



1 Cityplace Dr, Suite 490  
Creve Coeur, MO 63141

Phone: (314) 513-0147  
www.crowncastle.com

10/18/2022

MA – Town of Ashland  
Planning Department  
101 Main Street  
Ashland, MA 01721

\*\*\*\*\*NOTICE OF ELIGIBLE FACILITIES REQUEST\*\*\*\*\*

RE: Request for Minor Modification to Existing Wireless Facility – Section 6409  
34 Albert Ray Drive, Ashland, MA 01721  
Crown Site Number: 806042 / Crown Site Name: BOS Ashland 959026  
Customer Site Number: 137514 / Application Number: 593348

To Whom it May Concern,

On behalf of Verizon Wireless, Crown Castle USA Inc. (“Crown Castle”) is pleased to submit this request to modify the existing wireless facility noted above through the collocation, replacement and/or removal of the Applicant’s equipment as an eligible facilities request for a minor modification under Section 6409<sup>1</sup> and the rules of the Federal Communications Commission (“FCC”).<sup>2</sup>

Section 6409 mandates that state and local governments must approve any eligible facilities request for the modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station. Under Section 6409, to toll the review period, if the reviewing authority determines that the application is incomplete, it must provide written notice to the applicant within 30 days, which clearly and specifically delineates all missing documents or information reasonably related to whether the request meets the federal requirements. Additionally, if a state or local government, fails to issue any approvals required for this request within 60 days, these approvals are deemed granted. The FCC has clarified that the 30-day and 60-day deadlines begins when an applicant: (1) takes the first step required under state or local law; and (2) submits information sufficient to inform the jurisdiction that this modification qualifies under the federal law<sup>4</sup>. Please note that with the submission of this letter and enclosed items, the thirty and sixty-day review periods have started. Based on this filing, the deadline for written notice of incomplete application is November 17th, 2022, and the deadline for issuance of approval is December 17th, 2022.

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<sup>1</sup> Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, § 6409 (2012) (codified at 47 U.S.C. § 1455).

<sup>2</sup> *Acceleration of Broadband Deployment by Improving Wireless Facility Siting Policies*, 29 FCC Rcd. 12865 (2014) (codified at 47 CFR § 1.6100); and *Implementation of State & Local Governments’ Obligation to Approve Certain Wireless Facility Modification Requests Under Section 6409(a) of the Spectrum Act of 2012*, WT Docket No. 19-250 (June 10, 2020).



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The proposed scope of work for this project includes:

Remove and replace antennas and ancillary equipment as per plans for Verizon Wireless on an existing Wireless Communication Facility.

At the end of this letter is a checklist of the applicable substantial change criteria under Section 6409. Additionally, please find enclosed the following information in support of this request:

- (1) Building Permit Application
- (2) Construction Drawings;
- (3) Structural Analysis; and
- (4) Section 6409 Substantial Change Checklist.

As these documents indicate, (i) the modification involves the collocation, removal or replacement of transmission equipment; and (ii) such modification will not substantially change the physical dimensions of such tower or base station. As such, it is an “eligible facilities request” as defined in the FCC’s rules to which the 60 day deadline for approval applies. Accordingly, Applicant requests all authorization necessary for this proposed minor modification under Section 6409.

Our goal is to work with you to obtain approvals earlier than the deadline. We will respond promptly to any request for related information you may have in connection with this request. Please let us know how we can work with you to expedite the approval process. We look forward to working with you on this important project, which will improve wireless telecommunication services in your community using collocation on existing infrastructure. If you have any questions, please do not hesitate to contact me.

Regards,

*Katie Adams*

Katie Adams  
Sr. Site Acquisition Specialist  
Crown Castle Agent for Applicant  
(781) 392-7547  
kadams@nbcllc.com

**Section 6409 Substantial Change Checklist  
Towers Outside of the Public Right of Way**

The Federal Communications Commission has determined that a modification substantially changes the physical dimension of a wireless tower or base station under 47 U.S.C. § 1455(a) if it meets one of six enumerated criteria under 47 C.F.R. § 1.6100.

**Criteria for Towers Outside the Public Rights of Way**

YES/NO  <b>NO</b>	Does the modification increase the height of the tower by more than the greater of: (a) 10%; or (b) the height of an additional antenna array plus separation of up to 20 feet from the top of the nearest existing antenna?
YES/NO  <b>NO</b>	Does the modification add an appurtenance to the body of the tower that would protrude from the edge of the tower more than 20 feet or more than the width of the tower structure at the level of the appurtenance, whichever is greater?
YES/NO  <b>NO</b>	Does the modification involve the installation of more than the standard number of new equipment cabinets for the technology involved or add more than four new equipment cabinets?
YES/NO  <b>NO</b>	Does the modification entail any excavation or deployment outside the current site by more than 30 feet in any direction, not including any access or utility easements?
YES/NO  <b>NO</b>	Does the modification defeat the concealment elements of the eligible support structure?
YES/NO  <b>NO</b>	Does the modification violate conditions associated with the siting approval with the prior approval the tower or base station other than as specified in 47 C.F.R. § 1.6100(c)(7)(i) – (iv)?

If all questions in the above are area answered “NO,” then the modification does not constitute a substantial change to the existing tower under 47 C.F.R. § 1.6100.



**Town of Ashland  
Planning Department**

101 Main St.  
Ashland, MA 01721  
508.881.0101  
Ashlandmass.com/193/Planning

**Application for Planning Board Approval/Permit**

Note: Application must be complete, with a certified plot plan and all application fees to be accepted.

**Property Information:**

Street Address: 34 Albert Ray Drive

Zoning District: MA014 Overlay District: \_\_\_\_\_

Assessor's Map: 9 Lot: 173 Deed Book: 30867 Page: 0381

Current Property Owner: Crown Atlantic Company LLC

**Permit/Approval Sought:**

\_\_\_ Special Permit (§9.3) \_\_\_ Special Permit Amendment/Modification \_\_\_ Design Plan Review (§9.6)

\_\_\_ Site Plan Review (§9.4) \_\_\_ Site Plan Modification \_\_\_ Scenic Road Permit (Ch. 249 §20)

\_\_\_ Earth Removal Permit (Ch. 242 §3) \_\_\_ Site Alteration Special Permit (§5.8)

\_\_\_ Subdivision (Include Subdivision Application Form)  Wireless Communication Facilities (§6.4)

Use Type: Residential: \_\_\_ Commercial: \_\_\_ Industrial: \_\_\_ Mixed Use:

**Applicant Information:**

Owner: \_\_\_ Tenant:  Prospective Purchaser/Tenant: \_\_\_

Name: Verizon Wireless

Address: 1515 E. Woodfield Rd. Schaumburg, IL 60173

Phone: 630-470-1400 Email: William.Gates@crowncastle.com

Agent's Name: Katie Adams

Agent's Address: 100 Apollo Drive Suite 303, Chelmsford, MA 01824

Agent's Phone: 781-392-7547 Agent's Email: kadams@nbcllc.com

**Additional Information:**

Are all real estate taxes and other assessments to the Town current?: yes

Is the parcel on a scenic road?: N Is the parcel in a flood plain?: N

Is the parcel within 100 feet of a wetland or 200 feet of a river: N

Is this an amendment to a previously issued Special Permit? (attach approved permit): N

Date structure(s) built?: \_\_\_\_\_



**Description of the Relief Sought:** (attach additional pages if needed)

Verizon Wireless modification to existing wireless communication facility.  
Verizon to remove and replace antennas and ancillary equipment per plans.

This collocation will be aesthetically consistent with the existing structure  
and Verizons existing antenna array .

What specific zoning bylaws and/or Special Permit types are relevant to this application?:

**Section 6.4 - Wireless Communications Facility**

Benefits of Project:

Modifications to equipment to keep current with evolving technologies, to  
provide the best coverage for their carriers.

**Existing use and condition of the property and surrounding neighborhood:** (Please list all non-conformities.)

Existing Wireless Communication Cell Tower.

Attach Building Permit Denial letter if applicable.

By signing below you assert this application is complete and accurate to the best of your knowledge:

**Signatures:**

Applicant/Agent: Katie Adams Applicant's Name: Katie Adams

Agent's Relationship to Applicant: Agent for Verizon Firm: Network Building + Consulting and Crown Castle

Owner: \_\_\_\_\_ Owner's Name: \_\_\_\_\_

Note: If the applicant is not the owner, please have the owner sign above or submit a letter of permission with the application.





Two Chase Corporate Dr. Suite 105  
Birmingham, AL 35244

Phone: (205) 909-2039  
www.crowncastle.com

**Crown Castle Letter of Authorization**


**MA - TOWN OF ASHLAND  
Planning Department  
101 MAIN STREET, 2ND FLOOR  
ASHLAND, TX 77216-3112**

**Re: Application for Zoning/Building Permit  
Crown Castle telecommunications site at: ALBERT RAY DRIVE FOUNTAIN AND  
GREEN STREETS, ASHLAND, MA 01721**

CROWN ATLANTIC COMPANY LLC ("Crown Castle") hereby authorizes VERIZON WIRELESS, including their Agent, to act as our Agent in the processing of all zoning applications, building permits and approvals through the MA - TOWN OF ASHLAND for the existing wireless communications site described below:

**Crown Site ID/Name: 806042/BOS ASHLAND 959026  
Customer Site ID: 137514/ASHLAND\_MA  
Site Address: ALBERT RAY DRIVE FOUNTAIN AND GREEN STREETS,  
ASHLAND, MA 01721  
APN: ASHL-000009-000173**

Crown Castle

By:  Date: 8/22/22  
Donovan Pieper  
Services Supervisor

**CROWN ATLANTIC COMPANY LLC  
ASSISTANT SECRETARY’S CERTIFICATE**

I, Inge Pasman, do hereby certify that I am the Assistant Secretary of CROWN ATLANTIC COMPANY LLC, a Delaware limited liability company (“Company”), and further certify that:

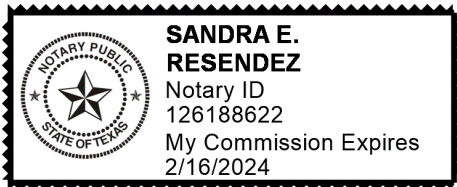
1. Donovan Pieper is a Service Delivery Supervisor of the Company and continues to hold such position as of the date below; and
2. pursuant to the Company's Commitment Authority Policy, dated December 6, 2021, a Service Delivery Supervisor is authorized to perform such acts as are necessary and appropriate to file and present on behalf of the Company such building, permitting, zoning and land use applications with the appropriate local, state or federal agencies, which are necessary to obtain zoning, construction and operation permits, land use changes, administrative permits, conditional use permits, zoning variances, special exceptions, building permits and any other permits and approvals that relate to the Company’s operations.


IN WITNESS WHEREOF, I have hereunto subscribed my name this 4th day of August, 2022.

DocuSigned by:  
  
B82A3B24DB204A0...  
 \_\_\_\_\_  
 Inge Pasman, Assistant Secretary  
 Crown Atlantic Company LLC

STATE OF TEXAS  
COUNTY OF HARRIS

This certificate was subscribed and sworn before me by means of an interactive two-way audio communication on the 4th day of August, 2022, by Inge Pasman, Assistant Secretary of CROWN ATLANTIC COMPANY LLC. This notarial act was an online notarization.



DocuSigned by:  
  
52179920DF0D4E8...  
 \_\_\_\_\_  
 Notary Public

My Commission Expires: 2/16/2024

PARID: 0140090017300000  
CROWN ATLANTIC COMPANY LLC

MUNICIPALITY: ASHLAND  
34 ALBERT RAY DR

LUC: 431  
PARCEL YEAR: 2023

### Property Information

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Property Location: 34 ALBERT RAY DR

Class: I-INDUSTRIAL

Use Code (LUC): 431-TELEPHONE RELAY TOWERS

District: MA014 - ASHLAND

Deeded Acres: .6900

Square Feet: 30,056

### Owner

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Owner	Co-Owner	City	Address	State	Zip Code	Deed Book/Page
CROWN ATLANTIC COMPANY P M B 353 LLC		MCMURRAY	4017 WASHINGTON RD	PA	15317	30867/0381

August 8, 2022

To The Planning Board  
34 Albert Ray Drive  
Crown Atlantic Company LLC  
Abutters To Map 9 Parcel 173

PARCEL ID	PARCEL LOCATION	OWNER NAME 1	OWNER NAME 2	MAILING ADDRESS	CITY/TOWN	STATE	ZIP
05-028-00-000	26 DEARTH CIRCLE	KREH KURT	SONJA KREH	26 DEARTH CIRCLE	ASHLAND	MA	01721
09-163-00-000	16 DEARTH CIRCLE	SURILLOV EUGENIY	SVETLANA SURILLOV	16 DEARTH CIRCLE	ASHLAND	MA	01721
09-164-00-000	20 DEARTH CIRCLE	DANGEL JEFFREY M	TRUSTEE OF THE JEFFREY M DANGEL FAMILY TRUST	20 DEARTH CIRCLE	ASHLAND	MA	01721
09-165-00-000	23 DEARTH CIRCLE	BRAVACOS LOUIS J JR	GRETCHEN BRAVACOS	23 DEARTH CIRCLE	ASHLAND	MA	01721
09-166-00-000	19 DEARTH CIRCLE	ALFANO JAMES A	WOLF ANDREA	19 DEARTH CIRCLE	ASHLAND	MA	01721
09-167-00-000	15 DEARTH CIRCLE	SOOD AMAN	KHETRAPAL NIDHI	15 DEARTH CIRCLE	ASHLAND	MA	01721
09-168-00-000	11 DEARTH CIRCLE	PARISI ROBERT J & ABELLI LINDA J	TRUSTEES ROBERT J PARISI TRUST	11 DEARTH CIRCLE	ASHLAND	MA	01721
09-169-00-000	7 DEARTH CIRCLE	YARGER MARK A	ROXANNE F YARGER	7 DEARTH CIRCLE	ASHLAND	MA	01721
09-170-00-000	22 ALBERT RAY DR	VISWANATHAN RAJESH	SUBASREE V VISWANATHAN	22 ALBERT RAY DR	ASHLAND	MA	01721
09-171-00-000	26 ALBERT RAY DR	KRISHNAN VENKATA S	LAKSHMI S KRISHNAN	26 ALBERT RAY DR	ASHLAND	MA	01721
09-172-00-000	30 ALBERT RAY DR	SIVAK JAMES M	CARLA SIVAK	30 ALBERT RAY DR	ASHLAND	MA	01721
09-174-00-000	38 ALBERT RAY DR	BOUDREAU JEFFERY	COURTNEY CAROLYN E	38 ALBERT RAY DR	ASHLAND	MA	01721
09-175-00-000	0 GREEN ST REAR	PECK KEELEY	TROSINSKI KEVIN	39 WILLIAM J HEIGHTS	FRAMINGHAM	MA	01701
10-001-00-000	35 ALBERT RAY DR	HELLERMAN TRACY	JENNIFER HELLERMAN	35 ALBERT RAY DR	ASHLAND	MA	01721
10-002-00-000	31 ALBERT RAY DR	MACDONALD RONALD F	ELIZABETH ANN MACDONALD	31 ALBERT RAY DR	ASHLAND	MA	01721
10-003-00-000	10 ENSLIN CIRCLE	GUSTAVSON PAUL F	CYNTHIA GUSTAVSON	10 ENSLIN CIRCLE	ASHLAND	MA	01721

The above reflects the latest information available on our records.



Richard E. Ball, M.A.A.  
Director of Assessing

Date 8/8/22

16 parcels/abutters



**VERIZON SITE NUMBER:** 137514  
**VERIZON SITE NAME:** ASHLAND\_MA  
**SITE TYPE:** MONOPOLE  
**TOWER HEIGHT:** 99'-0"

**BUSINESS UNIT #:** 806042  
**SITE ADDRESS:** ALBERT RAY DRIVE FOUNTAIN AND GREEN STREETS, ASHLAND, MA 01721  
**COUNTY:** MIDDLESEX  
**JURISDICTION:** TOWN OF ASHLAND

**VERIZON 5G L-SUB6 - CARRIER ADD 16243982**



**VERIZON SITE NUMBER:** 137514

**BU #:** 806042  
**BOS ASHLAND 959026**

ALBERT RAY DRIVE  
 FOUNTAIN AND GREEN  
 STREETS  
 ASHLAND, MA 01721

EXISTING 99'-0" MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/2/21	JJR	CONSTRUCTION	JJR
1	4/11/22	JHW	CONSTRUCTION	LR

**SITE INFORMATION**

CROWN CASTLE USA INC. BOS ASHLAND 959026  
 SITE NAME:  
 SITE ADDRESS: ALBERT RAY DRIVE FOUNTAIN AND GREEN STREETS, ASHLAND, MA 01721  
 COUNTY: MIDDLESEX  
 MAP/PARCEL #: 09-173-00-000  
 AREA OF CONSTRUCTION: EXISTING  
 LATITUDE: 42.273707°  
 LONGITUDE: -71.451451°  
 LAT/LONG TYPE: NAD83  
 GROUND ELEVATION: 323'-0"  
 CURRENT ZONING: RA  
 JURISDICTION: TOWN OF ASHLAND  
 OCCUPANCY CLASSIFICATION: U  
 TYPE OF CONSTRUCTION: IIB  
 A.D.A. COMPLIANCE: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION  
 PROPERTY OWNER: CROWN ATLANTIC COMPANY LLC, 4017 WASHINGTON RD, MCMURRAY PA 15317  
 TOWER OWNER: CROWN CASTLE, 2000 CORPORATE DRIVE, CANONSBURG, PA 15317  
 CARRIER/APPLICANT: VERIZON WIRELESS, 1515 E. WOODFIELD ROAD, SCHAUMBURG, IL 60173  
 ELECTRIC PROVIDER: NSTAR, (919) 553-8412  
 TELCO PROVIDER: COMCAST, (800) 934-6489

**DRAWING INDEX**

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1	SITE PLAN
C-2	TOWER ELEVATION & ANTENNA PLANS
C-3	EQUIPMENT SCHEDULES
C-4	EQUIPMENT DETAILS
C-5	EQUIPMENT DETAILS
C-6	PLUMBING DIAGRAM
G-1	GROUNDING DETAILS
G-2	GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR FULL SIZE. 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.

**APPROVALS**

SIGNATURE	DATE
_____	_____
_____	_____
_____	_____
_____	_____

**CONTRACTOR PMI REQUIREMENTS**

PMI ACCESSED AT	https://pmi.vxwsmart.com
SMART TOOL VENDOR	
PROJECT NUMBER	10050647
VzW LOCATION CODE (PSLC)	137514

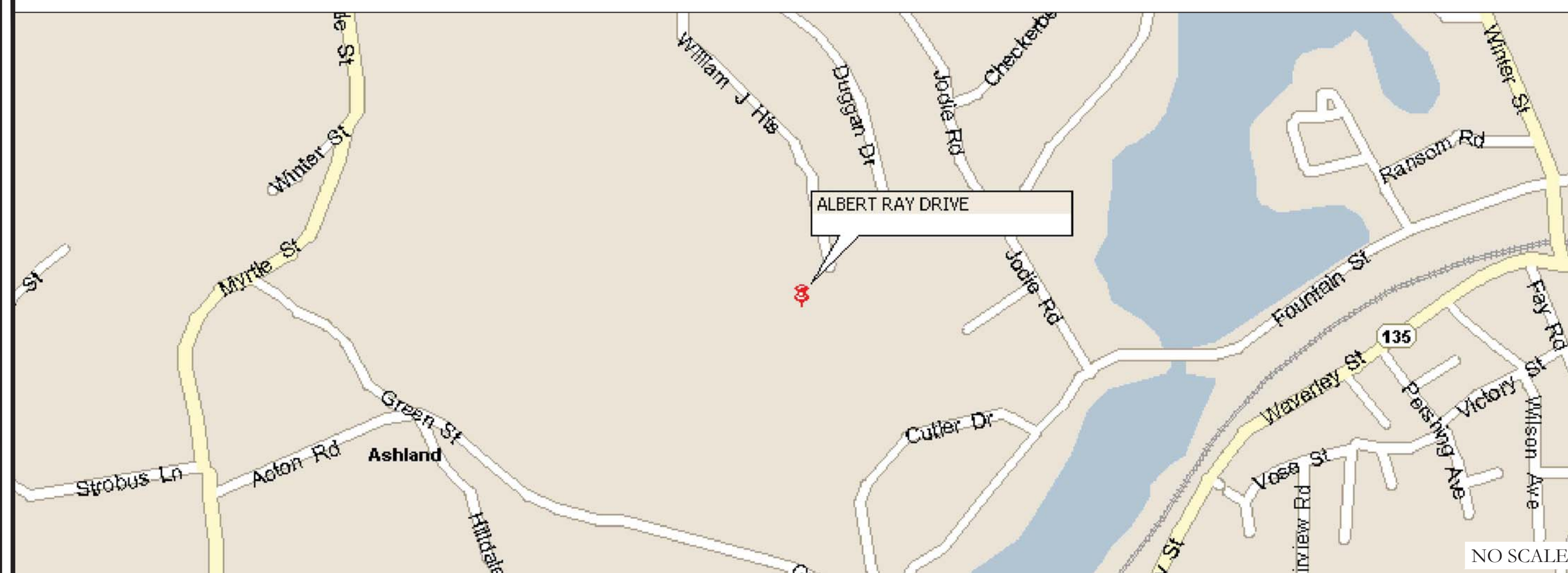
\*\*\* PMI AND REQUIREMENTS ALSO EMBEDDED IN MOUNT ANALYSIS REPORT

**MOUNT MODIFICATION REQUIRED** N

**VzW APPROVED SMART KIT VENDORS**

REFER TO MOUNT MODIFICATION DRAWINGS PAGE FOR VzW SMART KIT APPROVED VENDORS

**LOCATION MAP**



DRIVING DIRECTIONS FROM VERIZON LOCAL OFFICE (180 WASHINGTON VALLEY RD) HEAD NORTHEAST ON MA-16 E TOWARD LOCUST ST, TURN LEFT ONTO LOCUST ST, TAKE ASHLAND ST AND PROSPECT ST TO CHESTNUT ST IN ASHLAND, SLIGHT RIGHT ONTO CHESTNUT ST, TURN RIGHT ONTO MA-135 E, CONTINUE ON FOUNTAIN ST. DRIVE ARRIVED AT BOS ASHLAND 959026.

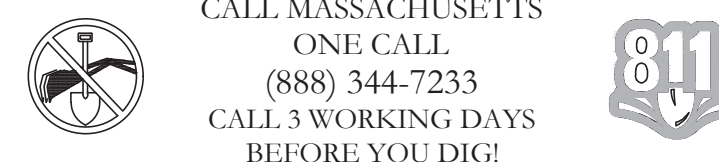
**APPLICABLE CODES/REFERENCE DOCUMENTS**

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	2015 IBC
MECHANICAL	2015 IMC
ELECTRICAL	2017 NEC

**REFERENCE DOCUMENTS:**

STRUCTURAL ANALYSIS:	PAUL, J. FORD & COMPANY
DATED:	3/24/22
MOUNT ANALYSIS:	MASER CONSULTING
DATED:	9/15/21
RFDS REVISION:	-
DATED:	9/1/21
ORDER ID:	593348
REVISION:	0



CALL MASSACHUSETTS ONE CALL (888) 344-7233 CALL 3 WORKING DAYS BEFORE YOU DIG!

**PROJECT DESCRIPTION**

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

- TOWER SCOPE OF WORK:
- INSTALL (3) NEW ANTENNA MOUNT PIPES
  - INSTALL (3) ANTENNAS
  - INSTALL (1) OVP
  - INSTALL (1) HYBRID CABLE



B&T ENGINEERING, INC.

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.

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

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

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

- 1. 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.
2. "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.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND 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).
5. ALL SITE WORK TO COMPLY WITH QAS-STD-10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE," CED-STD-10294 "STANDARD FOR INSTALLATION OF MOUNTS AND APPURTENANCES," 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.
6. 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.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
9. 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.
10. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
11. 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.
12. 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.
13. 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.
14. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
15. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
16. 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.
17. 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.
18. 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.
19. 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.
20. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
21. 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:**

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

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

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

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

**ELECTRICAL INSTALLATION NOTES:**

- 1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEC AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET NEW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEC AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECIMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER-ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3R (OR BETTER) FOR EXTERIOR LOCATIONS.
25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR CROWN CASTLE USA INC. BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "VERIZON".
30. 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
	GROUND	GREEN
120/208V, 3Ø	A PHASE	BLACK
	B PHASE	RED
	C PHASE	BLUE
	NEUTRAL	WHITE
277/480V, 3Ø	GROUND	GREEN
	A PHASE	BROWN
	B PHASE	ORANGE OR PURPLE
	C PHASE	YELLOW
DC VOLTAGE	NEUTRAL	GREY
	GROUND	GREEN
	POS (+)	RED**
	NEG (-)	BLACK**

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

**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

**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 PLAN
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

180 WASHINGTON VALLEY ROAD  
BEDMINSTER, NJ 07921

3 CORPORATE PARK DRIVE, SUITE 101  
CLIFTON PARK, NY 12065

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

VERIZON SITE NUMBER:  
**137514**

BU #: 806042  
**BOS ASHLAND 959026**

ALBERT RAY DRIVE  
FOUNTAIN AND GREEN  
STREETS  
ASHLAND, MA 01721

EXISTING 99'-0" MONOPOLE

ISSUED FOR:				
REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/2/21	JJR	CONSTRUCTION	JJR
1	4/11/22	JHW	CONSTRUCTION	LR

B&T ENGINEERING, INC.

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-2** REVISION: **1**

**verizon**

180 WASHINGTON VALLEY ROAD  
BEDMINSTER, NJ 07921

**CROWN CASTLE**

3 CORPORATE PARK DRIVE, SUITE 101  
CLIFTON PARK, NY 12065

**B+T GRP**

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

VERIZON SITE NUMBER:  
**137514**

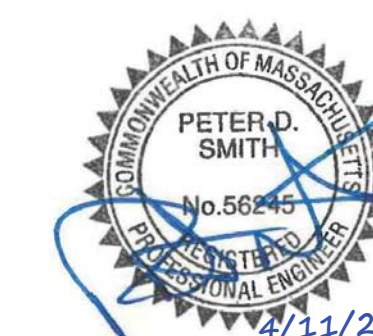
BU #: 806042  
**BOS ASHLAND 959026**

ALBERT RAY DRIVE  
FOUNTAIN AND GREEN  
STREETS  
ASHLAND, MA 01721

EXISTING 99'-0" MONOPOLE

**ISSUED FOR:**

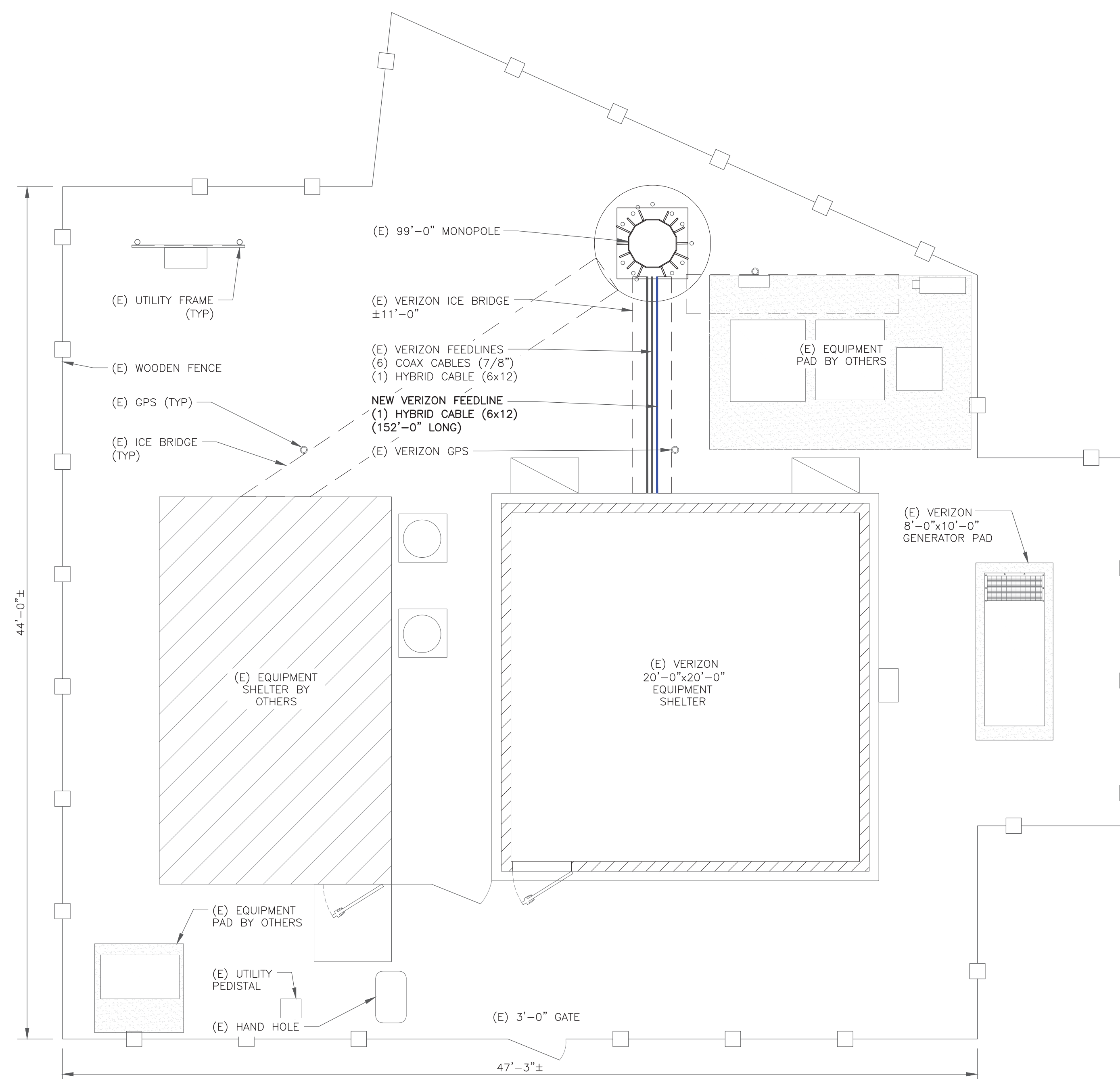
REV	DATE	DRWN	DESCRIPTION	DWG./QA
0	11/2/21	JJR	CONSTRUCTION	JJR
1	4/11/22	JHW	CONSTRUCTION	LR



B&T ENGINEERING, INC.

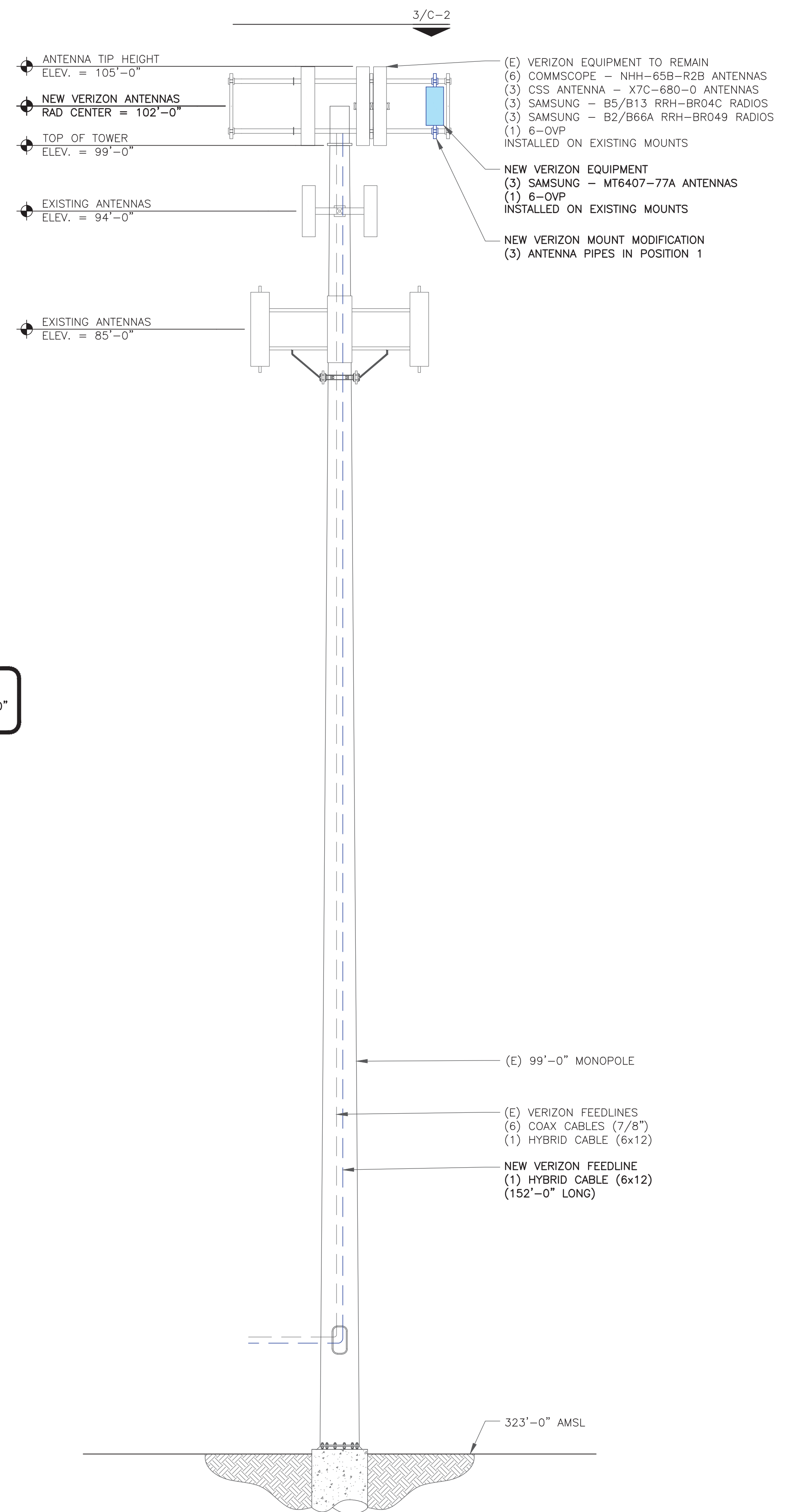
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OF A LICENSED PROFESSIONAL ENGINEER,  
TO ALTER THIS DOCUMENT.

SHEET NUMBER: **C-1** REVISION: **1**



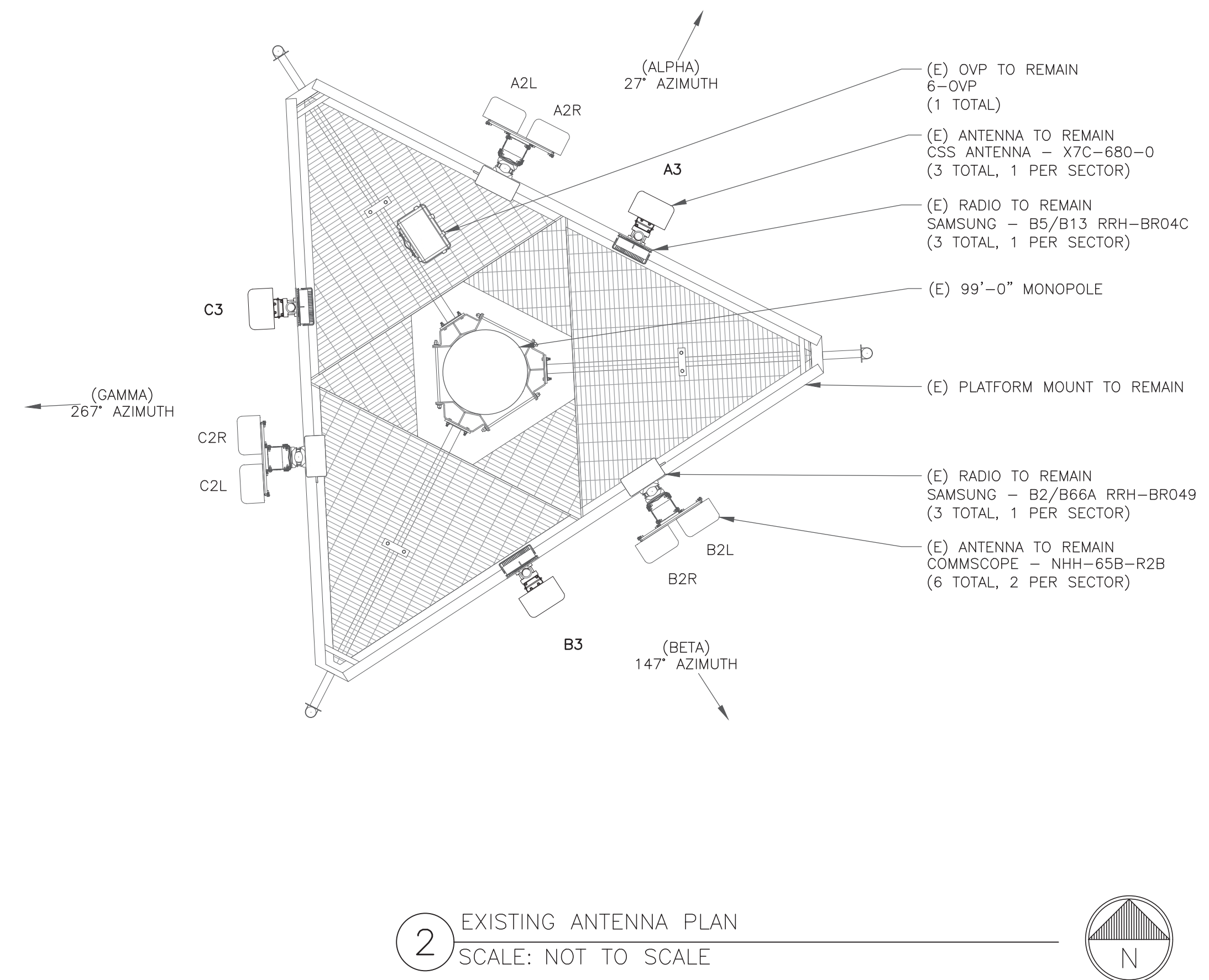
1 SITE PLAN  
 SCALE: 1/4"=1'-0" (FULL SIZE)  
 1/8"=1'-0" (11x17)





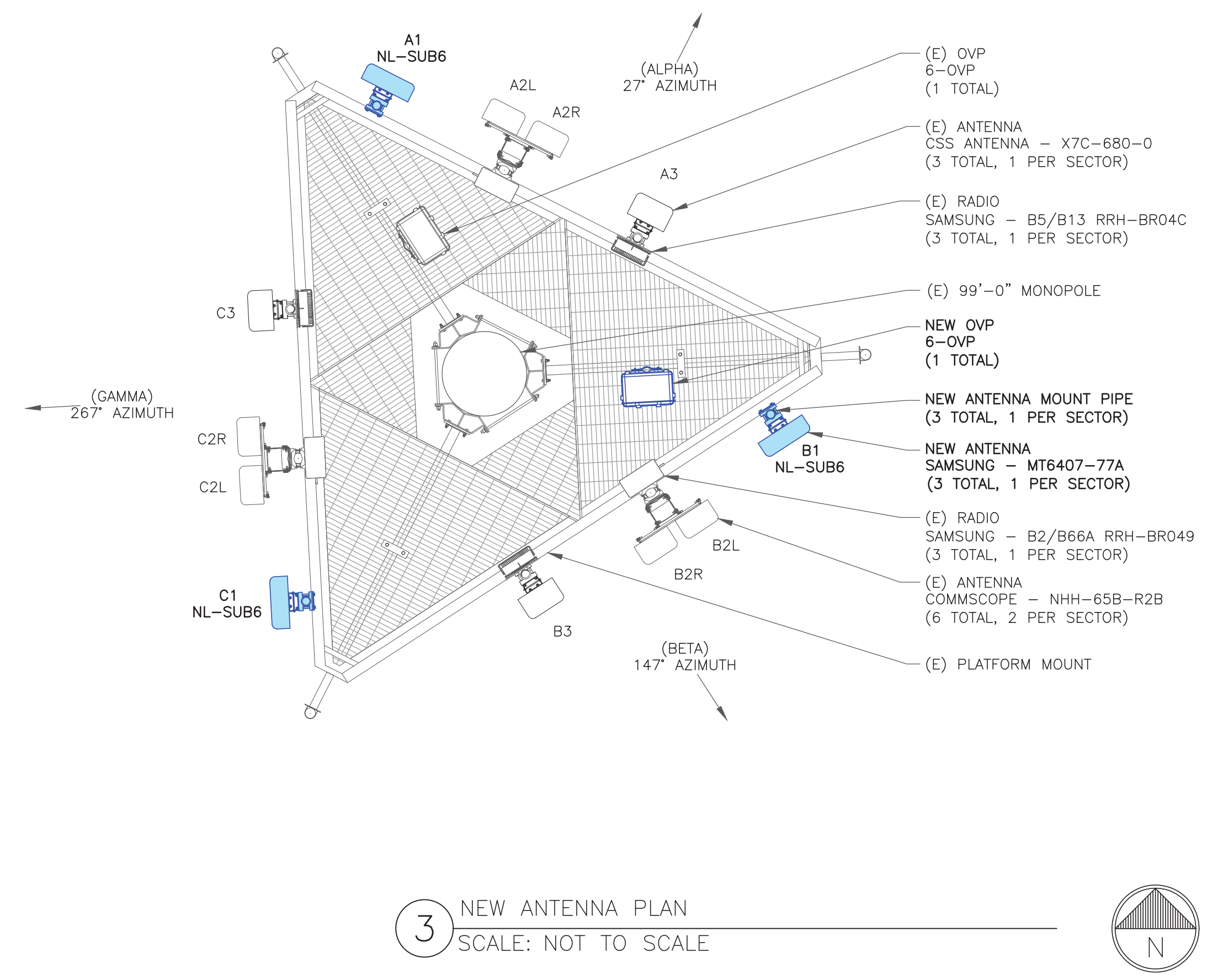
**VERIZON EQUIPMENT**  
 ANTENNA CL: 102'-0"  
 MOUNT CL: 102'-0"

1 TOWER ELEVATION  
 SCALE: NOT TO SCALE



2 EXISTING ANTENNA PLAN  
 SCALE: NOT TO SCALE

**NOTE:**  
 TOWER EQUIPMENT  
 PLACED PER MOUNT  
 ANALYSIS



3 NEW ANTENNA PLAN  
 SCALE: NOT TO SCALE

**verizon**  
 180 WASHINGTON VALLEY ROAD  
 BEDMINSTER, NJ 07921

**CROWN CASTLE**  
 3 CORPORATE PARK DRIVE, SUITE 101  
 CLIFTON PARK, NY 12065

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

VERIZON SITE NUMBER:  
**137514**

BU #: 806042  
**BOS ASHLAND 959026**

ALBERT RAY DRIVE  
 FOUNTAIN AND GREEN  
 STREETS  
 ASHLAND, MA 01721

EXISTING 99'-0" MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/2/21	JJR	CONSTRUCTION	JJR
1	4/11/22	JHW	CONSTRUCTION	LR

**PETER D. SMITH**  
 No. 56845  
 PROFESSIONAL ENGINEER  
 4/11/22

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

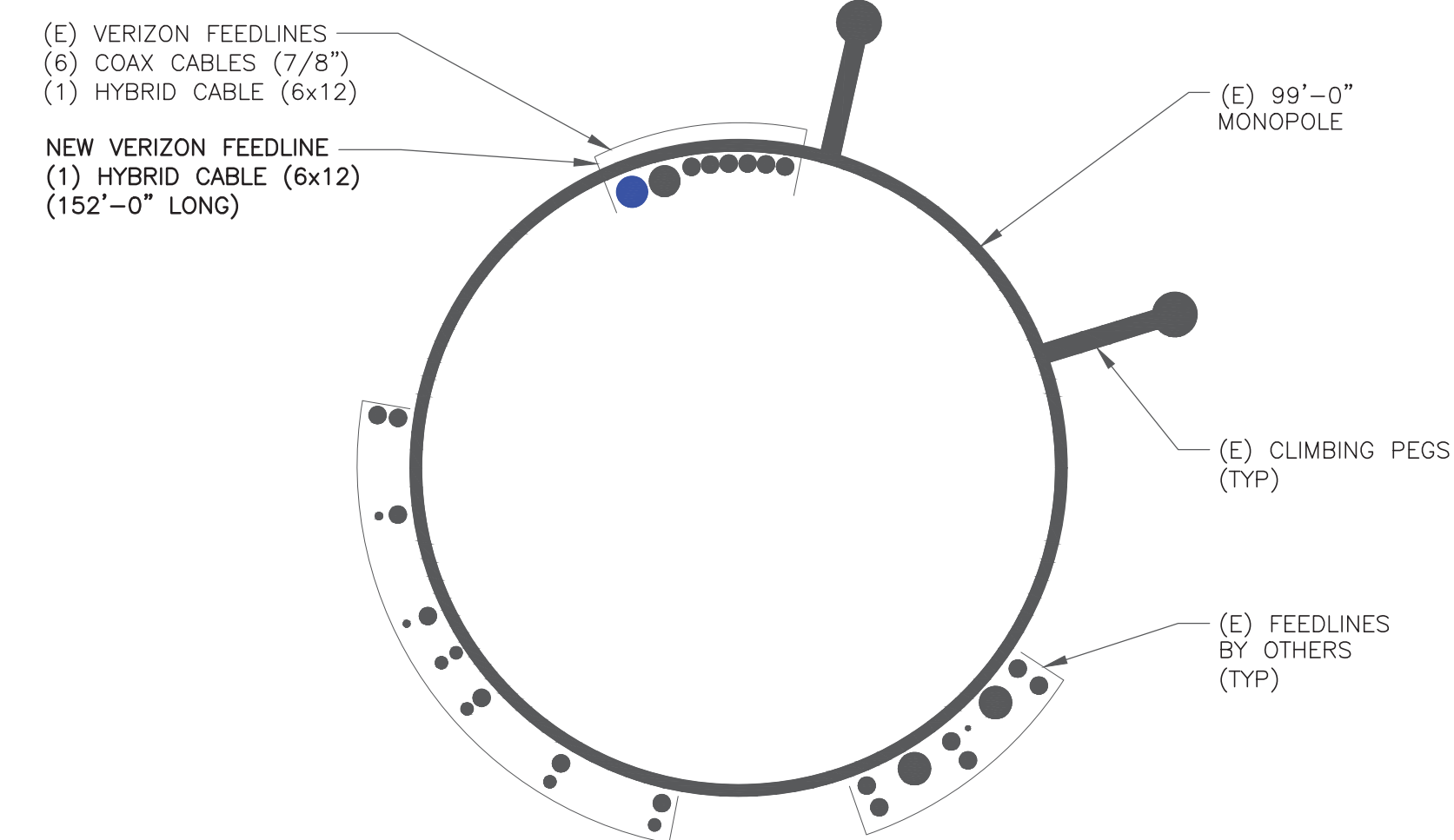
### ANTENNA/RRH SCHEDULE

SECTOR	STATUS	ANTENNA MANUFACTURER	ANTENNA MODEL	ANTENNA CENTERLINE	AZIMUTH	MECHANICAL DOWNTILTS	ELECTRICAL DOWNTILTS	TOWER EQUIPMENT MANUFACTURER	TOWER EQUIPMENT QTY/MODEL
A1	NEW	SAMSUNG	MT6407-77A	102'-0"	27°	0°	6°	SAMSUNG	(1) B2/B66A RRH-BR049
A2L	EXISTING	COMMSCOPE	NHH-65B-R2B	102'-0"	27°	0°	0°/0°/0°/0°/0°	SAMSUNG	(1) B5/B13 RRH-BR04C
A2L	EXISTING	COMMSCOPE	NHH-65B-R2B	102'-0"	27°	0°	0°/0°/0°/0°/0°	-	-
A3	EXISTING	CSS	X7C-680-0	102'-0"	27°	3°	0°	RAYCAP	(1) RVZDC-6627-PF-48
B1	NEW	SAMSUNG	MT6407-77A	102'-0"	147°	0°	6°	SAMSUNG	(1) B5/B13 RRH-BR04C
B2L	EXISTING	COMMSCOPE	NHH-65B-R2B	102'-0"	147°	0°	0°/0°/0°/0°/0°	SAMSUNG	(1) B2/B66A RRH-BR049
B2R	EXISTING	COMMSCOPE	NHH-65B-R2B	102'-0"	147°	0°	0°/0°/0°/0°/0°	-	-
B3	EXISTING	CSS	X7C-680-0	102'-0"	147°	4°	0°	RAYCAP	(1) RVZDC-6627-PF-48
C1	NEW	SAMSUNG	MT6407-77A	102'-0"	267°	0°	6°	SAMSUNG	(1) B5/B13 RRH-BR04C
C2L	EXISTING	COMMSCOPE	NHH-65B-R2B	102'-0"	267°	0°	0°/0°/0°/0°/0°	SAMSUNG	(1) B2/B66A RRH-BR049
C2R	EXISTING	COMMSCOPE	NHH-65B-R2B	102'-0"	267°	0°	0°/0°/0°/0°/0°	-	-
C3	EXISTING	CSS	X7C-680-0	102'-0"	267°	2°	0°	-	-

1 VERIZON TOWER EQUIPMENT SCHEDULE  
SCALE: NOT TO SCALE

### CABLE SCHEDULE

STATUS	CABLE TYPE	SIZE	LENGTH	QTY
EXISTING	COAX	7/8"	152'-0"±	6
EXISTING	HYBRID	6x12	152'-0"±	1
NEW	HYBRID	6x12	152'-0"±	1
TOTAL CABLE QTY:				8



2 BASE LEVEL DETAIL  
SCALE: NOT TO SCALE



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VERIZON SITE NUMBER:  
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BU #: 806042  
**BOS ASHLAND 959026**

ALBERT RAY DRIVE  
FOUNTAIN AND GREEN  
STREETS  
ASHLAND, MA 01721

EXISTING 99'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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1	4/11/22	JHW	CONSTRUCTION	LR

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SHEET NUMBER: **C-3**      REVISION: **1**

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CASTLE**

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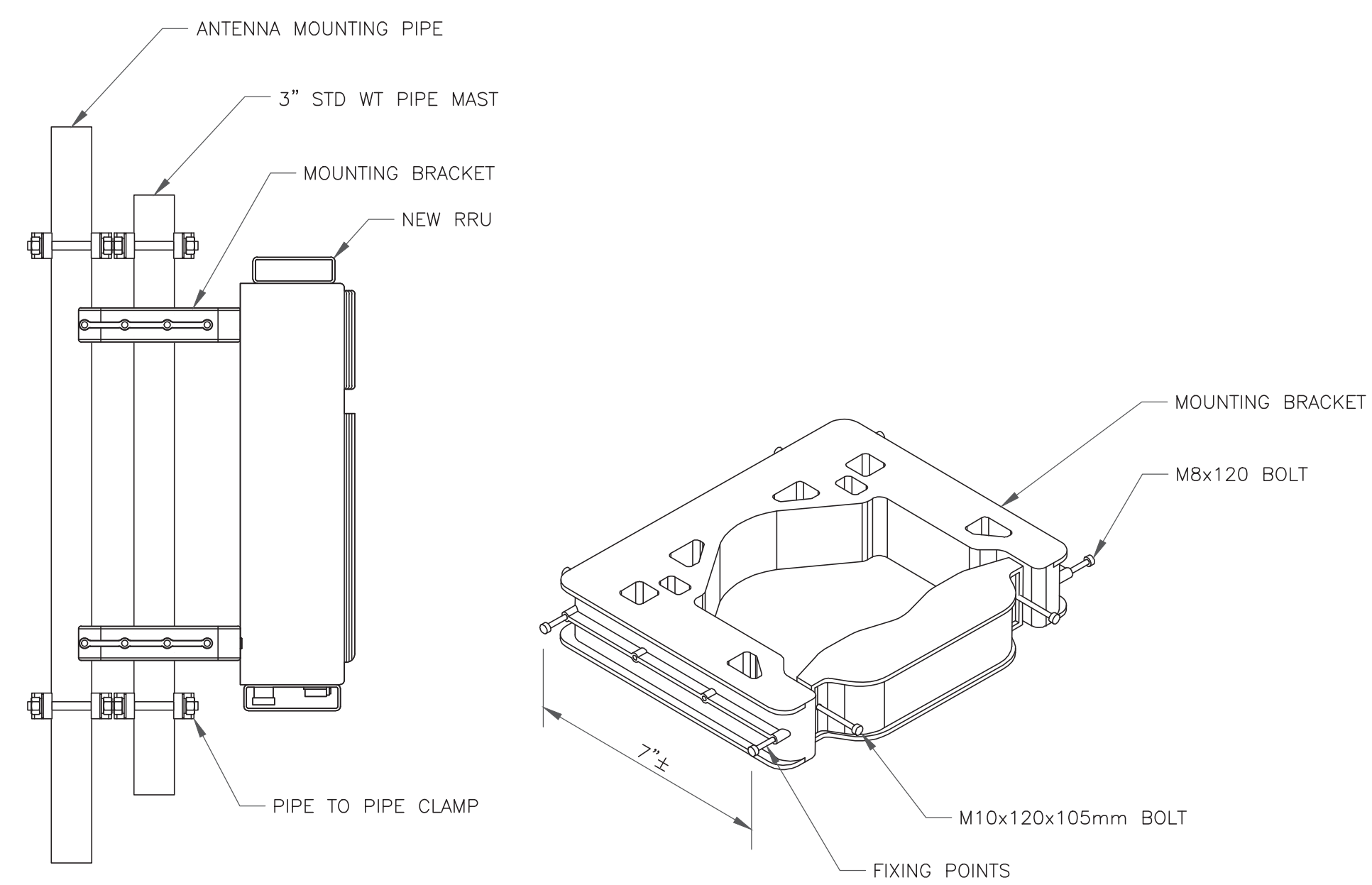
EXISTING 99'-0" MONOPOLE

**ISSUED FOR:**

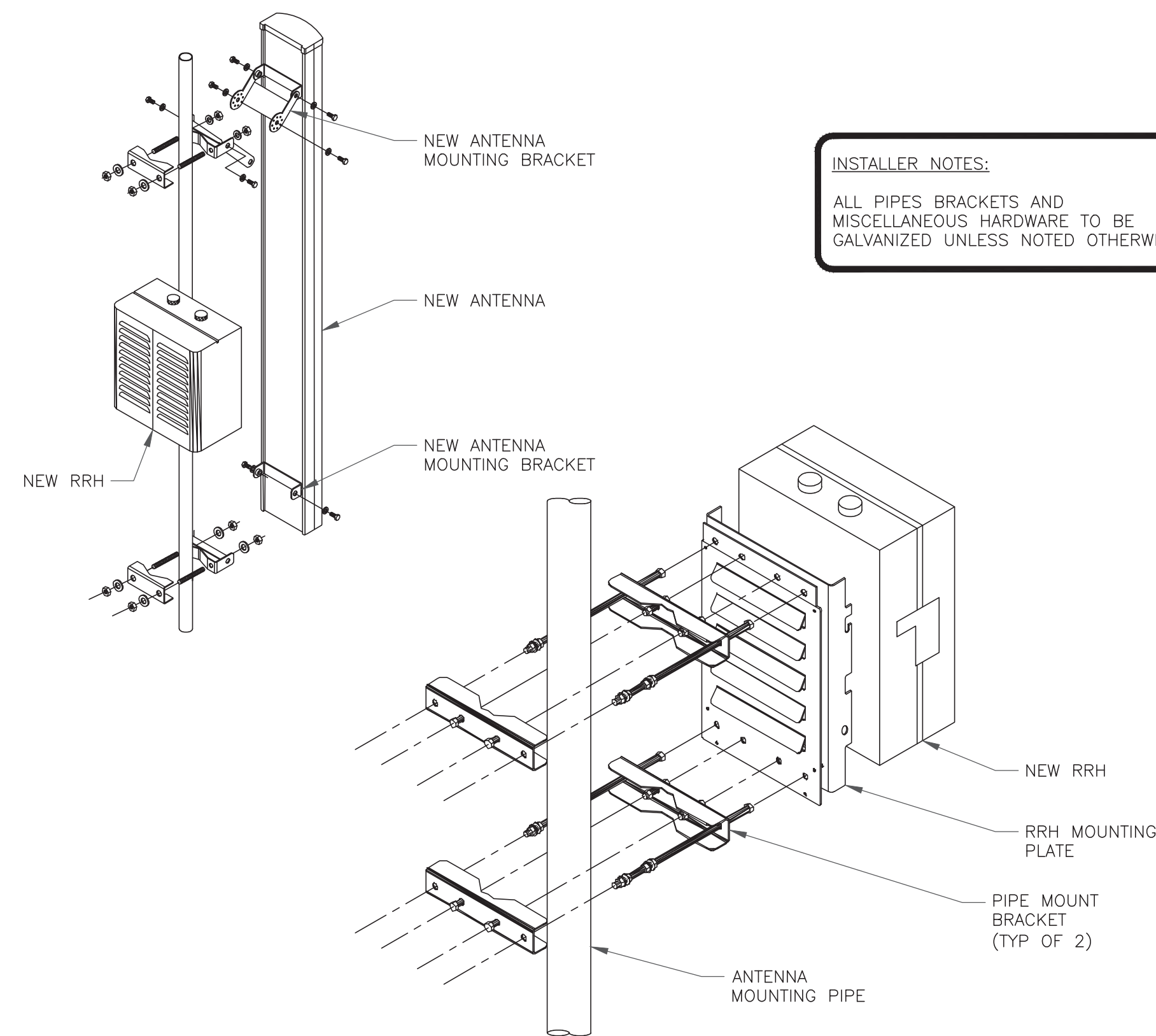
REV	DATE	DRWN	DESCRIPTION	DES./QA
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1	4/11/22	JHW	CONSTRUCTION	LR

1 NOT USED  
SCALE: NOT TO SCALE

2 NOT USED  
SCALE: NOT TO SCALE



3 NOKIA - FPKA BRACKET MOUNTING DETAIL  
SCALE: NOT TO SCALE



4 ANTENNA & RRH MOUNTING DETAIL  
SCALE: NOT TO SCALE

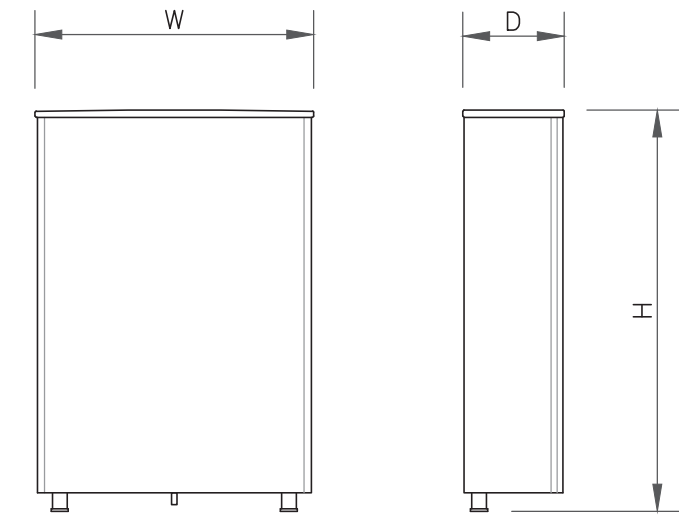


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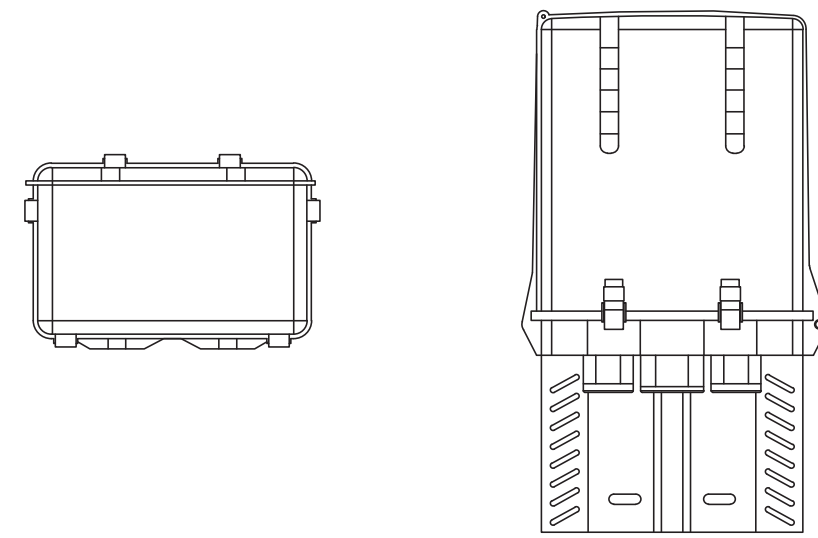
SHEET NUMBER:  
**C-4**

REVISION:  
**1**



ANTENNA SPECS	
MANUFACTURER	SAMSUNG
MODEL #	MT6407-77A
WIDTH	16.06"
DEPTH	5.51"
HEIGHT	35.06"
WEIGHT	81.57 LBS

1 ANTENNA SPECS  
SCALE: NOT TO SCALE



RAYCAP - RVZDC-6627-PF-48  
 WEIGHT (WITHOUT MOUNTING HARDWARE): 32.0 LBS  
 SIZE (HxWxD): 28.9x15.7x10.3 IN.  
 RATED WIND VELOCITY: 150 MPH (SUSTAINED)  
 OPERATING TEMPERATURE: -40° C TO +80° C  
 NOMINAL OPERATING DC VOLTAGE: 48 VDC

2 RAYCAP - RVZDC-6627-PF-48  
SCALE: NOT TO SCALE

3 NOT USED  
SCALE: NOT TO SCALE

4 NOT USED  
SCALE: NOT TO SCALE

5 NOT USED  
SCALE: NOT TO SCALE

6 NOT USED  
SCALE: NOT TO SCALE

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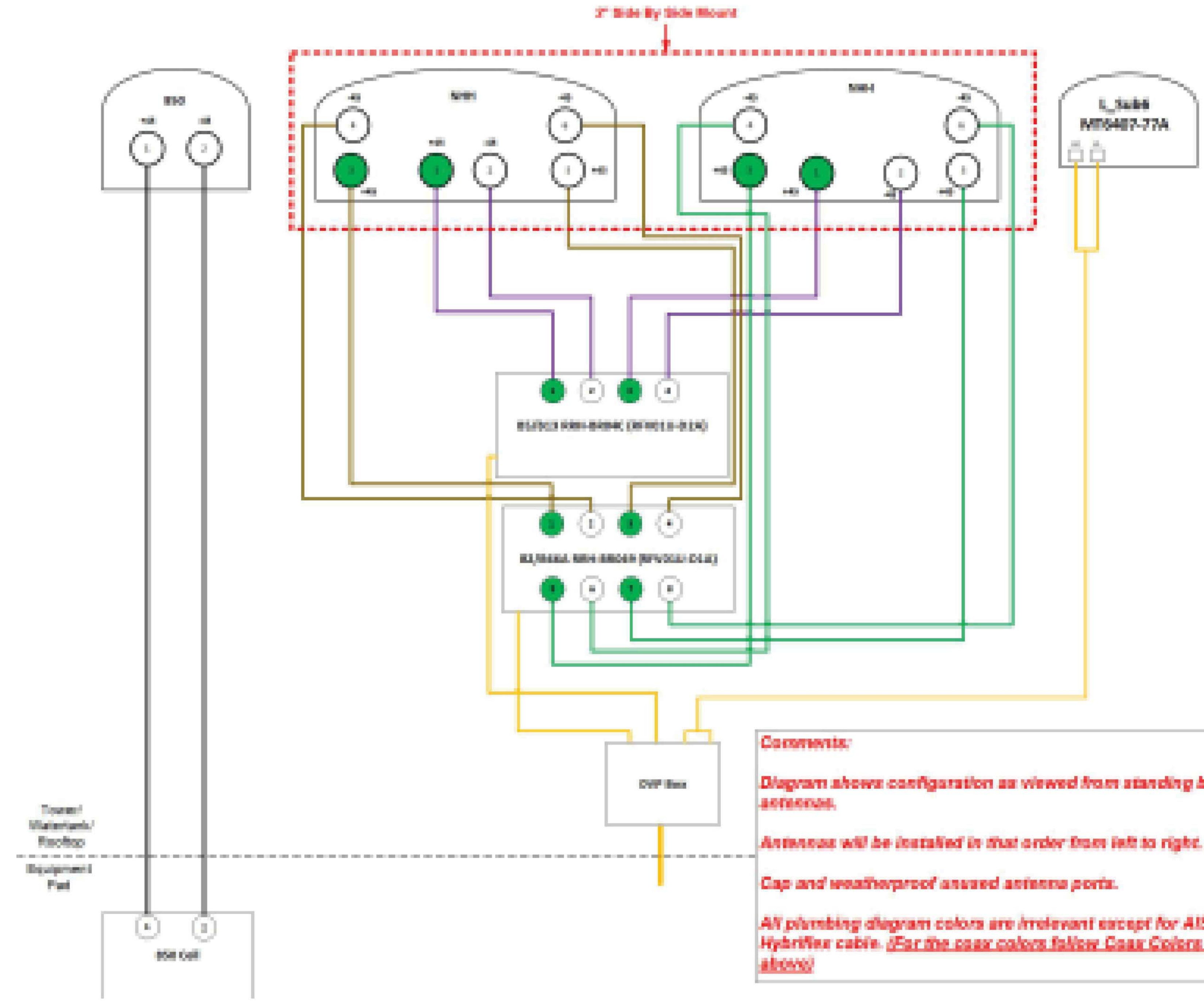
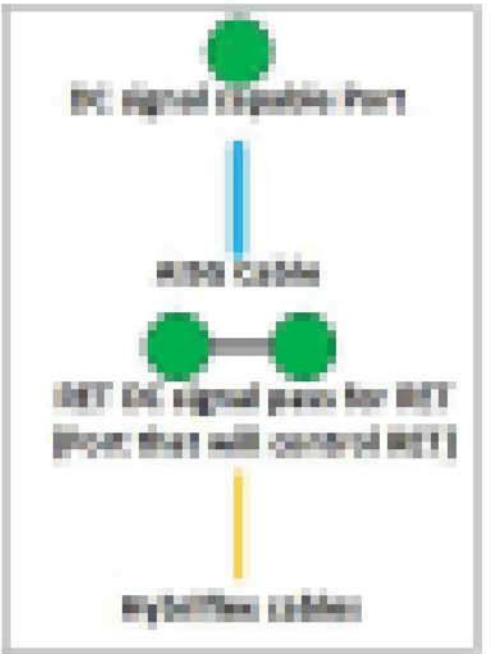
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SHEET NUMBER: **C-5** REVISION: **1**



- Port 1 & 2 are for low band (800-890 MHz).
- Port 3, 4, 5, & 6 are for high band (1600-2160 MHz).
- Smart Max Tone (SMT) is through port 3 for low band and port 4 for high band.
- AISG cable is only needed when drawn in the diagrams below, if it is not drawn then SMT is enough to control all RBT routers.
- Not all SBT ports are needed to control RBT, only green port connection to green part will control RBT.



**Comments:**

Diagram shows configuration as viewed from standing behind the antennas.

Antennas will be installed in that order from left to right.

Cap and weatherproof unused antenna ports.

All plumbing diagram colors are irrelevant except for AISG & Hybridex cable. (For the color colors follow Color Codes guide above)

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EXISTING 99'-0" MONOPOLE

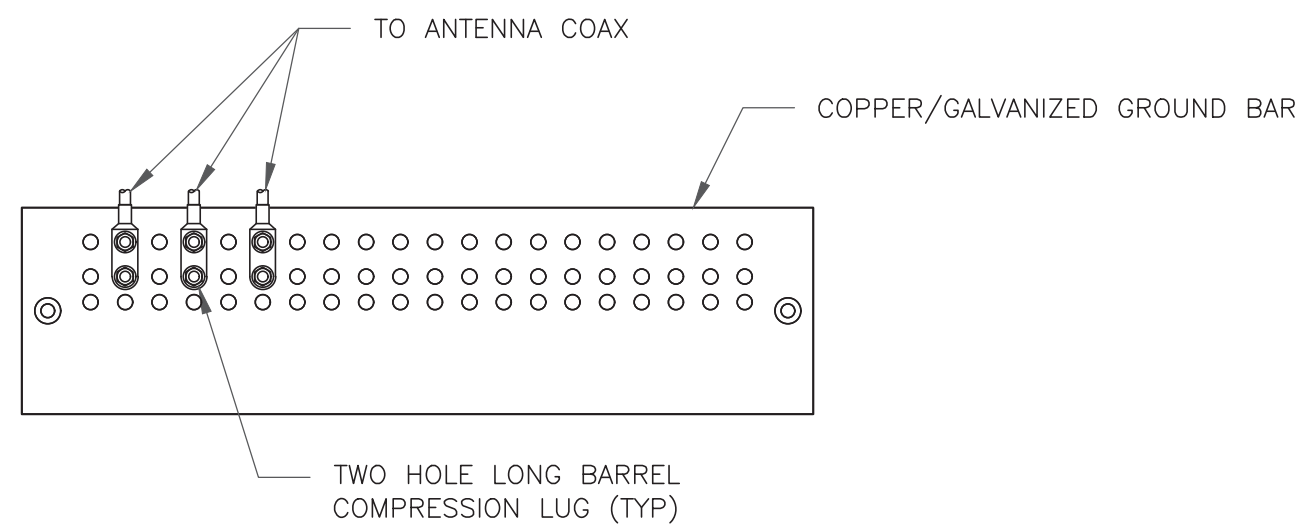
**ISSUED FOR:**

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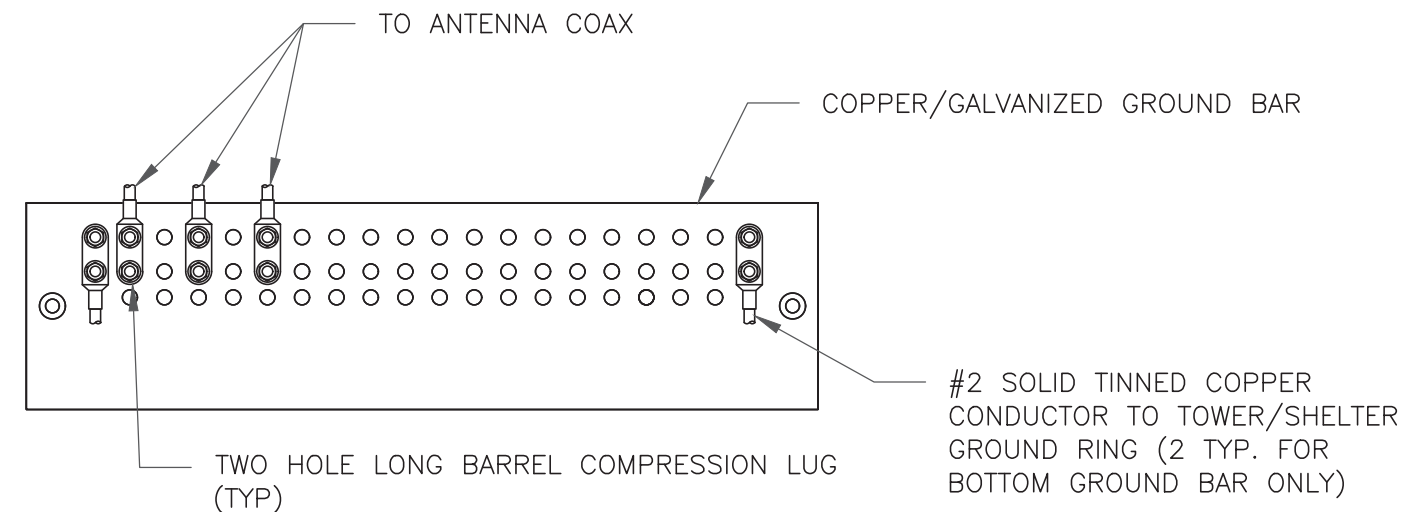
SHEET NUMBER: **C-6** REVISION: **1**



NOTES:

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

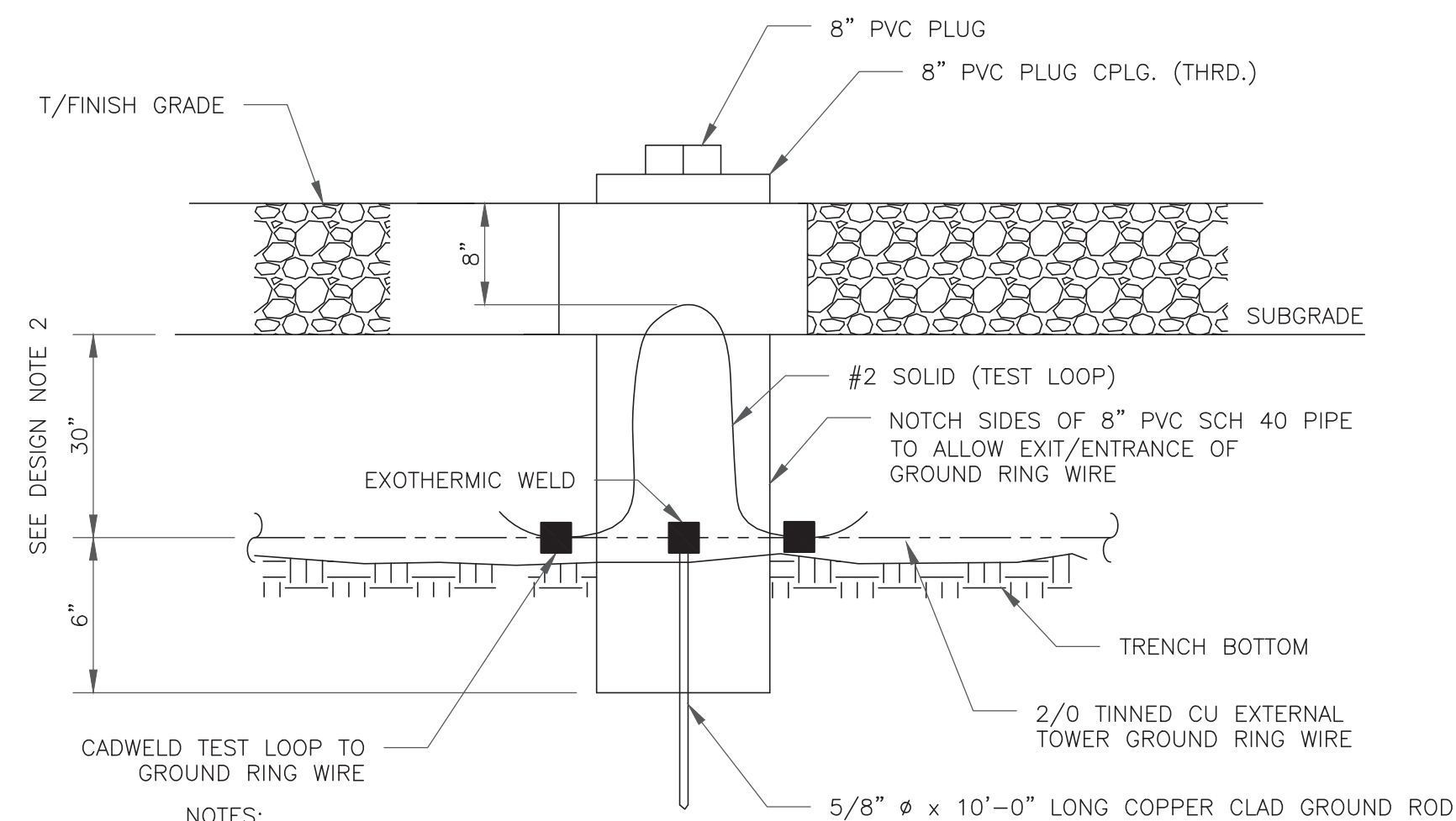
1 ANTENNA SECTOR GROUND BAR DETAIL  
SCALE: NOT TO SCALE



NOTES:

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

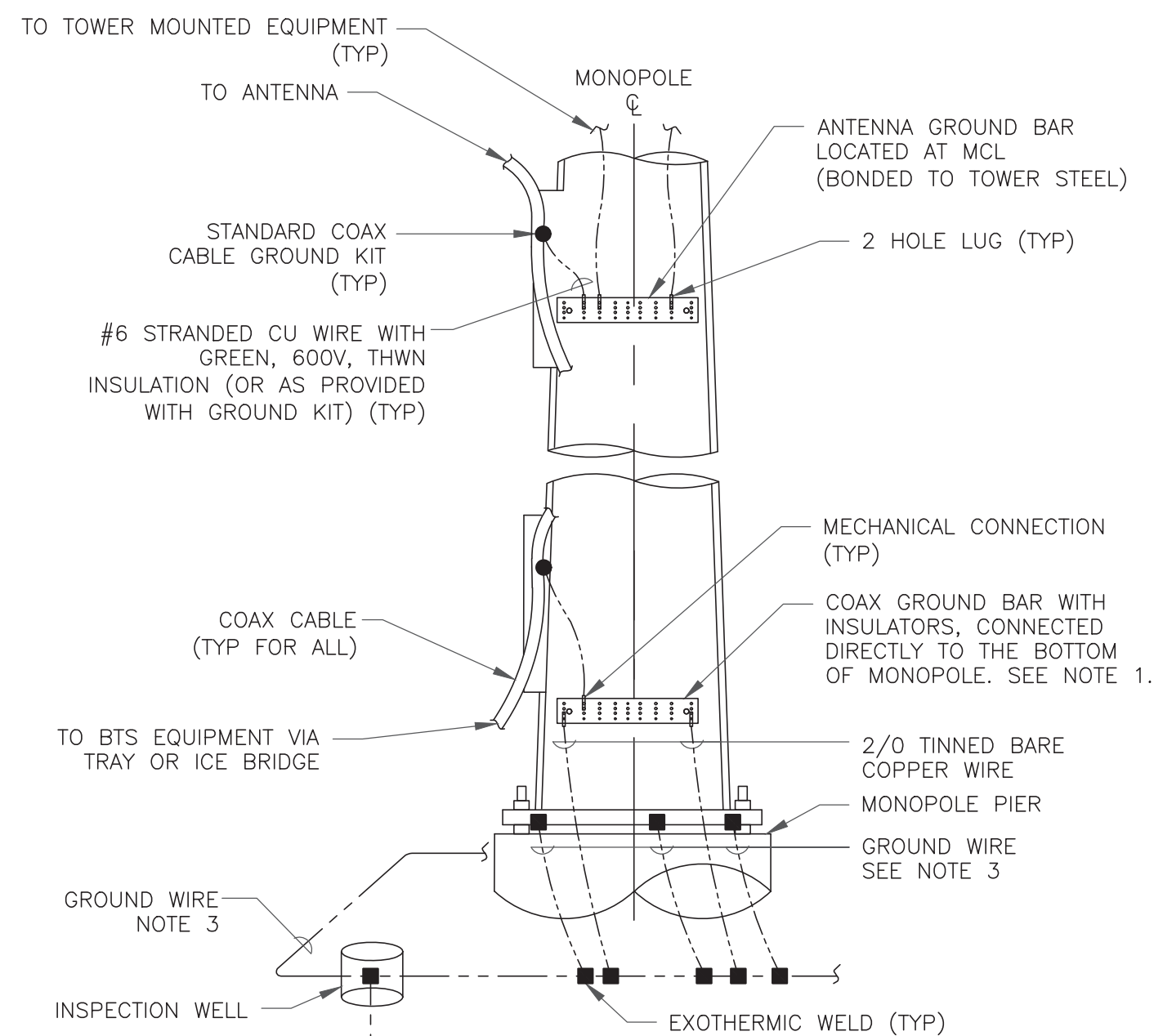
2 TOWER/SHELTER GROUND BAR DETAIL  
SCALE: NOT TO SCALE



NOTES:

- GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
- GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

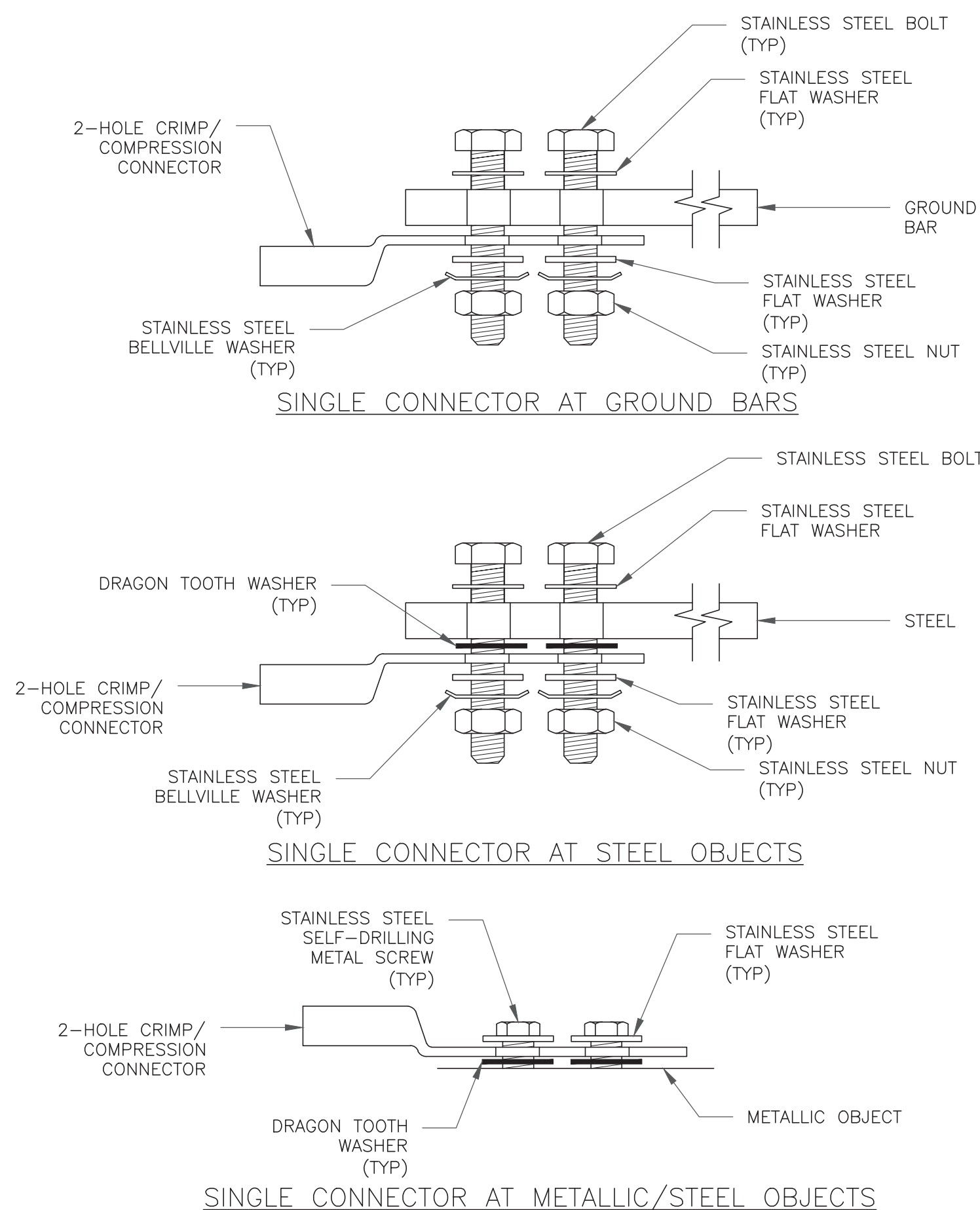
3 INSPECTION WELL DETAIL  
SCALE: NOT TO SCALE



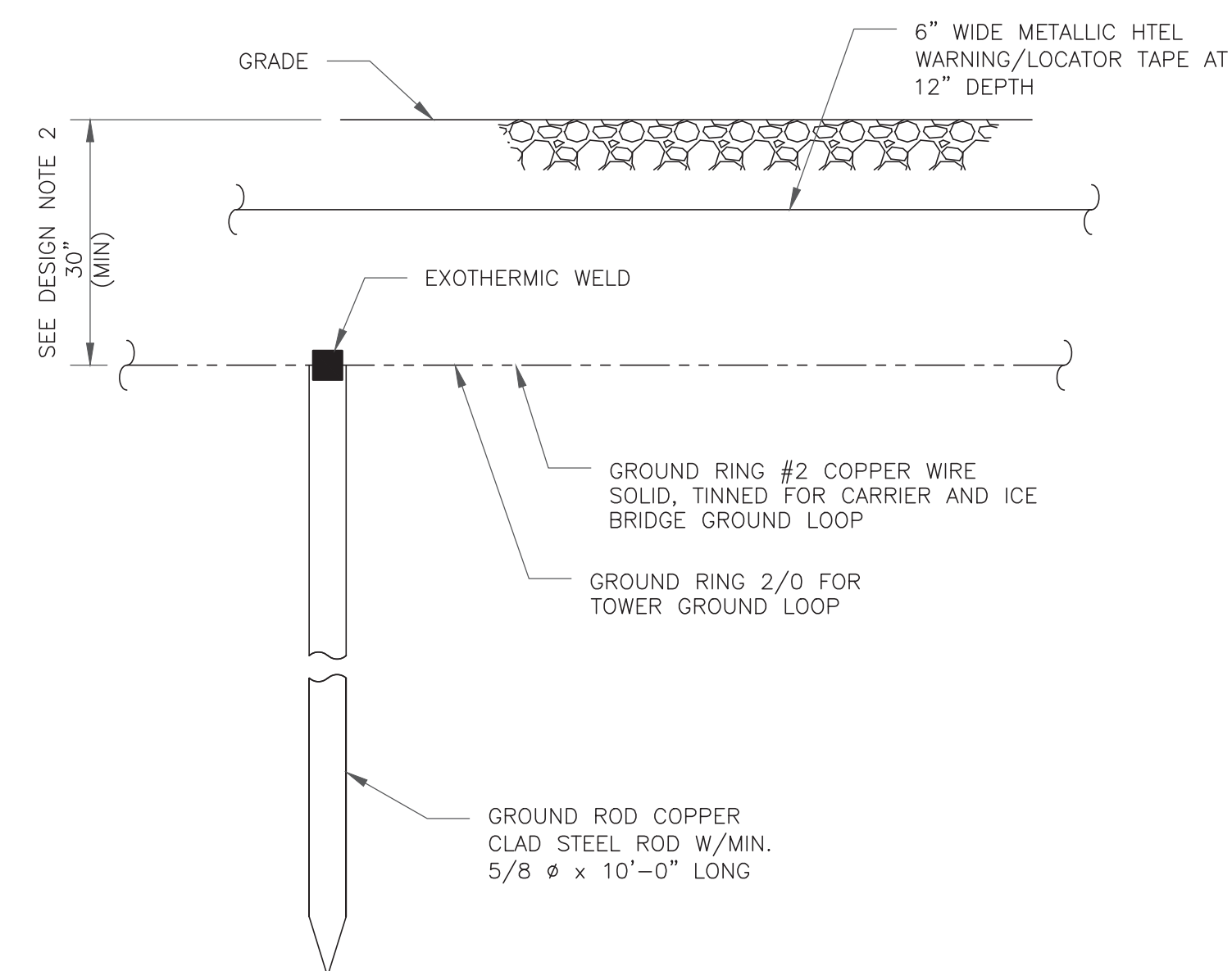
NOTES:

- NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATIONS AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET ON THE TOWER SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
- ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE USA INC. TOWERS. ALL MECHANICAL CONNECTIONS SHALL BE TREATED WITH AN ANTI-OXIDANT COATING.
- ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE RECOGNIZED EDITION OF ANSI/TIA 222 AND NFPA 780.

4 TYPICAL ANTENNA CABLE GROUNDING  
SCALE: NOT TO SCALE



5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS  
SCALE: NOT TO SCALE



NOTES:

- GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
- GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

6 GROUND ROD DETAIL  
SCALE: NOT TO SCALE

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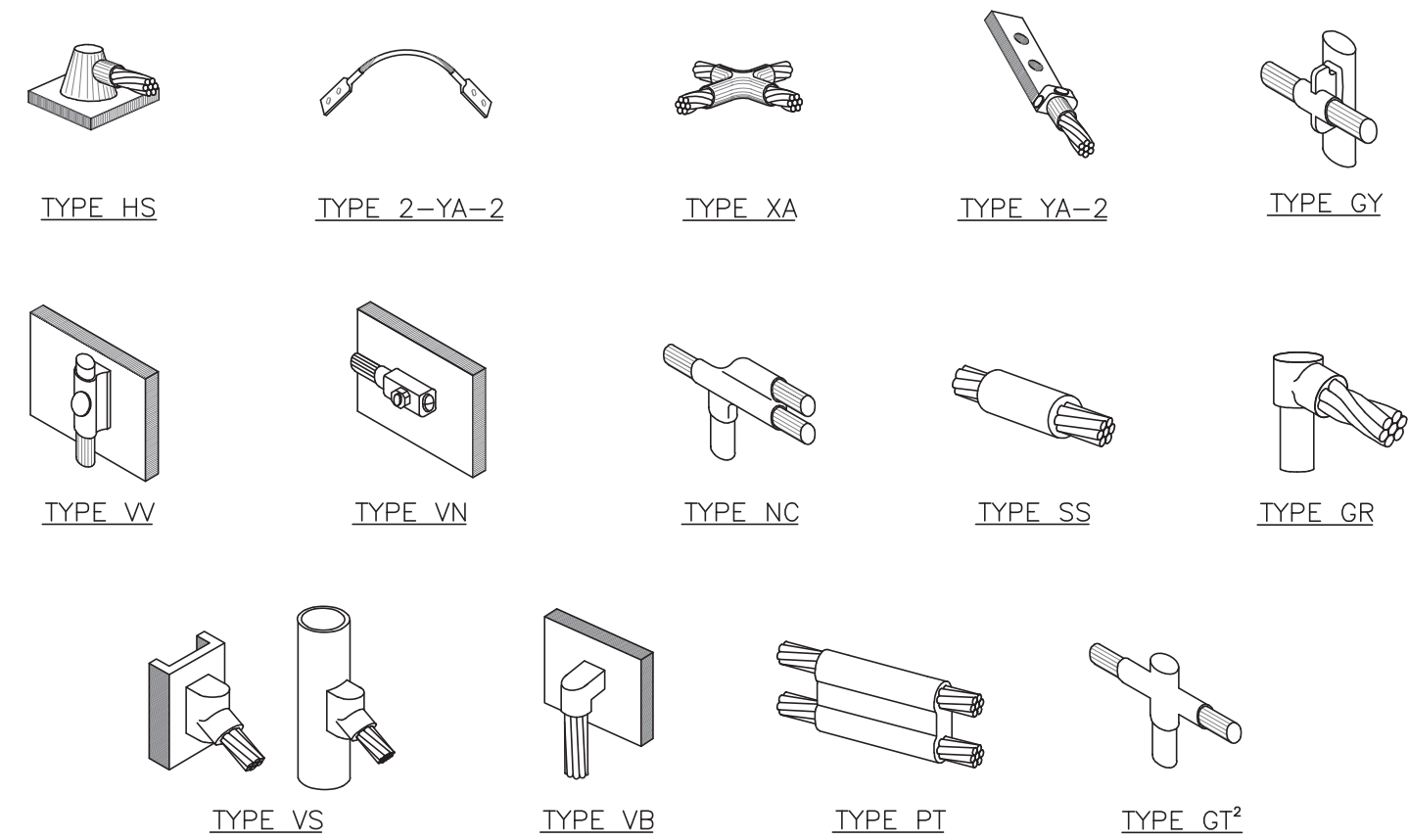
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SHEET NUMBER:

**G-1**

REVISION:

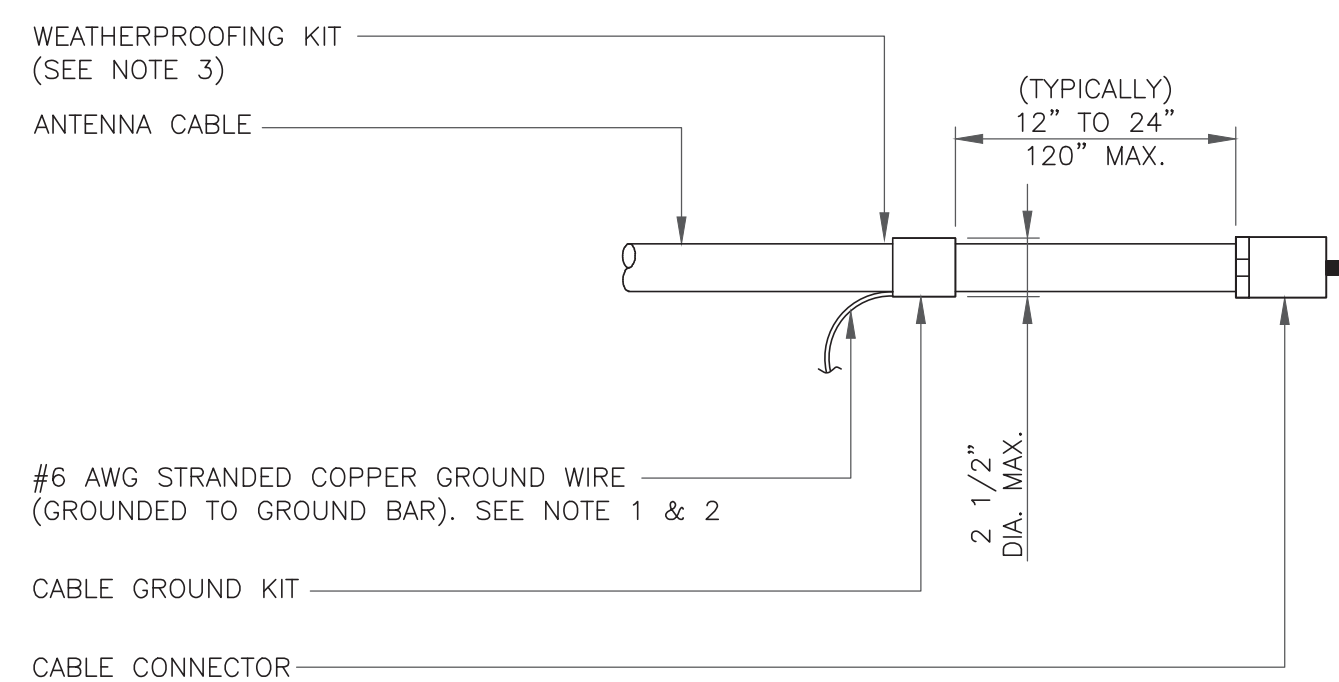
**1**



**NOTE:**

1. ERICO EXOTHERMIC "MOLD TYPES" SHOWN HERE ARE EXAMPLES. CONSULT WITH CONSTRUCTION MANAGER FOR SPECIFIC MOLDS TO BE USED FOR THIS PROJECT.
2. MOLD TYPE ONLY TO BE USED BELOW GRADE WHEN CONNECTING GROUND RING TO GROUND ROD.

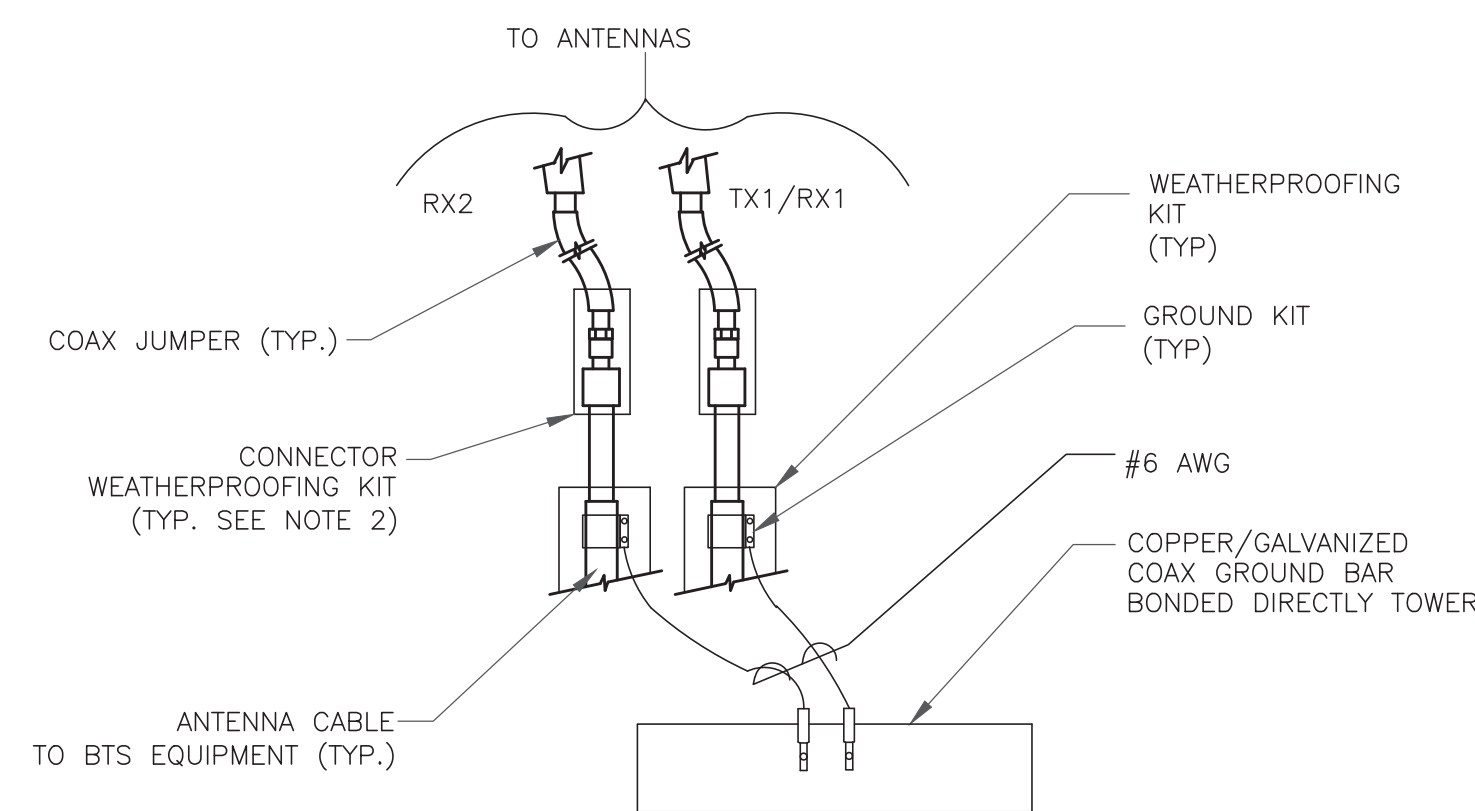
**1 CADWELD GROUNDING CONNECTIONS**  
SCALE: NOT TO SCALE



**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.

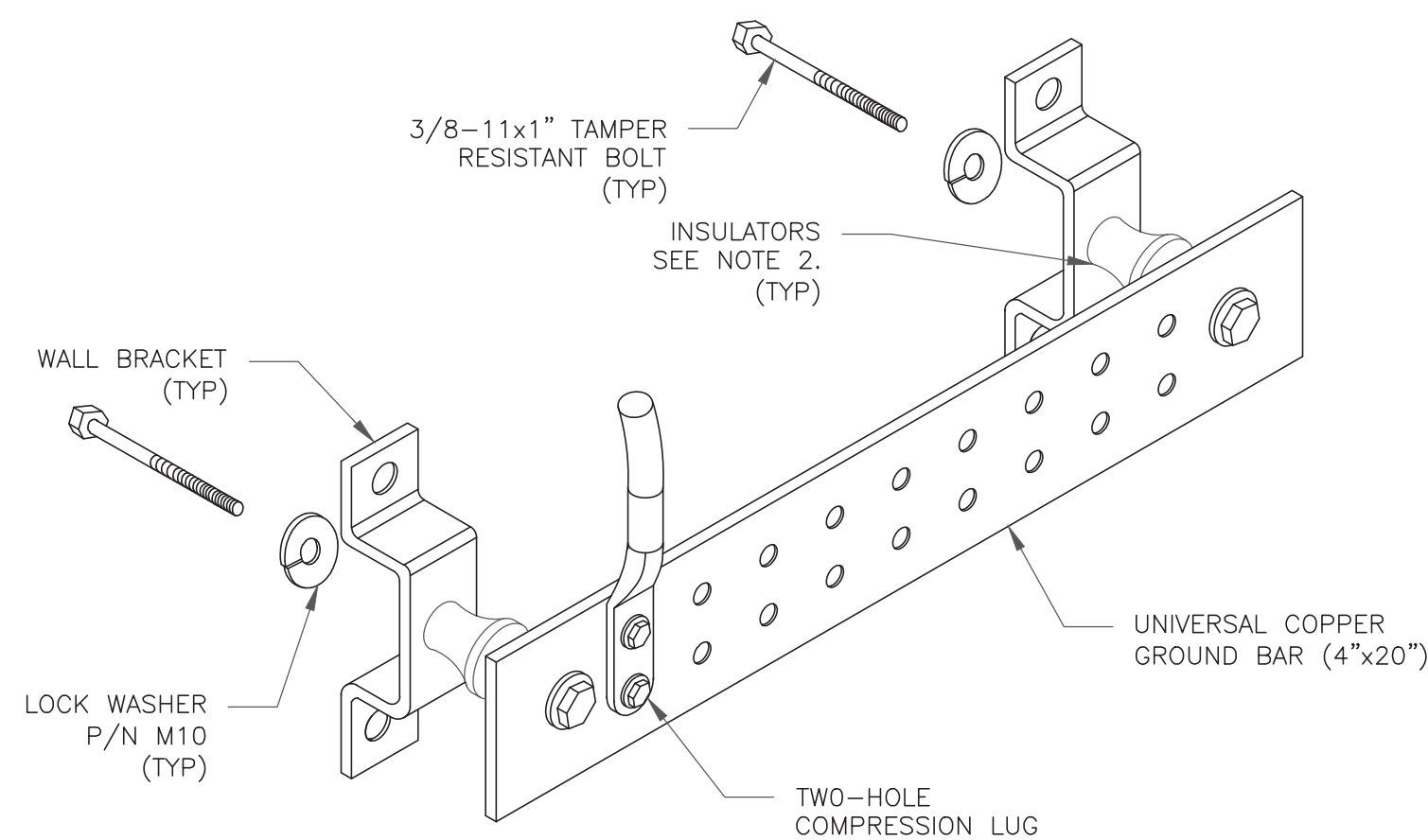
**3 CABLE GROUND KIT CONNECTION**  
SCALE: NOT TO SCALE



**NOTES:**

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

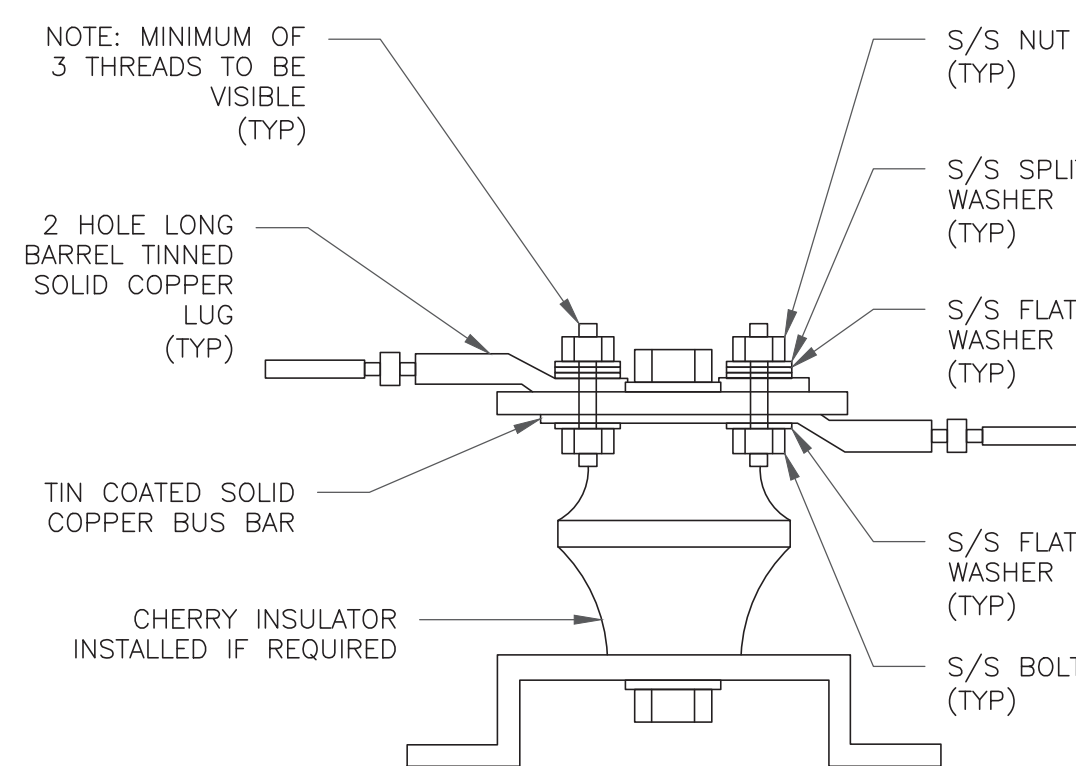
**4 GROUND CABLE CONNECTION**  
SCALE: NOT TO SCALE



**NOTES:**

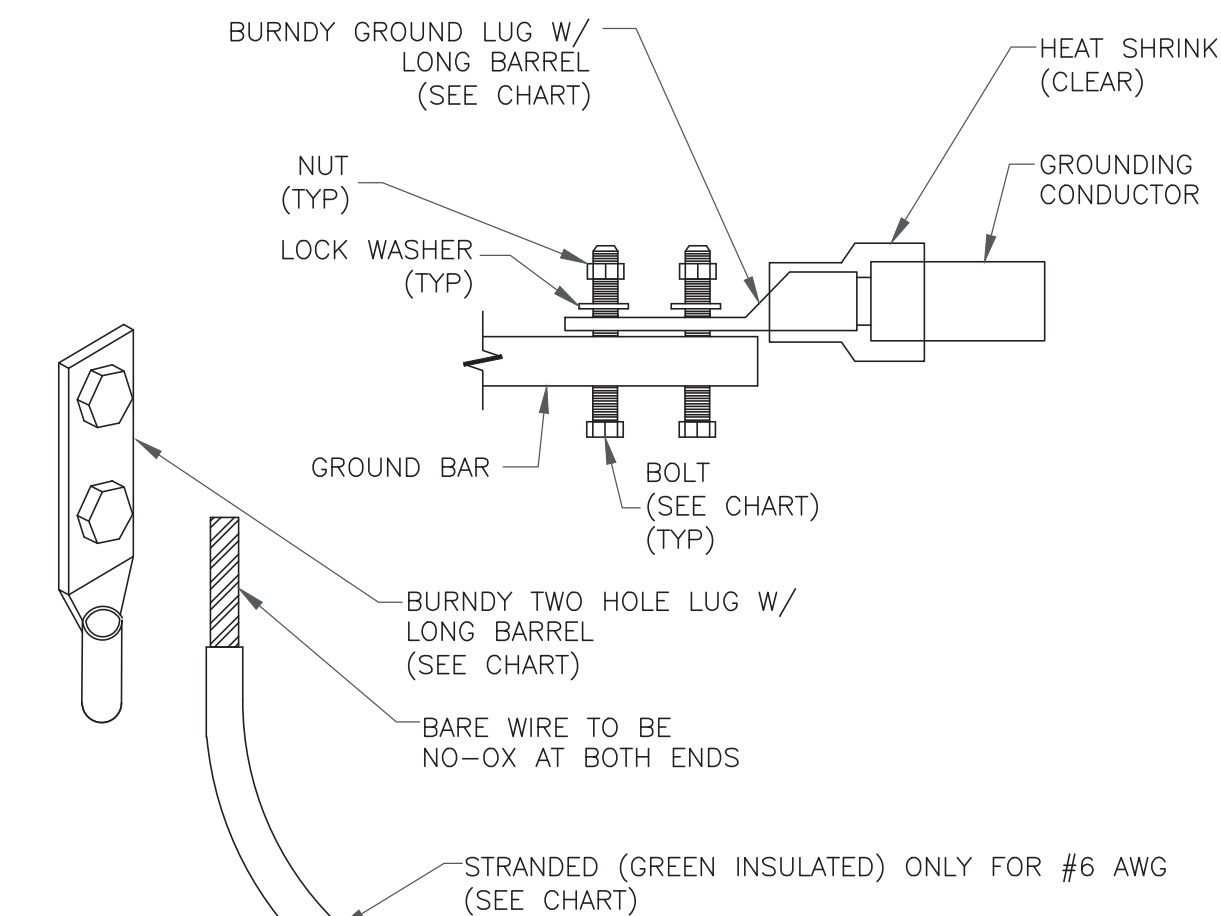
1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY GAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION. CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR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

**6 GROUND BAR DETAIL**  
SCALE: NOT TO SCALE



**7 LUG DETAIL**  
SCALE: NOT TO SCALE

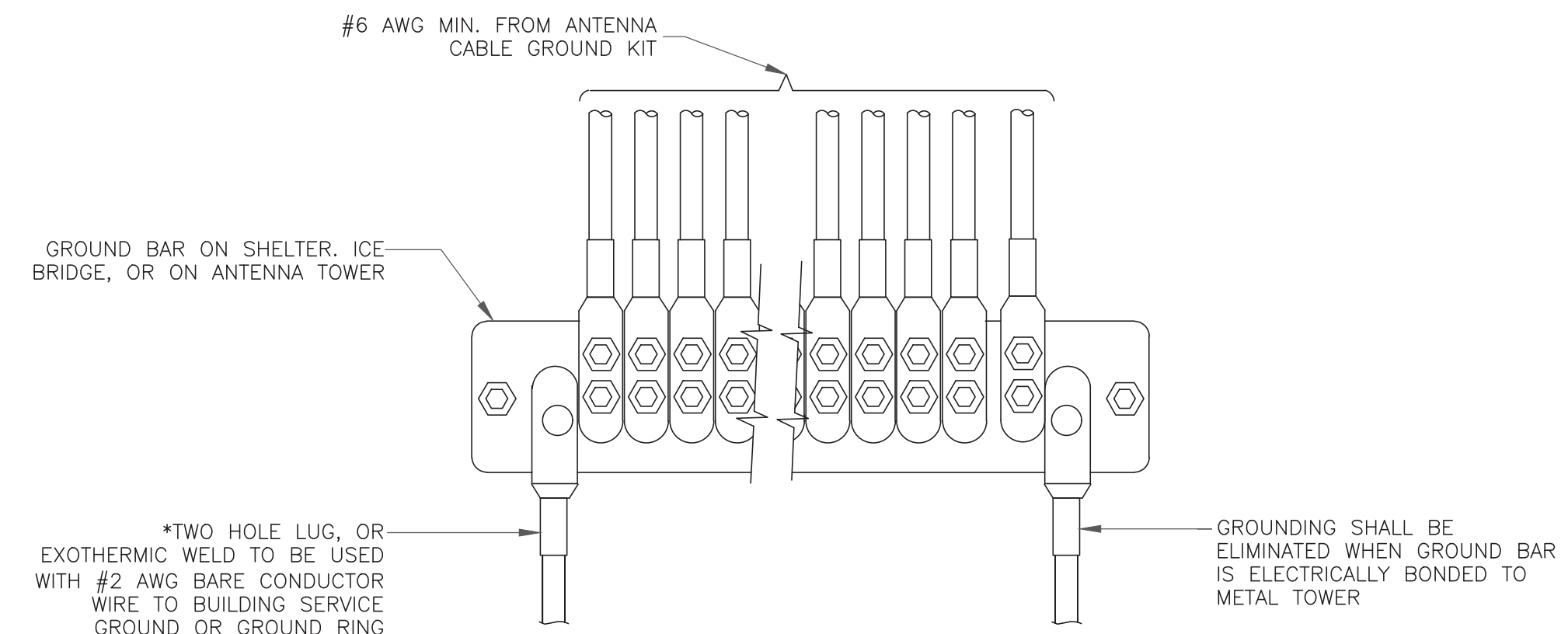
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



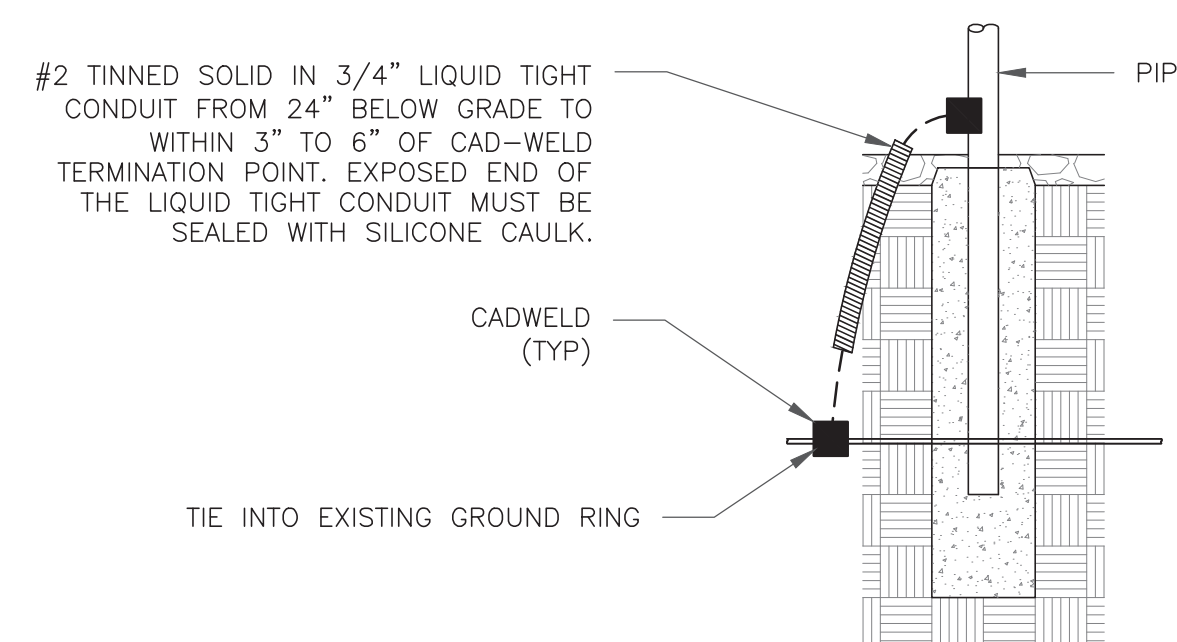
**NOTES:**

1. 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.

**2 MECHANICAL LUG CONNECTION**  
SCALE: NOT TO SCALE



**5 GROUNDWIRE INSTALLATION**  
SCALE: NOT TO SCALE



**8 TRANSITIONING GROUND DETAIL**  
SCALE: NOT TO SCALE

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No. 56845  
PROFESSIONAL ENGINEER  
4/11/22

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<b>SHEET NUMBER:</b> <b>G-2</b>	<b>REVISION:</b> <b>1</b>
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# Radio Frequency – Electromagnetic Energy (RF-EME) Site Compliance Report

---

Site Number: 674349

Ashland\_MA

Albert Ray Drive

Ashland, MA 01721

42° 16' 25.34" N, 071° 27' 05.22" W



Prepared For:

**verizon**✓






# Radio Frequency Exposure FCC Compliance Assessment

Pre-Activation  Post-Activation

SITE-SPECIFIC-INFORMATION			
Site Name	Ashland_MA	Multi-Licensee Facility	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
Street Address	Albert Ray Drive	Is Verizon a Significant Contributor To Co-Locator Areas Requiring Mitigation?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> N/A
City, State, Zip	Ashland, MA, 01721		
Verizon's Max % MPE (Measured - Occupational)	N/A	Verizon's Max % MPE (Predictive - Occupational)	1.40% Occupational Predictive
Structure Type	Lattice Tower	Assessment Date	7/18/2022
Broadcast (AM/FM/TV) Co-Locators	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Assessment Purpose	MODIFICATION
Total Access Points	1	Total Report Revisions	N/A
Original Report Date	7/18/2022	Report Revision Date	No Revisions
Compliance Status	<input checked="" type="checkbox"/> <b>COMPLIANT AS DESIGNED</b> <input type="checkbox"/> <b>COMPLIANT PER RF SAFETY PLAN SUBMISSION</b> <input type="checkbox"/> <b>MITIGATION IS REQUIRED</b>		

VERIZON'S WORST-CASE RF EMISSIONS IN ACCESSIBLE AREAS AT THIS FACILITY	
<input checked="" type="checkbox"/>	BELOW the General Population MPE limit
<input type="checkbox"/>	ABOVE the General Population MPE limit and BELOW the Occupational MPE limit
<input type="checkbox"/>	ABOVE the Occupational MPE limit and BELOW 10x the Occupational MPE limit
<input type="checkbox"/>	ABOVE 10x the Occupational MPE limit

Final Compliant Configuration						
	GUIDELINES	NOTICE	CAUTION	WARNING	NOC INFO	BARRIER/MARKER
Access Point(s)	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> dimensions
Alpha	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> dimensions
Beta	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> dimensions
Gamma	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> dimensions

NOTE: The table above represents EVERY compliance item that MUST be implemented at this location; Also in Sec. 4 (B)

<b>Additional Compliance Requirement(s):</b> N/A			
<b>Consultant Legal Name</b>	Centerline Communications, LLC	<b>Phone/Fax</b>	(781) 713-4725
<b>Address</b>	750 W Center St, West Bridgewater, MA 02379		

2

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## 1. Introduction

Verizon Wireless has contracted with Centerline Communications, LLC, an independent Radio Frequency consulting firm, to conduct a **Radio Frequency Exposure (RFE) FCC Compliance Assessment** of the Ashland\_MA cell site. The following report contains a detailed summary of the Radio Frequency environment as it relates to Federal Communications Commission (FCC) and Occupational Safety & Health Administration (OSHA) Rules and Regulations for all individuals.

The **Verizon Wireless antenna data** was provided by:

<b>Name</b>	Candace Vivenzio
<b>Title</b>	RF Engineer
<b>Date</b>	07/01/2022
<b>Sub-Market</b>	NE

This compliance assessment and report has been **prepared** and **reviewed** by:

	<b>Preparer</b>	<b>Reviewer</b>
<b>Name</b>	Matt Schulzinger	Yasir Alqadhili
<b>Title</b>	RF EME Technical Writer	RF EME Technical Writer
<b>Date</b>	7/18/2022	7/18/2022

This report utilizes the following **for predictive modeling of the ambient RF environment**:

**MPE Modeling Program:** RoofMaster™ 2020 Version 35.5.23.2022

**Required Modeling Assumptions:** 100% Duty Cycle and Maximum Total Power Output.

### **Additional Modeling Assumptions:**

Centerline Communications, LLC has performed theoretical modeling using Waterford Consultants' RoofMaster™ 2020 Version 35.5.23.2022 which uses a cylindrical model for conservative power density predictions within the near field of the antenna where the antenna pattern has not truly formed yet. Within this area power density values tend to decrease based upon an inverse distance function. At the point where it is appropriate for modeling to change from near-field calculations to far-field calculations the power decreases inversely with the square of the distance. This modeling technique is accurate with low antenna centerlines, such as rooftops, where persons can get close to the antennas and pass through fields in close proximity.

## 2. Existing Site Characteristics

### a. Structure

<b>Physical Description</b>	This site is located on a 99' monopole.
<b>Single-Family Home</b>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<b>Latitude (NAD 83)</b>	42° 16' 25.34" N
<b>Longitude (NAD 83)</b>	071° 27' 05.22" W
<b>Total Analyzed Elevations</b>	<p style="text-align: center;"> <b>Ground Level 0.00 ft.</b>  <b>Ground Level 0.00 ft.</b>  <b>Antenna Level 99.00 ft.</b>  <b>Residential Buildings 55.00 ft.</b>  <b>Residential Buildings 55.00 ft.</b>  <b>Elevation View</b> </p>

### b. Accessibility

<b>Did the property owner or agent of the property owner (e.g. a security guard) grant you access to the rooftop?</b>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>If not - were you required to be escorted by Verizon personnel in order to gain access?</b>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>Were you required to provide any proof of identity to gain access?</b>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>What specific documents were required in order to gain access?</b>	N/A
<b>All access points locked at time of assessment?</b>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>All access points alarmed at time of assessment?</b>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>Were there any broken locks or inoperable alarms on any of the access points to the rooftop?</b>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>Were there any access issues caused by either the property owner or agent of the property owner?</b>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>Additional Notes:</b> N/A	

**c. Existing Verizon Observations**

<b>Existing Observations</b>						
	<b>GUIDELINES</b>	<b>NOTICE</b>	<b>CAUTION</b>	<b>WARNING</b>	<b>NOC INFO</b>	<b>BARRIER/MARKER</b>
<b>Access Point(s)</b>	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> dimensions
<b>Alpha</b>	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> dimensions
<b>Beta</b>	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> dimensions
<b>Gamma</b>	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> dimensions

**NOTE: The table above represents EXISTING compliance items implemented at this location.**

<b>Are Verizon signs visible from all areas of approach?</b>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>Are there any broken, damaged or illegible Verizon signs?</b>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>Are there any broken or damaged Verizon physical barriers?</b>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>Are there any Verizon indicative markers in need of repair or replacement?</b>	<input type="checkbox"/> YES <input type="checkbox"/> NO

**d. Antenna Inventory**

<b>Z-height represents the distance from the ground to the Centerline of the antenna.</b>	<input type="checkbox"/> Bottom <input checked="" type="checkbox"/> Centerline <input type="checkbox"/> Top
<b>NON-Verizon Co-locator Data</b>	<input checked="" type="checkbox"/> Estimates <input type="checkbox"/> Actual Data

Ant Num	Carrier	Freq (MHz)	Tx (#)	Power (TPO)	ERP	Mfg	Model	Tech	(ft) Z	Gain in dbd	Azimuth	Horizontal BW	MDT	Length (ft.)
1	Verizon	850	7	20	2891.53	JMA	X7C-680-VR0-0	CDMA	102.00	13.15	27.00	78.00	3.00	6.00
2	Verizon	700	2	40	1355.47	COMMSCOPE	NHH-65B-R2B	LTE	102.00	12.29	27.00	65.00	0.00	6.00
2	Verizon	850	1	40	744.83	COMMSCOPE	NHH-65B-R2B	LTE	102.00	12.70	27.00	60.00	0.00	6.00
2	Verizon	850	1	40	744.83	COMMSCOPE	NHH-65B-R2B	NR	102.00	12.70	27.00	60.00	0.00	6.00
2	Verizon	2100	4	40	6700.70	COMMSCOPE	NHH-65B-R2B	AWS	102.00	16.22	27.00	64.00	0.00	6.00
3	Verizon	700	2	40	1355.47	COMMSCOPE	NHH-65B-R2B	LTE	102.00	12.29	27.00	65.00	0.00	6.00
3	Verizon	850	1	40	744.83	COMMSCOPE	NHH-65B-R2B	LTE	102.00	12.70	27.00	60.00	0.00	6.00
3	Verizon	850	1	40	744.83	COMMSCOPE	NHH-65B-R2B	NR	102.00	12.70	27.00	60.00	0.00	6.00
3	Verizon	1900	4	40	5876.52	COMMSCOPE	NHH-65B-R2B	LTE	102.00	15.65	27.00	69.00	0.00	6.00
4	Verizon	3700	4	50	43254.37	SAMSUNG	MT6407	C-Band	102.00	23.35	27.00	12.00	0.00	2.92
5	Verizon	850	7	20	2891.53	JMA	X7C-680-VR0-0	CDMA	102.00	13.15	147.00	78.00	4.00	6.00
6	Verizon	700	2	40	1355.47	COMMSCOPE	NHH-65B-R2B	LTE	102.00	12.29	147.00	65.00	0.00	6.00
6	Verizon	850	1	40	744.83	COMMSCOPE	NHH-65B-R2B	LTE	102.00	12.70	147.00	60.00	0.00	6.00
6	Verizon	850	1	40	744.83	COMMSCOPE	NHH-65B-R2B	NR	102.00	12.70	147.00	60.00	0.00	6.00
6	Verizon	2100	4	40	6700.70	COMMSCOPE	NHH-65B-R2B	AWS	102.00	16.22	147.00	64.00	0.00	6.00
7	Verizon	700	2	40	1355.47	COMMSCOPE	NHH-65B-R2B	LTE	102.00	12.29	147.00	65.00	0.00	6.00
7	Verizon	850	1	40	744.83	COMMSCOPE	NHH-65B-R2B	LTE	102.00	12.70	147.00	60.00	0.00	6.00
7	Verizon	850	1	40	744.83	COMMSCOPE	NHH-65B-R2B	NR	102.00	12.70	147.00	60.00	0.00	6.00
7	Verizon	1900	4	40	5876.52	COMMSCOPE	NHH-65B-R2B	LTE	102.00	15.65	147.00	69.00	0.00	6.00
8	Verizon	3700	4	50	43254.37	SAMSUNG	MT6407	C-Band	102.00	23.35	147.00	12.00	0.00	2.92
9	Verizon	850	7	20	2891.53	JMA	X7C-680-VR0-0	CDMA	102.00	13.15	267.00	78.00	2.00	6.00
10	Verizon	700	2	40	1355.47	COMMSCOPE	NHH-65B-R2B	LTE	102.00	12.29	267.00	65.00	0.00	6.00
10	Verizon	850	1	40	744.83	COMMSCOPE	NHH-65B-R2B	LTE	102.00	12.70	267.00	60.00	0.00	6.00
10	Verizon	850	1	40	744.83	COMMSCOPE	NHH-65B-R2B	NR	102.00	12.70	267.00	60.00	0.00	6.00
10	Verizon	2100	4	40	6700.70	COMMSCOPE	NHH-65B-R2B	AWS	102.00	16.22	267.00	64.00	0.00	6.00
11	Verizon	700	2	40	1355.47	COMMSCOPE	NHH-65B-R2B	LTE	102.00	12.29	267.00	65.00	0.00	6.00
11	Verizon	850	1	40	744.83	COMMSCOPE	NHH-65B-R2B	LTE	102.00	12.70	267.00	60.00	0.00	6.00
11	Verizon	850	1	40	744.83	COMMSCOPE	NHH-65B-R2B	NR	102.00	12.70	267.00	60.00	0.00	6.00
11	Verizon	1900	4	40	5876.52	COMMSCOPE	NHH-65B-R2B	LTE	102.00	15.65	267.00	69.00	0.00	6.00
12	Verizon	3700	4	50	43254.37	SAMSUNG	MT6407	C-Band	102.00	23.35	267.00	12.00	0.00	2.92
13	AT&T	3840	1	67.78	12476.75	GENERIC	GENERIC C-BAND	C-Band	94.00	22.65	27.00	14.00	0.00	2.46
14	AT&T	700	4	40	2736.02	GENERIC	PANEL 6FT	LTE	94.00	12.33	27.00	68.00	0.00	6.00
14	AT&T	850	4	40	2924.96	GENERIC	PANEL 6FT	LTE	94.00	12.62	27.00	66.00	0.00	6.00
14	AT&T	1900	4	40	6139.32	GENERIC	PANEL 6FT	LTE	94.00	15.84	27.00	66.00	0.00	6.00
14	AT&T	2100	4	40	6968.19	GENERIC	PANEL 6FT	LTE	94.00	16.39	27.00	63.00	0.00	6.00
15	AT&T	3840	1	67.78	12476.75	GENERIC	GENERIC C-BAND	C-Band	94.00	22.65	147.00	14.00	0.00	2.46
16	AT&T	700	4	40	2736.02	GENERIC	PANEL 6FT	LTE	94.00	12.33	147.00	68.00	0.00	6.00
16	AT&T	850	4	40	2924.96	GENERIC	PANEL 6FT	LTE	94.00	12.62	147.00	66.00	0.00	6.00
16	AT&T	1900	4	40	6139.32	GENERIC	PANEL 6FT	LTE	94.00	15.84	147.00	66.00	0.00	6.00
16	AT&T	2100	4	40	6968.19	GENERIC	PANEL 6FT	LTE	94.00	16.39	147.00	63.00	0.00	6.00
17	AT&T	3840	1	67.78	12476.75	GENERIC	GENERIC C-BAND	C-Band	94.00	22.65	267.00	14.00	0.00	2.46
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18	AT&T	1900	4	40	6139.32	GENERIC	PANEL 6FT	LTE	94.00	15.84	267.00	66.00	0.00	6.00
18	AT&T	2100	4	40	6968.19	GENERIC	PANEL 6FT	LTE	94.00	16.39	267.00	63.00	0.00	6.00
19	T-Mobile	2500	1	60	3222.19	GENERIC	GENERIC C-BAND	C-Band	85.00	17.30	27.00	65.00	0.00	2.76
19	T-Mobile	2500	1	90	15461.18	GENERIC	GENERIC C-BAND	C-Band	85.00	22.35	27.00	13.00	0.00	2.76
19	T-Mobile	2500	1	90	15461.18	GENERIC	GENERIC C-BAND	C-Band	85.00	22.35	27.00	13.00	0.00	2.76
20	T-Mobile	1900	2	60	4604.49	GENERIC	PANEL 6FT	LTE	85.00	15.84	27.00	66.00	0.00	6.00
20	T-Mobile	2100	2	60	5226.14	GENERIC	PANEL 6FT	LTE	85.00	16.39	27.00	63.00	0.00	6.00
21	T-Mobile	600	2	60	120.00	GENERIC	PANEL 6FT	LTE	85.00	0.00	27.00	68.00	0.00	6.00
21	T-Mobile	700	2	60	2052.02	GENERIC	PANEL 6FT	LTE	85.00	12.33	27.00	68.00	0.00	6.00
22	T-Mobile	2500	1	60	3222.19	GENERIC	GENERIC C-BAND	C-Band	85.00	17.30	147.00	65.00	0.00	2.76
22	T-Mobile	2500	1	90	15461.18	GENERIC	GENERIC C-BAND	C-Band	85.00	22.35	147.00	13.00	0.00	2.76
22	T-Mobile	2500	1	90	15461.18	GENERIC	GENERIC C-BAND	C-Band	85.00	22.35	147.00	13.00	0.00	2.76
23	T-Mobile	1900	2	60	4604.49	GENERIC	PANEL 6FT	LTE	85.00	15.84	147.00	66.00	0.00	6.00
23	T-Mobile	2100	2	60	5226.14	GENERIC	PANEL 6FT	LTE	85.00	16.39	147.00	63.00	0.00	6.00
24	T-Mobile	600	2	60	120.00	GENERIC	PANEL 6FT	LTE	85.00	0.00	147.00	68.00	0.00	6.00
24	T-Mobile	700	2	60	2052.02	GENERIC	PANEL 6FT	LTE	85.00	12.33	147.00	68.00	0.00	6.00
25	T-Mobile	2500	1	60	3222.19	GENERIC	GENERIC C-BAND	C-Band	85.00	17.30	267.00	65.00	0.00	2.76
25	T-Mobile	2500	1	90	15461.18	GENERIC	GENERIC C-BAND	C-Band	85.00	22.35	267.00	13.00	0.00	2.76
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26	T-Mobile	1900	2	60	4604.49	GENERIC	PANEL 6FT	LTE	85.00	15.84	267.00	66.00	0.00	6.00
26	T-Mobile	2100	2	60	5226.14	GENERIC	PANEL 6FT	LTE	85.00	16.39	267.00	63.00	0.00	6.00
27	T-Mobile	600	2	60	120.00	GENERIC	PANEL 6FT	LTE	85.00	0.00	267.00	68.00	0.00	6.00
27	T-Mobile	700	2	60	2052.02	GENERIC	PANEL 6FT	LTE	85.00	12.33	267.00	68.00	0.00	6.00



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### 3. Analysis

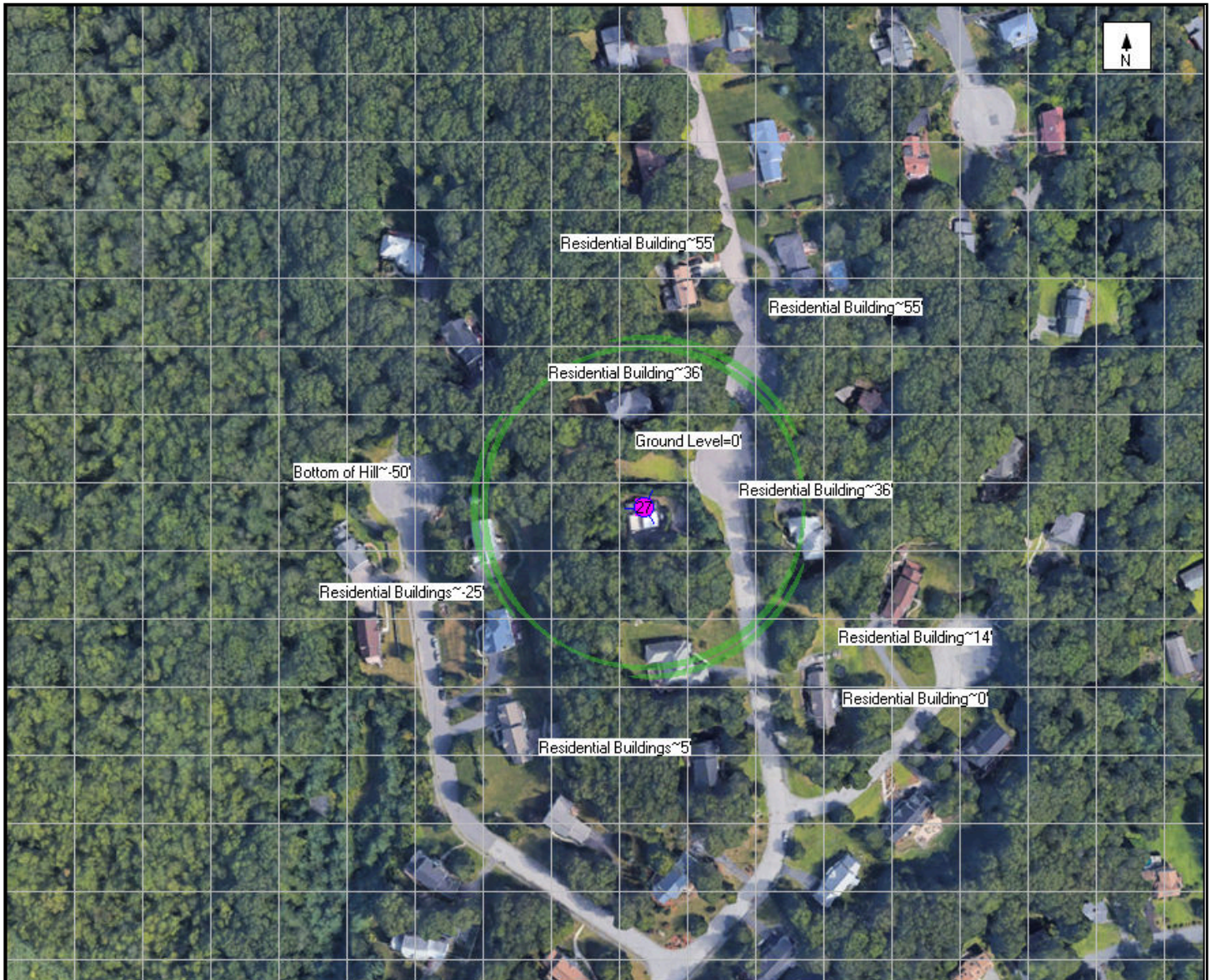
#### a. Overview Diagrams

Is the area being modeled completely **INACCESSIBLE** to members of the general population (including untrained maintenance workers)?

YES  NO

Predictive Model: All Transmitters

Reference Plane: Ground Level 0.00 ft.



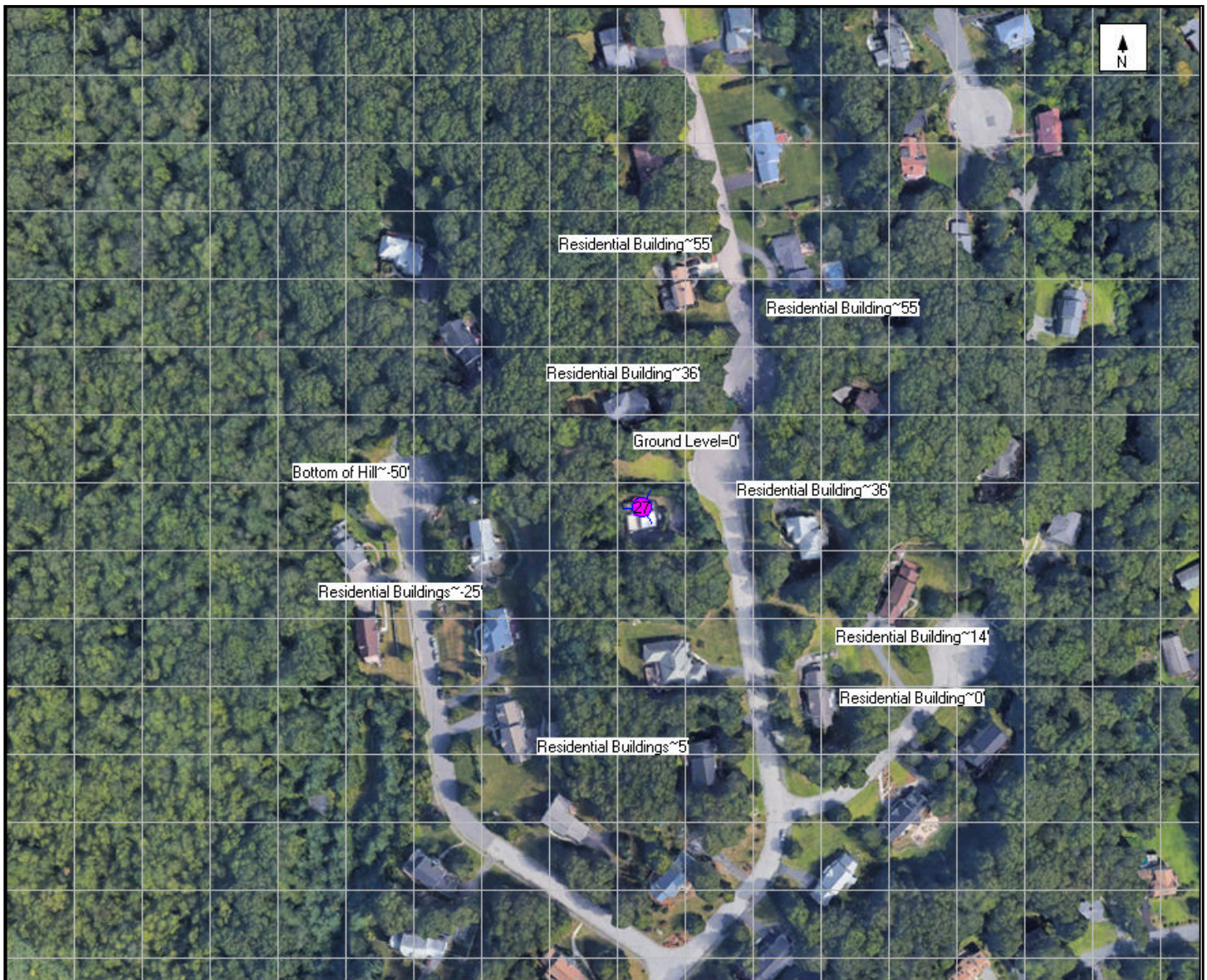
100' grid size

Plot includes MPE levels spatially averaged between the referenced plane and 6ft above.

<p><b>Carrier Color Code</b></p> <ul style="list-style-type: none"> <li><span style="color: red;">●</span> Verizon</li> <li><span style="color: cyan;">●</span> AT&amp;T Mobility</li> <li><span style="color: limegreen;">●</span> Clearwire</li> <li><span style="color: green;">●</span> Cricket</li> <li><span style="color: magenta;">●</span> T-Mobile</li> <li><span style="color: yellow;">●</span> Sprint</li> <li><span style="color: purple;">●</span> US Cellular</li> <li><span style="color: orange;">●</span> Metro PCS</li> <li><span style="color: lightblue;">●</span> Unknown</li> </ul>	<p>Existing Marker —</p> <p>Existing Barrier ••••</p> <p>Proposed Marker —</p> <p>Proposed Barrier ••••</p>	<p><b>Percent MPE Legend</b></p> <table border="1"> <tr><td style="background-color: white;"> </td><td>0% - 5%</td></tr> <tr><td style="background-color: green;"> </td><td>5% - 100%</td></tr> <tr><td style="background-color: blue;"> </td><td>100% - 500%</td></tr> <tr><td style="background-color: yellow;"> </td><td>500% - 5000%</td></tr> <tr><td style="background-color: red;"> </td><td>5000% +</td></tr> </table> <p>Public Limits</p>		0% - 5%		5% - 100%		100% - 500%		500% - 5000%		5000% +	<p><b>Percent MPE Legend</b></p> <table border="1"> <tr><td style="background-color: white;"> </td><td>0% - 1%</td></tr> <tr><td style="background-color: green;"> </td><td>1% - 20%</td></tr> <tr><td style="background-color: blue;"> </td><td>20% - 100%</td></tr> <tr><td style="background-color: yellow;"> </td><td>100% - 1000%</td></tr> <tr><td style="background-color: red;"> </td><td>1000% +</td></tr> </table> <p>Occupational Limits</p>		0% - 1%		1% - 20%		20% - 100%		100% - 1000%		1000% +
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	5000% +																						
	0% - 1%																						
	1% - 20%																						
	20% - 100%																						
	100% - 1000%																						
	1000% +																						

**Predictive Model: Verizon Transmitters**

**Reference Plane: Ground Level 0.00 ft.**



100' grid size

Plot includes MPE levels spatially averaged between the referenced plane and 6ft above.

<p><b>Carrier Color Code</b></p> <ul style="list-style-type: none"> <li><span style="color: red;">●</span> Verizon</li> <li><span style="color: cyan;">●</span> AT&amp;T Mobility</li> <li><span style="color: limegreen;">●</span> Clearwire</li> <li><span style="color: green;">●</span> Cricket</li> <li><span style="color: magenta;">●</span> T-Mobile</li> <li><span style="color: yellow;">●</span> Sprint</li> <li><span style="color: purple;">●</span> US Cellular</li> <li><span style="color: orange;">●</span> Metro PCS</li> <li><span style="color: lightblue;">●</span> Unknown</li> </ul>	<p><b>Existing Marker</b> —</p> <p><b>Existing Barrier</b> .....</p> <p><b>Proposed Marker</b> —</p> <p><b>Proposed Barrier</b> .....</p>	<p><b>Percent MPE Legend</b></p> <table border="1"> <tr><td style="background-color: white;"> </td><td>0% - 5%</td></tr> <tr><td style="background-color: green;"> </td><td>5% - 100%</td></tr> <tr><td style="background-color: blue;"> </td><td>100% - 500%</td></tr> <tr><td style="background-color: yellow;"> </td><td>500% - 5000%</td></tr> <tr><td style="background-color: red;"> </td><td>5000% +</td></tr> </table> <p><b>Public Limits</b></p>		0% - 5%		5% - 100%		100% - 500%		500% - 5000%		5000% +	<p><b>Percent MPE Legend</b></p> <table border="1"> <tr><td style="background-color: white;"> </td><td>0% - 1%</td></tr> <tr><td style="background-color: green;"> </td><td>1% - 20%</td></tr> <tr><td style="background-color: blue;"> </td><td>20% - 100%</td></tr> <tr><td style="background-color: yellow;"> </td><td>100% - 1000%</td></tr> <tr><td style="background-color: red;"> </td><td>1000% +</td></tr> </table> <p><b>Occupational Limits</b></p>		0% - 1%		1% - 20%		20% - 100%		100% - 1000%		1000% +
	0% - 5%																						
	5% - 100%																						
	100% - 500%																						
	500% - 5000%																						
	5000% +																						
	0% - 1%																						
	1% - 20%																						
	20% - 100%																						
	100% - 1000%																						
	1000% +																						

**Predictive Model: All Transmitters**

**Reference Plane: Antenna Level 99.00 ft.**



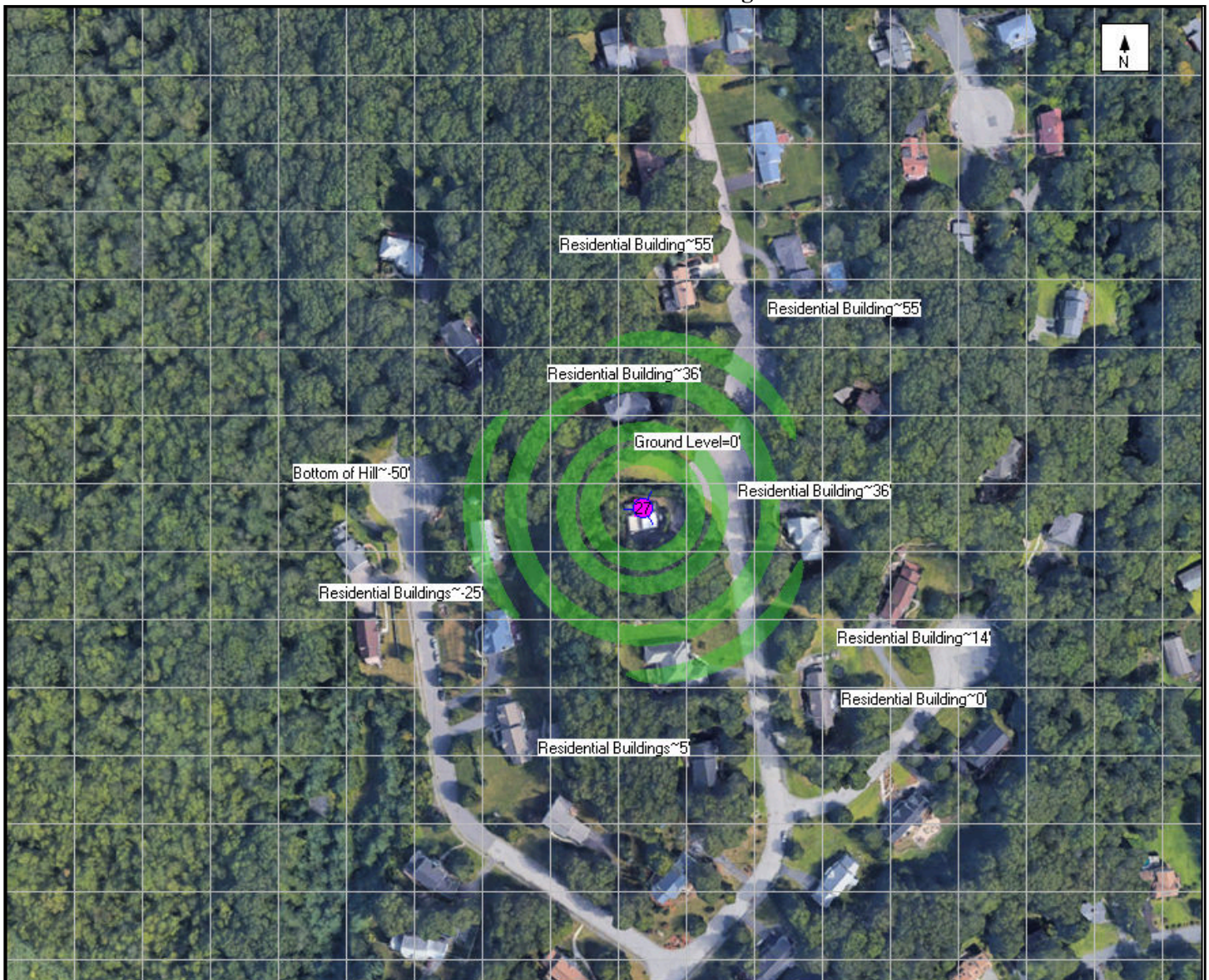
100' grid size

Plot includes MPE levels spatially averaged between the referenced plane and 6ft above.

<p><b>Carrier Color Code</b></p> <ul style="list-style-type: none"> <li><span style="color: red;">●</span> Verizon</li> <li><span style="color: cyan;">●</span> AT&amp;T Mobility</li> <li><span style="color: limegreen;">●</span> Clearwire</li> <li><span style="color: green;">●</span> Cricket</li> <li><span style="color: magenta;">●</span> T-Mobile</li> <li><span style="color: yellow;">●</span> Sprint</li> <li><span style="color: purple;">●</span> US Cellular</li> <li><span style="color: orange;">●</span> Metro PCS</li> <li><span style="color: lightblue;">●</span> Unknown</li> </ul>	<p>Existing Marker —</p> <p>Existing Barrier ····</p> <p>Proposed Marker —</p> <p>Proposed Barrier ····</p>	<p><b>Percent MPE Legend</b></p> <table border="1"> <tr><td style="background-color: white;"> </td><td>0% - 5%</td></tr> <tr><td style="background-color: green;"> </td><td>5% - 100%</td></tr> <tr><td style="background-color: blue;"> </td><td>100% - 500%</td></tr> <tr><td style="background-color: yellow;"> </td><td>500% - 5000%</td></tr> <tr><td style="background-color: red;"> </td><td>5000% +</td></tr> </table> <p>Public Limits</p>		0% - 5%		5% - 100%		100% - 500%		500% - 5000%		5000% +	<p><b>Percent MPE Legend</b></p> <table border="1"> <tr><td style="background-color: white;"> </td><td>0% - 1%</td></tr> <tr><td style="background-color: green;"> </td><td>1% - 20%</td></tr> <tr><td style="background-color: blue;"> </td><td>20% - 100%</td></tr> <tr><td style="background-color: yellow;"> </td><td>100% - 1000%</td></tr> <tr><td style="background-color: red;"> </td><td>1000% +</td></tr> </table> <p>Occupational Limits</p>		0% - 1%		1% - 20%		20% - 100%		100% - 1000%		1000% +
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	100% - 1000%																						
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**Predictive Model: All Transmitters**

**Reference Plane: Residential Buildings 55.00 ft.**



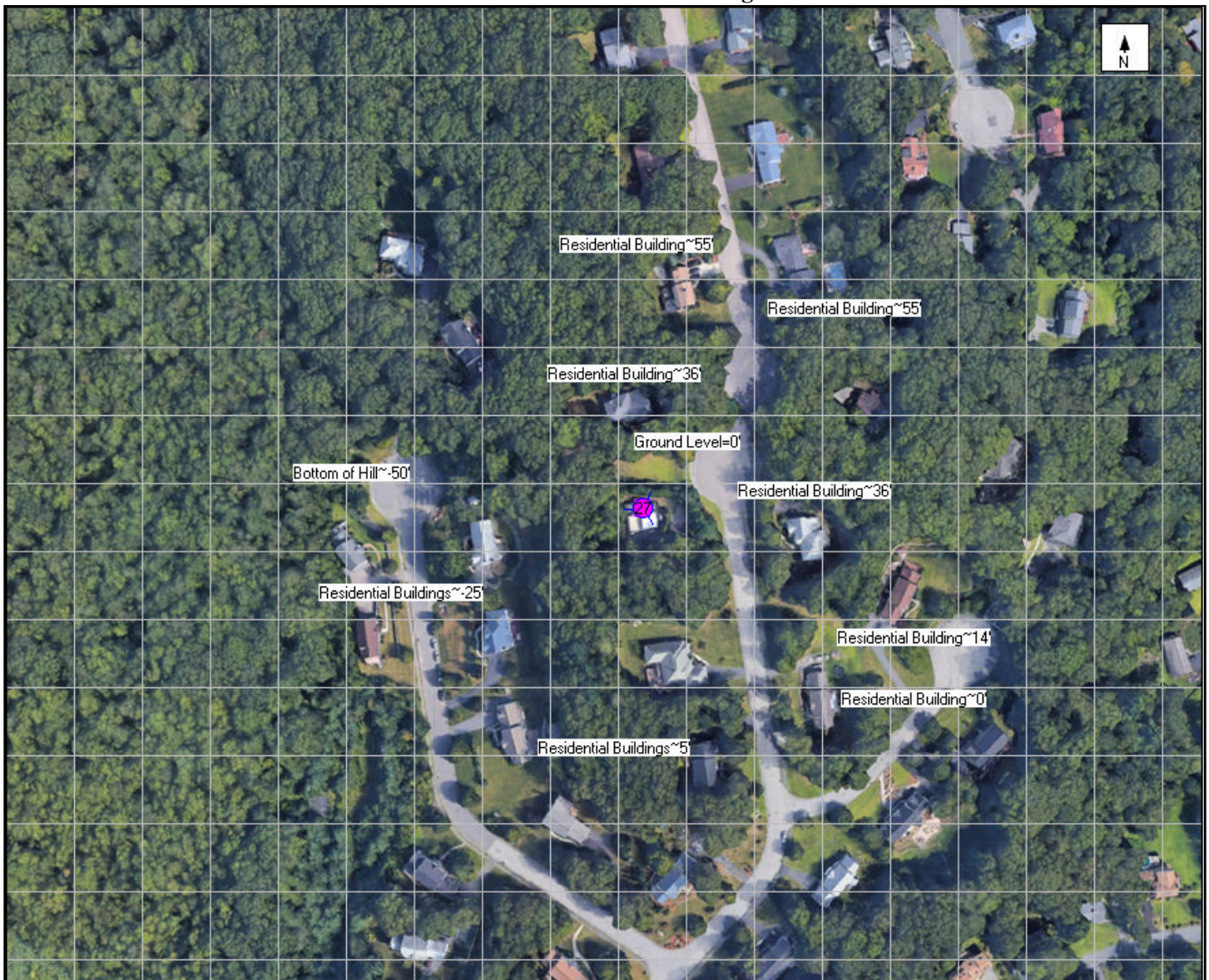
100' grid size

Plot includes MPE levels spatially averaged between the referenced plane and 6ft above.

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**Predictive Model: Verizon Transmitters**

**Reference Plane: Residential Buildings 55.00 ft.**



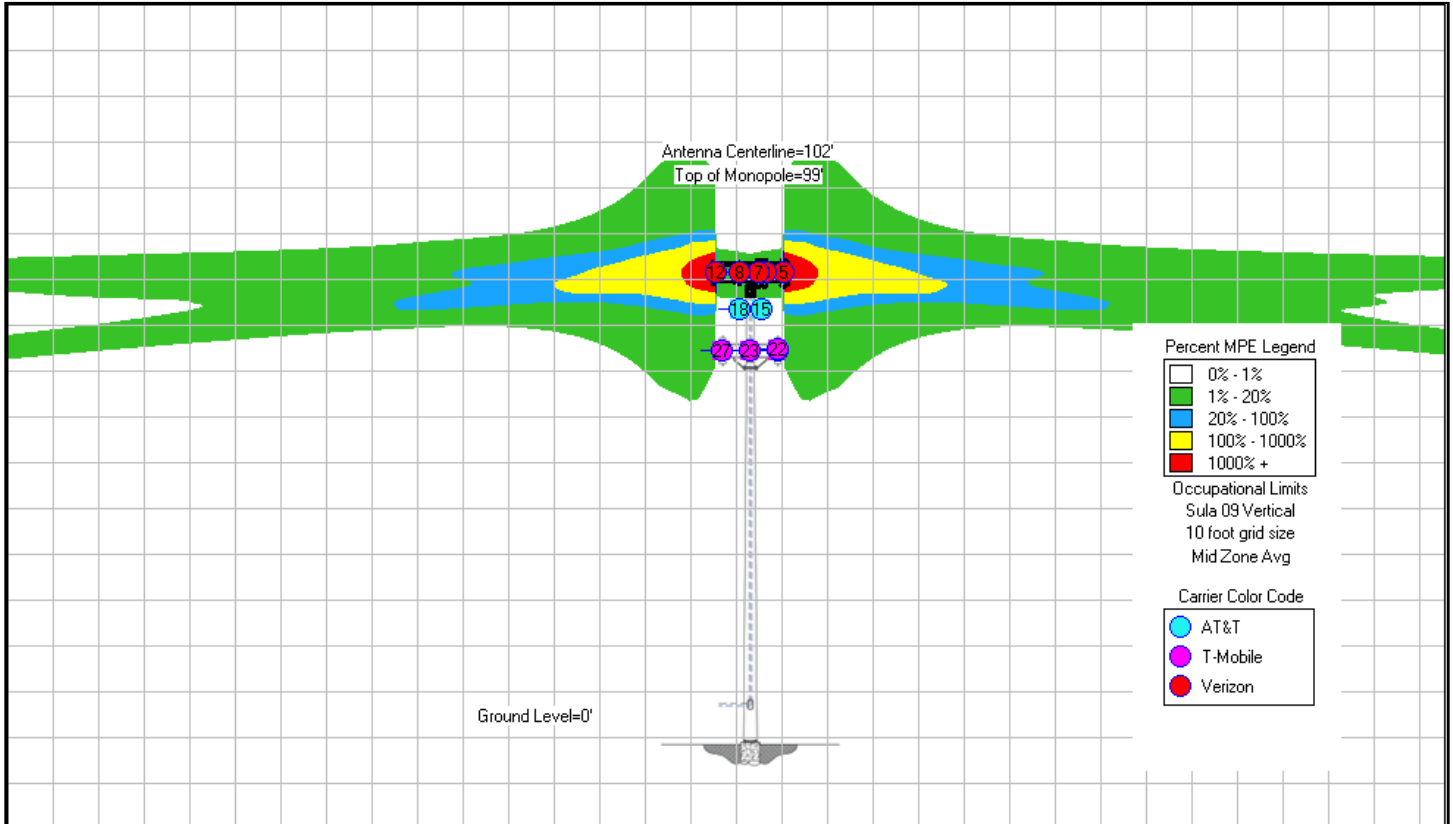
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**b. Elevation Diagram**  
**Predictive Model: Verizon Transmitters**

**Reference Plane: Elevation View**



10' grid size



**4. Conclusion**

**a. Conclusion Narrative**

Based on data provided for this pre-activation MPE modeling, this site has been determined to be **compliant as designed**.

**Description of MPE-Limit Exceeding Areas:**

Maximum Predicted MPE Level on Site:	% of MPE Limit:	Location:
Accessible <b>General Population</b> MPE Limits:	<b>7.00%</b>	<b>Sector A</b>
Accessible <b>Occupational</b> MPE Limits:	<b>1.40%</b>	

Antenna Level Assessment:	Distance from Antenna (ft.)
Antenna Level <b>General Population</b> Horizontal Distance:	<b>72'</b>
Antenna Level <b>Occupational</b> Horizontal Distance:	<b>36'</b>

Ground Level Assessment:	% of MPE Limit:
Ground Level <b>General Population</b> MPE Limits:	<b>7.00%</b>
Ground Level <b>Occupational</b> MPE Limits:	<b>1.40%</b>

Sector A: Transmitting over Ground Level	% of MPE Limit:	*Distance from Antenna (ft.):
Accessible <b>General Population</b> MPE Limits:	<b>7.00%</b>	<b>0'</b>
Accessible <b>Occupational</b> MPE Limits:	<b>1.40%</b>	<b>0'</b>

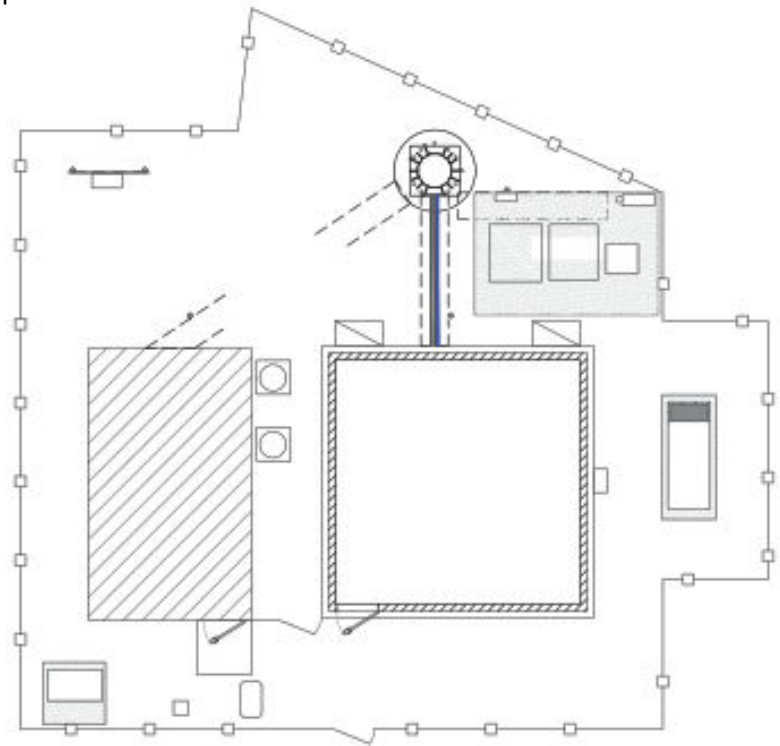
Sector B: Transmitting over Ground Level	% of MPE Limit:	*Distance from Antenna (ft.):
Accessible <b>General Population</b> MPE Limits:	<b>7.00%</b>	<b>0'</b>
Accessible <b>Occupational</b> MPE Limits:	<b>1.40%</b>	<b>0'</b>

Sector G: Transmitting over Ground Level	% of MPE Limit:	*Distance from Antenna (ft.):
Accessible <b>General Population</b> MPE Limits:	<b>7.00%</b>	<b>0'</b>
Accessible <b>Occupational</b> MPE Limits:	<b>1.40%</b>	<b>0'</b>

\*Distance from Antenna indicates how far the emissions are predicted to exceed limits from the front of the antennas across a walkable surface.

**b. Signage/Barrier Diagram**

No action is required; the site is compliant.









10' grid size

Existing Sign Proposed Sign	Existing Marker ——— Existing Barrier ·····  Proposed Marker ——— Proposed Barrier ·····	<b>Carrier Color Code</b> Verizon      T-Mobile      Clearwire      US Cellular      Unknown AT&T Mobility      Sprint      Cricket      Metro PCS
--------------------------------	--	--

<b>Final Compliant Configuration</b>						
	GUIDELINES	NOTICE	CAUTION	WARNING	NOC INFO	BARRIER/MARKER
<b>Access Point(s)</b>	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> dimensions
<b>Alpha</b>	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> dimensions
<b>Beta</b>	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> dimensions
<b>Gamma</b>	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> dimensions

**NOTE: The table above represents EVERY compliance item that MUST be implemented at this location.**

**c. Signage/Barrier Installation Detail**

<b>Mitigation Actions Required</b>													
	GUIDELINES		NOTICE		CAUTION		WARNING		NOC INFO		BARRIER/MARKER		
<b>Access Point(s)</b>	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/>	dimensions
<b>Alpha</b>	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/>	dimensions
<b>Beta</b>	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/>	dimensions
<b>Gamma</b>	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/> [#]	<input type="checkbox"/>	dimensions
	<b>ADD</b>	<b>REM</b>	<b>ADD</b>	<b>REM</b>	<b>ADD</b>	<b>REM</b>	<b>ADD</b>	<b>REM</b>	<b>ADD</b>	<b>REM</b>	<b>ADD</b>	<b>REM</b>	<b>ADD ONLY</b>

<b>SPECIAL MITIGATION INSTRUCTIONS</b>	
<b>Items to be Installed</b>	<p><b>Site Access Location</b> No action required.</p> <p><b>Verizon Sector A</b> No action required.</p> <p><b>Verizon Sector B</b> No action required.</p> <p><b>Verizon Sector G</b> No action required.</p>
<b>Items to be Removed</b>	N/A
<b>Items to be Repaired/Replaced</b>	N/A

## **5. Appendix C: RF Consultant Certifications**

### **a. Preparer Certification**

I, Matt Schulzinger, the preparer of this report, am fully aware of and familiar with the Rules and Regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation. I am also fully aware of and familiar with the Verizon Wireless Signage & Demarcation Policy. I have reviewed this Radio Frequency Exposure Assessment report and believe it to be both true and accurate to the best of my knowledge.

Matt Schulzinger 7/18/2022

### **b. Reviewer Certification**

I, Yasir Alqadhili, the reviewer and approver of this report, am fully aware of and familiar with the Rules and Regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation. I am also fully aware of and familiar with the Verizon Wireless Signage & Demarcation Policy. I have reviewed this Radio Frequency Exposure Assessment report and believe it to be both true and accurate to the best of my knowledge.

Yasir Alqadhili 7/18/2022

## 6. Appendix D: Reference Information

### a. FCC Rules & Regulations

The Federal Communications Commission (FCC) has established safety guidelines relating to RF exposure from cell sites. The FCC developed those standards, known as Maximum Permissible Exposure (MPE) limits, in consultation with numerous other federal agencies, including the Environmental Protection Agency, the Food and Drug Administration, and the Occupational Safety and Health Administration. The standards were developed by expert scientists and engineers after extensive reviews of the scientific literature related to RF biological effects. The FCC explains that its standards “incorporate prudent margins of safety.” The following represents explanations of the most applicable information:

#### Two Classifications for Exposure Limits

<u>Occupational</u> – Applies to situations in which persons are “exposed as a consequence of their <i>employment</i> ” and are “ <i>fully aware</i> of the potential for exposure and can <i>exercise control</i> over their exposure”.	<u>General Population</u> – Applies to situations in which persons are “exposed as a consequence of their employment <i>may not be made fully aware</i> of the potential for exposure or <i>cannot exercise control</i> over their exposure”. Generally speaking, those without significant and documented RF Safety & Awareness training would be in the General Population classification.
--	--

#### Environment Classification

<u>Controlled</u> – Applies to environments that are restricted or “controlled” in order to prevent access from members of the General Population classification.	<u>Uncontrolled</u> – Applies to environments that are unrestricted or “uncontrolled” that allow access from members of the General Population classification.
---	--

<i>Limits for Occupational/Controlled Exposure</i>		
Frequency	Power Density	Averaging Time
Range	(S)	E  <sup>2</sup> ,  H  <sup>2</sup> , or S
(MHz)	(mW/cm <sup>2</sup> )	(minutes)
300-1500	f/300	6
1500-100,000	5	6
<i>Limits for General Population/Uncontrolled Exposure</i>		
Frequency	Power Density	Averaging Time
Range	(S)	E  <sup>2</sup> ,  H  <sup>2</sup> , or S
(MHz)	(mW/cm <sup>2</sup> )	(minutes)
300-1500	f/1500	30
1500-100,000	1	30
<i>f = frequency in MHz</i>		

#### Significant Contribution to the RF Environment

Any carrier contributing an aggregate MPE percentage of 5 or more (to the applicable RF Environment Classification) is defined as a significant contributor. This means that if any area is determined to be out of compliance with FCC rules, all significant contributors are jointly responsible for correcting any deficiencies.
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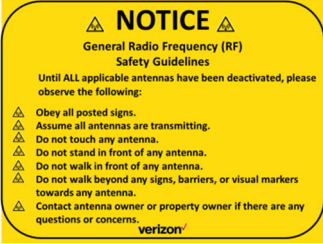

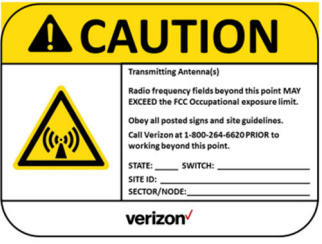
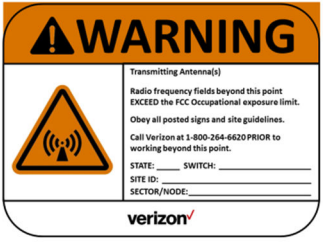
### b. Occupational Safety and Health Administration (OSHA) Requirements


A formal adopter of FCC Standards, OSHA stipulates that those in the Occupational classification must complete training in the following: RF Safety, RF Awareness, and Utilization of Personal Protective Equipment. OSHA also provides options for Hazard Prevention and Control:

Hazard Prevention	Control
<ul style="list-style-type: none"> <li>Utilization of good equipment</li> <li>Enact control of hazard areas</li> <li>Limit exposures</li> <li>Employ medical surveillance and accident response</li> </ul>	<ul style="list-style-type: none"> <li>Employ Lockout/Tag out</li> <li>Utilize personal alarms &amp; protective clothing</li> <li>Prevent access to hazardous locations</li> <li>Develop or operate an administrative control program</li> </ul>

**c. RF Signage**

Areas or portions of any transmitter site may be susceptible to high power densities that could cause personnel exposures in excess of the FCC guidelines. These areas must be demarcated by conspicuously posted signage that identifies the potential exposure. Signage **MUST** be viewable regardless of the viewer’s position.

GUIDELINES	NOTICE	CAUTION	WARNING
<p>This sign will inform anyone of the basic precautions to follow when entering an area with transmitting radiofrequency equipment.</p>	<p>This sign indicates that RF emissions may exceed the FCC General Population MPE limit.</p>	<p>This sign indicates that RF emissions may exceed the FCC Occupational MPE limit.</p>	<p>This sign indicates that RF emissions may exceed at least 10x the FCC Occupational MPE limit.</p>
			

NOC INFORMATION	
<p>Information signs are used as a means to provide contact information for any questions or concerns. They will include specific cell site identification information and the Verizon Wireless Network Operations Center phone number.</p>	

**d. Physical Barriers**

Physical barriers are control measures that require awareness and participation of personnel. Physical barriers are employed as an additional administration control to complement RF signage and physically demarcate an area in which RF exposure levels may exceed the FCC General Population limit. **Example:** chain-connected stanchions

**e. Indicative Markers**

Indicative markers are visible control measures that require awareness and participation of personnel, as they cannot physically prevent someone from entering an area of potential concern. Indicative markers are employed as an additional administration control to complement RF signage and visually demarcate an area in which RF exposure levels may exceed the FCC General Population limit. **Example:** paint stripes

Date: **March 23, 2022**

Paul J Ford & Company  
250 East Broad Street, STE 600  
Columbus, Ohio  
614-221-6679

**Subject:** Structural Analysis Report

**Carrier Designation:** Verizon Wireless Co-Locate  
**Site Number:** 137514  
**Site Name:** ASHLAND\_MA

**Crown Castle Designation:** BU Number: 806042  
**Site Name:** BOS ASHLAND 959026  
**JDE Job Number:** 693324  
**Work Order Number:** 2094325  
**Order Number:** 593348 Rev. 1

**Engineering Firm Designation:** Paul J Ford & Company Project Number: 37522-0071.002.7805

**Site Data:** ALBERT RAY DRIVE FOUNTAIN AND GREEN STREETS,  
ASHLAND, Middlesex County, MA  
Latitude 42° 16' 25.3", Longitude -71° 27' 5.6"  
100 Foot - Monopole Tower

Paul J Ford & 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**

This analysis utilizes an ultimate 3-second gust wind speed of 127 mph as required by the 2015 International Building Code as amended by the Massachusetts State Building Code, Ninth Edition. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Respectfully submitted by:



Donna L. Campbell  
Structural Designer II  
[dcampbell@pauljford.com](mailto:dcampbell@pauljford.com)



03/24/2022



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## 1) INTRODUCTION

This tower is a 100 ft Monopole tower designed by ITT MEYER INC. and mapped by AERO Solutions in February of 2008.

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>	127 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)
102.0	104.0	2	raycap	RVZDC-6627-PF-48	2 6	1-5/8 7/8
		3	samsung telecommunications	RFV01U-D1A		
		3	samsung telecommunications	RFV01U-D2A		
	102.0	6	commscope	NHH-65B-R2B w/ Mount Pipe		
		3	css	X7C-680 w/ Mount Pipe		
		3	samsung telecommunications	MT6407-77A w/ Mount Pipe		
		1	tower mounts	Platform Mount (LP 101-1)		
		1	tower mounts	Side Arm Mount [SO 203-3]		

**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)
94.0	94.0	3	ericsson	ERICSSON AIR 21 B2A B4P	1	1/4
		3	ericsson	ERICSSON AIR 21 B4A B2P	2	1-5/8
		1	tower mounts	T-Arm Mount [TA 702-3]	6	7/8
84.0	87.0	3	cci antennas	DMP65R-BU6e w/ Mount Pipe	7 3 6	7/8 3/8 13/16
		3	ericsson	RRUS 32 B2		
		3	ericsson	RRUS 32 B30		
		3	ericsson	RRUS 32 B66		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14		
		3	kathrein	80010965 w/ Mount Pipe		
2	raycap	DC6-48-60-18-8F				

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
	86.0	1	raycap	DC9-48-60-24-8C-EV		
		3	ericsson	AIR 6419 B77G w/ Mount Pipe		
		3	ericsson	AIR 6449 N77 w/ Mount Pipe		
	84.0	2	tower mounts	T-Arm Mount [TA 602-3]		
74.0	74.0	3	fujitsu	TA08025-B604	1	1-3/8
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-21 w/ Mount Pipe		
		1	mounts	Commscope_MC-Pk8-DSH_Platform		
		1	raycap	RDIDC-9181-PF-48		

### 3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	1094280	CCISITES
4-TOWER FOUNDATION MAPPING	1094282	CCISITES
4-TOWER MAPPING	2210647	CCISITES
4-TOWER REINFORCEMENT DRAWINGS	1287595	CCISITES
4-POST-MODIFICATION INSPECTION	2033623	CCISITES
4-TOWER REINFORCEMENT DRAWINGS	2217666	CCISITES
4-POST-MODIFICATION INSPECTION	3672212	CCISITES
4-TOWER REINFORCEMENT DRAWINGS	3794055	CCISITES
4-POST-MODIFICATION INSPECTION	3817361	CCISITES

#### 3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

### 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 structure was modified in conformance with the referenced modification drawings as shown in the referenced post modification inspection.
- 4) The connection at 0'-0" has been analyzed with a finite element analysis, FEA, and found to be sufficient per the referenced CCI Doc ID#10224534. The reactions at this elevation for this analysis comparable to (within 1%) the reactions used in the FEA. Therefore, the flange is assumed to be sufficient for this analysis. See Appendix C for referenced FEA results.

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

### 4) ANALYSIS RESULTS

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

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
100 - 95	Pole	TP15.793x15x0.19	Pole	22.4%	Pass
95 - 90	Pole	TP16.587x15.793x0.19	Pole	37.3%	Pass
90 - 85.5	Pole	TP17.301x16.587x0.19	Pole	49.7%	Pass
85.5 - 85.25	Pole + Reinf.	TP17.34x17.301x0.6025	Reinf. 7 Tension Rupture	24.7%	Pass
85.25 - 80.25	Pole + Reinf.	TP18.134x17.34x0.5775	Reinf. 7 Tension Rupture	37.9%	Pass
80.25 - 75.25	Pole + Reinf.	TP18.927x18.134x0.5525	Reinf. 7 Tension Rupture	49.2%	Pass
75.25 - 70.25	Pole + Reinf.	TP19.72x18.927x0.54	Reinf. 7 Tension Rupture	61.9%	Pass
70.25 - 66.5	Pole + Reinf.	TP20.95x19.72x0.5213	Reinf. 7 Tension Rupture	71.1%	Pass
66.5 - 61.5	Pole + Reinf.	TP20.735x19.94x0.575	Reinf. 7 Tension Rupture	75.9%	Pass
61.5 - 56.5	Pole + Reinf.	TP21.529x20.735x0.5625	Reinf. 7 Tension Rupture	85.5%	Pass
56.5 - 54.75	Pole + Reinf.	TP21.807x21.529x0.5625	Reinf. 7 Tension Rupture	88.7%	Pass
54.75 - 54.5	Pole + Reinf.	TP21.847x21.807x0.7375	Reinf. 3 Tension Rupture	68.4%	Pass
54.5 - 49.5	Pole + Reinf.	TP22.642x21.847x0.7125	Reinf. 3 Tension Rupture	75.5%	Pass
49.5 - 44.5	Pole + Reinf.	TP23.437x22.642x0.6875	Reinf. 3 Tension Rupture	82.1%	Pass
44.5 - 39.5	Pole + Reinf.	TP24.231x23.437x0.675	Reinf. 3 Tension Rupture	88.3%	Pass
39.5 - 34.5	Pole + Reinf.	TP25.026x24.231x0.65	Reinf. 3 Tension Rupture	94.2%	Pass
34.5 - 33	Pole + Reinf.	TP25.9x25.026x0.65	Reinf. 3 Tension Rupture	95.8%	Pass
33 - 28	Pole + Reinf.	TP25.554x24.76x0.925	Reinf. 5 Tension Rupture	76.2%	Pass
28 - 23.5	Pole + Reinf.	TP26.268x25.554x0.9	Reinf. 5 Tension Rupture	80.0%	Pass
23.5 - 23.25	Pole + Reinf.	TP26.308x26.268x0.9	Reinf. 5 Tension Rupture	79.6%	Pass
23.25 - 22.75	Pole + Reinf.	TP26.388x26.308x0.9	Reinf. 5 Tension Rupture	80.0%	Pass
22.75 - 22.5	Pole + Reinf.	TP26.427x26.388x1.05	Reinf. 3 Tension Rupture	73.4%	Pass
22.5 - 17.5	Pole + Reinf.	TP27.221x26.427x1.025	Reinf. 3 Tension Rupture	77.1%	Pass
17.5 - 15.75	Pole + Reinf.	TP27.499x27.221x1	Reinf. 3 Tension Rupture	78.4%	Pass
15.75 - 15.5	Pole + Reinf.	TP27.539x27.499x1.075	Reinf. 6 Tension Rupture	68.5%	Pass

15.5 - 12.25	Pole + Reinf.	TP28.055x27.539x1.0625	Reinf. 6 Tension Rupture	70.6%	Pass
12.25 - 12	Pole + Reinf.	TP28.095x28.055x0.95	Reinf. 1 Tension Rupture	78.6%	Pass
12 - 11.75	Pole + Reinf.	TP28.134x28.095x0.95	Reinf. 1 Tension Rupture	78.8%	Pass
11.75 - 11.5	Pole + Reinf.	TP28.174x28.134x0.75	Reinf. 6 Tension Rupture	91.0%	Pass
11.5 - 6.5	Pole + Reinf.	TP28.968x28.174x0.7375	Reinf. 6 Tension Rupture	94.6%	Pass
6.5 - 6	Pole + Reinf.	TP29.047x28.968x0.7375	Reinf. 6 Tension Rupture	95.0%	Pass
6 - 5.75	Pole + Reinf.	TP29.087x29.047x0.75	Reinf. 10 Tension Rupture	88.0%	Pass
5.75 - 4.5	Pole + Reinf.	TP29.285x29.087x0.75	Reinf. 10 Tension Rupture	88.9%	Pass
4.5 - 4.25	Pole + Reinf.	TP29.325x29.285x0.8	Reinf. 8 Tension Yield	88.9%	Pass
4.25 - 3	Pole + Reinf.	TP29.524x29.325x0.8	Reinf. 8 Tension Yield	89.7%	Pass
3 - 2.75	Pole + Reinf.	TP29.563x29.524x0.8	Reinf. 9 Tension Yield	91.2%	Pass
2.75 - 1.75	Pole + Reinf.	TP29.722x29.563x0.8	Reinf. 9 Tension Yield	91.8%	Pass
1.75 - 1.5	Pole + Reinf.	TP29.762x29.722x0.775	Reinf. 9 Tension Yield	97.2%	Pass
1.5 - 1.25	Pole + Reinf.	TP29.802x29.762x0.775	Reinf. 9 Tension Yield	97.4%	Pass
1.25 - 1	Pole + Reinf.	TP29.841x29.802x0.8	Reinf. 4 Tension Yield	88.3%	Pass
1 - 0	Pole + Reinf.	TP30x29.841x0.8	Reinf. 4 Tension Yield	89.0%	Pass
				Summary	
			Pole	80.7%	Pass
			Reinforcement	97.4%	Pass
			Overall	97.4%	Pass

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	83.5	Pass
1,2	Base Plate	0	Sufficient	
1	Base Foundation (Structure)	0	76.2	Pass
1	Base Foundation (Soil Interaction)	0	78.4	Pass

<b>Structure Rating (max from all components) =</b>	<b>97.4%</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.
- 2) The adequacy of the base plate was determined utilizing commercial FEA software

**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**



## 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 base elevation above sea level: 325.0000 ft.
- 2) Basic wind speed of 127 mph.
- 3) Risk Category II.
- 4) Exposure Category C.
- 5) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- 6) Topographic Category: 1.
- 7) Crest Height: 0.0000 ft.
- 8) Nominal ice thickness of 1.50 in.
- 9) Ice thickness is considered to increase with height.
- 10) Ice density of 56.00 pcf.
- 11) A wind speed of 50 mph is used in combination with ice.
- 12) Temperature drop of 50 °F.
- 13) Deflections calculated using a wind speed of 60 mph.
- 14) TIA-222-H ANNEX S.
- 15) A non-linear (P-delta) analysis was used.
- 16) Pressures are calculated at each section.
- 17) Stress ratio used in pole design is 1.
- 18) Tower analysis based on target reliabilities in accordance with Annex S.
- 19) Load Modification Factors used:  $K_{es}(F_w) = 0.95$ ,  $K_{es}(t_i) = 0.85$ .
- 20) Maximum demand-capacity ratio is: 1.05.
- 21) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile  Include Bolts In Member Capacity  Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt.  Autocalc Torque Arm Areas  Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption  <div style="text-align: center; background-color: #e0e0e0; padding: 2px;"><b>Poles</b></div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
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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	100.0000-95.0000	5.0000	0.00	12	15.00	15.79	0.19	0.76	A572-65 (65 ksi)
L2	95.0000-90.0000	5.0000	0.00	12	15.79	16.59	0.19	0.76	A572-65 (65 ksi)
L3	90.0000-85.5000	4.5000	0.00	12	16.59	17.30	0.19	0.76	A572-65 (65 ksi)
L4	85.5000-85.2500	0.2500	0.00	12	17.30	17.34	0.60	2.41	A572-65 (65 ksi)
L5	85.2500-80.2500	5.0000	0.00	12	17.34	18.13	0.58	2.31	A572-65 (65 ksi)
L6	80.2500-75.2500	5.0000	0.00	12	18.13	18.93	0.55	2.21	A572-65 (65 ksi)
L7	75.2500-70.2500	5.0000	0.00	12	18.93	19.72	0.54	2.16	A572-65 (65 ksi)
L8	70.2500-62.5000	7.7500	4.00	12	19.72	20.95	0.52	2.09	A572-65 (65 ksi)
L9	62.5000-61.5000	5.0000	0.00	12	19.94	20.73	0.57	2.30	A572-65 (65 ksi)
L10	61.5000-56.5000	5.0000	0.00	12	20.73	21.53	0.56	2.25	A572-65 (65 ksi)
L11	56.5000-54.7500	1.7500	0.00	12	21.53	21.81	0.56	2.25	A572-65 (65 ksi)
L12	54.7500-54.5000	0.2500	0.00	12	21.81	21.85	0.74	2.95	A572-65 (65 ksi)
L13	54.5000-49.5000	5.0000	0.00	12	21.85	22.64	0.71	2.85	A572-65 (65 ksi)
L14	49.5000-44.5000	5.0000	0.00	12	22.64	23.44	0.69	2.75	A572-65 (65 ksi)
L15	44.5000-39.5000	5.0000	0.00	12	23.44	24.23	0.68	2.70	A572-65 (65 ksi)
L16	39.5000-34.5000	5.0000	0.00	12	24.23	25.03	0.65	2.60	A572-65 (65 ksi)
L17	34.5000-29.0000	5.5000	4.00	12	25.03	25.90	0.65	2.60	A572-65 (65 ksi)
L18	29.0000-28.0000	5.0000	0.00	12	24.76	25.55	0.93	3.70	A572-65 (65 ksi)
L19	28.0000-23.5000	4.5000	0.00	12	25.55	26.27	0.90	3.60	A572-65 (65 ksi)
L20	23.5000-23.2500	0.2500	0.00	12	26.27	26.31	0.90	3.60	A572-65 (65 ksi)
L21	23.2500-22.7500	0.5000	0.00	12	26.31	26.39	0.90	3.60	A572-65 (65 ksi)
L22	22.7500-22.5000	0.2500	0.00	12	26.39	26.43	1.05	4.20	A572-65 (65 ksi)
L23	22.5000-17.5000	5.0000	0.00	12	26.43	27.22	1.02	4.10	A572-65 (65 ksi)
L24	17.5000-15.7500	1.7500	0.00	12	27.22	27.50	1.00	4.00	A572-65 (65 ksi)
L25	15.7500-15.5000	0.2500	0.00	12	27.50	27.54	1.08	4.30	A572-65 (65 ksi)
L26	15.5000-12.2500	3.2500	0.00	12	27.54	28.05	1.06	4.25	A572-65 (65 ksi)
L27	12.2500-12.0000	0.2500	0.00	12	28.05	28.09	0.95	3.80	A572-65 (65 ksi)
L28	12.0000-11.7500	0.2500	0.00	12	28.09	28.13	0.95	3.80	A572-65 (65 ksi)
L29	11.7500-11.5000	0.2500	0.00	12	28.13	28.17	0.75	3.00	A572-65 (65 ksi)
L30	11.5000-6.5000	5.0000	0.00	12	28.17	28.97	0.74	2.95	A572-65 (65 ksi)
L31	6.5000-6.0000	0.5000	0.00	12	28.97	29.05	0.74	2.95	A572-65 (65 ksi)
L32	6.0000-5.7500	0.2500	0.00	12	29.05	29.09	0.75	3.00	A572-65 (65 ksi)
L33	5.7500-4.5000	1.2500	0.00	12	29.09	29.29	0.75	3.00	A572-65 (65 ksi)
L34	4.5000-4.2500	0.2500	0.00	12	29.29	29.33	0.80	3.20	A572-65 (65 ksi)
L35	4.2500-3.0000	1.2500	0.00	12	29.33	29.52	0.80	3.20	A572-65

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L36	3.0000-2.7500	0.2500	0.00	12	29.52	29.56	0.80	3.20	(65 ksi) A572-65
L37	2.7500-1.7500	1.0000	0.00	12	29.56	29.72	0.80	3.20	(65 ksi) A572-65
L38	1.7500-1.5000	0.2500	0.00	12	29.72	29.76	0.78	3.10	(65 ksi) A572-65
L39	1.5000-1.2500	0.2500	0.00	12	29.76	29.80	0.78	3.10	(65 ksi) A572-65
L40	1.2500-1.0000	0.2500	0.00	12	29.80	29.84	0.80	3.20	(65 ksi) A572-65
L41	1.0000-0.0000	1.0000		12	29.84	30.00	0.80	3.20	(65 ksi) A572-65

### 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	15.46	9.06	253.67	5.30	7.77	32.65	513.99	4.46	3.51	18.478
	16.28	9.55	296.65	5.59	8.18	36.26	601.10	4.70	3.72	19.597
L2	16.28	9.55	296.65	5.59	8.18	36.26	601.10	4.70	3.72	19.597
	17.10	10.03	344.24	5.87	8.59	40.07	697.52	4.94	3.94	20.716
L3	17.10	10.03	344.24	5.87	8.59	40.07	697.52	4.94	3.94	20.716
	17.84	10.47	391.20	6.13	8.96	43.65	792.67	5.15	4.13	21.723
L4	17.70	32.40	1152.94	5.98	8.96	128.65	2336.16	15.94	3.02	5.016
	17.74	32.47	1161.17	5.99	8.98	129.27	2352.85	15.98	3.03	5.033
L5	17.75	31.17	1117.99	6.00	8.98	124.47	2265.34	15.34	3.10	5.367
	18.57	32.65	1284.35	6.29	9.39	136.73	2602.44	16.07	3.31	5.735
L6	18.58	31.28	1234.01	6.29	9.39	131.37	2500.43	15.39	3.38	6.116
	19.40	32.69	1408.71	6.58	9.80	143.68	2854.42	16.09	3.59	6.501
L7	19.40	31.97	1379.65	6.58	9.80	140.72	2795.54	15.74	3.63	6.713
	20.23	33.35	1566.04	6.87	10.22	153.31	3173.23	16.41	3.84	7.107
L8	20.23	32.22	1516.11	6.87	10.22	148.42	3072.04	15.86	3.89	7.459
	21.51	34.29	1826.47	7.31	10.85	168.31	3700.93	16.88	4.22	8.091
L9	21.10	35.85	1716.18	6.93	10.33	166.15	3477.44	17.65	3.80	6.614
	21.26	37.33	1936.24	7.22	10.74	180.27	3923.35	18.37	4.02	6.984
L10	21.27	36.54	1897.68	7.22	10.74	176.68	3845.21	17.98	4.05	7.199
	22.09	37.98	2130.90	7.51	11.15	191.07	4317.78	18.69	4.26	7.578
L11	22.09	37.98	2130.90	7.51	11.15	191.07	4317.78	18.69	4.26	7.578
	22.38	38.48	2216.83	7.61	11.30	196.24	4491.90	18.94	4.34	7.71
L12	22.32	50.04	2835.28	7.54	11.30	250.99	5745.04	24.63	3.87	5.245
	22.36	50.13	2851.35	7.56	11.32	251.96	5777.60	24.67	3.88	5.259
L13	22.37	48.49	2764.49	7.57	11.32	244.28	5601.61	23.86	3.95	5.538
	23.19	50.31	3088.20	7.85	11.73	263.31	6257.52	24.76	4.16	5.837
L14	23.20	48.60	2990.04	7.86	11.73	254.94	6058.64	23.92	4.23	6.146
	24.02	50.36	3326.62	8.14	12.14	274.02	6740.64	24.79	4.44	6.456
L15	24.03	49.47	3271.52	8.15	12.14	269.48	6628.99	24.35	4.47	6.625
	24.85	51.20	3626.28	8.43	12.55	288.91	7347.83	25.20	4.68	6.941
L16	24.86	49.36	3503.10	8.44	12.55	279.09	7098.24	24.29	4.75	7.311
	25.68	51.02	3869.33	8.73	12.96	298.48	7840.30	25.11	4.96	7.638
L17	25.68	51.02	3869.33	8.73	12.96	298.48	7840.30	25.11	4.96	7.638
	26.58	52.85	4300.70	9.04	13.42	320.56	8714.39	26.01	5.20	7.999
L18	25.96	70.99	5147.89	8.53	12.83	401.37	10431.02	34.94	4.16	4.494
	26.13	73.36	5679.64	8.82	13.24	429.07	11508.49	36.10	4.37	4.724
L19	26.14	71.45	5542.98	8.83	13.24	418.75	11231.58	35.16	4.44	4.929
	26.88	73.52	6039.04	9.08	13.61	443.82	12236.73	36.18	4.63	5.142
L20	26.88	73.52	6039.04	9.08	13.61	443.82	12236.73	36.18	4.63	5.142
	26.92	73.63	6067.43	9.10	13.63	445.23	12294.27	36.24	4.64	5.154
L21	26.92	73.63	6067.43	9.10	13.63	445.23	12294.27	36.24	4.64	5.154
	27.00	73.86	6124.49	9.12	13.67	448.06	12409.88	36.35	4.66	5.178
L22	26.95	85.67	7019.83	9.07	13.67	513.57	14224.07	42.16	4.26	4.055
	26.99	85.80	7052.87	9.09	13.69	515.21	14291.03	42.23	4.27	4.065
L23	27.00	83.84	6905.31	9.09	13.69	504.43	13992.04	41.26	4.34	4.23
	27.82	86.46	7573.23	9.38	14.10	537.09	15345.42	42.55	4.55	4.437
L24	27.83	84.43	7409.69	9.39	14.10	525.49	15014.04	41.56	4.62	4.615

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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
	28.12	85.33	7647.77	9.49	14.24	536.89	15496.45	42.00	4.69	4.69
L25	28.09	91.47	8151.74	9.46	14.24	572.27	16517.64	45.02	4.49	4.176
	28.13	91.60	8188.54	9.47	14.27	574.03	16592.20	45.08	4.50	4.185
L26	28.14	90.58	8104.80	9.48	14.27	568.16	16422.51	44.58	4.53	4.266
	28.67	92.35	8588.01	9.66	14.53	590.96	17401.65	45.45	4.67	4.396
L27	28.71	82.91	7775.11	9.70	14.53	535.02	15754.47	40.81	4.97	5.234
	28.75	83.04	7809.32	9.72	14.55	536.61	15823.80	40.87	4.98	5.246
L28	28.75	83.04	7809.32	9.72	14.55	536.61	15823.80	40.87	4.98	5.246
	28.79	83.16	7843.63	9.73	14.57	538.21	15893.32	40.93	4.99	5.257
L29	28.86	66.13	6330.02	9.80	14.57	434.35	12826.34	32.55	5.53	7.373
	28.90	66.23	6357.59	9.82	14.59	435.63	12882.20	32.60	5.54	7.387
L30	28.91	65.15	6260.18	9.82	14.59	428.95	12684.83	32.07	5.57	7.558
	29.73	67.04	6819.52	10.11	15.01	454.47	13818.20	33.00	5.79	7.847
L31	29.73	67.04	6819.52	10.11	15.01	454.47	13818.20	33.00	5.79	7.847
	29.81	67.23	6877.22	10.13	15.05	457.06	13935.12	33.09	5.81	7.875
L32	29.81	68.34	6984.52	10.13	15.05	464.20	14152.54	33.63	5.77	7.7
	29.85	68.43	7013.96	10.14	15.07	465.52	14212.19	33.68	5.79	7.714
L33	29.85	68.43	7013.96	10.14	15.07	465.52	14212.19	33.68	5.79	7.714
	30.05	68.91	7162.38	10.22	15.17	472.15	14512.93	33.92	5.84	7.785
L34	30.04	73.38	7599.78	10.20	15.17	500.98	15399.22	36.11	5.70	7.131
	30.08	73.48	7631.60	10.21	15.19	502.40	15463.69	36.17	5.72	7.144
L35	30.08	73.48	7631.60	10.21	15.19	502.40	15463.69	36.17	5.72	7.144
	30.28	73.99	7792.02	10.28	15.29	509.51	15788.74	36.42	5.77	7.21
L36	30.28	73.99	7792.02	10.28	15.29	509.51	15788.74	36.42	5.77	7.21
	30.32	74.09	7824.37	10.30	15.31	510.94	15854.30	36.47	5.78	7.224
L37	30.32	74.09	7824.37	10.30	15.31	510.94	15854.30	36.47	5.78	7.224
	30.49	74.50	7954.67	10.35	15.40	516.67	16118.32	36.67	5.82	7.277
L38	30.50	72.24	7726.09	10.36	15.40	501.82	15655.15	35.55	5.89	7.598
	30.54	72.34	7757.92	10.38	15.42	503.22	15719.64	35.60	5.90	7.612
L39	30.54	72.34	7757.92	10.38	15.42	503.22	15719.64	35.60	5.90	7.612
	30.58	72.44	7789.83	10.39	15.44	504.61	15784.32	35.65	5.91	7.626
L40	30.57	74.71	8020.36	10.38	15.44	519.55	16251.42	36.77	5.84	7.304
	30.61	74.81	8053.34	10.40	15.46	520.99	16318.25	36.82	5.85	7.317
L41	30.61	74.81	8053.34	10.40	15.46	520.99	16318.25	36.82	5.85	7.317
	30.78	75.22	8186.16	10.45	15.54	526.78	16587.38	37.02	5.90	7.37

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontal	Double Angle Stitch Bolt Spacing Redundants
ft	ft <sup>2</sup>	in					in	in	in
L1 100.0000-95.0000				1	1	1			
L2 95.0000-90.0000				1	1	1			
L3 90.0000-85.5000				1	1	1			
L4 85.5000-85.2500				1	1	0.845857			
L5 85.2500-80.2500				1	1	0.856207			
L6 80.2500-75.2500				1	1	0.86994			
L7 75.2500-70.2500				1	1	0.867235			
L8 70.2500-62.5000				1	1	0.88153			
L9 62.5000-61.5000				1	1	0.896555			
L10 61.5000-56.5000				1	1	0.898041			
L11 56.5000-54.7500				1	1	0.892103			
L12 54.7500-54.5000				1	1	0.854418			
L13 54.5000-49.5000				1	1	0.864055			
L14 49.5000-44.5000				1	1	0.875913			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_r$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft <sup>2</sup>	in							
L15 44.5000-39.5000				1	1	0.874059			
L16 39.5000-34.5000				1	1	0.889694			
L17 34.5000-29.0000				1	1	0.884802			
L18 29.0000-28.0000				1	1	0.855953			
L19 28.0000-23.5000				1	1	0.861908			
L20 23.5000-23.2500				1	1	1.0242			
L21 23.2500-22.7500				1	1	1.02187			
L22 22.7500-22.5000				1	1	0.974904			
L23 22.5000-17.5000				1	1	0.974853			
L24 17.5000-15.7500				1	1	0.990425			
L25 15.7500-15.5000				1	1	1.0155			
L26 15.5000-12.2500				1	1	1.01183			
L27 12.2500-12.0000				1	1	1.05755			
L28 12.0000-11.7500				1	1	1.05639			
L29 11.7500-11.5000				1	1	1.1988			
L30 11.5000-6.5000				1	1	1.19383			
L31 6.5000-6.0000				1	1	1.19143			
L32 6.0000-5.7500				1	1	1.26512			
L33 5.7500-4.5000				1	1	1.25864			
L34 4.5000-4.2500				1	1	1.18015			
L35 4.2500-3.0000				1	1	1.17416			
L36 3.0000-2.7500				1	1	1.13918			
L37 2.7500-1.7500				1	1	1.13464			
L38 1.7500-1.5000				1	1	1.05524			
L39 1.5000-1.2500				1	1	1.05424			
L40 1.2500-1.0000				1	1	0.954982			
L41 1.0000-0.0000				1	1	0.951488			

**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 r in	Weight plf
*****										

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	B	No	Surface Ar (CaAa)	94.0000 - 0.0000	2	2	-0.420 -0.400	1.63		1.07
FXL 780 PE(7/8)	B	No	Surface Ar (CaAa)	94.0000 - 0.0000	4	4	-0.380 -0.350	1.09		0.25
FXL 780 PE(7/8)	B	No	Surface Ar (CaAa)	94.0000 - 0.0000	2	2	-0.320 -0.300	1.09		0.25
LDF1-50A(1/4)	B	No	Surface Ar (CaAa)	94.0000 - 0.0000	1	1	-0.330 -0.330	0.34		0.06
*****										
CR 50 1070(7/8)	B	No	Surface Ar (CaAa)	84.0000 - 0.0000	6	6	0.450 0.470	0.00		0.28
FB-L98B-034-XXX(3/8)	C	No	Surface Ar (CaAa)	84.0000 - 0.0000	2	1	-0.400 -0.390	0.00		0.06
*****										
CU12PSM9P8XXX(1-3/8)	A	No	Surface Ar (CaAa)	74.0000 - 0.0000	1	1	-0.009 0.009	1.41		1.66
*****										
MP3-06	B	No	Surface Af (CaAa)	58.0000 - 1.7500	1	1	-0.226 -0.226	6.89	19.00	0.00
MP3-06	A	No	Surface Af (CaAa)	58.0000 - 1.7500	1	1	-0.226 -0.226	6.89	19.00	0.00
MP3-06	C	No	Surface Af (CaAa)	19.0000 - 1.7500	1	1	0.024 0.024	6.89	19.00	0.00
MP3-06	C	No	Surface Af (CaAa)	58.0000 - 8.5000	1	1	-0.226 -0.226	6.89	19.00	0.00
MP3-05	A	No	Surface Af (CaAa)	35.0000 - 10.0000	1	1	0.274 0.274	5.33	14.84	0.00
MP3-05	C	No	Surface Af (CaAa)	32.0000 - 2.2500	1	1	0.274 0.274	5.33	14.84	0.00
MP3-05	B	No	Surface Af (CaAa)	32.0000 - 2.2500	1	1	0.274 0.274	5.33	14.84	0.00
MP3-05	B	No	Surface Af (CaAa)	88.0000 - 58.0000	1	1	-0.226 -0.226	5.33	14.84	0.00
MP3-05	A	No	Surface Af (CaAa)	88.0000 - 58.0000	1	1	-0.226 -0.226	5.33	14.84	0.00
MP3-05	C	No	Surface Af (CaAa)	88.0000 - 58.0000	1	1	-0.226 -0.226	5.33	14.84	0.00
CCI-065125	B	No	Surface Af (CaAa)	25.5000 - 0.5000	1	1	-0.476 -0.476	6.50	15.50	0.00
CCI-060100	A	No	Surface Af (CaAa)	25.5000 - 4.0000	1	1	-0.476 -0.476	6.00	14.00	0.00
CCI-060100	B	No	Surface Af (CaAa)	25.5000 - 4.0000	1	1	0.024 0.024	6.00	14.00	0.00
***										
Stacked Plate	B	No	Surface Af (CaAa)	71.5000 - 1.5000	1	1	-0.476 -0.476	6.00	17.00	0.00
Stacked Plate	A	No	Surface Af (CaAa)	71.5000 - 1.5000	1	1	-0.476 -0.476	6.00	17.00	0.00
Stacked Plate	B	No	Surface Af (CaAa)	71.5000 - 1.5000	1	1	0.274 0.274	6.00	17.00	0.00
5 x 1.25	B	No	Surface Af (CaAa)	81.5000 - 71.5000	1	1	-0.476 -0.476	5.00	12.50	0.00
5 x 1.25	A	No	Surface Af (CaAa)	81.5000 - 71.5000	1	1	-0.476 -0.476	5.00	12.50	0.00
5 x 1.25	B	No	Surface Af (CaAa)	81.5000 - 71.5000	1	1	0.274 0.274	5.00	12.50	0.00

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

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C <sub>AA</sub>			Weight plf
							No Ice	1/2" Ice	1" Ice	
LDF5-50A(7/8)	C	No	No	Inside Pole	100.0000 - 0.0000	6	No Ice	0.0000	0.33	
							1/2" Ice	0.0000	0.33	
							1" Ice	0.0000	0.33	
							2" Ice	0.0000	0.33	
HB158-1-08U8-S8J18(1-5/8)	C	No	No	Inside Pole	100.0000 - 0.0000	1	No Ice	0.0000	1.30	
							1/2" Ice	0.0000	1.30	
							1" Ice	0.0000	1.30	
							2" Ice	0.0000	1.30	
HB158-1-08U8-S8J18(1-5/8)	C	No	No	Inside Pole	100.0000 - 0.0000	1	No Ice	0.0000	1.30	
							1/2" Ice	0.0000	1.30	
							1" Ice	0.0000	1.30	
							2" Ice	0.0000	1.30	
FB-L98B-235-XXX(3/8)	C	No	No	Inside Pole	84.0000 - 0.0000	1	No Ice	0.0000	0.06	
							1/2" Ice	0.0000	0.06	
							1" Ice	0.0000	0.06	
							2" Ice	0.0000	0.06	
PWRT-606-S(7/8)	C	No	No	Inside Pole	84.0000 - 0.0000	1	No Ice	0.0000	0.89	
							1/2" Ice	0.0000	0.89	
							1" Ice	0.0000	0.89	
							2" Ice	0.0000	0.89	
PWRT-608-S(13/16)	C	No	No	Inside Pole	84.0000 - 0.0000	6	No Ice	0.0000	0.62	
							1/2" Ice	0.0000	0.62	
							1" Ice	0.0000	0.62	
							2" Ice	0.0000	0.62	

### Feed Line/Linear Appurtenances Section Areas

Tower Section n	Tower Elevation ft	Face	A <sub>R</sub>	A <sub>F</sub>	C <sub>AA</sub> In Face	C <sub>AA</sub> Out Face	Weight
			ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	K
L1	100.0000-95.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.02
L2	95.0000-90.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	4.054	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.02
L3	90.0000-85.5000	A	0.000	0.000	2.221	0.000	0.00
		B	0.000	0.000	6.782	0.000	0.02
		C	0.000	0.000	2.221	0.000	0.02
L4	85.5000-85.2500	A	0.000	0.000	0.222	0.000	0.00
		B	0.000	0.000	0.475	0.000	0.00
		C	0.000	0.000	0.222	0.000	0.00
L5	85.2500-80.2500	A	0.000	0.000	5.454	0.000	0.00
		B	0.000	0.000	11.533	0.000	0.02
		C	0.000	0.000	4.442	0.000	0.04
L6	80.2500-75.2500	A	0.000	0.000	8.489	0.000	0.00
		B	0.000	0.000	17.604	0.000	0.03
		C	0.000	0.000	4.442	0.000	0.05
L7	75.2500-70.2500	A	0.000	0.000	9.256	0.000	0.01
		B	0.000	0.000	18.080	0.000	0.03
		C	0.000	0.000	4.442	0.000	0.05
L8	70.2500-62.5000	A	0.000	0.000	15.728	0.000	0.01
		B	0.000	0.000	30.239	0.000	0.04
		C	0.000	0.000	6.885	0.000	0.07
L9	62.5000-61.5000	A	0.000	0.000	2.029	0.000	0.00
		B	0.000	0.000	3.902	0.000	0.01
		C	0.000	0.000	0.888	0.000	0.01
L10	61.5000-56.5000	A	0.000	0.000	10.537	0.000	0.01
		B	0.000	0.000	19.899	0.000	0.03
		C	0.000	0.000	4.832	0.000	0.05
L11	56.5000-54.7500	A	0.000	0.000	4.007	0.000	0.00
		B	0.000	0.000	7.283	0.000	0.01

Tower Section	Tower Elevation	Face	A <sub>R</sub>	A <sub>F</sub>	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face	Weight
n	ft		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	K
L12	54.7500-54.5000	C	0.000	0.000	2.010	0.000	0.02
		A	0.000	0.000	0.572	0.000	0.00
		B	0.000	0.000	1.040	0.000	0.00
L13	54.5000-49.5000	C	0.000	0.000	0.287	0.000	0.00
		A	0.000	0.000	11.447	0.000	0.01
		B	0.000	0.000	20.809	0.000	0.03
		C	0.000	0.000	5.742	0.000	0.05
L14	49.5000-44.5000	A	0.000	0.000	11.447	0.000	0.01
		B	0.000	0.000	20.809	0.000	0.03
		C	0.000	0.000	5.742	0.000	0.05
L15	44.5000-39.5000	A	0.000	0.000	11.447	0.000	0.01
		B	0.000	0.000	20.809	0.000	0.03
		C	0.000	0.000	5.742	0.000	0.05
L16	39.5000-34.5000	A	0.000	0.000	11.891	0.000	0.01
		B	0.000	0.000	20.809	0.000	0.03
		C	0.000	0.000	5.742	0.000	0.05
L17	34.5000-29.0000	A	0.000	0.000	17.478	0.000	0.01
		B	0.000	0.000	25.555	0.000	0.03
		C	0.000	0.000	8.981	0.000	0.05
L18	29.0000-28.0000	A	0.000	0.000	3.178	0.000	0.00
		B	0.000	0.000	5.050	0.000	0.01
		C	0.000	0.000	2.037	0.000	0.01
L19	28.0000-23.5000	A	0.000	0.000	16.300	0.000	0.01
		B	0.000	0.000	26.892	0.000	0.02
		C	0.000	0.000	9.165	0.000	0.04
L20	23.5000-23.2500	A	0.000	0.000	1.044	0.000	0.00
		B	0.000	0.000	1.783	0.000	0.00
		C	0.000	0.000	0.509	0.000	0.00
L21	23.2500-22.7500	A	0.000	0.000	2.089	0.000	0.00
		B	0.000	0.000	3.567	0.000	0.00
		C	0.000	0.000	1.018	0.000	0.00
L22	22.7500-22.5000	A	0.000	0.000	1.044	0.000	0.00
		B	0.000	0.000	1.783	0.000	0.00
		C	0.000	0.000	0.509	0.000	0.00
L23	22.5000-17.5000	A	0.000	0.000	20.889	0.000	0.01
		B	0.000	0.000	35.667	0.000	0.03
		C	0.000	0.000	11.906	0.000	0.05
L24	17.5000-15.7500	A	0.000	0.000	7.311	0.000	0.00
		B	0.000	0.000	12.484	0.000	0.01
		C	0.000	0.000	5.574	0.000	0.02
L25	15.7500-15.5000	A	0.000	0.000	1.044	0.000	0.00
		B	0.000	0.000	1.783	0.000	0.00
		C	0.000	0.000	0.796	0.000	0.00
L26	15.5000-12.2500	A	0.000	0.000	13.578	0.000	0.01
		B	0.000	0.000	23.184	0.000	0.02
		C	0.000	0.000	10.351	0.000	0.03
L27	12.2500-12.0000	A	0.000	0.000	1.044	0.000	0.00
		B	0.000	0.000	1.783	0.000	0.00
		C	0.000	0.000	0.796	0.000	0.00
L28	12.0000-11.7500	A	0.000	0.000	1.044	0.000	0.00
		B	0.000	0.000	1.783	0.000	0.00
		C	0.000	0.000	0.796	0.000	0.00
L29	11.7500-11.5000	A	0.000	0.000	1.044	0.000	0.00
		B	0.000	0.000	1.783	0.000	0.00
		C	0.000	0.000	0.796	0.000	0.00
L30	11.5000-6.5000	A	0.000	0.000	17.780	0.000	0.01
		B	0.000	0.000	35.667	0.000	0.03
		C	0.000	0.000	13.628	0.000	0.05
L31	6.5000-6.0000	A	0.000	0.000	1.645	0.000	0.00
		B	0.000	0.000	3.567	0.000	0.00
		C	0.000	0.000	1.018	0.000	0.00
L32	6.0000-5.7500	A	0.000	0.000	0.822	0.000	0.00
		B	0.000	0.000	1.783	0.000	0.00
		C	0.000	0.000	0.509	0.000	0.00
L33	5.7500-4.5000	A	0.000	0.000	4.112	0.000	0.00
		B	0.000	0.000	8.917	0.000	0.01
		C	0.000	0.000	2.546	0.000	0.01
L34	4.5000-4.2500	A	0.000	0.000	0.822	0.000	0.00
		B	0.000	0.000	1.783	0.000	0.00

Tower Section n	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>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
L35	4.2500-3.0000	C	0.000	0.000	0.509	0.000	0.00
		A	0.000	0.000	3.112	0.000	0.00
		B	0.000	0.000	7.917	0.000	0.01
L36	3.0000-2.7500	C	0.000	0.000	2.546	0.000	0.01
		A	0.000	0.000	0.572	0.000	0.00
		B	0.000	0.000	1.533	0.000	0.00
L37	2.7500-1.7500	C	0.000	0.000	0.509	0.000	0.00
		A	0.000	0.000	2.289	0.000	0.00
		B	0.000	0.000	5.689	0.000	0.01
L38	1.7500-1.5000	C	0.000	0.000	1.593	0.000	0.01
		A	0.000	0.000	0.285	0.000	0.00
		B	0.000	0.000	1.024	0.000	0.00
L39	1.5000-1.2500	C	0.000	0.000	0.000	0.000	0.00
		A	0.000	0.000	0.035	0.000	0.00
		B	0.000	0.000	0.524	0.000	0.00
L40	1.2500-1.0000	C	0.000	0.000	0.000	0.000	0.00
		A	0.000	0.000	0.035	0.000	0.00
		B	0.000	0.000	0.524	0.000	0.00
L41	1.0000-0.0000	C	0.000	0.000	0.000	0.000	0.00
		A	0.000	0.000	0.141	0.000	0.00
		B	0.000	0.000	1.555	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.01

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

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L1	100.0000-95.0000	A	1.421	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.02
L2	95.0000-90.0000	A	1.413	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	10.404	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.02
L3	90.0000-85.5000	A	1.406	0.000	0.000	2.924	0.000	0.03
		B		0.000	0.000	14.596	0.000	0.15
		C		0.000	0.000	2.924	0.000	0.05
L4	85.5000-85.2500	A	1.402	0.000	0.000	0.292	0.000	0.00
		B		0.000	0.000	0.940	0.000	0.01
		C		0.000	0.000	0.292	0.000	0.00
L5	85.2500-80.2500	A	1.398	0.000	0.000	7.036	0.000	0.07
		B		0.000	0.000	22.474	0.000	0.23
		C		0.000	0.000	6.888	0.000	0.11
L6	80.2500-75.2500	A	1.389	0.000	0.000	10.613	0.000	0.10
		B		0.000	0.000	30.021	0.000	0.31
		C		0.000	0.000	7.220	0.000	0.12
L7	75.2500-70.2500	A	1.380	0.000	0.000	12.564	0.000	0.13
		B		0.000	0.000	30.748	0.000	0.31
		C		0.000	0.000	7.201	0.000	0.12
L8	70.2500-62.5000	A	1.367	0.000	0.000	22.086	0.000	0.22
		B		0.000	0.000	51.209	0.000	0.50
		C		0.000	0.000	11.123	0.000	0.19
L9	62.5000-61.5000	A	1.358	0.000	0.000	2.850	0.000	0.03
		B		0.000	0.000	6.608	0.000	0.06
		C		0.000	0.000	1.435	0.000	0.02
L10	61.5000-56.5000	A	1.351	0.000	0.000	14.591	0.000	0.14
		B		0.000	0.000	33.284	0.000	0.32
		C		0.000	0.000	7.534	0.000	0.12
L11	56.5000-54.7500	A	1.343	0.000	0.000	5.417	0.000	0.05
		B		0.000	0.000	11.943	0.000	0.12
		C		0.000	0.000	2.950	0.000	0.05
L12	54.7500-54.5000	A	1.341	0.000	0.000	0.773	0.000	0.01
		B		0.000	0.000	1.705	0.000	0.02
		C		0.000	0.000	0.421	0.000	0.01
L13	54.5000-49.5000	A	1.334	0.000	0.000	15.450	0.000	0.15
		B		0.000	0.000	34.041	0.000	0.33

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
L14	49.5000-44.5000	C		0.000	0.000	8.410	0.000	0.13
		A	1.321	0.000	0.000	15.410	0.000	0.15
		B		0.000	0.000	33.921	0.000	0.32
L15	44.5000-39.5000	C		0.000	0.000	8.383	0.000	0.13
		A	1.306	0.000	0.000	15.365	0.000	0.15
		B		0.000	0.000	33.788	0.000	0.32
L16	39.5000-34.5000	C		0.000	0.000	8.354	0.000	0.13
		A	1.290	0.000	0.000	15.889	0.000	0.15
		B		0.000	0.000	33.640	0.000	0.31
L17	34.5000-29.0000	C		0.000	0.000	8.321	0.000	0.13
		A	1.270	0.000	0.000	23.066	0.000	0.21
		B		0.000	0.000	40.236	0.000	0.37
L18	29.0000-28.0000	C		0.000	0.000	12.537	0.000	0.17
		A	1.256	0.000	0.000	4.194	0.000	0.04
		B		0.000	0.000	7.835	0.000	0.07
L19	28.0000-23.5000	C		0.000	0.000	2.799	0.000	0.03
		A	1.244	0.000	0.000	21.275	0.000	0.19
		B		0.000	0.000	40.182	0.000	0.35
L20	23.5000-23.2500	C		0.000	0.000	12.523	0.000	0.15
		A	1.232	0.000	0.000	1.352	0.000	0.01
		B		0.000	0.000	2.584	0.000	0.02
L21	23.2500-22.7500	C		0.000	0.000	0.694	0.000	0.01
		A	1.230	0.000	0.000	2.704	0.000	0.02
		B		0.000	0.000	5.165	0.000	0.04
L22	22.7500-22.5000	C		0.000	0.000	1.387	0.000	0.02
		A	1.228	0.000	0.000	1.351	0.000	0.01
		B		0.000	0.000	2.581	0.000	0.02
L23	22.5000-17.5000	C		0.000	0.000	0.693	0.000	0.01
		A	1.213	0.000	0.000	26.952	0.000	0.22
		B		0.000	0.000	51.443	0.000	0.43
L24	17.5000-15.7500	C		0.000	0.000	15.832	0.000	0.18
		A	1.191	0.000	0.000	9.394	0.000	0.08
		B		0.000	0.000	17.912	0.000	0.15
L25	15.7500-15.5000	C		0.000	0.000	7.156	0.000	0.08
		A	1.183	0.000	0.000	1.340	0.000	0.01
		B		0.000	0.000	2.554	0.000	0.02
L26	15.5000-12.2500	C		0.000	0.000	1.021	0.000	0.01
		A	1.169	0.000	0.000	17.377	0.000	0.14
		B		0.000	0.000	33.099	0.000	0.27
L27	12.2500-12.0000	C		0.000	0.000	13.241	0.000	0.14
		A	1.154	0.000	0.000	1.333	0.000	0.01
		B		0.000	0.000	2.537	0.000	0.02
L28	12.0000-11.7500	C		0.000	0.000	1.016	0.000	0.01
		A	1.151	0.000	0.000	1.332	0.000	0.01
		B		0.000	0.000	2.535	0.000	0.02
L29	11.7500-11.5000	C		0.000	0.000	1.015	0.000	0.01
		A	1.149	0.000	0.000	1.332	0.000	0.01
		B		0.000	0.000	2.534	0.000	0.02
L30	11.5000-6.5000	C		0.000	0.000	1.015	0.000	0.01
		A	1.120	0.000	0.000	22.594	0.000	0.17
		B		0.000	0.000	50.325	0.000	0.39
L31	6.5000-6.0000	C		0.000	0.000	17.451	0.000	0.18
		A	1.080	0.000	0.000	2.077	0.000	0.02
		B		0.000	0.000	4.985	0.000	0.04
L32	6.0000-5.7500	C		0.000	0.000	1.323	0.000	0.01
		A	1.073	0.000	0.000	1.037	0.000	0.01
		B		0.000	0.000	2.488	0.000	0.02
L33	5.7500-4.5000	C		0.000	0.000	0.661	0.000	0.01
		A	1.058	0.000	0.000	5.170	0.000	0.04
		B		0.000	0.000	12.398	0.000	0.09
L34	4.5000-4.2500	C		0.000	0.000	3.295	0.000	0.04
		A	1.042	0.000	0.000	1.031	0.000	0.01
		B		0.000	0.000	2.470	0.000	0.02
L35	4.2500-3.0000	C		0.000	0.000	0.657	0.000	0.01
		A	1.022	0.000	0.000	3.930	0.000	0.03
		B		0.000	0.000	11.085	0.000	0.08
L36	3.0000-2.7500	C		0.000	0.000	3.272	0.000	0.04
		A	0.999	0.000	0.000	0.722	0.000	0.01
		B		0.000	0.000	2.144	0.000	0.02

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> In Face	C <sub>A</sub> A <sub>A</sub> Out Face	Weight
n	ft		in	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	K
L37	2.7500-1.7500	C	0.975	0.000	0.000	0.651	0.000	0.01
		A		0.000	0.000	2.874	0.000	0.02
		B		0.000	0.000	7.981	0.000	0.06
L38	1.7500-1.5000	C	0.944	0.000	0.000	2.052	0.000	0.02
		A		0.000	0.000	0.380	0.000	0.00
		B		0.000	0.000	1.510	0.000	0.01
L39	1.5000-1.2500	C	0.928	0.000	0.000	0.047	0.000	0.00
		A		0.000	0.000	0.082	0.000	0.00
		B		0.000	0.000	0.910	0.000	0.01
L40	1.2500-1.0000	C	0.909	0.000	0.000	0.046	0.000	0.00
		A		0.000	0.000	0.081	0.000	0.00
		B		0.000	0.000	0.904	0.000	0.01
L41	1.0000-0.0000	C	0.839	0.000	0.000	0.045	0.000	0.00
		A		0.000	0.000	0.309	0.000	0.00
		B		0.000	0.000	2.890	0.000	0.02
		C		0.000	0.000	0.168	0.000	0.01

### Feed Line Center of Pressure

Section	Elevation	CP <sub>x</sub>	CP <sub>z</sub>	CP <sub>x</sub>	CP <sub>z</sub>
	ft	in	in	Ice in	Ice in
L1	100.0000-95.0000	0.00	0.00	0.00	0.00
L2	95.0000-90.0000	0.91	-3.19	0.98	-3.29
L3	90.0000-85.5000	0.65	-2.28	0.83	-2.77
L4	85.5000-85.2500	0.47	-1.63	0.70	-2.34
L5	85.2500-80.2500	0.32	-1.24	0.86	-1.71
L6	80.2500-75.2500	-0.01	-0.42	0.63	-1.00
L7	75.2500-70.2500	-0.14	-0.44	0.41	-1.06
L8	70.2500-62.5000	-0.22	-0.35	0.29	-0.96
L9	62.5000-61.5000	-0.23	-0.35	0.29	-0.97
L10	61.5000-56.5000	-0.22	-0.34	0.29	-0.97
L11	56.5000-54.7500	-0.22	-0.32	0.28	-0.95
L12	54.7500-54.5000	-0.22	-0.33	0.28	-0.96
L13	54.5000-49.5000	-0.22	-0.33	0.28	-0.97
L14	49.5000-44.5000	-0.23	-0.33	0.29	-0.99
L15	44.5000-39.5000	-0.24	-0.34	0.29	-1.01
L16	39.5000-34.5000	-0.24	-0.47	0.29	-1.13
L17	34.5000-29.0000	-0.21	-0.79	0.26	-1.33
L18	29.0000-28.0000	-0.20	-0.27	0.24	-0.86
L19	28.0000-23.5000	-0.38	-0.36	0.06	-0.89
L20	23.5000-23.2500	-0.57	-0.46	-0.14	-0.92
L21	23.2500-22.7500	-0.57	-0.46	-0.14	-0.92
L22	22.7500-22.5000	-0.57	-0.46	-0.14	-0.92
L23	22.5000-17.5000	-0.60	-0.15	-0.17	-0.67
L24	17.5000-15.7500	-0.64	0.52	-0.22	-0.09
L25	15.7500-15.5000	-0.64	0.52	-0.23	-0.09
L26	15.5000-12.2500	-0.65	0.52	-0.23	-0.09
L27	12.2500-12.0000	-0.66	0.53	-0.24	-0.08
L28	12.0000-11.7500	-0.66	0.53	-0.24	-0.08
L29	11.7500-11.5000	-0.66	0.53	-0.24	-0.08
L30	11.5000-6.5000	-1.05	0.90	-0.56	0.24
L31	6.5000-6.0000	-1.69	0.79	-1.09	0.12
L32	6.0000-5.7500	-1.70	0.79	-1.10	0.12
L33	5.7500-4.5000	-1.70	0.79	-1.10	0.13
L34	4.5000-4.2500	-1.71	0.80	-1.11	0.14
L35	4.2500-3.0000	-2.29	0.17	-1.56	-0.47
L36	3.0000-2.7500	-2.46	-0.02	-1.70	-0.64
L37	2.7500-1.7500	-2.66	-0.63	-1.84	-1.22
L38	1.7500-1.5000	-2.11	-2.59	-1.07	-2.99
L39	1.5000-1.2500	-2.60	-7.24	-0.78	-5.84
L40	1.2500-1.0000	-2.60	-7.25	-0.79	-5.85
L41	1.0000-0.0000	-1.18	-6.07	0.14	-5.06

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
L2	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	90.00 - 94.00	1.0000	1.0000
L2	6	FXL 780 PE(7/8)	90.00 - 94.00	1.0000	1.0000
L2	7	FXL 780 PE(7/8)	90.00 - 94.00	1.0000	1.0000
L2	8	LDF1-50A(1/4)	90.00 - 94.00	1.0000	1.0000
L3	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	85.50 - 90.00	1.0000	1.0000
L3	6	FXL 780 PE(7/8)	85.50 - 90.00	1.0000	1.0000
L3	7	FXL 780 PE(7/8)	85.50 - 90.00	1.0000	1.0000
L3	8	LDF1-50A(1/4)	85.50 - 90.00	1.0000	1.0000
L3	25	MP3-05	85.50 - 88.00	1.0000	1.0000
L3	26	MP3-05	85.50 - 88.00	1.0000	1.0000
L3	27	MP3-05	85.50 - 88.00	1.0000	1.0000
L4	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	85.25 - 85.50	1.0000	1.0000
L4	6	FXL 780 PE(7/8)	85.25 - 85.50	1.0000	1.0000
L4	7	FXL 780 PE(7/8)	85.25 - 85.50	1.0000	1.0000
L4	8	LDF1-50A(1/4)	85.25 - 85.50	1.0000	1.0000
L4	25	MP3-05	85.25 - 85.50	1.0000	1.0000
L4	26	MP3-05	85.25 - 85.50	1.0000	1.0000
L4	27	MP3-05	85.25 - 85.50	1.0000	1.0000
L5	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	80.25 - 85.25	1.0000	1.0000
L5	6	FXL 780 PE(7/8)	80.25 - 85.25	1.0000	1.0000
L5	7	FXL 780 PE(7/8)	80.25 - 85.25	1.0000	1.0000
L5	8	LDF1-50A(1/4)	80.25 - 85.25	1.0000	1.0000
L5	10	CR 50 1070(7/8)	80.25 - 84.00	1.0000	1.0000
L5	11	FB-L98B-034-XXX(3/8)	80.25 - 84.00	1.0000	1.0000
L5	25	MP3-05	80.25 - 85.25	1.0000	1.0000
L5	26	MP3-05	80.25 - 85.25	1.0000	1.0000
L5	27	MP3-05	80.25 - 85.25	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
L5	35	5 x 1.25	80.25 - 81.50	1.0000	1.0000
L5	36	5 x 1.25	80.25 - 81.50	1.0000	1.0000
L5	37	5 x 1.25	80.25 - 81.50	1.0000	1.0000
L6	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	75.25 - 80.25	1.0000	1.0000
L6	6	FXL 780 PE(7/8)	75.25 - 80.25	1.0000	1.0000
L6	7	FXL 780 PE(7/8)	75.25 - 80.25	1.0000	1.0000
L6	8	LDF1-50A(1/4)	75.25 - 80.25	1.0000	1.0000
L6	10	CR 50 1070(7/8)	75.25 - 80.25	1.0000	1.0000
L6	11	FB-L98B-034-XXX(3/8)	75.25 - 80.25	1.0000	1.0000
L6	25	MP3-05	75.25 - 80.25	1.0000	1.0000
L6	26	MP3-05	75.25 - 80.25	1.0000	1.0000
L6	27	MP3-05	75.25 - 80.25	1.0000	1.0000
L6	35	5 x 1.25	75.25 - 80.25	1.0000	1.0000
L6	36	5 x 1.25	75.25 - 80.25	1.0000	1.0000
L6	37	5 x 1.25	75.25 - 80.25	1.0000	1.0000
L7	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	70.25 - 75.25	1.0000	1.0000
L7	6	FXL 780 PE(7/8)	70.25 - 75.25	1.0000	1.0000
L7	7	FXL 780 PE(7/8)	70.25 - 75.25	1.0000	1.0000
L7	8	LDF1-50A(1/4)	70.25 - 75.25	1.0000	1.0000
L7	10	CR 50 1070(7/8)	70.25 - 75.25	1.0000	1.0000
L7	11	FB-L98B-034-XXX(3/8)	70.25 - 75.25	1.0000	1.0000
L7	16	CU12PSM9P8XXX(1-3/8)	70.25 - 74.00	1.0000	1.0000
L7	25	MP3-05	70.25 - 75.25	1.0000	1.0000
L7	26	MP3-05	70.25 - 75.25	1.0000	1.0000
L7	27	MP3-05	70.25 - 75.25	1.0000	1.0000
L7	32	Stacked Plate	70.25 - 71.50	1.0000	1.0000
L7	33	Stacked Plate	70.25 - 71.50	1.0000	1.0000
L7	34	Stacked Plate	70.25 - 71.50	1.0000	1.0000
L7	35	5 x 1.25	71.50 - 75.25	1.0000	1.0000
L7	36	5 x 1.25	71.50 - 75.25	1.0000	1.0000
L7	37	5 x 1.25	71.50 - 75.25	1.0000	1.0000
L8	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	62.50 - 70.25	1.0000	1.0000
L8	6	FXL 780 PE(7/8)	62.50 - 70.25	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
L8	7	FXL 780 PE(7/8)	62.50 - 70.25	1.0000	1.0000
L8	8	LDF1-50A(1/4)	62.50 - 70.25	1.0000	1.0000
L8	10	CR 50 1070(7/8)	62.50 - 70.25	1.0000	1.0000
L8	11	FB-L98B-034-XXX(3/8)	62.50 - 70.25	1.0000	1.0000
L8	16	CU12PSM9P8XXX(1-3/8)	62.50 - 70.25	1.0000	1.0000
L8	25	MP3-05	62.50 - 70.25	1.0000	1.0000
L8	26	MP3-05	62.50 - 70.25	1.0000	1.0000
L8	27	MP3-05	62.50 - 70.25	1.0000	1.0000
L8	32	Stacked Plate	62.50 - 70.25	1.0000	1.0000
L8	33	Stacked Plate	62.50 - 70.25	1.0000	1.0000
L8	34	Stacked Plate	62.50 - 70.25	1.0000	1.0000
L9	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	61.50 - 62.50	1.0000	1.0000
L9	6	FXL 780 PE(7/8)	61.50 - 62.50	1.0000	1.0000
L9	7	FXL 780 PE(7/8)	61.50 - 62.50	1.0000	1.0000
L9	8	LDF1-50A(1/4)	61.50 - 62.50	1.0000	1.0000
L9	10	CR 50 1070(7/8)	61.50 - 62.50	1.0000	1.0000
L9	11	FB-L98B-034-XXX(3/8)	61.50 - 62.50	1.0000	1.0000
L9	16	CU12PSM9P8XXX(1-3/8)	61.50 - 62.50	1.0000	1.0000
L9	25	MP3-05	61.50 - 62.50	1.0000	1.0000
L9	26	MP3-05	61.50 - 62.50	1.0000	1.0000
L9	27	MP3-05	61.50 - 62.50	1.0000	1.0000
L9	32	Stacked Plate	61.50 - 62.50	1.0000	1.0000
L9	33	Stacked Plate	61.50 - 62.50	1.0000	1.0000
L9	34	Stacked Plate	61.50 - 62.50	1.0000	1.0000
L10	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	56.50 - 61.50	1.0000	1.0000
L10	6	FXL 780 PE(7/8)	56.50 - 61.50	1.0000	1.0000
L10	7	FXL 780 PE(7/8)	56.50 - 61.50	1.0000	1.0000
L10	8	LDF1-50A(1/4)	56.50 - 61.50	1.0000	1.0000
L10	10	CR 50 1070(7/8)	56.50 - 61.50	1.0000	1.0000
L10	11	FB-L98B-034-XXX(3/8)	56.50 - 61.50	1.0000	1.0000
L10	16	CU12PSM9P8XXX(1-3/8)	56.50 - 61.50	1.0000	1.0000
L10	18	MP3-06	56.50 - 58.00	1.0000	1.0000
L10	19	MP3-06	56.50 - 58.00	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
L10	21	MP3-06	56.50 - 58.00	1.0000	1.0000
L10	25	MP3-05	58.00 - 61.50	1.0000	1.0000
L10	26	MP3-05	58.00 - 61.50	1.0000	1.0000
L10	27	MP3-05	58.00 - 61.50	1.0000	1.0000
L10	32	Stacked Plate	56.50 - 61.50	1.0000	1.0000
L10	33	Stacked Plate	56.50 - 61.50	1.0000	1.0000
L10	34	Stacked Plate	56.50 - 61.50	1.0000	1.0000
L11	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	54.75 - 56.50	1.0000	1.0000
L11	6	FXL 780 PE(7/8)	54.75 - 56.50	1.0000	1.0000
L11	7	FXL 780 PE(7/8)	54.75 - 56.50	1.0000	1.0000
L11	8	LDF1-50A(1/4)	54.75 - 56.50	1.0000	1.0000
L11	10	CR 50 1070(7/8)	54.75 - 56.50	1.0000	1.0000
L11	11	FB-L98B-034-XXX(3/8)	54.75 - 56.50	1.0000	1.0000
L11	16	CU12PSM9P8XXX(1-3/8)	54.75 - 56.50	1.0000	1.0000
L11	18	MP3-06	54.75 - 56.50	1.0000	1.0000
L11	19	MP3-06	54.75 - 56.50	1.0000	1.0000
L11	21	MP3-06	54.75 - 56.50	1.0000	1.0000
L11	32	Stacked Plate	54.75 - 56.50	1.0000	1.0000
L11	33	Stacked Plate	54.75 - 56.50	1.0000	1.0000
L11	34	Stacked Plate	54.75 - 56.50	1.0000	1.0000
L12	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	54.50 - 54.75	1.0000	1.0000
L12	6	FXL 780 PE(7/8)	54.50 - 54.75	1.0000	1.0000
L12	7	FXL 780 PE(7/8)	54.50 - 54.75	1.0000	1.0000
L12	8	LDF1-50A(1/4)	54.50 - 54.75	1.0000	1.0000
L12	10	CR 50 1070(7/8)	54.50 - 54.75	1.0000	1.0000
L12	11	FB-L98B-034-XXX(3/8)	54.50 - 54.75	1.0000	1.0000
L12	16	CU12PSM9P8XXX(1-3/8)	54.50 - 54.75	1.0000	1.0000
L12	18	MP3-06	54.50 - 54.75	1.0000	1.0000
L12	19	MP3-06	54.50 - 54.75	1.0000	1.0000
L12	21	MP3-06	54.50 - 54.75	1.0000	1.0000
L12	32	Stacked Plate	54.50 - 54.75	1.0000	1.0000
L12	33	Stacked Plate	54.50 - 54.75	1.0000	1.0000
L12	34	Stacked Plate	54.50 - 54.75	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
L13	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	49.50 - 54.50	1.0000	1.0000
L13	6	FXL 780 PE(7/8)	49.50 - 54.50	1.0000	1.0000
L13	7	FXL 780 PE(7/8)	49.50 - 54.50	1.0000	1.0000
L13	8	LDF1-50A(1/4)	49.50 - 54.50	1.0000	1.0000
L13	10	CR 50 1070(7/8)	49.50 - 54.50	1.0000	1.0000
L13	11	FB-L98B-034-XXX(3/8)	49.50 - 54.50	1.0000	1.0000
L13	16	CU12PSM9P8XXX(1-3/8)	49.50 - 54.50	1.0000	1.0000
L13	18	MP3-06	49.50 - 54.50	1.0000	1.0000
L13	19	MP3-06	49.50 - 54.50	1.0000	1.0000
L13	21	MP3-06	49.50 - 54.50	1.0000	1.0000
L13	32	Stacked Plate	49.50 - 54.50	1.0000	1.0000
L13	33	Stacked Plate	49.50 - 54.50	1.0000	1.0000
L13	34	Stacked Plate	49.50 - 54.50	1.0000	1.0000
L14	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	44.50 - 49.50	1.0000	1.0000
L14	6	FXL 780 PE(7/8)	44.50 - 49.50	1.0000	1.0000
L14	7	FXL 780 PE(7/8)	44.50 - 49.50	1.0000	1.0000
L14	8	LDF1-50A(1/4)	44.50 - 49.50	1.0000	1.0000
L14	10	CR 50 1070(7/8)	44.50 - 49.50	1.0000	1.0000
L14	11	FB-L98B-034-XXX(3/8)	44.50 - 49.50	1.0000	1.0000
L14	16	CU12PSM9P8XXX(1-3/8)	44.50 - 49.50	1.0000	1.0000
L14	18	MP3-06	44.50 - 49.50	1.0000	1.0000
L14	19	MP3-06	44.50 - 49.50	1.0000	1.0000
L14	21	MP3-06	44.50 - 49.50	1.0000	1.0000
L14	32	Stacked Plate	44.50 - 49.50	1.0000	1.0000
L14	33	Stacked Plate	44.50 - 49.50	1.0000	1.0000
L14	34	Stacked Plate	44.50 - 49.50	1.0000	1.0000
L15	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	39.50 - 44.50	1.0000	1.0000
L15	6	FXL 780 PE(7/8)	39.50 - 44.50	1.0000	1.0000
L15	7	FXL 780 PE(7/8)	39.50 - 44.50	1.0000	1.0000
L15	8	LDF1-50A(1/4)	39.50 - 44.50	1.0000	1.0000
L15	10	CR 50 1070(7/8)	39.50 - 44.50	1.0000	1.0000
L15	11	FB-L98B-034-XXX(3/8)	39.50 - 44.50	1.0000	1.0000
L15	16	CU12PSM9P8XXX(1-3/8)	39.50 - 44.50	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
L15	18	MP3-06	39.50 - 44.50	1.0000	1.0000
L15	19	MP3-06	39.50 - 44.50	1.0000	1.0000
L15	21	MP3-06	39.50 - 44.50	1.0000	1.0000
L15	32	Stacked Plate	39.50 - 44.50	1.0000	1.0000
L15	33	Stacked Plate	39.50 - 44.50	1.0000	1.0000
L15	34	Stacked Plate	39.50 - 44.50	1.0000	1.0000
L16	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	34.50 - 39.50	1.0000	1.0000
L16	6	FXL 780 PE(7/8)	34.50 - 39.50	1.0000	1.0000
L16	7	FXL 780 PE(7/8)	34.50 - 39.50	1.0000	1.0000
L16	8	LDF1-50A(1/4)	34.50 - 39.50	1.0000	1.0000
L16	10	CR 50 1070(7/8)	34.50 - 39.50	1.0000	1.0000
L16	11	FB-L98B-034-XXX(3/8)	34.50 - 39.50	1.0000	1.0000
L16	16	CU12PSM9P8XXX(1-3/8)	34.50 - 39.50	1.0000	1.0000
L16	18	MP3-06	34.50 - 39.50	1.0000	1.0000
L16	19	MP3-06	34.50 - 39.50	1.0000	1.0000
L16	21	MP3-06	34.50 - 39.50	1.0000	1.0000
L16	22	MP3-05	34.50 - 35.00	1.0000	1.0000
L16	32	Stacked Plate	34.50 - 39.50	1.0000	1.0000
L16	33	Stacked Plate	34.50 - 39.50	1.0000	1.0000
L16	34	Stacked Plate	34.50 - 39.50	1.0000	1.0000
L17	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	29.00 - 34.50	1.0000	1.0000
L17	6	FXL 780 PE(7/8)	29.00 - 34.50	1.0000	1.0000
L17	7	FXL 780 PE(7/8)	29.00 - 34.50	1.0000	1.0000
L17	8	LDF1-50A(1/4)	29.00 - 34.50	1.0000	1.0000
L17	10	CR 50 1070(7/8)	29.00 - 34.50	1.0000	1.0000
L17	11	FB-L98B-034-XXX(3/8)	29.00 - 34.50	1.0000	1.0000
L17	16	CU12PSM9P8XXX(1-3/8)	29.00 - 34.50	1.0000	1.0000
L17	18	MP3-06	29.00 - 34.50	1.0000	1.0000
L17	19	MP3-06	29.00 - 34.50	1.0000	1.0000
L17	21	MP3-06	29.00 - 34.50	1.0000	1.0000
L17	22	MP3-05	29.00 - 34.50	1.0000	1.0000
L17	23	MP3-05	29.00 - 32.00	1.0000	1.0000
L17	24	MP3-05	29.00 - 32.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L17	32	Stacked Plate	29.00 - 34.50	1.0000	1.0000
L17	33	Stacked Plate	29.00 - 34.50	1.0000	1.0000
L17	34	Stacked Plate	29.00 - 34.50	1.0000	1.0000
L18	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	28.00 - 29.00	1.0000	1.0000
L18	6	FXL 780 PE(7/8)	28.00 - 29.00	1.0000	1.0000
L18	7	FXL 780 PE(7/8)	28.00 - 29.00	1.0000	1.0000
L18	8	LDF1-50A(1/4)	28.00 - 29.00	1.0000	1.0000
L18	10	CR 50 1070(7/8)	28.00 - 29.00	1.0000	1.0000
L18	11	FB-L98B-034-XXX(3/8)	28.00 - 29.00	1.0000	1.0000
L18	16	CU12PSM9P8XXX(1-3/8)	28.00 - 29.00	1.0000	1.0000
L18	18	MP3-06	28.00 - 29.00	1.0000	1.0000
L18	19	MP3-06	28.00 - 29.00	1.0000	1.0000
L18	21	MP3-06	28.00 - 29.00	1.0000	1.0000
L18	22	MP3-05	28.00 - 29.00	1.0000	1.0000
L18	23	MP3-05	28.00 - 29.00	1.0000	1.0000
L18	24	MP3-05	28.00 - 29.00	1.0000	1.0000
L18	32	Stacked Plate	28.00 - 29.00	1.0000	1.0000
L18	33	Stacked Plate	28.00 - 29.00	1.0000	1.0000
L18	34	Stacked Plate	28.00 - 29.00	1.0000	1.0000
L19	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	23.50 - 28.00	1.0000	1.0000
L19	6	FXL 780 PE(7/8)	23.50 - 28.00	1.0000	1.0000
L19	7	FXL 780 PE(7/8)	23.50 - 28.00	1.0000	1.0000
L19	8	LDF1-50A(1/4)	23.50 - 28.00	1.0000	1.0000
L19	10	CR 50 1070(7/8)	23.50 - 28.00	1.0000	1.0000
L19	11	FB-L98B-034-XXX(3/8)	23.50 - 28.00	1.0000	1.0000
L19	16	CU12PSM9P8XXX(1-3/8)	23.50 - 28.00	1.0000	1.0000
L19	18	MP3-06	23.50 - 28.00	1.0000	1.0000
L19	19	MP3-06	23.50 - 28.00	1.0000	1.0000
L19	21	MP3-06	23.50 - 28.00	1.0000	1.0000
L19	22	MP3-05	23.50 - 28.00	1.0000	1.0000
L19	23	MP3-05	23.50 - 28.00	1.0000	1.0000
L19	24	MP3-05	23.50 - 28.00	1.0000	1.0000
L19	28	CCI-065125	23.50 - 25.50	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
L19	29	CCI-060100	23.50 - 25.50	1.0000	1.0000
L19	30	CCI-060100	23.50 - 25.50	1.0000	1.0000
L19	32	Stacked Plate	23.50 - 28.00	1.0000	1.0000
L19	33	Stacked Plate	23.50 - 28.00	1.0000	1.0000
L19	34	Stacked Plate	23.50 - 28.00	1.0000	1.0000
L20	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	23.25 - 23.50	1.0000	1.0000
L20	6	FXL 780 PE(7/8)	23.25 - 23.50	1.0000	1.0000
L20	7	FXL 780 PE(7/8)	23.25 - 23.50	1.0000	1.0000
L20	8	LDF1-50A(1/4)	23.25 - 23.50	1.0000	1.0000
L20	10	CR 50 1070(7/8)	23.25 - 23.50	1.0000	1.0000
L20	11	FB-L98B-034-XXX(3/8)	23.25 - 23.50	1.0000	1.0000
L20	16	CU12PSM9P8XXX(1-3/8)	23.25 - 23.50	1.0000	1.0000
L20	18	MP3-06	23.25 - 23.50	1.0000	1.0000
L20	19	MP3-06	23.25 - 23.50	1.0000	1.0000
L20	21	MP3-06	23.25 - 23.50	1.0000	1.0000
L20	22	MP3-05	23.25 - 23.50	1.0000	1.0000
L20	23	MP3-05	23.25 - 23.50	1.0000	1.0000
L20	24	MP3-05	23.25 - 23.50	1.0000	1.0000
L20	28	CCI-065125	23.25 - 23.50	1.0000	1.0000
L20	29	CCI-060100	23.25 - 23.50	1.0000	1.0000
L20	30	CCI-060100	23.25 - 23.50	1.0000	1.0000
L20	32	Stacked Plate	23.25 - 23.50	1.0000	1.0000
L20	33	Stacked Plate	23.25 - 23.50	1.0000	1.0000
L20	34	Stacked Plate	23.25 - 23.50	1.0000	1.0000
L21	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	22.75 - 23.25	1.0000	1.0000
L21	6	FXL 780 PE(7/8)	22.75 - 23.25	1.0000	1.0000
L21	7	FXL 780 PE(7/8)	22.75 - 23.25	1.0000	1.0000
L21	8	LDF1-50A(1/4)	22.75 - 23.25	1.0000	1.0000
L21	10	CR 50 1070(7/8)	22.75 - 23.25	1.0000	1.0000
L21	11	FB-L98B-034-XXX(3/8)	22.75 - 23.25	1.0000	1.0000
L21	16	CU12PSM9P8XXX(1-3/8)	22.75 - 23.25	1.0000	1.0000
L21	18	MP3-06	22.75 - 23.25	1.0000	1.0000
L21	19	MP3-06	22.75 - 23.25	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
L21	21	MP3-06	22.75 - 23.25	1.0000	1.0000
L21	22	MP3-05	22.75 - 23.25	1.0000	1.0000
L21	23	MP3-05	22.75 - 23.25	1.0000	1.0000
L21	24	MP3-05	22.75 - 23.25	1.0000	1.0000
L21	28	CCI-065125	22.75 - 23.25	1.0000	1.0000
L21	29	CCI-060100	22.75 - 23.25	1.0000	1.0000
L21	30	CCI-060100	22.75 - 23.25	1.0000	1.0000
L21	32	Stacked Plate	22.75 - 23.25	1.0000	1.0000
L21	33	Stacked Plate	22.75 - 23.25	1.0000	1.0000
L21	34	Stacked Plate	22.75 - 23.25	1.0000	1.0000
L22	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	22.50 - 22.75	1.0000	1.0000
L22	6	FXL 780 PE(7/8)	22.50 - 22.75	1.0000	1.0000
L22	7	FXL 780 PE(7/8)	22.50 - 22.75	1.0000	1.0000
L22	8	LDF1-50A(1/4)	22.50 - 22.75	1.0000	1.0000
L22	10	CR 50 1070(7/8)	22.50 - 22.75	1.0000	1.0000
L22	11	FB-L98B-034-XXX(3/8)	22.50 - 22.75	1.0000	1.0000
L22	16	CU12PSM9P8XXX(1-3/8)	22.50 - 22.75	1.0000	1.0000
L22	18	MP3-06	22.50 - 22.75	1.0000	1.0000
L22	19	MP3-06	22.50 - 22.75	1.0000	1.0000
L22	21	MP3-06	22.50 - 22.75	1.0000	1.0000
L22	22	MP3-05	22.50 - 22.75	1.0000	1.0000
L22	23	MP3-05	22.50 - 22.75	1.0000	1.0000
L22	24	MP3-05	22.50 - 22.75	1.0000	1.0000
L22	28	CCI-065125	22.50 - 22.75	1.0000	1.0000
L22	29	CCI-060100	22.50 - 22.75	1.0000	1.0000
L22	30	CCI-060100	22.50 - 22.75	1.0000	1.0000
L22	32	Stacked Plate	22.50 - 22.75	1.0000	1.0000
L22	33	Stacked Plate	22.50 - 22.75	1.0000	1.0000
L22	34	Stacked Plate	22.50 - 22.75	1.0000	1.0000
L23	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	17.50 - 22.50	1.0000	1.0000
L23	6	FXL 780 PE(7/8)	17.50 - 22.50	1.0000	1.0000
L23	7	FXL 780 PE(7/8)	17.50 - 22.50	1.0000	1.0000
L23	8	LDF1-50A(1/4)	17.50 - 22.50	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
L23	10	CR 50 1070(7/8)	17.50 - 22.50	1.0000	1.0000
L23	11	FB-L98B-034-XXX(3/8)	17.50 - 22.50	1.0000	1.0000
L23	16	CU12PSM9P8XXX(1-3/8)	17.50 - 22.50	1.0000	1.0000
L23	18	MP3-06	17.50 - 22.50	1.0000	1.0000
L23	19	MP3-06	17.50 - 22.50	1.0000	1.0000
L23	20	MP3-06	17.50 - 19.00	1.0000	1.0000
L23	21	MP3-06	17.50 - 22.50	1.0000	1.0000
L23	22	MP3-05	17.50 - 22.50	1.0000	1.0000
L23	23	MP3-05	17.50 - 22.50	1.0000	1.0000
L23	24	MP3-05	17.50 - 22.50	1.0000	1.0000
L23	28	CCI-065125	17.50 - 22.50	1.0000	1.0000
L23	29	CCI-060100	17.50 - 22.50	1.0000	1.0000
L23	30	CCI-060100	17.50 - 22.50	1.0000	1.0000
L23	32	Stacked Plate	17.50 - 22.50	1.0000	1.0000
L23	33	Stacked Plate	17.50 - 22.50	1.0000	1.0000
L23	34	Stacked Plate	17.50 - 22.50	1.0000	1.0000
L24	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	15.75 - 17.50	1.0000	1.0000
L24	6	FXL 780 PE(7/8)	15.75 - 17.50	1.0000	1.0000
L24	7	FXL 780 PE(7/8)	15.75 - 17.50	1.0000	1.0000
L24	8	LDF1-50A(1/4)	15.75 - 17.50	1.0000	1.0000
L24	10	CR 50 1070(7/8)	15.75 - 17.50	1.0000	1.0000
L24	11	FB-L98B-034-XXX(3/8)	15.75 - 17.50	1.0000	1.0000
L24	16	CU12PSM9P8XXX(1-3/8)	15.75 - 17.50	1.0000	1.0000
L24	18	MP3-06	15.75 - 17.50	1.0000	1.0000
L24	19	MP3-06	15.75 - 17.50	1.0000	1.0000
L24	20	MP3-06	15.75 - 17.50	1.0000	1.0000
L24	21	MP3-06	15.75 - 17.50	1.0000	1.0000
L24	22	MP3-05	15.75 - 17.50	1.0000	1.0000
L24	23	MP3-05	15.75 - 17.50	1.0000	1.0000
L24	24	MP3-05	15.75 - 17.50	1.0000	1.0000
L24	28	CCI-065125	15.75 - 17.50	1.0000	1.0000
L24	29	CCI-060100	15.75 - 17.50	1.0000	1.0000
L24	30	CCI-060100	15.75 - 17.50	1.0000	1.0000
L24	32	Stacked Plate	15.75 - 17.50	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
L24	33	Stacked Plate	15.75 - 17.50	1.0000	1.0000
L24	34	Stacked Plate	15.75 - 17.50	1.0000	1.0000
L25	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	15.50 - 15.75	1.0000	1.0000
L25	6	FXL 780 PE(7/8)	15.50 - 15.75	1.0000	1.0000
L25	7	FXL 780 PE(7/8)	15.50 - 15.75	1.0000	1.0000
L25	8	LDF1-50A(1/4)	15.50 - 15.75	1.0000	1.0000
L25	10	CR 50 1070(7/8)	15.50 - 15.75	1.0000	1.0000
L25	11	FB-L98B-034-XXX(3/8)	15.50 - 15.75	1.0000	1.0000
L25	16	CU12PSM9P8XXX(1-3/8)	15.50 - 15.75	1.0000	1.0000
L25	18	MP3-06	15.50 - 15.75	1.0000	1.0000
L25	19	MP3-06	15.50 - 15.75	1.0000	1.0000
L25	20	MP3-06	15.50 - 15.75	1.0000	1.0000
L25	21	MP3-06	15.50 - 15.75	1.0000	1.0000
L25	22	MP3-05	15.50 - 15.75	1.0000	1.0000
L25	23	MP3-05	15.50 - 15.75	1.0000	1.0000
L25	24	MP3-05	15.50 - 15.75	1.0000	1.0000
L25	28	CCI-065125	15.50 - 15.75	1.0000	1.0000
L25	29	CCI-060100	15.50 - 15.75	1.0000	1.0000
L25	30	CCI-060100	15.50 - 15.75	1.0000	1.0000
L25	32	Stacked Plate	15.50 - 15.75	1.0000	1.0000
L25	33	Stacked Plate	15.50 - 15.75	1.0000	1.0000
L25	34	Stacked Plate	15.50 - 15.75	1.0000	1.0000
L26	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	12.25 - 15.50	1.0000	1.0000
L26	6	FXL 780 PE(7/8)	12.25 - 15.50	1.0000	1.0000
L26	7	FXL 780 PE(7/8)	12.25 - 15.50	1.0000	1.0000
L26	8	LDF1-50A(1/4)	12.25 - 15.50	1.0000	1.0000
L26	10	CR 50 1070(7/8)	12.25 - 15.50	1.0000	1.0000
L26	11	FB-L98B-034-XXX(3/8)	12.25 - 15.50	1.0000	1.0000
L26	16	CU12PSM9P8XXX(1-3/8)	12.25 - 15.50	1.0000	1.0000
L26	18	MP3-06	12.25 - 15.50	1.0000	1.0000
L26	19	MP3-06	12.25 - 15.50	1.0000	1.0000
L26	20	MP3-06	12.25 - 15.50	1.0000	1.0000
L26	21	MP3-06	12.25 - 15.50	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	22	MP3-05	12.25 - 15.50	1.0000	1.0000
L26	23	MP3-05	12.25 - 15.50	1.0000	1.0000
L26	24	MP3-05	12.25 - 15.50	1.0000	1.0000
L26	28	CCI-065125	12.25 - 15.50	1.0000	1.0000
L26	29	CCI-060100	12.25 - 15.50	1.0000	1.0000
L26	30	CCI-060100	12.25 - 15.50	1.0000	1.0000
L26	32	Stacked Plate	12.25 - 15.50	1.0000	1.0000
L26	33	Stacked Plate	12.25 - 15.50	1.0000	1.0000
L26	34	Stacked Plate	12.25 - 15.50	1.0000	1.0000
L27	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	12.00 - 12.25	1.0000	1.0000
L27	6	FXL 780 PE(7/8)	12.00 - 12.25	1.0000	1.0000
L27	7	FXL 780 PE(7/8)	12.00 - 12.25	1.0000	1.0000
L27	8	LDF1-50A(1/4)	12.00 - 12.25	1.0000	1.0000
L27	10	CR 50 1070(7/8)	12.00 - 12.25	1.0000	1.0000
L27	11	FB-L98B-034-XXX(3/8)	12.00 - 12.25	1.0000	1.0000
L27	16	CU12PSM9P8XXX(1-3/8)	12.00 - 12.25	1.0000	1.0000
L27	18	MP3-06	12.00 - 12.25	1.0000	1.0000
L27	19	MP3-06	12.00 - 12.25	1.0000	1.0000
L27	20	MP3-06	12.00 - 12.25	1.0000	1.0000
L27	21	MP3-06	12.00 - 12.25	1.0000	1.0000
L27	22	MP3-05	12.00 - 12.25	1.0000	1.0000
L27	23	MP3-05	12.00 - 12.25	1.0000	1.0000
L27	24	MP3-05	12.00 - 12.25	1.0000	1.0000
L27	28	CCI-065125	12.00 - 12.25	1.0000	1.0000
L27	29	CCI-060100	12.00 - 12.25	1.0000	1.0000
L27	30	CCI-060100	12.00 - 12.25	1.0000	1.0000
L27	32	Stacked Plate	12.00 - 12.25	1.0000	1.0000
L27	33	Stacked Plate	12.00 - 12.25	1.0000	1.0000
L27	34	Stacked Plate	12.00 - 12.25	1.0000	1.0000
L28	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	11.75 - 12.00	1.0000	1.0000
L28	6	FXL 780 PE(7/8)	11.75 - 12.00	1.0000	1.0000
L28	7	FXL 780 PE(7/8)	11.75 - 12.00	1.0000	1.0000
L28	8	LDF1-50A(1/4)	11.75 - 12.00	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
L28	10	CR 50 1070(7/8)	11.75 - 12.00	1.0000	1.0000
L28	11	FB-L98B-034-XXX(3/8)	11.75 - 12.00	1.0000	1.0000
L28	16	CU12PSM9P8XXX(1-3/8)	11.75 - 12.00	1.0000	1.0000
L28	18	MP3-06	11.75 - 12.00	1.0000	1.0000
L28	19	MP3-06	11.75 - 12.00	1.0000	1.0000
L28	20	MP3-06	11.75 - 12.00	1.0000	1.0000
L28	21	MP3-06	11.75 - 12.00	1.0000	1.0000
L28	22	MP3-05	11.75 - 12.00	1.0000	1.0000
L28	23	MP3-05	11.75 - 12.00	1.0000	1.0000
L28	24	MP3-05	11.75 - 12.00	1.0000	1.0000
L28	28	CCI-065125	11.75 - 12.00	1.0000	1.0000
L28	29	CCI-060100	11.75 - 12.00	1.0000	1.0000
L28	30	CCI-060100	11.75 - 12.00	1.0000	1.0000
L28	32	Stacked Plate	11.75 - 12.00	1.0000	1.0000
L28	33	Stacked Plate	11.75 - 12.00	1.0000	1.0000
L28	34	Stacked Plate	11.75 - 12.00	1.0000	1.0000
L29	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	11.50 - 11.75	1.0000	1.0000
L29	6	FXL 780 PE(7/8)	11.50 - 11.75	1.0000	1.0000
L29	7	FXL 780 PE(7/8)	11.50 - 11.75	1.0000	1.0000
L29	8	LDF1-50A(1/4)	11.50 - 11.75	1.0000	1.0000
L29	10	CR 50 1070(7/8)	11.50 - 11.75	1.0000	1.0000
L29	11	FB-L98B-034-XXX(3/8)	11.50 - 11.75	1.0000	1.0000
L29	16	CU12PSM9P8XXX(1-3/8)	11.50 - 11.75	1.0000	1.0000
L29	18	MP3-06	11.50 - 11.75	1.0000	1.0000
L29	19	MP3-06	11.50 - 11.75	1.0000	1.0000
L29	20	MP3-06	11.50 - 11.75	1.0000	1.0000
L29	21	MP3-06	11.50 - 11.75	1.0000	1.0000
L29	22	MP3-05	11.50 - 11.75	1.0000	1.0000
L29	23	MP3-05	11.50 - 11.75	1.0000	1.0000
L29	24	MP3-05	11.50 - 11.75	1.0000	1.0000
L29	28	CCI-065125	11.50 - 11.75	1.0000	1.0000
L29	29	CCI-060100	11.50 - 11.75	1.0000	1.0000
L29	30	CCI-060100	11.50 - 11.75	1.0000	1.0000
L29	32	Stacked Plate	11.50 - 11.75	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
L29	33	Stacked Plate	11.50 - 11.75	1.0000	1.0000
L29	34	Stacked Plate	11.50 - 11.75	1.0000	1.0000
L30	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	6.50 - 11.50	1.0000	1.0000
L30	6	FXL 780 PE(7/8)	6.50 - 11.50	1.0000	1.0000
L30	7	FXL 780 PE(7/8)	6.50 - 11.50	1.0000	1.0000
L30	8	LDF1-50A(1/4)	6.50 - 11.50	1.0000	1.0000
L30	10	CR 50 1070(7/8)	6.50 - 11.50	1.0000	1.0000
L30	11	FB-L98B-034-XXX(3/8)	6.50 - 11.50	1.0000	1.0000
L30	16	CU12PSM9P8XXX(1-3/8)	6.50 - 11.50	1.0000	1.0000
L30	18	MP3-06	6.50 - 11.50	1.0000	1.0000
L30	19	MP3-06	6.50 - 11.50	1.0000	1.0000
L30	20	MP3-06	6.50 - 11.50	1.0000	1.0000
L30	21	MP3-06	8.50 - 11.50	1.0000	1.0000
L30	22	MP3-05	10.00 - 11.50	1.0000	1.0000
L30	23	MP3-05	6.50 - 11.50	1.0000	1.0000
L30	24	MP3-05	6.50 - 11.50	1.0000	1.0000
L30	28	CCI-065125	6.50 - 11.50	1.0000	1.0000
L30	29	CCI-060100	6.50 - 11.50	1.0000	1.0000
L30	30	CCI-060100	6.50 - 11.50	1.0000	1.0000
L30	32	Stacked Plate	6.50 - 11.50	1.0000	1.0000
L30	33	Stacked Plate	6.50 - 11.50	1.0000	1.0000
L30	34	Stacked Plate	6.50 - 11.50	1.0000	1.0000
L31	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	6.00 - 6.50	1.0000	1.0000
L31	6	FXL 780 PE(7/8)	6.00 - 6.50	1.0000	1.0000
L31	7	FXL 780 PE(7/8)	6.00 - 6.50	1.0000	1.0000
L31	8	LDF1-50A(1/4)	6.00 - 6.50	1.0000	1.0000
L31	10	CR 50 1070(7/8)	6.00 - 6.50	1.0000	1.0000
L31	11	FB-L98B-034-XXX(3/8)	6.00 - 6.50	1.0000	1.0000
L31	16	CU12PSM9P8XXX(1-3/8)	6.00 - 6.50	1.0000	1.0000
L31	18	MP3-06	6.00 - 6.50	1.0000	1.0000
L31	19	MP3-06	6.00 - 6.50	1.0000	1.0000
L31	20	MP3-06	6.00 - 6.50	1.0000	1.0000
L31	23	MP3-05	6.00 - 6.50	1.0000	1.0000
L31	24	MP3-05	6.00 - 6.50	1.0000	1.0000
L31	28	CCI-065125	6.00 - 6.50	1.0000	1.0000
L31	29	CCI-060100	6.00 - 6.50	1.0000	1.0000
L31	30	CCI-060100	6.00 - 6.50	1.0000	1.0000
L31	32	Stacked Plate	6.00 - 6.50	1.0000	1.0000
L31	33	Stacked Plate	6.00 - 6.50	1.0000	1.0000
L31	34	Stacked Plate	6.00 - 6.50	1.0000	1.0000
L32	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	5.75 - 6.00	1.0000	1.0000
L32	6	FXL 780 PE(7/8)	5.75 - 6.00	1.0000	1.0000
L32	7	FXL 780 PE(7/8)	5.75 - 6.00	1.0000	1.0000
L32	8	LDF1-50A(1/4)	5.75 - 6.00	1.0000	1.0000
L32	10	CR 50 1070(7/8)	5.75 - 6.00	1.0000	1.0000
L32	11	FB-L98B-034-XXX(3/8)	5.75 - 6.00	1.0000	1.0000
L32	16	CU12PSM9P8XXX(1-3/8)	5.75 - 6.00	1.0000	1.0000
L32	18	MP3-06	5.75 - 6.00	1.0000	1.0000
L32	19	MP3-06	5.75 - 6.00	1.0000	1.0000
L32	20	MP3-06	5.75 - 6.00	1.0000	1.0000
L32	23	MP3-05	5.75 - 6.00	1.0000	1.0000
L32	24	MP3-05	5.75 - 6.00	1.0000	1.0000
L32	28	CCI-065125	5.75 - 6.00	1.0000	1.0000
L32	29	CCI-060100	5.75 - 6.00	1.0000	1.0000
L32	30	CCI-060100	5.75 - 6.00	1.0000	1.0000
L32	32	Stacked Plate	5.75 - 6.00	1.0000	1.0000
L32	33	Stacked Plate	5.75 - 6.00	1.0000	1.0000
L32	34	Stacked Plate	5.75 - 6.00	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
L33	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	4.50 - 5.75	1.0000	1.0000
L33	6	FXL 780 PE(7/8)	4.50 - 5.75	1.0000	1.0000
L33	7	FXL 780 PE(7/8)	4.50 - 5.75	1.0000	1.0000
L33	8	LDF1-50A(1/4)	4.50 - 5.75	1.0000	1.0000
L33	10	CR 50 1070(7/8)	4.50 - 5.75	1.0000	1.0000
L33	11	FB-L98B-034-XXX(3/8)	4.50 - 5.75	1.0000	1.0000
L33	16	CU12PSM9P8XXX(1-3/8)	4.50 - 5.75	1.0000	1.0000
L33	18	MP3-06	4.50 - 5.75	1.0000	1.0000
L33	19	MP3-06	4.50 - 5.75	1.0000	1.0000
L33	20	MP3-06	4.50 - 5.75	1.0000	1.0000
L33	23	MP3-05	4.50 - 5.75	1.0000	1.0000
L33	24	MP3-05	4.50 - 5.75	1.0000	1.0000
L33	28	CCI-065125	4.50 - 5.75	1.0000	1.0000
L33	29	CCI-060100	4.50 - 5.75	1.0000	1.0000
L33	30	CCI-060100	4.50 - 5.75	1.0000	1.0000
L33	32	Stacked Plate	4.50 - 5.75	1.0000	1.0000
L33	33	Stacked Plate	4.50 - 5.75	1.0000	1.0000
L33	34	Stacked Plate	4.50 - 5.75	1.0000	1.0000
L34	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	4.25 - 4.50	1.0000	1.0000
L34	6	FXL 780 PE(7/8)	4.25 - 4.50	1.0000	1.0000
L34	7	FXL 780 PE(7/8)	4.25 - 4.50	1.0000	1.0000
L34	8	LDF1-50A(1/4)	4.25 - 4.50	1.0000	1.0000
L34	10	CR 50 1070(7/8)	4.25 - 4.50	1.0000	1.0000
L34	11	FB-L98B-034-XXX(3/8)	4.25 - 4.50	1.0000	1.0000
L34	16	CU12PSM9P8XXX(1-3/8)	4.25 - 4.50	1.0000	1.0000
L34	18	MP3-06	4.25 - 4.50	1.0000	1.0000
L34	19	MP3-06	4.25 - 4.50	1.0000	1.0000
L34	20	MP3-06	4.25 - 4.50	1.0000	1.0000
L34	23	MP3-05	4.25 - 4.50	1.0000	1.0000
L34	24	MP3-05	4.25 - 4.50	1.0000	1.0000
L34	28	CCI-065125	4.25 - 4.50	1.0000	1.0000
L34	29	CCI-060100	4.25 - 4.50	1.0000	1.0000
L34	30	CCI-060100	4.25 - 4.50	1.0000	1.0000
L34	32	Stacked Plate	4.25 - 4.50	1.0000	1.0000
L34	33	Stacked Plate	4.25 - 4.50	1.0000	1.0000
L34	34	Stacked Plate	4.25 - 4.50	1.0000	1.0000
L35	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	3.00 - 4.25	1.0000	1.0000
L35	6	FXL 780 PE(7/8)	3.00 - 4.25	1.0000	1.0000
L35	7	FXL 780 PE(7/8)	3.00 - 4.25	1.0000	1.0000
L35	8	LDF1-50A(1/4)	3.00 - 4.25	1.0000	1.0000
L35	10	CR 50 1070(7/8)	3.00 - 4.25	1.0000	1.0000
L35	11	FB-L98B-034-XXX(3/8)	3.00 - 4.25	1.0000	1.0000
L35	16	CU12PSM9P8XXX(1-3/8)	3.00 - 4.25	1.0000	1.0000
L35	18	MP3-06	3.00 - 4.25	1.0000	1.0000
L35	19	MP3-06	3.00 - 4.25	1.0000	1.0000
L35	20	MP3-06	3.00 - 4.25	1.0000	1.0000
L35	23	MP3-05	3.00 - 4.25	1.0000	1.0000
L35	24	MP3-05	3.00 - 4.25	1.0000	1.0000
L35	28	CCI-065125	3.00 - 4.25	1.0000	1.0000
L35	29	CCI-060100	4.00 - 4.25	1.0000	1.0000
L35	30	CCI-060100	4.00 - 4.25	1.0000	1.0000
L35	32	Stacked Plate	3.00 - 4.25	1.0000	1.0000
L35	33	Stacked Plate	3.00 - 4.25	1.0000	1.0000
L35	34	Stacked Plate	3.00 - 4.25	1.0000	1.0000
L36	5	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	2.75 - 3.00	1.0000	1.0000
L36	6	FXL 780 PE(7/8)	2.75 - 3.00	1.0000	1.0000
L36	7	FXL 780 PE(7/8)	2.75 - 3.00	1.0000	1.0000
L36	8	LDF1-50A(1/4)	2.75 - 3.00	1.0000	1.0000
L36	10	CR 50 1070(7/8)	2.75 - 3.00	1.0000	1.0000
L36	11	FB-L98B-034-XXX(3/8)	2.75 - 3.00	1.0000	1.0000
L36	16	CU12PSM9P8XXX(1-3/8)	2.75 - 3.00	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
L36	18	MP3-06	2.75 - 3.00	1.0000	1.0000
L36	19	MP3-06	2.75 - 3.00	1.0000	1.0000
L36	20	MP3-06	2.75 - 3.00	1.0000	1.0000
L36	23	MP3-05	2.75 - 3.00	1.0000	1.0000
L36	24	MP3-05	2.75 - 3.00	1.0000	1.0000
L36	28	CCI-065125	2.75 - 3.00	1.0000	1.0000
L36	32	Stacked Plate	2.75 - 3.00	1.0000	1.0000
L36	33	Stacked Plate	2.75 - 3.00	1.0000	1.0000
L36	34	Stacked Plate	2.75 - 3.00	1.0000	1.0000
L37	5	MLE HYBRID	1.75 - 2.75	1.0000	1.0000
		9POWER/18FIBER RL			
		2(1-5/8)			
L37	6	FXL 780 PE(7/8)	1.75 - 2.75	1.0000	1.0000
L37	7	FXL 780 PE(7/8)	1.75 - 2.75	1.0000	1.0000
L37	8	LDF1-50A(1/4)	1.75 - 2.75	1.0000	1.0000
L37	10	CR 50 1070(7/8)	1.75 - 2.75	1.0000	1.0000
L37	11	FB-L98B-034-XXX(3/8)	1.75 - 2.75	1.0000	1.0000
L37	16	CU12PSM9P8XXX(1-3/8)	1.75 - 2.75	1.0000	1.0000
L37	18	MP3-06	1.75 - 2.75	1.0000	1.0000
L37	19	MP3-06	1.75 - 2.75	1.0000	1.0000
L37	20	MP3-06	1.75 - 2.75	1.0000	1.0000
L37	23	MP3-05	2.25 - 2.75	1.0000	1.0000
L37	24	MP3-05	2.25 - 2.75	1.0000	1.0000
L37	28	CCI-065125	1.75 - 2.75	1.0000	1.0000
L37	32	Stacked Plate	1.75 - 2.75	1.0000	1.0000
L37	33	Stacked Plate	1.75 - 2.75	1.0000	1.0000
L37	34	Stacked Plate	1.75 - 2.75	1.0000	1.0000
L38	5	MLE HYBRID	1.50 - 1.75	1.0000	1.0000
		9POWER/18FIBER RL			
		2(1-5/8)			
L38	6	FXL 780 PE(7/8)	1.50 - 1.75	1.0000	1.0000
L38	7	FXL 780 PE(7/8)	1.50 - 1.75	1.0000	1.0000
L38	8	LDF1-50A(1/4)	1.50 - 1.75	1.0000	1.0000
L38	10	CR 50 1070(7/8)	1.50 - 1.75	1.0000	1.0000
L38	11	FB-L98B-034-XXX(3/8)	1.50 - 1.75	1.0000	1.0000
L38	16	CU12PSM9P8XXX(1-3/8)	1.50 - 1.75	1.0000	1.0000
L38	28	CCI-065125	1.50 - 1.75	1.0000	1.0000
L38	32	Stacked Plate	1.50 - 1.75	1.0000	1.0000
L38	33	Stacked Plate	1.50 - 1.75	1.0000	1.0000
L38	34	Stacked Plate	1.50 - 1.75	1.0000	1.0000
L39	5	MLE HYBRID	1.25 - 1.50	1.0000	1.0000
		9POWER/18FIBER RL			
		2(1-5/8)			
L39	6	FXL 780 PE(7/8)	1.25 - 1.50	1.0000	1.0000
L39	7	FXL 780 PE(7/8)	1.25 - 1.50	1.0000	1.0000
L39	8	LDF1-50A(1/4)	1.25 - 1.50	1.0000	1.0000
L39	10	CR 50 1070(7/8)	1.25 - 1.50	1.0000	1.0000
L39	11	FB-L98B-034-XXX(3/8)	1.25 - 1.50	1.0000	1.0000
L39	16	CU12PSM9P8XXX(1-3/8)	1.25 - 1.50	1.0000	1.0000
L39	28	CCI-065125	1.25 - 1.50	1.0000	1.0000
L40	5	MLE HYBRID	1.00 - 1.25	1.0000	1.0000
		9POWER/18FIBER RL			
		2(1-5/8)			
L40	6	FXL 780 PE(7/8)	1.00 - 1.25	1.0000	1.0000
L40	7	FXL 780 PE(7/8)	1.00 - 1.25	1.0000	1.0000
L40	8	LDF1-50A(1/4)	1.00 - 1.25	1.0000	1.0000
L40	10	CR 50 1070(7/8)	1.00 - 1.25	1.0000	1.0000
L40	11	FB-L98B-034-XXX(3/8)	1.00 - 1.25	1.0000	1.0000
L40	16	CU12PSM9P8XXX(1-3/8)	1.00 - 1.25	1.0000	1.0000
L40	28	CCI-065125	1.00 - 1.25	1.0000	1.0000
L41	5	MLE HYBRID	0.00 - 1.00	1.0000	1.0000
		9POWER/18FIBER RL			
		2(1-5/8)			
L41	6	FXL 780 PE(7/8)	0.00 - 1.00	1.0000	1.0000
L41	7	FXL 780 PE(7/8)	0.00 - 1.00	1.0000	1.0000
L41	8	LDF1-50A(1/4)	0.00 - 1.00	1.0000	1.0000
L41	10	CR 50 1070(7/8)	0.00 - 1.00	1.0000	1.0000
L41	11	FB-L98B-034-XXX(3/8)	0.00 - 1.00	1.0000	1.0000
L41	16	CU12PSM9P8XXX(1-3/8)	0.00 - 1.00	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
L41	28	CCI-065125	0.50 - 1.00	1.0000	1.0000

**Effective Width of Flat Linear Attachments / Feed Lines**

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L3	25	MP3-05	85.50 - 88.00	Manual	1.0000
L3	26	MP3-05	85.50 - 88.00	Manual	1.0000
L3	27	MP3-05	85.50 - 88.00	Manual	1.0000
L4	25	MP3-05	85.25 - 85.50	Manual	1.0000
L4	26	MP3-05	85.25 - 85.50	Manual	1.0000
L4	27	MP3-05	85.25 - 85.50	Manual	1.0000
L5	25	MP3-05	80.25 - 85.25	Manual	1.0000
L5	26	MP3-05	80.25 - 85.25	Manual	1.0000
L5	27	MP3-05	80.25 - 85.25	Manual	1.0000
L5	35	5 x 1.25	80.25 - 81.50	Manual	1.0000
L5	36	5 x 1.25	80.25 - 81.50	Manual	1.0000
L5	37	5 x 1.25	80.25 - 81.50	Manual	1.0000
L6	25	MP3-05	75.25 - 80.25	Manual	1.0000
L6	26	MP3-05	75.25 - 80.25	Manual	1.0000
L6	27	MP3-05	75.25 - 80.25	Manual	1.0000
L6	35	5 x 1.25	75.25 - 80.25	Manual	1.0000
L6	36	5 x 1.25	75.25 - 80.25	Manual	1.0000
L6	37	5 x 1.25	75.25 - 80.25	Manual	1.0000
L7	25	MP3-05	70.25 - 75.25	Manual	1.0000
L7	26	MP3-05	70.25 - 75.25	Manual	1.0000
L7	27	MP3-05	70.25 - 75.25	Manual	1.0000
L7	32	Stacked Plate	70.25 - 71.50	Manual	1.0000
L7	33	Stacked Plate	70.25 - 71.50	Manual	1.0000
L7	34	Stacked Plate	70.25 - 71.50	Manual	1.0000
L7	35	5 x 1.25	71.50 - 75.25	Manual	1.0000
L7	36	5 x 1.25	71.50 - 75.25	Manual	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L7	37	5 x 1.25	71.50 - 75.25	Manual	1.0000
L8	25	MP3-05	62.50 - 70.25	Manual	1.0000
L8	26	MP3-05	62.50 - 70.25	Manual	1.0000
L8	27	MP3-05	62.50 - 70.25	Manual	1.0000
L8	32	Stacked Plate	62.50 - 70.25	Manual	1.0000
L8	33	Stacked Plate	62.50 - 70.25	Manual	1.0000
L8	34	Stacked Plate	62.50 - 70.25	Manual	1.0000
L9	25	MP3-05	61.50 - 62.50	Manual	1.0000
L9	26	MP3-05	61.50 - 62.50	Manual	1.0000
L9	27	MP3-05	61.50 - 62.50	Manual	1.0000
L9	32	Stacked Plate	61.50 - 62.50	Manual	1.0000
L9	33	Stacked Plate	61.50 - 62.50	Manual	1.0000
L9	34	Stacked Plate	61.50 - 62.50	Manual	1.0000
L10	18	MP3-06	56.50 - 58.00	Manual	1.0000
L10	19	MP3-06	56.50 - 58.00	Manual	1.0000
L10	21	MP3-06	56.50 - 58.00	Manual	1.0000
L10	25	MP3-05	58.00 - 61.50	Manual	1.0000
L10	26	MP3-05	58.00 - 61.50	Manual	1.0000
L10	27	MP3-05	58.00 - 61.50	Manual	1.0000
L10	32	Stacked Plate	56.50 - 61.50	Manual	1.0000
L10	33	Stacked Plate	56.50 - 61.50	Manual	1.0000
L10	34	Stacked Plate	56.50 - 61.50	Manual	1.0000
L11	18	MP3-06	54.75 - 56.50	Manual	1.0000
L11	19	MP3-06	54.75 - 56.50	Manual	1.0000
L11	21	MP3-06	54.75 - 56.50	Manual	1.0000
L11	32	Stacked Plate	54.75 - 56.50	Manual	1.0000
L11	33	Stacked Plate	54.75 - 56.50	Manual	1.0000
L11	34	Stacked Plate	54.75 - 56.50	Manual	1.0000
L12	18	MP3-06	54.50 - 54.75	Manual	1.0000
L12	19	MP3-06	54.50 - 54.75	Manual	1.0000
L12	21	MP3-06	54.50 - 54.75	Manual	1.0000
L12	32	Stacked Plate	54.50 - 54.75	Manual	1.0000
L12	33	Stacked Plate	54.50 - 54.75	Manual	1.0000
L12	34	Stacked Plate	54.50 - 54.75	Manual	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L13	18	MP3-06	49.50 - 54.50	Manual	1.0000
L13	19	MP3-06	49.50 - 54.50	Manual	1.0000
L13	21	MP3-06	49.50 - 54.50	Manual	1.0000
L13	32	Stacked Plate	49.50 - 54.50	Manual	1.0000
L13	33	Stacked Plate	49.50 - 54.50	Manual	1.0000
L13	34	Stacked Plate	49.50 - 54.50	Manual	1.0000
L14	18	MP3-06	44.50 - 49.50	Manual	1.0000
L14	19	MP3-06	44.50 - 49.50	Manual	1.0000
L14	21	MP3-06	44.50 - 49.50	Manual	1.0000
L14	32	Stacked Plate	44.50 - 49.50	Manual	1.0000
L14	33	Stacked Plate	44.50 - 49.50	Manual	1.0000
L14	34	Stacked Plate	44.50 - 49.50	Manual	1.0000
L15	18	MP3-06	39.50 - 44.50	Manual	1.0000
L15	19	MP3-06	39.50 - 44.50	Manual	1.0000
L15	21	MP3-06	39.50 - 44.50	Manual	1.0000
L15	32	Stacked Plate	39.50 - 44.50	Manual	1.0000
L15	33	Stacked Plate	39.50 - 44.50	Manual	1.0000
L15	34	Stacked Plate	39.50 - 44.50	Manual	1.0000
L16	18	MP3-06	34.50 - 39.50	Manual	1.0000
L16	19	MP3-06	34.50 - 39.50	Manual	1.0000
L16	21	MP3-06	34.50 - 39.50	Manual	1.0000
L16	22	MP3-05	34.50 - 35.00	Manual	1.0000
L16	32	Stacked Plate	34.50 - 39.50	Manual	1.0000
L16	33	Stacked Plate	34.50 - 39.50	Manual	1.0000
L16	34	Stacked Plate	34.50 - 39.50	Manual	1.0000
L17	18	MP3-06	29.00 - 34.50	Manual	1.0000
L17	19	MP3-06	29.00 - 34.50	Manual	1.0000
L17	21	MP3-06	29.00 - 34.50	Manual	1.0000
L17	22	MP3-05	29.00 - 34.50	Manual	1.0000
L17	23	MP3-05	29.00 - 32.00	Manual	1.0000
L17	24	MP3-05	29.00 - 32.00	Manual	1.0000
L17	32	Stacked Plate	29.00 - 34.50	Manual	1.0000
L17	33	Stacked Plate	29.00 - 34.50	Manual	1.0000
L17	34	Stacked Plate	29.00 - 34.50	Manual	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L18	18	MP3-06	28.00 - 29.00	Manual	1.0000
L18	19	MP3-06	28.00 - 29.00	Manual	1.0000
L18	21	MP3-06	28.00 - 29.00	Manual	1.0000
L18	22	MP3-05	28.00 - 29.00	Manual	1.0000
L18	23	MP3-05	28.00 - 29.00	Manual	1.0000
L18	24	MP3-05	28.00 - 29.00	Manual	1.0000
L18	32	Stacked Plate	28.00 - 29.00	Manual	1.0000
L18	33	Stacked Plate	28.00 - 29.00	Manual	1.0000
L18	34	Stacked Plate	28.00 - 29.00	Manual	1.0000
L19	18	MP3-06	23.50 - 28.00	Manual	1.0000
L19	19	MP3-06	23.50 - 28.00	Manual	1.0000
L19	21	MP3-06	23.50 - 28.00	Manual	1.0000
L19	22	MP3-05	23.50 - 28.00	Manual	1.0000
L19	23	MP3-05	23.50 - 28.00	Manual	1.0000
L19	24	MP3-05	23.50 - 28.00	Manual	1.0000
L19	28	CCI-065125	23.50 - 25.50	Manual	1.0000
L19	29	CCI-060100	23.50 - 25.50	Manual	1.0000
L19	30	CCI-060100	23.50 - 25.50	Manual	1.0000
L19	32	Stacked Plate	23.50 - 28.00	Manual	1.0000
L19	33	Stacked Plate	23.50 - 28.00	Manual	1.0000
L19	34	Stacked Plate	23.50 - 28.00	Manual	1.0000
L20	18	MP3-06	23.25 - 23.50	Manual	1.0000
L20	19	MP3-06	23.25 - 23.50	Manual	1.0000
L20	21	MP3-06	23.25 - 23.50	Manual	1.0000
L20	22	MP3-05	23.25 - 23.50	Manual	1.0000
L20	23	MP3-05	23.25 - 23.50	Manual	1.0000
L20	24	MP3-05	23.25 - 23.50	Manual	1.0000
L20	28	CCI-065125	23.25 - 23.50	Manual	1.0000
L20	29	CCI-060100	23.25 - 23.50	Manual	1.0000
L20	30	CCI-060100	23.25 - 23.50	Manual	1.0000
L20	32	Stacked Plate	23.25 - 23.50	Manual	1.0000
L20	33	Stacked Plate	23.25 - 23.50	Manual	1.0000
L20	34	Stacked Plate	23.25 - 23.50	Manual	1.0000
L21	18	MP3-06	22.75 - 23.25	Manual	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L21	19	MP3-06	22.75 - 23.25	Manual	1.0000
L21	21	MP3-06	22.75 - 23.25	Manual	1.0000
L21	22	MP3-05	22.75 - 23.25	Manual	1.0000
L21	23	MP3-05	22.75 - 23.25	Manual	1.0000
L21	24	MP3-05	22.75 - 23.25	Manual	1.0000
L21	28	CCI-065125	22.75 - 23.25	Manual	1.0000
L21	29	CCI-060100	22.75 - 23.25	Manual	1.0000
L21	30	CCI-060100	22.75 - 23.25	Manual	1.0000
L21	32	Stacked Plate	22.75 - 23.25	Manual	1.0000
L21	33	Stacked Plate	22.75 - 23.25	Manual	1.0000
L21	34	Stacked Plate	22.75 - 23.25	Manual	1.0000
L22	18	MP3-06	22.50 - 22.75	Manual	1.0000
L22	19	MP3-06	22.50 - 22.75	Manual	1.0000
L22	21	MP3-06	22.50 - 22.75	Manual	1.0000
L22	22	MP3-05	22.50 - 22.75	Manual	1.0000
L22	23	MP3-05	22.50 - 22.75	Manual	1.0000
L22	24	MP3-05	22.50 - 22.75	Manual	1.0000
L22	28	CCI-065125	22.50 - 22.75	Manual	1.0000
L22	29	CCI-060100	22.50 - 22.75	Manual	1.0000
L22	30	CCI-060100	22.50 - 22.75	Manual	1.0000
L22	32	Stacked Plate	22.50 - 22.75	Manual	1.0000
L22	33	Stacked Plate	22.50 - 22.75	Manual	1.0000
L22	34	Stacked Plate	22.50 - 22.75	Manual	1.0000
L23	18	MP3-06	17.50 - 22.50	Manual	1.0000
L23	19	MP3-06	17.50 - 22.50	Manual	1.0000
L23	20	MP3-06	17.50 - 19.00	Manual	1.0000
L23	21	MP3-06	17.50 - 22.50	Manual	1.0000
L23	22	MP3-05	17.50 - 22.50	Manual	1.0000
L23	23	MP3-05	17.50 - 22.50	Manual	1.0000
L23	24	MP3-05	17.50 - 22.50	Manual	1.0000
L23	28	CCI-065125	17.50 - 22.50	Manual	1.0000
L23	29	CCI-060100	17.50 - 22.50	Manual	1.0000
L23	30	CCI-060100	17.50 - 22.50	Manual	1.0000
L23	32	Stacked Plate	17.50 - 22.50	Manual	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L23	33	Stacked Plate	17.50 - 22.50	Manual	1.0000
L23	34	Stacked Plate	17.50 - 22.50	Manual	1.0000
L24	18	MP3-06	15.75 - 17.50	Manual	1.0000
L24	19	MP3-06	15.75 - 17.50	Manual	1.0000
L24	20	MP3-06	15.75 - 17.50	Manual	1.0000
L24	21	MP3-06	15.75 - 17.50	Manual	1.0000
L24	22	MP3-05	15.75 - 17.50	Manual	1.0000
L24	23	MP3-05	15.75 - 17.50	Manual	1.0000
L24	24	MP3-05	15.75 - 17.50	Manual	1.0000
L24	28	CCI-065125	15.75 - 17.50	Manual	1.0000
L24	29	CCI-060100	15.75 - 17.50	Manual	1.0000
L24	30	CCI-060100	15.75 - 17.50	Manual	1.0000
L24	32	Stacked Plate	15.75 - 17.50	Manual	1.0000
L24	33	Stacked Plate	15.75 - 17.50	Manual	1.0000
L24	34	Stacked Plate	15.75 - 17.50	Manual	1.0000
L25	18	MP3-06	15.50 - 15.75	Manual	1.0000
L25	19	MP3-06	15.50 - 15.75	Manual	1.0000
L25	20	MP3-06	15.50 - 15.75	Manual	1.0000
L25	21	MP3-06	15.50 - 15.75	Manual	1.0000
L25	22	MP3-05	15.50 - 15.75	Manual	1.0000
L25	23	MP3-05	15.50 - 15.75	Manual	1.0000
L25	24	MP3-05	15.50 - 15.75	Manual	1.0000
L25	28	CCI-065125	15.50 - 15.75	Manual	1.0000
L25	29	CCI-060100	15.50 - 15.75	Manual	1.0000
L25	30	CCI-060100	15.50 - 15.75	Manual	1.0000
L25	32	Stacked Plate	15.50 - 15.75	Manual	1.0000
L25	33	Stacked Plate	15.50 - 15.75	Manual	1.0000
L25	34	Stacked Plate	15.50 - 15.75	Manual	1.0000
L26	18	MP3-06	12.25 - 15.50	Manual	1.0000
L26	19	MP3-06	12.25 - 15.50	Manual	1.0000
L26	20	MP3-06	12.25 - 15.50	Manual	1.0000
L26	21	MP3-06	12.25 - 15.50	Manual	1.0000
L26	22	MP3-05	12.25 - 15.50	Manual	1.0000
L26	23	MP3-05	12.25 - 15.50	Manual	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L26	24	MP3-05	12.25 - 15.50	Manual	1.0000
L26	28	CCI-065125	12.25 - 15.50	Manual	1.0000
L26	29	CCI-060100	12.25 - 15.50	Manual	1.0000
L26	30	CCI-060100	12.25 - 15.50	Manual	1.0000
L26	32	Stacked Plate	12.25 - 15.50	Manual	1.0000
L26	33	Stacked Plate	12.25 - 15.50	Manual	1.0000
L26	34	Stacked Plate	12.25 - 15.50	Manual	1.0000
L27	18	MP3-06	12.00 - 12.25	Manual	1.0000
L27	19	MP3-06	12.00 - 12.25	Manual	1.0000
L27	20	MP3-06	12.00 - 12.25	Manual	1.0000
L27	21	MP3-06	12.00 - 12.25	Manual	1.0000
L27	22	MP3-05	12.00 - 12.25	Manual	1.0000
L27	23	MP3-05	12.00 - 12.25	Manual	1.0000
L27	24	MP3-05	12.00 - 12.25	Manual	1.0000
L27	28	CCI-065125	12.00 - 12.25	Manual	1.0000
L27	29	CCI-060100	12.00 - 12.25	Manual	1.0000
L27	30	CCI-060100	12.00 - 12.25	Manual	1.0000
L27	32	Stacked Plate	12.00 - 12.25	Manual	1.0000
L27	33	Stacked Plate	12.00 - 12.25	Manual	1.0000
L27	34	Stacked Plate	12.00 - 12.25	Manual	1.0000
L28	18	MP3-06	11.75 - 12.00	Manual	1.0000
L28	19	MP3-06	11.75 - 12.00	Manual	1.0000
L28	20	MP3-06	11.75 - 12.00	Manual	1.0000
L28	21	MP3-06	11.75 - 12.00	Manual	1.0000
L28	22	MP3-05	11.75 - 12.00	Manual	1.0000
L28	23	MP3-05	11.75 - 12.00	Manual	1.0000
L28	24	MP3-05	11.75 - 12.00	Manual	1.0000
L28	28	CCI-065125	11.75 - 12.00	Manual	1.0000
L28	29	CCI-060100	11.75 - 12.00	Manual	1.0000
L28	30	CCI-060100	11.75 - 12.00	Manual	1.0000
L28	32	Stacked Plate	11.75 - 12.00	Manual	1.0000
L28	33	Stacked Plate	11.75 - 12.00	Manual	1.0000
L28	34	Stacked Plate	11.75 - 12.00	Manual	1.0000
L29	18	MP3-06	11.50 - 11.75	Manual	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L29	19	MP3-06	11.50 - 11.75	Manual	1.0000
L29	20	MP3-06	11.50 - 11.75	Manual	1.0000
L29	21	MP3-06	11.50 - 11.75	Manual	1.0000
L29	22	MP3-05	11.50 - 11.75	Manual	1.0000
L29	23	MP3-05	11.50 - 11.75	Manual	1.0000
L29	24	MP3-05	11.50 - 11.75	Manual	1.0000
L29	28	CCI-065125	11.50 - 11.75	Manual	1.0000
L29	29	CCI-060100	11.50 - 11.75	Manual	1.0000
L29	30	CCI-060100	11.50 - 11.75	Manual	1.0000
L29	32	Stacked Plate	11.50 - 11.75	Manual	1.0000
L29	33	Stacked Plate	11.50 - 11.75	Manual	1.0000
L29	34	Stacked Plate	11.50 - 11.75	Manual	1.0000
L30	18	MP3-06	6.50 - 11.50	Manual	1.0000
L30	19	MP3-06	6.50 - 11.50	Manual	1.0000
L30	20	MP3-06	6.50 - 11.50	Manual	1.0000
L30	21	MP3-06	8.50 - 11.50	Manual	1.0000
L30	22	MP3-05	10.00 - 11.50	Manual	1.0000
L30	23	MP3-05	6.50 - 11.50	Manual	1.0000
L30	24	MP3-05	6.50 - 11.50	Manual	1.0000
L30	28	CCI-065125	6.50 - 11.50	Manual	1.0000
L30	29	CCI-060100	6.50 - 11.50	Manual	1.0000
L30	30	CCI-060100	6.50 - 11.50	Manual	1.0000
L30	32	Stacked Plate	6.50 - 11.50	Manual	1.0000
L30	33	Stacked Plate	6.50 - 11.50	Manual	1.0000
L30	34	Stacked Plate	6.50 - 11.50	Manual	1.0000
L31	18	MP3-06	6.00 - 6.50	Manual	1.0000
L31	19	MP3-06	6.00 - 6.50	Manual	1.0000
L31	20	MP3-06	6.00 - 6.50	Manual	1.0000
L31	23	MP3-05	6.00 - 6.50	Manual	1.0000
L31	24	MP3-05	6.00 - 6.50	Manual	1.0000
L31	28	CCI-065125	6.00 - 6.50	Manual	1.0000
L31	29	CCI-060100	6.00 - 6.50	Manual	1.0000
L31	30	CCI-060100	6.00 - 6.50	Manual	1.0000
L31	32	Stacked Plate	6.00 - 6.50	Manual	1.0000
L31	33	Stacked Plate	6.00 - 6.50	Manual	1.0000
L31	34	Stacked Plate	6.00 - 6.50	Manual	1.0000
L32	18	MP3-06	5.75 - 6.00	Manual	1.0000
L32	19	MP3-06	5.75 - 6.00	Manual	1.0000
L32	20	MP3-06	5.75 - 6.00	Manual	1.0000
L32	23	MP3-05	5.75 - 6.00	Manual	1.0000
L32	24	MP3-05	5.75 - 6.00	Manual	1.0000
L32	28	CCI-065125	5.75 - 6.00	Manual	1.0000
L32	29	CCI-060100	5.75 - 6.00	Manual	1.0000
L32	30	CCI-060100	5.75 - 6.00	Manual	1.0000
L32	32	Stacked Plate	5.75 - 6.00	Manual	1.0000
L32	33	Stacked Plate	5.75 - 6.00	Manual	1.0000
L32	34	Stacked Plate	5.75 - 6.00	Manual	1.0000
L33	18	MP3-06	4.50 - 5.75	Manual	1.0000
L33	19	MP3-06	4.50 - 5.75	Manual	1.0000
L33	20	MP3-06	4.50 - 5.75	Manual	1.0000
L33	23	MP3-05	4.50 - 5.75	Manual	1.0000
L33	24	MP3-05	4.50 - 5.75	Manual	1.0000
L33	28	CCI-065125	4.50 - 5.75	Manual	1.0000
L33	29	CCI-060100	4.50 - 5.75	Manual	1.0000
L33	30	CCI-060100	4.50 - 5.75	Manual	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L33	32	Stacked Plate	4.50 - 5.75	Manual	1.0000
L33	33	Stacked Plate	4.50 - 5.75	Manual	1.0000
L33	34	Stacked Plate	4.50 - 5.75	Manual	1.0000
L34	18	MP3-06	4.25 - 4.50	Manual	1.0000
L34	19	MP3-06	4.25 - 4.50	Manual	1.0000
L34	20	MP3-06	4.25 - 4.50	Manual	1.0000
L34	23	MP3-05	4.25 - 4.50	Manual	1.0000
L34	24	MP3-05	4.25 - 4.50	Manual	1.0000
L34	28	CCI-065125	4.25 - 4.50	Manual	1.0000
L34	29	CCI-060100	4.25 - 4.50	Manual	1.0000
L34	30	CCI-060100	4.25 - 4.50	Manual	1.0000
L34	32	Stacked Plate	4.25 - 4.50	Manual	1.0000
L34	33	Stacked Plate	4.25 - 4.50	Manual	1.0000
L34	34	Stacked Plate	4.25 - 4.50	Manual	1.0000
L35	18	MP3-06	3.00 - 4.25	Manual	1.0000
L35	19	MP3-06	3.00 - 4.25	Manual	1.0000
L35	20	MP3-06	3.00 - 4.25	Manual	1.0000
L35	23	MP3-05	3.00 - 4.25	Manual	1.0000
L35	24	MP3-05	3.00 - 4.25	Manual	1.0000
L35	28	CCI-065125	3.00 - 4.25	Manual	1.0000
L35	29	CCI-060100	4.00 - 4.25	Manual	1.0000
L35	30	CCI-060100	4.00 - 4.25	Manual	1.0000
L35	32	Stacked Plate	3.00 - 4.25	Manual	1.0000
L35	33	Stacked Plate	3.00 - 4.25	Manual	1.0000
L35	34	Stacked Plate	3.00 - 4.25	Manual	1.0000
L36	18	MP3-06	2.75 - 3.00	Manual	1.0000
L36	19	MP3-06	2.75 - 3.00	Manual	1.0000
L36	20	MP3-06	2.75 - 3.00	Manual	1.0000
L36	23	MP3-05	2.75 - 3.00	Manual	1.0000
L36	24	MP3-05	2.75 - 3.00	Manual	1.0000
L36	28	CCI-065125	2.75 - 3.00	Manual	1.0000
L36	32	Stacked Plate	2.75 - 3.00	Manual	1.0000
L36	33	Stacked Plate	2.75 - 3.00	Manual	1.0000
L36	34	Stacked Plate	2.75 - 3.00	Manual	1.0000
L37	18	MP3-06	1.75 - 2.75	Manual	1.0000
L37	19	MP3-06	1.75 - 2.75	Manual	1.0000
L37	20	MP3-06	1.75 - 2.75	Manual	1.0000
L37	23	MP3-05	2.25 - 2.75	Manual	1.0000
L37	24	MP3-05	2.25 - 2.75	Manual	1.0000
L37	28	CCI-065125	1.75 - 2.75	Manual	1.0000
L37	32	Stacked Plate	1.75 - 2.75	Manual	1.0000
L37	33	Stacked Plate	1.75 - 2.75	Manual	1.0000
L37	34	Stacked Plate	1.75 - 2.75	Manual	1.0000
L38	28	CCI-065125	1.50 - 1.75	Manual	1.0000
L38	32	Stacked Plate	1.50 - 1.75	Manual	1.0000
L38	33	Stacked Plate	1.50 - 1.75	Manual	1.0000
L38	34	Stacked Plate	1.50 - 1.75	Manual	1.0000
L39	28	CCI-065125	1.25 - 1.50	Manual	1.0000
L40	28	CCI-065125	1.00 - 1.25	Manual	1.0000
L41	28	CCI-065125	0.50 - 1.00	Manual	1.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			ft ft ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
8-ft Ladder	C	From Leg	2.0000 0.00	0.0000	99.0000	No Ice 7.0700 9.7300	7.0700 7.0700 9.7300	0.04 0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
			1.00			11.1900	11.1900	0.08	
					1/2" Ice	13.9800	13.9800	0.11	
					1" Ice				
					2" Ice				
Top Hat 15" Diameter x 4' Tall	C	None		0.0000	100.0000	No Ice	2.5778	2.5778	0.20
						1/2"	3.8792	3.8792	0.24
						Ice	4.1898	4.1898	0.29
						1" Ice	4.8389	4.8389	0.40
						2" Ice			
*****									
***									
X7C-680 w/ Mount Pipe	A	From Face	4.0000 -4.00 0.00	0.0000	102.0000	No Ice	7.2800	5.9100	0.07
						1/2"	7.9500	6.5700	0.13
						Ice	8.6400	7.2300	0.21
						1" Ice	10.0700	8.6200	0.40
						2" Ice			
X7C-680 w/ Mount Pipe	B	From Face	4.0000 -4.00 0.00	0.0000	102.0000	No Ice	7.2800	5.9100	0.07
						1/2"	7.9500	6.5700	0.13
						Ice	8.6400	7.2300	0.21
						1" Ice	10.0700	8.6200	0.40
						2" Ice			
X7C-680 w/ Mount Pipe	C	From Face	4.0000 -4.00 0.00	0.0000	102.0000	No Ice	7.2800	5.9100	0.07
						1/2"	7.9500	6.5700	0.13
						Ice	8.6400	7.2300	0.21
						1" Ice	10.0700	8.6200	0.40
						2" Ice			
(2) NHH-65B-R2B w/ Mount Pipe	A	From Face	4.0000 4.00 0.00	0.0000	102.0000	No Ice	4.0900	3.2900	0.07
						1/2"	4.4800	3.6700	0.13
						Ice	4.8800	4.0600	0.21
						1" Ice	5.7000	4.8600	0.39
						2" Ice			
(2) NHH-65B-R2B w/ Mount Pipe	B	From Face	4.0000 4.00 0.00	0.0000	102.0000	No Ice	4.0900	3.2900	0.07
						1/2"	4.4800	3.6700	0.13
						Ice	4.8800	4.0600	0.21
						1" Ice	5.7000	4.8600	0.39
						2" Ice			
(2) NHH-65B-R2B w/ Mount Pipe	C	From Face	4.0000 4.00 0.00	0.0000	102.0000	No Ice	4.0900	3.2900	0.07
						1/2"	4.4800	3.6700	0.13
						Ice	4.8800	4.0600	0.21
						1" Ice	5.7000	4.8600	0.39
						2" Ice			
MT6407-77A w/ Mount Pipe	A	From Face	4.0000 8.00 0.00	0.0000	102.0000	No Ice	4.9069	2.6821	0.10
						1/2"	5.2559	3.1450	0.14
						Ice	5.6147	3.6241	0.18
						1" Ice	6.3615	4.6310	0.29
						2" Ice			
MT6407-77A w/ Mount Pipe	B	From Face	4.0000 8.00 0.00	0.0000	102.0000	No Ice	4.9069	2.6821	0.10
						1/2"	5.2559	3.1450	0.14
						Ice	5.6147	3.6241	0.18
						1" Ice	6.3615	4.6310	0.29
						2" Ice			
MT6407-77A w/ Mount Pipe	C	From Face	4.0000 8.00 0.00	0.0000	102.0000	No Ice	4.9069	2.6821	0.10
						1/2"	5.2559	3.1450	0.14
						Ice	5.6147	3.6241	0.18
						1" Ice	6.3615	4.6310	0.29
						2" Ice			
RFV01U-D1A	A	From Face	4.0000 0.00 2.00	0.0000	102.0000	No Ice	1.8750	1.2500	0.08
						1/2"	2.0454	1.3926	0.10
						Ice	2.2231	1.5426	0.12
						1" Ice	2.6009	1.8648	0.18
						2" Ice			
RFV01U-D1A	B	From Face	4.0000 0.00 2.00	0.0000	102.0000	No Ice	1.8750	1.2500	0.08
						1/2"	2.0454	1.3926	0.10
						Ice	2.2231	1.5426	0.12
						1" Ice	2.6009	1.8648	0.18

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C <sub>AA</sub> <sub>Front</sub>	C <sub>AA</sub> <sub>Side</sub>	Weight
			Horz	Lateral	Vert					
RFV01U-D1A	C	From Face	4.0000	0.0000	102.0000	2" Ice	1.8750	1.2500	0.08	
			0.00	0.0000	102.0000	No Ice	1.8750	1.2500	0.08	
			2.00	0.0000	102.0000	1/2"	2.0454	1.3926	0.10	
				0.0000	102.0000	Ice	2.2231	1.5426	0.12	
				0.0000	102.0000	1" Ice	2.6009	1.8648	0.18	
RFV01U-D2A	A	From Centroid-Face	4.0000	0.0000	102.0000	2" Ice	1.8750	1.0125	0.07	
			0.00	0.0000	102.0000	No Ice	1.8750	1.0125	0.07	
			2.00	0.0000	102.0000	1/2"	2.0454	1.1445	0.09	
				0.0000	102.0000	Ice	2.2231	1.2840	0.11	
				0.0000	102.0000	1" Ice	2.6009	1.5851	0.15	
RFV01U-D2A	B	From Face	4.0000	0.0000	102.0000	2" Ice	1.8750	1.0125	0.07	
			0.00	0.0000	102.0000	No Ice	1.8750	1.0125	0.07	
			2.00	0.0000	102.0000	1/2"	2.0454	1.1445	0.09	
				0.0000	102.0000	Ice	2.2231	1.2840	0.11	
				0.0000	102.0000	1" Ice	2.6009	1.5851	0.15	
RFV01U-D2A	C	From Face	4.0000	0.0000	102.0000	2" Ice	1.8750	1.0125	0.07	
			0.00	0.0000	102.0000	No Ice	1.8750	1.0125	0.07	
			2.00	0.0000	102.0000	1/2"	2.0454	1.1445	0.09	
				0.0000	102.0000	Ice	2.2231	1.2840	0.11	
				0.0000	102.0000	1" Ice	2.6009	1.5851	0.15	
RVZDC-6627-PF-48	A	From Face	4.0000	0.0000	102.0000	2" Ice	3.7922	2.5137	0.03	
			0.00	0.0000	102.0000	No Ice	3.7922	2.5137	0.03	
			2.00	0.0000	102.0000	1/2"	4.0441	2.7270	0.06	
				0.0000	102.0000	Ice	4.3033	2.9472	0.10	
				0.0000	102.0000	1" Ice	4.8439	3.4168	0.18	
RVZDC-6627-PF-48	A	From Face	4.0000	0.0000	102.0000	2" Ice	3.7922	2.5137	0.03	
			0.00	0.0000	102.0000	No Ice	3.7922	2.5137	0.03	
			2.00	0.0000	102.0000	1/2"	4.0441	2.7270	0.06	
				0.0000	102.0000	Ice	4.3033	2.9472	0.10	
				0.0000	102.0000	1" Ice	4.8439	3.4168	0.18	
12' Horizontal HSS 2" x 2" Tube	A	From Leg	4.0000	0.0000	102.0000	2" Ice	4.0000	0.0389	0.06	
			0.00	0.0000	102.0000	No Ice	4.0000	0.0389	0.06	
			0.00	0.0000	102.0000	1/2"	5.3580	0.0691	0.09	
				0.0000	102.0000	Ice	6.7284	0.0994	0.12	
				0.0000	102.0000	1" Ice	9.5062	0.1599	0.22	
12' Horizontal HSS 2" x 2" Tube	B	From Leg	4.0000	0.0000	102.0000	2" Ice	4.0000	0.0389	0.06	
			0.00	0.0000	102.0000	No Ice	4.0000	0.0389	0.06	
			0.00	0.0000	102.0000	1/2"	5.3580	0.0691	0.09	
				0.0000	102.0000	Ice	6.7284	0.0994	0.12	
				0.0000	102.0000	1" Ice	9.5062	0.1599	0.22	
12' Horizontal HSS 2" x 2" Tube	C	From Leg	4.0000	0.0000	102.0000	2" Ice	4.0000	0.0389	0.06	
			0.00	0.0000	102.0000	No Ice	4.0000	0.0389	0.06	
			0.00	0.0000	102.0000	1/2"	5.3580	0.0691	0.09	
				0.0000	102.0000	Ice	6.7284	0.0994	0.12	
				0.0000	102.0000	1" Ice	9.5062	0.1599	0.22	
Side Arm Mount [SO 203-3]	C	None		0.0000	102.0000	2" Ice	6.6800	6.6800	0.38	
				0.0000	102.0000	No Ice	6.6800	6.6800	0.38	
				0.0000	102.0000	1/2"	8.0500	8.0500	0.46	
				0.0000	102.0000	Ice	9.5500	9.5500	0.57	
				0.0000	102.0000	1" Ice	12.8000	12.8000	0.87	
Platform Mount (LP 101-1)	C	None		0.0000	102.0000	2" Ice	35.8300	35.8300	1.50	
				0.0000	102.0000	No Ice	35.8300	35.8300	1.50	
				0.0000	102.0000	1/2"	40.9800	40.9800	2.32	
				0.0000	102.0000	Ice	46.5700	46.5700	3.26	
				0.0000	102.0000	1" Ice	60.4600	60.4600	5.51	
*****										
ERICSSON AIR 21 B4A B2P	A	From Face	4.0000	0.0000	94.0000	2" Ice	3.1900	1.9800	0.09	
			4.00	0.0000	94.0000	No Ice	3.1900	1.9800	0.09	
			0.00	0.0000	94.0000	1/2"	3.5200	2.2800	0.13	
				0.0000	94.0000	Ice	3.8500	2.5900	0.18	
				0.0000	94.0000	1" Ice	4.5500	3.2500	0.29	
ERICSSON AIR 21 B2A B4P	A	From Face	4.0000	0.0000	94.0000	2" Ice	3.1900	1.9800	0.09	
			-4.00	0.0000	94.0000	No Ice	3.1900	1.9800	0.09	
			0.00	0.0000	94.0000	1/2"	3.5200	2.2800	0.13	
				0.0000	94.0000	Ice	3.8500	2.5900	0.18	
				0.0000	94.0000	1" Ice	4.5500	3.2500	0.29	

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>A</sub> Front	C <sub>A</sub> A <sub>A</sub> Side	Weight
			Horz	Lateral	Vert					
			ft	ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
							1" Ice	4.5500	3.2500	0.29
							2" Ice			
ERICSSON AIR 21 B4A	B	From Face	4.0000	0.0000	94.0000		No Ice	3.1900	1.9800	0.09
B2P			4.00				1/2"	3.5200	2.2800	0.13
			0.00				Ice	3.8500	2.5900	0.18
							1" Ice	4.5500	3.2500	0.29
							2" Ice			
ERICSSON AIR 21 B2A	B	From Face	4.0000	0.0000	94.0000		No Ice	3.1900	1.9800	0.09
B4P			-4.00				1/2"	3.5200	2.2800	0.13
			0.00				Ice	3.8500	2.5900	0.18
							1" Ice	4.5500	3.2500	0.29
							2" Ice			
ERICSSON AIR 21 B4A	C	From Face	4.0000	0.0000	94.0000		No Ice	3.1900	1.9800	0.09
B2P			4.00				1/2"	3.5200	2.2800	0.13
			0.00				Ice	3.8500	2.5900	0.18
							1" Ice	4.5500	3.2500	0.29
							2" Ice			
ERICSSON AIR 21 B2A	C	From Face	4.0000	0.0000	94.0000		No Ice	3.1900	1.9800	0.09
B4P			-4.00				1/2"	3.5200	2.2800	0.13
			0.00				Ice	3.8500	2.5900	0.18
							1" Ice	4.5500	3.2500	0.29
							2" Ice			
T-Arm Mount [TA 702-3]	C	None		0.0000	94.0000		No Ice	4.7500	4.7500	0.34
							1/2"	5.8200	5.8200	0.43
							Ice	6.9800	6.9800	0.55
							1" Ice	9.7200	9.7200	0.87
							2" Ice			
*****										
80010965 w/ Mount Pipe	A	From Face	4.0000	0.0000	84.0000		No Ice	12.2600	5.7900	0.14
			-3.00				1/2"	13.0300	6.4700	0.23
			3.00				Ice	13.8000	7.1700	0.33
							1" Ice	15.4100	8.6000	0.57
							2" Ice			
80010965 w/ Mount Pipe	B	From Face	4.0000	0.0000	84.0000		No Ice	12.2600	5.7900	0.14
			-3.00				1/2"	13.0300	6.4700	0.23
			3.00				Ice	13.8000	7.1700	0.33
							1" Ice	15.4100	8.6000	0.57
							2" Ice			
80010965 w/ Mount Pipe	C	From Face	4.0000	0.0000	84.0000		No Ice	12.2600	5.7900	0.14
			-3.00				1/2"	13.0300	6.4700	0.23
			3.00				Ice	13.8000	7.1700	0.33
							1" Ice	15.4100	8.6000	0.57
							2" Ice			
DMP65R-BU6e w/ Mount Pipe	A	From Face	4.0000	0.0000	84.0000		No Ice	12.5200	7.4100	0.13
			-6.00				1/2"	13.2900	8.1200	0.22
			3.00				Ice	14.0900	8.8400	0.33
							1" Ice	15.7200	10.3300	0.57
							2" Ice			
DMP65R-BU6e w/ Mount Pipe	B	From Face	4.0000	0.0000	84.0000		No Ice	12.5200	7.4100	0.13
			-6.00				1/2"	13.2900	8.1200	0.22
			3.00				Ice	14.0900	8.8400	0.33
							1" Ice	15.7200	10.3300	0.57
							2" Ice			
DMP65R-BU6e w/ Mount Pipe	C	From Face	4.0000	0.0000	84.0000		No Ice	12.5200	7.4100	0.13
			-6.00				1/2"	13.2900	8.1200	0.22
			3.00				Ice	14.0900	8.8400	0.33
							1" Ice	15.7200	10.3300	0.57
							2" Ice			
AIR 6419 B77G w/ Mount Pipe	A	From Face	4.0000	0.0000	84.0000		No Ice	4.3200	2.4900	0.08
			7.00				1/2"	4.7400	2.8400	0.11
			2.00				Ice	5.1700	3.2100	0.15
							1" Ice	6.0900	4.0000	0.24
							2" Ice			
AIR 6419 B77G w/ Mount Pipe	B	From Face	4.0000	0.0000	84.0000		No Ice	4.3200	2.4900	0.08
			7.00					4.7400	2.8400	0.11

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	
			2.00			1/2" Ice 6.0900	3.2100 4.0000	0.15 0.24	
AIR 6419 B77G w/ Mount Pipe	C	From Face	4.0000 7.00 2.00	0.0000	84.0000	No Ice 1/2" Ice 5.1700 6.0900	2.4900 2.8400 3.2100 4.0000	0.08 0.11 0.15 0.24	
AIR 6449 N77 w/ Mount Pipe	A	From Face	4.0000 5.00 2.00	0.0000	84.0000	No Ice 1/2" Ice 4.3500 5.1100	2.7200 3.0300 3.3600 4.0500	0.11 0.15 0.20 0.31	
AIR 6449 N77 w/ Mount Pipe	B	From Face	4.0000 5.00 2.00	0.0000	84.0000	No Ice 1/2" Ice 4.3500 5.1100	2.7200 3.0300 3.3600 4.0500	0.11 0.15 0.20 0.31	
AIR 6449 N77 w/ Mount Pipe	C	From Face	4.0000 5.00 2.00	0.0000	84.0000	No Ice 1/2" Ice 4.3500 5.1100	2.7200 3.0300 3.3600 4.0500	0.11 0.15 0.20 0.31	
RRUS 32 B2	A	From Face	4.0000 0.00 3.00	0.0000	84.0000	No Ice 1/2" Ice 3.1941 3.6753	1.6681 1.8552 2.0493 2.4585	0.05 0.07 0.10 0.16	
RRUS 32 B2	B	From Face	4.0000 0.00 3.00	0.0000	84.0000	No Ice 1/2" Ice 3.1941 3.6753	1.6681 1.8552 2.0493 2.4585	0.05 0.07 0.10 0.16	
RRUS 32 B2	C	From Face	4.0000 0.00 3.00	0.0000	84.0000	No Ice 1/2" Ice 3.1941 3.6753	1.6681 1.8552 2.0493 2.4585	0.05 0.07 0.10 0.16	
RRUS 32 B66	A	From Face	4.0000 0.00 3.00	0.0000	84.0000	No Ice 1/2" Ice 3.1941 3.6753	1.6681 1.8552 2.0493 2.4585	0.05 0.07 0.10 0.16	
RRUS 32 B66	B	From Face	4.0000 0.00 3.00	0.0000	84.0000	No Ice 1/2" Ice 3.1941 3.6753	1.6681 1.8552 2.0493 2.4585	0.05 0.07 0.10 0.16	
RRUS 32 B66	C	From Face	4.0000 0.00 3.00	0.0000	84.0000	No Ice 1/2" Ice 3.1941 3.6753	1.6681 1.8552 2.0493 2.4585	0.05 0.07 0.10 0.16	
RRUS 4478 B14	A	From Face	4.0000 0.00 3.00	0.0000	84.0000	No Ice 1/2" Ice 2.3860 2.7804	1.2459 1.3960 1.5536 1.8909	0.06 0.08 0.10 0.15	
RRUS 4478 B14	B	From Face	4.0000 0.00 3.00	0.0000	84.0000	No Ice 1/2" Ice 2.3860 2.7804	1.2459 1.3960 1.5536 1.8909	0.06 0.08 0.10 0.15	
RRUS 4478 B14	C	From Face	4.0000	0.0000	84.0000	No Ice	2.0212	1.2459	0.06

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	
			0.00			1/2"	2.1999	1.3960	0.08
			3.00			Ice	2.3860	1.5536	0.10
						1" Ice	2.7804	1.8909	0.15
						2" Ice			
RRUS 32 B30	A	From Face	4.0000	0.0000	84.0000	No Ice	2.7427	1.6681	0.05
			0.00			1/2"	2.9647	1.8552	0.07
			3.00			Ice	3.1941	2.0493	0.10
						1" Ice	3.6753	2.4585	0.16
						2" Ice			
RRUS 32 B30	B	From Face	4.0000	0.0000	84.0000	No Ice	2.7427	1.6681	0.05
			0.00			1/2"	2.9647	1.8552	0.07
			3.00			Ice	3.1941	2.0493	0.10
						1" Ice	3.6753	2.4585	0.16
						2" Ice			
RRUS 32 B30	C	From Face	4.0000	0.0000	84.0000	No Ice	2.7427	1.6681	0.05
			0.00			1/2"	2.9647	1.8552	0.07
			3.00			Ice	3.1941	2.0493	0.10
						1" Ice	3.6753	2.4585	0.16
						2" Ice			
RRUS 4449 B5/B12	A	From Face	4.0000	0.0000	84.0000	No Ice	1.9675	1.4081	0.07
			0.00			1/2"	2.1439	1.5637	0.09
			3.00			Ice	2.3278	1.7267	0.11
						1" Ice	2.7177	2.0749	0.16
						2" Ice			
RRUS 4449 B5/B12	B	From Face	4.0000	0.0000	84.0000	No Ice	1.9675	1.4081	0.07
			0.00			1/2"	2.1439	1.5637	0.09
			3.00			Ice	2.3278	1.7267	0.11
						1" Ice	2.7177	2.0749	0.16
						2" Ice			
RRUS 4449 B5/B12	C	From Face	4.0000	0.0000	84.0000	No Ice	1.9675	1.4081	0.07
			0.00			1/2"	2.1439	1.5637	0.09
			3.00			Ice	2.3278	1.7267	0.11
						1" Ice	2.7177	2.0749	0.16
						2" Ice			
DC6-48-60-18-8F	A	From Face	4.0000	0.0000	84.0000	No Ice	1.2117	1.2117	0.03
			0.00			1/2"	1.8924	1.8924	0.05
			3.00			Ice	2.1051	2.1051	0.08
						1" Ice	2.5703	2.5703	0.14
						2" Ice			
DC6-48-60-18-8F	C	From Face	4.0000	0.0000	84.0000	No Ice	1.2117	1.2117	0.03
			0.00			1/2"	1.8924	1.8924	0.05
			3.00			Ice	2.1051	2.1051	0.08
						1" Ice	2.5703	2.5703	0.14
						2" Ice			
DC9-48-60-24-8C-EV	B	From Face	4.0000	0.0000	84.0000	No Ice	2.7366	4.7848	0.03
			0.00			1/2"	2.9630	5.0645	0.06
			3.00			Ice	3.1964	5.3517	0.10
						1" Ice	3.6842	5.9483	0.20
						2" Ice			
(2) T-Arm Mount [TA 602-3]	C	None		0.0000	84.0000	No Ice	13.4000	13.4000	0.77
						1/2"	16.4400	16.4400	1.00
						Ice	19.7000	19.7000	1.29
						1" Ice	25.8600	25.8600	2.05
						2" Ice			
*****									
MX08FRO665-21 w/ Mount Pipe	A	From Face	4.0000	0.0000	74.0000	No Ice	8.0100	4.2300	0.11
			0.00			1/2"	8.5200	4.6900	0.19
			0.00			Ice	9.0400	5.1600	0.29
						1" Ice	10.1100	6.1200	0.52
						2" Ice			
MX08FRO665-21 w/ Mount Pipe	B	From Face	4.0000	0.0000	74.0000	No Ice	8.0100	4.2300	0.11
			0.00			1/2"	8.5200	4.6900	0.19
			0.00			Ice	9.0400	5.1600	0.29
						1" Ice	10.1100	6.1200	0.52
						2" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement		C <sub>AA</sub>	C <sub>AA</sub>	Weight
			Horz	Lateral				Front	Side	
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
MX08FRO665-21 w/ Mount Pipe	C	From Face	4.0000	0.0000	0.0000	74.0000	No Ice	8.0100	4.2300	0.11
			0.00				1/2"	8.5200	4.6900	0.19
			0.00				Ice	9.0400	5.1600	0.29
							1" Ice	10.1100	6.1200	0.52
							2" Ice			
TA08025-B604	A	From Face	4.0000	0.0000	0.0000	74.0000	No Ice	1.9635	0.9811	0.06
			0.00				1/2"	2.1378	1.1117	0.08
			0.00				Ice	2.3195	1.2496	0.10
							1" Ice	2.7052	1.5477	0.15
							2" Ice			
TA08025-B605	A	From Face	4.0000	0.0000	0.0000	74.0000	No Ice	1.9635	1.1295	0.08
			0.00				1/2"	2.1378	1.2666	0.09
			0.00				Ice	2.3195	1.4112	0.11
							1" Ice	2.7052	1.7225	0.16
							2" Ice			
TA08025-B604	B	From Face	4.0000	0.0000	0.0000	74.0000	No Ice	1.9635	0.9811	0.06
			0.00				1/2"	2.1378	1.1117	0.08
			0.00				Ice	2.3195	1.2496	0.10
							1" Ice	2.7052	1.5477	0.15
							2" Ice			
TA08025-B605	B	From Face	4.0000	0.0000	0.0000	74.0000	No Ice	1.9635	1.1295	0.08
			0.00				1/2"	2.1378	1.2666	0.09
			0.00				Ice	2.3195	1.4112	0.11
							1" Ice	2.7052	1.7225	0.16
							2" Ice			
TA08025-B604	C	From Face	4.0000	0.0000	0.0000	74.0000	No Ice	1.9635	0.9811	0.06
			0.00				1/2"	2.1378	1.1117	0.08
			0.00				Ice	2.3195	1.2496	0.10
							1" Ice	2.7052	1.5477	0.15
							2" Ice			
TA08025-B605	C	From Face	4.0000	0.0000	0.0000	74.0000	No Ice	1.9635	1.1295	0.08
			0.00				1/2"	2.1378	1.2666	0.09
			0.00				Ice	2.3195	1.4112	0.11
							1" Ice	2.7052	1.7225	0.16
							2" Ice			
RDIDC-9181-PF-48	C	From Face	4.0000	0.0000	0.0000	74.0000	No Ice	2.0119	1.1682	0.02
			0.00				1/2"	2.1886	1.3109	0.04
			0.00				Ice	2.3727	1.4611	0.06
							1" Ice	2.7631	1.7837	0.11
							2" Ice			
2.375" OD x 6' Mount Pipe	A	From Face	4.0000	0.0000	0.0000	74.0000	No Ice	1.4250	1.4250	0.03
			4.00				1/2"	1.9250	1.9250	0.04
			0.00				Ice	2.2939	2.2939	0.05
							1" Ice	3.0596	3.0596	0.09
							2" Ice			
2.375" OD x 6' Mount Pipe	A	From Face	4.0000	0.0000	0.0000	74.0000	No Ice	1.4250	1.4250	0.03
			-4.00				1/2"	1.9250	1.9250	0.04
			0.00				Ice	2.2939	2.2939	0.05
							1" Ice	3.0596	3.0596	0.09
							2" Ice			
2.375" OD x 6' Mount Pipe	B	From Face	4.0000	0.0000	0.0000	74.0000	No Ice	1.4250	1.4250	0.03
			4.00				1/2"	1.9250	1.9250	0.04
			0.00				Ice	2.2939	2.2939	0.05
							1" Ice	3.0596	3.0596	0.09
							2" Ice			
2.375" OD x 6' Mount Pipe	B	From Face	4.0000	0.0000	0.0000	74.0000	No Ice	1.4250	1.4250	0.03
			-4.00				1/2"	1.9250	1.9250	0.04
			0.00				Ice	2.2939	2.2939	0.05
							1" Ice	3.0596	3.0596	0.09
							2" Ice			
2.375" OD x 6' Mount Pipe	C	From Face	4.0000	0.0000	0.0000	74.0000	No Ice	1.4250	1.4250	0.03
			4.00				1/2"	1.9250	1.9250	0.04
			0.00				Ice	2.2939	2.2939	0.05
							1" Ice	3.0596	3.0596	0.09
							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
2.375" OD x 6' Mount Pipe	C	From Face	4.0000	0.0000	74.0000	No Ice	1.4250	1.4250	0.03
			-4.00			1/2"	1.9250	1.9250	0.04
			0.00			Ice	2.2939	2.2939	0.05
						1" Ice	3.0596	3.0596	0.09
						2" Ice			
Commscope_MC-Pk8-DSH_Platform	C	None		0.0000	74.0000	No Ice	34.2400	34.2400	1.75
						1/2"	62.9500	62.9500	2.10
						Ice	91.6600	91.6600	2.45
						1" Ice	149.0800	149.0800	3.15
						2" Ice			
***									

**Tower Pressures - No Ice**

$G_H = 1.100$

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>Z</sub> psf	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>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>
L1 100.0000-95.0000	97.4785	1.259	46.36	6.614	A	0.000	6.614	6.614	100.00	0.000	0.000
					B	0.000	6.614	100.00	0.000	0.000	
					C	0.000	6.614	100.00	0.000	0.000	
L2 95.0000-90.0000	92.4796	1.245	45.85	6.956	A	0.000	6.956	6.956	100.00	0.000	0.000
					B	0.000	6.956	100.00	4.054	0.000	
					C	0.000	6.956	100.00	0.000	0.000	
L3 90.0000-85.5000	87.7342	1.231	45.34	6.553	A	0.000	6.553	6.553	100.00	2.221	0.000
					B	0.000	6.553	100.00	6.782	0.000	
					C	0.000	6.553	100.00	2.221	0.000	
L4 85.5000-85.2500	85.3750	1.224	45.08	0.369	A	0.000	0.369	0.369	100.00	0.222	0.000
					B	0.000	0.369	100.00	0.475	0.000	
					C	0.000	0.369	100.00	0.222	0.000	
L5 85.2500-80.2500	82.7314	1.216	44.79	7.566	A	0.000	7.566	7.566	100.00	5.454	0.000
					B	0.000	7.566	100.00	11.533	0.000	
					C	0.000	7.566	100.00	4.442	0.000	
L6 80.2500-75.2500	77.7322	1.2	44.20	7.912	A	0.000	7.912	7.912	100.00	8.489	0.000
					B	0.000	7.912	100.00	17.604	0.000	
					C	0.000	7.912	100.00	4.442	0.000	
L7 75.2500-70.2500	72.7329	1.184	43.59	8.256	A	0.000	8.256	8.256	100.00	9.256	0.000
					B	0.000	8.256	100.00	18.080	0.000	
					C	0.000	8.256	100.00	4.442	0.000	
L8 70.2500-62.5000	66.3359	1.161	42.75	13.478	A	0.000	13.478	13.478	100.00	15.728	0.000
					B	0.000	13.478	100.00	30.239	0.000	
					C	0.000	13.478	100.00	6.885	0.000	
L9 62.5000-61.5000	61.9994	1.144	42.15	1.765	A	0.000	1.765	1.765	100.00	2.029	0.000
					B	0.000	1.765	100.00	3.902	0.000	
					C	0.000	1.765	100.00	0.888	0.000	
L10 61.5000-56.5000	58.9843	1.132	41.71	9.033	A	0.000	9.033	9.033	100.00	10.537	0.000
					B	0.000	9.033	100.00	19.899	0.000	
					C	0.000	9.033	100.00	4.832	0.000	
L11 56.5000-54.7500	55.6231	1.119	41.20	3.243	A	0.000	3.243	3.243	100.00	4.007	0.000
					B	0.000	3.243	100.00	7.283	0.000	
					C	0.000	3.243	100.00	2.010	0.000	
L12 54.7500-54.5000	54.6250	1.114	41.04	0.465	A	0.000	0.465	0.465	100.00	0.572	0.000
					B	0.000	0.465	100.00	1.040	0.000	
					C	0.000	0.465	100.00	0.287	0.000	
L13 54.5000-49.5000	51.9851	1.103	40.61	9.491	A	0.000	9.491	9.491	100.00	11.447	0.000
					B	0.000	9.491	100.00	20.809	0.000	
					C	0.000	9.491	100.00	5.742	0.000	

Section Elevation	z	K <sub>z</sub>	q <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	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>
ft	ft		psf	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>			
L14 49.5000- 44.5000	46.9856	1.08	39.76	9.837	A	0.000	9.837	9.837	100.00	11.447	0.000
					B	0.000	9.837		100.00	20.809	0.000
					C	0.000	9.837		100.00	5.742	0.000
L15 44.5000- 39.5000	41.9861	1.054	38.83	10.182	A	0.000	10.182	10.182	100.00	11.447	0.000
					B	0.000	10.182		100.00	20.809	0.000
					C	0.000	10.182		100.00	5.742	0.000
L16 39.5000- 34.5000	36.9866	1.027	37.81	10.528	A	0.000	10.528	10.528	100.00	11.891	0.000
					B	0.000	10.528		100.00	20.809	0.000
					C	0.000	10.528		100.00	5.742	0.000
L17 34.5000- 29.0000	31.7343	0.994	36.61	11.977	A	0.000	11.977	11.977	100.00	17.478	0.000
					B	0.000	11.977		100.00	25.555	0.000
					C	0.000	11.977		100.00	8.981	0.000
L18 29.0000- 28.0000	28.4995	0.972	35.79	2.171	A	0.000	2.171	2.171	100.00	3.178	0.000
					B	0.000	2.171		100.00	5.050	0.000
					C	0.000	2.171		100.00	2.037	0.000
L19 28.0000- 23.5000	25.7397	0.951	35.03	9.940	A	0.000	9.940	9.940	100.00	16.300	0.000
					B	0.000	9.940		100.00	26.892	0.000
					C	0.000	9.940		100.00	9.165	0.000
L20 23.5000- 23.2500	23.3750	0.932	34.32	0.560	A	0.000	0.560	0.560	100.00	1.044	0.000
					B	0.000	0.560		100.00	1.783	0.000
					C	0.000	0.560		100.00	0.509	0.000
L21 23.2500- 22.7500	22.9999	0.929	34.21	1.123	A	0.000	1.123	1.123	100.00	2.089	0.000
					B	0.000	1.123		100.00	3.567	0.000
					C	0.000	1.123		100.00	1.018	0.000
L22 22.7500- 22.5000	22.6250	0.926	34.09	0.562	A	0.000	0.562	0.562	100.00	1.044	0.000
					B	0.000	0.562		100.00	1.783	0.000
					C	0.000	0.562		100.00	0.509	0.000
L23 22.5000- 17.5000	19.9877	0.902	33.21	11.420	A	0.000	11.420	11.420	100.00	20.889	0.000
					B	0.000	11.420		100.00	35.667	0.000
					C	0.000	11.420		100.00	11.906	0.000
L24 17.5000- 15.7500	16.6235	0.867	31.95	4.079	A	0.000	4.079	4.079	100.00	7.311	0.000
					B	0.000	4.079		100.00	12.484	0.000
					C	0.000	4.079		100.00	5.574	0.000
L25 15.7500- 15.5000	15.6250	0.856	31.53	0.586	A	0.000	0.586	0.586	100.00	1.044	0.000
					B	0.000	0.586		100.00	1.783	0.000
					C	0.000	0.586		100.00	0.796	0.000
L26 15.5000- 12.2500	13.8700	0.85	31.30	7.692	A	0.000	7.692	7.692	100.00	13.578	0.000
					B	0.000	7.692		100.00	23.184	0.000
					C	0.000	7.692		100.00	10.351	0.000
L27 12.2500- 12.0000	12.1250	0.85	31.30	0.599	A	0.000	0.599	0.599	100.00	1.044	0.000
					B	0.000	0.599		100.00	1.783	0.000
					C	0.000	0.599		100.00	0.796	0.000
L28 12.0000- 11.7500	11.8750	0.85	31.30	0.599	A	0.000	0.599	0.599	100.00	1.044	0.000
					B	0.000	0.599		100.00	1.783	0.000
					C	0.000	0.599		100.00	0.796	0.000
L29 11.7500- 11.5000	11.6250	0.85	31.30	0.602	A	0.000	0.602	0.602	100.00	1.044	0.000
					B	0.000	0.602		100.00	1.783	0.000
					C	0.000	0.602		100.00	0.796	0.000
L30 11.5000- 6.5000	8.9884	0.85	31.30	12.216	A	0.000	12.216	12.216	100.00	17.780	0.000
					B	0.000	12.216		100.00	35.667	0.000
					C	0.000	12.216		100.00	13.628	0.000
L31 6.5000- 6.0000	6.2499	0.85	31.30	1.240	A	0.000	1.240	1.240	100.00	1.645	0.000
					B	0.000	1.240		100.00	3.567	0.000
					C	0.000	1.240		100.00	1.018	0.000
L32 6.0000- 5.7500	5.8750	0.85	31.30	0.621	A	0.000	0.621	0.621	100.00	0.822	0.000
					B	0.000	0.621		100.00	1.783	0.000
					C	0.000	0.621		100.00	0.509	0.000
L33 5.7500- 4.5000	5.1243	0.85	31.30	3.120	A	0.000	3.120	3.120	100.00	4.112	0.000
					B	0.000	3.120		100.00	8.917	0.000
					C	0.000	3.120		100.00	2.546	0.000
L34 4.5000- 4.2500	4.3750	0.85	31.30	0.626	A	0.000	0.626	0.626	100.00	0.822	0.000
					B	0.000	0.626		100.00	1.783	0.000
					C	0.000	0.626		100.00	0.509	0.000
L35 4.2500- 3.0000	3.6243	0.85	31.30	3.144	A	0.000	3.144	3.144	100.00	3.112	0.000
					B	0.000	3.144		100.00	7.917	0.000
					C	0.000	3.144		100.00	2.546	0.000
L36 3.0000- 2.7500	2.8750	0.85	31.30	0.631	A	0.000	0.631	0.631	100.00	0.572	0.000
					B	0.000	0.631		100.00	1.533	0.000

Section Elevation ft	z ft	$K_z$	$q_z$ psf	$A_G$ 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>
L37 2.7500-1.7500	2.2496	0.85	31.30	2.534	C	0.000	0.631	2.534	100.00	0.509	0.000
					A	0.000	2.534		100.00	2.289	0.000
					B	0.000	2.534		100.00	5.689	0.000
L38 1.7500-1.5000	1.6250	0.85	31.30	0.636	C	0.000	2.534	0.636	100.00	1.593	0.000
					A	0.000	0.636		100.00	0.285	0.000
					B	0.000	0.636		100.00	1.024	0.000
L39 1.5000-1.2500	1.3750	0.85	31.30	0.637	C	0.000	0.636	0.637	100.00	0.000	0.000
					A	0.000	0.637		100.00	0.035	0.000
					B	0.000	0.637		100.00	0.524	0.000
L40 1.2500-1.0000	1.1250	0.85	31.30	0.637	C	0.000	0.637	0.637	100.00	0.000	0.000
					A	0.000	0.637		100.00	0.035	0.000
					B	0.000	0.637		100.00	0.524	0.000
L41 1.0000-0.0000	0.4996	0.85	31.30	2.558	C	0.000	0.637	2.558	100.00	0.000	0.000
					A	0.000	2.558		100.00	0.141	0.000
					B	0.000	2.558		100.00	1.555	0.000
					C	0.000	2.558		100.00	0.000	0.000

### Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	$K_z$	$q_z$ psf	$t_z$ in	$A_G$ 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 100.0000-95.0000	97.4785	1.259	7.19	1.42	7.798	A	0.000	7.798	7.798	100.00	0.000	0.000
						B	0.000	7.798	100.00	0.000	0.000	
						C	0.000	7.798	100.00	0.000	0.000	
L2 95.0000-90.0000	92.4796	1.245	7.11	1.41	8.134	A	0.000	8.134	8.134	100.00	0.000	0.000
						B	0.000	8.134	100.00	10.404	0.000	
						C	0.000	8.134	100.00	0.000	0.000	
L3 90.0000-85.5000	87.7342	1.231	7.03	1.41	7.607	A	0.000	7.607	7.607	100.00	2.924	0.000
						B	0.000	7.607	100.00	14.596	0.000	
						C	0.000	7.607	100.00	2.924	0.000	
L4 85.5000-85.2500	85.3750	1.224	6.99	1.40	0.428	A	0.000	0.428	0.428	100.00	0.292	0.000
						B	0.000	0.428	100.00	0.940	0.000	
						C	0.000	0.428	100.00	0.292	0.000	
L5 85.2500-80.2500	82.7314	1.216	6.94	1.40	8.731	A	0.000	8.731	8.731	100.00	7.036	0.000
						B	0.000	8.731	100.00	22.474	0.000	
						C	0.000	8.731	100.00	6.888	0.000	
L6 80.2500-75.2500	77.7322	1.2	6.85	1.39	9.070	A	0.000	9.070	9.070	100.00	10.613	0.000
						B	0.000	9.070	100.00	30.021	0.000	
						C	0.000	9.070	100.00	7.220	0.000	
L7 75.2500-70.2500	72.7329	1.184	6.76	1.38	9.406	A	0.000	9.406	9.406	100.00	12.564	0.000
						B	0.000	9.406	100.00	30.748	0.000	
						C	0.000	9.406	100.00	7.201	0.000	
L8 70.2500-62.5000	66.3359	1.161	6.63	1.37	15.244	A	0.000	15.244	15.244	100.00	22.086	0.000
						B	0.000	15.244	100.00	51.209	0.000	
						C	0.000	15.244	100.00	11.123	0.000	
L9 62.5000-61.5000	61.9994	1.144	6.53	1.36	1.993	A	0.000	1.993	1.993	100.00	2.850	0.000
						B	0.000	1.993	100.00	6.608	0.000	
						C	0.000	1.993	100.00	1.435	0.000	
L10 61.5000-56.5000	58.9843	1.132	6.46	1.35	10.159	A	0.000	10.159	10.159	100.00	14.591	0.000
						B	0.000	10.159	100.00	33.284	0.000	
						C	0.000	10.159	100.00	7.534	0.000	
L11 56.5000-54.7500	55.6231	1.119	6.39	1.34	3.634	A	0.000	3.634	3.634	100.00	5.417	0.000
						B	0.000	3.634	100.00	11.943	0.000	
						C	0.000	3.634	100.00	2.950	0.000	
L12 54.7500-54.5000	54.6250	1.114	6.36	1.34	0.521	A	0.000	0.521	0.521	100.00	0.773	0.000
						B	0.000	0.521	100.00	1.705	0.000	
						C	0.000	0.521	100.00	0.421	0.000	
L13 54.5000-49.5000	51.9851	1.103	6.30	1.33	10.603	A	0.000	10.603	10.603	100.00	15.450	0.000
						B	0.000	10.603	100.00	34.041	0.000	
						C	0.000	10.603	100.00	8.410	0.000	

Section Elevation	z	$K_z$	$q_z$	$t_z$	$A_G$	F a c e	$A_F$	$A_R$	$A_{leg}$	Leg %	$C_A A_A$ In Face ft <sup>2</sup>	$C_A A_A$ Out Face ft <sup>2</sup>
ft	ft		psf	in	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L14 49.5000- 44.5000	46.9856	1.08	6.16	1.32	10.938	A	0.000	10.938	10.938	100.00	15.410	0.000
						B	0.000	10.938		100.00	33.921	0.000
						C	0.000	10.938		100.00	8.383	0.000
L15 44.5000- 39.5000	41.9861	1.054	6.02	1.31	11.270	A	0.000	11.270	11.270	100.00	15.365	0.000
						B	0.000	11.270		100.00	33.788	0.000
						C	0.000	11.270		100.00	8.354	0.000
L16 39.5000- 34.5000	36.9866	1.027	5.86	1.29	11.603	A	0.000	11.603	11.603	100.00	15.889	0.000
						B	0.000	11.603		100.00	33.640	0.000
						C	0.000	11.603		100.00	8.321	0.000
L17 34.5000- 29.0000	31.7343	0.994	5.67	1.27	13.141	A	0.000	13.141	13.141	100.00	23.066	0.000
						B	0.000	13.141		100.00	40.236	0.000
						C	0.000	13.141		100.00	12.537	0.000
L18 29.0000- 28.0000	28.4995	0.972	5.55	1.26	2.382	A	0.000	2.382	2.382	100.00	4.194	0.000
						B	0.000	2.382		100.00	7.835	0.000
						C	0.000	2.382		100.00	2.799	0.000
L19 28.0000- 23.5000	25.7397	0.951	5.43	1.24	10.873	A	0.000	10.873	10.873	100.00	21.275	0.000
						B	0.000	10.873		100.00	40.182	0.000
						C	0.000	10.873		100.00	12.523	0.000
L20 23.5000- 23.2500	23.3750	0.932	5.32	1.23	0.612	A	0.000	0.612	0.612	100.00	1.352	0.000
						B	0.000	0.612		100.00	2.584	0.000
						C	0.000	0.612		100.00	0.694	0.000
L21 23.2500- 22.7500	22.9999	0.929	5.30	1.23	1.226	A	0.000	1.226	1.226	100.00	2.704	0.000
						B	0.000	1.226		100.00	5.165	0.000
						C	0.000	1.226		100.00	1.387	0.000
L22 22.7500- 22.5000	22.6250	0.926	5.28	1.23	0.613	A	0.000	0.613	0.613	100.00	1.351	0.000
						B	0.000	0.613		100.00	2.581	0.000
						C	0.000	0.613		100.00	0.693	0.000
L23 22.5000- 17.5000	19.9877	0.902	5.15	1.21	12.431	A	0.000	12.431	12.431	100.00	26.952	0.000
						B	0.000	12.431		100.00	51.443	0.000
						C	0.000	12.431		100.00	15.832	0.000
L24 17.5000- 15.7500	16.6235	0.867	4.95	1.19	4.427	A	0.000	4.427	4.427	100.00	9.394	0.000
						B	0.000	4.427		100.00	17.912	0.000
						C	0.000	4.427		100.00	7.156	0.000
L25 15.7500- 15.5000	15.6250	0.856	4.89	1.18	0.635	A	0.000	0.635	0.635	100.00	1.340	0.000
						B	0.000	0.635		100.00	2.554	0.000
						C	0.000	0.635		100.00	1.021	0.000
L26 15.5000- 12.2500	13.8700	0.85	4.85	1.17	8.326	A	0.000	8.326	8.326	100.00	17.377	0.000
						B	0.000	8.326		100.00	33.099	0.000
						C	0.000	8.326		100.00	13.241	0.000
L27 12.2500- 12.0000	12.1250	0.85	4.85	1.15	0.647	A	0.000	0.647	0.647	100.00	1.333	0.000
						B	0.000	0.647		100.00	2.537	0.000
						C	0.000	0.647		100.00	1.016	0.000
L28 12.0000- 11.7500	11.8750	0.85	4.85	1.15	0.647	A	0.000	0.647	0.647	100.00	1.332	0.000
						B	0.000	0.647		100.00	2.535	0.000
						C	0.000	0.647		100.00	1.015	0.000
L29 11.7500- 11.5000	11.6250	0.85	4.85	1.15	0.650	A	0.000	0.650	0.650	100.00	1.332	0.000
						B	0.000	0.650		100.00	2.534	0.000
						C	0.000	0.650		100.00	1.015	0.000
L30 11.5000- 6.5000	8.9884	0.85	4.85	1.12	13.149	A	0.000	13.149	13.149	100.00	22.594	0.000
						B	0.000	13.149		100.00	50.325	0.000
						C	0.000	13.149		100.00	17.451	0.000
L31 6.5000- 6.0000	6.2499	0.85	4.85	1.08	1.330	A	0.000	1.330	1.330	100.00	2.077	0.000
						B	0.000	1.330		100.00	4.985	0.000
						C	0.000	1.330		100.00	1.323	0.000
L32 6.0000- 5.7500	5.8750	0.85	4.85	1.07	0.666	A	0.000	0.666	0.666	100.00	1.037	0.000
						B	0.000	0.666		100.00	2.488	0.000
						C	0.000	0.666		100.00	0.661	0.000
L33 5.7500- 4.5000	5.1243	0.85	4.85	1.06	3.340	A	0.000	3.340	3.340	100.00	5.170	0.000
						B	0.000	3.340		100.00	12.398	0.000
						C	0.000	3.340		100.00	3.295	0.000
L34 4.5000- 4.2500	4.3750	0.85	4.85	1.04	0.670	A	0.000	0.670	0.670	100.00	1.031	0.000
						B	0.000	0.670		100.00	2.470	0.000
						C	0.000	0.670		100.00	0.657	0.000
L35 4.2500- 3.0000	3.6243	0.85	4.85	1.02	3.357	A	0.000	3.357	3.357	100.00	3.930	0.000
						B	0.000	3.357		100.00	11.085	0.000
						C	0.000	3.357		100.00	3.272	0.000
L36 3.0000- 2.7500	2.8750	0.85	4.85	1.00	0.673	A	0.000	0.673	0.673	100.00	0.722	0.000
						B	0.000	0.673		100.00	2.144	0.000

Section Elevation ft	z ft	$K_z$	$q_z$ psf	$t_z$ in	$A_G$ ft <sup>2</sup>	Face ft <sup>2</sup>	$A_F$ 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>
L37 2.7500-1.7500	2.2496	0.85	4.85	0.97	2.696	C 0.000	0.000	0.673	2.696	100.00	0.651	0.000
						A 0.000	0.000	2.696		100.00	2.874	0.000
						B 0.000	0.000	2.696		100.00	7.981	0.000
						C 0.000	0.000	2.696		100.00	2.052	0.000
L38 1.7500-1.5000	1.6250	0.85	4.85	0.94	0.675	A 0.000	0.000	0.675	0.675	100.00	0.380	0.000
						B 0.000	0.000	0.675		100.00	1.510	0.000
						C 0.000	0.000	0.675		100.00	0.047	0.000
L39 1.5000-1.2500	1.3750	0.85	4.85	0.93	0.675	A 0.000	0.000	0.675	0.675	100.00	0.082	0.000
						B 0.000	0.000	0.675		100.00	0.910	0.000
						C 0.000	0.000	0.675		100.00	0.046	0.000
L40 1.2500-1.0000	1.1250	0.85	4.85	0.91	0.675	A 0.000	0.000	0.675	0.675	100.00	0.081	0.000
						B 0.000	0.000	0.675		100.00	0.904	0.000
						C 0.000	0.000	0.675		100.00	0.045	0.000
L41 1.0000-0.0000	0.4996	0.85	4.85	0.84	2.698	A 0.000	0.000	2.698	2.698	100.00	0.309	0.000
						B 0.000	0.000	2.698		100.00	2.890	0.000
						C 0.000	0.000	2.698		100.00	0.168	0.000

### Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	$K_z$	$q_z$ psf	$A_G$ ft <sup>2</sup>	Face ft <sup>2</sup>	$A_F$ 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 100.0000-95.0000	97.4785	1.259	9.75	6.614	A 0.000	0.000	6.614	6.614	100.00	0.000	0.000
					B 0.000	0.000	6.614		100.00	0.000	0.000
					C 0.000	0.000	6.614		100.00	0.000	0.000
L2 95.0000-90.0000	92.4796	1.245	9.64	6.956	A 0.000	0.000	6.956	6.956	100.00	0.000	0.000
					B 0.000	0.000	6.956		100.00	4.054	0.000
					C 0.000	0.000	6.956		100.00	0.000	0.000
L3 90.0000-85.5000	87.7342	1.231	9.53	6.553	A 0.000	0.000	6.553	6.553	100.00	2.221	0.000
					B 0.000	0.000	6.553		100.00	6.782	0.000
					C 0.000	0.000	6.553		100.00	2.221	0.000
L4 85.5000-85.2500	85.3750	1.224	9.48	0.369	A 0.000	0.000	0.369	0.369	100.00	0.222	0.000
					B 0.000	0.000	0.369		100.00	0.475	0.000
					C 0.000	0.000	0.369		100.00	0.222	0.000
L5 85.2500-80.2500	82.7314	1.216	9.42	7.566	A 0.000	0.000	7.566	7.566	100.00	5.454	0.000
					B 0.000	0.000	7.566		100.00	11.533	0.000
					C 0.000	0.000	7.566		100.00	4.442	0.000
L6 80.2500-75.2500	77.7322	1.2	9.29	7.912	A 0.000	0.000	7.912	7.912	100.00	8.489	0.000
					B 0.000	0.000	7.912		100.00	17.604	0.000
					C 0.000	0.000	7.912		100.00	4.442	0.000
L7 75.2500-70.2500	72.7329	1.184	9.16	8.256	A 0.000	0.000	8.256	8.256	100.00	9.256	0.000
					B 0.000	0.000	8.256		100.00	18.080	0.000
					C 0.000	0.000	8.256		100.00	4.442	0.000
L8 70.2500-62.5000	66.3359	1.161	8.99	13.478	A 0.000	0.000	13.478	13.478	100.00	15.728	0.000
					B 0.000	0.000	13.478		100.00	30.239	0.000
					C 0.000	0.000	13.478		100.00	6.885	0.000
L9 62.5000-61.5000	61.9994	1.144	8.86	1.765	A 0.000	0.000	1.765	1.765	100.00	2.029	0.000
					B 0.000	0.000	1.765		100.00	3.902	0.000
					C 0.000	0.000	1.765		100.00	0.888	0.000
L10 61.5000-56.5000	58.9843	1.132	8.77	9.033	A 0.000	0.000	9.033	9.033	100.00	10.537	0.000
					B 0.000	0.000	9.033		100.00	19.899	0.000
					C 0.000	0.000	9.033		100.00	4.832	0.000
L11 56.5000-54.7500	55.6231	1.119	8.66	3.243	A 0.000	0.000	3.243	3.243	100.00	4.007	0.000
					B 0.000	0.000	3.243		100.00	7.283	0.000
					C 0.000	0.000	3.243		100.00	2.010	0.000
L12 54.7500-54.5000	54.6250	1.114	8.63	0.465	A 0.000	0.000	0.465	0.465	100.00	0.572	0.000
					B 0.000	0.000	0.465		100.00	1.040	0.000
					C 0.000	0.000	0.465		100.00	0.287	0.000
L13 54.5000-49.5000	51.9851	1.103	8.54	9.491	A 0.000	0.000	9.491	9.491	100.00	11.447	0.000
					B 0.000	0.000	9.491		100.00	20.809	0.000
					C 0.000	0.000	9.491		100.00	5.742	0.000

Section Elevation	z	K <sub>z</sub>	q <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	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>
ft	ft		psf	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L14 49.5000- 44.5000	46.9856	1.08	8.36	9.837	A	0.000	9.837	9.837	100.00	11.447	0.000
					B	0.000	9.837		100.00	20.809	0.000
					C	0.000	9.837		100.00	5.742	0.000
L15 44.5000- 39.5000	41.9861	1.054	8.16	10.182	A	0.000	10.182	10.182	100.00	11.447	0.000
					B	0.000	10.182		100.00	20.809	0.000
					C	0.000	10.182		100.00	5.742	0.000
L16 39.5000- 34.5000	36.9866	1.027	7.95	10.528	A	0.000	10.528	10.528	100.00	11.891	0.000
					B	0.000	10.528		100.00	20.809	0.000
					C	0.000	10.528		100.00	5.742	0.000
L17 34.5000- 29.0000	31.7343	0.994	7.70	11.977	A	0.000	11.977	11.977	100.00	17.478	0.000
					B	0.000	11.977		100.00	25.555	0.000
					C	0.000	11.977		100.00	8.981	0.000
L18 29.0000- 28.0000	28.4995	0.972	7.52	2.171	A	0.000	2.171	2.171	100.00	3.178	0.000
					B	0.000	2.171		100.00	5.050	0.000
					C	0.000	2.171		100.00	2.037	0.000
L19 28.0000- 23.5000	25.7397	0.951	7.36	9.940	A	0.000	9.940	9.940	100.00	16.300	0.000
					B	0.000	9.940		100.00	26.892	0.000
					C	0.000	9.940		100.00	9.165	0.000
L20 23.5000- 23.2500	23.3750	0.932	7.22	0.560	A	0.000	0.560	0.560	100.00	1.044	0.000
					B	0.000	0.560		100.00	1.783	0.000
					C	0.000	0.560		100.00	0.509	0.000
L21 23.2500- 22.7500	22.9999	0.929	7.19	1.123	A	0.000	1.123	1.123	100.00	2.089	0.000
					B	0.000	1.123		100.00	3.567	0.000
					C	0.000	1.123		100.00	1.018	0.000
L22 22.7500- 22.5000	22.6250	0.926	7.17	0.562	A	0.000	0.562	0.562	100.00	1.044	0.000
					B	0.000	0.562		100.00	1.783	0.000
					C	0.000	0.562		100.00	0.509	0.000
L23 22.5000- 17.5000	19.9877	0.902	6.98	11.420	A	0.000	11.420	11.420	100.00	20.889	0.000
					B	0.000	11.420		100.00	35.667	0.000
					C	0.000	11.420		100.00	11.906	0.000
L24 17.5000- 15.7500	16.6235	0.867	6.72	4.079	A	0.000	4.079	4.079	100.00	7.311	0.000
					B	0.000	4.079		100.00	12.484	0.000
					C	0.000	4.079		100.00	5.574	0.000
L25 15.7500- 15.5000	15.6250	0.856	6.63	0.586	A	0.000	0.586	0.586	100.00	1.044	0.000
					B	0.000	0.586		100.00	1.783	0.000
					C	0.000	0.586		100.00	0.796	0.000
L26 15.5000- 12.2500	13.8700	0.85	6.58	7.692	A	0.000	7.692	7.692	100.00	13.578	0.000
					B	0.000	7.692		100.00	23.184	0.000
					C	0.000	7.692		100.00	10.351	0.000
L27 12.2500- 12.0000	12.1250	0.85	6.58	0.599	A	0.000	0.599	0.599	100.00	1.044	0.000
					B	0.000	0.599		100.00	1.783	0.000
					C	0.000	0.599		100.00	0.796	0.000
L28 12.0000- 11.7500	11.8750	0.85	6.58	0.599	A	0.000	0.599	0.599	100.00	1.044	0.000
					B	0.000	0.599		100.00	1.783	0.000
					C	0.000	0.599		100.00	0.796	0.000
L29 11.7500- 11.5000	11.6250	0.85	6.58	0.602	A	0.000	0.602	0.602	100.00	1.044	0.000
					B	0.000	0.602		100.00	1.783	0.000
					C	0.000	0.602		100.00	0.796	0.000
L30 11.5000- 6.5000	8.9884	0.85	6.58	12.216	A	0.000	12.216	12.216	100.00	17.780	0.000
					B	0.000	12.216		100.00	35.667	0.000
					C	0.000	12.216		100.00	13.628	0.000
L31 6.5000- 6.0000	6.2499	0.85	6.58	1.240	A	0.000	1.240	1.240	100.00	1.645	0.000
					B	0.000	1.240		100.00	3.567	0.000
					C	0.000	1.240		100.00	1.018	0.000
L32 6.0000- 5.7500	5.8750	0.85	6.58	0.621	A	0.000	0.621	0.621	100.00	0.822	0.000
					B	0.000	0.621		100.00	1.783	0.000
					C	0.000	0.621		100.00	0.509	0.000
L33 5.7500- 4.5000	5.1243	0.85	6.58	3.120	A	0.000	3.120	3.120	100.00	4.112	0.000
					B	0.000	3.120		100.00	8.917	0.000
					C	0.000	3.120		100.00	2.546	0.000
L34 4.5000- 4.2500	4.3750	0.85	6.58	0.626	A	0.000	0.626	0.626	100.00	0.822	0.000
					B	0.000	0.626		100.00	1.783	0.000
					C	0.000	0.626		100.00	0.509	0.000
L35 4.2500- 3.0000	3.6243	0.85	6.58	3.144	A	0.000	3.144	3.144	100.00	3.112	0.000
					B	0.000	3.144		100.00	7.917	0.000
					C	0.000	3.144		100.00	2.546	0.000
L36 3.0000- 2.7500	2.8750	0.85	6.58	0.631	A	0.000	0.631	0.631	100.00	0.572	0.000
					B	0.000	0.631		100.00	1.533	0.000

Section Elevation ft	z ft	$K_z$	$q_z$ psf	$A_G$ 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>
L37 2.7500-1.7500	2.2496	0.85	6.58	2.534	C	0.000	0.631	2.534	100.00	0.509	0.000
					A	0.000	2.534		100.00	2.289	0.000
					B	0.000	2.534		100.00	5.689	0.000
L38 1.7500-1.5000	1.6250	0.85	6.58	0.636	C	0.000	2.534	0.636	100.00	1.593	0.000
					A	0.000	0.636		100.00	0.285	0.000
					B	0.000	0.636		100.00	1.024	0.000
L39 1.5000-1.2500	1.3750	0.85	6.58	0.637	C	0.000	0.636	0.637	100.00	0.000	0.000
					A	0.000	0.637		100.00	0.035	0.000
					B	0.000	0.637		100.00	0.524	0.000
L40 1.2500-1.0000	1.1250	0.85	6.58	0.637	C	0.000	0.637	0.637	100.00	0.000	0.000
					A	0.000	0.637		100.00	0.035	0.000
					B	0.000	0.637		100.00	0.524	0.000
L41 1.0000-0.0000	0.4996	0.85	6.58	2.558	C	0.000	0.637	2.558	100.00	0.000	0.000
					A	0.000	2.558		100.00	0.141	0.000
					B	0.000	2.558		100.00	1.555	0.000
					C	0.000	2.558		100.00	0.000	0.000

### Load Combinations

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

Comb. No.	Description
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	100 - 95	Pole	Max Tension	26	0.00	-0.00	-0.00
			Max. Compression	26	-11.28	1.30	0.49
			Max. Mx	20	-3.84	50.26	0.60
			Max. My	2	-3.86	0.69	49.35
			Max. Vy	20	-7.39	50.26	0.60
			Max. Vx	14	7.32	-0.37	-49.20
			Max. Torque	2			1.88
L2	95 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-13.99	1.23	0.54
			Max. Mx	20	-5.03	92.02	0.91
			Max. My	2	-5.07	1.00	90.71
			Max. Vy	20	-8.73	92.02	0.91
			Max. Vx	14	8.64	-0.67	-90.55
			Max. Torque	2			1.88
L3	90 - 85.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-14.56	1.16	0.60
			Max. Mx	20	-5.28	132.15	1.20
			Max. My	14	-5.31	-0.95	-130.28
			Max. Vy	20	-9.12	132.15	1.20
			Max. Vx	14	9.03	-0.95	-130.28
			Max. Torque	2			1.88
L4	85.5 - 85.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-14.61	1.15	0.61
			Max. Mx	20	-5.32	134.43	1.21
			Max. My	14	-5.34	-0.96	-132.54
			Max. Vy	20	-9.14	134.43	1.21
			Max. Vx	14	9.05	-0.96	-132.54
			Max. Torque	2			1.88
L5	85.25 - 80.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25.75	0.89	0.78
			Max. Mx	20	-9.90	217.69	1.74
			Max. My	14	-9.95	-1.46	-215.28
			Max. Vy	20	-16.04	217.69	1.74
			Max. Vx	14	15.85	-1.46	-215.28
			Max. Torque	2			1.88
L6	80.25 - 75.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.04	0.77	0.88
			Max. Mx	20	-10.56	299.59	2.25
			Max. My	14	-10.63	-1.96	-295.87
			Max. Vy	20	-16.74	299.59	2.25
			Max. Vx	14	16.40	-1.96	-295.87
			Max. Torque	16			-1.34
L7	75.25 - 70.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.00	0.66	0.61
			Max. Mx	20	-14.19	397.99	2.68
			Max. My	14	-14.27	-2.46	-392.40
			Max. Vy	20	-20.91	397.99	2.68
			Max. Vx	14	20.43	-2.46	-392.40
			Max. Torque	16			-1.34
L8	70.25 - 62.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.04	0.57	0.72
			Max. Mx	20	-14.76	477.35	3.07

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L9	62.5 - 61.5	Pole	Max. My	14	-14.84	-2.84	-469.92
			Max. Vy	20	-21.45	477.35	3.07
			Max. Vx	14	20.94	-2.84	-469.92
			Max. Torque	2			1.30
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.14	0.46	0.87
			Max. Mx	20	-16.04	586.56	3.58
			Max. My	14	-16.12	-3.34	-576.50
			Max. Vy	20	-22.25	586.56	3.58
			Max. Vx	14	21.70	-3.34	-576.50
L10	61.5 - 56.5	Pole	Max. Torque	2			1.30
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.62	0.35	1.02
			Max. Mx	20	-16.93	699.47	4.10
			Max. My	14	-17.01	-3.85	-686.60
			Max. Vy	20	-22.95	699.47	4.10
			Max. Vx	14	22.37	-3.85	-686.60
			Max. Torque	2			1.31
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.15	0.31	1.06
L11	56.5 - 54.75	Pole	Max. Mx	20	-17.24	739.81	4.28
			Max. My	14	-17.32	-4.02	-725.92
			Max. Vy	20	-23.20	739.81	4.28
			Max. Vx	14	22.61	-4.02	-725.92
			Max. Torque	2			1.31
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.24	0.30	1.07
			Max. Mx	20	-17.32	745.61	4.31
			Max. My	14	-17.40	-4.05	-731.57
			Max. Vy	20	-23.22	745.61	4.31
L12	54.75 - 54.5	Pole	Max. Vx	14	22.63	-4.05	-731.57
			Max. Torque	2			1.31
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.93	0.18	1.20
			Max. Mx	20	-18.39	863.48	4.82
			Max. My	14	-18.46	-4.55	-846.41
			Max. Vy	20	-23.95	863.48	4.82
			Max. Vx	14	23.34	-4.55	-846.41
			Max. Torque	2			1.31
			Max Tension	1	0.00	0.00	0.00
L13	54.5 - 49.5	Pole	Max. Compression	26	-42.63	0.06	1.34
			Max. Mx	20	-19.50	984.93	5.34
			Max. My	14	-19.56	-5.06	-964.71
			Max. Vy	20	-24.66	984.93	5.34
			Max. Vx	14	24.02	-5.06	-964.71
			Max. Torque	2			1.31
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.35	-0.06	1.48
			Max. Mx	20	-20.64	1109.84	5.85
			Max. My	14	-20.70	-5.56	-1086.35
L14	49.5 - 44.5	Pole	Max. Vy	20	-25.34	1109.84	5.85
			Max. Vx	14	24.68	-5.56	-1086.35
			Max. Torque	2			1.32
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.07	-0.18	1.63
			Max. Mx	20	-21.81	1238.10	6.36
			Max. My	14	-21.86	-6.07	-1211.22
			Max. Vy	20	-26.00	1238.10	6.36
			Max. Vx	14	25.32	-6.07	-1211.22
			Max. Torque	2			1.32
L15	44.5 - 39.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.62	-0.21	1.68
			Max. Mx	20	-22.16	1277.21	6.51
			Max. My	14	-22.21	-6.22	-1249.32
			Max. Vy	20	-26.21	1277.21	6.51
			Max. Vx	14	25.52	-6.22	-1249.32
			Max. Torque	2			1.32
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.72	-0.33	1.84
			Max. Mx	20	-21.81	1238.10	6.36
L16	39.5 - 34.5	Pole	Max. My	14	-21.86	-6.07	-1211.22
			Max. Vy	20	-26.00	1238.10	6.36
			Max. Vx	14	25.32	-6.07	-1211.22
			Max. Torque	2			1.32
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.62	-0.21	1.68
			Max. Mx	20	-22.16	1277.21	6.51
			Max. My	14	-22.21	-6.22	-1249.32
			Max. Vy	20	-26.21	1277.21	6.51
			Max. Vx	14	25.52	-6.22	-1249.32
L17	34.5 - 29	Pole	Max. Torque	2			1.32
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.62	-0.21	1.68
			Max. Mx	20	-22.16	1277.21	6.51
			Max. My	14	-22.21	-6.22	-1249.32
			Max. Vy	20	-26.21	1277.21	6.51
			Max. Vx	14	25.52	-6.22	-1249.32
			Max. Torque	2			1.32
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.72	-0.33	1.84
L18	29 - 28	Pole	Max. Mx	20	-21.81	1238.10	6.36
			Max. My	14	-21.86	-6.07	-1211.22
			Max. Vy	20	-26.00	1238.10	6.36

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L19	28 - 23.5	Pole	Max. Mx	20	-24.36	1410.11	7.02
			Max. My	14	-24.41	-6.72	-1378.82
			Max. Vy	20	-26.98	1410.11	7.02
			Max. Vx	14	26.31	-6.72	-1378.82
			Max. Torque	2			1.33
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.76	-0.44	2.00
			Max. Mx	20	-25.73	1532.83	7.47
			Max. My	14	-25.77	-7.17	-1498.59
			Max. Vy	20	-27.60	1532.83	7.47
L20	23.5 - 23.25	Pole	Max. Vx	14	26.96	-7.17	-1498.59
			Max. Torque	2			1.33
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.89	-0.44	2.01
			Max. Mx	20	-25.83	1539.73	7.50
			Max. My	14	-25.87	-7.20	-1505.33
			Max. Vy	20	-27.63	1539.73	7.50
			Max. Vx	14	26.98	-7.20	-1505.33
			Max. Torque	2			1.33
			Max Tension	1	0.00	0.00	0.00
L21	23.25 - 22.75	Pole	Max. Compression	26	-52.15	-0.46	2.03
			Max. Mx	20	-26.01	1553.55	7.55
			Max. My	14	-26.04	-7.25	-1518.84
			Max. Vy	20	-27.70	1553.55	7.55
			Max. Vx	14	27.06	-7.25	-1518.84
			Max. Torque	2			1.33
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.29	-0.46	2.04
			Max. Mx	20	-26.11	1560.48	7.57
			Max. My	14	-26.14	-7.27	-1525.60
L22	22.75 - 22.5	Pole	Max. Vy	20	-27.73	1560.48	7.57
			Max. Vx	14	27.09	-7.27	-1525.60
			Max. Torque	2			1.33
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.05	-0.59	2.25
			Max. Mx	20	-28.03	1700.86	8.08
			Max. My	14	-28.06	-7.77	-1662.78
			Max. Vy	20	-28.45	1700.86	8.08
			Max. Vx	14	27.81	-7.77	-1662.78
			Max. Torque	2			1.35
L23	22.5 - 17.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.03	-0.63	2.30
			Max. Mx	20	-28.70	1750.84	8.25
			Max. My	14	-28.73	-7.95	-1711.62
			Max. Vy	20	-28.72	1750.84	8.25
			Max. Vx	14	28.06	-7.95	-1711.62
			Max. Torque	2			1.35
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.18	-0.64	2.31
			Max. Mx	20	-28.83	1758.02	8.28
L24	17.5 - 15.75	Pole	Max. My	14	-28.86	-7.97	-1718.63
			Max. Vy	20	-28.73	1758.02	8.28
			Max. Vx	14	28.07	-7.97	-1718.63
			Max. Torque	2			1.35
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.10	-0.72	2.41
			Max. Mx	20	-30.20	1852.10	8.60
			Max. My	14	-30.22	-8.29	-1810.52
			Max. Vy	20	-29.20	1852.10	8.60
			Max. Vx	14	28.51	-8.29	-1810.52
L25	15.75 - 15.5	Pole	Max. Torque	2			1.36
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.24	-0.72	2.42
			Max. Mx	20	-30.31	1859.40	8.63
			Max. My	14	-30.34	-8.32	-1817.64
			Max. Vy	20	-29.22	1859.40	8.63
			Max. Vx	14	28.53	-8.32	-1817.64
			Max. Torque	2			1.36
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.24	-0.72	2.42
L26	15.5 - 12.25	Pole	Max. Mx	20	-30.20	1852.10	8.60
			Max. My	14	-30.22	-8.29	-1810.52
			Max. Vy	20	-29.20	1852.10	8.60
			Max. Vx	14	28.51	-8.29	-1810.52
			Max. Torque	2			1.36
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.24	-0.72	2.42
			Max. Mx	20	-30.31	1859.40	8.63
			Max. My	14	-30.34	-8.32	-1817.64
			Max. Vy	20	-29.22	1859.40	8.63
L27	12.25 - 12	Pole	Max. Vx	14	28.53	-8.32	-1817.64
			Max. Torque	2			1.36
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.24	-0.72	2.42
			Max. Mx	20	-30.31	1859.40	8.63
			Max. My	14	-30.34	-8.32	-1817.64
			Max. Vy	20	-29.22	1859.40	8.63
			Max. Vx	14	28.53	-8.32	-1817.64
			Max. Torque	2			1.36
			Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L28	12 - 11.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.38	-0.73	2.42
			Max. Mx	20	-30.42	1866.71	8.65
			Max. My	14	-30.44	-8.34	-1824.78
			Max. Vy	20	-29.26	1866.71	8.65
			Max. Vx	14	28.56	-8.34	-1824.78
			Max. Torque	2			1.36
L29	11.75 - 11.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.52	-0.73	2.43
			Max. Mx	20	-30.51	1874.02	8.68
			Max. My	14	-30.53	-8.37	-1831.92
			Max. Vy	20	-29.29	1874.02	8.68
			Max. Vx	14	28.60	-8.37	-1831.92
			Max. Torque	2			1.36
L30	11.5 - 6.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.10	-0.87	2.57
			Max. Mx	20	-32.41	2021.98	9.17
			Max. My	14	-32.43	-8.87	-1976.32
			Max. Vy	20	-29.93	2021.98	9.17
			Max. Vx	14	29.20	-8.87	-1976.32
			Max. Torque	2			1.38
L31	6.5 - 6	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.36	-0.88	2.59
			Max. Mx	20	-32.62	2036.95	9.22
			Max. My	14	-32.63	-8.92	-1990.92
			Max. Vy	20	-29.98	2036.95	9.22
			Max. Vx	14	29.25	-8.92	-1990.92
			Max. Torque	2			1.38
L32	6 - 5.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.49	-0.88	2.60
			Max. Mx	20	-32.73	2044.44	9.25
			Max. My	14	-32.74	-8.94	-1998.23
			Max. Vy	20	-30.00	2044.44	9.25
			Max. Vx	14	29.27	-8.94	-1998.23
			Max. Torque	2			1.38
L33	5.75 - 4.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.15	-0.91	2.64
			Max. Mx	20	-33.22	2082.03	9.37
			Max. My	14	-33.23	-9.06	-2034.90
			Max. Vy	20	-30.18	2082.03	9.37
			Max. Vx	14	29.44	-9.06	-2034.90
			Max. Torque	2			1.39
L34	4.5 - 4.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.28	-0.92	2.65
			Max. Mx	20	-33.35	2089.57	9.40
			Max. My	14	-33.36	-9.09	-2042.26
			Max. Vy	20	-30.18	2089.57	9.40
			Max. Vx	14	29.45	-9.09	-2042.26
			Max. Torque	2			1.39
L35	4.25 - 3	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.92	-0.95	2.69
			Max. Mx	20	-33.84	2127.37	9.52
			Max. My	14	-33.85	-9.21	-2079.14
			Max. Vy	20	-30.35	2127.37	9.52
			Max. Vx	14	29.61	-9.21	-2079.14
			Max. Torque	2			1.40
L36	3 - 2.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.05	-0.96	2.69
			Max. Mx	20	-33.97	2134.96	9.54
			Max. My	14	-33.97	-9.24	-2086.54
			Max. Vy	20	-30.36	2134.96	9.54
			Max. Vx	14	29.62	-9.24	-2086.54
			Max. Torque	2			1.41
L37	2.75 - 1.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.53	-0.98	2.73
			Max. Mx	20	-34.35	2165.36	9.64
			Max. My	14	-34.36	-9.33	-2116.20
			Max. Vy	20	-30.49	2165.36	9.64
			Max. Vx	14	29.74	-9.33	-2116.20

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L38	1.75 - 1.5	Pole	Max. Torque	2			1.41
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.64	-0.99	2.74
			Max. Mx	20	-34.46	2172.98	9.67
			Max. My	14	-34.47	-9.36	-2123.64
			Max. Vy	20	-30.49	2172.98	9.67
			Max. Vx	14	29.74	-9.36	-2123.64
L39	1.5 - 1.25	Pole	Max. Torque	2			1.41
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.74	-0.99	2.74
			Max. Mx	20	-34.56	2180.60	9.69
			Max. My	14	-34.56	-9.38	-2131.07
			Max. Vy	20	-30.50	2180.60	9.69
			Max. Vx	14	29.76	-9.38	-2131.07
L40	1.25 - 1	Pole	Max. Torque	2			1.41
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.83	-1.00	2.75
			Max. Mx	20	-34.64	2188.22	9.72
			Max. My	14	-34.65	-9.41	-2138.51
			Max. Vy	20	-30.51	2188.22	9.72
			Max. Vx	14	29.77	-9.41	-2138.51
L41	1 - 0	Pole	Max. Torque	2			1.41
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.19	-1.02	2.77
			Max. Mx	20	-34.98	2218.73	9.81
			Max. My	14	-34.98	-9.51	-2168.29
			Max. Vy	20	-30.56	2218.73	9.81
			Max. Vx	14	29.83	-9.51	-2168.29
			Max. Torque	2			1.41

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	37	64.19	6.23	3.61
	Max. H <sub>x</sub>	20	35.00	30.54	0.09
	Max. H <sub>z</sub>	2	35.00	0.09	29.58
	Max. M <sub>x</sub>	2	2153.24	0.09	29.58
	Max. M <sub>z</sub>	8	2188.87	-30.03	-0.09
	Max. Torsion	2	1.41	0.09	29.58
	Min. Vert	7	26.25	-23.73	13.65
	Min. H <sub>x</sub>	9	26.25	-30.03	-0.09
	Min. H <sub>z</sub>	14	35.00	-0.09	-29.81
	Min. M <sub>x</sub>	14	-2168.29	-0.09	-29.81
	Min. M <sub>z</sub>	20	-2218.73	30.54	0.09
	Min. Torsion	14	-1.38	-0.09	-29.81

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overtuning Moment, M <sub>x</sub> kip-ft	Overtuning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	29.17	0.00	0.00	-0.28	-0.03	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	35.00	-0.09	-29.58	-2153.24	9.44	-1.41
0.9 Dead+1.0 Wind 0 deg - No Ice	26.25	-0.09	-29.58	-2129.32	9.32	-1.40
1.2 Dead+1.0 Wind 30 deg - No Ice	35.00	13.70	-23.84	-1806.04	-1037.28	-1.19

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
0.9 Dead+1.0 Wind 30 deg - No Ice	26.25	13.70	-23.84	-1785.66	-1025.62	-1.18
1.2 Dead+1.0 Wind 60 deg - No Ice	35.00	23.73	-13.65	-1034.25	-1800.63	-0.77
0.9 Dead+1.0 Wind 60 deg - No Ice	26.25	23.73	-13.65	-1022.54	-1780.35	-0.77
1.2 Dead+1.0 Wind 90 deg - No Ice	35.00	30.03	0.09	9.13	-2188.87	-0.23
0.9 Dead+1.0 Wind 90 deg - No Ice	26.25	30.03	0.09	9.10	-2164.62	-0.23
1.2 Dead+1.0 Wind 120 deg - No Ice	35.00	26.72	15.49	1125.37	-1940.70	0.44
0.9 Dead+1.0 Wind 120 deg - No Ice	26.25	26.72	15.49	1113.03	-1919.27	0.43
1.2 Dead+1.0 Wind 150 deg - No Ice	35.00	14.21	24.53	1830.52	-1062.75	1.03
0.9 Dead+1.0 Wind 150 deg - No Ice	26.25	14.21	24.53	1810.11	-1050.83	1.02
1.2 Dead+1.0 Wind 180 deg - No Ice	35.00	0.09	29.81	2168.29	-9.51	1.38
0.9 Dead+1.0 Wind 180 deg - No Ice	26.25	0.09	29.81	2144.39	-9.38	1.37
1.2 Dead+1.0 Wind 210 deg - No Ice	35.00	-13.70	23.84	1800.36	1034.33	1.20
0.9 Dead+1.0 Wind 210 deg - No Ice	26.25	-13.70	23.84	1780.23	1022.72	1.19
1.2 Dead+1.0 Wind 240 deg - No Ice	35.00	-23.85	13.72	1034.91	1802.90	0.81
0.9 Dead+1.0 Wind 240 deg - No Ice	26.25	-23.85	13.72	1023.38	1782.64	0.81
1.2 Dead+1.0 Wind 270 deg - No Ice	35.00	-30.54	-0.09	-9.81	2218.73	0.26
0.9 Dead+1.0 Wind 270 deg - No Ice	26.25	-30.54	-0.09	-9.60	2194.23	0.26
1.2 Dead+1.0 Wind 300 deg - No Ice	35.00	-26.61	-15.43	-1124.37	1937.71	-0.45
0.9 Dead+1.0 Wind 300 deg - No Ice	26.25	-26.61	-15.43	-1111.85	1916.30	-0.44
1.2 Dead+1.0 Wind 330 deg - No Ice	35.00	-13.81	-23.84	-1793.60	1040.97	-1.07
0.9 Dead+1.0 Wind 330 deg - No Ice	26.25	-13.81	-23.84	-1773.33	1029.25	-1.07
1.2 Dead+1.0 Ice+1.0 Temp	64.19	0.00	-0.00	-2.77	-1.02	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	64.19	-0.02	-6.66	-527.47	0.64	-0.37
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	64.19	3.02	-5.24	-437.56	-251.07	-0.32
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	64.19	5.22	-3.01	-252.30	-434.79	-0.18
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	64.19	7.04	0.02	-1.21	-548.58	-0.08
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	64.19	6.25	3.62	277.60	-485.27	0.09
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	64.19	3.15	5.44	437.45	-256.30	0.33
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	64.19	0.02	6.68	523.20	-2.74	0.37
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	64.19	-3.02	5.25	432.00	249.10	0.32
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	64.19	-5.26	3.03	247.41	434.26	0.18
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	64.19	-7.13	-0.02	-4.59	551.60	0.08
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	64.19	-6.23	-3.61	-283.11	482.66	-0.09
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	64.19	-3.09	-5.33	-437.59	250.93	-0.33
Dead+Wind 0 deg - Service	29.17	-0.02	-6.22	-450.56	1.96	-0.30
Dead+Wind 30 deg - Service	29.17	2.88	-5.01	-377.90	-216.93	-0.26

Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overturning Moment, M <sub>x</sub>	Overturning Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 60 deg - Service	29.17	4.99	-2.87	-216.50	-376.56	-0.17
Dead+Wind 90 deg - Service	29.17	6.32	0.02	1.69	-457.83	-0.05
Dead+Wind 120 deg - Service	29.17	5.62	3.26	235.19	-405.96	0.10
Dead+Wind 150 deg - Service	29.17	2.99	5.16	382.62	-222.27	0.23
Dead+Wind 180 deg - Service	29.17	0.02	6.27	453.29	-1.99	0.30
Dead+Wind 210 deg - Service	29.17	-2.88	5.01	376.28	216.29	0.26
Dead+Wind 240 deg - Service	29.17	-5.02	2.89	216.21	377.02	0.17
Dead+Wind 270 deg - Service	29.17	-6.42	-0.02	-2.26	464.07	0.05
Dead+Wind 300 deg - Service	29.17	-5.60	-3.24	-235.40	405.31	-0.10
Dead+Wind 330 deg - Service	29.17	-2.90	-5.01	-375.30	217.68	-0.23

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-29.17	0.00	0.00	29.17	0.00	0.000%
2	-0.09	-35.00	-29.58	0.09	35.00	29.58	0.000%
3	-0.09	-26.25	-29.58	0.09	26.25	29.58	0.000%
4	13.70	-35.00	-23.84	-13.70	35.00	23.84	0.000%
5	13.70	-26.25	-23.84	-13.70	26.25	23.84	0.000%
6	23.73	-35.00	-13.65	-23.73	35.00	13.65	0.000%
7	23.73	-26.25	-13.65	-23.73	26.25	13.65	0.000%
8	30.03	-35.00	0.09	-30.03	35.00	-0.09	0.000%
9	30.03	-26.25	0.09	-30.03	26.25	-0.09	0.000%
10	26.72	-35.00	15.49	-26.72	35.00	-15.49	0.000%
11	26.72	-26.25	15.49	-26.72	26.25	-15.49	0.000%
12	14.21	-35.00	24.53	-14.21	35.00	-24.53	0.000%
13	14.21	-26.25	24.53	-14.21	26.25	-24.53	0.000%
14	0.09	-35.00	29.81	-0.09	35.00	-29.81	0.000%
15	0.09	-26.25	29.81	-0.09	26.25	-29.81	0.000%
16	-13.70	-35.00	23.84	13.70	35.00	-23.84	0.000%
17	-13.70	-26.25	23.84	13.70	26.25	-23.84	0.000%
18	-23.85	-35.00	13.72	23.85	35.00	-13.72	0.000%
19	-23.85	-26.25	13.72	23.85	26.25	-13.72	0.000%
20	-30.54	-35.00	-0.09	30.54	35.00	0.09	0.000%
21	-30.54	-26.25	-0.09	30.54	26.25	0.09	0.000%
22	-26.61	-35.00	-15.43	26.61	35.00	15.43	0.000%
23	-26.61	-26.25	-15.43	26.61	26.25	15.43	0.000%
24	-13.81	-35.00	-23.84	13.81	35.00	23.84	0.000%
25	-13.81	-26.25	-23.84	13.81	26.25	23.84	0.000%
26	0.00	-64.19	0.00	-0.00	64.19	0.00	0.000%
27	-0.02	-64.19	-6.66	0.02	64.19	6.66	0.000%
28	3.02	-64.19	-5.24	-3.02	64.19	5.24	0.000%
29	5.22	-64.19	-3.01	-5.22	64.19	3.01	0.000%
30	7.04	-64.19	0.02	-7.04	64.19	-0.02	0.000%
31	6.25	-64.19	3.62	-6.25	64.19	-3.62	0.000%
32	3.15	-64.19	5.44	-3.15	64.19	-5.44	0.000%
33	0.02	-64.19	6.68	-0.02	64.19	-6.68	0.000%
34	-3.02	-64.19	5.25	3.02	64.19	-5.25	0.000%
35	-5.26	-64.19	3.03	5.26	64.19	-3.03	0.000%
36	-7.13	-64.19	-0.02	7.13	64.19	0.02	0.000%
37	-6.23	-64.19	-3.61	6.23	64.19	3.61	0.000%
38	-3.09	-64.19	-5.33	3.09	64.19	5.33	0.000%
39	-0.02	-29.17	-6.22	0.02	29.17	6.22	0.000%
40	2.88	-29.17	-5.01	-2.88	29.17	5.01	0.000%
41	4.99	-29.17	-2.87	-4.99	29.17	2.87	0.000%
42	6.32	-29.17	0.02	-6.32	29.17	-0.02	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
43	5.62	-29.17	3.26	-5.62	29.17	-3.26	0.000%
44	2.99	-29.17	5.16	-2.99	29.17	-5.16	0.000%
45	0.02	-29.17	6.27	-0.02	29.17	-6.27	0.000%
46	-2.88	-29.17	5.01	2.88	29.17	-5.01	0.000%
47	-5.02	-29.17	2.89	5.02	29.17	-2.89	0.000%
48	-6.42	-29.17	-0.02	6.42	29.17	0.02	0.000%
49	-5.60	-29.17	-3.24	5.60	29.17	3.24	0.000%
50	-2.90	-29.17	-5.01	2.90	29.17	5.01	0.000%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00077607
3	Yes	5	0.00000001	0.00034234
4	Yes	6	0.00000001	0.00050490
5	Yes	6	0.00000001	0.00015072
6	Yes	6	0.00000001	0.00053394
7	Yes	6	0.00000001	0.00016105
8	Yes	5	0.00000001	0.00007796
9	Yes	4	0.00000001	0.00073419
10	Yes	6	0.00000001	0.00056292
11	Yes	6	0.00000001	0.00016422
12	Yes	6	0.00000001	0.00051831
13	Yes	6	0.00000001	0.00015360
14	Yes	5	0.00000001	0.00048479
15	Yes	5	0.00000001	0.00021500
16	Yes	6	0.00000001	0.00053797
17	Yes	6	0.00000001	0.00016270
18	Yes	6	0.00000001	0.00050769
19	Yes	6	0.00000001	0.00015201
20	Yes	5	0.00000001	0.00029696
21	Yes	5	0.00000001	0.00012687
22	Yes	6	0.00000001	0.00055293
23	Yes	6	0.00000001	0.00016068
24	Yes	6	0.00000001	0.00053827
25	Yes	6	0.00000001	0.00016225
26	Yes	4	0.00000001	0.00018390
27	Yes	6	0.00000001	0.00052617
28	Yes	6	0.00000001	0.00061716
29	Yes	6	0.00000001	0.00062286
30	Yes	6	0.00000001	0.00053832
31	Yes	6	0.00000001	0.00068603
32	Yes	6	0.00000001	0.00061878
33	Yes	6	0.00000001	0.00052057
34	Yes	6	0.00000001	0.00061977
35	Yes	6	0.00000001	0.00061249
36	Yes	6	0.00000001	0.00054319
37	Yes	6	0.00000001	0.00069173
38	Yes	6	0.00000001	0.00063035
39	Yes	4	0.00000001	0.00082348
40	Yes	5	0.00000001	0.00012362
41	Yes	5	0.00000001	0.00014588
42	Yes	4	0.00000001	0.00035910
43	Yes	5	0.00000001	0.00016200
44	Yes	5	0.00000001	0.00013063
45	Yes	4	0.00000001	0.00076589
46	Yes	5	0.00000001	0.00015120
47	Yes	5	0.00000001	0.00012567
48	Yes	4	0.00000001	0.00039113
49	Yes	5	0.00000001	0.00015319
50	Yes	5	0.00000001	0.00014986

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	100 - 95	16.2661	49	1.4754	0.0094
L2	95 - 90	14.7370	49	1.4398	0.0070
L3	90 - 85.5	13.2618	49	1.3732	0.0048
L4	85.5 - 85.25	12.0052	49	1.2906	0.0031
L5	85.25 - 80.25	11.9376	49	1.2888	0.0031
L6	80.25 - 75.25	10.6099	49	1.2447	0.0026
L7	75.25 - 70.25	9.3365	49	1.1857	0.0022
L8	70.25 - 62.5	8.1312	49	1.1147	0.0019
L9	66.5 - 61.5	7.2799	49	1.0524	0.0016
L10	61.5 - 56.5	6.2016	49	0.9989	0.0015
L11	56.5 - 54.75	5.2054	49	0.9028	0.0012
L12	54.75 - 54.5	4.8807	49	0.8687	0.0012
L13	54.5 - 49.5	4.8353	49	0.8647	0.0011
L14	49.5 - 44.5	3.9732	43	0.7820	0.0010
L15	44.5 - 39.5	3.2005	43	0.6940	0.0008
L16	39.5 - 34.5	2.5215	43	0.6028	0.0007
L17	34.5 - 29	1.9403	43	0.5071	0.0005
L18	33 - 28	1.7855	43	0.4783	0.0005
L19	28 - 23.5	1.3072	43	0.4297	0.0004
L20	23.5 - 23.25	0.9345	43	0.3611	0.0003
L21	23.25 - 22.75	0.9157	43	0.3573	0.0003
L22	22.75 - 22.5	0.8787	43	0.3497	0.0003
L23	22.5 - 17.5	0.8604	43	0.3464	0.0003
L24	17.5 - 15.75	0.5332	43	0.2787	0.0003
L25	15.75 - 15.5	0.4353	43	0.2550	0.0002
L26	15.5 - 12.25	0.4221	43	0.2518	0.0002
L27	12.25 - 12	0.2651	43	0.2095	0.0002
L28	12 - 11.75	0.2542	43	0.2059	0.0002
L29	11.75 - 11.5	0.2435	43	0.2024	0.0002
L30	11.5 - 6.5	0.2330	43	0.1979	0.0002
L31	6.5 - 6	0.0727	43	0.1084	0.0001
L32	6 - 5.75	0.0618	43	0.0995	0.0001
L33	5.75 - 4.5	0.0567	43	0.0951	0.0001
L34	4.5 - 4.25	0.0346	43	0.0735	0.0001
L35	4.25 - 3	0.0309	43	0.0694	0.0001
L36	3 - 2.75	0.0154	43	0.0490	0.0000
L37	2.75 - 1.75	0.0129	43	0.0449	0.0000
L38	1.75 - 1.5	0.0052	43	0.0287	0.0000
L39	1.5 - 1.25	0.0038	43	0.0245	0.0000
L40	1.25 - 1	0.0027	43	0.0203	0.0000
L41	1 - 0	0.0017	43	0.0162	0.0000

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
102.0000	X7C-680 w/ Mount Pipe	49	16.2661	1.4754	0.0094	5575
100.0000	Top Hat 15" Diameter x 4' Tall	49	16.2661	1.4754	0.0094	5575
99.0000	8-ft Ladder	49	15.9583	1.4691	0.0089	5575
94.0000	ERICSSON AIR 21 B4A B2P	49	14.4364	1.4304	0.0066	4871
84.0000	80010965 w/ Mount Pipe	49	11.6016	1.2798	0.0029	5105
74.0000	MX08FRO665-21 w/ Mount Pipe	49	9.0281	1.1697	0.0021	4143

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	100 - 95	77.6105	22	7.0426	0.0443
L2	95 - 90	70.3389	22	6.8778	0.0332
L3	90 - 85.5	63.3215	10	6.5638	0.0227
L4	85.5 - 85.25	57.3385	10	6.1717	0.0144
L5	85.25 - 80.25	57.0168	10	6.1635	0.0143
L6	80.25 - 75.25	50.6893	10	5.9534	0.0121
L7	75.25 - 70.25	44.6178	10	5.6721	0.0103
L8	70.25 - 62.5	38.8674	10	5.3330	0.0087
L9	66.5 - 61.5	34.8041	10	5.0354	0.0076
L10	61.5 - 56.5	29.6556	10	4.7797	0.0069
L11	56.5 - 54.75	24.8971	10	4.3205	0.0057
L12	54.75 - 54.5	23.3457	10	4.1571	0.0053
L13	54.5 - 49.5	23.1288	10	4.1384	0.0053
L14	49.5 - 44.5	19.0066	10	3.7429	0.0045
L15	44.5 - 39.5	15.3105	10	3.3220	0.0037
L16	39.5 - 34.5	12.0624	10	2.8853	0.0030
L17	34.5 - 29	9.2821	10	2.4272	0.0024
L18	33 - 28	8.5415	10	2.2891	0.0022
L19	28 - 23.5	6.2530	10	2.0567	0.0019
L20	23.5 - 23.25	4.4701	10	1.7278	0.0016
L21	23.25 - 22.75	4.3802	10	1.7096	0.0015
L22	22.75 - 22.5	4.2031	10	1.6733	0.0015
L23	22.5 - 17.5	4.1159	10	1.6575	0.0015
L24	17.5 - 15.75	2.5503	10	1.3334	0.0012
L25	15.75 - 15.5	2.0823	10	1.2199	0.0010
L26	15.5 - 12.25	2.0189	10	1.2045	0.0010
L27	12.25 - 12	1.2679	10	1.0023	0.0008
L28	12 - 11.75	1.2159	10	0.9852	0.0008
L29	11.75 - 11.5	1.1648	10	0.9681	0.0008
L30	11.5 - 6.5	1.1146	10	0.9469	0.0008
L31	6.5 - 6	0.3477	10	0.5184	0.0004
L32	6 - 5.75	0.2956	10	0.4759	0.0004
L33	5.75 - 4.5	0.2712	10	0.4550	0.0004
L34	4.5 - 4.25	0.1656	10	0.3514	0.0003
L35	4.25 - 3	0.1478	10	0.3318	0.0003
L36	3 - 2.75	0.0736	10	0.2345	0.0002
L37	2.75 - 1.75	0.0618	10	0.2149	0.0002
L38	1.75 - 1.5	0.0249	10	0.1371	0.0001
L39	1.5 - 1.25	0.0183	10	0.1170	0.0001
L40	1.25 - 1	0.0127	10	0.0969	0.0001
L41	1 - 0	0.0081	10	0.0774	0.0001

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
102.0000	X7C-680 w/ Mount Pipe	22	77.6105	7.0426	0.0443	1229
100.0000	Top Hat 15" Diameter x 4' Tall	22	77.6105	7.0426	0.0443	1229
99.0000	8-ft Ladder	22	76.1474	7.0135	0.0420	1229
94.0000	ERICSSON AIR 21 B4A B2P	22	68.9086	6.8339	0.0312	1071
84.0000	80010965 w/ Mount Pipe	10	55.4155	6.1203	0.0137	1102
74.0000	MX08FRO665-21 w/ Mount Pipe	10	43.1467	5.5956	0.0099	887

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	$L_u$ ft	$Kl/r$	A $in^2$	$P_u$ K
L1	100 - 99	TP15.79x15x0.19	5.0000	0.0000	0.0	9.16	-3.66
	99 - 98					9.25	-3.70
	98 - 97					9.35	-3.74
	97 - 96					9.45	-3.78
	96 - 95					9.55	-3.82
L2	95 - 94	TP16.59x15.79x0.19	5.0000	0.0000	0.0	9.64	-3.87
	94 - 93					9.74	-4.87
	93 - 92					9.84	-4.91
	92 - 91					9.93	-4.96
	91 - 90					10.03	-5.02
L3	90 - 88.875	TP17.3x16.59x0.19	4.5000	0.0000	0.0	10.14	-5.07
	88.875 - 87.75					10.25	-5.13
	87.75 - 86.625					10.36	-5.19
L4	86.625 - 85.5	TP17.34x17.3x0.6	0.2500	0.0000	0.0	10.47	-5.25
	85.5 - 85.25 (4)					32.47	-5.29
L5	85.25 - 84.25	TP18.13x17.34x0.58	5.0000	0.0000	0.0	31.47	-5.40
	84.25 - 83.25					31.76	-9.48
	83.25 - 82.25					32.06	-9.60
	82.25 - 81.25					32.35	-9.73
	81.25 - 80.25					32.65	-9.86
L6	80.25 - 79.25	TP18.93x18.13x0.55	5.0000	0.0000	0.0	31.56	-9.99
	79.25 - 78.25					31.84	-10.12
	78.25 - 77.25					32.12	-10.25
	77.25 - 76.25					32.41	-10.38
	76.25 - 75.25					32.69	-10.52
L7	75.25 - 74.25	TP19.72x18.93x0.54	5.0000	0.0000	0.0	32.25	-10.66
	74.25 - 73.25					32.52	-13.70
	73.25 - 72.25					32.80	-13.85
	72.25 - 71.25					33.07	-13.99
	71.25 - 70.25					33.35	-14.14
L8	70.25 - 69	TP20.95x19.72x0.52	7.7500	0.0000	0.0	32.56	-14.33
	69 - 67.75					32.89	-14.52
	67.75 - 66.5					33.22	-14.71
	66.5 - 62.5					34.29	-7.60
L9	66.5 - 62.5	TP20.73x19.94x0.58	5.0000	0.0000	0.0	37.03	-8.20
	62.5 - 61.5					37.33	-16.00
L10	61.5 - 60.5	TP21.53x20.73x0.56	5.0000	0.0000	0.0	36.82	-16.17
	60.5 - 59.5					37.11	-16.35
	59.5 - 58.5					37.40	-16.53
	58.5 - 57.5					37.69	-16.72
	57.5 - 56.5					37.98	-16.90
L11	56.5 - 54.75 (11)	TP21.81x21.53x0.56	1.7500	0.0000	0.0	38.48	-17.21
	54.75 - 54.5 (12)					50.13	-17.29
L13	54.5 - 53.5	TP22.64x21.85x0.71	5.0000	0.0000	0.0	48.85	-17.49
	53.5 - 52.5					49.22	-17.70
	52.5 - 51.5					49.58	-17.92
	51.5 - 50.5					49.95	-18.14
	50.5 - 49.5					50.31	-18.36
L14	49.5 - 48.5	TP23.44x22.64x0.69	5.0000	0.0000	0.0	48.95	-18.58
	48.5 - 47.5					49.31	-18.80
	47.5 - 46.5					49.66	-19.02
	46.5 - 45.5					50.01	-19.24
	45.5 - 44.5					50.36	-19.47
L15	44.5 - 43.5	TP24.23x23.44x0.68	5.0000	0.0000	0.0	49.82	-19.69
	43.5 - 42.5					50.16	-19.92
	42.5 - 41.5					50.51	-20.15
	41.5 - 40.5					50.85	-20.38
	40.5 - 39.5					51.20	-20.61
L16	39.5 - 38.5	TP25.03x24.23x0.65	5.0000	0.0000	0.0	49.69	-20.85
	38.5 - 37.5					50.02	-21.08
	37.5 - 36.5					50.35	-21.32
	36.5 - 35.5					50.69	-21.55
	35.5 - 34.5					51.02	-21.79
L17	34.5 - 33	TP25.9x25.03x0.65	5.5000	0.0000	0.0	51.52	-22.14

Section No.	Elevation ft	Size	L ft	$L_u$ ft	$Kl/r$	A $in^2$	$P_u$ K
L18	33 - 29	TP25.55x24.76x0.93	5.0000	0.0000	0.0	52.85	-10.12
	33 - 29					72.88	-13.90
	29 - 28					73.36	-24.34
L19	28 - 26.875	TP26.27x25.55x0.9	4.5000	0.0000	0.0	71.96	-24.68
	26.875 - 25.75					72.48	-25.02
	25.75 - 24.625					73.00	-25.36
L20	24.625 - 23.5	TP26.31x26.27x0.9	0.2500	0.0000	0.0	73.52	-25.71
	23.5 - 23.25 (20)					73.63	-25.81
L21	23.25 - 22.75 (21)	TP26.39x26.31x0.9	0.5000	0.0000	0.0	73.86	-25.99
L22	22.75 - 22.5 (22)	TP26.43x26.39x1.05	0.2500	0.0000	0.0	85.80	-26.09
L23	22.5 - 21.5	TP27.22x26.43x1.03	5.0000	0.0000	0.0	84.36	-26.46
	21.5 - 20.5					84.89	-26.84
	20.5 - 19.5					85.41	-27.23
	19.5 - 18.5					85.94	-27.62
L24	18.5 - 17.5	TP27.5x27.22x1	1.7500	0.0000	0.0	86.46	-28.01
	17.5 - 15.75 (24)					85.33	-28.68
L25	15.75 - 15.5 (25)	TP27.54x27.5x1.08	0.2500	0.0000	0.0	91.60	-28.81
L26	15.5 - 14.4167	TP28.05x27.54x1.06	3.2500	0.0000	0.0	91.17	-29.26
	14.4167 - 13.3333					91.76	-29.72
	13.3333 - 12.25					92.35	-30.19
L27	12.25 - 12 (27)	TP28.09x28.05x0.95	0.2500	0.0000	0.0	83.04	-30.30
L28	12 - 11.75 (28)	TP28.13x28.09x0.95	0.2500	0.0000	0.0	83.16	-30.40
L29	11.75 - 11.5 (29)	TP28.17x28.13x0.75	0.2500	0.0000	0.0	66.23	-30.50
L30	11.5 - 10.5	TP28.97x28.17x0.74	5.0000	0.0000	0.0	65.53	-30.86
	10.5 - 9.5					65.91	-31.25
	9.5 - 8.5					66.29	-31.63
	8.5 - 7.5					66.66	-32.02
L31	7.5 - 6.5	TP29.05x28.97x0.74	0.5000	0.0000	0.0	67.04	-32.41
	6.5 - 6 (31)					67.23	-32.61
L32	6 - 5.75 (32)	TP29.09x29.05x0.75	0.2500	0.0000	0.0	68.43	-32.72
L33	5.75 - 4.5 (33)	TP29.29x29.09x0.75	1.2500	0.0000	0.0	68.91	-33.22
L34	4.5 - 4.25 (34)	TP29.33x29.29x0.8	0.2500	0.0000	0.0	73.48	-33.34
L35	4.25 - 3 (35)	TP29.52x29.33x0.8	1.2500	0.0000	0.0	73.99	-33.84
L36	3 - 2.75 (36)	TP29.56x29.52x0.8	0.2500	0.0000	0.0	74.09	-33.96
L37	2.75 - 1.75 (37)	TP29.72x29.56x0.8	1.0000	0.0000	0.0	74.50	-34.35
L38	1.75 - 1.5 (38)	TP29.76x29.72x0.78	0.2500	0.0000	0.0	72.34	-34.46
L39	1.5 - 1.25 (39)	TP29.8x29.76x0.78	0.2500	0.0000	0.0	72.44	-34.56
L40	1.25 - 1 (40)	TP29.84x29.8x0.8	0.2500	0.0000	0.0	74.81	-34.64
L41	1 - 0 (41)	TP30x29.84x0.8	1.0000	0.0000	0.0	75.22	-34.98

### Pole Bending Design Data

Section No.	Elevation ft	Size	$M_{ux}$ kip-ft
L1	100 - 99	TP15.79x15x0.19	20.97
	99 - 98		28.59
	98 - 97		35.85
	97 - 96		43.18
	96 - 95		50.57
L2	95 - 94	TP16.59x15.79x0.19	58.04

Section No.	Elevation ft	Size	$M_{ux}$ kip-ft
	94 - 93		66.57
	93 - 92		75.18
	92 - 91		83.86
	91 - 90		92.61
L3	90 - 88.875	TP17.3x16.59x0.19	102.58
	88.875 - 87.75		112.68
	87.75 - 86.625		122.93
L4	86.625 - 85.5		133.31
	85.5 - 85.25	TP17.34x17.3x0.6	135.64
	(4)		
L5	85.25 - 84.25	TP18.13x17.34x0.58	145.04
	84.25 - 83.25		171.95
	83.25 - 82.25		187.91
	82.25 - 81.25		204.01
	81.25 - 80.25		220.24
L6	80.25 - 79.25	TP18.93x18.13x0.55	236.61
	79.25 - 78.25		253.11
	78.25 - 77.25		269.76
	77.25 - 76.25		286.55
	76.25 - 75.25		303.48
L7	75.25 - 74.25	TP19.72x18.93x0.54	320.55
	74.25 - 73.25		340.32
	73.25 - 72.25		361.14
	72.25 - 71.25		382.11
	71.25 - 70.25		403.21
L8	70.25 - 69	TP20.95x19.72x0.52	429.79
	69 - 67.75		456.58
	67.75 - 66.5		483.59
	66.5 - 62.5		281.13
L9	66.5 - 62.5	TP20.73x19.94x0.58	290.52
	62.5 - 61.5		594.07
L10	61.5 - 60.5	TP21.53x20.73x0.56	616.62
	60.5 - 59.5		639.30
	59.5 - 58.5		662.12
	58.5 - 57.5		685.07
	57.5 - 56.5		708.17
L11	56.5 - 54.75	TP21.81x21.53x0.56	748.91
	(11)		
L12	54.75 - 54.5	TP21.85x21.81x0.74	754.76
	(12)		
L13	54.5 - 53.5	TP22.64x21.85x0.71	778.27
	53.5 - 52.5		801.93
	52.5 - 51.5		825.73
	51.5 - 50.5		849.67
	50.5 - 49.5		873.75
L14	49.5 - 48.5	TP23.44x22.64x0.69	897.98
	48.5 - 47.5		922.35
	47.5 - 46.5		946.85
	46.5 - 45.5		971.50
	45.5 - 44.5		996.28
L15	44.5 - 43.5	TP24.23x23.44x0.68	1021.21
	43.5 - 42.5		1046.26
	42.5 - 41.5		1071.45
	41.5 - 40.5		1096.78
	40.5 - 39.5		1122.24
L16	39.5 - 38.5	TP25.03x24.23x0.65	1147.84
	38.5 - 37.5		1173.57
	37.5 - 36.5		1199.42
	36.5 - 35.5		1225.40
	35.5 - 34.5		1251.52
L17	34.5 - 33	TP25.9x25.03x0.65	1290.93
	33 - 29		609.59
L18	33 - 29	TP25.55x24.76x0.93	788.37
	29 - 28		1425.14
L19	28 - 26.875	TP26.27x25.55x0.9	1455.91
	26.875 - 25.75		1486.86

Section No.	Elevation ft	Size	$M_{ux}$ kip-ft
	25.75 - 24.625		1518.00
L20	24.625 - 23.5 (20)	TP26.31x26.27x0.9	1549.32 1556.31
L21	23.25 - 22.75 (21)	TP26.39x26.31x0.9	1570.31
L22	22.75 - 22.5 (22)	TP26.43x26.39x1.05	1577.32
L23	22.5 - 21.5 21.5 - 20.5 20.5 - 19.5 19.5 - 18.5 18.5 - 17.5	TP27.22x26.43x1.03	1605.46 1633.75 1662.18 1690.75 1719.47
L24	17.5 - 15.75 (24)	TP27.5x27.22x1	1770.08
L25	15.75 - 15.5 (25)	TP27.54x27.5x1.08	1777.33
L26	15.5 - 14.4167 14.4167 - 13.3333 13.3333 - 12.25	TP28.05x27.54x1.06	1808.92 1840.65 1872.55
L27	12.25 - 12 (27)	TP28.09x28.05x0.95	1879.94
L28	12 - 11.75 (28)	TP28.13x28.09x0.95	1887.33
L29	11.75 - 11.5 (29)	TP28.17x28.13x0.75	1894.73
L30	11.5 - 10.5 10.5 - 9.5 9.5 - 8.5 8.5 - 7.5 7.5 - 6.5	TP28.97x28.17x0.74	1924.42 1954.22 1984.15 2014.21 2044.38
L31	6.5 - 6 (31)	TP29.05x28.97x0.74	2059.53
L32	6 - 5.75 (32)	TP29.09x29.05x0.75	2067.10
L33	5.75 - 4.5 (33)	TP29.29x29.09x0.75	2105.12
L34	4.5 - 4.25 (34)	TP29.33x29.29x0.8	2112.74
L35	4.25 - 3 (35)	TP29.52x29.33x0.8	2150.97
L36	3 - 2.75 (36)	TP29.56x29.52x0.8	2158.65
L37	2.75 - 1.75 (37)	TP29.72x29.56x0.8	2189.40
L38	1.75 - 1.5 (38)	TP29.76x29.72x0.78	2197.11
L39	1.5 - 1.25 (39)	TP29.8x29.76x0.78	2204.82
L40	1.25 - 1 (40)	TP29.84x29.8x0.8	2212.53
L41	1 - 0 (41)	TP30x29.84x0.8	2243.39

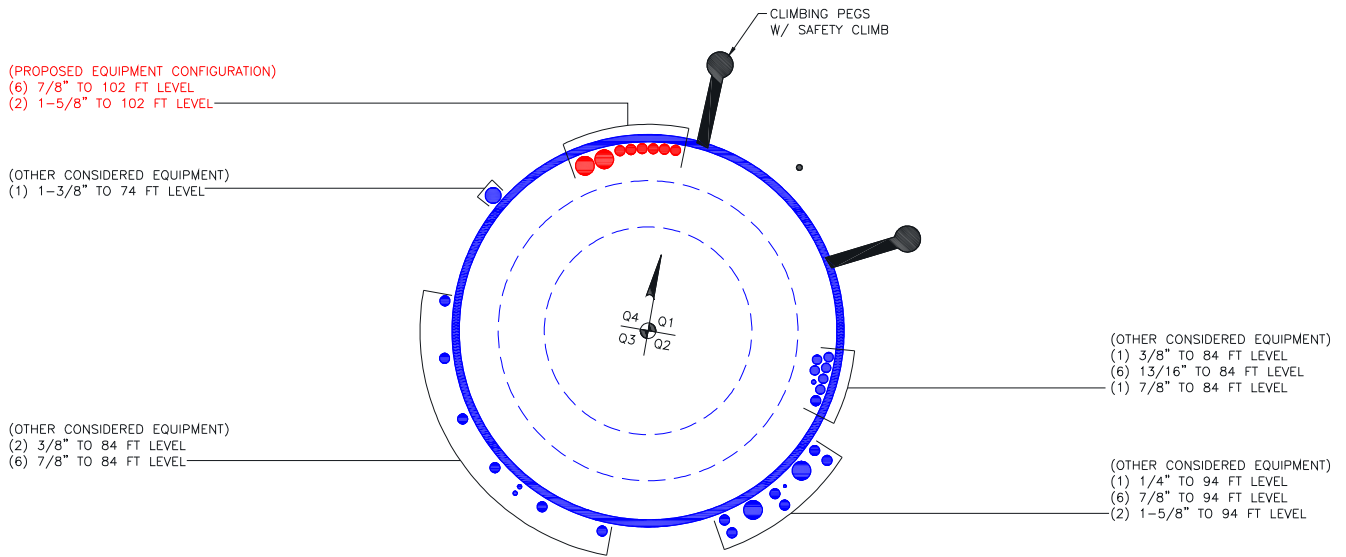
### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V_u$ K
L1	100 - 99 99 - 98 98 - 97 97 - 96 96 - 95	TP15.79x15x0.19	6.80 7.23 7.30 7.36 7.43
L2	95 - 94 94 - 93 93 - 92 92 - 91 91 - 90	TP16.59x15.79x0.19	7.51 8.57 8.65 8.72 8.80
L3	90 - 88.875	TP17.3x16.59x0.19	8.92

Section No.	Elevation ft	Size	Actual $V_u$ K
	88.875 - 87.75		9.05
	87.75 - 86.625		9.18
L4	86.625 - 85.5		9.30
	85.5 - 85.25	TP17.34x17.3x0.6	9.34
	(4)		
L5	85.25 - 84.25	TP18.13x17.34x0.58	9.47
	84.25 - 83.25		15.90
	83.25 - 82.25		16.03
	82.25 - 81.25		16.17
	81.25 - 80.25		16.31
L6	80.25 - 79.25	TP18.93x18.13x0.55	16.45
	79.25 - 78.25		16.59
	78.25 - 77.25		16.73
	77.25 - 76.25		16.87
	76.25 - 75.25		17.01
L7	75.25 - 74.25	TP19.72x18.93x0.54	17.15
	74.25 - 73.25		20.77
	73.25 - 72.25		20.91
	72.25 - 71.25		21.05
	71.25 - 70.25		21.18
L8	70.25 - 69	TP20.95x19.72x0.52	21.36
	69 - 67.75		21.53
	67.75 - 66.5		21.71
	66.5 - 62.5		11.15
L9	66.5 - 62.5	TP20.73x19.94x0.58	11.22
	62.5 - 61.5		22.49
L10	61.5 - 60.5	TP21.53x20.73x0.56	22.63
	60.5 - 59.5		22.77
	59.5 - 58.5		22.90
	58.5 - 57.5		23.04
	57.5 - 56.5		23.18
L11	56.5 - 54.75	TP21.81x21.53x0.56	23.43
	(11)		
L12	54.75 - 54.5	TP21.85x21.81x0.74	23.45
	(12)		
L13	54.5 - 53.5	TP22.64x21.85x0.71	23.60
	53.5 - 52.5		23.74
	52.5 - 51.5		23.88
	51.5 - 50.5		24.03
	50.5 - 49.5		24.17
L14	49.5 - 48.5	TP23.44x22.64x0.69	24.31
	48.5 - 47.5		24.45
	47.5 - 46.5		24.59
	46.5 - 45.5		24.73
	45.5 - 44.5		24.87
L15	44.5 - 43.5	TP24.23x23.44x0.68	25.01
	43.5 - 42.5		25.14
	42.5 - 41.5		25.28
	41.5 - 40.5		25.41
	40.5 - 39.5		25.55
L16	39.5 - 38.5	TP25.03x24.23x0.65	25.68
	38.5 - 37.5		25.81
	37.5 - 36.5		25.94
	36.5 - 35.5		26.07
	35.5 - 34.5		26.20
L17	34.5 - 33	TP25.9x25.03x0.65	26.41
	33 - 29		12.03
L18	33 - 29	TP25.55x24.76x0.93	15.12
	29 - 28		27.28
L19	28 - 26.875	TP26.27x25.55x0.9	27.45
	26.875 - 25.75		27.61
	25.75 - 24.625		27.78
	24.625 - 23.5		27.94
L20	23.5 - 23.25	TP26.31x26.27x0.9	27.96
	(20)		

Section No.	Elevation ft	Size	Actual $V_u$ K
L21	23.25 - 22.75 (21)	TP26.39x26.31x0.9	28.04
L22	22.75 - 22.5 (22)	TP26.43x26.39x1.05	28.07
L23	22.5 - 21.5 21.5 - 20.5 20.5 - 19.5 19.5 - 18.5 18.5 - 17.5	TP27.22x26.43x1.03	28.23 28.37 28.52 28.66 28.81
L24	17.5 - 15.75 (24)	TP27.5x27.22x1	29.06
L25	15.75 - 15.5 (25)	TP27.54x27.5x1.08	29.08
L26	15.5 - 14.4167 14.4167 - 13.3333 13.3333 - 12.25	TP28.05x27.54x1.06	29.24 29.39 29.54
L27	12.25 - 12 (27)	TP28.09x28.05x0.95	29.56
L28	12 - 11.75 (28)	TP28.13x28.09x0.95	29.59
L29	11.75 - 11.5 (29)	TP28.17x28.13x0.75	29.63
L30	11.5 - 10.5 10.5 - 9.5 9.5 - 8.5 8.5 - 7.5 7.5 - 6.5	TP28.97x28.17x0.74	29.77 29.89 30.02 30.14 30.26
L31	6.5 - 6 (31)	TP29.05x28.97x0.74	30.31
L32	6 - 5.75 (32)	TP29.09x29.05x0.75	30.34
L33	5.75 - 4.5 (33)	TP29.29x29.09x0.75	30.51
L34	4.5 - 4.25 (34)	TP29.33x29.29x0.8	30.52
L35	4.25 - 3 (35)	TP29.52x29.33x0.8	30.69
L36	3 - 2.75 (36)	TP29.56x29.52x0.8	30.70
L37	2.75 - 1.75 (37)	TP29.72x29.56x0.8	30.83
L38	1.75 - 1.5 (38)	TP29.76x29.72x0.78	30.83
L39	1.5 - 1.25 (39)	TP29.8x29.76x0.78	30.84
L40	1.25 - 1 (40)	TP29.84x29.8x0.8	30.85
L41	1 - 0 (41)	TP30x29.84x0.8	30.90

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



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

**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	100	37.5	4	12	15	20.95	0.19	Auto	A572-65
2	66.5	37.5	4	12	19.94	25.9	0.25	Auto	A572-65
3	33	33	0	12	24.76	30	0.25	Auto	A572-65

**Reinforcement Configuration**

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12
1	1.75	54.75	channel	MP3-06 (1.1875")	2	o				o							
2	1.75	15.75	channel	MP3-06 (1.1875")	1								o				
3	11.75	54.75	channel	MP3-06 (1.1875")	1									o			
4	0	1.75	plate	FP 1.25 x 2.75_1	5	c			c			c	c				c
5	12.25	32.75	channel	MP3-05 (1.1875")	1			o									
6	4.5	29.75	channel	MP3-05 (1.1875")	2							o				o	
7	54.75	85.5	channel	MP3-05 (1.1875")	3	o				o				o			
8	1.25	4.5	plate	FP 1.25 x 4.5_1	2						c					c	
9	1.25	3	plate	FP 1.25 x 4.5_1	1		c										
10	3	22.75	plate	6.5 x 1.25; (1) (1.1875)	1		o										
11	6	23.5	plate	FP 6 x 1; (1) (1.1875)	2						o						o
12	0	6	plate	FP 1.25 x 7.375_1	2						o						o
13	0	1.25	solid round	Round; (2.25 Max); (2	3		c				c				c		
14																	

**Reinforcement Details**

	B (in)	H (in)	Gross Area (in <sup>2</sup> )	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in <sup>2</sup> )	Bolt Hole Size (in)	Reinforcement Material
1	6.89	2.61	8.47	0.93	PC 8.8 - M20 (100)	41	PC 8.8 - M20 (100)	41.000	24.000	7.670	1.1875	A572-65
2	6.89	2.61	8.47	0.93	PC 8.8 - M20 (100)	41	PC 8.8 - M20 (100)	41.000	24.000	7.670	1.1875	A572-65
3	6.89	2.61	8.47	0.93	PC 8.8 - M20 (100)	41	PC 8.8 - M20 (100)	41.000	24.000	7.670	1.1875	A572-65
4	1.25	2.75	3.4375	1.375	None	n/a	None	n/a	0.000	3.438	0.0000	A572-65
5	5.33	2.09	5.65	0.79	PC 8.8 - M20 (100)	29	PC 8.8 - M20 (100)	29.000	18.000	5.025	1.1875	A572-65
6	5.33	2.09	5.65	0.79	PC 8.8 - M20 (100)	29	PC 8.8 - M20 (100)	29.000	18.000	5.025	1.1875	A572-65
7	5.33	2.09	5.65	0.79	PC 8.8 - M20 (100)	29	PC 8.8 - M20 (100)	29.000	18.000	5.025	1.1875	A572-65
8	1.25	4.5	5.625	2.25	None	n/a	None	n/a	0.000	5.625	0.0000	A572-65
9	1.25	4.5	5.625	2.25	None	n/a	None	n/a	0.000	5.625	0.0000	A572-65
10	6.5	1.25	8.125	0.625	PC 8.8 - M20 (100)	33	PC 8.8 - M20 (100)	33.000	19.250	6.563	1.1875	A572-65
11	6	1	6	0.5	PC 8.8 - M20 (100)	24	PC 8.8 - M20 (100)	24.000	16.375	4.750	1.1875	A572-65
12	1.25	7.375	9.21875	3.6875	None	n/a	None	n/a	0.000	9.219	0.0000	A572-65
13	-	-	3.97608	6.875	Capacity Input	n/a	Capacity Input	n/a	0.000	3.976	0.0000	A193 Gr B7

**Connection Details for Custom Reinforcements**

Reinforcement	End	# Bolts	N or X	Bolt Spacing (in)	Edge Dist (in)	Weld Grade (ksi)	Transverse (Horiz.) Weld Type	Horiz. Weld Length (in)	Horiz. Groove Depth (in)	Horiz. Groove Angle (deg)	Horiz. Fillet Size (in)	Vertical Weld Length (in)	Vertical Fillet Size (in)	Rev H Connection Capacity (kip)
FP 1.25 x 2.75_1	Top	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-
FP 1.25 x 4.5_1	Top	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-
FP 6.5 x 1.25; (1) (1.1875)_1	Top	11	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	11	N	3	3	-	-	-	-	-	-	-	-	-
FP 6 x 1; (1) (1.1875)_1	Top	8	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	8	N	3	3	-	-	-	-	-	-	-	-	-
FP 1.25 x 7.375_1	Top	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-
2.25 Solid Round; (2.25 Max); (2.25	Top	-	-	-	-	-	-	-	-	-	-	-	-	325
	Bottom	-	-	-	-	-	-	-	-	-	-	-	-	325

# 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	100 - 95	5		12	15.000	15.793	0.19	A572-65	1.000
2	95 - 90	5		12	15.793	16.587	0.19	A572-65	1.000
3	90 - 85.5	4.5		12	16.587	17.301	0.19	A572-65	1.000
4	85.5 - 85.25	0.25		12	17.301	17.340	0.6025	A572-65	0.846
5	85.25 - 80.25	5		12	17.340	18.134	0.5775	A572-65	0.856
6	80.25 - 75.25	5		12	18.134	18.927	0.5525	A572-65	0.870
7	75.25 - 70.25	5		12	18.927	19.720	0.54	A572-65	0.867
8	70.25 - 66.5	7.75	4	12	19.720	20.950	0.52125	A572-65	0.882
9	66.5 - 61.5	5		12	19.940	20.735	0.575	A572-65	0.897
10	61.5 - 56.5	5		12	20.735	21.529	0.5625	A572-65	0.898
11	56.5 - 54.75	1.75		12	21.529	21.807	0.5625	A572-65	0.892
12	54.75 - 54.5	0.25		12	21.807	21.847	0.7375	A572-65	0.854
13	54.5 - 49.5	5		12	21.847	22.642	0.7125	A572-65	0.864
14	49.5 - 44.5	5		12	22.642	23.437	0.6875	A572-65	0.876
15	44.5 - 39.5	5		12	23.437	24.231	0.675	A572-65	0.874
16	39.5 - 34.5	5		12	24.231	25.026	0.65	A572-65	0.890
17	34.5 - 33	5.5	4	12	25.026	25.900	0.65	A572-65	0.885
18	33 - 28	5		12	24.760	25.554	0.925	A572-65	0.856
19	28 - 23.5	4.5		12	25.554	26.268	0.9	A572-65	0.862
20	23.5 - 23.25	0.25		12	26.268	26.308	0.9	A572-65	1.024
21	23.25 - 22.75	0.5		12	26.308	26.388	0.9	A572-65	1.022
22	22.75 - 22.5	0.25		12	26.388	26.427	1.05	A572-65	0.975
23	22.5 - 17.5	5		12	26.427	27.221	1.025	A572-65	0.975
24	17.5 - 15.75	1.75		12	27.221	27.499	1	A572-65	0.990
25	15.75 - 15.5	0.25		12	27.499	27.539	1.075	A572-65	1.015
26	15.5 - 12.25	3.25		12	27.539	28.055	1.0625	A572-65	1.012
27	12.25 - 12	0.25		12	28.055	28.095	0.95	A572-65	1.058
28	12 - 11.75	0.25		12	28.095	28.134	0.95	A572-65	1.056
29	11.75 - 11.5	0.25		12	28.134	28.174	0.75	A572-65	1.199
30	11.5 - 6.5	5		12	28.174	28.968	0.7375	A572-65	1.194
31	6.5 - 6	0.5		12	28.968	29.047	0.7375	A572-65	1.191
32	6 - 5.75	0.25		12	29.047	29.087	0.75	A572-65	1.265
33	5.75 - 4.5	1.25		12	29.087	29.285	0.75	A572-65	1.259
34	4.5 - 4.25	0.25		12	29.285	29.325	0.8	A572-65	1.180
35	4.25 - 3	1.25		12	29.325	29.524	0.8	A572-65	1.174
36	3 - 2.75	0.25		12	29.524	29.563	0.8	A572-65	1.139
37	2.75 - 1.75	1		12	29.563	29.722	0.8	A572-65	1.135
38	1.75 - 1.5	0.25		12	29.722	29.762	0.775	A572-65	1.055
39	1.5 - 1.25	0.25		12	29.762	29.802	0.775	A572-65	1.054
40	1.25 - 1	0.25		12	29.802	29.841	0.8	A572-65	0.955
41	1 - 0	1		12	29.841	30.000	0.8	A572-65	0.951

## TNX Section Forces

Increment (ft):		TNX Output			
	5	Section Height (ft)	P <sub>u</sub> (K)	M <sub>ux</sub> (kip-ft)	V <sub>u</sub> (K)
1		100 - 95	3.82	50.57	7.43
2		95 - 90	5.02	92.61	8.80
3		90 - 85.5	5.25	133.31	9.30
4		85.5 - 85.25	5.29	135.64	9.34
5		85.25 - 80.25	9.86	220.24	16.31
6		80.25 - 75.25	10.52	303.48	17.01
7		75.25 - 70.25	14.14	403.21	21.18
8		70.25 - 66.5	14.71	483.59	21.71
9		66.5 - 61.5	16.00	594.07	22.49
10		61.5 - 56.5	16.90	708.17	23.18
11		56.5 - 54.75	17.21	748.91	23.43
12		54.75 - 54.5	17.29	754.76	23.45
13		54.5 - 49.5	18.36	873.75	24.17
14		49.5 - 44.5	19.47	996.28	24.87
15		44.5 - 39.5	20.61	1122.24	25.55
16		39.5 - 34.5	21.79	1251.51	26.20
17		34.5 - 33	22.14	1290.93	26.41
18		33 - 28	24.34	1425.14	27.28
19		28 - 23.5	25.71	1549.32	27.94
20		23.5 - 23.25	25.81	1556.31	27.96
21		23.25 - 22.75	25.99	1570.31	28.04
22		22.75 - 22.5	26.09	1577.32	28.07
23		22.5 - 17.5	28.01	1719.47	28.81
24		17.5 - 15.75	28.68	1770.07	29.06
25		15.75 - 15.5	28.81	1777.34	29.08
26		15.5 - 12.25	30.19	1872.55	29.54
27		12.25 - 12	30.30	1879.94	29.56
28		12 - 11.75	30.40	1887.33	29.59
29		11.75 - 11.5	30.50	1894.73	29.62
30		11.5 - 6.5	32.41	2044.39	30.26
31		6.5 - 6	32.61	2059.52	30.31
32		6 - 5.75	32.72	2067.10	30.34
33		5.75 - 4.5	33.22	2105.11	30.51
34		4.5 - 4.25	33.34	2112.74	30.52
35		4.25 - 3	33.84	2150.98	30.69
36		3 - 2.75	33.96	2158.65	30.70
37		2.75 - 1.75	34.35	2189.40	30.83
38		1.75 - 1.5	34.46	2197.11	30.83
39		1.5 - 1.25	34.56	2204.82	30.84
40		1.25 - 1	34.64	2212.53	30.85
41		1 - 0	34.98	2243.39	30.90

# Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
100 - 95	Pole	TP15.793x15x0.19	Pole	22.4%	Pass
95 - 90	Pole	TP16.587x15.793x0.19	Pole	37.3%	Pass
90 - 85.5	Pole	TP17.301x16.587x0.19	Pole	49.7%	Pass
85.5 - 85.25	Pole + Reinf.	TP17.34x17.301x0.6025	Reinf. 7 Tension Rupture	24.7%	Pass
85.25 - 80.25	Pole + Reinf.	TP18.134x17.34x0.5775	Reinf. 7 Tension Rupture	37.9%	Pass
80.25 - 75.25	Pole + Reinf.	TP18.927x18.134x0.5525	Reinf. 7 Tension Rupture	49.2%	Pass
75.25 - 70.25	Pole + Reinf.	TP19.72x18.927x0.54	Reinf. 7 Tension Rupture	61.9%	Pass
70.25 - 66.5	Pole + Reinf.	TP20.95x19.72x0.5213	Reinf. 7 Tension Rupture	71.1%	Pass
66.5 - 61.5	Pole + Reinf.	TP20.735x19.94x0.575	Reinf. 7 Tension Rupture	75.9%	Pass
61.5 - 56.5	Pole + Reinf.	TP21.529x20.735x0.5625	Reinf. 7 Tension Rupture	85.5%	Pass
56.5 - 54.75	Pole + Reinf.	TP21.807x21.529x0.5625	Reinf. 7 Tension Rupture	88.7%	Pass
54.75 - 54.5	Pole + Reinf.	TP21.847x21.807x0.7375	Reinf. 3 Tension Rupture	68.4%	Pass
54.5 - 49.5	Pole + Reinf.	TP22.642x21.847x0.7125	Reinf. 3 Tension Rupture	75.5%	Pass
49.5 - 44.5	Pole + Reinf.	TP23.437x22.642x0.6875	Reinf. 3 Tension Rupture	82.1%	Pass
44.5 - 39.5	Pole + Reinf.	TP24.231x23.437x0.675	Reinf. 3 Tension Rupture	88.3%	Pass
39.5 - 34.5	Pole + Reinf.	TP25.026x24.231x0.65	Reinf. 3 Tension Rupture	94.2%	Pass
34.5 - 33	Pole + Reinf.	TP25.9x25.026x0.65	Reinf. 3 Tension Rupture	95.8%	Pass
33 - 28	Pole + Reinf.	TP25.554x24.76x0.925	Reinf. 5 Tension Rupture	76.2%	Pass
28 - 23.5	Pole + Reinf.	TP26.268x25.554x0.9	Reinf. 5 Tension Rupture	80.0%	Pass
23.5 - 23.25	Pole + Reinf.	TP26.308x26.268x0.9	Reinf. 5 Tension Rupture	79.6%	Pass
23.25 - 22.75	Pole + Reinf.	TP26.388x26.308x0.9	Reinf. 5 Tension Rupture	80.0%	Pass
22.75 - 22.5	Pole + Reinf.	TP26.427x26.388x1.05	Reinf. 3 Tension Rupture	73.4%	Pass
22.5 - 17.5	Pole + Reinf.	TP27.221x26.427x1.025	Reinf. 3 Tension Rupture	77.1%	Pass
17.5 - 15.75	Pole + Reinf.	TP27.499x27.221x1	Reinf. 3 Tension Rupture	78.4%	Pass
15.75 - 15.5	Pole + Reinf.	TP27.539x27.499x1.075	Reinf. 6 Tension Rupture	68.5%	Pass
15.5 - 12.25	Pole + Reinf.	TP28.055x27.539x1.0625	Reinf. 6 Tension Rupture	70.6%	Pass
12.25 - 12	Pole + Reinf.	TP28.095x28.055x0.95	Reinf. 1 Tension Rupture	78.6%	Pass
12 - 11.75	Pole + Reinf.	TP28.134x28.095x0.95	Reinf. 1 Tension Rupture	78.8%	Pass
11.75 - 11.5	Pole + Reinf.	TP28.174x28.134x0.75	Reinf. 6 Tension Rupture	91.0%	Pass
11.5 - 6.5	Pole + Reinf.	TP28.968x28.174x0.7375	Reinf. 6 Tension Rupture	94.6%	Pass
6.5 - 6	Pole + Reinf.	TP29.047x28.968x0.7375	Reinf. 6 Tension Rupture	95.0%	Pass
6 - 5.75	Pole + Reinf.	TP29.087x29.047x0.75	Reinf. 10 Tension Rupture	88.0%	Pass
5.75 - 4.5	Pole + Reinf.	TP29.285x29.087x0.75	Reinf. 10 Tension Rupture	88.9%	Pass
4.5 - 4.25	Pole + Reinf.	TP29.325x29.285x0.8	Reinf. 8 Tension Yield	88.9%	Pass
4.25 - 3	Pole + Reinf.	TP29.524x29.325x0.8	Reinf. 8 Tension Yield	89.7%	Pass
3 - 2.75	Pole + Reinf.	TP29.563x29.524x0.8	Reinf. 9 Tension Yield	91.2%	Pass
2.75 - 1.75	Pole + Reinf.	TP29.722x29.563x0.8	Reinf. 9 Tension Yield	91.8%	Pass
1.75 - 1.5	Pole + Reinf.	TP29.762x29.722x0.775	Reinf. 9 Tension Yield	97.2%	Pass
1.5 - 1.25	Pole + Reinf.	TP29.802x29.762x0.775	Reinf. 9 Tension Yield	97.4%	Pass
1.25 - 1	Pole + Reinf.	TP29.841x29.802x0.8	Reinf. 4 Tension Yield	88.3%	Pass
1 - 0	Pole + Reinf.	TP30x29.841x0.8	Reinf. 4 Tension Yield	89.0%	Pass
				Summary	
			Pole	80.7%	Pass
			Reinforcement	97.4%	Pass
			Overall	97.4%	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	R10	R11	R12	R13	
100 - 95	297	n/a	297	9.53	n/a	9.53	22.4%														
95 - 90	345	n/a	345	10.02	n/a	10.02	37.3%														
90 - 85.5	392	n/a	392	10.45	n/a	10.45	49.7%														
85.5 - 85.25	394	769	1164	10.48	16.95	27.43	16.5%							24.7%							
85.25 - 80.25	452	834	1286	10.96	16.95	27.91	25.8%							37.9%							
80.25 - 75.25	514	902	1416	11.45	16.95	28.40	34.1%							49.2%							
75.25 - 70.25	583	972	1555	11.93	16.95	28.88	43.7%							61.9%							
70.25 - 66.5	637	1027	1664	12.30	16.95	29.25	51.0%							71.1%							
66.5 - 61.5	884	1066	1950	16.47	16.95	33.42	49.9%							75.9%							
61.5 - 56.5	991	1142	2134	17.11	16.95	34.06	56.9%							85.5%							
56.5 - 54.75	1031	1170	2200	17.33	16.95	34.28	59.3%							88.7%							
54.75 - 54.5	1036	1811	2847	17.36	25.41	42.77	46.3%	68.4%		68.4%											
54.5 - 49.5	1155	1932	3088	18.00	25.41	43.41	51.8%	75.5%		75.5%											
49.5 - 44.5	1283	2058	3341	18.64	25.41	44.05	57.1%	82.1%		82.1%											
44.5 - 39.5	1419	2188	3607	19.28	25.41	44.69	62.3%	88.3%		88.3%											
39.5 - 34.5	1565	2322	3886	19.92	25.41	45.33	67.4%	94.2%		94.2%											
34.5 - 33	1610	2362	3973	20.11	25.41	45.52	68.9%	95.8%		95.8%											
33 - 28	1667	3983	5650	20.34	42.36	62.70	54.3%	75.2%		75.2%		76.2%	76.2%								
28 - 23.5	1812	4193	6005	20.91	42.36	63.27	57.7%	78.9%		78.9%		80.0%	80.0%								
23.5 - 23.25	1821	4240	6061	20.95	54.36	75.31	57.5%	64.3%		78.5%		79.6%	65.2%						62.5%		
23.25 - 22.75	1837	4264	6101	21.01	54.36	75.37	57.9%	64.7%		79.0%		80.0%	65.5%						62.8%		
22.75 - 22.5	1871	5220	7091	21.04	62.49	83.53	55.2%	62.7%		73.4%		63.8%	66.2%					59.8%	63.4%		
22.5 - 17.5	2046	5515	7561	21.68	62.49	84.17	58.9%	65.9%		77.1%		67.1%	69.6%					62.9%	66.7%		
17.5 - 15.75	2110	5620	7730	21.90	62.49	84.39	60.1%	67.0%		78.4%		68.2%	70.8%					64.0%	67.9%		
15.75 - 15.5	2091	6175	8266	21.94	70.96	92.89	53.0%	67.7%		53.8%		63.2%	64.6%					58.3%	64.5%		
15.5 - 12.25	2212	6393	8605	22.35	70.96	93.31	55.1%	69.7%		55.5%		65.1%	66.6%					60.1%	66.5%		
12.25 - 12	2232	5646	7878	22.38	65.31	87.69	63.6%	78.6%		59.3%		70.8%	72.4%					73.6%	69.7%		
12 - 11.75	2242	5661	7903	22.41	65.31	87.72	63.7%	78.8%		59.4%		71.0%	72.6%					73.7%	69.8%		
11.75 - 11.5	2244	4186	6430	22.45	56.84	79.28	76.1%	84.5%		83.5%			91.0%					83.6%	72.8%		
11.5 - 6.5	2441	4408	6849	23.08	56.84	79.92	80.3%	88.0%		86.9%			94.6%					87.1%	75.8%		
6.5 - 6	2461	4431	6892	23.15	56.84	79.98	80.7%	88.3%		87.2%			95.0%					87.4%	76.1%		
6 - 5.75	2472	4629	7101	23.18	63.27	86.45	77.6%	77.4%		87.6%			83.4%					88.0%		58.9%	
5.75 - 4.5	2523	4688	7211	23.34	63.27	86.61	78.6%	78.2%		88.4%			84.2%					88.9%		59.5%	
4.5 - 4.25	2534	5096	7630	23.37	63.22	86.59	77.1%	71.7%		85.3%								87.3%		56.2%	
4.25 - 3	2586	5158	7743	23.53	63.22	86.75	78.2%	72.4%		86.0%								89.7%		56.7%	
3 - 2.75	2593	5255	7847	23.56	60.72	84.29	74.3%	69.3%		84.2%								86.2%	91.2%	57.5%	
2.75 - 1.75	2635	5306	7941	23.69	60.72	84.41	75.1%	69.9%		84.8%								86.9%	91.8%	57.9%	
1.75 - 1.5	2645	5074	7719	23.72	52.50	76.22	77.7%					92.5%						90.0%	97.2%	61.3%	
1.5 - 1.25	2655	5087	7742	23.75	52.50	76.25	77.9%											90.2%	97.4%	61.5%	
1.25 - 1	2666	5416	8082	23.79	47.55	71.34	74.2%													59.1%	83.9%
1 - 0	2709	5462	8171	23.91	47.55	71.47	75.0%													59.5%	84.5%

Note: Section capacity checked assuming all reinforcements are effective and using 5 degree increments.  
Rating per TIA-222-H Section 15.5.

# Monopole Base Plate Connection

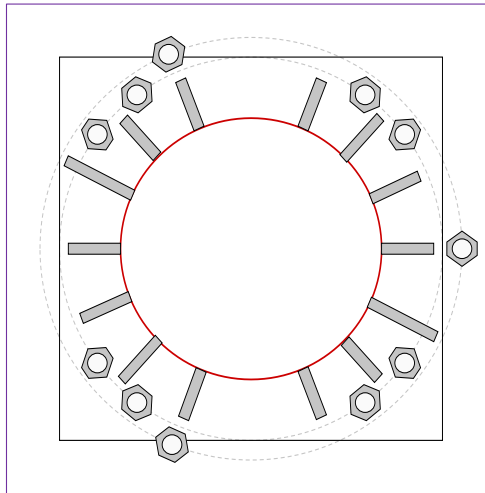


Site Info	
BU #	806042
Site Name	BOS ASHLAND 959026
Order #	593348 rev 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	Yes
$I_w$ (in)	1.75

Applied Loads	
Moment (kip-ft)	2243.39
Axial Force (kips)	34.98
Shear Force (kips)	30.90

\*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results																		
<b>Anchor Rod Data</b> GROUP 1: (8) 2-1/4" $\phi$ bolts (A615-75 X; $F_y=75$ ksi, $F_u=100$ ksi) on 44" BC <i>Anchor Spacing: 6.428 in</i> GROUP 2: (3) 2-1/4" $\phi$ bolts (F1554-105 X; $F_y=105$ ksi, $F_u=125$ ksi) on 48.5" BC	<b>Anchor Rod Summary</b> <i>(units of kips, kip-in)</i> GROUP 1: <table border="0"> <tr> <td><math>P_u_t = 213.75</math></td> <td><math>\phi P_{n_t} = 243.75</math></td> <td><b>Stress Rating</b></td> </tr> <tr> <td><math>V_u = 3.86</math></td> <td><math>\phi V_n = 149.1</math></td> <td><b>83.5%</b></td> </tr> <tr> <td><math>M_u = n/a</math></td> <td><math>\phi M_n = n/a</math></td> <td><b>Pass</b></td> </tr> </table> GROUP 2: <table border="0"> <tr> <td><math>P_u_t = 236.96</math></td> <td><math>\phi P_{n_t} = 304.69</math></td> <td><b>Stress Rating</b></td> </tr> <tr> <td><math>V_u = 0</math></td> <td><math>\phi V_n = 186.38</math></td> <td><b>74.1%</b></td> </tr> <tr> <td><math>M_u = n/a</math></td> <td><math>\phi M_n = n/a</math></td> <td><b>Pass</b></td> </tr> </table>	$P_u_t = 213.75$	$\phi P_{n_t} = 243.75$	<b>Stress Rating</b>	$V_u = 3.86$	$\phi V_n = 149.1$	<b>83.5%</b>	$M_u = n/a$	$\phi M_n = n/a$	<b>Pass</b>	$P_u_t = 236.96$	$\phi P_{n_t} = 304.69$	<b>Stress Rating</b>	$V_u = 0$	$\phi V_n = 186.38$	<b>74.1%</b>	$M_u = n/a$	$\phi M_n = n/a$	<b>Pass</b>
$P_u_t = 213.75$	$\phi P_{n_t} = 243.75$	<b>Stress Rating</b>																	
$V_u = 3.86$	$\phi V_n = 149.1$	<b>83.5%</b>																	
$M_u = n/a$	$\phi M_n = n/a$	<b>Pass</b>																	
$P_u_t = 236.96$	$\phi P_{n_t} = 304.69$	<b>Stress Rating</b>																	
$V_u = 0$	$\phi V_n = 186.38$	<b>74.1%</b>																	
$M_u = n/a$	$\phi M_n = n/a$	<b>Pass</b>																	
<b>Base Plate Data</b> 44" W x 2" Plate (A572-60; $F_y=60$ ksi, $F_u=75$ ksi); Clip: 0 in	<b>Base Plate Summary</b> <table border="0"> <tr> <td>Max Stress (ksi):</td> <td>110.62</td> <td>(Flexural)</td> </tr> <tr> <td>Allowable Stress (ksi):</td> <td>54</td> <td></td> </tr> <tr> <td>Stress Rating:</td> <td>FEA on File</td> <td><b>Sufficient</b></td> </tr> </table>	Max Stress (ksi):	110.62	(Flexural)	Allowable Stress (ksi):	54		Stress Rating:	FEA on File	<b>Sufficient</b>									
Max Stress (ksi):	110.62	(Flexural)																	
Allowable Stress (ksi):	54																		
Stress Rating:	FEA on File	<b>Sufficient</b>																	
<b>Stiffener Data</b> Group 1: (4) 18"H x 6"W x 1.25"T, Notch: 0.75" plate: $F_y=50$ ksi ; weld: $F_y=70$ ksi horiz. weld: 0.5" groove, 45° dbl bevel, 0.5" fillet vert. weld: 0.3125" fillet  Group 2: (3) 54"H x 6"W x 1.25"T, Notch: 0.75" plate: $F_y=50$ ksi ; weld: $F_y=70$ ksi horiz. weld: 0.5" groove, 45° dbl bevel, 0.5" fillet vert. weld: 0.3125" fillet  Group 3: (2) 36"H x 6"W x 1.25"T, Notch: 0.75" plate: $F_y=50$ ksi ; weld: $F_y=70$ ksi horiz. weld: 0.5" groove, 45° dbl bevel, 0.5" fillet vert. weld: 0.3125" fillet  Group 4: (3) 48"H x 6"W x 1.25"T, Notch: 0.75" plate: $F_y=50$ ksi ; weld: $F_y=80$ ksi horiz. weld: 0.625" groove, 45° dbl bevel, 0.625" fillet vert. weld: 0.707" fillet  Group 5: (2) 87"H x 8.4375"W x 1.25"T, Notch: 0.75" plate: $F_y=50$ ksi ; weld: $F_y=80$ ksi horiz. weld: 0.625" groove, 45° dbl bevel, 0.625" fillet vert. weld: 0.375" fillet	<b>Stiffener Summary</b> <table border="0"> <tr> <td>Horizontal Weld:</td> <td><b>53.9%</b></td> <td><b>Pass</b></td> </tr> <tr> <td>Vertical Weld:</td> <td><b>43.1%</b></td> <td><b>Pass</b></td> </tr> <tr> <td>Plate Flexure+Shear:</td> <td><b>7.1%</b></td> <td><b>Pass</b></td> </tr> <tr> <td>Plate Tension+Shear:</td> <td><b>32.6%</b></td> <td><b>Pass</b></td> </tr> <tr> <td>Plate Compression:</td> <td><b>34.2%</b></td> <td><b>Pass</b></td> </tr> </table>	Horizontal Weld:	<b>53.9%</b>	<b>Pass</b>	Vertical Weld:	<b>43.1%</b>	<b>Pass</b>	Plate Flexure+Shear:	<b>7.1%</b>	<b>Pass</b>	Plate Tension+Shear:	<b>32.6%</b>	<b>Pass</b>	Plate Compression:	<b>34.2%</b>	<b>Pass</b>			
Horizontal Weld:	<b>53.9%</b>	<b>Pass</b>																	
Vertical Weld:	<b>43.1%</b>	<b>Pass</b>																	
Plate Flexure+Shear:	<b>7.1%</b>	<b>Pass</b>																	
Plate Tension+Shear:	<b>32.6%</b>	<b>Pass</b>																	
Plate Compression:	<b>34.2%</b>	<b>Pass</b>																	
<b>Pole Data</b> 30" x 0.8" 12-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)	<b>Pole Summary</b> <table border="0"> <tr> <td>Punching Shear:</td> <td><b>4.6%</b></td> <td><b>Pass</b></td> </tr> </table>	Punching Shear:	<b>4.6%</b>	<b>Pass</b>															
Punching Shear:	<b>4.6%</b>	<b>Pass</b>																	

## **Base Plate FEA Results & Discussion**

**Analysis Software Information:** ANSYS, Inc. Products Release 19.R2

### **RESULTS SUMMARY**

<b>ELEMENT</b>	<b>MATERIAL</b>	<b>DESIGNATION</b>
Base Plate	Gr. 60	Sufficient

## **ANALYSIS APPROACH**

### **Finite Element Analysis**

This analysis has been completed by means of computer based finite element analysis (FEA). To establish the basic behavior of the connection, a finite element model (FEM) was developed with elastic material properties. If results of the elastic analysis prove to be unsatisfactory, the connection will be further analyzed with plastic (non-linear) material properties to allow for stress redistribution.

### **Loading**

The loading applied to the connection has been done by means of three applied loads: Axial, Shear, and Moment. All loads are calculated through tnxTower. The value of the moment has been adjusted to account for the moment induced by the shear component. The applied loads within the model are a set distance from the base plate. Loading has been applied in a direction that results in the highest stresses in the connection. The applied moment has been increased by a factor of 1.11 to consider a Phi equal to 0.9.

### **Loading Direction:**

Eight loading directions were considered in this analysis:

D1-D8) Load applied every 45° around the base plate, with the 0° datum chosen to ensure load into the corners of the base plate is considered.

### **Modeling Notes**

- All welded surfaces have been modeled using bonded contact definitions.
- All non-welded surfaces in contact have been conservatively modeled with frictionless contact definitions.
- The bolts have been modeled using deformable ANSYS one-dimensional beam elements.
- All other structural members are modeled as ANSYS two-dimensional shell elements or three-dimensional solid elements.
- The base plate is appropriately constrained at the anchor rod locations. A compression constraint is applied to the underside of the base plate to allow for proper bending.
- The load is applied at the top of the pole section. The length of the pole section modeled is chosen to allow for proper flexural behavior of the connection.

PJF Project:	37522-0071.001.7805
Engineer:	RMF
Date:	3/1/2022
Site Number:	806042
Site Name:	BOS ASHLAND 959026
Work Order Number:	2047354
Order Number:	586235 Rev 0

**Load Conversions For ANSYS Input** (Version v1.6 - Effective Date 08/11/2020 )

Analysis Levels:

Loading					
#	Elevation (ft)	Offset (in)	Load Type	Load From TNX (kip, kip-ft)	Load To ANSYS (lb, lb-in)
1	0.00	348.00	Moment <sup>1</sup>	2228.45	19,063,866.67
			Axial	36.02	36,020.00
			Shear	30.60	30,600.00

Axial/Shear Resultant: 47263.10

1. Moment accounts for  $\Phi=0.9$  as well as inherent moment caused by the shear load being applied at an offset.

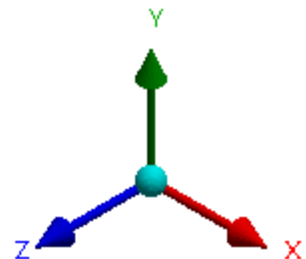
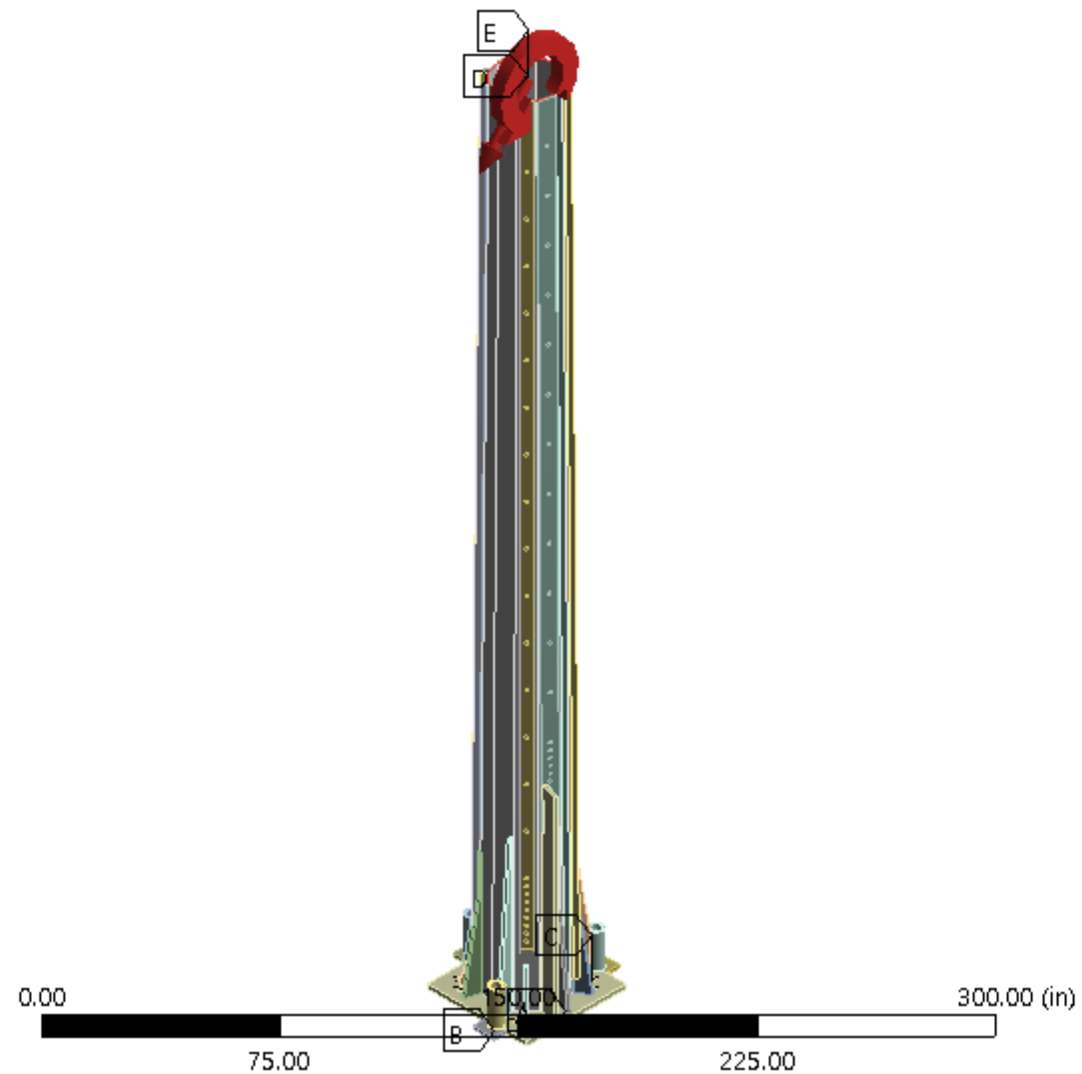
**B: 0**

0

Time: 1. s

3/1/2022 2:56 PM

- A** Compression Only Support
- B** Compression Only Support 2
- C** Fixed Support
- D** Moment:  $1.9064e+007$  lbf-in
- E** Remote Force: 47263 lbf



E: 225

Base Plate

Type: Equivalent (von-Mises) Stress

Unit: psi

Time: 1

3/1/2022 2:57 PM

65389 Max

60000

52500

45000

37500

30000

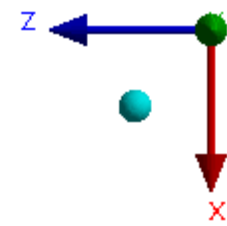
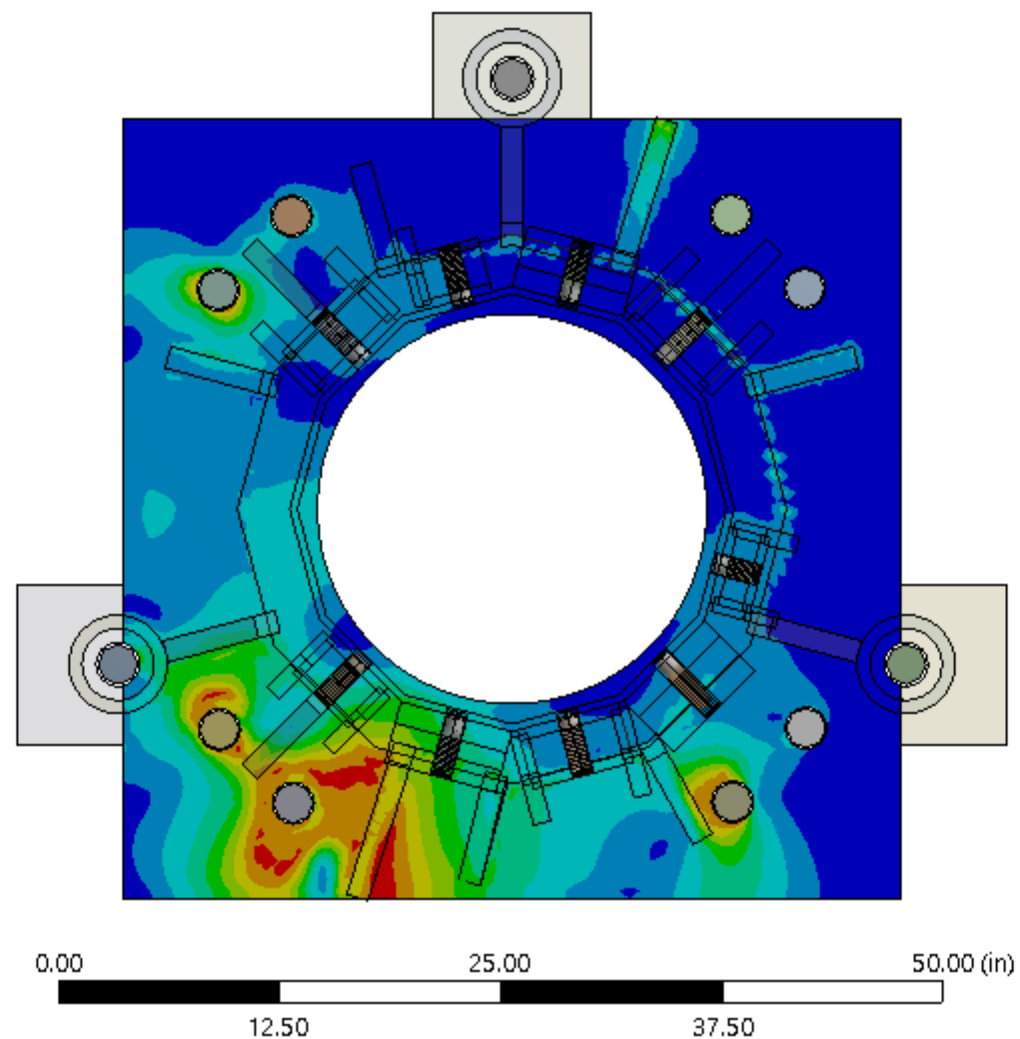
22500

15000

7500

4.6088 Min

0



F: 270

Base Plate

Type: Equivalent (von-Mises) Stress

Unit: psi

Time: 1

3/1/2022 2:58 PM

65484 Max

60000

52500

45000

37500

30000

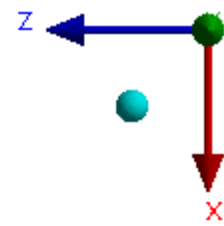
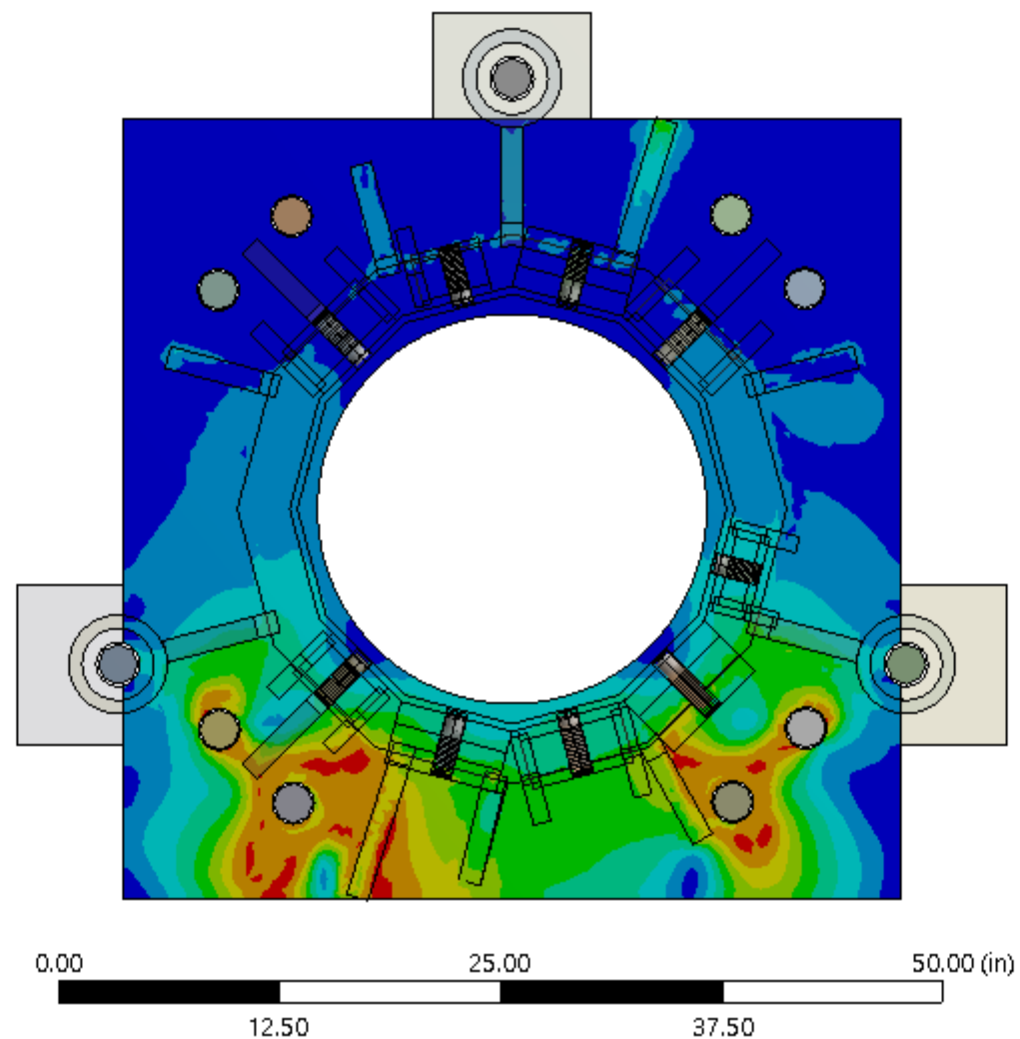
22500

15000

7500

2.3007 Min

0



G: 315

Base Plate

Type: Equivalent (von-Mises) Stress

Unit: psi

Time: 1

3/1/2022 2:58 PM

64093 Max

60000

52500

45000

37500

30000

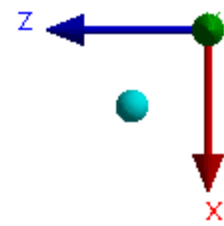
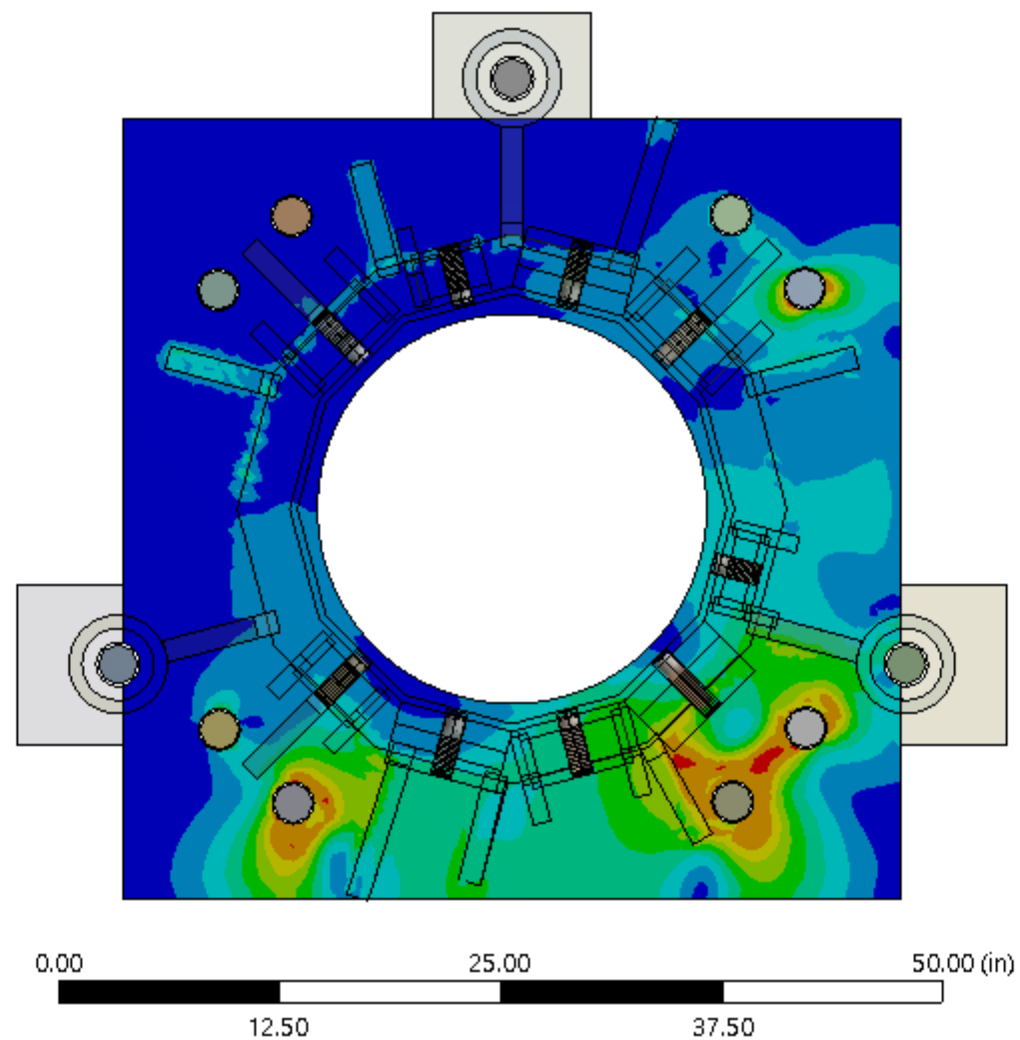
22500

15000

7500

3.2838 Min

0



## Drilled Pier Foundation

BU # :	806042
Site Name:	BOS ASHLAND 959026
Order Number:	593348 Rev 1
TIA-222 Revison:	H
Tower Type:	Monopole



Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	2243.38	
Axial Force (kips)	35	
Shear Force (kips)	30.89	

Material Properties		
Concrete Strength, f <sub>c</sub> :	3	ksi
Rebar Strength, F <sub>y</sub> :	60	ksi
Tie Yield Strength, F <sub>y</sub> :	40	ksi

Rebar 2, Fy  
Override  
(ksi)

Pier Design Data	
Depth	21.25 ft
Ext. Above Grade	0.25 ft
Pier Section 1	
<i>From 0.25' above grade to 21.25' below grade</i>	
Pier Diameter	6 ft
Rebar Quantity	46
Rebar Size	8
Clear Cover to Ties	4 in
Tie Size	4
Tie Spacing	in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

### Analysis Results

Soil Lateral Check	Compression	Uplift
D <sub>v=0</sub> (ft from TOC)	6.70	-
Soil Safety Factor	1.62	-
Max Moment (kip-ft)	2451.23	-
Rating*	78.4%	-

Soil Vertical Check	Compression	Uplift
Skin Friction (kips)	282.78	-
End Bearing (kips)	424.12	-
Weight of Concrete (kips)	85.59	-
Total Capacity (kips)	706.89	-
Axial (kips)	120.59	-
Rating*	16.2%	-

Reinforced Concrete Flexure	Compression	Uplift
Critical Depth (ft from TOC)	6.64	-
Critical Moment (kip-ft)	2451.19	-
Critical Moment Capacity	4663.70	-
Rating*	50.1%	-

Reinforced Concrete Shear	Compression	Uplift
Critical Depth (ft from TOC)	15.40	-
Critical Shear (kip)	347.52	-
Critical Shear Capacity	434.11	-
Rating*	76.2%	-

Structural Foundation Rating*	76.2%
Soil Interaction Rating*	78.4%

\*Rating per TIA-222-H Section 15.5

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

[Go to Soil Calculations](#)

Soil Profile													
Groundwater Depth	10			# of Layers	3								

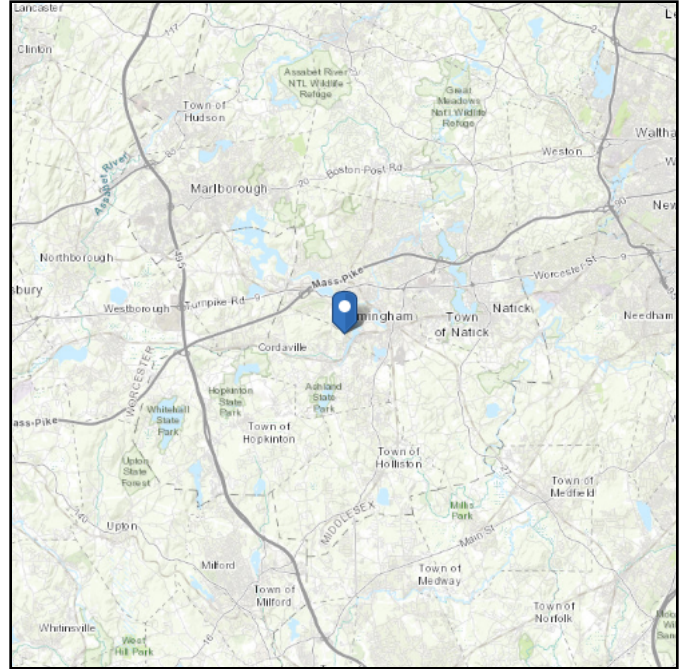
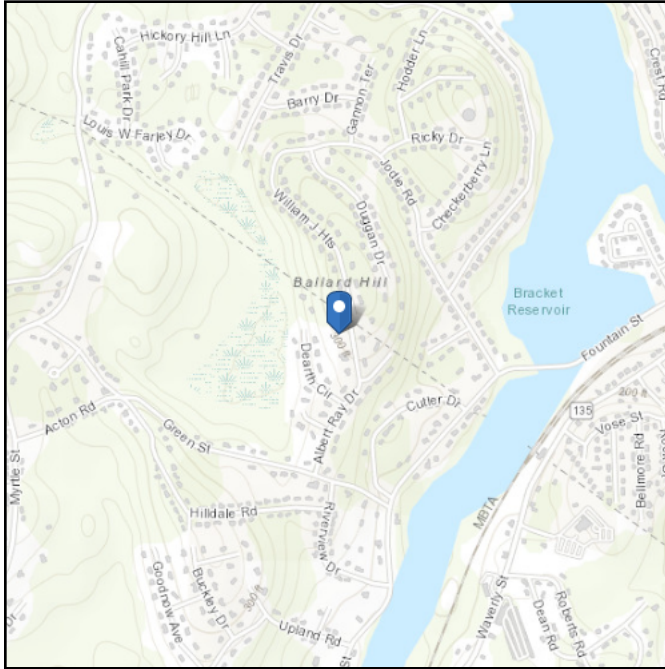
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	Y <sub>soil</sub> (pcf)	Y <sub>concrete</sub> (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	5	5	100	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	5	10	5	120	150		32	0.904	0.904				58	Cohesionless
3	10	21.25	11.25	57.6	87.6		32	1.376	1.376			20	58	Cohesionless

# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

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

**Elevation:** 324.94 ft (NAVD 88)  
**Latitude:** 42.273694  
**Longitude:** -71.451556

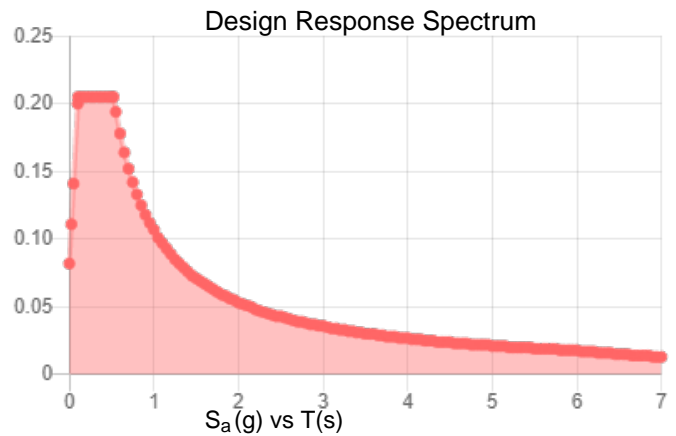
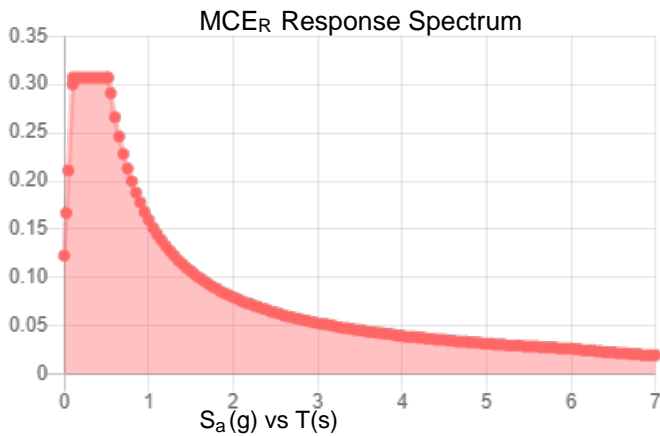


**Site Soil Class:** D - Stiff Soil

**Results:**

$S_s$ :	0.192	$S_{DS}$ :	0.205
$S_1$ :	0.067	$S_{D1}$ :	0.107
$F_a$ :	1.6	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.098
$S_{MS}$ :	0.307	PGA <sub>M</sub> :	0.157
$S_{M1}$ :	0.16	F <sub>PGA</sub> :	1.6
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:** Thu Feb 24 2022

**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

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**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 Feb 24 2022

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

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

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