



May 10, 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# 876405; T-Mobile Site ID# CTNH450A
186 Minortown Road, Woodbury, CT 06798
Latitude: 41° 34' 4.79"/ Longitude: -73° 10' 46.85"**

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 102-foot mount on the existing 110' foot Monopole Tower located at 186 Minortown Road in Woodbury. The property is owned by Raymond Hardisty 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. T-Mobile is also proposing mount modifications as shown on the enclosed Mount Analysis.

Planned Modifications:

Tower:

Remove and Replace:

(3) RFS – APXVSPP18-C-A20 Antennas (**REMOVE**) - (3) RFS – APX16DWV-16DWV-S-E-A20 Antennas (**REPLACE**)

(3) RFS – APXTM14-C-120 Antennas (**REMOVE**) – (3) RFS – APXVAALL24_43-U-NA20 Antennas (**REPLACE**)

(1) Sprint antenna platform mount (**REMOVE**) – (1) T-Mobile antenna platform mount (**REPLACE**)

Install New:

(3) Ericsson 4449 B71+B85 radios

(3) Ericsson 4424 B25 radios

(3) Ericsson 4415 B66A radios

(3) AIR6449 B41 Antennas

(3) hybrid cables

Remove:

(9) Sprint RRUs

Ground:

Install New:

- (1) SSC 6160 cabinet
- (1) B160 battery cabinet

Remove:

- (1) Sprint BBU cabinet
- (1) Sprint MMBS cabinet

This facility was approved by the Connecticut Siting Council in Docket No. 235 on June 19, 2003 and on July 13, 2004 in Petition No. 678 the Council approved a ten-foot extension in height to the tower. These approvals were given with conditions that this exempt modification 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 Barbara Perkinson, First Selectman for the Town of Woodbury, and Maryellen Edwards, Town Planner for the Town of Woodbury. A copy is also being sent to the property owner.

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



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

cc:

Barbara Perkinson, First Selectman (*via email only to barbaraperkinson@woodburyct.org*)
281 Main Street South
Woodbury, CT 06798
203-263-2141

Maryellen Edwards, Town Planner (*via email only to medwards@woodburyct.org*)
281 Main Street South
Woodbury, CT 06798
203-263-3467

Raymond Hardisty
200 Minortown Road
Woodbury, CT 06798

Zajac, Richard

From: Zajac, Richard
Sent: Monday, May 10, 2021 2:20 PM
To: barbaraperkinson@woodburyct.org
Subject: Connecticut Siting Council exempt modification application notification
Attachments: CSC Exempt Modification Application - 186 Minortown Road.pdf

Good afternoon,

Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 186 Minortown Road in Woodbury.

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

Thank you,

RICH ZAJAC

Site Acquisition Specialist

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

F: (724) 416-4461

CROWN CASTLE

4545 East River Road, Suite 320

West Henrietta, NY 14586

Zajac, Richard

From: Zajac, Richard
Sent: Monday, May 10, 2021 2:21 PM
To: medwards@woodburyct.org
Subject: Connecticut Siting Council exempt modification application notification
Attachments: CSC Exempt Modification Application - 186 Minortown Road.pdf

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CROWN CASTLE

4545 East River Road, Suite 320

West Henrietta, NY 14586

(585) 445-5896

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

SHIP DATE: 10MAY21
ACT WGT: 1.00 LB
CAD: 112911364INET4340

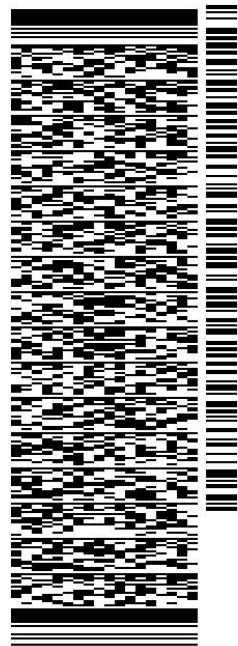
BILL SENDER

TO **RAYMOND HARDISTY**

200 MINORTOWN ROAD

WOODBURY CT 06798

(585) 445-5896 REF: 799001 7690
INV/ PO: DEPT:



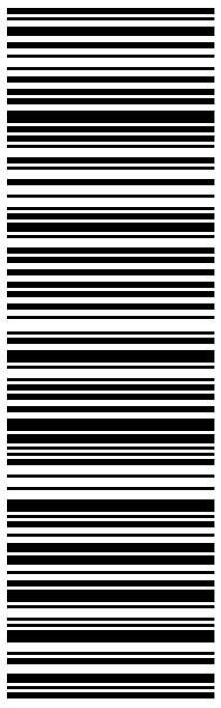
56DJ371DC/FE4A

TRK# 7736 7920 2698
0201

TUE - 11 MAY 4:30P
STANDARD OVERNIGHT

XE HFDA

06798
CT-US BDL



After printing this label:

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

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

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

Exhibit A

Original Facility Approval

Connecticut Siting Council

Decisions

DOCKET NO. 235 - Sprint Spectrum L.P. application for a } Connecticut
Certificate of Environmental Compatibility and Public Need }
for the construction, maintenance and operation of a } Siting
wireless telecommunications facility at 186 Minortown }
Road or Main Street North, North Woodbury, Connecticut. } Council

June 19, 2003

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. d/b/a Sprint PCS for the construction, maintenance and operation of a wireless telecommunications facility at 186 Minortown Road, Woodbury, Connecticut. The Council denies certification of Site B located at Main Street North, Woodbury, 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 no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of Sprint PCS, AT&T Wireless PCS, LLC and other entities, both public and private, but such tower shall not exceed a height of 100 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. Visual simulations of the monopole and stealth options for a 100-foot tower at the site including a flagpole and tree tower;
 - b. a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas, equipment building, access road, utility line, and landscaping; and
 - c. construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.
3. 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 ensure a recalculated report of electromagnetic radio frequency power density is submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.
4. 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.
5. 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.

6. If the facility does not initially provide wireless services within one year of completion of construction or ceases to provide wireless services for a period of one year, 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.
7. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.
8. 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 Waterbury Republican American, and Voices Sunday – The Weekly Star.

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, Esq.
Brown Rudnick Berlack Israels LLP
CityPlace I, 38th Floor
185 Asylum Street
Hartford, CT 06103-6522
860-509-6522

Intervenor

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

Its Representative

Daniel F. Leary, Esq.
Cuddy & Feder LLP
90 Maple Avenue
White Plains, New York 10601
(914) 761-1300

Party

Anthony J. Vallillo

Connecticut Siting Council

Petition Staff Reports

Petition No. 678 - Project Summary

Cellco Partnership

North Woodbury, Connecticut

July 13, 2004

Introduction

Cellco Partnership d/b/a as Verizon Wireless (Cellco) seeks to extend the height of a Sprint Spectrum L.P. (Sprint) owned 100-foot monopole located in North Woodbury, Connecticut. The existing tower was approved by the Council on June 19, 2003 under Docket 235. The tower currently supports the antennas of Sprint (100-foot centerline) and AT&T Wireless PCS LLC (90-foot centerline). Cellco is seeking a declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the tower extension. A copy of the Petition was provided to the Town. Additionally, Cellco contacted the First Selectman to discuss the proposal. The Town has no comment on the proposed tower extension. Abutting property owners were also notified of the proposed extension. No abutters commented on the proposal.

Proposed Modification

Cellco seeks to extend the height of the approved tower from 100 feet to 110 feet. Cellco would install three flush mounted PCS panel antennas a centerline height of 110 feet, bringing the total height of the facility to 112 feet above ground level. Cellco would expand the compound by 20 feet to the north to accommodate a 12-foot by 30-foot equipment shelter. The proposed compound expansion is within Sprint's 100-foot by 100-foot lease area and would require minimal grading. Additional site clearing would not be required.

Visibility Impact

Extending the tower from 100 feet agl to 110 feet agl would increase visibility from 27-acres to 34-acres within a two-mile radius of the site, mainly as a result of the expansion of existing areas with visibility. In addition, approximately 4 acres of seasonal visibility would occur from the open areas immediately southeast of the site. The extended tower would be seasonally visible from 0.2 miles of North Main Street, 0.1 miles of Minortown Road, and 0.2 miles of Middle Road Turnpike.

Power Density

The conservative worst-case approximation of electromagnetic radiofrequency emissions for telecommunications operations at the site would increase from 22.4% to 24.2% of the applicable standard for uncontrolled environments.

Exhibit B

Property Card



Town of Woodbury, CT

Property Listing Report

Map Block Lot

025-036

Building #

Unique Identifier

346710

Property Information

Property Location	186 MINORTOWN RD
Mailing Address	PMB 331 MC MURRAY PA 15317
Land Use	Broadcasting Facility
Zoning Code	OS60
Neighborhood	26

Owner	HARDISTY RAYMOND A
Co-Owner	
Book / Page	281/ 769
Land Class	Commercial
Census Tract	3621
Acreage	1.38

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	0	0
Outbuildings	274238	191970
Land	131100	91770
Total	405338	0

Utility Information

Electric	No
Gas	No
Sewer	No
Public Water	No
Well	No



Primary Construction Details

Year Built	
Building Desc.	
Building Style	
Stories	
Exterior Walls	
Exterior Walls 2	
Interior Walls	
Interior Walls 2	
Interior Floors 1	
Interior Floors 2	

Heating Fuel	
Heating Type	
AC Type	
Bedrooms	
Full Bathrooms	
Half Bathrooms	
Extra Fixtures	
Total Rooms	
Bath Style	
Kitchen Style	
Occupancy	

Building Use	
Building Condition	
Frame Type	
Fireplaces	
Bsmt Gar	
Fin Bsmt Area	
Fin Bsmt Quality	
Building Grade	
Roof Style	
Roof Cover	

Report Created On

5/10/2021

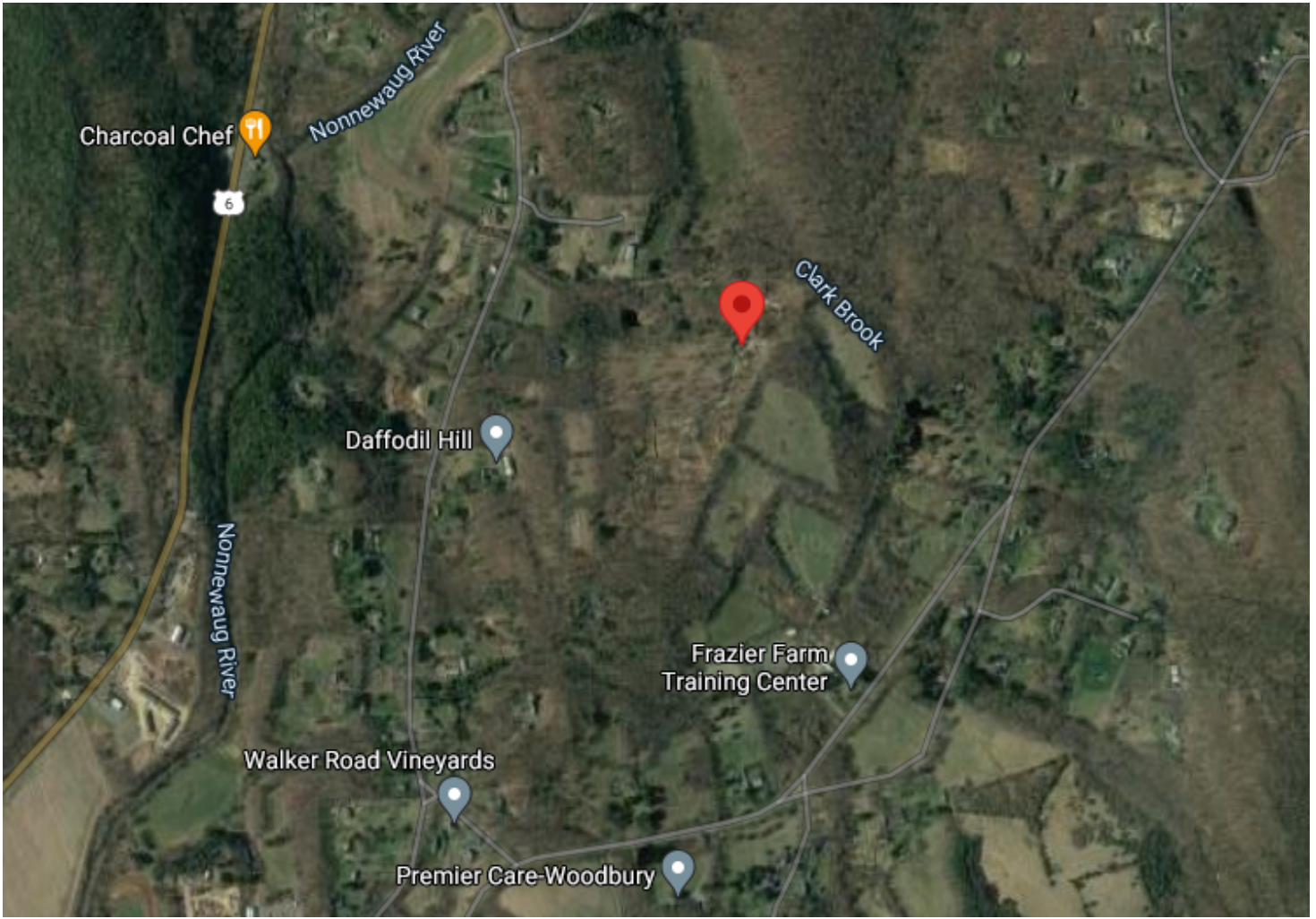


Exhibit C

Construction Drawings



T-MOBILE SITE NUMBER: CTNH450A
T-MOBILE SITE NAME: CTNH450A
SITE TYPE: MONOPOLE
TOWER HEIGHT: 110'-0"

BUSINESS UNIT #: 876405
SITE ADDRESS: 186 MINORTOWN WOODBURY, CT 06798
COUNTY: LITCHFIELD
JURISDICTION: TOWN OF WOODBURY

T-MOBILE SPRINT RETAIN SITE CONFIGURATION: TBD

T-Mobile
 35 GRIFFIN ROAD
 BLOOMFIELD, CT 06002

CROWN CASTLE
 1500 CORPORATE DRIVE
 CANONSBURG, PA 15317

INFINIGY
 FROM ZERO TO INFINIGY
 the solutions are endless
 1033 Watervliet Shaker Rd | Albany, NY 12205
 Phone: 518-690-0790 | Fax: 518-690-0793
 www.infinigy.com

T-MOBILE SITE NUMBER: CTNH450A
BU #: 876405
WOODBURY NORTH
 186 MINORTOWN
 WOODBURY, CT 06798
 EXISTING 110'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	04/29/21	RCD	FINAL	SS

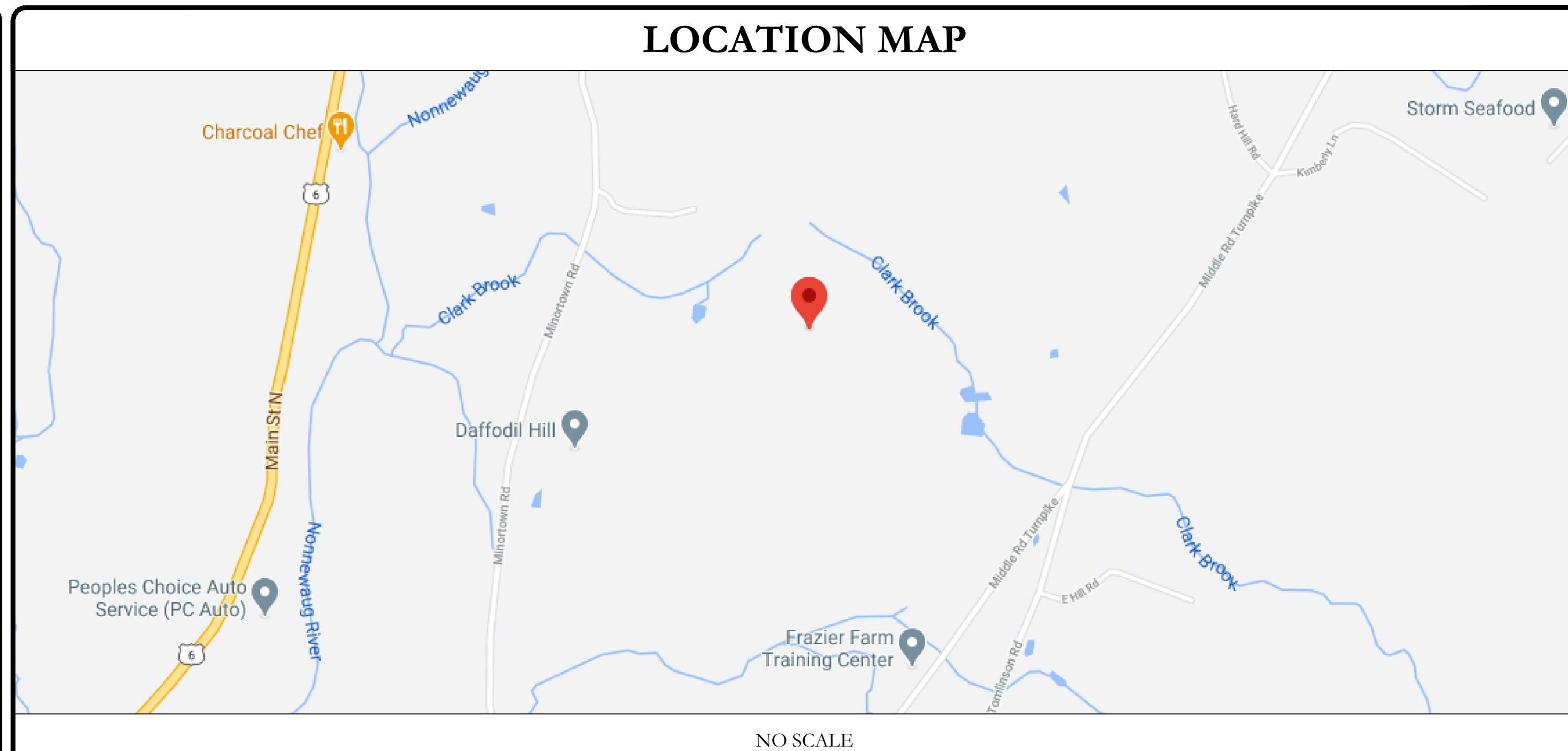
SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	WOODBURY NORTH
SITE ADDRESS:	186 MINORTOWN WOODBURY, CT 06798
COUNTY:	LITCHFIELD
MAP/PARCEL #:	MAP/BLOCK: 025-036 PARCEL 346700
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.567997° (41° 34' 04.79")
LONGITUDE:	-73.179681° (-73° 10' 46.85")
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	459.3 FT
CURRENT ZONING:	OS60
JURISDICTION:	TOWN OF WOODBURY
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	CROWN CASTLE USA 2000 CORPORATE DRIVE CANONSBURG, PA
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 35 GRIFFIN ROAD BLOOMFIELD, CT 06002
ELECTRIC PROVIDER:	TBD
TELCO PROVIDER:	TBD

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1	SITE PLAN & ENLARGED SITE PLAN
C-2	FINAL ELEVATION & ANTENNA PLANS
C-3	ANTENNA & CABLE SCHEDULE
C-4	PLUMBING DIAGRAM
C-5	EQUIPMENT SPECS
C-6	EQUIPMENT SPECS
S-1	MOUNT ANALYSIS DETAIL
E-1	AC PANEL SCHEDULES & ONE LINE DIAGRAM
G-1	ANTENNA GROUNDING DIAGRAM
G-2	GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR ----. 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.



PROJECT TEAM

A&E FIRM:	INFINIGY ENGINEERING, PLLC 1033 WATERVLIET SHAKER RD. ALBANY, NY 12205
CROWN CASTLE USA INC. DISTRICT CONTACTS:	1500 CORPORATE DRIVE CANONSBURG, PA 15317
	TBD - PROJECT MANAGER
	TBD - CONSTRUCTION MANAGER

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 (6) ANTENNAS
- REMOVE (9) RRHs
- REMOVE (1) ANTENNA PLATFORM MOUNT
- REMOVE (1) RRH MOUNT
- REMOVE (3) HYBRID CABLES
- INSTALL (9) ANTENNAS
- INSTALL (9) RRHs
- INSTALL (4) HYBRID CABLES
- INSTALL (1) ANTENNA PLATFORM MOUNT

GROUND SCOPE OF WORK:

- REMOVE (1) MMBS EQUIPMENT CABINET
- REMOVE (1) BBU EQUIPMENT CABINET
- INSTALL (1) 6160 & (1) B160 BATTERY CABINETS

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

APPLICABLE CODES/REFERENCE DOCUMENTS

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

CODE TYPE	CODE
BUILDING	2018 CT STATE BUILDING CODE
MECHANICAL	2015 IMC
ELECTRICAL	2017 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS: BY OTHERS
DATED:

MOUNT ANALYSIS: GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION
DATED: 03/10/2021

RFDS REVISION: N/A
DATED: N/A

ORDER ID: 538759
REVISION: 1

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

APPROVALS

APPROVAL	SIGNATURE	DATE
PROPERTY OWNER OR REP.	_____	_____
LAND USE PLANNER	_____	_____
T-MOBILE	_____	_____
OPERATIONS	_____	_____
RF	_____	_____
NETWORK	_____	_____
BACKHAUL	_____	_____
CONSTRUCTION MANAGER	_____	_____

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.

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
------------------------------------	------------------------------

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

- 1. NOTICE TO PROCEED- NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800-788-7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
2. "LOOK UP" - CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT: THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR...
21. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GREENFIELD GROUNDING NOTES:

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

GENERAL NOTES:

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

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

ELECTRICAL INSTALLATION NOTES:

- 1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (I.E. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEC AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SNEW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEC AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. 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.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3R (OR BETTER) FOR EXTERIOR LOCATIONS.
25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR CROWN CASTLE USA INC. BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "T-MOBILE".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

Table with columns: SYSTEM, CONDUCTOR, COLOR. Rows include 120/240V, 10; 120/208V, 30; 277/480V, 30; DC VOLTAGE.

APWA UNIFORM COLOR CODE:

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

ABBREVIATIONS:

- ANT ANTENNA
(E) EXISTING
FIF FACILITY INTERFACE FRAME
GEN GENERATOR
GPS GLOBAL POSITIONING SYSTEM
GSM GLOBAL SYSTEM FOR MOBILE
LTE LONG TERM EVOLUTION
MGB MASTER GROUND BAR
MW MICROWAVE
(N) NEW
NEC NATIONAL ELECTRIC CODE
(P) PROPOSED
PP POWER 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



35 GRIFFIN ROAD BLOOMFIELD, CT 06002

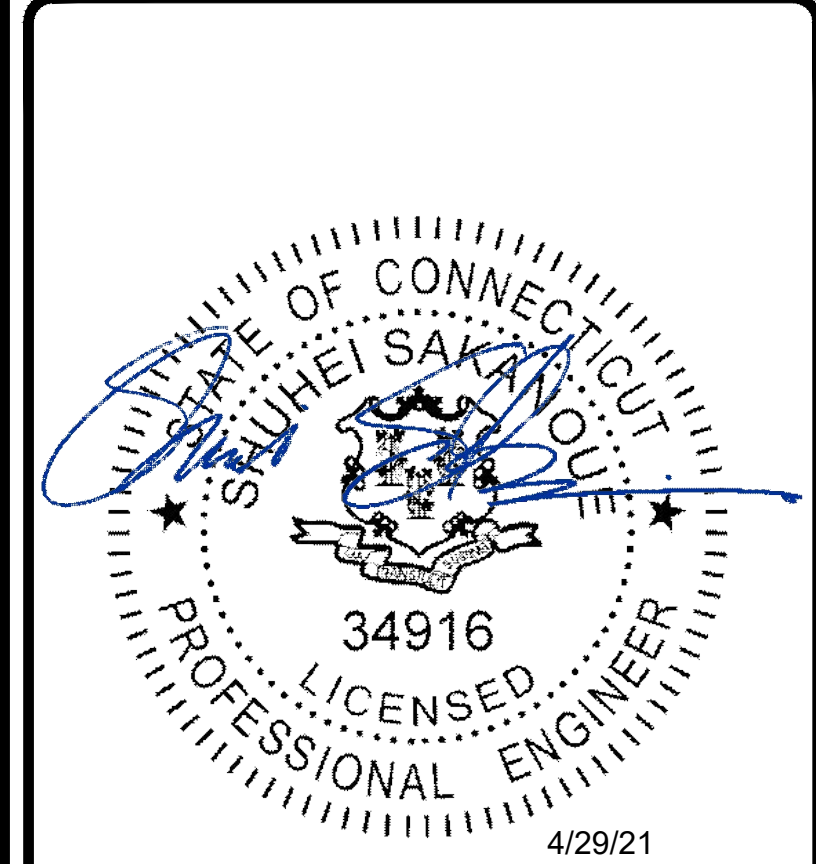


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T-MOBILE SITE NUMBER: CTNH450A BU #: 876405 WOODBURY NORTH 186 MINORTOWN WOODBURY, CT 06798 EXISTING 110'-0" MONOPOLE

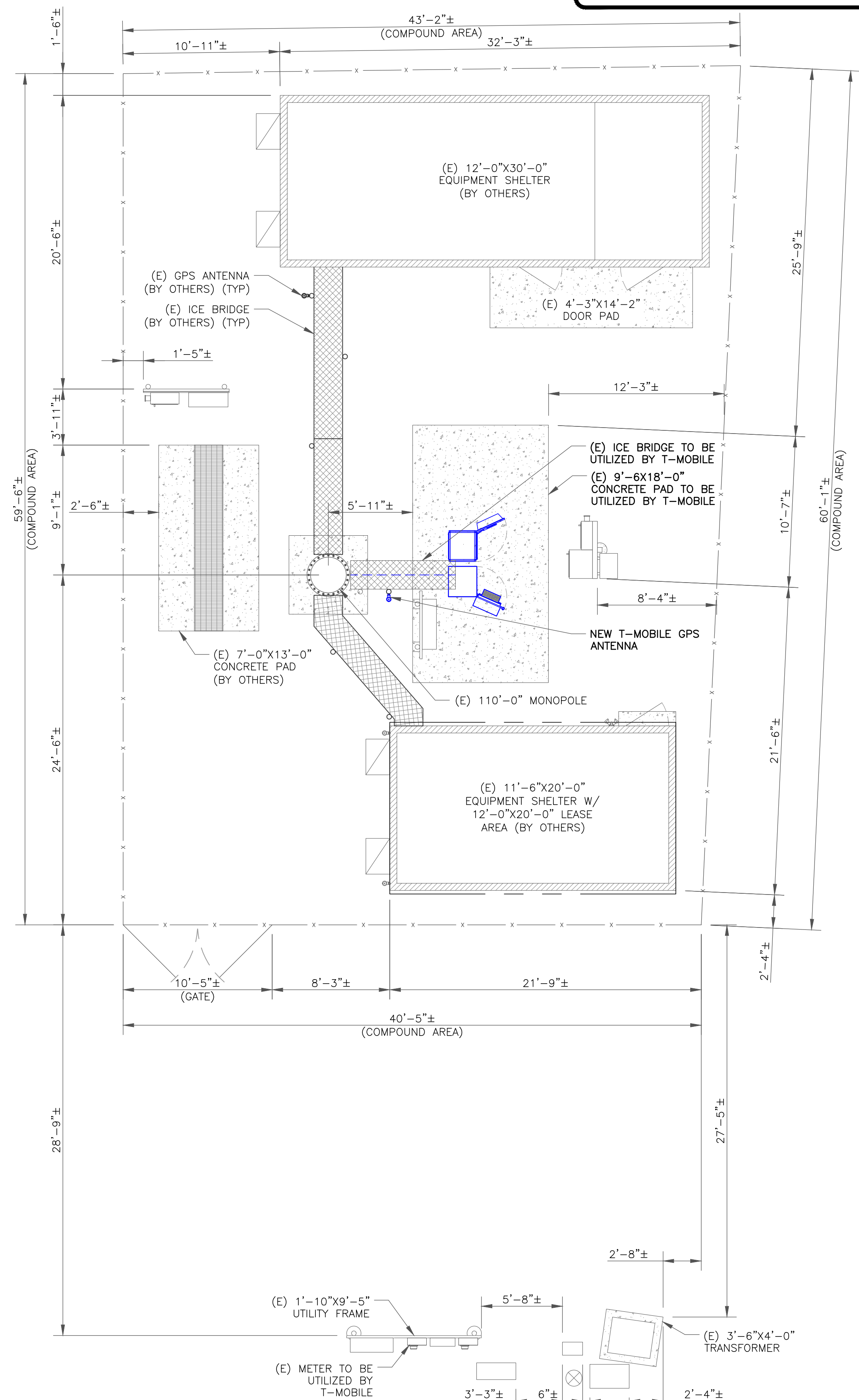
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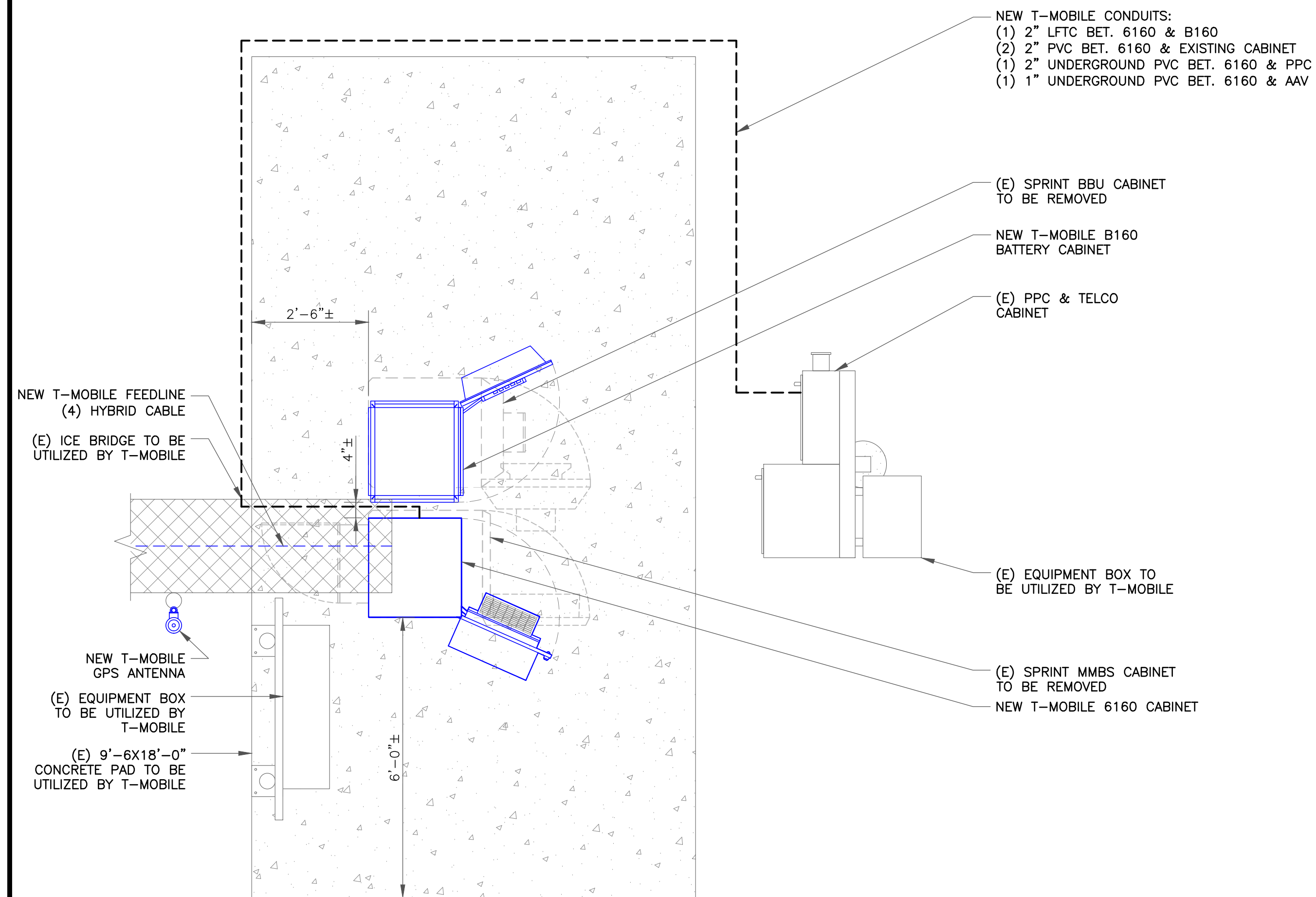
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NOTE:
 1. PLANS BASED ON SITE PLAN PROVIDED BY TOWER OWNER AND SITE VISIT PERFORMED BY INFINIGY. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING T-MOBILE EQUIPMENT.



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

NOTES:
 THE POWER DESIGN FOR ANY AC ELECTRICAL POWER CHANGES IS TO BE PERFORMED BY OTHERS AND IS SHOWN HERE FOR REFERENCE PURPOSES ONLY. T-MOBILE IS SOLELY RESPONSIBLE FOR THE ELECTRICAL POWER DESIGN.



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

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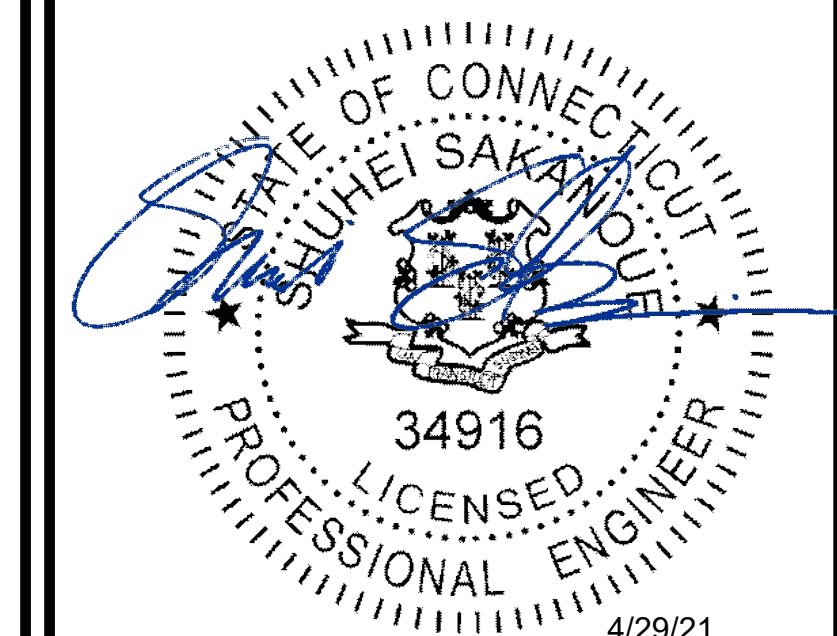
BU #: 876405
WOODBURY NORTH

186 MINORTOWN
 WOODBURY, CT 06798

EXISTING 110'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	04/29/21	RCD	FINAL	SS



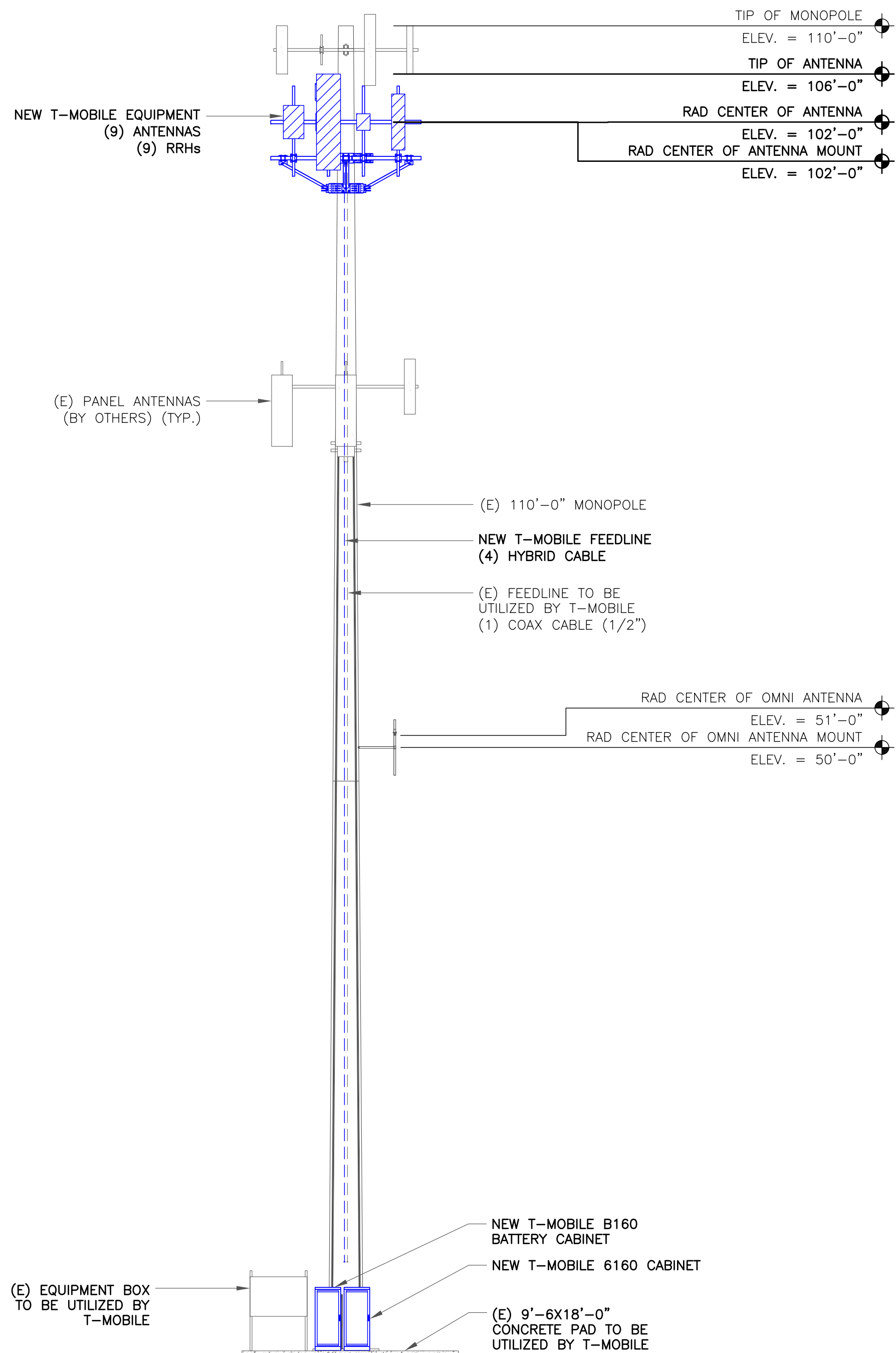
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SHEET NUMBER: REVISION:

C-1 **0**

NOTES:

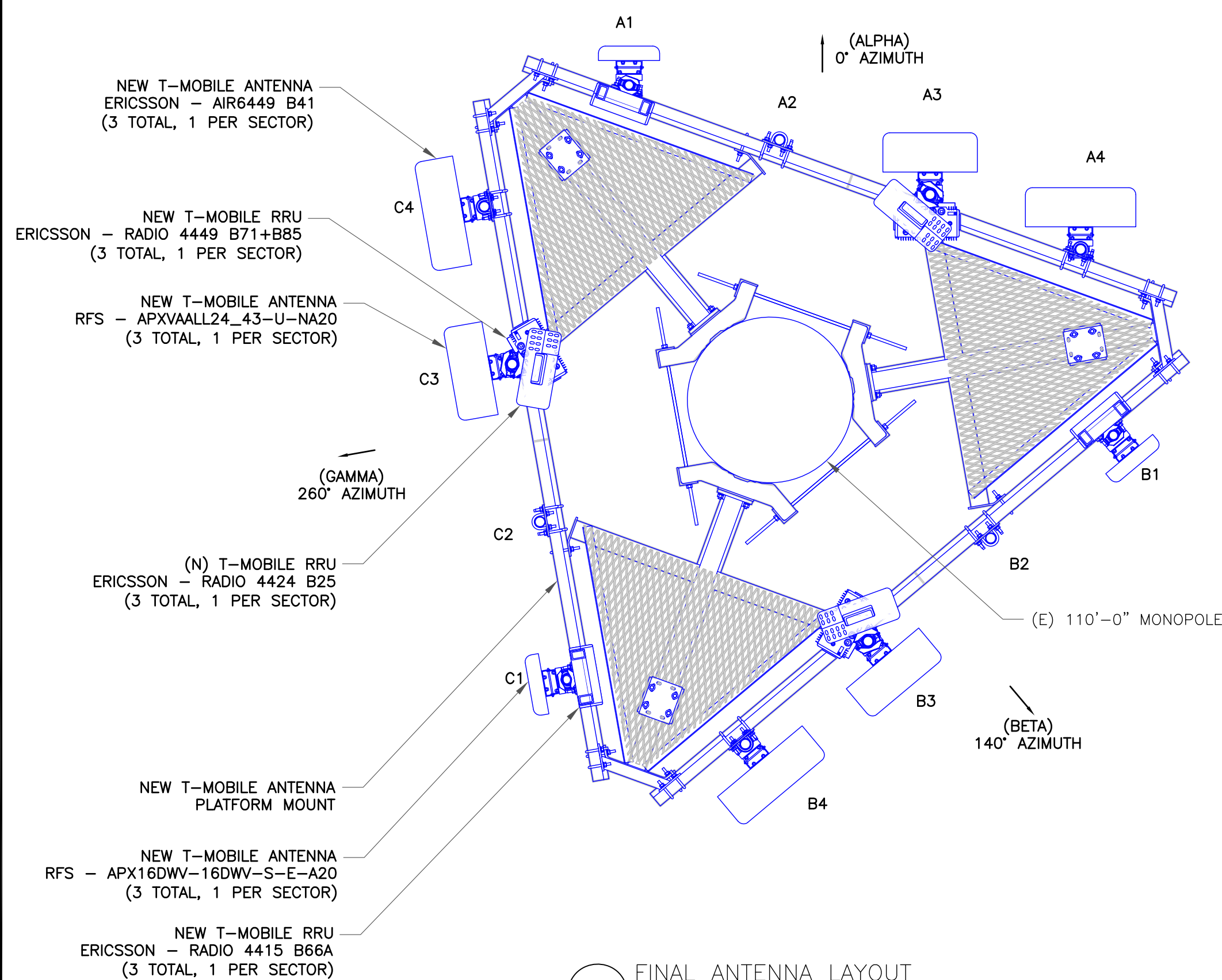
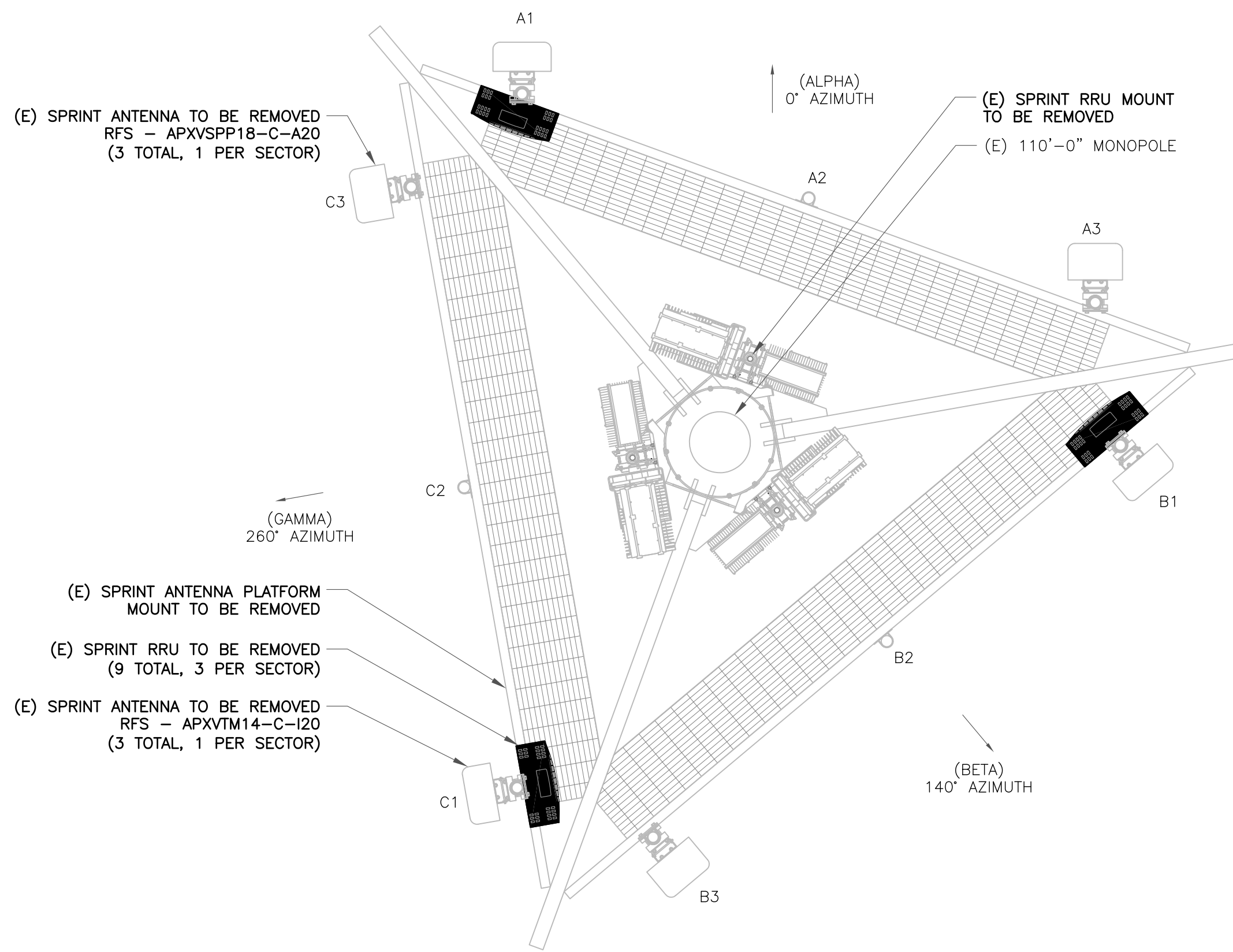
- ELEVATION BASED ON DRAWING PROVIDED BY TOWER OWNER. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING EQUIPMENT.
- INFINIGY HAS NOT EVALUATED THE TOWER OR MOUNT STRUCTURE AND ASSUMES NO RESPONSIBILITY FOR THEIR STRUCTURAL INTEGRITY REGARDING PROPOSED LOADINGS. FINAL INSTALLATION SHALL COMPLY WITH RESULTS OF PASSING STRUCTURAL ANALYSES PERFORMED BY OTHERS.



T-MOBILE EQUIPMENT

ANTENNA CL: 102'-0"
MOUNT CL: 102'-0"
ANTENNA CL: 51'-0"
MOUNT CL: 50'-0"

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



NOTE:
A STRUCTURAL EVALUATION OF THE T-MOBILE ANTENNA MOUNTS HAS BEEN PERFORMED BY GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION. REFER TO ANTENNA MOUNT STRUCTURAL ANALYSIS DATED 03-10-2021 PRIOR TO CONSTRUCTION.

INFINIGY HAS NOT EVALUATED THE TOWER FOR THIS SITE AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY. CONTRACTOR TO COORDINATE LOADING WITH RF ENGINEER. REFER TO STRUCTURAL ANALYSIS PERFORMED BY OTHERS PRIOR TO CONSTRUCTION.

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WOODBURY, CT 06798

EXISTING 110'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	04/28/21	RCD	FINAL	SS

STATE OF CONNECTICUT
SHUHEI SAKANO
34916
LICENSED PROFESSIONAL ENGINEER
4/29/21

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CTNH450A

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WOODBURY, CT 06798

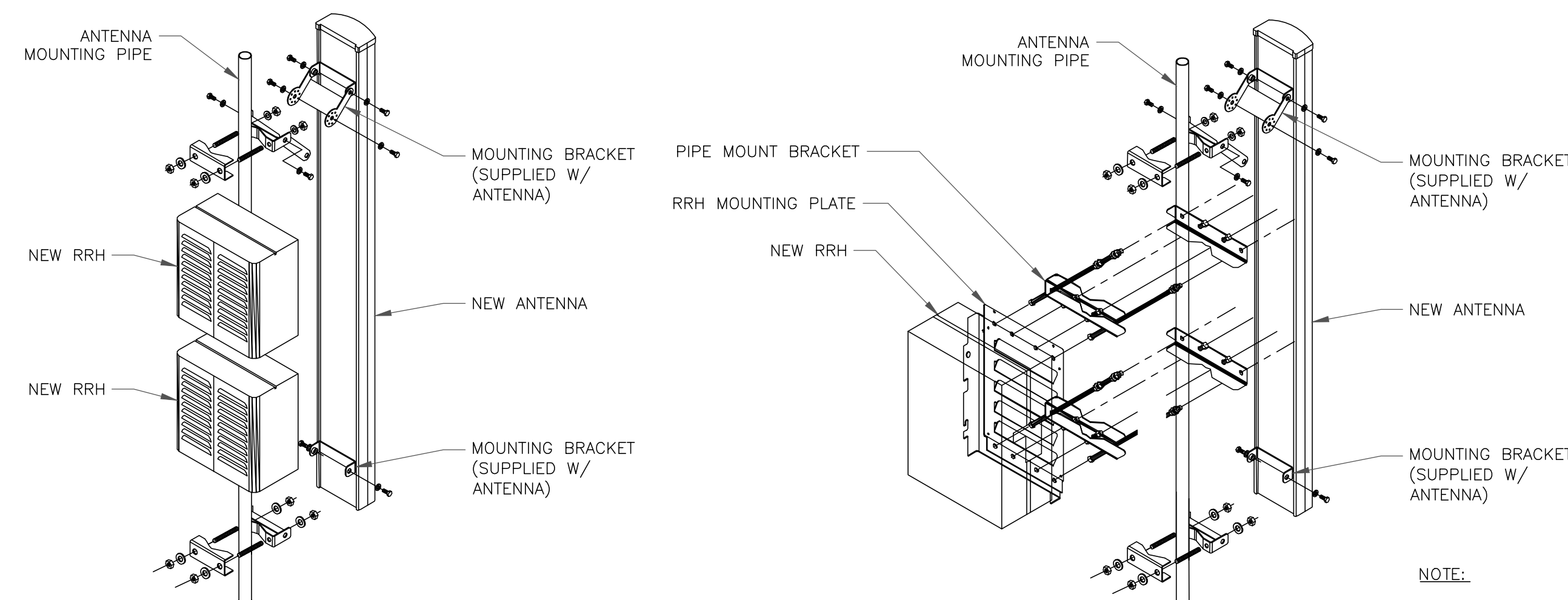
EXISTING 110'-0" MONOPOLE

ANTENNA SCHEDULE										
SECTOR	POS.	TECHNOLOGY	RAD CENTER	AZIMUTH	ANTENNA MANUFACTURER	ANTENNA MODEL	MECH. TILT	ELECT. TILT	TOWER MOUNTED EQUIPMENT	FEEDLINE TYPE
ALPHA	A1	L2100	102'-0"	0°	RFS	APX16DWV-16DWV-S-E-A20	0°	--	(1) ERICSSON - RRUS 4415 B66A	(1) 6X12 HCS HYBRID (SHARED)
ALPHA	A2	--	--	--	--	--	--	--	--	--
ALPHA	A3	L700, L600, N600, L1900, G1900	102'-0"	0°	RFS	APXVAALL24_43-U-NA20	0°	--	(1) ERICSSON - RRUS 4449 B71+B85 (1) ERICSSON - RRUS 4424 B25	(2) 6X12 HCS HYBRID SHARED
ALPHA	A4	L2500, N2500	102'-0"	0°	ERICSSON	AIR6449 B41	0°	--	--	(1) 6X12 HCS HYBRID (SHARED)
BETA	B1	L2100	102'-0"	140°	RFS	APX16DWV-16DWV-S-E-A20	0°	--	(1) ERICSSON - RRUS 4415 B66A	(1) 6X12 HCS HYBRID (SHARED)
BETA	B2	--	--	--	--	--	--	--	--	--
BETA	B3	L700, L600, N600, L1900, G1900	102'-0"	140°	RFS	APXVAALL24_43-U-NA20	0°	--	(1) ERICSSON - RRUS 4449 B71+B85 (1) ERICSSON - RRUS 4424 B25	(1) 6X12 HCS HYBRID (SHARED)
BETA	B4	L2500, N2500	102'-0"	140°	ERICSSON	AIR6449 B41	0°	--	--	(1) 6X12 HCS HYBRID (SHARED)
GAMMA	C1	L2100	102'-0"	260°	RFS	APX16DWV-16DWV-S-E-A20	0°	--	(1) ERICSSON - RRUS 4415 B66A	(1) 6X12 HCS HYBRID (SHARED)
GAMMA	C2	--	--	--	--	--	--	--	--	--
GAMMA	C3	L700, L600, N600, L1900, G1900	102'-0"	260°	RFS	APXVAALL24_43-U-NA20	0°	--	(1) ERICSSON - RRUS 4449 B71+B85 (1) ERICSSON - RRUS 4424 B25	(1) 6X12 HCS HYBRID (SHARED)
GAMMA	C4	L2500, N2500	102'-0"	260°	ERICSSON	AIR6449 B41	0°	--	--	(1) 6X12 HCS HYBRID (SHARED)

1 ANTENNA AND CABLE SCHEDULE
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.

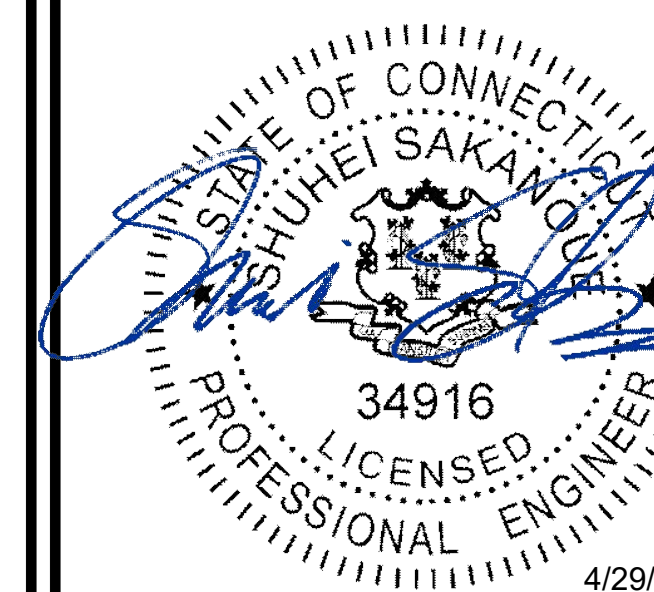


- NOTE:
1. CONTRACTOR SHALL INSTALL 3RD DUAL RRH MOUNT TO ACCOMMODATE ALL RRH BRACKETS HOLES IF NECESSARY.

2 ANTENNA WITH RRHs MOUNTING DETAIL
SCALE: NOT TO SCALE

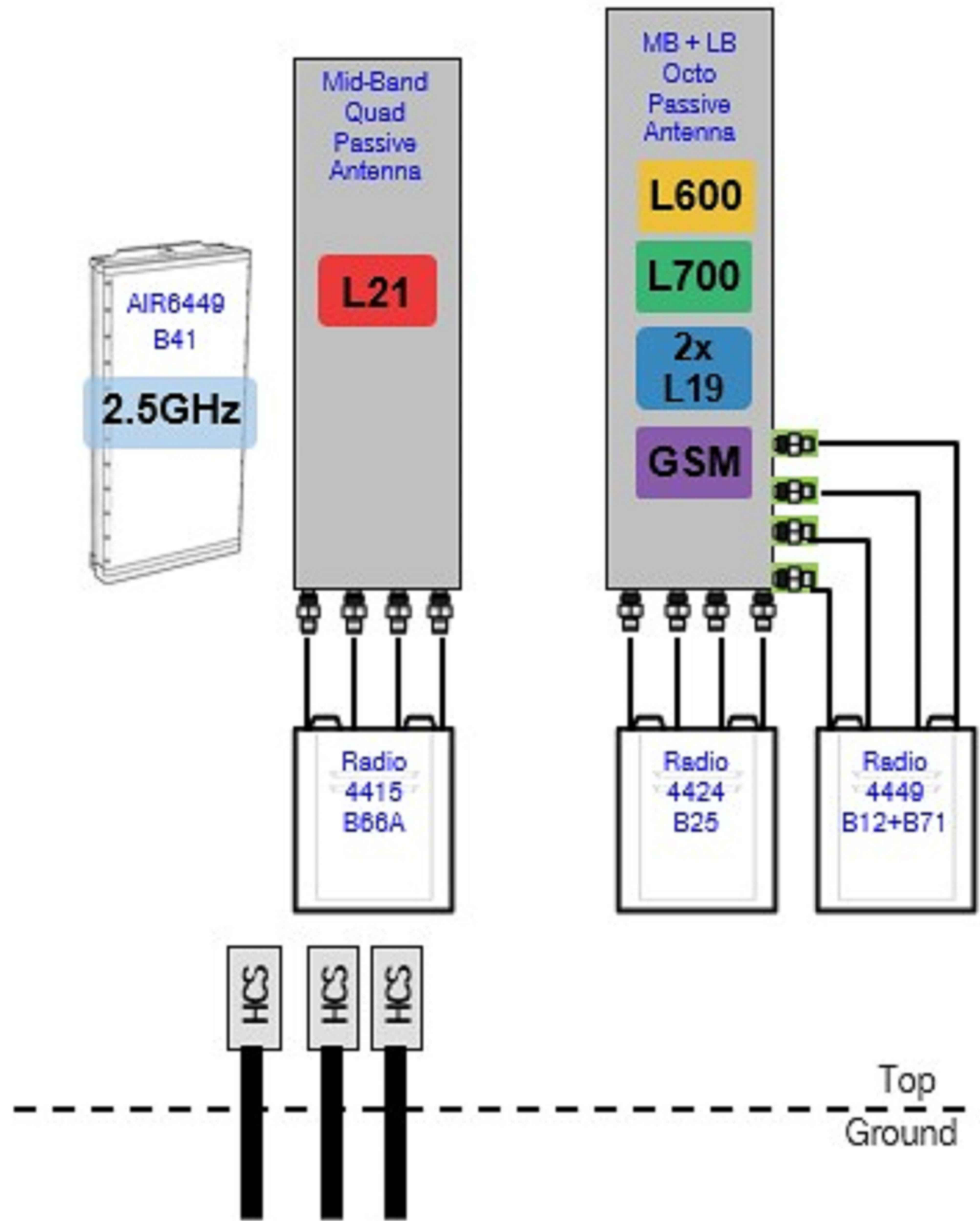
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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SHEET NUMBER: **C-3** REVISION: **0**



1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

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T-MOBILE SITE NUMBER:
CTNH450A

BU #: 876405
WOODBURY NORTH

186 MINORTOWN
WOODBURY, CT 06798

EXISTING 110'-0" MONOPOLE

ISSUED FOR:

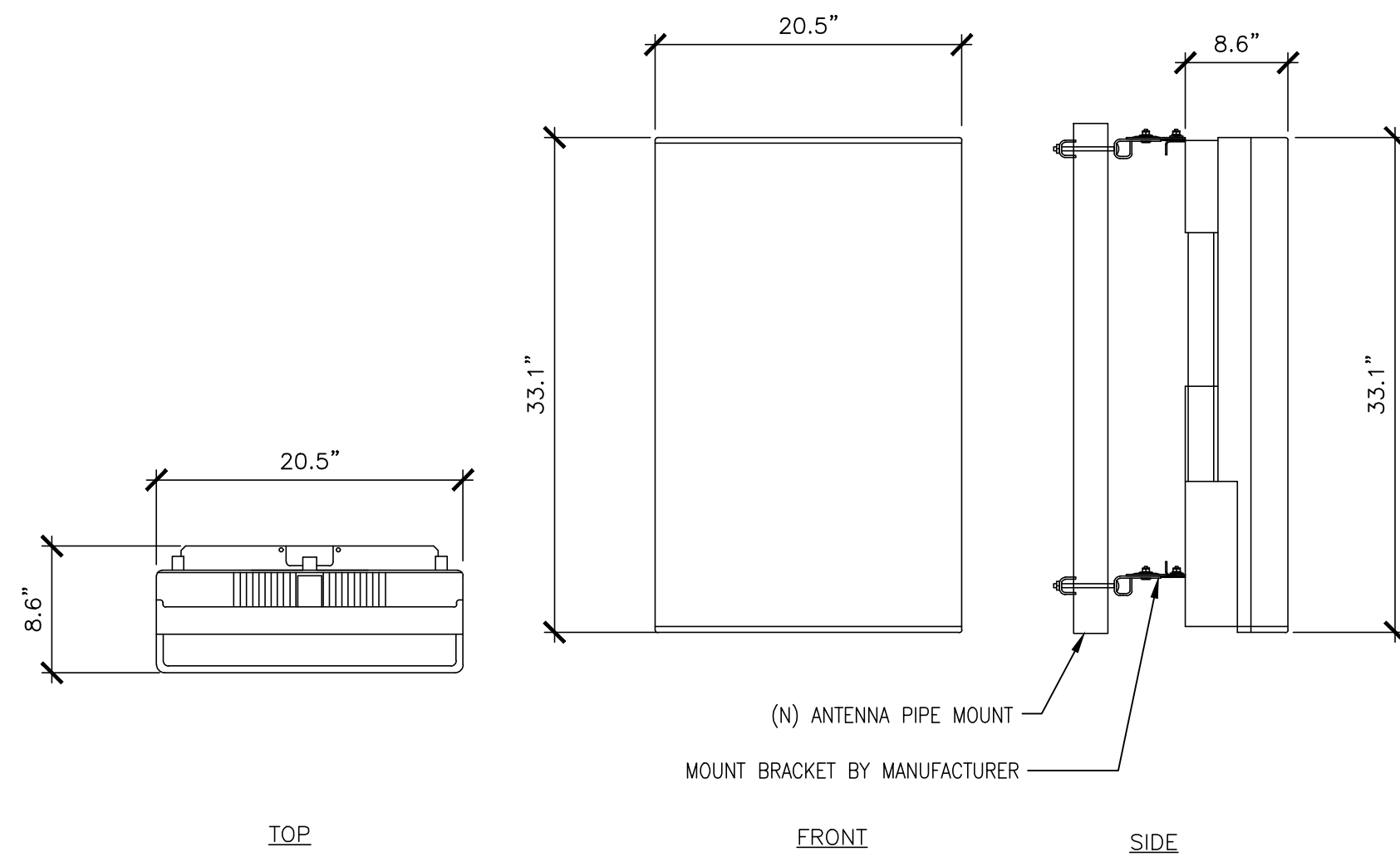
REV	DATE	DRWN	DESCRIPTION	DES/QA
0	04/29/21	RCD	FINAL	SS

STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
4/29/21

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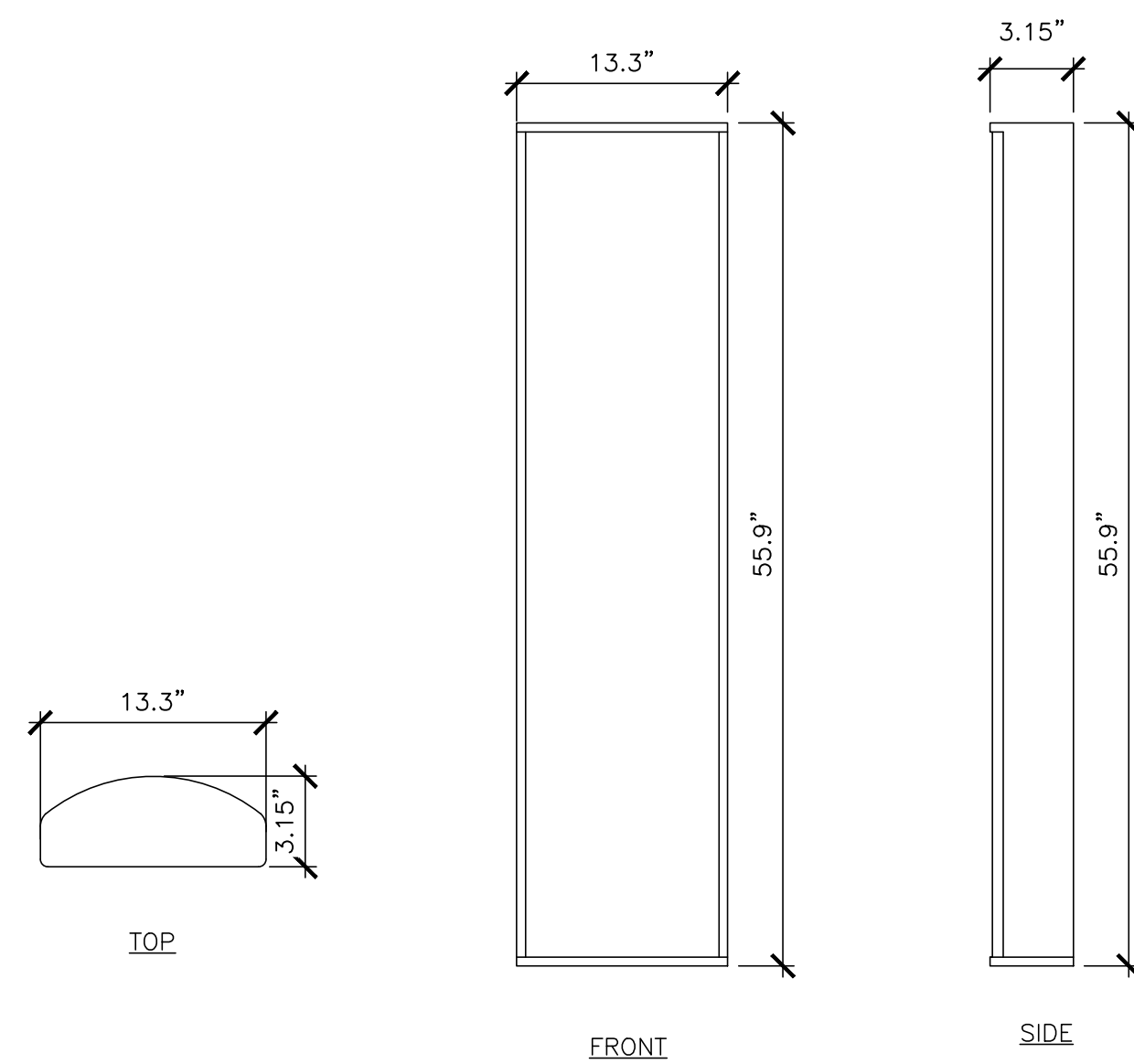
SHEET NUMBER: **C-4** REVISION: **0**

MANUFACTURER: ERICSSON
 MODEL: AIR6449 B41
 WEIGHT: 104 LBS (W/ MOUNT BRACKET 113)
 DIMENSIONS: 33.1"H. X 20.5"W. X 8.6"D.
 FREQUENCY: REFER TO RF DATA SHEET

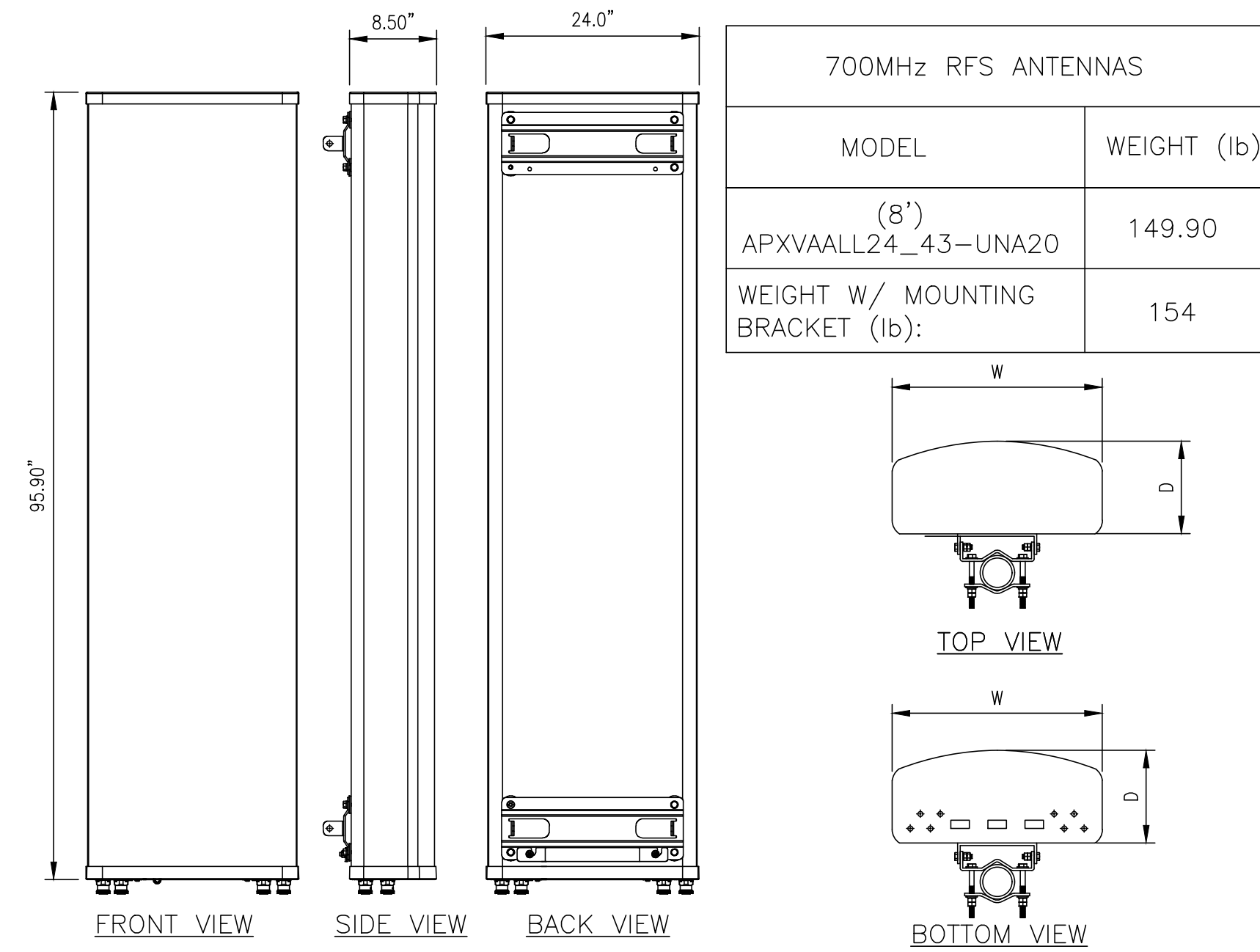


① (N) AIR6449 B41 ANTENNA SPEC
 SCALE: NOT TO SCALE

MANUFACTURER: RFS
 MODEL: APX16DWW-16DWW-S-E-A20
 WEIGHT: 40.7 LBS
 DIMENSIONS: 55.9"H. X 13.3"W. X 3.15"D.
 FREQUENCY: REFER TO RF DATA SHEET



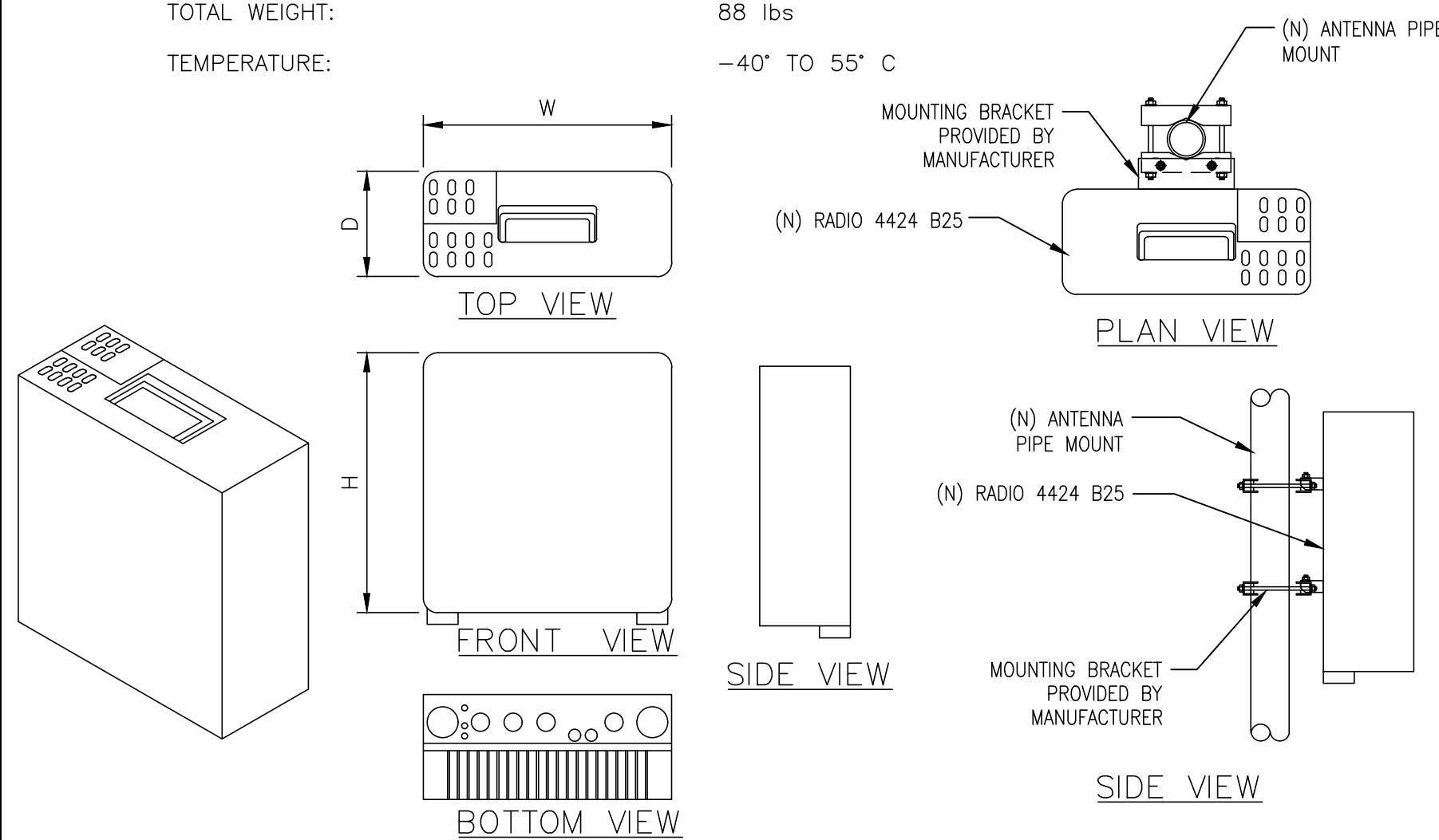
② (N) APX16DWW-16DWW-S-E-A20 ANTENNA SPEC
 SCALE: NOT TO SCALE



③ (N) APXVAALL24_43-UNA20 ANTENNA SPEC
 SCALE: NOT TO SCALE

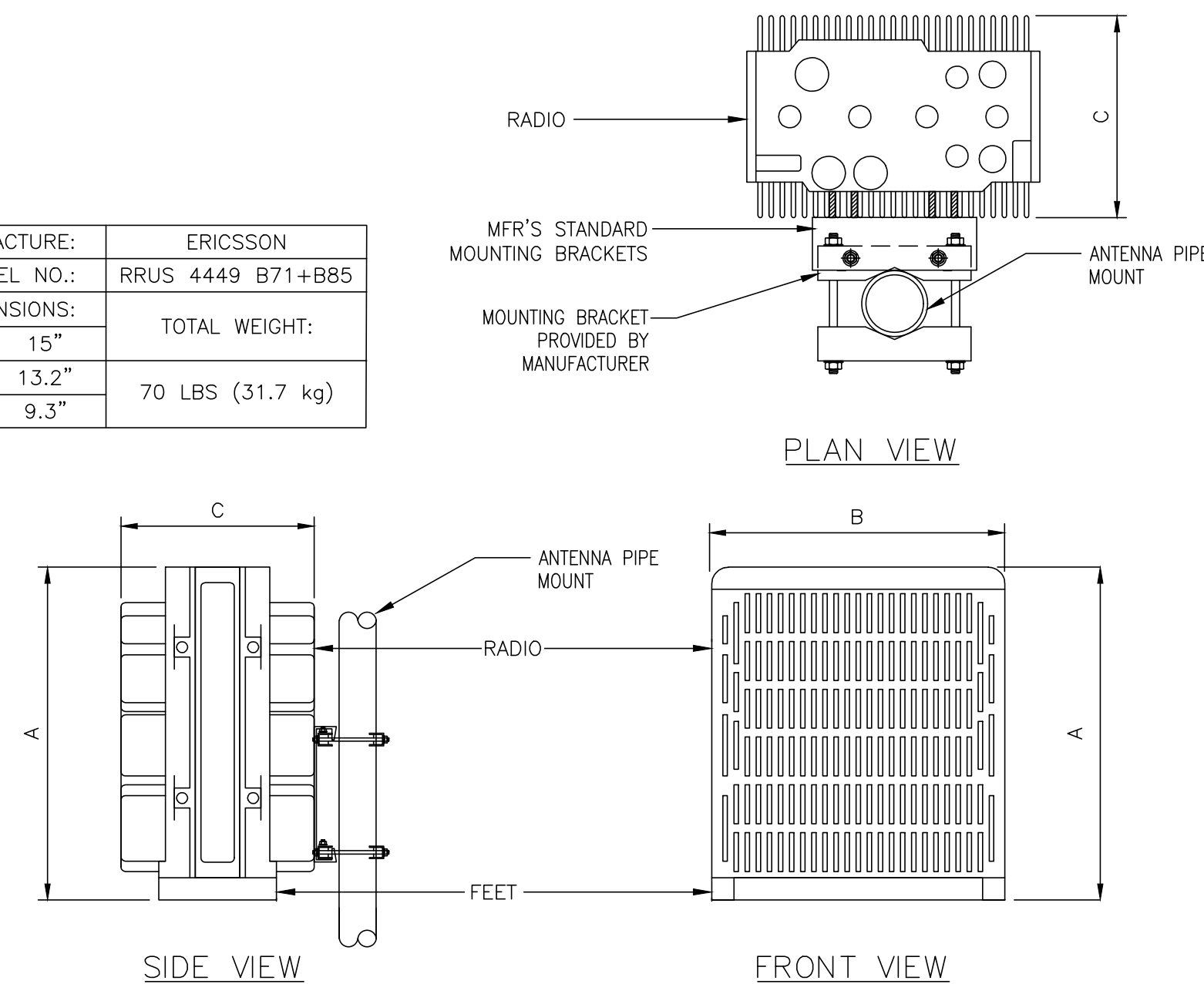
ERICSSON RADIO-4424 B25

DIMENSIONS, WxDxH: 13.5"x9.6"x16.5"
 MAX OUTPUT POWER: 4x80W (2x(2x80W))
 TOTAL WEIGHT: 88 lbs
 TEMPERATURE: -40° TO 55° C



④ (N) RADIO 4424 B25 SPEC
 SCALE: NOT TO SCALE

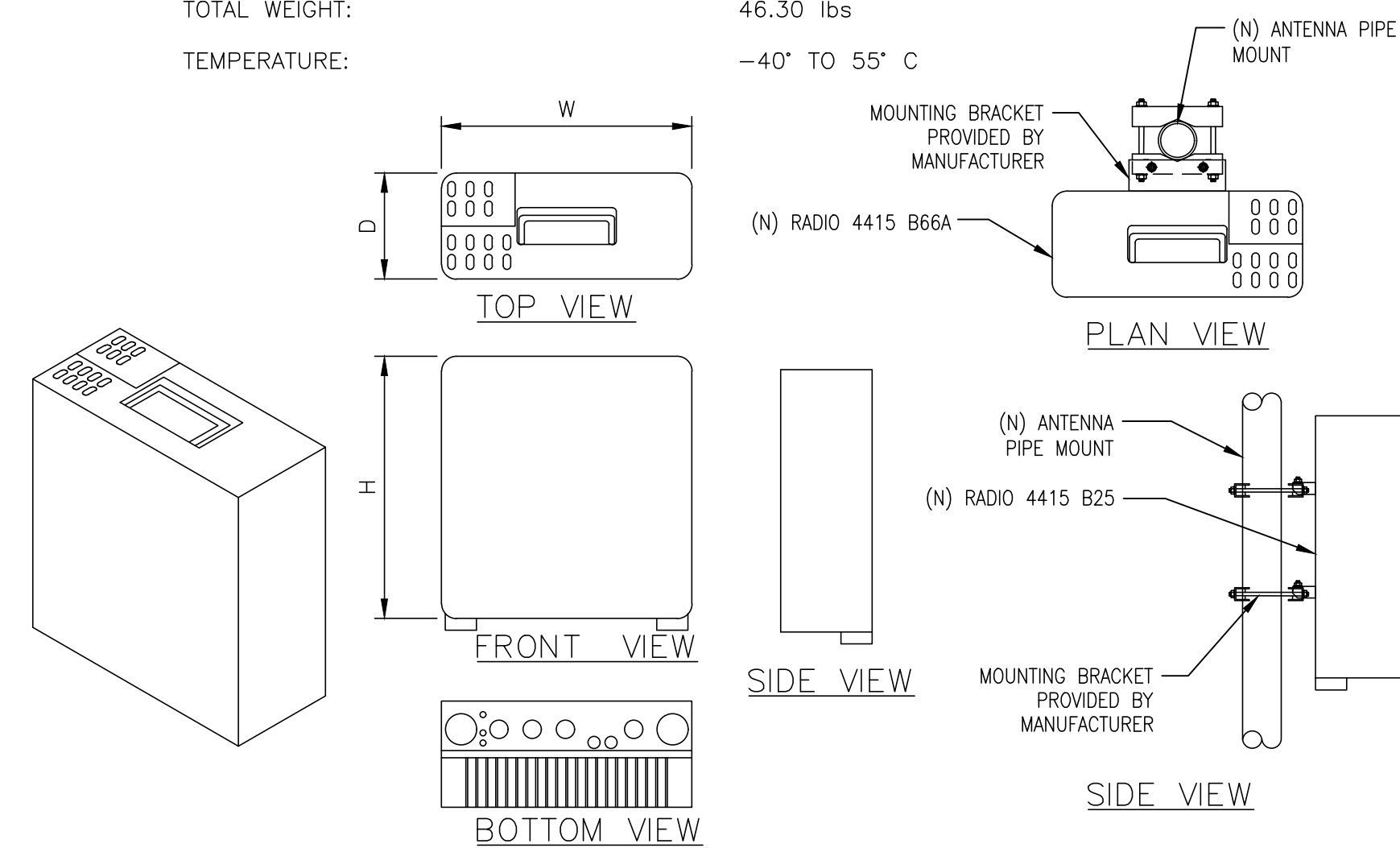
MANUFACTURE:		ERICSSON	
MODEL NO.:		RRUS 4449 B71+B85	
DIMENSIONS:		TOTAL WEIGHT:	
A	15"	70 LBS (31.7 kg)	
B	13.2"		
C	9.3"		



⑤ (N) RADIO 4449 B71+B85 SPEC
 SCALE: NOT TO SCALE

ERICSSON RADIO-4415 B66A

DIMENSIONS, WxDxH: 14.90"x5.40"x13.20"
 POWER CONSUMPTION: 660 WATTS
 TOTAL WEIGHT: 46.30 lbs
 TEMPERATURE: -40° TO 55° C



⑥ (N) RADIO 4415 B66A SPEC
 SCALE: NOT TO SCALE

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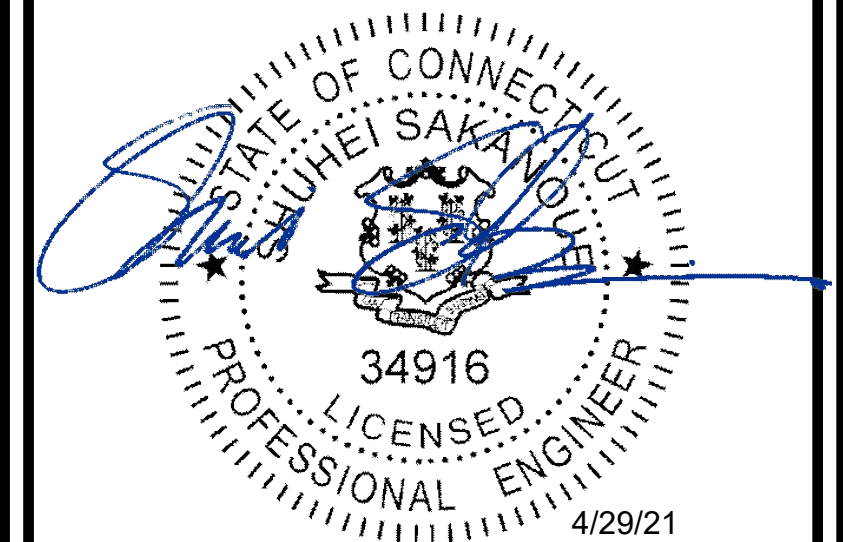
BU #: **876405**
WOODBURY NORTH

186 MINORTOWN
 WOODBURY, CT 06798

EXISTING 110'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES/QA
0	04/29/21	RCD	FINAL	SS



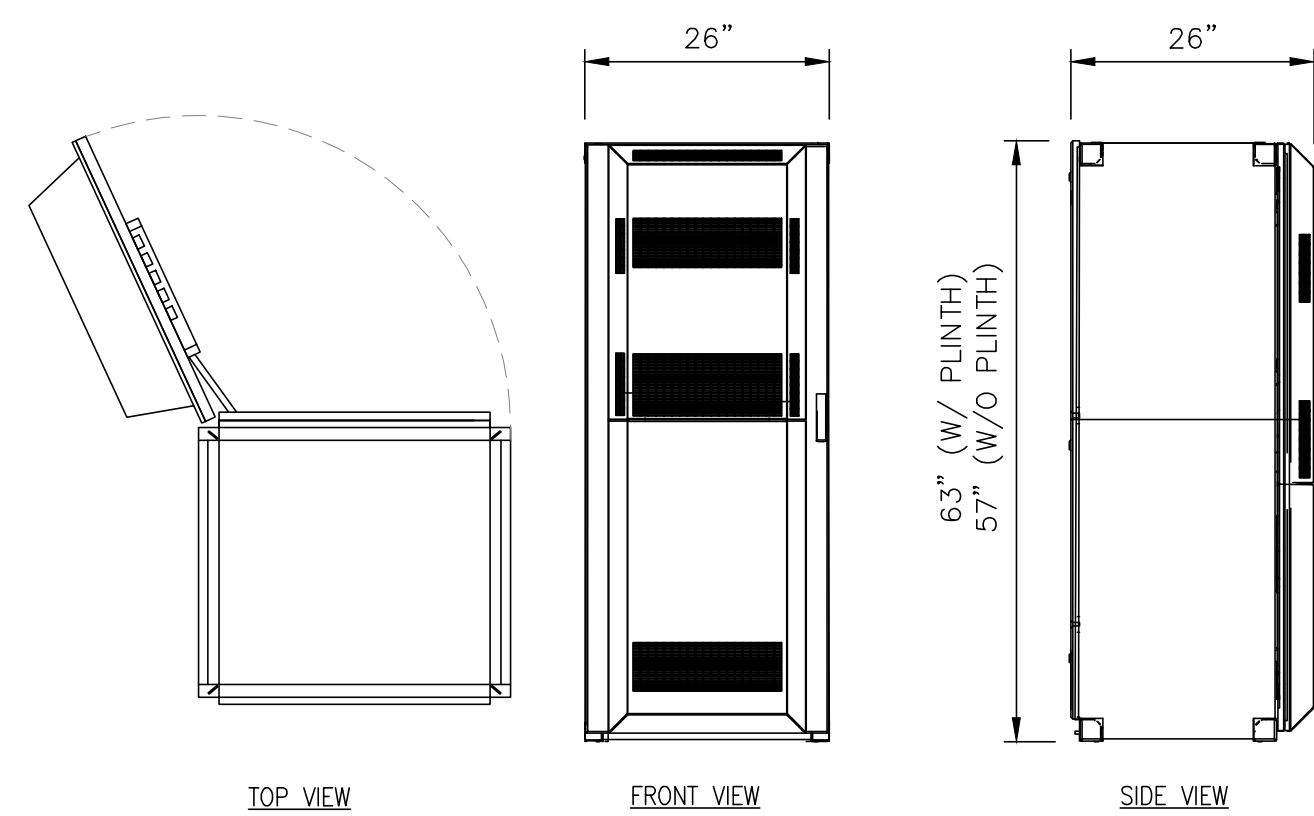
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SHEET NUMBER:

C-5

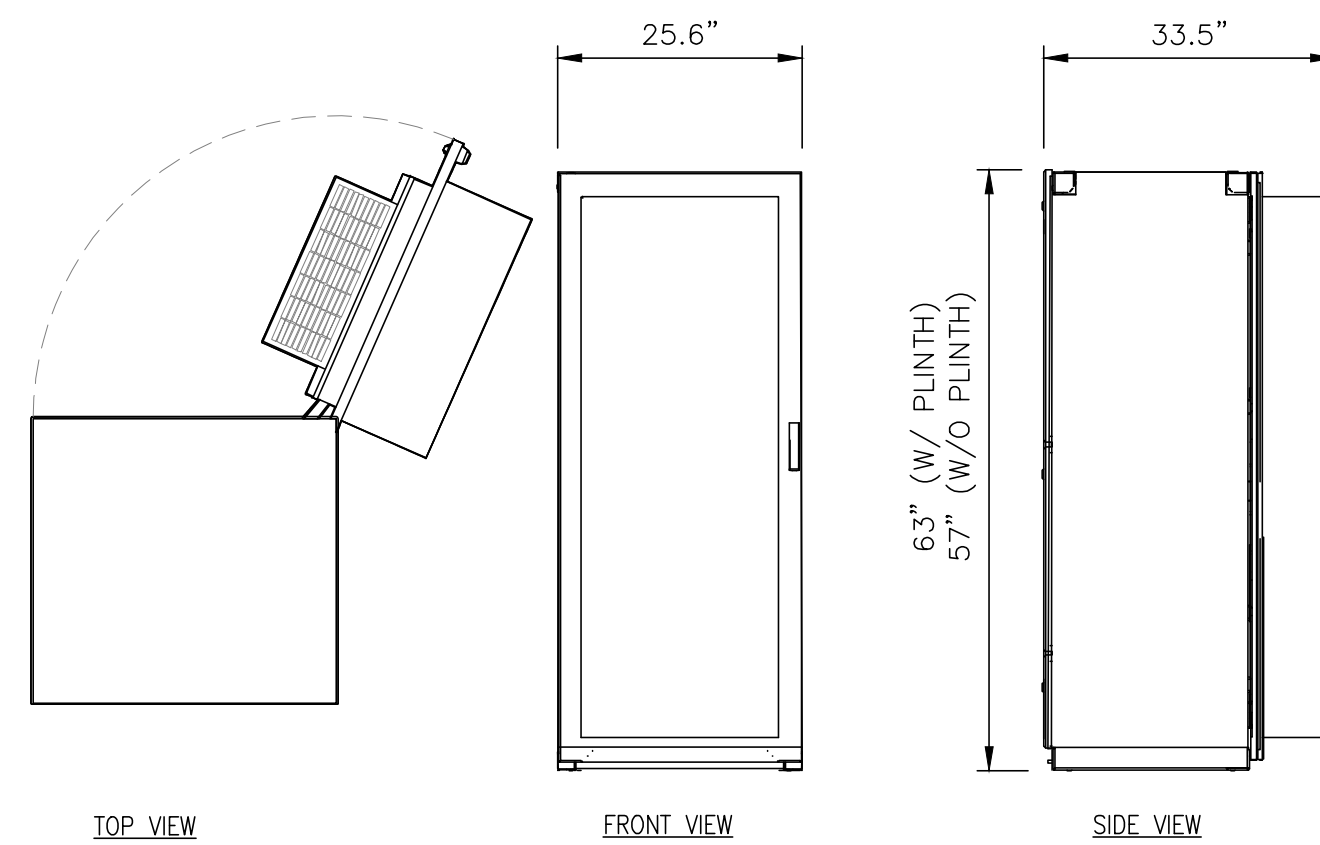
REVISION:

0



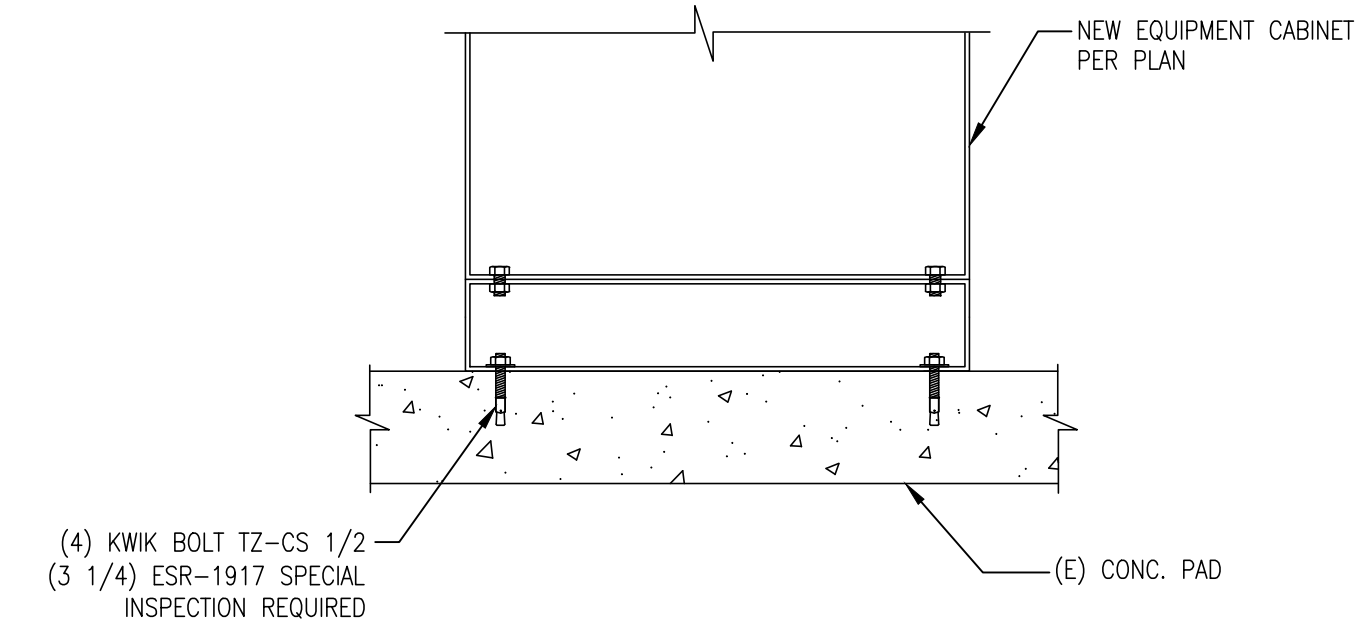
ERICSSON MODEL NO.:	B160
RACK SPACE:	19U
DIMENSIONS, HxWxD:	63"x26"x26" (W/ 6" PLINTH)
CABINET WEIGHT, EMPTY:	485 LBS
MAXIMUM WEIGHT:	2100± LBS

1 (N) B160 CABINET DETAIL
SCALE: NOT TO SCALE

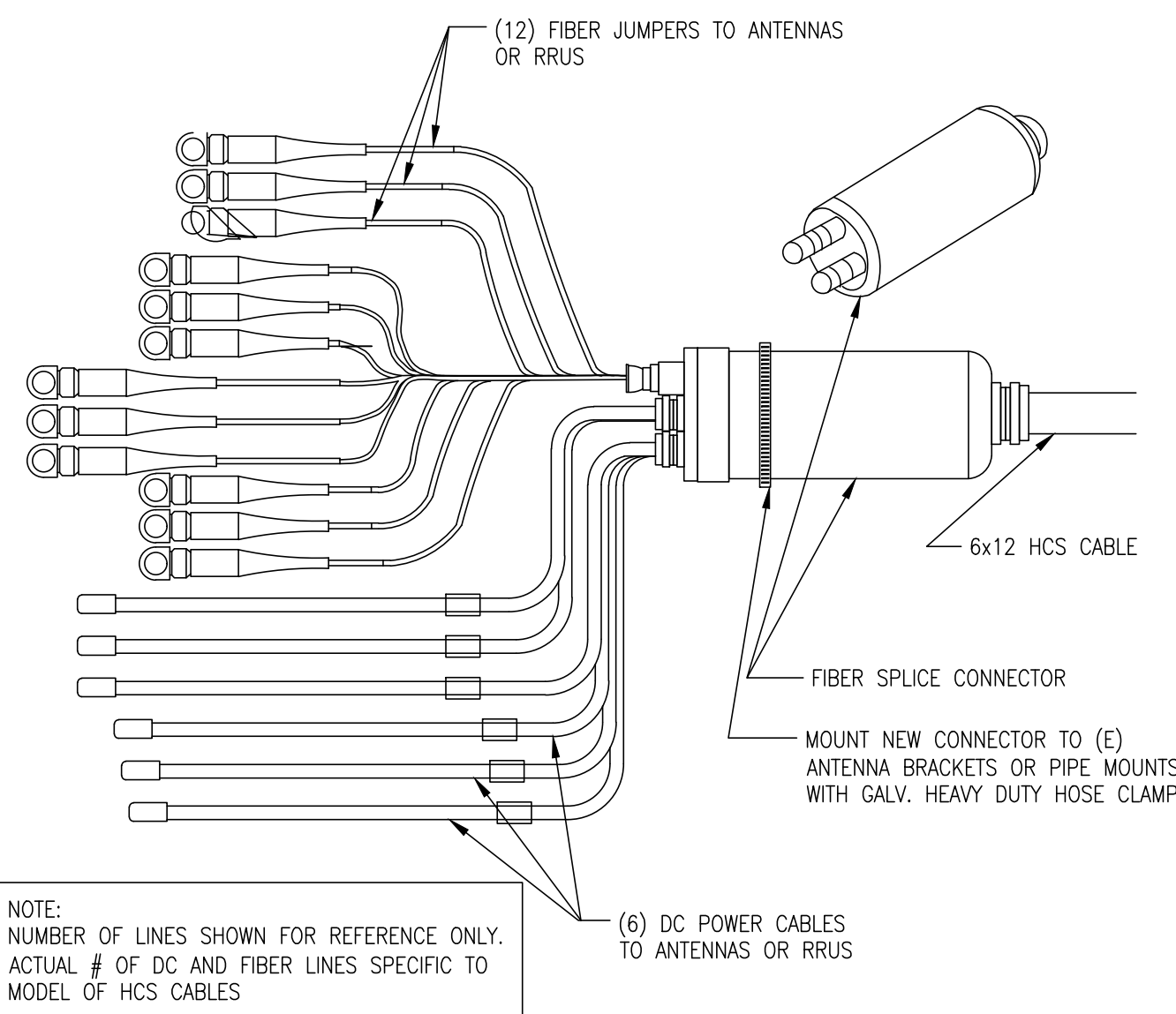


ERICSSON MODEL NO.:	6160
RACK SPACE:	19U
DIMENSIONS, HxWxD:	63"x25.6"x25.6" (W/ 6" PLINTH)
CABINET WEIGHT, EMPTY:	410 LBS
MAXIMUM WEIGHT:	770± LBS

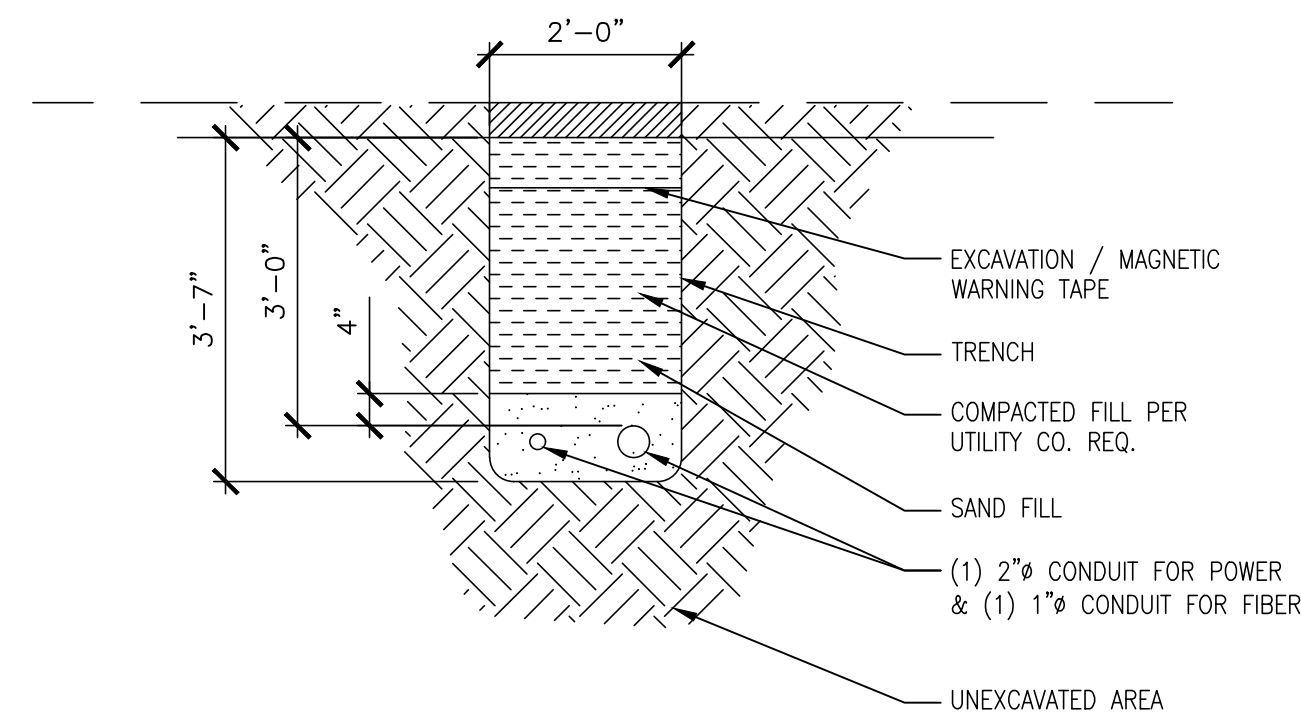
2 (N) 6160 CABINET DETAIL
SCALE: NOT TO SCALE



3 (N) EQUIPMENT CABINET MOUNTING DETAIL
SCALE: NOT TO SCALE



4 (N) 6X12 HCS CABLE DETAIL
SCALE: NOT TO SCALE



5 (N) CONDUIT TRENCH DETAIL
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

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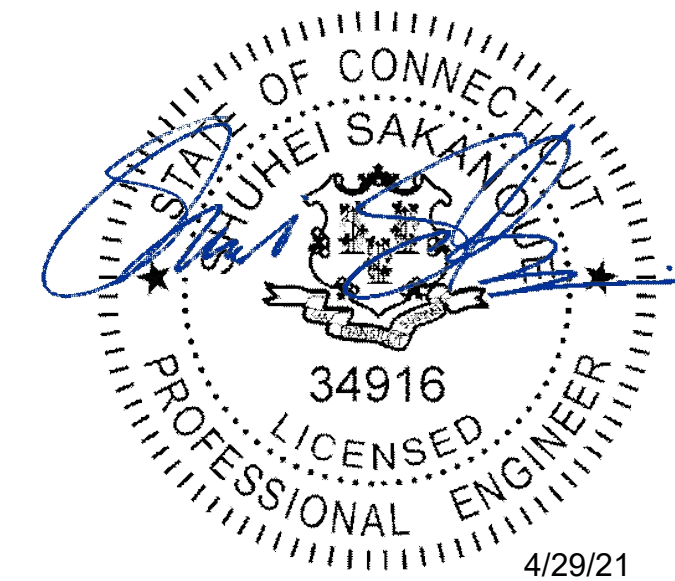
BU #: **876405**
WOODBURY NORTH

186 MINORTOWN
WOODBURY, CT 06798

EXISTING 110'-0" MONOPOLE

ISSUED FOR:

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SHEET NUMBER: **C-6** REVISION: **0**

T-MOBILE SITE NUMBER:
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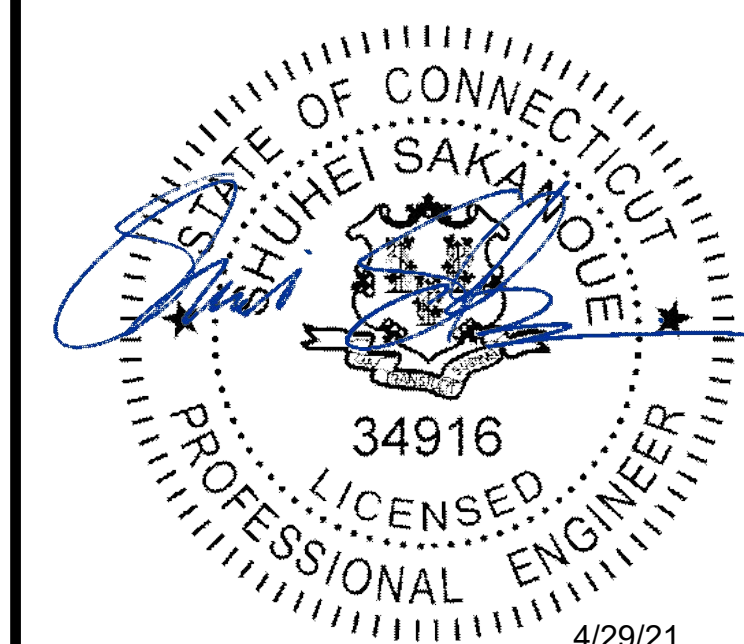
BU #: 876405
WOODBURY NORTH

186 MINORTOWN
WOODBURY, CT 06798

EXISTING 110'-0" MONOPOLE

ISSUED FOR:

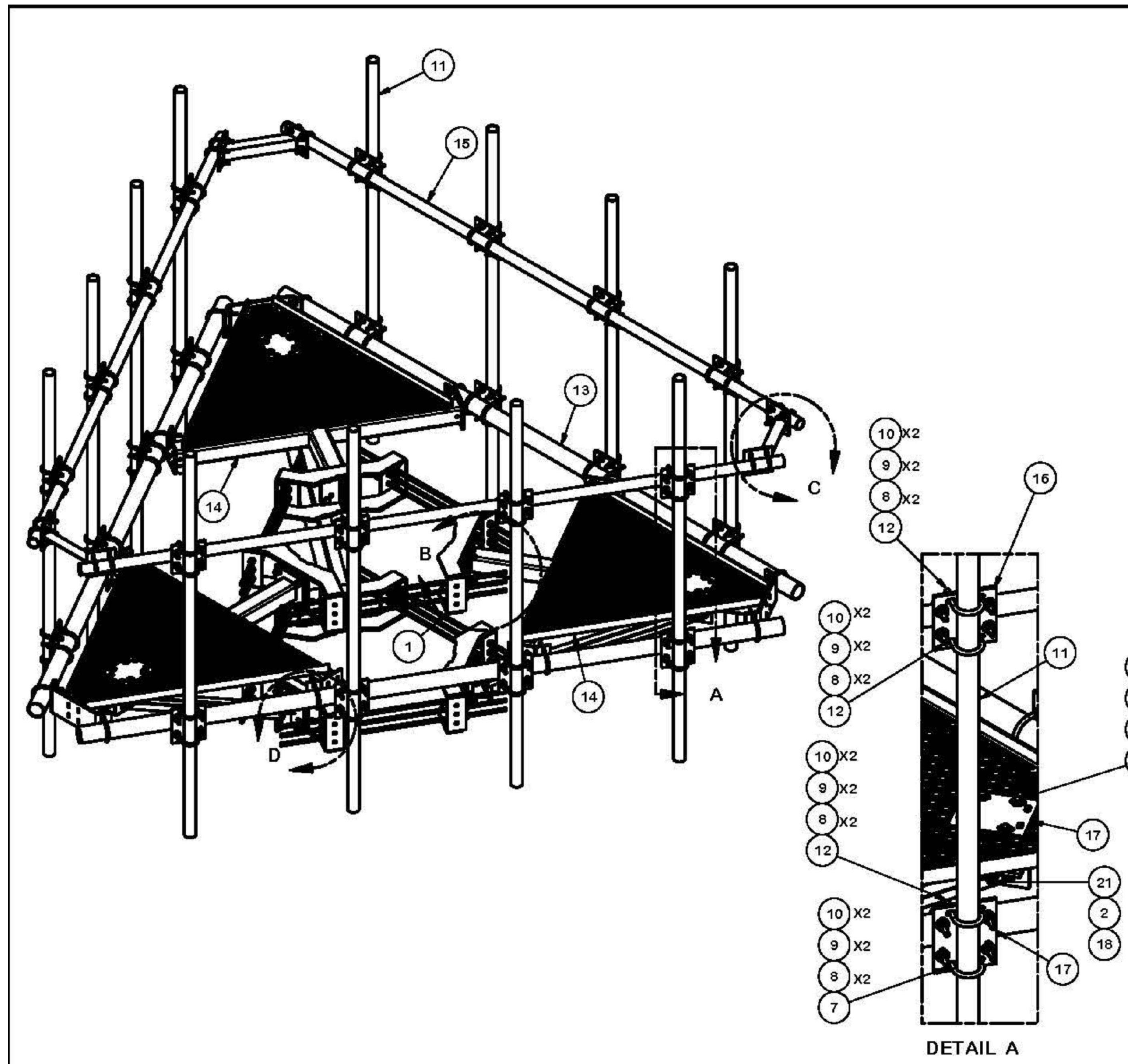
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SHEET NUMBER: REVISION:

S-1 0



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	6	X-LWRM	RING MOUNT WELDMENT		68.16	408.95
2	66	G58LW	5/8" HDG LOCKWASHER		0.03	1.72
3	60	A58NUT	5/8" HDG A325 HEX NUT		0.13	7.78
4	18	G58R-24	5/8" x 24" THREADED ROD (HDG.)		0.55	9.88
4	18	G58R-48	5/8" x 48" THREADED ROD (HDG.)		0.55	9.88
5	24	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2 3/4 in	0.36	8.53
6	24	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.82
7	36	X-UB1306	1/2" X 3-5/8" X 6" X 3" U-BOLT (HDG.)		0.73	26.34
8	264	G12FW	1/2" HDG USS FLATWASHER		0.03	8.99
9	252	G12LW	1/2" HDG LOCKWASHER		0.01	3.50
10	252	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	18.03
11	12	P296	2-3/8" X 96" SCH. 40 GALVANIZED PIPE	96 in	30.76	369.08
12	84	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.73	61.46
13	3	P3150	3-1/2" X 150" SCH 40 GALVANIZED PIPE	150 in	94.80	284.40
14	3	X-SV196	LOW PROFILE PLATFORM CORNER		212.10	636.31
15	3	P2150	2-3/8" OD X 150" SCH 40 GALVANIZED PIPE	150 in	48.06	144.17
16	12	SCX2	CROSSOVER PLATE	7 in	4.80	57.56
17	15	SCX4	CROSSOVER PLATE	8 1/2 in	6.02	90.32
18	6	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	0.78
19	6	X-253993	PLATFORM REINFORCEMENT KIT ANGLE	52 25/32 in	14.33	85.99
20	6	X-253992	T-BRACKET FOR REINFORCEMENT KIT		13.55	81.27
21	6	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	1.62
22	12	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	6 1/2 in	0.41	4.91
23	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
TOTAL WT. #						2448.72

TOLERANCE NOTES
TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES ($\pm 0.030"$)
DRILLED AND GAS CUT HOLES ($\pm 0.030"$) - NO CONING OF HOLES
LASER CUT EDGES AND HOLES ($\pm 0.010"$) - NO CONING OF HOLES
BENDS ARE $\pm 1/2$ DEGREE
ALL OTHER MACHINING ($\pm 0.030"$)
ALL OTHER ASSEMBLY ($\pm 0.060"$)

PROPRIETARY NOTE:
THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION
12' 6" LOW PROFILE PLATFORM
WITH TWELVE 2-3/8" ANTENNA MOUNTING
PIPES, AND HANDRAIL

CPD NO.	4488	DRAWN BY	CEK 7/14/2014	ENG. APPROVAL
CLASS	81	SUB	02	DRAWING USAGE
			CUSTOMER	CHECKED BY
				BMC 7/14/2014

SITE PRO
A valmont company

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

Engineering Support Team:
1-888-753-7446

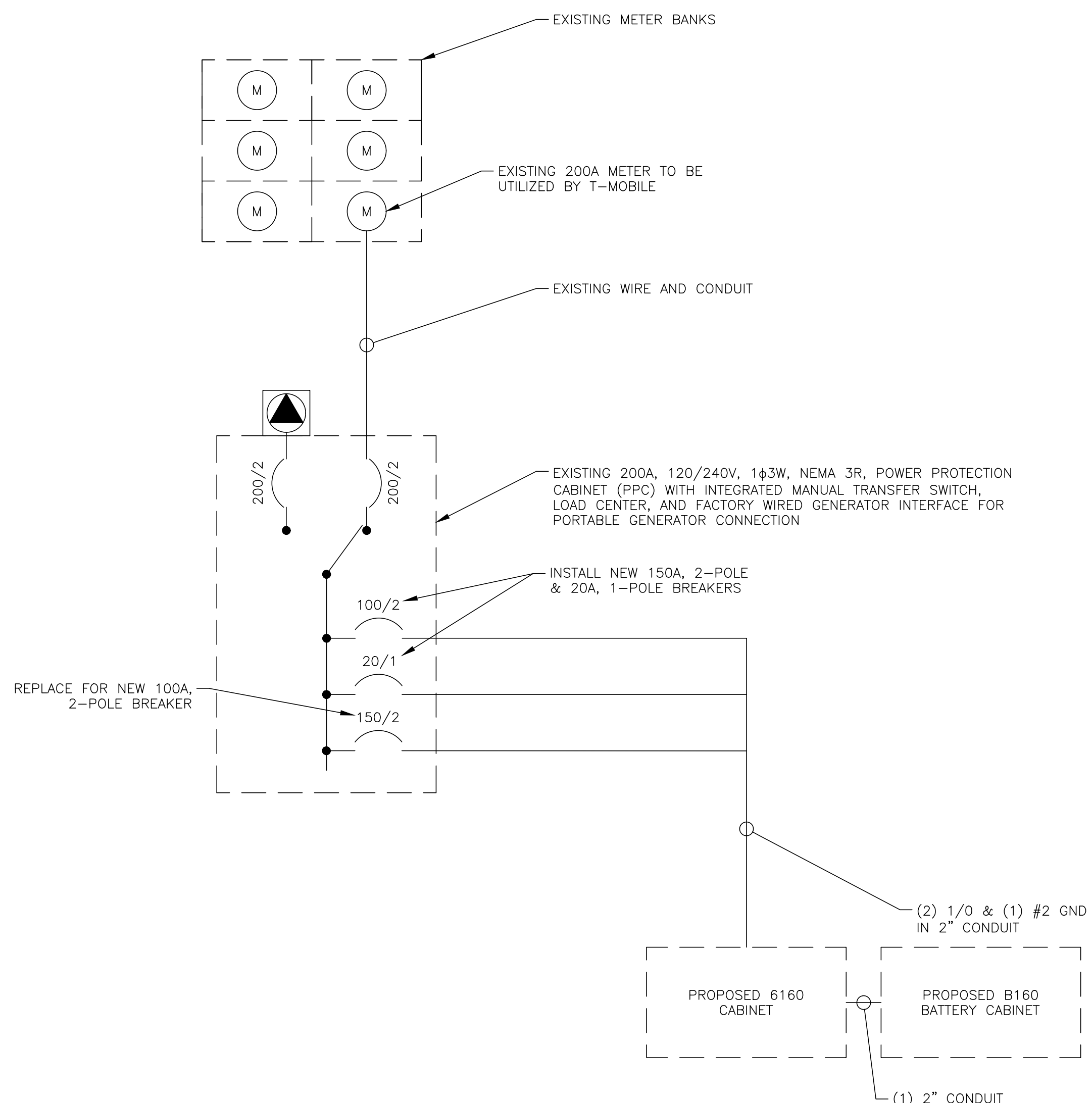
PART NO.	RMQP-496-HK
DWG. NO.	RMQP-496-HK

T-MOBILE PANEL SCHEDULE											
MAIN: 200A MAIN BREAKER			VOLTAGE/PHASE: 120/240V, 1-PHASE, 3-WIRE			SHORT CIRCUIT CURRENT RATING: --					
MOUNTING: INSIDE PPC ENCLOSURE			ENCLOSURE: NEMA 3R			SURGE PROTECTION DEVICE: YES					
DESCRIPTION	LOAD (VA)	C or NC	C/B	CIR No.	PHASE LOADS (VA)		CIR No.	C/B	C or NC	LOAD (VA)	DESCRIPTION
					A	B					
TVSS	0	NC	60	1	180		2	20	NC	180	SERVICE OUTLET
	0	NC		3		5040	4	150	C	5040	RBS 6131**
6160**	3500	C	150	5	8540		6			C	5040
	3500	C		7		3500	8				
6160 GFCI**	180	NC	20	9	180		10				
				11		0	12				
				13	0		14				
				15		0	16				
				17	0		18				
				19		0	20				
				21	0		22				
				23		0	24				
BASE LOAD (VA) =					8900	8540					
25% OF CONTINUOUS LOAD (VA) =					2135	2135					
TOTAL LOAD (VA) =					11035	10675					
TOTAL LOAD (A) =					92	89					

C = CONTINUOUS LOAD; NC = NON-CONTINUOUS LOAD
 * REMOVE WIRE TO EXISTING BREAKER AND MARK AS SPARE
 **INDICATES NEW LOAD. ALL OTHER LOADS ARE EXISTING.
 NEW BREAKER TO BE SAME TYPE AND HAVE SAME AIC RATING AS EXISTING.
 CUSTOMER HAS NOT PROVIDED LOADS FOR EQUIPMENT CABINETS
 THEREFORE THE CABINET LOADS SHOWN ARE ESTIMATED VALUES.

NOTES:

- ALL NEW CONDUCTORS TO BE INSTALLED SHALL BE COPPER. ALL CONDUCTORS SHALL BE THHW, THWN, THWN-2, XHHW, OR XHHW-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.



1 AC PANEL SCHEDULE
 SCALE: NOT TO SCALE

2 ONE LINE DIAGRAM
 SCALE: NOT TO SCALE

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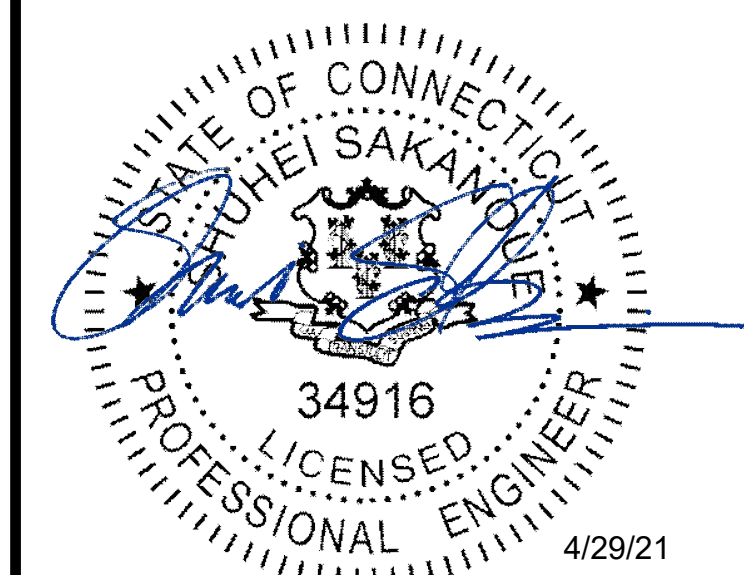
BU #: 876405
 WOODBURY NORTH

186 MINORTOWN
 WOODBURY, CT 06798

EXISTING 110'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES/QA
0	04/29/21	RCD	FINAL	SS



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SHEET NUMBER:

E-1

REVISION:

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T-MOBILE SITE NUMBER:
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BU #: 876405
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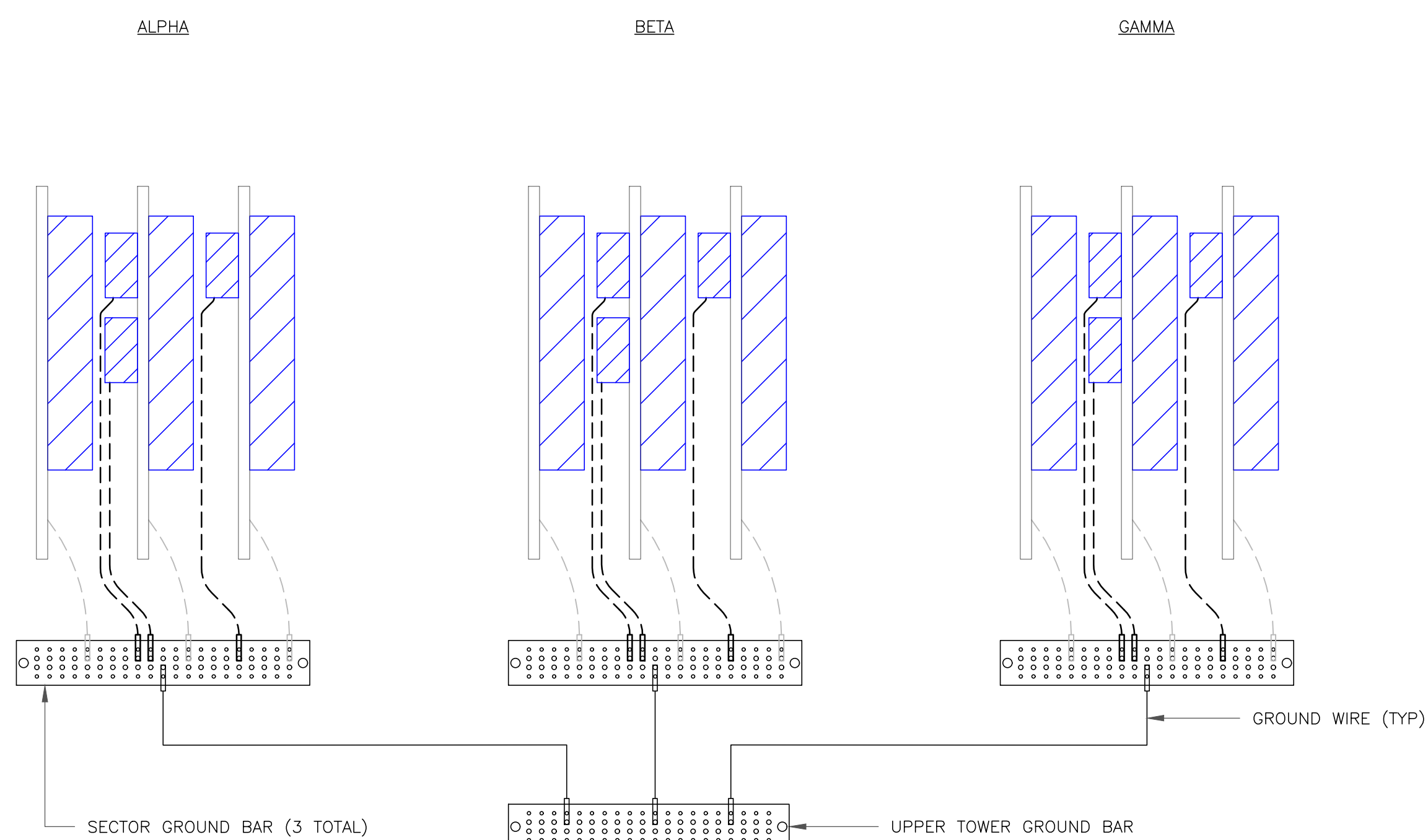
EXISTING 110'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES/QA
0	04/29/21	RCD	FINAL	SS

STATE OF CONNECTICUT
SHUHEI SAKAN
34916
LICENSED PROFESSIONAL ENGINEER
4/29/21

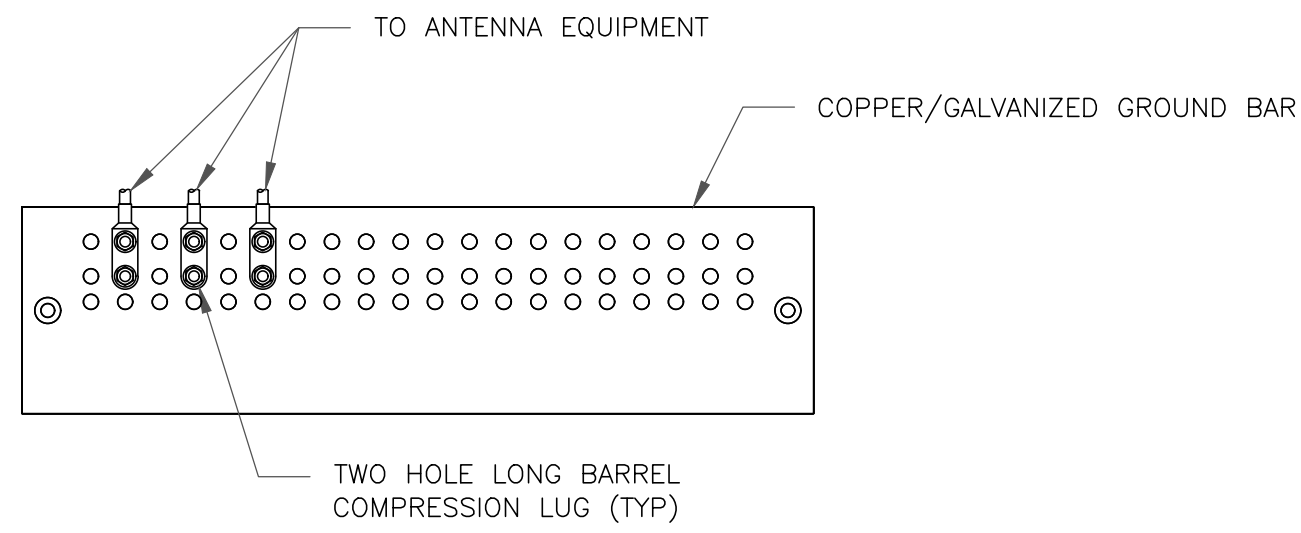
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TO ALTER THIS DOCUMENT.



NOTE:
ALL NEW GROUNDS TO BE #6 STRANDED
COPPER WITH GREEN INSULATION UNLESS
NOTED OTHERWISE.

1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

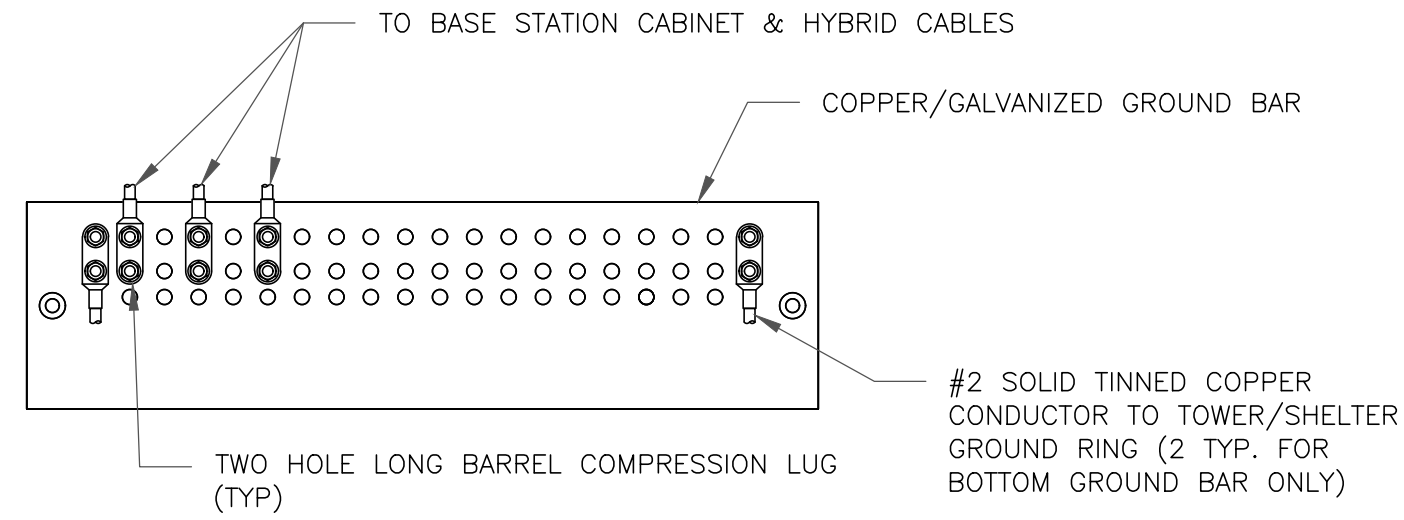
SHEET NUMBER: **G-1** REVISION: **0**



NOTES:

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

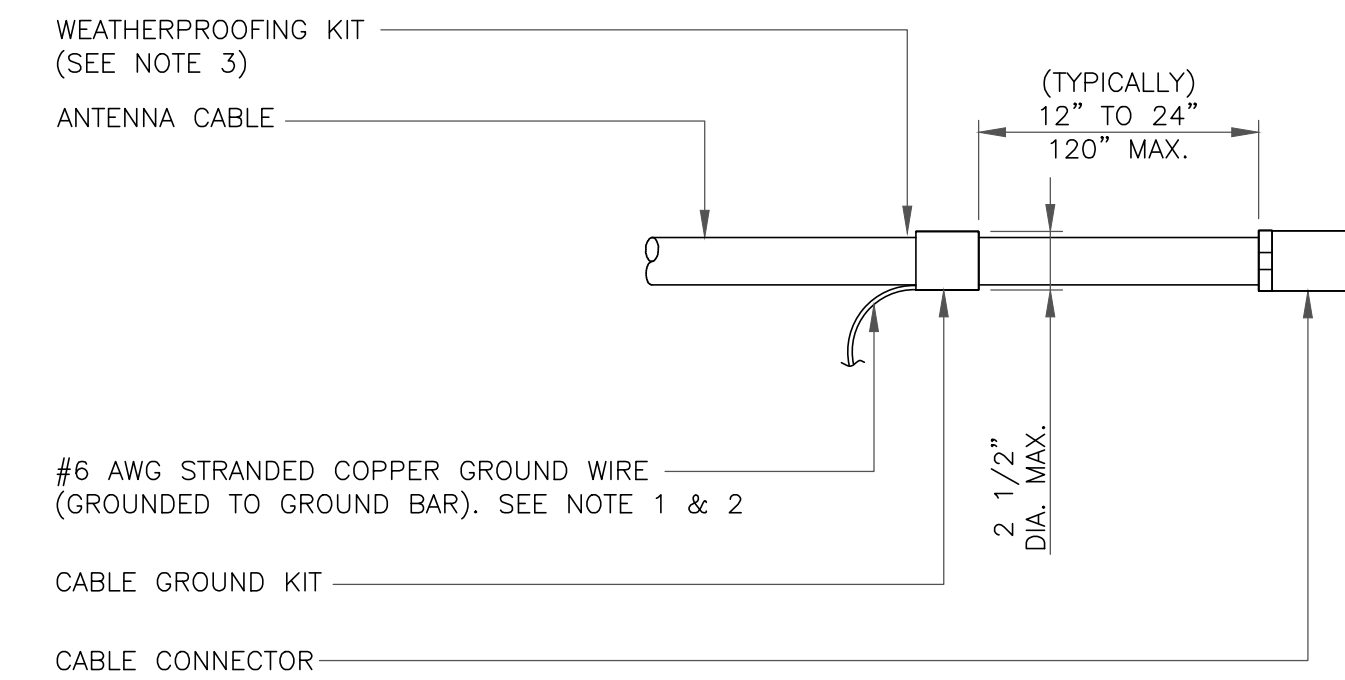
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

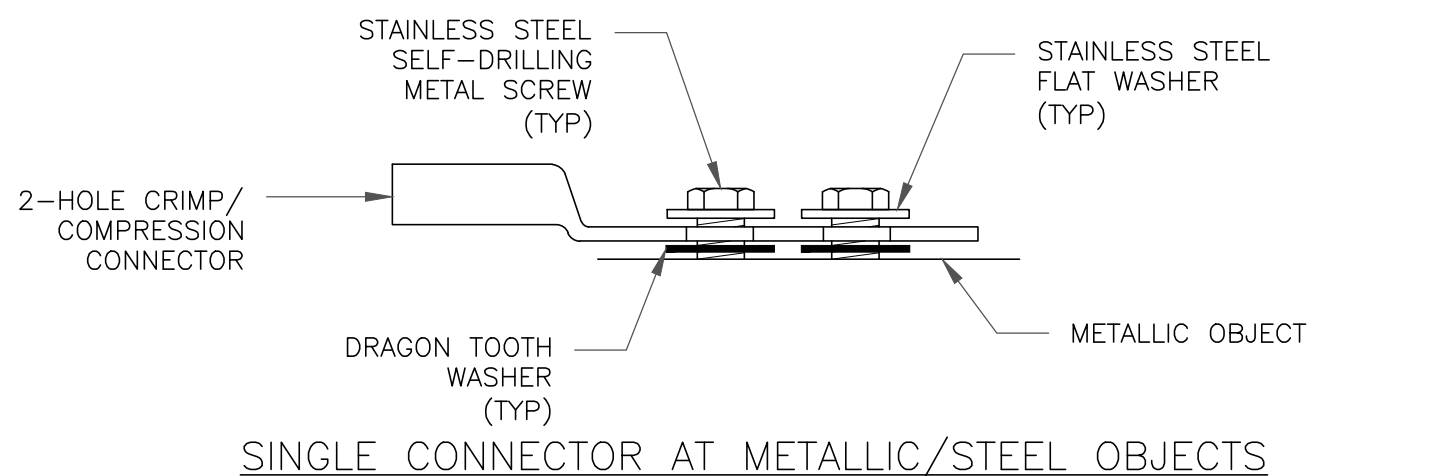
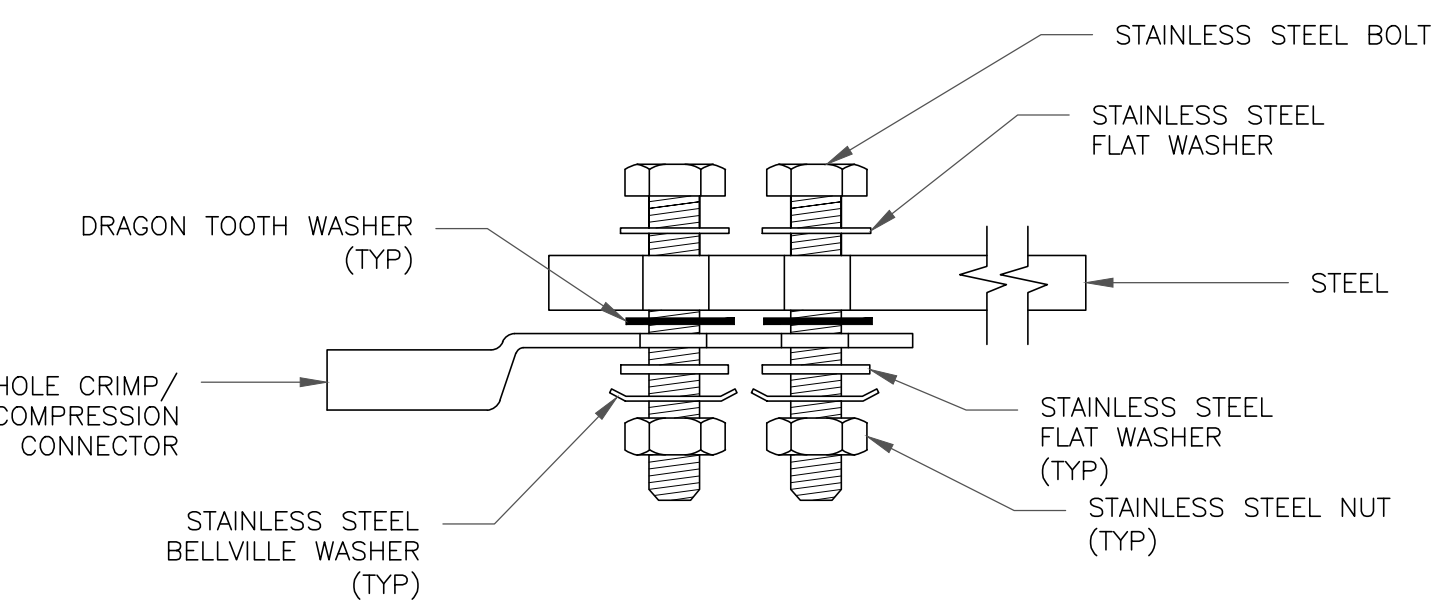
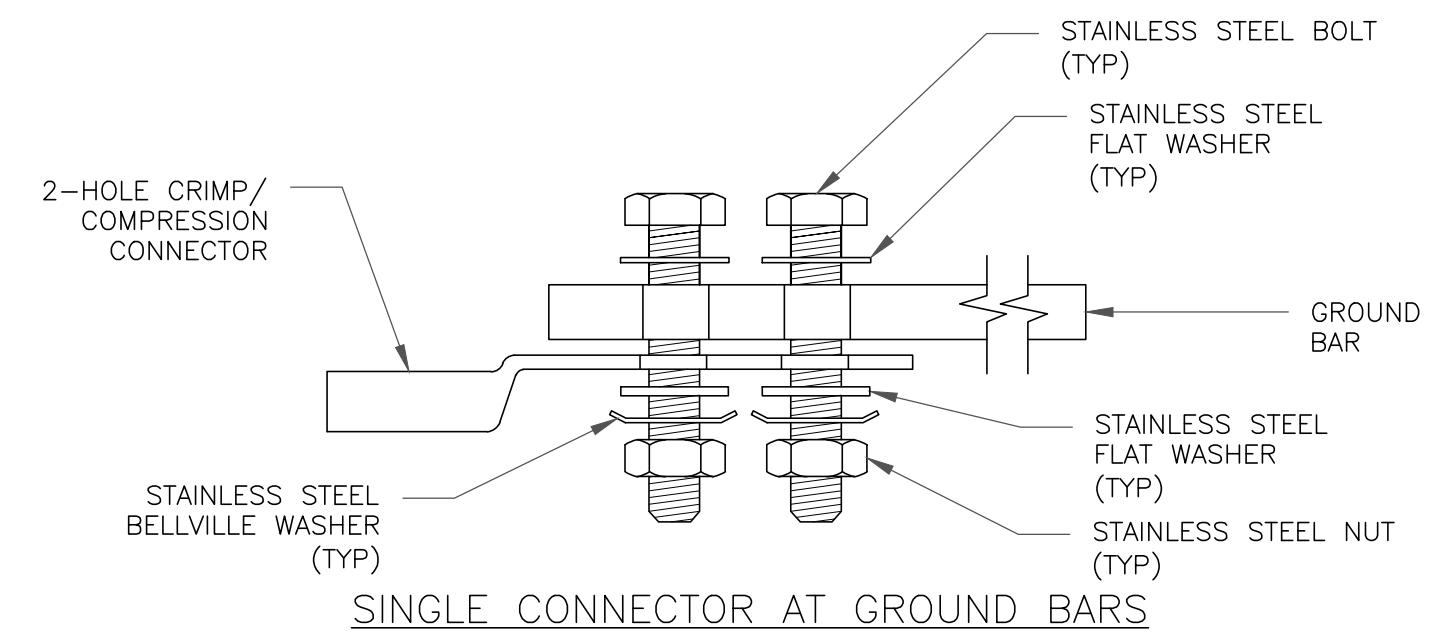
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



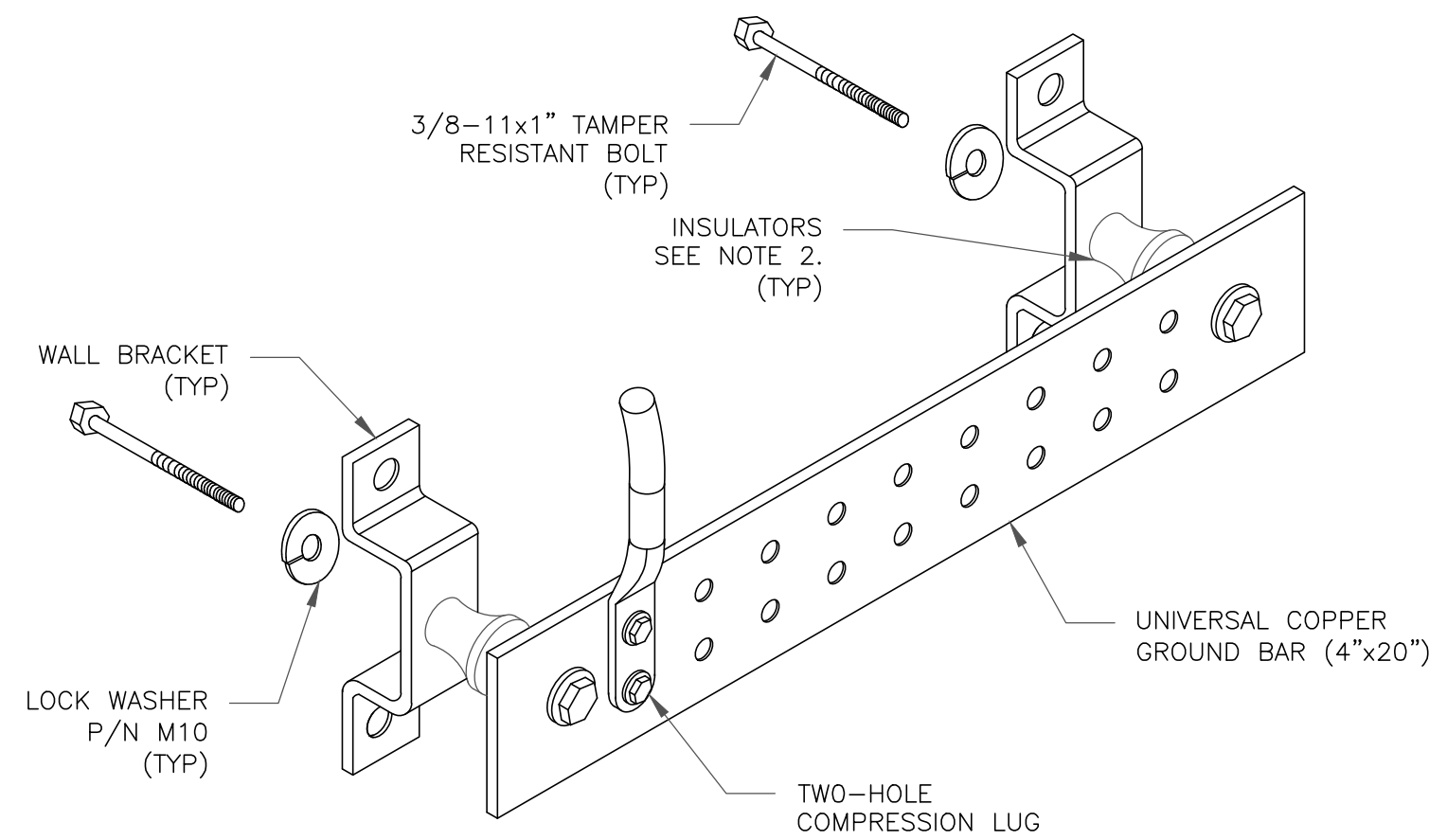
NOTES:

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



4 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
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 OAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

5 GROUND BAR DETAIL
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

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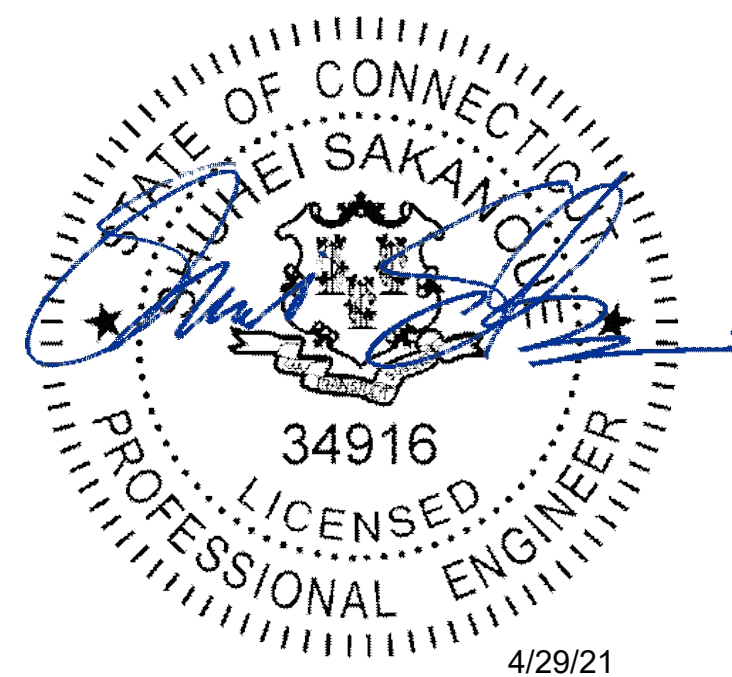
BU #: **876405**
WOODBURY NORTH

186 MINORTOWN
WOODBURY, CT 06798

EXISTING 110'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	04/29/21	RCD	FINAL	SS



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-2** REVISION: **0**

Exhibit D

Structural Analysis Report

Date: **March 18, 2021**



Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351

Subject: Structural Analysis Report

Carrier Designation:

Site Number: CTNH450A
Site Name: CTNH450A

Crown Castle Designation:

BU Number: 876405
Site Name: WOODBURY NORTH
JDE Job Number: 628908
Work Order Number: 1918893
Order Number: 538759 Rev. 1

Engineering Firm Designation:

TEP Project Number: 25604.514581

Site Data:

186 Minortown, Woodbury, Litchfield County, CT 06798
Latitude 41° 34' 4.79", Longitude -73° 10' 46.85"
110 Foot - Monopole Tower

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

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

LC5: Proposed Equipment Configuration

Sufficient Capacity - 80.1%

This analysis utilizes an ultimate 3-second gust wind speed of 120 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: T. Isaac Merrill, EIT / TLI

Respectfully submitted by:

Aaron T. Rucker, P.E.



Electronic Copy

03/18/2021

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1) INTRODUCTION

This tower is a 100-ft monopole tower designed by Engineered Endeavors, Inc. The tower has been modified multiple times in the past to accommodate additional loading. The tower was previously extended 10-ft, bringing the overall tower height to 110-ft.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	120 mph
Exposure Category:	C
Topographic Factor:	1.0
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
102.0	102.0	3	RFS Celwave	APX16DWV-16DWV-S-E-A20	4	1-5/8
		3	RFS Celwave	APXVAALL24_43-U-NA20_TMO		
		3	Ericsson	AIR6449 B41_T-MOBILE		
		3	Ericsson	RADIO 4415 B66A_CCIV3		
		3	Ericsson	RADIO 4424 B25_TMO		
		3	Ericsson	RADIO 4449 B71 B85A_T-MOBILE		
50.0	51.0	1	Lucent	KS24019-L112A	1	1/2
	50.0	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)
108.0	108.0	2	Antel	BXA-171085-8BF-EDIN-2 w/ Mount Pipe	12	1-5/8
		1	Antel	BXA-171063-8BF-2 w/ Mount Pipe		
		3	Antel	BXA-70063/6CF-2 w/ Mount Pipe		
		2	Antel	BXA-80080/4CF w/ Mount Pipe		
		1	Antel	BXA-80063/4CFx5 w/ Mount Pipe		
		6	RFS Celwave	FD9R6004/2C-3L		
		1	Tower Mounts	T-Arm Mount [TA 602-3]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
80.0	80.0	3	Powerwave Technologies	7770.00 w/ Mount Pipe	12 2 2 2	1-5/8 7/8 3/8 7/16
		1	Tower Mounts	T-Arm Mount [TA 602-3]		
	78.0	4	Cci Antennas	DMP65R-BU6D w/ Mount Pipe		
		2	Cci Antennas	DMP65R-BU4D w/ Mount Pipe		
		6	Powerwave Technologies	LGP21401		
		3	Ericsson	RRUS 8843 B2/B66A		
		3	Ericsson	RRUS 4478 B14		
		3	Ericsson	RRUS 4449 B5/B12		
		3	Powerwave Technologies	1001940		
		1	Raycap	DC6-48-60-0-8C-EV		
	1	Raycap	DC6-48-60-18-8F			
	75.0	75.0	3	Ericsson		
1			Tower Mounts	Side Arm Mount [SO 701-3]	-	-

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Geotechnical Report	2158106	CCISites
Tower Foundation Drawings	1613643	CCISites
Tower Manufacturer Drawings	1614551	CCISites
Post-Modification Inspection	1956156	CCISites
Tower Reinforcement Drawings	2177138	CCISites
Post-Modification Inspection	2309564	CCISites
Tower Reinforcement Drawings	2055775	CCISites
Post-Modification Inspection	3373272	CCISites
Tower Reinforcement Drawings	3382709	CCISites
Post-Modification Inspection	3849745	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.

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

3.2) Assumptions

- 1) The 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. Tower Engineering Professionals should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)^{1,2}

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
110 - 105	Pole	TP13.693x12.7x0.1875	Pole	5.3%	Pass
105 - 100	Pole	TP14.686x13.693x0.1875	Pole	17.5%	Pass
100 - 98.5	Pole	TP14.984x14.686x0.1875	Pole	22.4%	Pass
98.5 - 93.5	Pole	TP16.477x15.5x0.1875	Pole	34.1%	Pass
93.5 - 88.5	Pole	TP17.454x16.477x0.1875	Pole	44.6%	Pass
88.5 - 83.5	Pole	TP18.431x17.454x0.1875	Pole	53.4%	Pass
83.5 - 78.67	Pole	TP19.375x18.431x0.1875	Pole	61.8%	Pass
78.67 - 78.42	Pole + Reinf.	TP19.424x19.375x0.5475	Reinf. 5 Bolt-Shaft Bearing	34.1%	Pass
78.42 - 73.42	Pole + Reinf.	TP20.401x19.424x0.5225	Reinf. 5 Tension Rupture	41.1%	Pass
73.42 - 68.42	Pole + Reinf.	TP21.378x20.401x0.5025	Reinf. 5 Tension Rupture	47.9%	Pass
68.42 - 63.42	Pole + Reinf.	TP22.355x21.378x0.4825	Reinf. 5 Tension Rupture	54.0%	Pass
63.42 - 58.67	Pole + Reinf.	TP23.283x22.355x0.4675	Reinf. 5 Bolt-Shaft Bearing	59.8%	Pass
58.67 - 58.42	Pole + Reinf.	TP23.332x23.283x0.4675	Reinf. 4 Bolt-Shaft Bearing	60.0%	Pass
58.42 - 53.42	Pole + Reinf.	TP24.309x23.332x0.4525	Reinf. 4 Tension Rupture	64.6%	Pass
53.42 - 50.87	Pole + Reinf.	TP25.54x24.309x0.4475	Reinf. 4 Tension Rupture	66.9%	Pass
50.87 - 45.87	Pole + Reinf.	TP25.397x24.432x0.505	Reinf. 4 Tension Rupture	63.8%	Pass
45.87 - 40.87	Pole + Reinf.	TP26.362x25.397x0.495	Reinf. 4 Tension Rupture	67.1%	Pass
40.87 - 35.87	Pole + Reinf.	TP27.327x26.362x0.485	Reinf. 4 Tension Rupture	70.1%	Pass
35.87 - 30.87	Pole + Reinf.	TP28.292x27.327x0.475	Reinf. 4 Tension Rupture	72.8%	Pass
30.87 - 28.67	Pole + Reinf.	TP28.717x28.292x0.47	Reinf. 4 Tension Rupture	73.9%	Pass
28.67 - 28.42	Pole + Reinf.	TP28.765x28.717x0.47	Reinf. 7 Tension Rupture	74.0%	Pass
28.42 - 23.42	Pole + Reinf.	TP29.73x28.765x0.46	Reinf. 7 Tension Rupture	76.4%	Pass
23.42 - 18.42	Pole + Reinf.	TP30.695x29.73x0.455	Reinf. 7 Tension Rupture	78.5%	Pass
18.42 - 14.17	Pole + Reinf.	TP31.515x30.695x0.445	Reinf. 7 Tension Rupture	80.1%	Pass
14.17 - 13.92	Pole + Reinf.	TP31.563x31.515x0.54	Reinf. 3 Tension Rupture	71.3%	Pass
13.92 - 13.67	Pole + Reinf.	TP31.612x31.563x0.54	Reinf. 3 Tension Rupture	71.4%	Pass
13.67 - 13.42	Pole + Reinf.	TP31.66x31.612x0.5	Reinf. 3 Tension Rupture	72.7%	Pass
13.42 - 8.42	Pole + Reinf.	TP32.625x31.66x0.49	Reinf. 3 Tension Rupture	74.3%	Pass
8.42 - 5.75	Pole + Reinf.	TP33.14x32.625x0.485	Reinf. 3 Tension Rupture	75.1%	Pass
5.75 - 5.5	Pole + Reinf.	TP33.189x33.14x0.525	Reinf. 3 Tension Rupture	74.0%	Pass
5.5 - 3.57	Pole + Reinf.	TP33.561x33.189x0.59	Reinf. 1 Compression	61.2%	Pass

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
3.57 - 3.32	Pole + Reinf.	TP33.609x33.561x0.585	Reinf. 1 Compression	61.3%	Pass
3.32 - 3.17	Pole + Reinf.	TP33.638x33.609x0.585	Reinf. 1 Compression	61.4%	Pass
3.17 - 2.92	Pole + Reinf.	TP33.686x33.638x0.495	Reinf. 1 Compression	70.5%	Pass
2.92 - 2.75	Pole + Reinf.	TP33.719x33.686x0.495	Reinf. 1 Compression	70.5%	Pass
2.75 - 2.5	Pole + Reinf.	TP33.768x33.719x0.49	Reinf. 1 Compression	70.0%	Pass
2.5 - 0	Pole + Reinf.	TP34.25x33.768x0.485	Reinf. 1 Compression	70.6%	Pass
				Summary	
			Pole	61.8%	Pass
			Reinforcement	80.1%	Pass
			Overall	80.1%	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Flange Connection	98.5	49.9	Pass
1,2	Anchor Rods	-	51.6	Pass
1,2	Base Plate	-	79.0	Pass
1,2	Base Foundation Soil Interaction	-	75.4	Pass
1,2	Base Foundation Structural	-	47.6	Pass

Structure Rating (max from all components) =	80.1%
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Notes:

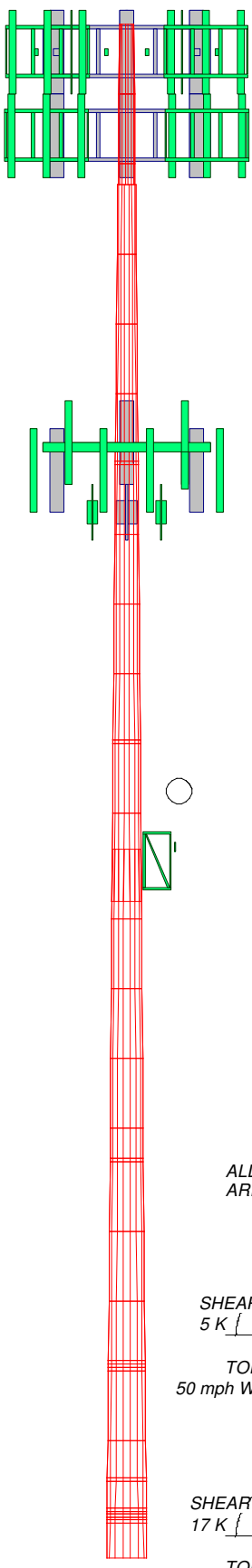
- 1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
- 2) Rating per TIA-222-H Section 15.5

4.1) Recommendations

- 1) 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	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	18	0.1875	12.7000	12.7000	13.6932		0.1
2	5.00	18	0.1875	15.50001	15.50001	16.477014		0.1
3	1.50	18	0.1875	16.4770	16.4770	17.4541		0.0
4	5.00	18	0.1875	16.4770	16.4770	17.4541		0.2
5	5.00	18	0.1875	16.4770	16.4770	17.4541		0.2
6	5.00	18	0.1875	17.4541	17.4541	18.4311		0.2
7	5.00	18	0.1875	17.4541	17.4541	18.4311		0.2
8	5.00	18	0.1875	17.4541	17.4541	18.4311		0.2
9	5.00	18	0.1875	19.42368	19.42368	20.40068		0.5
10	5.00	18	0.1875	20.4008	20.4008	21.3778		0.5
11	5.00	18	0.4825	21.3778	21.3778	22.3549		0.5
12	4.75	18	0.4675	23.3323	23.3323	24.3089		0.5
13	4.75	18	0.4675	23.3323	23.3323	24.3089		0.5
14	4.75	18	0.4675	23.3323	23.3323	24.3089		0.5
15	5.06630	18	0.4475	24.3089	24.3089	25.5400		0.7
16	5.00	18	0.5050	25.3972	25.3972	26.3622		0.6
17	5.00	18	0.4850	26.3622	26.3622	27.3272		0.6
18	5.00	18	0.4750	27.3272	27.3272	28.2922		0.7
19	5.00	18	0.4750	28.2922	28.2922	29.2572		0.7
20	5.00	18	0.4750	29.2572	29.2572	30.2222		0.7
21	5.00	18	0.4600	29.2572	29.2572	30.6950		0.7
22	5.00	18	0.4550	29.7900	29.7900	30.6950		0.7
23	5.00	18	0.4550	29.7900	29.7900	30.6950		0.7
24	4.25	18	0.4450	31.6600	31.6600	32.6250		0.8
25	4.25	18	0.4450	31.6600	31.6600	32.6250		0.8
26	4.25	18	0.4450	31.6600	31.6600	32.6250		0.8
27	4.25	18	0.4450	31.6600	31.6600	32.6250		0.8
28	5.00	18	0.4900	32.6250	32.6250	34.2000		0.4
29	2.67	18	0.4900	32.6250	32.6250	34.2000		0.4
30	2.67	18	0.4900	32.6250	32.6250	34.2000		0.4
31	2.67	18	0.4900	32.6250	32.6250	34.2000		0.4
32	2.67	18	0.4900	32.6250	32.6250	34.2000		0.4
33	2.67	18	0.4900	32.6250	32.6250	34.2000		0.4
34	2.67	18	0.4900	32.6250	32.6250	34.2000		0.4
35	2.67	18	0.4900	32.6250	32.6250	34.2000		0.4
36	2.67	18	0.4900	32.6250	32.6250	34.2000		0.4
37	2.67	18	0.4900	32.6250	32.6250	34.2000		0.4

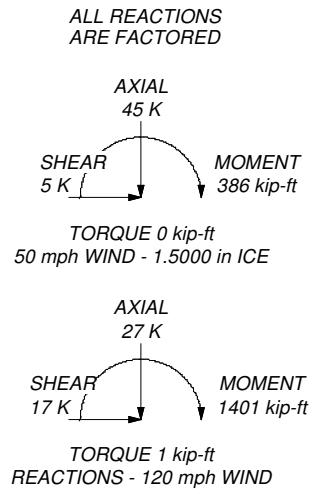


MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 120 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: 80.1%



 Tower Engineering Professional	Tower Engineering Professionals, Inc.		Job: Woodbury North (BU 876405)		
	326 Tryon Road		Project: TEP No. 25604.514581		
	Raleigh, NC 27603-5263		Client: Crown Castle	Drawn by: TLI	App'd:
	Phone: (919) 661-6351		Code: TIA-222-H	Date: 03/18/21	Scale: NTS
	FAX: (919) 661-6350		Path:	Dwg No. E-1	

C:\Users\infante\Desktop\25604.514581 WOODBURY NORTH\Tower\876405_1918893_LCS.dwg

<i>tnxTower</i> <i>Tower Engineering Professionals, Inc.</i> 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	Job Woodbury North (BU 876405)	Page 1 of 34
	Project TEP No. 25604.514581	Date 10:05:14 03/18/21
	Client Crown Castle	Designed by TLI

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 Litchfield County, Connecticut.

Tower base elevation above sea level: 460.00 ft.

Basic wind speed of 120 mph.

Risk Category II.

Exposure Category C.

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 56.00 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

TOWER RATING: 80.1%.

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"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric 	<ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination √ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs 	<ul style="list-style-type: none"> Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <li style="text-align: center;">Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
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tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Woodbury North (BU 876405)	Page	2 of 34
	Project	TEP No. 25604.514581	Date	10:05:14 03/18/21
	Client	Crown Castle	Designed by	TLI

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	110.00-105.00	5.00	0.00	18	12.7000	13.6932	0.1875	0.7500	A572-65 (65 ksi)
L2	105.00-100.00	5.00	0.00	18	13.6932	14.6863	0.1875	0.7500	A572-65 (65 ksi)
L3	100.00-98.50	1.50	0.00	18	14.6863	14.9843	0.1875	0.7500	A572-65 (65 ksi)
L4	98.50-93.50	5.00	0.00	18	15.5000	16.4770	0.1875	0.7500	A572-65 (65 ksi)
L5	93.50-88.50	5.00	0.00	18	16.4770	17.4541	0.1875	0.7500	A572-65 (65 ksi)
L6	88.50-83.50	5.00	0.00	18	17.4541	18.4311	0.1875	0.7500	A572-65 (65 ksi)
L7	83.50-78.67	4.83	0.00	18	18.4311	19.3749	0.1875	0.7500	A572-65 (65 ksi)
L8	78.67-78.42	0.25	0.00	18	19.3749	19.4238	0.5475	2.1900	A572-65 (65 ksi)
L9	78.42-73.42	5.00	0.00	18	19.4238	20.4008	0.5225	2.0900	A572-65 (65 ksi)
L10	73.42-68.42	5.00	0.00	18	20.4008	21.3778	0.5025	2.0100	A572-65 (65 ksi)
L11	68.42-63.42	5.00	0.00	18	21.3778	22.3549	0.4825	1.9300	A572-65 (65 ksi)
L12	63.42-58.67	4.75	0.00	18	22.3549	23.2831	0.4675	1.8700	A572-65 (65 ksi)
L13	58.67-58.42	0.25	0.00	18	23.2831	23.3319	0.4675	1.8700	A572-65 (65 ksi)
L14	58.42-53.42	5.00	0.00	18	23.3319	24.3089	0.4525	1.8100	A572-65 (65 ksi)
L15	53.42-47.12	6.30	3.75	18	24.3089	25.5400	0.4475	1.7900	A572-65 (65 ksi)
L16	47.12-45.87	5.00	0.00	18	24.4322	25.3972	0.5050	2.0200	A572-65 (65 ksi)
L17	45.87-40.87	5.00	0.00	18	25.3972	26.3622	0.4950	1.9800	A572-65 (65 ksi)
L18	40.87-35.87	5.00	0.00	18	26.3622	27.3272	0.4850	1.9400	A572-65 (65 ksi)
L19	35.87-30.87	5.00	0.00	18	27.3272	28.2922	0.4750	1.9000	A572-65 (65 ksi)
L20	30.87-28.67	2.20	0.00	18	28.2922	28.7168	0.4700	1.8800	A572-65 (65 ksi)
L21	28.67-28.42	0.25	0.00	18	28.7168	28.7650	0.4700	1.8800	A572-65 (65 ksi)
L22	28.42-23.42	5.00	0.00	18	28.7650	29.7300	0.4600	1.8400	A572-65 (65 ksi)
L23	23.42-18.42	5.00	0.00	18	29.7300	30.6950	0.4550	1.8200	A572-65 (65 ksi)
L24	18.42-14.17	4.25	0.00	18	30.6950	31.5152	0.4450	1.7800	A572-65 (65 ksi)
L25	14.17-13.92	0.25	0.00	18	31.5152	31.5635	0.5400	2.1600	A572-65 (65 ksi)
L26	13.92-13.67	0.25	0.00	18	31.5635	31.6117	0.5400	2.1600	A572-65 (65 ksi)
L27	13.67-13.42	0.25	0.00	18	31.6117	31.6600	0.5000	2.0000	A572-65 (65 ksi)
L28	13.42-8.42	5.00	0.00	18	31.6600	32.6250	0.4900	1.9600	A572-65 (65 ksi)
L29	8.42-5.75	2.67	0.00	18	32.6250	33.1403	0.4850	1.9400	A572-65 (65 ksi)

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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
L30	5.75-5.50	0.25	0.00	18	33.1403	33.1885	0.5250	2.1000	A572-65 (65 ksi)
L31	5.50-3.57	1.93	0.00	18	33.1885	33.5610	0.5900	2.3600	A572-65 (65 ksi)
L32	3.57-3.32	0.25	0.00	18	33.5610	33.6092	0.5850	2.3400	A572-65 (65 ksi)
L33	3.32-3.17	0.15	0.00	18	33.6092	33.6382	0.5850	2.3400	A572-65 (65 ksi)
L34	3.17-2.92	0.25	0.00	18	33.6382	33.6864	0.4950	1.9800	A572-65 (65 ksi)
L35	2.92-2.75	0.17	0.00	18	33.6864	33.7193	0.4950	1.9800	A572-65 (65 ksi)
L36	2.75-2.50	0.25	0.00	18	33.7193	33.7675	0.4900	1.9600	A572-65 (65 ksi)
L37	2.50-0.00	2.50		18	33.7675	34.2500	0.4850	1.9400	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	12.8670	7.4465	147.2916	4.4419	6.4516	22.8302	294.7770	3.7240	1.9052	10.161
	13.8755	8.0376	185.2228	4.7945	6.9561	26.6273	370.6893	4.0195	2.0800	11.093
L2	13.8755	8.0376	185.2228	4.7945	6.9561	26.6273	370.6893	4.0195	2.0800	11.093
	14.8840	8.6286	229.1639	5.1471	7.4607	30.7163	458.6293	4.3151	2.2548	12.026
L3	14.8840	8.6286	229.1639	5.1471	7.4607	30.7163	458.6293	4.3151	2.2548	12.026
	15.1865	8.8059	243.5842	5.2529	7.6120	31.9999	487.4888	4.4038	2.3072	12.305
L4	15.7102	9.1129	269.9504	5.4359	7.8740	34.2838	540.2560	4.5573	2.3980	12.789
	16.7023	9.6943	324.9912	5.7828	8.3703	38.8266	650.4101	4.8481	2.5700	13.706
L5	16.7023	9.6943	324.9912	5.7828	8.3703	38.8266	650.4101	4.8481	2.5700	13.706
	17.6944	10.2758	387.0470	6.1296	8.8667	43.6519	774.6033	5.1389	2.7419	14.624
L6	17.6944	10.2758	387.0470	6.1296	8.8667	43.6519	774.6033	5.1389	2.7419	14.624
	18.6865	10.8572	456.5385	6.4765	9.3630	48.7599	913.6777	5.4296	2.9139	15.541
L7	18.6865	10.8572	456.5385	6.4765	9.3630	48.7599	913.6777	5.4296	2.9139	15.541
	19.6449	11.4189	531.1230	6.8115	9.8425	53.9624	1062.9449	5.7105	3.0800	16.427
L8	19.5893	32.7176	1465.2126	6.6837	9.8425	148.8665	2932.3532	16.3619	2.4464	4.468
	19.6390	32.8025	1476.6477	6.7011	9.8673	149.6510	2955.2385	16.4044	2.4550	4.484
L9	19.6428	31.3461	1414.8275	6.7100	9.8673	143.3858	2831.5166	15.6761	2.4990	4.783
	20.6349	32.9665	1645.7676	7.0568	10.3636	158.8026	3293.7008	16.4864	2.6709	5.112
L10	20.6380	31.7365	1587.5539	7.0639	10.3636	153.1855	3177.1968	15.8713	2.7061	5.385
	21.6301	33.2948	1833.0776	7.4107	10.8599	168.7926	3668.5673	16.6506	2.8781	5.728
L11	21.6332	32.0003	1765.1831	7.4178	10.8599	162.5408	3532.6889	16.0032	2.9133	6.038
	22.6253	33.4966	2024.5533	7.7647	11.3563	178.2762	4051.7706	16.7515	3.0853	6.394
L12	22.6276	32.4775	1965.6524	7.7700	11.3563	173.0896	3933.8913	16.2418	3.1117	6.656
	23.5701	33.8547	2226.4807	8.0995	11.8278	188.2415	4455.8910	16.9306	3.2750	7.005
L13	23.5701	33.8547	2226.4807	8.0995	11.8278	188.2415	4455.8910	16.9306	3.2750	7.005
	23.6197	33.9272	2240.8129	8.1169	11.8526	189.0565	4484.5742	16.9668	3.2836	7.024
L14	23.6220	32.8602	2173.1866	8.1222	11.8526	183.3509	4349.2328	16.4332	3.3100	7.315
	24.6141	34.2634	2463.6539	8.4690	12.3489	199.5033	4930.5496	17.1350	3.4820	7.695
L15	24.6149	33.8919	2437.9635	8.4708	12.3489	197.4229	4879.1349	16.9492	3.4908	7.801
	25.8650	35.6405	2835.1054	8.9078	12.9743	218.5167	5673.9413	17.8236	3.7074	8.285
L16	25.4661	38.3522	2774.0402	8.4942	12.4116	223.5044	5551.7306	19.1798	3.4113	6.755
	25.7111	39.8990	3123.3897	8.8367	12.9018	242.0898	6250.8892	19.9533	3.5811	7.091
L17	25.7126	39.1246	3065.2316	8.8403	12.9018	237.5820	6134.4966	19.5660	3.5987	7.27
	26.6925	40.6407	3435.5616	9.1829	13.3920	256.5384	6875.6437	20.3242	3.7685	7.613
L18	26.6941	39.8351	3370.0617	9.1864	13.3920	251.6474	6744.5579	19.9213	3.7861	7.806

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Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
MP3-05 (1.25in)	C	No	Surface Af (CaAa)	31.17 - 0.00	1	1	0.000 0.000	5.3300	14.8400	0.00
MP3-05 (1.25in)	B	No	Surface Af (CaAa)	31.17 - 0.00	1	1	0.000 0.000	5.3300	14.8400	0.00

MP3-05 (1.25in)	C	No	Surface Af (CaAa)	61.17 - 31.17	1	1	0.000 0.000	5.3300	14.8400	0.00
MP3-05 (1.25in)	B	No	Surface Af (CaAa)	61.17 - 31.17	1	1	0.000 0.000	5.3300	14.8400	0.00
MP3-05 (1.25in)	A	No	Surface Af (CaAa)	61.17 - 31.17	1	1	0.000 0.000	5.3300	14.8400	0.00

MP3-05 (1.25in)	C	No	Surface Af (CaAa)	81.17 - 61.17	1	1	0.000 0.000	5.3300	14.8400	0.00
MP3-05 (1.25in)	B	No	Surface Af (CaAa)	81.17 - 61.17	1	1	0.000 0.000	5.3300	14.8400	0.00
MP3-05 (1.25in)	A	No	Surface Af (CaAa)	81.17 - 61.17	1	1	0.000 0.000	5.3300	14.8400	0.00

MP3-08.5 (1.25")	A	No	Surface Af (CaAa)	16.17 - 0.00	1	1	0.333 0.333	3.8400	13.2800	0.00
MP3-08.5 (1.25")	A	No	Surface Af (CaAa)	16.17 - 0.00	1	1	-0.333 -0.333	3.8400	13.2800	0.00

MP3-05 (1.25in)	A	No	Surface Af (CaAa)	31.17 - 11.17	1	1	0.000 0.000	5.3300	14.8400	0.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	CAAA	Weight	
							ft ² /ft	plf	
LDF7-50A(1-5/8)	C	No	No	Inside Pole	108.00 - 0.00	12	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.82 0.82 0.82 0.82
HB158-21U6S24-xx M_TMO(1-5/8)	C	No	No	Inside Pole	102.00 - 0.00	4	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	2.50 2.50 2.50 2.50
LDF7-50A(1-5/8)	C	No	No	Inside Pole	80.00 - 0.00	12	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.82 0.82 0.82 0.82
WR-VG66ST-BRD(7/8)	C	No	No	Inside Pole	80.00 - 0.00	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.91 0.91 0.91 0.91
FB-L98B-002-75000 (3/8)	C	No	No	Inside Pole	80.00 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.06 0.06 0.06 0.06
2" Flexible Conduit	C	No	No	Inside Pole	80.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.34 0.34 0.34

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
WR-VG122ST-BRD A(7/16)	C	No	No	Inside Pole	80.00 - 0.00	2	2" Ice	0.00	0.34
							No Ice	0.00	0.14
							1/2" Ice	0.00	0.14
							1" Ice	0.00	0.14
FB-L98B-034-XXX(3/8)	C	No	No	Inside Pole	80.00 - 0.00	1	2" Ice	0.00	0.14
							No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
3/8" Ground	C	No	No	Inside Pole	110.00 - 0.00	1	2" Ice	0.00	0.06
							No Ice	0.00	0.22
							1/2" Ice	0.00	0.22
							1" Ice	0.00	0.22
1/2" Ground	C	No	No	Inside Pole	110.00 - 0.00	2	2" Ice	0.00	0.22
							No Ice	0.00	0.52
							1/2" Ice	0.00	0.52
							1" Ice	0.00	0.52
							2" Ice	0.00	0.52

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	110.00-105.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.04
L2	105.00-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.08
L3	100.00-98.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.03
L4	98.50-93.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.11
L5	93.50-88.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.11
L6	88.50-83.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.11
L7	83.50-78.67	A	0.000	0.000	2.221	0.000	0.00
		B	0.000	0.000	2.221	0.000	0.00
		C	0.000	0.000	2.221	0.000	0.12
L8	78.67-78.42	A	0.000	0.000	0.222	0.000	0.00
		B	0.000	0.000	0.222	0.000	0.00
		C	0.000	0.000	0.222	0.000	0.01
L9	78.42-73.42	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	4.442	0.000	0.00
		C	0.000	0.000	4.442	0.000	0.17
L10	73.42-68.42	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	4.442	0.000	0.00
		C	0.000	0.000	4.442	0.000	0.17

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<i>Tower Section</i>	<i>Tower Elevation</i> ft	<i>Face</i>	<i>A_R</i> ft ²	<i>A_F</i> ft ²	<i>C_{AA}</i> <i>In Face</i> ft ²	<i>C_{AA}</i> <i>Out Face</i> ft ²	<i>Weight</i> K
L11	68.42-63.42	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	4.442	0.000	0.00
		C	0.000	0.000	4.442	0.000	0.17
L12	63.42-58.67	A	0.000	0.000	4.220	0.000	0.00
		B	0.000	0.000	4.220	0.000	0.00
		C	0.000	0.000	4.220	0.000	0.16
L13	58.67-58.42	A	0.000	0.000	0.222	0.000	0.00
		B	0.000	0.000	0.222	0.000	0.00
		C	0.000	0.000	0.222	0.000	0.01
L14	58.42-53.42	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	4.442	0.000	0.00
		C	0.000	0.000	4.442	0.000	0.17
L15	53.42-47.12	A	0.000	0.000	5.596	0.000	0.00
		B	0.000	0.000	5.777	0.000	0.00
		C	0.000	0.000	5.596	0.000	0.21
L16	47.12-45.87	A	0.000	0.000	1.110	0.000	0.00
		B	0.000	0.000	1.189	0.000	0.00
		C	0.000	0.000	1.110	0.000	0.04
L17	45.87-40.87	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	4.754	0.000	0.00
		C	0.000	0.000	4.442	0.000	0.17
L18	40.87-35.87	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	4.754	0.000	0.00
		C	0.000	0.000	4.442	0.000	0.17
L19	35.87-30.87	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	4.754	0.000	0.00
		C	0.000	0.000	4.442	0.000	0.17
L20	30.87-28.67	A	0.000	0.000	1.954	0.000	0.00
		B	0.000	0.000	2.092	0.000	0.00
		C	0.000	0.000	1.954	0.000	0.07
L21	28.67-28.42	A	0.000	0.000	0.222	0.000	0.00
		B	0.000	0.000	0.238	0.000	0.00
		C	0.000	0.000	0.222	0.000	0.01
L22	28.42-23.42	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	4.754	0.000	0.00
		C	0.000	0.000	4.442	0.000	0.17
L23	23.42-18.42	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	4.754	0.000	0.00
		C	0.000	0.000	4.442	0.000	0.17
L24	18.42-14.17	A	0.000	0.000	6.335	0.000	0.00
		B	0.000	0.000	4.041	0.000	0.00
		C	0.000	0.000	3.775	0.000	0.14
L25	14.17-13.92	A	0.000	0.000	0.542	0.000	0.00
		B	0.000	0.000	0.238	0.000	0.00
		C	0.000	0.000	0.222	0.000	0.01
L26	13.92-13.67	A	0.000	0.000	0.542	0.000	0.00
		B	0.000	0.000	0.238	0.000	0.00
		C	0.000	0.000	0.222	0.000	0.01
L27	13.67-13.42	A	0.000	0.000	0.542	0.000	0.00
		B	0.000	0.000	0.238	0.000	0.00
		C	0.000	0.000	0.222	0.000	0.01
L28	13.42-8.42	A	0.000	0.000	8.399	0.000	0.00
		B	0.000	0.000	4.754	0.000	0.00
		C	0.000	0.000	4.442	0.000	0.17
L29	8.42-5.75	A	0.000	0.000	5.353	0.000	0.00
		B	0.000	0.000	2.539	0.000	0.00
		C	0.000	0.000	2.372	0.000	0.09
L30	5.75-5.50	A	0.000	0.000	0.514	0.000	0.00
		B	0.000	0.000	0.238	0.000	0.00
		C	0.000	0.000	0.222	0.000	0.01
L31	5.50-3.57	A	0.000	0.000	3.965	0.000	0.00

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Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L32	3.57-3.32	B	0.000	0.000	1.835	0.000	0.00
		C	0.000	0.000	1.714	0.000	0.06
		A	0.000	0.000	0.514	0.000	0.00
L33	3.32-3.17	B	0.000	0.000	0.238	0.000	0.00
		C	0.000	0.000	0.222	0.000	0.01
		A	0.000	0.000	0.308	0.000	0.00
L34	3.17-2.92	B	0.000	0.000	0.143	0.000	0.00
		C	0.000	0.000	0.133	0.000	0.01
		A	0.000	0.000	0.514	0.000	0.00
L35	2.92-2.75	B	0.000	0.000	0.238	0.000	0.00
		C	0.000	0.000	0.222	0.000	0.01
		A	0.000	0.000	0.349	0.000	0.00
L36	2.75-2.50	B	0.000	0.000	0.162	0.000	0.00
		C	0.000	0.000	0.151	0.000	0.01
		A	0.000	0.000	0.514	0.000	0.00
L37	2.50-0.00	B	0.000	0.000	0.238	0.000	0.00
		C	0.000	0.000	0.222	0.000	0.01
		A	0.000	0.000	5.136	0.000	0.00
		B	0.000	0.000	2.377	0.000	0.00
		C	0.000	0.000	2.221	0.000	0.08
		A	0.000	0.000			

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	110.00-105.00	A	1.435	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.04
L2	105.00-100.00	A	1.428	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.08
L3	100.00-98.50	A	1.423	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.03
L4	98.50-93.50	A	1.419	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.11
L5	93.50-88.50	A	1.411	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.11
L6	88.50-83.50	A	1.403	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.11
L7	83.50-78.67	A	1.395	0.000	0.000	2.918	0.000	0.03
		B		0.000	0.000	2.918	0.000	0.03
		C		0.000	0.000	2.918	0.000	0.15
L8	78.67-78.42	A	1.390	0.000	0.000	0.292	0.000	0.00
		B		0.000	0.000	0.292	0.000	0.00
		C		0.000	0.000	0.292	0.000	0.01
L9	78.42-73.42	A	1.386	0.000	0.000	5.827	0.000	0.05
		B		0.000	0.000	5.827	0.000	0.05
		C		0.000	0.000	5.827	0.000	0.22
L10	73.42-68.42	A	1.376	0.000	0.000	5.818	0.000	0.05
		B		0.000	0.000	5.818	0.000	0.05
		C		0.000	0.000	5.818	0.000	0.22
L11	68.42-63.42	A	1.366	0.000	0.000	5.808	0.000	0.05
		B		0.000	0.000	5.808	0.000	0.05

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	Client	Crown Castle	Designed by	TLI

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L12	63.42-58.67	C		0.000	0.000	5.808	0.000	0.22
		A	1.356	0.000	0.000	5.508	0.000	0.05
		B		0.000	0.000	5.508	0.000	0.05
		C		0.000	0.000	5.508	0.000	0.21
L13	58.67-58.42	A	1.350	0.000	0.000	0.290	0.000	0.00
		B		0.000	0.000	0.290	0.000	0.00
		C		0.000	0.000	0.290	0.000	0.01
L14	58.42-53.42	A	1.344	0.000	0.000	5.786	0.000	0.05
		B		0.000	0.000	5.786	0.000	0.05
		C		0.000	0.000	5.786	0.000	0.22
L15	53.42-47.12	A	1.330	0.000	0.000	7.272	0.000	0.06
		B		0.000	0.000	8.218	0.000	0.07
		C		0.000	0.000	7.272	0.000	0.28
L16	47.12-45.87	A	1.319	0.000	0.000	1.443	0.000	0.01
		B		0.000	0.000	1.853	0.000	0.02
		C		0.000	0.000	1.443	0.000	0.05
L17	45.87-40.87	A	1.310	0.000	0.000	5.752	0.000	0.05
		B		0.000	0.000	7.375	0.000	0.07
		C		0.000	0.000	5.752	0.000	0.22
L18	40.87-35.87	A	1.294	0.000	0.000	5.736	0.000	0.05
		B		0.000	0.000	7.343	0.000	0.07
		C		0.000	0.000	5.736	0.000	0.22
L19	35.87-30.87	A	1.276	0.000	0.000	5.718	0.000	0.05
		B		0.000	0.000	7.307	0.000	0.06
		C		0.000	0.000	5.718	0.000	0.22
L20	30.87-28.67	A	1.262	0.000	0.000	2.510	0.000	0.02
		B		0.000	0.000	3.202	0.000	0.03
		C		0.000	0.000	2.510	0.000	0.09
L21	28.67-28.42	A	1.257	0.000	0.000	0.285	0.000	0.00
		B		0.000	0.000	0.363	0.000	0.00
		C		0.000	0.000	0.285	0.000	0.01
L22	28.42-23.42	A	1.245	0.000	0.000	5.686	0.000	0.05
		B		0.000	0.000	7.243	0.000	0.06
		C		0.000	0.000	5.686	0.000	0.21
L23	23.42-18.42	A	1.218	0.000	0.000	5.660	0.000	0.05
		B		0.000	0.000	7.190	0.000	0.06
		C		0.000	0.000	5.660	0.000	0.21
L24	18.42-14.17	A	1.188	0.000	0.000	8.296	0.000	0.07
		B		0.000	0.000	6.061	0.000	0.05
		C		0.000	0.000	4.785	0.000	0.18
L25	14.17-13.92	A	1.171	0.000	0.000	0.718	0.000	0.01
		B		0.000	0.000	0.355	0.000	0.00
		C		0.000	0.000	0.281	0.000	0.01
L26	13.92-13.67	A	1.169	0.000	0.000	0.717	0.000	0.01
		B		0.000	0.000	0.355	0.000	0.00
		C		0.000	0.000	0.281	0.000	0.01
L27	13.67-13.42	A	1.166	0.000	0.000	0.717	0.000	0.01
		B		0.000	0.000	0.354	0.000	0.00
		C		0.000	0.000	0.280	0.000	0.01
L28	13.42-8.42	A	1.141	0.000	0.000	11.195	0.000	0.10
		B		0.000	0.000	7.037	0.000	0.06
		C		0.000	0.000	5.583	0.000	0.21
L29	8.42-5.75	A	1.093	0.000	0.000	6.821	0.000	0.06
		B		0.000	0.000	3.706	0.000	0.03
		C		0.000	0.000	2.956	0.000	0.11
L30	5.75-5.50	A	1.068	0.000	0.000	0.650	0.000	0.01
		B		0.000	0.000	0.345	0.000	0.00
		C		0.000	0.000	0.275	0.000	0.01
L31	5.50-3.57	A	1.045	0.000	0.000	4.994	0.000	0.04
		B		0.000	0.000	2.642	0.000	0.02
		C		0.000	0.000	2.118	0.000	0.08

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	Client	Crown Castle	Designed by	TLI

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L32	3.57-3.32	A	1.017	0.000	0.000	0.643	0.000	0.01
		B		0.000	0.000	0.339	0.000	0.00
		C		0.000	0.000	0.273	0.000	0.01
L33	3.32-3.17	A	1.011	0.000	0.000	0.386	0.000	0.00
		B		0.000	0.000	0.203	0.000	0.00
		C		0.000	0.000	0.164	0.000	0.01
L34	3.17-2.92	A	1.005	0.000	0.000	0.642	0.000	0.01
		B		0.000	0.000	0.338	0.000	0.00
		C		0.000	0.000	0.272	0.000	0.01
L35	2.92-2.75	A	0.998	0.000	0.000	0.436	0.000	0.00
		B		0.000	0.000	0.229	0.000	0.00
		C		0.000	0.000	0.185	0.000	0.01
L36	2.75-2.50	A	0.990	0.000	0.000	0.640	0.000	0.01
		B		0.000	0.000	0.337	0.000	0.00
		C		0.000	0.000	0.272	0.000	0.01
L37	2.50-0.00	A	0.919	0.000	0.000	6.308	0.000	0.05
		B		0.000	0.000	3.296	0.000	0.02
		C		0.000	0.000	2.680	0.000	0.10

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	110.00-105.00	0.0000	0.0000	0.0000	0.0000
L2	105.00-100.00	0.0000	0.0000	0.0000	0.0000
L3	100.00-98.50	0.0000	0.0000	0.0000	0.0000
L4	98.50-93.50	0.0000	0.0000	0.0000	0.0000
L5	93.50-88.50	0.0000	0.0000	0.0000	0.0000
L6	88.50-83.50	0.0000	0.0000	0.0000	0.0000
L7	83.50-78.67	0.0000	0.0000	0.0000	0.0000
L8	78.67-78.42	0.0000	0.0000	0.0000	0.0000
L9	78.42-73.42	0.0000	0.0000	0.0000	0.0000
L10	73.42-68.42	0.0000	0.0000	0.0000	0.0000
L11	68.42-63.42	0.0000	0.0000	0.0000	0.0000
L12	63.42-58.67	0.0000	0.0000	0.0000	0.0000
L13	58.67-58.42	0.0000	0.0000	0.0000	0.0000
L14	58.42-53.42	0.0000	0.0000	0.0000	0.0000
L15	53.42-47.12	0.0757	-0.0437	0.2628	-0.1517
L16	47.12-45.87	0.1636	-0.0945	0.5570	-0.3216
L17	45.87-40.87	0.1660	-0.0958	0.5595	-0.3230
L18	40.87-35.87	0.1697	-0.0980	0.5671	-0.3274
L19	35.87-30.87	0.1733	-0.1000	0.5737	-0.3312
L20	30.87-28.67	0.1758	-0.1015	0.5776	-0.3335
L21	28.67-28.42	0.1767	-0.1020	0.5787	-0.3341
L22	28.42-23.42	0.1785	-0.1030	0.5808	-0.3354
L23	23.42-18.42	0.1818	-0.1050	0.5834	-0.3368
L24	18.42-14.17	-0.4685	-0.4595	-0.0538	-0.6343
L25	14.17-13.92	-1.0450	-0.7722	-0.6279	-0.9021
L26	13.92-13.67	-1.0458	-0.7729	-0.6286	-0.9024
L27	13.67-13.42	-1.0465	-0.7734	-0.6292	-0.9027
L28	13.42-8.42	0.1770	-0.0840	0.4263	-0.3315
L29	8.42-5.75	-0.6752	-0.5682	-0.1970	-0.6614
L30	5.75-5.50	-0.7978	-0.6384	-0.3019	-0.7135
L31	5.50-3.57	-0.8000	-0.6405	-0.3086	-0.7123
L32	3.57-3.32	-0.8022	-0.6424	-0.3169	-0.7102
L33	3.32-3.17	-0.8026	-0.6428	-0.3187	-0.7096

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Woodbury North (BU 876405)	Page	12 of 34
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Section	Elevation	CP _x	CP _z	CP _x	CP _z
	ft	in	in	Ice in	Ice in
L34	3.17-2.92	-0.8029	-0.6431	-0.3205	-0.7089
L35	2.92-2.75	-0.8033	-0.6434	-0.3226	-0.7082
L36	2.75-2.50	-0.8037	-0.6438	-0.3249	-0.7075
L37	2.50-0.00	-0.8064	-0.6463	-0.3461	-0.6990

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L7	25	MP3-05 (1.25in)	78.67 - 81.17	1.0000	1.0000
L7	26	MP3-05 (1.25in)	78.67 - 81.17	1.0000	1.0000
L7	27	MP3-05 (1.25in)	78.67 - 81.17	1.0000	1.0000
L8	25	MP3-05 (1.25in)	78.42 - 78.67	1.0000	1.0000
L8	26	MP3-05 (1.25in)	78.42 - 78.67	1.0000	1.0000
L8	27	MP3-05 (1.25in)	78.42 - 78.67	1.0000	1.0000
L9	25	MP3-05 (1.25in)	73.42 - 78.42	1.0000	1.0000
L9	26	MP3-05 (1.25in)	73.42 - 78.42	1.0000	1.0000
L9	27	MP3-05 (1.25in)	73.42 - 78.42	1.0000	1.0000
L10	25	MP3-05 (1.25in)	68.42 - 73.42	1.0000	1.0000
L10	26	MP3-05 (1.25in)	68.42 - 73.42	1.0000	1.0000
L10	27	MP3-05 (1.25in)	68.42 - 73.42	1.0000	1.0000
L11	25	MP3-05 (1.25in)	63.42 - 68.42	1.0000	1.0000
L11	26	MP3-05 (1.25in)	63.42 - 68.42	1.0000	1.0000
L11	27	MP3-05 (1.25in)	63.42 - 68.42	1.0000	1.0000
L12	21	MP3-05 (1.25in)	58.67 - 61.17	1.0000	1.0000
L12	22	MP3-05 (1.25in)	58.67 - 61.17	1.0000	1.0000
L12	23	MP3-05 (1.25in)	58.67 - 61.17	1.0000	1.0000
L12	25	MP3-05 (1.25in)	61.17 - 63.42	1.0000	1.0000
L12	26	MP3-05 (1.25in)	61.17 - 63.42	1.0000	1.0000
L12	27	MP3-05 (1.25in)	61.17 - 63.42	1.0000	1.0000
L13	21	MP3-05 (1.25in)	58.42 - 58.67	1.0000	1.0000
L13	22	MP3-05 (1.25in)	58.42 - 58.67	1.0000	1.0000
L13	23	MP3-05 (1.25in)	58.42 - 58.67	1.0000	1.0000
L14	21	MP3-05 (1.25in)	53.42 - 58.42	1.0000	1.0000
L14	22	MP3-05 (1.25in)	53.42 - 58.42	1.0000	1.0000
L14	23	MP3-05 (1.25in)	53.42 - 58.42	1.0000	1.0000
L15	12	LDF4-50A(1/2)	47.12 - 50.00	1.0000	1.0000
L15	21	MP3-05 (1.25in)	47.12 - 53.42	1.0000	1.0000
L15	22	MP3-05 (1.25in)	47.12 - 53.42	1.0000	1.0000
L15	23	MP3-05 (1.25in)	47.12 - 53.42	1.0000	1.0000
L16	12	LDF4-50A(1/2)	45.87 - 47.12	1.0000	1.0000
L16	21	MP3-05 (1.25in)	45.87 - 47.12	1.0000	1.0000
L16	22	MP3-05 (1.25in)	45.87 - 47.12	1.0000	1.0000
L16	23	MP3-05 (1.25in)	45.87 - 47.12	1.0000	1.0000
L17	12	LDF4-50A(1/2)	40.87 - 45.87	1.0000	1.0000
L17	21	MP3-05 (1.25in)	40.87 - 45.87	1.0000	1.0000
L17	22	MP3-05 (1.25in)	40.87 - 45.87	1.0000	1.0000
L17	23	MP3-05 (1.25in)	40.87 - 45.87	1.0000	1.0000
L18	12	LDF4-50A(1/2)	35.87 - 40.87	1.0000	1.0000
L18	21	MP3-05 (1.25in)	35.87 - 40.87	1.0000	1.0000
L18	22	MP3-05 (1.25in)	35.87 - 40.87	1.0000	1.0000
L18	23	MP3-05 (1.25in)	35.87 - 40.87	1.0000	1.0000

tnxTower**Tower Engineering
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Project

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Client

Crown Castle

Designed by

TLI

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L19	12	LDF4-50A(1/2)	30.87 - 35.87	1.0000	1.0000
L19	18	MP3-05 (1.25in)	30.87 - 31.17	1.0000	1.0000
L19	19	MP3-05 (1.25in)	30.87 - 31.17	1.0000	1.0000
L19	21	MP3-05 (1.25in)	31.17 - 35.87	1.0000	1.0000
L19	22	MP3-05 (1.25in)	31.17 - 35.87	1.0000	1.0000
L19	23	MP3-05 (1.25in)	31.17 - 35.87	1.0000	1.0000
L19	32	MP3-05 (1.25in)	30.87 - 31.17	1.0000	1.0000
L20	12	LDF4-50A(1/2)	28.67 - 30.87	1.0000	1.0000
L20	18	MP3-05 (1.25in)	28.67 - 30.87	1.0000	1.0000
L20	19	MP3-05 (1.25in)	28.67 - 30.87	1.0000	1.0000
L20	32	MP3-05 (1.25in)	28.67 - 30.87	1.0000	1.0000
L21	12	LDF4-50A(1/2)	28.42 - 28.67	1.0000	1.0000
L21	18	MP3-05 (1.25in)	28.42 - 28.67	1.0000	1.0000
L21	19	MP3-05 (1.25in)	28.42 - 28.67	1.0000	1.0000
L21	32	MP3-05 (1.25in)	28.42 - 28.67	1.0000	1.0000
L22	12	LDF4-50A(1/2)	23.42 - 28.42	1.0000	1.0000
L22	18	MP3-05 (1.25in)	23.42 - 28.42	1.0000	1.0000
L22	19	MP3-05 (1.25in)	23.42 - 28.42	1.0000	1.0000
L22	32	MP3-05 (1.25in)	23.42 - 28.42	1.0000	1.0000
L23	12	LDF4-50A(1/2)	18.42 - 23.42	1.0000	1.0000
L23	18	MP3-05 (1.25in)	18.42 - 23.42	1.0000	1.0000
L23	19	MP3-05 (1.25in)	18.42 - 23.42	1.0000	1.0000
L23	32	MP3-05 (1.25in)	18.42 - 23.42	1.0000	1.0000
L24	12	LDF4-50A(1/2)	14.17 - 18.42	1.0000	1.0000
L24	18	MP3-05 (1.25in)	14.17 - 18.42	1.0000	1.0000
L24	19	MP3-05 (1.25in)	14.17 - 18.42	1.0000	1.0000
L24	29	MP3-08.5 (1.25")	14.17 - 16.17	1.0000	1.0000
L24	30	MP3-08.5 (1.25")	14.17 - 16.17	1.0000	1.0000
L24	32	MP3-05 (1.25in)	14.17 - 18.42	1.0000	1.0000
L25	12	LDF4-50A(1/2)	13.92 - 14.17	1.0000	1.0000
L25	18	MP3-05 (1.25in)	13.92 - 14.17	1.0000	1.0000
L25	19	MP3-05 (1.25in)	13.92 - 14.17	1.0000	1.0000
L25	29	MP3-08.5 (1.25")	13.92 - 14.17	1.0000	1.0000
L25	30	MP3-08.5 (1.25")	13.92 - 14.17	1.0000	1.0000
L25	32	MP3-05 (1.25in)	13.92 - 14.17	1.0000	1.0000
L26	12	LDF4-50A(1/2)	13.67 - 13.92	1.0000	1.0000
L26	18	MP3-05 (1.25in)	13.67 - 13.92	1.0000	1.0000
L26	19	MP3-05 (1.25in)	13.67 - 13.92	1.0000	1.0000
L26	29	MP3-08.5 (1.25")	13.67 - 13.92	1.0000	1.0000
L26	30	MP3-08.5 (1.25")	13.67 - 13.92	1.0000	1.0000
L26	32	MP3-05 (1.25in)	13.67 - 13.92	1.0000	1.0000
L27	12	LDF4-50A(1/2)	13.42 - 13.67	1.0000	1.0000
L27	18	MP3-05 (1.25in)	13.42 - 13.67	1.0000	1.0000
L27	19	MP3-05 (1.25in)	13.42 - 13.67	1.0000	1.0000
L27	29	MP3-08.5 (1.25")	13.42 - 13.67	1.0000	1.0000
L27	30	MP3-08.5 (1.25")	13.42 - 13.67	1.0000	1.0000
L27	32	MP3-05 (1.25in)	13.42 - 13.67	1.0000	1.0000
L28	12	LDF4-50A(1/2)	8.42 - 13.42	1.0000	1.0000
L28	18	MP3-05 (1.25in)	8.42 - 13.42	1.0000	1.0000
L28	19	MP3-05 (1.25in)	8.42 - 13.42	1.0000	1.0000
L28	29	MP3-08.5 (1.25")	8.42 - 13.42	1.0000	1.0000
L28	30	MP3-08.5 (1.25")	8.42 - 13.42	1.0000	1.0000
L28	32	MP3-05 (1.25in)	11.17 - 13.42	1.0000	1.0000
L29	12	LDF4-50A(1/2)	5.75 - 8.42	1.0000	1.0000
L29	16	MP3-05 (1.25in)	5.75 - 8.25	1.0000	1.0000
L29	18	MP3-05 (1.25in)	5.75 - 8.42	1.0000	1.0000
L29	19	MP3-05 (1.25in)	5.75 - 8.42	1.0000	1.0000
L29	29	MP3-08.5 (1.25")	5.75 - 8.42	1.0000	1.0000
L29	30	MP3-08.5 (1.25")	5.75 - 8.42	1.0000	1.0000
L30	12	LDF4-50A(1/2)	5.50 - 5.75	1.0000	1.0000
L30	16	MP3-05 (1.25in)	5.50 - 5.75	1.0000	1.0000
L30	18	MP3-05 (1.25in)	5.50 - 5.75	1.0000	1.0000

<p>tnxTower</p> <p><i>Tower Engineering Professionals, Inc.</i> 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350</p>	<p>Job</p> <p>Woodbury North (BU 876405)</p>	<p>Page</p> <p>14 of 34</p>
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	<p>Client</p> <p>Crown Castle</p>	<p>Designed by</p> <p>TLI</p>

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L30	19	MP3-05 (1.25in)	5.50 - 5.75	1.0000	1.0000
L30	29	MP3-08.5 (1.25")	5.50 - 5.75	1.0000	1.0000
L30	30	MP3-08.5 (1.25")	5.50 - 5.75	1.0000	1.0000
L31	12	LDF4-50A(1/2)	3.57 - 5.50	1.0000	1.0000
L31	16	MP3-05 (1.25in)	3.57 - 5.50	1.0000	1.0000
L31	18	MP3-05 (1.25in)	3.57 - 5.50	1.0000	1.0000
L31	19	MP3-05 (1.25in)	3.57 - 5.50	1.0000	1.0000
L31	29	MP3-08.5 (1.25")	3.57 - 5.50	1.0000	1.0000
L31	30	MP3-08.5 (1.25")	3.57 - 5.50	1.0000	1.0000
L32	12	LDF4-50A(1/2)	3.32 - 3.57	1.0000	1.0000
L32	16	MP3-05 (1.25in)	3.32 - 3.57	1.0000	1.0000
L32	18	MP3-05 (1.25in)	3.32 - 3.57	1.0000	1.0000
L32	19	MP3-05 (1.25in)	3.32 - 3.57	1.0000	1.0000
L32	29	MP3-08.5 (1.25")	3.32 - 3.57	1.0000	1.0000
L32	30	MP3-08.5 (1.25")	3.32 - 3.57	1.0000	1.0000
L33	12	LDF4-50A(1/2)	3.17 - 3.32	1.0000	1.0000
L33	16	MP3-05 (1.25in)	3.17 - 3.32	1.0000	1.0000
L33	18	MP3-05 (1.25in)	3.17 - 3.32	1.0000	1.0000
L33	19	MP3-05 (1.25in)	3.17 - 3.32	1.0000	1.0000
L33	29	MP3-08.5 (1.25")	3.17 - 3.32	1.0000	1.0000
L33	30	MP3-08.5 (1.25")	3.17 - 3.32	1.0000	1.0000
L34	12	LDF4-50A(1/2)	2.92 - 3.17	1.0000	1.0000
L34	16	MP3-05 (1.25in)	2.92 - 3.17	1.0000	1.0000
L34	18	MP3-05 (1.25in)	2.92 - 3.17	1.0000	1.0000
L34	19	MP3-05 (1.25in)	2.92 - 3.17	1.0000	1.0000
L34	29	MP3-08.5 (1.25")	2.92 - 3.17	1.0000	1.0000
L34	30	MP3-08.5 (1.25")	2.92 - 3.17	1.0000	1.0000
L35	12	LDF4-50A(1/2)	2.75 - 2.92	1.0000	1.0000
L35	16	MP3-05 (1.25in)	2.75 - 2.92	1.0000	1.0000
L35	18	MP3-05 (1.25in)	2.75 - 2.92	1.0000	1.0000
L35	19	MP3-05 (1.25in)	2.75 - 2.92	1.0000	1.0000
L35	29	MP3-08.5 (1.25")	2.75 - 2.92	1.0000	1.0000
L35	30	MP3-08.5 (1.25")	2.75 - 2.92	1.0000	1.0000
L36	12	LDF4-50A(1/2)	2.50 - 2.75	1.0000	1.0000
L36	16	MP3-05 (1.25in)	2.50 - 2.75	1.0000	1.0000
L36	18	MP3-05 (1.25in)	2.50 - 2.75	1.0000	1.0000
L36	19	MP3-05 (1.25in)	2.50 - 2.75	1.0000	1.0000
L36	29	MP3-08.5 (1.25")	2.50 - 2.75	1.0000	1.0000
L36	30	MP3-08.5 (1.25")	2.50 - 2.75	1.0000	1.0000
L37	12	LDF4-50A(1/2)	0.00 - 2.50	1.0000	1.0000
L37	16	MP3-05 (1.25in)	0.00 - 2.50	1.0000	1.0000
L37	18	MP3-05 (1.25in)	0.00 - 2.50	1.0000	1.0000
L37	19	MP3-05 (1.25in)	0.00 - 2.50	1.0000	1.0000
L37	29	MP3-08.5 (1.25")	0.00 - 2.50	1.0000	1.0000
L37	30	MP3-08.5 (1.25")	0.00 - 2.50	1.0000	1.0000

Effective Width of Flat Linear Attachments / Feed Lines

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L7	25	MP3-05 (1.25in)	78.67 - 81.17	Auto	0.4302
L7	26	MP3-05 (1.25in)	78.67 - 81.17	Auto	0.4302
L7	27	MP3-05 (1.25in)	78.67 - 81.17	Auto	0.4302

tnxTower**Tower Engineering
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Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L8	25	MP3-05 (1.25in)	78.42 - 78.67	Auto	0.5402
L8	26	MP3-05 (1.25in)	78.42 - 78.67	Auto	0.5402
L8	27	MP3-05 (1.25in)	78.42 - 78.67	Auto	0.5402
L9	25	MP3-05 (1.25in)	73.42 - 78.42	Auto	0.5150
L9	26	MP3-05 (1.25in)	73.42 - 78.42	Auto	0.5150
L9	27	MP3-05 (1.25in)	73.42 - 78.42	Auto	0.5150
L10	25	MP3-05 (1.25in)	68.42 - 73.42	Auto	0.4762
L10	26	MP3-05 (1.25in)	68.42 - 73.42	Auto	0.4762
L10	27	MP3-05 (1.25in)	68.42 - 73.42	Auto	0.4762
L11	25	MP3-05 (1.25in)	63.42 - 68.42	Auto	0.4373
L11	26	MP3-05 (1.25in)	63.42 - 68.42	Auto	0.4373
L11	27	MP3-05 (1.25in)	63.42 - 68.42	Auto	0.4373
L12	21	MP3-05 (1.25in)	58.67 - 61.17	Auto	0.3936
L12	22	MP3-05 (1.25in)	58.67 - 61.17	Auto	0.3936
L12	23	MP3-05 (1.25in)	58.67 - 61.17	Auto	0.3936
L12	25	MP3-05 (1.25in)	61.17 - 63.42	Auto	0.4089
L12	26	MP3-05 (1.25in)	61.17 - 63.42	Auto	0.4089
L12	27	MP3-05 (1.25in)	61.17 - 63.42	Auto	0.4089
L13	21	MP3-05 (1.25in)	58.42 - 58.67	Auto	0.3847
L13	22	MP3-05 (1.25in)	58.42 - 58.67	Auto	0.3847
L13	23	MP3-05 (1.25in)	58.42 - 58.67	Auto	0.3847
L14	21	MP3-05 (1.25in)	53.42 - 58.42	Auto	0.3629
L14	22	MP3-05 (1.25in)	53.42 - 58.42	Auto	0.3629
L14	23	MP3-05 (1.25in)	53.42 - 58.42	Auto	0.3629
L15	21	MP3-05 (1.25in)	47.12 - 53.42	Auto	0.3247
L15	22	MP3-05 (1.25in)	47.12 - 53.42	Auto	0.3247
L15	23	MP3-05 (1.25in)	47.12 - 53.42	Auto	0.3247
L16	21	MP3-05 (1.25in)	45.87 - 47.12	Auto	0.3321
L16	22	MP3-05 (1.25in)	45.87 - 47.12	Auto	0.3321
L16	23	MP3-05 (1.25in)	45.87 - 47.12	Auto	0.3321
L17	21	MP3-05 (1.25in)	40.87 - 45.87	Auto	0.3089
L17	22	MP3-05 (1.25in)	40.87 - 45.87	Auto	0.3089
L17	23	MP3-05 (1.25in)	40.87 - 45.87	Auto	0.3089
L18	21	MP3-05 (1.25in)	35.87 - 40.87	Auto	0.2737
L18	22	MP3-05 (1.25in)	35.87 - 40.87	Auto	0.2737
L18	23	MP3-05 (1.25in)	35.87 - 40.87	Auto	0.2737
L19	18	MP3-05 (1.25in)	30.87 - 31.17	Auto	0.2236
L19	19	MP3-05 (1.25in)	30.87 - 31.17	Auto	0.2236
L19	21	MP3-05 (1.25in)	31.17 - 35.87	Auto	0.2395
L19	22	MP3-05 (1.25in)	31.17 - 35.87	Auto	0.2395
L19	23	MP3-05 (1.25in)	31.17 - 35.87	Auto	0.2395
L19	32	MP3-05 (1.25in)	30.87 - 31.17	Auto	0.2236
L20	18	MP3-05 (1.25in)	28.67 - 30.87	Auto	0.2140
L20	19	MP3-05 (1.25in)	28.67 - 30.87	Auto	0.2140
L20	32	MP3-05 (1.25in)	28.67 - 30.87	Auto	0.2140
L21	18	MP3-05 (1.25in)	28.42 - 28.67	Auto	0.2062
L21	19	MP3-05 (1.25in)	28.42 - 28.67	Auto	0.2062
L21	32	MP3-05 (1.25in)	28.42 - 28.67	Auto	0.2062
L22	18	MP3-05 (1.25in)	23.42 - 28.42	Auto	0.1861
L22	19	MP3-05 (1.25in)	23.42 - 28.42	Auto	0.1861
L22	32	MP3-05 (1.25in)	23.42 - 28.42	Auto	0.1861
L23	18	MP3-05 (1.25in)	18.42 - 23.42	Auto	0.1526
L23	19	MP3-05 (1.25in)	18.42 - 23.42	Auto	0.1526
L23	32	MP3-05 (1.25in)	18.42 - 23.42	Auto	0.1526
L24	18	MP3-05 (1.25in)	14.17 - 18.42	Auto	0.1198
L24	19	MP3-05 (1.25in)	14.17 - 18.42	Auto	0.1198
L24	29	MP3-08.5 (1.25")	14.17 - 16.17	Auto	0.0000
L24	30	MP3-08.5 (1.25")	14.17 - 16.17	Auto	0.0000
L24	32	MP3-05 (1.25in)	14.17 - 18.42	Auto	0.1198
L25	18	MP3-05 (1.25in)	13.92 - 14.17	Auto	0.1369
L25	19	MP3-05 (1.25in)	13.92 - 14.17	Auto	0.1369

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L25	29	MP3-08.5 (1.25")	13.92 - 14.17	Auto	0.0000
L25	30	MP3-08.5 (1.25")	13.92 - 14.17	Auto	0.0000
L25	32	MP3-05 (1.25in)	13.92 - 14.17	Auto	0.1369
L26	18	MP3-05 (1.25in)	13.67 - 13.92	Auto	0.1353
L26	19	MP3-05 (1.25in)	13.67 - 13.92	Auto	0.1353
L26	29	MP3-08.5 (1.25")	13.67 - 13.92	Auto	0.0000
L26	30	MP3-08.5 (1.25")	13.67 - 13.92	Auto	0.0000
L26	32	MP3-05 (1.25in)	13.67 - 13.92	Auto	0.1353
L27	18	MP3-05 (1.25in)	13.42 - 13.67	Auto	0.1205
L27	19	MP3-05 (1.25in)	13.42 - 13.67	Auto	0.1205
L27	29	MP3-08.5 (1.25")	13.42 - 13.67	Auto	0.0000
L27	30	MP3-08.5 (1.25")	13.42 - 13.67	Auto	0.0000
L27	32	MP3-05 (1.25in)	13.42 - 13.67	Auto	0.1205
L28	18	MP3-05 (1.25in)	8.42 - 13.42	Auto	0.1004
L28	19	MP3-05 (1.25in)	8.42 - 13.42	Auto	0.1004
L28	29	MP3-08.5 (1.25")	8.42 - 13.42	Auto	0.0000
L28	30	MP3-08.5 (1.25")	8.42 - 13.42	Auto	0.0000
L28	32	MP3-05 (1.25in)	11.17 - 13.42	Auto	0.1092
L29	16	MP3-05 (1.25in)	5.75 - 8.25	Auto	0.0738
L29	18	MP3-05 (1.25in)	5.75 - 8.42	Auto	0.0743
L29	19	MP3-05 (1.25in)	5.75 - 8.42	Auto	0.0743
L29	29	MP3-08.5 (1.25")	5.75 - 8.42	Auto	0.0000
L29	30	MP3-08.5 (1.25")	5.75 - 8.42	Auto	0.0000
L30	16	MP3-05 (1.25in)	5.50 - 5.75	Auto	0.0782
L30	18	MP3-05 (1.25in)	5.50 - 5.75	Auto	0.0782
L30	19	MP3-05 (1.25in)	5.50 - 5.75	Auto	0.0782
L30	29	MP3-08.5 (1.25")	5.50 - 5.75	Auto	0.0000
L30	30	MP3-08.5 (1.25")	5.50 - 5.75	Auto	0.0000
L31	16	MP3-05 (1.25in)	3.57 - 5.50	Auto	0.0928
L31	18	MP3-05 (1.25in)	3.57 - 5.50	Auto	0.0928
L31	19	MP3-05 (1.25in)	3.57 - 5.50	Auto	0.0928
L31	29	MP3-08.5 (1.25")	3.57 - 5.50	Auto	0.0000
L31	30	MP3-08.5 (1.25")	3.57 - 5.50	Auto	0.0000
L32	16	MP3-05 (1.25in)	3.32 - 3.57	Auto	0.0842
L32	18	MP3-05 (1.25in)	3.32 - 3.57	Auto	0.0842
L32	19	MP3-05 (1.25in)	3.32 - 3.57	Auto	0.0842
L32	29	MP3-08.5 (1.25")	3.32 - 3.57	Auto	0.0000
L32	30	MP3-08.5 (1.25")	3.32 - 3.57	Auto	0.0000
L33	16	MP3-05 (1.25in)	3.17 - 3.32	Auto	0.0829
L33	18	MP3-05 (1.25in)	3.17 - 3.32	Auto	0.0829
L33	19	MP3-05 (1.25in)	3.17 - 3.32	Auto	0.0829
L33	29	MP3-08.5 (1.25")	3.17 - 3.32	Auto	0.0000
L33	30	MP3-08.5 (1.25")	3.17 - 3.32	Auto	0.0000
L34	16	MP3-05 (1.25in)	2.92 - 3.17	Auto	0.0519
L34	18	MP3-05 (1.25in)	2.92 - 3.17	Auto	0.0519
L34	19	MP3-05 (1.25in)	2.92 - 3.17	Auto	0.0519
L34	29	MP3-08.5 (1.25")	2.92 - 3.17	Auto	0.0000
L34	30	MP3-08.5 (1.25")	2.92 - 3.17	Auto	0.0000
L35	16	MP3-05 (1.25in)	2.75 - 2.92	Auto	0.0506
L35	18	MP3-05 (1.25in)	2.75 - 2.92	Auto	0.0506
L35	19	MP3-05 (1.25in)	2.75 - 2.92	Auto	0.0506
L35	29	MP3-08.5 (1.25")	2.75 - 2.92	Auto	0.0000
L35	30	MP3-08.5 (1.25")	2.75 - 2.92	Auto	0.0000
L36	16	MP3-05 (1.25in)	2.50 - 2.75	Auto	0.0476
L36	18	MP3-05 (1.25in)	2.50 - 2.75	Auto	0.0476
L36	19	MP3-05 (1.25in)	2.50 - 2.75	Auto	0.0476
L36	29	MP3-08.5 (1.25")	2.50 - 2.75	Auto	0.0000
L36	30	MP3-08.5 (1.25")	2.50 - 2.75	Auto	0.0000
L37	16	MP3-05 (1.25in)	0.00 - 2.50	Auto	0.0372
L37	18	MP3-05 (1.25in)	0.00 - 2.50	Auto	0.0372
L37	19	MP3-05 (1.25in)	0.00 - 2.50	Auto	0.0372

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Woodbury North (BU 876405)	Page	17 of 34
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Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L37	29	MP3-08.5 (1.25")	0.00 - 2.50	Auto	0.0000
L37	30	MP3-08.5 (1.25")	0.00 - 2.50	Auto	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAAA Front ft ²	CAAA Side ft ²	Weight K
108								
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	108.00	No Ice 3.18 1/2" Ice 3.56 1" Ice 3.93 2" Ice 4.69	3.35 3.97 4.60 5.89	0.03 0.06 0.10 0.19
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	108.00	No Ice 3.18 1/2" Ice 3.56 1" Ice 3.93 2" Ice 4.69	3.35 3.97 4.60 5.89	0.03 0.06 0.10 0.19
BXA-171063-8BF-2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	108.00	No Ice 3.18 1/2" Ice 3.56 1" Ice 3.93 2" Ice 4.69	3.35 3.97 4.60 5.89	0.03 0.06 0.10 0.19
BXA-70063/6CF-2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	108.00	No Ice 7.81 1/2" Ice 8.36 1" Ice 8.87 2" Ice 9.93	5.40 6.55 7.41 9.18	0.04 0.10 0.17 0.33
BXA-70063/6CF-2 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	108.00	No Ice 7.81 1/2" Ice 8.36 1" Ice 8.87 2" Ice 9.93	5.40 6.55 7.41 9.18	0.04 0.10 0.17 0.33
BXA-70063/6CF-2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	108.00	No Ice 7.81 1/2" Ice 8.36 1" Ice 8.87 2" Ice 9.93	5.40 6.55 7.41 9.18	0.04 0.10 0.17 0.33
BXA-80080/4CF w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	108.00	No Ice 5.04 1/2" Ice 5.42 1" Ice 5.81 2" Ice 6.62	4.03 4.65 5.28 6.56	0.03 0.08 0.13 0.25
BXA-80080/4CF w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	108.00	No Ice 5.04 1/2" Ice 5.42 1" Ice 5.81 2" Ice 6.62	4.03 4.65 5.28 6.56	0.03 0.08 0.13 0.25
BXA-80063/4CFx5 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	108.00	No Ice 4.95 1/2" Ice 5.32 1" Ice 5.71 2" Ice 6.51	3.62 4.22 4.83 6.11	0.03 0.07 0.12 0.23
(2) FD9R6004/2C-3L	A	From Leg	4.00 0.00 0.00	0.00	108.00	No Ice 0.31 1/2" Ice 0.39 1" Ice 0.47 2" Ice 0.65	0.08 0.12 0.17 0.29	0.00 0.01 0.01 0.02
(2) FD9R6004/2C-3L	B	From Leg	4.00	0.00	108.00	No Ice 0.31	0.08	0.00

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Woodbury North (BU 876405)	Page	18 of 34
	Project	TEP No. 25604.514581	Date	10:05:14 03/18/21
	Client	Crown Castle	Designed by	TLI

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
			0.00			1/2" Ice	0.39	0.12	0.01
			0.00			1" Ice	0.47	0.17	0.01
						2" Ice	0.65	0.29	0.02
(2) FD9R6004/2C-3L	C	From Leg	4.00		0.00	No Ice	0.31	0.08	0.00
			0.00			1/2" Ice	0.39	0.12	0.01
			0.00			1" Ice	0.47	0.17	0.01
						2" Ice	0.65	0.29	0.02
2.4" Dia. x 6-ft	A	From Leg	4.00		0.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
2.4" Dia. x 6-ft	B	From Leg	4.00		0.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
2.4" Dia. x 6-ft	C	From Leg	4.00		0.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
T-Arm Mount [TA 602-3]	C	None			0.00	No Ice	13.40	13.40	0.77
						1/2" Ice	16.44	16.44	1.00
						1" Ice	19.70	19.70	1.29
						2" Ice	25.86	25.86	2.05
102									
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00		0.00	No Ice	6.29	2.76	0.06
						1/2" Ice	6.86	3.27	0.11
						1" Ice	7.45	3.79	0.16
						2" Ice	8.68	4.90	0.29
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00		0.00	No Ice	6.29	2.76	0.06
						1/2" Ice	6.86	3.27	0.11
						1" Ice	7.45	3.79	0.16
						2" Ice	8.68	4.90	0.29
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00		0.00	No Ice	6.29	2.76	0.06
						1/2" Ice	6.86	3.27	0.11
						1" Ice	7.45	3.79	0.16
						2" Ice	8.68	4.90	0.29
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00		0.00	No Ice	14.69	6.87	0.18
						1/2" Ice	15.46	7.55	0.31
						1" Ice	16.23	8.25	0.45
						2" Ice	17.82	9.67	0.78
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00		0.00	No Ice	14.69	6.87	0.18
						1/2" Ice	15.46	7.55	0.31
						1" Ice	16.23	8.25	0.45
						2" Ice	17.82	9.67	0.78
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00		0.00	No Ice	14.69	6.87	0.18
						1/2" Ice	15.46	7.55	0.31
						1" Ice	16.23	8.25	0.45
						2" Ice	17.82	9.67	0.78
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00		0.00	No Ice	5.87	3.27	0.13
						1/2" Ice	6.23	3.73	0.18
						1" Ice	6.61	4.20	0.23
						2" Ice	7.38	5.20	0.36
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00		0.00	No Ice	5.87	3.27	0.13
						1/2" Ice	6.23	3.73	0.18
						1" Ice	6.61	4.20	0.23
						2" Ice	7.38	5.20	0.36
AIR6449 B41_T-MOBILE	C	From	4.00		0.00	No Ice	5.87	3.27	0.13

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Woodbury North (BU 876405)	Page	19 of 34
	Project	TEP No. 25604.514581	Date	10:05:14 03/18/21
	Client	Crown Castle	Designed by	TLI

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	CAA Front	CAA Side	Weight
			ft ft ft	°	ft	ft ²	ft ²	K
w/ Mount Pipe		Centroid-Le g	0.00 0.00			1/2" Ice 6.23 1" Ice 6.61 2" Ice 7.38	3.73 4.20 5.20	0.18 0.23 0.36
RADIO 4415 B66A_CCIV3	A	From Centroid-Le g	4.00 0.00 0.00	0.00	102.00	No Ice 1.64 1/2" Ice 1.80 1" Ice 1.97 2" Ice 2.32	0.68 0.79 0.91 1.18	0.05 0.06 0.07 0.11
RADIO 4415 B66A_CCIV3	B	From Centroid-Le g	4.00 0.00 0.00	0.00	102.00	No Ice 1.64 1/2" Ice 1.80 1" Ice 1.97 2" Ice 2.32	0.68 0.79 0.91 1.18	0.05 0.06 0.07 0.11
RADIO 4415 B66A_CCIV3	C	From Centroid-Le g	4.00 0.00 0.00	0.00	102.00	No Ice 1.64 1/2" Ice 1.80 1" Ice 1.97 2" Ice 2.32	0.68 0.79 0.91 1.18	0.05 0.06 0.07 0.11
RADIO 4424 B25_TMO	A	From Centroid-Le g	4.00 0.00 0.00	0.00	102.00	No Ice 2.05 1/2" Ice 2.23 1" Ice 2.42 2" Ice 2.81	1.61 1.77 1.94 2.30	0.09 0.11 0.13 0.19
RADIO 4424 B25_TMO	B	From Centroid-Le g	4.00 0.00 0.00	0.00	102.00	No Ice 2.05 1/2" Ice 2.23 1" Ice 2.42 2" Ice 2.81	1.61 1.77 1.94 2.30	0.09 0.11 0.13 0.19
RADIO 4424 B25_TMO	C	From Centroid-Le g	4.00 0.00 0.00	0.00	102.00	No Ice 2.05 1/2" Ice 2.23 1" Ice 2.42 2" Ice 2.81	1.61 1.77 1.94 2.30	0.09 0.11 0.13 0.19
RADIO 4449 B71 B85A_T-MOBILE	A	From Centroid-Le g	4.00 0.00 0.00	0.00	102.00	No Ice 1.97 1/2" Ice 2.15 1" Ice 2.33 2" Ice 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
RADIO 4449 B71 B85A_T-MOBILE	B	From Centroid-Le g	4.00 0.00 0.00	0.00	102.00	No Ice 1.97 1/2" Ice 2.15 1" Ice 2.33 2" Ice 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
RADIO 4449 B71 B85A_T-MOBILE	C	From Centroid-Le g	4.00 0.00 0.00	0.00	102.00	No Ice 1.97 1/2" Ice 2.15 1" Ice 2.33 2" Ice 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
2.4" x 8' Pipe	A	From Centroid-Le g	4.00 0.00 0.00	0.00	102.00	No Ice 1.90 1/2" Ice 2.73 1" Ice 3.42 2" Ice 4.46	1.90 2.73 3.42 4.46	0.03 0.05 0.07 0.13
2.4" x 8' Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.00	102.00	No Ice 1.90 1/2" Ice 2.73 1" Ice 3.42 2" Ice 4.46	1.90 2.73 3.42 4.46	0.03 0.05 0.07 0.13
2.4" x 8' Pipe	C	From Centroid-Le g	4.00 0.00 0.00	0.00	102.00	No Ice 1.90 1/2" Ice 2.73 1" Ice 3.42 2" Ice 4.46	1.90 2.73 3.42 4.46	0.03 0.05 0.07 0.13
SitePro1 RMQP-4096-HK	C	None		0.00	102.00	No Ice 23.14 1/2" Ice 28.17 1" Ice 33.23 2" Ice 43.26	21.40 26.44 31.60 41.56	1.95 2.34 2.85 3.50

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tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Woodbury North (BU 876405)	Page	20 of 34
	Project	TEP No. 25604.514581	Date	10:05:14 03/18/21
	Client	Crown Castle	Designed by	TLI

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight	
			Horz	Vert						ft
			ft	ft	°	ft	ft ²	ft ²	K	
7770.00 w/ Mount Pipe	A	From Leg	4.00	0.00	0.00	80.00	No Ice	5.75	4.25	0.06
			0.00	0.00			1/2" Ice	6.18	5.01	0.10
			0.00	0.00			1" Ice	6.61	5.71	0.16
							2" Ice	7.49	7.16	0.29
7770.00 w/ Mount Pipe	B	From Leg	4.00	0.00	0.00	80.00	No Ice	5.75	4.25	0.06
			0.00	0.00			1/2" Ice	6.18	5.01	0.10
			0.00	0.00			1" Ice	6.61	5.71	0.16
							2" Ice	7.49	7.16	0.29
7770.00 w/ Mount Pipe	C	From Leg	4.00	0.00	0.00	80.00	No Ice	5.75	4.25	0.06
			0.00	0.00			1/2" Ice	6.18	5.01	0.10
			0.00	0.00			1" Ice	6.61	5.71	0.16
							2" Ice	7.49	7.16	0.29
(2) DMP65R-BU6D w/ Mount Pipe	A	From Leg	4.00	0.00	0.00	80.00	No Ice	11.96	5.97	0.11
			0.00	0.00			1/2" Ice	12.70	6.63	0.20
			-2.00	0.00			1" Ice	13.46	7.30	0.30
							2" Ice	15.02	8.69	0.53
(2) DMP65R-BU6D w/ Mount Pipe	C	From Leg	4.00	0.00	0.00	80.00	No Ice	11.96	5.97	0.11
			0.00	0.00			1/2" Ice	12.70	6.63	0.20
			-2.00	0.00			1" Ice	13.46	7.30	0.30
							2" Ice	15.02	8.69	0.53
(2) DMP65R-BU4D w/ Mount Pipe	B	From Leg	4.00	0.00	0.00	80.00	No Ice	7.53	3.79	0.09
			0.00	0.00			1/2" Ice	8.04	4.23	0.16
			-2.00	0.00			1" Ice	8.57	4.68	0.22
							2" Ice	9.68	5.63	0.39
(2) LGP21401	A	From Leg	4.00	0.00	0.00	80.00	No Ice	1.10	0.21	0.01
			0.00	0.00			1/2" Ice	1.24	0.27	0.02
			-2.00	0.00			1" Ice	1.38	0.35	0.03
							2" Ice	1.69	0.52	0.05
(2) LGP21401	B	From Leg	4.00	0.00	0.00	80.00	No Ice	1.10	0.21	0.01
			0.00	0.00			1/2" Ice	1.24	0.27	0.02
			-2.00	0.00			1" Ice	1.38	0.35	0.03
							2" Ice	1.69	0.52	0.05
(2) LGP21401	C	From Leg	4.00	0.00	0.00	80.00	No Ice	1.10	0.21	0.01
			0.00	0.00			1/2" Ice	1.24	0.27	0.02
			-2.00	0.00			1" Ice	1.38	0.35	0.03
							2" Ice	1.69	0.52	0.05
(3) RRUS 8843 B2/B66A	A	From Leg	4.00	0.00	0.00	80.00	No Ice	1.64	1.35	0.07
			0.00	0.00			1/2" Ice	1.80	1.50	0.09
			-2.00	0.00			1" Ice	1.97	1.65	0.11
							2" Ice	2.32	1.99	0.16
(3) RRUS 4478 B14	A	From Leg	4.00	0.00	0.00	80.00	No Ice	1.84	1.06	0.06
			0.00	0.00			1/2" Ice	2.01	1.20	0.08
			-2.00	0.00			1" Ice	2.19	1.34	0.09
							2" Ice	2.57	1.66	0.14
RRUS 4449 B5/B12	A	From Leg	4.00	0.00	0.00	80.00	No Ice	1.97	1.41	0.07
			0.00	0.00			1/2" Ice	2.14	1.56	0.09
			-2.00	0.00			1" Ice	2.33	1.73	0.11
							2" Ice	2.72	2.07	0.16
(2) RRUS 4449 B5/B12	B	From Leg	4.00	0.00	0.00	80.00	No Ice	1.97	1.41	0.07
			0.00	0.00			1/2" Ice	2.14	1.56	0.09
			-2.00	0.00			1" Ice	2.33	1.73	0.11
							2" Ice	2.72	2.07	0.16
1001940	B	From Leg	4.00	0.00	0.00	80.00	No Ice	0.18	0.08	0.00
			0.00	0.00			1/2" Ice	0.23	0.13	0.00
			-2.00	0.00			1" Ice	0.30	0.18	0.01
							2" Ice	0.44	0.30	0.01
(2) 1001940	C	From Leg	4.00	0.00	0.00	80.00	No Ice	0.18	0.08	0.00

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Woodbury North (BU 876405)	Page	21 of 34
	Project	TEP No. 25604.514581	Date	10:05:14 03/18/21
	Client	Crown Castle	Designed by	TLI

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Vert	Lateral					
			ft	ft	ft					
			0.00				1/2" Ice	0.23	0.13	0.00
			-2.00				1" Ice	0.30	0.18	0.01
							2" Ice	0.44	0.30	0.01
DC6-48-60-0-8C-EV	C	From Leg	4.00	0.00	80.00		No Ice	1.14	1.14	0.03
			0.00				1/2" Ice	1.79	1.79	0.05
			-2.00				1" Ice	2.00	2.00	0.07
							2" Ice	2.45	2.45	0.13
DC6-48-60-18-8F	B	From Leg	4.00	0.00	80.00		No Ice	1.21	1.21	0.03
			0.00				1/2" Ice	1.89	1.89	0.05
			-2.00				1" Ice	2.11	2.11	0.08
							2" Ice	2.57	2.57	0.14
T-Arm Mount [TA 602-3]	C	None		0.00	80.00		No Ice	13.40	13.40	0.77
							1/2" Ice	16.44	16.44	1.00
							1" Ice	19.70	19.70	1.29
							2" Ice	25.86	25.86	2.05
75										
RRUS 11 B12	A	From Leg	2.00	0.00	75.00		No Ice	2.79	1.19	0.05
			0.00				1/2" Ice	3.00	1.34	0.07
			0.00				1" Ice	3.21	1.50	0.10
							2" Ice	3.67	1.84	0.15
RRUS 11 B12	B	From Leg	2.00	0.00	75.00		No Ice	2.79	1.19	0.05
			0.00				1/2" Ice	3.00	1.34	0.07
			0.00				1" Ice	3.21	1.50	0.10
							2" Ice	3.67	1.84	0.15
RRUS 11 B12	C	From Leg	2.00	0.00	75.00		No Ice	2.79	1.19	0.05
			0.00				1/2" Ice	3.00	1.34	0.07
			0.00				1" Ice	3.21	1.50	0.10
							2" Ice	3.67	1.84	0.15
2.4" Dia. x 4-ft	A	From Leg	2.00	0.00	75.00		No Ice	0.87	0.87	0.01
			0.00				1/2" Ice	1.12	1.12	0.02
			0.00				1" Ice	1.37	1.37	0.03
							2" Ice	1.91	1.91	0.06
2.4" Dia. x 4-ft	B	From Leg	2.00	0.00	75.00		No Ice	0.87	0.87	0.01
			0.00				1/2" Ice	1.12	1.12	0.02
			0.00				1" Ice	1.37	1.37	0.03
							2" Ice	1.91	1.91	0.06
2.4" Dia. x 4-ft	C	From Leg	2.00	0.00	75.00		No Ice	0.87	0.87	0.01
			0.00				1/2" Ice	1.12	1.12	0.02
			0.00				1" Ice	1.37	1.37	0.03
							2" Ice	1.91	1.91	0.06
Side Arm Mount [SO 701-3]	C	None		0.00	75.00		No Ice	3.02	3.02	0.20
							1/2" Ice	4.18	4.18	0.24
							1" Ice	5.33	5.33	0.28
							2" Ice	7.63	7.63	0.36
50										
KS24019-L112A	B	From Leg	3.00	0.00	50.00		No Ice	0.08	0.08	0.01
			0.00				1/2" Ice	0.13	0.13	0.01
			1.00				1" Ice	0.19	0.19	0.01
							2" Ice	0.35	0.35	0.02
Side Arm Mount [SO 701-1]	B	From Leg	1.50	0.00	50.00		No Ice	0.85	1.67	0.07
			0.00				1/2" Ice	1.14	2.34	0.08
			0.00				1" Ice	1.43	3.01	0.09
							2" Ice	2.01	4.35	0.12
**										

<p>tnxTower</p> <p><i>Tower Engineering Professionals, Inc.</i> 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350</p>	<p>Job</p> <p>Woodbury North (BU 876405)</p>	<p>Page</p> <p>22 of 34</p>
	<p>Project</p> <p>TEP No. 25604.514581</p>	<p>Date</p> <p>10:05:14 03/18/21</p>
	<p>Client</p> <p>Crown Castle</p>	<p>Designed by</p> <p>TLI</p>

Load Combinations

<i>Comb. No.</i>	<i>Description</i>
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
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

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Woodbury North (BU 876405)	Page	23 of 34
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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	110 - 105	Pole	Max Tension	39	0.00	0.00	-0.00
			Max. Compression	26	-4.12	-0.05	0.03
			Max. Mx	8	-1.27	-8.83	0.02
			Max. My	14	-1.26	0.03	-8.81
			Max. Vy	8	2.98	-8.83	0.02
			Max. Vx	14	2.97	0.03	-8.81
			Max. Torque	13			0.08
L2	105 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-13.13	-0.05	0.06
			Max. Mx	8	-5.60	-33.16	0.06
			Max. My	14	-5.59	0.06	-33.14
			Max. Vy	8	7.64	-33.16	0.06
			Max. Vx	14	7.64	0.06	-33.14
			Max. Torque	13			0.08
L3	100 - 98.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-13.27	-0.05	0.07
			Max. Mx	8	-5.69	-44.68	0.08
			Max. My	14	-5.68	0.07	-44.65
			Max. Vy	8	7.71	-44.68	0.08
			Max. Vx	14	7.71	0.07	-44.65
			Max. Torque	13			0.08
L4	98.5 - 93.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-13.74	-0.06	0.11
			Max. Mx	8	-6.03	-83.77	0.14
			Max. My	14	-6.02	0.11	-83.75
			Max. Vy	8	7.93	-83.77	0.14
			Max. Vx	14	7.94	0.11	-83.75
			Max. Torque	13			0.08
L5	93.5 - 88.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-14.23	-0.07	0.15
			Max. Mx	8	-6.39	-123.97	0.20
			Max. My	14	-6.38	0.14	-123.96
			Max. Vy	8	8.15	-123.97	0.20
			Max. Vx	14	8.16	0.14	-123.96
			Max. Torque	13			0.08
L6	88.5 - 83.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-14.74	-0.07	0.20
			Max. Mx	8	-6.78	-165.26	0.26
			Max. My	14	-6.77	0.18	-165.27
			Max. Vy	8	8.37	-165.26	0.26
			Max. Vx	14	8.38	0.18	-165.27
			Max. Torque	13			0.08
L7	83.5 - 78.67	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21.74	-0.44	4.02
			Max. Mx	8	-9.72	-206.92	2.34
			Max. My	2	-9.69	-0.70	208.41
			Max. Vy	8	12.15	-206.92	2.34
			Max. Vx	14	12.34	-0.33	-204.16
			Max. Torque	20			-1.46
L8	78.67 - 78.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21.80	-0.44	4.02
			Max. Mx	8	-9.77	-209.95	2.36
			Max. My	2	-9.75	-0.71	211.49
			Max. Vy	8	12.15	-209.95	2.36
			Max. Vx	14	12.35	-0.31	-207.25
			Max. Torque	20			-1.46
L9	78.42 - 73.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.79	-0.45	4.08
			Max. Mx	8	-10.99	-272.14	2.68
			Max. My	2	-10.96	-1.02	274.59
			Max. Vy	8	12.90	-272.14	2.68

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L10	73.42 - 68.42	Pole	Max. Vx	14	13.27	-0.01	-270.86
			Max. Torque	20			-1.46
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24.93	-0.46	4.13
			Max. Mx	8	-11.81	-337.28	3.01
			Max. My	2	-11.79	-1.33	340.65
			Max. Vy	8	13.17	-337.28	3.01
			Max. Vx	14	13.72	0.29	-338.30
L11	68.42 - 63.42	Pole	Max. Torque	20			-1.46
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.09	-0.46	4.18
			Max. Mx	8	-12.66	-403.80	3.34
			Max. My	2	-12.64	-1.64	408.08
			Max. Vy	8	13.45	-403.80	3.34
			Max. Vx	14	14.00	0.59	-407.56
			Max. Torque	20			-1.46
L12	63.42 - 58.67	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.20	-0.47	4.22
			Max. Mx	8	-13.48	-468.25	3.64
			Max. My	14	-13.43	0.88	-474.61
			Max. Vy	8	13.71	-468.25	3.64
			Max. Vx	14	14.25	0.88	-474.61
			Max. Torque	20			-1.46
			Max Tension	1	0.00	0.00	0.00
L13	58.67 - 58.42	Pole	Max. Compression	26	-27.26	-0.47	4.22
			Max. Mx	8	-13.53	-471.68	3.66
			Max. My	14	-13.48	0.89	-478.18
			Max. Vy	8	13.71	-471.68	3.66
			Max. Vx	14	14.26	0.89	-478.18
			Max. Torque	20			-1.46
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.46	-0.48	4.26
L14	58.42 - 53.42	Pole	Max. Mx	8	-14.41	-540.89	3.98
			Max. My	14	-14.36	1.19	-550.14
			Max. Vy	8	13.98	-540.89	3.98
			Max. Vx	14	14.53	1.19	-550.14
			Max. Torque	20			-1.46
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-29.08	-0.48	4.28
			Max. Mx	8	-14.87	-576.70	4.14
L15	53.42 - 47.12	Pole	Max. My	14	-14.82	1.35	-587.35
			Max. Vy	8	14.12	-576.70	4.14
			Max. Vx	14	14.67	1.35	-587.35
			Max. Torque	20			-1.46
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-31.18	-0.79	4.15
			Max. Mx	8	-16.41	-648.47	4.41
			Max. My	14	-16.37	1.52	-661.86
L16	47.12 - 45.87	Pole	Max. Vy	8	14.49	-648.47	4.41
			Max. Vx	14	15.06	1.52	-661.86
			Max. Torque	20			-1.37
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.52	-0.82	4.19
			Max. Mx	8	-17.43	-721.51	4.80
			Max. My	14	-17.39	1.89	-737.72
			Max. Vy	8	14.74	-721.51	4.80
L17	45.87 - 40.87	Pole	Max. Vx	14	15.31	1.89	-737.72
			Max. Torque	20			-1.37
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.88	-0.84	4.23
			Max. Mx	8	-18.47	-795.81	5.18
			Max. My	14	-17.39	1.89	-737.72
			Max. Vy	8	14.74	-721.51	4.80
			Max. Vx	14	15.31	1.89	-737.72
L18	40.87 - 35.87	Pole	Max. Torque	20			-1.37
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.88	-0.84	4.23
			Max. Mx	8	-18.47	-795.81	5.18

<p>tnxTower</p> <p><i>Tower Engineering Professionals, Inc.</i></p> <p>326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350</p>	<p>Job</p> <p>Woodbury North (BU 876405)</p>	<p>Page</p> <p>25 of 34</p>
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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft			
L19	35.87 - 30.87	Pole	Max. My	14	-18.44	2.26	-814.85			
			Max. Vy	8	14.99	-795.81	5.18			
			Max. Vx	14	15.56	2.26	-814.85			
			Max. Torque	20			-1.36			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-35.26	-0.86	4.26			
			Max. Mx	8	-19.53	-871.34	5.56			
			Max. My	14	-19.50	2.63	-893.20			
			Max. Vy	8	15.24	-871.34	5.56			
			Max. Vx	14	15.80	2.63	-893.20			
L20	30.87 - 28.67	Pole	Max. Torque	20			-1.36			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-35.87	-0.87	4.27			
			Max. Mx	8	-20.00	-904.95	5.73			
			Max. My	14	-19.97	2.79	-928.05			
			Max. Vy	8	15.34	-904.95	5.73			
			Max. Vx	14	15.90	2.79	-928.05			
			Max. Torque	20			-1.36			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-35.94	-0.87	4.27			
L21	28.67 - 28.42	Pole	Max. Mx	8	-20.06	-908.78	5.75			
			Max. My	14	-20.04	2.81	-932.02			
			Max. Vy	8	15.34	-908.78	5.75			
			Max. Vx	14	15.91	2.81	-932.02			
			Max. Torque	20			-1.36			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-37.35	-0.89	4.29			
			Max. Mx	8	-21.14	-986.05	6.12			
			Max. My	14	-21.12	3.18	-1012.10			
			Max. Vy	8	15.58	-986.05	6.12			
L22	28.42 - 23.42	Pole	Max. Vx	14	16.14	3.18	-1012.10			
			Max. Torque	20			-1.36			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-38.76	-0.90	4.30			
			Max. Mx	8	-22.25	-1064.40	6.50			
			Max. My	14	-22.23	3.54	-1093.25			
			Max. Vy	8	15.79	-1064.40	6.50			
			Max. Vx	14	16.35	3.54	-1093.25			
			Max. Torque	20			-1.36			
			Max Tension	1	0.00	0.00	0.00			
L23	23.42 - 18.42	Pole	Max. Compression	26	-40.01	-0.88	4.33			
			Max. Mx	8	-23.20	-1131.80	6.81			
			Max. My	14	-23.19	3.85	-1163.01			
			Max. Vy	8	15.95	-1131.80	6.81			
			Max. Vx	14	16.51	3.85	-1163.01			
			Max. Torque	20			-1.36			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-40.09	-0.87	4.33			
			Max. Mx	8	-23.27	-1135.79	6.83			
			Max. My	14	-23.26	3.87	-1167.14			
L24	18.42 - 14.17	Pole	Max. Vy	8	15.95	-1135.79	6.83			
			Max. Vx	14	16.51	3.87	-1167.14			
			Max. Torque	20			-1.36			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-40.18	-0.87	4.34			
			Max. Mx	8	-23.34	-1139.78	6.85			
			Max. My	14	-23.33	3.89	-1171.26			
			Max. Vy	8	15.97	-1139.78	6.85			
			Max. Vx	14	16.52	3.89	-1171.26			
			Max. Torque	20			-1.36			
L25	14.17 - 13.92	Pole	Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-40.18	-0.87	4.34			
L26	13.92 - 13.67	Pole	Max. Mx	8	-23.34	-1139.78	6.85			
			Max. My	14	-23.33	3.89	-1171.26			
			Max. Vy	8	15.97	-1139.78	6.85			
			Max. Vx	14	16.52	3.89	-1171.26			
			Max. Torque	20			-1.36			
			Max Tension	1	0.00	0.00	0.00			
			L27	13.67 - 13.42	Pole	Max. Compression	26	-40.18	-0.87	4.34
						Max. Mx	8	-23.34	-1139.78	6.85

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L28	13.42 - 8.42	Pole	Max. Compression	26	-40.26	-0.86	4.34
			Max. Mx	8	-23.40	-1143.77	6.87
			Max. My	14	-23.39	3.91	-1175.39
			Max. Vy	8	15.98	-1143.77	6.87
			Max. Vx	14	16.53	3.91	-1175.39
			Max. Torque	20			-1.36
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.83	-0.81	4.39
			Max. Mx	8	-24.61	-1224.17	7.23
			Max. My	14	-24.61	4.27	-1258.52
L29	8.42 - 5.75	Pole	Max. Vy	8	16.20	-1224.17	7.23
			Max. Vx	14	16.74	4.27	-1258.52
			Max. Torque	20			-1.36
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.69	-0.77	4.42
			Max. Mx	8	-25.27	-1267.54	7.43
			Max. My	14	-25.26	4.46	-1303.32
			Max. Vy	8	16.32	-1267.54	7.43
			Max. Vx	14	16.85	4.46	-1303.32
			Max. Torque	20			-1.36
L30	5.75 - 5.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.77	-0.76	4.43
			Max. Mx	8	-25.35	-1271.62	7.45
			Max. My	14	-25.34	4.48	-1307.53
			Max. Vy	8	16.31	-1271.62	7.45
			Max. Vx	14	16.84	4.48	-1307.53
			Max. Torque	20			-1.36
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.50	-0.73	4.45
			Max. Mx	8	-25.93	-1303.19	7.59
L31	5.5 - 3.57	Pole	Max. My	14	-25.92	4.62	-1340.11
			Max. Vy	8	16.42	-1303.19	7.59
			Max. Vx	14	16.95	4.62	-1340.11
			Max. Torque	20			-1.36
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.59	-0.73	4.45
			Max. Mx	8	-26.02	-1307.29	7.60
			Max. My	14	-26.01	4.64	-1344.35
			Max. Vy	8	16.42	-1307.29	7.60
			Max. Vx	14	16.94	4.64	-1344.35
L32	3.57 - 3.32	Pole	Max. Torque	20			-1.36
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.65	-0.73	4.45
			Max. Mx	8	-26.06	-1309.76	7.61
			Max. My	14	-26.06	4.65	-1346.89
			Max. Vy	8	16.42	-1309.76	7.61
			Max. Vx	14	16.95	4.65	-1346.89
			Max. Torque	20			-1.36
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.74	-0.72	4.46
L33	3.32 - 3.17	Pole	Max. Mx	8	-26.13	-1313.86	7.63
			Max. My	14	-26.13	4.66	-1351.12
			Max. Vy	8	16.43	-1313.86	7.63
			Max. Vx	14	16.96	4.66	-1351.12
			Max. Torque	20			-1.36
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.79	-0.72	4.46
			Max. Mx	8	-26.18	-1316.66	7.64
			Max. My	14	-26.17	4.68	-1354.01
			Max. Vy	8	16.44	-1316.66	7.64
L34	3.17 - 2.92	Pole	Max. Vx	14	16.96	4.68	-1354.01
			Max. Torque	20			-1.36
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.79	-0.72	4.46
			Max. Mx	8	-26.18	-1316.66	7.64
L35	2.92 - 2.75	Pole	Max. My	14	-26.17	4.68	-1354.01
			Max. Vy	8	16.44	-1316.66	7.64
			Max. Vx	14	16.96	4.68	-1354.01
			Max. Torque	20			-1.36
			Max Tension	1	0.00	0.00	0.00

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L36	2.75 - 2.5	Pole	Max. Torque	20			-1.36
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.87	-0.72	4.46
			Max. Mx	8	-26.24	-1320.77	7.66
			Max. My	14	-26.23	4.70	-1358.25
			Max. Vy	8	16.45	-1320.77	7.66
			Max. Vx	14	16.97	4.70	-1358.25
L37	2.5 - 0	Pole	Max. Torque	20			-1.36
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.64	-0.68	4.49
			Max. Mx	8	-26.85	-1362.02	7.84
			Max. My	14	-26.85	4.87	-1400.80
			Max. Vy	8	16.57	-1362.02	7.84
			Max. Vx	14	17.08	4.87	-1400.80
		Max. Torque	20			-1.36	

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	44.64	-0.02	4.54
	Max. H _x	21	20.14	16.55	-0.07
	Max. H _z	2	26.86	-0.07	16.71
	Max. M _x	2	1377.97	-0.07	16.71
	Max. M _z	8	1362.02	-16.55	0.07
	Max. Torsion	8	1.36	-16.55	0.07
	Min. Vert	11	20.14	-14.27	-8.29
	Min. H _x	9	20.14	-16.55	0.07
	Min. H _z	14	26.86	0.07	-17.07
	Min. M _x	14	-1400.80	0.07	-17.07
	Min. M _z	20	-1360.54	16.55	-0.07
	Min. Torsion	20	-1.36	16.55	-0.07

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	22.38	0.00	-0.00	-1.81	-0.60	-0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	26.86	0.07	-16.71	-1377.97	-6.36	0.01
0.9 Dead+1.0 Wind 0 deg - No Ice	20.14	0.07	-16.71	-1360.41	-6.11	0.01
1.2 Dead+1.0 Wind 30 deg - No Ice	26.86	8.32	-14.51	-1196.68	-686.10	-0.66
0.9 Dead+1.0 Wind 30 deg - No Ice	20.14	8.32	-14.51	-1181.36	-677.45	-0.66
1.2 Dead+1.0 Wind 60 deg - No Ice	26.86	14.65	-8.60	-708.61	-1205.62	-1.16
0.9 Dead+1.0 Wind 60 deg - No Ice	20.14	14.65	-8.60	-699.34	-1190.59	-1.15
1.2 Dead+1.0 Wind 90 deg - No Ice	26.86	16.55	-0.07	-7.84	-1362.02	-1.36

<p>tnxTower</p> <p><i>Tower Engineering Professionals, Inc.</i> 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350</p>	<p>Job</p> <p>Woodbury North (BU 876405)</p>	<p>Page</p> <p>28 of 34</p>
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	<p>Client</p> <p>Crown Castle</p>	<p>Designed by</p> <p>TLI</p>

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Ice						
0.9 Dead+1.0 Wind 90 deg - No Ice	20.14	16.55	-0.07	-7.19	-1345.01	-1.34
1.2 Dead+1.0 Wind 120 deg - No Ice	26.86	14.27	8.29	680.80	-1176.40	-1.19
0.9 Dead+1.0 Wind 120 deg - No Ice	20.14	14.27	8.29	672.96	-1161.67	-1.17
1.2 Dead+1.0 Wind 150 deg - No Ice	26.86	8.25	14.52	1187.46	-676.86	-0.70
0.9 Dead+1.0 Wind 150 deg - No Ice	20.14	8.25	14.52	1173.38	-668.30	-0.69
1.2 Dead+1.0 Wind 180 deg - No Ice	26.86	-0.07	17.07	1400.80	4.87	-0.02
0.9 Dead+1.0 Wind 180 deg - No Ice	20.14	-0.07	17.07	1384.14	5.01	-0.02
1.2 Dead+1.0 Wind 210 deg - No Ice	26.86	-8.32	14.51	1192.24	684.62	0.67
0.9 Dead+1.0 Wind 210 deg - No Ice	20.14	-8.32	14.51	1178.10	676.35	0.66
1.2 Dead+1.0 Wind 240 deg - No Ice	26.86	-14.34	8.42	690.52	1180.51	1.17
0.9 Dead+1.0 Wind 240 deg - No Ice	20.14	-14.34	8.42	682.57	1166.12	1.16
1.2 Dead+1.0 Wind 270 deg - No Ice	26.86	-16.55	0.07	3.40	1360.54	1.36
0.9 Dead+1.0 Wind 270 deg - No Ice	20.14	-16.55	0.07	3.92	1343.92	1.34
1.2 Dead+1.0 Wind 300 deg - No Ice	26.86	-14.58	-8.47	-698.89	1198.54	1.18
0.9 Dead+1.0 Wind 300 deg - No Ice	20.14	-14.58	-8.47	-689.73	1183.96	1.16
1.2 Dead+1.0 Wind 330 deg - No Ice	26.86	-8.25	-14.52	-1191.91	675.37	0.69
0.9 Dead+1.0 Wind 330 deg - No Ice	20.14	-8.25	-14.52	-1176.65	667.21	0.67
1.2 Dead+1.0 Ice+1.0 Temp	44.64	0.00	-0.00	-4.49	-0.68	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	44.64	0.02	-4.54	-385.66	-1.87	0.03
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	44.64	2.26	-3.94	-335.19	-190.74	-0.13
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	44.64	3.90	-2.28	-196.15	-328.76	-0.25
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	44.64	4.50	-0.02	-5.71	-378.76	-0.30
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	44.64	3.89	2.25	185.01	-327.52	-0.27
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	44.64	2.24	3.92	324.95	-188.71	-0.17
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	44.64	-0.02	4.54	376.67	0.48	-0.03
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	44.64	-2.26	3.94	326.12	189.36	0.13
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	44.64	-3.90	2.28	187.05	327.31	0.25
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	44.64	-4.50	0.02	-3.36	377.38	0.30
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	44.64	-3.89	-2.25	-194.12	326.20	0.27
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	44.64	-2.24	-3.92	-334.01	187.32	0.17
Dead+Wind 0 deg - Service	22.38	0.02	-3.94	-323.69	-1.93	0.00

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Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead+Wind 30 deg - Service	22.38	1.96	-3.42	-281.28	-160.95	-0.16
Dead+Wind 60 deg - Service	22.38	3.45	-2.02	-167.10	-282.50	-0.28
Dead+Wind 90 deg - Service	22.38	3.90	-0.02	-3.16	-319.07	-0.32
Dead+Wind 120 deg - Service	22.38	3.36	1.95	157.95	-275.64	-0.28
Dead+Wind 150 deg - Service	22.38	1.94	3.42	276.48	-158.78	-0.16
Dead+Wind 180 deg - Service	22.38	-0.02	4.02	326.41	0.70	-0.00
Dead+Wind 210 deg - Service	22.38	-1.96	3.42	277.60	159.72	0.16
Dead+Wind 240 deg - Service	22.38	-3.38	1.98	160.22	275.73	0.28
Dead+Wind 270 deg - Service	22.38	-3.90	0.02	-0.53	317.84	0.32
Dead+Wind 300 deg - Service	22.38	-3.43	-2.00	-164.83	279.96	0.28
Dead+Wind 330 deg - Service	22.38	-1.94	-3.42	-280.16	157.56	0.16

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	-22.38	0.00	0.00	22.38	0.00	0.000%
2	0.07	-26.86	-16.71	-0.07	26.86	16.71	0.000%
3	0.07	-20.14	-16.71	-0.07	20.14	16.71	0.000%
4	8.32	-26.86	-14.51	-8.32	26.86	14.51	0.000%
5	8.32	-20.14	-14.51	-8.32	20.14	14.51	0.000%
6	14.65	-26.86	-8.60	-14.65	26.86	8.60	0.000%
7	14.65	-20.14	-8.60	-14.65	20.14	8.60	0.000%
8	16.55	-26.86	-0.07	-16.55	26.86	0.07	0.000%
9	16.55	-20.14	-0.07	-16.55	20.14	0.07	0.000%
10	14.27	-26.86	8.29	-14.27	26.86	-8.29	0.000%
11	14.27	-20.14	8.29	-14.27	20.14	-8.29	0.000%
12	8.25	-26.86	14.52	-8.25	26.86	-14.52	0.000%
13	8.25	-20.14	14.52	-8.25	20.14	-14.52	0.000%
14	-0.07	-26.86	17.07	0.07	26.86	-17.07	0.000%
15	-0.07	-20.14	17.07	0.07	20.14	-17.07	0.000%
16	-8.32	-26.86	14.51	8.32	26.86	-14.51	0.000%
17	-8.32	-20.14	14.51	8.32	20.14	-14.51	0.000%
18	-14.34	-26.86	8.42	14.34	26.86	-8.42	0.000%
19	-14.34	-20.14	8.42	14.34	20.14	-8.42	0.000%
20	-16.55	-26.86	0.07	16.55	26.86	-0.07	0.000%
21	-16.55	-20.14	0.07	16.55	20.14	-0.07	0.000%
22	-14.58	-26.86	-8.47	14.58	26.86	8.47	0.000%
23	-14.58	-20.14	-8.47	14.58	20.14	8.47	0.000%
24	-8.25	-26.86	-14.52	8.25	26.86	14.52	0.000%
25	-8.25	-20.14	-14.52	8.25	20.14	14.52	0.000%
26	0.00	-44.64	0.00	-0.00	44.64	0.00	0.000%
27	0.02	-44.64	-4.54	-0.02	44.64	4.54	0.000%
28	2.26	-44.64	-3.94	-2.26	44.64	3.94	0.000%
29	3.90	-44.64	-2.28	-3.90	44.64	2.28	0.000%
30	4.50	-44.64	-0.02	-4.50	44.64	0.02	0.000%
31	3.89	-44.64	2.25	-3.89	44.64	-2.25	0.000%
32	2.24	-44.64	3.92	-2.24	44.64	-3.92	0.000%
33	-0.02	-44.64	4.54	0.02	44.64	-4.54	0.000%
34	-2.26	-44.64	3.94	2.26	44.64	-3.94	0.000%
35	-3.90	-44.64	2.28	3.90	44.64	-2.28	0.000%
36	-4.50	-44.64	0.02	4.50	44.64	-0.02	0.000%
37	-3.89	-44.64	-2.25	3.89	44.64	2.25	0.000%
38	-2.24	-44.64	-3.92	2.24	44.64	3.92	0.000%
39	0.02	-22.38	-3.94	-0.02	22.38	3.94	0.000%
40	1.96	-22.38	-3.42	-1.96	22.38	3.42	0.000%
41	3.45	-22.38	-2.02	-3.45	22.38	2.02	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
42	3.90	-22.38	-0.02	-3.90	22.38	0.02	0.000%
43	3.36	-22.38	1.95	-3.36	22.38	-1.95	0.000%
44	1.94	-22.38	3.42	-1.94	22.38	-3.42	0.000%
45	-0.02	-22.38	4.02	0.02	22.38	-4.02	0.000%
46	-1.96	-22.38	3.42	1.96	22.38	-3.42	0.000%
47	-3.38	-22.38	1.98	3.38	22.38	-1.98	0.000%
48	-3.90	-22.38	0.02	3.90	22.38	-0.02	0.000%
49	-3.43	-22.38	-2.00	3.43	22.38	2.00	0.000%
50	-1.94	-22.38	-3.42	1.94	22.38	3.42	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.0000001	0.00000689
2	Yes	5	0.0000001	0.00014279
3	Yes	5	0.0000001	0.00005371
4	Yes	6	0.0000001	0.00062903
5	Yes	6	0.0000001	0.00020263
6	Yes	6	0.0000001	0.00069853
7	Yes	6	0.0000001	0.00022585
8	Yes	6	0.0000001	0.00007372
9	Yes	5	0.0000001	0.00057875
10	Yes	6	0.0000001	0.00060254
11	Yes	6	0.0000001	0.00019530
12	Yes	6	0.0000001	0.00064765
13	Yes	6	0.0000001	0.00021108
14	Yes	5	0.0000001	0.00016968
15	Yes	5	0.0000001	0.00007471
16	Yes	6	0.0000001	0.00065758
17	Yes	6	0.0000001	0.00021417
18	Yes	6	0.0000001	0.00060915
19	Yes	6	0.0000001	0.00019702
20	Yes	6	0.0000001	0.00006162
21	Yes	5	0.0000001	0.00048367
22	Yes	6	0.0000001	0.00068576
23	Yes	6	0.0000001	0.00022242
24	Yes	6	0.0000001	0.00061947
25	Yes	6	0.0000001	0.00020041
26	Yes	4	0.0000001	0.00074732
27	Yes	6	0.0000001	0.00055700
28	Yes	6	0.0000001	0.00069395
29	Yes	6	0.0000001	0.00070265
30	Yes	6	0.0000001	0.00054786
31	Yes	6	0.0000001	0.00065700
32	Yes	6	0.0000001	0.00066629
33	Yes	6	0.0000001	0.00053496
34	Yes	6	0.0000001	0.00066632
35	Yes	6	0.0000001	0.00065711
36	Yes	6	0.0000001	0.00054382
37	Yes	6	0.0000001	0.00069283
38	Yes	6	0.0000001	0.00068426
39	Yes	4	0.0000001	0.00043985
40	Yes	5	0.0000001	0.00016338
41	Yes	5	0.0000001	0.00021319
42	Yes	5	0.0000001	0.00006875

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43	Yes	5	0.00000001	0.00014677
44	Yes	5	0.00000001	0.00017925
45	Yes	4	0.00000001	0.00043997
46	Yes	5	0.00000001	0.00018292
47	Yes	5	0.00000001	0.00014824
48	Yes	5	0.00000001	0.00006579
49	Yes	5	0.00000001	0.00020546
50	Yes	5	0.00000001	0.00015852

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L1	110 - 105 (1)	TP13.6932x12.7x0.1875	5.00	0.00	0.0	8.0376	-1.26	470.20	0.003
L2	105 - 100 (2)	TP14.6863x13.6932x0.1875	5.00	0.00	0.0	8.6286	-5.59	504.77	0.011
L3	100 - 98.5 (3)	TP14.9843x14.6863x0.1875	1.50	0.00	0.0	8.8060	-5.68	515.15	0.011
L4	98.5 - 93.5 (4)	TP16.477x15.5x0.1875	5.00	0.00	0.0	9.6943	-6.01	567.12	0.011
L5	93.5 - 88.5 (5)	TP17.4541x16.477x0.1875	5.00	0.00	0.0	10.2758	-6.37	601.13	0.011
L6	88.5 - 83.5 (6)	TP18.4311x17.4541x0.1875	5.00	0.00	0.0	10.8572	-6.76	635.15	0.011
L7	83.5 - 78.67 (7)	TP19.3749x18.4311x0.1875	4.83	0.00	0.0	11.4189	-9.69	668.01	0.015
L8	78.67 - 78.42 (8)	TP19.4238x19.3749x0.5475	0.25	0.00	0.0	32.8025	-9.74	1918.95	0.005
L9	78.42 - 73.42 (9)	TP20.4008x19.4238x0.5225	5.00	0.00	0.0	32.9665	-10.96	1928.54	0.006
L10	73.42 - 68.42 (10)	TP21.3778x20.4008x0.5025	5.00	0.00	0.0	33.2948	-11.76	1947.75	0.006
L11	68.42 - 63.42 (11)	TP22.3549x21.3778x0.4825	5.00	0.00	0.0	33.4966	-12.61	1959.55	0.006
L12	63.42 - 58.67 (12)	TP23.2831x22.3549x0.4675	4.75	0.00	0.0	33.8547	-13.44	1980.50	0.007
L13	58.67 - 58.42 (13)	TP23.3319x23.2831x0.4675	0.25	0.00	0.0	33.9272	-13.49	1984.74	0.007
L14	58.42 - 53.42 (14)	TP24.3089x23.3319x0.4525	5.00	0.00	0.0	34.2635	-14.37	2004.41	0.007
L15	53.42 - 47.12 (15)	TP25.54x24.3089x0.4475	6.30	0.00	0.0	34.5997	-14.83	2024.08	0.007
L16	47.12 - 45.87 (16)	TP25.3972x24.4322x0.505	5.00	0.00	0.0	39.8990	-16.37	2334.09	0.007
L17	45.87 - 40.87 (17)	TP26.3622x25.3972x0.495	5.00	0.00	0.0	40.6407	-17.40	2377.48	0.007
L18	40.87 - 35.87 (18)	TP27.3272x26.3622x0.485	5.00	0.00	0.0	41.3206	-18.44	2417.25	0.008
L19	35.87 - 30.87 (19)	TP28.2922x27.3272x0.475	5.00	0.00	0.0	41.9386	-19.50	2453.41	0.008
L20	30.87 - 28.67 (20)	TP28.7168x28.2922x0.47	2.20	0.00	0.0	42.1380	-19.98	2465.07	0.008
L21	28.67 - 28.42 (21)	TP28.765x28.7168x0.47	0.25	0.00	0.0	42.2099	-20.04	2469.28	0.008
L22	28.42 - 23.42 (22)	TP29.73x28.765x0.46	5.00	0.00	0.0	42.7354	-21.12	2500.02	0.008
L23	23.42 - 18.42 (23)	TP30.695x29.73x0.455	5.00	0.00	0.0	43.6717	-22.23	2554.79	0.009
L24	18.42 - 14.17 (24)	TP31.5152x30.695x0.445	4.25	0.00	0.0	43.8845	-23.19	2567.24	0.009

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L25	14.17 - 13.92 (25)	TP31.5635x31.5152x0.54	0.25	0.00	0.0	53.1730	-23.26	3110.62	0.007
L26	13.92 - 13.67 (26)	TP31.6117x31.5635x0.54	0.25	0.00	0.0	53.2557	-23.33	3115.46	0.007
L27	13.67 - 13.42 (27)	TP31.66x31.6117x0.5	0.25	0.00	0.0	49.4509	-23.39	2892.88	0.008
L28	13.42 - 8.42 (28)	TP32.625x31.66x0.49	5.00	0.00	0.0	49.9782	-24.61	2923.73	0.008
L29	8.42 - 5.75 (29)	TP33.1403x32.625x0.485	2.67	0.00	0.0	50.2692	-25.26	2940.75	0.009
L30	5.75 - 5.5 (30)	TP33.1885x33.1403x0.525	0.25	0.00	0.0	54.4288	-25.34	3184.09	0.008
L31	5.5 - 3.57 (31)	TP33.561x33.1885x0.59	1.93	0.00	0.0	61.7435	-25.92	3611.99	0.007
L32	3.57 - 3.32 (32)	TP33.6092x33.561x0.585	0.25	0.00	0.0	61.3191	-26.01	3587.17	0.007
L33	3.32 - 3.17 (33)	TP33.6382x33.6092x0.585	0.15	0.00	0.0	61.3728	-26.06	3590.31	0.007
L34	3.17 - 2.92 (34)	TP33.6864x33.6382x0.495	0.25	0.00	0.0	52.1481	-26.13	3050.66	0.009
L35	2.92 - 2.75 (35)	TP33.7193x33.6864x0.495	0.17	0.00	0.0	52.1996	-26.17	3053.68	0.009
L36	2.75 - 2.5 (36)	TP33.7675x33.7193x0.49	0.25	0.00	0.0	51.7552	-26.23	3027.68	0.009
L37	2.5 - 0 (37)	TP34.25x33.7675x0.485	2.50	0.00	0.0	51.9775	-26.85	3040.68	0.009

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	110 - 105 (1)	TP13.6932x12.7x0.1875	8.85	164.86	0.054	0.00	164.86	0.000
L2	105 - 100 (2)	TP14.6863x13.6932x0.1875	33.22	190.17	0.175	0.00	190.17	0.000
L3	100 - 98.5 (3)	TP14.9843x14.6863x0.1875	44.76	198.12	0.226	0.00	198.12	0.000
L4	98.5 - 93.5 (4)	TP16.477x15.5x0.1875	83.92	240.38	0.349	0.00	240.38	0.000
L5	93.5 - 88.5 (5)	TP17.4541x16.477x0.1875	124.19	270.26	0.460	0.00	270.26	0.000
L6	88.5 - 83.5 (6)	TP18.4311x17.4541x0.1875	165.55	300.19	0.551	0.00	300.19	0.000
L7	83.5 - 78.67 (7)	TP19.3749x18.4311x0.1875	208.58	328.00	0.636	0.00	328.00	0.000
L8	78.67 - 78.42 (8)	TP19.4238x19.3749x0.5475	211.66	926.52	0.228	0.00	926.52	0.000
L9	78.42 - 73.42 (9)	TP20.4008x19.4238x0.5225	274.81	983.18	0.280	0.00	983.18	0.000
L10	73.42 - 68.42 (10)	TP21.3778x20.4008x0.5025	341.56	1045.03	0.327	0.00	1045.03	0.000
L11	68.42 - 63.42 (11)	TP22.3549x21.3778x0.4825	410.41	1103.75	0.372	0.00	1103.75	0.000
L12	63.42 - 58.67 (12)	TP23.2831x22.3549x0.4675	477.08	1165.45	0.409	0.00	1165.45	0.000
L13	58.67 - 58.42 (13)	TP23.3319x23.2831x0.4675	480.63	1170.50	0.411	0.00	1170.50	0.000
L14	58.42 - 53.42 (14)	TP24.3089x23.3319x0.4525	552.18	1235.18	0.447	0.00	1235.18	0.000
L15	53.42 - 47.12 (15)	TP25.54x24.3089x0.4475	589.17	1274.36	0.462	0.00	1274.36	0.000
L16	47.12 - 45.87 (16)	TP25.3972x24.4322x0.505	663.28	1498.84	0.443	0.00	1498.84	0.000
L17	45.87 - 40.87 (17)	TP26.3622x25.3972x0.495	738.73	1588.29	0.465	0.00	1588.29	0.000
L18	40.87 - 35.87 (18)	TP27.3272x26.3622x0.485	815.45	1677.49	0.486	0.00	1677.49	0.000
L19	35.87 - 30.87 (19)	TP28.2922x27.3272x0.475	893.38	1766.14	0.506	0.00	1766.14	0.000
L20	30.87 - 28.67 (20)	TP28.7168x28.2922x0.47	928.05	1802.72	0.515	0.00	1802.72	0.000

<p>tnxTower</p> <p>Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350</p>	<p>Job</p> <p>Woodbury North (BU 876405)</p>	<p>Page</p> <p>33 of 34</p>
	<p>Project</p> <p>TEP No. 25604.514581</p>	<p>Date</p> <p>10:05:14 03/18/21</p>
	<p>Client</p> <p>Crown Castle</p>	<p>Designed by</p> <p>TLI</p>

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{rx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{rx}}$	M_{uy} kip-ft	ϕM_{ry} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ry}}$
L21	28.67 - 28.42 (21)	TP28.765x28.7168x0.47	932.01	1808.93	0.515	0.00	1808.93	0.000
L22	28.42 - 23.42 (22)	TP29.73x28.765x0.46	1012.10	1896.22	0.534	0.00	1896.22	0.000
L23	23.42 - 18.42 (23)	TP30.695x29.73x0.455	1093.25	2003.31	0.546	0.00	2003.31	0.000
L24	18.42 - 14.17 (24)	TP31.5152x30.695x0.445	1163.02	2069.82	0.562	0.00	2069.82	0.000
L25	14.17 - 13.92 (25)	TP31.5635x31.5152x0.54	1167.14	2496.54	0.468	0.00	2496.54	0.000
L26	13.92 - 13.67 (26)	TP31.6117x31.5635x0.54	1171.27	2504.38	0.468	0.00	2504.38	0.000
L27	13.67 - 13.42 (27)	TP31.66x31.6117x0.5	1175.40	2335.13	0.503	0.00	2335.13	0.000
L28	13.42 - 8.42 (28)	TP32.625x31.66x0.49	1258.53	2435.78	0.517	0.00	2435.78	0.000
L29	8.42 - 5.75 (29)	TP33.1403x32.625x0.485	1303.33	2490.60	0.523	0.00	2490.60	0.000
L30	5.75 - 5.5 (30)	TP33.1885x33.1403x0.525	1307.53	2694.13	0.485	0.00	2694.13	0.000
L31	5.5 - 3.57 (31)	TP33.561x33.1885x0.59	1340.13	3079.44	0.435	0.00	3079.44	0.000
L32	3.57 - 3.32 (32)	TP33.6092x33.561x0.585	1344.36	3063.76	0.439	0.00	3063.76	0.000
L33	3.32 - 3.17 (33)	TP33.6382x33.6092x0.585	1346.89	3069.18	0.439	0.00	3069.18	0.000
L34	3.17 - 2.92 (34)	TP33.6864x33.6382x0.495	1351.13	2625.96	0.515	0.00	2625.96	0.000
L35	2.92 - 2.75 (35)	TP33.7193x33.6864x0.495	1354.02	2631.19	0.515	0.00	2631.19	0.000
L36	2.75 - 2.5 (36)	TP33.7675x33.7193x0.49	1358.26	2613.42	0.520	0.00	2613.42	0.000
L37	2.5 - 0 (37)	TP34.25x33.7675x0.485	1400.81	2664.04	0.526	0.00	2664.04	0.000

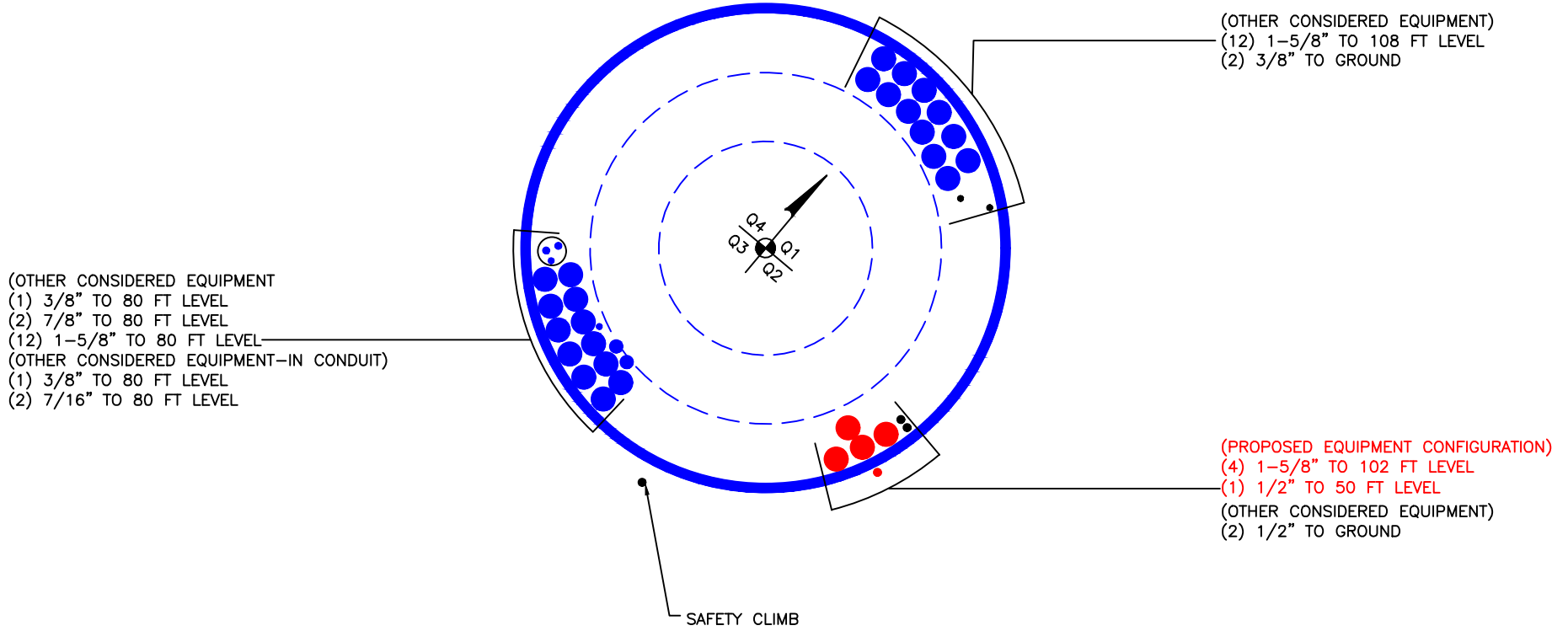
Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	110 - 105 (1)	TP13.6932x12.7x0.1875	2.99	141.06	0.021	0.00	166.84	0.000
L2	105 - 100 (2)	TP14.6863x13.6932x0.1875	7.66	151.43	0.051	0.00	192.28	0.000
L3	100 - 98.5 (3)	TP14.9843x14.6863x0.1875	7.72	154.54	0.050	0.00	200.26	0.000
L4	98.5 - 93.5 (4)	TP16.477x15.5x0.1875	7.95	170.13	0.047	0.00	242.71	0.000
L5	93.5 - 88.5 (5)	TP17.4541x16.477x0.1875	8.17	180.34	0.045	0.00	272.69	0.000
L6	88.5 - 83.5 (6)	TP18.4311x17.4541x0.1875	8.39	190.54	0.044	0.00	304.43	0.000
L7	83.5 - 78.67 (7)	TP19.3749x18.4311x0.1875	12.34	200.40	0.062	0.84	336.74	0.003
L8	78.67 - 78.42 (8)	TP19.4238x19.3749x0.5475	12.35	575.68	0.021	0.84	951.66	0.001
L9	78.42 - 73.42 (9)	TP20.4008x19.4238x0.5225	13.09	578.56	0.023	0.84	1007.18	0.001
L10	73.42 - 68.42 (10)	TP21.3778x20.4008x0.5025	13.64	584.32	0.023	1.32	1068.23	0.001
L11	68.42 - 63.42 (11)	TP22.3549x21.3778x0.4825	13.91	587.86	0.024	1.32	1126.04	0.001
L12	63.42 - 58.67 (12)	TP23.2831x22.3549x0.4675	14.17	594.15	0.024	1.32	1187.16	0.001
L13	58.67 - 58.42 (13)	TP23.3319x23.2831x0.4675	14.18	595.42	0.024	1.32	1192.24	0.001
L14	58.42 - 53.42 (14)	TP24.3089x23.3319x0.4525	14.45	601.32	0.024	1.32	1256.30	0.001
L15	53.42 - 47.12 (15)	TP25.54x24.3089x0.4475	14.59	607.23	0.024	1.32	1295.39	0.001
L16	47.12 - 45.87 (16)	TP25.3972x24.4322x0.505	14.97	700.23	0.021	1.17	1526.45	0.001

<p>tnxTower</p> <p>Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350</p>	Job	Woodbury North (BU 876405)	Page	34 of 34
	Project	TEP No. 25604.514581	Date	10:05:14 03/18/21
	Client	Crown Castle	Designed by	TLI

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L17	45.87 - 40.87 (17)	TP26.3622x25.3972x0.495	15.23	713.25	0.021	1.16	1615.72	0.001
L18	40.87 - 35.87 (18)	TP27.3272x26.3622x0.485	15.48	725.18	0.021	1.16	1704.68	0.001
L19	35.87 - 30.87 (19)	TP28.2922x27.3272x0.475	15.72	736.02	0.021	1.16	1793.02	0.001
L20	30.87 - 28.67 (20)	TP28.7168x28.2922x0.47	15.82	739.52	0.021	1.16	1829.36	0.001
L21	28.67 - 28.42 (21)	TP28.765x28.7168x0.47	15.82	740.78	0.021	1.16	1835.62	0.001
L22	28.42 - 23.42 (22)	TP29.73x28.765x0.46	16.14	750.01	0.022	0.02	1922.51	0.000
L23	23.42 - 18.42 (23)	TP30.695x29.73x0.455	16.35	766.44	0.021	0.02	2029.73	0.000
L24	18.42 - 14.17 (24)	TP31.5152x30.695x0.445	16.51	770.17	0.021	0.02	2095.63	0.000
L25	14.17 - 13.92 (25)	TP31.5635x31.5152x0.54	16.51	933.19	0.018	0.02	2535.36	0.000
L26	13.92 - 13.67 (26)	TP31.6117x31.5635x0.54	16.52	934.64	0.018	0.02	2543.25	0.000
L27	13.67 - 13.42 (27)	TP31.66x31.6117x0.5	16.53	867.86	0.019	0.02	2368.25	0.000
L28	13.42 - 8.42 (28)	TP32.625x31.66x0.49	16.74	877.12	0.019	0.02	2468.40	0.000
L29	8.42 - 5.75 (29)	TP33.1403x32.625x0.485	16.85	882.22	0.019	0.02	2522.97	0.000
L30	5.75 - 5.5 (30)	TP33.1885x33.1403x0.525	16.84	955.23	0.018	0.02	2732.43	0.000
L31	5.5 - 3.57 (31)	TP33.561x33.1885x0.59	16.95	1083.60	0.016	0.02	3128.82	0.000
L32	3.57 - 3.32 (32)	TP33.6092x33.561x0.585	16.94	1076.15	0.016	0.02	3112.33	0.000
L33	3.32 - 3.17 (33)	TP33.6382x33.6092x0.585	16.95	1077.09	0.016	0.02	3117.79	0.000
L34	3.17 - 2.92 (34)	TP33.6864x33.6382x0.495	16.96	915.20	0.019	0.02	2660.24	0.000
L35	2.92 - 2.75 (35)	TP33.7193x33.6864x0.495	16.96	916.10	0.019	0.02	2665.51	0.000
L36	2.75 - 2.5 (36)	TP33.7675x33.7193x0.49	16.97	908.30	0.019	0.02	2647.05	0.000
L37	2.5 - 0 (37)	TP34.25x33.7675x0.485	17.09	912.21	0.019	0.02	2697.36	0.000

APPENDIX B
BASE LEVEL DRAWING



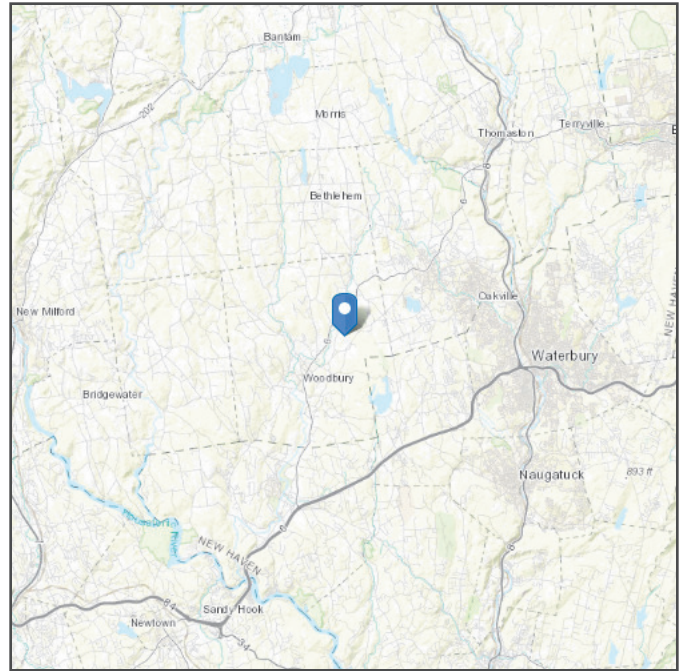
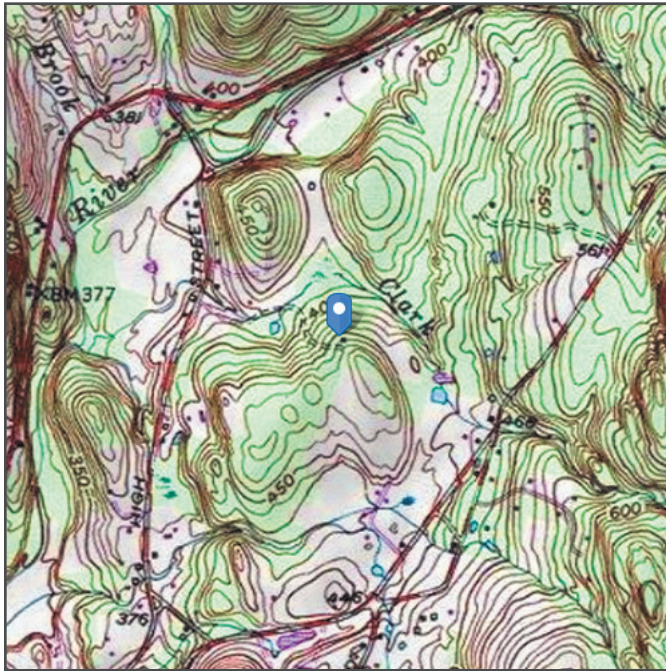
APPENDIX C
ADDITIONAL CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This
Location

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

Elevation: 460.09 ft (NAVD 88)
Latitude: 41.567997
Longitude: -73.179681



Wind

Results:

Wind Speed:	118 Vmph	120 Vmph Required per Jurisdiction
10-year MRI	76 Vmph	
25-year MRI	85 Vmph	
50-year MRI	90 Vmph	
100-year MRI	97 Vmph	

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).

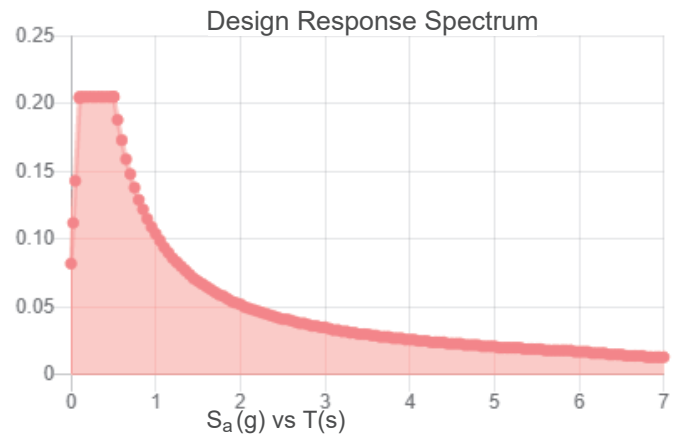
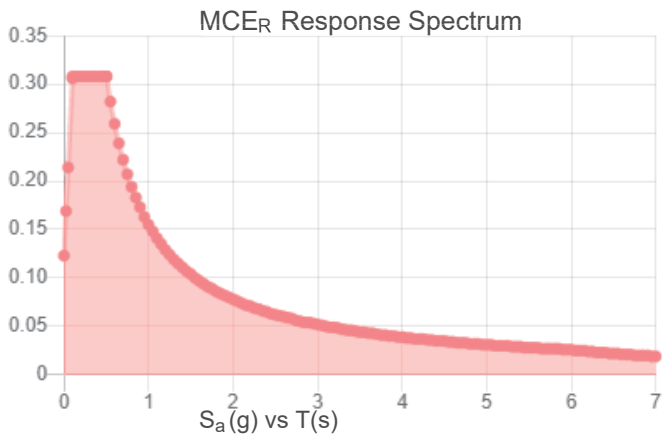
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.192	S_{DS} :	0.205
S_1 :	0.065	S_{D1} :	0.104
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.1
S_{MS} :	0.308	PGA _M :	0.16
S_{M1} :	0.155	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Wed Mar 17 2021

Date Source:

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

Ice

Results:

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

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

Date Accessed: Wed Mar 17 2021

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

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

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

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TNX Geometry Input

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

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	110 - 105	5		18	12.700	13.693	0.1875	A572-65	1.000
2	105 - 100	5		18	13.693	14.686	0.1875	A572-65	1.000
3	100 - 98.5	1.5	0	18	14.686	14.984	0.1875	A572-65	1.000
4	98.5 - 93.5	5		18	15.500	16.477	0.1875	A572-65	1.000
5	93.5 - 88.5	5		18	16.477	17.454	0.1875	A572-65	1.000
6	88.5 - 83.5	5		18	17.454	18.431	0.1875	A572-65	1.000
7	83.5 - 78.67	4.83		18	18.431	19.375	0.1875	A572-65	1.000
8	78.67 - 78.42	0.25		18	19.375	19.424	0.55	A572-65	0.862
9	78.42 - 73.42	5		18	19.424	20.401	0.525	A572-65	0.875
10	73.42 - 68.42	5		18	20.401	21.378	0.5	A572-65	0.892
11	68.42 - 63.42	5		18	21.378	22.355	0.4875	A572-65	0.891
12	63.42 - 58.67	4.75		18	22.355	23.283	0.475	A572-65	0.893
13	58.67 - 58.42	0.25		18	23.283	23.332	0.475	A572-65	0.892
14	58.42 - 53.42	5		18	23.332	24.309	0.45625	A572-65	0.906
15	53.42 - 50.87	6.3	3.75	18	24.309	25.540	0.45	A572-65	0.908
16	50.87 - 45.87	5		18	24.432	25.397	0.5125	A572-65	0.912
17	45.87 - 40.87	5		18	25.397	26.362	0.5	A572-65	0.918
18	40.87 - 35.87	5		18	26.362	27.327	0.4875	A572-65	0.926
19	35.87 - 30.87	5		18	27.327	28.292	0.475	A572-65	0.935
20	30.87 - 28.67	2.2		18	28.292	28.717	0.475	A572-65	0.929
21	28.67 - 28.42	0.25		18	28.717	28.765	0.475	A572-65	0.928
22	28.42 - 23.42	5		18	28.765	29.730	0.4625	A572-65	0.939
23	23.42 - 18.42	5		18	29.730	30.695	0.45625	A572-65	0.939
24	18.42 - 14.17	4.25		18	30.695	31.515	0.45	A572-65	0.941
25	14.17 - 13.92	0.25		18	31.515	31.563	0.55	A572-65	0.955
26	13.92 - 13.67	0.25		18	31.563	31.612	0.55	A572-65	0.954
27	13.67 - 13.42	0.25		18	31.612	31.660	0.5	A572-65	0.933
28	13.42 - 8.42	5		18	31.660	32.625	0.49375	A572-65	0.932
29	8.42 - 5.75	2.67		18	32.625	33.140	0.4875	A572-65	0.937
30	5.75 - 5.5	0.25		18	33.140	33.189	0.525	A572-65	0.974
31	5.5 - 3.57	1.93		18	33.189	33.561	0.5875	A572-65	1.019
32	3.57 - 3.32	0.25		18	33.561	33.609	0.5875	A572-65	1.018
33	3.32 - 3.17	0.15		18	33.609	33.638	0.5875	A572-65	1.017
34	3.17 - 2.92	0.25		18	33.638	33.686	0.5	A572-65	1.003
35	2.92 - 2.75	0.17		18	33.686	33.719	0.5	A572-65	1.002
36	2.75 - 2.5	0.25		18	33.719	33.768	0.4875	A572-65	0.917
37	2.5 - 0	2.5		18	33.768	34.250	0.4875	A572-65	0.911

TNX Section Forces

Increment (ft):		TNX Output				
	5	Section Height (ft)		P_u (K)	M_{ux} (kip-ft)	V_u (K)
1		110 - 105	1.26	8.85	2.99	
2		105 - 100	5.59	33.22	7.66	
3		100 - 98.5	5.68	44.76	7.72	
4		98.5 - 93.5	6.01	83.92	7.95	
5		93.5 - 88.5	6.37	124.19	8.17	
6		88.5 - 83.5	6.76	165.55	8.39	
7		83.5 - 78.67	9.69	208.58	12.34	
8		78.67 - 78.42	9.74	211.66	12.35	
9		78.42 - 73.42	10.96	274.81	13.09	
10		73.42 - 68.42	11.76	341.56	13.64	
11		68.42 - 63.42	12.61	410.41	13.91	
12		63.42 - 58.67	13.44	477.08	14.17	
13		58.67 - 58.42	13.49	480.63	14.18	
14		58.42 - 53.42	14.37	552.18	14.45	
15		53.42 - 50.87	14.83	589.18	14.59	
16		50.87 - 45.87	16.37	663.28	14.97	
17		45.87 - 40.87	17.40	738.73	15.23	
18		40.87 - 35.87	18.44	815.45	15.48	
19		35.87 - 30.87	19.50	893.38	15.72	
20		30.87 - 28.67	19.97	928.05	15.90	
21		28.67 - 28.42	20.04	932.03	15.91	
22		28.42 - 23.42	21.12	1012.10	16.14	
23		23.42 - 18.42	22.23	1093.25	16.35	
24		18.42 - 14.17	23.19	1163.02	16.51	
25		14.17 - 13.92	23.26	1167.14	16.51	
26		13.92 - 13.67	23.33	1171.27	16.52	
27		13.67 - 13.42	23.39	1175.40	16.53	
28		13.42 - 8.42	24.61	1258.53	16.74	
29		8.42 - 5.75	25.26	1303.33	16.85	
30		5.75 - 5.5	25.34	1307.54	16.84	
31		5.5 - 3.57	25.92	1340.12	16.95	
32		3.57 - 3.32	26.01	1344.35	16.94	
33		3.32 - 3.17	26.06	1346.90	16.95	
34		3.17 - 2.92	26.13	1351.13	16.96	
35		2.92 - 2.75	26.17	1354.02	16.96	
36		2.75 - 2.5	26.23	1358.26	16.97	
37		2.5 - 0	26.85	1400.81	17.09	

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
110 - 105	Pole	TP13.693x12.7x0.1875	Pole	5.3%	Pass
105 - 100	Pole	TP14.686x13.693x0.1875	Pole	17.5%	Pass
100 - 98.5	Pole	TP14.984x14.686x0.1875	Pole	22.4%	Pass
98.5 - 93.5	Pole	TP16.477x15.5x0.1875	Pole	34.1%	Pass
93.5 - 88.5	Pole	TP17.454x16.477x0.1875	Pole	44.6%	Pass
88.5 - 83.5	Pole	TP18.431x17.454x0.1875	Pole	53.4%	Pass
83.5 - 78.67	Pole	TP19.375x18.431x0.1875	Pole	61.8%	Pass
78.67 - 78.42	Pole + Reinf.	TP19.424x19.375x0.55	Reinf. 5 Bolt-Shaft Bearing	34.1%	Pass
78.42 - 73.42	Pole + Reinf.	TP20.401x19.424x0.525	Reinf. 5 Tension Rupture	41.1%	Pass
73.42 - 68.42	Pole + Reinf.	TP21.378x20.401x0.5	Reinf. 5 Tension Rupture	47.9%	Pass
68.42 - 63.42	Pole + Reinf.	TP22.355x21.378x0.4875	Reinf. 5 Tension Rupture	54.0%	Pass
63.42 - 58.67	Pole + Reinf.	TP23.283x22.355x0.475	Reinf. 5 Bolt-Shaft Bearing	59.8%	Pass
58.67 - 58.42	Pole + Reinf.	TP23.332x23.283x0.475	Reinf. 4 Bolt-Shaft Bearing	60.0%	Pass
58.42 - 53.42	Pole + Reinf.	TP24.309x23.332x0.4563	Reinf. 4 Tension Rupture	64.6%	Pass
53.42 - 50.87	Pole + Reinf.	TP25.54x24.309x0.45	Reinf. 4 Tension Rupture	66.9%	Pass
50.87 - 45.87	Pole + Reinf.	TP25.397x24.432x0.5125	Reinf. 4 Tension Rupture	63.8%	Pass
45.87 - 40.87	Pole + Reinf.	TP26.362x25.397x0.5	Reinf. 4 Tension Rupture	67.1%	Pass
40.87 - 35.87	Pole + Reinf.	TP27.327x26.362x0.4875	Reinf. 4 Tension Rupture	70.1%	Pass
35.87 - 30.87	Pole + Reinf.	TP28.292x27.327x0.475	Reinf. 4 Tension Rupture	72.8%	Pass
30.87 - 28.67	Pole + Reinf.	TP28.717x28.292x0.475	Reinf. 4 Tension Rupture	73.9%	Pass
28.67 - 28.42	Pole + Reinf.	TP28.765x28.717x0.475	Reinf. 7 Tension Rupture	74.0%	Pass
28.42 - 23.42	Pole + Reinf.	TP29.73x28.765x0.4625	Reinf. 7 Tension Rupture	76.4%	Pass
23.42 - 18.42	Pole + Reinf.	TP30.695x29.73x0.4563	Reinf. 7 Tension Rupture	78.5%	Pass
18.42 - 14.17	Pole + Reinf.	TP31.515x30.695x0.45	Reinf. 7 Tension Rupture	80.1%	Pass
14.17 - 13.92	Pole + Reinf.	TP31.563x31.515x0.55	Reinf. 3 Tension Rupture	71.3%	Pass
13.92 - 13.67	Pole + Reinf.	TP31.612x31.563x0.55	Reinf. 3 Tension Rupture	71.4%	Pass
13.67 - 13.42	Pole + Reinf.	TP31.66x31.612x0.5	Reinf. 3 Tension Rupture	72.7%	Pass
13.42 - 8.42	Pole + Reinf.	TP32.625x31.66x0.4938	Reinf. 3 Tension Rupture	74.3%	Pass
8.42 - 5.75	Pole + Reinf.	TP33.14x32.625x0.4875	Reinf. 3 Tension Rupture	75.1%	Pass
5.75 - 5.5	Pole + Reinf.	TP33.189x33.14x0.525	Reinf. 3 Tension Rupture	74.0%	Pass
5.5 - 3.57	Pole + Reinf.	TP33.561x33.189x0.5875	Reinf. 1 Compression	61.2%	Pass
3.57 - 3.32	Pole + Reinf.	TP33.609x33.561x0.5875	Reinf. 1 Compression	61.3%	Pass
3.32 - 3.17	Pole + Reinf.	TP33.638x33.609x0.5875	Reinf. 1 Compression	61.4%	Pass
3.17 - 2.92	Pole + Reinf.	TP33.686x33.638x0.5	Reinf. 1 Compression	70.5%	Pass
2.92 - 2.75	Pole + Reinf.	TP33.719x33.686x0.5	Reinf. 1 Compression	70.5%	Pass
2.75 - 2.5	Pole + Reinf.	TP33.768x33.719x0.4875	Reinf. 1 Compression	70.0%	Pass
2.5 - 0	Pole + Reinf.	TP34.25x33.768x0.4875	Reinf. 1 Compression	70.6%	Pass
				Summary	
			Pole	61.8%	Pass
			Reinforcement	80.1%	Pass
			Overall	80.1%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in ⁴)			Area (in ²)			% Capacity*							
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7
110 - 105	185	n/a	185	8.04	n/a	8.04	5.3%							
105 - 100	229	n/a	229	8.63	n/a	8.63	17.5%							
100 - 98.5	244	n/a	244	8.81	n/a	8.81	22.4%							
98.5 - 93.5	325	n/a	325	9.69	n/a	9.69	34.1%							
93.5 - 88.5	387	n/a	387	10.28	n/a	10.28	44.6%							
88.5 - 83.5	456	n/a	456	10.86	n/a	10.86	53.4%							
83.5 - 78.67	531	n/a	531	11.42	n/a	11.42	61.8%							
78.67 - 78.42	535	945	1481	11.45	16.95	28.40	22.3%					34.1%		
78.42 - 73.42	621	1034	1655	12.03	16.95	28.98	27.5%					41.1%		
73.42 - 68.42	715	1128	1843	12.61	16.95	29.56	32.6%					47.9%		
68.42 - 63.42	819	1225	2043	13.19	16.95	30.14	37.4%					54.0%		
63.42 - 58.67	926	1321	2246	13.74	16.95	30.69	41.6%					59.8%		
58.67 - 58.42	932	1326	2258	13.77	16.95	30.72	41.9%				60.0%			
58.42 - 53.42	1055	1431	2486	14.35	16.95	31.30	46.1%				64.6%			
53.42 - 50.87	1122	1486	2608	14.65	16.95	31.60	48.2%				66.9%			
50.87 - 45.87	1594	1553	3146	19.95	16.95	36.90	42.4%				63.8%			
45.87 - 40.87	1784	1665	3449	20.72	16.95	37.67	45.2%				67.1%			
40.87 - 35.87	1989	1781	3771	21.48	16.95	38.43	47.8%				70.1%			
35.87 - 30.87	2210	1901	4111	22.25	16.95	39.20	50.2%				72.8%			
30.87 - 28.67	2312	1956	4267	22.59	16.95	39.54	51.2%				73.9%			
28.67 - 28.42	2324	1962	4285	22.63	16.95	39.58	51.3%			74.0%				74.0%
28.42 - 23.42	2568	2088	4655	23.39	16.95	40.34	53.6%			76.4%				76.4%
23.42 - 18.42	2828	2218	5046	24.16	16.95	41.11	55.7%			78.5%				78.5%
18.42 - 14.17	3063	2331	5394	24.81	16.95	41.76	57.4%			80.1%				80.1%
14.17 - 13.92	3124	3440	6564	24.85	26.87	51.72	52.0%			71.3%			52.8%	55.8%
13.92 - 13.67	3138	3450	6588	24.88	26.87	51.75	52.1%			71.4%			52.9%	55.9%
13.67 - 13.42	3110	2982	6092	24.92	21.22	46.14	53.8%			72.7%			65.4%	
13.42 - 8.42	3405	3158	6563	25.69	21.22	46.91	55.7%			74.3%			66.9%	
8.42 - 5.75	3570	3254	6824	26.10	21.22	47.32	56.7%			75.1%			67.7%	
5.75 - 5.5	3633	3788	7421	26.14	26.87	53.01	55.1%		58.2%	74.0%			55.1%	
5.5 - 3.57	3724	4793	8518	26.43	36.20	62.63	48.4%	61.2%	41.0%				45.2%	
3.57 - 3.32	3741	4806	8547	26.47	36.20	62.66	48.5%	61.3%	41.1%				45.2%	
3.32 - 3.17	3750	4814	8564	26.49	36.20	62.69	48.6%	61.4%	41.1%				45.3%	
3.17 - 2.92	3748	3538	7286	26.53	26.28	52.81	54.8%	70.5%	52.2%					
2.92 - 2.75	3759	3544	7303	26.56	26.28	52.83	54.9%	70.5%	52.2%					
2.75 - 2.5	3774	3500	7273	26.60	20.63	47.22	54.9%	70.0%						
2.5 - 0	3939	3591	7530	26.98	20.63	47.60	55.7%	70.6%						

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

Monopole Flange Plate Connection

Elevation = 98.5 ft.



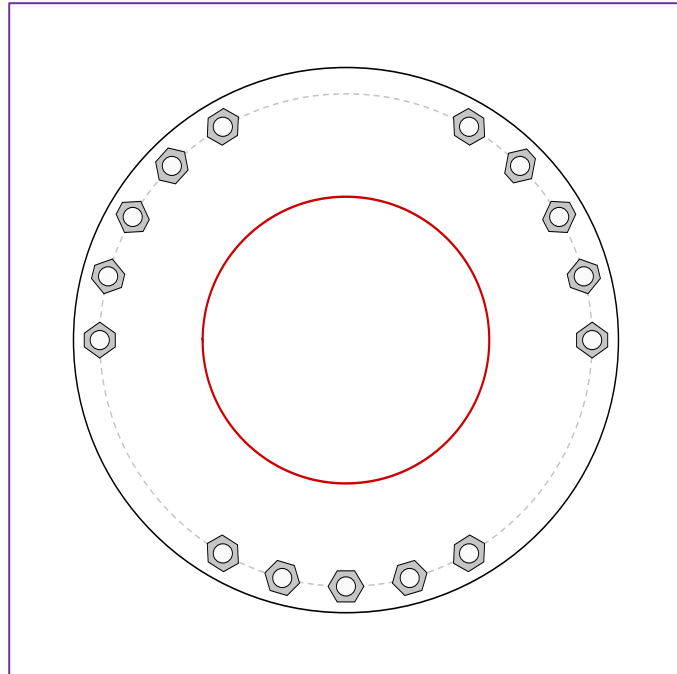
BU #	876405
Site Name	Woodbury North
Order #	538759 Rev. 1

Applied Loads	
Moment (kip-ft)	44.76
Axial Force (kips)	5.68
Shear Force (kips)	7.72

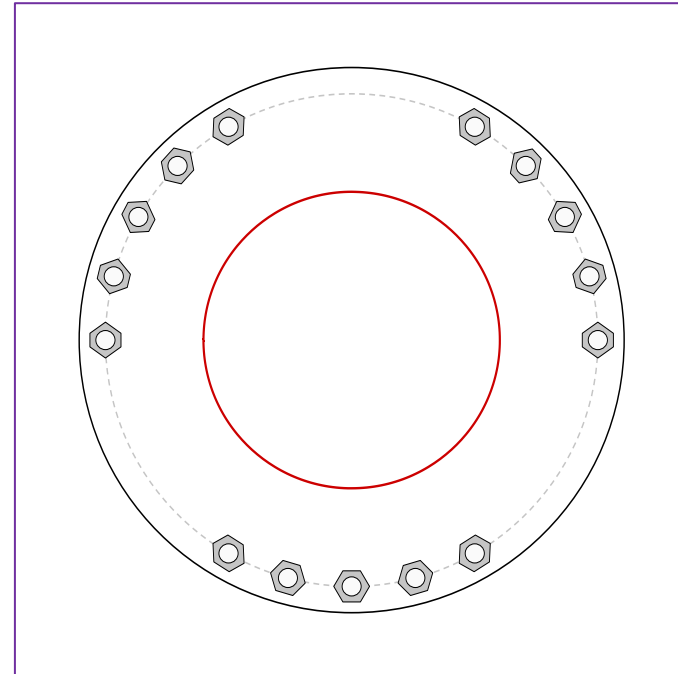
TIA-222 Revision	H
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*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(15) 1" ϕ bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 25.75" BC

Top Plate Data

28.5" OD x 1" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Bottom Plate Data

28.5" OD x 1" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

14.9843" x 0.1875" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Bottom Pole Data

15.5" x 0.1875" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	5.18
Allowable (kips)	54.53
Stress Rating:	9.0% Pass

Top Plate Capacity

Max Stress (ksi):	24.22	(Flexural)
Allowable Stress (ksi):	54.00	
Stress Rating:	42.7%	Pass
Tension Side Stress Rating:	49.9%	Pass

Bottom Plate Capacity

Max Stress (ksi):	23.27	(Flexural)
Allowable Stress (ksi):	54.00	
Stress Rating:	41.0%	Pass
Tension Side Stress Rating:	45.1%	Pass

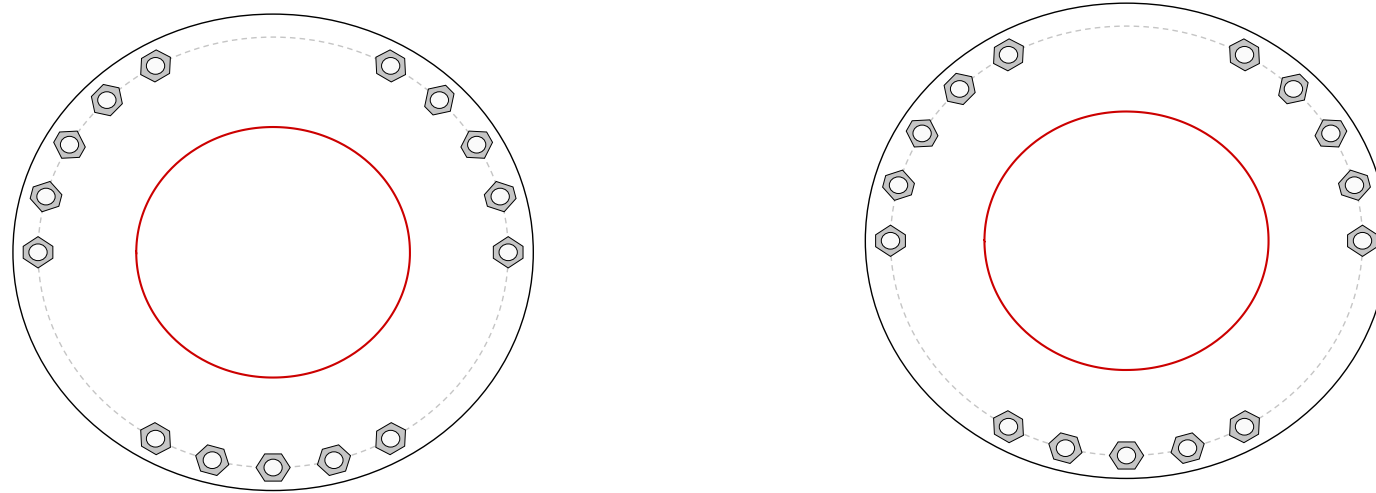
CCIplate

Elevation (ft) 98.5 (Flange)

Bolt Group	Resist Axial	Resist Shear	Induce Plate Bending
1	Yes	Yes	Yes

Custom Bolt Connection										
Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, η :	I_{ar} (in):	Thread Type	Area Override, in ²	Tension Only
1	1	0	1	A325	25.75	0.5	0	N-Included		No
2	1	15	1	A325	25.75	0.5	0	N-Included		No
3	1	30	1	A325	25.75	0.5	0	N-Included		No
4	1	45	1	A325	25.75	0.5	0	N-Included		No
5	1	60	1	A325	25.75	0.5	0	N-Included		No
6	1	120	1	A325	25.75	0.5	0	N-Included		No
7	1	135	1	A325	25.75	0.5	0	N-Included		No
8	1	150	1	A325	25.75	0.5	0	N-Included		No
9	1	165	1	A325	25.75	0.5	0	N-Included		No
10	1	180	1	A325	25.75	0.5	0	N-Included		No
11	1	240	1	A325	25.75	0.5	0	N-Included		No
12	1	255	1	A325	25.75	0.5	0	N-Included		No
13	1	270	1	A325	25.75	0.5	0	N-Included		No
14	1	285	1	A325	25.75	0.5	0	N-Included		No
15	1	300	1	A325	25.75	0.5	0	N-Included		No

Plot Graphic



Monopole Base Plate Connection

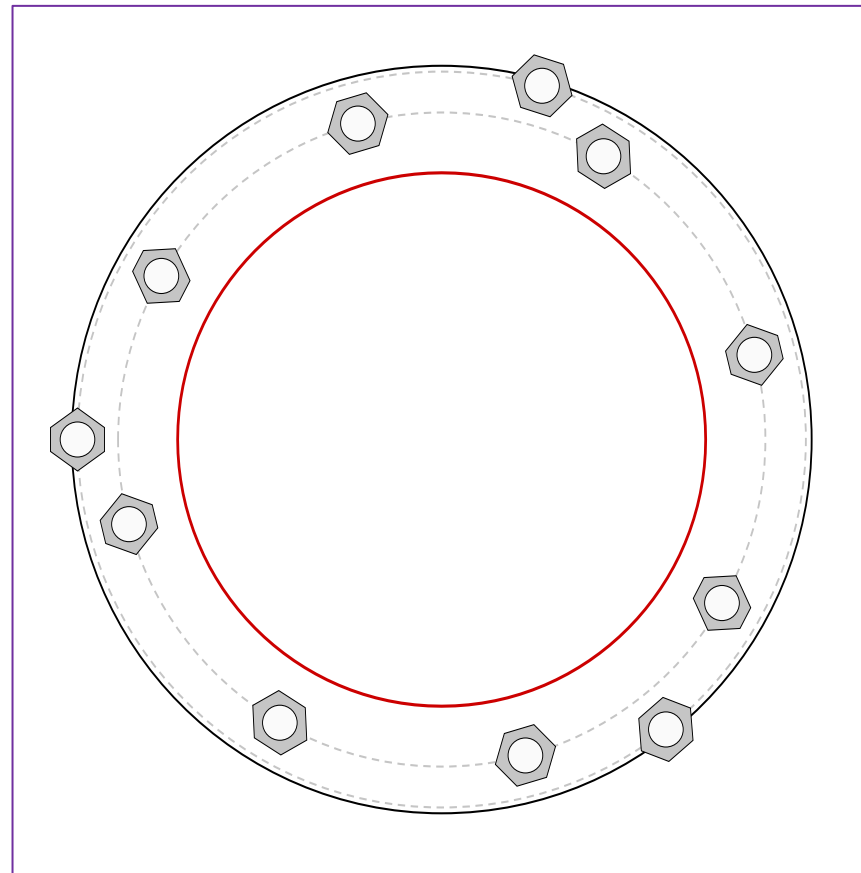


Site Info	
BU #	876405
Site Name	Woodbury North
Order #	538759 Rev. 1

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

Applied Loads	
Moment (kip-ft)	1401.00
Axial Force (kips)	27.00
Shear Force (kips)	17.00

*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data

GROUP 1: (8) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 42" BC
 GROUP 2: (3) 2-1/4" ϕ bolts (A193 Gr. B7 (MOD) N; $F_y=99.19$ ksi, $F_u=125$ ksi) on 47.25" pos. (deg): 74, 180, 308

Base Plate Data

48" OD x 1.5" Plate (A572-60; $F_y=60$ ksi, $F_u=75$ ksi)

Stiffener Data

N/A

Pole Data

34.25" x 0.25" 18-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

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

GROUP 1:	$P_{u,c} = 145.43$	$\phi P_{n,c} = 268.39$	Stress Rating
	$V_u = 2.13$	$\phi V_n = 120.77$	51.6%
	$M_u = n/a$	$\phi M_n = n/a$	Pass

GROUP 2:	$P_{u,c} = 153.99$	$\phi P_{n,c} = 354.95$	Stress Rating
	$V_u = 0$	$\phi V_n = 159.73$	41.3%
	$M_u = n/a$	$\phi M_n = n/a$	Pass

Base Plate Summary

Max Stress (ksi):	44.79	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	79.0%	Pass

CCiplate

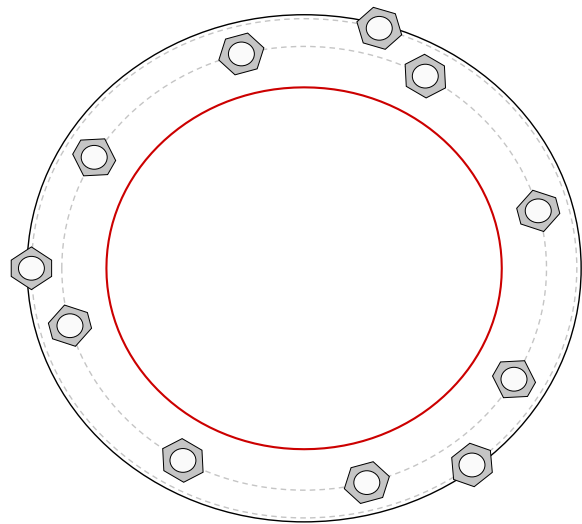
Elevation (ft) 0 (Base)

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

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

Custom Bolt Connection										
Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, η :	I_{ar} (in):	Thread Type	Area Override, in ²	Tension Only
1	1	15	2.25	A615-75	42	0.5	0.75	N-Included		No
2	1	60	2.25	A615-75	42	0.5	0.75	N-Included		No
3	1	105	2.25	A615-75	42	0.5	0.75	N-Included		No
4	1	150	2.25	A615-75	42	0.5	0.75	N-Included		No
5	1	195	2.25	A615-75	42	0.5	0.75	N-Included		No
6	1	240	2.25	A615-75	42	0.5	0.75	N-Included		No
7	1	285	2.25	A615-75	42	0.5	0.75	N-Included		No
8	1	330	2.25	A615-75	42	0.5	0.75	N-Included		No
9	2	74	2.25	193 Gr. B7 (MOE)	47.25	0.5	1	N-Included		No
10	2	180	2.25	193 Gr. B7 (MOE)	47.25	0.5	1	N-Included		No
11	2	308	2.25	193 Gr. B7 (MOE)	47.25	0.5	1	N-Included		No

Plot Graphic



Pier and Pad Foundation



BU #: 876405
 Site Name: Woodbury North
 App. Number: 538759 Rev. 1

TIA-222 Revision: H
 Tower Type: Monopole

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

Superstructure Analysis Reactions		
Compression, P_{comp} :	27	kips
Base Shear, Vu_{comp} :	17	kips
Moment, M_u :	1401	ft-kips
Tower Height, H :	110	ft
BP Dist. Above Fdn, bp_{dist} :	3	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	158.55	17.00	10.2%	Pass
<i>Bearing Pressure (ksf)</i>	9.00	3.44	38.2%	Pass
<i>Overturning (kip*ft)</i>	2033.20	1532.75	75.4%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	2957.98	1477.50	47.6%	Pass
<i>Pier Compression (kip)</i>	19253.52	51.50	0.3%	Pass
<i>Pad Flexure (kip*ft)</i>	1867.53	662.10	33.8%	Pass
<i>Pad Shear - 1-way (kips)</i>	591.69	141.72	22.8%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.190	0.000	0.0%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	3203.98	886.50	26.4%	Pass

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$:	5.5	ft
Ext. Above Grade, E :	1	ft
Pier Rebar Size, Sc :	8	
Pier Rebar Quantity, mc :	30	
Pier Tie/Spiral Size, St :	4	
Pier Tie/Spiral Quantity, mt :	5	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

*Rating per TIA-222-H Section 15.5

Soil Rating*:	75.4%
Structural Rating*:	47.6%

Pad Properties		
Depth, D :	6.5	ft
Pad Width, W_1 :	16.5	ft
Pad Thickness, T :	3	ft
Pad Rebar Size (Bottom dir. 2), Sp_2 :	8	
Pad Rebar Quantity (Bottom dir. 2), mp_2 :	17	
Pad Clear Cover, cc_{pad} :	3	in

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

Soil Properties		
Total Soil Unit Weight, γ :	125	pcf
Ultimate Gross Bearing, Q_{ult} :	12.000	ksf
Cohesion, C_u :	0.000	ksf
Friction Angle, ϕ :	34	degrees
SPT Blow Count, N_{blows} :	60	
Base Friction, μ :		
Neglected Depth, N :	3.50	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	N/A	ft

<--Toggle between Gross and Net

Exhibit E

Mount Analysis

Date: **March 10, 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 Replacement Analysis Report**

Carrier Designation: **Sprint PCS Loading Modification**
Carrier Site Number: CTNH450A
Carrier Site Name: CTNH450A

Crown Castle Designation: **Crown Castle BU Number:** 876405
Crown Castle Site Name: WOODBURY NORTH
Crown Castle JDE Job Number: 628908
Crown Castle Order Number: 538759 Rev. 1

Engineering Firm Designation: **GPD Report Designation:** 2021777.876405.02

Site Data: **186 Minortown, Woodbury, Litchfield County, CT 06798**
Latitude 41° 34' 4.79" Longitude -73° 10' 46.85"

Structure Information: **Tower Height & Type:** **110.0 ft Monopole Tower**
Mount Elevation: **102.0 ft**
Mount Type: **12.5 ft Platform Mount**

Dear Darcy Tarr,

GPD is pleased to submit this "**Mount Replacement 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 – 39.7%***
***See Section 4.1 of this report for the loading and structural modifications required in order for the mount to support the loading listed in Table 1.**

This analysis utilizes an ultimate 3-second gust wind speed of 120 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

3/10/2021

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1) INTRODUCTION

This is a proposed 12.5' Platform Mount designed by Site Pro 1 (Part #: RMQP-496-HK, dated 7/14/2014).

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	120 mph
Exposure Category:	C
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
102.0	102.0	3	Ericsson	AIR6449 B41_T-MOBILE	12.5 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 538759 Rev. 1	-	CCI
Mount Design	Site Pro 1 Part #: RMQP-496-HK, dated 7/14/2014	-	Site Pro 1
RF Data Sheet	Sprint Retain RFDS #: CTNH450A, 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) 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	Standoff Arm	M91	102.0	16.2	Pass
	Cross Arm	M47		15.1	Pass
	Grating Angle	M49		39.7	Pass
	Toe Rail	M16		10.4	Pass
	Connection Plate (End)	M51		21.1	Pass
	Connection Plate (Mid)	M55A		28.2	Pass
	Pipe Mount	A3		36.7	Pass
	Support Rail	M79		25.5	Pass
	Support Rail Corner	M84		37.2	Pass
	Platform Reinforcement Kicker	M92A		9.0	Pass
	Reinforcement Connection Plate	M91A		7.7	Pass
2,3	Mount to Tower Connection	-	11.5	Pass	
	Kicker to Tower Connection	-	6.2	Pass	

Structure Rating (max from all components) =	39.7%³
---	--------------------------

Notes:

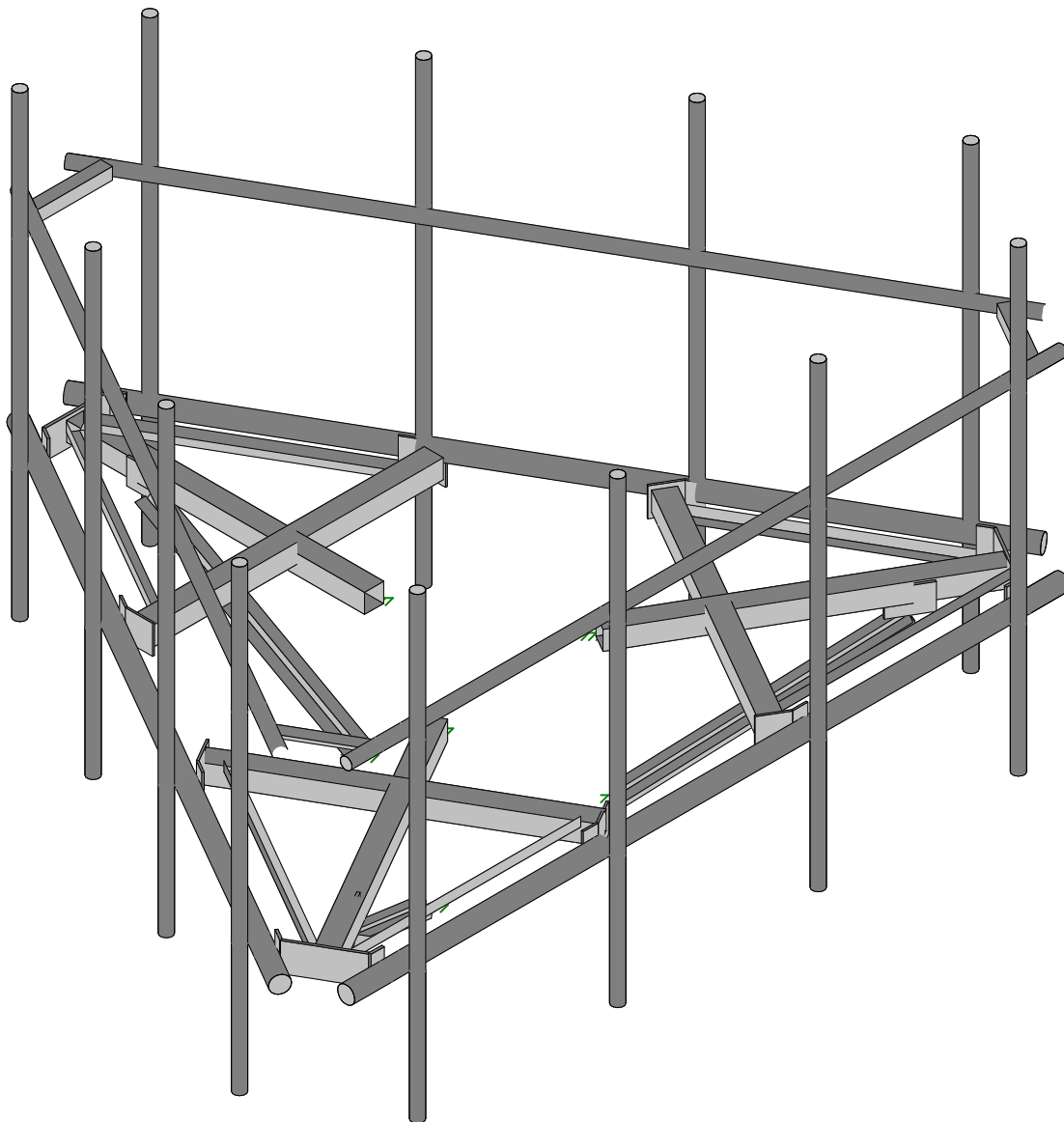
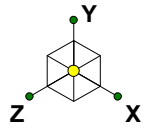
- 1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
- 2) See additional documentation in "Appendix D - Additional Calculations" for calculations supporting the % capacity consumed.
- 3) Ratings per TIA-222-H section 15.5.

4.1) Recommendations

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

Site Pro 1 RMQP-496-HK

APPENDIX A
WIRE FRAME AND RENDERED MODELS

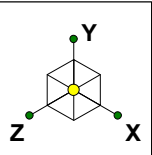


Envelope Only Solution

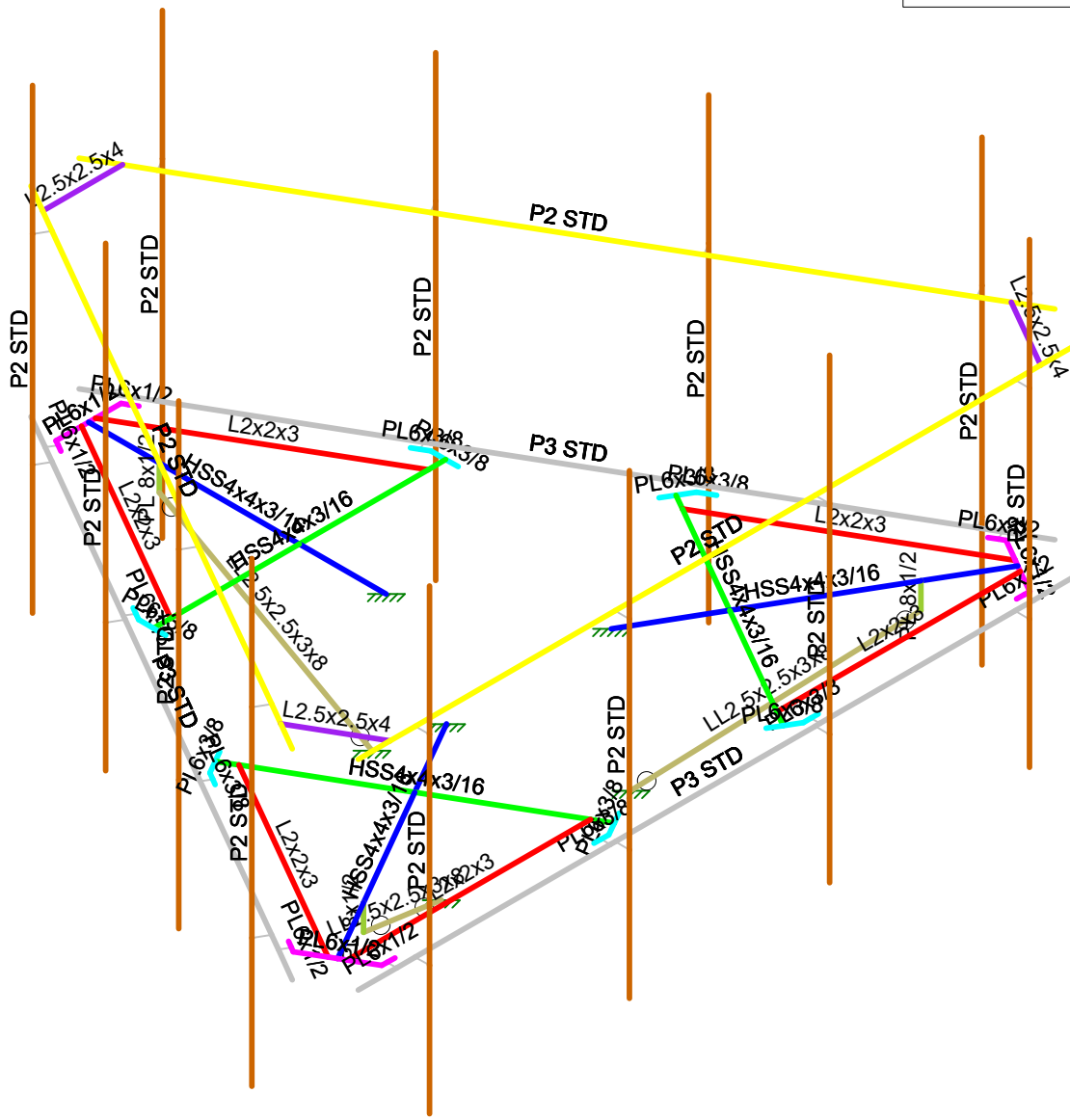
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Steward, Matthew
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876405 - WOODBURY NORTH

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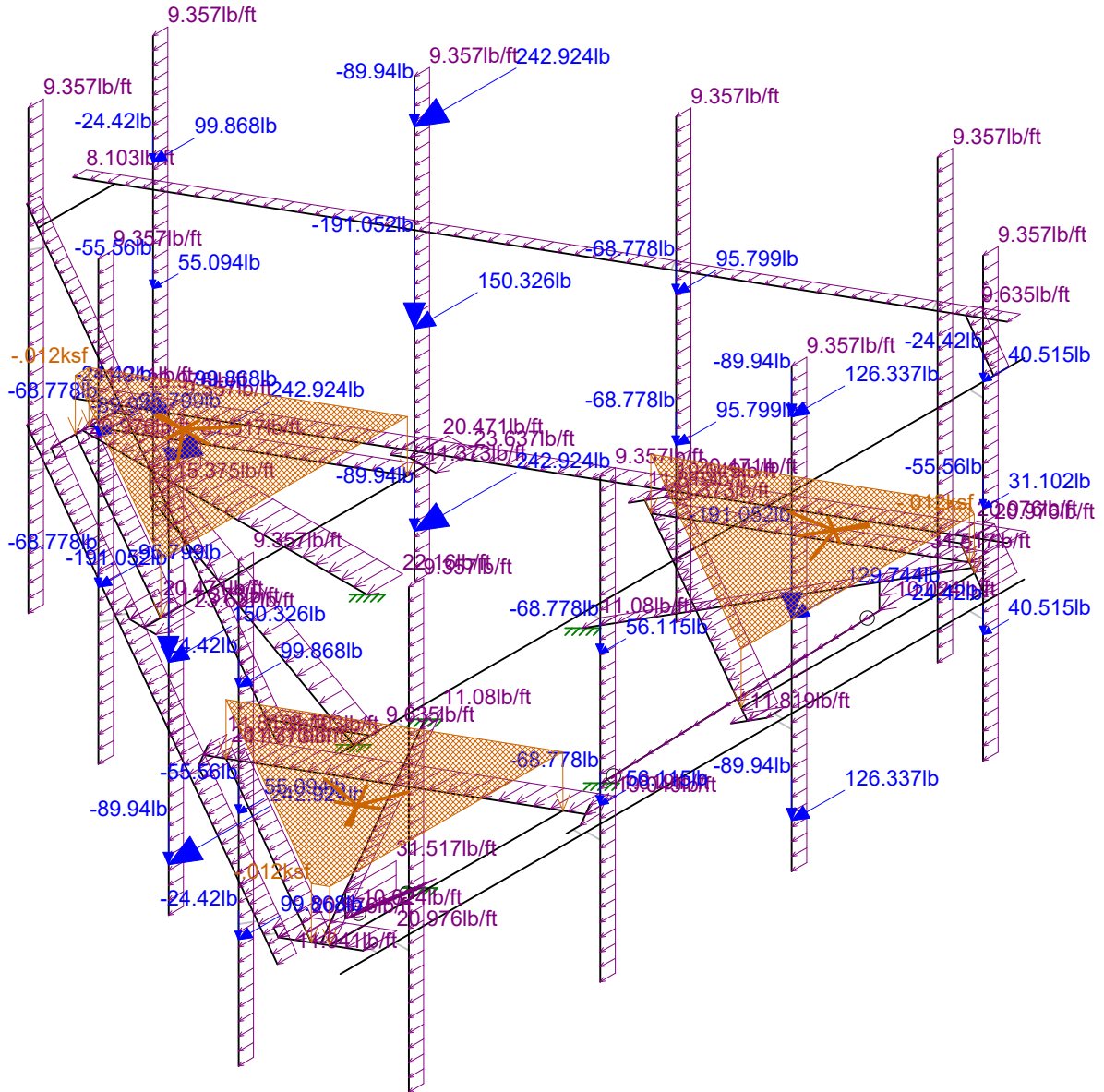
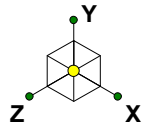


Section Sets	
█	Standoff Arm
█	Cross Arm
█	Grating Angle
█	Toe Rail
█	Connection Plate (End)
█	Connection Plate (Mid)
█	Pipe Mount
█	Support Rail
█	Support Rail Corner
█	Platform Reinforcement Kicker
█	Reinforcement Connection Plate
█	RIGID



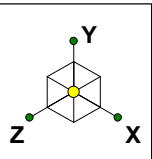
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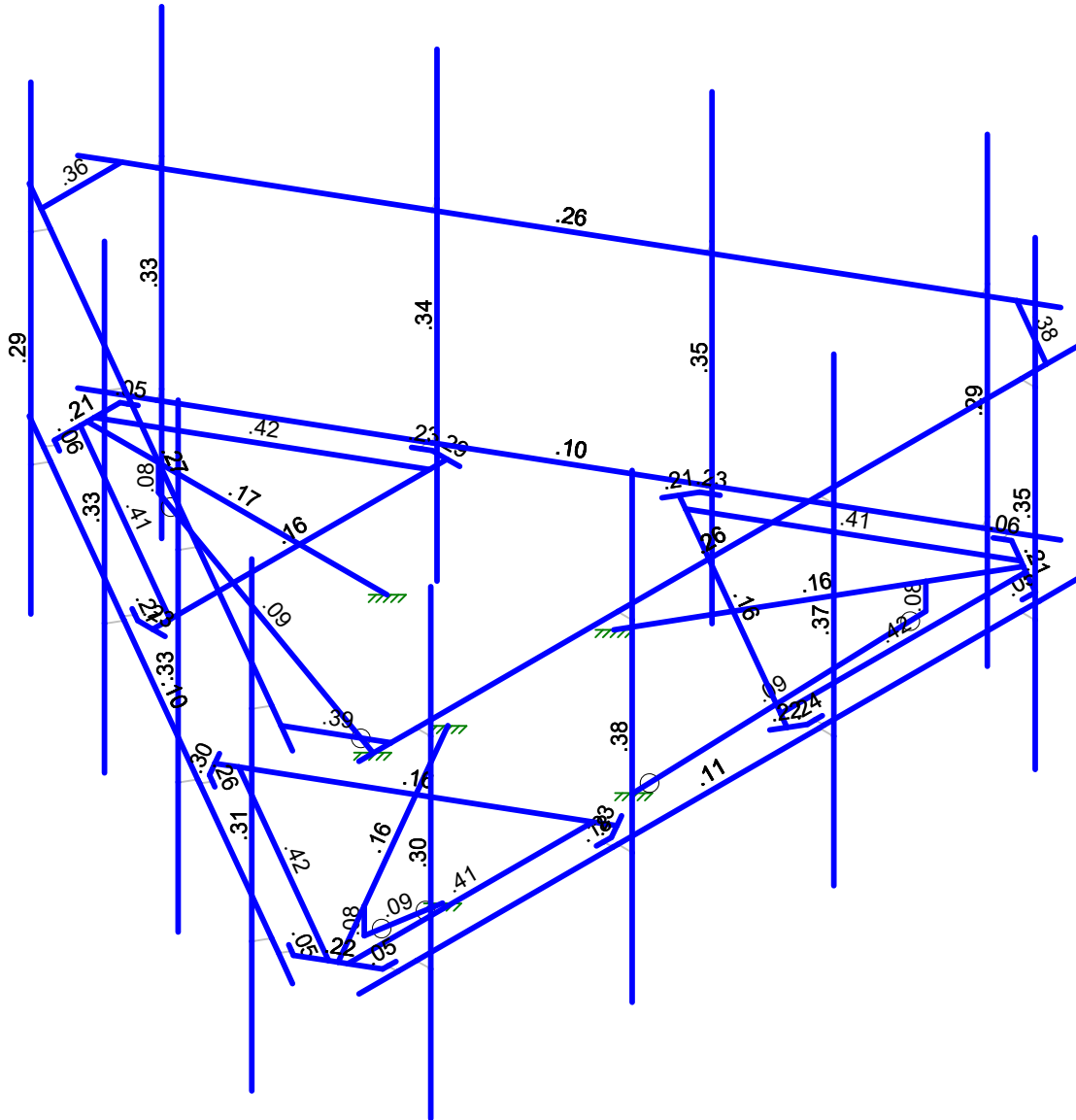


Loads: LC 8, 1.2 Dead + 1.0 Wind @ 90° - No Ice
Envelope Only Solution

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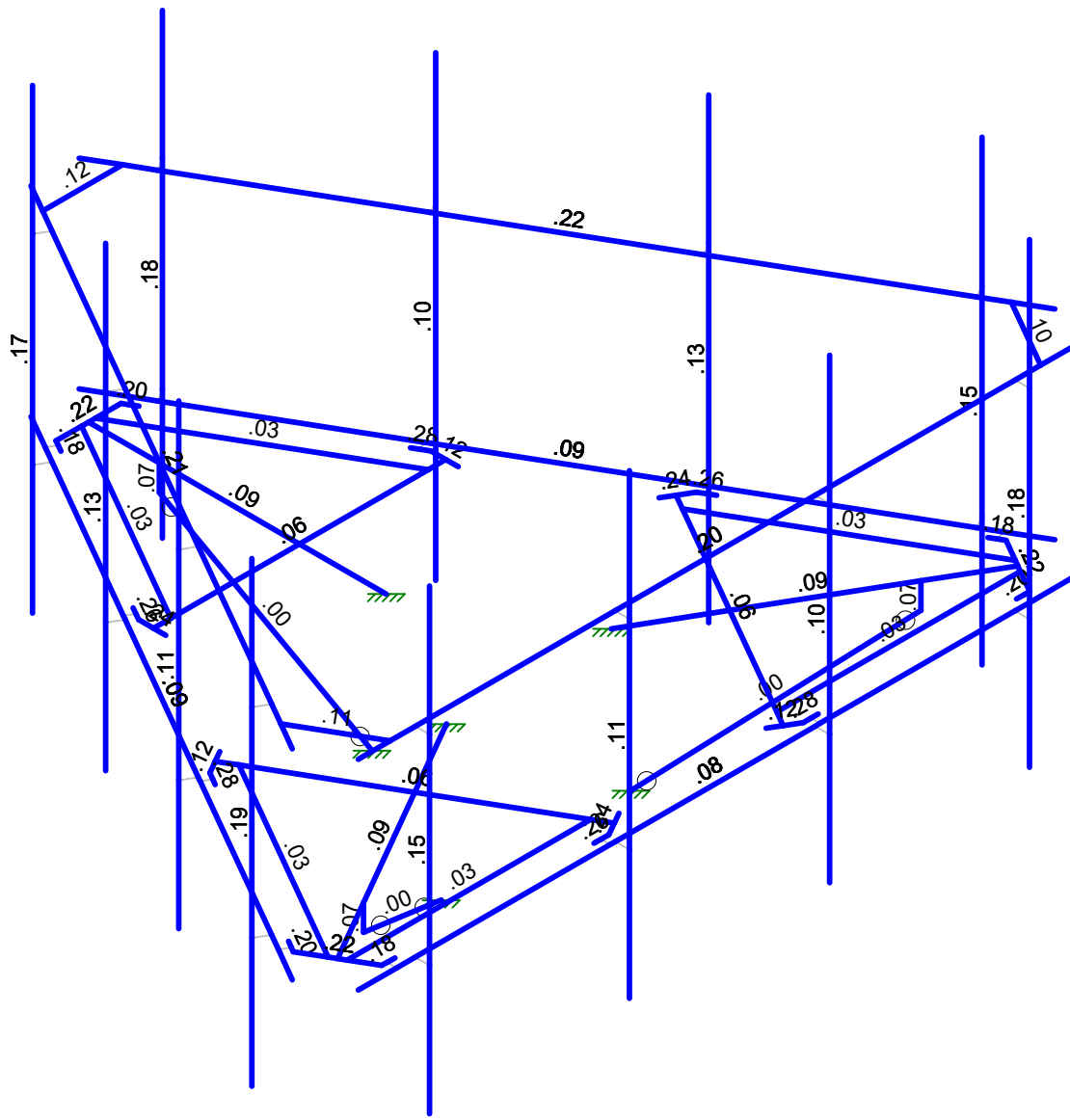
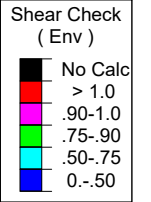
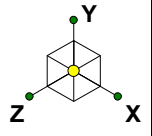


Code Check (Env)	
Black	No Calc
Red	> 1.0
Magenta	.90-1.0
Green	.75-.90
Cyan	.50-.75
Blue	0.-.50



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

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Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

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Steward, Matthew		Mar 10, 2021 at 3:03 PM
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APPENDIX B
SOFTWARE INPUT CALCULATIONS



Structure Information	
Structure Type:	Monopole
Structure Height:	110 ft
z (Mount Centerline) =	102 ft
Gh (Mount Gust Effect Factor) =	1.00
Risk Category:	II

Code Specifications	
TIA/EIA Code:	H
Ultimate Wind Speed (No Ice) =	120 mph (3-s gust)
Ultimate Wind Speed (With Ice) =	50 mph (3-s gust)
Ice Thickness	1.5 in
Exposure Category	C
Tower Base Elevation (AMSL)	460 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 _s	User's Wind Multiplier	Normal Wind Force (lb/ft)*	Normal Ice Wind Force (lb/ft)*	Ice Weight (lb/ft)*	
Standoff Arm	Square/Rect.	62.500	4	4		5.66	Flat	0.90	1.00	24.62	5.44	15.05	
Cross Arm	Square/Rect.	61.000	4	4		5.66	Flat	0.90	1.00	24.44	5.42	15.05	
Grating Angle	Angle	52.000	2	2		2.83	Flat	0.90	1.00	14.59	3.72	9.25	
Toe Rail	Pipe	150.000	3.5	3.5		3.50	Round	0.90	1.00	15.32	4.91	10.63	
Connection Plate (End)	Square/Rect.	19.000	6	0.5		6.02	Flat	0.90	1.00	26.91	6.05	15.80	
Connection Plate (Mid)	Square/Rect.	8.500	6	0.375		6.01	Flat	0.90	1.00	26.26	6.05	15.78	
Pipe Mount	Pipe	96.000	2.375	2.375		2.38	Round	0.90	1.00	10.40	3.69	8.32	
Support Rail	Pipe	150.000	2.375	2.375		2.38	Round	0.90	1.00	10.40	4.36	8.32	
Support Rail Corner	Angle	15.000	2.5	2.5		3.54	Flat	0.90	1.00	12.36	3.40	10.70	
Platform Reinforcement Kicker	Other	53.000	2.5	5.5	5.5	5.50	Flat	0.90	1.00	17.08	4.12	14.73	
Reinforcement Connection Plate	Square/Rect.	4.000	8	0.5		8.02	Flat	0.90	1.00	35.02	7.57	19.89	

*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 _s 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	102	33.11	20.51	8.54	114.63	Flat	0%	0%	0.90	222.94	114.63	45.07	147.69
(3) APX16DWV-16DWV-S-E-A20	102	55.9	13.3	3.15	40.7	CFD	0%	0%	0.90	246.62	40.70	56.88	134.60
(3) APXVAALL24_43-U-NA20_TMO	102	95.9	24	8.5	149.9	CFD	0%	0%	0.90	577.94	149.90	118.30	413.42
(3) RADIO 4415 B66A_CCI3	102	14.9	13.2	5.4	46.3	Flat	0%	0%	0.90	64.57	46.30	14.72	51.39
(3) RADIO 4424 B25_TMO	102	17.1	14.4	11.3	86	Flat	0%	0%	0.90	80.84	86.00	17.93	82.41
(3) RADIO 4449 B71 B85A_T-MOBILE	102	17.91	13.2	10.63	73.21	Flat	0%	0%	0.90	77.61	73.21	17.32	78.21

*All forces are unfactored.

APPENDIX C
SOFTWARE ANALYSIS OUTPUT



Company : GPD
 Designer : Steward, Matthew
 Job Number : 2021777.876405.02
 Model Name : 876405 - WOODBURY NORTH

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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	Standoff Arm	HSS4x4x3/16	None	None	A500 Gr.B Rect	Typical	2.859	6.944	6.944	10.39
2	Cross Arm	HSS4x4x3/16	None	None	A500 Gr.B Rect	Typical	2.859	6.944	6.944	10.39
3	Grating Angle	L2x2x3	None	None	A36 Gr.36	Typical	.722	.271	.271	.009
4	Toe Rail	P3 STD	None	None	A53 Gr.B	Typical	2.228	3.017	3.017	6.034
5	Connection Plate (End)	PL6x1/2	None	None	A36 Gr.36	Typical	3	.063	9	.237
6	Connection Plate (Mid)	PL6x3/8	None	None	A36 Gr.36	Typical	2.25	.026	6.75	.101
7	Pipe Mount	P2 STD	None	None	A53 Gr.B	Typical	1.075	.666	.666	1.331
8	Support Rail	P2 STD	None	None	A53 Gr.B	Typical	1.075	.666	.666	1.331
9	Support Rail Corner	L2.5x2.5x4	None	None	A36 Gr.36	Typical	1.19	.692	.692	.026
10	Platform Reinforcement ...	LL2.5x2.5x3x8	None	None	A36 Gr.36	Typical	1.805	2.703	1.093	.02
11	Reinforcement Connecti...	PL 8x1/2	None	None	A36 Gr.36	Typical	4	.083	21.333	.32

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M46	SA	N88			Standoff Arm	None	None	A500 Gr.B...	Typical
2	M47	N89	N90			Cross Arm	None	None	A500 Gr.B...	Typical
3	M48	N92	N93			Grating Angle	None	None	A36 Gr.36	Typical
4	M49	N94	N95		270	Grating Angle	None	None	A36 Gr.36	Typical
5	M50	N96	N97			Connection Pl...	None	None	A36 Gr.36	Typical
6	M51	N97	N98			Connection Pl...	None	None	A36 Gr.36	Typical
7	M52	N98	N99			Connection Pl...	None	None	A36 Gr.36	Typical
8	M53	N100	N101			Connection Pl...	None	None	A36 Gr.36	Typical
9	M54	N101	N102			Connection Pl...	None	None	A36 Gr.36	Typical
10	M55	N103	N104			Connection Pl...	None	None	A36 Gr.36	Typical
11	M56	N104	N105			Connection Pl...	None	None	A36 Gr.36	Typical
12	M57	N106	N107			RIGID	None	None	RIGID	Typical
13	M58	N108	N109			RIGID	None	None	RIGID	Typical
14	M59	N110	N111			RIGID	None	None	RIGID	Typical
15	M60	N112	N113			RIGID	None	None	RIGID	Typical
16	M16	N29	N30			Toe Rail	None	None	A53 Gr.B	Typical
17	M46A	SB	N93A			Standoff Arm	None	None	A500 Gr.B...	Typical
18	M47A	N94A	N95A			Cross Arm	None	None	A500 Gr.B...	Typical
19	M48A	N97A	N98A			Grating Angle	None	None	A36 Gr.36	Typical
20	M49A	N99A	N100A		270	Grating Angle	None	None	A36 Gr.36	Typical
21	M50A	N101A	N102A			Connection Pl...	None	None	A36 Gr.36	Typical
22	M51A	N102A	N103A			Connection Pl...	None	None	A36 Gr.36	Typical
23	M52A	N103A	N104A			Connection Pl...	None	None	A36 Gr.36	Typical
24	M53A	N105A	N106A			Connection Pl...	None	None	A36 Gr.36	Typical
25	M54A	N106A	N107A			Connection Pl...	None	None	A36 Gr.36	Typical
26	M55A	N108A	N109A			Connection Pl...	None	None	A36 Gr.36	Typical
27	M56A	N109A	N110A			Connection Pl...	None	None	A36 Gr.36	Typical
28	M57A	N111A	N112A			RIGID	None	None	RIGID	Typical
29	M58A	N113A	N114			RIGID	None	None	RIGID	Typical



Company : GPD
 Designer : Steward, Matthew
 Job Number : 2021777.876405.02
 Model Name : 876405 - WOODBURY NORTH

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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
30	M59A	N115	N116			RIGID	None	None	RIGID	Typical
31	M60A	N117	N118			RIGID	None	None	RIGID	Typical
32	M61	N119	N120			Toe Rail	None	None	A53 Gr.B	Typical
33	M91	SC	N183			Standoff Arm	None	None	A500 Gr.B...	Typical
34	M92	N184	N185			Cross Arm	None	None	A500 Gr.B...	Typical
35	M93	N187	N188			Grating Angle	None	None	A36 Gr.36	Typical
36	M94	N189	N190		270	Grating Angle	None	None	A36 Gr.36	Typical
37	M95	N191	N192			Connection Pl...	None	None	A36 Gr.36	Typical
38	M96	N192	N193			Connection Pl...	None	None	A36 Gr.36	Typical
39	M97	N193	N194			Connection Pl...	None	None	A36 Gr.36	Typical
40	M98	N195	N196			Connection Pl...	None	None	A36 Gr.36	Typical
41	M99	N196	N197			Connection Pl...	None	None	A36 Gr.36	Typical
42	M100	N198	N199			Connection Pl...	None	None	A36 Gr.36	Typical
43	M101	N199	N200			Connection Pl...	None	None	A36 Gr.36	Typical
44	M102	N201	N202			RIGID	None	None	RIGID	Typical
45	M103	N203	N204			RIGID	None	None	RIGID	Typical
46	M104	N205	N206			RIGID	None	None	RIGID	Typical
47	M105	N207	N208			RIGID	None	None	RIGID	Typical
48	M106	N209	N210			Toe Rail	None	None	A53 Gr.B	Typical
49	M49B	N89A	N90A			RIGID	None	None	RIGID	Typical
50	M50B	N91A	N92A			RIGID	None	None	RIGID	Typical
51	M51B	N93B	N94B			RIGID	None	None	RIGID	Typical
52	M52B	N95B	N96B			RIGID	None	None	RIGID	Typical
53	A1	N97B	N101B			Pipe Mount	None	None	A53 Gr.B	Typical
54	A2	N98B	N102B			Pipe Mount	None	None	A53 Gr.B	Typical
55	A3	N99B	N103B			Pipe Mount	None	None	A53 Gr.B	Typical
56	A4	N100B	N104B			Pipe Mount	None	None	A53 Gr.B	Typical
57	M57B	N105B	N106B			RIGID	None	None	RIGID	Typical
58	M58B	N107B	N108B			RIGID	None	None	RIGID	Typical
59	M59B	N109B	N110B			RIGID	None	None	RIGID	Typical
60	M60B	N111B	N112B			RIGID	None	None	RIGID	Typical
61	B1	N113B	N117A			Pipe Mount	None	None	A53 Gr.B	Typical
62	B2	N114A	N118A			Pipe Mount	None	None	A53 Gr.B	Typical
63	B3	N115A	N119A			Pipe Mount	None	None	A53 Gr.B	Typical
64	B4	N116A	N120A			Pipe Mount	None	None	A53 Gr.B	Typical
65	M65	N121	N122			RIGID	None	None	RIGID	Typical
66	M66	N123	N124			RIGID	None	None	RIGID	Typical
67	M67	N125	N126			RIGID	None	None	RIGID	Typical
68	M68	N127	N128			RIGID	None	None	RIGID	Typical
69	C1	N129	N133			Pipe Mount	None	None	A53 Gr.B	Typical
70	C2	N130	N134			Pipe Mount	None	None	A53 Gr.B	Typical
71	C3	N131	N135			Pipe Mount	None	None	A53 Gr.B	Typical
72	C4	N132	N136			Pipe Mount	None	None	A53 Gr.B	Typical
73	M73	N137	N138			Support Rail	None	None	A53 Gr.B	Typical
74	M74	N139	N140			RIGID	None	None	RIGID	Typical
75	M75	N141	N142			RIGID	None	None	RIGID	Typical
76	M76	N143	N144			RIGID	None	None	RIGID	Typical
77	M77	N145	N146			RIGID	None	None	RIGID	Typical
78	M78	N147	N148		180	Support Rail C...	None	None	A36 Gr.36	Typical
79	M79	N149	N150			Support Rail	None	None	A53 Gr.B	Typical
80	M80	N151	N152			RIGID	None	None	RIGID	Typical
81	M81	N153	N154			RIGID	None	None	RIGID	Typical
82	M82	N155	N156			RIGID	None	None	RIGID	Typical
83	M83	N157	N158			RIGID	None	None	RIGID	Typical
84	M84	N159	N160		180	Support Rail C...	None	None	A36 Gr.36	Typical
85	M85	N161	N162			Support Rail	None	None	A53 Gr.B	Typical
86	M86	N163	N164			RIGID	None	None	RIGID	Typical



Company : GPD
 Designer : Steward, Matthew
 Job Number : 2021777.876405.02
 Model Name : 876405 - WOODBURY NORTH

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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...
33	1.2 Dead + 1.0 Ice Wind @ ...	Yes	Y		1	1.2	22	1	14	1		1	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								
35	1.2 Dead + 1.0 Ice Wind @ ...	Yes	Y		1	1.2	24	1	14	1		1	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								
37	1.2 Dead + 1.0 Ice Wind @ ...	Yes	Y		1	1.2	26	1	14	1		1	0	0	0	0								
38	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	2	.063	0		0	0	0	0								
39	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	3	.063	0		0	0	0	0								
40	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	4	.063	0		0	0	0	0								
41	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	5	.063	0		0	0	0	0								
42	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	6	.063	0		0	0	0	0								
43	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	7	.063	0		0	0	0	0								
44	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	8	.063	0		0	0	0	0								
45	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	9	.063	0		0	0	0	0								
46	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	10	.063	0		0	0	0	0								
47	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	11	.063	0		0	0	0	0								
48	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	12	.063	0		0	0	0	0								
49	1.2 Dead + 1.5 Live_M - A1 ...	Yes	Y		1	1.2	27	1.5	13	.063	0		0	0	0	0								
50	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	2	.063	0		0	0	0	0								
51	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	3	.063	0		0	0	0	0								
52	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	4	.063	0		0	0	0	0								
53	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	5	.063	0		0	0	0	0								
54	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	6	.063	0		0	0	0	0								
55	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	7	.063	0		0	0	0	0								
56	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	8	.063	0		0	0	0	0								
57	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	9	.063	0		0	0	0	0								
58	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	10	.063	0		0	0	0	0								
59	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	11	.063	0		0	0	0	0								
60	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	12	.063	0		0	0	0	0								
61	1.2 Dead + 1.5 Live_M - A2 ...	Yes	Y		1	1.2	28	1.5	13	.063	0		0	0	0	0								
62	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	2	.063	0		0	0	0	0								
63	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	3	.063	0		0	0	0	0								
64	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	4	.063	0		0	0	0	0								
65	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	5	.063	0		0	0	0	0								
66	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	6	.063	0		0	0	0	0								
67	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	7	.063	0		0	0	0	0								
68	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	8	.063	0		0	0	0	0								
69	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	9	.063	0		0	0	0	0								
70	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	10	.063	0		0	0	0	0								
71	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	11	.063	0		0	0	0	0								
72	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	12	.063	0		0	0	0	0								
73	1.2 Dead + 1.5 Live_M - A3 ...	Yes	Y		1	1.2	29	1.5	13	.063	0		0	0	0	0								
74	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	2	.063	0		0	0	0	0								
75	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	3	.063	0		0	0	0	0								
76	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	4	.063	0		0	0	0	0								
77	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	5	.063	0		0	0	0	0								
78	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	6	.063	0		0	0	0	0								
79	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	7	.063	0		0	0	0	0								
80	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	8	.063	0		0	0	0	0								
81	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	9	.063	0		0	0	0	0								
82	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	10	.063	0		0	0	0	0								
83	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	11	.063	0		0	0	0	0								
84	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	12	.063	0		0	0	0	0								
85	1.2 Dead + 1.5 Live_M - A4 ...	Yes	Y		1	1.2	30	1.5	13	.063	0		0	0	0	0								
86	1.2 Dead + 1.5 Live_M - B1 ...	Yes	Y		1	1.2	31	1.5	2	.063	0		0	0	0	0								
87	1.2 Dead + 1.5 Live_M - B1 ...	Yes	Y		1	1.2	31	1.5	3	.063	0		0	0	0	0								
88	1.2 Dead + 1.5 Live_M - B1 ...	Yes	Y		1	1.2	31	1.5	4	.063	0		0	0	0	0								
89	1.2 Dead + 1.5 Live_M - B1 ...	Yes	Y		1	1.2	31	1.5	5	.063	0		0	0	0	0								



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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...
147	1.2 Dead + 1.5 Live_M - C2	Yes	Y		1	1.2	36	1.5	3	.063	0		0		0		0		0		0		0	
148	1.2 Dead + 1.5 Live_M - C2	Yes	Y		1	1.2	36	1.5	4	.063	0		0		0		0		0		0		0	
149	1.2 Dead + 1.5 Live_M - C2	Yes	Y		1	1.2	36	1.5	5	.063	0		0		0		0		0		0		0	
150	1.2 Dead + 1.5 Live_M - C2	Yes	Y		1	1.2	36	1.5	6	.063	0		0		0		0		0		0		0	
151	1.2 Dead + 1.5 Live_M - C2	Yes	Y		1	1.2	36	1.5	7	.063	0		0		0		0		0		0		0	
152	1.2 Dead + 1.5 Live_M - C2	Yes	Y		1	1.2	36	1.5	8	.063	0		0		0		0		0		0		0	
153	1.2 Dead + 1.5 Live_M - C2	Yes	Y		1	1.2	36	1.5	9	.063	0		0		0		0		0		0		0	
154	1.2 Dead + 1.5 Live_M - C2	Yes	Y		1	1.2	36	1.5	10	.063	0		0		0		0		0		0		0	
155	1.2 Dead + 1.5 Live_M - C2	Yes	Y		1	1.2	36	1.5	11	.063	0		0		0		0		0		0		0	
156	1.2 Dead + 1.5 Live_M - C2	Yes	Y		1	1.2	36	1.5	12	.063	0		0		0		0		0		0		0	
157	1.2 Dead + 1.5 Live_M - C2	Yes	Y		1	1.2	36	1.5	13	.063	0		0		0		0		0		0		0	
158	1.2 Dead + 1.5 Live_M - C3	Yes	Y		1	1.2	37	1.5	2	.063	0		0		0		0		0		0		0	
159	1.2 Dead + 1.5 Live_M - C3	Yes	Y		1	1.2	37	1.5	3	.063	0		0		0		0		0		0		0	
160	1.2 Dead + 1.5 Live_M - C3	Yes	Y		1	1.2	37	1.5	4	.063	0		0		0		0		0		0		0	
161	1.2 Dead + 1.5 Live_M - C3	Yes	Y		1	1.2	37	1.5	5	.063	0		0		0		0		0		0		0	
162	1.2 Dead + 1.5 Live_M - C3	Yes	Y		1	1.2	37	1.5	6	.063	0		0		0		0		0		0		0	
163	1.2 Dead + 1.5 Live_M - C3	Yes	Y		1	1.2	37	1.5	7	.063	0		0		0		0		0		0		0	
164	1.2 Dead + 1.5 Live_M - C3	Yes	Y		1	1.2	37	1.5	8	.063	0		0		0		0		0		0		0	
165	1.2 Dead + 1.5 Live_M - C3	Yes	Y		1	1.2	37	1.5	9	.063	0		0		0		0		0		0		0	
166	1.2 Dead + 1.5 Live_M - C3	Yes	Y		1	1.2	37	1.5	10	.063	0		0		0		0		0		0		0	
167	1.2 Dead + 1.5 Live_M - C3	Yes	Y		1	1.2	37	1.5	11	.063	0		0		0		0		0		0		0	
168	1.2 Dead + 1.5 Live_M - C3	Yes	Y		1	1.2	37	1.5	12	.063	0		0		0		0		0		0		0	
169	1.2 Dead + 1.5 Live_M - C3	Yes	Y		1	1.2	37	1.5	13	.063	0		0		0		0		0		0		0	
170	1.2 Dead + 1.5 Live_M - C4	Yes	Y		1	1.2	38	1.5	2	.063	0		0		0		0		0		0		0	
171	1.2 Dead + 1.5 Live_M - C4	Yes	Y		1	1.2	38	1.5	3	.063	0		0		0		0		0		0		0	
172	1.2 Dead + 1.5 Live_M - C4	Yes	Y		1	1.2	38	1.5	4	.063	0		0		0		0		0		0		0	
173	1.2 Dead + 1.5 Live_M - C4	Yes	Y		1	1.2	38	1.5	5	.063	0		0		0		0		0		0		0	
174	1.2 Dead + 1.5 Live_M - C4	Yes	Y		1	1.2	38	1.5	6	.063	0		0		0		0		0		0		0	
175	1.2 Dead + 1.5 Live_M - C4	Yes	Y		1	1.2	38	1.5	7	.063	0		0		0		0		0		0		0	
176	1.2 Dead + 1.5 Live_M - C4	Yes	Y		1	1.2	38	1.5	8	.063	0		0		0		0		0		0		0	
177	1.2 Dead + 1.5 Live_M - C4	Yes	Y		1	1.2	38	1.5	9	.063	0		0		0		0		0		0		0	
178	1.2 Dead + 1.5 Live_M - C4	Yes	Y		1	1.2	38	1.5	10	.063	0		0		0		0		0		0		0	
179	1.2 Dead + 1.5 Live_M - C4	Yes	Y		1	1.2	38	1.5	11	.063	0		0		0		0		0		0		0	
180	1.2 Dead + 1.5 Live_M - C4	Yes	Y		1	1.2	38	1.5	12	.063	0		0		0		0		0		0		0	
181	1.2 Dead + 1.5 Live_M - C4	Yes	Y		1	1.2	38	1.5	13	.063	0		0		0		0		0		0		0	
182	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	39	1.5	0		0		0		0		0		0		0		0	
183	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	40	1.5	0		0		0		0		0		0		0		0	
184	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	41	1.5	0		0		0		0		0		0		0		0	
185	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	42	1.5	0		0		0		0		0		0		0		0	
186	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	43	1.5	0		0		0		0		0		0		0		0	
187	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	44	1.5	0		0		0		0		0		0		0		0	
188	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	45	1.5	0		0		0		0		0		0		0		0	
189	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	46	1.5	0		0		0		0		0		0		0		0	
190	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	47	1.5	0		0		0		0		0		0		0		0	
191	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	48	1.5	0		0		0		0		0		0		0		0	
192	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	49	1.5	0		0		0		0		0		0		0		0	
193	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	50	1.5	0		0		0		0		0		0		0		0	
194	1.2 Dead + 1.5 Live_V - M1	Yes	Y		1	1.2	51	1.5	0		0		0		0		0		0		0		0	
195	1.2 Dead + 1.5 Live_V - M1	Yes	Y		1	1.2	52	1.5	0		0		0		0		0		0		0		0	
196	1.2 Dead + 1.5 Live_V - M1	Yes	Y		1	1.2	53	1.5	0		0		0		0		0		0		0		0	
197	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	54	1.5	0		0		0		0		0		0		0		0	
198	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	55	1.5	0		0		0		0		0		0		0		0	
199	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	56	1.5	0		0		0		0		0		0		0		0	
200	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	57	1.5	0		0		0		0		0		0		0		0	
201	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	58	1.5	0		0		0		0		0		0		0		0	
202	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	59	1.5	0		0		0		0		0		0		0		0	
203	1.2 Dead + 1.5 Live_V - M4	Yes	Y		1	1.2	60	1.5	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...	Fa...	B...
204 1.2 Dead + 1.5 Live_V - M4...	Yes	Y		1	1.2	61	1.5	0		0		0		0		0		0		0		0		0
205 1.2 Dead + 1.5 Live_V - M4...	Yes	Y		1	1.2	62	1.5	0		0		0		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		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		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		0		0		0
209 1.2 Dead + 1.5 Live_V - M6...	Yes	Y		1	1.2	66	1.5	0		0		0		0		0		0		0		0		0
210 1.2 Dead + 1.5 Live_V - M6...	Yes	Y		1	1.2	67	1.5	0		0		0		0		0		0		0		0		0
211 1.2 Dead + 1.5 Live_V - M6...	Yes	Y		1	1.2	68	1.5	0		0		0		0		0		0		0		0		0
212 1.2 Dead + 1.5 Live_V - M9...	Yes	Y		1	1.2	69	1.5	0		0		0		0		0		0		0		0		0
213 1.2 Dead + 1.5 Live_V - M9...	Yes	Y		1	1.2	70	1.5	0		0		0		0		0		0		0		0		0
214 1.2 Dead + 1.5 Live_V - M9...	Yes	Y		1	1.2	71	1.5	0		0		0		0		0		0		0		0		0
215 1.2 Dead + 1.5 Live_V - M9...	Yes	Y		1	1.2	72	1.5	0		0		0		0		0		0		0		0		0
216 1.2 Dead + 1.5 Live_V - M9...	Yes	Y		1	1.2	73	1.5	0		0		0		0		0		0		0		0		0
217 1.2 Dead + 1.5 Live_V - M9...	Yes	Y		1	1.2	74	1.5	0		0		0		0		0		0		0		0		0
218 1.2 Dead + 1.5 Live_V - M9...	Yes	Y		1	1.2	75	1.5	0		0		0		0		0		0		0		0		0
219 1.2 Dead + 1.5 Live_V - M9...	Yes	Y		1	1.2	76	1.5	0		0		0		0		0		0		0		0		0
220 1.2 Dead + 1.5 Live_V - M9...	Yes	Y		1	1.2	77	1.5	0		0		0		0		0		0		0		0		0
221 1.2 Dead + 1.5 Live_V - M9...	Yes	Y		1	1.2	78	1.5	0		0		0		0		0		0		0		0		0
222 1.2 Dead + 1.5 Live_V - M9...	Yes	Y		1	1.2	79	1.5	0		0		0		0		0		0		0		0		0
223 1.2 Dead + 1.5 Live_V - M9...	Yes	Y		1	1.2	80	1.5	0		0		0		0		0		0		0		0		0
224 1.2 Dead + 1.5 Live_V - M1...	Yes	Y		1	1.2	81	1.5	0		0		0		0		0		0		0		0		0
225 1.2 Dead + 1.5 Live_V - M1...	Yes	Y		1	1.2	82	1.5	0		0		0		0		0		0		0		0		0
226 1.2 Dead + 1.5 Live_V - M1...	Yes	Y		1	1.2	83	1.5	0		0		0		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	57	
3	No Ice Wind 30 deg	None					60	98	
4	No Ice Wind 60 deg	None					60	114	
5	No Ice Wind 90 deg	None					30	49	
6	No Ice Wind 120 deg	None					60	114	
7	No Ice Wind 150 deg	None					60	98	
8	No Ice Wind 180 deg	None					30	57	
9	No Ice Wind 210 deg	None					60	98	
10	No Ice Wind 240 deg	None					60	114	
11	No Ice Wind 270 deg	None					30	49	
12	No Ice Wind 300 deg	None					60	114	
13	No Ice Wind 330 deg	None					60	98	
14	Ice Weight	None					30	60	3
15	Ice Wind 0 deg	None					30	57	
16	Ice Wind 30 deg	None					60	98	
17	Ice Wind 60 deg	None					60	114	
18	Ice Wind 90 deg	None					30	49	
19	Ice Wind 120 deg	None					60	114	
20	Ice Wind 150 deg	None					60	98	
21	Ice Wind 180 deg	None					30	57	
22	Ice Wind 210 deg	None					60	98	
23	Ice Wind 240 deg	None					60	114	
24	Ice Wind 270 deg	None					30	49	
25	Ice Wind 300 deg	None					60	114	
26	Ice Wind 330 deg	None					60	98	
27	Live Load - A1	None					1		
28	Live Load - A2	None					1		
29	Live Load - A3	None					1		



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Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...)	Surface(P...
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 - M46 (Start)	None					1		
40	Live Load - M46 (Mid...	None					1		
41	Live Load - M46 (End)	None					1		
42	Live Load - M47 (Start)	None					1		
43	Live Load - M47 (Mid...	None					1		
44	Live Load - M47 (End)	None					1		
45	Live Load - M48 (Start)	None					1		
46	Live Load - M48 (Mid...	None					1		
47	Live Load - M48 (End)	None					1		
48	Live Load - M49 (Start)	None					1		
49	Live Load - M49 (Mid...	None					1		
50	Live Load - M49 (End)	None					1		
51	Live Load - M16 (Start)	None					1		
52	Live Load - M16 (Mid...	None					1		
53	Live Load - M16 (End)	None					1		
54	Live Load - M46A (St...	None					1		
55	Live Load - M46A (Mi...	None					1		
56	Live Load - M46A (E...	None					1		
57	Live Load - M47A (St...	None					1		
58	Live Load - M47A (Mi...	None					1		
59	Live Load - M47A (E...	None					1		
60	Live Load - M48A (St...	None					1		
61	Live Load - M48A (Mi...	None					1		
62	Live Load - M48A (E...	None					1		
63	Live Load - M49A (St...	None					1		
64	Live Load - M49A (Mi...	None					1		
65	Live Load - M49A (E...	None					1		
66	Live Load - M61 (Start)	None					1		
67	Live Load - M61 (Mid...	None					1		
68	Live Load - M61 (End)	None					1		
69	Live Load - M91 (Start)	None					1		
70	Live Load - M91 (Mid...	None					1		
71	Live Load - M91 (End)	None					1		
72	Live Load - M92 (Start)	None					1		
73	Live Load - M92 (Mid...	None					1		
74	Live Load - M92 (End)	None					1		
75	Live Load - M93 (Start)	None					1		
76	Live Load - M93 (Mid...	None					1		
77	Live Load - M93 (End)	None					1		
78	Live Load - M94 (Start)	None					1		
79	Live Load - M94 (Mid...	None					1		
80	Live Load - M94 (End)	None					1		
81	Live Load - M106 (St...	None					1		
82	Live Load - M106 (Mi...	None					1		
83	Live Load - M106 (En...	None					1		
84	BLC 1 Transient Area...	None						51	
85	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	SA	max	1344.978	15	1394.307	30	3955.694	22	1.352	33	1.271	4	1.134	50
2		min	-2379.453	2	415.114	23	-2155.287	11	.302	5	-1.259	17	.111	15
3	SB	max	1008.262	15	1393.78	35	2255.914	21	-.335	23	1.57	12	.967	73
4		min	-2050.171	2	415.599	11	-4047.25	8	-1.631	30	-1.556	25	-.049	103
5	SC	max	4567.06	14	1394.612	26	1184.722	21	.684	155	1.634	20	-.467	3
6		min	-2492.131	3	414.583	15	-1188.108	8	-.49	113	-1.62	9	-1.698	32
7	RC	max	238.154	3	1965.229	32	31.889	21	0	141	0	123	0	226
8		min	-3475.508	32	-128.385	3	-31.873	9	0	123	0	141	0	1
9	RA	max	1731.961	36	1958.364	36	226.668	11	0	175	0	175	0	49
10		min	-133.87	11	-140.262	11	-2999.822	36	0	49	0	49	0	175
11	RB	max	1729.798	29	1953.531	29	2989.216	29	0	83	0	83	0	83
12		min	-92.466	21	-90.418	21	-139.096	21	0	89	0	89	0	89
13	Totals:	max	4941.149	14	9531.527	31	5144.216	21						
14		min	-4941.147	3	2836.087	25	-5144.217	8						

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	M46	HSS4x4x3...	.157	0	27	.088	0	y	50	106237...	118378...	14.115	14.115	2...	H1-1b			
2	M47	HSS4x4x3...	.159	30.6	35	.056	30.6	y	26	106648...	118378...	14.115	14.115	1...	H1-1b			
3	M48	L2x2x3	.411	25.5	1...	.031	51.1	y	1	15920...	23392.8	.558	1.169	1...	H2-1			
4	M49	L2x2x3	.417	25.5	1...	.030	0	z	1	15920...	23392.8	.558	1.166	1...	H2-1			
5	M50	PL6x1/2	.055	1.642	20	.180	2.765	y	1	95340...	97200	1.012	12.15	3...	H1-1b			
6	M51	PL6x1/2	.209	6.81	22	.222	6.81	y	1	60829...	97200	1.012	12.15	1...	H1-1b			
7	M52	PL6x1/2	.054	1.123	22	.204	0	y	49	95340...	97200	1.012	12.15	3...	H1-1b			
8	M53	PL6x3/8	.215	2.627	16	.241	2.627	y	29	62895...	72900	.57	9.113	1...	H1-1b			
9	M54	PL6x3/8	.229	1.595	8	.256	0	y	36	69770.62	72900	.57	9.113	1...	H1-1b			
10	M55	PL6x3/8	.218	2.627	4	.124	2.627	y	1	62895...	72900	.57	9.113	1...	H1-1b			
11	M56	PL6x3/8	.240	1.595	12	.277	0	y	35	69770.62	72900	.57	9.113	1...	H1-1b			
12	M16	P3 STD	.109	53.1	20	.080	53.1		24	29986.1	70196...	6.124	6.124	3...	H1-1b			
13	M46A	HSS4x4x3...	.164	0	12	.088	0	y	1	106237...	118378...	14.115	14.115	2...	H1-1b			
14	M47A	HSS4x4x3...	.159	30.6	29	.057	30.6	y	31	106648...	118378...	14.115	14.115	1...	H1-1b			
15	M48A	L2x2x3	.411	25.5	2...	.031	51.1	y	2	15920...	23392.8	.558	1.169	1...	H2-1			
16	M49A	L2x2x3	.417	25.5	2...	.030	0	z	2	15920...	23392.8	.558	1.166	1...	H2-1			
17	M50A	PL6x1/2	.050	1.642	8	.179	2.765	y	74	95340...	97200	1.012	12.15	2...	H1-1b			
18	M51A	PL6x1/2	.217	6.81	8	.222	6.81	y	2	60829...	97200	1.012	12.15	1...	H1-1b			
19	M52A	PL6x1/2	.048	1.123	6	.205	0	y	89	95340...	97200	1.012	12.15	3...	H1-1b			
20	M53A	PL6x3/8	.228	2.627	22	.240	2.627	y	32	62895...	72900	.57	9.113	1...	H1-1b			
21	M54A	PL6x3/8	.181	1.595	16	.256	0	y	29	69770.62	72900	.57	9.113	1...	H1-1b			
22	M55A	PL6x3/8	.296	2.627	12	.124	2.627	y	73	62895...	72900	.57	9.113	1...	H1-1b			
23	M56A	PL6x3/8	.261	1.595	20	.277	0	y	28	69770.62	72900	.57	9.113	1...	H1-1b			
24	M61	P3 STD	.103	54.6	1...	.086	53.1		8	29986.1	70196...	6.124	6.124	2...	H1-1b			
25	M91	HSS4x4x3...	.170	0	20	.088	0	y	1	106237...	118378...	14.115	14.115	2...	H1-1b			
26	M92	HSS4x4x3...	.158	30.6	31	.057	30.6	y	35	106648...	118378...	14.115	14.115	1...	H1-1b			
27	M93	L2x2x3	.411	25.5	2...	.031	51.1	y	2	15920...	23392.8	.558	1.169	1...	H2-1			
28	M94	L2x2x3	.417	25.5	2...	.030	0	z	2	15920...	23392.8	.558	1.166	1...	H2-1			
29	M95	PL6x1/2	.056	1.642	14	.180	2.765	y	1	95340...	97200	1.012	12.15	2...	H1-1b			
30	M96	PL6x1/2	.210	6.81	14	.222	6.81	y	2	60829...	97200	1.012	12.15	1...	H1-1b			
31	M97	PL6x1/2	.053	1.123	14	.204	0	y	1	95340...	97200	1.012	12.15	3...	H1-1b			
32	M98	PL6x3/8	.225	2.627	8	.240	2.627	y	37	62895...	72900	.57	9.113	1...	H1-1b			
33	M99	PL6x3/8	.211	1.595	2	.256	0	y	32	69770.62	72900	.57	9.113	1...	H1-1b			
34	M100	PL6x3/8	.286	2.627	20	.125	2.627	y	1	62895...	72900	.57	9.113	1...	H1-1b			
35	M101	PL6x3/8	.232	1.595	4	.277	0	y	32	69770.62	72900	.57	9.113	1...	H1-1b			
36	M106	P3 STD	.105	53.1	12	.090	96.8		20	29986.1	70196...	6.124	6.124	2...	H1-1b			
37	A1	P2 STD	.346	69	22	.182	69		2	15808...	33847...	1.997	1.997	3...	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	A2	P2 STD	.369	69	20	.101	27	24	15808	33847	1.997	1.997	3	H1-1b				
39	A3	P2 STD	.385	69	8	.112	69	2	15808	33847	1.997	1.997	3	H1-1b				
40	A4	P2 STD	.296	69	8	.154	27	2	15808	33847	1.997	1.997	4	H1-1b				
41	B1	P2 STD	.309	69	6	.189	27	8	15808	33847	1.997	1.997	3	H1-1b				
42	B2	P2 STD	.334	69	2	.109	69	8	15808	33847	1.997	1.997	2	H1-1b				
43	B3	P2 STD	.333	69	16	.128	69	12	15808	33847	1.997	1.997	4	H1-1b				
44	B4	P2 STD	.286	69	14	.167	69	20	15808	33847	1.997	1.997	4	H1-1b				
45	C1	P2 STD	.326	69	14	.182	69	18	15808	33847	1.997	1.997	4	H1-1b				
46	C2	P2 STD	.342	69	8	.095	69	16	15808	33847	1.997	1.997	3	H1-1b				
47	C3	P2 STD	.350	69	2	.134	69	20	15808	33847	1.997	1.997	4	H1-1b				
48	C4	P2 STD	.294	69	20	.151	27	18	15808	33847	1.997	1.997	3	H1-1b				
49	M73	P2 STD	.264	53.1	24	.201	12.5	24	6684.464	33847	1.997	1.997	3	H1-1b				
50	M78	L2.5x2.5x4	.378	0	24	.096	0	y	16	36167	38556	1.114	2.537	1	H2-1			
51	M79	P2 STD	.268	53.1	8	.206	7.813	24	6684.464	33847	1.997	1.997	3	H1-1b				
52	M84	L2.5x2.5x4	.391	0	8	.107	0	y	24	36167	38556	1.114	2.537	1	H2-1			
53	M85	P2 STD	.262	53.1	18	.221	7.813	8	6684.464	33847	1.997	1.997	3	H1-1b				
54	M90	L2.5x2.5x4	.355	0	16	.115	0	y	8	36167	38556	1.114	2.537	1	H2-1			
55	M91A	PL 8x1/2	.081	0	32	.067	0	y	32	120475	129600	1.35	21.6	1	H1-1b			
56	M92A	LL2.5x2.5x...	.094	50.9	32	.004	0	y	33	42543	58482	4.246	2.614	1	H1-1b*			
57	M93A	PL 8x1/2	.081	0	35	.067	0	y	36	120475	129600	1.35	21.6	1	H1-1b			
58	M94A	LL2.5x2.5x...	.094	50.9	36	.004	0	y	37	42543	58482	4.246	2.614	1	H1-1b*			
59	M95A	PL 8x1/2	.080	0	29	.067	0	y	29	120475	129600	1.35	21.6	1	H1-1b			
60	M96A	LL2.5x2.5x...	.093	50.9	29	.004	50.9	y	29	42543	58482	4.246	2.614	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	M46	HSS4x4x3/16	0.157	1.05	0.15*	0	27	0.088	1.05	0.084*	0	106237.62	118378.13	14.115	14.115	2.94	H1-1b
2	M47	HSS4x4x3/16	0.159	1.05	0.151*	30.69	35	0.056	1.05	0.053*	30.69	106648.52	118378.13	14.115	14.115	1.329	H1-1b
3	M48	L2x2x3	0.411	1.05	0.391*	25.58	189	0.031	1.05	0.03*	51.17	15920.319	23392.8	0.558	1.169	1.757	H2-1
4	M49	L2x2x3	0.417	1.05	0.397*	25.58	192	0.03	1.05	0.029*	0	15920.319	23392.8	0.558	1.166	1.728	H2-1
5	M50	PL6x1/2	0.055	1.05	0.052*	1.642	20	0.18	1.05	0.171*	2.765	95340.363	97200	1.012	12.15	3.147	H1-1b
6	M51	PL6x1/2	0.209	1.05	0.199*	6.81	22	0.222	1.05	0.211*	6.81	60829.391	97200	1.012	12.15	1.309	H1-1b
7	M52	PL6x1/2	0.054	1.05	0.051*	1.123	22	0.204	1.05	0.194*	0	95340.363	97200	1.012	12.15	3.696	H1-1b
8	M53	PL6x3/8	0.215	1.05	0.205*	2.627	16	0.241	1.05	0.23*	2.627	62895.756	72900	0.57	9.113	1.531	H1-1b
9	M54	PL6x3/8	0.229	1.05	0.218*	1.595	8	0.256	1.05	0.244*	0	69770.62	72900	0.57	9.113	1.419	H1-1b
10	M55	PL6x3/8	0.218	1.05	0.208*	2.627	4	0.124	1.05	0.118*	2.627	62895.756	72900	0.57	9.113	1.447	H1-1b
11	M56	PL6x3/8	0.24	1.05	0.229*	1.595	12	0.277	1.05	0.264*	0	69770.62	72900	0.57	9.113	1.913	H1-1b
12	M16	P3 STD	0.109	1.05	0.104*	53.13	20	0.08	1.05	0.076*	53.13	29986.1	70196.802	6.124	6.124	3.127	H1-1b
13	M46A	HSS4x4x3/16	0.164	1.05	0.156*	0	12	0.088	1.05	0.084*	0	106237.62	118378.13	14.115	14.115	2.859	H1-1b
14	M47A	HSS4x4x3/16	0.159	1.05	0.151*	30.69	29	0.057	1.05	0.054*	30.69	106648.52	118378.13	14.115	14.115	1.328	H1-1b
15	M48A	L2x2x3	0.411	1.05	0.391*	25.58	204	0.031	1.05	0.03*	51.17	15920.319	23392.8	0.558	1.169	1.757	H2-1
16	M49A	L2x2x3	0.417	1.05	0.397*	25.58	207	0.03	1.05	0.029*	0	15920.319	23392.8	0.558	1.166	1.728	H2-1
17	M50A	PL6x1/2	0.05	1.05	0.048*	1.642	8	0.179	1.05	0.17*	2.765	95340.363	97200	1.012	12.15	2.746	H1-1b
18	M51A	PL6x1/2	0.217	1.05	0.207*	6.81	8	0.222	1.05	0.211*	6.81	60829.391	97200	1.012	12.15	1.368	H1-1b
19	M52A	PL6x1/2	0.048	1.05	0.046*	1.123	6	0.205	1.05	0.195*	0	95340.363	97200	1.012	12.15	3.531	H1-1b
20	M53A	PL6x3/8	0.228	1.05	0.217*	2.627	22	0.24	1.05	0.229*	2.627	62895.756	72900	0.57	9.113	1.57	H1-1b
21	M54A	PL6x3/8	0.181	1.05	0.172*	1.595	16	0.256	1.05	0.244*	0	69770.62	72900	0.57	9.113	1.434	H1-1b
22	M55A	PL6x3/8	0.296	1.05	0.282*	2.627	12	0.124	1.05	0.118*	2.627	62895.756	72900	0.57	9.113	1.444	H1-1b
23	M56A	PL6x3/8	0.261	1.05	0.249*	1.595	20	0.277	1.05	0.264*	0	69770.62	72900	0.57	9.113	1.732	H1-1b
24	M61	P3 STD	0.103	1.05	0.098*	54.69	105	0.086	1.05	0.082*	53.13	29986.1	70196.802	6.124	6.124	2.328	H1-1b
25	M91	HSS4x4x3/16	0.17	1.05	0.162*	0	20	0.088	1.05	0.084*	0	106237.62	118378.13	14.115	14.115	2.91	H1-1b
26	M92	HSS4x4x3/16	0.158	1.05	0.15*	30.69	31	0.057	1.05	0.054*	30.69	106648.52	118378.13	14.115	14.115	1.329	H1-1b
27	M93	L2x2x3	0.411	1.05	0.391*	25.58	219	0.031	1.05	0.03*	51.17	15920.319	23392.8	0.558	1.169	1.757	H2-1
28	M94	L2x2x3	0.417	1.05	0.397*	25.58	222	0.03	1.05	0.029*	0	15920.319	23392.8	0.558	1.166	1.728	H2-1
29	M95	PL6x1/2	0.056	1.05	0.053*	1.642	14	0.18	1.05	0.171*	2.765	95340.363	97200	1.012	12.15	2.978	H1-1b
30	M96	PL6x1/2	0.21	1.05	0.2*	6.81	14	0.222	1.05	0.211*	6.81	60829.391	97200	1.012	12.15	1.307	H1-1b
31	M97	PL6x1/2	0.053	1.05	0.05*	1.123	14	0.204	1.05	0.194*	0	95340.363	97200	1.012	12.15	3.528	H1-1b
32	M98	PL6x3/8	0.225	1.05	0.214*	2.627	8	0.24	1.05	0.229*	2.627	62895.756	72900	0.57	9.113	1.517	H1-1b
33	M99	PL6x3/8	0.211	1.05	0.201*	1.595	2	0.256	1.05	0.244*	0	69770.62	72900	0.57	9.113	1.432	H1-1b
34	M100	PL6x3/8	0.286	1.05	0.272*	2.627	20	0.125	1.05	0.119*	2.627	62895.756	72900	0.57	9.113	1.442	H1-1b
35	M101	PL6x3/8	0.232	1.05	0.221*	1.595	4	0.277	1.05	0.264*	0	69770.62	72900	0.57	9.113	1.889	H1-1b
36	M106	P3 STD	0.105	1.05	0.1*	53.13	12	0.09	1.05	0.086*	96.88	29986.1	70196.802	6.124	6.124	2.99	H1-1b
37	A1	P2 STD	0.346	1.05	0.33*	69	22	0.182	1.05	0.173*	69	15808.485	33847.742	1.997	1.997	3.298	H1-1b
38	A2	P2 STD	0.369	1.05	0.351*	69	20	0.101	1.05	0.096*	27	15808.485	33847.742	1.997	1.997	3.156	H1-1b
39	A3	P2 STD	0.385	1.05	0.367*	69	8	0.112	1.05	0.107*	69	15808.485	33847.742	1.997	1.997	3.39	H1-1b
40	A4	P2 STD	0.296	1.05	0.282*	69	8	0.154	1.05	0.147*	27	15808.485	33847.742	1.997	1.997	4.829	H1-1b
41	B1	P2 STD	0.309	1.05	0.294*	69	6	0.189	1.05	0.18*	27	15808.485	33847.742	1.997	1.997	3.954	H1-1b
42	B2	P2 STD	0.334	1.05	0.318*	69	2	0.109	1.05	0.104*	69	15808.485	33847.742	1.997	1.997	2.787	H1-1b
43	B3	P2 STD	0.333	1.05	0.317*	69	16	0.128	1.05	0.122*	69	15808.485	33847.742	1.997	1.997	4.626	H1-1b
44	B4	P2 STD	0.286	1.05	0.272*	69	14	0.167	1.05	0.159*	69	15808.485	33847.742	1.997	1.997	4.199	H1-1b
45	C1	P2 STD	0.326	1.05	0.31*	69	14	0.182	1.05	0.173*	69	15808.485	33847.742	1.997	1.997	4.166	H1-1b
46	C2	P2 STD	0.342	1.05	0.326*	69	8	0.095	1.05	0.09*	69	15808.485	33847.742	1.997	1.997	3.415	H1-1b
47	C3	P2 STD	0.35	1.05	0.333*	69	2	0.134	1.05	0.128*	69	15808.485	33847.742	1.997	1.997	4.321	H1-1b
48	C4	P2 STD	0.294	1.05	0.28*	69	20	0.151	1.05	0.144*	27	15808.485	33847.742	1.997	1.997	3.441	H1-1b
49	M73	P2 STD	0.264	1.05	0.251*	53.13	24	0.201	1.05	0.191*	12.5	6684.464	33847.742	1.997	1.997	3.696	H1-1b
50	M78	L2.5x2.5x4	0.378	1.05	0.36*	0	24	0.096	1.05	0.091*	0	36167.335	38556	1.114	2.537	1.735	H2-1
51	M79	P2 STD	0.268	1.05	0.255*	53.13	8	0.206	1.05	0.196*	7.813	6684.464	33847.742	1.997	1.997	3.768	H1-1b
52	M84	L2.5x2.5x4	0.391	1.05	0.372*	0	8	0.107	1.05	0.102*	0	36167.335	38556	1.114	2.537	1.72	H2-1
53	M85	P2 STD	0.262	1.05	0.25*	53.13	18	0.221	1.05	0.21*	7.813	6684.464	33847.742	1.997	1.997	3.822	H1-1b
54	M90	L2.5x2.5x4	0.355	1.05	0.338*	0	16	0.115	1.05	0.11*	0	36167.335	38556	1.114	2.537	1.68	H2-1
55	M91A	PL 8x1/2	0.081	1.05	0.077*	0	32	0.067	1.05	0.064*	0	120475.67	129600	1.35	21.6	1.667	H1-1b
56	M92A	LL2.5x2.5x3x8	0.094	1.05	0.09*	50.97	32	0.004	1.05	0.004*	0	42543.862	58482	4.246	2.614	1	H1-1b*
57	M93A	PL 8x1/2	0.081	1.05	0.077*	0	35	0.067	1.05	0.064*	0	120475.67	129600	1.35	21.6	1.667	H1-1b
58	M94A	LL2.5x2.5x3x8	0.094	1.05	0.09*	50.97	36	0.004	1.05	0.004*	0	42543.862	58482	4.246	2.614	1.136	H1-1b*
59	M95A	PL 8x1/2	0.08	1.05	0.076*	0	29	0.067	1.05	0.064*	0	120475.67	129600	1.35	21.6	1.667	H1-1b
60	M96A	LL2.5x2.5x3x8	0.093	1.05	0.089*	50.97	29	0.004	1.05	0.004*	50.97	42543.862	58482	4.246	2.614	1.136	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
2021777.876405.02

Bolt Information	
Bolt Diameter (d)	0.625 in
Net Tensile Area (A _n)	0.226 in ²
# of Bolts Total (n)	4
Bolt Distance Up-Down	6 in
Bolt Distance Left-Right	6 in
Bolt Grade	A325N
Bolt Tensile Strength (F _{ub})	120 ksi

Flange Information	
Height (h)	8 in
Width (w)	8 in
Thickness (t)	0.75 in
Steel Grade	A36
Plate Yield Strength (F _y)	36 ksi
Support Arm Height	4 in
Support Arm Width	4 in

RISA 3D Reactions (Up-Down)	
Moment (M)	1.12 k-ft
Axial (T)	2.03 kips
Shear (V)	3.64 kips

RISA 3D Reactions (Left-Right)	
Moment (M)	1.63 k-ft
Axial (T)	1.70 kips
Shear (V)	0.80 kips

Bolt Capacity (Up-Down)	
Nominal Tensile Strength (R _{nt})	27.120 kips
Nominal Shear Strength (R _{nv})	18.41 kips
Bolt Tensile Force (T _{ub})	1.63 kips
Bolt Shear Force (V _{ub})	0.909 kips
T _{ub} /φR _{nt}	0.07630
V _{ub} /φR _{nv}	0.06271
(V _{ub} /φR _{nv}) ² +(T _{ub} /φR _{nt}) ²	0.01024
Bolt Capacity =	7.6% OK

Bolt Capacity (Left-Right)	
Nominal Tensile Strength (R _{nt})	27.120 kips
Nominal Shear Strength (R _{nv})	18.41 kips
Bolt Tensile Force (T _{ub})	2.06 kips
Bolt Shear Force (V _{ub})	0.200 kips
T _{ub} /φR _{nt}	0.09636
V _{ub} /φR _{nv}	0.01382
(V _{ub} /φR _{nv}) ² +(T _{ub} /φR _{nt}) ²	0.00995
Bolt Capacity =	9.6% OK

*Rating per TIA-222-H, Section 15.5

*Rating per TIA-222-H, Section 15.5

Plate Capacity (Up-Down)	
Bolt Circle (D _{BC})	8.485 in
Effective Width (B _{eff})	7.48 in
Flexural Moment (M _u)	3.26 k-in
Flexural Strength (φM _n)	34.10 k-in
Plate Capacity=	9.1% OK

Plate Capacity (Left-Right)	
Bolt Circle (D _{BC})	8.485 in
Effective Width (B _{eff})	7.48 in
Flexural Moment (M _u)	4.12 k-in
Flexural Strength (φM _n)	34.10 k-in
Plate Capacity=	11.5% OK

*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
2021777.876405.02

Bolt Information	
Bolt Diameter (d)	0.625 in
Net Tensile Area (A _n)	0.226 in ²
# of Bolts Total (n)	4
Bolt Grade	A325N
Bolt Tensile Strength (F _{ub})	120 ksi

RISA 3D Reactions	
Moment (M)	0.00 k-ft
Axial (T)	-1.74 kips
Shear (V)	3.59 kips

Bolt Capacity	
Nominal Tensile Strength (R _{nt})	27.120 kips
Nominal Shear Strength (R _{nv})	18.41 kips
Bolt Tensile Force (T _{ub})	-0.43 kips
Bolt Shear Force (V _{ub})	0.899 kips
$T_{ub}/\phi R_{nt}$	-0.02034
$V_{ub}/\phi R_{nv}$	0.06200
$(V_{ub}/\phi R_{nv})^2 + (T_{ub}/\phi R_{nt})^2$	0.00447
Bolt Capacity =	6.2% OK

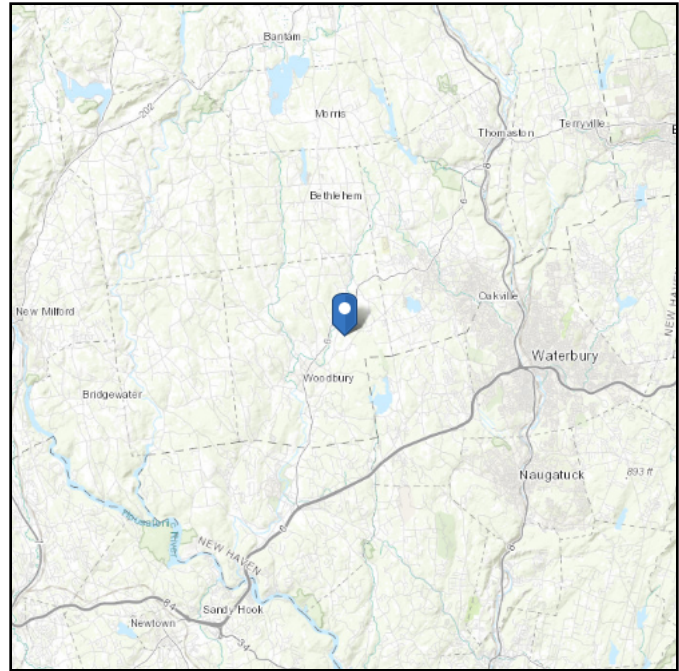
*Rating per TIA-222-H, Section 15.5

ASCE 7 Hazards Report

Address:
No Address at This
Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see
Section 11.4.3)

Elevation: 460.09 ft (NAVD 88)
Latitude: 41.567997
Longitude: -73.179681



Wind

Results:

Wind Speed:	116 Vmph	120 mph per jurisdiction requirement
10-year MRI	75 Vmph	
25-year MRI	84 Vmph	
50-year MRI	89 Vmph	
100-year MRI	96 Vmph	

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

Date Accessed: Wed Mar 10 2021

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

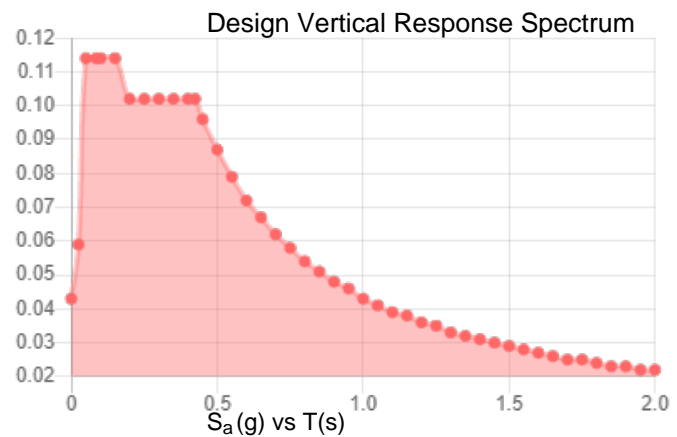
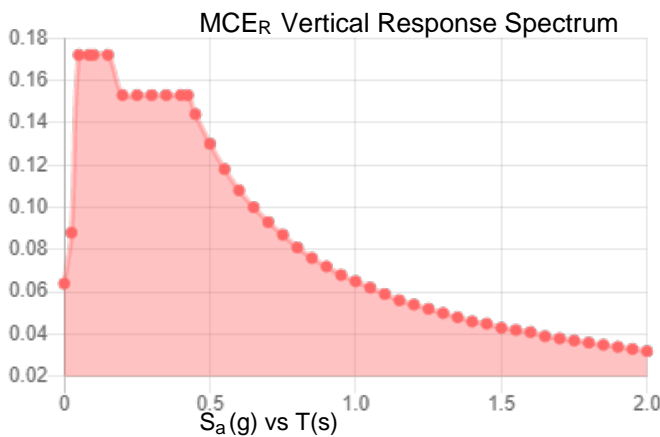
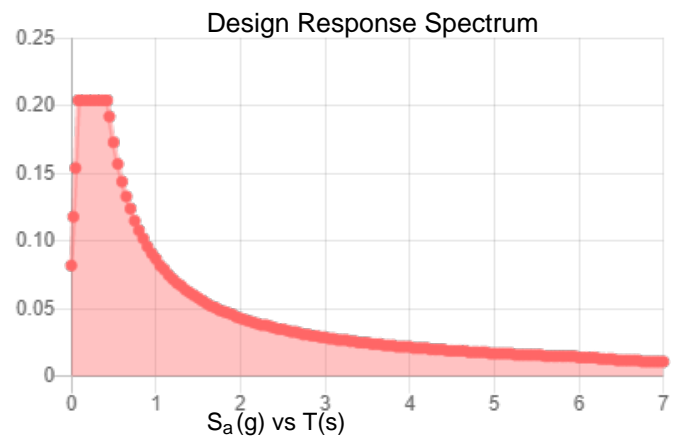
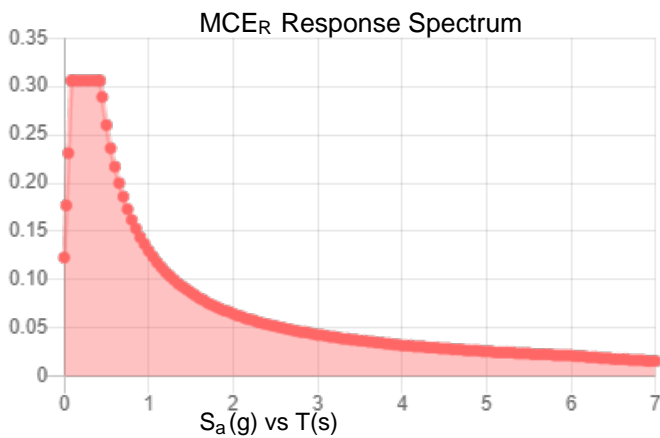
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_s :	0.192	S_{D1} :	0.087
S_1 :	0.054	T_L :	6
F_a :	1.6	PGA :	0.105
F_v :	2.4	PGA _M :	0.168
S_{MS} :	0.306	F_{PGA} :	1.589
S_{M1} :	0.13	I_e :	1
S_{DS} :	0.204	C_v :	0.7

Seismic Design Category B



Data Accessed:

Wed Mar 10 2021

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness: 1.00 in.

Concurrent Temperature: 15 F

Gust Speed: 50 mph

Data Source: Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

Date Accessed: Wed Mar 10 2021

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

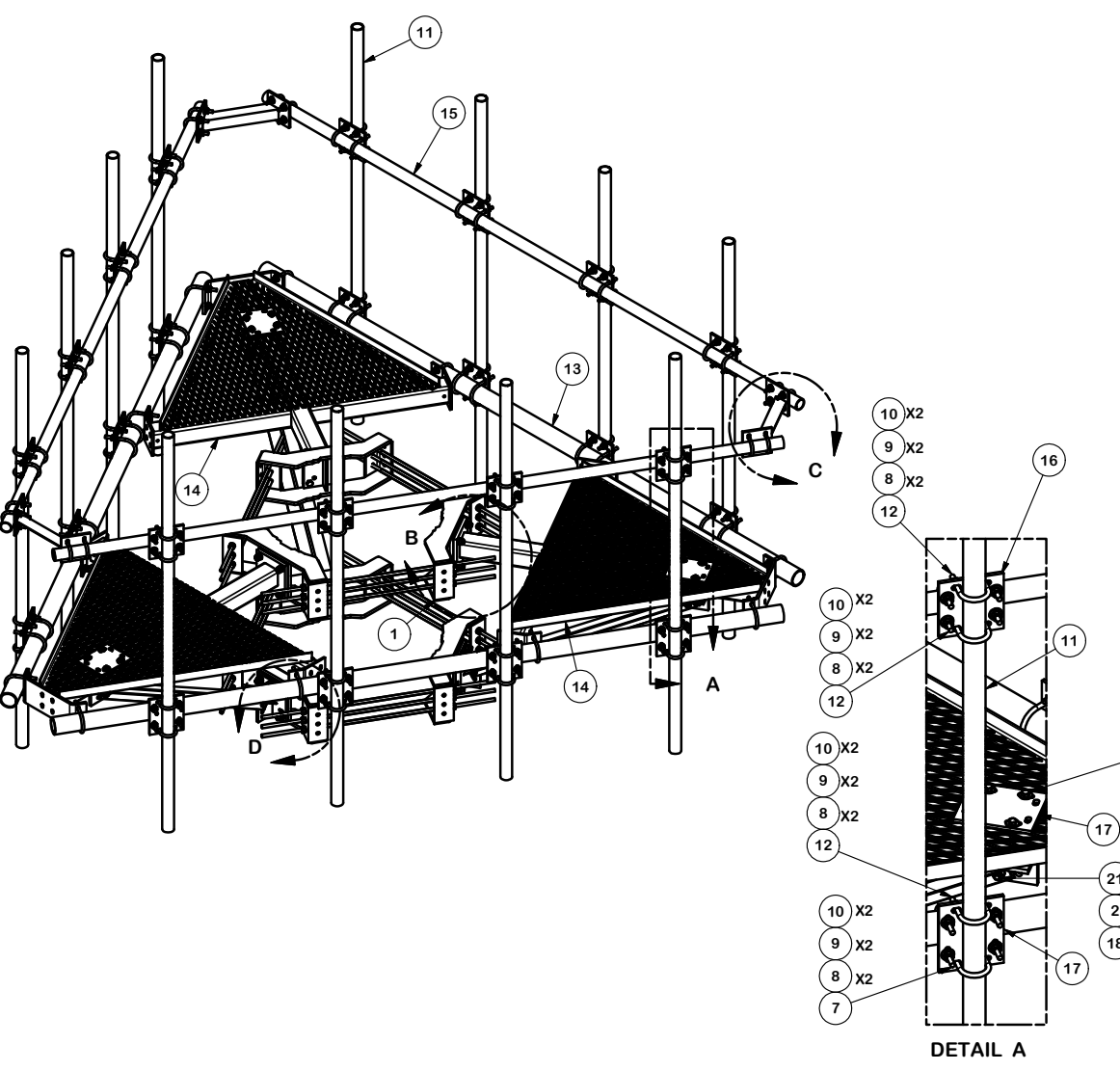
Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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APPENDIX E
SUPPLEMENTAL DRAWINGS



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	6	X-LWRM	RING MOUNT WELDMNT		68.16	408.95
2	66	G58LW	5/8" HDG LOCKWASHER		0.03	1.72
3	60	A58NUT	5/8" HDG A325 HEX NUT		0.13	7.78
4	18	G58R-24	5/8" x 24" THREADED ROD (HDG.)		0.55	9.88
4	18	G58R-48	5/8" x 48" THREADED ROD (HDG.)		0.55	9.88
5	24	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2 3/4 in	0.36	8.53
6	24	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.82
7	36	X-UB1306	1/2" X 3-5/8" X 6" X 3" U-BOLT (HDG.)		0.73	26.34
8	264	G12FW	1/2" HDG USS FLATWASHER		0.03	8.99
9	252	G12LW	1/2" HDG LOCKWASHER		0.01	3.50
10	252	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	18.03
11	12	P296	2-3/8" X 96" SCH. 40 GALVANIZED PIPE	96 in	30.76	369.08
12	84	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.73	61.46
13	3	P3150	3-1/2" X 150" SCH 40 GALVANIZED PIPE	150 in	94.80	284.40
14	3	X-SV196	LOW PROFILE PLATFORM CORNER		212.10	636.31
15	3	P2150	2-3/8" OD X 150" SCH 40 GALVANIZED PIPE	150 in	48.06	144.17
16	12	SCX2	CROSSOVER PLATE	7 in	4.80	57.56
17	15	SCX4	CROSSOVER PLATE	8 1/2 in	6.02	90.32
18	6	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	0.78
19	6	X-253993	PLATFORM REINFORCEMENT KIT ANGLE	52 25/32 in	14.33	85.99
20	6	X-253992	T-BRACKET FOR REINFORCEMENT KIT		13.55	81.27
21	6	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	1.62
22	12	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	6 1/2 in	0.41	4.91
23	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
					TOTAL WT. #	2448.72

TOLERANCE NOTES
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 SAWED, SHEARED AND GAS CUT EDGES ($\pm 0.030"$)
 DRILLED AND GAS CUT HOLES ($\pm 0.030"$) - NO CONING OF HOLES
 LASER CUT EDGES AND HOLES ($\pm 0.010"$) - NO CONING OF HOLES
 BENDS ARE $\pm 1/2$ DEGREE
 ALL OTHER MACHINING ($\pm 0.030"$)
 ALL OTHER ASSEMBLY ($\pm 0.060"$)

PROPRIETARY NOTE:
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DESCRIPTION
 12' 6" LOW PROFILE PLATFORM
 WITH TWELVE 2-3/8" ANTENNA MOUTING
 PIPES, AND HANDRAIL

CPD NO. 4488	DRAWN BY CEK 7/14/2014	ENG. APPROVAL
CLASS 81	SUB 02	DRAWING USAGE CUSTOMER
CHECKED BY BMC 7/14/2014		

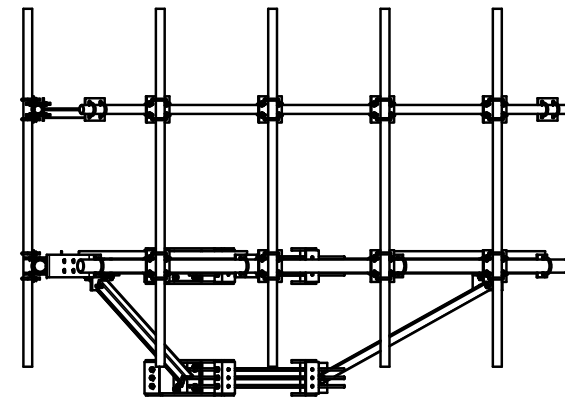
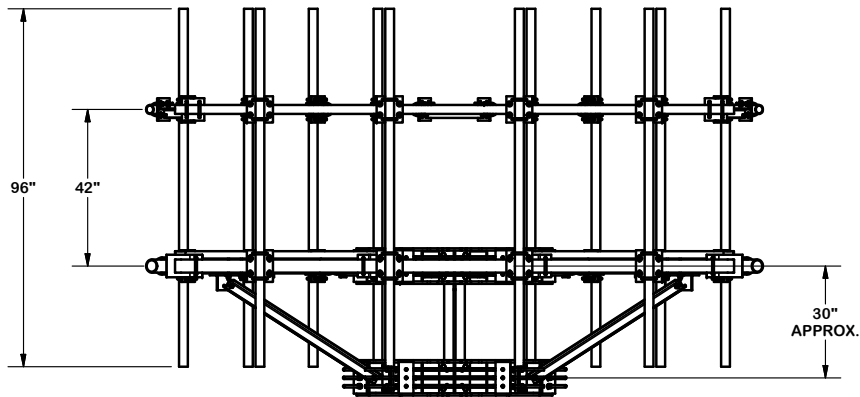
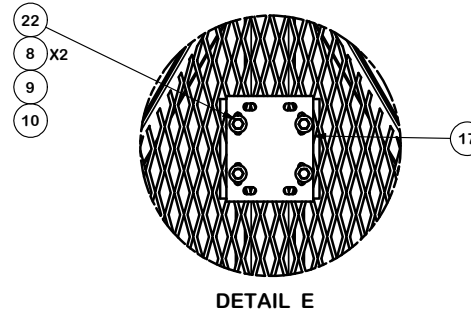
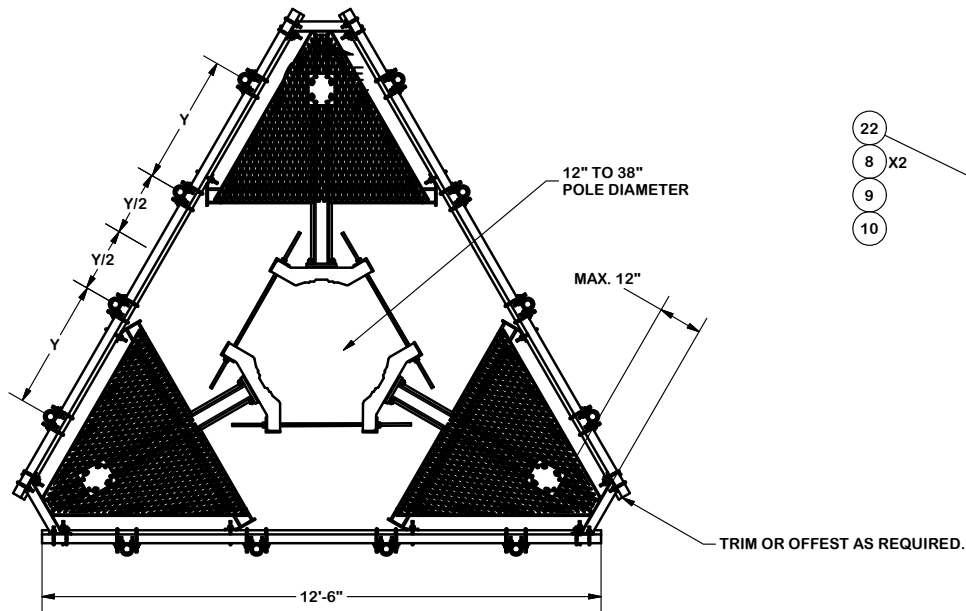
SITE PRO 1
 Engineering Support Team:
 1-888-753-7446

Locations:
 New York, NY
 Atlanta, GA
 Los Angeles, CA
 Plymouth, IN
 Salem, OR
 Dallas, TX

PART NO. **RMQP-496-HK**

DWG. NO. **RMQP-496-HK**

PAGE 1 OF 3



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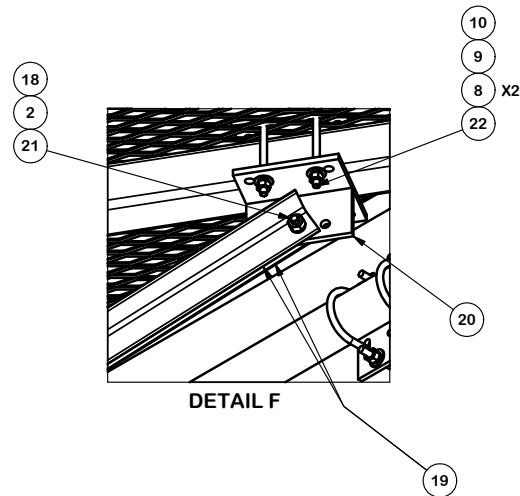
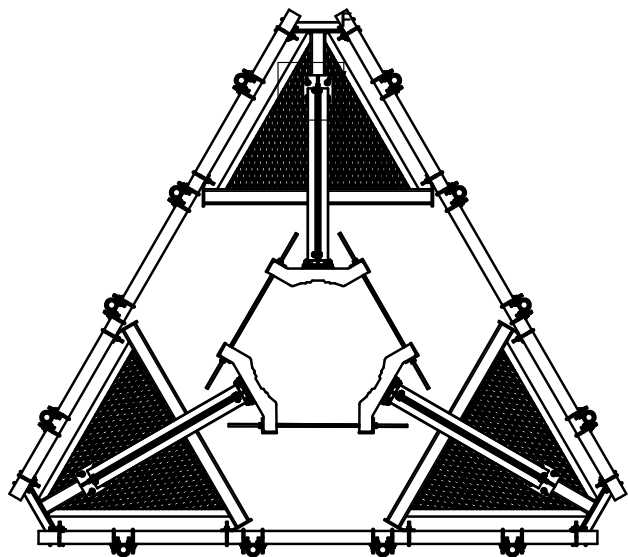
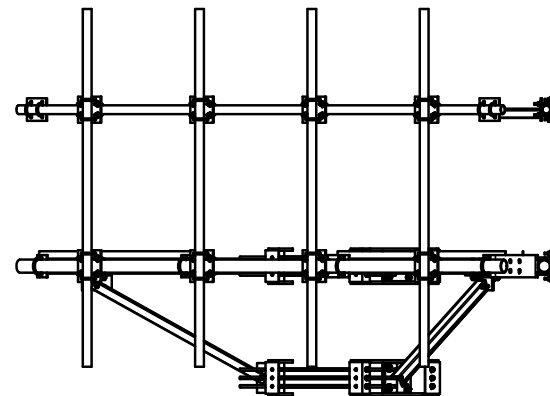
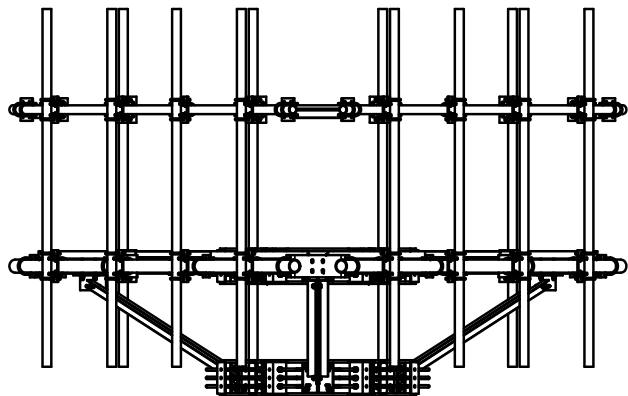
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 SAWED, SHEARED AND GAS CUT EDGES ($\pm 0.030"$)
 DRILLED AND GAS CUT HOLES ($\pm 0.030"$) - NO CONING OF HOLES
 LASER CUT EDGES AND HOLES ($\pm 0.010"$) - NO CONING OF HOLES
 BENDS ARE $\pm 1/2$ DEGREE
 ALL OTHER MACHINING ($\pm 0.030"$)
 ALL OTHER ASSEMBLY ($\pm 0.060"$)

PROPRIETARY NOTE:
 THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION
**12" 6" LOW PROFILE PLATFORM
 WITH TWELVE 2-3/8" ANTENNA MOUTING
 PIPES, AND HANDRAIL**

CPD NO. 4488	DRAWN BY CEK 7/14/2014	ENG. APPROVAL
CLASS 81	SUB 02	DRAWING USAGE CUSTOMER
CHECKED BY BMC 7/14/2014		

SITE PRO 1
 A valmont COMPANY

Engineering Support Team:
 1-888-753-7446

Locations:
 New York, NY
 Atlanta, GA
 Los Angeles, CA
 Plymouth, IN
 Salem, OR
 Dallas, TX

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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: CTNH450A

CT54XC77I

186 Minortown

Woodbury, Connecticut 06798

May 3, 2021

EBI Project Number: 6221002098

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	37.88%

May 3, 2021

T-Mobile

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

Emissions Analysis for Site: CTNH450A - CT54XC771

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **186 Minortown in Woodbury, 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 186 Minortown in Woodbury, 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 102 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):	102 feet	Height (AGL):	102 feet	Height (AGL):	102 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 %:	1.82%	Antenna BI MPE %:	1.82%	Antenna CI MPE %:	1.82%
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):	102 feet	Height (AGL):	102 feet	Height (AGL):	102 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 %:	7.14%	Antenna B2 MPE %:	7.14%	Antenna C2 MPE %:	7.14%
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):	102 feet	Height (AGL):	102 feet	Height (AGL):	102 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 %:	5.03%	Antenna B3 MPE %:	5.03%	Antenna C3 MPE %:	5.03%

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	13.99%
Sprint	5.65%
Verizon	3.35%
AT&T	14.89%
Site Total MPE % :	37.88%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	13.99%
T-Mobile Sector B Total:	13.99%
T-Mobile Sector C Total:	13.99%
Site Total MPE % :	37.88%

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	102.0	18.21	2100 MHz LTE	1000	1.82%
T-Mobile 600 MHz LTE	2	591.73	102.0	4.62	600 MHz LTE	400	1.15%
T-Mobile 600 MHz NR	1	1577.94	102.0	6.16	600 MHz NR	400	1.54%
T-Mobile 700 MHz LTE	2	695.22	102.0	5.42	700 MHz LTE	467	1.16%
T-Mobile 1900 MHz GSM	4	1052.26	102.0	16.42	1900 MHz GSM	1000	1.64%
T-Mobile 1900 MHz LTE	2	2104.51	102.0	16.42	1900 MHz LTE	1000	1.64%
T-Mobile 2500 MHz LTE	1	6444.38	102.0	25.14	2500 MHz LTE	1000	2.51%
T-Mobile 2500 MHz NR	1	6444.38	102.0	25.14	2500 MHz NR	1000	2.51%
						Total:	13.99%

• 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:	13.99%
Sector B:	13.99%
Sector C:	13.99%
T-Mobile Maximum MPE % (Sector A):	13.99%
Site Total:	37.88%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **37.88%** 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.