NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

March 17, 2022

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

RE: Tower Share Application
1684 Chamberlain Hwy, Berlin, CT 06037
Latitude: 41.589722
Longitude: -72.805555
Site #: 876382_Crown_Dish

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Dish Wireless LLC. Dish Wireless LLC plans to install antennas and related equipment to the tower site located at 1684 Chamberlain Hwy, Berlin, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900 MHz 5G antennas and six (6) RRUs, at the 111-foot level of the existing 133-foot monopole, one (1) Fiber cable will also be installed. Dish Wireless LLC equipment cabinets will be placed within a 7' x 5' lease area within the existing fenced compound. Included are plans by B+T Group, dated July 7, 2021, Exhibit C. Also included is a structural analysis prepared by Crown Castle, dated February 17, 2022, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. The facility was approved by the Town of Berlin Planning & Zoning Commission on March 23, 2000. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of Dish Wireless LLC intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Mayor Mark Kaczynski, Arosha Jayawickrema, Town Manager and Maureen Giusti, Town Planner for the Town of Berlin, as well as the tower owner (Crown Castle) and property owner (Ronald & Arlene Laviana).

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

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the existing tower is 133-feet and the Dish Wireless LLC antennas will be located at a centerline height of 111-feet.

2. The proposed modifications will not result in an increase of the site boundary as depicted on the attached site plan.

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3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed local and state criteria. The incremental effect of the proposed changes will be negligent.

4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. The combined site operations will result in a total power density of 37.81% as evidenced by Exhibit F.

Connecticut General Statutes 16-50aa indicates that the Council must approve the shared use of a telecommunications facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns. As demonstrated in this letter, Dish Wireless LLC respectfully submits that the shared use of this facility satisfies these criteria.

A. Technical Feasibility. The existing monopole has been deemed structurally capable of supporting Dish Wireless LLC proposed loading. The structural analysis is included as Exhibit D.

B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this monopole in Berlin. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit Dish Wireless LLC to obtain a building permit for the proposed installation. Further, a Letter of Authorization is included as Exhibit G, authorizing Dish Wireless LLC to file this application for shared use.

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of Dish Wireless LLC equipment at the 111-foot level of the existing 133-foot tower would have an insignificant visual impact on the area around the tower. Dish Wireless LLC ground equipment would be installed within the existing facility compound. Dish Wireless LLC shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by Exhibit F, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

D. Economic Feasibility. Dish Wireless LLC will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the Letter of Authorization has been provided by the owner to assist Dish Wireless LLC with this tower sharing application.

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting Dish Wireless LLC proposed loading. Dish Wireless LLC is not aware of any public safety concerns relative to the proposed sharing of the existing tower. Dish Wireless LLC intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of local residents and individuals traveling through Berlin.

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

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Attachments

Cc: Mayor Mark Kaczynski
Berlin Town Hall
240 Kensington Rd
Berlin, CT 06037

Arosha Jayawickrema, Town Manager
Berlin Town Hall
240 Kensington Rd
Berlin, CT 06037

Maureen Giusti, Town Planner
Berlin Town Hall
240 Kensington Rd
Berlin, CT 06037

Ronald & Arlene Laviana – Property Owner
1684 Chamberlain Hwy
Berlin, CT 06037

Crown Castle – Tower Owner

Exhibit A

Original Facility Approval

VOL. 433 PAGE 0333

Town of Berlin

Department of Development Services

April 11, 2000

NOTICE OF DECISION

BERLIN PLANNING AND ZONING COMMISSION

Application: Special Permit - #00-02-SP

Applicant: SPRINT Spectrum L.P. dba SPRINT PCS

Location: Lot 17, Block 15, Chamberlain Highway

At its Regular Meeting of March 23, 2000, the Berlin Planning and Zoning voted five to two to grant the Special Permit Application of SPRINT Spectrum L.P., d/b/a SPRINT PCS for a telecommunications tower and related equipment at Lot 17, Block 15, Chamberlain Highway.

001240

Brian J. Miller, AICP
Director of Development Services

Lawrence J. & Nellie C. Laviana
Owner of Record

Certified Mail (Return Receipt Requested): 7099 3400 0001 5361 6271

Visit Our Web Site: http://www.edc.ci.berlin.ct.us

Town of Berlin, Connecticut • Planning and Zoning Commission
240 Kensington Road • Berlin, CT 06037 • (860) 828-7060 • Fax (860) 828-7180

RECEIVED May 3 2000
AT 12 HR 58 MIN p.m.
AND RECORDED IN
BERLIN LAND RECORDS
VOL. 433 PAGE 333
Cheryl DeFrancesco
ASST TOWN CLERK

Exhibit B

Property Card

Town of Berlin, CT

Property Listing Report

Map Block Lot	19-4-15-17	Building #	1	PID	3445	Account	1036200

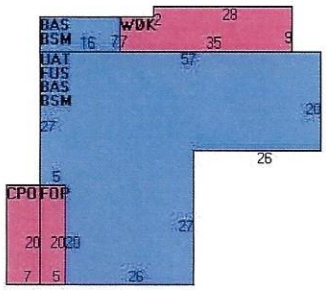
Property Information

Property Location	1684 CHAMBERLAIN HWY
Owner	LAVIANA RONALD L & ARLENE G
Co-Owner	
Mailing Address	1684 CHAMBERLAIN HWY KENSINGTON CT 06037
Land Use	1070 SFR w/Apt
Land Class	R
Zoning Code	MR-1
Census Tract	4002

District	0
Acreage	65.05
Utilities	Gas,Well,Septic
Book / Page	0456/0137

Photo

Sketch



Primary Construction Details

Year Built	1800
Building Desc.	SFR w/Apt
Building Style	Colonial
Stories	2
Occupancy	1.00
Exterior Walls	Vinyl Siding
Exterior Walls 2	
Roof Style	Gable
Roof Cover	Asph/F Gls/Cmp
Interior Walls	Drywall
Interior Walls 2	
Interior Floors 1	Carpet
Interior Floors 2	

Heating Fuel	Gas/Oil
Heating Type	Hot Water
AC Type	None
Bedrooms	6 Bedrooms
Full Bathrooms	3
Half Bathrooms	0
Extra Fixtures	0
Total Rooms	12
Bath Style	Average
Kitchen Style	Average
Fin BSMT Area	
Fin BSMT Quality	
Fin BSMT Area 2	
Fin BSMT Qual 2	

BSMT Garages	0
Fireplaces	2
Whirlpool Tub	0
Building Use	Residential
Building Condition	A

Industrial / Commercial Details
(*Residential Not Applicable)

Heat / AC	NA
Frame Type	NA
Baths / Plumbing	NA
Ceiling / Wall	NA
Rooms / Prtns	NA
Wall Height	NA
First Floor Use	NA

Report Created On 7/6/2020

Town of Berlin, CT

Property Listing Report

Map Block Lot	19-4-15-17	Building #	1	PID	3445	Account	1036200

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	210800	147600
Extras	7500	5300
Improvements		
Outbuildings	276700	193700
Land	1481400	122176
Total	1976400	468776

Outbuilding and Extra Features

Type	Description
Barn 1 Story	638 S.F.
Barn 1 Sty w/Bsm	2100 S.F.
Garage - Avg	504 S.F.
Shed Wd Res	420 S.F.
Cell Tower	150 L.F.
Generator	22 UNITS

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	1989	1989
Concrete Patio	140	0
Porch, Open, Finished	100	0
Upper Story, Finished	1877	1877
Deck, Wood	301	0
Basement	1989	0
Attic, Unfinished	1877	0
Total Area	8273	3866

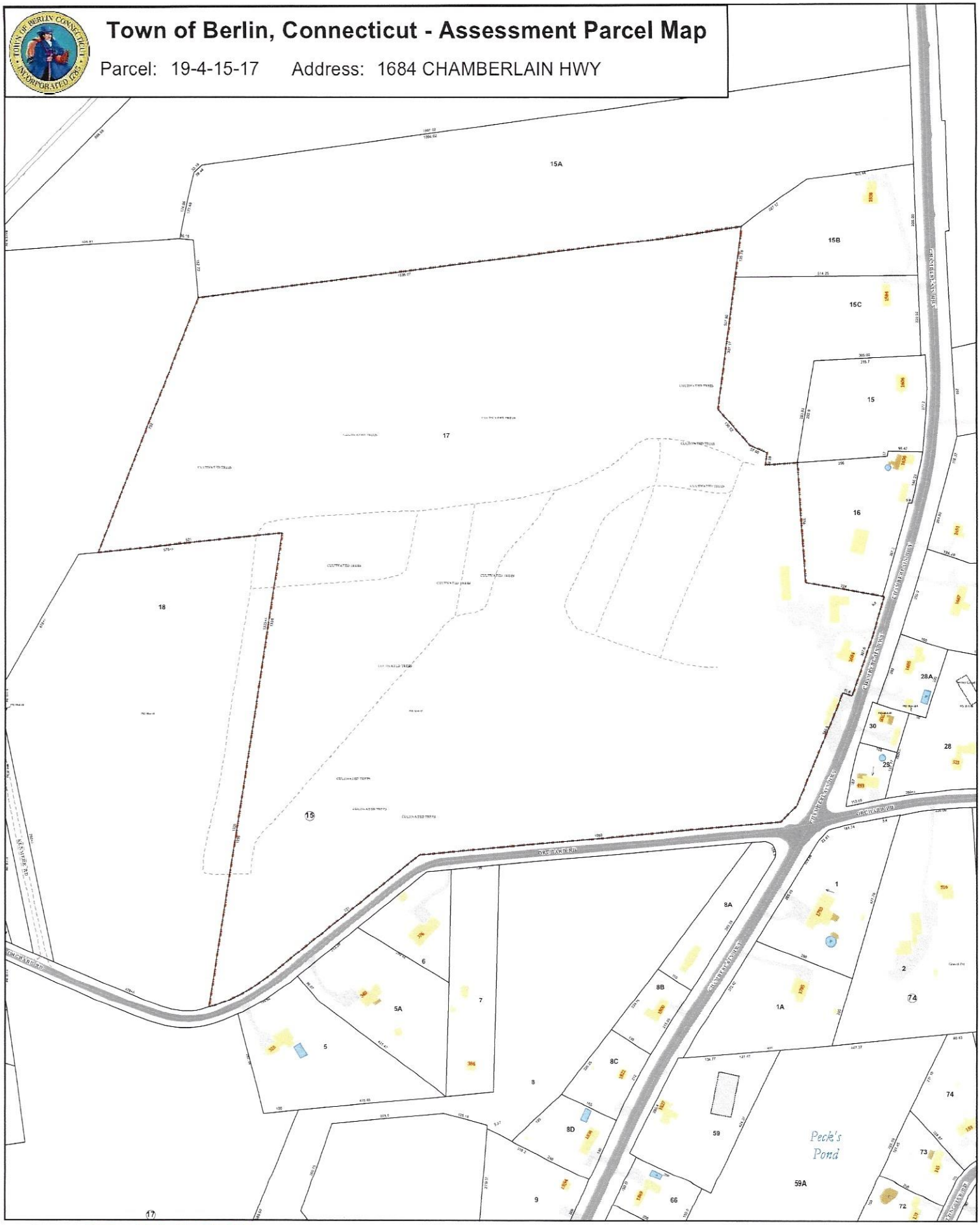
Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
LAVIANA RONALD L & ARLENE G	0456/0137	2001-09-19	0
LAVIANA,LAWRENCE,,	0088/0223	1944-04-23	0

Report Created On 7/6/2020

Town of Berlin, Connecticut - Assessment Parcel Map

Parcel: 19-4-15-17 Address: 1684 CHAMBERLAIN HWY



N W E S

NEGEO
New England Geosystems
www.negeosystems.com
282 Main Street Extension - C2
Middletown, CT 06457 • (203)-404 - 7129

Approximate Scale: 1 inch = 333 feet

0 160 320 480 640 Feet

Map Produced: March 2020

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

Exhibit C

Construction Drawings

DISH Wireless L.L.C. SITE ID:

BOBDL00095A

DISH Wireless L.L.C. SITE ADDRESS:

1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

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

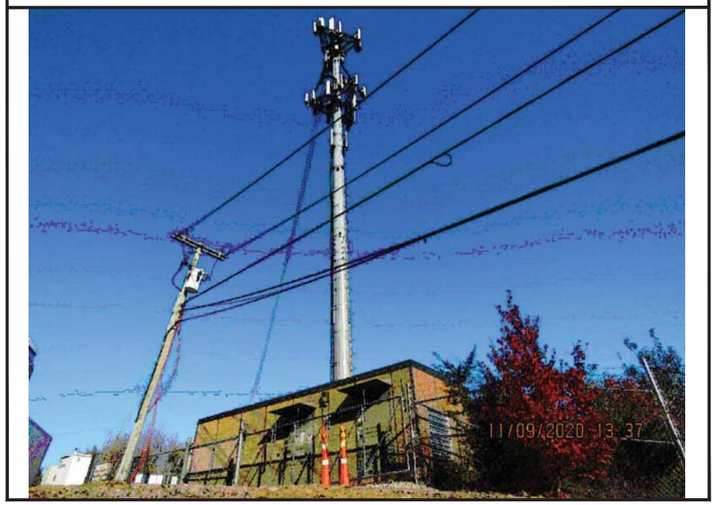
SCOPE OF WORK

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

TOWER SCOPE OF WORK:
- INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR)
- INSTALL (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:
- 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 FIBER NID (IF REQUIRED)

SITE PHOTO



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

811

GENERAL NOTES

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

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

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

SITE INFORMATION

PROPERTY OWNER:	LAVIANA RONALD & ARLENE G
ADDRESS:	1684 CHAMBERLAIN HWY KENSINGTON, CT 06037
TOWER TYPE:	MONOPOLE
TOWER CO SITE ID:	876382
TOWER APP NUMBER:	556603
COUNTY:	HARTFORD
LATITUDE (NAD 83):	41° 35' 23.07" N 41.589750 N
LONGITUDE (NAD 83):	72° 48' 19.20" W 72.805333 W
ZONING JURISDICTION:	CT – TOWN OF BERLIN
ZONING DISTRICT:	T.B.D.
PARCEL NUMBER:	BERL-000036-000200
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	II-B
POWER COMPANY:	CONNECTICUT LIGHT & POWER
TELEPHONE COMPANY:	LIGHTOWER

PROJECT DIRECTORY

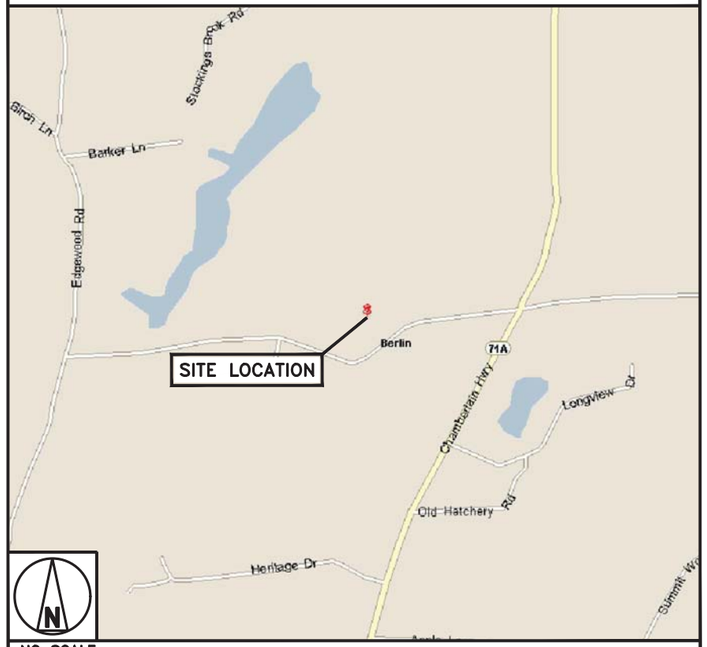
APPLICANT:	DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317 (877) 486-9377
SITE DESIGNER:	B+T GROUP 1717 S. BOULDER AVE, SUITE 300 TULSA, OK 74119 (918) 587-4630
SITE ACQUISITION:	NICHOLAS CURRY NICHOLAS.CURRY@CROWNCASTLE.COM
CONSTRUCTION MANAGER:	JAVIER SOTO JAVIER.SOTO@DISH.COM
RF ENGINEER:	BOSSENER CHARLES BOSSENER.CHARLES@DISH.COM

DIRECTIONS

DIRECTIONS FROM BRADLEY INTERNATIONAL AIRPORT:

CONTINUE TO BRADLEY INTERNATIONAL AIRPORT CON. TAKE I-91 S TO CT-372 E IN BERLIN. TAKE EXIT 21 FROM CT-9 N. TAKE US-5 S TO ORCHARD RD. SLIGHT RIGHT TO STAY ON ORCHARD RD. DESTINATION WILL BE ON THE RIGHT.

VICINITY MAP



NO SCALE

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

STATE OF CONNECTICUT
No. 23924
LICENSED PROFESSIONAL ENGINEER
7/7/21

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
LHT	RMC	MDW

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	5/27/21	ISSUED FOR REVIEW
0	7/7/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

145855.002.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00095A
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET TITLE

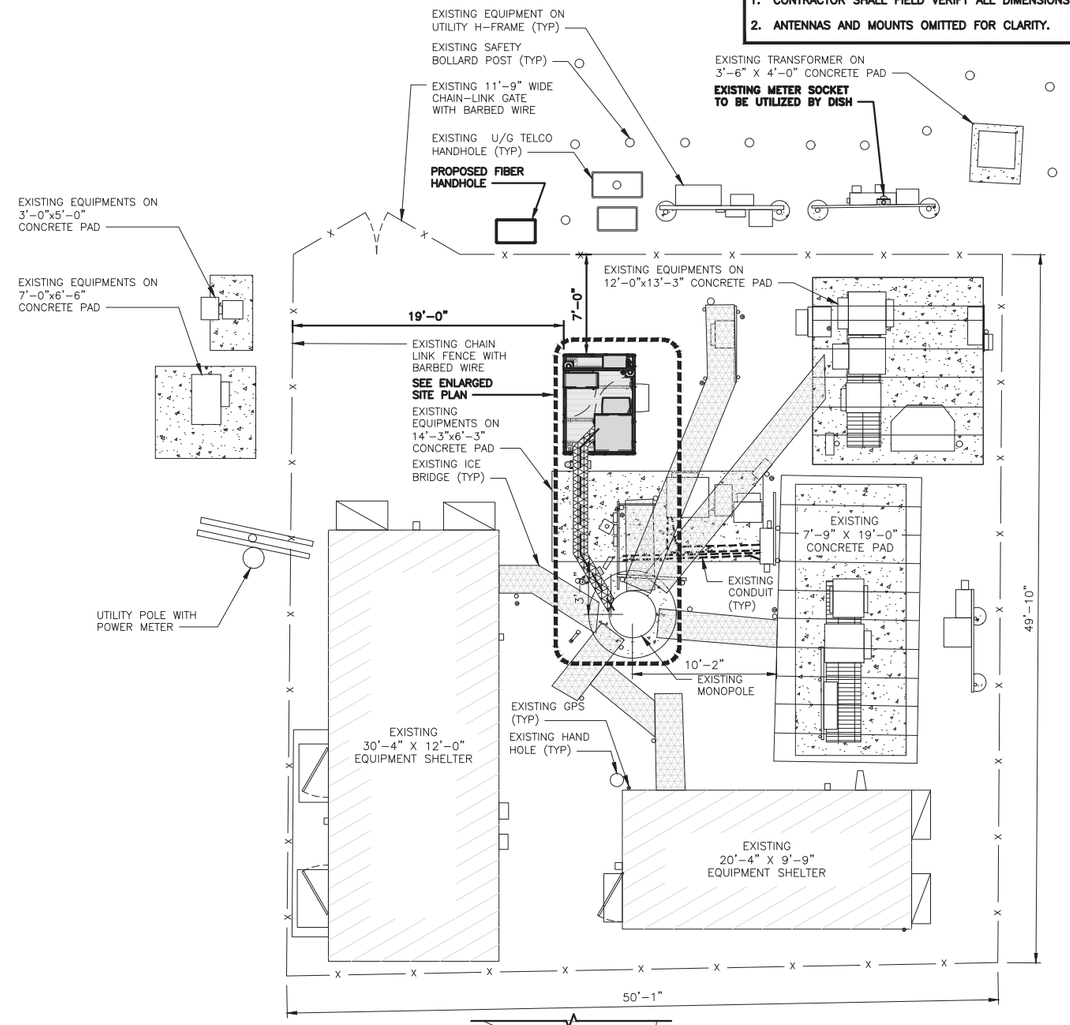
TITLE SHEET

SHEET NUMBER

T-1

NOTES

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



1
A-2

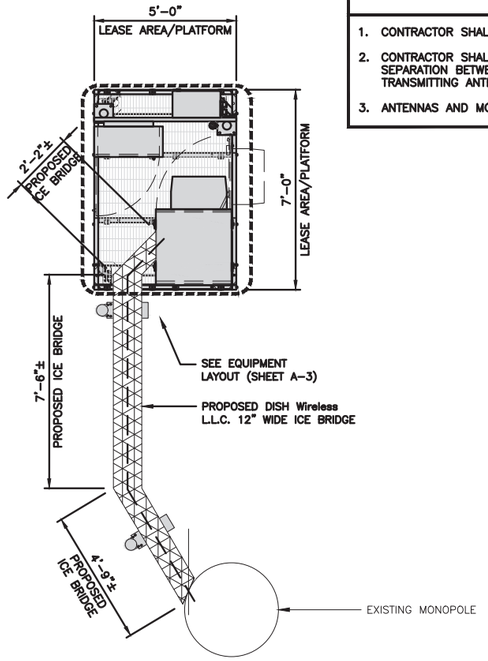
OVERALL SITE PLAN

6' 4' 2' 0 5' 10'
3/16"=1'-0"

1

NOTES

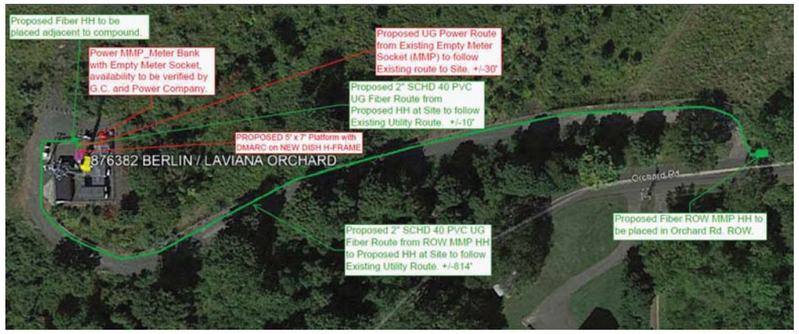
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



ENLARGED SITE PLAN

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

2



NOT USED

3

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00095A
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET TITLE

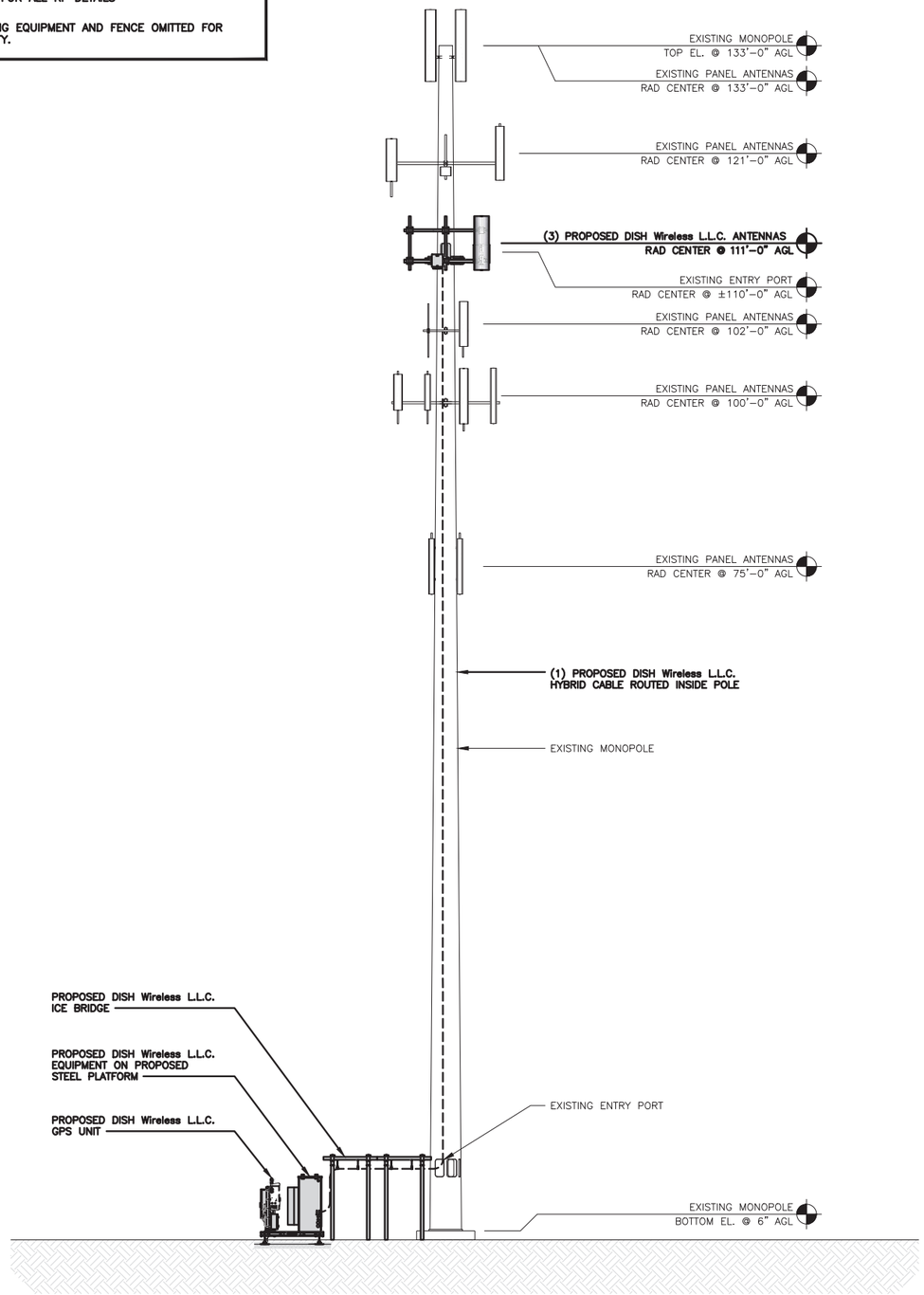
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

A-1

NOTES

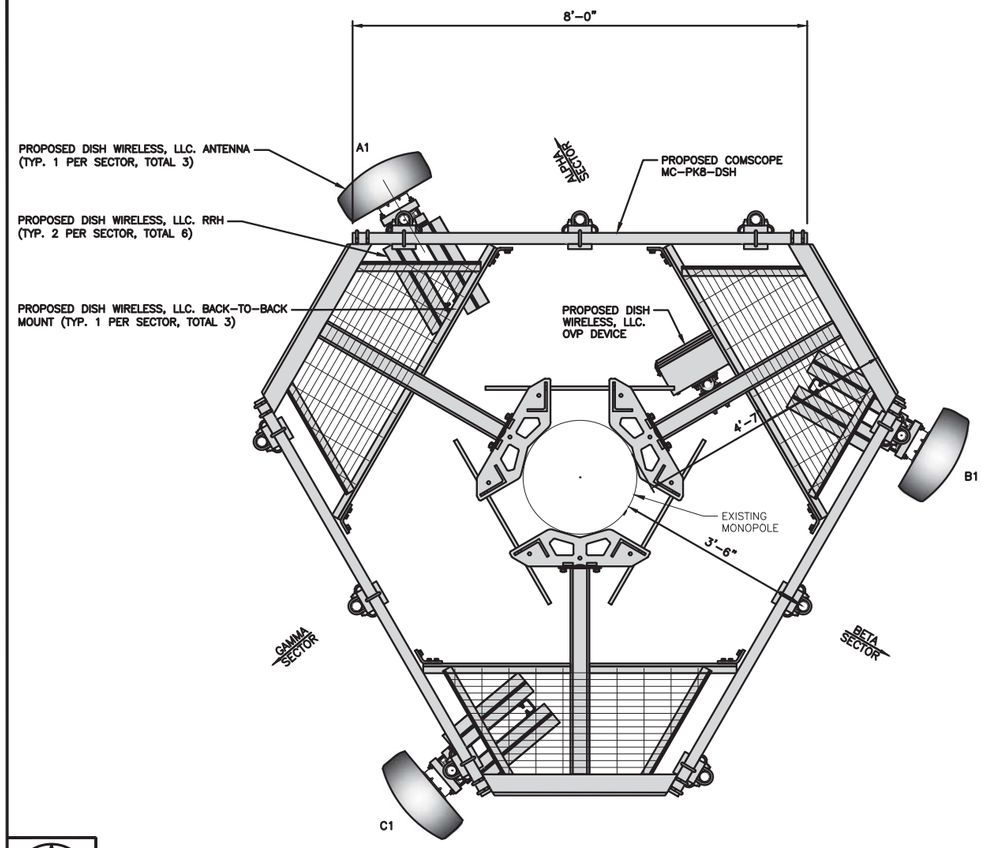
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



PROPOSED WEST ELEVATION

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

1



N

ANTENNA LAYOUT

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

2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	330°	111'-0"	(1) HIGH-CAPACITY HYBRID CABLE (150'-0" LONG)
BETA	B1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	120°	111'-0"	
GAMMA	C1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	230°	111'-0"	

SECTOR	POSITION	RRH	
		MANUFACTURER – MODEL NUMBER	TECHNOLOGY
ALPHA	A1	FUJITSU – TA08025-B604	n70|n66
	A1	FUJITSU – TA08025-B605	n71|n29
BETA	B1	FUJITSU – TA08025-B604	n70|n66
	B1	FUJITSU – TA08025-B605	n71|n29
GAMMA	C1	FUJITSU – TA08025-B604	n70|n66
	C1	FUJITSU – TA08025-B605	n71|n29

NOTES

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

ANTENNA SCHEDULE

NO SCALE

3

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
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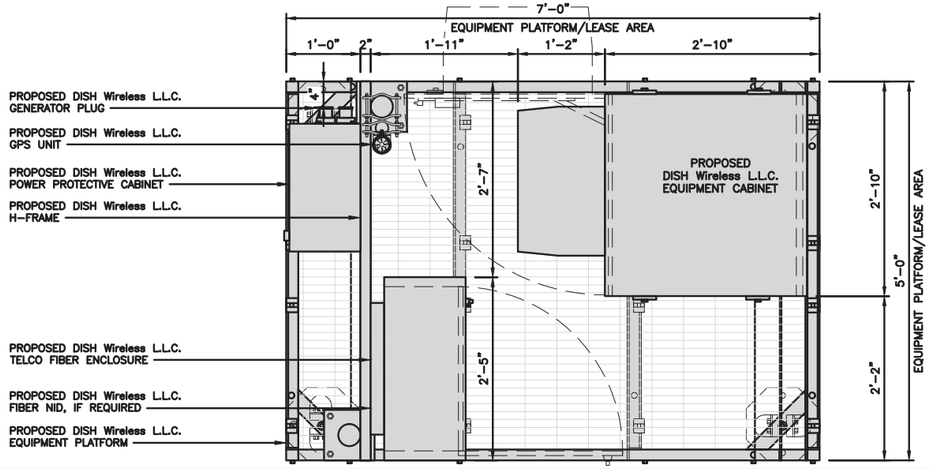
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET TITLE

ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER

A-2



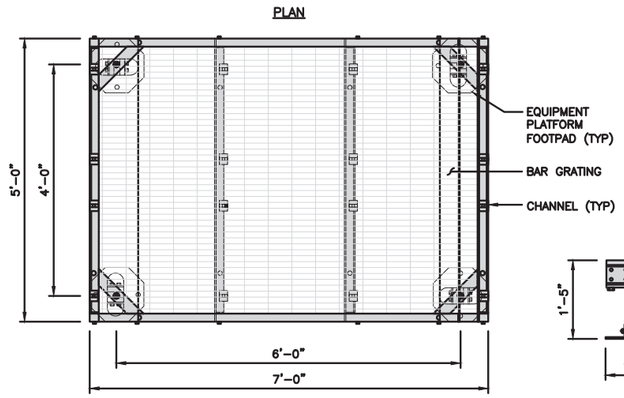
PLATFORM EQUIPMENT PLAN

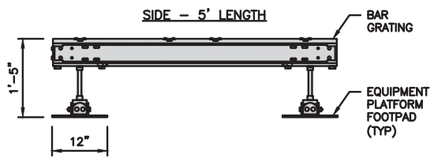
12" 9" 6" 3" 0 1' 2'
1"=1'-0"

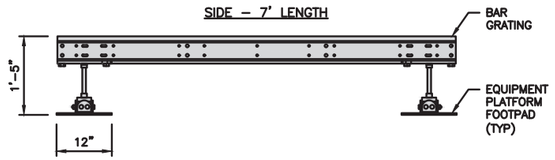
1

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

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

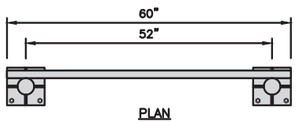


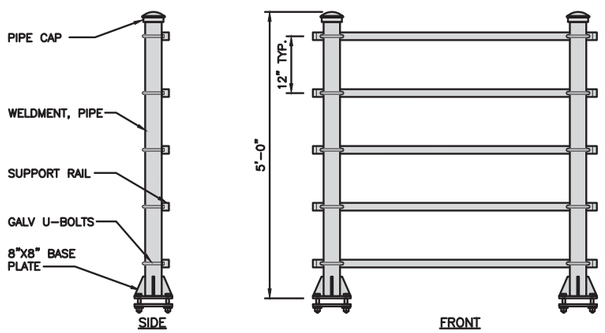




PLATFORM DETAIL | NO SCALE | 2

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



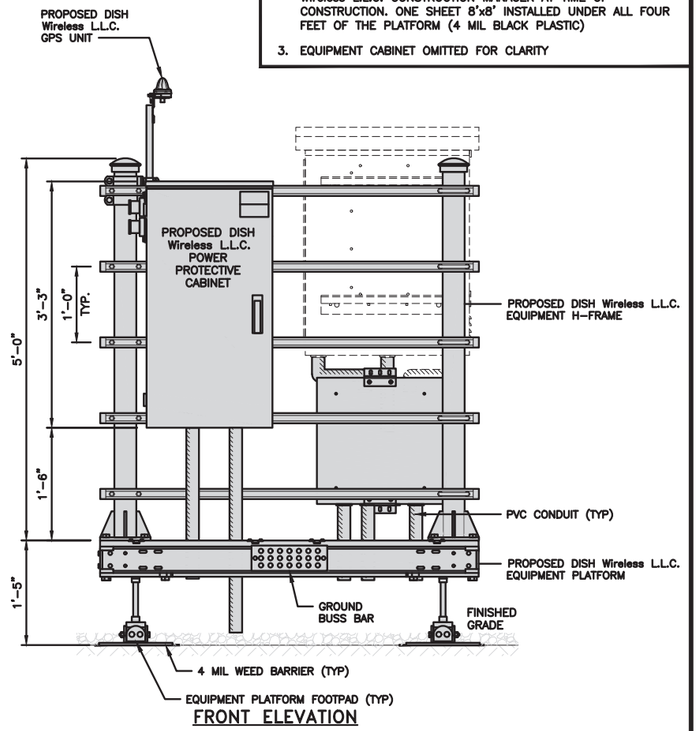


H-FRAME DETAIL | NO SCALE | 3

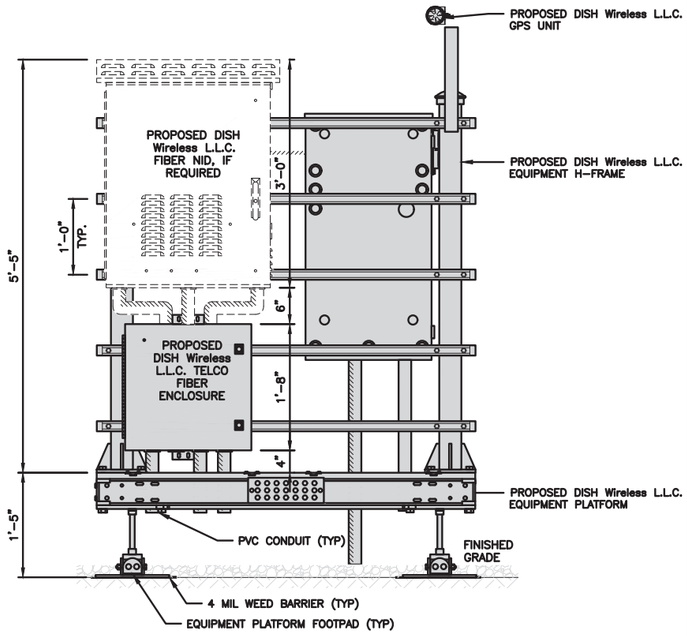
NOT USED | NO SCALE | 4

NOTES

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



FRONT ELEVATION



BACK ELEVATION

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

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STATE OF CONNECTICUT — No. 29924 — LICENSED PROFESSIONAL ENGINEER — 7/7/21

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PEC.0001564
Expires 2/10/22

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LHT	RMC	MDW

RFDS REV #: ---

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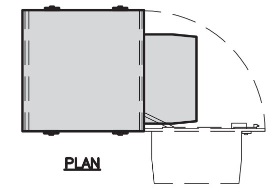
A&E PROJECT NUMBER
145855.002.01

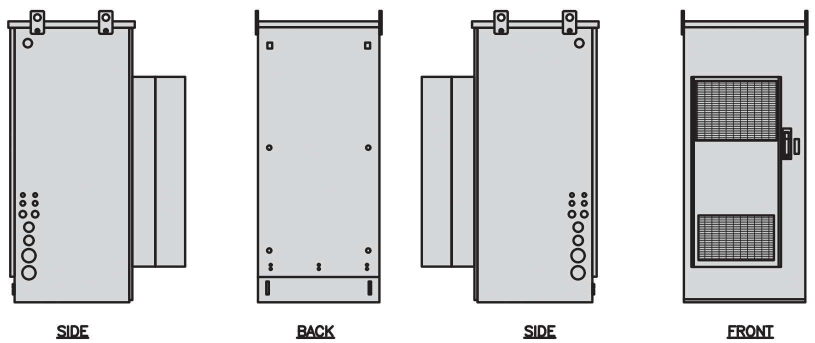
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00095A
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER
A-3

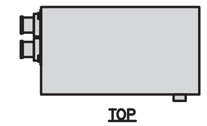
CHARLES INDUSTRY HEX CUBE-PM639155N4	
DIMENSIONS (HxWxD):	74"x32"x32"
POWER PLANT:	-48VDC ABB/600W
TOTAL WEIGHT (EMPTY)	408 LBS

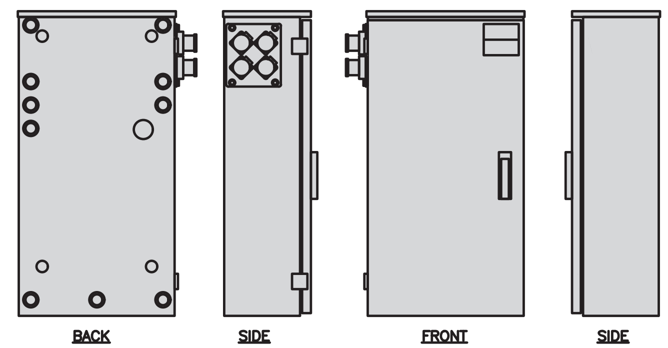




CABINET DETAIL | NO SCALE | 1

RAYCAP PPC RDIAC-2465-P-240-MTS	
ENCLOSURE DIMENSIONS (HxWxD):	39"x22.855"x12.593
WEIGHT:	80 lbs
OPERATING AC VOLTAGE	240/120 1 PHASE 3W+G



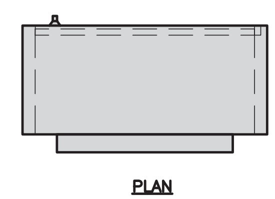


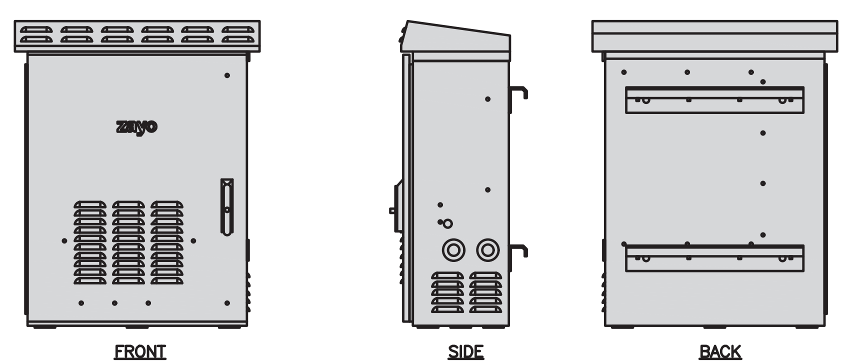
POWER PROTECTION CABINET (PPC) DETAIL | NO SCALE | 2

NOT USED | NO SCALE | 3

NOT USED | NO SCALE | 4

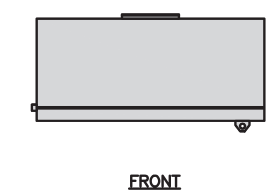
ZAYO 5RU CABINET LEFT SWING DOOR ("LIT" SITES)	
DIMENSIONS (HxWxD)	36.115"x29"x12.9"
WEIGHT	85 LBS
POWER INPUT	20A, -48VDC

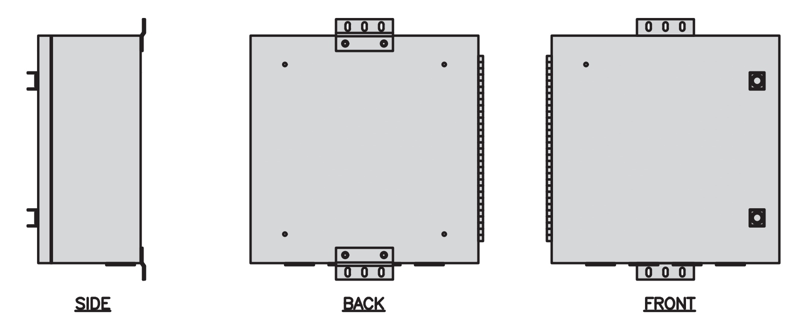




NETWORK INTERFACE UNIT DETAIL | NO SCALE | 5

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

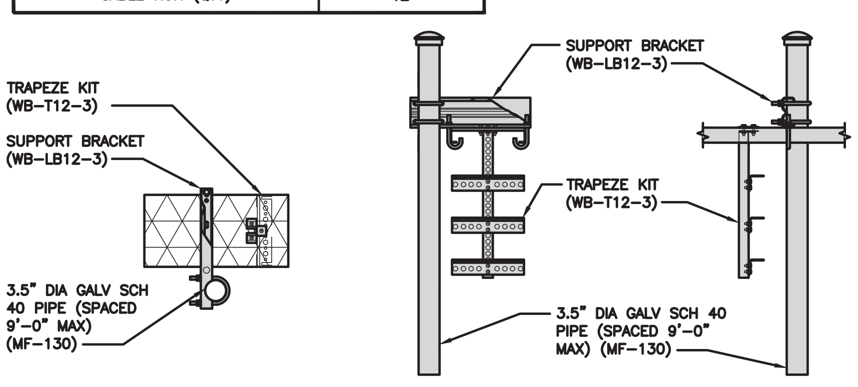




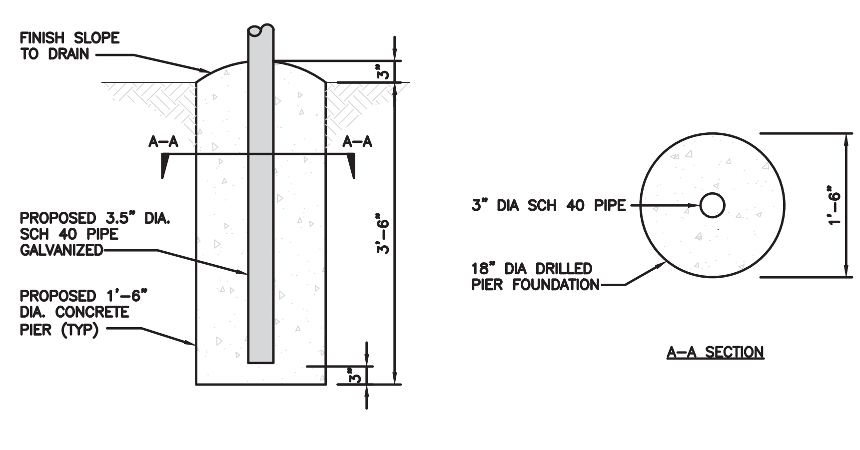
FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

COMMSCOPE WB-K110-B WAVEGUIDE BRIDGE KIT	
DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

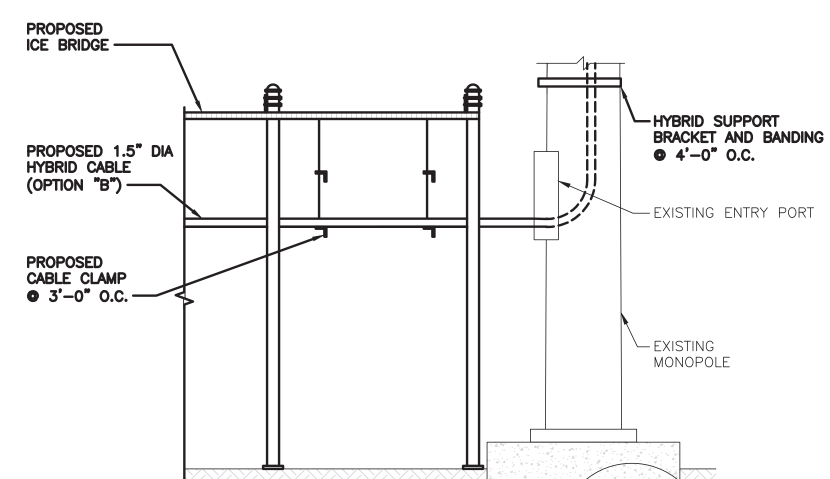
INCLUDED PRODUCTS:	
	WB-T12-3 TRAPEZE KIT, 3 RUNGS
	WB-LB12-3 SUPPORT BRACKET
	MF-130 DIRECT BURIAL PIPE COLUMN, 13'-4"



ICE BRIDGE DETAIL | NO SCALE | 7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL | NO SCALE | 8



HYBRID CABLE RUN | NO SCALE | 9

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DISH Wireless L.L.C.
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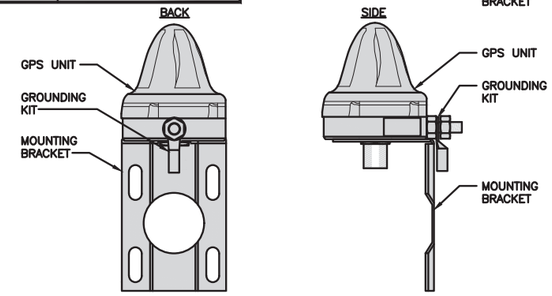
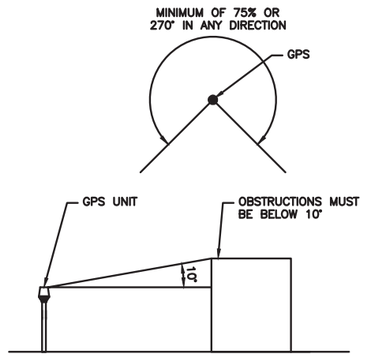
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

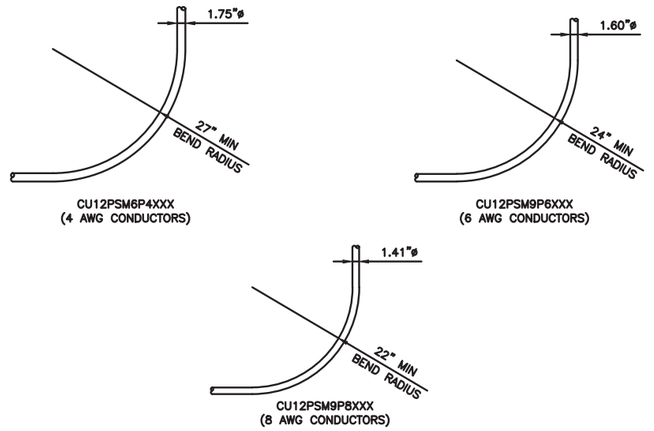
ROSENBERGER GPSGLONASS-36-N-S	
DIMENSION (DIA x H)	69mm x 98.5mm
WEIGHT (WITH ACCESSORIES)	515.74g
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1559 MHz ~ 1610.5MHz



GPS ANTENNA DETAIL | NO SCALE | 1



GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 2



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

NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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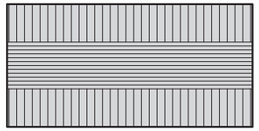
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

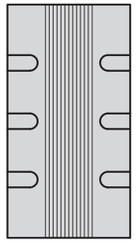
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

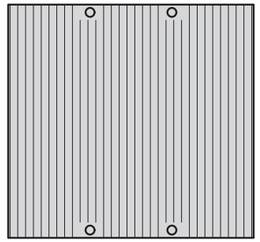
FUJITSU TA08025-B604 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-58~-36V



PLAN



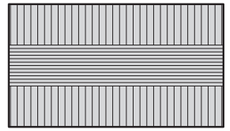
SIDE



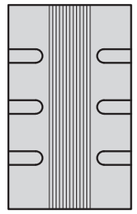
FRONT

REMOTE RADIO HEAD DETAIL — NO SCALE — 1

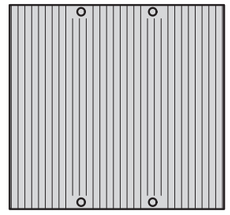
FUJITSU TA08025-B605 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x230/14.9"x15.7"x9.0"
WEIGHT(KG,LB)/ VOLUME	34kg,74.9lb/ 35L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE

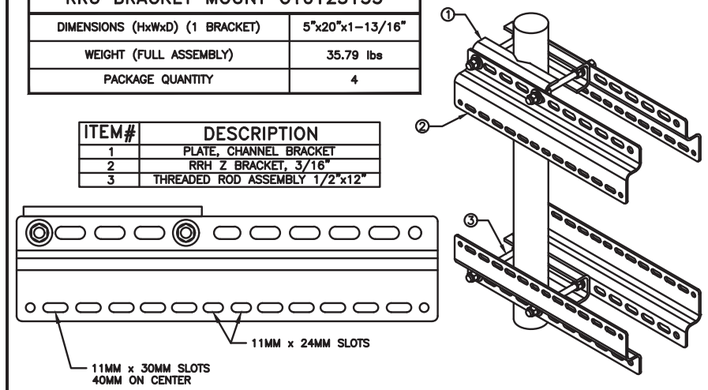


FRONT

REMOTE RADIO HEAD DETAIL — NO SCALE — 2

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

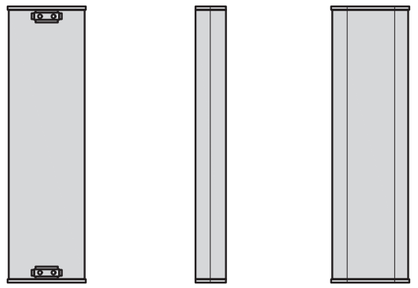
ITEM#	DESCRIPTION
1	PLATE, CHANNEL BRACKET
2	RRH Z BRACKET, 3/16"
3	THREADED ROD ASSEMBLY 1/2"x12"



REMOTE RADIO MOUNT DETAIL — NO SCALE — 3

JMA WIRELESS MX08FRO665-21 ANTENNA	
DIMENSIONS (HxWxD)	72.8"x20.0"x8.0"
TOTAL WEIGHT	64.5 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE

PLAN

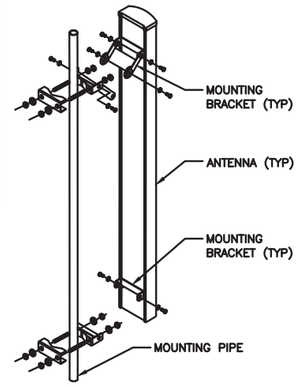


BACK SIDE FRONT

ANTENNA DETAIL — NO SCALE — 4

NOT USED — NO SCALE — 5

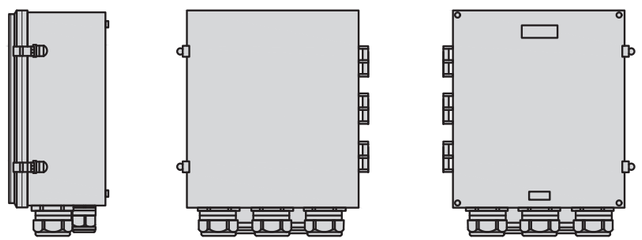
M04 MOUNTING BRACKET HPA-33R-BUU-H4-K	
WIDTH	5" (135mm)
DEPTH	2" (51mm)
HEIGHT	8" (213mm)
TOTAL WEIGHT (WITH BRACKETS)	1.5 LBS (15.50 Kg)
HOUSING MATERIAL	ASA/ABS/ALUMINUM
RADOME COLOR	LIGHT GRAY
CONNECTOR	1X8-PIN DAISY CHAIN



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

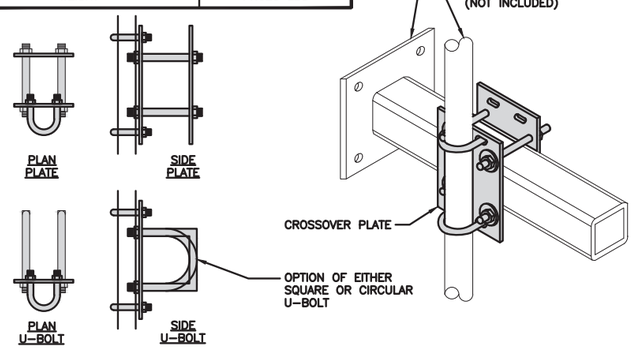
PLAN



SIDE BACK FRONT

SURGE SUPPRESSION DETAIL (OVP) — NO SCALE — 7

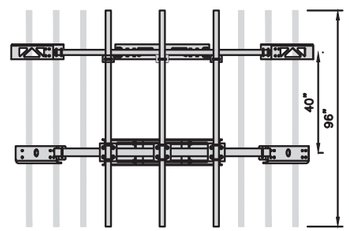
COMMSCOPE XP-2040 CROSSOVER PLATE	
DIMENSIONS (HxW)	10"x12"
WEIGHT	11.023 LBS

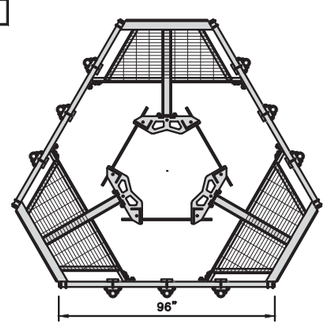


RRH/OVP MOUNT DETAIL — NO SCALE — 8

COMMSCOPE MC-PK8-DSH	
FACE WIDTH	96"
WEIGHT	1373.08 lbs
NOTE: 15" TO 38" O.D.	

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





ANTENNA PLATFORM DETAIL — NO SCALE — 9

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1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET TITLE

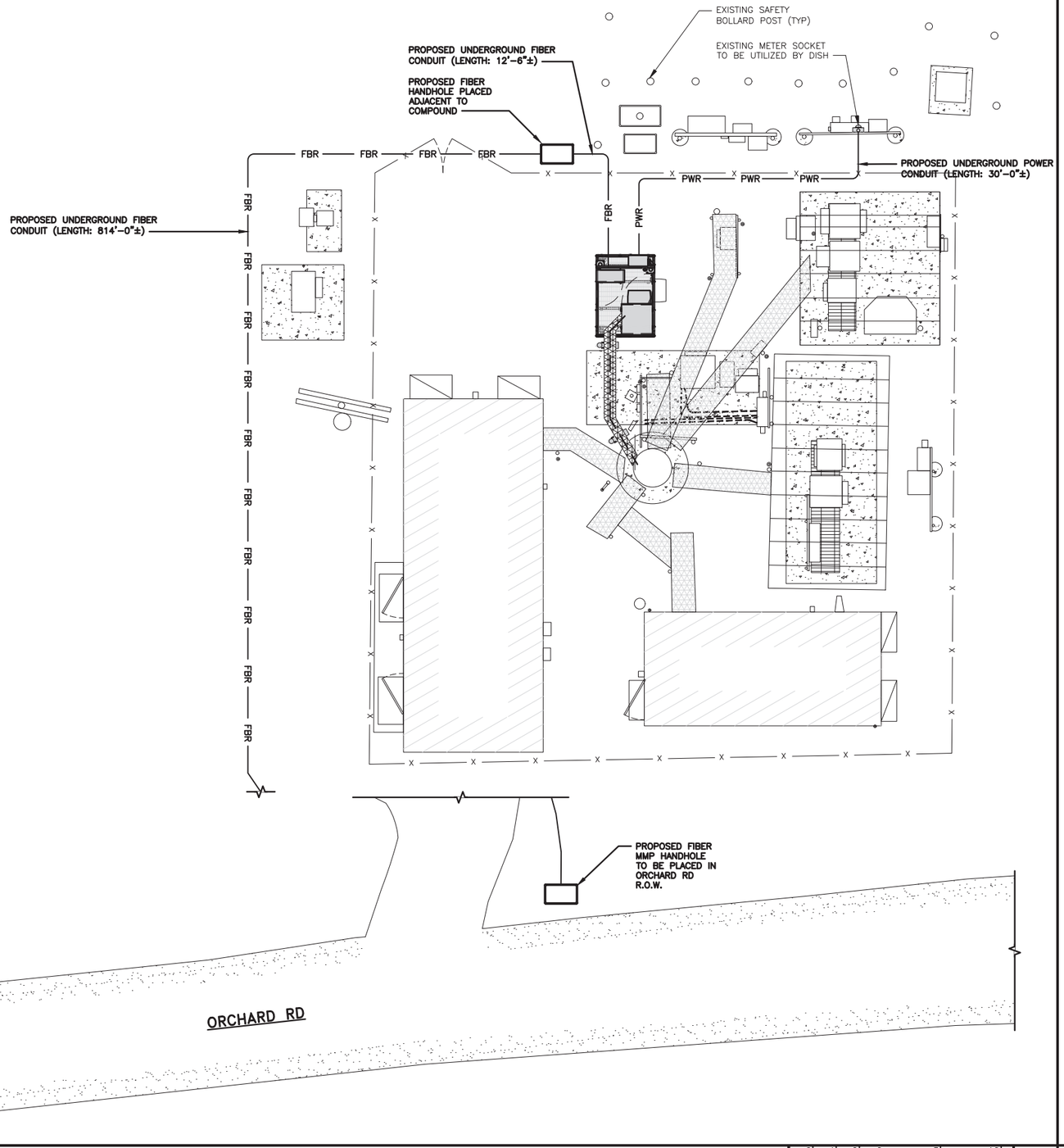
EQUIPMENT DETAILS

SHEET NUMBER

A-6

NOTES

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



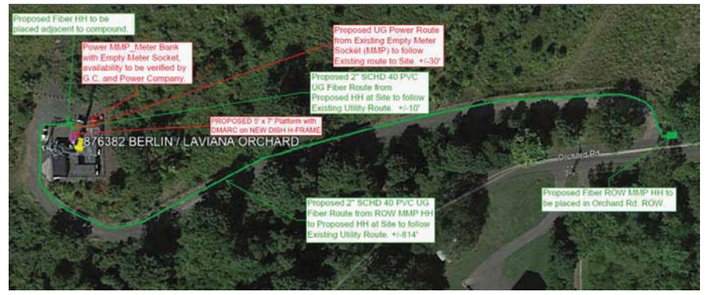
UTILITY ROUTE PLAN

6' 4' 2' 0 5' 10'
3/16"=1'-0"

1

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

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



ELECTRICAL NOTES

NO SCALE

2

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145855.002.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00095A
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET TITLE

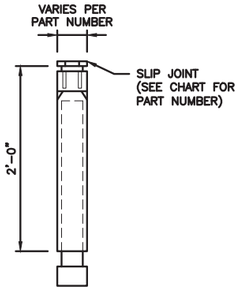
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

SHEET NUMBER

E-1

CARLON EXPANSION FITTINGS

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

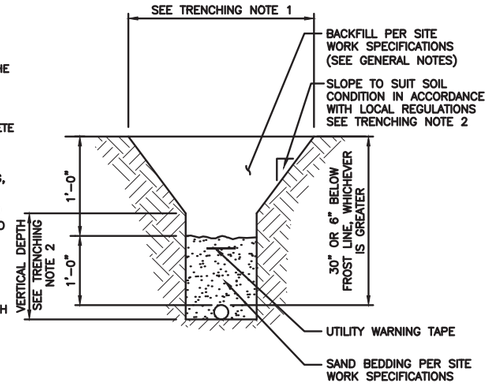


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

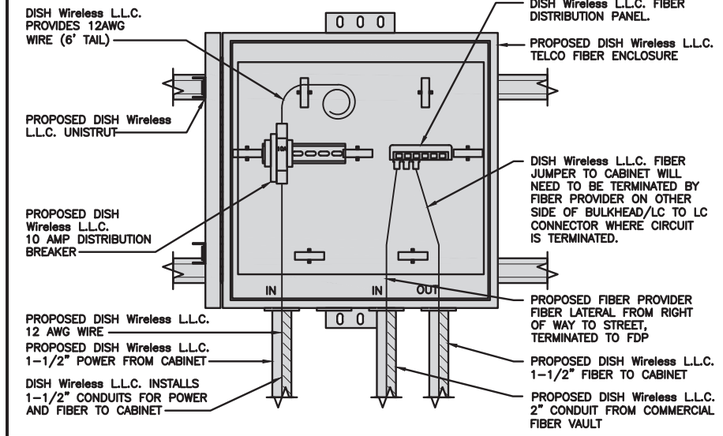
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

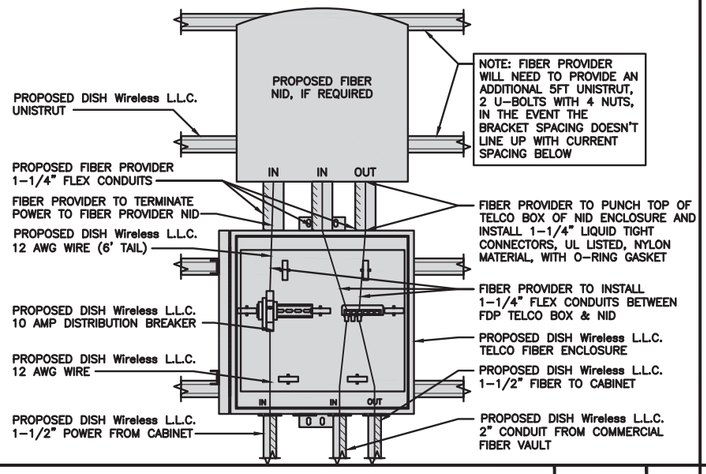
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT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



TYPICAL UNDERGROUND TRENCH DETAIL | NO SCALE | 2



DARK TELCO BOX – INTERIOR WIRING LAYOUT | NO SCALE | 3



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

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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STATE OF CONNECTICUT — No. 23924 LICENSED PROFESSIONAL ENGINEER — 7/7/21

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
LHT	RMC	MDW

RFDS REV #: ---

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PROJECT INFORMATION
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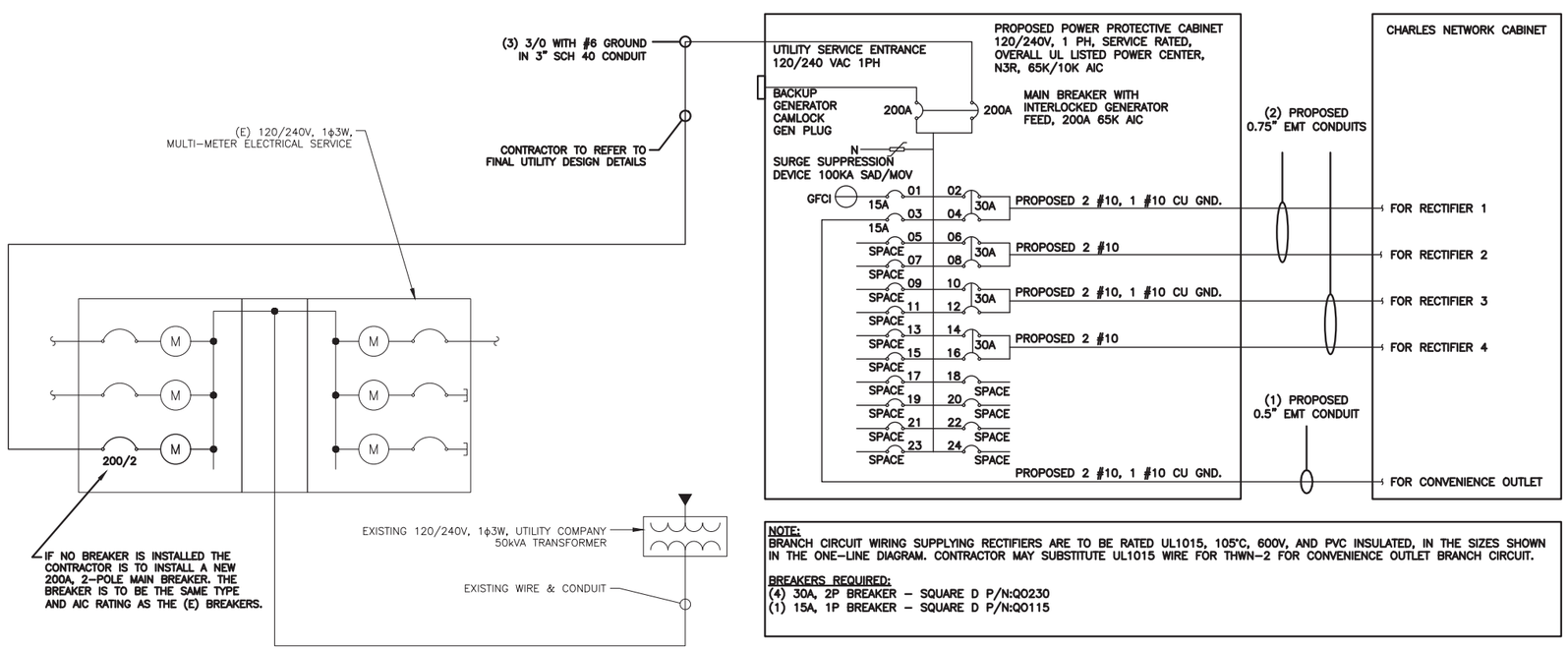
SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-2



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

BREAKERS REQUIRED:
(4) 30A, 2P BREAKER - SQUARE D P/N:QO230
(1) 15A, 1P BREAKER - SQUARE D P/N:QO115

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)(a) 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.

PPC ONE-LINE DIAGRAM | NO SCALE | 1

PROPOSED CHARLES PANEL SCHEDULE

LOAD SERVED	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	LOAD SERVED
PPC GFCI OUTLET	180		15A	1	A	2	30A	2880		ABB/GE INFINITY RECTIFIER 1
CHARLES GFCI OUTLET		180	15A	3	B	4			2880	
-SPACE-				5	A	6	30A	2880		ABB/GE INFINITY RECTIFIER 2
-SPACE-				7	B	8			2880	
-SPACE-				9	A	10	30A	2880		ABB/GE INFINITY RECTIFIER 3
-SPACE-				11	B	12			2880	
-SPACE-				13	A	14	30A	2880		ABB/GE INFINITY RECTIFIER 4
-SPACE-				15	B	16			2880	
-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					
MB RATING: 65,000 AIC			11700		11700		VOLTAGE AMPS			
			98		98		AMPS			
			98				MAX AMPS			
			123				MAX 125%			

PANEL SCHEDULE | NO SCALE | 2

NOT USED | NO SCALE | 3

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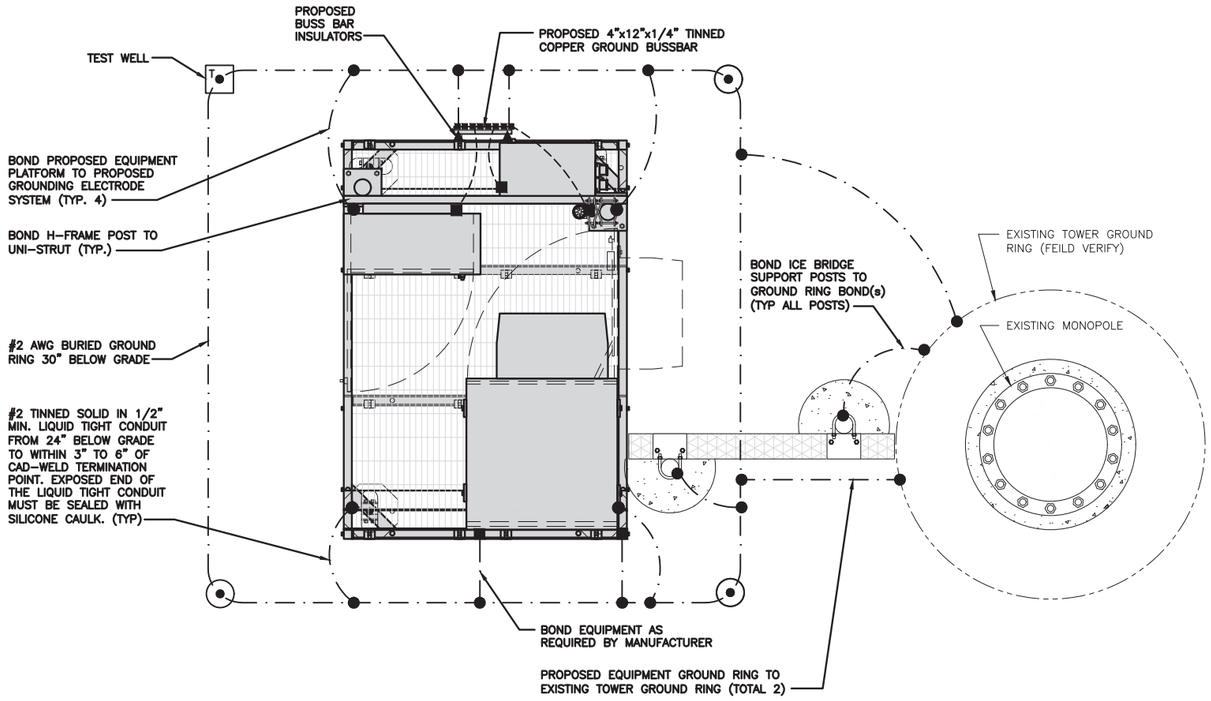
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

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

SHEET NUMBER
E-3

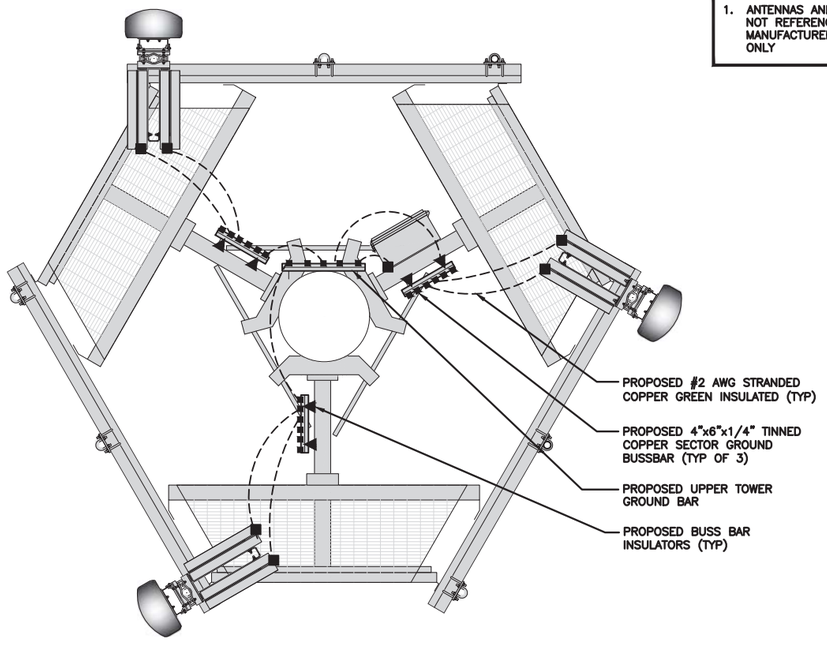


TYPICAL EQUIPMENT GROUNDING PLAN

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

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

GROUNDING LEGEND

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

GROUNDING KEY NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(P) TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO PROPOSED ANTENNA MOUNT COLLAR.

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

GROUNDING KEY NOTES

NO SCALE | 3

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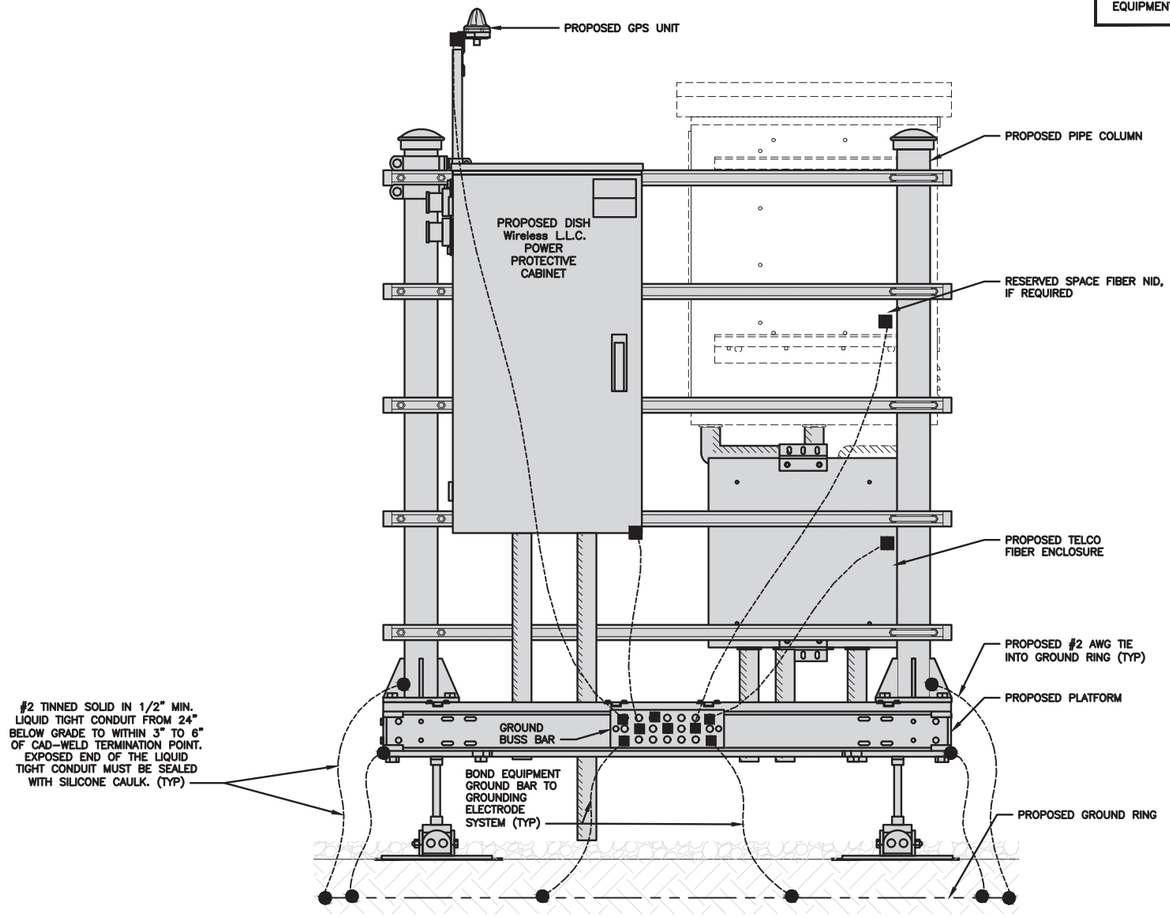
SHEET TITLE
GROUNDING PLANS AND NOTES

SHEET NUMBER
G-1

NOTES

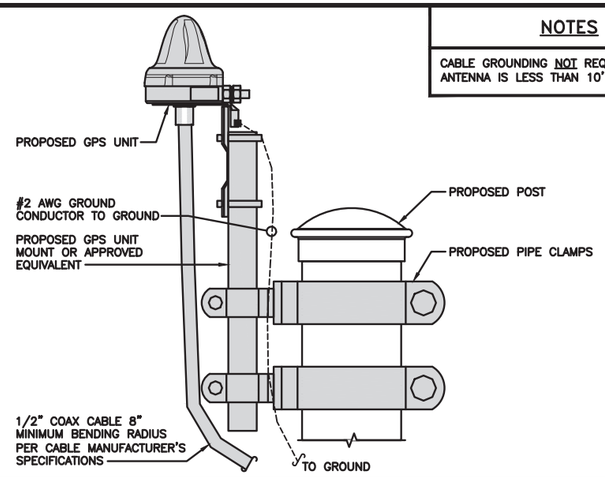
EQUIPMENT CABINET OMITTED FOR CLARITY



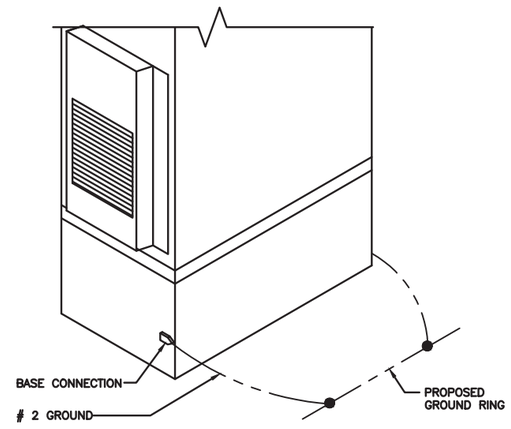
H-FRAME GROUNDING DETAIL | NO SCALE | 1

NOTES

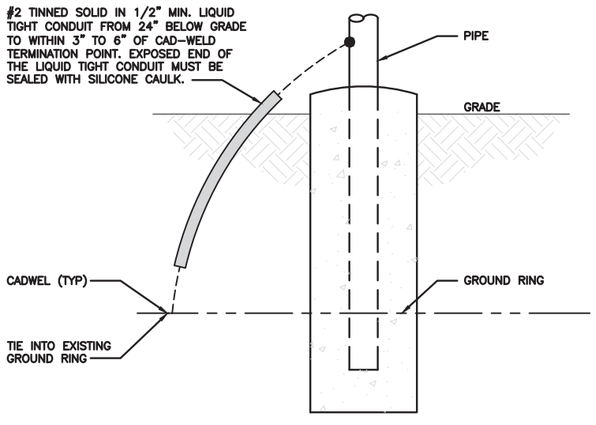
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



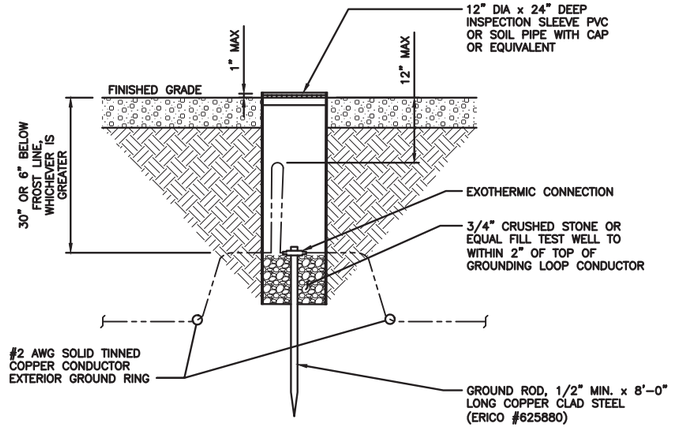
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



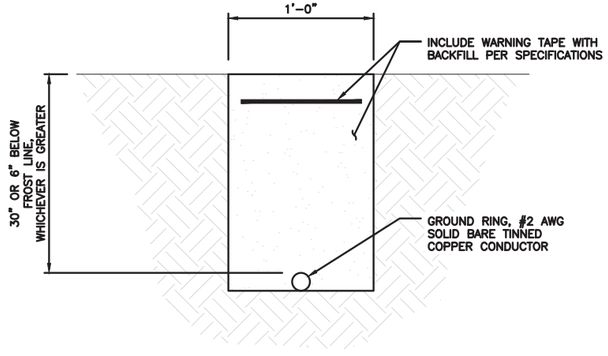
OUTDOOR CABINET GROUNDING | NO SCALE | 3



TRANSITIONING GROUND DETAIL | NO SCALE | 4



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



TYPICAL GROUND RING TRENCH | NO SCALE | 6

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SHEET TITLE

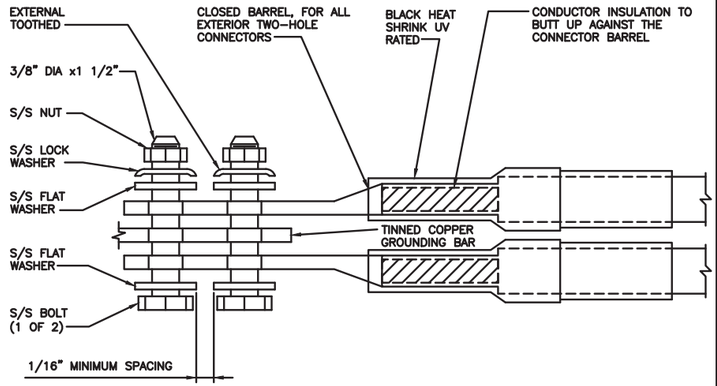
GROUNDING DETAILS

SHEET NUMBER

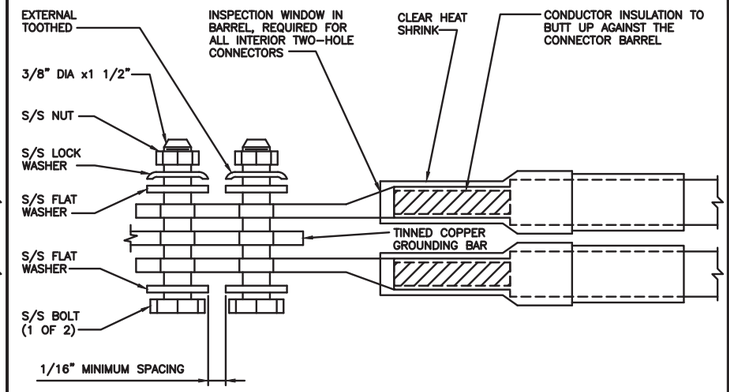
G-2

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

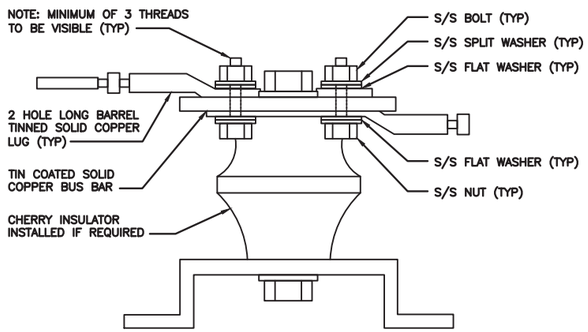
TYPICAL GROUNDING NOTES | NO SCALE | 1



TYPICAL EXTERIOR TWO HOLE LUG | NO SCALE | 2



TYPICAL INTERIOR TWO HOLE LUG | NO SCALE | 3



LUG DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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SHEET TITLE
GROUNDING DETAILS

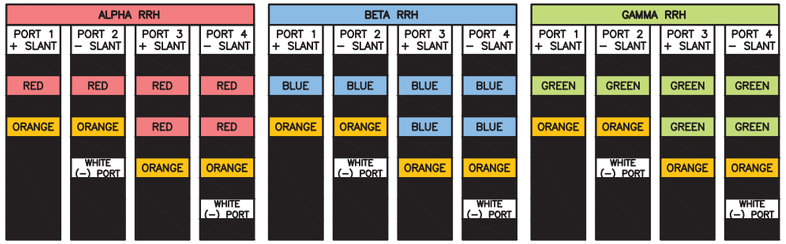
SHEET NUMBER
G-3

RF JUMPER COLOR CODING

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

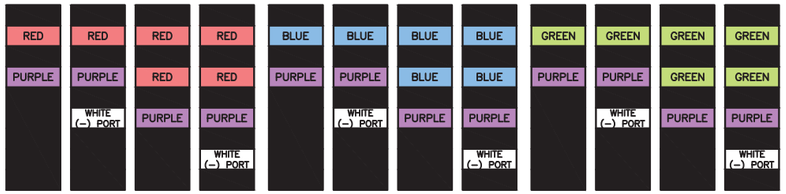
LOW-BAND RRH –
(600MHz N71 BASEBAND) +
(850MHz N26 BAND) +
(700MHz N29 BAND) – OPTIONAL PER MARKET

ADD FREQUENCY COLOR TO SECTOR BAND
(CBRS WILL USE YELLOW BANDS)



MID-BAND RRH –
(AWS BANDS N66+N70)

ADD FREQUENCY COLOR TO SECTOR BAND
(CBRS WILL USE YELLOW BANDS)

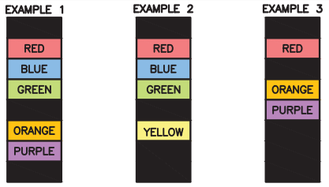


HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED
ALONG WITH FREQUENCY BANDS

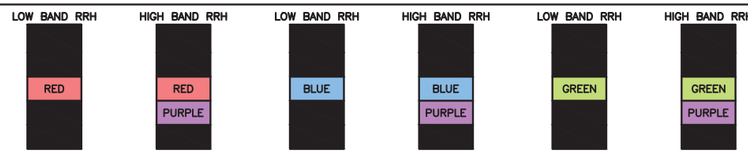
EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS
ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS

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



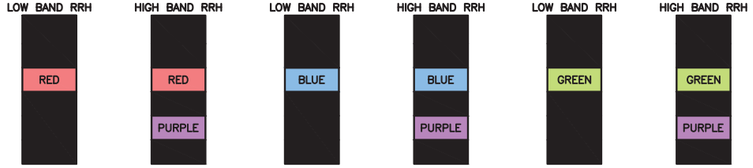
FIBER JUMPERS TO RRHs

LOW-BAND RRH FIBER CABLES HAVE SECTOR
STRIPE ONLY

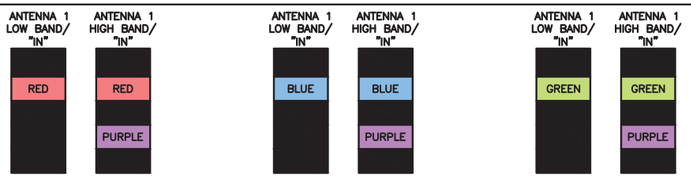


POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR
STRIPE ONLY



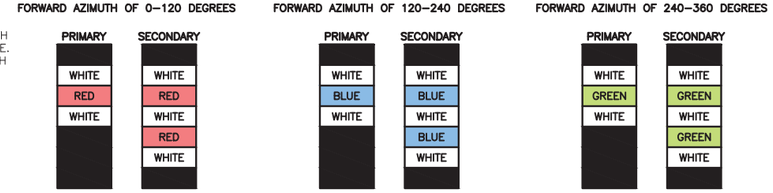
RET MOTORS AT ANTENNAS



MICROWAVE RADIO LINKS

LINKS WILL HAVE A 1.5-2 INCH WHITE WRAP WITH
THE AZIMUTH COLOR OVERLAPPING IN THE MIDDLE.
ADD ADDITIONAL SECTOR COLOR BANDS FOR EACH
ADDITIONAL MW RADIO.

MICROWAVE CABLES WILL REQUIRE P-TOUCH
LABELS INSIDE THE CABINET TO IDENTIFY THE
LOCAL AND REMOTE SITE ID'S



RF CABLE COLOR CODES	NO SCALE	1

LOW BANDS (N71+N26)
OPTIONAL – (N29)
ORANGE

AWS
(N66+N70+H-BLOCK)
PURPLE

CBRS TECH
(3 GHz)
YELLOW

NEGATIVE SLANT PORT
ON ANT/RRH
WHITE

ALPHA SECTOR
RED

BETA SECTOR
BLUE

GAMMA SECTOR
GREEN

COLOR IDENTIFIER	NO SCALE	2

NOT USED	NO SCALE	3

NOT USED	NO SCALE	4

dish wireless.

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LITTLETON, CO 80120

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

STATE OF CONNECTICUT
No. 23924
LICENSED
PROFESSIONAL ENGINEER
7/7/21

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
LHT	RMC	MDW

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	5/27/21	ISSUED FOR REVIEW
0	7/7/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

145855.002.01

DISH Wireless L.L.C.
PROJECT INFORMATION

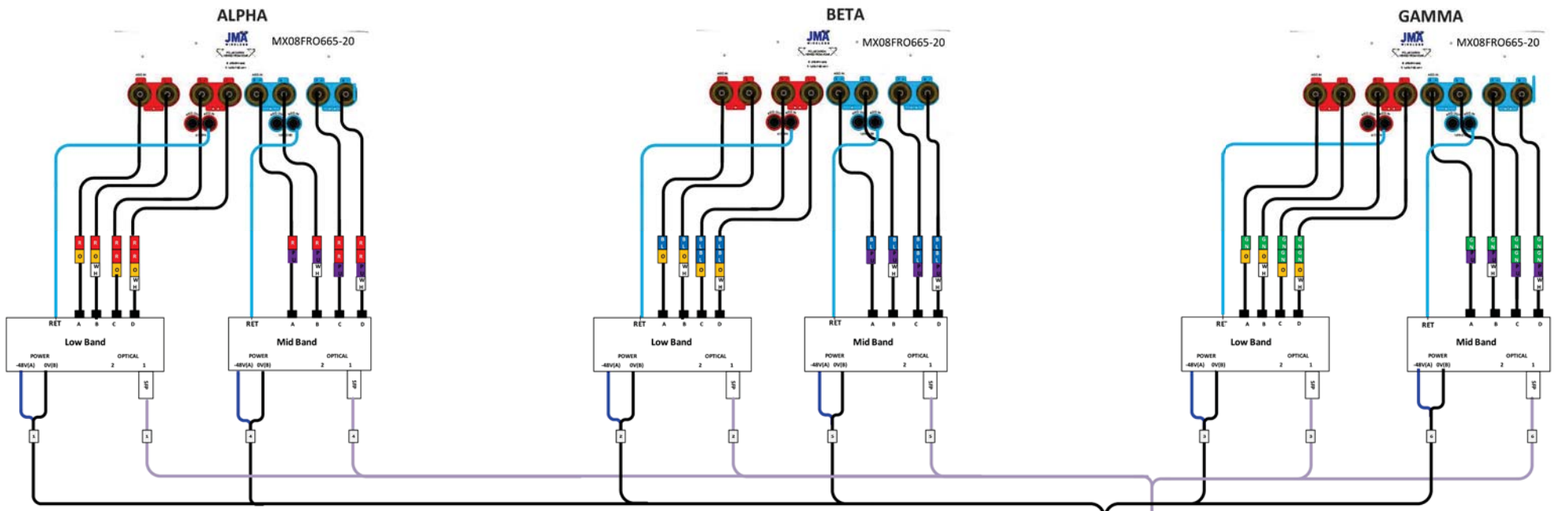
BOBDL00095A
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET TITLE

RF
CABLE COLOR CODES

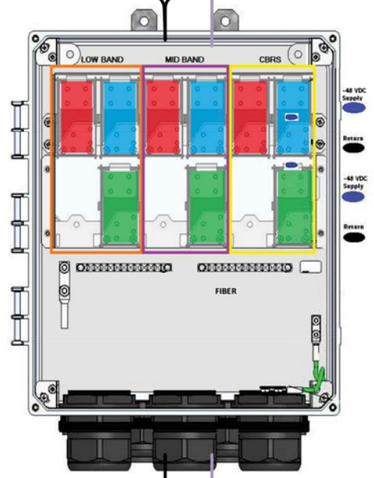
SHEET NUMBER

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



CSR NCS540

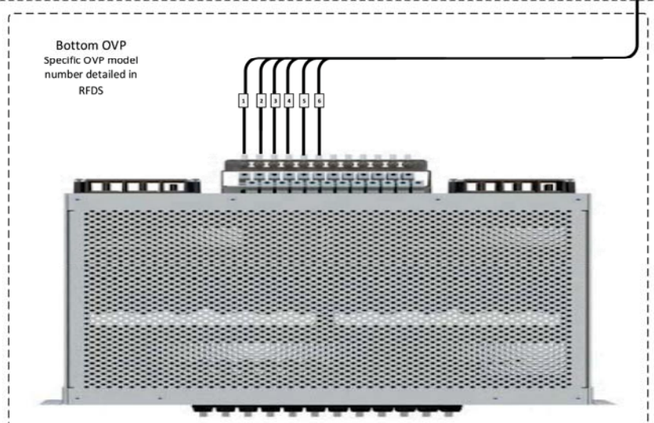
Port	Interface	Description
0	Gi0/0/0/0	SiteBoss
1	Gi0/0/0/1	CBRS - Alpha
2	Gi0/0/0/2	CBRS - Beta
3	Gi0/0/0/3	CBRS - Gamma
4	Te0/0/0/4	Fujitsu Low-Band RU - Alpha
5	Te0/0/0/5	Fujitsu Mid-Band RU - Alpha
6	Te0/0/0/6	Fujitsu Low-Band RU - Beta
7	Te0/0/0/7	Fujitsu Mid-Band RU - Beta
8	Te0/0/0/8	Fujitsu Low-Band RU - Gamma
9	Te0/0/0/9	Fujitsu Mid-Band RU - Gamma
10	Te0/0/0/10	Fixed Wifi
11	Te0/0/0/11	Fixed Wifi
12	Te0/0/0/12	Fixed Wifi
13	Te0/0/0/13	Fixed Wifi
14	Te0/0/0/14	CBRS1
15	Te0/0/0/15	CBRS2
16	Te0/0/0/16	CBRS3
17	Gi0/0/0/17	SM1 - BMC
18	Gi0/0/0/18	SM2 - BMC
19	Te0/0/019	SM1 - Data 1
20	Te0/0/020	SM1 - Data 2
21	Te0/0/021	SM2 - Data 1
22	Te0/0/022	SM2 - Data 2
23	Te0/0/023	Reserved Uplink (EDC, LDC)
24	Te0/0/024	Blank/Future
25	Te0/0/025	Blank/Future
26	Te0/0/026	Fiber NIU
27	Te0/0/027	Fiber NIU
28	Te0/0/028	Blank/Future
29	Te0/0/029	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 CBRS
Circuit 8	Beta CBRS
Circuit 9	Gamma CBRS
Circuit 10	Open
Circuit 11	Open
Circuit 12	Open



Quan Liu	5G plumbing diagram JMA MX08FRO665-20 2-2-2(LB+MB)
5-Jan-2021	SIZE: — FSCM NO: — DWG NO: — REV: 3 SCALE: None SHEET: —

PLUMBING DIAGRAM

NO SCALE | 1

dish wireless.

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1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET TITLE

RF
PLUMBING DIAGRAM

SHEET NUMBER

RF-2

LEGEND

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

BUSS BAR INSULATOR

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM — T

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE — T

SINGLE POLE SWITCH — $

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE — GFCI

FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48–T8 — F

SMOKE DETECTION (DC) — SD

EMERGENCY LIGHTING (DC)

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

CHAIN LINK FENCE — x — x — x — x

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE — W — W — W — W — W

UNDERGROUND POWER — UGP — UGP — UGP — UGP — UGP

UNDERGROUND TELCO — UGT — UGT — UGT — UGT — UGT

OVERHEAD POWER — OHP — OHP — OHP — OHP

OVERHEAD TELCO — OHT — OHT — OHT — OHT

UNDERGROUND TELCO/POWER — UGT/P — UGT/P — UGT/P — UGT/P

ABOVE GROUND POWER — AGP — AGP — AGP — AGP — AGP

ABOVE GROUND TELCO — AGT — AGT — AGT — AGT — AGT

ABOVE GROUND TELCO/POWER — AGT/P — AGT/P — AGT/P — AGT/P

WORKPOINT — W.P.

SECTION REFERENCE — XX / X–X

DETAIL REFERENCE — XX / X–X

ABBREVIATIONS

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

dish wireless.

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7/7/21

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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00095A
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET TITLE

LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SITE ACTIVITY REQUIREMENTS:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES:

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

CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION

CARRIER:DISH Wireless L.L.C.

TOWER OWNER:TOWER OWNER

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

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

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

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

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

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

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

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

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

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

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

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

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

dish wireless.

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7/7/21

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
LHT	RMC	MDW

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

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A&E PROJECT NUMBER

145855.002.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00095A
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

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.

dish wireless.

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7/7/21

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PEC.0001564
Expires 2/10/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
LHT	RMC	MDW

RFDS REV #: ---

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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00095A
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

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.

dish wireless.

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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00095A
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

Exhibit D

Structural Analysis Report

Date: **February 17, 2022**

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***DISH Network* Co-Locate**	
	Site Number:	BOBDL00095A
	Site Name:	CT-CCI-T-876382
Crown Castle Designation:	**BU Number:**	876382
	Site Name:	BERLIN / LAVIANA ORCHARD
	JDE Job Number:	650080
	Work Order Number:	2077369
	Order Number:	556603 Rev. 4
Engineering Firm Designation:	**Crown Castle Project Number:**	2077369
Site Data:	**1684 Chamberlain Highway, BERLIN, HARTFORD County, CT** **Latitude *41° 35' 23.07"*, Longitude *-72° 48' 19.2"*** **133 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:

LC7: Proposed Equipment Configuration **Sufficient Capacity – 94.6%**

This analysis utilizes an ultimate 3-second gust wind speed of 118 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: Matthew Schmitt

Respectfully submitted by:

STATE OF CONNECTICUT
TERRY P. STYRAN
31522
LICENSED
PROFESSIONAL ENGINEER

Terry P Styran
2022.02.18
15:05:51 -05'00'

Terry P. Styran, P.E.
Senior Project Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 133 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:	118 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1 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)
111.0	111.0	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-PK8-DSH		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
132.0	132.0	3	cci antennas	TPA65R-BU8D_CCIV2 w/ Mount Pipe	6 4 2 2	1-1/4 3/4 3/8 Conduit
		3	ericsson	RRUS 4415 B25		
		3	ericsson	RRUS 4449 B5/B12		
		3	kaelus	DBC0111F2V62-1		
		1	raycap	DC6-48-60-18-8C-EV		
		1	raycap	DC6-48-60-18-8F		
		1	tower mounts	Side Arm Mount [SO 901-3]		
120.0	121.0	3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe	3	1-5/8
		3	ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	ericsson	Radio 4480_TMOV2		
		3	rfs celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
	120.0	1		SitePro1 RMQP-496-HK		
101.0	101.0	3	andrew	ETT19VS12UB	6	1-5/8
		3	ericsson	KRY 112 144/1		
		3	rfs celwave	APX16DWV-16DWVS-C w/ Mount Pipe		
		1	tower mounts	T-Arm Mount [TA 602-3]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
93.0	94.0	3	alcatel lucent	RRH2X40-AWS	13	1-5/8
		3	andrew	LNX-6514DS-A1M w/ Mount Pipe		
		3	antel	BXA-171063-12CF-EDIN-X w/ Mount Pipe		
		2	antel	BXA-171063-8BF-2 w/ Mount Pipe		
		1	antel	BXA-171085-8BF-EDIN-0 w/ Mount Pipe		
		3	antel	BXA-70063-4CF-EDIN-X w/ Mount Pipe		
		1	rfs celwave	DB-T1-6Z-8AB-0Z		
		6	rfs celwave	FD9R6004/2C-3L		
	93.0	1	tower mounts	Platform Mount [LP 1201-1]		
75.0	75.0	3	rfs celwave	APXV18-206517S-C	6	1-5/8
		1	tower mounts	Pipe Mount [PM 601-3]		
50.0	51.0	1	lucent	KS24019-L112A	1	1/2
	50.0	1	tower mounts	Side Arm Mount [SO 702-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	1629353	CCISITES
4-POST-MODIFICATION INSPECTION	8482047	CCISITES
4-POST-MODIFICATION INSPECTION	5287888	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	1629413	CCISITES
4-TOWER MANUFACTURER DRAWINGS	1629384	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	8173364	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	2611098	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	2339268	CCISITES

3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. 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 reinforcing elements. These calculations are presented 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 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L1	133 - 128	Pole	TP14x14x0.375	Pole	5.5%	Pass
L2	128 - 123	Pole	TP14x14x0.375	Pole	12.4%	Pass
L3	123 - 118	Pole	TP22.75x22x0.1875	Pole	12.3%	Pass
L4	118 - 113	Pole	TP23.5x22.75x0.1875	Pole	19.4%	Pass
L5	113 - 108	Pole	TP24.251x23.5x0.1875	Pole	28.7%	Pass
L6	108 - 103	Pole	TP25.001x24.251x0.1875	Pole	38.4%	Pass
L7	103 - 98	Pole	TP25.751x25.001x0.1875	Pole	48.5%	Pass
L8	98 - 93	Pole	TP26.501x25.751x0.1875	Pole	58.3%	Pass
L9	93 - 88	Pole	TP27.251x26.501x0.1875	Pole	71.1%	Pass
L10	88 - 85.75	Pole	TP28.114x27.251x0.1875	Pole	76.2%	Pass
L11	85.75 - 80.75	Pole	TP27.964x27.214x0.25	Pole	56.9%	Pass
L12	80.75 - 75.75	Pole	TP28.714x27.964x0.25	Pole	63.3%	Pass
L13	75.75 - 70.75	Pole	TP29.465x28.714x0.25	Pole	69.4%	Pass
L14	70.75 - 65.75	Pole	TP30.215x29.465x0.25	Pole	75.2%	Pass
L15	65.75 - 60.75	Pole	TP30.965x30.215x0.25	Pole	80.6%	Pass
L16	60.75 - 57.75	Pole	TP31.415x30.965x0.25	Pole	83.7%	Pass
L17	57.75 - 57.5	Pole + Reinf.	TP31.453x31.415x0.4625	Reinf. 2 Tension Rupture	72.7%	Pass
L18	57.5 - 52.5	Pole + Reinf.	TP32.203x31.453x0.4563	Reinf. 2 Tension Rupture	77.2%	Pass
L19	52.5 - 47.5	Pole + Reinf.	TP32.953x32.203x0.45	Reinf. 2 Tension Rupture	81.4%	Pass
L20	47.5 - 45	Pole + Reinf.	TP33.966x32.953x0.45	Reinf. 2 Tension Rupture	83.4%	Pass
L21	45 - 40	Pole + Reinf.	TP33.578x32.828x0.4813	Reinf. 2 Tension Rupture	83.6%	Pass
L22	40 - 35	Pole + Reinf.	TP34.329x33.578x0.4688	Reinf. 2 Tension Rupture	87.1%	Pass
L23	35 - 30	Pole + Reinf.	TP35.079x34.329x0.4688	Reinf. 2 Tension Rupture	90.3%	Pass
L24	30 - 29.75	Pole	TP35.116x35.079x0.2813	Pole	94.6%	Pass
L25	29.75 - 29.5	Pole + Reinf.	TP35.154x35.116x0.5188	Reinf. 1 Tension Rupture	76.9%	Pass
L26	29.5 - 24.5	Pole + Reinf.	TP35.904x35.154x0.5125	Reinf. 1 Tension Rupture	79.6%	Pass
L27	24.5 - 19.5	Pole + Reinf.	TP36.654x35.904x0.5063	Reinf. 1 Tension Rupture	82.1%	Pass
L28	19.5 - 14.5	Pole + Reinf.	TP37.404x36.654x0.5063	Reinf. 1 Tension Rupture	84.5%	Pass
L29	14.5 - 9.5	Pole + Reinf.	TP38.155x37.404x0.4938	Reinf. 1 Tension Rupture	86.8%	Pass
L30	9.5 - 4.5	Pole + Reinf.	TP38.905x38.155x0.4938	Reinf. 1 Tension Rupture	88.9%	Pass
L31	4.5 - 0	Pole + Reinf.	TP39.58x38.905x0.4875	Reinf. 1 Tension Rupture	90.8%	Pass
					Summary	
				Pole	94.6%	Pass
				Reinforcement	90.8%	Pass
				Overall	94.6%	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Bolts	123	16.4	Pass
1	Flange Plate	123	43.9	Pass
1	Anchor Rods	0	73.7	Pass
1	Base Plate	0	49.7	Pass
1	Base Foundation (Structure)	0	71.3	Pass
1	Base Foundation (Soil Interaction)	0	44.3	Pass

Structure Rating (max from all components) =	94.6%

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

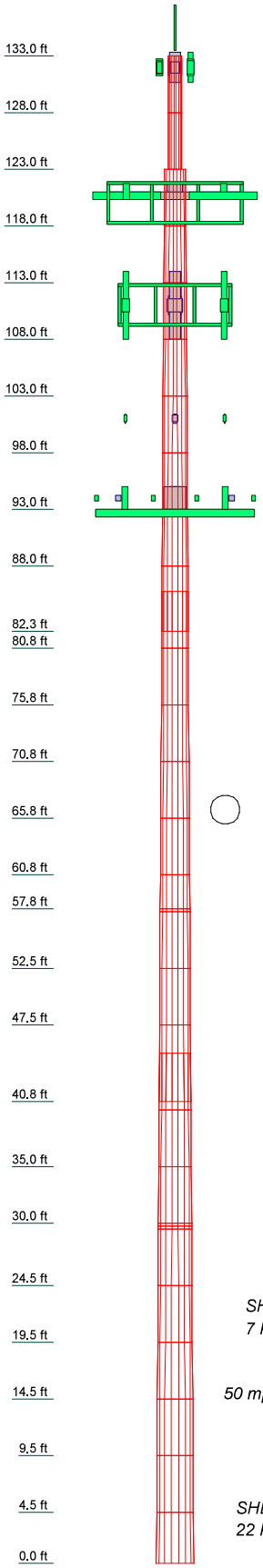
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Length (ft)	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	4.5000
Number of Sides	0	0	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Thickness (in)	0.3750	0.3750	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.4500	0.4500	0.4500	0.4688	0.4688	0.4688	0.4688	0.4688	0.5125	0.5062	0.5062	0.4938	0.4938	0.4875
Socket Length (ft)										3.5000										4.2500											
Top Dia (in)	14.0000	14.0000	22.0000	22.7502	23.5004	24.2506	25.0007	25.7509	26.5011	27.2513	27.9964	28.7143	29.4646	30.2148	30.9651	31.7153	32.4655	32.2029	32.9532	33.9660	34.3283	33.5785	34.3287	35.0789	35.8292	35.1538	35.9041	36.6543	37.4045	38.1546	38.9048
Bot Dia (in)	14.0000	14.0000	22.7502	23.5004	24.2506	25.0007	25.7509	26.5011	27.2513	28.1140	27.9964	28.7143	29.4646	30.2148	30.9651	31.7153	32.4655	32.9532	33.9660	34.3283	35.0789	35.8292	36.5794	37.3296	35.9041	36.6543	37.4045	38.1546	38.9048	39.5800	
Grade	A53-B-35					A607-60														A572-65											
Weight (K)	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.0	0.7	0.7	1.0	0.8	0.8	0.8	0.0	0.0	0.9	0.9	0.9	1.0	1.0	0.9



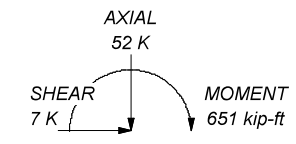
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	60 ksi	A572-65	65 ksi	80 ksi
A607-60	60 ksi	75 ksi			

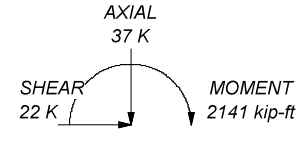
TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 118 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 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 0.0000 ft
8. TOWER RATING: 94.6%

ALL REACTIONS ARE FACTORED



TORQUE 1 kip-ft
50 mph WIND - 1.0000 in ICE



TORQUE 2 kip-ft
REACTIONS - 118 mph WIND

CROWN CASTLE
The Foundation for a Wireless World

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

Job: ***BU# 876382***			
Project:			
Client: Crown Castle	Drawn by: Matthew Schmitt		App'd:
Code: TIA-222-H	Date: 02/17/22		Scale: NTS
Path: C:\Work Area\876382\WO 2077369 - SA\Prod\876382_R.eri			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: 345.0400 ft.
- Basic wind speed of 118 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.0000 ft.
- Nominal ice thickness of 1.0000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.00 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in 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		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-H Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-H Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known

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

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	133.0000-128.0000	5.0000	0.00	Round	14.0000	14.0000	0.3750		A53-B-35 (35 ksi)
L2	128.0000-123.0000	5.0000	0.00	Round	14.0000	14.0000	0.3750		A53-B-35 (35 ksi)
L3	123.0000-118.0000	5.0000	0.00	18	22.0000	22.7502	0.1875	0.7500	A607-60 (60 ksi)
L4	118.0000-113.0000	5.0000	0.00	18	22.7502	23.5004	0.1875	0.7500	A607-60 (60 ksi)
L5	113.0000-108.0000	5.0000	0.00	18	23.5004	24.2506	0.1875	0.7500	A607-60 (60 ksi)
L6	108.0000-103.0000	5.0000	0.00	18	24.2506	25.0007	0.1875	0.7500	A607-60 (60 ksi)
L7	103.0000-98.0000	5.0000	0.00	18	25.0007	25.7509	0.1875	0.7500	A607-60 (60 ksi)
L8	98.0000-93.0000	5.0000	0.00	18	25.7509	26.5011	0.1875	0.7500	A607-60 (60 ksi)
L9	93.0000-88.0000	5.0000	0.00	18	26.5011	27.2513	0.1875	0.7500	A607-60 (60 ksi)
L10	88.0000-82.2500	5.7500	3.50	18	27.2513	28.1140	0.1875	0.7500	A607-60 (60 ksi)
L11	82.2500-80.7500	5.0000	0.00	18	27.2139	27.9641	0.2500	1.0000	A572-65 (65 ksi)
L12	80.7500-75.7500	5.0000	0.00	18	27.9641	28.7143	0.2500	1.0000	A572-65 (65 ksi)
L13	75.7500-70.7500	5.0000	0.00	18	28.7143	29.4646	0.2500	1.0000	A572-65 (65 ksi)
L14	70.7500-65.7500	5.0000	0.00	18	29.4646	30.2148	0.2500	1.0000	A572-65 (65 ksi)
L15	65.7500-60.7500	5.0000	0.00	18	30.2148	30.9651	0.2500	1.0000	A572-65 (65 ksi)
L16	60.7500-57.7500	3.0000	0.00	18	30.9651	31.4152	0.2500	1.0000	A572-65 (65 ksi)
L17	57.7500-57.5000	0.2500	0.00	18	31.4152	31.4527	0.4625	1.8500	A572-65 (65 ksi)
L18	57.5000-52.5000	5.0000	0.00	18	31.4527	32.2029	0.4562	1.8250	A572-65 (65 ksi)
L19	52.5000-47.5000	5.0000	0.00	18	32.2029	32.9532	0.4500	1.8000	A572-65 (65 ksi)
L20	47.5000-40.7500	6.7500	4.25	18	32.9532	33.9660	0.4500	1.8000	A572-65 (65 ksi)
L21	40.7500-40.0000	5.0000	0.00	18	32.8283	33.5785	0.4813	1.9250	A572-65 (65 ksi)
L22	40.0000-35.0000	5.0000	0.00	18	33.5785	34.3287	0.4688	1.8750	A572-65 (65 ksi)
L23	35.0000-30.0000	5.0000	0.00	18	34.3287	35.0789	0.4688	1.8750	A572-65 (65 ksi)
L24	30.0000-29.7500	0.2500	0.00	18	35.0789	35.1164	0.2813	1.1250	A572-65 (65 ksi)
L25	29.7500-29.5000	0.2500	0.00	18	35.1164	35.1539	0.5188	2.0750	A572-65 (65 ksi)
L26	29.5000-24.5000	5.0000	0.00	18	35.1539	35.9041	0.5125	2.0500	A572-65 (65 ksi)
L27	24.5000-19.5000	5.0000	0.00	18	35.9041	36.6543	0.5062	2.0250	A572-65 (65 ksi)
L28	19.5000-14.5000	5.0000	0.00	18	36.6543	37.4045	0.5062	2.0250	A572-65 (65 ksi)
L29	14.5000-9.5000	5.0000	0.00	18	37.4045	38.1546	0.4938	1.9750	A572-65 (65 ksi)
L30	9.5000-4.5000	5.0000	0.00	18	38.1546	38.9048	0.4938	1.9750	A572-65 (65 ksi)
L31	4.5000-0.0000	4.5000		18	38.9048	39.5800	0.4875	1.9500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	14.0000	16.0516	372.7602	4.8190	7.0000	53.2515	745.5204	8.0210	0.0000	0
	14.0000	16.0516	372.7602	4.8190	7.0000	53.2515	745.5204	8.0210	0.0000	0
L2	14.0000	16.0516	372.7602	4.8190	7.0000	53.2515	745.5204	8.0210	0.0000	0
	14.0000	16.0516	372.7602	4.8190	7.0000	53.2515	745.5204	8.0210	0.0000	0
L3	22.3105	12.9812	780.3007	7.7434	11.1760	69.8193	1561.6281	6.4918	3.5420	18.891
	23.0722	13.4276	863.6105	8.0098	11.5571	74.7256	1728.3574	6.7151	3.6740	19.595
L4	23.0722	13.4276	863.6105	8.0098	11.5571	74.7256	1728.3574	6.7151	3.6740	19.595
	23.8340	13.8741	952.6487	8.2761	11.9382	79.7984	1906.5509	6.9384	3.8061	20.299
L5	23.8340	13.8741	952.6487	8.2761	11.9382	79.7984	1906.5509	6.9384	3.8061	20.299
	24.5957	14.3205	1047.6055	8.5424	12.3193	85.0379	2096.5895	7.1616	3.9381	21.003
L6	24.5957	14.3205	1047.6055	8.5424	12.3193	85.0379	2096.5895	7.1616	3.9381	21.003
	25.3575	14.7670	1148.6716	8.8087	12.7004	90.4439	2298.8546	7.3849	4.0701	21.707
L7	25.3575	14.7670	1148.6716	8.8087	12.7004	90.4439	2298.8546	7.3849	4.0701	21.707
	26.1192	15.2134	1256.0373	9.0750	13.0815	96.0165	2513.7272	7.6082	4.2022	22.412
L8	26.1192	15.2134	1256.0373	9.0750	13.0815	96.0165	2513.7272	7.6082	4.2022	22.412
	26.8810	15.6599	1369.8931	9.3413	13.4626	101.7558	2741.5886	7.8314	4.3342	23.116
L9	26.8810	15.6599	1369.8931	9.3413	13.4626	101.7558	2741.5886	7.8314	4.3342	23.116
	27.6428	16.1063	1490.4294	9.6076	13.8437	107.6616	2982.8200	8.0547	4.4662	23.82
L10	27.6428	16.1063	1490.4294	9.6076	13.8437	107.6616	2982.8200	8.0547	4.4662	23.82
	28.5188	16.6198	1637.5523	9.9139	14.2819	114.6592	3277.2593	8.3115	4.6181	24.63
L11	28.1284	21.3958	1965.3102	9.5722	13.8246	142.1599	3933.2064	10.6999	4.3496	17.399
	28.3569	21.9911	2133.9640	9.8385	14.2058	150.2181	4270.7359	10.9977	4.4817	17.927
L12	28.3569	21.9911	2133.9640	9.8385	14.2058	150.2181	4270.7359	10.9977	4.4817	17.927
	29.1187	22.5865	2312.0005	10.1048	14.5869	158.4986	4627.0433	11.2954	4.6137	18.455
L13	29.1187	22.5865	2312.0005	10.1048	14.5869	158.4986	4627.0433	11.2954	4.6137	18.455
	29.8806	23.1818	2499.6739	10.3712	14.9680	167.0011	5002.6370	11.5931	4.7458	18.983
L14	29.8806	23.1818	2499.6739	10.3712	14.9680	167.0011	5002.6370	11.5931	4.7458	18.983
	30.6424	23.7771	2697.2381	10.6375	15.3491	175.7258	5398.0253	11.8908	4.8778	19.511
L15	30.6424	23.7771	2697.2381	10.6375	15.3491	175.7258	5398.0253	11.8908	4.8778	19.511
	31.4042	24.3724	2904.9471	10.9038	15.7302	184.6727	5813.7166	12.1885	5.0098	20.039
L16	31.4042	24.3724	2904.9471	10.9038	15.7302	184.6727	5813.7166	12.1885	5.0098	20.039
	31.8613	24.7296	3034.5476	11.0636	15.9589	190.1474	6073.0882	12.3671	5.0891	20.356
L17	31.8285	45.4378	5499.8589	10.9882	15.9589	344.6260	11006.9546	22.7232	4.7151	10.195
	31.8666	45.4928	5519.8791	11.0015	15.9780	345.4680	11047.0214	22.7507	4.7217	10.209
L18	31.8675	44.8871	5448.5814	11.0037	15.9780	341.0057	10904.3321	22.4478	4.7327	10.373
	32.6293	45.9736	5853.8660	11.2701	16.3591	357.8355	11715.4346	22.9912	4.8647	10.662
L19	32.6303	45.3527	5777.0867	11.2723	16.3591	353.1422	11561.7750	22.6807	4.8757	10.835
	33.3921	46.4243	6196.3290	11.5386	16.7402	370.1463	12400.8114	23.2166	5.0078	11.128
L20	33.3921	46.4243	6196.3290	11.5386	16.7402	370.1463	12400.8114	23.2166	5.0078	11.128
	34.4206	47.8709	6793.8105	11.8982	17.2547	393.7362	13596.5606	23.9400	5.1860	11.524
L21	33.9080	49.4097	6531.5930	11.4832	16.6768	391.6580	13071.7804	24.7096	4.9308	10.246
	34.0222	50.5556	6996.6536	11.7495	17.0579	410.1715	14002.5136	25.2826	5.0628	10.52
L22	34.0242	49.2611	6822.6467	11.7540	17.0579	399.9706	13654.2709	24.6352	5.0848	10.848
	34.7859	50.3772	7296.9892	12.0203	17.4390	418.4301	14603.5800	25.1934	5.2168	11.129
L23	34.7859	50.3772	7296.9892	12.0203	17.4390	418.4301	14603.5800	25.1934	5.2168	11.129
	35.5477	51.4934	7792.8231	12.2866	17.8201	437.3061	15595.9002	25.7516	5.3489	11.411
L24	35.5766	31.0634	4752.0979	12.3532	17.8201	266.6712	9510.4487	15.5346	5.6789	20.192
	35.6147	31.0969	4767.4817	12.3665	17.8391	267.2487	9541.2367	15.5514	5.6855	20.215
L25	35.5781	56.9654	8614.7238	12.2822	17.8391	482.9120	17240.7831	28.4881	5.2675	10.154
	35.6162	57.0272	8642.7735	12.2955	17.8582	483.9674	17296.9194	28.5190	5.2741	10.167
L26	35.6171	56.3503	8543.2670	12.2977	17.8582	478.3953	17097.7754	28.1805	5.2851	10.312
	36.3789	57.5706	9110.4089	12.5640	18.2393	499.4942	18232.8056	28.7908	5.4171	10.57

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
L27	36.3799	56.8786	9004.0749	12.5662	18.2393	493.6642	18019.9977	28.4447	5.4281	10.722
	37.1416	58.0840	9588.7654	12.8325	18.6204	514.9612	19190.1480	29.0475	5.5602	10.983
L28	37.1416	58.0840	9588.7654	12.8325	18.6204	514.9612	19190.1480	29.0475	5.5602	10.983
	37.9034	59.2894	10198.2350	13.0989	19.0015	536.7079	20409.8892	29.6503	5.6922	11.244
L29	37.9053	57.8451	9956.5388	13.1033	19.0015	523.9881	19926.1788	28.9280	5.7142	11.573
	38.6671	59.0207	10576.0440	13.3696	19.3826	545.6475	21166.0042	29.5160	5.8462	11.84
L30	38.6671	59.0207	10576.0440	13.3696	19.3826	545.6475	21166.0042	29.5160	5.8462	11.84
	39.4288	60.1964	11220.7279	13.6359	19.7637	567.7456	22456.2204	30.1039	5.9783	12.108
L31	39.4298	59.4441	11084.1023	13.6382	19.7637	560.8327	22182.7893	29.7277	5.9893	12.286
	40.1154	60.4888	11678.8297	13.8778	20.1066	580.8444	23373.0268	30.2501	6.1081	12.529

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 133.0000-128.0000				1	1	1			
L2 128.0000-123.0000				1	1	1			
L3 123.0000-118.0000				1	1	1			
L4 118.0000-113.0000				1	1	1			
L5 113.0000-108.0000				1	1	1			
L6 108.0000-103.0000				1	1	1			
L7 103.0000-98.0000				1	1	1			
L8 98.0000-93.0000				1	1	1			
L9 93.0000-88.0000				1	1	1			
L10 88.0000-82.2500				1	1	1			
L11 82.2500-80.7500				1	1	1			
L12 80.7500-75.7500				1	1	1			
L13 75.7500-70.7500				1	1	1			
L14 70.7500-65.7500				1	1	1			
L15 65.7500-60.7500				1	1	1			
L16 60.7500-57.7500				1	1	1			
L17 57.7500-57.5000				1	1	0.94611			
L18 57.5000-52.5000				1	1	0.949166			
L19 52.5000-47.5000				1	1	0.952774			
L20 47.5000-40.7500				1	1	0.948243			
L21 40.7500-40.0000				1	1	0.949567			
L22 40.0000-				1	1	0.966223			

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
35.0000									
L23 35.0000-30.0000				1	1	0.958285			
L24 30.0000-29.7500				1	1	1			
L25 29.7500-29.5000				1	1	0.948669			
L26 29.5000-24.5000				1	1	0.951347			
L27 24.5000-19.5000				1	1	0.954468			
L28 19.5000-14.5000				1	1	0.946358			
L29 14.5000-9.5000				1	1	0.962012			
L30 9.5000-4.5000				1	1	0.954349			
L31 4.5000-0.0000				1	1	0.9597			

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
AVA7-50(1-5/8) ***	A	No	Surface Ar (CaAa)	75.0000 - 0.0000	2	2	0.349 0.433	2.0100		0.70
LDF4-50A(1/2) ***	B	No	Surface Ar (CaAa)	50.0000 - 0.0000	1	1	0.396 0.396	0.6300		0.15
FP 6.125 x 1.25 Reinforcement	A	No	Surface Af (CaAa)	13.5330 - 0.0000	1	1	0.167 0.167	6.1250	14.7500	0.00
FP 6.125 x 1.25 Reinforcement	A	No	Surface Af (CaAa)	29.7500 - 13.5330	1	1	0.167 0.167	6.1250	14.7500	0.00
FP 6.125 x 1.25 Reinforcement	C	No	Surface Af (CaAa)	13.5330 - 0.0000	1	1	0.167 0.167	6.1250	14.7500	0.00
FP 6.125 x 1.25 Reinforcement	C	No	Surface Af (CaAa)	29.7500 - 13.5330	1	1	0.167 0.167	6.1250	14.7500	0.00
FP 6.125 x 1.25 Reinforcement	B	No	Surface Af (CaAa)	13.5330 - 0.0000	1	1	0.167 0.167	6.1250	14.7500	0.00
FP 6.125 x 1.25 Reinforcement	B	No	Surface Af (CaAa)	29.7500 - 13.5330	1	1	0.167 0.167	6.1250	14.7500	0.00
FP 4.875 x 1.25 Reinforcement	A	No	Surface Af (CaAa)	59.5000 - 29.7500	1	1	0.167 0.167	4.8750	12.2500	0.00
FP 4.875 x 1.25 Reinforcement	C	No	Surface Af (CaAa)	59.5000 - 29.7500	1	1	0.167 0.167	4.8750	12.2500	0.00
FP 4.875 x 1.25 Reinforcement ***	B	No	Surface Af (CaAa)	59.5000 - 29.7500	1	1	0.167 0.167	4.8750	12.2500	0.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF6-50A(1-1/4)	C	No	No	Inside Pole	132.0000 - 0.0000	6	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.60 0.60 0.60

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	132.0000 - 0.0000	4	No Ice	0.0000	0.58
							1/2" Ice	0.0000	0.58
							1" Ice	0.0000	0.58
FB-L98B-034-XXX(3/8")	C	No	No	Inside Pole	132.0000 - 0.0000	2	No Ice	0.0000	0.06
							1/2" Ice	0.0000	0.06
							1" Ice	0.0000	0.06
2" Flex Conduit	C	No	No	Inside Pole	132.0000 - 0.0000	2	No Ice	0.0000	0.36
							1/2" Ice	0.0000	0.36
							1" Ice	0.0000	0.36
***									
HB158-21U6S24-xxM_TMO(1-5/8)	B	No	No	Inside Pole	120.0000 - 0.0000	3	No Ice	0.0000	2.50
							1/2" Ice	0.0000	2.50
							1" Ice	0.0000	2.50
***									
CU12PSM9P6XXX (1-1/2)	C	No	No	Inside Pole	111.0000 - 0.0000	1	No Ice	0.0000	2.35
							1/2" Ice	0.0000	2.35
							1" Ice	0.0000	2.35
***									
LDF7-50A(1-5/8)	C	No	No	Inside Pole	101.0000 - 0.0000	6	No Ice	0.0000	0.82
							1/2" Ice	0.0000	0.82
							1" Ice	0.0000	0.82
***									
LDF7-50A(1-5/8)	C	No	No	Inside Pole	93.0000 - 0.0000	12	No Ice	0.0000	0.82
							1/2" Ice	0.0000	0.82
							1" Ice	0.0000	0.82
HB158-1-08U8-S8J18(1-5/8)	C	No	No	Inside Pole	93.0000 - 0.0000	1	No Ice	0.0000	1.30
							1/2" Ice	0.0000	1.30
							1" Ice	0.0000	1.30
***									
AVA7-50(1-5/8)	C	No	No	Inside Pole	75.0000 - 0.0000	4	No Ice	0.0000	0.70
							1/2" Ice	0.0000	0.70
							1" Ice	0.0000	0.70
***									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	133.0000-128.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.03
L2	128.0000-123.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.03
L3	123.0000-118.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.03
L4	118.0000-113.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.03
L5	113.0000-108.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.04
L6	108.0000-103.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.05
L7	103.0000-98.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.06
L8	98.0000-93.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.000	0.000	0.07
L9	93.0000-88.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.13
L10	88.0000-82.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.14
L11	82.2500-80.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.04
L12	80.7500-75.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.13
L13	75.7500-70.7500	A	0.000	0.000	1.708	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.14
L14	70.7500-65.7500	A	0.000	0.000	2.010	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.14
L15	65.7500-60.7500	A	0.000	0.000	2.010	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.14
L16	60.7500-57.7500	A	0.000	0.000	2.628	0.000	0.00
		B	0.000	0.000	1.422	0.000	0.02
		C	0.000	0.000	1.422	0.000	0.08
L17	57.7500-57.5000	A	0.000	0.000	0.304	0.000	0.00
		B	0.000	0.000	0.203	0.000	0.00
		C	0.000	0.000	0.203	0.000	0.01
L18	57.5000-52.5000	A	0.000	0.000	6.072	0.000	0.01
		B	0.000	0.000	4.063	0.000	0.04
		C	0.000	0.000	4.063	0.000	0.14
L19	52.5000-47.5000	A	0.000	0.000	6.072	0.000	0.01
		B	0.000	0.000	4.220	0.000	0.04
		C	0.000	0.000	4.063	0.000	0.14
L20	47.5000-40.7500	A	0.000	0.000	8.198	0.000	0.01
		B	0.000	0.000	5.910	0.000	0.05
		C	0.000	0.000	5.484	0.000	0.19
L21	40.7500-40.0000	A	0.000	0.000	0.911	0.000	0.00
		B	0.000	0.000	0.657	0.000	0.01
		C	0.000	0.000	0.609	0.000	0.02
L22	40.0000-35.0000	A	0.000	0.000	6.072	0.000	0.01
		B	0.000	0.000	4.378	0.000	0.04
		C	0.000	0.000	4.063	0.000	0.14
L23	35.0000-30.0000	A	0.000	0.000	6.072	0.000	0.01
		B	0.000	0.000	4.378	0.000	0.04
		C	0.000	0.000	4.063	0.000	0.14
L24	30.0000-29.7500	A	0.000	0.000	0.304	0.000	0.00
		B	0.000	0.000	0.219	0.000	0.00
		C	0.000	0.000	0.203	0.000	0.01
L25	29.7500-29.5000	A	0.000	0.000	0.356	0.000	0.00
		B	0.000	0.000	0.271	0.000	0.00
		C	0.000	0.000	0.255	0.000	0.01
L26	29.5000-24.5000	A	0.000	0.000	7.114	0.000	0.01
		B	0.000	0.000	5.419	0.000	0.04
		C	0.000	0.000	5.104	0.000	0.14
L27	24.5000-19.5000	A	0.000	0.000	7.114	0.000	0.01
		B	0.000	0.000	5.419	0.000	0.04
		C	0.000	0.000	5.104	0.000	0.14
L28	19.5000-14.5000	A	0.000	0.000	7.114	0.000	0.01
		B	0.000	0.000	5.419	0.000	0.04
		C	0.000	0.000	5.104	0.000	0.14
L29	14.5000-9.5000	A	0.000	0.000	7.114	0.000	0.01
		B	0.000	0.000	5.419	0.000	0.04
		C	0.000	0.000	5.104	0.000	0.14
L30	9.5000-4.5000	A	0.000	0.000	7.114	0.000	0.01
		B	0.000	0.000	5.419	0.000	0.04
		C	0.000	0.000	5.104	0.000	0.14
L31	4.5000-0.0000	A	0.000	0.000	6.403	0.000	0.01
		B	0.000	0.000	4.877	0.000	0.03

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	4.594	0.000	0.13

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	133.0000-128.0000	A	0.975	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.03
L2	128.0000-123.0000	A	0.971	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.03
L3	123.0000-118.0000	A	0.968	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.03
L4	118.0000-113.0000	A	0.963	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.03
L5	113.0000-108.0000	A	0.959	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.04
L6	108.0000-103.0000	A	0.955	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.05
L7	103.0000-98.0000	A	0.950	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.06
L8	98.0000-93.0000	A	0.945	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.07
L9	93.0000-88.0000	A	0.940	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.13
L10	88.0000-82.2500	A	0.934	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.14
L11	82.2500-80.7500	A	0.930	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.04
L12	80.7500-75.7500	A	0.927	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.13
L13	75.7500-70.7500	A	0.921	0.000	0.000	3.114	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.14
L14	70.7500-65.7500	A	0.914	0.000	0.000	3.655	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.14
L15	65.7500-60.7500	A	0.907	0.000	0.000	3.646	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.14
L16	60.7500-57.7500	A	0.901	0.000	0.000	3.921	0.000	0.03
		B		0.000	0.000	1.737	0.000	0.03
		C		0.000	0.000	1.737	0.000	0.09
L17	57.7500-57.5000	A	0.899	0.000	0.000	0.430	0.000	0.00
		B		0.000	0.000	0.248	0.000	0.00
		C		0.000	0.000	0.248	0.000	0.01
L18	57.5000-52.5000	A	0.895	0.000	0.000	8.588	0.000	0.06
		B		0.000	0.000	4.957	0.000	0.06
		C		0.000	0.000	4.957	0.000	0.17
L19	52.5000-47.5000	A	0.886	0.000	0.000	8.569	0.000	0.06
		B		0.000	0.000	5.549	0.000	0.07
		C		0.000	0.000	4.949	0.000	0.17
L20	47.5000-40.7500	A	0.875	0.000	0.000	11.534	0.000	0.08
		B		0.000	0.000	8.272	0.000	0.10

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	6.666	0.000	0.22
L21	40.7500-40.0000	A	0.867	0.000	0.000	1.282	0.000	0.01
		B		0.000	0.000	0.919	0.000	0.01
		C		0.000	0.000	0.741	0.000	0.02
L22	40.0000-35.0000	A	0.861	0.000	0.000	8.512	0.000	0.06
		B		0.000	0.000	6.099	0.000	0.07
		C		0.000	0.000	4.923	0.000	0.17
L23	35.0000-30.0000	A	0.849	0.000	0.000	8.485	0.000	0.06
		B		0.000	0.000	6.075	0.000	0.07
		C		0.000	0.000	4.911	0.000	0.17
L24	30.0000-29.7500	A	0.842	0.000	0.000	0.423	0.000	0.00
		B		0.000	0.000	0.303	0.000	0.00
		C		0.000	0.000	0.245	0.000	0.01
L25	29.7500-29.5000	A	0.841	0.000	0.000	0.475	0.000	0.00
		B		0.000	0.000	0.355	0.000	0.00
		C		0.000	0.000	0.297	0.000	0.01
L26	29.5000-24.5000	A	0.833	0.000	0.000	9.488	0.000	0.06
		B		0.000	0.000	7.082	0.000	0.07
		C		0.000	0.000	5.934	0.000	0.17
L27	24.5000-19.5000	A	0.816	0.000	0.000	9.451	0.000	0.06
		B		0.000	0.000	7.050	0.000	0.07
		C		0.000	0.000	5.919	0.000	0.17
L28	19.5000-14.5000	A	0.795	0.000	0.000	9.406	0.000	0.06
		B		0.000	0.000	7.010	0.000	0.07
		C		0.000	0.000	5.900	0.000	0.17
L29	14.5000-9.5000	A	0.768	0.000	0.000	9.126	0.000	0.05
		B		0.000	0.000	6.736	0.000	0.07
		C		0.000	0.000	5.653	0.000	0.17
L30	9.5000-4.5000	A	0.728	0.000	0.000	9.002	0.000	0.05
		B		0.000	0.000	6.622	0.000	0.07
		C		0.000	0.000	5.579	0.000	0.16
L31	4.5000-0.0000	A	0.650	0.000	0.000	7.977	0.000	0.04
		B		0.000	0.000	5.853	0.000	0.06
		C		0.000	0.000	4.985	0.000	0.15

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	133.0000-128.0000	0.0000	0.0000	0.0000	0.0000
L2	128.0000-123.0000	0.0000	0.0000	0.0000	0.0000
L3	123.0000-118.0000	0.0000	0.0000	0.0000	0.0000
L4	118.0000-113.0000	0.0000	0.0000	0.0000	0.0000
L5	113.0000-108.0000	0.0000	0.0000	0.0000	0.0000
L6	108.0000-103.0000	0.0000	0.0000	0.0000	0.0000
L7	103.0000-98.0000	0.0000	0.0000	0.0000	0.0000
L8	98.0000-93.0000	0.0000	0.0000	0.0000	0.0000
L9	93.0000-88.0000	0.0000	0.0000	0.0000	0.0000
L10	88.0000-82.2500	0.0000	0.0000	0.0000	0.0000
L11	82.2500-80.7500	0.0000	0.0000	0.0000	0.0000
L12	80.7500-75.7500	0.0000	0.0000	0.0000	0.0000
L13	75.7500-70.7500	-0.5619	-2.4275	-0.5251	-2.2686
L14	70.7500-65.7500	-0.6436	-2.7807	-0.5939	-2.5661
L15	65.7500-60.7500	-0.6454	-2.7886	-0.5969	-2.5787
L16	60.7500-57.7500	-0.4015	-1.7345	-0.4335	-1.8727
L17	57.7500-57.5000	-0.3173	-1.3710	-0.3635	-1.5703
L18	57.5000-52.5000	-0.3194	-1.3801	-0.3655	-1.5792
L19	52.5000-47.5000	-0.2185	-1.3558	-0.1173	-1.4935

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L20	47.5000-40.7500	-0.1175	-1.3339	0.1238	-1.4129
L21	40.7500-40.0000	-0.1176	-1.3353	0.1240	-1.4146
L22	40.0000-35.0000	-0.1183	-1.3443	0.1213	-1.4214
L23	35.0000-30.0000	-0.1195	-1.3596	0.1198	-1.4354
L24	30.0000-29.7500	-0.1201	-1.3671	0.1187	-1.4419
L25	29.7500-29.5000	-0.1070	-1.2182	0.1102	-1.3399
L26	29.5000-24.5000	-0.1076	-1.2259	0.1090	-1.3464
L27	24.5000-19.5000	-0.1087	-1.2403	0.1062	-1.3583
L28	19.5000-14.5000	-0.1098	-1.2544	0.1022	-1.3690
L29	14.5000-9.5000	-0.1109	-1.2684	0.0977	-1.3991
L30	9.5000-4.5000	-0.1120	-1.2821	0.0879	-1.4087
L31	4.5000-0.0000	-0.1130	-1.2949	0.0662	-1.4027

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
L13	18	AVA7-50(1-5/8)	70.75 - 75.00	1.0000	1.0000
L14	18	AVA7-50(1-5/8)	65.75 - 70.75	1.0000	1.0000
L15	18	AVA7-50(1-5/8)	60.75 - 65.75	1.0000	1.0000
L16	18	AVA7-50(1-5/8)	57.75 - 60.75	1.0000	1.0000
L16	28	FP 4.875 x 1.25 Reinforcement	57.75 - 59.50	1.0000	1.0000
L16	29	FP 4.875 x 1.25 Reinforcement	57.75 - 59.50	1.0000	1.0000
L16	30	FP 4.875 x 1.25 Reinforcement	57.75 - 59.50	1.0000	1.0000
L17	18	AVA7-50(1-5/8)	57.50 - 57.75	1.0000	1.0000
L17	28	FP 4.875 x 1.25 Reinforcement	57.50 - 57.75	1.0000	1.0000
L17	29	FP 4.875 x 1.25 Reinforcement	57.50 - 57.75	1.0000	1.0000
L17	30	FP 4.875 x 1.25 Reinforcement	57.50 - 57.75	1.0000	1.0000
L18	18	AVA7-50(1-5/8)	52.50 - 57.50	1.0000	1.0000
L18	28	FP 4.875 x 1.25 Reinforcement	52.50 - 57.50	1.0000	1.0000
L18	29	FP 4.875 x 1.25 Reinforcement	52.50 - 57.50	1.0000	1.0000
L18	30	FP 4.875 x 1.25 Reinforcement	52.50 - 57.50	1.0000	1.0000
L19	18	AVA7-50(1-5/8)	47.50 - 52.50	1.0000	1.0000
L19	20	LDF4-50A(1/2)	47.50 - 50.00	1.0000	1.0000
L19	28	FP 4.875 x 1.25 Reinforcement	47.50 - 52.50	1.0000	1.0000
L19	29	FP 4.875 x 1.25 Reinforcement	47.50 - 52.50	1.0000	1.0000
L19	30	FP 4.875 x 1.25 Reinforcement	47.50 - 52.50	1.0000	1.0000
L20	18	AVA7-50(1-5/8)	40.75 - 47.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L20	20	LDF4-50A(1/2)	40.75 - 47.50	1.0000	1.0000
L20	28	FP 4.875 x 1.25 Reinforcement	40.75 - 47.50	1.0000	1.0000
L20	29	FP 4.875 x 1.25 Reinforcement	40.75 - 47.50	1.0000	1.0000
L20	30	FP 4.875 x 1.25 Reinforcement	40.75 - 47.50	1.0000	1.0000
L21	18	AVA7-50(1-5/8)	40.00 - 40.75	1.0000	1.0000
L21	20	LDF4-50A(1/2)	40.00 - 40.75	1.0000	1.0000
L21	28	FP 4.875 x 1.25 Reinforcement	40.00 - 40.75	1.0000	1.0000
L21	29	FP 4.875 x 1.25 Reinforcement	40.00 - 40.75	1.0000	1.0000
L21	30	FP 4.875 x 1.25 Reinforcement	40.00 - 40.75	1.0000	1.0000
L22	18	AVA7-50(1-5/8)	35.00 - 40.00	1.0000	1.0000
L22	20	LDF4-50A(1/2)	35.00 - 40.00	1.0000	1.0000
L22	28	FP 4.875 x 1.25 Reinforcement	35.00 - 40.00	1.0000	1.0000
L22	29	FP 4.875 x 1.25 Reinforcement	35.00 - 40.00	1.0000	1.0000
L22	30	FP 4.875 x 1.25 Reinforcement	35.00 - 40.00	1.0000	1.0000
L23	18	AVA7-50(1-5/8)	30.00 - 35.00	1.0000	1.0000
L23	20	LDF4-50A(1/2)	30.00 - 35.00	1.0000	1.0000
L23	28	FP 4.875 x 1.25 Reinforcement	30.00 - 35.00	1.0000	1.0000
L23	29	FP 4.875 x 1.25 Reinforcement	30.00 - 35.00	1.0000	1.0000
L23	30	FP 4.875 x 1.25 Reinforcement	30.00 - 35.00	1.0000	1.0000
L24	18	AVA7-50(1-5/8)	29.75 - 30.00	1.0000	1.0000
L24	20	LDF4-50A(1/2)	29.75 - 30.00	1.0000	1.0000
L24	28	FP 4.875 x 1.25 Reinforcement	29.75 - 30.00	1.0000	1.0000
L24	29	FP 4.875 x 1.25 Reinforcement	29.75 - 30.00	1.0000	1.0000
L24	30	FP 4.875 x 1.25 Reinforcement	29.75 - 30.00	1.0000	1.0000
L25	18	AVA7-50(1-5/8)	29.50 - 29.75	1.0000	1.0000
L25	20	LDF4-50A(1/2)	29.50 - 29.75	1.0000	1.0000
L25	23	FP 6.125 x 1.25 Reinforcement	29.50 - 29.75	1.0000	1.0000
L25	25	FP 6.125 x 1.25 Reinforcement	29.50 - 29.75	1.0000	1.0000
L25	27	FP 6.125 x 1.25 Reinforcement	29.50 - 29.75	1.0000	1.0000
L26	18	AVA7-50(1-5/8)	24.50 - 29.50	1.0000	1.0000
L26	20	LDF4-50A(1/2)	24.50 - 29.50	1.0000	1.0000
L26	23	FP 6.125 x 1.25 Reinforcement	24.50 - 29.50	1.0000	1.0000
L26	25	FP 6.125 x 1.25 Reinforcement	24.50 - 29.50	1.0000	1.0000
L26	27	FP 6.125 x 1.25 Reinforcement	24.50 - 29.50	1.0000	1.0000
L27	18	AVA7-50(1-5/8)	19.50 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			24.50		
L27	20	LDF4-50A(1/2)	19.50 - 24.50	1.0000	1.0000
L27	23	FP 6.125 x 1.25 Reinforcement	19.50 - 24.50	1.0000	1.0000
L27	25	FP 6.125 x 1.25 Reinforcement	19.50 - 24.50	1.0000	1.0000
L27	27	FP 6.125 x 1.25 Reinforcement	19.50 - 24.50	1.0000	1.0000
L28	18	AVA7-50(1-5/8)	14.50 - 19.50	1.0000	1.0000
L28	20	LDF4-50A(1/2)	14.50 - 19.50	1.0000	1.0000
L28	23	FP 6.125 x 1.25 Reinforcement	14.50 - 19.50	1.0000	1.0000
L28	25	FP 6.125 x 1.25 Reinforcement	14.50 - 19.50	1.0000	1.0000
L28	27	FP 6.125 x 1.25 Reinforcement	14.50 - 19.50	1.0000	1.0000
L29	18	AVA7-50(1-5/8)	9.50 - 14.50	1.0000	1.0000
L29	20	LDF4-50A(1/2)	9.50 - 14.50	1.0000	1.0000
L29	22	FP 6.125 x 1.25 Reinforcement	9.50 - 13.53	1.0000	1.0000
L29	23	FP 6.125 x 1.25 Reinforcement	13.53 - 14.50	1.0000	1.0000
L29	24	FP 6.125 x 1.25 Reinforcement	9.50 - 13.53	1.0000	1.0000
L29	25	FP 6.125 x 1.25 Reinforcement	13.53 - 14.50	1.0000	1.0000
L29	26	FP 6.125 x 1.25 Reinforcement	9.50 - 13.53	1.0000	1.0000
L29	27	FP 6.125 x 1.25 Reinforcement	13.53 - 14.50	1.0000	1.0000
L30	18	AVA7-50(1-5/8)	4.50 - 9.50	1.0000	1.0000
L30	20	LDF4-50A(1/2)	4.50 - 9.50	1.0000	1.0000
L30	22	FP 6.125 x 1.25 Reinforcement	4.50 - 9.50	1.0000	1.0000
L30	24	FP 6.125 x 1.25 Reinforcement	4.50 - 9.50	1.0000	1.0000
L30	26	FP 6.125 x 1.25 Reinforcement	4.50 - 9.50	1.0000	1.0000
L31	18	AVA7-50(1-5/8)	0.00 - 4.50	1.0000	1.0000
L31	20	LDF4-50A(1/2)	0.00 - 4.50	1.0000	1.0000
L31	22	FP 6.125 x 1.25 Reinforcement	0.00 - 4.50	1.0000	1.0000
L31	24	FP 6.125 x 1.25 Reinforcement	0.00 - 4.50	1.0000	1.0000
L31	26	FP 6.125 x 1.25 Reinforcement	0.00 - 4.50	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
L16	28	FP 4.875 x 1.25 Reinforcement	57.75 - 59.50	Auto	0.0000
L16	29	FP 4.875 x 1.25 Reinforcement	57.75 - 59.50	Auto	0.0000
L16	30	FP 4.875 x 1.25	57.75 -	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
		Reinforcement	59.50		
L17	28	FP 4.875 x 1.25	57.50 -	Auto	0.0321
		Reinforcement	57.75		
L17	29	FP 4.875 x 1.25	57.50 -	Auto	0.0321
		Reinforcement	57.75		
L17	30	FP 4.875 x 1.25	57.50 -	Auto	0.0321
		Reinforcement	57.75		
L18	28	FP 4.875 x 1.25	52.50 -	Auto	0.0157
		Reinforcement	57.50		
L18	29	FP 4.875 x 1.25	52.50 -	Auto	0.0157
		Reinforcement	57.50		
L18	30	FP 4.875 x 1.25	52.50 -	Auto	0.0157
		Reinforcement	57.50		
L19	28	FP 4.875 x 1.25	47.50 -	Auto	0.0000
		Reinforcement	52.50		
L19	29	FP 4.875 x 1.25	47.50 -	Auto	0.0000
		Reinforcement	52.50		
L19	30	FP 4.875 x 1.25	47.50 -	Auto	0.0000
		Reinforcement	52.50		
L20	28	FP 4.875 x 1.25	40.75 -	Auto	0.0000
		Reinforcement	47.50		
L20	29	FP 4.875 x 1.25	40.75 -	Auto	0.0000
		Reinforcement	47.50		
L20	30	FP 4.875 x 1.25	40.75 -	Auto	0.0000
		Reinforcement	47.50		
L21	28	FP 4.875 x 1.25	40.00 -	Auto	0.0000
		Reinforcement	40.75		
L21	29	FP 4.875 x 1.25	40.00 -	Auto	0.0000
		Reinforcement	40.75		
L21	30	FP 4.875 x 1.25	40.00 -	Auto	0.0000
		Reinforcement	40.75		
L22	28	FP 4.875 x 1.25	35.00 -	Auto	0.0000
		Reinforcement	40.00		
L22	29	FP 4.875 x 1.25	35.00 -	Auto	0.0000
		Reinforcement	40.00		
L22	30	FP 4.875 x 1.25	35.00 -	Auto	0.0000
		Reinforcement	40.00		
L23	28	FP 4.875 x 1.25	30.00 -	Auto	0.0000
		Reinforcement	35.00		
L23	29	FP 4.875 x 1.25	30.00 -	Auto	0.0000
		Reinforcement	35.00		
L23	30	FP 4.875 x 1.25	30.00 -	Auto	0.0000
		Reinforcement	35.00		
L24	28	FP 4.875 x 1.25	29.75 -	Auto	0.0000
		Reinforcement	30.00		
L24	29	FP 4.875 x 1.25	29.75 -	Auto	0.0000
		Reinforcement	30.00		
L24	30	FP 4.875 x 1.25	29.75 -	Auto	0.0000
		Reinforcement	30.00		
L25	23	FP 6.125 x 1.25	29.50 -	Auto	0.1395
		Reinforcement	29.75		
L25	25	FP 6.125 x 1.25	29.50 -	Auto	0.1395
		Reinforcement	29.75		
L25	27	FP 6.125 x 1.25	29.50 -	Auto	0.1395
		Reinforcement	29.75		
L26	23	FP 6.125 x 1.25	24.50 -	Auto	0.1264
		Reinforcement	29.50		
L26	25	FP 6.125 x 1.25	24.50 -	Auto	0.1264
		Reinforcement	29.50		
L26	27	FP 6.125 x 1.25	24.50 -	Auto	0.1264
		Reinforcement	29.50		
L27	23	FP 6.125 x 1.25	19.50 -	Auto	0.1030
		Reinforcement	24.50		
L27	25	FP 6.125 x 1.25	19.50 -	Auto	0.1030
		Reinforcement	24.50		
L27	27	FP 6.125 x 1.25	19.50 -	Auto	0.1030
		Reinforcement	24.50		
L28	23	FP 6.125 x 1.25	14.50 -	Auto	0.0814

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
		Reinforcement	19.50		
L28	25	FP 6.125 x 1.25 Reinforcement	14.50 - 19.50	Auto	0.0814
L28	27	FP 6.125 x 1.25 Reinforcement	14.50 - 19.50	Auto	0.0814
L29	22	FP 6.125 x 1.25 Reinforcement	9.50 - 13.53	Auto	0.0542
L29	23	FP 6.125 x 1.25 Reinforcement	13.53 - 14.50	Auto	0.0650
L29	24	FP 6.125 x 1.25 Reinforcement	9.50 - 13.53	Auto	0.0542
L29	25	FP 6.125 x 1.25 Reinforcement	13.53 - 14.50	Auto	0.0650
L29	26	FP 6.125 x 1.25 Reinforcement	9.50 - 13.53	Auto	0.0542
L29	27	FP 6.125 x 1.25 Reinforcement	13.53 - 14.50	Auto	0.0650
L30	22	FP 6.125 x 1.25 Reinforcement	4.50 - 9.50	Auto	0.0347
L30	24	FP 6.125 x 1.25 Reinforcement	4.50 - 9.50	Auto	0.0347
L30	26	FP 6.125 x 1.25 Reinforcement	4.50 - 9.50	Auto	0.0347
L31	22	FP 6.125 x 1.25 Reinforcement	0.00 - 4.50	Auto	0.0125
L31	24	FP 6.125 x 1.25 Reinforcement	0.00 - 4.50	Auto	0.0125
L31	26	FP 6.125 x 1.25 Reinforcement	0.00 - 4.50	Auto	0.0125

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
5/8" X 5' Lightning Rod *******	C	None		0.00	135.5000
TPA65R-BU8D_CCIV2 w/ Mount Pipe	A	From Leg	1.0000 0.00 0.00	0.00	132.0000
TPA65R-BU8D_CCIV2 w/ Mount Pipe	B	From Leg	1.0000 0.00 0.00	0.00	132.0000
TPA65R-BU8D_CCIV2 w/ Mount Pipe	C	From Leg	1.0000 0.00 0.00	0.00	132.0000
DC6-48-60-18-8F	A	From Leg	1.0000 0.00 0.00	0.00	132.0000
DC6-48-60-18-8C-EV	B	From Leg	1.0000 0.00 0.00	0.00	132.0000
RRUS 4449 B5/B12	A	From Leg	1.0000 0.00 0.00	0.00	132.0000
RRUS 4449 B5/B12	B	From Leg	1.0000 0.00	0.00	132.0000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
RRUS 4449 B5/B12	C	From Leg	0.00 1.0000 0.00	0.00	132.0000
RRUS 4415 B25	A	From Leg	0.00 1.0000 0.00	0.00	132.0000
RRUS 4415 B25	B	From Leg	0.00 1.0000 0.00	0.00	132.0000
RRUS 4415 B25	C	From Leg	0.00 1.0000 0.00	0.00	132.0000
DBC0111F2V62-1	A	From Leg	0.00 1.0000 0.00	0.00	132.0000
DBC0111F2V62-1	B	From Leg	0.00 1.0000 0.00	0.00	132.0000
DBC0111F2V62-1	C	From Leg	0.00 1.0000 0.00	0.00	132.0000
Side Arm Mount [SO 901-3]	C	None	0.00	0.00	132.0000
**** *** AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.0000 0.00	0.00	120.0000
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	1.00 4.0000 0.00	0.00	120.0000
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	1.00 4.0000 0.00	0.00	120.0000
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Leg	1.00 4.0000 0.00	0.00	120.0000
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	B	From Leg	1.00 4.0000 0.00	0.00	120.0000
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	C	From Leg	1.00 4.0000 0.00	0.00	120.0000
RADIO 4460 B2/B25 B66_TMO	A	From Leg	1.00 4.0000 0.00	0.00	120.0000
RADIO 4460 B2/B25 B66_TMO	B	From Leg	1.00 4.0000 0.00	0.00	120.0000
RADIO 4460 B2/B25 B66_TMO	C	From Leg	1.00 4.0000 0.00	0.00	120.0000
Radio 4480_TMOV2	A	From Leg	1.00 4.0000 0.00	0.00	120.0000
Radio 4480_TMOV2	A	From Leg	1.00 4.0000 0.00	0.00	120.0000
Radio 4480_TMOV2	A	From Leg	1.00 4.0000 0.00	0.00	120.0000
SitePro1 RMQP-496-HK	C	None	1.00	0.00	120.0000
*** MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.0000 0.00	0.00	111.0000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
MX08FRO665-21 w/ Mount Pipe	B	From Leg	0.00 4.0000 0.00	0.00	111.0000
MX08FRO665-21 w/ Mount Pipe	C	From Leg	0.00 4.0000 0.00	0.00	111.0000
TA08025-B604	A	From Leg	0.00 4.0000 0.00	0.00	111.0000
TA08025-B604	B	From Leg	0.00 4.0000 0.00	0.00	111.0000
TA08025-B604	C	From Leg	0.00 4.0000 0.00	0.00	111.0000
TA08025-B605	A	From Leg	0.00 4.0000 0.00	0.00	111.0000
TA08025-B605	B	From Leg	0.00 4.0000 0.00	0.00	111.0000
TA08025-B605	C	From Leg	0.00 4.0000 0.00	0.00	111.0000
RDIDC-9181-PF-48	A	From Leg	0.00 4.0000 0.00	0.00	111.0000
Commscope MC-PK8-DSH	C	None	0.00	0.00	111.0000
(2) 8' x 2" Mount Pipe	A	From Leg	4.0000 0.00	0.00	111.0000
(2) 8' x 2" Mount Pipe	B	From Leg	0.00 4.0000 0.00	0.00	111.0000
(2) 8' x 2" Mount Pipe	C	From Leg	0.00 4.0000 0.00	0.00	111.0000
***			0.00		
APX16DWV-16DWVS-C w/ Mount Pipe	A	From Leg	4.0000 0.00	0.00	101.0000
APX16DWV-16DWVS-C w/ Mount Pipe	B	From Leg	0.00 4.0000 0.00	0.00	101.0000
APX16DWV-16DWVS-C w/ Mount Pipe	C	From Leg	0.00 4.0000 0.00	0.00	101.0000
ETT19VS12UB	A	From Leg	0.00 4.0000 0.00	0.00	101.0000
ETT19VS12UB	B	From Leg	0.00 4.0000 0.00	0.00	101.0000
ETT19VS12UB	C	From Leg	0.00 4.0000 0.00	0.00	101.0000
KRY 112 144/1	A	From Leg	0.00 4.0000 0.00	0.00	101.0000
KRY 112 144/1	B	From Leg	0.00 4.0000 0.00	0.00	101.0000
KRY 112 144/1	C	From Leg	0.00 4.0000 0.00	0.00	101.0000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
			0.00		
T-Arm Mount [TA 602-3]	C	None		0.00	101.0000
2.375" OD x 6' Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	101.0000
2.375" OD x 6' Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	101.0000
2.375" OD x 6' Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	101.0000
***					
BXA-70063-4CF-EDIN-X w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	93.0000
BXA-70063-4CF-EDIN-X w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	93.0000
BXA-70063-4CF-EDIN-X w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	93.0000
LNX-6514DS-A1M w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	93.0000
LNX-6514DS-A1M w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	93.0000
LNX-6514DS-A1M w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	93.0000
BXA-171063-8BF-2 w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	93.0000
BXA-171063-8BF-2 w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	93.0000
BXA-171085-8BF-EDIN-0 w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	93.0000
BXA-171063-12CF-EDIN-X w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	93.0000
BXA-171063-12CF-EDIN-X w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	93.0000
BXA-171063-12CF-EDIN-X w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	93.0000
RRH2X40-AWS	A	From Leg	4.0000 0.00 1.00	0.00	93.0000
RRH2X40-AWS	B	From Leg	4.0000 0.00 1.00	0.00	93.0000
RRH2X40-AWS	C	From Leg	4.0000 0.00 1.00	0.00	93.0000
(2) FD9R6004/2C-3L	A	From Leg	4.0000 0.00 1.00	0.00	93.0000
(2) FD9R6004/2C-3L	B	From Leg	4.0000 0.00 1.00	0.00	93.0000
(2) FD9R6004/2C-3L	C	From Leg	4.0000 0.00	0.00	93.0000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
DB-T1-6Z-8AB-0Z	A	From Leg	1.00 4.0000 0.00	0.00	93.0000
Platform Mount [LP 1201-1]	C	None	1.00	0.00	93.0000
****					
APXV18-206517S-C	A	From Face	1.0000 0.00 0.00	0.00	75.0000
APXV18-206517S-C	B	From Face	1.0000 0.00 0.00	0.00	75.0000
APXV18-206517S-C	C	From Face	1.0000 0.00 0.00	0.00	75.0000
Pipe Mount [PM 601-3]	C	None		0.00	75.0000
****					
KS24019-L112A	A	From Face	2.0000 0.00 1.00	0.00	50.0000
Side Arm Mount [SO 702-1]	A	From Leg	1.0000 0.00 0.00	0.00	50.0000
****					

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg % 	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 133.0000-128.0000	130.5000	1.339	42.527	5.833	A	0.000	5.833	5.833	100.00	0.000	0.000
					B	0.000	5.833		100.00	0.000	0.000
					C	0.000	5.833		100.00	0.000	0.000
L2 128.0000-123.0000	125.5000	1.328	42.179	5.833	A	0.000	5.833	5.833	100.00	0.000	0.000
					B	0.000	5.833		100.00	0.000	0.000
					C	0.000	5.833		100.00	0.000	0.000
L3 123.0000-118.0000	120.4860	1.316	41.819	9.455	A	0.000	9.455	9.455	100.00	0.000	0.000
					B	0.000	9.455		100.00	0.000	0.000
					C	0.000	9.455		100.00	0.000	0.000
L4 118.0000-113.0000	115.4865	1.305	41.447	9.772	A	0.000	9.772	9.772	100.00	0.000	0.000
					B	0.000	9.772		100.00	0.000	0.000
					C	0.000	9.772		100.00	0.000	0.000
L5 113.0000-108.0000	110.4869	1.292	41.063	10.090	A	0.000	10.090	10.090	100.00	0.000	0.000
					B	0.000	10.090		100.00	0.000	0.000
					C	0.000	10.090		100.00	0.000	0.000
L6 108.0000-103.0000	105.4873	1.28	40.664	10.407	A	0.000	10.407	10.407	100.00	0.000	0.000
					B	0.000	10.407		100.00	0.000	0.000
					C	0.000	10.407		100.00	0.000	0.000
L7 103.0000-98.0000	100.4877	1.267	40.251	10.724	A	0.000	10.724	10.724	100.00	0.000	0.000
					B	0.000	10.724		100.00	0.000	0.000
					C	0.000	10.724		100.00	0.000	0.000
L8 98.0000-93.0000	95.4880	1.253	39.821	11.042	A	0.000	11.042	11.042	100.00	0.000	0.000
					B	0.000	11.042		100.00	0.000	0.000
					C	0.000	11.042		100.00	0.000	0.000
L9 93.0000-88.0000	90.4884	1.239	39.372	11.359	A	0.000	11.359	11.359	100.00	0.000	0.000
					B	0.000	11.359		100.00	0.000	0.000

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
					C	0.000	11.359		100.00	0.000	0.000
L10 88.0000-82.2500	85.1101	1.223	38.868	13.455	A	0.000	13.455	13.455	100.00	0.000	0.000
					B	0.000	13.455		100.00	0.000	0.000
					C	0.000	13.455		100.00	0.000	0.000
L11 82.2500-80.7500	81.4990	1.212	38.515	3.530	A	0.000	3.530	3.530	100.00	0.000	0.000
					B	0.000	3.530		100.00	0.000	0.000
					C	0.000	3.530		100.00	0.000	0.000
L12 80.7500-75.7500	78.2390	1.202	38.185	11.974	A	0.000	11.974	11.974	100.00	0.000	0.000
					B	0.000	11.974		100.00	0.000	0.000
					C	0.000	11.974		100.00	0.000	0.000
L13 75.7500-70.7500	73.2393	1.185	37.658	12.292	A	0.000	12.292	12.292	100.00	1.708	0.000
					B	0.000	12.292		100.00	0.000	0.000
					C	0.000	12.292		100.00	0.000	0.000
L14 70.7500-65.7500	68.2395	1.168	37.101	12.609	A	0.000	12.609	12.609	100.00	2.010	0.000
					B	0.000	12.609		100.00	0.000	0.000
					C	0.000	12.609		100.00	0.000	0.000
L15 65.7500-60.7500	63.2398	1.149	36.512	12.926	A	0.000	12.926	12.926	100.00	2.010	0.000
					B	0.000	12.926		100.00	0.000	0.000
					C	0.000	12.926		100.00	0.000	0.000
L16 60.7500-57.7500	59.2464	1.134	36.014	7.908	A	0.000	7.908	7.908	100.00	2.628	0.000
					B	0.000	7.908		100.00	1.422	0.000
					C	0.000	7.908		100.00	1.422	0.000
L17 57.7500-57.5000	57.6250	1.127	35.804	0.663	A	0.000	0.663	0.663	100.00	0.304	0.000
					B	0.000	0.663		100.00	0.203	0.000
					C	0.000	0.663		100.00	0.203	0.000
L18 57.5000-52.5000	54.9902	1.116	35.453	13.437	A	0.000	13.437	13.437	100.00	6.072	0.000
					B	0.000	13.437		100.00	4.063	0.000
					C	0.000	13.437		100.00	4.063	0.000
L19 52.5000-47.5000	49.9904	1.094	34.749	13.755	A	0.000	13.755	13.755	100.00	6.072	0.000
					B	0.000	13.755		100.00	4.220	0.000
					C	0.000	13.755		100.00	4.063	0.000
L20 47.5000-40.7500	44.1080	1.065	33.845	19.072	A	0.000	19.072	19.072	100.00	8.198	0.000
					B	0.000	19.072		100.00	5.910	0.000
					C	0.000	19.072		100.00	5.484	0.000
L21 40.7500-40.0000	40.3748	1.046	33.220	2.123	A	0.000	2.123	2.123	100.00	0.911	0.000
					B	0.000	2.123		100.00	0.657	0.000
					C	0.000	2.123		100.00	0.609	0.000
L22 40.0000-35.0000	37.4908	1.029	32.706	14.335	A	0.000	14.335	14.335	100.00	6.072	0.000
					B	0.000	14.335		100.00	4.378	0.000
					C	0.000	14.335		100.00	4.063	0.000
L23 35.0000-30.0000	32.4910	0.999	31.735	14.653	A	0.000	14.653	14.653	100.00	6.072	0.000
					B	0.000	14.653		100.00	4.378	0.000
					C	0.000	14.653		100.00	4.063	0.000
L24 30.0000-29.7500	29.8750	0.981	31.179	0.742	A	0.000	0.742	0.742	100.00	0.304	0.000
					B	0.000	0.742		100.00	0.219	0.000
					C	0.000	0.742		100.00	0.203	0.000
L25 29.7500-29.5000	29.6250	0.98	31.124	0.742	A	0.000	0.742	0.742	100.00	0.356	0.000
					B	0.000	0.742		100.00	0.271	0.000
					C	0.000	0.742		100.00	0.255	0.000
L26 29.5000-24.5000	26.9912	0.961	30.520	14.999	A	0.000	14.999	14.999	100.00	7.114	0.000
					B	0.000	14.999		100.00	5.419	0.000
					C	0.000	14.999		100.00	5.104	0.000
L27 24.5000-19.5000	21.9914	0.92	29.232	15.317	A	0.000	15.317	15.317	100.00	7.114	0.000
					B	0.000	15.317		100.00	5.419	0.000
					C	0.000	15.317		100.00	5.104	0.000
L28 19.5000-14.5000	16.9916	0.871	27.687	15.634	A	0.000	15.634	15.634	100.00	7.114	0.000
					B	0.000	15.634		100.00	5.419	0.000
					C	0.000	15.634		100.00	5.104	0.000
L29 14.5000-9.5000	11.9917	0.85	27.005	15.953	A	0.000	15.953	15.953	100.00	7.114	0.000
					B	0.000	15.953		100.00	5.419	0.000
					C	0.000	15.953		100.00	5.104	0.000
L30 9.5000-4.5000	6.9919	0.85	27.005	16.270	A	0.000	16.270	16.270	100.00	7.114	0.000
					B	0.000	16.270		100.00	5.419	0.000
					C	0.000	16.270		100.00	5.104	0.000
L31 4.5000-0.0000	2.2435	0.85	27.005	14.915	A	0.000	14.915	14.915	100.00	6.403	0.000
					B	0.000	14.915		100.00	4.877	0.000
					C	0.000	14.915		100.00	4.594	0.000

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 133.0000-128.0000	130.5000	1.339	7.636	0.9753	6.646	A	0.000	6.646	6.646	100.00	0.000	0.000
						B	0.000	6.646		100.00	0.000	0.000
						C	0.000	6.646		100.00	0.000	0.000
L2 128.0000-123.0000	125.5000	1.328	7.573	0.9715	6.643	A	0.000	6.643	6.643	100.00	0.000	0.000
						B	0.000	6.643		100.00	0.000	0.000
						C	0.000	6.643		100.00	0.000	0.000
L3 123.0000-118.0000	120.4860	1.316	7.508	0.9675	10.261	A	0.000	10.261	10.261	100.00	0.000	0.000
						B	0.000	10.261		100.00	0.000	0.000
						C	0.000	10.261		100.00	0.000	0.000
L4 118.0000-113.0000	115.4865	1.305	7.442	0.9634	10.575	A	0.000	10.575	10.575	100.00	0.000	0.000
						B	0.000	10.575		100.00	0.000	0.000
						C	0.000	10.575		100.00	0.000	0.000
L5 113.0000-108.0000	110.4869	1.292	7.373	0.9592	10.889	A	0.000	10.889	10.889	100.00	0.000	0.000
						B	0.000	10.889		100.00	0.000	0.000
						C	0.000	10.889		100.00	0.000	0.000
L6 108.0000-103.0000	105.4873	1.28	7.301	0.9547	11.203	A	0.000	11.203	11.203	100.00	0.000	0.000
						B	0.000	11.203		100.00	0.000	0.000
						C	0.000	11.203		100.00	0.000	0.000
L7 103.0000-98.0000	100.4877	1.267	7.227	0.9501	11.516	A	0.000	11.516	11.516	100.00	0.000	0.000
						B	0.000	11.516		100.00	0.000	0.000
						C	0.000	11.516		100.00	0.000	0.000
L8 98.0000-93.0000	95.4880	1.253	7.150	0.9453	11.829	A	0.000	11.829	11.829	100.00	0.000	0.000
						B	0.000	11.829		100.00	0.000	0.000
						C	0.000	11.829		100.00	0.000	0.000
L9 93.0000-88.0000	90.4884	1.239	7.069	0.9402	12.143	A	0.000	12.143	12.143	100.00	0.000	0.000
						B	0.000	12.143		100.00	0.000	0.000
						C	0.000	12.143		100.00	0.000	0.000
L10 88.0000-82.2500	85.1101	1.223	6.979	0.9345	14.351	A	0.000	14.351	14.351	100.00	0.000	0.000
						B	0.000	14.351		100.00	0.000	0.000
						C	0.000	14.351		100.00	0.000	0.000
L11 82.2500-80.7500	81.4990	1.212	6.915	0.9304	3.764	A	0.000	3.764	3.764	100.00	0.000	0.000
						B	0.000	3.764		100.00	0.000	0.000
						C	0.000	3.764		100.00	0.000	0.000
L12 80.7500-75.7500	78.2390	1.202	6.856	0.9266	12.746	A	0.000	12.746	12.746	100.00	0.000	0.000
						B	0.000	12.746		100.00	0.000	0.000
						C	0.000	12.746		100.00	0.000	0.000
L13 75.7500-70.7500	73.2393	1.185	6.761	0.9205	13.059	A	0.000	13.059	13.059	100.00	3.114	0.000
						B	0.000	13.059		100.00	0.000	0.000
						C	0.000	13.059		100.00	0.000	0.000
L14 70.7500-65.7500	68.2395	1.168	6.661	0.9141	13.371	A	0.000	13.371	13.371	100.00	3.655	0.000
						B	0.000	13.371		100.00	0.000	0.000
						C	0.000	13.371		100.00	0.000	0.000
L15 65.7500-60.7500	63.2398	1.149	6.556	0.9071	13.682	A	0.000	13.682	13.682	100.00	3.646	0.000
						B	0.000	13.682		100.00	0.000	0.000
						C	0.000	13.682		100.00	0.000	0.000
L16 60.7500-57.7500	59.2464	1.134	6.466	0.9012	8.359	A	0.000	8.359	8.359	100.00	3.921	0.000
						B	0.000	8.359		100.00	1.737	0.000
						C	0.000	8.359		100.00	1.737	0.000
L17 57.7500-57.5000	57.6250	1.127	6.428	0.8987	0.701	A	0.000	0.701	0.701	100.00	0.430	0.000
						B	0.000	0.701		100.00	0.248	0.000
						C	0.000	0.701		100.00	0.248	0.000
L18 57.5000-52.5000	54.9902	1.116	6.365	0.8945	14.182	A	0.000	14.182	14.182	100.00	8.588	0.000
						B	0.000	14.182		100.00	4.957	0.000
						C	0.000	14.182		100.00	4.957	0.000
L19 52.5000-47.5000	49.9904	1.094	6.239	0.8860	14.493	A	0.000	14.493	14.493	100.00	8.569	0.000
						B	0.000	14.493		100.00	5.549	0.000
						C	0.000	14.493		100.00	4.949	0.000
L20 47.5000-40.7500	44.1080	1.065	6.077	0.8750	20.057	A	0.000	20.057	20.057	100.00	11.534	0.000
						B	0.000	20.057		100.00	8.272	0.000
						C	0.000	20.057		100.00	6.666	0.000
L21 40.7500-	40.3748	1.046	5.965	0.8673	2.232	A	0.000	2.232	2.232	100.00	1.282	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
40.0000						B	0.000	2.232		100.00	0.919	0.000
						C	0.000	2.232		100.00	0.741	0.000
L22 40.0000-35.0000	37.4908	1.029	5.872	0.8609	15.053	A	0.000	15.053	15.053	100.00	8.512	0.000
						B	0.000	15.053		100.00	6.099	0.000
						C	0.000	15.053		100.00	4.923	0.000
L23 35.0000-30.0000	32.4910	0.999	5.698	0.8487	15.360	A	0.000	15.360	15.360	100.00	8.485	0.000
						B	0.000	15.360		100.00	6.075	0.000
						C	0.000	15.360		100.00	4.911	0.000
L24 30.0000-29.7500	29.8750	0.981	5.598	0.8416	0.777	A	0.000	0.777	0.777	100.00	0.423	0.000
						B	0.000	0.777		100.00	0.303	0.000
						C	0.000	0.777		100.00	0.245	0.000
L25 29.7500-29.5000	29.6250	0.98	5.588	0.8409	0.777	A	0.000	0.777	0.777	100.00	0.475	0.000
						B	0.000	0.777		100.00	0.355	0.000
						C	0.000	0.777		100.00	0.297	0.000
L26 29.5000-24.5000	26.9912	0.961	5.480	0.8331	15.693	A	0.000	15.693	15.693	100.00	9.488	0.000
						B	0.000	15.693		100.00	7.082	0.000
						C	0.000	15.693		100.00	5.934	0.000
L27 24.5000-19.5000	21.9914	0.92	5.248	0.8162	15.997	A	0.000	15.997	15.997	100.00	9.451	0.000
						B	0.000	15.997		100.00	7.050	0.000
						C	0.000	15.997		100.00	5.919	0.000
L28 19.5000-14.5000	16.9916	0.871	4.971	0.7954	16.297	A	0.000	16.297	16.297	100.00	9.406	0.000
						B	0.000	16.297		100.00	7.010	0.000
						C	0.000	16.297		100.00	5.900	0.000
L29 14.5000-9.5000	11.9917	0.85	4.849	0.7682	16.593	A	0.000	16.593	16.593	100.00	9.126	0.000
						B	0.000	16.593		100.00	6.736	0.000
						C	0.000	16.593		100.00	5.653	0.000
L30 9.5000-4.5000	6.9919	0.85	4.849	0.7278	16.876	A	0.000	16.876	16.876	100.00	9.002	0.000
						B	0.000	16.876		100.00	6.622	0.000
						C	0.000	16.876		100.00	5.579	0.000
L31 4.5000-0.0000	2.2435	0.85	4.849	0.6496	15.402	A	0.000	15.402	15.402	100.00	7.977	0.000
						B	0.000	15.402		100.00	5.853	0.000
						C	0.000	15.402		100.00	4.985	0.000

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 133.0000-128.0000	130.5000	1.339	10.356	5.833	A	0.000	5.833	5.833	100.00	0.000	0.000
					B	0.000	5.833		100.00	0.000	0.000
					C	0.000	5.833		100.00	0.000	0.000
L2 128.0000-123.0000	125.5000	1.328	10.271	5.833	A	0.000	5.833	5.833	100.00	0.000	0.000
					B	0.000	5.833		100.00	0.000	0.000
					C	0.000	5.833		100.00	0.000	0.000
L3 123.0000-118.0000	120.4860	1.316	10.183	9.455	A	0.000	9.455	9.455	100.00	0.000	0.000
					B	0.000	9.455		100.00	0.000	0.000
					C	0.000	9.455		100.00	0.000	0.000
L4 118.0000-113.0000	115.4865	1.305	10.093	9.772	A	0.000	9.772	9.772	100.00	0.000	0.000
					B	0.000	9.772		100.00	0.000	0.000
					C	0.000	9.772		100.00	0.000	0.000
L5 113.0000-108.0000	110.4869	1.292	9.999	10.090	A	0.000	10.090	10.090	100.00	0.000	0.000
					B	0.000	10.090		100.00	0.000	0.000
					C	0.000	10.090		100.00	0.000	0.000
L6 108.0000-103.0000	105.4873	1.28	9.902	10.407	A	0.000	10.407	10.407	100.00	0.000	0.000
					B	0.000	10.407		100.00	0.000	0.000
					C	0.000	10.407		100.00	0.000	0.000
L7 103.0000-98.0000	100.4877	1.267	9.801	10.724	A	0.000	10.724	10.724	100.00	0.000	0.000
					B	0.000	10.724		100.00	0.000	0.000
					C	0.000	10.724		100.00	0.000	0.000
L8 98.0000-	95.4880	1.253	9.697	11.042	A	0.000	11.042	11.042	100.00	0.000	0.000

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
93.0000					B	0.000	11.042		100.00	0.000	0.000
					C	0.000	11.042		100.00	0.000	0.000
L9 93.0000-88.0000	90.4884	1.239	9.587	11.359	A	0.000	11.359	11.359	100.00	0.000	0.000
					B	0.000	11.359		100.00	0.000	0.000
					C	0.000	11.359		100.00	0.000	0.000
L10 88.0000-82.2500	85.1101	1.223	9.465	13.455	A	0.000	13.455	13.455	100.00	0.000	0.000
					B	0.000	13.455		100.00	0.000	0.000
					C	0.000	13.455		100.00	0.000	0.000
L11 82.2500-80.7500	81.4990	1.212	9.379	3.530	A	0.000	3.530	3.530	100.00	0.000	0.000
					B	0.000	3.530		100.00	0.000	0.000
					C	0.000	3.530		100.00	0.000	0.000
L12 80.7500-75.7500	78.2390	1.202	9.298	11.974	A	0.000	11.974	11.974	100.00	0.000	0.000
					B	0.000	11.974		100.00	0.000	0.000
					C	0.000	11.974		100.00	0.000	0.000
L13 75.7500-70.7500	73.2393	1.185	9.170	12.292	A	0.000	12.292	12.292	100.00	1.708	0.000
					B	0.000	12.292		100.00	0.000	0.000
					C	0.000	12.292		100.00	0.000	0.000
L14 70.7500-65.7500	68.2395	1.168	9.034	12.609	A	0.000	12.609	12.609	100.00	2.010	0.000
					B	0.000	12.609		100.00	0.000	0.000
					C	0.000	12.609		100.00	0.000	0.000
L15 65.7500-60.7500	63.2398	1.149	8.891	12.926	A	0.000	12.926	12.926	100.00	2.010	0.000
					B	0.000	12.926		100.00	0.000	0.000
					C	0.000	12.926		100.00	0.000	0.000
L16 60.7500-57.7500	59.2464	1.134	8.770	7.908	A	0.000	7.908	7.908	100.00	2.628	0.000
					B	0.000	7.908		100.00	1.422	0.000
					C	0.000	7.908		100.00	1.422	0.000
L17 57.7500-57.5000	57.6250	1.127	8.719	0.663	A	0.000	0.663	0.663	100.00	0.304	0.000
					B	0.000	0.663		100.00	0.203	0.000
					C	0.000	0.663		100.00	0.203	0.000
L18 57.5000-52.5000	54.9902	1.116	8.633	13.437	A	0.000	13.437	13.437	100.00	6.072	0.000
					B	0.000	13.437		100.00	4.063	0.000
					C	0.000	13.437		100.00	4.063	0.000
L19 52.5000-47.5000	49.9904	1.094	8.462	13.755	A	0.000	13.755	13.755	100.00	6.072	0.000
					B	0.000	13.755		100.00	4.220	0.000
					C	0.000	13.755		100.00	4.063	0.000
L20 47.5000-40.7500	44.1080	1.065	8.241	19.072	A	0.000	19.072	19.072	100.00	8.198	0.000
					B	0.000	19.072		100.00	5.910	0.000
					C	0.000	19.072		100.00	5.484	0.000
L21 40.7500-40.0000	40.3748	1.046	8.089	2.123	A	0.000	2.123	2.123	100.00	0.911	0.000
					B	0.000	2.123		100.00	0.657	0.000
					C	0.000	2.123		100.00	0.609	0.000
L22 40.0000-35.0000	37.4908	1.029	7.964	14.335	A	0.000	14.335	14.335	100.00	6.072	0.000
					B	0.000	14.335		100.00	4.378	0.000
					C	0.000	14.335		100.00	4.063	0.000
L23 35.0000-30.0000	32.4910	0.999	7.728	14.653	A	0.000	14.653	14.653	100.00	6.072	0.000
					B	0.000	14.653		100.00	4.378	0.000
					C	0.000	14.653		100.00	4.063	0.000
L24 30.0000-29.7500	29.8750	0.981	7.592	0.742	A	0.000	0.742	0.742	100.00	0.304	0.000
					B	0.000	0.742		100.00	0.219	0.000
					C	0.000	0.742		100.00	0.203	0.000
L25 29.7500-29.5000	29.6250	0.98	7.579	0.742	A	0.000	0.742	0.742	100.00	0.356	0.000
					B	0.000	0.742		100.00	0.271	0.000
					C	0.000	0.742		100.00	0.255	0.000
L26 29.5000-24.5000	26.9912	0.961	7.432	14.999	A	0.000	14.999	14.999	100.00	7.114	0.000
					B	0.000	14.999		100.00	5.419	0.000
					C	0.000	14.999		100.00	5.104	0.000
L27 24.5000-19.5000	21.9914	0.92	7.118	15.317	A	0.000	15.317	15.317	100.00	7.114	0.000
					B	0.000	15.317		100.00	5.419	0.000
					C	0.000	15.317		100.00	5.104	0.000
L28 19.5000-14.5000	16.9916	0.871	6.742	15.634	A	0.000	15.634	15.634	100.00	7.114	0.000
					B	0.000	15.634		100.00	5.419	0.000
					C	0.000	15.634		100.00	5.104	0.000
L29 14.5000-9.5000	11.9917	0.85	6.576	15.953	A	0.000	15.953	15.953	100.00	7.114	0.000
					B	0.000	15.953		100.00	5.419	0.000
					C	0.000	15.953		100.00	5.104	0.000
L30 9.5000-4.5000	6.9919	0.85	6.576	16.270	A	0.000	16.270	16.270	100.00	7.114	0.000
					B	0.000	16.270		100.00	5.419	0.000
					C	0.000	16.270		100.00	5.104	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L31 4.5000-0.0000	2.2435	0.85	6.576	14.915	A	0.000	14.915	14.915	100.00	6.403	0.000
					B	0.000	14.915		100.00	4.877	0.000
					C	0.000	14.915		100.00	4.594	0.000

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
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice
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	133 - 128	Pole	Max Tension	39	0.00	0.00	-0.00
			Max. Compression	26	-3.05	-0.10	0.06
			Max. Mx	8	-1.54	-9.89	0.01
			Max. My	2	-1.53	-0.04	9.87
			Max. Vy	8	2.52	-9.89	0.01
			Max. Vx	2	-2.53	-0.04	9.87
			Max. Torque	12			0.08
L2	128 - 123	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-3.50	-0.10	0.07
			Max. Mx	8	-1.89	-23.02	0.02
			Max. My	2	-1.88	-0.04	23.01
			Max. Vy	8	2.73	-23.02	0.02
			Max. Vx	2	-2.73	-0.04	23.01
			Max. Torque	12			0.08
L3	123 - 118	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-10.32	-0.10	2.20
			Max. Mx	8	-5.96	-46.50	1.36
			Max. My	2	-5.92	-0.04	48.45
			Max. Vy	8	6.57	-46.50	1.36
			Max. Vx	2	-6.75	-0.04	48.45
			Max. Torque	20			-0.96
L4	118 - 113	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-10.82	-0.10	2.24
			Max. Mx	8	-6.30	-80.24	1.39
			Max. My	2	-6.26	-0.04	83.07
			Max. Vy	8	6.93	-80.24	1.39
			Max. Vx	2	-7.10	-0.04	83.07
			Max. Torque	20			-0.96
L5	113 - 108	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-16.23	-0.10	2.60
			Max. Mx	8	-9.55	-125.73	1.51
			Max. My	2	-9.50	-0.04	129.71
			Max. Vy	8	10.61	-125.73	1.51
			Max. Vx	2	-10.83	-0.04	129.71
			Max. Torque	20			-1.20
L6	108 - 103	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-16.77	-0.10	2.65
			Max. Mx	8	-9.94	-179.63	1.54
			Max. My	2	-9.90	-0.05	184.71
			Max. Vy	8	10.96	-179.63	1.54
			Max. Vx	2	-11.18	-0.05	184.71
			Max. Torque	20			-1.20
L7	103 - 98	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-19.56	-0.10	2.70
			Max. Mx	8	-11.57	-239.65	1.56
			Max. My	2	-11.52	-0.05	245.83
			Max. Vy	8	12.76	-239.65	1.56
			Max. Vx	2	-12.99	-0.05	245.83
			Max. Torque	20			-1.20
L8	98 - 93	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-20.16	-0.10	2.74
			Max. Mx	8	-12.04	-304.28	1.59
			Max. My	2	-12.00	-0.05	311.58
			Max. Vy	8	13.10	-304.28	1.59
			Max. Vx	2	-13.32	-0.05	311.58
			Max. Torque	20			-1.20
L9	93 - 88	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.62	-0.10	3.42
			Max. Mx	8	-15.75	-387.45	1.83
			Max. My	2	-15.70	-0.05	396.73
			Max. Vy	8	16.42	-387.45	1.83
			Max. Vx	2	-16.75	-0.05	396.73
			Max. Torque	20			-1.58
L10	88 - 82.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.93	-0.10	3.44
			Max. Mx	8	-16.02	-424.53	1.84
			Max. My	2	-15.97	-0.05	434.53
			Max. Vy	8	16.56	-424.53	1.84
			Max. Vx	2	-16.88	-0.05	434.53

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	20			-1.58
L11	82.25 - 80.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.08	-0.10	3.49
			Max. Mx	8	-16.93	-508.23	1.87
			Max. My	2	-16.88	-0.05	519.86
			Max. Vy	8	16.93	-508.23	1.87
			Max. Vx	2	-17.26	-0.05	519.86
			Max. Torque	20			-1.58
L12	80.75 - 75.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.90	-0.10	3.53
			Max. Mx	8	-17.66	-593.60	1.89
			Max. My	2	-17.61	-0.05	606.85
			Max. Vy	20	-17.24	593.50	1.89
			Max. Vx	2	-17.56	-0.05	606.85
			Max. Torque	20			-1.58
L13	75.75 - 70.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30.35	-0.07	3.58
			Max. Mx	8	-18.73	-682.35	1.92
			Max. My	2	-18.68	-0.04	697.22
			Max. Vy	20	-17.98	682.26	1.92
			Max. Vx	2	-18.30	-0.04	697.22
			Max. Torque	20			-1.57
L14	70.75 - 65.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-31.25	-0.03	3.63
			Max. Mx	8	-19.53	-772.88	1.94
			Max. My	2	-19.49	-0.03	789.38
			Max. Vy	20	-18.27	772.82	1.94
			Max. Vx	2	-18.59	-0.03	789.38
			Max. Torque	20			-1.57
L15	65.75 - 60.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.17	0.01	3.68
			Max. Mx	8	-20.35	-864.82	1.96
			Max. My	2	-20.31	-0.02	882.93
			Max. Vy	20	-18.54	864.78	1.96
			Max. Vx	2	-18.86	-0.02	882.93
			Max. Torque	20			-1.57
L16	60.75 - 57.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.75	0.04	3.71
			Max. Mx	8	-20.85	-920.64	1.97
			Max. My	2	-20.82	-0.01	939.71
			Max. Vy	20	-18.70	920.60	1.97
			Max. Vx	2	-19.02	-0.01	939.71
			Max. Torque	20			-1.57
L17	57.75 - 57.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.82	0.04	3.72
			Max. Mx	8	-20.92	-925.31	1.97
			Max. My	2	-20.89	-0.01	944.46
			Max. Vy	20	-18.71	925.28	1.97
			Max. Vx	2	-19.03	-0.01	944.46
			Max. Torque	20			-1.57
L18	57.5 - 52.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.21	0.08	3.76
			Max. Mx	8	-22.08	-1019.67	1.99
			Max. My	2	-22.05	-0.00	1040.42
			Max. Vy	20	-19.05	1019.66	1.99
			Max. Vx	2	-19.37	-0.00	1040.42
			Max. Torque	20			-1.57
L19	52.5 - 47.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.69	0.14	3.97
			Max. Mx	20	-23.30	1115.90	2.08
			Max. My	2	-23.27	0.02	1138.22
			Max. Vy	20	-19.45	1115.90	2.08
			Max. Vx	2	-19.73	0.02	1138.22

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	20			-1.71
L20	47.5 - 40.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.40	0.16	4.00
			Max. Mx	20	-23.89	1164.70	2.09
			Max. My	2	-23.87	0.03	1187.72
			Max. Vy	20	-19.61	1164.70	2.09
			Max. Vx	2	-19.89	0.03	1187.72
			Max. Torque	20			-1.71
L21	40.75 - 40	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.82	0.19	4.03
			Max. Mx	20	-25.90	1263.71	2.11
			Max. My	2	-25.88	0.04	1288.14
			Max. Vy	20	-20.00	1263.71	2.11
			Max. Vx	2	-20.28	0.04	1288.14
			Max. Torque	20			-1.71
L22	40 - 35	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.32	0.22	4.06
			Max. Mx	20	-27.19	1364.41	2.12
			Max. My	2	-27.17	0.05	1390.25
			Max. Vy	20	-20.30	1364.41	2.12
			Max. Vx	2	-20.58	0.05	1390.25
			Max. Torque	20			-1.71
L23	35 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.83	0.25	4.09
			Max. Mx	20	-28.49	1466.55	2.14
			Max. My	2	-28.47	0.06	1493.77
			Max. Vy	20	-20.58	1466.55	2.14
			Max. Vx	2	-20.86	0.06	1493.77
			Max. Torque	20			-1.71
L24	30 - 29.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.89	0.25	4.09
			Max. Mx	20	-28.55	1471.69	2.14
			Max. My	2	-28.53	0.06	1498.98
			Max. Vy	20	-20.58	1471.69	2.14
			Max. Vx	2	-20.86	0.06	1498.98
			Max. Torque	20			-1.71
L25	29.75 - 29.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.97	0.25	4.09
			Max. Mx	20	-28.62	1476.83	2.14
			Max. My	2	-28.60	0.06	1504.20
			Max. Vy	20	-20.59	1476.83	2.14
			Max. Vx	2	-20.87	0.06	1504.20
			Max. Torque	20			-1.71
L26	29.5 - 24.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.61	0.28	4.12
			Max. Mx	20	-30.02	1580.46	2.15
			Max. My	2	-30.00	0.07	1609.21
			Max. Vy	20	-20.87	1580.46	2.15
			Max. Vx	2	-21.15	0.07	1609.21
			Max. Torque	20			-1.71
L27	24.5 - 19.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.25	0.31	4.15
			Max. Mx	20	-31.45	1685.40	2.16
			Max. My	2	-31.43	0.08	1715.52
			Max. Vy	20	-21.12	1685.40	2.16
			Max. Vx	2	-21.40	0.08	1715.52
			Max. Torque	20			-1.71
L28	19.5 - 14.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.90	0.35	4.18
			Max. Mx	20	-32.89	1791.54	2.17
			Max. My	2	-32.88	0.09	1823.02
			Max. Vy	20	-21.35	1791.54	2.17
			Max. Vx	2	-21.63	0.09	1823.02
			Max. Torque	20			-1.70
L29	14.5 - 9.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.56	0.38	4.21
			Max. Mx	20	-34.35	1898.77	2.18
			Max. My	2	-34.34	0.10	1931.61
			Max. Vy	20	-21.56	1898.77	2.18

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	2	-21.84	0.10	1931.61
			Max. Torque	20			-1.70
L30	9.5 - 4.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.22	0.41	4.24
			Max. Mx	20	-35.83	2007.04	2.19
			Max. My	2	-35.82	0.11	2041.22
			Max. Vy	20	-21.77	2007.04	2.19
			Max. Vx	2	-22.04	0.11	2041.22
			Max. Torque	20			-1.70
L31	4.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.70	0.44	4.26
			Max. Mx	20	-37.17	2105.35	2.19
			Max. My	2	-37.17	0.12	2140.73
			Max. Vy	20	-21.95	2105.35	2.19
			Max. Vx	2	-22.22	0.12	2140.73
			Max. Torque	20			-1.70

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	51.70	0.00	6.55
	Max. H_x	21	27.89	21.93	0.00
	Max. H_z	2	37.18	0.00	22.20
	Max. M_x	2	2140.73	0.00	22.20
	Max. M_z	8	2105.11	-21.93	0.00
	Max. Torsion	8	1.70	-21.93	0.00
	Min. Vert	11	27.89	-18.99	-11.10
	Min. H_x	9	27.89	-21.93	0.00
	Min. H_z	14	37.18	0.00	-22.20
	Min. M_x	14	-2136.33	0.00	-22.20
	Min. M_z	20	-2105.35	21.93	0.00
	Min. Torsion	20	-1.70	21.93	0.00

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	30.99	0.00	-0.00	-1.76	0.10	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	37.18	0.00	-22.20	-2140.73	0.12	0.06
0.9 Dead+1.0 Wind 0 deg - No Ice	27.89	0.00	-22.20	-2108.33	0.09	0.06
1.2 Dead+1.0 Wind 30 deg - No Ice	37.18	10.97	-19.22	-1854.25	-1052.44	-0.81
0.9 Dead+1.0 Wind 30 deg - No Ice	27.89	10.97	-19.22	-1826.11	-1036.85	-0.78
1.2 Dead+1.0 Wind 60 deg - No Ice	37.18	18.99	-11.10	-1071.51	-1823.04	-1.45
0.9 Dead+1.0 Wind 60 deg - No Ice	27.89	18.99	-11.10	-1055.02	-1795.99	-1.41
1.2 Dead+1.0 Wind 90 deg - No Ice	37.18	21.93	0.00	-2.19	-2105.11	-1.70
0.9 Dead+1.0 Wind 90 deg - No Ice	27.89	21.93	-0.00	-1.60	-2073.88	-1.65
1.2 Dead+1.0 Wind 120 deg - No Ice	37.18	18.99	11.10	1067.12	-1823.03	-1.50
0.9 Dead+1.0 Wind 120 deg - No Ice	27.89	18.99	11.10	1051.82	-1795.99	-1.45

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 150 deg - No Ice	37.18	10.97	19.22	1849.85	-1052.44	-0.90
0.9 Dead+1.0 Wind 150 deg - No Ice	27.89	10.97	19.22	1822.91	-1036.84	-0.87
1.2 Dead+1.0 Wind 180 deg - No Ice	37.18	0.00	22.20	2136.33	0.12	-0.06
0.9 Dead+1.0 Wind 180 deg - No Ice	27.89	0.00	22.20	2105.12	0.09	-0.06
1.2 Dead+1.0 Wind 210 deg - No Ice	37.18	-10.97	19.22	1849.85	1052.68	0.79
0.9 Dead+1.0 Wind 210 deg - No Ice	27.89	-10.97	19.22	1822.91	1037.03	0.77
1.2 Dead+1.0 Wind 240 deg - No Ice	37.18	-18.99	11.10	1067.12	1823.27	1.44
0.9 Dead+1.0 Wind 240 deg - No Ice	27.89	-18.99	11.10	1051.81	1796.17	1.39
1.2 Dead+1.0 Wind 270 deg - No Ice	37.18	-21.93	0.00	-2.19	2105.35	1.70
0.9 Dead+1.0 Wind 270 deg - No Ice	27.89	-21.93	-0.00	-1.60	2074.06	1.65
1.2 Dead+1.0 Wind 300 deg - No Ice	37.18	-18.99	-11.10	-1071.51	1823.28	1.51
0.9 Dead+1.0 Wind 300 deg - No Ice	27.89	-18.99	-11.10	-1055.02	1796.18	1.47
1.2 Dead+1.0 Wind 330 deg - No Ice	37.18	-10.97	-19.22	-1854.25	1052.69	0.91
0.9 Dead+1.0 Wind 330 deg - No Ice	27.89	-10.97	-19.22	-1826.11	1037.03	0.89
1.2 Dead+1.0 Ice	51.70	-0.00	-0.00	-4.26	0.44	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice	51.70	0.00	-6.55	-651.33	0.44	0.02
1.2 Dead+1.0 Wind 30 deg+1.0 Ice	51.70	3.25	-5.67	-564.66	-319.22	-0.24
1.2 Dead+1.0 Wind 60 deg+1.0 Ice	51.70	5.63	-3.28	-327.85	-553.22	-0.43
1.2 Dead+1.0 Wind 90 deg+1.0 Ice	51.70	6.50	-0.00	-4.36	-638.87	-0.51
1.2 Dead+1.0 Wind 120 deg+1.0 Ice	51.70	5.63	3.28	319.14	-553.22	-0.45
1.2 Dead+1.0 Wind 150 deg+1.0 Ice	51.70	3.25	5.67	555.95	-319.22	-0.27
1.2 Dead+1.0 Wind 180 deg+1.0 Ice	51.70	0.00	6.55	642.62	0.44	-0.02
1.2 Dead+1.0 Wind 210 deg+1.0 Ice	51.70	-3.25	5.67	555.95	320.10	0.23
1.2 Dead+1.0 Wind 240 deg+1.0 Ice	51.70	-5.63	3.28	319.14	554.11	0.43
1.2 Dead+1.0 Wind 270 deg+1.0 Ice	51.70	-6.50	-0.00	-4.36	639.75	0.51
1.2 Dead+1.0 Wind 300 deg+1.0 Ice	51.70	-5.63	-3.28	-327.85	554.11	0.45
1.2 Dead+1.0 Wind 330 deg+1.0 Ice	51.70	-3.25	-5.67	-564.66	320.10	0.27
Dead+Wind 0 deg - Service	30.99	0.00	-5.41	-518.69	0.10	0.02
Dead+Wind 30 deg - Service	30.99	2.67	-4.68	-449.44	-254.30	-0.19
Dead+Wind 60 deg - Service	30.99	4.63	-2.70	-260.25	-440.54	-0.35
Dead+Wind 90 deg - Service	30.99	5.34	0.00	-1.81	-508.71	-0.41
Dead+Wind 120 deg - Service	30.99	4.63	2.70	256.63	-440.54	-0.37
Dead+Wind 150 deg - Service	30.99	2.67	4.68	445.82	-254.30	-0.22
Dead+Wind 180 deg - Service	30.99	0.00	5.41	515.06	0.10	-0.02
Dead+Wind 210 deg - Service	30.99	-2.67	4.68	445.82	254.51	0.19
Dead+Wind 240 deg - Service	30.99	-4.63	2.70	256.63	440.74	0.35
Dead+Wind 270 deg - Service	30.99	-5.34	0.00	-1.81	508.91	0.41

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 300 deg - Service	30.99	-4.63	-2.70	-260.25	440.74	0.37
Dead+Wind 330 deg - Service	30.99	-2.67	-4.68	-449.44	254.51	0.22

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-30.99	0.00	0.00	30.99	0.00	0.000%
2	0.00	-37.18	-22.20	0.00	37.18	22.20	0.000%
3	0.00	-27.89	-22.20	0.00	27.89	22.20	0.000%
4	10.97	-37.18	-19.22	-10.97	37.18	19.22	0.000%
5	10.97	-27.89	-19.22	-10.97	27.89	19.22	0.000%
6	18.99	-37.18	-11.10	-18.99	37.18	11.10	0.000%
7	18.99	-27.89	-11.10	-18.99	27.89	11.10	0.000%
8	21.93	-37.18	0.00	-21.93	37.18	0.00	0.000%
9	21.93	-27.89	0.00	-21.93	27.89	0.00	0.000%
10	18.99	-37.18	11.10	-18.99	37.18	-11.10	0.000%
11	18.99	-27.89	11.10	-18.99	27.89	-11.10	0.000%
12	10.97	-37.18	19.22	-10.97	37.18	-19.22	0.000%
13	10.97	-27.89	19.22	-10.97	27.89	-19.22	0.000%
14	0.00	-37.18	22.20	0.00	37.18	-22.20	0.000%
15	0.00	-27.89	22.20	0.00	27.89	-22.20	0.000%
16	-10.97	-37.18	19.22	10.97	37.18	-19.22	0.000%
17	-10.97	-27.89	19.22	10.97	27.89	-19.22	0.000%
18	-18.99	-37.18	11.10	18.99	37.18	-11.10	0.000%
19	-18.99	-27.89	11.10	18.99	27.89	-11.10	0.000%
20	-21.93	-37.18	0.00	21.93	37.18	0.00	0.000%
21	-21.93	-27.89	0.00	21.93	27.89	0.00	0.000%
22	-18.99	-37.18	-11.10	18.99	37.18	11.10	0.000%
23	-18.99	-27.89	-11.10	18.99	27.89	11.10	0.000%
24	-10.97	-37.18	-19.22	10.97	37.18	19.22	0.000%
25	-10.97	-27.89	-19.22	10.97	27.89	19.22	0.000%
26	0.00	-51.70	0.00	0.00	51.70	0.00	0.000%
27	0.00	-51.70	-6.55	0.00	51.70	6.55	0.000%
28	3.25	-51.70	-5.67	-3.25	51.70	5.67	0.000%
29	5.63	-51.70	-3.28	-5.63	51.70	3.28	0.000%
30	6.50	-51.70	0.00	-6.50	51.70	0.00	0.000%
31	5.63	-51.70	3.28	-5.63	51.70	-3.28	0.000%
32	3.25	-51.70	5.67	-3.25	51.70	-5.67	0.000%
33	0.00	-51.70	6.55	0.00	51.70	-6.55	0.000%
34	-3.25	-51.70	5.67	3.25	51.70	-5.67	0.000%
35	-5.63	-51.70	3.28	5.63	51.70	-3.28	0.000%
36	-6.50	-51.70	0.00	6.50	51.70	0.00	0.000%
37	-5.63	-51.70	-3.28	5.63	51.70	3.28	0.000%
38	-3.25	-51.70	-5.67	3.25	51.70	5.67	0.000%
39	0.00	-30.99	-5.41	0.00	30.99	5.41	0.000%
40	2.67	-30.99	-4.68	-2.67	30.99	4.68	0.000%
41	4.63	-30.99	-2.70	-4.63	30.99	2.70	0.000%
42	5.34	-30.99	0.00	-5.34	30.99	0.00	0.000%
43	4.63	-30.99	2.70	-4.63	30.99	-2.70	0.000%
44	2.67	-30.99	4.68	-2.67	30.99	-4.68	0.000%
45	0.00	-30.99	5.41	0.00	30.99	-5.41	0.000%
46	-2.67	-30.99	4.68	2.67	30.99	-4.68	0.000%
47	-4.63	-30.99	2.70	4.63	30.99	-2.70	0.000%
48	-5.34	-30.99	0.00	5.34	30.99	0.00	0.000%
49	-4.63	-30.99	-2.70	4.63	30.99	2.70	0.000%
50	-2.67	-30.99	-4.68	2.67	30.99	4.68	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000617
2	Yes	5	0.00000001	0.00027782
3	Yes	5	0.00000001	0.00010100
4	Yes	7	0.00000001	0.00007496
5	Yes	6	0.00000001	0.00034840
6	Yes	7	0.00000001	0.00007923
7	Yes	6	0.00000001	0.00036898
8	Yes	6	0.00000001	0.00008811
9	Yes	5	0.00000001	0.00055479
10	Yes	7	0.00000001	0.00007305
11	Yes	6	0.00000001	0.00034035
12	Yes	7	0.00000001	0.00007791
13	Yes	6	0.00000001	0.00036299
14	Yes	5	0.00000001	0.00027679
15	Yes	5	0.00000001	0.00010074
16	Yes	7	0.00000001	0.00007765
17	Yes	6	0.00000001	0.00036176
18	Yes	7	0.00000001	0.00007317
19	Yes	6	0.00000001	0.00034092
20	Yes	6	0.00000001	0.00008811
21	Yes	5	0.00000001	0.00055479
22	Yes	7	0.00000001	0.00007938
23	Yes	6	0.00000001	0.00036970
24	Yes	7	0.00000001	0.00007474
25	Yes	6	0.00000001	0.00034731
26	Yes	4	0.00000001	0.00004564
27	Yes	5	0.00000001	0.00040679
28	Yes	6	0.00000001	0.00021057
29	Yes	6	0.00000001	0.00023277
30	Yes	5	0.00000001	0.00053442
31	Yes	6	0.00000001	0.00019403
32	Yes	6	0.00000001	0.00021777
33	Yes	5	0.00000001	0.00039584
34	Yes	6	0.00000001	0.00021638
35	Yes	6	0.00000001	0.00019471
36	Yes	5	0.00000001	0.00053459
37	Yes	6	0.00000001	0.00023395
38	Yes	6	0.00000001	0.00020958
39	Yes	4	0.00000001	0.00087814
40	Yes	5	0.00000001	0.00025810
41	Yes	5	0.00000001	0.00029547
42	Yes	5	0.00000001	0.00008775
43	Yes	5	0.00000001	0.00024214
44	Yes	5	0.00000001	0.00028001
45	Yes	4	0.00000001	0.00086475
46	Yes	5	0.00000001	0.00027724
47	Yes	5	0.00000001	0.00024282
48	Yes	5	0.00000001	0.00008774
49	Yes	5	0.00000001	0.00029718
50	Yes	5	0.00000001	0.00025628

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	133 - 128	24.75	39	1.61	0.01
L2	128 - 123	23.06	39	1.61	0.01
L3	123 - 118	21.38	39	1.59	0.01
L4	118 - 113	19.72	39	1.58	0.01
L5	113 - 108	18.08	39	1.55	0.00
L6	108 - 103	16.47	39	1.52	0.00
L7	103 - 98	14.91	39	1.47	0.00
L8	98 - 93	13.40	39	1.40	0.00
L9	93 - 88	11.97	39	1.33	0.00

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L10	88 - 82.25	10.62	39	1.24	0.00
L11	85.75 - 80.75	10.04	39	1.20	0.00
L12	80.75 - 75.75	8.81	39	1.15	0.00
L13	75.75 - 70.75	7.65	39	1.06	0.00
L14	70.75 - 65.75	6.59	39	0.97	0.00
L15	65.75 - 60.75	5.63	39	0.87	0.00
L16	60.75 - 57.75	4.78	39	0.76	0.00
L17	57.75 - 57.5	4.32	39	0.70	0.00
L18	57.5 - 52.5	4.28	39	0.70	0.00
L19	52.5 - 47.5	3.58	39	0.64	0.00
L20	47.5 - 40.75	2.95	39	0.57	0.00
L21	45 - 40	2.66	39	0.54	0.00
L22	40 - 35	2.10	39	0.51	0.00
L23	35 - 30	1.61	39	0.44	0.00
L24	30 - 29.75	1.18	39	0.38	0.00
L25	29.75 - 29.5	1.16	39	0.37	0.00
L26	29.5 - 24.5	1.14	39	0.37	0.00
L27	24.5 - 19.5	0.79	39	0.31	0.00
L28	19.5 - 14.5	0.50	39	0.24	0.00
L29	14.5 - 9.5	0.28	39	0.18	0.00
L30	9.5 - 4.5	0.12	39	0.12	0.00
L31	4.5 - 0	0.03	39	0.06	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
135.5000	5/8" X 5' Lightning Rod	39	24.75	1.61	0.01	30616
132.0000	TPA65R-BU8D_CCIV2 w/ Mount Pipe	39	24.41	1.61	0.01	30616
120.0000	AIR6449 B41_T-MOBILE w/ Mount Pipe	39	20.38	1.59	0.01	16281
111.0000	MX08FRO665-21 w/ Mount Pipe	39	17.43	1.54	0.00	7918
101.0000	APX16DWV-16DWVS-C w/ Mount Pipe	39	14.30	1.44	0.00	4692
93.0000	BXA-70063-4CF-EDIN-X w/ Mount Pipe	39	11.97	1.33	0.00	3597
75.0000	APXV18-206517S-C	39	7.49	1.04	0.00	3123
50.0000	KS24019-L112A	39	3.26	0.61	0.00	4541

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	133 - 128	101.91	2	6.63	0.02
L2	128 - 123	94.98	2	6.62	0.02
L3	123 - 118	88.09	2	6.56	0.02
L4	118 - 113	81.27	2	6.50	0.02
L5	113 - 108	74.53	2	6.40	0.02
L6	108 - 103	67.91	2	6.25	0.02
L7	103 - 98	61.48	2	6.05	0.02
L8	98 - 93	55.29	2	5.79	0.01
L9	93 - 88	49.39	2	5.49	0.01
L10	88 - 82.25	43.82	2	5.14	0.01
L11	85.75 - 80.75	41.45	2	4.96	0.01
L12	80.75 - 75.75	36.36	2	4.73	0.01
L13	75.75 - 70.75	31.59	2	4.37	0.01
L14	70.75 - 65.75	27.22	2	3.99	0.01
L15	65.75 - 60.75	23.26	2	3.58	0.01

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L16	60.75 - 57.75	19.73	2	3.16	0.00
L17	57.75 - 57.5	17.83	2	2.89	0.00
L18	57.5 - 52.5	17.68	2	2.88	0.00
L19	52.5 - 47.5	14.79	2	2.63	0.00
L20	47.5 - 40.75	12.17	2	2.37	0.00
L21	45 - 40	10.97	2	2.24	0.00
L22	40 - 35	8.69	2	2.09	0.00
L23	35 - 30	6.64	2	1.82	0.00
L24	30 - 29.75	4.88	2	1.55	0.00
L25	29.75 - 29.5	4.79	2	1.53	0.00
L26	29.5 - 24.5	4.72	2	1.51	0.00
L27	24.5 - 19.5	3.26	2	1.26	0.00
L28	19.5 - 14.5	2.07	2	1.01	0.00
L29	14.5 - 9.5	1.15	2	0.75	0.00
L30	9.5 - 4.5	0.49	2	0.49	0.00
L31	4.5 - 0	0.11	2	0.24	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
135.5000	5/8" X 5' Lightning Rod	2	101.91	6.63	0.02	7703
132.0000	TPA65R-BU8D_CCIV2 w/ Mount Pipe	2	100.52	6.63	0.02	7703
120.0000	AIR6449 B41_T-MOBILE w/ Mount Pipe	2	83.99	6.52	0.02	4219
111.0000	MX08FRO665-21 w/ Mount Pipe	2	71.86	6.34	0.02	2026
101.0000	APX16DWV-16DWVS-C w/ Mount Pipe	2	58.97	5.95	0.02	1175
93.0000	BXA-70063-4CF-EDIN-X w/ Mount Pipe	2	49.39	5.49	0.01	893
75.0000	APXV18-206517S-C	2	30.91	4.31	0.01	766
50.0000	KS24019-L112A	2	13.45	2.51	0.00	1103

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 $\frac{P_u}{\phi P_n}$
L1	133 - 132	TP14x14x0.375	5.0000	0.0000	0.0	16.0516	-0.07	505.63	0.000
	132 - 131					16.0516	-1.34	505.63	0.003
	131 - 130					16.0516	-1.40	505.63	0.003
	130 - 129					16.0516	-1.47	505.63	0.003
	129 - 128					16.0516	-1.54	505.63	0.003
L2	128 - 127	TP14x14x0.375	5.0000	0.0000	0.0	16.0516	-1.61	505.63	0.003
	127 - 126					16.0516	-1.68	505.63	0.003
	126 - 125					16.0516	-1.75	505.63	0.003

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	125 - 124					16.0516	-1.82	505.63	0.004
	124 - 123					16.0516	-1.89	505.63	0.004
L3	123 - 122	TP22.7502x22x0.1875	5.0000	0.0000	0.0	13.0705	-1.94	705.80	0.003
	122 - 121					13.1597	-2.00	710.63	0.003
	121 - 120					13.2490	-2.06	715.45	0.003
	120 - 119					13.3383	-5.86	720.27	0.008
	119 - 118					13.4276	-5.92	725.09	0.008
L4	118 - 117	TP23.5004x22.7502x0.1875	5.0000	0.0000	0.0	13.5169	-5.99	729.91	0.008
	117 - 116					13.6062	-6.06	734.74	0.008
	116 - 115					13.6955	-6.12	739.56	0.008
	115 - 114					13.7848	-6.19	744.38	0.008
	114 - 113					13.8741	-6.26	749.20	0.008
L5	113 - 112	TP24.2506x23.5004x0.1875	5.0000	0.0000	0.0	13.9634	-6.33	754.02	0.008
	112 - 111					14.0527	-6.40	758.84	0.008
	111 - 110					14.1419	-9.35	763.66	0.012
	110 - 109					14.2312	-9.43	768.49	0.012
	109 - 108					14.3205	-9.50	773.31	0.012
L6	108 - 107	TP25.0007x24.2506x0.1875	5.0000	0.0000	0.0	14.4098	-9.58	778.13	0.012
	107 - 106					14.4991	-9.66	782.95	0.012
	106 - 105					14.5884	-9.74	787.77	0.012
	105 - 104					14.6777	-9.82	792.60	0.012
	104 - 103					14.7670	-9.90	797.42	0.012
L7	103 - 102	TP25.7509x25.0007x0.1875	5.0000	0.0000	0.0	14.8563	-9.98	802.24	0.012
	102 - 101					14.9456	-10.07	807.06	0.012
	101 - 100					15.0348	-11.34	811.88	0.014
	100 - 99					15.1241	-11.43	816.70	0.014
	99 - 98					15.2134	-11.52	821.52	0.014
L8	98 - 97	TP26.5011x25.7509x0.1875	5.0000	0.0000	0.0	15.3027	-11.61	826.35	0.014
	97 - 96					15.3920	-11.71	831.17	0.014
	96 - 95					15.4813	-11.80	835.99	0.014
	95 - 94					15.5706	-11.90	840.81	0.014
	94 - 93					15.6599	-12.00	845.63	0.014
L9	93 - 92	TP27.2513x26.5011x0.1875	5.0000	0.0000	0.0	15.7492	-15.23	850.46	0.018
	92 - 91					15.8385	-15.34	855.28	0.018
	91 - 90					15.927	-15.46	860.10	0.018

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
	90 - 89					8 16.017 0	-15.58	864.92	0.018
	89 - 88					16.106 3	-15.70	869.74	0.018
L10	88 - 86.875	TP28.114x27.2513x0.187 5	5.7500	0.0000	0.0	16.206 8	-15.83	875.17	0.018
	86.875 - 85.75					16.307 2	-15.97	880.59	0.018
	85.75 - 82.25					16.619 8	-7.24	897.47	0.008
L11	85.75 - 82.25	TP27.9641x27.2139x0.25	5.0000	0.0000	0.0	21.812 6	-9.42	1276.03	0.007
	82.25 - 80.75					21.991 1	-16.88	1286.48	0.013
L12	80.75 - 79.75	TP28.7143x27.9641x0.25	5.0000	0.0000	0.0	22.110 2	-17.02	1293.45	0.013
	79.75 - 78.75					22.229 3	-17.17	1300.41	0.013
	78.75 - 77.75					22.348 3	-17.31	1307.38	0.013
	77.75 - 76.75					22.467 4	-17.46	1314.34	0.013
	76.75 - 75.75					22.586 5	-17.61	1321.31	0.013
L13	75.75 - 74.75	TP29.4646x28.7143x0.25	5.0000	0.0000	0.0	22.705 5	-18.06	1328.27	0.014
	74.75 - 73.75					22.824 6	-18.21	1335.24	0.014
	73.75 - 72.75					22.943 6	-18.37	1342.20	0.014
	72.75 - 71.75					23.062 7	-18.52	1349.17	0.014
	71.75 - 70.75					23.181 8	-18.68	1356.13	0.014
L14	70.75 - 69.75	TP30.2148x29.4646x0.25	5.0000	0.0000	0.0	23.300 8	-18.84	1363.10	0.014
	69.75 - 68.75					23.419 9	-19.00	1370.06	0.014
	68.75 - 67.75					23.539 0	-19.16	1377.03	0.014
	67.75 - 66.75					23.658 0	-19.32	1383.99	0.014
	66.75 - 65.75					23.777 1	-19.49	1390.96	0.014
L15	65.75 - 64.75	TP30.9651x30.2148x0.25	5.0000	0.0000	0.0	23.896 1	-19.65	1397.92	0.014
	64.75 - 63.75					24.015 2	-19.81	1404.89	0.014
	63.75 - 62.75					24.134 3	-19.98	1411.85	0.014
	62.75 - 61.75					24.253 3	-20.15	1418.82	0.014
	61.75 - 60.75					24.372 4	-20.31	1425.79	0.014
L16	60.75 - 59.75	TP31.4152x30.9651x0.25	3.0000	0.0000	0.0	24.491 5	-20.48	1432.75	0.014
	59.75 - 58.75					24.610 5	-20.65	1439.72	0.014
	58.75 - 57.75					24.729 6	-20.82	1446.68	0.014
L17	57.75 - 57.5 (17)	TP31.4527x31.4152x0.46 25	0.2500	0.0000	0.0	45.492 9	-20.89	2661.33	0.008
L18	57.5 - 56.5	TP32.2029x31.4527x0.45 63	5.0000	0.0000	0.0	45.104 4	-21.12	2638.61	0.008
	56.5 - 55.5					45.321 7	-21.35	2651.32	0.008
	55.5 - 54.5					45.539 0	-21.58	2664.03	0.008

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	54.5 - 53.5					45.7563	-21.81	2676.74	0.008
	53.5 - 52.5					45.9736	-22.05	2689.45	0.008
L19	52.5 - 51.5	TP32.9532x32.2029x0.45	5.0000	0.0000	0.0	45.5670	-22.28	2665.67	0.008
	51.5 - 50.5					45.7814	-22.52	2678.21	0.008
	50.5 - 49.5					45.9957	-22.79	2690.75	0.008
	49.5 - 48.5					46.2100	-23.03	2703.28	0.009
	48.5 - 47.5					46.4243	-23.27	2715.82	0.009
L20	47.5 - 46.25	TP33.966x32.9532x0.45	6.7500	0.0000	0.0	46.6922	-23.57	2731.49	0.009
	46.25 - 45					46.9601	-23.87	2747.16	0.009
	45 - 40.75					47.8709	-12.56	2800.45	0.004
L21	45 - 40.75	TP33.5785x32.8283x0.4813	5.0000	0.0000	0.0	50.3837	-13.12	2947.45	0.004
	40.75 - 40					50.5556	-25.88	2957.50	0.009
L22	40 - 39	TP34.3287x33.5785x0.4688	5.0000	0.0000	0.0	49.4843	-26.13	2894.83	0.009
	39 - 38					49.7075	-26.39	2907.89	0.009
	38 - 37					49.9308	-26.65	2920.95	0.009
	37 - 36					50.1540	-26.91	2934.01	0.009
	36 - 35					50.3772	-27.17	2947.07	0.009
L23	35 - 34	TP35.0789x34.3287x0.4688	5.0000	0.0000	0.0	50.6005	-27.43	2960.13	0.009
	34 - 33					50.8237	-27.69	2973.19	0.009
	33 - 32					51.0469	-27.95	2986.24	0.009
	32 - 31					51.2701	-28.21	2999.30	0.009
	31 - 30					51.4934	-28.47	3012.36	0.009
L24	30 - 29.75 (24)	TP35.1164x35.0789x0.2813	0.2500	0.0000	0.0	31.0969	-28.53	1819.17	0.016
L25	29.75 - 29.5 (25)	TP35.1539x35.1164x0.5188	0.2500	0.0000	0.0	57.0272	-28.60	3336.09	0.009
L26	29.5 - 28.5	TP35.9041x35.1539x0.5125	5.0000	0.0000	0.0	56.5943	-28.87	3310.77	0.009
	28.5 - 27.5					56.8384	-29.15	3325.05	0.009
	27.5 - 26.5					57.0825	-29.44	3339.32	0.009
	26.5 - 25.5					57.3265	-29.72	3353.60	0.009
	25.5 - 24.5					57.5706	-30.00	3367.88	0.009
L27	24.5 - 23.5	TP36.6543x35.9041x0.5063	5.0000	0.0000	0.0	57.1196	-30.29	3341.50	0.009
	23.5 - 22.5					57.3607	-30.57	3355.60	0.009
	22.5 - 21.5					57.6018	-30.86	3369.71	0.009
	21.5 - 20.5					57.8429	-31.15	3383.81	0.009
	20.5 - 19.5					58.0840	-31.43	3397.91	0.009
L28	19.5 - 18.5	TP37.4045x36.6543x0.50	5.0000	0.0000	0.0	58.325	-31.72	3412.02	0.009

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
		63				1			
	18.5 - 17.5					58.566	-32.01	3426.12	0.009
						2			
	17.5 - 16.5					58.807	-32.30	3440.22	0.009
						2			
	16.5 - 15.5					59.048	-32.59	3454.33	0.009
						3			
	15.5 - 14.5					59.289	-32.88	3468.43	0.009
						4			
L29	14.5 - 13.5	TP38.1546x37.4045x0.49	5.0000	0.0000	0.0	58.080	-33.17	3397.69	0.010
		38				2			
	13.5 - 12.5					58.315	-33.46	3411.45	0.010
						3			
	12.5 - 11.5					58.550	-33.76	3425.20	0.010
						5			
	11.5 - 10.5					58.785	-34.05	3438.96	0.010
						6			
	10.5 - 9.5					59.020	-34.34	3452.71	0.010
						7			
L30	9.5 - 8.5	TP38.9048x38.1546x0.49	5.0000	0.0000	0.0	59.255	-34.64	3466.47	0.010
		38				9			
	8.5 - 7.5					59.491	-34.93	3480.22	0.010
						0			
	7.5 - 6.5					59.726	-35.23	3493.98	0.010
						1			
	6.5 - 5.5					59.961	-35.53	3507.73	0.010
						3			
	5.5 - 4.5					60.196	-35.82	3521.49	0.010
						4			
L31	4.5 - 3.375	TP39.58x38.9048x0.4875	4.5000	0.0000	0.0	59.705	-36.16	3492.76	0.010
						3			
	3.375 - 2.25					59.966	-36.49	3508.04	0.010
						4			
	2.25 - 1.125					60.227	-36.83	3523.32	0.010
						6			
	1.125 - 0					60.488	-37.17	3538.60	0.011
						8			

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	133 - 132	TP14x14x0.375	0.07	182.79	0.000	0.00	182.79	0.000
	132 - 131		2.50	182.79	0.014	0.00	182.79	0.000
	131 - 130		4.93	182.79	0.027	0.00	182.79	0.000
	130 - 129		7.39	182.79	0.040	0.00	182.79	0.000
	129 - 128		9.90	182.79	0.054	0.00	182.79	0.000
L2	128 - 127	TP14x14x0.375	12.44	182.79	0.068	0.00	182.79	0.000
	127 - 126		15.03	182.79	0.082	0.00	182.79	0.000
	126 - 125		17.65	182.79	0.097	0.00	182.79	0.000
	125 - 124		20.32	182.79	0.111	0.00	182.79	0.000
	124 - 123		23.03	182.79	0.126	0.00	182.79	0.000
L3	123 - 122	TP22.7502x22x0.1875	25.79	386.66	0.067	0.00	386.66	0.000
	122 - 121		28.62	391.19	0.073	0.00	391.19	0.000
	121 - 120		31.53	395.74	0.080	0.00	395.74	0.000
	120 - 119		41.74	400.30	0.104	0.00	400.30	0.000
	119 - 118		48.45	404.88	0.120	0.00	404.88	0.000
L4	118 - 117	TP23.5004x22.7502x0.18	55.23	409.47	0.135	0.00	409.47	0.000
		75						
	117 - 116		62.09	414.08	0.150	0.00	414.08	0.000
	116 - 115		69.01	418.69	0.165	0.00	418.69	0.000
	115 - 114		76.01	423.32	0.180	0.00	423.32	0.000
	114 - 113		83.07	427.97	0.194	0.00	427.97	0.000
L5	113 - 112	TP24.2506x23.5004x0.18	90.21	432.63	0.209	0.00	432.63	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 $\frac{M_{uy}}{\phi M_{ny}}$
		75						
	112 - 111		97.42	437.30	0.223	0.00	437.30	0.000
	111 - 110		108.19	441.98	0.245	0.00	441.98	0.000
	110 - 109		118.91	446.68	0.266	0.00	446.68	0.000
	109 - 108		129.71	451.39	0.287	0.00	451.39	0.000
L6	108 - 107	TP25.0007x24.2506x0.18 75	140.57	456.11	0.308	0.00	456.11	0.000
	107 - 106		151.50	460.84	0.329	0.00	460.84	0.000
	106 - 105		162.50	465.58	0.349	0.00	465.58	0.000
	105 - 104		173.57	470.33	0.369	0.00	470.33	0.000
	104 - 103		184.71	475.10	0.389	0.00	475.10	0.000
L7	103 - 102	TP25.7509x25.0007x0.18 75	195.91	479.88	0.408	0.00	479.88	0.000
	102 - 101		207.19	484.66	0.427	0.00	484.66	0.000
	101 - 100		220.01	489.46	0.449	0.00	489.46	0.000
	100 - 99		232.89	494.26	0.471	0.00	494.26	0.000
	99 - 98		245.83	499.08	0.493	0.00	499.08	0.000
L8	98 - 97	TP26.5011x25.7509x0.18 75	258.85	503.91	0.514	0.00	503.91	0.000
	97 - 96		271.93	508.75	0.535	0.00	508.75	0.000
	96 - 95		285.08	513.59	0.555	0.00	513.59	0.000
	95 - 94		298.30	518.45	0.575	0.00	518.45	0.000
	94 - 93		311.58	523.31	0.595	0.00	523.31	0.000
L9	93 - 92	TP27.2513x26.5011x0.18 75	330.28	528.18	0.625	0.00	528.18	0.000
	92 - 91		346.80	533.06	0.651	0.00	533.06	0.000
	91 - 90		363.38	537.95	0.675	0.00	537.95	0.000
	90 - 89		380.02	542.85	0.700	0.00	542.85	0.000
	89 - 88		396.73	547.75	0.724	0.00	547.75	0.000
L10	88 - 86.875	TP28.114x27.2513x0.187 5	415.59	553.28	0.751	0.00	553.28	0.000
	86.875 - 85.75		434.53	558.81	0.778	0.00	558.81	0.000
	85.75 - 82.25		217.59	576.09	0.378	0.00	576.09	0.000
L11	85.75 - 82.25	TP27.9641x27.2139x0.25	276.48	880.76	0.314	0.00	880.76	0.000
	82.25 - 80.75		519.86	893.20	0.582	0.00	893.20	0.000
L12	80.75 - 79.75	TP28.7143x27.9641x0.25	537.13	901.53	0.596	0.00	901.53	0.000
	79.75 - 78.75		554.47	909.88	0.609	0.00	909.88	0.000
	78.75 - 77.75		571.87	918.25	0.623	0.00	918.25	0.000
	77.75 - 76.75		589.33	926.64	0.636	0.00	926.64	0.000
	76.75 - 75.75		606.85	935.05	0.649	0.00	935.05	0.000
L13	75.75 - 74.75	TP29.4646x28.7143x0.25	624.54	943.49	0.662	0.00	943.49	0.000
	74.75 - 73.75		642.62	951.94	0.675	0.00	951.94	0.000
	73.75 - 72.75		660.76	960.42	0.688	0.00	960.42	0.000
	72.75 - 71.75		678.96	968.92	0.701	0.00	968.92	0.000
	71.75 - 70.75		697.22	977.43	0.713	0.00	977.43	0.000
L14	70.75 - 69.75	TP30.2148x29.4646x0.25	715.54	985.97	0.726	0.00	985.97	0.000
	69.75 - 68.75		733.91	994.52	0.738	0.00	994.52	0.000
	68.75 - 67.75		752.34	1003.10	0.750	0.00	1003.10	0.000
	67.75 - 66.75		770.83	1011.70	0.762	0.00	1011.70	0.000
	66.75 - 65.75		789.38	1020.31	0.774	0.00	1020.31	0.000
L15	65.75 - 64.75	TP30.9651x30.2148x0.25	807.98	1028.94	0.785	0.00	1028.94	0.000
	64.75 - 63.75		826.64	1037.59	0.797	0.00	1037.59	0.000
	63.75 - 62.75		845.35	1046.27	0.808	0.00	1046.27	0.000
	62.75 - 61.75		864.11	1054.95	0.819	0.00	1054.95	0.000
	61.75 - 60.75		882.93	1063.66	0.830	0.00	1063.66	0.000
L16	60.75 - 59.75	TP31.4152x30.9651x0.25	901.80	1072.38	0.841	0.00	1072.38	0.000
	59.75 - 58.75		920.73	1081.12	0.852	0.00	1081.12	0.000
	58.75 - 57.75		939.71	1089.88	0.862	0.00	1089.88	0.000
L17	57.75 - 57.5 (17)	TP31.4527x31.4152x0.46 25	944.46	2138.88	0.442	0.00	2138.88	0.000
L18	57.5 - 56.5	TP32.2029x31.4527x0.45 63	963.52	2131.89	0.452	0.00	2131.89	0.000
	56.5 - 55.5		982.64	2152.63	0.456	0.00	2152.63	0.000
	55.5 - 54.5		1001.83	2173.47	0.461	0.00	2173.47	0.000
	54.5 - 53.5		1021.09	2194.41	0.465	0.00	2194.41	0.000
	53.5 - 52.5		1040.42	2215.45	0.470	0.00	2215.45	0.000
L19	52.5 - 51.5	TP32.9532x32.2029x0.45	1059.82	2207.25	0.480	0.00	2207.25	0.000
	51.5 - 50.5		1079.28	2228.21	0.484	0.00	2228.21	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 $\frac{M_{uy}}{\phi M_{ny}}$
	50.5 - 49.5		1098.91	2249.26	0.489	0.00	2249.26	0.000
	49.5 - 48.5		1118.53	2270.42	0.493	0.00	2270.42	0.000
	48.5 - 47.5		1138.22	2291.67	0.497	0.00	2291.67	0.000
L20	47.5 - 46.25	TP33.966x32.9532x0.45	1162.93	2318.38	0.502	0.00	2318.38	0.000
	46.25 - 45		1187.72	2345.23	0.506	0.00	2345.23	0.000
	45 - 40.75		630.57	2437.72	0.259	0.00	2437.72	0.000
L21	45 - 40.75	TP33.5785x32.8283x0.4813	642.39	2522.12	0.255	0.00	2522.12	0.000
	40.75 - 40		1288.14	2539.47	0.507	0.00	2539.47	0.000
L22	40 - 39	TP34.3287x33.5785x0.4688	1308.45	2498.97	0.524	0.00	2498.97	0.000
	39 - 38		1328.81	2521.72	0.527	0.00	2521.72	0.000
	38 - 37		1349.23	2544.58	0.530	0.00	2544.58	0.000
	37 - 36		1369.71	2567.54	0.533	0.00	2567.54	0.000
	36 - 35		1390.25	2590.61	0.537	0.00	2590.61	0.000
L23	35 - 34	TP35.0789x34.3287x0.4688	1410.84	2613.78	0.540	0.00	2613.78	0.000
	34 - 33		1431.49	2637.04	0.543	0.00	2637.04	0.000
	33 - 32		1452.19	2660.42	0.546	0.00	2660.42	0.000
	32 - 31		1472.96	2683.89	0.549	0.00	2683.89	0.000
	31 - 30		1493.78	2707.47	0.552	0.00	2707.47	0.000
L24	30 - 29.75 (24)	TP35.1164x35.0789x0.2813	1498.98	1535.13	0.976	0.00	1535.13	0.000
L25	29.75 - 29.5 (25)	TP35.1539x35.1164x0.5188	1504.20	2996.37	0.502	0.00	2996.37	0.000
L26	29.5 - 28.5	TP35.9041x35.1539x0.5125	1525.09	2987.77	0.510	0.00	2987.77	0.000
	28.5 - 27.5		1546.04	3013.78	0.513	0.00	3013.78	0.000
	27.5 - 26.5		1567.04	3039.90	0.515	0.00	3039.90	0.000
	26.5 - 25.5		1588.10	3066.14	0.518	0.00	3066.14	0.000
	25.5 - 24.5		1609.21	3092.49	0.520	0.00	3092.49	0.000
L27	24.5 - 23.5	TP36.6543x35.9041x0.5063	1630.37	3082.55	0.529	0.00	3082.55	0.000
	23.5 - 22.5		1651.58	3108.81	0.531	0.00	3108.81	0.000
	22.5 - 21.5		1672.85	3135.18	0.534	0.00	3135.18	0.000
	21.5 - 20.5		1694.16	3161.66	0.536	0.00	3161.66	0.000
	20.5 - 19.5		1715.53	3188.25	0.538	0.00	3188.25	0.000
L28	19.5 - 18.5	TP37.4045x36.6543x0.5063	1736.93	3214.96	0.540	0.00	3214.96	0.000
	18.5 - 17.5		1758.38	3241.78	0.542	0.00	3241.78	0.000
	17.5 - 16.5		1779.88	3268.70	0.545	0.00	3268.70	0.000
	16.5 - 15.5		1801.43	3295.74	0.547	0.00	3295.74	0.000
	15.5 - 14.5		1823.03	3322.89	0.549	0.00	3322.89	0.000
L29	14.5 - 13.5	TP38.1546x37.4045x0.4938	1844.66	3270.74	0.564	0.00	3270.74	0.000
	13.5 - 12.5		1866.33	3297.46	0.566	0.00	3297.46	0.000
	12.5 - 11.5		1888.05	3324.28	0.568	0.00	3324.28	0.000
	11.5 - 10.5		1909.81	3351.20	0.570	0.00	3351.20	0.000
	10.5 - 9.5		1931.61	3378.24	0.572	0.00	3378.24	0.000
L30	9.5 - 8.5	TP38.9048x38.1546x0.4938	1953.45	3405.38	0.574	0.00	3405.38	0.000
	8.5 - 7.5		1975.33	3432.64	0.575	0.00	3432.64	0.000
	7.5 - 6.5		1997.26	3460.00	0.577	0.00	3460.00	0.000
	6.5 - 5.5		2019.22	3487.47	0.579	0.00	3487.47	0.000
	5.5 - 4.5		2041.22	3515.06	0.581	0.00	3515.06	0.000
L31	4.5 - 3.375	TP39.58x38.9048x0.4875	2066.03	3503.03	0.590	0.00	3503.03	0.000
	3.375 - 2.25		2090.88	3533.93	0.592	0.00	3533.93	0.000
	2.25 - 1.125		2115.78	3564.97	0.593	0.00	3564.97	0.000
	1.125 - 0		2140.72	3596.15	0.595	0.00	3596.15	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 $\frac{T_u}{\phi T_n}$

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	133 - 132	TP14x14x0.375	0.06	151.69	0.000	0.00	181.70	0.000
	132 - 131		2.40	151.69	0.016	0.04	181.70	0.000
	131 - 130		2.44	151.69	0.016	0.04	181.70	0.000
	130 - 129		2.48	151.69	0.016	0.04	181.70	0.000
	129 - 128		2.53	151.69	0.017	0.00	181.70	0.000
L2	128 - 127	TP14x14x0.375	2.57	151.69	0.017	0.00	181.70	0.000
	127 - 126		2.61	151.69	0.017	0.00	181.70	0.000
	126 - 125		2.65	151.69	0.017	0.00	181.70	0.000
	125 - 124		2.69	151.69	0.018	0.04	181.70	0.000
	124 - 123		2.73	151.69	0.018	0.04	181.70	0.000
L3	123 - 122	TP22.7502x22x0.1875	2.80	211.74	0.013	0.04	407.26	0.000
	122 - 121		2.87	213.19	0.013	0.04	412.84	0.000
	121 - 120		2.94	214.63	0.014	0.04	418.46	0.000
	120 - 119		6.68	216.08	0.031	0.07	424.12	0.000
	119 - 118		6.75	217.53	0.031	0.07	429.82	0.000
L4	118 - 117	TP23.5004x22.7502x0.1875	6.82	218.97	0.031	0.07	435.55	0.000
	117 - 116		6.89	220.42	0.031	0.07	441.33	0.000
	116 - 115		6.96	221.87	0.031	0.07	447.14	0.000
	115 - 114		7.03	223.31	0.031	0.07	452.99	0.000
	114 - 113		7.10	224.76	0.032	0.07	458.88	0.000
L5	113 - 112	TP24.2506x23.5004x0.1875	7.17	226.21	0.032	0.07	464.80	0.000
	112 - 111		7.25	227.65	0.032	0.07	470.76	0.000
	111 - 110		10.69	229.10	0.047	0.07	476.77	0.000
	110 - 109		10.76	230.55	0.047	0.07	482.81	0.000
	109 - 108		10.83	231.99	0.047	0.07	488.88	0.000
L6	108 - 107	TP25.0007x24.2506x0.1875	10.90	233.44	0.047	0.07	495.00	0.000
	107 - 106		10.97	234.89	0.047	0.07	501.15	0.000
	106 - 105		11.04	236.33	0.047	0.07	507.34	0.000
	105 - 104		11.11	237.78	0.047	0.07	513.57	0.000
	104 - 103		11.18	239.22	0.047	0.07	519.84	0.000
L7	103 - 102	TP25.7509x25.0007x0.1875	11.25	240.67	0.047	0.07	526.15	0.000
	102 - 101		11.32	242.12	0.047	0.07	532.49	0.000
	101 - 100		12.85	243.57	0.053	0.07	538.87	0.000
	100 - 99		12.92	245.01	0.053	0.07	545.29	0.000
	99 - 98		12.99	246.46	0.053	0.07	551.75	0.000
L8	98 - 97	TP26.5011x25.7509x0.1875	13.06	247.90	0.053	0.07	558.24	0.000
	97 - 96		13.12	249.35	0.053	0.07	564.78	0.000
	96 - 95		13.19	250.80	0.053	0.07	571.35	0.000
	95 - 94		13.26	252.24	0.053	0.07	577.96	0.000
	94 - 93		13.32	253.69	0.053	0.07	584.61	0.000
L9	93 - 92	TP27.2513x26.5011x0.1875	16.50	255.14	0.065	0.07	591.29	0.000
	92 - 91		16.56	256.58	0.065	0.07	598.02	0.000
	91 - 90		16.62	258.03	0.064	0.07	604.78	0.000
	90 - 89		16.68	259.48	0.064	0.07	611.58	0.000
	89 - 88		16.75	260.92	0.064	0.07	618.42	0.000
L10	88 - 86.875	TP28.114x27.2513x0.1875	16.82	262.55	0.064	0.07	626.15	0.000
	86.875 - 85.75		16.88	264.18	0.064	0.07	633.94	0.000
	85.75 - 82.25		7.63	269.24	0.028	0.03	658.47	0.000
L11	85.75 - 82.25	TP27.9641x27.2139x0.25	9.53	382.81	0.025	0.04	921.56	0.000
	82.25 - 80.75		17.26	385.94	0.045	0.07	936.71	0.000
L12	80.75 - 79.75	TP28.7143x27.9641x0.25	17.32	388.03	0.045	0.07	946.88	0.000
	79.75 - 78.75		17.38	390.12	0.045	0.07	957.11	0.000
	78.75 - 77.75		17.44	392.21	0.044	0.07	967.38	0.000
	77.75 - 76.75		17.50	394.30	0.044	0.07	977.73	0.000
	76.75 - 75.75		17.56	396.39	0.044	0.07	988.12	0.000
L13	75.75 - 74.75	TP29.4646x28.7143x0.25	18.06	398.48	0.045	0.07	998.56	0.000
	74.75 - 73.75		18.12	400.57	0.045	0.07	1009.06	0.000
	73.75 - 72.75		18.18	402.66	0.045	0.07	1019.61	0.000
	72.75 - 71.75		18.24	404.75	0.045	0.07	1030.22	0.000
	71.75 - 70.75		18.30	406.84	0.045	0.07	1040.88	0.000
L14	70.75 - 69.75	TP30.2148x29.4646x0.25	18.36	408.93	0.045	0.07	1051.61	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 $\frac{T_u}{\phi T_n}$
	69.75 - 68.75		18.42	411.02	0.045	0.07	1062.38	0.000
	68.75 - 67.75		18.47	413.11	0.045	0.07	1073.21	0.000
	67.75 - 66.75		18.53	415.20	0.045	0.07	1084.09	0.000
	66.75 - 65.75		18.59	417.29	0.045	0.07	1095.03	0.000
L15	65.75 - 64.75	TP30.9651x30.2148x0.25	18.64	419.38	0.044	0.07	1106.03	0.000
	64.75 - 63.75		18.70	421.47	0.044	0.07	1117.08	0.000
	63.75 - 62.75		18.75	423.56	0.044	0.07	1128.18	0.000
	62.75 - 61.75		18.81	425.65	0.044	0.07	1139.34	0.000
	61.75 - 60.75		18.86	427.74	0.044	0.07	1150.55	0.000
L16	60.75 - 59.75	TP31.4152x30.9651x0.25	18.91	427.74	0.044	0.07	1161.83	0.000
	59.75 - 58.75		18.97	429.82	0.044	0.07	1173.14	0.000
	58.75 - 57.75		19.02	431.92	0.044	0.07	1184.53	0.000
L17	57.75 - 57.5 (17)	TP31.4527x31.4152x0.4625	19.03	797.43	0.024	0.07	2166.83	0.000
L18	57.5 - 56.5	TP32.2029x31.4527x0.4563	19.10	787.77	0.024	0.07	2159.17	0.000
	56.5 - 55.5		19.17	791.58	0.024	0.07	2180.02	0.000
	55.5 - 54.5		19.23	795.40	0.024	0.07	2200.97	0.000
	54.5 - 53.5		19.30	799.21	0.024	0.07	2222.03	0.000
	53.5 - 52.5		19.37	803.02	0.024	0.07	2243.18	0.000
L19	52.5 - 51.5	TP32.9532x32.2029x0.45	19.44	795.94	0.024	0.07	2234.29	0.000
	51.5 - 50.5		19.50	799.70	0.024	0.07	2255.36	0.000
	50.5 - 49.5		19.60	803.46	0.024	0.07	2276.52	0.000
	49.5 - 48.5		19.67	807.22	0.024	0.06	2297.78	0.000
	48.5 - 47.5		19.73	810.99	0.024	0.06	2319.15	0.000
L20	47.5 - 46.25	TP33.966x32.9532x0.45	19.81	814.75	0.024	0.06	2345.99	0.000
	46.25 - 45		19.89	819.45	0.024	0.06	2372.98	0.000
	45 - 40.75		10.12	824.15	0.012	0.03	2465.93	0.000
L21	45 - 40.75	TP33.5785x32.8283x0.4813	10.14	884.24	0.011	0.03	2554.23	0.000
	40.75 - 40		20.28	884.24	0.023	0.06	2571.69	0.000
L22	40 - 39	TP34.3287x33.5785x0.4688	20.34	864.53	0.024	0.06	2529.55	0.000
	39 - 38		20.40	868.45	0.023	0.06	2552.43	0.000
	38 - 37		20.46	872.37	0.023	0.06	2575.41	0.000
	37 - 36		20.52	876.28	0.023	0.06	2598.48	0.000
	36 - 35		20.58	880.20	0.023	0.06	2621.67	0.000
L23	35 - 34	TP35.0789x34.3287x0.4688	20.63	884.12	0.023	0.06	2644.95	0.000
	34 - 33		20.69	888.04	0.023	0.06	2668.34	0.000
	33 - 32		20.75	891.96	0.023	0.06	2691.83	0.000
	32 - 31		20.80	899.79	0.023	0.06	2715.43	0.000
	31 - 30		20.86	903.71	0.023	0.06	2739.13	0.000
L24	30 - 29.75 (24)	TP35.1164x35.0789x0.2813	20.86	545.16	0.038	0.06	1664.91	0.000
L25	29.75 - 29.5 (25)	TP35.1539x35.1164x0.5188	20.87	999.74	0.021	0.06	3035.68	0.000
L26	29.5 - 28.5	TP35.9041x35.1539x0.5125	20.93	993.23	0.021	0.06	3026.23	0.000
	28.5 - 27.5		20.99	997.51	0.021	0.06	3052.39	0.000
	27.5 - 26.5		21.04	1001.80	0.021	0.06	3078.66	0.000
	26.5 - 25.5		21.10	1006.08	0.021	0.06	3105.04	0.000
	25.5 - 24.5		21.15	1010.36	0.021	0.06	3131.54	0.000
L27	24.5 - 23.5	TP36.6543x35.9041x0.5063	21.20	1002.45	0.021	0.06	3120.72	0.000
	23.5 - 22.5		21.25	1006.68	0.021	0.06	3147.13	0.000
	22.5 - 21.5		21.30	1010.91	0.021	0.06	3173.64	0.000
	21.5 - 20.5		21.35	1015.14	0.021	0.06	3200.26	0.000
	20.5 - 19.5		21.40	1019.37	0.021	0.06	3226.99	0.000
L28	19.5 - 18.5	TP37.4045x36.6543x0.5063	21.45	1023.60	0.021	0.06	3253.83	0.000
	18.5 - 17.5		21.49	1027.84	0.021	0.06	3280.79	0.000
	17.5 - 16.5		21.54	1032.07	0.021	0.06	3307.86	0.000
	16.5 - 15.5		21.58	1036.30	0.021	0.06	3335.03	0.000
	15.5 - 14.5		21.63	1040.53	0.021	0.06	3362.32	0.000
L29	14.5 - 13.5	TP38.1546x37.4045x0.4938	21.67	1019.31	0.021	0.06	3308.26	0.000
	13.5 - 12.5		21.71	1023.43	0.021	0.06	3335.10	0.000
	12.5 - 11.5		21.75	1027.56	0.021	0.06	3362.05	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 $\frac{T_u}{\phi T_n}$
	11.5 - 10.5		21.79	1031.69	0.021	0.06	3389.11	0.000
	10.5 - 9.5		21.84	1035.81	0.021	0.06	3416.28	0.000
L30	9.5 - 8.5	TP38.9048x38.1546x0.4938	21.88	1039.94	0.021	0.06	3443.54	0.000
	8.5 - 7.5		21.92	1044.07	0.021	0.06	3470.93	0.000
	7.5 - 6.5		21.96	1048.19	0.021	0.06	3498.42	0.000
	6.5 - 5.5		22.00	1052.32	0.021	0.06	3526.02	0.000
	5.5 - 4.5		22.04	1056.45	0.021	0.06	3553.72	0.000
L31	4.5 - 3.375	TP39.58x38.9048x0.4875	22.09	1047.83	0.021	0.06	3540.80	0.000
	3.375 - 2.25		22.13	1052.41	0.021	0.06	3571.84	0.000
	2.25 - 1.125		22.17	1056.99	0.021	0.06	3603.03	0.000
	1.125 - 0		22.22	1061.58	0.021	0.06	3634.34	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	133 - 132	0.000	0.000	0.000	0.000	0.000	0.001	1.050	4.8.2
	132 - 131	0.003	0.014	0.000	0.016	0.000	0.017	1.050	4.8.2
	131 - 130	0.003	0.027	0.000	0.016	0.000	0.030	1.050	4.8.2
	130 - 129	0.003	0.040	0.000	0.016	0.000	0.044	1.050	4.8.2
	129 - 128	0.003	0.054	0.000	0.017	0.000	0.057	1.050	4.8.2
L2	128 - 127	0.003	0.068	0.000	0.017	0.000	0.072	1.050	4.8.2
	127 - 126	0.003	0.082	0.000	0.017	0.000	0.086	1.050	4.8.2
	126 - 125	0.003	0.097	0.000	0.017	0.000	0.100	1.050	4.8.2
	125 - 124	0.004	0.111	0.000	0.018	0.000	0.115	1.050	4.8.2
	124 - 123	0.004	0.126	0.000	0.018	0.000	0.130	1.050	4.8.2
L3	123 - 122	0.003	0.067	0.000	0.013	0.000	0.070	1.050	4.8.2
	122 - 121	0.003	0.073	0.000	0.013	0.000	0.076	1.050	4.8.2
	121 - 120	0.003	0.080	0.000	0.014	0.000	0.083	1.050	4.8.2
	120 - 119	0.008	0.104	0.000	0.031	0.000	0.113	1.050	4.8.2
	119 - 118	0.008	0.120	0.000	0.031	0.000	0.129	1.050	4.8.2
L4	118 - 117	0.008	0.135	0.000	0.031	0.000	0.144	1.050	4.8.2
	117 - 116	0.008	0.150	0.000	0.031	0.000	0.159	1.050	4.8.2
	116 - 115	0.008	0.165	0.000	0.031	0.000	0.174	1.050	4.8.2
	115 - 114	0.008	0.180	0.000	0.031	0.000	0.189	1.050	4.8.2
	114 - 113	0.008	0.194	0.000	0.032	0.000	0.203	1.050	4.8.2
L5	113 - 112	0.008	0.209	0.000	0.032	0.000	0.218	1.050	4.8.2
	112 - 111	0.008	0.223	0.000	0.032	0.000	0.232	1.050	4.8.2
	111 - 110	0.012	0.245	0.000	0.047	0.000	0.259	1.050	4.8.2
	110 - 109	0.012	0.266	0.000	0.047	0.000	0.281	1.050	4.8.2
	109 - 108	0.012	0.287	0.000	0.047	0.000	0.302	1.050	4.8.2
L6	108 - 107	0.012	0.308	0.000	0.047	0.000	0.323	1.050	4.8.2
	107 - 106	0.012	0.329	0.000	0.047	0.000	0.343	1.050	4.8.2
	106 - 105	0.012	0.349	0.000	0.047	0.000	0.364	1.050	4.8.2
	105 - 104	0.012	0.369	0.000	0.047	0.000	0.384	1.050	4.8.2
	104 - 103	0.012	0.389	0.000	0.047	0.000	0.403	1.050	4.8.2
L7	103 - 102	0.012	0.408	0.000	0.047	0.000	0.423	1.050	4.8.2
	102 - 101	0.012	0.427	0.000	0.047	0.000	0.442	1.050	4.8.2
	101 - 100	0.014	0.449	0.000	0.053	0.000	0.466	1.050	4.8.2
	100 - 99	0.014	0.471	0.000	0.053	0.000	0.488	1.050	4.8.2
	99 - 98	0.014	0.493	0.000	0.053	0.000	0.509	1.050	4.8.2
L8	98 - 97	0.014	0.514	0.000	0.053	0.000	0.531	1.050	4.8.2
	97 - 96	0.014	0.535	0.000	0.053	0.000	0.551	1.050	4.8.2
	96 - 95	0.014	0.555	0.000	0.053	0.000	0.572	1.050	4.8.2
	95 - 94	0.014	0.575	0.000	0.053	0.000	0.592	1.050	4.8.2
	94 - 93	0.014	0.595	0.000	0.053	0.000	0.612	1.050	4.8.2
L9	93 - 92	0.018	0.625	0.000	0.065	0.000	0.647	1.050	4.8.2
	92 - 91	0.018	0.651	0.000	0.065	0.000	0.673	1.050	4.8.2
	91 - 90	0.018	0.675	0.000	0.064	0.000	0.698	1.050	4.8.2
	90 - 89	0.018	0.700	0.000	0.064	0.000	0.722	1.050	4.8.2
	89 - 88	0.018	0.724	0.000	0.064	0.000	0.746	1.050	4.8.2

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L10	88 - 86.875	0.018	0.751	0.000	0.064	0.000	0.773	1.050	4.8.2
	86.875 - 85.75	0.018	0.778	0.000	0.064	0.000	0.800	1.050	4.8.2
	85.75 - 82.25	0.008	0.378	0.000	0.028	0.000	0.387	1.050	4.8.2
L11	85.75 - 82.25	0.007	0.314	0.000	0.025	0.000	0.322	1.050	4.8.2
	82.25 - 80.75	0.013	0.582	0.000	0.045	0.000	0.597	1.050	4.8.2
L12	80.75 - 79.75	0.013	0.596	0.000	0.045	0.000	0.611	1.050	4.8.2
	79.75 - 78.75	0.013	0.609	0.000	0.045	0.000	0.625	1.050	4.8.2
	78.75 - 77.75	0.013	0.623	0.000	0.044	0.000	0.638	1.050	4.8.2
	77.75 - 76.75	0.013	0.636	0.000	0.044	0.000	0.651	1.050	4.8.2
	76.75 - 75.75	0.013	0.649	0.000	0.044	0.000	0.664	1.050	4.8.2
L13	75.75 - 74.75	0.014	0.662	0.000	0.045	0.000	0.678	1.050	4.8.2
	74.75 - 73.75	0.014	0.675	0.000	0.045	0.000	0.691	1.050	4.8.2
	73.75 - 72.75	0.014	0.688	0.000	0.045	0.000	0.704	1.050	4.8.2
	72.75 - 71.75	0.014	0.701	0.000	0.045	0.000	0.717	1.050	4.8.2
	71.75 - 70.75	0.014	0.713	0.000	0.045	0.000	0.729	1.050	4.8.2
L14	70.75 - 69.75	0.014	0.726	0.000	0.045	0.000	0.742	1.050	4.8.2
	69.75 - 68.75	0.014	0.738	0.000	0.045	0.000	0.754	1.050	4.8.2
	68.75 - 67.75	0.014	0.750	0.000	0.045	0.000	0.766	1.050	4.8.2
	67.75 - 66.75	0.014	0.762	0.000	0.045	0.000	0.778	1.050	4.8.2
	66.75 - 65.75	0.014	0.774	0.000	0.045	0.000	0.790	1.050	4.8.2
L15	65.75 - 64.75	0.014	0.785	0.000	0.044	0.000	0.801	1.050	4.8.2
	64.75 - 63.75	0.014	0.797	0.000	0.044	0.000	0.813	1.050	4.8.2
	63.75 - 62.75	0.014	0.808	0.000	0.044	0.000	0.824	1.050	4.8.2
	62.75 - 61.75	0.014	0.819	0.000	0.044	0.000	0.835	1.050	4.8.2
	61.75 - 60.75	0.014	0.830	0.000	0.044	0.000	0.846	1.050	4.8.2
L16	60.75 - 59.75	0.014	0.841	0.000	0.044	0.000	0.857	1.050	4.8.2
	59.75 - 58.75	0.014	0.852	0.000	0.044	0.000	0.868	1.050	4.8.2
	58.75 - 57.75	0.014	0.862	0.000	0.044	0.000	0.879	1.050	4.8.2
L17	57.75 - 57.5 (17)	0.008	0.442	0.000	0.024	0.000	0.450	1.050	4.8.2
L18	57.5 - 56.5	0.008	0.452	0.000	0.024	0.000	0.461	1.050	4.8.2
	56.5 - 55.5	0.008	0.456	0.000	0.024	0.000	0.465	1.050	4.8.2
	55.5 - 54.5	0.008	0.461	0.000	0.024	0.000	0.470	1.050	4.8.2
	54.5 - 53.5	0.008	0.465	0.000	0.024	0.000	0.474	1.050	4.8.2
	53.5 - 52.5	0.008	0.470	0.000	0.024	0.000	0.478	1.050	4.8.2
L19	52.5 - 51.5	0.008	0.480	0.000	0.024	0.000	0.489	1.050	4.8.2
	51.5 - 50.5	0.008	0.484	0.000	0.024	0.000	0.493	1.050	4.8.2
	50.5 - 49.5	0.008	0.489	0.000	0.024	0.000	0.498	1.050	4.8.2
	49.5 - 48.5	0.009	0.493	0.000	0.024	0.000	0.502	1.050	4.8.2
	48.5 - 47.5	0.009	0.497	0.000	0.024	0.000	0.506	1.050	4.8.2
L20	47.5 - 46.25	0.009	0.502	0.000	0.024	0.000	0.511	1.050	4.8.2
	46.25 - 45	0.009	0.506	0.000	0.024	0.000	0.516	1.050	4.8.2
	45 - 40.75	0.004	0.259	0.000	0.012	0.000	0.263	1.050	4.8.2
L21	45 - 40.75	0.004	0.255	0.000	0.011	0.000	0.259	1.050	4.8.2
	40.75 - 40	0.009	0.507	0.000	0.023	0.000	0.517	1.050	4.8.2
L22	40 - 39	0.009	0.524	0.000	0.024	0.000	0.533	1.050	4.8.2
	39 - 38	0.009	0.527	0.000	0.023	0.000	0.537	1.050	4.8.2
	38 - 37	0.009	0.530	0.000	0.023	0.000	0.540	1.050	4.8.2
	37 - 36	0.009	0.533	0.000	0.023	0.000	0.543	1.050	4.8.2
	36 - 35	0.009	0.537	0.000	0.023	0.000	0.546	1.050	4.8.2
L23	35 - 34	0.009	0.540	0.000	0.023	0.000	0.550	1.050	4.8.2
	34 - 33	0.009	0.543	0.000	0.023	0.000	0.553	1.050	4.8.2
	33 - 32	0.009	0.546	0.000	0.023	0.000	0.556	1.050	4.8.2
	32 - 31	0.009	0.549	0.000	0.023	0.000	0.559	1.050	4.8.2
	31 - 30	0.009	0.552	0.000	0.023	0.000	0.562	1.050	4.8.2
L24	30 - 29.75 (24)	0.016	0.976	0.000	0.038	0.000	0.994	1.050	4.8.2
L25	29.75 - 29.5 (25)	0.009	0.502	0.000	0.021	0.000	0.511	1.050	4.8.2
L26	29.5 - 28.5	0.009	0.510	0.000	0.021	0.000	0.520	1.050	4.8.2
	28.5 - 27.5	0.009	0.513	0.000	0.021	0.000	0.522	1.050	4.8.2
	27.5 - 26.5	0.009	0.515	0.000	0.021	0.000	0.525	1.050	4.8.2
	26.5 - 25.5	0.009	0.518	0.000	0.021	0.000	0.527	1.050	4.8.2
	25.5 - 24.5	0.009	0.520	0.000	0.021	0.000	0.530	1.050	4.8.2
L27	24.5 - 23.5	0.009	0.529	0.000	0.021	0.000	0.538	1.050	4.8.2
	23.5 - 22.5	0.009	0.531	0.000	0.021	0.000	0.541	1.050	4.8.2
	22.5 - 21.5	0.009	0.534	0.000	0.021	0.000	0.543	1.050	4.8.2
	21.5 - 20.5	0.009	0.536	0.000	0.021	0.000	0.545	1.050	4.8.2

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	20.5 - 19.5	0.009	0.538	0.000	0.021	0.000	0.548	1.050	4.8.2
L28	19.5 - 18.5	0.009	0.540	0.000	0.021	0.000	0.550	1.050	4.8.2
	18.5 - 17.5	0.009	0.542	0.000	0.021	0.000	0.552	1.050	4.8.2
	17.5 - 16.5	0.009	0.545	0.000	0.021	0.000	0.554	1.050	4.8.2
	16.5 - 15.5	0.009	0.547	0.000	0.021	0.000	0.556	1.050	4.8.2
	15.5 - 14.5	0.009	0.549	0.000	0.021	0.000	0.559	1.050	4.8.2
L29	14.5 - 13.5	0.010	0.564	0.000	0.021	0.000	0.574	1.050	4.8.2
	13.5 - 12.5	0.010	0.566	0.000	0.021	0.000	0.576	1.050	4.8.2
	12.5 - 11.5	0.010	0.568	0.000	0.021	0.000	0.578	1.050	4.8.2
	11.5 - 10.5	0.010	0.570	0.000	0.021	0.000	0.580	1.050	4.8.2
	10.5 - 9.5	0.010	0.572	0.000	0.021	0.000	0.582	1.050	4.8.2
L30	9.5 - 8.5	0.010	0.574	0.000	0.021	0.000	0.584	1.050	4.8.2
	8.5 - 7.5	0.010	0.575	0.000	0.021	0.000	0.586	1.050	4.8.2
	7.5 - 6.5	0.010	0.577	0.000	0.021	0.000	0.588	1.050	4.8.2
	6.5 - 5.5	0.010	0.579	0.000	0.021	0.000	0.590	1.050	4.8.2
	5.5 - 4.5	0.010	0.581	0.000	0.021	0.000	0.591	1.050	4.8.2
L31	4.5 - 3.375	0.010	0.590	0.000	0.021	0.000	0.601	1.050	4.8.2
	3.375 - 2.25	0.010	0.592	0.000	0.021	0.000	0.603	1.050	4.8.2
	2.25 - 1.125	0.010	0.593	0.000	0.021	0.000	0.604	1.050	4.8.2
	1.125 - 0	0.011	0.595	0.000	0.021	0.000	0.606	1.050	4.8.2

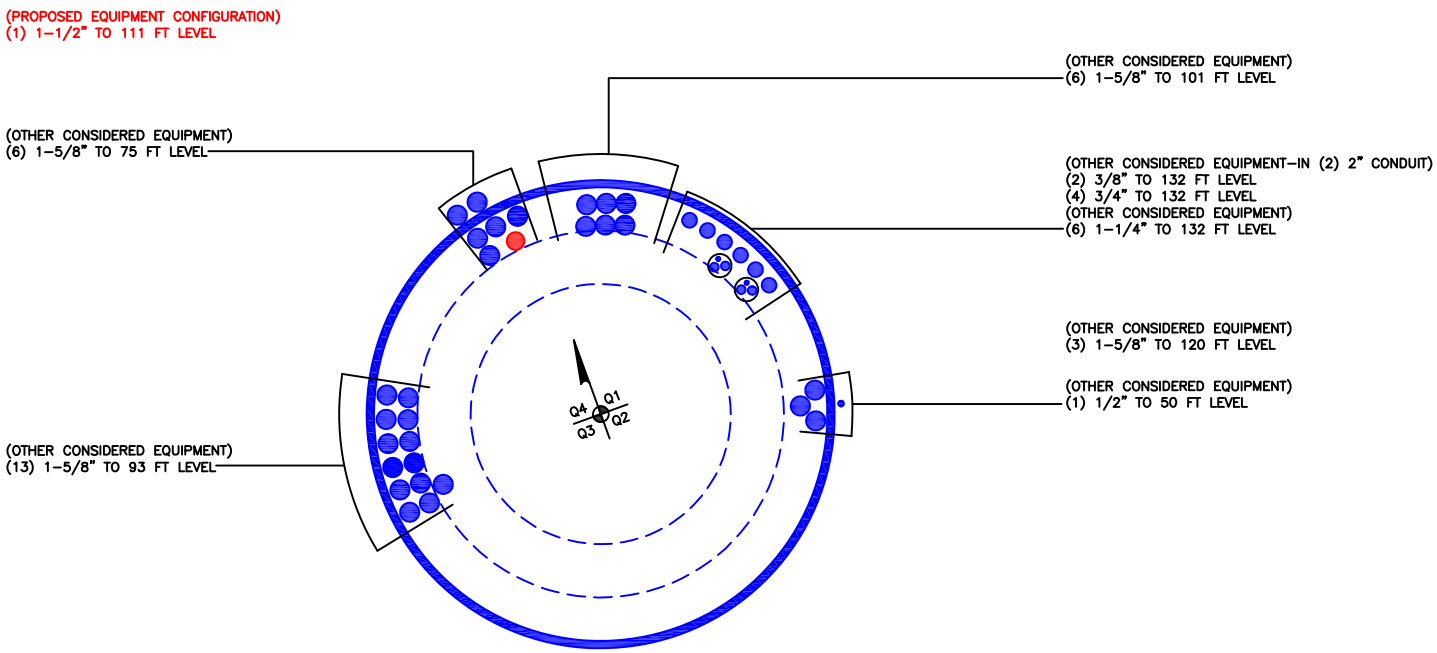
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	133 - 128	Pole	TP14x14x0.375	1	-1.54	530.91	5.5	Pass
L2	128 - 123	Pole	TP14x14x0.375	2	-1.89	530.91	12.4	Pass
L3	123 - 118	Pole	TP22.7502x22x0.1875	3	-5.92	761.35	12.3	Pass
L4	118 - 113	Pole	TP23.5004x22.7502x0.1875	4	-6.26	786.66	19.4	Pass
L5	113 - 108	Pole	TP24.2506x23.5004x0.1875	5	-9.50	811.97	28.7	Pass
L6	108 - 103	Pole	TP25.0007x24.2506x0.1875	6	-9.90	837.29	38.4	Pass
L7	103 - 98	Pole	TP25.7509x25.0007x0.1875	7	-11.52	862.60	48.5	Pass
L8	98 - 93	Pole	TP26.5011x25.7509x0.1875	8	-12.00	887.92	58.3	Pass
L9	93 - 88	Pole	TP27.2513x26.5011x0.1875	9	-15.70	913.23	71.1	Pass
L10	88 - 82.25	Pole	TP28.114x27.2513x0.1875	10	-15.97	924.62	76.2	Pass
L11	82.25 - 80.75	Pole	TP27.9641x27.2139x0.25	11	-16.88	1350.80	56.9	Pass
L12	80.75 - 75.75	Pole	TP28.7143x27.9641x0.25	12	-17.61	1387.38	63.3	Pass
L13	75.75 - 70.75	Pole	TP29.4646x28.7143x0.25	13	-18.68	1423.94	69.4	Pass
L14	70.75 - 65.75	Pole	TP30.2148x29.4646x0.25	14	-19.49	1460.51	75.2	Pass
L15	65.75 - 60.75	Pole	TP30.9651x30.2148x0.25	15	-20.31	1497.08	80.6	Pass
L16	60.75 - 57.75	Pole	TP31.4152x30.9651x0.25	16	-20.82	1519.01	83.7	Pass
L17	57.75 - 57.5	Pole	TP31.4527x31.4152x0.4625	17	-20.89	2794.40	42.9	Pass
L18	57.5 - 52.5	Pole	TP32.2029x31.4527x0.4563	18	-22.05	2823.92	45.6	Pass
L19	52.5 - 47.5	Pole	TP32.9532x32.2029x0.45	19	-23.27	2851.61	48.2	Pass
L20	47.5 - 40.75	Pole	TP33.966x32.9532x0.45	20	-23.87	2884.52	49.1	Pass
L21	40.75 - 40	Pole	TP33.5785x32.8283x0.4813	21	-25.88	3105.37	49.2	Pass
L22	40 - 35	Pole	TP34.3287x33.5785x0.4688	22	-27.17	3094.42	52.0	Pass
L23	35 - 30	Pole	TP35.0789x34.3287x0.4688	23	-28.47	3162.98	53.5	Pass
L24	30 - 29.75	Pole	TP35.1164x35.0789x0.2813	24	-28.53	1910.13	94.6	Pass
L25	29.75 - 29.5	Pole	TP35.1539x35.1164x0.5188	25	-28.60	3502.89	48.7	Pass
L26	29.5 - 24.5	Pole	TP35.9041x35.1539x0.5125	26	-30.00	3536.27	50.4	Pass
L27	24.5 - 19.5	Pole	TP36.6543x35.9041x0.5063	27	-31.43	3567.81	52.2	Pass
L28	19.5 - 14.5	Pole	TP37.4045x36.6543x0.5063	28	-32.88	3641.85	53.2	Pass
L29	14.5 - 9.5	Pole	TP38.1546x37.4045x0.4938	29	-34.34	3625.35	55.4	Pass
L30	9.5 - 4.5	Pole	TP38.9048x38.1546x0.4938	30	-35.82	3697.56	56.3	Pass
L31	4.5 - 0	Pole	TP39.58x38.9048x0.4875	31	-37.17	3715.53	57.7	Pass
							Summary	
						Pole (L24)	94.6	Pass
						RATING =	**94.6**	**Pass**

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

APPENDIX B

BASE LEVEL DRAWING


(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1-1/2" TO 111 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(6) 1-5/8" TO 101 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(6) 1-5/8" TO 75 FT LEVEL
(OTHER CONSIDERED EQUIPMENT-IN (2) 2" CONDUIT)
(2) 3/8" TO 132 FT LEVEL
(4) 3/4" TO 132 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(6) 1-1/4" TO 132 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(3) 1-5/8" TO 120 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 50 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(13) 1-5/8" TO 93 FT LEVEL
Q1
Q2
Q3
Q4

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- H

Site BU: 876382

Work Order: 2077369

CROWN CASTLE

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	133	10	0	0	14	14	0.375		A53-B-35
2	123	40.75	3.5	18	22.00	28.114	0.1875	Auto	A607-60
3	85.75	45	4.25	18	27.21	33.966	0.25	Auto	A572-65
4	45	45	0	18	32.83	39.58	0.28125	Auto	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	29.75	plate	Plate 6.125X1.25	3																		
2	29.75	57.75	plate	Plate 4.875X1.25	3																		
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in2)	Bolt Hole Size (in)	Reinforcement Material
1	6.125	1.25	7.65625	0.625	Welded	n/a	PC 8.8 - M20 (100)	27.000	15.000	6.094	1.1875	A572-65
2	4.875	1.25	6.09375	0.625	PC 8.8 - M20 (100)	12	PC 8.8 - M20 (100)	21.000	18.000	4.531	1.1875	A572-65

Connection Details for Custom Reinforcements

Reinforcement	End	# Bolts	N or X	Bolt Spacing (in)	Edge Dist (in)	Weld Grade (ksi)	Transverse (Horiz.) Weld Type	Horiz. Weld Length (in)	Horiz. Groove Depth (in)	Horiz. Groove Angle (deg)	Horiz. Fillet Size (in)	Vertical Weld Length (in)	Vertical Fillet Size (in)	Rev H Connection Capacity (kip)
Plate 6.125X1.25	Top	9	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	70	CJP Groove	6.125	1.25	45	0.25	-	-	-
Plate 4.875X1.25	Top	7	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	4	N	3	3	70	None	-	-	-	-	9	0.500	-

TNX Geometry Input

Increment (ft): 5 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	133 - 128	5		0	14.000	14.000	0.375	A53-B-35	1.000
2	128 - 123	5	0	0	14.000	14.000	0.375	A53-B-35	1.000
3	123 - 118	5		18	22.000	22.750	0.1875	A607-60	1.000
4	118 - 113	5		18	22.750	23.500	0.1875	A607-60	1.000
5	113 - 108	5		18	23.500	24.251	0.1875	A607-60	1.000
6	108 - 103	5		18	24.251	25.001	0.1875	A607-60	1.000
7	103 - 98	5		18	25.001	25.751	0.1875	A607-60	1.000
8	98 - 93	5		18	25.751	26.501	0.1875	A607-60	1.000
9	93 - 88	5		18	26.501	27.251	0.1875	A607-60	1.000
10	88 - 85.75	5.75	3.5	18	27.251	28.114	0.1875	A607-60	1.000
11	85.75 - 80.75	5		18	27.214	27.964	0.25	A572-65	1.000
12	80.75 - 75.75	5		18	27.964	28.714	0.25	A572-65	1.000
13	75.75 - 70.75	5		18	28.714	29.465	0.25	A572-65	1.000
14	70.75 - 65.75	5		18	29.465	30.215	0.25	A572-65	1.000
15	65.75 - 60.75	5		18	30.215	30.965	0.25	A572-65	1.000
16	60.75 - 57.75	3		18	30.965	31.415	0.25	A572-65	1.000
17	57.75 - 57.5	0.25		18	31.415	31.453	0.4625	A572-65	0.946
18	57.5 - 52.5	5		18	31.453	32.203	0.45625	A572-65	0.949
19	52.5 - 47.5	5		18	32.203	32.953	0.45	A572-65	0.953
20	47.5 - 45	6.75	4.25	18	32.953	33.966	0.45	A572-65	0.948
21	45 - 40	5		18	32.828	33.578	0.48125	A572-65	0.950
22	40 - 35	5		18	33.578	34.329	0.46875	A572-65	0.966
23	35 - 30	5		18	34.329	35.079	0.46875	A572-65	0.958
24	30 - 29.75	0.25		18	35.079	35.116	0.28125	A572-65	1.000
25	29.75 - 29.5	0.25		18	35.116	35.154	0.51875	A572-65	0.949
26	29.5 - 24.5	5		18	35.154	35.904	0.5125	A572-65	0.951
27	24.5 - 19.5	5		18	35.904	36.654	0.50625	A572-65	0.954
28	19.5 - 14.5	5		18	36.654	37.404	0.50625	A572-65	0.946
29	14.5 - 9.5	5		18	37.404	38.155	0.49375	A572-65	0.962
30	9.5 - 4.5	5		18	38.155	38.905	0.49375	A572-65	0.954
31	4.5 - 0	4.5		18	38.905	39.580	0.4875	A572-65	0.960

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	133 - 128	1.54	9.90	2.53
2	128 - 123	1.89	23.03	2.73
3	123 - 118	5.92	48.45	6.75
4	118 - 113	6.26	83.07	7.10
5	113 - 108	9.50	129.71	10.83
6	108 - 103	9.90	184.71	11.18
7	103 - 98	11.52	245.83	12.99
8	98 - 93	12.00	311.58	13.32
9	93 - 88	15.70	396.73	16.75
10	88 - 85.75	15.97	434.53	16.88
11	85.75 - 80.75	16.88	519.86	17.26
12	80.75 - 75.75	17.61	606.85	17.56
13	75.75 - 70.75	18.68	697.22	18.30
14	70.75 - 65.75	19.49	789.38	18.59
15	65.75 - 60.75	20.31	882.93	18.86
16	60.75 - 57.75	20.82	939.71	19.02
17	57.75 - 57.5	20.89	944.46	19.03
18	57.5 - 52.5	22.05	1040.42	19.37
19	52.5 - 47.5	23.27	1138.22	19.73
20	47.5 - 45	23.87	1187.72	19.89
21	45 - 40	25.88	1288.14	20.28
22	40 - 35	27.17	1390.25	20.58
23	35 - 30	28.47	1493.77	20.86
24	30 - 29.75	28.53	1498.98	20.86
25	29.75 - 29.5	28.60	1504.20	20.87
26	29.5 - 24.5	30.00	1609.21	21.15
27	24.5 - 19.5	31.43	1715.52	21.40
28	19.5 - 14.5	32.88	1823.02	21.63
29	14.5 - 9.5	34.34	1931.61	21.84
30	9.5 - 4.5	35.82	2041.22	22.04
31	4.5 - 0	37.17	2140.73	22.22

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
133 - 128	Pole	TP14x14x0.375	Pole	5.5%	Pass
128 - 123	Pole	TP14x14x0.375	Pole	12.4%	Pass
123 - 118	Pole	TP22.75x22x0.1875	Pole	12.3%	Pass
118 - 113	Pole	TP23.5x22.75x0.1875	Pole	19.4%	Pass
113 - 108	Pole	TP24.251x23.5x0.1875	Pole	28.7%	Pass
108 - 103	Pole	TP25.001x24.251x0.1875	Pole	38.4%	Pass
103 - 98	Pole	TP25.751x25.001x0.1875	Pole	48.5%	Pass
98 - 93	Pole	TP26.501x25.751x0.1875	Pole	58.3%	Pass
93 - 88	Pole	TP27.251x26.501x0.1875	Pole	71.1%	Pass
88 - 85.75	Pole	TP28.114x27.251x0.1875	Pole	76.2%	Pass
85.75 - 80.75	Pole	TP27.964x27.214x0.25	Pole	56.9%	Pass
80.75 - 75.75	Pole	TP28.714x27.964x0.25	Pole	63.3%	Pass
75.75 - 70.75	Pole	TP29.465x28.714x0.25	Pole	69.4%	Pass
70.75 - 65.75	Pole	TP30.215x29.465x0.25	Pole	75.2%	Pass
65.75 - 60.75	Pole	TP30.965x30.215x0.25	Pole	80.6%	Pass
60.75 - 57.75	Pole	TP31.415x30.965x0.25	Pole	83.7%	Pass
57.75 - 57.5	Pole + Reinf.	TP31.453x31.415x0.4625	Reinf. 2 Tension Rupture	72.7%	Pass
57.5 - 52.5	Pole + Reinf.	TP32.203x31.453x0.4563	Reinf. 2 Tension Rupture	77.2%	Pass
52.5 - 47.5	Pole + Reinf.	TP32.953x32.203x0.45	Reinf. 2 Tension Rupture	81.4%	Pass
47.5 - 45	Pole + Reinf.	TP33.966x32.953x0.45	Reinf. 2 Tension Rupture	83.4%	Pass
45 - 40	Pole + Reinf.	TP33.578x32.828x0.4813	Reinf. 2 Tension Rupture	83.6%	Pass
40 - 35	Pole + Reinf.	TP34.329x33.578x0.4688	Reinf. 2 Tension Rupture	87.1%	Pass
35 - 30	Pole + Reinf.	TP35.079x34.329x0.4688	Reinf. 2 Tension Rupture	90.3%	Pass
30 - 29.75	Pole	TP35.116x35.079x0.2813	Pole	94.6%	Pass
29.75 - 29.5	Pole + Reinf.	TP35.154x35.116x0.5188	Reinf. 1 Tension Rupture	76.9%	Pass
29.5 - 24.5	Pole + Reinf.	TP35.904x35.154x0.5125	Reinf. 1 Tension Rupture	79.6%	Pass
24.5 - 19.5	Pole + Reinf.	TP36.654x35.904x0.5063	Reinf. 1 Tension Rupture	82.1%	Pass
19.5 - 14.5	Pole + Reinf.	TP37.404x36.654x0.5063	Reinf. 1 Tension Rupture	84.5%	Pass
14.5 - 9.5	Pole + Reinf.	TP38.155x37.404x0.4938	Reinf. 1 Tension Rupture	86.8%	Pass
9.5 - 4.5	Pole + Reinf.	TP38.905x38.155x0.4938	Reinf. 1 Tension Rupture	88.9%	Pass
4.5 - 0	Pole + Reinf.	TP39.58x38.905x0.4875	Reinf. 1 Tension Rupture	90.8%	Pass
				Summary	
			Pole	94.6%	Pass
			Reinforcement	90.8%	Pass
			Overall	94.6%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*		
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2
133 - 128	373	n/a	373	16.05	n/a	16.05	5.5%		
128 - 123	373	n/a	373	16.05	n/a	16.05	12.4%		
123 - 118	863	n/a	863	13.43	n/a	13.43	12.3%		
118 - 113	952	n/a	952	13.87	n/a	13.87	19.4%		
113 - 108	1047	n/a	1047	14.32	n/a	14.32	28.7%		
108 - 103	1148	n/a	1148	14.77	n/a	14.77	38.4%		
103 - 98	1256	n/a	1256	15.21	n/a	15.21	48.5%		
98 - 93	1369	n/a	1369	15.66	n/a	15.66	58.3%		
93 - 88	1490	n/a	1490	16.11	n/a	16.11	71.1%		
88 - 85.75	1546	n/a	1546	16.31	n/a	16.31	76.2%		
85.75 - 80.75	2133	n/a	2133	21.99	n/a	21.99	56.9%		
80.75 - 75.75	2311	n/a	2311	22.59	n/a	22.59	63.3%		
75.75 - 70.75	2499	n/a	2499	23.18	n/a	23.18	69.4%		
70.75 - 65.75	2696	n/a	2696	23.78	n/a	23.78	75.2%		
65.75 - 60.75	2904	n/a	2904	24.37	n/a	24.37	80.6%		
60.75 - 57.75	3033	n/a	3033	24.73	n/a	24.73	83.7%		
57.75 - 57.5	3044	2463	5508	24.76	18.28	43.04	45.7%		72.7%
57.5 - 52.5	3269	2577	5846	25.35	18.28	43.63	49.0%		77.2%
52.5 - 47.5	3505	2693	6198	25.95	18.28	44.23	52.1%		81.4%
47.5 - 45	3627	2752	6379	26.25	18.28	44.53	53.6%		83.4%
45 - 40	4162	2791	6953	29.72	18.28	48.00	51.8%		83.6%
40 - 35	4450	2912	7362	30.39	18.28	48.67	54.4%		87.1%
35 - 30	4750	3035	7786	31.06	18.28	49.34	56.8%		90.3%
30 - 29.75	4766	n/a	4766	31.10	n/a	31.10	94.6%		
29.75 - 29.5	4781	3842	8623	31.13	22.97	54.10	51.8%	76.9%	
29.5 - 24.5	5096	4001	9097	31.80	22.97	54.77	54.0%	79.6%	
24.5 - 19.5	5425	4162	9588	32.47	22.97	55.44	56.2%	82.1%	
19.5 - 14.5	5768	4327	10095	33.14	22.97	56.11	58.3%	84.5%	
14.5 - 9.5	6125	4495	10620	33.81	22.97	56.78	60.4%	86.8%	
9.5 - 4.5	6496	4667	11163	34.48	22.97	57.45	62.3%	88.9%	
4.5 - 0	6843	4824	11666	35.08	22.97	58.05	64.1%	90.8%	

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

Monopole Flange Plate Connection

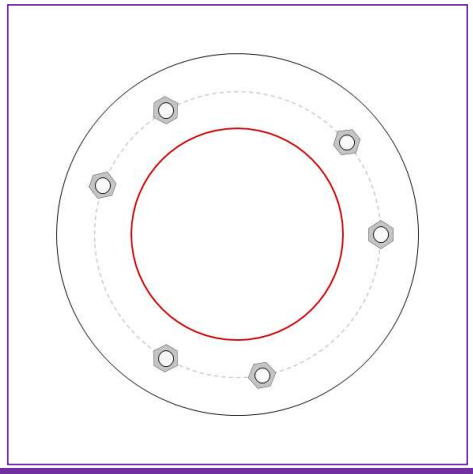
Elevation = 123 ft.

BU #	876382
Site Name	KLIN / LAVIANA ORCHA
Order #	556603 Rev 4
TIA-222 Revision	H

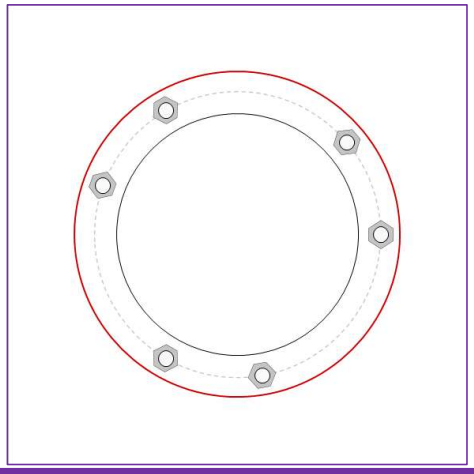
Applied Loads	
Moment (kip-ft)	23.03
Axial Force (kips)	1.89
Shear Force (kips)	2.73

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(6) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 19" BC

Top Plate Data

24" OD x 1.5" Plate (A572-65; Fy=65 ksi, Fu=80 ksi)

Bottom Plate Data

16" ID x 0.75" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

14" x 0.375" round pole (A53-B-35; Fy=35 ksi, Fu=60 ksi)

Bottom Pole Data

22" x 0.1875" 18-sided pole (A607-60; Fy=60 ksi, Fu=75 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	9.37	
Allowable (kips)	54.54	
Stress Rating:	**16.4%**	Pass

Top Plate Capacity

Max Stress (ksi):	5.02	(Flexural)
Allowable Stress (ksi):	58.50	
Stress Rating:	**8.2%**	Pass
Tension Side Stress Rating:	**5.1%**	Pass

Bottom Plate Capacity

Max Stress (ksi):	14.93	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**43.9%**	Pass
Tension Side Stress Rating:	**N/A**	

CCIplate

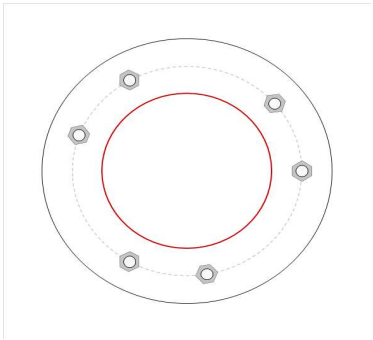
Elevation (ft)	123	*(Flange)*

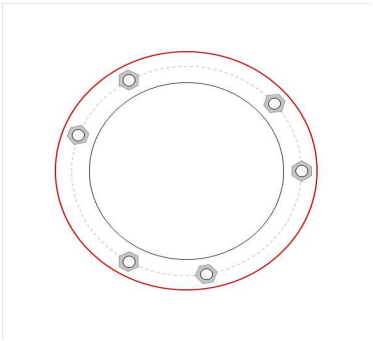
Bolt Group	Resist Axial	Resist Shear	Induce Plate Bending
1	Yes	Yes	Yes

Custom Bolt Connection

Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, η:	I_{ar} (in):	Thread Type	Area Override, in^2	Tension Only
1	1	0	1	A325	19	0.5	0	N-Included		No
2	1	40	1	A325	19	0.5	0	N-Included		No
3	1	120	1	A325	19	0.5	0	N-Included		No
4	1	160	1	A325	19	0.5	0	N-Included		No
5	1	240	1	A325	19	0.5	0	N-Included		No
6	1	280	1	A325	19	0.5	0	N-Included		No

Plot Graphic





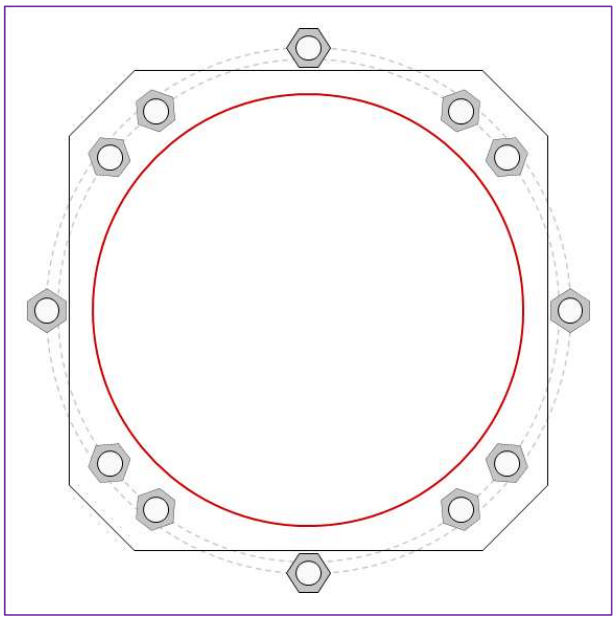
Monopole Base Plate Connection

Site Info	
BU #	876382
Site Name	LIN / LAVIANA ORCHA
Order #	556603 Rev 4

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

Applied Loads	
Moment (kip-ft)	2140.73
Axial Force (kips)	37.17
Shear Force (kips)	22.22

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

GROUP 1: (8) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 46" BC

Anchor Spacing: 6 in

GROUP 2: (4) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 48.08" BC

Base Plate Data

44" W x 2.75" Plate (A572-55; Fy=55 ksi, Fu=70 ksi); Clip: 6 in

Stiffener Data

N/A

Pole Data

39.58" x 0.28125" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

GROUP 1:		
Pu_t = 175.59	ϕPn_t = 243.75	**Stress Rating**
Vu = 2.78	ϕVn = 149.1	**68.6%**
Mu = n/a	ϕMn = n/a	**Pass**
GROUP 2:		
Pu_t = 188.57	ϕPn_t = 243.75	**Stress Rating**
Vu = 0	ϕVn = 149.1	**73.7%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	25.83	(Flexural)
Allowable Stress (ksi):	49.5	
Stress Rating:	**49.7%**	**Pass**

CCIplate

Elevation (ft)	0	*(Base)*

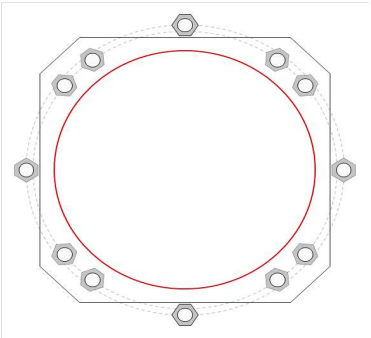
note: Bending interaction not considered when Grout Considered = "Yes"

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		

Custom Bolt Connection

Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, η:	l_{er} (in):	Thread Type	Area Override, in^2	Tension Only
1	1	37.505283	2.25	A615-75	46	0.5	1.75	N-Included		No
2	1	52.494717	2.25	A615-75	46	0.5	1.75	N-Included		No
3	1	127.50528	2.25	A615-75	46	0.5	1.75	N-Included		No
4	1	142.49472	2.25	A615-75	46	0.5	1.75	N-Included		No
5	1	217.50528	2.25	A615-75	46	0.5	1.75	N-Included		No
6	1	232.49472	2.25	A615-75	46	0.5	1.75	N-Included		No
7	1	307.50528	2.25	A615-75	46	0.5	1.75	N-Included		No
8	1	322.49472	2.25	A615-75	46	0.5	1.75	N-Included		No
9	2	0	2.25	A615-75	48.08	0.5	1.75	N-Included		No
10	2	90	2.25	A615-75	48.08	0.5	1.75	N-Included		No
11	2	180	2.25	A615-75	48.08	0.5	1.75	N-Included		No
12	2	270	2.25	A615-75	48.08	0.5	1.75	N-Included		No

Plot Graphic



Drilled Pier Foundation

BU # :	876382
Site Name:	Berlin/Laviana Orchard
Order Number:	556603 Rev 4
TIA-222 Revison:	H
Tower Type:	Monopole

Check Limitation	
Apply TIA-222-H Section 15.5:	☑
N/A	☐
Additional Longitudinal Rebar	
Input Effective Depths (else Actual):	☐
Shear Design Options	
Check Shear along Depth of Pier:	☑
Utilize Shear-Friction Methodology:	☐
Override Critical Depth:	☐

Go to Soil Calculations

Applied Loads	Comp.	Uplift
Moment (kip-ft)	2140.73	
Axial Force (kips)	37.18	
Shear Force (kips)	22.2	

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

Pier Design Data		
Depth	20	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 20' below grade		
Pier Diameter	6	ft
Rebar Quantity	16	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	
Tie Spacing	18	in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	5.37	-
Soil Safety Factor	2.86	-
Max Moment (kip-ft)	2245.69	-
Rating*	*44.3%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	127.23	-
End Bearing (kips)	848.23	-
Weight of Concrete (kips)	93.74	-
Total Capacity (kips)	975.46	-
Axial (kips)	130.92	-
Rating*	*12.8%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	5.09	-
Critical Moment (kip-ft)	2245.06	-
Critical Moment Capacity	3351.69	-
Rating*	*63.8%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	14.86	-
Critical Shear (kip)	320.62	-
Critical Shear Capacity	427.97	-
Rating*	*71.3%*	-

Structural Foundation Rating*	**71.3%**
Soil Interaction Rating*	**44.3%**

*Rating per TIA-222-H Section 15.5

Soil Profile

Groundwater Depth	15	# of Layers	4

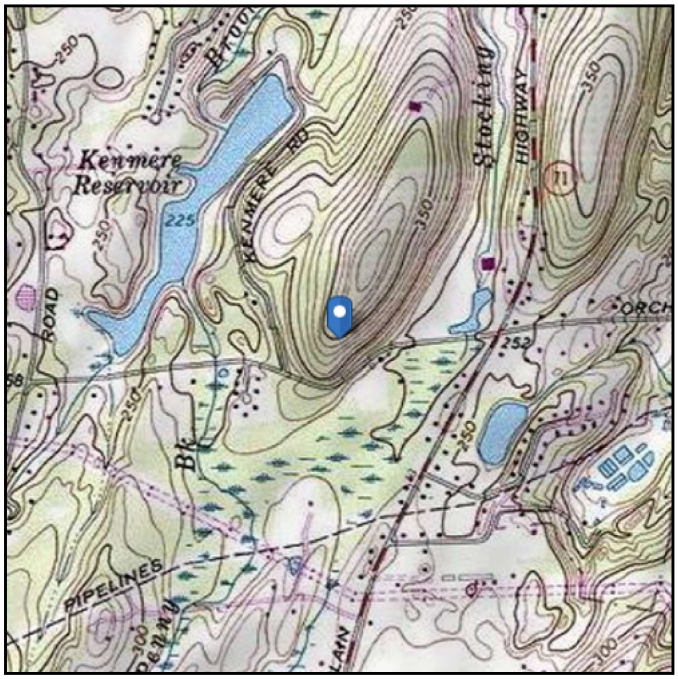
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3.33	3.33	135	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	3.33	5	1.67	135	150	0	38	0.000	0.000	0.00	0.00			Cohesionless
3	5	15	10	135	150	0	38	0.000	0.000	0.60	0.60			Cohesionless
4	15	20	5	75	87.6	0	38	0.000	0.000	0.60	0.60	40		Cohesionless

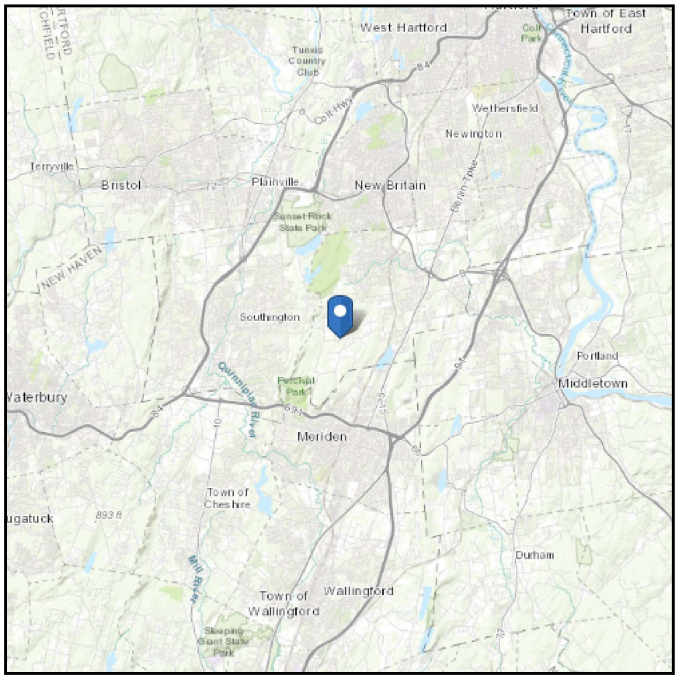
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Elevation: 345.04 ft (NAVD 88)
Latitude: 41.589742
Longitude: -72.805333





Wind

Results:

Wind Speed	118 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	98 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Thu Feb 17 2022

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

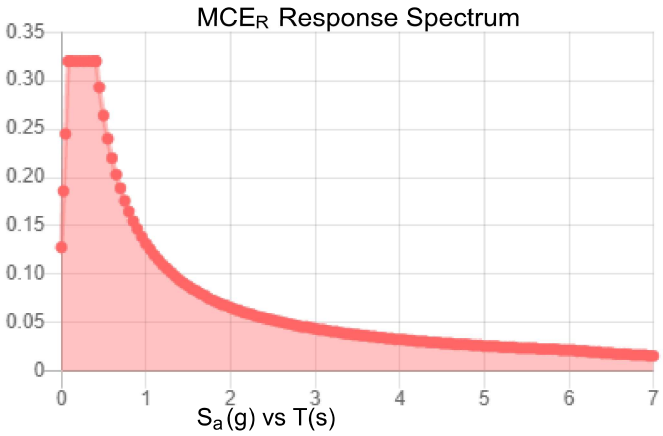
Seismic

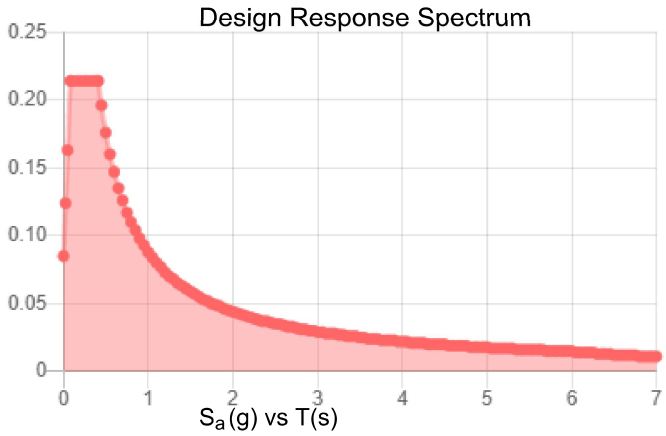
Site Soil Class: D - Default (see Section 11.4.3)

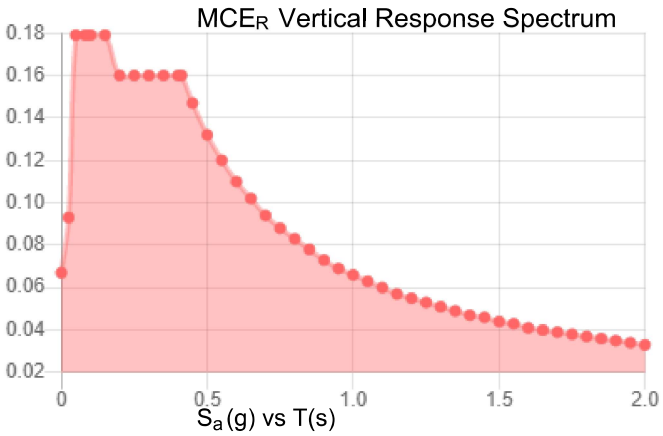
Results:

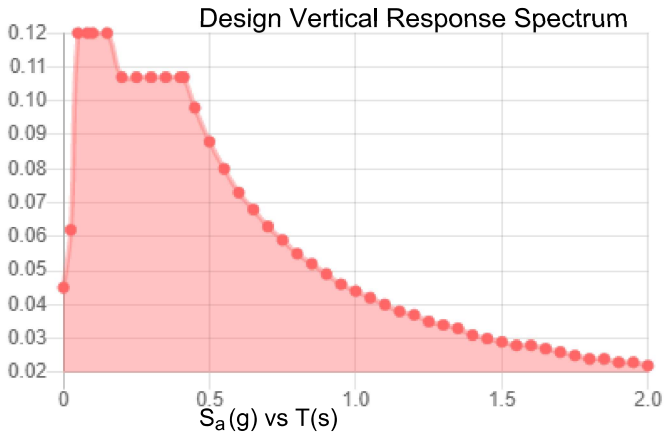
S_S :	0.2	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.11
F_v :	2.4	PGA_M :	0.174
S_{MS} :	0.32	F_{PGA} :	1.579
S_{M1} :	0.132	I_e :	1
S_{DS} :	0.214	C_v :	0.7

Seismic Design Category B









Data Accessed: **Thu Feb 17 2022**

Date Source:

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

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Thu Feb 17 2022

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

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

Exhibit E

Mount Analysis

Date: **August 2, 2021**

Darch 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:	BOBDL00095A
	Carrier Site Name:	CT-CCI-T-876382
Crown Castle Designation:	**Crown Castle BU Number:**	876382
	Crown Castle Site Name:	BERLIN / LAVIANA ORCHARD
	Crown Castle JDE Job Number:	650080
	Crown Castle Order Number:	556603 Rev. 0
Engineering Firm Designation:	**Trylon Report Designation:**	189195
Site Data:	**1684 Chamberlain Highway, Berlin, Hartford County, CT, 06037 Latitude 41°35'23.07" Longitude -72°48'19.20"**	
Structure Information:	**Tower Height & Type:**	**133.0 ft Monopole**
	Mount Elevation:	**111.0 ft**
	Mount Type:	**8.0 ft Platform**

Dear Darch 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: Steve Mustaro, P.E.

Respectfully Submitted by:
Cliff Abernathy, P.E.

STATE OF CONNECTICUT
CLIFF ABERNATHY
No. 31022
LICENSED
PROFESSIONAL ENGINEER
8-2-21

Cliff Abernathy
Digitally signed by Cliff Abernathy
Date: 2021.08.02 16:29:56 -04'00'

TABLE OF CONTENTS

1) INTRODUCTION

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

2) ANALYSIS CRITERIA

Building Code:	2015 IBC / 2018 CTSBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	125 mph
Exposure Category:	C
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:	0.183
Seismic S_1:	0.063
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
111.0	111.0	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	556603 Rev. 0	CCI Sites
Mount Manufacturer Drawings	Commscope	MC-PK8-DSH	Trylon

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. Trylon 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)	MP5	111.0	38.1	Pass
	Horizontal(s)	H2		11.9	Pass
	Standoff(s)	M2		46.1	Pass
	Bracing(s)	M1		38.3	Pass
	Handrail(s)	M19		13.8	Pass
	Mount Connection(s)	-		16.6	Pass

Structure Rating (max from all components) =	46.1%

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

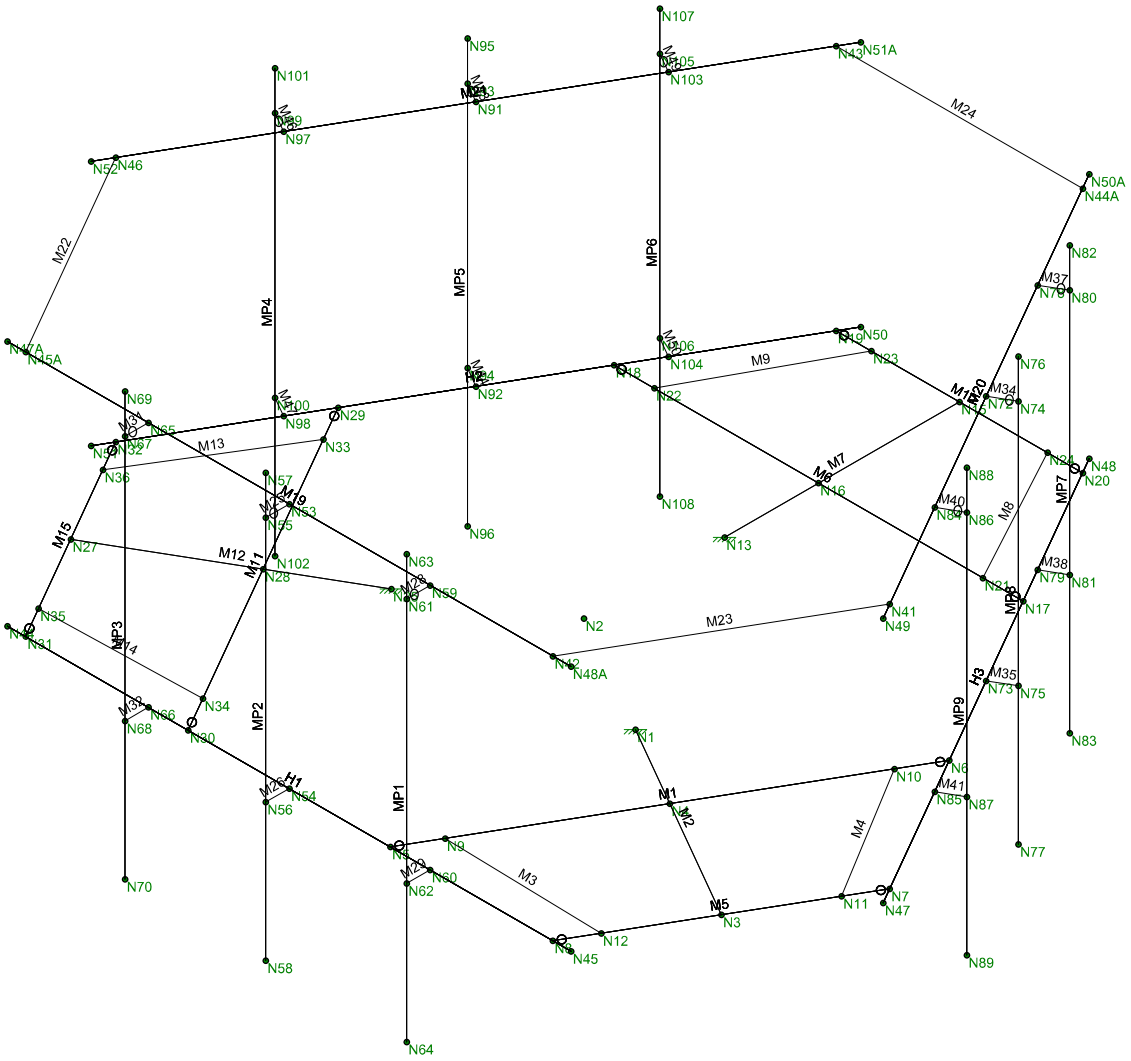
The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the proposed mount listed below must be installed.

1. Commscope MC-PK8-DSH.

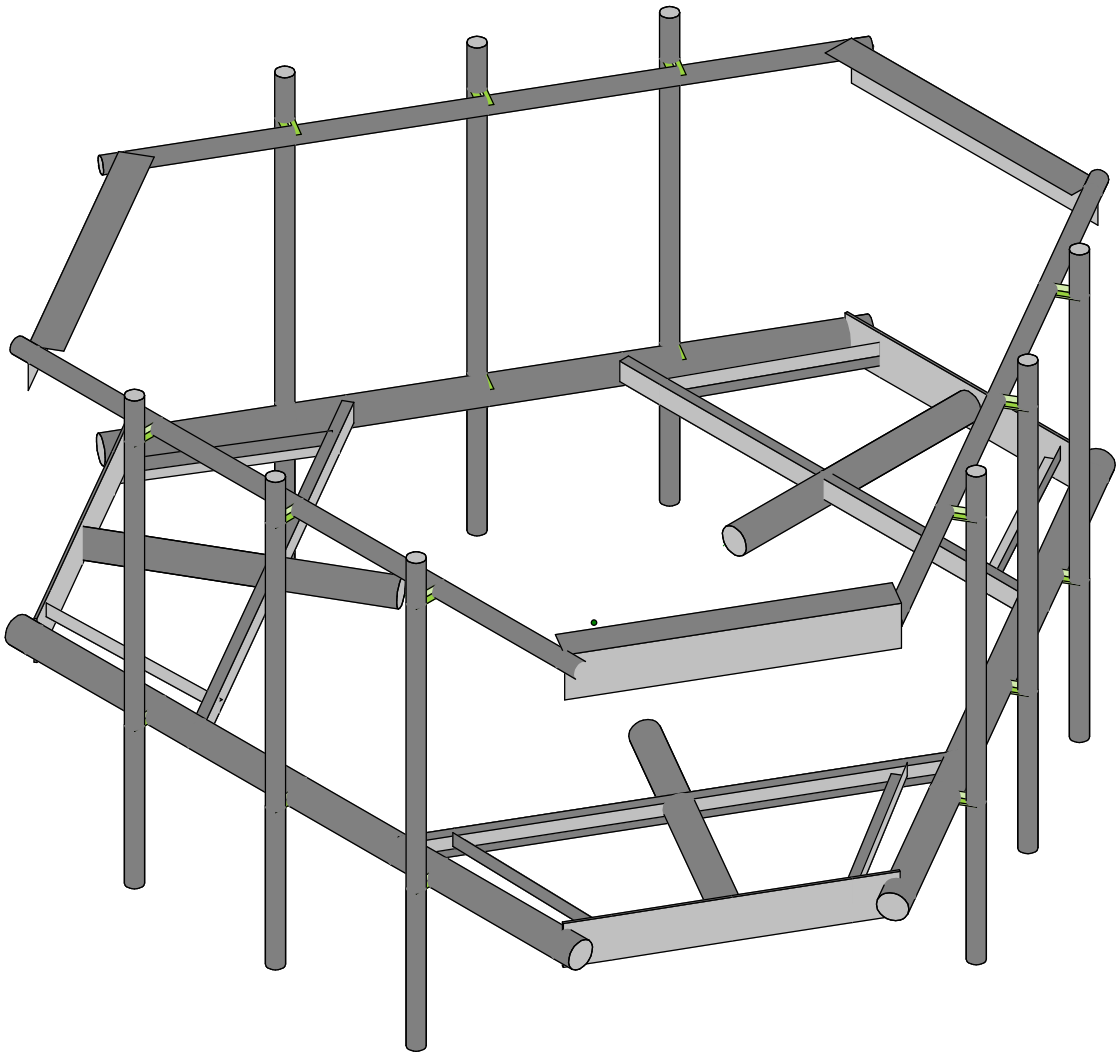
No structural modifications are required at this time, provided that the above-listed changes are implemented.

APPENDIX A

WIRE FRAME AND RENDERED MODELS



Trylon	876382	Wireframe
SMM		Aug 2, 2021 at 10:52 AM
189195		876382_loaded.r3d



Trylon	876382	Render
SMM		Aug 2, 2021 at 10:52 AM
189195		876382_loaded.r3d

APPENDIX B

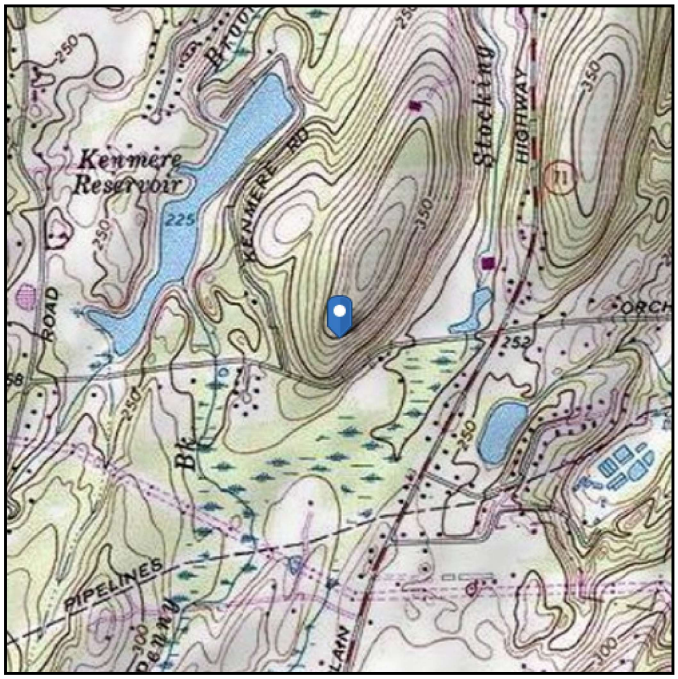
SOFTWARE INPUT CALCULATIONS

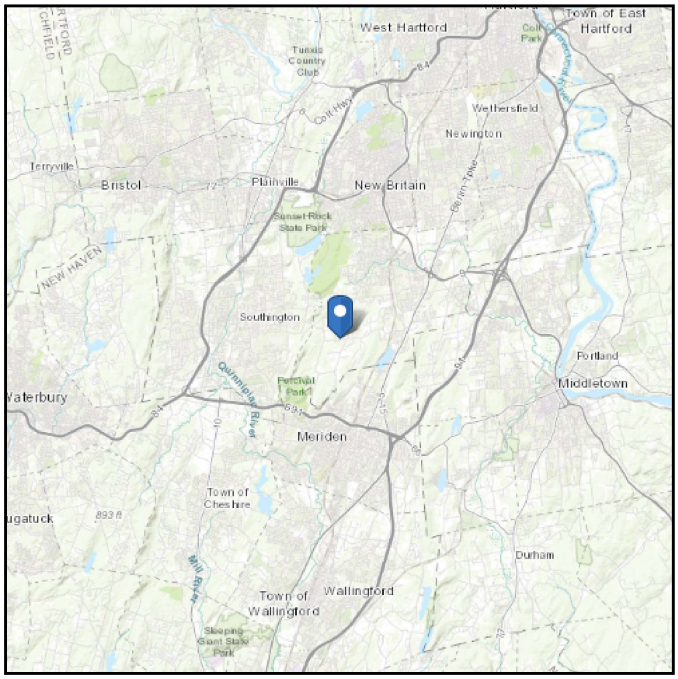
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 345.04 ft (NAVD 88)
Latitude: 41.589742
Longitude: -72.805333





Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	5 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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CONNECTICUT DESIGN CRITERIA - STATE

Revison: R-400 7/30/2021

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

(APPENDIX N) MUNICIPALITY - SPECIFIC STRUCTURAL DESIGN PARAMETERS

				Wind Design Parameters								
Municipality	**Ground Snow Load**	**MCE Spectral Accelerations** (%g)		**Ultimate Design Wind Speeds,** V_{ult} (mph)			**Nominal Design Wind Speeds,** V_{asd} (mph)			**Wind-Borne Debris Regions**[1]		**Hurricane-Prone Regions**
		S_s	S_1	Risk Cat.I	Risk Cat.II	Risk Cat III-IV	Risk Cat. I	Risk Cat. II	Risk Cat. III-IV	Risk Cat. II & III except Occup I-2	Risk Cat III Occup I-2 & Risk Cat. IV	
Berlin	30	0.183	0.063	115	125	135	89	97	105			Yes

1. Wind-Borne Debris Regions:

Type A: Full Municipality.

Type B: Areas south of Interstate 95.

Exception: Areas that are more than one mile from the coastal mean high-water line as certified by a registered design professional may be classified as being outside a wind-borne debris region.

Type C: Areas south of Metro North/Amtrak Railroad to the west of the Quinnipiac River and areas south of Interstate 95 to the east of the Quinnipiac River.

Exception: Areas that are more than one mile from the coastal mean high-water line as certified by a registered design professional may be classified as being outside a wind-borne debris region.

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

TIA LOAD CALCULATOR 2.0

PROJECT DATA	
Job Code:	189195
Carrier Site ID:	BU# 876382
Carrier Site Name:	ERLIN / LAVIANA ORCHAR

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

STRUCTURE DETAILS		
Mount Type:	Platform	--
Mount Elevation:	111.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	133.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	C	--
Site Class:	D - Default	--
Ground Elevation:	345.04	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):	1.29	--
Directionality Factor (K_d):	0.95	--
Gust Effect Factor (Gh):	1.00	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	48.55	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_{zi}):	48.55	psf
Mount Ice Thickness (t_{iz}):	1.69	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	87.39	psf
Round Member Pressure:	52.44	psf
Ice Wind Pressure:	7.32	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel .(S_s):	0.18	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 (Cs):	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

Appurtenance Name/Location	Qty.	Elevation [ft]	--	EPA $_N$ (ft2)	EPA $_T$ (ft2)	Weight (lbs)
MX08FRO665-21	3	111	No Ice	12.49	5.87	82.50
MP2/MP5/MP8, 330/120/230	--	--	w/ Ice	13.69	6.97	277.27
TA08025-B604	3	111	No Ice	1.96	0.98	63.90
MP2/MP5/MP8, 330/120/230	--	--	w/ Ice	2.38	1.30	67.99
TA08025-B605	3	111	No Ice	1.96	1.13	75.00
MP2/MP5/MP8, 330/120/230	--	--	w/ Ice	2.38	1.46	72.44
RDIDC-9181-PF-48	1	111	No Ice	2.01	1.17	21.85
MP2, 330/0/0	--	--	w/ Ice	2.43	1.52	71.40
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
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			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			

EQUIPMENT WIND CALCULATIONS

Appurtenance Name	Qty.	Elevation [ft]	K_{zt}	K_z	K_d	t_d	q_z [psf]	q_{zi} [psf]
MX08FRO665-21	3	111	1.00	1.29	0.95	1.69	48.55	7.77
TA08025-B604	3	111	1.00	1.29	0.95	1.69	48.55	7.77
TA08025-B605	3	111	1.00	1.29	0.95	1.69	48.55	7.77
RDIDC-9181-PF-48	1	111	1.00	1.29	0.95	1.69	48.55	7.77

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	545.72	328.69	473.38	256.35	473.38	328.69
MP2/MP5/MP8, 330/120/230	--	w/ Ice	95.70	60.46	83.95	48.71	83.95	60.46
TA08025-B604	3	No Ice	85.80	53.60	75.07	42.87	75.07	53.60
MP2/MP5/MP8, 330/120/230	--	w/ Ice	16.62	10.99	14.74	9.11	14.74	10.99
TA08025-B605	3	No Ice	85.80	58.47	76.69	49.35	76.69	58.47
MP2/MP5/MP8, 330/120/230	--	w/ Ice	16.62	11.84	15.03	10.24	15.03	11.84
RDIDC-9181-PF-48	1	No Ice	87.91	60.26	78.70	51.05	78.70	60.26
MP2, 330/0/0	--	w/ Ice	17.00	12.21	15.40	10.61	15.40	12.21
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
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		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						

EQUIPMENT SEISMIC FORCE CALCULATIONS

Appurtenance Name	Qty.	Elevation [ft]	Weight [lbs]	F_p [lbs]
MX08FRO665-21	3	111	82.5	9.66
TA08025-B604	3	111	63.9	7.48
TA08025-B605	3	111	75	8.78
RDIDC-9181-PF-48	1	111	21.85	2.56

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 15th(360-16): LRFD
Cold Formed Steel Code	AISI S100-16: LRFD
Wood Code	AWC NDS-15: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-14
Masonry Code	ACI 530-13: Strength
Aluminum Code	AA ADM1-10: LRFD - Building
Stainless Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k...	Yield[psi]	Ry	Fu[psi]	Rt
1	A992	29000	11154	.3	.65	.49	50000	1.1	65000	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36000	1.5	58000	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50000	1.1	65000	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42000	1.4	58000	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46000	1.4	58000	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35000	1.6	60000	1.2
7	A1085	29000	11154	.3	.65	.49	50000	1.4	65000	1.3

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]	Yield[psi]	Fu[psi]
1	A653 SS Gr33	29500	11346	.3	.65	.49	33000	45000
2	A653 SS Gr50/1	29500	11346	.3	.65	.49	50000	65000

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Plates	6.5"x0.37" Plate	Beam	RECT	A53 Gr.B	Typical	2.405	.027	8.468	.106
2	Grating Bracing	L2x2x3	Beam	Single An...	A36 Gr.36	Typical	.722	.271	.271	.009
3	Standoffs	PIPE 3.5	Beam	Pipe	A53 Gr.B	Typical	2.5	4.52	4.52	9.04
4	Standoff Bracing	C3X5	Beam	Channel	A36 Gr.36	Typical	1.47	.241	1.85	.043
5	Handrails	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
6	Handrail Corners	L6 5/8x4 7/16x3/16	Beam	Single An...	A36 Gr.36	Typical	2.039	3.593	9.575	.023
7	Horizontals	PIPE_3.5	Beam	Pipe	A53 Gr.B	Typical	2.5	4.52	4.52	9.04

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
8	Mount Pipes	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF1A	8C U1.25X0...	Beam	None	A653 SS Gr33	Typical	.581	.057	4.41	.00063

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N25	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N13	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Self Weight	DL		-1			13		3	
2	Structure Wind Z	WLZ						33		
3	Structure Wind X	WLX						33		
4	Wind Load 0 AZI	WLZ					13			
5	Wind Load 30 AZI	None					26			
6	Wind Load 45 AZI	None					26			
7	Wind Load 60 AZI	None					26			
8	Wind Load 90 AZI	WLX					13			
9	Wind Load 120 AZI	None					26			
10	Wind Load 135 AZI	None					26			
11	Wind Load 150 AZI	None					26			
12	Ice Weight	OL1					13	33	3	
13	Ice Structure Wind Z	OL2						33		
14	Ice Structure Wind X	OL3						33		
15	Ice Wind Load 0 AZI	OL2					13			
16	Ice Wind Load 30 AZI	None					26			
17	Ice Wind Load 45 AZI	None					26			
18	Ice Wind Load 60 AZI	None					26			
19	Ice Wind Load 90 AZI	OL3					13			
20	Ice Wind Load 120 AZI	None					26			
21	Ice Wind Load 135 AZI	None					26			
22	Ice Wind Load 150 AZI	None					26			
23	Seismic Load Z	ELZ			-.117		13			
24	Seismic Load X	ELX	-.117				13			
25	Live Load 1 (Lv)	None					1			
26	Live Load 2 (Lv)	None					1			
27	Live Load 3 (Lv)	None					1			
28	Live Load 4 (Lv)	None					1			
29	Live Load 5 (Lv)	None					1			
30	Live Load 6 (Lv)	None					1			
31	Live Load 7 (Lv)	None					1			
32	Live Load 8 (Lv)	None					1			
33	Live Load 9 (Lv)	None					1			

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
34	Maintenance Load 1 (...	None					1			
35	Maintenance Load 2 (...	None					1			
36	Maintenance Load 3 (...	None					1			
37	Maintenance Load 4 (...	None					1			
38	Maintenance Load 5 (...	None					1			
39	Maintenance Load 6 (...	None					1			
40	Maintenance Load 7 (...	None					1			
41	Maintenance Load 8 (...	None					1			
42	Maintenance Load 9 (...	None					1			
43	BLC 1 Transient Area...	None						9		
44	BLC 12 Transient Are...	None						9		

Load Combinations

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.4DL	Yes	Y		DL	1.4																		
2	1.2DL + 1WL 0 AZI	Yes	Y		DL	1.2	2	1	3		4	1												
3	1.2DL + 1WL 30 AZI	Yes	Y		DL	1.2	2	.866	3	.5	5	1												
4	1.2DL + 1WL 45 AZI	Yes	Y		DL	1.2	2	.707	3	.707	6	1												
5	1.2DL + 1WL 60 AZI	Yes	Y		DL	1.2	2	.5	3	.866	7	1												
6	1.2DL + 1WL 90 AZI	Yes	Y		DL	1.2	2		3	1	8	1												
7	1.2DL + 1WL 120 AZI	Yes	Y		DL	1.2	2	-.5	3	.866	9	1												
8	1.2DL + 1WL 135 AZI	Yes	Y		DL	1.2	2	-.707	3	.707	10	1												
9	1.2DL + 1WL 150 AZI	Yes	Y		DL	1.2	2	-.866	3	.5	11	1												
10	1.2DL + 1WL 180 AZI	Yes	Y		DL	1.2	2	-1	3		4	-1												
11	1.2DL + 1WL 210 AZI	Yes	Y		DL	1.2	2	-.866	3	-.5	5	-1												
12	1.2DL + 1WL 225 AZI	Yes	Y		DL	1.2	2	-.707	3	-.707	6	-1												
13	1.2DL + 1WL 240 AZI	Yes	Y		DL	1.2	2	-.5	3	-.866	7	-1												
14	1.2DL + 1WL 270 AZI	Yes	Y		DL	1.2	2		3	-1	8	-1												
15	1.2DL + 1WL 300 AZI	Yes	Y		DL	1.2	2	.5	3	-.866	9	-1												
16	1.2DL + 1WL 315 AZI	Yes	Y		DL	1.2	2	.707	3	-.707	10	-1												
17	1.2DL + 1WL 330 AZI	Yes	Y		DL	1.2	2	.866	3	-.5	11	-1												
18	0.9DL + 1WL 0 AZI	Yes	Y		DL	.9	2	1	3		4	1												
19	0.9DL + 1WL 30 AZI	Yes	Y		DL	.9	2	.866	3	.5	5	1												
20	0.9DL + 1WL 45 AZI	Yes	Y		DL	.9	2	.707	3	.707	6	1												
21	0.9DL + 1WL 60 AZI	Yes	Y		DL	.9	2	.5	3	.866	7	1												
22	0.9DL + 1WL 90 AZI	Yes	Y		DL	.9	2		3	1	8	1												
23	0.9DL + 1WL 120 AZI	Yes	Y		DL	.9	2	-.5	3	.866	9	1												
24	0.9DL + 1WL 135 AZI	Yes	Y		DL	.9	2	-.707	3	.707	10	1												
25	0.9DL + 1WL 150 AZI	Yes	Y		DL	.9	2	-.866	3	.5	11	1												
26	0.9DL + 1WL 180 AZI	Yes	Y		DL	.9	2	-1	3		4	-1												
27	0.9DL + 1WL 210 AZI	Yes	Y		DL	.9	2	-.866	3	-.5	5	-1												
28	0.9DL + 1WL 225 AZI	Yes	Y		DL	.9	2	-.707	3	-.707	6	-1												
29	0.9DL + 1WL 240 AZI	Yes	Y		DL	.9	2	-.5	3	-.866	7	-1												
30	0.9DL + 1WL 270 AZI	Yes	Y		DL	.9	2		3	-1	8	-1												
31	0.9DL + 1WL 300 AZI	Yes	Y		DL	.9	2	.5	3	-.866	9	-1												
32	0.9DL + 1WL 315 AZI	Yes	Y		DL	.9	2	.707	3	-.707	10	-1												
33	0.9DL + 1WL 330 AZI	Yes	Y		DL	.9	2	.866	3	-.5	11	-1												
34	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13	1	14		15	1										
35	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13	.866	14	.5	16	1										
36	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13	.707	14	.707	17	1										

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
37	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	.5	14	.866	18	1												
38	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13		14	1	19	1												
39	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	-.5	14	.866	20	1												
40	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	-.707	14	.707	21	1												
41	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	-.866	14	.5	22	1												
42	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	-1	14		15	-1												
43	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	-.866	14	-.5	16	-1												
44	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	-.707	14	-.707	17	-1												
45	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	-.5	14	-.866	18	-1												
46	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13		14	-1	19	-1												
47	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	.5	14	-.866	20	-1												
48	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	.707	14	-.707	21	-1												
49	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	.866	14	-.5	22	-1												
50	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	1	24																	
51	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	.866	24	.5																
52	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	.707	24	.707																
53	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	.5	24	.866																
54	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23		24	1																
55	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	-.5	24	.866																
56	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	-.707	24	.707																
57	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	-.866	24	.5																
58	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	-1	24																	
59	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	-.866	24	-.5																
60	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	-.707	24	-.707																
61	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	-.5	24	-.866																
62	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23		24	-1																
63	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	.5	24	-.866																
64	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	.707	24	-.707																
65	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	.866	24	-.5																
66	(0.9-0.2Sds)DL + 1E..	Yes	Y		DL	.861	23	1	24																	
67	(0.9-0.2Sds)DL + 1E..	Yes	Y		DL	.861	23	.866	24	.5																
68	(0.9-0.2Sds)DL + 1E..	Yes	Y		DL	.861	23	.707	24	.707																
69	(0.9-0.2Sds)DL + 1E..	Yes	Y		DL	.861	23	.5	24	.866																
70	(0.9-0.2Sds)DL + 1E..	Yes	Y		DL	.861	23		24	1																
71	(0.9-0.2Sds)DL + 1E..	Yes	Y		DL	.861	23	-.5	24	.866																
72	(0.9-0.2Sds)DL + 1E..	Yes	Y		DL	.861	23	-.707	24	.707																
73	(0.9-0.2Sds)DL + 1E..	Yes	Y		DL	.861	23	-.866	24	.5																
74	(0.9-0.2Sds)DL + 1E..	Yes	Y		DL	.861	23	-1	24																	
75	(0.9-0.2Sds)DL + 1E..	Yes	Y		DL	.861	23	-.866	24	-.5																
76	(0.9-0.2Sds)DL + 1E..	Yes	Y		DL	.861	23	-.707	24	-.707																
77	(0.9-0.2Sds)DL + 1E..	Yes	Y		DL	.861	23	-.5	24	-.866																
78	(0.9-0.2Sds)DL + 1E..	Yes	Y		DL	.861	23		24	-1																
79	(0.9-0.2Sds)DL + 1E..	Yes	Y		DL	.861	23	.5	24	-.866																
80	(0.9-0.2Sds)DL + 1E..	Yes	Y		DL	.861	23	.707	24	-.707																
81	(0.9-0.2Sds)DL + 1E..	Yes	Y		DL	.861	23	.866	24	-.5																
82	1.2DL + 1Lv1	Yes	Y		DL	1.2	25	1.5																		
83	1.2DL + 1Lv2	Yes	Y		DL	1.2	26	1.5																		
84	1.2DL + 1Lv3	Yes	Y		DL	1.2	27	1.5																		
85	1.2DL + 1Lv4	Yes	Y		DL	1.2	28	1.5																		
86	1.2DL + 1Lv5	Yes	Y		DL	1.2	29	1.5																		
87	1.2DL + 1Lv6	Yes	Y		DL	1.2	30	1.5																		
88	1.2DL + 1Lv7	Yes	Y		DL	1.2	31	1.5																		

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..
89	1.2DL + 1Lv8	Yes	Y		DL	1.2	32	1.5																
90	1.2DL + 1Lv9	Yes	Y		DL	1.2	33	1.5																
91	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	.058	3		4	.058										
92	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	.05	3	.029	5	.058										
93	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	.041	3	.041	6	.058										
94	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	.029	3	.05	7	.058										
95	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2		3	.058	8	.058										
96	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	-.029	3	.05	9	.058										
97	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	-.041	3	.041	10	.058										
98	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	-.05	3	.029	11	.058										
99	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	-.058	3		4	-.058										
100	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	-.05	3	-.029	5	-.058										
101	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	-.041	3	-.041	6	-.058										
102	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	-.029	3	-.05	7	-.058										
103	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2		3	-.058	8	-.058										
104	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	.029	3	-.05	9	-.058										
105	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	.041	3	-.041	10	-.058										
106	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	.05	3	-.029	11	-.058										
107	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	.058	3		4	.058										
108	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	.05	3	.029	5	.058										
109	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	.041	3	.041	6	.058										
110	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	.029	3	.05	7	.058										
111	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2		3	.058	8	.058										
112	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	-.029	3	.05	9	.058										
113	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	-.041	3	.041	10	.058										
114	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	-.05	3	.029	11	.058										
115	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	-.058	3		4	-.058										
116	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	-.05	3	-.029	5	-.058										
117	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	-.041	3	-.041	6	-.058										
118	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	-.029	3	-.05	7	-.058										
119	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2		3	-.058	8	-.058										
120	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	.029	3	-.05	9	-.058										
121	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	.041	3	-.041	10	-.058										
122	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	.05	3	-.029	11	-.058										
123	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	.058	3		4	.058										
124	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	.05	3	.029	5	.058										
125	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	.041	3	.041	6	.058										
126	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	.029	3	.05	7	.058										
127	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2		3	.058	8	.058										
128	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	-.029	3	.05	9	.058										
129	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	-.041	3	.041	10	.058										
130	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	-.05	3	.029	11	.058										
131	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	-.058	3		4	-.058										
132	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	-.05	3	-.029	5	-.058										
133	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	-.041	3	-.041	6	-.058										
134	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	-.029	3	-.05	7	-.058										
135	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2		3	-.058	8	-.058										
136	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	.029	3	-.05	9	-.058										
137	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	.041	3	-.041	10	-.058										
138	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	.05	3	-.029	11	-.058										
139	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	.058	3		4	.058										
140	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	.05	3	.029	5	.058										

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
141	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	.041	3	.041	6	.058												
142	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	.029	3	.05	7	.058												
143	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2		3	.058	8	.058												
144	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	-.029	3	.05	9	.058												
145	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	-.041	3	.041	10	.058												
146	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	-.05	3	.029	11	.058												
147	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	-.058	3		4	-.058												
148	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	-.05	3	-.029	5	-.058												
149	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	-.041	3	-.041	6	-.058												
150	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	-.029	3	-.05	7	-.058												
151	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2		3	-.058	8	-.058												
152	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	.029	3	-.05	9	-.058												
153	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	.041	3	-.041	10	-.058												
154	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	.05	3	-.029	11	-.058												
155	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	.058	3		4	.058												
156	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	.05	3	.029	5	.058												
157	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	.041	3	.041	6	.058												
158	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	.029	3	.05	7	.058												
159	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2		3	.058	8	.058												
160	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	-.029	3	.05	9	.058												
161	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	-.041	3	.041	10	.058												
162	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	-.05	3	.029	11	.058												
163	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	-.058	3		4	-.058												
164	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	-.05	3	-.029	5	-.058												
165	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	-.041	3	-.041	6	-.058												
166	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	-.029	3	-.05	7	-.058												
167	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2		3	-.058	8	-.058												
168	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	.029	3	-.05	9	-.058												
169	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	.041	3	-.041	10	-.058												
170	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	.05	3	-.029	11	-.058												
171	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	.058	3		4	.058												
172	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	.05	3	.029	5	.058												
173	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	.041	3	.041	6	.058												
174	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	.029	3	.05	7	.058												
175	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2		3	.058	8	.058												
176	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	-.029	3	.05	9	.058												
177	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	-.041	3	.041	10	.058												
178	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	-.05	3	.029	11	.058												
179	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	-.058	3		4	-.058												
180	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	-.05	3	-.029	5	-.058												
181	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	-.041	3	-.041	6	-.058												
182	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	-.029	3	-.05	7	-.058												
183	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2		3	-.058	8	-.058												
184	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	.029	3	-.05	9	-.058												
185	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	.041	3	-.041	10	-.058												
186	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	.05	3	-.029	11	-.058												
187	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	.058	3		4	.058												
188	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	.05	3	.029	5	.058												
189	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	.041	3	.041	6	.058												
190	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	.029	3	.05	7	.058												
191	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2		3	.058	8	.058												
192	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	-.029	3	.05	9	.058												

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
193	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	-.041	3	.041	10	.058												
194	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	-.05	3	.029	11	.058												
195	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	-.058	3		4	-.058												
196	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	-.05	3	-.029	5	-.058												
197	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	-.041	3	-.041	6	-.058												
198	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	-.029	3	-.05	7	-.058												
199	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2		3	-.058	8	-.058												
200	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	.029	3	-.05	9	-.058												
201	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	.041	3	-.041	10	-.058												
202	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	.05	3	-.029	11	-.058												
203	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	.058	3		4	.058												
204	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	.05	3	.029	5	.058												
205	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	.041	3	.041	6	.058												
206	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	.029	3	.05	7	.058												
207	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2		3	.058	8	.058												
208	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	-.029	3	.05	9	.058												
209	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	-.041	3	.041	10	.058												
210	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	-.05	3	.029	11	.058												
211	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	-.058	3		4	-.058												
212	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	-.05	3	-.029	5	-.058												
213	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	-.041	3	-.041	6	-.058												
214	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	-.029	3	-.05	7	-.058												
215	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2		3	-.058	8	-.058												
216	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	.029	3	-.05	9	-.058												
217	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	.041	3	-.041	10	-.058												
218	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	.05	3	-.029	11	-.058												
219	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	.058	3		4	.058												
220	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	.05	3	.029	5	.058												
221	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	.041	3	.041	6	.058												
222	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	.029	3	.05	7	.058												
223	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2		3	.058	8	.058												
224	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	-.029	3	.05	9	.058												
225	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	-.041	3	.041	10	.058												
226	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	-.05	3	.029	11	.058												
227	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	-.058	3		4	-.058												
228	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	-.05	3	-.029	5	-.058												
229	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	-.041	3	-.041	6	-.058												
230	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	-.029	3	-.05	7	-.058												
231	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2		3	-.058	8	-.058												
232	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	.029	3	-.05	9	-.058												
233	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	.041	3	-.041	10	-.058												
234	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	.05	3	-.029	11	-.058												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N25	max	1183.31	20	1883.849	39	2024.913	3	376.201	18	2280.038	3	210.835	30
2		min	-1190.227	12	25.072	31	-2020.47	27	-2040.759	42	-2279.453	27	-3282.05	38
3	N1	max	1155.352	8	1887.266	45	1859.367	17	396.445	19	2102.953	25	3289.147	45
4		min	-1148.527	32	4.333	21	-1855	25	-2043.206	43	-2103.636	17	-261.542	21
5	N13	max	1899.39	22	1818.908	34	481.556	18	3701.663	34	1796.805	14	688.938	167

Envelope Joint Reactions (Continued)

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
6		min	-1899.265	30	-41.654	26	-490.754	10	-414.325	26	-1796.878	6	-688.983	223
7	Totals:	max	3525.32	22	5294.964	42	3952.596	18						
8		min	-3525.32	30	1345.794	66	-3952.597	10						

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

	Member	Shape	Code Check	Loc[in]	LC	Shea...	Loc.....	L...	phi*Pn...	phi*Pn...	phi*Mn...	phi*Mn...	...	Eqn
1	M2	PIPE_3.5	.484	40	45	.187	40	9	75262....	78750	7953.75	7953.75	2...	H1-1b
2	M12	PIPE_3.5	.483	40	39	.200	40	11	75262....	78750	7953.75	7953.75	2...	H1-1b
3	M7	PIPE_3.5	.466	40	34	.166	40	6	75262....	78750	7953.75	7953.75	2...	H1-1b
4	M1	C3X5	.402	34.856	45	.138	6.536	y 34	11202....	47628	981.263	4104	1...	H1-1b
5	M11	C3X5	.402	34.856	41	.138	63....	y 34	11202....	47628	981.263	4104	1...	H1-1b
6	MP5	PIPE_2.0	.400	48	10	.063	48	10	20866....	32130	1871.6...	1871.6...	1...	H1-1b
7	MP4	PIPE_2.0	.388	48	10	.032	48	4	20866....	32130	1871.6...	1871.6...	1...	H1-1b
8	M6	C3X5	.384	34.856	34	.131	63....	y 45	37027....	47628	981.263	4020.2...	1	H1-1b
9	MP2	PIPE_2.0	.368	48	4	.057	48	15	20866....	32130	1871.6...	1871.6...	1...	H1-1b
10	MP3	PIPE_2.0	.360	48	4	.043	48	9	20866....	32130	1871.6...	1871.6...	2...	H1-1b
11	MP8	PIPE_2.0	.356	48	4	.051	48	10	20866....	32130	1871.6...	1871.6...	1...	H1-1b
12	MP1	PIPE_2.0	.353	48	15	.055	48	10	20866....	32130	1871.6...	1871.6...	2...	H1-1b
13	MP6	PIPE_2.0	.338	48	2	.047	48	3	20866....	32130	1871.6...	1871.6...	1...	H1-1b
14	MP9	PIPE_2.0	.338	48	10	.035	48	14	20866....	32130	1871.6...	1871.6...	1...	H1-1b
15	MP7	PIPE_2.0	.337	48	4	.044	48	15	20866....	32130	1871.6...	1871.6...	2...	H1-1b
16	M10	6.5"x0.37...	.277	21	2	.085	21	y 37	3513.8...	75757.5	583.963	6164.3...	1...	H1-1b
17	M5	6.5"x0.37...	.275	21	12	.088	21	y 42	3513.8...	75757.5	583.963	6396.8...	1...	H1-1b
18	M15	6.5"x0.37...	.261	21	8	.088	21	y 42	3513.8...	75757.5	583.963	6410.5...	1...	H1-1b
19	M4	L2x2x3	.195	0	13	.029	0	y 41	18051....	23392.8	557.717	1239.29	2...	H2-1
20	M9	L2x2x3	.184	0	2	.028	0	y 46	18051....	23392.8	557.717	1239.29	2...	H2-1
21	M13	L2x2x3	.171	0	7	.029	0	z 43	18051....	23392.8	557.717	1239.29	2...	H2-1
22	M3	L2x2x3	.165	0	12	.029	0	z 49	18051....	23392.8	557.717	1239.29	2...	H2-1
23	M8	L2x2x3	.161	0	2	.028	0	z 38	18051....	23392.8	557.717	1239.29	2...	H2-1
24	M14	L2x2x3	.160	0	8	.029	0	y 35	18051....	23392.8	557.717	1239.29	2...	H2-1
25	M19	PIPE_2.0	.145	24	10	.136	24	2	14916....	32130	1871.6...	1871.6...	1...	H1-1b
26	M21	PIPE_2.0	.138	72	4	.127	24	12	14916....	32130	1871.6...	1871.6...	1...	H1-1b
27	M20	PIPE_2.0	.132	24	16	.116	24	6	14916....	32130	1871.6...	1871.6...	1...	H1-1b
28	M23	L6 5/8x4 ...	.129	42	33	.035	42	y 17	15453....	66065....	1040.5...	3031.0...	2...	H2-1
29	M24	L6 5/8x4 ...	.126	24.063	18	.031	42	y 6	15453....	66065....	1040.5...	3031.0...	1...	H2-1
30	H2	PIPE_3.5	.125	65	26	.087	72	4	60666....	78750	7953.75	7953.75	1...	H1-1b
31	M22	L6 5/8x4 ...	.122	0	21	.038	0	y 3	15453....	66065....	1040.5...	3031.0...	2...	H2-1
32	H1	PIPE_3.5	.120	48	92	.097	24	10	60666....	78750	7953.75	7953.75	1...	H1-1b
33	H3	PIPE_3.5	.117	48	146	.083	24	16	60666....	78750	7953.75	7953.75	1...	H1-1b

Envelope AISI S100-16: LRFD Cold Formed Steel Code Checks

Mem...	Shape	Code Check	Loc[in]	LC	She...	Lo...	...	...	phi*...	phi*T...	phi*...	phi*...	phi...	phi...	Cb	Eqn
No Data to Print ...																

APPENDIX D

ADDITIONAL CALCUATIONS

Trylon

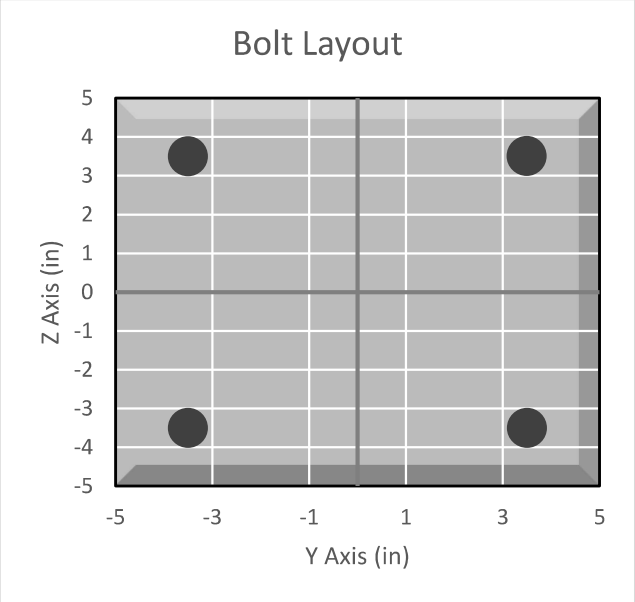
Analysis date: 8/2/2021

BOLT TOOL 1.5.2

Project Data	
Job Code:	189195
Carrier Site ID:	BU# 876382
Carrier Site Name:	ERLIN / LAVIANA ORCHAF

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

Bolt Properties		
Connection Type:	Bolt	
Diameter:	0.625	in
Grade:	A325	--
Yield Strength (Fy):	92	ksi
Ultimate Strength (Fu):	120	ksi
Number of Bolts:	4	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	-	in



Connection Description
Standoff to Collar Connection

Bolt Check*		
Tensile Capacity (ϕT_n):	20340.1	lbs
Shear Capacity (ϕV_n):	13805.8	lbs
Tension Force (T_u):	3544.4	lbs
Shear Force (V_u):	581.5	lbs
Tension Usage:	16.6%	--
Shear Usage:	4.0%	--
Interaction:	16.6%	Pass
Controlling Member:	M12	--
Controlling LC:	42	--

**Rating per TIA-222-H Section 15.5*

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

APPENDIX E

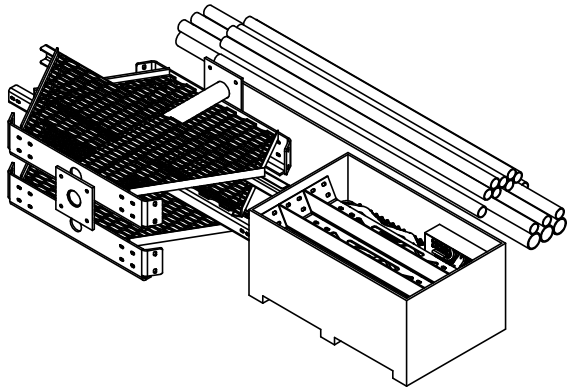
SUPPLEMENTAL DRAWINGS

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	

C

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

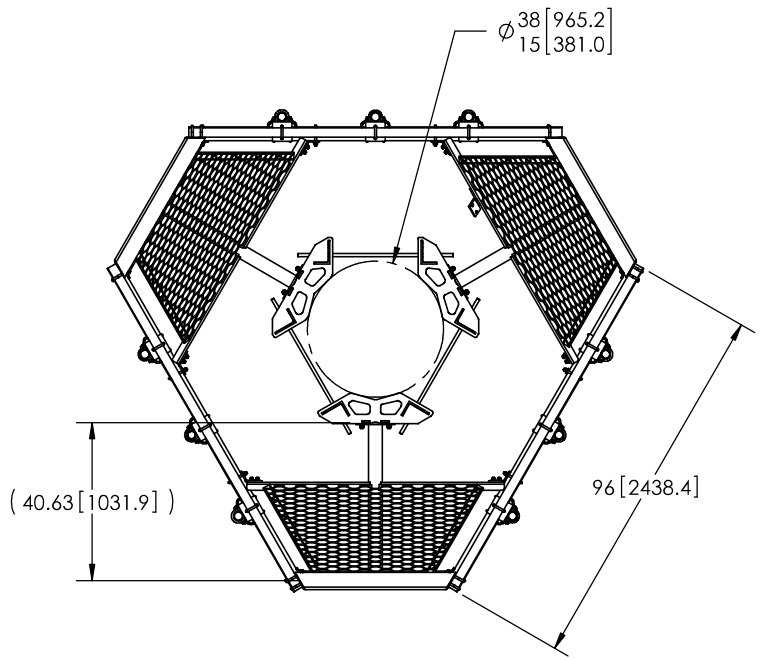


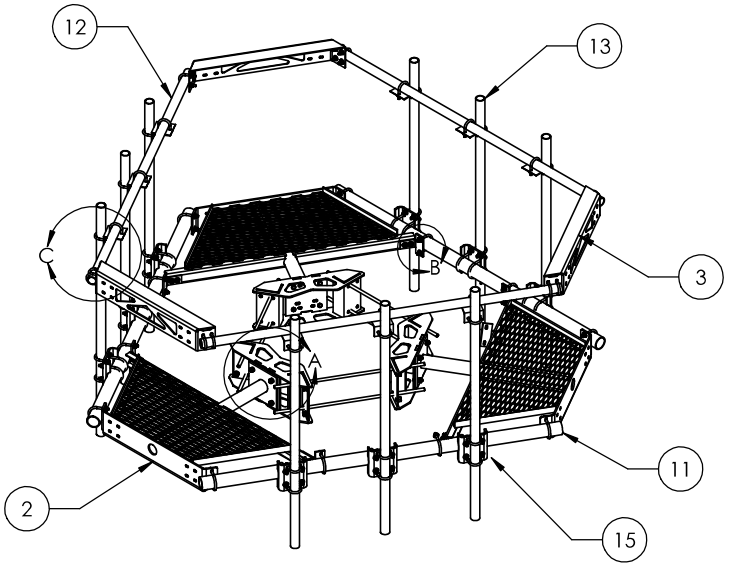
NOTES:
1. CUSTOMER ASSEMBLY SHEETS 2–3.

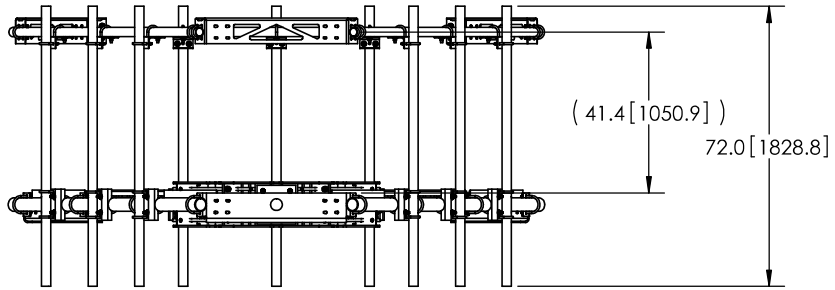
ALL DIMENSIONS ARE IN INCHES U.O.S.
TOLERANCES UNLESS OTHERWISE SPECIFIED:
.X = ± .12 ANGLES ±2°
.XX = ± .06 FRACTIONS ±1/32
.XXX= ± .03
REMOVE BURRS AND BREAK EDGES .005

DO NOT SCALE THIS PRINT

DRAWN BY: MSM	SHEET: 1 of 3	PART NUMBER: MC-PK8-C	
CHECKED BY: TP	SCALE: NTS	DESCRIPTION: LOW PROFILE PLATFORM KIT 8' FACE	
DATE: 10/18/11	MATERIAL: A36, A500	DRAWING TYPE: ASSEMBLY DRAWING	
REVISION: C	FINISH: GALV A123	WEIGHT: 1410.14 LBS	ANDREW® WESTCHESTER, IL. 60154 U.S.A.





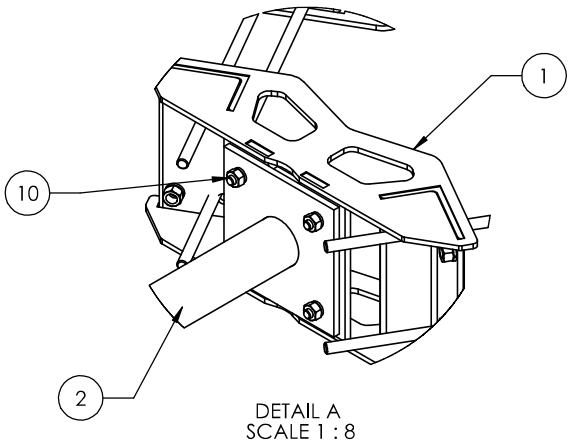


ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT
C				
1	MC-RM1550-3	12" - 50" OD RINGMOUNT	1	230.42 LBS
2	MTC300601	Low Profile Co-Location Platform Snub Nose	3	134.21 LBS
3	MT195801	Corner Weldment Snub Nose Handrail	3	27.10 LBS
4	XA2020.01	CROSS OVER ANGLE	9	2.65 LBS
5	GUB-4356	1/2" X 3-5/8" X 6" GALV U-BOLT	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

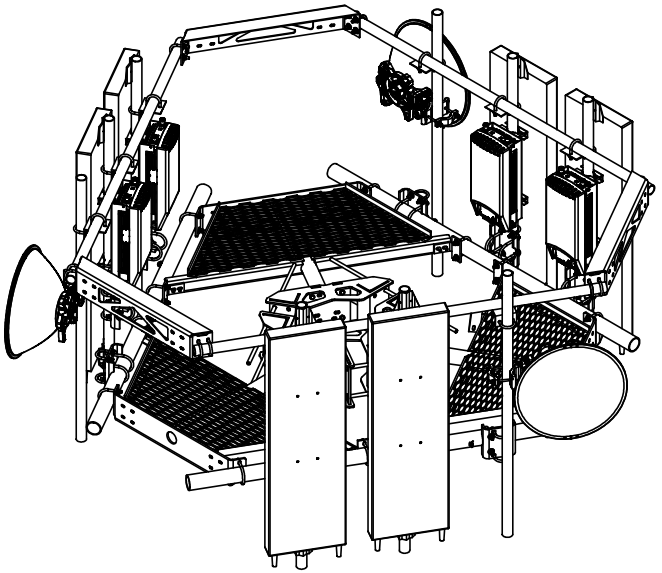
NOTES:
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.
2. WILL FIT MONOPOLES 15"–38" OD.

ALL DIMENSIONS ARE IN INCHES U.O.S.
TOLERANCES UNLESS OTHERWISE SPECIFIED:
.X = ± .12 ANGLES ±2°
.XX = ± .06 FRACTIONS ±1/32
.XXX= ± .03
REMOVE BURRS AND BREAK EDGES .005
DO NOT SCALE THIS PRINT

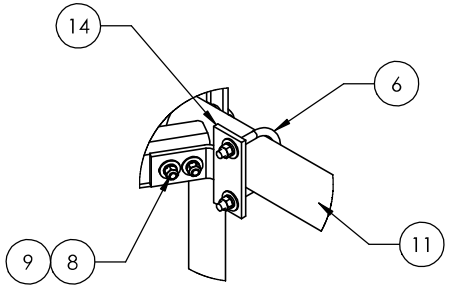
DRAWN BY: MSM	SHEET: 2 of 3	PART NUMBER: MC-PK8-C	
CHECKED BY: TP	SCALE: NTS	DESCRIPTION: 25" OD Snub Nose MT-196	
DATE: 10/18/11	MATERIAL: A36, A53	DRAWING TYPE: ASSEMBLY DRAWING	
REVISION: C	FINISH: GALV A123	WEIGHT: 1361.27 LBS	ANDREW® WESTCHESTER, IL. 60154 U.S.A.



DETAIL A
SCALE 1 : 8



WITH ANTENNAS



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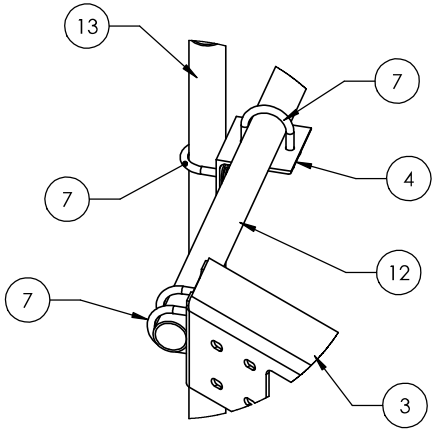
SCALE 1 : 8



DETAIL C
SCALE 1 : 8

NOTES:
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.

ALL DIMENSIONS ARE IN INCHES U.O.S.
TOLERANCES UNLESS OTHERWISE SPECIFIED:
.X = ± .12 ANGLES ±2°
.XX = ± .06 FRACTIONS ±1/32
.XXX= ± .03
REMOVE BURRS AND BREAK EDGES .005
DO NOT SCALE THIS PRINT

DRAWN BY: MSM	SHEET: 3 of 3	PART NUMBER: MC-PK8-C
CHECKED BY: TP	SCALE: NTS	DESCRIPTION: 25" OD Snub Nose MT-196
DATE: 10/18/11	MATERIAL: A36, A53	DRAWING TYPE: ASSEMBLY DRAWING
REVISION: C	FINISH: GALV A123	
	WEIGHT: 1361.27 LBS	

ANDREW®
WESTCHESTER, IL. 60154
U.S.A.

Exhibit F

Power Density/RF Emissions Report

EBI Consulting

environmental | engineering | due diligence

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

Dish Wireless Existing Facility

Site ID: 876382

BOBDL00095A
1684 Chamberlain Highway
Berlin, Connecticut 06037

June 24, 2021

EBI Project Number: 6221003210

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**37.81%**

21 B Street, Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

June 24, 2021

Dish Wireless

Emissions Analysis for Site: 876382 - BOBDL00095A

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **1684 Chamberlain Highway** in **Berlin, 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu W/cm^2$). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed Dish Wireless Wireless antenna facility located at 1684 Chamberlain Highway in Berlin, 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 111 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 #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21
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):	111 feet	Height (AGL):	111 feet	Height (AGL):	111 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 A1 MPE %:	**15.04%**	Antenna B1 MPE %:	**15.04%**	Antenna C1 MPE %:	**15.04%**

Site Composite MPE %	
Carrier	**MPE %**
Dish Wireless (Max at Sector A):	15.04%
Town	0.01%
Metro PCS	1.43%
Clearwire	0.14%
Sprint	4.02%
T-Mobile	4.08%
Verizon	7.2%
AT&T	5.89%
Site Total MPE % :	37.81%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	15.04%
Dish Wireless Sector B Total:	15.04%
Dish Wireless Sector C Total:	15.04%
Site Total MPE % :	37.81%

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 (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
Dish Wireless 600 MHz 5G	4	1667.71	111.0	21.75	600 MHz 5G	400	5.44%
Dish Wireless 1900 MHz 5G	4	7363.09	111.0	96.04	1900 MHz 5G	1000	9.60%
						Total:	**15.04%**

• 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:	15.04%
Sector B:	15.04%
Sector C:	15.04%
Dish Wireless Maximum MPE % (Sector A):	15.04%
Site Total:	37.81%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **37.81%** 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 G

Letter of Authorization

4545 E River Rd, Suite 320
West Henrietta, NY 14586

Phone: (585) 445-5896
Fax: (724) 416-4461
www.crowncastle.com

Crown Castle Letter of Authorization

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

Re: Tower Share Application
Crown Castle telecommunications site at:
1684 CHAMBERLAIN HIGHWAY, BERLIN, CT 6037

GLOBAL SIGNAL ACQUISITIONS II LLC ("Crown Castle") hereby authorizes DISH Wireless LLC, including their Agent, to act as our Agent in the processing of all zoning applications, building permits and approvals through the CT - CONNECTICUT SITING COUNCIL for the existing wireless communications site described below:

Crown Site ID/Name:	**876382/BERLIN / LAVIANA ORCHARD**
Customer Site ID:	**BOBDL00095A/CT-CCI-T-876382**
Site Address:	**1684 Chamberlain Highway, BERLIN, CT 6037**

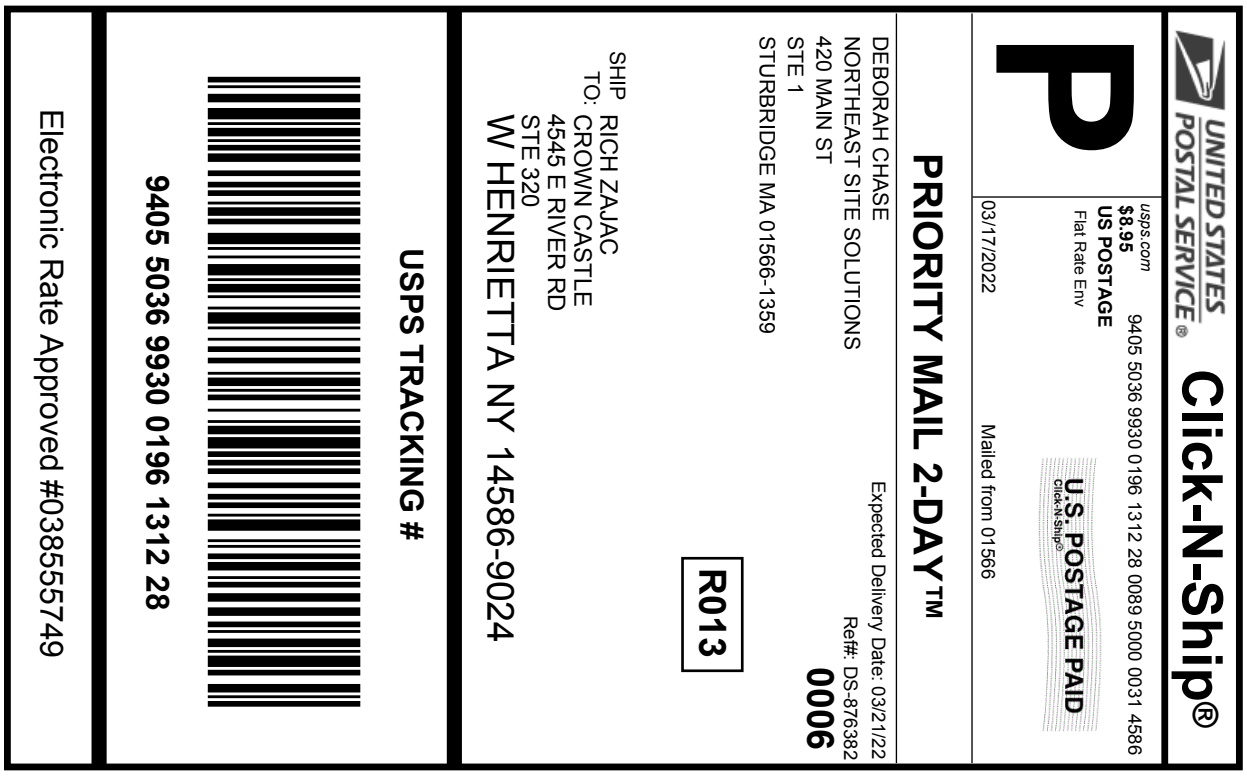
Crown Castle

By: _____ Date: 3/14/2022

Richard Zajac
Site Acquisition Specialist

Exhibit H

Recipient Mailings



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Instructions

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2. **Place your label so it does not wrap around the edge of the package.**
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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.**

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USPS TRACKING # :
9405 5036 9930 0196 1312 28

Trans. #:	559097886
Print Date:	03/17/2022
Ship Date:	03/17/2022
Expected Delivery Date:	03/21/2022

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

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

Ref#: DS-876382

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

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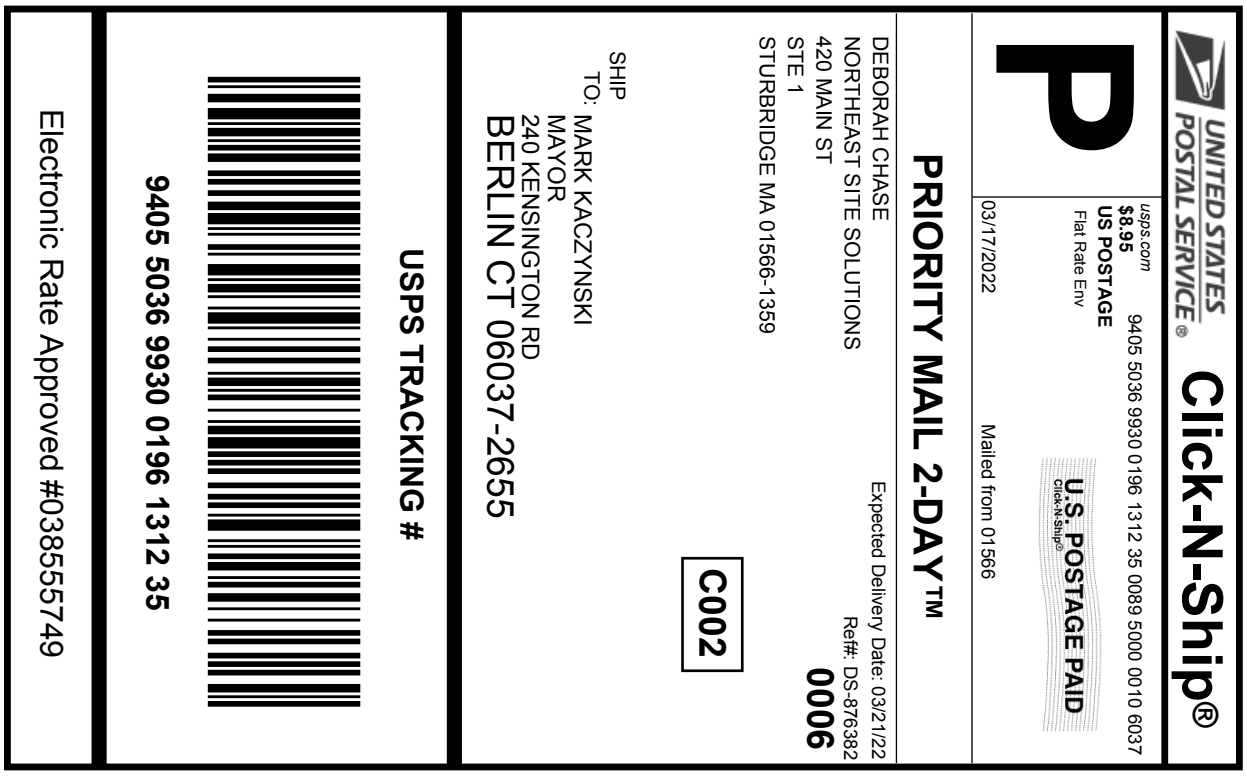

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Trans. #:	559097886
Print Date:	03/17/2022
Ship Date:	03/17/2022
Expected Delivery Date:	03/21/2022

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

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

Ref#: DS-876382

To: MARK KACZYNSKI
MAYOR
240 KENSINGTON RD
BERLIN CT 06037-2655

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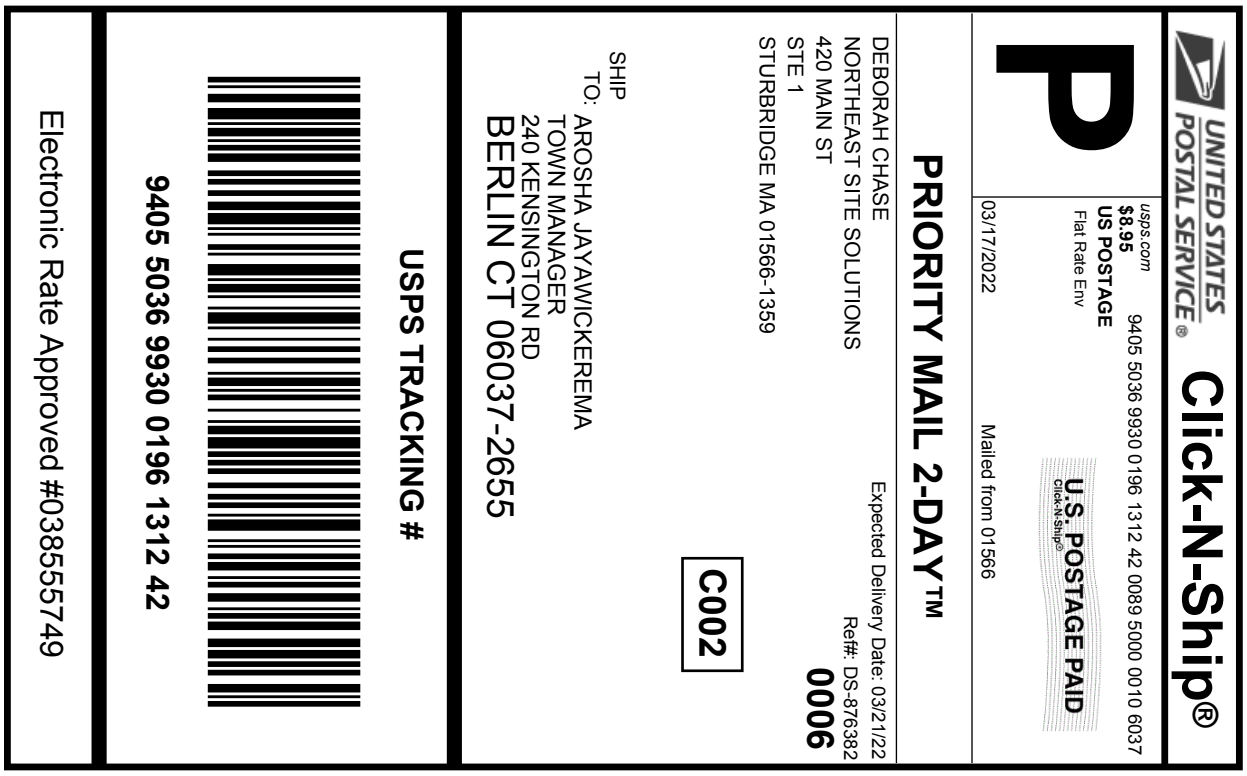

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Click-N-Ship® Label Record

USPS TRACKING # :
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Trans. #:	559097886
Print Date:	03/17/2022
Ship Date:	03/17/2022
Expected Delivery Date:	03/21/2022

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

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

Ref#: DS-876382

To: AROSHA JAYAWICKEREMA
TOWN MANAGER
240 KENSINGTON RD
BERLIN CT 06037-2655

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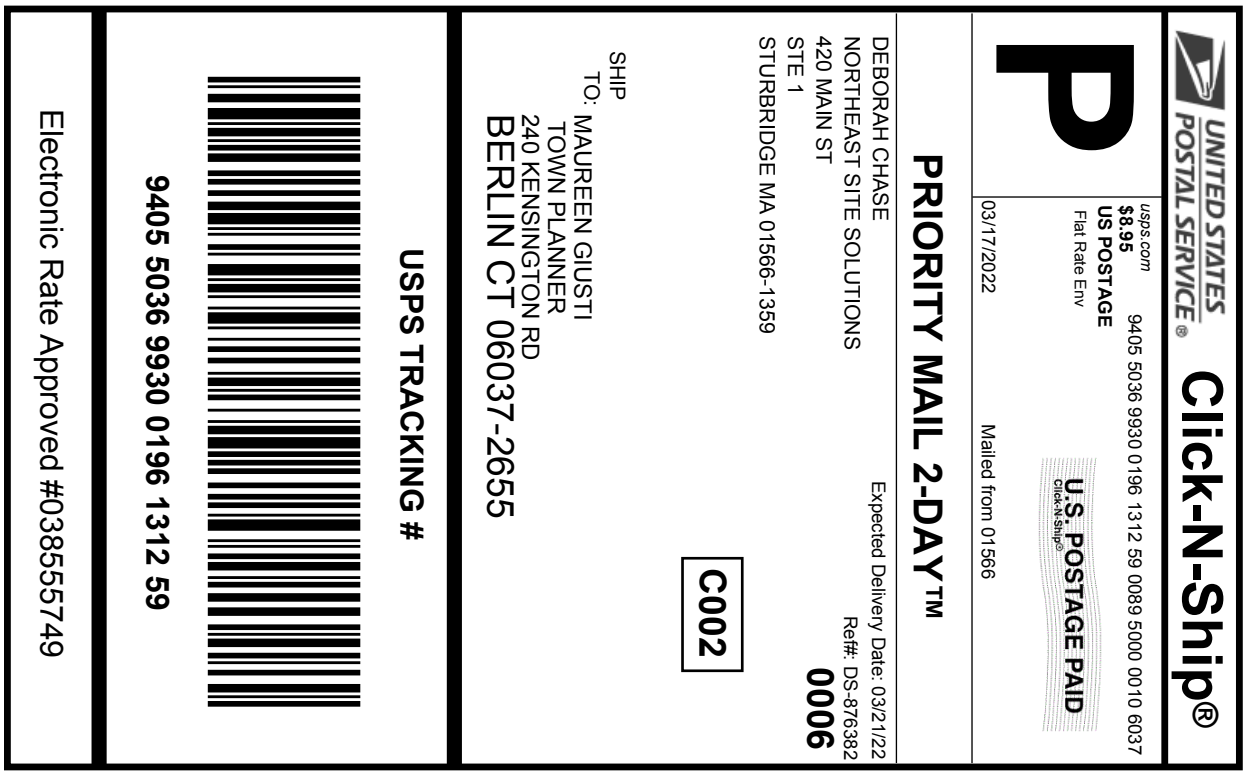

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9405 5036 9930 0196 1312 59

Trans. #:	559097886
Print Date:	03/17/2022
Ship Date:	03/17/2022
Expected Delivery Date:	03/21/2022

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

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

Ref#: DS-876382

To: MAUREEN GIUSTI
TOWN PLANNER
240 KENSINGTON RD
BERLIN CT 06037-2655

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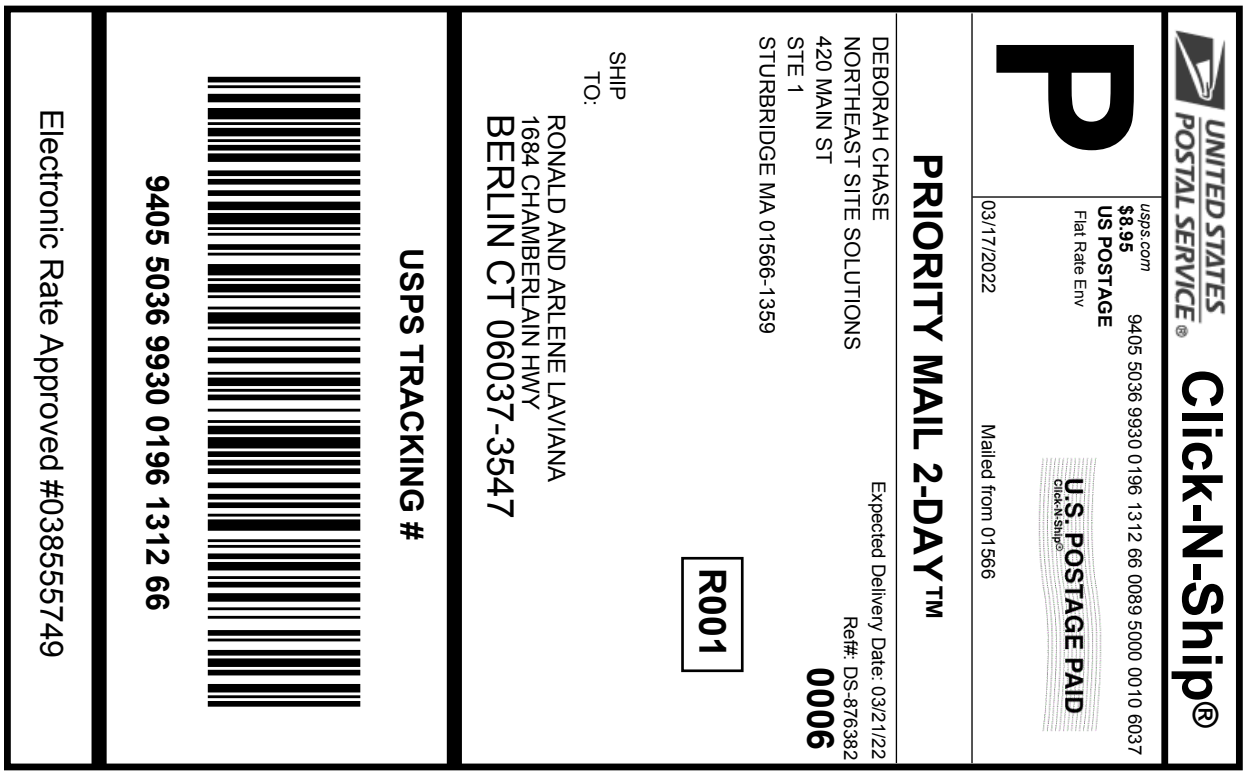

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Click-N-Ship® Label Record

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9405 5036 9930 0196 1312 66

Trans. #:	559097886
Print Date:	03/17/2022
Ship Date:	03/17/2022
Expected Delivery Date:	03/21/2022

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

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

Ref#: DS-876382

To: RONALD AND ARLENE LAVIANA
1684 CHAMBERLAIN HWY
BERLIN CT 06037-3547

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876382 Crown DISL

UNITED STATES POSTAL SERVICE.

FARMINGTON
210 MAIN ST
FARMINGTON, CT 06032-9998
(800)275-8777

03/18/2022 03:23 PM

Product	Qty	Unit Price	Price
Prepaid Mail West Henrietta, NY 14586 Weight: 0 lb 1.90 oz Acceptance Date: Fri 03/18/2022 Tracking #: 9405 5036 9930 0196 1312 28	1		$0.00
Prepaid Mail Berlin, CT 06037 Weight: 0 lb 8.30 oz Acceptance Date: Fri 03/18/2022 Tracking #: 9405 5036 9930 0196 1312 66	1		$0.00
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