



**Crown Castle**  
3 Corporate Park Drive, Suite 101  
Clifton Park, NY 12065

August 18, 2020

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

**RE: Notice of Exempt Modification for AT&T: 825983  
90 Industrial Park Rd., Middletown, CT 06457  
Latitude: 41° 35' 8.30"/ Longitude: -72° 42' 50.49"**

Dear Ms. Bachman:

AT&T currently maintains nine (9) total antennas at the 175-foot mount on the existing 185-foot Monopole Tower, located at 90 Industrial Park Rd. Middletown, CT. The tower is owned by Crown Castle. The property is owned by Airline Avenue Realty LLC. AT&T now intends to replace three (3) existing antennas with six (6) new antennas at the 175-foot mount. AT&T is also proposing mount replacements as shown on the enclosed Mount Replacement Analysis.

The tower was approved by the City of Middletown, CT on January 28, 1998 with no conditions. The City approval documents are included.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Mayor Ben Florsheim, City of Middletown, Zoning Enforcement Officer, Mr. Ronald Baia, as well as the property owner, and Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

**The Foundation for a Wireless World.**

CrownCastle.com

Melanie A. Bachman

Page 2

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, AT&T respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Anne Marie Zsamba.

Sincerely,

Anne Marie Zsamba  
Site Acquisition Specialist  
3 Corporate Park Drive, Suite 101  
Clifton Park, NY 12065  
201-236-9224  
annemarie.zsamba@crowncastle.com

Attachments

cc:

City Mayor Ben Florsheim (*via email to mayor@MiddletownCT.gov*)  
City of Middletown  
245 DeKoven Drive  
Middletown, CT 06457  
860-638-4801

Mr. Ronald Baia, Zoning Enforcement Officer (*via email to Ronald.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

Crown Castle, Tower Owner

ORIGIN ID: SCHA (518) 350-3639  
ANNE MARIE ZSAMBRA  
CROWN CASTLE  
21 HEATHER DRIVE  
GANSEVOORT, NY 12831  
UNITED STATES US

SHIP DATE: 18AUG20  
ACTWGT: 1.00 LB  
CAD: 104924194IN/ET4280

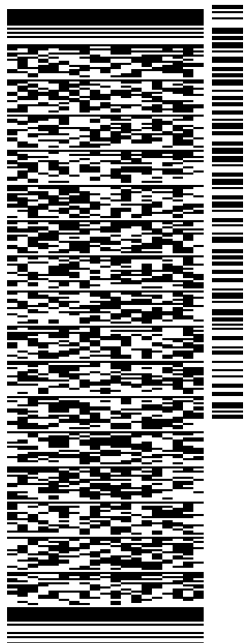
BILL SENDER

TO AIRLINE AVENUE REALTY LLC

15 MULLEN ROAD

ENFIELD CT 06082

(201) 236-9224 REF: 1734.7890  
INV/ DEPT:  
PO:



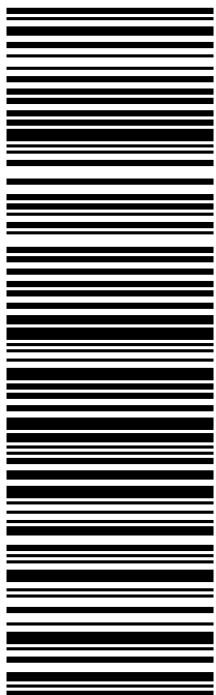
J202020071401uv

56BJ27709/B766

TRK# 7712 8646 8033  
0201

WED - 19 AUG 10:30A  
PRIORITY OVERNIGHT

EB QCWA 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.

**From:** [Zsamba, Anne Marie](#)  
**To:** [mayor@MiddletownCT.gov](mailto:mayor@MiddletownCT.gov)  
**Subject:** Notice of Exempt Modification - 90 Industrial Park Rd - AT&T  
**Date:** Tuesday, August 18, 2020 6:31:00 AM  
**Attachments:** [EM AT&T 90 Industrial Park Road Middletown 825983 notice.pdf](#)

---

Dear Mayor Florsheim:

Attached please find AT&T's exempt modification application that is being submitted to the Connecticut Siting Council, today Tuesday, August 18, 2020.

In light of the present circumstances with Covid-19, The Council has advised that electronic notification of this filing is acceptable. If you could kindly confirm receipt. Thank you.

Best,  
Anne Marie Zsamba

**ANNE MARIE ZSAMBA**  
Site Acquisition Specialist  
T: (201) 236-9224  
M: (518) 350-3639  
F: (724) 416-6112

**CROWN CASTLE**  
3 Corporate Park Drive, Suite 101  
Clifton Park, NY 12065  
[CrownCastle.com](http://CrownCastle.com)



**From:** [Zsamba, Anne Marie](#)  
**To:** ["Ronald.Baia@middletownct.gov"](mailto:Ronald.Baia@middletownct.gov)  
**Subject:** Notice of Exempt Modification - 90 Industrial Park Rd - AT&T  
**Date:** Tuesday, August 18, 2020 6:31:00 AM  
**Attachments:** [EM AT&T 90 Industrial Park Road Middletown 825983 notice.pdf](#)

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Dear ZEO Baia:

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In light of the present circumstances with Covid-19, The Council has advised that electronic notification of this filing is acceptable. If you could kindly confirm receipt. Thank you.

Best,  
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T: (201) 236-9224  
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3 Corporate Park Drive, Suite 101  
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[CrownCastle.com](http://CrownCastle.com)

# 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> ■ Complete items 1 and/or 2 for additional services. ■ Complete items 3, 4a, and 4b. ■ Print your name and address on the reverse of this form so that we can return this card to you. ■ Attach this form to the front of the mailpiece, or on the back if space does not permit. ■ Write "Return Receipt Requested" on the mailpiece below the article number. ■ The Return Receipt will show to whom the article was delivered and the date delivered.		I also wish to receive the following services (for an extra fee): 1. <input type="checkbox"/> Addressee's Address 2. <input type="checkbox"/> Restricted Delivery Consult postmaster for fee.
	3. Article Addressed to: OmniPoint Communications, Inc. 25 Van Zant St. 4th floor Norwalk, CT 06855	4a. Article Number P348 778 241	4b. Service Type <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
	5. Received By: (Print Name)	7. Date of Delivery 2/5/98	8. Addressee's Address (Only if requested and fee is paid)
	6. Signature: (Addressee or Agent) X		

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. Date 11-6-97  
Address: 1515 SUMMER ST City STAMFORD Phone# (203) 359-1280  
Agent: THOMAS M. GILLIGAN State CT Zip 06905  
Address: 1515 SUMMER ST City STAMFORD 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 MIDDLETOWN, 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]  
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]  
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 ; 1/28/98  
 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] 2/6/98

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

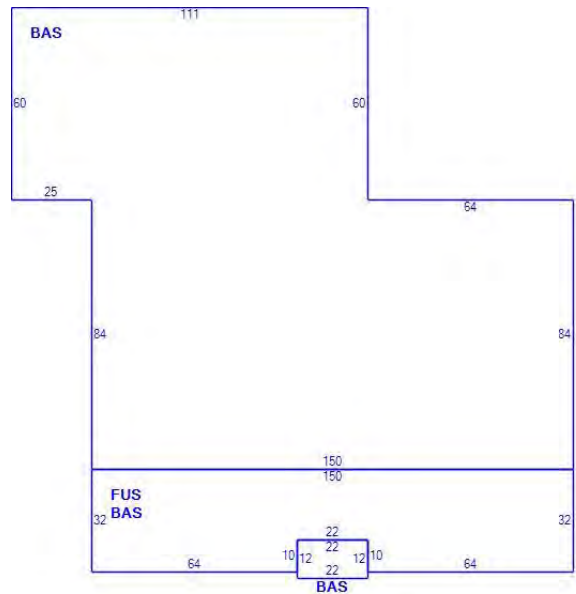
Building Attributes	
Field	Description
STYLE	Office/Warehs
MODEL	Industrial
Grade	C
Stories	1
Occupancy	2.00
Exterior Wall 1	Pre-finsh Metl
Exterior Wall 2	Concrete
Roof Structure	Flat
Roof Cover	Tar and Gravel
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	Carpet
Heating Fuel	Gas
Heating Type	Forced Air
AC Type	Partial
Struct Class	
Bldg Use	Industrial
Usrflid 215	
Usrflid 216	
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/A00\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					<u>Legend</u>
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 Category** No

**Land Line Valuation**

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

**Outbuildings**

Outbuildings						<u>Legend</u>
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
2019	\$1,255,960	\$635,630	\$1,891,590
2018	\$1,255,960	\$635,630	\$1,891,590
2017	\$1,255,960	\$635,630	\$1,891,590

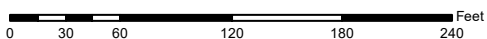
Assessment			
Valuation Year	Improvements	Land	Total
2019	\$879,170	\$444,940	\$1,324,110
2018	\$879,170	\$444,940	\$1,324,110
2017	\$879,170	\$444,940	\$1,324,110



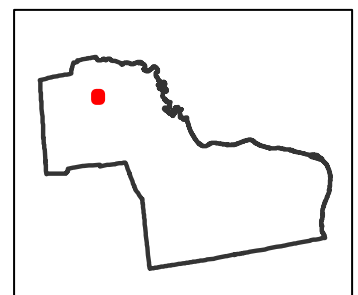
# City of Middletown, Connecticut

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**





**AT&T SITE NUMBER:** CTL01044  
**AT&T SITE NAME:** CROMWELL EAST  
**AT&T FA CODE:** 10035130  
**AT&T PACE NUMBER:** MRCTB045506  
 MRCTB045490  
 MRCTB045504  
 MRCTB045475  
 MRCTB045474  
**AT&T PROJECT:** LTE 6C/7C/5GNR/BWE

**BUSINESS UNIT #:** 825983  
**SITE ADDRESS:** 90 INDUSTRIAL PARK ROAD  
 MIDDLETOWN, CT 06457  
**COUNTY:** MIDDLESEX  
**SITE TYPE:** MONOPOLE  
**TOWER HEIGHT:** 185'-0"



AT&T SITE NUMBER: CTL01044  
 BU #: 825983  
 MIDDLETOWN\_1  
 90 INDUSTRIAL PARK ROAD  
 MIDDLETOWN, CT 06457  
 EXISTING 185'-0" MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	06/30/20	TG	CONSTRUCTION	JL
1	07/14/20	TG	CONSTRUCTION	JL
2	07/30/20	TG	CONSTRUCTION	JL

DocuSigned by:  
 Justin C. Lutter  
 18400582647C41D  
  
 7/30/2020 10:42:42 PM EDT  
 Crown Castle USA Inc. Certificate of Registration #PEC.0001101  
 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.

**SHEET NUMBER:** T-1  
**REVISION:** 2

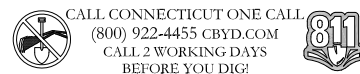
**SITE INFORMATION**

CROWN CASTLE USA INC. MIDDLETOWN\_1  
 SITE NAME:  
 SITE ADDRESS: 90 INDUSTRIAL PARK ROAD  
 MIDDLETOWN, CT 06457  
 COUNTY: MIDDLESEX  
 MAP/PARCEL #: MTWN-000000-000000-000347R  
 AREA OF CONSTRUCTION: EXISTING  
 LATITUDE: 41° 35' 08.30"  
 LONGITUDE: -72° 42' 50.49"  
 LAT/LONG TYPE: NAD83  
 GROUND ELEVATION: 185 FT.  
 CURRENT ZONING: IT  
 JURISDICTION: CITY OF MIDDLETOWN  
 OCCUPANCY CLASSIFICATION: U  
 TYPE OF CONSTRUCTION: IIB  
 A.D.A. COMPLIANCE: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION  
 PROPERTY OWNER: GLOBAL SIGNAL ACQUISITIONS IV LLC  
 PO BOX 277455  
 ATLANTA, GA 30384-7455  
 TOWER OWNER: CCTMO LLC  
 2000 CORPORATE DRIVE  
 CANONSBURG, PA 15317  
 CARRIER/APPLICANT: AT&T TOWER ASSET GROUP  
 575 MOROSGO DRIVE  
 ATLANTA, GA 30324-3300  
 ELECTRIC PROVIDER: NORTHEAST UTILITIES  
 (800) 286-2000  
 TELCO PROVIDER: CROWN CASTLE  
 (888) 632-0931

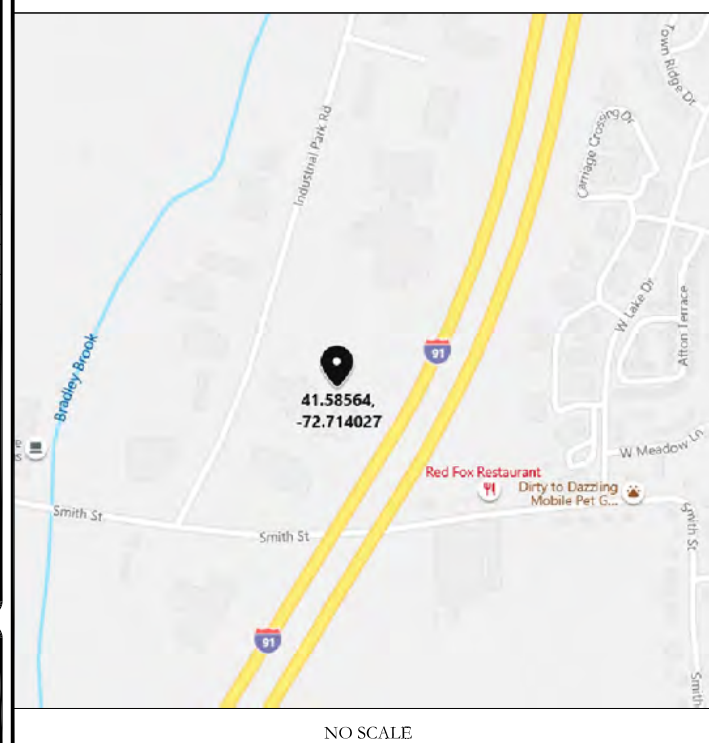
**DRAWING INDEX**

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1.1	SITE PLAN
C-1.2	EXISTING & FINAL EQUIPMENT PLANS
C-2	FINAL ELEVATION & ANTENNA PLANS
C-3	FINAL EQUIPMENT SCHEDULE
C-4	EQUIPMENT SPECS
G-1	GROUNDING SCHEMATIC
G-2	GROUNDING DETAILS
ATTACHED	PLUMBING DIAGRAM
ATTACHED	MOUNT SPECIFICATIONS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11X17. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.



**LOCATION MAP**



**SITE PHOTO**



**PROJECT TEAM**

A&E FIRM: CROWN CASTLE USA INC.  
 2000 CORPORATE DRIVE  
 CANONSBURG, PA 15317  
 CROWNNAE.APPROVAL@CROWNCastle.COM  
 CROWN CASTLE USA INC. DISTRICT CONTACTS:  
 1200 MACARTHUR BLVD, SUITE 200  
 MAHWAH, NJ 07430  
 VERONICA DELIA - PROJECT MANAGER  
 (610) 635-3222  
 JASON D'AMICO - CONSTRUCTION MANAGER  
 (860) 209-0104

**PROJECT DESCRIPTION**

THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

**TOWER SCOPE OF WORK:**

- REMOVE (3) CCI ANTENNAS - OPA-65R-LCUU-H6 ANTENNAS
- REMOVE (3) ERICSSON - RRUS-11 B2 RRHs
- REMOVE (3) ERICSSON - RRUS-12 B5 RRHs
- REMOVE (3) T-ARM ANTENNA MOUNTS
- INSTALL SABRE - C10857803 SECTOR MOUNTS PER MOUNT ANALYSIS BY B+T GROUP DATED APRIL 3, 2020
- INSTALL (3) CCI ANTENNAS - OPA65R-BUGDA-K ANTENNAS
- INSTALL (3) CCI ANTENNAS - DMP65R-BUGDA ANTENNAS
- INSTALL (3) ERICSSON - RRUS 32 B2 RRHs
- INSTALL (3) ERICSSON - 4449 B5/B12 RRHs
- INSTALL (3) ERICSSON - 4478 B14 RRHs
- INSTALL (1) RAYCAP - DC9-48-60-24-EC-EV SQUID
- INSTALL (1) FIBER CABLE
- INSTALL (3) DC CABLES

**GROUND SCOPE OF WORK:**

- REMOVE (1) XMU02
- INSTALL (3) ERICSSON - RRUS-E2 B29 RRHs
- INSTALL (1) XMU03
- INSTALL (1) 6630 + IDLe

**INSTALLER NOTE:**  
 NO PROPOSED LOADING TO BE ADDED UNTIL MOUNT SWAP IS COMPLETE. CONTRACTOR TO INSTALL MOUNT PER MANUFACTURER'S SPECIFICATIONS.

**APPLICABLE CODES/REFERENCE DOCUMENTS**

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

**REFERENCE DOCUMENTS:**

STRUCTURAL ANALYSIS: PAUL J. FORD AND COMPANY  
 DATED: APRIL 7, 2020  
 MOUNT ANALYSIS: B+T GROUP  
 DATED: APRIL 3, 2020  
 RFDS REVISION: PRELIMINARY  
 DATED: 11/23/19  
 ORDER ID: 509310  
 REVISION: 0

**NOTE:**  
 PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER.



**CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:**

- NOTICE TO PROCEED- NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800-788-7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
- "LOOK UP" - CROWN CASTLE USA INC. 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 CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
- 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.
- 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 LANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD CED-STD-10253, 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).
- ALL SITE WORK TO COMPLY WITH QAS-STD-10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE" AND LATEST VERSION OF ANSI/TIA-1019-A-2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.
- IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
- 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.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- 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.
- ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS. LATEST APPROVED REVISION.
- 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.
- 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 CONTRACTOR, TOWER OWNER, CROWN CASTLE USA INC., AND/OR LOCAL UTILITIES.
- 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.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
- THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- 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.
- 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.
- 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.
- 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.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
- 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.

**GREENFIELD GROUNDING NOTES:**

- 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.
- THE CONTRACTOR SHALL PERFORM IEEE FALL-OFF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
- 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.
- 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.
- 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.
- 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.
- 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.
- ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
- ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
- USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
- EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
- ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
- COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
- ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
- APPROVED ANTI-OXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
- ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
- MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
- BOND ALL METALLIC OBJECTS WITHIN 6 ft. OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
- 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.
- 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).
- 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).

**GENERAL NOTES:**

- FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:  
CONTRACTOR: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION  
CARRIER: AT&T  
TOWER OWNER: CROWN CASTLE USA INC.
- 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.
- 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.
- 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.
- 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.
- 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 CROWN CASTLE.
- 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.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- 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 CROWN CASTLE PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
- CONTRACTOR IS TO PERFORM A SITE INVESTIGATION AND IS 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.
- 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 CROWN CASTLE USA INC.
- 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.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

**CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:**

- 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.
- UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90° AT TIME OF PLACEMENT.
- 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.
- 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
- 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"
- A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

**ELECTRICAL INSTALLATION NOTES:**

- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
- CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
- WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
- ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.  
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.
- EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
- ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
- PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
- ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
- ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THW, THW, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THW, THW, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
- POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
- POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
- ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
- RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
- ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
- ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
- SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
- LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
- CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET NEW FITTINGS WHEN NOT ACCEPTABLE.
- CABINETTS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
- WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREFOLD SPECMATE WIREWAY).
- SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
- CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER-ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO 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.
- 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 3R (OR BETTER) FOR EXTERIOR LOCATIONS.
- METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
- NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
- THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR CROWN CASTLE USA INC. BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
- THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
- INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "AT&T".
- ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

CONDUCTOR COLOR CODE		
SYSTEM	CONDUCTOR	COLOR
120/240V, 1Ø	A PHASE	BLACK
	B PHASE	RED
	NEUTRAL	WHITE
120/208V, 3Ø	GROUND	GREEN
	A PHASE	BLACK
	B PHASE	RED
277/480V, 3Ø	C PHASE	BLUE
	NEUTRAL	WHITE
	GROUND	GREEN
DC VOLTAGE	A PHASE	BROWN
	B PHASE	ORANGE OR PURPLE
	C PHASE	YELLOW
	NEUTRAL	GREY
	GROUND	GREEN
	POS (+)	RED**
	NEG (-)	BLACK**

\* SEE NEC 210.5(C)(1) AND (2)  
\*\* POLARITY MARKED AT TERMINATION

**ABBREVIATIONS:**

- ANT ANTENNA
- (E) EXISTING
- FIF FACILITY INTERFACE FRAME
- GEN GENERATOR
- GPS GLOBAL POSITIONING SYSTEM
- GSM GLOBAL SYSTEM FOR MOBILE
- LTE LONG TERM EVOLUTION
- MGB MASTER GROUND BAR
- MW MICROWAVE
- (N) NEW
- NEC NATIONAL ELECTRIC CODE
- (P) PROPOSED
- PP POWER PLANT
- QTY QUANTITY
- RECT RECTIFIER
- RBS RADIO BASE STATION
- RETS REMOTE ELECTRIC TILT
- RFDS RADIO FREQUENCY DATA SHEET
- RRH REMOTE RADIO HEAD
- RRU REMOTE RADIO UNIT
- SIAD SMART INTEGRATED DEVICE
- TMA TOWER MOUNTED AMPLIFIER
- TYP TYPICAL
- UMTS UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
- W.P. WORK POINT

**APWA UNIFORM COLOR CODE:**

- WHITE PROPOSED EXCAVATION
- PINK TEMPORARY SURVEY MARKINGS
- RED ELECTRIC POWER LINES, CABLES, CONDUIT, AND LIGHTING CABLES
- YELLOW GAS, OIL, STEAM, PETROLEUM, OR GASEOUS MATERIALS
- ORANGE COMMUNICATION, ALARM OR SIGNAL LINES, CABLES, OR CONDUIT AND TRAFFIC LOOPS
- BLUE POTABLE WATER
- PURPLE RECLAIMED WATER, IRRIGATION, AND SLURRY LINES
- GREEN SEWERS AND DRAIN LINES



AT&T SITE NUMBER: CTL01044

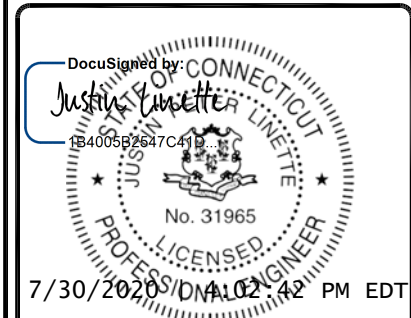
BU #: 825983  
MIDDLETOWN\_1

90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

EXISTING 185'-0" MONOPOLE

**ISSUED FOR:**

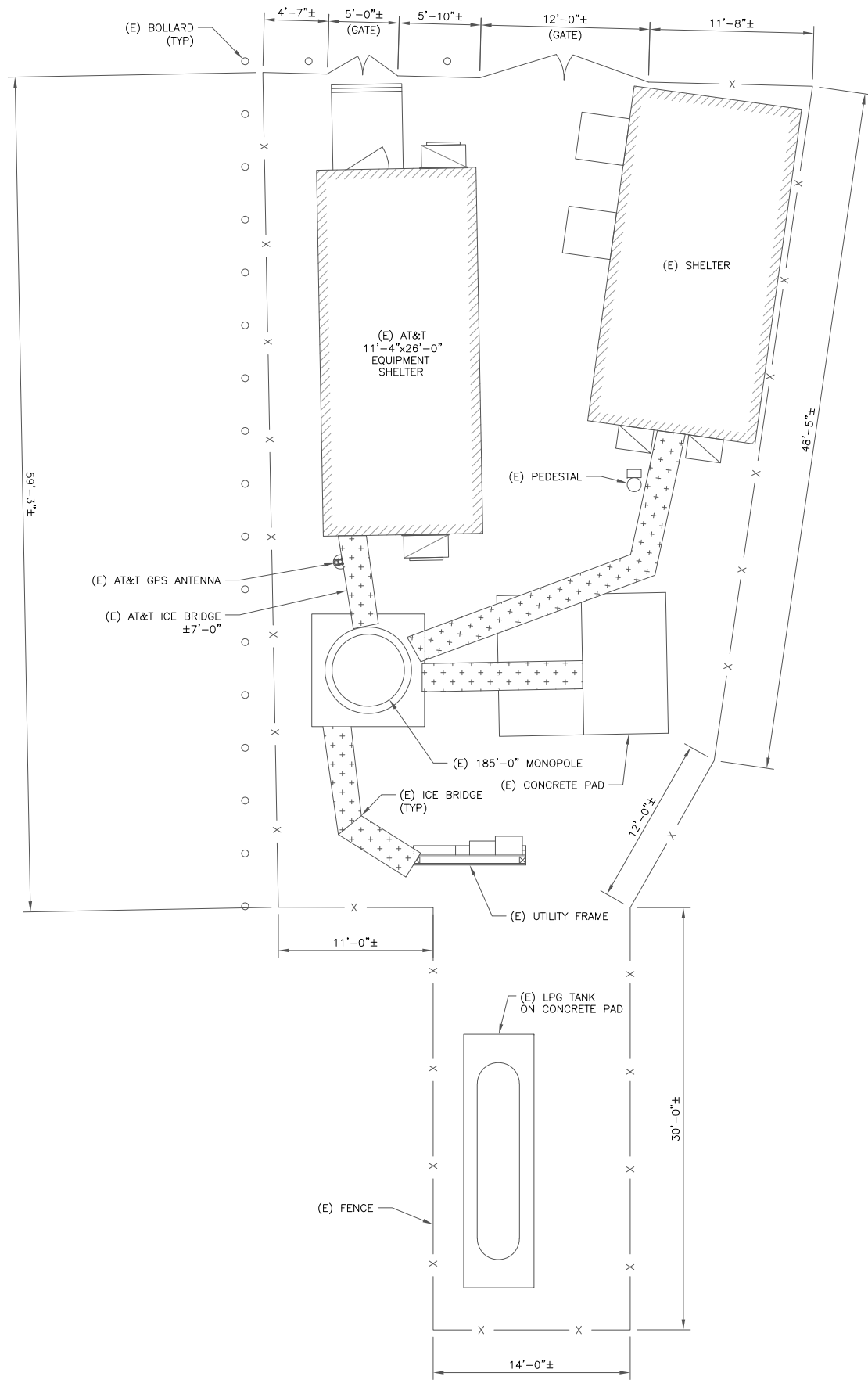
REV	DATE	DRWN	DESCRIPTION	DES./QA
0	06/30/20	TG	CONSTRUCTION	JL
1	07/14/20	TG	CONSTRUCTION	JL
2	07/30/20	TG	CONSTRUCTION	JL



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SHEET NUMBER: **T-2** REVISION: **2**



1 SITE PLAN  
 SCALE: 3/16"=1'-0" (FULL SIZE)  
 3/32"=1'-0" (11x17)



575 MOROSGO DRIVE  
 ATLANTA, GA 30324-3300

1200 MACARTHUR BLVD, SUITE 200  
 MAHWAH, NJ 07430

AT&T SITE NUMBER: CTL01044  
 BU #: 825983  
 MIDDLETOWN\_1  
 90 INDUSTRIAL PARK ROAD  
 MIDDLETOWN, CT 06457  
 EXISTING 185'-0" MONOPOLE

ISSUED FOR:

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1	07/14/20	TG	CONSTRUCTION	JL
2	07/30/20	TG	CONSTRUCTION	JL

DocuSigned by:  
 Justin C. Carter  
 18400582647C419

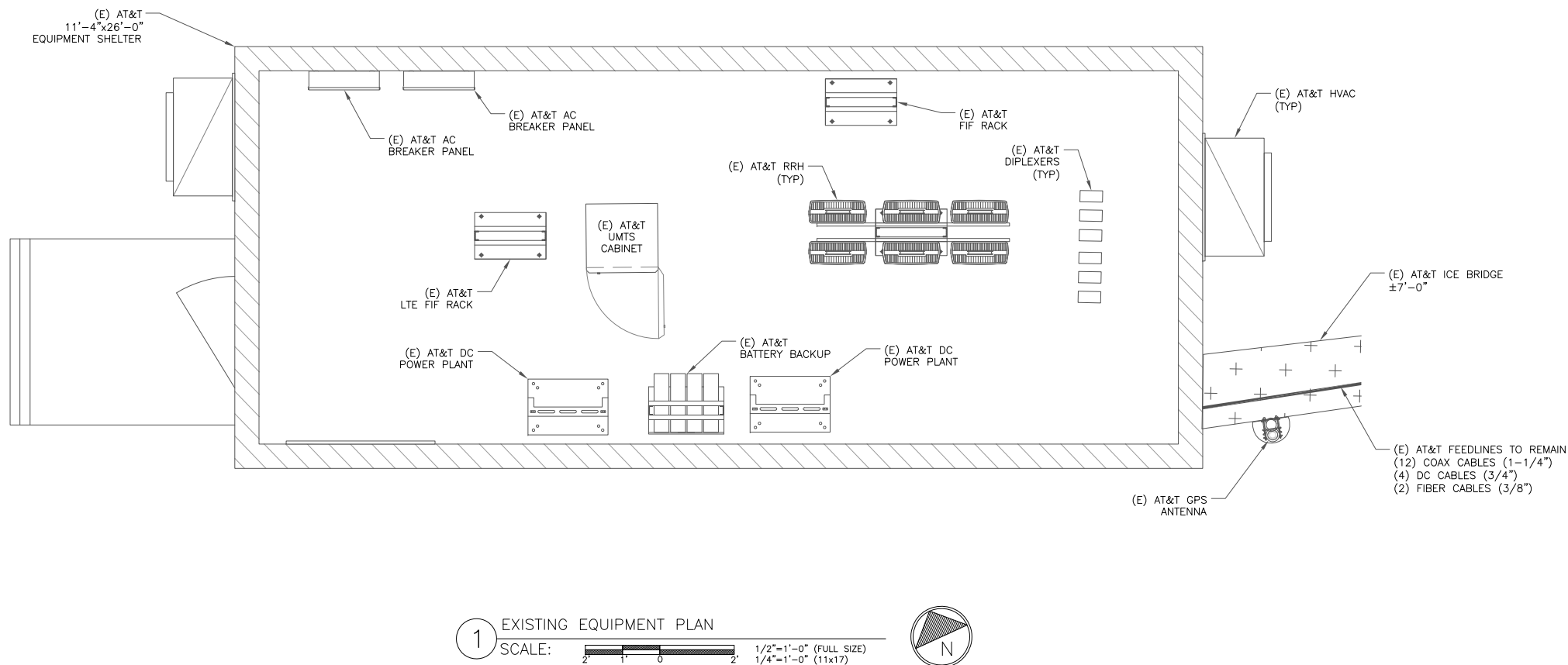
7/30/2020 11:02:42 PM EDT

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SHEET NUMBER: C-1.1  
 REVISION: 2





1 EXISTING EQUIPMENT PLAN  
SCALE: 1/2"=1'-0" (FULL SIZE)  
1/4"=1'-0" (11x17)

AT&T SITE NUMBER: CTL01044

BU #: 825983  
MIDDLETOWN\_1

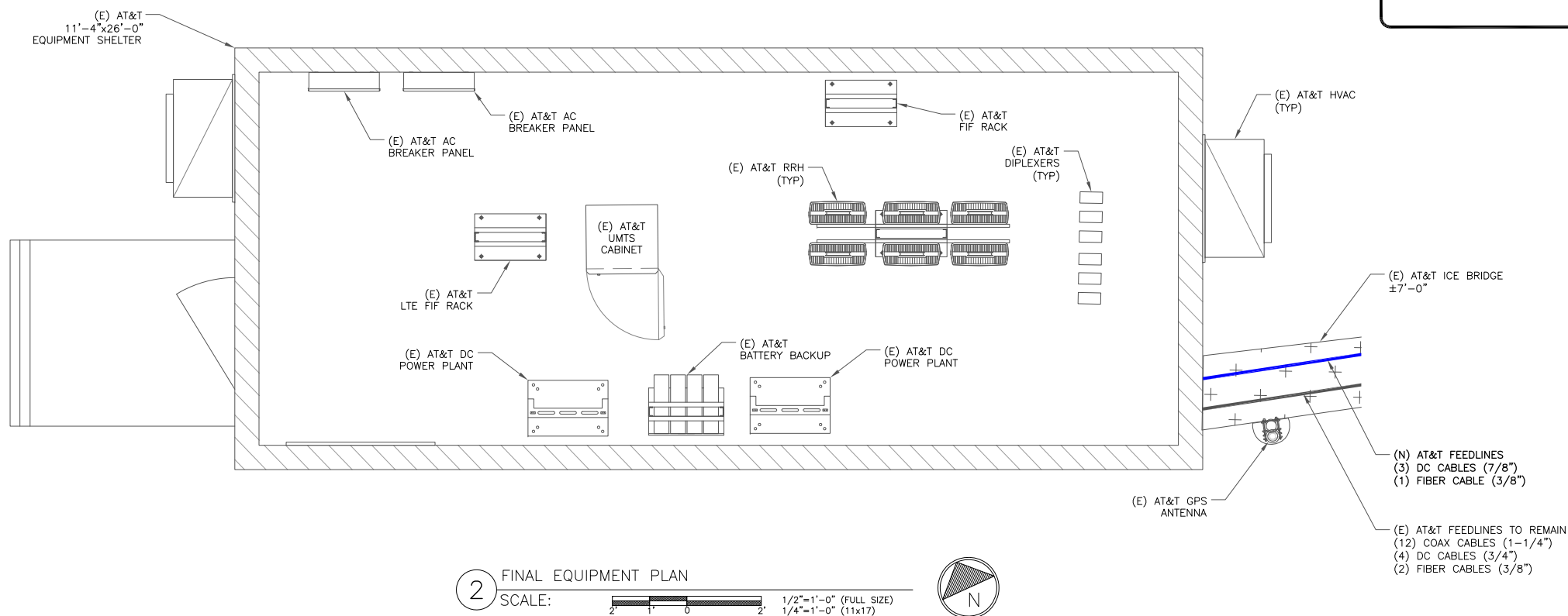
90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

EXISTING 185'-0" MONOPOLE

- GROUND SCOPE OF WORK:
- REMOVE (2) XMU
  - INSTALL (3) ERICSSON - RRUS E2 B29 RRHs
  - INSTALL (1) 6630 5G
  - INSTALL (1) XMU03
  - INSTALL (1) 6601

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	06/30/20	TG	CONSTRUCTION	JL
1	07/14/20	TG	CONSTRUCTION	JL
2	07/30/20	TG	CONSTRUCTION	JL

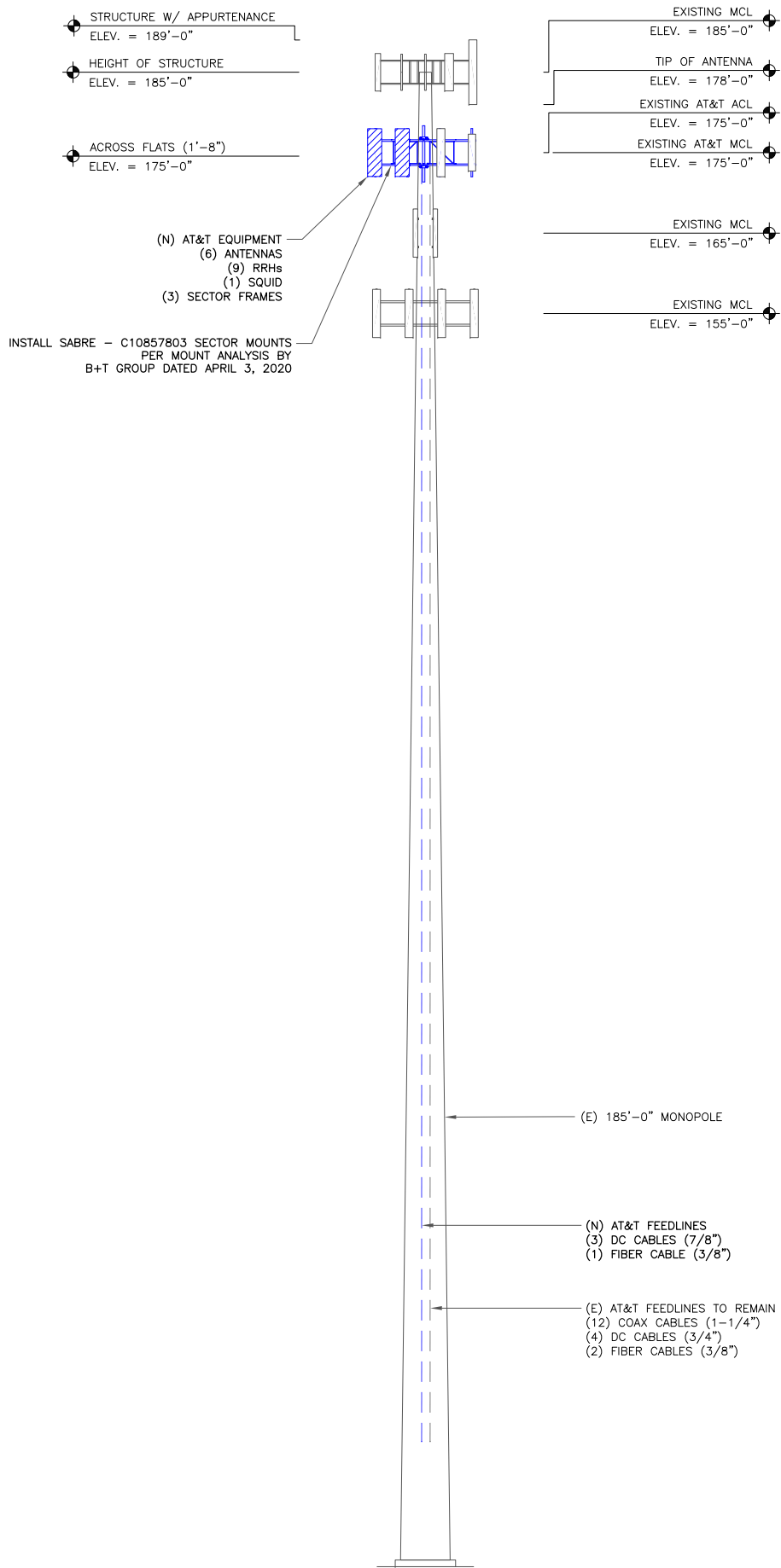


2 FINAL EQUIPMENT PLAN  
SCALE: 1/2"=1'-0" (FULL SIZE)  
1/4"=1'-0" (11x17)

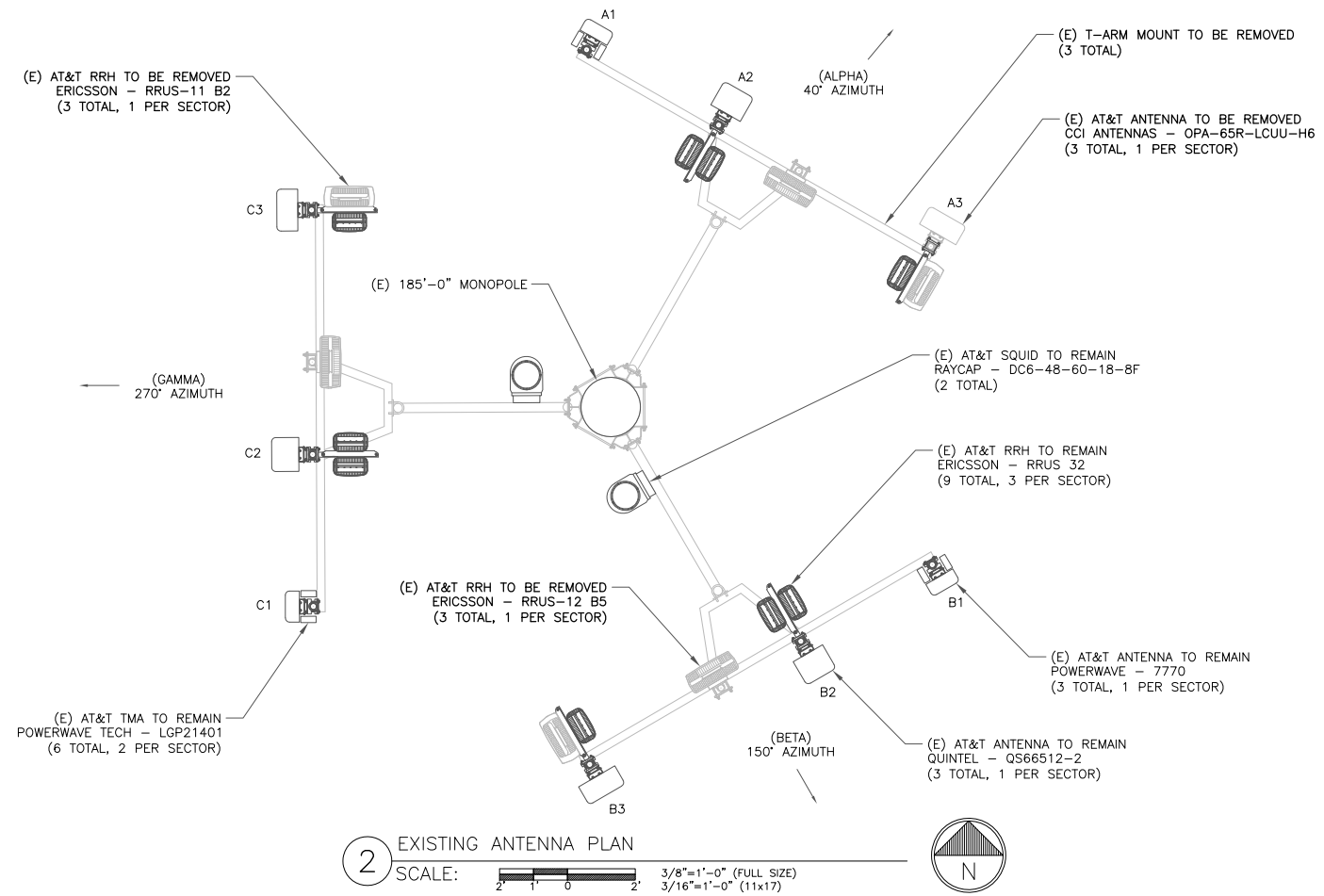
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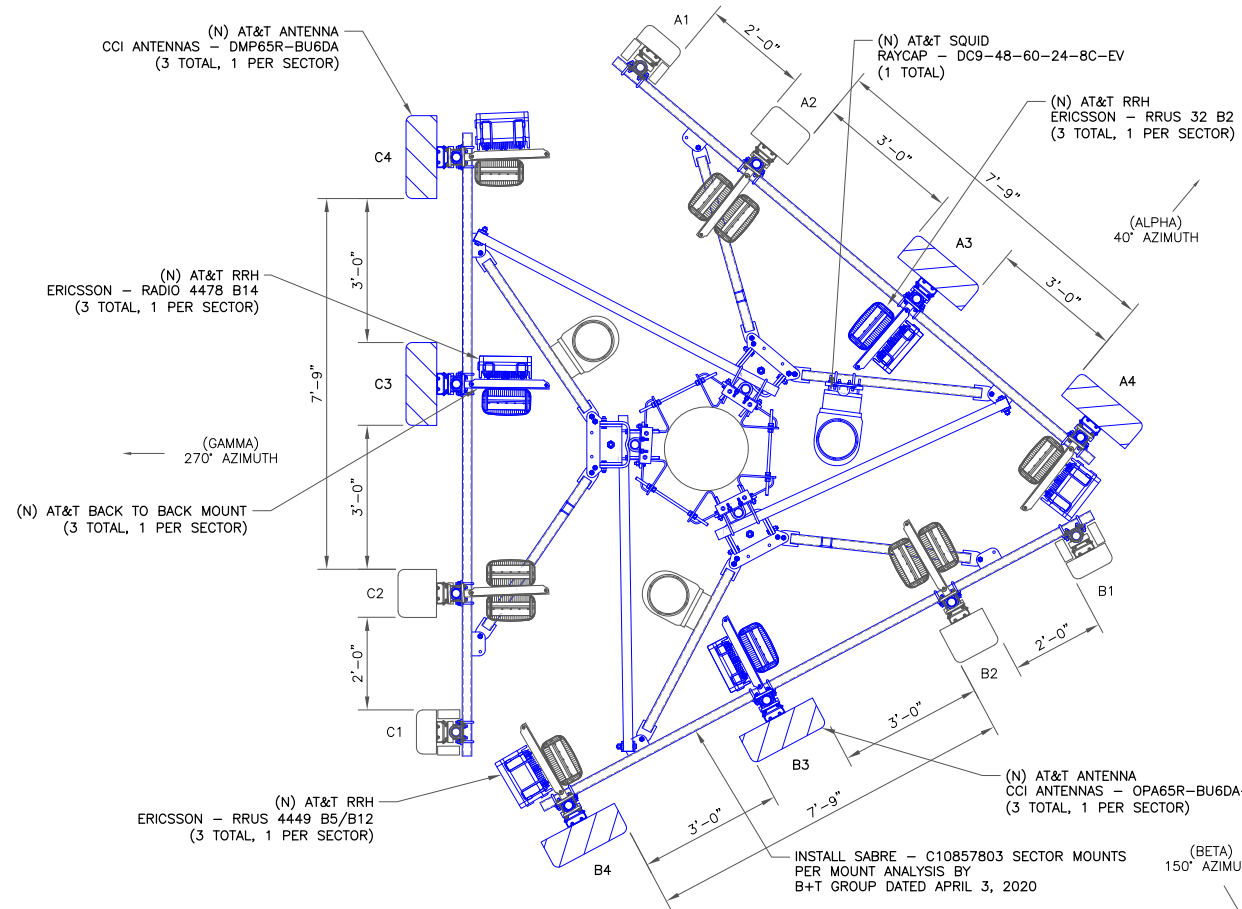
SHEET NUMBER: C-1.2  
REVISION: 2



1 FINAL ELEVATION  
SCALE: NOT TO SCALE



2 EXISTING ANTENNA PLAN  
SCALE: 3/8"=1'-0" (FULL SIZE)  
3/16"=1'-0" (11x17)



3 FINAL ANTENNA PLAN  
SCALE: 1/2"=1'-0" (FULL SIZE)  
1/4"=1'-0" (11x17)

**"LOOK UP" - CROWN CASTLE USA INC. 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 CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.

- INSTALLER NOTES:**
- REFERENCE C-3 FOR FINAL EQUIPMENT SCHEDULE.
  - REFERENCE C-4 FOR NEW EQUIPMENT SPECIFICATIONS.
  - CONTRACTOR TO VERIFY ALL ANTENNA TIP HEIGHTS DO NOT EXCEED BEACON BASE HEIGHT.
  - 3'-0" MINIMUM DISTANCE REQUIRED BETWEEN LTE ANTENNAS ON SAME SECTOR.
  - 6'-0" MINIMUM DISTANCE REQUIRED BETWEEN 700BC & 700DE ANTENNAS ON SAME SECTOR.
  - 4'-0" MINIMUM DISTANCE REQUIRED BETWEEN LTE 700 ANTENNAS ON OPPOSING SECTORS.
  - ALL ANTENNA MEASUREMENT DISTANCES MUST BE EDGE TO EDGE (RELOCATE ANTENNAS AS NEEDED).
  - 8" MINIMUM DISTANCE REQUIRED BETWEEN ANTENNA & RADIO. SEE GENERIC EXAMPLE DETAIL ON SHEET C-4.

575 MOROSGO DRIVE  
ATLANTA, GA 30324-3300

1200 MACARTHUR BLVD, SUITE 200  
MAHWAH, NJ 07430

AT&T SITE NUMBER: CTL01044

BU #: 825983  
MIDDLETOWN\_1

90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

EXISTING 185'-0" MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
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1	07/14/20	TG	CONSTRUCTION	JL
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DocuSigned by:  
Justin Cincotta

7/30/2020 10:02:42 PM EDT

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SHEET NUMBER: **C-2** REVISION: **2**

FINAL EQUIPMENT SCHEDULE  
(VERIFY WITH CURRENT RFDS)

ALPHA																			
POSITION	ANTENNA				RADIO			DIPLEXER			TMA		SURGE PROTECTION		CABLES				
	TECH.	STATUS/MANUFACTURER MODEL	AZIMUTH	RAD CENTER	QTY.	STATUS/MODEL	LOCATION	QTY.	STATUS	LOCATION	QTY.	STATUS/MODEL	QTY.	STATUS/MODEL	QTY.	STATUS/TYPE	SIZE	LENGTH	
A1	UMTS	(E) POWERWAVE TECH 7770	40°	175'-0"	-	-	-	2	(E)	GROUND	2	(E) LGP21401	-	-	2	(E) COAX	1-1/4"	225'-0"	
A2	LTE	(E) QUINTEL QS66512-2	40°	175'-0"	1	(E) RRUS 32 B66A	TOWER	-	-	-	-	-	-	-	2	(E) COAX	1-1/4"	225'-0"	
					1	(E) RRUS 32 B30	TOWER	-	-	-	-	-	-	-	-	-	-	-	-
					1	(E) RRUS E2 B29	GROUND	-	-	-	-	-	-	-	-	-	-	-	-
A3	LTE	(N) CCI ANTENNAS OPA65R-BU6DA-K	40°	175'-0"	1	(N) RADIO 4478 B14	TOWER	-	-	-	-	-	1	(E) DC6-48-60-18-8F	2	(E) DC	3/4"	225'-0"	
					1	(N) RRUS 32 B2	TOWER	-	-	-	-	-	1	(E) FIBER	3/8"	225'-0"			
A4	LTE 5G	(N) CCI ANTENNAS DMP65R-BU6DA	40°	175'-0"	1	(N) RADIO 4449 B5/B12	TOWER	-	-	-	-	-	-	-	-	-	-	-	
					1	(E) RRUS 32 B2	TOWER	-	-	-	-	-	-	-	-	-	-	-	-
BETA																			
B1	UMTS	(E) POWERWAVE TECH 7770	150°	175'-0"	-	-	-	2	(E)	GROUND	2	(E) LGP21401	-	-	2	(E) COAX	1-1/4"	225'-0"	
B2	LTE	(E) QUINTEL QS66512-2	150°	175'-0"	1	(E) RRUS 32 B66A	TOWER	-	-	-	-	-	-	-	2	(E) COAX	1-1/4"	225'-0"	
					1	(E) RRUS 32 B30	TOWER	-	-	-	-	-	-	-	-	-	-	-	
					1	(E) RRUS E2 B29	GROUND	-	-	-	-	-	-	-	-	-	-	-	-
B3	LTE	(N) CCI ANTENNAS OPA65R-BU6DA-K	150°	175'-0"	1	(N) RADIO 4478 B14	TOWER	-	-	-	-	-	1	(N) DC9-48-60-24-8C-EV	3	(N) DC	7/8"	225'-0"	
					1	(N) RRUS 32 B2	TOWER	-	-	-	-	-	1	(N) FIBER	3/8"	225'-0"			
B4	LTE 5G	(N) CCI ANTENNAS DMP65R-BU6DA	150°	175'-0"	1	(N) RADIO 4449 B5/B12	TOWER	-	-	-	-	-	-	-	-	-	-	-	
					1	(E) RRUS 32 B2	TOWER	-	-	-	-	-	-	-	-	-	-	-	
GAMMA																			
C1	UMTS	(E) POWERWAVE TECH 7770	270°	175'-0"	-	-	-	2	(E)	GROUND	2	(E) LGP21401	-	-	2	(E) COAX	1-1/4"	225'-0"	
C2	LTE	(E) QUINTEL QS66512-2	270°	175'-0"	1	(E) RRUS 32 B66A	TOWER	-	-	-	-	-	-	-	2	(E) COAX	1-1/4"	225'-0"	
					1	(E) RRUS 32 B30	TOWER	-	-	-	-	-	-	-	-	-	-		
					1	(E) RRUS E2 B29	GROUND	-	-	-	-	-	-	-	-	-	-	-	
C3	LTE	(N) CCI ANTENNAS OPA65R-BU6DA-K	270°	175'-0"	1	(N) RADIO 4478 B14	TOWER	-	-	-	-	-	1	(E) DC6-48-60-18-8F	2	(E) DC	3/4"	225'-0"	
					1	(N) RRUS 32 B2	TOWER	-	-	-	-	-	1	(E) FIBER	3/8"	225'-0"			
C4	LTE 5G	(N) CCI ANTENNAS DMP65R-BU6DA	270°	175'-0"	1	(N) RADIO 4449 B5/B12	TOWER	-	-	-	-	-	-	-	-	-	-	-	
					1	(E) RRUS 32 B2	TOWER	-	-	-	-	-	-	-	-	-	-		

NOTE:  
(E) - EXISTING  
(N) - NEW



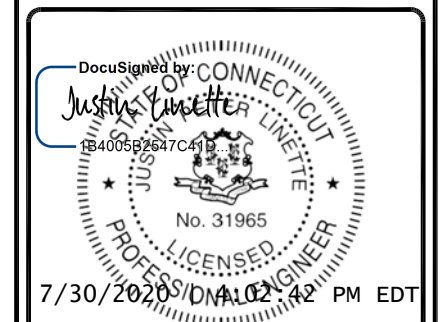
AT&T SITE NUMBER: CTL01044

BU #: 825983  
MIDDLETOWN\_1

90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

EXISTING 185'-0" MONOPOLE

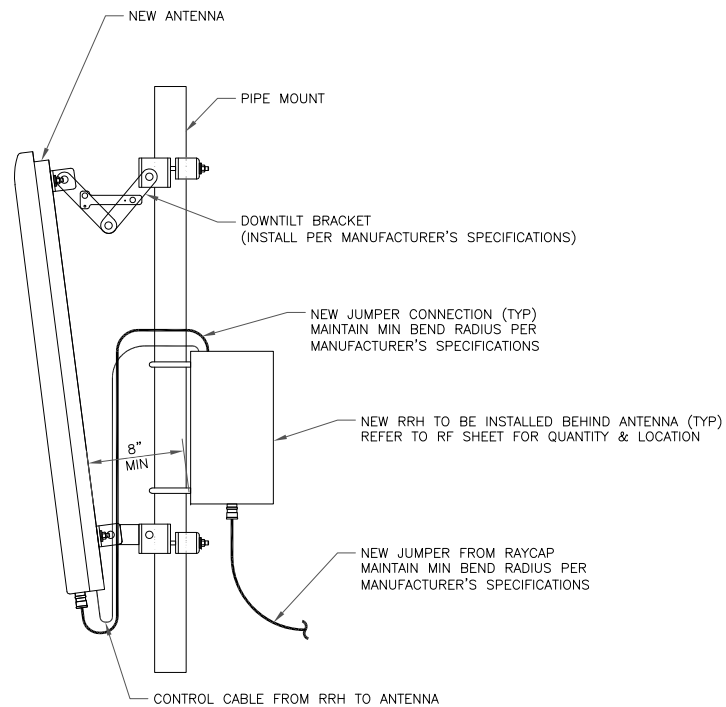
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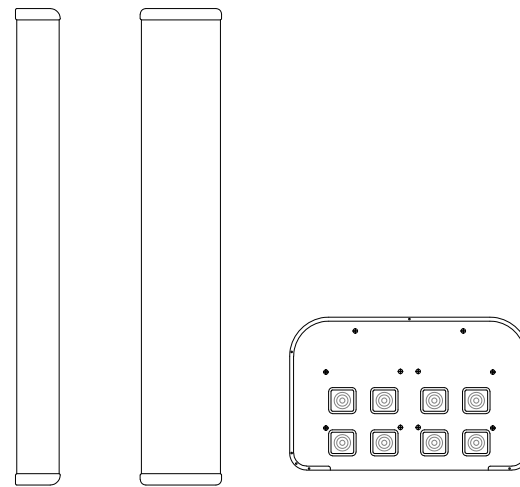
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SHEET NUMBER: <b>C-3</b>	REVISION: <b>2</b>
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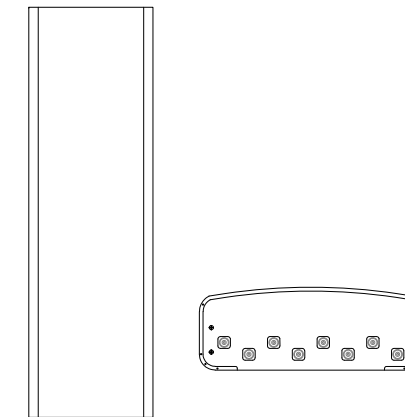


1 GENERIC ANTENNA MOUNTING ELEVATION  
SCALE: NOT TO SCALE



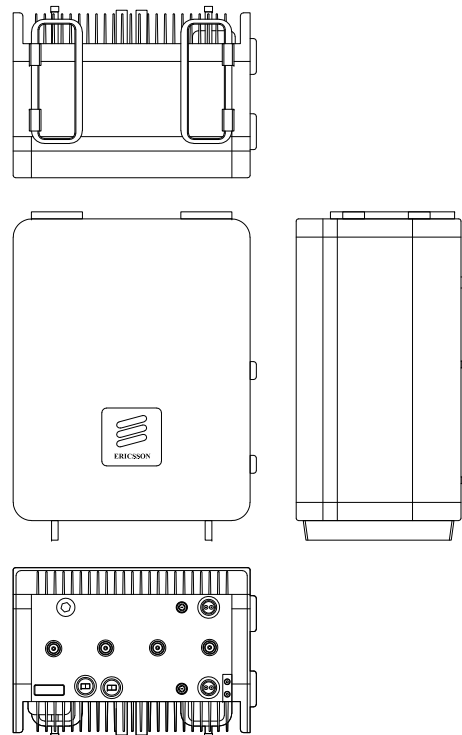
CCI ANTENNAS - OPA65R-BU6BA-K  
WEIGHT (WITHOUT MOUNTING HARDWARE): 55.0 LBS  
SIZE (HxWxD): 71.1x11.7x8.4 IN.  
MOUNTING HARDWARE P/N: MBK-01  
RATED WIND VELOCITY: 150.0 MPH

2 CCI ANTENNAS - OPA65R-BU6BA-K  
SCALE: NOT TO SCALE



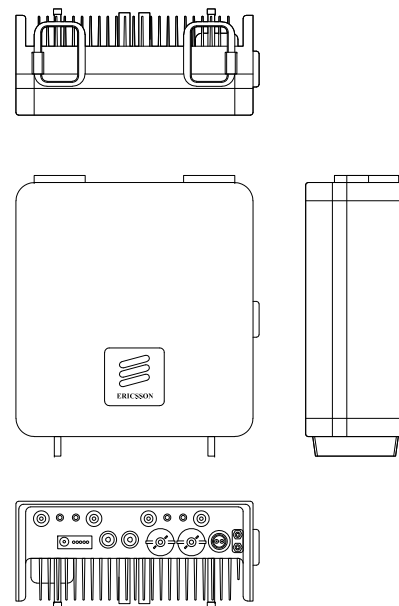
CCI ANTENNAS - DMP65R-BU6DA  
WEIGHT (WITHOUT MOUNTING HARDWARE): 89.3 LBS  
SIZE (HxWxD): 71.2x20.7x7.7 IN.

3 CCI ANTENNAS - DMP65R-BU6DA  
SCALE: NOT TO SCALE



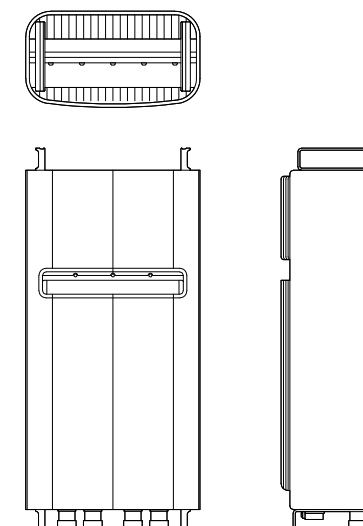
ERICSSON - RADIO 4449 B5/B12  
WEIGHT: 70.0 LBS  
SIZE (HxWxD): 18.0x13.2x9.4 IN.

4 ERICSSON - RADIO 4449 B5/B12  
SCALE: NOT TO SCALE



ERICSSON - RADIO 4478 B14  
WEIGHT: 60.0 LBS  
SIZE (HxWxD): 15.0x13.0x8.0 IN.

5 ERICSSON - RADIO 4478 B14  
SCALE: NOT TO SCALE



ERICSSON - RRUS 32 B2  
WEIGHT (WITHOUT MOUNTING HARDWARE): 52.9 LBS  
SIZE (HxWxD): 27.20x12.05x7.00 IN.

6 ERICSSON - RRUS 32 B2  
SCALE: NOT TO SCALE

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MIDDLETOWN\_1

90 INDUSTRIAL PARK ROAD  
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EXISTING 185'-0" MONOPOLE

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DocuSigned by:  
Justin Cawter  
18400582647C41D  
No. 31965  
7/30/2020 11:02:42 PM EDT

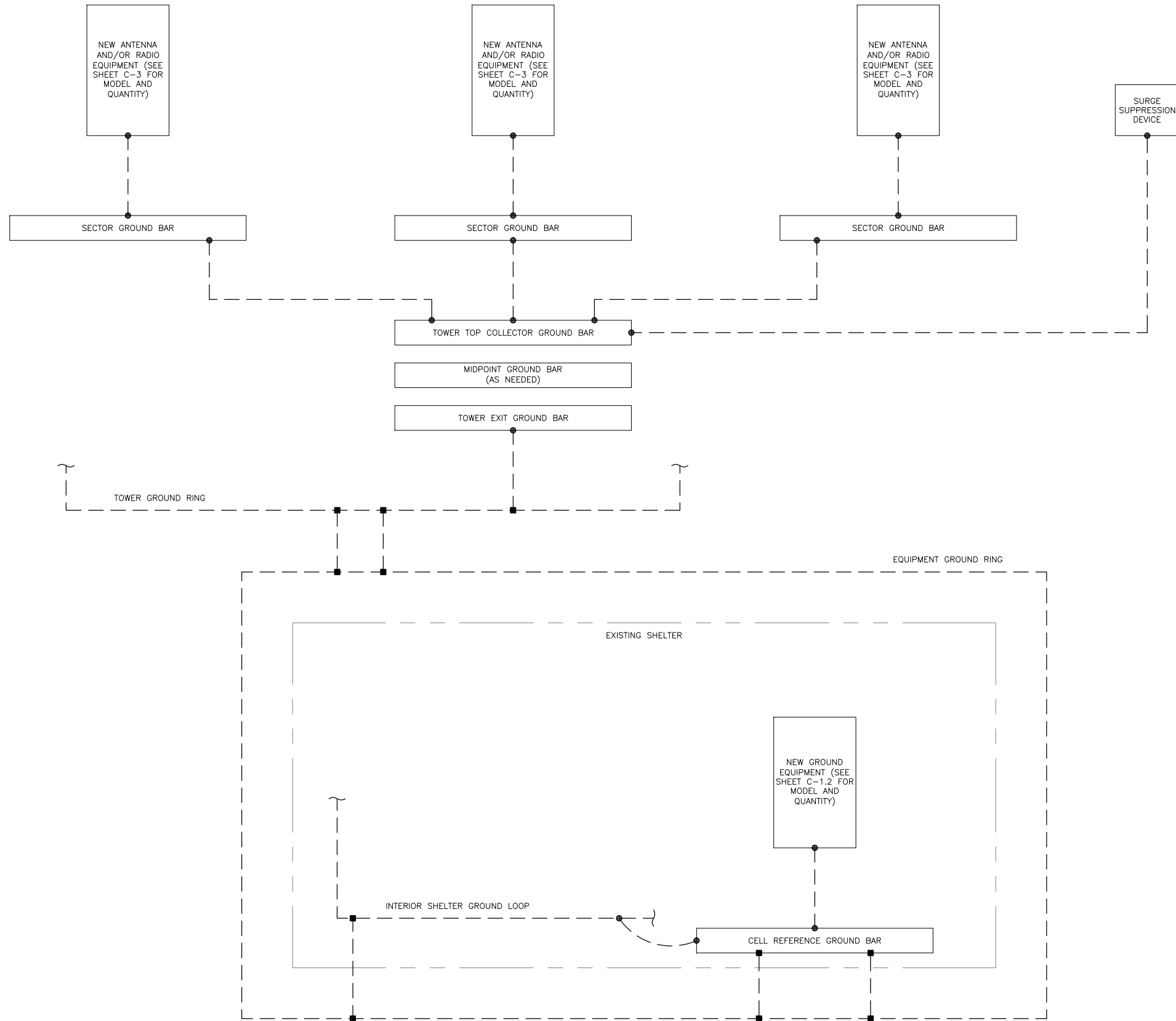
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SHEET NUMBER:  
**C-4**

REVISION:  
**2**





**GROUNDING PLAN LEGEND:**

- GROUND WIRE
- EXOTHERMIC WELD
- MECHANICAL CONNECTION
- ⊙ COPPER GROUND ROD
- ⊗ GROUND ROD W/ TEST WELL

**CELL REFERENCE GROUND BAR:** POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUITS (ATT-TP-76416 7.6.7).

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

**EXTERIOR CABLE ENTRY PORT GROUND BARS:** LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE (ATT-TP-76416 7.6.7.2).

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 SERVICES CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR PER TP76300 SECTION H 6 AND TP76416 FIGURE 7-11 REQUIREMENTS.

575 MOROSGO DRIVE  
ATLANTA, GA 30324-3300

1200 MACARTHUR BLVD, SUITE 200  
MAHWAH, NJ 07430

AT&T SITE NUMBER: **CTL01044**

BU #: **825983**  
**MIDDLETOWN\_1**

90 INDUSTRIAL PARK ROAD  
MIDDLETOWN, CT 06457

EXISTING 185'-0" MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	06/30/20	TG	CONSTRUCTION	JL
1	07/14/20	TG	CONSTRUCTION	JL
2	07/30/20	TG	CONSTRUCTION	JL

DocuSigned by:  
*Justin C. Carter*  
18400582647C41D

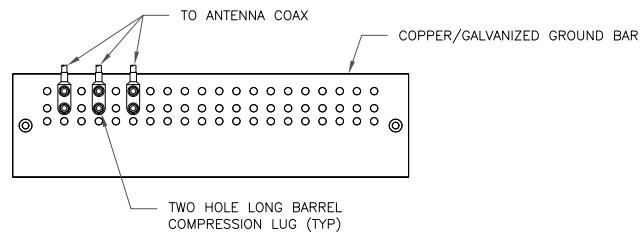
7/30/2020 10:02:42 PM EDT

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1 GROUNDING SCHEMATIC  
SCALE: NOT TO SCALE

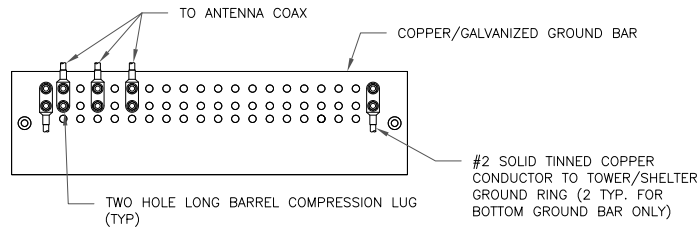
SHEET NUMBER: **G-1** REVISION: **2**



NOTES:

1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO ANTENNA MOUNT STEEL.

1 ANTENNA SECTOR GROUND BAR DETAIL  
SCALE: NOT TO SCALE

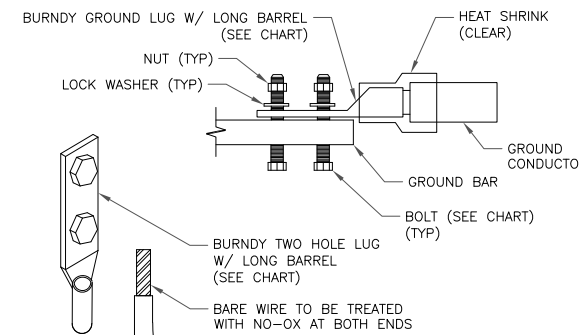


NOTES:

1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
3. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

2 TOWER/SHELTER GROUND BAR DETAIL  
SCALE: NOT TO SCALE

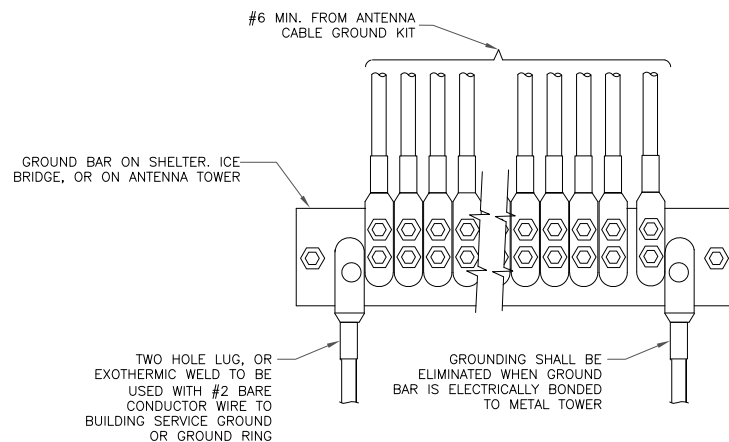
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC SS 2 BOLT
#2 SOLID TINNED	YA3C-2TC38	3/8" - 16 NC SS 2 BOLT
#2 STRANDED	YA2C-2TC38	3/8" - 16 NC SS 2 BOLT
#2/0 STRANDED	YA26-2TC38	3/8" - 16 NC SS 2 BOLT
#4/0 STRANDED	YA28-2N	1/2" - 16 NC SS 2 BOLT



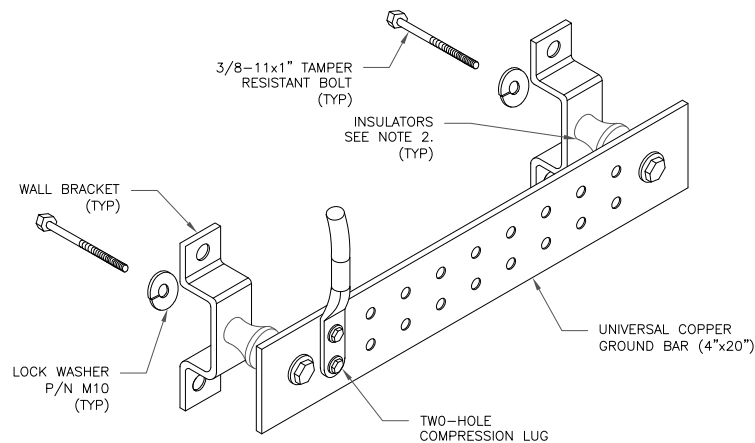
NOTE:

ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER, GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

3 MECHANICAL LUG CONNECTION  
SCALE: NOT TO SCALE



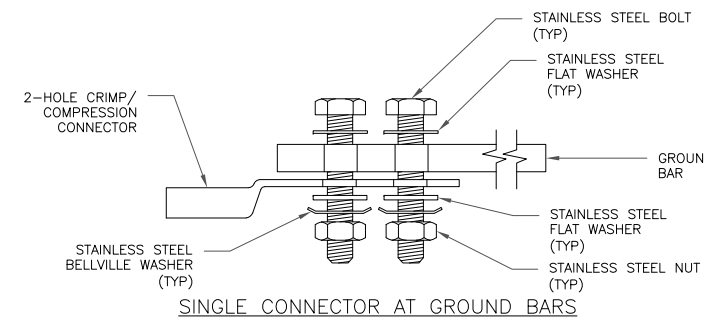
4 GROUNDWIRE INSTALLATION  
SCALE: NOT TO SCALE



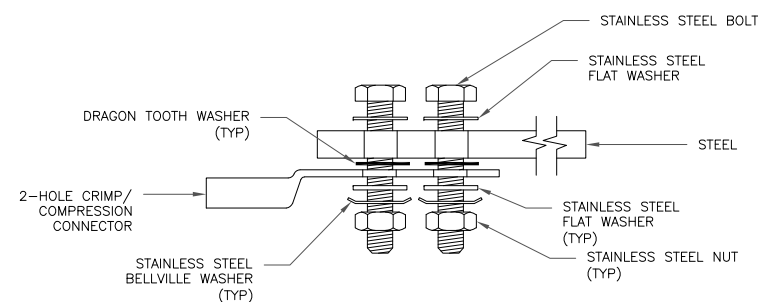
NOTES:

1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

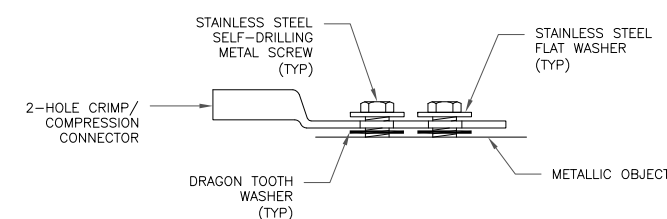
5 GROUND BAR DETAIL  
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

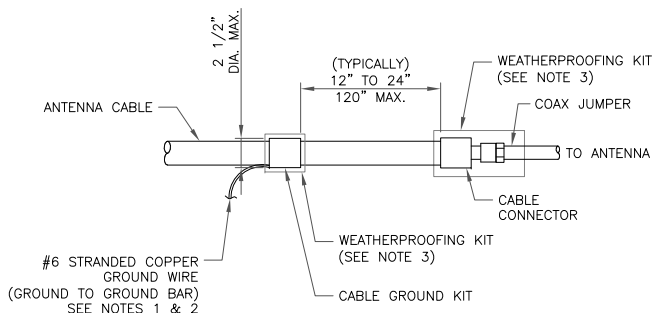


SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

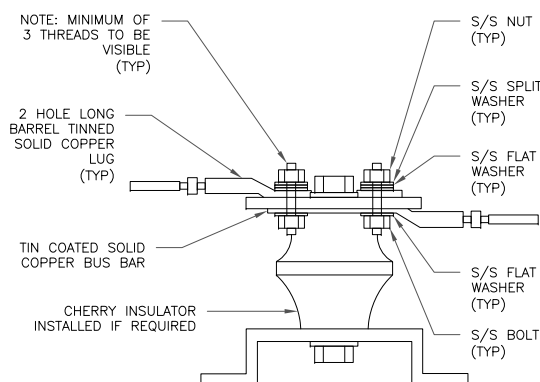
8 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS  
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

6 CABLE GROUND KIT CONNECTION  
SCALE: NOT TO SCALE



7 LUG DETAIL  
SCALE: NOT TO SCALE



AT&T SITE NUMBER: CTL01044

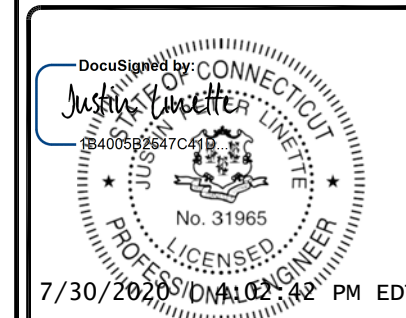
BU #: 825983  
MIDDLETOWN\_1

90 INDUSTRIAL PARK ROAD  
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EXISTING 185'-0" MONOPOLE

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2	07/30/20	TG	CONSTRUCTION	JL



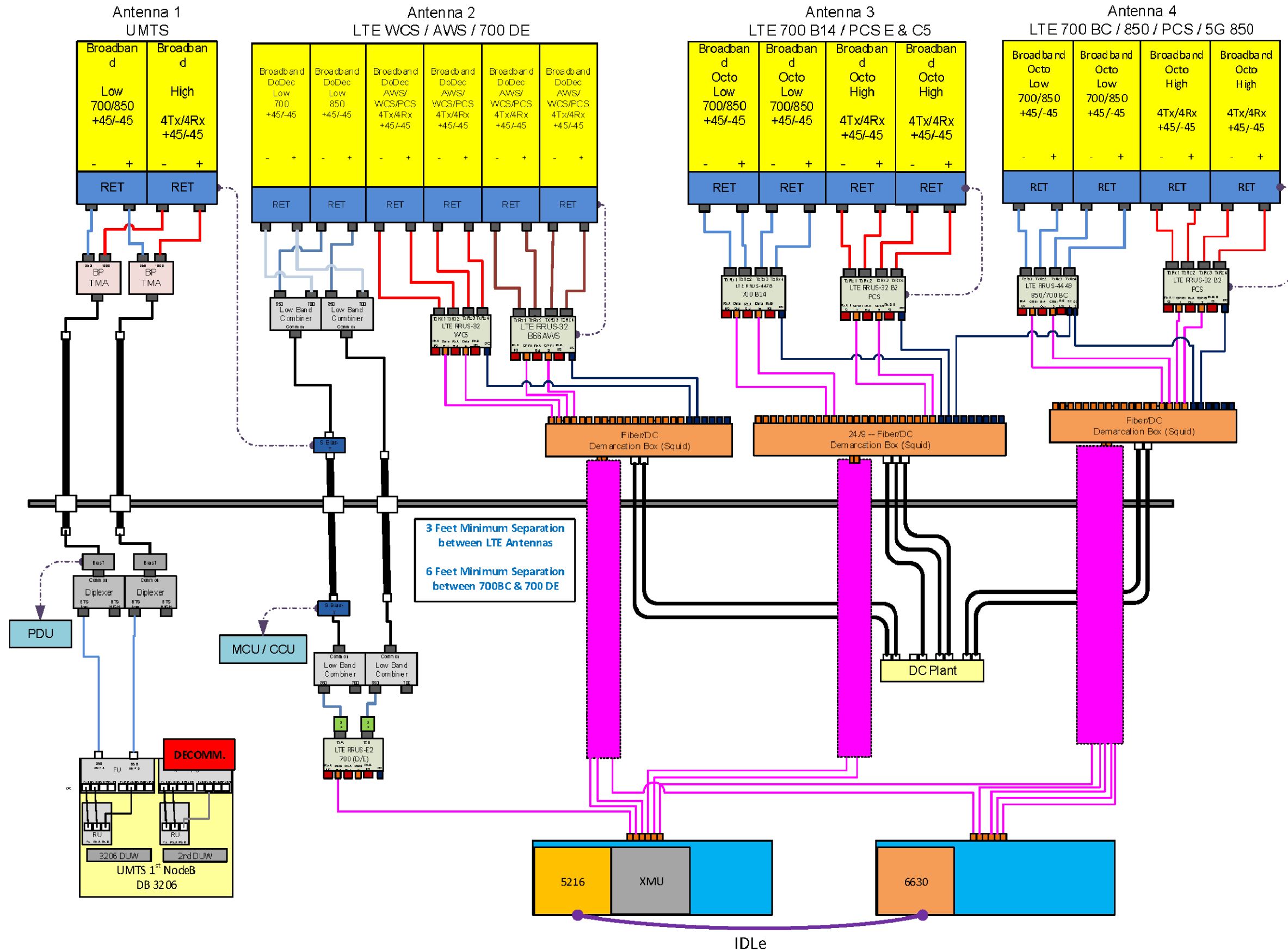
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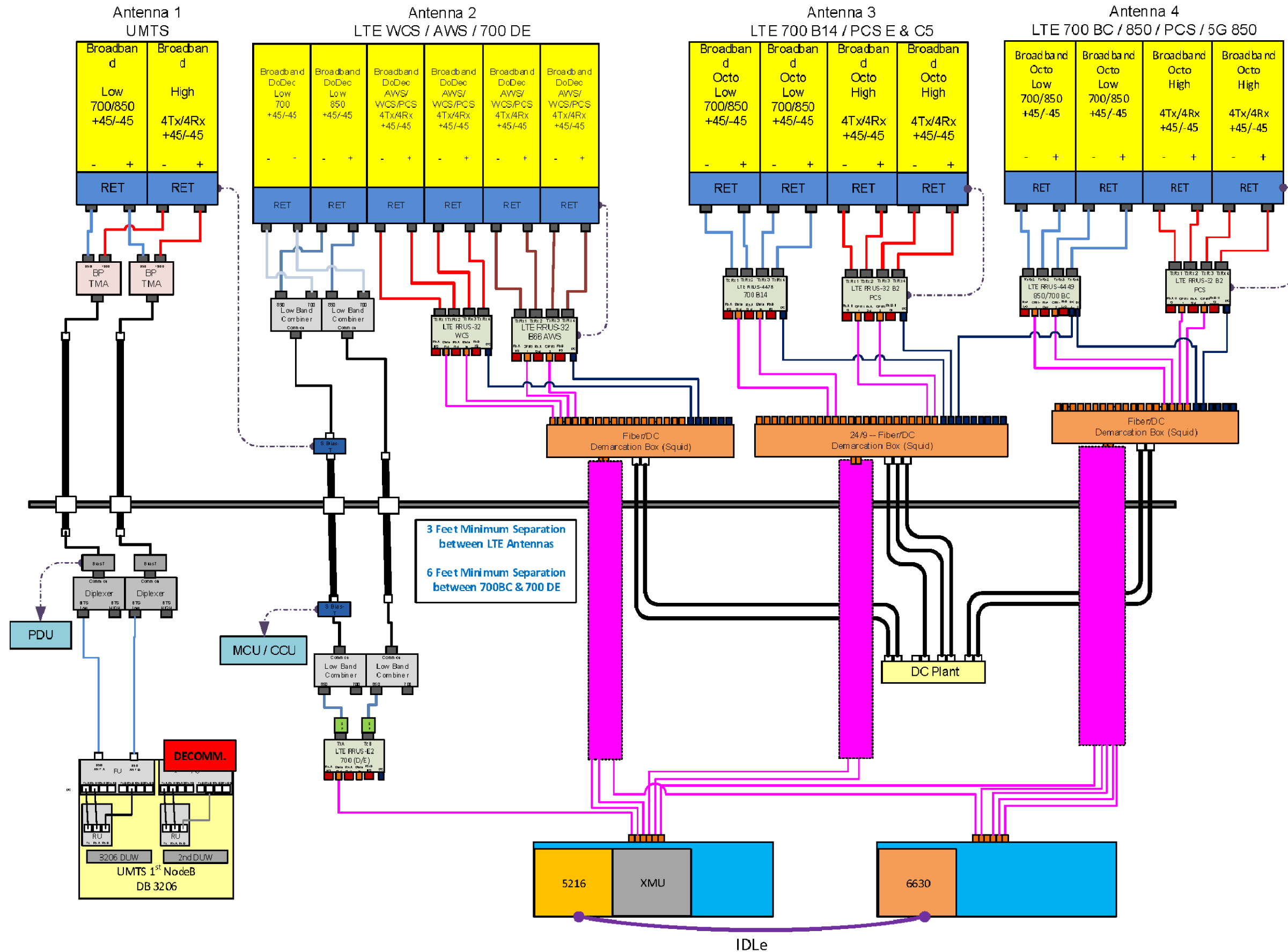
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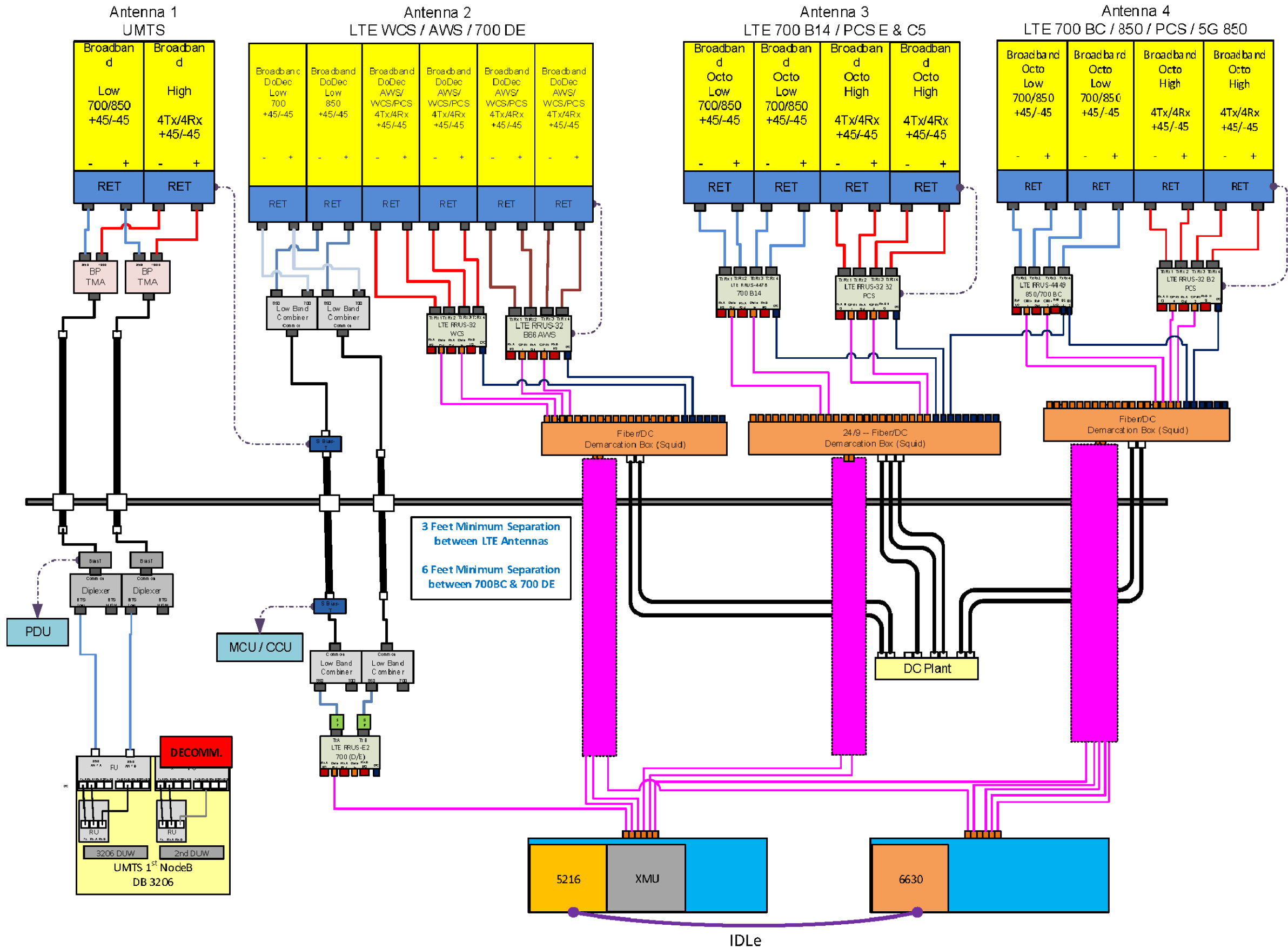
SHEET NUMBER: **G-2** REVISION: **2**

Diagram - Sector A Diagram File Name - CT1044\_ABC\_Multicarrier\_2.vsd  
 Atoll Site Name - CTU1044 Location Name - CROMWELL EAST Market - CONNECTICUT Market Cluster - NEW ENGLAND  
 Comments: "Important Note: For detailed radio to antenna wiring refer to the latest field notice - Antenna\_Radio Connection Drawings Playbook v6.0\_Ericsson"









## Certificate Of Completion

Envelope Id: 9531BAB392964D98AAF174815C298F40	Status: Completed
Subject: Please DocuSign: 10035130_825983_MIDDLETOWN_1_AT&T LTE 7C_FCD REV 2_7.30.2020 (HALFSIZE).pdf	
Source Envelope:	
Document Pages: 12	Signatures: 9
Certificate Pages: 3	Initials: 0
AutoNav: Enabled	Envelope Originator:
Envelopeld Stamping: Enabled	Phillip Lander
Time Zone: (UTC-05:00) Eastern Time (US & Canada)	2000 Corporate Drive
	Canonsburg, PA 15317
	Phil.Lander@crowncastle.com
	IP Address: 162.220.42.50

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Status: Original	Holder: Phillip Lander	Location: DocuSign
7/30/2020 3:09:49 PM	Phil.Lander@crowncastle.com	

## Signer Events

Justin Linette  
 Justin.linette@crowncastle.com  
 Crown Castle International Corp.  
 Security Level: Email, Account Authentication (None)

## Signature



DocuSigned by:  
 Justin Linette  
 1B4005B2547C41D...

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In Person Signer Events	Signature	Timestamp
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Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	7/30/2020 3:11:53 PM
Certified Delivered	Security Checked	7/30/2020 4:01:51 PM
Signing Complete	Security Checked	7/30/2020 4:02:42 PM
Completed	Security Checked	7/30/2020 4:02:42 PM
Payment Events	Status	Timestamps
Electronic Record and Signature Disclosure		

Parties agreed to: Justin Linette

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To contact us by email, send messages to: [esignature@CrownCastle.com](mailto:esignature@CrownCastle.com)

To contact us by paper mail, send correspondence to

Crown Castle  
2000 Corporate Drive  
Canonsburg, PA 15317

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Mobile Signing:	Apple iOS 7.0 or above; Android 4.0 or above
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# Exhibit D

## **Structural Analysis Report**

Date: April 07, 2020

Cheryl Schultz  
Crown Castle  
6325 Ardrey Kell Rd, Suite 600  
Charlotte, NC 28277

Paul J. Ford and Company  
250 E. Broad St., Suite 600  
Columbus, OH 43215  
614-221-6679

**Subject:** Structural Analysis Report

**Carrier Designation:** AT&T Mobility Co-Locate  
**Carrier Site Number:** 10035130  
**Carrier Site Name:** CROMWELL EAST

**Crown Castle Designation:** Crown Castle BU Number: 825983  
Crown Castle Site Name: MIDDLETOWN\_1  
Crown Castle JDE Job Number: 596316  
Crown Castle Work Order Number: 1835101  
Crown Castle Order Number: 509310 Rev. 0

**Engineering Firm Designation:** Paul J. Ford and Company Project Number: 37520-0639.001.7805

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

Dear Cheryl Schultz,

Paul J. Ford and Company is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower.

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

LC7: Proposed Equipment Configuration

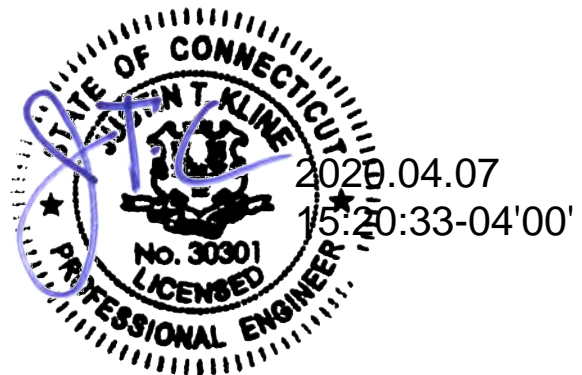
**Sufficient Capacity – 95.3%**

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

Respectfully submitted by:



Steven Pozz, EI  
Structural Designer  
spozz@pauljford.com



## TABLE OF CONTENTS

### 1) INTRODUCTION

### 2) ANALYSIS CRITERIA

Table 1 - Proposed Equipment Configuration

Table 2 - Other Considered Equipment

### 3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

### 4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Table 5 – Tower Component Stresses vs. Capacity

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 in May of 1998..

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)
175.0	175.0	3	cci antennas	DMP65R-BU6D w/ Mount Pipe	12 3 3 4	1-1/4 3/8 7/8 3/4
		3	cci antennas	OPA-65R-BU6D w/ Mount Pipe		
		3	ericsson	RRUS 32 B2		
		3	ericsson	RRUS 32 B2_CCIV2		
		3	ericsson	RRUS 32 B30		
		3	ericsson	RRUS 32 B66		
		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	sabre	C10857803		



**Table 2 - Other Considered Equipment**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
185.0	185.0	1	sitepro-1	RMQP-496-HK	9	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		
165.0	165.0	3	rfs celwave	APXV18-206517S-C	6	1-5/8
		1	tower mounts	Pipe Mount [PM 601-3]		
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 3 - Documents Provided**

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti, 3/27/1998	3473514	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Nudd, 98-5980, 5/1/1998	3880469	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Nudd, 98-5980, 5/1/1998	3473517	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	All-Points Tech, CT107572, 4/26/2005	3879955	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37513-1570, 08/14/2013	3954032	CCISITES
4-POST-MODIFICATION INSPECTION	SGS, 13068, 1/13/2015	5650784	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37513-1570A, 09/17/2013	3990532	CCISITES
4-POST-MODIFICATION INSPECTION	SGS, 146075, 12/30/2014	5512978	CCISITES

### 3.1) Analysis Method

tnxTower (version 8.0.5.0), 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 presented in Appendix C.

### 3.2) Assumptions

- 1) Tower and structures were maintained in accordance with the TIA-222 standard.
  - 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
  - 3) The Nudd manufacturer's drawings specify an anchor rod that does not exist. From experience with Nudd monopoles, the anchors are likely A36 standard anchors and have been assumed as such.
  - 4) Monopole was reinforced in conformance with the referenced modification drawings.
- This analysis may be affected if any assumptions are not valid or have been made in error. Paul J. Ford and Company should be notified to determine the effect on the structural integrity of the tower.

## 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L1	185 - 180	Pole	TP18x18x0.1875	Pole	16.3%	Pass
L2	180 - 175	Pole	TP19.631x18x0.25	Pole	20.9%	Pass
L3	175 - 170	Pole	TP21.263x19.631x0.25	Pole	40.2%	Pass
L4	170 - 165	Pole	TP22.894x21.263x0.25	Pole	53.9%	Pass
L5	165 - 160	Pole	TP24.525x22.894x0.25	Pole	65.0%	Pass
L6	160 - 155	Pole	TP26.156x24.525x0.25	Pole	74.1%	Pass
L7	155 - 154	Pole	TP26.483x26.156x0.25	Pole	77.0%	Pass
L8	154 - 153.75	Pole + Reinf.	TP26.564x26.483x0.3688	Reinf. 8 Tension Rupture	60.5%	Pass
L9	153.75 - 152.5	Pole + Reinf.	TP26.972x26.564x0.3625	Reinf. 8 Tension Rupture	62.9%	Pass
L10	152.5 - 152.25	Pole + Reinf.	TP27.053x26.972x0.55	Reinf. 8 Tension Rupture	43.2%	Pass
L11	152.25 - 151.5	Pole + Reinf.	TP27.298x27.053x0.55	Reinf. 8 Tension Rupture	44.2%	Pass
L12	151.5 - 151.25	Pole + Reinf.	TP27.38x27.298x0.425	Reinf. 3 Tension Rupture	54.1%	Pass
L13	151.25 - 146.25	Pole + Reinf.	TP29.011x27.38x0.4125	Reinf. 3 Tension Rupture	61.4%	Pass
L14	146.25 - 141.25	Pole + Reinf.	TP30.642x29.011x0.4	Reinf. 3 Tension Rupture	67.7%	Pass
L15	141.25 - 136.25	Pole + Reinf.	TP32.273x30.642x0.3938	Reinf. 3 Tension Rupture	73.1%	Pass
L16	136.25 - 135	Pole + Reinf.	TP34.313x32.273x0.3938	Reinf. 3 Tension Rupture	74.4%	Pass
L17	135 - 129	Pole + Reinf.	TP34.133x32.181x0.475	Reinf. 7 Tension Rupture	69.7%	Pass
L18	129 - 124	Pole + Reinf.	TP35.76x34.133x0.4625	Reinf. 7 Tension Rupture	73.6%	Pass
L19	124 - 121.42	Pole + Reinf.	TP36.599x35.76x0.4625	Pole	75.9%	Pass
L20	121.42 - 121.17	Pole + Reinf.	TP36.68x36.599x0.5	Pole	69.8%	Pass
L21	121.17 - 116.17	Pole + Reinf.	TP38.307x36.68x0.4875	Pole	74.8%	Pass
L22	116.17 - 115	Pole + Reinf.	TP38.688x38.307x0.4875	Pole	75.9%	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L23	115 - 113.75	Pole + Reinf.	TP39.094x38.688x0.55	Reinf. 7 Tension Rupture	65.6%	Pass
L24	113.75 - 113.5	Pole + Reinf.	TP39.175x39.094x0.4688	Pole	71.9%	Pass
L25	113.5 - 108.5	Pole + Reinf.	TP40.8x39.175x0.4625	Pole	75.5%	Pass
L26	108.5 - 103.5	Pole + Reinf.	TP42.425x40.8x0.4563	Pole	79.0%	Pass
L27	103.5 - 101	Pole + Reinf.	TP45.188x42.425x0.45	Pole	80.7%	Pass
L28	101 - 94	Pole + Reinf.	TP44.853x42.613x0.5875	Pole	67.2%	Pass
L29	94 - 91.4	Pole + Reinf.	TP45.685x44.853x0.575	Pole	68.8%	Pass
L30	91.4 - 91.15	Pole + Reinf.	TP45.765x45.685x0.4438	Pole	89.0%	Pass
L31	91.15 - 91	Pole + Reinf.	TP45.813x45.765x0.4438	Pole	89.1%	Pass
L32	91 - 86	Pole + Reinf.	TP47.445x45.813x0.5	Pole	74.8%	Pass
L33	86 - 81	Pole + Reinf.	TP49.078x47.445x0.5	Pole	77.0%	Pass
L34	81 - 76	Pole + Reinf.	TP50.711x49.078x0.4938	Pole	79.2%	Pass
L35	76 - 71	Pole + Reinf.	TP52.344x50.711x0.4875	Pole	81.3%	Pass
L36	71 - 66	Pole + Reinf.	TP53.977x52.344x0.4875	Pole	83.4%	Pass
L37	66 - 63.75	Pole + Reinf.	TP54.711x53.977x0.4875	Pole	84.3%	Pass
L38	63.75 - 63.5	Pole + Reinf.	TP54.793x54.711x0.4875	Pole	84.4%	Pass
L39	63.5 - 58.5	Pole + Reinf.	TP56.426x54.793x0.4813	Pole	86.5%	Pass
L40	58.5 - 58	Pole + Reinf.	TP58.875x56.426x0.4813	Pole	86.7%	Pass
L41	58 - 50	Pole + Reinf.	TP58.438x55.839x0.55	Pole	79.2%	Pass
L42	50 - 45	Pole + Reinf.	TP60.063x58.438x0.55	Pole	81.3%	Pass
L43	45 - 40.42	Pole + Reinf.	TP61.551x60.063x0.5438	Pole	83.2%	Pass
L44	40.42 - 40.17	Pole + Reinf.	TP61.632x61.551x0.475	Pole	95.8%	Pass
L45	40.17 - 40	Pole + Reinf.	TP61.688x61.632x0.475	Pole	95.9%	Pass
L46	40 - 35	Pole + Reinf.	TP63.31x61.688x0.5313	Pole	79.8%	Pass
L47	35 - 33	Pole + Reinf.	TP63.958x63.31x0.525	Pole	80.4%	Pass
L48	33 - 32.75	Pole + Reinf.	TP64.039x63.958x0.6	Pole	72.6%	Pass
L49	32.75 - 28	Pole + Reinf.	TP68.5x64.039x0.6	Pole	74.0%	Pass
L50	28 - 18	Pole + Reinf.	TP67.958x64.705x0.6	Pole	78.4%	Pass
L51	18 - 13	Pole + Reinf.	TP69.584x67.958x0.5875	Pole	79.9%	Pass
L52	13 - 8	Pole + Reinf.	TP71.21x69.584x0.5875	Pole	81.5%	Pass
L53	8 - 6.42	Pole + Reinf.	TP71.724x71.21x0.5875	Pole	81.9%	Pass
L54	6.42 - 6.17	Pole + Reinf.	TP71.806x71.724x1.0125	Reinf. 9 Connection	61.7%	Pass
L55	6.17 - 1.17	Pole + Reinf.	TP73.432x71.806x0.9875	Reinf. 9 Compression	62.6%	Pass
L56	1.17 - 0	Pole + Reinf.	TP73.813x73.432x0.9875	Reinf. 9 Connection	62.8%	Pass
					Summary	
				Pole	95.9%	Pass
				Reinforcement	77.8%	Pass
				Overall	95.9%	Pass

**Table 5 - Tower Component Stresses vs. Capacity – LC7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	65.1	Pass
1	Base Plate	0	41.2	Pass
1	Base Foundation (Micropiles)	0	76.0	Pass
1	Base Foundation Steel	0	30.8	Pass
1	Base Foundation Soil Interaction	0	39.7	Pass

<b>Structure Rating (max from all components) =</b>	<b>95.9%</b>
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Notes:

- All structural ratings are per TIA-222-H Section 15.5.
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

**4.1) Recommendations**

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

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

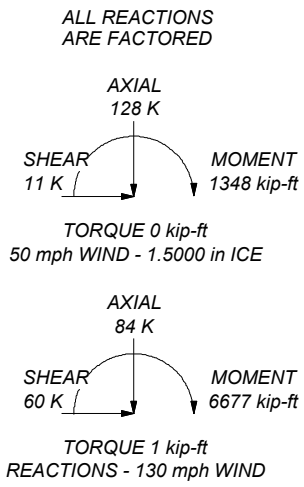
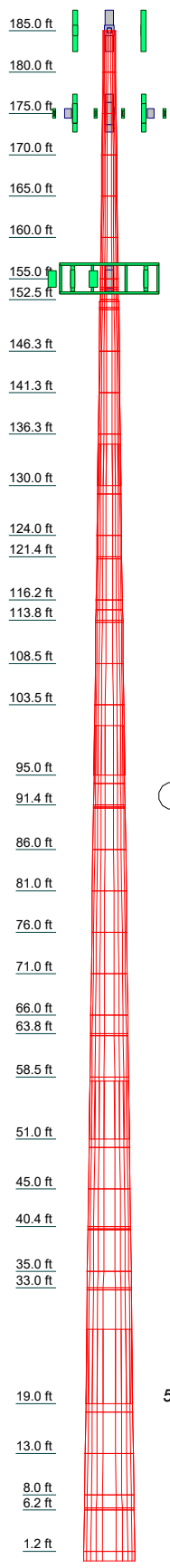
**MATERIAL STRENGTH**


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. TIA-222-H Annex S
9. TOWER RATING: 95.9%

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
2	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
3	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
4	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
5	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
6	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
7	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
8	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
9	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
10	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
11	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
12	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
13	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
14	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
15	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
16	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
17	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
18	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
19	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
20	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
21	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
22	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
23	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
24	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
25	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
26	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
27	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
28	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
29	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
30	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
31	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
32	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
33	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
34	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
35	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
36	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
37	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
38	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
39	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
40	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
41	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
42	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
43	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
44	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
45	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
46	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
47	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
48	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
49	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
50	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
51	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
52	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
53	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
54	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
55	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013
56	1.176	12	0.488	9.000	73.432	73.372	A36M-42	54.013



 <p><b>Paul J. Ford and Company</b> 250 E. Broad St., Ste 600 Columbus, OH 43215 Phone: 614-221-6679 FAX:</p>	Job: <b>185' Monopole / Middletown, CT</b>		
	Project: <b>375120-0639 / BU 825983</b>		
Client: CCI	Drawn by: Steven Pozz	App'd:	
Code: TIA-222-H	Date: 04/07/20	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:

- 1) Tower is located in Middlesex County, Connecticut.
- 2) Tower base elevation above sea level: 89.450 ft.
- 3) Basic wind speed of 130 mph.
- 4) Risk Category II.
- 5) Exposure Category C.
- 6) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- 7) Topographic Category: 1.
- 8) Crest Height: 0.000 ft.
- 9) Nominal ice thickness of 1.5000 in.
- 10) Ice thickness is considered to increase with height.
- 11) Ice density of 56.000 pcf.
- 12) A wind speed of 50 mph is used in combination with ice.
- 13) Temperature drop of 50.000 °F.
- 14) Deflections calculated using a wind speed of 60 mph.
- 15) TIA-222-H Annex S.
- 16) TOWER RATING: 95.3%.
- 17) A non-linear (P-delta) analysis was used.
- 18) Pressures are calculated at each section.
- 19) Stress ratio used in pole design is 1.05.
- 20) Tower analysis based on target reliabilities in accordance with Annex S.
- 21) Load Modification Factors used:  $K_{es}(F_w) = 0.95$ ,  $K_{es}(t_i) = 0.85$ .
- 22) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

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

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	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)

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
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 (42 ksi)
L36	71.000-66.000	5.000	0.000	12	52.3438	53.9766	0.4875	1.9500	A36M-42 (42 ksi)
L37	66.000-63.750	2.250	0.000	12	53.9766	54.7113	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
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>	It/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
L9	27.7955	31.0598	2807.0740	9.5262	13.9714	200.9153	5687.8929	15.2867	6.2570	17.261
L10	27.7293	46.7931	4169.6098	9.4590	13.9714	298.4383	8448.7598	23.0302	5.7545	10.463
L10	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
L11	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

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
	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
L30	47.1395	64.6434	16887.663	16.1962	23.6646	713.6265	34218.985	31.8155	11.0542	24.911
	47.2224	64.7577	16977.410	16.2248	23.7060	716.1648	34400.836	31.8718	11.0756	24.959
L31	47.2224	64.7577	16977.410	16.2248	23.7060	716.1648	34400.836	31.8718	11.0756	24.959

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
	47.2721	64.8263	17031.4110	16.2420	23.7309	717.6900	34510.2561	31.9055	11.0885	24.988
L32	47.2522	72.9531	19119.0319	16.2219	23.7309	805.6606	38740.3421	35.9053	10.9377	21.876
	48.9426	75.5820	21261.2377	16.8064	24.5767	865.0983	43081.0318	37.1991	11.3753	22.751
L33	48.9426	75.5820	21261.2377	16.8064	24.5767	865.0983	43081.0318	37.1991	11.3753	22.751
	50.6330	78.2108	23557.7642	17.3910	25.4225	926.6513	47734.4171	38.4930	11.8129	23.626
L34	50.6352	77.2431	23272.2724	17.3932	25.4225	915.4214	47155.9333	38.0167	11.8297	23.959
	52.3257	79.8391	25698.4009	17.9778	26.2683	978.3060	52071.9275	39.2944	12.2673	24.845
L35	52.3279	78.8382	25382.5797	17.9800	26.2683	966.2830	51431.9879	38.8018	12.2840	25.198
	54.0183	81.4013	27939.5730	18.5645	27.1141	1030.4458	56613.1497	40.0633	12.7216	26.096
L36	54.0183	81.4013	27939.5730	18.5645	27.1141	1030.4458	56613.1497	40.0633	12.7216	26.096
	55.7087	83.9645	30662.7719	19.1491	27.9599	1096.6712	62131.0890	41.3248	13.1592	26.993
L37	55.7087	83.9645	30662.7719	19.1491	27.9599	1096.6712	62131.0890	41.3248	13.1592	26.993
	56.4694	85.1179	31943.8284	19.4121	28.3405	1127.1454	64726.8567	41.8924	13.3561	27.397
L38	56.4694	85.1179	31943.8284	19.4121	28.3405	1127.1454	64726.8567	41.8924	13.3561	27.397
	56.5539	85.2460	32088.3324	19.4414	28.3828	1130.5572	65019.6611	41.9555	13.3780	27.442
L39	56.5561	84.1628	31687.8819	19.4436	28.3828	1116.4483	64208.2397	41.4224	13.3948	27.833
	58.2465	86.6930	34632.6303	20.0281	29.2286	1184.8903	70175.0983	42.6677	13.8324	28.743
L40	58.2465	86.6930	34632.6303	20.0281	29.2286	1184.8903	70175.0983	42.6677	13.8324	28.743
	60.7821	90.4884	39383.2600	20.9050	30.4973	1291.3709	79801.1622	44.5356	14.4888	30.106
L41	59.9695	97.9169	38205.1736	19.7935	28.9246	1320.8524	77414.0397	48.1917	13.4909	24.529
	60.3058	102.5203	43850.8917	20.7240	30.2711	1448.6070	88853.7952	50.4574	14.1875	25.795
L42	60.3058	102.5203	43850.8917	20.7240	30.2711	1448.6070	88853.7952	50.4574	14.1875	25.795
	61.9877	105.3974	47647.3330	21.3056	31.1126	1531.4481	96546.4144	51.8734	14.6229	26.587
L43	61.9899	104.2107	47120.7286	21.3079	31.1126	1514.5224	95479.3712	51.2893	14.6396	26.923
	63.5305	106.8161	50744.1763	21.8406	31.8834	1591.5529	102821.4586	52.5717	15.0384	27.657
L44	63.5548	93.4158	44478.2774	21.8652	31.8834	1395.0277	90125.0486	45.9764	15.2227	32.048
	63.6389	93.5400	44655.9772	21.8943	31.9255	1398.7552	90485.1166	46.0376	15.2444	32.094
L45	63.6389	93.5400	44655.9772	21.8943	31.9255	1398.7552	90485.1166	46.0376	15.2444	32.094
	63.6960	93.6245	44777.0814	21.9141	31.9541	1401.2927	90730.5066	46.0791	15.2593	32.125
L46	63.6762	104.6154	49941.6983	21.8939	31.9541	1562.9187	101195.4207	51.4885	15.1085	28.44
	65.3554	107.3901	54021.7786	22.4746	32.7943	1647.2900	109462.7694	52.8541	15.5432	29.258
L47	65.3576	106.1372	53402.1747	22.4769	32.7943	1628.3964	108207.2840	52.2375	15.5600	29.638
	66.0293	107.2340	55074.9002	22.7091	33.1304	1662.3667	111596.6794	52.7773	15.7338	29.969
L48	66.0029	122.4083	62719.7471	22.6823	33.1304	1893.1168	127087.2119	60.2456	15.5328	25.888
	66.0868	122.5650	62960.9093	22.7113	33.1724	1897.9892	127575.8718	60.3228	15.5546	25.924

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
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 ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants 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- 146.250				1	1	0.965409			
L14 146.250- 141.250				1	1	0.975178			
L15 141.250- 136.250				1	1	0.97226			

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
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			
L47 35.000-33.000				1	1	1.00258			
L48 33.000-32.750				1	1	1.07829			

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
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)	185.000 - 0.000	7	7	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
CCI-060100 (L)	B	No	Surface Af (CaAa)	101.670 - 61.670	1	1	0.182 0.182	6.0000	14.0000	0.000
CCI-060100 (L)	A	No	Surface Af (CaAa)	101.670 - 61.670	1	1	0.182 0.182	6.0000	14.0000	0.000
CCI-060100 (L)	C	No	Surface Af (CaAa)	101.670 - 61.670	1	1	0.182 0.182	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-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

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

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight klf
LDF7-50A(1-5/8")	C	No	No	Inside Pole	185.000 - 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
***									
LDF6-50A(1-1/4")	C	No	No	Inside Pole	175.000 - 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	175.000 - 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	175.000 - 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	175.000 - 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
*****									
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### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	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
L1	185.000-180.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	6.930	0.000	0.029

Tower Section	Tower Elevation ft	Face	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
L2	180.000-175.000	C	0.000	0.000	0.000	0.000	0.008
		A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	6.930	0.000	0.029
L3	175.000-170.000	C	0.000	0.000	0.000	0.000	0.008
		A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	6.930	0.000	0.029
L4	170.000-165.000	C	0.000	0.000	0.000	0.000	0.073
		A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	6.930	0.000	0.029
L5	165.000-160.000	C	0.000	0.000	0.000	0.000	0.073
		A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	6.930	0.000	0.029
L6	160.000-155.000	C	0.000	0.000	0.000	0.000	0.098
		A	0.000	0.000	0.138	0.000	0.000
		B	0.000	0.000	7.068	0.000	0.029
L7	155.000-154.000	C	0.000	0.000	0.138	0.000	0.098
		A	0.000	0.000	0.928	0.000	0.000
		B	0.000	0.000	2.314	0.000	0.006
L8	154.000-153.750	C	0.000	0.000	0.928	0.000	0.022
		A	0.000	0.000	0.326	0.000	0.000
		B	0.000	0.000	0.672	0.000	0.001
L9	153.750-152.500	C	0.000	0.000	0.326	0.000	0.006
		A	0.000	0.000	1.628	0.000	0.000
		B	0.000	0.000	3.361	0.000	0.007
L10	152.500-152.250	C	0.000	0.000	1.628	0.000	0.028
		A	0.000	0.000	0.326	0.000	0.000
		B	0.000	0.000	0.672	0.000	0.001
L11	152.250-151.500	C	0.000	0.000	0.326	0.000	0.006
		A	0.000	0.000	0.977	0.000	0.000
		B	0.000	0.000	2.017	0.000	0.004
L12	151.500-151.250	C	0.000	0.000	0.977	0.000	0.017
		A	0.000	0.000	0.326	0.000	0.000
		B	0.000	0.000	0.672	0.000	0.001
L13	151.250-146.250	C	0.000	0.000	0.326	0.000	0.006
		A	0.000	0.000	4.303	0.000	0.000
		B	0.000	0.000	11.233	0.000	0.029
L14	146.250-141.250	C	0.000	0.000	4.303	0.000	0.111
		A	0.000	0.000	3.750	0.000	0.000
		B	0.000	0.000	10.680	0.000	0.029
L15	141.250-136.250	C	0.000	0.000	3.750	0.000	0.111
		A	0.000	0.000	3.750	0.000	0.000
		B	0.000	0.000	10.680	0.000	0.029
L16	136.250-130.000	C	0.000	0.000	3.750	0.000	0.111
		A	0.000	0.000	6.354	0.000	0.000
		B	0.000	0.000	15.017	0.000	0.036
L17	130.000-129.000	C	0.000	0.000	6.354	0.000	0.139
		A	0.000	0.000	1.417	0.000	0.000
		B	0.000	0.000	2.803	0.000	0.006
L18	129.000-124.000	C	0.000	0.000	1.417	0.000	0.022
		A	0.000	0.000	7.083	0.000	0.000
		B	0.000	0.000	14.013	0.000	0.029
L19	124.000-121.420	C	0.000	0.000	7.083	0.000	0.111
		A	0.000	0.000	6.155	0.000	0.000
		B	0.000	0.000	9.731	0.000	0.015
L20	121.420-121.170	C	0.000	0.000	6.155	0.000	0.057
		A	0.000	0.000	0.604	0.000	0.000
		B	0.000	0.000	0.951	0.000	0.001
L21	121.170-116.170	C	0.000	0.000	0.604	0.000	0.006
		A	0.000	0.000	9.586	0.000	0.000
		B	0.000	0.000	16.516	0.000	0.029
L22	116.170-115.000	C	0.000	0.000	9.586	0.000	0.111
		A	0.000	0.000	1.950	0.000	0.000
		B	0.000	0.000	3.572	0.000	0.007
L23	115.000-113.750	C	0.000	0.000	1.950	0.000	0.026
		A	0.000	0.000	2.083	0.000	0.000
		B	0.000	0.000	3.816	0.000	0.007
L24	113.750-113.500	C	0.000	0.000	2.083	0.000	0.028
		A	0.000	0.000	0.417	0.000	0.000
		B	0.000	0.000	0.763	0.000	0.001



Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> <sub>A</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L25	113.500-108.500	C	0.000	0.000	0.417	0.000	0.006
		A	0.000	0.000	5.667	0.000	0.000
		B	0.000	0.000	12.597	0.000	0.029
L26	108.500-103.500	C	0.000	0.000	5.667	0.000	0.111
		A	0.000	0.000	5.000	0.000	0.000
		B	0.000	0.000	11.930	0.000	0.029
L27	103.500-95.000	C	0.000	0.000	5.000	0.000	0.111
		A	0.000	0.000	15.170	0.000	0.000
		B	0.000	0.000	26.951	0.000	0.049
L28	95.000-94.000	C	0.000	0.000	15.170	0.000	0.189
		A	0.000	0.000	2.000	0.000	0.000
		B	0.000	0.000	3.386	0.000	0.006
L29	94.000-91.400	C	0.000	0.000	2.000	0.000	0.022
		A	0.000	0.000	5.200	0.000	0.000
		B	0.000	0.000	8.804	0.000	0.015
L30	91.400-91.150	C	0.000	0.000	5.200	0.000	0.058
		A	0.000	0.000	0.500	0.000	0.000
		B	0.000	0.000	0.847	0.000	0.001
L31	91.150-91.000	C	0.000	0.000	0.500	0.000	0.006
		A	0.000	0.000	0.300	0.000	0.000
		B	0.000	0.000	0.508	0.000	0.001
L32	91.000-86.000	C	0.000	0.000	0.300	0.000	0.003
		A	0.000	0.000	7.110	0.000	0.000
		B	0.000	0.000	14.040	0.000	0.029
L33	86.000-81.000	C	0.000	0.000	7.110	0.000	0.111
		A	0.000	0.000	5.000	0.000	0.000
		B	0.000	0.000	11.930	0.000	0.029
L34	81.000-76.000	C	0.000	0.000	5.000	0.000	0.111
		A	0.000	0.000	5.000	0.000	0.000
		B	0.000	0.000	11.930	0.000	0.029
L35	76.000-71.000	C	0.000	0.000	5.000	0.000	0.111
		A	0.000	0.000	5.000	0.000	0.000
		B	0.000	0.000	11.930	0.000	0.029
L36	71.000-66.000	C	0.000	0.000	5.000	0.000	0.111
		A	0.000	0.000	5.000	0.000	0.000
		B	0.000	0.000	11.930	0.000	0.029
L37	66.000-63.750	C	0.000	0.000	5.000	0.000	0.111
		A	0.000	0.000	4.000	0.000	0.000
		B	0.000	0.000	7.119	0.000	0.013
L38	63.750-63.500	C	0.000	0.000	4.000	0.000	0.050
		A	0.000	0.000	0.500	0.000	0.000
		B	0.000	0.000	0.846	0.000	0.001
L39	63.500-58.500	C	0.000	0.000	0.500	0.000	0.006
		A	0.000	0.000	6.830	0.000	0.000
		B	0.000	0.000	13.760	0.000	0.029
L40	58.500-51.000	C	0.000	0.000	6.830	0.000	0.111
		A	0.000	0.000	9.690	0.000	0.000
		B	0.000	0.000	20.085	0.000	0.043
L41	51.000-50.000	C	0.000	0.000	9.690	0.000	0.167
		A	0.000	0.000	1.750	0.000	0.000
		B	0.000	0.000	3.136	0.000	0.006
L42	50.000-45.000	C	0.000	0.000	1.750	0.000	0.022
		A	0.000	0.000	8.750	0.000	0.000
		B	0.000	0.000	15.680	0.000	0.029
L43	45.000-40.420	C	0.000	0.000	8.750	0.000	0.111
		A	0.000	0.000	8.015	0.000	0.000
		B	0.000	0.000	14.363	0.000	0.026
L44	40.420-40.170	C	0.000	0.000	8.015	0.000	0.102
		A	0.000	0.000	0.438	0.000	0.000
		B	0.000	0.000	0.784	0.000	0.001
L45	40.170-40.000	C	0.000	0.000	0.438	0.000	0.006
		A	0.000	0.000	0.297	0.000	0.000
		B	0.000	0.000	0.533	0.000	0.001
L46	40.000-35.000	C	0.000	0.000	0.297	0.000	0.004
		A	0.000	0.000	12.667	0.000	0.000
		B	0.000	0.000	16.168	0.000	0.029
L47	35.000-33.000	C	0.000	0.000	9.238	0.000	0.111
		A	0.000	0.000	7.667	0.000	0.000
		B	0.000	0.000	7.605	0.000	0.011

Tower Section	Tower Elevation	Face	A <sub>R</sub>	A <sub>F</sub>	C <sub>A</sub> A <sub>A</sub>	C <sub>A</sub> A <sub>A</sub>	Weight
n	ft		ft <sup>2</sup>	ft <sup>2</sup>	In Face	Out Face	K
					ft <sup>2</sup>	ft <sup>2</sup>	
L48	33.000-32.750	C	0.000	0.000	4.833	0.000	0.044
		A	0.000	0.000	0.958	0.000	0.000
		B	0.000	0.000	0.951	0.000	0.001
L49	32.750-19.000	C	0.000	0.000	0.604	0.000	0.006
		A	0.000	0.000	41.208	0.000	0.000
		B	0.000	0.000	40.787	0.000	0.079
		C	0.000	0.000	21.729	0.000	0.305
L50	19.000-18.000	A	0.000	0.000	2.833	0.000	0.000
		B	0.000	0.000	2.803	0.000	0.006
		C	0.000	0.000	1.417	0.000	0.022
L51	18.000-13.000	A	0.000	0.000	14.167	0.000	0.000
		B	0.000	0.000	14.013	0.000	0.029
		C	0.000	0.000	7.083	0.000	0.111
L52	13.000-8.000	A	0.000	0.000	14.167	0.000	0.000
		B	0.000	0.000	14.013	0.000	0.029
		C	0.000	0.000	7.083	0.000	0.111
L53	8.000-6.420	A	0.000	0.000	4.477	0.000	0.000
		B	0.000	0.000	4.428	0.000	0.009
		C	0.000	0.000	2.238	0.000	0.035
L54	6.420-6.170	A	0.000	0.000	0.708	0.000	0.000
		B	0.000	0.000	0.701	0.000	0.001
		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	14.013	0.000	0.029
		C	0.000	0.000	7.083	0.000	0.111
L56	1.170-0.000	A	0.000	0.000	3.315	0.000	0.000
		B	0.000	0.000	3.279	0.000	0.007
		C	0.000	0.000	1.658	0.000	0.026

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

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	A <sub>R</sub>	A <sub>F</sub>	C <sub>A</sub> A <sub>A</sub>	C <sub>A</sub> A <sub>A</sub>	Weight
n	ft		in	ft <sup>2</sup>	ft <sup>2</sup>	In Face	Out Face	K
						ft <sup>2</sup>	ft <sup>2</sup>	
L1	185.000-180.000	A	1.513	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	10.554	0.000	0.141
		C		0.000	0.000	0.000	0.000	0.008
L2	180.000-175.000	A	1.509	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	10.548	0.000	0.140
		C		0.000	0.000	0.000	0.000	0.008
L3	175.000-170.000	A	1.504	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	10.543	0.000	0.140
		C		0.000	0.000	0.000	0.000	0.073
L4	170.000-165.000	A	1.500	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	10.537	0.000	0.140
		C		0.000	0.000	0.000	0.000	0.073
L5	165.000-160.000	A	1.495	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	10.532	0.000	0.139
		C		0.000	0.000	0.000	0.000	0.098
L6	160.000-155.000	A	1.491	0.000	0.000	0.178	0.000	0.002
		B		0.000	0.000	10.704	0.000	0.141
		C		0.000	0.000	0.178	0.000	0.100
L7	155.000-154.000	A	1.488	0.000	0.000	1.236	0.000	0.014
		B		0.000	0.000	3.340	0.000	0.041
		C		0.000	0.000	1.236	0.000	0.036
L8	154.000-153.750	A	1.487	0.000	0.000	0.440	0.000	0.005
		B		0.000	0.000	0.966	0.000	0.012
		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	4.829	0.000	0.058
		C		0.000	0.000	2.199	0.000	0.051
L10	152.500-152.250	A	1.486	0.000	0.000	0.440	0.000	0.005
		B		0.000	0.000	0.966	0.000	0.012
		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	2.897	0.000	0.035
		C		0.000	0.000	1.319	0.000	0.030
L12	151.500-151.250	A	1.485	0.000	0.000	0.440	0.000	0.005

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	0.966	0.000	0.012
		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	16.459	0.000	0.195
		C		0.000	0.000	5.943	0.000	0.168
L14	146.250-141.250	A	1.477	0.000	0.000	5.227	0.000	0.048
		B		0.000	0.000	15.736	0.000	0.186
		C		0.000	0.000	5.227	0.000	0.159
L15	141.250-136.250	A	1.472	0.000	0.000	5.222	0.000	0.047
		B		0.000	0.000	15.724	0.000	0.185
		C		0.000	0.000	5.222	0.000	0.158
L16	136.250-130.000	A	1.466	0.000	0.000	8.919	0.000	0.080
		B		0.000	0.000	22.038	0.000	0.252
		C		0.000	0.000	8.919	0.000	0.219
L17	130.000-129.000	A	1.462	0.000	0.000	2.003	0.000	0.018
		B		0.000	0.000	4.102	0.000	0.045
		C		0.000	0.000	2.003	0.000	0.040
L18	129.000-124.000	A	1.458	0.000	0.000	10.000	0.000	0.089
		B		0.000	0.000	20.485	0.000	0.226
		C		0.000	0.000	10.000	0.000	0.200
L19	124.000-121.420	A	1.454	0.000	0.000	8.382	0.000	0.074
		B		0.000	0.000	13.790	0.000	0.144
		C		0.000	0.000	8.382	0.000	0.131
L20	121.420-121.170	A	1.452	0.000	0.000	0.822	0.000	0.007
		B		0.000	0.000	1.346	0.000	0.014
		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	23.442	0.000	0.248
		C		0.000	0.000	12.968	0.000	0.224
L22	116.170-115.000	A	1.445	0.000	0.000	2.626	0.000	0.023
		B		0.000	0.000	5.076	0.000	0.054
		C		0.000	0.000	2.626	0.000	0.049
L23	115.000-113.750	A	1.444	0.000	0.000	2.805	0.000	0.024
		B		0.000	0.000	5.422	0.000	0.058
		C		0.000	0.000	2.805	0.000	0.052
L24	113.750-113.500	A	1.443	0.000	0.000	0.561	0.000	0.005
		B		0.000	0.000	1.084	0.000	0.012
		C		0.000	0.000	0.561	0.000	0.010
L25	113.500-108.500	A	1.439	0.000	0.000	7.394	0.000	0.063
		B		0.000	0.000	17.856	0.000	0.198
		C		0.000	0.000	7.394	0.000	0.174
L26	108.500-103.500	A	1.433	0.000	0.000	6.433	0.000	0.054
		B		0.000	0.000	16.886	0.000	0.189
		C		0.000	0.000	6.433	0.000	0.165
L27	103.500-95.000	A	1.423	0.000	0.000	19.488	0.000	0.163
		B		0.000	0.000	37.239	0.000	0.390
		C		0.000	0.000	19.488	0.000	0.352
L28	95.000-94.000	A	1.416	0.000	0.000	2.569	0.000	0.021
		B		0.000	0.000	4.658	0.000	0.048
		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
		B		0.000	0.000	12.094	0.000	0.125
		C		0.000	0.000	6.670	0.000	0.113
L30	91.400-91.150	A	1.412	0.000	0.000	0.641	0.000	0.005
		B		0.000	0.000	1.163	0.000	0.012
		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	0.697	0.000	0.007
		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	19.532	0.000	0.208
		C		0.000	0.000	9.111	0.000	0.186
L33	86.000-81.000	A	1.399	0.000	0.000	6.399	0.000	0.052
		B		0.000	0.000	16.810	0.000	0.185
		C		0.000	0.000	6.399	0.000	0.164
L34	81.000-76.000	A	1.390	0.000	0.000	6.390	0.000	0.052
		B		0.000	0.000	16.791	0.000	0.183
		C		0.000	0.000	6.390	0.000	0.163
L35	76.000-71.000	A	1.381	0.000	0.000	6.381	0.000	0.052

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
L36	71.000-66.000	B	1.372	0.000	0.000	16.770	0.000	0.182
		C		0.000	0.000	6.381	0.000	0.163
		A		0.000	0.000	6.372	0.000	0.051
L37	66.000-63.750	B	1.364	0.000	0.000	16.749	0.000	0.181
		C		0.000	0.000	6.372	0.000	0.162
		A		0.000	0.000	5.091	0.000	0.041
L38	63.750-63.500	B	1.362	0.000	0.000	9.757	0.000	0.099
		C		0.000	0.000	5.091	0.000	0.091
		A		0.000	0.000	0.636	0.000	0.005
L39	63.500-58.500	B	1.356	0.000	0.000	1.154	0.000	0.012
		C		0.000	0.000	0.636	0.000	0.011
		A		0.000	0.000	8.682	0.000	0.069
L40	58.500-51.000	B	1.341	0.000	0.000	19.039	0.000	0.198
		C		0.000	0.000	8.682	0.000	0.180
		A		0.000	0.000	12.485	0.000	0.099
L41	51.000-50.000	B	1.341	0.000	0.000	27.993	0.000	0.291
		C		0.000	0.000	12.485	0.000	0.266
		A		0.000	0.000	2.286	0.000	0.018
L42	50.000-45.000	B	1.330	0.000	0.000	4.354	0.000	0.044
		C		0.000	0.000	2.286	0.000	0.041
		A		0.000	0.000	11.395	0.000	0.090
L43	45.000-40.420	B	1.322	0.000	0.000	21.710	0.000	0.216
		C		0.000	0.000	11.395	0.000	0.201
		A		0.000	0.000	10.412	0.000	0.081
L44	40.420-40.170	B	1.308	0.000	0.000	19.845	0.000	0.196
		C		0.000	0.000	10.412	0.000	0.183
		A		0.000	0.000	0.568	0.000	0.004
L45	40.170-40.000	B	1.301	0.000	0.000	1.082	0.000	0.011
		C		0.000	0.000	0.568	0.000	0.010
		A		0.000	0.000	0.386	0.000	0.003
L46	40.000-35.000	B	1.300	0.000	0.000	0.736	0.000	0.007
		C		0.000	0.000	0.386	0.000	0.007
		A		0.000	0.000	15.487	0.000	0.115
L47	35.000-33.000	B	1.291	0.000	0.000	21.710	0.000	0.210
		C		0.000	0.000	11.434	0.000	0.197
		A		0.000	0.000	9.201	0.000	0.067
L48	33.000-32.750	B	1.279	0.000	0.000	9.961	0.000	0.092
		C		0.000	0.000	5.856	0.000	0.087
		A		0.000	0.000	1.150	0.000	0.008
L49	32.750-19.000	B	1.275	0.000	0.000	1.244	0.000	0.011
		C		0.000	0.000	0.732	0.000	0.011
		A		0.000	0.000	48.610	0.000	0.342
L50	19.000-18.000	B	1.244	0.000	0.000	53.808	0.000	0.513
		C		0.000	0.000	25.710	0.000	0.487
		A		0.000	0.000	3.331	0.000	0.023
L51	18.000-13.000	B	1.203	0.000	0.000	3.709	0.000	0.036
		C		0.000	0.000	1.665	0.000	0.034
		A		0.000	0.000	16.531	0.000	0.110
L52	13.000-8.000	B	1.182	0.000	0.000	18.406	0.000	0.171
		C		0.000	0.000	8.265	0.000	0.166
		A		0.000	0.000	16.441	0.000	0.105
L53	8.000-6.420	B	1.137	0.000	0.000	18.304	0.000	0.165
		C		0.000	0.000	8.220	0.000	0.164
		A		0.000	0.000	5.169	0.000	0.032
L54	6.420-6.170	B	1.095	0.000	0.000	5.754	0.000	0.051
		C		0.000	0.000	2.584	0.000	0.051
		A		0.000	0.000	0.816	0.000	0.005
L55	6.170-1.170	B	1.080	0.000	0.000	0.909	0.000	0.008
		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	1.023	0.000	0.000	18.048	0.000	0.151
		C		0.000	0.000	8.107	0.000	0.158
		A		0.000	0.000	3.714	0.000	0.018
		B	0.852	0.000	0.000	4.133	0.000	0.030
		C		0.000	0.000	1.857	0.000	0.035
		A		0.000	0.000			

**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	4.5985	1.5353	4.0852	1.3639
L2	180.000-175.000	4.6796	1.5623	4.1822	1.3962
L3	175.000-170.000	4.8258	1.6111	4.3625	1.4564
L4	170.000-165.000	4.9597	1.6558	4.5312	1.5128
L5	165.000-160.000	5.0829	1.6970	4.6894	1.5656
L6	160.000-155.000	5.0748	1.6943	4.7481	1.5852
L7	155.000-154.000	2.6647	0.8896	2.9575	0.9874
L8	154.000-153.750	2.2676	0.7571	2.5191	0.8410
L9	153.750-152.500	2.2805	0.7614	2.5355	0.8465
L10	152.500-152.250	2.2950	0.7662	2.5532	0.8524
L11	152.250-151.500	2.3036	0.7691	2.5641	0.8560
L12	151.500-151.250	2.3109	0.7715	2.5740	0.8594
L13	151.250-146.250	2.8349	0.9465	3.1268	1.0439
L14	146.250-141.250	3.0751	1.0267	3.4012	1.1355
L15	141.250-136.250	3.1592	1.0547	3.5167	1.1741
L16	136.250-130.000	2.9035	0.9694	3.2372	1.0808
L17	130.000-129.000	2.5346	0.8462	2.8138	0.9394
L18	129.000-124.000	2.5771	0.8604	2.8696	0.9580
L19	124.000-121.420	1.9583	0.6538	2.2245	0.7427
L20	121.420-121.170	1.9593	0.6541	2.2285	0.7440
L21	121.170-116.170	2.2852	0.7629	2.6112	0.8718
L22	116.170-115.000	2.5086	0.8375	2.8783	0.9610
L23	115.000-113.750	2.5244	0.8428	2.8990	0.9678
L24	113.750-113.500	2.5332	0.8457	2.9109	0.9718
L25	113.500-108.500	3.0477	1.0175	3.5596	1.1884
L26	108.500-103.500	3.2619	1.0890	3.8427	1.2829
L27	103.500-95.000	2.6173	0.8738	3.0999	1.0349
L28	95.000-94.000	2.5010	0.8350	2.9666	0.9904
L29	94.000-91.400	2.5203	0.8414	2.9925	0.9991
L30	91.400-91.150	2.5346	0.8462	3.0121	1.0056
L31	91.150-91.000	2.5368	0.8469	3.0150	1.0066
L32	91.000-86.000	3.0411	1.0153	3.6158	1.2072
L33	86.000-81.000	3.9658	1.3240	4.2128	1.4065
L34	81.000-76.000	4.0299	1.3454	4.2876	1.4315
L35	76.000-71.000	4.0919	1.3661	4.3602	1.4557
L36	71.000-66.000	4.1521	1.3862	4.4307	1.4792
L37	66.000-63.750	3.3176	1.1076	3.6126	1.2061
L38	63.750-63.500	2.8557	0.9534	3.4341	1.1465
L39	63.500-58.500	3.7749	1.2603	4.0766	1.3610
L40	58.500-51.000	3.9301	1.3121	4.2179	1.4082
L41	51.000-50.000	3.1083	1.0377	3.7191	1.2416
L42	50.000-45.000	3.1353	1.0468	3.7568	1.2542
L43	45.000-40.420	3.1776	1.0609	3.8161	1.2740
L44	40.420-40.170	3.1980	1.0677	3.8449	1.2837
L45	40.170-40.000	3.1998	1.0683	3.8475	1.2845
L46	40.000-35.000	3.1976	2.0174	3.8747	2.2234
L47	35.000-33.000	2.9083	2.6319	3.5147	2.8151
L48	33.000-32.750	2.9191	2.6418	3.5285	2.8263
L49	32.750-19.000	3.5297	3.1954	4.3056	3.4500
L50	19.000-18.000	3.7050	3.3546	4.5347	3.6343
L51	18.000-13.000	3.7323	3.3798	4.5635	3.6581
L52	13.000-8.000	3.7773	3.4212	4.6186	3.7032
L53	8.000-6.420	3.8064	3.4479	4.6519	3.7306
L54	6.420-6.170	3.8181	3.4586	4.6644	3.7408
L55	6.170-1.170	3.8407	3.4794	4.6860	3.7588
L56	1.170-0.000	3.8671	3.5037	4.6924	3.7652

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 - 185.00	1.0000	1.0000
L2	2	LDF7-50A(1-5/8")	175.00 - 180.00	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
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
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
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
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
L8	37	CCI-045100 (L)	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
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
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

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L10	54	CCI-040075 (W)	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
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
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
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
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
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
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

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
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
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
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
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
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
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



Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
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
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
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
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
L25	2	LDF7-50A(1-5/8")	108.50 - 113.50	1.0000	1.0000
L25	32	CCI-060100 (L)	108.50 - 113.50	1.0000	1.0000
L25	33	CCI-060100 (L)	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

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
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
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
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
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
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
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

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
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
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
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
L35	2	LDF7-50A(1-5/8")	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
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
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
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

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L38	48	CCI-060100 (L)	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
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
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
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
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 - 40.42	1.0000	1.0000
L44	31	CCI-045100 (L)	40.17 - 40.42	1.0000	1.0000
L44	43	CCI-060100 (L)	40.17 - 40.42	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	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
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
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
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
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

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
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
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
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
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
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
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
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
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
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

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
***185***								
APX16DWV-16DWVS-E-A20 w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	185.000	No Ice 6.290 6.860	2.760 3.270	0.061 0.105

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
			0.000			1/2" Ice 7.450 8.680	3.790 4.900	0.157 0.290
APX16DWV-16DWVS-E-A20 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	185.000	No Ice 6.290 1/2" Ice 6.860 Ice 7.450 1" Ice 8.680 2" Ice 8.680	2.760 3.270 3.790 4.900	0.061 0.105 0.157 0.290
APX16DWV-16DWVS-E-A20 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	185.000	No Ice 6.290 1/2" Ice 6.860 Ice 7.450 1" Ice 8.680 2" Ice 8.680	2.760 3.270 3.790 4.900	0.061 0.105 0.157 0.290
AIR 32 B2A B66AA w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	185.000	No Ice 7.087 1/2" Ice 7.561 Ice 8.021 1" Ice 8.966 2" Ice 8.966	6.374 7.231 7.973 9.507	0.165 0.228 0.298 0.464
AIR 32 B2A B66AA w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	185.000	No Ice 7.087 1/2" Ice 7.561 Ice 8.021 1" Ice 8.966 2" Ice 8.966	6.374 7.231 7.973 9.507	0.165 0.228 0.298 0.464
AIR 32 B2A B66AA w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	185.000	No Ice 7.087 1/2" Ice 7.561 Ice 8.021 1" Ice 8.966 2" Ice 8.966	6.374 7.231 7.973 9.507	0.165 0.228 0.298 0.464
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	185.000	No Ice 14.690 1/2" Ice 15.460 Ice 16.230 1" Ice 17.820 2" Ice 17.820	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	185.000	No Ice 14.690 1/2" Ice 15.460 Ice 16.230 1" Ice 17.820 2" Ice 17.820	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	185.000	No Ice 14.690 1/2" Ice 15.460 Ice 16.230 1" Ice 17.820 2" Ice 17.820	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	185.000	No Ice 1.650 1/2" Ice 1.810 Ice 1.978 1" Ice 2.336 2" Ice 2.336	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	185.000	No Ice 1.650 1/2" Ice 1.810 Ice 1.978 1" Ice 2.336 2" Ice 2.336	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	185.000	No Ice 1.650 1/2" Ice 1.810 Ice 1.978 1" Ice 2.336 2" Ice 2.336	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	185.000	No Ice 0.350 1/2" Ice 0.426 Ice 0.509 1" Ice 0.698 2" Ice 0.698	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	185.000	No Ice 0.350	0.175	0.011

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
			0.000			1/2"	0.426	0.234	0.014
			0.000			Ice	0.509	0.301	0.019
						1" Ice	0.698	0.456	0.032
						2" Ice			
KRY 112 144/1	A	From Leg	4.000	0.000	185.000	No Ice	0.350	0.175	0.011
			0.000			1/2"	0.426	0.234	0.014
			0.000			Ice	0.509	0.301	0.019
						1" Ice	0.698	0.456	0.032
						2" Ice			
RMQP-496-HK	C	None		0.000	185.000	No Ice	23.140	23.140	1.945
						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	175.000	No Ice	11.960	5.970	0.115
			0.000			1/2"	12.700	6.630	0.201
			0.000			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	175.000	No Ice	11.960	5.970	0.115
			0.000			1/2"	12.700	6.630	0.201
			0.000			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	175.000	No Ice	11.960	5.970	0.115
			0.000			1/2"	12.700	6.630	0.201
			0.000			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	175.000	No Ice	5.746	4.254	0.055
			0.000			1/2"	6.179	5.014	0.103
			0.000			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	175.000	No Ice	5.746	4.254	0.055
			0.000			1/2"	6.179	5.014	0.103
			0.000			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	175.000	No Ice	5.746	4.254	0.055
			0.000			1/2"	6.179	5.014	0.103
			0.000			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	175.000	No Ice	12.250	6.050	0.089
			0.000			1/2"	13.000	6.710	0.176
			0.000			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	175.000	No Ice	12.250	6.050	0.089
			0.000			1/2"	13.000	6.710	0.176
			0.000			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	175.000	No Ice	12.250	6.050	0.089
			0.000			1/2"	13.000	6.710	0.176
			0.000			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	175.000	No Ice	4.040	4.180	0.137
			0.000			1/2"	4.420	4.570	0.206
			0.000			Ice	4.820	4.970	0.287
						1" Ice	5.630	5.790	0.482
						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
QS66512-2 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	4.040	4.180	0.137
						1/2" Ice	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	175.000	No Ice	4.040	4.180	0.137
						1/2" Ice	4.420	4.570	0.206
						Ice	4.820	4.970	0.287
						1" Ice	5.630	5.790	0.482
						2" Ice			
(2) LGP21401	A	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	1.104	0.347	0.014
						1/2" Ice	1.239	0.442	0.021
						Ice	1.381	0.544	0.030
						1" Ice	1.688	0.770	0.055
						2" Ice			
(2) LGP21401	B	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	1.104	0.347	0.014
						1/2" Ice	1.239	0.442	0.021
						Ice	1.381	0.544	0.030
						1" Ice	1.688	0.770	0.055
						2" Ice			
(2) LGP21401	C	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	1.104	0.347	0.014
						1/2" Ice	1.239	0.442	0.021
						Ice	1.381	0.544	0.030
						1" Ice	1.688	0.770	0.055
						2" Ice			
DC6-48-60-18-8F	A	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	1.212	1.212	0.033
						1/2" Ice	1.892	1.892	0.055
						Ice	2.105	2.105	0.080
						1" Ice	2.570	2.570	0.138
						2" Ice			
DC6-48-60-18-8F	B	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	1.212	1.212	0.033
						1/2" Ice	1.892	1.892	0.055
						Ice	2.105	2.105	0.080
						1" Ice	2.570	2.570	0.138
						2" Ice			
782 10254	A	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	0.044	0.078	0.003
						1/2" Ice	0.074	0.122	0.004
						Ice	0.112	0.173	0.007
						1" Ice	0.210	0.297	0.014
						2" Ice			
782 10254	B	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	0.044	0.078	0.003
						1/2" Ice	0.074	0.122	0.004
						Ice	0.112	0.173	0.007
						1" Ice	0.210	0.297	0.014
						2" Ice			
782 10254	C	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	0.044	0.078	0.003
						1/2" Ice	0.074	0.122	0.004
						Ice	0.112	0.173	0.007
						1" Ice	0.210	0.297	0.014
						2" Ice			
RRUS 32 B66	A	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	2.743	1.668	0.053
						1/2" Ice	2.965	1.855	0.074
						Ice	3.194	2.049	0.098
						1" Ice	3.675	2.458	0.157
						2" Ice			
RRUS 32 B66	B	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	2.743	1.668	0.053
						1/2" Ice	2.965	1.855	0.074
						Ice	3.194	2.049	0.098
						1" Ice	3.675	2.458	0.157
						2" Ice			
RRUS 32 B66	C	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	2.743	1.668	0.053
						1/2" Ice	2.965	1.855	0.074
						Ice	3.194	2.049	0.098
						1" Ice	3.675	2.458	0.157
						2" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert 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
RRUS 32 B2	A	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	2.743	1.668	0.053
						1/2" Ice	2.965	1.855	0.074
						Ice	3.194	2.049	0.098
						1" Ice	3.675	2.458	0.157
						2" Ice			
RRUS 32 B2	B	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	2.743	1.668	0.053
						1/2" Ice	2.965	1.855	0.074
						Ice	3.194	2.049	0.098
						1" Ice	3.675	2.458	0.157
						2" Ice			
RRUS 32 B2	C	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	2.743	1.668	0.053
						1/2" Ice	2.965	1.855	0.074
						Ice	3.194	2.049	0.098
						1" Ice	3.675	2.458	0.157
						2" Ice			
(2) DBC0061F1V51-2	A	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	0.213	0.413	0.013
						1/2" Ice	0.279	0.496	0.016
						Ice	0.353	0.586	0.021
						1" Ice	0.521	0.788	0.036
						2" Ice			
(2) DBC0061F1V51-2	B	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	0.213	0.413	0.013
						1/2" Ice	0.279	0.496	0.016
						Ice	0.353	0.586	0.021
						1" Ice	0.521	0.788	0.036
						2" Ice			
(2) DBC0061F1V51-2	C	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	0.213	0.413	0.013
						1/2" Ice	0.279	0.496	0.016
						Ice	0.353	0.586	0.021
						1" Ice	0.521	0.788	0.036
						2" Ice			
RRUS 32 B30	A	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	2.743	1.668	0.053
						1/2" Ice	2.965	1.855	0.074
						Ice	3.194	2.049	0.098
						1" Ice	3.675	2.458	0.157
						2" Ice			
RRUS 32 B30	B	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	2.743	1.668	0.053
						1/2" Ice	2.965	1.855	0.074
						Ice	3.194	2.049	0.098
						1" Ice	3.675	2.458	0.157
						2" Ice			
RRUS 32 B30	C	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	2.743	1.668	0.053
						1/2" Ice	2.965	1.855	0.074
						Ice	3.194	2.049	0.098
						1" Ice	3.675	2.458	0.157
						2" Ice			
DC9-48-60-24-8C-EV	A	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	2.737	4.785	0.026
						1/2" Ice	2.963	5.065	0.063
						Ice	3.196	5.352	0.104
						1" Ice	3.684	5.948	0.200
						2" Ice			
RRUS 4478 B14_CCIV2	A	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	2.021	1.246	0.059
						1/2" Ice	2.200	1.396	0.077
						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	0.000	175.000	No Ice	2.021	1.246	0.059
						1/2" Ice	2.200	1.396	0.077
						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	0.000	175.000	No Ice	2.021	1.246	0.059
						1/2" Ice	2.200	1.396	0.077
						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
RRUS 4449 B5/B12	A	From Leg	4.000 0.000 0.000	0.000	175.000	No Ice	1.968	1.408	0.071
						1/2" Ice	2.144	1.564	0.090
						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	0.000	175.000	No Ice	1.968	1.408	0.071
						1/2" Ice	2.144	1.564	0.090
						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	0.000	175.000	No Ice	1.968	1.408	0.071
						1/2" Ice	2.144	1.564	0.090
						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	0.000	175.000	No Ice	2.864	1.782	0.055
						1/2" Ice	3.090	1.973	0.077
						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	0.000	175.000	No Ice	2.864	1.782	0.055
						1/2" Ice	3.090	1.973	0.077
						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	0.000	175.000	No Ice	2.864	1.782	0.055
						1/2" Ice	3.090	1.973	0.077
						Ice	3.323	2.171	0.103
						1" Ice	3.813	2.589	0.165
						2" Ice			
Sector Mount [SM 502-3]	C	None		0.000	175.000	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*** APXV18-206517S-C	A	From Leg	1.000 0.000 0.000	0.000	165.000	No Ice	3.830	1.810	0.026
						1/2" Ice	4.460	2.410	0.054
						Ice	5.110	3.030	0.087
						1" Ice	6.440	4.310	0.172
						2" Ice			
APXV18-206517S-C	B	From Leg	1.000 0.000 0.000	0.000	165.000	No Ice	3.830	1.810	0.026
						1/2" Ice	4.460	2.410	0.054
						Ice	5.110	3.030	0.087
						1" Ice	6.440	4.310	0.172
						2" Ice			
APXV18-206517S-C	C	From Leg	1.000 0.000 0.000	0.000	165.000	No Ice	3.830	1.810	0.026
						1/2" Ice	4.460	2.410	0.054
						Ice	5.110	3.030	0.087
						1" Ice	6.440	4.310	0.172
						2" Ice			
Pipe Mount [PM 601-3]	C	None		0.000	165.000	No Ice	3.170	3.170	0.195
						1/2" Ice	3.790	3.790	0.232
						Ice	4.420	4.420	0.279
						1" Ice	5.760	5.760	0.401
						2" Ice			
***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
						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			
(4) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice	4.090	3.300	0.066
						1/2" Ice	4.490	3.680	0.130
						Ice	4.890	4.070	0.204

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" Ice	5.720	4.870	0.386
(4) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	155.000	2" Ice	4.090	3.300	0.066
						No Ice	4.490	3.680	0.130
						1/2" Ice	4.890	4.070	0.204
						1" Ice	5.720	4.870	0.386
RRH2x60-700	A	From Leg	4.000 0.000 0.000	0.000	155.000	2" Ice	3.500	1.816	0.060
						No Ice	3.761	2.052	0.083
						1/2" Ice	4.029	2.289	0.109
						1" Ice	4.585	2.785	0.173
RRH2x60-700	B	From Leg	4.000 0.000 0.000	0.000	155.000	2" Ice	3.500	1.816	0.060
						No Ice	3.761	2.052	0.083
						1/2" Ice	4.029	2.289	0.109
						1" Ice	4.585	2.785	0.173
RRH2x60-700	C	From Leg	4.000 0.000 0.000	0.000	155.000	2" Ice	3.500	1.816	0.060
						No Ice	3.761	2.052	0.083
						1/2" Ice	4.029	2.289	0.109
						1" Ice	4.585	2.785	0.173
RRH2X60-PCS	A	From Leg	4.000 0.000 0.000	0.000	155.000	2" Ice	2.200	1.723	0.055
						No Ice	2.393	1.901	0.075
						1/2" Ice	2.593	2.087	0.099
						1" Ice	3.015	2.480	0.155
RRH2X60-PCS	B	From Leg	4.000 0.000 0.000	0.000	155.000	2" Ice	2.200	1.723	0.055
						No Ice	2.393	1.901	0.075
						1/2" Ice	2.593	2.087	0.099
						1" Ice	3.015	2.480	0.155
RRH2X60-PCS	C	From Leg	4.000 0.000 0.000	0.000	155.000	2" Ice	2.200	1.723	0.055
						No Ice	2.393	1.901	0.075
						1/2" Ice	2.593	2.087	0.099
						1" Ice	3.015	2.480	0.155
AWS4 (B66) 4x45 RRH	C	From Leg	4.000 0.000 0.000	0.000	155.000	2" Ice	2.660	1.586	0.064
						No Ice	2.878	1.769	0.084
						1/2" Ice	3.104	1.959	0.108
						1" Ice	3.577	2.359	0.165
AWS4 (B66) 4x45 RRH	A	From Leg	4.000 0.000 0.000	0.000	155.000	2" Ice	2.660	1.586	0.064
						No Ice	2.878	1.769	0.084
						1/2" Ice	3.104	1.959	0.108
						1" Ice	3.577	2.359	0.165
AWS4 (B66) 4x45 RRH	B	From Leg	4.000 0.000 0.000	0.000	155.000	2" Ice	2.660	1.586	0.064
						No Ice	2.878	1.769	0.084
						1/2" Ice	3.104	1.959	0.108
						1" Ice	3.577	2.359	0.165
(2) DB-T1-6Z-8AB-0Z	C	From Leg	4.000 0.000 0.000	0.000	155.000	2" Ice	4.800	2.000	0.044
						No Ice	5.070	2.193	0.080
						1/2" Ice	5.348	2.393	0.120
						1" Ice	5.926	2.815	0.213
Platform Mount [LP 403-1]	C	None		0.000	155.000	2" Ice	18.940	18.940	1.500
						No Ice	23.310	23.310	1.902
						1/2" Ice	27.740	27.740	2.374
						1" Ice	36.770	36.770	3.530
						2" Ice			

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### Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	$K_z$	$q_z$ ksf	$A_G$ ft <sup>2</sup>	F a c e	$A_F$ ft <sup>2</sup>	$A_R$ ft <sup>2</sup>	$A_{leg}$ ft <sup>2</sup>	Leg %	$C_A A_A$ In Face ft <sup>2</sup>	$C_A A_A$ Out Face ft <sup>2</sup>
L1 185.000- 180.000	182.500	1.436	0.056	7.737	A	0.000	7.737	7.737	100.00	0.000	0.000
					B	0.000	7.737	100.00	6.930	0.000	
					C	0.000	7.737	100.00	0.000	0.000	
L2 180.000- 175.000	177.464	1.428	0.056	8.080	A	0.000	8.080	8.080	100.00	0.000	0.000
					B	0.000	8.080	100.00	6.930	0.000	
					C	0.000	8.080	100.00	0.000	0.000	
L3 175.000- 170.000	172.467	1.42	0.055	8.783	A	0.000	8.783	8.783	100.00	0.000	0.000
					B	0.000	8.783	100.00	6.930	0.000	
					C	0.000	8.783	100.00	0.000	0.000	
L4 170.000- 165.000	167.469	1.411	0.055	9.487	A	0.000	9.487	9.487	100.00	0.000	0.000
					B	0.000	9.487	100.00	6.930	0.000	
					C	0.000	9.487	100.00	0.000	0.000	
L5 165.000- 160.000	162.471	1.402	0.055	10.191	A	0.000	10.191	10.191	100.00	0.000	0.000
					B	0.000	10.191	100.00	6.930	0.000	
					C	0.000	10.191	100.00	0.000	0.000	
L6 160.000- 155.000	157.473	1.393	0.054	10.894	A	0.000	10.894	10.894	100.00	0.138	0.000
					B	0.000	10.894	100.00	7.068	0.000	
					C	0.000	10.894	100.00	0.138	0.000	
L7 155.000- 154.000	154.499	1.387	0.054	2.263	A	0.000	2.263	2.263	100.00	0.928	0.000
					B	0.000	2.263	100.00	2.314	0.000	
					C	0.000	2.263	100.00	0.928	0.000	
L8 154.000- 153.750	153.875	1.386	0.054	0.569	A	0.000	0.569	0.569	100.00	0.326	0.000
					B	0.000	0.569	100.00	0.672	0.000	
					C	0.000	0.569	100.00	0.326	0.000	
L9 153.750- 152.500	153.123	1.384	0.054	2.873	A	0.000	2.873	2.873	100.00	1.628	0.000
					B	0.000	2.873	100.00	3.361	0.000	
					C	0.000	2.873	100.00	1.628	0.000	
L10 152.500- 152.250	152.375	1.383	0.054	0.579	A	0.000	0.579	0.579	100.00	0.326	0.000
					B	0.000	0.579	100.00	0.672	0.000	
					C	0.000	0.579	100.00	0.326	0.000	
L11 152.250- 151.500	151.874	1.382	0.054	1.746	A	0.000	1.746	1.746	100.00	0.977	0.000
					B	0.000	1.746	100.00	2.017	0.000	
					C	0.000	1.746	100.00	0.977	0.000	
L12 151.500- 151.250	151.375	1.381	0.054	0.587	A	0.000	0.587	0.587	100.00	0.326	0.000
					B	0.000	0.587	100.00	0.672	0.000	
					C	0.000	0.587	100.00	0.326	0.000	
L13 151.250- 146.250	148.726	1.376	0.054	12.102	A	0.000	12.102	12.102	100.00	4.303	0.000
					B	0.000	12.102	100.00	11.233	0.000	
					C	0.000	12.102	100.00	4.303	0.000	
L14 146.250- 141.250	143.727	1.366	0.053	12.807	A	0.000	12.807	12.807	100.00	3.750	0.000
					B	0.000	12.807	100.00	10.680	0.000	
					C	0.000	12.807	100.00	3.750	0.000	
L15 141.250- 136.250	138.728	1.356	0.053	13.512	A	0.000	13.512	13.512	100.00	3.750	0.000
					B	0.000	13.512	100.00	10.680	0.000	
					C	0.000	13.512	100.00	3.750	0.000	
L16 136.250- 130.000	133.093	1.344	0.052	17.879	A	0.000	17.879	17.879	100.00	6.354	0.000
					B	0.000	17.879	100.00	15.017	0.000	
					C	0.000	17.879	100.00	6.354	0.000	
L17 130.000- 129.000	129.499	1.336	0.052	2.917	A	0.000	2.917	2.917	100.00	1.417	0.000
					B	0.000	2.917	100.00	2.803	0.000	
					C	0.000	2.917	100.00	1.417	0.000	
L18 129.000- 124.000	126.481	1.33	0.052	15.007	A	0.000	15.007	15.007	100.00	7.083	0.000
					B	0.000	15.007	100.00	14.013	0.000	
					C	0.000	15.007	100.00	7.083	0.000	
L19 124.000- 121.420	122.705	1.321	0.051	8.018	A	0.000	8.018	8.018	100.00	6.155	0.000
					B	0.000	8.018	100.00	9.731	0.000	
					C	0.000	8.018	100.00	6.155	0.000	
L20 121.420- 121.170	121.295	1.318	0.051	0.787	A	0.000	0.787	0.787	100.00	0.604	0.000
					B	0.000	0.787	100.00	0.951	0.000	
					C	0.000	0.787	100.00	0.604	0.000	
L21 121.170- 116.170	118.652	1.312	0.051	16.102	A	0.000	16.102	16.102	100.00	9.586	0.000
					B	0.000	16.102	100.00	16.516	0.000	
					C	0.000	16.102	100.00	9.586	0.000	

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> ksf	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	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>
L22 116.170- 115.000	115.584	1.305	0.051	3.869	A	0.000	3.869	3.869	100.00	1.950	0.000
					B	0.000	3.869	100.00	3.572	0.000	
					C	0.000	3.869	100.00	1.950	0.000	
L23 115.000- 113.750	114.374	1.302	0.051	4.174	A	0.000	4.174	4.174	100.00	2.083	0.000
					B	0.000	4.174	100.00	3.816	0.000	
					C	0.000	4.174	100.00	2.083	0.000	
L24 113.750- 113.500	113.625	1.3	0.051	0.841	A	0.000	0.841	0.841	100.00	0.417	0.000
					B	0.000	0.841	100.00	0.763	0.000	
					C	0.000	0.841	100.00	0.417	0.000	
L25 113.500- 108.500	110.983	1.294	0.050	17.181	A	0.000	17.181	17.181	100.00	5.667	0.000
					B	0.000	17.181	100.00	12.597	0.000	
					C	0.000	17.181	100.00	5.667	0.000	
L26 108.500- 103.500	105.984	1.281	0.050	17.883	A	0.000	17.883	17.883	100.00	5.000	0.000
					B	0.000	17.883	100.00	11.930	0.000	
					C	0.000	17.883	100.00	5.000	0.000	
L27 103.500- 95.000	99.205	1.263	0.049	32.012	A	0.000	32.012	32.012	100.00	15.170	0.000
					B	0.000	32.012	100.00	26.951	0.000	
					C	0.000	32.012	100.00	15.170	0.000	
L28 95.000- 94.000	94.499	1.251	0.049	3.838	A	0.000	3.838	3.838	100.00	2.000	0.000
					B	0.000	3.838	100.00	3.386	0.000	
					C	0.000	3.838	100.00	2.000	0.000	
L29 94.000- 91.400	92.696	1.246	0.048	10.110	A	0.000	10.110	10.110	100.00	5.200	0.000
					B	0.000	10.110	100.00	8.804	0.000	
					C	0.000	10.110	100.00	5.200	0.000	
L30 91.400- 91.150	91.275	1.242	0.048	0.983	A	0.000	0.983	0.983	100.00	0.500	0.000
					B	0.000	0.983	100.00	0.847	0.000	
					C	0.000	0.983	100.00	0.500	0.000	
L31 91.150- 91.000	91.075	1.241	0.048	0.591	A	0.000	0.591	0.591	100.00	0.300	0.000
					B	0.000	0.591	100.00	0.508	0.000	
					C	0.000	0.591	100.00	0.300	0.000	
L32 91.000- 86.000	88.485	1.233	0.048	20.041	A	0.000	20.041	20.041	100.00	7.110	0.000
					B	0.000	20.041	100.00	14.040	0.000	
					C	0.000	20.041	100.00	7.110	0.000	
L33 86.000- 81.000	83.486	1.218	0.047	20.745	A	0.000	20.745	20.745	100.00	5.000	0.000
					B	0.000	20.745	100.00	11.930	0.000	
					C	0.000	20.745	100.00	5.000	0.000	
L34 81.000- 76.000	78.486	1.203	0.047	21.450	A	0.000	21.450	21.450	100.00	5.000	0.000
					B	0.000	21.450	100.00	11.930	0.000	
					C	0.000	21.450	100.00	5.000	0.000	
L35 76.000- 71.000	73.487	1.186	0.046	22.155	A	0.000	22.155	22.155	100.00	5.000	0.000
					B	0.000	22.155	100.00	11.930	0.000	
					C	0.000	22.155	100.00	5.000	0.000	
L36 71.000- 66.000	68.487	1.169	0.045	22.860	A	0.000	22.860	22.860	100.00	5.000	0.000
					B	0.000	22.860	100.00	11.930	0.000	
					C	0.000	22.860	100.00	5.000	0.000	
L37 66.000- 63.750	64.872	1.155	0.045	10.517	A	0.000	10.517	10.517	100.00	4.000	0.000
					B	0.000	10.517	100.00	7.119	0.000	
					C	0.000	10.517	100.00	4.000	0.000	
L38 63.750- 63.500	63.625	1.151	0.045	1.177	A	0.000	1.177	1.177	100.00	0.500	0.000
					B	0.000	1.177	100.00	0.846	0.000	
					C	0.000	1.177	100.00	0.500	0.000	
L39 63.500- 58.500	60.988	1.14	0.044	23.917	A	0.000	23.917	23.917	100.00	6.830	0.000
					B	0.000	23.917	100.00	13.760	0.000	
					C	0.000	23.917	100.00	6.830	0.000	
L40 58.500- 51.000	54.723	1.115	0.043	37.196	A	0.000	37.196	37.196	100.00	9.690	0.000
					B	0.000	37.196	100.00	20.085	0.000	
					C	0.000	37.196	100.00	9.690	0.000	
L41 51.000- 50.000	50.500	1.096	0.043	5.011	A	0.000	5.011	5.011	100.00	1.750	0.000
					B	0.000	5.011	100.00	3.136	0.000	
					C	0.000	5.011	100.00	1.750	0.000	
L42 50.000- 45.000	47.489	1.082	0.042	25.478	A	0.000	25.478	25.478	100.00	8.750	0.000
					B	0.000	25.478	100.00	15.680	0.000	
					C	0.000	25.478	100.00	8.750	0.000	
L43 45.000- 40.420	42.701	1.058	0.041	23.953	A	0.000	23.953	23.953	100.00	8.015	0.000
					B	0.000	23.953	100.00	14.363	0.000	
					C	0.000	23.953	100.00	8.015	0.000	
L44 40.420- 40.170	40.295	1.045	0.041	1.325	A	0.000	1.325	1.325	100.00	0.438	0.000
					B	0.000	1.325	100.00	0.784	0.000	
					C	0.000	1.325	100.00	0.784	0.000	

Section Elevation ft	z ft	$K_Z$	$q_z$ ksf	$A_G$ ft <sup>2</sup>	F a c e	$A_F$ ft <sup>2</sup>	$A_R$ ft <sup>2</sup>	$A_{leg}$ ft <sup>2</sup>	Leg %	$C_A A_A$ In Face ft <sup>2</sup>	$C_A A_A$ Out Face ft <sup>2</sup>
L45 40.170-40.000	40.085	1.044	0.041	0.902	C	0.000	1.325	0.902	100.00	0.438	0.000
					A	0.000	0.902		100.00	0.297	0.000
					B	0.000	0.902		100.00	0.533	0.000
L46 40.000-35.000	37.489	1.029	0.040	26.882	C	0.000	0.902	26.882	100.00	0.297	0.000
					A	0.000	26.882		100.00	12.667	0.000
					B	0.000	26.882		100.00	16.168	0.000
L47 35.000-33.000	33.998	1.008	0.039	10.949	C	0.000	26.882	10.949	100.00	9.238	0.000
					A	0.000	10.949		100.00	7.667	0.000
					B	0.000	10.949		100.00	7.605	0.000
L48 33.000-32.750	32.875	1.001	0.039	1.376	C	0.000	10.949	1.376	100.00	4.833	0.000
					A	0.000	1.376		100.00	0.958	0.000
					B	0.000	1.376		100.00	0.951	0.000
L49 32.750-19.000	25.798	0.952	0.037	78.370	C	0.000	1.376	78.370	100.00	0.604	0.000
					A	0.000	78.370		100.00	41.208	0.000
					B	0.000	78.370		100.00	40.787	0.000
L50 19.000-18.000	18.500	0.887	0.035	5.831	C	0.000	78.370	5.831	100.00	21.729	0.000
					A	0.000	5.831		100.00	2.833	0.000
					B	0.000	5.831		100.00	2.803	0.000
L51 18.000-13.000	15.490	0.855	0.033	29.579	C	0.000	5.831	29.579	100.00	1.417	0.000
					A	0.000	29.579		100.00	14.167	0.000
					B	0.000	29.579		100.00	14.013	0.000
L52 13.000-8.000	10.490	0.85	0.033	30.281	C	0.000	29.579	30.281	100.00	7.083	0.000
					A	0.000	30.281		100.00	14.167	0.000
					B	0.000	30.281		100.00	14.013	0.000
L53 8.000-6.420	7.209	0.85	0.033	9.715	C	0.000	30.281	9.715	100.00	7.083	0.000
					A	0.000	9.715		100.00	4.477	0.000
					B	0.000	9.715		100.00	4.428	0.000
L54 6.420-6.170	6.295	0.85	0.033	1.540	C	0.000	9.715	1.540	100.00	2.238	0.000
					A	0.000	1.540		100.00	0.708	0.000
					B	0.000	1.540		100.00	0.701	0.000
L55 6.170-1.170	3.661	0.85	0.033	31.180	C	0.000	1.540	31.180	100.00	0.354	0.000
					A	0.000	31.180		100.00	14.167	0.000
					B	0.000	31.180		100.00	14.013	0.000
L56 1.170-0.000	0.584	0.85	0.033	7.397	C	0.000	31.180	7.397	100.00	7.083	0.000
					A	0.000	7.397		100.00	3.315	0.000
					B	0.000	7.397		100.00	3.279	0.000
					C	0.000	7.397		100.00	1.658	0.000

### Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	$K_Z$	$q_z$ ksf	$t_z$ in	$A_G$ ft <sup>2</sup>	F a c e	$A_F$ ft <sup>2</sup>	$A_R$ ft <sup>2</sup>	$A_{leg}$ ft <sup>2</sup>	Leg %	$C_A A_A$ In Face ft <sup>2</sup>	$C_A A_A$ Out Face ft <sup>2</sup>
L1 185.000-180.000	182.500	1.436	0.008	1.5128	8.998	A	0.000	8.998	8.998	100.00	0.000	0.000
						B	0.000	8.998		100.00	10.554	0.000
						C	0.000	8.998		100.00	0.000	0.000
L2 180.000-175.000	177.464	1.428	0.008	1.5086	9.337	A	0.000	9.337	9.337	100.00	0.000	0.000
						B	0.000	9.337		100.00	10.548	0.000
						C	0.000	9.337		100.00	0.000	0.000
L3 175.000-170.000	172.467	1.42	0.008	1.5043	10.037	A	0.000	10.037	10.037	100.00	0.000	0.000
						B	0.000	10.037		100.00	10.543	0.000
						C	0.000	10.037		100.00	0.000	0.000
L4 170.000-165.000	167.469	1.411	0.008	1.4999	10.737	A	0.000	10.737	10.737	100.00	0.000	0.000
						B	0.000	10.737		100.00	10.537	0.000
						C	0.000	10.737		100.00	0.000	0.000
L5 165.000-160.000	162.471	1.402	0.008	1.4953	11.437	A	0.000	11.437	11.437	100.00	0.000	0.000
						B	0.000	11.437		100.00	10.532	0.000
						C	0.000	11.437		100.00	0.000	0.000
L6 160.000-155.000	157.473	1.393	0.008	1.4907	12.137	A	0.000	12.137	12.137	100.00	0.178	0.000
						B	0.000	12.137		100.00	10.704	0.000
						C	0.000	12.137		100.00	0.178	0.000
L7 155.000-154.000	154.499	1.387	0.008	1.4878	2.511	A	0.000	2.511	2.511	100.00	1.236	0.000
						B	0.000	2.511		100.00	3.340	0.000
						C	0.000	2.511		100.00	1.236	0.000

Section Elevation ft	z ft	K <sub>z</sub>	q <sub>z</sub> ksf	t <sub>z</sub> in	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	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>
L8 154.000- 153.750	153.875	1.386	0.008	1.4872	0.631	A	0.000	0.631	0.631	100.00	0.440	0.000
						B	0.000	0.631	0.631	100.00	0.966	0.000
						C	0.000	0.631	0.631	100.00	0.440	0.000
L9 153.750- 152.500	153.123	1.384	0.008	1.4865	3.183	A	0.000	3.183	3.183	100.00	2.199	0.000
						B	0.000	3.183	3.183	100.00	4.829	0.000
						C	0.000	3.183	3.183	100.00	2.199	0.000
L10 152.500- 152.250	152.375	1.383	0.008	1.4858	0.640	A	0.000	0.640	0.640	100.00	0.440	0.000
						B	0.000	0.640	0.640	100.00	0.966	0.000
						C	0.000	0.640	0.640	100.00	0.440	0.000
L11 152.250- 151.500	151.874	1.382	0.008	1.4853	1.932	A	0.000	1.932	1.932	100.00	1.319	0.000
						B	0.000	1.932	1.932	100.00	2.897	0.000
						C	0.000	1.932	1.932	100.00	1.319	0.000
L12 151.500- 151.250	151.375	1.381	0.008	1.4848	0.648	A	0.000	0.648	0.648	100.00	0.440	0.000
						B	0.000	0.648	0.648	100.00	0.966	0.000
						C	0.000	0.648	0.648	100.00	0.440	0.000
L13 151.250- 146.250	148.726	1.376	0.008	1.4822	13.337	A	0.000	13.337	13.337	100.00	5.943	0.000
						B	0.000	13.337	13.337	100.00	16.459	0.000
						C	0.000	13.337	13.337	100.00	5.943	0.000
L14 146.250- 141.250	143.727	1.366	0.008	1.4771	14.038	A	0.000	14.038	14.038	100.00	5.227	0.000
						B	0.000	14.038	14.038	100.00	15.736	0.000
						C	0.000	14.038	14.038	100.00	5.227	0.000
L15 141.250- 136.250	138.728	1.356	0.008	1.4719	14.739	A	0.000	14.739	14.739	100.00	5.222	0.000
						B	0.000	14.739	14.739	100.00	15.724	0.000
						C	0.000	14.739	14.739	100.00	5.222	0.000
L16 136.250- 130.000	133.093	1.344	0.008	1.4658	19.406	A	0.000	19.406	19.406	100.00	8.919	0.000
						B	0.000	19.406	19.406	100.00	22.038	0.000
						C	0.000	19.406	19.406	100.00	8.919	0.000
L17 130.000- 129.000	129.499	1.336	0.008	1.4618	3.161	A	0.000	3.161	3.161	100.00	2.003	0.000
						B	0.000	3.161	3.161	100.00	4.102	0.000
						C	0.000	3.161	3.161	100.00	2.003	0.000
L18 129.000- 124.000	126.481	1.33	0.008	1.4583	16.222	A	0.000	16.222	16.222	100.00	10.000	0.000
						B	0.000	16.222	16.222	100.00	20.485	0.000
						C	0.000	16.222	16.222	100.00	10.000	0.000
L19 124.000- 121.420	122.705	1.321	0.008	1.4539	8.643	A	0.000	8.643	8.643	100.00	8.382	0.000
						B	0.000	8.643	8.643	100.00	13.790	0.000
						C	0.000	8.643	8.643	100.00	8.382	0.000
L20 121.420- 121.170	121.295	1.318	0.008	1.4523	0.847	A	0.000	0.847	0.847	100.00	0.822	0.000
						B	0.000	0.847	0.847	100.00	1.346	0.000
						C	0.000	0.847	0.847	100.00	0.822	0.000
L21 121.170- 116.170	118.652	1.312	0.008	1.4491	17.309	A	0.000	17.309	17.309	100.00	12.968	0.000
						B	0.000	17.309	17.309	100.00	23.442	0.000
						C	0.000	17.309	17.309	100.00	12.968	0.000
L22 116.170- 115.000	115.584	1.305	0.008	1.4453	4.151	A	0.000	4.151	4.151	100.00	2.626	0.000
						B	0.000	4.151	4.151	100.00	5.076	0.000
						C	0.000	4.151	4.151	100.00	2.626	0.000
L23 115.000- 113.750	114.374	1.302	0.007	1.4437	4.475	A	0.000	4.475	4.475	100.00	2.805	0.000
						B	0.000	4.475	4.475	100.00	5.422	0.000
						C	0.000	4.475	4.475	100.00	2.805	0.000
L24 113.750- 113.500	113.625	1.3	0.007	1.4428	0.901	A	0.000	0.901	0.901	100.00	0.561	0.000
						B	0.000	0.901	0.901	100.00	1.084	0.000
						C	0.000	0.901	0.901	100.00	0.561	0.000
L25 113.500- 108.500	110.983	1.294	0.007	1.4394	18.381	A	0.000	18.381	18.381	100.00	7.394	0.000
						B	0.000	18.381	18.381	100.00	17.856	0.000
						C	0.000	18.381	18.381	100.00	7.394	0.000
L26 108.500- 103.500	105.984	1.281	0.007	1.4328	19.077	A	0.000	19.077	19.077	100.00	6.433	0.000
						B	0.000	19.077	19.077	100.00	16.886	0.000
						C	0.000	19.077	19.077	100.00	6.433	0.000
L27 103.500- 95.000	99.205	1.263	0.007	1.4234	34.028	A	0.000	34.028	34.028	100.00	19.488	0.000
						B	0.000	34.028	34.028	100.00	37.239	0.000
						C	0.000	34.028	34.028	100.00	19.488	0.000
L28 95.000- 94.000	94.499	1.251	0.007	1.4165	4.076	A	0.000	4.076	4.076	100.00	2.569	0.000
						B	0.000	4.076	4.076	100.00	4.658	0.000
						C	0.000	4.076	4.076	100.00	2.569	0.000
L29 94.000- 91.400	92.696	1.246	0.007	1.4137	10.723	A	0.000	10.723	10.723	100.00	6.670	0.000
						B	0.000	10.723	10.723	100.00	12.094	0.000
						C	0.000	10.723	10.723	100.00	6.670	0.000
L30 91.400- 91.150	91.275	1.242	0.007	1.4115	1.042	A	0.000	1.042	1.042	100.00	0.641	0.000
						B	0.000	1.042	1.042	100.00	1.163	0.000
						C	0.000	1.042	1.042	100.00	0.641	0.000



Section Elevation ft	z ft	K <sub>z</sub>	q <sub>z</sub> ksf	t <sub>z</sub> in	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	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>
L31 91.150- 91.000	91.075	1.241	0.007	1.4112	0.626	C	0.000	1.042	0.626	100.00	0.641	0.000
						A	0.000	0.626		100.00	0.385	0.000
						B	0.000	0.626		100.00	0.697	0.000
L32 91.000- 86.000	88.485	1.233	0.007	1.4072	21.213	C	0.000	0.626	21.213	100.00	0.385	0.000
						A	0.000	21.213		100.00	9.111	0.000
						B	0.000	21.213		100.00	19.532	0.000
L33 86.000- 81.000	83.486	1.218	0.007	1.3990	21.911	C	0.000	21.213	21.911	100.00	9.111	0.000
						A	0.000	21.911		100.00	6.399	0.000
						B	0.000	21.911		100.00	16.810	0.000
L34 81.000- 76.000	78.486	1.203	0.007	1.3904	22.609	C	0.000	21.911	22.609	100.00	6.399	0.000
						A	0.000	22.609		100.00	6.390	0.000
						B	0.000	22.609		100.00	16.791	0.000
L35 76.000- 71.000	73.487	1.186	0.007	1.3813	23.307	C	0.000	22.609	23.307	100.00	6.390	0.000
						A	0.000	23.307		100.00	6.381	0.000
						B	0.000	23.307		100.00	16.770	0.000
L36 71.000- 66.000	68.487	1.169	0.007	1.3716	24.003	C	0.000	23.307	24.003	100.00	6.381	0.000
						A	0.000	24.003		100.00	6.372	0.000
						B	0.000	24.003		100.00	16.749	0.000
L37 66.000- 63.750	64.872	1.155	0.007	1.3642	11.028	C	0.000	24.003	11.028	100.00	6.372	0.000
						A	0.000	11.028		100.00	5.091	0.000
						B	0.000	11.028		100.00	9.757	0.000
L38 63.750- 63.500	63.625	1.151	0.007	1.3615	1.234	C	0.000	11.028	1.234	100.00	5.091	0.000
						A	0.000	1.234		100.00	0.636	0.000
						B	0.000	1.234		100.00	1.154	0.000
L39 63.500- 58.500	60.988	1.14	0.007	1.3558	25.047	C	0.000	1.234	25.047	100.00	0.636	0.000
						A	0.000	25.047		100.00	8.682	0.000
						B	0.000	25.047		100.00	19.039	0.000
L40 58.500- 51.000	54.723	1.115	0.006	1.3411	38.873	C	0.000	25.047	38.873	100.00	8.682	0.000
						A	0.000	38.873		100.00	12.485	0.000
						B	0.000	38.873		100.00	27.993	0.000
L41 51.000- 50.000	50.500	1.096	0.006	1.3304	5.235	C	0.000	38.873	5.235	100.00	12.485	0.000
						A	0.000	5.235		100.00	2.286	0.000
						B	0.000	5.235		100.00	4.354	0.000
L42 50.000- 45.000	47.489	1.082	0.006	1.3223	26.580	C	0.000	5.235	26.580	100.00	2.286	0.000
						A	0.000	26.580		100.00	11.395	0.000
						B	0.000	26.580		100.00	21.710	0.000
L43 45.000- 40.420	42.701	1.058	0.006	1.3083	24.952	C	0.000	26.580	24.952	100.00	11.395	0.000
						A	0.000	24.952		100.00	10.412	0.000
						B	0.000	24.952		100.00	19.845	0.000
L44 40.420- 40.170	40.295	1.045	0.006	1.3007	1.379	C	0.000	24.952	1.379	100.00	10.412	0.000
						A	0.000	1.379		100.00	0.568	0.000
						B	0.000	1.379		100.00	1.082	0.000
L45 40.170- 40.000	40.085	1.044	0.006	1.3000	0.939	C	0.000	1.379	0.939	100.00	0.568	0.000
						A	0.000	0.939		100.00	0.386	0.000
						B	0.000	0.939		100.00	0.736	0.000
L46 40.000- 35.000	37.489	1.029	0.006	1.2914	27.958	C	0.000	0.939	27.958	100.00	0.386	0.000
						A	0.000	27.958		100.00	15.487	0.000
						B	0.000	27.958		100.00	21.710	0.000
L47 35.000- 33.000	33.998	1.008	0.006	1.2788	11.375	C	0.000	27.958	11.375	100.00	11.434	0.000
						A	0.000	11.375		100.00	9.201	0.000
						B	0.000	11.375		100.00	9.961	0.000
L48 33.000- 32.750	32.875	1.001	0.006	1.2745	1.429	C	0.000	11.375	1.429	100.00	5.856	0.000
						A	0.000	1.429		100.00	1.150	0.000
						B	0.000	1.429		100.00	1.244	0.000
L49 32.750- 19.000	25.798	0.952	0.005	1.2440	81.221	C	0.000	1.429	81.221	100.00	0.732	0.000
						A	0.000	81.221		100.00	48.610	0.000
						B	0.000	81.221		100.00	53.808	0.000
L50 19.000- 18.000	18.500	0.887	0.005	1.2033	6.039	C	0.000	81.221	6.039	100.00	25.710	0.000
						A	0.000	6.039		100.00	3.331	0.000
						B	0.000	6.039		100.00	3.709	0.000
L51 18.000- 13.000	15.490	0.855	0.005	1.1821	30.564	C	0.000	6.039	30.564	100.00	1.665	0.000
						A	0.000	30.564		100.00	16.531	0.000
						B	0.000	30.564		100.00	18.406	0.000
L52 13.000- 8.000	10.490	0.85	0.005	1.1369	31.228	C	0.000	30.564	31.228	100.00	8.265	0.000
						A	0.000	31.228		100.00	16.441	0.000
						B	0.000	31.228		100.00	18.304	0.000
						C	0.000	31.228		100.00	8.220	0.000

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> ksf	t <sub>z</sub> in	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	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>
L53 8.000-6.420	7.209	0.85	0.005	1.0951	10.003	A	0.000	10.003	10.003	100.00	5.169	0.000
						B	0.000	10.003	10.003	100.00	5.754	0.000
						C	0.000	10.003	10.003	100.00	2.584	0.000
L54 6.420-6.170	6.295	0.85	0.005	1.0803	1.585	A	0.000	1.585	1.585	100.00	0.816	0.000
						B	0.000	1.585	1.585	100.00	0.909	0.000
						C	0.000	1.585	1.585	100.00	0.408	0.000
L55 6.170-1.170	3.661	0.85	0.005	1.0233	32.033	A	0.000	32.033	32.033	100.00	16.213	0.000
						B	0.000	32.033	32.033	100.00	18.048	0.000
						C	0.000	32.033	32.033	100.00	8.107	0.000
L56 1.170-0.000	0.584	0.85	0.005	0.8518	7.564	A	0.000	7.564	7.564	100.00	3.714	0.000
						B	0.000	7.564	7.564	100.00	4.133	0.000
						C	0.000	7.564	7.564	100.00	1.857	0.000

### Tower Pressure - Service

**G<sub>H</sub> = 1.100**

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> ksf	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	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>
L1 185.000-180.000	182.500	1.436	0.011	7.737	A	0.000	7.737	7.737	100.00	0.000	0.000
					B	0.000	7.737	7.737	100.00	6.930	0.000
					C	0.000	7.737	7.737	100.00	0.000	0.000
L2 180.000-175.000	177.464	1.428	0.011	8.080	A	0.000	8.080	8.080	100.00	0.000	0.000
					B	0.000	8.080	8.080	100.00	6.930	0.000
					C	0.000	8.080	8.080	100.00	0.000	0.000
L3 175.000-170.000	172.467	1.42	0.011	8.783	A	0.000	8.783	8.783	100.00	0.000	0.000
					B	0.000	8.783	8.783	100.00	6.930	0.000
					C	0.000	8.783	8.783	100.00	0.000	0.000
L4 170.000-165.000	167.469	1.411	0.011	9.487	A	0.000	9.487	9.487	100.00	0.000	0.000
					B	0.000	9.487	9.487	100.00	6.930	0.000
					C	0.000	9.487	9.487	100.00	0.000	0.000
L5 165.000-160.000	162.471	1.402	0.011	10.191	A	0.000	10.191	10.191	100.00	0.000	0.000
					B	0.000	10.191	10.191	100.00	6.930	0.000
					C	0.000	10.191	10.191	100.00	0.000	0.000
L6 160.000-155.000	157.473	1.393	0.011	10.894	A	0.000	10.894	10.894	100.00	0.138	0.000
					B	0.000	10.894	10.894	100.00	7.068	0.000
					C	0.000	10.894	10.894	100.00	0.138	0.000
L7 155.000-154.000	154.499	1.387	0.011	2.263	A	0.000	2.263	2.263	100.00	0.928	0.000
					B	0.000	2.263	2.263	100.00	2.314	0.000
					C	0.000	2.263	2.263	100.00	0.928	0.000
L8 154.000-153.750	153.875	1.386	0.011	0.569	A	0.000	0.569	0.569	100.00	0.326	0.000
					B	0.000	0.569	0.569	100.00	0.672	0.000
					C	0.000	0.569	0.569	100.00	0.326	0.000
L9 153.750-152.500	153.123	1.384	0.011	2.873	A	0.000	2.873	2.873	100.00	1.628	0.000
					B	0.000	2.873	2.873	100.00	3.361	0.000
					C	0.000	2.873	2.873	100.00	1.628	0.000
L10 152.500-152.250	152.375	1.383	0.011	0.579	A	0.000	0.579	0.579	100.00	0.326	0.000
					B	0.000	0.579	0.579	100.00	0.672	0.000
					C	0.000	0.579	0.579	100.00	0.326	0.000
L11 152.250-151.500	151.874	1.382	0.011	1.746	A	0.000	1.746	1.746	100.00	0.977	0.000
					B	0.000	1.746	1.746	100.00	2.017	0.000
					C	0.000	1.746	1.746	100.00	0.977	0.000
L12 151.500-151.250	151.375	1.381	0.011	0.587	A	0.000	0.587	0.587	100.00	0.326	0.000
					B	0.000	0.587	0.587	100.00	0.672	0.000
					C	0.000	0.587	0.587	100.00	0.326	0.000
L13 151.250-146.250	148.726	1.376	0.011	12.102	A	0.000	12.102	12.102	100.00	4.303	0.000
					B	0.000	12.102	12.102	100.00	11.233	0.000
					C	0.000	12.102	12.102	100.00	4.303	0.000
L14 146.250-141.250	143.727	1.366	0.011	12.807	A	0.000	12.807	12.807	100.00	3.750	0.000
					B	0.000	12.807	12.807	100.00	10.680	0.000
					C	0.000	12.807	12.807	100.00	3.750	0.000
L15 141.250-136.250	138.728	1.356	0.011	13.512	A	0.000	13.512	13.512	100.00	3.750	0.000
					B	0.000	13.512	13.512	100.00	10.680	0.000
					C	0.000	13.512	13.512	100.00	3.750	0.000

Section Elevation ft	z ft	$K_z$	$q_z$ ksf	$A_G$ ft <sup>2</sup>	F a c e	$A_F$ ft <sup>2</sup>	$A_R$ ft <sup>2</sup>	$A_{leg}$ ft <sup>2</sup>	Leg %	$C_A A_A$ In Face ft <sup>2</sup>	$C_A A_A$ Out Face ft <sup>2</sup>
L16 136.250- 130.000	133.093	1.344	0.010	17.879	A	0.000	17.879	17.879	100.00	6.354	0.000
					B	0.000	17.879	100.00	15.017	0.000	
					C	0.000	17.879	100.00	6.354	0.000	
L17 130.000- 129.000	129.499	1.336	0.010	2.917	A	0.000	2.917	2.917	100.00	1.417	0.000
					B	0.000	2.917	100.00	2.803	0.000	
					C	0.000	2.917	100.00	1.417	0.000	
L18 129.000- 124.000	126.481	1.33	0.010	15.007	A	0.000	15.007	15.007	100.00	7.083	0.000
					B	0.000	15.007	100.00	14.013	0.000	
					C	0.000	15.007	100.00	7.083	0.000	
L19 124.000- 121.420	122.705	1.321	0.010	8.018	A	0.000	8.018	8.018	100.00	6.155	0.000
					B	0.000	8.018	100.00	9.731	0.000	
					C	0.000	8.018	100.00	6.155	0.000	
L20 121.420- 121.170	121.295	1.318	0.010	0.787	A	0.000	0.787	0.787	100.00	0.604	0.000
					B	0.000	0.787	100.00	0.951	0.000	
					C	0.000	0.787	100.00	0.604	0.000	
L21 121.170- 116.170	118.652	1.312	0.010	16.102	A	0.000	16.102	16.102	100.00	9.586	0.000
					B	0.000	16.102	100.00	16.516	0.000	
					C	0.000	16.102	100.00	9.586	0.000	
L22 116.170- 115.000	115.584	1.305	0.010	3.869	A	0.000	3.869	3.869	100.00	1.950	0.000
					B	0.000	3.869	100.00	3.572	0.000	
					C	0.000	3.869	100.00	1.950	0.000	
L23 115.000- 113.750	114.374	1.302	0.010	4.174	A	0.000	4.174	4.174	100.00	2.083	0.000
					B	0.000	4.174	100.00	3.816	0.000	
					C	0.000	4.174	100.00	2.083	0.000	
L24 113.750- 113.500	113.625	1.3	0.010	0.841	A	0.000	0.841	0.841	100.00	0.417	0.000
					B	0.000	0.841	100.00	0.763	0.000	
					C	0.000	0.841	100.00	0.417	0.000	
L25 113.500- 108.500	110.983	1.294	0.010	17.181	A	0.000	17.181	17.181	100.00	5.667	0.000
					B	0.000	17.181	100.00	12.597	0.000	
					C	0.000	17.181	100.00	5.667	0.000	
L26 108.500- 103.500	105.984	1.281	0.010	17.883	A	0.000	17.883	17.883	100.00	5.000	0.000
					B	0.000	17.883	100.00	11.930	0.000	
					C	0.000	17.883	100.00	5.000	0.000	
L27 103.500- 95.000	99.205	1.263	0.010	32.012	A	0.000	32.012	32.012	100.00	15.170	0.000
					B	0.000	32.012	100.00	26.951	0.000	
					C	0.000	32.012	100.00	15.170	0.000	
L28 95.000- 94.000	94.499	1.251	0.010	3.838	A	0.000	3.838	3.838	100.00	2.000	0.000
					B	0.000	3.838	100.00	3.386	0.000	
					C	0.000	3.838	100.00	2.000	0.000	
L29 94.000- 91.400	92.696	1.246	0.010	10.110	A	0.000	10.110	10.110	100.00	5.200	0.000
					B	0.000	10.110	100.00	8.804	0.000	
					C	0.000	10.110	100.00	5.200	0.000	
L30 91.400- 91.150	91.275	1.242	0.010	0.983	A	0.000	0.983	0.983	100.00	0.500	0.000
					B	0.000	0.983	100.00	0.847	0.000	
					C	0.000	0.983	100.00	0.500	0.000	
L31 91.150- 91.000	91.075	1.241	0.010	0.591	A	0.000	0.591	0.591	100.00	0.300	0.000
					B	0.000	0.591	100.00	0.508	0.000	
					C	0.000	0.591	100.00	0.300	0.000	
L32 91.000- 86.000	88.485	1.233	0.010	20.041	A	0.000	20.041	20.041	100.00	7.110	0.000
					B	0.000	20.041	100.00	14.040	0.000	
					C	0.000	20.041	100.00	7.110	0.000	
L33 86.000- 81.000	83.486	1.218	0.010	20.745	A	0.000	20.745	20.745	100.00	5.000	0.000
					B	0.000	20.745	100.00	11.930	0.000	
					C	0.000	20.745	100.00	5.000	0.000	
L34 81.000- 76.000	78.486	1.203	0.009	21.450	A	0.000	21.450	21.450	100.00	5.000	0.000
					B	0.000	21.450	100.00	11.930	0.000	
					C	0.000	21.450	100.00	5.000	0.000	
L35 76.000- 71.000	73.487	1.186	0.009	22.155	A	0.000	22.155	22.155	100.00	5.000	0.000
					B	0.000	22.155	100.00	11.930	0.000	
					C	0.000	22.155	100.00	5.000	0.000	
L36 71.000- 66.000	68.487	1.169	0.009	22.860	A	0.000	22.860	22.860	100.00	5.000	0.000
					B	0.000	22.860	100.00	11.930	0.000	
					C	0.000	22.860	100.00	5.000	0.000	
L37 66.000- 63.750	64.872	1.155	0.009	10.517	A	0.000	10.517	10.517	100.00	4.000	0.000
					B	0.000	10.517	100.00	7.119	0.000	
					C	0.000	10.517	100.00	4.000	0.000	
L38 63.750- 63.500	63.625	1.151	0.009	1.177	A	0.000	1.177	1.177	100.00	0.500	0.000
					B	0.000	1.177	100.00	0.846	0.000	
					C	0.000	1.177	100.00	0.846	0.000	

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> ksf	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	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>
L39 63.500-58.500	60.988	1.14	0.009	23.917	C	0.000	1.177	23.917	100.00	0.500	0.000
					A	0.000	23.917		100.00	6.830	0.000
					B	0.000	23.917		100.00	13.760	0.000
L40 58.500-51.000	54.723	1.115	0.009	37.196	C	0.000	23.917	37.196	100.00	6.830	0.000
					A	0.000	37.196		100.00	9.690	0.000
					B	0.000	37.196		100.00	20.085	0.000
L41 51.000-50.000	50.500	1.096	0.009	5.011	C	0.000	37.196	5.011	100.00	9.690	0.000
					A	0.000	5.011		100.00	1.750	0.000
					B	0.000	5.011		100.00	3.136	0.000
L42 50.000-45.000	47.489	1.082	0.008	25.478	C	0.000	5.011	25.478	100.00	1.750	0.000
					A	0.000	25.478		100.00	8.750	0.000
					B	0.000	25.478		100.00	15.680	0.000
L43 45.000-40.420	42.701	1.058	0.008	23.953	C	0.000	25.478	23.953	100.00	8.750	0.000
					A	0.000	23.953		100.00	8.015	0.000
					B	0.000	23.953		100.00	14.363	0.000
L44 40.420-40.170	40.295	1.045	0.008	1.325	C	0.000	23.953	1.325	100.00	8.015	0.000
					A	0.000	1.325		100.00	0.438	0.000
					B	0.000	1.325		100.00	0.784	0.000
L45 40.170-40.000	40.085	1.044	0.008	0.902	C	0.000	1.325	0.902	100.00	0.438	0.000
					A	0.000	0.902		100.00	0.297	0.000
					B	0.000	0.902		100.00	0.533	0.000
L46 40.000-35.000	37.489	1.029	0.008	26.882	C	0.000	0.902	26.882	100.00	0.297	0.000
					A	0.000	26.882		100.00	12.667	0.000
					B	0.000	26.882		100.00	16.168	0.000
L47 35.000-33.000	33.998	1.008	0.008	10.949	C	0.000	26.882	10.949	100.00	9.238	0.000
					A	0.000	10.949		100.00	7.667	0.000
					B	0.000	10.949		100.00	7.605	0.000
L48 33.000-32.750	32.875	1.001	0.008	1.376	C	0.000	10.949	1.376	100.00	4.833	0.000
					A	0.000	1.376		100.00	0.958	0.000
					B	0.000	1.376		100.00	0.951	0.000
L49 32.750-19.000	25.798	0.952	0.007	78.370	C	0.000	1.376	78.370	100.00	0.604	0.000
					A	0.000	78.370		100.00	41.208	0.000
					B	0.000	78.370		100.00	40.787	0.000
L50 19.000-18.000	18.500	0.887	0.007	5.831	C	0.000	78.370	5.831	100.00	21.729	0.000
					A	0.000	5.831		100.00	2.833	0.000
					B	0.000	5.831		100.00	2.803	0.000
L51 18.000-13.000	15.490	0.855	0.007	29.579	C	0.000	5.831	29.579	100.00	1.417	0.000
					A	0.000	29.579		100.00	14.167	0.000
					B	0.000	29.579		100.00	14.013	0.000
L52 13.000-8.000	10.490	0.85	0.007	30.281	C	0.000	29.579	30.281	100.00	7.083	0.000
					A	0.000	30.281		100.00	14.167	0.000
					B	0.000	30.281		100.00	14.013	0.000
L53 8.000-6.420	7.209	0.85	0.007	9.715	C	0.000	30.281	9.715	100.00	7.083	0.000
					A	0.000	9.715		100.00	4.477	0.000
					B	0.000	9.715		100.00	4.428	0.000
L54 6.420-6.170	6.295	0.85	0.007	1.540	C	0.000	9.715	1.540	100.00	2.238	0.000
					A	0.000	1.540		100.00	0.708	0.000
					B	0.000	1.540		100.00	0.701	0.000
L55 6.170-1.170	3.661	0.85	0.007	31.180	C	0.000	1.540	31.180	100.00	0.354	0.000
					A	0.000	31.180		100.00	14.167	0.000
					B	0.000	31.180		100.00	14.013	0.000
L56 1.170-0.000	0.584	0.85	0.007	7.397	C	0.000	31.180	7.397	100.00	7.083	0.000
					A	0.000	7.397		100.00	3.315	0.000
					B	0.000	7.397		100.00	3.279	0.000
					C	0.000	7.397		100.00	1.658	0.000

### Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice

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

**Maximum Member Forces**

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	185 - 180	Pole	Max Tension	26	0.000	0.000	-0.000
			Max. Compression	26	-8.560	-0.112	0.466
			Max. Mx	8	-3.797	-29.916	0.201
			Max. My	2	-3.797	-0.030	30.230
			Max. Vy	8	6.215	-29.916	0.201
			Max. Vx	2	-6.242	-0.030	30.230
			Max. Torque	8			0.156
			Max Tension	1	0.000	0.000	0.000
L2	180 - 175	Pole	Max. Compression	26	-9.213	-0.227	0.540
			Max. Mx	8	-4.110	-62.231	0.229
			Max. My	2	-4.111	-0.061	62.669
			Max. Vy	8	6.709	-62.231	0.229
			Max. Vx	2	-6.736	-0.061	62.669
			Max. Torque	8			0.156
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-22.364	-0.843	1.672
L3	175 - 170	Pole	Max. Mx	8	-8.722	-140.763	0.395
			Max. My	2	-8.736	-0.241	140.896
			Max. Vy	8	15.935	-140.763	0.395
			Max. Vx	2	-15.860	-0.241	140.896

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L4	170 - 165	Pole	Max. Torque	8			1.441
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-23.177	-0.980	1.765
			Max. Mx	8	-9.218	-221.808	0.435
			Max. My	2	-9.232	-0.281	221.554
			Max. Vy	8	16.484	-221.808	0.435
			Max. Vx	2	-16.409	-0.281	221.554
L5	165 - 160	Pole	Max. Torque	8			1.440
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-24.845	-1.124	1.858
			Max. Mx	8	-10.061	-308.795	0.474
			Max. My	2	-10.076	-0.323	308.150
			Max. Vy	8	17.687	-308.795	0.474
			Max. Vx	2	-17.612	-0.323	308.150
L6	160 - 155	Pole	Max. Torque	8			1.440
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-25.777	-1.274	1.953
			Max. Mx	8	-10.670	-398.739	0.513
			Max. My	2	-10.684	-0.367	397.701
			Max. Vy	8	18.293	-398.739	0.513
			Max. Vx	2	-18.217	-0.367	397.701
L7	155 - 154	Pole	Max. Torque	8			1.439
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-34.584	0.231	1.085
			Max. Mx	8	-13.932	-421.498	0.407
			Max. My	2	-13.959	-0.093	420.441
			Max. Vy	8	23.310	-421.498	0.407
			Max. Vx	2	-23.093	-0.093	420.441
L8	154 - 153.75	Pole	Max. Torque	18			-1.115
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-34.656	0.221	1.094
			Max. Mx	8	-13.983	-427.331	0.439
			Max. My	2	-14.010	-0.124	426.219
			Max. Vy	8	23.352	-427.331	0.439
			Max. Vx	2	-23.135	-0.124	426.219
L9	153.75 - 152.5	Pole	Max. Torque	18			-1.115
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-35.015	0.184	1.116
			Max. Mx	8	-14.174	-456.670	0.593
			Max. My	2	-14.202	-0.281	455.273
			Max. Vy	8	23.587	-456.670	0.593
			Max. Vx	2	-23.358	-0.281	455.273
L10	152.5 - 152.25	Pole	Max. Torque	18			-1.115
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-35.100	0.172	1.126
			Max. Mx	8	-14.237	-462.573	0.626
			Max. My	2	-14.265	-0.312	461.118
			Max. Vy	8	23.631	-462.573	0.626
			Max. Vx	2	-23.404	-0.312	461.118
L11	152.25 - 151.5	Pole	Max. Torque	18			-1.115
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-35.358	0.151	1.137
			Max. Mx	8	-14.393	-480.354	0.718
			Max. My	2	-14.421	-0.407	478.722
			Max. Vy	8	23.777	-480.354	0.718
			Max. Vx	2	-23.541	-0.407	478.722
L12	151.5 - 151.25	Pole	Max. Torque	18			-1.115
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-35.435	0.141	1.146
			Max. Mx	8	-14.440	-486.305	0.750
			Max. My	2	-14.469	-0.438	484.614
			Max. Vy	8	23.825	-486.305	0.750
			Max. Vx	2	-23.590	-0.438	484.614
			Max. Torque	18			-1.115

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L13	151.25 - 146.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-36.885	-0.023	1.245
			Max. Mx	8	-15.349	-607.700	1.371
			Max. My	2	-15.378	-1.067	604.784
			Max. Vy	8	24.735	-607.700	1.371
			Max. Vx	2	-24.490	-1.067	604.784
L14	146.25 - 141.25	Pole	Max. Torque	18			-1.115
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-38.349	-0.195	1.349
			Max. Mx	8	-16.304	-733.679	1.994
			Max. My	2	-16.331	-1.700	729.519
			Max. Vy	8	25.661	-733.679	1.994
L15	141.25 - 136.25	Pole	Max. Vx	2	-25.415	-1.700	729.519
			Max. Torque	18			-1.114
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-39.853	-0.366	1.446
			Max. Mx	8	-17.293	-864.362	2.618
			Max. My	2	-17.319	-2.335	858.955
L16	136.25 - 130	Pole	Max. Vy	8	26.617	-864.362	2.618
			Max. Vx	2	-26.372	-2.335	858.955
			Max. Torque	18			-1.114
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-40.251	-0.410	1.471
			Max. Mx	8	-17.544	-897.791	2.774
L17	130 - 129	Pole	Max. My	2	-17.570	-2.494	892.070
			Max. Vy	8	26.869	-897.791	2.774
			Max. Vx	2	-26.620	-2.494	892.070
			Max. Torque	18			-1.114
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-43.552	-0.627	1.593
L18	129 - 124	Pole	Max. Mx	8	-19.753	-1063.041	3.526
			Max. My	2	-19.780	-3.260	1055.746
			Max. Vy	8	28.213	-1063.041	3.526
			Max. Vx	2	-27.942	-3.260	1055.746
			Max. Torque	18			-1.113
			Max Tension	1	0.000	0.000	0.000
L19	124 - 121.42	Pole	Max. Compression	26	-45.448	-0.814	1.699
			Max. Mx	8	-20.976	-1206.862	4.153
			Max. My	2	-21.004	-3.902	1198.103
			Max. Vy	8	29.320	-1206.862	4.153
			Max. Vx	2	-29.013	-3.902	1198.103
			Max. Torque	18			-1.113
L20	121.42 - 121.17	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-46.527	-0.914	1.755
			Max. Mx	8	-21.618	-1283.295	4.477
			Max. My	2	-21.644	-4.234	1273.744
			Max. Vy	8	29.931	-1283.295	4.477
			Max. Vx	2	-29.633	-4.234	1273.744
L21	121.17 - 116.17	Pole	Max. Torque	18			-1.113
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-46.637	-0.929	1.769
			Max. Mx	8	-21.697	-1290.786	4.509
			Max. My	2	-21.723	-4.266	1281.160
			Max. Vy	8	29.988	-1290.786	4.509
L22	116.17 - 115	Pole	Max. Vx	2	-29.696	-4.266	1281.160
			Max. Torque	18			-1.113
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-48.755	-1.123	1.873
			Max. Mx	8	-23.047	-1443.624	5.136
			Max. My	2	-23.071	-4.911	1432.531
L22	116.17 - 115	Pole	Max. Vy	8	31.150	-1443.624	5.136
			Max. Vx	2	-30.870	-4.911	1432.531
			Max. Torque	18			-1.113
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-48.755	-1.123	1.873
			Max. Mx	8	-23.047	-1443.624	5.136

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L23	115 - 113.75	Pole	Max. Compression	26	-49.247	-1.170	1.900
			Max. Mx	8	-23.370	-1480.230	5.284
			Max. My	2	-23.393	-5.062	1468.806
			Max. Vy	8	31.421	-1480.230	5.284
			Max. Vx	2	-31.145	-5.062	1468.806
			Max. Torque	18			-1.112
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-49.815	-1.222	1.929
			Max. Mx	8	-23.755	-1519.690	5.441
			Max. My	2	-23.778	-5.224	1507.919
L24	113.75 - 113.5	Pole	Max. Vy	8	31.715	-1519.690	5.441
			Max. Vx	2	-31.443	-5.224	1507.919
			Max. Torque	18			-1.112
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-49.920	-1.237	1.943
			Max. Mx	8	-23.833	-1527.627	5.473
			Max. My	2	-23.855	-5.256	1515.788
			Max. Vy	8	31.771	-1527.627	5.473
			Max. Vx	2	-31.507	-5.256	1515.788
			Max. Torque	18			-1.112
L25	113.5 - 108.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-51.931	-1.443	2.054
			Max. Mx	8	-25.232	-1688.695	6.102
			Max. My	2	-25.240	-5.904	1676.167
			Max. Vy	8	32.657	-1688.695	6.102
			Max. Vx	2	-32.664	-5.904	1676.167
			Max. Torque	18			-1.112
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-53.963	-1.661	2.177
			Max. Mx	8	-26.677	-1854.240	6.731
L26	108.5 - 103.5	Pole	Max. My	2	-26.673	-6.554	1842.403
			Max. Vy	8	33.563	-1854.240	6.731
			Max. Vx	2	-33.844	-6.554	1842.403
			Max. Torque	18			-1.112
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-55.063	-1.775	2.240
			Max. Mx	8	-27.406	-1938.910	7.047
			Max. My	2	-27.402	-6.880	1927.769
			Max. Vy	8	34.173	-1938.910	7.047
			Max. Vx	2	-34.459	-6.880	1927.769
L27	103.5 - 95	Pole	Max. Torque	18			-1.112
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-60.698	-2.095	2.422
			Max. Mx	8	-31.437	-2184.791	7.931
			Max. My	2	-31.433	-7.794	2175.670
			Max. Vy	8	36.071	-2184.791	7.931
			Max. Vx	2	-36.370	-7.794	2175.670
			Max. Torque	18			-1.111
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-62.079	-2.216	2.490
L28	95 - 94	Pole	Max. Mx	8	-32.403	-2279.461	8.261
			Max. My	2	-32.399	-8.135	2271.104
			Max. Vy	8	36.751	-2279.461	8.261
			Max. Vx	2	-37.050	-8.135	2271.104
			Max. Torque	18			-1.111
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-62.195	-2.234	2.506
			Max. Mx	8	-32.489	-2288.658	8.293
			Max. My	2	-32.486	-8.167	2280.375
			Max. Vy	8	36.813	-2288.658	8.293
L29	94 - 91.4	Pole	Max. Vx	2	-37.121	-8.167	2280.375
			Max. Torque	18			-1.111
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-62.264	-2.246	2.518
			Max. Mx	8	-32.537	-2294.183	8.312
			Max. My	2	-32.533	-8.187	2285.946
			Max. Vy	8	36.813	-2288.658	8.293
			Max. Vx	2	-37.121	-8.167	2280.375
			Max. Torque	18			-1.111
			Max Tension	1	0.000	0.000	0.000
L30	91.4 - 91.15	Pole	Max. Compression	26	-62.264	-2.246	2.518
			Max. Mx	8	-32.537	-2294.183	8.312
			Max. My	2	-32.533	-8.187	2285.946
			Max. Vy	8	36.813	-2288.658	8.293
			Max. Vx	2	-37.121	-8.167	2280.375
			Max. Torque	18			-1.111
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-62.264	-2.246	2.518
			Max. Mx	8	-32.537	-2294.183	8.312
			Max. My	2	-32.533	-8.187	2285.946
L31	91.15 - 91	Pole	Max. Vy	8	36.813	-2288.658	8.293
			Max. Vx	2	-37.121	-8.167	2280.375
			Max. Torque	18			-1.111
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-62.264	-2.246	2.518
			Max. Mx	8	-32.537	-2294.183	8.312
			Max. My	2	-32.533	-8.187	2285.946
			Max. Vy	8	36.813	-2288.658	8.293
			Max. Vx	2	-37.121	-8.167	2280.375
			Max. Torque	18			-1.111



Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L32	91 - 86	Pole	Max. Vy	8	36.863	-2294.183	8.312
			Max. Vx	2	-37.188	-8.187	2285.946
			Max. Torque	18			-1.111
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-64.686	-2.475	2.636
			Max. Mx	8	-34.259	-2481.610	8.944
			Max. My	2	-34.257	-8.844	2474.768
			Max. Vy	8	38.123	-2481.610	8.944
L33	86 - 81	Pole	Max. Vx	2	-38.394	-8.844	2474.768
			Max. Torque	18			-1.111
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-67.092	-2.722	2.776
			Max. Mx	8	-36.035	-2675.397	9.578
			Max. My	2	-36.043	-9.502	2669.167
			Max. Vy	8	39.394	-2675.397	9.578
			Max. Vx	2	-39.378	-9.502	2669.167
L34	81 - 76	Pole	Max. Torque	18			-1.111
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-69.548	-2.976	2.919
			Max. Mx	8	-37.856	-2875.583	10.211
			Max. My	2	-37.873	-10.161	2868.520
			Max. Vy	8	40.682	-2875.583	10.211
			Max. Vx	2	-40.376	-10.161	2868.520
			Max. Torque	18			-1.111
L35	76 - 71	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-72.054	-3.236	3.066
			Max. Mx	8	-39.723	-3082.246	10.845
			Max. My	2	-39.746	-10.822	3072.895
			Max. Vy	8	41.985	-3082.246	10.845
			Max. Vx	2	-41.387	-10.822	3072.895
			Max. Torque	18			-1.111
			Max Tension	1	0.000	0.000	0.000
L36	71 - 66	Pole	Max. Compression	26	-74.608	-3.503	3.217
			Max. Mx	8	-41.635	-3295.455	11.478
			Max. My	2	-41.663	-11.483	3282.350
			Max. Vy	8	43.301	-3295.455	11.478
			Max. Vx	14	42.447	9.805	-3226.042
			Max. Torque	18			-1.111
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-75.828	-3.625	3.285
L37	66 - 63.75	Pole	Max. Mx	8	-42.509	-3393.574	11.763
			Max. My	2	-42.540	-11.781	3378.280
			Max. Vy	8	43.914	-3393.574	11.763
			Max. Vx	14	43.077	10.039	-3322.210
			Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-75.966	-3.645	3.303
			Max. Mx	8	-42.617	-3404.563	11.795
L38	63.75 - 63.5	Pole	Max. My	2	-42.648	-11.814	3389.007
			Max. Vy	8	43.980	-3404.563	11.795
			Max. Vx	14	43.146	10.066	-3332.983
			Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-78.648	-3.915	3.449
			Max. Mx	8	-44.594	-3627.056	12.428
			Max. My	2	-44.621	-12.477	3606.250
L39	63.5 - 58.5	Pole	Max. Vy	8	45.016	-3627.056	12.428
			Max. Vx	14	44.512	10.583	-3552.016
			Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-78.920	-3.945	3.468
			Max. Mx	8	-44.801	-3649.591	12.491
			Max. My	2	-44.828	-12.543	3628.261
			Max. Vy	8	45.114	-3649.591	12.491
L40	58.5 - 51	Pole	Max. Vx	14	44.641	10.634	-3574.295
			Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-86.918	-4.399	3.723
			Max. Mx	8	-50.882	-4017.833	13.505
			Max. My	2			
			Max. Vy	8			
			Max. Vx	8			
L41	51 - 50	Pole	Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-86.918	-4.399	3.723
			Max. Mx	8	-50.882	-4017.833	13.505

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L42	50 - 45	Pole	Max. My	2	-50.905	-13.606	3988.133
			Max. Vy	8	46.924	-4017.833	13.505
			Max. Vx	14	46.951	11.458	-3940.544
			Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-90.042	-4.687	3.886
			Max. Mx	8	-53.224	-4255.059	14.139
			Max. My	2	-53.240	-14.272	4221.208
			Max. Vy	8	47.964	-4255.059	14.139
			Max. Vx	14	48.319	11.969	-4178.601
L43	45 - 40.42	Pole	Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-92.941	-4.956	4.038
			Max. Mx	8	-55.407	-4476.918	14.720
			Max. My	2	-55.418	-14.883	4440.646
			Max. Vy	8	48.916	-4476.918	14.720
			Max. Vx	14	49.569	12.435	-4402.653
			Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			L44	40.42 - 40.17	Pole	Max. Compression	26
Max. Mx	8	-55.524				-4489.155	14.751
Max. My	2	-55.534				-14.916	4452.790
Max. Vy	8	48.963				-4489.155	14.751
Max. Vx	14	49.632				12.460	-4415.048
Max. Torque	18						-1.110
Max Tension	1	0.000				0.000	0.000
Max. Compression	26	-93.186				-4.988	4.063
Max. Mx	8	-55.599				-4497.482	14.773
Max. My	2	-55.608				-14.939	4461.056
L45	40.17 - 40	Pole	Max. Vy	8	49.005	-4497.482	14.773
			Max. Vx	14	49.685	12.478	-4423.487
			Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-96.400	-5.206	4.251
			Max. Mx	8	-57.998	-4745.901	15.406
			Max. My	2	-58.006	-15.606	4707.631
			Max. Vy	8	50.367	-4745.901	15.406
			Max. Vx	14	51.062	12.982	-4675.217
			Max. Torque	18			-1.110
L46	40 - 35	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-97.739	-5.265	4.345
			Max. Mx	8	-58.977	-4847.215	15.659
			Max. My	2	-58.985	-15.872	4808.166
			Max. Vy	8	50.942	-4847.215	15.659
			Max. Vx	14	51.631	13.183	-4777.864
			Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-97.932	-5.277	4.364
			Max. Mx	8	-59.133	-4859.961	15.690
L47	35 - 33	Pole	Max. My	2	-59.141	-15.906	4820.811
			Max. Vy	8	51.010	-4859.961	15.690
			Max. Vx	14	51.698	13.208	-4790.776
			Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-101.497	-5.419	4.582
			Max. Mx	8	-61.939	-5105.338	16.292
			Max. My	2	-61.945	-16.542	5064.149
			Max. Vy	8	52.300	-5105.338	16.292
			Max. Vx	14	52.945	13.682	-5039.193
L48	33 - 32.75	Pole	Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-115.044	-5.727	5.058
			Max. Mx	8	-72.899	-5642.987	17.557
			Max. My	2	-72.905	-17.879	5596.713
			Max. Vy	8	55.198	-5642.987	17.557
			Max. Vx	14	55.747	14.676	-5582.545
			Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			L49	32.75 - 19	Pole	Max. Compression	26
Max. Mx	8	-72.899				-5642.987	17.557
Max. My	2	-72.905				-17.879	5596.713
Max. Vy	8	55.198				-5642.987	17.557
Max. Vx	14	55.747				14.676	-5582.545
Max. Torque	18						-1.110
Max Tension	1	0.000				0.000	0.000
Max. Compression	26	-115.044				-5.727	5.058
Max. Mx	8	-72.899				-5642.987	17.557
Max. My	2	-72.905				-17.879	5596.713
L50	19 - 18	Pole	Max. Vy	8	55.198	-5642.987	17.557
			Max. Vx	14	55.747	14.676	-5582.545
			Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-115.044	-5.727	5.058
			Max. Mx	8	-72.899	-5642.987	17.557
			Max. My	2	-72.905	-17.879	5596.713
			Max. Vy	8	55.198	-5642.987	17.557
			Max. Vx	14	55.747	14.676	-5582.545
			Max. Torque	18			-1.110
L51	18 - 13	Pole	Max. Torque	18			-1.110
			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
L52	13 - 8	Pole	Max. Compression	26	-118.861	-5.885	5.293
			Max. Mx	8	-75.989	-5922.081	18.189
			Max. My	2	-75.993	-18.548	5872.876
			Max. Vy	8	56.437	-5922.081	18.189
			Max. Vx	14	56.938	15.169	-5864.126
			Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-122.704	-6.044	5.526
			Max. Mx	8	-79.129	-6207.400	18.821
			Max. My	2	-79.131	-19.218	6155.026
L53	8 - 6.42	Pole	Max. Vy	8	57.688	-6207.400	18.821
			Max. Vx	14	58.142	15.658	-6151.693
			Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-123.922	-6.094	5.599
			Max. Mx	8	-80.127	-6298.869	19.020
			Max. My	2	-80.129	-19.430	6245.444
			Max. Vy	8	58.096	-6298.869	19.020
			Max. Vx	14	58.535	15.812	-6243.822
			Max. Torque	18			-1.110
L54	6.42 - 6.17	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-124.097	-6.104	5.613
			Max. Mx	8	-80.280	-6313.400	19.051
			Max. My	2	-80.282	-19.464	6259.807
			Max. Vy	8	58.143	-6313.400	19.051
			Max. Vx	14	58.580	15.836	-6258.456
			Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-127.561	-6.263	5.831
			Max. Mx	8	-83.069	-6607.520	19.682
L55	6.17 - 1.17	Pole	Max. My	14	-83.069	16.320	-6554.495
			Max. Vy	8	59.484	-6607.520	19.682
			Max. Vx	14	59.874	16.320	-6554.495
			Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-128.351	-6.299	5.877
			Max. Mx	8	-83.729	-6677.313	19.829
			Max. My	14	-83.729	16.433	-6624.703
			Max. Vy	8	59.802	-6677.313	19.829
			Max. Vx	14	60.180	16.433	-6624.703
L56	1.17 - 0	Pole	Max. Torque	18			-1.110
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-128.351	-6.299	5.877
			Max. Mx	8	-83.729	-6677.313	19.829
			Max. My	14	-83.729	16.433	-6624.703
			Max. Vy	8	59.802	-6677.313	19.829
			Max. Vx	14	60.180	16.433	-6624.703
			Max. Torque	18			-1.110

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	128.351	0.001	-0.001
	Max. H <sub>x</sub>	21	62.802	57.276	-0.115
	Max. H <sub>z</sub>	3	62.802	-0.115	59.066
	Max. M <sub>x</sub>	2	6619.374	-0.115	59.066
	Max. M <sub>z</sub>	8	6677.313	-59.792	0.115
	Max. Torsion	6	1.110	-52.343	30.185
	Min. Vert	9	62.802	-59.792	0.115
	Min. H <sub>x</sub>	8	83.737	-59.792	0.115
	Min. H <sub>z</sub>	14	83.737	0.115	-60.170
	Min. M <sub>x</sub>	14	-6624.703	0.115	-60.170
	Min. M <sub>z</sub>	20	-6525.826	57.276	-0.115
	Min. Torsion	18	-1.110	51.388	-29.633

### 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	69.781	0.000	-0.000	-1.189	-1.571	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	83.737	0.115	-59.066	-6619.374	-20.291	-0.608
0.9 Dead+1.0 Wind 0 deg - No Ice	62.802	0.115	-59.066	-6575.606	-19.669	-0.603
1.2 Dead+1.0 Wind 30 deg - No Ice	83.737	29.768	-51.269	-5666.984	-3300.353	-0.992
0.9 Dead+1.0 Wind 30 deg - No Ice	62.802	29.768	-51.269	-5629.602	-3278.296	-0.985
1.2 Dead+1.0 Wind 60 deg - No Ice	83.737	52.343	-30.185	-3330.456	-5778.701	-1.110
0.9 Dead+1.0 Wind 60 deg - No Ice	62.802	52.343	-30.185	-3308.432	-5740.630	-1.103
1.2 Dead+1.0 Wind 90 deg - No Ice	83.737	59.792	-0.115	-19.829	-6677.313	-0.930
0.9 Dead+1.0 Wind 90 deg - No Ice	62.802	59.792	-0.115	-19.322	-6633.053	-0.925
1.2 Dead+1.0 Wind 120 deg - No Ice	83.737	51.272	29.434	3291.654	-5753.302	-0.502
0.9 Dead+1.0 Wind 120 deg - No Ice	62.802	51.272	29.434	3270.421	-5715.034	-0.500
1.2 Dead+1.0 Wind 150 deg - No Ice	83.737	29.564	51.146	5644.309	-3267.753	0.061
0.9 Dead+1.0 Wind 150 deg - No Ice	62.802	29.564	51.146	5607.824	-3245.930	0.059
1.2 Dead+1.0 Wind 180 deg - No Ice	83.737	-0.115	60.170	6624.703	16.433	0.608
0.9 Dead+1.0 Wind 180 deg - No Ice	62.802	-0.115	60.170	6581.969	16.793	0.603
1.2 Dead+1.0 Wind 210 deg - No Ice	83.737	-29.807	51.335	5754.563	3348.752	0.992
0.9 Dead+1.0 Wind 210 deg - No Ice	62.802	-29.807	51.335	5717.215	3327.261	0.985
1.2 Dead+1.0 Wind 240 deg - No Ice	83.737	-51.388	29.633	3323.436	5767.768	1.110
0.9 Dead+1.0 Wind 240 deg - No Ice	62.802	-51.388	29.633	3301.976	5730.349	1.103
1.2 Dead+1.0 Wind 270 deg - No Ice	83.737	-57.276	0.115	16.894	6525.826	0.931
0.9 Dead+1.0 Wind 270 deg - No Ice	62.802	-57.276	0.115	17.140	6483.511	0.925
1.2 Dead+1.0 Wind 300 deg - No Ice	83.737	-52.228	-29.985	-3298.683	5756.536	0.502
0.9 Dead+1.0 Wind 300 deg - No Ice	62.802	-52.228	-29.985	-3276.884	5719.573	0.500
1.2 Dead+1.0 Wind 330 deg - No Ice	83.737	-29.603	-51.212	-5737.776	3316.163	-0.061
0.9 Dead+1.0 Wind 330 deg - No Ice	62.802	-29.603	-51.212	-5699.815	3294.904	-0.059
1.2 Dead+1.0 Ice+1.0 Temp	128.351	-0.001	0.001	-5.877	-6.299	-0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	128.351	0.018	-10.867	-1339.954	-9.683	-0.107
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	128.351	5.465	-9.420	-1159.574	-676.877	-0.197
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	128.351	9.445	-5.448	-674.081	-1164.825	-0.235
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	128.351	10.961	-0.018	-9.315	-1347.628	-0.209
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	128.351	9.429	5.417	657.922	-1164.675	-0.128
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	128.351	5.433	9.402	1143.969	-671.638	-0.012
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	128.351	-0.018	10.864	1324.054	-3.633	0.107
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	128.351	-5.467	9.424	1150.988	665.866	0.197
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	128.351	-9.447	5.449	663.161	1154.385	0.234

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
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	128.351	-10.867	0.018	-3.265	1327.790	0.209
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	128.351	-9.426	-5.416	-668.843	1148.486	0.128
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	128.351	-5.435	-9.405	-1160.544	660.628	0.012
Dead+Wind 0 deg - Service	69.781	0.023	-11.849	-1323.994	-5.269	-0.122
Dead+Wind 30 deg - Service	69.781	5.972	-10.285	-1133.679	-660.905	-0.200
Dead+Wind 60 deg - Service	69.781	10.501	-6.056	-666.681	-1156.362	-0.224
Dead+Wind 90 deg - Service	69.781	11.995	-0.023	-4.892	-1335.863	-0.188
Dead+Wind 120 deg - Service	69.781	10.286	5.905	657.047	-1151.254	-0.102
Dead+Wind 150 deg - Service	69.781	5.931	10.261	1127.280	-654.387	0.012
Dead+Wind 180 deg - Service	69.781	-0.023	12.071	1323.210	2.069	0.122
Dead+Wind 210 deg - Service	69.781	-5.980	10.299	1149.373	668.179	0.200
Dead+Wind 240 deg - Service	69.781	-10.310	5.945	663.402	1151.722	0.224
Dead+Wind 270 deg - Service	69.781	-11.490	0.023	2.445	1303.128	0.188
Dead+Wind 300 deg - Service	69.781	-10.478	-6.016	-660.326	1149.493	0.102
Dead+Wind 330 deg - Service	69.781	-5.939	-10.274	-1147.869	661.661	-0.012

### 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	-69.781	0.000	-0.000	69.781	0.000	0.000%
2	0.115	-83.737	-59.067	-0.115	83.737	59.066	0.001%
3	0.115	-62.802	-59.067	-0.115	62.802	59.066	0.001%
4	29.768	-83.737	-51.269	-29.768	83.737	51.269	0.000%
5	29.768	-62.802	-51.269	-29.768	62.802	51.269	0.000%
6	52.343	-83.737	-30.185	-52.343	83.737	30.185	0.000%
7	52.343	-62.802	-30.185	-52.343	62.802	30.185	0.000%
8	59.792	-83.737	-0.115	-59.792	83.737	0.115	0.000%
9	59.792	-62.802	-0.115	-59.792	62.802	0.115	0.001%
10	51.272	-83.737	29.434	-51.272	83.737	-29.434	0.000%
11	51.272	-62.802	29.434	-51.272	62.802	-29.434	0.000%
12	29.564	-83.737	51.146	-29.564	83.737	-51.146	0.000%
13	29.564	-62.802	51.146	-29.564	62.802	-51.146	0.000%
14	-0.115	-83.737	60.171	0.115	83.737	-60.170	0.000%
15	-0.115	-62.802	60.171	0.115	62.802	-60.170	0.001%
16	-29.807	-83.737	51.335	29.807	83.737	-51.335	0.000%
17	-29.807	-62.802	51.335	29.807	62.802	-51.335	0.000%
18	-51.388	-83.737	29.633	51.388	83.737	-29.633	0.000%
19	-51.388	-62.802	29.633	51.388	62.802	-29.633	0.000%
20	-57.277	-83.737	0.115	57.276	83.737	-0.115	0.001%
21	-57.277	-62.802	0.115	57.276	62.802	-0.115	0.001%
22	-52.228	-83.737	-29.985	52.228	83.737	29.985	0.000%
23	-52.228	-62.802	-29.985	52.228	62.802	29.985	0.000%
24	-29.603	-83.737	-51.212	29.603	83.737	51.212	0.000%
25	-29.603	-62.802	-51.212	29.603	62.802	51.212	0.000%
26	0.000	-128.351	0.000	0.001	128.351	-0.001	0.001%
27	0.018	-128.351	-10.867	-0.018	128.351	10.867	0.000%
28	5.465	-128.351	-9.420	-5.465	128.351	9.420	0.000%
29	9.445	-128.351	-5.448	-9.445	128.351	5.448	0.000%
30	10.961	-128.351	-0.018	-10.961	128.351	0.018	0.000%
31	9.429	-128.351	5.417	-9.429	128.351	-5.417	0.000%
32	5.433	-128.351	9.402	-5.433	128.351	-9.402	0.000%
33	-0.018	-128.351	10.864	0.018	128.351	-10.864	0.000%
34	-5.467	-128.351	9.424	5.467	128.351	-9.424	0.000%
35	-9.447	-128.351	5.449	9.447	128.351	-5.449	0.000%
36	-10.867	-128.351	0.018	10.867	128.351	-0.018	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
37	-9.426	-128.351	-5.416	9.426	128.351	5.416	0.000%
38	-5.435	-128.351	-9.405	5.435	128.351	9.405	0.000%
39	0.023	-69.781	-11.850	-0.023	69.781	11.849	0.001%
40	5.972	-69.781	-10.286	-5.972	69.781	10.285	0.001%
41	10.501	-69.781	-6.056	-10.501	69.781	6.056	0.000%
42	11.996	-69.781	-0.023	-11.995	69.781	0.023	0.001%
43	10.287	-69.781	5.905	-10.286	69.781	-5.905	0.000%
44	5.931	-69.781	10.261	-5.931	69.781	-10.261	0.001%
45	-0.023	-69.781	12.072	0.023	69.781	-12.071	0.001%
46	-5.980	-69.781	10.299	5.980	69.781	-10.299	0.000%
47	-10.310	-69.781	5.945	10.310	69.781	-5.945	0.000%
48	-11.491	-69.781	0.023	11.490	69.781	-0.023	0.001%
49	-10.478	-69.781	-6.016	10.478	69.781	6.016	0.000%
50	-5.939	-69.781	-10.274	5.939	69.781	10.274	0.000%

**Non-Linear Convergence Results**

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	16	0.00000001	0.00012306
3	Yes	16	0.00000001	0.00007495
4	Yes	21	0.00000001	0.00007172
5	Yes	20	0.00000001	0.00012677
6	Yes	21	0.00000001	0.00007494
7	Yes	20	0.00000001	0.00013219
8	Yes	17	0.00000001	0.00008526
9	Yes	16	0.00000001	0.00013586
10	Yes	21	0.00000001	0.00007450
11	Yes	20	0.00000001	0.00013158
12	Yes	21	0.00000001	0.00007117
13	Yes	20	0.00000001	0.00012595
14	Yes	17	0.00000001	0.00006997
15	Yes	16	0.00000001	0.00010679
16	Yes	21	0.00000001	0.00007679
17	Yes	20	0.00000001	0.00013563
18	Yes	21	0.00000001	0.00007514
19	Yes	20	0.00000001	0.00013265
20	Yes	16	0.00000001	0.00014010
21	Yes	16	0.00000001	0.00009206
22	Yes	21	0.00000001	0.00007313
23	Yes	20	0.00000001	0.00012911
24	Yes	21	0.00000001	0.00007480
25	Yes	20	0.00000001	0.00013211
26	Yes	7	0.00000001	0.00012831
27	Yes	19	0.00000001	0.00011268
28	Yes	19	0.00000001	0.00011983
29	Yes	19	0.00000001	0.00012017
30	Yes	19	0.00000001	0.00011307
31	Yes	19	0.00000001	0.00011888
32	Yes	19	0.00000001	0.00011793
33	Yes	19	0.00000001	0.00011092
34	Yes	19	0.00000001	0.00011826
35	Yes	19	0.00000001	0.00011834
36	Yes	19	0.00000001	0.00011150
37	Yes	19	0.00000001	0.00011849
38	Yes	19	0.00000001	0.00011902
39	Yes	14	0.00000001	0.00011919
40	Yes	15	0.00000001	0.00014554
41	Yes	16	0.00000001	0.00007365
42	Yes	14	0.00000001	0.00012220
43	Yes	16	0.00000001	0.00007006
44	Yes	15	0.00000001	0.00014638
45	Yes	14	0.00000001	0.00011811
46	Yes	16	0.00000001	0.00007439
47	Yes	16	0.00000001	0.00006981
48	Yes	14	0.00000001	0.00011904
49	Yes	16	0.00000001	0.00007076
50	Yes	16	0.00000001	0.00007122

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	185 - 180	18.787	42	1.133	0.003
L2	180 - 175	17.604	42	1.123	0.003
L3	175 - 170	16.438	42	1.103	0.003
L4	170 - 165	15.298	42	1.070	0.002
L5	165 - 160	14.203	42	1.022	0.001
L6	160 - 155	13.162	42	0.965	0.001
L7	155 - 154	12.183	42	0.903	0.001
L8	154 - 153.75	11.995	42	0.891	0.001
L9	153.75 - 152.5	11.949	42	0.888	0.001
L10	152.5 - 152.25	11.718	42	0.877	0.001
L11	152.25 - 151.5	11.672	42	0.876	0.001
L12	151.5 - 151.25	11.535	42	0.871	0.001

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L13	151.25 - 146.25	11.489	42	0.869	0.001
L14	146.25 - 141.25	10.601	42	0.827	0.001
L15	141.25 - 136.25	9.759	42	0.781	0.001
L16	136.25 - 130	8.965	42	0.735	0.000
L17	135 - 129	8.775	42	0.723	0.000
L18	129 - 124	7.883	42	0.693	0.000
L19	124 - 121.42	7.178	42	0.652	0.000
L20	121.42 - 121.17	6.832	42	0.631	0.000
L21	121.17 - 116.17	6.799	42	0.629	0.000
L22	116.17 - 115	6.160	42	0.591	0.000
L23	115 - 113.75	6.017	42	0.582	0.000
L24	113.75 - 113.5	5.865	42	0.574	0.000
L25	113.5 - 108.5	5.836	42	0.572	0.000
L26	108.5 - 103.5	5.257	42	0.533	0.000
L27	103.5 - 95	4.719	42	0.495	0.000
L28	101 - 94	4.465	42	0.475	0.000
L29	94 - 91.4	3.785	42	0.449	0.000
L30	91.4 - 91.15	3.545	42	0.434	0.000
L31	91.15 - 91	3.522	42	0.432	0.000
L32	91 - 86	3.509	42	0.431	0.000
L33	86 - 81	3.075	42	0.397	0.000
L34	81 - 76	2.677	42	0.364	0.000
L35	76 - 71	2.312	42	0.332	0.000
L36	71 - 66	1.981	42	0.301	0.000
L37	66 - 63.75	1.682	42	0.270	0.000
L38	63.75 - 63.5	1.558	42	0.256	0.000
L39	63.5 - 58.5	1.545	42	0.254	0.000
L40	58.5 - 51	1.294	42	0.224	0.000
L41	58 - 50	1.271	42	0.221	0.000
L42	50 - 45	0.919	42	0.197	0.000
L43	45 - 40.42	0.726	42	0.171	0.000
L44	40.42 - 40.17	0.574	42	0.148	0.000
L45	40.17 - 40	0.566	42	0.146	0.000
L46	40 - 35	0.561	42	0.145	0.000
L47	35 - 33	0.422	42	0.120	0.000
L48	33 - 32.75	0.374	42	0.110	0.000
L49	32.75 - 19	0.368	42	0.109	0.000
L50	28 - 18	0.270	42	0.088	0.000
L51	18 - 13	0.108	42	0.065	0.000
L52	13 - 8	0.051	42	0.043	0.000
L53	8 - 6.42	0.017	42	0.022	0.000
L54	6.42 - 6.17	0.011	42	0.016	0.000
L55	6.17 - 1.17	0.010	42	0.015	0.000
L56	1.17 - 0	0.000	42	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
185.000	APX16DWV-16DWVS-E-A20 w/ Mount Pipe	42	18.787	1.133	0.003	17962
175.000	DMP65R-BU6D w/ Mount Pipe	42	16.438	1.103	0.003	10894
165.000	APXV18-206517S-C	42	14.203	1.022	0.001	5422
155.000	(4) SBNHH-1D65B w/ Mount Pipe	42	12.183	0.903	0.001	5160

**Maximum Tower Deflections - Design Wind**

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	185 - 180	94.003	8	5.672	0.013
L2	180 - 175	88.090	8	5.624	0.013
L3	175 - 170	82.257	8	5.526	0.012



Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L4	170 - 165	76.559	8	5.358	0.009
L5	165 - 160	71.077	8	5.118	0.007
L6	160 - 155	65.869	8	4.835	0.006
L7	155 - 154	60.972	8	4.527	0.004
L8	154 - 153.75	60.032	8	4.464	0.004
L9	153.75 - 152.5	59.799	8	4.453	0.004
L10	152.5 - 152.25	58.642	8	4.397	0.004
L11	152.25 - 151.5	58.412	8	4.390	0.004
L12	151.5 - 151.25	57.725	8	4.366	0.004
L13	151.25 - 146.25	57.497	8	4.356	0.004
L14	146.25 - 141.25	53.053	8	4.143	0.003
L15	141.25 - 136.25	48.838	8	3.915	0.003
L16	136.25 - 130	44.865	8	3.681	0.002
L17	135 - 129	43.910	8	3.623	0.002
L18	129 - 124	39.446	8	3.473	0.002
L19	124 - 121.42	35.922	8	3.266	0.002
L20	121.42 - 121.17	34.187	8	3.161	0.002
L21	121.17 - 116.17	34.022	8	3.151	0.002
L22	116.17 - 115	30.826	8	2.960	0.001
L23	115 - 113.75	30.107	8	2.917	0.001
L24	113.75 - 113.5	29.350	8	2.875	0.001
L25	113.5 - 108.5	29.200	8	2.866	0.001
L26	108.5 - 103.5	26.305	8	2.671	0.001
L27	103.5 - 95	23.612	8	2.478	0.001
L28	101 - 94	22.341	8	2.382	0.001
L29	94 - 91.4	18.939	8	2.252	0.001
L30	91.4 - 91.15	17.735	8	2.173	0.001
L31	91.15 - 91	17.622	8	2.164	0.001
L32	91 - 86	17.554	8	2.158	0.001
L33	86 - 81	15.385	8	1.989	0.001
L34	81 - 76	13.390	8	1.825	0.001
L35	76 - 71	11.564	8	1.663	0.001
L36	71 - 66	9.907	8	1.504	0.000
L37	66 - 63.75	8.413	8	1.349	0.000
L38	63.75 - 63.5	7.794	8	1.281	0.000
L39	63.5 - 58.5	7.727	8	1.273	0.000
L40	58.5 - 51	6.473	8	1.122	0.000
L41	58 - 50	6.357	8	1.107	0.000
L42	50 - 45	4.595	8	0.984	0.000
L43	45 - 40.42	3.633	8	0.855	0.000
L44	40.42 - 40.17	2.868	8	0.739	0.000
L45	40.17 - 40	2.830	8	0.732	0.000
L46	40 - 35	2.804	8	0.727	0.000
L47	35 - 33	2.109	8	0.600	0.000
L48	33 - 32.75	1.869	8	0.550	0.000
L49	32.75 - 19	1.840	8	0.544	0.000
L50	28 - 18	1.350	8	0.441	0.000
L51	18 - 13	0.538	8	0.324	0.000
L52	13 - 8	0.255	8	0.216	0.000
L53	8 - 6.42	0.084	8	0.111	0.000
L54	6.42 - 6.17	0.053	8	0.079	0.000
L55	6.17 - 1.17	0.049	8	0.076	0.000
L56	1.17 - 0	0.002	8	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
185.000	APX16DWV-16DWVS-E-A20 w/ Mount Pipe	8	94.003	5.672	0.014	3725
175.000	DMP65R-BU6D w/ Mount Pipe	8	82.257	5.526	0.013	2244
165.000	APXV18-206517S-C	8	71.077	5.118	0.007	1106
155.000	(4) SBNHH-1D65B w/ Mount Pipe	8	60.972	4.527	0.004	1044

## Compression Checks Pole Design Data

Section No.	Elevation ft	Size	L ft	$L_u$ ft	$Kl/r$	A in <sup>2</sup>	$P_u$ K
L1	185 - 180 (1)	TP18x18x0.1875	5.000	0.000	0.0	10.754	-3.797
L2	180 - 175 (2)	TP19.6313x18x0.25	5.000	0.000	0.0	15.601 3	-4.111
L3	175 - 170 (3)	TP21.2625x19.6313x0.25	5.000	0.000	0.0	16.915 9	-8.733
L4	170 - 165 (4)	TP22.8938x21.2625x0.25	5.000	0.000	0.0	18.228 1	-9.218
L5	165 - 160 (5)	TP24.525x22.8938x0.25	5.000	0.000	0.0	19.541 2	-10.061
L6	160 - 155 (6)	TP26.1563x24.525x0.25	5.000	0.000	0.0	20.854 4	-10.670
L7	155 - 154 (7)	TP26.4825x26.1563x0.25	1.000	0.000	0.0	21.117 5	-13.932
L8	154 - 153.75 (8)	TP26.5641x26.4825x0.36	0.250	0.000	0.0	31.103 2	-13.983
L9	153.75 - 152.5 (9)	TP26.9719x26.5641x0.36	1.250	0.000	0.0	31.059 7	-14.174
L10	152.5 - 152.25 (10)	TP27.0534x26.9719x0.55	0.250	0.000	0.0	46.937 8	-14.237
L11	152.25 - 151.5 (11)	TP27.2981x27.0534x0.55	0.750	0.000	0.0	47.370 6	-14.393
L12	151.5 - 151.25 (12)	TP27.3797x27.2981x0.42	0.250	0.000	0.0	36.887 9	-14.440
L13	151.25 - 146.25 (13)	TP29.0109x27.3797x0.41	5.000	0.000	0.0	37.985 5	-15.349
L14	146.25 - 141.25 (14)	TP30.6422x29.0109x0.4	5.000	0.000	0.0	38.951 9	-16.304
L15	141.25 - 136.25 (15)	TP32.2734x30.6422x0.39	5.000	0.000	0.0	40.419 9	-17.293
L16	136.25 - 130 (16)	TP34.3125x32.2734x0.39	6.250	0.000	0.0	40.936 5	-17.544
L17	130 - 129 (17)	TP34.1331x32.1813x0.47	6.000	0.000	0.0	51.480 5	-19.753
L18	129 - 124 (18)	TP35.7597x34.1331x0.46	5.000	0.000	0.0	52.566 1	-20.976
L19	124 - 121.42 (19)	TP36.599x35.7597x0.462	2.580	0.000	0.0	53.816 3	-21.618
L20	121.42 - 121.17 (20)	TP36.6803x36.599x0.5	0.250	0.000	0.0	58.250 3	-21.697
L21	121.17 - 116.17 (21)	TP38.3069x36.6803x0.48	5.000	0.000	0.0	59.367 0	-23.047
L22	116.17 - 115 (22)	TP38.6875x38.3069x0.48	1.170	0.000	0.0	59.964 5	-23.370
L23	115 - 113.75 (23)	TP39.0938x38.6875x0.55	1.250	0.000	0.0	68.261 0	-23.755
L24	113.75 - 113.5 (24)	TP39.175x39.0938x0.468	0.250	0.000	0.0	58.422 8	-23.833
L25	113.5 - 108.5 (25)	TP40.8x39.175x0.4625	5.000	0.000	0.0	60.072 2	-25.232
L26	108.5 - 103.5 (26)	TP42.425x40.8x0.4563	5.000	0.000	0.0	61.657 6	-26.652
L27	103.5 - 95 (27)	TP45.1875x42.425x0.45	8.500	0.000	0.0	61.999 3	-27.382
L28	95 - 94 (28)	TP44.8525x42.6125x0.58	7.000	0.000	0.0	83.738 1	-31.413
L29	94 - 91.4 (29)	TP45.6845x44.8525x0.57	2.600	0.000	0.0	83.520 3	-32.380
L30	91.4 - 91.15 (30)	TP45.7645x45.6845x0.44	0.250	0.000	0.0	64.757 2	-32.467
L31	91.15 - 91 (31)	TP45.8125x45.7645x0.44	0.150	0.000	0.0	64.826 7	-32.514
L32	91 - 86 (32)	TP47.4453x45.8125x0.5	5.000	0.000	0.0	75.582 3	-34.239
						0	

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K
L33	86 - 81 (33)	TP49.0781x47.4453x0.5	5.000	0.000	0.0	78.210	-36.026
L34	81 - 76 (34)	TP50.7109x49.0781x0.49	5.000	0.000	0.0	79.839	-37.858
L35	76 - 71 (35)	TP52.3438x50.7109x0.48	5.000	0.000	0.0	81.401	-39.733
L36	71 - 66 (36)	TP53.9766x52.3438x0.48	5.000	0.000	0.0	83.964	-41.651
L37	66 - 63.75 (37)	TP54.7113x53.9766x0.48	2.250	0.000	0.0	85.117	-42.528
L38	63.75 - 63.5 (38)	TP54.793x54.7113x0.487	0.250	0.000	0.0	85.246	-42.636
L39	63.5 - 58.5 (39)	TP56.4258x54.793x0.481	5.000	0.000	0.0	86.693	-44.611
L40	58.5 - 51 (40)	TP58.875x56.4258x0.481	7.500	0.000	0.0	86.946	-44.818
L41	51 - 50 (41)	TP58.4384x55.8391x0.55	8.000	0.000	0.0	102.52	-50.882
L42	50 - 45 (42)	TP60.0629x58.4384x0.55	5.000	0.000	0.0	105.39	-53.224
L43	45 - 40.42 (43)	TP61.551x60.0629x0.543	4.580	0.000	0.0	106.81	-55.407
L44	40.42 - 40.17 (44)	TP61.6323x61.551x0.475	0.250	0.000	0.0	93.540	-55.524
L45	40.17 - 40 (45)	TP61.6875x61.6323x0.47	0.170	0.000	0.0	93.624	-55.599
L46	40 - 35 (46)	TP63.3095x61.6875x0.53	5.000	0.000	0.0	107.39	-57.998
L47	35 - 33 (47)	TP63.9583x63.3095x0.52	2.000	0.000	0.0	107.23	-58.977
L48	33 - 32.75 (48)	TP64.0394x63.9583x0.6	0.250	0.000	0.0	122.56	-59.133
L49	32.75 - 19 (49)	TP68.5x64.0394x0.6	13.750	0.000	0.0	125.54	-61.939
L50	19 - 18 (50)	TP67.9579x64.7054x0.6	10.000	0.000	0.0	130.13	-72.900
L51	18 - 13 (51)	TP69.5842x67.9579x0.58	5.000	0.000	0.0	130.52	-75.989
L52	13 - 8 (52)	TP71.2105x69.5842x0.58	5.000	0.000	0.0	133.60	-79.129
L53	8 - 6.42 (53)	TP71.7244x71.2105x0.58	1.580	0.000	0.0	134.57	-80.127
L54	6.42 - 6.17 (54)	TP71.8057x71.7244x1.01	0.250	0.000	0.0	230.80	-80.280
L55	6.17 - 1.17 (55)	TP73.432x71.8057x0.987	5.000	0.000	0.0	230.35	-83.069
L56	1.17 - 0 (56)	TP73.8125x73.432x0.987	1.170	0.000	0.0	231.56	-83.729

### Pole Bending Design Data

Section No.	Elevation ft	Size	M <sub>ux</sub> kip-ft	M <sub>uy</sub> kip-ft
L1	185 - 180 (1)	TP18x18x0.1875	30.230	0.000
L2	180 - 175 (2)	TP19.6313x18x0.25	62.669	0.000
L3	175 - 170 (3)	TP21.2625x19.6313x0.25	140.905	0.000
L4	170 - 165 (4)	TP22.8938x21.2625x0.25	221.808	0.000
L5	165 - 160 (5)	TP24.525x22.8938x0.25	308.796	0.000
L6	160 - 155 (6)	TP26.1563x24.525x0.25	398.739	0.000
L7	155 - 154 (7)	TP26.4825x26.1563x0.25	421.498	0.000
L8	154 - 153.75 (8)	TP26.5641x26.4825x0.3688	427.332	0.000
L9	153.75 - 152.5 (9)	TP26.9719x26.5641x0.3625	456.670	0.000
L10	152.5 - 152.25 (10)	TP27.0534x26.9719x0.55	462.573	0.000
L11	152.25 - 151.5 (11)	TP27.2981x27.0534x0.55	480.354	0.000
L12	151.5 - 151.25 (12)	TP27.3797x27.2981x0.425	486.306	0.000
L13	151.25 - 146.25 (13)	TP29.0109x27.3797x0.4125	607.702	0.000
L14	146.25 - 141.25 (14)	TP30.6422x29.0109x0.4	733.682	0.000
L15	141.25 - 136.25 (15)	TP32.2734x30.6422x0.3938	864.367	0.000

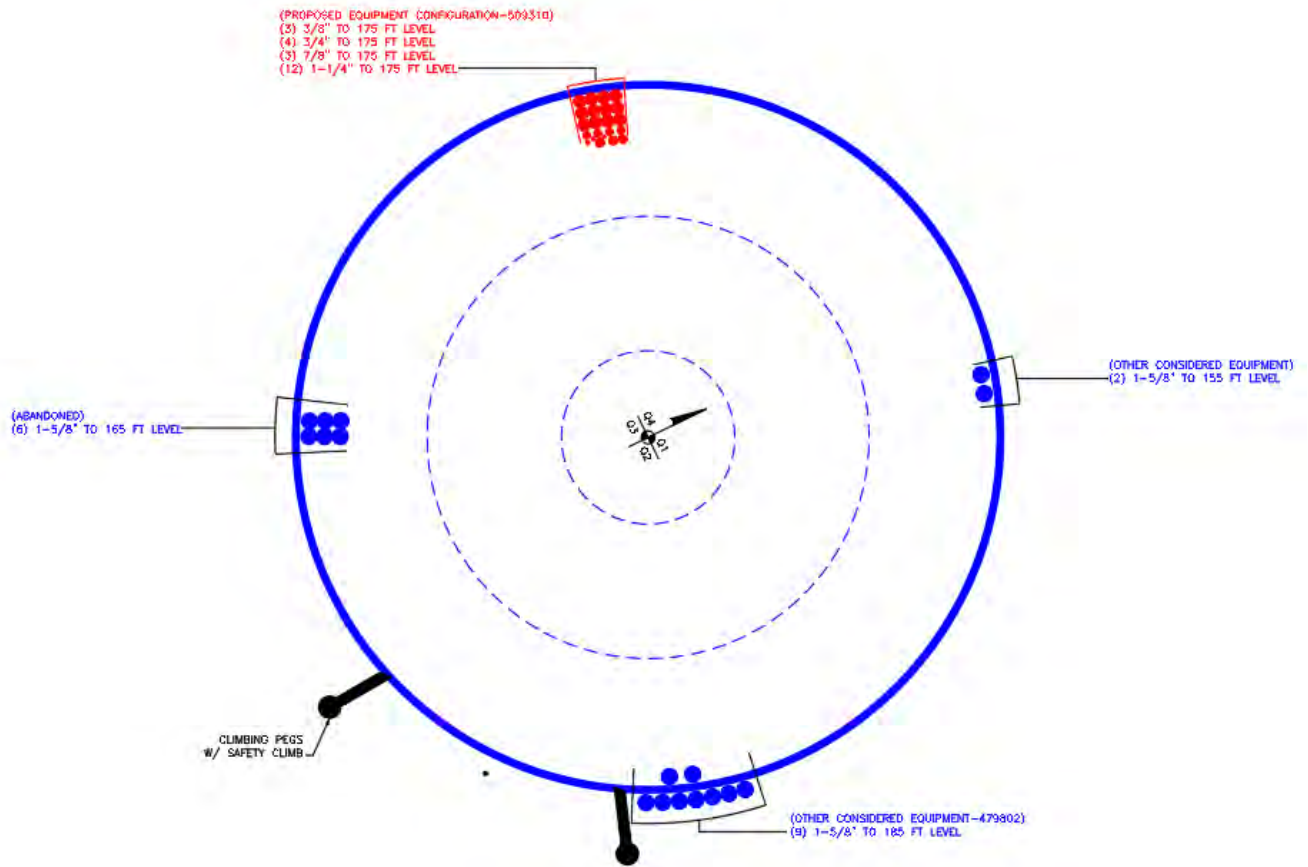
Section No.	Elevation ft	Size	M <sub>ux</sub> kip-ft	M <sub>uy</sub> kip-ft
L16	136.25 - 130 (16)	TP34.3125x32.2734x0.3938	897.792	0.000
L17	130 - 129 (17)	TP34.1331x32.1813x0.475	1063.050	0.000
L18	129 - 124 (18)	TP35.7597x34.1331x0.4625	1206.867	0.000
L19	124 - 121.42 (19)	TP36.599x35.7597x0.4625	1283.300	0.000
L20	121.42 - 121.17 (20)	TP36.6803x36.599x0.5	1290.792	0.000
L21	121.17 - 116.17 (21)	TP38.3069x36.6803x0.4875	1443.633	0.000
L22	116.17 - 115 (22)	TP38.6875x38.3069x0.4875	1480.242	0.000
L23	115 - 113.75 (23)	TP39.0938x38.6875x0.55	1519.700	0.000
L24	113.75 - 113.5 (24)	TP39.175x39.0938x0.4688	1527.633	0.000
L25	113.5 - 108.5 (25)	TP40.8x39.175x0.4625	1688.708	0.000
L26	108.5 - 103.5 (26)	TP42.425x40.8x0.4563	1855.692	0.000
L27	103.5 - 95 (27)	TP45.1875x42.425x0.45	1941.667	0.000
L28	95 - 94 (28)	TP44.8525x42.6125x0.5875	2191.258	0.000
L29	94 - 91.4 (29)	TP45.6845x44.8525x0.575	2287.317	0.000
L30	91.4 - 91.15 (30)	TP45.7645x45.6845x0.4438	2296.650	0.000
L31	91.15 - 91 (31)	TP45.8125x45.7645x0.4438	2302.258	0.000
L32	91 - 86 (32)	TP47.4453x45.8125x0.5	2492.283	0.000
L33	86 - 81 (33)	TP49.0781x47.4453x0.5	2687.875	0.000
L34	81 - 76 (34)	TP50.7109x49.0781x0.4938	2888.425	0.000
L35	76 - 71 (35)	TP52.3438x50.7109x0.4875	3093.983	0.000
L36	71 - 66 (36)	TP53.9766x52.3438x0.4875	3304.625	0.000
L37	66 - 63.75 (37)	TP54.7113x53.9766x0.4875	3401.083	0.000
L38	63.75 - 63.5 (38)	TP54.793x54.7113x0.4875	3411.867	0.000
L39	63.5 - 58.5 (39)	TP56.4258x54.793x0.4813	3630.283	0.000
L40	58.5 - 51 (40)	TP58.875x56.4258x0.4813	3652.408	0.000
L41	51 - 50 (41)	TP58.4384x55.8391x0.55	4017.858	0.000
L42	50 - 45 (42)	TP60.0629x58.4384x0.55	4255.083	0.000
L43	45 - 40.42 (43)	TP61.551x60.0629x0.5438	4476.942	0.000
L44	40.42 - 40.17 (44)	TP61.6323x61.551x0.475	4489.175	0.000
L45	40.17 - 40 (45)	TP61.6875x61.6323x0.475	4497.508	0.000
L46	40 - 35 (46)	TP63.3095x61.6875x0.5313	4745.925	0.000
L47	35 - 33 (47)	TP63.9583x63.3095x0.525	4847.242	0.000
L48	33 - 32.75 (48)	TP64.0394x63.9583x0.6	4859.983	0.000
L49	32.75 - 19 (49)	TP68.5x64.0394x0.6	5105.367	0.000
L50	19 - 18 (50)	TP67.9579x64.7054x0.6	5643.017	0.000
L51	18 - 13 (51)	TP69.5842x67.9579x0.5875	5922.108	0.000
L52	13 - 8 (52)	TP71.2105x69.5842x0.5875	6207.425	0.000
L53	8 - 6.42 (53)	TP71.7244x71.2105x0.5875	6298.900	0.000
L54	6.42 - 6.17 (54)	TP71.8057x71.7244x1.0125	6313.433	0.000
L55	6.17 - 1.17 (55)	TP73.432x71.8057x0.9875	6607.550	0.000
L56	1.17 - 0 (56)	TP73.8125x73.432x0.9875	6677.341	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V <sub>u</sub> K	Actual T <sub>u</sub> kip-ft
L1	185 - 180 (1)	TP18x18x0.1875	6.242	0.000
L2	180 - 175 (2)	TP19.6313x18x0.25	6.736	0.000
L3	175 - 170 (3)	TP21.2625x19.6313x0.25	15.912	1.117
L4	170 - 165 (4)	TP22.8938x21.2625x0.25	16.484	1.440
L5	165 - 160 (5)	TP24.525x22.8938x0.25	17.688	1.439
L6	160 - 155 (6)	TP26.1563x24.525x0.25	18.293	1.438
L7	155 - 154 (7)	TP26.4825x26.1563x0.25	23.310	0.935
L8	154 - 153.75 (8)	TP26.5641x26.4825x0.3688	23.352	0.935
L9	153.75 - 152.5 (9)	TP26.9719x26.5641x0.3625	23.587	0.935
L10	152.5 - 152.25 (10)	TP27.0534x26.9719x0.55	23.632	0.935
L11	152.25 - 151.5 (11)	TP27.2981x27.0534x0.55	23.777	0.935
L12	151.5 - 151.25 (12)	TP27.3797x27.2981x0.425	23.825	0.935
L13	151.25 - 146.25 (13)	TP29.0109x27.3797x0.4125	24.736	0.934
L14	146.25 - 141.25 (14)	TP30.6422x29.0109x0.4	25.661	0.934
L15	141.25 - 136.25 (15)	TP32.2734x30.6422x0.3938	26.618	0.934
L16	136.25 - 130 (16)	TP34.3125x32.2734x0.3938	26.869	0.934
L17	130 - 129 (17)	TP34.1331x32.1813x0.475	28.213	0.933
L18	129 - 124 (18)	TP35.7597x34.1331x0.4625	29.320	0.933
L19	124 - 121.42 (19)	TP36.599x35.7597x0.4625	29.932	0.933
L20	121.42 - 121.17 (20)	TP36.6803x36.599x0.5	29.988	0.933
L21	121.17 - 116.17 (21)	TP38.3069x36.6803x0.4875	31.150	0.933

Section No.	Elevation ft	Size	Actual $V_u$ K	Actual $T_u$ kip-ft
L22	116.17 - 115 (22)	TP38.6875x38.3069x0.4875	31.421	0.933
L23	115 - 113.75 (23)	TP39.0938x38.6875x0.55	31.715	0.933
L24	113.75 - 113.5 (24)	TP39.175x39.0938x0.4688	31.771	0.932
L25	113.5 - 108.5 (25)	TP40.8x39.175x0.4625	32.657	0.932
L26	108.5 - 103.5 (26)	TP42.425x40.8x0.4563	34.105	1.112
L27	103.5 - 95 (27)	TP45.1875x42.425x0.45	34.720	1.112
L28	95 - 94 (28)	TP44.8525x42.6125x0.5875	36.632	1.111
L29	94 - 91.4 (29)	TP45.6845x44.8525x0.575	37.311	1.111
L30	91.4 - 91.15 (30)	TP45.7645x45.6845x0.4438	37.373	1.111
L31	91.15 - 91 (31)	TP45.8125x45.7645x0.4438	37.422	1.111
L32	91 - 86 (32)	TP47.4453x45.8125x0.5	38.655	1.111
L33	86 - 81 (33)	TP49.0781x47.4453x0.5	39.638	1.111
L34	81 - 76 (34)	TP50.7109x49.0781x0.4938	40.636	1.111
L35	76 - 71 (35)	TP52.3438x50.7109x0.4875	41.646	1.111
L36	71 - 66 (36)	TP53.9766x52.3438x0.4875	42.668	1.110
L37	66 - 63.75 (37)	TP54.7113x53.9766x0.4875	43.132	1.110
L38	63.75 - 63.5 (38)	TP54.793x54.7113x0.4875	43.191	1.110
L39	63.5 - 58.5 (39)	TP56.4258x54.793x0.4813	44.231	1.110
L40	58.5 - 51 (40)	TP58.875x56.4258x0.4813	44.328	1.110
L41	51 - 50 (41)	TP58.4384x55.8391x0.55	46.924	0.931
L42	50 - 45 (42)	TP60.0629x58.4384x0.55	47.965	0.931
L43	45 - 40.42 (43)	TP61.551x60.0629x0.5438	48.916	0.931
L44	40.42 - 40.17 (44)	TP61.6323x61.551x0.475	48.963	0.930
L45	40.17 - 40 (45)	TP61.6875x61.6323x0.475	49.005	0.930
L46	40 - 35 (46)	TP63.3095x61.6875x0.5313	50.367	0.930
L47	35 - 33 (47)	TP63.9583x63.3095x0.525	50.942	0.930
L48	33 - 32.75 (48)	TP64.0394x63.9583x0.6	51.011	0.930
L49	32.75 - 19 (49)	TP68.5x64.0394x0.6	52.300	0.930
L50	19 - 18 (50)	TP67.9579x64.7054x0.6	55.199	0.930
L51	18 - 13 (51)	TP69.5842x67.9579x0.5875	56.437	0.930
L52	13 - 8 (52)	TP71.2105x69.5842x0.5875	57.688	0.930
L53	8 - 6.42 (53)	TP71.7244x71.2105x0.5875	58.096	0.930
L54	6.42 - 6.17 (54)	TP71.8057x71.7244x1.0125	58.143	0.930
L55	6.17 - 1.17 (55)	TP73.432x71.8057x0.9875	59.484	0.930
L56	1.17 - 0 (56)	TP73.8125x73.432x0.9875	59.802	0.930

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



BUSINESS UNIT: 825983 TOWER ID: C\_BASELEVEL

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



Site BU: 825983  
Work Order: 1835101

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**Pole Geometry**

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	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	CI-045100; (1) (1.1875)	3	o				o				o			
2	91.4	121.42	plate	CI-060100; (1) (1.1875)	3	o				o				o			
3	121.42	152.5	plate	CI-045100; (1) (1.1875)	3		o				o				o		
4	6.42	33	plate	CI-085125; (1) (1.1875)	4			o			o			o		o	
5	33	63.75	plate	CI-060100; (1) (1.1875)	3				o				o				o
6	63.75	99.42	plate	CI-060100; (1) (1.1875)	3			o				o				o	
7	113.75	131	plate	CI-040075; (1) (1.1875)	3			o				o				o	
8	151.5	154	plate	CI-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 Length (in)	Top Termination Length (in)	L <sub>u</sub> (in)	Net Area (in <sup>2</sup> )	Bolt Hole Size (in)	Reinforcement Material
1	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65
2	6	1	6	0.5	30.000	30.000	16.000	4.750	1.1875	A572-65
3	4.5	1	4.5	0.5	24.000	24.000	20.000	3.250	1.1875	A572-65
4	8.5	1.25	10.625	0.625	48.000	51.000	17.000	9.063	1.1875	A572-65
5	6	1	6	0.5	27.000	27.000	16.000	4.750	1.1875	A572-65
6	6	1	6	0.5	27.000	27.000	16.000	4.750	1.1875	A572-65
7	4	0.75	3	0.375	15.000	18.000	16.000	2.063	1.1875	A572-65
8	4	0.75	3	0.375	15.000	15.000	16.000	2.063	1.1875	A572-65
9	11.69775971	0.343655546	4.02	48.00075	n/a	n/a	0.000	3.500	0.0000	A572-65

# TNX Geometry Input

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

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	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			M <sub>ux</sub> (kip-ft)	
	Section Height (ft)	P <sub>u</sub> (K)		V <sub>u</sub> (K)
1	185 - 180	3.80	30.23	6.24
2	180 - 175	4.11	62.67	6.74
3	175 - 170	8.75	141.00	15.88
4	170 - 165	9.23	221.84	16.46
5	165 - 160	10.06	308.80	17.69
6	160 - 155	10.67	398.74	18.29
7	155 - 154	13.93	421.50	23.31
8	154 - 153.75	13.98	427.33	23.35
9	153.75 - 152.5	14.17	456.67	23.59
10	152.5 - 152.25	14.24	462.57	23.63
11	152.25 - 151.5	14.39	480.35	23.78
12	151.5 - 151.25	14.44	486.31	23.83
13	151.25 - 146.25	15.35	607.70	24.74
14	146.25 - 141.25	16.30	733.68	25.66
15	141.25 - 136.25	17.29	864.37	26.62
16	136.25 - 135	17.54	897.80	26.87
17	135 - 129	19.75	1063.05	28.21
18	129 - 124	20.98	1206.87	29.32
19	124 - 121.42	21.62	1283.30	29.93
20	121.42 - 121.17	21.70	1290.79	29.99
21	121.17 - 116.17	23.05	1443.63	31.15
22	116.17 - 115	23.37	1480.24	31.42
23	115 - 113.75	23.75	1519.70	31.71
24	113.75 - 113.5	23.83	1527.64	31.77
25	113.5 - 108.5	25.23	1688.71	32.66
26	108.5 - 103.5	26.65	1855.70	34.10
27	103.5 - 101	27.38	1941.67	34.72
28	101 - 94	31.41	2191.26	36.63
29	94 - 91.4	32.38	2287.32	37.31
30	91.4 - 91.15	32.47	2296.65	37.37
31	91.15 - 91	32.51	2302.26	37.42
32	91 - 86	34.24	2492.28	38.65
33	86 - 81	36.03	2687.88	39.64
34	81 - 76	37.86	2888.42	40.64
35	76 - 71	39.73	3093.99	41.65
36	71 - 66	41.65	3304.62	42.67
37	66 - 63.75	42.53	3401.08	43.13
38	63.75 - 63.5	42.64	3411.87	43.19
39	63.5 - 58.5	44.61	3630.29	44.23
40	58.5 - 58	44.82	3652.41	44.33
41	58 - 50	50.88	4017.86	46.92
42	50 - 45	53.22	4255.08	47.96
43	45 - 40.42	55.41	4476.94	48.92
44	40.42 - 40.17	55.52	4489.18	48.96
45	40.17 - 40	55.60	4497.51	49.00
46	40 - 35	58.00	4745.93	50.37
47	35 - 33	58.98	4847.24	50.94
48	33 - 32.75	59.13	4859.99	51.01
49	32.75 - 28	61.94	5105.36	52.30
50	28 - 18	72.90	5643.01	55.20
51	18 - 13	75.99	5922.11	56.44
52	13 - 8	79.13	6207.43	57.69
53	8 - 6.42	80.13	6298.90	58.10
54	6.42 - 6.17	80.28	6313.43	58.14
55	6.17 - 1.17	83.07	6607.55	59.48
56	1.17 - 0	83.73	6677.34	59.80

# Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
185 - 180	Pole	TP18x18x0.1875	Pole	16.3%	Pass
180 - 175	Pole	TP19.631x18x0.25	Pole	20.9%	Pass
175 - 170	Pole	TP21.263x19.631x0.25	Pole	40.2%	Pass
170 - 165	Pole	TP22.894x21.263x0.25	Pole	53.9%	Pass
165 - 160	Pole	TP24.525x22.894x0.25	Pole	65.0%	Pass
160 - 155	Pole	TP26.156x24.525x0.25	Pole	74.1%	Pass
155 - 154	Pole	TP26.483x26.156x0.25	Pole	77.0%	Pass
154 - 153.75	Pole + Reinf.	TP26.564x26.483x0.3688	Reinf. 8 Tension Rupture	60.5%	Pass
153.75 - 152.5	Pole + Reinf.	TP26.972x26.564x0.3625	Reinf. 8 Tension Rupture	62.9%	Pass
152.5 - 152.25	Pole + Reinf.	TP27.053x26.972x0.55	Reinf. 8 Tension Rupture	43.2%	Pass
152.25 - 151.5	Pole + Reinf.	TP27.298x27.053x0.55	Reinf. 8 Tension Rupture	44.2%	Pass
151.5 - 151.25	Pole + Reinf.	TP27.38x27.298x0.425	Reinf. 3 Tension Rupture	54.1%	Pass
151.25 - 146.25	Pole + Reinf.	TP29.011x27.38x0.4125	Reinf. 3 Tension Rupture	61.4%	Pass
146.25 - 141.25	Pole + Reinf.	TP30.642x29.011x0.4	Reinf. 3 Tension Rupture	67.7%	Pass
141.25 - 136.25	Pole + Reinf.	TP32.273x30.642x0.3938	Reinf. 3 Tension Rupture	73.1%	Pass
136.25 - 135	Pole + Reinf.	TP34.313x32.273x0.3938	Reinf. 3 Tension Rupture	74.4%	Pass
135 - 129	Pole + Reinf.	TP34.133x32.181x0.475	Reinf. 7 Tension Rupture	69.7%	Pass
129 - 124	Pole + Reinf.	TP35.76x34.133x0.4625	Reinf. 7 Tension Rupture	73.6%	Pass
124 - 121.42	Pole + Reinf.	TP36.599x35.76x0.4625	Pole	75.9%	Pass
121.42 - 121.17	Pole + Reinf.	TP36.68x36.599x0.5	Pole	69.8%	Pass
121.17 - 116.17	Pole + Reinf.	TP38.307x36.68x0.4875	Pole	74.8%	Pass
116.17 - 115	Pole + Reinf.	TP38.688x38.307x0.4875	Pole	75.9%	Pass
115 - 113.75	Pole + Reinf.	TP39.094x38.688x0.55	Reinf. 7 Tension Rupture	65.6%	Pass
113.75 - 113.5	Pole + Reinf.	TP39.175x39.094x0.4688	Pole	71.9%	Pass
113.5 - 108.5	Pole + Reinf.	TP40.8x39.175x0.4625	Pole	75.5%	Pass
108.5 - 103.5	Pole + Reinf.	TP42.425x40.8x0.4563	Pole	79.0%	Pass
103.5 - 101	Pole + Reinf.	TP45.188x42.425x0.45	Pole	80.7%	Pass
101 - 94	Pole + Reinf.	TP44.853x42.613x0.5875	Pole	67.2%	Pass
94 - 91.4	Pole + Reinf.	TP45.685x44.853x0.575	Pole	68.8%	Pass
91.4 - 91.15	Pole + Reinf.	TP45.765x45.685x0.4438	Pole	89.0%	Pass
91.15 - 91	Pole + Reinf.	TP45.813x45.765x0.4438	Pole	89.1%	Pass
91 - 86	Pole + Reinf.	TP47.445x45.813x0.5	Pole	74.8%	Pass
86 - 81	Pole + Reinf.	TP49.078x47.445x0.5	Pole	77.0%	Pass
81 - 76	Pole + Reinf.	TP50.711x49.078x0.4938	Pole	79.2%	Pass
76 - 71	Pole + Reinf.	TP52.344x50.711x0.4875	Pole	81.3%	Pass
71 - 66	Pole + Reinf.	TP53.977x52.344x0.4875	Pole	83.4%	Pass
66 - 63.75	Pole + Reinf.	TP54.711x53.977x0.4875	Pole	84.3%	Pass
63.75 - 63.5	Pole + Reinf.	TP54.793x54.711x0.4875	Pole	84.4%	Pass
63.5 - 58.5	Pole + Reinf.	TP56.426x54.793x0.4813	Pole	86.5%	Pass
58.5 - 58	Pole + Reinf.	TP58.875x56.426x0.4813	Pole	86.7%	Pass
58 - 50	Pole + Reinf.	TP58.438x55.839x0.55	Pole	79.2%	Pass
50 - 45	Pole + Reinf.	TP60.063x58.438x0.55	Pole	81.3%	Pass
45 - 40.42	Pole + Reinf.	TP61.551x60.063x0.5438	Pole	83.2%	Pass
40.42 - 40.17	Pole + Reinf.	TP61.632x61.551x0.475	Pole	95.8%	Pass
40.17 - 40	Pole + Reinf.	TP61.688x61.632x0.475	Pole	95.9%	Pass
40 - 35	Pole + Reinf.	TP63.31x61.688x0.5313	Pole	79.8%	Pass
35 - 33	Pole + Reinf.	TP63.958x63.31x0.525	Pole	80.4%	Pass
33 - 32.75	Pole + Reinf.	TP64.039x63.958x0.6	Pole	72.6%	Pass
32.75 - 28	Pole + Reinf.	TP68.5x64.039x0.6	Pole	74.0%	Pass
28 - 18	Pole + Reinf.	TP67.958x64.705x0.6	Pole	78.4%	Pass
18 - 13	Pole + Reinf.	TP69.584x67.958x0.5875	Pole	79.9%	Pass
13 - 8	Pole + Reinf.	TP71.21x69.584x0.5875	Pole	81.5%	Pass
8 - 6.42	Pole + Reinf.	TP71.724x71.21x0.5875	Pole	81.9%	Pass
6.42 - 6.17	Pole + Reinf.	TP71.806x71.724x1.0125	Reinf. 9 Connection	61.7%	Pass
6.17 - 1.17	Pole + Reinf.	TP73.432x71.806x0.9875	Reinf. 9 Compression	62.6%	Pass
1.17 - 0	Pole + Reinf.	TP73.813x73.432x0.9875	Reinf. 9 Connection	62.8%	Pass
				Summary	
			Pole	95.9%	Pass
			Reinforcement	77.8%	Pass
			Overall	95.9%	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	16.3%									
180 - 175	749	n/a	749	15.58	n/a	15.58	20.9%									
175 - 170	955	n/a	955	16.89	n/a	16.89	40.2%									
170 - 165	1195	n/a	1195	18.20	n/a	18.20	53.9%									
165 - 160	1472	n/a	1472	19.51	n/a	19.51	65.0%									
160 - 155	1789	n/a	1789	20.82	n/a	20.82	74.1%									
155 - 154	1857	n/a	1857	21.09	n/a	21.09	77.0%									
154 - 153.75	1875	846	2720	21.15	9.00	30.15	51.7%								60.5%	
153.75 - 152.5	1963	871	2834	21.48	9.00	30.48	54.1%								62.9%	
152.5 - 152.25	1981	2216	4197	21.55	22.50	44.05	37.1%			41.5%					43.2%	
152.25 - 151.5	2036	2255	4291	21.74	22.50	44.24	38.2%			42.5%					44.2%	
151.5 - 151.25	2054	1371	3426	21.81	13.50	35.31	48.6%			54.1%						
151.25 - 146.25	2448	1532	3980	23.12	13.50	36.62	56.3%			61.4%						
146.25 - 141.25	2888	1702	4590	24.43	13.50	37.93	63.4%			67.7%						
141.25 - 136.25	3379	1880	5259	25.74	13.50	39.24	70.0%			73.1%						
136.25 - 135	3510	1926	5436	26.07	13.50	39.57	71.6%			74.4%						
135 - 129	4002	3470	7472	27.24	22.50	49.74	65.6%			66.8%				69.7%		
129 - 124	4607	3798	8405	28.54	22.50	51.04	70.8%			70.6%				73.6%		
124 - 121.42	4941	3973	8914	29.22	22.50	51.72	75.9%			72.4%				75.5%		
121.42 - 121.17	4975	4805	9779	29.28	27.00	56.28	69.8%	60.7%						69.3%		
121.17 - 116.17	5671	5226	10897	30.59	27.00	57.59	74.8%	63.6%						72.6%		
116.17 - 115	5843	5328	11171	30.90	27.00	57.90	75.9%	64.2%						73.3%		
115 - 113.75	7501	5437	12938	38.97	27.00	65.97	59.8%	57.4%						65.6%		
113.75 - 113.5	7549	3659	11208	39.05	18.00	57.05	71.9%	66.8%								
113.5 - 108.5	8536	3959	12495	40.68	18.00	58.68	75.5%	68.9%								
108.5 - 103.5	9605	4271	13876	42.32	18.00	60.32	79.0%	70.9%								
103.5 - 101	10172	4431	14603	43.13	18.00	61.13	80.7%	71.8%								
101 - 94	11364	9517	20880	44.75	36.00	80.75	67.2%	58.7%					58.7%			
94 - 91.4	12013	9863	21876	45.59	36.00	81.59	68.8%	59.6%					59.6%			
91.4 - 91.15	12076	4948	17025	45.67	18.00	63.67	89.0%							77.1%		
91.15 - 91	12115	4958	17073	45.72	18.00	63.72	89.1%							77.1%		
91 - 86	16095	5308	21404	56.76	18.00	74.76	74.8%							68.9%		
86 - 81	17829	5670	23499	58.72	18.00	76.72	77.0%							70.0%		
81 - 76	19683	6044	25727	60.69	18.00	78.69	79.2%							70.9%		
76 - 71	21661	6430	28091	62.66	18.00	80.66	81.3%							71.8%		
71 - 66	23768	6828	30596	64.63	18.00	82.63	83.4%							72.6%		
66 - 63.75	24758	7011	31770	65.52	18.00	83.52	84.3%							72.9%		
63.75 - 63.5	24870	7032	31902	65.62	18.00	83.62	84.4%					73.0%				
63.5 - 58.5	27177	7448	34624	67.58	18.00	85.58	86.5%					73.6%				
58.5 - 58	27415	7490	34905	67.78	18.00	85.78	86.7%					73.7%				
58 - 50	30211	13951	44161	70.01	31.50	101.51	79.2%	72.5%				66.2%				
50 - 45	32818	14721	47539	71.97	31.50	103.47	81.3%	73.3%				67.0%				
45 - 40.42	35334	15446	50780	73.76	31.50	105.26	83.2%	74.0%				67.6%				
40.42 - 40.17	35475	8854	44329	73.86	18.00	91.86	95.8%					77.8%				
40.17 - 40	35571	8870	44441	73.93	18.00	91.93	95.9%					77.8%				
40 - 35	44748	9333	54081	88.44	18.00	106.44	79.8%					69.1%				
35 - 33	46148	9522	55669	89.36	18.00	107.36	80.4%					69.3%				
33 - 32.75	46436	17211	63646	89.47	42.50	131.97	72.6%				54.2%					
32.75 - 28	49889	18029	67918	91.64	42.50	134.14	74.0%				54.7%					
28 - 18	55547	19329	74876	94.98	42.50	137.48	78.4%				57.0%					
18 - 13	59654	20245	79898	97.27	42.50	139.77	79.9%				57.4%					
13 - 8	63958	21182	85140	99.56	42.50	142.06	81.5%				57.9%					
8 - 6.42	65360	21482	86842	100.28	42.50	142.78	81.9%				58.0%					
6.42 - 6.17	65480	83631	149110	100.40	24.12	124.52	48.0%									59.9%
6.17 - 1.17	70057	85283	155340	102.68	24.12	126.80	49.9%									60.8%
1.17 - 0	71158	85672	156830	103.22	24.12	127.34	50.4%									61.0%

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

# Monopole Base Plate Connection

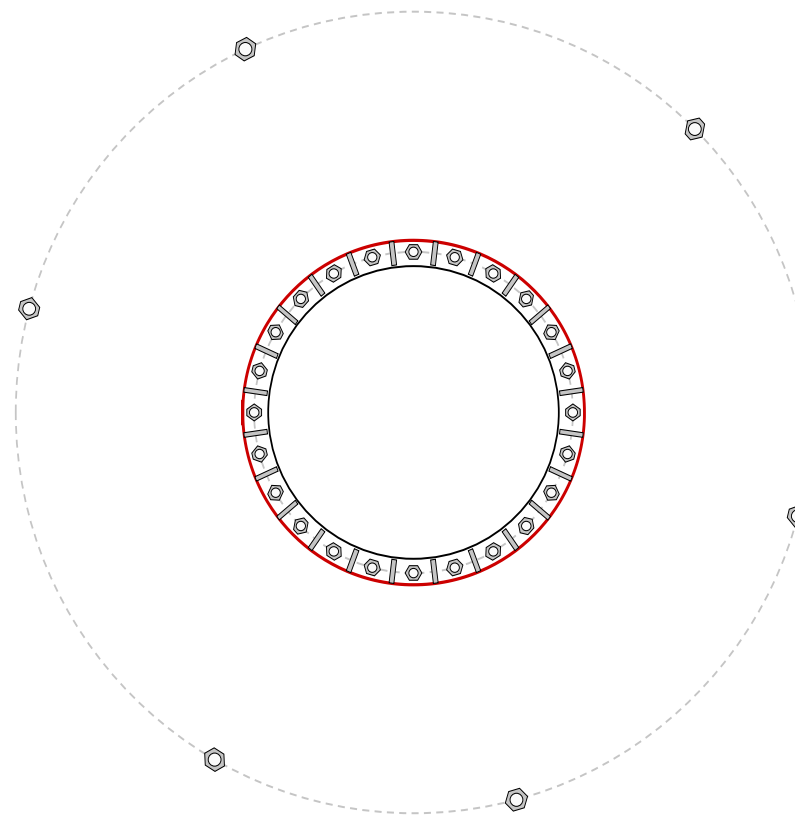


Site Info	
BU #	825983
Site Name	MIDDLETOWN_1
Order #	509310 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
$l_{ar}$ (in)	1.75

Applied Loads	
Moment (kip-ft)	6677.34
Axial Force (kips)	83.73
Shear Force (kips)	59.80

\*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:			
$P_{u,c} = 69.31$	$\phi P_{n,c} = 101.79$	<b>Stress Rating</b>	
$V_u = 2.49$	$\phi V_n = 45.8$		<b>65.1%</b>
$M_u = n/a$	$\phi M_n = n/a$		<b>Pass</b>

GROUP 2:			
$P_{u,c} = 227.39$	$\phi P_{n,c} = 285.12$	<b>Stress Rating</b>	
$V_u = 0$	$\phi V_n = 128.3$		<b>76.0%</b>
$M_u = 0$	$\phi M_n = 127.72$		<b>Pass</b>

### Base Plate Summary

Max Stress (ksi):	14.02	(Roark's Flexural)
Allowable Stress (ksi):	32.4	
Stress Rating:	<b>41.2%</b>	<b>Pass</b>

### Stiffener Summary

Horizontal Weld:	<b>21.9%</b>	<b>Pass</b>
Vertical Weld:	<b>11.1%</b>	<b>Pass</b>
Plate Flexure+Shear:	<b>2.1%</b>	<b>Pass</b>
Plate Tension+Shear:	<b>16.2%</b>	<b>Pass</b>
Plate Compression:	<b>14.5%</b>	<b>Pass</b>

### Pole Summary

Punching Shear:	<b>3.6%</b>	<b>Pass</b>
-----------------	-------------	-------------



# Pier and Pad Foundation



BU #: 825983  
 Site Name: MIDDLETOWN\_1  
 App. Number: 509310 Rev. 0

TIA-222 Revision: H  
 Tower Type: Monopole

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

Superstructure Analysis Reactions		
Compression, $P_{comp}$ :	84	kips
Base Shear, $V_{u\_comp}$ :	60	kips
Moment, $M_u$ :	2237	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>	401.31	60.00	14.2%	Pass
<i>Bearing Pressure (ksf)</i>	5.82	2.43	39.7%	Pass
<i>Overturing (kip*ft)</i>	8139.30	2912.00	35.8%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	8823.96	2702.00	29.2%	Pass
<i>Pier Compression (kip)</i>	28118.83	145.63	0.5%	Pass
<i>Pad Flexure (kip*ft)</i>	3818.20	976.48	24.4%	Pass
<i>Pad Shear - 1-way (kips)</i>	896.51	154.24	16.4%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.190	0.032	16.0%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	5013.71	1621.20	30.8%	Pass

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, $d_{pier}$ :	7.5	ft
Ext. Above Grade, $E$ :	0.25	ft
Pier Rebar Size, $S_c$ :	8	
Pier Rebar Quantity, $mc$ :	65	
Pier Tie/Spiral Size, $S_t$ :	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

Soil Rating*:	39.7%
Structural Rating*:	30.8%

Pad Properties		
Depth, $D$ :	10.5	ft
Pad Width, $W$ :	25	ft
Pad Thickness, $T$ :	3	ft
Pad Rebar Size (Bottom), $S_p$ :	8	
Pad Rebar Quantity (Bottom), $mp$ :	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

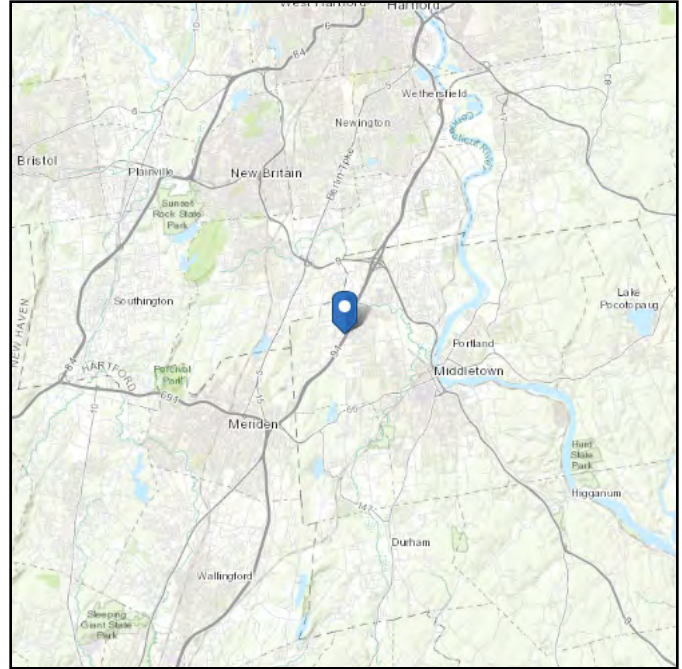
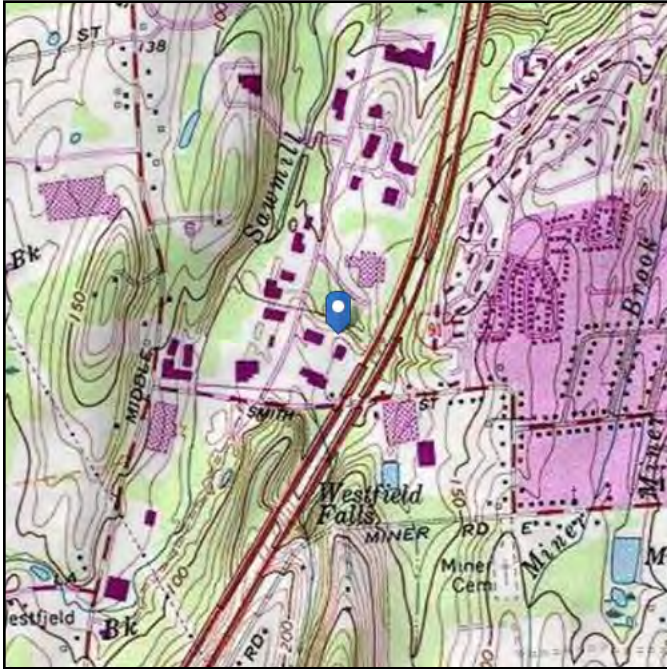
<--Toggle between Gross and Net

# 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



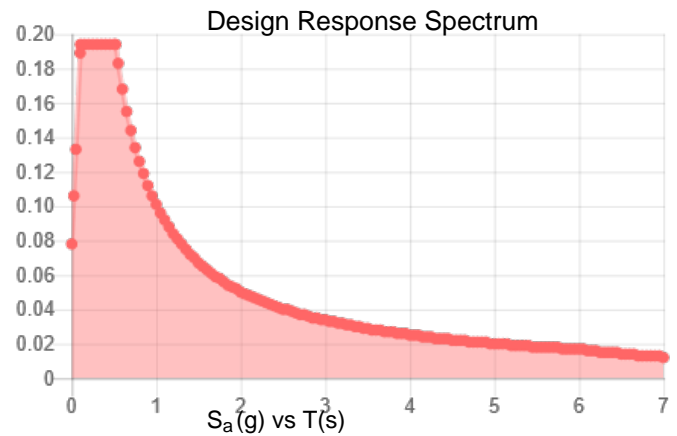
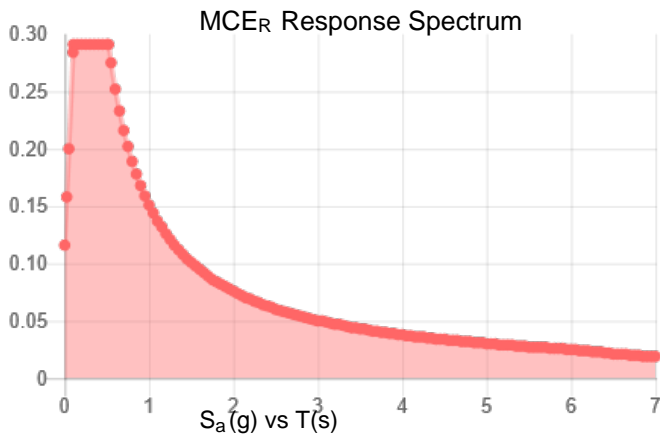


**Site Soil Class:** D - Stiff Soil

**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:**

Thu Jun 06 2019

**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:** Thu Jun 06 2019

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

---

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

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# Exhibit E

## **Mount Analysis**



Date: April 3, 2020

Ms. Darcy Tarr  
Crown Castle USA  
2000 Corporate Drive  
Canonsburg, PA 15317  
(724) 416-2000

B+T Group  
1717 S. Boulder, Suite 300  
Tulsa, OK 74119  
(918) 587-4630  
btwo@btgrp.com

**Subject:** Mount Replacement Analysis Report

**Carrier Designation:** AT&T Mobility  
Carrier Site Number: 10035130  
Carrier Site Name: Cromwell East

**Crown Castle Designation:** BU Number: 825983  
Site Name: Middletown\_1  
JDE Job Number: 596316  
Order Number: 509310, Rev.0

**Engineering Firm Designation:** B+T Group Report Designation: 136918.005.01

**Site Data:** 90 Industrial Park Road, Middletown, CT 06457. Middlesex County  
Latitude 41° 35' 8.30", Longitude -72° 42' 50.49"

**Structure Information:** Tower Height & Type: 185.0 ft. Monopole  
Mount Elevation: 175.0 ft.  
Mount Type: 13.0 ft. Sector Frame

Dear Ms. Tarr,

B+T Group is pleased to submit this "Mount Replacement Analysis Report" to determine the structural integrity of AT&T Mobility's antenna mounting system with the proposed appurtenance and equipment addition on the above-mentioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

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

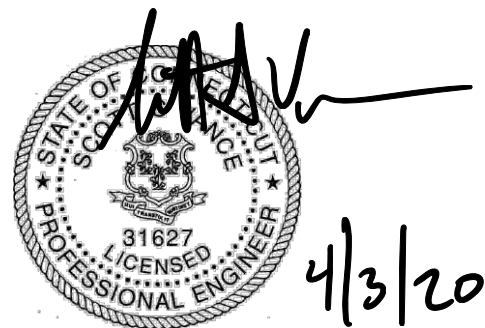
**(3) Sector Frames**

**Sufficient**

This analysis has been performed in accordance with the ANSI/TIA-222-H Standard and the 2018 International Building Code based upon a Basic Wind Speed of 119 mph 3-second gust. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount structural analysis prepared by: Khup Hatzaw.

Respectfully submitted by: B&T Engineering, Inc.  
COA #: PEC.001564, Expires: 02/10/2020



Scott S. Vance, P.E.  
Engineer of Record

## **TABLE OF CONTENTS**

### **1) INTRODUCTION**

### **2) ANALYSIS CRITERIA**

Table 1 – Proposed Equipment Configuration  
Table 2 – Documents Provided

### **3) ANALYSIS PROCEDURE**

3.1) Analysis Method  
3.2) Assumptions

### **4) ANALYSIS RESULTS**

Table 3 – Mount Component Stresses vs. Capacity

### **5) RECOMMENDATION**

### **6) APPENDIX A**

Wire Frame and Rendered Models

### **7) APPENDIX B**

Software Input Calculations

### **8) APPENDIX C**

Software Input and Output

## 1) INTRODUCTION

The Mount consists of (3) 12.0 ft. Sector Frames (12' EHD V-Boom Assembly w/Tieback on Monopole Pipe Mount Assembly) designed by Sabre Industries (Part #C10857803), attached to the 185.0 ft. Monopole at the elevation of 175.0 ft.

## 2) ANALYSIS CRITERIA

Building Code:	<b>2018 International Building Code</b>
TIA-222 Revision:	<b>TIA-222-H</b>
Risk Category:	<b>II</b>
Basic Wind Speed:	<b>119 mph</b>
Exposure Category:	<b>C</b>
Topographic Factor at Base:	<b>1.0</b>
Topographic Factor at Mount:	<b>1.0</b>
Escalated Ice Thickness:	<b>1.0 in</b>
Wind Speed with Ice:	<b>50 mph</b>
Seismic S <sub>s</sub> :	<b>0.205</b>
Seismic S <sub>1</sub> :	<b>0.054</b>
Live Loading Wind Speed:	<b>30 mph</b>
Man-Live Load at Mid/End-Points:	<b>250 lb.</b>
Man-Live Load at Mount Pipes:	<b>500 lb.</b>

**Table 1 - Proposed Equipment Configuration**

Mount Centerline (ft.)	Antenna Centerline (ft.)	Quantity	Manufacturer	Model/Type	Mount / Modification Details
175.0	175.0	3	CCI Antennas	DMP65R-BU6D	(3) New 13.0 ft. Sector Frames
		3	CCI Antennas	OPA65R-BU6D	
		3	Powerwave	7770.00	
		3	Quintel	QS66512-2	
		3	Ericsson	RRUS 32 B2	
		3	Ericsson	RRUS 32 B2_CCIV2	
		3	Ericsson	RRUS 32 B66	
		3	Ericsson	RRUS 4449 B5/B12	
		3	Ericsson	RRUS 4478 B14_CCIV2	
		3	Ericsson	RRUS 32 B30	
		6	Kaelus	DBC0061F1V51-2	
		3	Kathrein	782 10254	
		6	Powerwave	LGP21401	
		2	Raycap	DC6-48-60-18-8F	
		1	Raycap	DC9-48-60-24-8C-EV	

**Table 2 – Documents Provided**

Document	Descriptions	Reference	Source
Crown Castle Order Information	Existing Loading and Proposed Loading	Order ID: 509310, Rev. 0	Crown Castle
RFDS	Existing Loading and Proposed Loading	Dated: 03/02/2020	
Construction Document by Crown Castle	Construction Drawing (Loading Configuration)	Dated: 03/06/2020 175.0 ft. Proposed Level	
Mount Analysis Report by B+T Group	Mount Structural Analysis	Dated: 03/30/2020	On File

### 3) ANALYSIS PROCEDURE

#### 3.1) Analysis Method

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

A tool internally developed by B+T Group, was used to calculate wind loading on all appurtenances, dishes and mount members for various loading cases. Selected output from the analysis is included in Appendix B “Software Input Calculations”.

This analysis was performed in accordance with Crown Castle’s ENG-SOW-10208 *Tower Mount Analysis* (Revision C). In addition, this analysis is in accordance with AT&T’s *Mount Technical Directive – R14.1*.

#### 3.2) Assumptions

1. The mount was properly fabricated and installed in accordance with its original design and manufacturer’s specifications.
2. The mount has been maintained in accordance with the manufacturer’s specifications and is free of damage.
3. The configuration of antennas, mounts, and other appurtenances are as specified in Table-1.
4. All mount components have been assumed to be in sufficient condition to carry their full design capacity for the analysis.
5. Mount areas and weights are determined from field measurements, standard material properties, and/or manufacturer product data.
6. The following assumptions have been included in the analysis of the mount:

Component	Section	Length	Note
Proposed Mount Pipes	2-1/2" STD Pipe	10'-0"	All Positions, All Sectors

7. Serviceability with respect to antenna twist, tilt, roll or lateral translation is not checked and is left to the carrier or tower owner to ensure conformance.
8. All prior structural modifications, if any are assumed to be correctly installed and fully effective.
9. All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
10. The analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.

11. The following material grades were assumed (Unless Noted Otherwise):
- (a) Connection Bolts : ASTM A325
  - (b) Steel Pipe : ASTM A53 (GR. 35)
  - (c) HSS (Round) : ASTM 500 (GR. B-42)
  - (d) HSS (Rectangular) : ASTM 500 (GR. B-46)
  - (e) Channel : ASTM A36 (GR. 36)
  - (f) Steel Solid Rod : ASTM A36 (GR. 36)
  - (g) Steel Plate : ASTM A36 (GR. 36)
  - (h) Steel Angle : ASTM A36 (GR. 36)
  - (i) UNISTRUT : ASTM A570 (GR. 33)

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group should be notified to determine the effect on the structural integrity of the antenna mounting system.

#### 4) ANALYSIS RESULTS

**Table 3 – Mount Component Stresses vs. Capacity**

Notes	Component	Elevation ( ft. )	Critical Member	Capacity ( % )	Pass / Fail
1	Antenna Mount – Pipes	175.0	MP13	21.8	Pass
	Face Horizontal – Pipes	175.0	H22	38.5	Pass
	V-Frame Horizontal – Pipes	175.0	F13	17.3	Pass
	V-Frame Bracing – Pipes	175.0	D12	16.4	Pass
	Frame Connection – Plates	175.0	C14	51.4	Pass
	Frame Bridge – Plates	175.0	B12	27.9	Pass
	Frame Mount – Pipes	175.0	P2	24.9	Pass
	Frame Tieback – Pipes	175.0	T32	10.1	Pass

Note:

1. See additional documentation in Appendix C: "Software Input and Output" for the analysis supporting the Capacity percentage usage.

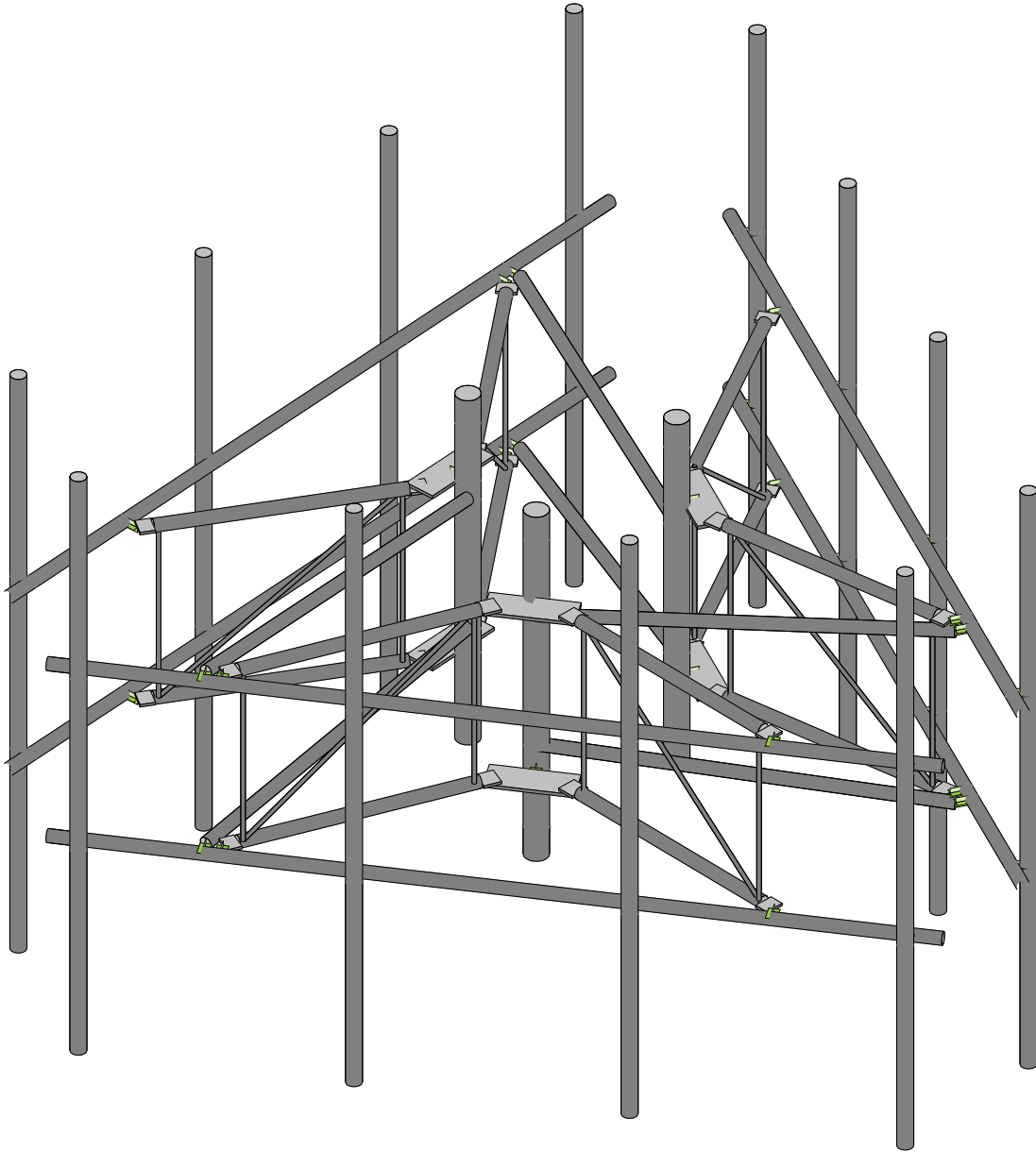
<b>Structural Rating (Max. from Components)</b>	<b>51.4%</b>
---	--------------

#### 5) RECOMMENDATIONS

The Mounts (12' EHD V-Boom Assembly w/Tieback on Monopole Pipe Mount Assembly) designed by Sabre Industries (Part #C10857803), have sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.



## **APPENDIX A WIRE FRAME AND RENDERED MODELS**



Envelope Only Solution

B+T GROUP

KH

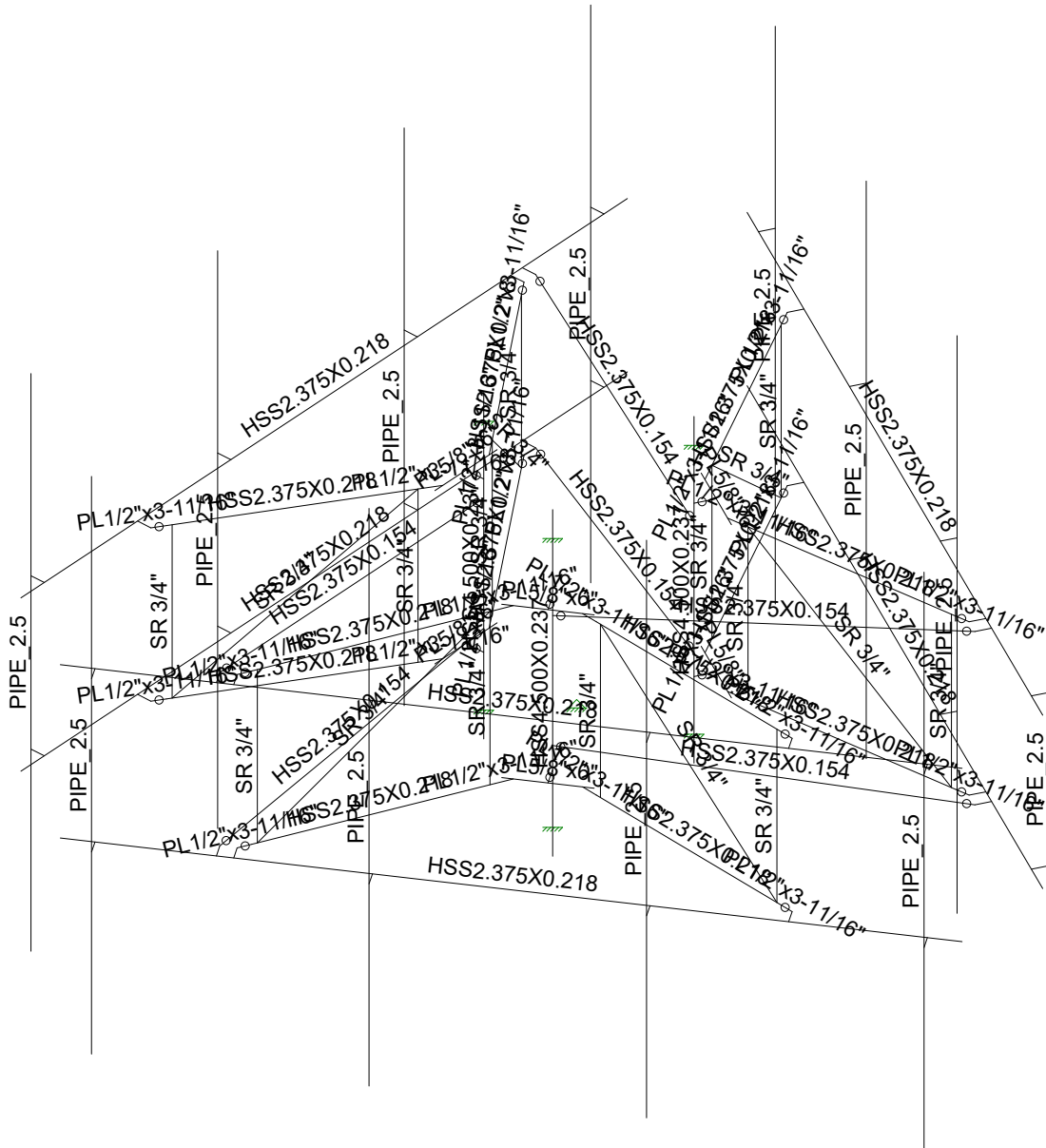
136918.005.01

MIDDLETOWN\_1 825983  
(3) sSECTOR FRAMES (#C10857803)

SK - 1

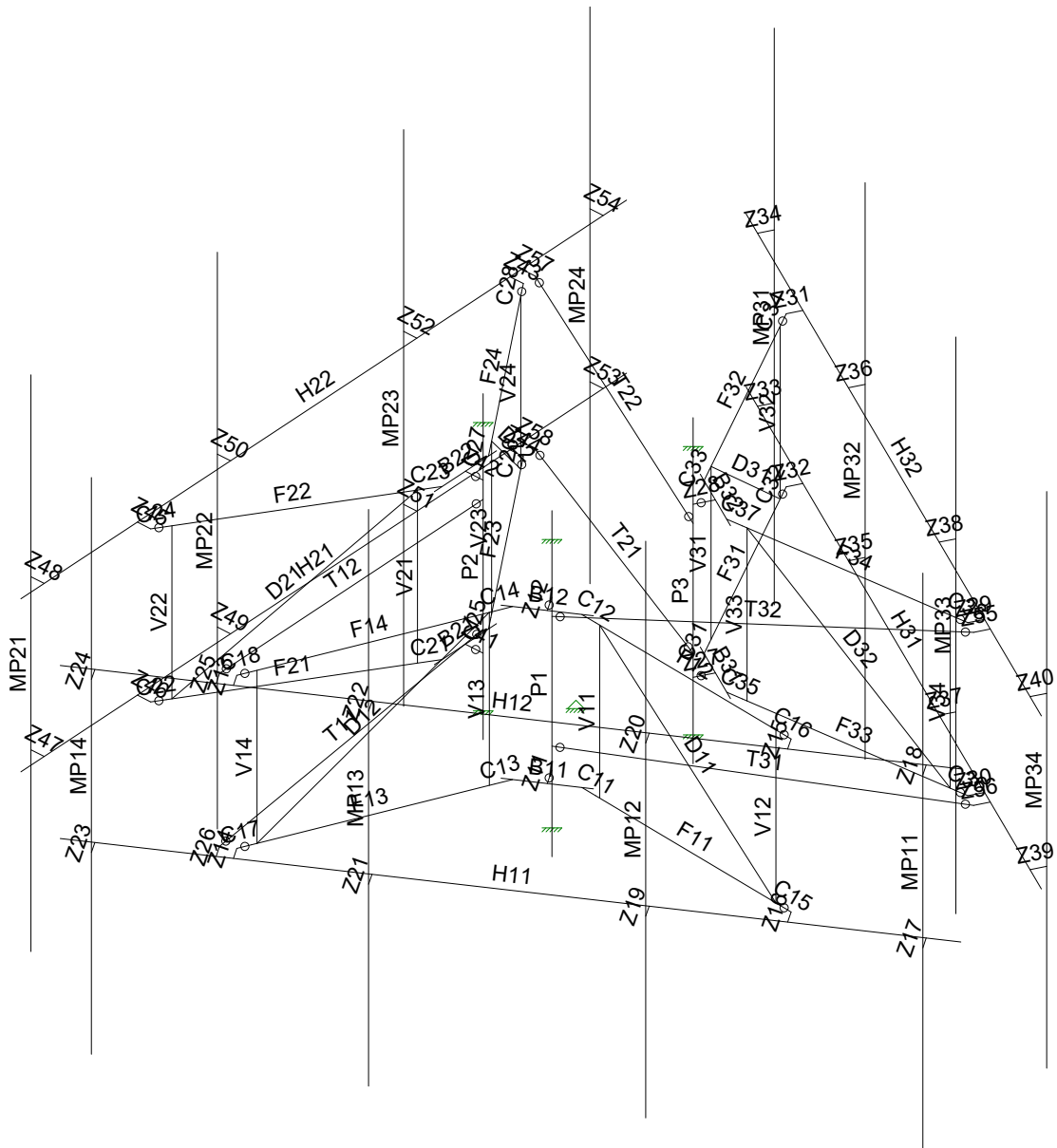
Apr 3, 2020 at 12:38 PM

136918.005.01\_(3)SectorFrames....



Envelope Only Solution

B+T GROUP	MIDDLETOWN_1 825983 (3) SECTOR FRAMES - MEMBERS	SK - 2
KH		Apr 3, 2020 at 12:38 PM
136918.005.01		136918.005.01_(3)SectorFrames....



Envelope Only Solution

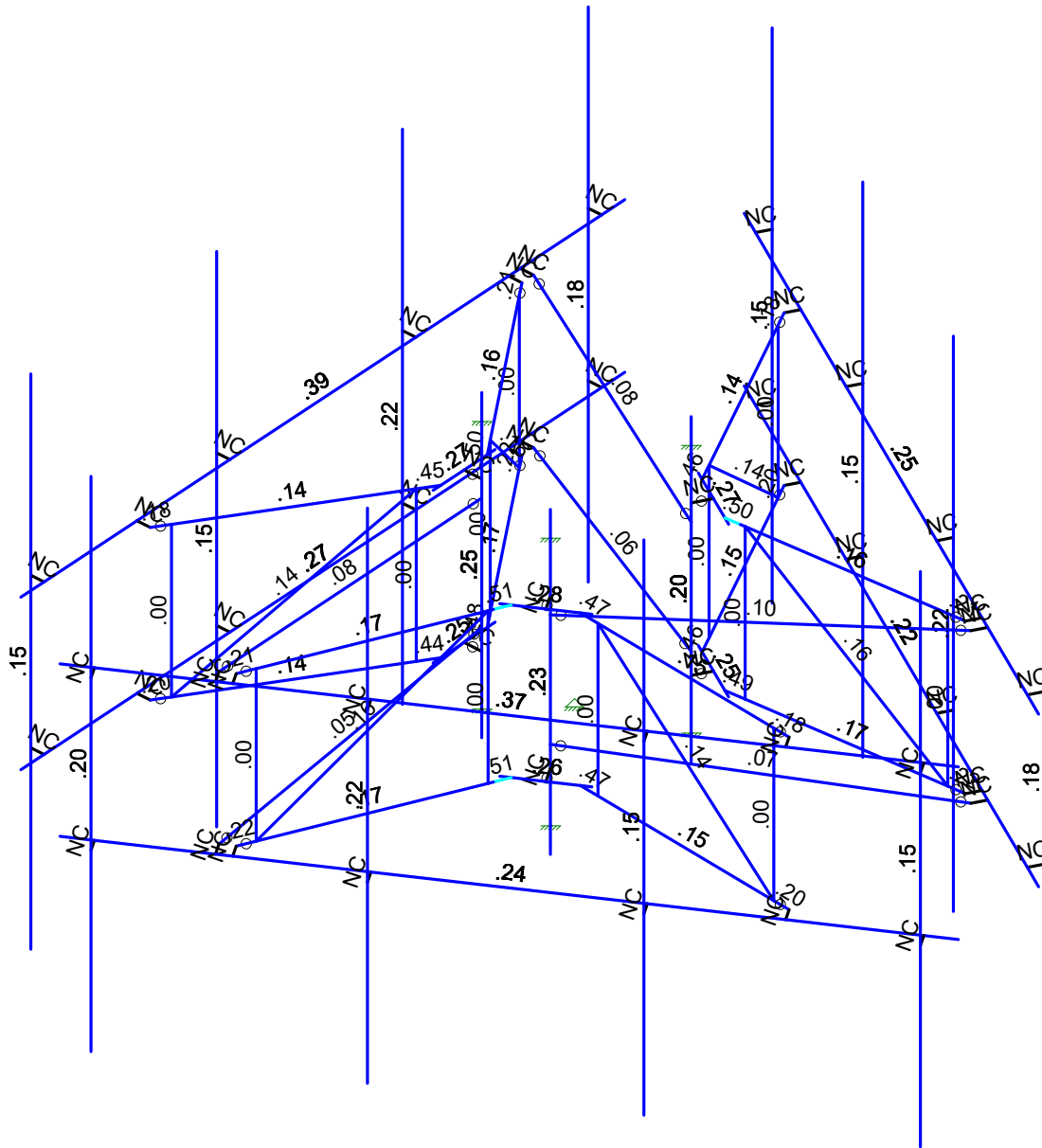
B+T GROUP
KH
136918.005.01

MIDDLETOWN_1 825983
(3) SECTOR FRAMES - LABEL

SK - 3
Apr 3, 2020 at 12:38 PM
136918.005.01_(3)SectorFrames....

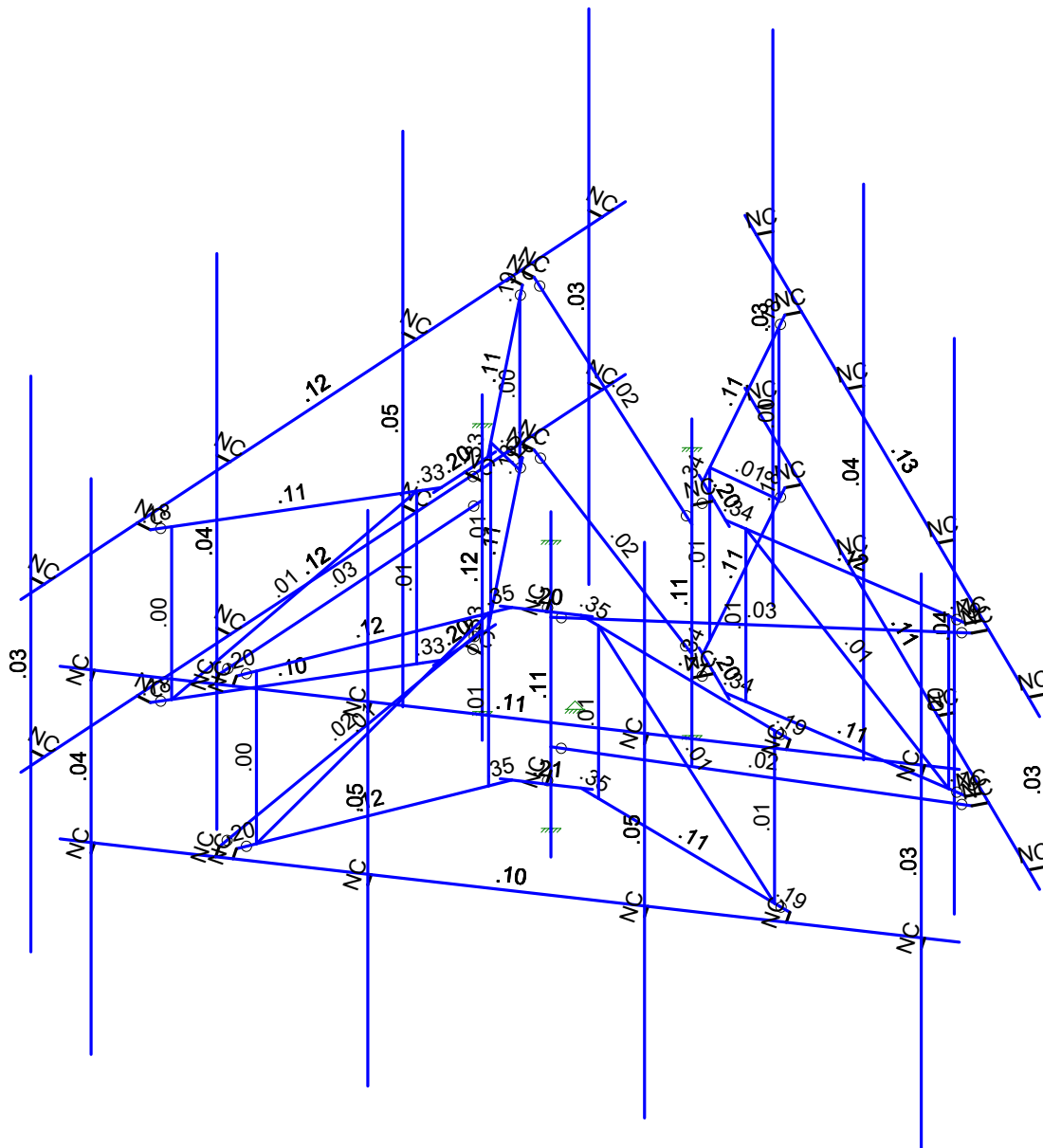
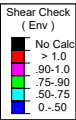


Code Check (Env)	
Black	No Calc
Red	> 1.0
Yellow	.90-1.0
Green	.75-90
Cyan	.50-75
Blue	0-.50



Member Code Checks Displayed (Enveloped)  
Envelope Only Solution

B+T GROUP	MIDDLETOWN_1 825983 (3) SECTOR FRAMES - CODE CHECK	SK - 4
KH		Apr 3, 2020 at 12:39 PM
136918.005.01		136918.005.01_(3)SectorFrames....



Member Shear Checks Displayed (Enveloped)  
Envelope Only Solution

B+T GROUP	MIDDLETOWN_1 825983 (3) SECTOR FRAMES - SHEAR CHECK	SK - 5
KH		Apr 3, 2020 at 12:39 PM
136918.005.01		136918.005.01_(3)SectorFrames....

## **APPENDIX B SOFTWARE INPUT CALCULATIONS**

PROJECT	<b>136918.004.01 - MIDDLETOW</b>	<b>KSC</b>
SUBJECT	<b>(3) SECTOR FRAMES Mount Analysis</b>	
DATE	<b>04/03/20</b>	PAGE OF



Tower Type	:	Monopole	
Ground Elevation	$Z_g$	: 89 ft	[ASCE7 Hazard Tool]
Tower Height	:	185.00 ft	
Mount Elevation	:	175.00 ft	
Antenna Elevation	:	175.00 ft	
Crest Height	:	0 ft	
Risk Category	:	II	[Table 2-1 ]
Exposure Category	:	C	[Sec. 2.6.5.1.2]
Topography Category	:	1.00	[Sec. 2.6.6.2]
Wind Velocity	$V$	: 119 mph	[ASCE7 Hazard Tool]
Ice wind Velocity	$V_i$	: 50 mph	[ASCE7 Hazard Tool]
Service Velocity	$V_s$	: 30 mph	[ASCE7 Hazard Tool]
Base Ice thickness	$t_i$	: 1.00 in	[ASCE7 Hazard Tool]
Seismic Design Cat.	:	B	[ASCE7 Hazard Tool]
	$S_S$	: 0.21	
	$S_1$	: 0.06	
	$S_{DS}$	: 0.22	
	$S_{D1}$	: 0.09	
Gust Factor	$G_H$	: 1.00	[Sec. 16.6]
Pressure Coefficient	$K_z$	: 1.42	[Sec. 2.6.5.2]
Topography Factor	$K_{zt}$	: 1.00	[Sec. 2.6.6]
Elevation Factor	$K_e$	: 1.00	[Sec. 2.6.8]
Directionality Factor	$K_d$	: 0.95	[Sec. 16.6]
Shielding Factor	$K_a$	: 0.90	[Sec. 16.6]
Design Ice Thickness	$t_{iz}$	: 1.18 in	[Sec. 2.6.10]
Importance Factor	$I_e$	: 1	[Table 2-3 ]
Response Coefficient	$C_s$	: 0.110	[Sec. 2.7.7.1]
Amplification	$A_s$	: 2.783784	[Sec. 16.7]



PROJECT	<b>136918.004.01 - MIDDLETOW</b>	<b>KSC</b>
SUBJECT	<b>(3) SECTOR FRAMES Mount Analysis</b>	
DATE	<b>04/03/20</b>	PAGE OF



Manufacturer	Model	Qty	Aspect Ratio	C <sub>a</sub> flat/round	EPA <sub>N</sub> (ft <sup>2</sup> )	EPA <sub>T</sub> (ft <sup>2</sup> )	EPA <sub>N-Ice</sub> (ft <sup>2</sup> )	EPA <sub>T-Ice</sub> (ft <sup>2</sup> )	F <sub>A</sub> No Ice (N)	F <sub>A</sub> No Ice (T)	F <sub>A</sub> Ice (N)	F <sub>A</sub> Ice (T)
PERWAVE TECHNOLOG	7770.00	0.5	5.00	1.31	2.10	0.95	2.66	1.47	0.12	0.06	0.02	0.01
PERWAVE TECHNOLOG	7770.00	0.5	5.00	1.31	2.10	0.95	2.66	1.47	0.12	0.06	0.02	0.01
PERWAVE TECHNOLOG	TME-LGP21401	2	1.57	1.20	1.84	0.52	2.69	1.16	0.10	0.03	0.02	0.00
QUINTEL TECHNOLOG	QS66512-2	0.5	6.00	1.36	3.00	2.40	3.71	3.09	0.10	0.08	0.02	0.02
QUINTEL TECHNOLOG	QS66512-2	0.5	6.00	1.36	3.00	2.40	3.71	3.09	0.10	0.08	0.02	0.02
ERICSSON	TME-RRUS 32 B66	1	3.89	1.26	1.32	2.29	1.92	2.97	0.07	0.13	0.01	0.02
ERICSSON	TME-RRUS 32 B30	1	3.89	1.26	1.32	2.29	1.92	2.97	0.07	0.13	0.01	0.02
CCI ANTENNAS	OPA65R-BU6D	0.5	3.39	1.24	5.19	1.93	5.97	2.60	0.30	0.11	0.06	0.03
CCI ANTENNAS	OPA65R-BU6D	0.5	3.39	1.24	5.19	1.93	5.97	2.60	0.30	0.11	0.06	0.03
ERICSSON	RRUS 4478 B14_CCIV2	1	2.19	1.20	1.04	1.68	1.51	2.24	0.05	0.09	0.01	0.02
ERICSSON	RRUS 4449 B5/B12	1	1.90	1.20	1.17	1.64	1.66	2.19	0.06	0.09	0.01	0.02
ERICSSON	RRUS 32 B2_CCIV2	1	2.22	1.20	2.39	1.42	3.08	2.03	0.13	0.07	0.02	0.01
CCI ANTENNAS	DMP65R-BU6D	0.5	3.44	1.24	5.12	1.90	5.89	2.57	0.29	0.11	0.06	0.02
CCI ANTENNAS	DMP65R-BU6D	0.5	3.44	1.24	5.12	1.90	5.89	2.57	0.29	0.11	0.06	0.02
ERICSSON	TME-RRUS 32 B2	1	2.26	1.20	2.28	1.32	2.96	1.92	0.12	0.07	0.02	0.01
PERWAVE TECHNOLOG	7770.00	0.5	5.00	1.31	2.10	0.95	2.66	1.47	0.12	0.06	0.02	0.01
PERWAVE TECHNOLOG	7770.00	0.5	5.00	1.31	2.10	0.95	2.66	1.47	0.12	0.06	0.02	0.01
PERWAVE TECHNOLOG	TME-LGP21401	2	1.57	1.20	1.84	0.52	2.69	1.16	0.10	0.03	0.02	0.00
QUINTEL TECHNOLOG	QS66512-2	0.5	6.00	1.36	3.00	2.40	3.71	3.09	0.10	0.08	0.02	0.02
QUINTEL TECHNOLOG	QS66512-2	0.5	6.00	1.36	3.00	2.40	3.71	3.09	0.10	0.08	0.02	0.02
ERICSSON	TME-RRUS 32 B66	1	3.89	1.26	1.32	2.29	1.92	2.97	0.07	0.13	0.01	0.02
ERICSSON	TME-RRUS 32 B30	1	3.89	1.26	1.32	2.29	1.92	2.97	0.07	0.13	0.01	0.02

PROJECT	<b>136918.004.01 - MIDDLETOW</b>	<b>KH</b>
SUBJECT	<b>(3) SECTOR FRAMES Mount Analysis</b>	
DATE	<b>04/03/20</b>	PAGE 3 OF



Manufacturer	Model	Qty	Aspect Ratio	C <sub>a</sub> flat/round	EPA <sub>N</sub> (ft <sup>2</sup> )	EPA <sub>T</sub> (ft <sup>2</sup> )	EPA <sub>N-Ice</sub> (ft <sup>2</sup> )	EPA <sub>T-Ice</sub> (ft <sup>2</sup> )	F <sub>A</sub> No Ice (N)	F <sub>A</sub> No Ice (T)	F <sub>A</sub> Ice (N)	F <sub>A</sub> Ice (T)
CCI ANTENNAS	OPA65R-BU6D	0.5	3.39	1.24	5.19	1.93	5.97	2.60	0.00	0.11	0.06	0.03
CCI ANTENNAS	OPA65R-BU6D	0.5	3.39	1.24	5.19	1.93	5.97	2.60	0.00	0.11	0.06	0.03
ERICSSON	RRUS 4478 B14_CCIV2	1	2.19	1.20	1.04	1.68	1.51	2.24	0.00	0.09	0.01	0.02
ERICSSON	RRUS 4449 B5/B12	1	1.90	1.20	1.17	1.64	1.66	2.19	0.00	0.09	0.01	0.02
ERICSSON	RRUS 32 B2_CCIV2	1	2.22	1.20	2.39	1.42	3.08	2.03	0.00	0.07	0.02	0.01
CCI ANTENNAS	DMP65R-BU6D	0.5	3.44	1.24	5.12	1.90	5.89	2.57	0.00	0.11	0.06	0.02
CCI ANTENNAS	DMP65R-BU6D	0.5	3.44	1.24	5.12	1.90	5.89	2.57	0.00	0.11	0.06	0.02
ERICSSON	TME-RRUS 32 B2	1	2.26	1.20	2.28	1.32	2.96	1.92	0.00	0.07	0.02	0.01
VERWAVE TECHNOLOG	7770.00	0.5	5.00	1.31	2.10	0.95	2.66	1.47	0.00	0.06	0.02	0.01
VERWAVE TECHNOLOG	7770.00	0.5	5.00	1.31	2.10	0.95	2.66	1.47	0.00	0.06	0.02	0.01
VERWAVE TECHNOLOG	TME-LGP21401	2	1.57	1.20	1.84	0.52	2.69	1.16	0.00	0.03	0.02	0.00
INTEL TECHNOLOG	QS66512-2	0.5	6.00	1.36	3.00	2.40	3.71	3.09	0.00	0.08	0.02	0.02
INTEL TECHNOLOG	QS66512-2	0.5	6.00	1.36	3.00	2.40	3.71	3.09	0.00	0.08	0.02	0.02
ERICSSON	TME-RRUS 32 B66	1	3.89	1.26	1.32	2.29	1.92	2.97	0.00	0.13	0.01	0.02
ERICSSON	TME-RRUS 32 B30	1	3.89	1.26	1.32	2.29	1.92	2.97	0.00	0.13	0.01	0.02
CCI ANTENNAS	OPA65R-BU6D	0.5	3.39	1.24	5.19	1.93	5.97	2.60	0.00	0.11	0.06	0.03
CCI ANTENNAS	OPA65R-BU6D	0.5	3.39	1.24	5.19	1.93	5.97	2.60	0.00	0.11	0.06	0.03
ERICSSON	RRUS 4478 B14_CCIV2	1	2.19	1.20	1.04	1.68	1.51	2.24	0.00	0.09	0.01	0.02
ERICSSON	RRUS 4449 B5/B12	1	1.90	1.20	1.17	1.64	1.66	2.19	0.00	0.09	0.01	0.02
ERICSSON	RRUS 32 B2_CCIV2	1	2.22	1.20	2.39	1.42	3.08	2.03	0.00	0.07	0.02	0.01
CCI ANTENNAS	DMP65R-BU6D	0.5	3.44	1.24	5.12	1.90	5.89	2.57	0.00	0.11	0.06	0.02
CCI ANTENNAS	DMP65R-BU6D	0.5	3.44	1.24	5.12	1.90	5.89	2.57	0.00	0.11	0.06	0.02
ERICSSON	TME-RRUS 32 B2	1	2.26	1.20	2.28	1.32	2.96	1.92	0.00	0.07	0.02	0.01

PROJECT	<b>136918.004.01 - MIDDLETOW</b>	<b>KH</b>
SUBJECT	<b>(3) SECTOR FRAMES Mount Analysis</b>	
DATE	<b>04/03/20</b>	PAGE 4 OF



Manufacturer	Model	Qty	Aspect Ratio	C <sub>a</sub> flat/round	EPA <sub>N</sub> (ft <sup>2</sup> )	EPA <sub>T</sub> (ft <sup>2</sup> )	EPA <sub>N-Ice</sub> (ft <sup>2</sup> )	EPA <sub>T-Ice</sub> (ft <sup>2</sup> )	F <sub>A</sub> No Ice (N)	F <sub>A</sub> No Ice (T)	F <sub>A</sub> Ice (N)	F <sub>A</sub> Ice (T)
KATHREIN	782 10254	1	1.43	1.20	0.09	0.05	0.25	0.19	0.00	0.00	0.00	0.00
KAELUS	DBC0061F1V51-2	2	1.29	1.20	0.69	0.72	1.23	1.28	0.04	0.04	0.01	0.01
KATHREIN	782 10254	1	1.43	1.20	0.09	0.05	0.25	0.19	0.00	0.00	0.00	0.00
KAELUS	DBC0061F1V51-2	2	1.29	1.20	0.69	0.72	1.23	1.28	0.04	0.04	0.01	0.01
KATHREIN	782 10254	1	1.43	1.20	0.09	0.05	0.25	0.19	0.00	0.00	0.00	0.00
KAELUS	DBC0061F1V51-2	2	1.29	1.20	0.69	0.72	1.23	1.28	0.04	0.04	0.01	0.01
RAYCAP (Proposed)	TME-DC9-48-60-24-8C-EV	1	3.07	1.23	2.23	3.99	2.95	4.84	0.12	0.21	0.02	0.04
RAYCAP	TME-DC6-48-60-18-8F	1	2.84	0.51	2.39	2.39	3.12	3.12	0.05	0.05	0.01	0.01
RAYCAP	TME-DC6-48-60-18-8F	1	2.84	0.51	2.39	2.39	3.12	3.12	0.05	0.05	0.01	0.01

## **APPENDIX C SOFTWARE INPUT AND OUTPUT**















































**A Ya Vyf Dc ]bh @ UXg f6 @ - : \$ GY]ga ]VL'f7 cb]bi YXL**

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Í	T ÚFF	Z	€	€
Î	T ÚFG	Z	ÈÈH	Á FÍ
Ï	T ÚFG	Z	ÈÈH	Á ÍÍ
Ï	T ÚFG	Z	ÈÈFÍ	Á ÍÈ
J	T ÚFG	Z	ÈÈFÍ	Á ÍÈ
F€	T ÚFG	Z	€	€
FF	T ÚFH	Z	ÈÈFJ	Á FÍ
FG	T ÚFH	Z	ÈÈFJ	Á ÍÍ
FH	T ÚFH	Z	ÈÈFÍ	Á ÍÈ
FI	T ÚFH	Z	ÈÈGG	Á ÍÈ
FÍ	T ÚFH	Z	ÈÈFÍ	Á G
FÎ	T ÚFI	Z	ÈÈG	Á FÍ
FÏ	T ÚFI	Z	ÈÈG	Á ÍÍ
FÏ	T ÚFI	Z	ÈÈFÍ	Á ÍÈ
FJ	T ÚFI	Z	€	€
ÖE	T ÚFI	Z	€	€
GF	T ÚGF	Z	ÈÈFF	Á ÖE
GG	T ÚGF	Z	ÈÈFF	Á ÍÍ
GH	T ÚGF	Z	ÈÈÈ	Á ÍÈ
G	T ÚGF	Z	€	€
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Ĝ	T ÚGG	Z	ÈÈFÍ	Á ÍÈ
GJ	T ÚGG	Z	ÈÈFÍ	Á ÍÈ
H€	T ÚGG	Z	€	€
HF	T ÚGH	Z	ÈÈFJ	Á FÍ
HG	T ÚGH	Z	ÈÈFJ	Á ÍÍ
HH	T ÚGH	Z	ÈÈFÍ	Á ÍÈ
HI	T ÚGH	Z	ÈÈGG	Á ÍÈ
HÎ	T ÚGH	Z	ÈÈFÍ	Á G
HÏ	T ÚG	Z	ÈÈG	Á FÍ
HÏ	T ÚG	Z	ÈÈG	Á ÍÍ
HÏ	T ÚG	Z	ÈÈFÍ	Á ÍÈ
HJ	T ÚG	Z	€	€
I€	T ÚG	Z	€	€
IF	T ÚHF	Z	ÈÈFF	Á ÖE
IG	T ÚHF	Z	ÈÈFF	Á ÍÍ
IH	T ÚHF	Z	ÈÈÈ	Á ÍÈ
II	T ÚHF	Z	€	€
ÍÍ	T ÚHF	Z	€	€
ÎÎ	T ÚHG	Z	ÈÈH	Á FÍ
ÏÏ	T ÚHG	Z	ÈÈH	Á ÍÍ
ÏÏ	T ÚHG	Z	ÈÈFÍ	Á ÍÈ
IJ	T ÚHG	Z	ÈÈFÍ	Á ÍÈ
Í€	T ÚHG	Z	€	€
ÍF	T ÚHH	Z	ÈÈFJ	Á FÍ
ÍG	T ÚHH	Z	ÈÈFJ	Á ÍÍ











**A Ya Vyf'8 jgh|Vi hYX' @ UXg'f6 @ ' & . \$ 'K jbx!' Bc =WYl'f7 cb|bi YXL**

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Í H	VGG	Z	ÉÉÉ	ÉÉÉ	€	€
Í I	VHF	Z	ÉÉÉ	ÉÉÉ	€	€
Í Î	VHG	Z	ÉÉÉ	ÉÉÉ	€	€
Í Ï	XFF	Z	ÉÉÉH	ÉÉÉH	€	€
Í Ï	XFG	Z	ÉÉÉH	ÉÉÉH	€	€
Í Ï	XFH	Z	ÉÉÉH	ÉÉÉH	€	€
Í J	XFI	Z	ÉÉÉH	ÉÉÉH	€	€
Í €	XG	Z	ÉÉÉH	ÉÉÉH	€	€
Í F	XGG	Z	ÉÉÉH	ÉÉÉH	€	€
Í G	XGH	Z	ÉÉÉH	ÉÉÉH	€	€
Í H	XG	Z	ÉÉÉH	ÉÉÉH	€	€
Í I	XHF	Z	ÉÉÉH	ÉÉÉH	€	€
Í Î	XHG	Z	ÉÉÉH	ÉÉÉH	€	€
Í Ï	XHH	Z	ÉÉÉH	ÉÉÉH	€	€
Í Ï	XHI	Z	ÉÉÉH	ÉÉÉH	€	€

**A Ya Vyf'8 jgh|Vi hYX' @ UXg'f6 @ ' ' : - \$ 'K jbx!' Bc =WYl'**

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F	ÓFF	Ý	ÉÉÉH	ÉÉÉH	€	€
G	ÓFG	Ý	ÉÉÉH	ÉÉÉH	€	€
H	ÓGF	Ý	ÉÉÉH	ÉÉÉH	€	€
I	ÓGG	Ý	ÉÉÉH	ÉÉÉH	€	€
Í	ÓHF	Ý	ÉÉÉH	ÉÉÉH	€	€

**A Ya Vyf'8 jgfhjvi hyx' @ Uxg'f6 @ ' " : - \$ 'K jbx'! Bc =wlf'f' c b h i yxL**

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Í	ÓHG	Ý	ÈÈÈH	ÈÈÈH	€	€
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Ï	ÓFG	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
J	ÓFH	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
F€	ÓFI	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
FF	ÓFÍ	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
FG	ÓFĪ	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
FH	ÓFİ	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
FI	ÓFİ	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
FÍ	ÓGF	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
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FÌ	ÓG	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
FJ	ÓG	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
G€	ÓG	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
GF	ÓG	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
GG	ÓG	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
GH	ÓHF	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
G	ÓHG	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
G	ÓHH	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
G	ÓH	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
G	ÓH	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
G	ÓH	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
GJ	ÓH	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
H€	ÓH	Ý	ÈÈÈÍ	ÈÈÈÍ	€	€
HF	ÓFF	Ý	ÈÈÈH	ÈÈÈH	€	€
HG	ÓFG	Ý	ÈÈÈH	ÈÈÈH	€	€
HH	ÓGF	Ý	ÈÈÈH	ÈÈÈH	€	€
HI	ÓGG	Ý	ÈÈÈH	ÈÈÈH	€	€
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HÌ	ØFG	Ý	ÈÈÈJ	ÈÈÈJ	€	€
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IG	ØGG	Ý	ÈÈÈJ	ÈÈÈJ	€	€
IH	ØGH	Ý	ÈÈÈJ	ÈÈÈJ	€	€
II	ØG	Ý	ÈÈÈJ	ÈÈÈJ	€	€
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Ï	ØHH	Ý	ÈÈÈJ	ÈÈÈJ	€	€
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IJ	PFF	Ý	ÈÈÈF	ÈÈÈF	€	€
I€	PFG	Ý	ÈÈÈF	ÈÈÈF	€	€
IF	PGF	Ý	ÈÈÈF	ÈÈÈF	€	€
IG	PGG	Ý	ÈÈÈF	ÈÈÈF	€	€
IH	PHF	Ý	ÈÈÈF	ÈÈÈF	€	€
II	PHG	Ý	ÈÈÈF	ÈÈÈF	€	€
Í	TUFF	Ý	ÈÈÈFH	ÈÈÈFH	€	€
Ï	TUFG	Ý	ÈÈÈFH	ÈÈÈFH	€	€
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**A Ya Vyf'8 jgfh]Vi hYX'@ UXg'f6 @' ( : \$ 'K jbx'! =WYLF'7 cb]bi YXL**

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İ H	VGG	Z	İİİİİ	İİİİİ	€	€
İ I	VHF	Z	İİİİİ	İİİİİ	€	€
İ İ	VHG	Z	İİİİİ	İİİİİ	€	€
İ Ĩ	XFF	Z	İİİİİ	İİİİİ	€	€
İ Ī	XFG	Z	İİİİİ	İİİİİ	€	€
İ Ĭ	XFH	Z	İİİİİ	İİİİİ	€	€
İ J	XFI	Z	İİİİİ	İİİİİ	€	€
İ €	XGF	Z	İİİİİ	İİİİİ	€	€
İ F	XGG	Z	İİİİİ	İİİİİ	€	€
İ G	XGH	Z	İİİİİ	İİİİİ	€	€
İ H	XGI	Z	İİİİİ	İİİİİ	€	€
İ I	XHF	Z	İİİİİ	İİİİİ	€	€
İ İ	XHG	Z	İİİİİ	İİİİİ	€	€
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**A Ya Vyf'8 jgfh]Vi hYX'@ UXg'f6 @' ) : - \$ 'K jbx'! =WYLF**

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H	ÖGF	Ý	İİİİİ	İİİİİ	€	€
I	ÖGG	Ý	İİİİİ	İİİİİ	€	€
Í	ÖHF	Ý	İİİİİ	İİİİİ	€	€
Ī	ÖHG	Ý	İİİİİ	İİİİİ	€	€
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Ì	ÖFG	Ý	İİİİİ	İİİİİ	€	€
J	ÖFH	Ý	İİİİİ	İİİİİ	€	€
F€	ÖFI	Ý	İİİİİ	İİİİİ	€	€
FF	ÖFİ	Ý	İİİİİ	İİİİİ	€	€
FG	ÖFĪ	Ý	İİİİİ	İİİİİ	€	€
FH	ÖFĬ	Ý	İİİİİ	İİİİİ	€	€
FI	ÖFĪ	Ý	İİİİİ	İİİİİ	€	€
FÍ	ÖGF	Ý	İİİİİ	İİİİİ	€	€
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FĬ	ÖGH	Ý	İİİİİ	İİİİİ	€	€
FÌ	ÖG	Ý	İİİİİ	İİİİİ	€	€
FJ	ÖGĪ	Ý	İİİİİ	İİİİİ	€	€
F€	ÖGĪ	Ý	İİİİİ	İİİİİ	€	€
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GG	ÖGĪ	Ý	İİİİİ	İİİİİ	€	€
GH	ÖHF	Ý	İİİİİ	İİİİİ	€	€
G	ÖHG	Ý	İİİİİ	İİİİİ	€	€
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G	ÖH	Ý	İİİİİ	İİİİİ	€	€
GJ	ÖH	Ý	İİİİİ	İİİİİ	€	€
H€	ÖH	Ý	İİİİİ	İİİİİ	€	€
HF	ÖFF	Ý	İİİİİ	İİİİİ	€	€



**A Ya VYf'8 jglfjVi hYX'@ UXg'f6 @ ) : - \$ 'K jbx'! =WYl'f7 cbjbi YXL**

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í	XHG	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
î	XHH	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
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**A Ya VYf'8 jglfjVi hYX'@ UXg'f6 @ \* : \$ 'K jbx'! 'GYfj jWl**

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H	ÖGF	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
I	ÖGG	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
Í	ÖHF	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
Î	ÖHG	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
Ï	ÖFF	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
Ì	ÖFG	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
J	ÖFH	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
F€	ÖFI	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
FF	ÖFÍ	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
FG	ÖFÎ	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
FH	ÖFÏ	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
FI	ÖFÌ	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
FÍ	ÖGF	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
FÎ	ÖGG	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
FÏ	ÖGH	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
FÌ	ÖG	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
FJ	ÖGÍ	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
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GF	ÖGÍ	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
GG	ÖGÏ	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
GH	ÖHF	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
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GÌ	ÖH	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
GJ	ÖHÍ	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
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HF	ÖFF	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
HG	ÖFG	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
HH	ÖGF	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
HI	ÖGG	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
HÍ	ÖHF	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
HÎ	ÖHG	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
HÏ	ÖFF	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
HÌ	ÖFG	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
HJ	ÖFH	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
I€	ÖFI	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
IF	ÖGF	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
IG	ÖGG	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
IH	ÖGH	Z	ÉÉÉÉ	ÉÉÉÉ	€	€
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**A Ya Vyf'8 jglfjVi hYX'@ UXg'f6 @' - : \$'GYjga jWEfT cbfjbi YXL**

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**A Ya Vyf'8 jglfjVi hYX'@ UXg'f6 @' %' - : \$'GYjga jWE**

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H	ÖGF	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
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İ	ÖFF	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
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J	ÖFH	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
F€	ÖFI	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
FF	ÖFĪ	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
FG	ÖFĪ	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
FH	ÖFĪ	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
FI	ÖFĪ	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
FĪ	ÖGF	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
FĬ	ÖGG	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
FĪ	ÖGH	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
FĬ	ÖG	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
FJ	ÖGĪ	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
G€	ÖGĪ	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
GF	ÖGĪ	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
GG	ÖGĪ	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
GH	ÖHF	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
G	ÖHG	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
GĪ	ÖHH	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
GĬ	ÖH	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
GĪ	ÖHĪ	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
GĬ	ÖH	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
GĪ	ÖHĪ	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
GJ	ÖHĪ	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
H€	ÖHĪ	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
HF	ÖFF	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
HG	ÖFG	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
HH	ÖGF	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
HI	ÖGG	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
HĪ	ÖHF	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
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HĬ	ÖFG	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
HJ	ÖFH	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
I€	ÖFI	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
IF	ÖGF	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
IG	ÖGG	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
IH	ÖGH	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€
II	ÖG	Ý	ÉÉÉÉ	ÉÉÉÉ	€	€









# Exhibit F

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





# RF EMISSIONS COMPLIANCE REPORT

## Crown Castle on behalf of AT&T Mobility, LLC

Crown Castle Site Name: MIDDLETOWN\_1  
Crown Castle Site BU: 825983  
AT&T Mobility, LLC Site FA #: 10035130  
90 Industrial Park Road  
Middletown, CT  
3/25/2020

### Report Status:

**AT&T Mobility, LLC is Compliant**



Michael Fischer, P.E.  
Registered Professional Engineer (Electrical)  
Connecticut License Number 33928  
Expires January 31, 2021

Signed 25 March 2020

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 on behalf of AT&T Mobility, LLC (see attached Site Summary and Carrier documents) and that AT&T Mobility, LLC's installation involves communications equipment, antennas and associated technical equipment at a location referred to as "MIDDLETOWN\_1" ("the site"); and

That AT&T Mobility, LLC proposes to operate at the site with transmit antennas listed in the carrier summary and with a maximum effective radiated power as specified by AT&T Mobility, LLC 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 AT&T Mobility, LLC's 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 AT&T Mobility, LLC operation is

no more than 1.659% 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 4.303% 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 AT&T Mobility, LLC's 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	0.110 %
AT&T Mobility, LLC	0.206 %
AT&T Mobility, LLC	0.057 %
AT&T Mobility, LLC (Proposed)	0.190 %
AT&T Mobility, LLC (Proposed)	0.189 %
AT&T Mobility, LLC (Proposed)	0.752 %
AT&T Mobility, LLC (Proposed)	0.155 %
T-Mobile	0.168 %
T-Mobile	0.137 %
T-Mobile	0.295 %
T-Mobile	0.126 %
Verizon Wireless	0.539 %
Verizon Wireless	0.381 %
Verizon Wireless	0.470 %
Verizon Wireless	0.528 %
 <b>Composite Site MPE:</b>	 4.303 %

**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:** 1.09573  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.10957 %

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	175	40	2858	0.497214	0.049721	1.018197	0.101820
Quintel	QS66512-2	175	150	2858	0.497214	0.049721	1.018197	0.101820
Quintel	QS66512-2	175	270	2858	0.497214	0.049721	1.018197	0.101820

**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:** 2.05592  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.20559 %

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	175	40	4788	1.178665	0.117867	1.955754	0.195575
Quintel	QS66512-2	175	150	4788	1.178665	0.117867	1.955754	0.195575
Quintel	QS66512-2	175	270	4788	1.178665	0.117867	1.955754	0.195575

**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:** 0.32217  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.05685 %

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	175	27	547	0.168187	0.029680	0.261700	0.046182
Powerwave	7770	175	141	547	0.168187	0.029680	0.261700	0.046182
Powerwave	7770	175	261	547	0.168187	0.029680	0.261700	0.046182

**AT&T Mobility, LLC (Proposed)**  
**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: 1.07499  $\mu\text{W}/\text{cm}^2$   
Highest percentage of Maximum Permissible Exposure: 0.18970 %

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	DMP65R-BU6D	175	40	2239	0.558324	0.098528	1.024272	0.180754
CCI	DMP65R-BU6D	175	150	2239	0.558324	0.098528	1.024272	0.180754
CCI	DMP65R-BU6D	175	270	2239	0.558324	0.098528	1.024272	0.180754



**AT&T Mobility, LLC (Proposed)**  
**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: 0.92670  $\mu\text{W}/\text{cm}^2$   
 Highest percentage of Maximum Permissible Exposure: 0.18861 %

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	DMP65R-BU6D	175	40	2400	0.587655	0.119604	0.778530	0.158453
CCI	DMP65R-BU6D	175	150	2400	0.587655	0.119604	0.778530	0.158453
CCI	DMP65R-BU6D	175	270	2400	0.587655	0.119604	0.778530	0.158453

**AT&T Mobility, LLC (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: 7.52065  $\mu\text{W}/\text{cm}^2$   
Highest percentage of Maximum Permissible Exposure: 0.75207 %

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	OPA65R-BU6D	175	40	4458	3.127634	0.312763	3.819850	0.381985
CCI	DMP65R-BU6D	175	40	4075	3.091604	0.309160	3.710320	0.371032
CCI	OPA65R-BU6D	175	150	4458	3.127634	0.312763	3.819850	0.381985
CCI	DMP65R-BU6D	175	150	4075	3.091604	0.309160	3.710320	0.371032
CCI	OPA65R-BU6D	175	270	4458	3.127634	0.312763	3.819850	0.381985
CCI	DMP65R-BU6D	175	270	4075	3.091604	0.309160	3.710320	0.371032

**AT&T Mobility, LLC (Proposed)**  
**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: 0.78860  $\mu\text{W}/\text{cm}^2$   
Highest percentage of Maximum Permissible Exposure: 0.15503 %

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	OPA65R-BU6D	175	40	2450	0.610825	0.120084	0.637609	0.125349
CCI	OPA65R-BU6D	175	150	2450	0.610825	0.120084	0.637609	0.125349
CCI	OPA65R-BU6D	175	270	2450	0.610825	0.120084	0.637609	0.125349

## 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:** 0.78362  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.16792 %

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	185	60	3484	0.643364	0.137864	0.672596	0.144128
RFS	APXVAARR24_43-U-NA20	185	180	3484	0.643364	0.137864	0.672596	0.144128
RFS	APXVAARR24_43-U-NA20	185	300	3484	0.643364	0.137864	0.672596	0.144128

## 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:** 0.54711  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.13678 %

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	185	60	2501	0.496488	0.124122	0.509395	0.127349
RFS	APXVAARR24_43-U-NA20	185	180	2501	0.496488	0.124122	0.509395	0.127349
RFS	APXVAARR24_43-U-NA20	185	300	2501	0.496488	0.124122	0.509395	0.127349

# 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:** 2.94975  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.29497 %

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	185	60	4626	2.768941	0.276894	2.768941	0.276894
Ericsson	AIR 32 B2A B66AA	185	180	4626	2.768941	0.276894	2.768941	0.276894
Ericsson	AIR 32 B2A B66AA	185	300	4626	2.768941	0.276894	2.768941	0.276894

## 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:** 1.25933  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.12593 %

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	185	60	1691	0.223860	0.022386	0.265724	0.026572
Ericsson	AIR 32 B2A B66AA	185	60	4626	0.641697	0.064170	0.733314	0.073331
RFS	APX16DWV-16DWVS-C-A20	185	180	1691	0.223860	0.022386	0.265724	0.026572
Ericsson	AIR 32 B2A B66AA	185	180	4626	0.641697	0.064170	0.733314	0.073331
RFS	APX16DWV-16DWVS-C-A20	185	300	1691	0.223860	0.022386	0.265724	0.026572
Ericsson	AIR 32 B2A B66AA	185	300	4626	0.641697	0.064170	0.733314	0.073331

**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:** 5.38690  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.53869 %

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	2.799806	0.279981	4.233978	0.423398
ANDREW	SBNHH-1D65B	155	120	7732	2.799806	0.279981	4.233978	0.423398
ANDREW	SBNHH-1D65B	155	270	7732	2.799806	0.279981	4.233978	0.423398



**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:** 1.90640  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.38077 %

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	0.615472	0.122931	0.991397	0.198015
ANDREW	SBNHH-1D65B	155	120	2043	0.615472	0.122931	0.991397	0.198015
ANDREW	SBNHH-1D65B	155	270	2043	0.615472	0.122931	0.991397	0.198015

**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:** 4.69579  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.46958 %

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	3.266673	0.326667	4.227652	0.422765
ANDREW	SBNHH-1D65B	155	120	4583	3.266673	0.326667	4.227652	0.422765
ANDREW	SBNHH-1D65B	155	270	4583	3.266673	0.326667	4.227652	0.422765

# 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:** 2.99293  $\mu\text{W}/\text{cm}^2$   
**Highest percentage of Maximum Permissible Exposure:** 0.52816 %

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	1.456758	0.257075	1.594544	0.281390
ANDREW	SBNHH-1D65B	155	120	2892	1.456758	0.257075	1.594544	0.281390
ANDREW	SBNHH-1D65B	155	270	2892	1.456758	0.257075	1.594544	0.281390