NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

October 13, 2021

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

RE: Tower Share Application
1358 New Britain Avenue, West Hartford CT 06110
Latitude: 41.730746
Longitude: 72.753669
Site# 876324_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 1358 New Britain Avenue in West Hartford, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900 5G MHz antenna and six (6) RRUs, at the 86-foot level of the existing 130-foot monopole tower, one (1) Fiber cables will also be installed. Dish Wireless LLC equipment cabinets will be placed within 7x5 lease area. Included are plans by B+T Group, dated August 18, 2021 Exhibit C. Also included is a structural analysis prepared by Crown Castle, dated September 13, 2021, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. The facility was approved by the CT Siting Council, TS-NEXTEL-155-010531 on July 13, 2001. Please see attached Exhibit A.

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 the Mayor, Shari Cantor and Todd Dumais, Town Planner for the Town of West Hartford, as well as the tower owner (Crown Castle) and property owner (West Hartford Methodist Church)

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 tower is 130-feet; Dish Wireless LLC proposed antennas will be located at a center line height of 86-feet.

2. The proposed modifications will not result in the 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. As indicated in the attached power density calculations, the combined site operations will result in a total power density of 16.94% 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 indicates 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 West Hartford. 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 86-foot level of the existing 130-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 West Hartford.

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 Shari Cantor
West Hartford Town Hall
50 S. Main Street, West Hartford CT 06107

Todd Dumais, Town Planner
West Hartford Town Hall
50 S. Main Street, West Hartford CT 06107

West Hartford Methodist Church
1358 New Britain Ave. West Hartford, CT 06110

Crown Castle, Tower Owner

Exhibit A

Original Facility Approval

CT-257
08

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Ten Franklin Square
New Britain, Connecticut 06051
Phone: (860) 827-2935
Fax: (860) 827-2950

July 13, 2001

Ronald C. Clark
~~Manager, Real Estate~~ Operations
Nextel Communications
100 Corporate Park
Rocky Hill, CT 06067

RE: **TS-NEXTEL-155-010531** - Nextel Communications, Inc. request for an order to approve tower sharing at an existing telecommunications facility located at 1358 New Britain Avenue, West Hartford, Connecticut.

Dear Mr. Clark:

At a public meeting held July 11, 2001, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures, with the condition for placement of an architectural wall façade with a brick veneer consistent the adjacent church building and vegetative landscaping, and that these plans be submitted to the West Hartford Town Planner for review. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Any additional change to this facility may require an explicit request to this agency pursuant to General Statutes § 16-50aa or notice pursuant to Regulations of Connecticut State Agencies Section 16-50j-73, as applicable. Such request or notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

This decision applies only to this request for tower sharing and is not applicable to any other request or construction.

* The proposed shared use is to be implemented as specified in your letters dated May 31, 2001, June 11, 2001, and July 9, 2001.

Thank you for your attention and cooperation.

Very truly yours,

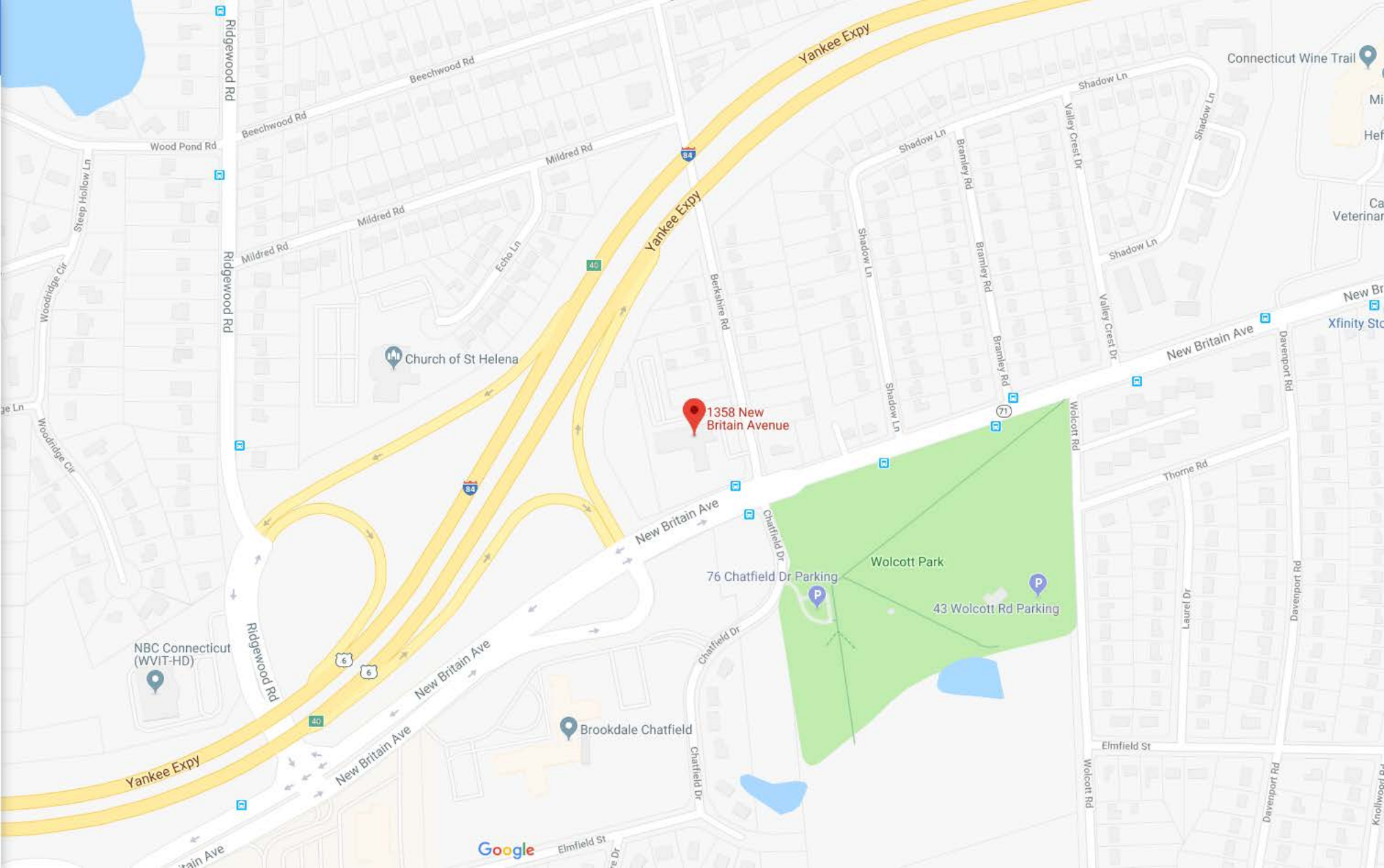
Mortimer A. Gelston
Chairman

MAG/RKP/laf

c: Barry M. Feldman, Town Manager, Town of West Hartford
Donald Foster, Town Planner, Town of West Hartford
Julie M. Donaldson, Esq., Hurwitz & Sagarin LLC
Christopher B. Fisher, Esq., Cuddy & Feder & Worby LLP
Stephen J. Humes, Esq., LeBoeuf, Lamb, Greene & MacRae

Exhibit B

Property Card


Yankee Expy
Ridgewood Rd
Beechwood Rd
Wood Pond Rd
Mildred Rd
Steep Hollow Ln
Woodridge Cir
Echo Ln
Church of St Helena
1358 New Britain Avenue
Berkshire Rd
Shadow Ln
Bramley Rd
Valley Crest Dr
New Britain Ave
Davenport Rd
Wolcott Rd
Thorne Rd
Chatfield Dr
Wolcott Park
76 Chatfield Dr Parking
43 Wolcott Rd Parking
Laurel Dr
Elmfield St
Brookdale Chatfield
NBC Connecticut (WVIT-HD)
Connecticut Wine Trail
Xfinity Sto
Google

1358 NEW BRITAIN AVENUE

Location	1358 NEW BRITAIN AVENUE	**Mblu**	E15/ 3771/ 1358/ /
Parcel ID	3771 2 1358 0002	**Owner**	WEST HARTFORD METHODIST CHURCH
Assessment	$161,070	**Appraisal**	$235,300
Vision Id #	18679	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$55,100	$180,200	$235,300
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$34,930	$126,140	$161,070

Owner of Record

Owner	WEST HARTFORD METHODIST CHURCH
Co-Owner	C/O CROWN CASTLE (SITE 876324)
Address	PMB 331 4017 WASHINGTON ROAD MCMURRAY, PA 15317

Sale Price	$0
Certificate	1
Book & Page	515/ 149
Sale Date	07/16/1973
Instrument	U

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
WEST HARTFORD METHODIST CHURCH	$0	1	515/ 149	U	07/16/1973
	$0	1	298/ 256	U	

Building Information

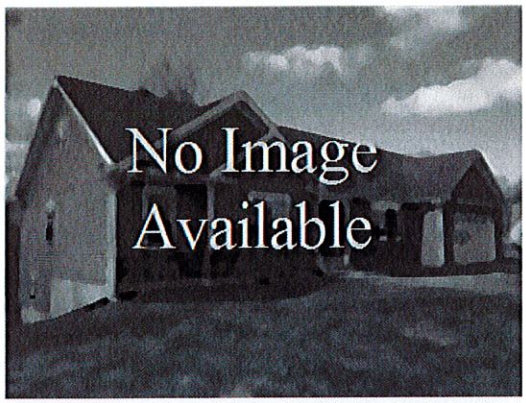
Building 1 : Section 1

Year Built:	1998
Living Area:	200
Replacement Cost:	$40,602
Building Percent Good:	82
Replacement Cost Less Depreciation:	$33,300

Building Photo

Building Attributes	
Field	**Description**

STYLE	Equipment Shed
MODEL	Comm/Ind
Grade	C 1.50
Stories:	1
Occupancy	
Exterior Wall 1	Brick w/Frame
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Built Up
Interior Wall 1	Typical
Interior Wall 2	
Floor Type	Reinf Concrete
Floor Cover	Vinyl
Heating Fuel	Typical
Heating Type	Complete HVAC
AC Type	Complete HVAC
As Built Use	ESHD
Bldg Use	Commercial
# of Bedrooms	
Total Baths	
Type	00
Wet Sprinkler	
Dry Sprinkler	
1st Floor Use:	
Class	Class C
Frame Type	Rigid Steel
Plumbing	LIGHT
Ceiling	Not Applicable
Group	COM
Wall Height	10
Adjustment	



(http://images.vgsi.com/photos/WestHartfordCTPhotos//default.j

Building Layout

TEL[200]

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
TEL	TELEPHONE BUILDING	200	200
		200	200

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	201
Description	Commercial
Zone	R-6

Land Line Valuation

Size (Acres)	0.01
Frontage	
Depth	

Neighborhood		**Assessed Value**	$126,140
Alt Land Appr	No	**Appraised Value**	$180,200
Category			

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
CP18	Chn Link Fence 8' hght			800 LF	$13,800	1
CFC5	Shed - Concrete Block			135 SF	$8,000	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$55,100	$180,200	$235,300
2016	$55,100	$180,200	$235,300
2015	$38,400	$150,300	$188,700

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$34,930	$126,140	$161,070
2016	$34,930	$126,140	$161,070
2015	$26,880	$105,210	$132,090

Exhibit C

Construction Drawings

DISH Wireless L.L.C. SITE ID:

BOBDL00078A

DISH Wireless L.L.C. SITE ADDRESS:

1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

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)
- INSTALL (1) PROPOSED METER IN A EXISTING SOCKET
- REPLACE EXISTING FENCE AS NECESSARY

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

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:	WEST HARTFORD METHODIST CHURCH
ADDRESS:	1358 NEW BRITAIN AVENUE WEST HARTFORD, CT 06110
TOWER TYPE:	MONOPOLE
TOWER CO SITE ID:	876324
TOWER APP NUMBER:	556615
COUNTY:	HARTFORD
LATITUDE (NAD 83):	41° 43' 50.7" N 41.730746 N
LONGITUDE (NAD 83):	72° 45' 13.2" W 72.753669 W
ZONING JURISDICTION:	CONNECTICUT SITING COUNCIL
ZONING DISTRICT:	R-6
PARCEL NUMBER:	09003155-0381170001
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	V-B
POWER COMPANY:	EVERSOURCE
TELEPHONE COMPANY:	CROWN CASTLE

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 DISTRICT OFFICE:

FROM WATERBURY, TAKE 84 EAST TO EXIT 40, EXIT OFF TURN LEFT, GO TO FIRST STOP LIGHT, TURN LEFT AGAIN, TOWER IN CHURCH PARKING LOT ON THE LEFT.

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

8/18/21

B&T ENGINEERING, INC.

DRAWN BY:	CHECKED BY:	APPROVED BY:
MAH	JTS	MDW

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	7/2/21	ISSUED FOR REVIEW
0	8/18/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

127816.003.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00078A
1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

SHEET TITLE

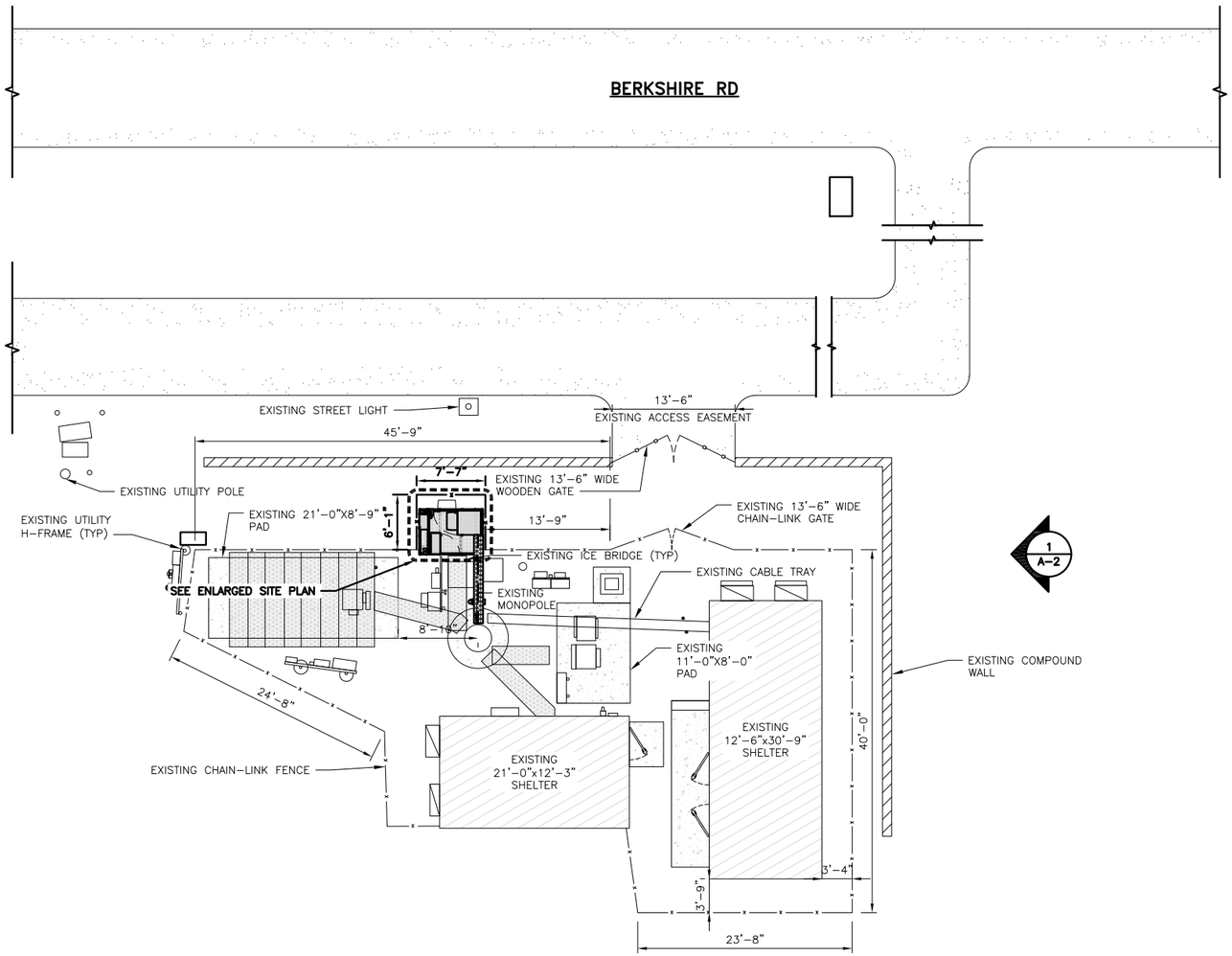
TITLE SHEET

SHEET NUMBER

T-1

NOTES

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



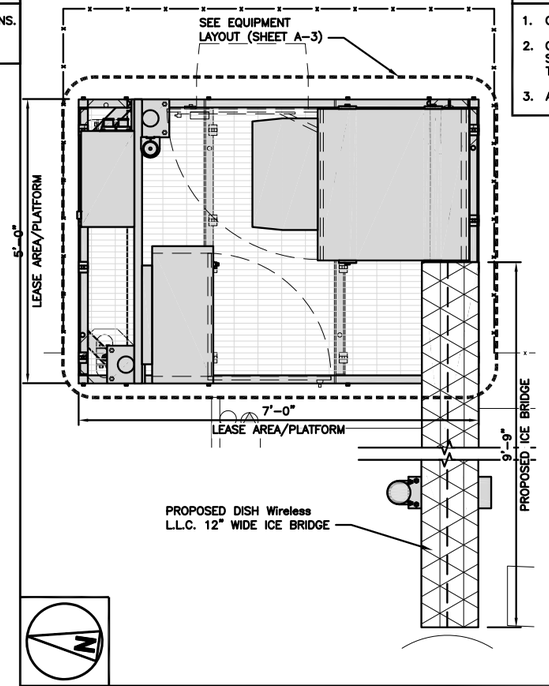
OVERALL SITE PLAN

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

1

NOTES

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



ENLARGED SITE PLAN

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

2

OVERALL UTILITY PLAN

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
www.btgrp.com

STATE OF COLORADO · CHRISTOPHER T. STOUT · No. 23924 · LICENSED · PROFESSIONAL ENGINEER

8/18/21

B&T ENGINEERING, INC.

DRAWN BY:	CHECKED BY:	APPROVED BY:
MAH	JTS	MDW

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS

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127816.003.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00078A
1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

SHEET TITLE

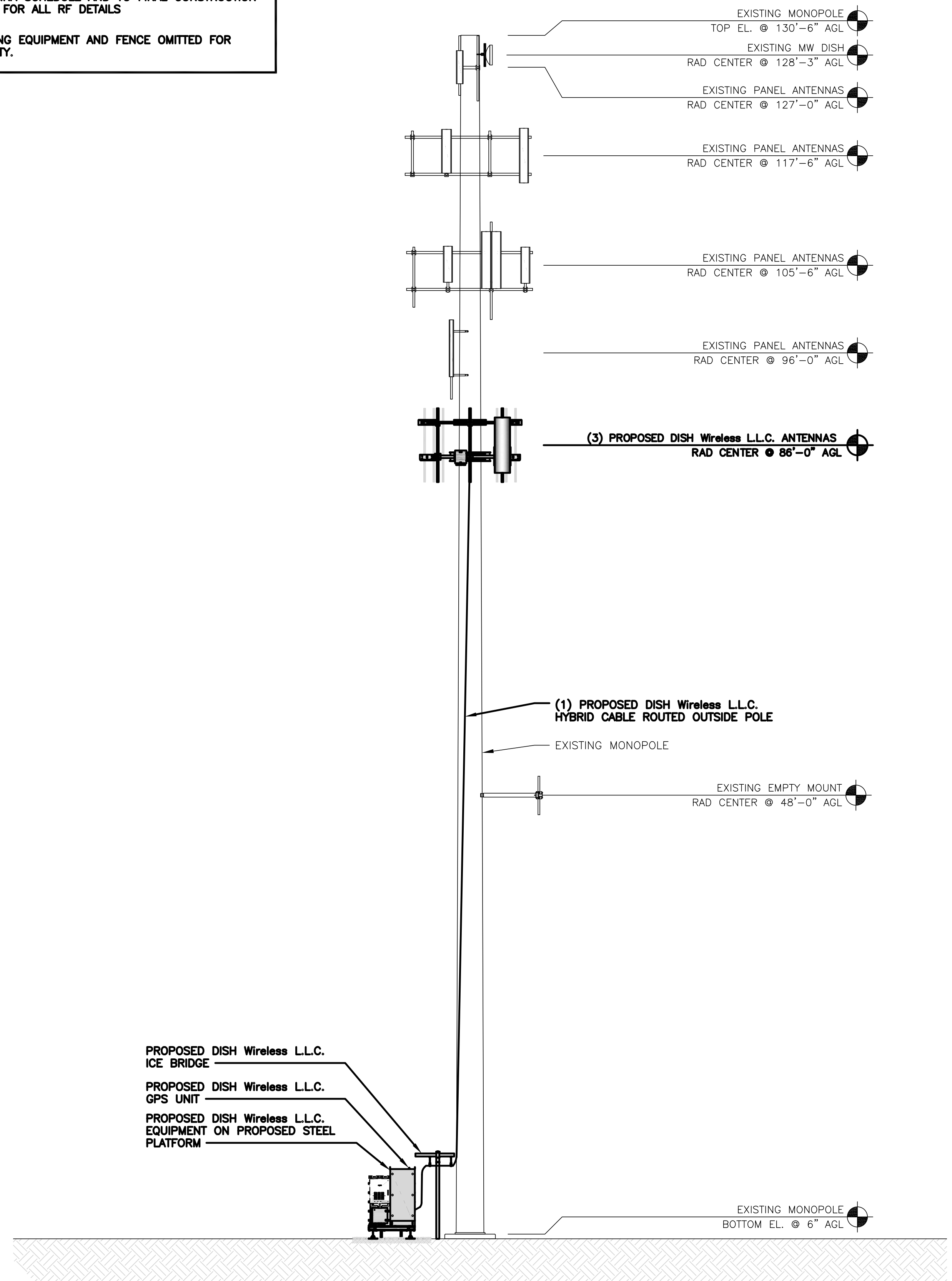
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

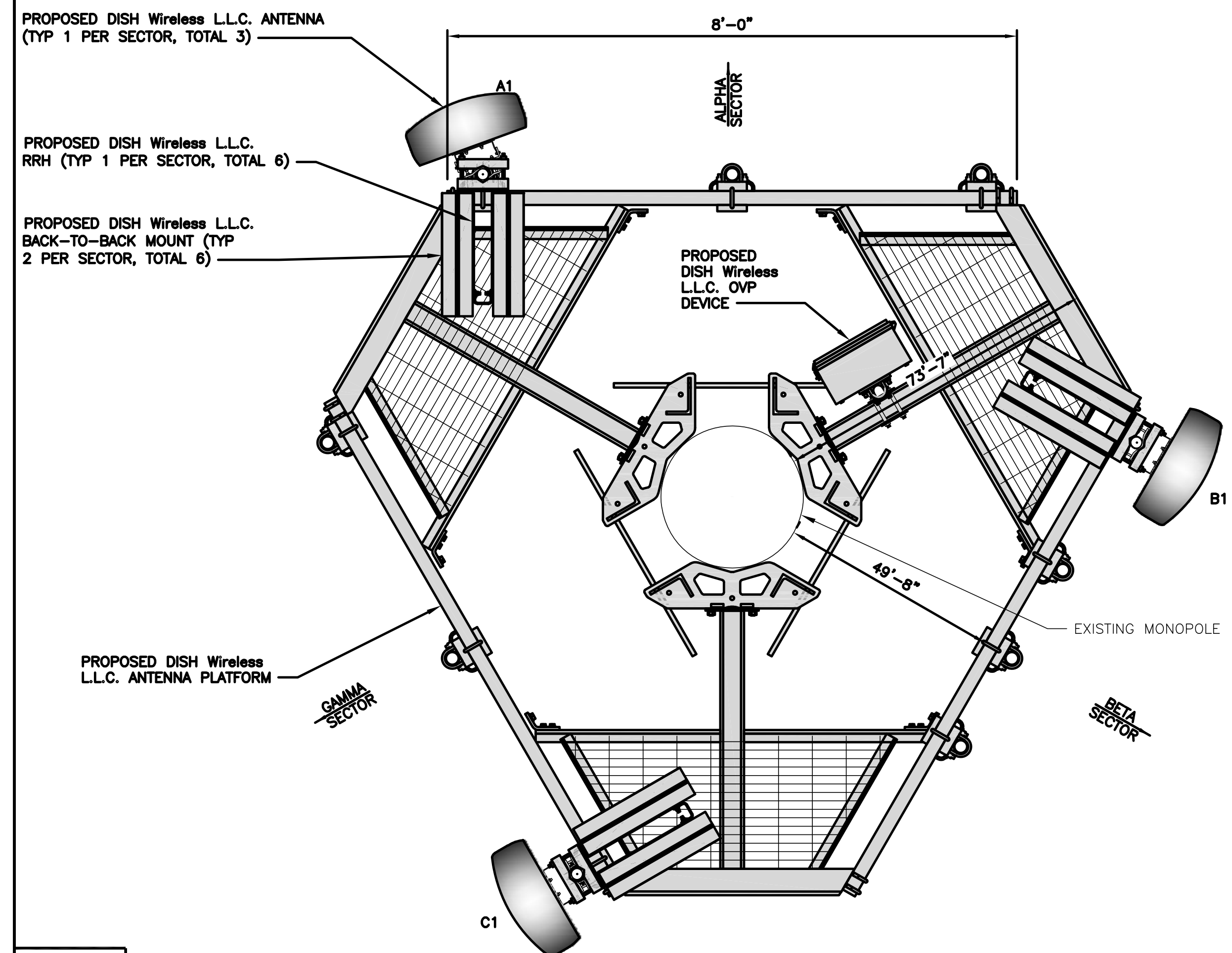
A-1

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 SOUTH ELEVATION — 8' 4' 0 8' 16' — 1/8"=1'–0" — 1



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"	340°	86'–0"	(1) HIGH–CAPACITY HYBRID CABLE (119' LONG)
BETA	B1	PROPOSED	JMA WIRELESS–MX08FRO665–21	5G	72.0" x 20.0"	120°	86'–0"	
GAMMA	C1	PROPOSED	JMA WIRELESS–MX08FRO665–21	5G	72.0" x 20.0"	240°	86'–0"	

SECTOR	POSITION	RRH	
		MANUFACTURER – MODEL NUMBER	TECHNOLOGY
ALPHA	A1	FUJITSU – TA08025–B604	5G
	A1	FUJITSU – TA08025–B605	5G
BETA	B1	FUJITSU – TA08025–B604	5G
	B1	FUJITSU – TA08025–B605	5G
GAMMA	C1	FUJITSU – TA08025–B604	5G
	C1	FUJITSU – TA08025–B605	5G

NOTES

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

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
www.btgrp.com

No. 23924
LICENSED PROFESSIONAL ENGINEER
8/18/21

B&T ENGINEERING, INC.

DRAWN BY:	CHECKED BY:	APPROVED BY:
MAH	JTS	MDW

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS

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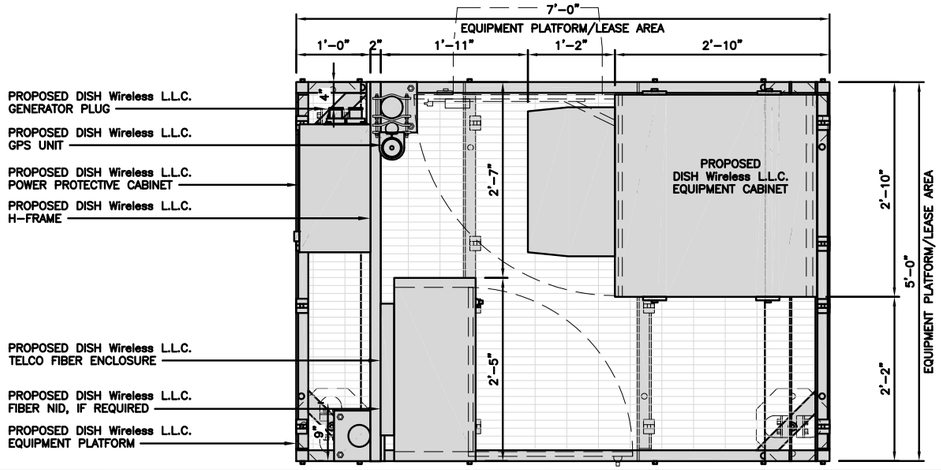
DISH Wireless L.L.C. PROJECT INFORMATION
BOBDL00078A
1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2



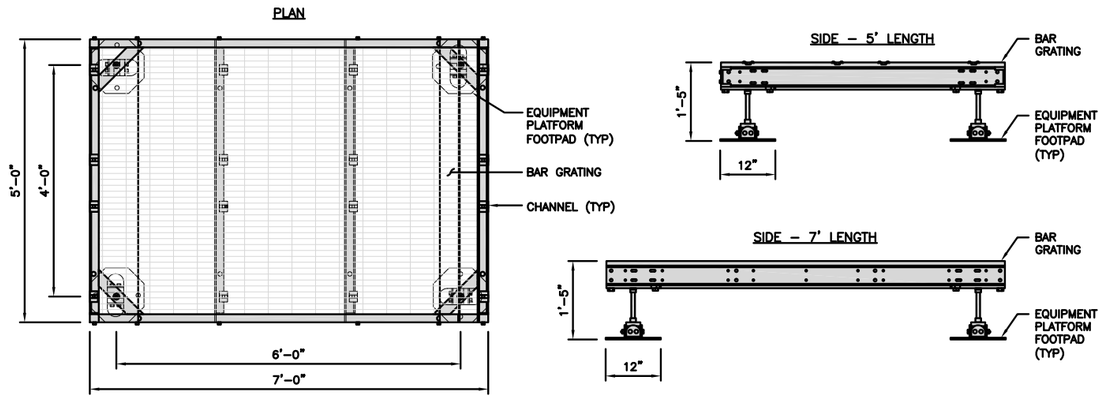
PLATFORM EQUIPMENT PLAN

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"

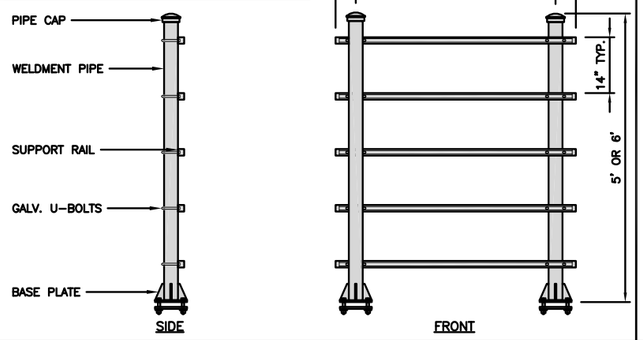


PLATFORM DETAIL

NO SCALE

2

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



H-FRAME DETAIL

NO SCALE

3

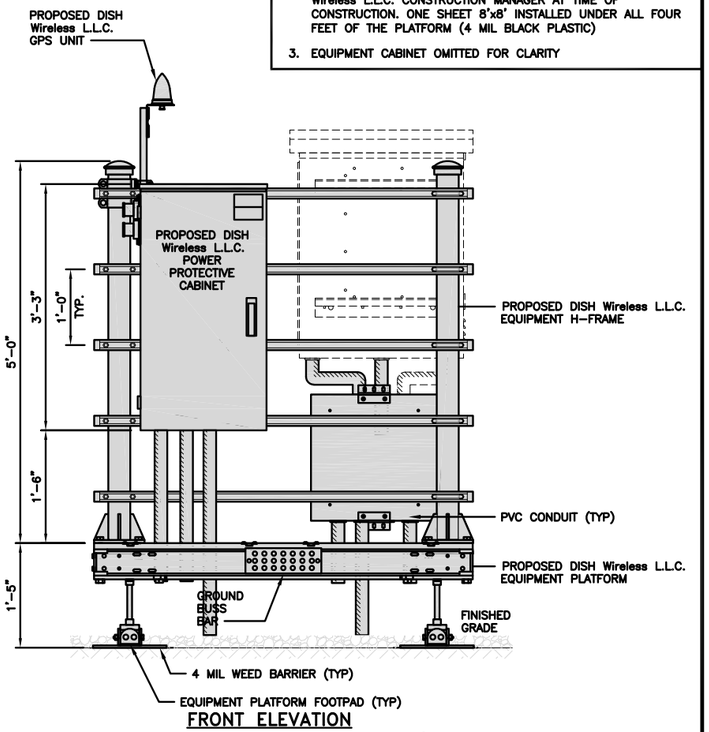
NOT USED

NO SCALE

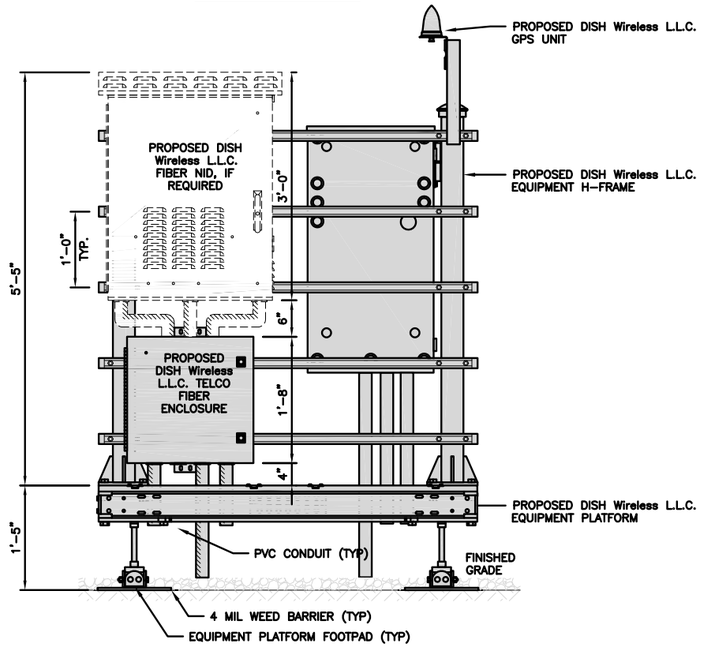
4

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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SUITE 300
TULSA, OK 74119
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MAH	JTS	MDW

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

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A&E PROJECT NUMBER

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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00078A
1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

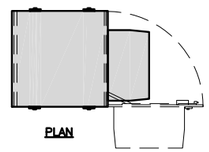
SHEET TITLE

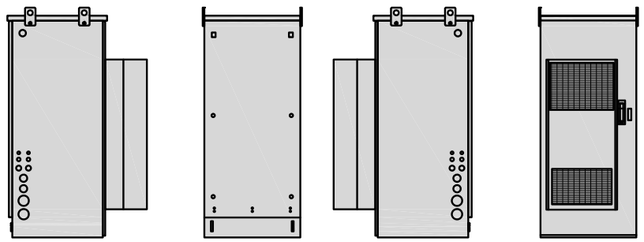
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER

A-3

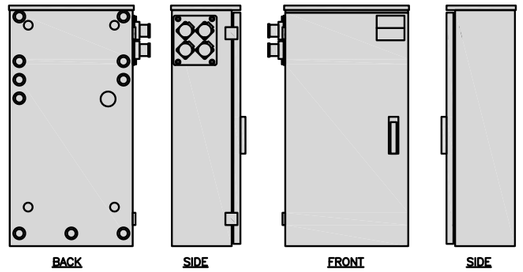
CHARLES INDUSTRY HEX CUBE–PM639155N4	
DIMENSIONS (HxWxD):	74"x32"x32"
POWER PLANT:	–48VDC ABB/600W
TOTAL WEIGHT (EMPTY)	408 LBS





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

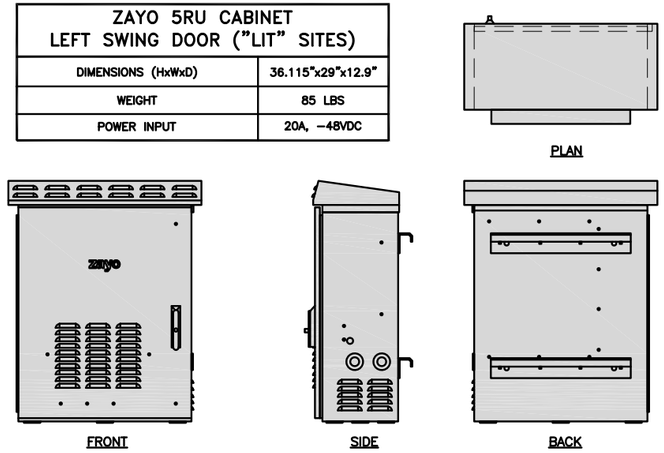


POWER PROTECTION CABINET (PPC) DETAIL | NO SCALE | 2

NOT USED | NO SCALE | 3

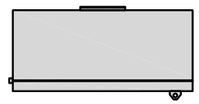
NOT USED | NO SCALE | 4

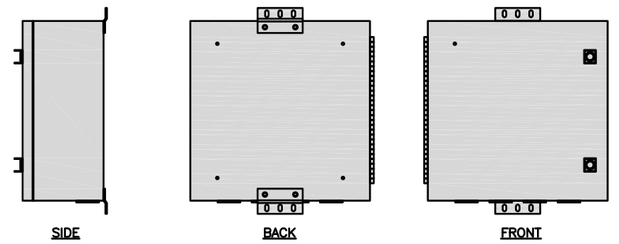
ZAYO 5RU CABINET LEFT SWING DOOR ("LIT" SITES)	
DIMENSIONS (HxWxD)	36.115"x29"x12.9"
WEIGHT	85 LBS
POWER INPUT	20A, –48VDC



NETWORK INTERFACE UNIT DETAIL | NO SCALE | 5

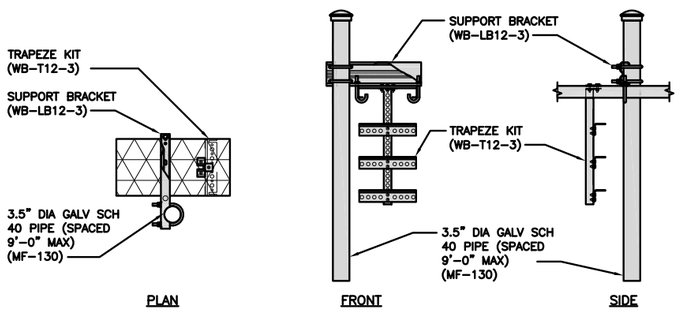
CHARLES CFIT–PF2020DSH1 FIBER TELCO ENCLOSURE	
ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4





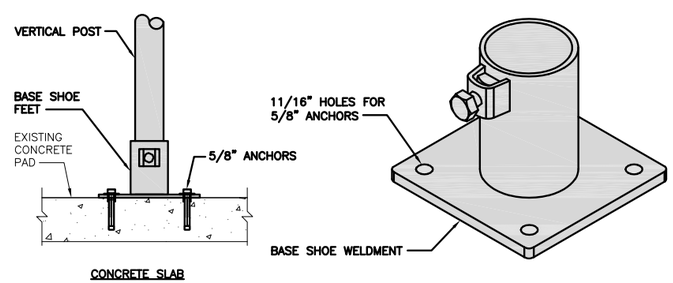
FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

COMMSCOPE WB–K110–B WAVEGUIDE BRIDGE KIT		INCLUDED PRODUCTS:	WB–T12–3 TRAPEZE KIT, 3 RUNGS WB–LB12–3 SUPPORT BRACKET MF–130 DIRECT BURIAL PIPE COLUMN, 13'–4"
DIMENSIONS (HxL)	160"x10'		
WEIGHT/ VOLUME	325.0 LBS		
CABLE RUN (QTY)	12		

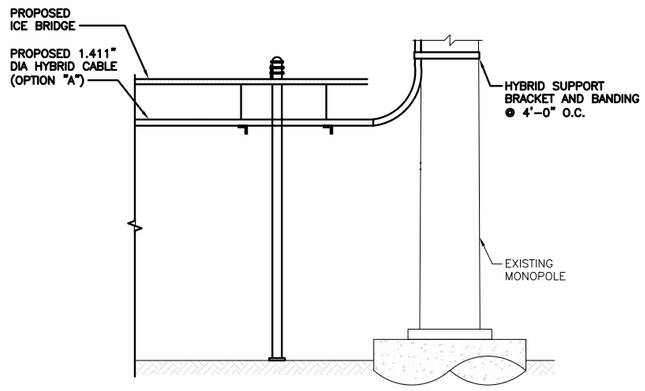


ICE BRIDGE DETAIL | NO SCALE | 7

SITEPRO1 BSF35 BASE SHOE FEET	
DIMENSIONS (HxWxL)	8"x8"x1/2"
WEIGHT	15.0 LBS
POST SIZE:	2–7/8" OR 3–1/2"



ICE BRIDGE PIPE MOUNT DETAIL | NO SCALE | 8



HYBRID CABLE RUN | NO SCALE | 9

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SUITE 300
TULSA, OK 74119
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DISH Wireless L.L.C.
PROJECT INFORMATION

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WEST HARTFORD, CT 06110

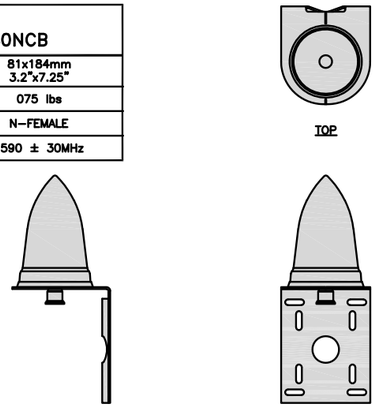
SHEET TITLE

EQUIPMENT DETAILS

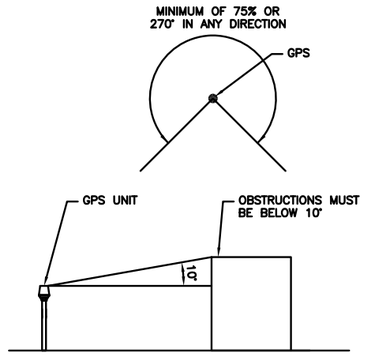
SHEET NUMBER

A-4

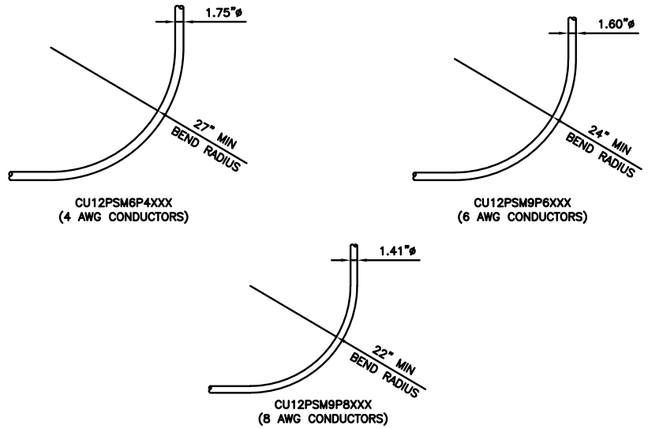
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



GPS DETAIL | NO SCALE | 1



GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 2



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

NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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SHEET TITLE

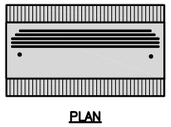
EQUIPMENT DETAILS

SHEET NUMBER

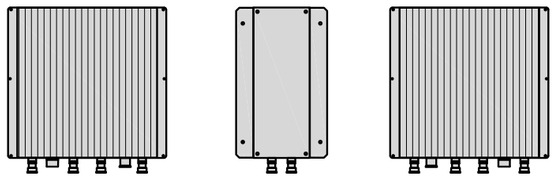
A-5

FUJITSU TRIPLE BAND TA08025-B605

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



PLAN



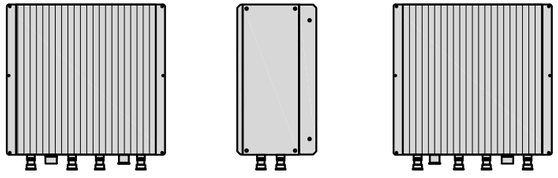
BACK SIDE FRONT

RRH DETAIL | NO SCALE | 1

FUJITSU DUAL BAND TA08025-B604

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

PLAN



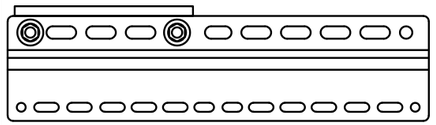
BACK SIDE FRONT

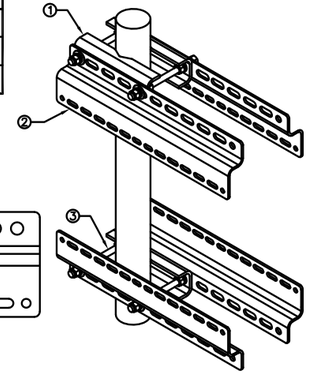
RRH DETAIL | NO SCALE | 2

SABRE DOUBLE Z-BRACKET C10123155

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

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





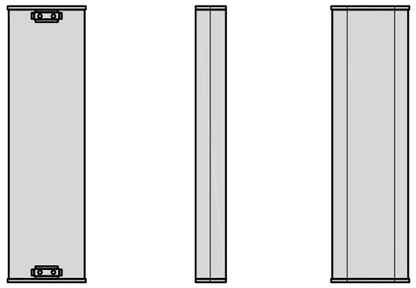
NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

RRH MOUNT DETAIL | NO SCALE | 3

JMA WIRELESS MX08FRO665-21 ANTENNA

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

PLAN



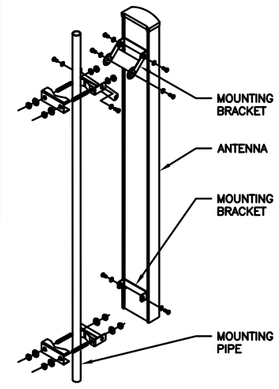
BACK SIDE FRONT

ANTENNA DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

M04 MOUNTING BRACKET HPA-33R-BUU-H4-K

WIDTH	5"
DEPTH	2"
HEIGHT	8"
TOTAL WEIGHT	1.5 lbs
HOUSING MATERIAL	ASA/ABS/ALUMINUM
RADOME COLOR	LIGHT GRAY
CONNECTOR	1x8-PIN DAISY CHAIN

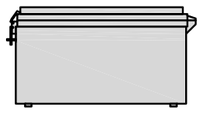


NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

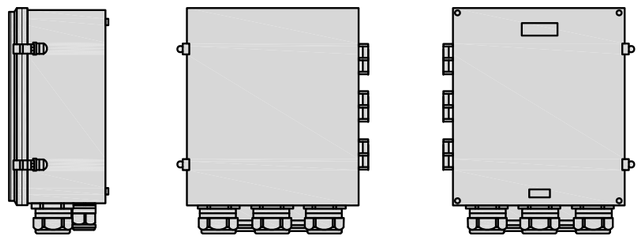
ANTENNA MOUNTING DETAIL | NO SCALE | 6

RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION (OVP)

DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



PLAN



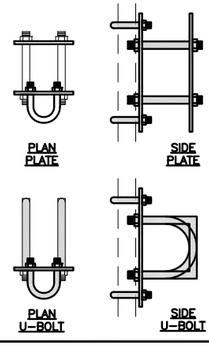
SIDE BACK FRONT

SURGE SUPPRESSION DETAIL (OVP) | NO SCALE | 7

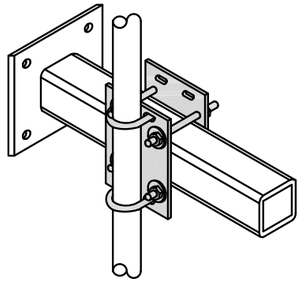
COMMSCOPE XP-2040 CROSSOVER PLATE

DIMENSIONS (HxW)	10"x12"
WEIGHT	11 lbs

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



PLAN PLATE SIDE PLATE PLAN U-BOLT SIDE U-BOLT

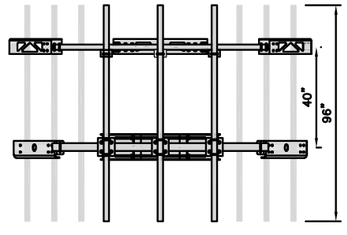


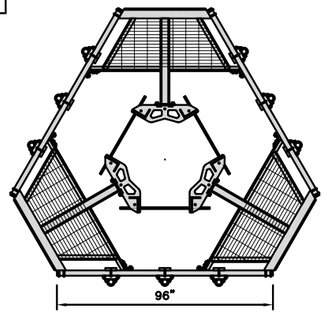
RRH/OVP MOUNT DETAIL | NO SCALE | 8

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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SHEET TITLE

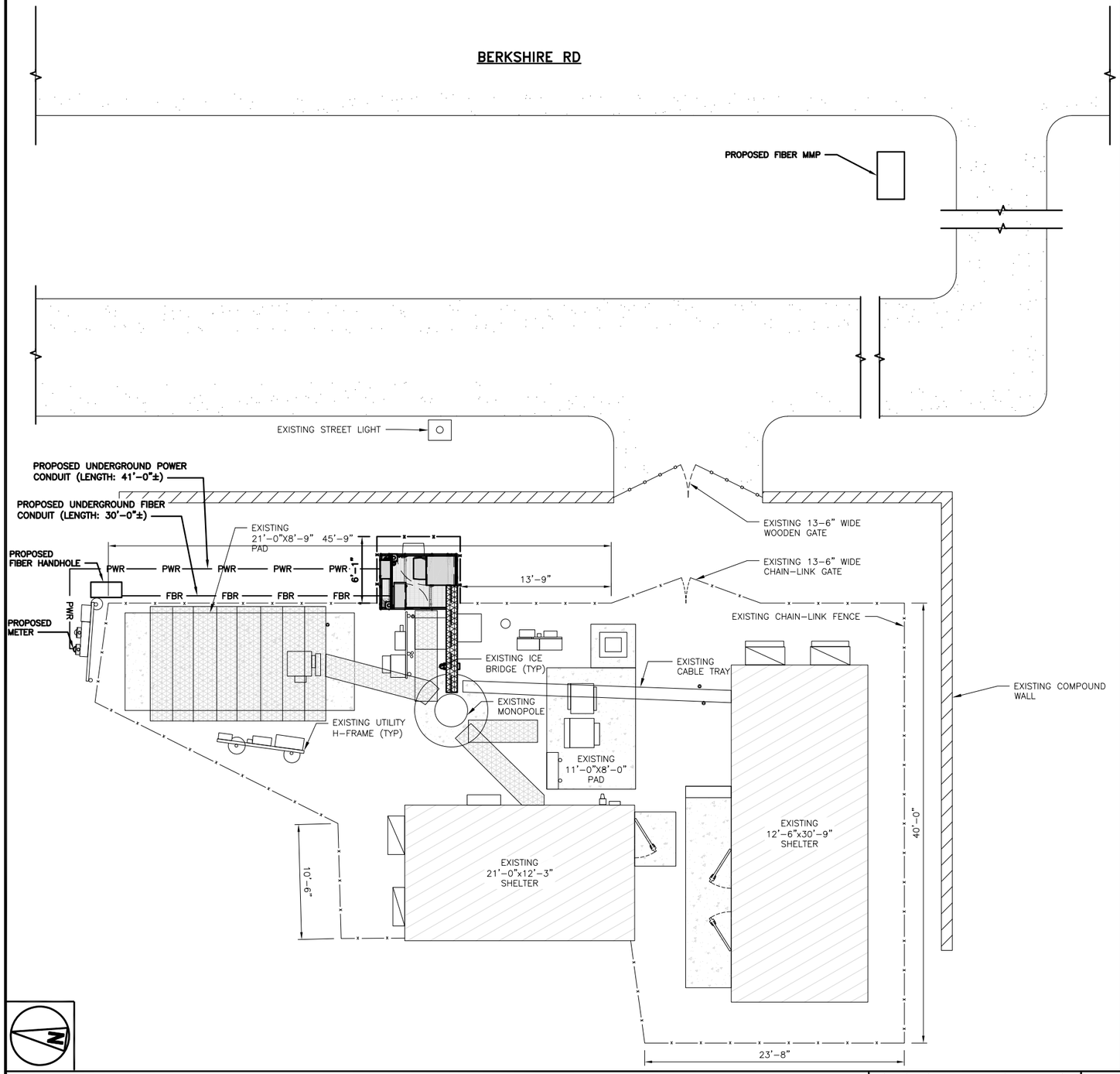
EQUIPMENT DETAILS

SHEET NUMBER

A-6

NOTES

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



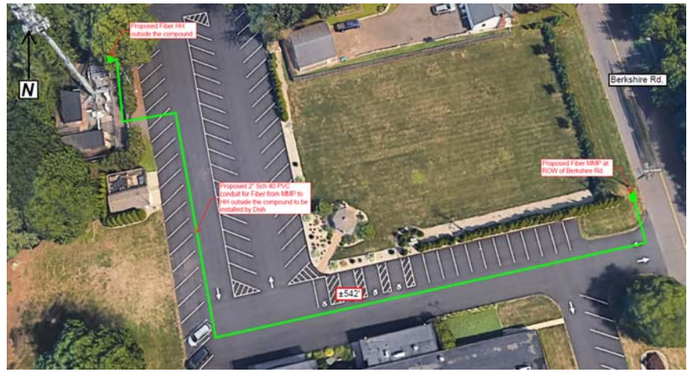
UTILITY ROUTE PLAN

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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SHEET TITLE

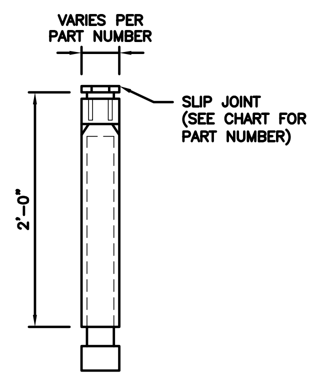
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

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"

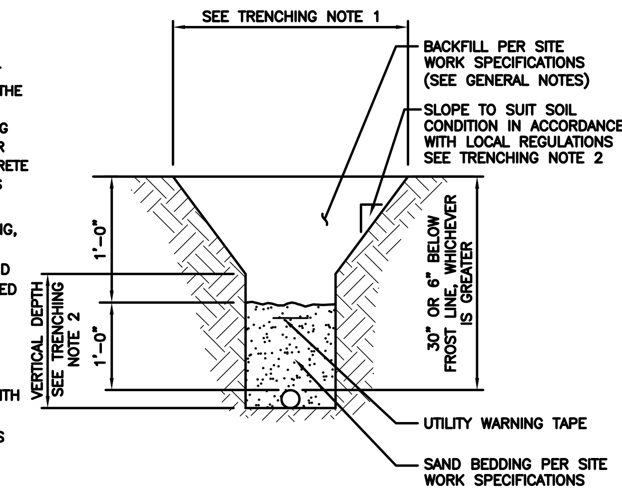


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

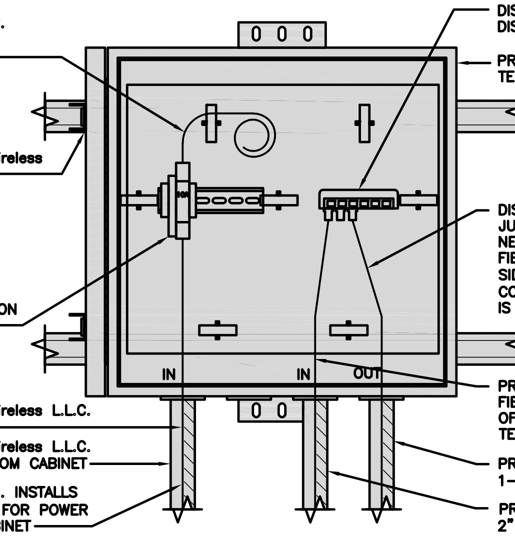
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

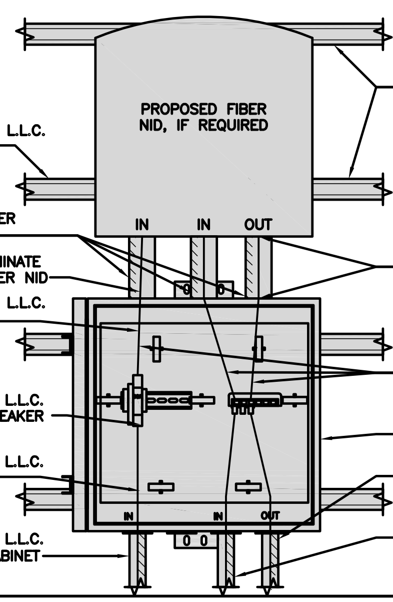
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT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

DISH Wireless L.L.C. TEMPLATE VERSION 34 – 06/11/2021

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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

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DRAWN BY:	CHECKED BY:	APPROVED BY:
MAH	JTS	MDW

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS

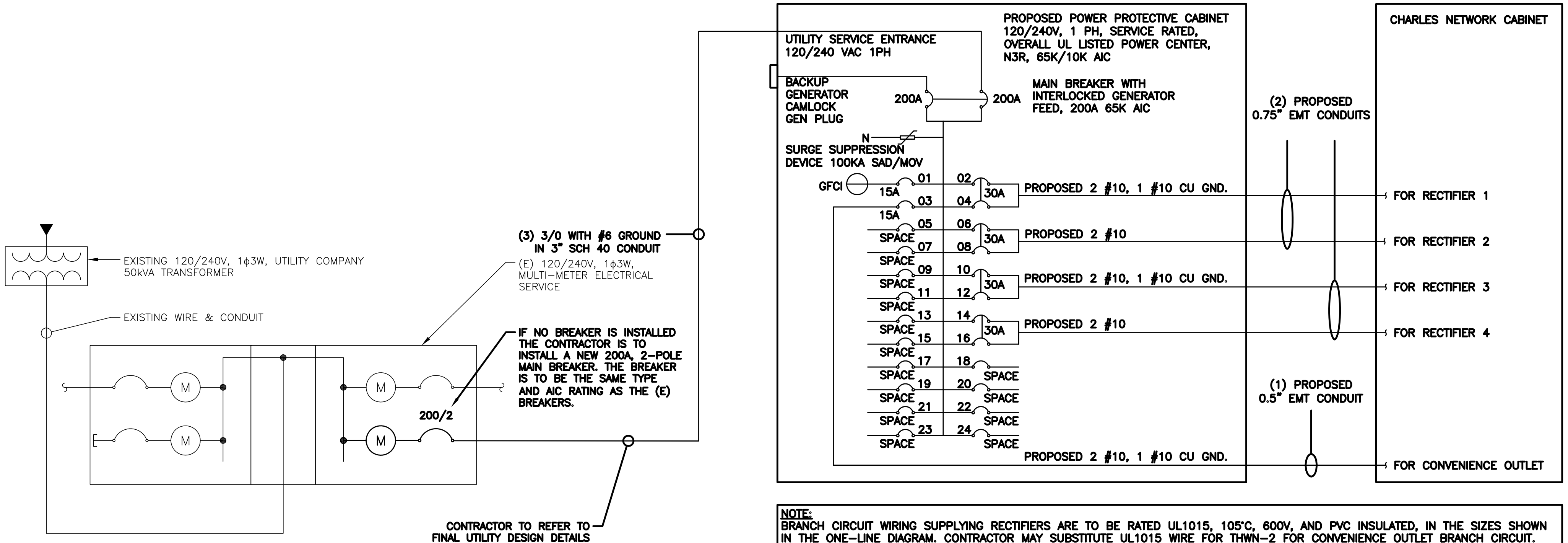
REV	DATE	DESCRIPTION
A	7/2/21	ISSUED FOR REVIEW
0	8/18/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
127816.003.01

DISH Wireless L.L.C. PROJECT INFORMATION
BOBDL00078A
1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

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

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

8/18/21

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MAH	JTS	MDW

RFDS REV #: 0

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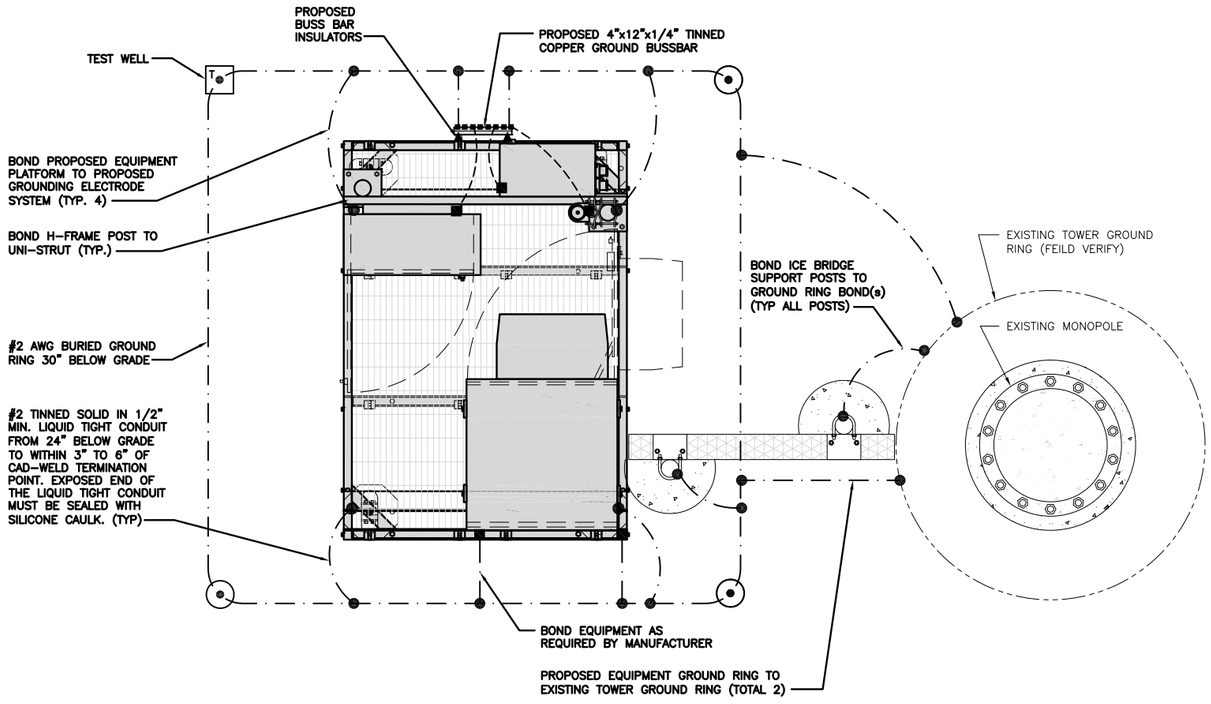
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00078A
1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

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

SHEET NUMBER
E-3

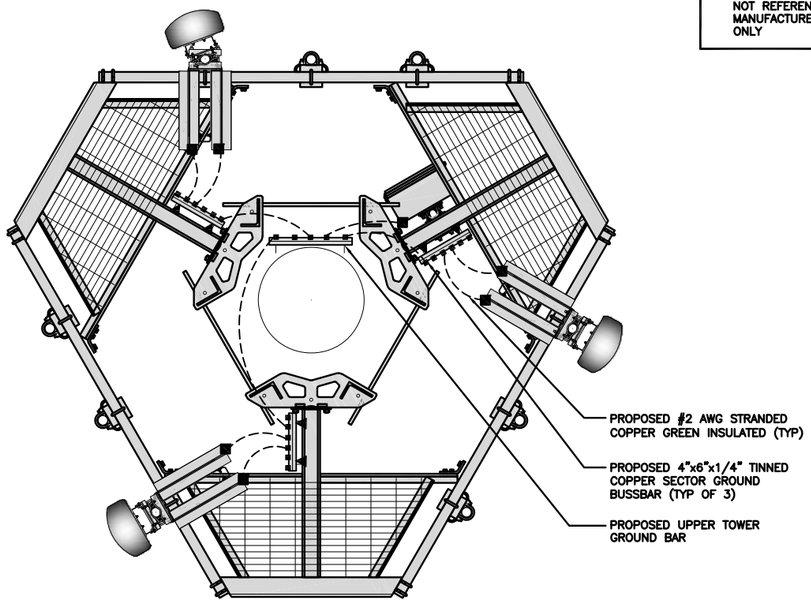


TYPICAL EQUIPMENT GROUNDING PLAN

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

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

B&T ENGINEERING, INC.

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MAH	JTS	MDW

RFDS REV #: 0

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127816.003.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00078A
1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

SHEET TITLE

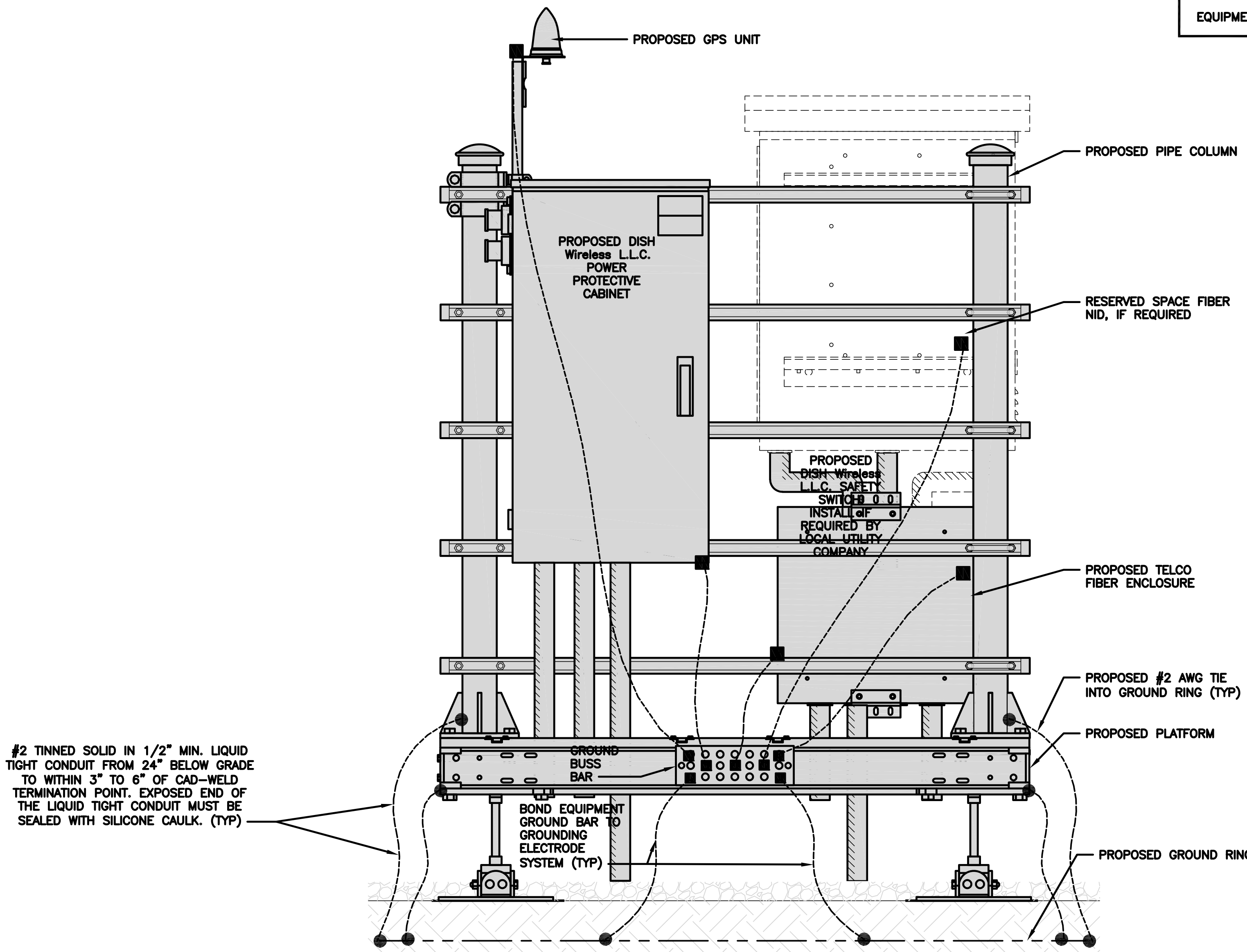
GROUNDING PLANS AND NOTES

SHEET NUMBER

G-1

NOTES

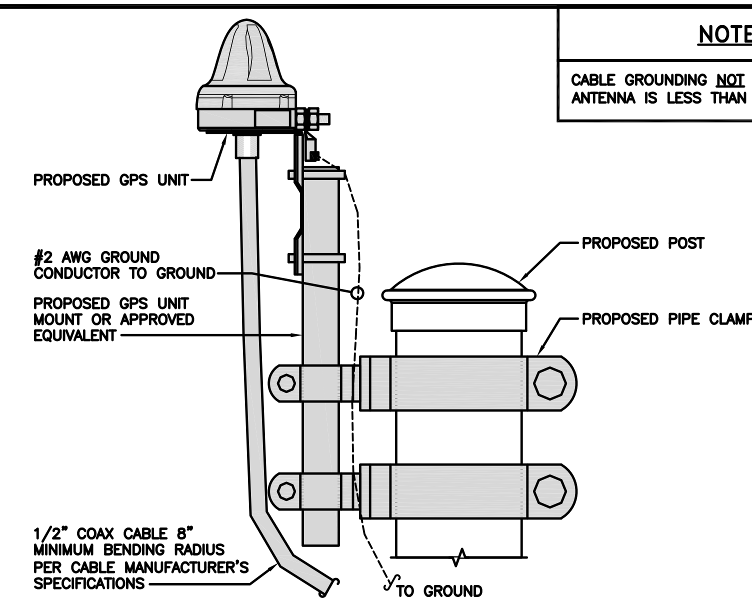
EQUIPMENT CABINET OMITTED FOR CLARITY



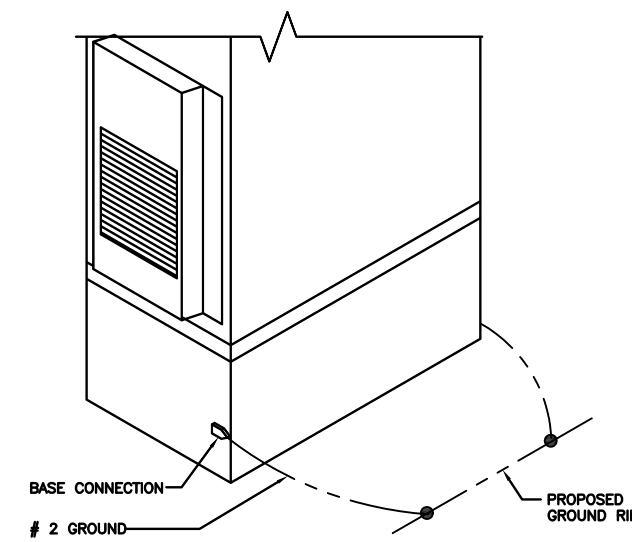
H-FRAME GROUNDING DETAIL — NO SCALE — 1

NOTES

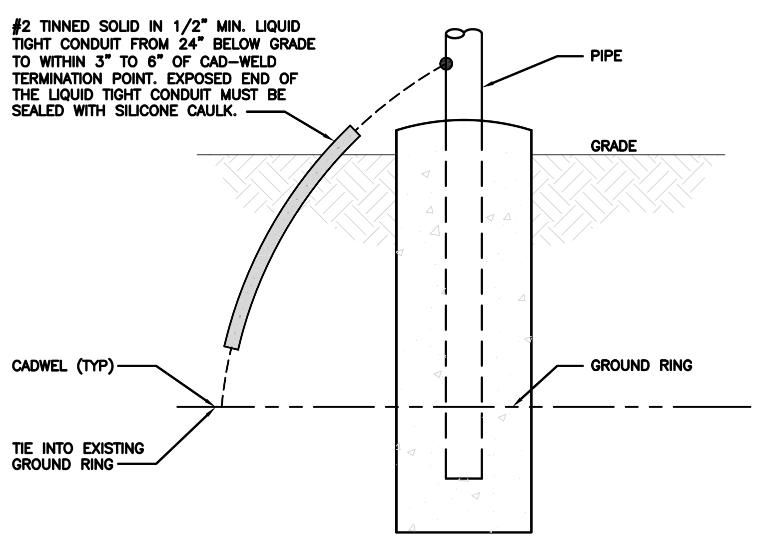
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



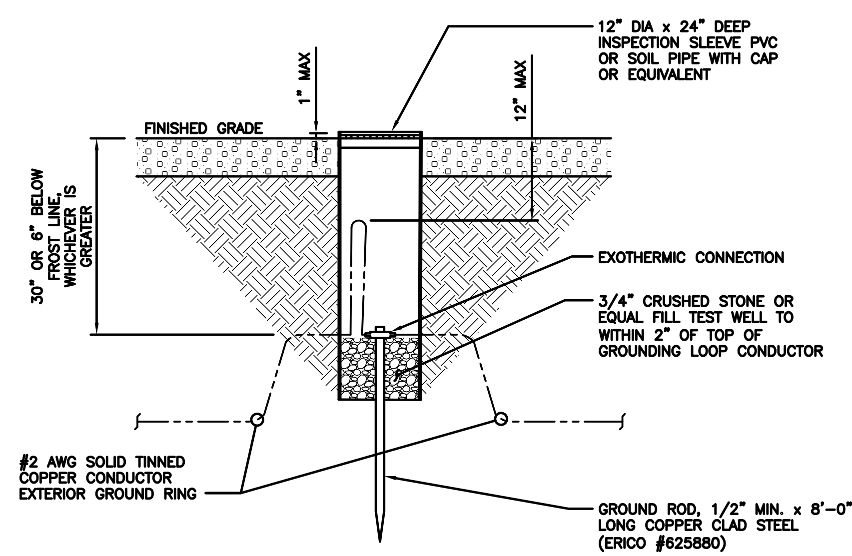
TYPICAL GPS UNIT GROUNDING — NO SCALE — 2



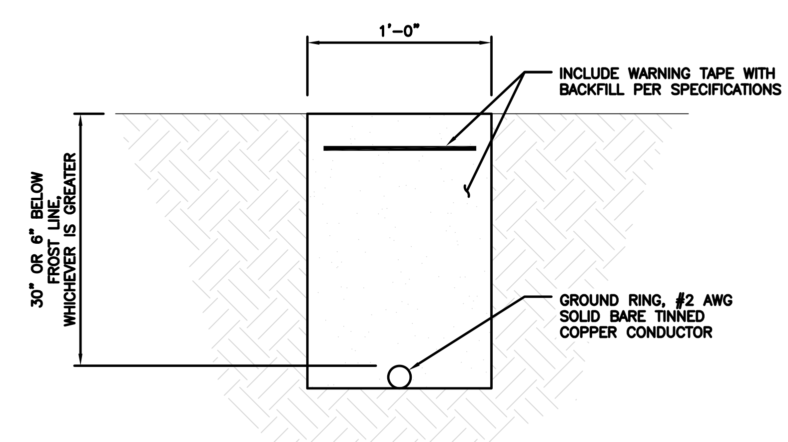
OUTDOOR CABINET GROUNDING — NO SCALE — 3



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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LITTLETON, CO 80120

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

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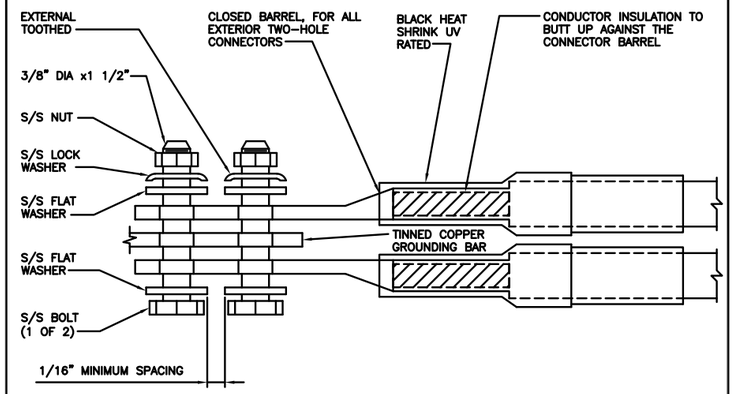
SHEET TITLE
GROUNDING DETAILS

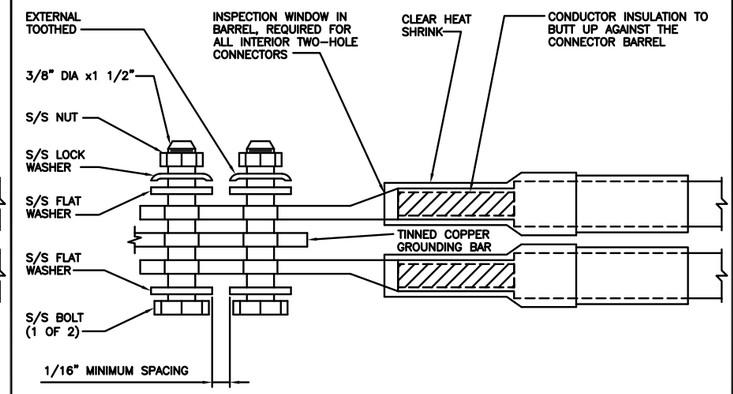
SHEET NUMBER
G-2

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).

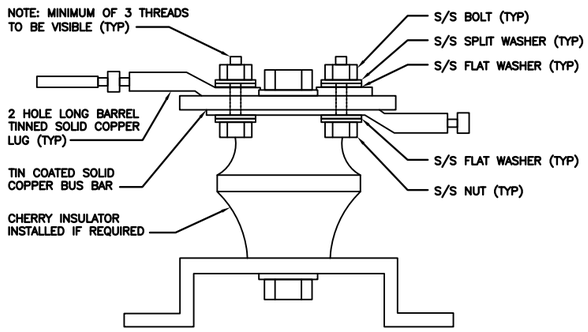
TYPICAL GROUNDING NOTES | NO SCALE | 1



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

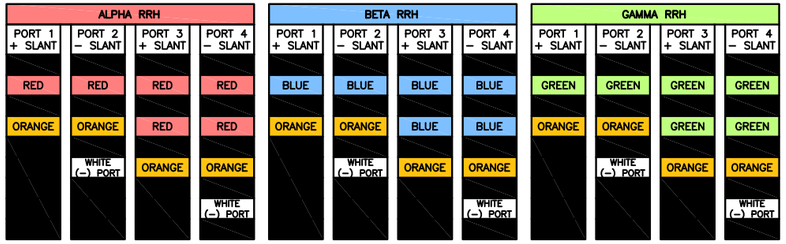
G-3

RF JUMPER COLOR CODING

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

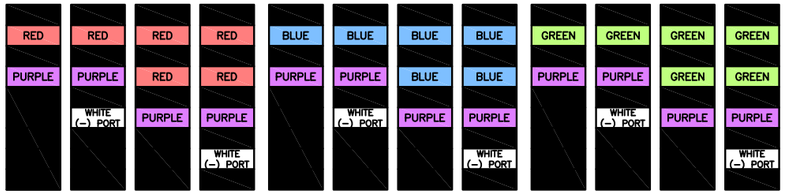
LOW-BAND RRH –
(600MHz N71 BASEBAND) +
(850MHz N26 BAND) +
(700MHz N29 BAND) – OPTIONAL PER MARKET

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)

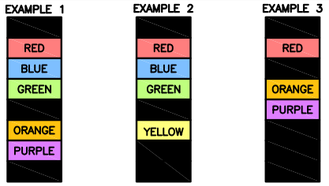


HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED
ALONG WITH FREQUENCY BANDS

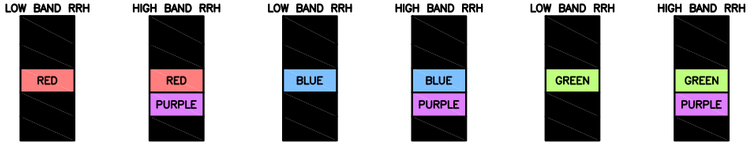
EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS
ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS

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



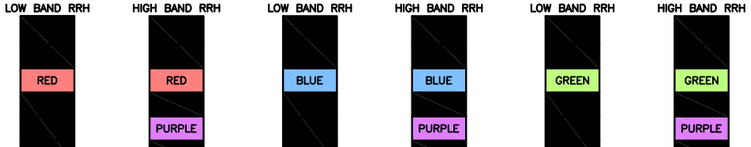
FIBER JUMPERS TO RRHs

LOW-BAND RRH FIBER CABLES HAVE SECTOR
STRIPE ONLY

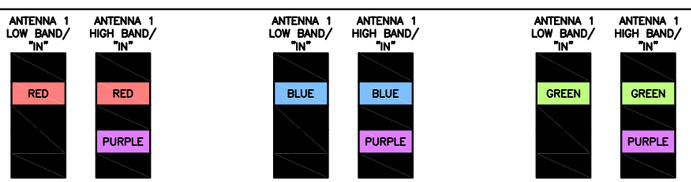


POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR
STRIPE ONLY



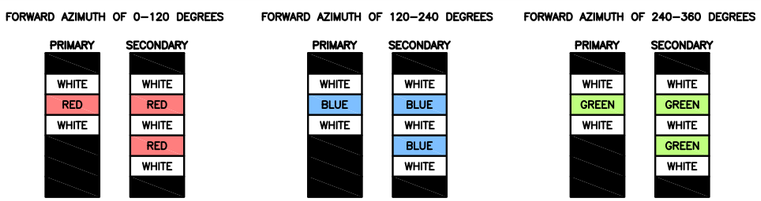
RET MOTORS AT ANTENNAS



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.

5701 SOUTH SANTA FE DRIVE
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1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

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127816.003.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00078A
1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

SHEET TITLE

RF
CABLE COLOR CODES

SHEET NUMBER

RF-1

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	UNINTERRUPTIBLE POWER SYSTEM (DC POWER PLANT)
VIF	VERIFIED IN FIELD
W	WIDE
W/	WITH
WD	WOOD
WP	WEATHERPROOF
WT	WEIGHT

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WEST HARTFORD, CT 06110

SHEET TITLE
LEGEND AND ABBREVIATIONS

SHEET NUMBER
GN-1

SITE ACTIVITY REQUIREMENTS:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES:

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

CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION

CARRIER:DISH Wireless L.L.C.

TOWER OWNER:TOWER OWNER

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

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

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

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

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

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

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

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

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

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

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

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

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1717 S. BOULDER
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DRAWN BY:	CHECKED BY:	APPROVED BY:
MAH	JTS	MDW

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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.
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

B&T ENGINEERING, INC.

DRAWN BY:	CHECKED BY:	APPROVED BY:
MAH	JTS	MDW

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	7/2/21	ISSUED FOR REVIEW
0	8/18/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

127816.003.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00078A
1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

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.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

B+T GRP
1717 S. BOULDER
SUITE 300
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PH: (918) 587-4630
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BOBDL00078A
1358 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

Exhibit D

Structural Analysis Report

Date: **September 13, 2021**

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***DISH Network* Co-Locate**	
	Site Number:	BOBDL00078A
	Site Name:	CT-CCI-T-876324
Crown Castle Designation:	**BU Number:**	876324
	Site Name:	WEST HARTFORD UNITED METHODIST
	JDE Job Number:	650068
	Work Order Number:	2016303
	Order Number:	556615 Rev. 0
Engineering Firm Designation:	**Crown Castle Project Number:**	2016303
Site Data:	**1358 New Britain Avenue, WEST HARTFORD, HARTFORD County, CT**	
	Latitude *41° 43' 50.37"*, Longitude *-72° 45' 13.17"*	
	130 Foot - Monopole Tower	

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

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

LC5: Proposed Equipment Configuration **Sufficient Capacity-96.8%**

This analysis utilizes an ultimate 3-second gust wind speed of 117 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: Kibreab Gebremariam

Respectfully submitted by:

STATE OF CONNECTICUT
TERRY P. STYRAN
31522
LICENSED
PROFESSIONAL ENGINEER

Terry P Styran
2021.09.14
17:56:06 -04'00'

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

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 130 ft Monopole tower designed by ROHN. 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:	117 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	2 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)
86.0	86.0	3	fujitsu	TA08025-B604	1	1-3/8
		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)
127.0	128.0	1	andrew	VHLP2-18	3 3 3 2	1/4 5/16 1/2 Conduit
	127.0	3	argus technologies	LLPX310R w/ Mount Pipe		
		2	dragonwave	A-ANT-18G-2-C		
		1	raycap	DC6-48-60-18-8F		
		3	samsung telecommunications	RRH-2WB		
		1	tower mounts	Side Arm Mount [SO 102-3]		
117.0	117.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-
		1	tower mounts	Side Arm Mount [SO 102-3]		
	115.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz		
116.0	116.0	3	alcatel lucent	TD-RRH8x20-25	3 1	1-1/4 3/4
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe		
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe		
		1	tower mounts	Platform Mount [LP 502-1]		
105.0	107.0	3	antel	BXA-70063/4CF w/ Mount Pipe	6 2	7/8 1-5/8
		6	commscope	SBNHH-1D65B w/ Mount Pipe		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		3	samsung telecommunications	RFV01U-D1A		
	106.0	1	raycap	RRFDC-3315-PF-48		
		1	rfs celwave	DB-T1-6Z-8AB-0Z		
		3	samsung telecommunications	RFV01U-D2A		
	105.0	1	tower mounts	Platform Mount [LP 502-1]		
	104.0	3	antel	BXA-80063-4CF-EDIN-2 w/ Mount Pipe		
96.0	96.0	3	rfs celwave	APXV18-209015-C-A20	6	1-5/8
		1	tower mounts	Pipe Mount [PM 601-3]		
60.0	60.0	2	tower mounts	Side Arm Mount [SO 701-1]	-	-
50.0	50.0	1	lucent	KS24019-L112A	1	1/2
		1	tower mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	1529734	CCISITES
4-POST-MODIFICATION INSPECTION	2364340	CCISITES
4-POST-MODIFICATION INSPECTION	2745780	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	1615437	CCISITES
4-TOWER MANUFACTURER DRAWINGS	1771422	CCISITES
4-POST-MODIFICATION INSPECTION	6894104	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	2364338	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	2745779	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	6581208	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 pole and in the reinforcing elements. These calculations are included in Appendix C.

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
130 - 126	Pole	TP16x16x0.1875	Pole	1.7%	Pass
126 - 122	Pole	TP16x16x0.1875	Pole	6.6%	Pass
122 - 120	Pole	TP16x16x0.1875	Pole	9.3%	Pass
120 - 116	Pole	TP24x24x0.25	Pole	5.3%	Pass
116 - 112	Pole	TP24x24x0.25	Pole	10.9%	Pass
112 - 108	Pole	TP24x24x0.25	Pole	16.4%	Pass
108 - 104	Pole	TP24x24x0.25	Pole	24.0%	Pass
104 - 100	Pole	TP24x24x0.25	Pole	33.1%	Pass
100 - 96	Pole	TP24x24x0.25	Pole	42.5%	Pass
96 - 92	Pole	TP24x24x0.25	Pole	52.6%	Pass
92 - 90	Pole	TP24x24x0.25	Pole	57.7%	Pass
90 - 86	Pole	TP24x24x0.375	Pole	43.3%	Pass
86 - 83.5	Pole	TP24x24x0.375	Pole	49.0%	Pass
83.5 - 83.25	Pole + Reinf.	TP24x24x0.6	Reinf. 8 Tension Rupture	35.3%	Pass
83.25 - 79.25	Pole + Reinf.	TP24x24x0.6	Reinf. 8 Tension Rupture	41.6%	Pass
79.25 - 75.25	Pole + Reinf.	TP24x24x0.6	Reinf. 8 Tension Rupture	48.0%	Pass
75.25 - 75	Pole + Reinf.	TP24x24x0.6	Reinf. 8 Tension Rupture	48.4%	Pass
75 - 74.75	Pole + Reinf.	TP24x24x0.6	Reinf. 3 Compression	49.3%	Pass
74.75 - 70.75	Pole + Reinf.	TP24x24x0.6	Reinf. 3 Compression	55.9%	Pass
70.75 - 66.75	Pole + Reinf.	TP24x24x0.6	Reinf. 3 Compression	62.9%	Pass
66.75 - 62.75	Pole + Reinf.	TP24x24x0.6	Reinf. 3 Compression	69.9%	Pass
62.75 - 60	Pole + Reinf.	TP24x24x0.6	Reinf. 3 Compression	74.9%	Pass
60 - 59.75	Pole + Reinf.	TP30x30x0.5438	Reinf. 2 Compression	51.8%	Pass
59.75 - 55.75	Pole + Reinf.	TP30x30x0.5438	Reinf. 2 Compression	57.5%	Pass
55.75 - 51.75	Pole + Reinf.	TP30x30x0.5438	Reinf. 2 Compression	63.2%	Pass
51.75 - 48.5	Pole + Reinf.	TP30x30x0.5438	Reinf. 2 Compression	67.9%	Pass
48.5 - 48.25	Pole + Reinf.	TP30x30x0.7375	Reinf. 2 Compression	50.3%	Pass
48.25 - 44.25	Pole + Reinf.	TP30x30x0.7375	Reinf. 2 Compression	54.7%	Pass
44.25 - 40.25	Pole + Reinf.	TP30x30x0.7375	Reinf. 2 Compression	59.2%	Pass
40.25 - 36.25	Pole + Reinf.	TP30x30x0.7375	Reinf. 2 Compression	63.8%	Pass
36.25 - 32.25	Pole + Reinf.	TP30x30x0.7375	Reinf. 2 Compression	68.5%	Pass
32.25 - 30	Pole + Reinf.	TP30x30x0.7375	Reinf. 2 Compression	71.1%	Pass
30 - 29.75	Pole + Reinf.	TP36x36x0.55	Pole	63.4%	Pass

29.75 - 25.75	Pole + Reinf.	TP36x36x0.55	Pole	68.1%	Pass
25.75 - 23	Pole + Reinf.	TP36x36x0.55	Pole	71.4%	Pass
23 - 22.75	Pole + Reinf.	TP36x36x0.55	Pole	72.4%	Pass
22.75 - 20.75	Pole + Reinf.	TP36x36x0.55	Pole	74.9%	Pass
20.75 - 20.5	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	71.8%	Pass
20.5 - 17.75	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	75.0%	Pass
17.75 - 17.5	Pole + Reinf.	TP36x36x0.7	Reinf. 1 Tension Rupture	73.8%	Pass
17.5 - 13.5	Pole + Reinf.	TP36x36x0.7	Reinf. 1 Tension Rupture	78.5%	Pass
13.5 - 9.5	Pole + Reinf.	TP36x36x0.7	Reinf. 1 Tension Rupture	83.3%	Pass
9.5 - 5.5	Pole + Reinf.	TP36x36x0.7	Reinf. 1 Tension Rupture	88.1%	Pass
5.5 - 3.25	Pole + Reinf.	TP36x36x0.7	Reinf. 1 Tension Rupture	90.9%	Pass
3.25 - 3	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	93.0%	Pass
3 - 0	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	96.8%	Pass
				Summary	
			Pole	81.7%	Pass
			Reinforcement	96.8%	Pass
			Overall	96.8%	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	83.3	Pass
1	Base Plate	0	69.7	Pass
1	Base Foundation (Structure)	0	82.9	Pass
1	Base Foundation (Soil Interaction)	0	28.3	Pass
1	Flange Connection	120	7.9	Pass
1	Flange Connection	90	39.6	Pass
1	Flange Connection	60	47.6	Pass
1	Flange Connection	30	58.9	Pass

Structure Rating (max from all components) =	96.8%

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

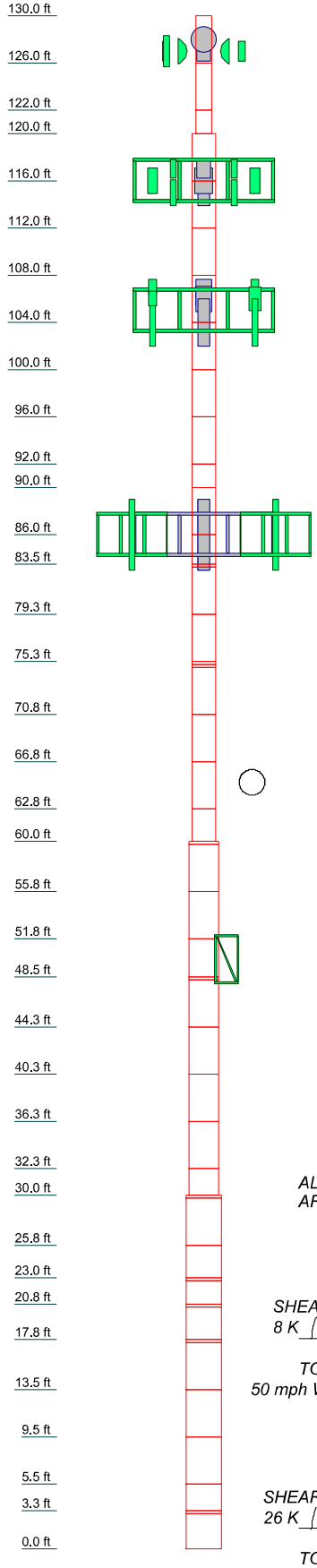
4.1) Recommendations

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	Size	Length (ft)	Grade	Weight (K)
1	P36x0.1875	4.0000	A53-B-42	0.1
2	P36x0.1875	4.0000		0.1
3	P36x0.1875	4.0000		0.1
4	P36x0.1875	4.0000		0.3
5	P36x0.1875	4.0000		0.3
6	P36x0.1875	4.0000		0.3
7	P36x0.1875	4.0000		0.3
8	P36x0.1875	4.0000		0.3
9	P36x0.1875	4.0000		0.3
10	P36x0.1875	4.0000		0.3
11	P36x0.1875	2.0000		0.1
12	P36x0.1875	4.0000		0.4
13	P36x0.1875	2.0000		0.2
14	P36x0.1875	2.0000		0.0
15	P36x0.1875	4.0000		0.6
16	P36x0.1875	4.0000		0.6
17	P36x0.1875	2.0000		0.0
18	P36x0.1875	2.0000		0.0
19	P36x0.1875	4.0000		0.6
20	P36x0.1875	4.0000		0.6
21	P36x0.1875	4.0000		0.6
22	P36x0.1875	2.0000		0.4
23	P36x0.1875	2.0000		0.0
24	P36x0.1875	4.0000		0.7
25	P36x0.1875	4.0000		0.7
26	P36x0.1875	2.0000		0.5
27	P36x0.1875	2.0000		0.1
28	P36x0.1875	4.0000		0.9
29	P36x0.1875	4.0000		0.9
30	P36x0.1875	4.0000		0.9
31	P36x0.1875	4.0000		0.9
32	P36x0.1875	2.0000		0.5
33	P36x0.1875	2.0000		0.0
34	P36x0.1875	4.0000		0.8
35	P36x0.1875	4.0000		0.6
36	P36x0.1875	2.0000		0.1
37	P36x0.1875	2.0000		0.0
38	P36x0.1875	2.0000		0.0
39	P36x0.1875	4.0000		0.7
40	P36x0.1875	2.0000		0.1
41	P36x0.1875	4.0000		1.1
42	P36x0.1875	4.0000		1.1
43	P36x0.1875	4.0000		1.1
44	P36x0.1875	2.0000		0.6
45	P36x0.1875	2.0000		0.3
46	P36x0.1875	3.0000		0.7
				19.6



MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 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 117 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 2.00 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: 96.8%

ALL REACTIONS ARE FACTORED

AXIAL 76 K

SHEAR 8 K *MOMENT 682 kip-ft*

TORQUE 0 kip-ft
50 mph WIND - 2.0000 in ICE

AXIAL 40 K

SHEAR 26 K *MOMENT 2002 kip-ft*

TORQUE 1 kip-ft
REACTIONS - 117 mph WIND

CROWN CASTLE
The pathway to Possible

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

Job: *BU 876324*			
Project:			
Client: Crown Castle	Drawn by: KGebremariam		App'd:
Code: TIA-222-H	Date: 09/13/21		Scale: NTS
Path: C:\Users\KGebremariam\Desktop\Work Area\876324\WO 2016303 - SA\Prod\876324 R.er			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: 158.0000 ft.
- Basic wind speed of 117 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 2.0000 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.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- TOWER RATING: 96.8%.
- 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

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	130.0000-126.0000	4.0000	P16x0.1875	A53-B-42 (42 ksi)	
L2	126.0000-122.0000	4.0000	P16x0.1875	A53-B-42 (42 ksi)	
L3	122.0000-120.0000	2.0000	P16x0.1875	A53-B-42 (42 ksi)	
L4	120.0000-116.0000	4.0000	P24x0.25	A53-B-42 (42 ksi)	
L5	116.0000-112.0000	4.0000	P24x0.25	A53-B-42 (42 ksi)	
L6	112.0000-108.0000	4.0000	P24x0.25	A53-B-42 (42 ksi)	
L7	108.0000-104.0000	4.0000	P24x0.25	A53-B-42 (42 ksi)	
L8	104.0000-100.0000	4.0000	P24x0.25	A53-B-42 (42 ksi)	
L9	100.0000-96.0000	4.0000	P24x0.25	A53-B-42 (42 ksi)	
L10	96.0000-92.0000	4.0000	P24x0.25	A53-B-42 (42 ksi)	
L11	92.0000-90.0000	2.0000	P24x0.25	A53-B-42 (42 ksi)	
L12	90.0000-86.0000	4.0000	P24x0.375	A53-B-42 (42 ksi)	
L13	86.0000-83.5000	2.5000	P24x0.375	A53-B-42 (42 ksi)	
L14	83.5000-83.2500	0.2500	P24x0.6	A53-B-42 (42 ksi)	
L15	83.2500-79.2500	4.0000	P24x0.6	A53-B-42 (42 ksi)	
L16	79.2500-75.2500	4.0000	P24x0.6	A53-B-42 (42 ksi)	
L17	75.2500-75.0000	0.2500	P24x0.6	A53-B-42 (42 ksi)	
L18	75.0000-74.7500	0.2500	P24x0.6	A53-B-42 (42 ksi)	
L19	74.7500-70.7500	4.0000	P24x0.6	A53-B-42 (42 ksi)	
L20	70.7500-66.7500	4.0000	P24x0.6	A53-B-42 (42 ksi)	
L21	66.7500-62.7500	4.0000	P24x0.6	A53-B-42 (42 ksi)	
L22	62.7500-60.0000	2.7500	P24x0.6	A53-B-42 (42 ksi)	
L23	60.0000-59.7500	0.2500	P30x0.54375	A53-B-42 (42 ksi)	
L24	59.7500-55.7500	4.0000	P30x0.54375	A53-B-42 (42 ksi)	
L25	55.7500-51.7500	4.0000	P30x0.54375	A53-B-42 (42 ksi)	
L26	51.7500-48.5000	3.2500	P30x0.54375	A53-B-42 (42 ksi)	
L27	48.5000-48.2500	0.2500	P30x0.7375	A53-B-42 (42 ksi)	
L28	48.2500-44.2500	4.0000	P30x0.7375	A53-B-42 (42 ksi)	
L29	44.2500-40.2500	4.0000	P30x0.7375	A53-B-42 (42 ksi)	
L30	40.2500-36.2500	4.0000	P30x0.7375	A53-B-42 (42 ksi)	
L31	36.2500-32.2500	4.0000	P30x0.7375	A53-B-42 (42 ksi)	
L32	32.2500-30.0000	2.2500	P30x0.7375	A53-B-42 (42 ksi)	
L33	30.0000-29.7500	0.2500	P36x0.55	A53-B-42 (42 ksi)	
L34	29.7500-25.7500	4.0000	P36x0.55	A53-B-42 (42 ksi)	
L35	25.7500-23.0000	2.7500	P36x0.55	A53-B-42	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L36	23.0000-22.7500	0.2500	P36x0.55	(42 ksi) A53-B-42 (42 ksi)	
L37	22.7500-20.7500	2.0000	P36x0.55	A53-B-42 (42 ksi)	
L38	20.7500-20.5000	0.2500	P36x0.6875	A53-B-42 (42 ksi)	
L39	20.5000-17.7500	2.7500	P36x0.6875	A53-B-42 (42 ksi)	
L40	17.7500-17.5000	0.2500	P36x0.7	A53-B-42 (42 ksi)	
L41	17.5000-13.5000	4.0000	P36x0.7	A53-B-42 (42 ksi)	
L42	13.5000-9.5000	4.0000	P36x0.7	A53-B-42 (42 ksi)	
L43	9.5000-5.5000	4.0000	P36x0.7	A53-B-42 (42 ksi)	
L44	5.5000-3.2500	2.2500	P36x0.7	A53-B-42 (42 ksi)	
L45	3.2500-3.0000	0.2500	P36x0.6875	A53-B-42 (42 ksi)	
L46	3.0000-0.0000	3.0000	P36x0.6875	A53-B-42 (42 ksi)	

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 130.0000-126.0000				1	1	1			
L2 126.0000-122.0000				1	1	1			
L3 122.0000-120.0000				1	1	1			
L4 120.0000-116.0000				1	1	1			
L5 116.0000-112.0000				1	1	1			
L6 112.0000-108.0000				1	1	1			
L7 108.0000-104.0000				1	1	1			
L8 104.0000-100.0000				1	1	1			
L9 100.0000-96.0000				1	1	1			
L10 96.0000-92.0000				1	1	1			
L11 92.0000-90.0000				1	1	1			
L12 90.0000-86.0000				1	1	1			
L13 86.0000-83.5000				1	1	1			
L14 83.5000-83.2500				1	1	0.937077			
L15 83.2500-79.2500				1	1	0.937077			
L16 79.2500-75.2500				1	1	0.937077			
L17 75.2500-75.0000				1	1	0.937077			
L18 75.0000-74.7500				1	1	0.937077			
L19 74.7500-70.7500				1	1	0.937077			

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
L20 70.7500-66.7500				1	1	0.937077			
L21 66.7500-62.7500				1	1	0.937077			
L22 62.7500-60.0000				1	1	0.937077			
L23 60.0000-59.7500				1	1	0.961898			
L24 59.7500-55.7500				1	1	0.961898			
L25 55.7500-51.7500				1	1	0.961898			
L26 51.7500-48.5000				1	1	0.961898			
L27 48.5000-48.2500				1	1	0.979382			
L28 48.2500-44.2500				1	1	0.979382			
L29 44.2500-40.2500				1	1	0.979382			
L30 40.2500-36.2500				1	1	0.979382			
L31 36.2500-32.2500				1	1	0.979382			
L32 32.2500-30.0000				1	1	0.979382			
L33 30.0000-29.7500				1	1	0.979046			
L34 29.7500-25.7500				1	1	0.979046			
L35 25.7500-23.0000				1	1	0.979046			
L36 23.0000-22.7500				1	1	0.979046			
L37 22.7500-20.7500				1	1	0.979046			
L38 20.7500-20.5000				1	1	0.952228			
L39 20.5000-17.7500				1	1	0.952228			
L40 17.7500-17.5000				1	1	1.04022			
L41 17.5000-13.5000				1	1	1.04022			
L42 13.5000-9.5000				1	1	1.04022			
L43 9.5000-5.5000				1	1	1.04022			
L44 5.5000-3.2500				1	1	1.04022			
L45 3.2500-3.0000				1	1	0.952228			
L46 3.0000-0.0000				1	1	0.952228			

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
FSJ4-50B(1/2)	B	No	Surface Ar (CaAa)	127.0000 - 0.0000	3	2	-0.100 -0.050	0.5300		0.14

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
2" Rigid Conduit	B	No	Surface Ar (CaAa)	127.0000 - 0.0000	2	2	-0.050 0.050	2.0000		2.80
****										
LDF4-50A(1/2)	C	No	Surface Ar (CaAa)	50.0000 - 0.0000	1	1	0.150 0.160	0.6300		0.15
***										
3.75 x 1.25 FP	A	No	Surface Af (CaAa)	22.0000 - 0.0000	1	1	0.450 0.500	3.3750	9.2500	0.00
3.75 x 1.25 FP	B	No	Surface Af (CaAa)	22.0000 - 0.0000	1	1	0.450 0.500	3.3750	9.2500	0.00
3.75 x 1.25 FP	C	No	Surface Af (CaAa)	22.0000 - 0.0000	1	1	0.450 0.500	3.3750	9.2500	0.00
***										
CCI-65FP-045100	A	No	Surface Af (CaAa)	51.5000 - 30.0000	1	1	0.000 0.100	4.5000	11.0000	0.00
CCI-65FP-045100	B	No	Surface Af (CaAa)	51.5000 - 30.0000	1	1	0.000 0.100	4.5000	11.0000	0.00
CCI-65FP-045100	C	No	Surface Af (CaAa)	51.5000 - 30.0000	1	1	0.000 0.100	4.5000	11.0000	0.00
***										
CCI-65FP-045100	A	No	Surface Af (CaAa)	75.0000 - 60.0000	1	1	0.000 0.100	4.5000	11.0000	0.00
CCI-65FP-045100	B	No	Surface Af (CaAa)	75.0000 - 60.0000	1	1	0.000 0.100	4.5000	11.0000	0.00
CCI-65FP-045100	C	No	Surface Af (CaAa)	75.0000 - 60.0000	1	1	0.000 0.100	4.5000	11.0000	0.00
***										
MS-600	A	No	Surface Af (CaAa)	25.0000 - 0.0000	1	1	-0.500 -0.150	6.0000	14.0000	0.00
MS-600	B	No	Surface Af (CaAa)	25.0000 - 0.0000	1	1	-0.500 -0.150	6.0000	14.0000	0.00
MS-600	C	No	Surface Af (CaAa)	25.0000 - 0.0000	1	1	-0.500 -0.150	6.0000	14.0000	0.00
***										
MS-600	A	No	Surface Af (CaAa)	30.0000 - 19.0000	1	1	0.150 0.250	6.0000	14.0000	0.00
MS-600	B	No	Surface Af (CaAa)	30.0000 - 19.0000	1	1	0.150 0.250	6.0000	14.0000	0.00
MS-600	C	No	Surface Af (CaAa)	30.0000 - 19.0000	1	1	0.150 0.250	6.0000	14.0000	0.00
***										
CCI-65FP-065125	A	No	Surface Af (CaAa)	20.5000 - 0.5000	1	1	0.150 0.250	6.5000	15.5000	0.00
***										
MS-600	A	No	Surface Af (CaAa)	51.5000 - 30.0000	1	1	0.350 0.450	6.0000	14.0000	0.00
MS-600	B	No	Surface Af (CaAa)	51.5000 - 30.0000	1	1	0.350 0.450	6.0000	14.0000	0.00
MS-600	C	No	Surface Af (CaAa)	51.5000 - 30.0000	1	1	0.350 0.450	6.0000	14.0000	0.00
***										
CCI-65FP-045100	A	No	Surface Af (CaAa)	85.0000 - 75.0000	1	1	0.000 0.100	4.5000	11.0000	0.00
CCI-65FP-045100	B	No	Surface Af (CaAa)	85.0000 - 75.0000	1	1	0.000 0.100	4.5000	11.0000	0.00
CCI-65FP-045100	C	No	Surface Af (CaAa)	85.0000 - 75.0000	1	1	0.000 0.100	4.5000	11.0000	0.00
***										
CU12PSM9P8XXX(1-3/8)	A	No	Surface Ar (CaAa)	86.0000 - 0.0000	1	1	0.000 0.100	1.4110		1.66

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
FSJ1-50A(1/4)	B	No	No	Inside Pole	127.0000 - 0.0000	3	No Ice	0.0000	0.04
							1/2" Ice	0.0000	0.04
							1" Ice	0.0000	0.04
							2" Ice	0.0000	0.04
9207(5/16)	B	No	No	Inside Pole	127.0000 - 0.0000	3	No Ice	0.0000	0.60
							1/2" Ice	0.0000	0.60
							1" Ice	0.0000	0.60
							2" Ice	0.0000	0.60
***									
HB114-1-08U4-M5J(1-1/4)	C	No	No	Inside Pole	116.0000 - 0.0000	2	No Ice	0.0000	1.08
							1/2" Ice	0.0000	1.08
							1" Ice	0.0000	1.08
							2" Ice	0.0000	1.08
HB114-21U3M12-XXXF(1-1/4)	C	No	No	Inside Pole	116.0000 - 0.0000	1	No Ice	0.0000	1.22
							1/2" Ice	0.0000	1.22
							1" Ice	0.0000	1.22
							2" Ice	0.0000	1.22
***									
HB158-1-08U8-S8J18(1-5/8)	C	No	No	Inside Pole	105.0000 - 0.0000	2	No Ice	0.0000	1.30
							1/2" Ice	0.0000	1.30
							1" Ice	0.0000	1.30
							2" Ice	0.0000	1.30
LCF78-50A(7/8)	C	No	No	Inside Pole	105.0000 - 0.0000	6	No Ice	0.0000	0.34
							1/2" Ice	0.0000	0.34
							1" Ice	0.0000	0.34
							2" Ice	0.0000	0.34
***									
AVA7-50(1-5/8)	C	No	No	Inside Pole	96.0000 - 0.0000	6	No Ice	0.0000	0.70
							1/2" Ice	0.0000	0.70
							1" Ice	0.0000	0.70
							2" 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	130.0000-126.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.506	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.00
L2	126.0000-122.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	2.024	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.00
L3	122.0000-120.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	1.012	0.000	0.02
		C	0.000	0.000	0.000	0.000	0.00
L4	120.0000-116.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	2.024	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.00
L5	116.0000-112.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	2.024	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.01
L6	112.0000-108.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	2.024	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.01
L7	108.0000-104.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	2.024	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.02
L8	104.0000-100.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	2.024	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.03
L9	100.0000-	A	0.000	0.000	0.000	0.000	0.00

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
	96.0000	B	0.000	0.000	2.024	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.03
L10	96.0000-92.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	2.024	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.05
L11	92.0000-90.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	1.012	0.000	0.02
		C	0.000	0.000	0.000	0.000	0.02
L12	90.0000-86.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	2.024	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.05
L13	86.0000-83.5000	A	0.000	0.000	1.478	0.000	0.00
		B	0.000	0.000	2.390	0.000	0.02
		C	0.000	0.000	1.125	0.000	0.03
L14	83.5000-83.2500	A	0.000	0.000	0.223	0.000	0.00
		B	0.000	0.000	0.314	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.00
L15	83.2500-79.2500	A	0.000	0.000	3.564	0.000	0.01
		B	0.000	0.000	5.024	0.000	0.03
		C	0.000	0.000	3.000	0.000	0.05
L16	79.2500-75.2500	A	0.000	0.000	3.564	0.000	0.01
		B	0.000	0.000	5.024	0.000	0.03
		C	0.000	0.000	3.000	0.000	0.05
L17	75.2500-75.0000	A	0.000	0.000	0.223	0.000	0.00
		B	0.000	0.000	0.314	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.00
L18	75.0000-74.7500	A	0.000	0.000	0.223	0.000	0.00
		B	0.000	0.000	0.314	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.00
L19	74.7500-70.7500	A	0.000	0.000	3.564	0.000	0.01
		B	0.000	0.000	5.024	0.000	0.03
		C	0.000	0.000	3.000	0.000	0.05
L20	70.7500-66.7500	A	0.000	0.000	3.564	0.000	0.01
		B	0.000	0.000	5.024	0.000	0.03
		C	0.000	0.000	3.000	0.000	0.05
L21	66.7500-62.7500	A	0.000	0.000	3.564	0.000	0.01
		B	0.000	0.000	5.024	0.000	0.03
		C	0.000	0.000	3.000	0.000	0.05
L22	62.7500-60.0000	A	0.000	0.000	2.451	0.000	0.00
		B	0.000	0.000	3.454	0.000	0.02
		C	0.000	0.000	2.063	0.000	0.03
L23	60.0000-59.7500	A	0.000	0.000	0.035	0.000	0.00
		B	0.000	0.000	0.127	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L24	59.7500-55.7500	A	0.000	0.000	0.564	0.000	0.01
		B	0.000	0.000	2.024	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.05
L25	55.7500-51.7500	A	0.000	0.000	0.564	0.000	0.01
		B	0.000	0.000	2.024	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.05
L26	51.7500-48.5000	A	0.000	0.000	5.709	0.000	0.01
		B	0.000	0.000	6.894	0.000	0.03
		C	0.000	0.000	5.345	0.000	0.04
L27	48.5000-48.2500	A	0.000	0.000	0.473	0.000	0.00
		B	0.000	0.000	0.564	0.000	0.00
		C	0.000	0.000	0.453	0.000	0.00
L28	48.2500-44.2500	A	0.000	0.000	7.564	0.000	0.01
		B	0.000	0.000	9.024	0.000	0.03
		C	0.000	0.000	7.252	0.000	0.05
L29	44.2500-40.2500	A	0.000	0.000	7.564	0.000	0.01
		B	0.000	0.000	9.024	0.000	0.03
		C	0.000	0.000	7.252	0.000	0.05
L30	40.2500-36.2500	A	0.000	0.000	7.564	0.000	0.01
		B	0.000	0.000	9.024	0.000	0.03
		C	0.000	0.000	7.252	0.000	0.05
L31	36.2500-32.2500	A	0.000	0.000	7.564	0.000	0.01
		B	0.000	0.000	9.024	0.000	0.03
		C	0.000	0.000	7.252	0.000	0.05
L32	32.2500-30.0000	A	0.000	0.000	4.255	0.000	0.00

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
		B	0.000	0.000	5.076	0.000	0.02
		C	0.000	0.000	4.079	0.000	0.03
L33	30.0000-29.7500	A	0.000	0.000	0.272	0.000	0.00
		B	0.000	0.000	0.363	0.000	0.00
		C	0.000	0.000	0.252	0.000	0.00
L34	29.7500-25.7500	A	0.000	0.000	4.344	0.000	0.01
		B	0.000	0.000	5.804	0.000	0.03
		C	0.000	0.000	4.032	0.000	0.05
L35	25.7500-23.0000	A	0.000	0.000	4.987	0.000	0.00
		B	0.000	0.000	5.990	0.000	0.02
		C	0.000	0.000	4.772	0.000	0.03
L36	23.0000-22.7500	A	0.000	0.000	0.522	0.000	0.00
		B	0.000	0.000	0.613	0.000	0.00
		C	0.000	0.000	0.502	0.000	0.00
L37	22.7500-20.7500	A	0.000	0.000	4.875	0.000	0.00
		B	0.000	0.000	5.605	0.000	0.02
		C	0.000	0.000	4.719	0.000	0.02
L38	20.7500-20.5000	A	0.000	0.000	0.662	0.000	0.00
		B	0.000	0.000	0.753	0.000	0.00
		C	0.000	0.000	0.643	0.000	0.00
L39	20.5000-17.7500	A	0.000	0.000	9.082	0.000	0.00
		B	0.000	0.000	7.106	0.000	0.02
		C	0.000	0.000	5.888	0.000	0.03
L40	17.7500-17.5000	A	0.000	0.000	0.697	0.000	0.00
		B	0.000	0.000	0.517	0.000	0.00
		C	0.000	0.000	0.406	0.000	0.00
L41	17.5000-13.5000	A	0.000	0.000	11.148	0.000	0.01
		B	0.000	0.000	8.274	0.000	0.03
		C	0.000	0.000	6.502	0.000	0.05
L42	13.5000-9.5000	A	0.000	0.000	11.148	0.000	0.01
		B	0.000	0.000	8.274	0.000	0.03
		C	0.000	0.000	6.502	0.000	0.05
L43	9.5000-5.5000	A	0.000	0.000	11.148	0.000	0.01
		B	0.000	0.000	8.274	0.000	0.03
		C	0.000	0.000	6.502	0.000	0.05
L44	5.5000-3.2500	A	0.000	0.000	6.271	0.000	0.00
		B	0.000	0.000	4.654	0.000	0.02
		C	0.000	0.000	3.657	0.000	0.03
L45	3.2500-3.0000	A	0.000	0.000	0.697	0.000	0.00
		B	0.000	0.000	0.517	0.000	0.00
		C	0.000	0.000	0.406	0.000	0.00
L46	3.0000-0.0000	A	0.000	0.000	7.819	0.000	0.00
		B	0.000	0.000	6.205	0.000	0.02
		C	0.000	0.000	4.877	0.000	0.04

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	130.0000-	A	1.947	0.000	0.000	0.000	0.000	0.00
	126.0000	B		0.000	0.000	1.606	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.00
L2	126.0000-	A	1.941	0.000	0.000	0.000	0.000	0.00
	122.0000	B		0.000	0.000	6.411	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.00
L3	122.0000-	A	1.936	0.000	0.000	0.000	0.000	0.00
	120.0000	B		0.000	0.000	3.201	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.00
L4	120.0000-	A	1.931	0.000	0.000	0.000	0.000	0.00
	116.0000	B		0.000	0.000	6.392	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.00
L5	116.0000-	A	1.924	0.000	0.000	0.000	0.000	0.00
	112.0000	B		0.000	0.000	6.379	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.01
L6	112.0000-	A	1.918	0.000	0.000	0.000	0.000	0.00

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
	108.0000	B		0.000	0.000	6.365	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.01
L7	108.0000-	A	1.910	0.000	0.000	0.000	0.000	0.00
	104.0000	B		0.000	0.000	6.351	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.02
L8	104.0000-	A	1.903	0.000	0.000	0.000	0.000	0.00
	100.0000	B		0.000	0.000	6.336	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.03
L9	100.0000-	A	1.895	0.000	0.000	0.000	0.000	0.00
	96.0000	B		0.000	0.000	6.321	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.03
L10	96.0000-92.0000	A	1.888	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	6.305	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.05
L11	92.0000-90.0000	A	1.881	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	3.146	0.000	0.05
		C		0.000	0.000	0.000	0.000	0.02
L12	90.0000-86.0000	A	1.875	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	6.280	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.05
L13	86.0000-83.5000	A	1.868	0.000	0.000	2.721	0.000	0.04
		B		0.000	0.000	5.351	0.000	0.09
		C		0.000	0.000	1.435	0.000	0.05
L14	83.5000-83.2500	A	1.865	0.000	0.000	0.368	0.000	0.01
		B		0.000	0.000	0.630	0.000	0.01
		C		0.000	0.000	0.239	0.000	0.01
L15	83.2500-79.2500	A	1.860	0.000	0.000	5.875	0.000	0.09
		B		0.000	0.000	10.073	0.000	0.16
		C		0.000	0.000	3.822	0.000	0.10
L16	79.2500-75.2500	A	1.851	0.000	0.000	5.864	0.000	0.09
		B		0.000	0.000	10.050	0.000	0.16
		C		0.000	0.000	3.818	0.000	0.10
L17	75.2500-75.0000	A	1.846	0.000	0.000	0.366	0.000	0.01
		B		0.000	0.000	0.627	0.000	0.01
		C		0.000	0.000	0.239	0.000	0.01
L18	75.0000-74.7500	A	1.845	0.000	0.000	0.402	0.000	0.01
		B		0.000	0.000	0.664	0.000	0.01
		C		0.000	0.000	0.275	0.000	0.01
L19	74.7500-70.7500	A	1.840	0.000	0.000	6.431	0.000	0.09
		B		0.000	0.000	10.604	0.000	0.16
		C		0.000	0.000	4.394	0.000	0.10
L20	70.7500-66.7500	A	1.829	0.000	0.000	6.416	0.000	0.09
		B		0.000	0.000	10.577	0.000	0.16
		C		0.000	0.000	4.388	0.000	0.10
L21	66.7500-62.7500	A	1.819	0.000	0.000	6.400	0.000	0.09
		B		0.000	0.000	10.548	0.000	0.16
		C		0.000	0.000	4.381	0.000	0.10
L22	62.7500-60.0000	A	1.809	0.000	0.000	4.391	0.000	0.06
		B		0.000	0.000	7.234	0.000	0.11
		C		0.000	0.000	3.008	0.000	0.07
L23	60.0000-59.7500	A	1.804	0.000	0.000	0.125	0.000	0.00
		B		0.000	0.000	0.384	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.00
L24	59.7500-55.7500	A	1.798	0.000	0.000	2.003	0.000	0.03
		B		0.000	0.000	6.126	0.000	0.10
		C		0.000	0.000	0.000	0.000	0.05
L25	55.7500-51.7500	A	1.785	0.000	0.000	1.992	0.000	0.03
		B		0.000	0.000	6.100	0.000	0.10
		C		0.000	0.000	0.000	0.000	0.05
L26	51.7500-48.5000	A	1.773	0.000	0.000	8.988	0.000	0.11
		B		0.000	0.000	12.313	0.000	0.16
		C		0.000	0.000	8.003	0.000	0.13
L27	48.5000-48.2500	A	1.766	0.000	0.000	0.738	0.000	0.01
		B		0.000	0.000	0.993	0.000	0.01
		C		0.000	0.000	0.718	0.000	0.01
L28	48.2500-44.2500	A	1.758	0.000	0.000	11.784	0.000	0.14
		B		0.000	0.000	15.860	0.000	0.21
		C		0.000	0.000	11.472	0.000	0.17
L29	44.2500-40.2500	A	1.743	0.000	0.000	11.746	0.000	0.14

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
		B		0.000	0.000	15.803	0.000	0.20
		C		0.000	0.000	11.434	0.000	0.17
L30	40.2500-36.2500	A	1.725	0.000	0.000	11.705	0.000	0.14
		B		0.000	0.000	15.741	0.000	0.20
		C		0.000	0.000	11.393	0.000	0.17
L31	36.2500-32.2500	A	1.706	0.000	0.000	11.660	0.000	0.13
		B		0.000	0.000	15.673	0.000	0.20
		C		0.000	0.000	11.347	0.000	0.17
L32	32.2500-30.0000	A	1.690	0.000	0.000	6.537	0.000	0.07
		B		0.000	0.000	8.783	0.000	0.11
		C		0.000	0.000	6.361	0.000	0.09
L33	30.0000-29.7500	A	1.683	0.000	0.000	0.400	0.000	0.01
		B		0.000	0.000	0.649	0.000	0.01
		C		0.000	0.000	0.380	0.000	0.01
L34	29.7500-25.7500	A	1.671	0.000	0.000	6.384	0.000	0.08
		B		0.000	0.000	10.355	0.000	0.15
		C		0.000	0.000	6.072	0.000	0.12
L35	25.7500-23.0000	A	1.649	0.000	0.000	7.031	0.000	0.08
		B		0.000	0.000	9.743	0.000	0.13
		C		0.000	0.000	6.816	0.000	0.11
L36	23.0000-22.7500	A	1.639	0.000	0.000	0.729	0.000	0.01
		B		0.000	0.000	0.974	0.000	0.01
		C		0.000	0.000	0.709	0.000	0.01
L37	22.7500-20.7500	A	1.631	0.000	0.000	6.931	0.000	0.08
		B		0.000	0.000	8.892	0.000	0.11
		C		0.000	0.000	6.775	0.000	0.10
L38	20.7500-20.5000	A	1.622	0.000	0.000	0.948	0.000	0.01
		B		0.000	0.000	1.193	0.000	0.01
		C		0.000	0.000	0.929	0.000	0.01
L39	20.5000-17.7500	A	1.610	0.000	0.000	12.873	0.000	0.14
		B		0.000	0.000	11.692	0.000	0.14
		C		0.000	0.000	8.798	0.000	0.13
L40	17.7500-17.5000	A	1.597	0.000	0.000	1.016	0.000	0.01
		B		0.000	0.000	0.908	0.000	0.01
		C		0.000	0.000	0.646	0.000	0.01
L41	17.5000-13.5000	A	1.576	0.000	0.000	16.189	0.000	0.17
		B		0.000	0.000	14.455	0.000	0.18
		C		0.000	0.000	10.285	0.000	0.15
L42	13.5000-9.5000	A	1.530	0.000	0.000	16.043	0.000	0.16
		B		0.000	0.000	14.288	0.000	0.17
		C		0.000	0.000	10.174	0.000	0.15
L43	9.5000-5.5000	A	1.466	0.000	0.000	15.839	0.000	0.15
		B		0.000	0.000	14.057	0.000	0.16
		C		0.000	0.000	10.020	0.000	0.14
L44	5.5000-3.2500	A	1.389	0.000	0.000	8.771	0.000	0.08
		B		0.000	0.000	7.751	0.000	0.09
		C		0.000	0.000	5.532	0.000	0.08
L45	3.2500-3.0000	A	1.343	0.000	0.000	0.965	0.000	0.01
		B		0.000	0.000	0.851	0.000	0.01
		C		0.000	0.000	0.608	0.000	0.01
L46	3.0000-0.0000	A	1.248	0.000	0.000	10.689	0.000	0.09
		B		0.000	0.000	9.955	0.000	0.10
		C		0.000	0.000	7.123	0.000	0.09

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	130.0000-126.0000	1.0309	-0.6392	1.0868	-0.7154
L2	126.0000-122.0000	2.9252	-1.8140	2.4137	-1.5887
L3	122.0000-120.0000	2.9252	-1.8140	2.4130	-1.5881

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L4	120.0000-116.0000	3.2447	-2.0140	3.0101	-1.9837
L5	116.0000-112.0000	3.2447	-2.0140	3.0082	-1.9822
L6	112.0000-108.0000	3.2447	-2.0140	3.0062	-1.9808
L7	108.0000-104.0000	3.2447	-2.0140	3.0042	-1.9792
L8	104.0000-100.0000	3.2447	-2.0140	3.0020	-1.9776
L9	100.0000-96.0000	3.2447	-2.0140	2.9998	-1.9760
L10	96.0000-92.0000	3.2447	-2.0140	2.9975	-1.9743
L11	92.0000-90.0000	3.2447	-2.0140	2.9957	-1.9729
L12	90.0000-86.0000	3.2447	-2.0140	2.9938	-1.9715
L13	86.0000-83.5000	1.2778	-1.4043	1.4609	-1.8983
L14	83.5000-83.2500	0.9971	-1.0958	1.2738	-1.6548
L15	83.2500-79.2500	0.9971	-1.0958	1.2732	-1.6535
L16	79.2500-75.2500	0.9971	-1.0958	1.2722	-1.6512
L17	75.2500-75.0000	0.9971	-1.0958	1.2716	-1.6499
L18	75.0000-74.7500	0.9971	-1.0958	1.2123	-1.5729
L19	74.7500-70.7500	0.9971	-1.0958	1.2118	-1.5717
L20	70.7500-66.7500	0.9971	-1.0958	1.2107	-1.5693
L21	66.7500-62.7500	0.9971	-1.0958	1.2096	-1.5668
L22	62.7500-60.0000	0.9971	-1.0958	1.2087	-1.5645
L23	60.0000-59.7500	2.3423	-2.5795	2.0925	-2.7126
L24	59.7500-55.7500	2.3423	-2.5795	2.0915	-2.7101
L25	55.7500-51.7500	2.3423	-2.5795	2.0895	-2.7052
L26	51.7500-48.5000	0.5632	-0.5897	0.9295	-1.0875
L27	48.5000-48.2500	0.5164	-0.5057	0.8013	-0.8015
L28	48.2500-44.2500	0.5164	-0.5057	0.8009	-0.8009
L29	44.2500-40.2500	0.5164	-0.5057	0.8001	-0.7997
L30	40.2500-36.2500	0.5164	-0.5057	0.7992	-0.7983
L31	36.2500-32.2500	0.5164	-0.5057	0.7983	-0.7968
L32	32.2500-30.0000	0.5164	-0.5057	0.7975	-0.7955
L33	30.0000-29.7500	1.0486	-1.0278	1.2536	-1.2500
L34	29.7500-25.7500	1.0486	-1.0278	1.2523	-1.2481
L35	25.7500-23.0000	0.5921	-0.5804	0.9735	-0.9695
L36	23.0000-22.7500	0.5416	-0.5308	0.8972	-0.8931
L37	22.7500-20.7500	0.4869	-0.4772	0.8007	-0.7968
L38	20.7500-20.5000	0.4591	-0.4500	0.7519	-0.7480
L39	20.5000-17.7500	0.0047	-2.2152	0.3491	-2.3044
L40	17.7500-17.5000	0.0054	-2.5709	0.3913	-2.5915
L41	17.5000-13.5000	0.0054	-2.5709	0.3893	-2.5920
L42	13.5000-9.5000	0.0054	-2.5709	0.3851	-2.5925
L43	9.5000-5.5000	0.0054	-2.5709	0.3794	-2.5922
L44	5.5000-3.2500	0.0054	-2.5709	0.3724	-2.5919
L45	3.2500-3.0000	0.0054	-2.5709	0.3682	-2.5916
L46	3.0000-0.0000	0.0972	-2.2715	0.4445	-2.3306

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	2	FSJ4-50B(1/2)	126.00 - 127.00	1.0000	1.0000
L1	4	2" Rigid Conduit	126.00 - 127.00	1.0000	1.0000
L2	2	FSJ4-50B(1/2)	122.00 - 126.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L2	4	2" Rigid Conduit	122.00 - 126.00	1.0000	1.0000
L3	2	FSJ4-50B(1/2)	120.00 - 122.00	1.0000	1.0000
L3	4	2" Rigid Conduit	120.00 - 122.00	1.0000	1.0000
L4	2	FSJ4-50B(1/2)	116.00 - 120.00	1.0000	1.0000
L4	4	2" Rigid Conduit	116.00 - 120.00	1.0000	1.0000
L5	2	FSJ4-50B(1/2)	112.00 - 116.00	1.0000	1.0000
L5	4	2" Rigid Conduit	112.00 - 116.00	1.0000	1.0000
L6	2	FSJ4-50B(1/2)	108.00 - 112.00	1.0000	1.0000
L6	4	2" Rigid Conduit	108.00 - 112.00	1.0000	1.0000
L7	2	FSJ4-50B(1/2)	104.00 - 108.00	1.0000	1.0000
L7	4	2" Rigid Conduit	104.00 - 108.00	1.0000	1.0000
L8	2	FSJ4-50B(1/2)	100.00 - 104.00	1.0000	1.0000
L8	4	2" Rigid Conduit	100.00 - 104.00	1.0000	1.0000
L9	2	FSJ4-50B(1/2)	96.00 - 100.00	1.0000	1.0000
L9	4	2" Rigid Conduit	96.00 - 100.00	1.0000	1.0000
L10	2	FSJ4-50B(1/2)	92.00 - 96.00	1.0000	1.0000
L10	4	2" Rigid Conduit	92.00 - 96.00	1.0000	1.0000
L11	2	FSJ4-50B(1/2)	90.00 - 92.00	1.0000	1.0000
L11	4	2" Rigid Conduit	90.00 - 92.00	1.0000	1.0000
L12	2	FSJ4-50B(1/2)	86.00 - 90.00	1.0000	1.0000
L12	4	2" Rigid Conduit	86.00 - 90.00	1.0000	1.0000
L13	2	FSJ4-50B(1/2)	83.50 - 86.00	1.0000	1.0000
L13	4	2" Rigid Conduit	83.50 - 86.00	1.0000	1.0000
L13	43	CCI-65FP-045100	83.50 - 85.00	1.0000	1.0000
L13	44	CCI-65FP-045100	83.50 - 85.00	1.0000	1.0000
L13	45	CCI-65FP-045100	83.50 - 85.00	1.0000	1.0000
L13	47	CU12PSM9P8XXX(1-3/8)	83.50 - 86.00	1.0000	1.0000
L14	2	FSJ4-50B(1/2)	83.25 - 83.50	1.0000	1.0000
L14	4	2" Rigid Conduit	83.25 - 83.50	1.0000	1.0000
L14	43	CCI-65FP-045100	83.25 - 83.50	1.0000	1.0000
L14	44	CCI-65FP-045100	83.25 - 83.50	1.0000	1.0000
L14	45	CCI-65FP-045100	83.25 - 83.50	1.0000	1.0000
L14	47	CU12PSM9P8XXX(1-3/8)	83.25 - 83.50	1.0000	1.0000
L15	2	FSJ4-50B(1/2)	79.25 - 83.25	1.0000	1.0000
L15	4	2" Rigid Conduit	79.25 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L15	43	CCI-65FP-045100	79.25 - 83.25	1.0000	1.0000
L15	44	CCI-65FP-045100	79.25 - 83.25	1.0000	1.0000
L15	45	CCI-65FP-045100	79.25 - 83.25	1.0000	1.0000
L15	47	CU12PSM9P8XXX(1-3/8)	79.25 - 83.25	1.0000	1.0000
L16	2	FSJ4-50B(1/2)	75.25 - 79.25	1.0000	1.0000
L16	4	2" Rigid Conduit	75.25 - 79.25	1.0000	1.0000
L16	43	CCI-65FP-045100	75.25 - 79.25	1.0000	1.0000
L16	44	CCI-65FP-045100	75.25 - 79.25	1.0000	1.0000
L16	45	CCI-65FP-045100	75.25 - 79.25	1.0000	1.0000
L16	47	CU12PSM9P8XXX(1-3/8)	75.25 - 79.25	1.0000	1.0000
L17	2	FSJ4-50B(1/2)	75.00 - 75.25	1.0000	1.0000
L17	4	2" Rigid Conduit	75.00 - 75.25	1.0000	1.0000
L17	43	CCI-65FP-045100	75.00 - 75.25	1.0000	1.0000
L17	44	CCI-65FP-045100	75.00 - 75.25	1.0000	1.0000
L17	45	CCI-65FP-045100	75.00 - 75.25	1.0000	1.0000
L17	47	CU12PSM9P8XXX(1-3/8)	75.00 - 75.25	1.0000	1.0000
L18	2	FSJ4-50B(1/2)	74.75 - 75.00	1.0000	1.0000
L18	4	2" Rigid Conduit	74.75 - 75.00	1.0000	1.0000
L18	25	CCI-65FP-045100	74.75 - 75.00	1.0000	1.0000
L18	26	CCI-65FP-045100	74.75 - 75.00	1.0000	1.0000
L18	27	CCI-65FP-045100	74.75 - 75.00	1.0000	1.0000
L18	47	CU12PSM9P8XXX(1-3/8)	74.75 - 75.00	1.0000	1.0000
L19	2	FSJ4-50B(1/2)	70.75 - 74.75	1.0000	1.0000
L19	4	2" Rigid Conduit	70.75 - 74.75	1.0000	1.0000
L19	25	CCI-65FP-045100	70.75 - 74.75	1.0000	1.0000
L19	26	CCI-65FP-045100	70.75 - 74.75	1.0000	1.0000
L19	27	CCI-65FP-045100	70.75 - 74.75	1.0000	1.0000
L19	47	CU12PSM9P8XXX(1-3/8)	70.75 - 74.75	1.0000	1.0000
L20	2	FSJ4-50B(1/2)	66.75 - 70.75	1.0000	1.0000
L20	4	2" Rigid Conduit	66.75 - 70.75	1.0000	1.0000
L20	25	CCI-65FP-045100	66.75 - 70.75	1.0000	1.0000
L20	26	CCI-65FP-045100	66.75 - 70.75	1.0000	1.0000
L20	27	CCI-65FP-045100	66.75 - 70.75	1.0000	1.0000
L20	47	CU12PSM9P8XXX(1-3/8)	66.75 - 70.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L21	2	FSJ4-50B(1/2)	62.75 - 66.75	1.0000	1.0000
L21	4	2" Rigid Conduit	62.75 - 66.75	1.0000	1.0000
L21	25	CCI-65FP-045100	62.75 - 66.75	1.0000	1.0000
L21	26	CCI-65FP-045100	62.75 - 66.75	1.0000	1.0000
L21	27	CCI-65FP-045100	62.75 - 66.75	1.0000	1.0000
L21	47	CU12PSM9P8XXX(1-3/8)	62.75 - 66.75	1.0000	1.0000
L22	2	FSJ4-50B(1/2)	60.00 - 62.75	1.0000	1.0000
L22	4	2" Rigid Conduit	60.00 - 62.75	1.0000	1.0000
L22	25	CCI-65FP-045100	60.00 - 62.75	1.0000	1.0000
L22	26	CCI-65FP-045100	60.00 - 62.75	1.0000	1.0000
L22	27	CCI-65FP-045100	60.00 - 62.75	1.0000	1.0000
L22	47	CU12PSM9P8XXX(1-3/8)	60.00 - 62.75	1.0000	1.0000
L23	2	FSJ4-50B(1/2)	59.75 - 60.00	1.0000	1.0000
L23	4	2" Rigid Conduit	59.75 - 60.00	1.0000	1.0000
L23	47	CU12PSM9P8XXX(1-3/8)	59.75 - 60.00	1.0000	1.0000
L24	2	FSJ4-50B(1/2)	55.75 - 59.75	1.0000	1.0000
L24	4	2" Rigid Conduit	55.75 - 59.75	1.0000	1.0000
L24	47	CU12PSM9P8XXX(1-3/8)	55.75 - 59.75	1.0000	1.0000
L25	2	FSJ4-50B(1/2)	51.75 - 55.75	1.0000	1.0000
L25	4	2" Rigid Conduit	51.75 - 55.75	1.0000	1.0000
L25	47	CU12PSM9P8XXX(1-3/8)	51.75 - 55.75	1.0000	1.0000
L26	2	FSJ4-50B(1/2)	48.50 - 51.75	1.0000	1.0000
L26	4	2" Rigid Conduit	48.50 - 51.75	1.0000	1.0000
L26	15	LDF4-50A(1/2)	48.50 - 50.00	1.0000	1.0000
L26	21	CCI-65FP-045100	48.50 - 51.50	1.0000	1.0000
L26	22	CCI-65FP-045100	48.50 - 51.50	1.0000	1.0000
L26	23	CCI-65FP-045100	48.50 - 51.50	1.0000	1.0000
L26	39	MS-600	48.50 - 51.50	1.0000	1.0000
L26	40	MS-600	48.50 - 51.50	1.0000	1.0000
L26	41	MS-600	48.50 - 51.50	1.0000	1.0000
L26	47	CU12PSM9P8XXX(1-3/8)	48.50 - 51.75	1.0000	1.0000
L27	2	FSJ4-50B(1/2)	48.25 - 48.50	1.0000	1.0000
L27	4	2" Rigid Conduit	48.25 - 48.50	1.0000	1.0000
L27	15	LDF4-50A(1/2)	48.25 - 48.50	1.0000	1.0000
L27	21	CCI-65FP-045100	48.25 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			48.50		
L27	22	CCI-65FP-045100	48.25 - 48.50	1.0000	1.0000
L27	23	CCI-65FP-045100	48.25 - 48.50	1.0000	1.0000
L27	39	MS-600	48.25 - 48.50	1.0000	1.0000
L27	40	MS-600	48.25 - 48.50	1.0000	1.0000
L27	41	MS-600	48.25 - 48.50	1.0000	1.0000
L27	47	CU12PSM9P8XXX(1-3/8)	48.25 - 48.50	1.0000	1.0000
L28	2	FSJ4-50B(1/2)	44.25 - 48.25	1.0000	1.0000
L28	4	2" Rigid Conduit	44.25 - 48.25	1.0000	1.0000
L28	15	LDF4-50A(1/2)	44.25 - 48.25	1.0000	1.0000
L28	21	CCI-65FP-045100	44.25 - 48.25	1.0000	1.0000
L28	22	CCI-65FP-045100	44.25 - 48.25	1.0000	1.0000
L28	23	CCI-65FP-045100	44.25 - 48.25	1.0000	1.0000
L28	39	MS-600	44.25 - 48.25	1.0000	1.0000
L28	40	MS-600	44.25 - 48.25	1.0000	1.0000
L28	41	MS-600	44.25 - 48.25	1.0000	1.0000
L28	47	CU12PSM9P8XXX(1-3/8)	44.25 - 48.25	1.0000	1.0000
L29	2	FSJ4-50B(1/2)	40.25 - 44.25	1.0000	1.0000
L29	4	2" Rigid Conduit	40.25 - 44.25	1.0000	1.0000
L29	15	LDF4-50A(1/2)	40.25 - 44.25	1.0000	1.0000
L29	21	CCI-65FP-045100	40.25 - 44.25	1.0000	1.0000
L29	22	CCI-65FP-045100	40.25 - 44.25	1.0000	1.0000
L29	23	CCI-65FP-045100	40.25 - 44.25	1.0000	1.0000
L29	39	MS-600	40.25 - 44.25	1.0000	1.0000
L29	40	MS-600	40.25 - 44.25	1.0000	1.0000
L29	41	MS-600	40.25 - 44.25	1.0000	1.0000
L29	47	CU12PSM9P8XXX(1-3/8)	40.25 - 44.25	1.0000	1.0000
L30	2	FSJ4-50B(1/2)	36.25 - 40.25	1.0000	1.0000
L30	4	2" Rigid Conduit	36.25 - 40.25	1.0000	1.0000
L30	15	LDF4-50A(1/2)	36.25 - 40.25	1.0000	1.0000
L30	21	CCI-65FP-045100	36.25 - 40.25	1.0000	1.0000
L30	22	CCI-65FP-045100	36.25 - 40.25	1.0000	1.0000
L30	23	CCI-65FP-045100	36.25 - 40.25	1.0000	1.0000
L30	39	MS-600	36.25 - 40.25	1.0000	1.0000
L30	40	MS-600	36.25 - 40.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L30	41	MS-600	36.25 - 40.25	1.0000	1.0000
L30	47	CU12PSM9P8XXX(1-3/8)	36.25 - 40.25	1.0000	1.0000
L31	2	FSJ4-50B(1/2)	32.25 - 36.25	1.0000	1.0000
L31	4	2" Rigid Conduit	32.25 - 36.25	1.0000	1.0000
L31	15	LDF4-50A(1/2)	32.25 - 36.25	1.0000	1.0000
L31	21	CCI-65FP-045100	32.25 - 36.25	1.0000	1.0000
L31	22	CCI-65FP-045100	32.25 - 36.25	1.0000	1.0000
L31	23	CCI-65FP-045100	32.25 - 36.25	1.0000	1.0000
L31	39	MS-600	32.25 - 36.25	1.0000	1.0000
L31	40	MS-600	32.25 - 36.25	1.0000	1.0000
L31	41	MS-600	32.25 - 36.25	1.0000	1.0000
L31	47	CU12PSM9P8XXX(1-3/8)	32.25 - 36.25	1.0000	1.0000
L32	2	FSJ4-50B(1/2)	30.00 - 32.25	1.0000	1.0000
L32	4	2" Rigid Conduit	30.00 - 32.25	1.0000	1.0000
L32	15	LDF4-50A(1/2)	30.00 - 32.25	1.0000	1.0000
L32	21	CCI-65FP-045100	30.00 - 32.25	1.0000	1.0000
L32	22	CCI-65FP-045100	30.00 - 32.25	1.0000	1.0000
L32	23	CCI-65FP-045100	30.00 - 32.25	1.0000	1.0000
L32	39	MS-600	30.00 - 32.25	1.0000	1.0000
L32	40	MS-600	30.00 - 32.25	1.0000	1.0000
L32	41	MS-600	30.00 - 32.25	1.0000	1.0000
L32	47	CU12PSM9P8XXX(1-3/8)	30.00 - 32.25	1.0000	1.0000
L33	2	FSJ4-50B(1/2)	29.75 - 30.00	1.0000	1.0000
L33	4	2" Rigid Conduit	29.75 - 30.00	1.0000	1.0000
L33	15	LDF4-50A(1/2)	29.75 - 30.00	1.0000	1.0000
L33	33	MS-600	29.75 - 30.00	1.0000	1.0000
L33	34	MS-600	29.75 - 30.00	1.0000	1.0000
L33	35	MS-600	29.75 - 30.00	1.0000	1.0000
L33	47	CU12PSM9P8XXX(1-3/8)	29.75 - 30.00	1.0000	1.0000
L34	2	FSJ4-50B(1/2)	25.75 - 29.75	1.0000	1.0000
L34	4	2" Rigid Conduit	25.75 - 29.75	1.0000	1.0000
L34	15	LDF4-50A(1/2)	25.75 - 29.75	1.0000	1.0000
L34	33	MS-600	25.75 - 29.75	1.0000	1.0000
L34	34	MS-600	25.75 - 29.75	1.0000	1.0000
L34	35	MS-600	25.75 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L34	47	CU12PSM9P8XXX(1-3/8)	29.75 - 25.75	1.0000	1.0000
L35	2	FSJ4-50B(1/2)	29.75 - 23.00	1.0000	1.0000
L35	4	2" Rigid Conduit	25.75 - 23.00	1.0000	1.0000
L35	15	LDF4-50A(1/2)	25.75 - 23.00	1.0000	1.0000
L35	29	MS-600	25.75 - 23.00	1.0000	1.0000
L35	30	MS-600	25.00 - 23.00	1.0000	1.0000
L35	31	MS-600	25.00 - 23.00	1.0000	1.0000
L35	33	MS-600	25.00 - 23.00	1.0000	1.0000
L35	34	MS-600	25.75 - 23.00	1.0000	1.0000
L35	35	MS-600	25.75 - 23.00	1.0000	1.0000
L35	47	CU12PSM9P8XXX(1-3/8)	25.75 - 23.00	1.0000	1.0000
L36	2	FSJ4-50B(1/2)	23.00 - 22.75	1.0000	1.0000
L36	4	2" Rigid Conduit	23.00 - 22.75	1.0000	1.0000
L36	15	LDF4-50A(1/2)	23.00 - 22.75	1.0000	1.0000
L36	29	MS-600	23.00 - 22.75	1.0000	1.0000
L36	30	MS-600	23.00 - 22.75	1.0000	1.0000
L36	31	MS-600	23.00 - 22.75	1.0000	1.0000
L36	33	MS-600	23.00 - 22.75	1.0000	1.0000
L36	34	MS-600	23.00 - 22.75	1.0000	1.0000
L36	35	MS-600	23.00 - 22.75	1.0000	1.0000
L36	47	CU12PSM9P8XXX(1-3/8)	23.00 - 22.75	1.0000	1.0000
L37	2	FSJ4-50B(1/2)	22.75 - 20.75	1.0000	1.0000
L37	4	2" Rigid Conduit	22.75 - 20.75	1.0000	1.0000
L37	15	LDF4-50A(1/2)	22.75 - 20.75	1.0000	1.0000
L37	17	3.75 x 1.25 FP	22.75 - 22.00	1.0000	1.0000
L37	18	3.75 x 1.25 FP	22.75 - 22.00	1.0000	1.0000
L37	19	3.75 x 1.25 FP	22.75 - 22.00	1.0000	1.0000
L37	29	MS-600	22.75 - 20.75	1.0000	1.0000
L37	30	MS-600	22.75 - 20.75	1.0000	1.0000
L37	31	MS-600	22.75 - 20.75	1.0000	1.0000
L37	33	MS-600	22.75 - 20.75	1.0000	1.0000
L37	34	MS-600	22.75 - 20.75	1.0000	1.0000
L37	35	MS-600	22.75 - 20.75	1.0000	1.0000
L37	47	CU12PSM9P8XXX(1-3/8)	22.75 - 20.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L38	2	FSJ4-50B(1/2)	20.50 - 20.75	1.0000	1.0000
L38	4	2" Rigid Conduit	20.50 - 20.75	1.0000	1.0000
L38	15	LDF4-50A(1/2)	20.50 - 20.75	1.0000	1.0000
L38	17	3.75 x 1.25 FP	20.50 - 20.75	1.0000	1.0000
L38	18	3.75 x 1.25 FP	20.50 - 20.75	1.0000	1.0000
L38	19	3.75 x 1.25 FP	20.50 - 20.75	1.0000	1.0000
L38	29	MS-600	20.50 - 20.75	1.0000	1.0000
L38	30	MS-600	20.50 - 20.75	1.0000	1.0000
L38	31	MS-600	20.50 - 20.75	1.0000	1.0000
L38	33	MS-600	20.50 - 20.75	1.0000	1.0000
L38	34	MS-600	20.50 - 20.75	1.0000	1.0000
L38	35	MS-600	20.50 - 20.75	1.0000	1.0000
L38	47	CU12PSM9P8XXX(1-3/8)	20.50 - 20.75	1.0000	1.0000
L39	2	FSJ4-50B(1/2)	17.75 - 20.50	1.0000	1.0000
L39	4	2" Rigid Conduit	17.75 - 20.50	1.0000	1.0000
L39	15	LDF4-50A(1/2)	17.75 - 20.50	1.0000	1.0000
L39	17	3.75 x 1.25 FP	17.75 - 20.50	1.0000	1.0000
L39	18	3.75 x 1.25 FP	17.75 - 20.50	1.0000	1.0000
L39	19	3.75 x 1.25 FP	17.75 - 20.50	1.0000	1.0000
L39	29	MS-600	17.75 - 20.50	1.0000	1.0000
L39	30	MS-600	17.75 - 20.50	1.0000	1.0000
L39	31	MS-600	17.75 - 20.50	1.0000	1.0000
L39	33	MS-600	19.00 - 20.50	1.0000	1.0000
L39	34	MS-600	19.00 - 20.50	1.0000	1.0000
L39	35	MS-600	19.00 - 20.50	1.0000	1.0000
L39	37	CCI-65FP-065125	17.75 - 20.50	1.0000	1.0000
L39	47	CU12PSM9P8XXX(1-3/8)	17.75 - 20.50	1.0000	1.0000
L40	2	FSJ4-50B(1/2)	17.50 - 17.75	1.0000	1.0000
L40	4	2" Rigid Conduit	17.50 - 17.75	1.0000	1.0000
L40	15	LDF4-50A(1/2)	17.50 - 17.75	1.0000	1.0000
L40	17	3.75 x 1.25 FP	17.50 - 17.75	1.0000	1.0000
L40	18	3.75 x 1.25 FP	17.50 - 17.75	1.0000	1.0000
L40	19	3.75 x 1.25 FP	17.50 - 17.75	1.0000	1.0000
L40	29	MS-600	17.50 - 17.75	1.0000	1.0000
L40	30	MS-600	17.50 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L40	31	MS-600	17.75 - 17.50	1.0000	1.0000
L40	37	CCI-65FP-065125	17.75 - 17.50	1.0000	1.0000
L40	47	CU12PSM9P8XXX(1-3/8)	17.75 - 17.50	1.0000	1.0000
L41	2	FSJ4-50B(1/2)	17.75 - 13.50	1.0000	1.0000
L41	4	2" Rigid Conduit	17.50 - 13.50	1.0000	1.0000
L41	15	LDF4-50A(1/2)	17.50 - 13.50	1.0000	1.0000
L41	17	3.75 x 1.25 FP	17.50 - 13.50	1.0000	1.0000
L41	18	3.75 x 1.25 FP	17.50 - 13.50	1.0000	1.0000
L41	19	3.75 x 1.25 FP	17.50 - 13.50	1.0000	1.0000
L41	29	MS-600	17.50 - 13.50	1.0000	1.0000
L41	30	MS-600	17.50 - 13.50	1.0000	1.0000
L41	31	MS-600	17.50 - 13.50	1.0000	1.0000
L41	37	CCI-65FP-065125	17.50 - 13.50	1.0000	1.0000
L41	47	CU12PSM9P8XXX(1-3/8)	17.50 - 13.50	1.0000	1.0000
L42	2	FSJ4-50B(1/2)	9.50 - 13.50	1.0000	1.0000
L42	4	2" Rigid Conduit	9.50 - 13.50	1.0000	1.0000
L42	15	LDF4-50A(1/2)	9.50 - 13.50	1.0000	1.0000
L42	17	3.75 x 1.25 FP	9.50 - 13.50	1.0000	1.0000
L42	18	3.75 x 1.25 FP	9.50 - 13.50	1.0000	1.0000
L42	19	3.75 x 1.25 FP	9.50 - 13.50	1.0000	1.0000
L42	29	MS-600	9.50 - 13.50	1.0000	1.0000
L42	30	MS-600	9.50 - 13.50	1.0000	1.0000
L42	31	MS-600	9.50 - 13.50	1.0000	1.0000
L42	37	CCI-65FP-065125	9.50 - 13.50	1.0000	1.0000
L42	47	CU12PSM9P8XXX(1-3/8)	9.50 - 13.50	1.0000	1.0000
L43	2	FSJ4-50B(1/2)	5.50 - 9.50	1.0000	1.0000
L43	4	2" Rigid Conduit	5.50 - 9.50	1.0000	1.0000
L43	15	LDF4-50A(1/2)	5.50 - 9.50	1.0000	1.0000
L43	17	3.75 x 1.25 FP	5.50 - 9.50	1.0000	1.0000
L43	18	3.75 x 1.25 FP	5.50 - 9.50	1.0000	1.0000
L43	19	3.75 x 1.25 FP	5.50 - 9.50	1.0000	1.0000
L43	29	MS-600	5.50 - 9.50	1.0000	1.0000
L43	30	MS-600	5.50 - 9.50	1.0000	1.0000
L43	31	MS-600	5.50 - 9.50	1.0000	1.0000
L43	37	CCI-65FP-065125	5.50 - 9.50	1.0000	1.0000
L43	47	CU12PSM9P8XXX(1-3/8)	5.50 - 9.50	1.0000	1.0000
L44	2	FSJ4-50B(1/2)	3.25 - 5.50	1.0000	1.0000
L44	4	2" Rigid Conduit	3.25 - 5.50	1.0000	1.0000
L44	15	LDF4-50A(1/2)	3.25 - 5.50	1.0000	1.0000
L44	17	3.75 x 1.25 FP	3.25 - 5.50	1.0000	1.0000
L44	18	3.75 x 1.25 FP	3.25 - 5.50	1.0000	1.0000
L44	19	3.75 x 1.25 FP	3.25 - 5.50	1.0000	1.0000
L44	29	MS-600	3.25 - 5.50	1.0000	1.0000
L44	30	MS-600	3.25 - 5.50	1.0000	1.0000
L44	31	MS-600	3.25 - 5.50	1.0000	1.0000
L44	37	CCI-65FP-065125	3.25 - 5.50	1.0000	1.0000
L44	47	CU12PSM9P8XXX(1-3/8)	3.25 - 5.50	1.0000	1.0000
L45	2	FSJ4-50B(1/2)	3.00 - 3.25	1.0000	1.0000
L45	4	2" Rigid Conduit	3.00 - 3.25	1.0000	1.0000
L45	15	LDF4-50A(1/2)	3.00 - 3.25	1.0000	1.0000
L45	17	3.75 x 1.25 FP	3.00 - 3.25	1.0000	1.0000
L45	18	3.75 x 1.25 FP	3.00 - 3.25	1.0000	1.0000
L45	19	3.75 x 1.25 FP	3.00 - 3.25	1.0000	1.0000
L45	29	MS-600	3.00 - 3.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L45	30	MS-600	3.00 - 3.25	1.0000	1.0000
L45	31	MS-600	3.00 - 3.25	1.0000	1.0000
L45	37	CCI-65FP-065125	3.00 - 3.25	1.0000	1.0000
L45	47	CU12PSM9P8XXX(1-3/8)	3.00 - 3.25	1.0000	1.0000
L46	2	FSJ4-50B(1/2)	0.00 - 3.00	1.0000	1.0000
L46	4	2" Rigid Conduit	0.00 - 3.00	1.0000	1.0000
L46	15	LDF4-50A(1/2)	0.00 - 3.00	1.0000	1.0000
L46	17	3.75 x 1.25 FP	0.00 - 3.00	1.0000	1.0000
L46	18	3.75 x 1.25 FP	0.00 - 3.00	1.0000	1.0000
L46	19	3.75 x 1.25 FP	0.00 - 3.00	1.0000	1.0000
L46	29	MS-600	0.00 - 3.00	1.0000	1.0000
L46	30	MS-600	0.00 - 3.00	1.0000	1.0000
L46	31	MS-600	0.00 - 3.00	1.0000	1.0000
L46	37	CCI-65FP-065125	0.50 - 3.00	1.0000	1.0000
L46	47	CU12PSM9P8XXX(1-3/8)	0.00 - 3.00	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
L13	43	CCI-65FP-045100	83.50 - 85.00	Auto	1.0000
L13	44	CCI-65FP-045100	83.50 - 85.00	Auto	1.0000
L13	45	CCI-65FP-045100	83.50 - 85.00	Auto	1.0000
L14	43	CCI-65FP-045100	83.25 - 83.50	Auto	1.0000
L14	44	CCI-65FP-045100	83.25 - 83.50	Auto	1.0000
L14	45	CCI-65FP-045100	83.25 - 83.50	Auto	1.0000
L15	43	CCI-65FP-045100	79.25 - 83.25	Auto	1.0000
L15	44	CCI-65FP-045100	79.25 - 83.25	Auto	1.0000
L15	45	CCI-65FP-045100	79.25 - 83.25	Auto	1.0000
L16	43	CCI-65FP-045100	75.25 - 79.25	Auto	1.0000
L16	44	CCI-65FP-045100	75.25 - 79.25	Auto	1.0000
L16	45	CCI-65FP-045100	75.25 - 79.25	Auto	1.0000
L17	43	CCI-65FP-045100	75.00 - 75.25	Auto	1.0000
L17	44	CCI-65FP-045100	75.00 - 75.25	Auto	1.0000
L17	45	CCI-65FP-045100	75.00 - 75.25	Auto	1.0000
L18	25	CCI-65FP-045100	74.75 - 75.00	Auto	1.0000
L18	26	CCI-65FP-045100	74.75 - 75.00	Auto	1.0000
L18	27	CCI-65FP-045100	74.75 - 75.00	Auto	1.0000
L19	25	CCI-65FP-045100	70.75 - 74.75	Auto	1.0000
L19	26	CCI-65FP-045100	70.75 -	Auto	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L19	27	CCI-65FP-045100	74.75 - 70.75	Auto	1.0000
L20	25	CCI-65FP-045100	74.75 - 66.75	Auto	1.0000
L20	26	CCI-65FP-045100	70.75 - 66.75	Auto	1.0000
L20	27	CCI-65FP-045100	70.75 - 66.75	Auto	1.0000
L21	25	CCI-65FP-045100	70.75 - 62.75	Auto	1.0000
L21	26	CCI-65FP-045100	66.75 - 62.75	Auto	1.0000
L21	27	CCI-65FP-045100	66.75 - 62.75	Auto	1.0000
L22	25	CCI-65FP-045100	66.75 - 60.00	Auto	1.0000
L22	26	CCI-65FP-045100	62.75 - 60.00	Auto	1.0000
L22	27	CCI-65FP-045100	62.75 - 60.00	Auto	1.0000
L26	21	CCI-65FP-045100	62.75 - 48.50	Auto	1.0000
L26	22	CCI-65FP-045100	51.50 - 48.50	Auto	1.0000
L26	23	CCI-65FP-045100	51.50 - 48.50	Auto	1.0000
L26	39	MS-600	51.50 - 48.50	Auto	1.0000
L26	40	MS-600	51.50 - 48.50	Auto	1.0000
L26	41	MS-600	51.50 - 48.50	Auto	1.0000
L27	21	CCI-65FP-045100	51.50 - 48.25	Auto	1.0000
L27	22	CCI-65FP-045100	48.50 - 48.25	Auto	1.0000
L27	23	CCI-65FP-045100	48.50 - 48.25	Auto	1.0000
L27	39	MS-600	48.50 - 48.25	Auto	1.0000
L27	40	MS-600	48.50 - 48.25	Auto	1.0000
L27	41	MS-600	48.50 - 48.25	Auto	1.0000
L28	21	CCI-65FP-045100	48.50 - 44.25	Auto	1.0000
L28	22	CCI-65FP-045100	48.25 - 44.25	Auto	1.0000
L28	23	CCI-65FP-045100	48.25 - 44.25	Auto	1.0000
L28	39	MS-600	48.25 - 44.25	Auto	1.0000
L28	40	MS-600	48.25 - 44.25	Auto	1.0000
L28	41	MS-600	48.25 - 44.25	Auto	1.0000
L29	21	CCI-65FP-045100	48.25 - 40.25	Auto	1.0000
L29	22	CCI-65FP-045100	44.25 - 40.25	Auto	1.0000
L29	23	CCI-65FP-045100	44.25 - 40.25	Auto	1.0000
L29	39	MS-600	44.25 - 40.25	Auto	1.0000
L29	40	MS-600	44.25 - 40.25	Auto	1.0000
L29	41	MS-600	44.25 - 40.25	Auto	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L30	21	CCI-65FP-045100	44.25 - 36.25	Auto	1.0000
L30	22	CCI-65FP-045100	40.25 - 36.25	Auto	1.0000
L30	23	CCI-65FP-045100	40.25 - 36.25	Auto	1.0000
L30	39	MS-600	40.25 - 36.25	Auto	1.0000
L30	40	MS-600	40.25 - 36.25	Auto	1.0000
L30	41	MS-600	40.25 - 36.25	Auto	1.0000
L31	21	CCI-65FP-045100	40.25 - 32.25	Auto	1.0000
L31	22	CCI-65FP-045100	36.25 - 32.25	Auto	1.0000
L31	23	CCI-65FP-045100	36.25 - 32.25	Auto	1.0000
L31	39	MS-600	36.25 - 32.25	Auto	1.0000
L31	40	MS-600	36.25 - 32.25	Auto	1.0000
L31	41	MS-600	36.25 - 32.25	Auto	1.0000
L32	21	CCI-65FP-045100	36.25 - 30.00	Auto	1.0000
L32	22	CCI-65FP-045100	32.25 - 30.00	Auto	1.0000
L32	23	CCI-65FP-045100	32.25 - 30.00	Auto	1.0000
L32	39	MS-600	32.25 - 30.00	Auto	1.0000
L32	40	MS-600	32.25 - 30.00	Auto	1.0000
L32	41	MS-600	32.25 - 30.00	Auto	1.0000
L33	33	MS-600	32.25 - 29.75	Auto	1.0000
L33	34	MS-600	30.00 - 29.75	Auto	1.0000
L33	35	MS-600	30.00 - 29.75	Auto	1.0000
L34	33	MS-600	30.00 - 25.75	Auto	1.0000
L34	34	MS-600	29.75 - 25.75	Auto	1.0000
L34	35	MS-600	29.75 - 25.75	Auto	1.0000
L35	29	MS-600	29.75 - 23.00	Auto	1.0000
L35	30	MS-600	25.00 - 23.00	Auto	1.0000
L35	31	MS-600	25.00 - 23.00	Auto	1.0000
L35	33	MS-600	25.00 - 23.00	Auto	1.0000
L35	34	MS-600	25.75 - 23.00	Auto	1.0000
L35	35	MS-600	25.75 - 23.00	Auto	1.0000
L36	29	MS-600	25.75 - 22.75	Auto	1.0000
L36	30	MS-600	23.00 - 22.75	Auto	1.0000
L36	31	MS-600	23.00 - 22.75	Auto	1.0000
L36	33	MS-600	23.00 - 22.75	Auto	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L36	34	MS-600	23.00 - 22.75	Auto	1.0000
L36	35	MS-600	23.00 - 22.75	Auto	1.0000
L37	17	3.75 x 1.25 FP	23.00 - 20.75	Auto	1.0000
L37	18	3.75 x 1.25 FP	22.00 - 20.75	Auto	1.0000
L37	19	3.75 x 1.25 FP	22.00 - 20.75	Auto	1.0000
L37	29	MS-600	22.00 - 20.75	Auto	1.0000
L37	30	MS-600	22.75 - 20.75	Auto	1.0000
L37	31	MS-600	22.75 - 20.75	Auto	1.0000
L37	33	MS-600	22.75 - 20.75	Auto	1.0000
L37	34	MS-600	22.75 - 20.75	Auto	1.0000
L37	35	MS-600	22.75 - 20.75	Auto	1.0000
L38	17	3.75 x 1.25 FP	22.75 - 20.50	Auto	1.0000
L38	18	3.75 x 1.25 FP	20.75 - 20.50	Auto	1.0000
L38	19	3.75 x 1.25 FP	20.75 - 20.50	Auto	1.0000
L38	29	MS-600	20.75 - 20.50	Auto	1.0000
L38	30	MS-600	20.75 - 20.50	Auto	1.0000
L38	31	MS-600	20.75 - 20.50	Auto	1.0000
L38	33	MS-600	20.75 - 20.50	Auto	1.0000
L38	34	MS-600	20.75 - 20.50	Auto	1.0000
L38	35	MS-600	20.75 - 20.50	Auto	1.0000
L39	17	3.75 x 1.25 FP	20.75 - 17.75	Auto	1.0000
L39	18	3.75 x 1.25 FP	20.50 - 17.75	Auto	1.0000
L39	19	3.75 x 1.25 FP	20.50 - 17.75	Auto	1.0000
L39	29	MS-600	20.50 - 17.75	Auto	1.0000
L39	30	MS-600	20.50 - 17.75	Auto	1.0000
L39	31	MS-600	20.50 - 17.75	Auto	1.0000
L39	33	MS-600	20.50 - 19.00	Auto	1.0000
L39	34	MS-600	20.50 - 19.00	Auto	1.0000
L39	35	MS-600	20.50 - 19.00	Auto	1.0000
L39	37	CCI-65FP-065125	20.50 - 17.75	Auto	1.0000
L40	17	3.75 x 1.25 FP	20.50 - 17.50	Auto	1.0000
L40	18	3.75 x 1.25 FP	17.75 - 17.50	Auto	1.0000
L40	19	3.75 x 1.25 FP	17.75 - 17.50	Auto	1.0000
L40	29	MS-600	17.75 - 17.50	Auto	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L40	30	MS-600	17.75 - 17.50	Auto	1.0000
L40	31	MS-600	17.75 - 17.50	Auto	1.0000
L40	37	CCI-65FP-065125	17.75 - 17.50	Auto	1.0000
L41	17	3.75 x 1.25 FP	17.75 - 13.50	Auto	1.0000
L41	18	3.75 x 1.25 FP	17.50 - 13.50	Auto	1.0000
L41	19	3.75 x 1.25 FP	17.50 - 13.50	Auto	1.0000
L41	29	MS-600	17.50 - 13.50	Auto	1.0000
L41	30	MS-600	17.50 - 13.50	Auto	1.0000
L41	31	MS-600	17.50 - 13.50	Auto	1.0000
L41	37	CCI-65FP-065125	17.50 - 13.50	Auto	1.0000
L42	17	3.75 x 1.25 FP	13.50 - 9.50	Auto	1.0000
L42	18	3.75 x 1.25 FP	13.50 - 9.50	Auto	1.0000
L42	19	3.75 x 1.25 FP	13.50 - 9.50	Auto	1.0000
L42	29	MS-600	13.50 - 9.50	Auto	1.0000
L42	30	MS-600	13.50 - 9.50	Auto	1.0000
L42	31	MS-600	13.50 - 9.50	Auto	1.0000
L42	37	CCI-65FP-065125	13.50 - 9.50	Auto	1.0000
L43	17	3.75 x 1.25 FP	9.50 - 5.50	Auto	1.0000
L43	18	3.75 x 1.25 FP	9.50 - 5.50	Auto	1.0000
L43	19	3.75 x 1.25 FP	9.50 - 5.50	Auto	1.0000
L43	29	MS-600	9.50 - 5.50	Auto	1.0000
L43	30	MS-600	9.50 - 5.50	Auto	1.0000
L43	31	MS-600	9.50 - 5.50	Auto	1.0000
L43	37	CCI-65FP-065125	9.50 - 5.50	Auto	1.0000
L44	17	3.75 x 1.25 FP	5.50 - 3.25	Auto	1.0000
L44	18	3.75 x 1.25 FP	5.50 - 3.25	Auto	1.0000
L44	19	3.75 x 1.25 FP	5.50 - 3.25	Auto	1.0000
L44	29	MS-600	5.50 - 3.25	Auto	1.0000
L44	30	MS-600	5.50 - 3.25	Auto	1.0000
L44	31	MS-600	5.50 - 3.25	Auto	1.0000
L44	37	CCI-65FP-065125	5.50 - 3.25	Auto	1.0000
L45	17	3.75 x 1.25 FP	3.25 - 3.00	Auto	1.0000
L45	18	3.75 x 1.25 FP	3.25 - 3.00	Auto	1.0000
L45	19	3.75 x 1.25 FP	3.25 - 3.00	Auto	1.0000
L45	29	MS-600	3.25 - 3.00	Auto	1.0000
L45	30	MS-600	3.25 - 3.00	Auto	1.0000
L45	31	MS-600	3.25 - 3.00	Auto	1.0000
L45	37	CCI-65FP-065125	3.25 - 3.00	Auto	1.0000
L46	17	3.75 x 1.25 FP	3.00 - 0.00	Auto	1.0000
L46	18	3.75 x 1.25 FP	3.00 - 0.00	Auto	1.0000
L46	19	3.75 x 1.25 FP	3.00 - 0.00	Auto	1.0000
L46	29	MS-600	3.00 - 0.00	Auto	1.0000
L46	30	MS-600	3.00 - 0.00	Auto	1.0000
L46	31	MS-600	3.00 - 0.00	Auto	1.0000
L46	37	CCI-65FP-065125	0.50 - 0.00	Auto	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft
LLPX310R w/ Mount Pipe	A	From Leg	1.0000 0.00 0.00	0.00	127.0000
LLPX310R w/ Mount Pipe	B	From Leg	1.0000 0.00 0.00	0.00	127.0000
LLPX310R w/ Mount Pipe	C	From Leg	1.0000 0.00 0.00	0.00	127.0000
RRH-2WB	A	From Leg	3.0000 0.00 0.00	0.00	127.0000
RRH-2WB	B	From Leg	3.0000 0.00 0.00	0.00	127.0000
RRH-2WB	C	From Leg	3.0000 0.00 0.00	0.00	127.0000
DC6-48-60-18-8F	C	From Leg	3.0000 0.00 0.00	0.00	127.0000
2.375" OD x 6' Mount Pipe	A	From Leg	3.0000 0.00 0.00	0.00	127.0000
2.375" OD x 6' Mount Pipe	B	From Leg	3.0000 0.00 0.00	0.00	127.0000
2.375" OD x 6' Mount Pipe	C	From Leg	3.0000 0.00 0.00	0.00	127.0000
Side Arm Mount [SO 102-3]	C	None		0.00	127.0000
****					
800MHz 2X50W RRH W/FILTER	A	From Leg	2.0000 0.00 0.00	0.00	117.0000
800MHz 2X50W RRH W/FILTER	B	From Leg	2.0000 0.00 0.00	0.00	117.0000
800MHz 2X50W RRH W/FILTER	C	From Leg	2.0000 0.00 0.00	0.00	117.0000
PCS 1900MHz 4x45W-65MHz	A	From Leg	2.0000 0.00 -2.00	0.00	117.0000
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.0000 0.00 -2.00	0.00	117.0000
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.0000 0.00 -2.00	0.00	117.0000
Side Arm Mount [SO 102-3]	C	None		0.00	117.0000
****					
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	116.0000
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	116.0000
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	116.0000
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	116.0000
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.0000	0.00	116.0000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft
			0.00 0.00		
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.0000 0.00	0.00	116.0000
			0.00		
TD-RRH8x20-25	A	From Leg	4.0000 0.00	0.00	116.0000
			0.00		
TD-RRH8x20-25	B	From Leg	4.0000 0.00	0.00	116.0000
			0.00		
TD-RRH8x20-25	C	From Leg	4.0000 0.00	0.00	116.0000
			0.00		
Platform Mount [LP 502-1]	C	None		0.00	116.0000
(2) 2.375" OD x 6' Mount Pipe	A	From Leg	4.0000 0.00	0.00	116.0000
			0.00		
(2) 2.375" OD x 6' Mount Pipe	B	From Leg	4.0000 0.00	0.00	116.0000
			0.00		
(2) 2.375" OD x 6' Mount Pipe	C	From Leg	4.0000 0.00	0.00	116.0000
			0.00		
**** *****					
BXA-80063-4CF-EDIN-2 w/ Mount Pipe	A	From Leg	4.0000 0.00	0.00	105.0000
			-1.00		
BXA-80063-4CF-EDIN-2 w/ Mount Pipe	B	From Leg	4.0000 0.00	0.00	105.0000
			-1.00		
BXA-80063-4CF-EDIN-2 w/ Mount Pipe	C	From Leg	4.0000 0.00	0.00	105.0000
			-1.00		
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.0000 0.00	0.00	105.0000
			2.00		
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.0000 0.00	0.00	105.0000
			2.00		
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.0000 0.00	0.00	105.0000
			2.00		
BXA-70063/4CF w/ Mount Pipe	A	From Leg	4.0000 0.00	0.00	105.0000
			2.00		
BXA-70063/4CF w/ Mount Pipe	B	From Leg	4.0000 0.00	0.00	105.0000
			2.00		
BXA-70063/4CF w/ Mount Pipe	C	From Leg	4.0000 0.00	0.00	105.0000
			2.00		
RFV01U-D1A	A	From Leg	4.0000 0.00	0.00	105.0000
			2.00		
RFV01U-D1A	B	From Leg	4.0000 0.00	0.00	105.0000
			2.00		
RFV01U-D1A	C	From Leg	4.0000 0.00	0.00	105.0000
			2.00		
RFV01U-D2A	A	From Leg	4.0000 0.00	0.00	105.0000
			1.00		

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
RFV01U-D2A	B	From Leg	4.0000 0.00 1.00	0.00	105.0000
RFV01U-D2A	C	From Leg	4.0000 0.00 1.00	0.00	105.0000
RRFDC-3315-PF-48	A	From Leg	4.0000 0.00 1.00	0.00	105.0000
DB-T1-6Z-8AB-0Z	B	From Leg	4.0000 0.00 1.00	0.00	105.0000
Platform Mount [LP 502-1] ****	C	None		0.00	105.0000
APXV18-209015-C-A20	A	From Leg	1.0000 0.00 0.00	0.00	96.0000
APXV18-209015-C-A20	B	From Leg	1.0000 0.00 0.00	0.00	96.0000
APXV18-209015-C-A20	C	From Leg	1.0000 0.00 0.00	0.00	96.0000
Pipe Mount [PM 601-3] ****	C	None		0.00	96.0000
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	86.0000
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	86.0000
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	86.0000
TA08025-B604	A	From Leg	4.0000 0.00 0.00	0.00	86.0000
TA08025-B604	B	From Leg	4.0000 0.00 0.00	0.00	86.0000
TA08025-B604	C	From Leg	4.0000 0.00 0.00	0.00	86.0000
TA08025-B605	A	From Leg	4.0000 0.00 0.00	0.00	86.0000
TA08025-B605	B	From Leg	4.0000 0.00 0.00	0.00	86.0000
TA08025-B605	C	From Leg	4.0000 0.00 0.00	0.00	86.0000
RDIDC-9181-PF-48	A	From Leg	4.0000 0.00 0.00	0.00	86.0000
(2) 8' x 2" Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	86.0000
(2) 8' x 2" Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	86.0000
(2) 8' x 2" Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	86.0000
Commscope MC-PK8-DSH	C	None		0.00	86.0000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
**					
Side Arm Mount [SO 701-1]	A	From Leg	1.0000 0.00 0.00	60.00	60.0000
Side Arm Mount [SO 701-1]	A	From Leg	1.0000 0.00 0.00	-60.00	60.0000
****					
KS24019-L112A	B	From Leg	4.0000 0.00 0.00	60.00	50.0000
Side Arm Mount [SO 701-1]	B	From Leg	1.0000 0.00 0.00	60.00	50.0000
****					
Bridge Stiffener (111" x 11.5" x 1.25")	A	None		0.00	60.0000
Bridge Stiffener (111" x 11.5" x 1.25")	B	None		0.00	60.0000
Bridge Stiffener (111" x 11.5" x 1.25")	C	None		0.00	60.0000
Channel Bridge Stiffener (44" x 6" x 1.25")	A	None		0.00	60.0000
Channel Bridge Stiffener (44" x 6" x 1.25")	B	None		0.00	60.0000
Channel Bridge Stiffener (44" x 6" x 1.25")	C	None		0.00	60.0000
***					
Channel Bridge Stiffener (56" x 8" x 1.25")	A	None		0.00	30.0000
Channel Bridge Stiffener (56" x 8" x 1.25")	B	None		0.00	30.0000
Channel Bridge Stiffener (56" x 8" x 1.25")	C	None		0.00	30.0000
Bridge Stiffener (135" x 11.5" x 1.25")	A	None		0.00	30.0000
Bridge Stiffener (135" x 11.5" x 1.25")	B	None		0.00	30.0000
Bridge Stiffener (135" x 11.5" x 1.25")	C	None		0.00	30.0000
**					
*****					

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft
VHLP2-18	A	Paraboloid w/o Radome	From Leg	1.0000 0.00 1.00	30.00		127.0000	2.1750
A-ANT-18G-2-C	B	Paraboloid w/o Radome	From Leg	1.0000 0.00 0.00	30.00		127.0000	2.1750
A-ANT-18G-2-C	C	Paraboloid w/o Radome	From Leg	1.0000 0.00 0.00	30.00		127.0000	2.1750

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

Comb. No.	Description
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	130 - 126	Pole	Max Tension	42	0.00	0.00	0.00
			Max. Compression	26	-2.38	0.38	-0.18
			Max. Mx	20	-0.72	2.04	-0.28
			Max. My	14	-0.73	0.32	-1.96
			Max. Vy	20	-1.62	2.04	-0.28
			Max. Vx	14	1.53	0.32	-1.96
			Max. Torque	12			-0.49
L2	126 - 122	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-2.82	0.31	-0.14
			Max. Mx	20	-0.90	8.84	-0.27
			Max. My	14	-0.91	0.83	-8.37
			Max. Vy	20	-1.78	8.84	-0.27
			Max. Vx	14	1.69	0.83	-8.37
			Max. Torque	12			-0.49
L3	122 - 120	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-3.04	0.27	-0.12
			Max. Mx	20	-0.99	12.47	-0.27
			Max. My	14	-1.00	1.09	-11.82
			Max. Vy	20	-1.86	12.47	-0.27
			Max. Vx	14	1.77	1.09	-11.82
			Max. Torque	12			-0.49
L4	120 - 116	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-5.00	0.17	-0.06
			Max. Mx	20	-1.79	20.56	-0.25
			Max. My	14	-1.80	1.59	-19.52
			Max. Vy	20	-2.77	20.56	-0.25
			Max. Vx	14	2.67	1.59	-19.52
			Max. Torque	12			-0.49
L5	116 - 112	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-12.94	0.06	0.01
			Max. Mx	20	-4.16	41.84	-0.23
			Max. My	14	-4.16	2.11	-40.43
			Max. Vy	20	-5.45	41.84	-0.23
			Max. Vx	14	5.35	2.11	-40.43
			Max. Torque	12			-0.49
L6	112 - 108	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-13.62	-0.06	0.08
			Max. Mx	20	-4.51	64.07	-0.21
			Max. My	14	-4.51	2.62	-62.30
			Max. Vy	20	-5.68	64.07	-0.21
			Max. Vx	14	5.59	2.62	-62.30
			Max. Torque	12			-0.49
L7	108 - 104	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.18	-1.10	0.46
			Max. Mx	20	-7.09	92.97	-0.06
			Max. My	14	-7.09	2.87	-90.97
			Max. Vy	20	-9.13	92.97	-0.06
			Max. Vx	14	9.03	2.87	-90.97
			Max. Torque	12			-0.49
L8	104 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.88	-1.22	0.53
			Max. Mx	20	-7.47	129.91	0.14
			Max. My	14	-7.47	3.22	-127.52
			Max. Vy	20	-9.35	129.91	0.14
			Max. Vx	14	9.26	3.22	-127.52
			Max. Torque	20			-0.45
L9	100 - 96	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24.58	-1.34	0.61
			Max. Mx	20	-7.86	167.73	0.34
			Max. My	14	-7.85	3.57	-164.97
			Max. Vy	20	-9.57	167.73	0.34
			Max. Vx	14	9.48	3.57	-164.97
			Max. Torque	20			-0.45
L10	96 - 92	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.23	-1.47	0.69
			Max. Mx	20	-8.59	208.52	0.53
			Max. My	14	-8.58	3.92	-205.38
			Max. Vy	20	-10.31	208.52	0.53
			Max. Vx	14	10.22	3.92	-205.38
			Max. Torque	20			-0.45
L11	92 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.59	-1.53	0.73
			Max. Mx	20	-8.80	229.22	0.63
			Max. My	14	-8.79	4.10	-225.90
			Max. Vy	20	-10.41	229.22	0.63
			Max. Vx	14	10.32	4.10	-225.90
			Max. Torque	20			-0.45
L12	90 - 86	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.45	-1.65	0.80
			Max. Mx	20	-9.36	271.26	0.83
			Max. My	14	-9.36	4.45	-267.57
			Max. Vy	20	-10.63	271.26	0.83
			Max. Vx	14	10.53	4.45	-267.57
			Max. Torque	20			-0.45

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L13	86 - 83.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.83	-1.70	1.44
			Max. Mx	20	-12.78	305.48	1.06
			Max. My	2	-12.79	6.56	301.59
			Max. Vy	20	-13.76	305.48	1.06
			Max. Vx	14	13.70	4.67	-301.53
			Max. Torque	20			-0.68
L14	83.5 - 83.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.91	-1.71	1.44
			Max. Mx	20	-12.84	308.92	1.08
			Max. My	2	-12.85	6.60	305.01
			Max. Vy	20	-13.77	308.92	1.08
			Max. Vx	14	13.73	4.70	-304.96
			Max. Torque	20			-0.68
L15	83.25 - 79.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.19	-1.79	1.54
			Max. Mx	20	-13.63	364.40	1.28
			Max. My	14	-13.60	5.06	-360.69
			Max. Vy	8	14.18	-363.52	-0.85
			Max. Vx	14	14.16	5.06	-360.69
			Max. Torque	20			-0.68
L16	79.25 - 75.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.46	-1.88	1.64
			Max. Mx	8	-14.39	-421.07	-1.01
			Max. My	14	-14.39	5.42	-418.11
			Max. Vy	8	14.59	-421.07	-1.01
			Max. Vx	14	14.57	5.42	-418.11
			Max. Torque	20			-0.68
L17	75.25 - 75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.54	-1.88	1.65
			Max. Mx	8	-14.44	-424.72	-1.01
			Max. My	14	-14.45	5.45	-421.75
			Max. Vy	8	14.61	-424.72	-1.01
			Max. Vx	14	14.59	5.45	-421.75
			Max. Torque	20			-0.68
L18	75 - 74.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.62	-1.89	1.65
			Max. Mx	8	-14.49	-428.38	-1.02
			Max. My	14	-14.50	5.47	-425.40
			Max. Vy	8	14.64	-428.38	-1.02
			Max. Vx	14	14.62	5.47	-425.40
			Max. Torque	20			-0.68
L19	74.75 - 70.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.89	-1.97	1.75
			Max. Mx	8	-15.29	-487.74	-1.18
			Max. My	14	-15.30	5.83	-484.64
			Max. Vy	8	15.04	-487.74	-1.18
			Max. Vx	14	15.02	5.83	-484.64
			Max. Torque	20			-0.68
L20	70.75 - 66.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.15	-2.06	1.85
			Max. Mx	8	-16.10	-548.67	-1.34
			Max. My	14	-16.10	6.19	-545.44
			Max. Vy	8	15.42	-548.67	-1.34
			Max. Vx	14	15.40	6.19	-545.44
			Max. Torque	20			-0.68
L21	66.75 - 62.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.42	-2.14	1.94
			Max. Mx	8	-16.92	-611.09	-1.50
			Max. My	14	-16.92	6.55	-607.73
			Max. Vy	8	15.79	-611.09	-1.50
			Max. Vx	14	15.77	6.55	-607.73
			Max. Torque	20			-0.68
L22	62.75 - 60	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-42.28	-2.19	2.00
			Max. Mx	8	-17.49	-654.83	-1.61
			Max. My	14	-17.49	6.80	-651.38
			Max. Vy	8	16.03	-654.83	-1.61
			Max. Vx	14	16.01	6.80	-651.38
			Max. Torque	20			-0.68
L23	60 - 59.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.65	-2.20	2.53
			Max. Mx	8	-19.79	-659.35	-1.31
			Max. My	14	-19.79	6.82	-655.58
			Max. Vy	8	18.08	-659.35	-1.31
			Max. Vx	14	18.09	6.82	-655.58
			Max. Torque	20			-0.86
L24	59.75 - 55.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.93	-2.29	2.63
			Max. Mx	8	-20.71	-732.12	-1.46
			Max. My	14	-20.71	7.18	-728.34
			Max. Vy	8	18.30	-732.12	-1.46
			Max. Vx	14	18.31	7.18	-728.34
			Max. Torque	20			-0.86
L25	55.75 - 51.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.20	-2.38	2.74
			Max. Mx	8	-21.65	-805.73	-1.62
			Max. My	14	-21.65	7.53	-801.94
			Max. Vy	8	18.51	-805.73	-1.62
			Max. Vx	14	18.52	7.53	-801.94
			Max. Torque	20			-0.86
L26	51.75 - 48.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.61	-2.75	2.64
			Max. Mx	8	-22.49	-866.76	-1.84
			Max. My	14	-22.49	7.64	-862.82
			Max. Vy	8	18.95	-866.76	-1.84
			Max. Vx	14	18.92	7.64	-862.82
			Max. Torque	20			-0.86
L27	48.5 - 48.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.73	-2.76	2.65
			Max. Mx	8	-22.57	-871.50	-1.85
			Max. My	14	-22.57	7.67	-867.55
			Max. Vy	8	18.97	-871.50	-1.85
			Max. Vx	14	18.94	7.67	-867.55
			Max. Torque	20			-0.78
L28	48.25 - 44.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.63	-2.85	2.72
			Max. Mx	8	-23.79	-948.32	-2.01
			Max. My	14	-23.79	8.02	-944.19
			Max. Vy	8	19.44	-948.32	-2.01
			Max. Vx	14	19.40	8.02	-944.19
			Max. Torque	20			-0.78
L29	44.25 - 40.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.51	-2.92	2.79
			Max. Mx	8	-25.01	-1026.96	-2.16
			Max. My	14	-25.02	8.37	-1022.63
			Max. Vy	8	19.88	-1026.96	-2.16
			Max. Vx	14	19.84	8.37	-1022.63
			Max. Torque	20			-0.78
L30	40.25 - 36.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.39	-2.99	2.85
			Max. Mx	8	-26.25	-1107.33	-2.31
			Max. My	14	-26.25	8.72	-1102.76
			Max. Vy	8	20.31	-1107.33	-2.31
			Max. Vx	14	20.26	8.72	-1102.76
			Max. Torque	20			-0.78
L31	36.25 - 32.25	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-57.26	-3.06	2.91
			Max. Mx	8	-27.49	-1189.34	-2.47
			Max. My	14	-27.49	9.07	-1184.51
			Max. Vy	8	20.71	-1189.34	-2.47
			Max. Vx	14	20.65	9.07	-1184.51
			Max. Torque	20			-0.78
L32	32.25 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.31	-3.10	2.94
			Max. Mx	8	-28.19	-1236.15	-2.55
			Max. My	14	-28.20	9.26	-1231.17
			Max. Vy	8	20.92	-1236.15	-2.55
			Max. Vx	14	20.86	9.26	-1231.17
			Max. Torque	20			-0.77
L33	30 - 29.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.59	-3.11	2.94
			Max. Mx	8	-30.39	-1241.93	-2.56
			Max. My	14	-30.39	9.28	-1236.93
			Max. Vy	8	23.14	-1241.93	-2.56
			Max. Vx	14	23.08	9.28	-1236.93
			Max. Torque	20			-0.77
L34	29.75 - 25.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.25	-3.19	3.01
			Max. Mx	8	-31.52	-1335.35	-2.71
			Max. My	14	-31.52	9.63	-1330.05
			Max. Vy	8	23.57	-1335.35	-2.71
			Max. Vx	14	23.51	9.63	-1330.05
			Max. Torque	20			-0.77
L35	25.75 - 23	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.46	-3.25	3.06
			Max. Mx	8	-32.30	-1400.55	-2.81
			Max. My	14	-32.30	9.86	-1395.04
			Max. Vy	8	23.86	-1400.55	-2.81
			Max. Vx	14	23.80	9.86	-1395.04
			Max. Torque	20			-0.77
L36	23 - 22.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.57	-3.25	3.07
			Max. Mx	8	-32.38	-1406.52	-2.82
			Max. My	14	-32.38	9.88	-1400.99
			Max. Vy	8	23.87	-1406.52	-2.82
			Max. Vx	14	23.82	9.88	-1400.99
			Max. Torque	20			-0.77
L37	22.75 - 20.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-65.51	-3.29	3.10
			Max. Mx	8	-32.95	-1454.48	-2.90
			Max. My	14	-32.95	10.05	-1448.81
			Max. Vy	8	24.09	-1454.48	-2.90
			Max. Vx	14	24.03	10.05	-1448.81
			Max. Torque	20			-0.77
L38	20.75 - 20.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-65.64	-3.30	3.10
			Max. Mx	8	-33.04	-1460.50	-2.90
			Max. My	14	-33.04	10.07	-1454.82
			Max. Vy	8	24.11	-1460.50	-2.90
			Max. Vx	14	24.05	10.07	-1454.82
			Max. Torque	20			-0.77
L39	20.5 - 17.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.08	-3.31	3.20
			Max. Mx	8	-33.96	-1527.21	-3.01
			Max. My	14	-33.96	10.30	-1521.35
			Max. Vy	8	24.41	-1527.21	-3.01
			Max. Vx	14	24.36	10.30	-1521.35
			Max. Torque	20			-0.77
L40	17.75 - 17.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.21	-3.32	3.21
			Max. Mx	8	-34.06	-1533.31	-3.01
			Max. My	14	-34.06	10.33	-1527.44
			Max. Vy	8	24.43	-1533.31	-3.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	14	24.38	10.33	-1527.44
			Max. Torque	20			-0.77
L41	17.5 - 13.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-69.34	-3.34	3.34
			Max. Mx	8	-35.53	-1631.81	-3.16
			Max. My	14	-35.53	10.66	-1625.69
			Max. Vy	8	24.82	-1631.81	-3.16
			Max. Vx	14	24.77	10.66	-1625.69
			Max. Torque	20			-0.77
L42	13.5 - 9.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-71.43	-3.36	3.47
			Max. Mx	8	-37.02	-1731.80	-3.31
			Max. My	14	-37.02	11.00	-1725.46
			Max. Vy	8	25.19	-1731.80	-3.31
			Max. Vx	14	25.15	11.00	-1725.46
			Max. Torque	20			-0.77
L43	9.5 - 5.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-73.50	-3.39	3.60
			Max. Mx	8	-38.52	-1833.24	-3.45
			Max. My	14	-38.52	11.33	-1826.70
			Max. Vy	8	25.54	-1833.24	-3.45
			Max. Vx	14	25.51	11.33	-1826.70
			Max. Torque	20			-0.77
L44	5.5 - 3.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.64	-3.40	3.66
			Max. Mx	8	-39.36	-1890.92	-3.54
			Max. My	14	-39.36	11.51	-1884.27
			Max. Vy	8	25.74	-1890.92	-3.54
			Max. Vx	14	25.71	11.51	-1884.27
			Max. Torque	20			-0.77
L45	3.25 - 3	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.76	-3.40	3.67
			Max. Mx	8	-39.45	-1897.35	-3.54
			Max. My	14	-39.45	11.53	-1890.69
			Max. Vy	8	25.75	-1897.35	-3.54
			Max. Vx	14	25.72	11.53	-1890.69
			Max. Torque	20			-0.77
L46	3 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-76.12	-3.43	3.75
			Max. Mx	8	-40.48	-1974.97	-3.65
			Max. My	14	-40.48	11.78	-1968.18
			Max. Vy	8	26.00	-1974.97	-3.65
			Max. Vx	14	25.98	11.78	-1968.18
			Max. Torque	20			-0.77

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	30	76.12	-7.67	-0.01
	Max. H_x	20	40.49	24.48	0.04
	Max. H_z	2	40.49	0.17	24.42
	Max. M_x	2	1873.28	0.17	24.42
	Max. M_z	8	1974.97	-25.99	-0.04
	Max. Torsion	10	0.43	-21.31	-12.19
	Min. Vert	19	30.37	21.03	-12.28
	Min. H_x	8	40.49	-25.99	-0.04
	Min. H_z	14	40.49	0.09	-25.96
	Min. M_x	14	-1968.18	0.09	-25.96
	Min. M_z	20	-1880.78	24.48	0.04
	Min. Torsion	20	-0.77	24.48	0.04

Tower Mast Reaction Summary

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 Only	33.74	0.00	0.00	-0.84	-0.92	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	40.49	-0.17	-24.42	-1873.28	21.09	0.34
0.9 Dead+1.0 Wind 0 deg - No Ice	30.37	-0.17	-24.42	-1855.24	21.13	0.34
1.2 Dead+1.0 Wind 30 deg - No Ice	40.49	12.20	-21.20	-1630.83	-938.07	0.31
0.9 Dead+1.0 Wind 30 deg - No Ice	30.37	12.20	-21.20	-1615.06	-928.86	0.31
1.2 Dead+1.0 Wind 60 deg - No Ice	40.49	22.45	-12.80	-966.07	-1710.09	-0.14
0.9 Dead+1.0 Wind 60 deg - No Ice	30.37	22.45	-12.80	-956.79	-1693.73	-0.14
1.2 Dead+1.0 Wind 90 deg - No Ice	40.49	25.99	0.04	3.65	-1974.97	-0.36
0.9 Dead+1.0 Wind 90 deg - No Ice	30.37	25.99	0.04	3.88	-1956.14	-0.36
1.2 Dead+1.0 Wind 120 deg - No Ice	40.49	21.31	12.19	924.59	-1632.45	-0.43
0.9 Dead+1.0 Wind 120 deg - No Ice	30.37	21.31	12.19	916.12	-1616.65	-0.42
1.2 Dead+1.0 Wind 150 deg - No Ice	40.49	12.56	21.73	1669.31	-966.66	-0.13
0.9 Dead+1.0 Wind 150 deg - No Ice	30.37	12.56	21.73	1653.71	-957.18	-0.12
1.2 Dead+1.0 Wind 180 deg - No Ice	40.49	-0.09	25.96	1968.18	11.78	-0.13
0.9 Dead+1.0 Wind 180 deg - No Ice	30.37	-0.09	25.96	1949.98	11.91	-0.12
1.2 Dead+1.0 Wind 210 deg - No Ice	40.49	-12.94	22.47	1708.00	981.54	0.10
0.9 Dead+1.0 Wind 210 deg - No Ice	30.37	-12.94	22.47	1692.24	972.62	0.10
1.2 Dead+1.0 Wind 240 deg - No Ice	40.49	-21.03	12.28	946.31	1606.88	0.36
0.9 Dead+1.0 Wind 240 deg - No Ice	30.37	-21.03	12.28	937.55	1591.95	0.36
1.2 Dead+1.0 Wind 270 deg - No Ice	40.49	-24.48	-0.04	-5.52	1880.78	0.77
0.9 Dead+1.0 Wind 270 deg - No Ice	30.37	-24.48	-0.04	-5.20	1863.18	0.77
1.2 Dead+1.0 Wind 300 deg - No Ice	40.49	-22.32	-13.08	-1004.28	1694.49	0.65
0.9 Dead+1.0 Wind 300 deg - No Ice	30.37	-22.32	-13.08	-994.55	1678.89	0.64
1.2 Dead+1.0 Wind 330 deg - No Ice	40.49	-13.09	-22.65	-1734.22	1000.90	0.53
0.9 Dead+1.0 Wind 330 deg - No Ice	30.37	-13.09	-22.65	-1717.64	991.76	0.53
1.2 Dead+1.0 Ice+1.0 Temp	76.12	0.00	-0.00	-3.75	-3.43	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	76.12	-0.04	-7.63	-678.42	2.25	0.11
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	76.12	3.81	-6.62	-590.18	-341.11	0.09
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	76.12	6.63	-3.79	-336.57	-589.74	-0.03
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	76.12	7.67	0.01	-2.57	-680.50	-0.10
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	76.12	6.65	3.81	330.79	-590.47	-0.13
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	76.12	3.85	6.65	584.06	-343.39	-0.07
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	76.12	-0.02	7.66	671.77	-0.26	-0.06
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	76.12	-3.82	6.63	582.13	333.86	0.00

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 240 deg+1.0 Ice+1.0 Temp	76.12	-6.58	3.83	336.30	577.47	0.08
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	76.12	-7.65	-0.01	-5.04	673.89	0.20
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	76.12	-6.60	-3.85	-346.49	579.39	0.19
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	76.12	-3.83	-6.63	-590.93	335.97	0.16
Dead+Wind 0 deg - Service	33.74	-0.04	-6.05	-462.13	4.52	0.08
Dead+Wind 30 deg - Service	33.74	3.02	-5.25	-402.40	-231.78	0.07
Dead+Wind 60 deg - Service	33.74	5.56	-3.17	-238.66	-422.02	-0.03
Dead+Wind 90 deg - Service	33.74	6.44	0.01	0.28	-487.29	-0.09
Dead+Wind 120 deg - Service	33.74	5.28	3.02	227.18	-402.85	-0.10
Dead+Wind 150 deg - Service	33.74	3.11	5.38	410.66	-238.83	-0.03
Dead+Wind 180 deg - Service	33.74	-0.02	6.43	484.33	2.23	-0.03
Dead+Wind 210 deg - Service	33.74	-3.20	5.57	420.22	241.17	0.03
Dead+Wind 240 deg - Service	33.74	-5.21	3.04	232.52	395.22	0.09
Dead+Wind 270 deg - Service	33.74	-6.06	-0.01	-1.98	462.69	0.19
Dead+Wind 300 deg - Service	33.74	-5.53	-3.24	-248.06	416.84	0.16
Dead+Wind 330 deg - Service	33.74	-3.24	-5.61	-427.92	245.95	0.13

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	-33.74	0.00	0.00	33.74	0.00	0.000%
2	-0.17	-40.49	-24.42	0.17	40.49	24.42	0.000%
3	-0.17	-30.37	-24.42	0.17	30.37	24.42	0.000%
4	12.20	-40.49	-21.20	-12.20	40.49	21.20	0.000%
5	12.20	-30.37	-21.20	-12.20	30.37	21.20	0.000%
6	22.45	-40.49	-12.80	-22.45	40.49	12.80	0.000%
7	22.45	-30.37	-12.80	-22.45	30.37	12.80	0.000%
8	25.99	-40.49	0.04	-25.99	40.49	-0.04	0.000%
9	25.99	-30.37	0.04	-25.99	30.37	-0.04	0.000%
10	21.31	-40.49	12.19	-21.31	40.49	-12.19	0.000%
11	21.31	-30.37	12.19	-21.31	30.37	-12.19	0.000%
12	12.56	-40.49	21.73	-12.56	40.49	-21.73	0.000%
13	12.56	-30.37	21.73	-12.56	30.37	-21.73	0.000%
14	-0.09	-40.49	25.96	0.09	40.49	-25.96	0.000%
15	-0.09	-30.37	25.96	0.09	30.37	-25.96	0.000%
16	-12.94	-40.49	22.47	12.94	40.49	-22.47	0.000%
17	-12.94	-30.37	22.47	12.94	30.37	-22.47	0.000%
18	-21.03	-40.49	12.28	21.03	40.49	-12.28	0.000%
19	-21.03	-30.37	12.28	21.03	30.37	-12.28	0.000%
20	-24.48	-40.49	-0.04	24.48	40.49	0.04	0.000%
21	-24.48	-30.37	-0.04	24.48	30.37	0.04	0.000%
22	-22.32	-40.49	-13.08	22.32	40.49	13.08	0.000%
23	-22.32	-30.37	-13.08	22.32	30.37	13.08	0.000%
24	-13.09	-40.49	-22.65	13.09	40.49	22.65	0.000%
25	-13.09	-30.37	-22.65	13.09	30.37	22.65	0.000%
26	0.00	-76.12	0.00	-0.00	76.12	0.00	0.000%
27	-0.04	-76.12	-7.63	0.04	76.12	7.63	0.000%
28	3.81	-76.12	-6.62	-3.81	76.12	6.62	0.000%
29	6.63	-76.12	-3.79	-6.63	76.12	3.79	0.000%
30	7.67	-76.12	0.01	-7.67	76.12	-0.01	0.000%
31	6.65	-76.12	3.81	-6.65	76.12	-3.81	0.000%
32	3.85	-76.12	6.65	-3.85	76.12	-6.65	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
33	-0.02	-76.12	7.66	0.02	76.12	-7.66	0.000%
34	-3.82	-76.12	6.63	3.82	76.12	-6.63	0.000%
35	-6.58	-76.12	3.83	6.58	76.12	-3.83	0.000%
36	-7.65	-76.12	-0.01	7.65	76.12	0.01	0.000%
37	-6.60	-76.12	-3.85	6.60	76.12	3.85	0.000%
38	-3.83	-76.12	-6.63	3.83	76.12	6.63	0.000%
39	-0.04	-33.74	-6.05	0.04	33.74	6.05	0.000%
40	3.02	-33.74	-5.25	-3.02	33.74	5.25	0.000%
41	5.56	-33.74	-3.17	-5.56	33.74	3.17	0.000%
42	6.44	-33.74	0.01	-6.44	33.74	-0.01	0.000%
43	5.28	-33.74	3.02	-5.28	33.74	-3.02	0.000%
44	3.11	-33.74	5.38	-3.11	33.74	-5.38	0.000%
45	-0.02	-33.74	6.43	0.02	33.74	-6.43	0.000%
46	-3.20	-33.74	5.57	3.20	33.74	-5.57	0.000%
47	-5.21	-33.74	3.04	5.21	33.74	-3.04	0.000%
48	-6.06	-33.74	-0.01	6.06	33.74	0.01	0.000%
49	-5.53	-33.74	-3.24	5.53	33.74	3.24	0.000%
50	-3.24	-33.74	-5.61	3.24	33.74	5.61	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00010613
3	Yes	5	0.00000001	0.00004356
4	Yes	6	0.00000001	0.00024941
5	Yes	6	0.00000001	0.00008535
6	Yes	6	0.00000001	0.00025868
7	Yes	6	0.00000001	0.00008772
8	Yes	5	0.00000001	0.00012596
9	Yes	5	0.00000001	0.00005361
10	Yes	6	0.00000001	0.00023809
11	Yes	6	0.00000001	0.00008154
12	Yes	6	0.00000001	0.00026154
13	Yes	6	0.00000001	0.00008877
14	Yes	5	0.00000001	0.00011090
15	Yes	5	0.00000001	0.00004664
16	Yes	6	0.00000001	0.00026219
17	Yes	6	0.00000001	0.00008884
18	Yes	6	0.00000001	0.00023976
19	Yes	6	0.00000001	0.00008217
20	Yes	5	0.00000001	0.00032470
21	Yes	5	0.00000001	0.00015436
22	Yes	6	0.00000001	0.00027064
23	Yes	6	0.00000001	0.00009166
24	Yes	6	0.00000001	0.00026873
25	Yes	6	0.00000001	0.00009033
26	Yes	4	0.00000001	0.00065548
27	Yes	6	0.00000001	0.00092679
28	Yes	7	0.00000001	0.00015348
29	Yes	7	0.00000001	0.00015148
30	Yes	6	0.00000001	0.00093091
31	Yes	7	0.00000001	0.00014932
32	Yes	7	0.00000001	0.00015194
33	Yes	6	0.00000001	0.00091370
34	Yes	7	0.00000001	0.00014771
35	Yes	7	0.00000001	0.00014714
36	Yes	6	0.00000001	0.00091877
37	Yes	7	0.00000001	0.00015138
38	Yes	7	0.00000001	0.00015053
39	Yes	4	0.00000001	0.00040264
40	Yes	5	0.00000001	0.00009198
41	Yes	5	0.00000001	0.00009574
42	Yes	4	0.00000001	0.00043779

43	Yes	5	0.00000001	0.00008310
44	Yes	5	0.00000001	0.00009556
45	Yes	4	0.00000001	0.00040215
46	Yes	5	0.00000001	0.00009604
47	Yes	5	0.00000001	0.00008346
48	Yes	4	0.00000001	0.00055362
49	Yes	5	0.00000001	0.00010310
50	Yes	5	0.00000001	0.00009673

Maximum Tower Deflections - Service Wind

Section No.	Elevation	Horz. Deflection	Gov. Load	Tilt	Twist
	ft	in	Comb.	°	°
L1	130 - 126	17.64	50	1.10	0.00
L2	126 - 122	16.72	50	1.10	0.00
L3	122 - 120	15.80	50	1.09	0.00
L4	120 - 116	15.35	50	1.09	0.00
L5	116 - 112	14.43	50	1.09	0.00
L6	112 - 108	13.53	50	1.08	0.00
L7	108 - 104	12.63	50	1.07	0.00
L8	104 - 100	11.74	50	1.05	0.00
L9	100 - 96	10.87	50	1.03	0.00
L10	96 - 92	10.02	50	1.00	0.00
L11	92 - 90	9.20	50	0.96	0.00
L12	90 - 86	8.80	50	0.93	0.00
L13	86 - 83.5	8.04	50	0.90	0.00
L14	83.5 - 83.25	7.58	50	0.87	0.00
L15	83.25 - 79.25	7.53	50	0.87	0.00
L16	79.25 - 75.25	6.82	50	0.84	0.00
L17	75.25 - 75	6.13	50	0.80	0.00
L18	75 - 74.75	6.09	50	0.80	0.00
L19	74.75 - 70.75	6.05	50	0.79	0.00
L20	70.75 - 66.75	5.40	50	0.75	0.00
L21	66.75 - 62.75	4.79	50	0.70	0.00
L22	62.75 - 60	4.23	50	0.65	0.00
L23	60 - 59.75	3.87	50	0.61	0.00
L24	59.75 - 55.75	3.83	50	0.60	0.00
L25	55.75 - 51.75	3.34	50	0.57	0.00
L26	51.75 - 48.5	2.88	50	0.53	0.00
L27	48.5 - 48.25	2.54	50	0.49	0.00
L28	48.25 - 44.25	2.51	50	0.49	0.00
L29	44.25 - 40.25	2.12	50	0.45	0.00
L30	40.25 - 36.25	1.75	50	0.42	0.00
L31	36.25 - 32.25	1.42	50	0.37	0.00
L32	32.25 - 30	1.13	50	0.33	0.00
L33	30 - 29.75	0.98	50	0.30	0.00
L34	29.75 - 25.75	0.96	50	0.30	0.00
L35	25.75 - 23	0.73	50	0.26	0.00
L36	23 - 22.75	0.58	50	0.23	0.00
L37	22.75 - 20.75	0.57	50	0.23	0.00
L38	20.75 - 20.5	0.48	50	0.21	0.00
L39	20.5 - 17.75	0.47	50	0.21	0.00
L40	17.75 - 17.5	0.36	50	0.18	0.00
L41	17.5 - 13.5	0.35	50	0.18	0.00
L42	13.5 - 9.5	0.21	50	0.14	0.00
L43	9.5 - 5.5	0.11	50	0.10	0.00
L44	5.5 - 3.25	0.04	50	0.06	0.00
L45	3.25 - 3	0.01	50	0.04	0.00
L46	3 - 0	0.01	50	0.03	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
128.0000	VHLP2-18	50	17.18	1.10	0.00	57672
127.0000	A-ANT-18G-2-C	50	16.95	1.10	0.00	57672
117.0000	800MHz 2X50W RRH W/FILTER	50	14.66	1.09	0.00	45023
116.0000	APXVSPP18-C-A20 w/ Mount Pipe	50	14.43	1.09	0.00	43522
105.0000	BXA-80063-4CF-EDIN-2 w/ Mount Pipe	50	11.96	1.06	0.00	12315
96.0000	APXV18-209015-C-A20	50	10.02	1.00	0.00	6250
86.0000	MX08FRO665-21 w/ Mount Pipe	50	8.04	0.90	0.00	5936
60.0000	Side Arm Mount [SO 701-1]	50	3.87	0.61	0.00	4825
50.0000	KS24019-L112A	50	2.69	0.51	0.00	5602
30.0000	Channel Bridge Stiffener (56" x 8" x 1.25")	50	0.98	0.30	0.00	5406

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	130 - 126	71.62	24	4.47	0.01
L2	126 - 122	67.88	24	4.47	0.01
L3	122 - 120	64.15	24	4.45	0.01
L4	120 - 116	62.29	24	4.43	0.01
L5	116 - 112	58.59	24	4.42	0.01
L6	112 - 108	54.91	24	4.39	0.01
L7	108 - 104	51.26	24	4.34	0.01
L8	104 - 100	47.65	24	4.28	0.01
L9	100 - 96	44.11	24	4.18	0.01
L10	96 - 92	40.67	24	4.05	0.01
L11	92 - 90	37.35	24	3.88	0.00
L12	90 - 86	35.75	24	3.79	0.00
L13	86 - 83.5	32.64	24	3.64	0.00
L14	83.5 - 83.25	30.76	24	3.53	0.00
L15	83.25 - 79.25	30.57	24	3.53	0.00
L16	79.25 - 75.25	27.68	24	3.40	0.00
L17	75.25 - 75	24.89	24	3.25	0.00
L18	75 - 74.75	24.73	24	3.24	0.00
L19	74.75 - 70.75	24.56	24	3.23	0.00
L20	70.75 - 66.75	21.93	24	3.05	0.00
L21	66.75 - 62.75	19.46	24	2.85	0.00
L22	62.75 - 60	17.16	24	2.63	0.00
L23	60 - 59.75	15.69	24	2.46	0.00
L24	59.75 - 55.75	15.57	24	2.45	0.00
L25	55.75 - 51.75	13.57	24	2.31	0.00
L26	51.75 - 48.5	11.71	24	2.14	0.00
L27	48.5 - 48.25	10.30	24	2.00	0.00
L28	48.25 - 44.25	10.19	24	1.99	0.00
L29	44.25 - 40.25	8.59	24	1.84	0.00
L30	40.25 - 36.25	7.11	24	1.69	0.00
L31	36.25 - 32.25	5.77	24	1.52	0.00
L32	32.25 - 30	4.57	24	1.33	0.00
L33	30 - 29.75	3.97	24	1.23	0.00
L34	29.75 - 25.75	3.90	24	1.22	0.00
L35	25.75 - 23	2.95	24	1.06	0.00
L36	23 - 22.75	2.37	24	0.95	0.00
L37	22.75 - 20.75	2.32	24	0.94	0.00
L38	20.75 - 20.5	1.95	24	0.85	0.00
L39	20.5 - 17.75	1.90	24	0.84	0.00
L40	17.75 - 17.5	1.44	24	0.74	0.00
L41	17.5 - 13.5	1.41	24	0.73	0.00
L42	13.5 - 9.5	0.85	24	0.58	0.00
L43	9.5 - 5.5	0.43	24	0.42	0.00
L44	5.5 - 3.25	0.15	24	0.25	0.00
L45	3.25 - 3	0.05	24	0.15	0.00
L46	3 - 0	0.04	24	0.14	0.00

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
128.0000	VHLP2-18	24	69.75	4.47	0.01	14842
127.0000	A-ANT-18G-2-C	24	68.82	4.47	0.01	14842
117.0000	800MHz 2X50W RRH W/FILTER	24	59.52	4.42	0.01	11262
116.0000	APXVSPP18-C-A20 w/ Mount Pipe	24	58.59	4.42	0.01	10880
105.0000	BXA-80063-4CF-EDIN-2 w/ Mount Pipe	24	48.55	4.30	0.01	3071
96.0000	APXV18-209015-C-A20	24	40.67	4.05	0.01	1555
86.0000	MX08FRO665-21 w/ Mount Pipe	24	32.64	3.64	0.00	1472
60.0000	Side Arm Mount [SO 701-1]	24	15.69	2.46	0.00	1192
50.0000	KS24019-L112A	24	10.94	2.06	0.00	1382
30.0000	Channel Bridge Stiffener (56" x 8" x 1.25")	24	3.97	1.23	0.00	1332

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	130 - 126 (1)	P16x0.1875	4.0000	0.0000	0.0	9.3143	-0.72	342.69	0.002
L2	126 - 122 (2)	P16x0.1875	4.0000	0.0000	0.0	9.3143	-0.90	342.69	0.003
L3	122 - 120 (3)	P16x0.1875	2.0000	0.0000	0.0	9.3143	-0.98	342.69	0.003
L4	120 - 116 (4)	P24x0.25	4.0000	0.0000	0.0	18.6532	-1.78	662.26	0.003
L5	116 - 112 (5)	P24x0.25	4.0000	0.0000	0.0	18.6532	-4.14	662.26	0.006
L6	112 - 108 (6)	P24x0.25	4.0000	0.0000	0.0	18.6532	-4.49	662.26	0.007
L7	108 - 104 (7)	P24x0.25	4.0000	0.0000	0.0	18.6532	-7.06	662.26	0.011
L8	104 - 100 (8)	P24x0.25	4.0000	0.0000	0.0	18.6532	-7.44	662.26	0.011
L9	100 - 96 (9)	P24x0.25	4.0000	0.0000	0.0	18.6532	-7.83	662.26	0.012
L10	96 - 92 (10)	P24x0.25	4.0000	0.0000	0.0	18.6532	-8.56	662.26	0.013
L11	92 - 90 (11)	P24x0.25	2.0000	0.0000	0.0	18.6532	-8.77	662.26	0.013
L12	90 - 86 (12)	P24x0.375	4.0000	0.0000	0.0	27.8325	-9.33	1052.07	0.009
L13	86 - 83.5 (13)	P24x0.375	2.5000	0.0000	0.0	27.8325	-12.75	1052.07	0.012
L14	83.5 - 83.25 (14)	P24x0.6	0.2500	0.0000	0.0	44.1080	-12.80	1667.28	0.008
L15	83.25 - 79.25 (15)	P24x0.6	4.0000	0.0000	0.0	44.1080	-13.59	1667.28	0.008
L16	79.25 - 75.25 (16)	P24x0.6	4.0000	0.0000	0.0	44.1080	-14.40	1667.28	0.009
L17	75.25 - 75 (17)	P24x0.6	0.2500	0.0000	0.0	44.1080	-14.45	1667.28	0.009

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L18	75 - 74.75 (18)	P24x0.6	0.2500	0.0000	0.0	44.1080	-14.50	1667.28	0.009
L19	74.75 - 70.75 (19)	P24x0.6	4.0000	0.0000	0.0	44.1080	-15.26	1667.28	0.009
L20	70.75 - 66.75 (20)	P24x0.6	4.0000	0.0000	0.0	44.1080	-16.07	1667.28	0.010
L21	66.75 - 62.75 (21)	P24x0.6	4.0000	0.0000	0.0	44.1080	-16.90	1667.28	0.010
L22	62.75 - 60 (22)	P24x0.6	2.7500	0.0000	0.0	44.1080	-17.46	1667.28	0.010
L23	60 - 59.75 (23)	P30x0.54375	0.2500	0.0000	0.0	50.3184	-19.76	1902.03	0.010
L24	59.75 - 55.75 (24)	P30x0.54375	4.0000	0.0000	0.0	50.3184	-20.69	1902.03	0.011
L25	55.75 - 51.75 (25)	P30x0.54375	4.0000	0.0000	0.0	50.3184	-21.63	1902.03	0.011
L26	51.75 - 48.5 (26)	P30x0.54375	3.2500	0.0000	0.0	50.3184	-22.47	1902.03	0.012
L27	48.5 - 48.25 (27)	P30x0.7375	0.2500	0.0000	0.0	67.7990	-22.55	2562.80	0.009
L28	48.25 - 44.25 (28)	P30x0.7375	4.0000	0.0000	0.0	67.7990	-23.77	2562.80	0.009
L29	44.25 - 40.25 (29)	P30x0.7375	4.0000	0.0000	0.0	67.7990	-25.00	2562.80	0.010
L30	40.25 - 36.25 (30)	P30x0.7375	4.0000	0.0000	0.0	67.7990	-26.23	2562.80	0.010
L31	36.25 - 32.25 (31)	P30x0.7375	4.0000	0.0000	0.0	67.7990	-27.48	2562.80	0.011
L32	32.25 - 30 (32)	P30x0.7375	2.2500	0.0000	0.0	67.7990	-28.18	2562.80	0.011
L33	30 - 29.75 (33)	P36x0.55	0.2500	0.0000	0.0	61.2532	-30.37	2315.37	0.013
L34	29.75 - 25.75 (34)	P36x0.55	4.0000	0.0000	0.0	61.2532	-31.51	2315.37	0.014
L35	25.75 - 23 (35)	P36x0.55	2.7500	0.0000	0.0	61.2532	-32.29	2315.37	0.014
L36	23 - 22.75 (36)	P36x0.55	0.2500	0.0000	0.0	61.2532	-32.37	2315.37	0.014
L37	22.75 - 20.75 (37)	P36x0.55	2.0000	0.0000	0.0	61.2532	-32.94	2315.37	0.014
L38	20.75 - 20.5 (38)	P36x0.6875	0.2500	0.0000	0.0	76.2695	-33.03	2882.99	0.011
L39	20.5 - 17.75 (39)	P36x0.6875	2.7500	0.0000	0.0	76.2695	-33.95	2882.99	0.012
L40	17.75 - 17.5 (40)	P36x0.7	0.2500	0.0000	0.0	77.6288	-34.05	2934.37	0.012
L41	17.5 - 13.5 (41)	P36x0.7	4.0000	0.0000	0.0	77.6288	-35.53	2934.37	0.012
L42	13.5 - 9.5 (42)	P36x0.7	4.0000	0.0000	0.0	77.6288	-37.02	2934.37	0.013
L43	9.5 - 5.5 (43)	P36x0.7	4.0000	0.0000	0.0	77.6288	-38.51	2934.37	0.013
L44	5.5 - 3.25 (44)	P36x0.7	2.2500	0.0000	0.0	77.6288	-39.36	2934.37	0.013
L45	3.25 - 3 (45)	P36x0.6875	0.2500	0.0000	0.0	76.2695	-39.45	2882.99	0.014
L46	3 - 0 (46)	P36x0.6875	3.0000	0.0000	0.0	76.2695	-40.48	2882.99	0.014

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	130 - 126 (1)	P16x0.1875	2.07	133.84	0.015	0.00	133.84	0.000

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L2	126 - 122 (2)	P16x0.1875	8.87	133.84	0.066	0.00	133.84	0.000
L3	122 - 120 (3)	P16x0.1875	12.62	133.84	0.094	0.00	133.84	0.000
L4	120 - 116 (4)	P24x0.25	20.99	396.68	0.053	0.00	396.68	0.000
L5	116 - 112 (5)	P24x0.25	42.65	396.68	0.108	0.00	396.68	0.000
L6	112 - 108 (6)	P24x0.25	65.33	396.68	0.165	0.00	396.68	0.000
L7	108 - 104 (7)	P24x0.25	95.06	396.68	0.240	0.00	396.68	0.000
L8	104 - 100 (8)	P24x0.25	132.71	396.68	0.335	0.00	396.68	0.000
L9	100 - 96 (9)	P24x0.25	171.31	396.68	0.432	0.00	396.68	0.000
L10	96 - 92 (10)	P24x0.25	212.94	396.68	0.537	0.00	396.68	0.000
L11	92 - 90 (11)	P24x0.25	234.09	396.68	0.590	0.00	396.68	0.000
L12	90 - 86 (12)	P24x0.375	277.06	623.72	0.444	0.00	623.72	0.000
L13	86 - 83.5 (13)	P24x0.375	311.87	623.72	0.500	0.00	623.72	0.000
L14	83.5 - 83.25 (14)	P24x0.6	315.38	1035.12	0.305	0.00	1035.12	0.000
L15	83.25 - 79.25 (15)	P24x0.6	372.10	1035.12	0.359	0.00	1035.12	0.000
L16	79.25 - 75.25 (16)	P24x0.6	429.82	1035.12	0.415	0.00	1035.12	0.000
L17	75.25 - 75 (17)	P24x0.6	433.46	1035.12	0.419	0.00	1035.12	0.000
L18	75 - 74.75 (18)	P24x0.6	437.11	1035.12	0.422	0.00	1035.12	0.000
L19	74.75 - 70.75 (19)	P24x0.6	496.82	1035.12	0.480	0.00	1035.12	0.000
L20	70.75 - 66.75 (20)	P24x0.6	558.85	1035.12	0.540	0.00	1035.12	0.000
L21	66.75 - 62.75 (21)	P24x0.6	622.37	1035.12	0.601	0.00	1035.12	0.000
L22	62.75 - 60 (22)	P24x0.6	666.87	1035.12	0.644	0.00	1035.12	0.000
L23	60 - 59.75 (23)	P30x0.54375	671.73	1443.46	0.465	0.00	1443.46	0.000
L24	59.75 - 55.75 (24)	P30x0.54375	745.69	1443.46	0.517	0.00	1443.46	0.000
L25	55.75 - 51.75 (25)	P30x0.54375	820.50	1443.46	0.568	0.00	1443.46	0.000
L26	51.75 - 48.5 (26)	P30x0.54375	882.10	1443.46	0.611	0.00	1443.46	0.000
L27	48.5 - 48.25 (27)	P30x0.7375	886.91	1989.70	0.446	0.00	1989.70	0.000
L28	48.25 - 44.25 (28)	P30x0.7375	964.83	1989.70	0.485	0.00	1989.70	0.000
L29	44.25 - 40.25 (29)	P30x0.7375	1044.56	1989.70	0.525	0.00	1989.70	0.000
L30	40.25 - 36.25 (30)	P30x0.7375	1126.02	1989.70	0.566	0.00	1989.70	0.000
L31	36.25 - 32.25 (31)	P30x0.7375	1209.12	1989.70	0.608	0.00	1989.70	0.000
L32	32.25 - 30 (32)	P30x0.7375	1256.54	1989.70	0.632	0.00	1989.70	0.000
L33	30 - 29.75 (33)	P36x0.55	1262.39	2052.07	0.615	0.00	2052.07	0.000
L34	29.75 - 25.75 (34)	P36x0.55	1356.89	2052.07	0.661	0.00	2052.07	0.000
L35	25.75 - 23 (35)	P36x0.55	1422.83	2052.07	0.693	0.00	2052.07	0.000
L36	23 - 22.75 (36)	P36x0.55	1428.87	2052.07	0.696	0.00	2052.07	0.000
L37	22.75 - 20.75 (37)	P36x0.55	1477.36	2052.07	0.720	0.00	2052.07	0.000
L38	20.75 - 20.5 (38)	P36x0.6875	1483.45	2649.32	0.560	0.00	2649.32	0.000
L39	20.5 - 17.75 (39)	P36x0.6875	1550.88	2649.32	0.585	0.00	2649.32	0.000
L40	17.75 - 17.5 (40)	P36x0.7	1557.05	2705.17	0.576	0.00	2705.17	0.000
L41	17.5 - 13.5 (41)	P36x0.7	1656.51	2705.17	0.612	0.00	2705.17	0.000
L42	13.5 - 9.5 (42)	P36x0.7	1757.39	2705.17	0.650	0.00	2705.17	0.000

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L43	9.5 - 5.5 (43)	P36x0.7	1859.63	2705.17	0.687	0.00	2705.17	0.000
L44	5.5 - 3.25 (44)	P36x0.7	1917.72	2705.17	0.709	0.00	2705.17	0.000
L45	3.25 - 3 (45)	P36x0.6875	1924.20	2649.32	0.726	0.00	2649.32	0.000
L46	3 - 0 (46)	P36x0.6875	2002.33	2649.32	0.756	0.00	2649.32	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V_u	ϕV_n	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u	ϕT_n	Ratio $\frac{T_u}{\phi T_n}$
	ft		K	K		kip-ft	kip-ft	
L1	130 - 126 (1)	P16x0.1875	1.57	105.63	0.015	0.18	128.62	0.001
L2	126 - 122 (2)	P16x0.1875	1.82	105.63	0.017	0.49	128.62	0.004
L3	122 - 120 (3)	P16x0.1875	1.92	105.63	0.018	0.49	128.62	0.004
L4	120 - 116 (4)	P24x0.25	2.85	201.86	0.014	0.49	324.23	0.002
L5	116 - 112 (5)	P24x0.25	5.54	201.86	0.027	0.49	324.23	0.002
L6	112 - 108 (6)	P24x0.25	5.80	201.86	0.029	0.49	324.23	0.002
L7	108 - 104 (7)	P24x0.25	9.29	201.86	0.046	0.10	324.23	0.000
L8	104 - 100 (8)	P24x0.25	9.53	201.86	0.047	0.10	324.23	0.000
L9	100 - 96 (9)	P24x0.25	9.77	201.86	0.048	0.10	324.23	0.000
L10	96 - 92 (10)	P24x0.25	10.52	201.86	0.052	0.10	324.23	0.000
L11	92 - 90 (11)	P24x0.25	10.63	201.86	0.053	0.10	324.23	0.000
L12	90 - 86 (12)	P24x0.375	10.86	315.62	0.034	0.10	655.57	0.000
L13	86 - 83.5 (13)	P24x0.375	14.04	315.62	0.044	0.01	655.57	0.000
L14	83.5 - 83.25 (14)	P24x0.6	14.06	500.18	0.028	0.01	1029.03	0.000
L15	83.25 - 79.25 (15)	P24x0.6	14.31	500.18	0.029	0.01	1029.03	0.000
L16	79.25 - 75.25 (16)	P24x0.6	14.56	500.18	0.029	0.01	1029.03	0.000
L17	75.25 - 75 (17)	P24x0.6	14.57	500.18	0.029	0.01	1029.03	0.000
L18	75 - 74.75 (18)	P24x0.6	14.59	500.18	0.029	0.01	1029.03	0.000
L19	74.75 - 70.75 (19)	P24x0.6	15.32	500.18	0.031	0.42	1029.03	0.000
L20	70.75 - 66.75 (20)	P24x0.6	15.70	500.18	0.031	0.42	1029.03	0.000
L21	66.75 - 62.75 (21)	P24x0.6	16.07	500.18	0.032	0.42	1029.03	0.000
L22	62.75 - 60 (22)	P24x0.6	16.31	500.18	0.033	0.42	1029.03	0.000
L23	60 - 59.75 (23)	P30x0.54375	18.38	570.61	0.032	0.51	1477.73	0.000
L24	59.75 - 55.75 (24)	P30x0.54375	18.60	570.61	0.033	0.51	1477.73	0.000
L25	55.75 - 51.75 (25)	P30x0.54375	18.81	570.61	0.033	0.51	1477.73	0.000
L26	51.75 - 48.5 (26)	P30x0.54375	19.22	570.61	0.034	0.53	1477.73	0.000
L27	48.5 - 48.25 (27)	P30x0.7375	19.25	768.84	0.025	0.53	1978.01	0.000
L28	48.25 - 44.25 (28)	P30x0.7375	19.72	768.84	0.026	0.53	1978.01	0.000
L29	44.25 - 40.25 (29)	P30x0.7375	20.16	768.84	0.026	0.53	1978.01	0.000
L30	40.25 - 36.25 (30)	P30x0.7375	20.58	768.84	0.027	0.53	1978.01	0.000
L31	36.25 - 32.25 (31)	P30x0.7375	20.98	768.84	0.027	0.53	1978.01	0.000
L32	32.25 - 30 (32)	P30x0.7375	21.20	768.84	0.028	0.53	1978.01	0.000
L33	30 - 29.75 (33)	P36x0.55	23.41	694.61	0.034	0.53	2164.90	0.000
L34	29.75 - 25.75 (34)	P36x0.55	23.84	694.61	0.034	0.53	2164.90	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 $\frac{T_u}{\phi T_n}$
L35	25.75 - 23 (35)	P36x0.55	24.13	694.61	0.035	0.53	2164.90	0.000
L36	23 - 22.75 (36)	P36x0.55	24.15	694.61	0.035	0.53	2164.90	0.000
L37	22.75 - 20.75 (37)	P36x0.55	24.36	694.61	0.035	0.53	2164.90	0.000
L38	20.75 - 20.5 (38)	P36x0.6875	24.38	864.90	0.028	0.53	2685.18	0.000
L39	20.5 - 17.75 (39)	P36x0.6875	24.67	864.90	0.029	0.53	2685.18	0.000
L40	17.75 - 17.5 (40)	P36x0.7	24.68	880.31	0.028	0.53	2732.06	0.000
L41	17.5 - 13.5 (41)	P36x0.7	25.06	880.31	0.028	0.53	2732.06	0.000
L42	13.5 - 9.5 (42)	P36x0.7	25.40	880.31	0.029	0.53	2732.06	0.000
L43	9.5 - 5.5 (43)	P36x0.7	25.74	880.31	0.029	0.53	2732.06	0.000
L44	5.5 - 3.25 (44)	P36x0.7	25.92	880.31	0.029	0.53	2732.06	0.000
L45	3.25 - 3 (45)	P36x0.6875	25.93	864.90	0.030	0.53	2685.18	0.000
L46	3 - 0 (46)	P36x0.6875	26.17	864.90	0.030	0.53	2685.18	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	130 - 126 (1)	0.002	0.015	0.000	0.015	0.001	0.018	1.050	4.8.2
L2	126 - 122 (2)	0.003	0.066	0.000	0.017	0.004	0.069	1.050	4.8.2
L3	122 - 120 (3)	0.003	0.094	0.000	0.018	0.004	0.098	1.050	4.8.2
L4	120 - 116 (4)	0.003	0.053	0.000	0.014	0.002	0.056	1.050	4.8.2
L5	116 - 112 (5)	0.006	0.108	0.000	0.027	0.002	0.115	1.050	4.8.2
L6	112 - 108 (6)	0.007	0.165	0.000	0.029	0.002	0.172	1.050	4.8.2
L7	108 - 104 (7)	0.011	0.240	0.000	0.046	0.000	0.252	1.050	4.8.2
L8	104 - 100 (8)	0.011	0.335	0.000	0.047	0.000	0.348	1.050	4.8.2
L9	100 - 96 (9)	0.012	0.432	0.000	0.048	0.000	0.446	1.050	4.8.2
L10	96 - 92 (10)	0.013	0.537	0.000	0.052	0.000	0.552	1.050	4.8.2
L11	92 - 90 (11)	0.013	0.590	0.000	0.053	0.000	0.606	1.050	4.8.2
L12	90 - 86 (12)	0.009	0.444	0.000	0.034	0.000	0.454	1.050	4.8.2
L13	86 - 83.5 (13)	0.012	0.500	0.000	0.044	0.000	0.514	1.050	4.8.2
L14	83.5 - 83.25 (14)	0.008	0.305	0.000	0.028	0.000	0.313	1.050	4.8.2
L15	83.25 - 79.25 (15)	0.008	0.359	0.000	0.029	0.000	0.368	1.050	4.8.2
L16	79.25 - 75.25 (16)	0.009	0.415	0.000	0.029	0.000	0.425	1.050	4.8.2
L17	75.25 - 75 (17)	0.009	0.419	0.000	0.029	0.000	0.428	1.050	4.8.2
L18	75 - 74.75 (18)	0.009	0.422	0.000	0.029	0.000	0.432	1.050	4.8.2
L19	74.75 - 70.75 (19)	0.009	0.480	0.000	0.031	0.000	0.490	1.050	4.8.2
L20	70.75 - 66.75 (20)	0.010	0.540	0.000	0.031	0.000	0.551	1.050	4.8.2
L21	66.75 - 62.75 (21)	0.010	0.601	0.000	0.032	0.000	0.612	1.050	4.8.2
L22	62.75 - 60 (22)	0.010	0.644	0.000	0.033	0.000	0.656	1.050	4.8.2
L23	60 - 59.75 (23)	0.010	0.465	0.000	0.032	0.000	0.477	1.050	4.8.2
L24	59.75 - 55.75 (24)	0.011	0.517	0.000	0.033	0.000	0.529	1.050	4.8.2
L25	55.75 - 51.75 (25)	0.011	0.568	0.000	0.033	0.000	0.581	1.050	4.8.2
L26	51.75 - 48.5	0.012	0.611	0.000	0.034	0.000	0.624	1.050	4.8.2

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
	(26)								
L27	48.5 - 48.25 (27)	0.009	0.446	0.000	0.025	0.000	0.455	1.050	4.8.2
L28	48.25 - 44.25 (28)	0.009	0.485	0.000	0.026	0.000	0.495	1.050	4.8.2
L29	44.25 - 40.25 (29)	0.010	0.525	0.000	0.026	0.000	0.535	1.050	4.8.2
L30	40.25 - 36.25 (30)	0.010	0.566	0.000	0.027	0.000	0.577	1.050	4.8.2
L31	36.25 - 32.25 (31)	0.011	0.608	0.000	0.027	0.000	0.619	1.050	4.8.2
L32	32.25 - 30 (32)	0.011	0.632	0.000	0.028	0.000	0.643	1.050	4.8.2
L33	30 - 29.75 (33)	0.013	0.615	0.000	0.034	0.000	0.629	1.050	4.8.2
L34	29.75 - 25.75 (34)	0.014	0.661	0.000	0.034	0.000	0.676	1.050	4.8.2
L35	25.75 - 23 (35)	0.014	0.693	0.000	0.035	0.000	0.709	1.050	4.8.2
L36	23 - 22.75 (36)	0.014	0.696	0.000	0.035	0.000	0.712	1.050	4.8.2
L37	22.75 - 20.75 (37)	0.014	0.720	0.000	0.035	0.000	0.735	1.050	4.8.2
L38	20.75 - 20.5 (38)	0.011	0.560	0.000	0.028	0.000	0.572	1.050	4.8.2
L39	20.5 - 17.75 (39)	0.012	0.585	0.000	0.029	0.000	0.598	1.050	4.8.2
L40	17.75 - 17.5 (40)	0.012	0.576	0.000	0.028	0.000	0.588	1.050	4.8.2
L41	17.5 - 13.5 (41)	0.012	0.612	0.000	0.028	0.000	0.625	1.050	4.8.2
L42	13.5 - 9.5 (42)	0.013	0.650	0.000	0.029	0.000	0.663	1.050	4.8.2
L43	9.5 - 5.5 (43)	0.013	0.687	0.000	0.029	0.000	0.701	1.050	4.8.2
L44	5.5 - 3.25 (44)	0.013	0.709	0.000	0.029	0.000	0.723	1.050	4.8.2
L45	3.25 - 3 (45)	0.014	0.726	0.000	0.030	0.000	0.741	1.050	4.8.2
L46	3 - 0 (46)	0.014	0.756	0.000	0.030	0.000	0.771	1.050	4.8.2

Section Capacity Table

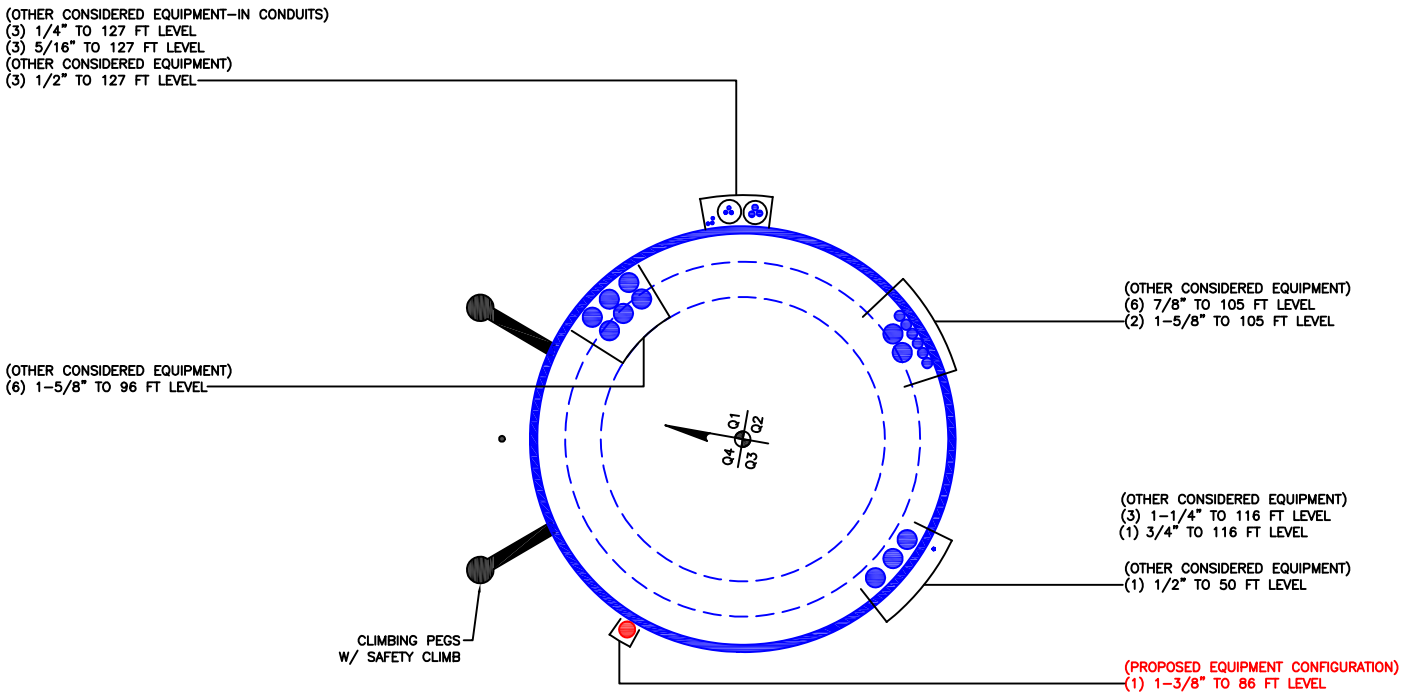
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	130 - 126	Pole	P16x0.1875	1	-0.72	359.83	1.8	Pass
L2	126 - 122	Pole	P16x0.1875	2	-0.90	359.83	6.6	Pass
L3	122 - 120	Pole	P16x0.1875	3	-0.98	359.83	9.3	Pass
L4	120 - 116	Pole	P24x0.25	4	-1.78	695.38	5.3	Pass
L5	116 - 112	Pole	P24x0.25	5	-4.14	695.38	10.9	Pass
L6	112 - 108	Pole	P24x0.25	6	-4.49	695.38	16.4	Pass
L7	108 - 104	Pole	P24x0.25	7	-7.06	695.38	24.0	Pass
L8	104 - 100	Pole	P24x0.25	8	-7.44	695.38	33.1	Pass
L9	100 - 96	Pole	P24x0.25	9	-7.83	695.38	42.5	Pass
L10	96 - 92	Pole	P24x0.25	10	-8.56	695.38	52.6	Pass
L11	92 - 90	Pole	P24x0.25	11	-8.77	695.38	57.7	Pass
L12	90 - 86	Pole	P24x0.375	12	-9.33	1104.67	43.3	Pass
L13	86 - 83.5	Pole	P24x0.375	13	-12.75	1104.67	49.0	Pass
L14	83.5 - 83.25	Pole	P24x0.6	14	-12.80	1750.64	29.8	Pass
L15	83.25 - 79.25	Pole	P24x0.6	15	-13.59	1750.64	35.1	Pass
L16	79.25 - 75.25	Pole	P24x0.6	16	-14.40	1750.64	40.4	Pass
L17	75.25 - 75	Pole	P24x0.6	17	-14.45	1750.64	40.8	Pass
L18	75 - 74.75	Pole	P24x0.6	18	-14.50	1750.64	41.1	Pass
L19	74.75 - 70.75	Pole	P24x0.6	19	-15.26	1750.64	46.7	Pass
L20	70.75 - 66.75	Pole	P24x0.6	20	-16.07	1750.64	52.4	Pass
L21	66.75 - 62.75	Pole	P24x0.6	21	-16.90	1750.64	58.3	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L22	62.75 - 60	Pole	P24x0.6	22	-17.46	1750.64	62.5	Pass
L23	60 - 59.75	Pole	P30x0.54375	23	-19.76	1997.13	45.4	Pass
L24	59.75 - 55.75	Pole	P30x0.54375	24	-20.69	1997.13	50.3	Pass
L25	55.75 - 51.75	Pole	P30x0.54375	25	-21.63	1997.13	55.3	Pass
L26	51.75 - 48.5	Pole	P30x0.54375	26	-22.47	1997.13	59.4	Pass
L27	48.5 - 48.25	Pole	P30x0.7375	27	-22.55	2690.94	43.4	Pass
L28	48.25 - 44.25	Pole	P30x0.7375	28	-23.77	2690.94	47.1	Pass
L29	44.25 - 40.25	Pole	P30x0.7375	29	-25.00	2690.94	51.0	Pass
L30	40.25 - 36.25	Pole	P30x0.7375	30	-26.23	2690.94	54.9	Pass
L31	36.25 - 32.25	Pole	P30x0.7375	31	-27.48	2690.94	59.0	Pass
L32	32.25 - 30	Pole	P30x0.7375	32	-28.18	2690.94	61.3	Pass
L33	30 - 29.75	Pole	P36x0.55	33	-30.37	2431.14	59.9	Pass
L34	29.75 - 25.75	Pole	P36x0.55	34	-31.51	2431.14	64.4	Pass
L35	25.75 - 23	Pole	P36x0.55	35	-32.29	2431.14	67.5	Pass
L36	23 - 22.75	Pole	P36x0.55	36	-32.37	2431.14	67.8	Pass
L37	22.75 - 20.75	Pole	P36x0.55	37	-32.94	2431.14	70.0	Pass
L38	20.75 - 20.5	Pole	P36x0.6875	38	-33.03	3027.14	54.5	Pass
L39	20.5 - 17.75	Pole	P36x0.6875	39	-33.95	3027.14	57.0	Pass
L40	17.75 - 17.5	Pole	P36x0.7	40	-34.05	3081.09	56.0	Pass
L41	17.5 - 13.5	Pole	P36x0.7	41	-35.53	3081.09	59.6	Pass
L42	13.5 - 9.5	Pole	P36x0.7	42	-37.02	3081.09	63.2	Pass
L43	9.5 - 5.5	Pole	P36x0.7	43	-38.51	3081.09	66.8	Pass
L44	5.5 - 3.25	Pole	P36x0.7	44	-39.36	3081.09	68.9	Pass
L45	3.25 - 3	Pole	P36x0.6875	45	-39.45	3027.14	70.6	Pass
L46	3 - 0	Pole	P36x0.6875	46	-40.48	3027.14	73.4	Pass
							Summary	
						Pole (L46)	73.4	Pass
						RATING =	**73.4**	**Pass**

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

APPENDIX B

BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT–IN CONDUITS)
(3) 1/4" TO 127 FT LEVEL
(3) 5/16" TO 127 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(3) 1/2" TO 127 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(6) 7/8" TO 105 FT LEVEL
(2) 1–5/8" TO 105 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(6) 1–5/8" TO 96 FT LEVEL
Q1
Q2
Q4
Q3
(OTHER CONSIDERED EQUIPMENT)
(3) 1–1/4" TO 116 FT LEVEL
(1) 3/4" TO 116 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 50 FT LEVEL
CLIMBING PEGS
W/ SAFETY CLIMB
(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1–3/8" TO 86 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- H

Site BU: 876324

Work Order: 2016303

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	130	10		0	16	16	0.1875		A53-B-42
2	120	30		0	24.00	24	0.25		A53-B-42
3	90	30		0	24.00	24	0.375		A53-B-42
4	60	30		0	30.00	30	0.375		A53-B-42
5	30	30		0	36.00	36	0.375		A53-B-42

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	20.75	plate	FP 3.375 x 1.25 BW	3	117	231	357															
2	30	60	plate	MS-450 (1.1875")	3				45	165	285												
3	60	75	plate	MS-450 (1.1875")	3				45	165	285												
4	0	23	plate	MS-600 (1.1875")	3							59	174	294									
5	23	30	plate	MS-600 (1.1875")	3							20	137	260									
6	3.25	17.75	plate	CCI-SFP-065125	1	20																	
7	30	48.5	plate	CCI-SFP-060100	3		15	150	255														
8	75	83.5	plate	CCI-SFP-045100	3		45	165	285														
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	3.375	1.25	4.21875	0.625	Welded	n/a	PC 8.8 - M20 (100)	12.000	24.000	2.656	1.1875	A572-65
2	4.5	1	4.5	0.5	PC 8.8 - M20 (100)	18	PC 8.8 - M20 (100)	18.000	20.625	3.250	1.1875	A572-65
3	4.5	1	4.5	0.5	PC 8.8 - M20 (100)	18	PC 8.8 - M20 (100)	18.000	20.625	3.250	1.1875	A572-65
4	6	1	6	0.5	PC 8.8 - M20 (100)	24	PC 8.8 - M20 (100)	24.000	16.375	4.750	1.1875	A572-65
5	6	1	6	0.5	PC 8.8 - M20 (100)	24	PC 8.8 - M20 (100)	24.000	16.375	4.750	1.1875	A572-65
6	6.5	1.25	8.125	0.625	PC 8.8 - M20 (100)	33	PC 8.8 - M20 (100)	33.000	19.000	6.563	1.1875	A572-65
7	6	1	6	0.5	PC 8.8 - M20 (100)	24	PC 8.8 - M20 (100)	24.000	16.000	4.750	1.1875	A572-65
8	4.5	1	4.5	0.5	PC 8.8 - M20 (100)	18	PC 8.8 - M20 (100)	18.000	20.000	3.250	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)
FP 3.375 x 1.25 BW	Top	4	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	80	CJP Groove	3.375	1.25	45	0.3125	-	-	-

TNX Geometry Input

Increment (ft): 4 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	130 - 126	4		0	16.000	16.000	0.1875	A53-B-42	1.000
2	126 - 122	4		0	16.000	16.000	0.1875	A53-B-42	1.000
3	122 - 120	2	0	0	16.000	16.000	0.1875	A53-B-42	1.000
4	120 - 116	4		0	24.000	24.000	0.25	A53-B-42	1.000
5	116 - 112	4		0	24.000	24.000	0.25	A53-B-42	1.000
6	112 - 108	4		0	24.000	24.000	0.25	A53-B-42	1.000
7	108 - 104	4		0	24.000	24.000	0.25	A53-B-42	1.000
8	104 - 100	4		0	24.000	24.000	0.25	A53-B-42	1.000
9	100 - 96	4		0	24.000	24.000	0.25	A53-B-42	1.000
10	96 - 92	4		0	24.000	24.000	0.25	A53-B-42	1.000
11	92 - 90	2	0	0	24.000	24.000	0.25	A53-B-42	1.000
12	90 - 86	4		0	24.000	24.000	0.375	A53-B-42	1.000
13	86 - 83.5	2.5		0	24.000	24.000	0.375	A53-B-42	1.000
14	83.5 - 83.25	0.25		0	24.000	24.000	0.6	A53-B-42	0.937
15	83.25 - 79.25	4		0	24.000	24.000	0.6	A53-B-42	0.937
16	79.25 - 75.25	4		0	24.000	24.000	0.6	A53-B-42	0.937
17	75.25 - 75	0.25		0	24.000	24.000	0.6	A53-B-42	0.937
18	75 - 74.75	0.25		0	24.000	24.000	0.6	A53-B-42	0.937
19	74.75 - 70.75	4		0	24.000	24.000	0.6	A53-B-42	0.937
20	70.75 - 66.75	4		0	24.000	24.000	0.6	A53-B-42	0.937
21	66.75 - 62.75	4		0	24.000	24.000	0.6	A53-B-42	0.937
22	62.75 - 60	2.75	0	0	24.000	24.000	0.6	A53-B-42	0.937
23	60 - 59.75	0.25		0	30.000	30.000	0.54375	A53-B-42	0.962
24	59.75 - 55.75	4		0	30.000	30.000	0.54375	A53-B-42	0.962
25	55.75 - 51.75	4		0	30.000	30.000	0.54375	A53-B-42	0.962
26	51.75 - 48.5	3.25		0	30.000	30.000	0.54375	A53-B-42	0.962
27	48.5 - 48.25	0.25		0	30.000	30.000	0.7375	A53-B-42	0.979
28	48.25 - 44.25	4		0	30.000	30.000	0.7375	A53-B-42	0.979
29	44.25 - 40.25	4		0	30.000	30.000	0.7375	A53-B-42	0.979
30	40.25 - 36.25	4		0	30.000	30.000	0.7375	A53-B-42	0.979
31	36.25 - 32.25	4		0	30.000	30.000	0.7375	A53-B-42	0.979
32	32.25 - 30	2.25	0	0	30.000	30.000	0.7375	A53-B-42	0.979
33	30 - 29.75	0.25		0	36.000	36.000	0.55	A53-B-42	0.979
34	29.75 - 25.75	4		0	36.000	36.000	0.55	A53-B-42	0.979
35	25.75 - 23	2.75		0	36.000	36.000	0.55	A53-B-42	0.979
36	23 - 22.75	0.25		0	36.000	36.000	0.55	A53-B-42	0.979
37	22.75 - 20.75	2		0	36.000	36.000	0.55	A53-B-42	0.979
38	20.75 - 20.5	0.25		0	36.000	36.000	0.6875	A53-B-42	0.952
39	20.5 - 17.75	2.75		0	36.000	36.000	0.6875	A53-B-42	0.952
40	17.75 - 17.5	0.25		0	36.000	36.000	0.7	A53-B-42	1.040
41	17.5 - 13.5	4		0	36.000	36.000	0.7	A53-B-42	1.040
42	13.5 - 9.5	4		0	36.000	36.000	0.7	A53-B-42	1.040
43	9.5 - 5.5	4		0	36.000	36.000	0.7	A53-B-42	1.040
44	5.5 - 3.25	2.25		0	36.000	36.000	0.7	A53-B-42	1.040
45	3.25 - 3	0.25		0	36.000	36.000	0.6875	A53-B-42	0.952
46	3 - 0	3		0	36.000	36.000	0.6875	A53-B-42	0.952

TNX Section Forces

Increment (ft):	4	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	130 - 126	0.72	2.07	1.57
2	126 - 122	0.90	8.87	1.82
3	122 - 120	0.98	12.62	1.92
4	120 - 116	1.78	20.99	2.85
5	116 - 112	4.14	42.65	5.54
6	112 - 108	4.49	65.33	5.80
7	108 - 104	7.06	95.06	9.29
8	104 - 100	7.44	132.71	9.53
9	100 - 96	7.83	171.31	9.77
10	96 - 92	8.56	212.94	10.52
11	92 - 90	8.77	234.09	10.63
12	90 - 86	9.33	277.06	10.86
13	86 - 83.5	12.75	311.87	14.04
14	83.5 - 83.25	12.80	315.38	14.06
15	83.25 - 79.25	13.59	372.10	14.31
16	79.25 - 75.25	14.40	429.82	14.56
17	75.25 - 75	14.45	433.46	14.57
18	75 - 74.75	14.50	437.11	14.59
19	74.75 - 70.75	15.26	496.82	15.32
20	70.75 - 66.75	16.07	558.85	15.70
21	66.75 - 62.75	16.90	622.37	16.07
22	62.75 - 60	17.46	666.87	16.31
23	60 - 59.75	19.76	671.73	18.38
24	59.75 - 55.75	20.69	745.69	18.60
25	55.75 - 51.75	21.63	820.50	18.81
26	51.75 - 48.5	22.47	882.10	19.22
27	48.5 - 48.25	22.55	886.91	19.25
28	48.25 - 44.25	23.77	964.82	19.72
29	44.25 - 40.25	25.00	1044.56	20.16
30	40.25 - 36.25	26.23	1126.02	20.58
31	36.25 - 32.25	27.48	1209.12	20.98
32	32.25 - 30	28.18	1256.54	21.20
33	30 - 29.75	30.37	1262.39	23.41
34	29.75 - 25.75	31.51	1356.89	23.84
35	25.75 - 23	32.29	1422.83	24.13
36	23 - 22.75	32.37	1428.86	24.15
37	22.75 - 20.75	32.94	1477.36	24.36
38	20.75 - 20.5	33.03	1483.45	24.38
39	20.5 - 17.75	33.95	1550.88	24.67
40	17.75 - 17.5	34.05	1557.05	24.68
41	17.5 - 13.5	35.53	1656.51	25.06
42	13.5 - 9.5	37.02	1757.39	25.40
43	9.5 - 5.5	38.51	1859.63	25.74
44	5.5 - 3.25	39.36	1917.72	25.92
45	3.25 - 3	39.45	1924.20	25.93
46	3 - 0	40.48	2002.33	26.17

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
130 - 126	Pole	TP16x16x0.1875	Pole	1.7%	Pass
126 - 122	Pole	TP16x16x0.1875	Pole	6.6%	Pass
122 - 120	Pole	TP16x16x0.1875	Pole	9.3%	Pass
120 - 116	Pole	TP24x24x0.25	Pole	5.3%	Pass
116 - 112	Pole	TP24x24x0.25	Pole	10.9%	Pass
112 - 108	Pole	TP24x24x0.25	Pole	16.4%	Pass
108 - 104	Pole	TP24x24x0.25	Pole	24.0%	Pass
104 - 100	Pole	TP24x24x0.25	Pole	33.1%	Pass
100 - 96	Pole	TP24x24x0.25	Pole	42.5%	Pass
96 - 92	Pole	TP24x24x0.25	Pole	52.6%	Pass
92 - 90	Pole	TP24x24x0.25	Pole	57.7%	Pass
90 - 86	Pole	TP24x24x0.375	Pole	43.3%	Pass
86 - 83.5	Pole	TP24x24x0.375	Pole	49.0%	Pass
83.5 - 83.25	Pole + Reinf.	TP24x24x0.6	Reinf. 8 Tension Rupture	35.3%	Pass
83.25 - 79.25	Pole + Reinf.	TP24x24x0.6	Reinf. 8 Tension Rupture	41.6%	Pass
79.25 - 75.25	Pole + Reinf.	TP24x24x0.6	Reinf. 8 Tension Rupture	48.0%	Pass
75.25 - 75	Pole + Reinf.	TP24x24x0.6	Reinf. 8 Tension Rupture	48.4%	Pass
75 - 74.75	Pole + Reinf.	TP24x24x0.6	Reinf. 3 Compression	49.3%	Pass
74.75 - 70.75	Pole + Reinf.	TP24x24x0.6	Reinf. 3 Compression	55.9%	Pass
70.75 - 66.75	Pole + Reinf.	TP24x24x0.6	Reinf. 3 Compression	62.9%	Pass
66.75 - 62.75	Pole + Reinf.	TP24x24x0.6	Reinf. 3 Compression	69.9%	Pass
62.75 - 60	Pole + Reinf.	TP24x24x0.6	Reinf. 3 Compression	74.9%	Pass
60 - 59.75	Pole + Reinf.	TP30x30x0.5438	Reinf. 2 Compression	51.8%	Pass
59.75 - 55.75	Pole + Reinf.	TP30x30x0.5438	Reinf. 2 Compression	57.5%	Pass
55.75 - 51.75	Pole + Reinf.	TP30x30x0.5438	Reinf. 2 Compression	63.2%	Pass
51.75 - 48.5	Pole + Reinf.	TP30x30x0.5438	Reinf. 2 Compression	67.9%	Pass
48.5 - 48.25	Pole + Reinf.	TP30x30x0.7375	Reinf. 2 Compression	50.3%	Pass
48.25 - 44.25	Pole + Reinf.	TP30x30x0.7375	Reinf. 2 Compression	54.7%	Pass
44.25 - 40.25	Pole + Reinf.	TP30x30x0.7375	Reinf. 2 Compression	59.2%	Pass
40.25 - 36.25	Pole + Reinf.	TP30x30x0.7375	Reinf. 2 Compression	63.8%	Pass
36.25 - 32.25	Pole + Reinf.	TP30x30x0.7375	Reinf. 2 Compression	68.5%	Pass
32.25 - 30	Pole + Reinf.	TP30x30x0.7375	Reinf. 2 Compression	71.1%	Pass
30 - 29.75	Pole + Reinf.	TP36x36x0.55	Pole	63.4%	Pass
29.75 - 25.75	Pole + Reinf.	TP36x36x0.55	Pole	68.1%	Pass
25.75 - 23	Pole + Reinf.	TP36x36x0.55	Pole	71.4%	Pass
23 - 22.75	Pole + Reinf.	TP36x36x0.55	Pole	72.4%	Pass
22.75 - 20.75	Pole + Reinf.	TP36x36x0.55	Pole	74.9%	Pass
20.75 - 20.5	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	71.8%	Pass
20.5 - 17.75	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	75.0%	Pass
17.75 - 17.5	Pole + Reinf.	TP36x36x0.7	Reinf. 1 Tension Rupture	73.8%	Pass
17.5 - 13.5	Pole + Reinf.	TP36x36x0.7	Reinf. 1 Tension Rupture	78.5%	Pass
13.5 - 9.5	Pole + Reinf.	TP36x36x0.7	Reinf. 1 Tension Rupture	83.3%	Pass
9.5 - 5.5	Pole + Reinf.	TP36x36x0.7	Reinf. 1 Tension Rupture	88.1%	Pass
5.5 - 3.25	Pole + Reinf.	TP36x36x0.7	Reinf. 1 Tension Rupture	90.9%	Pass
3.25 - 3	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	93.0%	Pass
3 - 0	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	96.8%	Pass
				Summary	
			Pole	81.7%	Pass
			Reinforcement	96.8%	Pass
			Overall	96.8%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*								
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8
130 - 126	291	n/a	291	9.31	n/a	9.31	1.7%								
126 - 122	291	n/a	291	9.31	n/a	9.31	6.6%								
122 - 120	291	n/a	291	9.31	n/a	9.31	9.3%								
120 - 116	1315	n/a	1315	18.65	n/a	18.65	5.3%								
116 - 112	1315	n/a	1315	18.65	n/a	18.65	10.9%								
112 - 108	1315	n/a	1315	18.65	n/a	18.65	16.4%								
108 - 104	1315	n/a	1315	18.65	n/a	18.65	24.0%								
104 - 100	1315	n/a	1315	18.65	n/a	18.65	33.1%								
100 - 96	1315	n/a	1315	18.65	n/a	18.65	42.5%								
96 - 92	1315	n/a	1315	18.65	n/a	18.65	52.6%								
92 - 90	1315	n/a	1315	18.65	n/a	18.65	57.7%								
90 - 86	1942	n/a	1942	27.83	n/a	27.83	43.3%								
86 - 83.5	1942	n/a	1942	27.83	n/a	27.83	49.0%								
83.5 - 83.25	1942	1067	3009	27.83	13.50	41.33	31.9%								35.3%
83.25 - 79.25	1942	1067	3009	27.83	13.50	41.33	37.5%								41.6%
79.25 - 75.25	1942	1067	3009	27.83	13.50	41.33	43.2%								48.0%
75.25 - 75	1942	1067	3009	27.83	13.50	41.33	43.6%								48.4%
75 - 74.75	1942	1067	3009	27.83	13.50	41.33	44.0%			49.3%					
74.75 - 70.75	1942	1067	3009	27.83	13.50	41.33	49.9%			55.9%					
70.75 - 66.75	1942	1067	3009	27.83	13.50	41.33	56.1%			62.9%					
66.75 - 62.75	1942	1067	3009	27.83	13.50	41.33	62.4%			69.9%					
62.75 - 60	1942	1067	3009	27.83	13.50	41.33	66.8%			74.9%					
60 - 59.75	3829	1634	5463	34.90	13.50	48.40	48.4%		51.8%						
59.75 - 55.75	3829	1634	5463	34.90	13.50	48.40	53.6%		57.5%						
55.75 - 51.75	3829	1634	5463	34.90	13.50	48.40	58.9%		63.2%						
51.75 - 48.5	3829	1634	5463	34.90	13.50	48.40	63.3%		67.9%						
48.5 - 48.25	3831	3463	7294	34.90	31.50	66.40	48.3%		50.3%					44.7%	
48.25 - 44.25	3831	3463	7294	34.90	31.50	66.40	52.5%		54.7%					48.6%	
44.25 - 40.25	3831	3463	7294	34.90	31.50	66.40	56.8%		59.2%					52.6%	
40.25 - 36.25	3831	3463	7294	34.90	31.50	66.40	61.2%		63.8%					56.7%	
36.25 - 32.25	3831	3463	7294	34.90	31.50	66.40	65.7%		68.5%					60.9%	
32.25 - 30	3831	3463	7294	34.90	31.50	66.40	68.3%		71.1%					63.2%	
30 - 29.75	6659	3004	9663	41.97	18.00	59.97	63.4%					59.1%			
29.75 - 25.75	6659	3004	9663	41.97	18.00	59.97	68.1%					63.5%			
25.75 - 23	6659	3004	9663	41.97	18.00	59.97	71.4%					66.5%			
23 - 22.75	6660	2933	9593	41.97	18.00	59.97	72.4%				67.0%				
22.75 - 20.75	6660	2933	9593	41.97	18.00	59.97	74.9%				69.2%				
20.75 - 20.5	6661	5291	11952	41.97	30.66	72.63	60.6%	71.8%			56.8%				
20.5 - 17.75	6661	5291	11952	41.97	30.66	72.63	63.3%	75.0%			59.3%				
17.75 - 17.5	6660	5449	12109	41.97	38.78	80.75	62.3%	73.8%			59.1%		43.7%		
17.5 - 13.5	6660	5449	12109	41.97	38.78	80.75	66.3%	78.5%			62.8%		46.5%		
13.5 - 9.5	6660	5449	12109	41.97	38.78	80.75	70.3%	83.3%			66.6%		49.3%		
9.5 - 5.5	6660	5449	12109	41.97	38.78	80.75	74.4%	88.1%			70.5%		52.1%		
5.5 - 3.25	6660	5449	12109	41.97	38.78	80.75	76.7%	90.9%			72.7%		53.7%		
3.25 - 3	6661	5291	11952	41.97	30.66	72.63	78.5%	93.0%			73.5%				
3 - 0	6661	5291	11952	41.97	30.66	72.63	81.7%	96.8%			76.5%				

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

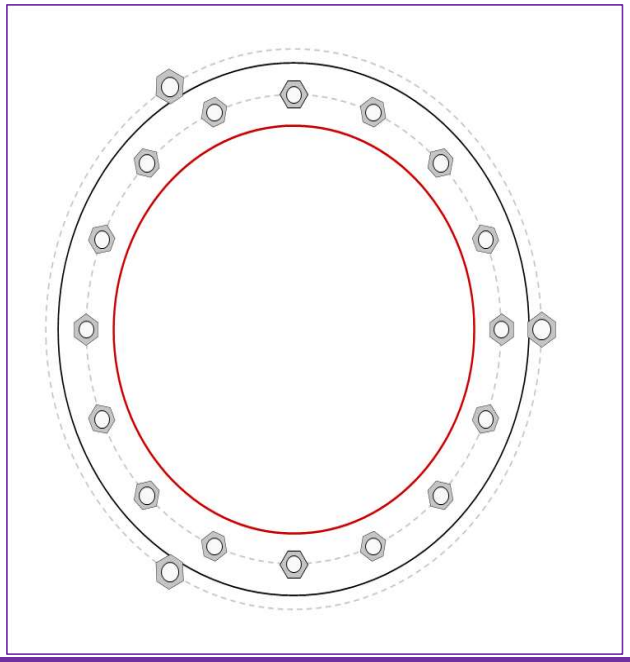
Monopole Base Plate Connection

Site Info	
BU #	876324
Site Name	ARTFORD UNITED MET
Order #	556615 Rev# 0

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

Applied Loads	
Moment (kip-ft)	2002.33
Axial Force (kips)	40.48
Shear Force (kips)	26.17

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

GROUP 1: (16) 1-1/2" ø bolts (A354-BC N; Fy=109 ksi, Fu=125 ksi) on 41.5" BC

GROUP 2: (3) 1-3/4" ø bolts (Williams N; Fy=127.7 ksi, Fu=125 ksi) on 49.5" BC

Base Plate Data

47" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Stiffener Data

N/A

Pole Data

36" x 0.6875" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

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

GROUP 1:		
Pu_t = 94.44	ϕPn_t = 132.19	**Stress Rating**
Vu = 1.64	ϕVn = 82.83	**68.0%**
Mu = n/a	ϕMn = n/a	**Pass**
GROUP 2:		
Pu_t = 213.27	ϕPn_t = 243.75	**Stress Rating**
Vu = 0	ϕVn = 121.88	**83.3%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	23.7	(Flexural)
Allowable Stress (ksi):	32.4	
Stress Rating:	**69.7%**	**Pass**

CCIplate

Elevation (ft)	0	*(Base)*

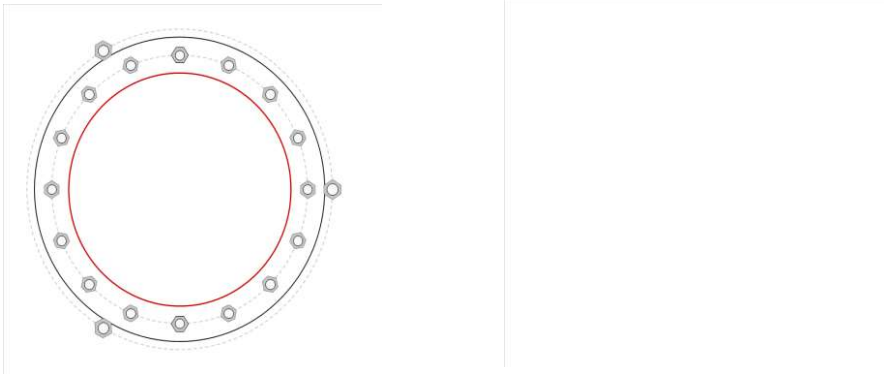
note: Bending interaction not considered when Grout Considered = "Yes"

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	No	

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	1.5	A354-BC	41.5	0.5	0	N-Included		No
2	1	22.5	1.5	A354-BC	41.5	0.5	0	N-Included		No
3	1	45	1.5	A354-BC	41.5	0.5	0	N-Included		No
4	1	67.5	1.5	A354-BC	41.5	0.5	0	N-Included		No
5	1	90	1.5	A354-BC	41.5	0.5	0	N-Included		No
6	1	112.5	1.5	A354-BC	41.5	0.5	0	N-Included		No
7	1	135	1.5	A354-BC	41.5	0.5	0	N-Included		No
8	1	157.5	1.5	A354-BC	41.5	0.5	0	N-Included		No
9	1	180	1.5	A354-BC	41.5	0.5	0	N-Included		No
10	1	202.5	1.5	A354-BC	41.5	0.5	0	N-Included		No
11	1	225	1.5	A354-BC	41.5	0.5	0	N-Included		No
12	1	247.5	1.5	A354-BC	41.5	0.5	0	N-Included		No
13	1	270	1.5	A354-BC	41.5	0.5	0	N-Included		No
14	1	292.5	1.5	A354-BC	41.5	0.5	0	N-Included		No
15	1	315	1.5	A354-BC	41.5	0.5	0	N-Included		No
16	1	337.5	1.5	A354-BC	41.5	0.5	0	N-Included		No
17	2	0	1.75	Williams	49.5	0.5	0	N-Included	2.6	No
18	2	120	1.75	Williams	49.5	0.5	0	N-Included	2.6	No
19	2	240	1.75	Williams	49.5	0.5	0	N-Included	2.6	No

Plot Graphic



Monopole Flange Plate Connection

Elevation = 30 ft.

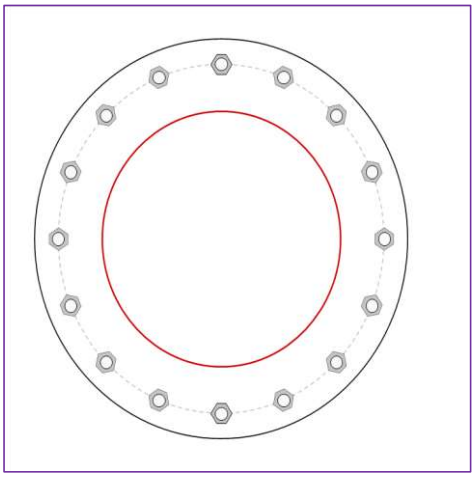
BU #	876324
Site Name	ARTFORD UNITED MET
Order #	556615 Rev# 0

TIA-222 Revision: H

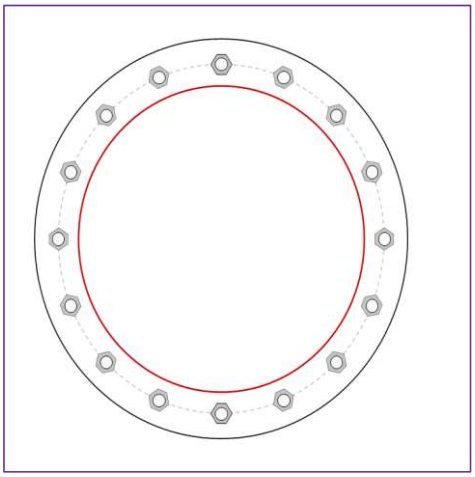
Applied Loads to Flange Connections		Applied Loads to Bridge Stiffeners	
Moment (kip-ft)	543.65	Moment (kip-ft)	712.90
Axial Force (kips)	28.18	Axial Force (kips)	0.00
Shear Force (kips)	21.20	Shear Force (kips)	0.00

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(16) 1-1/2" ø bolts (A325 N; Fy=81 ksi, Fu=120 ksi) on 41" BC

Top Plate Data

47" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

47" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

30" x 0.7375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

36" x 0.55" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bridge Stiffener Group 1 Data

(3) Welded, 6.5''x1'', A572-65, Lu=6", Upper Plate Width=10.5'', Lower Plate Width=10.5'', Neglect Flange in MOI: No

Analysis Results

Bolt Capacity

Max Load (kips)	38.00	
Allowable (kips)	126.88	
Stress Rating:	**28.5%**	Pass

Top Plate Capacity

Max Stress (ksi):	19.99	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**58.8%**	Pass
Tension Side Stress Rating:	**32.2%**	Pass

Bottom Plate Capacity

Max Stress (ksi):	8.98	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**26.4%**	Pass
Tension Side Stress Rating:	**9.6%**	Pass

Bridge Stiffener Group 1 Analysis Capacity

Max Compression (kip):	225.87	
Max Tension (kip):	225.87	
Comp. Capacity (kip):	364.95	
Tens. Capacity (kip):	380.25	(Yield)
Comp. Stress Rating:	**58.9%**	Pass
Tens. Stress Rating:	**56.6%**	Pass

Welded Bridge Stiffener Design

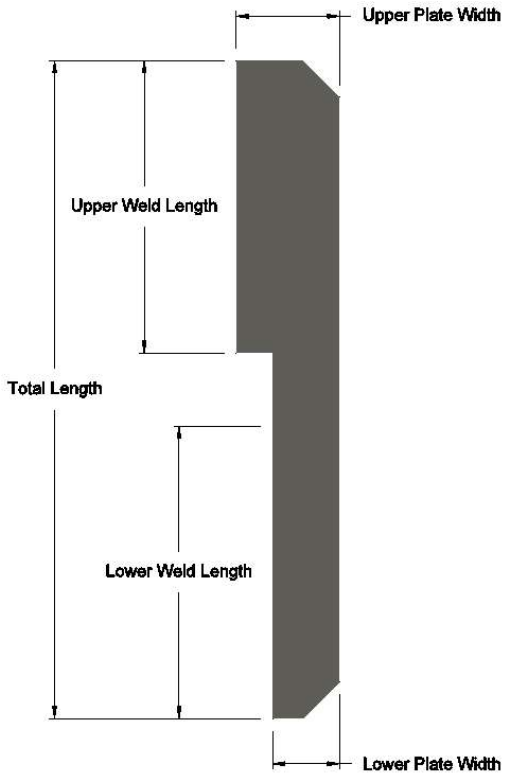
Elevation = 30 ft.

BU #	876324
Site Name	ARTFORD UNITED MET
Order #	556615 Rev# 0

TIA-222 Revision	H

Applied Loads to Design Groups	
Moment (kip-ft)	712.90
Axial Force (kips)	0.00
Shear Force (kips)	0.00

**TIA-222-H Section 15.5 Applied*



Design Properties

Bridge Stiffener Group 1 Data

(3) Welded, 6.5''x1'', A572-65, Lu=6", Upper Plate Width=10.5'', Lower Plate Width=10.5'', Neglect Flange in MOI: No

Total Length:	120	in
Weld Type:	Fillet (both sides)	
Weld Size:	0.25	in
Exx:	70	ksi
Upper Weld Length:	60	in
Upper Plate Width:	10.5	in
Lower Weld Length:	54	in
Lower Plate Width:	10.5	in
Stiffener Front EPA (No Ice):	13.54	ft²
Stiffener Side EPA (No Ice):	1.67	ft²
Stiffener Front EPA (1/2'' Ice):	14.20	ft²
Stiffener Side EPA (1/2'' Ice):	3.36	ft²
Stiffener Weight (No Ice):	0.357	kip
Stiffener Weight (1/2'' Ice):	0.403	kip

Upper Weld Size:	***Good***
Upper Weld Rating:	**33.17%**
Lower Weld Size:	***Good***
Lower Weld Rating:	**36.03%**
Top Plate Lateral-Torsional Buckling Rating:	**5.54%**
Top Plate Tension Yield Rating:	**9.19%**
Top Plate Tension Rupture Rating:	**9.96%**
Top Plate Interaction Rating:	**6.59%**
Bottom Plate Lateral-Torsional Buckling Rating:	**4.68%**
Bottom Plate Tension Yield Rating:	**10.21%**
Bottom Plate Tension Rupture Rating:	**11.07%**
Bottom Plate Interaction Rating:	**5.97%**
Top Pole Punching Shear Rating:	**6.59%**
Bottom Pole Punching Shear Rating:	**7.72%**

Monopole Flange Plate Connection

Elevation = 60 ft.

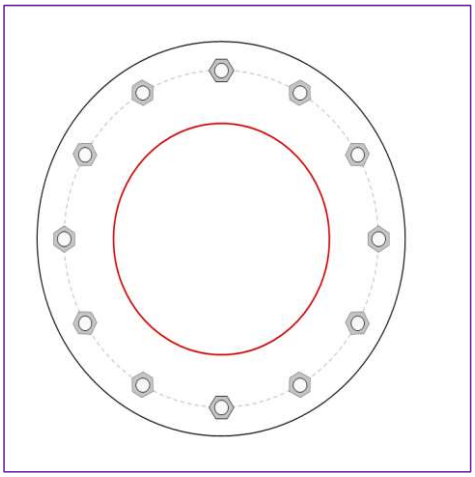
BU #	876324
Site Name	ARTFORD UNITED MET
Order #	556615 Rev# 0

TIA-222 Revision: H

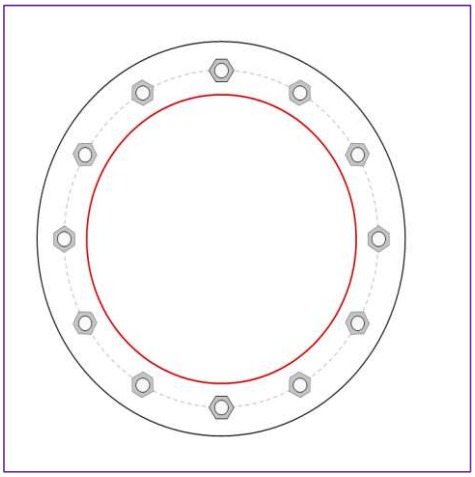
Applied Loads to Flange Connections		Applied Loads to Bridge Stiffeners	
Moment (kip-ft)	263.44	Moment (kip-ft)	403.42
Axial Force (kips)	17.46	Axial Force (kips)	0.00
Shear Force (kips)	16.31	Shear Force (kips)	0.00

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(12) 1-1/2" ø bolts (A325 N; Fy=81 ksi, Fu=120 ksi) on 35" BC

Top Plate Data

41" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

41" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

24" x 0.6" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

30" x 0.54375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bridge Stiffener Group 1 Data

(3) Welded, 5''x1'', A572-65, Lu=6", Upper Plate Width=10.5'', Lower Plate Width=10.5'', Neglect Flange in MOI: No

Analysis Results

Bolt Capacity

Max Load (kips)	28.63	
Allowable (kips)	126.88	
Stress Rating:	**21.5%**	Pass

Top Plate Capacity

Max Stress (ksi):	13.62	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**40.0%**	Pass
Tension Side Stress Rating:	**22.5%**	Pass

Bottom Plate Capacity

Max Stress (ksi):	6.44	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**18.9%**	Pass
Tension Side Stress Rating:	**6.5%**	Pass

Bridge Stiffener Group 1 Analysis Capacity

Max Compression (kip):	140.32	
Max Tension (kip):	140.32	
Comp. Capacity (kip):	280.73	
Tens. Capacity (kip):	292.50	(Yield)
Comp. Stress Rating:	**47.6%**	Pass
Tens. Stress Rating:	**45.7%**	Pass

Welded Bridge Stiffener Design

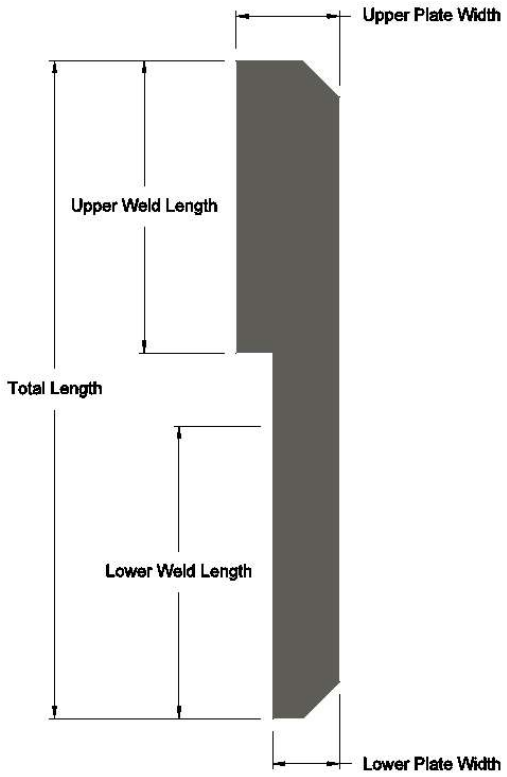
Elevation = 60 ft.

BU #	876324
Site Name	ARTFORD UNITED MET
Order #	556615 Rev# 0

TIA-222 Revision	H

Applied Loads to Design Groups	
Moment (kip-ft)	403.42
Axial Force (kips)	0.00
Shear Force (kips)	0.00

**TIA-222-H Section 15.5 Applied*



Design Properties

Bridge Stiffener Group 1 Data

(3) Welded, 5''x1'', A572-65, Lu=6", Upper Plate Width=10.5'', Lower Plate Width=10.5'', Neglect Flange in MOI: No

Total Length:	96	in
Weld Type:	Fillet (both sides)	
Weld Size:	0.25	in
Exx:	70	ksi
Upper Weld Length:	48	in
Upper Plate Width:	10.5	in
Lower Weld Length:	42	in
Lower Plate Width:	10.5	in
Stiffener Front EPA (No Ice):	10.30	ft²
Stiffener Side EPA (No Ice):	1.33	ft²
Stiffener Front EPA (1/2'' Ice):	10.85	ft²
Stiffener Side EPA (1/2'' Ice):	2.69	ft²
Stiffener Weight (No Ice):	0.286	kip
Stiffener Weight (1/2'' Ice):	0.323	kip

Upper Weld Size:	***Good***
Upper Weld Rating:	**27.35%**
Lower Weld Size:	***Good***
Lower Weld Rating:	**29.96%**
Top Plate Lateral-Torsional Buckling Rating:	**5.41%**
Top Plate Tension Yield Rating:	**7.14%**
Top Plate Tension Rupture Rating:	**7.73%**
Top Plate Interaction Rating:	**6.03%**
Bottom Plate Lateral-Torsional Buckling Rating:	**4.98%**
Bottom Plate Tension Yield Rating:	**8.16%**
Bottom Plate Tension Rupture Rating:	**8.84%**
Bottom Plate Interaction Rating:	**5.80%**
Top Pole Punching Shear Rating:	**8.44%**
Bottom Pole Punching Shear Rating:	**8.85%**

Monopole Flange Plate Connection

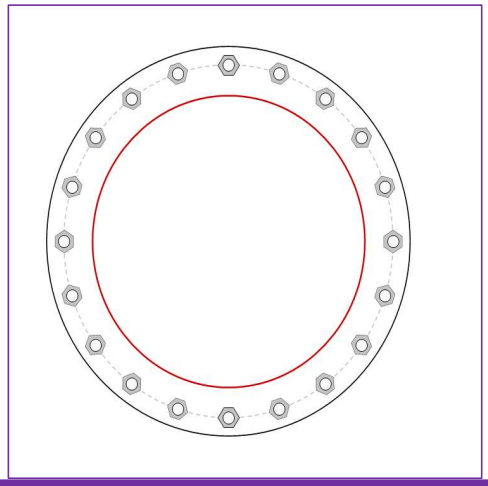
Elevation = 90 ft.

BU #	876324
Site Name	ARTFORD UNITED ME
Order #	556615 Rev# 0
TIA-222 Revision	H

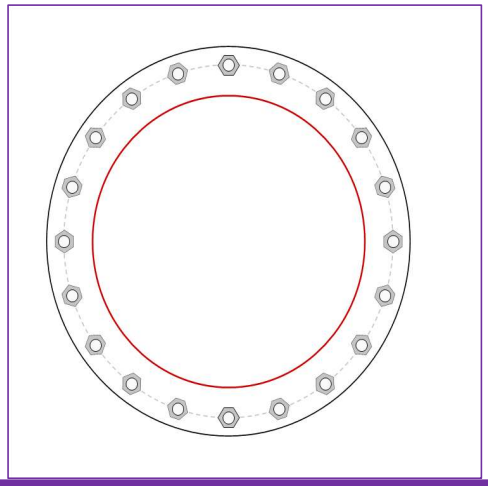
Applied Loads	
Moment (kip-ft)	234.09
Axial Force (kips)	8.77
Shear Force (kips)	10.63

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(20) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 29" BC

Top Plate Data

32" OD x 1.5" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

32" OD x 1.5" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

24" x 0.25" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	18.93	
Allowable (kips)	54.53	
Stress Rating:	**33.1%**	Pass

Top Plate Capacity

Max Stress (ksi):	13.47	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**39.6%**	Pass
Tension Side Stress Rating:	**18.9%**	Pass

Bottom Plate Capacity

Max Stress (ksi):	13.47	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**39.6%**	Pass
Tension Side Stress Rating:	**18.9%**	Pass

Monopole Flange Plate Connection

Elevation = 120 ft.

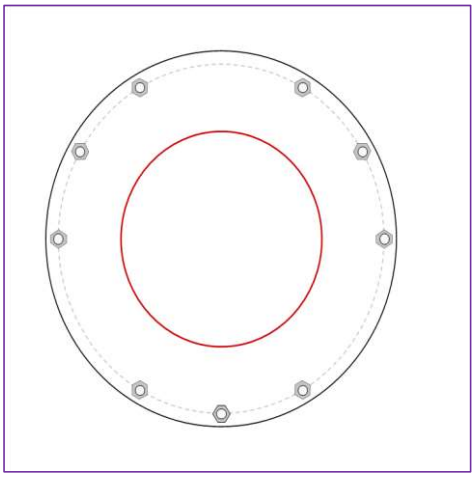
BU #	876324
Site Name	ARTFORD UNITED MET
Order #	556615 Rev# 0

TIA-222 Revision	H

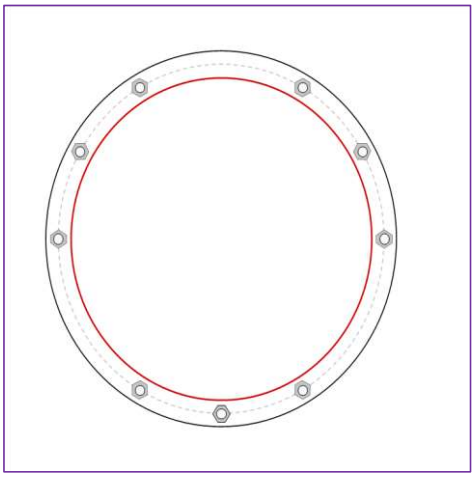
Applied Loads	
Moment (kip-ft)	12.62
Axial Force (kips)	0.98
Shear Force (kips)	1.92

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(9) 3/4" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 26" BC

Top Plate Data

28" OD x 1.5" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

28" OD x 0.75" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

16" x 0.1875" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

24" x 0.25" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	2.48	
Allowable (kips)	30.06	
Stress Rating:	**7.9%**	Pass

Top Plate Capacity

Max Stress (ksi):	2.50	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**7.3%**	Pass
Tension Side Stress Rating:	**4.9%**	Pass

Bottom Plate Capacity

Max Stress (ksi):	2.07	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**6.1%**	Pass
Tension Side Stress Rating:	**2.3%**	Pass

Drilled Pier Foundation

BU # :	876324
Site Name:	WEST HARTFORD UNITED
Order Number:	556615 rev# 0
TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	2002	
Axial Force (kips)	40	
Shear Force (kips)	26	

Material Properties		
Concrete Strength, f'c:	3.5	ksi
Rebar Strength, Fy:	60	ksi
Tie Yield Strength, Fyt:	60	ksi

Pier Design Data		
Depth	24	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 24' below grade		
Pier Diameter	5.5	ft
Rebar Quantity	20	
Rebar Size	9	
Clear Cover to Ties	3	in
Tie Size	5	
Tie Spacing		in

Rebar & Pier Options
Embedded Pole Inputs
Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	9.41	-
Soil Safety Factor	4.48	-
Max Moment (kip-ft)	2238.09	-
Rating*	*28.3%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	417.45	-
End Bearing (kips)	142.55	-
Weight of Concrete (kips)	74.53	-
Total Capacity (kips)	560.00	-
Axial (kips)	114.53	-
Rating*	*19.5%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	9.56	-
Critical Moment (kip-ft)	2237.66	-
Critical Moment Capacity	2571.32	-
Rating*	*82.9%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	16.95	-
Critical Shear (kip)	296.59	-
Critical Shear Capacity	376.18	-
Rating*	*75.1%*	-

Structural Foundation Rating*	**82.9%**
Soil Interaction Rating*	**28.3%**

*Rating per TIA-222-H Section 15.5

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

Soil Profile

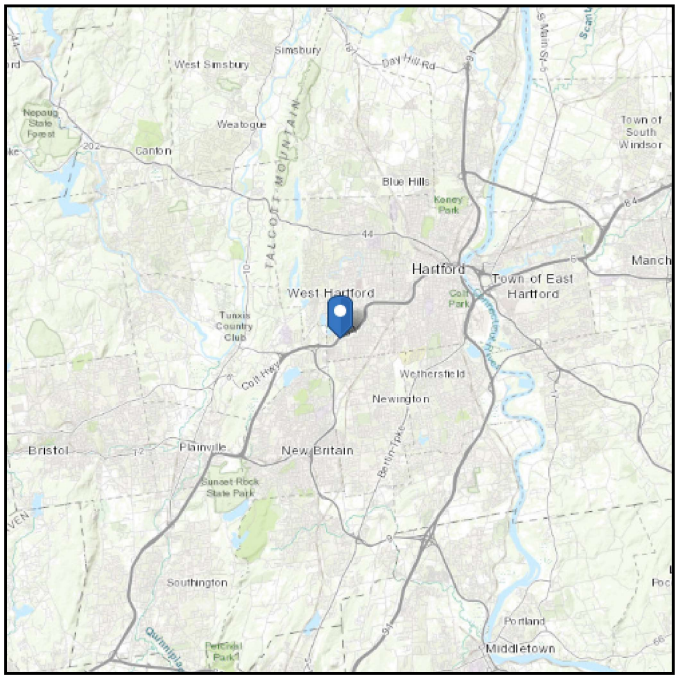
Groundwater Depth	7	# of Layers	5

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	6	6	70	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	6	7	1	108	150	0	0	0.000	0.000					Cohesionless
3	7	8.25	1.25	63	87.6	0	0	0.000	0.000					Cohesionless
4	8.25	16	7.75	63	87.6	4	0	2.045	2.045					Cohesive
5	16	24	8	63	87.6	4	0	2.045	2.045			8		Cohesive

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Elevation:**	158.39 ft (NAVD 88)
Risk Category:	II	**Latitude:**	41.730658
Soil Class:	D - Stiff Soil	**Longitude:**	-72.753658



Wind

Results:

Wind Speed:	117 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	97 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:	Mon Sep 13 2021

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.

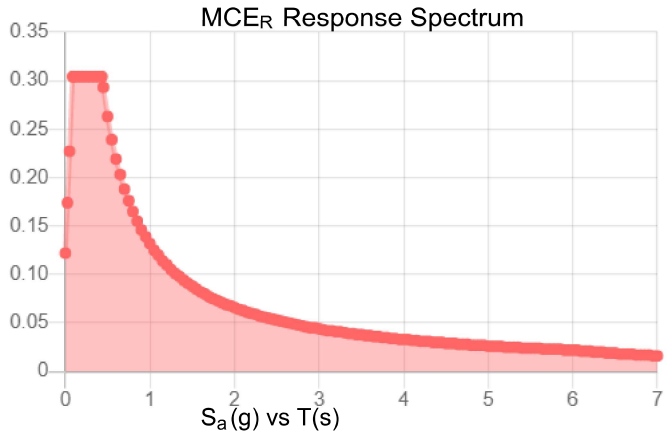
Seismic

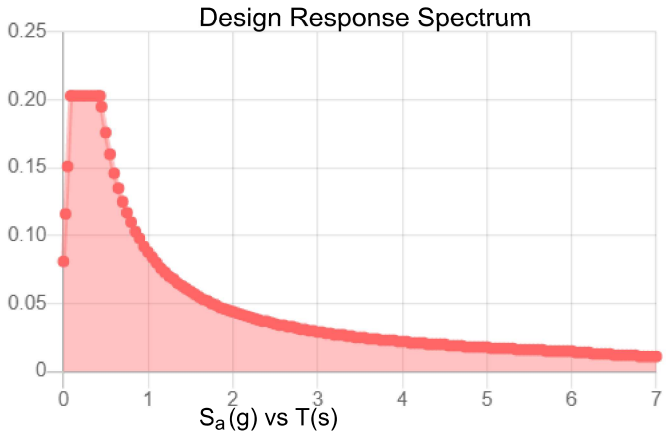
Site Soil Class: D - Stiff Soil

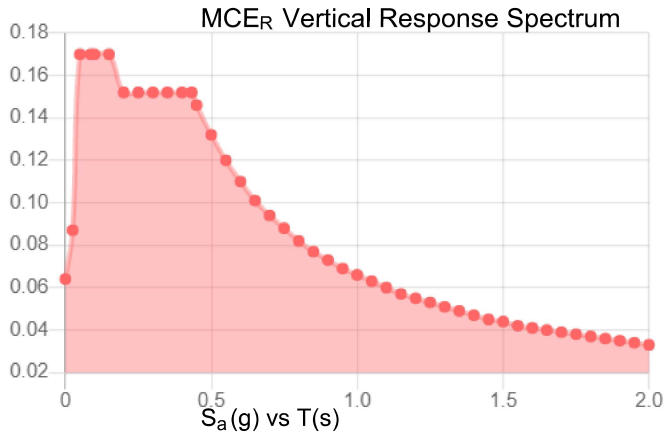
Results:

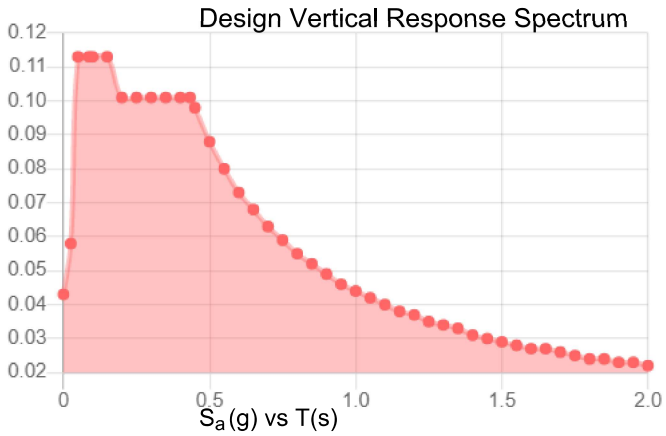
S_S :	0.19	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.103
F_v :	2.4	PGA_M :	0.164
S_{MS} :	0.304	F_{PGA} :	1.594
S_{M1} :	0.132	I_e :	1
S_{DS} :	0.203	C_v :	0.7

Seismic Design Category B









Data Accessed: Mon Sep 13 2021

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:	1.50 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Mon Sep 13 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 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**

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

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

Subject:	**Mount Replacement Analysis Report**	
Carrier Designation:	**Dish Network Dish 5G**	
	Carrier Site Number:	BOBDL00078A
	Carrier Site Name:	CT-CCI-T-876324
Crown Castle Designation:	**Crown Castle BU Number:**	876324
	Crown Castle Site Name:	West Hartford United Methodist
	Crown Castle JDE Job Number:	650068
	Crown Castle Order Number:	556615 Rev. 0
Engineering Firm Designation:	**Trylon Report Designation:**	189042
Site Data:	**1358 New Britain Avenue, West Hartford, Hartford County, CT, 06110 Latitude 41°43'50.37" Longitude -72°45'13.17"**	
Structure Information:	**Tower Height & Type:**	**130.0 ft Monopole**
	Mount Elevation:	**86.0 ft**
	Mount Type:	**8.0 ft Platform**

Dear Darcy Tarr,

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

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

Platform **Sufficient***

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

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

Mount analysis prepared by: Aura Baltoiu

Respectfully Submitted by:
Cliff Abernathy, P.E.

Cliff Abernathy Digitally signed by Cliff Abernathy
Date: 2021.08.02 16:20:13 -04'00'

TABLE OF CONTENTS

1) INTRODUCTION

This is a proposed 3 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:	1.00
Topographic Factor at Mount:	1.00
Ice Thickness:	2.0 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.181
Seismic S_1:	0.064
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
86.0	86.0	3	JMA WIRELESS	MX08FRO665-21	8.0 ft Platform **[Commscope, MC-PK8-C]**
		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	556615, Rev.0	CCI Sites
Mount Manufacturer Drawings	Commscope	MC–PK8–C	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)	MP3	86.0	35.8	Pass
	Horizontal(s)	H1		10.7	Pass
	Standoff(s)	SA2		60.6	Pass
	Bracing(s)	PB2		42.4	Pass
	Handrail(s)	M19		18.0	Pass
	Corner Angle(s)	CP3		9.3	Pass
	Plate(s)	CP5		24.6	Pass
	Mount Connection(s)	-		24.4	Pass

Structure Rating (max from all components) =	60.6%

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

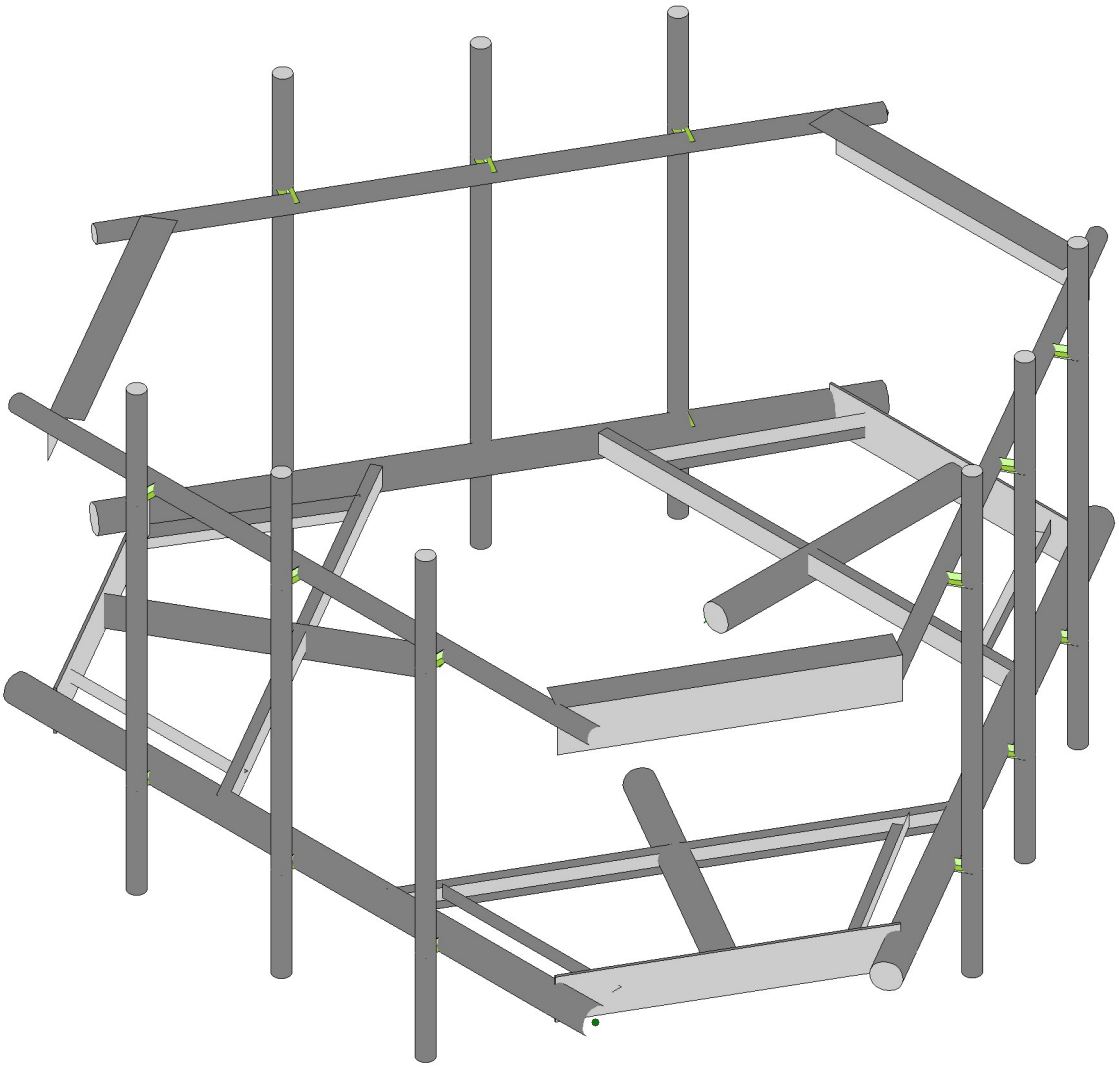
The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the proposed mount listed below must be installed.

1. Commscope, MC-PK8-C.

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

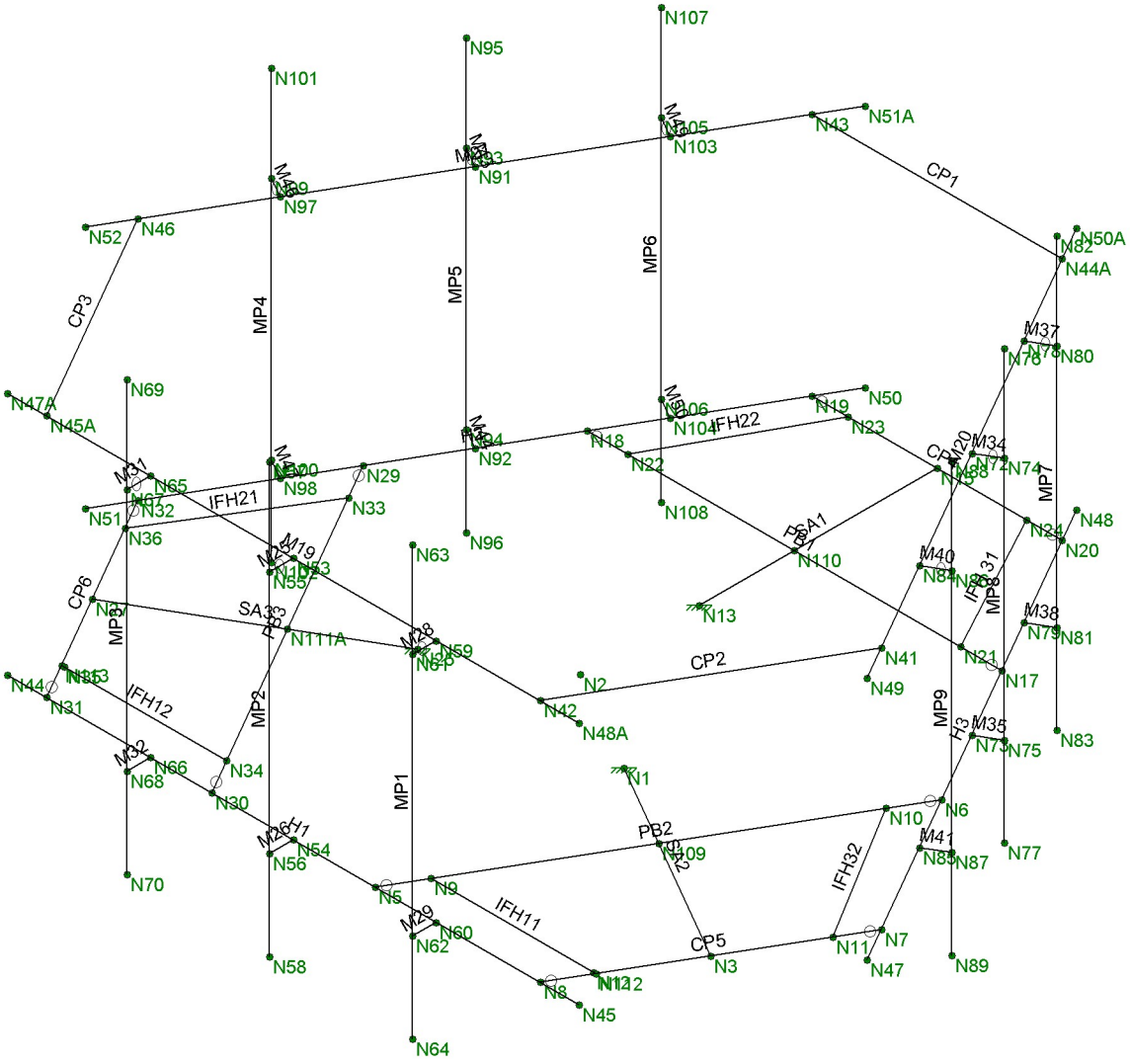
APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

Trylon	876324	SK - 1
AB		July 28, 2021 at 1:28 PM
189042		876324.r3d



Envelope Only Solution

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AB		July 28, 2021 at 1:28 PM
189042		876324.r3d

APPENDIX B

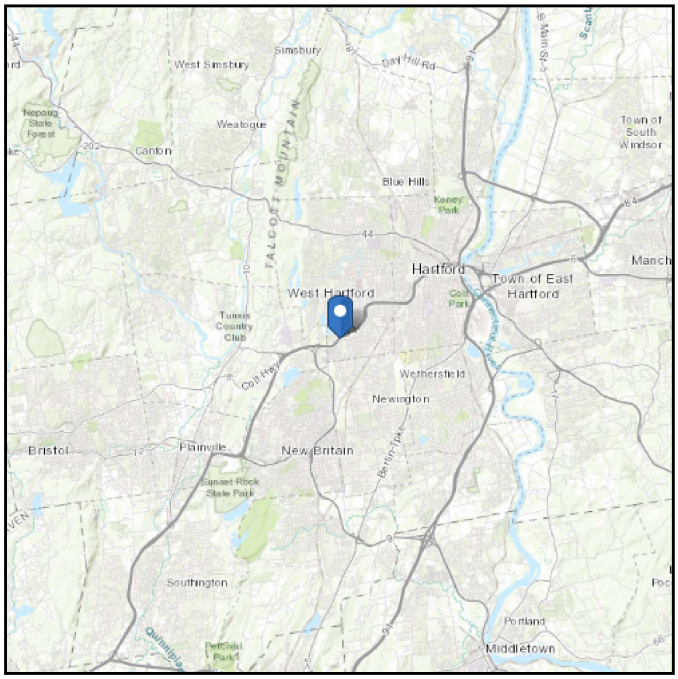
SOFTWARE INPUT CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 158.39 ft (NAVD 88)
Latitude: 41.730658
Longitude: -72.753658



Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph

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

Date Accessed: Wed Jul 28 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.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

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

TIA LOAD CALCULATOR 2.0

PROJECT DATA	
Job Code:	189042
Carrier Site ID:	BOBDL00078A
Carrier Site Name:	CT-CCI-T-876324

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

STRUCTURE DETAILS		
Mount Type:	Platform	--
Mount Elevation:	86.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	130.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	C	--
Site Class:	D - Stiff Soil	--
Ground Elevation:	158.39	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):	1.23	--
Directionality Factor (K_d):	0.95	--
Gust Effect Factor (Gh):	1.00	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	46.32	psf

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness (t_i):	2.00	in
Importance Factor (I_i):	1.00	--
Ice Velocity Pressure (q_{zi}):	46.32	psf
Mount Ice Thickness (t_{iz}):	2.20	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	83.38	psf
Round Member Pressure:	50.03	psf
Ice Wind Pressure:	7.19	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel .(S_s):	0.181	g
1 Second Accel (S_1):	0.064	g
Short Period Des. (S_{DS}):	0.19	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	86	No Ice	8.01	3.21	82.50
MP1/MP4/MP7, 0/120/240	--	--	w/ Ice	10.18	5.12	375.99
TA08025-B604	3	86	No Ice	1.96	0.98	63.90
MP1/MP4/MP7, 0/120/240	--	--	w/ Ice	2.52	1.42	95.09
TA08025-B605	3	86	No Ice	1.96	1.13	75.00
MP1/MP4/MP7, 0/120/240	--	--	w/ Ice	2.52	1.58	101.05
RDIDC-9181-PF-48	1	86	No Ice	2.01	1.17	21.85
MP1, 0	--	--	w/ Ice	2.57	1.64	99.66
			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			
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			No Ice			
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			No Ice			
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			No Ice			
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			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			

EQUIPMENT LOADING [CONT.]

Appurtenance Name/Location	Qty.	Elevation [ft]	--	EPA_N (ft2)	EPA_T (ft2)	Weight (lbs)
			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			
--	--	--	w/ Ice			
			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	86	1.00	1.23	0.95	2.20	46.32	7.41
TA08025-B604	3	86	1.00	1.23	0.95	2.20	46.32	7.41
TA08025-B605	3	86	1.00	1.23	0.95	2.20	46.32	7.41
RDIDC-9181-PF-48	1	86	1.00	1.23	0.95	2.20	46.32	7.41

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	333.95	183.86	283.92	133.83	283.92	183.86
MP1/MP4/MP7, 0/120/240	--	w/ Ice	67.93	42.59	59.48	34.15	59.48	42.59
TA08025-B604	3	No Ice	81.86	51.14	71.62	40.90	71.62	51.14
MP1/MP4/MP7, 0/120/240	--	w/ Ice	16.80	11.28	14.96	9.44	14.96	11.28
TA08025-B605	3	No Ice	81.86	55.78	73.17	47.09	73.17	55.78
MP1/MP4/MP7, 0/120/240	--	w/ Ice	16.80	12.11	15.23	10.55	15.23	12.11
RDIDC-9181-PF-48	1	No Ice	83.88	57.50	75.08	48.70	75.08	57.50
MP1, 0	--	w/ Ice	17.17	12.49	15.61	10.92	15.61	12.49
		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						
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		No Ice						
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		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						

EQUIPMENT LATERAL WIND FORCE CALCULATIONS [CONT.]

Appurtenance Name	Qty.	--	0° 180°	30° 210°	60° 240°	90° 270°	120° 300°	150° 330°
		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						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		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	86	82.5	9.56
TA08025-B604	3	86	63.9	7.40
TA08025-B605	3	86	75	8.69
RDIDC-9181-PF-48	1	86	21.85	2.53

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	Z
Global Member Orientation Plane	XY
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 S100-12: 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?	Yes
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/ft^3]	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 ...	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 Angle	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	6.6x4.46x0.25	Beam	Single Angle	A36 Gr.36	Typical	2.702	4.759	12.473	.055
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 ...	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 R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF1A	8CU1.25X057	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	Distribu...	Area (M...	Surface...
1	Self Weight	DL			-1		13		3	
2	Structure Wind X	WLX						33		
3	Structure Wind Y	WLY						33		
4	Wind Load 0 AZI	WLX					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	WLY					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	Structure Ice Wind X	OL2						33		
14	Structure Ice Wind Y	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 X	ELX	-.116				13			
24	Seismic Load Y	ELY		-.116			13			
25	Live Load 1 (Lv)	LL					1			
26	Live Load 2 (Lv)	LL					1			
27	Live Load 3 (Lv)	LL					1			
28	Live Load 4 (Lv)	LL					1			
29	Live Load 5 (Lv)	LL					1			
30	Live Load 6 (Lv)	LL					1			
31	Maintenance Load 1 (Lm)	None					1			
32	Maintenance Load 2 (Lm)	None					1			
33	Maintenance Load 3 (Lm)	None					1			

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area (M...	Surface...
34	Maintenance Load 4 (Lm)	None					1			
35	Maintenance Load 5 (Lm)	None					1			
36	Maintenance Load 6 (Lm)	None					1			
37	Maintenance Load 7 (Lm)	None					1			
38	Maintenance Load 8 (Lm)	None					1			
39	Maintenance Load 9 (Lm)	None					1			
40	BLC 1 Transient Area Loads	None						9		
41	BLC 12 Transient Area Loads	None						9		

Load Combinations

	Description	Solve	PD...	SR...	B...	Factor	BLC	Factor	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
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	-.7...	6	-1												
13	1.2DL + 1WL 240 AZI	Yes	Y		DL	1.2	2	-.5	3	-.8...	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	-.8...	9	-1												
16	1.2DL + 1WL 315 AZI	Yes	Y		DL	1.2	2	.707	3	-.7...	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	-.7...	6	-1												
29	0.9DL + 1WL 240 AZI	Yes	Y		DL	.9	2	-.5	3	-.8...	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	-.8...	9	-1												
32	0.9DL + 1WL 315 AZI	Yes	Y		DL	.9	2	.707	3	-.7...	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										
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										

Load Combinations (Continued)

	Description	Solve	PD...	SR...	B...	Factor	BLC	Factor	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
40	1.2DL + 1DLi + 1W L...	Yes	Y		DL	1.2	OL1	1	13	-.7...	14	.707	21	1												
41	1.2DL + 1DLi + 1W L...	Yes	Y		DL	1.2	OL1	1	13	-.8...	14	.5	22	1												
42	1.2DL + 1DLi + 1W L...	Yes	Y		DL	1.2	OL1	1	13	-1	14		15	-1												
43	1.2DL + 1DLi + 1W L...	Yes	Y		DL	1.2	OL1	1	13	-.8...	14	-.5	16	-1												
44	1.2DL + 1DLi + 1W L...	Yes	Y		DL	1.2	OL1	1	13	-.7...	14	-.7...	17	-1												
45	1.2DL + 1DLi + 1W L...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	-.8...	18	-1												
46	1.2DL + 1DLi + 1W L...	Yes	Y		DL	1.2	OL1	1	13		14	-1	19	-1												
47	1.2DL + 1DLi + 1W L...	Yes	Y		DL	1.2	OL1	1	13	.5	14	-.8...	20	-1												
48	1.2DL + 1DLi + 1W L...	Yes	Y		DL	1.2	OL1	1	13	.707	14	-.7...	21	-1												
49	1.2DL + 1DLi + 1W L...	Yes	Y		DL	1.2	OL1	1	13	.866	14	-.5	22	-1												
50	(1.2+0.2Sds) + 1.0E ...	Yes	Y		DL	1.239	ELX	1	E...																	
51	(1.2+0.2Sds) + 1.0E ...	Yes	Y		DL	1.239	ELX	.866	E...	.5																
52	(1.2+0.2Sds) + 1.0E ...	Yes	Y		DL	1.239	ELX	.707	E...	.707																
53	(1.2+0.2Sds) + 1.0E ...	Yes	Y		DL	1.239	ELX	.5	E...	.866																
54	(1.2+0.2Sds) + 1.0E ...	Yes	Y		DL	1.239	ELX		E...	1																
55	(1.2+0.2Sds) + 1.0E ...	Yes	Y		DL	1.239	ELX	-.5	E...	.866																
56	(1.2+0.2Sds) + 1.0E ...	Yes	Y		DL	1.239	ELX	-.707	E...	.707																
57	(1.2+0.2Sds) + 1.0E ...	Yes	Y		DL	1.239	ELX	-.866	E...	.5																
58	(1.2+0.2Sds) + 1.0E ...	Yes	Y		DL	1.239	ELX	-1	E...																	
59	(1.2+0.2Sds) + 1.0E ...	Yes	Y		DL	1.239	ELX	-.866	E...	-.5																
60	(1.2+0.2Sds) + 1.0E ...	Yes	Y		DL	1.239	ELX	-.707	E...	-.7...																
61	(1.2+0.2Sds) + 1.0E ...	Yes	Y		DL	1.239	ELX	-.5	E...	-.8...																
62	(1.2+0.2Sds) + 1.0E ...	Yes	Y		DL	1.239	ELX		E...	-1																
63	(1.2+0.2Sds) + 1.0E ...	Yes	Y		DL	1.239	ELX	.5	E...	-.8...																
64	(1.2+0.2Sds) + 1.0E ...	Yes	Y		DL	1.239	ELX	.707	E...	-.7...																
65	(1.2+0.2Sds) + 1.0E ...	Yes	Y		DL	1.239	ELX	.866	E...	-.5																
66	(0.9-0.2Sds) + 1.0E ...	Yes	Y		DL	.861	ELX	1	E...																	
67	(0.9-0.2Sds) + 1.0E ...	Yes	Y		DL	.861	ELX	.866	E...	.5																
68	(0.9-0.2Sds) + 1.0E ...	Yes	Y		DL	.861	ELX	.707	E...	.707																
69	(0.9-0.2Sds) + 1.0E ...	Yes	Y		DL	.861	ELX	.5	E...	.866																
70	(0.9-0.2Sds) + 1.0E ...	Yes	Y		DL	.861	ELX		E...	1																
71	(0.9-0.2Sds) + 1.0E ...	Yes	Y		DL	.861	ELX	-.5	E...	.866																
72	(0.9-0.2Sds) + 1.0E ...	Yes	Y		DL	.861	ELX	-.707	E...	.707																
73	(0.9-0.2Sds) + 1.0E ...	Yes	Y		DL	.861	ELX	-.866	E...	.5																
74	(0.9-0.2Sds) + 1.0E ...	Yes	Y		DL	.861	ELX	-1	E...																	
75	(0.9-0.2Sds) + 1.0E ...	Yes	Y		DL	.861	ELX	-.866	E...	-.5																
76	(0.9-0.2Sds) + 1.0E ...	Yes	Y		DL	.861	ELX	-.707	E...	-.7...																
77	(0.9-0.2Sds) + 1.0E ...	Yes	Y		DL	.861	ELX	-.5	E...	-.8...																
78	(0.9-0.2Sds) + 1.0E ...	Yes	Y		DL	.861	ELX		E...	-1																
79	(0.9-0.2Sds) + 1.0E ...	Yes	Y		DL	.861	ELX	.5	E...	-.8...																
80	(0.9-0.2Sds) + 1.0E ...	Yes	Y		DL	.861	ELX	.707	E...	-.7...																
81	(0.9-0.2Sds) + 1.0E ...	Yes	Y		DL	.861	ELX	.866	E...	-.5																
82	1.2D + 1.5 Lv1	Yes	Y		DL	1.2	25	1.5																		
83	1.2D + 1.5 Lv2	Yes	Y		DL	1.2	26	1.5																		
84	1.2D + 1.5 Lv3	Yes	Y		DL	1.2	27	1.5																		
85	1.2D + 1.5 Lv4	Yes	Y		DL	1.2	28	1.5																		
86	1.2D + 1.5 Lv5	Yes	Y		DL	1.2	29	1.5																		
87	1.2D + 1.5 Lv6	Yes	Y		DL	1.2	30	1.5																		
88	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	31	1.5	4	.058	2	.058	3													
89	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	31	1.5	5	.058	2	.05	3	.029												
90	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	31	1.5	6	.058	2	.041	3	.041												
91	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	31	1.5	7	.058	2	.029	3	.05												

Load Combinations (Continued)

	Description	Solve	PD...	SR...	B...	Factor	BLC	Factor	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
92	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	31	1.5	8	.058	2	3....	3	.058												
93	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	31	1.5	9	.058	2	-.0...	3	.05												
94	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	31	1.5	10	.058	2	-.0...	3	.041												
95	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	31	1.5	11	.058	2	-.05	3	.029												
96	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	31	1.5	4	.058	2	-.0...	3	7....												
97	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	31	1.5	5	.058	2	-.05	3	-.0...												
98	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	31	1.5	6	.058	2	-.0...	3	-.0...												
99	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	31	1.5	7	.058	2	-.0...	3	-.05												
100	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	31	1.5	8	.058	2	-1....	3	-.0...												
101	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	31	1.5	9	.058	2	.029	3	-.05												
102	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	31	1.5	10	.058	2	.041	3	-.0...												
103	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	31	1.5	11	.058	2	.05	3	-.0...												
104	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	32	1.5	4	.058	2	.058	3													
105	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	32	1.5	5	.058	2	.05	3	.029												
106	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	32	1.5	6	.058	2	.041	3	.041												
107	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	32	1.5	7	.058	2	.029	3	.05												
108	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	32	1.5	8	.058	2	3....	3	.058												
109	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	32	1.5	9	.058	2	-.0...	3	.05												
110	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	32	1.5	10	.058	2	-.0...	3	.041												
111	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	32	1.5	11	.058	2	-.05	3	.029												
112	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	32	1.5	4	.058	2	-.0...	3	7....												
113	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	32	1.5	5	.058	2	-.05	3	-.0...												
114	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	32	1.5	6	.058	2	-.0...	3	-.0...												
115	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	32	1.5	7	.058	2	-.0...	3	-.05												
116	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	32	1.5	8	.058	2	-1....	3	-.0...												
117	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	32	1.5	9	.058	2	.029	3	-.05												
118	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	32	1.5	10	.058	2	.041	3	-.0...												
119	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	32	1.5	11	.058	2	.05	3	-.0...												
120	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	33	1.5	4	.058	2	.058	3													
121	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	33	1.5	5	.058	2	.05	3	.029												
122	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	33	1.5	6	.058	2	.041	3	.041												
123	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	33	1.5	7	.058	2	.029	3	.05												
124	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	33	1.5	8	.058	2	3....	3	.058												
125	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	33	1.5	9	.058	2	-.0...	3	.05												
126	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	33	1.5	10	.058	2	-.0...	3	.041												
127	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	33	1.5	11	.058	2	-.05	3	.029												
128	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	33	1.5	4	.058	2	-.0...	3	7....												
129	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	33	1.5	5	.058	2	-.05	3	-.0...												
130	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	33	1.5	6	.058	2	-.0...	3	-.0...												
131	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	33	1.5	7	.058	2	-.0...	3	-.05												
132	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	33	1.5	8	.058	2	-1....	3	-.0...												
133	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	33	1.5	9	.058	2	.029	3	-.05												
134	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	33	1.5	10	.058	2	.041	3	-.0...												
135	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	33	1.5	11	.058	2	.05	3	-.0...												
136	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	34	1.5	4	.058	2	.058	3													
137	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	34	1.5	5	.058	2	.05	3	.029												
138	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	34	1.5	6	.058	2	.041	3	.041												
139	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	34	1.5	7	.058	2	.029	3	.05												
140	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	34	1.5	8	.058	2	3....	3	.058												
141	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	34	1.5	9	.058	2	-.0...	3	.05												
142	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	34	1.5	10	.058	2	-.0...	3	.041												
143	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	34	1.5	11	.058	2	-.05	3	.029												

Load Combinations (Continued)

	Description	Solve	PD...	SR...	B...	Factor	BLC	Factor	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
144	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	34	1.5	4	.058	2	-.0...	3	7....												
145	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	34	1.5	5	.058	2	-.05	3	-.0...												
146	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	34	1.5	6	.058	2	-.0...	3	-.0...												
147	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	34	1.5	7	.058	2	-.0...	3	-.05												
148	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	34	1.5	8	.058	2	-1....	3	-.0...												
149	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	34	1.5	9	.058	2	.029	3	-.05												
150	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	34	1.5	10	.058	2	.041	3	-.0...												
151	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	34	1.5	11	.058	2	.05	3	-.0...												
152	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	35	1.5	4	.058	2	.058	3													
153	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	35	1.5	5	.058	2	.05	3	.029												
154	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	35	1.5	6	.058	2	.041	3	.041												
155	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	35	1.5	7	.058	2	.029	3	.05												
156	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	35	1.5	8	.058	2	3....	3	.058												
157	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	35	1.5	9	.058	2	-.0...	3	.05												
158	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	35	1.5	10	.058	2	-.0...	3	.041												
159	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	35	1.5	11	.058	2	-.05	3	.029												
160	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	35	1.5	4	.058	2	-.0...	3	7....												
161	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	35	1.5	5	.058	2	-.05	3	-.0...												
162	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	35	1.5	6	.058	2	-.0...	3	-.0...												
163	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	35	1.5	7	.058	2	-.0...	3	-.05												
164	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	35	1.5	8	.058	2	-1....	3	-.0...												
165	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	35	1.5	9	.058	2	.029	3	-.05												
166	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	35	1.5	10	.058	2	.041	3	-.0...												
167	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	35	1.5	11	.058	2	.05	3	-.0...												
168	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	36	1.5	4	.058	2	.058	3													
169	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	36	1.5	5	.058	2	.05	3	.029												
170	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	36	1.5	6	.058	2	.041	3	.041												
171	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	36	1.5	7	.058	2	.029	3	.05												
172	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	36	1.5	8	.058	2	3....	3	.058												
173	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	36	1.5	9	.058	2	-.0...	3	.05												
174	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	36	1.5	10	.058	2	-.0...	3	.041												
175	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	36	1.5	11	.058	2	-.05	3	.029												
176	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	36	1.5	4	.058	2	-.0...	3	7....												
177	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	36	1.5	5	.058	2	-.05	3	-.0...												
178	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	36	1.5	6	.058	2	-.0...	3	-.0...												
179	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	36	1.5	7	.058	2	-.0...	3	-.05												
180	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	36	1.5	8	.058	2	-1....	3	-.0...												
181	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	36	1.5	9	.058	2	.029	3	-.05												
182	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	36	1.5	10	.058	2	.041	3	-.0...												
183	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	36	1.5	11	.058	2	.05	3	-.0...												
184	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	37	1.5	4	.058	2	.058	3													
185	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	37	1.5	5	.058	2	.05	3	.029												
186	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	37	1.5	6	.058	2	.041	3	.041												
187	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	37	1.5	7	.058	2	.029	3	.05												
188	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	37	1.5	8	.058	2	3....	3	.058												
189	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	37	1.5	9	.058	2	-.0...	3	.05												
190	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	37	1.5	10	.058	2	-.0...	3	.041												
191	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	37	1.5	11	.058	2	-.05	3	.029												
192	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	37	1.5	4	.058	2	-.0...	3	7....												
193	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	37	1.5	5	.058	2	-.05	3	-.0...												
194	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	37	1.5	6	.058	2	-.0...	3	-.0...												
195	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	37	1.5	7	.058	2	-.0...	3	-.05												

Load Combinations (Continued)

	Description	Solve	PD...	SR...	B...	Factor	BLC	Factor	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
196	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	37	1.5	8	.058	2	-1....	3	-.0...												
197	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	37	1.5	9	.058	2	.029	3	-.05												
198	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	37	1.5	10	.058	2	.041	3	-.0...												
199	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	37	1.5	11	.058	2	.05	3	-.0...												
200	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	38	1.5	4	.058	2	.058	3													
201	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	38	1.5	5	.058	2	.05	3	.029												
202	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	38	1.5	6	.058	2	.041	3	.041												
203	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	38	1.5	7	.058	2	.029	3	.05												
204	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	38	1.5	8	.058	2	3....	3	.058												
205	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	38	1.5	9	.058	2	-.0...	3	.05												
206	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	38	1.5	10	.058	2	-.0...	3	.041												
207	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	38	1.5	11	.058	2	-.05	3	.029												
208	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	38	1.5	4	.058	2	-.0...	3	7....												
209	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	38	1.5	5	.058	2	-.05	3	-.0...												
210	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	38	1.5	6	.058	2	-.0...	3	-.0...												
211	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	38	1.5	7	.058	2	-.0...	3	-.05												
212	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	38	1.5	8	.058	2	-1....	3	-.0...												
213	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	38	1.5	9	.058	2	.029	3	-.05												
214	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	38	1.5	10	.058	2	.041	3	-.0...												
215	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	38	1.5	11	.058	2	.05	3	-.0...												
216	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	39	1.5	4	.058	2	.058	3													
217	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	39	1.5	5	.058	2	.05	3	.029												
218	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	39	1.5	6	.058	2	.041	3	.041												
219	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	39	1.5	7	.058	2	.029	3	.05												
220	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	39	1.5	8	.058	2	3....	3	.058												
221	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	39	1.5	9	.058	2	-.0...	3	.05												
222	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	39	1.5	10	.058	2	-.0...	3	.041												
223	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	39	1.5	11	.058	2	-.05	3	.029												
224	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	39	1.5	4	.058	2	-.0...	3	7....												
225	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	39	1.5	5	.058	2	-.05	3	-.0...												
226	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	39	1.5	6	.058	2	-.0...	3	-.0...												
227	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	39	1.5	7	.058	2	-.0...	3	-.05												
228	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	39	1.5	8	.058	2	-1....	3	-.0...												
229	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	39	1.5	9	.058	2	.029	3	-.05												
230	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	39	1.5	10	.058	2	.041	3	-.0...												
231	1.2D + 1.5Lm + 1.0...	Yes	Y		DL	1.2	39	1.5	11	.058	2	.05	3	-.0...												

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	1627.34	3	1040.25	20	2317.63	39	523.47	30	473.35	33	1928.84	19
2		min	-1620.22	27	-1043.96	12	-111.37	31	-4290.91	38	-2366.53	41	-1934.42	11
3	N1	max	1687.7	17	963.16	8	2384.6	45	4232.29	45	543.66	19	1980.12	25
4		min	-1687.24	25	-954.52	32	-101.09	21	-451.45	21	-2841.48	43	-1986.8	17
5	N13	max	362.1	18	1654.32	22	2258.11	34	757.83	14	4755.82	34	1628.81	30
6		min	-370.01	10	-1659.15	14	-142.03	26	-652.19	22	-648.23	26	-1633.62	6
7	Totals:	max	3226.15	18	3013.14	6	6661.61	43						
8		min	-3226.15	10	-3013.14	30	1366.08	67						

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

	Member	Shape	Code Check	Loc[in]	LC	She...	Lo...	...	...	phi*P ...	phi*P ...	phi*M...	phi*M.....		Eqn
1	SA2	PIPE_3.5	.637	40	45	.200	40		9	64491...	78750	7953....	7953.....	....	H1-1b
2	SA3	PIPE_3.5	.613	40	39	.193	40		3	64491...	78750	7953....	7953.....	....	H1-1b
3	SA1	PIPE_3.5	.598	40	34	.182	40		14	64491...	78750	7953....	7953.....	....	H1-1b
4	PB2	C3X5	.446	34.86	45	.167	63....	y	41	32858...	47628	981.26	4104	...	H1-1b
5	PB3	C3X5	.442	34.86	40	.169	63....	y	36	32858...	47628	981.26	4104	...	H1-1b
6	PB1	C3X5	.422	34.86	34	.160	63....	y	46	32858...	47628	981.26	4104	...	H1-1b
7	MP3	PIPE_2.0	.376	57	5	.039	57		10	20866...	32130	1871....	1871.....	1	H1-1b
8	MP9	PIPE_2.0	.374	57	10	.039	57		3	20866...	32130	1871....	1871.....	....	H1-1b
9	MP8	PIPE_2.0	.367	57	10	.044	57		14	20866...	32130	1871....	1871.....	....	H1-1b
10	MP2	PIPE_2.0	.364	57	5	.052	57		9	20866...	32130	1871....	1871.....	1	H1-1b
11	MP1	PIPE_2.0	.356	57	16	.046	57		17	20866...	32130	1871....	1871.....	....	H1-1b
12	MP6	PIPE_2.0	.349	57	7	.039	57		8	20866...	32130	1871....	1871.....	1	H1-1b
13	MP5	PIPE_2.0	.349	57	16	.052	57		3	20866...	32130	1871....	1871.....	....	H1-1b
14	MP4	PIPE_2.0	.337	57	11	.042	57		11	20866...	32130	1871....	1871.....	....	H1-1b
15	MP7	PIPE_2.0	.334	57	10	.033	57		9	20866...	32130	1871....	1871.....	....	H1-1b
16	CP5	6.5"x0.37" Plate	.259	21	12	.121	21	y	42	27548...	75757...	583.96	6615.....	....	H1-1b
17	CP6	6.5"x0.37" Plate	.257	21	7	.120	21	y	37	27548...	75757...	583.96	6353.....	....	H1-1b
18	CP4	6.5"x0.37" Plate	.257	21	2	.113	21	y	48	27548...	75757...	583.96	6379.....	....	H1-1b
19	M21	PIPE_2.0	.182	72	5	.187	72		13	14916...	32130	1871....	1871.....	....	H1-1b
20	M19	PIPE_2.0	.181	72	10	.190	72		2	14916...	32130	1871....	1871.....	....	H1-1b
21	M20	PIPE_2.0	.172	72	15	.185	72		8	14916...	32130	1871....	1871.....	....	H1-1b
22	IFH11	L2x2x3	.165	0	3	.032	0	z	49	18084...	23392...	557.72	1179....	1	H2-1
23	IFH21	L2x2x3	.162	0	14	.032	0	z	43	18084...	23392...	557.72	1182....	1	H2-1
24	IFH 31	L2x2x3	.134	0	9	.031	0	z	38	18084...	23392...	557.72	1182....	1	H2-1
25	IFH32	L2x2x3	.116	0	13	.036	0	y	42	18084...	23392...	557.72	1182....	1	H2-1
26	H1	PIPE_3.5	.109	34	12	.113	24		10	60666...	78750	7953....	7953.....	....	H1-1b
27	H3	PIPE_3.5	.107	34	2	.112	24		16	60666...	78750	7953....	7953.....	....	H1-1b
28	IFH22	L2x2x3	.101	0	2	.034	0	y	47	18084...	23392...	557.72	1182....	1	H2-1
29	H2	PIPE_3.5	.101	34	7	.105	24		5	60666...	78750	7953....	7953.....	....	H1-1b
30	IFH12	L2x2x3	.100	0	8	.035	0	y	36	18084...	23392...	557.72	1179....	1	H2-1
31	CP3	6.6x4.46x0.25	.098	0	21	.043	42	z	4	51170...	87561	2464....	7125....	1	H2-1
32	CP2	6.6x4.46x0.25	.096	0	26	.042	0	y	9	51170...	87561	2464....	7125....	1	H2-1
33	CP1	6.6x4.46x0.25	.088	0	32	.040	0	y	14	51170...	87561	2464....	7125....	1	H2-1

Envelope AISI S100-12: LRFD Cold Formed Steel Code Checks

Member	Shape	Code Check	Loc[in]	LC	Shea...	Loc[i...	Dir	LC	phi*Pn[...	phi*Tn[...	phi*Mn...	phi*Mn...	Cb	Cmyy	Cmzz	Eqn
No Data to Print ...																

APPENDIX D

ADDITIONAL CALCUATIONS

Trylon

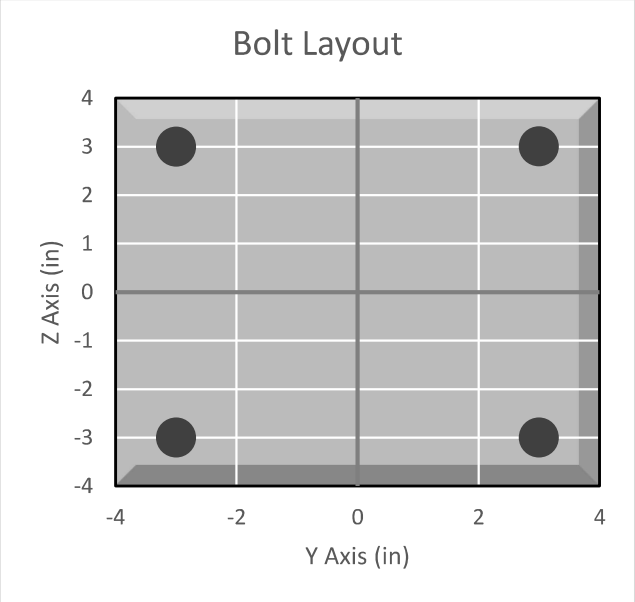
Analysis date: 07/29/21

BOLT TOOL 1.5.2

Project Data	
Job Code:	189042
Carrier Site ID:	BOBDL00078A
Carrier Site Name:	CT-CCI-T-876324

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

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:	No	--
Double Shear:	No	--
Connection Pipe Size:	-	in



Connection Description
Standoff to Monopole

Bolt Check*		
Tensile Capacity (ϕT_n):	20340.1	lbs
Shear Capacity (ϕV_n):	17257.3	lbs
Tension Force (T_u):	5205.1	lbs
Shear Force (V_u):	834.8	lbs
Tension Usage:	24.4%	--
Shear Usage:	4.6%	--
Interaction:	24.4%	Pass
Controlling Member:	SA2	--
Controlling LC:	42	--

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

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

APPENDIX E

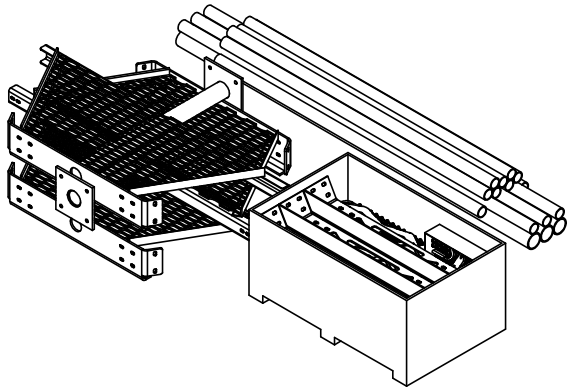
SUPPLEMENTAL DRAWINGS

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

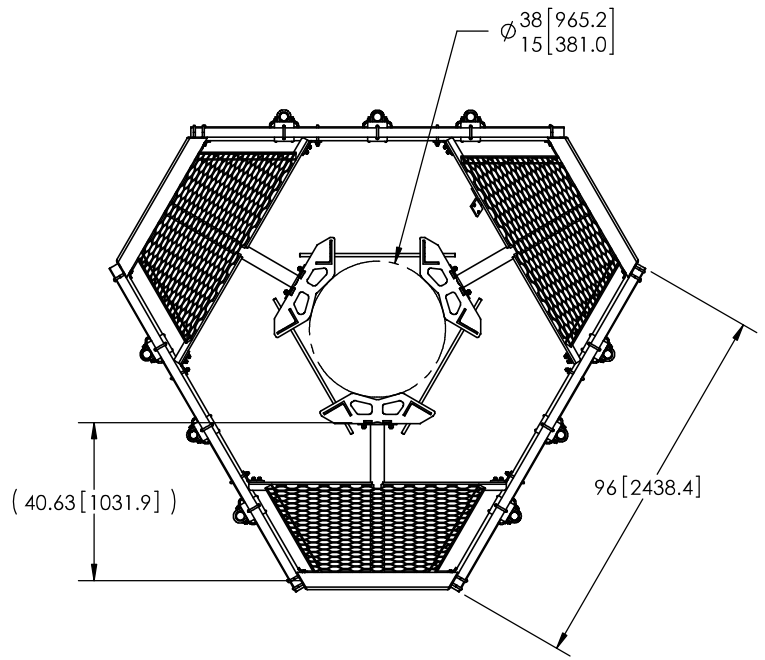


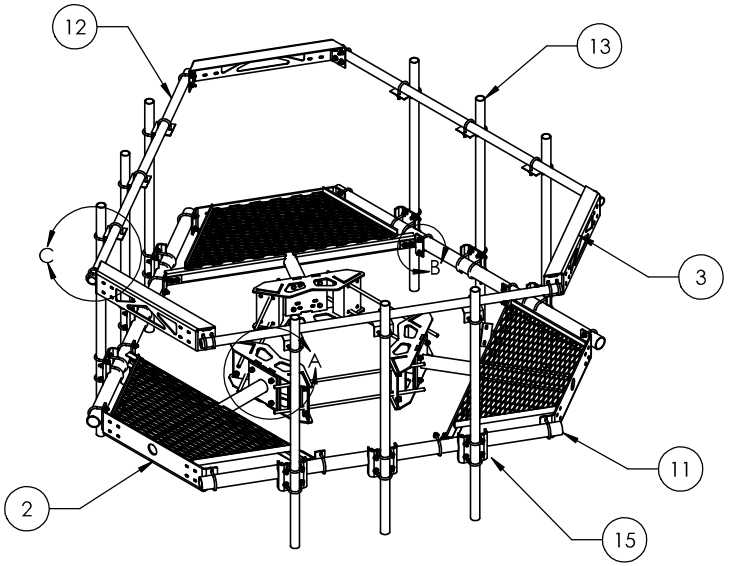
NOTES:
1. CUSTOMER ASSEMBLY SHEETS 2–3.

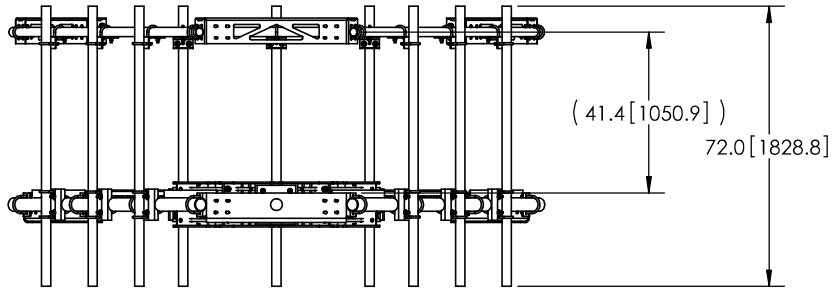
ALL DIMENSIONS ARE IN INCHES U.O.S.
TOLERANCES UNLESS OTHERWISE SPECIFIED:
.X = ± .12 ANGLES ±2°
.XX = ± .06 FRACTIONS ±1/32
.XXX= ± .03
REMOVE BURRS AND BREAK EDGES .005

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.	





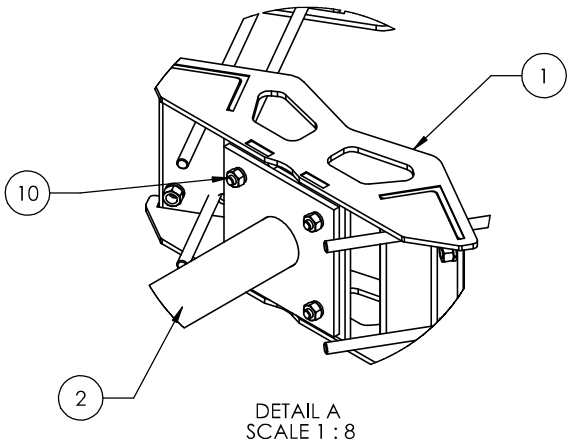


ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT
C				
1	MC-RM1550-3	12" - 50" OD RINGMOUNT	1	230.42 LBS
2	MTC300601	Low Profile Co-Location Platform Snub Nose	3	134.21 LBS
3	MT195801	Corner Weldment Snub Nose Handrail	3	27.10 LBS
4	XA2020.01	CROSS OVER ANGLE	9	2.65 LBS
5	GUB-4356	1/2" X 3-5/8" X 6" GALV U-BOLT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

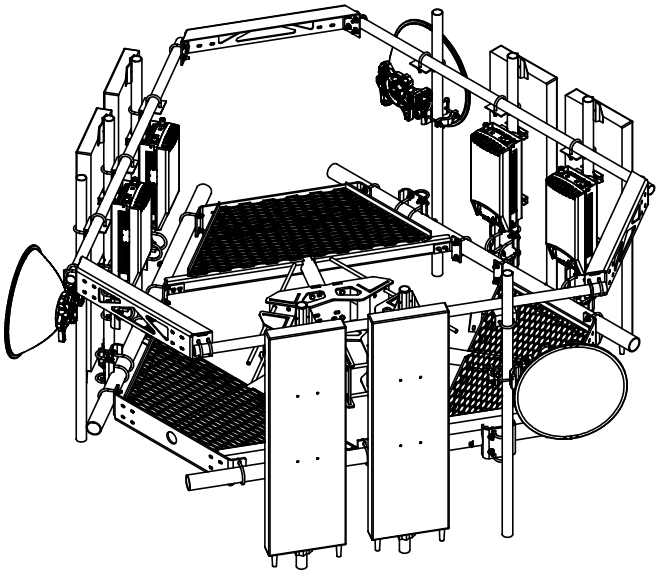
NOTES:
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.
2. WILL FIT MONOPOLES 15"–38" OD.

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

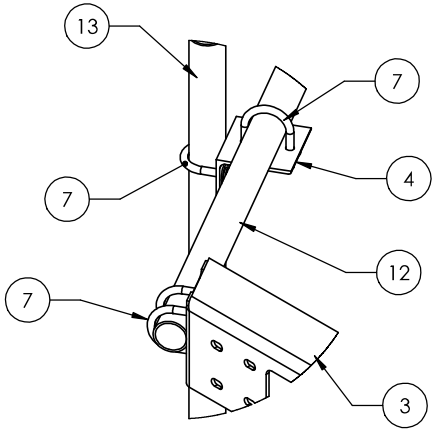
DRAWN BY: MSM	SHEET: 2 of 3	PART NUMBER: MC-PK8-C	
CHECKED BY: TP	SCALE: NTS	DESCRIPTION: 25" OD Snub Nose MT-196	
DATE: 10/18/11	MATERIAL: A36, A53	DRAWING TYPE: ASSEMBLY DRAWING	
REVISION: C	FINISH: GALV A123	WEIGHT: 1361.27 LBS	ANDREW® WESTCHESTER, IL. 60154 U.S.A.



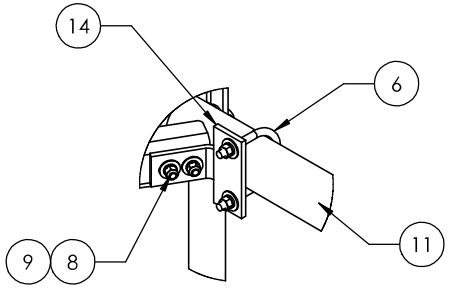
DETAIL A
SCALE 1 : 8



WITH ANTENNAS



DETAIL C
SCALE 1 : 8



DETAIL B
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: BOBDL00078A

876324
1358 New Britain Avenue
West Hartford, Connecticut 06110

October 5, 2021

EBI Project Number: 6221005701

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**16.94%**

October 5, 2021

Dish Wireless

Emissions Analysis for Site: BOBDL00078A - 876324

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **1358 New Britain Avenue** in **West Hartford, 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 1358 New Britain Avenue in West Hartford, 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 20 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 n71 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 n70 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 20 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 20 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 86 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):	86 feet	Height (AGL):	86 feet	Height (AGL):	86 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):	3,065.51	ERP (W):	3,065.51	ERP (W):	3,065.51
Antenna A1 MPE %:	**2.48%**	Antenna B1 MPE %:	**2.48%**	Antenna C1 MPE %:	**2.48%**

Site Composite MPE %	
Carrier	**MPE %**
Dish Wireless (Max at Sector A):	2.48%
Nextel	0.47%
Clearwire	0.13%
AT&T	0.5%
Sprint	1.23%
Verizon	9.97%
Metro PCS	1.5%
VoiceStream	0.66%
Site Total MPE % :	16.94%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	2.48%
Dish Wireless Sector B Total:	2.48%
Dish Wireless Sector C Total:	2.48%
Site Total MPE % :	16.94%

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 n71	4	223.68	86.0	5.03	600 MHz n71	400	1.26%
Dish Wireless 1900 MHz n70	4	542.70	86.0	12.19	1900 MHz n70	1000	1.22%
						Total:	**2.48%**

• 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:	2.48%
Sector B:	2.48%
Sector C:	2.48%
Dish Wireless Maximum MPE % (Sector A):	2.48%
Site Total:	16.94%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **16.94%** 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:
1358 NEW BRITAIN AVENUE, WEST HARTFORD, CT 06110

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: 876324/WEST HARTFORD UNITED METHODIST
Customer Site ID: BOBDL00078A/CT-CCI-T-876324
Site Address: 1358 New Britain Avenue, WEST HARTFORD, CT 06110

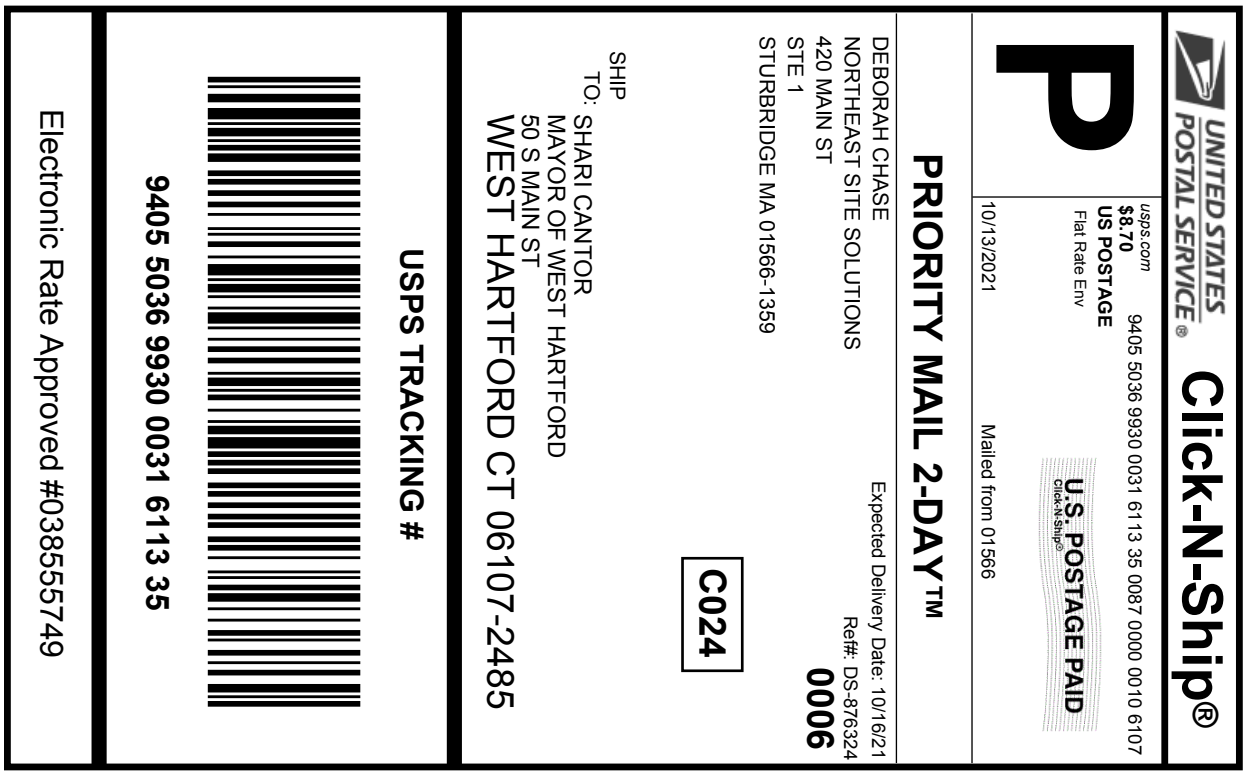
Crown Castle

By: _____ Date: 10/11/2021

Richard Zajac
Site Acquisition Specialist

Exhibit H

Recipient Mailings



Cut on dotted line.

Instructions

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

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0031 6113 35

Trans. #:	545870645
Print Date:	10/13/2021
Ship Date:	10/13/2021
Expected Delivery Date:	10/16/2021

Priority Mail® Postage:	**$8.70**
Total:	**$8.70**

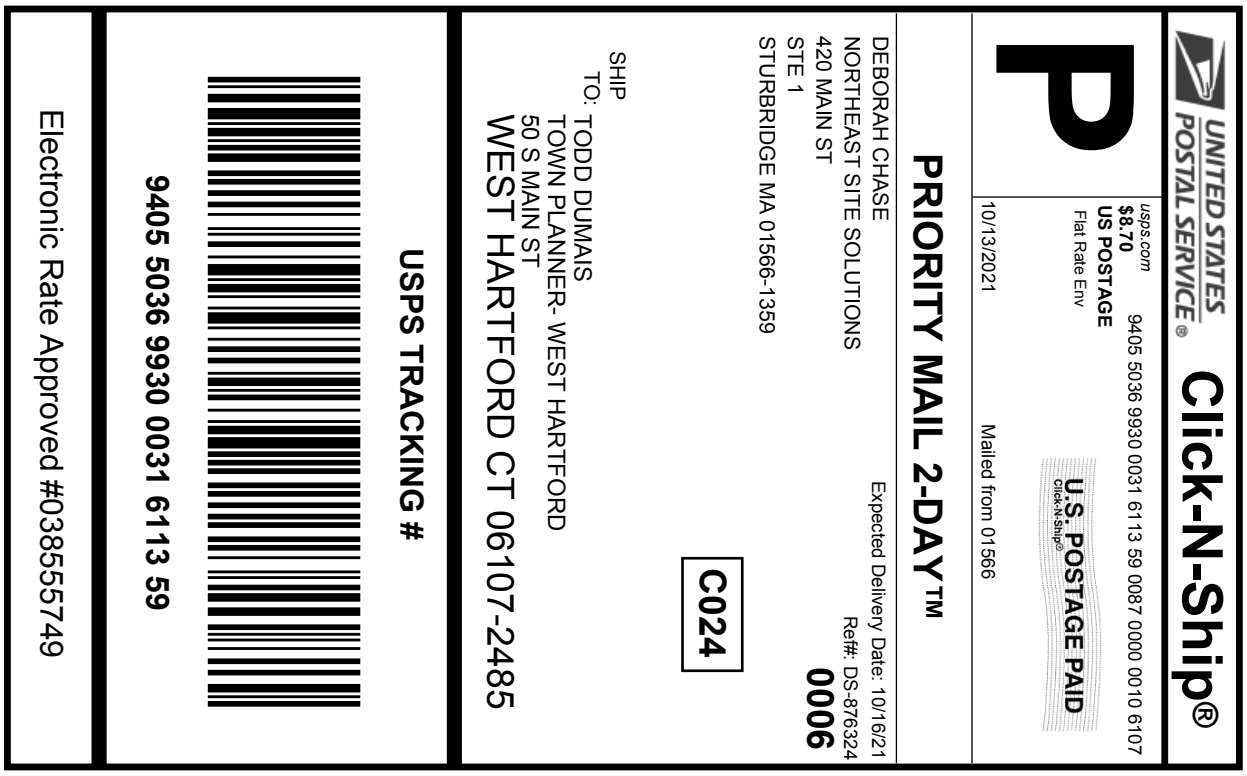
From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: DS-876324

To: SHARI CANTOR
MAYOR OF WEST HARTFORD
50 S MAIN ST
WEST HARTFORD CT 06107-2485

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

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



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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0031 6113 59

Trans. #:	545870645
Print Date:	10/13/2021
Ship Date:	10/13/2021
Expected Delivery Date:	10/16/2021

Priority Mail® Postage:	**$8.70**
Total:	**$8.70**

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

Ref#: DS-876324

To: TODD DUMAIS
TOWN PLANNER- WEST HARTFORD
50 S MAIN ST
WEST HARTFORD CT 06107-2485

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

Thank you for shipping with the United States Postal Service!
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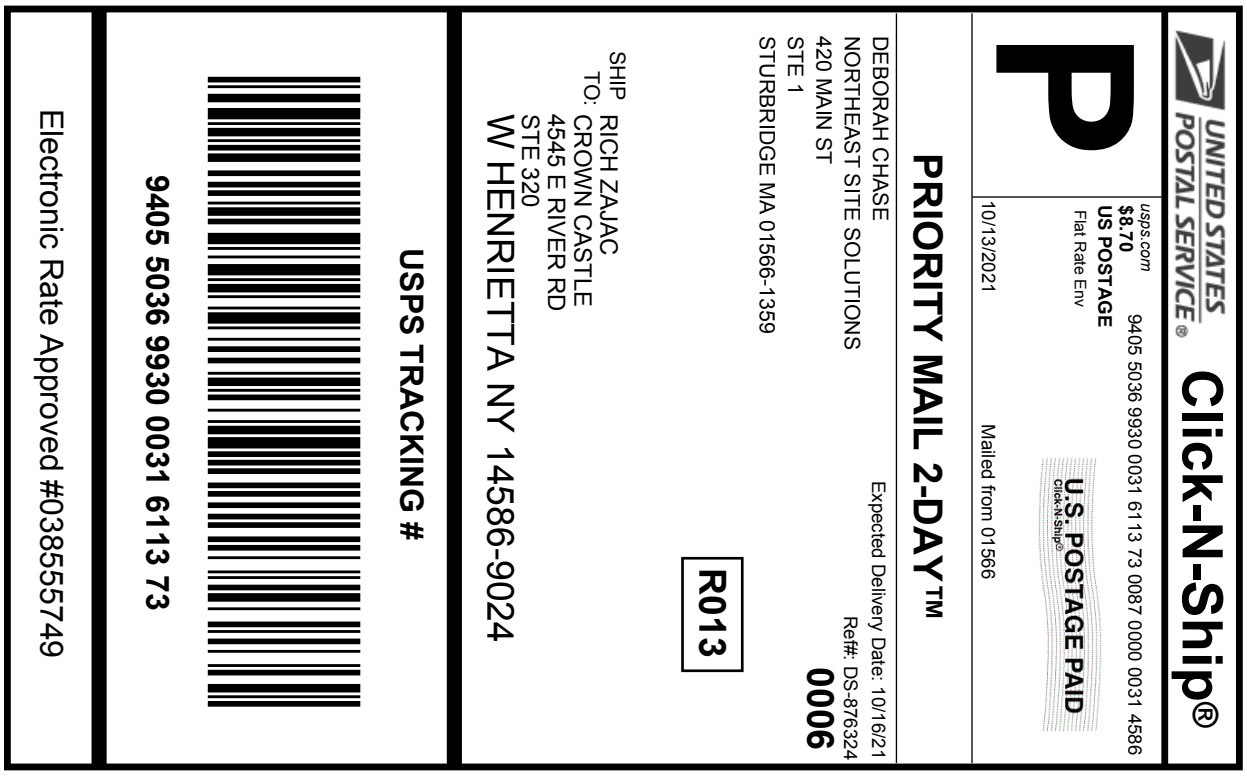

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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0031 6113 73

Trans. #:	545870645
Print Date:	10/13/2021
Ship Date:	10/13/2021
Expected Delivery Date:	10/16/2021

Priority Mail® Postage:	**$8.70**
Total:	**$8.70**

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

Ref#: DS-876324

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

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

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UNITED STATES POSTAL SERVICE®

Click-N-Ship®

9405 5036 9930 0031 6113 97 0087 0000 0010 6110

usps.com
$8.70
US POSTAGE
Flat Rate Env

U.S. POSTAGE PAID
Click-N-Ship®

10/13/2021 Mailed from 01566

P

PRIORITY MAIL 2-DAY™

Expected Delivery Date: 10/16/21

Ref#: DS-876324

0006

C024

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

SHIP TO:

WEST HARTFORD METHODIST CHURCH
1358 NEW BRITAIN AVE
WEST HARTFORD CT 06110-1633

USPS TRACKING #

9405 5036 9930 0031 6113 97

Electronic Rate Approved #038555749

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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0031 6113 97

Trans. #:	545870645
Print Date:	10/13/2021
Ship Date:	10/13/2021
Expected Delivery Date:	10/16/2021

Priority Mail® Postage:	**$8.70**
Total:	**$8.70**

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

Ref#: DS-876324

To: WEST HARTFORD METHODIST CHURCH
1358 NEW BRITAIN AVE
WEST HARTFORD CT 06110-1633

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

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876324

UNITED STATES POSTAL SERVICE.

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

10/14/2021 03:51 PM

Product	Qty	Unit Price	Price
Prepaid Mail West Henrietta, NY 14586 Weight: 0 lb 2.00 oz Acceptance Date: Thu 10/14/2021 Tracking #: 9405 5036 9930 0031 6113 73	1		$0.00
Prepaid Mail West Hartford, CT 06107 Weight: 0 lb 14.20 oz Acceptance Date: Thu 10/14/2021 Tracking #: 9405 5036 9930 0031 6113 59	1		$0.00
Prepaid Mail West Hartford, CT 06110 Weight: 0 lb 14.10 oz Acceptance Date: Thu 10/14/2021 Tracking #: 9405 5036 9930 0031 6113 97	1		$0.00
Prepaid Mail West Hartford, CT 06107 Weight: 0 lb 14.20 oz Acceptance Date: Thu 10/14/2021 Tracking #: 9405 5036 9930 0031 6113 35	1		$0.00
Grand Total:			$0.00