏ	Ÿ	Ě Ě Ĩ	Ā Ī €

A Ya Vyf'Dc]bhi@UXg'f6 @ '&' : 'Qj Y@UX'fI@LL

	T^{ à!;Çæ^!}	Öä^&çā}	Tæ} æ^ à^ Ža]PaEca	Š &çā} ŽĀ á
F	PF	Ÿ	Ě Ě €	€

A Ya Vyf'Dc]bhi@UXg'f6 @ '&*' : 'Qj Y@UX'fI@LL

	T^{ à!;Çæ^!}	Öä^&çā}	Tæ} æ^ à^ Ža]PaEca	Š &çā} ŽĀ á
F	PF	Ÿ	Ě Ě €	Ā Ī €

A Ya Vyf'Dc]bhi@UXg'f6 @ '&+ : 'Qj Y@UX' fI@LL

	T^{ à!;Çæ^!}	Öä^&çā}	Tæ} æ^ à^ Ža]PaEca	Š &çā} ŽĀ á
F	PF	Ÿ	Ě Ě €	Ā Ī €€

A Ya Vyf'Dc]bhi@UXg'f6 @ '&' : 'Qj Y@UX' fI@LL

	T^{ à!;Çæ^!}	Öä^&çā}	Tæ} æ^ à^ Ža]PaEca	Š &çā} ŽĀ á
F	PH	Ÿ	Ě Ě €	€

A Ya Vyf'Dc]bhi@UXg'f6 @ '&' : 'Qj Y@UX' fI@LL

	T^{ à!;Çæ^!}	Öä^&çā}	Tæ} æ^ à^ Ža]PaEca	Š &çā} ŽĀ á
F	PH	Ÿ	Ě Ě €	Ā Ī €

A Ya Vyf Dc]bhí @ UXg f6 @ ' (& : 'AUjbyb UbW' @ UX' - 'f @ H

	T ^{ à^! Á ð^ ^}	Öá^&çá}	T æ} æ à^ Á ð^ Á Écá	Š &çá} Ž É á
F	T ÚÍ	Û	È €	Á €

A Ya Vyf '8]qf]Vi hyX' @ UXg f6 @ ' & : 'Gfi Wi fY'K]bX'NÉ

	T ^{ à^! Á ð^ ^}	Öá^&çá}	ÚcæT æ} æ à^ Á ð^ Á Écá	Öá^&çá} Ž É á	Ó) á Á &çá} Ž É á	
F	TF	UZ	È È Jì	È È Jì	€	Á FEE
G	TG	UZ	È È FJ	È È FJ	€	Á FEE
H	TH	UZ	È È Jì	È È Jì	€	Á FEE
I	TI	UZ	È È Jì	È È Jì	€	Á FEE
Í	TÍ	UZ	È È Jì	È È Jì	€	Á FEE
Î	TÎ	UZ	È È FJ	È È FJ	€	Á FEE
Ì	TÌ	UZ	È È Jì	È È Jì	€	Á FEE
J	TJ	UZ	È È Jì	È È Jì	€	Á FEE
F€	TF€	UZ	È È Jì	È È Jì	€	Á FEE
FF	TF	UZ	È È Jì	È È Jì	€	Á FEE
FG	TFG	UZ	È È FJ	È È FJ	€	Á FEE
FH	TFH	UZ	È È Jì	È È Jì	€	Á FEE
FI	TFI	UZ	È È Jì	È È Jì	€	Á FEE
FÍ	TFÍ	UZ	È È Jì	È È Jì	€	Á FEE
FÎ	PF	UZ	È È FJ	È È FJ	€	Á FEE
FÌ	PH	UZ	È È FJ	È È FJ	€	Á FEE
FÌ	PG	UZ	È È FJ	È È FJ	€	Á FEE
FJ	TFJ	UZ	È È FJ	È È FJ	€	Á FEE
€	T€	UZ	È È FJ	È È FJ	€	Á FEE
G	TG	UZ	È È FJ	È È FJ	€	Á FEE
GG	TGG	UZ	È È Jì	È È Jì	€	Á FEE
GH	TGH	UZ	È È Jì	È È Jì	€	Á FEE
G	TG	UZ	È È Jì	È È Jì	€	Á FEE
Ĝ	TĜ	UZ	È È Jì	È È Jì	€	Á FEE
Ĝ	TĜ	UZ	È È Jì	È È Jì	€	Á FEE
Ĝ	TÚG	UZ	È È FJ	È È FJ	€	Á FEE
Ĝ	TĜ	UZ	È È Jì	È È Jì	€	Á FEE
GJ	TGJ	UZ	È È Jì	È È Jì	€	Á FEE
H€	TÚF	UZ	È È FJ	È È FJ	€	Á FEE
HF	TFH	UZ	È È Jì	È È Jì	€	Á FEE
HG	TFG	UZ	È È Jì	È È Jì	€	Á FEE
HH	TFH	UZ	È È FJ	È È FJ	€	Á FEE
H	TFH	UZ	È È Jì	È È Jì	€	Á FEE
HÍ	TFÍ	UZ	È È Jì	È È Jì	€	Á FEE
HÎ	TÚÍ	UZ	È È FJ	È È FJ	€	Á FEE
HÌ	TFH	UZ	È È Jì	È È Jì	€	Á FEE
HÌ	TFH	UZ	È È Jì	È È Jì	€	Á FEE
HJ	TÚÍ	UZ	È È FJ	È È FJ	€	Á FEE
I€	TFI	UZ	È È Jì	È È Jì	€	Á FEE
IF	TFI	UZ	È È Jì	È È Jì	€	Á FEE
IG	TÚG	UZ	È È FJ	È È FJ	€	Á FEE
IH	TFH	UZ	È È Jì	È È Jì	€	Á FEE
II	TFI	UZ	È È Jì	È È Jì	€	Á FEE
ÍÍ	TÚÍ	UZ	È È FJ	È È FJ	€	Á FEE
ÌÌ	TFI	UZ	È È Jì	È È Jì	€	Á FEE

A Ya VYf'8]glf]Vi hYX' @ UXg'f6 @ ' & . 'Gfi Wi fY'K]bX'NL'f7 cb]jbi YXL

	T^ { à^!Àæ^}	Öá^&á}	ÚcæÁ æ} æ à^ZáD(Ë) áÁ æ} æ à^ZáD(Ë) ÚcæÁ &æ}	ÚcæÁ &æ}	ÚcæÁ &æ}	ÚcæÁ &æ}	ÚcæÁ &æ}
Iï	TIï	ÛZ	Ë Ë Jì	Ë Ë Jì	€	À FEE	
Iì	TÚì	ÛZ	Ë Ë FJ	Ë Ë FJ	€	À FEE	
Ij	TIj	ÛZ	Ë Ë Jì	Ë Ë Jì	€	À FEE	
Í€	TÍ€	ÛZ	Ë Ë Jì	Ë Ë Jì	€	À FEE	
ÍF	TÚÍ	ÛZ	Ë Ë FJ	Ë Ë FJ	€	À FEE	

A Ya VYf'8]glf]Vi hYX' @ UXg'f6 @ ' ' : 'Gfi Wi fY'K]bX'L'L

	T^ { à^!Àæ^}	Öá^&á}	ÚcæÁ æ} æ à^ZáD(Ë) áÁ æ} æ à^ZáD(Ë) ÚcæÁ &æ}	ÚcæÁ &æ}	ÚcæÁ &æ}	ÚcæÁ &æ}	ÚcæÁ &æ}
F	TF	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
G	TG	ÛY	Ë Ë FJ	Ë Ë FJ	€	À FEE	
H	TH	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
I	TI	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
Í	TÍ	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
Ì	TÌ	ÛY	Ë Ë FJ	Ë Ë FJ	€	À FEE	
Î	TÎ	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
J	TJ	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
F€	TF€	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
FF	TF€	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
FG	TFG	ÛY	Ë Ë FJ	Ë Ë FJ	€	À FEE	
FH	TFH	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
FI	TFI	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
FÍ	TFÍ	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
FÌ	PF	ÛY	Ë Ë FJ	Ë Ë FJ	€	À FEE	
FÎ	PH	ÛY	Ë Ë FJ	Ë Ë FJ	€	À FEE	
FÏ	PG	ÛY	Ë Ë FJ	Ë Ë FJ	€	À FEE	
FJ	TFJ	ÛY	Ë Ë FJ	Ë Ë FJ	€	À FEE	
€	T€	ÛY	Ë Ë FJ	Ë Ë FJ	€	À FEE	
GF	TGF	ÛY	Ë Ë FJ	Ë Ë FJ	€	À FEE	
GG	TGG	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
GH	TGH	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
G	TG	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
G	TG	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
G	TG	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
G	TG	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
G	TUG	ÛY	Ë Ë FJ	Ë Ë FJ	€	À FEE	
G	TG	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
GJ	TGJ	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
€	TUF	ÛY	Ë Ë FJ	Ë Ë FJ	€	À FEE	
HF	TFH	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
HG	THG	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
HH	TUH	ÛY	Ë Ë FJ	Ë Ë FJ	€	À FEE	
HI	THI	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
HÍ	THÍ	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
HÌ	TÚì	ÛY	Ë Ë FJ	Ë Ë FJ	€	À FEE	
HÏ	THÏ	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
H	TH	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
HJ	TÚj	ÛY	Ë Ë FJ	Ë Ë FJ	€	À FEE	
I€	TÍ€	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
IF	TÍF	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	
IG	TÚj	ÛY	Ë Ë FJ	Ë Ë FJ	€	À FEE	
IH	TIH	ÛY	Ë Ë Jì	Ë Ë Jì	€	À FEE	

APPENDIX D
ADDITIONAL CALCUATIONS

BOLT TOOL 1.5.2

Project Data	
Job Code:	189055
Carrier Site ID:	BOBDL00077A
Carrier Site Name:	CT-CCI-T-876313

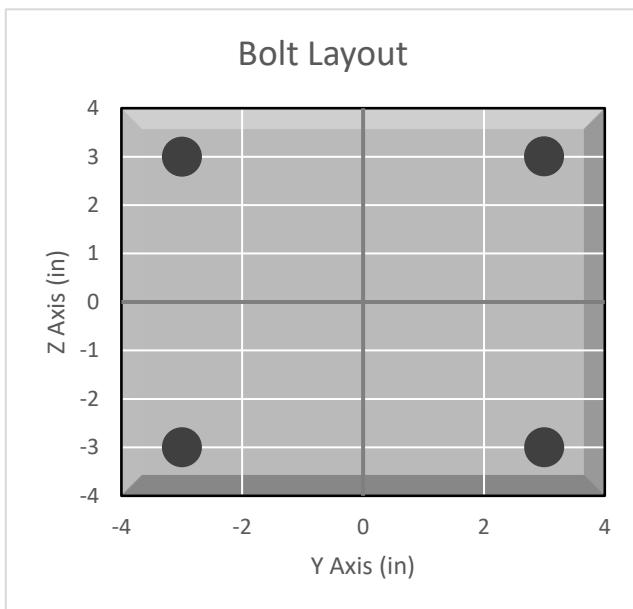
Code	
Design Standard:	TIA-222-H
Slip Check:	No
Pretension Standard:	TIA-222-H

Bolt Properties		
Connection Type:	Bolt	
Diameter:	0.75	in
Grade:	A529	--
Yield Strength (Fy):	50	ksi
Ultimate Strength (Fu):	65	ksi
Number of Bolts:	4	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	-	in

Connection Description
Mount Standoff to Collar

Bolt Check*		
Tensile Capacity (ϕT_n):	16304.9	lbs
Shear Capacity (ϕV_n):	10768.5	lbs
Tension Force (T_u):	4226.5	lbs
Shear Force (V_u):	602.9	lbs
Tension Usage:	24.7%	--
Shear Usage:	5.3%	--
Interaction:	24.7%	Pass
Controlling Member:	M12	--
Controlling LC:	42	--

*Rating per TIA-222-H Section 15.5



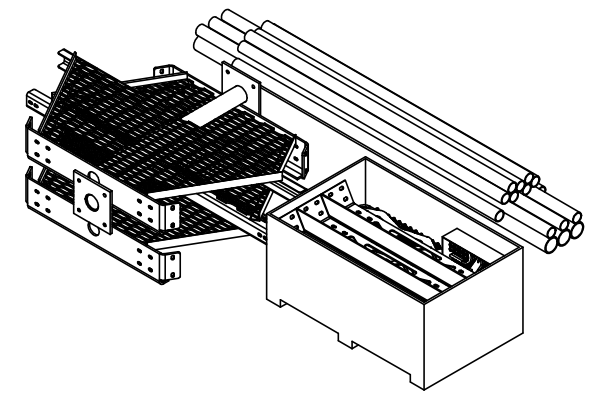
APPENDIX E
SUPPLEMENTAL DRAWINGS

ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT	NOTE NO.
1	MTC3006SB	STEEL BUNDLE FOR SNUB NOSE PLATFORM	1	402.64 LBS	
2	MCPK8CSB	PIPE STEEL BUNDLE FOR MC-PK8-C	1	464.27 LBS	
3	MCPK8CHWK	HARDWARE KIT FOR MC-PK8-C	1	543.22 LBS	




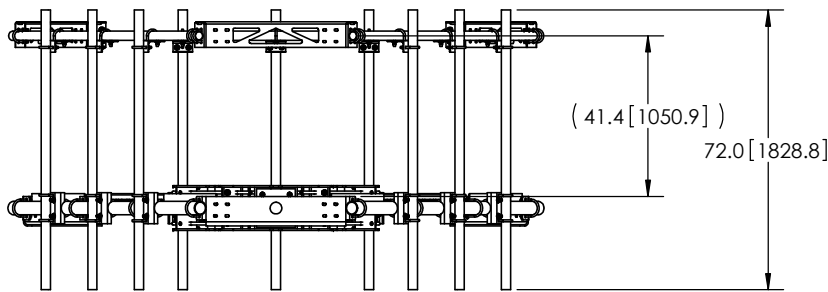
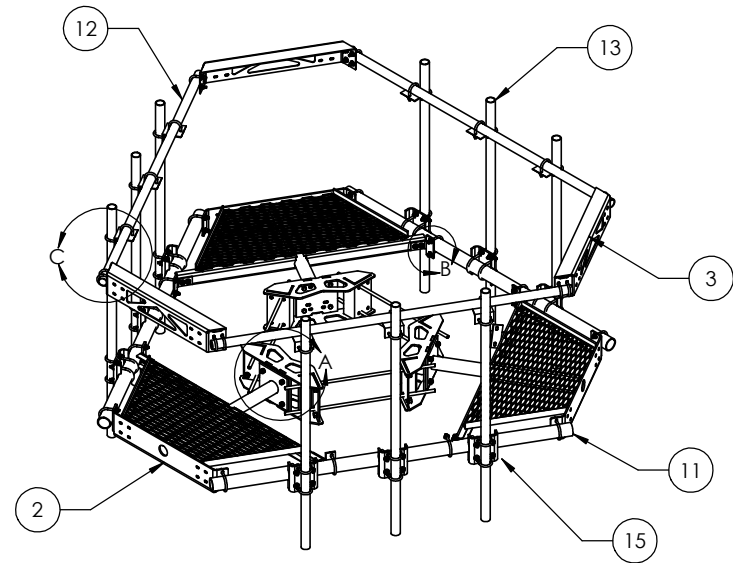
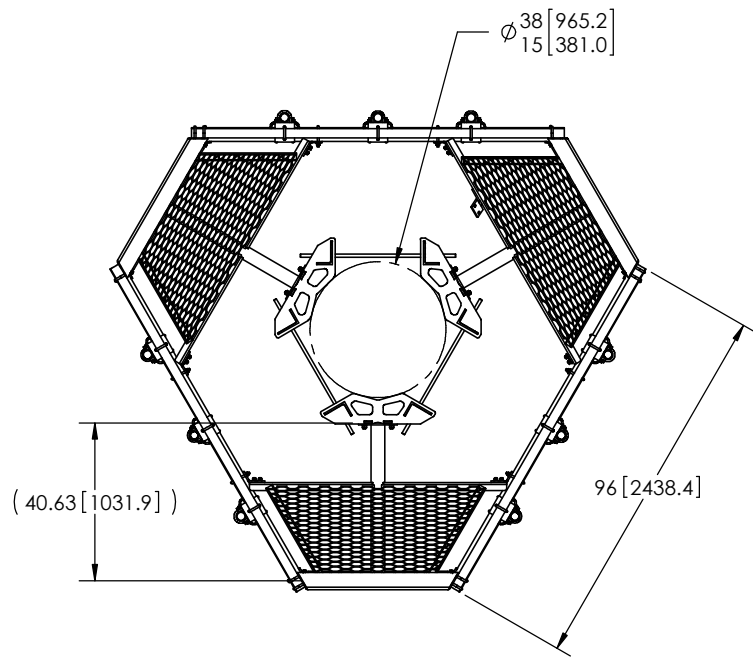
REVISIONS				
REV.	ECN	DESCRIPTION	BY	DATE
A		INITIAL RELEASE	DRR	12/27/11
B	8000005979	CHANGE NOSE CORNER BRKT, ADD GUB-4240	MSM	11/25/14
C	8000007579	NEW RINGMOUNT WELDMENT DESIGN	RJC	04/07/15

FOR BOM ENTRY ONLY




NOTES:
1. CUSTOMER ASSEMBLY SHEETS 2-3.

<small>These drawings and specifications are the proprietary property of ANDREW CORPORATION and may be used only for the specific purpose authorized in writing by Andrew Corporation.</small>			<small>DRAWN BY:</small> MSM	<small>SHEET:</small> 1 of 3	<small>PART NUMBER:</small> MC-PK8-C
<small>ALL DIMENSIONS ARE IN INCHES U.O.S. TOLERANCES UNLESS OTHERWISE SPECIFIED:</small>			<small>CHECKED BY:</small> TP	<small>SCALE:</small> NTS	<small>DESCRIPTION:</small> LOW PROFILE PLATFORM KIT 8' FACE
<small>.X = ± .12 ANGLES ±2° .XX = ± .06 FRACTIONS ±1/32 .XXX = ± .03</small>			<small>DATE:</small> 10/18/11	<small>MATERIAL:</small> A36, A500	<small>DRAWING TYPE:</small> ASSEMBLY DRAWING
<small>REMOVE BURRS AND BREAK EDGES .005</small>			<small>REVISION:</small> C	<small>FINISH:</small> GALV A123	 WESTCHESTER, IL. 60154 U.S.A.
<small>DO NOT SCALE THIS PRINT</small>				<small>WEIGHT:</small> 1410.14 LBS	

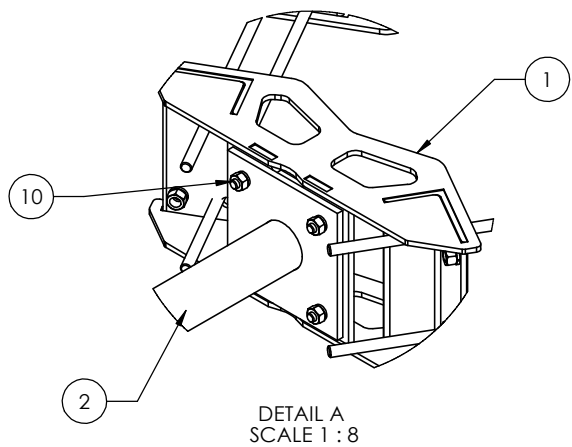


ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT
1	MC-RM1550-3	12" - 50" OD RINGMOUNT	1	230.42 LBS
2	MTC300601	Low Profile Co-Location Platform Snub Nose	3	134.21 LBS
3	MT195801	Corner Weldment Snub Nose Handrail	3	27.10 LBS
4	XA2020.01	CROSS OVER ANGLE	9	2.65 LBS
5	GUB-4356	1/2" X 3-5/8" X 6" GALV U-BOLT	18	0.82 LBS
6	GUB-4355	1/2" X 3-5/8" X 5" GALV U-BOLT	12	0.71 LBS
7	GUB-4240	1/2" X 2-1/2" X 4" GALV U-BOLT	48	0.56 LBS
8	GB-04145	1/2" X 1-1/2" GALV BOLT KIT	12	0.13 LBS
9	GWF-04	1/2" GALV FLAT WASHER	24	0.03 LBS
10	GB-0520A	5/8" X 2" GALV BOLT KIT (A325)	12	0.27 LBS
11	MT54796	3.50" OD X 96" GALV PIPE	3	60.28 LBS
12	MT-651-96	Ø2.375" OD X 96" PIPE	3	29.07 LBS
13	MT-651	2.375" OD x 72" PIPE	9	21.80 LBS
14	MT19617	MT196 Pipe Mount Plate	6	2.49 LBS
15	MT21701	PIPE MOUNT PLATE	9	7.93 LBS

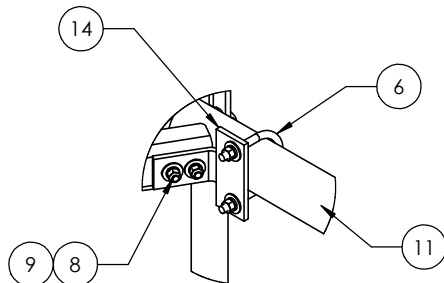
<small>These drawings and specifications are the proprietary property of ANDREW CORPORATION and may be used only for the specific purpose authorized in writing by Andrew Corporation.</small>			
<small>ALL DIMENSIONS ARE IN INCHES U.O.S. TOLERANCES UNLESS OTHERWISE SPECIFIED:</small> .X = ± .12 ANGLES ±2° .XX = ± .06 FRACTIONS ±1/32 .XXX = ± .03 REMOVE BURRS AND BREAK EDGES .005 DO NOT SCALE THIS PRINT	<small>DRAWN BY:</small> MSM <small>CHECKED BY:</small> TP <small>DATE:</small> 10/18/11 <small>REVISION:</small> C	<small>SHEET:</small> 2 of 3 <small>SCALE:</small> NTS <small>MATERIAL:</small> A36, A53 <small>FINISH:</small> GALV A123 <small>WEIGHT:</small> 1361.27 LBS	<small>PART NUMBER:</small> MC-PK8-C <small>DESCRIPTION:</small> 25" OD Snub Nose MT-196 <small>DRAWING TYPE:</small> ASSEMBLY DRAWING 
			<small>WESTCHESTER, IL. 60154 U.S.A.</small>

- NOTES:
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.
 2. WILL FIT MONOPOLES 15"-38" OD.

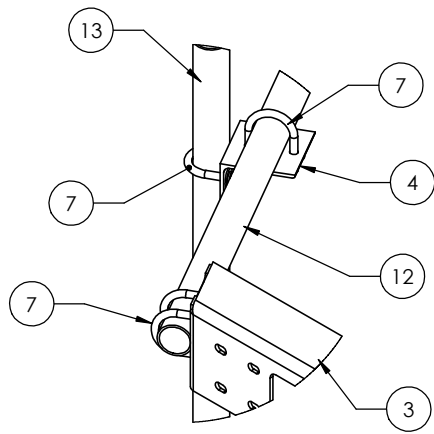
8 7 6 5 4 3 2 1



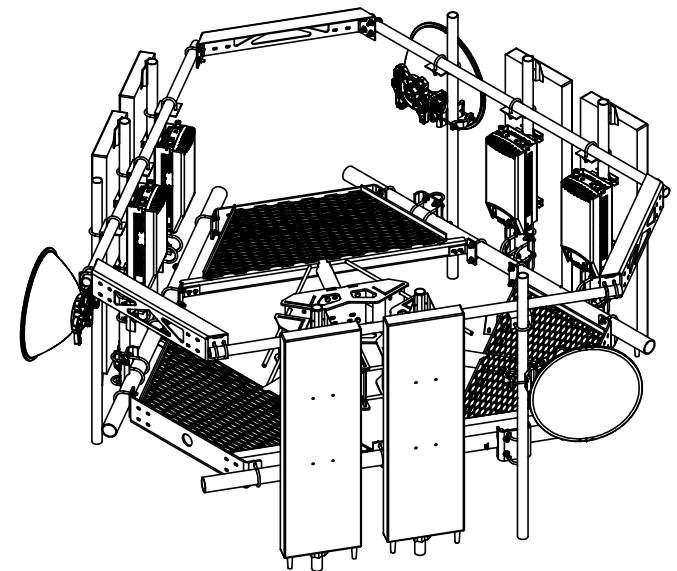
DETAIL A
SCALE 1 : 8



DETAIL B
SCALE 1 : 8




DETAIL C
SCALE 1 : 8



WITH ANTENNAS

NOTES:
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.

<small>These drawings and specifications are the proprietary property of ANDREW CORPORATION and may be used only for the specific purpose authorized in writing by Andrew Corporation.</small>		<small>DRAWN BY:</small> MSM	<small>SHEET:</small> 3 of 3	<small>PART NUMBER:</small> MC-PK8-C
<small>ALL DIMENSIONS ARE IN INCHES U.O.S. TOLERANCES UNLESS OTHERWISE SPECIFIED:</small> .X = ± .12 ANGLES ±2° .XX = ± .06 FRACTIONS ±1/32 .XXX = ± .03 REMOVE BURRS AND BREAK EDGES .005		<small>CHECKED BY:</small> TP	<small>SCALE:</small> NTS	<small>DESCRIPTION:</small> 25" OD Snub Nose MT-196
<small>DO NOT SCALE THIS PRINT</small>		<small>DATE:</small> 10/18/11	<small>MATERIAL:</small> A36, A53	<small>DRAWING TYPE:</small> ASSEMBLY DRAWING
		<small>REVISION:</small> C	<small>FINISH:</small> GALV A123	 WESTCHESTER, IL. 60154 U.S.A.
			<small>WEIGHT:</small> 1361.27 LBS	

8 7 6 5 4 3 2 1

Exhibit E

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL
TO NON-IONIZING EMISSIONS

Dish Wireless Existing Facility

Site ID: 876313

BOBDL00077A

1394 Meriden Waterbury Turnpike
Southington, Connecticut 06489

June 24, 2021

EBI Project Number: 6221003215

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	30.72%

June 24, 2021

Dish Wireless

Emissions Analysis for Site: 876313 - BOBDL00077A

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **1394 Meriden Waterbury Turnpike** in **Southington, Connecticut** for the purpose of determining whether the emissions from the Proposed Dish Wireless Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately $400 \mu\text{W}/\text{cm}^2$ and $467 \mu\text{W}/\text{cm}^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed Dish Wireless Wireless antenna facility located at 1394 Meriden Waterbury Turnpike in Southington, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since Dish Wireless is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

- 1) 4 5G channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 4 5G channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 3) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 4) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

- 5) The antennas used in this modeling are the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz channel(s) in Sector A, the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz channel(s) in Sector B, the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 6) The antenna mounting height centerline of the proposed antennas is 119 feet above ground level (AGL).
- 7) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 8) All calculations were done with respect to uncontrolled / general population threshold limits.

Dish Wireless Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	I	Antenna #:	I	Antenna #:	I
Make / Model:	JMA MX08FRO665-2I	Make / Model:	JMA MX08FRO665-2I	Make / Model:	JMA MX08FRO665-2I
Frequency Bands:	600 MHz / 1900 MHz	Frequency Bands:	600 MHz / 1900 MHz	Frequency Bands:	600 MHz / 1900 MHz
Gain:	17.45 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd
Height (AGL):	119 feet	Height (AGL):	119 feet	Height (AGL):	119 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	280 Watts	Total TX Power (W):	280 Watts	Total TX Power (W):	280 Watts
ERP (W):	36,123.20	ERP (W):	36,123.20	ERP (W):	36,123.20
Antenna AI MPE %:	12.99%	Antenna BI MPE %:	12.99%	Antenna CI MPE %:	12.99%

Site Composite MPE %	
Carrier	MPE %
Dish Wireless (Max at Sector A):	12.99%
AT&T	6.61%
Metro PCS	0.95%
Verizon	4.87%
Sprint	2.64%
T-Mobile	2.66%
Site Total MPE % :	30.72%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	12.99%
Dish Wireless Sector B Total:	12.99%
Dish Wireless Sector C Total:	12.99%
Site Total MPE % :	
	30.72%

Dish Wireless Maximum MPE Power Values (Sector A)							
Dish Wireless Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
Dish Wireless 600 MHz 5G	4	1667.71	119.0	18.78	600 MHz 5G	400	4.70%
Dish Wireless 1900 MHz 5G	4	7363.09	119.0	82.92	1900 MHz 5G	1000	8.29%
						Total:	12.99%

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.


The anticipated maximum composite contributions from the Dish Wireless facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

Dish Wireless Sector	Power Density Value (%)
Sector A:	12.99%
Sector B:	12.99%
Sector C:	12.99%
Dish Wireless Maximum MPE % (Sector A):	12.99%
Site Total:	30.72%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **30.72%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Exhibit F



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usps.com 9405 5036 9930 0005 4339 63 0079 5000 0031 4586
US POSTAGE
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Mailed from 01566

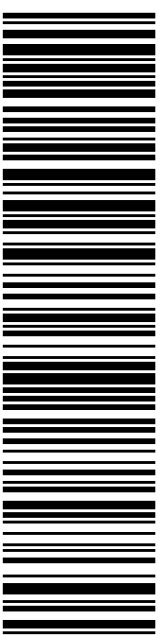
PRIORITY MAIL 2-DAY™

Expected Delivery Date: 09/20/21
 Re#: DS-876313
0006

R013

SHIP TO: RICH ZAJAC
 CROWN CASTLE
 4545 E RIVER RD
 STE 320
 W HENRIETTA NY 14586-9024

USPS TRACKING #



9405 5036 9930 0005 4339 63

Electronic Rate Approved #038555749



Cut on dotted line.

Instructions

1. Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.
2. Place your label so it does not wrap around the edge of the package.
3. Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
5. Mail your package on the "Ship Date" you selected when creating this label.

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0005 4339 63

Trans. #: 543720430	Priority Mail® Postage: \$7.95
Print Date: 09/15/2021	Total: \$7.95
Ship Date: 09/15/2021	
Expected Delivery Date: 09/20/2021	

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

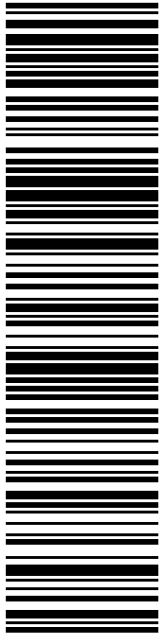
Re#: DS-876313

To: RICH ZAJAC
 CROWN CASTLE
 4545 E RIVER RD
 STE 320
 W HENRIETTA NY 14586-9024

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



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9405 5036 9930 0005 4339 70

Electronic Rate Approved #038555749

SHIP TO: MARK J SCIOTA
SOUTHINGTON TOWN MANAGER
75 MAIN ST
SOUTHINGTON CT 06489-2504

P

usps.com 9405 5036 9930 0005 4339 70 0079 5000 0010 6489
US POSTAGE
 Flat Rate Env
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09/15/2021 Mailed from 01566

PRIORITY MAIL 2-DAY™

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

Expected Delivery Date: 09/20/21
 Re#: DS-876313
0006

C019



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- Place your label so it does not wrap around the edge of the package.
- Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
- To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
- Mail your package on the "Ship Date" you selected when creating this label.

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0005 4339 70


Trans. #: 543720430	Priority Mail® Postage: \$7.95
Print Date: 09/15/2021	Total: \$7.95
Ship Date: 09/15/2021	
Expected Delivery Date: 09/20/2021	

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

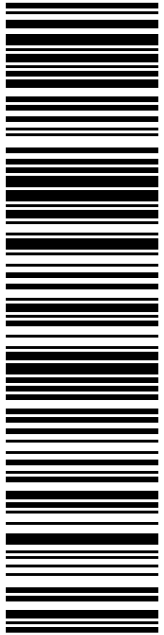
Re#: DS-876313

To: MARK J SCIOTA
SOUTHINGTON TOWN MANAGER
75 MAIN ST
SOUTHINGTON CT 06489-2504

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usps.com 9405 5036 9930 0005 4339 87 0079 5000 0010 6489
US POSTAGE
 Flat Rate Env
 09/15/2021 Mailed from 01566

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

Expected Delivery Date: 09/20/21
 Re#: DS-876313
0006

C020

SHIP MATTHEW A REIMONDO
 TO: SOUTHINGTON ZONING ENFORCEMENT OFFICER
 196 N MAIN ST
 # 200
 SOUTHINGTON CT 06489-2514



Cut on dotted line.

Instructions

1. Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.
2. Place your label so it does not wrap around the edge of the package.
3. Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
5. Mail your package on the "Ship Date" you selected when creating this label.

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0005 4339 87

Trans. #: 543720430	Priority Mail® Postage: \$7.95
Print Date: 09/15/2021	Total: \$7.95
Ship Date: 09/15/2021	
Expected Delivery Date: 09/20/2021	

From: DEBORAH CHASE Re#: DS-876313
 NORTHEAST SITE SOLUTIONS
 420 MAIN ST
 STE 1
 STURBRIDGE MA 01566-1359

To: MATTHEW A REIMONDO
 SOUTHINGTON ZONING ENFORCEMENT OFFICER
 196 N MAIN ST
 # 200
 SOUTHINGTON CT 06489-2514

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



Thank you for shipping with the United States Postal Service!
 Check the status of your shipment on the USPS Tracking® page at usps.com

806478 - Haddam



FISKDALE
458 MAIN ST
FISKDALE, MA 01518-9998
(800)275-8777

09/17/2021 10:12 AM

Product	Qty	Unit Price	Price
Prepaid Mail	1		\$0.00
Southington, CT 06489			
Weight: 1 lb 14.80 oz			
Acceptance Date:			
Fri 09/17/2021			
Tracking #:			
9405 5036 9930 0005 4339 70			
Prepaid Mail	1		\$0.00
West Henrietta, NY 14586			
Weight: 0 lb 2.00 oz			
Acceptance Date:			
Fri 09/17/2021			
Tracking #:			
9405 5036 9930 0005 4339 63			
Prepaid Mail	1		\$0.00
Southington, CT 06489			
Weight: 1 lb 14.90 oz			
Acceptance Date:			
Fri 09/17/2021			
Tracking #:			
9405 5036 9930 0005 4339 87			
Prepaid Mail	1		\$0.00
West Henrietta, NY 14586			
Weight: 0 lb 2.00 oz			
Acceptance Date:			
Fri 09/17/2021			
Tracking #:			
9405 5036 9930 0005 0393 63			
Grand Total:			\$0.00

Tracking Number: 9405503699300005433963

Remove X

Your item was delivered to the front desk, reception area, or mail room at 10:09 am on September 21, 2021 in WEST HENRIETTA, NY 14586.

USPS Tracking Plus™ Available ✓

Status

✓ **Delivered, Front Desk/Reception/Mail Room**

September 21, 2021 at 10:09 am
WEST HENRIETTA, NY 14586

Get Updates ✓



Delivered

Tracking Number: 9405503699300005433987

Remove X

Your item was delivered in or at the mailbox at 1:57 pm on September 20, 2021 in SOUTHLINGTON, CT 06489.

USPS Tracking Plus™ Available ✓

Status

 **Delivered, In/At Mailbox**

September 20, 2021 at 1:57 pm
SOUTHLINGTON, CT 06489

Get Updates ✓



Delivered

Tracking Number: 9405503699300005433963

Remove X

Your item was delivered to the front desk, reception area, or mail room at 10:09 am on September 21, 2021 in WEST HENRIETTA, NY 14586.

USPS Tracking Plus™ Available ✓

Status

✓ **Delivered, Front Desk/Reception/Mail Room**

September 21, 2021 at 10:09 am
WEST HENRIETTA, NY 14586

Get Updates ✓



Delivered

806478 - Haddam



FISKDALE
458 MAIN ST
FISKDALE, MA 01518-9998
(800)275-8777

09/17/2021 10:12 AM

Product	Qty	Unit Price	Price
Prepaid Mail	1		\$0.00
Southington, CT 06489			
Weight: 1 lb 14.80 oz			
Acceptance Date:			
Fri 09/17/2021			
Tracking #:			
9405 5036 9930 0005 4339 70			
Prepaid Mail	1		\$0.00
West Henrietta, NY 14586			
Weight: 0 lb 2.00 oz			
Acceptance Date:			
Fri 09/17/2021			
Tracking #:			
9405 5036 9930 0005 4339 63			
Prepaid Mail	1		\$0.00
Southington, CT 06489			
Weight: 1 lb 14.90 oz			
Acceptance Date:			
Fri 09/17/2021			
Tracking #:			
9405 5036 9930 0005 4339 87			
Prepaid Mail	1		\$0.00
West Henrietta, NY 14586			
Weight: 0 lb 2.00 oz			
Acceptance Date:			
Fri 09/17/2021			
Tracking #:			
9405 5036 9930 0005 0393 63			
Grand Total:			\$0.00