April 9, 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# 846176; T-Mobile Site ID# CTNH494A
1749 Durham Road, Madison, CT 06443
Latitude: 41° 23' 22.3"/ Longitude: -72° 38' 56"

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 106-foot mount on the existing 119-foot self support Tower located at 1749 Durham Road in Madison. The property is owned by the South Central Connecticut Regional Water Authority 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. tower. T-Mobile is also proposing tower mount modifications, as shown on the enclosed mount analysis.

Planned Modifications:
Tower:

Remove and Replace:
(3) RFS/Celwave – APXVTM14-ALU-120 Antennas **(REMOVE)** - (3) RFS – APX16DWV-16DWV-S-E-A20 Antennas **(REPLACE)**

(3) Commscope – LLPX31OR-V1 Antennas **(REMOVE)** – (3) RFS – APXVAALL24_43-U-NA20 Antennas **(REPLACE)**

(3) Alcatel Lucent – RRH8X20-25 Radios **(REMOVE)** – (3) Ericsson – 4424 B25 Radios **(REPLACE)**

(6) Alcatel Lucent – RRH2X50-800 Radios (REMOVE) – (3) Ericsson – 4415 B66A Radios **(REPLACE)**

Install New:
(3) AIR6449 B41 Antennas
(3) Ericsson Radio 4449 B71+B85
(4) 1 5/8'' HCS 6/24 4AWG 100m cables
(1) Site Pro 1 handrail kit

Remove:
(3) Alcatel Lucent – PCS 1900MHz 4X45W Radios

Ground:

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

This facility was approved by the Siting Council in Docket No. 290. The approval was given with conditions which this proposal complies with.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Peggy Lyons, First Selectwoman for the Town of Madison, David Anderson, Town Planner for the Town of Madison, and 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).

Sincerely,

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

cc:

Peggy Lyons, First Selectwoman *(via email only to lyonsp@madisonct.org)*
Town of Madison
8 Campus Drive
Madison, CT 06443

David Anderson, Town Planner *(via email only to andersond@madisonct.org)*
Town of Madison
8 Campus Drive
Madison, CT 06443

South Central Connecticut Regional Water Authority
Attn: John Triana – Real Estate Manager *(via email only to jtriana1@rwater.com)*
90 Sargent Drive
New Haven, CT 06511

Zajac, Richard

From: Zajac, Richard
Sent: Friday, April 9, 2021 1:48 PM
To: lyonsp@madisonct.org
Subject: Connecticut Siting Council exempt modification application notification
Attachments: CSC Exempt Modification Application - 1749 Durham Rd.pdf

Good afternoon,
Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 1749 Durham Road in Madison.

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: Friday, April 9, 2021 1:52 PM
To: andersond@madisonct.org
Subject: Connecticut Siting Council exempt modification application notification
Attachments: CSC Exempt Modification Application - 1749 Durham Rd.pdf

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

Thank you,
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F: (724) 416-4461
CROWN CASTLE
4545 East River Road, Suite 320
West Henrietta, NY 14586

Zajac, Richard

From: Zajac, Richard
Sent: Friday, April 9, 2021 1:53 PM
To: jtriana1@rwater.com
Subject: Connecticut Siting Council exempt modification application notification
Attachments: CSC Exempt Modification Application - 1749 Durham Rd.pdf

Good afternoon,
Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 1749 Durham Road in Madison.

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

Thank you,
RICH ZAJAC
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CROWN CASTLE
4545 East River Road, Suite 320
West Henrietta, NY 14586

Exhibit A

Original Facility Approval

DOCKET NO. 290 – AT&T Wireless PCS, LLC d/b/a AT&T Wireless application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at one of two locations on Durham Road (Route 79), Madison, Connecticut.	}	Connecticut
	}	Siting
	}	Council
		August 26, 2004

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 AT&T Wireless PCS, LLC d/b/a AT&T Wireless at Site A, located at 1749 Durham Road, Madison, Connecticut. The Council denies certification of Site B, located on the Elka Perez Trust property, Durham Road, Madison, Connecticut.

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

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of AT&T Wirleless and other entities, both public and private, but such tower shall not exceed a height of 120 feet above ground level. The height at the top of the antennas shall not exceed 123 feet above ground level. The tower and tower foundation shall be of sufficient capacity to support a tower extension to 150 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 served on the Town of Madison, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:

a. a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas, equipment building, relocated access road, utility line, and landscaping; and

b. 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 in the event other carriers locate at this facility or if circumstances in equipment 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. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.

7. 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.

8. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.

9. 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. Any request for extension of this period shall be filed with the Council not later than sixty days prior to

expiration date of this Certificate and shall be served on all parties and intervenors and the Town of Madison, as listed in the service list. Any proposed modifications to this Decision and Order shall likewise be so served.

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 The Shoreline Times and The Source.

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	**Its Representative**
AT&T Wireless PCS, LLC d/b/a AT&T Wireless	Christopher B. Fisher, Esq. 90 Maple Avenue White Plains, New York 10601
Intervenor	**Its Representative**
Sprint Spectrum L. P. d/b/a Sprint PCS	Thomas J. Regan, Esq. Brown Rudnick Berlack Israels LLP CityPlace I, 38th Floor 185 Asylum Street Hartford, CT 06103-3402

Exhibit B

Property Card

1749 DURHAM RD

Location	1749 DURHAM RD	**MBLU**	154/ 3/ / /
Acct#	00722900	**Owner**	SOUTH CENTRAL CONNECTICUT REGIONAL WATER
Assessment	$138,800	**Appraisal**	$801,600
PID	7618	**Building Count**	1
Dev. Map			

Current Value

Appraisal					
Valuation Year	**Building**	**Extra Features**	**Outbuildings**	**Land**	**Total**
2020	$0	$0	$0	$801,600	$801,600
Assessment					
Valuation Year	**Building**	**Extra Features**	**Outbuildings**	**Land**	**Total**
2020	$0	$0	$0	$138,800	$138,800

Parcel Addreses

Additional Addresses
No Additional Addresses available for this parcel

Owner of Record

Owner	SOUTH CENTRAL CONNECTICUT REGIONAL WATER	**Sale Price**	$0
Co-Owner	AUTHORITY	**Book & Page**	1761/0176
Care Of		**Sale Date**	01/06/2012
		Instrument	28

Ownership History

Ownership History				
Owner	**Sale Price**	**Book & Page**	**Instrument**	**Sale Date**
SOUTH CENTRAL CONNECTICUT REGIONAL WATER	$0	1761/0176	28	01/06/2012
RUGE ANITA	$0	1761/0172	01	01/06/2012
RUGE FRIEDA L/U & ANITA S REMAINDER	$0	1755/0158	01	12/02/2011

RUGE FRIEDA L/U& FRED& ANITA S REMAINDER	$0	1504/0164	25	04/12/2007
RUGE FRIEDA L/U &FRED& ANITA S REMAINDER	$0	0466/0239	00	06/20/1991

Building Information

Building 1 : Section 1

Year Built:

Living Area: 0

Building Attributes	
Field	**Description**
Style:	Outbuildings
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Num Kitchens	
Cndtn	
Fireplace(s)	
Xtra FPL Open	
Num Park	
Fireplaces	
Fndtn Cndtn	
Basement	

Building Photo

(http://images.vgsi.com/photos/MadisonCTPhotos//\01\01\41\63.jpg)

Building Layout

Building Layout (ParcelSketch.ashx?pid=7618&bid=7618)

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

Extra Features

Extra Features
No Data for Extra Features

Land

Land Use

Use Code	9300
Description	Pilot - Forest
Zone	RU-1

Land Line Valuation

Size (Acres)	34.61

Outbuildings

Outbuildings
No Data for Outbuildings

Exhibit C

Construction Drawings

T-Mobile

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

T-MOBILE SITE NUMBER: CTNH494A
T-MOBILE SITE NAME: CTNH494A
SITE TYPE: MONOPOLE
TOWER HEIGHT: 119'-0"

BUSINESS UNIT #: 846176
SITE ADDRESS: 1749 DURHAM ROAD MADISON, CT 06443
COUNTY: NEW HAVEN
JURISDICTION: TOWN OF MADISON

T-MOBILE SPRINT-RETAIN SITE CONFIGURATION: 67D5998C_1xAIR+1QP+1OP (GSM ONLY)

SITE INFORMATION

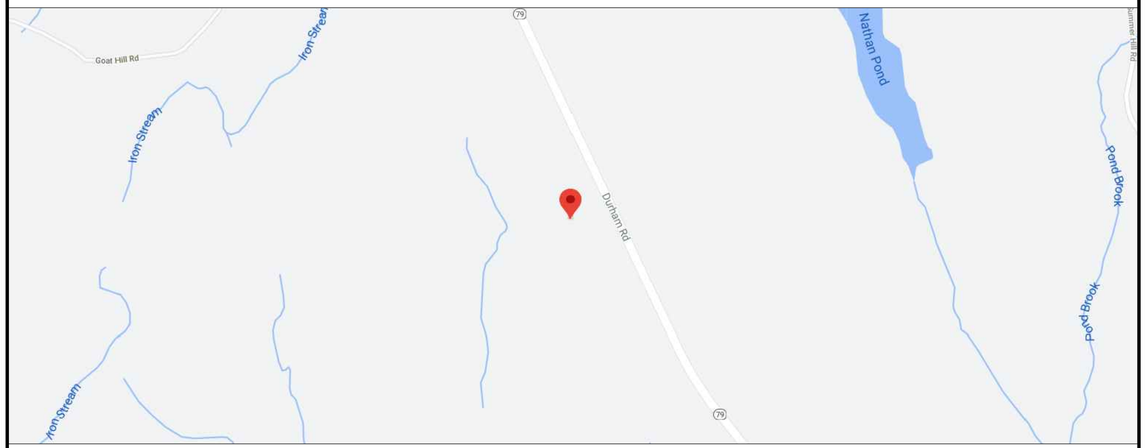
CROWN CASTLE USA INC. SITE NAME:	MADISON DURHAM ROAD
SITE ADDRESS:	1749 DURHAM ROAD MADISON, CT 06443
COUNTY:	NEW HAVEN
MAP/PARCEL #:	104174
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41° 23' 22.33" (41.389536)
LONGITUDE:	-72° 38' 55.97" (-72.648881)
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	361 FT
CURRENT ZONING:	RU-1
JURISDICTION:	TOWN OF MADISON
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	AT&T 1749 DURHAM ROAD MADISON, CT 06443
TOWER OWNER:	CROWN CASTLE USA, INC. 1200 MACARTHUR BLVD, SUITE 200 MAHWAH, NJ 07430
CARRIER/APPLICANT:	T-MOBILE 35 GRIFFIN ROAD BLOOMFIELD, CT 06002
ELECTRIC PROVIDER:	NORTHEAST UTILITIES (800) 286-2000
TELCO PROVIDER:	AT&T (800) 331-0500

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1.1	FINAL SITE PLAN
C-1.2	EXISTING & FINAL EQUIPMENT PLAN
C-2	FINAL ELEVATION & ANTENNA PLANS
C-3	ANTENNA & CABLE SCHEDULE
C-4	EQUIPMENT SPECS
C-5	ICE BRIDGE DETAIL
C-6	CABINET SPECS
E-1	AC PANEL SCHEDULES & ONE LINE DIAGRAM
G-1	ANTENNA GROUNDING DIAGRAM
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS

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

LOCATION MAP



NO SCALE

PROJECT TEAM

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

NOTE:
PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN 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) EXISTING SPRINT ANTENNAS
- REMOVE (9) EXISTING SPRINT RRHs w/ (3) FILTERS
- REUSE (1) PLATFORM MOUNT
- INSTALL (1) SITEPRO1 SUPPORT RAIL
- INSTALL (9) ANTENNAS
- INSTALL (9) RRHs
- INSTALL (6) BACK-TO-BACK RADIO MOUNTS
- INSTALL (4) 6/24 HCS 4AWG 100m CABLES

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

APPLICABLE CODES/REFERENCE DOCUMENTS

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

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

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	TOWER ENGINEERING PROFESSIONALS
DATED:	02/17/2021
MOUNT ANALYSIS:	GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION
DATED:	02/03/2021
ORDER ID:	538760
REVISION:	0
RFDS VERSION:	1
DATED:	01/12/2021

ANALYSIS CRITERIA:

APPLICABLE CODES:	TIA-222-H / ASCE 7-16
WIND SPEED:	V = 130 MPH (ULTIMATE 3 SECOND GUST)
EXPOSURE CATEGORY:	B
RISK CATEGORY:	II
TOPOGRAPHIC CATEGORY:	1
SEISMIC Ss:	0.176
SEISMIC S1:	0.061
SERVICE WIND SPEED:	60 MPH

APPROVALS

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

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

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
1200 MACARTHUR BLVD, SUITE 200
MAHWAH, NJ 07430

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

TEP JOB #: 217566.498712

T-MOBILE SITE NUMBER:
CTNH494A

BU #: 846176
MADISON DURHAM ROAD

1749 DURHAM ROAD
MADISON, CT 06443
(NEW HAVEN COUNTY)

EXISTING 119'-0"
MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	03/01/21	CLR	PRELIMINARY	BSE
0	03/17/21	CLR	CONSTRUCTION	BSE

SEAL:

GRAHAM M. ANDRES
29538
LICENSED
PROFESSIONAL ENGINEER

03/17/21

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

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION
   CARRIER: 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.
13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
14. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST–IN–PLACE CONCRETE.
2. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°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.

GREENFIELD GROUNDING NOTES:

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

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. VERYIFY 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 PER 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/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL–CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON–PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER–ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY–COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 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.

CONDUCTOR COLOR CODE

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

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

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
RET	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

T · · Mobile · · ·

35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE

1200 MACARTHUR BLVD, SUITE 200
MAHWAH, NJ 07430

TOWER ENGINEERING PROFESSIONALS

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

TEP JOB #: 217566.498712

T-MOBILE SITE NUMBER:
CTNH494A

BU #: 846176
MADISON DURHAM ROAD

1749 DURHAM ROAD
MADISON, CT 06443
(NEW HAVEN COUNTY)

EXISTING 119'-0"
MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	03/01/21	CLR	PRELIMINARY	BSE
0	03/17/21	CLR	CONSTRUCTION	BSE

SEAL:

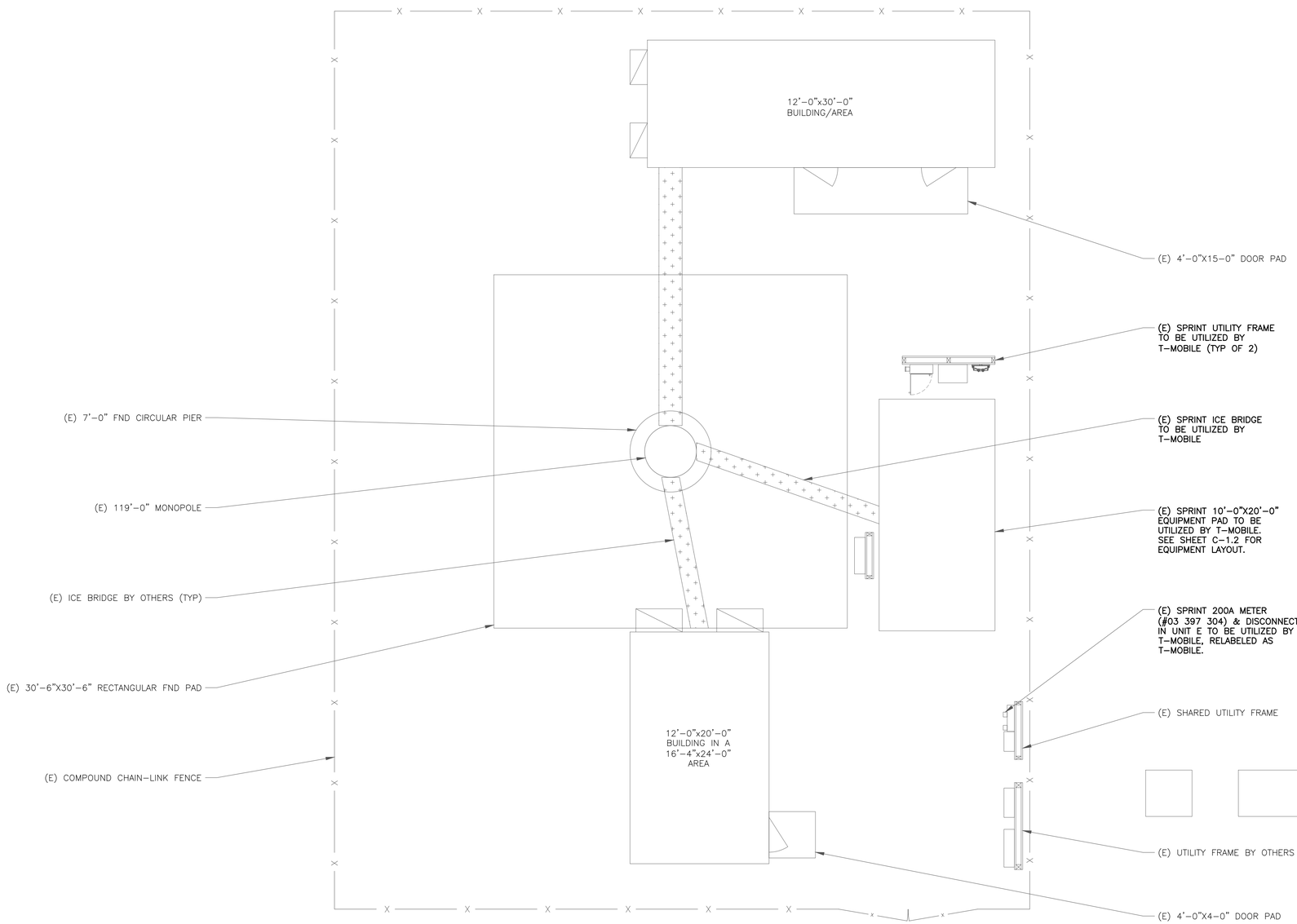
03/17/21

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

SHEET NUMBER:	REVISION:
T-2	0

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

FLOODPLAIN NOTE:
THE TOWER IS LOCATED IN ZONE "X" AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN ACCORDING TO FEMA COMMUNITY PANEL #09009C0344H, DATED 12/17/2010.



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

N

T-Mobile

35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE

1200 MACARTHUR BLVD, SUITE 200
MAHWAH, NJ 07430

TOWER ENGINEERING PROFESSIONALS

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

TEP JOB #: 217566.498712

T-MOBILE SITE NUMBER:
CTNH494A

BU #: 846176
MADISON DURHAM ROAD

1749 DURHAM ROAD
MADISON, CT 06443
(NEW HAVEN COUNTY)

EXISTING 119'-0"
MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	03/01/21	CLR	PRELIMINARY	BSE
0	03/17/21	CLR	CONSTRUCTION	BSE

SEAL:

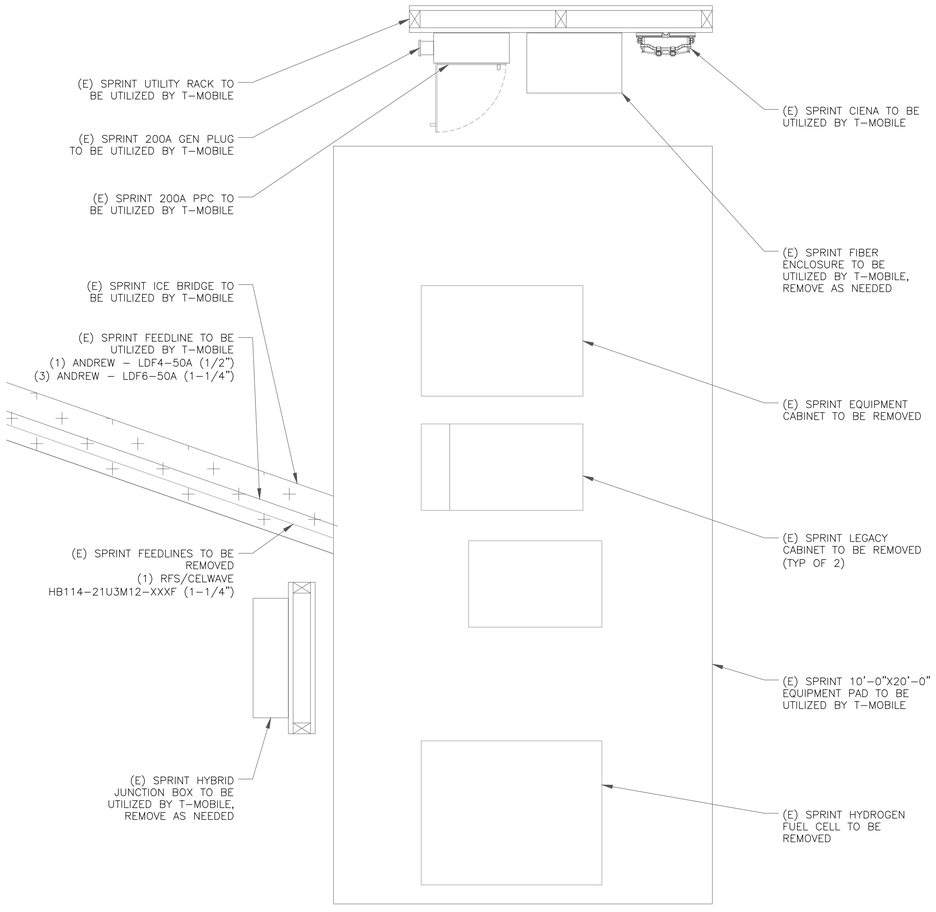
GRADY M. ANDRES
STATE OF CONNECTICUT
20538
LICENSED
PROFESSIONAL ENGINEER

03/17/21

SHEET NUMBER: C-1.1

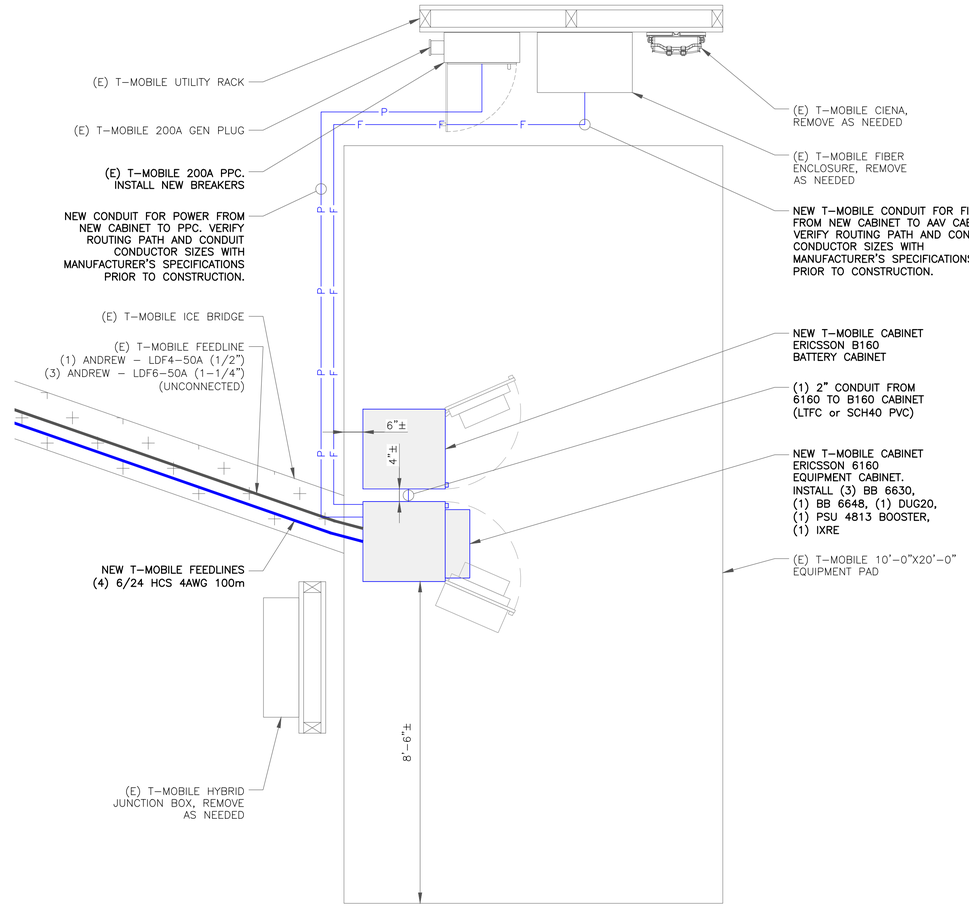
REVISION: 0

FLOODPLAIN NOTE:
THE TOWER IS LOCATED IN ZONE "X" AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN ACCORDING TO FEMA COMMUNITY PANEL #09009C0344H, DATED 12/17/2010.



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

N



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

N

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
1200 MACARTHUR BLVD, SUITE 200
MAHWAH, NJ 07430

TOWER ENGINEERING PROFESSIONALS
326 TRYON RD
RALEIGH, NC 27603
(919) 661-6351
TEP JOB #: 217566.498712

T-MOBILE SITE NUMBER:
CTNH494A

BU #: 846176
MADISON DURHAM ROAD

1749 DURHAM ROAD
MADISON, CT 06443
(NEW HAVEN COUNTY)

EXISTING 119'-0" MONOPOLE

ISSUED FOR:

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SEAL:

03/17/21

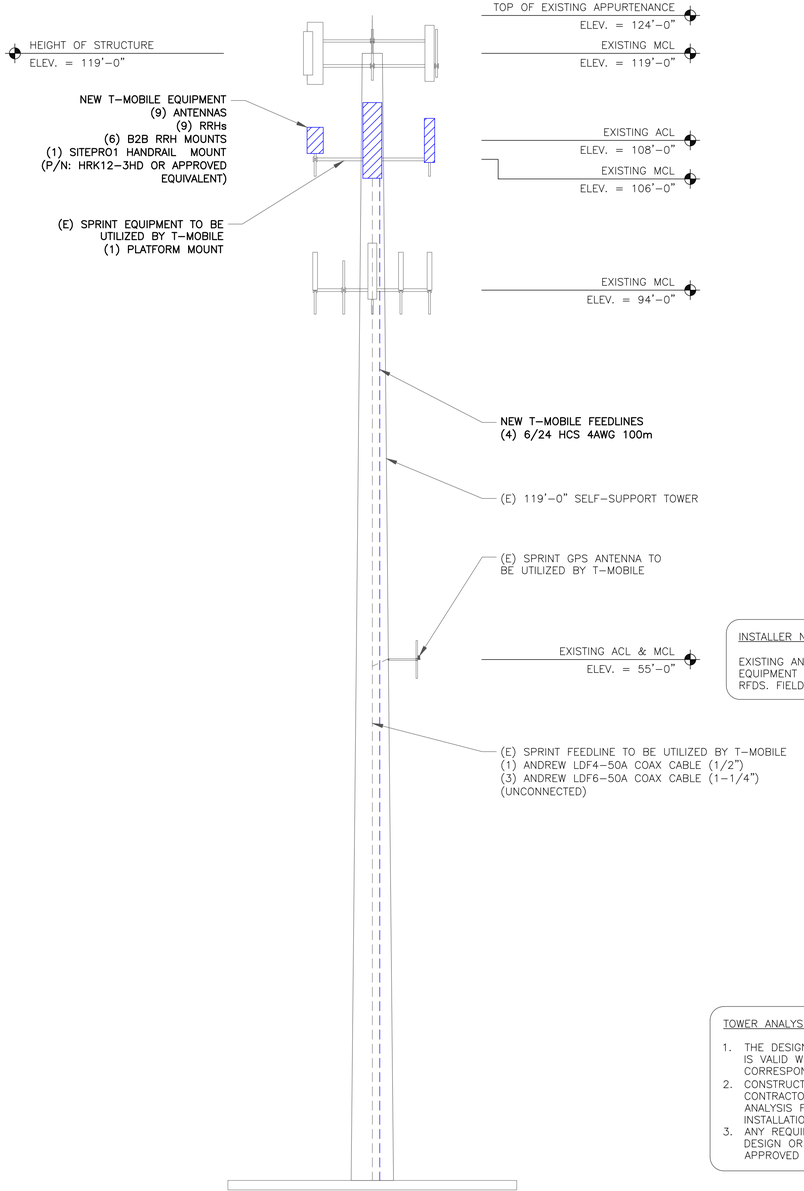
SHEET NUMBER: C-1.2

REVISION: 0

T–MOBILE EQUIPMENT

ANTENNA CL: 108'–0"
MOUNT CL: 106'–0"

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



1 FINAL ELEVATION
SCALE: NOT TO SCALE

INSTALLER NOTE:

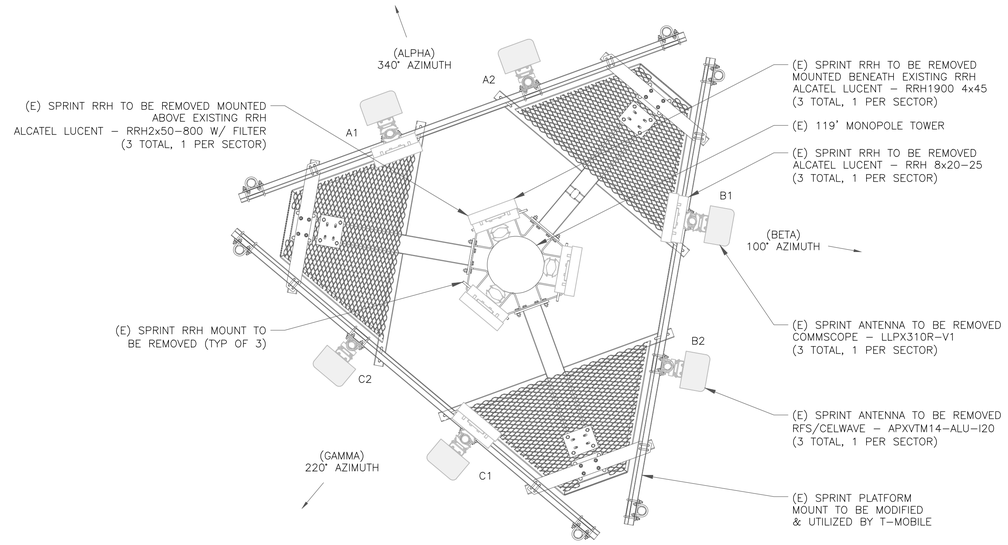
EXISTING AND PROPOSED ANTENNA/ EQUIPMENT POSITIONING SHOWN PER RFDS. FIELD CONDITIONS MAY VARY.

TOWER ANALYSIS NOTES:

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

MOUNT ANALYSIS NOTES:

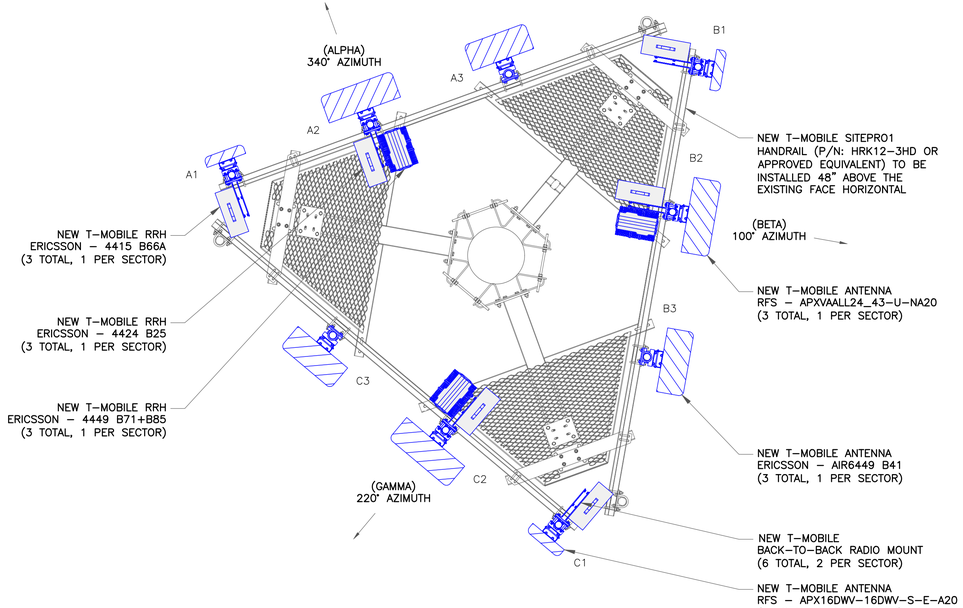
1. THE DESIGN DEPICTED IN THESE DRAWINGS IS VALID WHEN ACCOMPANIED BY A CORRESPONDING PASSING MOUNT ANALYSIS.
2. CONSTRUCTION MANAGER / GENERAL CONTRACTOR SHALL REVIEW THE MOUNT ANALYSIS FOR ANY CONDITIONS PRIOR TO INSTALLATION.
3. ANY REQUIRED MOUNT MODIFICATION DESIGN OR MOUNT REPLACEMENT SHALL BE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



2 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE

RRH NOTE:

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



3 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
1200 MACARTHUR BLVD, SUITE 200
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MADISON DURHAM ROAD

1749 DURHAM ROAD
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(NEW HAVEN COUNTY)

EXISTING 119'-0"
MONOPOLE

ISSUED FOR:

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SEAL:

03/17/21

SHEET NUMBER: C-2

REVISION: 0

FINAL ANTENNA SCHEDULE

SECTOR	POS.	TECHNOLOGY	RAD CENTER	AZIMUTH	ANTENNA MANUFACTURER	ANTENNA MODEL	MECH. TILT	ELECT. TILT	TOWER MOUNTED EQUIPMENT	FEEDLINE TYPE
ALPHA	A1	L2100	108'–0"	340°	RFS	APX16DWV–16DWV–S–E–A20 (QUAD)	0°	2°	(1) ERICSSON – 4415 B66A	HYBRID (SHARED)
ALPHA	A2	L700, L600, N600, L1900, G1900	108'–0"	340°	RFS	APXVAALL24_43–U–NA20 (OCTO)	0°	2°/5°	(1) ERICSSON – 4449 B71+B85 (1) ERICSSON – 4424 B25	(1) 6/24 HCS 4AWG 100m
ALPHA	A3	L2500, N2500	108'–0"	340°	ERICSSON	AIR6449 B41 (ACTIVE ANTENNA – MASSIVE MIMO)	0°	2°	–	(1) 6/24 HCS 4AWG 100m
BETA	B1	L2100	108'–0"	100°	RFS	APX16DWV–16DWV–S–E–A20 (QUAD)	0°	2°	(1) ERICSSON – 4415 B66A	HYBRID (SHARED)
BETA	B2	L700, L600, N600, L1900, G1900	108'–0"	100°	RFS	APXVAALL24_43–U–NA20 (OCTO)	0°	2°/5°	(1) ERICSSON – 4449 B71+B85 (1) ERICSSON – 4424 B25	(1) 6/24 HCS 4AWG 100m
BETA	B3	L2500, N2500	108'–0"	100°	ERICSSON	AIR6449 B41 (ACTIVE ANTENNA – MASSIVE MIMO)	0°	2°	–	HYBRID (SHARED)
GAMMA	C1	L2100	108'–0"	220°	RFS	APX16DWV–16DWV–S–E–A20 (QUAD)	0°	2°	(1) ERICSSON – 4415 B66A	HYBRID (SHARED)
GAMMA	C2	L700, L600, N600, L1900, G1900	108'–0"	220°	RFS	APXVAALL24_43–U–NA20 (OCTO)	0°	2°/5°	(1) ERICSSON – 4449 B71+B85 (1) ERICSSON – 4424 B25	(1) 6/24 HCS 4AWG 100m
GAMMA	C3	L2500, N2500	108'–0"	220°	ERICSSON	AIR6449 B41 (ACTIVE ANTENNA – MASSIVE MIMO)	0°	2°	–	HYBRID (SHARED)

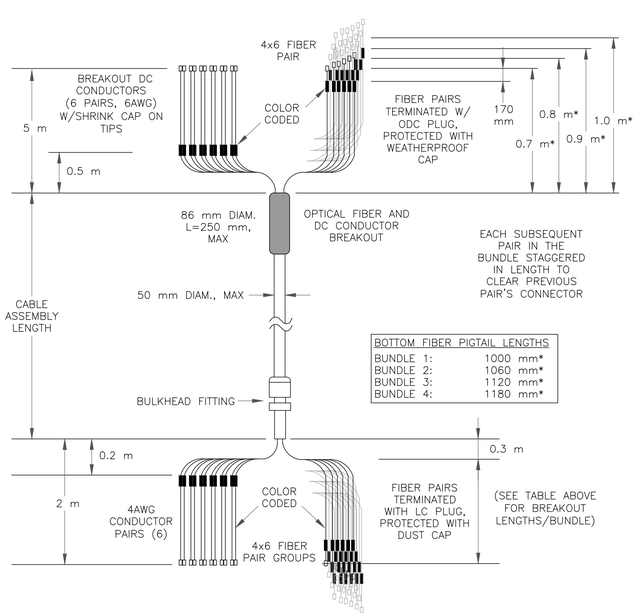
PROPOSED ANTENNA/EQUIPMENT SHOWN IN BOLD

FINAL CABLE SCHEDULE

STATUS	CABLE TYPE	SIZE	QUANTITY
NEW	HCS	6/24 4AWG 100m	3
CABLE QUANTITY			3

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

1 PROPOSED ANTENNA AND CABLE SCHEDULE
SCALE: NOT TO SCALE



2 HCS DETAIL
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
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MAHWAH, NJ 07430

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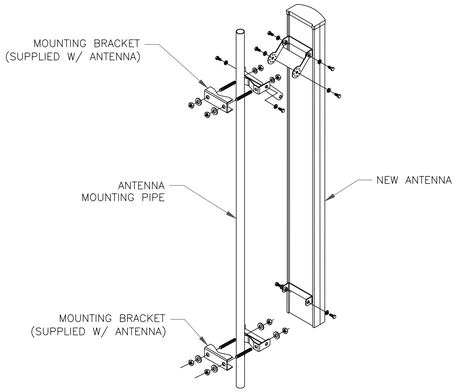
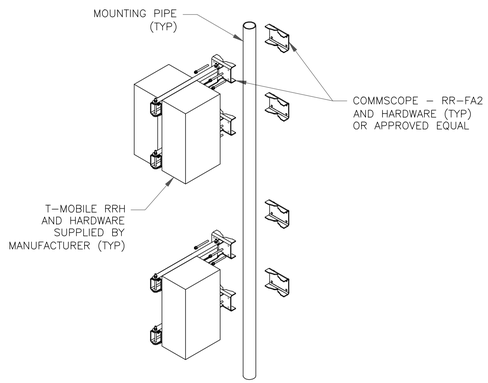
REVISION: 0



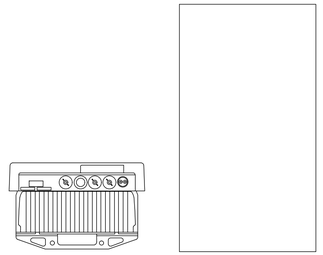
1 ANTENNA MOUNTING DETAIL
SCALE: NOT TO SCALE

INSTALLER NOTES:

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

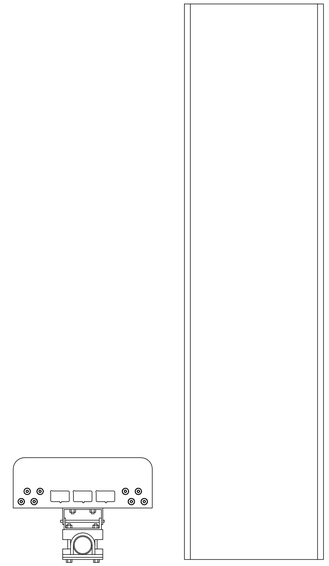


2 RRHs MOUNTING DETAIL
SCALE: NOT TO SCALE



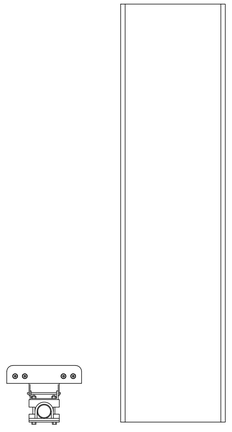
ERICSSON – AIR6449 B41
WEIGHT: 104.0 LBS
SIZE (HxWxD): 33.10x20.60x8.60 IN.

3 ERICSSON – AIR6449 B41
SCALE: NOT TO SCALE



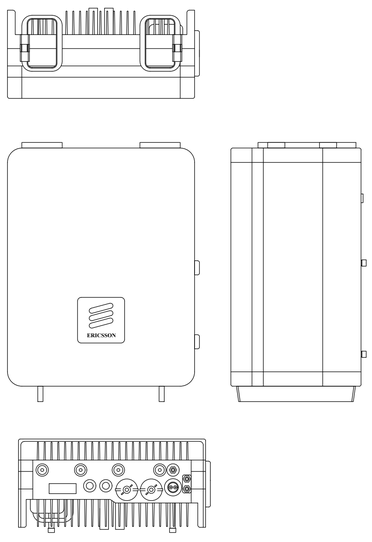
RFS/CELWAVE – APXVAALL24_43-U-NA20
WEIGHT (WITHOUT MOUNTING HARDWARE): 149.9 LBS
SIZE (HxWxD): 95.9x24.0x8.5 IN.

4 RFS/CELWAVE – APXVAALL24_43-U-NA20
SCALE: NOT TO SCALE



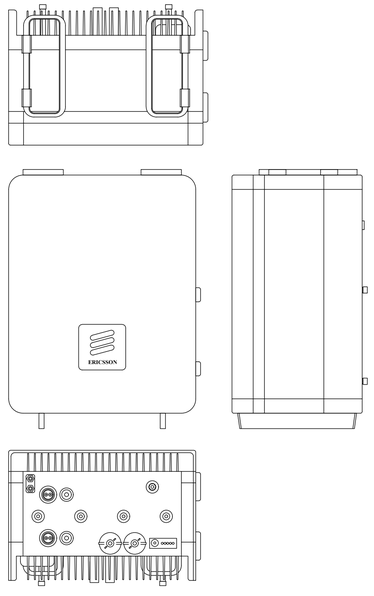
RFS – APX16DWV-16DWV-S-E-A20
WEIGHT (WITHOUT MOUNTING HARDWARE): 40.70 LBS
SIZE (HxWxD): 55.9x13.3x3.15 IN.

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



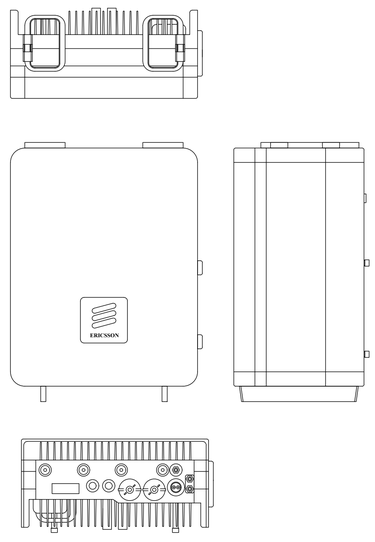
ERICSSON – RADIO 4415 B25
WEIGHT: 44.0 LBS
SIZE (HxWxD): 14.96x13.19x5.39 IN.

6 ERICSSON – RADIO 4415 B25
SCALE: NOT TO SCALE



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

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



ERICSSON – RADIO 4424 B25
WEIGHT: 86.0 LBS
SIZE (HxWxD): 17.91x13.20x10.63 IN.

8 ERICSSON – RADIO 4424 B25
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
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(919) 661-6351

TEP JOB #: 217566.498712

T-MOBILE SITE NUMBER:
CTNH494A

BU #: 846176
MADISON DURHAM ROAD

1749 DURHAM ROAD
MADISON, CT 06443
(NEW HAVEN COUNTY)

EXISTING 119'-0"
MONOPOLE

ISSUED FOR:

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SEAL:

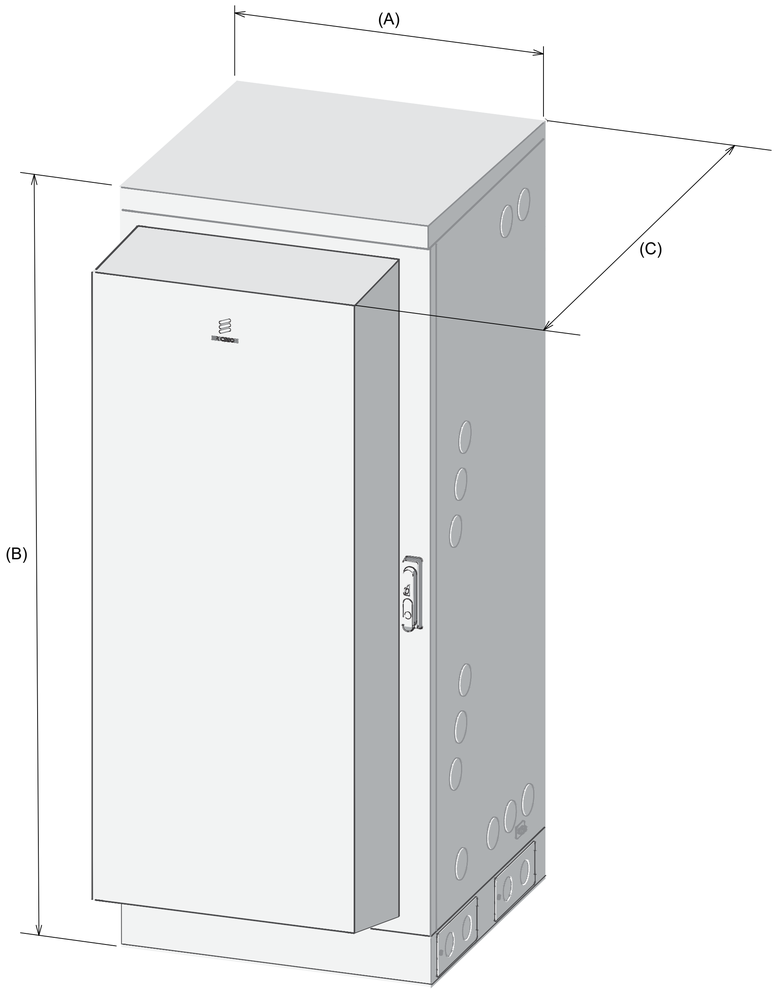
03/17/21

SHEET NUMBER: C-4

REVISION: 0

INSTALLER NOTES:

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



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

1 ERICSSON 6160 CABINET DETAILS
SCALE: NOT TO SCALE

2 ERICSSON B160 CABINET DETAILS
SCALE: NOT TO SCALE

T-Mobile

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CROWN CASTLE

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SEAL:

STATE OF CONNECTICUT
29538
LICENSED
PROFESSIONAL ENGINEER

03/17/21

SHEET NUMBER: C-5

REVISION: 0

NOTE:
LOAD CALCULATIONS TAKEN FROM INFORMATION PROVIDED BY CROWN CASTLE & POWER ANALYSIS TOOL BASED ON THE RFDS DATED 01/12/2021 V1.0. CONTRACTOR TO VERIFY LOADS WITH MANUFACTURER'S SPECIFICATIONS PRIOR TO CONSTRUCTION.

EXISTING 200A M.C.B, 240/120 VAC, 1ø, 3W PPC PANEL SCHEDULE

LOAD SERVED	VOLT AMPERES (WATTS) L1	VOLT AMPERES (WATTS) L2	TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPERES (WATTS) L1	VOLT AMPERES (WATTS) L2	LOAD SERVED
SURGE	100		60	1	A	2	10	340		FAN
		100		3	B	4	15		180	RECEPTACLE
NID OUTLET	180		15	5	A	6	10	500		LIGHT
**BTS 1		9600	**100	7	B	8	20		0	*UNKNOWN (OFF)
	9600			9	A	10	15	0		*UNKNOWN (OFF)
SPARE		–	–	11	B	12	80		0	*BTS 2 (OFF)
SPARE	–		–	13	A	14		0		
SPARE		–	–	15	B	16	15		1440	GENERATOR HEATER
SPARE	–		–	17	A	18	–	–		SPARE
SPARE		–	–	19	B	20	–		–	SPARE
SPARE	–		–	21	A	22	–	–		SPARE
SPARE		–	–	23	B	24	–		–	SPARE
VOLT AMPS	9880	9700						840	1620	VOLT AMPS

L1 VOLT AMPERES	10720	11320 L2 VOLT AMPERES
	11320	MAX VOLT AMPERES
	94.4	MAX AMPS
	117.9	MAX AMPS x 125%

*NOTE – EXISTING BREAKER TO BE REMOVED. NOTIFY TEP IF BREAKER IS TO REMAIN.
**NOTE – REUSE BREAKER FOR NEW CABINET INSTALL

PROPOSED 200A M.C.B, 240/120 VAC, 1ø, 3W PPC PANEL SCHEDULE

LOAD SERVED	VOLT AMPERES (WATTS) L1	VOLT AMPERES (WATTS) L2	TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPERES (WATTS) L1	VOLT AMPERES (WATTS) L2	LOAD SERVED
SURGE	100		60	1	A	2	10	340		FAN
		100		3	B	4	15		180	RECEPTACLE
NID OUTLET	180		15	5	A	6	10	500		LIGHT
6160 ENCLOSURE		**7405**	**100	7	B	8	–		–	SPARE
	7405			9	A	10	–	–		SPARE
GFCI INTERNAL IN 6160		**180**	**20**	11	B	12	–		–	SPARE
SPARE	–		–	13	A	14	–	–		SPARE
SPARE		–	–	15	B	16	15		1440	GENERATOR HEATER
SPARE	–		–	17	A	18	–	–		SPARE
SPARE		–	–	19	B	20	–		–	SPARE
SPARE	–		–	21	A	22	–	–		SPARE
SPARE		–	–	23	B	24	–		–	SPARE
VOLT AMPS	7685	7685						840	1620	VOLT AMPS

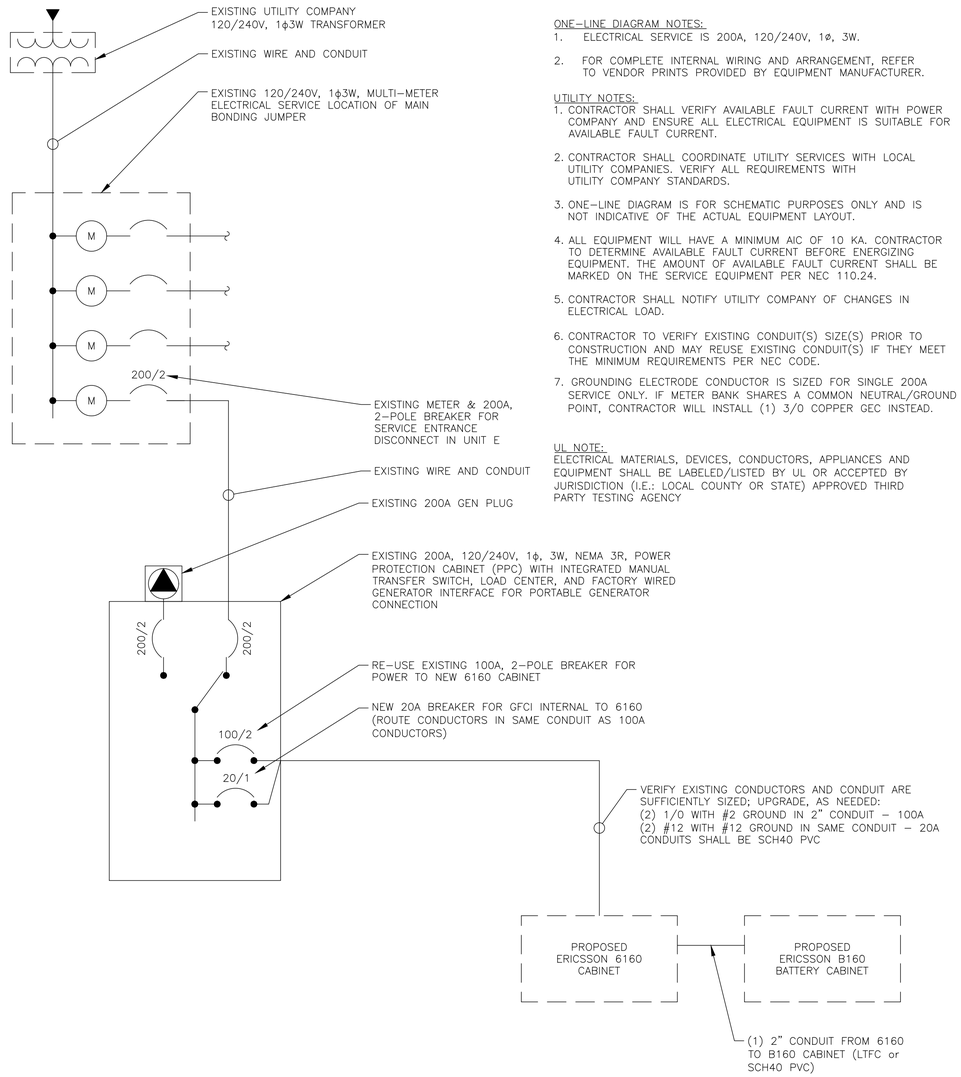
L1 VOLT AMPERES	8525	9305 L2 VOLT AMPERES
	9305	MAX VOLT AMPERES
	77.5	MAX AMPS
	96.9	MAX AMPS x 125%

NOTE – PROPOSED BREAKER IN BOLD

1 AC PANEL SCHEDULES
SCALE: NOT TO SCALE

GENERAL NOTES:

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



ONE–LINE DIAGRAM NOTES:
1. ELECTRICAL SERVICE IS 200A, 120/240V, 1ø, 3W.
2. FOR COMPLETE INTERNAL WIRING AND ARRANGEMENT, REFER TO VENDOR PRINTS PROVIDED BY EQUIPMENT MANUFACTURER.

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

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

2 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
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03/17/21

SHEET NUMBER: E-1

REVISION: 0

T-MOBILE GROUNDING NOTES:

ALL GROUNDS MUST ROUTE DOWNHILL FOR ENTIRE DURATION OF ROUTE

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

ICE BRIDGE/ EQUIPMENT POST:

#2 SOLID COPPER TINNED, EXOTHERMICALLY WELDED TO GROUND RING (BOTH ENDS), FINAL WELD COLD GALVANIZED, IN ½" NON–METALLIC SEAL TIGHT CONDUIT, SEALED WITH SILICONE, ANCHORED TO PAD/PLATFORM TO AVOID TRIP HAZARD USING HAMMER SET ANCHORS.

PEDESTALS, PLINTHS, SSC CABINET, FCOA CABINETS:

1. #2 SOLID COPPER TINNED, 2 HOLE LUG WITH FLAT AND LOCK WASHER AT EQUIPMENT; EXOTHERMICALLY WELDED TO GROUND RING, FINAL WELD COLD GALVANIZED, IN ½" NON–METALLIC SEAL TIGHT CONDUIT, SEALED WITH SILICONE, ANCHORED TO PAD TO AVOID TRIP HAZARD USING HAMMER SET ANCHORS. EACH PART REQUIRES A SEPARATE DOWNLEAD, NO DAISY CHAINS.

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

COVP's:

#6 THHN STRANDED (GREEN JACKET), CONNECTED AT EQUIPMENT SIDE USING OVP TERMINAL BLOCK CONNECTION; MECHANICALLY CONNECTED TO GROUND REFERENCE AT MASTER BUSS BAR USING 2 HOLE LUG WITH FLAT AND LOCK WASHER, IN ½" NON–METALLIC SEAL TIGHT CONDUIT, SEALED WITH SILICONE, AND ANCHORED TO PAD/PLATFORM TO AVOID TRIP HAZARD.

ANTENNA/ COVP/ RRU MAST PIPES:

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

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

AIR TERMINALS:

TO BE INSTALLED, ONLY IF REQUIRED

TMA's, DIPLEXERS AND TRIPLEXERS:

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

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

ELEVATED STEEL PLATFORMS WITH LUNAR FEET:

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

STEEL CANOPY (STEEL PLATFORM OR CONCRETE PAD):

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

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

RRU:

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

FSBE ALARM BOX:

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

SURGE SUPPRESSORS:

#6 THHN TO PREVIOUSLY GROUNDED BUSS BAR USING PROPER LUGS

FYGA/FYGB BRACKET:

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

2. THROUGH BOLTS WITH FLAT, LOCK ON BRACKET

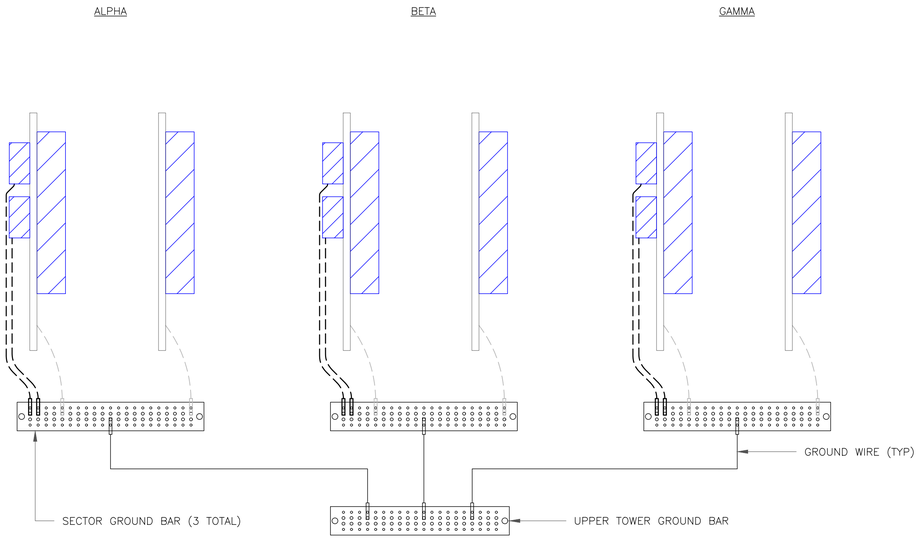
BUSS BARS:

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

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

GENERAL:

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



NOTE:

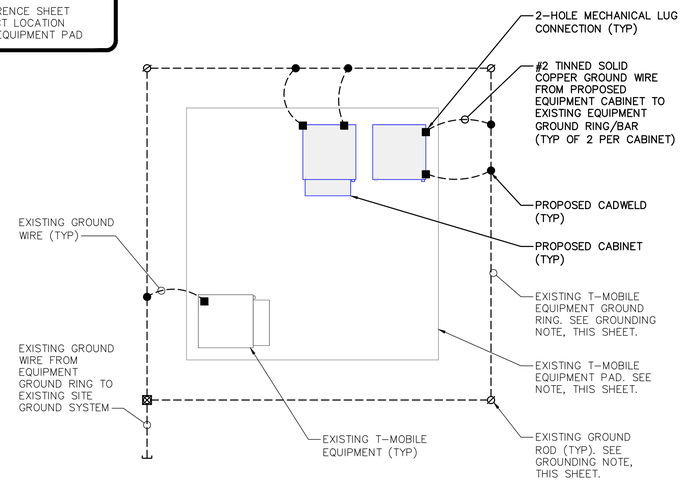
ALL NEW GROUNDS TO BE #6 STRANDED COPPER WITH GREEN INSULATION UNLESS NOTED OTHERWISE.

GROUNDING SHOWN TYPICAL PER SECTOR.

1 TYPICAL ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

NOTE:

CONTRACTOR TO REFERENCE SHEET C–1.1 & 1.2 FOR EXACT LOCATION AND ORIENTATION OF EQUIPMENT PAD



2 TYPICAL CABINET GROUNDING DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
1200 MACARTHUR BLVD, SUITE 200
MAHWAH, NJ 07430

TOWER ENGINEERING PROFESSIONALS
326 TRYON RD
RALEIGH, NC 27603
(919) 661-6351
TEP JOB #: 217566.498712

T-MOBILE SITE NUMBER:
CTNH494A

BU #: 846176
MADISON DURHAM ROAD

1749 DURHAM ROAD
MADISON, CT 06443
(NEW HAVEN COUNTY)

EXISTING 119'-0"
MONOPOLE

ISSUED FOR:

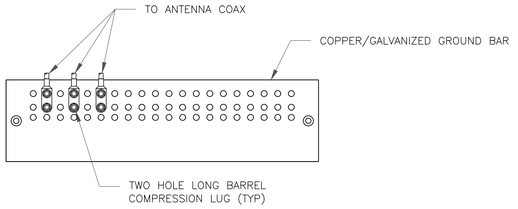
REV	DATE	DRWN	DESCRIPTION	DES./QA
A	03/01/21	CLR	PRELIMINARY	BSE
0	03/17/21	CLR	CONSTRUCTION	BSE

SEAL:

03/17/21

SHEET NUMBER: G-1

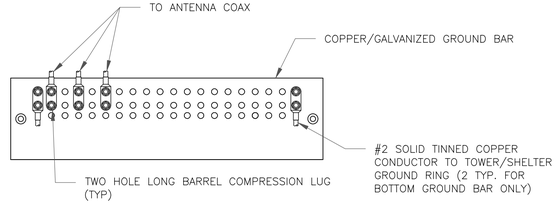
REVISION: 0



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.

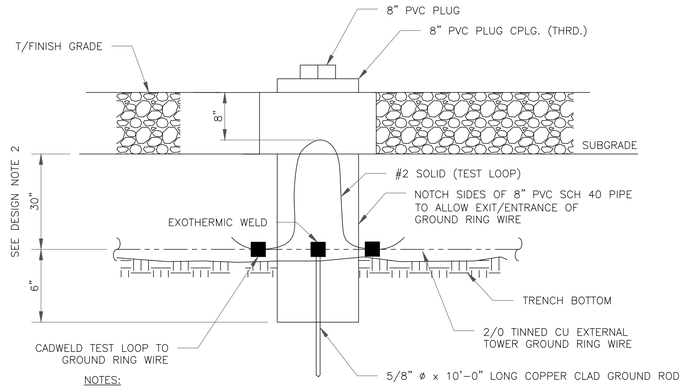
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



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.

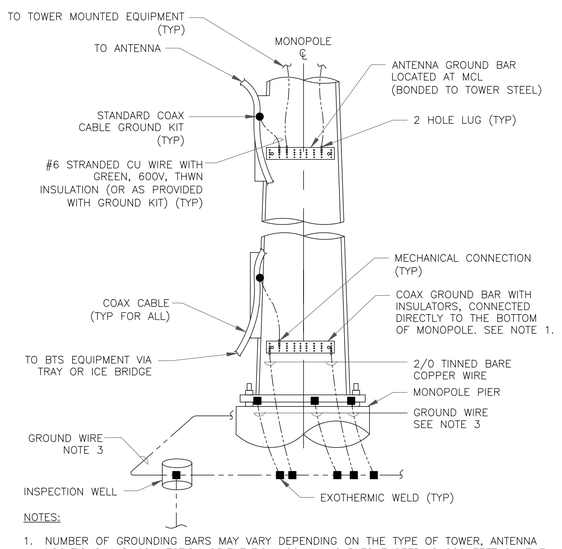
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

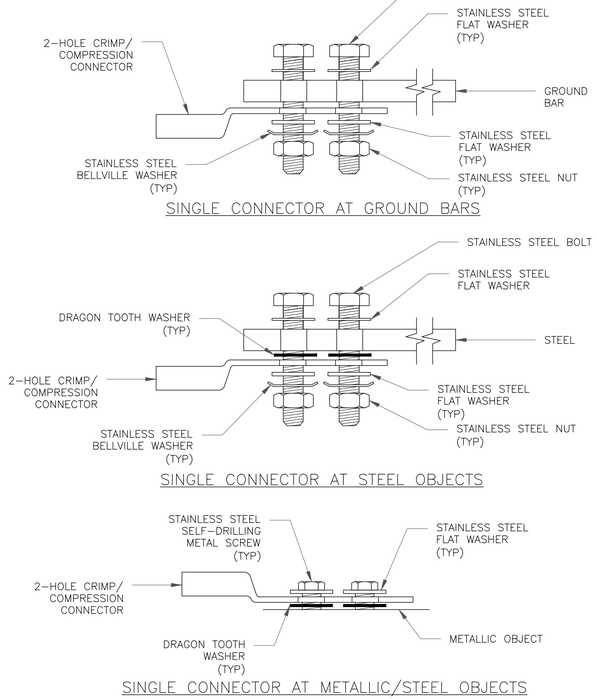
3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



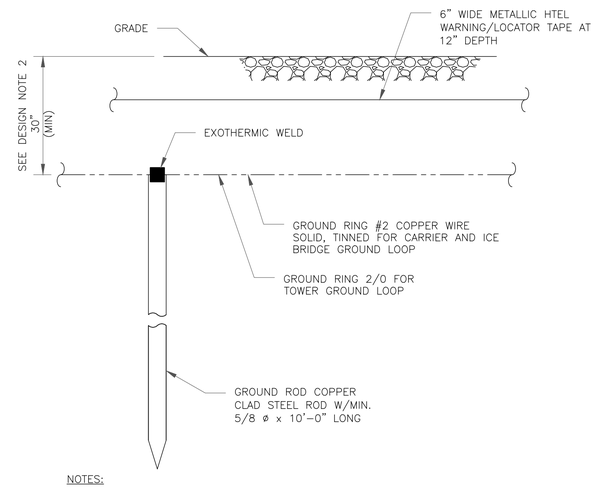
NOTES:

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

4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

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

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
1200 MACARTHUR BLVD, SUITE 200
MAHWAH, NJ 07430

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

TEP JOB #: 217566.498712

T-MOBILE SITE NUMBER:
CTNH494A

BU #: 846176
MADISON DURHAM ROAD

1749 DURHAM ROAD
MADISON, CT 06443
(NEW HAVEN COUNTY)

EXISTING 119'-0"
MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	03/01/21	CLR	PRELIMINARY	BSE
0	03/17/21	CLR	CONSTRUCTION	BSE

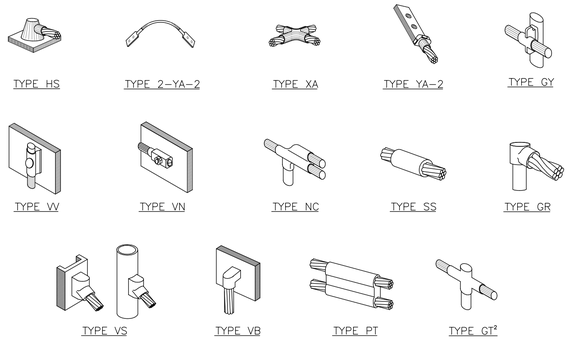
SEAL:

STATE OF CONNECTICUT
GRAHAM M. SANDRES
29538
LICENSED
PROFESSIONAL ENGINEER

03/17/21

SHEET NUMBER: G-2

REVISION: 0

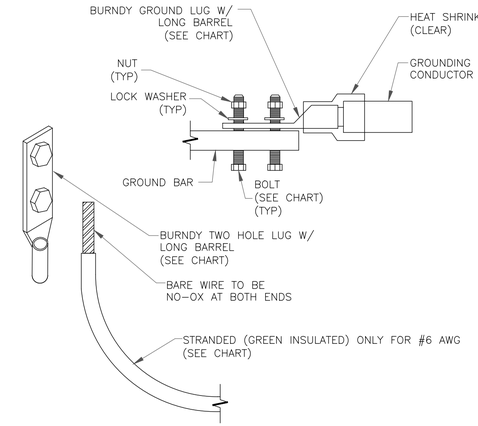


NOTE:

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

1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE

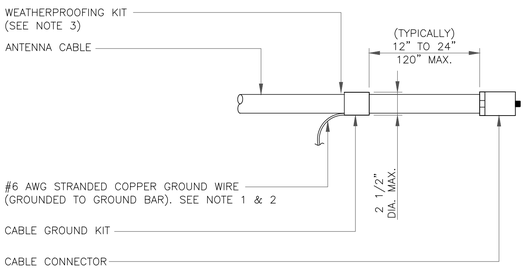
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



NOTES:

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

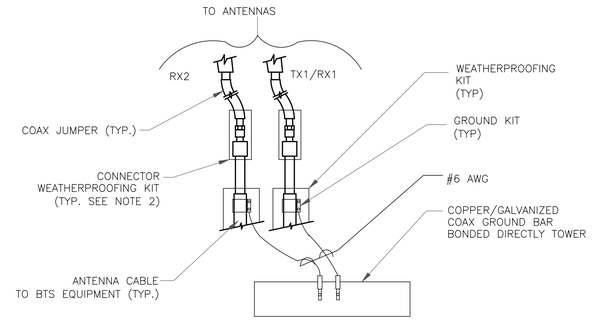
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



NOTES:

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

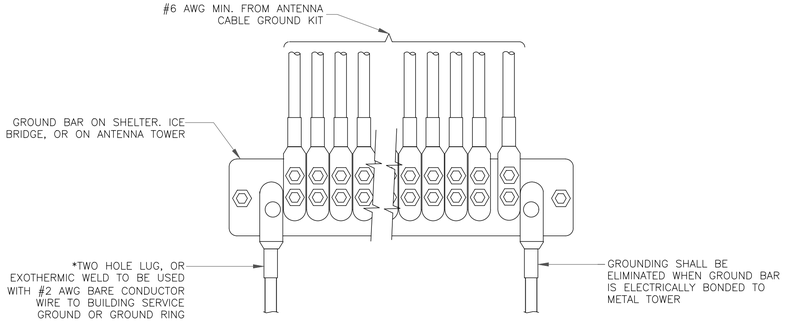
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



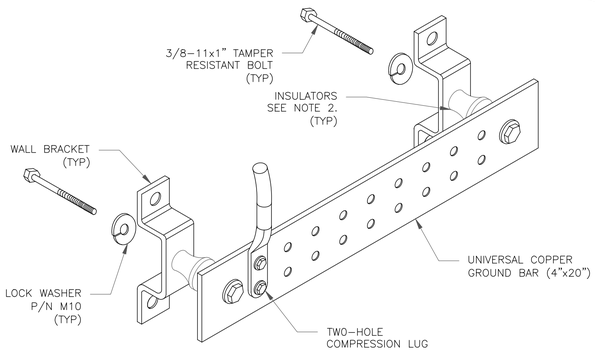
NOTES:

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

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



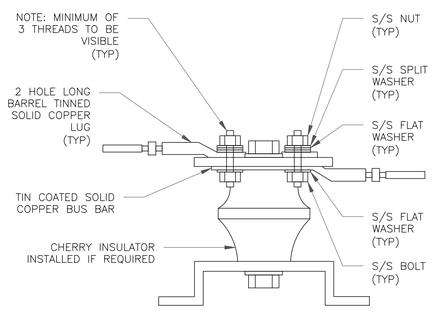
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



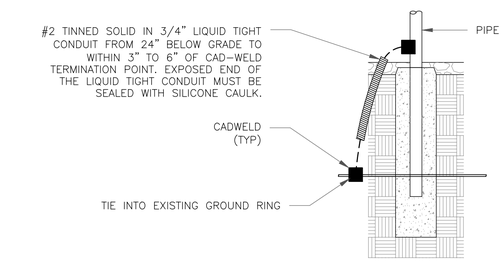
NOTES:

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

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
1200 MACARTHUR BLVD, SUITE 200
MAHWAH, NJ 07430

TOWER ENGINEERING PROFESSIONALS
326 TRYON RD
RALEIGH, NC 27603
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TEP JOB #: 217566.498712

T-MOBILE SITE NUMBER:
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MADISON DURHAM ROAD

1749 DURHAM ROAD
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(NEW HAVEN COUNTY)

EXISTING 119'-0"
MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	03/01/21	CLR	PRELIMINARY	BSE
0	03/17/21	CLR	CONSTRUCTION	BSE

SEAL:

03/17/21

SHEET NUMBER: G-3

REVISION: 0

Exhibit D

Structural Analysis Report

Date: **February 17, 2021**

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

Subject: Structural Analysis Report

Carrier Designation:	***Sprint PCS* Co-Locate**	
	Site Number:	CTNH494A
	Site Name:	CTNH494A
Crown Castle Designation:	**BU Number:**	846176
	Site Name:	MADISON DURHAM ROAD
	JDE Job Number:	628904
	Work Order Number:	1918913
	Order Number:	538760 Rev. 1
Engineering Firm Designation:	**TEP Project Number:**	217566.498361
Site Data:	**1749 Durham Road, Madison, New Haven County, CT 06443** **Latitude *41° 23' 22.33"*, Longitude *-72° 38' 55.97"*** **119 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 – 47.3%**

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

Structural analysis prepared by: Jonathan C. McGinnis, E.I. / RLM

Respectfully submitted by:

Aaron T. Rucker, P.E.

02/17/2021

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 119-ft monopole tower designed by Sabre Communications.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	130 mph
Exposure Category:	B
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)
106.0	108.0	3	RFS Celwave	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	4 3	1-5/8 1-1/4
		3	RFS Celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
		3	Ericsson	AIR6449 B41_T-Mobile w/ Mount Pipe		
		3	Ericsson	RADIO 4415 B66A_CCIV3		
		3	Ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	Ericsson	RADIO 4424 B25_TMO		
	106.0	1	Tower Mounts	Platform Mount [LP 602-1]		
55.0	55.0	1	Pctel	GPS-TMG-HR-26NCM	1	1/2
		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)
119.0	119.0	3	Powerwave Technologies	7770.00 w/ Mount Pipe	12 4 2	1-5/8 3/4 3/8
		3	CCI Antennas	OPA65R-BU6A w/ Mount Pipe		
		3	Kathrein	80010965 w/ Mount Pipe		
		6	Powerwave Technologies	LGP21401		
		2	Raycap	DC6-48-60-18-8F		
		3	Ericsson	RRUS 4449 B5/B12		
		3	Ericsson	RRUS 8843 B2/B66A		
		1	Tower Mounts	Platform Mount [LP 602-1]		
94.0	96.0	4	RFS Celwave	APL868013 w/ Mount Pipe	12	1-5/8
		3	Antel	BXA-171063-8BF-EDIN-0 w/ Mount Pipe		
		3	Antel	BXA-70063-6CF-EDIN-0 w/ Mount Pipe		
		2	Decibel	DB846F65E-SX w/ Mount Pipe		
		6	RFS Celwave	FD9R6004/2C-3L		
	94.0	1	Tower Mounts	Platform Mount [LP 601-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Geotechnical Report	4301706	CCISites
Tower Foundation Drawings	4552185	CCISites
Tower Manufacturer Drawings	4516773	CCISites

3.1) Analysis Method

tnxTower (version 8.0.7.5), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 Standard.

3.2) Assumptions

1) 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)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	ϕP_{allow} (lb)	% Capacity	Pass / Fail
L1	119 - 97.25	Pole	TP30.86x25.5x0.25	1	-8.79	1443.91	12.8	Pass
L2	97.25 - 48	Pole	TP42.47x29.374x0.313	2	-20.21	2489.82	36.8	Pass
L3	48 - 0	Pole	TP53.65x40.554x0.375	3	-36.26	3895.00	41.0	Pass
							Summary	
						Pole (L3)	41.0	Pass
						RATING =	**41.0**	**Pass**

Table 5 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	-	34.8	Pass
1,2	Base Plate	-	33.7	Pass
1,2	Base Foundation Soil Interaction	-	47.3	Pass
1,2	Base Foundation Structural	-	37.9	Pass

Structure Rating (max from all components) =	**47.3%**

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

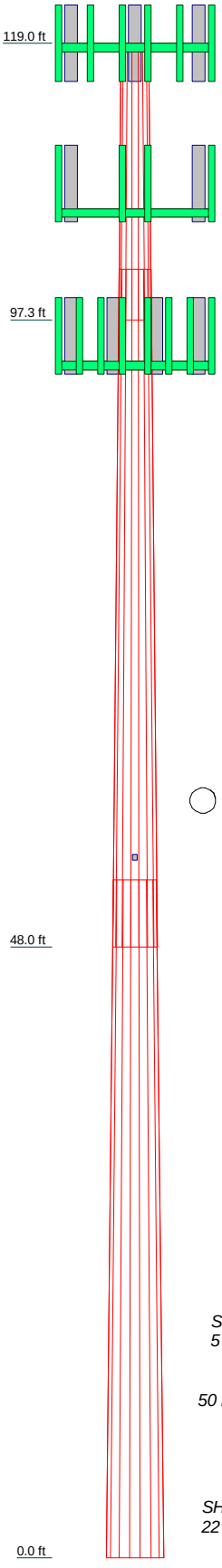
4.1) Recommendations

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	21.750	18	0.250	4.000	25.500	30.860		1.6
2	53.250	18	0.313	5.250	29.374	42.470	A572-65	6.4
3	53.250	18	0.375		40.554	53.650		10.1
								18.1



ALL REACTIONS ARE FACTORED

AXIAL 57 K
SHEAR 5 K
MOMENT 469 kip-ft
TORQUE 0 kip-ft
50 mph WIND - 1.500 in ICE

AXIAL 36 K
SHEAR 22 K
MOMENT 1915 kip-ft
TORQUE 1 kip-ft
REACTIONS - 130 mph WIND

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for Exposure B to the TIA-222-H Standard.
2. Tower designed for a 130 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.000 ft
7. TIA-222-H Annex S
8. TOWER RATING: 41%

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job: *Madison Durham Road (BU 846176)*			
Project: *TEP No. 217566.498361*			
Client: Crown Castle	Drawn by: Jonathan McGinnis	App'd:	
Code: TIA-222-H	Date: 02/17/21	Scale: NTS	
Path:		Dwg No. E-1	

Tower Input Data

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

Tower base elevation above sea level: 343.000 ft.
Basic wind speed of 130 mph.
Risk Category II.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.000 ft.
Nominal ice thickness of 1.500 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
TIA-222-H Annex S.
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

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	119.000-97.250	21.750	4.000	18	25.500	30.860	0.250	1.000	A572-65 (65 ksi)
L2	97.250-48.000	53.250	5.250	18	29.374	42.470	0.313	1.250	A572-65 (65 ksi)
L3	48.000-0.000	53.250		18	40.554	53.650	0.375	1.500	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	It/Q in^2	w in	w/t
L1	25.855	20.036	1613.870	8.964	12.954	124.585	3229.863	10.020	4.048	16.192
	31.297	24.289	2875.242	10.867	15.677	183.407	5754.267	12.147	4.991	19.965
L2	30.778	28.826	3075.812	10.317	14.922	206.124	6155.672	14.416	4.620	14.784
	43.077	41.815	9388.991	14.966	21.575	435.184	18790.337	20.911	6.925	22.159
L3	42.433	47.823	9753.687	14.263	20.601	473.449	19520.207	23.916	6.477	17.273
	54.420	63.411	22737.673	18.913	27.254	834.281	45505.265	31.711	8.782	23.42

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 119.000-97.250				1	1	1			
L2 97.250-48.000				1	1	1			
L3 48.000-0.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
***											

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight klf
Safety Line 3/8	B	No	No	CaAa (Out Of Face)	119.000 - 0.000	6.000	0	1	No Ice	0.037	0.000
									1/2"	0.137	0.001
										0.238	0.001

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight klf
									Ice	0.437	0.002
									1" Ice		
									2" Ice		
Step Pegs (5/8" SR) 7-in. w/30" step	B	No	No	CaAa (Out Of Face)	119.000 - 0.000	0.000	0	1	No	0.035	0.000
									Ice	0.135	0.001
									1/2" Ice	0.235	0.002
									1" Ice	0.435	0.006
									2" Ice		
*****											
LDF7-50A(1-5/8)	C	No	No	Inside Pole	119.000 - 0.000	0.000	0	12	No	0.000	0.001
									Ice	0.000	0.001
									1/2" Ice	0.000	0.001
									1" Ice	0.000	0.001
									2" Ice		
FB-L98B-002-75000(3/8)	C	No	No	Inside Pole	119.000 - 0.000	0.000	0	2	No	0.000	0.000
									Ice	0.000	0.000
									1/2" Ice	0.000	0.000
									1" Ice	0.000	0.000
									2" Ice		
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	119.000 - 0.000	0.000	0	4	No	0.000	0.001
									Ice	0.000	0.001
									1/2" Ice	0.000	0.001
									1" Ice	0.000	0.001
									2" Ice		
2" Rigid Conduit	C	No	No	Inside Pole	119.000 - 0.000	0.000	0	2	No	0.000	0.003
									Ice	0.000	0.003
									1/2" Ice	0.000	0.003
									1" Ice	0.000	0.003
									2" Ice		
***											
LDF6-50A(1-1/4)	B	No	No	Inside Pole	106.000 - 0.000	0.000	0	3	No	0.000	0.001
									Ice	0.000	0.001
									1/2" Ice	0.000	0.001
									1" Ice	0.000	0.001
									2" Ice		
561(1-5/8")	B	No	No	Inside Pole	106.000 - 0.000	0.000	0	4	No	0.000	0.001
									Ice	0.000	0.001
									1/2" Ice	0.000	0.001
									1" Ice	0.000	0.001
									2" Ice		
***											
561(1-5/8)	A	No	No	Inside Pole	94.000 - 0.000	0.000	0	12	No	0.000	0.001
									Ice	0.000	0.001
									1/2" Ice	0.000	0.001
									1" Ice	0.000	0.001
									2" Ice		
***											
LDF4-50A(1/2)	B	No	No	Inside Pole	55.000 - 0.000	0.000	0	1	No	0.000	0.000
									Ice	0.000	0.000
									1/2" Ice	0.000	0.000
									1" Ice	0.000	0.000

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	C_AA_A ft^2/ft	Weight klf
									2" Ice	
***										

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	119.000-97.250	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	1.577	0.08
		C	0.000	0.000	0.000	0.000	0.39
L2	97.250-48.000	A	0.000	0.000	0.000	0.000	0.75
		B	0.000	0.000	0.000	3.571	0.39
		C	0.000	0.000	0.000	0.000	0.88
L3	48.000-0.000	A	0.000	0.000	0.000	0.000	0.78
		B	0.000	0.000	0.000	3.480	0.39
		C	0.000	0.000	0.000	0.000	0.86

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_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	119.000-97.250	A	1.435	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	14.063	0.18
		C		0.000	0.000	0.000	0.000	0.39
L2	97.250-48.000	A	1.378	0.000	0.000	0.000	0.000	0.75
		B		0.000	0.000	0.000	31.844	0.63
		C		0.000	0.000	0.000	0.000	0.88
L3	48.000-0.000	A	1.231	0.000	0.000	0.000	0.000	0.78
		B		0.000	0.000	0.000	29.941	0.61
		C		0.000	0.000	0.000	0.000	0.86

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	119.000-97.250	0.563	0.325	2.236	1.291
L2	97.250-48.000	0.568	0.328	2.380	1.374
L3	48.000-0.000	0.573	0.331	2.439	1.408

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

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
116									
7770.00 w/ Mount Pipe	A	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.746 6.179 6.607 7.488	4.254 5.014 5.711 7.155	0.06 0.10 0.16 0.29
7770.00 w/ Mount Pipe	B	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.746 6.179 6.607 7.488	4.254 5.014 5.711 7.155	0.06 0.10 0.16 0.29
7770.00 w/ Mount Pipe	C	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.746 6.179 6.607 7.488	4.254 5.014 5.711 7.155	0.06 0.10 0.16 0.29
OPA65R-BU6A w/ Mount Pipe	A	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	6.760 7.400 8.060 9.420	6.060 6.690 7.330 8.670	0.10 0.16 0.24 0.42
OPA65R-BU6A w/ Mount Pipe	B	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	6.760 7.400 8.060 9.420	6.060 6.690 7.330 8.670	0.10 0.16 0.24 0.42
OPA65R-BU6A w/ Mount Pipe	C	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	6.760 7.400 8.060 9.420	6.060 6.690 7.330 8.670	0.10 0.16 0.24 0.42
80010965 w/ Mount Pipe	A	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	12.260 13.030 13.800 15.410	5.790 6.470 7.170 8.600	0.14 0.23 0.33 0.57
80010965 w/ Mount Pipe	B	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	12.260 13.030 13.800 15.410	5.790 6.470 7.170 8.600	0.14 0.23 0.33 0.57
80010965 w/ Mount Pipe	C	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	12.260 13.030 13.800 15.410	5.790 6.470 7.170 8.600	0.14 0.23 0.33 0.57
(2) LGP21401	A	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.104 1.239 1.381 1.688	0.207 0.274 0.348 0.521	0.01 0.02 0.03 0.05
(2) LGP21401	B	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.104 1.239 1.381 1.688	0.207 0.274 0.348 0.521	0.01 0.02 0.03 0.05
(2) LGP21401	C	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.104 1.239 1.381 1.688	0.207 0.274 0.348 0.521	0.01 0.02 0.03 0.05
RRUS 4449 B5/B12	A	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.968 2.144 2.328 2.718	1.408 1.564 1.727 2.075	0.07 0.09 0.11 0.16
RRUS 4449 B5/B12	B	From	4.000	0.000	119.000	No Ice	1.968	1.408	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
		Centroid-Leg	0.000 0.000			1/2" Ice 1" Ice 2" Ice	2.144 2.328 2.718	1.564 1.727 2.075	0.09 0.11 0.16
RRUS 4449 B5/B12	C	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.968 2.144 2.328 2.718	1.408 1.564 1.727 2.075	0.07 0.09 0.11 0.16
RRUS 8843 B2/B66A	A	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.639 1.799 1.966 2.323	1.353 1.500 1.655 1.986	0.07 0.09 0.11 0.16
RRUS 8843 B2/B66A	B	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.639 1.799 1.966 2.323	1.353 1.500 1.655 1.986	0.07 0.09 0.11 0.16
RRUS 8843 B2/B66A	C	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.639 1.799 1.966 2.323	1.353 1.500 1.655 1.986	0.07 0.09 0.11 0.16
DC6-48-60-18-8F	A	From Centroid-Leg	2.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.212 1.892 2.105 2.570	1.212 1.892 2.105 2.570	0.03 0.05 0.08 0.14
DC6-48-60-18-8F	C	From Centroid-Leg	2.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.212 1.892 2.105 2.570	1.212 1.892 2.105 2.570	0.03 0.05 0.08 0.14
6' x 2" Mount Pipe	A	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.02 0.03 0.05 0.09
6' x 2" Mount Pipe	B	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.02 0.03 0.05 0.09
6' x 2" Mount Pipe	C	From Centroid-Leg	4.000 0.000 0.000	0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.02 0.03 0.05 0.09
Platform Mount [LP 602-1]	C	None		0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	32.030 38.710 45.390 58.750	32.030 38.710 45.390 58.750	1.34 1.80 2.26 3.17
110 **106** APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	A	From Centroid-Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	6.290 6.860 7.450 8.680	2.760 3.270 3.790 4.900	0.06 0.11 0.16 0.29
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	B	From Centroid-Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	6.290 6.860 7.450 8.680	2.760 3.270 3.790 4.900	0.06 0.11 0.16 0.29
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	C	From Centroid-Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	6.290 6.860 7.450 8.680	2.760 3.270 3.790 4.900	0.06 0.11 0.16 0.29

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	A	From Centroid-Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.690 15.460 16.230 17.820	6.870 7.550 8.250 9.670	0.18 0.31 0.45 0.78
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	B	From Centroid-Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.690 15.460 16.230 17.820	6.870 7.550 8.250 9.670	0.18 0.31 0.45 0.78
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	C	From Centroid-Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.690 15.460 16.230 17.820	6.870 7.550 8.250 9.670	0.18 0.31 0.45 0.78
AIR6449 B41_T-Mobile w/ Mount Pipe	A	From Centroid-Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.928 6.305 6.693 7.500	3.342 3.814 4.302 5.328	0.13 0.18 0.23 0.36
AIR6449 B41_T-Mobile w/ Mount Pipe	B	From Centroid-Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.928 6.305 6.693 7.500	3.342 3.814 4.302 5.328	0.13 0.18 0.23 0.36
AIR6449 B41_T-Mobile w/ Mount Pipe	C	From Centroid-Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.928 6.305 6.693 7.500	3.342 3.814 4.302 5.328	0.13 0.18 0.23 0.36
RADIO 4415 B66A_CCIV3	A	From Centroid-Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.639 1.799 1.966 2.323	0.677 0.789 0.911 1.181	0.05 0.06 0.07 0.11
RADIO 4415 B66A_CCIV3	B	From Centroid-Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.639 1.799 1.966 2.323	0.677 0.789 0.911 1.181	0.05 0.06 0.07 0.11
RADIO 4415 B66A_CCIV3	C	From Centroid-Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.639 1.799 1.966 2.323	0.677 0.789 0.911 1.181	0.05 0.06 0.07 0.11
RADIO 4449 B71 B85A_T-MOBILE	A	From Centroid-Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.970 2.147 2.331 2.721	1.587 1.749 1.918 2.280	0.07 0.09 0.12 0.17
RADIO 4449 B71 B85A_T-MOBILE	B	From Centroid-Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.970 2.147 2.331 2.721	1.587 1.749 1.918 2.280	0.07 0.09 0.12 0.17
RADIO 4449 B71 B85A_T-MOBILE	C	From Centroid-Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.970 2.147 2.331 2.721	1.587 1.749 1.918 2.280	0.07 0.09 0.12 0.17
RADIO 4424 B25_TMO	A	From Centroid-Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.052 2.231 2.417 2.811	1.610 1.772 1.941 2.301	0.09 0.11 0.13 0.19
RADIO 4424 B25_TMO	B	From Centroid-Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.052 2.231 2.417 2.811	1.610 1.772 1.941 2.301	0.09 0.11 0.13 0.19
RADIO 4424 B25_TMO	C	From	4.000	0.000	106.000	No Ice	2.052	1.610	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
		Centroid-Leg	0.000 2.000			1/2" Ice 1" Ice 2" Ice	2.231 2.417 2.811	1.772 1.941 2.301	0.11 0.13 0.19
6' x 2" Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.02 0.03 0.05 0.09
6' x 2" Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.02 0.03 0.05 0.09
6' x 2" Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.02 0.03 0.05 0.09
Platform Mount [LP 602-1]	C	None		0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	32.030 38.710 45.390 58.750	32.030 38.710 45.390 58.750	1.34 1.80 2.26 3.17
94									
(2) APL868013 w/ Mount Pipe	A	From Centroid-Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.630 3.070 3.530 4.490	4.130 4.600 5.090 6.110	0.03 0.06 0.11 0.21
(2) APL868013 w/ Mount Pipe	B	From Centroid-Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.630 3.070 3.530 4.490	4.130 4.600 5.090 6.110	0.03 0.06 0.11 0.21
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	A	From Centroid-Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.179 3.555 3.930 4.692	3.353 3.971 4.595 5.893	0.03 0.06 0.10 0.19
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	B	From Centroid-Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.179 3.555 3.930 4.692	3.353 3.971 4.595 5.893	0.03 0.06 0.10 0.19
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	C	From Centroid-Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.179 3.555 3.930 4.692	3.353 3.971 4.595 5.893	0.03 0.06 0.10 0.19
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	A	From Centroid-Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.806 8.357 8.872 9.927	5.801 6.953 7.819 9.601	0.04 0.10 0.17 0.34
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	B	From Centroid-Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.806 8.357 8.872 9.927	5.801 6.953 7.819 9.601	0.04 0.10 0.17 0.34
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	C	From Centroid-Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.806 8.357 8.872 9.927	5.801 6.953 7.819 9.601	0.04 0.10 0.17 0.34
(2) DB846F65E-SX w/ Mount Pipe	C	From Centroid-Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	10.080 15.220 15.820 17.290	8.110 9.310 10.220 12.910	0.04 0.12 0.22 0.38
(2) FD9R6004/2C-3L	A	From	4.000	0.000	94.000	No Ice	0.314	0.076	0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
		Centroid-Leg	0.000 2.000			1/2" Ice 1" Ice 2" Ice	0.386 0.466 0.647	0.119 0.169 0.294	0.01 0.01 0.02
(2) FD9R6004/2C-3L	B	From Centroid-Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.314 0.386 0.466 0.647	0.076 0.119 0.169 0.294	0.00 0.01 0.01 0.02
(2) FD9R6004/2C-3L	C	From Centroid-Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.314 0.386 0.466 0.647	0.076 0.119 0.169 0.294	0.00 0.01 0.01 0.02
Platform Mount [LP 601-1]	C	None		0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	28.470 33.590 38.710 48.950	28.470 33.590 38.710 48.950	1.12 1.51 1.91 2.69
55									
GPS-TMG-HR-26NCM	A	From Leg	3.000 0.000 0.000	0.000	55.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.133 0.183 0.239 0.375	0.133 0.183 0.239 0.375	0.00 0.00 0.01 0.01
Side Arm Mount [SO 701-1]	A	From Leg	1.500 0.000 0.000	0.000	55.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.850 1.140 1.430 2.010	1.670 2.340 3.010 4.350	0.07 0.08 0.09 0.12
*****									

Load Combinations

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

Comb. No.	Description
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	119 - 97.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-18.60	0.09	0.05
			Max. Mx	20	-8.79	127.54	0.00
			Max. My	2	-8.79	0.04	127.50
			Max. Vy	20	-10.60	127.54	0.00
			Max. Vx	2	-10.60	0.04	127.50
			Max. Torque	16			-0.11
L2	97.25 - 48	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.63	0.66	-0.28
			Max. Mx	20	-20.21	866.04	-4.19
			Max. My	2	-20.22	-4.32	861.04
			Max. Vy	20	-17.69	866.04	-4.19
			Max. Vx	2	-17.55	-4.32	861.04
			Max. Torque	24			1.06
L3	48 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.84	0.18	-0.56
			Max. Mx	20	-36.26	1910.17	-9.61
			Max. My	2	-36.26	-9.78	1897.44
			Max. Vy	20	-21.50	1910.17	-9.61
			Max. Vx	2	-21.36	-9.78	1897.44
			Max. Torque	12			-0.86

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	35	56.84	4.72	-2.72
	Max. H_x	20	36.27	21.48	-0.10
	Max. H_z	2	36.27	-0.10	21.34
	Max. M_x	2	1897.44	-0.10	21.34
	Max. M_z	8	1910.17	-21.48	0.10
	Max. Torsion	24	0.75	10.65	18.43
	Min. Vert	13	27.20	-10.65	-18.43
	Min. H_x	8	36.27	-21.48	0.10
	Min. H_z	14	36.27	0.10	-21.34
	Min. M_x	14	-1897.11	0.10	-21.34
	Min. M_z	20	-1910.17	21.48	-0.10
	Min. Torsion	12	-0.75	-10.65	-18.43

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	30.23	-0.00	0.00	-0.13	-0.00	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	36.27	0.10	-21.34	-1897.44	-9.78	-0.58
0.9 Dead+1.0 Wind 0 deg - No Ice	27.20	0.10	-21.34	-1886.32	-9.72	-0.58
1.2 Dead+1.0 Wind 30 deg - No Ice	36.27	10.83	-18.53	-1648.13	-963.56	-0.25
0.9 Dead+1.0 Wind 30 deg - No Ice	27.20	10.83	-18.53	-1638.48	-957.94	-0.25
1.2 Dead+1.0 Wind 60 deg - No Ice	36.27	18.65	-10.75	-957.26	-1659.14	0.15
0.9 Dead+1.0 Wind 60 deg - No Ice	27.20	18.65	-10.75	-951.64	-1649.47	0.15
1.2 Dead+1.0 Wind 90 deg - No Ice	36.27	21.48	-0.10	-9.94	-1910.17	0.51
0.9 Dead+1.0 Wind 90 deg - No Ice	27.20	21.48	-0.10	-9.85	-1899.03	0.51
1.2 Dead+1.0 Wind 120 deg - No Ice	36.27	18.55	10.58	940.00	-1649.38	0.73
0.9 Dead+1.0 Wind 120 deg - No Ice	27.20	18.55	10.58	934.56	-1639.75	0.73
1.2 Dead+1.0 Wind 150 deg - No Ice	36.27	10.65	18.43	1638.04	-946.62	0.75
0.9 Dead+1.0 Wind 150 deg - No Ice	27.20	10.65	18.43	1628.52	-941.10	0.75
1.2 Dead+1.0 Wind 180 deg - No Ice	36.27	-0.10	21.34	1897.11	9.78	0.57
0.9 Dead+1.0 Wind 180 deg - No Ice	27.20	-0.10	21.34	1886.08	9.72	0.57
1.2 Dead+1.0 Wind 210 deg - No Ice	36.27	-10.83	18.53	1647.81	963.56	0.24
0.9 Dead+1.0 Wind 210 deg - No Ice	27.20	-10.83	18.53	1638.23	957.94	0.24
1.2 Dead+1.0 Wind 240 deg - No Ice	36.27	-18.65	10.75	956.94	1659.15	-0.15

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.0 Wind 240 deg - No Ice	27.20	-18.65	10.75	951.39	1649.47	-0.15
1.2 Dead+1.0 Wind 270 deg - No Ice	36.27	-21.48	0.10	9.61	1910.17	-0.51
0.9 Dead+1.0 Wind 270 deg - No Ice	27.20	-21.48	0.10	9.60	1899.03	-0.51
1.2 Dead+1.0 Wind 300 deg - No Ice	36.27	-18.55	-10.58	-940.33	1649.38	-0.73
0.9 Dead+1.0 Wind 300 deg - No Ice	27.20	-18.55	-10.58	-934.80	1639.75	-0.73
1.2 Dead+1.0 Wind 330 deg - No Ice	36.27	-10.65	-18.43	-1638.37	946.62	-0.75
0.9 Dead+1.0 Wind 330 deg - No Ice	27.20	-10.65	-18.43	-1628.76	941.10	-0.75
1.2 Dead+1.0 Ice+1.0 Temp	56.84	0.00	0.00	0.56	0.18	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	56.84	0.03	-5.39	-462.92	-2.61	0.33
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	56.84	2.74	-4.68	-402.24	-235.90	0.47
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	56.84	4.72	-2.72	-233.62	-405.92	0.47
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	56.84	5.43	-0.03	-2.24	-467.11	0.35
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	56.84	4.69	2.67	229.90	-403.08	0.14
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	56.84	2.69	4.66	400.59	-230.99	-0.11
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	56.84	-0.03	5.39	464.11	3.06	-0.33
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	56.84	-2.74	4.68	403.43	236.35	-0.47
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	56.84	-4.72	2.72	234.81	406.36	-0.47
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	56.84	-5.43	0.03	3.43	467.56	-0.35
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	56.84	-4.69	-2.67	-228.70	403.53	-0.14
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	56.84	-2.69	-4.66	-399.40	231.43	0.11
Dead+Wind 0 deg - Service	30.23	0.02	-4.28	-379.41	-1.95	-0.12
Dead+Wind 30 deg - Service	30.23	2.17	-3.72	-329.57	-192.62	-0.05
Dead+Wind 60 deg - Service	30.23	3.74	-2.16	-191.47	-331.67	0.03
Dead+Wind 90 deg - Service	30.23	4.31	-0.02	-2.09	-381.85	0.10
Dead+Wind 120 deg - Service	30.23	3.72	2.12	187.81	-329.72	0.15
Dead+Wind 150 deg - Service	30.23	2.14	3.70	327.35	-189.23	0.15
Dead+Wind 180 deg - Service	30.23	-0.02	4.28	379.14	1.96	0.12
Dead+Wind 210 deg - Service	30.23	-2.17	3.72	329.30	192.62	0.05
Dead+Wind 240 deg - Service	30.23	-3.74	2.16	191.19	331.67	-0.03
Dead+Wind 270 deg - Service	30.23	-4.31	0.02	1.82	381.85	-0.10
Dead+Wind 300 deg - Service	30.23	-3.72	-2.12	-188.08	329.72	-0.15
Dead+Wind 330 deg - Service	30.23	-2.14	-3.70	-327.62	189.23	-0.15

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-30.23	0.00	0.00	30.23	0.00	0.002%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
2	0.10	-36.27	-21.34	-0.10	36.27	21.34	0.000%
3	0.10	-27.20	-21.34	-0.10	27.20	21.34	0.000%
4	10.83	-36.27	-18.53	-10.83	36.27	18.53	0.000%
5	10.83	-27.20	-18.53	-10.83	27.20	18.53	0.000%
6	18.65	-36.27	-10.75	-18.65	36.27	10.75	0.000%
7	18.65	-27.20	-10.75	-18.65	27.20	10.75	0.000%
8	21.48	-36.27	-0.10	-21.48	36.27	0.10	0.000%
9	21.48	-27.20	-0.10	-21.48	27.20	0.10	0.000%
10	18.55	-36.27	10.58	-18.55	36.27	-10.58	0.000%
11	18.55	-27.20	10.58	-18.55	27.20	-10.58	0.000%
12	10.65	-36.27	18.43	-10.65	36.27	-18.43	0.000%
13	10.65	-27.20	18.43	-10.65	27.20	-18.43	0.000%
14	-0.10	-36.27	21.34	0.10	36.27	-21.34	0.000%
15	-0.10	-27.20	21.34	0.10	27.20	-21.34	0.000%
16	-10.83	-36.27	18.53	10.83	36.27	-18.53	0.000%
17	-10.83	-27.20	18.53	10.83	27.20	-18.53	0.000%
18	-18.65	-36.27	10.75	18.65	36.27	-10.75	0.000%
19	-18.65	-27.20	10.75	18.65	27.20	-10.75	0.000%
20	-21.48	-36.27	0.10	21.48	36.27	-0.10	0.000%
21	-21.48	-27.20	0.10	21.48	27.20	-0.10	0.000%
22	-18.55	-36.27	-10.58	18.55	36.27	10.58	0.000%
23	-18.55	-27.20	-10.58	18.55	27.20	10.58	0.000%
24	-10.65	-36.27	-18.43	10.65	36.27	18.43	0.000%
25	-10.65	-27.20	-18.43	10.65	27.20	18.43	0.000%
26	0.00	-56.84	0.00	0.00	56.84	0.00	0.000%
27	0.03	-56.84	-5.39	-0.03	56.84	5.39	0.000%
28	2.74	-56.84	-4.68	-2.74	56.84	4.68	0.000%
29	4.72	-56.84	-2.72	-4.72	56.84	2.72	0.000%
30	5.43	-56.84	-0.03	-5.43	56.84	0.03	0.000%
31	4.69	-56.84	2.67	-4.69	56.84	-2.67	0.000%
32	2.69	-56.84	4.66	-2.69	56.84	-4.66	0.000%
33	-0.03	-56.84	5.39	0.03	56.84	-5.39	0.000%
34	-2.74	-56.84	4.68	2.74	56.84	-4.68	0.000%
35	-4.72	-56.84	2.72	4.72	56.84	-2.72	0.000%
36	-5.43	-56.84	0.03	5.43	56.84	-0.03	0.000%
37	-4.69	-56.84	-2.67	4.69	56.84	2.67	0.000%
38	-2.69	-56.84	-4.66	2.69	56.84	4.66	0.000%
39	0.02	-30.23	-4.28	-0.02	30.23	4.28	0.000%
40	2.17	-30.23	-3.72	-2.17	30.23	3.72	0.000%
41	3.74	-30.23	-2.16	-3.74	30.23	2.16	0.000%
42	4.31	-30.23	-0.02	-4.31	30.23	0.02	0.000%
43	3.72	-30.23	2.12	-3.72	30.23	-2.12	0.000%
44	2.14	-30.23	3.70	-2.14	30.23	-3.70	0.000%
45	-0.02	-30.23	4.28	0.02	30.23	-4.28	0.000%
46	-2.17	-30.23	3.72	2.17	30.23	-3.72	0.000%
47	-3.74	-30.23	2.16	3.74	30.23	-2.16	0.000%
48	-4.31	-30.23	0.02	4.31	30.23	-0.02	0.000%
49	-3.72	-30.23	-2.12	3.72	30.23	2.12	0.000%
50	-2.14	-30.23	-3.70	2.14	30.23	3.70	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00018033

3	Yes	4	0.00000001	0.00011818
4	Yes	5	0.00000001	0.00007671
5	Yes	5	0.00000001	0.00003622
6	Yes	5	0.00000001	0.00007836
7	Yes	5	0.00000001	0.00003701
8	Yes	4	0.00000001	0.00009932
9	Yes	4	0.00000001	0.00006437
10	Yes	5	0.00000001	0.00007989
11	Yes	5	0.00000001	0.00003790
12	Yes	5	0.00000001	0.00007316
13	Yes	5	0.00000001	0.00003458
14	Yes	4	0.00000001	0.00024376
15	Yes	4	0.00000001	0.00015960
16	Yes	5	0.00000001	0.00008013
17	Yes	5	0.00000001	0.00003792
18	Yes	5	0.00000001	0.00007850
19	Yes	5	0.00000001	0.00003709
20	Yes	4	0.00000001	0.00016181
21	Yes	4	0.00000001	0.00010552
22	Yes	5	0.00000001	0.00007361
23	Yes	5	0.00000001	0.00003477
24	Yes	5	0.00000001	0.00008033
25	Yes	5	0.00000001	0.00003814
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00083663
28	Yes	4	0.00000001	0.00092894
29	Yes	4	0.00000001	0.00092879
30	Yes	4	0.00000001	0.00084303
31	Yes	4	0.00000001	0.00092307
32	Yes	4	0.00000001	0.00091849
33	Yes	4	0.00000001	0.00084055
34	Yes	4	0.00000001	0.00093494
35	Yes	4	0.00000001	0.00094155
36	Yes	4	0.00000001	0.00084823
37	Yes	4	0.00000001	0.00092206
38	Yes	4	0.00000001	0.00092024
39	Yes	4	0.00000001	0.00001062
40	Yes	4	0.00000001	0.00002761
41	Yes	4	0.00000001	0.00002929
42	Yes	4	0.00000001	0.00000797
43	Yes	4	0.00000001	0.00003352
44	Yes	4	0.00000001	0.00002597
45	Yes	4	0.00000001	0.00001107
46	Yes	4	0.00000001	0.00003178
47	Yes	4	0.00000001	0.00002947
48	Yes	4	0.00000001	0.00000834
49	Yes	4	0.00000001	0.00002613
50	Yes	4	0.00000001	0.00003433

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119 - 97.25	7.092	47	0.496	0.001
L2	101.25 - 48	5.279	47	0.472	0.001
L3	53.25 - 0	1.469	41	0.255	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
119.000	7770.00 w/ Mount Pipe	47	7.092	0.496	0.001	81186
106.000	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	47	5.755	0.481	0.001	31225
94.000	(2) APL868013 w/ Mount Pipe	41	4.575	0.452	0.001	18224
55.000	GPS-TMG-HR-26NCM	41	1.563	0.264	0.000	8771

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119 - 97.25	35.495	18	2.483	0.004
L2	101.25 - 48	26.421	18	2.363	0.004
L3	53.25 - 0	7.350	6	1.276	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
119.000	7770.00 w/ Mount Pipe	18	35.495	2.483	0.004	16299
106.000	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	18	28.803	2.409	0.004	6268
94.000	(2) APL868013 w/ Mount Pipe	6	22.902	2.261	0.004	3656
55.000	GPS-TMG-HR-26NCM	6	7.822	1.322	0.001	1754

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	119 - 97.25 (1)	TP30.86x25.5x0.25	21.750	0.000	0.0	23.507	-8.79	1375.15	0.006
L2	97.25 - 48 (2)	TP42.47x29.374x0.313	53.250	0.000	0.0	40.534	-20.21	2371.26	0.009
L3	48 - 0 (3)	TP53.65x40.554x0.375	53.250	0.000	0.0	63.411	-36.26	3709.52	0.010

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	119 - 97.25 (1)	TP30.86x25.5x0.25	127.54	1000.79	0.127	0.00	1000.79	0.000
L2	97.25 - 48 (2)	TP42.47x29.374x0.313	868.52	2304.57	0.377	0.00	2304.57	0.000
L3	48 - 0 (3)	TP53.65x40.554x0.375	1915.49	4556.43	0.420	0.00	4556.43	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	119 - 97.25 (1)	TP30.86x25.5x0.25	10.60	412.55	0.026	0.02	1070.28	0.000
L2	97.25 - 48 (2)	TP42.47x29.374x0.313	17.75	711.38	0.025	0.12	2545.93	0.000
L3	48 - 0 (3)	TP53.65x40.554x0.375	21.55	1112.86	0.019	0.15	5192.09	0.000

Pole Interaction Design Data

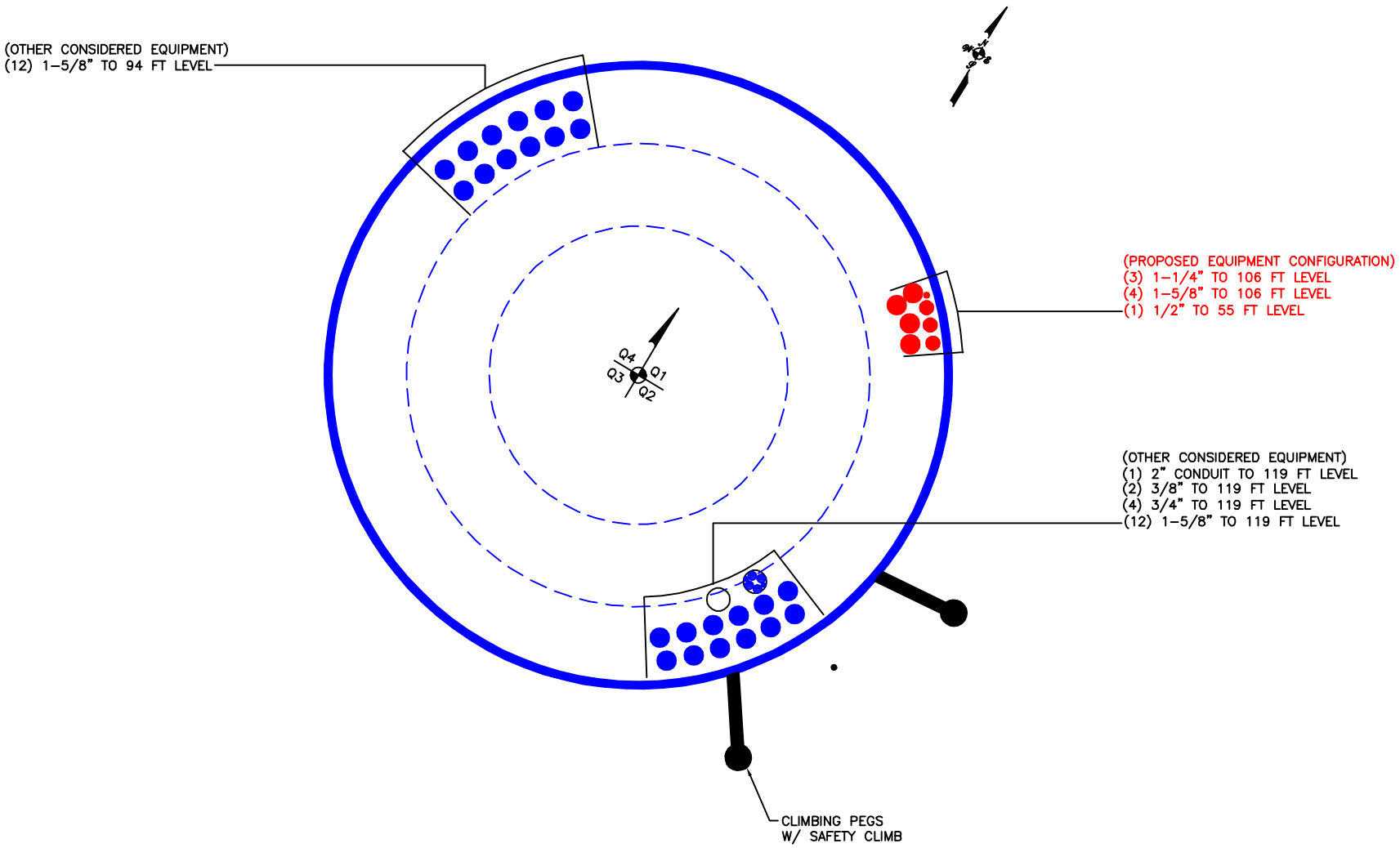
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	119 - 97.25 (1)	0.006	0.127	0.000	0.026	0.000	0.134	1.050	4.8.2
L2	97.25 - 48 (2)	0.009	0.377	0.000	0.025	0.000	0.386	1.050	4.8.2
L3	48 - 0 (3)	0.010	0.420	0.000	0.019	0.000	0.431	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	119 - 97.25	Pole	TP30.86x25.5x0.25	1	-8.79	1443.91	12.8	Pass
L2	97.25 - 48	Pole	TP42.47x29.374x0.313	2	-20.21	2489.82	36.8	Pass
L3	48 - 0	Pole	TP53.65x40.554x0.375	3	-36.26	3895.00	41.0	Pass
							Summary	
						Pole (L3)	41.0	Pass
						RATING =	**41.0**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT)
(12) 1-5/8" TO 94 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(3) 1-1/4" TO 106 FT LEVEL
(4) 1-5/8" TO 106 FT LEVEL
(1) 1/2" TO 55 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 2" CONDUIT TO 119 FT LEVEL
(2) 3/8" TO 119 FT LEVEL
(4) 3/4" TO 119 FT LEVEL
(12) 1-5/8" TO 119 FT LEVEL
Q4
Q1
Q3
Q2
CLIMBING PEGS
W/ SAFETY CLIMB

APPENDIX C

ADDITIONAL CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-10	**Elevation:**	343.31 ft (NAVD 88)
Risk Category:	II	**Latitude:**	41.389536
Soil Class:	D - Stiff Soil	**Longitude:**	-72.648881

Wind

Results:

Wind Speed:	128 Vmph	*130 mph required by jurisdiction
10-year MRI	78 Vmph	
25-year MRI	88 Vmph	
50-year MRI	95 Vmph	
100-year MRI	104 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

Date Accessed: Tue Feb 16 2021

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

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

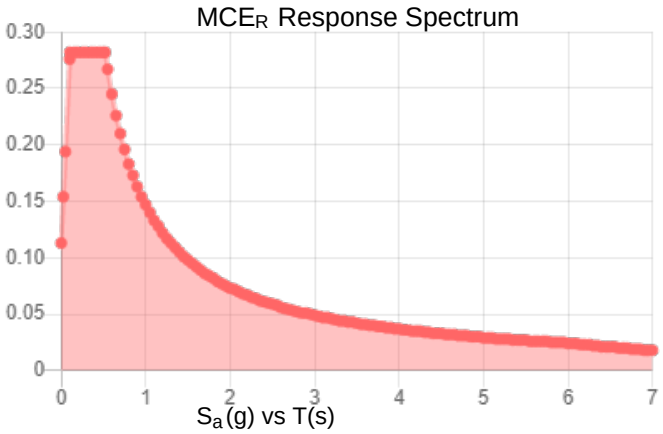
Seismic

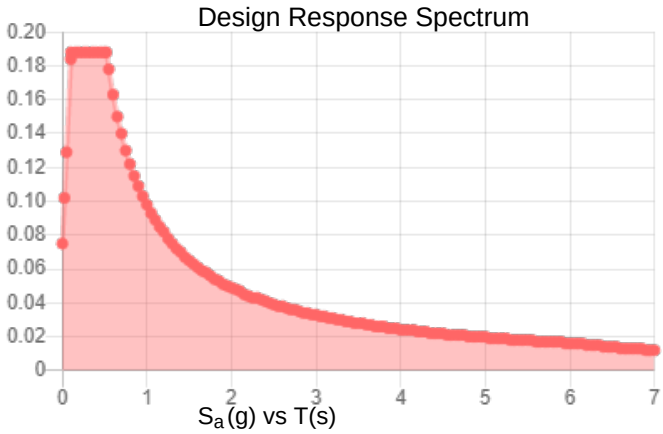
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.176	S_{DS} :	0.188
S_1 :	0.061	S_{D1} :	0.098
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.09
S_{MS} :	0.282	PGA_M :	0.144
S_{M1} :	0.147	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Tue Feb 16 2021

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

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Tue Feb 16 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.

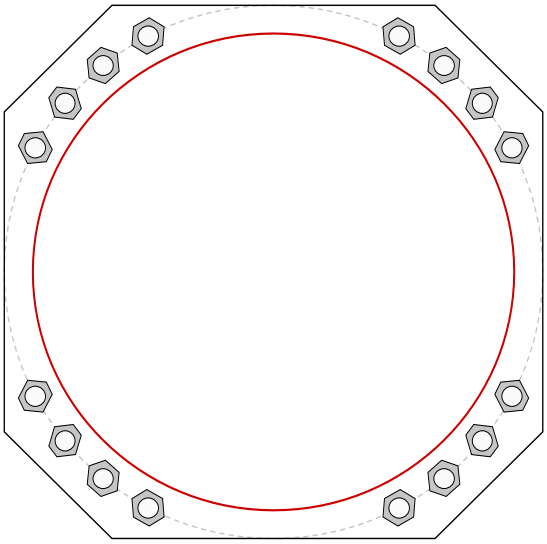
Monopole Base Plate Connection

Site Info	
BU #	846176
Site Name	Madison Durham Road
Order #	538760 Rev. 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	2.25

Applied Loads	
Moment (kip-ft)	1915.00
Axial Force (kips)	36.00
Shear Force (kips)	22.00

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(16) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 60" BC

Anchor Spacing: 6 in

Base Plate Data

60" W x 2.5" Plate (A572-60; Fy=60 ksi, Fu=75 ksi); Clip: 12 in

Stiffener Data

N/A

Pole Data

53.65" x 0.375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

Pu_c = 97.95	ϕPn_c = 268.39	**Stress Rating**
Vu = 1.38	ϕVn = 120.77	**34.8%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	19.13	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**33.7%**	**Pass**

Pier and Pad Foundation

BU # :	846176
Site Name:	Madison Durham R
App. Number:	538760 Rev. 1

TIA-222 Revision:	H
Tower Type:	Monopole

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

Superstructure Analysis Reactions		
Compression, P_{comp}:	36	kips
Base Shear, Vu_comp:	22	kips
Moment, M_u:	1915	ft-kips
Tower Height, **H**:	119	ft
BP Dist. Above Fdn, bp_{dist}:	4.5	in
Bolt Circle / Bearing Plate Width, **BC**:	60	in

Foundation Analysis Checks	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	114.74	22.00	**18.3%**	**Pass**
Bearing Pressure (ksf)	15.34	0.69	**4.3%**	**Pass**
*Overturning (kip*ft)*	4159.36	1967.25	**47.3%**	**Pass**
*Pad Flexure (kip*ft)*	2148.99	854.53	**37.9%**	**Pass**
Pad Shear - 1-way (kips)	677.08	103.46	**14.6%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.190	0.006	**2.8%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	835.39	0.00	**0.0%**	**Pass**

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

Soil Rating*:	**47.3%**
Structural Rating*:	**47.3%**

Pad Properties		
Depth, **D**:	1	ft
Pad Width, W_1:	30.5	ft
Pad Thickness, **T**:	2	ft
Pad Rebar Size (Bottom dir. 2), Sp_2:	8	
Pad Rebar Quantity (Bottom dir. 2), mp_2:	32	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	4	ksi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	120	pcf
Ultimate Net Bearing, Qnet:	20.333	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	39	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:	0.55	
Neglected Depth, **N**:	1.00	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	N/A	ft

<--Toggle between Gross and Net

Exhibit E

Mount Analysis

Date: **February 3, 2021**

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

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

Subject:	**Mount Analysis Report**	
Carrier Designation:	***Sprint PCS* Loading Modification**	
	Carrier Site Number:	CTNH494A
	Carrier Site Name:	CTNH494A
Crown Castle Designation:	**Crown Castle BU Number:**	846176
	Crown Castle Site Name:	MADISON DURHAM ROAD
	Crown Castle JDE Job Number:	628904
	Crown Castle Order Number:	538760 Rev. 0
Engineering Firm Designation:	**GPD Report Designation:**	2021777.846176.01
Site Data:	**1749 Durham Road, Madison, New Haven County, CT 06443** **Latitude 41° 23' 22.33" Longitude -72° 38' 55.97"**	
Structure Information:	**Tower Height & Type:**	**119.0 ft Monopole Tower**
	Mount Elevation:	**106.0 ft**
	Mount Type:	**12.5 ft Platform Mount**

Dear Darcy Tarr,

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

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

Platform Mount **Sufficient – 97.4%***
***The mount has sufficient capacity once the loading changes, as described in Section 4.1 Recommendations of this report, are completed.**

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

Mount analysis prepared by: Eric Nieto

Respectfully Submitted by:

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

2/3/2021

TABLE OF CONTENTS

1) INTRODUCTION

This is a 12.5' Platform Mount. Mount geometry was obtained from site photos and experience with similar mounts.

A proposed support rail designed by Site Pro 1 (Part #: HRK12-3HD, or engineer approved equivalent) has been assumed for the purpose of this analysis. In order for the analysis results to be valid, the proposed support rail shall be installed 48" above the existing face horizontal. See Appendices A & E.

New mount pipes have been assumed for the AIR6449 B41_T-MOBILE, APX16DWV-16DWV-S-E-A20, and APXVAALL24_43-U-NA20_TMO panels.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount Details
106.0	108.0	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 538760 Rev. 0	-	CCI
RF Data Sheet	Site ID: CTNH494A, Draft Rev. 1, dated 1/12/2021	-	CCI
Support Rail Design	Site Pro 1 DWG #: HRK12-3HD, dated 4/7/2015	-	Site Pro 1

3.1) Analysis Method

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

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

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

3.2) Assumptions

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

Channel, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	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	Mount Standoff	M1	106.0	39.6	Pass
	Cross Bracing	M5		27.5	Pass
	Cross Bracing Plate	M23		9.1	Pass
	Standoff Plate	M20		53.3	Pass
	Face Horizontal	M24		83.5	Pass
	Support Rail	M33		14.5	Pass
	Support Rail Pipe Bracing	M67		5.7	Pass
	Support Rail Angle Bracing	M64		27.0	Pass
	Pipe Mount	A2		38.7	Pass
2,3	Mount to Tower Connection	-		97.4	Pass

Structure Rating (max from all components) =	97.4%[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

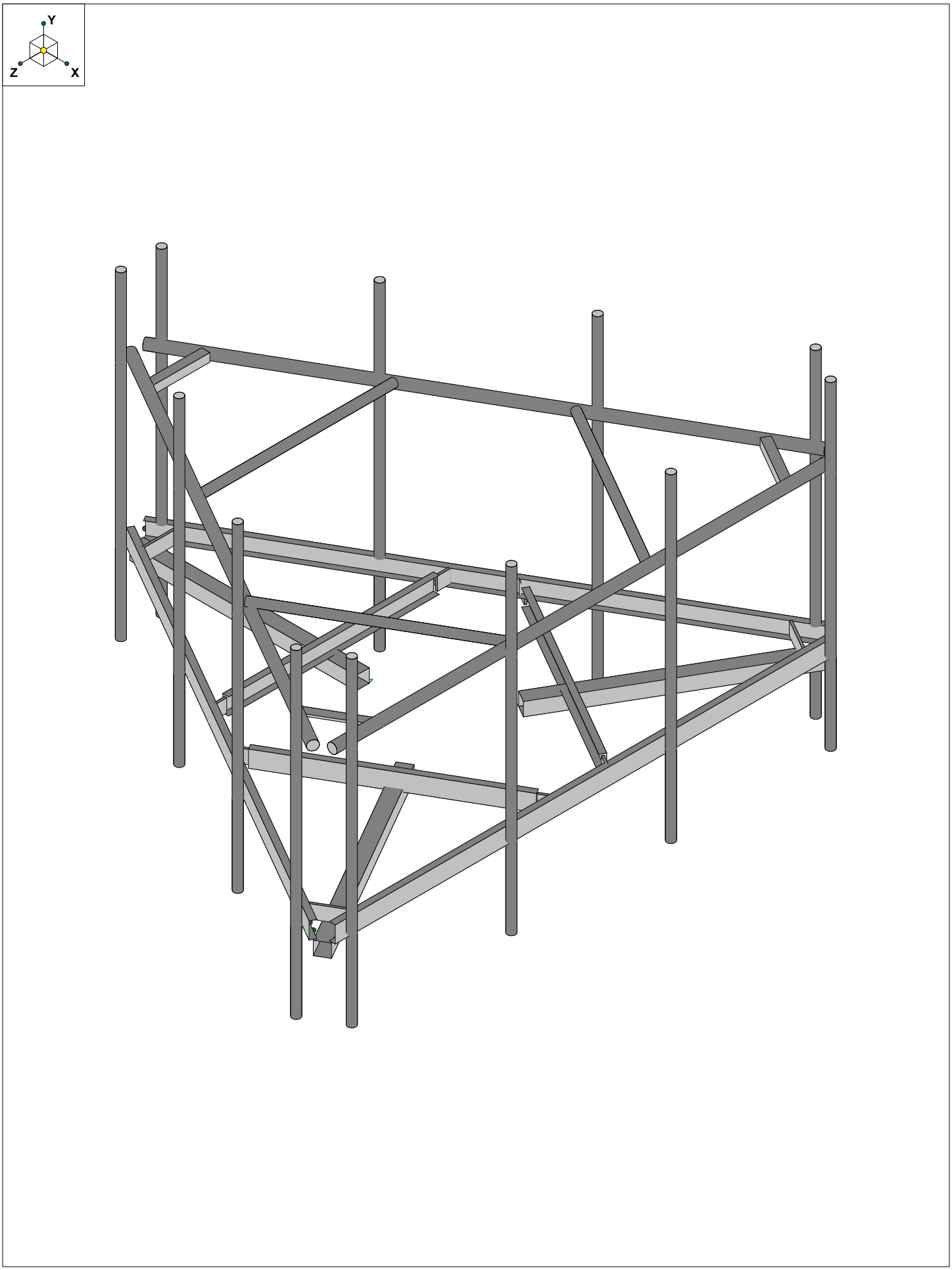
The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the loading modification listed below must be completed.

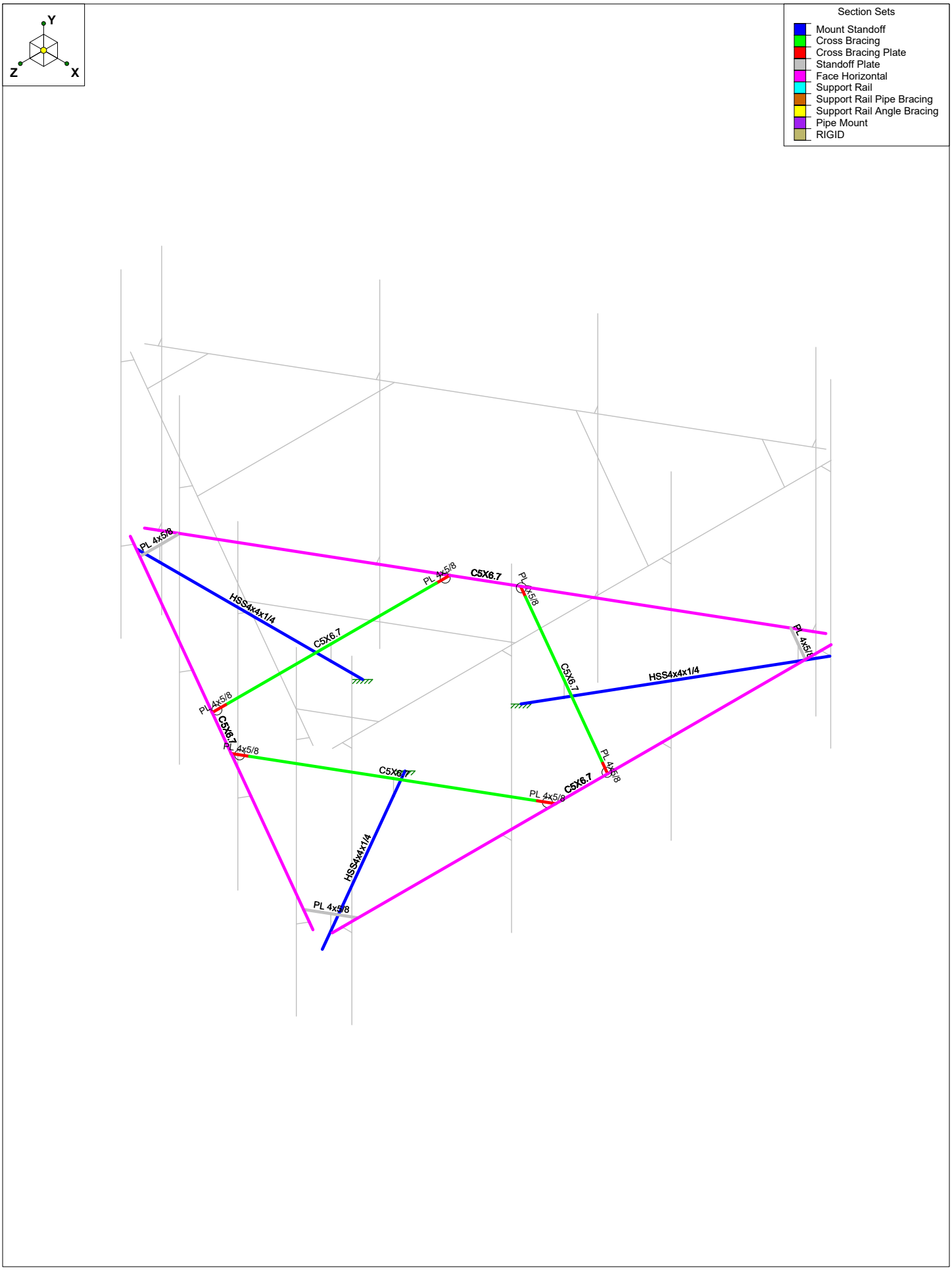
1. Install a support rail designed by Site Pro 1 (Part #: HRK12-3HD, or engineer approved equivalent) 48” above the existing face horizontal. See Appendices A & E.

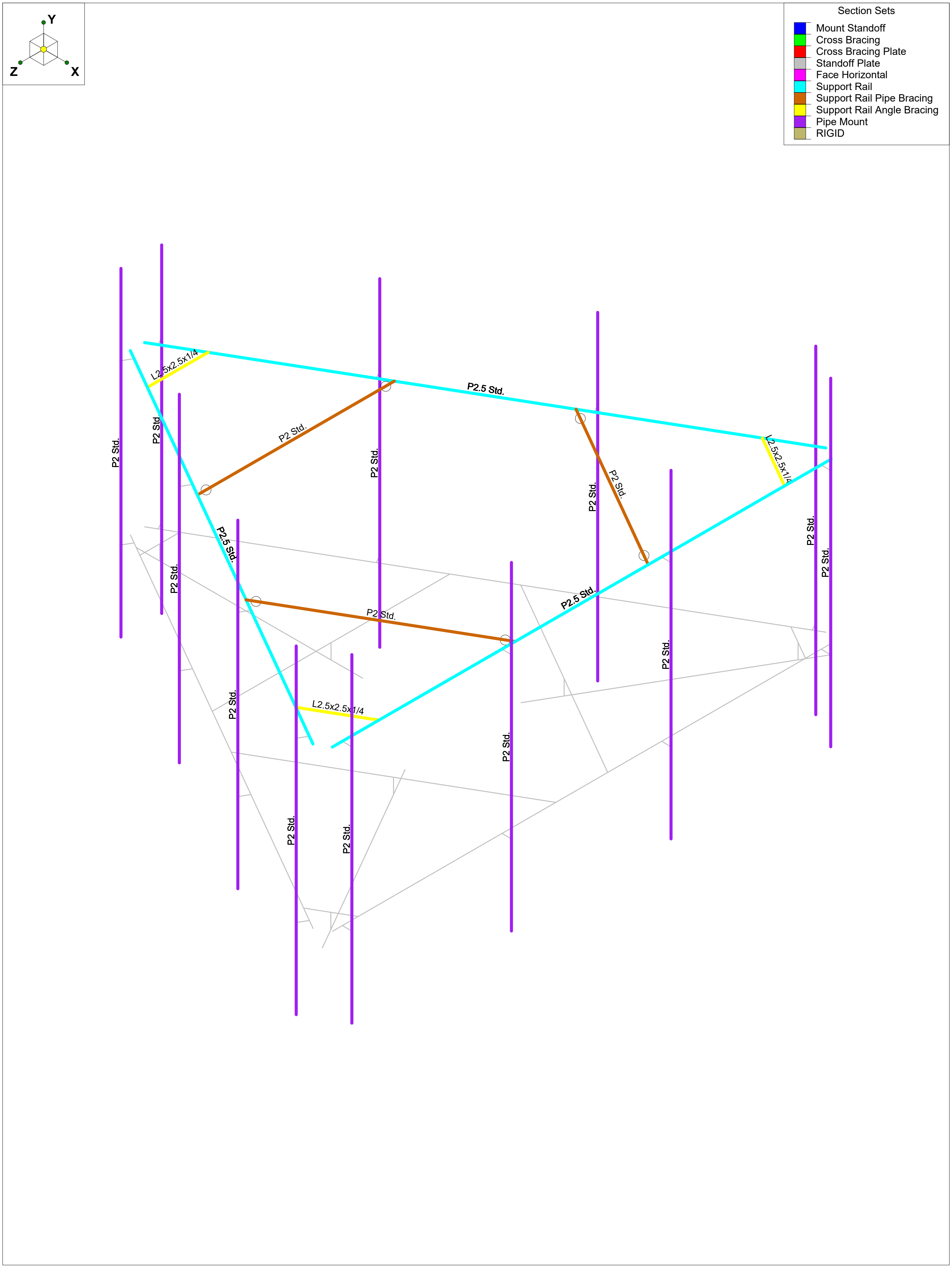
No structural modifications are required at this time, provided that the above-listed changes are implemented.

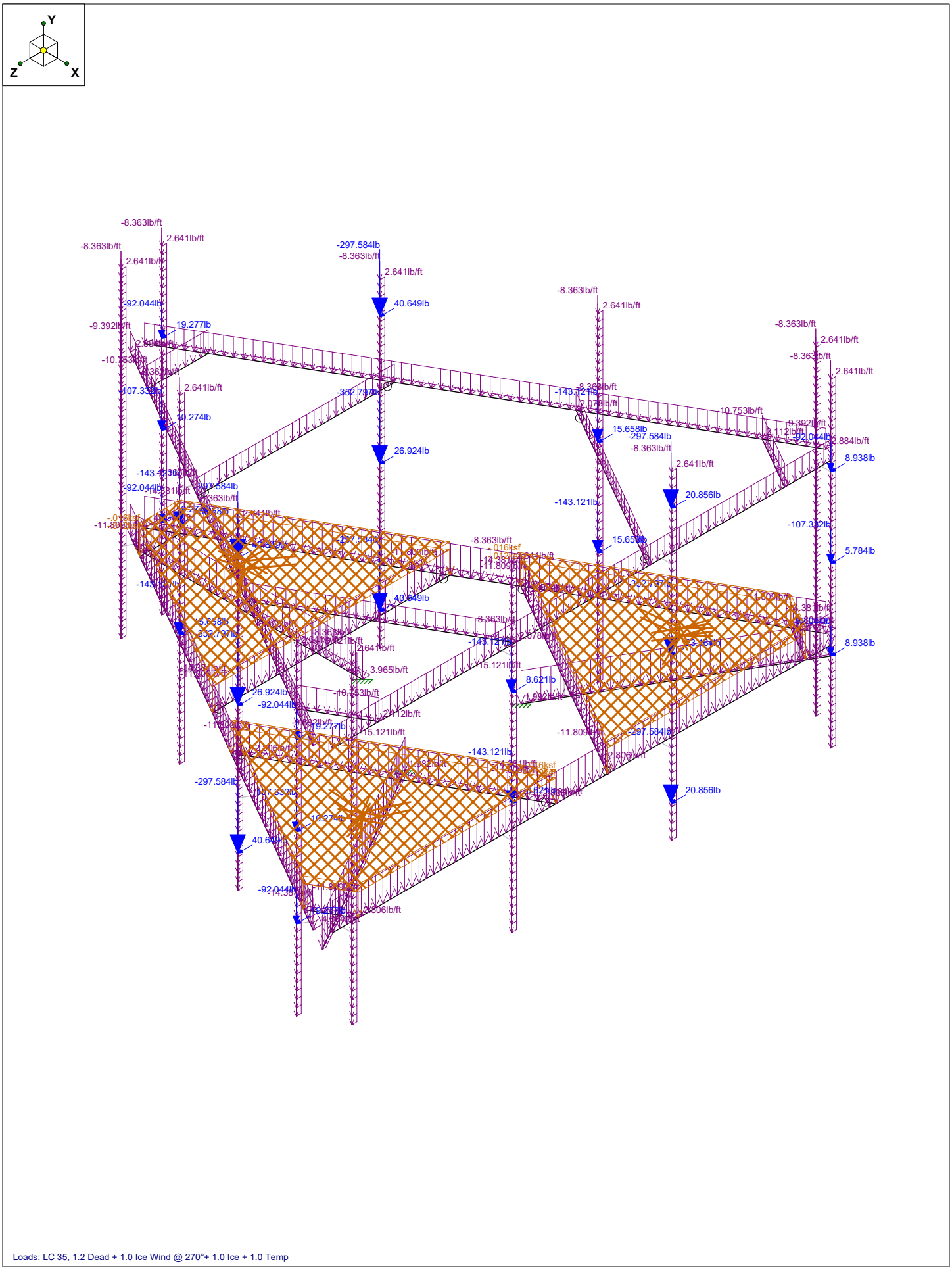
APPENDIX A

WIRE FRAME AND RENDERED MODELS

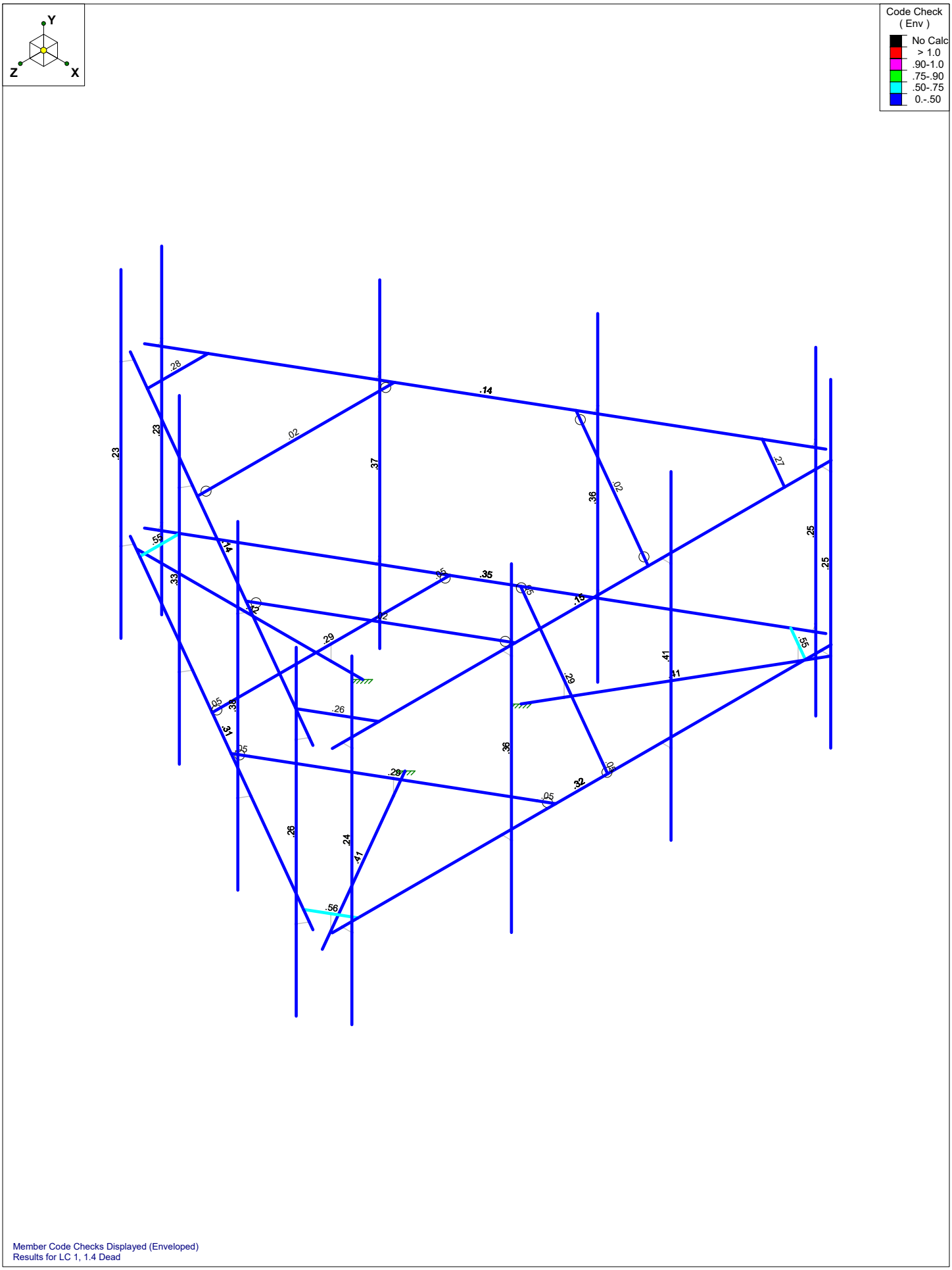

Y
Z
X

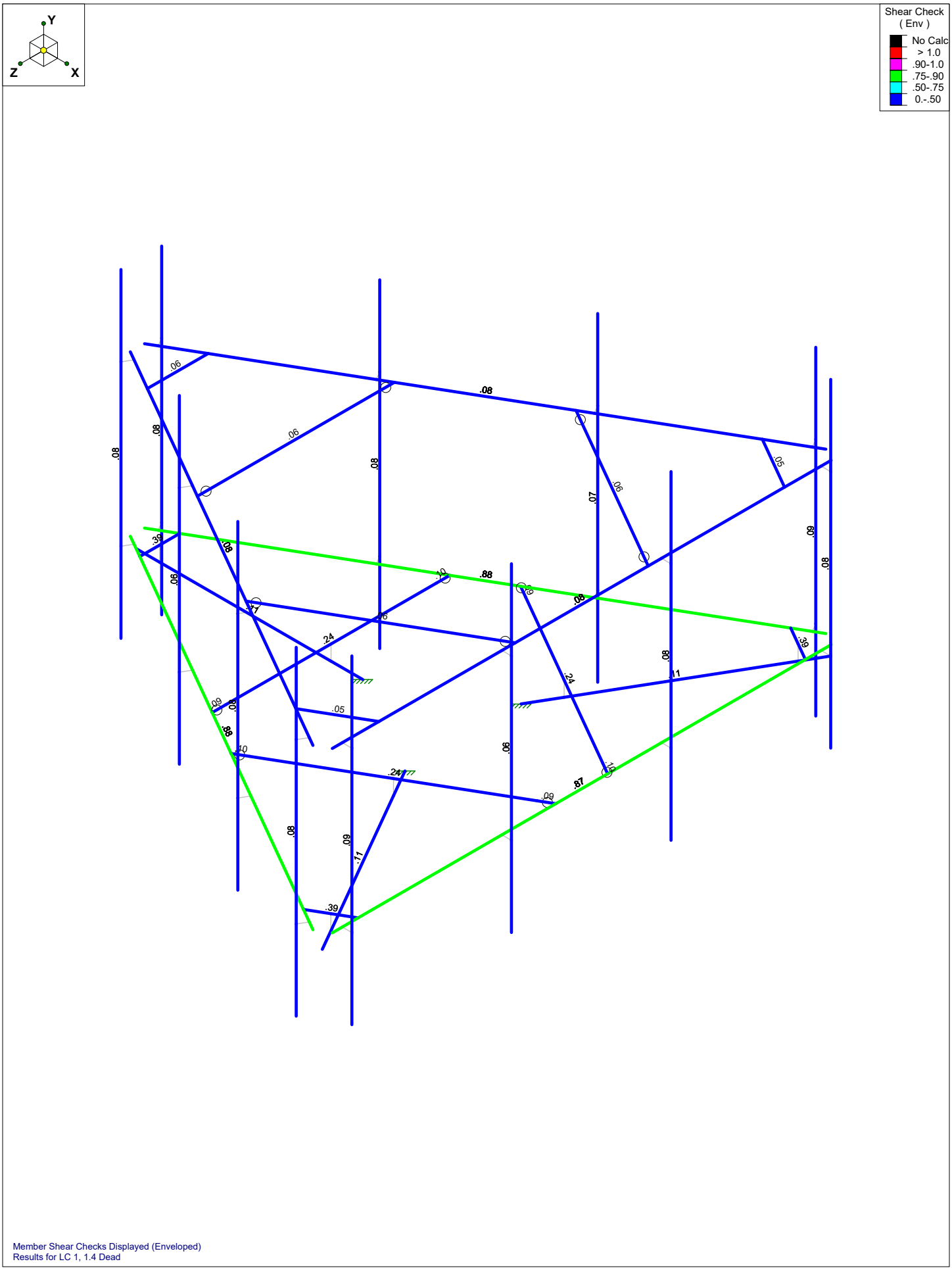

Y
Z
X
Section Sets
Mount Standoff
Cross Bracing
Cross Bracing Plate
Standoff Plate
Face Horizontal
Support Rail
Support Rail Pipe Bracing
Support Rail Angle Bracing
Pipe Mount
RIGID
PL 4x5/8
HSS4x4x1/4
C5X6.7


Y
Z
X
Section Sets
Mount Standoff
Cross Bracing
Cross Bracing Plate
Standoff Plate
Face Horizontal
Support Rail
Support Rail Pipe Bracing
Support Rail Angle Bracing
Pipe Mount
RIGID
L2.5x2.5x1/4
P2.5 Std.
P2 Std.
L2.5x2.5x1/4
P2.5 Std.
P2.5 Std.
L2.5x2.5x1/4
P2 Std.



Loads: LC 35, 1.2 Dead + 1.0 Ice Wind @ 270°+ 1.0 Ice + 1.0 Temp


Y
Z
X
Code Check
(Env)
No Calc
> 1.0
.90-1.0
.75-.90
.50-.75
0.-.50
Member Code Checks Displayed (Enveloped)
Results for LC 1, 1.4 Dead



Member Shear Checks Displayed (Enveloped)
Results for LC 1, 1.4 Dead

APPENDIX B

SOFTWARE INPUT CALCULATIONS

TIA-222-H: Mount Analysis Wind Loading
846176 - MADISON DURHAM ROAD
2021777.846176.01

Structure Information		
Structure Type:	Monopole	
Structure Height:	119	ft
z (Mount Centerline) =	106	ft
Gh (Mount Gust Effect Factor) =	1.00	
Risk Category:	II	

Code Specifications		
TIA/EIA Code:	H	
Ultimate Wind Speed (No Ice) =	130	mph (3-s gust)
Ultimate Wind Speed (With Ice) =	50	mph (3-s gust)
Ice Thickness	1.5	in
Exposure Category	B	
Tower Base Elevation (AMSL)	342	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_a	User's Wind Multiplier	Normal Wind Force (lb/ft)*	Normal Ice Wind Force (lb/ft)*	Ice Weight (lb/ft)*
Mount Standoff	Square/Rect.	68.000	4	4		5.66	Flat	0.90	1.00	23.57	4.41	15.12
Cross Bracing	Square/Rect.	66.000	5	1.75		5.30	Flat	0.90	1.00	27.31	4.98	14.38
Cross Bracing Plate	Square/Rect.	6.000	4	0.625		4.05	Flat	0.90	1.00	16.32	3.60	11.81
Standoff Plate	Square/Rect.	12.000	4	0.625		4.05	Flat	0.90	1.00	16.62	3.60	11.81
Face Horizontal	Square/Rect.	150.000	5	1.75		5.30	Flat	0.90	1.00	33.99	6.20	14.38
Support Rail	Pipe	150.000	2.875	2.875		2.88	Round	0.90	1.00	11.73	3.70	9.39
Support Rail Pipe Bracing	Pipe	72.000	2.375	2.375		2.38	Round	0.90	1.00	9.69	2.67	8.36
Support Rail Angle Bracing	Angle	15.600	2.5	2.5		3.54	Flat	0.90	1.00	11.61	2.71	10.75
Pipe Mount	Pipe	96.000	2.375	2.375		2.38	Round	0.90	1.00	9.69	2.93	8.36

*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_a 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	108	33.11	20.51	8.54	114.63	Flat	0%	0%	0.90	208.87	114.63	36.01	148.69
(3) APX16DWV-16DWV-S-E-A20	108	55.9	13.3	3.15	40.7	CFD	0%	0%	0.90	231.05	40.70	45.45	135.25
(3) APXVAALL24_43-U-NA20_TMO	108	95.9	24	8.5	149.9	CFD	0%	0%	0.90	541.45	149.90	94.49	415.29
(3) RADIO 4415 B66A_CCIV3	108	14.9	13.2	5.4	46.3	Flat	0%	0%	0.90	60.49	46.30	11.77	51.77
(3) RADIO 4424 B25_TMO	108	17.1	14.4	11.3	86	Flat	0%	0%	0.90	75.74	86.00	14.33	82.99
(3) RADIO 4449 B71 B85A_T-MOBILE	108	17.91	13.2	10.63	73.21	Flat	0%	0%	0.90	72.71	73.21	13.85	78.76

*All forces are unfactored.

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[lb/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	490	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	490	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	490	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	490	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	490	50	1.4	65	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Desig...	A [in2]	Iyy [i...	Izz [i...	J [in4]
1	Mount Standoff	HSS4x4x1/4	None	None	A500 Gr.B Rect	Typical	3.75	8.828	8.828	13.1...
2	Cross Bracing	C5X6.7	None	None	A36 Gr.36	Typical	1.97	.47	7.48	.055
3	Cross Bracing Plate	PL 4x5/8	None	None	A36 Gr.36	Typical	2.5	.081	3.333	.293
4	Standoff Plate	PL 4x5/8	None	None	A36 Gr.36	Typical	2.5	.081	3.333	.293
5	Face Horizontal	C5X6.7	None	None	A36 Gr.36	Typical	1.97	.47	7.48	.055
6	Support Rail	P2.5 Std.	None	None	A53 Gr.B	Typical	1.707	1.538	1.538	3.076
7	Support Rail Pipe Bracing	P2 Std.	None	None	A53 Gr.B	Typical	1.077	.67	.67	1.34
8	Support Rail Angle Braci...	L2.5x2.5x1/4	None	None	A36 Gr.36	Typical	1.188	.703	.703	.023
9	Pipe Mount	P2 Std.	None	None	A53 Gr.B	Typical	1.077	.67	.67	1.34

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Grav...	Joint	Point	Distrib...	Area(Member)	Surface(Plate/W...
1	Dead	DL		-1			30		3	
2	No Ice Wind 0 deg	None					30	38		
3	No Ice Wind 30 deg	None					60	62		
4	No Ice Wind 60 deg	None					60	76		
5	No Ice Wind 90 deg	None					30	31		
6	No Ice Wind 120 deg	None					60	76		
7	No Ice Wind 150 deg	None					60	62		
8	No Ice Wind 180 deg	None					30	38		
9	No Ice Wind 210 deg	None					60	62		
10	No Ice Wind 240 deg	None					60	76		
11	No Ice Wind 270 deg	None					30	31		
12	No Ice Wind 300 deg	None					60	76		
13	No Ice Wind 330 deg	None					60	62		
14	Ice Weight	None					30	39	3	
15	Ice Wind 0 deg	None					30	38		
16	Ice Wind 30 deg	None					60	62		
17	Ice Wind 60 deg	None					60	76		
18	Ice Wind 90 deg	None					30	31		
19	Ice Wind 120 deg	None					60	76		
20	Ice Wind 150 deg	None					60	62		
21	Ice Wind 180 deg	None					30	38		
22	Ice Wind 210 deg	None					60	62		
23	Ice Wind 240 deg	None					60	76		
24	Ice Wind 270 deg	None					30	31		
25	Ice Wind 300 deg	None					60	76		
26	Ice Wind 330 deg	None					60	62		
27	Live Load - A1	None					1			
28	Live Load - A2	None					1			
29	Live Load - A3	None					1			
30	Live Load - A4	None					1			
31	Live Load - B1	None					1			

Basic Load Cases (Continued)

	BLC Description	Category	X Gra...	Y Gra...	Z Grav...	Joint	Point	Distrib...	Area(Member)	Surface(Plate/W...
32	Live Load - B2	None					1			
33	Live Load - B3	None					1			
34	Live Load - B4	None					1			
35	Live Load - C1	None					1			
36	Live Load - C2	None					1			
37	Live Load - C3	None					1			
38	Live Load - C4	None					1			
39	Live Load - M1 (Start)	None					1			
40	Live Load - M1 (Middle)	None					1			
41	Live Load - M1 (End)	None					1			
42	Live Load - M5 (Start)	None					1			
43	Live Load - M5 (Middle)	None					1			
44	Live Load - M5 (End)	None					1			
45	Live Load - M8 (Start)	None					1			
46	Live Load - M8 (Middle)	None					1			
47	Live Load - M8 (End)	None					1			
48	Live Load - M9 (Start)	None					1			
49	Live Load - M9 (Middle)	None					1			
50	Live Load - M9 (End)	None					1			
51	Live Load - M13 (Start)	None					1			
52	Live Load - M13 (Middle)	None					1			
53	Live Load - M13 (End)	None					1			
54	Live Load - M16 (Start)	None					1			
55	Live Load - M16 (Middle)	None					1			
56	Live Load - M16 (End)	None					1			
57	Live Load - M17 (Start)	None					1			
58	Live Load - M17 (Middle)	None					1			
59	Live Load - M17 (End)	None					1			
60	Live Load - M21 (Start)	None					1			
61	Live Load - M21 (Middle)	None					1			
62	Live Load - M21 (End)	None					1			
63	Live Load - M24 (Start)	None					1			
64	Live Load - M24 (Middle)	None					1			
65	Live Load - M24 (End)	None					1			
66	BLC 1 Transient Area Loads	None						56		
67	BLC 14 Transient Area Loads	None						56		

Load Combinations

	Description	S...	PDel...	SRSS	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4 Dead	Y...	Y		1	1.4	0		0		0		0		0		0		0					
2	1.2 Dead + 1.0 Wind @ 0° - No Ice	Y...	Y		1	1.2	2	1	0		0		0		0		0		0					
3	0.9 Dead + 1.0 Wind @ 0° - No Ice	Y...	Y		1	.9	2	1	0		0		0		0		0		0					
4	1.2 Dead + 1.0 Wind @ 30° - No Ice	Y...	Y		1	1.2	3	1	0		0		0		0		0		0					
5	0.9 Dead + 1.0 Wind @ 30° - No Ice	Y...	Y		1	.9	3	1	0		0		0		0		0		0					
6	1.2 Dead + 1.0 Wind @ 60° - No Ice	Y...	Y		1	1.2	4	1	0		0		0		0		0		0					
7	0.9 Dead + 1.0 Wind @ 60° - No Ice	Y...	Y		1	.9	4	1	0		0		0		0		0		0					
8	1.2 Dead + 1.0 Wind @ 90° - No Ice	Y...	Y		1	1.2	5	1	0		0		0		0		0		0					
9	0.9 Dead + 1.0 Wind @ 90° - No Ice	Y...	Y		1	.9	5	1	0		0		0		0		0		0					
10	1.2 Dead + 1.0 Wind @ 120° - No I...	Y...	Y		1	1.2	6	1	0		0		0		0		0		0					
11	0.9 Dead + 1.0 Wind @ 120° - No I...	Y...	Y		1	.9	6	1	0		0		0		0		0		0					
12	1.2 Dead + 1.0 Wind @ 150° - No I...	Y...	Y		1	1.2	7	1	0		0		0		0		0		0					
13	0.9 Dead + 1.0 Wind @ 150° - No I...	Y...	Y		1	.9	7	1	0		0		0		0		0		0					
14	1.2 Dead + 1.0 Wind @ 180° - No I...	Y...	Y		1	1.2	8	1	0		0		0		0		0		0					
15	0.9 Dead + 1.0 Wind @ 180° - No I...	Y...	Y		1	.9	8	1	0		0		0		0		0		0					
16	1.2 Dead + 1.0 Wind @ 210° - No I...	Y...	Y		1	1.2	9	1	0		0		0		0		0		0					

Load Combinations (Continued)

	Description	S...	PDel...	SRSS	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
17	0.9 Dead + 1.0 Wind @ 210° - No I...	Y...	Y		1	.9	9	1	0		0		0		0		0							
18	1.2 Dead + 1.0 Wind @ 240° - No I...	Y...	Y		1	1.2	10	1	0		0		0		0		0							
19	0.9 Dead + 1.0 Wind @ 240° - No I...	Y...	Y		1	.9	10	1	0		0		0		0		0							
20	1.2 Dead + 1.0 Wind @ 270° - No I...	Y...	Y		1	1.2	11	1	0		0		0		0		0							
21	0.9 Dead + 1.0 Wind @ 270° - No I...	Y...	Y		1	.9	11	1	0		0		0		0		0							
22	1.2 Dead + 1.0 Wind @ 300° - No I...	Y...	Y		1	1.2	12	1	0		0		0		0		0							
23	0.9 Dead + 1.0 Wind @ 300° - No I...	Y...	Y		1	.9	12	1	0		0		0		0		0							
24	1.2 Dead + 1.0 Wind @ 330° - No I...	Y...	Y		1	1.2	13	1	0		0		0		0		0							
25	0.9 Dead + 1.0 Wind @ 330° - No I...	Y...	Y		1	.9	13	1	0		0		0		0		0							
26	1.2 Dead + 1.0 Ice Wind @ 0°+ 1.0...	Y...	Y		1	1.2	15	1	14	1		1	0		0		0							
27	1.2 Dead + 1.0 Ice Wind @ 30°+ 1...	Y...	Y		1	1.2	16	1	14	1		1	0		0		0							
28	1.2 Dead + 1.0 Ice Wind @ 60°+ 1...	Y...	Y		1	1.2	17	1	14	1		1	0		0		0							
29	1.2 Dead + 1.0 Ice Wind @ 90°+ 1...	Y...	Y		1	1.2	18	1	14	1		1	0		0		0							
30	1.2 Dead + 1.0 Ice Wind @ 120°+ ...	Y...	Y		1	1.2	19	1	14	1		1	0		0		0							
31	1.2 Dead + 1.0 Ice Wind @ 150°+ ...	Y...	Y		1	1.2	20	1	14	1		1	0		0		0							
32	1.2 Dead + 1.0 Ice Wind @ 180°+ ...	Y...	Y		1	1.2	21	1	14	1		1	0		0		0							
33	1.2 Dead + 1.0 Ice Wind @ 210°+ ...	Y...	Y		1	1.2	22	1	14	1		1	0		0		0							
34	1.2 Dead + 1.0 Ice Wind @ 240°+ ...	Y...	Y		1	1.2	23	1	14	1		1	0		0		0							
35	1.2 Dead + 1.0 Ice Wind @ 270°+ ...	Y...	Y		1	1.2	24	1	14	1		1	0		0		0							
36	1.2 Dead + 1.0 Ice Wind @ 300°+ ...	Y...	Y		1	1.2	25	1	14	1		1	0		0		0							
37	1.2 Dead + 1.0 Ice Wind @ 330°+ ...	Y...	Y		1	1.2	26	1	14	1		1	0		0		0							
38	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	2	.053	0		0		0		0							
39	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	3	.053	0		0		0		0							
40	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	4	.053	0		0		0		0							
41	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	5	.053	0		0		0		0							
42	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	6	.053	0		0		0		0							
43	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	7	.053	0		0		0		0							
44	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	8	.053	0		0		0		0							
45	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	9	.053	0		0		0		0							
46	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	10	.053	0		0		0		0							
47	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	11	.053	0		0		0		0							
48	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	12	.053	0		0		0		0							
49	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	13	.053	0		0		0		0							
50	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	2	.053	0		0		0		0							
51	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	3	.053	0		0		0		0							
52	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	4	.053	0		0		0		0							
53	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	5	.053	0		0		0		0							
54	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	6	.053	0		0		0		0							
55	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	7	.053	0		0		0		0							
56	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	8	.053	0		0		0		0							
57	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	9	.053	0		0		0		0							
58	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	10	.053	0		0		0		0							
59	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	11	.053	0		0		0		0							
60	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	12	.053	0		0		0		0							
61	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	13	.053	0		0		0		0							
62	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	2	.053	0		0		0		0							
63	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	3	.053	0		0		0		0							
64	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	4	.053	0		0		0		0							
65	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	5	.053	0		0		0		0							
66	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	6	.053	0		0		0		0							
67	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	7	.053	0		0		0		0							
68	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	8	.053	0		0		0		0							
69	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	9	.053	0		0		0		0							
70	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	10	.053	0		0		0		0							
71	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	11	.053	0		0		0		0							
72	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	12	.053	0		0		0		0							
73	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	13	.053	0		0		0		0							

Load Combinations (Continued)

	Description	S...	PDel...	SRSS	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
74	1.2 Dead + 1.5 Live_M - A4 + 1.0 ...	Y...	Y		1	1.2	30	1.5	2	.053	0		0		0		0					
75	1.2 Dead + 1.5 Live_M - A4 + 1.0 ...	Y...	Y		1	1.2	30	1.5	3	.053	0		0		0		0					
76	1.2 Dead + 1.5 Live_M - A4 + 1.0 ...	Y...	Y		1	1.2	30	1.5	4	.053	0		0		0		0					
77	1.2 Dead + 1.5 Live_M - A4 + 1.0 ...	Y...	Y		1	1.2	30	1.5	5	.053	0		0		0		0					
78	1.2 Dead + 1.5 Live_M - A4 + 1.0 ...	Y...	Y		1	1.2	30	1.5	6	.053	0		0		0		0					
79	1.2 Dead + 1.5 Live_M - A4 + 1.0 ...	Y...	Y		1	1.2	30	1.5	7	.053	0		0		0		0					
80	1.2 Dead + 1.5 Live_M - A4 + 1.0 ...	Y...	Y		1	1.2	30	1.5	8	.053	0		0		0		0					
81	1.2 Dead + 1.5 Live_M - A4 + 1.0 ...	Y...	Y		1	1.2	30	1.5	9	.053	0		0		0		0					
82	1.2 Dead + 1.5 Live_M - A4 + 1.0 ...	Y...	Y		1	1.2	30	1.5	10	.053	0		0		0		0					
83	1.2 Dead + 1.5 Live_M - A4 + 1.0 ...	Y...	Y		1	1.2	30	1.5	11	.053	0		0		0		0					
84	1.2 Dead + 1.5 Live_M - A4 + 1.0 ...	Y...	Y		1	1.2	30	1.5	12	.053	0		0		0		0					
85	1.2 Dead + 1.5 Live_M - A4 + 1.0 ...	Y...	Y		1	1.2	30	1.5	13	.053	0		0		0		0					
86	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	31	1.5	2	.053	0		0		0		0					
87	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	31	1.5	3	.053	0		0		0		0					
88	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	31	1.5	4	.053	0		0		0		0					
89	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	31	1.5	5	.053	0		0		0		0					
90	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	31	1.5	6	.053	0		0		0		0					
91	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	31	1.5	7	.053	0		0		0		0					
92	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	31	1.5	8	.053	0		0		0		0					
93	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	31	1.5	9	.053	0		0		0		0					
94	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	31	1.5	10	.053	0		0		0		0					
95	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	31	1.5	11	.053	0		0		0		0					
96	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	31	1.5	12	.053	0		0		0		0					
97	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	31	1.5	13	.053	0		0		0		0					
98	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	32	1.5	2	.053	0		0		0		0					
99	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	32	1.5	3	.053	0		0		0		0					
100	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	32	1.5	4	.053	0		0		0		0					
101	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	32	1.5	5	.053	0		0		0		0					
102	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	32	1.5	6	.053	0		0		0		0					
103	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	32	1.5	7	.053	0		0		0		0					
104	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	32	1.5	8	.053	0		0		0		0					
105	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	32	1.5	9	.053	0		0		0		0					
106	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	32	1.5	10	.053	0		0		0		0					
107	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	32	1.5	11	.053	0		0		0		0					
108	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	32	1.5	12	.053	0		0		0		0					
109	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	32	1.5	13	.053	0		0		0		0					
110	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	33	1.5	2	.053	0		0		0		0					
111	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	33	1.5	3	.053	0		0		0		0					
112	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	33	1.5	4	.053	0		0		0		0					
113	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	33	1.5	5	.053	0		0		0		0					
114	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	33	1.5	6	.053	0		0		0		0					
115	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	33	1.5	7	.053	0		0		0		0					
116	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	33	1.5	8	.053	0		0		0		0					
117	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	33	1.5	9	.053	0		0		0		0					
118	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	33	1.5	10	.053	0		0		0		0					
119	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	33	1.5	11	.053	0		0		0		0					
120	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	33	1.5	12	.053	0		0		0		0					
121	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	33	1.5	13	.053	0		0		0		0					
122	1.2 Dead + 1.5 Live_M - B4 + 1.0 ...	Y...	Y		1	1.2	34	1.5	2	.053	0		0		0		0					
123	1.2 Dead + 1.5 Live_M - B4 + 1.0 ...	Y...	Y		1	1.2	34	1.5	3	.053	0		0		0		0					
124	1.2 Dead + 1.5 Live_M - B4 + 1.0 ...	Y...	Y		1	1.2	34	1.5	4	.053	0		0		0		0					
125	1.2 Dead + 1.5 Live_M - B4 + 1.0 ...	Y...	Y		1	1.2	34	1.5	5	.053	0		0		0		0					
126	1.2 Dead + 1.5 Live_M - B4 + 1.0 ...	Y...	Y		1	1.2	34	1.5	6	.053	0		0		0		0					
127	1.2 Dead + 1.5 Live_M - B4 + 1.0 ...	Y...	Y		1	1.2	34	1.5	7	.053	0		0		0		0					
128	1.2 Dead + 1.5 Live_M - B4 + 1.0 ...	Y...	Y		1	1.2	34	1.5	8	.053	0		0		0		0					
129	1.2 Dead + 1.5 Live_M - B4 + 1.0 ...	Y...	Y		1	1.2	34	1.5	9	.053	0		0		0		0					
130	1.2 Dead + 1.5 Live_M - B4 + 1.0 ...	Y...	Y		1	1.2	34	1.5	10	.053	0		0		0		0					

Load Combinations (Continued)

	Description	S...	PDel...	SRSS	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
131	1.2 Dead + 1.5 Live_M - B4 + 1.0 ...	Y...	Y		1	1.2	34	1.5	11	.053	0		0		0		0		0					
132	1.2 Dead + 1.5 Live_M - B4 + 1.0 ...	Y...	Y		1	1.2	34	1.5	12	.053	0		0		0		0		0					
133	1.2 Dead + 1.5 Live_M - B4 + 1.0 ...	Y...	Y		1	1.2	34	1.5	13	.053	0		0		0		0		0					
134	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	35	1.5	2	.053	0		0		0		0		0					
135	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	35	1.5	3	.053	0		0		0		0		0					
136	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	35	1.5	4	.053	0		0		0		0		0					
137	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	35	1.5	5	.053	0		0		0		0		0					
138	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	35	1.5	6	.053	0		0		0		0		0					
139	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	35	1.5	7	.053	0		0		0		0		0					
140	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	35	1.5	8	.053	0		0		0		0		0					
141	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	35	1.5	9	.053	0		0		0		0		0					
142	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	35	1.5	10	.053	0		0		0		0		0					
143	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	35	1.5	11	.053	0		0		0		0		0					
144	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	35	1.5	12	.053	0		0		0		0		0					
145	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	35	1.5	13	.053	0		0		0		0		0					
146	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	36	1.5	2	.053	0		0		0		0		0					
147	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	36	1.5	3	.053	0		0		0		0		0					
148	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	36	1.5	4	.053	0		0		0		0		0					
149	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	36	1.5	5	.053	0		0		0		0		0					
150	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	36	1.5	6	.053	0		0		0		0		0					
151	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	36	1.5	7	.053	0		0		0		0		0					
152	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	36	1.5	8	.053	0		0		0		0		0					
153	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	36	1.5	9	.053	0		0		0		0		0					
154	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	36	1.5	10	.053	0		0		0		0		0					
155	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	36	1.5	11	.053	0		0		0		0		0					
156	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	36	1.5	12	.053	0		0		0		0		0					
157	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	36	1.5	13	.053	0		0		0		0		0					
158	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	37	1.5	2	.053	0		0		0		0		0					
159	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	37	1.5	3	.053	0		0		0		0		0					
160	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	37	1.5	4	.053	0		0		0		0		0					
161	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	37	1.5	5	.053	0		0		0		0		0					
162	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	37	1.5	6	.053	0		0		0		0		0					
163	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	37	1.5	7	.053	0		0		0		0		0					
164	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	37	1.5	8	.053	0		0		0		0		0					
165	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	37	1.5	9	.053	0		0		0		0		0					
166	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	37	1.5	10	.053	0		0		0		0		0					
167	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	37	1.5	11	.053	0		0		0		0		0					
168	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	37	1.5	12	.053	0		0		0		0		0					
169	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	37	1.5	13	.053	0		0		0		0		0					
170	1.2 Dead + 1.5 Live_M - C4 + 1.0 ...	Y...	Y		1	1.2	38	1.5	2	.053	0		0		0		0		0					
171	1.2 Dead + 1.5 Live_M - C4 + 1.0 ...	Y...	Y		1	1.2	38	1.5	3	.053	0		0		0		0		0					
172	1.2 Dead + 1.5 Live_M - C4 + 1.0 ...	Y...	Y		1	1.2	38	1.5	4	.053	0		0		0		0		0					
173	1.2 Dead + 1.5 Live_M - C4 + 1.0 ...	Y...	Y		1	1.2	38	1.5	5	.053	0		0		0		0		0					
174	1.2 Dead + 1.5 Live_M - C4 + 1.0 ...	Y...	Y		1	1.2	38	1.5	6	.053	0		0		0		0		0					
175	1.2 Dead + 1.5 Live_M - C4 + 1.0 ...	Y...	Y		1	1.2	38	1.5	7	.053	0		0		0		0		0					
176	1.2 Dead + 1.5 Live_M - C4 + 1.0 ...	Y...	Y		1	1.2	38	1.5	8	.053	0		0		0		0		0					
177	1.2 Dead + 1.5 Live_M - C4 + 1.0 ...	Y...	Y		1	1.2	38	1.5	9	.053	0		0		0		0		0					
178	1.2 Dead + 1.5 Live_M - C4 + 1.0 ...	Y...	Y		1	1.2	38	1.5	10	.053	0		0		0		0		0					
179	1.2 Dead + 1.5 Live_M - C4 + 1.0 ...	Y...	Y		1	1.2	38	1.5	11	.053	0		0		0		0		0					
180	1.2 Dead + 1.5 Live_M - C4 + 1.0 ...	Y...	Y		1	1.2	38	1.5	12	.053	0		0		0		0		0					
181	1.2 Dead + 1.5 Live_M - C4 + 1.0 ...	Y...	Y		1	1.2	38	1.5	13	.053	0		0		0		0		0					
182	1.2 Dead + 1.5 Live_V - M1 (Start)	Y...	Y		1	1.2	39	1.5	0		0		0		0		0		0					
183	1.2 Dead + 1.5 Live_V - M1 (Middle)	Y...	Y		1	1.2	40	1.5	0		0		0		0		0		0					
184	1.2 Dead + 1.5 Live_V - M1 (End)	Y...	Y		1	1.2	41	1.5	0		0		0		0		0		0					
185	1.2 Dead + 1.5 Live_V - M5 (Start)	Y...	Y		1	1.2	42	1.5	0		0		0		0		0		0					
186	1.2 Dead + 1.5 Live_V - M5 (Middle)	Y...	Y		1	1.2	43	1.5	0		0		0		0		0		0					
187	1.2 Dead + 1.5 Live_V - M5 (End)	Y...	Y		1	1.2	44	1.5	0		0		0		0		0		0					

Load Combinations (Continued)

	Description	S...	PDel..	SRSS	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
188	1.2 Dead + 1.5 Live_V - M8 (Start)	Y...	Y		1	1.2	45	1.5	0		0		0		0		0		0					
189	1.2 Dead + 1.5 Live_V - M8 (Middle)	Y...	Y		1	1.2	46	1.5	0		0		0		0		0		0					
190	1.2 Dead + 1.5 Live_V - M8 (End)	Y...	Y		1	1.2	47	1.5	0		0		0		0		0		0					
191	1.2 Dead + 1.5 Live_V - M9 (Start)	Y...	Y		1	1.2	48	1.5	0		0		0		0		0		0					
192	1.2 Dead + 1.5 Live_V - M9 (Middle)	Y...	Y		1	1.2	49	1.5	0		0		0		0		0		0					
193	1.2 Dead + 1.5 Live_V - M9 (End)	Y...	Y		1	1.2	50	1.5	0		0		0		0		0		0					
194	1.2 Dead + 1.5 Live_V - M13 (Start)	Y...	Y		1	1.2	51	1.5	0		0		0		0		0		0					
195	1.2 Dead + 1.5 Live_V - M13 (Midd..	Y...	Y		1	1.2	52	1.5	0		0		0		0		0		0					
196	1.2 Dead + 1.5 Live_V - M13 (End)	Y...	Y		1	1.2	53	1.5	0		0		0		0		0		0					
197	1.2 Dead + 1.5 Live_V - M16 (Start)	Y...	Y		1	1.2	54	1.5	0		0		0		0		0		0					
198	1.2 Dead + 1.5 Live_V - M16 (Midd..	Y...	Y		1	1.2	55	1.5	0		0		0		0		0		0					
199	1.2 Dead + 1.5 Live_V - M16 (End)	Y...	Y		1	1.2	56	1.5	0		0		0		0		0		0					
200	1.2 Dead + 1.5 Live_V - M17 (Start)	Y...	Y		1	1.2	57	1.5	0		0		0		0		0		0					
201	1.2 Dead + 1.5 Live_V - M17 (Midd..	Y...	Y		1	1.2	58	1.5	0		0		0		0		0		0					
202	1.2 Dead + 1.5 Live_V - M17 (End)	Y...	Y		1	1.2	59	1.5	0		0		0		0		0		0					
203	1.2 Dead + 1.5 Live_V - M21 (Start)	Y...	Y		1	1.2	60	1.5	0		0		0		0		0		0					
204	1.2 Dead + 1.5 Live_V - M21 (Midd..	Y...	Y		1	1.2	61	1.5	0		0		0		0		0		0					
205	1.2 Dead + 1.5 Live_V - M21 (End)	Y...	Y		1	1.2	62	1.5	0		0		0		0		0		0					
206	1.2 Dead + 1.5 Live_V - M24 (Start)	Y...	Y		1	1.2	63	1.5	0		0		0		0		0		0					
207	1.2 Dead + 1.5 Live_V - M24 (Midd..	Y...	Y		1	1.2	64	1.5	0		0		0		0		0		0					
208	1.2 Dead + 1.5 Live_V - M24 (End)	Y...	Y		1	1.2	65	1.5	0		0		0		0		0		0					

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	N1	m...	1151.156	3	3500.871	26	1664.764	9	1.01	8	2.108	8	1.844	15
2		min	-3150.2...	32	-81.249	15	-1673.021	20	-.888	21	-2.092	21	-7.401	26
3	N15	m...	2321.159	2	3469.647	30	787.047	11	6.27	29	1.894	16	3.802	31
4		min	-1390.8...	15	4.65	23	-2670.546	36	-1.329	23	-1.876	5	-.89	25
5	N29	m...	1768.785	24	3465.956	35	2765.948	29	1.448	9	1.893	24	3.492	33
6		min	-849.22	13	2.834	7	-1139.835	21	-6.444	35	-1.877	13	-.76	5
7	Totals:	m...	4881.704	2	9761.515	34	4852.792	9						
8		min	-4881.7...	15	2930.407	7	-4852.795	20						

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

	Member	Shape	Code Che...	Loc[in]	LC	Shear Che...	Loc[in]	Dir	LC	phi*...	phi*...	phi*...	phi*...	...	Eqn
1	M24	C5X6.7	.312	66.667	25	.877	66.667	y	35	4719..	63828	1.604	9.585	...	H1-...
2	M8	C5X6.7	.346	66.667	9	.877	83.333	y	29	4719..	63828	1.604	9.585	...	H1-...
3	M16	C5X6.7	.318	66.667	17	.871	66.667	y	31	4719..	63828	1.604	9.497	...	H1-...
4	M4	PL 4x5/8	.554	6.061	33	.395	5.939	y	26	6417..	81000	1.055	6.75	...	H1-...
5	M12	PL 4x5/8	.550	6.061	37	.391	5.939	y	30	6417..	81000	1.055	6.75	...	H1-...
6	M20	PL 4x5/8	.560	6.061	29	.390	5.939	y	34	6417..	81000	1.055	6.75	...	H1-...
7	M21	C5X6.7	.288	32.008	29	.242	32.008	y	35	5114..	63828	1.604	9.585	...	H1-...
8	M5	C5X6.7	.289	32.008	33	.241	32.008	y	27	5114..	63828	1.604	9.585	...	H1-...
9	M13	C5X6.7	.286	32.008	37	.240	32.008	y	31	5114..	63828	1.604	9.585	...	H1-...
10	M1	HSS4x4x1/4	.416	0	26	.111	0	z	8	1360..	1552..	18.22	18.22	...	H1-...
11	M9	HSS4x4x1/4	.410	0	30	.107	0	y	14	1360..	1552..	18.22	18.22	...	H1-...
12	M17	HSS4x4x1/4	.414	0	35	.106	0	y	36	1360..	1552..	18.22	18.22	...	H1-...
13	M23	PL 4x5/8	.050	4.046	29	.096	0	y	35	7888..	81000	1.055	6.75	...	H1-...
14	M7	PL 4x5/8	.051	4.046	37	.096	0	y	27	7888..	81000	1.055	6.75	...	H1-...
15	M15	PL 4x5/8	.050	4.046	29	.095	0	y	31	7888..	81000	1.055	6.75	...	H1-...
16	M14	PL 4x5/8	.048	4.046	30	.095	0	y	29	7888..	81000	1.055	6.75	...	H1-...
17	M6	PL 4x5/8	.048	4.046	26	.094	0	y	37	7888..	81000	1.055	6.75	...	H1-...
18	M22	PL 4x5/8	.048	4.046	35	.094	0	y	33	7888..	81000	1.055	6.75	...	H1-...
19	A4	P2 Std.	.237	71.758	10	.087	71.758		8	1589..	3392..	2.006	2.006	...	H1-...

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

	Member	Shape	Code Che...	Loc[in]	LC	Shear Che...	Loc[in]	Dir	LC	phi*...	phi*...	phi*...	phi*...	...	Eqn
20	C4	P2 Std.	.252	71.758	2	.086	71.758		2	1589..	3392..	2.006	2.006	...	H1-...
21	B2	P2 Std.	.379	71.758	4	.085	71.758		8	1589..	3392..	2.006	2.006	...	H1-...
22	A1	P2 Std.	.251	71.758	20	.082	71.758		20	1589..	3392..	2.006	2.006	...	H1-...
23	B4	P2 Std.	.228	71.758	18	.080	71.758		16	1589..	3392..	2.006	2.006	...	H1-...
24	M59	P2.5 Std.	.142	98.485	14	.080	134.8...		20	1544..	5377..	3.827	3.827	...	H1-...
25	C2	P2 Std.	.374	71.758	14	.080	71.758		16	1589..	3392..	2.006	2.006	...	H1-...
26	B1	P2 Std.	.257	71.758	2	.079	71.758		2	1589..	3392..	2.006	2.006	...	H1-...
27	A2	P2 Std.	.406	71.758	20	.079	71.758		24	1589..	3392..	2.006	2.006	...	H1-...
28	M33	P2.5 Std.	.152	51.515	20	.078	134.8...		2	1544..	5377..	3.827	3.827	...	H1-...
29	M46	P2.5 Std.	.142	51.515	2	.076	134.8...		12	1544..	5377..	3.827	3.827	...	H1-...
30	C1	P2 Std.	.230	71.758	10	.076	71.758		14	1589..	3392..	2.006	2.006	...	H1-...
31	C3	P2 Std.	.362	71.758	2	.068	71.758		20	1589..	3392..	2.006	2.006	...	H1-...
32	B3	P2 Std.	.332	71.758	4	.064	71.758		12	1589..	3392..	2.006	2.006	...	H1-...
33	A3	P2 Std.	.363	71.758	20	.062	71.758		4	1589..	3392..	2.006	2.006	...	H1-...
34	M67	P2 Std.	.023	29.332	14	.060	0		8	2541..	3392..	2.006	2.006	...	H1-...
35	M69	P2 Std.	.022	29.332	35	.056	0		24	2541..	3392..	2.006	2.006	...	H1-...
36	M68	P2 Std.	.023	29.93	29	.056	0		16	2541..	3392..	2.006	2.006	...	H1-...
37	M64	L2.5x2.5x1/4	.283	18.262	20	.055	0	y	20	3577..	38475	1.145	2.565	...	H2-1
38	M66	L2.5x2.5x1/4	.261	18.262	12	.051	0	y	12	3577..	38475	1.145	2.565	...	H2-1
39	M65	L2.5x2.5x1/4	.267	18.262	4	.051	0	y	4	3577..	38475	1.145	2.565	...	H2-1

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	Eqn
1	M24	C5X6.7	0.312	1.05	0.297*	66.67	25	0.877	1.05	0.835*	66.67	4719.057	63828	1.604	9.585	2.071	H1-1b
2	M8	C5X6.7	0.346	1.05	0.33*	66.67	9	0.877	1.05	0.835*	83.33	4719.057	63828	1.604	9.585	2.072	H1-1b
3	M16	C5X6.7	0.318	1.05	0.303*	66.67	17	0.871	1.05	0.83*	66.67	4719.057	63828	1.604	9.497	2.045	H1-1b
4	M4	PL 4x5/8	0.554	1.05	0.528*	6.061	33	0.395	1.05	0.376*	5.939	76418.791	81000	1.055	6.75	1.448	H1-1b
5	M12	PL 4x5/8	0.55	1.05	0.524*	6.061	37	0.391	1.05	0.372*	5.939	76418.791	81000	1.055	6.75	1.403	H1-1b
6	M20	PL 4x5/8	0.56	1.05	0.533*	6.061	29	0.39	1.05	0.371*	5.939	76418.791	81000	1.055	6.75	1.438	H1-1b
7	M21	C5X6.7	0.288	1.05	0.274*	32.01	29	0.242	1.05	0.23*	32.01	51143.182	63828	1.604	9.585	1.335	H1-1b
8	M5	C5X6.7	0.289	1.05	0.275*	32.01	33	0.241	1.05	0.23*	32.01	51143.182	63828	1.604	9.585	1.334	H1-1b
9	M13	C5X6.7	0.286	1.05	0.272*	32.01	37	0.24	1.05	0.229*	32.01	51143.182	63828	1.604	9.585	1.336	H1-1b
10	M1	HSS4x4x1/4	0.416	1.05	0.396*	0	26	0.111	1.05	0.106*	0	136034.79	155250	18.22	18.22	2.493	H1-1b
11	M9	HSS4x4x1/4	0.41	1.05	0.39*	0	30	0.107	1.05	0.102*	0	136034.79	155250	18.22	18.22	2.497	H1-1b
12	M17	HSS4x4x1/4	0.414	1.05	0.394*	0	35	0.106	1.05	0.101*	0	136034.79	155250	18.22	18.22	2.497	H1-1b
13	M23	PL 4x5/8	0.05	1.05	0.048*	4.046	29	0.096	1.05	0.091*	0	78883.674	81000	1.055	6.75	1.675	H1-1b
14	M7	PL 4x5/8	0.051	1.05	0.049*	4.046	37	0.096	1.05	0.091*	0	78883.674	81000	1.055	6.75	1.676	H1-1b
15	M15	PL 4x5/8	0.05	1.05	0.048*	4.046	29	0.095	1.05	0.09*	0	78883.674	81000	1.055	6.75	1.676	H1-1b
16	M14	PL 4x5/8	0.048	1.05	0.046*	4.046	30	0.095	1.05	0.09*	0	78883.674	81000	1.055	6.75	1.676	H1-1b
17	M6	PL 4x5/8	0.048	1.05	0.046*	4.046	26	0.094	1.05	0.09*	0	78883.674	81000	1.055	6.75	1.676	H1-1b
18	M22	PL 4x5/8	0.048	1.05	0.046*	4.046	35	0.094	1.05	0.09*	0	78883.674	81000	1.055	6.75	1.676	H1-1b
19	A4	P2 Std.	0.237	1.05	0.226*	71.76	10	0.087	1.05	0.083*	71.76	15893.913	33925.5	2.006	2.006	2.542	H1-1b
20	C4	P2 Std.	0.252	1.05	0.24*	71.76	2	0.086	1.05	0.082*	71.76	15893.913	33925.5	2.006	2.006	2.2	H1-1b
21	B2	P2 Std.	0.379	1.05	0.361*	71.76	4	0.085	1.05	0.081*	71.76	15893.913	33925.5	2.006	2.006	1.82	H1-1b
22	A1	P2 Std.	0.251	1.05	0.239*	71.76	20	0.082	1.05	0.078*	71.76	15893.913	33925.5	2.006	2.006	1.928	H1-1b
23	B4	P2 Std.	0.228	1.05	0.217*	71.76	18	0.08	1.05	0.076*	71.76	15893.913	33925.5	2.006	2.006	2.001	H1-1b
24	M59	P2.5 Std.	0.142	1.05	0.135*	98.49	14	0.08	1.05	0.076*	134.8	15442.36	53770.5	3.827	3.827	3.851	H1-1b
25	C2	P2 Std.	0.374	1.05	0.356*	71.76	14	0.08	1.05	0.076*	71.76	15893.913	33925.5	2.006	2.006	1.986	H1-1b
26	B1	P2 Std.	0.257	1.05	0.245*	71.76	2	0.079	1.05	0.075*	71.76	15893.913	33925.5	2.006	2.006	2.177	H1-1b
27	A2	P2 Std.	0.406	1.05	0.387*	71.76	20	0.079	1.05	0.075*	71.76	15893.913	33925.5	2.006	2.006	1.504	H1-1b
28	M33	P2.5 Std.	0.152	1.05	0.145*	51.52	20	0.078	1.05	0.074*	134.8	15442.36	53770.5	3.827	3.827	3.88	H1-1b
29	M46	P2.5 Std.	0.142	1.05	0.135*	51.52	2	0.076	1.05	0.072*	134.8	15442.36	53770.5	3.827	3.827	3.562	H1-1b
30	C1	P2 Std.	0.23	1.05	0.219*	71.76	10	0.076	1.05	0.072*	71.76	15893.913	33925.5	2.006	2.006	2.087	H1-1b
31	C3	P2 Std.	0.362	1.05	0.345*	71.76	2	0.068	1.05	0.065*	71.76	15893.913	33925.5	2.006	2.006	2.082	H1-1b
32	B3	P2 Std.	0.332	1.05	0.316*	71.76	4	0.064	1.05	0.061*	71.76	15893.913	33925.5	2.006	2.006	2.123	H1-1b
33	A3	P2 Std.	0.363	1.05	0.346*	71.76	20	0.062	1.05	0.059*	71.76	15893.913	33925.5	2.006	2.006	2.062	H1-1b
34	M67	P2 Std.	0.023	1.05	0.022*	29.33	14	0.06	1.05	0.057*	0	25411.983	33925.5	2.006	2.006	1.14	H1-1b
35	M69	P2 Std.	0.022	1.05	0.021*	29.33	35	0.056	1.05	0.053*	0	25411.983	33925.5	2.006	2.006	1.14	H1-1b
36	M68	P2 Std.	0.023	1.05	0.022*	29.93	29	0.056	1.05	0.053*	0	25411.983	33925.5	2.006	2.006	1.14	H1-1b
37	M64	L2.5x2.5x1/4	0.283	1.05	0.27*	18.26	20	0.055	1.05	0.052*	0	35777.368	38475	1.145	2.565	2.246	H2-1
38	M66	L2.5x2.5x1/4	0.261	1.05	0.249*	18.26	12	0.051	1.05	0.049*	0	35777.368	38475	1.145	2.565	2.249	H2-1
39	M65	L2.5x2.5x1/4	0.267	1.05	0.254*	18.26	4	0.051	1.05	0.049*	0	35777.368	38475	1.145	2.565	2.238	H2-1

*Rating per TIA-222-H, Section 15.5

APPENDIX D

ADDITIONAL CALCULATIONS

TIA-222-H CONNECTION CHECK
Mount to Tower Connection - Typ. All Sectors
2021777.846176.01

Bolt Information		
Bolt Diameter (d)	0.625	in
Net Tensile Area (An)	0.226	in^2
# of Bolts Total (n)	4	
Bolt Distance Up-Down	9.25	in
Bolt Distance Left-Right	9.25	in
Bolt Grade	A325N	
Bolt Tensile Strength (F_{ub})	120	ksi

Flange Information		
Height (h)	11	in
Width (w)	11	in
Thickness (t)	0.5	in
Steel Grade	A36	
Plate Yield Strength (Fy)	36	ksi
Support Arm Height	4	in
Support Arm Width	4	in

RISA 3D Reactions (Up-Down)		
Moment (M)	6.35	k-ft
Axial (T)	0.88	kips
Shear (V)	2.37	kips

RISA 3D Reactions (Left -Right)		
Moment (M)	0.03	k-ft
Axial (T)	-2.30	kips
Shear (V)	3.50	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})	4.34	kips
Bolt Shear Force (V_{ub})	0.592	kips
$T_{ub}/\phi R_{nt}$	0.20318	
$V_{ub}/\phi R_{nv}$	0.04084	
$(V_{ub}/\phi R_{nv})^2+(T_{ub}/\phi R_{nt})^2$	0.04510	
Bolt Capacity =	20.3%	OK

*Rating per TIA-222-H, Section 15.5

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})	-0.55	kips
Bolt Shear Force (V_{ub})	0.875	kips
$T_{ub}/\phi R_{nt}$	-0.02586	
$V_{ub}/\phi R_{nv}$	0.06038	
$(V_{ub}/\phi R_{nv})^2+(T_{ub}/\phi R_{nt})^2$	0.00453	
Bolt Capacity =	6.0%	OK

*Rating per TIA-222-H, Section 15.5

Plate Capacity (Up-Down)		
Bolt Circle (D_{BC})	13.081	in
Effective Width (B_{eff})	11.00	in
Flexural Moment (M_u)	22.78	k-in
Flexural Strength ($\emptyset M_n$)	22.28	k-in
Plate Capacity=	97.4%	OK

*Rating per TIA-222-H, Section 15.5

Plate Capacity (Left-Right)		
Bolt Circle (D_{BC})	13.081	in
Effective Width (B_{eff})	11.00	in
Flexural Moment (M_u)	6.49	k-in
Flexural Strength ($\emptyset M_n$)	22.28	k-in
Plate Capacity=	27.8%	OK

*Rating per TIA-222-H, Section 15.5

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 343.31 ft (NAVD 88)
Latitude: 41.389536
Longitude: -72.648881

Wind

Results:

Wind Speed:	~~128 Vmph~~	130 Vmph per 2018 Connecticut Building Code Appendix N
10-year MRI	78 Vmph	
25-year MRI	88 Vmph	
50-year MRI	95 Vmph	
100-year MRI	104 Vmph	

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

Date Accessed: Wed Feb 03 2021

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

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

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

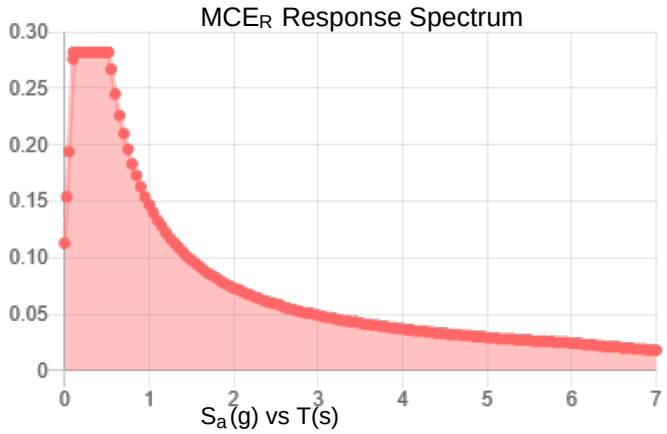
Seismic

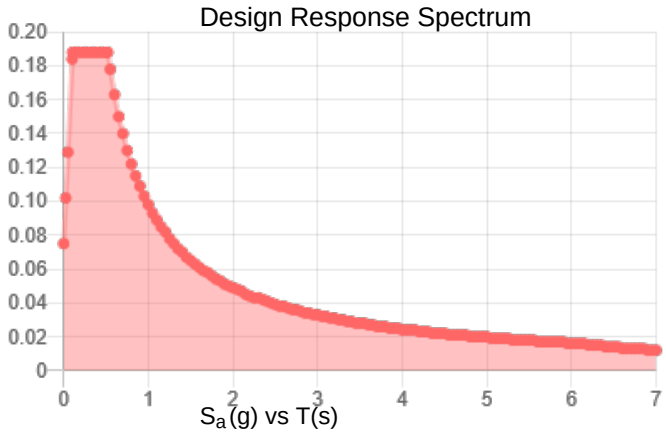
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.176	S_{DS} :	0.188
S_1 :	0.061	S_{D1} :	0.098
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.09
S_{MS} :	0.282	PGA_M :	0.144
S_{M1} :	0.147	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Wed Feb 03 2021

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

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Wed Feb 03 2021

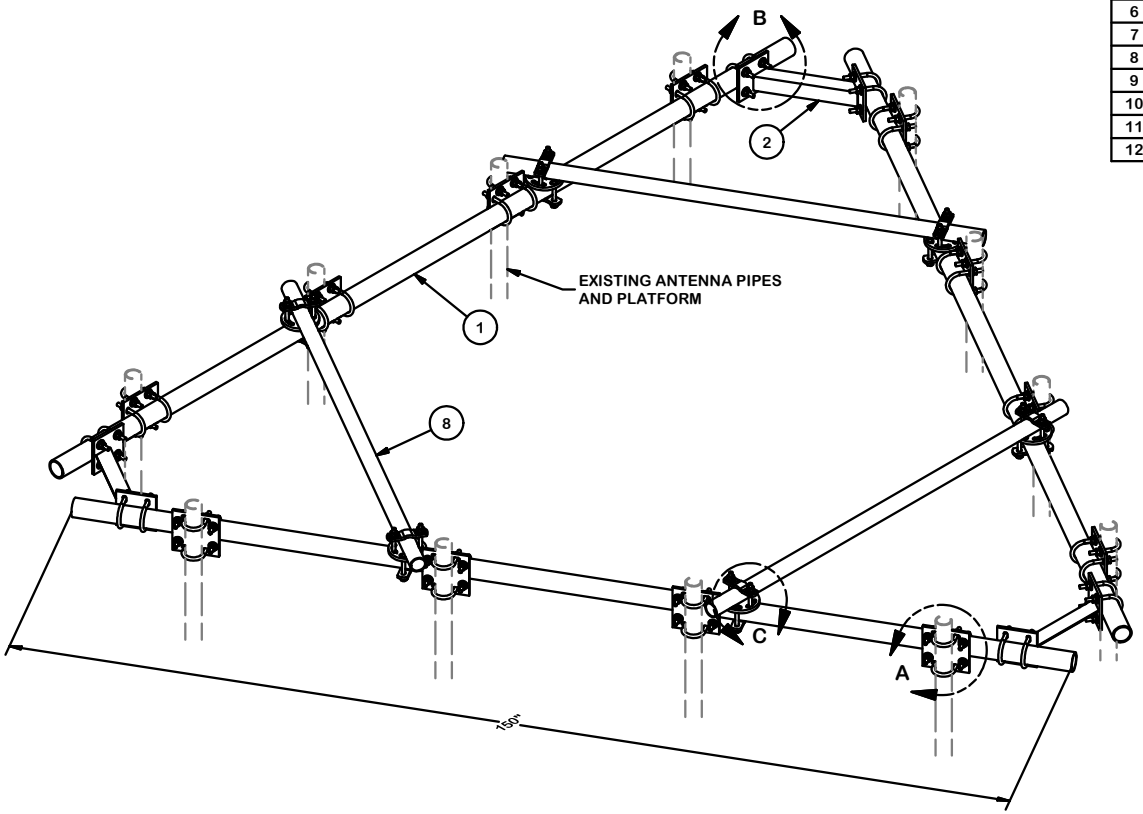
Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

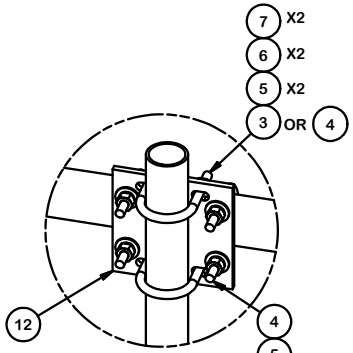
Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from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

APPENDIX E

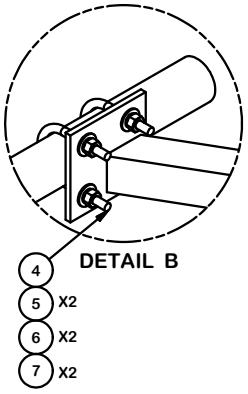
SUPPLEMENTAL DRAWINGS

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	P30150	2-7/8" O.D. X 150" SCH. 40 PIPE	150 in	76.94	230.81
2	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
3	24	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.73	17.56
4	60	X-UB1300	1/2" X 3" X 5" X 2" U-BOLT (HDG.)		0.73	43.90
5	144	G12FW	1/2" HDG USS FLATWASHER		0.03	4.91
6	144	G12LW	1/2" HDG LOCKWASHER		0.01	2.00
7	144	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	10.31
8	3	P272	2-3/8" X 72" SCH 40 GALVANIZED PIPE	72 in	23.07	69.20
9	6	X-127594	FLAT DISK CLAMP PLATE 4" CENTERS (GALVANIZED)		2.48	14.90
10	12	X-100064	CLAMP (S) (4" V-CLAMP) GALVANIZED		0.91	10.95
11	24	G1204	1/2" x 4" HDG HEX BOLT GR5 FULL THREAD	4 in	0.27	6.48
12	12	SCX2	CROSSOVER PLATE	7 in	4.80	57.56
					TOTAL WT. #	502.34

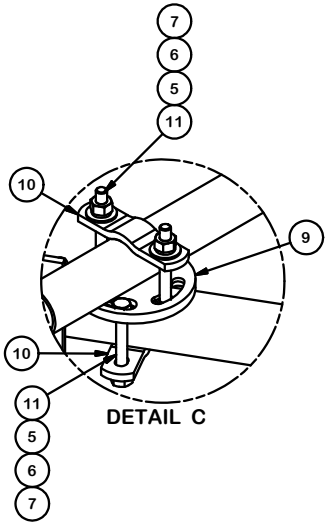




DETAIL A



DETAIL B



DETAIL C

TOLERANCE NOTES

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

DESCRIPTION
HEAY DUTY HANDRAIL KIT
FOR 12' PLATFORMS WITH
2-7/8" HANDRAIL PIPES

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

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 4/6/2015		HRK12-3HD

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	BMC 4/7/2015	HRK12-3HD

Exhibit F

Power Density/RF Emissions Report

EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CTNH494A

CT33XC540
1749 Durham Road
Madison, Connecticut 06443

March 23, 2021

EBI Project Number: 6221001356

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**40.52%**

March 23, 2021

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

Emissions Analysis for Site: CTNH494A - CT33XC540

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **1749 Durham Road** in **Madison, 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu W/cm^2$). The number of $\mu W/cm^2$ 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 ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. 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 1749 Durham Road in Madison, 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 108 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):	108 feet	Height (AGL):	108 feet	Height (AGL):	108 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 A1 MPE %:	**1.61%**	Antenna B1 MPE %:	**1.61%**	Antenna C1 MPE %:	**1.61%**
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):	108 feet	Height (AGL):	108 feet	Height (AGL):	108 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 %:	**6.32%**	Antenna B2 MPE %:	**6.32%**	Antenna C2 MPE %:	**6.32%**
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):	108 feet	Height (AGL):	108 feet	Height (AGL):	108 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 %:	**4.45%**	Antenna B3 MPE %:	**4.45%**	Antenna C3 MPE %:	**4.45%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	12.39%
AT&T	16.79%
Sprint	5.31%
Verizon	6.03%
Site Total MPE % :	40.52%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	12.39%
T-Mobile Sector B Total:	12.39%
T-Mobile Sector C Total:	12.39%
Site Total MPE % :	40.52%

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 (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 2100 MHz LTE	2	2334.27	108.0	16.13	2100 MHz LTE	1000	1.61%
T-Mobile 600 MHz LTE	2	591.73	108.0	4.09	600 MHz LTE	400	1.02%
T-Mobile 600 MHz NR	1	1577.94	108.0	5.45	600 MHz NR	400	1.36%
T-Mobile 700 MHz LTE	2	695.22	108.0	4.80	700 MHz LTE	467	1.03%
T-Mobile 1900 MHz GSM	4	1052.26	108.0	14.54	1900 MHz GSM	1000	1.45%
T-Mobile 1900 MHz LTE	2	2104.51	108.0	14.54	1900 MHz LTE	1000	1.45%
T-Mobile 2500 MHz LTE	1	6444.38	108.0	22.27	2500 MHz LTE	1000	2.23%
T-Mobile 2500 MHz NR	1	6444.38	108.0	22.27	2500 MHz NR	1000	2.23%
						Total:	**12.39%**

• 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:	12.39%
Sector B:	12.39%
Sector C:	12.39%
T-Mobile Maximum MPE % (Sector A):	12.39%
Site Total:	40.52%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **40.52%** 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.