



April 16, 2021

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

RE: **Notice of Exempt Modification for T-Mobile  
Crown Site ID# 876368; T-Mobile Site ID# CTHA696A  
1 Public Works Drive, East Hampton, CT 06032  
Latitude: 41° 33' 53.14" / Longitude: -72° 32' 35.18"**

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 177-foot mount on the existing 180-foot Monopole Tower located at 1 Public Works Drive in East Hampton. The property is owned by the Town of East Hampton and the Tower is owned by Crown Castle. T-Mobile now intends to replace six (6) existing antennas and add three (3) new antennas. This modification/proposal includes hardware that is both 4G(LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times.

**Planned Modifications:  
Tower:**

Remove and Replace:

(3) RFS – APXVTM14-ALU-120 Antennas (**REMOVE**) – (3) RFS – APX16DWV-16DWV-S-E-A20 Antennas (**REPLACE**)

(3) Commscope – NNVV-65B-R4 Antennas (**REMOVE**) – (3) RFS – APXVAALL24\_43-U-NA20 Antennas (**REPLACE**)

(6) Alcatel Lucent - 800 MHz 2X50W RRH Radios (**REMOVE**) – (3) Ericsson – 4415 B66A Radios (**REPLACE**)

(3) Nokia – FZHN Radios (**REMOVE**) – (3) Ericsson – 4449 B71+B85 Radios (**REPLACE**)

(3) Alcatel Lucent – PCS 1900MHz 4X45-65MHz Radios (**REMOVE**) – (3) Ericsson – 4424 B25 Radios (**REPLACE**)

Install New:

(3) AIR6449 B41 Antennas  
(4) 1 5/8" feedlines

**Ground:**

Install New:

- (1) SSC 6160 cabinet
- (1) B160 battery cabinet
- (1) BB6648
- (3) BB6630
- (1) PSU 4813 voltage booster
- (1) DUG20
- (1) IXRe router

The facility was approved by the Connecticut Siting Council on November 21<sup>st</sup>, 2002 via Docket No. 229. The approval was given with conditions which this proposal complies with.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to David Cox, Town Manager for the Town of East Hampton, as well as Jeremy DeCarli, Planning and Zoning Official for the Town of East Hampton.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Melanie A. Bachman

Page 3

Sincerely,

A handwritten signature in black ink, appearing to read "Richard Zajac". The signature is fluid and cursive, with the first name "Richard" and last name "Zajac" clearly distinguishable.

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

cc:

David Cox, Town Manager  
Town of East Hampton  
1 Community Drive  
East Hampton, CT 06424  
(860) 267-4468

Jeremy DeCarli, Planning and Zoning Official  
Town of East Hampton  
1 Community Drive  
East Hampton, CT 06424  
(860) 267-7450

(585) 445-5896

ORIGIN ID: ONHA  
RICHARD ZAJAC  
CROWN CASTLE  
629 KAYLEIGH DR  
WEBSTER, NY 14580  
UNITED STATES US

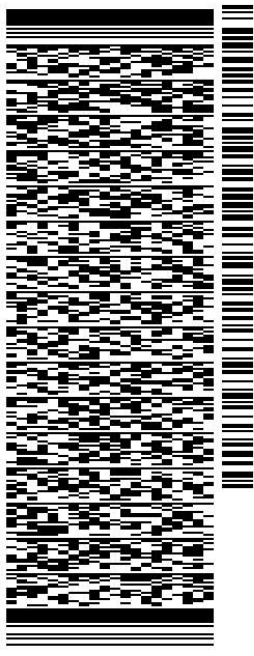
SHIP DATE: 16APR21  
ACT WGT: 1.00 LB  
CAD: 112911364INET4340

BILL SENDER

TO **DAVID COX, TOWN MANAGER**  
**TOWN OF EAST HAMPTON**  
**1 COMMUNITY DRIVE**

**EAST HAMPTON CT 06424**

(860) 267-4468  
INV/ REF: 799001 7890  
DEPT:



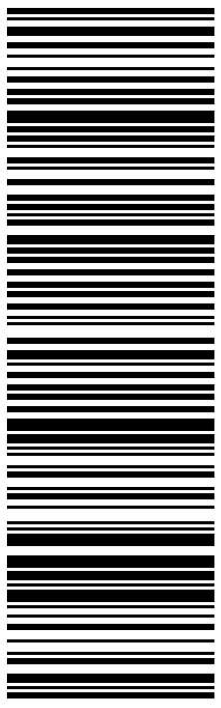
56DJ3/F9A6/FE4A

TRK# 7734 6992 7786  
0201

MON - 19 APR 4:30P  
STANDARD OVERNIGHT

**XE SKKA**

06424  
CT-US BDL



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

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

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

ORIGIN ID: ONHA (585) 445-5896

RICHARD ZAJAC  
CROWN CASTLE  
629 KAYLEIGH DR

WEBSTER, NY 14580  
UNITED STATES US

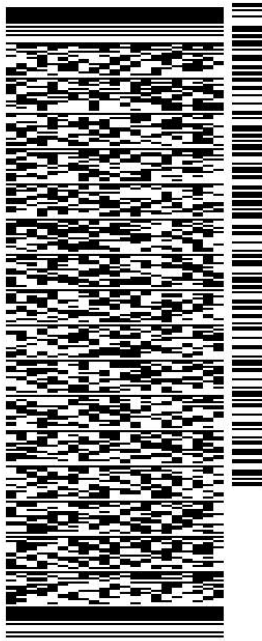
SHIP DATE: 16APR21  
ACT WGT: 1.00 LB  
CAD: 112911364INET4340

BILL SENDER

TO **JEREMY DECARLI, PLANNING & ZONING**  
**TOWN OF EAST HAMPTON**  
**1 COMMUNITY DRIVE**

**EAST HAMPTON CT 06424**

(860) 267-7450 REF: 7990017890  
INV/ PO: DEPT:



J211321033101uv

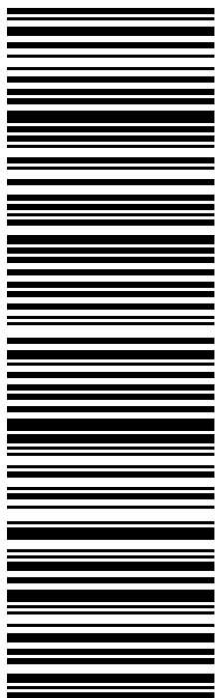
56DJ3/F9A6/FE4A

TRK# 7734 6996 1597  
0201

MON - 19 APR 4:30P  
STANDARD OVERNIGHT

**XE SKKA**

06424  
CT-US BDL



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# Exhibit A

## **Original Facility Approval**

<b>DOCKET NO. 229</b> – Sprint Spectrum, L. P. application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a cellular telecommunications facility at Public Works Drive, East Hampton, Connecticut.	}	Connecticut
	}	Siting
	}	Council
	}	November 21, 2002

## Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Sprint Spectrum L. P. (Sprint) for the construction, maintenance and operation of a wireless telecommunications facility at the proposed site located at 1 Public Works Drive in East Hampton, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of Sprint, AT&T Wireless LLC, and other entities, both public and private, but such tower shall not exceed a height of 180 feet above ground level.
2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include:
  - a. a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas, equipment building, security fence, access road, utility line, and landscaping;
  - b. a schedule for the removal of the 100-foot town tower; and

- c. construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.
3. Site preparation and construction activities shall occur during the time period of October 31 through March 31 to reduce potential impacts to populations of the state endangered eastern timber rattlesnake (*Crotalus horridus*).
4. The Certificate Holder shall transfer the town's communication equipment from the 100-foot town tower to the approved facility within 30 days of completion of the approved facility. The 100-foot town tower shall be dismantled within 60-days of completion of the approved facility.
5. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall provide a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.
6. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.
7. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.
8. If the facility does not initially provide, or permanently ceases to provide wireless services following completion of construction, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.
9. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and ceases to function.
10. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved.



Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The Hartford Courant, Rivereast News Bulletin, and the Middletown Press.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

**Applicant**

Sprint Spectrum, L.P.  
d/b/a Sprint PCS

**Its Representative**

Thomas J. Regan, Esquire  
Brown Rudnick Berlack Israels LLP  
CityPlace I, 38<sup>th</sup> Floor  
185 Asylum Street  
Hartford, CT 06103-3402  
(860) 509-6522

**Intervenor**

AT&T Wireless PCS, LLC  
d/b/a AT&T Wireless

**Its Representative**

Christopher B. Fisher  
Cuddy & Feder & Worby  
90 Maple Avenue  
White Plains, NY 10601  
(914) 761-1300

# Exhibit B

## **Property Card**

# 1 PUBLIC WORKS DR #CELL

**Location** 1 PUBLIC WORKS DR #CELL

**Mblu** 06/ 5A/ 8B/ /

**Acct#** R07102

**Owner** EAST HAMPTON TOWN OF &

**Assessment** \$203,000

**Appraisal** \$290,000

**PID** 5538

**Building Count** 1

## Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2021	\$90,000	\$200,000	\$290,000

Assessment			
Valuation Year	Improvements	Land	Total
2021	\$63,000	\$140,000	\$203,000

## Owner of Record

**Owner** EAST HAMPTON TOWN OF &  
**Co-Owner** SPRINT SPECTRUM LP PROPTY TAX  
**Address** PO BOX 8430 (CT33XC018)  
 KANSAS CITY, MO 64114

**Sale Price** \$0  
**Certificate**  
**Book & Page** 0000/0000  
**Sale Date** 01/01/1900  
**Instrument** 29

## Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
EAST HAMPTON TOWN OF &	\$0		0000/0000	29	01/01/1900

## Building Information

### Building 1 : Section 1

**Year Built:**  
**Living Area:** 0  
**Replacement Cost:** \$0  
**Building Percent Good:**  
**Replacement Cost**  
**Less Depreciation:** \$0

**Building Attributes**

Field	Description
Style:	Outbuildings
Model	
Grade:	
Story Height	
Foundation	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
# Extra Fixtures	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Fireplace	
Cndtn	
Fin Basement	
Fin Bsmt Qual	
Bsmt. Garages	
Num Park	
Fireplaces	
Solar	
Gas Fireplace	
Fndtn Cndtn	
Basement	

### Building Photo



(<http://images.vgsi.com/photos/EastHamptonCTPhotos//default.jpg>)

### Building Layout

 Building Layout

([http://images.vgsi.com/photos/EastHamptonCTPhotos//Sketches/5538\\_55](http://images.vgsi.com/photos/EastHamptonCTPhotos//Sketches/5538_55))

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

### Extra Features

Extra Features	Legend
No Data for Extra Features	

## Land

### Land Use

**Use Code** 200  
**Description** Commercial Vacant  
**Zone** C  
**Neighborhood** COM  
**Alt Land Appr Category** No

### Land Line Valuation

**Size (Acres)** 1  
**Frontage**  
**Depth**  
**Assessed Value** \$140,000  
**Appraised Value** \$200,000

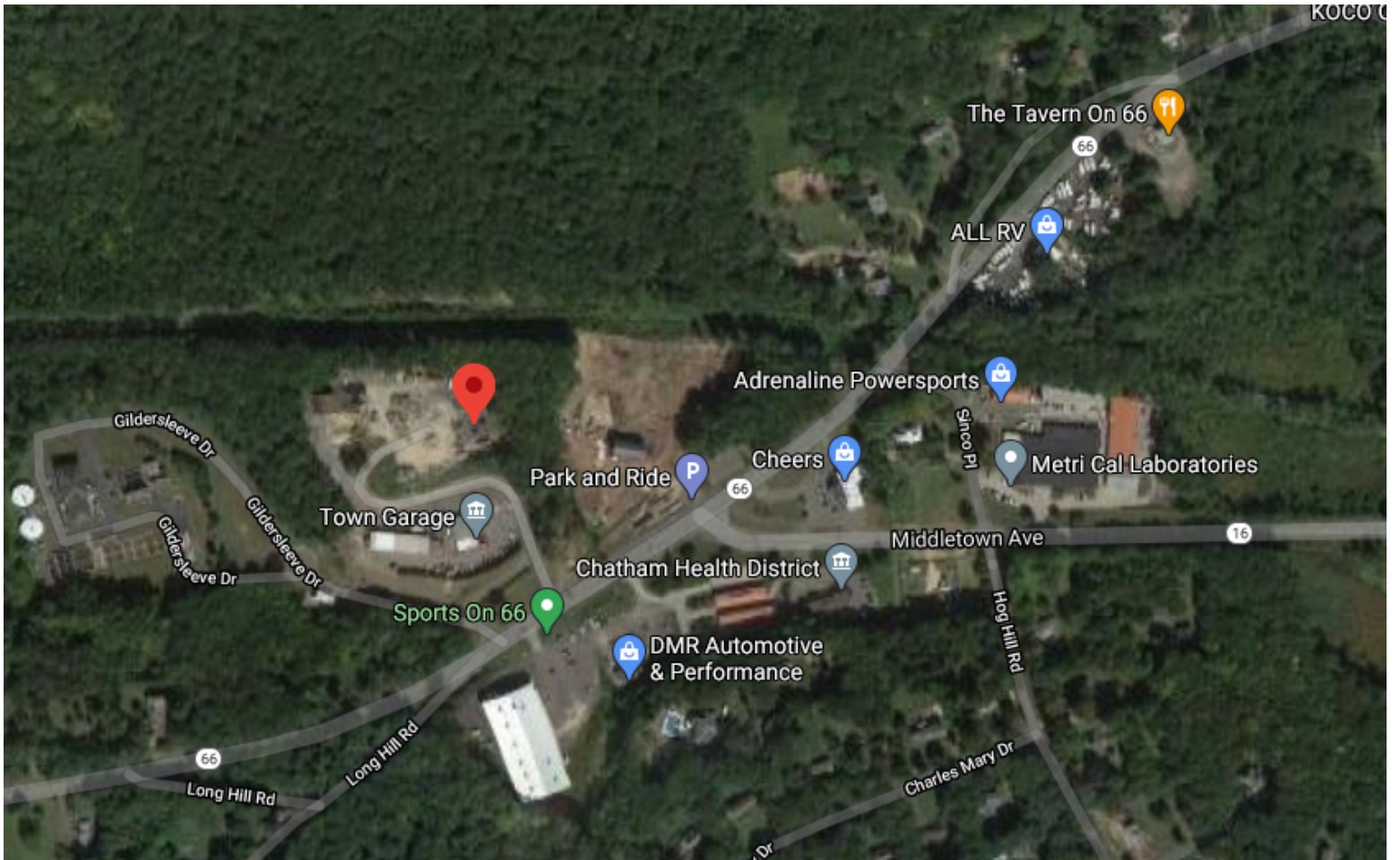
## Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
CEL	Cell Tower			1.00 UNITS	\$90,000	1

## Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2020	\$90,000	\$200,000	\$290,000
2020	\$100,000	\$200,000	\$300,000
2020	\$100,000	\$200,000	\$300,000
2019	\$100,000	\$200,000	\$300,000

Assessment			
Valuation Year	Improvements	Land	Total
2020	\$63,000	\$140,000	\$203,000
2020	\$70,000	\$140,000	\$210,000
2020	\$70,000	\$140,000	\$210,000
2019	\$70,000	\$140,000	\$210,000



# Exhibit C

## **Construction Drawings**

# T-Mobile

CALL CONNECTICUT ONE CALL  
(800) 922-4455 CBYD.COM  
CALL 2 WORKING DAYS  
BEFORE YOU DIG!

**T-MOBILE SITE NUMBER:CTHA696A**

**T-MOBILE SITE NAME: CTHA696A**

**SITE TYPE: MONOPOLE**

**TOWER HEIGHT: 180'-0"**

**BUSINESS UNIT #:876368**

**SITE ADDRESS: 1 PUBLIC WORKS DRIVE  
EAST HAMPTON, CT 06032**

**COUNTY: MIDDLESEX**

**JURISDICTION: TOWN OF EAST HAMPTON**

**T-MOBILE SPRINT-RETAIN SITE CONFIGURATION: 67D5998C\_1XAIR+1QP+1OP (GSM ONLY)**

T-Mobile

35 GRIFFIN ROAD  
BLOOMFIELD, CT 06002

**CROWN CASTLE**

1200 MACARTHUR BLVD, SUITE 200  
MAHWAH, NJ 07430

**TOWER ENGINEERING PROFESSIONALS**

326 TRYON RD  
RALEIGH, NC 27603  
(919) 661-6351

TEP JOB #: 218229.498736

**T-MOBILE SITE NUMBER:  
CTHA696A**

**BU #: 876368**  
YANKEE LAKE/EAST  
HAMPTON/TOWN

1 PUBLIC WORKS DRIVE  
EAST HAMPTON, CT 06032  
(MIDDLESEX COUNTY)

EXISTING 180'-0"  
MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	03/01/21	SBS	PRELIMINARY	BSE
0	03/26/21	JW	CONSTRUCTION	JTC

SEAL:



03/26/21

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

**SHEET NUMBER:**

**T-1**

**REVISION:**

**0**

**SITE INFORMATION**

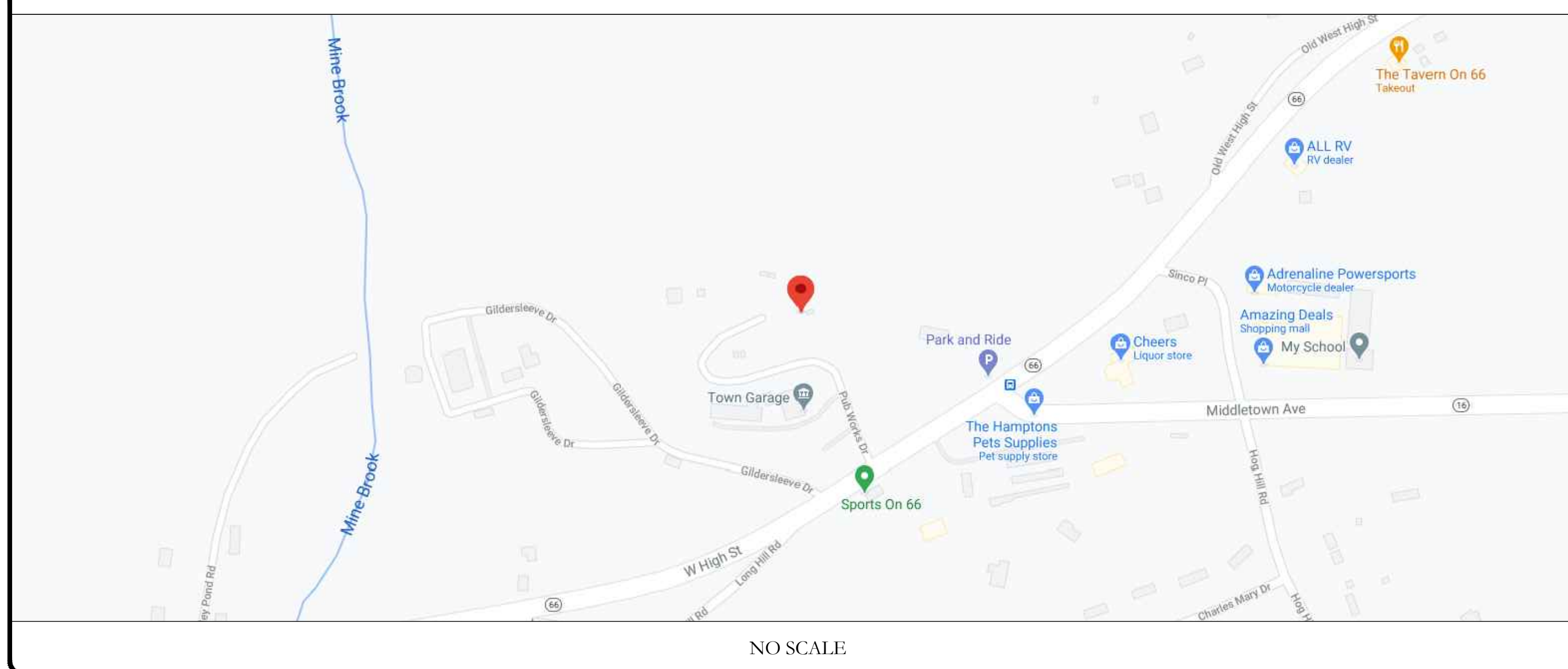
CROWN CASTLE USA INC. YANKEE LAKE/EAST HAMPTON/TOWN  
SITE NAME:  
SITE ADDRESS: 1 PUBLIC WORKS DRIVE  
EAST HAMPTON, CT 06032  
COUNTY: MIDDLESEX  
PARCEL #: 06-5A-8B  
AREA OF CONSTRUCTION: EXISTING  
LATITUDE: 41° 33' 53.14" (41.56477000)  
LONGITUDE: -72° 32' 35.18" (-72.54310000)  
LAT/LONG TYPE: NAD83  
GROUND ELEVATION: 337 FT (AMSL)  
CURRENT ZONING: R-2  
JURISDICTION: TOWN OF EAST HAMPTON  
TYPE OF CONSTRUCTION: IIB  
A.D.A. COMPLIANCE: FACILITY IS UNMANNED AND NOT FOR  
HUMAN HABITATION  
PROPERTY OWNER: TOWN OF EAST HAMPTON & SPRINT  
SPECTRUM LP PROPTY TAX  
PO BOX 8430 (CT33XC018)  
KANSAS CITY, MO 64114  
TOWER OWNER: CROWN CASTLE USA, INC.  
1200 MACARTHUR BLVD, SUITE 200  
MAHWAH, NJ 07430  
CARRIER/APPLICANT: T-MOBILE  
35 GRIFFIN ROAD  
BLOOMFIELD, CT 06002  
ELECTRIC PROVIDER: CONNECTICUT LIGHT & POWER CO.  
(800) 286-2000  
TELCO PROVIDER: AT&T  
(800) 288-2020

**DRAWING INDEX**

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1.1	FINAL SITE PLAN
C-1.2	EXISTING & FINAL EQUIPMENT PLAN
C-2	FINAL ELEVATION & ANTENNA PLANS
C-3	ANTENNA & CABLE SCHEDULE
C-4	EQUIPMENT SPECS
C-5	CABINET SPECS
E-1	AC PANEL SCHEDULES & ONE LINE DIAGRAM
G-1	ANTENNA GROUNDING DIAGRAM
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 22x34. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

**LOCATION MAP**



**APPLICABLE CODES/REFERENCE DOCUMENTS**

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

CODE TYPE	CODE
BUILDING	2018 CONNECTICUT STATE BUILDING CODE
MECHANICAL	2018 INTERNATIONAL MECHANICAL CODE
ELECTRICAL	2017 NEC

**REFERENCE DOCUMENTS:**

STRUCTURAL ANALYSIS:	MORRISON HERSFIELD
DATED:	02/12/2021
MOUNT ANALYSIS:	BY GPD ENGINEERING
DATED:	02/04/2021

ORDER ID:	538768	RFDS VERSION:	1
REVISION:	1	DATED:	01/11/2021

**ANALYSIS CRITERIA:**

APPLICABLE CODES: TIA-222-H / ASCE 7-16  
WIND SPEED: V = 130 MPH (ULTIMATE 3 SECOND GUST)  
EXPOSURE CATEGORY: B  
RISK CATEGORY: II  
TOPOGRAPHIC CATEGORY: 1  
SEISMIC Ss: 0.178  
SEISMIC S1: 0.062  
SERVICE WIND SPEED: 60 MPH

**APPROVALS**

APPROVAL	SIGNATURE	DATE
RF	_____	_____
CONST.	_____	_____
FAA	_____	_____
OPS	_____	_____
RE	_____	_____
SR DEV MGR	_____	_____
REG DIR	_____	_____

THE PARTIES ABOVE HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL CONSTRUCTION DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND ANY CHANGES AND MODIFICATIONS THEY MAY IMPOSE.

**PROJECT TEAM**

A&E FIRM: TOWER ENGINEERING PROFESSIONALS  
326 TRYON ROAD  
RALEIGH, NC 27603  
JOSEPH T. CRESS - PROJECT MANAGER  
(919) 661-6351  
GRAHAM M. ANDRES - CIVIL ENGINEER  
(919) 661-6351  
GRAHAM M. ANDRES - ELECTRICAL ENGINEER  
(919) 661-6351  
CROWN CASTLE USA INC. DISTRICT CONTACTS:  
4511 N. HIMES AVENUE, SUITE 210  
TAMPA, FL 33614  
NITSA CRENSHAW - A&E SPECIALIST  
(813) 342-3871

**PROJECT DESCRIPTION**

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

**TOWER SCOPE OF WORK:**

- REMOVE (4) EXISTING SPRINT CABLES
- REMOVE (4) HYBRID CABLES
- REMOVE (6) EXISTING SPRINT ANTENNAS
- REMOVE (12) EXISTING SPRINT RRHS
- REUSE (1) PLATFORM MOUNT WITH HANDRAIL
- REUSE (1) GPS ANTENNA & CABLE
- INSTALL (9) ANTENNAS
- INSTALL (9) RRHS
- INSTALL (3) BACK-TO-BACK RADIO MOUNTS
- INSTALL (4) 6x24 HCS 4AWG 100m CABLES

**GROUND SCOPE OF WORK:**

- REMOVE LEGACY SPRINT CABINET(S) AS NEEDED
- INSTALL (2) CABINETS
- INSTALL ICE BRIDGE
- INSTALL (3) BB 6630, (1) BB 6648, (1) DUG20, (1) IXRE ROUTER, (1) PSU 4813 BOOSTER
- REUSE EXISTING SPRINT PAD, ICE BRIDGE & UTILITY EQUIPMENT

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



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

- NOTICE TO PROCEED- NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800-788-7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
- "LOOK UP" - CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT: THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
- PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
- ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADDRESS TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD C&S-STD-10253, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA-322 (LATEST EDITION).
- ALL SITE WORK TO COMPLY WITH QAS-STD-10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE" AND LATEST VERSION OF ANSI/TIA-1019-A-2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
- IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.
- ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS. LATEST APPROVED REVISION.
- CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
- ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, TOWER OWNER, CROWN CASTLE USA INC., AND/OR LOCAL UTILITIES.
- THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
- THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
- CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
- THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
- CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
- NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

**GREENFIELD GROUNDING NOTES:**

- ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
- THE CONTRACTOR SHALL PERFORM IEEE FALL-OFF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
- THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
- METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
- METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
- EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.
- CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
- ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
- ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
- USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
- EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
- ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
- COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
- ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
- APPROVED ANTI-OXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
- ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH CORROSION RESISTANT MATERIAL.
- MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
- BOND ALL METALLIC OBJECTS WITHIN 6 FT. OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
- GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
- ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).
- BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY).

**GENERAL NOTES:**

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

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

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

**ELECTRICAL INSTALLATION NOTES:**

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

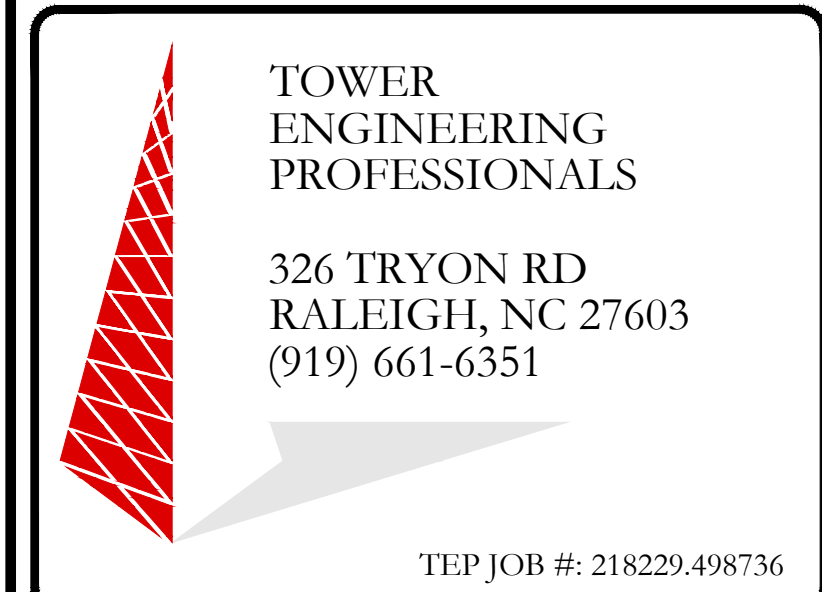
\* SEE NEC 210.5(C)(1) AND (2)  
\*\* POLARITY MARKED AT TERMINATION

**ABBREVIATIONS:**

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

**APWA UNIFORM COLOR CODE:**

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



**T-MOBILE SITE NUMBER:**  
**CTHA696A**

**BU #: 876368**  
**YANKEE LAKE/EAST HAMPTON/TOWN**

**1 PUBLIC WORKS DRIVE, EAST HAMPTON, CT 06032 (MIDDLESEX COUNTY)**

**EXISTING 180'-0" MONOPOLE**

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	03/01/21	SBS	PRELIMINARY	BSE
0	03/26/21	JW	CONSTRUCTION	JTC

SEAL:

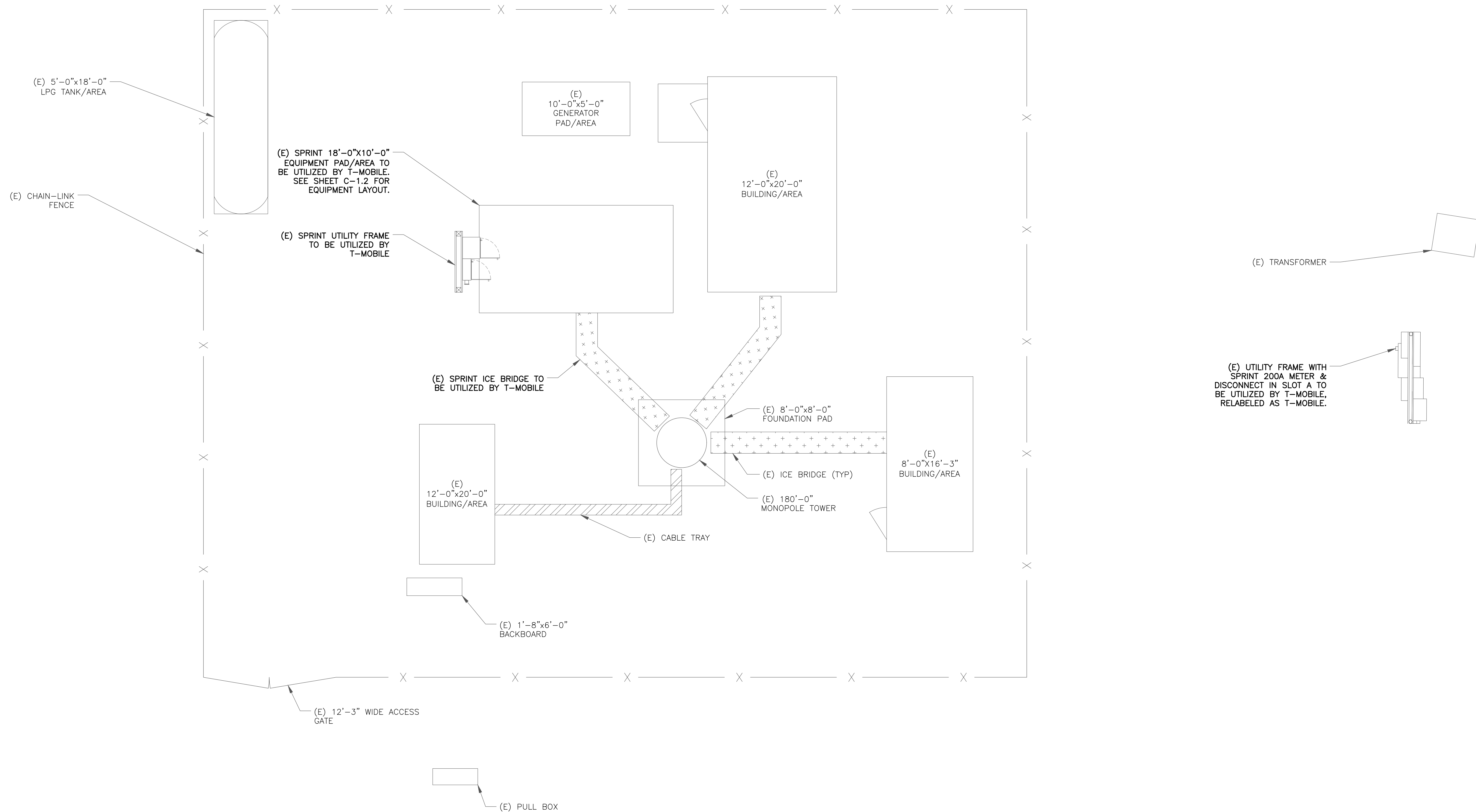
03/26/21

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**SHEET NUMBER: T-2**      **REVISION: 0**

**NOTE:**  
 SITE PLAN SHOWN BELOW WAS REPRODUCED FROM INFORMATION PROVIDED BY CROWN CASTLE AND SITE WALK CONDUCTED BY TEP CONTRACTOR TO VERIFY ALL EXISTING INFORMATION IS AS INDICATED ON SITE PLAN. CONTRACTOR IS TO ESTABLISH THE EXISTENCE AND LOCATION OF ALL EXISTING UNDERGROUND AND OVERHEAD UTILITIES. IMMEDIATELY NOTIFY THE CONSTRUCTION MANAGER OF ANY DISCREPANCIES.

**FLOODPLAIN NOTE:**  
 THE TOWER IS LOCATED IN ZONE "X" AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN ACCORDING TO FEMA COMMUNITY PANEL #09007C0135G, DATED 08/28/2008.



**T-Mobile**

35 GRIFFIN ROAD  
 BLOOMFIELD, CT 06002

**CROWN CASTLE**

1200 MACARTHUR BLVD, SUITE 200  
 MAHWAH, NJ 07430

**TOWER ENGINEERING PROFESSIONALS**

326 TRYON RD  
 RALEIGH, NC 27603  
 (919) 661-6351

TEP JOB #: 218229.498736

**T-MOBILE SITE NUMBER: CTHA696A**

**BU #: 876368**  
 YANKEE LAKE/EAST HAMPTON/TOWN

1 PUBLIC WORKS DRIVE  
 EAST HAMPTON, CT 06032  
 (MIDDLESEX COUNTY)

EXISTING 180'-0"  
 MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
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SEAL:



03/26/21

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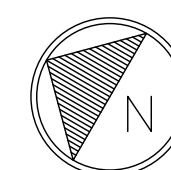
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**C-1.1**

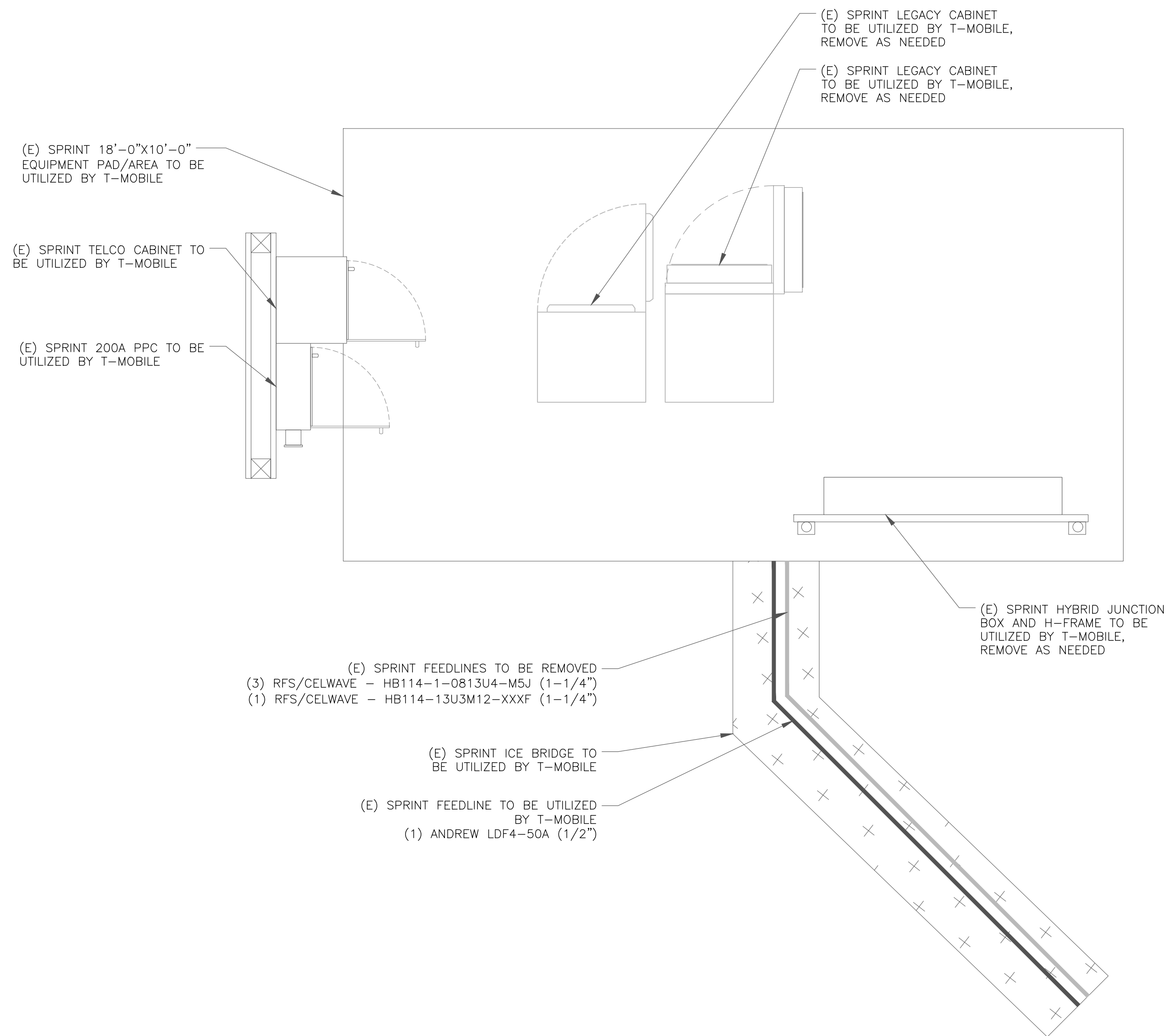
REVISION:

**0**

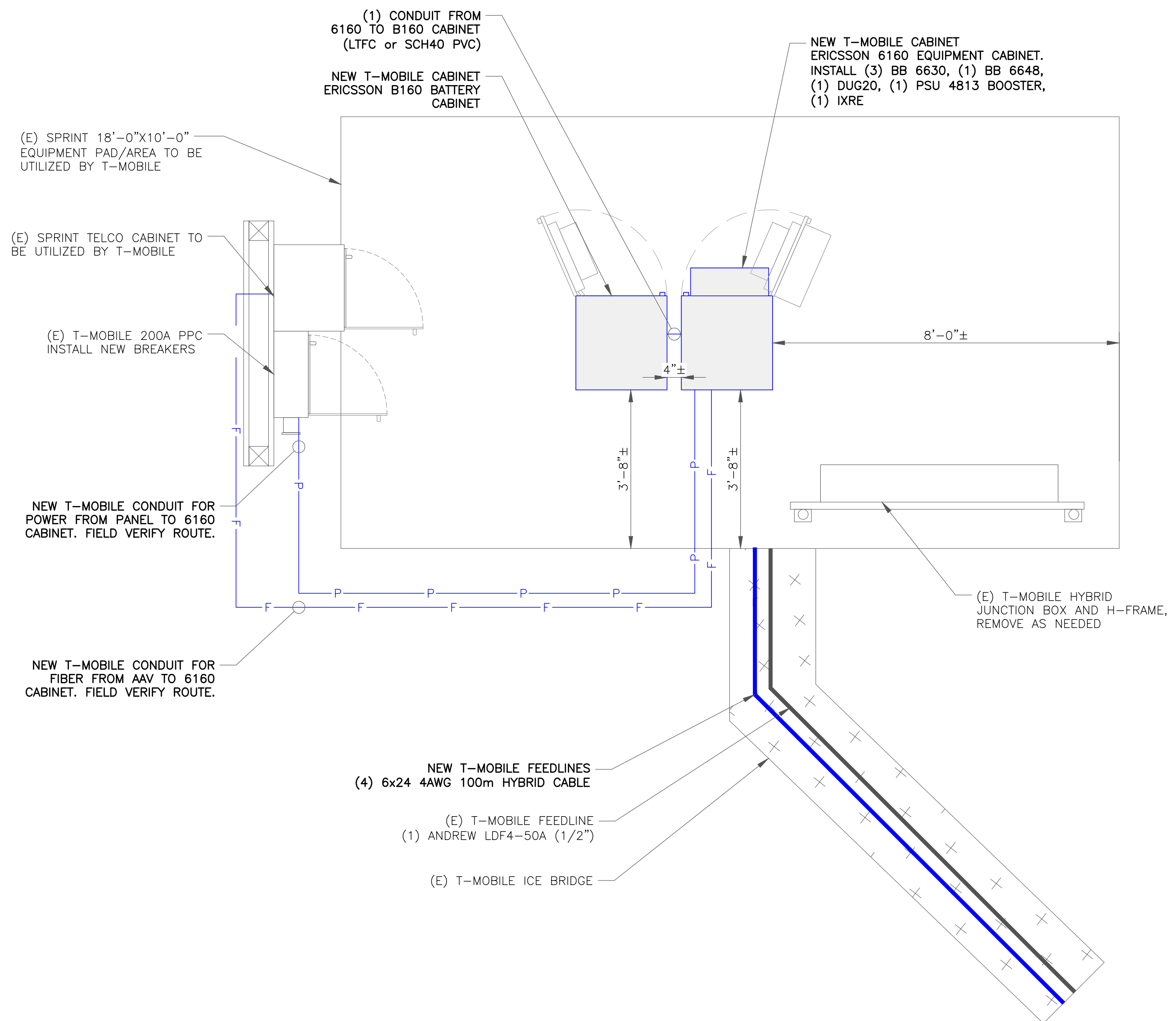
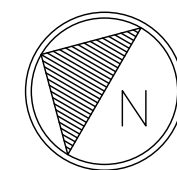
**1** SITE PLAN  
 SCALE: 3/8"=1'-0" (FULL SIZE)  
 3/16"=1'-0" (11x17)



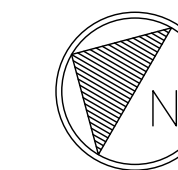
FLOODPLAIN NOTE:  
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 DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE  
 FLOODPLAIN ACCORDING TO FEMA COMMUNITY PANEL  
 #09007C0135G, DATED 08/28/2008.



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



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



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35 GRIFFIN ROAD  
 BLOOMFIELD, CT 06002

CROWN CASTLE

1200 MACARTHUR BLVD, SUITE 200  
 MAHWAH, NJ 07430

TOWER ENGINEERING PROFESSIONALS

326 TRYON RD  
 RALEIGH, NC 27603  
 (919) 661-6351

TEP JOB #: 218229.498736

T-MOBILE SITE NUMBER:  
**CTHA696A**

BU #: 876368  
 YANKEE LAKE/EAST HAMPTON/TOWN

1 PUBLIC WORKS DRIVE  
 EAST HAMPTON, CT 06032  
 (MIDDLESEX COUNTY)

EXISTING 180'-0"  
 MONOPOLE

ISSUED FOR:

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SEAL:



03/26/21

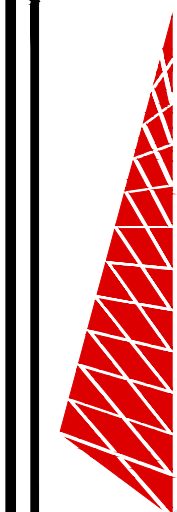
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SHEET NUMBER:

C-1.2

REVISION:

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TOWER ENGINEERING PROFESSIONALS

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SEAL:



03/26/21

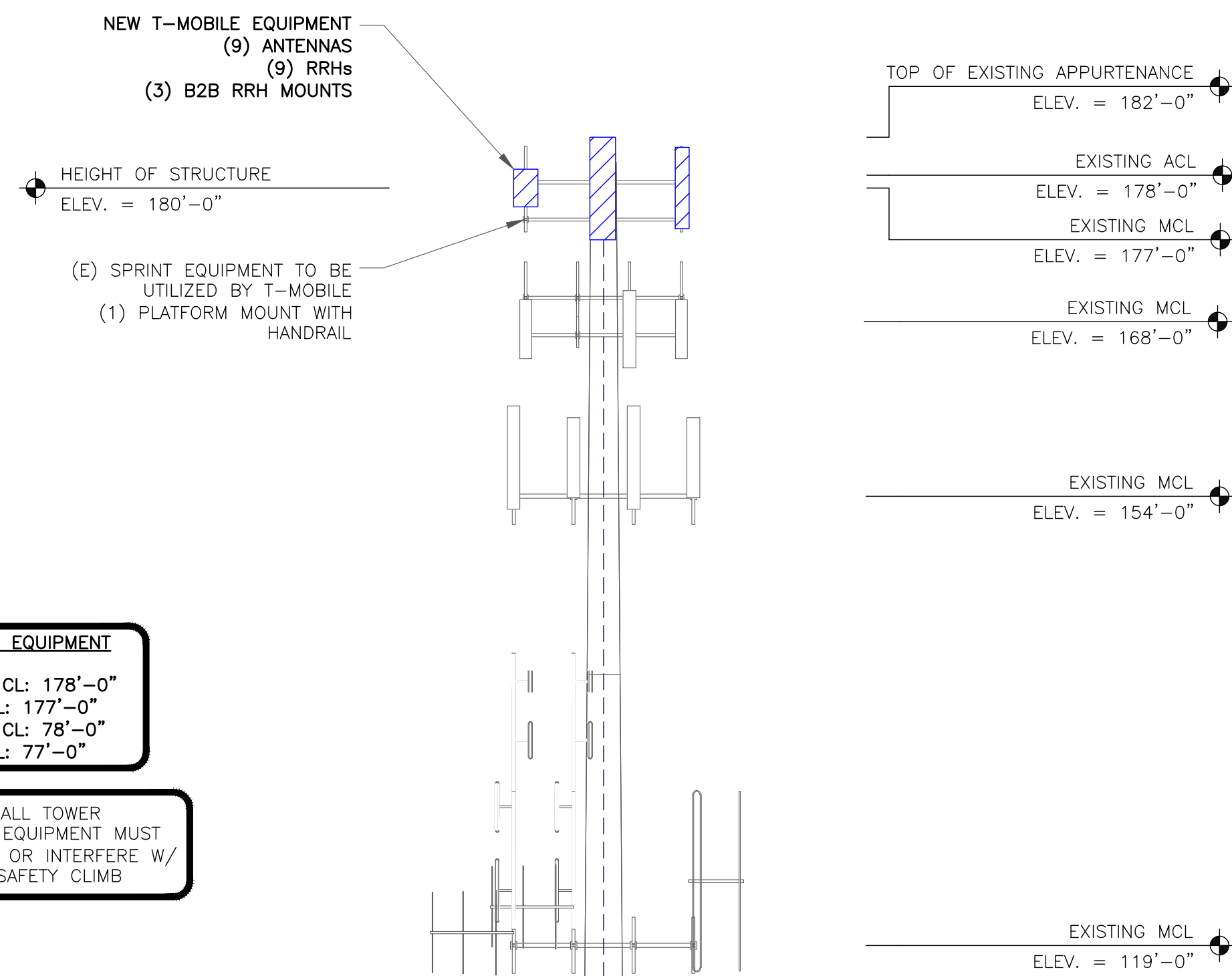
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**C-2**

REVISION:

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T-MOBILE EQUIPMENT

ANTENNA CL: 178'-0"  
MOUNT CL: 177'-0"  
ANTENNA CL: 78'-0"  
MOUNT CL: 77'-0"

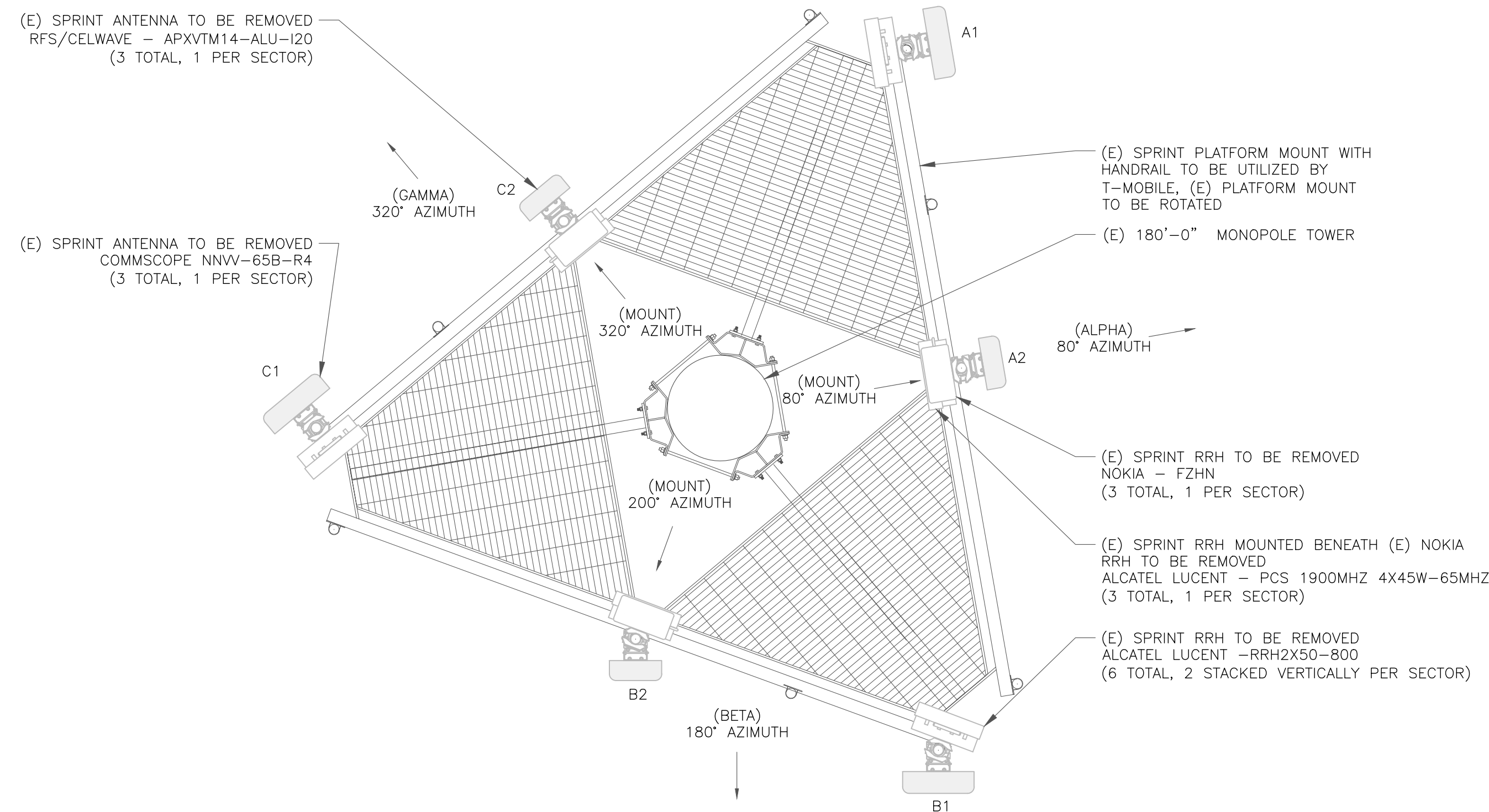
ANY AND ALL TOWER MOUNTED EQUIPMENT MUST NOT TRAP OR INTERFERE W/ EXISTING SAFETY CLIMB

(E) SPRINT EQUIPMENT TO BE UTILIZED BY T-MOBILE REMOVE AS NEEDED  
(1) STAND-OFF MOUNT  
(1) LUCENT KS24019-L112A GPS ANTENNA

NEW T-MOBILE FEEDLINES  
(4) ERICSSON HYBRID TRUNK 6/24 4AWG 100m

(E) SPRINT FEEDLINE TO BE UTILIZED BY T-MOBILE REMOVE AS NEEDED  
(1) ANDREW LDF4-50A (1/2")

1 FINAL ELEVATION  
SCALE: NOT TO SCALE

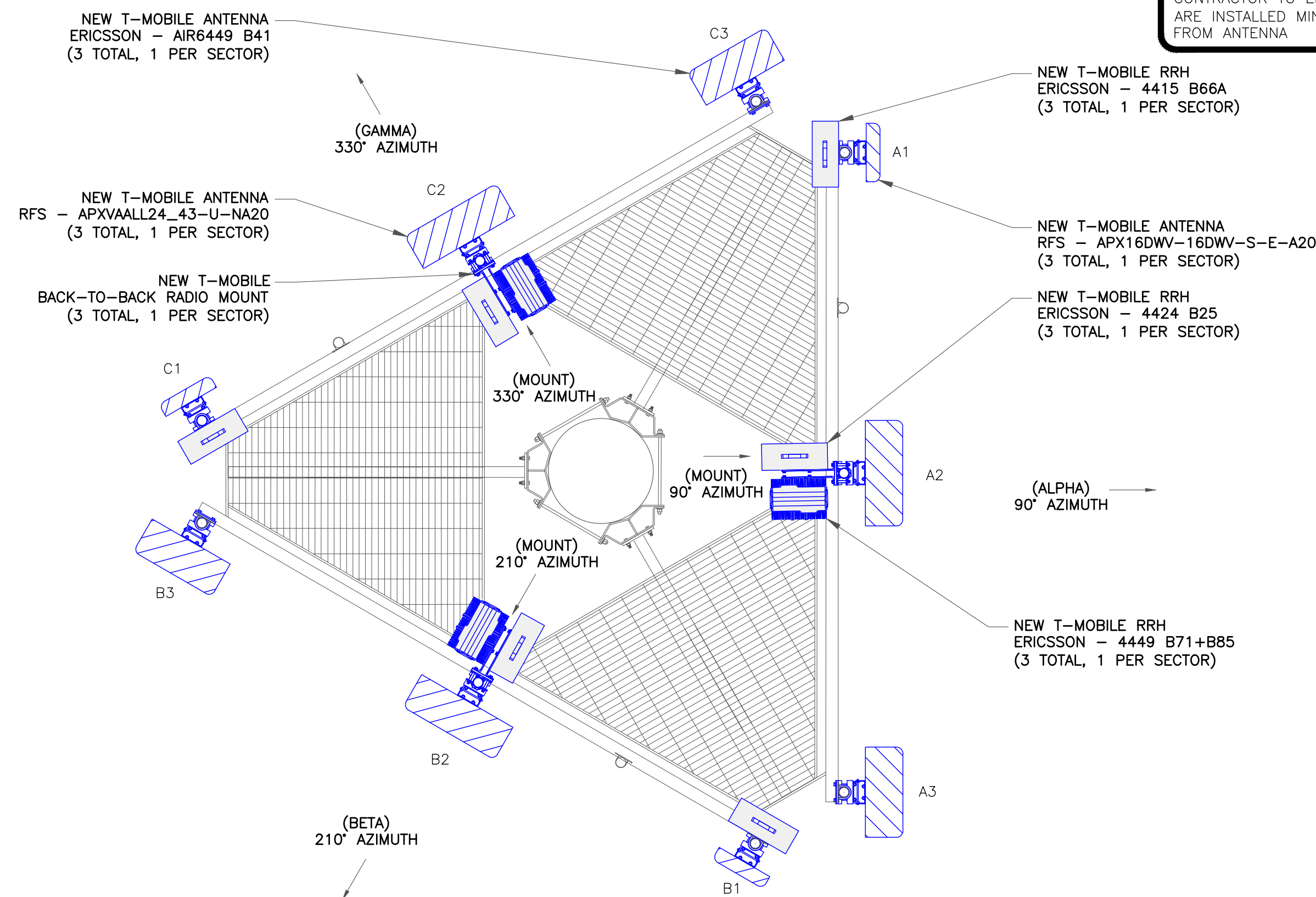


2 EXISTING ANTENNA LAYOUT  
SCALE: NOT TO SCALE

INSTALLER NOTE:  
EXISTING AND PROPOSED ANTENNA/EQUIPMENT POSITIONING SHOWN PER RFDS. FIELD CONDITIONS MAY VARY.

TOWER ANALYSIS NOTES:  
1. THE DESIGN DEPICTED IN THESE DRAWINGS IS VALID WHEN ACCOMPANIED BY A CORRESPONDING PASSING TOWER ANALYSIS.  
2. CONSTRUCTION MANAGER / GENERAL CONTRACTOR SHALL REVIEW THE TOWER ANALYSIS FOR ANY CONDITIONS PRIOR TO INSTALLATION.  
3. ANY REQUIRED TOWER MODIFICATION DESIGN OR TOWER REPLACEMENT SHALL BE APPROVED BY EOR.

MOUNT ANALYSIS NOTES:  
1. THE DESIGN DEPICTED IN THESE DRAWINGS IS VALID WHEN ACCOMPANIED BY A CORRESPONDING PASSING MOUNT ANALYSIS.  
2. CONSTRUCTION MANAGER / GENERAL CONTRACTOR SHALL REVIEW THE MOUNT ANALYSIS FOR ANY CONDITIONS PRIOR TO INSTALLATION.  
3. ANY REQUIRED MOUNT MODIFICATION DESIGN OR MOUNT REPLACEMENT SHALL BE APPROVED BY EOR.



RRH NOTE:  
CONTRACTOR TO ENSURE RRHs ARE INSTALLED MIN 8" AWAY FROM ANTENNA

3 FINAL ANTENNA LAYOUT  
SCALE: NOT TO SCALE



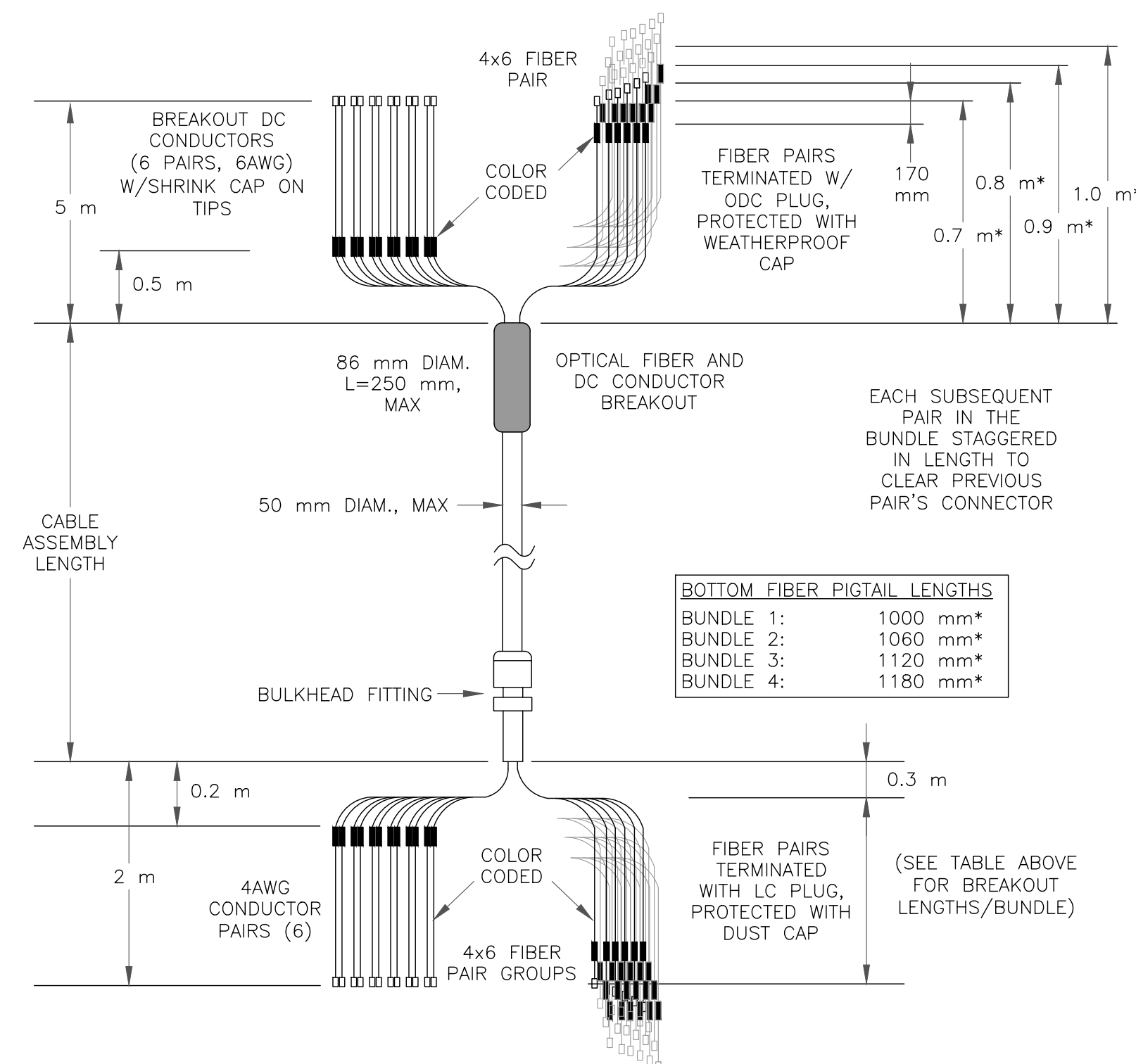
FINAL ANTENNA SCHEDULE										
SECTOR	POS.	TECHNOLOGY	RAD CENTER	AZIMUTH	ANTENNA MANUFACTURER	ANTENNA MODEL	MECH. TILT	ELECT. TILT	TOWER MOUNTED EQUIPMENT	FEEDLINE TYPE
ALPHA	A1	L2100	178'-0"	90°	ERICSSON	APX16DWV-16DWV-S-E-A20 (QUAD)	-	2'	(1) ERICSSON - 4415 B66A	HYBRID (SHARED)
ALPHA	A2	L700, L600, N600, L1900, G1900	178'-0"	90°	RFS	APXVAALL24_43-U-NA20 (OCTO)	-	2'	(1) ERICSSON - 4449 B71+B85 (1) ERICSSON - 4424 B25	(1) 6x24 4AWG 100m
ALPHA	A3	L2500, N2500	178'-0"	90°	ERICSSON	AIR6449 B41 (ACTIVE ANTENNA - MASSIVE MIMO)	-	2'	-	(1) 6x24 4AWG 100m
BETA	B1	L2100	178'-0"	210°	ERICSSON	APX16DWV-16DWV-S-E-A20 (QUAD)	-	2'	(1) ERICSSON - 4415 B66A	HYBRID (SHARED)
BETA	B2	L700, L600, N600, L1900, G1900	178'-0"	210°	RFS	APXVAALL24_43-U-NA20 (OCTO)	-	2'	(1) ERICSSON - 4449 B71+B85 (1) ERICSSON - 4424 B25	(1) 6x24 4AWG 100m
BETA	B3	L2500, N2500	178'-0"	210°	ERICSSON	AIR6449 B41 (ACTIVE ANTENNA - MASSIVE MIMO)	-	2'	-	HYBRID (SHARED)
GAMMA	C1	L2100	178'-0"	330°	ERICSSON	APX16DWV-16DWV-S-E-A20 (QUAD)	-	2'	(1) ERICSSON - 4415 B66A	HYBRID (SHARED)
GAMMA	C2	L700, L600, N600, L1900, G1900	178'-0"	330°	RFS	APXVAALL24_43-U-NA20 (OCTO)	-	2'	(1) ERICSSON - 4449 B71+B85 (1) ERICSSON - 4424 B25	(1) 6x24 4AWG 100m
GAMMA	C3	L2500, N2500	178'-0"	330°	ERICSSON	AIR6449 B41 (ACTIVE ANTENNA - MASSIVE MIMO)	-	2'	-	HYBRID (SHARED)

PROPOSED ANTENNA/EQUIPMENT SHOWN IN BOLD

FINAL CABLE SCHEDULE			
STATUS	CABLE TYPE	SIZE	QUANTITY
NEW	HCS	6x24 4AWG 100m	4
CABLE QUANTITY			4

NOTE:  
 (3) HYBRID SHARED BETWEEN APX/4415/4449/4424 PER SECTOR  
 (1) HYBRID SHARED BETWEEN 6449 ANTENNAS PER SECTOR

1 PROPOSED ANTENNA AND CABLE SCHEDULE  
 SCALE: NOT TO SCALE



2 HCS DETAIL  
 SCALE: NOT TO SCALE



T-MOBILE SITE NUMBER:  
**CTHA696A**

BU #: 876368  
 YANKEE LAKE/EAST HAMPTON/TOWN

1 PUBLIC WORKS DRIVE  
 EAST HAMPTON, CT 06032  
 (MIDDLESEX COUNTY)

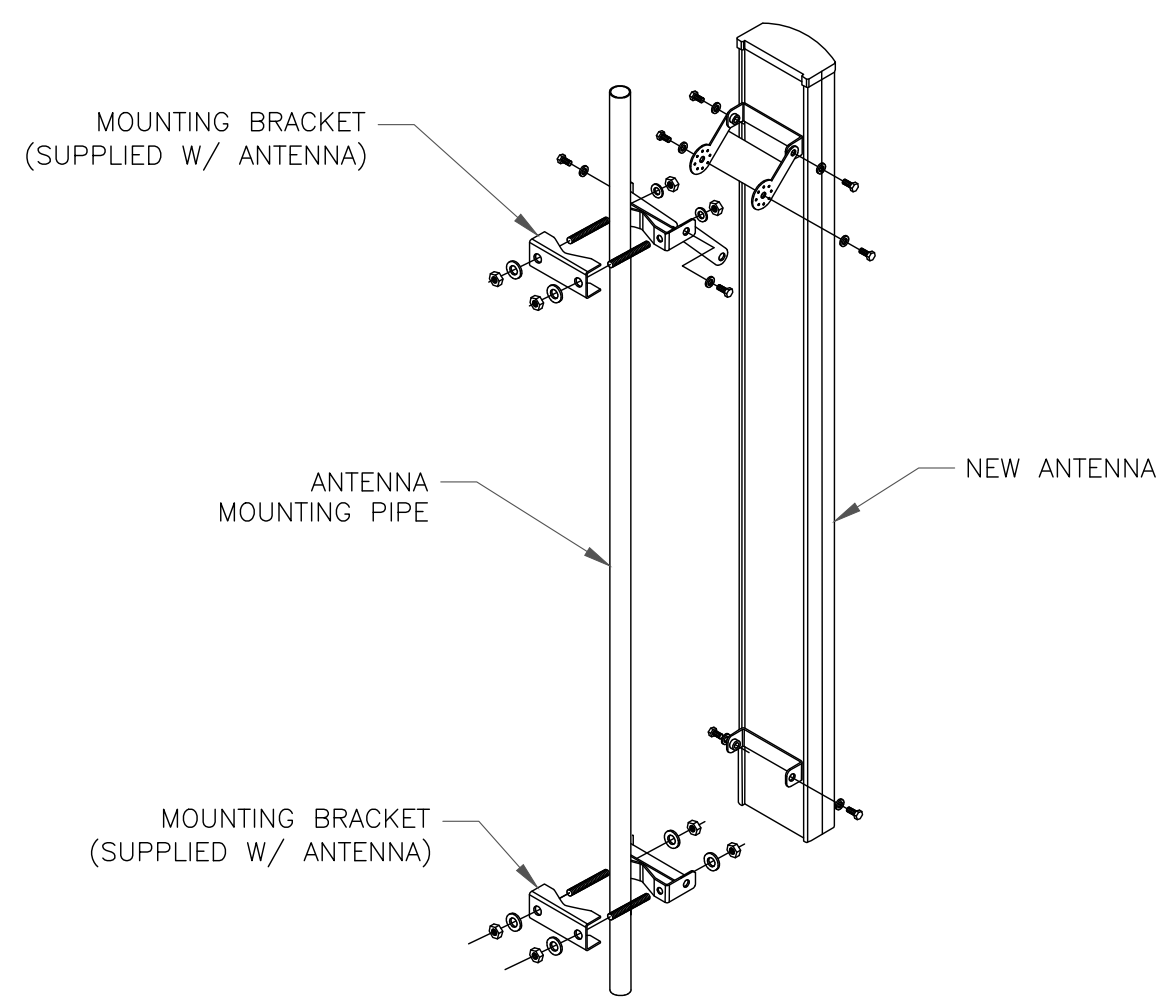
EXISTING 180'-0"  
 MONOPOLE

ISSUED FOR:				
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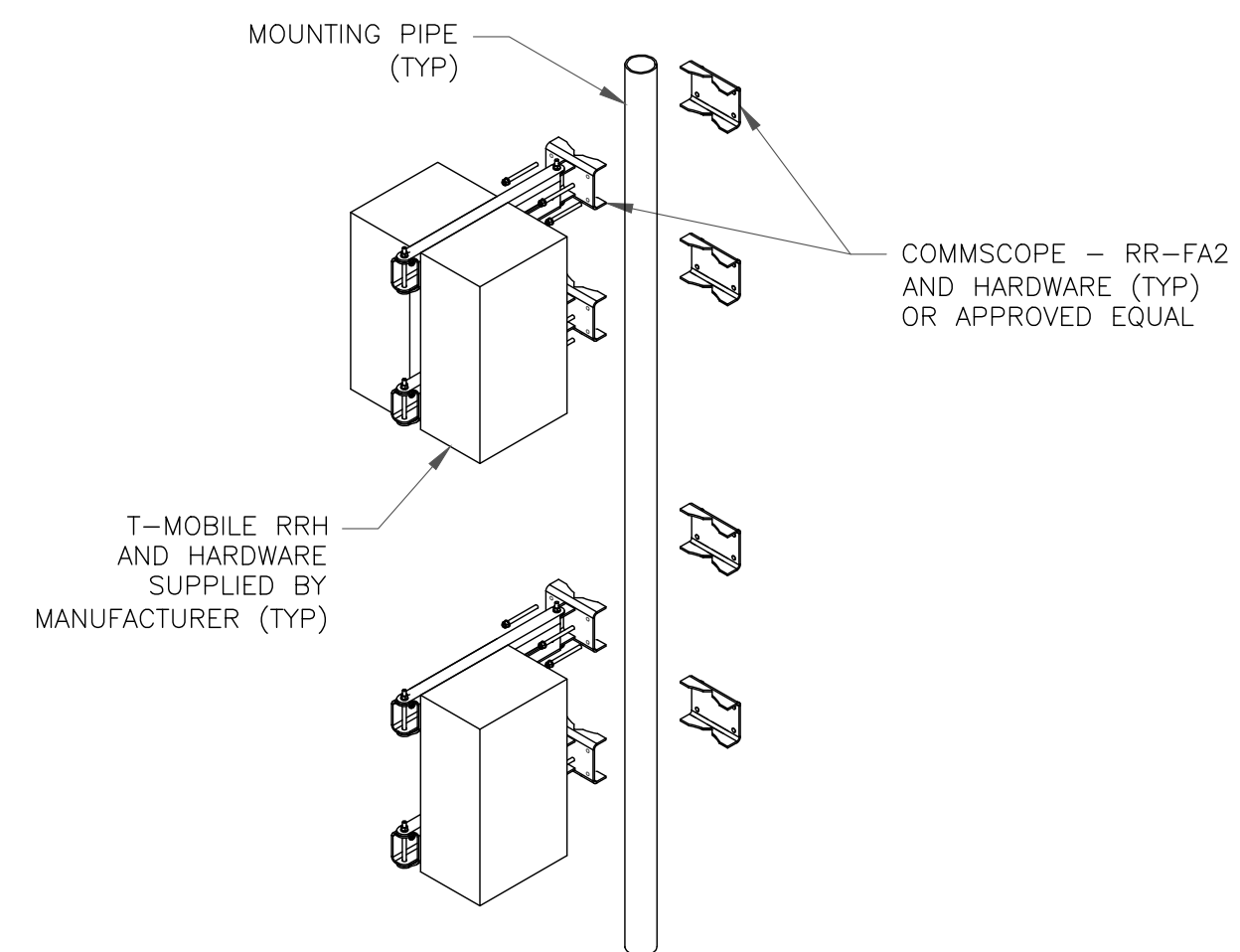
SHEET NUMBER: **C-3** REVISION: **0**



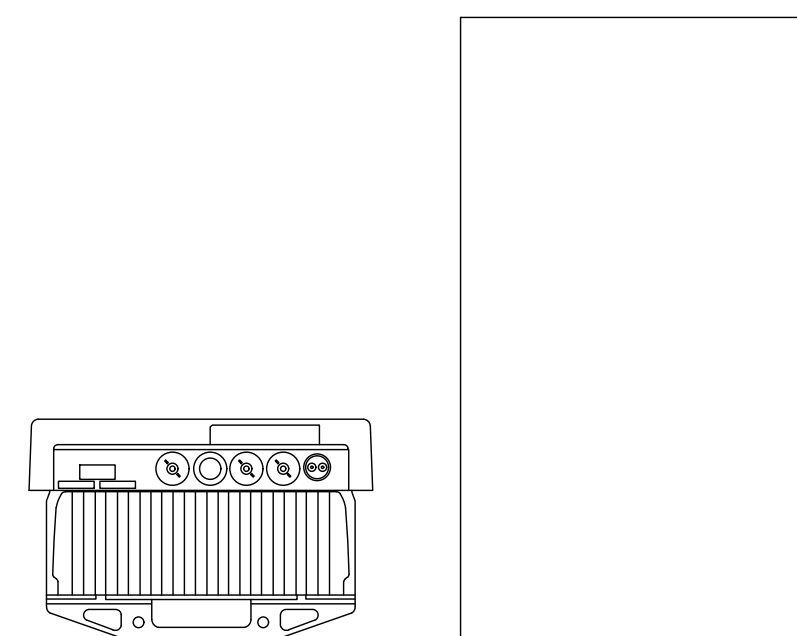
1 ANTENNA MOUNTING DETAIL  
SCALE: NOT TO SCALE

**INSTALLER NOTES:**

1. COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRHs RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING.
2. DO NOT OPEN RRH PACKAGES IN THE RAIN.
3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.

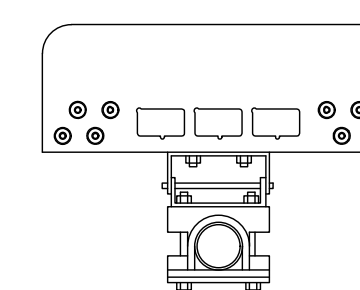


2 RRHs MOUNTING DETAIL  
SCALE: NOT TO SCALE



ERICSSON - AIR6449 B41  
WEIGHT: 104.0 LBS  
SIZE (HxWxD): 33.10x20.60x8.60 IN.

3 ERICSSON - AIR6449 B41  
SCALE: NOT TO SCALE



RFS/CELWAVE - APXVAALL24\_43-U-NA20  
WEIGHT (WITHOUT MOUNTING HARDWARE): 149.9 LBS  
SIZE (HxWxD): 95.9x24.0x8.5 IN.

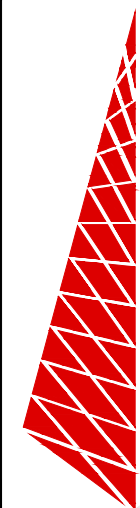
4 RFS/CELWAVE - APXVAALL24\_43-U-NA20  
SCALE: NOT TO SCALE

**T-Mobile**

35 GRIFFIN ROAD  
BLOOMFIELD, CT 06002

**CROWN CASTLE**

1200 MACARTHUR BLVD, SUITE 200  
MAHWAH, NJ 07430



**TOWER ENGINEERING PROFESSIONALS**

326 TRYON RD  
RALEIGH, NC 27603  
(919) 661-6351

TEP JOB #: 218229.498736

**T-MOBILE SITE NUMBER:  
CTHA696A**

**BU #: 876368  
YANKEE LAKE/EAST HAMPTON/TOWN**

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EAST HAMPTON, CT 06032  
(MIDDLESEX COUNTY)**

**EXISTING 180'-0"  
MONOPOLE**

**ISSUED FOR:**

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SEAL:



03/26/21

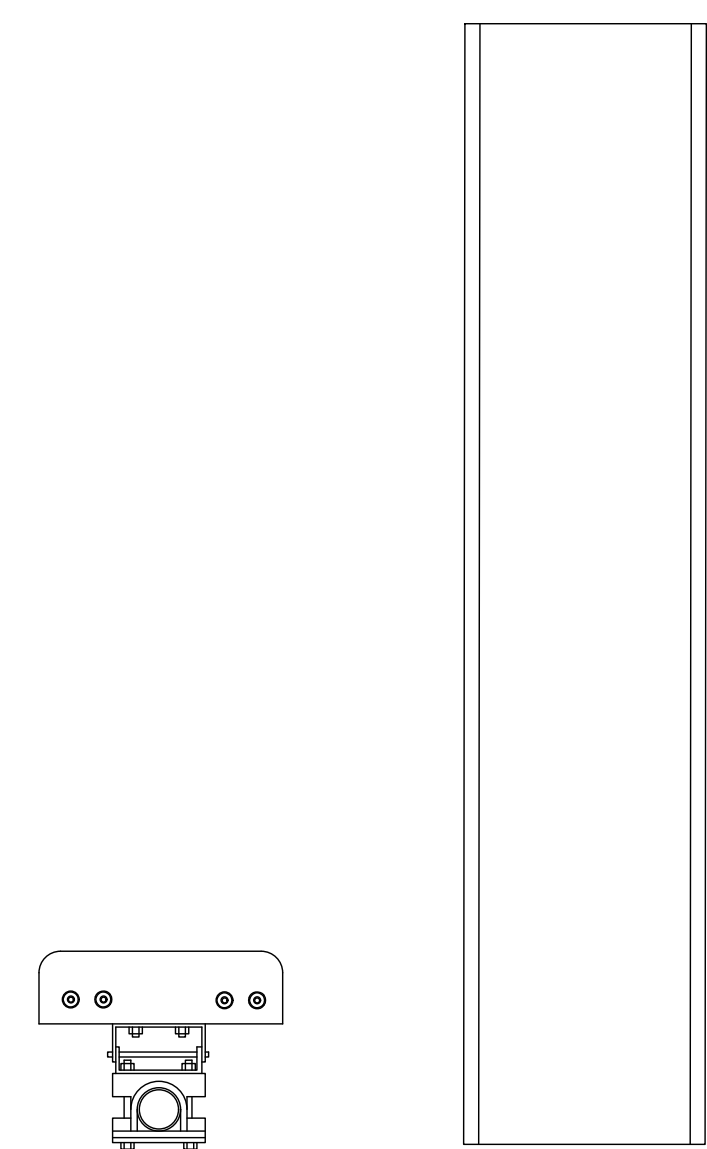
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**SHEET NUMBER:**

**C-4**

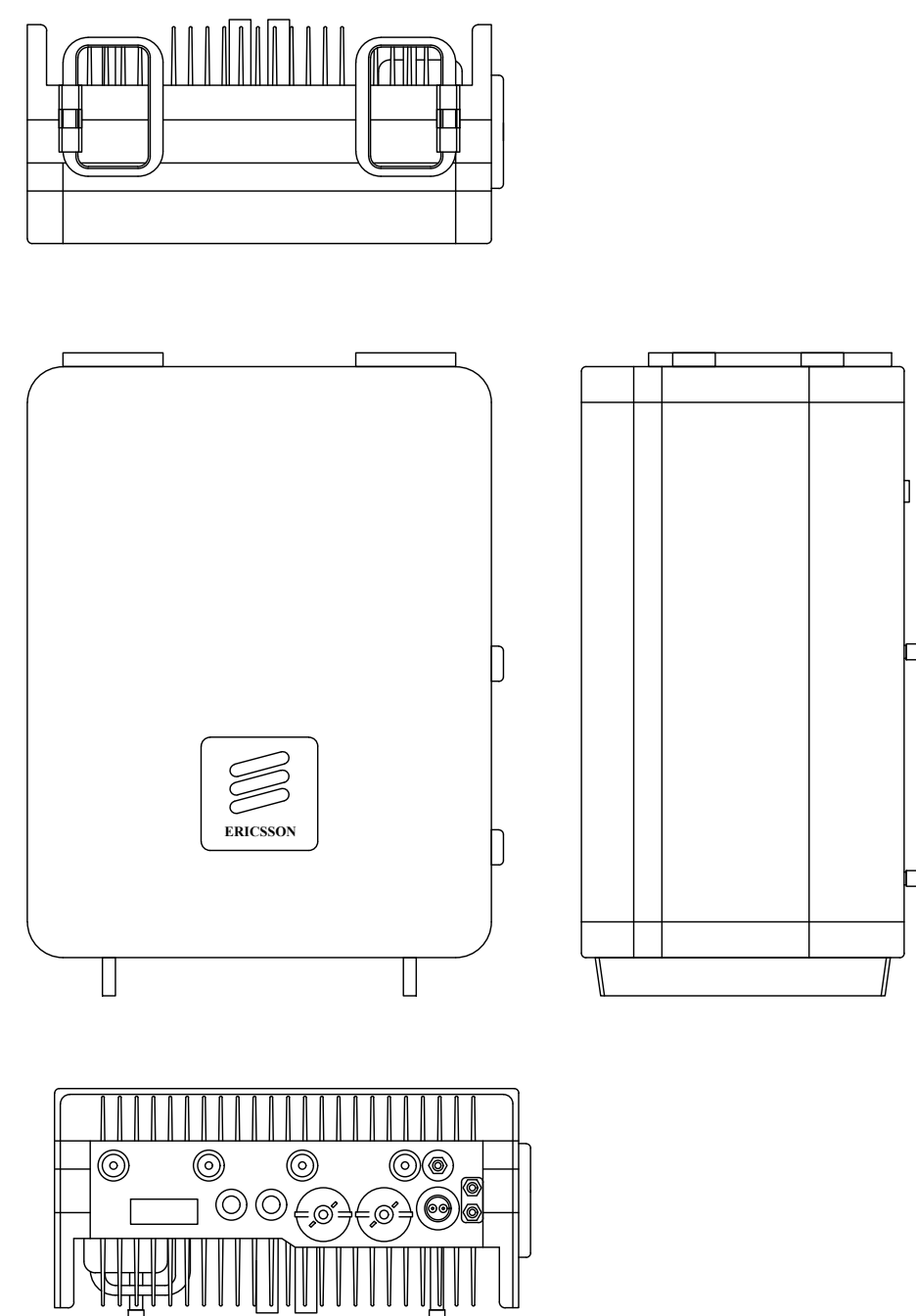
**REVISION:**

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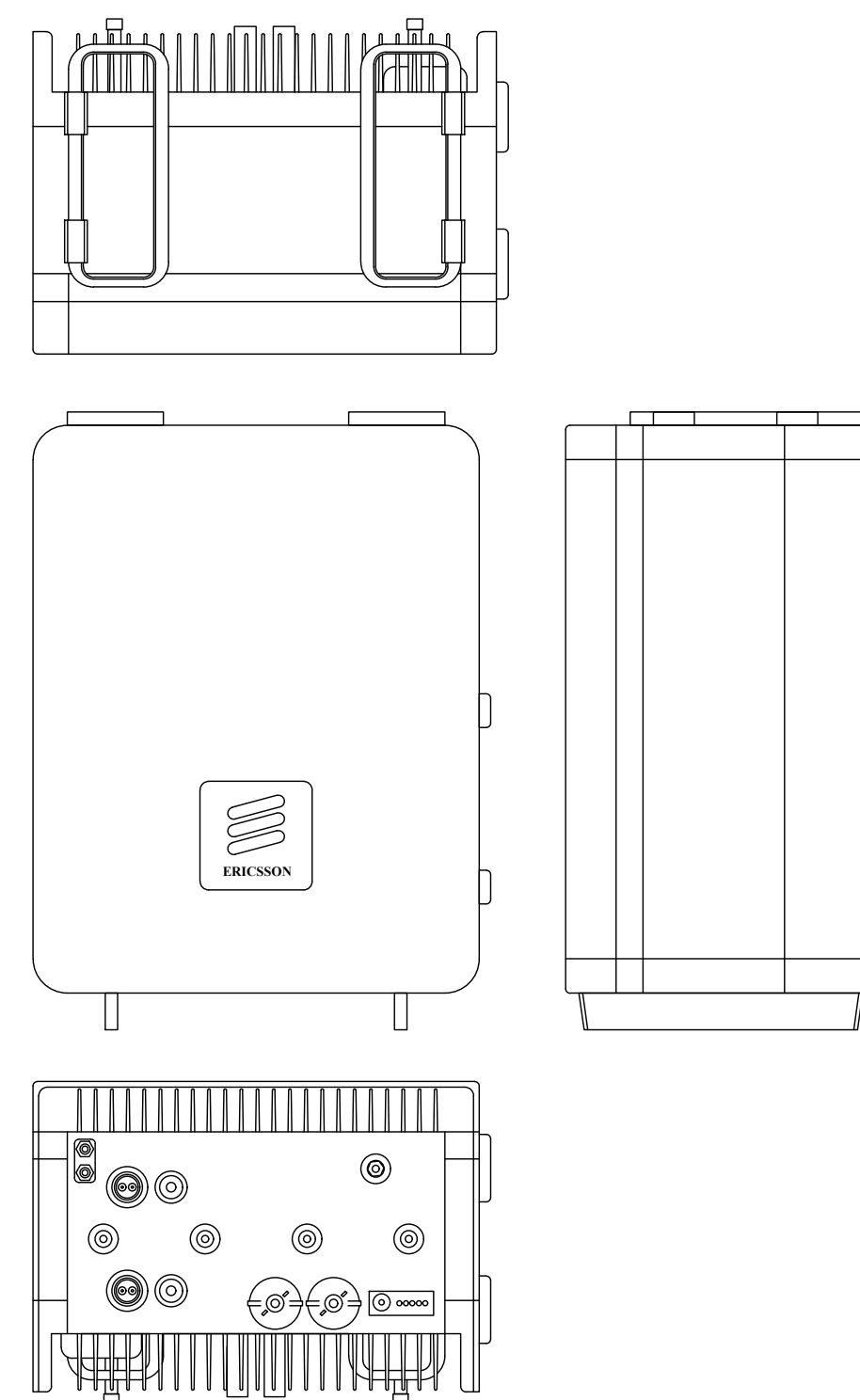
RFS/CELWAVE - APX16DWV-16DWV-S-E-A20  
WEIGHT (WITHOUT MOUNTING HARDWARE): 40.7 LBS  
SIZE (HxWxD): 55.90x13.30x3.15 IN.

5 RFS/CELWAVE - APX16DWV-16DWV-S-E-A20  
SCALE: NOT TO SCALE



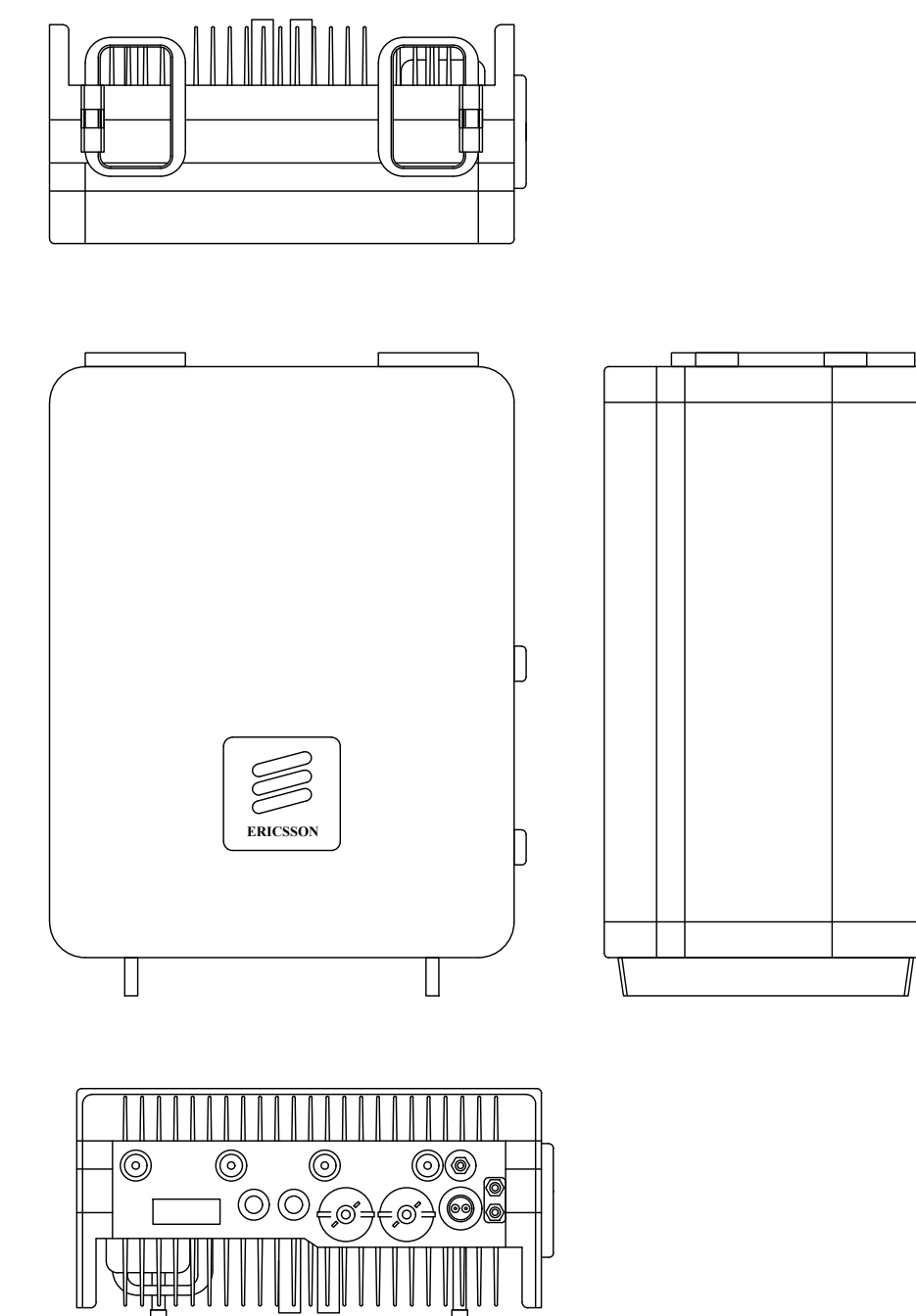
ERICSSON - RADIO 4415 B66A  
WEIGHT: 46.0 LBS  
SIZE (HxWxD): 14.90x13.20x5.40 IN.

6 ERICSSON - RADIO 4415 B66A  
SCALE: NOT TO SCALE



ERICSSON - RADIO 4449 B71/B85  
WEIGHT: 73.21 LBS  
SIZE (HxWxD): 17.91x13.2x10.63 IN.

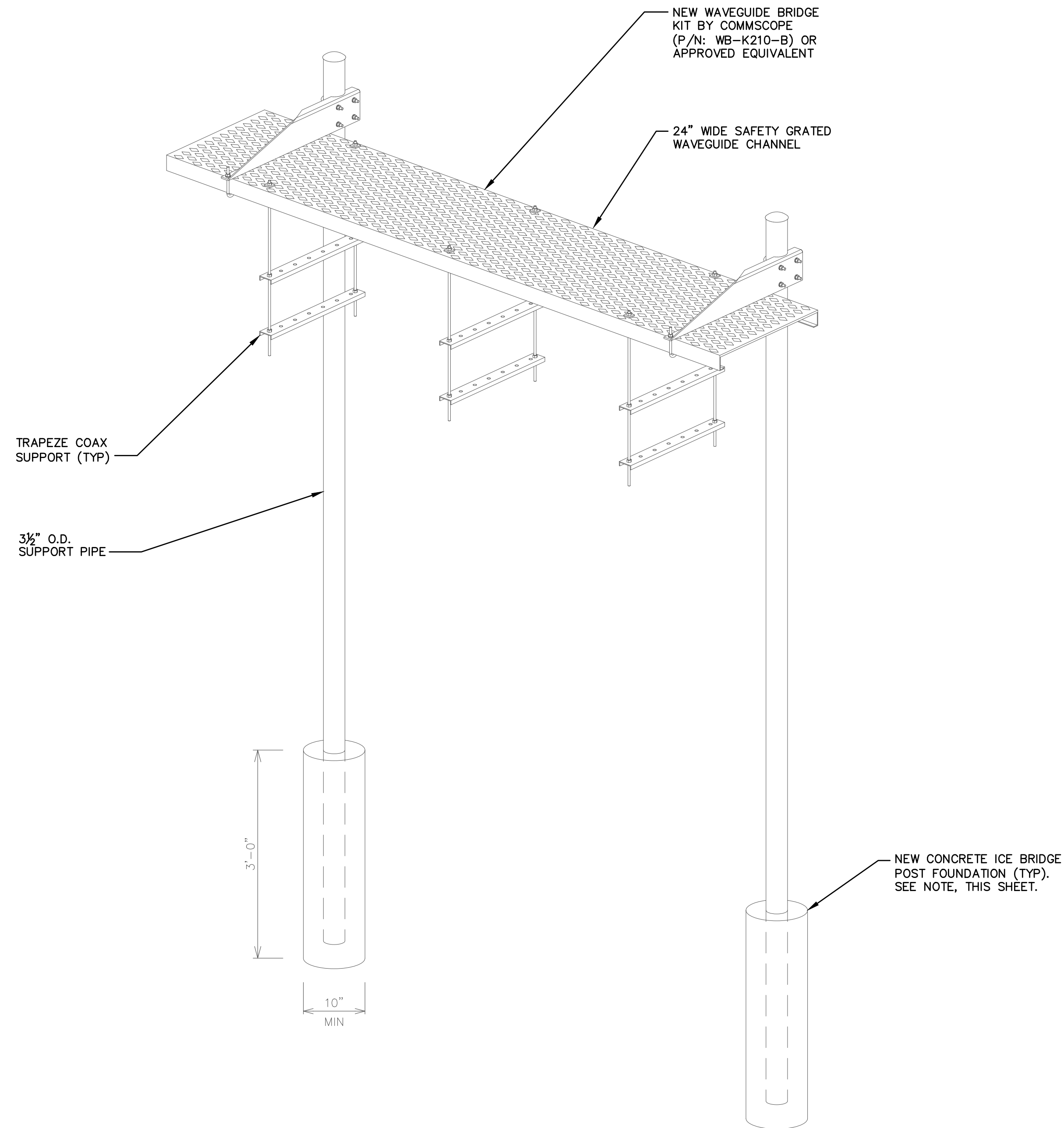
7 ERICSSON - RADIO 4449 B71/B85  
SCALE: NOT TO SCALE



ERICSSON - RADIO 4424 B25  
WEIGHT: 86.0 LBS  
SIZE (HxWxD): 17.10x14.40x11.30 IN.

8 ERICSSON - RADIO 4424 B25  
SCALE: NOT TO SCALE

NOTE:  
CONCRETE SHALL BE 3,000 PSI.



1 ICE BRIDGE DETAIL  
SCALE: NOT TO SCALE

**T-Mobile**

35 GRIFFIN ROAD  
BLOOMFIELD, CT 06002

**CROWN CASTLE**

1200 MACARTHUR BLVD, SUITE 200  
MAHWAH, NJ 07430



TOWER  
ENGINEERING  
PROFESSIONALS

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(919) 661-6351

TEP JOB #: 218229.498736

T-MOBILE SITE NUMBER:  
**CTHA696A**

BU #: 876368  
YANKEE LAKE/EAST  
HAMPTON/TOWN

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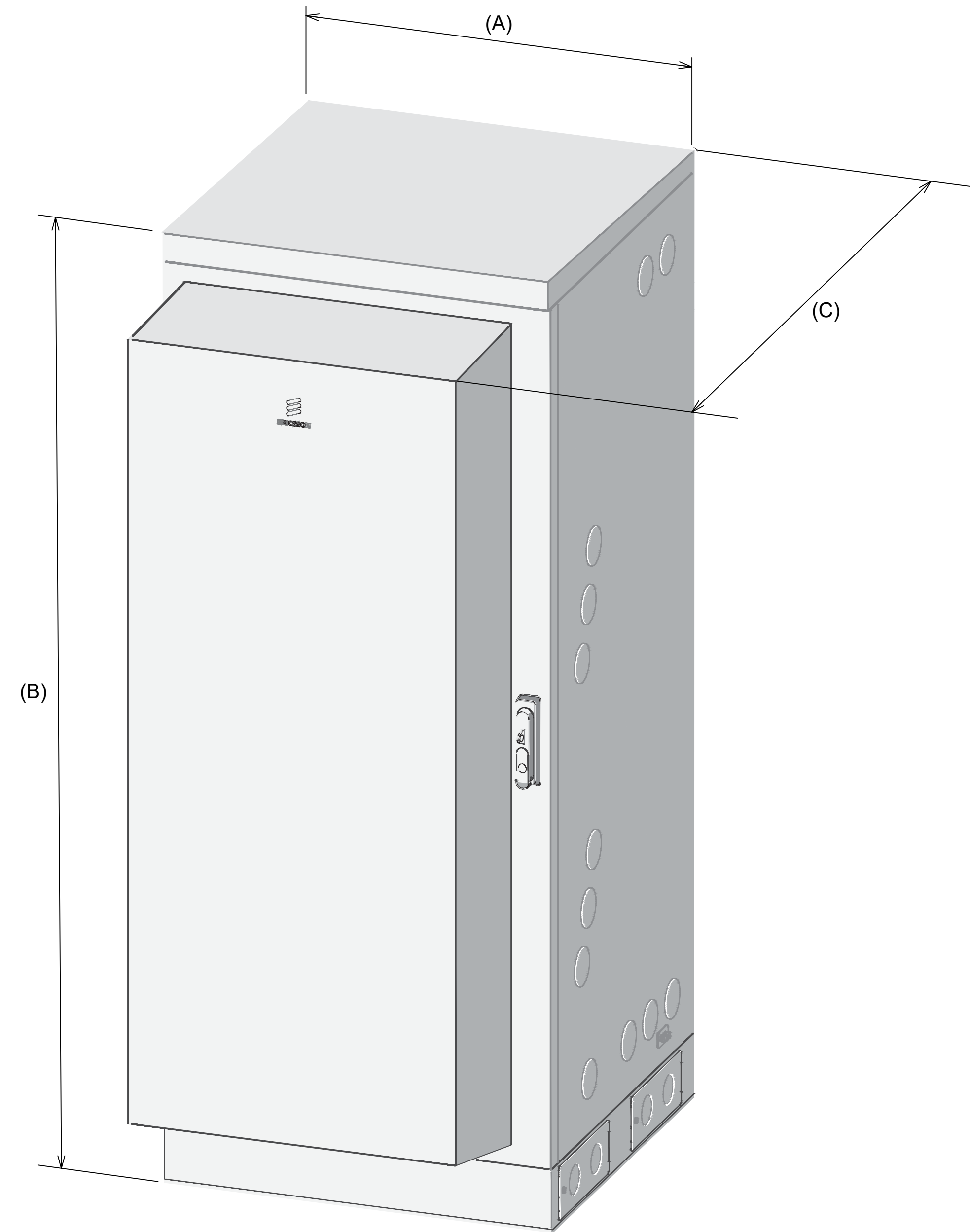
SHEET NUMBER: REVISION:

**DNU**

**0**

**INSTALLER NOTES:**

1. INFORMATION SHOWN PROVIDED BY T-MOBILE. CONTRACTOR TO REFERENCE CABINET MANUFACTURER'S SPECIFICATIONS FOR FURTHER DETAILS.
2. CONTRACTOR TO FOLLOW THE LATEST VERSION OF T-MOBILE REGIONAL CONSTRUCTION STANDARDS. CONTACT T-MOBILE FOR DETAILS.



Dimensions	
Width (A)	650 mm / 25.5906 in
Height (B)	1450 mm / 57.08661 in (without base frame) 1600 mm / 62.99213 in (with base frame)
Depth (C)	850 mm / 33.4646 in
Weight	
Empty enclosure	176 kg / 388.014 lb

1 ERICSSON 6160 CABINET DETAILS  
SCALE: NOT TO SCALE



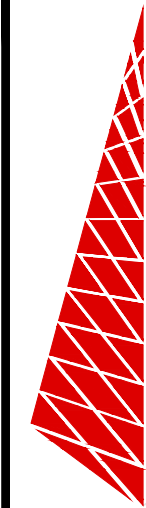
2 ERICSSON B160 CABINET DETAILS  
SCALE: NOT TO SCALE

**T-Mobile**

35 GRIFFIN ROAD  
BLOOMFIELD, CT 06002

**CROWN CASTLE**

1200 MACARTHUR BLVD, SUITE 200  
MAHWAH, NJ 07430



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TEP JOB #: 218229.498736

T-MOBILE SITE NUMBER:  
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BU #: 876368  
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SHEET NUMBER:

**C-5**

REVISION:

**0**



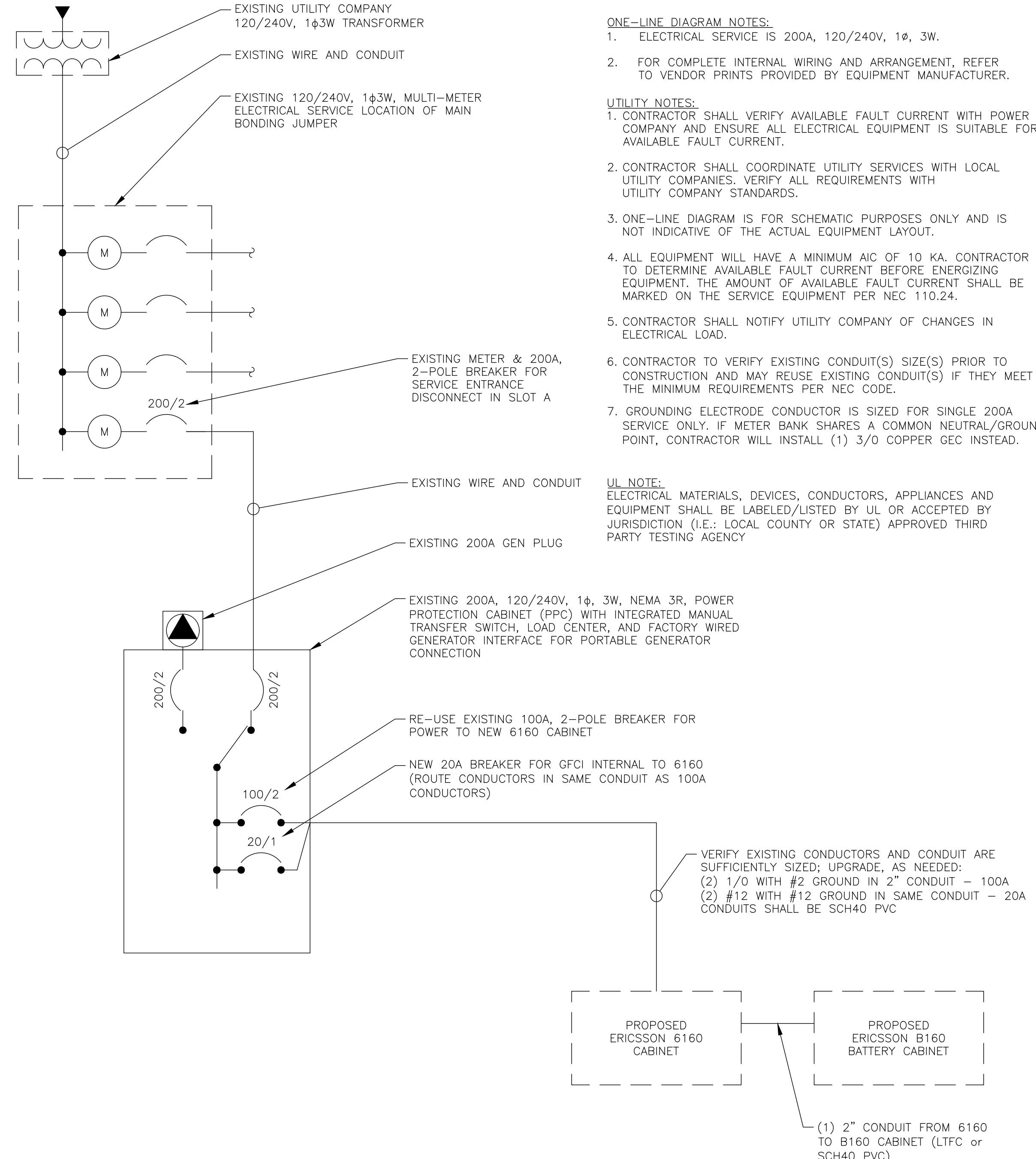
NOTE:  
LOAD CALCULATIONS TAKEN FROM  
INFORMATION PROVIDED BY CROWN  
CASTLE & POWER ANALYSIS TOOL  
BASED ON THE RFDS DATED  
01/11/2021 V1.0. CONTRACTOR  
TO VERIFY LOADS WITH  
MANUFACTURER'S SPECIFICATIONS  
PRIOR TO CONSTRUCTION.

EXISTING 200A M.C.B, 240/120 VAC, 1 $\phi$ , 3W PPC PANEL SCHEDULE										
LOAD SERVED	VOLT AMPERES (WATTS)		TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPERES (WATTS)		LOAD SERVED
	L1	L2						L1	L2	
**UNIT 1	9600		**100	1	A	2	60	100		AC SURGE PROTECTOR
		9600		3	B	4			100	
SPARE	-		-	5	A	6	-	-		SPARE
SPARE	-		-	7	B	8	-	-		SPARE
SPARE	-		-	9	A	10	15	180		TELCO GFI
TELCO FAN		340	10	11	B	12	-			SPARE
VOLT AMPS	9600	9940						280	100	VOLT AMPS
L1 VOLT AMPERES				9880	10040	L2 VOLT AMPERES				
				10040	MAX VOLT AMPERES					
				83.7	MAX AMPS					
				104.6	MAX AMPS x 125%					

\*NOTE - REUSE BREAKER FOR NEW CABINET INSTALL

PROPOSED 200A M.C.B, 240/120 VAC, 1 $\phi$ , 3W PPC PANEL SCHEDULE										
LOAD SERVED	VOLT AMPERES (WATTS)		TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPERES (WATTS)		LOAD SERVED
	L1	L2						L1	L2	
<b>6160 ENCLOSURE</b>	<b>7405</b>		<b>*100</b>	1	A	2	60	100		AC SURGE PROTECTOR
		<b>7405</b>		3	B	4			100	
<b>GFCI INTERNAL IN 6160</b>	<b>180</b>		<b>20</b>	5	A	6	-	-		SPARE
SPARE	-		-	7	B	8	-	-		SPARE
SPARE	-		-	9	A	10	15	180		TELCO GFI
TELCO FAN		340	10	11	B	12	-			SPARE
VOLT AMPS	<b>7585</b>	<b>7745</b>						280	100	VOLT AMPS
L1 VOLT AMPERES				<b>7865</b>	<b>7845</b>	L2 VOLT AMPERES				
				<b>7865</b>	MAX VOLT AMPERES					
				<b>65.5</b>	MAX AMPS					
				<b>81.9</b>	MAX AMPS x 125%					

NOTE - PROPOSED BREAKER IN BOLD



GENERAL NOTES:

- ALL NEW CONDUCTORS TO BE INSTALLED SHALL BE COPPER. ALL CONDUCTORS SHALL BE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 UNLESS NOTED OTHERWISE.
- CONTRACTOR IS TO FIELD VERIFY ALL EXISTING ITEMS SHOWN ON THE ELECTRICAL ONE-LINE DIAGRAM AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
- ALL GROUNDING AND BONDING PER THE NEC.

ONE-LINE DIAGRAM NOTES:

- ELECTRICAL SERVICE IS 200A, 120/240V, 1 $\phi$ , 3W.
- FOR COMPLETE INTERNAL WIRING AND ARRANGEMENT, REFER TO VENDOR PRINTS PROVIDED BY EQUIPMENT MANUFACTURER.

UTILITY NOTES:

- CONTRACTOR SHALL VERIFY AVAILABLE FAULT CURRENT WITH POWER COMPANY AND ENSURE ALL ELECTRICAL EQUIPMENT IS SUITABLE FOR AVAILABLE FAULT CURRENT.
- CONTRACTOR SHALL COORDINATE UTILITY SERVICES WITH LOCAL UTILITY COMPANIES. VERIFY ALL REQUIREMENTS WITH UTILITY COMPANY STANDARDS.
- ONE-LINE DIAGRAM IS FOR SCHEMATIC PURPOSES ONLY AND IS NOT INDICATIVE OF THE ACTUAL EQUIPMENT LAYOUT.
- ALL EQUIPMENT WILL HAVE A MINIMUM AIC OF 10 KA. CONTRACTOR TO DETERMINE AVAILABLE FAULT CURRENT BEFORE ENERGIZING EQUIPMENT. THE AMOUNT OF AVAILABLE FAULT CURRENT SHALL BE MARKED ON THE SERVICE EQUIPMENT PER NEC 110.24.
- CONTRACTOR SHALL NOTIFY UTILITY COMPANY OF CHANGES IN ELECTRICAL LOAD.
- CONTRACTOR TO VERIFY EXISTING CONDUIT(S) SIZE(S) PRIOR TO CONSTRUCTION AND MAY REUSE EXISTING CONDUIT(S) IF THEY MEET THE MINIMUM REQUIREMENTS PER NEC CODE.
- GROUNDING ELECTRODE CONDUCTOR IS SIZED FOR SINGLE 200A SERVICE ONLY. IF METER BANK SHARES A COMMON NEUTRAL/GROUND POINT, CONTRACTOR WILL INSTALL (1) 3/0 COPPER GEC INSTEAD.

UL NOTE:

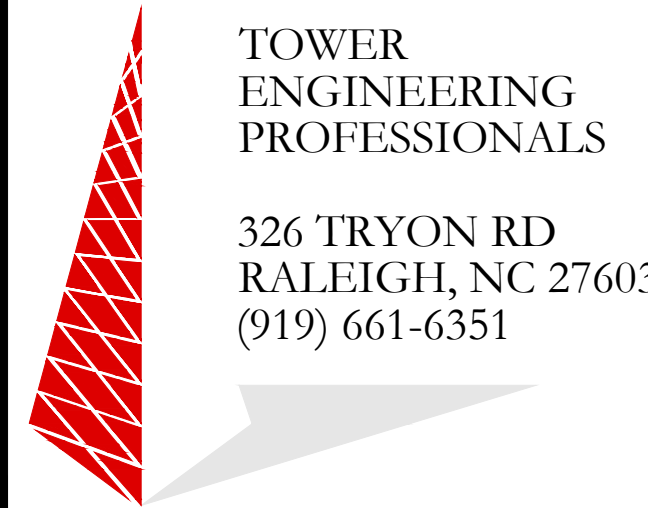
ELECTRICAL MATERIALS, DEVICES, CONDUCTORS, APPLIANCES AND EQUIPMENT SHALL BE LABELED/LISTED BY UL OR ACCEPTED BY JURISDICTION (I.E.: LOCAL COUNTY OR STATE) APPROVED THIRD PARTY TESTING AGENCY



35 GRIFFIN ROAD  
BLOOMFIELD, CT 06002



1200 MACARTHUR BLVD, SUITE 200  
MAHWAH, NJ 07430



TOWER  
ENGINEERING  
PROFESSIONALS

326 TRYON RD  
RALEIGH, NC 27603  
(919) 661-6351

TEP JOB #: 218229.498736

T-MOBILE SITE NUMBER:  
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BU #: **876368**  
YANKEE LAKE/EAST  
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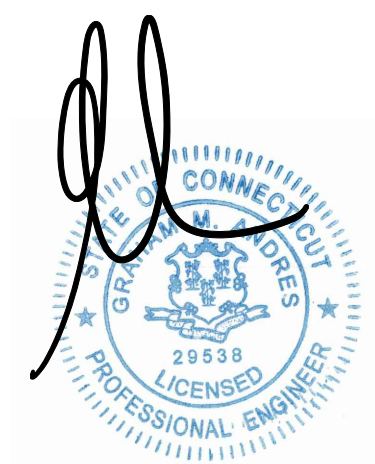
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**T-MOBILE GROUNDING NOTES:**

**ALL GROUNDS MUST ROUTE DOWNHILL FOR ENTIRE DURATION OF ROUTE**

1. PROVIDE LABOR, MATERIALS, INSPECTION, AND TESTING TO PROVIDE CODE COMPLIANCE FOR ELECTRIC, TELEPHONE, AND GROUNDING/LIGHTNING SYSTEMS.

**ICE BRIDGE/ EQUIPMENT POST:**

#2 SOLID COPPER TINNED, EXOTHERMICALLY WELDED TO GROUND RING (BOTH ENDS), FINAL WELD COLD GALVANIZED, IN 1/2" NON-METALLIC SEAL TIGHT CONDUIT, SEALED WITH SILICONE, ANCHORED TO PAD/PLATFORM TO AVOID TRIP HAZARD USING HAMMER SET ANCHORS.

**PEDESTALS, PLINTHS, SSC CABINET, FCOA CABINETS:**

1. #2 SOLID COPPER TINNED, 2 HOLE LUG WITH FLAT AND LOCK WASHER AT EQUIPMENT; EXOTHERMICALLY WELDED TO GROUND RING, FINAL WELD COLD GALVANIZED, IN 1/2" NON-METALLIC SEAL TIGHT CONDUIT, SEALED WITH SILICONE, ANCHORED TO PAD TO AVOID TRIP HAZARD USING HAMMER SET ANCHORS. EACH PART REQUIRES A SEPARATE DOWNLEAD, NO DAISY CHAINS.

2. ALL COMPONENTS INSIDE FCOA CABINETS REQUIRE A DEDICATED GROUND.

**COVP's:**

#6 THHN STRANDED (GREEN JACKET), CONNECTED AT EQUIPMENT SIDE USING OVP TERMINAL BLOCK CONNECTION; MECHANICALLY CONNECTED TO GROUND REFERENCE AT MASTER BUSS BAR USING 2 HOLE LUG WITH FLAT AND LOCK WASHER, IN 1/2" NON-METALLIC SEAL TIGHT CONDUIT, SEALED WITH SILICONE, AND ANCHORED TO PAD/PLATFORM TO AVOID TRIP HAZARD.

**ANTENNA/ COVP/ RRU MAST PIPES:**

1. ALL VERTICAL MAST PIPES: #2 SOLID COPPER TINNED, EXOTHERMICALLY WELDED TO TOP OF PIPE (PIPE, DOWN MOLD), FINAL WELD COLD GALVANIZED, BONDED TO TOP BUSS BAR WITH 2 HOLE COPPER COMPRESSION LUG, FLAT AND LOCK WASHER.

2. EXISTING/REUSED PIPES: #2 SOLID COPPER TINNED, BONDED WITH COLD WATER CLAMP TO TOP OF PIPE, BONDED TO TOP BUSS WITH 2 HOLE COPPER COMPRESSION LUG, FLAT AND LOCK WASHER

**AIR TERMINALS:**

TO BE INSTALLED, ONLY IF REQUIRED

**TMA's, DIPLEXERS AND TRIPLEXERS:**

1. #6 THHN, WITH PROPER COPPER COMPRESSION LUG, FLATS AND LOCK WASHERS

2. ALL GROUND LUGS ON TMA MUST BE GROUNDED WITH SEPARATE DOWNLEAD TO BUSS BAR (NO DAISY CHAINS)

**ELEVATED STEEL PLATFORMS WITH LUNAR FEET:**

#2 SOLID COPPER TINNED, EXOTHERMICALLY WELDED (FLAT PLATE MOLD) TO OUTSIDE PERIMETER BEAMS IN FOUR (4) PLACES, FINAL WELD COLD GALVANIZED, BONDED DIRECTLY TO SUBGRADE GROUND RING.

**STEEL CANOPY (STEEL PLATFORM OR CONCRETE PAD):**

1. #2 SOLID COPPER TINNED, EXOTHERMICALLY WELDED (PIPE, DOWN MOLD) TO BOTTOM OF ALL VERTICAL SUPPORT POSTS, TYPICALLY FOUR (4) PIPES, FINAL WELD COLD GALVANIZED, BONDED DIRECTLY TO SUBGRADE GROUND RING.

2. #2 SOLID COPPER TINNED, EXOTHERMICALLY WELDED (PIPE, UP MOLD) TO TOP OF ALL VERTICAL SUPPORT POSTS, TYPICALLY FOUR (4) PIPES, FINAL WELD COLD GALVANIZED, BONDED UP TO CANOPY GRIP-STRUT USING 2 HOLE COPPER COMPRESSION LUG, FLAT AND LOCK WASHER.

**RRU:**

#6 THHN, WITH PROPER COPPER COMPRESSION LUG, ANTI-OXIDANT TO SECTOR BUSS BAR

**FSBE ALARM BOX:**

#6 THHN WITH ONE HOLE LUG BONDED TO PREVIOUSLY GROUNDED FCOA, PLINTH OR BUSS BAR.

**SURGE SUPPRESSORS:**

#6 THHN TO PREVIOUSLY GROUNDED BUSS BAR USING PROPER LUGS

**FYGA/FYGB BRACKET:**

1. #6 THHN TO PREVIOUSLY GROUNDED BUSS BAR USING PROPER LUGS

2. THROUGH BOLTS WITH FLAT, LOCK ON BRACKET

**BUSS BARS:**

1. PLATFORM / PAD BUSS BAR SHOULD BE MINIMUM 12" TINNED COPPER WITH INSULATORS, AND SHOULD HAVE TWO (2) EXOTHERMICALLY WELDED DOWN LEADS DIRECTLY TO GROUND RING USING #2 SOLID COPPER TINNED WIRE.

2. SECTOR BUSS BAR SHOULD BE PROPERLY SIZED TO ACCOMMODATE NECESSARY GROUNDING FOR EQUIPMENT ON EACH MOUNT, AND MAY BE SOLID COPPER (TINNED NOT REQUIRED). DO NOT USE INSULATORS ON SECTOR BUSS BARS ATTACH DIRECTLY TO TOWER MOUNT STEEL.

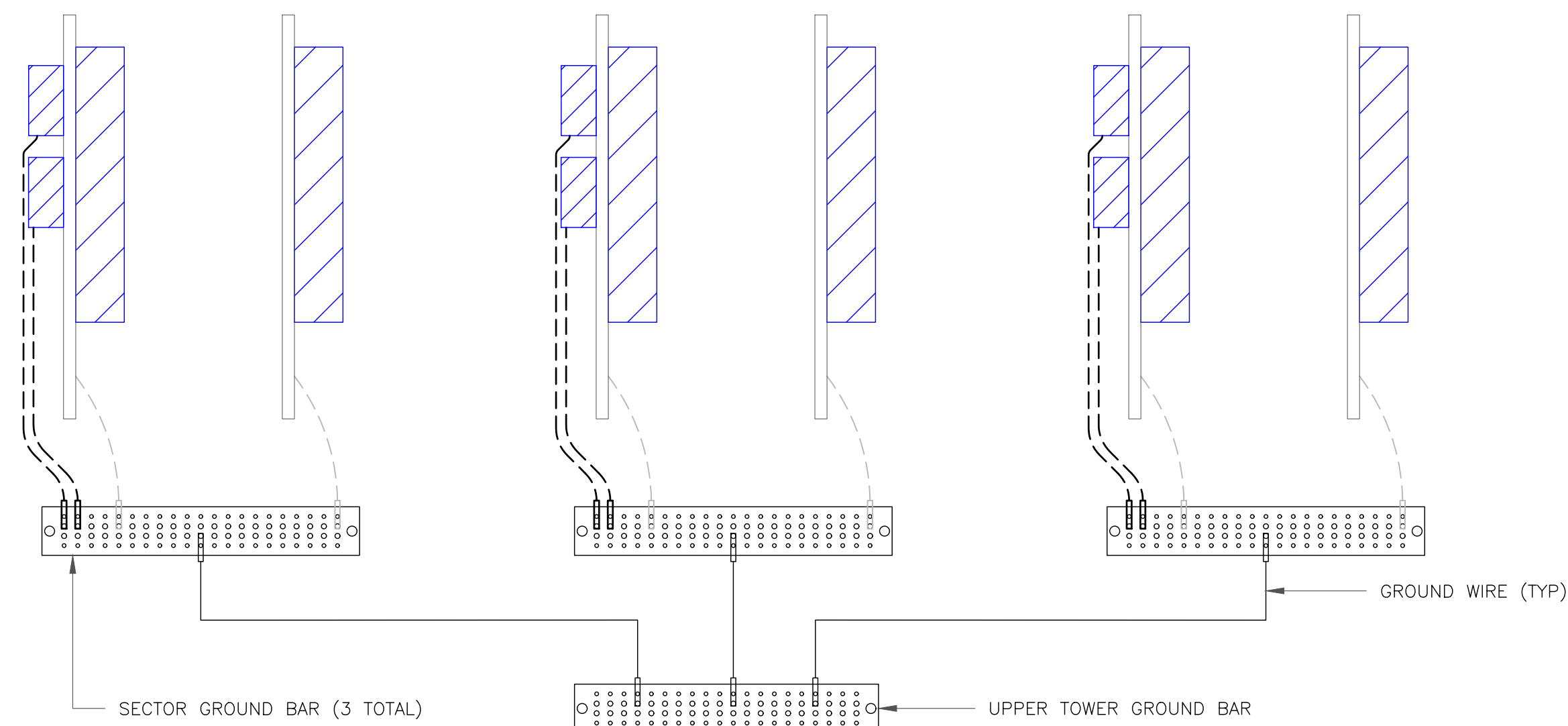
**GENERAL:**

- NO GROUND KITS ON HYBRID TRUNKS (TOP OR BOTTOM)
- NO GROUND KITS ON MICROWAVE IF CABLES (TOP OR BOTTOM)
- MICROWAVE SURGE SUPPRESSORS ARE NOT TO BE INSTALLED UPSTAIRS ON TOWER, DOWNSTAIRS ONLY (BULKHEAD PREFERRED)
- MICROWAVE ODU MUST BE GROUNDED TO TOWER TOP SECTOR OR COLLECTOR BUSS BAR
- ALL TMA'S AND DIPLEXERS MUST BE GROUNDED TO BUSS BAR. NO DAISY CHAIN ON TWIN/DUAL TMA
- ALL LUGS SHOULD BE PROPERLY SIZED FOR CONDUCTOR, BURNDY TINNED COPPER COMPRESSION STYLE
  1. INDOOR (OR INSIDE CABINET) SHOULD HAVE WINDOW
  2. OUTDOOR SHOULD NOT HAVE WINDOW
- CONTRACTOR TO VERIFY EXISTENCE AND LOCATION OF EXISTING SITE GROUND SYSTEM.
- CONTRACTOR SHALL VERIFY THAT GROUNDING ELECTRODES SHALL BE CONNECTED IN A RING USING #2 AWG BARE TINNED COPPER WIRE. THE TOP OF THE GROUND RODS AND THE RING CONDUCTOR SHALL BE 30" BELOW FINISHED GRADE, OR TO FROST DEPTH, WHICHEVER IS GREATER. GROUNDING ELECTRODES SHALL BE DRIVEN ON 10'-0" CENTERS (PROVIDE AND INSTALL AS REQUIRED, REQUIRED PER PLAN BELOW).
- GROUNDING CONDUCTORS SHALL BE OF EQUAL LENGTH, MATERIAL, AND BONDING TECHNIQUE.
- CONTRACTOR SHALL ENSURE GROUND RING IS WITHIN 12 TO 36 INCHES OF THE EQUIPMENT PAD. PROVIDE AND INSTALL GROUNDING CONNECTIONS SHOWN BELOW AS NEEDED PER EXISTING SITE GROUNDING SYSTEM. CONTRACTOR SHALL VERIFY ALL EXISTING SITE GROUNDING CONDITIONS BEFORE STARTING WORK OR PURCHASING EQUIPMENT.
- ALL DOWN CONDUCTORS MUST GO DOWN.

ALPHA

BETA

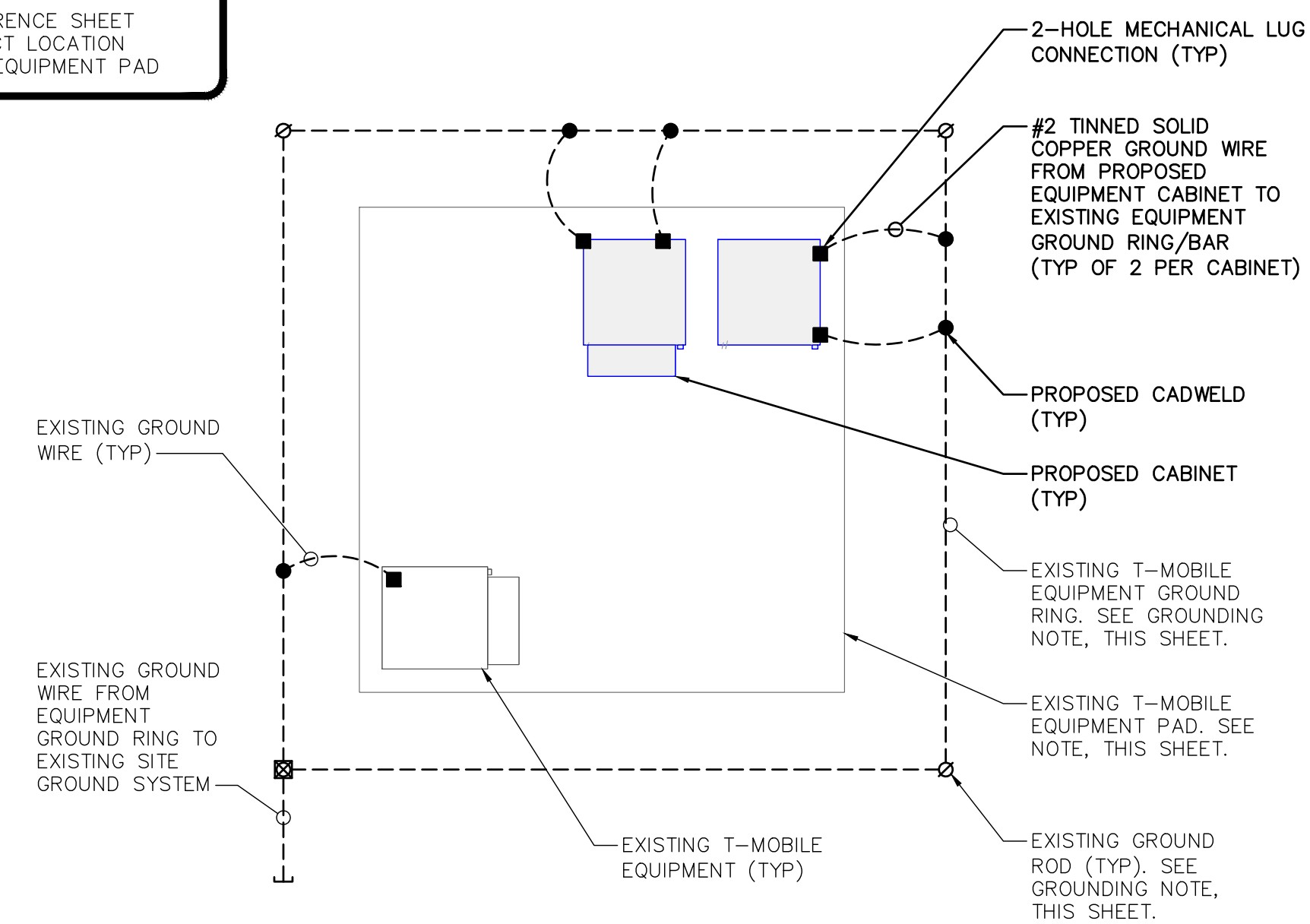
GAMMA



**NOTE:**  
ALL NEW GROUNDS TO BE #6 STRANDED COPPER WITH GREEN INSULATION UNLESS NOTED OTHERWISE.  
GROUNDING SHOWN TYPICAL PER SECTOR.

1 TYPICAL ANTENNA GROUNDING DIAGRAM  
SCALE: NOT TO SCALE

**NOTE:**  
CONTRACTOR TO REFERENCE SHEET C-1.1 & 1.2 FOR EXACT LOCATION AND ORIENTATION OF EQUIPMENT PAD



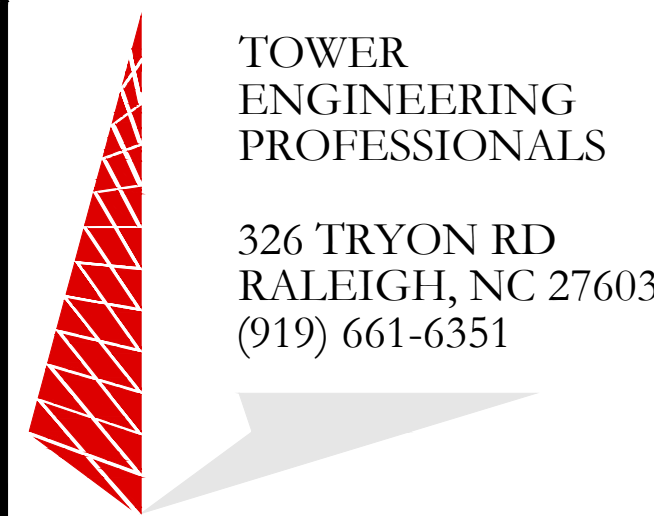
2 TYPICAL CABINET GROUNDING DIAGRAM  
SCALE: NOT TO SCALE



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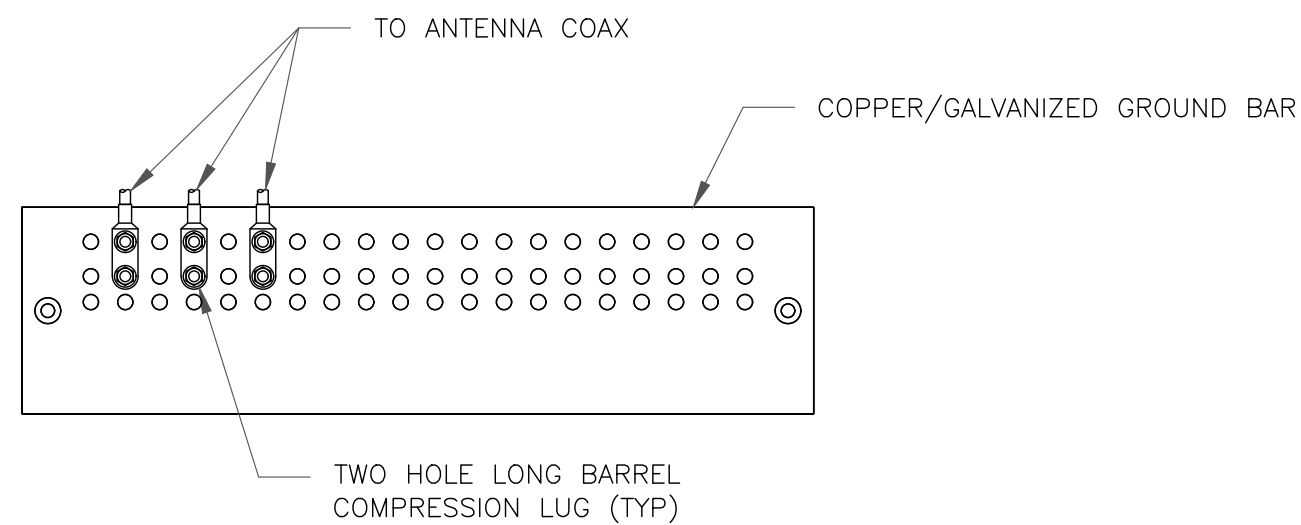
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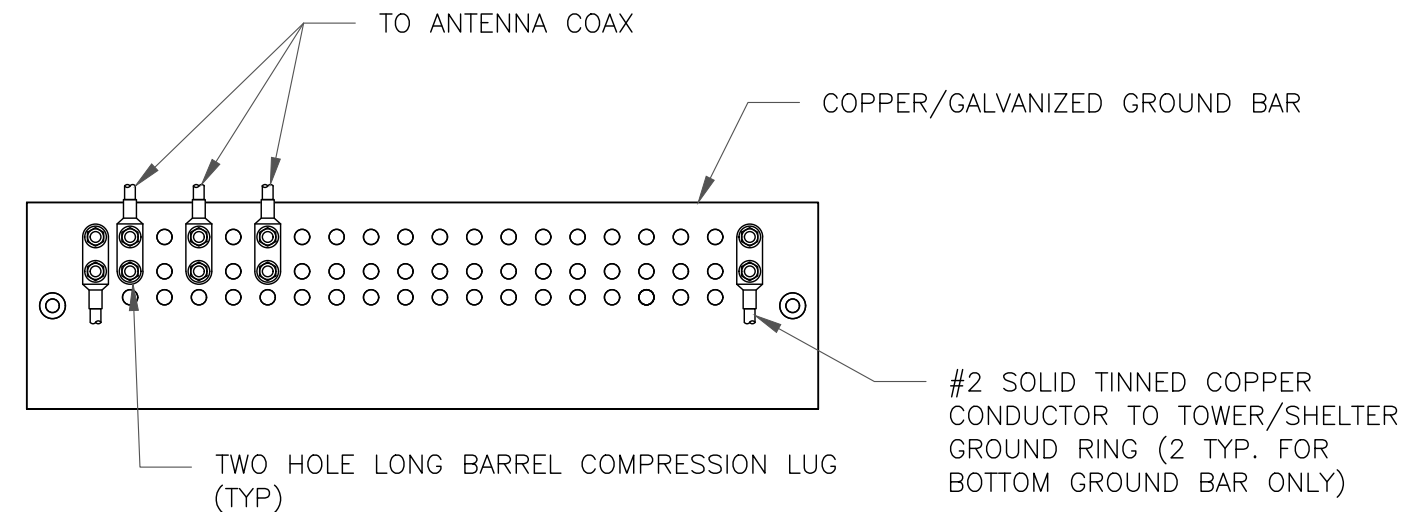
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NOTES:

- 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.

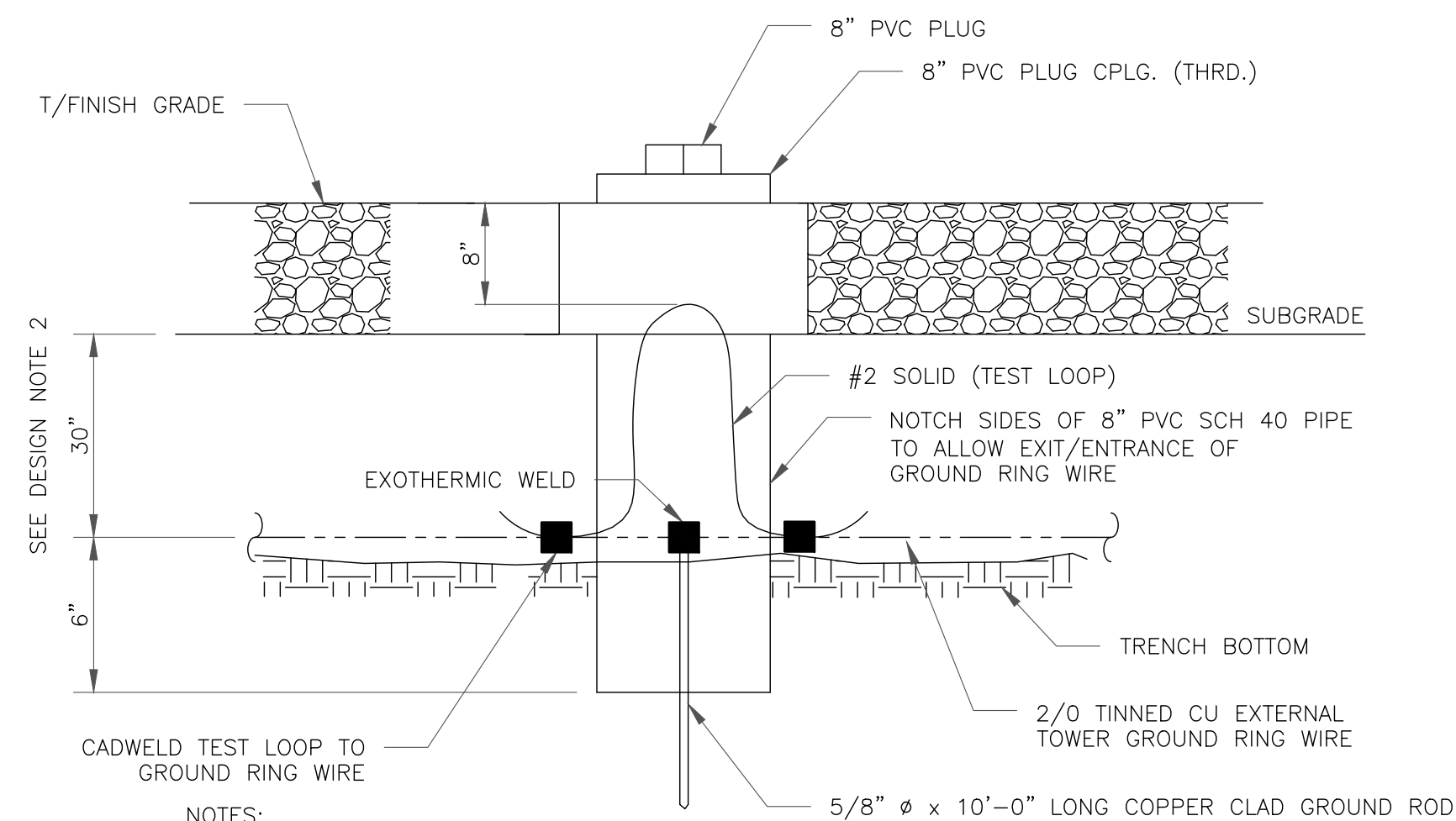
1 ANTENNA SECTOR GROUND BAR DETAIL  
SCALE: NOT TO SCALE



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.

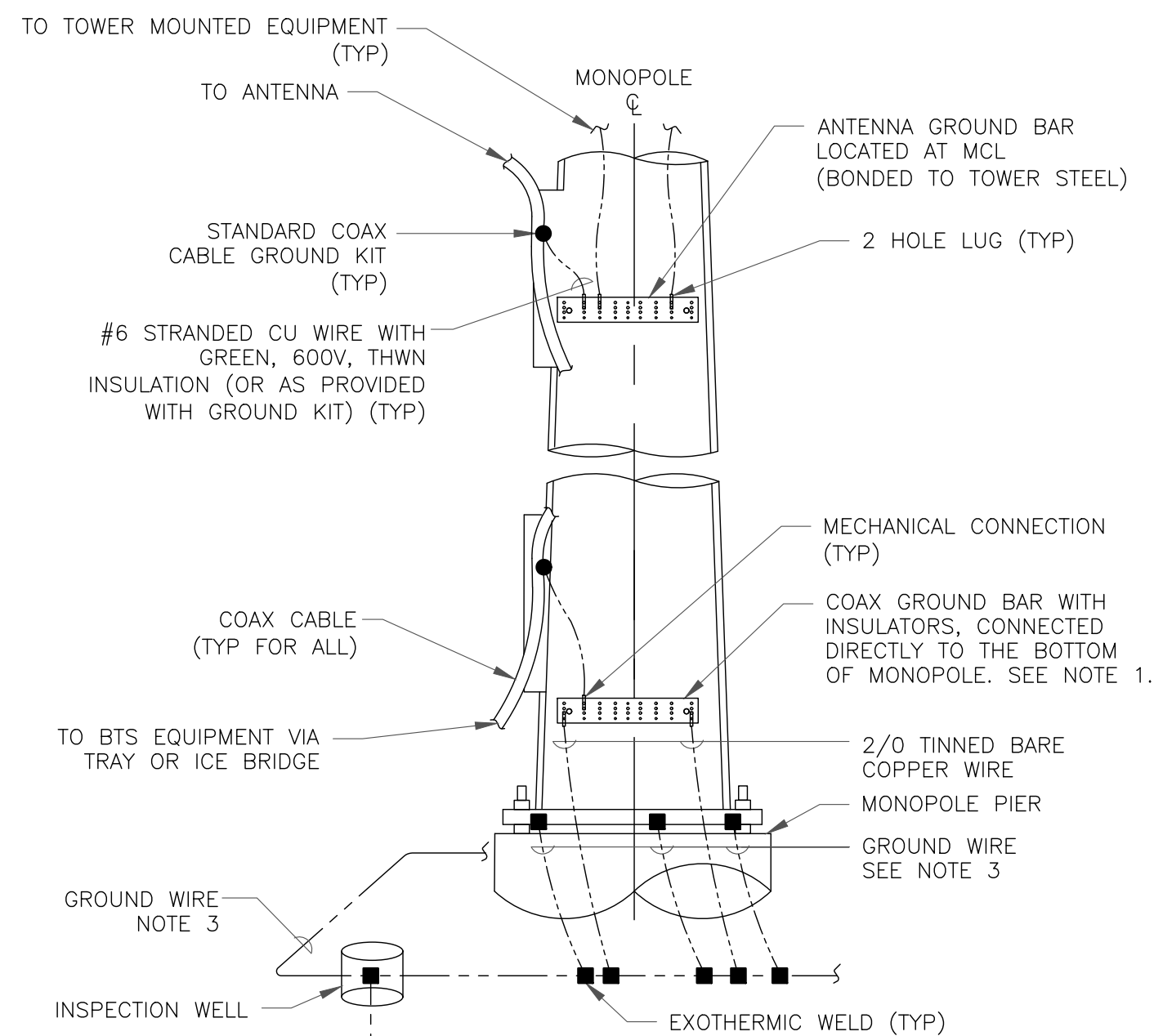
2 TOWER/SHELTER GROUND BAR DETAIL  
SCALE: NOT TO SCALE



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)

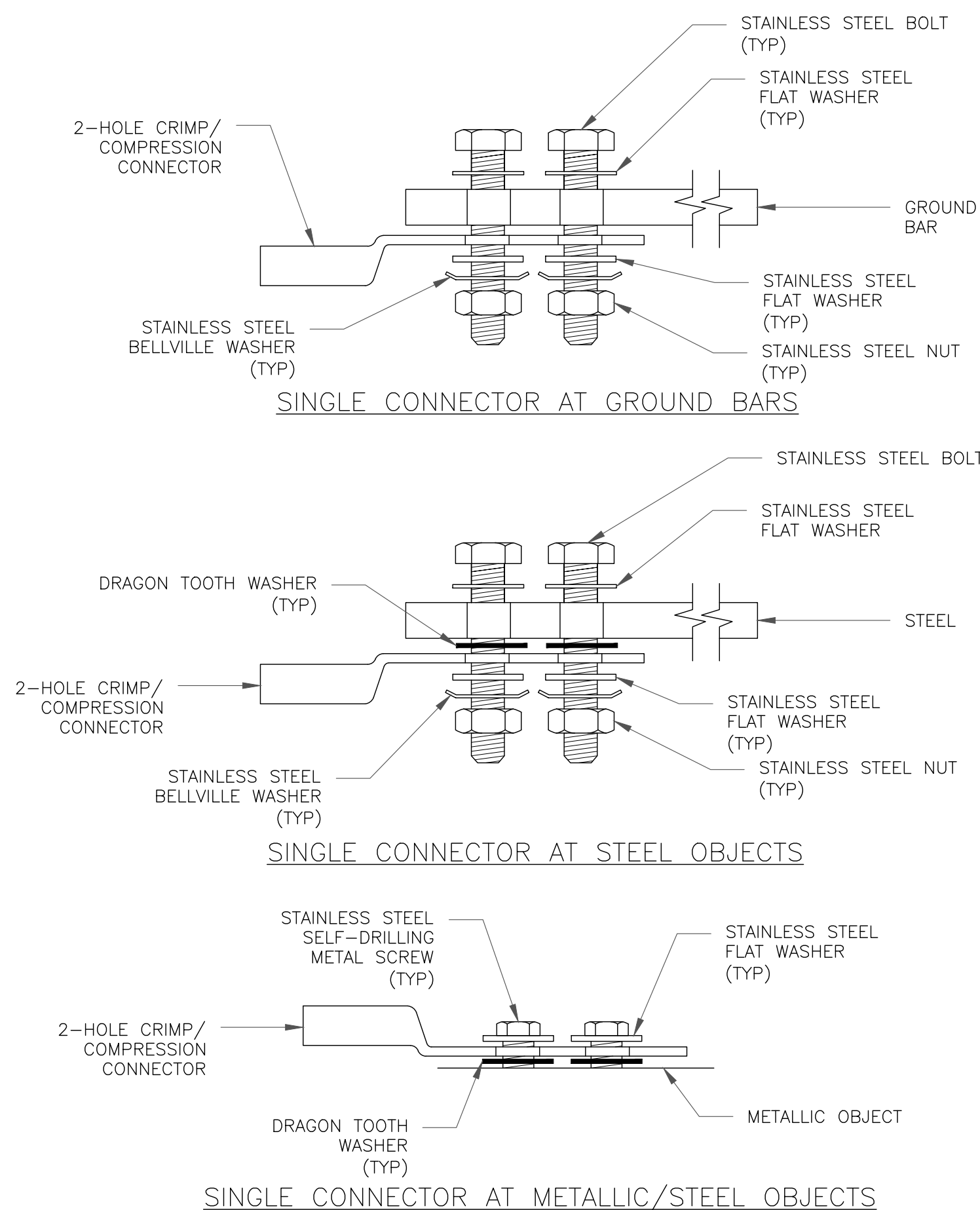
3 INSPECTION WELL DETAIL  
SCALE: NOT TO SCALE



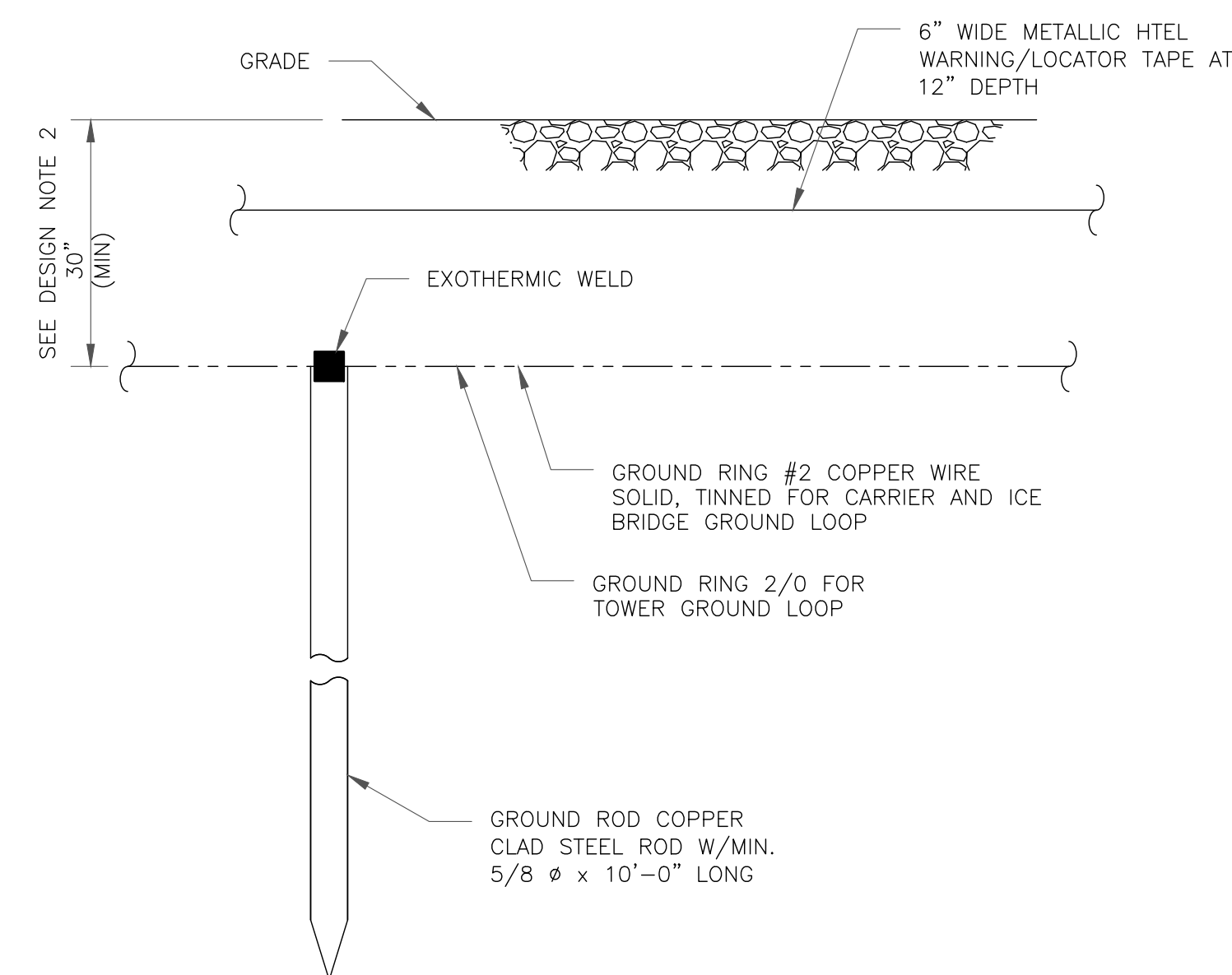
NOTES:

- 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

T-Mobile

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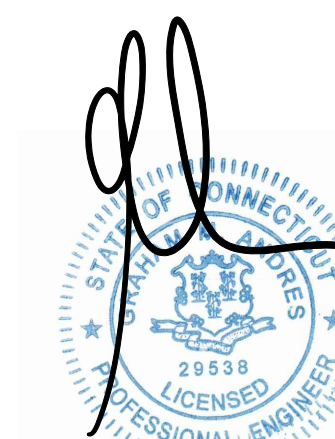
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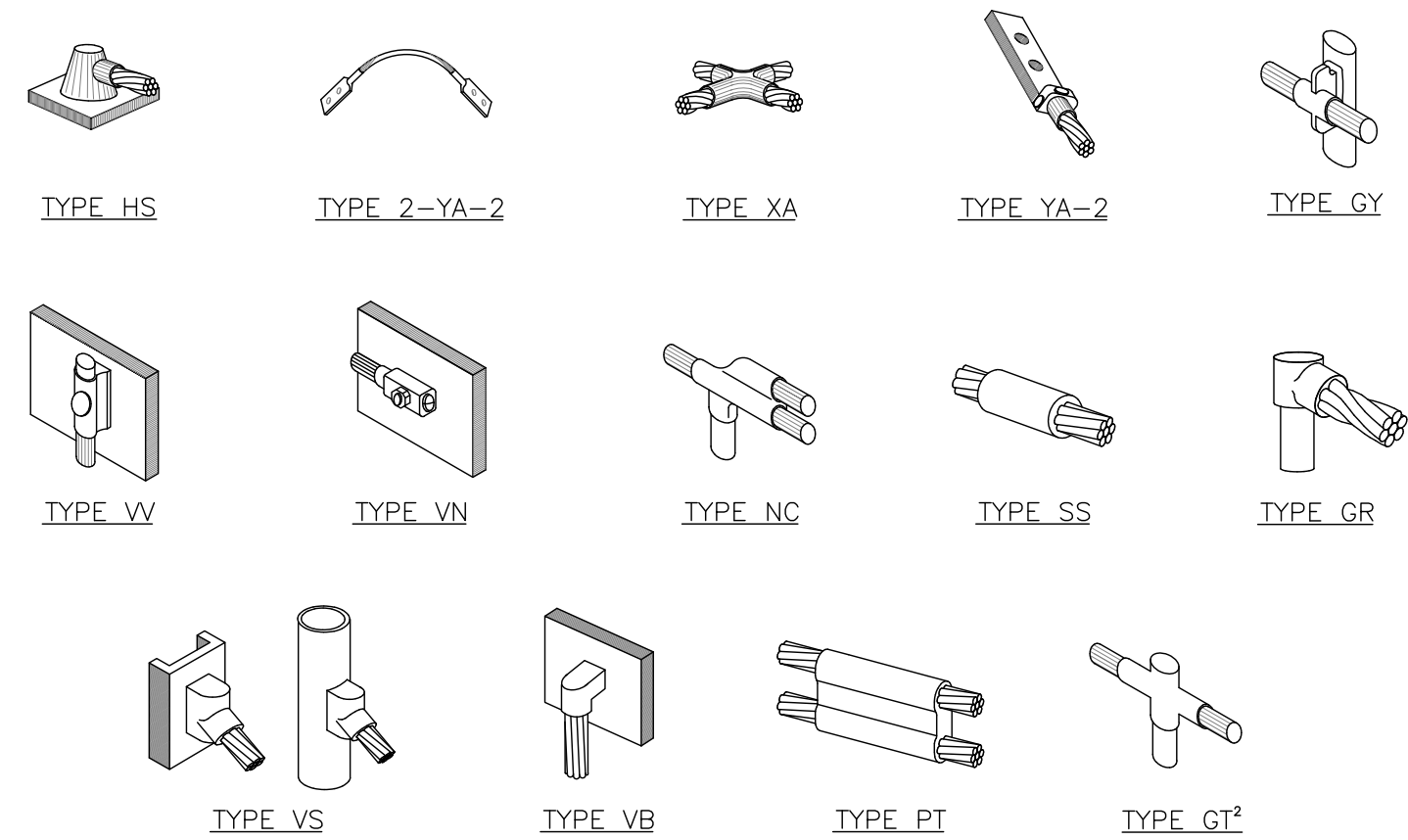
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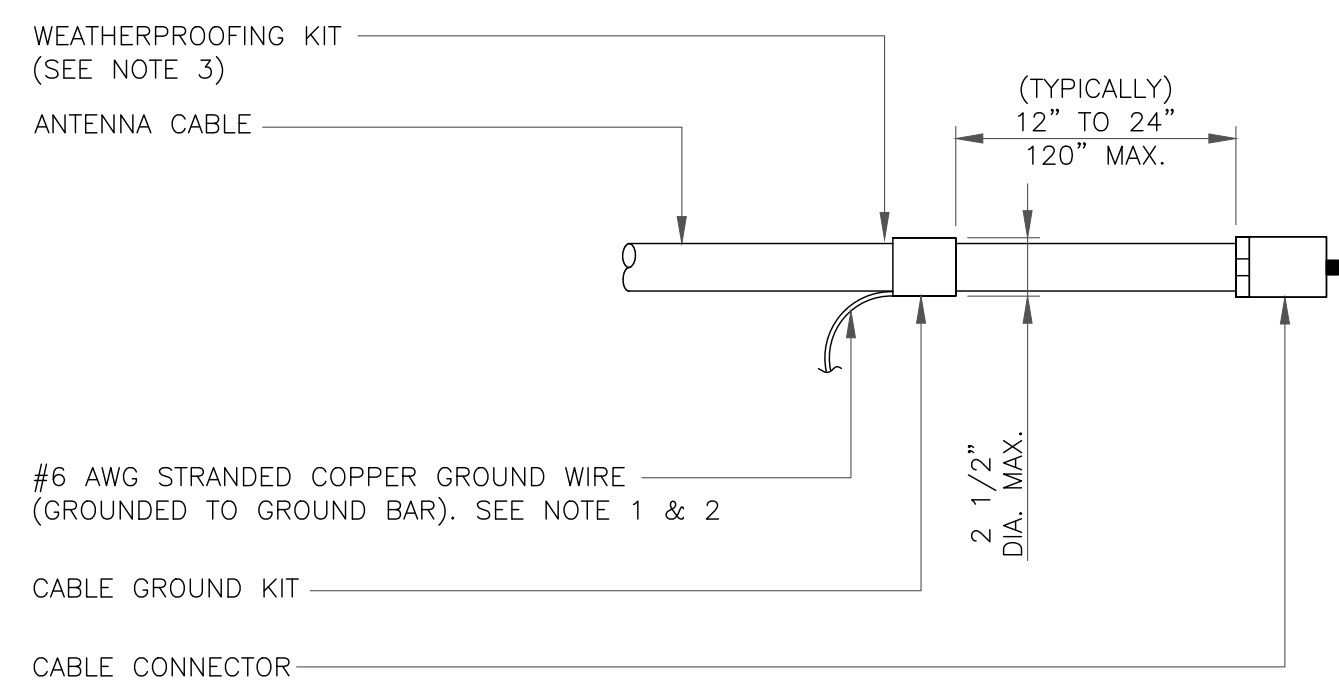
SHEET NUMBER: G-2 REVISION: 0



**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.

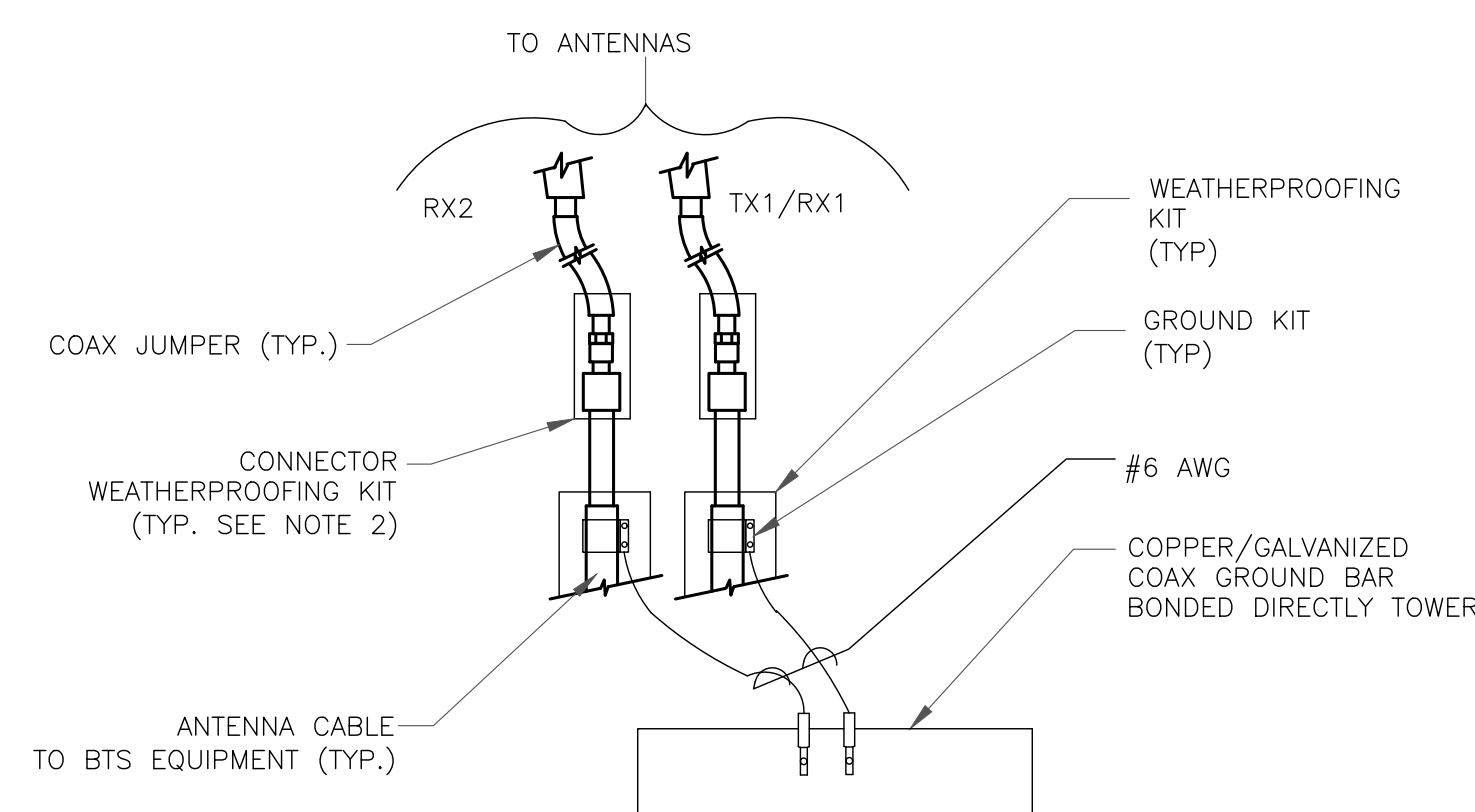
**1** CADWELD GROUNDING CONNECTIONS  
SCALE: NOT TO SCALE



**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.

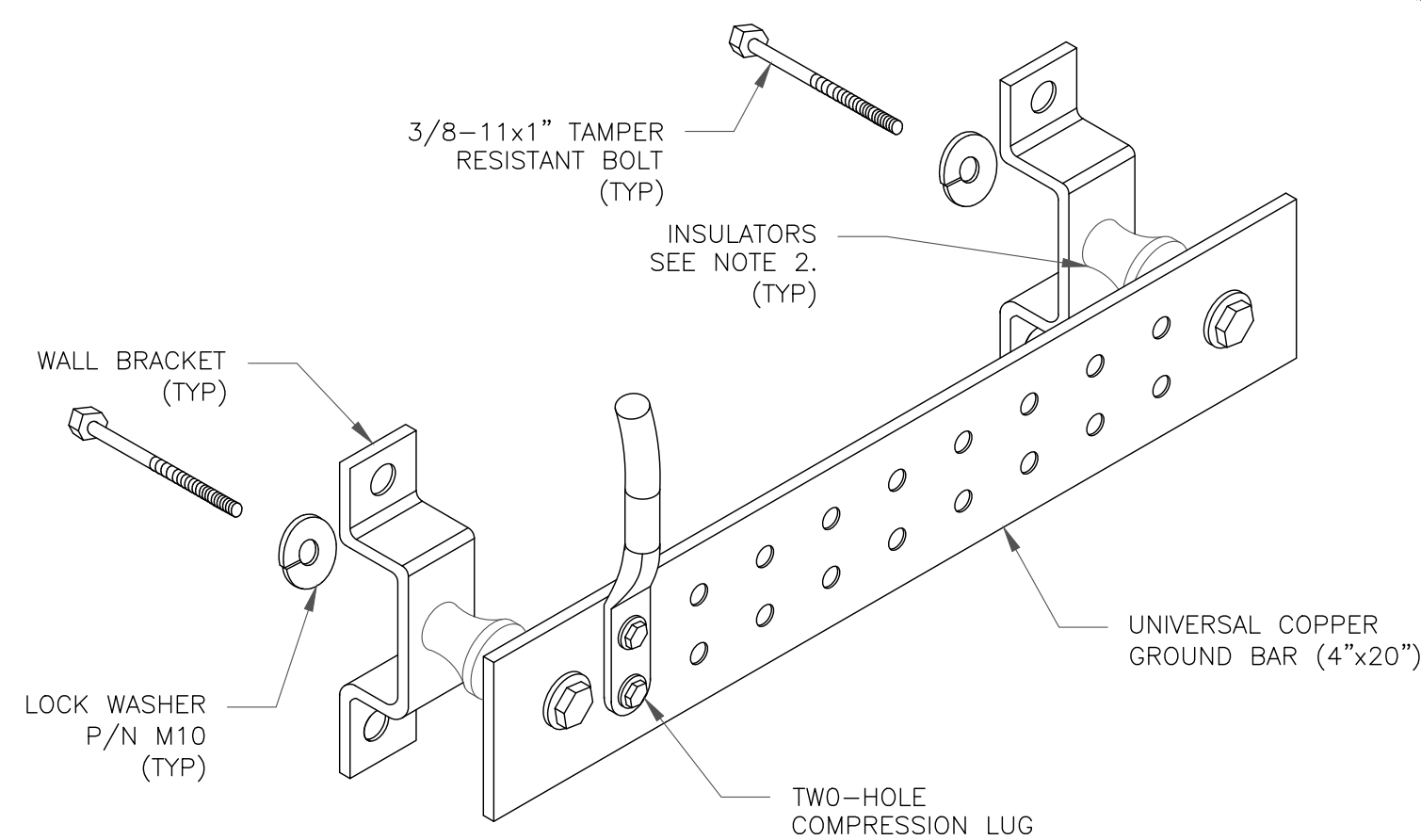
**3** CABLE GROUND KIT CONNECTION  
SCALE: NOT TO SCALE



**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.

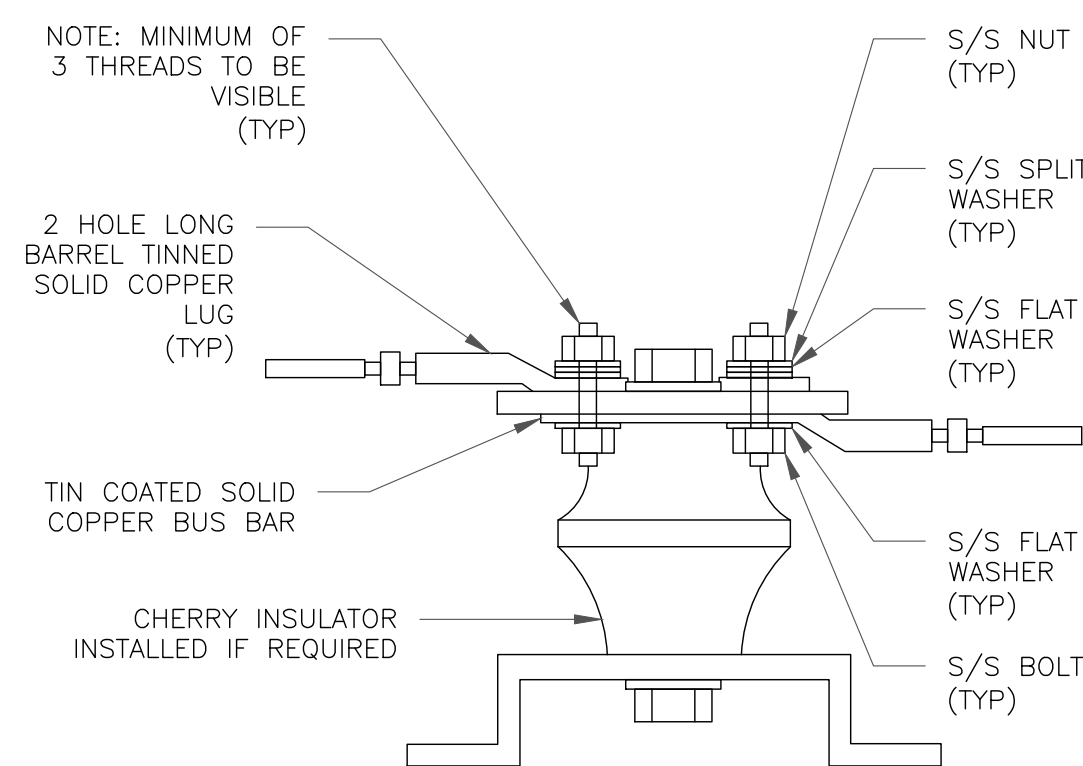
**4** GROUND CABLE CONNECTION  
SCALE: NOT TO SCALE



**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.

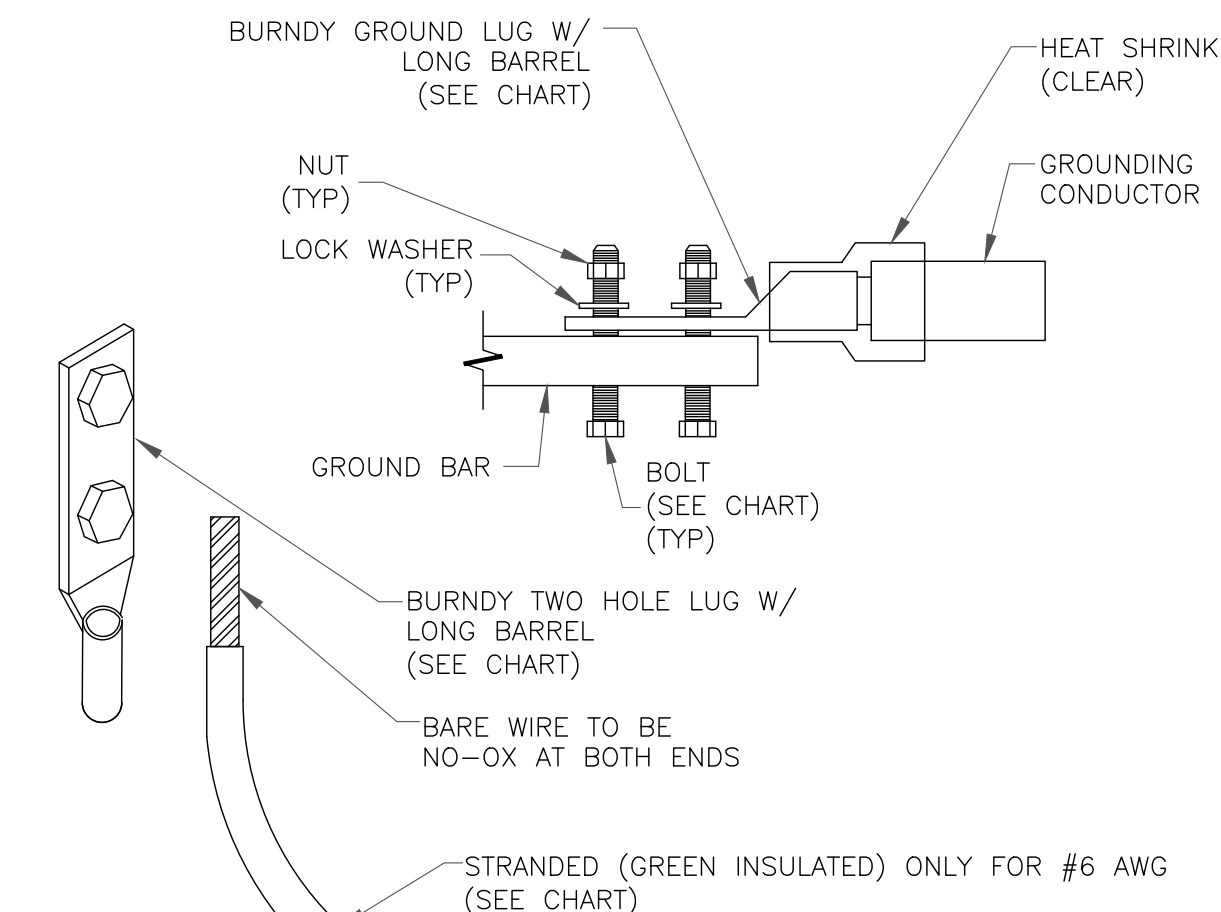
**6** GROUND BAR DETAIL  
SCALE: NOT TO SCALE



NOTE: MINIMUM OF 3 THREADS TO BE VISIBLE (TYP)

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

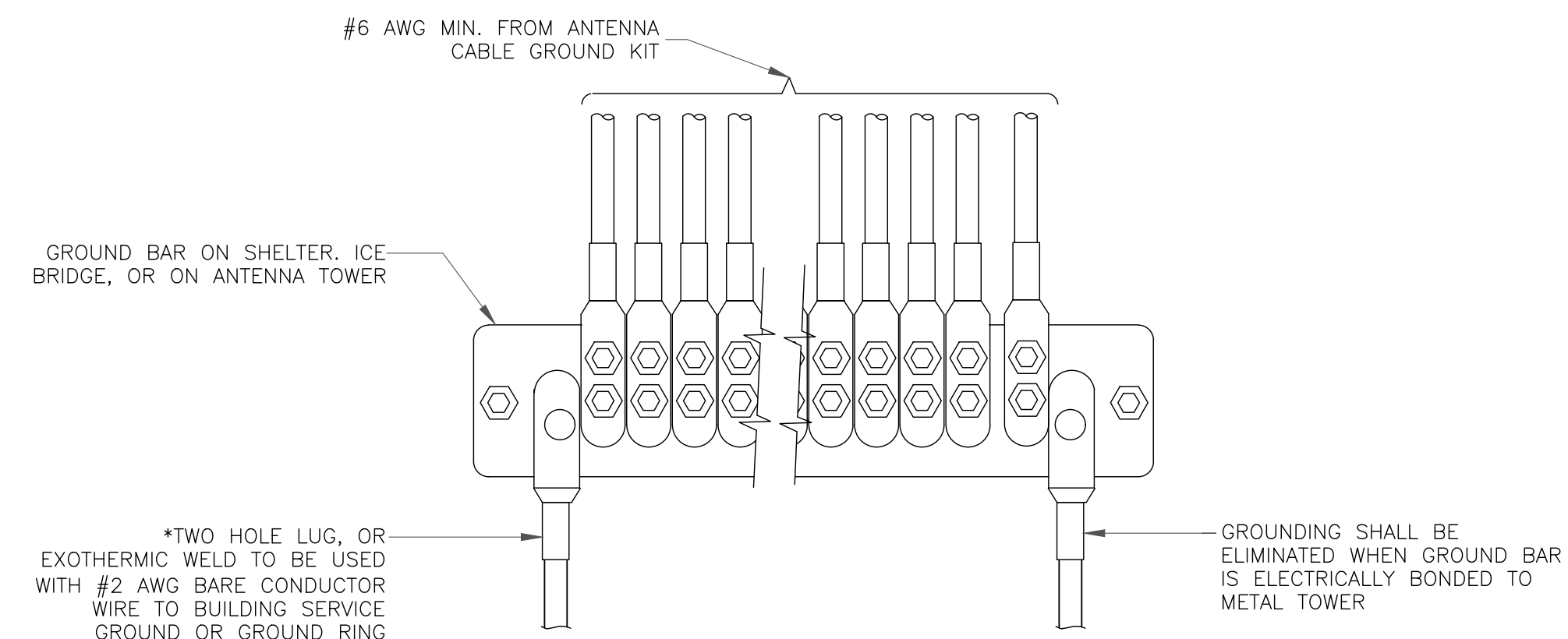
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



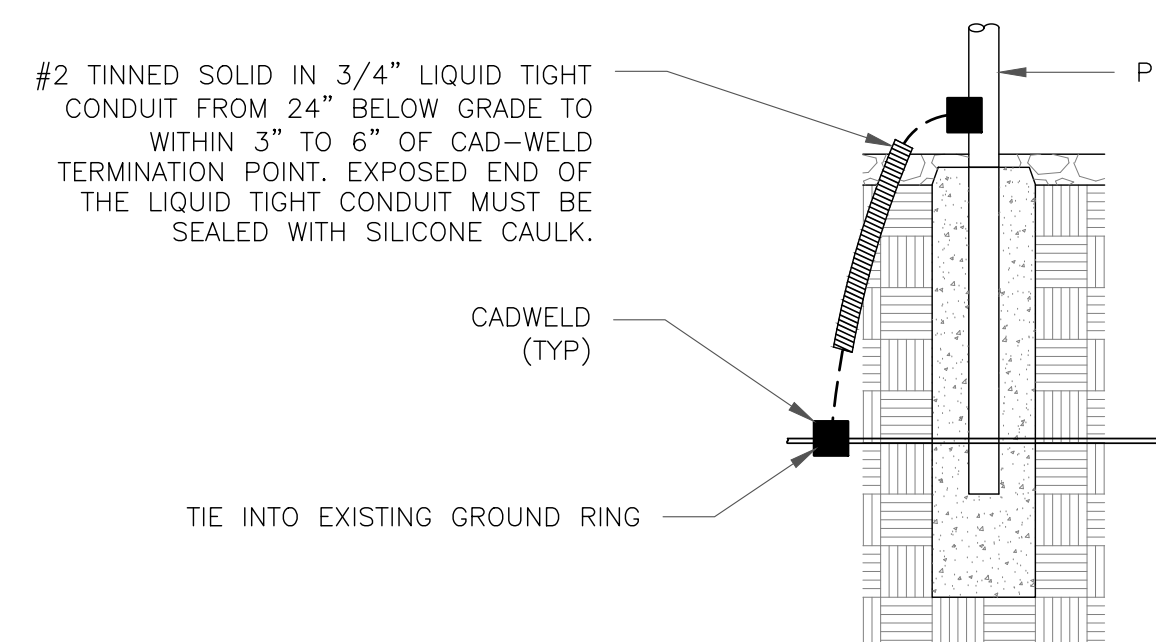
**NOTES:**

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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0	03/26/21	JW	CONSTRUCTION	JTC

SEAL:



03/26/21

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

SHEET NUMBER:

**G-3**

REVISION:

**0**

# Exhibit D

## **Structural Analysis Report**



MORRISON HERSHFIELD

Date: **February 12, 2021**

Morrison Hershfield  
1455 Lincoln Parkway, Suite 500  
Atlanta, GA 30346  
(770) 379-8500

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

**Carrier Designation:** **Sprint PCS Co-Locate**  
**Carrier Site Number:** CTHA696A  
**Carrier Site Name:** CTHA696A

**Crown Castle Designation:** **Crown Castle BU Number:** 876368  
**Crown Castle Site Name:** Yankee Lake/East Hampton/Town  
**Crown Castle JDE Job Number:** 628905  
**Crown Castle Work Order Number:** 1918927  
**Crown Castle Order Number:** 538768 Rev. 1

**Engineering Firm Designation:** **Morrison Hershfield Project Number:** CN7-211 / 2101398

**Site Data:** **1 Public Works Dr., East Hampton, Middlesex County, CT 06032**  
**Latitude 41° 33' 53.14", Longitude -72° 32' 35.18"**  
**180 Foot - Monopole Tower**

Morrison Hershfield 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 130 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Respectfully submitted by:

G. Lance Cooke, P.E. (CT License No. PEN.0028133)  
Senior Engineer



G. Lance Cooke  
2021.02.12  
11:00:42-08'00'

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## 1) INTRODUCTION

This tower is a 180 ft monopole tower designed by Valmont Microflect Co., Inc.

## 2) ANALYSIS CRITERIA

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	130 mph
<b>Exposure Category:</b>	B
<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)
177.0	178.0	3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe	4	1-5/8
		3	rfs celwave	APX16DWW-16DWW-S-E-A20 w/ Mount Pipe		
		3	rfs celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
		3	ericsson	RADIO 4424 B25_TMO		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
	177.0	1	tower mounts	Miscellaneous [NA 507-1]		
		1	tower mounts	Miscellaneous [NA 509-3]		
		1	tower mounts	Platform Mount [LP 601-1]		
77.0	78.0	1	lucent	KS24019-L112A	1	1/2
	77.0	1	tower mounts	Side Arm Mount [SO 701-1]		

**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)
168.0	171.0	1	raycap	DC6-48-60-18-8F	12 6 2	1-5/8 3/4 3/8
	169.0	3	ericsson	RRUS 32 B2		
		3	ericsson	RRUS 32 B30		
		3	kaelus	DBC0061F1V51-2		
		6	powerwave technologies	7020.00		
		6	powerwave technologies	LGP21401		
	1	raycap	DC6-48-60-18-8F			
	168.0	1	tower mounts	Platform Mount [LP 303-1_HR-1]		
	167.0	3	cci antennas	DMP65R-BU6D w/ Mount Pipe		



Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		3	cci antennas	OPA65R-BU6BA-K w/ Mount Pipe		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		3	quintel technology	QS66512-2 w/ Mount Pipe		
		3	ericsson	RRUS 32 B66A		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14		
		1	raycap	DC6-48-60-0-8F		
154.0	157.0	6	commscope	HBXX-6517DS-A2M w/ Mount Pipe	2	1-5/8
		6	commscope	LNX-6515DS-A1M w/ Mount Pipe		
		3	alcatel lucent	B66A RRH4X45		
		3	alcatel lucent	RRH2X60-AWS		
		2	rfs celwave	DB-T1-6Z-8AB-0Z		
	154.0	1	tower mounts	Platform Mount [LP 304-1]		
119.0	131.0	5	decibel	DB264-A	9	1-1/4
	128.0	1	decibel	DB420		
	124.0	1	decibel	DB225-K		
	122.0	1	decibel	DB230-E		
	120.0	1	decibel	DB230-E		
	119.0	1	tower mounts	Platform Mount [LP 304-1]		

### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

Document	Reference	Source
4-GEOTECHNICAL REPORTS	1441254	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	2069183	CCISITES
4-TOWER MANUFACTURER DRAWINGS	1531979	CCISITES

#### 3.1) Analysis Method

tnxTower (version 8.0.7.5), 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.

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

#### 4) ANALYSIS RESULTS

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

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	180 - 140.083	Pole	TP31.67x24.16x0.2188	1	-13.44	1308.45	49.8	Pass
L2	140.083 - 92.5	Pole	TP40.17x30.3074x0.3438	2	-24.72	2606.62	67.0	Pass
L3	92.5 - 45.583	Pole	TP48.31x38.3553x0.4388	3	-39.72	4003.68	70.3	Pass
L4	45.583 - 0	Pole	TP56x46.1313x0.5	4	-62.21	5437.50	72.4	Pass
							Summary	
						Pole (L4)	72.4	Pass
						Rating =	72.4	Pass

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	59.3	Pass
1	Base Plate	0	45.7	Pass
1	Base Foundation	0	68.5	Pass
1	Base Foundation Soil Interaction	0	67.7	Pass

<b>Structure Rating (max from all components) =</b>	<b>72.4%*</b>
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Notes:

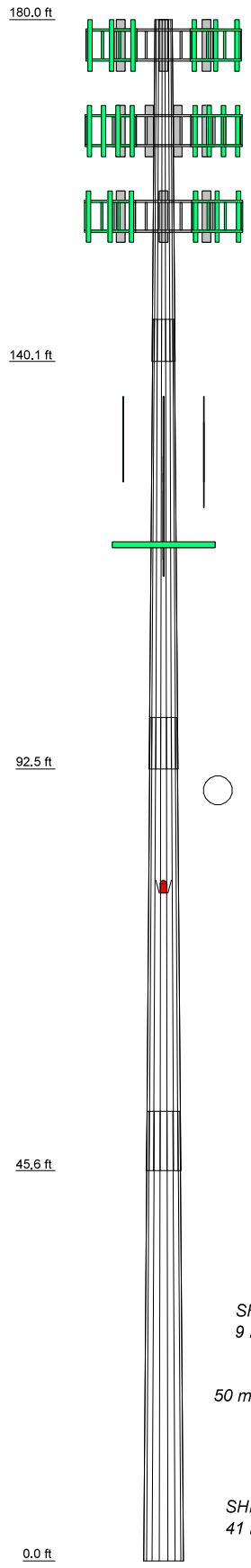
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) \*Rating per TIA-222-H, Section 15.5

#### 4.1) Recommendations

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

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

Section	1	2	3	4	
Length (ft)	39.92	52.50	52.92	52.50	
Number of Sides	16	16	16	16	
Thickness (in)	0.2188	0.3438	0.4387	0.5000	
Socket Length (ft)	4.92	6.00	6.92	46.1313	
Top Dia (in)	24.1600	30.3074	38.3553	56.0000	
Bot Dia (in)	31.6700	40.1700	48.3100		
Grade			A572-65		
Weight (K)	2.6	6.8	10.8	14.4	34.7



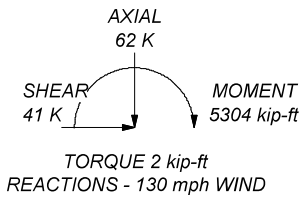
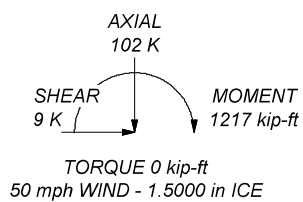
**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

**TOWER DESIGN NOTES**

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 130 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 72.4%

ALL REACTIONS ARE FACTORED



Consulting Engineers

**Morrison Hershfield**

1455 Lincoln Parkway, Suite 500  
 Atlanta, GA 30346  
 Phone: (770) 379-8500  
 FAX: (770) 379-8501

Job: **CN7-211 / 2101398**

Project: **876368 / Yankee Lake/East Hampton/Town**

Client: **Crown Castle USA** Drawn by: **MG** App'd:

Code: **TIA-222-H** Date: **02/12/21** Scale: **NTS**

Path: **C:\Users\Wich\Desktop\Import\Jobs\2021\SA\BU 876368\Analysis\CN7-211\_BU\_876368\_WC\_191897.dwg** Dwg No. **E-1**

## Tower Input Data

The tower is a monopole.  
 This tower is designed using the TIA-222-H standard.  
 The following design criteria apply:  
 Tower is located in Middlesex County, Connecticut.  
 Tower base elevation above sea level: 379.00 ft.  
 Basic wind speed of 130 mph.  
 Risk Category II.  
 Exposure Category B.  
 Simplified Topographic Factor Procedure for wind speed-up calculations is used.  
 Topographic Category: 1.  
 Crest Height: 0.00 ft.  
 Nominal ice thickness of 1.5000 in.  
 Ice thickness is considered to increase with height.  
 Ice density of 56 pcf.  
 A wind speed of 50 mph is used in combination with ice.  
 Temperature drop of 50 °F.  
 Deflections calculated using a wind speed of 60 mph.  
 A non-linear (P-delta) analysis was used.  
 Pressures are calculated at each section.  
 Stress ratio used in pole design is 1.05.  
 Tower analysis based on target reliabilities in accordance with Annex S.  
 Load Modification Factors used:  $K_{es}(F_w) = 0.95$ ,  $K_{es}(t_i) = 0.85$ .  
 Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

- |  |   |  |
|--|---|--|
| <ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>Use Code Stress Ratios</li> <li>√ Use Code Safety Factors - Guys</li> <li>Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <br/> <li>Include Bolts In Member Capacity</li> <br/> <li>Leg Bolts Are At Top Of Section</li> <li>Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>SR Members Have Cut Ends</li> <li>SR Members Are Concentric</li> </ul> | <ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>√ Assume Rigid Index Plate</li> <li>√ Use Clear Spans For Wind Area</li> <li>Use Clear Spans For KL/r</li> <li>Retension Guys To Initial Tension</li> <li>√ Bypass Mast Stability Checks</li> <li>√ Use Azimuth Dish Coefficients</li> <li>√ Project Wind Area of Appurt.</li> <br/> <li>Autocalc Torque Arm Areas</li> <br/> <li>Add IBC .6D+W Combination</li> <li>Sort Capacity Reports By Component</li> <li>Triangulate Diamond Inner Bracing</li> <li>Treat Feed Line Bundles As Cylinder</li> <li>Ignore KL/ry For 60 Deg. Angle Legs</li> </ul> | <ul style="list-style-type: none"> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>Calculate Redundant Bracing Forces</li> <li>Ignore Redundant Members in FEA</li> <li>SR Leg Bolts Resist Compression</li> <li>All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>√ Consider Feed Line Torque</li> <li>Include Angle Block Shear Check</li> <li>Use TIA-222-H Bracing Resist. Exemption</li> <li>Use TIA-222-H Tension Splice Exemption</li> <br/> <li style="text-align: center;"><b>Poles</b></li> <li>√ Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> <li>Pole Without Linear Attachments</li> <li>Pole With Shroud Or No Appurtenances</li> <li>Outside and Inside Corner Radii Are Known</li> </ul> |
|--|---|--|

## Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	180.00-140.08	39.92	4.92	16	24.1600	31.6700	0.2188	0.8750	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L2	140.08-92.50	52.50	6.00	16	30.3074	40.1700	0.3438	1.3750	A572-65 (65 ksi)
L3	92.50-45.58	52.92	6.92	16	38.3553	48.3100	0.4387	1.7550	A572-65 (65 ksi)
L4	45.58-0.00	52.50		16	46.1313	56.0000	0.5000	2.0000	A572-65 (65 ksi)

### 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	24.5905	16.7065	1209.7443	8.5231	12.3216	98.1808	2437.8055	8.2605	4.3725	19.989
	32.2476	21.9471	2742.6276	11.1966	16.1517	169.8043	5526.7819	10.8517	5.8670	26.821
L2	31.7756	32.8570	3726.7693	10.6671	15.4568	241.1090	7509.9664	16.2461	5.3471	15.555
	40.8896	43.6720	8750.9661	14.1781	20.4867	427.1535	17634.4324	21.5935	7.3098	21.265
L3	40.1716	53.0685	9638.5174	13.4983	19.5612	492.7358	19422.9736	26.2396	6.7596	15.406
	49.1705	67.0012	19397.5321	17.0422	24.6381	787.2982	39088.7664	33.1286	8.7406	19.922
L4	48.2628	72.7819	19145.3441	16.2447	23.5270	813.7621	38580.5720	35.9868	8.1851	16.37
	56.9991	88.5225	34447.2058	19.7580	28.5600	1206.1347	69415.9843	43.7697	10.1490	20.298

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 180.00- 140.08				1	1	1			
L2 140.08- 92.50				1	1	1			
L3 92.50- 45.58				1	1	1			
L4 45.58-0.00				1	1	1			

### Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Componen t Type	Placement ft	Total Number	Number Per Row	Start/En d Position	Width or Diamete r in	Perimete r in	Weight plf
***** Climbing Pegs	A	No	Surface Ar (CaAa)	170.00 - 8.00	1	1	-0.500 -0.300	0.7050		1.80
***** LDF7-50A(1-5/8)	C	No	Surface Ar (CaAa)	168.00 - 8.00	12	6	0.400 0.500	1.9800		0.82
***** FB-L98B-002- 75000(3/8)	C	No	Surface Ar (CaAa)	168.00 - 8.00	2	1	0.300 0.350	0.3937		0.06
***** WR-VG86ST-BRD(3/4)	C	No	Surface Ar (CaAa)	168.00 - 8.00	4	2	0.350 0.400	0.7950		0.58
***** WR-VG86ST-BRD(3/4)	C	No	Surface Ar (CaAa)	168.00 - 8.00	2	2	0.350 0.400	0.7950		0.58
*****										

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

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Componen t Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
*****									
***									
HB158-21U6S24- xxM_TMO(1-5/8)	A	No	No	Inside Pole	177.00 - 1.00	4	No Ice	0.00	2.50
							1/2" Ice	0.00	2.50
							1" Ice	0.00	2.50
							2" Ice	0.00	2.50
*****									
HB158-1-08U8- S8J18(1-5/8)	B	No	No	Inside Pole	154.00 - 1.00	2	No Ice	0.00	1.30
							1/2" Ice	0.00	1.30
							1" Ice	0.00	1.30
							2" Ice	0.00	1.30
*****									
LDF6-50A(1-1/4)	C	No	No	Inside Pole	119.00 - 8.00	9	No Ice	0.00	0.60
							1/2" Ice	0.00	0.60
							1" Ice	0.00	0.60
							2" Ice	0.00	0.60
*****									
LDF4-50A(1/2)	A	No	No	Inside Pole	77.00 - 8.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
*****									

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L1	180.00-140.08	A	0.000	0.000	2.109	0.000	0.42
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	43.142	0.000	0.38
L2	140.08-92.50	A	0.000	0.000	3.355	0.000	0.56
		B	0.000	0.000	0.000	0.000	0.12
		C	0.000	0.000	73.533	0.000	0.78
L3	92.50-45.58	A	0.000	0.000	3.308	0.000	0.56
		B	0.000	0.000	0.000	0.000	0.12
		C	0.000	0.000	72.504	0.000	0.88
L4	45.58-0.00	A	0.000	0.000	2.650	0.000	0.52
		B	0.000	0.000	0.000	0.000	0.12
		C	0.000	0.000	58.080	0.000	0.71

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

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
L1	180.00-140.08	A	1.492	0.000	0.000	11.039	0.000	0.54
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	93.233	0.000	1.65
L2	140.08-92.50	A	1.445	0.000	0.000	17.557	0.000	0.75
		B		0.000	0.000	0.000	0.000	0.12
		C		0.000	0.000	158.911	0.000	2.96
L3	92.50-45.58	A	1.372	0.000	0.000	16.870	0.000	0.74
		B		0.000	0.000	0.000	0.000	0.12
		C		0.000	0.000	154.589	0.000	2.95
L4	45.58-0.00	A	1.226	0.000	0.000	12.964	0.000	0.65
		B		0.000	0.000	0.000	0.000	0.12
		C		0.000	0.000	121.225	0.000	2.27

### Feed Line Center of Pressure

Section	Elevation	CP <sub>x</sub>	CP <sub>z</sub>	CP <sub>x</sub> Ice	CP <sub>z</sub> Ice
	ft	in	in	in	in
L1	180.00-140.08	-5.0391	3.8298	-4.7281	3.7189
L2	140.08-92.50	-6.4719	4.9297	-6.0375	4.7715
L3	92.50-45.58	-6.8948	5.2539	-6.6861	5.2830
L4	45.58-0.00	-6.2271	4.7463	-6.3698	5.0295

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

### Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L1	2	Climbing Pegs	140.08 - 170.00	1.0000	1.0000
L1	9	LDF7-50A(1-5/8)	140.08 - 168.00	1.0000	1.0000
L1	10	FB-L98B-002-75000(3/8)	140.08 - 168.00	1.0000	1.0000
L1	11	WR-VG86ST-BRD(3/4)	140.08 - 168.00	1.0000	1.0000
L1	13	WR-VG86ST-BRD(3/4)	140.08 - 168.00	1.0000	1.0000
L2	2	Climbing Pegs	92.50 - 140.08	1.0000	1.0000
L2	9	LDF7-50A(1-5/8)	92.50 - 140.08	1.0000	1.0000
L2	10	FB-L98B-002-75000(3/8)	92.50 - 140.08	1.0000	1.0000
L2	11	WR-VG86ST-BRD(3/4)	92.50 - 140.08	1.0000	1.0000
L2	13	WR-VG86ST-BRD(3/4)	92.50 - 140.08	1.0000	1.0000
L3	2	Climbing Pegs	45.58 - 92.50	1.0000	1.0000
L3	9	LDF7-50A(1-5/8)	45.58 - 92.50	1.0000	1.0000
L3	10	FB-L98B-002-75000(3/8)	45.58 - 92.50	1.0000	1.0000
L3	11	WR-VG86ST-BRD(3/4)	45.58 - 92.50	1.0000	1.0000
L3	13	WR-VG86ST-BRD(3/4)	45.58 - 92.50	1.0000	1.0000
L4	2	Climbing Pegs	8.00 - 45.58	1.0000	1.0000
L4	9	LDF7-50A(1-5/8)	8.00 - 45.58	1.0000	1.0000
L4	10	FB-L98B-002-75000(3/8)	8.00 - 45.58	1.0000	1.0000
L4	11	WR-VG86ST-BRD(3/4)	8.00 - 45.58	1.0000	1.0000
L4	13	WR-VG86ST-BRD(3/4)	8.00 - 45.58	1.0000	1.0000



### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement  ft	C <sub>AA</sub> Front  ft <sup>2</sup>	C <sub>AA</sub> Side  ft <sup>2</sup>	Weight  K	
*****									
7'x2" Antenna Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice	1.66	1.66	0.03
						1/2" Ice	2.39	2.39	0.04
						Ice	2.83	2.83	0.06
						1" Ice	3.71	3.71	0.10
						2" Ice			
7'x2" Antenna Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice	1.66	1.66	0.03
						1/2" Ice	2.39	2.39	0.04
						Ice	2.83	2.83	0.06
						1" Ice	3.71	3.71	0.10
						2" Ice			
7'x2" Antenna Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice	1.66	1.66	0.03
						1/2" Ice	2.39	2.39	0.04
						Ice	2.83	2.83	0.06
						1" Ice	3.71	3.71	0.10
						2" Ice			
Miscellaneous [NA 507-1]	A	None		0.0000	177.00	No Ice	4.56	4.56	0.25
						1/2" Ice	6.39	6.39	0.31
						Ice	8.18	8.18	0.40
						1" Ice	11.66	11.66	0.66
						2" Ice			
Miscellaneous [NA 509-3]	A	None		0.0000	177.00	No Ice	11.84	11.84	0.28
						1/2" Ice	16.96	16.96	0.30
						Ice	22.08	22.08	0.32
						1" Ice	32.32	32.32	0.36
						2" Ice			
Platform Mount [LP 601-1]	A	None		0.0000	177.00	No Ice	28.50	28.50	1.12
						1/2" Ice	31.69	31.69	1.68
						Ice	34.87	34.87	2.28
						1" Ice	41.23	41.23	3.65
						2" Ice			
***									
APX16DWW-16DWW-S-E- A20 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	6.29	2.76	0.06
						1/2" Ice	6.86	3.27	0.11
						Ice	7.45	3.79	0.16
						1" Ice	8.68	4.90	0.29
						2" Ice			
APX16DWW-16DWW-S-E- A20 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	6.29	2.76	0.06
						1/2" Ice	6.86	3.27	0.11
						Ice	7.45	3.79	0.16
						1" Ice	8.68	4.90	0.29
						2" Ice			
APX16DWW-16DWW-S-E- A20 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	6.29	2.76	0.06
						1/2" Ice	6.86	3.27	0.11
						Ice	7.45	3.79	0.16
						1" Ice	8.68	4.90	0.29
						2" Ice			
APXVAALL24_43-U- NA20_TMO w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	14.69	6.87	0.18
						1/2" Ice	15.46	7.55	0.31
						Ice	16.23	8.25	0.45
						1" Ice	17.82	9.67	0.78
						2" Ice			
APXVAALL24_43-U- NA20_TMO w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	14.69	6.87	0.18
						1/2" Ice	15.46	7.55	0.31
						Ice	16.23	8.25	0.45
						1" Ice	17.82	9.67	0.78
						2" Ice			
APXVAALL24_43-U- NA20_TMO w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	14.69	6.87	0.18
						1/2" Ice	15.46	7.55	0.31
						Ice	16.23	8.25	0.45
						1" Ice	17.82	9.67	0.78
						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
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	5.87	3.27	0.13
						1/2" Ice	6.23	3.73	0.18
						Ice	6.61	4.20	0.23
						1" Ice	7.38	5.20	0.36
						2" Ice			
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	5.87	3.27	0.13
						1/2" Ice	6.23	3.73	0.18
						Ice	6.61	4.20	0.23
						1" Ice	7.38	5.20	0.36
						2" Ice			
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	5.87	3.27	0.13
						1/2" Ice	6.23	3.73	0.18
						Ice	6.61	4.20	0.23
						1" Ice	7.38	5.20	0.36
						2" Ice			
RADIO 4415 B66A_CCIV3	A	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	1.64	0.68	0.05
						1/2" Ice	1.80	0.79	0.06
						Ice	1.97	0.91	0.07
						1" Ice	2.32	1.18	0.11
						2" Ice			
RADIO 4415 B66A_CCIV3	B	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	1.64	0.68	0.05
						1/2" Ice	1.80	0.79	0.06
						Ice	1.97	0.91	0.07
						1" Ice	2.32	1.18	0.11
						2" Ice			
RADIO 4415 B66A_CCIV3	C	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	1.64	0.68	0.05
						1/2" Ice	1.80	0.79	0.06
						Ice	1.97	0.91	0.07
						1" Ice	2.32	1.18	0.11
						2" Ice			
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	1.97	1.59	0.07
						1/2" Ice	2.15	1.75	0.09
						Ice	2.33	1.92	0.12
						1" Ice	2.72	2.28	0.17
						2" Ice			
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	1.97	1.59	0.07
						1/2" Ice	2.15	1.75	0.09
						Ice	2.33	1.92	0.12
						1" Ice	2.72	2.28	0.17
						2" Ice			
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	1.97	1.59	0.07
						1/2" Ice	2.15	1.75	0.09
						Ice	2.33	1.92	0.12
						1" Ice	2.72	2.28	0.17
						2" Ice			
RADIO 4424 B25_TMO	A	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	2.05	1.61	0.09
						1/2" Ice	2.23	1.77	0.11
						Ice	2.42	1.94	0.13
						1" Ice	2.81	2.30	0.19
						2" Ice			
RADIO 4424 B25_TMO	B	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	2.05	1.61	0.09
						1/2" Ice	2.23	1.77	0.11
						Ice	2.42	1.94	0.13
						1" Ice	2.81	2.30	0.19
						2" Ice			
RADIO 4424 B25_TMO	C	From Leg	4.00 0.00 1.00	0.0000	177.00	No Ice	2.05	1.61	0.09
						1/2" Ice	2.23	1.77	0.11
						Ice	2.42	1.94	0.13
						1" Ice	2.81	2.30	0.19
						2" Ice			
*****									
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 -1.00	0.0000	168.00	No Ice	5.75	4.25	0.06
						1/2" Ice	6.18	5.01	0.10
						Ice	6.61	5.71	0.16
						1" Ice	7.49	7.16	0.29

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
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 -1.00	0.0000	168.00	2" Ice			
						No Ice	5.75	4.25	0.06
						1/2"	6.18	5.01	0.10
						Ice	6.61	5.71	0.16
7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 -1.00	0.0000	168.00	1" Ice	7.49	7.16	0.29
						2" Ice			
						No Ice	5.75	4.25	0.06
						1/2"	6.18	5.01	0.10
7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 -1.00	0.0000	168.00	Ice	6.61	5.71	0.16
						1" Ice	7.49	7.16	0.29
						2" Ice			
						No Ice	5.75	4.25	0.06
QS66512-2 w/ Mount Pipe	A	From Leg	4.00 0.00 -1.00	0.0000	168.00	1/2"	4.42	4.57	0.21
						Ice	4.82	4.97	0.29
						1" Ice	5.63	5.79	0.48
						2" Ice			
QS66512-2 w/ Mount Pipe	B	From Leg	4.00 0.00 -1.00	0.0000	168.00	No Ice	4.04	4.18	0.14
						1/2"	4.42	4.57	0.21
						Ice	4.82	4.97	0.29
						1" Ice	5.63	5.79	0.48
QS66512-2 w/ Mount Pipe	B	From Leg	4.00 0.00 -1.00	0.0000	168.00	2" Ice			
						No Ice	4.04	4.18	0.14
						1/2"	4.42	4.57	0.21
						Ice	4.82	4.97	0.29
QS66512-2 w/ Mount Pipe	C	From Leg	4.00 0.00 -1.00	0.0000	168.00	1" Ice	5.63	5.79	0.48
						2" Ice			
						No Ice	4.04	4.18	0.14
						1/2"	4.42	4.57	0.21
(3) LGP21401	A	From Leg	4.00 0.00 1.00	0.0000	168.00	Ice	4.82	4.97	0.29
						1" Ice	5.63	5.79	0.48
						2" Ice			
						No Ice	4.04	4.18	0.14
(2) LGP21401	B	From Leg	4.00 0.00 1.00	0.0000	168.00	1/2"	4.42	4.57	0.21
						Ice	4.82	4.97	0.29
						1" Ice	5.63	5.79	0.48
						2" Ice			
LGP21401	C	From Leg	4.00 0.00 1.00	0.0000	168.00	No Ice	4.04	4.18	0.14
						1/2"	4.42	4.57	0.21
						Ice	4.82	4.97	0.29
						1" Ice	5.63	5.79	0.48
(2) 7020.00	A	From Leg	4.00 0.00 1.00	0.0000	168.00	2" Ice			
						No Ice	1.10	0.21	0.01
						1/2"	1.24	0.27	0.02
						Ice	1.38	0.35	0.03
(2) 7020.00	B	From Leg	4.00 0.00 1.00	0.0000	168.00	1" Ice	1.69	0.52	0.05
						2" Ice			
						No Ice	1.10	0.21	0.01
						1/2"	1.24	0.27	0.02
(2) 7020.00	C	From Leg	4.00 0.00 1.00	0.0000	168.00	Ice	1.38	0.35	0.03
						1" Ice	1.69	0.52	0.05
						2" Ice			
						No Ice	1.10	0.21	0.01
RRUS 32 B2	A	From Leg	4.00 0.00 1.00	0.0000	168.00	1/2"	1.24	0.27	0.02
						Ice	1.38	0.35	0.03
						1" Ice	1.69	0.52	0.05
						2" Ice			
RRUS 32 B2	B	From Leg	4.00 0.00 1.00	0.0000	168.00	No Ice	0.10	0.17	0.00
						1/2"	0.15	0.24	0.01
						Ice	0.20	0.31	0.01
						1" Ice	0.33	0.48	0.02
RRUS 32 B2	C	From Leg	4.00 0.00 1.00	0.0000	168.00	2" Ice			
						No Ice	0.10	0.17	0.00
						1/2"	0.15	0.24	0.01
						Ice	0.20	0.31	0.01
RRUS 32 B2	A	From Leg	4.00 0.00 1.00	0.0000	168.00	1" Ice	0.33	0.48	0.02
						2" Ice			
						No Ice	2.73	1.67	0.05
						1/2"	2.95	1.86	0.07
RRUS 32 B2	B	From Leg	4.00 0.00 1.00	0.0000	168.00	Ice	3.18	2.05	0.10
						1" Ice	3.66	2.46	0.16
						2" Ice			
						No Ice	2.73	1.67	0.05
RRUS 32 B2	C	From Leg	4.00 0.00 1.00	0.0000	168.00	1/2"	2.95	1.86	0.07
						Ice	3.18	2.05	0.10
						1" Ice	3.66	2.46	0.16
						2" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
RRUS 32 B2	C	From Leg	4.00 0.00 1.00	0.0000	168.00	2" Ice			
						No Ice	2.73	1.67	0.05
						1/2"	2.95	1.86	0.07
						Ice	3.18	2.05	0.10
						1" Ice	3.66	2.46	0.16
RRUS 32 B30	A	From Leg	4.00 0.00 1.00	0.0000	168.00	2" Ice			
						No Ice	2.69	1.57	0.06
						1/2"	2.91	1.76	0.08
						Ice	3.14	1.95	0.10
						1" Ice	3.61	2.35	0.16
RRUS 32 B30	B	From Leg	4.00 0.00 1.00	0.0000	168.00	2" Ice			
						No Ice	2.69	1.57	0.06
						1/2"	2.91	1.76	0.08
						Ice	3.14	1.95	0.10
						1" Ice	3.61	2.35	0.16
RRUS 32 B30	C	From Leg	4.00 0.00 1.00	0.0000	168.00	2" Ice			
						No Ice	2.69	1.57	0.06
						1/2"	2.91	1.76	0.08
						Ice	3.14	1.95	0.10
						1" Ice	3.61	2.35	0.16
DBC0061F1V51-2	A	From Leg	4.00 0.00 1.00	0.0000	168.00	2" Ice			
						No Ice	0.43	0.41	0.03
						1/2"	0.51	0.50	0.03
						Ice	0.61	0.59	0.04
						1" Ice	0.81	0.79	0.06
DBC0061F1V51-2	B	From Leg	4.00 0.00 1.00	0.0000	168.00	2" Ice			
						No Ice	0.43	0.41	0.03
						1/2"	0.51	0.50	0.03
						Ice	0.61	0.59	0.04
						1" Ice	0.81	0.79	0.06
DBC0061F1V51-2	C	From Leg	4.00 0.00 1.00	0.0000	168.00	2" Ice			
						No Ice	0.43	0.41	0.03
						1/2"	0.51	0.50	0.03
						Ice	0.61	0.59	0.04
						1" Ice	0.81	0.79	0.06
DC6-48-60-18-8F	A	From Leg	4.00 0.00 1.00	0.0000	168.00	2" Ice			
						No Ice	0.92	0.92	0.02
						1/2"	1.46	1.46	0.04
						Ice	1.64	1.64	0.06
						1" Ice	2.04	2.04	0.11
DC6-48-60-18-8F	A	From Leg	4.00 0.00 3.00	0.0000	168.00	2" Ice			
						No Ice	0.92	0.92	0.02
						1/2"	1.46	1.46	0.04
						Ice	1.64	1.64	0.06
						1" Ice	2.04	2.04	0.11
***									
OPA65R-BU6BA-K w/ Mount Pipe	A	From Leg	4.00 0.00 -1.00	0.0000	168.00	2" Ice			
						No Ice	6.76	6.06	0.10
						1/2"	7.40	6.69	0.16
						Ice	8.06	7.33	0.24
						1" Ice	9.42	8.67	0.42
OPA65R-BU6BA-K w/ Mount Pipe	B	From Leg	4.00 0.00 -1.00	0.0000	168.00	2" Ice			
						No Ice	6.76	6.06	0.10
						1/2"	7.40	6.69	0.16
						Ice	8.06	7.33	0.24
						1" Ice	9.42	8.67	0.42
OPA65R-BU6BA-K w/ Mount Pipe	C	From Leg	4.00 0.00 -1.00	0.0000	168.00	2" Ice			
						No Ice	6.76	6.06	0.10
						1/2"	7.40	6.69	0.16
						Ice	8.06	7.33	0.24
						1" Ice	9.42	8.67	0.42
DMP65R-BU6D w/ Mount Pipe	A	From Leg	4.00 0.00 -1.00	0.0000	168.00	2" Ice			
						No Ice	11.96	5.97	0.11
						1/2"	12.70	6.63	0.20
						Ice	13.46	7.30	0.30

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	
DMP65R-BU6D w/ Mount Pipe	B	From Leg	4.00 0.00 -1.00	0.0000	168.00	1" Ice	15.02	8.69	0.53
						2" Ice			
						No Ice	11.96	5.97	0.11
						1/2" Ice	12.70	6.63	0.20
						Ice	13.46	7.30	0.30
DMP65R-BU6D w/ Mount Pipe	C	From Leg	4.00 0.00 -1.00	0.0000	168.00	1" Ice	15.02	8.69	0.53
						2" Ice			
						No Ice	11.96	5.97	0.11
						1/2" Ice	12.70	6.63	0.20
						Ice	13.46	7.30	0.30
RRUS 4478 B14	A	From Leg	4.00 0.00 -1.00	0.0000	168.00	1" Ice	15.02	8.69	0.53
						2" Ice			
						No Ice	1.84	1.06	0.06
						1/2" Ice	2.01	1.20	0.08
						Ice	2.19	1.34	0.09
RRUS 4478 B14	B	From Leg	4.00 0.00 -1.00	0.0000	168.00	1" Ice	2.57	1.66	0.14
						2" Ice			
						No Ice	1.84	1.06	0.06
						1/2" Ice	2.01	1.20	0.08
						Ice	2.19	1.34	0.09
RRUS 4478 B14	C	From Leg	4.00 0.00 -1.00	0.0000	168.00	1" Ice	2.57	1.66	0.14
						2" Ice			
						No Ice	1.84	1.06	0.06
						1/2" Ice	2.01	1.20	0.08
						Ice	2.19	1.34	0.09
RRUS 32 B66A	A	From Leg	4.00 0.00 -1.00	0.0000	168.00	1" Ice	2.57	1.66	0.14
						2" Ice			
						No Ice	2.86	1.78	0.06
						1/2" Ice	3.09	1.97	0.08
						Ice	3.32	2.17	0.10
RRUS 32 B66A	B	From Leg	4.00 0.00 -1.00	0.0000	168.00	1" Ice	3.81	2.59	0.16
						2" Ice			
						No Ice	2.86	1.78	0.06
						1/2" Ice	3.09	1.97	0.08
						Ice	3.32	2.17	0.10
RRUS 32 B66A	C	From Leg	4.00 0.00 -1.00	0.0000	168.00	1" Ice	3.81	2.59	0.16
						2" Ice			
						No Ice	2.86	1.78	0.06
						1/2" Ice	3.09	1.97	0.08
						Ice	3.32	2.17	0.10
RRUS 4449 B5/B12	A	From Leg	4.00 0.00 -1.00	0.0000	168.00	1" Ice	3.81	2.59	0.16
						2" Ice			
						No Ice	1.97	1.41	0.07
						1/2" Ice	2.14	1.56	0.09
						Ice	2.33	1.73	0.11
RRUS 4449 B5/B12	B	From Leg	4.00 0.00 -1.00	0.0000	168.00	1" Ice	2.72	2.07	0.16
						2" Ice			
						No Ice	1.97	1.41	0.07
						1/2" Ice	2.14	1.56	0.09
						Ice	2.33	1.73	0.11
RRUS 4449 B5/B12	C	From Leg	4.00 0.00 -1.00	0.0000	168.00	1" Ice	2.72	2.07	0.16
						2" Ice			
						No Ice	1.97	1.41	0.07
						1/2" Ice	2.14	1.56	0.09
						Ice	2.33	1.73	0.11
DC6-48-60-0-8F	A	From Leg	4.00 0.00 -1.00	0.0000	168.00	1" Ice	2.72	2.07	0.16
						2" Ice			
						No Ice	0.92	0.92	0.02
						1/2" Ice	1.46	1.46	0.04
						Ice	1.64	1.64	0.06
Platform Mount [LP 303-1_HR-1]	A	None		0.0000	168.00	1" Ice	2.04	2.04	0.11
						2" Ice			
						No Ice	17.09	17.09	1.50
						Ice	25.72	25.72	2.35

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K
						1" Ice	33.96	33.96	3.52
						2" Ice			
*****									
(2) HBXX-6517DS-A2M w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.97 8.73 9.50 11.11	5.99 6.72 7.47 9.02	0.08 0.14 0.22 0.40
(2) HBXX-6517DS-A2M w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.97 8.73 9.50 11.11	5.99 6.72 7.47 9.02	0.08 0.14 0.22 0.40
(2) HBXX-6517DS-A2M w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.97 8.73 9.50 11.11	5.99 6.72 7.47 9.02	0.08 0.14 0.22 0.40
(2) LNX-6515DS-A1M w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.31 5.80 6.30 7.33	4.27 4.75 5.24 6.24	0.08 0.17 0.26 0.49
(2) LNX-6515DS-A1M w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.31 5.80 6.30 7.33	4.27 4.75 5.24 6.24	0.08 0.17 0.26 0.49
(2) LNX-6515DS-A1M w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.31 5.80 6.30 7.33	4.27 4.75 5.24 6.24	0.08 0.17 0.26 0.49
B66A RRH4X45	A	From Leg	4.00 0.00 3.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.58 2.79 3.01 3.48	1.63 1.81 2.00 2.40	0.06 0.08 0.10 0.16
B66A RRH4X45	B	From Leg	4.00 0.00 3.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.58 2.79 3.01 3.48	1.63 1.81 2.00 2.40	0.06 0.08 0.10 0.16
B66A RRH4X45	C	From Leg	4.00 0.00 3.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.58 2.79 3.01 3.48	1.63 1.81 2.00 2.40	0.06 0.08 0.10 0.16
DB-T1-6Z-8AB-0Z	B	From Leg	4.00 0.00 3.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.80 5.07 5.35 5.93	2.00 2.19 2.39 2.81	0.04 0.08 0.12 0.21
DB-T1-6Z-8AB-0Z	C	From Leg	4.00 0.00 3.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.80 5.07 5.35 5.93	2.00 2.19 2.39 2.81	0.04 0.08 0.12 0.21
RRH2X60-AWS	A	From Leg	4.00 0.00 3.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.50 3.76 4.03 4.58	2.10 2.34 2.58 3.09	0.06 0.08 0.11 0.18
RRH2X60-AWS	B	From Leg	4.00 0.00	0.0000	154.00	No Ice 1/2"	3.50 3.76	2.10 2.34	0.06 0.08

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
			3.00			Ice 4.03	2.58	0.11
						1" Ice 4.58	3.09	0.18
						2" Ice		
RRH2X60-AWS	C	From Leg	4.00	0.0000	154.00	No Ice 3.50	2.10	0.06
			0.00			1/2" 3.76	2.34	0.08
			3.00			Ice 4.03	2.58	0.11
						1" Ice 4.58	3.09	0.18
						2" Ice		
Platform Mount [LP 304-1]	C	None		0.0000	154.00	No Ice 17.49	17.49	1.35
						1/2" 21.37	21.37	1.71
						Ice 25.28	25.28	2.13
						1" Ice 33.17	33.17	3.16
						2" Ice		
*****								
DB225-K	A	From Leg	4.00	0.0000	119.00	No Ice 0.45	0.45	0.00
			0.00			1/2" 0.81	0.81	0.00
			5.00			Ice 1.17	1.17	0.00
						1" Ice 1.89	1.89	0.01
						2" Ice		
(2) DB264-A	A	From Leg	4.00	0.0000	119.00	No Ice 3.16	3.16	0.04
			0.00			1/2" 5.69	5.69	0.05
			12.00			Ice 8.22	8.22	0.06
						1" Ice 13.27	13.27	0.08
						2" Ice		
DB264-A	B	From Leg	4.00	0.0000	119.00	No Ice 3.16	3.16	0.04
			0.00			1/2" 5.69	5.69	0.05
			12.00			Ice 8.22	8.22	0.06
						1" Ice 13.27	13.27	0.08
						2" Ice		
(2) DB264-A	C	From Leg	4.00	0.0000	119.00	No Ice 3.16	3.16	0.04
			0.00			1/2" 5.69	5.69	0.05
			12.00			Ice 8.22	8.22	0.06
						1" Ice 13.27	13.27	0.08
						2" Ice		
DB230-E	A	From Leg	4.00	0.0000	119.00	No Ice 0.50	0.50	0.03
			0.00			1/2" 0.90	0.90	0.04
			1.00			Ice 1.30	1.30	0.04
						1" Ice 2.10	2.10	0.06
						2" Ice		
DB230-E	A	From Leg	4.00	0.0000	119.00	No Ice 0.50	0.50	0.03
			0.00			1/2" 0.90	0.90	0.04
			3.00			Ice 1.30	1.30	0.04
						1" Ice 2.10	2.10	0.06
						2" Ice		
DB420	B	From Leg	4.00	0.0000	119.00	No Ice 3.33	3.33	0.03
			0.00			1/2" 5.99	5.99	0.04
			9.00			Ice 8.66	8.66	0.05
						1" Ice 13.99	13.99	0.07
						2" Ice		
(3) 5' x 2" Pipe Mount	A	From Leg	4.00	0.0000	119.00	No Ice 1.19	1.19	0.02
			0.00			1/2" 1.50	1.50	0.03
			0.00			Ice 1.81	1.81	0.04
						1" Ice 2.46	2.46	0.08
						2" Ice		
(4) 5' x 2" Pipe Mount	B	From Leg	4.00	0.0000	119.00	No Ice 1.19	1.19	0.02
			0.00			1/2" 1.50	1.50	0.03
			0.00			Ice 1.81	1.81	0.04
						1" Ice 2.46	2.46	0.08
						2" Ice		
(3) 5' x 2" Pipe Mount	C	From Leg	4.00	0.0000	119.00	No Ice 1.19	1.19	0.02
			0.00			1/2" 1.50	1.50	0.03
			0.00			Ice 1.81	1.81	0.04
						1" Ice 2.46	2.46	0.08
						2" Ice		
Platform Mount [LP 304-1]	C	None		0.0000	119.00	No Ice 17.49	17.49	1.35

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>A</sub> A <sub>Front</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>Side</sub> ft <sup>2</sup>	Weight K	
						1/2" Ice	21.37	21.37	1.71
						1" Ice	25.28	25.28	2.13
						2" Ice	33.17	33.17	3.16
*****									
KS24019-L112A	A	From Leg	4.00 0.00 1.00	0.0000	77.00	No Ice	0.16	0.16	0.01
						1/2" Ice	0.22	0.22	0.01
						1" Ice	0.30	0.30	0.01
						2" Ice	0.48	0.48	0.02
Side Arm Mount [SO 701-1]	A	From Leg	1.50 0.00 0.00	0.0000	77.00	No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12

## 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



Comb. No.	Description
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

### Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	180 - 140.083	Pole	Max Tension	3	0.00	0.00	-0.00
			Max. Compression	26	-34.98	-0.01	-1.51
			Max. Mx	20	-13.77	423.39	0.05
			Max. My	14	-13.77	-0.38	-423.62
			Max. Vy	20	-19.34	423.39	0.05
			Max. Vx	14	19.28	-0.38	-423.62
			Max. Torque	9			0.68
L2	140.083 - 92.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.86	0.11	-5.98
			Max. Mx	20	-25.38	1488.64	-0.04
			Max. My	14	-25.39	-1.10	-1487.02
			Max. Vy	20	-26.26	1488.64	-0.04
			Max. Vx	12	27.17	-818.73	-1415.66
			Max. Torque	24			2.18
L3	92.5 - 45.583	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.13	0.58	-11.21
			Max. Mx	20	-40.15	2803.76	-0.42
			Max. My	14	-40.16	-1.69	-2799.65
			Max. Vy	20	-30.73	2803.76	-0.42
			Max. Vx	12	32.25	-1617.32	-2796.58
			Max. Torque	24			2.59
L4	45.583 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-101.96	1.04	-16.80
			Max. Mx	20	-62.22	4525.81	-1.14
			Max. My	12	-62.21	-2655.33	-4591.48
			Max. Vy	20	-34.63	4525.81	-1.14
			Max. Vx	12	35.74	-2655.33	-4591.48
			Max. Torque	24			2.45

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	101.96	-0.00	-8.31
	Max. H <sub>x</sub>	21	46.68	34.58	0.02
	Max. H <sub>z</sub>	24	62.24	20.66	35.70
	Max. M <sub>x</sub>	24	4583.85	20.66	35.70
	Max. M <sub>z</sub>	8	4525.05	-34.58	-0.02
	Max. Torsion	24	2.44	20.66	35.70
	Min. Vert	5	46.68	-17.28	29.87
	Min. H <sub>x</sub>	9	46.68	-34.58	-0.02
	Min. H <sub>z</sub>	12	62.24	-20.66	-35.70
	Min. M <sub>x</sub>	12	-4591.48	-20.66	-35.70
	Min. M <sub>z</sub>	20	-4525.81	34.58	0.02
	Min. Torsion	12	-2.43	-20.66	-35.70

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	51.87	0.00	0.00	3.04	0.30	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	62.24	-0.02	-34.50	-4510.76	3.10	0.26
0.9 Dead+1.0 Wind 0 deg - No Ice	46.68	-0.02	-34.50	-4447.04	2.96	0.26
1.2 Dead+1.0 Wind 30 deg - No Ice	62.24	17.28	-29.87	-3904.57	-2260.01	-0.14
0.9 Dead+1.0 Wind 30 deg - No Ice	46.68	17.28	-29.87	-3849.55	-2227.72	-0.14
1.2 Dead+1.0 Wind 60 deg - No Ice	62.24	29.94	-17.24	-2251.09	-3917.43	-0.51
0.9 Dead+1.0 Wind 60 deg - No Ice	46.68	29.94	-17.24	-2219.78	-3861.39	-0.51
1.2 Dead+1.0 Wind 90 deg - No Ice	62.24	34.58	0.02	6.57	-4525.05	-0.74
0.9 Dead+1.0 Wind 90 deg - No Ice	46.68	34.58	0.02	5.53	-4460.29	-0.75
1.2 Dead+1.0 Wind 120 deg - No Ice	62.24	31.92	18.39	2398.00	-4153.10	-0.78
0.9 Dead+1.0 Wind 120 deg - No Ice	46.68	31.92	18.39	2362.97	-4094.17	-0.78
1.2 Dead+1.0 Wind 150 deg - No Ice	62.24	20.66	35.70	4591.48	-2655.33	2.43
0.9 Dead+1.0 Wind 150 deg - No Ice	46.68	20.66	35.70	4526.42	-2618.34	2.43
1.2 Dead+1.0 Wind 180 deg - No Ice	62.24	0.02	34.50	4518.43	-2.33	-0.26
0.9 Dead+1.0 Wind 180 deg - No Ice	46.68	0.02	34.50	4452.71	-2.39	-0.26
1.2 Dead+1.0 Wind 210 deg - No Ice	62.24	-17.28	29.87	3912.24	2260.76	0.15
0.9 Dead+1.0 Wind 210 deg - No Ice	46.68	-17.28	29.87	3855.23	2228.28	0.15
1.2 Dead+1.0 Wind 240 deg - No Ice	62.24	-29.94	17.24	2258.79	3918.17	0.52
0.9 Dead+1.0 Wind 240 deg - No Ice	46.68	-29.94	17.24	2225.47	3861.94	0.52
1.2 Dead+1.0 Wind 270 deg - No Ice	62.24	-34.58	-0.02	1.14	4525.81	0.74
0.9 Dead+1.0 Wind 270 deg - No Ice	46.68	-34.58	-0.02	0.18	4460.86	0.75
1.2 Dead+1.0 Wind 300 deg - No Ice	62.24	-31.92	-18.39	-2390.30	4153.88	0.77
0.9 Dead+1.0 Wind 300 deg - No Ice	46.68	-31.92	-18.39	-2357.27	4094.75	0.77
1.2 Dead+1.0 Wind 330 deg - No Ice	62.24	-20.66	-35.70	-4583.85	2656.05	-2.44
0.9 Dead+1.0 Wind 330 deg - No Ice	46.68	-20.66	-35.70	-4520.77	2618.87	-2.44
1.2 Dead+1.0 Ice+1.0 Temp	101.96	-0.00	0.00	16.80	1.04	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	101.96	-0.00	-8.31	-1113.50	1.59	0.08
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	101.96	4.16	-7.20	-961.78	-564.77	-0.09
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	101.96	7.21	-4.15	-547.80	-979.51	-0.24
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	101.96	8.33	0.00	17.51	-1131.50	-0.32
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	101.96	7.22	4.16	582.70	-980.07	-0.32
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	101.96	4.45	7.69	1058.15	-601.42	0.39
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	101.96	0.00	8.31	1147.44	0.53	-0.08
1.2 Dead+1.0 Wind 210	101.96	-4.16	7.20	995.77	566.90	0.09

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
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 240	101.96	-7.21	4.15	581.78	981.66	0.24
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 270	101.96	-8.33	-0.00	16.45	1133.61	0.32
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	101.96	-7.22	-4.16	-548.72	982.15	0.32
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	101.96	-4.45	-7.69	-1024.21	603.53	-0.39
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	51.87	-0.00	-6.92	-895.51	0.86	0.05
Dead+Wind 30 deg - Service	51.87	3.47	-5.99	-774.84	-449.65	-0.03
Dead+Wind 60 deg - Service	51.87	6.01	-3.46	-445.70	-779.58	-0.10
Dead+Wind 90 deg - Service	51.87	6.94	0.00	3.72	-900.54	-0.15
Dead+Wind 120 deg - Service	51.87	6.40	3.69	479.89	-826.69	-0.16
Dead+Wind 150 deg - Service	51.87	4.15	7.16	917.03	-528.69	0.50
Dead+Wind 180 deg - Service	51.87	0.00	6.92	901.88	-0.23	-0.05
Dead+Wind 210 deg - Service	51.87	-3.47	5.99	781.20	450.28	0.03
Dead+Wind 240 deg - Service	51.87	-6.01	3.46	452.06	780.21	0.10
Dead+Wind 270 deg - Service	51.87	-6.94	-0.00	2.64	901.17	0.15
Dead+Wind 300 deg - Service	51.87	-6.40	-3.69	-473.52	827.33	0.16
Dead+Wind 330 deg - Service	51.87	-4.15	-7.16	-910.67	529.32	-0.50

## 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	-51.87	0.00	0.00	51.87	0.00	0.000%
2	-0.02	-62.24	-34.50	0.02	62.24	34.50	0.000%
3	-0.02	-46.68	-34.50	0.02	46.68	34.50	0.000%
4	17.28	-62.24	-29.87	-17.28	62.24	29.87	0.000%
5	17.28	-46.68	-29.87	-17.28	46.68	29.87	0.000%
6	29.94	-62.24	-17.24	-29.94	62.24	17.24	0.000%
7	29.94	-46.68	-17.24	-29.94	46.68	17.24	0.000%
8	34.58	-62.24	0.02	-34.58	62.24	-0.02	0.000%
9	34.58	-46.68	0.02	-34.58	46.68	-0.02	0.000%
10	31.92	-62.24	18.39	-31.92	62.24	-18.39	0.000%
11	31.92	-46.68	18.39	-31.92	46.68	-18.39	0.000%
12	20.66	-62.24	35.70	-20.66	62.24	-35.70	0.000%
13	20.66	-46.68	35.70	-20.66	46.68	-35.70	0.000%
14	0.02	-62.24	34.50	-0.02	62.24	-34.50	0.000%
15	0.02	-46.68	34.50	-0.02	46.68	-34.50	0.000%
16	-17.28	-62.24	29.87	17.28	62.24	-29.87	0.000%
17	-17.28	-46.68	29.87	17.28	46.68	-29.87	0.000%
18	-29.94	-62.24	17.24	29.94	62.24	-17.24	0.000%
19	-29.94	-46.68	17.24	29.94	46.68	-17.24	0.000%
20	-34.58	-62.24	-0.02	34.58	62.24	0.02	0.000%
21	-34.58	-46.68	-0.02	34.58	46.68	0.02	0.000%
22	-31.92	-62.24	-18.39	31.92	62.24	18.39	0.000%
23	-31.92	-46.68	-18.39	31.92	46.68	18.39	0.000%
24	-20.66	-62.24	-35.70	20.66	62.24	35.70	0.000%
25	-20.66	-46.68	-35.70	20.66	46.68	35.70	0.000%
26	0.00	-101.96	0.00	0.00	101.96	-0.00	0.000%
27	-0.00	-101.96	-8.31	0.00	101.96	8.31	0.000%
28	4.16	-101.96	-7.20	-4.16	101.96	7.20	0.000%
29	7.21	-101.96	-4.15	-7.21	101.96	4.15	0.000%
30	8.33	-101.96	0.00	-8.33	101.96	-0.00	0.000%
31	7.22	-101.96	4.16	-7.22	101.96	-4.16	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
32	4.45	-101.96	7.69	-4.45	101.96	-7.69	0.000%
33	0.00	-101.96	8.31	-0.00	101.96	-8.31	0.000%
34	-4.16	-101.96	7.20	4.16	101.96	-7.20	0.000%
35	-7.21	-101.96	4.15	7.21	101.96	-4.15	0.000%
36	-8.33	-101.96	-0.00	8.33	101.96	0.00	0.000%
37	-7.22	-101.96	-4.16	7.22	101.96	4.16	0.000%
38	-4.45	-101.96	-7.69	4.45	101.96	7.69	0.000%
39	-0.00	-51.87	-6.92	0.00	51.87	6.92	0.000%
40	3.47	-51.87	-5.99	-3.47	51.87	5.99	0.000%
41	6.01	-51.87	-3.46	-6.01	51.87	3.46	0.000%
42	6.94	-51.87	0.00	-6.94	51.87	-0.00	0.000%
43	6.40	-51.87	3.69	-6.40	51.87	-3.69	0.000%
44	4.15	-51.87	7.16	-4.15	51.87	-7.16	0.000%
45	0.00	-51.87	6.92	-0.00	51.87	-6.92	0.000%
46	-3.47	-51.87	5.99	3.47	51.87	-5.99	0.000%
47	-6.01	-51.87	3.46	6.01	51.87	-3.46	0.000%
48	-6.94	-51.87	-0.00	6.94	51.87	0.00	0.000%
49	-6.40	-51.87	-3.69	6.40	51.87	3.69	0.000%
50	-4.15	-51.87	-7.16	4.15	51.87	7.16	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	0.00001963
3	Yes	4	0.00000001	0.00043976
4	Yes	6	0.00000001	0.00020910
5	Yes	6	0.00000001	0.00006707
6	Yes	6	0.00000001	0.00021039
7	Yes	6	0.00000001	0.00006755
8	Yes	5	0.00000001	0.00003241
9	Yes	4	0.00000001	0.00052568
10	Yes	6	0.00000001	0.00022609
11	Yes	6	0.00000001	0.00007080
12	Yes	6	0.00000001	0.00025177
13	Yes	6	0.00000001	0.00007585
14	Yes	5	0.00000001	0.00002563
15	Yes	4	0.00000001	0.00046975
16	Yes	6	0.00000001	0.00021029
17	Yes	6	0.00000001	0.00006743
18	Yes	6	0.00000001	0.00020899
19	Yes	6	0.00000001	0.00006691
20	Yes	5	0.00000001	0.00004185
21	Yes	4	0.00000001	0.00059127
22	Yes	6	0.00000001	0.00022859
23	Yes	6	0.00000001	0.00007182
24	Yes	6	0.00000001	0.00025937
25	Yes	6	0.00000001	0.00007866
26	Yes	4	0.00000001	0.00007779
27	Yes	5	0.00000001	0.00069993
28	Yes	5	0.00000001	0.00097071
29	Yes	5	0.00000001	0.00097347
30	Yes	5	0.00000001	0.00071193
31	Yes	6	0.00000001	0.00015018
32	Yes	6	0.00000001	0.00016125
33	Yes	5	0.00000001	0.00072189
34	Yes	6	0.00000001	0.00015046
35	Yes	6	0.00000001	0.00015024
36	Yes	5	0.00000001	0.00071280
37	Yes	5	0.00000001	0.00097780
38	Yes	6	0.00000001	0.00015760
39	Yes	4	0.00000001	0.00006815
40	Yes	4	0.00000001	0.00051754
41	Yes	4	0.00000001	0.00052890
42	Yes	4	0.00000001	0.00007194

43	Yes	4	0.00000001	0.00059131
44	Yes	4	0.00000001	0.00071193
45	Yes	4	0.00000001	0.00006899
46	Yes	4	0.00000001	0.00053027
47	Yes	4	0.00000001	0.00052006
48	Yes	4	0.00000001	0.00007246
49	Yes	4	0.00000001	0.00060994
50	Yes	4	0.00000001	0.00077903

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 140.083	30.657	44	1.4727	0.0011
L2	145 - 92.5	20.195	44	1.3197	0.0014
L3	98.5 - 45.583	9.193	44	0.8904	0.0009
L4	52.5 - 0	2.595	44	0.4516	0.0003

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.00	7'x2" Antenna Mount Pipe	44	29.730	1.4629	0.0012	48726
168.00	7770.00 w/ Mount Pipe	44	26.963	1.4319	0.0013	20302
154.00	(2) HBXX-6517DS-A2M w/ Mount Pipe	44	22.768	1.3718	0.0014	9369
119.00	DB225-K	44	13.547	1.0993	0.0012	6406
77.00	KS24019-L112A	44	5.532	0.6783	0.0006	5502

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 140.083	153.450	12	7.3948	0.0055
L2	145 - 92.5	101.152	12	6.6249	0.0068
L3	98.5 - 45.583	46.082	12	4.4689	0.0046
L4	52.5 - 0	13.011	12	2.2653	0.0017

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.00	7'x2" Antenna Mount Pipe	12	148.819	7.3452	0.0060	10045
168.00	7770.00 w/ Mount Pipe	12	134.990	7.1891	0.0064	4183
154.00	(2) HBXX-6517DS-A2M w/ Mount Pipe	12	114.018	6.8870	0.0068	1927
119.00	DB225-K	12	67.886	5.5179	0.0060	1303
77.00	KS24019-L112A	12	27.737	3.4035	0.0031	1105

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	$L_u$ ft	$Kl/r$	A $in^2$	$P_u$ K	$\phi P_n$ K	Ratio $\frac{P_u}{\phi P_n}$
L1	180 - 140.083 (1)	TP31.67x24.16x0.2188	39.92	0.00	0.0	21,301 5	-13.44	1246.14	0.011
L2	140.083 - 92.5 (2)	TP40.17x30.3074x0.3438	52.50	0.00	0.0	42,436 0	-24.72	2482.50	0.010
L3	92.5 - 45.583 (3)	TP48.31x38.3553x0.4388	52.92	0.00	0.0	65,180 0	-39.72	3813.03	0.010
L4	45.583 - 0 (4)	TP56x46.1313x0.5	52.50	0.00	0.0	88,522 5	-62.21	5178.57	0.012

### Pole Bending Design Data

Section No.	Elevation ft	Size	$M_{ux}$ kip-ft	$\phi M_{nx}$ kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	$M_{uy}$ kip-ft	$\phi M_{ny}$ kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	180 - 140.083 (1)	TP31.67x24.16x0.2188	439.64	864.22	0.509	0.00	864.22	0.000
L2	140.083 - 92.5 (2)	TP40.17x30.3074x0.3438	1635.37	2362.53	0.692	0.00	2362.53	0.000
L3	92.5 - 45.583 (3)	TP48.31x38.3553x0.4388	3230.57	4445.43	0.727	0.00	4445.43	0.000
L4	45.583 - 0 (4)	TP56x46.1313x0.5	5304.01	7099.14	0.747	0.00	7099.14	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	180 - 140.083 (1)	TP31.67x24.16x0.2188	20.20	373.84	0.054	0.16	1000.68	0.000
L2	140.083 - 92.5 (2)	TP40.17x30.3074x0.3438	31.40	744.75	0.042	2.16	2527.25	0.001
L3	92.5 - 45.583 (3)	TP48.31x38.3553x0.4388	37.27	1143.91	0.033	2.44	4671.27	0.001
L4	45.583 - 0 (4)	TP56x46.1313x0.5	41.30	1553.57	0.027	2.43	7560.67	0.000

### Pole Interaction Design Data

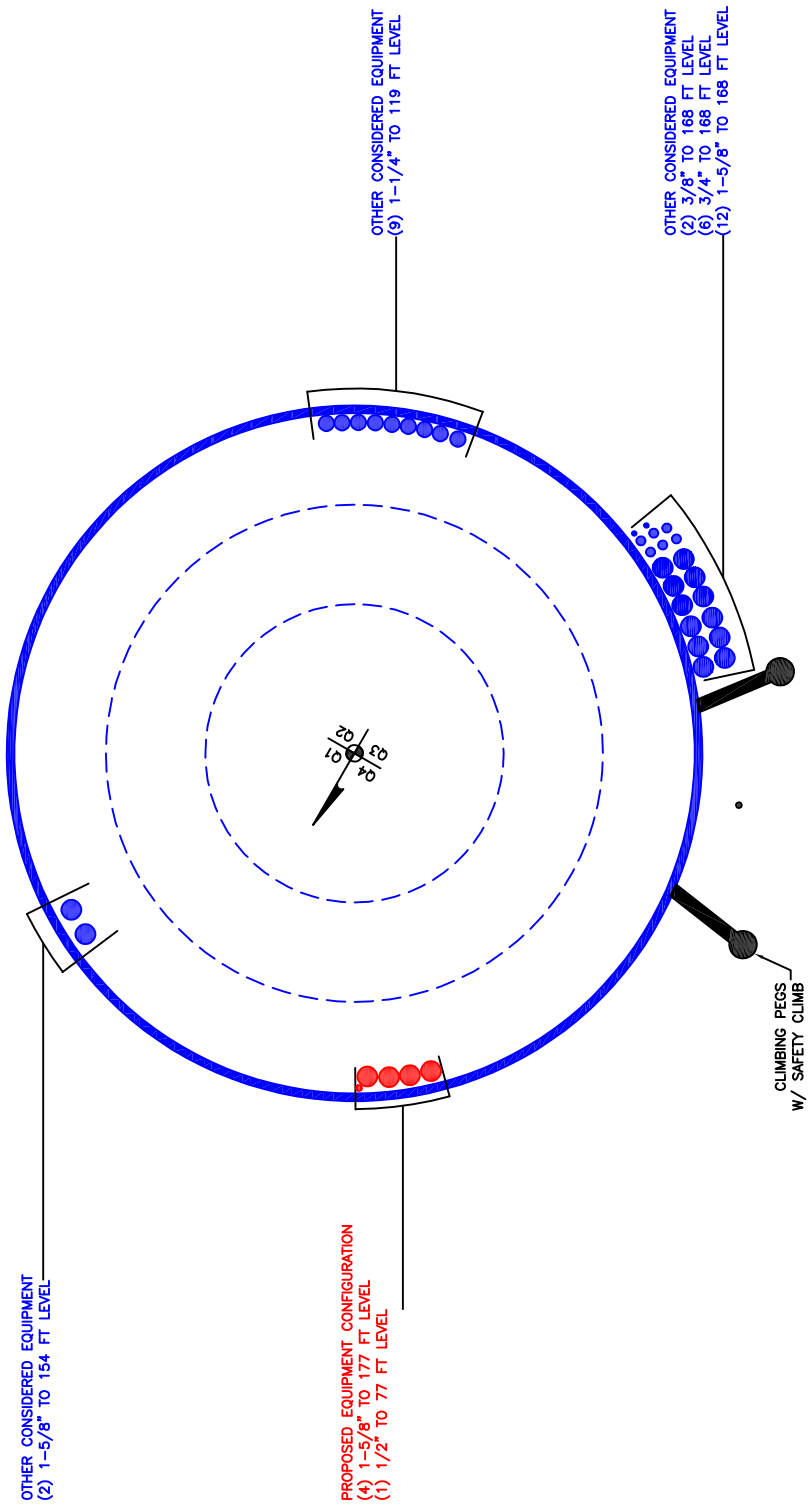
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	180 - 140.083 (1)	0.011	0.509	0.000	0.054	0.000	0.522	1.050	4.8.2
L2	140.083 - 92.5 (2)	0.010	0.692	0.000	0.042	0.001	0.704	1.050	4.8.2
L3	92.5 - 45.583 (3)	0.010	0.727	0.000	0.033	0.001	0.738	1.050	4.8.2
L4	45.583 - 0 (4)	0.012	0.747	0.000	0.027	0.000	0.760	1.050	4.8.2

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail	
L1	180 - 140.083	Pole	TP31.67x24.16x0.2188	1	-13.44	1308.45	49.8	Pass	
L2	140.083 - 92.5	Pole	TP40.17x30.3074x0.3438	2	-24.72	2606.62	67.0	Pass	
L3	92.5 - 45.583	Pole	TP48.31x38.3553x0.4388	3	-39.72	4003.68	70.3	Pass	
L4	45.583 - 0	Pole	TP56x46.1313x0.5	4	-62.21	5437.50	72.4	Pass	
							Summary		
							Pole (L4)	72.4	Pass
							<b>RATING =</b>	<b>72.4</b>	<b>Pass</b>

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





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

# Monopole Base Plate Connection

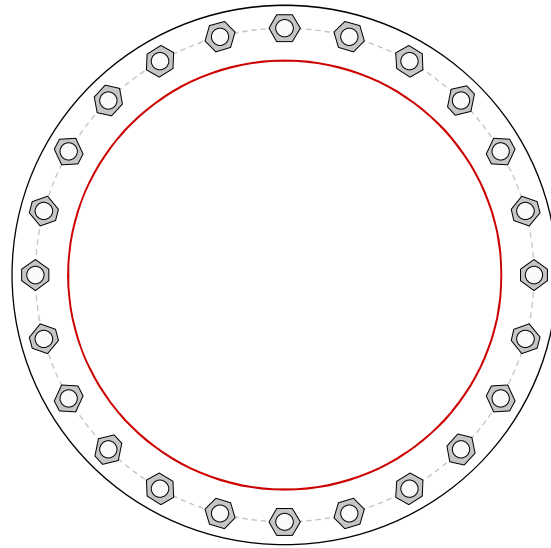


Site Info	
BU #	876368
Site Name	Pe Lake/East Hampton/
Order #	538768 Rev. 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
$l_{ar}$ (in)	2

Applied Loads	
Moment (kip-ft)	5304.01
Axial Force (kips)	62.21
Shear Force (kips)	41.30

\*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
(24) 2-1/4" $\varnothing$ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 64.48" BC
Base Plate Data
70.48" OD x 3" Plate (A633 Gr. E; $F_y=60$ ksi, $F_u=70$ ksi)
Stiffener Data
N/A
Pole Data
56" x 0.5" 16-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary	<i>(units of kips, kip-in)</i>	
$Pu_c = 167.03$	$\phi Pn_c = 268.39$	<b>Stress Rating</b>
$Vu = 1.72$	$\phi Vn = 120.77$	<b>59.3%</b>
$Mu = n/a$	$\phi Mn = n/a$	<b>Pass</b>
Base Plate Summary		
Max Stress (ksi):	25.93	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	<b>45.7%</b>	<b>Pass</b>

# Pier and Pad Foundation



**BU #:** 876368  
**Site Name:** Yankee Lake/East  
**App. Number:** 538768 Rev. 1

**TIA-222 Revision:** H  
**Tower Type:** Monopole

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

Superstructure Analysis Reactions		
Compression, $P_{comp}$ :	62.24	kips
Base Shear, $Vu_{comp}$ :	41.25	kips
Moment, $M_u$ :	5304	ft-kips
Tower Height, $H$ :	180	ft
BP Dist. Above Fdn, $bp_{dist}$ :	4.25	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	380.09	41.25	10.3%	Pass
<i>Bearing Pressure (ksf)</i>	6.00	2.49	41.6%	Pass
<i>Overturing (kip*ft)</i>	8313.89	5627.98	67.7%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	9991.29	5489.63	52.3%	Pass
<i>Pier Compression (kip)</i>	23994.73	102.96	0.4%	Pass
<i>Pad Flexure (kip*ft)</i>	4863.98	2002.87	39.2%	Pass
<i>Pad Shear - 1-way (kips)</i>	848.83	290.36	32.6%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.164	0.045	26.3%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	4581.16	3293.78	68.5%	Pass

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, $dpier$ :	8	ft
Ext. Above Grade, $E$ :	0.5	ft
Pier Rebar Size, $Sc$ :	11	
Pier Rebar Quantity, $mc$ :	36	
Pier Tie/Spiral Size, $St$ :	4	
Pier Tie/Spiral Quantity, $mt$ :	8	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, $cc_{pier}$ :	3	in

\*Rating per TIA-222-H Section 15.5

Soil Rating*:	67.7%
Structural Rating*:	68.5%

Pad Properties		
Depth, $D$ :	7	ft
Pad Width, $W_1$ :	27.5	ft
Pad Thickness, $T$ :	3	ft
Pad Rebar Size (Top dir. 2), $Sp_{top2}$ :	8	
Pad Rebar Quantity (Top dir. 2), $mp_{top2}$ :	24	
Pad Rebar Size (Bottom dir. 2), $Sp_2$ :	9	
Pad Rebar Quantity (Bottom dir. 2), $mp_2$ :	36	
Pad Clear Cover, $cc_{pad}$ :	3	in

Material Properties		
Rebar Grade, $Fy$ :	60	ksi
Concrete Compressive Strength, $F'c$ :	3	ksi
Dry Concrete Density, $\delta c$ :	150	pcf

Soil Properties		
Total Soil Unit Weight, $\gamma$ :	130	pcf
Ultimate Gross Bearing, $Q_{ult}$ :	8.000	ksf
Cohesion, $Cu$ :	0.000	ksf
Friction Angle, $\phi$ :	34	degrees
SPT Blow Count, $N_{blows}$ :	16	
Base Friction, $\mu$ :		
Neglected Depth, $N$ :	4.00	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, $gw$ :	N/A	ft

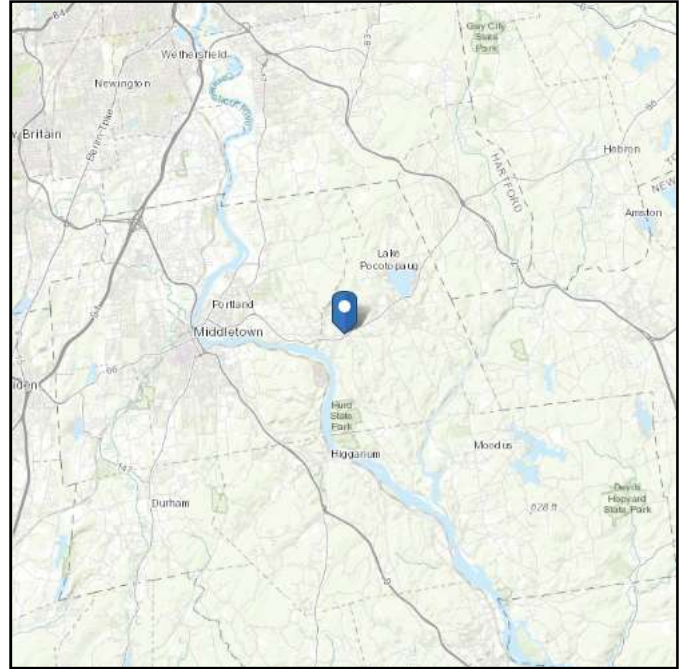
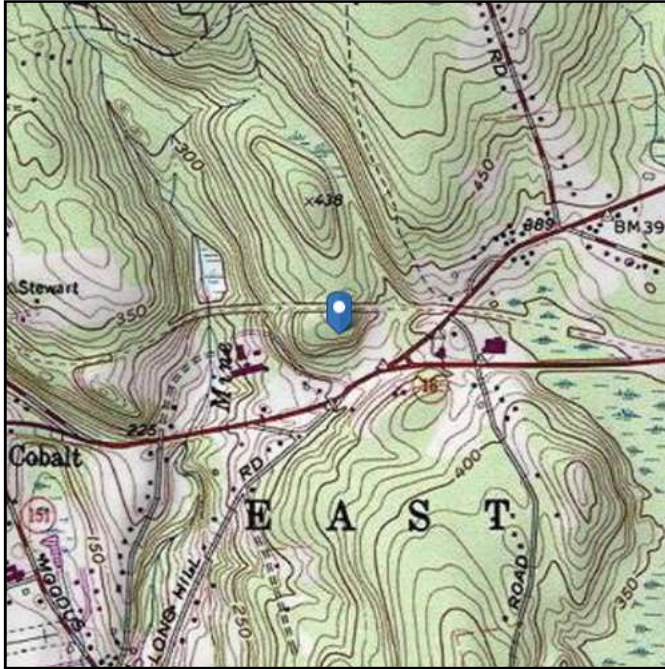
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# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

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

**Elevation:** 378.98 ft (NAVD 88)  
**Latitude:** 41.564761  
**Longitude:** -72.543106



## Wind

### Results:

Wind Speed:	<b>126 Vmph</b>
10-year MRI	78 Vmph
25-year MRI	87 Vmph
50-year MRI	95 Vmph
100-year MRI	103 Vmph

Ultimate 130 Vmph as per jurisdiction requirements

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

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

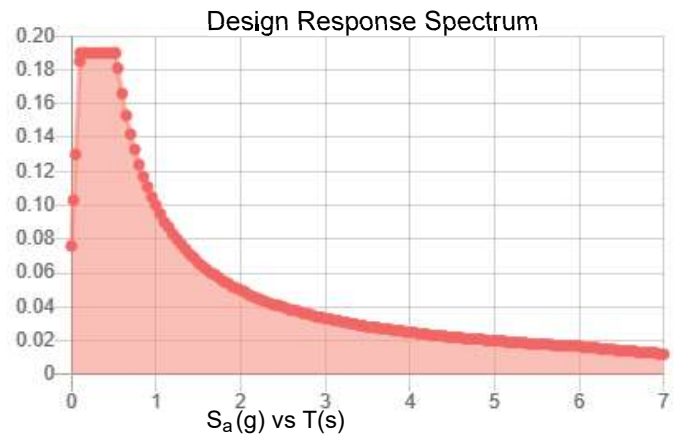
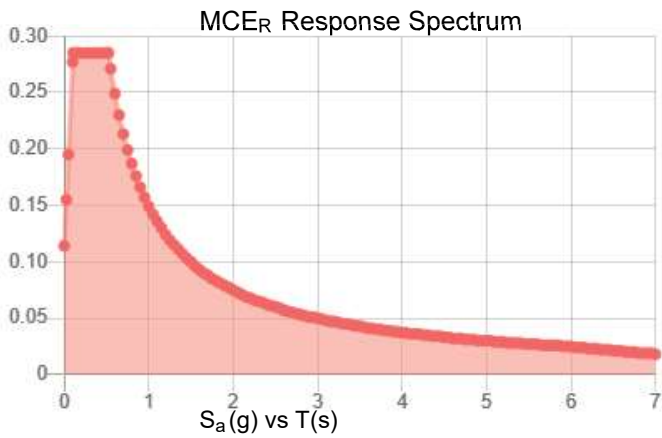
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

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

**Results:**

$S_s$ :	0.178	$S_{DS}$ :	0.19
$S_1$ :	0.062	$S_{D1}$ :	0.1
$F_a$ :	1.6	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.09
$S_{MS}$ :	0.285	PGA <sub>M</sub> :	0.144
$S_{M1}$ :	0.149	F <sub>PGA</sub> :	1.6
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:**

Fri Feb 12 2021

**Date Source:**

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

## Ice

---

**Results:**

Ice Thickness: 0.75 in.

$$\text{Ice Thickness} = 2 * 0.75 = 1.5 \text{ in}$$

Concurrent Temperature: 15 F

Gust Speed: 50 mph

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

**Date Accessed:** Fri Feb 12 2021

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

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

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

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# Exhibit E

## **Mount Analysis**



Date: February 4, 2021

Darcy Tarr  
Crown Castle  
6325 Ardrey Kell Road, Suite 600  
Charlotte, NC 28277  
(704) 405-6589



GPD Engineering and Architecture  
Professional Corporation  
520 South Main Street, Suite 2531  
Akron, Ohio 44311  
(216) 927-8663  
CrownMA@gpdgroup.com

**Subject:** Mount Analysis Report

**Carrier Designation:** Sprint PCS Loading Modification  
**Carrier Site Number:** CTHA696A  
**Carrier Site Name:** CTHA696A

**Crown Castle Designation:** **Crown Castle BU Number:** 876368  
**Crown Castle Site Name:** YANKEE LAKE/EAST HAMPTON/TOWN  
**Crown Castle JDE Job Number:** 628905  
**Crown Castle Order Number:** 538768 Rev. 0

**Engineering Firm Designation:** **GPD Report Designation:** 2021777.876368.01

**Site Data:** 1 Public Works Dr., East Hampton, Middlesex County, CT 06032  
Latitude 41° 33' 53.14" Longitude -72° 32' 35.18"

**Structure Information:** **Tower Height & Type:** 180.0 ft Monopole Tower  
**Mount Elevation:** 177.0 ft  
**Mount Type:** 13.0 ft Platform Mount

Dear Darcy Tarr,

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

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

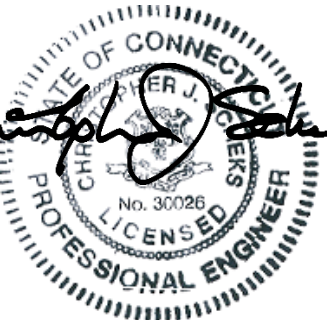

**Platform Mount**

**Sufficient Capacity-72.2%**

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

Mount analysis prepared by: Matt Steward

Respectfully Submitted by:



Christopher J. Scheks, P.E.  
Connecticut #: 0030026

2/4/2021

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### 1) INTRODUCTION

This is a 13.0' Platform Mount. Mount geometry was obtained from site photos and experience with similar mounts.

### 2) ANALYSIS CRITERIA

**TIA-222 Revision:** TIA-222-H  
**Risk Category:** II  
**Ultimate Wind Speed:** 130 mph  
**Exposure Category:** B  
**Topographic Factor at Base:** 1  
**Topographic Factor at Mount:** 1  
**Ice Thickness:** 1.5 in  
**Wind Speed with Ice:** 50 mph  
**Live Loading Wind Speed:** 30 mph  
**Man Live Load at Mid/End-Points:** 250 lb  
**Man Live Load at Mount Pipes:** 500 lb

**Table 1 - Proposed Equipment Configuration**

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount Details
177.0	178.0	3	Ericsson	AIR6449 B41_T-MOBILE	13.0 ft. Platform Mount
		3	RFS/Celwave	APX16DWV-16DWV-S-E-A20	
		3	RFS/Celwave	APXVAALL24_43-U-NA20_TMO	
		3	Ericsson	RADIO 4415 B66A_CCIV3	
		3	Ericsson	RADIO 4424 B25_TMO	
		3	Ericsson	RADIO 4449 B71 B85A_T-MOBILE	

### 3) ANALYSIS PROCEDURE

**Table 2 - Documents Provided**

Document	Remarks	Reference	Source
CCI Application	Crown Order Number 538768 Rev. 0	-	CCI
RF Data Sheet	Sprint Retain RFDS File: CTHA696A_Sprint_Retain_1_draft, dated 1/11/2021	-	CCI

### 3.1) Analysis Method

RISA-3D Edition (Version 17.0.2), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

A tool internally developed by GPD, using Microsoft Excel, was used to calculate wind loading on all appurtenances, dishes, and mount members for various load cases. Selected output from the analysis is included in Appendix B.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis* (Revision C).

### 3.2) Assumptions

- 1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
- 2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
- 3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
- 4) This analysis assumes all information reference in Table 2 is current and correct.
- 5) The mount was modeled from site photos. Member information and dimensions not provided have been assumed based on previous experience with similar mounts. No guarantee can be made as to the accuracy of these assumptions without a complete mount mapping.
- 6) Steel grades have been assumed as follows, unless noted otherwise:

Angle, Plate	ASTM A36 (GR 36)
HSS (Square)	ASTM 500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

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

**4) ANALYSIS RESULTS**

**Table 3 - Mount Component Stresses vs. Capacity (Platform Mount)**

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,3	Face Horizontal	M19	177.0	41.1	Pass
	Standoff Arm	M23		15.0	Pass
	Platform Internal Bracing	M7		57.2	Pass
	Center Connection Plate	M9		21.5	Pass
	End Connection Plate	M21		52.8	Pass
	Pipe Mount	B3		47.0	Pass
	Support Rail	M60		31.0	Pass
	Support Rail Corner	M69		72.2	Pass
	Kicker	M73		12.9	Pass
2,3	Mount to Tower Connection	-		12.1	Pass
	Kicker to Tower Connection	-		5.2	Pass

<b>Structure Rating (max from all components) =</b>	<b>72.2%<sup>3</sup></b>
---	--------------------------

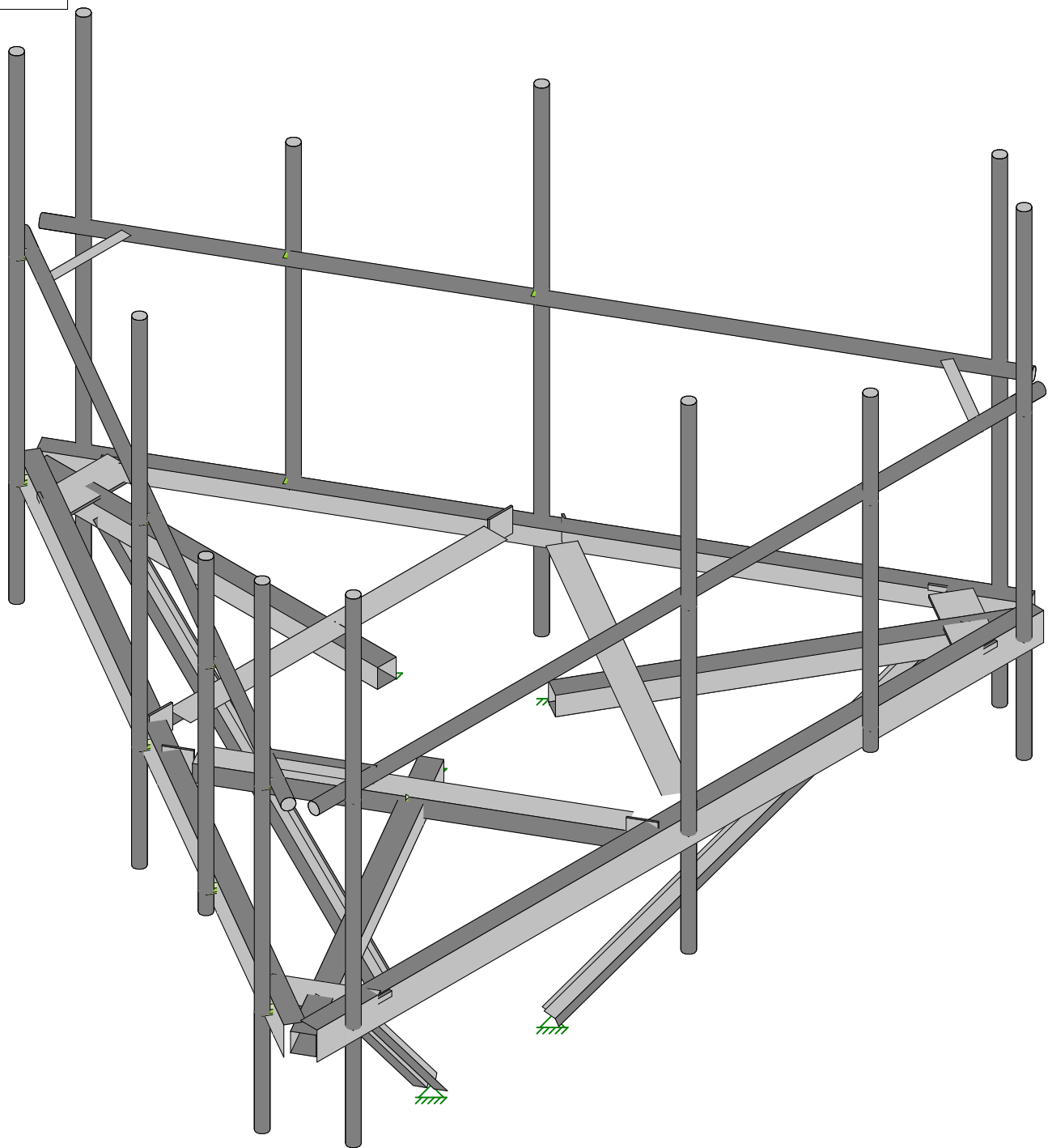
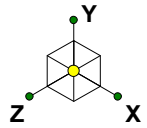
Notes:

- 1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed
- 2) See additional documentation in "Appendix D - Additional Calculations" for calculations supporting the % capacity consumed.
- 3) Ratings per TIA-222-H section 15.5.

**4.1) Recommendations**

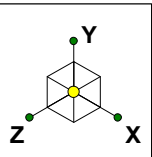
The mount has sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

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

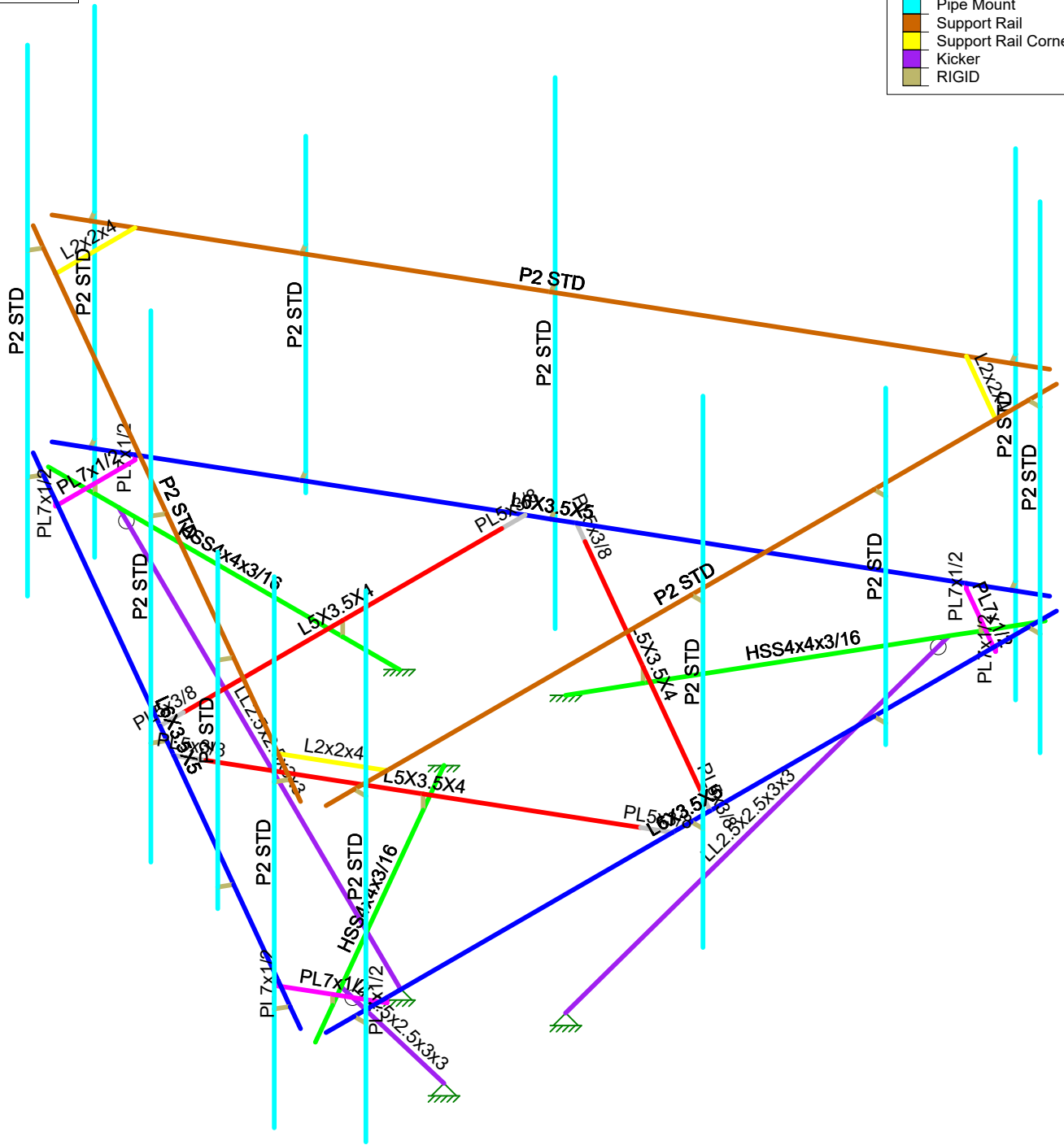


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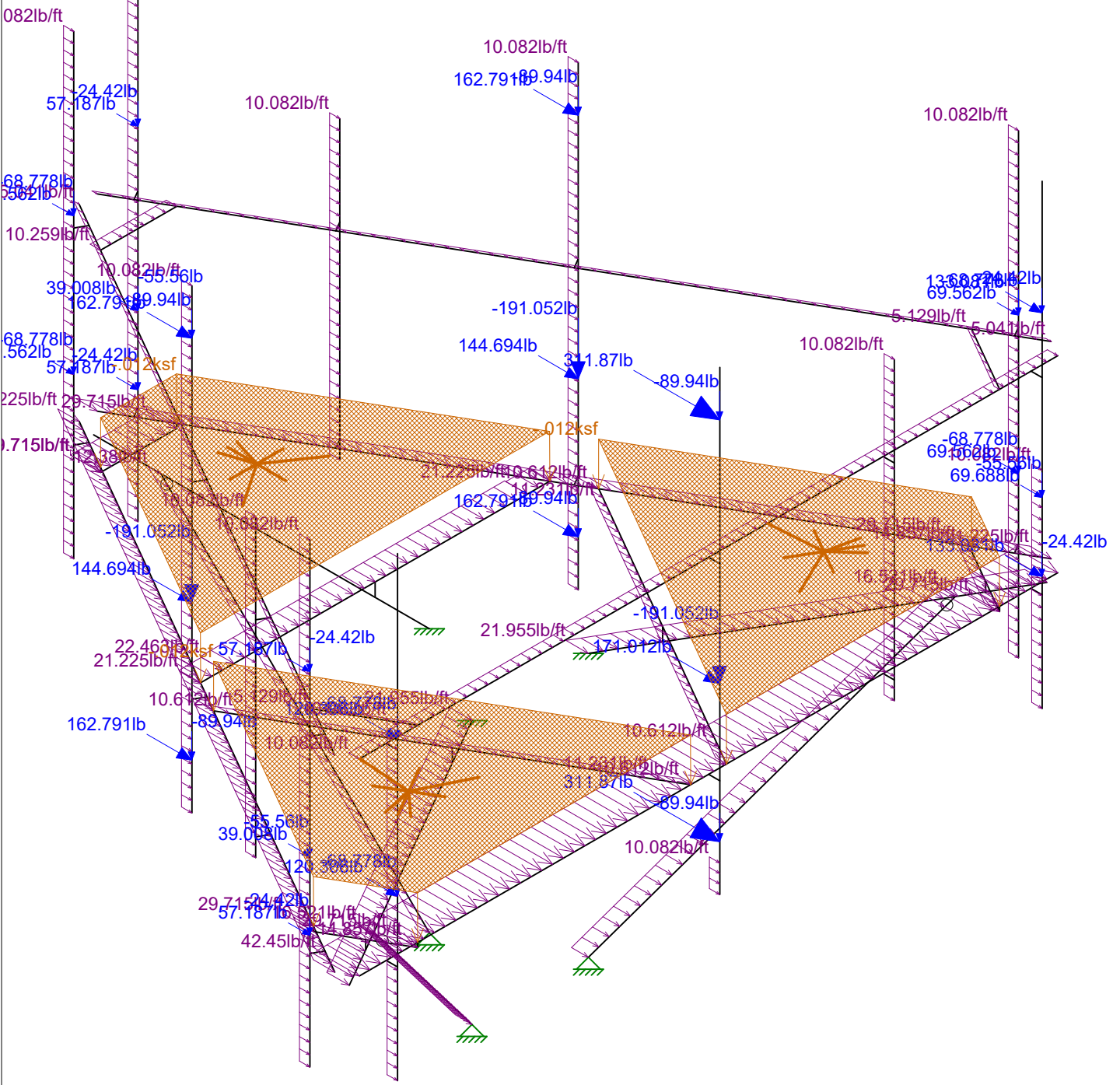
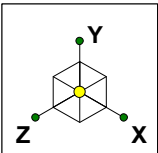
Section Sets	
[Blue Box]	Face Horizontal
[Green Box]	Standoff Arm
[Red Box]	Platform Internal Bracing
[Grey Box]	Center Connection Plate
[Magenta Box]	End Connection Plate
[Cyan Box]	Pipe Mount
[Brown Box]	Support Rail
[Yellow Box]	Support Rail Corner
[Purple Box]	Kicker
[Tan Box]	RIGID



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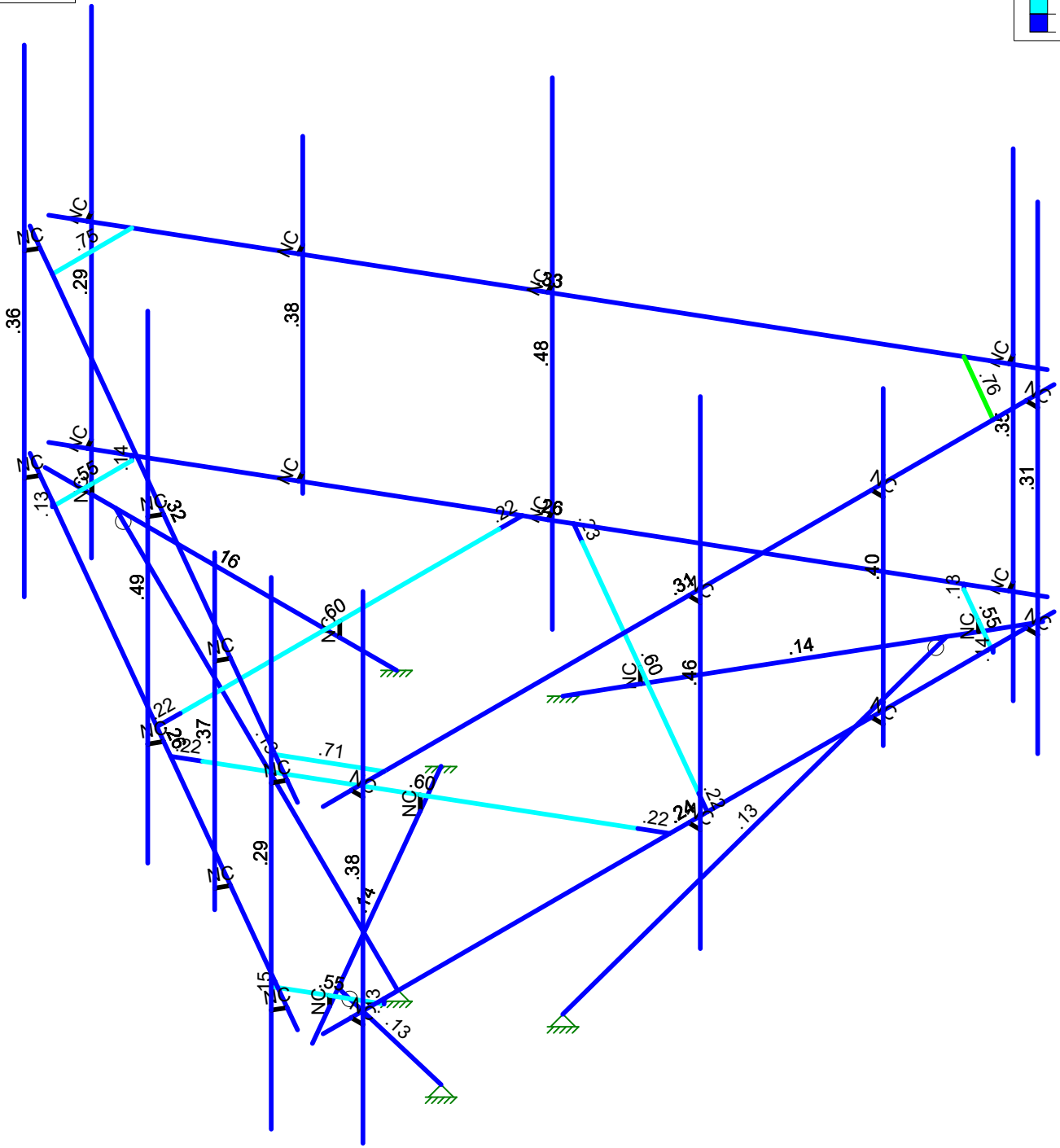
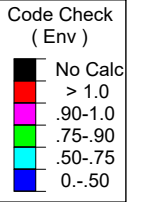
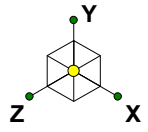
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Loads: LC 2, 1.2 Dead + 1.0 Wind @ 0° - No Ice  
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Member Code Checks Displayed (Enveloped)  
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**APPENDIX B**  
**SOFTWARE INPUT CALCULATIONS**



Structure Information		
Structure Type:	Monopole	
Structure Height:	180	ft
z (Mount Centerline) =	177	ft
Gh (Mount Gust Effect Factor) =	1.00	
Risk Category:	II	

Code Specifications		
TIA/EIA Code:	H	
Ultimate Wind Speed (No Ice) =	130	mph (3-s gust)
Ultimate Wind Speed (With Ice) =	50	mph (3-s gust)
Ice Thickness	1.5	in
Exposure Category	B	
Tower Base Elevation (AMSL)	377	ft

Topographic Inputs	
Topographic Feature:	N/A

Section Sets										No Ice		Ice Output	
Mount Components	Member Type	Length (in)	Side (Longest seeing wind) (in)	Other Side (in)	Calculated Dc, for ice weight (in)	Dc, for ice weight (in)	Area Type (Round or Flat)	K <sub>s</sub>	User's Wind Multiplier	Normal Wind Force (lb/ft)*	Normal Ice Wind Force (lb/ft)*	Ice Weight (lb/ft)*	
Face Horizontal	Angle	156.000	6	3.5		6.95	Flat	0.90	1.00	47.17	8.05	18.90	
Standoff Arm	Square/Rect.	75.000	4	4		5.66	Flat	0.90	1.00	28.17	5.27	16.11	
Platform Internal Bracing	Angle	68.000	3.5	5		6.10	Flat	0.90	1.00	24.96	4.80	17.08	
Center Connection Plate	Square/Rect.	5.000	5	0.375		5.01	Flat	0.90	1.00	23.58	4.93	14.72	
End Connection Plate	Square/Rect.	17.000	7	0.5		7.02	Flat	0.90	1.00	33.02	6.33	19.06	
Pipe Mount	Pipe	102.000	2.375	2.375		2.38	Round	0.90	1.00	11.20	3.54	8.99	
Support Rail	Pipe	156.000	2.375	2.375		2.38	Round	0.90	1.00	11.20	4.13	8.99	
Support Rail Corner	Angle	17.000	2	2		2.83	Flat	0.90	1.00	11.40	2.89	9.98	
Kicker	Other	84.009	2.5	5.375	5.375	5.38	Flat	0.90	1.00	19.65	4.34	15.50	

\*All forces are unfactored.

Appurtenances							Shielding			No Ice		Ice Output	
Appurtenance Model	Loading Elevation (ft)	Height (in)	Front Width (in)	Side Depth (in)	Wt (lbs)	Type for Area	Front Shielding (%)	Side Shielding (%)	K <sub>s</sub> and/or block shielding	Normal Wind Force (lbs)*	Wt (lbs) (no ice)*	Normal Wind Force (lbs) (w/ ice)*	Wt (lbs) (only ice)*
(3) AIR6449 B41 T-MOBILE	178	33.11	20.51	8.54	114.63	Flat	0%	0%	0.90	240.61	114.63	41.80	157.68
(3) APX16DWV-16DWV-S-E-A20	178	55.9	13.3	3.15	40.7	CFD	0%	0%	0.90	266.16	40.70	53.06	143.37
(3) APXVAALL24_43-U-NA20_TMO	178	95.9	24	8.5	149.9	CFD	0%	0%	0.90	623.74	149.90	109.75	438.78
(3) RADIO 4415 B66A_CCIV3	178	14.9	13.2	5.4	46.3	Flat	0%	0%	0.90	69.69	46.30	13.74	55.23
(3) RADIO 4424 B25_TMO	178	17.1	14.4	11.3	86	Flat	0%	0%	0.90	87.25	86.00	16.71	88.23
(3) RADIO 4449 B71 B85A_T-MOBILE	178	17.91	13.2	10.63	73.21	Flat	0%	0%	0.90	83.76	73.21	16.15	83.76

\*All forces are unfactored.

**APPENDIX C**  
**SOFTWARE ANALYSIS OUTPUT**



Company : GPD  
 Designer : Steward, Matthew  
 Job Number : 2021777.876368.01  
 Model Name : 876368 - YANKEE LAKE/EAST HAMPTON/TOWN

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### Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

### Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Face Horizontal	L6X3.5X5	Beam	None	A36 Gr.36	Typical	2.89	2.84	10.9	.099
2	Standoff Arm	HSS4x4x3/16	Beam	None	A500 Gr.B Rect	Typical	2.859	6.944	6.944	10.39
3	Platform Internal Bracing	L5X3.5X4	Beam	None	A36 Gr.36	Typical	2.07	2.2	5.36	.046
4	Center Connection Plate	PL5x3/8	Beam	None	A36 Gr.36	Typical	1.875	.022	3.906	.084
5	End Connection Plate	PL7x1/2	Beam	None	A36 Gr.36	Typical	3.5	.073	14.292	.279
6	Pipe Mount	P2 STD	Beam	None	A53 Gr.B	Typical	1.075	.666	.666	1.331
7	Support Rail	P2 STD	Beam	None	A53 Gr.B	Typical	1.075	.666	.666	1.331
8	Support Rail Corner	L2x2x4	Beam	None	A36 Gr.36	Typical	.944	.346	.346	.021
9	Kicker	LL2.5x2.5x3x3	Beam	None	A36 Gr.36	Typical	1.8	2.46	1.07	.023

### Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	A1	N25	N29			Pipe Mount	Beam	None	A53 Gr.B	Typical
2	A2	N104	N105A			Pipe Mount	Beam	None	A53 Gr.B	Typical
3	A3	N105	N106			Pipe Mount	Beam	None	A53 Gr.B	Typical
4	A4	N28	N32			Pipe Mount	Beam	None	A53 Gr.B	Typical
5	B1	N57	N61			Pipe Mount	Beam	None	A53 Gr.B	Typical
6	B2	N102B	N103B			Pipe Mount	Beam	None	A53 Gr.B	Typical
7	B3	N103A	N104A			Pipe Mount	Beam	None	A53 Gr.B	Typical
8	B4	N60	N64			Pipe Mount	Beam	None	A53 Gr.B	Typical
9	C1	N89	N93			Pipe Mount	Beam	None	A53 Gr.B	Typical
10	C2	N100B	N101C			Pipe Mount	Beam	None	A53 Gr.B	Typical
11	C3	N101B	N102C			Pipe Mount	Beam	None	A53 Gr.B	Typical
12	C4	N92	N96			Pipe Mount	Beam	None	A53 Gr.B	Typical
13	M1	N2	N1		180	Face Horizontal	Beam	None	A36 Gr.36	Typical
14	M2	N3	N4			Standoff Arm	Beam	None	A500 Gr.B...	Typical
15	M3	N7	N8		90	End Connectio...	Beam	None	A36 Gr.36	Typical
16	M4	N8	N9		90	End Connectio...	Beam	None	A36 Gr.36	Typical
17	M5	N7	N10		30	End Connectio...	Beam	None	A36 Gr.36	Typical
18	M6	N6	N11			RIGID	None	None	RIGID	Typical
19	M7	N12	N13		90	Platform Intern...	Beam	None	A36 Gr.36	Typical
20	M8	N14	N5			RIGID	None	None	RIGID	Typical
21	M9	N15	N12			Center Conne...	Beam	None	A36 Gr.36	Typical
22	M10	N13	N16			Center Conne...	Beam	None	A36 Gr.36	Typical
23	M11	N17	N18			RIGID	None	None	RIGID	Typical
24	M14	N23	N24			RIGID	None	None	RIGID	Typical
25	M19	N34	N33		180	Face Horizontal	Beam	None	A36 Gr.36	Typical
26	M20	N35	N36			Standoff Arm	Beam	None	A500 Gr.B...	Typical
27	M21	N39	N40		90	End Connectio...	Beam	None	A36 Gr.36	Typical
28	M22	N40	N41		150	End Connectio...	Beam	None	A36 Gr.36	Typical
29	M23	N39	N42		90	End Connectio...	Beam	None	A36 Gr.36	Typical
30	M24	N38	N43			RIGID	None	None	RIGID	Typical
31	M25	N44	N45		90	Platform Intern...	Beam	None	A36 Gr.36	Typical



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 Designer : Steward, Matthew  
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**Member Primary Data (Continued)**

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
32	M26	N46	N37			RIGID	None	None	RIGID	Typical
33	M27	N47	N44			Center Conne...	Beam	None	A36 Gr.36	Typical
34	M28	N45	N48			Center Conne...	Beam	None	A36 Gr.36	Typical
35	M29	N49	N50			RIGID	None	None	RIGID	Typical
36	M32	N55	N56			RIGID	None	None	RIGID	Typical
37	M37	N66	N65		180	Face Horizontal	Beam	None	A36 Gr.36	Typical
38	M38	N67	N68			Standoff Arm	Beam	None	A500 Gr.B...	Typical
39	M39	N71	N72		90	End Connectio...	Beam	None	A36 Gr.36	Typical
40	M40	N72	N73		30	End Connectio...	Beam	None	A36 Gr.36	Typical
41	M41	N71	N74		150	End Connectio...	Beam	None	A36 Gr.36	Typical
42	M42	N70	N75			RIGID	None	None	RIGID	Typical
43	M43	N76	N77		90	Platform Intern...	Beam	None	A36 Gr.36	Typical
44	M44	N78	N69			RIGID	None	None	RIGID	Typical
45	M45	N79	N76			Center Conne...	Beam	None	A36 Gr.36	Typical
46	M46	N77	N80			Center Conne...	Beam	None	A36 Gr.36	Typical
47	M47	N81	N82			RIGID	None	None	RIGID	Typical
48	M50	N87	N88			RIGID	None	None	RIGID	Typical
49	M55	N103	N97			RIGID	None	None	RIGID	Typical
50	M55A	N102A	N100			RIGID	None	None	RIGID	Typical
51	M55B	N101A	N98			RIGID	None	None	RIGID	Typical
52	M55C	N100A	N101			RIGID	None	None	RIGID	Typical
53	M55D	N99A	N99			RIGID	None	None	RIGID	Typical
54	M55E	N98A	N102			RIGID	None	None	RIGID	Typical
55	M55F	N98B	N97A		180	Support Rail	Beam	None	A53 Gr.B	Typical
56	M56F	N101D	N102D			RIGID	None	None	RIGID	Typical
57	M57	N104B	N103C		180	Support Rail	Beam	None	A53 Gr.B	Typical
58	M58	N105B	N106A			RIGID	None	None	RIGID	Typical
59	M59	N107	N108			RIGID	None	None	RIGID	Typical
60	M60	N110	N109		180	Support Rail	Beam	None	A53 Gr.B	Typical
61	M61	N111	N112			RIGID	None	None	RIGID	Typical
62	M62	N113	N114			RIGID	None	None	RIGID	Typical
63	M63	N121	N115			RIGID	None	None	RIGID	Typical
64	M64	N122	N118			RIGID	None	None	RIGID	Typical
65	M65	N123	N116			RIGID	None	None	RIGID	Typical
66	M66	N124	N119			RIGID	None	None	RIGID	Typical
67	M67	N125	N117			RIGID	None	None	RIGID	Typical
68	M68	N132	N131		90	Support Rail C...	Beam	None	A36 Gr.36	Typical
69	M69	N127	N128		90	Support Rail C...	Beam	None	A36 Gr.36	Typical
70	M70	N129	N130		180	Support Rail C...	Beam	None	A36 Gr.36	Typical
71	M71	N133	N136		180	Kicker	Beam	None	A36 Gr.36	Typical
72	M72	N135	N137		180	Kicker	Beam	None	A36 Gr.36	Typical
73	M73	N134	N138		180	Kicker	Beam	None	A36 Gr.36	Typical
74	M74	N100C	N99B			RIGID	None	None	RIGID	Typical
75	M75	N126	N120			RIGID	None	None	RIGID	Typical

**Joint Boundary Conditions**

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N3	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N35	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N67	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N136	Reaction	Reaction	Reaction			
5	N137	Reaction	Reaction	Reaction			
6	N138	Reaction	Reaction	Reaction			





Company : GPD  
 Designer : Steward, Matthew  
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 Model Name : 876368 - YANKEE LAKE/EAST HAMPTON/TOWN

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### Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	
1	1.4 Dead	Yes	Y		1	1.4	0		0		0		0		0		0		0		0		0		0
2	1.2 Dead + 1.0 Wind @ 0° - ...	Yes	Y		1	1.2	2	1	0		0		0		0		0		0		0		0		0
3	0.9 Dead + 1.0 Wind @ 0° - ...	Yes	Y		1	.9	2	1	0		0		0		0		0		0		0		0		0
4	1.2 Dead + 1.0 Wind @ 30° ...	Yes	Y		1	1.2	3	1	0		0		0		0		0		0		0		0		0
5	0.9 Dead + 1.0 Wind @ 30° ...	Yes	Y		1	.9	3	1	0		0		0		0		0		0		0		0		0
6	1.2 Dead + 1.0 Wind @ 60° ...	Yes	Y		1	1.2	4	1	0		0		0		0		0		0		0		0		0
7	0.9 Dead + 1.0 Wind @ 60° ...	Yes	Y		1	.9	4	1	0		0		0		0		0		0		0		0		0
8	1.2 Dead + 1.0 Wind @ 90° ...	Yes	Y		1	1.2	5	1	0		0		0		0		0		0		0		0		0
9	0.9 Dead + 1.0 Wind @ 90° ...	Yes	Y		1	.9	5	1	0		0		0		0		0		0		0		0		0
10	1.2 Dead + 1.0 Wind @ 120° ...	Yes	Y		1	1.2	6	1	0		0		0		0		0		0		0		0		0
11	0.9 Dead + 1.0 Wind @ 120° ...	Yes	Y		1	.9	6	1	0		0		0		0		0		0		0		0		0
12	1.2 Dead + 1.0 Wind @ 150° ...	Yes	Y		1	1.2	7	1	0		0		0		0		0		0		0		0		0
13	0.9 Dead + 1.0 Wind @ 150° ...	Yes	Y		1	.9	7	1	0		0		0		0		0		0		0		0		0
14	1.2 Dead + 1.0 Wind @ 180° ...	Yes	Y		1	1.2	8	1	0		0		0		0		0		0		0		0		0
15	0.9 Dead + 1.0 Wind @ 180° ...	Yes	Y		1	.9	8	1	0		0		0		0		0		0		0		0		0
16	1.2 Dead + 1.0 Wind @ 210° ...	Yes	Y		1	1.2	9	1	0		0		0		0		0		0		0		0		0
17	0.9 Dead + 1.0 Wind @ 210° ...	Yes	Y		1	.9	9	1	0		0		0		0		0		0		0		0		0
18	1.2 Dead + 1.0 Wind @ 240° ...	Yes	Y		1	1.2	10	1	0		0		0		0		0		0		0		0		0
19	0.9 Dead + 1.0 Wind @ 240° ...	Yes	Y		1	.9	10	1	0		0		0		0		0		0		0		0		0
20	1.2 Dead + 1.0 Wind @ 270° ...	Yes	Y		1	1.2	11	1	0		0		0		0		0		0		0		0		0
21	0.9 Dead + 1.0 Wind @ 270° ...	Yes	Y		1	.9	11	1	0		0		0		0		0		0		0		0		0
22	1.2 Dead + 1.0 Wind @ 300° ...	Yes	Y		1	1.2	12	1	0		0		0		0		0		0		0		0		0
23	0.9 Dead + 1.0 Wind @ 300° ...	Yes	Y		1	.9	12	1	0		0		0		0		0		0		0		0		0
24	1.2 Dead + 1.0 Wind @ 330° ...	Yes	Y		1	1.2	13	1	0		0		0		0		0		0		0		0		0
25	0.9 Dead + 1.0 Wind @ 330° ...	Yes	Y		1	.9	13	1	0		0		0		0		0		0		0		0		0
26	1.2 Dead + 1.0 Ice Wind @ ...	Yes	Y		1	1.2	15	1	14	1		1	0		0		0		0		0		0		0
27	1.2 Dead + 1.0 Ice Wind @ ...	Yes	Y		1	1.2	16	1	14	1		1	0		0		0		0		0		0		0
28	1.2 Dead + 1.0 Ice Wind @ ...	Yes	Y		1	1.2	17	1	14	1		1	0		0		0		0		0		0		0
29	1.2 Dead + 1.0 Ice Wind @ ...	Yes	Y		1	1.2	18	1	14	1		1	0		0		0		0		0		0		0
30	1.2 Dead + 1.0 Ice Wind @ ...	Yes	Y		1	1.2	19	1	14	1		1	0		0		0		0		0		0		0
31	1.2 Dead + 1.0 Ice Wind @ ...	Yes	Y		1	1.2	20	1	14	1		1	0		0		0		0		0		0		0
32	1.2 Dead + 1.0 Ice Wind @ ...	Yes	Y		1	1.2	21	1	14	1		1	0		0		0		0		0		0		0
33	1.2 Dead + 1.0 Ice Wind @ ...	Yes	Y		1	1.2	22	1	14	1		1	0		0		0		0		0		0		0
34	1.2 Dead + 1.0 Ice Wind @ ...	Yes	Y		1	1.2	23	1	14	1		1	0		0		0		0		0		0		0
35	1.2 Dead + 1.0 Ice Wind @ ...	Yes	Y		1	1.2	24	1	14	1		1	0		0		0		0		0		0		0
36	1.2 Dead + 1.0 Ice Wind @ ...	Yes	Y		1	1.2	25	1	14	1		1	0		0		0		0		0		0		0
37	1.2 Dead + 1.0 Ice Wind @ ...	Yes	Y		1	1.2	26	1	14	1		1	0		0		0		0		0		0		0
38	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	2	.053	0		0		0		0		0		0		0		0
39	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	3	.053	0		0		0		0		0		0		0		0
40	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	4	.053	0		0		0		0		0		0		0		0
41	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	5	.053	0		0		0		0		0		0		0		0
42	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	6	.053	0		0		0		0		0		0		0		0
43	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	7	.053	0		0		0		0		0		0		0		0
44	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	8	.053	0		0		0		0		0		0		0		0
45	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	9	.053	0		0		0		0		0		0		0		0
46	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	10	.053	0		0		0		0		0		0		0		0
47	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	11	.053	0		0		0		0		0		0		0		0
48	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	12	.053	0		0		0		0		0		0		0		0
49	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	13	.053	0		0		0		0		0		0		0		0
50	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	2	.053	0		0		0		0		0		0		0		0
51	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	3	.053	0		0		0		0		0		0		0		0
52	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	4	.053	0		0		0		0		0		0		0		0
53	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	5	.053	0		0		0		0		0		0		0		0
54	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	6	.053	0		0		0		0		0		0		0		0
55	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	7	.053	0		0		0		0		0		0		0		0
56	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	8	.053	0		0		0		0		0		0		0		0

### Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...
57	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	9	.053	0		0		0		0		0		0		0
58	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	10	.053	0		0		0		0		0		0		0
59	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	11	.053	0		0		0		0		0		0		0
60	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	12	.053	0		0		0		0		0		0		0
61	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	13	.053	0		0		0		0		0		0		0
62	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	2	.053	0		0		0		0		0		0		0
63	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	3	.053	0		0		0		0		0		0		0
64	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	4	.053	0		0		0		0		0		0		0
65	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	5	.053	0		0		0		0		0		0		0
66	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	6	.053	0		0		0		0		0		0		0
67	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	7	.053	0		0		0		0		0		0		0
68	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	8	.053	0		0		0		0		0		0		0
69	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	9	.053	0		0		0		0		0		0		0
70	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	10	.053	0		0		0		0		0		0		0
71	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	11	.053	0		0		0		0		0		0		0
72	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	12	.053	0		0		0		0		0		0		0
73	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	13	.053	0		0		0		0		0		0		0
74	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	2	.053	0		0		0		0		0		0		0
75	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	3	.053	0		0		0		0		0		0		0
76	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	4	.053	0		0		0		0		0		0		0
77	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	5	.053	0		0		0		0		0		0		0
78	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	6	.053	0		0		0		0		0		0		0
79	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	7	.053	0		0		0		0		0		0		0
80	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	8	.053	0		0		0		0		0		0		0
81	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	9	.053	0		0		0		0		0		0		0
82	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	10	.053	0		0		0		0		0		0		0
83	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	11	.053	0		0		0		0		0		0		0
84	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	12	.053	0		0		0		0		0		0		0
85	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	13	.053	0		0		0		0		0		0		0
86	1.2 Dead + 1.5 Live_M - B1 ...	Yes	Y		1	1.2	31	1.5	2	.053	0		0		0		0		0		0		0
87	1.2 Dead + 1.5 Live_M - B1 ...	Yes	Y		1	1.2	31	1.5	3	.053	0		0		0		0		0		0		0
88	1.2 Dead + 1.5 Live_M - B1 ...	Yes	Y		1	1.2	31	1.5	4	.053	0		0		0		0		0		0		0
89	1.2 Dead + 1.5 Live_M - B1 ...	Yes	Y		1	1.2	31	1.5	5	.053	0		0		0		0		0		0		0
90	1.2 Dead + 1.5 Live_M - B1 ...	Yes	Y		1	1.2	31	1.5	6	.053	0		0		0		0		0		0		0
91	1.2 Dead + 1.5 Live_M - B1 ...	Yes	Y		1	1.2	31	1.5	7	.053	0		0		0		0		0		0		0
92	1.2 Dead + 1.5 Live_M - B1 ...	Yes	Y		1	1.2	31	1.5	8	.053	0		0		0		0		0		0		0
93	1.2 Dead + 1.5 Live_M - B1 ...	Yes	Y		1	1.2	31	1.5	9	.053	0		0		0		0		0		0		0
94	1.2 Dead + 1.5 Live_M - B1 ...	Yes	Y		1	1.2	31	1.5	10	.053	0		0		0		0		0		0		0
95	1.2 Dead + 1.5 Live_M - B1 ...	Yes	Y		1	1.2	31	1.5	11	.053	0		0		0		0		0		0		0
96	1.2 Dead + 1.5 Live_M - B1 ...	Yes	Y		1	1.2	31	1.5	12	.053	0		0		0		0		0		0		0
97	1.2 Dead + 1.5 Live_M - B1 ...	Yes	Y		1	1.2	31	1.5	13	.053	0		0		0		0		0		0		0
98	1.2 Dead + 1.5 Live_M - B2 ...	Yes	Y		1	1.2	32	1.5	2	.053	0		0		0		0		0		0		0
99	1.2 Dead + 1.5 Live_M - B2 ...	Yes	Y		1	1.2	32	1.5	3	.053	0		0		0		0		0		0		0
100	1.2 Dead + 1.5 Live_M - B2 ...	Yes	Y		1	1.2	32	1.5	4	.053	0		0		0		0		0		0		0
101	1.2 Dead + 1.5 Live_M - B2 ...	Yes	Y		1	1.2	32	1.5	5	.053	0		0		0		0		0		0		0
102	1.2 Dead + 1.5 Live_M - B2 ...	Yes	Y		1	1.2	32	1.5	6	.053	0		0		0		0		0		0		0
103	1.2 Dead + 1.5 Live_M - B2 ...	Yes	Y		1	1.2	32	1.5	7	.053	0		0		0		0		0		0		0
104	1.2 Dead + 1.5 Live_M - B2 ...	Yes	Y		1	1.2	32	1.5	8	.053	0		0		0		0		0		0		0
105	1.2 Dead + 1.5 Live_M - B2 ...	Yes	Y		1	1.2	32	1.5	9	.053	0		0		0		0		0		0		0
106	1.2 Dead + 1.5 Live_M - B2 ...	Yes	Y		1	1.2	32	1.5	10	.053	0		0		0		0		0		0		0
107	1.2 Dead + 1.5 Live_M - B2 ...	Yes	Y		1	1.2	32	1.5	11	.053	0		0		0		0		0		0		0
108	1.2 Dead + 1.5 Live_M - B2 ...	Yes	Y		1	1.2	32	1.5	12	.053	0		0		0		0		0		0		0
109	1.2 Dead + 1.5 Live_M - B2 ...	Yes	Y		1	1.2	32	1.5	13	.053	0		0		0		0		0		0		0
110	1.2 Dead + 1.5 Live_M - B3 ...	Yes	Y		1	1.2	33	1.5	2	.053	0		0		0		0		0		0		0
111	1.2 Dead + 1.5 Live_M - B3 ...	Yes	Y		1	1.2	33	1.5	3	.053	0		0		0		0		0		0		0
112	1.2 Dead + 1.5 Live_M - B3 ...	Yes	Y		1	1.2	33	1.5	4	.053	0		0		0		0		0		0		0
113	1.2 Dead + 1.5 Live_M - B3 ...	Yes	Y		1	1.2	33	1.5	5	.053	0		0		0		0		0		0		0



**Load Combinations (Continued)**

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
114	1.2 Dead + 1.5 Live_M - B3	Yes	Y			1	1.2	33	1.5	6	.053	0														
115	1.2 Dead + 1.5 Live_M - B3	Yes	Y			1	1.2	33	1.5	7	.053	0														
116	1.2 Dead + 1.5 Live_M - B3	Yes	Y			1	1.2	33	1.5	8	.053	0														
117	1.2 Dead + 1.5 Live_M - B3	Yes	Y			1	1.2	33	1.5	9	.053	0														
118	1.2 Dead + 1.5 Live_M - B3	Yes	Y			1	1.2	33	1.5	10	.053	0														
119	1.2 Dead + 1.5 Live_M - B3	Yes	Y			1	1.2	33	1.5	11	.053	0														
120	1.2 Dead + 1.5 Live_M - B3	Yes	Y			1	1.2	33	1.5	12	.053	0														
121	1.2 Dead + 1.5 Live_M - B3	Yes	Y			1	1.2	33	1.5	13	.053	0														
122	1.2 Dead + 1.5 Live_M - B4	Yes	Y			1	1.2	34	1.5	2	.053	0														
123	1.2 Dead + 1.5 Live_M - B4	Yes	Y			1	1.2	34	1.5	3	.053	0														
124	1.2 Dead + 1.5 Live_M - B4	Yes	Y			1	1.2	34	1.5	4	.053	0														
125	1.2 Dead + 1.5 Live_M - B4	Yes	Y			1	1.2	34	1.5	5	.053	0														
126	1.2 Dead + 1.5 Live_M - B4	Yes	Y			1	1.2	34	1.5	6	.053	0														
127	1.2 Dead + 1.5 Live_M - B4	Yes	Y			1	1.2	34	1.5	7	.053	0														
128	1.2 Dead + 1.5 Live_M - B4	Yes	Y			1	1.2	34	1.5	8	.053	0														
129	1.2 Dead + 1.5 Live_M - B4	Yes	Y			1	1.2	34	1.5	9	.053	0														
130	1.2 Dead + 1.5 Live_M - B4	Yes	Y			1	1.2	34	1.5	10	.053	0														
131	1.2 Dead + 1.5 Live_M - B4	Yes	Y			1	1.2	34	1.5	11	.053	0														
132	1.2 Dead + 1.5 Live_M - B4	Yes	Y			1	1.2	34	1.5	12	.053	0														
133	1.2 Dead + 1.5 Live_M - B4	Yes	Y			1	1.2	34	1.5	13	.053	0														
134	1.2 Dead + 1.5 Live_M - C1	Yes	Y			1	1.2	35	1.5	2	.053	0														
135	1.2 Dead + 1.5 Live_M - C1	Yes	Y			1	1.2	35	1.5	3	.053	0														
136	1.2 Dead + 1.5 Live_M - C1	Yes	Y			1	1.2	35	1.5	4	.053	0														
137	1.2 Dead + 1.5 Live_M - C1	Yes	Y			1	1.2	35	1.5	5	.053	0														
138	1.2 Dead + 1.5 Live_M - C1	Yes	Y			1	1.2	35	1.5	6	.053	0														
139	1.2 Dead + 1.5 Live_M - C1	Yes	Y			1	1.2	35	1.5	7	.053	0														
140	1.2 Dead + 1.5 Live_M - C1	Yes	Y			1	1.2	35	1.5	8	.053	0														
141	1.2 Dead + 1.5 Live_M - C1	Yes	Y			1	1.2	35	1.5	9	.053	0														
142	1.2 Dead + 1.5 Live_M - C1	Yes	Y			1	1.2	35	1.5	10	.053	0														
143	1.2 Dead + 1.5 Live_M - C1	Yes	Y			1	1.2	35	1.5	11	.053	0														
144	1.2 Dead + 1.5 Live_M - C1	Yes	Y			1	1.2	35	1.5	12	.053	0														
145	1.2 Dead + 1.5 Live_M - C1	Yes	Y			1	1.2	35	1.5	13	.053	0														
146	1.2 Dead + 1.5 Live_M - C2	Yes	Y			1	1.2	36	1.5	2	.053	0														
147	1.2 Dead + 1.5 Live_M - C2	Yes	Y			1	1.2	36	1.5	3	.053	0														
148	1.2 Dead + 1.5 Live_M - C2	Yes	Y			1	1.2	36	1.5	4	.053	0														
149	1.2 Dead + 1.5 Live_M - C2	Yes	Y			1	1.2	36	1.5	5	.053	0														
150	1.2 Dead + 1.5 Live_M - C2	Yes	Y			1	1.2	36	1.5	6	.053	0														
151	1.2 Dead + 1.5 Live_M - C2	Yes	Y			1	1.2	36	1.5	7	.053	0														
152	1.2 Dead + 1.5 Live_M - C2	Yes	Y			1	1.2	36	1.5	8	.053	0														
153	1.2 Dead + 1.5 Live_M - C2	Yes	Y			1	1.2	36	1.5	9	.053	0														
154	1.2 Dead + 1.5 Live_M - C2	Yes	Y			1	1.2	36	1.5	10	.053	0														
155	1.2 Dead + 1.5 Live_M - C2	Yes	Y			1	1.2	36	1.5	11	.053	0														
156	1.2 Dead + 1.5 Live_M - C2	Yes	Y			1	1.2	36	1.5	12	.053	0														
157	1.2 Dead + 1.5 Live_M - C2	Yes	Y			1	1.2	36	1.5	13	.053	0														
158	1.2 Dead + 1.5 Live_M - C3	Yes	Y			1	1.2	37	1.5	2	.053	0														
159	1.2 Dead + 1.5 Live_M - C3	Yes	Y			1	1.2	37	1.5	3	.053	0														
160	1.2 Dead + 1.5 Live_M - C3	Yes	Y			1	1.2	37	1.5	4	.053	0														
161	1.2 Dead + 1.5 Live_M - C3	Yes	Y			1	1.2	37	1.5	5	.053	0														
162	1.2 Dead + 1.5 Live_M - C3	Yes	Y			1	1.2	37	1.5	6	.053	0														
163	1.2 Dead + 1.5 Live_M - C3	Yes	Y			1	1.2	37	1.5	7	.053	0														
164	1.2 Dead + 1.5 Live_M - C3	Yes	Y			1	1.2	37	1.5	8	.053	0														
165	1.2 Dead + 1.5 Live_M - C3	Yes	Y			1	1.2	37	1.5	9	.053	0														
166	1.2 Dead + 1.5 Live_M - C3	Yes	Y			1	1.2	37	1.5	10	.053	0														
167	1.2 Dead + 1.5 Live_M - C3	Yes	Y			1	1.2	37	1.5	11	.053	0														
168	1.2 Dead + 1.5 Live_M - C3	Yes	Y			1	1.2	37	1.5	12	.053	0														
169	1.2 Dead + 1.5 Live_M - C3	Yes	Y			1	1.2	37	1.5	13	.053	0														
170	1.2 Dead + 1.5 Live_M - C4	Yes	Y			1	1.2	38	1.5	2	.053	0														



### Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
171	1.2 Dead + 1.5 Live_M - C4 ...	Yes	Y			1	1.2	38	1.5	3	.053	0		0		0		0		0				
172	1.2 Dead + 1.5 Live_M - C4 ...	Yes	Y			1	1.2	38	1.5	4	.053	0		0		0		0		0				
173	1.2 Dead + 1.5 Live_M - C4 ...	Yes	Y			1	1.2	38	1.5	5	.053	0		0		0		0		0				
174	1.2 Dead + 1.5 Live_M - C4 ...	Yes	Y			1	1.2	38	1.5	6	.053	0		0		0		0		0				
175	1.2 Dead + 1.5 Live_M - C4 ...	Yes	Y			1	1.2	38	1.5	7	.053	0		0		0		0		0				
176	1.2 Dead + 1.5 Live_M - C4 ...	Yes	Y			1	1.2	38	1.5	8	.053	0		0		0		0		0				
177	1.2 Dead + 1.5 Live_M - C4 ...	Yes	Y			1	1.2	38	1.5	9	.053	0		0		0		0		0				
178	1.2 Dead + 1.5 Live_M - C4 ...	Yes	Y			1	1.2	38	1.5	10	.053	0		0		0		0		0				
179	1.2 Dead + 1.5 Live_M - C4 ...	Yes	Y			1	1.2	38	1.5	11	.053	0		0		0		0		0				
180	1.2 Dead + 1.5 Live_M - C4 ...	Yes	Y			1	1.2	38	1.5	12	.053	0		0		0		0		0				
181	1.2 Dead + 1.5 Live_M - C4 ...	Yes	Y			1	1.2	38	1.5	13	.053	0		0		0		0		0				
182	1.2 Dead + 1.5 Live_V - M1 ...	Yes	Y			1	1.2	39	1.5	0		0		0		0		0		0				
183	1.2 Dead + 1.5 Live_V - M1 ...	Yes	Y			1	1.2	40	1.5	0		0		0		0		0		0				
184	1.2 Dead + 1.5 Live_V - M1 ...	Yes	Y			1	1.2	41	1.5	0		0		0		0		0		0				
185	1.2 Dead + 1.5 Live_V - M2 ...	Yes	Y			1	1.2	42	1.5	0		0		0		0		0		0				
186	1.2 Dead + 1.5 Live_V - M2 ...	Yes	Y			1	1.2	43	1.5	0		0		0		0		0		0				
187	1.2 Dead + 1.5 Live_V - M2 ...	Yes	Y			1	1.2	44	1.5	0		0		0		0		0		0				
188	1.2 Dead + 1.5 Live_V - M7 ...	Yes	Y			1	1.2	45	1.5	0		0		0		0		0		0				
189	1.2 Dead + 1.5 Live_V - M7 ...	Yes	Y			1	1.2	46	1.5	0		0		0		0		0		0				
190	1.2 Dead + 1.5 Live_V - M7 ...	Yes	Y			1	1.2	47	1.5	0		0		0		0		0		0				
191	1.2 Dead + 1.5 Live_V - M1 ...	Yes	Y			1	1.2	48	1.5	0		0		0		0		0		0				
192	1.2 Dead + 1.5 Live_V - M1 ...	Yes	Y			1	1.2	49	1.5	0		0		0		0		0		0				
193	1.2 Dead + 1.5 Live_V - M1 ...	Yes	Y			1	1.2	50	1.5	0		0		0		0		0		0				
194	1.2 Dead + 1.5 Live_V - M2 ...	Yes	Y			1	1.2	51	1.5	0		0		0		0		0		0				
195	1.2 Dead + 1.5 Live_V - M2 ...	Yes	Y			1	1.2	52	1.5	0		0		0		0		0		0				
196	1.2 Dead + 1.5 Live_V - M2 ...	Yes	Y			1	1.2	53	1.5	0		0		0		0		0		0				
197	1.2 Dead + 1.5 Live_V - M2 ...	Yes	Y			1	1.2	54	1.5	0		0		0		0		0		0				
198	1.2 Dead + 1.5 Live_V - M2 ...	Yes	Y			1	1.2	55	1.5	0		0		0		0		0		0				
199	1.2 Dead + 1.5 Live_V - M2 ...	Yes	Y			1	1.2	56	1.5	0		0		0		0		0		0				
200	1.2 Dead + 1.5 Live_V - M3 ...	Yes	Y			1	1.2	57	1.5	0		0		0		0		0		0				
201	1.2 Dead + 1.5 Live_V - M3 ...	Yes	Y			1	1.2	58	1.5	0		0		0		0		0		0				
202	1.2 Dead + 1.5 Live_V - M3 ...	Yes	Y			1	1.2	59	1.5	0		0		0		0		0		0				
203	1.2 Dead + 1.5 Live_V - M3 ...	Yes	Y			1	1.2	60	1.5	0		0		0		0		0		0				
204	1.2 Dead + 1.5 Live_V - M3 ...	Yes	Y			1	1.2	61	1.5	0		0		0		0		0		0				
205	1.2 Dead + 1.5 Live_V - M3 ...	Yes	Y			1	1.2	62	1.5	0		0		0		0		0		0				
206	1.2 Dead + 1.5 Live_V - M4 ...	Yes	Y			1	1.2	63	1.5	0		0		0		0		0		0				
207	1.2 Dead + 1.5 Live_V - M4 ...	Yes	Y			1	1.2	64	1.5	0		0		0		0		0		0				
208	1.2 Dead + 1.5 Live_V - M4 ...	Yes	Y			1	1.2	65	1.5	0		0		0		0		0		0				

### Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...	Surface(P...
1	Dead	DL		-1			30		3
2	No Ice Wind 0 deg	None					30	44	
3	No Ice Wind 30 deg	None					60	76	
4	No Ice Wind 60 deg	None					60	88	
5	No Ice Wind 90 deg	None					30	38	
6	No Ice Wind 120 deg	None					60	88	
7	No Ice Wind 150 deg	None					60	76	
8	No Ice Wind 180 deg	None					30	44	
9	No Ice Wind 210 deg	None					60	76	
10	No Ice Wind 240 deg	None					60	88	
11	No Ice Wind 270 deg	None					30	38	
12	No Ice Wind 300 deg	None					60	88	
13	No Ice Wind 330 deg	None					60	76	
14	Ice Weight	None					30	45	3



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**Basic Load Cases (Continued)**

BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...	Surface(P...
15 Ice Wind 0 deg	None					30	44	
16 Ice Wind 30 deg	None					60	76	
17 Ice Wind 60 deg	None					60	88	
18 Ice Wind 90 deg	None					30	38	
19 Ice Wind 120 deg	None					60	88	
20 Ice Wind 150 deg	None					60	76	
21 Ice Wind 180 deg	None					30	44	
22 Ice Wind 210 deg	None					60	76	
23 Ice Wind 240 deg	None					60	88	
24 Ice Wind 270 deg	None					30	38	
25 Ice Wind 300 deg	None					60	88	
26 Ice Wind 330 deg	None					60	76	
27 Live Load - A1	None					1		
28 Live Load - A2	None					1		
29 Live Load - A3	None					1		
30 Live Load - A4	None					1		
31 Live Load - B1	None					1		
32 Live Load - B2	None					1		
33 Live Load - B3	None					1		
34 Live Load - B4	None					1		
35 Live Load - C1	None					1		
36 Live Load - C2	None					1		
37 Live Load - C3	None					1		
38 Live Load - C4	None					1		
39 Live Load - M1 (Start)	None					1		
40 Live Load - M1 (Mid...	None					1		
41 Live Load - M1 (End)	None					1		
42 Live Load - M2 (Start)	None					1		
43 Live Load - M2 (Mid...	None					1		
44 Live Load - M2 (End)	None					1		
45 Live Load - M7 (Start)	None					1		
46 Live Load - M7 (Mid...	None					1		
47 Live Load - M7 (End)	None					1		
48 Live Load - M19 (Start)	None					1		
49 Live Load - M19 (Mid...	None					1		
50 Live Load - M19 (End)	None					1		
51 Live Load - M20 (Start)	None					1		
52 Live Load - M20 (Mid...	None					1		
53 Live Load - M20 (End)	None					1		
54 Live Load - M25 (Start)	None					1		
55 Live Load - M25 (Mid...	None					1		
56 Live Load - M25 (End)	None					1		
57 Live Load - M37 (Start)	None					1		
58 Live Load - M37 (Mid...	None					1		
59 Live Load - M37 (End)	None					1		
60 Live Load - M38 (Start)	None					1		
61 Live Load - M38 (Mid...	None					1		
62 Live Load - M38 (End)	None					1		
63 Live Load - M43 (Start)	None					1		
64 Live Load - M43 (Mid...	None					1		
65 Live Load - M43 (End)	None					1		
66 BLC 1 Transient Area...	None						51	
67 BLC 14 Transient Are...	None						51	



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### Envelope Joint Reactions

Joint	X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC		
1	N3	max	1967.177	15	960.766	29	3327.73	22	.676	33	1.624	5	.805	4
2		min	-2696.475	2	77.571	21	-2070.208	11	-.145	5	-1.633	16	-.555	17
3	N35	max	1580.204	15	957.474	33	2226.371	21	.302	3	1.602	13	.746	24
4		min	-2300.221	2	97.12	5	-3481.992	8	-.745	32	-1.607	24	-.512	13
5	N67	max	4237.313	14	956.378	26	2345.387	20	.82	20	1.814	21	.032	15
6		min	-2788.936	3	81.237	15	-2341.836	9	-.809	9	-1.822	8	-.77	26
7	N136	max	1477.227	35	2974.553	35	202.584	11	0	208	0	208	0	208
8		min	-126.452	9	-246.753	11	-2547.892	35	0	1	0	1	0	1
9	N137	max	1470.215	29	2962.933	28	2541.16	28	0	208	0	208	0	208
10		min	-122.423	19	-241.908	19	-198.302	19	0	1	0	1	0	1
11	N138	max	307.831	3	2989.396	32	61.607	21	0	208	0	208	0	208
12		min	-2960.048	32	-324.883	3	-61.539	9	0	1	0	1	0	1
13	Totals:	max	6055.483	15	10944.372	26	6016.649	20						
14		min	-6055.488	2	3106.739	9	-6016.645	9						

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

Member	Shape	Code Check	Loc	LC	Shear	Loc	Dir	LC	phi*Pnc	phi*Pnt	phi*Mn	phi*Mn	Cb	Eqn	
1	A1	P2 STD	.308	79.6	20	.141	79.6	16	14330	33847	1.997	1.997	1	H1-1b	
2	A2	P2 STD	.405	61.8	20	.150	61.8	24	23618	33847	1.997	1.997	2	H1-1b	
3	A3	P2 STD	.461	79.6	12	.096	79.6	8	14330	33847	1.997	1.997	1	H1-1b	
4	A4	P2 STD	.379	79.6	8	.142	79.6	12	14330	33847	1.997	1.997	1	H1-1b	
5	B1	P2 STD	.287	79.6	4	.142	79.6	24	14330	33847	1.997	1.997	2	H1-1b	
6	B2	P2 STD	.374	61.8	4	.158	61.8	8	23618	33847	1.997	1.997	2	H1-1b	
7	B3	P2 STD	.494	79.6	20	.090	79.6	16	14330	33847	1.997	1.997	2	H1-1b	
8	B4	P2 STD	.359	79.6	14	.153	79.6	20	14330	33847	1.997	1.997	2	H1-1b	
9	C1	P2 STD	.292	79.6	14	.151	79.6	8	14330	33847	1.997	1.997	2	H1-1b	
10	C2	P2 STD	.377	61.8	14	.150	61.8	16	23618	33847	1.997	1.997	2	H1-1b	
11	C3	P2 STD	.477	79.6	4	.096	79.6	2	14330	33847	1.997	1.997	1	H1-1b	
12	C4	P2 STD	.354	79.6	24	.146	79.6	4	14330	33847	1.997	1.997	2	H1-1b	
13	M1	L6X3.5X5	.240	13	4	.425	78	z	14	15782	93636	2.872	7.62	1	H2-1
14	M2	HSS4x4x3	.144	0	4	.132	0	z	4	101298	118378	14.115	14.115	1	H1-1b
15	M3	PL7x1/2	.550	8.5	37	.178	8.5	y	24	54633	113400	1.181	16.538	1	H1-1b
16	M4	PL7x1/2	.144	1	34	.128	0	y	12	113113	113400	1.181	16.538	1	H1-1b
17	M5	PL7x1/2	.130	1	26	.177	0	y	20	113113	113400	1.181	16.538	1	H1-1b
18	M7	L5X3.5X4	.601	34	26	.047	34	z	26	40568	67068	2.629	7.156	1	H2-1
19	M9	PL5x3/8	.226	5	35	.030	5	y	36	54296	60750	.475	6.328	1	H1-1b
20	M10	PL5x3/8	.221	0	26	.029	0	y	26	54296	60750	.475	6.328	1	H1-1b
21	M19	L6X3.5X5	.264	13	14	.432	74.75	z	20	15782	93636	2.872	7.586	1	H2-1
22	M20	HSS4x4x3	.142	0	12	.133	0	z	12	101298	118378	14.115	14.115	2	H1-1b
23	M21	PL7x1/2	.554	8.5	29	.191	8.5	y	8	54633	113400	1.181	16.538	1	H1-1b
24	M22	PL7x1/2	.145	1	26	.147	0	y	20	113113	113400	1.181	16.538	1	H1-1b
25	M23	PL7x1/2	.129	1	29	.157	0	y	4	113113	113400	1.181	16.538	1	H1-1b
26	M25	L5X3.5X4	.597	34	29	.047	34	z	30	40568	67068	2.629	7.15	1	H2-1
27	M27	PL5x3/8	.224	5	27	.030	5	y	29	54296	60750	.475	6.328	1	H1-1b
28	M28	PL5x3/8	.217	0	30	.029	0	y	31	54296	60750	.475	6.328	1	H1-1b
29	M37	L6X3.5X5	.262	13	20	.412	81.25	z	8	15782	93636	2.872	7.591	1	H2-1
30	M38	HSS4x4x3	.157	0	20	.146	0	z	20	101298	118378	14.115	14.115	1	H1-1b
31	M39	PL7x1/2	.551	8.5	33	.178	8.5	y	16	54633	113400	1.181	16.538	1	H1-1b
32	M40	PL7x1/2	.144	1	29	.139	0	y	4	113113	113400	1.181	16.538	1	H1-1b
33	M41	PL7x1/2	.128	1	33	.172	0	y	12	113113	113400	1.181	16.538	1	H1-1b
34	M43	L5X3.5X4	.596	34	35	.047	34	z	35	40568	67068	2.629	7.162	1	H2-1
35	M45	PL5x3/8	.223	5	31	.030	5	y	32	54296	60750	.475	6.328	1	H1-1b
36	M46	PL5x3/8	.219	0	35	.029	0	y	35	54296	60750	.475	6.328	1	H1-1b
37	M55F	P2 STD	.306	78	4	.224	13	z	2	6180.163	33847	1.997	1.997	1	H1-1b



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

Member	Shape	Code Check	Loc	LC	Shear	Loc	Dir	LC	phi*	Pnc	phi*	Pnt	phi*	Mn	phi*	Mn	Cb	Eqn
38	M57	P2 STD		.321	78	8	.216	13		106180.16333847...	1.997	1.997	1...	H1-1b				
39	M60	P2 STD		.325	78	20	.218	13		186180.16333847...	1.997	1.997	1...	H1-1b				
40	M68	L2x2x4		.747	0	20	.112	0	y	8 27631....	30585.6	.691	1.577	2...	H2-1			
41	M69	L2x2x4		.758	0	2	.105	0	y	1627631....	30585.6	.691	1.577	1...	H2-1			
42	M70	L2x2x4		.714	17	10	.105	1.24	z	2427631....	30585.6	.691	1.577	1...	H2-1			
43	M71	LL2.5x2.5x...		.134	84.0	.35	.003	0	y	3531216....	58320	3.954	2.112	1...	H1-1b*			
44	M72	LL2.5x2.5x...		.134	84.0	.28	.003	0	y	2931216....	58320	3.954	2.112	1...	H1-1b*			
45	M73	LL2.5x2.5x...		.135	84.0	.32	.004	0	y	3231216....	58320	3.954	2.112	1	H1-1b*			

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

Member	Shape	Code Check Actual	Code Check Allowable	Ratio (Act./Allow.)	Loc[in]	LC	Shear Check	Shear Check Allowable	Ratio (Act./Allow.)	Loc[in]	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Egn	
1	A1	P2 STD	0.308	1.05	0.293*	79.69	20	0.141	1.05	0.134*	79.69	14330.745	33847.742	1.997	1.997	1.7	H1-1b
2	A2	P2 STD	0.405	1.05	0.386*	61.88	20	0.15	1.05	0.143*	61.88	23618.423	33847.742	1.997	1.997	2.473	H1-1b
3	A3	P2 STD	0.461	1.05	0.439*	79.69	12	0.096	1.05	0.091*	79.69	14330.745	33847.742	1.997	1.997	1.659	H1-1b
4	A4	P2 STD	0.379	1.05	0.361*	79.69	8	0.142	1.05	0.135*	79.69	14330.745	33847.742	1.997	1.997	1.843	H1-1b
5	B1	P2 STD	0.287	1.05	0.273*	79.69	4	0.142	1.05	0.135*	79.69	14330.745	33847.742	1.997	1.997	2.258	H1-1b
6	B2	P2 STD	0.374	1.05	0.356*	61.88	4	0.158	1.05	0.15*	61.88	23618.423	33847.742	1.997	1.997	2.436	H1-1b
7	B3	P2 STD	0.494	1.05	0.47*	79.69	20	0.09	1.05	0.086*	79.69	14330.745	33847.742	1.997	1.997	2.321	H1-1b
8	B4	P2 STD	0.359	1.05	0.342*	79.69	14	0.153	1.05	0.146*	79.69	14330.745	33847.742	1.997	1.997	2.114	H1-1b
9	C1	P2 STD	0.292	1.05	0.278*	79.69	14	0.151	1.05	0.144*	79.69	14330.745	33847.742	1.997	1.997	2.007	H1-1b
10	C2	P2 STD	0.377	1.05	0.359*	61.88	14	0.15	1.05	0.143*	61.88	23618.423	33847.742	1.997	1.997	2.457	H1-1b
11	C3	P2 STD	0.477	1.05	0.454*	79.69	4	0.096	1.05	0.091*	79.69	14330.745	33847.742	1.997	1.997	1.957	H1-1b
12	C4	P2 STD	0.354	1.05	0.337*	79.69	24	0.146	1.05	0.139*	79.69	14330.745	33847.742	1.997	1.997	2.314	H1-1b
13	M1	L6X3.5X5	0.24	1.05	0.229*	13	4	0.425	1.05	0.405*	78	15782.624	93636	2.872	7.62	1.372	H2-1
14	M2	HSS4x4x3/16	0.144	1.05	0.137*	0	4	0.132	1.05	0.126*	0	101298.11	118378.13	14.115	14.115	1.766	H1-1b
15	M3	PL7x1/2	0.55	1.05	0.524*	8.5	37	0.178	1.05	0.17*	8.5	54633.166	113400	1.181	16.538	1.371	H1-1b
16	M4	PL7x1/2	0.144	1.05	0.137*	1	34	0.128	1.05	0.122*	0	113113.81	113400	1.181	16.538	1.097	H1-1b
17	M5	PL7x1/2	0.13	1.05	0.124*	1	26	0.177	1.05	0.169*	0	113113.81	113400	1.181	16.538	1.111	H1-1b
18	M7	L5X3.5X4	0.601	1.05	0.572*	34	26	0.047	1.05	0.045*	34	40568.853	67068	2.629	7.156	1.305	H2-1
19	M9	PL5x3/8	0.226	1.05	0.215*	5	35	0.03	1.05	0.029*	5	54296.551	60750	0.475	6.328	1.648	H1-1b
20	M10	PL5x3/8	0.221	1.05	0.21*	0	26	0.029	1.05	0.028*	0	54296.551	60750	0.475	6.328	1.71	H1-1b
21	M19	L6X3.5X5	0.264	1.05	0.251*	13	14	0.432	1.05	0.411*	74.75	15782.624	93636	2.872	7.586	1.361	H2-1
22	M20	HSS4x4x3/16	0.142	1.05	0.135*	0	12	0.133	1.05	0.127*	0	101298.11	118378.13	14.115	14.115	2.162	H1-1b
23	M21	PL7x1/2	0.554	1.05	0.528*	8.5	29	0.191	1.05	0.182*	8.5	54633.166	113400	1.181	16.538	1.381	H1-1b
24	M22	PL7x1/2	0.145	1.05	0.138*	1	26	0.147	1.05	0.14*	0	113113.81	113400	1.181	16.538	1.1	H1-1b
25	M23	PL7x1/2	0.129	1.05	0.123*	1	29	0.157	1.05	0.15*	0	113113.81	113400	1.181	16.538	1.09	H1-1b
26	M25	L5X3.5X4	0.597	1.05	0.569*	34	29	0.047	1.05	0.045*	34	40568.853	67068	2.629	7.15	1.298	H2-1
27	M27	PL5x3/8	0.224	1.05	0.213*	5	27	0.03	1.05	0.029*	5	54296.551	60750	0.475	6.328	1.67	H1-1b
28	M28	PL5x3/8	0.217	1.05	0.207*	0	30	0.029	1.05	0.028*	0	54296.551	60750	0.475	6.328	1.746	H1-1b
29	M37	L6X3.5X5	0.262	1.05	0.25*	13	20	0.412	1.05	0.392*	81.25	15782.624	93636	2.872	7.591	1.362	H2-1
30	M38	HSS4x4x3/16	0.157	1.05	0.15*	0	20	0.146	1.05	0.139*	0	101298.11	118378.13	14.115	14.115	1.892	H1-1b
31	M39	PL7x1/2	0.551	1.05	0.525*	8.5	33	0.178	1.05	0.17*	8.5	54633.166	113400	1.181	16.538	1.379	H1-1b
32	M40	PL7x1/2	0.144	1.05	0.137*	1	29	0.139	1.05	0.132*	0	113113.81	113400	1.181	16.538	1.124	H1-1b
33	M41	PL7x1/2	0.128	1.05	0.122*	1	33	0.172	1.05	0.164*	0	113113.81	113400	1.181	16.538	1.09	H1-1b
34	M43	L5X3.5X4	0.596	1.05	0.568*	34	35	0.047	1.05	0.045*	34	40568.853	67068	2.629	7.162	1.311	H2-1
35	M45	PL5x3/8	0.223	1.05	0.212*	5	31	0.03	1.05	0.029*	5	54296.551	60750	0.475	6.328	1.701	H1-1b
36	M46	PL5x3/8	0.219	1.05	0.209*	0	35	0.029	1.05	0.028*	0	54296.551	60750	0.475	6.328	1.725	H1-1b
37	M55F	P2 STD	0.306	1.05	0.291*	78	4	0.224	1.05	0.213*	13	6180.163	33847.742	1.997	1.997	1.405	H1-1b
38	M57	P2 STD	0.321	1.05	0.306*	78	8	0.216	1.05	0.206*	13	6180.163	33847.742	1.997	1.997	1.374	H1-1b
39	M60	P2 STD	0.325	1.05	0.31*	78	20	0.218	1.05	0.208*	13	6180.163	33847.742	1.997	1.997	1.39	H1-1b
40	M68	L2x2x4	0.747	1.05	0.711*	0	20	0.112	1.05	0.107*	0	27631.173	30585.6	0.691	1.577	2.17	H2-1
41	M69	L2x2x4	0.758	1.05	0.722*	0	2	0.105	1.05	0.1*	0	27631.173	30585.6	0.691	1.577	1.381	H2-1
42	M70	L2x2x4	0.714	1.05	0.68*	17	10	0.105	1.05	0.1*	1.24	27631.173	30585.6	0.691	1.577	1.36	H2-1
43	M71	LL2.5x2.5x3x3	0.134	1.05	0.128*	84.01	35	0.003	1.05	0.003*	0	31216.071	58320	3.954	2.112	1.136	H1-1b*
44	M72	LL2.5x2.5x3x3	0.134	1.05	0.128*	84.01	28	0.003	1.05	0.003*	0	31216.071	58320	3.954	2.112	1.136	H1-1b*
45	M73	LL2.5x2.5x3x3	0.135	1.05	0.129*	84.01	32	0.004	1.05	0.004*	0	31216.071	58320	3.954	2.112	1	H1-1b*

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



**APPENDIX D**  
**ADDITIONAL CALCULATIONS**



**TIA-222-H CONNECTION CHECK**  
**Mount to Tower Connection - Typ. All Sectors**  
**2021777.876368.01**

Bolt Information	
Bolt Diameter (d)	0.625 in
Net Tensile Area (A <sub>n</sub> )	0.226 in <sup>2</sup>
# of Bolts Total (n)	4
Bolt Distance Up-Down	6.5 in
Bolt Distance Left-Right	6.5 in
Bolt Grade	A325N
Bolt Tensile Strength (F <sub>ub</sub> )	120 ksi

Flange Information	
Height (h)	8.5 in
Width (w)	8.5 in
Thickness (t)	0.75 in
Steel Grade	A36
Plate Yield Strength (F <sub>y</sub> )	36 ksi
Support Arm Height	4 in
Support Arm Width	4 in

RISA 3D Reactions (Up-Down)	
Moment (M)	0.66 k-ft
Axial (T)	2.96 kips
Shear (V)	0.87 kips

RISA 3D Reactions (Left-Right)	
Moment (M)	1.81 k-ft
Axial (T)	1.00 kips
Shear (V)	2.38 kips

Bolt Capacity (Up-Down)	
Nominal Tensile Strength (R <sub>nt</sub> )	27.120 kips
Nominal Shear Strength (R <sub>nv</sub> )	18.41 kips
Bolt Tensile Force (T <sub>ub</sub> )	1.35 kips
Bolt Shear Force (V <sub>ub</sub> )	0.218 kips
T <sub>ub</sub> /φR <sub>nt</sub>	0.06319
V <sub>ub</sub> /φR <sub>nv</sub>	0.01506
(V <sub>ub</sub> /φR <sub>nv</sub> ) <sup>2</sup> +(T <sub>ub</sub> /φR <sub>nt</sub> ) <sup>2</sup>	0.00443
<b>Bolt Capacity =</b>	<b>6.3% OK</b>

Bolt Capacity (Left-Right)	
Nominal Tensile Strength (R <sub>nt</sub> )	27.120 kips
Nominal Shear Strength (R <sub>nv</sub> )	18.41 kips
Bolt Tensile Force (T <sub>ub</sub> )	1.92 kips
Bolt Shear Force (V <sub>ub</sub> )	0.596 kips
T <sub>ub</sub> /φR <sub>nt</sub>	0.08999
V <sub>ub</sub> /φR <sub>nv</sub>	0.04113
(V <sub>ub</sub> /φR <sub>nv</sub> ) <sup>2</sup> +(T <sub>ub</sub> /φR <sub>nt</sub> ) <sup>2</sup>	0.01028
<b>Bolt Capacity =</b>	<b>9.0% OK</b>

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

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

Plate Capacity (Up-Down)	
Bolt Circle (D <sub>BC</sub> )	9.192 in
Effective Width (B <sub>eff</sub> )	8.28 in
Flexural Moment (M <sub>u</sub> )	3.37 k-in
Flexural Strength (φM <sub>n</sub> )	37.71 k-in
<b>Plate Capacity=</b>	<b>8.5% OK</b>

Plate Capacity (Left-Right)	
Bolt Circle (D <sub>BC</sub> )	9.192 in
Effective Width (B <sub>eff</sub> )	8.28 in
Flexural Moment (M <sub>u</sub> )	4.81 k-in
Flexural Strength (φM <sub>n</sub> )	37.71 k-in
<b>Plate Capacity=</b>	<b>12.1% OK</b>

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

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



**TIA-222-H CONNECTION CHECK**  
**Kicker to Tower Connection - Typ. All Sectors**  
**2021777.876368.01**

Bolt Information		
Bolt Diameter (d)	0.625	in
Net Tensile Area (A <sub>n</sub> )	0.226	in <sup>2</sup>
# of Bolts Total (n)	4	
Bolt Distance Up-Down	6	in
Bolt Distance Left-Right	6	in
Bolt Grade	A325N	
Bolt Tensile Strength (F <sub>ub</sub> )	120	ksi

RISA 3D Reactions		
Moment (M)	0.00	k-ft
Axial (T)	-2.96	kips
Shear (V)	2.99	kips

Bolt Capacity		
Nominal Tensile Strength (R <sub>nt</sub> )	27.120	kips
Nominal Shear Strength (R <sub>nv</sub> )	18.41	kips
Bolt Tensile Force (T <sub>ub</sub> )	-0.74	kips
Bolt Shear Force (V <sub>ub</sub> )	0.747	kips
$T_{ub}/\phi R_{nt}$	-0.03465	
$V_{ub}/\phi R_{nv}$	0.05156	
$(V_{ub}/\phi R_{nv})^2 + (T_{ub}/\phi R_{nt})^2$	0.00405	
<b>Bolt Capacity =</b>	5.2%	OK

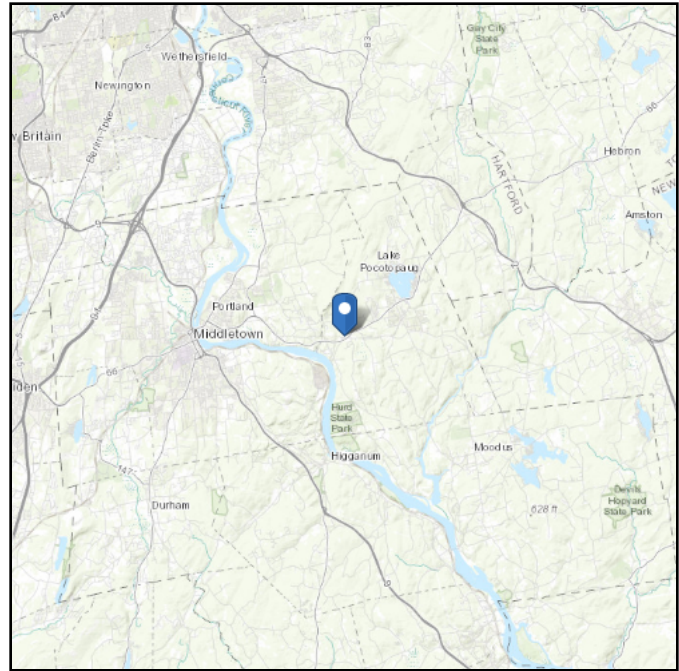
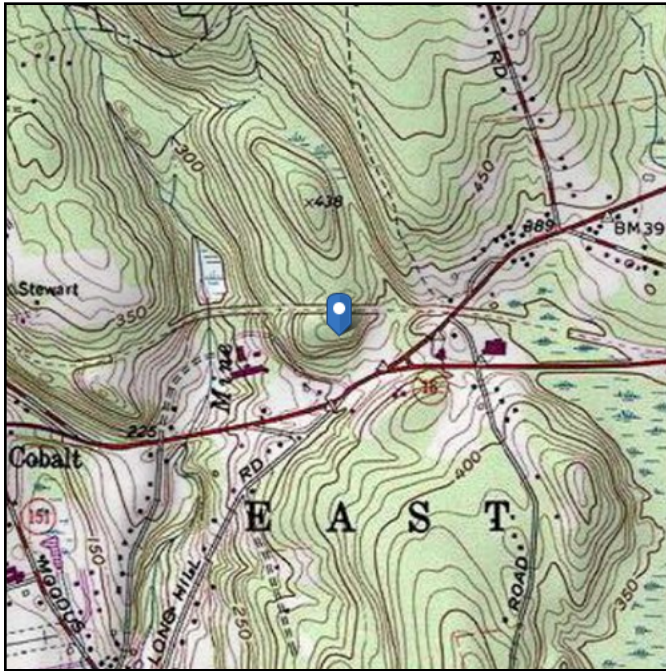
\*Rating per TIA-222-H, Section 15.5

# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

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

**Elevation:** 378.98 ft (NAVD 88)  
**Latitude:** 41.564761  
**Longitude:** -72.543106



## Wind

### Results:

Wind Speed:	130 Vmph
10-year MRI	78 Vmph
25-year MRI	87 Vmph
50-year MRI	95 Vmph
100-year MRI	103 Vmph

**Data Source:** ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014

**Date Accessed:** Wed Feb 03 2021

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

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

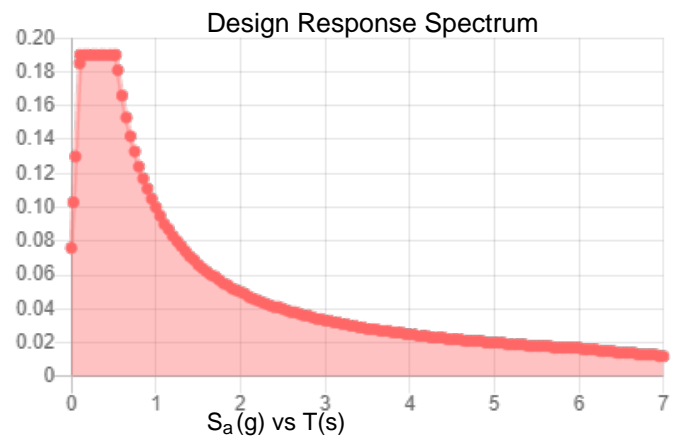
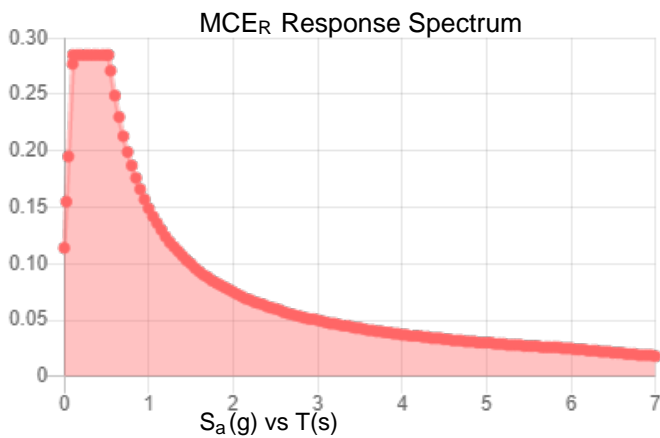
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

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

**Results:**

$S_s$ :	0.178	$S_{DS}$ :	0.19
$S_1$ :	0.062	$S_{D1}$ :	0.1
$F_a$ :	1.6	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.09
$S_{MS}$ :	0.285	$PGA_M$ :	0.144
$S_{M1}$ :	0.149	$F_{PGA}$ :	1.6
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:**

Wed Feb 03 2021

**Date Source:**

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

## Ice

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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:** Wed Feb 03 2021

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

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

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

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# Exhibit F

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

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

T-Mobile Existing Facility

Site ID: CTHA696A

I Public Works Drive  
East Haven, Connecticut 06032

**April 1, 2021**

**EBI Project Number: 6221001506**

<b>Site Compliance Summary</b>	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>11.64%</b>



April 1, 2021

T-Mobile

Attn: Jason Overbey, RF Manager  
35 Griffin Road South  
Bloomfield, Connecticut 06002

Emissions Analysis for Site: CTHA696A

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **1 Public Works Drive in East Haven, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The number of  $\mu\text{W}/\text{cm}^2$  calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

## **CALCULATIONS**

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 1 Public Works Drive in East Haven, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower. For power density calculations, the broadcast footprint of the AIR6449 antenna has been considered. Due to the beamforming nature of this antenna, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

For all calculations, all equipment was calculated using the following assumptions:

- 1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.
- 3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 5) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

- 6) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 7) 1 LTE channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.
- 8) 1 NR channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.
- 9) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 10) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 11) The antennas used in this modeling are the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector A, the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector B, the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

- 12) The antenna mounting height centerline of the proposed antennas is 178 feet above ground level (AGL).
- 13) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 14) All calculations were done with respect to uncontrolled / general population threshold limits.

## T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20
Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	178 feet	Height (AGL):	178 feet	Height (AGL):	178 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna AI MPE %:	0.57%	Antenna BI MPE %:	0.57%	Antenna CI MPE %:	0.57%
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd
Height (AGL):	178 feet	Height (AGL):	178 feet	Height (AGL):	178 feet
Channel Count:	11	Channel Count:	11	Channel Count:	11
Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts
ERP (W):	12,569.87	ERP (W):	12,569.87	ERP (W):	12,569.87
Antenna A2 MPE %:	2.22%	Antenna B2 MPE %:	2.22%	Antenna C2 MPE %:	2.22%
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	17.3 dBd / 17.3 dBd	Gain:	17.3 dBd / 17.3 dBd	Gain:	17.3 dBd / 17.3 dBd
Height (AGL):	178 feet	Height (AGL):	178 feet	Height (AGL):	178 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	12,888.76	ERP (W):	12,888.76	ERP (W):	12,888.76
Antenna A3 MPE %:	1.57%	Antenna B3 MPE %:	1.57%	Antenna C3 MPE %:	1.57%

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	4.36%
Sprint	1.89%
Town (PD-455)	0%
Town (Austin APC)	0.14%
AT&T	1.42%
Verizon	3.47%
Nextel	0.36%
<b>Site Total MPE % :</b>	<b>11.64%</b>

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	4.36%
T-Mobile Sector B Total:	4.36%
T-Mobile Sector C Total:	4.36%
Site Total MPE % :	11.64%

### T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
T-Mobile 2100 MHz LTE	2	2334.27	178.0	5.67	2100 MHz LTE	1000	0.57%
T-Mobile 600 MHz LTE	2	591.73	178.0	1.44	600 MHz LTE	400	0.36%
T-Mobile 600 MHz NR	1	1577.94	178.0	1.92	600 MHz NR	400	0.48%
T-Mobile 700 MHz LTE	2	695.22	178.0	1.69	700 MHz LTE	467	0.36%
T-Mobile 1900 MHz GSM	4	1052.26	178.0	5.11	1900 MHz GSM	1000	0.51%
T-Mobile 1900 MHz LTE	2	2104.51	178.0	5.11	1900 MHz LTE	1000	0.51%
T-Mobile 2500 MHz LTE	1	6444.38	178.0	7.83	2500 MHz LTE	1000	0.78%
T-Mobile 2500 MHz NR	1	6444.38	178.0	7.83	2500 MHz NR	1000	0.78%
						<b>Total:</b>	<b>4.36%</b>

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

## Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	4.36%
Sector B:	4.36%
Sector C:	4.36%
T-Mobile Maximum MPE % (Sector A):	4.36%
Site Total:	11.64%
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **11.64%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.