



June 21, 2021

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

**RE: Request of DISH Wireless LLC for an Order to Approve the Shared Use of an Existing Tower  
90 Industrial Park Rd., Middletown, CT 06457  
Latitude: 41° 35' 8.30"/ Longitude: -72° 42' 50.49"**

Dear Ms. Bachman:

Pursuant to Connecticut General Statutes ("C.G.S.") §16-50aa, as amended, DISH Wireless LLC ("DISH") hereby requests an order from the Connecticut Siting Council ("Council") to approve the shared use by DISH of an existing telecommunication tower at 90 Industrial Park Road in Middletown (the "Property"). The existing 185-foot monopole tower is owned by Crown Castle International Corp. ("Crown Castle"). The underlying property is owned by Airline Avenue Realty LLC. DISH requests that the Council find that the proposed shared use of the Crown Castle tower satisfies the criteria of C.G.S. §16-50aa and issue an order approving the proposed shared use. This modification/proposal includes hardware that is both 4G(LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times. A copy of this filing is being sent to Mayor Ben Florsheim, City of Middletown, Mr. Ronald Baia, Zoning Enforcement Officer for the City of Middletown, as well as the property owner.

### **Background**

The existing Crown Castle facility consists of a 185-foot monopole tower within a 2742 square foot leased area. T-Mobile currently maintains antennas at the 183-foot level, AT&T currently maintains antennas at the 174-foot level, and Verizon currently maintains antennas at the 155-foot level. T-Mobile's equipment is located northeast of the tower, AT&T's equipment is located northwest of the tower, and Verizon's equipment is located north of the tower.

DISH is licensed by the Federal Communications Commission ("FCC") to provide wireless services throughout the State of Connecticut. DISH and Crown Castle have agreed to the proposed shared use of the 90 Industrial Park Road tower pursuant to mutually acceptable terms and conditions. Likewise, DISH and Crown Castle have agreed to the proposed installation of equipment cabinets on the ground on the east side of the tower within the existing compound. Crown Castle has authorized DISH to apply for all necessary permits and approvals that may be required to share the existing tower.

DISH proposes to install three (3) antennas, six (6) RRUs, three (3) antenna t-arm mounts, and one (1) hybrid cable. In addition, DISH will install a ground equipment cabinet on a 5'x7' equipment platform. Included in the Construction Drawings are DISH's project specifications for locations of all proposed site improvements. The Construction Drawings also contain specifications for DISH's proposed antennas and ground work.

C.G.S. § 16-50aa(c)(1) provides that, upon written request for approval of a proposed shared use, "if the Council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns, the council shall issue an order approving such a shared use." DISH respectfully submits that the shared use of the tower satisfies these criteria.

**A. Technical Feasibility.** The existing Crown Castle tower is structurally capable of supporting DISH's proposed improvements. The proposed shared use of this tower is, therefore, technically feasible. A Feasibility Structural Analysis Report ("Structural Report") prepared for this project confirms that this tower can support DISH's proposed loading. A copy of the Structural Report has been included in this application.

**B. Legal Feasibility.** Under C.G.S. § 16-50aa, the Council has been authorized to issue order approving the shared use of an existing tower such as the Crown Castle tower. This authority complements the Council's prior-existing authority under C.G.S. § 16-50p to issue orders approving the construction of new towers that are subject to the Council's jurisdiction. In addition, § 16-50x(a) directs the Council to "give such consideration to the other state laws and municipal regulations as it shall deem appropriate" in ruling on requests for the shared use of existing tower facilities. Under the statutory authority vested in the Council, an order by the Council approving the requested shared use would permit the Applicant to obtain a building permit for the proposed installations.

**C. Environmental Feasibility.** The proposed shared use of the Crown Castle tower would have a minimal environmental effect for the following reasons:

1. The proposed installation will have no visual impact on the area of the tower. DISH's equipment cabinet would be installed within the existing facility compound. DISH's shared use of this tower therefore will not cause any significant change or alteration in the physical or environmental characteristics of the existing site.
2. Operation of DISH's antennas at this site would not exceed the RF emissions standard adopted by the Federal Communications Commission ("FCC"). Included in the EME report of this filing are the approximation tables that demonstrate that DISH's proposed facility will operate well within the FCC RF emissions safety standards.
3. Under ordinary operating conditions, the proposed installation would not require the use of any water or sanitary facilities and would not generate air emissions or discharges to water bodies or sanitary facilities. After construction is complete the

Melanie A. Bachman

June 21, 2021

Page 3

proposed installations would not generate any increased traffic to the Crown Castle facility other than periodic maintenance. The proposed shared use of the Crown Castle tower, would, therefore, have a minimal environmental effect, and is environmentally feasible.

**D. Economic Feasibility.** As previously mentioned, DISH has entered into an agreement with Crown Castle for the shared use of the existing facility subject to mutually agreeable terms. The proposed tower sharing is, therefore, economically feasible.

**E. Public Safety Concerns.** As discussed above, the tower is structurally capable of supporting DISH's full array of three (3) antennas, six (6) RRUs, three (3) antenna t-arm mounts, one (1) hybrid cable and all related equipment. DISH is not aware of any public safety concerns relative to the proposed sharing of the existing Crown Castle tower

### **Conclusion**

For the reasons discussed above, the proposed shared use of the existing Crown Castle tower at 90 Industrial Park Road satisfies the criteria stated in C.G.S. §16-50aa and advances the General Assembly's and the Council's goal of preventing the unnecessary proliferation of towers in Connecticut. The Applicant, therefore, respectfully requests that the Council issue an order approving the proposed shared use.

Sincerely,



Richard Zajac  
Site Acquisition Specialist  
4545 East River Road, Suite 320  
West Henrietta, NY 14586  
(585) 445-5896  
[richard.zajac@crowncastle.com](mailto:richard.zajac@crowncastle.com)

Melanie A. Bachman

June 21, 2021

Page 4

CC:

City Mayor Ben Florsheim (*via email to [mayor@MiddletownCT.gov](mailto:mayor@MiddletownCT.gov)*)

City of Middletown

245 DeKoven Drive

Middletown, CT 06457

860-638-4801

Mr. Ronald Baia, Zoning Enforcement Officer (*via email to [ron.baia@middletownct.gov](mailto:ron.baia@middletownct.gov)*)

City of Middletown

245 DeKoven Drive

Middletown, CT 06457

860-638-4870

Airline Avenue Realty LLC (*via Fedex delivery*)

15 Mullen Road

Enfield, CT 06082

## Zajac, Richard

---

**From:** Zajac, Richard  
**Sent:** Monday, June 21, 2021 12:56 PM  
**To:** 'mayor@MiddletownCT.gov'  
**Subject:** Connecticut Siting Council Shared Use application notification  
**Attachments:** CSC Shared Use Application - 90 Industrial Park Road.pdf

Good afternoon,

Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 90 Industrial Park Road in Middletown.

Should you have any questions/comments/concerns regarding this application, please do not hesitate to contact me.

Thank you,

**RICH ZAJAC**

Site Acquisition Specialist

T: (585) 445-5896 M: (607) 346-7212

F: (724) 416-4461

**CROWN CASTLE**

4545 East River Road, Suite 320

West Henrietta, NY 14586

## Zajac, Richard

---

**From:** Zajac, Richard  
**Sent:** Monday, June 21, 2021 12:57 PM  
**To:** 'ron.baia@middletownct.gov'  
**Subject:** Connecticut Siting Council Shared Use application notification  
**Attachments:** CSC Shared Use Application - 90 Industrial Park Road.pdf

Good afternoon,

Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 90 Industrial Park Road in Middletown.

Should you have any questions/comments/concerns regarding this application, please do not hesitate to contact me.

Thank you,

**RICH ZAJAC**

Site Acquisition Specialist

T: (585) 445-5896 M: (607) 346-7212

F: (724) 416-4461

**CROWN CASTLE**

4545 East River Road, Suite 320

West Henrietta, NY 14586

ORIGIN ID: ONHA (585) 445-5896  
RICHARD ZAJAC  
CROWN CASTLE  
629 KAYLEIGH DR  
WEBSTER, NY 14580  
UNITED STATES US

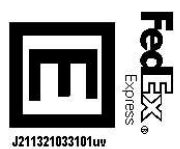
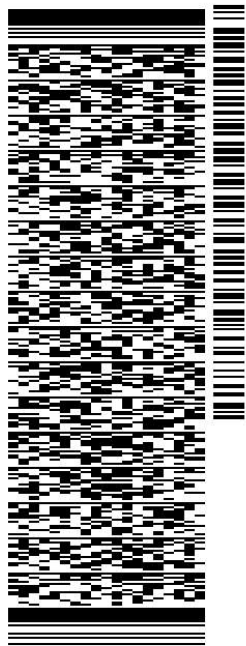
SHIP DATE: 21 JUN 21  
ACTWGT: 1.00 LB  
CAD: 112911364INET4340  
BILL SENDER

TO AIRLINE AVENUE REALTY LLC

15 MULLEN ROAD

ENFIELD CT 06082

(585) 445-5896 REF: 799001 7680  
INV/ DEPT:  
PO:



56DJ3/B387/FE4A

TRK# 7740 5329 4324 TUE - 22 JUN 4:30P  
0201 STANDARD OVERNIGHT

XEQCWA 06082  
CT-US BDL

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

**Warning:** Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



3 Corporate Dr, Suite 101  
Clifton Park, NY 12065

Phone: (201) 236-9224  
Fax: (724) 416-6112  
www.crowncastle.com

**Crown Castle Letter of Authorization**

**CT - CONNECTICUT SITING COUNCIL**

**Re: Tower Share Application**

**Crown Castle telecommunications site at: 90 Industrial Park Road, Middletown, CT 06457**

CROWN ATLANTIC COMPANY 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: 825983/MIDDLETOWN\_1**

**Customer Site ID: BOBDL00056A/CT-CCI-T-825983**

**Site Address: 90 Industrial Park Road, Middletown, CT 06457**

Crown Castle USA Inc.

By:  Date: 5/13/21  
Anne Marie Zsamba  
Project Manager – Site Acquisition



# Exhibit A

## **Original Facility Approval**

## LEGAL NOTICE

### NOTICE OF DECISION BY THE MIDDLETOWN PLANNING AND ZONING COMMISSION at its meeting of January 28, 1998

1. Denied without prejudice a request for release of the cash bond for Wesleyan Hills PRD, Red Area Section III. Applicant/agent Larsen, St. John & Johnson, P.C./Atty. Frank St. John PRD
2. Denied without prejudice a request for release of the cash bond for Longhill Meadows Subdivision located off South Main Street. Applicant/agent Krasow, Garlick & Hadley, LLC/Atty. Herbert A. Krasow S87-32
3. Denied without prejudice a request for release of the cash bond for Richards Brook Subdivision, Lots #2 and #3, located on Kenneth Dooley Drive. Applicant/agent Tyler Cooper & Alcorn, LLP/Atty. Barry M. Winnick S89-6
4. Granted Final Approval of a portion of Pond Place in Section 3 of The Meadows at Riverbend Subdivision located off East Street with the condition that all departmental comments be addressed and that a cash bond in the amount of \$45,000 be posted. Applicant/agent Tuttle Road Associates/Robert C. Fusari, President S93-3
5. Granted a one (1) year extension of the Special Exception approval for the Connecticut Beverage Mart Plaza located at 955 Washington Street. Applicant/agent 3127 Berlin Turnpike Associates/Brigham S. Metcalfe SE95-6
6. Denied without prejudice a proposed Zoning Code text amendment to modify Section 42 Protection of Water Sources. Applicant/agent City of Middletown Water and Sewer Department/Guy P. Russo, Director Z97-7
7. Granted a Special Exception for construction of a 185 foot monopole and installation of associated antennae and equipment for up to three (3) wireless communication providers at the Dainty Rubbish facility at 90 Industrial Park Road with the condition that all staff comments and conditions be addressed and adhered to. Applicant/agent Omnipoint Communications, Inc./Thomas M. Gilligan SE97-18
8. Granted a Special Exception to convert a former insurance business to a new use as a home for the aged and a rest home at 26 Silver Street with the following conditions: 1) there be no nurse on the premises; 2) no residents are to be older than fifty-five (55) years of age; 3) all residents are to administer their own medication; and 4) any modification to the structure are to be approved by the Design Preservation Board. Applicant/agent Deonarine and Neeta Dhanraj/Atty. Owen P. Eagan SE97-19

9. Adopted a Zoning Map amendment to rezone a portion of a piece of property located behind Middlesex Schools Federal Credit Union on South Main Street from RPZ Residential Pre Zoning to the B-2 General Business Zone with an effective date of February 15, 1998. A copy of the adopted map change is on file in the Office of the Town Clerk. Applicant/agent Middlesex Schools Federal Credit Union/Attorney Philip F. Karpel Z97-12

W. Lee Osborne, Chairman  
 Planning and Zoning Commission

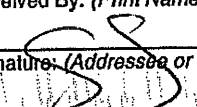
P. O. No. 061920, Account No. 067419

The above legal notice to appear in the Hartford Courant ONCE

Thursday, February 5, 1998

**THE MUNICIPAL BUILDING IS WHEELCHAIR ACCESSIBLE**

P 348 778 241  
 US Postal Service

Is your RETURN ADDRESS completed on the reverse side?	<b>SENDER:</b>		I also wish to receive the following services (for an extra fee):
	<ul style="list-style-type: none"> <li>■ Complete items 1 and/or 2 for additional services.</li> <li>■ Complete items 3, 4a, and 4b.</li> <li>■ Print your name and address on the reverse of this form so that we can return this card to you.</li> <li>■ Attach this form to the front of the mailpiece, or on the back if space does not permit.</li> <li>■ Write "Return Receipt Requested" on the mailpiece below the article number.</li> <li>■ The Return Receipt will show to whom the article was delivered and the date delivered.</li> </ul>		
	3. Article Addressed to:		4a. Article Number
	Omnipoint Communications, Inc. 25 Van Zant St. 4th floor Norwalk, CT 06855		P348 778 241
	5. Received By: (Print Name)		4b. Service Type
6. Signature: (Addressee or Agent)		<input type="checkbox"/> Registered <input checked="" type="checkbox"/> Certified <input type="checkbox"/> Express Mail <input type="checkbox"/> Insured <input type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> COD	
		7. Date of Delivery	
		8. Addressee's Address (Only if requested and fee is paid)	
X 		7-30-98	

Thank you for using Return Receipt Service.

Please fill out this application so we will know who you are, what you are applying to do, and how to contact you. With this basic information we will evaluate your project as it relates to City regulations as quickly as possible. Thank you for your cooperation.

GENERAL INFORMATION ABOUT THE PEOPLE INVOLVED

Applicant: OMNIPONT COMMUNICATIONS, INC.  
Address: 1515 SUMMER ST City STAMFORD  
Agent: THOMAS M. GILLIGAN  
Address: 1515 SUMMER ST City STAMFORD

Date 11-6-97  
Phone# (203) 359-1280  
State CT Zip 06905  
Phone# (203) 359-1280  
State CT Zip 06905

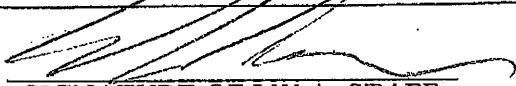
WHAT ARE YOU APPLYING TO DO? (CHECK ONE OR MORE)

- Add an addition to a single/two family dwelling to be used for
- Construct a single family dwelling (A-2 survey required)
- Add an addition to a multi-family or non-residential building to be used for (A-2 survey required)
- Convert an existing building from present use as \_\_\_\_\_ to a new use as \_\_\_\_\_
- Construct one or more new buildings to be used for (A-2 survey required)
- Subdivide land into building lots (A-2 survey required)
- Change the text of the Zoning Code or amend the Zoning Map
- Install a sign
- Start a Residential Unit Business Pursuit
- Application for Zoning Board of Appeals
- Extract Natural Resources like sand or gravel or fill an area
- Other WIRELESS COMMUNICATIONS MIDDLE, ASSOCIATED ANTENNAE AND EQUIPMENT DESIGNED FOR UP TO THREE CARRIERS

DEPT. PLANNING & ZONING  
97 NOV -6 PM 4:28

FACTS ABOUT LAND PROPOSED FOR USE

Landowner: PHILIP ARMETTA Location: 90 INDUSTRIAL PARK ROAD  
Zone IT Lot Area 2,54A Tax Assessor's Map 6 Block 22 Lot 6B1  
Is this project within 500' of a Municipal Boundary? Yes \_\_\_\_\_ No   
Is this project located in a FEMA 100 or 500 year flood plain? Yes \_\_\_\_\_ No   
Utilities Available: City Water ; Private Well ( ); City Sewer ; Private Septic ( )


  
SIGNATURE OF I.W.A. STAFF

DATE APPLIED \_\_\_\_\_  
 PERMIT REQUIRED  
 PERMIT NOT REQUIRED  
 IWA REVIEW REQUIRED

---

Meets Zoning Requirements

Wayne J. Bell  
ZONING ENFORCEMENT OFFICER  
MARCH 6, 1998  
DATE 9/17/97  
DATE OF APPROVED PLANS \_\_\_\_\_

  
SIGNATURE OF APPLICANT/AGENT\*\*  
Philip C. Armetta  
SIGNATURE OF OWNER\*\*

\*\*Both signatures required. I certify that the above information and plans submitted are true and correct, and that, if required, an application for an Inland/Wetlands permit has been filed before or on the same day as the filing of this application with the P&Z Commission.

*pd. \$110.00  
ck # 1846  
11/7/97*

INITIAL APPLICATION FOR LAND-USE IN MIDDLETOWN, CT

ALL DOCUMENTS WHICH MAKE UP THE RECORD OF THIS APPLICATION MUST BE LISTED BELOW. THIS INCLUDES ALL MAPS AND TEXT MATERIAL.

PROJECT: CONSTRUCTION OF A 185' MONOPOLE AND INSTALLATION OF ASSOCIATED ANTENNAE AND EQUIPMENT DESIGNED FOR UP TO 3 CARRIERS

- 1.) COVER LETTER
- 2.) SPECIAL EXCEPTION FORM
- 3.) LIST OF ADJOINING OWNERS
- 4.) DEED
- 5.) EXECUTED LEASE SIGNATURE PAGE
- 6.) GENERAL INFORMATION
- 7.) 8.5 x 11 ARCHITECTURAL PLANS
- 8.) SITE PLAN
- 9.) ARCHITECTURAL PLANS

IN THE EVENT A PUBLIC HEARING IS REQUIRED FOR THIS APPLICATION, ALL PERSONS MAKING VERBAL PRESENTATIONS AT THE PUBLIC HEARING FOR THIS PROJECT AND THE APPROXIMATE TIME EACH WILL REQUIRE MUST BE LISTED BELOW.

ELENI SOTIRIOU, DIR. OF ZONING & LEASE MGMT. - 10-15 MINUTES  
JONATHAN LINDENTHALER, PROJECT COORDINATOR - 10-15 MINUTES  
THOMAS GILLIGAN, ZONING SPECIALIST/PLANNER. 10-15 MINUTES  
MOHAN KUPPASWAMY, RF ENGINEER - 10-15 MINUTES  
LOU CORNACCHIA, RF HEALTH PROFESSIONAL - 10-15 MINUTES

**SPECIAL EXCEPTION FORM**  
 MIDDLETOWN, CONNECTICUT  
 PLANNING & ZONING COMMISSION

A. GENERAL INFORMATION ABOUT APPLICANT (Please type or print clearly)  
 Name OMNIBUS COMMUNICATIONS, INC Date 11-6-97  
 Address 1515 SUMNER STREET Phone 203-359-1280  
 Agent THOMAS W. GILLMAN Phone 203-359-1280

B. DESCRIPTION OF PREMISES  
 Owner of Record PHILIP ARMETTA  
 Location 90 INDUSTRIAL PARK ROAD  
 Deed Filed in Town Clerk's Office on \_\_\_\_\_  
 Map File# \_\_\_\_\_ Vol. & Page# 505 ; 134  
 Zone FT Current Use OFFICE & BULKY WASTE TRANSFER STA.  
 Relevant Zoning Code Provision SECTION 61

NOTE: A legal description of the premises to be affected by the Special Exception must be attached to this form.

C. NATURE OF SPECIAL EXCEPTION  
CONSTRUCTION OF A 185 FOOT MONOPOLE AND INSTALLATION OF ASSOCIATED ANTENNAE AND EQUIPMENT FOR UP TO 3 WIRELESS COMMUNICATIONS PROVIDERS

[Signature]  
 Signature of Applicant or Agent  
[Signature]  
 Signature of Owner  
 \*Both Signatures Required

NOTE: An approved Special Exception will not be effective until a copy of this certification is recorded in the Middletown Town Clerk's Office.

The owner, applicant and/or other authorized agent hereby grant the Middletown Planning and Zoning Commission and/or its agents permission to enter upon the property for which the Special Exception application has been filed for the purpose of inspection and enforcement of the Regulations of the City of Middletown.

Staff Comments \_\_\_\_\_

D. CERTIFICATION OF COMMISSION RESPONSE  
 Dates Legal Notices Published 1/16/98 ; 1/23/98  
 Date of Public Hearing 1/28/98  
 Final Action: Disapproved \_\_\_\_\_ Approved X  
 Zoning Regulation to which Special Exception is granted Sec. 61  
 Date Notice of Decision Published 2/5/98  
 Effective Date upon filing this form

E. MATERIAL FILED IN TOWN CLERK'S OFFICE  
 This Form  Site Plan  
 Other legal description ; Date \_\_\_\_\_  
[Signature] 2/9/98

F. This is to certify that a Special Exception, as depicted on this form, was granted by the Middletown Planning and Zoning Commission.  
[Signature]  
 Chairman

# Exhibit B

## **Property Card**

# 90 INDUSTRIAL PARK RD

**Location** 90 INDUSTRIAL PARK RD

**Map-Lot** 06 / / 0018 / /

**Acct#** R00347

**Owner** AIRLINE AVENUE REALTY LLC

**Municipality**

**Assessment** \$1,324,110

**Appraisal** \$1,891,590

**PID** 396

**Building Count** 1

**Assessing District**

## Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2018	\$1,255,960	\$635,630	\$1,891,590

Assessment			
Valuation Year	Improvements	Land	Total
2018	\$879,170	\$444,940	\$1,324,110

## Parcel Addresses

Additional Addresses
No Additional Addresses available for this parcel

## Owner of Record

<b>Owner</b>	AIRLINE AVENUE REALTY LLC	<b>Sale Price</b>	\$1,000,000
<b>Co-Owner</b>		<b>Certificate</b>	
<b>Address</b>	15 MULLEN RD	<b>Book &amp; Page</b>	1956/943
	ENFIELD, CT 06082	<b>Sale Date</b>	11/15/2019
		<b>Instrument</b>	25

## Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
AIRLINE AVENUE REALTY LLC	\$1,000,000		1956/943	25	11/15/2019
90 INDUSTRIAL PARK ROAD LLC	\$0		1843/0205	29	06/11/2015
ARMETTA PHILIP C	\$0		0505/0134	29	02/22/1978



## Building Information

### Building 1 : Section 1

**Year Built:** 1986  
**Living Area:** 28,684  
**Replacement Cost:** \$1,523,694  
**Building Percent Good:** 77  
**Replacement Cost Less Depreciation:** \$1,173,240

#### Building Attributes

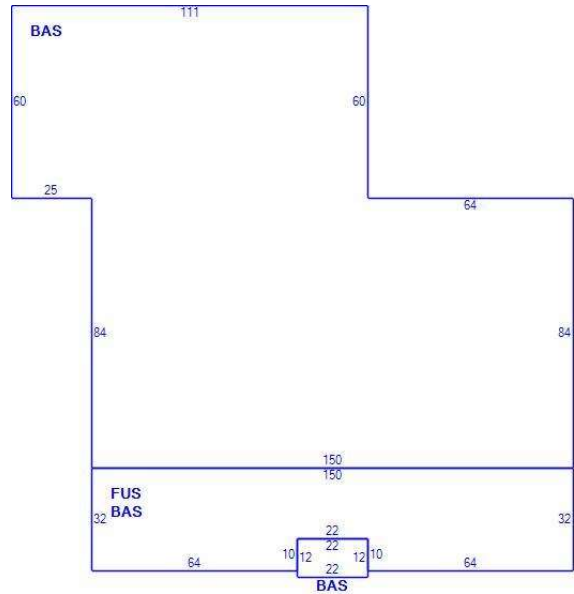
Field	Description
Style	Office/Warehs
Model	Industrial
Grade	C
Stories	1
Occupancy	2.00
Exterior Wall 1	Pre-finish Metl
Exterior Wall 2	Concrete
Roof Structure	Flat
Roof Cover	Tar and Gravel
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	Carpet
Heating Fuel	Gas
Heating Type	Forced Air
AC Type	Partial
Struct Class	
Bldg Use	Industrial
Cov Parking	0
Uncov Parking	0
Percent Fin	100
1st Floor Use	
Heat/AC	Heat/AC Pkg
Frame Type	Steel
Baths/Plumbing	Average
Ceiling/Walls	Typical
Rooms/Prtns	Average
Wall Height	25.00

### Building Photo



(<http://images.vgsi.com/photos/MiddletownCTPhotos/\00\02\11\86.jpg>)

### Building Layout



(ParcelSketch.ashx?pid=396&bid=396)

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	24,104	24,104
FUS	Finished Upper Story	4,580	4,580
		28,684	28,684

### Extra Features

Extra Features				Legend
Code	Description	Size	Value	Bldg #
A/C	Air Condition	8896.00 UNITS	\$23,290	1

## Land

### Land Use

**Use Code** 301  
**Description** Industrial  
**Zone** IT  
**Neighborhood** 3100  
**Alt Land Appr** No  
**Category**

### Land Line Valuation

**Size (Acres)** 2.61  
**Assessed Value** \$444,940  
**Appraised Value** \$635,630

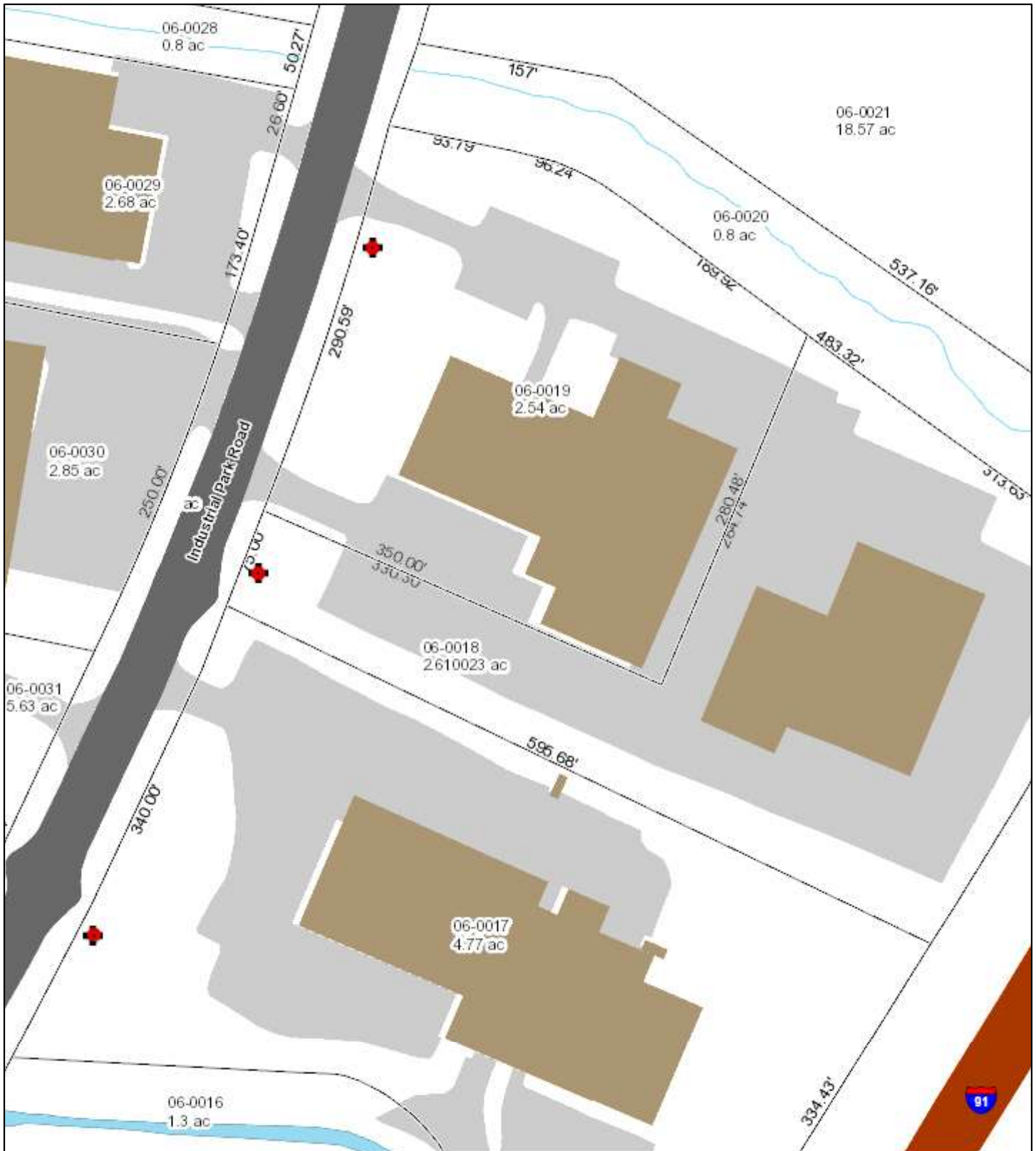
## Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
LT1	Lights-In W/PI			4.00 UNITS	\$210	1
PAV1	Paving	AS	Asphalt	51134.00 UNITS	\$57,530	1
PAV2	Paving	CN	Concrete LD	2100.00 UNITS	\$3,830	1
CSHD	Cell Shed			288.00 UNITS	\$34,200	1

## Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2020	\$1,255,960	\$635,630	\$1,891,590
2019	\$1,255,960	\$635,630	\$1,891,590
2018	\$1,255,960	\$635,630	\$1,891,590

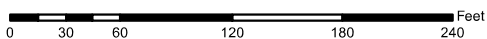
Assessment			
Valuation Year	Improvements	Land	Total
2020	\$879,170	\$444,940	\$1,324,110
2019	\$879,170	\$444,940	\$1,324,110
2018	\$879,170	\$444,940	\$1,324,110



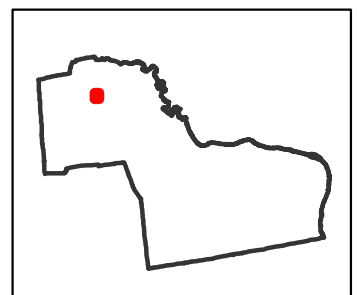
## City of Middletown, Connecticut

Map generated 7/15/2019

Map Legend: <http://gis.cityofmiddletown.com/middletownct/legend.pdf>  
 Property Card: <http://gis.vgsi.com/MiddletownCT/Parcel.aspx?pid=396>



1 in = 104 ft



### MAP FOR REFERENCE ONLY - NOT A LEGAL DOCUMENT

Because of different update schedules, current property assessments may not reflect recent changes to property boundaries. Check with the Board of Assessors to confirm boundaries uses at the time of assessment.

# Exhibit C

## **Construction Drawings**



DISH WIRELESS, LLC. SITE ID:

**BOBDL00056A**

DISH WIRELESS, LLC. SITE ADDRESS:

**90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457**

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:	
<b>TOWER SCOPE OF WORK:</b>	
<ul style="list-style-type: none"> <li>• INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR)</li> <li>• INSTALL PROPOSED T-ARM MOUNT (1 PER SECTOR)</li> <li>• INSTALL PROPOSED JUMPERS</li> <li>• INSTALL (6) PROPOSED RRUs (2 PER SECTOR)</li> <li>• INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP)</li> <li>• INSTALL (1) PROPOSED HYBRID CABLE</li> <li>• REMOVE ABANDONED EQUIPMENT</li> </ul>	
<b>GROUND SCOPE OF WORK:</b>	
<ul style="list-style-type: none"> <li>• INSTALL (1) PROPOSED METAL PLATFORM</li> <li>• INSTALL (1) PROPOSED ICE BRIDGE</li> <li>• INSTALL (1) PROPOSED PPC CABINET</li> <li>• INSTALL (1) PROPOSED EQUIPMENT CABINET</li> <li>• INSTALL (1) PROPOSED POWER CONDUIT</li> <li>• INSTALL (1) PROPOSED TELCO CONDUIT</li> <li>• INSTALL (1) PROPOSED TELCO-FIBER BOX</li> <li>• INSTALL (1) PROPOSED GPS UNIT</li> <li>• INSTALL (1) PROPOSED SAFETY SWITCH (IF REQUIRED)</li> <li>• INSTALL (1) PROPOSED CIENA BOX (IF REQUIRED)</li> <li>• EXISTING METER SOCKET ON EXISTING H-FRAME TO BE UTILIZED</li> </ul>	

SITE INFORMATION	PROJECT DIRECTORY
PROPERTY OWNER: GLOBAL SIGNAL ACQUISITION	APPLICANT: DISH WIRELESS, LLC. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
ADDRESS: PO BOX 277455 ATLANTA, GA 30384-7455	TOWER OWNER: CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317 (877) 486-9377
TOWER TYPE: MONOPOLE	SITE DESIGNER: INFINIGY 2500 W. HIGGINS RD. STE. 500 HOFFMAN ESTATES, IL 60169 (847) 648-4068
TOWER CO SITE ID: 825983	SITE ACQUISITION: NICHOLAS CURRY NICHOLAS.CURRY@CROWNCastle.COM
TOWER APP NUMBER: 553287	CONSTRUCTION MANAGER: JAVIER SOTO TBD
COUNTY: MIDDLESEX	RF ENGINEER: BOSSENER CHARLES
LATITUDE (NAD 83): 41° 35' 8.30" N 41.585639 N	
LONGITUDE (NAD 83): -72° 42' 50.49" W -72.714028 W	
ZONING JURISDICTION: TBD	
ZONING DISTRICT: TBD	
PARCEL NUMBER: MTWN-000000-000000-000347R	
OCCUPANCY GROUP: U	
CONSTRUCTION TYPE: V-B	
POWER COMPANY: NORTHEAST UTILITIES	
TELEPHONE COMPANY: TBD	



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

CONNECTICUT CODE COMPLIANCE	
ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:	
CODE TYPE	CODE
BUILDING	2018 CT STATE BUILDING CODE/2015 IBC W/ CT AMENDMENTS
MECHANICAL	2018 CT STATE BUILDING CODE/2015 IMC W/ CT AMENDMENTS
ELECTRICAL	2018 CT STATE BUILDING CODE/2017 NEC W/ CT AMENDMENTS

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



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

**GENERAL NOTES**

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

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

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

**DIRECTIONS**

**DIRECTIONS FROM HARTFORD-BRAINARD AIRPORT:**  
DEPART AND HEAD TOWARD MAXIM RD, TURN LEFT ONTO MAXIM RD, BEAR RIGHT ONTO BRAINARD RD, TURN RIGHT ONTO AIRPORT RD, TAKE THE RAMP ON THE LEFT FOR I-91 SOUTH AND HEAD TOWARD NY CITY / NEW HAVEN, KEEP STRAIGHT TO GET ONTO INDUSTRIAL PARK RD, TURN LEFT, ARRIVE AT 90 INDUSTRIAL PARK ROAD, MIDDLETOWN, CT 06457



DRAWN BY: RCD	CHECKED BY: SS	APPROVED BY: CJW
RFDS REV #: N/A		

**CONSTRUCTION DOCUMENTS**

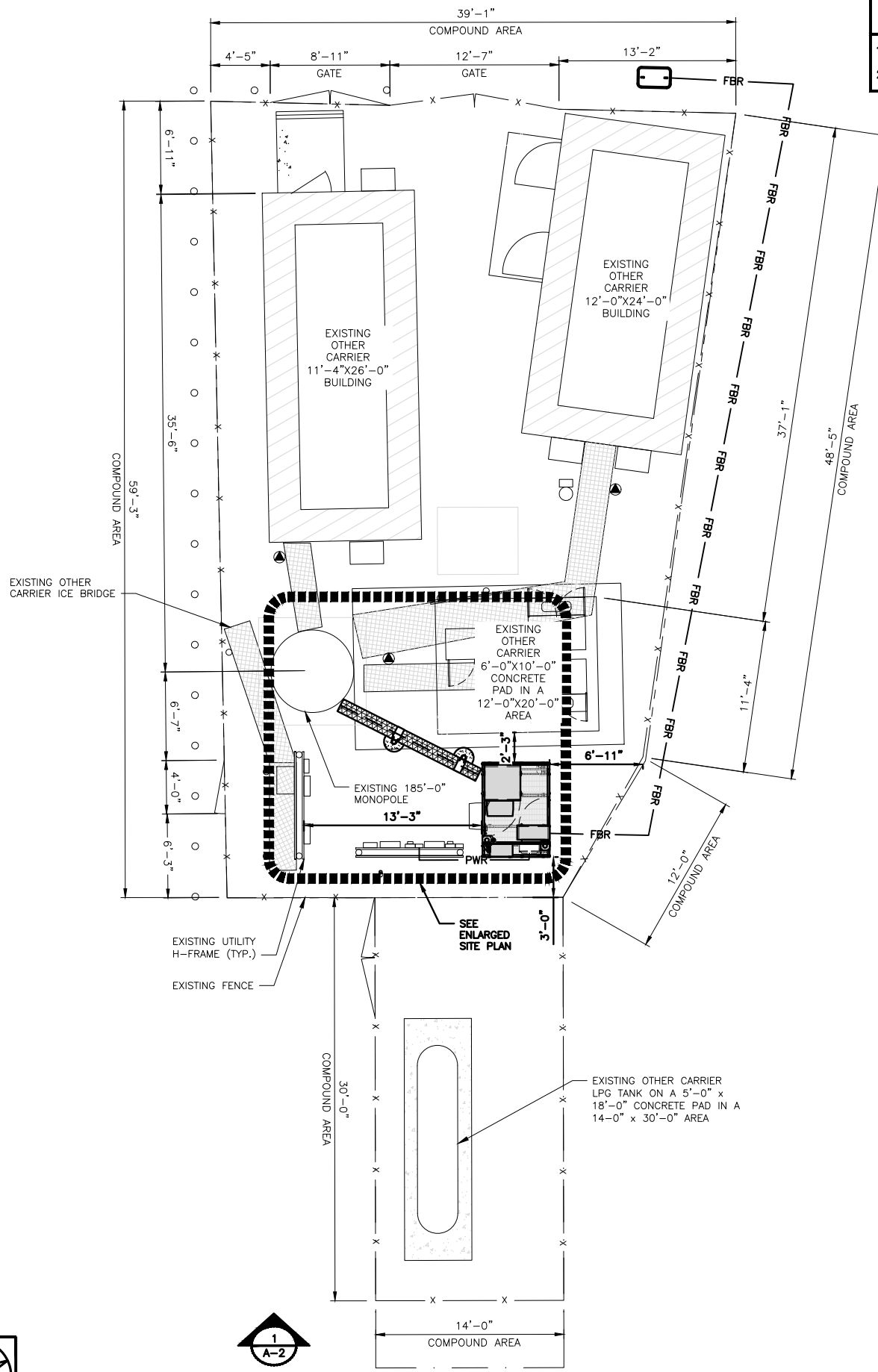
SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

A&E PROJECT NUMBER  
**2039-Z5555C**

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
**BOBDL00056A**  
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

SHEET TITLE  
**TITLE SHEET**

SHEET NUMBER  
**T-1**



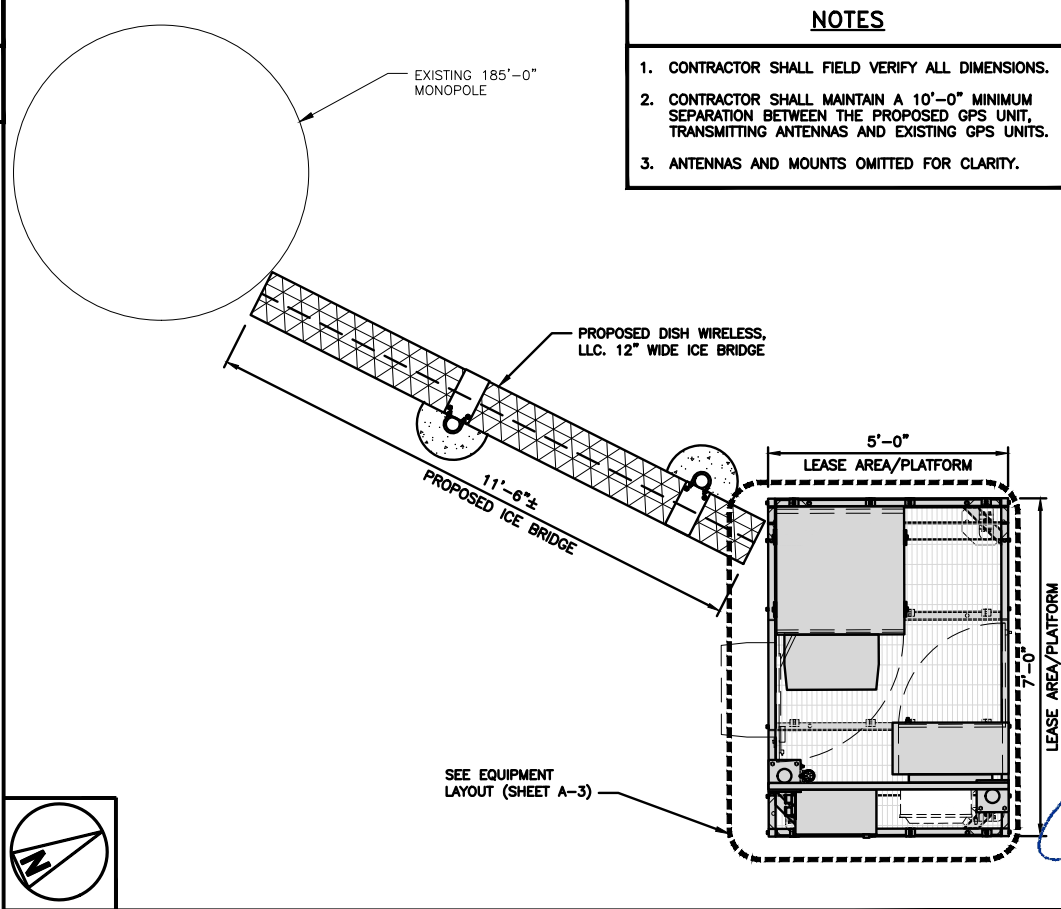
**NOTES**

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

**COMPOUND PLAN**

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

1



**NOTES**

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

**ENLARGED SITE PLAN**

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

2



**SITE PLAN**

64' 32' 0 64' 128' 1/64"=1'-0"

3

**dish wireless.**

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

**CROWN CASTLE**

2000 CORPORATE DRIVE  
CANONSBURG, PA 15317

**INFINIGY**

FROM ZERO TO INFINIGY

the solutions are endless

2500 W. HIGGINS RD. SUITE 500 |  
HOFFMAN ESTATES, IL 60169  
PHONE: 847-648-4068 | FAX: 518-690-0793  
WWW.INFINIGY.COM

STATE OF CONNECTICUT  
SHUHEI SAKAGUCHI  
34916  
LICENSED PROFESSIONAL ENGINEER  
5/18/21

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW
RFDS REV #:	N/A	

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

A&E PROJECT NUMBER  
2039-Z5555C

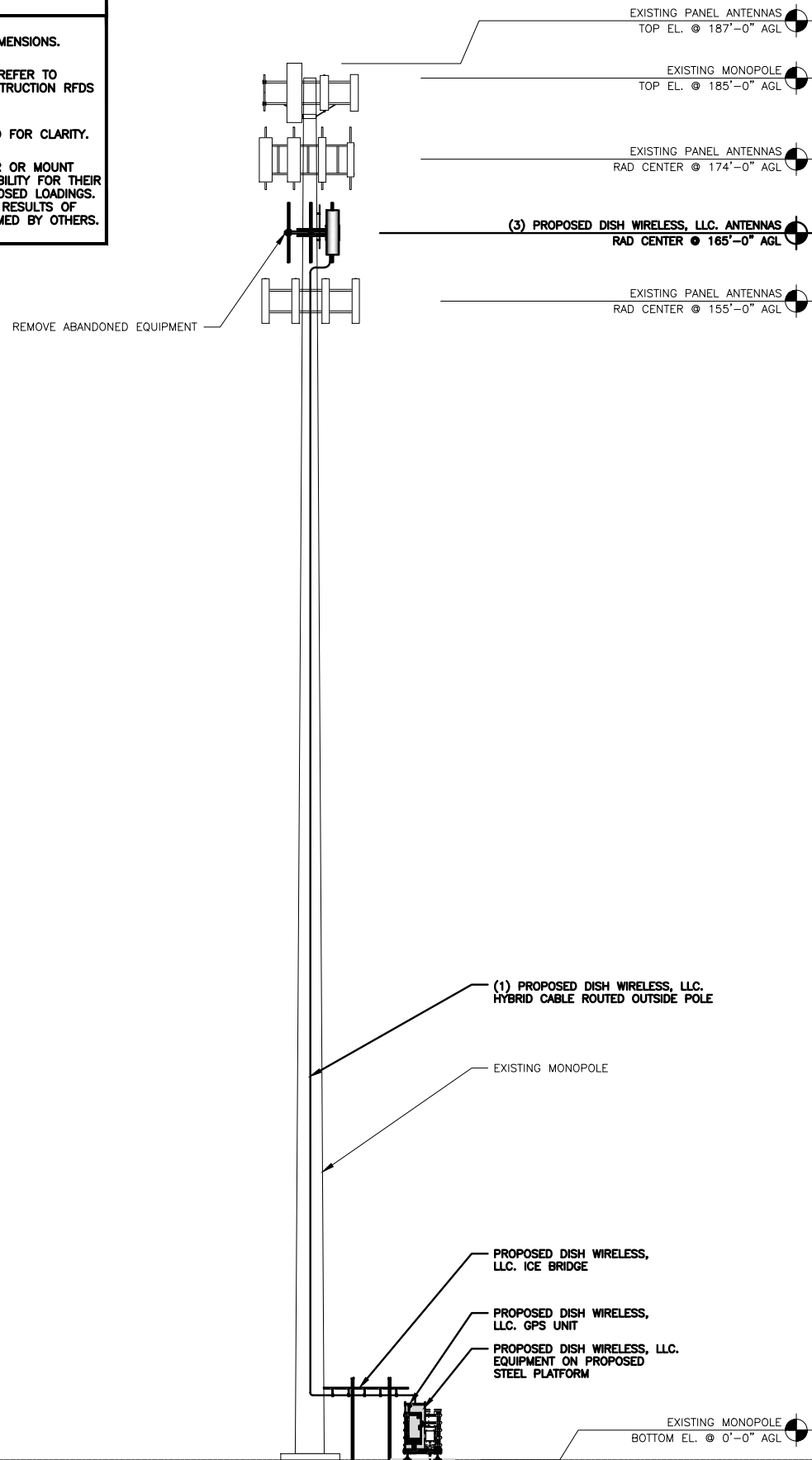
DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00056A  
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

SHEET TITLE  
OVERALL AND ENLARGED  
SITE PLAN

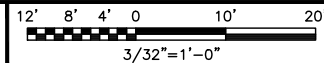
SHEET NUMBER  
**A-1**

**NOTES**

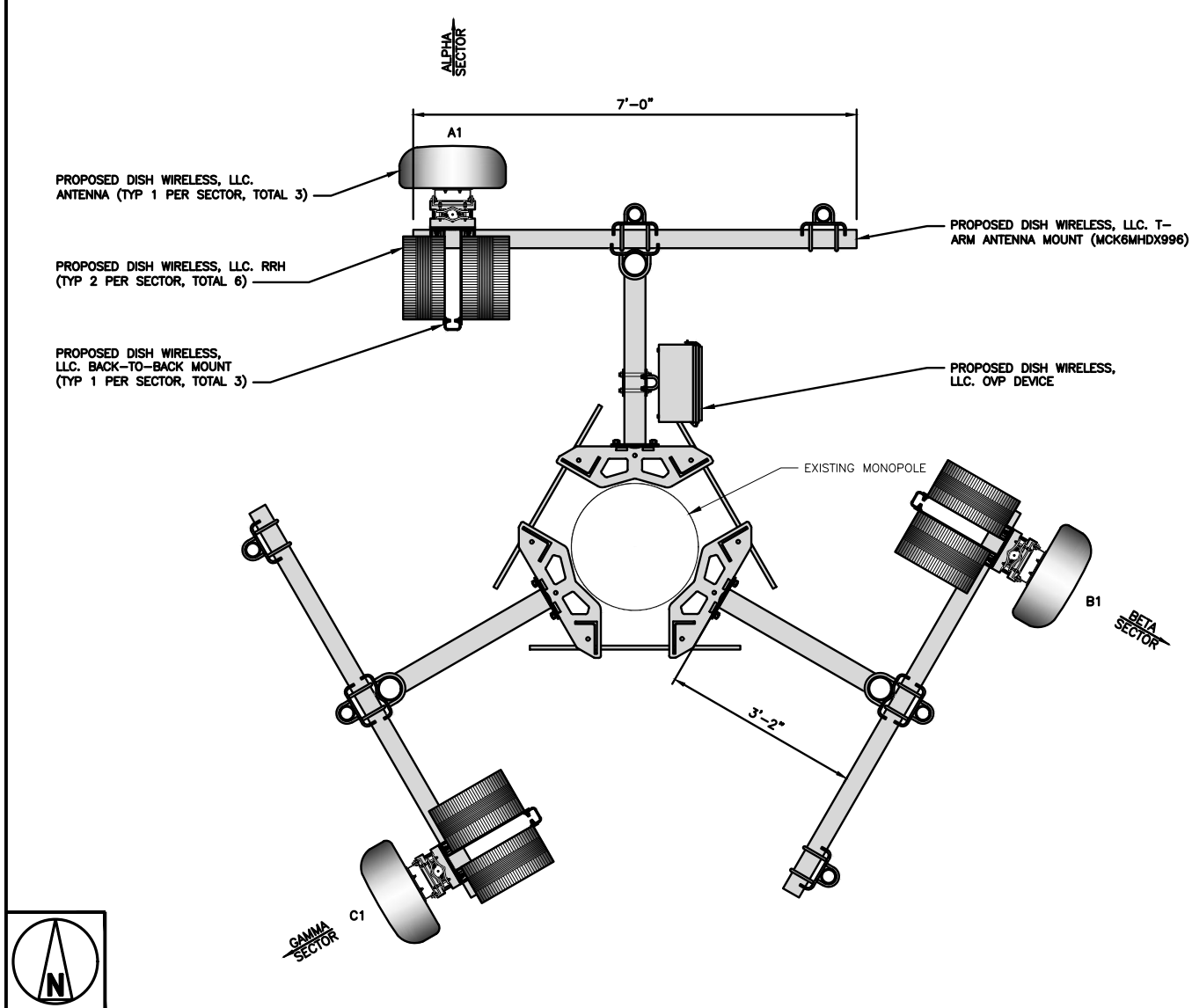
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.
4. INFINIGY HAS NOT EVALUATED THE TOWER OR MOUNT STRUCTURE AND ASSUMES NO RESPONSIBILITY FOR THEIR STRUCTURAL INTEGRITY REGARDING PROPOSED LOADINGS. FINAL INSTALLATION SHALL COMPLY WITH RESULTS OF PASSING STRUCTURAL ANALYSES PERFORMED BY OTHERS.



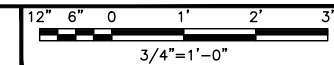
**PROPOSED SOUTH ELEVATION**



1



**ANTENNA LAYOUT**



2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZMUTH	RAD CENTER	
ALPHA	A1	PROPOSED	JMA WIRELESS - MX08FRO665-20	5G	72.0" x 20.0"	0°	165'-0"	(1) HIGH-CAPACITY HYBRID CABLE (200' LONG)
BETA	B1	PROPOSED	JMA WIRELESS - MX08FRO665-20	5G	72.0" x 20.0"	120°	165'-0"	
GAMMA	C1	PROPOSED	JMA WIRELESS - MX08FRO665-20	5G	72.0" x 20.0"	240°	165'-0"	

**NOTES**

1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
2. ANTENNA OR 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.

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

**ANTENNA SCHEDULE**

NO SCALE

3



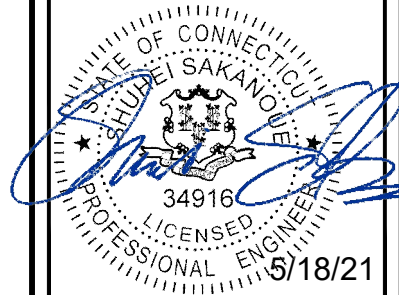
5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



2000 CORPORATE DRIVE  
CANONSBURG, PA 15317



FROM ZERO TO INFINIGY  
the solutions are endless  
2500 W. HIGGINS RD., SUITE 500 |  
HOFFMAN ESTATES, IL 60169  
PHONE: 847-648-4068 | FAX: 518-690-0793  
WWW.INFINIGY.COM



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

DRAWN BY: CHECKED BY: APPROVED BY:

RCD SS CJW

RFDS REV #: N/A

**CONSTRUCTION DOCUMENTS**

**SUBMITTALS**

REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

A&E PROJECT NUMBER

2039-Z5555C

DISH WIRELESS, LLC. PROJECT INFORMATION

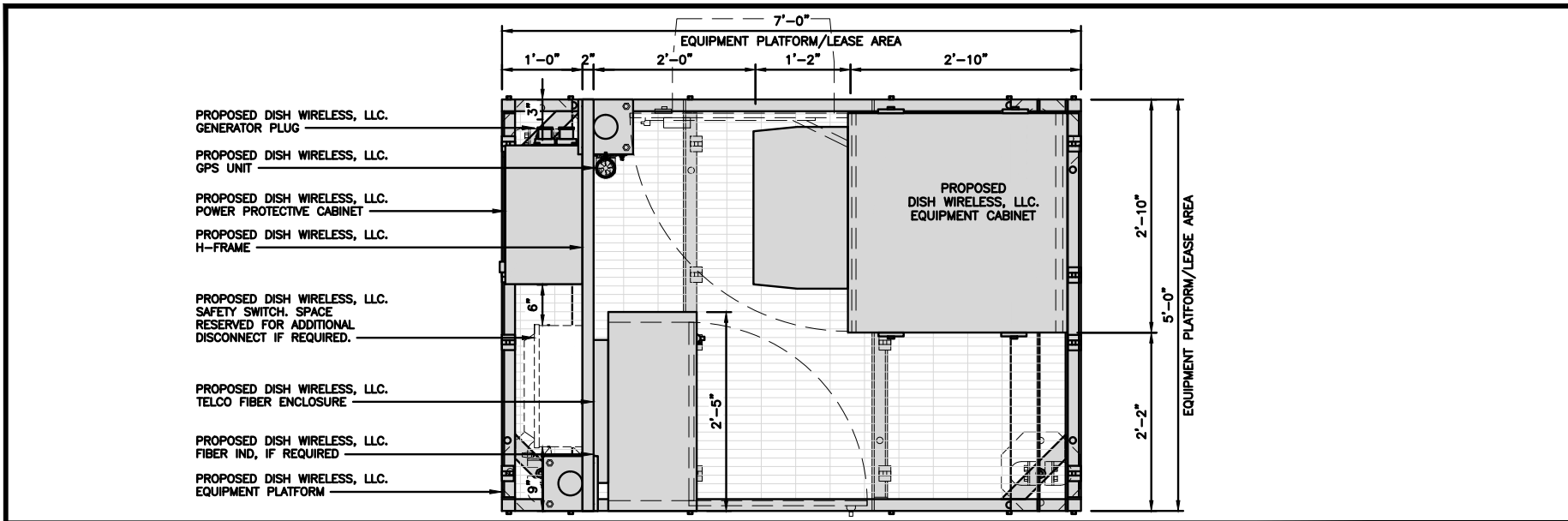
BOBDL00056A

90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

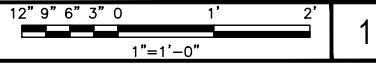
SHEET TITLE  
ELEVATION, ANTENNA  
LAYOUT AND SCHEDULE

SHEET NUMBER

**A-2**

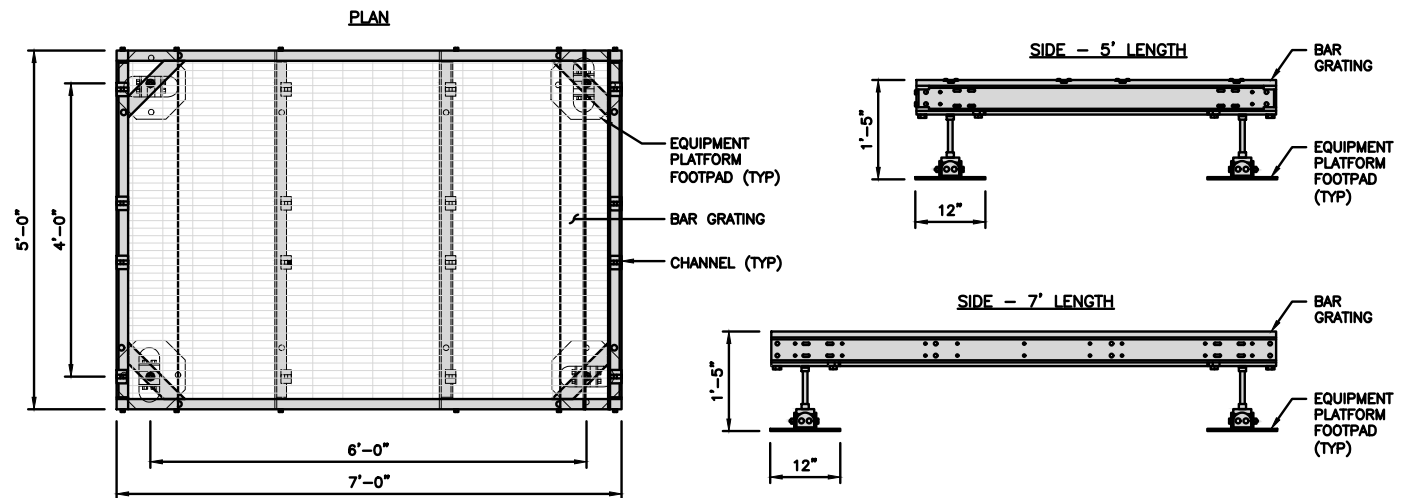


PLATFORM EQUIPMENT PLAN



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

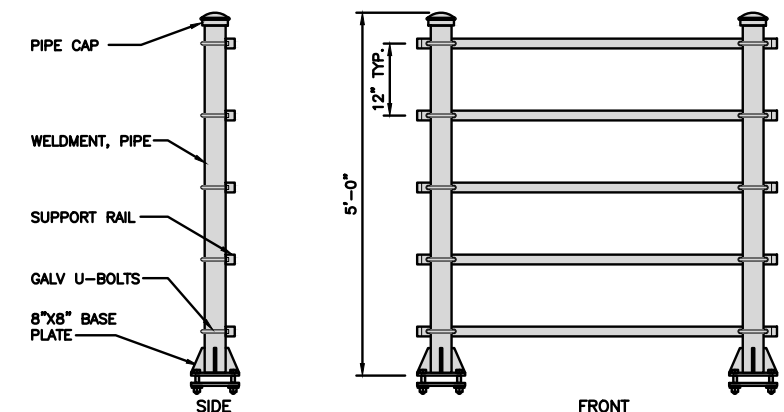
NOTE:  
GC TO PROVIDE EXTENDED THREAD FOR PLATFORM IF REQUIRED HEIGHT EXCEEDS 17"



PLATFORM DETAIL

NO SCALE 2

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



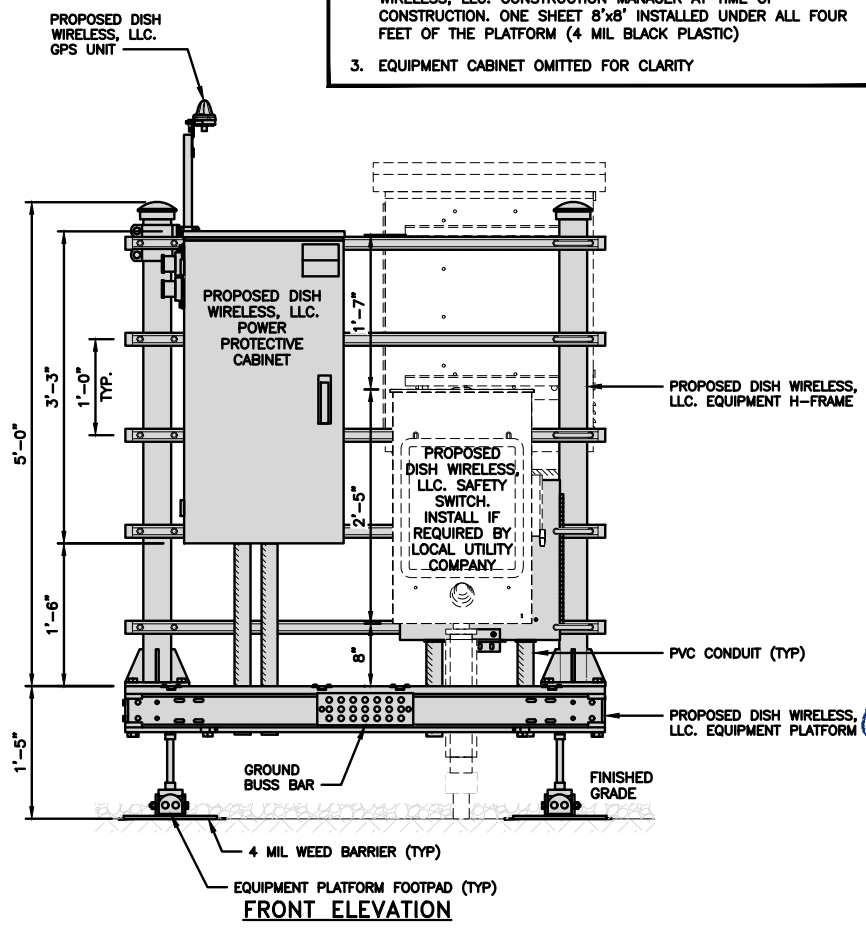
H-FRAME DETAIL

NO SCALE 3

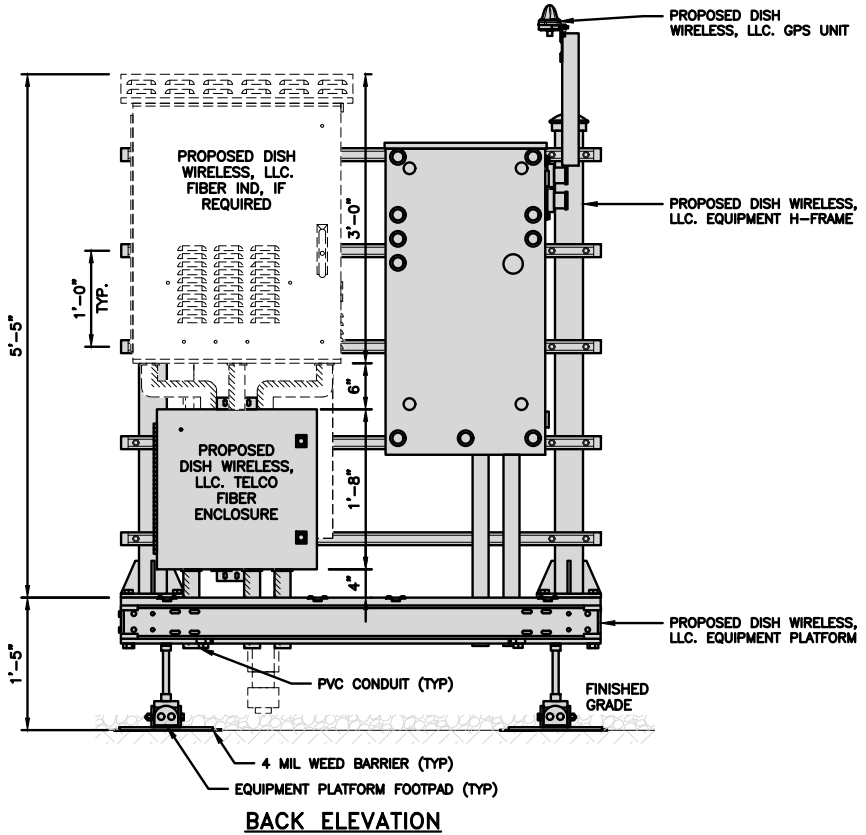
NOT USED

NO SCALE 4

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

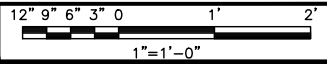


FRONT ELEVATION



BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION



5



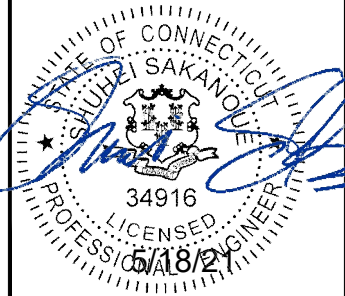
5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



2000 CORPORATE DRIVE  
CANONSBURG, PA 15317



FROM ZERO TO INFINIGY  
the solutions are endless  
2500 W. HIGGINS RD., SUITE 500 |  
HOFFMAN ESTATES, IL 60169  
PHONE: 847-648-4068 | FAX: 518-690-0793  
WWW.INFINIGY.COM



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

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

A&E PROJECT NUMBER  
2039-Z5555C

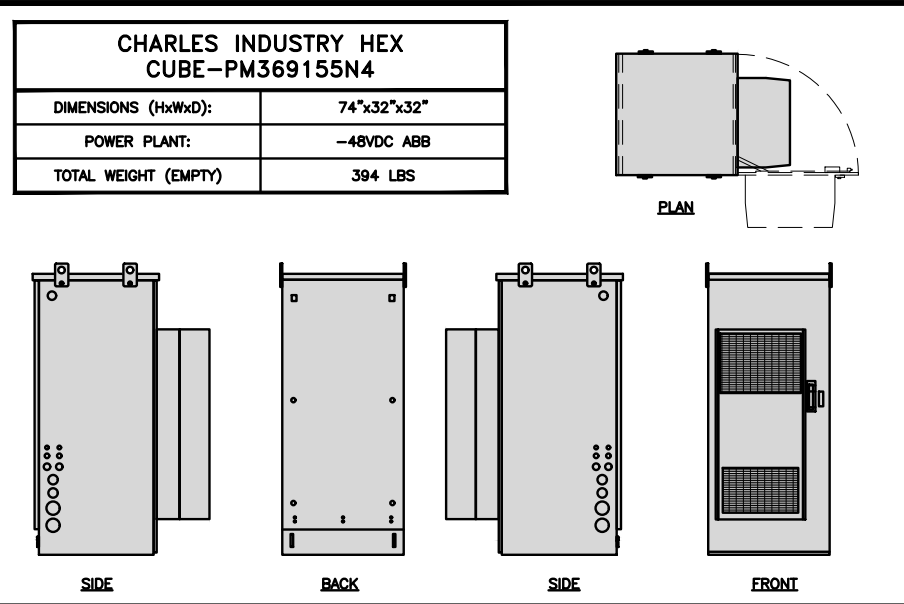
DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00056A  
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

SHEET TITLE  
EQUIPMENT PLATFORM AND  
H-FRAME DETAILS

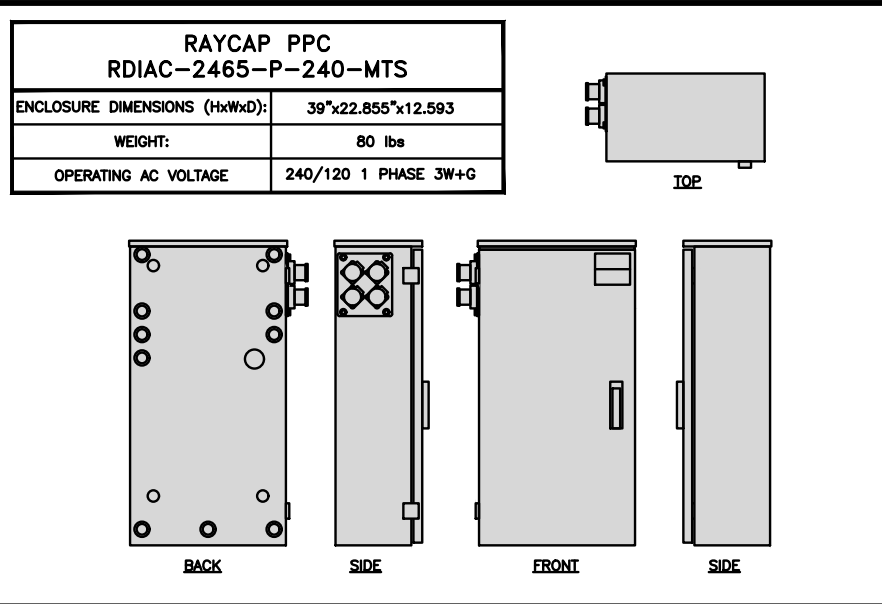
SHEET NUMBER

**A-3**

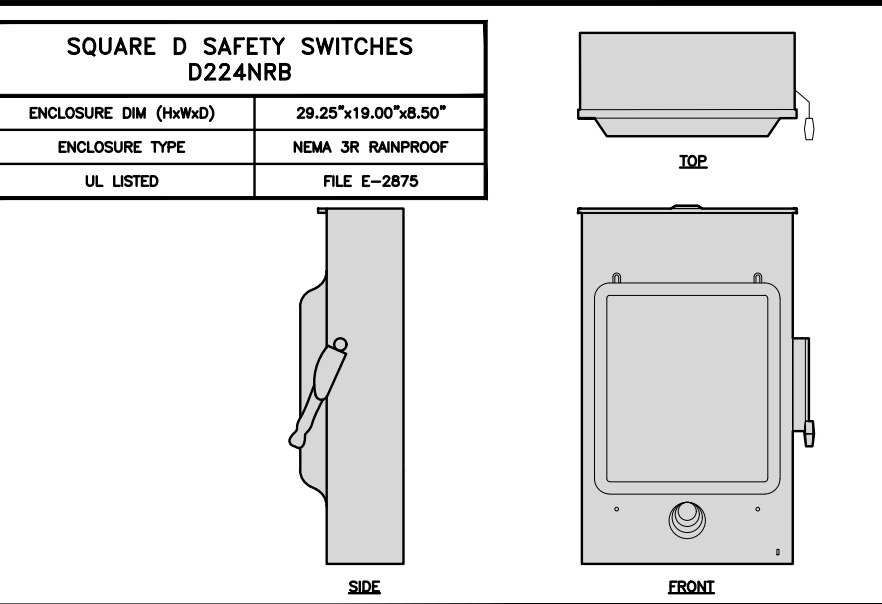




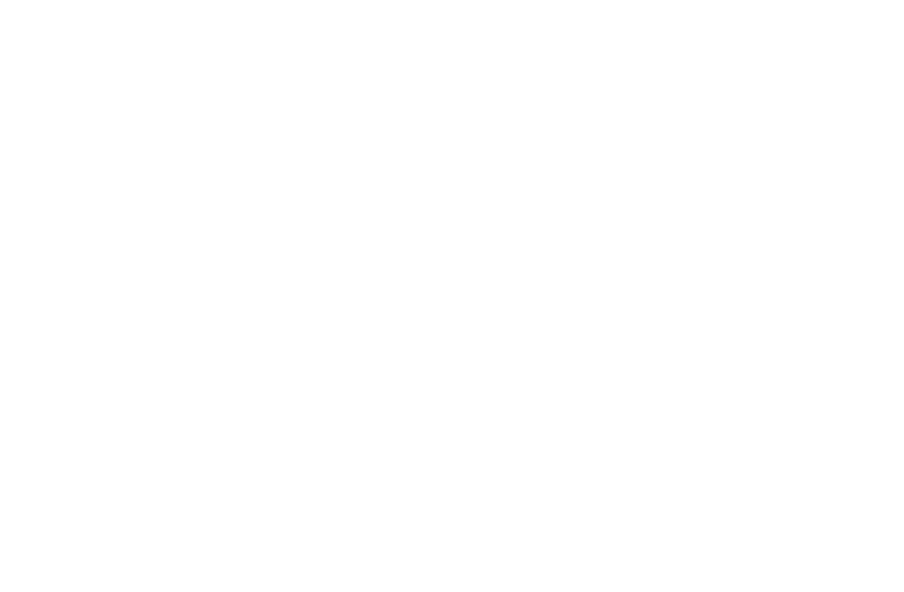
**CABINET DETAIL**      NO SCALE      1



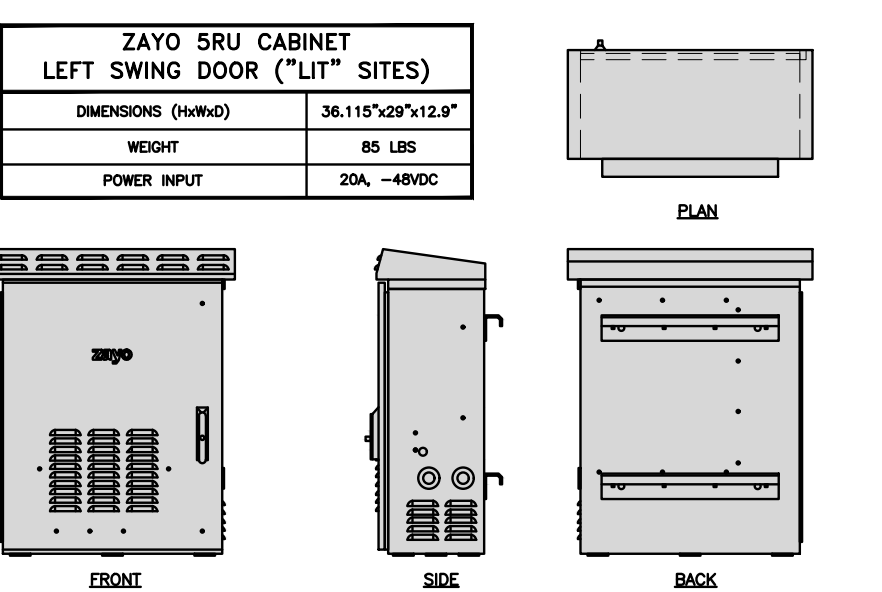
**POWER PROTECTION CABINET (PPC) DETAIL**      NO SCALE      2



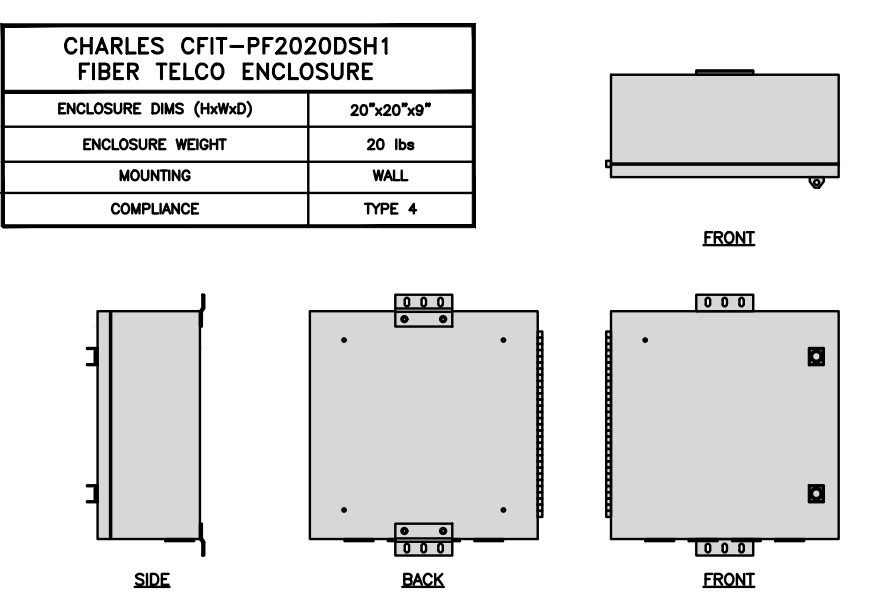
**SAFETY SWITCH DETAIL**      NO SCALE      3



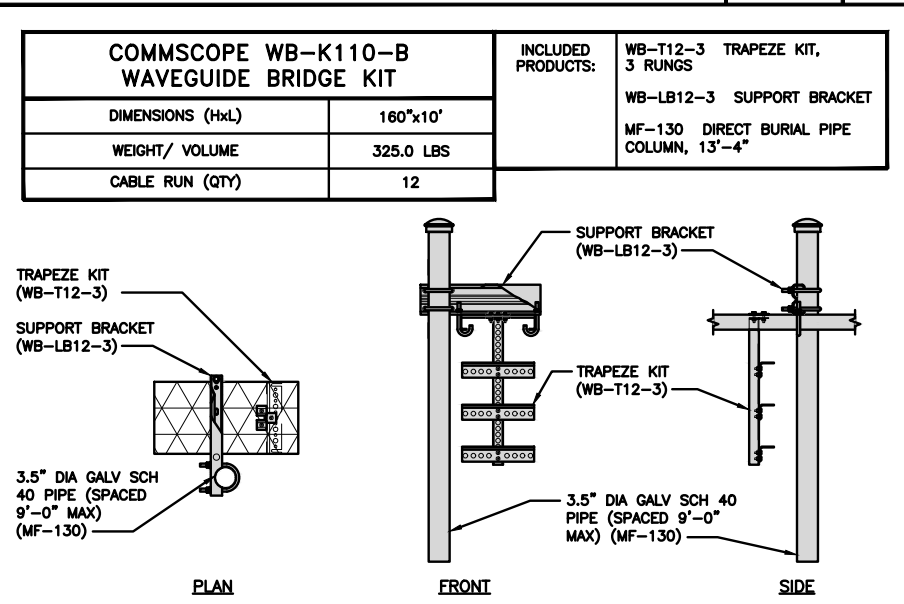
**NOT USED**      NO SCALE      4



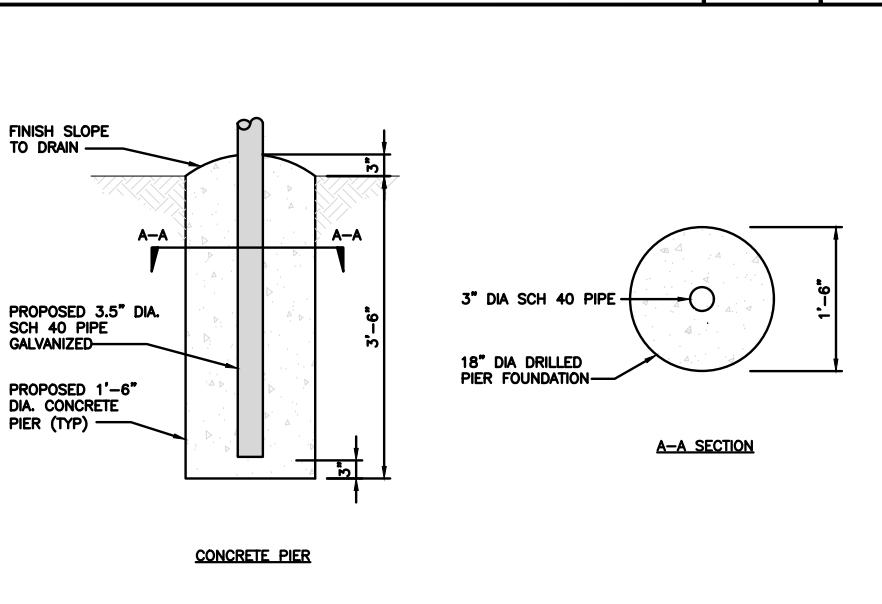
**NETWORK INTERFACE UNIT DETAIL**      NO SCALE      5



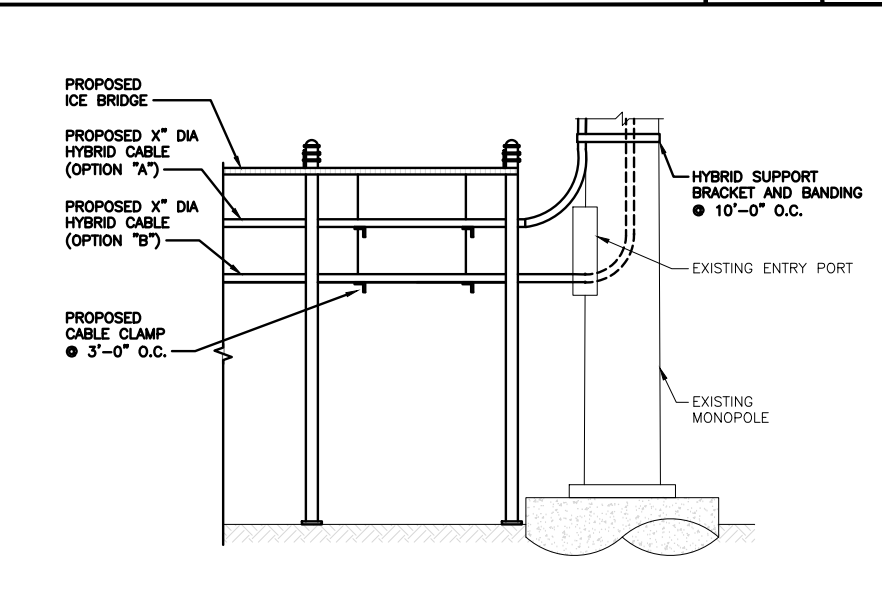
**FIBER TELCO ENCLOSURE DETAIL**      NO SCALE      6



**ICE BRIDGE DETAIL**      NO SCALE      7



**TYPICAL ICE BRIDGE CONCRETE PIER DETAIL**      NO SCALE      8



**HYBRID CABLE RUN**      NO SCALE      9

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

2000 CORPORATE DRIVE  
CANONSBURG, PA 15317

FROM ZERO TO INFINIGY  
the solutions are endless  
2500 W. HIGGINS RD., SUITE 500 |  
HOFFMAN ESTATES, IL 60169  
PHONE: 847-648-4068 | FAX: 518-690-0793  
WWW.INFINIGY.COM

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW
RFDS REV #: N/A		

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

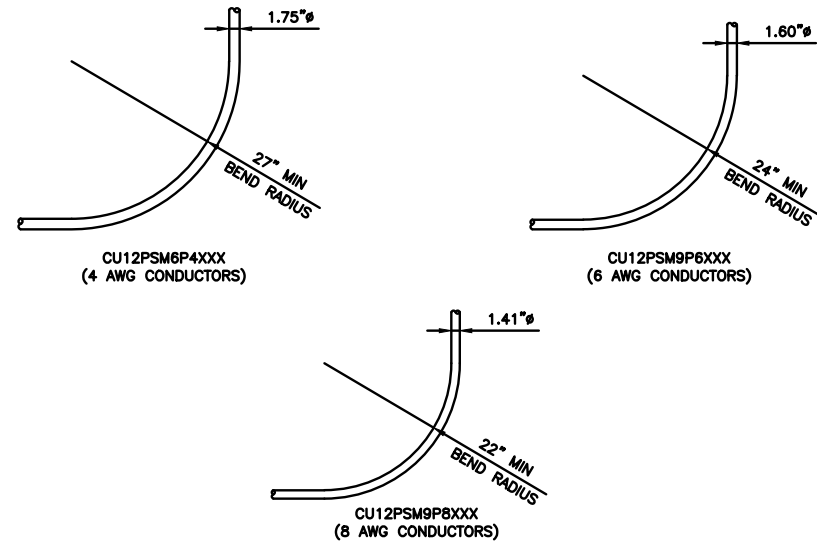
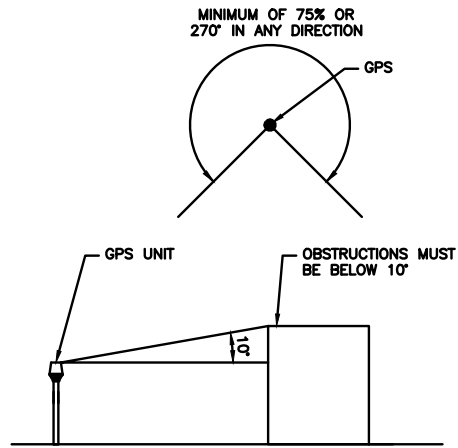
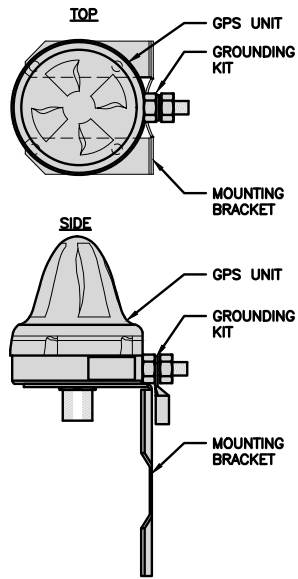
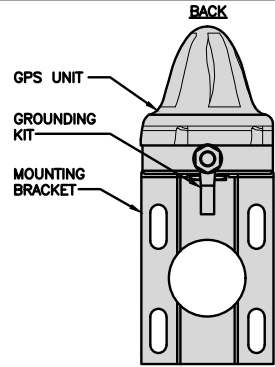
A&E PROJECT NUMBER  
**2039-Z5555C**

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00056A  
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

SHEET TITLE  
**EQUIPMENT DETAILS**

SHEET NUMBER  
**A-4**

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



GPS ANTENNA DETAIL

NO SCALE 1

GPS MINIMUM SKY VIEW REQUIREMENTS

NO SCALE 2

CABLES UNLIMITED HYBRID CABLE  
MINIMUM BEND RADIUSES

NO SCALE 3

NOT USED

NO SCALE 4

NOT USED

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 7

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9

**dish**  
wireless.

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

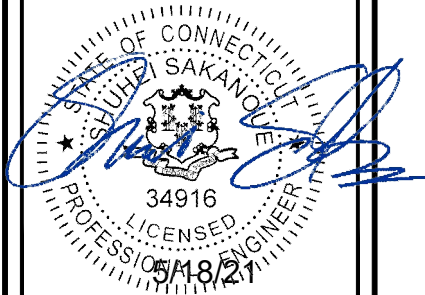
**CROWN CASTLE**

2000 CORPORATE DRIVE  
CANONSBURG, PA 15317

**INFINIGY**

FROM ZERO TO INFINIGY

the solutions are endless  
2500 W. HIGGINS RD., SUITE 500 |  
HOFFMAN ESTATES, IL 60169  
PHONE: 847-648-4068 | FAX: 518-690-0793  
WWW.INFINIGY.COM



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

DRAWN BY: CHECKED BY: APPROVED BY:

RCD SS CJW

RFDS REV #: N/A

**CONSTRUCTION  
DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

A&E PROJECT NUMBER  
2039-Z5555C

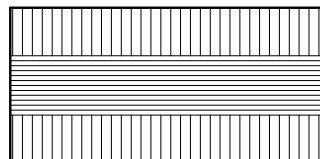
DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00056A  
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

SHEET TITLE  
EQUIPMENT DETAILS

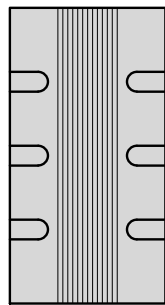
SHEET NUMBER

**A-5**

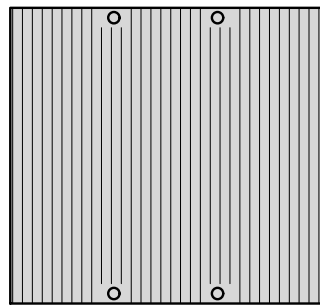
FUJITSU TA08025-B604 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



FRONT

**NOTES**

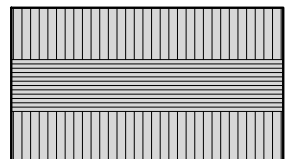
FINAL RRH SPECIFICATIONS TO BE CONFIRMED BY GC

REMOTE RADIO HEAD DETAIL

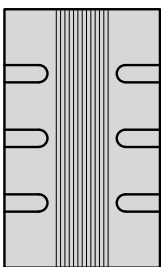
NO SCALE

1

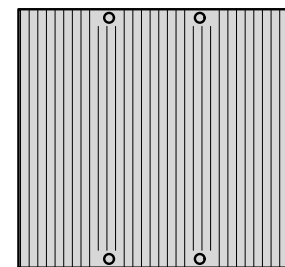
FUJITSU TA08025-B605 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x230/14.9"x15.7"x9.0"
WEIGHT(KG,LB)/ VOLUME	34kg,74.9lb/ 35L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



FRONT

**NOTES**

FINAL RRH SPECIFICATIONS TO BE CONFIRMED BY GC

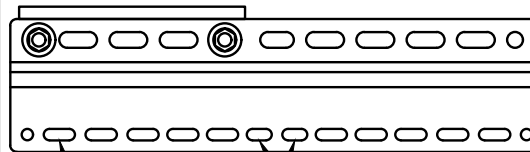
REMOTE RADIO HEAD DETAIL

NO SCALE

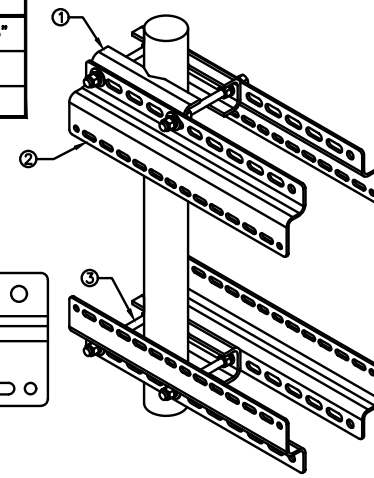
2

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

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



11MM x 30MM SLOTS  
40MM ON CENTER  
11MM x 24MM SLOTS



REMOTE RADIO MOUNT DETAIL

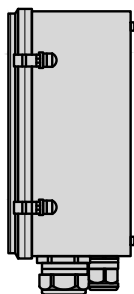
NO SCALE

3

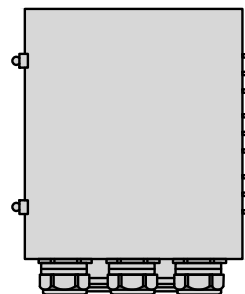
RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



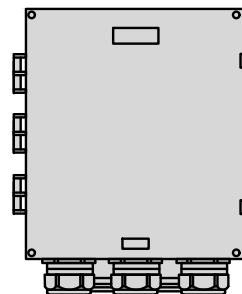
PLAN



SIDE



BACK



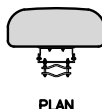
FRONT

SURGE SUPPRESSION DETAIL

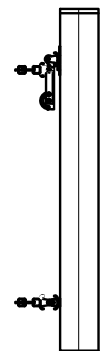
NO SCALE

4

JMA WIRELESS MX08FRO665-20 ANTENNA	
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	54 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE



PLAN



**NOTES**

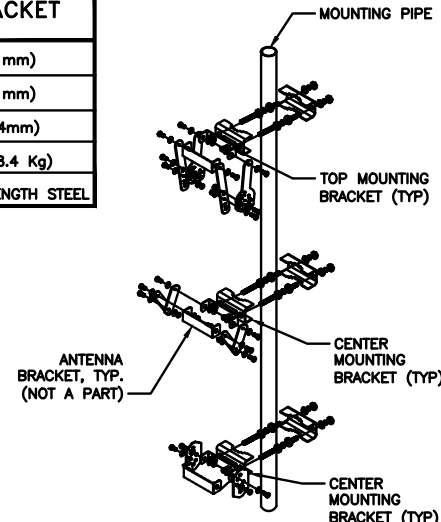
FINAL ANTENNA SPECIFICATIONS TO BE CONFIRMED BY GC

ANTENNA DETAIL

NO SCALE

5

JMA 91900318 MOUNTING BRACKET	
WIDTH	8.3" (211mm)
DEPTH	7.5" (191mm)
HEIGHT	11.2" (284mm)
TOTAL WEIGHT (WITH BRACKETS)	18.5 LBS (8.4 Kg)
HOUSING MATERIAL	GALV. HIGH STRENGTH STEEL

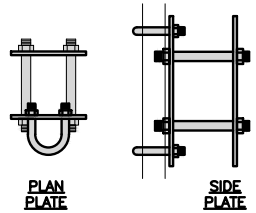


ANTENNA MOUNTING DETAIL

NO SCALE

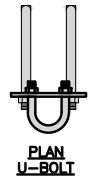
6

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



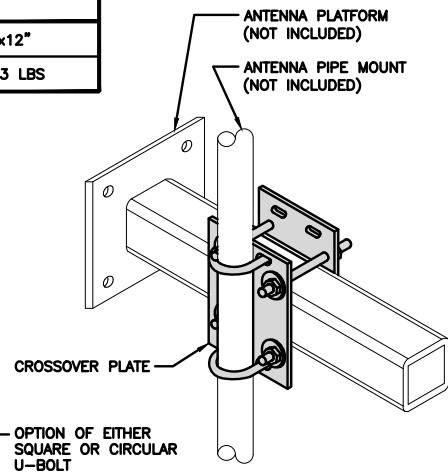
PLAN PLATE

SIDE PLATE



PLAN U-BOLT

SIDE U-BOLT



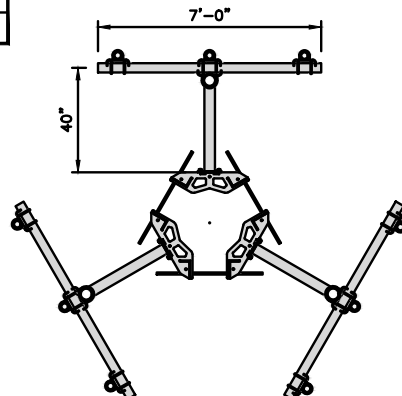
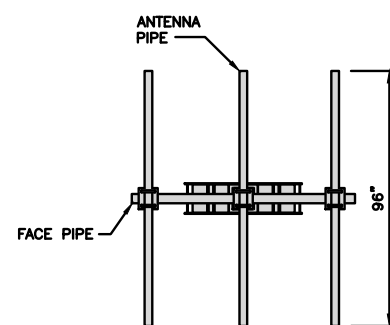
CROSSOVER PLATE  
OPTION OF EITHER SQUARE OR CIRCULAR U-BOLT

RRH/OVP MOUNT DETAIL

NO SCALE

7

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



T-ARM MOUNT DETAIL

NO SCALE

8

NOT USED

NO SCALE

9



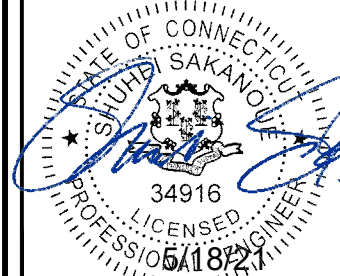
5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



2000 CORPORATE DRIVE  
CANONSBURG, PA 15317



FROM ZERO TO INFINIGY  
the solutions are endless  
2500 W. HIGGINS RD., SUITE 500  
HOFFMAN ESTATES, IL 60169  
PHONE: 847-648-4068 | FAX: 518-690-0793  
WWW.INFINIGY.COM



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

DRAWN BY: CHECKED BY: APPROVED BY:

RCD SS CJW

RFDS REV #: N/A

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

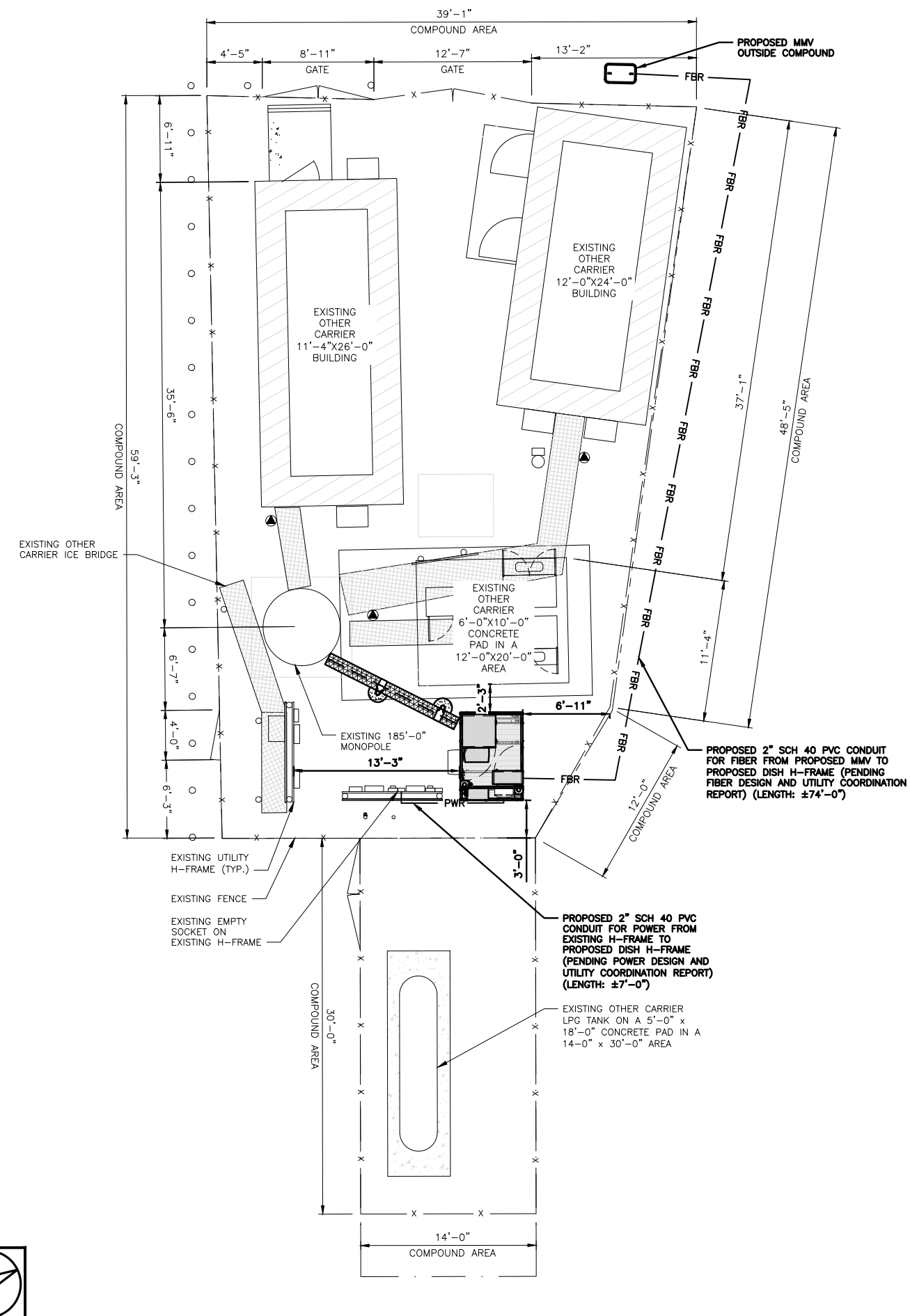
A&E PROJECT NUMBER  
2039-Z5555C

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00056A  
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

SHEET TITLE  
EQUIPMENT DETAILS

SHEET NUMBER

**A-6**



**NOTES**

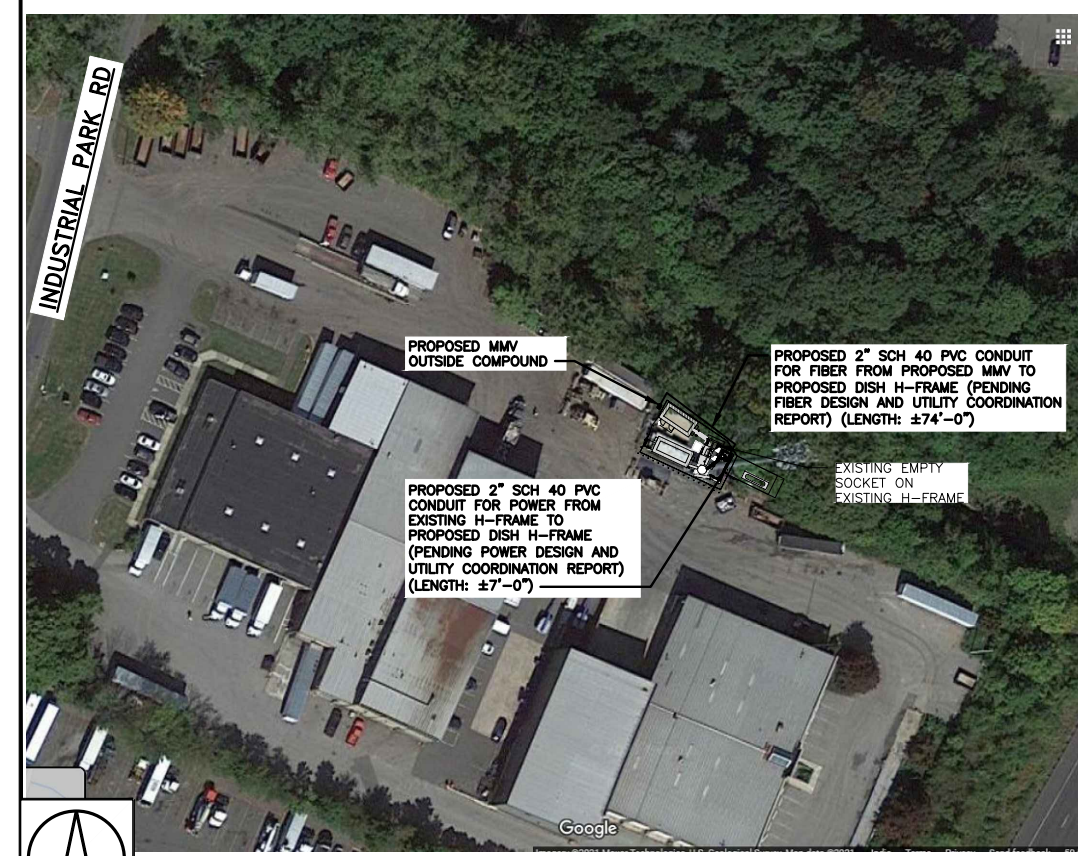
1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.

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.

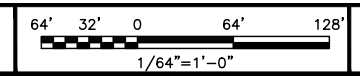
1. CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING A BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTOR'S FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION, 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. FIBER ROUTE IS PRELIMINARY, FINAL FIBER ROUTE TO BE DETERMINED ONCE UCR (UTILITY COORDINATION REPORT) HAS BEEN FINALIZED.

**ELECTRICAL NOTES**

2

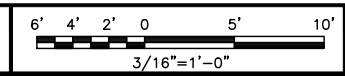


**OVERALL UTILITY ROUTE PLAN**



3

**UTILITY ROUTE PLAN**



1

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

---

2000 CORPORATE DRIVE  
CANONSBURG, PA 15317

---

FROM ZERO TO INFINIGY  
the solutions are endless  
2500 W. HIGGINS RD., SUITE 500 |  
HOFFMAN ESTATES, IL 60169  
PHONE: 847-648-4068 | FAX: 518-690-0793  
WWW.INFINIGY.COM

---

---

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

DRAWN BY: CHECKED BY: APPROVED BY:

RCD	SS	CJW
-----	----	-----

RFDS REV #: N/A

---

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

---

A&E PROJECT NUMBER  
**2039-Z5555C**

---

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00056A  
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

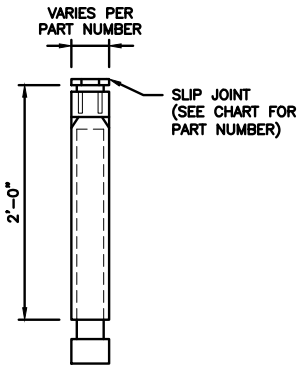
---

SHEET TITLE  
**ELECTRICAL/FIBER ROUTE PLAN AND NOTES**

---

SHEET NUMBER  
**E-1**

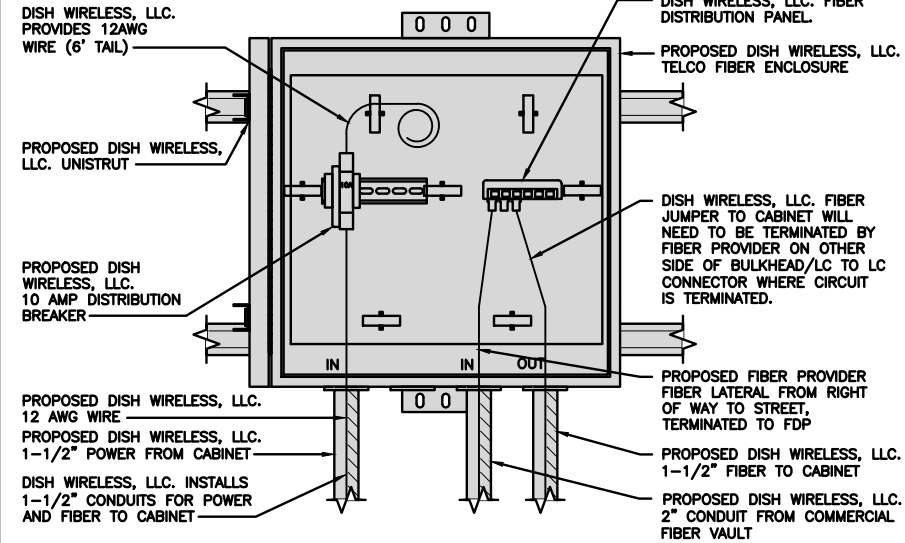
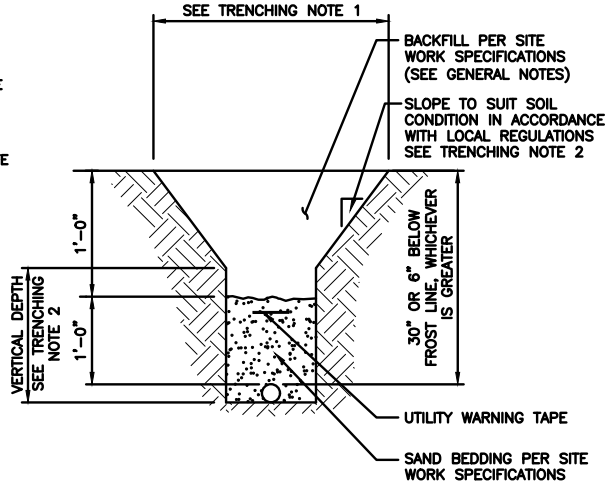
CARLON EXPANSION FITTINGS				
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
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.

**TRENCHING NOTES**

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



EXPANSION JOINT DETAIL

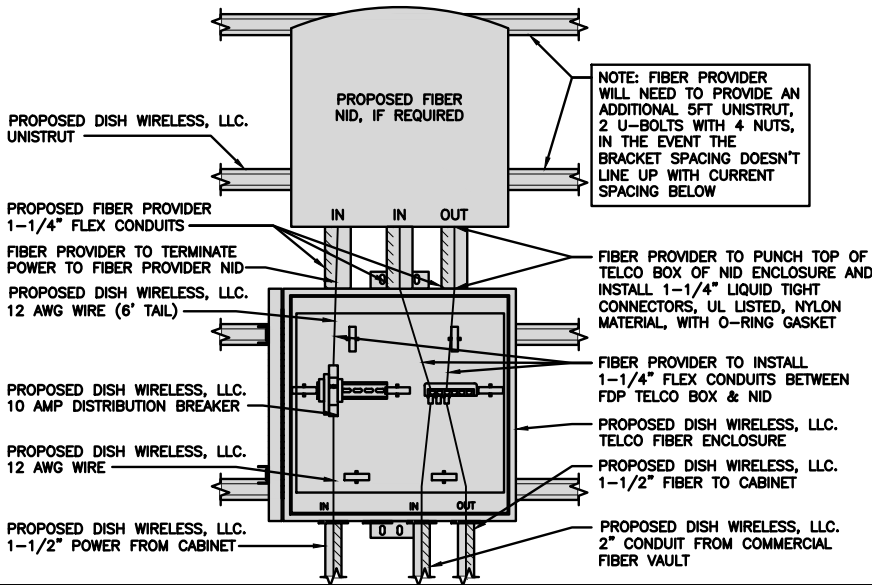
NO SCALE 1

TYPICAL UNDERGROUND TRENCH DETAIL

NO SCALE 2

DARK TELCO BOX – INTERIOR WIRING LAYOUT

NO SCALE 3



LIT TELCO BOX – INTERIOR WIRING LAYOUT (OPTIONAL)

NO SCALE 4

NOT USED

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9



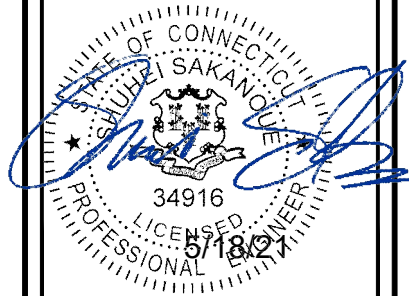
5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



2000 CORPORATE DRIVE  
CANONSBURG, PA 15317



FROM ZERO TO INFINIGY  
the solutions are endless  
2500 W. HIGGINS RD., SUITE 500 I  
HOFFMAN ESTATES, IL 60169  
PHONE: 847-648-4068 | FAX: 518-690-0793  
WWW.INFINIGY.COM



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

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW
RFDS REV #:	N/A	

**CONSTRUCTION DOCUMENTS**

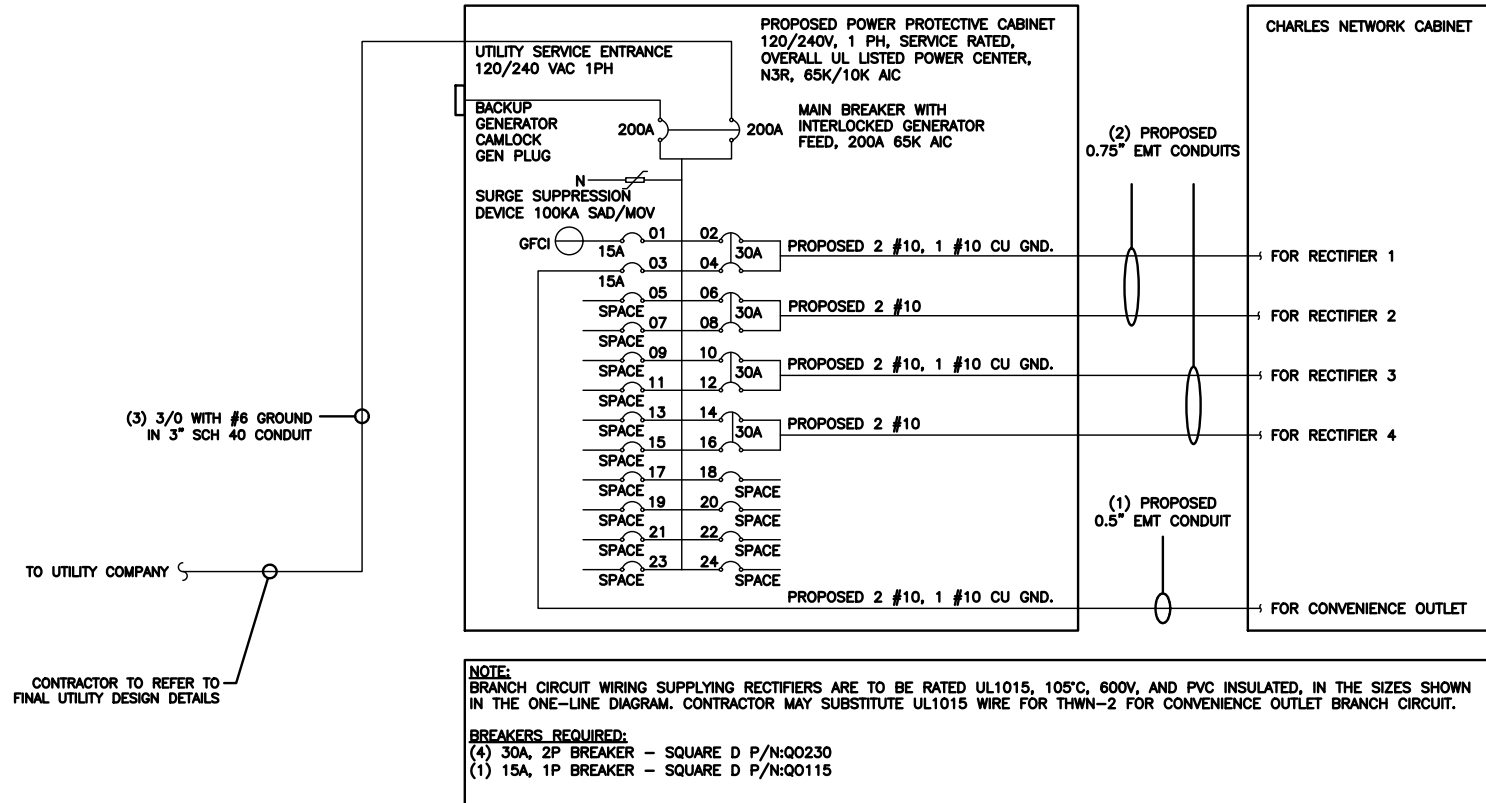
SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

A&E PROJECT NUMBER  
2039-Z5555C

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00056A  
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

SHEET TITLE  
ELECTRICAL  
DETAILS

SHEET NUMBER  
**E-2**



**NOTES**

THE (2) CONDUITS WITH (4) CURRENT CARRYING CONDUCTORS EACH, SHALL APPLY THE ADJUSTMENT FACTOR OF 80% PER 2014/17 NEC TABLE 310.15(B)(3)(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.

**dish wireless.**

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

**CROWN CASTLE**

2000 CORPORATE DRIVE  
CANONSBURG, PA 15317

**INFINIGY**  
FROM ZERO TO INFINIGY

the solutions are endless  
2500 W. HIGGINS RD., SUITE 500 |  
HOFFMAN ESTATES, IL 60169  
PHONE: 847-648-4068 | FAX: 518-690-0793  
WWW.INFINIGY.COM

STATE OF CONNECTICUT  
SHEI SAKANOU  
34916  
LICENSED PROFESSIONAL ENGINEER  
05/18/21

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

DRAWN BY: RCD | CHECKED BY: SS | APPROVED BY: CJW

RFDS REV #: N/A

**CONSTRUCTION DOCUMENTS**

SUBMITTALS

REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

A&E PROJECT NUMBER  
2039-Z5555C

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00056A  
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

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

SHEET NUMBER  
**E-3**

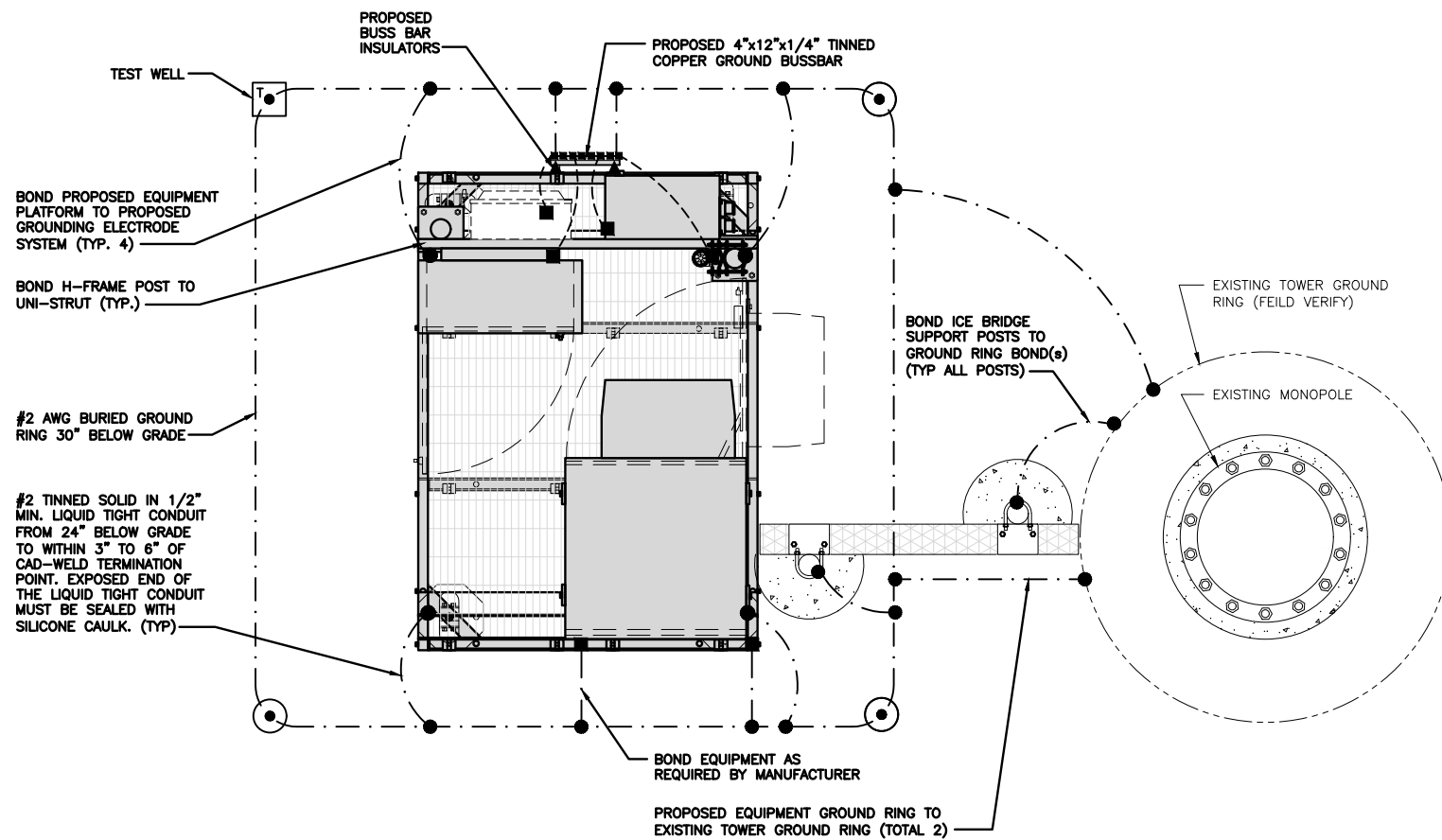
PPC ONE-LINE DIAGRAM NO SCALE 1

**PROPOSED CHARLES PANEL SCHEDULE**

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

PANEL SCHEDULE NO SCALE 2

NOT USED NO SCALE 3

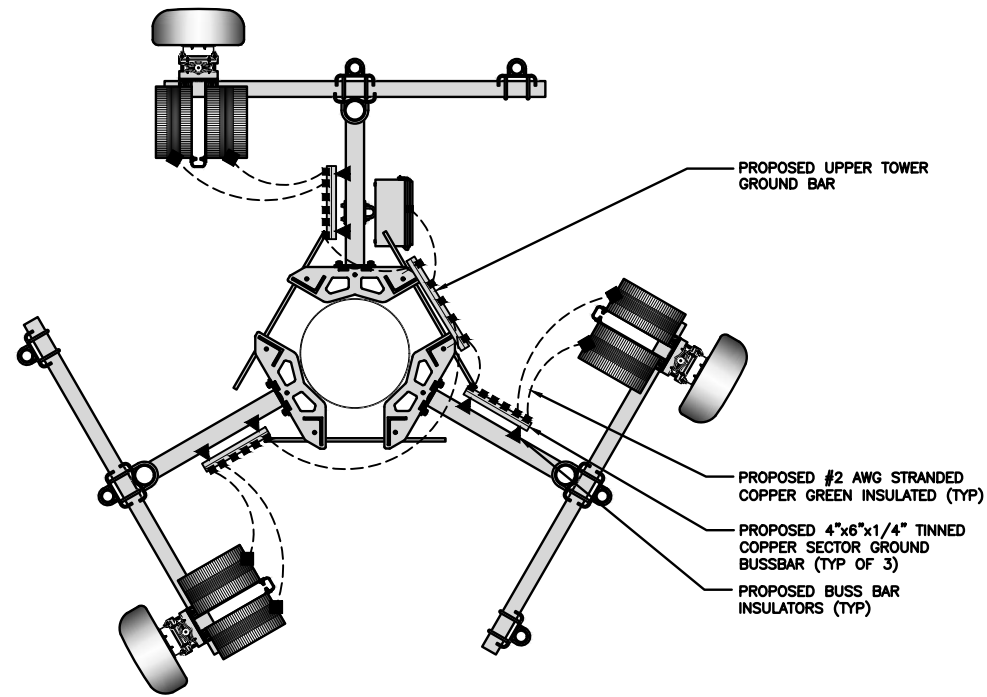


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1

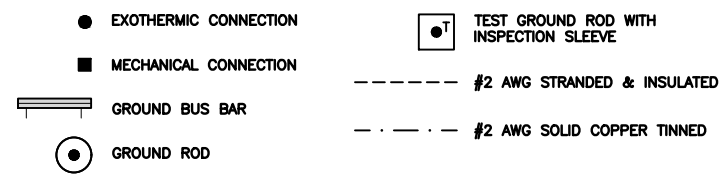
NOTES

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



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2



GROUNDING LEGEND

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, LLC. 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.
- (J) TELCO GROUND BAR: BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.
- (K) FRAME BONDING: THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.
- (L) 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.
- (M) 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.
- (N) 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
- (P) 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.
- (Q) 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
- (R) TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO PROPOSED ANTENNA MOUNT COLLAR. REFER TO DISH WIRELESS, LLC. GROUNDING NOTES.

GROUNDING KEY NOTES

NO SCALE 3



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



2000 CORPORATE DRIVE  
CANONSBURG, PA 15317



FROM ZERO TO INFINIGY  
the solutions are endless  
2500 W. HIGGINS RD., SUITE 500  
HOFFMAN ESTATES, IL 60169  
PHONE: 847-648-4068 | FAX: 518-690-0793  
WWW.INFINIGY.COM



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

DRAWN BY: RCD  
CHECKED BY: SS  
APPROVED BY: CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

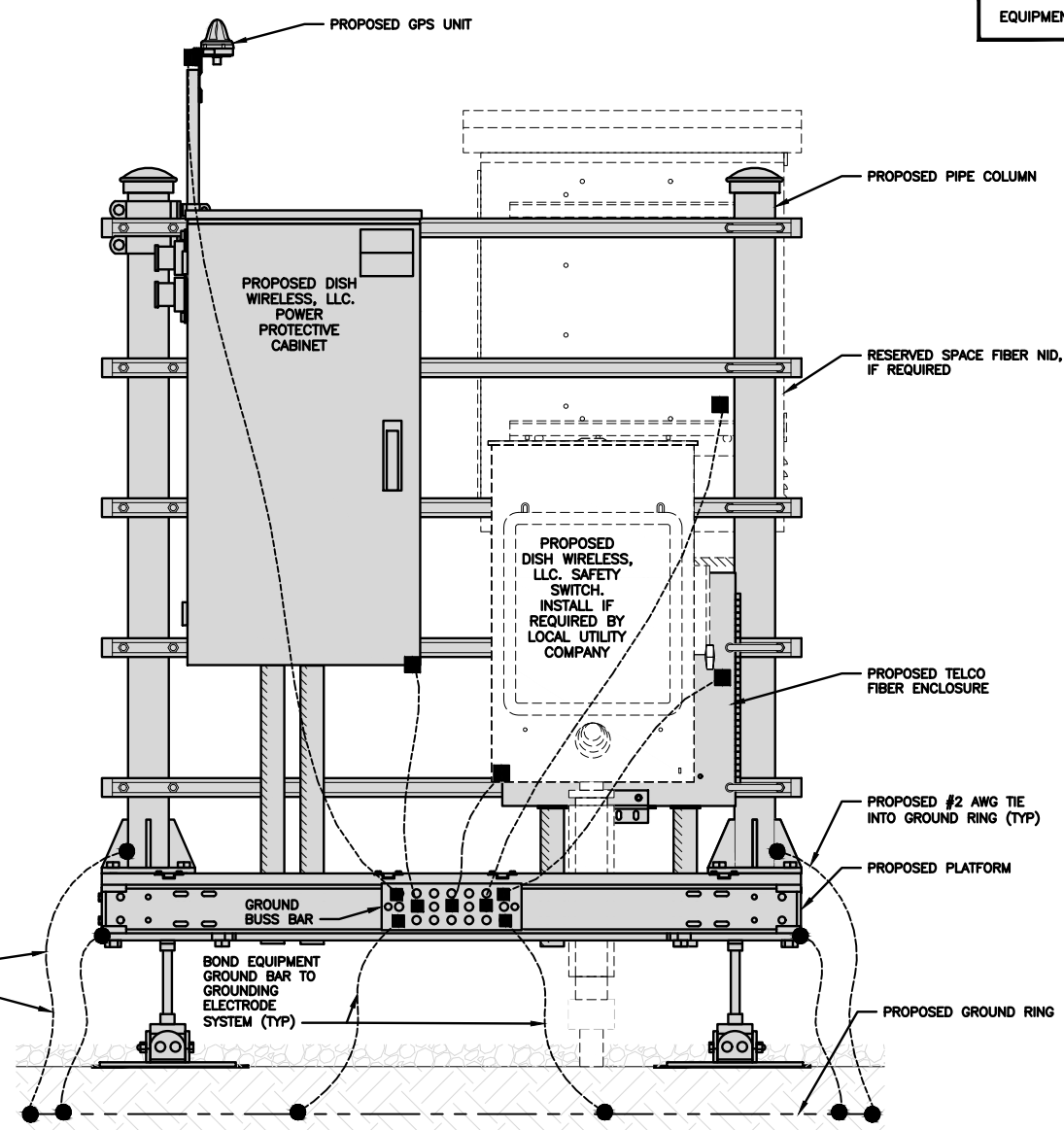
A&E PROJECT NUMBER  
2039-Z5555C

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00056A  
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

SHEET TITLE  
GROUNDING PLANS AND NOTES

SHEET NUMBER  
G-1

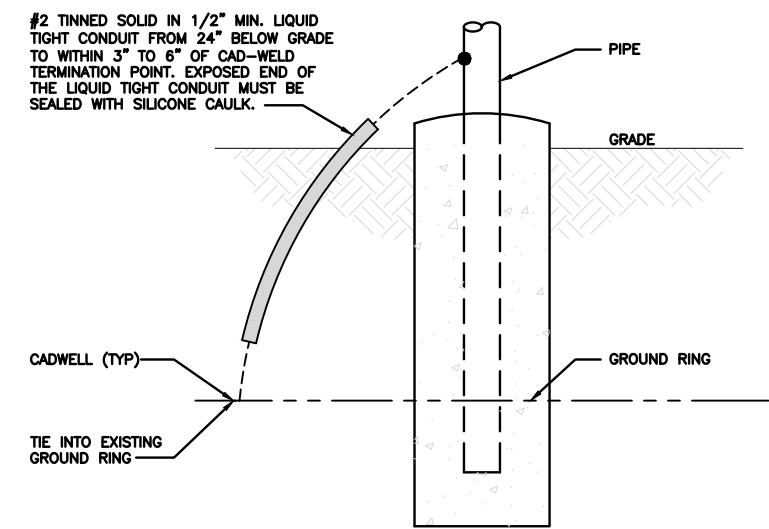
**NOTES**  
EQUIPMENT CABINET OMITTED FOR CLARITY



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

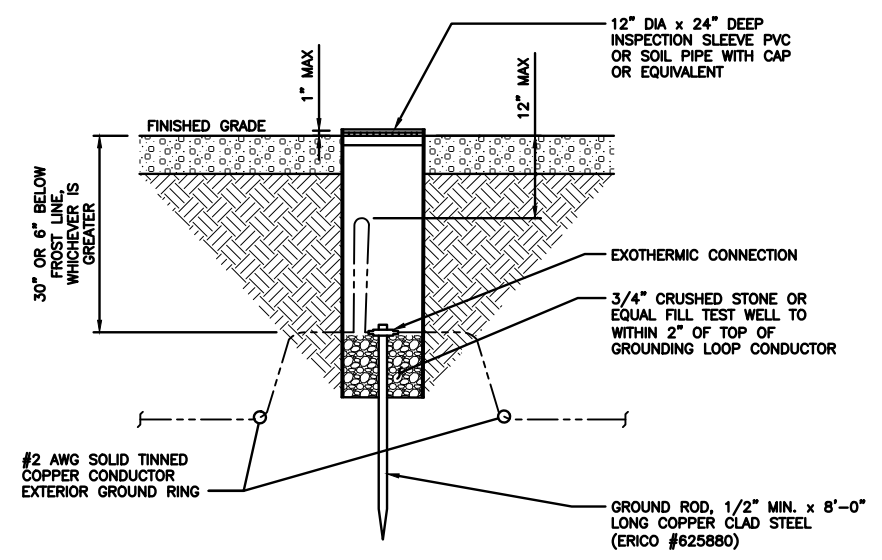
**H-FRAME GROUNDING DETAIL**

NO SCALE 1



**TRANSITIONING GROUND DETAIL**

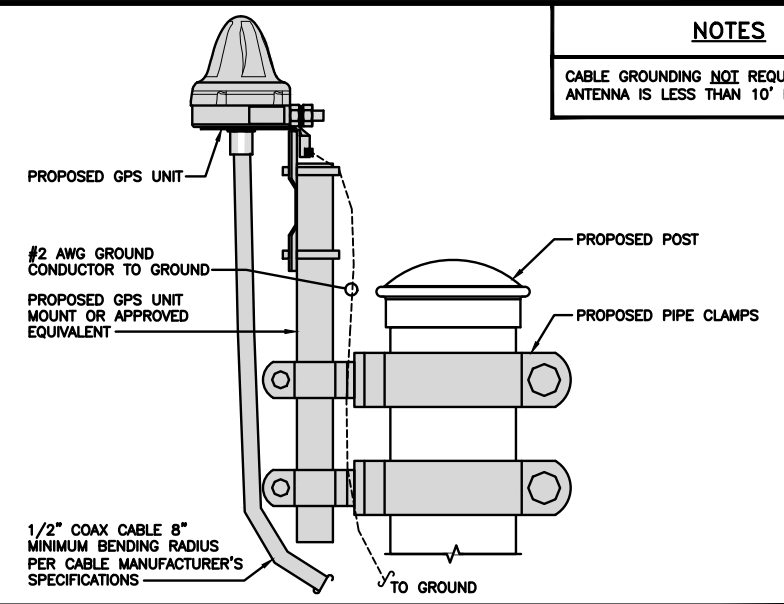
NO SCALE 4



**TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE**

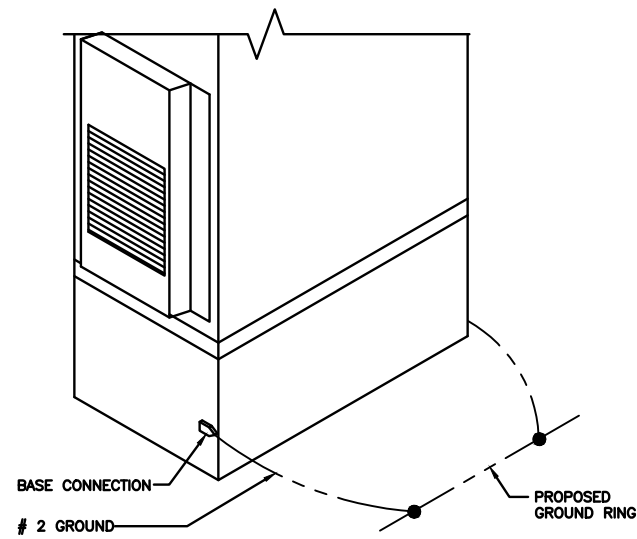
NO SCALE 5

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



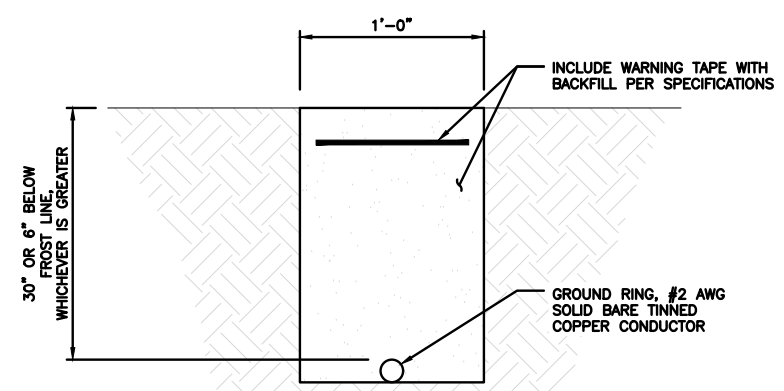
**TYPICAL GPS UNIT GROUNDING**

NO SCALE 2



**OUTDOOR CABINET GROUNDING**

NO SCALE 3



**TYPICAL GROUND RING TRENCH**

NO SCALE 6

**dish wireless.**

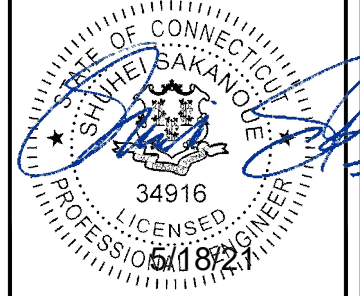
5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

**CROWN CASTLE**

2000 CORPORATE DRIVE  
CANONSBURG, PA 15317

**INFINIGY**

FROM ZERO TO INFINIGY  
the solutions are endless  
2500 W. HIGGINS RD., SUITE 500 |  
HOFFMAN ESTATES, IL 60169  
PHONE: 847-648-4068 | FAX: 518-690-0793  
WWW.INFINIGY.COM



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

DRAWN BY: CHECKED BY: APPROVED BY:  
RCD SS CJW

RFDS REV #: N/A

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

A&E PROJECT NUMBER  
2039-Z5555C

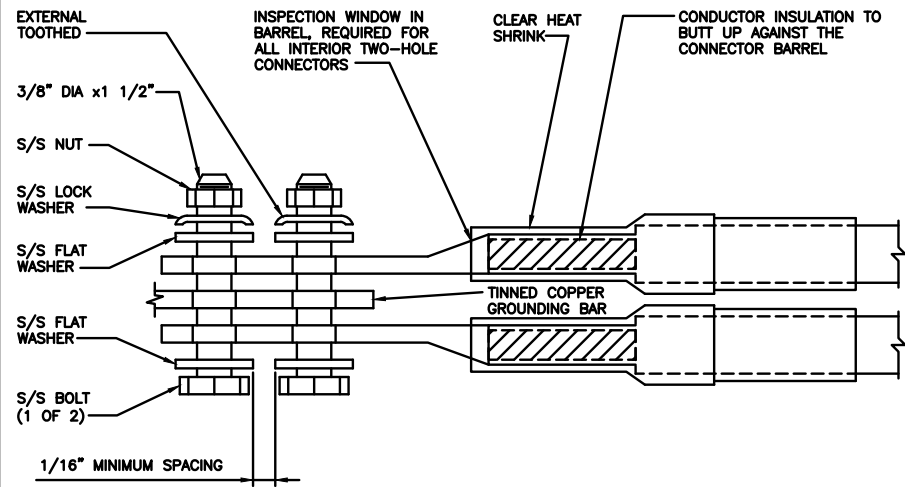
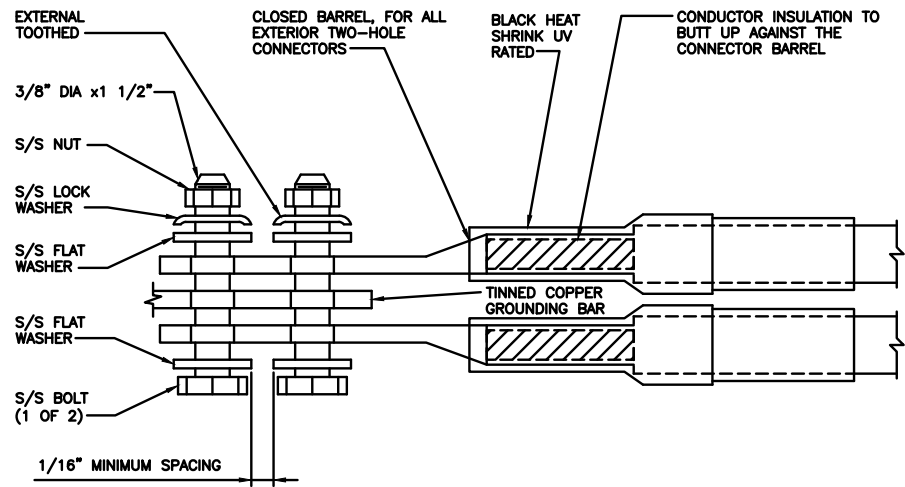
DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00056A  
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

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.
9. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).



TYPICAL GROUNDING NOTES

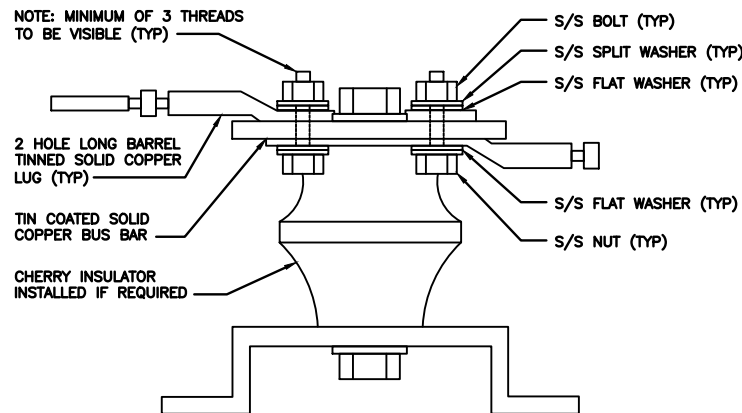
NO SCALE 1

TYPICAL EXTERIOR TWO HOLE LUG

NO SCALE 2

TYPICAL INTERIOR TWO HOLE LUG

NO SCALE 3



LUG DETAIL

NO SCALE 4

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.

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

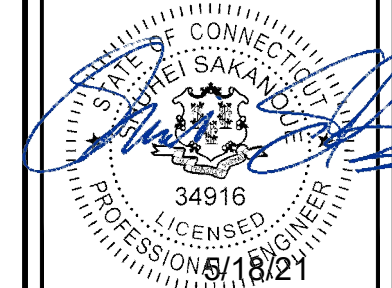
**CROWN CASTLE**

2000 CORPORATE DRIVE  
CANONSBURG, PA 15317

**INFINIGY**

FROM ZERO TO INFINIGY

the solutions are endless  
2500 W. HIGGINS RD., SUITE 500 |  
HOFFMAN ESTATES, IL 60169  
PHONE: 847-648-4068 | FAX: 518-690-0793  
WWW.INFINIGY.COM



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

DRAWN BY: CHECKED BY: APPROVED BY:

RCD SS CJW

RFDS REV #: N/A

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

A&E PROJECT NUMBER  
2039-Z5555C

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00056A  
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

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)

ALPHA RRH				BETA RRH				GAMMA RRH			
PORT 1 + SLANT	PORT 2 + SLANT	PORT 3 + SLANT	PORT 4 + SLANT	PORT 1 + SLANT	PORT 2 + SLANT	PORT 3 + SLANT	PORT 4 + SLANT	PORT 1 + SLANT	PORT 2 + SLANT	PORT 3 + SLANT	PORT 4 + SLANT
RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
ORANGE	ORANGE	RED	RED	ORANGE	ORANGE	BLUE	BLUE	ORANGE	ORANGE	GREEN	GREEN
	WHITE (1) PORT	ORANGE	ORANGE		WHITE (1) PORT	ORANGE	ORANGE		WHITE (1) PORT	ORANGE	ORANGE
			WHITE (1) PORT				WHITE (1) PORT				WHITE (1) PORT

MID-BAND RRH -  
(AWS BANDS N66+N70)

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

RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
PURPLE	PURPLE	RED	RED	PURPLE	PURPLE	BLUE	BLUE	PURPLE	PURPLE	GREEN	GREEN
	WHITE (1) PORT	PURPLE	PURPLE		WHITE (1) PORT	PURPLE	PURPLE		WHITE (1) PORT	PURPLE	PURPLE
			WHITE (1) PORT				WHITE (1) PORT				WHITE (1) PORT

**HYBRID/DISCREET CABLES**

INCLUDE SECTOR BANDS BEING SUPPORTED AM  
LONG 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

EXAMPLE 1	EXAMPLE 2
RED	RED
BLUE	BLUE
GREEN	GREEN
ORANGE	YELLOW
PURPLE	

**HYBRID/DISCREET CABLES**

LOW-BAND RRH FIBER CABLES HAVE SECTOR  
STRIPE ONLY

LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	LOW BAND RRH	LOW BAND RRH	LOW BAND RRH
RED	RED	BLUE	BLUE	GREEN	GREEN
	PURPLE		PURPLE		PURPLE

**POWER CABLES TO RRHs**

LOW-BAND RRH POWER CABLES HAVE SECTOR  
STRIPE ONLY

LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	LOW BAND RRH	LOW BAND RRH	LOW BAND RRH
RED	RED	BLUE	BLUE	GREEN	GREEN
	PURPLE		PURPLE		PURPLE

**RET MOTORS AT ANTENNAS**

PORT 1/ ANTENNA 1 "IN"	PORT 1/ ANTENNA 1 "IN"	PORT 1/ ANTENNA 1 "IN"
RED	BLUE	GREEN

**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 CABINETS WILL REQUIRE P-TOUCH  
LABELS INSIDE THE CABINET TO IDENTIFY THE  
LOCAL AND REMOTE SITE ID'S.

PRIMARY	SECONDARY
WHITE	WHITE
RED	RED
WHITE	WHITE
	RED
	WHITE

**RF CABLE COLOR CODES**

NO SCALE 1

LOW BANDS (N71-N28)  
OPTIONAL - (N29)



AWS  
(N65+N70+H-BLOCK)



CBRS TECH  
(3 GHz)



NEGATIVE SLANT PORT  
ON ANTRRH



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR



COLOR IDENTIFIER

NO SCALE 2

NOT USED

NO SCALE 3

NOT USED

NO SCALE 4



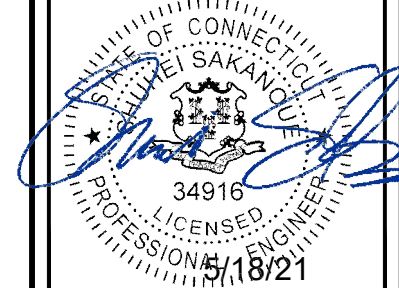
5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



2000 CORPORATE DRIVE  
CANONSBURG, PA 15317



FROM ZERO TO INFINIGY  
the solutions are endless  
2500 W. HIGGINS RD., SUITE 500 |  
HOFFMAN ESTATES, IL 60169  
PHONE: 847-648-4068 | FAX: 518-690-0793  
WWW.INFINIGY.COM



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

DRAWN BY: CHECKED BY: APPROVED BY:  
RCD SS CJW

RFDS REV #: N/A

**CONSTRUCTION DOCUMENTS**

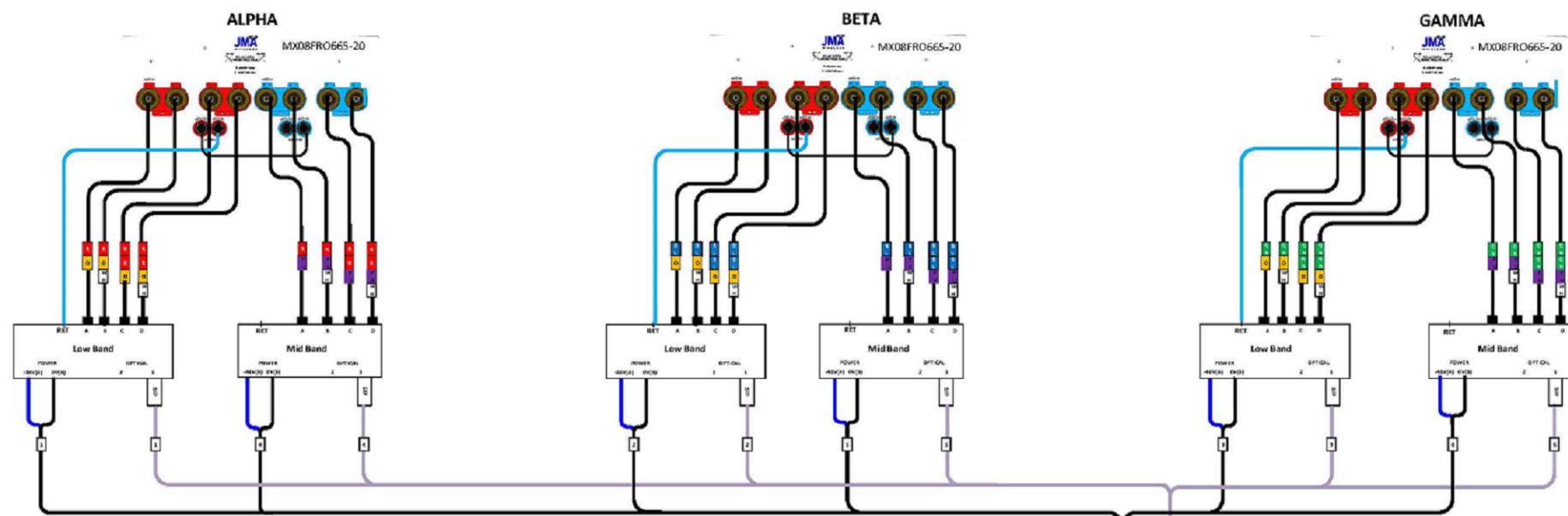
SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

A&E PROJECT NUMBER  
2039-Z5555C

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00056A  
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

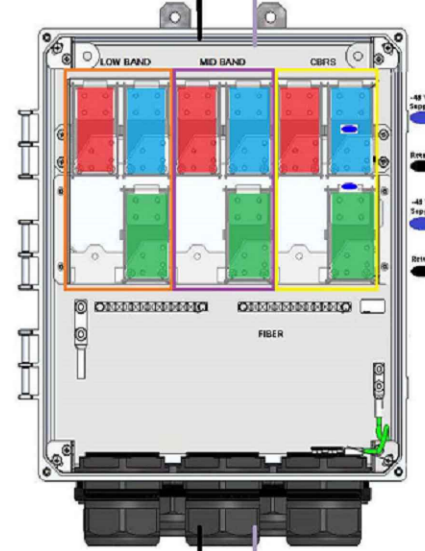
SHEET TITLE  
RF  
CABLE COLOR CODES

SHEET NUMBER  
RF-1



Fiber Patch Panel

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

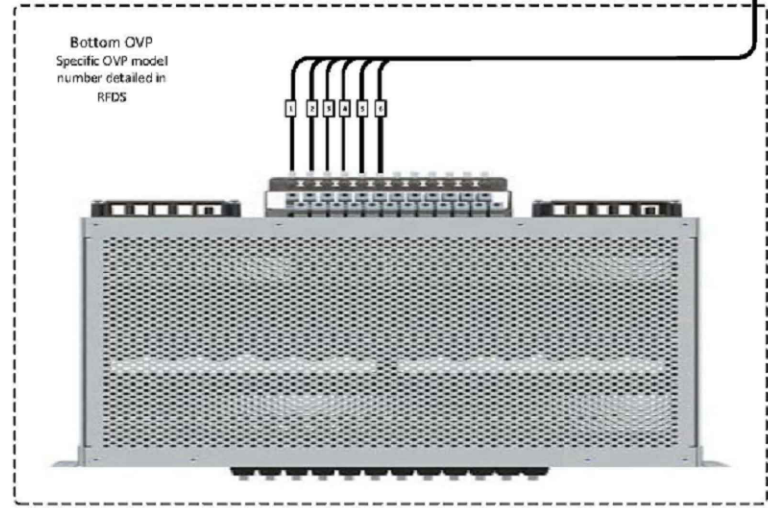


CSR NCS540

Port	Interface	Description
0	G0/0/0	Spine00
1	G0/0/1	CBRS - Alpha
2	G0/0/2	CBRS - Beta
3	G0/0/3	CBRS - Gamma
4	Te0/0/4	Fujitsu Low-Band RU - Alpha
5	Te0/0/5	Fujitsu Mid-Band RU - Alpha
6	Te0/0/6	Fujitsu Low-Band RU - Beta
7	Te0/0/7	Fujitsu Mid-Band RU - Beta
8	Te0/0/8	Fujitsu Low-Band RU - Gamma
9	Te0/0/9	Fujitsu Mid-Band RU - Gamma
10	Te0/0/10	Fixed WtS
11	Te0/0/11	Fixed WtS
12	Te0/0/12	Fixed WtS
13	Te0/0/13	Fixed WtS
14	Te0/0/14	CBRS1
15	Te0/0/15	CBRS2
16	Te0/0/16	CBRS3
17	G0/0/17	SM1 - BMC
18	G0/0/18	SM2 - BMC
19	Te0/0/19	SM1 - Data 1
20	Te0/0/20	SM1 - Data 2
21	Te0/0/21	SM2 - Data 1
22	Te0/0/22	SM2 - Data 2
23	Te0/0/23	Reserved Uplink (EDC, LDC)
24	Te0/0/24	Blank/Future
25	Te0/0/25	Blank/Future
26	Te0/0/26	Fiber NIU
27	Te0/0/27	Fiber NIU
28	Te0/0/28	Blank/Future
29	Te0/0/29	Blank/Future

Bottom OVP Layout

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



5G plumbing diagram JMA MX08FRO665-20 2-2-2(LB+MB)

DATE	REV	BY	CHK	APP
5-Jan-2022	1	RF	RF	JMA



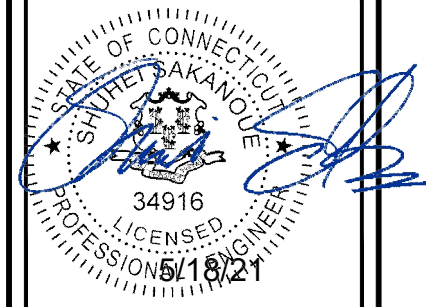
5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



2000 CORPORATE DRIVE  
CANONSBURG, PA 15317



FROM ZERO TO INFINIGY  
the solutions are endless  
2500 W. HIGGINS RD., SUITE 500  
HOFFMAN ESTATES, IL 60169  
PHONE: 847-648-4068 | FAX: 518-690-0793  
WWW.INFINIGY.COM



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

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

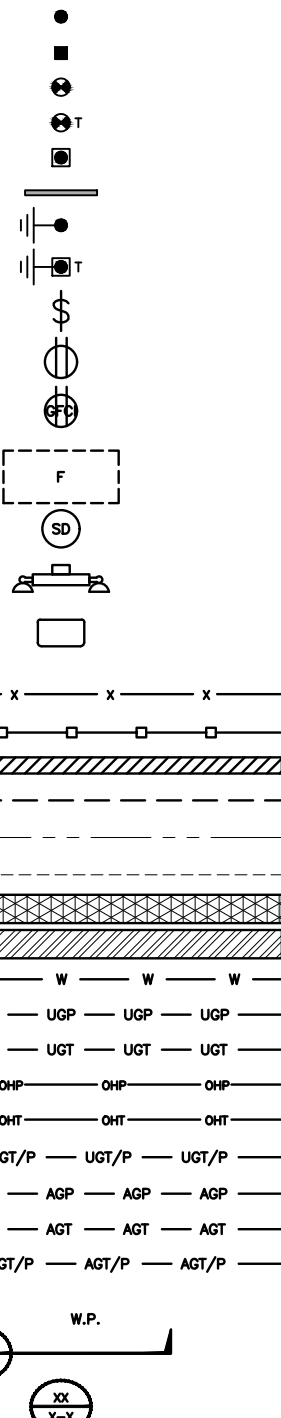
A&E PROJECT NUMBER  
2039-Z5555C

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00056A  
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

SHEET TITLE  
RF  
PLUMBING DIAGRAM

SHEET NUMBER  
RF-2

EXOTHERMIC CONNECTION  
 MECHANICAL CONNECTION  
 CHEMICAL ELECTROLYTIC GROUNDING SYSTEM  
 TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM  
 EXOTHERMIC WITH INSPECTION SLEEVE  
 GROUNDING BAR  
 GROUND ROD  
 TEST GROUND ROD WITH INSPECTION SLEEVE  
 SINGLE POLE SWITCH  
 DUPLEX RECEPTACLE  
 DUPLEX GFCI RECEPTACLE  
 FLUORESCENT LIGHTING FIXTURE  
 (2) TWO LAMPS 48-T8  
 SMOKE DETECTION (DC)  
 EMERGENCY LIGHTING (DC)  
 SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW  
 LED-1-25A400/51K-SR4-120-PE-DEBTD  
 CHAIN LINK FENCE  
 WOOD/WROUGHT IRON FENCE  
 WALL STRUCTURE  
 LEASE AREA  
 PROPERTY LINE (PL)  
 SETBACKS  
 ICE BRIDGE  
 CABLE TRAY  
 WATER LINE  
 UNDERGROUND POWER  
 UNDERGROUND TELCO  
 OVERHEAD POWER  
 OVERHEAD TELCO  
 UNDERGROUND TELCO/POWER  
 ABOVE GROUND POWER  
 ABOVE GROUND TELCO  
 ABOVE GROUND TELCO/POWER  
 WORKPOINT  
 SECTION REFERENCE  
 DETAIL REFERENCE



**LEGEND**

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

**ABBREVIATIONS**



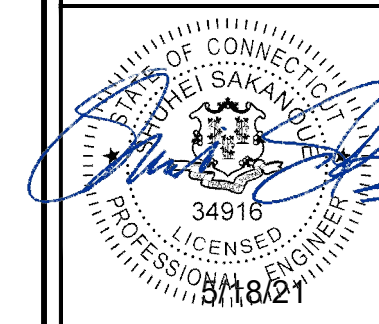
5701 SOUTH SANTA FE DRIVE  
 LITTLETON, CO 80120



2000 CORPORATE DRIVE  
 CANONSBURG, PA 15317



FROM ZERO TO INFINIGY  
 the solutions are endless  
 2500 W. HIGGINS RD., SUITE 500 |  
 HOFFMAN ESTATES, IL 60169  
 PHONE: 847-648-4068 | FAX: 518-690-0793  
 WWW.INFINIGY.COM



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

DRAWN BY: RCD  
 CHECKED BY: SS  
 APPROVED BY: CJW

RFDS REV #: N/A

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

A&E PROJECT NUMBER  
 2039-Z5555C

DISH WIRELESS, LLC.  
 PROJECT INFORMATION  
 BOBDL00056A  
 90 INDUSTRIAL PARK ROAD  
 MIDDLETOWN, CT 06457

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, LLC. AND TOWER OWNER NOC & THE DISH WIRELESS, LLC. AND TOWER OWNER CONSTRUCTION MANAGER.
2. "LOOK UP" – DISH WIRELESS, LLC. 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, LLC. AND DISH WIRELESS, LLC. 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, LLC. 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, LLC. AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH WIRELESS, LLC. 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, LLC. 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, LLC. 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, LLC.  
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, LLC. AND TOWER OWNER
13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
14. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.



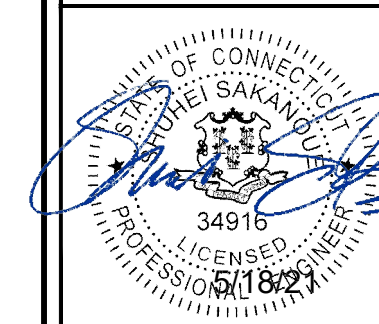
5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



2000 CORPORATE DRIVE  
CANONSBURG, PA 15317



FROM ZERO TO INFINIGY  
the solutions are endless  
2500 W. HIGGINS RD., SUITE 500 |  
HOFFMAN ESTATES, IL 60169  
PHONE: 847-648-4068 | FAX: 518-690-0793  
WWW.INFINIGY.COM



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

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW
RFDS REV #: N/A		

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

A&E PROJECT NUMBER  
2039-Z5555C

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00056A  
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

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, LLC. 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, LLC."
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.



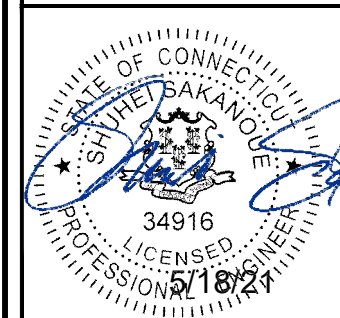
5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



2000 CORPORATE DRIVE  
CANONSBURG, PA 15317



FROM ZERO TO INFINIGY  
the solutions are endless  
2500 W. HIGGINS RD., SUITE 500 |  
HOFFMAN ESTATES, IL 60169  
PHONE: 847-648-4068 | FAX: 518-690-0793  
WWW.INFINIGY.COM



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

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW
RFDS REV #: N/A		

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

A&E PROJECT NUMBER  
2039-Z5555C

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00056A  
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

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

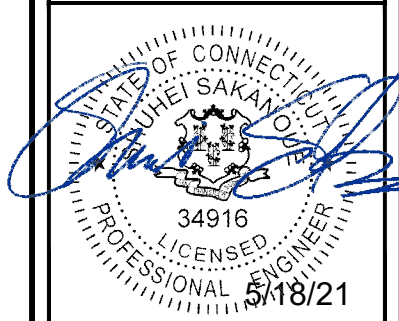
**CROWN**  
**CASTLE**

2000 CORPORATE DRIVE  
CANONSBURG, PA 15317

**INFINIGY**

FROM ZERO TO INFINIGY

the solutions are endless  
2500 W. HIGGINS RD., SUITE 500 |  
HOFFMAN ESTATES, IL 60169  
PHONE: 847-648-4068 | FAX: 518-690-0793  
WWW.INFINIGY.COM



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

DRAWN BY: CHECKED BY: APPROVED BY:

RCD SS CJW

RFDS REV #: N/A

**CONSTRUCTION**  
**DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL
1	05/18/2021	FINAL

A&E PROJECT NUMBER  
2039-Z5555C

DISH WIRELESS, LLC.  
PROJECT INFORMATION  
BOBDL00056A  
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

SHEET TITLE  
GENERAL NOTES

SHEET NUMBER  
**GN-4**

# Exhibit D

## **Structural Analysis Report**



Date: **May 26, 2021**



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

**Subject:** **Structural Analysis Report**

**Carrier Designation:** **DISH Network Co-Locate**  
**Site Number:** BOBDL00056A  
**Site Name:** CT-CCI-T-825983

**Crown Castle Designation:** **BU Number:** 825983  
**Site Name:** MIDDLETOWN\_1  
**JDE Job Number:** 645127  
**Work Order Number:** 1973695  
**Order Number:** 553287 Rev. 3

**Engineering Firm Designation:** **Crown Castle Project Number:** 1973695

**Site Data:** **90 Industrial Park Road, Middletown, Middlesex County, CT**  
**Latitude 41° 35' 8.3", Longitude -72° 42' 50.49"**  
**185 Foot - Monopole Tower**

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

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

LC5: Proposed Equipment Configuration **\*Sufficient Capacity-99.3%**

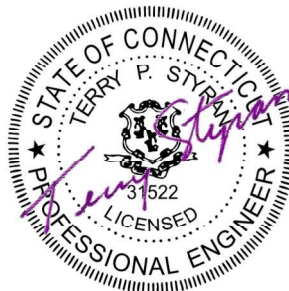
**\*The structure has sufficient capacity once the loading changes, described in the Recommendations section of this report, are completed.**

This analysis utilizes an ultimate 3-second gust wind speed of 130 mph as required by the 2018 Connecticut State Building Code based upon an ultimate. Applicable Standard references and design criteria are listed in Section 2 - "Analysis Criteria".

Structural analysis prepared by: Subhash Mandal

Respectfully submitted by:

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



Terry P Styran  
2021.05.27  
14:35:22 -04'00'

## TABLE OF CONTENTS

### 1) INTRODUCTION

### 2) ANALYSIS CRITERIA

- Table 1 - Proposed Equipment Configuration
- Table 2 - Non-Carrier Equipment To Be Conditionally Removed
- Table 3 - Other Considered Equipment

### 3) ANALYSIS PROCEDURE

- Table 4 - Documents Provided
- 3.1) Analysis Method
- 3.2) Assumptions

### 4) ANALYSIS RESULTS

- Table 5 - Section Capacity (Summary)
- Table 6 - Tower Component Stresses vs. Capacity - LC5
- 4.1) Recommendations

### 5) APPENDIX A

- tnxTower Output

### 6) APPENDIX B

- Base Level Drawing

### 7) APPENDIX C

- Additional Calculations

## 1) INTRODUCTION

This tower is a 185 ft Monopole tower designed by FRED A. NUDD CORPORATION. The tower has been modified multiple times to accommodate additional loading.

## 2) ANALYSIS CRITERIA

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	130 mph
<b>Exposure Category:</b>	C
<b>Topographic Factor:</b>	1
<b>Ice Thickness:</b>	1.5 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Service Wind Speed:</b>	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)
165.0	165.0	3	fujitsu	TA08025-B604	1	1-3/4
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-20 w/ Mount Pipe		
		1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Commscope MC-PK8-DSH		

**Table 2 - Non-Carrier Equipment To Be Conditionally Removed**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
165.0	165.0	3	rfs celwave	APXV18-206517S-C	-	-
		1	tower mounts	Pipe Mount [PM 601-3]		

**Table 3 - Other Considered Equipment**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
183.0	183.0	1	sitepro1	RMQP-496-HK	12	1-5/8
		3	ericsson	AIR 32 B2A B66AA w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APX16DWV-16DWVS-E-A20 w/ Mount Pipe		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
174.0	174.0	3	cci antennas	DMP65R-BU6D w/ Mount Pipe	3	3/8
		3	cci antennas	OPA65R-BU6D w/ Mount Pipe	4	3/4
		3	ericsson	RRUS 32 B2	3	7/8

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		3	ericsson	RRUS 32 B2_CCIV2	12	1-1/4
		3	ericsson	RRUS 32 B30		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14_CCIV2		
		6	kaelus	DBC0061F1V51-2		
		3	kathrein	782 10254		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		6	powerwave technologies	LGP21401		
		3	quintel technology	QS66512-2 w/ Mount Pipe		
		2	raycap	DC6-48-60-18-8F		
		1	raycap	DC9-48-60-24-8C-EV		
		1	tower mounts	Sector Mount [SM 502-3]		
165.0	165.0	-	-	-	6	1-5/8
155.0	155.0	3	alcatel lucent	AWS4 (B66) 4x45 RRH	2	1-5/8
		3	alcatel lucent	RRH2X60-PCS		
		3	alcatel lucent	RRH2x60-700		
		12	andrew	SBNHH-1D65B w/ Mount Pipe		
		2	rfs celwave	DB-T1-6Z-8AB-0Z		
		1	tower mounts	Platform Mount [LP 403-1]		

### 3) ANALYSIS PROCEDURE

**Table 4 - Documents Provided**

Document	Reference	Source
4-GEOTECHNICAL REPORTS	3473514	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	3880469	CCISITES
4-TOWER MANUFACTURER DRAWINGS	3473517	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	3879955	CCISITES
4-POST-MODIFICATION INSPECTION	5512978	CCISITES
4-POST-MODIFICATION INSPECTION	5650784	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	3954032	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	3990532	CCISITES

### 3.1) Analysis Method

tnxTower (version 8.0.9.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

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

### 3.2) Assumptions

- 1) Tower and structures were maintained in accordance with the TIA-222 Standard.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 3 and the referenced drawings.

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

## 4) ANALYSIS RESULTS

**Table 5 - Section Capacity (Summary)**

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
185 - 180	Pole	TP18x18x0.1875	Pole	9.9%	Pass
180 - 175	Pole	TP19.631x18x0.25	Pole	16.3%	Pass
175 - 170	Pole	TP21.263x19.631x0.25	Pole	33.7%	Pass
170 - 165	Pole	TP22.894x21.263x0.25	Pole	47.9%	Pass
165 - 160	Pole	TP24.525x22.894x0.25	Pole	64.0%	Pass
160 - 155	Pole	TP26.156x24.525x0.25	Pole	76.3%	Pass
155 - 154	Pole	TP26.483x26.156x0.25	Pole	80.2%	Pass
154 - 153.75	Pole + Reinf.	TP26.564x26.483x0.3688	Reinf. 8 Tension Rupture	62.4%	Pass
153.75 - 152.5	Pole + Reinf.	TP26.972x26.564x0.3625	Reinf. 8 Tension Rupture	65.4%	Pass
152.5 - 152.25	Pole + Reinf.	TP27.053x26.972x0.55	Reinf. 8 Tension Rupture	44.8%	Pass
152.25 - 151.5	Pole + Reinf.	TP27.298x27.053x0.55	Reinf. 8 Tension Rupture	46.1%	Pass
151.5 - 151.25	Pole + Reinf.	TP27.38x27.298x0.425	Reinf. 3 Tension Rupture	56.4%	Pass
151.25 - 146.25	Pole + Reinf.	TP29.011x27.38x0.4125	Reinf. 3 Tension Rupture	65.2%	Pass
146.25 - 141.25	Pole + Reinf.	TP30.642x29.011x0.4	Reinf. 3 Tension Rupture	72.7%	Pass
141.25 - 136.25	Pole + Reinf.	TP32.273x30.642x0.3938	Reinf. 3 Tension Rupture	79.0%	Pass
136.25 - 135	Pole + Reinf.	TP34.313x32.273x0.3938	Reinf. 3 Tension Rupture	80.5%	Pass
135 - 129	Pole + Reinf.	TP34.133x32.181x0.475	Reinf. 7 Tension Rupture	75.6%	Pass
129 - 124	Pole + Reinf.	TP35.76x34.133x0.4625	Reinf. 7 Tension Rupture	79.9%	Pass
124 - 121.42	Pole + Reinf.	TP36.599x35.76x0.4625	Pole	82.4%	Pass
121.42 - 121.17	Pole + Reinf.	TP36.68x36.599x0.5	Pole	75.7%	Pass
121.17 - 116.17	Pole + Reinf.	TP38.307x36.68x0.4875	Pole	81.0%	Pass
116.17 - 115	Pole + Reinf.	TP38.688x38.307x0.4875	Pole	82.2%	Pass
115 - 113.75	Pole + Reinf.	TP39.094x38.688x0.55	Reinf. 7 Tension Rupture	71.1%	Pass
113.75 - 113.5	Pole + Reinf.	TP39.175x39.094x0.4688	Pole	78.0%	Pass
113.5 - 108.5	Pole + Reinf.	TP40.8x39.175x0.4625	Pole	81.7%	Pass

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
108.5 - 103.5	Pole + Reinf.	TP42.425x40.8x0.4563	Pole	85.2%	Pass
103.5 - 101	Pole + Reinf.	TP45.188x42.425x0.45	Pole	86.9%	Pass
101 - 94	Pole + Reinf.	TP44.853x42.613x0.5875	Pole	71.9%	Pass
94 - 91.4	Pole + Reinf.	TP45.685x44.853x0.575	Pole	73.5%	Pass
91.4 - 91.15	Pole + Reinf.	TP45.765x45.685x0.4438	Pole	95.1%	Pass
91.15 - 91	Pole + Reinf.	TP45.813x45.765x0.4438	Pole	95.2%	Pass
91 - 86	Pole + Reinf.	TP47.445x45.813x0.5	Pole	79.7%	Pass
86 - 81	Pole + Reinf.	TP49.078x47.445x0.5	Pole	81.7%	Pass
81 - 76	Pole + Reinf.	TP50.711x49.078x0.4938	Pole	83.7%	Pass
76 - 71	Pole + Reinf.	TP52.344x50.711x0.4875	Pole	85.7%	Pass
71 - 66	Pole + Reinf.	TP53.977x52.344x0.4875	Pole	87.7%	Pass
66 - 63.75	Pole + Reinf.	TP54.711x53.977x0.4875	Pole	88.5%	Pass
63.75 - 63.5	Pole + Reinf.	TP54.793x54.711x0.4875	Pole	88.6%	Pass
63.5 - 58.5	Pole + Reinf.	TP56.426x54.793x0.4813	Pole	90.5%	Pass
58.5 - 58	Pole + Reinf.	TP58.875x56.426x0.4813	Pole	90.7%	Pass
58 - 50	Pole + Reinf.	TP58.438x55.839x0.55	Pole	82.5%	Pass
50 - 45	Pole + Reinf.	TP60.063x58.438x0.55	Pole	84.4%	Pass
45 - 40.42	Pole + Reinf.	TP61.551x60.063x0.5438	Pole	86.2%	Pass
40.42 - 40.17	Pole + Reinf.	TP61.632x61.551x0.475	Pole	99.2%	Pass
40.17 - 40	Pole + Reinf.	TP61.688x61.632x0.475	Pole	99.3%	Pass
40 - 35	Pole + Reinf.	TP63.31x61.688x0.5313	Pole	82.5%	Pass
35 - 33	Pole + Reinf.	TP63.958x63.31x0.525	Pole	83.1%	Pass
33 - 32.75	Pole + Reinf.	TP64.039x63.958x0.6	Pole	74.9%	Pass
32.75 - 28	Pole + Reinf.	TP68.5x64.039x0.6	Pole	76.2%	Pass
28 - 18	Pole + Reinf.	TP67.958x64.705x0.6	Pole	80.2%	Pass
18 - 13	Pole + Reinf.	TP69.584x67.958x0.5875	Pole	81.5%	Pass
13 - 8	Pole + Reinf.	TP71.21x69.584x0.5875	Pole	82.8%	Pass
8 - 6.42	Pole + Reinf.	TP71.724x71.21x0.5875	Pole	83.2%	Pass
6.42 - 6.17	Pole + Reinf.	TP71.806x71.724x1.0125	Reinf. 9 Tension Rupture	82.7%	Pass
6.17 - 1.17	Pole + Reinf.	TP73.432x71.806x0.9875	Reinf. 9 Tension Rupture	83.6%	Pass
1.17 - 0	Pole + Reinf.	TP73.813x73.432x0.9875	Reinf. 9 Tension Rupture	83.9%	Pass
				Summary	
			Pole	99.3%	Pass
			Reinforcement	83.9%	Pass
			Overall	99.3%	Pass

**Table 6 - Tower Component Stresses vs. Capacity - LC5**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	76.9	Pass
1	Base Plate	0	41.9	Pass
1	Base Foundation (Structure)	0	82.2	Pass
1	Base Foundation (Soil Interaction)	0	90.7	Pass
<b>Structure Rating (max from all components) =</b>				<b>99.3%</b>

Notes:

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

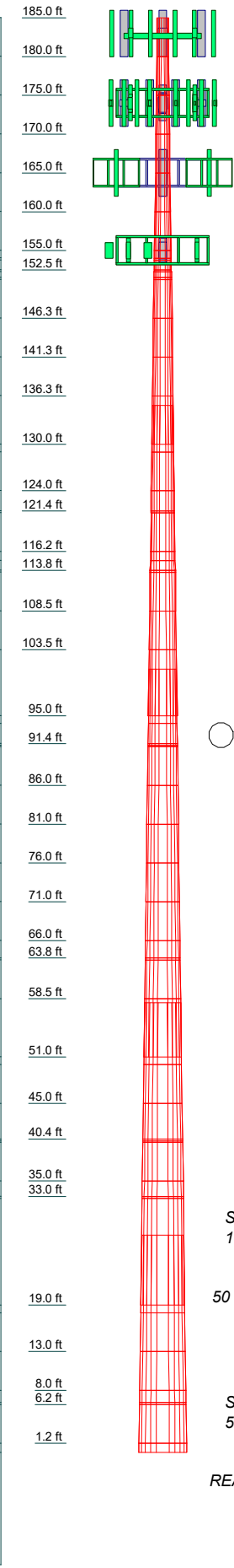
**4.1) Recommendations**

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

**APPENDIX A**  
**TNXTOWER OUTPUT**



Section	1	2	3	4	5	6	13	14	15	16	17	18	19	20	21	25	26	27	32	33	34	35	36	39	40	41	42	43	44	46	47	49	50	51	52	55	56																							
Length (ft)	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	6.6650	5.000	5.000	5.000	5.000	5.000	5.000	5.000	7.78650	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000																						
Number of Sides	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12																					
Thickness (in)	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937	0.3937																						
Socket Length (ft)																					5.000										6.000										7.000										9.000									
Top Dia (in)	1.26249																				1.26249										1.26249										1.26249										1.26249									
Bot Dia (in)	1.26249																				1.26249										1.26249										1.26249										1.26249									
Grade	0.000																				0.000										0.000										0.000										0.000									
Weight (K)	0.3937																				0.3937										0.3937										0.3937										0.3937									

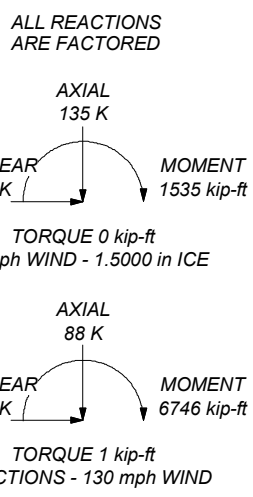


**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A36M-42	42 ksi	60 ksi			

**TOWER DESIGN NOTES**

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 130 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 99.3%



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

Job: <b>825983</b>	Project:	
Client: Crown Castle	Drawn by: SMandal	App'd:
Code: TIA-222-H	Date: 05/26/21	Scale: NTS
Path:	Dwg No. E-1	

## Tower Input Data

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

- Tower is located in Middlesex County, Connecticut.
- Tower base elevation above sea level: 89.450 ft.
- Basic wind speed of 130 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.000 ft.
- Nominal ice thickness of 1.5000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.000 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50.000 °F.
- Deflections calculated using a wind speed of 60 mph.
- TOWER RATING: 99.3%.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used:  $K_{es}(F_w) = 0.95$ ,  $K_{es}(t_i) = 0.85$ .
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile  Include Bolts In Member Capacity  Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt.  Autocalc Torque Arm Areas  Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption  <div style="text-align: center; background-color: #e0e0e0; padding: 2px;"><b>Poles</b></div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
--	---	---

## Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	185.000-180.000	5.000	0.000	12	18.0000	18.0000	0.1875	0.7500	A36M-42 (42 ksi)
L2	180.000-175.000	5.000	0.000	12	18.0000	19.6313	0.2500	1.0000	A36M-42 (42 ksi)
L3	175.000-170.000	5.000	0.000	12	19.6313	21.2625	0.2500	1.0000	A36M-42 (42 ksi)
L4	170.000-165.000	5.000	0.000	12	21.2625	22.8938	0.2500	1.0000	A36M-42 (42 ksi)
L5	165.000-160.000	5.000	0.000	12	22.8938	24.5250	0.2500	1.0000	A36M-42 (42 ksi)
L6	160.000-155.000	5.000	0.000	12	24.5250	26.1563	0.2500	1.0000	A36M-42 (42 ksi)
L7	155.000-154.000	1.000	0.000	12	26.1563	26.4825	0.2500	1.0000	A36M-42 (42 ksi)
L8	154.000-153.750	0.250	0.000	12	26.4825	26.5641	0.3688	1.4750	A36M-42 (42 ksi)
L9	153.750-152.500	1.250	0.000	12	26.5641	26.9719	0.3625	1.4500	A36M-42 (42 ksi)
L10	152.500-152.250	0.250	0.000	12	26.9719	27.0534	0.5500	2.2000	A36M-42 (42 ksi)
L11	152.250-151.500	0.750	0.000	12	27.0534	27.2981	0.5500	2.2000	A36M-42 (42 ksi)
L12	151.500-151.250	0.250	0.000	12	27.2981	27.3797	0.4250	1.7000	A36M-42 (42 ksi)
L13	151.250-146.250	5.000	0.000	12	27.3797	29.0109	0.4125	1.6500	A36M-42 (42 ksi)
L14	146.250-141.250	5.000	0.000	12	29.0109	30.6422	0.4000	1.6000	A36M-42 (42 ksi)
L15	141.250-136.250	5.000	0.000	12	30.6422	32.2734	0.3937	1.5750	A36M-42 (42 ksi)
L16	136.250-130.000	6.250	5.000	12	32.2734	34.3125	0.3937	1.5750	A36M-42 (42 ksi)
L17	130.000-129.000	6.000	0.000	12	32.1812	34.1331	0.4750	1.9000	A36M-42 (42 ksi)
L18	129.000-124.000	5.000	0.000	12	34.1331	35.7597	0.4625	1.8500	A36M-42 (42 ksi)
L19	124.000-121.420	2.580	0.000	12	35.7597	36.5990	0.4625	1.8500	A36M-42 (42 ksi)
L20	121.420-121.170	0.250	0.000	12	36.5990	36.6803	0.5000	2.0000	A36M-42 (42 ksi)
L21	121.170-116.170	5.000	0.000	12	36.6803	38.3069	0.4875	1.9500	A36M-42 (42 ksi)
L22	116.170-115.000	1.170	0.000	12	38.3069	38.6875	0.4875	1.9500	A36M-42 (42 ksi)
L23	115.000-113.750	1.250	0.000	12	38.6875	39.0938	0.5500	2.2000	A36M-42 (42 ksi)
L24	113.750-113.500	0.250	0.000	12	39.0938	39.1750	0.4688	1.8750	A36M-42 (42 ksi)
L25	113.500-108.500	5.000	0.000	12	39.1750	40.8000	0.4625	1.8500	A36M-42 (42 ksi)
L26	108.500-103.500	5.000	0.000	12	40.8000	42.4250	0.4562	1.8250	A36M-42 (42 ksi)
L27	103.500-95.000	8.500	6.000	12	42.4250	45.1875	0.4500	1.8000	A36M-42 (42 ksi)
L28	95.000-94.000	7.000	0.000	12	42.6125	44.8525	0.5875	2.3500	A36M-42 (42 ksi)
L29	94.000-91.400	2.600	0.000	12	44.8525	45.6845	0.5750	2.3000	A36M-42 (42 ksi)
L30	91.400-91.150	0.250	0.000	12	45.6845	45.7645	0.4437	1.7750	A36M-42 (42 ksi)
L31	91.150-91.000	0.150	0.000	12	45.7645	45.8125	0.4437	1.7750	A36M-42 (42 ksi)
L32	91.000-86.000	5.000	0.000	12	45.8125	47.4453	0.5000	2.0000	A36M-42 (42 ksi)
L33	86.000-81.000	5.000	0.000	12	47.4453	49.0781	0.5000	2.0000	A36M-42 (42 ksi)
L34	81.000-76.000	5.000	0.000	12	49.0781	50.7109	0.4938	1.9750	A36M-42 (42 ksi)
L35	76.000-71.000	5.000	0.000	12	50.7109	52.3438	0.4875	1.9500	A36M-42

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L36	71.000-66.000	5.000	0.000	12	52.3438	53.9766	0.4875	1.9500	(42 ksi) A36M-42
L37	66.000-63.750	2.250	0.000	12	53.9766	54.7113	0.4875	1.9500	(42 ksi) A36M-42
L38	63.750-63.500	0.250	0.000	12	54.7113	54.7930	0.4875	1.9500	(42 ksi) A36M-42
L39	63.500-58.500	5.000	0.000	12	54.7930	56.4258	0.4813	1.9250	(42 ksi) A36M-42
L40	58.500-51.000	7.500	7.000	12	56.4258	58.8750	0.4813	1.9250	(42 ksi) A36M-42
L41	51.000-50.000	8.000	0.000	12	55.8391	58.4384	0.5500	2.2000	(42 ksi) A36M-42
L42	50.000-45.000	5.000	0.000	12	58.4384	60.0629	0.5500	2.2000	(42 ksi) A36M-42
L43	45.000-40.420	4.580	0.000	12	60.0629	61.5510	0.5437	2.1750	(42 ksi) A36M-42
L44	40.420-40.170	0.250	0.000	12	61.5510	61.6323	0.4750	1.9000	(42 ksi) A36M-42
L45	40.170-40.000	0.170	0.000	12	61.6323	61.6875	0.4750	1.9000	(42 ksi) A36M-42
L46	40.000-35.000	5.000	0.000	12	61.6875	63.3095	0.5313	2.1250	(42 ksi) A36M-42
L47	35.000-33.000	2.000	0.000	12	63.3095	63.9583	0.5250	2.1000	(42 ksi) A36M-42
L48	33.000-32.750	0.250	0.000	12	63.9583	64.0394	0.6000	2.4000	(42 ksi) A36M-42
L49	32.750-19.000	13.750	9.000	12	64.0394	68.5000	0.6000	2.4000	(42 ksi) A36M-42
L50	19.000-18.000	10.000	0.000	12	64.7054	67.9579	0.6000	2.4000	(42 ksi) A36M-42
L51	18.000-13.000	5.000	0.000	12	67.9579	69.5842	0.5875	2.3500	(42 ksi) A36M-42
L52	13.000-8.000	5.000	0.000	12	69.5842	71.2105	0.5875	2.3500	(42 ksi) A36M-42
L53	8.000-6.420	1.580	0.000	12	71.2105	71.7244	0.5875	2.3500	(42 ksi) A36M-42
L54	6.420-6.170	0.250	0.000	12	71.7244	71.8057	1.0125	4.0500	(42 ksi) A36M-42
L55	6.170-1.170	5.000	0.000	12	71.8057	73.4320	0.9875	3.9500	(42 ksi) A36M-42
L56	1.170-0.000	1.170		12	73.4320	73.8125	0.9875	3.9500	(42 ksi) A36M-42

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>2</sup>	w in	w/t
L1	18.5688	10.7543	435.5296	6.3769	9.3240	46.7106	882.5011	5.2929	4.3215	23.048
L2	18.5688	10.7543	435.5296	6.3769	9.3240	46.7106	882.5011	5.2929	4.3215	23.048
L2	18.5468	14.2888	574.6149	6.3545	9.3240	61.6275	1164.3256	7.0325	4.1540	16.616
L2	20.2356	15.6019	748.0441	6.9385	10.1690	73.5613	1515.7401	7.6788	4.5912	18.365
L3	20.2356	15.6019	748.0441	6.9385	10.1690	73.5613	1515.7401	7.6788	4.5912	18.365
L3	21.9244	16.9151	953.2680	7.5225	11.0140	86.5508	1931.5794	8.3251	5.0283	20.113
L4	21.9244	16.9151	953.2680	7.5225	11.0140	86.5508	1931.5794	8.3251	5.0283	20.113
L4	23.6132	18.2282	1192.9628	8.1065	11.8590	100.5959	2417.2660	8.9714	5.4655	21.862
L5	23.6132	18.2282	1192.9628	8.1065	11.8590	100.5959	2417.2660	8.9714	5.4655	21.862
L5	25.3020	19.5414	1469.8044	8.6905	12.7039	115.6966	2978.2222	9.6177	5.9027	23.611
L6	25.3020	19.5414	1469.8044	8.6905	12.7039	115.6966	2978.2222	9.6177	5.9027	23.611
L6	26.9908	20.8545	1786.4690	9.2744	13.5489	131.8531	3619.8706	10.2640	6.3399	25.36
L7	26.9908	20.8545	1786.4690	9.2744	13.5489	131.8531	3619.8706	10.2640	6.3399	25.36
L7	27.3285	21.1172	1854.8162	9.3912	13.7179	135.2110	3758.3604	10.3932	6.4273	25.709
L8	27.2866	31.0068	2698.8676	9.3487	13.7179	196.7401	5468.6374	15.2606	6.1091	16.567
L8	27.3711	31.1037	2724.2351	9.3779	13.7602	197.9795	5520.0388	15.3083	6.1309	16.626
L9	27.3733	30.5838	2679.9789	9.3802	13.7602	194.7633	5430.3639	15.0524	6.1477	16.959

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L10	27.7955	31.0598	2807.0740	9.5262	13.9714	200.9153	5687.8929	15.2867	6.2570	17.261
	27.7293	46.7931	4169.6098	9.4590	13.9714	298.4383	8448.7598	23.0302	5.7545	10.463
	27.8138	46.9376	4208.3432	9.4882	14.0137	300.3025	8527.2443	23.1013	5.7763	10.502
L11	27.8138	46.9376	4208.3432	9.4882	14.0137	300.3025	8527.2443	23.1013	5.7763	10.502
	28.0671	47.3709	4325.9804	9.5758	14.1404	305.9299	8765.6090	23.3145	5.8419	10.622
L12	28.1112	36.7759	3389.8874	9.6206	14.1404	239.7302	6868.8309	18.1000	6.1769	14.534
	28.1956	36.8875	3420.8468	9.6498	14.1827	241.1989	6931.5632	18.1549	6.1988	14.585
L13	28.2000	35.8192	3324.8550	9.6543	14.1827	234.4307	6737.0577	17.6291	6.2323	15.108
	29.8888	37.9859	3965.4522	10.2382	15.0277	263.8768	8035.0812	18.6955	6.6694	16.168
L14	29.8932	36.8509	3850.3313	10.2427	15.0277	256.2162	7801.8151	18.1369	6.7029	16.757
	31.5820	38.9519	4547.1722	10.8267	15.8727	286.4784	9213.8036	19.1710	7.1401	17.85
L15	31.5842	38.3512	4478.8983	10.8289	15.8727	282.1770	9075.4623	18.8753	7.1569	18.176
	33.2730	40.4195	5243.2984	11.4129	16.7176	313.6387	10624.344	19.8932	7.5940	19.286
L16	33.2730	40.4195	5243.2984	11.4129	16.7176	313.6387	10624.344	19.8932	7.5940	19.286
	35.3840	43.0047	6315.1243	12.1429	17.7739	355.3037	12796.154	21.1656	8.1405	20.674
L17	34.8329	48.4947	6222.5740	11.3508	16.6699	373.2823	12608.622	23.8676	7.3516	15.477
	35.1696	51.4801	7443.9798	12.0496	17.6810	421.0168	15083.521	25.3369	7.8747	16.578
L18	35.1741	50.1440	7256.1640	12.0541	17.6810	410.3943	14702.955	24.6793	7.9082	17.099
	36.8580	52.5663	8359.3757	12.6364	18.5235	451.2845	16938.361	25.8716	8.3441	18.041
L19	36.8580	52.5663	8359.3757	12.6364	18.5235	451.2845	16938.361	25.8716	8.3441	18.041
	37.7269	53.8163	8969.9826	12.9369	18.9583	473.1433	18175.616	26.4867	8.5690	18.528
L20	37.7137	58.1194	9667.1203	12.9234	18.9583	509.9155	19588.206	28.6046	8.4685	16.937
	37.7979	58.2503	9732.6053	12.9526	19.0004	512.2314	19720.896	28.6690	8.4903	16.981
L21	37.8023	56.8137	9499.1289	12.9570	19.0004	499.9435	19247.810	27.9620	8.5238	17.485
	39.4862	59.3670	10838.265	13.5393	19.8430	546.2019	21961.264	29.2186	8.9597	18.379
L22	39.4862	59.3670	10838.265	13.5393	19.8430	546.2019	21961.264	29.2186	8.9597	18.379
	39.8803	59.9644	11168.800	13.6756	20.0401	557.3219	22631.017	29.5127	9.0618	18.588
L23	39.8582	67.5415	12538.950	13.6532	20.0401	625.6922	25407.312	33.2419	8.8942	16.171
	40.2788	68.2610	12943.937	13.7987	20.2506	639.1890	26227.926	33.5960	9.0031	16.369
L24	40.3075	58.2996	11101.676	13.8278	20.2506	548.2157	22495.007	28.6933	9.2209	19.671
	40.3916	58.4222	11171.883	13.8568	20.2926	550.5384	22637.264	28.7537	9.2426	19.718
L25	40.3938	57.6526	11028.265	13.8591	20.2926	543.4611	22346.255	28.3749	9.2594	20.02
	42.0761	60.0726	12476.147	14.4408	21.1344	590.3242	25280.056	29.5659	9.6949	20.962
L26	42.0783	59.2700	12313.272	14.4431	21.1344	582.6176	24950.028	29.1709	9.7117	21.286
	43.7606	61.6573	13861.901	15.0248	21.9762	630.7702	28087.970	30.3459	10.1472	22.24
L27	43.7628	60.8218	13678.121	15.0270	21.9762	622.4075	27715.582	29.9346	10.1639	22.586
	46.6228	64.8246	16560.348	16.0160	23.4071	707.4918	33555.755	31.9047	10.9042	24.232
L28	45.8962	79.5008	17921.438	15.0450	22.0733	811.9066	36313.692	39.1279	9.8456	16.759
	46.2275	83.7383	20942.624	15.8469	23.2336	901.3940	42435.434	41.2135	10.4460	17.78
L29	46.2319	81.9798	20514.405	15.8513	23.2336	882.9630	41567.747	40.3480	10.4795	18.225
	47.0932	83.5202	21692.704	16.1492	23.6646	916.6743	43955.301	41.1061	10.7024	18.613

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L30	47.1395	64.6434	16887.663 9	16.1962	23.6646	713.6265	34218.985 5	31.8155	11.0542	24.911
	47.2224	64.7577	16977.410 6	16.2248	23.7060	716.1648	34400.836 7	31.8718	11.0756	24.959
L31	47.2224	64.7577	16977.410 6	16.2248	23.7060	716.1648	34400.836 7	31.8718	11.0756	24.959
	47.2721	64.8263	17031.411 0	16.2420	23.7309	717.6900	34510.256 1	31.9055	11.0885	24.988
L32	47.2522	72.9531	19119.031 9	16.2219	23.7309	805.6606	38740.342 1	35.9053	10.9377	21.876
	48.9426	75.5820	21261.237 7	16.8064	24.5767	865.0983	43081.031 8	37.1991	11.3753	22.751
L33	48.9426	75.5820	21261.237 7	16.8064	24.5767	865.0983	43081.031 8	37.1991	11.3753	22.751
	50.6330	78.2108	23557.764 2	17.3910	25.4225	926.6513	47734.417 1	38.4930	11.8129	23.626
L34	50.6352	77.2431	23272.272 4	17.3932	25.4225	915.4214	47155.933 3	38.0167	11.8297	23.959
	52.3257	79.8391	25698.400 9	17.9778	26.2683	978.3060	52071.927 5	39.2944	12.2673	24.845
L35	52.3279	78.8382	25382.579 7	17.9800	26.2683	966.2830	51431.987 9	38.8018	12.2840	25.198
	54.0183	81.4013	27939.573 0	18.5645	27.1141	1030.4458	56613.149 7	40.0633	12.7216	26.096
L36	54.0183	81.4013	27939.573 0	18.5645	27.1141	1030.4458	56613.149 7	40.0633	12.7216	26.096
	55.7087	83.9645	30662.771 9	19.1491	27.9599	1096.6712	62131.089 0	41.3248	13.1592	26.993
L37	55.7087	83.9645	30662.771 9	19.1491	27.9599	1096.6712	62131.089 0	41.3248	13.1592	26.993
	56.4694	85.1179	31943.828 4	19.4121	28.3405	1127.1454	64726.856 7	41.8924	13.3561	27.397
L38	56.4694	85.1179	31943.828 4	19.4121	28.3405	1127.1454	64726.856 7	41.8924	13.3561	27.397
	56.5539	85.2460	32088.332 4	19.4414	28.3828	1130.5572	65019.661 1	41.9555	13.3780	27.442
L39	56.5561	84.1628	31687.881 9	19.4436	28.3828	1116.4483	64208.239 7	41.4224	13.3948	27.833
	58.2465	86.6930	34632.630 3	20.0281	29.2286	1184.8903	70175.098 3	42.6677	13.8324	28.743
L40	58.2465	86.6930	34632.630 3	20.0281	29.2286	1184.8903	70175.098 3	42.6677	13.8324	28.743
	60.7821	90.4884	39383.260 0	20.9050	30.4973	1291.3709	79801.162 2	44.5356	14.4888	30.106
L41	59.9695	97.9169	38205.173 6	19.7935	28.9246	1320.8524	77414.039 7	48.1917	13.4909	24.529
	60.3058	102.5203	43850.891 7	20.7240	30.2711	1448.6070	88853.795 2	50.4574	14.1875	25.795
L42	60.3058	102.5203	43850.891 7	20.7240	30.2711	1448.6070	88853.795 2	50.4574	14.1875	25.795
	61.9877	105.3974	47647.333 0	21.3056	31.1126	1531.4481	96546.414 4	51.8734	14.6229	26.587
L43	61.9899	104.2107	47120.728 6	21.3079	31.1126	1514.5224	95479.371 2	51.2893	14.6396	26.923
	63.5305	106.8161	50744.176 3	21.8406	31.8834	1591.5529	102821.45 86	52.5717	15.0384	27.657
L44	63.5548	93.4158	44478.277 4	21.8652	31.8834	1395.0277	90125.048 6	45.9764	15.2227	32.048
	63.6389	93.5400	44655.977 2	21.8943	31.9255	1398.7552	90485.116 6	46.0376	15.2444	32.094
L45	63.6389	93.5400	44655.977 2	21.8943	31.9255	1398.7552	90485.116 6	46.0376	15.2444	32.094
	63.6960	93.6245	44777.081 4	21.9141	31.9541	1401.2927	90730.506 6	46.0791	15.2593	32.125
L46	63.6762	104.6154	49941.698 3	21.8939	31.9541	1562.9187	101195.42 07	51.4885	15.1085	28.44
	65.3554	107.3901	54021.778 6	22.4746	32.7943	1647.2900	109462.76 94	52.8541	15.5432	29.258
L47	65.3576	106.1372	53402.174 7	22.4769	32.7943	1628.3964	108207.28 40	52.2375	15.5600	29.638

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
	66.0293	107.2340	55074.900	22.7091	33.1304	1662.3667	111596.67	52.7773	15.7338	29.969
L48	66.0029	122.4083	62719.747	22.6823	33.1304	1893.1168	127087.21	60.2456	15.5328	25.888
	66.0868	122.5650	62960.909	22.7113	33.1724	1897.9892	127575.87	60.3228	15.5546	25.924
L49	66.0868	122.5650	62960.909	22.7113	33.1724	1897.9892	127575.87	60.3228	15.5546	25.924
	70.7048	131.1828	77197.350	24.3082	35.4830	2175.6151	156422.76	64.5642	16.7500	27.917
L50	69.8068	123.8515	64964.491	22.9497	33.5174	1938.2333	131635.67	60.9560	15.7330	26.222
	70.1435	130.1355	75363.115	24.1141	35.2022	2140.8640	152706.10	64.0487	16.6047	27.675
L51	70.1480	127.4480	73834.140	24.1186	35.2022	2097.4299	149607.98	62.7260	16.6382	28.32
	71.8316	130.5245	79311.168	24.7008	36.0446	2200.3616	160705.93	64.2402	17.0741	29.062
L52	71.8316	130.5245	79311.168	24.7008	36.0446	2200.3616	160705.93	64.2402	17.0741	29.062
	73.5152	133.6010	85052.566	25.2830	36.8870	2305.7588	172339.55	65.7543	17.5099	29.804
L53	73.5152	133.6010	85052.566	25.2830	36.8870	2305.7588	172339.55	65.7543	17.5099	29.804
	74.0473	134.5732	86922.819	25.4670	37.1532	2339.5770	176129.19	66.2328	17.6476	30.039
L54	73.8974	230.5383	147134.21	25.3148	37.1532	3960.2009	298133.80	113.4640	16.5086	16.305
	73.9815	230.8035	147642.38	25.3440	37.1953	3969.3785	299163.49	113.5944	16.5304	16.326
L55	73.9904	225.1841	144149.49	25.3529	37.1953	3875.4720	292085.96	110.8288	16.5974	16.808
	75.6740	230.3552	154310.08	25.9351	38.0378	4056.7616	312674.07	113.3738	17.0333	17.249
L56	75.6740	230.3552	154310.08	25.9351	38.0378	4056.7616	312674.07	113.3738	17.0333	17.249
	76.0680	231.5653	156754.64	26.0713	38.2349	4099.7817	317627.39	113.9694	17.1352	17.352

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft <sup>2</sup>	in					in	in	in
L1 185.000-180.000				1	1	1			
L2 180.000-175.000				1	1	1			
L3 175.000-170.000				1	1	1			
L4 170.000-165.000				1	1	1			
L5 165.000-160.000				1	1	1			
L6 160.000-155.000				1	1	1			
L7 155.000-154.000				1	1	1			
L8 154.000-153.750				1	1	0.970809			
L9 153.750-152.500				1	1	0.98275			
L10 152.500-152.250				1	1	0.939738			
L11 152.250-151.500				1	1	0.935299			
L12 151.500-151.250				1	1	0.958557			
L13 151.250-				1	1	0.965409			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_r$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft <sup>2</sup>	in							
L14 146.250-141.250				1	1	0.975178			
L15 141.250-136.250				1	1	0.97226			
L16 136.250-130.000				1	1	0.967999			
L17 130.000-129.000				1	1	0.967523			
L18 129.000-124.000				1	1	0.972439			
L19 124.000-121.420				1	1	0.962408			
L20 121.420-121.170				1	1	0.967636			
L21 121.170-116.170				1	1	0.971491			
L22 116.170-115.000				1	1	0.966921			
L23 115.000-113.750				1	1	0.967791			
L24 113.750-113.500				1	1	0.977901			
L25 113.500-108.500				1	1	0.978255			
L26 108.500-103.500				1	1	0.979632			
L27 103.500-95.000				1	1	0.987419			
L28 95.000-94.000				1	1	0.965747			
L29 94.000-91.400				1	1	0.978292			
L30 91.400-91.150				1	1	0.984623			
L31 91.150-91.000				1	1	0.984326			
L32 91.000-86.000				1	1	0.990491			
L33 86.000-81.000				1	1	0.982407			
L34 81.000-76.000				1	1	0.987066			
L35 76.000-71.000				1	1	0.992343			
L36 71.000-66.000				1	1	0.985532			
L37 66.000-63.750				1	1	0.982601			
L38 63.750-63.500				1	1	0.982281			
L39 63.500-58.500				1	1	0.988627			
L40 58.500-51.000				1	1	0.988018			
L41 51.000-50.000				1	1	0.991576			
L42 50.000-45.000				1	1	0.98312			
L43 45.000-40.420				1	1	0.986885			
L44 40.420-40.170				1	1	0.983471			
L45 40.170-40.000				1	1	0.983296			
L46 40.000-35.000				1	1	0.992613			



Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_r$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft <sup>2</sup>	in							
L47 35.000-33.000				1	1	1.00258			
L48 33.000-32.750				1	1	1.07829			
L49 32.750-19.000				1	1	1.07001			
L50 19.000-18.000				1	1	1.05798			
L51 18.000-13.000				1	1	1.07238			
L52 13.000-8.000				1	1	1.06483			
L53 8.000-6.420				1	1	1.06252			
L54 6.420-6.170				1	1	0.540263			
L55 6.170-1.170				1	1	0.551259			
L56 1.170-0.000				1	1	0.550694			

**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 klf
LDF7-50A(1-5/8")	B	No	Surface Ar (CaAa)	183.000 - 0.000	9	6	0.328 0.480	1.9800		0.001
*****										
CCI-045100 (L)	C	No	Surface Af (CaAa)	53.920 - 38.920	1	1	-0.318 -0.318	4.5000	11.0000	0.000
CCI-045100 (L)	B	No	Surface Af (CaAa)	53.920 - 38.920	1	1	-0.318 -0.318	4.5000	11.0000	0.000
CCI-045100 (L)	A	No	Surface Af (CaAa)	53.920 - 38.920	1	1	-0.318 -0.318	4.5000	11.0000	0.000
CCI-060100 (L)	C	No	Surface Af (CaAa)	123.920 - 88.890	1	1	-0.318 -0.318	6.0000	14.0000	0.000
CCI-060100 (L)	B	No	Surface Af (CaAa)	123.920 - 88.890	1	1	-0.318 -0.318	6.0000	14.0000	0.000
CCI-060100 (L)	A	No	Surface Af (CaAa)	123.920 - 88.890	1	1	-0.318 -0.318	6.0000	14.0000	0.000
CCI-045100 (L)	B	No	Surface Af (CaAa)	154.500 - 119.500	1	1	0.432 0.432	4.5000	11.0000	0.000
CCI-045100 (L)	A	No	Surface Af (CaAa)	154.500 - 119.500	1	1	0.432 0.432	4.5000	11.0000	0.000
CCI-045100 (L)	C	No	Surface Af (CaAa)	154.500 - 119.500	1	1	0.432 0.432	4.5000	11.0000	0.000
*****										
CCI-085125 (L)	B	No	Surface Af (CaAa)	37.420 - 0.000	1	1	0.182 0.182	8.5000	19.5000	0.000
CCI-085125 (L)	A	No	Surface Af (CaAa)	37.420 - 0.000	1	1	0.432 0.432	8.5000	19.5000	0.000
CCI-085125 (L)	A	No	Surface Af (CaAa)	37.420 - 0.000	1	1	-0.318 -0.318	8.5000	19.5000	0.000
CCI-085125 (L)	C	No	Surface Af (CaAa)	37.420 - 0.000	1	1	0.182 0.182	8.5000	19.5000	0.000
CCI-060100 (L)	B	No	Surface Af (CaAa)	65.500 - 30.500	1	1	-0.068 -0.068	6.0000	14.0000	0.000
CCI-060100 (L)	A	No	Surface Af (CaAa)	65.500 - 30.500	1	1	-0.068 -0.068	6.0000	14.0000	0.000
CCI-060100 (L)	C	No	Surface Af (CaAa)	65.500 - 30.500	1	1	-0.068 -0.068	6.0000	14.0000	0.000

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 klf
CCI-060100 (L)	B	No	Surface Af (CaAa)	101.670 - 61.670	1	1	0.182	6.0000	14.0000	0.000
CCI-060100 (L)	A	No	Surface Af (CaAa)	101.670 - 61.670	1	1	0.182	6.0000	14.0000	0.000
CCI-060100 (L)	C	No	Surface Af (CaAa)	101.670 - 61.670	1	1	0.182	6.0000	14.0000	0.000
CCI-040075 (W)	B	No	Surface Af (CaAa)	132.500 - 112.500	1	1	0.182	4.0000	9.5000	0.000
CCI-040075 (W)	A	No	Surface Af (CaAa)	132.500 - 112.500	1	1	0.182	4.0000	9.5000	0.000
CCI-040075 (W)	C	No	Surface Af (CaAa)	132.500 - 112.500	1	1	0.182	4.0000	9.5000	0.000
CCI-040075 (W)	B	No	Surface Af (CaAa)	155.250 - 150.250	1	1	0.182	4.0000	9.5000	0.000
CCI-040075 (W)	A	No	Surface Af (CaAa)	155.250 - 150.250	1	1	0.182	4.0000	9.5000	0.000
CCI-040075 (W)	C	No	Surface Af (CaAa)	155.250 - 150.250	1	1	0.182	4.0000	9.5000	0.000
***										
CU12PSM6P4XXX(1-3/4)	B	No	Surface Ar (CaAa)	165.000 - 0.000	1	1	-0.100	1.7500		0.003

### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Ice	CAAA ft <sup>2</sup> /ft	Weight klf
LDF7-50A(1-5/8")	C	No	No	Inside Pole	183.000 - 0.000	3	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.001 0.001 0.001 0.001
***									
LDF6-50A(1-1/4")	C	No	No	Inside Pole	174.000 - 0.000	12	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.001 0.001 0.001 0.001
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	174.000 - 0.000	4	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.001 0.001 0.001 0.001
FB-L98B-034-XXXXXX(3/8)	C	No	No	Inside Pole	174.000 - 0.000	3	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000
WR-VG66ST-BRD_CCIV2(7/8)	C	No	No	Inside Pole	174.000 - 0.000	3	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.001 0.001 0.001 0.001
***									
LDF7-50A(1-5/8")	C	No	No	Inside Pole	165.000 - 0.000	6	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.001 0.001 0.001 0.001
***									
HB158-1-08U8-S8J18( 1-5/8)	C	No	No	Inside Pole	155.000 - 0.000	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.001 0.001 0.001 0.001
*****									
***									
*****									
****									
*****									
*****									

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C <sub>AA</sub> ft <sup>2</sup> /ft	Weight klf
*****								

**Feed Line/Linear Appurtenances Section Areas**

Tower Section n	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	185.000-180.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	3.564	0.000	0.022
		C	0.000	0.000	0.000	0.000	0.007
L2	180.000-175.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	5.940	0.000	0.037
		C	0.000	0.000	0.000	0.000	0.012
L3	175.000-170.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	5.940	0.000	0.037
		C	0.000	0.000	0.000	0.000	0.064
L4	170.000-165.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	5.940	0.000	0.037
		C	0.000	0.000	0.000	0.000	0.078
L5	165.000-160.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	6.815	0.000	0.051
		C	0.000	0.000	0.000	0.000	0.102
L6	160.000-155.000	A	0.000	0.000	0.138	0.000	0.000
		B	0.000	0.000	6.953	0.000	0.051
		C	0.000	0.000	0.138	0.000	0.102
L7	155.000-154.000	A	0.000	0.000	0.928	0.000	0.000
		B	0.000	0.000	2.291	0.000	0.010
		C	0.000	0.000	0.928	0.000	0.023
L8	154.000-153.750	A	0.000	0.000	0.326	0.000	0.000
		B	0.000	0.000	0.666	0.000	0.003
		C	0.000	0.000	0.326	0.000	0.006
L9	153.750-152.500	A	0.000	0.000	1.628	0.000	0.000
		B	0.000	0.000	3.332	0.000	0.013
		C	0.000	0.000	1.628	0.000	0.029
L10	152.500-152.250	A	0.000	0.000	0.326	0.000	0.000
		B	0.000	0.000	0.666	0.000	0.003
		C	0.000	0.000	0.326	0.000	0.006
L11	152.250-151.500	A	0.000	0.000	0.977	0.000	0.000
		B	0.000	0.000	1.999	0.000	0.008
		C	0.000	0.000	0.977	0.000	0.017
L12	151.500-151.250	A	0.000	0.000	0.326	0.000	0.000
		B	0.000	0.000	0.666	0.000	0.003
		C	0.000	0.000	0.326	0.000	0.006
L13	151.250-146.250	A	0.000	0.000	4.303	0.000	0.000
		B	0.000	0.000	11.118	0.000	0.051
		C	0.000	0.000	4.303	0.000	0.115
L14	146.250-141.250	A	0.000	0.000	3.750	0.000	0.000
		B	0.000	0.000	10.565	0.000	0.051
		C	0.000	0.000	3.750	0.000	0.115
L15	141.250-136.250	A	0.000	0.000	3.750	0.000	0.000
		B	0.000	0.000	10.565	0.000	0.051
		C	0.000	0.000	3.750	0.000	0.115
L16	136.250-130.000	A	0.000	0.000	6.354	0.000	0.000
		B	0.000	0.000	14.873	0.000	0.063
		C	0.000	0.000	6.354	0.000	0.144
L17	130.000-129.000	A	0.000	0.000	1.417	0.000	0.000
		B	0.000	0.000	2.780	0.000	0.010
		C	0.000	0.000	1.417	0.000	0.023
L18	129.000-124.000	A	0.000	0.000	7.083	0.000	0.000
		B	0.000	0.000	13.898	0.000	0.051
		C	0.000	0.000	7.083	0.000	0.115
L19	124.000-121.420	A	0.000	0.000	6.155	0.000	0.000

Tower Sectio n	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
		B	0.000	0.000	9.672	0.000	0.026
		C	0.000	0.000	6.155	0.000	0.059
L20	121.420-121.170	A	0.000	0.000	0.604	0.000	0.000
		B	0.000	0.000	0.945	0.000	0.003
		C	0.000	0.000	0.604	0.000	0.006
L21	121.170-116.170	A	0.000	0.000	9.586	0.000	0.000
		B	0.000	0.000	16.401	0.000	0.051
		C	0.000	0.000	9.586	0.000	0.115
L22	116.170-115.000	A	0.000	0.000	1.950	0.000	0.000
		B	0.000	0.000	3.545	0.000	0.012
		C	0.000	0.000	1.950	0.000	0.027
L23	115.000-113.750	A	0.000	0.000	2.083	0.000	0.000
		B	0.000	0.000	3.787	0.000	0.013
		C	0.000	0.000	2.083	0.000	0.029
L24	113.750-113.500	A	0.000	0.000	0.417	0.000	0.000
		B	0.000	0.000	0.757	0.000	0.003
		C	0.000	0.000	0.417	0.000	0.006
L25	113.500-108.500	A	0.000	0.000	5.667	0.000	0.000
		B	0.000	0.000	12.482	0.000	0.051
		C	0.000	0.000	5.667	0.000	0.115
L26	108.500-103.500	A	0.000	0.000	5.000	0.000	0.000
		B	0.000	0.000	11.815	0.000	0.051
		C	0.000	0.000	5.000	0.000	0.115
L27	103.500-95.000	A	0.000	0.000	15.170	0.000	0.000
		B	0.000	0.000	26.756	0.000	0.086
		C	0.000	0.000	15.170	0.000	0.196
L28	95.000-94.000	A	0.000	0.000	2.000	0.000	0.000
		B	0.000	0.000	3.363	0.000	0.010
		C	0.000	0.000	2.000	0.000	0.023
L29	94.000-91.400	A	0.000	0.000	5.200	0.000	0.000
		B	0.000	0.000	8.744	0.000	0.026
		C	0.000	0.000	5.200	0.000	0.060
L30	91.400-91.150	A	0.000	0.000	0.500	0.000	0.000
		B	0.000	0.000	0.841	0.000	0.003
		C	0.000	0.000	0.500	0.000	0.006
L31	91.150-91.000	A	0.000	0.000	0.300	0.000	0.000
		B	0.000	0.000	0.504	0.000	0.002
		C	0.000	0.000	0.300	0.000	0.003
L32	91.000-86.000	A	0.000	0.000	7.110	0.000	0.000
		B	0.000	0.000	13.925	0.000	0.051
		C	0.000	0.000	7.110	0.000	0.115
L33	86.000-81.000	A	0.000	0.000	5.000	0.000	0.000
		B	0.000	0.000	11.815	0.000	0.051
		C	0.000	0.000	5.000	0.000	0.115
L34	81.000-76.000	A	0.000	0.000	5.000	0.000	0.000
		B	0.000	0.000	11.815	0.000	0.051
		C	0.000	0.000	5.000	0.000	0.115
L35	76.000-71.000	A	0.000	0.000	5.000	0.000	0.000
		B	0.000	0.000	11.815	0.000	0.051
		C	0.000	0.000	5.000	0.000	0.115
L36	71.000-66.000	A	0.000	0.000	5.000	0.000	0.000
		B	0.000	0.000	11.815	0.000	0.051
		C	0.000	0.000	5.000	0.000	0.115
L37	66.000-63.750	A	0.000	0.000	4.000	0.000	0.000
		B	0.000	0.000	7.067	0.000	0.023
		C	0.000	0.000	4.000	0.000	0.052
L38	63.750-63.500	A	0.000	0.000	0.500	0.000	0.000
		B	0.000	0.000	0.841	0.000	0.003
		C	0.000	0.000	0.500	0.000	0.006
L39	63.500-58.500	A	0.000	0.000	6.830	0.000	0.000
		B	0.000	0.000	13.645	0.000	0.051
		C	0.000	0.000	6.830	0.000	0.115
L40	58.500-51.000	A	0.000	0.000	9.690	0.000	0.000
		B	0.000	0.000	19.913	0.000	0.076
		C	0.000	0.000	9.690	0.000	0.173
L41	51.000-50.000	A	0.000	0.000	1.750	0.000	0.000
		B	0.000	0.000	3.113	0.000	0.010
		C	0.000	0.000	1.750	0.000	0.023
L42	50.000-45.000	A	0.000	0.000	8.750	0.000	0.000

Tower Sectio n	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
		B	0.000	0.000	15.565	0.000	0.051
		C	0.000	0.000	8.750	0.000	0.115
L43	45.000-40.420	A	0.000	0.000	8.015	0.000	0.000
		B	0.000	0.000	14.258	0.000	0.046
		C	0.000	0.000	8.015	0.000	0.105
L44	40.420-40.170	A	0.000	0.000	0.438	0.000	0.000
		B	0.000	0.000	0.778	0.000	0.003
		C	0.000	0.000	0.438	0.000	0.006
L45	40.170-40.000	A	0.000	0.000	0.297	0.000	0.000
		B	0.000	0.000	0.529	0.000	0.002
		C	0.000	0.000	0.297	0.000	0.004
L46	40.000-35.000	A	0.000	0.000	12.667	0.000	0.000
		B	0.000	0.000	16.053	0.000	0.051
		C	0.000	0.000	9.238	0.000	0.115
L47	35.000-33.000	A	0.000	0.000	7.667	0.000	0.000
		B	0.000	0.000	7.559	0.000	0.020
		C	0.000	0.000	4.833	0.000	0.046
L48	33.000-32.750	A	0.000	0.000	0.958	0.000	0.000
		B	0.000	0.000	0.945	0.000	0.003
		C	0.000	0.000	0.604	0.000	0.006
L49	32.750-19.000	A	0.000	0.000	41.208	0.000	0.000
		B	0.000	0.000	40.470	0.000	0.139
		C	0.000	0.000	21.729	0.000	0.317
L50	19.000-18.000	A	0.000	0.000	2.833	0.000	0.000
		B	0.000	0.000	2.780	0.000	0.010
		C	0.000	0.000	1.417	0.000	0.023
L51	18.000-13.000	A	0.000	0.000	14.167	0.000	0.000
		B	0.000	0.000	13.898	0.000	0.051
		C	0.000	0.000	7.083	0.000	0.115
L52	13.000-8.000	A	0.000	0.000	14.167	0.000	0.000
		B	0.000	0.000	13.898	0.000	0.051
		C	0.000	0.000	7.083	0.000	0.115
L53	8.000-6.420	A	0.000	0.000	4.477	0.000	0.000
		B	0.000	0.000	4.392	0.000	0.016
		C	0.000	0.000	2.238	0.000	0.036
L54	6.420-6.170	A	0.000	0.000	0.708	0.000	0.000
		B	0.000	0.000	0.695	0.000	0.003
		C	0.000	0.000	0.354	0.000	0.006
L55	6.170-1.170	A	0.000	0.000	14.167	0.000	0.000
		B	0.000	0.000	13.898	0.000	0.051
		C	0.000	0.000	7.083	0.000	0.115
L56	1.170-0.000	A	0.000	0.000	3.315	0.000	0.000
		B	0.000	0.000	3.252	0.000	0.012
		C	0.000	0.000	1.658	0.000	0.027

**Feed Line/Linear Appurtenances Section Areas - With Ice**

Tower Sectio n	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	185.000-180.000	A	1.513	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	5.590	0.000	0.090
		C		0.000	0.000	0.000	0.000	0.007
L2	180.000-175.000	A	1.509	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	9.311	0.000	0.149
		C		0.000	0.000	0.000	0.000	0.012
L3	175.000-170.000	A	1.504	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	9.305	0.000	0.149
		C		0.000	0.000	0.000	0.000	0.064
L4	170.000-165.000	A	1.500	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	9.300	0.000	0.149
		C		0.000	0.000	0.000	0.000	0.078
L5	165.000-160.000	A	1.495	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	11.664	0.000	0.192
		C		0.000	0.000	0.000	0.000	0.102
L6	160.000-155.000	A	1.491	0.000	0.000	0.178	0.000	0.002

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
		B		0.000	0.000	11.832	0.000	0.193
		C		0.000	0.000	0.178	0.000	0.104
L7	155.000-154.000	A	1.488	0.000	0.000	1.236	0.000	0.014
		B		0.000	0.000	3.565	0.000	0.052
		C		0.000	0.000	1.236	0.000	0.037
L8	154.000-153.750	A	1.487	0.000	0.000	0.440	0.000	0.005
		B		0.000	0.000	1.022	0.000	0.014
		C		0.000	0.000	0.440	0.000	0.010
L9	153.750-152.500	A	1.486	0.000	0.000	2.199	0.000	0.023
		B		0.000	0.000	5.110	0.000	0.071
		C		0.000	0.000	2.199	0.000	0.052
L10	152.500-152.250	A	1.486	0.000	0.000	0.440	0.000	0.005
		B		0.000	0.000	1.022	0.000	0.014
		C		0.000	0.000	0.440	0.000	0.010
L11	152.250-151.500	A	1.485	0.000	0.000	1.319	0.000	0.014
		B		0.000	0.000	3.065	0.000	0.042
		C		0.000	0.000	1.319	0.000	0.031
L12	151.500-151.250	A	1.485	0.000	0.000	0.440	0.000	0.005
		B		0.000	0.000	1.022	0.000	0.014
		C		0.000	0.000	0.440	0.000	0.010
L13	151.250-146.250	A	1.482	0.000	0.000	5.943	0.000	0.057
		B		0.000	0.000	17.578	0.000	0.247
		C		0.000	0.000	5.943	0.000	0.172
L14	146.250-141.250	A	1.477	0.000	0.000	5.227	0.000	0.048
		B		0.000	0.000	16.851	0.000	0.237
		C		0.000	0.000	5.227	0.000	0.163
L15	141.250-136.250	A	1.472	0.000	0.000	5.222	0.000	0.047
		B		0.000	0.000	16.834	0.000	0.237
		C		0.000	0.000	5.222	0.000	0.163
L16	136.250-130.000	A	1.466	0.000	0.000	8.919	0.000	0.080
		B		0.000	0.000	23.417	0.000	0.316
		C		0.000	0.000	8.919	0.000	0.224
L17	130.000-129.000	A	1.462	0.000	0.000	2.003	0.000	0.018
		B		0.000	0.000	4.323	0.000	0.056
		C		0.000	0.000	2.003	0.000	0.041
L18	129.000-124.000	A	1.458	0.000	0.000	10.000	0.000	0.089
		B		0.000	0.000	21.581	0.000	0.277
		C		0.000	0.000	10.000	0.000	0.205
L19	124.000-121.420	A	1.454	0.000	0.000	8.382	0.000	0.074
		B		0.000	0.000	14.353	0.000	0.170
		C		0.000	0.000	8.382	0.000	0.133
L20	121.420-121.170	A	1.452	0.000	0.000	0.822	0.000	0.007
		B		0.000	0.000	1.400	0.000	0.017
		C		0.000	0.000	0.822	0.000	0.013
L21	121.170-116.170	A	1.449	0.000	0.000	12.968	0.000	0.113
		B		0.000	0.000	24.528	0.000	0.299
		C		0.000	0.000	12.968	0.000	0.228
L22	116.170-115.000	A	1.445	0.000	0.000	2.626	0.000	0.023
		B		0.000	0.000	5.330	0.000	0.066
		C		0.000	0.000	2.626	0.000	0.050
L23	115.000-113.750	A	1.444	0.000	0.000	2.805	0.000	0.024
		B		0.000	0.000	5.692	0.000	0.071
		C		0.000	0.000	2.805	0.000	0.053
L24	113.750-113.500	A	1.443	0.000	0.000	0.561	0.000	0.005
		B		0.000	0.000	1.138	0.000	0.014
		C		0.000	0.000	0.561	0.000	0.011
L25	113.500-108.500	A	1.439	0.000	0.000	7.394	0.000	0.063
		B		0.000	0.000	18.933	0.000	0.249
		C		0.000	0.000	7.394	0.000	0.178
L26	108.500-103.500	A	1.433	0.000	0.000	6.433	0.000	0.054
		B		0.000	0.000	17.957	0.000	0.239
		C		0.000	0.000	6.433	0.000	0.169
L27	103.500-95.000	A	1.423	0.000	0.000	19.488	0.000	0.163
		B		0.000	0.000	39.043	0.000	0.476
		C		0.000	0.000	19.488	0.000	0.359
L28	95.000-94.000	A	1.416	0.000	0.000	2.569	0.000	0.021
		B		0.000	0.000	4.870	0.000	0.058
		C		0.000	0.000	2.569	0.000	0.044
L29	94.000-91.400	A	1.414	0.000	0.000	6.670	0.000	0.055

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
		B		0.000	0.000	12.640	0.000	0.151
		C		0.000	0.000	6.670	0.000	0.115
L30	91.400-91.150	A	1.412	0.000	0.000	0.641	0.000	0.005
		B		0.000	0.000	1.215	0.000	0.014
		C		0.000	0.000	0.641	0.000	0.011
L31	91.150-91.000	A	1.411	0.000	0.000	0.385	0.000	0.003
		B		0.000	0.000	0.729	0.000	0.009
		C		0.000	0.000	0.385	0.000	0.007
L32	91.000-86.000	A	1.407	0.000	0.000	9.111	0.000	0.075
		B		0.000	0.000	20.577	0.000	0.258
		C		0.000	0.000	9.111	0.000	0.190
L33	86.000-81.000	A	1.399	0.000	0.000	6.399	0.000	0.052
		B		0.000	0.000	17.847	0.000	0.234
		C		0.000	0.000	6.399	0.000	0.168
L34	81.000-76.000	A	1.390	0.000	0.000	6.390	0.000	0.052
		B		0.000	0.000	17.819	0.000	0.233
		C		0.000	0.000	6.390	0.000	0.167
L35	76.000-71.000	A	1.381	0.000	0.000	6.381	0.000	0.052
		B		0.000	0.000	17.789	0.000	0.231
		C		0.000	0.000	6.381	0.000	0.167
L36	71.000-66.000	A	1.372	0.000	0.000	6.372	0.000	0.051
		B		0.000	0.000	17.758	0.000	0.230
		C		0.000	0.000	6.372	0.000	0.166
L37	66.000-63.750	A	1.364	0.000	0.000	5.091	0.000	0.041
		B		0.000	0.000	10.208	0.000	0.121
		C		0.000	0.000	5.091	0.000	0.092
L38	63.750-63.500	A	1.362	0.000	0.000	0.636	0.000	0.005
		B		0.000	0.000	1.204	0.000	0.014
		C		0.000	0.000	0.636	0.000	0.011
L39	63.500-58.500	A	1.356	0.000	0.000	8.682	0.000	0.069
		B		0.000	0.000	20.032	0.000	0.246
		C		0.000	0.000	8.682	0.000	0.184
L40	58.500-51.000	A	1.341	0.000	0.000	12.485	0.000	0.099
		B		0.000	0.000	29.461	0.000	0.363
		C		0.000	0.000	12.485	0.000	0.272
L41	51.000-50.000	A	1.330	0.000	0.000	2.286	0.000	0.018
		B		0.000	0.000	4.550	0.000	0.053
		C		0.000	0.000	2.286	0.000	0.041
L42	50.000-45.000	A	1.322	0.000	0.000	11.395	0.000	0.090
		B		0.000	0.000	22.670	0.000	0.264
		C		0.000	0.000	11.395	0.000	0.205
L43	45.000-40.420	A	1.308	0.000	0.000	10.412	0.000	0.081
		B		0.000	0.000	20.711	0.000	0.239
		C		0.000	0.000	10.412	0.000	0.187
L44	40.420-40.170	A	1.301	0.000	0.000	0.568	0.000	0.004
		B		0.000	0.000	1.129	0.000	0.013
		C		0.000	0.000	0.568	0.000	0.010
L45	40.170-40.000	A	1.300	0.000	0.000	0.386	0.000	0.003
		B		0.000	0.000	0.768	0.000	0.009
		C		0.000	0.000	0.386	0.000	0.007
L46	40.000-35.000	A	1.291	0.000	0.000	15.487	0.000	0.115
		B		0.000	0.000	22.639	0.000	0.257
		C		0.000	0.000	11.434	0.000	0.201
L47	35.000-33.000	A	1.279	0.000	0.000	9.201	0.000	0.067
		B		0.000	0.000	10.327	0.000	0.111
		C		0.000	0.000	5.856	0.000	0.089
L48	33.000-32.750	A	1.275	0.000	0.000	1.150	0.000	0.008
		B		0.000	0.000	1.290	0.000	0.014
		C		0.000	0.000	0.732	0.000	0.011
L49	32.750-19.000	A	1.244	0.000	0.000	48.610	0.000	0.342
		B		0.000	0.000	56.232	0.000	0.639
		C		0.000	0.000	25.710	0.000	0.498
L50	19.000-18.000	A	1.203	0.000	0.000	3.331	0.000	0.023
		B		0.000	0.000	3.885	0.000	0.045
		C		0.000	0.000	1.665	0.000	0.035
L51	18.000-13.000	A	1.182	0.000	0.000	16.531	0.000	0.110
		B		0.000	0.000	19.225	0.000	0.215
		C		0.000	0.000	8.265	0.000	0.170
L52	13.000-8.000	A	1.137	0.000	0.000	16.441	0.000	0.105

Tower Sectio n	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L53	8.000-6.420	B	1.095	0.000	0.000	19.078	0.000	0.209
		C		0.000	0.000	8.220	0.000	0.168
		A		0.000	0.000	5.169	0.000	0.032
L54	6.420-6.170	B	1.080	0.000	0.000	5.986	0.000	0.064
		C		0.000	0.000	2.584	0.000	0.052
		A		0.000	0.000	0.816	0.000	0.005
L55	6.170-1.170	B	1.023	0.000	0.000	0.945	0.000	0.010
		C		0.000	0.000	0.408	0.000	0.008
		A		0.000	0.000	16.213	0.000	0.093
L56	1.170-0.000	B	0.852	0.000	0.000	18.709	0.000	0.192
		C		0.000	0.000	8.107	0.000	0.162
		A		0.000	0.000	3.714	0.000	0.018
		B		0.000	0.000	4.247	0.000	0.039
		C		0.000	0.000	1.857	0.000	0.036

### Feed Line Center of Pressure

Section	Elevation ft	CP <sub>x</sub> in	CP <sub>z</sub> in	CP <sub>x</sub> Ice in	CP <sub>z</sub> Ice in
L1	185.000-180.000	3.2917	1.0990	3.1874	1.0642
L2	180.000-175.000	4.1151	1.3739	4.2546	1.4204
L3	175.000-170.000	4.2813	1.4294	4.4023	1.4697
L4	170.000-165.000	4.4382	1.4817	4.5399	1.5157
L5	165.000-160.000	4.8250	1.0392	5.0671	0.7204
L6	160.000-155.000	4.8619	1.0446	5.1214	0.7253
L7	155.000-154.000	2.8396	0.6093	3.2677	0.4618
L8	154.000-153.750	2.4423	0.5239	2.8258	0.3992
L9	153.750-152.500	2.4576	0.5270	2.8423	0.4013
L10	152.500-152.250	2.4740	0.5304	2.8604	0.4037
L11	152.250-151.500	2.4841	0.5324	2.8713	0.4051
L12	151.500-151.250	2.4935	0.5343	2.8811	0.4064
L13	151.250-146.250	3.1162	0.6671	3.4538	0.4864
L14	146.250-141.250	3.4169	0.7302	3.7295	0.5240
L15	141.250-136.250	3.5294	0.7530	3.8422	0.5388
L16	136.250-130.000	3.2209	0.6860	3.5470	0.4965
L17	130.000-129.000	2.7742	0.5905	3.1032	0.4338
L18	129.000-124.000	2.8274	0.6014	3.1581	0.4418
L19	124.000-121.420	2.1339	0.4534	2.5014	0.3497
L20	121.420-121.170	2.1359	0.4537	2.5053	0.3502
L21	121.170-116.170	2.4842	0.5274	2.9007	0.4053
L22	116.170-115.000	2.7260	0.5783	3.1714	0.4431
L23	115.000-113.750	2.7454	0.5823	3.1921	0.4459
L24	113.750-113.500	2.7567	0.5846	3.2038	0.4475
L25	113.500-108.500	3.3856	0.7175	3.8792	0.5419
L26	108.500-103.500	3.6618	0.7753	4.1657	0.5819
L27	103.500-95.000	2.8725	0.6075	3.3925	0.4742
L28	95.000-94.000	2.7337	0.5778	3.2519	0.4541
L29	94.000-91.400	2.7580	0.5828	3.2762	0.4587
L30	91.400-91.150	2.7765	0.5866	3.2954	0.4615
L31	91.150-91.000	2.7792	0.5871	3.2982	0.4619
L32	91.000-86.000	3.3538	0.7082	3.8865	0.5446
L33	86.000-81.000	3.9346	0.8303	4.4968	0.6309
L34	81.000-76.000	3.9938	0.8422	4.5714	0.6423
L35	76.000-71.000	4.0510	0.8537	4.6435	0.6536
L36	71.000-66.000	4.1066	0.8648	4.7132	0.6648
L37	66.000-63.750	3.2772	0.6899	3.8517	0.5442
L38	63.750-63.500	3.1051	0.6535	3.6679	0.5186
L39	63.500-58.500	3.7273	0.7843	4.3360	0.6139
L40	58.500-51.000	3.8767	0.8152	4.4788	0.6365
L41	51.000-50.000	3.4262	0.7203	3.9795	0.5653
L42	50.000-45.000	3.4557	0.7263	4.0120	0.5734
L43	45.000-40.420	3.5021	0.7357	4.0672	0.5836
L44	40.420-40.170	3.5245	0.7402	4.0938	0.5888
L45	40.170-40.000	3.5265	0.7406	4.0961	0.5892



Section	Elevation	CP <sub>x</sub>	CP <sub>z</sub>	CP <sub>x</sub>	CP <sub>z</sub>
	ft	in	in	Ice in	Ice in
L46	40.000-35.000	3.5076	1.8247	4.1169	1.5573
L47	35.000-33.000	3.1808	2.5637	3.7606	2.2652
L48	33.000-32.750	3.1925	2.5735	3.7736	2.2746
L49	32.750-19.000	3.8942	3.1418	4.5522	2.7567
L50	19.000-18.000	4.0964	3.3066	4.7821	2.8974
L51	18.000-13.000	4.1268	3.3322	4.7921	2.9274
L52	13.000-8.000	4.1769	3.3743	4.8335	2.9715
L53	8.000-6.420	4.2092	3.4016	4.8544	3.0017
L54	6.420-6.170	4.2220	3.4122	4.8630	3.0131
L55	6.170-1.170	4.2472	3.4335	4.8680	3.0399
L56	1.170-0.000	4.2767	3.4583	4.8253	3.0855

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 <sub>a</sub> No Ice	K <sub>a</sub> Ice
L1	2	LDF7-50A(1-5/8")	180.00 - 183.00	1.0000	1.0000
L2	2	LDF7-50A(1-5/8")	175.00 - 180.00	1.0000	1.0000
L3	2	LDF7-50A(1-5/8")	170.00 - 175.00	1.0000	1.0000
L4	2	LDF7-50A(1-5/8")	165.00 - 170.00	1.0000	1.0000
L5	2	LDF7-50A(1-5/8")	160.00 - 165.00	1.0000	1.0000
L5	56	CU12PSM6P4XXX(1-3/4)	160.00 - 165.00	1.0000	1.0000
L6	2	LDF7-50A(1-5/8")	155.00 - 160.00	1.0000	1.0000
L6	52	CCI-040075 (W)	155.00 - 155.25	1.0000	1.0000
L6	53	CCI-040075 (W)	155.00 - 155.25	1.0000	1.0000
L6	54	CCI-040075 (W)	155.00 - 155.25	1.0000	1.0000
L6	56	CU12PSM6P4XXX(1-3/4)	155.00 - 160.00	1.0000	1.0000
L7	2	LDF7-50A(1-5/8")	154.00 - 155.00	1.0000	1.0000
L7	35	CCI-045100 (L)	154.00 - 154.50	1.0000	1.0000
L7	36	CCI-045100 (L)	154.00 - 154.50	1.0000	1.0000
L7	37	CCI-045100 (L)	154.00 - 154.50	1.0000	1.0000
L7	52	CCI-040075 (W)	154.00 - 155.00	1.0000	1.0000
L7	53	CCI-040075 (W)	154.00 - 155.00	1.0000	1.0000
L7	54	CCI-040075 (W)	154.00 - 155.00	1.0000	1.0000
L7	56	CU12PSM6P4XXX(1-3/4)	154.00 - 155.00	1.0000	1.0000
L8	2	LDF7-50A(1-5/8")	153.75 - 154.00	1.0000	1.0000
L8	35	CCI-045100 (L)	153.75 - 154.00	1.0000	1.0000
L8	36	CCI-045100 (L)	153.75 - 154.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L8	37	CCI-045100 (L)	154.00 153.75 - 154.00	1.0000	1.0000
L8	52	CCI-040075 (W)	153.75 - 154.00	1.0000	1.0000
L8	53	CCI-040075 (W)	153.75 - 154.00	1.0000	1.0000
L8	54	CCI-040075 (W)	153.75 - 154.00	1.0000	1.0000
L8	56	CU12PSM6P4XXX(1-3/4)	153.75 - 154.00	1.0000	1.0000
L9	2	LDF7-50A(1-5/8")	152.50 - 153.75	1.0000	1.0000
L9	35	CCI-045100 (L)	152.50 - 153.75	1.0000	1.0000
L9	36	CCI-045100 (L)	152.50 - 153.75	1.0000	1.0000
L9	37	CCI-045100 (L)	152.50 - 153.75	1.0000	1.0000
L9	52	CCI-040075 (W)	152.50 - 153.75	1.0000	1.0000
L9	53	CCI-040075 (W)	152.50 - 153.75	1.0000	1.0000
L9	54	CCI-040075 (W)	152.50 - 153.75	1.0000	1.0000
L9	56	CU12PSM6P4XXX(1-3/4)	152.50 - 153.75	1.0000	1.0000
L10	2	LDF7-50A(1-5/8")	152.25 - 152.50	1.0000	1.0000
L10	35	CCI-045100 (L)	152.25 - 152.50	1.0000	1.0000
L10	36	CCI-045100 (L)	152.25 - 152.50	1.0000	1.0000
L10	37	CCI-045100 (L)	152.25 - 152.50	1.0000	1.0000
L10	52	CCI-040075 (W)	152.25 - 152.50	1.0000	1.0000
L10	53	CCI-040075 (W)	152.25 - 152.50	1.0000	1.0000
L10	54	CCI-040075 (W)	152.25 - 152.50	1.0000	1.0000
L10	56	CU12PSM6P4XXX(1-3/4)	152.25 - 152.50	1.0000	1.0000
L11	2	LDF7-50A(1-5/8")	151.50 - 152.25	1.0000	1.0000
L11	35	CCI-045100 (L)	151.50 - 152.25	1.0000	1.0000
L11	36	CCI-045100 (L)	151.50 - 152.25	1.0000	1.0000
L11	37	CCI-045100 (L)	151.50 - 152.25	1.0000	1.0000
L11	52	CCI-040075 (W)	151.50 - 152.25	1.0000	1.0000
L11	53	CCI-040075 (W)	151.50 - 152.25	1.0000	1.0000
L11	54	CCI-040075 (W)	151.50 - 152.25	1.0000	1.0000
L11	56	CU12PSM6P4XXX(1-3/4)	151.50 - 152.25	1.0000	1.0000
L12	2	LDF7-50A(1-5/8")	151.25 - 151.50	1.0000	1.0000
L12	35	CCI-045100 (L)	151.25 - 151.50	1.0000	1.0000
L12	36	CCI-045100 (L)	151.25 - 151.50	1.0000	1.0000
L12	37	CCI-045100 (L)	151.25 - 151.50	1.0000	1.0000
L12	52	CCI-040075 (W)	151.25 - 151.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L12	53	CCI-040075 (W)	151.25 - 151.50	1.0000	1.0000
L12	54	CCI-040075 (W)	151.25 - 151.50	1.0000	1.0000
L12	56	CU12PSM6P4XXX(1-3/4)	151.25 - 151.50	1.0000	1.0000
L13	2	LDF7-50A(1-5/8")	146.25 - 151.25	1.0000	1.0000
L13	35	CCI-045100 (L)	146.25 - 151.25	1.0000	1.0000
L13	36	CCI-045100 (L)	146.25 - 151.25	1.0000	1.0000
L13	37	CCI-045100 (L)	146.25 - 151.25	1.0000	1.0000
L13	52	CCI-040075 (W)	150.25 - 151.25	1.0000	1.0000
L13	53	CCI-040075 (W)	150.25 - 151.25	1.0000	1.0000
L13	54	CCI-040075 (W)	150.25 - 151.25	1.0000	1.0000
L13	56	CU12PSM6P4XXX(1-3/4)	146.25 - 151.25	1.0000	1.0000
L14	2	LDF7-50A(1-5/8")	141.25 - 146.25	1.0000	1.0000
L14	35	CCI-045100 (L)	141.25 - 146.25	1.0000	1.0000
L14	36	CCI-045100 (L)	141.25 - 146.25	1.0000	1.0000
L14	37	CCI-045100 (L)	141.25 - 146.25	1.0000	1.0000
L14	56	CU12PSM6P4XXX(1-3/4)	141.25 - 146.25	1.0000	1.0000
L15	2	LDF7-50A(1-5/8")	136.25 - 141.25	1.0000	1.0000
L15	35	CCI-045100 (L)	136.25 - 141.25	1.0000	1.0000
L15	36	CCI-045100 (L)	136.25 - 141.25	1.0000	1.0000
L15	37	CCI-045100 (L)	136.25 - 141.25	1.0000	1.0000
L15	56	CU12PSM6P4XXX(1-3/4)	136.25 - 141.25	1.0000	1.0000
L16	2	LDF7-50A(1-5/8")	130.00 - 136.25	1.0000	1.0000
L16	35	CCI-045100 (L)	130.00 - 136.25	1.0000	1.0000
L16	36	CCI-045100 (L)	130.00 - 136.25	1.0000	1.0000
L16	37	CCI-045100 (L)	130.00 - 136.25	1.0000	1.0000
L16	49	CCI-040075 (W)	130.00 - 132.50	1.0000	1.0000
L16	50	CCI-040075 (W)	130.00 - 132.50	1.0000	1.0000
L16	51	CCI-040075 (W)	130.00 - 132.50	1.0000	1.0000
L16	56	CU12PSM6P4XXX(1-3/4)	130.00 - 136.25	1.0000	1.0000
L17	2	LDF7-50A(1-5/8")	129.00 - 130.00	1.0000	1.0000
L17	35	CCI-045100 (L)	129.00 - 130.00	1.0000	1.0000
L17	36	CCI-045100 (L)	129.00 - 130.00	1.0000	1.0000
L17	37	CCI-045100 (L)	129.00 - 130.00	1.0000	1.0000
L17	49	CCI-040075 (W)	129.00 - 130.00	1.0000	1.0000
L17	50	CCI-040075 (W)	129.00 - 130.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L17	51	CCI-040075 (W)	130.00 129.00 - 130.00	1.0000	1.0000
L17	56	CU12PSM6P4XXX(1-3/4)	129.00 - 130.00	1.0000	1.0000
L18	2	LDF7-50A(1-5/8")	124.00 - 129.00	1.0000	1.0000
L18	35	CCI-045100 (L)	124.00 - 129.00	1.0000	1.0000
L18	36	CCI-045100 (L)	124.00 - 129.00	1.0000	1.0000
L18	37	CCI-045100 (L)	124.00 - 129.00	1.0000	1.0000
L18	49	CCI-040075 (W)	124.00 - 129.00	1.0000	1.0000
L18	50	CCI-040075 (W)	124.00 - 129.00	1.0000	1.0000
L18	51	CCI-040075 (W)	124.00 - 129.00	1.0000	1.0000
L18	56	CU12PSM6P4XXX(1-3/4)	124.00 - 129.00	1.0000	1.0000
L19	2	LDF7-50A(1-5/8")	121.42 - 124.00	1.0000	1.0000
L19	32	CCI-060100 (L)	121.42 - 123.92	1.0000	1.0000
L19	33	CCI-060100 (L)	121.42 - 123.92	1.0000	1.0000
L19	34	CCI-060100 (L)	121.42 - 123.92	1.0000	1.0000
L19	35	CCI-045100 (L)	121.42 - 124.00	1.0000	1.0000
L19	36	CCI-045100 (L)	121.42 - 124.00	1.0000	1.0000
L19	37	CCI-045100 (L)	121.42 - 124.00	1.0000	1.0000
L19	49	CCI-040075 (W)	121.42 - 124.00	1.0000	1.0000
L19	50	CCI-040075 (W)	121.42 - 124.00	1.0000	1.0000
L19	51	CCI-040075 (W)	121.42 - 124.00	1.0000	1.0000
L19	56	CU12PSM6P4XXX(1-3/4)	121.42 - 124.00	1.0000	1.0000
L20	2	LDF7-50A(1-5/8")	121.17 - 121.42	1.0000	1.0000
L20	32	CCI-060100 (L)	121.17 - 121.42	1.0000	1.0000
L20	33	CCI-060100 (L)	121.17 - 121.42	1.0000	1.0000
L20	34	CCI-060100 (L)	121.17 - 121.42	1.0000	1.0000
L20	35	CCI-045100 (L)	121.17 - 121.42	1.0000	1.0000
L20	36	CCI-045100 (L)	121.17 - 121.42	1.0000	1.0000
L20	37	CCI-045100 (L)	121.17 - 121.42	1.0000	1.0000
L20	49	CCI-040075 (W)	121.17 - 121.42	1.0000	1.0000
L20	50	CCI-040075 (W)	121.17 - 121.42	1.0000	1.0000
L20	51	CCI-040075 (W)	121.17 - 121.42	1.0000	1.0000
L20	56	CU12PSM6P4XXX(1-3/4)	121.17 - 121.42	1.0000	1.0000
L21	2	LDF7-50A(1-5/8")	116.17 - 121.17	1.0000	1.0000
L21	32	CCI-060100 (L)	116.17 - 121.17	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L21	33	CCI-060100 (L)	116.17 - 121.17	1.0000	1.0000
L21	34	CCI-060100 (L)	116.17 - 121.17	1.0000	1.0000
L21	35	CCI-045100 (L)	119.50 - 121.17	1.0000	1.0000
L21	36	CCI-045100 (L)	119.50 - 121.17	1.0000	1.0000
L21	37	CCI-045100 (L)	119.50 - 121.17	1.0000	1.0000
L21	49	CCI-040075 (W)	116.17 - 121.17	1.0000	1.0000
L21	50	CCI-040075 (W)	116.17 - 121.17	1.0000	1.0000
L21	51	CCI-040075 (W)	116.17 - 121.17	1.0000	1.0000
L21	56	CU12PSM6P4XXX(1-3/4)	116.17 - 121.17	1.0000	1.0000
L22	2	LDF7-50A(1-5/8")	115.00 - 116.17	1.0000	1.0000
L22	32	CCI-060100 (L)	115.00 - 116.17	1.0000	1.0000
L22	33	CCI-060100 (L)	115.00 - 116.17	1.0000	1.0000
L22	34	CCI-060100 (L)	115.00 - 116.17	1.0000	1.0000
L22	49	CCI-040075 (W)	115.00 - 116.17	1.0000	1.0000
L22	50	CCI-040075 (W)	115.00 - 116.17	1.0000	1.0000
L22	51	CCI-040075 (W)	115.00 - 116.17	1.0000	1.0000
L22	56	CU12PSM6P4XXX(1-3/4)	115.00 - 116.17	1.0000	1.0000
L23	2	LDF7-50A(1-5/8")	113.75 - 115.00	1.0000	1.0000
L23	32	CCI-060100 (L)	113.75 - 115.00	1.0000	1.0000
L23	33	CCI-060100 (L)	113.75 - 115.00	1.0000	1.0000
L23	34	CCI-060100 (L)	113.75 - 115.00	1.0000	1.0000
L23	49	CCI-040075 (W)	113.75 - 115.00	1.0000	1.0000
L23	50	CCI-040075 (W)	113.75 - 115.00	1.0000	1.0000
L23	51	CCI-040075 (W)	113.75 - 115.00	1.0000	1.0000
L23	56	CU12PSM6P4XXX(1-3/4)	113.75 - 115.00	1.0000	1.0000
L24	2	LDF7-50A(1-5/8")	113.50 - 113.75	1.0000	1.0000
L24	32	CCI-060100 (L)	113.50 - 113.75	1.0000	1.0000
L24	33	CCI-060100 (L)	113.50 - 113.75	1.0000	1.0000
L24	34	CCI-060100 (L)	113.50 - 113.75	1.0000	1.0000
L24	49	CCI-040075 (W)	113.50 - 113.75	1.0000	1.0000
L24	50	CCI-040075 (W)	113.50 - 113.75	1.0000	1.0000
L24	51	CCI-040075 (W)	113.50 - 113.75	1.0000	1.0000
L24	56	CU12PSM6P4XXX(1-3/4)	113.50 - 113.75	1.0000	1.0000
L25	2	LDF7-50A(1-5/8")	108.50 - 113.50	1.0000	1.0000
L25	32	CCI-060100 (L)	108.50 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L25	33	CCI-060100 (L)	113.50 108.50 - 113.50	1.0000	1.0000
L25	34	CCI-060100 (L)	108.50 - 113.50	1.0000	1.0000
L25	49	CCI-040075 (W)	112.50 - 113.50	1.0000	1.0000
L25	50	CCI-040075 (W)	112.50 - 113.50	1.0000	1.0000
L25	51	CCI-040075 (W)	112.50 - 113.50	1.0000	1.0000
L25	56	CU12PSM6P4XXX(1-3/4)	108.50 - 113.50	1.0000	1.0000
L26	2	LDF7-50A(1-5/8")	103.50 - 108.50	1.0000	1.0000
L26	32	CCI-060100 (L)	103.50 - 108.50	1.0000	1.0000
L26	33	CCI-060100 (L)	103.50 - 108.50	1.0000	1.0000
L26	34	CCI-060100 (L)	103.50 - 108.50	1.0000	1.0000
L26	56	CU12PSM6P4XXX(1-3/4)	103.50 - 108.50	1.0000	1.0000
L27	2	LDF7-50A(1-5/8")	95.00 - 103.50	1.0000	1.0000
L27	32	CCI-060100 (L)	95.00 - 103.50	1.0000	1.0000
L27	33	CCI-060100 (L)	95.00 - 103.50	1.0000	1.0000
L27	34	CCI-060100 (L)	95.00 - 103.50	1.0000	1.0000
L27	46	CCI-060100 (L)	95.00 - 101.67	1.0000	1.0000
L27	47	CCI-060100 (L)	95.00 - 101.67	1.0000	1.0000
L27	48	CCI-060100 (L)	95.00 - 101.67	1.0000	1.0000
L27	56	CU12PSM6P4XXX(1-3/4)	95.00 - 103.50	1.0000	1.0000
L28	2	LDF7-50A(1-5/8")	94.00 - 95.00	1.0000	1.0000
L28	32	CCI-060100 (L)	94.00 - 95.00	1.0000	1.0000
L28	33	CCI-060100 (L)	94.00 - 95.00	1.0000	1.0000
L28	34	CCI-060100 (L)	94.00 - 95.00	1.0000	1.0000
L28	46	CCI-060100 (L)	94.00 - 95.00	1.0000	1.0000
L28	47	CCI-060100 (L)	94.00 - 95.00	1.0000	1.0000
L28	48	CCI-060100 (L)	94.00 - 95.00	1.0000	1.0000
L28	56	CU12PSM6P4XXX(1-3/4)	94.00 - 95.00	1.0000	1.0000
L29	2	LDF7-50A(1-5/8")	91.40 - 94.00	1.0000	1.0000
L29	32	CCI-060100 (L)	91.40 - 94.00	1.0000	1.0000
L29	33	CCI-060100 (L)	91.40 - 94.00	1.0000	1.0000
L29	34	CCI-060100 (L)	91.40 - 94.00	1.0000	1.0000
L29	46	CCI-060100 (L)	91.40 - 94.00	1.0000	1.0000
L29	47	CCI-060100 (L)	91.40 - 94.00	1.0000	1.0000
L29	48	CCI-060100 (L)	91.40 - 94.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L29	56	CU12PSM6P4XXX(1-3/4)	91.40 - 94.00	1.0000	1.0000
L30	2	LDF7-50A(1-5/8")	91.15 - 91.40	1.0000	1.0000
L30	32	CCI-060100 (L)	91.15 - 91.40	1.0000	1.0000
L30	33	CCI-060100 (L)	91.15 - 91.40	1.0000	1.0000
L30	34	CCI-060100 (L)	91.15 - 91.40	1.0000	1.0000
L30	46	CCI-060100 (L)	91.15 - 91.40	1.0000	1.0000
L30	47	CCI-060100 (L)	91.15 - 91.40	1.0000	1.0000
L30	48	CCI-060100 (L)	91.15 - 91.40	1.0000	1.0000
L30	56	CU12PSM6P4XXX(1-3/4)	91.15 - 91.40	1.0000	1.0000
L31	2	LDF7-50A(1-5/8")	91.00 - 91.15	1.0000	1.0000
L31	32	CCI-060100 (L)	91.00 - 91.15	1.0000	1.0000
L31	33	CCI-060100 (L)	91.00 - 91.15	1.0000	1.0000
L31	34	CCI-060100 (L)	91.00 - 91.15	1.0000	1.0000
L31	46	CCI-060100 (L)	91.00 - 91.15	1.0000	1.0000
L31	47	CCI-060100 (L)	91.00 - 91.15	1.0000	1.0000
L31	48	CCI-060100 (L)	91.00 - 91.15	1.0000	1.0000
L31	56	CU12PSM6P4XXX(1-3/4)	91.00 - 91.15	1.0000	1.0000
L32	2	LDF7-50A(1-5/8")	86.00 - 91.00	1.0000	1.0000
L32	32	CCI-060100 (L)	88.89 - 91.00	1.0000	1.0000
L32	33	CCI-060100 (L)	88.89 - 91.00	1.0000	1.0000
L32	34	CCI-060100 (L)	88.89 - 91.00	1.0000	1.0000
L32	46	CCI-060100 (L)	86.00 - 91.00	1.0000	1.0000
L32	47	CCI-060100 (L)	86.00 - 91.00	1.0000	1.0000
L32	48	CCI-060100 (L)	86.00 - 91.00	1.0000	1.0000
L32	56	CU12PSM6P4XXX(1-3/4)	86.00 - 91.00	1.0000	1.0000
L33	2	LDF7-50A(1-5/8")	81.00 - 86.00	1.0000	1.0000
L33	46	CCI-060100 (L)	81.00 - 86.00	1.0000	1.0000
L33	47	CCI-060100 (L)	81.00 - 86.00	1.0000	1.0000
L33	48	CCI-060100 (L)	81.00 - 86.00	1.0000	1.0000
L33	56	CU12PSM6P4XXX(1-3/4)	81.00 - 86.00	1.0000	1.0000
L34	2	LDF7-50A(1-5/8")	76.00 - 81.00	1.0000	1.0000
L34	46	CCI-060100 (L)	76.00 - 81.00	1.0000	1.0000
L34	47	CCI-060100 (L)	76.00 - 81.00	1.0000	1.0000
L34	48	CCI-060100 (L)	76.00 - 81.00	1.0000	1.0000
L34	56	CU12PSM6P4XXX(1-3/4)	76.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L35	2	LDF7-50A(1-5/8")	81.00 71.00 - 76.00	1.0000	1.0000
L35	46	CCI-060100 (L)	71.00 - 76.00	1.0000	1.0000
L35	47	CCI-060100 (L)	71.00 - 76.00	1.0000	1.0000
L35	48	CCI-060100 (L)	71.00 - 76.00	1.0000	1.0000
L35	56	CU12PSM6P4XXX(1-3/4)	71.00 - 76.00	1.0000	1.0000
L36	2	LDF7-50A(1-5/8")	66.00 - 71.00	1.0000	1.0000
L36	46	CCI-060100 (L)	66.00 - 71.00	1.0000	1.0000
L36	47	CCI-060100 (L)	66.00 - 71.00	1.0000	1.0000
L36	48	CCI-060100 (L)	66.00 - 71.00	1.0000	1.0000
L36	56	CU12PSM6P4XXX(1-3/4)	66.00 - 71.00	1.0000	1.0000
L37	2	LDF7-50A(1-5/8")	63.75 - 66.00	1.0000	1.0000
L37	43	CCI-060100 (L)	63.75 - 65.50	1.0000	1.0000
L37	44	CCI-060100 (L)	63.75 - 65.50	1.0000	1.0000
L37	45	CCI-060100 (L)	63.75 - 65.50	1.0000	1.0000
L37	46	CCI-060100 (L)	63.75 - 66.00	1.0000	1.0000
L37	47	CCI-060100 (L)	63.75 - 66.00	1.0000	1.0000
L37	48	CCI-060100 (L)	63.75 - 66.00	1.0000	1.0000
L37	56	CU12PSM6P4XXX(1-3/4)	63.75 - 66.00	1.0000	1.0000
L38	2	LDF7-50A(1-5/8")	63.50 - 63.75	1.0000	1.0000
L38	43	CCI-060100 (L)	63.50 - 63.75	1.0000	1.0000
L38	44	CCI-060100 (L)	63.50 - 63.75	1.0000	1.0000
L38	45	CCI-060100 (L)	63.50 - 63.75	1.0000	1.0000
L38	46	CCI-060100 (L)	63.50 - 63.75	1.0000	1.0000
L38	47	CCI-060100 (L)	63.50 - 63.75	1.0000	1.0000
L38	48	CCI-060100 (L)	63.50 - 63.75	1.0000	1.0000
L38	56	CU12PSM6P4XXX(1-3/4)	63.50 - 63.75	1.0000	1.0000
L39	2	LDF7-50A(1-5/8")	58.50 - 63.50	1.0000	1.0000
L39	43	CCI-060100 (L)	58.50 - 63.50	1.0000	1.0000
L39	44	CCI-060100 (L)	58.50 - 63.50	1.0000	1.0000
L39	45	CCI-060100 (L)	58.50 - 63.50	1.0000	1.0000
L39	46	CCI-060100 (L)	61.67 - 63.50	1.0000	1.0000
L39	47	CCI-060100 (L)	61.67 - 63.50	1.0000	1.0000
L39	48	CCI-060100 (L)	61.67 - 63.50	1.0000	1.0000
L39	56	CU12PSM6P4XXX(1-3/4)	58.50 - 63.50	1.0000	1.0000



Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L40	2	LDF7-50A(1-5/8")	51.00 - 58.50	1.0000	1.0000
L40	29	CCI-045100 (L)	51.00 - 53.92	1.0000	1.0000
L40	30	CCI-045100 (L)	51.00 - 53.92	1.0000	1.0000
L40	31	CCI-045100 (L)	51.00 - 53.92	1.0000	1.0000
L40	43	CCI-060100 (L)	51.00 - 58.50	1.0000	1.0000
L40	44	CCI-060100 (L)	51.00 - 58.50	1.0000	1.0000
L40	45	CCI-060100 (L)	51.00 - 58.50	1.0000	1.0000
L40	56	CU12PSM6P4XXX(1-3/4)	51.00 - 58.50	1.0000	1.0000
L41	2	LDF7-50A(1-5/8")	50.00 - 51.00	1.0000	1.0000
L41	29	CCI-045100 (L)	50.00 - 51.00	1.0000	1.0000
L41	30	CCI-045100 (L)	50.00 - 51.00	1.0000	1.0000
L41	31	CCI-045100 (L)	50.00 - 51.00	1.0000	1.0000
L41	43	CCI-060100 (L)	50.00 - 51.00	1.0000	1.0000
L41	44	CCI-060100 (L)	50.00 - 51.00	1.0000	1.0000
L41	45	CCI-060100 (L)	50.00 - 51.00	1.0000	1.0000
L41	56	CU12PSM6P4XXX(1-3/4)	50.00 - 51.00	1.0000	1.0000
L42	2	LDF7-50A(1-5/8")	45.00 - 50.00	1.0000	1.0000
L42	29	CCI-045100 (L)	45.00 - 50.00	1.0000	1.0000
L42	30	CCI-045100 (L)	45.00 - 50.00	1.0000	1.0000
L42	31	CCI-045100 (L)	45.00 - 50.00	1.0000	1.0000
L42	43	CCI-060100 (L)	45.00 - 50.00	1.0000	1.0000
L42	44	CCI-060100 (L)	45.00 - 50.00	1.0000	1.0000
L42	45	CCI-060100 (L)	45.00 - 50.00	1.0000	1.0000
L42	56	CU12PSM6P4XXX(1-3/4)	45.00 - 50.00	1.0000	1.0000
L43	2	LDF7-50A(1-5/8")	40.42 - 45.00	1.0000	1.0000
L43	29	CCI-045100 (L)	40.42 - 45.00	1.0000	1.0000
L43	30	CCI-045100 (L)	40.42 - 45.00	1.0000	1.0000
L43	31	CCI-045100 (L)	40.42 - 45.00	1.0000	1.0000
L43	43	CCI-060100 (L)	40.42 - 45.00	1.0000	1.0000
L43	44	CCI-060100 (L)	40.42 - 45.00	1.0000	1.0000
L43	45	CCI-060100 (L)	40.42 - 45.00	1.0000	1.0000
L43	56	CU12PSM6P4XXX(1-3/4)	40.42 - 45.00	1.0000	1.0000
L44	2	LDF7-50A(1-5/8")	40.17 - 40.42	1.0000	1.0000
L44	29	CCI-045100 (L)	40.17 - 40.42	1.0000	1.0000
L44	30	CCI-045100 (L)	40.17 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L44	31	CCI-045100 (L)	40.42 40.17 - 40.42	1.0000	1.0000
L44	43	CCI-060100 (L)	40.17 - 40.42	1.0000	1.0000
L44	44	CCI-060100 (L)	40.17 - 40.42	1.0000	1.0000
L44	45	CCI-060100 (L)	40.17 - 40.42	1.0000	1.0000
L44	56	CU12PSM6P4XXX(1-3/4)	40.17 - 40.42	1.0000	1.0000
L45	2	LDF7-50A(1-5/8")	40.00 - 40.17	1.0000	1.0000
L45	29	CCI-045100 (L)	40.00 - 40.17	1.0000	1.0000
L45	30	CCI-045100 (L)	40.00 - 40.17	1.0000	1.0000
L45	31	CCI-045100 (L)	40.00 - 40.17	1.0000	1.0000
L45	43	CCI-060100 (L)	40.00 - 40.17	1.0000	1.0000
L45	44	CCI-060100 (L)	40.00 - 40.17	1.0000	1.0000
L45	45	CCI-060100 (L)	40.00 - 40.17	1.0000	1.0000
L45	56	CU12PSM6P4XXX(1-3/4)	40.00 - 40.17	1.0000	1.0000
L46	2	LDF7-50A(1-5/8")	35.00 - 40.00	1.0000	1.0000
L46	29	CCI-045100 (L)	38.92 - 40.00	1.0000	1.0000
L46	30	CCI-045100 (L)	38.92 - 40.00	1.0000	1.0000
L46	31	CCI-045100 (L)	38.92 - 40.00	1.0000	1.0000
L46	39	CCI-085125 (L)	35.00 - 37.42	1.0000	1.0000
L46	40	CCI-085125 (L)	35.00 - 37.42	1.0000	1.0000
L46	41	CCI-085125 (L)	35.00 - 37.42	1.0000	1.0000
L46	42	CCI-085125 (L)	35.00 - 37.42	1.0000	1.0000
L46	43	CCI-060100 (L)	35.00 - 40.00	1.0000	1.0000
L46	44	CCI-060100 (L)	35.00 - 40.00	1.0000	1.0000
L46	45	CCI-060100 (L)	35.00 - 40.00	1.0000	1.0000
L46	56	CU12PSM6P4XXX(1-3/4)	35.00 - 40.00	1.0000	1.0000
L47	2	LDF7-50A(1-5/8")	33.00 - 35.00	1.0000	1.0000
L47	39	CCI-085125 (L)	33.00 - 35.00	1.0000	1.0000
L47	40	CCI-085125 (L)	33.00 - 35.00	1.0000	1.0000
L47	41	CCI-085125 (L)	33.00 - 35.00	1.0000	1.0000
L47	42	CCI-085125 (L)	33.00 - 35.00	1.0000	1.0000
L47	43	CCI-060100 (L)	33.00 - 35.00	1.0000	1.0000
L47	44	CCI-060100 (L)	33.00 - 35.00	1.0000	1.0000
L47	45	CCI-060100 (L)	33.00 - 35.00	1.0000	1.0000
L47	56	CU12PSM6P4XXX(1-3/4)	33.00 - 35.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L48	2	LDF7-50A(1-5/8")	32.75 - 33.00	1.0000	1.0000
L48	39	CCI-085125 (L)	32.75 - 33.00	1.0000	1.0000
L48	40	CCI-085125 (L)	32.75 - 33.00	1.0000	1.0000
L48	41	CCI-085125 (L)	32.75 - 33.00	1.0000	1.0000
L48	42	CCI-085125 (L)	32.75 - 33.00	1.0000	1.0000
L48	43	CCI-060100 (L)	32.75 - 33.00	1.0000	1.0000
L48	44	CCI-060100 (L)	32.75 - 33.00	1.0000	1.0000
L48	45	CCI-060100 (L)	32.75 - 33.00	1.0000	1.0000
L48	56	CU12PSM6P4XXX(1-3/4)	32.75 - 33.00	1.0000	1.0000
L49	2	LDF7-50A(1-5/8")	19.00 - 32.75	1.0000	1.0000
L49	39	CCI-085125 (L)	19.00 - 32.75	1.0000	1.0000
L49	40	CCI-085125 (L)	19.00 - 32.75	1.0000	1.0000
L49	41	CCI-085125 (L)	19.00 - 32.75	1.0000	1.0000
L49	42	CCI-085125 (L)	19.00 - 32.75	1.0000	1.0000
L49	43	CCI-060100 (L)	30.50 - 32.75	1.0000	1.0000
L49	44	CCI-060100 (L)	30.50 - 32.75	1.0000	1.0000
L49	45	CCI-060100 (L)	30.50 - 32.75	1.0000	1.0000
L49	56	CU12PSM6P4XXX(1-3/4)	19.00 - 32.75	1.0000	1.0000
L50	2	LDF7-50A(1-5/8")	18.00 - 19.00	1.0000	1.0000
L50	39	CCI-085125 (L)	18.00 - 19.00	1.0000	1.0000
L50	40	CCI-085125 (L)	18.00 - 19.00	1.0000	1.0000
L50	41	CCI-085125 (L)	18.00 - 19.00	1.0000	1.0000
L50	42	CCI-085125 (L)	18.00 - 19.00	1.0000	1.0000
L50	56	CU12PSM6P4XXX(1-3/4)	18.00 - 19.00	1.0000	1.0000
L51	2	LDF7-50A(1-5/8")	13.00 - 18.00	1.0000	1.0000
L51	39	CCI-085125 (L)	13.00 - 18.00	1.0000	1.0000
L51	40	CCI-085125 (L)	13.00 - 18.00	1.0000	1.0000
L51	41	CCI-085125 (L)	13.00 - 18.00	1.0000	1.0000
L51	42	CCI-085125 (L)	13.00 - 18.00	1.0000	1.0000
L51	56	CU12PSM6P4XXX(1-3/4)	13.00 - 18.00	1.0000	1.0000
L52	2	LDF7-50A(1-5/8")	8.00 - 13.00	1.0000	1.0000
L52	39	CCI-085125 (L)	8.00 - 13.00	1.0000	1.0000
L52	40	CCI-085125 (L)	8.00 - 13.00	1.0000	1.0000
L52	41	CCI-085125 (L)	8.00 - 13.00	1.0000	1.0000
L52	42	CCI-085125 (L)	8.00 - 13.00	1.0000	1.0000
L52	56	CU12PSM6P4XXX(1-3/4)	8.00 - 13.00	1.0000	1.0000
L53	2	LDF7-50A(1-5/8")	6.42 - 8.00	1.0000	1.0000
L53	39	CCI-085125 (L)	6.42 - 8.00	1.0000	1.0000
L53	40	CCI-085125 (L)	6.42 - 8.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L53	41	CCI-085125 (L)	6.42 - 8.00	1.0000	1.0000
L53	42	CCI-085125 (L)	6.42 - 8.00	1.0000	1.0000
L53	56	CU12PSM6P4XXX(1-3/4)	6.42 - 8.00	1.0000	1.0000
L54	2	LDF7-50A(1-5/8")	6.17 - 6.42	1.0000	1.0000
L54	39	CCI-085125 (L)	6.17 - 6.42	1.0000	1.0000
L54	40	CCI-085125 (L)	6.17 - 6.42	1.0000	1.0000
L54	41	CCI-085125 (L)	6.17 - 6.42	1.0000	1.0000
L54	42	CCI-085125 (L)	6.17 - 6.42	1.0000	1.0000
L54	56	CU12PSM6P4XXX(1-3/4)	6.17 - 6.42	1.0000	1.0000
L55	2	LDF7-50A(1-5/8")	1.17 - 6.17	1.0000	1.0000
L55	39	CCI-085125 (L)	1.17 - 6.17	1.0000	1.0000
L55	40	CCI-085125 (L)	1.17 - 6.17	1.0000	1.0000
L55	41	CCI-085125 (L)	1.17 - 6.17	1.0000	1.0000
L55	42	CCI-085125 (L)	1.17 - 6.17	1.0000	1.0000
L55	56	CU12PSM6P4XXX(1-3/4)	1.17 - 6.17	1.0000	1.0000
L56	2	LDF7-50A(1-5/8")	0.00 - 1.17	1.0000	1.0000
L56	39	CCI-085125 (L)	0.00 - 1.17	1.0000	1.0000
L56	40	CCI-085125 (L)	0.00 - 1.17	1.0000	1.0000
L56	41	CCI-085125 (L)	0.00 - 1.17	1.0000	1.0000
L56	42	CCI-085125 (L)	0.00 - 1.17	1.0000	1.0000
L56	56	CU12PSM6P4XXX(1-3/4)	0.00 - 1.17	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
L6	52	CCI-040075 (W)	155.00 - 155.25	Auto	0.0000
L6	53	CCI-040075 (W)	155.00 - 155.25	Auto	0.0000
L6	54	CCI-040075 (W)	155.00 - 155.25	Auto	0.0000
L7	35	CCI-045100 (L)	154.00 - 154.50	Auto	0.0000
L7	36	CCI-045100 (L)	154.00 - 154.50	Auto	0.0000
L7	37	CCI-045100 (L)	154.00 - 154.50	Auto	0.0000
L7	52	CCI-040075 (W)	154.00 - 155.00	Auto	0.0000
L7	53	CCI-040075 (W)	154.00 - 155.00	Auto	0.0000
L7	54	CCI-040075 (W)	154.00 - 155.00	Auto	0.0000
L8	35	CCI-045100 (L)	153.75 - 154.00	Auto	0.0000
L8	36	CCI-045100 (L)	153.75 - 154.00	Auto	0.0000
L8	37	CCI-045100 (L)	153.75 - 154.00	Auto	0.0000
L8	52	CCI-040075 (W)	153.75 - 154.00	Auto	0.0000
L8	53	CCI-040075 (W)	153.75 - 154.00	Auto	0.0000
L8	54	CCI-040075 (W)	153.75 - 154.00	Auto	0.0000
L9	35	CCI-045100 (L)	152.50 - 153.75	Auto	0.0000
L9	36	CCI-045100 (L)	152.50 -	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L9	37	CCI-045100 (L)	153.75 - 152.50 - 153.75	Auto	0.0000
L9	52	CCI-040075 (W)	152.50 - 153.75	Auto	0.0000
L9	53	CCI-040075 (W)	152.50 - 153.75	Auto	0.0000
L9	54	CCI-040075 (W)	152.50 - 153.75	Auto	0.0000
L10	35	CCI-045100 (L)	152.25 - 152.50	Auto	0.0000
L10	36	CCI-045100 (L)	152.25 - 152.50	Auto	0.0000
L10	37	CCI-045100 (L)	152.25 - 152.50	Auto	0.0000
L10	52	CCI-040075 (W)	152.25 - 152.50	Auto	0.0000
L10	53	CCI-040075 (W)	152.25 - 152.50	Auto	0.0000
L10	54	CCI-040075 (W)	152.25 - 152.50	Auto	0.0000
L11	35	CCI-045100 (L)	151.50 - 152.25	Auto	0.0000
L11	36	CCI-045100 (L)	151.50 - 152.25	Auto	0.0000
L11	37	CCI-045100 (L)	151.50 - 152.25	Auto	0.0000
L11	52	CCI-040075 (W)	151.50 - 152.25	Auto	0.0000
L11	53	CCI-040075 (W)	151.50 - 152.25	Auto	0.0000
L11	54	CCI-040075 (W)	151.50 - 152.25	Auto	0.0000
L12	35	CCI-045100 (L)	151.25 - 151.50	Auto	0.0000
L12	36	CCI-045100 (L)	151.25 - 151.50	Auto	0.0000
L12	37	CCI-045100 (L)	151.25 - 151.50	Auto	0.0000
L12	52	CCI-040075 (W)	151.25 - 151.50	Auto	0.0000
L12	53	CCI-040075 (W)	151.25 - 151.50	Auto	0.0000
L12	54	CCI-040075 (W)	151.25 - 151.50	Auto	0.0000
L13	35	CCI-045100 (L)	146.25 - 151.25	Auto	0.0000
L13	36	CCI-045100 (L)	146.25 - 151.25	Auto	0.0000
L13	37	CCI-045100 (L)	146.25 - 151.25	Auto	0.0000
L13	52	CCI-040075 (W)	150.25 - 151.25	Auto	0.0000
L13	53	CCI-040075 (W)	150.25 - 151.25	Auto	0.0000
L13	54	CCI-040075 (W)	150.25 - 151.25	Auto	0.0000
L14	35	CCI-045100 (L)	141.25 - 146.25	Auto	0.0000
L14	36	CCI-045100 (L)	141.25 - 146.25	Auto	0.0000
L14	37	CCI-045100 (L)	141.25 - 146.25	Auto	0.0000
L15	35	CCI-045100 (L)	136.25 - 141.25	Auto	0.0000
L15	36	CCI-045100 (L)	136.25 - 141.25	Auto	0.0000
L15	37	CCI-045100 (L)	136.25 - 141.25	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L16	35	CCI-045100 (L)	141.25 130.00 - 136.25	Auto	0.0000
L16	36	CCI-045100 (L)	130.00 - 136.25	Auto	0.0000
L16	37	CCI-045100 (L)	130.00 - 136.25	Auto	0.0000
L16	49	CCI-040075 (W)	130.00 - 132.50	Auto	0.0000
L16	50	CCI-040075 (W)	130.00 - 132.50	Auto	0.0000
L16	51	CCI-040075 (W)	130.00 - 132.50	Auto	0.0000
L17	35	CCI-045100 (L)	129.00 - 130.00	Auto	0.0000
L17	36	CCI-045100 (L)	129.00 - 130.00	Auto	0.0000
L17	37	CCI-045100 (L)	129.00 - 130.00	Auto	0.0000
L17	49	CCI-040075 (W)	129.00 - 130.00	Auto	0.0000
L17	50	CCI-040075 (W)	129.00 - 130.00	Auto	0.0000
L17	51	CCI-040075 (W)	129.00 - 130.00	Auto	0.0000
L18	35	CCI-045100 (L)	124.00 - 129.00	Auto	0.0000
L18	36	CCI-045100 (L)	124.00 - 129.00	Auto	0.0000
L18	37	CCI-045100 (L)	124.00 - 129.00	Auto	0.0000
L18	49	CCI-040075 (W)	124.00 - 129.00	Auto	0.0000
L18	50	CCI-040075 (W)	124.00 - 129.00	Auto	0.0000
L18	51	CCI-040075 (W)	124.00 - 129.00	Auto	0.0000
L19	32	CCI-060100 (L)	121.42 - 123.92	Auto	0.0000
L19	33	CCI-060100 (L)	121.42 - 123.92	Auto	0.0000
L19	34	CCI-060100 (L)	121.42 - 123.92	Auto	0.0000
L19	35	CCI-045100 (L)	121.42 - 124.00	Auto	0.0000
L19	36	CCI-045100 (L)	121.42 - 124.00	Auto	0.0000
L19	37	CCI-045100 (L)	121.42 - 124.00	Auto	0.0000
L19	49	CCI-040075 (W)	121.42 - 124.00	Auto	0.0000
L19	50	CCI-040075 (W)	121.42 - 124.00	Auto	0.0000
L19	51	CCI-040075 (W)	121.42 - 124.00	Auto	0.0000
L20	32	CCI-060100 (L)	121.17 - 121.42	Auto	0.0000
L20	33	CCI-060100 (L)	121.17 - 121.42	Auto	0.0000
L20	34	CCI-060100 (L)	121.17 - 121.42	Auto	0.0000
L20	35	CCI-045100 (L)	121.17 - 121.42	Auto	0.0000
L20	36	CCI-045100 (L)	121.17 - 121.42	Auto	0.0000
L20	37	CCI-045100 (L)	121.17 - 121.42	Auto	0.0000
L20	49	CCI-040075 (W)	121.17 -	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L20	50	CCI-040075 (W)	121.42 121.17 - 121.42	Auto	0.0000
L20	51	CCI-040075 (W)	121.17 - 121.42	Auto	0.0000
L21	32	CCI-060100 (L)	116.17 - 121.17	Auto	0.0000
L21	33	CCI-060100 (L)	116.17 - 121.17	Auto	0.0000
L21	34	CCI-060100 (L)	116.17 - 121.17	Auto	0.0000
L21	35	CCI-045100 (L)	119.50 - 121.17	Auto	0.0000
L21	36	CCI-045100 (L)	119.50 - 121.17	Auto	0.0000
L21	37	CCI-045100 (L)	119.50 - 121.17	Auto	0.0000
L21	49	CCI-040075 (W)	116.17 - 121.17	Auto	0.0000
L21	50	CCI-040075 (W)	116.17 - 121.17	Auto	0.0000
L21	51	CCI-040075 (W)	116.17 - 121.17	Auto	0.0000
L22	32	CCI-060100 (L)	115.00 - 116.17	Auto	0.0000
L22	33	CCI-060100 (L)	115.00 - 116.17	Auto	0.0000
L22	34	CCI-060100 (L)	115.00 - 116.17	Auto	0.0000
L22	49	CCI-040075 (W)	115.00 - 116.17	Auto	0.0000
L22	50	CCI-040075 (W)	115.00 - 116.17	Auto	0.0000
L22	51	CCI-040075 (W)	115.00 - 116.17	Auto	0.0000
L23	32	CCI-060100 (L)	113.75 - 115.00	Auto	0.0000
L23	33	CCI-060100 (L)	113.75 - 115.00	Auto	0.0000
L23	34	CCI-060100 (L)	113.75 - 115.00	Auto	0.0000
L23	49	CCI-040075 (W)	113.75 - 115.00	Auto	0.0000
L23	50	CCI-040075 (W)	113.75 - 115.00	Auto	0.0000
L23	51	CCI-040075 (W)	113.75 - 115.00	Auto	0.0000
L24	32	CCI-060100 (L)	113.50 - 113.75	Auto	0.0000
L24	33	CCI-060100 (L)	113.50 - 113.75	Auto	0.0000
L24	34	CCI-060100 (L)	113.50 - 113.75	Auto	0.0000
L24	49	CCI-040075 (W)	113.50 - 113.75	Auto	0.0000
L24	50	CCI-040075 (W)	113.50 - 113.75	Auto	0.0000
L24	51	CCI-040075 (W)	113.50 - 113.75	Auto	0.0000
L25	32	CCI-060100 (L)	108.50 - 113.50	Auto	0.0000
L25	33	CCI-060100 (L)	108.50 - 113.50	Auto	0.0000
L25	34	CCI-060100 (L)	108.50 - 113.50	Auto	0.0000
L25	49	CCI-040075 (W)	112.50 - 113.50	Auto	0.0000
L25	50	CCI-040075 (W)	112.50 - 113.50	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L25	51	CCI-040075 (W)	113.50 112.50 - 113.50	Auto	0.0000
L26	32	CCI-060100 (L)	103.50 - 108.50	Auto	0.0000
L26	33	CCI-060100 (L)	103.50 - 108.50	Auto	0.0000
L26	34	CCI-060100 (L)	103.50 - 108.50	Auto	0.0000
L27	32	CCI-060100 (L)	95.00 - 103.50	Auto	0.0000
L27	33	CCI-060100 (L)	95.00 - 103.50	Auto	0.0000
L27	34	CCI-060100 (L)	95.00 - 103.50	Auto	0.0000
L27	46	CCI-060100 (L)	95.00 - 101.67	Auto	0.0000
L27	47	CCI-060100 (L)	95.00 - 101.67	Auto	0.0000
L27	48	CCI-060100 (L)	95.00 - 101.67	Auto	0.0000
L28	32	CCI-060100 (L)	94.00 - 95.00	Auto	0.0000
L28	33	CCI-060100 (L)	94.00 - 95.00	Auto	0.0000
L28	34	CCI-060100 (L)	94.00 - 95.00	Auto	0.0000
L28	46	CCI-060100 (L)	94.00 - 95.00	Auto	0.0000
L28	47	CCI-060100 (L)	94.00 - 95.00	Auto	0.0000
L28	48	CCI-060100 (L)	94.00 - 95.00	Auto	0.0000
L29	32	CCI-060100 (L)	91.40 - 94.00	Auto	0.0000
L29	33	CCI-060100 (L)	91.40 - 94.00	Auto	0.0000
L29	34	CCI-060100 (L)	91.40 - 94.00	Auto	0.0000
L29	46	CCI-060100 (L)	91.40 - 94.00	Auto	0.0000
L29	47	CCI-060100 (L)	91.40 - 94.00	Auto	0.0000
L29	48	CCI-060100 (L)	91.40 - 94.00	Auto	0.0000
L30	32	CCI-060100 (L)	91.15 - 91.40	Auto	0.0000
L30	33	CCI-060100 (L)	91.15 - 91.40	Auto	0.0000
L30	34	CCI-060100 (L)	91.15 - 91.40	Auto	0.0000
L30	46	CCI-060100 (L)	91.15 - 91.40	Auto	0.0000
L30	47	CCI-060100 (L)	91.15 - 91.40	Auto	0.0000
L30	48	CCI-060100 (L)	91.15 - 91.40	Auto	0.0000
L31	32	CCI-060100 (L)	91.00 - 91.15	Auto	0.0000
L31	33	CCI-060100 (L)	91.00 - 91.15	Auto	0.0000
L31	34	CCI-060100 (L)	91.00 - 91.15	Auto	0.0000
L31	46	CCI-060100 (L)	91.00 - 91.15	Auto	0.0000
L31	47	CCI-060100 (L)	91.00 - 91.15	Auto	0.0000
L31	48	CCI-060100 (L)	91.00 - 91.15	Auto	0.0000



Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L32	32	CCI-060100 (L)	91.15 88.89 - 91.00	Auto	0.0000
L32	33	CCI-060100 (L)	88.89 - 91.00	Auto	0.0000
L32	34	CCI-060100 (L)	88.89 - 91.00	Auto	0.0000
L32	46	CCI-060100 (L)	86.00 - 91.00	Auto	0.0000
L32	47	CCI-060100 (L)	86.00 - 91.00	Auto	0.0000
L32	48	CCI-060100 (L)	86.00 - 91.00	Auto	0.0000
L33	46	CCI-060100 (L)	81.00 - 86.00	Auto	0.0000
L33	47	CCI-060100 (L)	81.00 - 86.00	Auto	0.0000
L33	48	CCI-060100 (L)	81.00 - 86.00	Auto	0.0000
L34	46	CCI-060100 (L)	76.00 - 81.00	Auto	0.0000
L34	47	CCI-060100 (L)	76.00 - 81.00	Auto	0.0000
L34	48	CCI-060100 (L)	76.00 - 81.00	Auto	0.0000
L35	46	CCI-060100 (L)	71.00 - 76.00	Auto	0.0000
L35	47	CCI-060100 (L)	71.00 - 76.00	Auto	0.0000
L35	48	CCI-060100 (L)	71.00 - 76.00	Auto	0.0000
L36	46	CCI-060100 (L)	66.00 - 71.00	Auto	0.0000
L36	47	CCI-060100 (L)	66.00 - 71.00	Auto	0.0000
L36	48	CCI-060100 (L)	66.00 - 71.00	Auto	0.0000
L37	43	CCI-060100 (L)	63.75 - 65.50	Auto	0.0000
L37	44	CCI-060100 (L)	63.75 - 65.50	Auto	0.0000
L37	45	CCI-060100 (L)	63.75 - 65.50	Auto	0.0000
L37	46	CCI-060100 (L)	63.75 - 66.00	Auto	0.0000
L37	47	CCI-060100 (L)	63.75 - 66.00	Auto	0.0000
L37	48	CCI-060100 (L)	63.75 - 66.00	Auto	0.0000
L38	43	CCI-060100 (L)	63.50 - 63.75	Auto	0.0000
L38	44	CCI-060100 (L)	63.50 - 63.75	Auto	0.0000
L38	45	CCI-060100 (L)	63.50 - 63.75	Auto	0.0000
L38	46	CCI-060100 (L)	63.50 - 63.75	Auto	0.0000
L38	47	CCI-060100 (L)	63.50 - 63.75	Auto	0.0000
L38	48	CCI-060100 (L)	63.50 - 63.75	Auto	0.0000
L39	43	CCI-060100 (L)	58.50 - 63.50	Auto	0.0000
L39	44	CCI-060100 (L)	58.50 - 63.50	Auto	0.0000
L39	45	CCI-060100 (L)	58.50 - 63.50	Auto	0.0000
L39	46	CCI-060100 (L)	61.67 -	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L39	47	CCI-060100 (L)	63.50 61.67 - 63.50	Auto	0.0000
L39	48	CCI-060100 (L)	61.67 - 63.50	Auto	0.0000
L40	29	CCI-045100 (L)	51.00 - 53.92	Auto	0.0000
L40	30	CCI-045100 (L)	51.00 - 53.92	Auto	0.0000
L40	31	CCI-045100 (L)	51.00 - 53.92	Auto	0.0000
L40	43	CCI-060100 (L)	51.00 - 58.50	Auto	0.0000
L40	44	CCI-060100 (L)	51.00 - 58.50	Auto	0.0000
L40	45	CCI-060100 (L)	51.00 - 58.50	Auto	0.0000
L41	29	CCI-045100 (L)	50.00 - 51.00	Auto	0.0000
L41	30	CCI-045100 (L)	50.00 - 51.00	Auto	0.0000
L41	31	CCI-045100 (L)	50.00 - 51.00	Auto	0.0000
L41	43	CCI-060100 (L)	50.00 - 51.00	Auto	0.0000
L41	44	CCI-060100 (L)	50.00 - 51.00	Auto	0.0000
L41	45	CCI-060100 (L)	50.00 - 51.00	Auto	0.0000
L42	29	CCI-045100 (L)	45.00 - 50.00	Auto	0.0000
L42	30	CCI-045100 (L)	45.00 - 50.00	Auto	0.0000
L42	31	CCI-045100 (L)	45.00 - 50.00	Auto	0.0000
L42	43	CCI-060100 (L)	45.00 - 50.00	Auto	0.0000
L42	44	CCI-060100 (L)	45.00 - 50.00	Auto	0.0000
L42	45	CCI-060100 (L)	45.00 - 50.00	Auto	0.0000
L43	29	CCI-045100 (L)	40.42 - 45.00	Auto	0.0000
L43	30	CCI-045100 (L)	40.42 - 45.00	Auto	0.0000
L43	31	CCI-045100 (L)	40.42 - 45.00	Auto	0.0000
L43	43	CCI-060100 (L)	40.42 - 45.00	Auto	0.0000
L43	44	CCI-060100 (L)	40.42 - 45.00	Auto	0.0000
L43	45	CCI-060100 (L)	40.42 - 45.00	Auto	0.0000
L44	29	CCI-045100 (L)	40.17 - 40.42	Auto	0.0000
L44	30	CCI-045100 (L)	40.17 - 40.42	Auto	0.0000
L44	31	CCI-045100 (L)	40.17 - 40.42	Auto	0.0000
L44	43	CCI-060100 (L)	40.17 - 40.42	Auto	0.0000
L44	44	CCI-060100 (L)	40.17 - 40.42	Auto	0.0000
L44	45	CCI-060100 (L)	40.17 - 40.42	Auto	0.0000
L45	29	CCI-045100 (L)	40.00 - 40.17	Auto	0.0000
L45	30	CCI-045100 (L)	40.00 -	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L45	31	CCI-045100 (L)	40.17 40.00 - 40.17	Auto	0.0000
L45	43	CCI-060100 (L)	40.00 - 40.17	Auto	0.0000
L45	44	CCI-060100 (L)	40.00 - 40.17	Auto	0.0000
L45	45	CCI-060100 (L)	40.00 - 40.17	Auto	0.0000
L46	29	CCI-045100 (L)	38.92 - 40.00	Auto	0.0000
L46	30	CCI-045100 (L)	38.92 - 40.00	Auto	0.0000
L46	31	CCI-045100 (L)	38.92 - 40.00	Auto	0.0000
L46	39	CCI-085125 (L)	35.00 - 37.42	Auto	0.0000
L46	40	CCI-085125 (L)	35.00 - 37.42	Auto	0.0000
L46	41	CCI-085125 (L)	35.00 - 37.42	Auto	0.0000
L46	42	CCI-085125 (L)	35.00 - 37.42	Auto	0.0000
L46	43	CCI-060100 (L)	35.00 - 40.00	Auto	0.0000
L46	44	CCI-060100 (L)	35.00 - 40.00	Auto	0.0000
L46	45	CCI-060100 (L)	35.00 - 40.00	Auto	0.0000
L47	39	CCI-085125 (L)	33.00 - 35.00	Auto	0.0000
L47	40	CCI-085125 (L)	33.00 - 35.00	Auto	0.0000
L47	41	CCI-085125 (L)	33.00 - 35.00	Auto	0.0000
L47	42	CCI-085125 (L)	33.00 - 35.00	Auto	0.0000
L47	43	CCI-060100 (L)	33.00 - 35.00	Auto	0.0000
L47	44	CCI-060100 (L)	33.00 - 35.00	Auto	0.0000
L47	45	CCI-060100 (L)	33.00 - 35.00	Auto	0.0000
L48	39	CCI-085125 (L)	32.75 - 33.00	Auto	0.0000
L48	40	CCI-085125 (L)	32.75 - 33.00	Auto	0.0000
L48	41	CCI-085125 (L)	32.75 - 33.00	Auto	0.0000
L48	42	CCI-085125 (L)	32.75 - 33.00	Auto	0.0000
L48	43	CCI-060100 (L)	32.75 - 33.00	Auto	0.0000
L48	44	CCI-060100 (L)	32.75 - 33.00	Auto	0.0000
L48	45	CCI-060100 (L)	32.75 - 33.00	Auto	0.0000
L49	39	CCI-085125 (L)	19.00 - 32.75	Auto	0.0000
L49	40	CCI-085125 (L)	19.00 - 32.75	Auto	0.0000
L49	41	CCI-085125 (L)	19.00 - 32.75	Auto	0.0000
L49	42	CCI-085125 (L)	19.00 - 32.75	Auto	0.0000
L49	43	CCI-060100 (L)	30.50 - 32.75	Auto	0.0000
L49	44	CCI-060100 (L)	30.50 -	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L49	45	CCI-060100 (L)	32.75 30.50 - 32.75	Auto	0.0000
L50	39	CCI-085125 (L)	18.00 - 19.00	Auto	0.0000
L50	40	CCI-085125 (L)	18.00 - 19.00	Auto	0.0000
L50	41	CCI-085125 (L)	18.00 - 19.00	Auto	0.0000
L50	42	CCI-085125 (L)	18.00 - 19.00	Auto	0.0000
L51	39	CCI-085125 (L)	13.00 - 18.00	Auto	0.0000
L51	40	CCI-085125 (L)	13.00 - 18.00	Auto	0.0000
L51	41	CCI-085125 (L)	13.00 - 18.00	Auto	0.0000
L51	42	CCI-085125 (L)	13.00 - 18.00	Auto	0.0000
L52	39	CCI-085125 (L)	8.00 - 13.00	Auto	0.0000
L52	40	CCI-085125 (L)	8.00 - 13.00	Auto	0.0000
L52	41	CCI-085125 (L)	8.00 - 13.00	Auto	0.0000
L52	42	CCI-085125 (L)	8.00 - 13.00	Auto	0.0000
L53	39	CCI-085125 (L)	6.42 - 8.00	Auto	0.0000
L53	40	CCI-085125 (L)	6.42 - 8.00	Auto	0.0000
L53	41	CCI-085125 (L)	6.42 - 8.00	Auto	0.0000
L53	42	CCI-085125 (L)	6.42 - 8.00	Auto	0.0000
L54	39	CCI-085125 (L)	6.17 - 6.42	Auto	0.0000
L54	40	CCI-085125 (L)	6.17 - 6.42	Auto	0.0000
L54	41	CCI-085125 (L)	6.17 - 6.42	Auto	0.0000
L54	42	CCI-085125 (L)	6.17 - 6.42	Auto	0.0000
L55	39	CCI-085125 (L)	1.17 - 6.17	Auto	0.0000
L55	40	CCI-085125 (L)	1.17 - 6.17	Auto	0.0000
L55	41	CCI-085125 (L)	1.17 - 6.17	Auto	0.0000
L55	42	CCI-085125 (L)	1.17 - 6.17	Auto	0.0000
L56	39	CCI-085125 (L)	0.00 - 1.17	Auto	0.0000
L56	40	CCI-085125 (L)	0.00 - 1.17	Auto	0.0000
L56	41	CCI-085125 (L)	0.00 - 1.17	Auto	0.0000
L56	42	CCI-085125 (L)	0.00 - 1.17	Auto	0.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horiz Lateral	Azimuth Adjustment	Placement	CA <sub>AA</sub> Front	CA <sub>AA</sub> Side	Weight	
			ft ft ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
***185***									
APX16DWV-16DWVS-E-A20 w/ Mount Pipe	A	From Leg	4.000	0.000	183.000	No Ice	6.290	2.760	0.061
						1/2" Ice	6.860	3.270	0.105
						1" Ice	7.450	3.790	0.157
						2" Ice	8.680	4.900	0.290
APX16DWV-16DWVS-E-A20 w/ Mount Pipe	B	From Leg	4.000	0.000	183.000	No Ice	6.290	2.760	0.061
						1/2" Ice	6.860	3.270	0.105
						1" Ice	7.450	3.790	0.157
						2" Ice	8.680	4.900	0.290
APX16DWV-16DWVS-E-	C	From Leg	4.000	0.000	183.000	No Ice	6.290	2.760	0.061

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
A20 w/ Mount Pipe			0.000 0.000			1/2" 6.860 Ice 7.450 1" Ice 8.680 2" Ice	3.270 3.790 4.900	0.105 0.157 0.290
AIR 32 B2A B66AA w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	183.000	No Ice 3.760 1/2" 4.120 Ice 4.480 1" Ice 5.240 2" Ice	3.150 3.490 3.840 4.580	0.194 0.252 0.320 0.485
AIR 32 B2A B66AA w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	183.000	No Ice 3.760 1/2" 4.120 Ice 4.480 1" Ice 5.240 2" Ice	3.150 3.490 3.840 4.580	0.194 0.252 0.320 0.485
AIR 32 B2A B66AA w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	183.000	No Ice 3.760 1/2" 4.120 Ice 4.480 1" Ice 5.240 2" Ice	3.150 3.490 3.840 4.580	0.194 0.252 0.320 0.485
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	183.000	No Ice 14.690 1/2" 15.460 Ice 16.230 1" Ice 17.820 2" Ice	6.870 7.550 8.250 9.670	0.186 0.315 0.458 0.788
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	183.000	No Ice 14.690 1/2" 15.460 Ice 16.230 1" Ice 17.820 2" Ice	6.870 7.550 8.250 9.670	0.186 0.315 0.458 0.788
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	183.000	No Ice 14.690 1/2" 15.460 Ice 16.230 1" Ice 17.820 2" Ice	6.870 7.550 8.250 9.670	0.186 0.315 0.458 0.788
RADIO 4449 B12/B71	A	From Leg	4.000 0.000 0.000	0.000	183.000	No Ice 1.650 1/2" 1.810 Ice 1.978 1" Ice 2.336 2" Ice	1.163 1.301 1.447 1.762	0.074 0.090 0.109 0.155
RADIO 4449 B12/B71	B	From Leg	4.000 0.000 0.000	0.000	183.000	No Ice 1.650 1/2" 1.810 Ice 1.978 1" Ice 2.336 2" Ice	1.163 1.301 1.447 1.762	0.074 0.090 0.109 0.155
RADIO 4449 B12/B71	C	From Leg	4.000 0.000 0.000	0.000	183.000	No Ice 1.650 1/2" 1.810 Ice 1.978 1" Ice 2.336 2" Ice	1.163 1.301 1.447 1.762	0.074 0.090 0.109 0.155
KRY 112 144/1	A	From Leg	4.000 0.000 0.000	0.000	183.000	No Ice 0.350 1/2" 0.426 Ice 0.509 1" Ice 0.698 2" Ice	0.175 0.234 0.301 0.456	0.011 0.014 0.019 0.032
KRY 112 144/1	A	From Leg	4.000 0.000 0.000	0.000	183.000	No Ice 0.350 1/2" 0.426 Ice 0.509 1" Ice 0.698 2" Ice	0.175 0.234 0.301 0.456	0.011 0.014 0.019 0.032
KRY 112 144/1	A	From Leg	4.000 0.000 0.000	0.000	183.000	No Ice 0.350 1/2" 0.426 Ice 0.509 1" Ice 0.698 2" Ice	0.175 0.234 0.301 0.456	0.011 0.014 0.019 0.032
RMQP-496-HK	C	None		0.000	183.000	No Ice 23.140	23.140	1.945

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
						1/2"	28.170	28.170	2.335
						Ice	33.200	33.200	2.725
						1" Ice	43.260	43.260	3.505
						2" Ice			
***175***									
DMP65R-BU6D w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	174.000	No Ice	11.960	5.970	0.115
						1/2"	12.700	6.630	0.201
						Ice	13.460	7.300	0.298
						1" Ice	15.020	8.690	0.529
						2" Ice			
DMP65R-BU6D w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	174.000	No Ice	11.960	5.970	0.115
						1/2"	12.700	6.630	0.201
						Ice	13.460	7.300	0.298
						1" Ice	15.020	8.690	0.529
						2" Ice			
DMP65R-BU6D w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	174.000	No Ice	11.960	5.970	0.115
						1/2"	12.700	6.630	0.201
						Ice	13.460	7.300	0.298
						1" Ice	15.020	8.690	0.529
						2" Ice			
7770.00 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	174.000	No Ice	5.746	4.254	0.055
						1/2"	6.179	5.014	0.103
						Ice	6.607	5.711	0.157
						1" Ice	7.488	7.155	0.287
						2" Ice			
7770.00 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	174.000	No Ice	5.746	4.254	0.055
						1/2"	6.179	5.014	0.103
						Ice	6.607	5.711	0.157
						1" Ice	7.488	7.155	0.287
						2" Ice			
7770.00 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	174.000	No Ice	5.746	4.254	0.055
						1/2"	6.179	5.014	0.103
						Ice	6.607	5.711	0.157
						1" Ice	7.488	7.155	0.287
						2" Ice			
OPA65R-BU6D w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	174.000	No Ice	12.250	6.050	0.089
						1/2"	13.000	6.710	0.176
						Ice	13.760	7.390	0.275
						1" Ice	15.340	8.790	0.508
						2" Ice			
OPA65R-BU6D w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	174.000	No Ice	12.250	6.050	0.089
						1/2"	13.000	6.710	0.176
						Ice	13.760	7.390	0.275
						1" Ice	15.340	8.790	0.508
						2" Ice			
OPA65R-BU6D w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	174.000	No Ice	12.250	6.050	0.089
						1/2"	13.000	6.710	0.176
						Ice	13.760	7.390	0.275
						1" Ice	15.340	8.790	0.508
						2" Ice			
QS66512-2 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	174.000	No Ice	4.040	4.180	0.137
						1/2"	4.420	4.570	0.206
						Ice	4.820	4.970	0.287
						1" Ice	5.630	5.790	0.482
						2" Ice			
QS66512-2 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	174.000	No Ice	4.040	4.180	0.137
						1/2"	4.420	4.570	0.206
						Ice	4.820	4.970	0.287
						1" Ice	5.630	5.790	0.482
						2" Ice			
QS66512-2 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	174.000	No Ice	4.040	4.180	0.137
						1/2"	4.420	4.570	0.206
						Ice	4.820	4.970	0.287
						1" Ice	5.630	5.790	0.482
						2" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
(2) LGP21401	A	From Leg	4.000	0.000	0.000	174.000	No Ice	1.104	0.207	0.014
			0.000	0.000			1/2"	1.239	0.274	0.021
			0.000	0.000			Ice	1.381	0.348	0.030
							1" Ice	1.688	0.521	0.055
							2" Ice			
(2) LGP21401	B	From Leg	4.000	0.000	0.000	174.000	No Ice	1.104	0.207	0.014
			0.000	0.000			1/2"	1.239	0.274	0.021
			0.000	0.000			Ice	1.381	0.348	0.030
							1" Ice	1.688	0.521	0.055
							2" Ice			
(2) LGP21401	C	From Leg	4.000	0.000	0.000	174.000	No Ice	1.104	0.207	0.014
			0.000	0.000			1/2"	1.239	0.274	0.021
			0.000	0.000			Ice	1.381	0.348	0.030
							1" Ice	1.688	0.521	0.055
							2" Ice			
(2) DBC0061F1V51-2	A	From Leg	4.000	0.000	0.000	174.000	No Ice	0.413	0.433	0.025
			0.000	0.000			1/2"	0.496	0.518	0.031
			0.000	0.000			Ice	0.586	0.609	0.038
							1" Ice	0.788	0.815	0.057
							2" Ice			
(2) DBC0061F1V51-2	B	From Leg	4.000	0.000	0.000	174.000	No Ice	0.413	0.433	0.025
			0.000	0.000			1/2"	0.496	0.518	0.031
			0.000	0.000			Ice	0.586	0.609	0.038
							1" Ice	0.788	0.815	0.057
							2" Ice			
(2) DBC0061F1V51-2	C	From Leg	4.000	0.000	0.000	174.000	No Ice	0.413	0.433	0.025
			0.000	0.000			1/2"	0.496	0.518	0.031
			0.000	0.000			Ice	0.586	0.609	0.038
							1" Ice	0.788	0.815	0.057
							2" Ice			
RRUS 32 B2	A	From Leg	4.000	0.000	0.000	174.000	No Ice	2.731	1.668	0.053
			0.000	0.000			1/2"	2.953	1.855	0.074
			0.000	0.000			Ice	3.182	2.049	0.098
							1" Ice	3.663	2.458	0.157
							2" Ice			
RRUS 32 B2	B	From Leg	4.000	0.000	0.000	174.000	No Ice	2.731	1.668	0.053
			0.000	0.000			1/2"	2.953	1.855	0.074
			0.000	0.000			Ice	3.182	2.049	0.098
							1" Ice	3.663	2.458	0.157
							2" Ice			
RRUS 32 B2	C	From Leg	4.000	0.000	0.000	174.000	No Ice	2.731	1.668	0.053
			0.000	0.000			1/2"	2.953	1.855	0.074
			0.000	0.000			Ice	3.182	2.049	0.098
							1" Ice	3.663	2.458	0.157
							2" Ice			
RRUS 32 B30	A	From Leg	4.000	0.000	0.000	174.000	No Ice	2.692	1.573	0.060
			0.000	0.000			1/2"	2.912	1.756	0.080
			0.000	0.000			Ice	3.138	1.945	0.104
							1" Ice	3.614	2.346	0.161
							2" Ice			
RRUS 32 B30	B	From Leg	4.000	0.000	0.000	174.000	No Ice	2.692	1.573	0.060
			0.000	0.000			1/2"	2.912	1.756	0.080
			0.000	0.000			Ice	3.138	1.945	0.104
							1" Ice	3.614	2.346	0.161
							2" Ice			
RRUS 32 B30	C	From Leg	4.000	0.000	0.000	174.000	No Ice	2.692	1.573	0.060
			0.000	0.000			1/2"	2.912	1.756	0.080
			0.000	0.000			Ice	3.138	1.945	0.104
							1" Ice	3.614	2.346	0.161
							2" Ice			
782 10254	A	From Leg	4.000	0.000	0.000	174.000	No Ice	0.142	0.080	0.003
			0.000	0.000			1/2"	0.194	0.122	0.004
			0.000	0.000			Ice	0.252	0.173	0.007
							1" Ice	0.392	0.297	0.014
							2" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
782 10254	B	From Leg	4.000	0.000	0.000	174.000	No Ice	0.142	0.080	0.003
			0.000	0.000			1/2"	0.194	0.122	0.004
			0.000	0.000			Ice	0.252	0.173	0.007
							1" Ice	0.392	0.297	0.014
							2" Ice			
782 10254	C	From Leg	4.000	0.000	0.000	174.000	No Ice	0.142	0.080	0.003
			0.000	0.000			1/2"	0.194	0.122	0.004
			0.000	0.000			Ice	0.252	0.173	0.007
							1" Ice	0.392	0.297	0.014
							2" Ice			
DC6-48-60-18-8F	A	From Leg	4.000	0.000	0.000	174.000	No Ice	1.212	1.212	0.020
			0.000	0.000			1/2"	1.892	1.892	0.042
			0.000	0.000			Ice	2.105	2.105	0.067
							1" Ice	2.570	2.570	0.126
							2" Ice			
DC6-48-60-18-8F	B	From Leg	4.000	0.000	0.000	174.000	No Ice	1.212	1.212	0.020
			0.000	0.000			1/2"	1.892	1.892	0.042
			0.000	0.000			Ice	2.105	2.105	0.067
							1" Ice	2.570	2.570	0.126
							2" Ice			
RRUS 4449 B5/B12	A	From Leg	4.000	0.000	0.000	174.000	No Ice	1.968	1.408	0.071
			0.000	0.000			1/2"	2.144	1.564	0.090
			0.000	0.000			Ice	2.328	1.727	0.111
							1" Ice	2.718	2.075	0.163
							2" Ice			
RRUS 4449 B5/B12	B	From Leg	4.000	0.000	0.000	174.000	No Ice	1.968	1.408	0.071
			0.000	0.000			1/2"	2.144	1.564	0.090
			0.000	0.000			Ice	2.328	1.727	0.111
							1" Ice	2.718	2.075	0.163
							2" Ice			
RRUS 4449 B5/B12	C	From Leg	4.000	0.000	0.000	174.000	No Ice	1.968	1.408	0.071
			0.000	0.000			1/2"	2.144	1.564	0.090
			0.000	0.000			Ice	2.328	1.727	0.111
							1" Ice	2.718	2.075	0.163
							2" Ice			
RRUS 32 B2_CCIV2	A	From Leg	4.000	0.000	0.000	174.000	No Ice	2.864	1.782	0.055
			0.000	0.000			1/2"	3.090	1.973	0.077
			0.000	0.000			Ice	3.323	2.171	0.103
							1" Ice	3.813	2.589	0.165
							2" Ice			
RRUS 32 B2_CCIV2	B	From Leg	4.000	0.000	0.000	174.000	No Ice	2.864	1.782	0.055
			0.000	0.000			1/2"	3.090	1.973	0.077
			0.000	0.000			Ice	3.323	2.171	0.103
							1" Ice	3.813	2.589	0.165
							2" Ice			
RRUS 32 B2_CCIV2	C	From Leg	4.000	0.000	0.000	174.000	No Ice	2.864	1.782	0.055
			0.000	0.000			1/2"	3.090	1.973	0.077
			0.000	0.000			Ice	3.323	2.171	0.103
							1" Ice	3.813	2.589	0.165
							2" Ice			
RRUS 4478 B14_CCIV2	A	From Leg	4.000	0.000	0.000	174.000	No Ice	2.021	1.246	0.059
			0.000	0.000			1/2"	2.200	1.396	0.077
			0.000	0.000			Ice	2.386	1.554	0.097
							1" Ice	2.780	1.891	0.147
							2" Ice			
RRUS 4478 B14_CCIV2	B	From Leg	4.000	0.000	0.000	174.000	No Ice	2.021	1.246	0.059
			0.000	0.000			1/2"	2.200	1.396	0.077
			0.000	0.000			Ice	2.386	1.554	0.097
							1" Ice	2.780	1.891	0.147
							2" Ice			
RRUS 4478 B14_CCIV2	C	From Leg	4.000	0.000	0.000	174.000	No Ice	2.021	1.246	0.059
			0.000	0.000			1/2"	2.200	1.396	0.077
			0.000	0.000			Ice	2.386	1.554	0.097
							1" Ice	2.780	1.891	0.147
							2" Ice			



Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
DC9-48-60-24-8C-EV	A	From Leg	4.000 0.000 0.000	0.000	174.000	No Ice	1.145	1.145	0.026
						1/2" Ice	1.792	1.792	0.047
						Ice	2.002	2.002	0.070
						1" Ice	2.451	2.451	0.125
						2" Ice			
Sector Mount [SM 502-3]	C	None		0.000	174.000	No Ice	29.820	29.820	1.673
						1/2" Ice	42.210	42.210	2.266
						Ice	54.430	54.430	3.052
						1" Ice	78.490	78.490	5.180
						2" Ice			
***165*** ***155*** (4) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice	4.090	3.300	0.066
(4) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	155.000	1/2" Ice	4.490	3.680	0.130
						Ice	4.890	4.070	0.204
						1" Ice	5.720	4.870	0.386
						2" Ice			
						No Ice	4.090	3.300	0.066
(4) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	155.000	1/2" Ice	4.490	3.680	0.130
						Ice	4.890	4.070	0.204
						1" Ice	5.720	4.870	0.386
						2" Ice			
						No Ice	4.090	3.300	0.066
RRH2x60-700	A	From Leg	4.000 0.000 0.000	0.000	155.000	1/2" Ice	3.761	2.052	0.083
						Ice	4.029	2.289	0.109
						1" Ice	4.585	2.785	0.173
						2" Ice			
						No Ice	3.500	1.816	0.060
RRH2x60-700	B	From Leg	4.000 0.000 0.000	0.000	155.000	1/2" Ice	3.761	2.052	0.083
						Ice	4.029	2.289	0.109
						1" Ice	4.585	2.785	0.173
						2" Ice			
						No Ice	3.500	1.816	0.060
RRH2x60-700	C	From Leg	4.000 0.000 0.000	0.000	155.000	1/2" Ice	3.761	2.052	0.083
						Ice	4.029	2.289	0.109
						1" Ice	4.585	2.785	0.173
						2" Ice			
						No Ice	3.500	1.816	0.060
RRH2X60-PCS	A	From Leg	4.000 0.000 0.000	0.000	155.000	1/2" Ice	2.393	1.901	0.075
						Ice	2.593	2.087	0.099
						1" Ice	3.015	2.480	0.155
						2" Ice			
						No Ice	2.200	1.723	0.055
RRH2X60-PCS	B	From Leg	4.000 0.000 0.000	0.000	155.000	1/2" Ice	2.393	1.901	0.075
						Ice	2.593	2.087	0.099
						1" Ice	3.015	2.480	0.155
						2" Ice			
						No Ice	2.200	1.723	0.055
RRH2X60-PCS	C	From Leg	4.000 0.000 0.000	0.000	155.000	1/2" Ice	2.393	1.901	0.075
						Ice	2.593	2.087	0.099
						1" Ice	3.015	2.480	0.155
						2" Ice			
						No Ice	2.200	1.723	0.055
AWS4 (B66) 4x45 RRH	C	From Leg	4.000 0.000 0.000	0.000	155.000	1/2" Ice	2.878	1.769	0.084
						Ice	3.104	1.959	0.108
						1" Ice	3.577	2.359	0.165
						2" Ice			
						No Ice	2.660	1.586	0.064
AWS4 (B66) 4x45 RRH	A	From Leg	4.000 0.000 0.000	0.000	155.000	1/2" Ice	2.878	1.769	0.084
						Ice	3.104	1.959	0.108
						1" Ice			
						2" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
						1" Ice	3.577	2.359	0.165
						2" Ice			
AWS4 (B66) 4x45 RRH	B	From Leg	4.000	0.000	155.000	No Ice	2.660	1.586	0.064
			0.000			1/2"	2.878	1.769	0.084
			0.000			Ice	3.104	1.959	0.108
						1" Ice	3.577	2.359	0.165
						2" Ice			
(2) DB-T1-6Z-8AB-0Z	C	From Leg	4.000	0.000	155.000	No Ice	4.800	2.000	0.044
			0.000			1/2"	5.070	2.193	0.080
			0.000			Ice	5.348	2.393	0.120
						1" Ice	5.926	2.815	0.213
						2" Ice			
Platform Mount [LP 403-1]	C	None		0.000	155.000	No Ice	18.940	18.940	1.500
						1/2"	23.310	23.310	1.902
						Ice	27.740	27.740	2.374
						1" Ice	36.770	36.770	3.530
						2" Ice			
*****									
MX08FRO665-20 w/ Mount Pipe	A	From Leg	4.000	0.000	165.000	No Ice	8.010	4.230	0.098
			0.000			1/2"	8.520	4.690	0.184
			0.000			Ice	9.040	5.160	0.281
						1" Ice	10.110	6.120	0.512
						2" Ice			
MX08FRO665-20 w/ Mount Pipe	B	From Leg	4.000	0.000	165.000	No Ice	8.010	4.230	0.098
			0.000			1/2"	8.520	4.690	0.184
			0.000			Ice	9.040	5.160	0.281
						1" Ice	10.110	6.120	0.512
						2" Ice			
MX08FRO665-20 w/ Mount Pipe	C	From Leg	4.000	0.000	165.000	No Ice	8.010	4.230	0.098
			0.000			1/2"	8.520	4.690	0.184
			0.000			Ice	9.040	5.160	0.281
						1" Ice	10.110	6.120	0.512
						2" Ice			
TA08025-B604	A	From Leg	4.000	0.000	165.000	No Ice	1.964	0.981	0.064
			0.000			1/2"	2.138	1.112	0.081
			0.000			Ice	2.320	1.250	0.100
						1" Ice	2.705	1.548	0.148
						2" Ice			
TA08025-B604	B	From Leg	4.000	0.000	165.000	No Ice	1.964	0.981	0.064
			0.000			1/2"	2.138	1.112	0.081
			0.000			Ice	2.320	1.250	0.100
						1" Ice	2.705	1.548	0.148
						2" Ice			
TA08025-B604	C	From Leg	4.000	0.000	165.000	No Ice	1.964	0.981	0.064
			0.000			1/2"	2.138	1.112	0.081
			0.000			Ice	2.320	1.250	0.100
						1" Ice	2.705	1.548	0.148
						2" Ice			
TA08025-B605	A	From Leg	4.000	0.000	165.000	No Ice	1.964	1.129	0.075
			0.000			1/2"	2.138	1.267	0.093
			0.000			Ice	2.320	1.411	0.114
						1" Ice	2.705	1.723	0.164
						2" Ice			
TA08025-B605	B	From Leg	4.000	0.000	165.000	No Ice	1.964	1.129	0.075
			0.000			1/2"	2.138	1.267	0.093
			0.000			Ice	2.320	1.411	0.114
						1" Ice	2.705	1.723	0.164
						2" Ice			
TA08025-B605	C	From Leg	4.000	0.000	165.000	No Ice	1.964	1.129	0.075
			0.000			1/2"	2.138	1.267	0.093
			0.000			Ice	2.320	1.411	0.114
						1" Ice	2.705	1.723	0.164
						2" Ice			
RDIDC-9181-PF-48	A	From Leg	4.000	0.000	165.000	No Ice	2.312	1.293	0.022
			0.000			1/2"	2.502	1.448	0.041

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAAA Front ft <sup>2</sup>	CAAA Side ft <sup>2</sup>	Weight K
			0.000			Ice 2.700	1.610	0.063
						1" Ice 3.118	1.957	0.117
						2" Ice		
(2) 8' x 2" Mount Pipe	A	From Leg	4.000	0.000	165.000	No Ice 1.900	1.900	0.029
			0.000			1/2" 2.728	2.728	0.044
			0.000			Ice 3.401	3.401	0.063
						1" Ice 4.396	4.396	0.119
						2" Ice		
(2) 8' x 2" Mount Pipe	B	From Leg	4.000	0.000	165.000	No Ice 1.900	1.900	0.029
			0.000			1/2" 2.728	2.728	0.044
			0.000			Ice 3.401	3.401	0.063
						1" Ice 4.396	4.396	0.119
						2" Ice		
(2) 8' x 2" Mount Pipe	C	From Leg	4.000	0.000	165.000	No Ice 1.900	1.900	0.029
			0.000			1/2" 2.728	2.728	0.044
			0.000			Ice 3.401	3.401	0.063
						1" Ice 4.396	4.396	0.119
						2" Ice		
Commscope MC-PK8-DSH	C	None		0.000	165.000	No Ice 34.240	34.240	1.749
						1/2" 62.950	62.950	2.099
						Ice 91.660	91.660	2.450
						1" Ice 149.080	149.080	3.151
						2" Ice		

### Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
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	185 - 180	Pole	Max Tension	20	0.000	-0.000	-0.000
			Max. Compression	26	-8.582	-0.079	0.444
			Max. Mx	8	-3.956	-16.775	0.192
			Max. My	2	-3.938	-0.024	17.124
			Max. Vy	8	5.663	-16.775	0.192
			Max. Vx	2	-5.724	-0.024	17.124
			Max. Torque	8			0.156
L2	180 - 175	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-9.251	-0.216	0.531
			Max. Mx	8	-4.280	-46.354	0.223
			Max. My	2	-4.249	-0.067	47.286
			Max. Vy	8	6.161	-46.354	0.223
			Max. Vx	2	-6.342	-0.067	47.286
			Max. Torque	8			0.156
L3	175 - 170	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-22.035	-0.791	1.376
			Max. Mx	8	-8.825	-111.348	0.433
			Max. My	2	-8.765	-0.192	113.581
			Max. Vy	8	14.877	-111.348	0.433
			Max. Vx	2	-15.176	-0.192	113.581
			Max. Torque	10			0.635
L4	170 - 165	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-22.864	-0.955	1.487
			Max. Mx	8	-9.319	-187.141	0.476
			Max. My	2	-9.251	-0.245	191.084
			Max. Vy	8	15.435	-187.141	0.476
			Max. Vx	2	-15.828	-0.245	191.084
			Max. Torque	10			0.635
L5	165 - 160	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-29.752	-1.172	2.097
			Max. Mx	8	-12.734	-287.092	0.637
			Max. My	2	-12.648	-0.319	293.588
			Max. Vy	8	20.274	-287.092	0.637
			Max. Vx	2	-20.805	-0.319	293.588
			Max. Torque	22			-0.911
L6	160 - 155	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-30.745	-1.398	2.241
			Max. Mx	8	-13.382	-389.971	0.694
			Max. My	2	-13.293	-0.395	399.273
			Max. Vy	8	20.871	-389.971	0.694
			Max. Vx	2	-21.474	-0.395	399.273
			Max. Torque	22			-0.911

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L7	155 - 154	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-39.565	0.091	1.384
			Max. Mx	20	-16.652	415.451	0.233
			Max. My	2	-16.562	-0.132	425.273
			Max. Vy	8	25.843	-415.293	0.593
			Max. Vx	2	-26.341	-0.132	425.273
			Max. Torque	6			0.655
L8	154 - 153.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-39.640	0.078	1.393
			Max. Mx	20	-16.706	421.911	0.205
			Max. My	2	-16.617	-0.165	431.862
			Max. Vy	20	-25.873	421.911	0.205
			Max. Vx	2	-26.373	-0.165	431.862
			Max. Torque	6			0.655
L9	153.75 - 152.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-40.014	0.019	1.430
			Max. Mx	20	-16.912	454.325	0.067
			Max. My	2	-16.821	-0.330	464.949
			Max. Vy	8	26.035	-454.208	0.785
			Max. Vx	2	-26.563	-0.330	464.949
			Max. Torque	6			0.655
L10	152.5 - 152.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-40.103	0.006	1.439
			Max. Mx	20	-16.979	460.833	0.040
			Max. My	2	-16.888	-0.363	471.594
			Max. Vy	20	-26.068	460.833	0.040
			Max. Vx	2	-26.599	-0.363	471.594
			Max. Torque	6			0.655
L11	152.25 - 151.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-40.370	-0.029	1.461
			Max. Mx	20	-17.143	480.406	-0.043
			Max. My	2	-17.051	-0.463	491.590
			Max. Vy	8	26.169	-480.317	0.914
			Max. Vx	2	-26.717	-0.463	491.590
			Max. Torque	6			0.655
L12	151.5 - 151.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-40.450	-0.042	1.470
			Max. Mx	20	-17.194	486.949	-0.071
			Max. My	2	-17.102	-0.496	498.276
			Max. Vy	20	-26.206	486.949	-0.071
			Max. Vx	2	-26.756	-0.496	498.276
			Max. Torque	6			0.655
L13	151.25 - 146.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-41.961	-0.291	1.627
			Max. Mx	8	-18.156	-619.611	1.589
			Max. My	2	-18.064	-1.161	633.898
			Max. Vy	8	26.884	-619.611	1.589
			Max. Vx	2	-27.495	-1.161	633.898
			Max. Torque	6			0.655
L14	146.25 - 141.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-43.486	-0.553	1.790
			Max. Mx	8	-19.166	-755.810	2.234
			Max. My	2	-19.075	-1.831	773.210
			Max. Vy	8	27.587	-755.810	2.234
			Max. Vx	2	-28.234	-1.831	773.210
			Max. Torque	6			0.655
L15	141.25 - 136.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-45.051	-0.826	1.958
			Max. Mx	8	-20.212	-895.582	2.881
			Max. My	2	-20.123	-2.505	916.248
			Max. Vy	8	28.314	-895.582	2.881
			Max. Vx	2	-28.986	-2.505	916.248
			Max. Torque	6			0.655

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L16	136.25 - 130	Pole	Max. Torque	6			0.654
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-45.464	-0.897	2.001
			Max. Mx	8	-20.477	-931.098	3.043
			Max. My	2	-20.389	-2.675	952.600
			Max. Vy	8	28.501	-931.098	3.043
			Max. Vx	2	-29.180	-2.675	952.600
L17	130 - 129	Pole	Max. Torque	6			0.654
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-48.837	-1.241	2.212
			Max. Mx	8	-22.749	-1105.244	3.823
			Max. My	2	-22.661	-3.491	1130.883
			Max. Vy	8	29.525	-1105.244	3.823
			Max. Vx	2	-30.242	-3.491	1130.883
L18	129 - 124	Pole	Max. Torque	6			0.654
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-50.794	-1.538	2.392
			Max. Mx	8	-24.029	-1254.880	4.475
			Max. My	2	-23.943	-4.175	1284.162
			Max. Vy	8	30.320	-1254.880	4.475
			Max. Vx	2	-31.075	-4.175	1284.162
L19	124 - 121.42	Pole	Max. Torque	6			0.654
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-51.903	-1.695	2.487
			Max. Mx	8	-24.700	-1333.666	4.812
			Max. My	2	-24.614	-4.529	1364.929
			Max. Vy	8	30.743	-1333.666	4.812
			Max. Vx	2	-31.538	-4.529	1364.929
L20	121.42 - 121.17	Pole	Max. Torque	6			0.654
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-52.017	-1.712	2.499
			Max. Mx	8	-24.782	-1341.359	4.845
			Max. My	2	-24.697	-4.563	1372.819
			Max. Vy	20	-30.786	1340.457	-3.369
			Max. Vx	2	-31.580	-4.563	1372.819
L21	121.17 - 116.17	Pole	Max. Torque	6			0.654
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-54.195	-2.024	2.685
			Max. Mx	8	-26.185	-1497.400	5.499
			Max. My	2	-26.099	-5.253	1532.997
			Max. Vy	8	31.624	-1497.400	5.499
			Max. Vx	2	-32.495	-5.253	1532.997
L22	116.17 - 115	Pole	Max. Torque	6			0.654
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-54.702	-2.098	2.730
			Max. Mx	8	-26.520	-1534.528	5.652
			Max. My	2	-26.434	-5.415	1571.144
			Max. Vy	8	31.826	-1534.528	5.652
			Max. Vx	2	-32.712	-5.415	1571.144
L23	115 - 113.75	Pole	Max. Torque	6			0.653
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-55.284	-2.179	2.778
			Max. Mx	8	-26.917	-1574.457	5.816
			Max. My	2	-26.832	-5.588	1612.181
			Max. Vy	8	32.046	-1574.457	5.816
			Max. Vx	2	-32.948	-5.588	1612.181
L24	113.75 - 113.5	Pole	Max. Torque	6			0.653
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-55.392	-2.197	2.790
			Max. Mx	8	-26.998	-1582.477	5.850
			Max. My	2	-26.913	-5.623	1620.424
			Max. Vy	20	-32.095	1581.284	-4.201
			Max. Vx	2	-32.993	-5.623	1620.424
L25	113.5 - 108.5	Pole	Max. Torque	6			0.653
			Max Tension	1	0.000	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L26	108.5 - 103.5	Pole	Max. Compression	26	-57.463	-2.524	2.985
			Max. Mx	8	-28.432	-1745.132	6.506
			Max. My	2	-28.351	-6.318	1787.621
			Max. Vy	8	32.961	-1745.132	6.506
			Max. Vx	2	-33.890	-6.318	1787.621
			Max. Torque	6			0.653
			Max Tension	1	0.000	0.000	0.000
			L27	103.5 - 95	Pole	Max. Compression	26
Max. Mx	8	-29.913				-1912.205	7.164
Max. My	2	-29.836				-7.016	1959.307
Max. Vy	8	33.855				-1912.205	7.164
Max. Vx	2	-34.789				-7.016	1959.307
Max. Torque	6						0.653
Max Tension	1	0.000				0.000	0.000
L28	95 - 94	Pole				Max. Compression	26
			Max. Mx	8	-30.666	-1997.428	7.494
			Max. My	2	-30.591	-7.367	2046.860
			Max. Vy	8	34.308	-1997.428	7.494
			Max. Vx	2	-35.256	-7.367	2046.860
			Max. Torque	6			0.653
			Max Tension	1	0.000	0.000	0.000
			L29	94 - 91.4	Pole	Max. Compression	26
Max. Mx	8	-34.760				-2242.769	8.420
Max. My	2	-34.686				-8.352	2298.919
Max. Vy	8	35.759				-2242.769	8.420
Max. Vx	2	-36.750				-8.352	2298.919
Max. Torque	6						0.653
Max Tension	1	0.000				0.000	0.000
L30	91.4 - 91.15	Pole				Max. Compression	26
			Max. Mx	8	-35.749	-2336.420	8.765
			Max. My	2	-35.677	-8.719	2395.140
			Max. Vy	8	36.262	-2336.420	8.765
			Max. Vx	2	-37.267	-8.719	2395.140
			Max. Torque	6			0.653
			Max Tension	1	0.000	0.000	0.000
			L31	91.15 - 91	Pole	Max. Compression	26
Max. Mx	8	-35.838				-2345.494	8.798
Max. My	2	-35.767				-8.755	2404.464
Max. Vy	20	-36.317				2343.356	-6.596
Max. Vx	2	-37.314				-8.755	2404.464
Max. Torque	6						0.653
Max Tension	1	0.000				0.000	0.000
L32	91 - 86	Pole				Max. Compression	26
			Max. Mx	8	-35.887	-2350.945	8.819
			Max. My	2	-35.816	-8.776	2410.064
			Max. Vy	20	-36.382	2348.801	-6.612
			Max. Vx	2	-37.358	-8.776	2410.064
			Max. Torque	6			0.653
			Max Tension	1	0.000	0.000	0.000
			L33	86 - 81	Pole	Max. Compression	26
Max. Mx	8	-37.652				-2535.043	9.482
Max. My	2	-37.585				-9.485	2599.149
Max. Vy	8	37.290				-2535.043	9.482
Max. Vx	2	-38.297				-9.485	2599.149
Max. Torque	6						0.653
Max Tension	1	0.000				0.000	0.000
L34	81 - 76	Pole				Max. Compression	26
			Max. Mx	8	-39.468	-2723.968	10.147
			Max. My	2	-39.406	-10.198	2793.053
			Max. Vy	8	38.263	-2723.968	10.147
			Max. Vx	2	-39.268	-10.198	2793.053
			Max. Torque	6			0.653
			Max Tension	1	0.000	0.000	0.000
			L34	81 - 76	Pole	Max. Compression	26
Max. Mx	8	-41.328				-2917.796	10.813
Max. My	2	-41.270				-10.912	2991.852
Max. Vy	8	39.251				-2917.796	10.813
Max. Vx	2	-40.254				-10.912	2991.852

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L35	76 - 71	Pole	Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-78.029	-5.127	4.487
			Max. Mx	8	-43.231	-3116.595	11.479
			Max. My	2	-43.179	-11.629	3195.613
			Max. Vy	8	40.251	-3116.595	11.479
L36	71 - 66	Pole	Max. Vx	2	-41.252	-11.629	3195.613
			Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-80.642	-5.513	4.710
			Max. Mx	8	-45.178	-3320.425	12.146
			Max. My	2	-45.130	-12.349	3404.395
L37	66 - 63.75	Pole	Max. Vy	8	41.262	-3320.425	12.146
			Max. Vx	2	-42.262	-12.349	3404.395
			Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-81.888	-5.689	4.811
			Max. Mx	8	-46.067	-3413.808	12.447
L38	63.75 - 63.5	Pole	Max. My	2	-46.022	-12.673	3500.002
			Max. Vy	8	41.722	-3413.808	12.447
			Max. Vx	2	-42.722	-12.673	3500.002
			Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-82.029	-5.711	4.826
L39	63.5 - 58.5	Pole	Max. Mx	8	-46.177	-3424.249	12.480
			Max. My	2	-46.132	-12.709	3510.690
			Max. Vy	20	-41.783	3420.758	-9.497
			Max. Vx	2	-42.771	-12.709	3510.690
			Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
L40	58.5 - 51	Pole	Max. Compression	26	-84.769	-6.108	5.053
			Max. Mx	8	-48.180	-3635.722	13.148
			Max. My	2	-48.140	-13.432	3727.098
			Max. Vy	8	42.796	-3635.722	13.148
			Max. Vx	2	-43.794	-13.432	3727.098
			Max. Torque	6			0.652
L41	51 - 50	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-85.046	-6.150	5.077
			Max. Mx	8	-48.389	-3657.153	13.215
			Max. My	2	-48.350	-13.504	3749.021
			Max. Vy	20	-42.895	3653.366	-10.063
			Max. Vx	2	-43.890	-13.504	3749.021
L42	50 - 45	Pole	Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-93.137	-6.805	5.455
			Max. Mx	8	-54.515	-4007.689	14.287
			Max. My	2	-54.480	-14.666	4107.442
			Max. Vy	8	44.695	-4007.689	14.287
L43	45 - 40.42	Pole	Max. Vx	2	-45.692	-14.666	4107.442
			Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-99.268	-7.608	5.918
			Max. Mx	8	-59.091	-4445.464	15.572
			Max. My	2	-59.063	-16.064	4554.630
L44	40.42 - 40.17	Pole	Max. Vy	8	46.673	-4445.464	15.572
			Max. Vx	2	-47.666	-16.064	4554.630
			Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-99.417	-7.632	5.932
			Max. Mx	8	-59.208	-4457.142	15.606
			Max. My	2	-59.182	-16.101	4566.554



Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L45	40.17 - 40	Pole	Max. Vy	20	-46.731	4452.353	-11.878
			Max. Vx	2	-47.713	-16.101	4566.554
			Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-99.518	-7.647	5.942
			Max. Mx	8	-59.283	-4465.091	15.629
			Max. My	2	-59.257	-16.126	4574.669
			Max. Vy	20	-46.788	4460.293	-11.895
L46	40 - 35	Pole	Max. Vx	2	-47.757	-16.126	4574.669
			Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-102.788	-8.001	6.217
			Max. Mx	8	-61.713	-4701.484	16.300
			Max. My	2	-61.690	-16.858	4815.955
			Max. Vy	8	47.776	-4701.484	16.300
			Max. Vx	2	-48.765	-16.858	4815.955
L47	35 - 33	Pole	Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-104.150	-8.113	6.343
			Max. Mx	8	-62.703	-4797.470	16.568
			Max. My	2	-62.682	-17.152	4913.895
			Max. Vy	8	48.180	-4797.470	16.568
			Max. Vx	2	-49.169	-17.152	4913.895
			Max. Torque	6			0.652
L48	33 - 32.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-104.345	-8.130	6.361
			Max. Mx	8	-62.860	-4809.526	16.602
			Max. My	2	-62.840	-17.188	4926.195
			Max. Vy	20	-48.237	4804.296	-12.621
			Max. Vx	2	-49.217	-17.188	4926.195
			Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
L49	32.75 - 19	Pole	Max. Compression	26	-107.962	-8.403	6.661
			Max. Mx	8	-65.692	-5040.915	17.241
			Max. My	2	-65.676	-17.890	5162.210
			Max. Vy	8	49.166	-5040.915	17.241
			Max. Vx	2	-50.152	-17.890	5162.210
			Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-121.619	-8.983	7.300
L50	19 - 18	Pole	Max. Mx	8	-76.712	-5543.584	18.586
			Max. My	2	-76.699	-19.364	5674.605
			Max. Vy	8	51.312	-5543.584	18.586
			Max. Vx	2	-52.296	-19.364	5674.605
			Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-125.490	-9.276	7.618
			Max. Mx	8	-79.825	-5802.466	19.259
L51	18 - 13	Pole	Max. My	2	-79.817	-20.104	5938.335
			Max. Vy	8	52.210	-5802.466	19.259
			Max. Vx	2	-53.192	-20.104	5938.335
			Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-129.385	-9.572	7.933
			Max. Mx	8	-82.987	-6065.870	19.932
			Max. My	2	-82.982	-20.846	6206.569
L52	13 - 8	Pole	Max. Vy	8	53.120	-6065.870	19.932
			Max. Vx	2	-54.098	-20.846	6206.569
			Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-130.620	-9.665	8.031
			Max. Mx	8	-83.992	-6150.057	20.145
			Max. My	2	-83.988	-21.081	6292.279
			Max. Vy	8	53.419	-6150.057	20.145
L53	8 - 6.42	Pole	Max. Vx	2	-54.397	-21.081	6292.279
			Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-130.797	-9.680	8.047
			Max. Mx	8	-84.145	-6163.420	20.178
			Max. My	2			
			Max. Vy	8			
			Max. Vx	2			
L54	6.42 - 6.17	Pole	Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-130.797	-9.680	8.047

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L55	6.17 - 1.17	Pole	Max. My	2	-84.142	-21.118	6305.883
			Max. Vy	20	-53.450	6156.499	-15.233
			Max. Vx	2	-54.426	-21.118	6305.883
			Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-134.312	-9.972	8.347
			Max. Mx	8	-86.959	-6433.279	20.852
			Max. My	2	-86.958	-21.862	6580.551
			Max. Vy	8	54.444	-6433.279	20.852
			Max. Vx	2	-55.420	-21.862	6580.551
L56	1.17 - 0	Pole	Max. Torque	6			0.652
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-135.113	-10.038	8.410
			Max. Mx	8	-87.625	-6497.145	21.009
			Max. My	2	-87.625	-22.036	6645.541
			Max. Vy	8	54.681	-6497.145	21.009
			Max. Vx	2	-55.655	-22.036	6645.541
			Max. Torque	6			0.652

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	135.113	0.000	-0.000
	Max. H <sub>x</sub>	21	65.724	54.670	-0.115
	Max. H <sub>z</sub>	2	87.632	-0.115	55.645
	Max. M <sub>x</sub>	2	6645.541	-0.115	55.645
	Max. M <sub>z</sub>	8	6497.145	-54.670	0.115
	Max. Torsion	6	0.652	-47.404	27.408
	Min. Vert	3	65.724	-0.115	55.644
	Min. H <sub>x</sub>	8	87.632	-54.670	0.115
	Min. H <sub>z</sub>	14	87.632	0.115	-55.645
	Min. M <sub>x</sub>	14	-6640.363	0.115	-55.645
	Min. M <sub>z</sub>	20	-6489.808	54.670	-0.115
	Min. Torsion	18	-0.652	47.404	-27.408

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	73.027	0.000	-0.000	-2.088	-2.939	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	87.632	0.115	-55.645	-6645.541	-22.036	-0.615
0.9 Dead+1.0 Wind 0 deg - No Ice	65.724	0.115	-55.644	-6595.189	-20.968	-0.608
1.2 Dead+1.0 Wind 30 deg - No Ice	87.632	28.178	-48.642	-5834.824	-3385.182	-0.594
0.9 Dead+1.0 Wind 30 deg - No Ice	65.724	28.178	-48.642	-5790.498	-3358.946	-0.584
1.2 Dead+1.0 Wind 60 deg - No Ice	87.632	47.404	-27.408	-3261.644	-5636.437	-0.652
0.9 Dead+1.0 Wind 60 deg - No Ice	65.724	47.404	-27.408	-3236.643	-5593.472	-0.642
1.2 Dead+1.0 Wind 90 deg - No Ice	87.632	54.670	-0.115	-21.009	-6497.145	-0.398
0.9 Dead+1.0 Wind 90 deg - No Ice	65.724	54.670	-0.115	-20.198	-6447.710	-0.391
1.2 Dead+1.0 Wind 120 deg - No Ice	87.632	47.289	27.208	3224.589	-5618.069	-0.037

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
0.9 Dead+1.0 Wind 120 deg - No Ice	65.724	47.289	27.208	3201.170	-5575.248	-0.035
1.2 Dead+1.0 Wind 150 deg - No Ice	87.632	27.236	47.241	5605.474	-3234.493	0.333
0.9 Dead+1.0 Wind 150 deg - No Ice	65.724	27.236	47.241	5564.277	-3209.464	0.331
1.2 Dead+1.0 Wind 180 deg - No Ice	87.632	-0.115	55.645	6640.363	14.799	0.615
0.9 Dead+1.0 Wind 180 deg - No Ice	65.724	-0.115	55.644	6591.341	15.575	0.607
1.2 Dead+1.0 Wind 210 deg - No Ice	87.632	-28.178	48.642	5829.653	3377.954	0.594
0.9 Dead+1.0 Wind 210 deg - No Ice	65.724	-28.178	48.642	5786.654	3353.561	0.583
1.2 Dead+1.0 Wind 240 deg - No Ice	87.632	-47.404	27.408	3256.471	5629.215	0.652
0.9 Dead+1.0 Wind 240 deg - No Ice	65.724	-47.404	27.408	3232.798	5588.091	0.642
1.2 Dead+1.0 Wind 270 deg - No Ice	87.632	-54.670	0.115	15.827	6489.808	0.398
0.9 Dead+1.0 Wind 270 deg - No Ice	65.724	-54.670	0.115	16.346	6442.330	0.391
1.2 Dead+1.0 Wind 300 deg - No Ice	87.632	-47.289	-27.208	-3229.778	5610.844	0.038
0.9 Dead+1.0 Wind 300 deg - No Ice	65.724	-47.289	-27.208	-3205.026	5569.864	0.035
1.2 Dead+1.0 Wind 330 deg - No Ice	87.632	-27.236	-47.241	-5610.661	3227.259	-0.333
0.9 Dead+1.0 Wind 330 deg - No Ice	65.724	-27.236	-47.241	-5568.132	3204.073	-0.330
1.2 Dead+1.0 Ice+1.0 Temp	135.113	-0.000	0.000	-8.410	-10.038	-0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	135.113	0.018	-11.839	-1522.032	-13.380	-0.111
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	135.113	5.955	-10.289	-1325.891	-773.098	-0.151
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	135.113	10.269	-5.936	-767.985	-1323.350	-0.188
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	135.113	11.847	-0.018	-11.705	-1524.710	-0.152
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	135.113	10.250	5.904	745.390	-1320.309	-0.076
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	135.113	5.907	10.244	1300.438	-764.895	0.020
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	135.113	-0.018	11.839	1504.705	-7.297	0.111
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	135.113	-5.955	10.289	1308.565	752.422	0.151
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	135.113	-10.269	5.936	750.655	1302.668	0.187
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	135.113	-11.847	0.018	-5.623	1504.036	0.152
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	135.113	-10.250	-5.904	-762.719	1299.634	0.076
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	135.113	-5.907	-10.244	-1317.766	744.218	-0.020
Dead+Wind 0 deg - Service	73.027	0.023	-11.166	-1329.812	-6.680	-0.119
Dead+Wind 30 deg - Service	73.027	5.655	-9.762	-1167.917	-678.918	-0.120
Dead+Wind 60 deg - Service	73.027	9.513	-5.500	-653.556	-1128.867	-0.137
Dead+Wind 90 deg - Service	73.027	10.971	-0.023	-5.829	-1300.769	-0.089
Dead+Wind 120 deg - Service	73.027	9.490	5.460	642.883	-1125.189	-0.018
Dead+Wind 150 deg - Service	73.027	5.466	9.481	1118.759	-648.773	0.058
Dead+Wind 180 deg - Service	73.027	-0.023	11.166	1325.511	0.676	0.119
Dead+Wind 210 deg - Service	73.027	-5.655	9.762	1163.615	672.915	0.120
Dead+Wind 240 deg - Service	73.027	-9.513	5.500	649.254	1122.864	0.137

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead+Wind 270 deg - Service	73.027	-10.971	0.023	1.527	1294.767	0.089
Dead+Wind 300 deg - Service	73.027	-9.490	-5.460	-647.185	1119.186	0.018
Dead+Wind 330 deg - Service	73.027	-5.466	-9.481	-1123.061	642.770	-0.058

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-73.027	0.000	-0.000	73.027	0.000	0.000%
2	0.115	-87.632	-55.645	-0.115	87.632	55.645	0.001%
3	0.115	-65.724	-55.645	-0.115	65.724	55.644	0.001%
4	28.178	-87.632	-48.642	-28.178	87.632	48.642	0.000%
5	28.178	-65.724	-48.642	-28.178	65.724	48.642	0.000%
6	47.404	-87.632	-27.408	-47.404	87.632	27.408	0.000%
7	47.404	-65.724	-27.408	-47.404	65.724	27.408	0.000%
8	54.671	-87.632	-0.115	-54.670	87.632	0.115	0.001%
9	54.671	-65.724	-0.115	-54.670	65.724	0.115	0.001%
10	47.289	-87.632	27.208	-47.289	87.632	-27.208	0.000%
11	47.289	-65.724	27.208	-47.289	65.724	-27.208	0.000%
12	27.236	-87.632	47.241	-27.236	87.632	-47.241	0.000%
13	27.236	-65.724	47.241	-27.236	65.724	-47.241	0.000%
14	-0.115	-87.632	55.645	0.115	87.632	-55.645	0.001%
15	-0.115	-65.724	55.645	0.115	65.724	-55.644	0.001%
16	-28.178	-87.632	48.642	28.178	87.632	-48.642	0.000%
17	-28.178	-65.724	48.642	28.178	65.724	-48.642	0.000%
18	-47.404	-87.632	27.408	47.404	87.632	-27.408	0.000%
19	-47.404	-65.724	27.408	47.404	65.724	-27.408	0.000%
20	-54.671	-87.632	0.115	54.670	87.632	-0.115	0.001%
21	-54.671	-65.724	0.115	54.670	65.724	-0.115	0.001%
22	-47.289	-87.632	-27.208	47.289	87.632	27.208	0.000%
23	-47.289	-65.724	-27.208	47.289	65.724	27.208	0.000%
24	-27.236	-87.632	-47.241	27.236	87.632	47.241	0.000%
25	-27.236	-65.724	-47.241	27.236	65.724	47.241	0.000%
26	0.000	-135.113	0.000	0.000	135.113	-0.000	0.000%
27	0.018	-135.113	-11.839	-0.018	135.113	11.839	0.000%
28	5.955	-135.113	-10.289	-5.955	135.113	10.289	0.000%
29	10.269	-135.113	-5.936	-10.269	135.113	5.936	0.000%
30	11.847	-135.113	-0.018	-11.847	135.113	0.018	0.000%
31	10.250	-135.113	5.904	-10.250	135.113	-5.904	0.000%
32	5.907	-135.113	10.244	-5.907	135.113	-10.244	0.000%
33	-0.018	-135.113	11.839	0.018	135.113	-11.839	0.000%
34	-5.955	-135.113	10.289	5.955	135.113	-10.289	0.000%
35	-10.269	-135.113	5.936	10.269	135.113	-5.936	0.000%
36	-11.847	-135.113	0.018	11.847	135.113	-0.018	0.000%
37	-10.250	-135.113	-5.904	10.250	135.113	5.904	0.000%
38	-5.907	-135.113	-10.244	5.907	135.113	10.244	0.000%
39	0.023	-73.027	-11.167	-0.023	73.027	11.166	0.002%
40	5.655	-73.027	-9.762	-5.655	73.027	9.762	0.000%
41	9.513	-73.027	-5.500	-9.513	73.027	5.500	0.000%
42	10.972	-73.027	-0.023	-10.971	73.027	0.023	0.002%
43	9.490	-73.027	5.460	-9.490	73.027	-5.460	0.000%
44	5.466	-73.027	9.481	-5.466	73.027	-9.481	0.000%
45	-0.023	-73.027	11.167	0.023	73.027	-11.166	0.002%
46	-5.655	-73.027	9.762	5.655	73.027	-9.762	0.000%
47	-9.513	-73.027	5.500	9.513	73.027	-5.500	0.000%
48	-10.972	-73.027	0.023	10.971	73.027	-0.023	0.002%
49	-9.490	-73.027	-5.460	9.490	73.027	5.460	0.000%
50	-5.466	-73.027	-9.481	5.466	73.027	9.481	0.000%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.0000001	0.0000001
2	Yes	17	0.0000001	0.00006817
3	Yes	16	0.0000001	0.00009143
4	Yes	21	0.0000001	0.00009855
5	Yes	21	0.0000001	0.00007087
6	Yes	21	0.0000001	0.00009082
7	Yes	21	0.0000001	0.00006567
8	Yes	17	0.0000001	0.00007984
9	Yes	16	0.0000001	0.00011637
10	Yes	21	0.0000001	0.00008848
11	Yes	21	0.0000001	0.00006406
12	Yes	21	0.0000001	0.00008823
13	Yes	21	0.0000001	0.00006387
14	Yes	17	0.0000001	0.00008502
15	Yes	16	0.0000001	0.00012829
16	Yes	21	0.0000001	0.00009937
17	Yes	21	0.0000001	0.00007155
18	Yes	21	0.0000001	0.00008917
19	Yes	21	0.0000001	0.00006452
20	Yes	16	0.00001940	0.00014657
21	Yes	16	0.0000001	0.00008766
22	Yes	21	0.0000001	0.00008861
23	Yes	21	0.0000001	0.00006414
24	Yes	21	0.0000001	0.00008888
25	Yes	21	0.0000001	0.00006436
26	Yes	12	0.0000001	0.00013863
27	Yes	19	0.0000001	0.00014066
28	Yes	20	0.0000001	0.00006984
29	Yes	20	0.0000001	0.00006950
30	Yes	19	0.0000001	0.00014062
31	Yes	20	0.0000001	0.00006846
32	Yes	20	0.0000001	0.00006827
33	Yes	19	0.0000001	0.00013864
34	Yes	20	0.0000001	0.00006833
35	Yes	19	0.0000001	0.00014970
36	Yes	19	0.0000001	0.00013878
37	Yes	20	0.0000001	0.00006835
38	Yes	20	0.0000001	0.00006852
39	Yes	14	0.0000001	0.00014151
40	Yes	16	0.0000001	0.00008808
41	Yes	16	0.0000001	0.00008327
42	Yes	14	0.0000001	0.00013845
43	Yes	16	0.0000001	0.00007946
44	Yes	16	0.0000001	0.00007915
45	Yes	14	0.0000001	0.00014133
46	Yes	16	0.0000001	0.00008980
47	Yes	16	0.0000001	0.00007893
48	Yes	14	0.0000001	0.00013753
49	Yes	16	0.0000001	0.00008006
50	Yes	16	0.0000001	0.00008040

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	185 - 180	19.644	40	1.155	0.001
L2	180 - 175	18.435	40	1.152	0.001
L3	175 - 170	17.235	40	1.138	0.001
L4	170 - 165	16.056	40	1.112	0.001
L5	165 - 160	14.912	40	1.071	0.001
L6	160 - 155	13.818	40	1.018	0.001
L7	155 - 154	12.783	40	0.957	0.001

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L8	154 - 153.75	12.584	40	0.944	0.001
L9	153.75 - 152.5	12.535	40	0.942	0.001
L10	152.5 - 152.25	12.290	40	0.930	0.000
L11	152.25 - 151.5	12.241	40	0.929	0.000
L12	151.5 - 151.25	12.096	40	0.924	0.000
L13	151.25 - 146.25	12.047	40	0.922	0.000
L14	146.25 - 141.25	11.105	40	0.877	0.000
L15	141.25 - 136.25	10.212	40	0.829	0.000
L16	136.25 - 130	9.371	40	0.778	0.000
L17	135 - 129	9.169	40	0.766	0.000
L18	129 - 124	8.224	40	0.733	0.000
L19	124 - 121.42	7.480	40	0.689	0.000
L20	121.42 - 121.17	7.114	40	0.666	0.000
L21	121.17 - 116.17	7.079	40	0.664	0.000
L22	116.17 - 115	6.406	40	0.622	0.000
L23	115 - 113.75	6.254	40	0.613	0.000
L24	113.75 - 113.5	6.095	40	0.604	0.000
L25	113.5 - 108.5	6.063	40	0.602	0.000
L26	108.5 - 103.5	5.455	40	0.560	0.000
L27	103.5 - 95	4.891	40	0.518	0.000
L28	101 - 94	4.625	40	0.498	0.000
L29	94 - 91.4	3.913	40	0.470	0.000
L30	91.4 - 91.15	3.662	40	0.453	0.000
L31	91.15 - 91	3.638	40	0.451	0.000
L32	91 - 86	3.624	40	0.450	0.000
L33	86 - 81	3.172	40	0.414	0.000
L34	81 - 76	2.757	40	0.379	0.000
L35	76 - 71	2.378	40	0.345	0.000
L36	71 - 66	2.035	40	0.311	0.000
L37	66 - 63.75	1.726	40	0.279	0.000
L38	63.75 - 63.5	1.598	40	0.264	0.000
L39	63.5 - 58.5	1.584	40	0.263	0.000
L40	58.5 - 51	1.326	40	0.231	0.000
L41	58 - 50	1.302	40	0.228	0.000
L42	50 - 45	0.939	40	0.202	0.000
L43	45 - 40.42	0.742	40	0.175	0.000
L44	40.42 - 40.17	0.585	40	0.151	0.000
L45	40.17 - 40	0.577	40	0.150	0.000
L46	40 - 35	0.572	40	0.149	0.000
L47	35 - 33	0.430	40	0.123	0.000
L48	33 - 32.75	0.381	40	0.112	0.000
L49	32.75 - 19	0.375	40	0.111	0.000
L50	28 - 18	0.275	40	0.090	0.000
L51	18 - 13	0.109	40	0.066	0.000
L52	13 - 8	0.052	40	0.044	0.000
L53	8 - 6.42	0.017	40	0.023	0.000
L54	6.42 - 6.17	0.011	40	0.016	0.000
L55	6.17 - 1.17	0.010	40	0.015	0.000
L56	1.17 - 0	0.000	40	0.000	0.000

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
183.000	APX16DWV-16DWVS-E-A20 w/ Mount Pipe	40	19.160	1.155	0.001	31901
174.000	DMP65R-BU6D w/ Mount Pipe	40	16.997	1.134	0.001	13008
165.000	MX08FRO665-20 w/ Mount Pipe	40	14.912	1.071	0.001	6118
155.000	(4) SBNHH-1D65B w/ Mount Pipe	40	12.783	0.957	0.001	5099

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	185 - 180	98.081	4	5.772	0.006
L2	180 - 175	92.058	4	5.755	0.006
L3	175 - 170	86.081	4	5.686	0.005
L4	170 - 165	80.202	4	5.558	0.005
L5	165 - 160	74.499	4	5.354	0.004
L6	160 - 155	69.038	4	5.092	0.003
L7	155 - 154	63.874	4	4.786	0.003
L8	154 - 153.75	62.880	4	4.722	0.002
L9	153.75 - 152.5	62.634	4	4.711	0.002
L10	152.5 - 152.25	61.410	4	4.653	0.002
L11	152.25 - 151.5	61.167	4	4.645	0.002
L12	151.5 - 151.25	60.441	4	4.621	0.002
L13	151.25 - 146.25	60.200	4	4.611	0.002
L14	146.25 - 141.25	55.496	4	4.387	0.002
L15	141.25 - 136.25	51.035	4	4.145	0.002
L16	136.25 - 130	46.831	4	3.894	0.001
L17	135 - 129	45.821	4	3.831	0.001
L18	129 - 124	41.103	4	3.669	0.001
L19	124 - 121.42	37.382	4	3.445	0.001
L20	121.42 - 121.17	35.554	4	3.331	0.001
L21	121.17 - 116.17	35.380	4	3.320	0.001
L22	116.17 - 115	32.014	4	3.113	0.001
L23	115 - 113.75	31.258	4	3.066	0.001
L24	113.75 - 113.5	30.462	4	3.021	0.001
L25	113.5 - 108.5	30.304	4	3.011	0.001
L26	108.5 - 103.5	27.264	4	2.801	0.001
L27	103.5 - 95	24.442	4	2.593	0.001
L28	101 - 94	23.112	4	2.490	0.001
L29	94 - 91.4	19.557	4	2.350	0.001
L30	91.4 - 91.15	18.301	4	2.266	0.001
L31	91.15 - 91	18.182	4	2.256	0.000
L32	91 - 86	18.112	4	2.250	0.000
L33	86 - 81	15.852	4	2.070	0.000
L34	81 - 76	13.777	4	1.895	0.000
L35	76 - 71	11.883	4	1.724	0.000
L36	71 - 66	10.167	4	1.556	0.000
L37	66 - 63.75	8.624	4	1.392	0.000
L38	63.75 - 63.5	7.984	4	1.321	0.000
L39	63.5 - 58.5	7.916	4	1.313	0.000
L40	58.5 - 51	6.624	4	1.155	0.000
L41	58 - 50	6.504	4	1.139	0.000
L42	50 - 45	4.693	4	1.010	0.000
L43	45 - 40.42	3.706	4	0.877	0.000
L44	40.42 - 40.17	2.923	4	0.756	0.000
L45	40.17 - 40	2.884	4	0.749	0.000
L46	40 - 35	2.857	4	0.744	0.000
L47	35 - 33	2.147	4	0.613	0.000
L48	33 - 32.75	1.901	4	0.561	0.000
L49	32.75 - 19	1.872	4	0.556	0.000
L50	28 - 18	1.372	4	0.449	0.000
L51	18 - 13	0.545	4	0.329	0.000
L52	13 - 8	0.259	4	0.219	0.000
L53	8 - 6.42	0.085	4	0.113	0.000
L54	6.42 - 6.17	0.053	4	0.080	0.000
L55	6.17 - 1.17	0.049	4	0.077	0.000
L56	1.17 - 0	0.002	4	0.014	0.000

### Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
-----------------	--------------	-----------------------	------------------	-----------	------------	------------------------------

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
183.000	APX16DWV-16DWVS-E-A20 w/ Mount Pipe	4	95.670	5.769	0.007	6703
174.000	DMP65R-BU6D w/ Mount Pipe	4	84.895	5.666	0.006	2692
165.000	MX08FRO665-20 w/ Mount Pipe	4	74.499	5.354	0.004	1256
155.000	(4) SBNHH-1D65B w/ Mount Pipe	4	63.874	4.786	0.003	1038

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	KI/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
L1	185 - 180 (1)	TP18x18x0.1875	5.000	0.000	0.0	10.754	-3.928	406.512	0.010
L2	180 - 175 (2)	TP19.6313x18x0.25	5.000	0.000	0.0	15.601 3	-4.223	589.752	0.007
L3	175 - 170 (3)	TP21.2625x19.6313x0.25	5.000	0.000	0.0	16.915 9	-8.723	639.389	0.014
L4	170 - 165 (4)	TP22.8938x21.2625x0.25	5.000	0.000	0.0	18.228 1	-9.208	689.027	0.013
L5	165 - 160 (5)	TP24.525x22.8938x0.25	5.000	0.000	0.0	19.541 2	-12.598	738.664	0.017
L6	160 - 155 (6)	TP26.1563x24.525x0.25	5.000	0.000	0.0	20.854 4	-13.242	788.301	0.017
L7	155 - 154 (7)	TP26.4825x26.1563x0.25	1.000	0.000	0.0	21.117 5	-16.494	798.229	0.021
L8	154 - 153.75 (8)	TP26.5641x26.4825x0.36 88	0.250	0.000	0.0	31.103 7	-16.549	1175.720	0.014
L9	153.75 - 152.5 (9)	TP26.9719x26.5641x0.36 25	1.250	0.000	0.0	31.059 8	-16.753	1174.060	0.014
L10	152.5 - 152.25 (10)	TP27.0534x26.9719x0.55	0.250	0.000	0.0	46.937 6	-16.820	1774.240	0.009
L11	152.25 - 151.5 (11)	TP27.2981x27.0534x0.55	0.750	0.000	0.0	47.370 9	-16.982	1790.620	0.009
L12	151.5 - 151.25 (12)	TP27.3797x27.2981x0.42 5	0.250	0.000	0.0	36.887 5	-17.033	1394.350	0.012
L13	151.25 - 146.25 (13)	TP29.0109x27.3797x0.41 25	5.000	0.000	0.0	37.985 9	-17.992	1435.870	0.013
L14	146.25 - 141.25 (14)	TP30.6422x29.0109x0.4 9	5.000	0.000	0.0	38.951 9	-19.000	1472.380	0.013
L15	141.25 - 136.25 (15)	TP32.2734x30.6422x0.39 38	5.000	0.000	0.0	40.419 5	-20.046	1527.860	0.013
L16	136.25 - 130 (16)	TP34.3125x32.2734x0.39 38	6.250	0.000	0.0	40.936 5	-20.311	1547.400	0.013
L17	130 - 129 (17)	TP34.1331x32.1813x0.47 5	6.000	0.000	0.0	51.480 1	-22.580	1945.950	0.012
L18	129 - 124 (18)	TP35.7597x34.1331x0.46 25	5.000	0.000	0.0	52.566 3	-23.863	1987.010	0.012
L19	124 - 121.42 (19)	TP36.599x35.7597x0.462 5	2.580	0.000	0.0	53.816 3	-24.537	2034.260	0.012
L20	121.42 - 121.17 (20)	TP36.6803x36.599x0.5	0.250	0.000	0.0	58.250 3	-24.621	2201.860	0.011
L21	121.17 - 116.17 (21)	TP38.3069x36.6803x0.48 75	5.000	0.000	0.0	59.367 0	-26.029	2244.070	0.012
L22	116.17 - 115 (22)	TP38.6875x38.3069x0.48 75	1.170	0.000	0.0	59.964 5	-26.366	2266.660	0.012
L23	115 - 113.75 (23)	TP39.0938x38.6875x0.55	1.250	0.000	0.0	68.261 0	-26.765	2580.270	0.010
L24	113.75 - 113.5 (24)	TP39.175x39.0938x0.468 8	0.250	0.000	0.0	58.422 2	-26.847	2208.360	0.012



Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	KI/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio P <sub>u</sub> / φP <sub>n</sub>
L25	113.5 - 108.5 (25)	TP40.8x39.175x0.4625	5.000	0.000	0.0	60.072 6	-28.290	2270.750	0.012
L26	108.5 - 103.5 (26)	TP42.425x40.8x0.4563	5.000	0.000	0.0	61.657 3	-29.779	2330.650	0.013
L27	103.5 - 95 (27)	TP45.1875x42.425x0.45	8.500	0.000	0.0	61.999 1	-30.537	2343.570	0.013
L28	95 - 94 (28)	TP44.8525x42.6125x0.58 75	7.000	0.000	0.0	83.738 3	-34.636	3165.310	0.011
L29	94 - 91.4 (29)	TP45.6845x44.8525x0.57 5	2.600	0.000	0.0	83.520 2	-35.629	3157.070	0.011
L30	91.4 - 91.15 (30)	TP45.7645x45.6845x0.44 38	0.250	0.000	0.0	64.757 7	-35.719	2447.840	0.015
L31	91.15 - 91 (31)	TP45.8125x45.7645x0.44 38	0.150	0.000	0.0	64.826 3	-35.768	2450.430	0.015
L32	91 - 86 (32)	TP47.4453x45.8125x0.5	5.000	0.000	0.0	75.582 0	-37.540	2857.000	0.013
L33	86 - 81 (33)	TP49.0781x47.4453x0.5	5.000	0.000	0.0	78.210 8	-39.365	2956.370	0.013
L34	81 - 76 (34)	TP50.7109x49.0781x0.49 38	5.000	0.000	0.0	79.839 1	-41.233	3017.920	0.014
L35	76 - 71 (35)	TP52.3438x50.7109x0.48 75	5.000	0.000	0.0	81.401 4	-43.145	3076.970	0.014
L36	71 - 66 (36)	TP53.9766x52.3438x0.48 75	5.000	0.000	0.0	83.964 5	-45.099	3173.860	0.014
L37	66 - 63.75 (37)	TP54.7113x53.9766x0.48 75	2.250	0.000	0.0	85.117 9	-45.993	3217.460	0.014
L38	63.75 - 63.5 (38)	TP54.793x54.7113x0.487 5	0.250	0.000	0.0	85.246 0	-46.103	3222.300	0.014
L39	63.5 - 58.5 (39)	TP56.4258x54.793x0.481 3	5.000	0.000	0.0	86.693 0	-48.114	3277.000	0.015
L40	58.5 - 51 (40)	TP58.875x56.4258x0.481 3	7.500	0.000	0.0	86.946 1	-48.325	3286.560	0.015
L41	51 - 50 (41)	TP58.4384x55.8391x0.55	8.000	0.000	0.0	102.52 00	-54.457	3875.270	0.014
L42	50 - 45 (42)	TP60.0629x58.4384x0.55	5.000	0.000	0.0	105.39 70	-56.832	3984.020	0.014
L43	45 - 40.42 (43)	TP61.551x60.0629x0.543 8	4.580	0.000	0.0	106.81 60	-59.046	4037.650	0.015
L44	40.42 - 40.17 (44)	TP61.6323x61.551x0.475	0.250	0.000	0.0	93.540 0	-59.164	3535.810	0.017
L45	40.17 - 40 (45)	TP61.6875x61.6323x0.47 5	0.170	0.000	0.0	93.624 5	-59.240	3539.010	0.017
L46	40 - 35 (46)	TP63.3095x61.6875x0.53 13	5.000	0.000	0.0	107.39 00	-61.676	4059.350	0.015
L47	35 - 33 (47)	TP63.9583x63.3095x0.52 5	2.000	0.000	0.0	107.23 40	-62.669	4053.450	0.015
L48	33 - 32.75 (48)	TP64.0394x63.9583x0.6	0.250	0.000	0.0	122.56 50	-62.827	4632.960	0.014
L49	32.75 - 19 (49)	TP68.5x64.0394x0.6	13.750	0.000	0.0	125.54 20	-65.665	4745.490	0.014
L50	19 - 18 (50)	TP67.9579x64.7054x0.6	10.000	0.000	0.0	130.13 50	-76.691	4919.120	0.016
L51	18 - 13 (51)	TP69.5842x67.9579x0.58 75	5.000	0.000	0.0	130.52 40	-79.811	4933.830	0.016
L52	13 - 8 (52)	TP71.2105x69.5842x0.58 75	5.000	0.000	0.0	133.60 10	-82.979	5050.120	0.016
L53	8 - 6.42 (53)	TP71.7244x71.2105x0.58 75	1.580	0.000	0.0	134.57 30	-83.986	5086.870	0.017
L54	6.42 - 6.17 (54)	TP71.8057x71.7244x1.01 25	0.250	0.000	0.0	230.53 80	-84.003	8714.350	0.010
L55	6.17 - 1.17 (55)	TP73.432x71.8057x0.987 5	5.000	0.000	0.0	225.18 40	-84.148	8511.960	0.010
L56	1.17 - 0 (56)	TP73.8125x73.432x0.987 5	1.170	0.000	0.0	230.35 50	-86.971	8707.430	0.010

### Pole Bending Design Data

Section No.	Elevation ft	Size	$M_{ux}$	$\phi M_{nx}$	Ratio	$M_{uy}$	$\phi M_{ny}$	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{nx}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{ny}}$
L1	185 - 180 (1)	TP18x18x0.1875	17.141	185.394	0.092	0.000	185.394	0.000
L2	180 - 175 (2)	TP19.6313x18x0.25	47.763	291.965	0.164	0.000	291.965	0.000
L3	175 - 170 (3)	TP21.2625x19.6313x0.25	115.016	343.520	0.335	0.000	343.520	0.000
L4	170 - 165 (4)	TP22.8938x21.2625x0.25	193.583	399.265	0.485	0.000	399.265	0.000
L5	165 - 160 (5)	TP24.525x22.8938x0.25	297.222	459.200	0.647	0.000	459.200	0.000
L6	160 - 155 (6)	TP26.1563x24.525x0.25	404.175	519.537	0.778	0.000	519.537	0.000
L7	155 - 154 (7)	TP26.4825x26.1563x0.25	430.381	530.759	0.811	0.000	530.759	0.000
L8	154 - 153.75 (8)	TP26.5641x26.4825x0.3688	437.072	785.781	0.556	0.000	785.781	0.000
L9	153.75 - 152.5 (9)	TP26.9719x26.5641x0.3625	470.671	797.433	0.590	0.000	797.433	0.000
L10	152.5 - 152.25 (10)	TP27.0534x26.9719x0.55	477.423	1191.900	0.401	0.000	1191.900	0.000
L11	152.25 - 151.5 (11)	TP27.2981x27.0534x0.55	497.733	1214.233	0.410	0.000	1214.233	0.000
L12	151.5 - 151.25 (12)	TP27.3797x27.2981x0.425	504.524	957.317	0.527	0.000	957.317	0.000
L13	151.25 - 146.25 (13)	TP29.0109x27.3797x0.4125	642.455	1047.325	0.613	0.000	1047.325	0.000
L14	146.25 - 141.25 (14)	TP30.6422x29.0109x0.4	784.462	1137.033	0.690	0.000	1137.033	0.000
L15	141.25 - 136.25 (15)	TP32.2734x30.6422x0.3938	930.600	1244.833	0.748	0.000	1244.833	0.000
L16	136.25 - 130 (16)	TP34.3125x32.2734x0.3938	967.783	1277.083	0.758	0.000	1277.083	0.000
L17	130 - 129 (17)	TP34.1331x32.1813x0.475	1150.358	1671.017	0.688	0.000	1671.017	0.000
L18	129 - 124 (18)	TP35.7597x34.1331x0.4625	1307.492	1791.150	0.730	0.000	1791.150	0.000
L19	124 - 121.42 (19)	TP36.599x35.7597x0.4625	1390.292	1877.908	0.740	0.000	1877.908	0.000
L20	121.42 - 121.17 (20)	TP36.6803x36.599x0.5	1398.375	2033.050	0.688	0.000	2033.050	0.000
L21	121.17 - 116.17 (21)	TP38.3069x36.6803x0.4875	1562.367	2167.875	0.721	0.000	2167.875	0.000
L22	116.17 - 115 (22)	TP38.6875x38.3069x0.4875	1601.358	2212.008	0.724	0.000	2212.008	0.000
L23	115 - 113.75 (23)	TP39.0938x38.6875x0.55	1643.292	2536.942	0.648	0.000	2536.942	0.000
L24	113.75 - 113.5 (24)	TP39.175x39.0938x0.4688	1651.717	2185.083	0.756	0.000	2185.083	0.000
L25	113.5 - 108.5 (25)	TP40.8x39.175x0.4625	1822.367	2343.000	0.778	0.000	2343.000	0.000
L26	108.5 - 103.5 (26)	TP42.425x40.8x0.4563	1997.433	2503.525	0.798	0.000	2503.525	0.000
L27	103.5 - 95 (27)	TP45.1875x42.425x0.45	2086.650	2567.417	0.813	0.000	2567.417	0.000
L28	95 - 94 (28)	TP44.8525x42.6125x0.5875	2343.192	3577.633	0.655	0.000	3577.633	0.000
L29	94 - 91.4 (29)	TP45.6845x44.8525x0.575	2441.000	3638.283	0.671	0.000	3638.283	0.000
L30	91.4 - 91.15 (30)	TP45.7645x45.6845x0.4438	2450.475	2834.067	0.865	0.000	2834.067	0.000
L31	91.15 - 91 (31)	TP45.8125x45.7645x0.4438	2456.167	2839.217	0.865	0.000	2839.217	0.000
L32	91 - 86 (32)	TP47.4453x45.8125x0.5	2648.258	3433.575	0.771	0.000	3433.575	0.000
L33	86 - 81 (33)	TP49.0781x47.4453x0.5	2845.167	3677.875	0.774	0.000	3677.875	0.000
L34	81 - 76 (34)	TP50.7109x49.0781x0.4938	3046.975	3876.175	0.786	0.000	3876.175	0.000
L35	76 - 71 (35)	TP52.3438x50.7109x0.4875	3253.733	4028.008	0.808	0.000	4028.008	0.000
L36	71 - 66 (36)	TP53.9766x52.3438x0.4875	3465.508	4245.058	0.816	0.000	4245.058	0.000
L37	66 - 63.75 (37)	TP54.7113x53.9766x0.4875	3562.458	4343.675	0.820	0.000	4343.675	0.000
L38	63.75 - 63.5	TP54.793x54.7113x0.487	3573.292	4354.667	0.821	0.000	4354.667	0.000

Section No.	Elevation ft	Size	$M_{ux}$	$\phi M_{nx}$	Ratio	$M_{uy}$ kip-ft	$\phi M_{ny}$	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{nx}}$		kip-ft	$\frac{M_{uy}}{\phi M_{ny}}$
L39	(38) 63.5 - 58.5	5 TP56.4258x54.793x0.481	3792.683	4498.483	0.843	0.000	4498.483	0.000
L40	(39) 58.5 - 51 (40)	3 TP58.875x56.4258x0.481	3814.908	4520.283	0.844	0.000	4520.283	0.000
L41	(41) 51 - 50	55.8391x0.55 TP58.4384x55.8391x0.55	4178.100	5681.075	0.735	0.000	5681.075	0.000
L42	(42) 50 - 45	58.4384x0.55 TP60.0629x58.4384x0.55	4412.117	5954.450	0.741	0.000	5954.450	0.000
L43	(43) 45 - 40.42	8 TP61.551x60.0629x0.543	4630.992	6115.800	0.757	0.000	6115.800	0.000
L44	(44) 40.42 - 40.17	8 TP61.6323x61.551x0.475	4643.058	5111.283	0.908	0.000	5111.283	0.000
L45	(45) 40.17 - 40	5 TP61.6875x61.6323x0.47	4651.275	5118.700	0.909	0.000	5118.700	0.000
L46	(46) 40 - 35	13 TP63.3095x61.6875x0.53	4895.533	6217.933	0.787	0.000	6217.933	0.000
L47	(47) 35 - 33	5 TP63.9583x63.3095x0.52	4994.650	6224.600	0.802	0.000	6224.600	0.000
L48	(48) 33 - 32.75	0.6 TP64.0394x63.9583x0.6	5007.100	7433.050	0.674	0.000	7433.050	0.000
L49	(49) 32.75 - 19	0.6 TP68.5x64.0394x0.6	5245.925	7742.017	0.678	0.000	7742.017	0.000
L50	(50) 19 - 18	0.6 TP67.9579x64.7054x0.6	5764.217	8225.017	0.701	0.000	8225.017	0.000
L51	(51) 18 - 13	0.58 TP69.5842x67.9579x0.58	6030.891	8323.867	0.725	0.000	8323.867	0.000
L52	(52) 13 - 8	0.58 TP71.2105x69.5842x0.58	6302.058	8649.917	0.729	0.000	8649.917	0.000
L53	(53) 8 - 6.42	0.58 TP71.7244x71.2105x0.58	6388.700	8753.500	0.730	0.000	8753.500	0.000
L54	(54) 6.42 - 6.17	1.01 TP71.8057x71.7244x1.01	6388.700	15718.000	0.406	0.000	15718.000	0.000
L55	(55) 6.17 - 1.17	0.987 TP73.432x71.8057x0.987	6402.450	15381.749	0.416	0.000	15381.749	0.000
L56	(56) 1.17 - 0	0.987 TP73.8125x73.432x0.987	6680.041	16101.249	0.415	0.000	16101.249	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual	$\phi V_n$	Ratio	Actual	$\phi T_n$	Ratio
			$V_u$ K	K	$\frac{V_u}{\phi V_n}$	$T_u$ kip-ft	kip-ft	$\frac{T_u}{\phi T_n}$
L1	185 - 180 (1)	TP18x18x0.1875	5.737	121.954	0.047	0.078	191.082	0.000
L2	180 - 175 (2)	TP19.6313x18x0.25	6.509	176.926	0.037	0.061	301.628	0.000
L3	175 - 170 (3)	TP21.2625x19.6313x0.25	15.374	191.817	0.080	0.067	354.539	0.000
L4	170 - 165 (4)	TP22.8938x21.2625x0.25	16.050	206.708	0.078	0.067	411.723	0.000
L5	165 - 160 (5)	TP24.525x22.8938x0.25	21.043	221.599	0.095	0.093	473.181	0.000
L6	160 - 155 (6)	TP26.1563x24.525x0.25	21.734	236.490	0.092	0.093	538.912	0.000
L7	155 - 154 (7)	TP26.4825x26.1563x0.25	26.739	239.469	0.112	0.597	552.571	0.001
L8	154 - 153.75 (8)	88 TP26.5641x26.4825x0.36	26.783	352.716	0.076	0.597	812.733	0.001
L9	153.75 - 152.5 (9)	25 TP26.9719x26.5641x0.36	26.974	352.218	0.077	0.597	824.416	0.001
L10	152.5 - 152.25 (10)	TP27.0534x26.9719x0.55	27.026	532.272	0.051	0.597	1240.900	0.000
L11	152.25 - 151.5 (11)	TP27.2981x27.0534x0.55	27.137	537.186	0.051	0.597	1263.917	0.000
L12	151.5 - 151.25 (12)	5 TP27.3797x27.2981x0.42	27.188	418.304	0.065	0.597	991.808	0.001
L13	151.25 - 146.25 (13)	25 TP29.0109x27.3797x0.41	27.989	430.760	0.065	0.597	1083.625	0.001
L14	146.25 - 141.25 (14)	0.4 TP30.6422x29.0109x0.4	28.809	441.715	0.065	0.597	1175.050	0.001
L15	141.25 - 136.25 (15)	38 TP32.2734x30.6422x0.39	29.640	458.357	0.065	0.596	1285.342	0.000
L16	136.25 - 130 (16)	38 TP34.3125x32.2734x0.39	29.849	464.220	0.064	0.596	1318.433	0.000

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L17	130 - 129 (17)	TP34.1331x32.1813x0.475	30.986	583.784	0.053	0.596	1728.392	0.000
L18	129 - 124 (18)	TP35.7597x34.1331x0.4625	31.859	596.102	0.053	0.596	1850.808	0.000
L19	124 - 121.42 (19)	TP36.599x35.7597x0.4625	32.317	610.277	0.053	0.596	1939.867	0.000
L20	121.42 - 121.17 (20)	TP36.6803x36.599x0.5	32.368	660.559	0.049	0.596	2102.250	0.000
L21	121.17 - 116.17 (21)	TP38.3069x36.6803x0.4875	33.225	673.222	0.049	0.596	2239.608	0.000
L22	116.17 - 115 (22)	TP38.6875x38.3069x0.4875	33.427	679.997	0.049	0.596	2284.917	0.000
L23	115 - 113.75 (23)	TP39.0938x38.6875x0.55	33.647	774.080	0.043	0.596	2624.458	0.000
L24	113.75 - 113.5 (24)	TP39.175x39.0938x0.4688	33.696	662.508	0.051	0.595	2255.650	0.000
L25	113.5 - 108.5 (25)	TP40.8x39.175x0.4625	34.561	681.224	0.051	0.595	2417.125	0.000
L26	108.5 - 103.5 (26)	TP42.425x40.8x0.4563	35.453	699.194	0.051	0.595	2581.208	0.000
L27	103.5 - 95 (27)	TP45.1875x42.425x0.45	35.906	703.070	0.051	0.595	2646.150	0.000
L28	95 - 94 (28)	TP44.8525x42.6125x0.5875	37.361	949.593	0.039	0.595	3697.408	0.000
L29	94 - 91.4 (29)	TP45.6845x44.8525x0.575	37.863	947.120	0.040	0.595	3758.133	0.000
L30	91.4 - 91.15 (30)	TP45.7645x45.6845x0.4438	37.908	734.352	0.052	0.595	2927.533	0.000
L31	91.15 - 91 (31)	TP45.8125x45.7645x0.4438	37.950	735.130	0.052	0.595	2933.733	0.000
L32	91 - 86 (32)	TP47.4453x45.8125x0.5	38.889	857.099	0.045	0.595	3539.350	0.000
L33	86 - 81 (33)	TP49.0781x47.4453x0.5	39.859	886.910	0.045	0.595	3789.833	0.000
L34	81 - 76 (34)	TP50.7109x49.0781x0.4938	40.844	905.375	0.045	0.595	3999.267	0.000
L35	76 - 71 (35)	TP52.3438x50.7109x0.4875	41.841	923.091	0.045	0.594	4210.617	0.000
L36	71 - 66 (36)	TP53.9766x52.3438x0.4875	42.850	952.157	0.045	0.594	4479.950	0.000
L37	66 - 63.75 (37)	TP54.7113x53.9766x0.4875	43.308	965.236	0.045	0.594	4603.875	0.000
L38	63.75 - 63.5 (38)	TP54.793x54.7113x0.4875	43.351	966.690	0.045	0.594	4617.750	0.000
L39	63.5 - 58.5 (39)	TP56.4258x54.793x0.4813	44.379	983.099	0.045	0.594	4837.875	0.000
L40	58.5 - 51 (40)	TP58.875x56.4258x0.4813	44.473	985.968	0.045	0.594	4866.158	0.000
L41	51 - 50 (41)	TP58.4384x55.8391x0.55	46.277	1162.580	0.040	0.594	5919.900	0.000
L42	50 - 45 (42)	TP60.0629x58.4384x0.55	47.306	1195.210	0.040	0.594	6256.825	0.000
L43	45 - 40.42 (43)	TP61.551x60.0629x0.5438	48.247	1211.290	0.040	0.594	6500.267	0.000
L44	40.42 - 40.17 (44)	TP61.6323x61.551x0.475	48.287	1060.740	0.046	0.594	5706.350	0.000
L45	40.17 - 40 (45)	TP61.6875x61.6323x0.475	48.321	1061.700	0.046	0.594	5716.667	0.000
L46	40 - 35 (46)	TP63.3095x61.6875x0.5313	49.345	1217.800	0.041	0.594	6724.908	0.000
L47	35 - 33 (47)	TP63.9583x63.3095x0.525	49.748	1216.030	0.041	0.594	6785.208	0.000
L48	33 - 32.75 (48)	TP64.0394x63.9583x0.6	49.789	1389.890	0.036	0.594	7756.017	0.000
L49	32.75 - 19 (49)	TP68.5x64.0394x0.6	50.730	1423.650	0.036	0.594	8137.375	0.000
L50	19 - 18 (50)	TP67.9579x64.7054x0.6	52.873	1475.740	0.036	0.594	8743.750	0.000
L51	18 - 13 (51)	TP69.5842x67.9579x0.5875	53.766	1480.150	0.036	0.594	8983.250	0.000
L52	13 - 8 (52)	TP71.2105x69.5842x0.5875	54.670	1515.040	0.036	0.594	9411.750	0.000
L53	8 - 6.42 (53)	TP71.7244x71.2105x0.5875	54.968	1526.060	0.036	0.594	9549.167	0.000

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $V_u$ $\phi V_n$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $T_u$ $\phi T_n$
L54	6.42 - 6.17 (54)	TP71.8057x71.7244x1.01 25	54.996	2617.310	0.021	0.594	16261.000	0.000
L55	6.17 - 1.17 (55)	TP73.432x71.8057x0.987 5	55.198	2565.320	0.022	0.594	15907.249	0.000
L56	1.17 - 0 (56)	TP73.8125x73.432x0.987 5	56.225	2625.950	0.021	0.594	16646.249	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $P_u$ $\phi P_n$	Ratio $M_{ux}$ $\phi M_{nx}$	Ratio $M_{uy}$ $\phi M_{ny}$	Ratio $V_u$ $\phi V_n$	Ratio $T_u$ $\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	185 - 180 (1)	0.010	0.092	0.000	0.047	0.000	0.104	1.050	4.8.2
L2	180 - 175 (2)	0.007	0.164	0.000	0.037	0.000	0.172	1.050	4.8.2
L3	175 - 170 (3)	0.014	0.335	0.000	0.080	0.000	0.355	1.050	4.8.2
L4	170 - 165 (4)	0.013	0.485	0.000	0.078	0.000	0.504	1.050	4.8.2
L5	165 - 160 (5)	0.017	0.647	0.000	0.095	0.000	0.673	1.050	4.8.2
L6	160 - 155 (6)	0.017	0.778	0.000	0.092	0.000	0.803	1.050	4.8.2
L7	155 - 154 (7)	0.021	0.811	0.000	0.112	0.001	0.844	1.050	4.8.2
L8	154 - 153.75 (8)	0.014	0.556	0.000	0.076	0.001	0.576	1.050	4.8.2
L9	153.75 - 152.5 (9)	0.014	0.590	0.000	0.077	0.001	0.610	1.050	4.8.2
L10	152.5 - 152.25 (10)	0.009	0.401	0.000	0.051	0.000	0.413	1.050	4.8.2
L11	152.25 - 151.5 (11)	0.009	0.410	0.000	0.051	0.000	0.422	1.050	4.8.2
L12	151.5 - 151.25 (12)	0.012	0.527	0.000	0.065	0.001	0.544	1.050	4.8.2
L13	151.25 - 146.25 (13)	0.013	0.613	0.000	0.065	0.001	0.630	1.050	4.8.2
L14	146.25 - 141.25 (14)	0.013	0.690	0.000	0.065	0.001	0.707	1.050	4.8.2
L15	141.25 - 136.25 (15)	0.013	0.748	0.000	0.065	0.000	0.765	1.050	4.8.2
L16	136.25 - 130 (16)	0.013	0.758	0.000	0.064	0.000	0.775	1.050	4.8.2
L17	130 - 129 (17)	0.012	0.688	0.000	0.053	0.000	0.703	1.050	4.8.2
L18	129 - 124 (18)	0.012	0.730	0.000	0.053	0.000	0.745	1.050	4.8.2
L19	124 - 121.42 (19)	0.012	0.740	0.000	0.053	0.000	0.755	1.050	4.8.2
L20	121.42 - 121.17 (20)	0.011	0.688	0.000	0.049	0.000	0.701	1.050	4.8.2
L21	121.17 - 116.17 (21)	0.012	0.721	0.000	0.049	0.000	0.735	1.050	4.8.2
L22	116.17 - 115 (22)	0.012	0.724	0.000	0.049	0.000	0.738	1.050	4.8.2
L23	115 - 113.75 (23)	0.010	0.648	0.000	0.043	0.000	0.660	1.050	4.8.2
L24	113.75 - 113.5 (24)	0.012	0.756	0.000	0.051	0.000	0.771	1.050	4.8.2
L25	113.5 - 108.5 (25)	0.012	0.778	0.000	0.051	0.000	0.793	1.050	4.8.2
L26	108.5 - 103.5 (26)	0.013	0.798	0.000	0.051	0.000	0.813	1.050	4.8.2
L27	103.5 - 95 (27)	0.013	0.813	0.000	0.051	0.000	0.828	1.050	4.8.2
L28	95 - 94 (28)	0.011	0.655	0.000	0.039	0.000	0.667	1.050	4.8.2
L29	94 - 91.4 (29)	0.011	0.671	0.000	0.040	0.000	0.684	1.050	4.8.2
L30	91.4 - 91.15 (30)	0.015	0.865	0.000	0.052	0.000	0.882	1.050	4.8.2
L31	91.15 - 91 (31)	0.015	0.865	0.000	0.052	0.000	0.882	1.050	4.8.2

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$P_u$	$M_{ux}$	$M_{uy}$	$V_u$	$T_u$			
L32	91 - 86 (32)	0.013	0.771	0.000	0.045	0.000	0.786	1.050	4.8.2
L33	86 - 81 (33)	0.013	0.774	0.000	0.045	0.000	0.789	1.050	4.8.2
L34	81 - 76 (34)	0.014	0.786	0.000	0.045	0.000	0.802	1.050	4.8.2
L35	76 - 71 (35)	0.014	0.808	0.000	0.045	0.000	0.824	1.050	4.8.2
L36	71 - 66 (36)	0.014	0.816	0.000	0.045	0.000	0.833	1.050	4.8.2
L37	66 - 63.75 (37)	0.014	0.820	0.000	0.045	0.000	0.836	1.050	4.8.2
L38	63.75 - 63.5 (38)	0.014	0.821	0.000	0.045	0.000	0.837	1.050	4.8.2
L39	63.5 - 58.5 (39)	0.015	0.843	0.000	0.045	0.000	0.860	1.050	4.8.2
L40	58.5 - 51 (40)	0.015	0.844	0.000	0.045	0.000	0.861	1.050	4.8.2
L41	51 - 50 (41)	0.014	0.735	0.000	0.040	0.000	0.751	1.050	4.8.2
L42	50 - 45 (42)	0.014	0.741	0.000	0.040	0.000	0.757	1.050	4.8.2
L43	45 - 40.42 (43)	0.015	0.757	0.000	0.040	0.000	0.773	1.050	4.8.2
L44	40.42 - 40.17 (44)	0.017	0.908	0.000	0.046	0.000	0.927	1.050	4.8.2
L45	40.17 - 40 (45)	0.017	0.909	0.000	0.046	0.000	0.928	1.050	4.8.2
L46	40 - 35 (46)	0.015	0.787	0.000	0.041	0.000	0.804	1.050	4.8.2
L47	35 - 33 (47)	0.015	0.802	0.000	0.041	0.000	0.820	1.050	4.8.2
L48	33 - 32.75 (48)	0.014	0.674	0.000	0.036	0.000	0.688	1.050	4.8.2
L49	32.75 - 19 (49)	0.014	0.678	0.000	0.036	0.000	0.693	1.050	4.8.2
L50	19 - 18 (50)	0.016	0.701	0.000	0.036	0.000	0.718	1.050	4.8.2
L51	18 - 13 (51)	0.016	0.725	0.000	0.036	0.000	0.742	1.050	4.8.2
L52	13 - 8 (52)	0.016	0.729	0.000	0.036	0.000	0.746	1.050	4.8.2
L53	8 - 6.42 (53)	0.017	0.730	0.000	0.036	0.000	0.748	1.050	4.8.2
L54	6.42 - 6.17 (54)	0.010	0.406	0.000	0.021	0.000	0.417	1.050	4.8.2
L55	6.17 - 1.17 (55)	0.010	0.416	0.000	0.022	0.000	0.427	1.050	4.8.2
L56	1.17 - 0 (56)	0.010	0.415	0.000	0.021	0.000	0.425	1.050	4.8.2

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
L1	185 - 180	Pole	TP18x18x0.1875	1	-3.928	426.838	9.9	Pass
L2	180 - 175	Pole	TP19.6313x18x0.25	2	-4.223	619.240	16.4	Pass
L3	175 - 170	Pole	TP21.2625x19.6313x0.25	3	-8.723	671.358	33.8	Pass
L4	170 - 165	Pole	TP22.8938x21.2625x0.25	4	-9.208	723.478	48.0	Pass
L5	165 - 160	Pole	TP24.525x22.8938x0.25	5	-12.598	775.597	64.1	Pass
L6	160 - 155	Pole	TP26.1563x24.525x0.25	6	-13.242	827.716	76.5	Pass
L7	155 - 154	Pole	TP26.4825x26.1563x0.25	7	-16.494	838.140	80.4	Pass
L8	154 - 153.75	Pole	TP26.5641x26.4825x0.3688	8	-16.549	1234.506	54.9	Pass
L9	153.75 - 152.5	Pole	TP26.9719x26.5641x0.3625	9	-16.753	1232.763	58.1	Pass
L10	152.5 - 152.25	Pole	TP27.0534x26.9719x0.55	10	-16.820	1862.952	39.3	Pass
L11	152.25 - 151.5	Pole	TP27.2981x27.0534x0.55	11	-16.982	1880.151	40.2	Pass
L12	151.5 - 151.25	Pole	TP27.3797x27.2981x0.425	12	-17.033	1464.067	51.8	Pass
L13	151.25 - 146.25	Pole	TP29.0109x27.3797x0.4125	13	-17.992	1507.663	60.0	Pass
L14	146.25 - 141.25	Pole	TP30.6422x29.0109x0.4	14	-19.000	1545.999	67.3	Pass
L15	141.25 - 136.25	Pole	TP32.2734x30.6422x0.3938	15	-20.046	1604.253	72.9	Pass
L16	136.25 - 130	Pole	TP34.3125x32.2734x0.3938	16	-20.311	1624.770	73.8	Pass
L17	130 - 129	Pole	TP34.1331x32.1813x0.475	17	-22.580	2043.247	66.9	Pass
L18	129 - 124	Pole	TP35.7597x34.1331x0.4625	18	-23.863	2086.360	70.9	Pass
L19	124 - 121.42	Pole	TP36.599x35.7597x0.4625	19	-24.537	2135.973	71.9	Pass
L20	121.42 - 121.17	Pole	TP36.6803x36.599x0.5	20	-24.621	2311.953	66.8	Pass
L21	121.17 - 116.17	Pole	TP38.3069x36.6803x0.4875	21	-26.029	2356.273	70.0	Pass
L22	116.17 - 115	Pole	TP38.6875x38.3069x0.4875	22	-26.366	2379.993	70.3	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail	
L23	115 - 113.75	Pole	TP39.0938x38.6875x0.55	23	-26.765	2709.283	62.9	Pass	
L24	113.75 - 113.5	Pole	TP39.175x39.0938x0.4688	24	-26.847	2318.778	73.4	Pass	
L25	113.5 - 108.5	Pole	TP40.8x39.175x0.4625	25	-28.290	2384.287	75.5	Pass	
L26	108.5 - 103.5	Pole	TP42.425x40.8x0.4563	26	-29.779	2447.182	77.4	Pass	
L27	103.5 - 95	Pole	TP45.1875x42.425x0.45	27	-30.537	2460.748	78.9	Pass	
L28	95 - 94	Pole	TP44.8525x42.6125x0.5875	28	-34.636	3323.575	63.6	Pass	
L29	94 - 91.4	Pole	TP45.6845x44.8525x0.575	29	-35.629	3314.923	65.1	Pass	
L30	91.4 - 91.15	Pole	TP45.7645x45.6845x0.4438	30	-35.719	2570.232	84.0	Pass	
L31	91.15 - 91	Pole	TP45.8125x45.7645x0.4438	31	-35.768	2572.951	84.0	Pass	
L32	91 - 86	Pole	TP47.4453x45.8125x0.5	32	-37.540	2999.850	74.9	Pass	
L33	86 - 81	Pole	TP49.0781x47.4453x0.5	33	-39.365	3104.188	75.1	Pass	
L34	81 - 76	Pole	TP50.7109x49.0781x0.4938	34	-41.233	3168.816	76.4	Pass	
L35	76 - 71	Pole	TP52.3438x50.7109x0.4875	35	-43.145	3230.818	78.5	Pass	
L36	71 - 66	Pole	TP53.9766x52.3438x0.4875	36	-45.099	3332.553	79.3	Pass	
L37	66 - 63.75	Pole	TP54.7113x53.9766x0.4875	37	-45.993	3378.333	79.7	Pass	
L38	63.75 - 63.5	Pole	TP54.793x54.7113x0.4875	38	-46.103	3383.415	79.7	Pass	
L39	63.5 - 58.5	Pole	TP56.4258x54.793x0.4813	39	-48.114	3440.850	81.9	Pass	
L40	58.5 - 51	Pole	TP58.875x56.4258x0.4813	40	-48.325	3450.888	82.0	Pass	
L41	51 - 50	Pole	TP58.4384x55.8391x0.55	41	-54.457	4069.033	71.5	Pass	
L42	50 - 45	Pole	TP60.0629x58.4384x0.55	42	-56.832	4183.221	72.1	Pass	
L43	45 - 40.42	Pole	TP61.551x60.0629x0.5438	43	-59.046	4239.532	73.7	Pass	
L44	40.42 - 40.17	Pole	TP61.6323x61.551x0.475	44	-59.164	3712.600	88.3	Pass	
L45	40.17 - 40	Pole	TP61.6875x61.6323x0.475	45	-59.240	3715.960	88.3	Pass	
L46	40 - 35	Pole	TP63.3095x61.6875x0.5313	46	-61.676	4262.317	76.6	Pass	
L47	35 - 33	Pole	TP63.9583x63.3095x0.525	47	-62.669	4256.122	78.1	Pass	
L48	33 - 32.75	Pole	TP64.0394x63.9583x0.6	48	-62.827	4864.608	65.6	Pass	
L49	32.75 - 19	Pole	TP68.5x64.0394x0.6	49	-65.665	4982.764	66.0	Pass	
L50	19 - 18	Pole	TP67.9579x64.7054x0.6	50	-76.691	5165.076	68.4	Pass	
L51	18 - 13	Pole	TP69.5842x67.9579x0.5875	51	-79.811	5180.521	70.7	Pass	
L52	13 - 8	Pole	TP71.2105x69.5842x0.5875	52	-82.979	5302.626	71.1	Pass	
L53	8 - 6.42	Pole	TP71.7244x71.2105x0.5875	53	-83.986	5341.213	71.2	Pass	
L54	6.42 - 6.17	Pole	TP71.8057x71.7244x1.0125	54	-84.003	9150.067	39.7	Pass	
L55	6.17 - 1.17	Pole	TP73.432x71.8057x0.9875	55	-84.148	8937.558	40.6	Pass	
L56	1.17 - 0	Pole	TP73.8125x73.432x0.9875	56	-86.971	9142.801	40.5	Pass	
							Summary		
							Pole (L45)	88.3	Pass
							<b>RATING =</b>	<b>88.3</b>	<b>Pass</b>

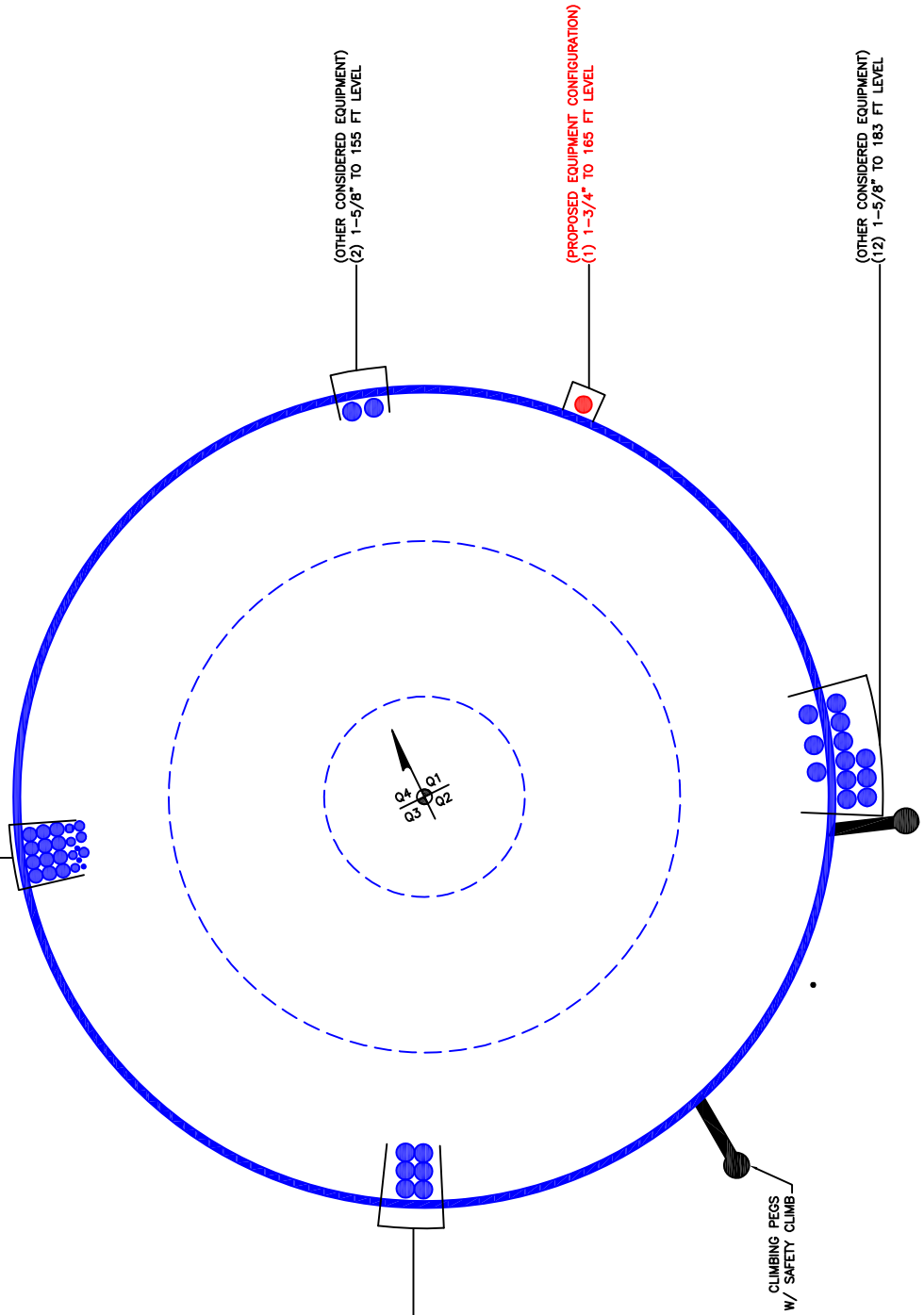
**\*NOTE: Above stress ratios for reinforced sections are approximate. More exact calculations are presented in Appendix C.**

**APPENDIX B**  
**BASE LEVEL DRAWING**





(OTHER CONSIDERED EQUIPMENT)  
(3) 3/8" TO 174 FT LEVEL  
(4) 3/4" TO 174 FT LEVEL  
(3) 7/8" TO 174 FT LEVEL  
(12) 1-1/4" TO 174 FT LEVEL



(OTHER CONSIDERED EQUIPMENT)  
(6) 1-5/8" TO 165 FT LEVEL

(PROPOSED EQUIPMENT CONFIGURATION)  
(1) 1-3/4" TO 165 FT LEVEL

CLIMBING PEGS  
W/ SAFETY CLIMB

(OTHER CONSIDERED EQUIPMENT)  
(12) 1-5/8" TO 183 FT LEVEL

**APPENDIX C**  
**ADDITIONAL CALCULATIONS**

Site BU: 825983  
Work Order: 1973695



Copyright © 2019 Crown Castle

**Pole Geometry**

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	185	5	0	12	18	18	0.1875	Auto	A36M-42
2	180	50	5	12	18.00	34.3125	0.25	Auto	A36M-42
3	135	20	0	12	32.18	38.6875	0.25	Auto	A36M-42
4	115	20	6	12	38.69	45.1875	0.3125	Auto	A36M-42
5	101	10	0	12	42.61	45.8125	0.3125	Auto	A36M-42
6	91	40	7	12	45.81	58.875	0.375	Auto	A36M-42
7	58	18	0	12	55.84	61.6875	0.375	Auto	A36M-42
8	40	21	9	12	61.69	68.5	0.4375	Auto	A36M-42
9	28	28	0	12	64.71	73.8125	0.4375	Auto	A36M-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
1	40.42	52.42	plate	I-045100; (1) (1.1875)	3	o				o				o			
2	91.4	121.42	plate	I-060100; (1) (1.1875)	3	o				o				o			
3	121.42	152.5	plate	I-045100; (1) (1.1875)	3		o				o				o		
4	6.42	33	plate	I-085125; (1) (1.1875)	4			o			o			o		o	
5	33	63.75	plate	I-060100; (1) (1.1875)	3				o			o				o	
6	63.75	99.42	plate	I-060100; (1) (1.1875)	3					o		o			o		
7	113.75	131	plate	I-040075; (1) (1.1875)	3				o			o			o		
8	151.5	154	plate	I-040075; (1) (1.1875)	3				o			o			o		
9	0	6.42	plate	Titan 73/45_1	6	o		c		c			o	c			o
10																	

**Reinforcement Details**

	B (in)	H (in)	Gross Area (in <sup>2</sup> )	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in <sup>2</sup> )	Bolt Hole Size (in)	Reinforcement Material
1	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
2	6	1	6	0.5	PC 8.8 - M20 (100)	30	PC 8.8 - M20 (100)	30.000	16.000	4.750	1.1875	A572-65
3	4.5	1	4.5	0.5	PC 8.8 - M20 (100)	24	PC 8.8 - M20 (100)	24.000	20.000	3.250	1.1875	A572-65
4	8.5	1.25	10.625	0.625	PC 8.8 - M20 (100)	48	PC 8.8 - M20 (100)	51.000	17.000	9.063	1.1875	A572-65
5	6	1	6	0.5	PC 8.8 - M20 (100)	27	PC 8.8 - M20 (100)	27.000	16.000	4.750	1.1875	A572-65
6	6	1	6	0.5	PC 8.8 - M20 (100)	27	PC 8.8 - M20 (100)	27.000	16.000	4.750	1.1875	A572-65
7	4	0.75	3	0.375	PC 8.8 - M20 (100)	15	PC 8.8 - M20 (100)	18.000	16.000	2.063	1.1875	A572-65
8	4	0.75	3	0.375	PC 8.8 - M20 (100)	15	PC 8.8 - M20 (100)	15.000	16.000	2.063	1.1875	A572-65
9	11.6978	0.34366	4.02	48.00075	Capacity Input	0	Capacity Input	0.000	0.000	3.500	0.0000	A572-65

**Connection Details for Custom Reinforcements**

Reinforcement	End	# Bolts	N or X	Bolt Spacing (in)	Edge Dist (in)	Weld Grade (ksi)	Transverse (Horiz.) Weld Type	Horiz. Weld Length (in)	Horiz. Groove Depth (in)	Horiz. Groove Angle (deg)	Horiz. Fillet Size (in)	Vertical Weld Length (in)	Vertical Fillet Size (in)	Rev H Connection Capacity (kip)
CCI-045100; (1) (1.1875)_1	Top	6	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	6	N	3	3	-	-	-	-	-	-	-	-	-
CCI-060100; (1) (1.1875)_1	Top	10	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	10	N	3	3	-	-	-	-	-	-	-	-	-
CCI-045100; (1) (1.1875)_2	Top	8	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	8	N	3	3	-	-	-	-	-	-	-	-	-
CCI-085125; (1) (1.1875)_1	Top	17	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	16	N	3	3	-	-	-	-	-	-	-	-	-
CCI-060100; (1) (1.1875)_2	Top	9	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	9	N	3	3	-	-	-	-	-	-	-	-	-
CCI-040075; (1) (1.1875)_1	Top	6	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	5	N	3	3	-	-	-	-	-	-	-	-	-
CCI-040075; (1) (1.1875)_2	Top	5	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	5	N	3	3	-	-	-	-	-	-	-	-	-
Titan 73/45_1	Top	0	0	0	0	-	-	-	-	-	-	-	-	285.12
	Bottom	0	-	0	0	0	0	0	-	-	0	-	-	285.12

# TNX Geometry Input

Increment (ft): 5 [Export to TNX](#)

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	185 - 180	5	0	12	18.000	18.000	0.1875	A36M-42	1.000
2	180 - 175	5		12	18.000	19.631	0.25	A36M-42	1.000
3	175 - 170	5		12	19.631	21.263	0.25	A36M-42	1.000
4	170 - 165	5		12	21.263	22.894	0.25	A36M-42	1.000
5	165 - 160	5		12	22.894	24.525	0.25	A36M-42	1.000
6	160 - 155	5		12	24.525	26.156	0.25	A36M-42	1.000
7	155 - 154	1		12	26.156	26.483	0.25	A36M-42	1.000
8	154 - 153.75	0.25		12	26.483	26.564	0.36875	A36M-42	0.971
9	153.75 - 152.5	1.25		12	26.564	26.972	0.3625	A36M-42	0.983
10	152.5 - 152.25	0.25		12	26.972	27.053	0.55	A36M-42	0.940
11	152.25 - 151.5	0.75		12	27.053	27.298	0.55	A36M-42	0.935
12	151.5 - 151.25	0.25		12	27.298	27.380	0.425	A36M-42	0.959
13	151.25 - 146.25	5		12	27.380	29.011	0.4125	A36M-42	0.965
14	146.25 - 141.25	5		12	29.011	30.642	0.4	A36M-42	0.975
15	141.25 - 136.25	5		12	30.642	32.273	0.39375	A36M-42	0.972
16	136.25 - 135	6.25	5	12	32.273	34.313	0.39375	A36M-42	0.968
17	135 - 129	6		12	32.181	34.133	0.475	A36M-42	0.968
18	129 - 124	5		12	34.133	35.760	0.4625	A36M-42	0.972
19	124 - 121.42	2.58		12	35.760	36.599	0.4625	A36M-42	0.962
20	121.42 - 121.17	0.25		12	36.599	36.680	0.5	A36M-42	0.968
21	121.17 - 116.17	5		12	36.680	38.307	0.4875	A36M-42	0.971
22	116.17 - 115	1.17	0	12	38.307	38.688	0.4875	A36M-42	0.967
23	115 - 113.75	1.25		12	38.688	39.094	0.55	A36M-42	0.968
24	113.75 - 113.5	0.25		12	39.094	39.175	0.46875	A36M-42	0.978
25	113.5 - 108.5	5		12	39.175	40.800	0.4625	A36M-42	0.978
26	108.5 - 103.5	5		12	40.800	42.425	0.45625	A36M-42	0.980
27	103.5 - 101	8.5	6	12	42.425	45.188	0.45	A36M-42	0.987
28	101 - 94	7		12	42.613	44.853	0.5875	A36M-42	0.966
29	94 - 91.4	2.6		12	44.853	45.685	0.575	A36M-42	0.978
30	91.4 - 91.15	0.25		12	45.685	45.765	0.44375	A36M-42	0.985
31	91.15 - 91	0.15	0	12	45.765	45.813	0.44375	A36M-42	0.984
32	91 - 86	5		12	45.813	47.445	0.5	A36M-42	0.990
33	86 - 81	5		12	47.445	49.078	0.5	A36M-42	0.982
34	81 - 76	5		12	49.078	50.711	0.49375	A36M-42	0.987
35	76 - 71	5		12	50.711	52.344	0.4875	A36M-42	0.992
36	71 - 66	5		12	52.344	53.977	0.4875	A36M-42	0.986
37	66 - 63.75	2.25		12	53.977	54.711	0.4875	A36M-42	0.983
38	63.75 - 63.5	0.25		12	54.711	54.793	0.4875	A36M-42	0.982
39	63.5 - 58.5	5		12	54.793	56.426	0.48125	A36M-42	0.989
40	58.5 - 58	7.5	7	12	56.426	58.875	0.48125	A36M-42	0.988
41	58 - 50	8		12	55.839	58.438	0.55	A36M-42	0.992
42	50 - 45	5		12	58.438	60.063	0.55	A36M-42	0.983
43	45 - 40.42	4.58		12	60.063	61.551	0.54375	A36M-42	0.987
44	40.42 - 40.17	0.25		12	61.551	61.632	0.475	A36M-42	0.983
45	40.17 - 40	0.17	0	12	61.632	61.688	0.475	A36M-42	0.983
46	40 - 35	5		12	61.688	63.310	0.53125	A36M-42	0.993
47	35 - 33	2		12	63.310	63.958	0.525	A36M-42	1.003
48	33 - 32.75	0.25		12	63.958	64.039	0.6	A36M-42	1.078
49	32.75 - 28	13.75	9	12	64.039	68.500	0.6	A36M-42	1.070
50	28 - 18	10		12	64.705	67.958	0.6	A36M-42	1.058
51	18 - 13	5		12	67.958	69.584	0.5875	A36M-42	1.072
52	13 - 8	5		12	69.584	71.210	0.5875	A36M-42	1.065
53	8 - 6.42	1.58		12	71.210	71.724	0.5875	A36M-42	1.063
54	6.42 - 6.17	0.25		12	71.724	71.806	1.0125	A36M-42	0.540
55	6.17 - 1.17	5		12	71.806	73.432	0.9875	A36M-42	0.551
56	1.17 - 0	1.17		12	73.432	73.813	0.9875	A36M-42	0.551

# TNX Section Forces

Increment (ft):		TNX Output			
	5	P <sub>u</sub>	M <sub>ux</sub> (kip-ft)	V <sub>u</sub>	(K)
Section Height (ft)		(K)		(K)	
1	185 - 180	3.93	17.14	5.74	
2	180 - 175	4.22	47.76	6.51	
3	175 - 170	8.72	115.02	15.37	
4	170 - 165	9.21	193.58	16.05	
5	165 - 160	12.60	297.22	21.04	
6	160 - 155	13.24	404.17	21.73	
7	155 - 154	16.49	430.38	26.74	
8	154 - 153.75	16.55	437.07	26.78	
9	153.75 - 152.5	16.75	470.67	26.97	
10	152.5 - 152.25	16.82	477.42	27.03	
11	152.25 - 151.5	16.98	497.73	27.14	
12	151.5 - 151.25	17.03	504.52	27.19	
13	151.25 - 146.25	17.99	642.45	27.99	
14	146.25 - 141.25	19.00	784.46	28.81	
15	141.25 - 136.25	20.05	930.60	29.64	
16	136.25 - 135	20.31	967.79	29.85	
17	135 - 129	22.58	1150.36	30.99	
18	129 - 124	23.86	1307.49	31.86	
19	124 - 121.42	24.54	1390.29	32.32	
20	121.42 - 121.17	24.62	1398.38	32.37	
21	121.17 - 116.17	26.03	1562.36	33.22	
22	116.17 - 115	26.37	1601.36	33.43	
23	115 - 113.75	26.77	1643.29	33.65	
24	113.75 - 113.5	26.85	1651.71	33.70	
25	113.5 - 108.5	28.29	1822.37	34.56	
26	108.5 - 103.5	29.78	1997.43	35.45	
27	103.5 - 101	30.54	2086.65	35.91	
28	101 - 94	34.64	2343.19	37.36	
29	94 - 91.4	35.63	2441.00	37.86	
30	91.4 - 91.15	35.72	2450.47	37.91	
31	91.15 - 91	35.77	2456.17	37.95	
32	91 - 86	37.54	2648.26	38.89	
33	86 - 81	39.36	2845.17	39.86	
34	81 - 76	41.23	3046.97	40.84	
35	76 - 71	43.14	3253.73	41.84	
36	71 - 66	45.10	3465.51	42.85	
37	66 - 63.75	45.99	3562.46	43.31	
38	63.75 - 63.5	46.10	3573.29	43.35	
39	63.5 - 58.5	48.11	3792.69	44.38	
40	58.5 - 58	48.32	3814.91	44.47	
41	58 - 50	54.46	4178.10	46.28	
42	50 - 45	56.83	4412.12	47.31	
43	45 - 40.42	59.05	4630.99	48.25	
44	40.42 - 40.17	59.16	4643.06	48.29	
45	40.17 - 40	59.24	4651.28	48.32	
46	40 - 35	61.68	4895.53	49.35	
47	35 - 33	62.67	4994.65	49.75	
48	33 - 32.75	62.83	5007.10	49.79	
49	32.75 - 28	65.66	5245.93	50.73	
50	28 - 18	76.69	5764.22	52.87	
51	18 - 13	79.81	6030.89	53.77	
52	13 - 8	82.98	6302.06	54.67	
53	8 - 6.42	83.99	6388.70	54.97	
54	6.42 - 6.17	84.14	6402.45	55.00	
55	6.17 - 1.17	86.96	6680.04	55.99	
56	1.17 - 0	87.62	6745.71	56.23	

# Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
185 - 180	Pole	TP18x18x0.1875	Pole	9.9%	Pass
180 - 175	Pole	TP19.631x19.631x0.25	Pole	16.3%	Pass
175 - 170	Pole	TP21.263x19.631x0.25	Pole	33.7%	Pass
170 - 165	Pole	TP22.894x21.263x0.25	Pole	47.9%	Pass
165 - 160	Pole	TP24.525x22.894x0.25	Pole	64.0%	Pass
160 - 155	Pole	TP26.156x24.525x0.25	Pole	76.3%	Pass
155 - 154	Pole	TP26.483x26.156x0.25	Pole	80.2%	Pass
154 - 153.75	Pole + Reinf.	TP26.564x26.483x0.3688	Reinf. 8 Tension Rupture	62.4%	Pass
153.75 - 152.5	Pole + Reinf.	TP26.972x26.564x0.3625	Reinf. 8 Tension Rupture	65.4%	Pass
152.5 - 152.25	Pole + Reinf.	TP27.053x26.972x0.55	Reinf. 8 Tension Rupture	44.8%	Pass
152.25 - 151.5	Pole + Reinf.	TP27.298x27.053x0.55	Reinf. 8 Tension Rupture	46.1%	Pass
151.5 - 151.25	Pole + Reinf.	TP27.38x27.298x0.425	Reinf. 3 Tension Rupture	56.4%	Pass
151.25 - 146.25	Pole + Reinf.	TP29.011x27.38x0.4125	Reinf. 3 Tension Rupture	65.2%	Pass
146.25 - 141.25	Pole + Reinf.	TP30.642x29.011x0.4	Reinf. 3 Tension Rupture	72.7%	Pass
141.25 - 136.25	Pole + Reinf.	TP32.273x30.642x0.3938	Reinf. 3 Tension Rupture	79.0%	Pass
136.25 - 135	Pole + Reinf.	TP34.313x32.273x0.3938	Reinf. 3 Tension Rupture	80.5%	Pass
135 - 129	Pole + Reinf.	TP34.133x32.181x0.475	Reinf. 7 Tension Rupture	75.6%	Pass
129 - 124	Pole + Reinf.	TP35.76x34.133x0.4625	Reinf. 7 Tension Rupture	79.9%	Pass
124 - 121.42	Pole + Reinf.	TP36.599x35.76x0.4625	Pole	82.4%	Pass
121.42 - 121.17	Pole + Reinf.	TP36.68x36.599x0.5	Pole	75.7%	Pass
121.17 - 116.17	Pole + Reinf.	TP38.307x36.68x0.4875	Pole	81.0%	Pass
116.17 - 115	Pole + Reinf.	TP38.688x38.307x0.4875	Pole	82.2%	Pass
115 - 113.75	Pole + Reinf.	TP39.094x38.688x0.55	Reinf. 7 Tension Rupture	71.1%	Pass
113.75 - 113.5	Pole + Reinf.	TP39.175x39.094x0.4688	Pole	78.0%	Pass
113.5 - 108.5	Pole + Reinf.	TP40.8x39.175x0.4625	Pole	81.7%	Pass
108.5 - 103.5	Pole + Reinf.	TP42.425x40.8x0.4563	Pole	85.2%	Pass
103.5 - 101	Pole + Reinf.	TP45.188x42.425x0.45	Pole	86.9%	Pass
101 - 94	Pole + Reinf.	TP44.853x42.613x0.5875	Pole	71.9%	Pass
94 - 91.4	Pole + Reinf.	TP45.685x44.853x0.575	Pole	73.5%	Pass
91.4 - 91.15	Pole + Reinf.	TP45.765x45.685x0.4438	Pole	95.1%	Pass
91.15 - 91	Pole + Reinf.	TP45.813x45.765x0.4438	Pole	95.2%	Pass
91 - 86	Pole + Reinf.	TP47.445x45.813x0.5	Pole	79.7%	Pass
86 - 81	Pole + Reinf.	TP49.078x47.445x0.5	Pole	81.7%	Pass
81 - 76	Pole + Reinf.	TP50.711x49.078x0.4938	Pole	83.7%	Pass
76 - 71	Pole + Reinf.	TP52.344x50.711x0.4875	Pole	85.7%	Pass
71 - 66	Pole + Reinf.	TP53.977x52.344x0.4875	Pole	87.7%	Pass
66 - 63.75	Pole + Reinf.	TP54.711x53.977x0.4875	Pole	88.5%	Pass
63.75 - 63.5	Pole + Reinf.	TP54.793x54.711x0.4875	Pole	88.6%	Pass
63.5 - 58.5	Pole + Reinf.	TP56.426x54.793x0.4813	Pole	90.5%	Pass
58.5 - 58	Pole + Reinf.	TP58.875x56.426x0.4813	Pole	90.7%	Pass
58 - 50	Pole + Reinf.	TP58.438x55.839x0.55	Pole	82.5%	Pass
50 - 45	Pole + Reinf.	TP60.063x58.438x0.55	Pole	84.4%	Pass
45 - 40.42	Pole + Reinf.	TP61.551x60.063x0.5438	Pole	86.2%	Pass
40.42 - 40.17	Pole + Reinf.	TP61.632x61.551x0.475	Pole	99.2%	Pass
40.17 - 40	Pole + Reinf.	TP61.688x61.632x0.475	Pole	99.3%	Pass
40 - 35	Pole + Reinf.	TP63.31x61.688x0.5313	Pole	82.5%	Pass
35 - 33	Pole + Reinf.	TP63.958x63.31x0.525	Pole	83.1%	Pass
33 - 32.75	Pole + Reinf.	TP64.039x63.958x0.6	Pole	74.9%	Pass
32.75 - 28	Pole + Reinf.	TP68.5x64.039x0.6	Pole	76.2%	Pass
28 - 18	Pole + Reinf.	TP67.958x64.705x0.6	Pole	80.2%	Pass
18 - 13	Pole + Reinf.	TP69.584x67.958x0.5875	Pole	81.5%	Pass
13 - 8	Pole + Reinf.	TP71.21x69.584x0.5875	Pole	82.8%	Pass
8 - 6.42	Pole + Reinf.	TP71.724x71.21x0.5875	Pole	83.2%	Pass
6.42 - 6.17	Pole + Reinf.	TP71.806x71.724x1.0125	Reinf. 9 Tension Rupture	82.7%	Pass
6.17 - 1.17	Pole + Reinf.	TP73.432x71.806x0.9875	Reinf. 9 Tension Rupture	83.6%	Pass
1.17 - 0	Pole + Reinf.	TP73.813x73.432x0.9875	Reinf. 9 Tension Rupture	83.9%	Pass
				Summary	
			Pole	99.3%	Pass
			Reinforcement	83.9%	Pass
			Overall	99.3%	Pass

# Additional Calculations

Section Elevation (ft)	Moment of Inertia (in <sup>4</sup> )			Area (in <sup>2</sup> )			% Capacity*									
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8	R9
185 - 180	436	n/a	436	10.74	n/a	10.74	9.9%									
180 - 175	749	n/a	749	15.58	n/a	15.58	16.3%									
175 - 170	955	n/a	955	16.89	n/a	16.89	33.7%									
170 - 165	1195	n/a	1195	18.20	n/a	18.20	47.9%									
165 - 160	1472	n/a	1472	19.51	n/a	19.51	64.0%									
160 - 155	1789	n/a	1789	20.82	n/a	20.82	76.3%									
155 - 154	1857	n/a	1857	21.09	n/a	21.09	80.2%									
154 - 153.75	1875	846	2720	21.15	9.00	30.15	53.4%								62.4%	
153.75 - 152.5	1963	871	2834	21.48	9.00	30.48	56.3%								65.4%	
152.5 - 152.25	1981	2216	4197	21.55	22.50	44.05	38.6%			43.1%					44.8%	
152.25 - 151.5	2036	2255	4291	21.74	22.50	44.24	39.8%			44.3%					46.1%	
151.5 - 151.25	2054	1371	3426	21.81	13.50	35.31	50.7%			56.4%						
151.25 - 146.25	2448	1532	3980	23.12	13.50	36.62	59.9%			65.2%						
146.25 - 141.25	2888	1702	4590	24.43	13.50	37.93	68.1%			72.7%						
141.25 - 136.25	3379	1880	5259	25.74	13.50	39.24	75.7%			79.0%						
136.25 - 135	3510	1926	5436	26.07	13.50	39.57	77.5%			80.5%						
135 - 129	4002	3470	7472	27.24	22.50	49.74	71.1%			72.5%				75.6%		
129 - 124	4607	3798	8405	28.54	22.50	51.04	76.8%			76.6%				79.9%		
124 - 121.42	4941	3973	8914	29.22	22.50	51.72	82.4%			78.6%				81.9%		
121.42 - 121.17	4975	4805	9779	29.28	27.00	56.28	75.7%		65.9%					75.2%		
121.17 - 116.17	5671	5226	10897	30.59	27.00	57.59	81.0%		68.9%					78.7%		
116.17 - 115	5843	5328	11171	30.90	27.00	57.90	82.2%		69.6%					79.4%		
115 - 113.75	7501	5437	12938	38.97	27.00	65.97	64.8%		62.3%					71.1%		
113.75 - 113.5	7549	3659	11208	39.05	18.00	57.05	78.0%		72.4%							
113.5 - 108.5	8536	3959	12495	40.68	18.00	58.68	81.7%		74.6%							
108.5 - 103.5	9605	4271	13876	42.32	18.00	60.32	85.2%		76.5%							
103.5 - 101	10172	4431	14603	43.13	18.00	61.13	86.9%		77.3%							
101 - 94	11364	9517	20880	44.75	36.00	80.75	71.9%		62.9%				62.9%			
94 - 91.4	12013	9863	21876	45.59	36.00	81.59	73.5%		63.7%				63.7%			
91.4 - 91.15	12076	4948	17025	45.67	18.00	63.67	95.1%						82.4%			
91.15 - 91	12115	4958	17073	45.72	18.00	63.72	95.2%						82.5%			
91 - 86	16095	5308	21404	56.76	18.00	74.76	79.7%						73.4%			
86 - 81	17829	5670	23499	58.72	18.00	76.72	81.7%						74.3%			
81 - 76	19683	6044	25727	60.69	18.00	78.69	83.7%						75.0%			
76 - 71	21661	6430	28091	62.66	18.00	80.66	85.7%						75.7%			
71 - 66	23768	6828	30596	64.63	18.00	82.63	87.7%						76.3%			
66 - 63.75	24758	7011	31770	65.52	18.00	83.52	88.5%						76.6%			
63.75 - 63.5	24870	7032	31902	65.62	18.00	83.62	88.6%				76.6%					
63.5 - 58.5	27177	7448	34624	67.58	18.00	85.58	90.5%						77.1%			
58.5 - 58	27415	7490	34905	67.78	18.00	85.78	90.7%						77.2%			
58 - 50	30211	13951	44161	70.01	31.50	101.51	82.5%	75.5%			69.0%					
50 - 45	32818	14721	47539	71.97	31.50	103.47	84.4%	76.1%			69.5%					
45 - 40.42	35334	15446	50780	73.76	31.50	105.26	86.2%	76.6%			70.0%					
40.42 - 40.17	35475	8854	44329	73.86	18.00	91.86	99.2%				80.6%					
40.17 - 40	35571	8870	44441	73.93	18.00	91.93	99.3%				80.6%					
40 - 35	44748	9333	54081	88.44	18.00	106.44	82.5%				71.5%					
35 - 33	46148	9522	55669	89.36	18.00	107.36	83.1%				71.6%					
33 - 32.75	46436	17211	63646	89.47	42.50	131.97	74.9%				56.0%					
32.75 - 28	49889	18029	67918	91.64	42.50	134.14	76.2%				56.3%					
28 - 18	55547	19329	74876	94.98	42.50	137.48	80.2%				58.3%					
18 - 13	59654	20245	79898	97.27	42.50	139.77	81.5%				58.6%					
13 - 8	63958	21182	85140	99.56	42.50	142.06	82.8%				58.8%					
8 - 6.42	65360	21482	86842	100.28	42.50	142.78	83.2%				58.9%					
6.42 - 6.17	65480	83631	149110	100.40	24.12	124.52	49.4%								82.7%	
6.17 - 1.17	70057	85283	155340	102.68	24.12	126.80	51.2%								83.6%	
1.17 - 0	71158	85672	156830	103.22	24.12	127.34	51.6%								83.9%	

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

# Monopole Base Plate Connection

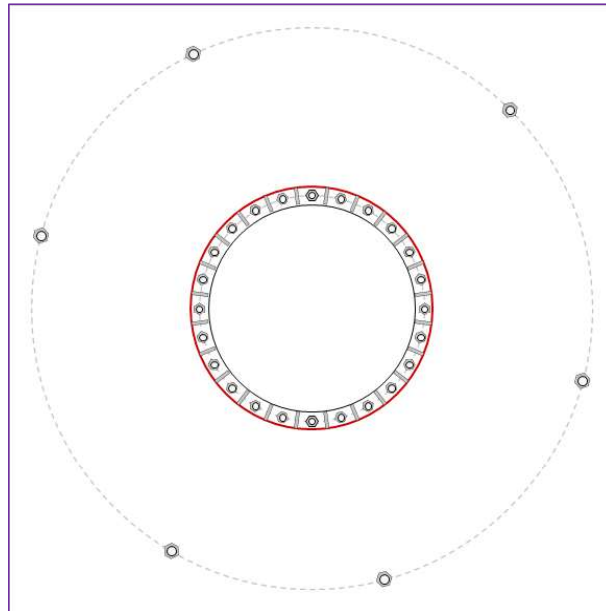


Site Info	
BU #	825983
Site Name	MIDDLETOWN_1
Order #	553287 Rev.3

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

Applied Loads	
Moment (kip-ft)	6745.71
Axial Force (kips)	87.62
Shear Force (kips)	56.23

\*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results
-----------------------	------------------

### Anchor Rod Data

GROUP 1: (24) 2"  $\phi$  bolts (A36 N;  $F_y=36$  ksi,  $F_u=58$  ksi) on 68" BC  
 GROUP 2: (6) 2-3/4"  $\phi$  bolts (TITAN 73/45 N;  $F_y=90.51429$  ksi,  $F_u=108.6171$  ksi) on 169"  
*pos. (deg): 45, 115, 165, 240, 285, 345*

### Base Plate Data

62" ID x 2" Plate (A36;  $F_y=36$  ksi,  $F_u=58$  ksi)

### Stiffener Data

(24) 18"H x 5"W x 1"T, Notch: 1"  
**plate:  $F_y=50$  ksi ; weld:  $F_y=70$  ksi**  
**horiz. weld: 0.75" fillet**  
**vert. weld: 0.375" fillet**

### Pole Data

73.8125" x 0.4375" 12-sided pole (A36M-42;  $F_y=42$  ksi,  $F_u=60$  ksi)

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

GROUP 1:  
 $Pu_c = 70.57$                        $\phi Pn_c = 101.79$                       **Stress Rating**  
 $Vu = 2.34$                            $\phi Vn = 45.8$                                       **66.3%**  
 $Mu = n/a$                            $\phi Mn = n/a$                                       **Pass**

GROUP 2:  
 $Pu_c = 230.09$                        $\phi Pn_c = 285.12$                       **Stress Rating**  
 $Vu = 0$                                    $\phi Vn = 128.3$                                       **76.9%**  
 $Mu = n/a$                            $\phi Mn = n/a$                                       **Pass**

### Base Plate Summary

Max Stress (ksi): 14.27 (Roark's Flexural)  
 Allowable Stress (ksi): 32.4  
 Stress Rating: **41.9%** **Pass**

### Stiffener Summary

Horizontal Weld: **22.3%** **Pass**  
 Vertical Weld: **11.3%** **Pass**  
 Plate Flexure+Shear: **2.1%** **Pass**  
 Plate Tension+Shear: **16.5%** **Pass**  
 Plate Compression: **14.8%** **Pass**

### Pole Summary

Punching Shear: **3.6%** **Pass**



# CClplate

Elevation (ft) 0 (Base)

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

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

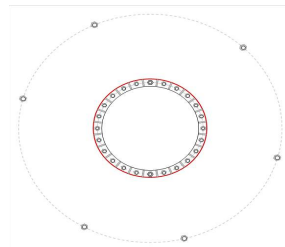
## Custom Bolt Connection

Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, η	l <sub>r</sub> (in):	Thread Type	Area Override, in²	Tension Only
1	1	0	2	A36	68	0.5	1.75	N-Included		No
2	1	15	2	A36	68	0.5	1.75	N-Included		No
3	1	30	2	A36	68	0.5	1.75	N-Included		No
4	1	45	2	A36	68	0.5	1.75	N-Included		No
5	1	60	2	A36	68	0.5	1.75	N-Included		No
6	1	75	2	A36	68	0.5	1.75	N-Included		No
7	1	90	2	A36	68	0.5	1.75	N-Included		No
8	1	105	2	A36	68	0.5	1.75	N-Included		No
9	1	120	2	A36	68	0.5	1.75	N-Included		No
10	1	135	2	A36	68	0.5	1.75	N-Included		No
11	1	150	2	A36	68	0.5	1.75	N-Included		No
12	1	165	2	A36	68	0.5	1.75	N-Included		No
13	1	180	2	A36	68	0.5	1.75	N-Included		No
14	1	195	2	A36	68	0.5	1.75	N-Included		No
15	1	210	2	A36	68	0.5	1.75	N-Included		No
16	1	225	2	A36	68	0.5	1.75	N-Included		No
17	1	240	2	A36	68	0.5	1.75	N-Included		No
18	1	255	2	A36	68	0.5	1.75	N-Included		No
19	1	270	2	A36	68	0.5	1.75	N-Included		No
20	1	285	2	A36	68	0.5	1.75	N-Included		No
21	1	300	2	A36	68	0.5	1.75	N-Included		No
22	1	315	2	A36	68	0.5	1.75	N-Included		No
23	1	330	2	A36	68	0.5	1.75	N-Included		No
24	1	345	2	A36	68	0.5	1.75	N-Included		No
25	2	45	2.75	TITAN 73/45	169	0.5	0	N-Included	3.5	No
26	2	115	2.75	TITAN 73/45	169	0.5	0	N-Included	3.5	No
27	2	165	2.75	TITAN 73/45	169	0.5	0	N-Included	3.5	No
28	2	240	2.75	TITAN 73/45	169	0.5	0	N-Included	3.5	No
29	2	285	2.75	TITAN 73/45	169	0.5	0	N-Included	3.5	No
30	2	345	2.75	TITAN 73/45	169	0.5	0	N-Included	3.5	No

## Custom Stiffener Connection

Stiffener	Stiffener Group ID	Location (deg.)	Width (in)	Height (in)	Thickness (in)	H. Notch (in)	V. Notch (in)	Grade (ksi)	Weld Type	Groove Depth (in)	Groove Angle (deg.)	H. Fillet Weld Size (in)	V. Fillet Weld Size (in)	Weld Strength (ksi)
1	1	7.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
2	1	22.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
3	1	37.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
4	1	52.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
5	1	67.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
6	1	82.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
7	1	97.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
8	1	112.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
9	1	127.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
10	1	142.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
11	1	157.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
12	1	172.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
13	1	187.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
14	1	202.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
15	1	217.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
16	1	232.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
17	1	247.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
18	1	262.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
19	1	277.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
20	1	292.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
21	1	307.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
22	1	322.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
23	1	337.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
24	1	352.5	5	18	1	1	1	50	Fillet			0.75	0.375	70

## Plot Graphic



# Pier and Pad Foundation



BU #: 825983  
 Site Name: MIDDLETOWN 1  
 App. Number: 553287 Rev.3

TIA-222 Revision: H  
 Tower Type: Monopole

Top & Bot. Pad Rein. Different?:   
 Block Foundation?:   
 Rectangular Pad?:

Superstructure Analysis Reactions		
Compression, $P_{comp}$ :	87.63	kips
Base Shear, $V_{u\_comp}$ :	56.21	kips
Moment, $M_u$ :	6745.71	ft-kips
Tower Height, $H$ :	185	ft
BP Dist. Above Fdn, $bp_{dist}$ :	6	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	401.92	56.21	13.3%	Pass
<i>Bearing Pressure (ksf)</i>	5.82	4.64	79.8%	Pass
<i>Overturning (kip*ft)</i>	8130.62	7378.07	90.7%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	8832.57	7181.34	77.4%	Pass
<i>Pier Compression (kip)</i>	28118.83	149.26	0.5%	Pass
<i>Pad Flexure (kip*ft)</i>	3818.20	3296.10	82.2%	Pass
<i>Pad Shear - 1-way (kips)</i>	896.51	512.27	54.4%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.190	0.000	0.0%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	5013.71	4308.80	81.8%	Pass

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, $dpier$ :	7.5	ft
Ext. Above Grade, $E$ :	0.25	ft
Pier Rebar Size, $Sc$ :	8	
Pier Rebar Quantity, $mc$ :	65	
Pier Tie/Spiral Size, $St$ :	4	
Pier Tie/Spiral Quantity, $mt$ :	8	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, $cc_{pier}$ :	3	in

\*Rating per TIA-222-H Section 15.5

Structural Rating*:	82.2%
Soil Rating*:	90.7%

Pad Properties		
Depth, $D$ :	10.5	ft
Pad Width, $W_1$ :	25	ft
Pad Thickness, $T$ :	3	ft
Pad Rebar Size (Bottom dir. 2), $Sp_2$ :	8	
Pad Rebar Quantity (Bottom dir. 2), $mp_2$ :	35	
Pad Clear Cover, $cc_{pad}$ :	3	in

Material Properties		
Rebar Grade, $F_y$ :	60	ksi
Concrete Compressive Strength, $F'_c$ :	4	ksi
Dry Concrete Density, $\delta_c$ :	150	pcf

Soil Properties		
Total Soil Unit Weight, $\gamma$ :	110	pcf
Ultimate Net Bearing, $Q_{net}$ :	6.600	ksf
Cohesion, $C_u$ :	1.000	ksf
Friction Angle, $\phi$ :	0	degrees
SPT Blow Count, $N_{blows}$ :	13	
Base Friction, $\mu$ :	0.3	
Neglected Depth, $N$ :	3.80	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, $gw$ :	16	ft

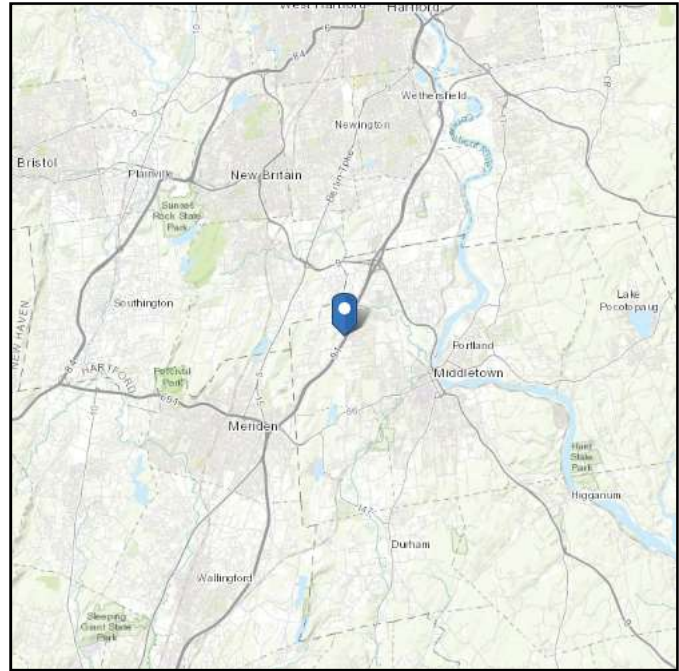
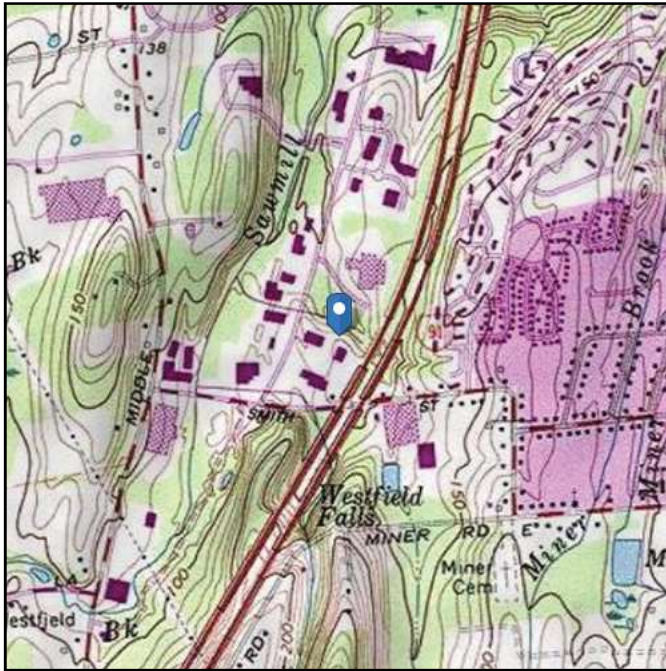
<--Toggle between Gross and Net

# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

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

**Elevation:** 89.45 ft (NAVD 88)  
**Latitude:** 41.585639  
**Longitude:** -72.714025



## Wind

### Results:

Wind Speed:	124 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	93 Vmph
100-year MRI	101 Vmph

**Date Accessed:** 7/20/2021  
**ASCE/SEI 7-10** Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

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 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

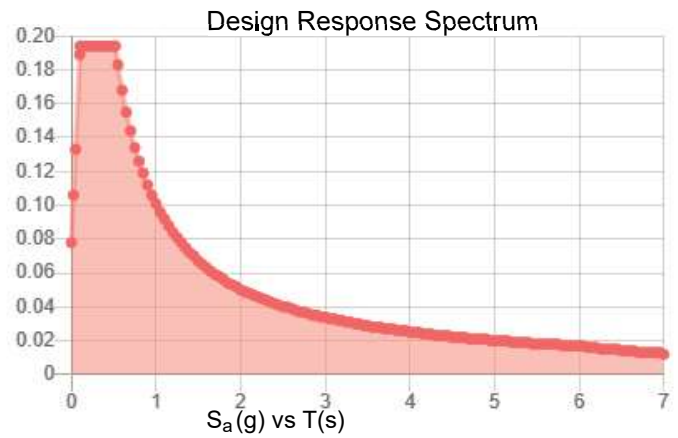
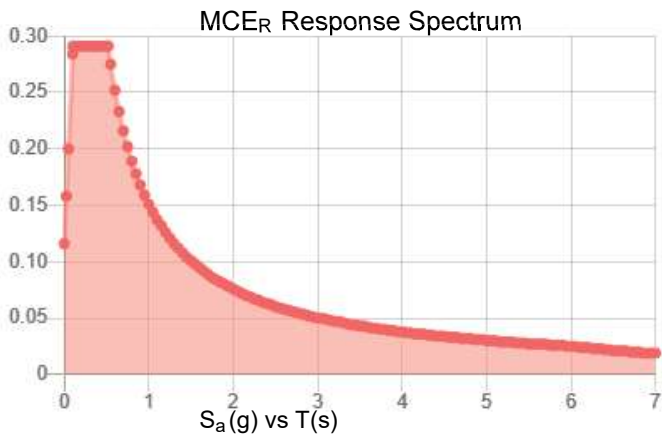
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

**Site Soil Class:** D - Stiff Soil

**Results:**

$S_s$ :	0.182	$S_{DS}$ :	0.194
$S_1$ :	0.063	$S_{D1}$ :	0.101
$F_a$ :	1.6	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.093
$S_{MS}$ :	0.291	PGA <sub>M</sub> :	0.148
$S_{M1}$ :	0.151	F <sub>PGA</sub> :	1.6
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:**

Tue Mar 30 2021

**Date Source:**

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

## Ice

---

**Results:**

Ice Thickness: 0.75 in.  
Concurrent Temperature: 15 F  
Gust Speed: 50 mph

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

**Date Accessed:** Tue Mar 30 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.

# Exhibit E

## **Power Density/RF Emissions Report**



## RF EMISSIONS COMPLIANCE REPORT

### Crown Castle on behalf of Dish Wireless

Crown Castle Site Name: MIDDLETOWN\_1  
Crown Castle Site BU Number: 825983  
Dish Wireless Site ID: BOBDL0056A  
90 Industrial Park Road  
Middletown, CT  
5/27/2021

### Report Status:

**Dish Wireless Is Compliant**



Michael Fischer, P.E.  
Registered Professional Engineer (Electrical)  
Connecticut License Number 33928  
Expires January 31, 2022

Signed 27 May 2021

Prepared By:

**Site Safe, LLC**

Engineering Statement in Re:  
Electromagnetic Energy Analysis  
Crown Castle  
Middletown, CT

My signature on the cover of this document indicates:

That I am registered as a Professional Engineer in the jurisdiction indicated; and

That I have extensive professional experience in the wireless communications engineering industry; and

That I am an employee of Site Safe, LLC in Vienna, Virginia; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission ("the FCC" and "the FCC Rules") both in general and specifically as they apply to the FCC's Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields; and

That the technical information serving as the basis for this report was supplied by Crown Castle (see attached Site Summary and Carrier documents) and that Dish Wireless' installation involves communications equipment, antennas and associated technical equipment at a location referred to as "MIDDLETOWN\_1" ("the site"); and

That Dish Wireless proposes to operate at the site with transmit antennas listed in the carrier summary and with a maximum effective radiated power as specified by Dish Wireless and shown on the worksheet and that worst-case 100% duty cycle has been assumed; and

That this analysis has been performed with the assumption that the ground immediately surrounding the tower is primarily flat or falling; and

That at this time, the FCC requires that certain licensees address specific levels of radio frequency energy to which workers or members of the public might possibly be exposed (at §1.1307(b) of the FCC Rules); and

That such consideration of possible exposure of humans to radio frequency energy must utilize the standards set by the FCC, which is the federal agency having jurisdiction over communications facilities; and

That the FCC rules define two tiers of permissible exposure guidelines: 1) "uncontrolled environments," which defines situations in which persons may not be aware of (the "general public"), or may not be able to control their exposure to a transmission facility; and 2) "controlled environments," which defines situations in which persons are aware of their potential for exposure (industry personnel); and

That this statement specifically addresses the uncontrolled environment (which is more conservative than the controlled environment) and the limit set forth in the FCC rules for licensees of Dish Wireless' operating frequencies as shown on the attached antenna worksheet; and

That when applying the uncontrolled environment standards, the predicted Maximum Power Density at two meters above ground level from the proposed Dish Wireless operation is no more



than 0.707% of the maximum permissible exposure limits in any accessible area on the ground; and

That it is understood per FCC Guidelines and OET 65 Appendix A, that regardless of the existent radio frequency environment, only those licensees whose contributions exceed 5% of the exposure limit pertinent to their operation(s) bear any responsibility for bringing any non-compliant area(s) into compliance; and

That when applying the uncontrolled environment standards, the cumulative predicted energy density from the proposed operation is no more than 5.031% of the maximum in any accessible area up to two meters above the ground per OET 65; and

That the calculations provided in this report are based on data provided by the client and antenna pattern data supplied by the antenna manufacturer, in accordance with FCC guidelines listed in OET 65. Horizontal and vertical antenna patterns are combined for modeling purposes to accurately reflect the energy two meters above ground level where on-axis energy refers to maximum energy two meters above the ground along the azimuth of the antenna and where area energy refers to the maximum energy anywhere two meters above the ground regardless of the antenna azimuth, accounting for cumulative energy from multiple antennas for the carrier(s) and frequency range(s) indicated; and

That the Occupational Safety and Health Administration has policies in place which address worker safety in and around communications sites, thus individual companies will be responsible for their employees' training regarding radio frequency safety; and

In summary, it is stated here that the proposed operation at the site will not result in exposure of the public to excessive levels of radio frequency energy as defined in the FCC Rules and Regulations, specifically 47 CFR 1.1307(b), and that Dish Wireless' proposed operation is completely compliant.

Finally, it is stated that access to the tower should be restricted to communication industry professionals and approved contractor personnel trained in radio frequency safety and that this instant analysis addresses exposure levels at two meters above ground level and does not address exposure levels on the tower or in the immediate proximity of the antennas.

**Crown Castle  
MIDDLETOWN\_1  
Site Summary**

<b>Carrier</b>	<b>Area Maximum Percentage MPE</b>
AT&T Mobility, LLC	0.191 %
AT&T Mobility, LLC	0.760 %
AT&T Mobility, LLC	0.157 %
AT&T Mobility, LLC	0.111 %
AT&T Mobility, LLC	0.209 %
AT&T Mobility, LLC	0.238 %
Dish Wireless (Proposed)	0.191 %
Dish Wireless (Proposed)	0.191 %
Dish Wireless (Proposed)	0.325 %
T-Mobile	0.172 %
T-Mobile	0.140 %
T-Mobile	0.302 %
T-Mobile	0.129 %
Verizon Wireless	0.538 %
Verizon Wireless	0.381 %
Verizon Wireless	0.468 %
Verizon Wireless	0.528 %
 <b>Composite Site MPE:</b>	 5.031 %

**AT&T Mobility, LLC  
MIDDLETOWN\_1  
Carrier Summary**

Frequency: 737 MHz  
 Maximum Permissible Exposure (MPE): 491.33  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 0.93792  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.19089 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
CCI Antennas	DMP65R-BU6D	174	40	2400	0.596377	0.121379	0.78875	0.160532
CCI Antennas	DMP65R-BU6D	174	150	2400	0.596377	0.121379	0.78875	0.160532
CCI Antennas	DMP65R-BU6D	174	270	2400	0.596377	0.121379	0.78875	0.160532

**AT&T Mobility, LLC  
MIDDLETOWN\_1  
Carrier Summary**

Frequency: 1900 MHz  
 Maximum Permissible Exposure (MPE): 1000  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 7.60208  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.76021 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
CCI Antennas	OPA65R-BU6D	174	40	4458	3.142514	0.314251	3.877024	0.387702
CCI Antennas	DMP65R-BU6D	174	40	4075	3.146273	0.314627	3.753377	0.375338
CCI Antennas	OPA65R-BU6D	174	150	4458	3.142514	0.314251	3.877024	0.387702
CCI Antennas	DMP65R-BU6D	174	150	4075	3.146273	0.314627	3.753377	0.375338
CCI Antennas	OPA65R-BU6D	174	270	4458	3.142514	0.314251	3.877024	0.387702
CCI Antennas	DMP65R-BU6D	174	270	4075	3.146273	0.314627	3.753377	0.375338

**AT&T Mobility, LLC  
MIDDLETOWN\_1  
Carrier Summary**

Frequency: 763 MHz  
 Maximum Permissible Exposure (MPE): 508.67  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 0.79826  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.15693 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
CCI Antennas	OPA65R-BU6D	174	40	2450	0.613243	0.120559	0.644154	0.126636
CCI Antennas	OPA65R-BU6D	174	150	2450	0.613243	0.120559	0.644154	0.126636
CCI Antennas	OPA65R-BU6D	174	270	2450	0.613243	0.120559	0.644154	0.126636

**AT&T Mobility, LLC  
MIDDLETOWN\_1  
Carrier Summary**

Frequency: 2300 MHz  
 Maximum Permissible Exposure (MPE): 1000  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 1.11231  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.11123 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
Quintel	QS66512-2	174	40	2858	0.496896	0.04969	1.033514	0.103351
Quintel	QS66512-2	174	150	2858	0.496896	0.04969	1.033514	0.103351
Quintel	QS66512-2	174	270	2858	0.496896	0.04969	1.033514	0.103351

**AT&T Mobility, LLC  
MIDDLETOWN\_1  
Carrier Summary**

Frequency: 2100 MHz  
 Maximum Permissible Exposure (MPE): 1000  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 2.08596  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.2086 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
Quintel	QS66512-2	174	40	4788	1.188974	0.118897	1.975993	0.197599
Quintel	QS66512-2	174	150	4788	1.188974	0.118897	1.975993	0.197599
Quintel	QS66512-2	174	270	4788	1.188974	0.118897	1.975993	0.197599

**AT&T Mobility, LLC  
MIDDLETOWN\_1  
Carrier Summary**

Frequency: 850 MHz  
 Maximum Permissible Exposure (MPE): 566.67  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 1.35013  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.23826 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
Powerwave	7770	174	27	547	0.170204	0.030036	0.264616	0.046697
CCI Antennas	DMP65R-BU6D	174	40	2239	0.562874	0.099331	1.036652	0.182939
Powerwave	7770	174	141	547	0.170204	0.030036	0.264616	0.046697
CCI Antennas	DMP65R-BU6D	174	150	2239	0.562874	0.099331	1.036652	0.182939
Powerwave	7770	174	261	547	0.170204	0.030036	0.264616	0.046697
CCI Antennas	DMP65R-BU6D	174	270	2239	0.562874	0.099331	1.036652	0.182939



**Dish Wireless (Proposed)**  
**MIDDLETOWN\_1**  
**Carrier Summary**

Frequency: 2100 MHz  
Maximum Permissible Exposure (MPE): 1000  $\mu\text{W}/\text{cm}^2$   
Maximum power density at ground level: 1.90844  $\mu\text{W}/\text{cm}^2$   
Highest percentage of Maximum Permissible Exposure: 0.19084 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
JMA Wireless	MX08FRO665-20	165	0	6904	1.023384	0.102338	1.87695	0.187695
JMA Wireless	MX08FRO665-20	165	120	6904	1.023384	0.102338	1.87695	0.187695
JMA Wireless	MX08FRO665-20	165	240	6904	1.023384	0.102338	1.87695	0.187695

**Dish Wireless (Proposed)**  
**MIDDLETOWN\_1**  
**Carrier Summary**

Frequency: 1900 MHz  
Maximum Permissible Exposure (MPE): 1000  $\mu\text{W}/\text{cm}^2$   
Maximum power density at ground level: 1.90844  $\mu\text{W}/\text{cm}^2$   
Highest percentage of Maximum Permissible Exposure: 0.19084 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
JMA Wireless	MX08FRO665-20	165	0	6904	1.023384	0.102338	1.87695	0.187695
JMA Wireless	MX08FRO665-20	165	120	6904	1.023384	0.102338	1.87695	0.187695
JMA Wireless	MX08FRO665-20	165	240	6904	1.023384	0.102338	1.87695	0.187695

**Dish Wireless (Proposed)**  
**MIDDLETOWN\_1**  
**Carrier Summary**

Frequency: 600 MHz  
 Maximum Permissible Exposure (MPE): 400  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 1.29903  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.32476 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
JMA Wireless	MX08FRO665-20	165	0	3229	0.780732	0.195183	1.238675	0.309669
JMA Wireless	MX08FRO665-20	165	120	3229	0.780732	0.195183	1.238675	0.309669
JMA Wireless	MX08FRO665-20	165	240	3229	0.780732	0.195183	1.238675	0.309669

**T-Mobile  
MIDDLETOWN\_1  
Carrier Summary**

Frequency: 700 MHz  
 Maximum Permissible Exposure (MPE): 466.67  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 0.80149  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.17175 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
RFS	APXVAARR24_43-U-NA20	183	60	3484	0.658032	0.141007	0.687931	0.147414
RFS	APXVAARR24_43-U-NA20	183	180	3484	0.658032	0.141007	0.687931	0.147414
RFS	APXVAARR24_43-U-NA20	183	300	3484	0.658032	0.141007	0.687931	0.147414

## T-Mobile MIDDLETOWN\_1 Carrier Summary

**Frequency:** 600 MHz  
**Maximum Permissible Exposure (MPE):** 400  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 0.55958  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.1399 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
RFS	APXVAARR24_43-U-NA20	183	60	2501	0.507808	0.126952	0.521009	0.130252
RFS	APXVAARR24_43-U-NA20	183	180	2501	0.507808	0.126952	0.521009	0.130252
RFS	APXVAARR24_43-U-NA20	183	300	2501	0.507808	0.126952	0.521009	0.130252

## T-Mobile MIDDLETOWN\_1 Carrier Summary

**Frequency:** 2100 MHz  
**Maximum Permissible Exposure (MPE):** 1000  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 3.01706  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.30171 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
Ericsson	AIR 32 B2A B66AA	183	60	4626	2.832071	0.283207	2.832071	0.283207
Ericsson	AIR 32 B2A B66AA	183	180	4626	2.832071	0.283207	2.832071	0.283207
Ericsson	AIR 32 B2A B66AA	183	300	4626	2.832071	0.283207	2.832071	0.283207

## T-Mobile MIDDLETOWN\_1 Carrier Summary

**Frequency:** 1900 MHz  
**Maximum Permissible Exposure (MPE):** 1000  $\mu\text{W}/\text{cm}^2$   
**Maximum power density at ground level:** 1.2881  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.12881 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
RFS	APX16DWV-16DWVS-C-A20	183	60	1691	0.228964	0.022896	0.271783	0.027178
Ericsson	AIR 32 B2A B66AA	183	60	4626	0.656327	0.065633	0.750033	0.075003
RFS	APX16DWV-16DWVS-C-A20	183	180	1691	0.228964	0.022896	0.271783	0.027178
Ericsson	AIR 32 B2A B66AA	183	180	4626	0.656327	0.065633	0.750033	0.075003
RFS	APX16DWV-16DWVS-C-A20	183	300	1691	0.228964	0.022896	0.271783	0.027178
Ericsson	AIR 32 B2A B66AA	183	300	4626	0.656327	0.065633	0.750033	0.075003

**Verizon Wireless  
MIDDLETOWN\_1  
Carrier Summary**

Frequency: 2100 MHz  
 Maximum Permissible Exposure (MPE): 1000  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 5.38471  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.53847 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
ANDREW	SBNHH-1D65B	155	30	7732	2.818761	0.281876	4.23397	0.423397
ANDREW	SBNHH-1D65B	155	120	7732	2.818761	0.281876	4.23397	0.423397
ANDREW	SBNHH-1D65B	155	270	7732	2.818761	0.281876	4.23397	0.423397



**Verizon Wireless  
MIDDLETOWN\_1  
Carrier Summary**

Frequency: 751 MHz  
 Maximum Permissible Exposure (MPE): 500.67  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 1.90816  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.38112 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
ANDREW	SBNHH-1D65B	155	30	2043	0.612963	0.122429	0.99136	0.198008
ANDREW	SBNHH-1D65B	155	120	2043	0.612963	0.122429	0.99136	0.198008
ANDREW	SBNHH-1D65B	155	270	2043	0.612963	0.122429	0.99136	0.198008

**Verizon Wireless  
MIDDLETOWN\_1  
Carrier Summary**

Frequency: 1900 MHz  
 Maximum Permissible Exposure (MPE): 1000  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 4.68025  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.46802 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
ANDREW	SBNHH-1D65B	155	30	4583	3.286279	0.328628	4.226123	0.422612
ANDREW	SBNHH-1D65B	155	120	4583	3.286279	0.328628	4.226123	0.422612
ANDREW	SBNHH-1D65B	155	270	4583	3.286279	0.328628	4.226123	0.422612

**Verizon Wireless  
MIDDLETOWN\_1  
Carrier Summary**

Frequency: 850 MHz  
 Maximum Permissible Exposure (MPE): 566.67  $\mu\text{W}/\text{cm}^2$   
 Maximum power density at ground level: 2.99242  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.52807 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE	Max Power Density ( $\mu\text{W}/\text{cm}^2$ )	Percent of MPE
ANDREW	SBNHH-1D65B	155	30	2892	1.439135	0.253965	1.596069	0.281659
ANDREW	SBNHH-1D65B	155	120	2892	1.439135	0.253965	1.596069	0.281659
ANDREW	SBNHH-1D65B	155	270	2892	1.439135	0.253965	1.596069	0.281659