December 16, 2020

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: 801487 - T-Mobile Site ID: CTHA160A
848 East Street, Suffield, CT 06078
Latitude: 41° 57' 25.2" / Longitude: -72° 37' 32.6"

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 162-foot mount on the existing 166-foot Monopole Tower located at 848 East Street in Suffield, CT. The tower is owned by Crown Castle and the property is owned by the Town of Suffield. T-Mobile now intends to replace six (6) antennas as well as add three (3) new antennas and ancillary equipment at the 162-ft level. This modification/proposal includes hardware that is both 4G(LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times. T-Mobile is also proposing sector mount modifications as shown on the enclosed mount analysis.

Planned Modifications:
Tower:

Remove and Replace:
(3) AIR21_KRC118023-1_B2A_B4P 1900/2100 MHz Antenna **(REMOVE)** - (3) AIR6449_B41 5G Antenna 2500 MHz **(REPLACE)**

(3) SBNH-1D65C-SR Antenna **(REMOVE)** - (3) AIR32_KRD901146-1_B66A_B2A 1900/2100 MHz Antenna **(REPLACE)**

(3) Radio RRUS11_B2 **(REMOVE)** - (3) Radio 4449_B71+B85 **(REPLACE)**

(3) Radio RRUS11_B12 **(REMOVE)** - (3) Radio 4415_B25 **(REPLACE)**

Install New:
(3) RFS-APXVAALL24_43-U-NA20 600/700 MHz Antenna
(3) Diplexer SDX1926Q-43
(3) 1 5/8" hybrid cable
(3) 8' VFA8-HD sector mounts

Remove:
(6) Coax cables

Ground:

Install New:
(1) 6160 equipment cabinet
(1) B160 battery cabinet
(2) BB6630
(1) BB6648
(1) PSU 4813 voltage booster
(1) IXRE router

Remove:
(1) Nortel Cabinet

This facility was approved by the Town of Suffield in File #740 on May 1st, 2000. The approval was given with conditions which this proposed exempt modification is following.

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 Melissa Mack, First Selectman for the Town of Suffield, as well as James Taylor, Zoning Enforcement Officer for the Town of Suffield.

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-referenced 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 14586
(585) 445-5896
richard.zajac@crowncastle.com

cc:

Town of Suffield
Attn: The Honorable Melissa M. Mack, First Selectman
83 Mountain Road
Suffield, CT 06078

Town of Suffield
Attn: James Taylor – Zoning Enforcement Officer
83 Mountain Road
Suffield, CT 06078

Zajac, Richard

From: Zajac, Richard
Sent: Wednesday, December 16, 2020 2:40 PM
To: firstselectman@suffieldct.gov
Subject: Connecticut Siting Council exempt modification application notification
Attachments: CSC Exempt Modification Application - 848 East St.pdf

Good afternoon Ms. Mack,
Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 848 East Street in Suffield.

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: Wednesday, December 16, 2020 2:44 PM
To: jtaylor@suffieldct.gov
Subject: Connecticut Siting Council exempt modification application notification
Attachments: CSC Exempt Modification Application - 848 East St.pdf

Good afternoon Mr. Taylor,
Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 848 East Street in Suffield.

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

Exhibit A

Original Facility Approval

SUFFIELD ZONING AND PLANNING COMMISSION
MINUTES OF A SPECIAL MEETING
MAY 1, 2000

PRESENT:.....Dr. Douglas Viets, Chairman
.....Mr. Stephen Martin, Secretary
.....Mr. Lawrence Boudreau, Alternate
.....Mr. Christopher Burke
.....Mr. Chester Kuras
.....Mr. Timothy Reynolds, Alternate

ABSENT.....Mr. Frank Bauchiero, Jr.
.....Mr. David Berto, Alternate
.....Mr. J. Scott Guilmartin

ALSO PRESENT:.....Mr. William Kweder, Planning Consultant
.....Mr. Gerald Turbet, Town Engineer

Chairman Viets called the Special Meeting to order at 7:38 P.M.

File #740– Request of Suffield Economic Development Commission for a special use permit for the approval of sites for communication towers located on Town properties: WPCA, Highway Department, and Landfill. Discussion tabled from the April 17, 2000 Regular Meeting.

Chairman Viets appointed Mr. Reynolds as voting alternate since he had been present at the public hearing on File #740.

Mr. Boudreau stated that he had not been present nor had he listened to the hearing tapes. Therefore, voting members numbered five.

Chairman Viets asked if the requested information from the State Historic Preservation Office concerning the impact on the Hatheway House had been received. Mr. Kweder reported that no information had been received to this date. Upon questioning, it was found that the applicant had received a letter, but it had not been forwarded to the Commission.

Crown Atlantic Company's attorney, Kenneth Baldwin, presented the State Historic Preservation Office (SHPO) letter, dated April 11, 2000, to Commission. Chairman Viets read the letter to the Commission for the record. The had been sent prior to the public hearing when the Town Garage Site was proposed to support a 180-foot tower. The size of the tower was reduced (public hearing testimony) to 120-feet. The Commission proceeded to review the three proposed tower sites beginning with the Town Garage.

Mr. Turbet suggested that, if the three sites were approved, general conditions be approved for all three locations. These conditions, in brief, are:

1. provision of detail;
2. submission of FCC licenses for each company;
3. revision of site plans;
4. provisions of self-collapsing towers certified by a registered Connecticut professional engineer;

5. under-grounding of utilities;
6. sign-off by the Zoning Enforcement Official on each application;
7. height limits to include antennae at tops of structures.

The Public Garage site tower was reduced from 180-feet to 120-feet. The Commission members reviewed pictures of the site with and without the tower from South Main Street along with the view-shed map for this site, and discussed the location in respect to visibility.

The WPCA Site tower was reduced from 199-feet to 174-feet. The Commission members reviewed view-shed maps and discussed the location in respect to visibility.

The Transfer Station Site tower was 199-feet. The same procedure was followed in respect to visibility.

Following an extensive discussion, a motion was made by Mr. Martin, seconded by Mr. Burke, to approve a special use permit for the Town of Suffield for three (3) proposed telecommunication sites located as designated:

1. Town of Suffield Transfer Station site on the west side of Mountain Road (Route 168), on undeveloped land west of the Transfer Station operations (Site A);
2. Town of Suffield Public Works garage/maintenance facility off of Mountain Road, on land immediately adjacent to the Maintenance Facility Building (Site B); and
3. Town of Suffield Sewage Treatment Plant on the east side of East Street (Route 159), on undeveloped land along the north side of the Treatment's Plant's access driveway (Site C).

with the following conditions:

1. The heights of the respective mono-pole towers, including antennae, shall not exceed 199-feet (Site A); 120-feet (Site B); and 174-feet (Site C);
2. Each tower shall be certified as "self-collapsing" by a Connecticut registered professional engineer;
3. Details drawings are to be submitted with each request for building permits for both the towers and related facilities;
4. FCC licenses shall be produced prior to the issuance of the permits for company leasing space on the towers;
5. The Zoning Enforcement Officer shall review each proposal for zoning conformance prior to the issuance of the building permits;
6. All utilities are to be underground;
7. Site plans are to be revised.

The motion was approved 5-0-0.

Mr. Boudreau was seated for the next item of business.

File #740A – Request of the Board of Selectmen for a report on the proposed twenty-year lease of portions of Town property known as:

1. Transfer Station;
2. Town Yard;
3. Sewer Plant.

First Selectman, Robert Skinner, sat as an ex-officio member of the Commission and answered various questions from the members regarding the lease agreement.

Following discussion, a motion was made by Mr. Burke, seconded by Mr. Reynolds, to forward a favorable report to the Board of Selectmen, as required under CGS 8-24, concerning a lease agreement between Crown Atlantic Company, LLC as Lessee and the Town of Suffield as the Lessor for sites for telecommunication towers located on Town properties as follows:

1. Town of Suffield Transfer Station site on the west side of Mountain Road (Route 168), on undeveloped land west of the Transfer Station operations (Site A);
2. Town of Suffield Public Works garage/maintenance facility off of Mountain Road, on land immediately adjacent to the Maintenance Facility Building (Site B); and
3. Town of Suffield Sewage Treatment Plant on the east side of East Street (Route 159), on undeveloped land along the north side of the Treatment's Plant's access driveway (Site C).

The motion was approved 6-0-0.

There, being no further business before the Special Meeting, a motion was made by Mr. Burke, seconded by Mr. Reynolds, to adjourn. The motion was 6-0-0. The Special Meeting was adjourned at 8:30 P.M.

Respectfully submitted,

_____
Stephen J. Martin, Secretary

WGK:SJM:bgk

Exhibit B

Property Card

848 EAST ST S

Location	848 EAST ST S	**Mblu**	69/H 55/ 78/ /
Acct#	69524	**Owner**	SUFFIELD TOWN OF
Assessment	$88,130	**Appraisal**	$125,900
PID	4244	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$0	$125,900	$125,900

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$0	$88,130	$88,130

Owner of Record

Owner	SUFFIELD TOWN OF	**Sale Price**	$75,000
Co-Owner	TOWN HALL	**Certificate**	
Address	83 MOUNTAIN RD SUFFIELD, CT 06078	**Book & Page**	200/ 182
		Sale Date	06/19/1987

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
SUFFIELD TOWN OF	$75,000		200/ 182	06/19/1987
HANZALEK ASTRID T	$0		102/ 78	07/09/1962

Building Information

Building 1 : Section 1

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

Building Attributes	
Field	**Description**
Style	Vacant Land
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:	

Building Photo

(http://images.vgsi.com/photos/SuffieldCTPhotos//default.jpg)

Building Layout

(http://images.vgsi.com/photos/SuffieldCTPhotos//Sketches/4244_4512.jpg

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

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	903V
Description	Mun Town MDL-00
Zone	PDIP
Neighborhood	C
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	4.7
Frontage	0
Depth	0
Assessed Value	$88,130
Appraised Value	$125,900

Outbuildings

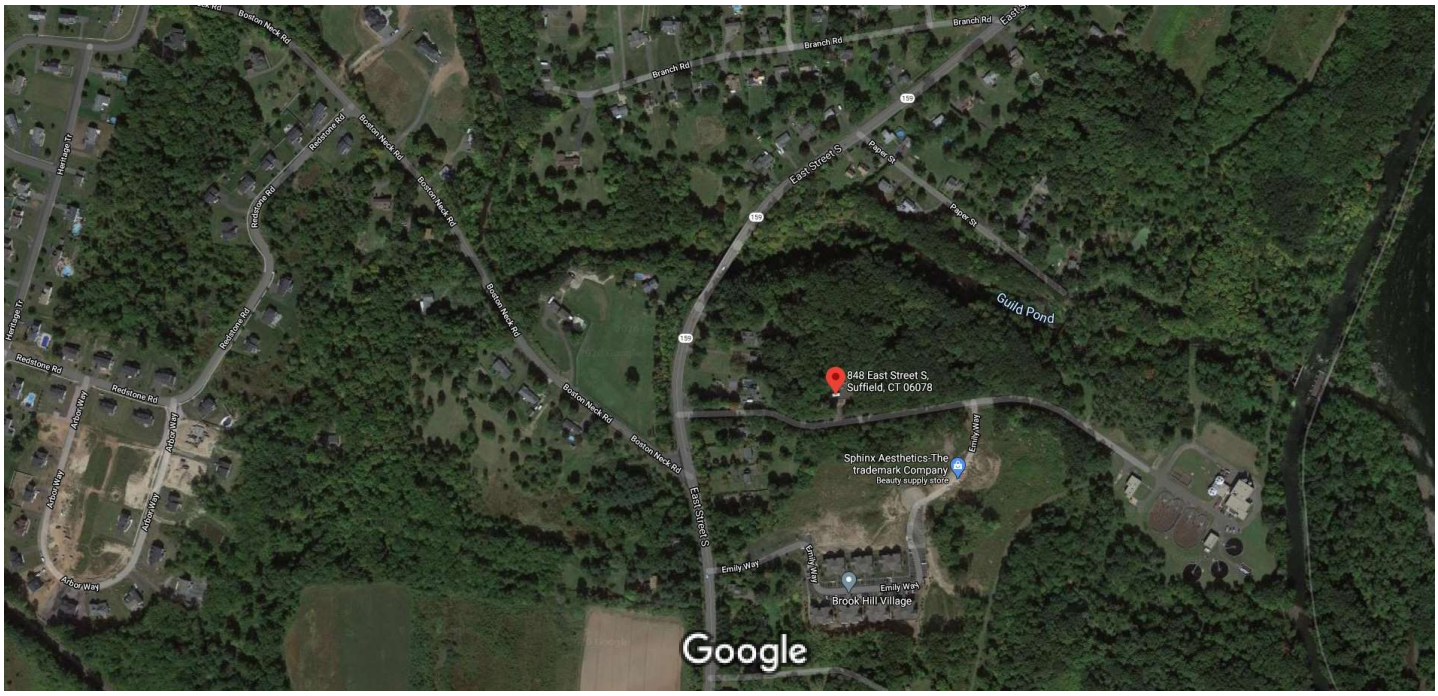
Outbuildings	Legend
No Data for Outbuildings	

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2019	$0	$125,900	$125,900
2018	$0	$125,900	$125,900
2017	$0	$129,600	$129,600

Assessment			
Valuation Year	Improvements	Land	Total
2019	$0	$88,130	$88,130
2018	$0	$88,130	$88,130
2017	$0	$90,720	$90,720

Google Maps 848 East Street S



Imagery ©2020 MassGIS, Commonwealth of Massachusetts EOEA, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency, Map data ©2020 200 ft

848 East Street S

Suffield, CT 06078
Building

Directions Save Nearby Send to your phone Share

Photos

Exhibit C

Construction Drawings

T-Mobile

T-MOBILE SITE NUMBER: CTHA160A
T-MOBILE SITE NAME: HA160/CROWN SUFFIELD MP
SITE TYPE: MONOPOLE
TOWER HEIGHT: 166'-0"
BUSINESS UNIT #: 801487
SITE ADDRESS: 848 EAST STREET SUFFIELD, CT 06078
COUNTY: HARTFORD
JURISDICTION: NA

T-MOBILE ANCHOR SITE CONFIGURATION: 67D5A997DB

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	CT SUFFIELD 3 CAC 801487
SITE ADDRESS:	848 EAST STREET SUFFIELD, CT 06078
COUNTY:	HARTFORD
MAP/PARCEL #:	NA
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.95670000 (41° 57' 25.20")
LONGITUDE:	-72.62560000 (-72° 37' 32.60")
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	114.01 FT
CURRENT ZONING:	NA
JURISDICTION:	NA
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	NA NA NA
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 35 GRIFFIN ROAD BLOOMFIELD, CT 06002
ELECTRIC PROVIDER:	---- ----
TELCO PROVIDER:	---- ----

PROJECT TEAM

A&E FIRM:	INFINIGY 1033 WATERVLIET SHAKER RD. ALBANY, NY 12205
CROWN CASTLE USA INC. DISTRICT CONTACTS:	3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065
	---- - PROJECT MANAGER ----
	---- - CONSTRUCTION MANAGER ----

DRAWING INDEX

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

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

PROJECT DESCRIPTION

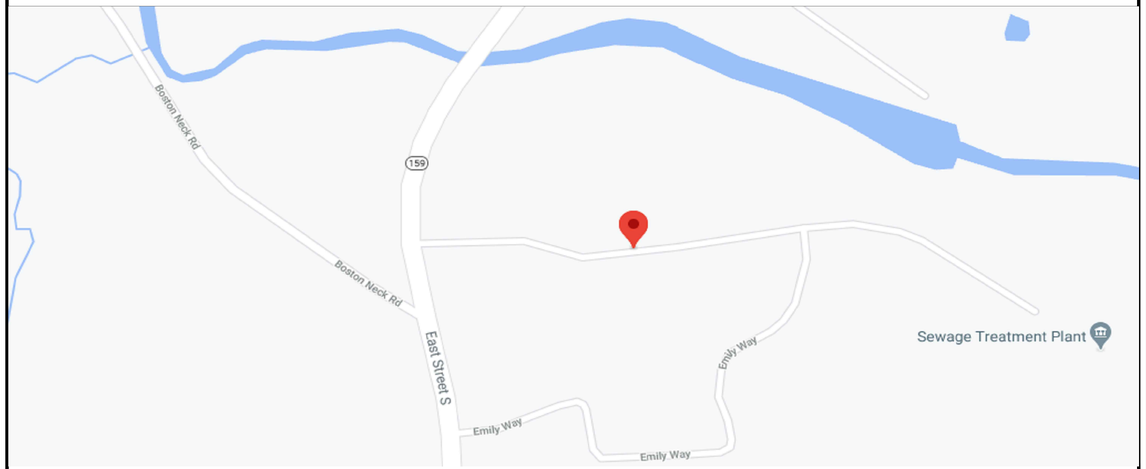
THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

TOWER SCOPE OF WORK:
- REMOVE (6) ANTENNAS
- REMOVE (6) RRHs
- REMOVE (6) COAX CABLES
- INSTALL (9) ANTENNAS
- INSTALL (6) RRHs
- INSTALL (3) DIPLEXERS
- INSTALL (3) HYBRID CABLE
- REPLACE (3) SECTOR MOUNTS

GROUND SCOPE OF WORK:
- REMOVE (1) EXISTING BASE STATION CABINET
- INSTALL (1) 6160 & (1) B160 BATTERY CABINETS
- INSTALL (1) iXRe ROUTER IN (P) CABINET
- INSTALL (1) PSU4813 BOOSTER IN (P) CABINET
- INSTALL (1) BB6630 IN (E) CABINET
- INSTALL (1) BB6630 IN (P) CABINET
- INSTALL (1) BB6648 IN (P) CABINET

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

LOCATION MAP



NO SCALE

APPLICABLE CODES/REFERENCE DOCUMENTS

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

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

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	BY OTHERS
DATED:	
MOUNT ANALYSIS:	BY OTHERS
DATED:	
RFDS REVISION:	6
DATED:	9/20/2020
ORDER ID:	529729
REVISION:	0

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

APPROVALS

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

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

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

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

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

T-MOBILE SITE NUMBER:
CTHA160A

BU #: **801487**
CT SUFFIELD 3 CAC 801487

848 EAST STREET
SUFFIELD, CT 06078

EXISTING 166'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	10/31/20	RCD	PRELIMINARY	SS
0	11/03/20	SS	FINAL	SS
1	11/24/20	BMM	CONDUIT LAYOUT ADD	SS

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23644
12/11/20
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER: T-1
REVISION: 1

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED– NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800–788–7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
2. "LOOK UP" – CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT:
   THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD CED–STD–10253, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA–322 (LATEST EDITION).
5. ALL SITE WORK TO COMPLY WITH QAS–STD–10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE," CED–STD–10294 "STANDARD FOR INSTALLATION OF MOUNTS AND APPURTENANCES," AND LATEST VERSION OF ANSI/TIA–1019–A–2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
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 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–POTENTAL 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 PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI–CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP–STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/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

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CTHA160A

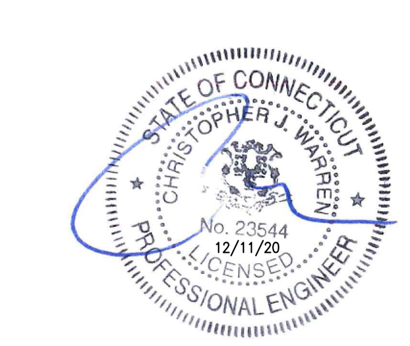
BU #: **801487**
CT SUFFIELD 3 CAC 801487

848 EAST STREET
SUFFIELD, CT 06078

EXISTING 166'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	10/31/20	RCD	PRELIMINARY	SS
0	11/03/20	SS	FINAL	SS
1	11/24/20	BMM	CONDUIT LAYOUT ADD	SS

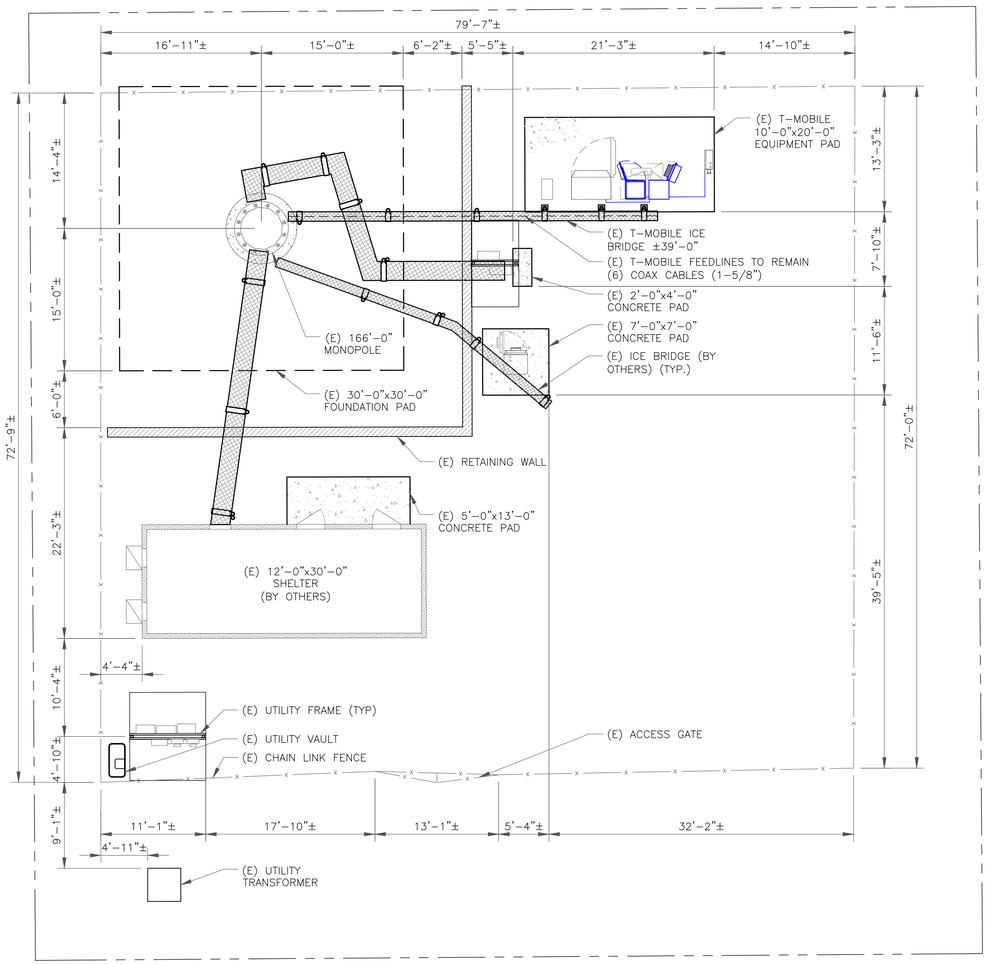


IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER:	REVISION:
T-2	1

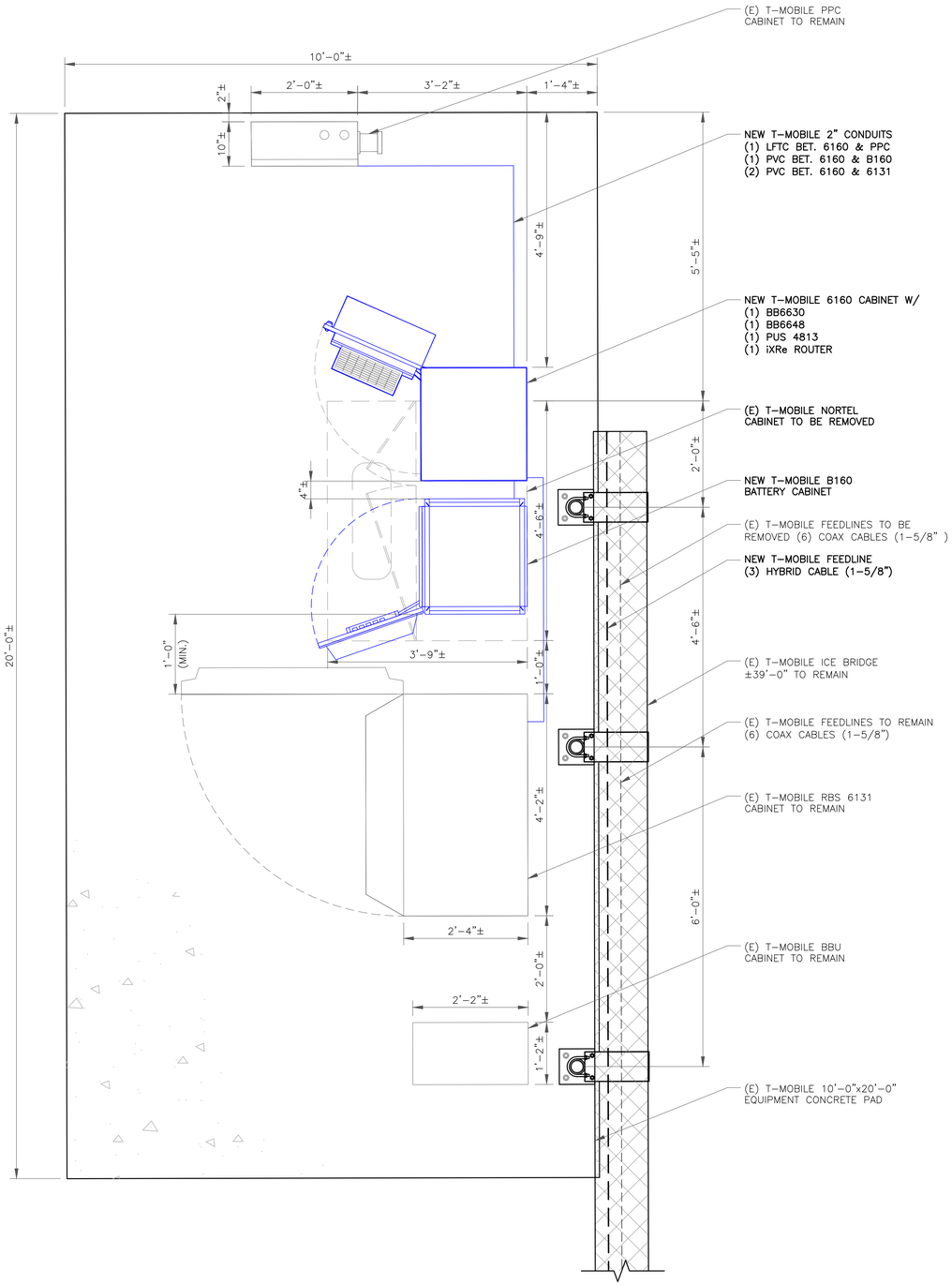
NOTE:

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



1 SITE PLAN
SCALE: 4' 3' 2' 1' 0 4' 1/4"=1'-0" (FULL SIZE) 1/8"=1'-0" (11x17)

N



2 ENLARGED SITE PLAN
SCALE: 0 6" 1' 1-1/2"=1'-0" (FULL SIZE) 3/4"=1'-0" (11x17)

N

T-Mobile

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BU #: **801487**
CT SUFFIELD 3 CAC 801487

848 EAST STREET
SUFFIELD, CT 06078

EXISTING 166'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	10/31/20	RCD	PRELIMINARY	SS
0	11/03/20	SS	FINAL	SS
1	11/24/20	BMM	CONDUIT LAYOUT ADD	SS

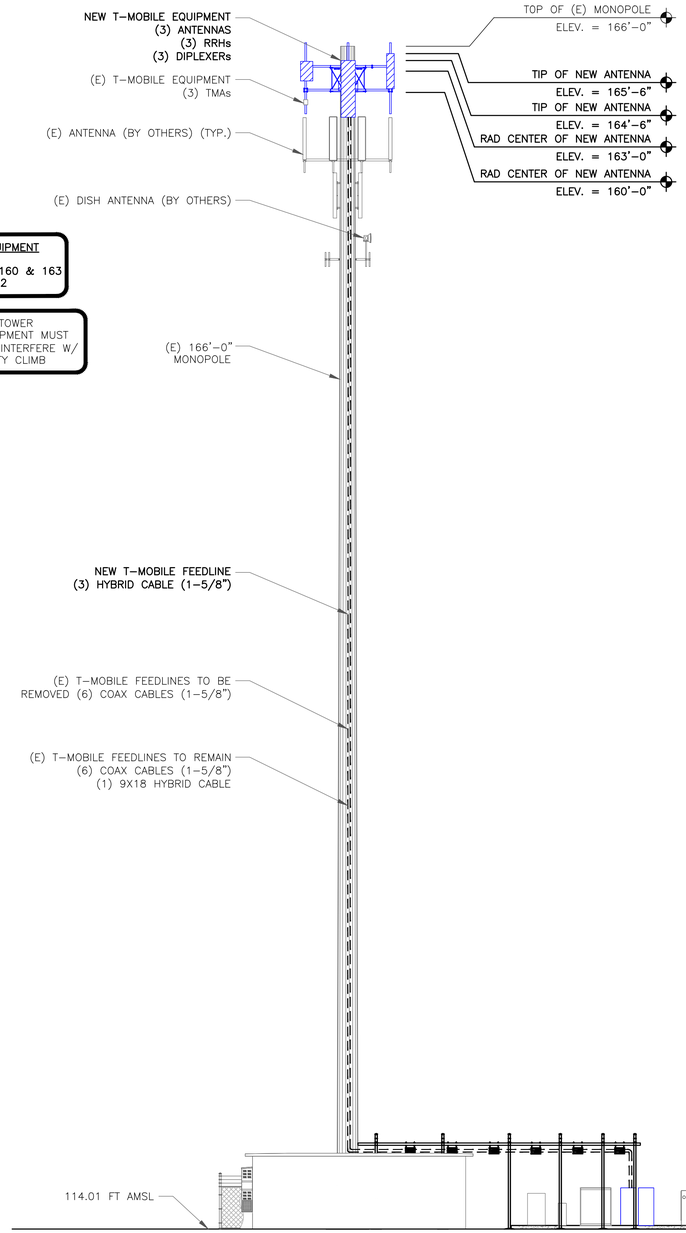
STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 27344
12/11/20
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER: C-1

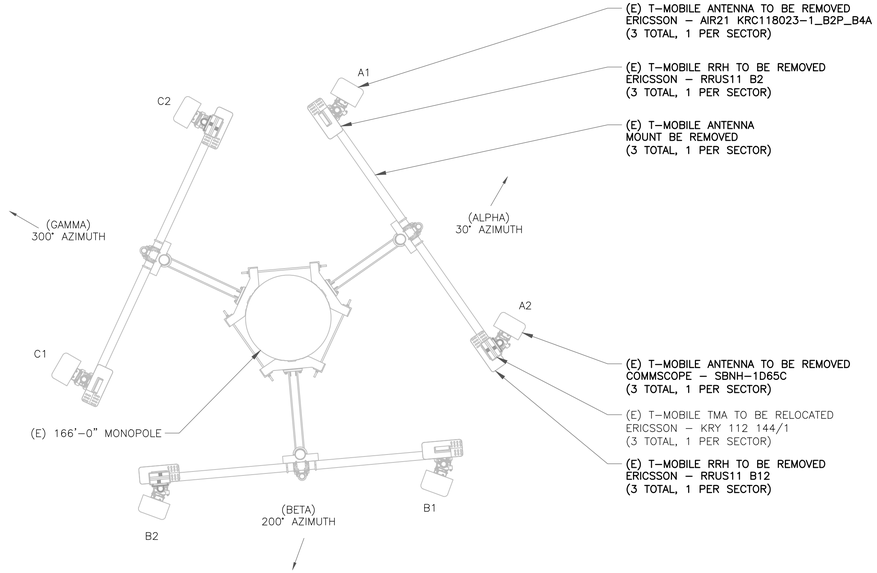
REVISION: 1

NOTES:

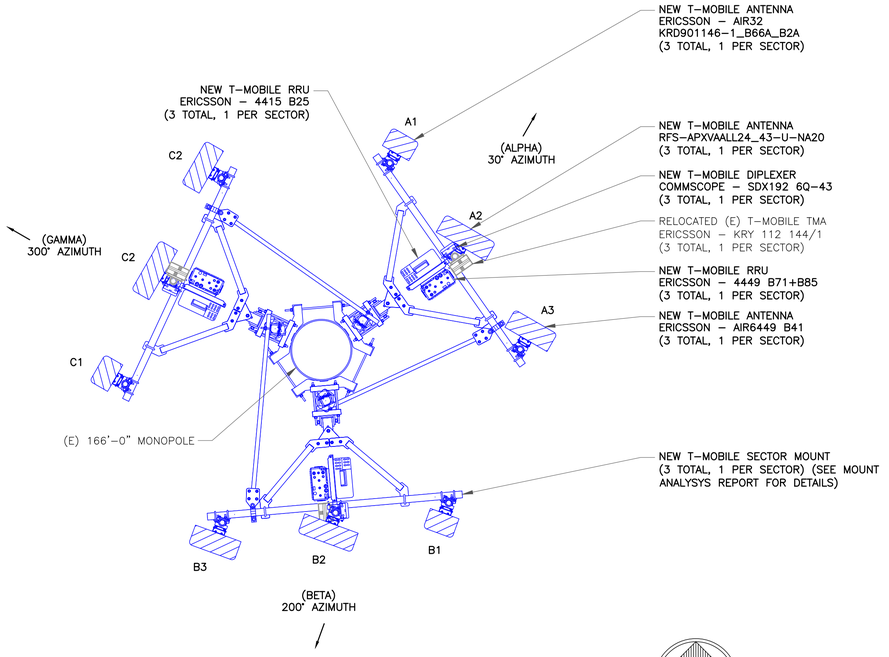
1. ELEVATION BASED ON DRAWING PROVIDED BY TOWER OWNER. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING EQUIPMENT.
2. INFINIGY HAS NOT EVALUATED THE TOWER OR MOUNT STRUCTURE AND ASSUMES NO RESPONSIBILITY FOR THEIR STRUCTURAL INTEGRITY REGARDING PROPOSED LOADINGS. FINAL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



1 FINAL ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE



3 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE

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T-MOBILE SITE NUMBER:
CTHA160A

BU #: **801487**
CT SUFFIELD 3 CAC 801487

848 EAST STREET
SUFFIELD, CT 06078

EXISTING 166'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	10/31/20	RCD	PRELIMINARY	SS
0	11/03/20	SS	FINAL	SS
1	11/24/20	BMM	CONDUIT LAYOUT ADD	SS

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 27844
12/11/20
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER: C-2

REVISION: 1

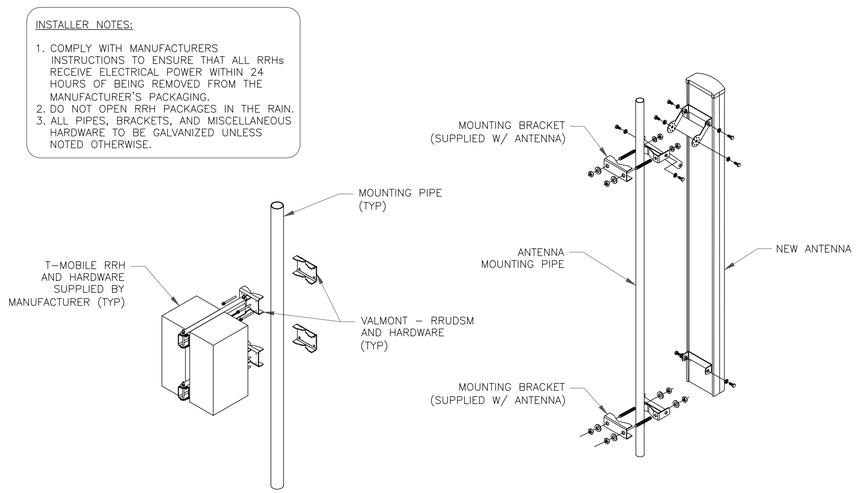
ANTENNA SCHEDULE

SECTOR	POS.	TECHNOLOGY	RAD CENTER	AZIMUTH	ANTENNA MANUFACTURER	ANTENNA MODEL	MECH. TILT	ELECT. TILT	TOWER MOUNTED EQUIPMENT	FEEDLINE TYPE
ALPHA	A1	L2100, L1900	163	30°	ERICSSON	AIR32 KRD901146-1_B66A_B2A	0°	–	–	(1) 6X12 HCS HYBRID (SHARED)
ALPHA	A2	L600, N600, L700, L1900, U2100	160	30°	RFS	APXVAALL24_43-U-NA20	0°	–	(1) ERICSSON – RRUS 4449 B71+B85 (1) ERICSSON – RRUS 4415 B25 (1) ERICSSON – KRY 112 144/1 (1) COMMSCOPE – SDX1926Q-43	(2) 1-5/8" COAX (2) 6X12 HCS HYBRID (SHARED)
ALPHA	A3	L2500, N2500	163	30°	ERICSSON	AIR6449 B41	0°	–	–	(1) 6X12 HCS HYBRID (SHARED)
BETA	B1	L2100, L1900	163	200	ERICSSON	AIR32 KRD901146-1_B66A_B2A	0°	–	–	(1) 6X12 HCS HYBRID (SHARED)
BETA	B2	L600, N600, L700, L1900, U2100	160	200	RFS	APXVAALL24_43-U-NA20	0°	–	(1) ERICSSON – RRUS 4449 B71+B85 (1) ERICSSON – RRUS 4415 B25 (1) ERICSSON – KRY 112 144/1 (1) COMMSCOPE – SDX1926Q-43	(2) 1-5/8" COAX (2) 6X12 HCS HYBRID (SHARED)
BETA	B3	L2500, N2500	163	200	ERICSSON	AIR6449 B41	0°	–	–	(1) 6X12 HCS HYBRID (SHARED)
GAMMA	C1	L2100, L1900	163	300	ERICSSON	AIR32 KRD901146-1_B66A_B2A	0°	–	–	(1) 6X12 HCS HYBRID (SHARED)
GAMMA	C2	L600, N600, L700, L1900, U2100	160	300	RFS	APXVAALL24_43-U-NA20	0°	–	(1) ERICSSON – RRUS 4449 B71+B85 (1) ERICSSON – RRUS 4415 B25 (1) ERICSSON – KRY 112 144/1 (1) COMMSCOPE – SDX1926Q-43	(2) 1-5/8" COAX (2) 6X12 HCS HYBRID (SHARED)
GAMMA	C3	L2500, N2500	163	300	ERICSSON	AIR6449 B41	0°	–	–	(1) 6X12 HCS HYBRID (SHARED)

1 ANTENNA AND CABLE SCHEDULE
SCALE: NOT TO SCALE

INSTALLER NOTES:

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



2 ANTENNA WITH RRHs MOUNTING DETAIL
SCALE: NOT TO SCALE

NOTE:

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

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T-MOBILE SITE NUMBER:
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BU #: **801487**
CT SUFFIELD 3 CAC 801487

848 EAST STREET
SUFFIELD, CT 06078

EXISTING 166'-0" MONOPOLE

ISSUED FOR:

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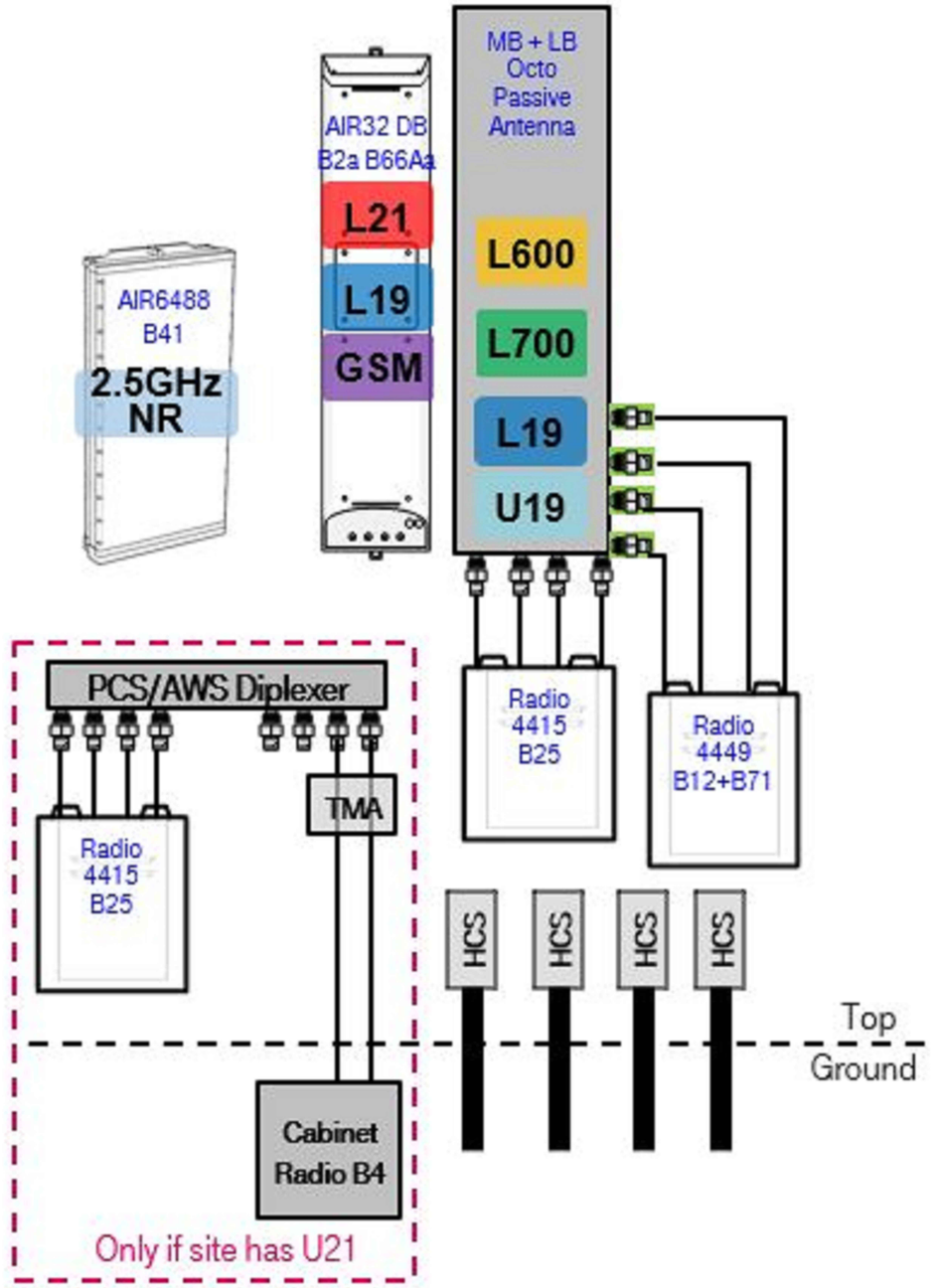
A	10/31/20	RCD	PRELIMINARY	SS
0	11/03/20	SS	FINAL	SS
1	11/24/20	BMM	CONDUIT LAYOUT ADD	SS

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23644
12/11/20
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER: C-3

REVISION: 1



1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

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T-MOBILE SITE NUMBER:
CTHA160A

BU #: **801487**
CT SUFFIELD 3 CAC 801487

848 EAST STREET
SUFFIELD, CT 06078

EXISTING 166'-0" MONOPOLE

ISSUED FOR:

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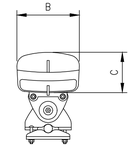
A	10/31/20	RCD	PRELIMINARY	SS
0	11/03/20	SS	FINAL	SS
1	11/24/20	BMM	CONDUIT LAYOUT ADD	SS

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23644
12/11/20
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER: C-4

REVISION: 1

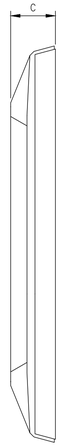
MANUFACTURER:		ERICSSON	
MODEL NO.:		AIR 32 KRD901146-1 B66 B2 (OCTO)	
DIMENSIONS:		WEIGHT WITHOUT INSTALLATION KIT:	WEIGHT WITH SINGLE POLE CLAMP AND WITHOUT INSTALLATION KIT:
A	59.25"	99 LBS	131 LBS
B	12.87"		
C	8.67"		



TOP VIEW

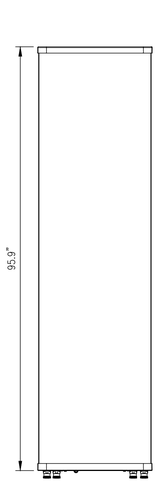
FRONT VIEW

BACK VIEW

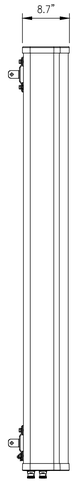


SIDE VIEW

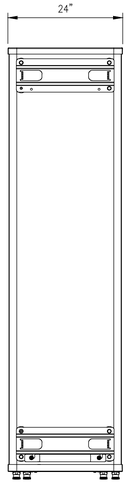
1 (N) AIR32 ANTENNA SPEC
SCALE: NOT TO SCALE



FRONT VIEW

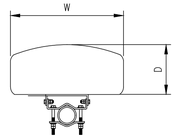


SIDE VIEW

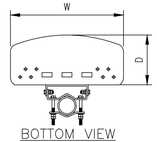


BACK VIEW

700MHz RFS ANTENNAS	
MODEL	WEIGHT (lb)
(8') APXVAARR24_43-U-NA20	128
WEIGHT W/ MOUNTING BRACKET (lb):	154



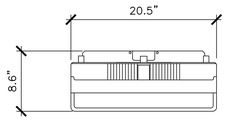
TOP VIEW



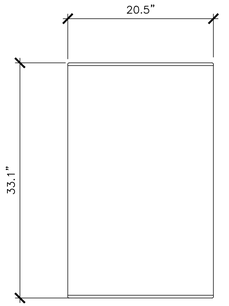
BOTTOM VIEW

2 (N) APXVAARR24_43-U-NA20 ANTENNA SPEC
SCALE: NOT TO SCALE

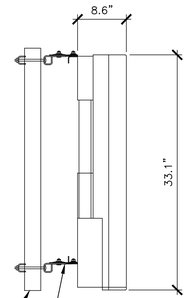
MANUFACTURER: ERICSSON
MODEL: AIR6449 B41
WEIGHT: 104 LBS (W/ MOUNT BRACKET 113)
DIMENSIONS: 33.1"H. X 20.5"W. X 8.6"D.
FREQUENCY: REFER TO RF DATA SHEET



TOP



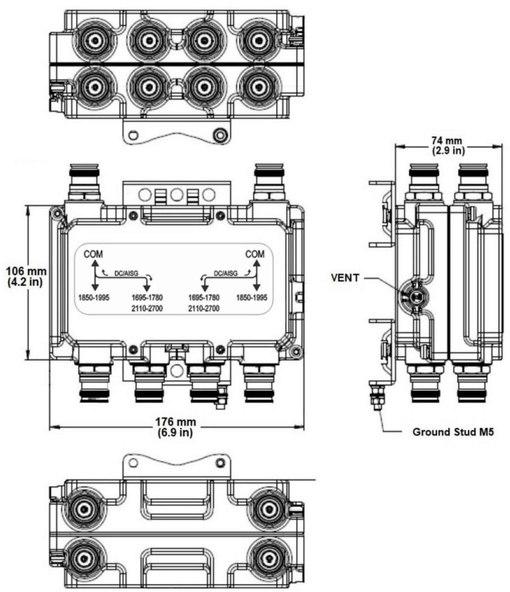
FRONT



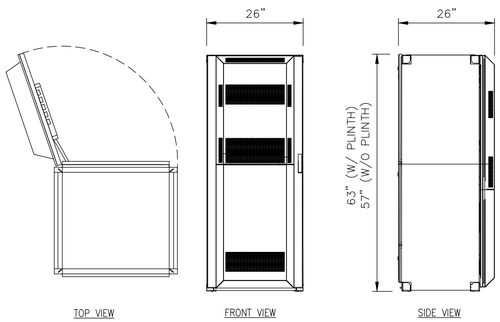
SIDE

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

MANUFACTURER: COMMSCOPE
MODEL: SDX1926Q-43
WEIGHT: 6.17 LBS
DIMENSIONS: 6.9" X 4.2" X 2.9"
FREQUENCY: REFER TO RF DATA SHEET



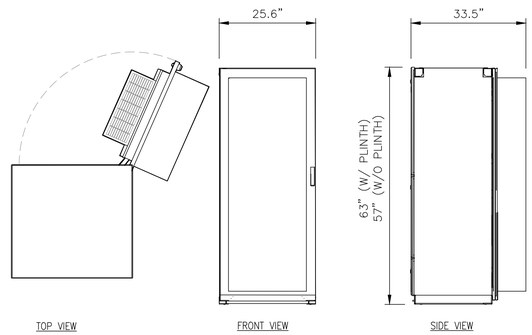
4 (N) DIPLEX SDX1926Q-43 SPEC
SCALE: NOT TO SCALE



TOP VIEW FRONT VIEW SIDE VIEW

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

5 B160 CABINET DETAIL
SCALE: NOT TO SCALE



TOP VIEW FRONT VIEW SIDE VIEW

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

6 6160 CABINET DETAIL
SCALE: NOT TO SCALE

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EXISTING 166'-0" MONOPOLE

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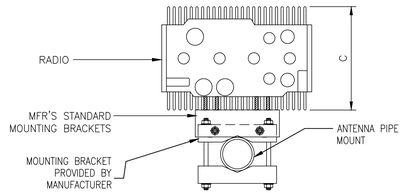
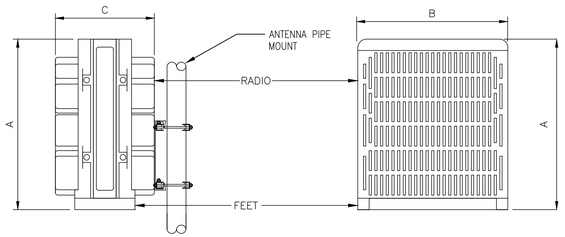
1	11/24/20	BMM	CONDUIT LAYOUT ADD	SS

SHEET NUMBER:	REVISION:
C-5	1

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



PLAN VIEW



SIDE VIEW FRONT VIEW

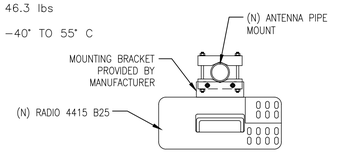
RADIO 4449 B71+B85 SPECIFICATIONS

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

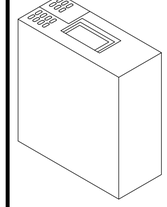
ERICSSON RADIO-4415 B25

DIMENSIONS, WxDxH:	13.2"x5.4"x14.9"
POWER CONSUMPTION:	660 WATTS
TOTAL WEIGHT:	46.3 lbs
TEMPERATURE:	-40° TO 55° C

TOP VIEW

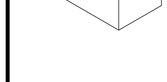


PLAN VIEW

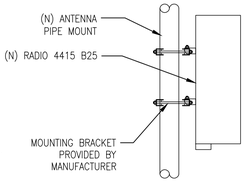


FRONT VIEW

SIDE VIEW

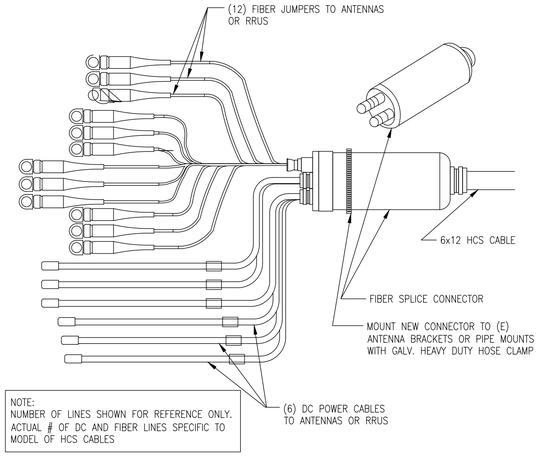


BOTTOM VIEW



SIDE VIEW

2 (N) RADIO 4415 B25 SPEC
SCALE: NOT TO SCALE



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

4 NOT USED
SCALE: NOT TO SCALE

5 NOT USED
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

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SHEET NUMBER: C-6

REVISION: 1

T-MOBILE PANEL SCHEDULE

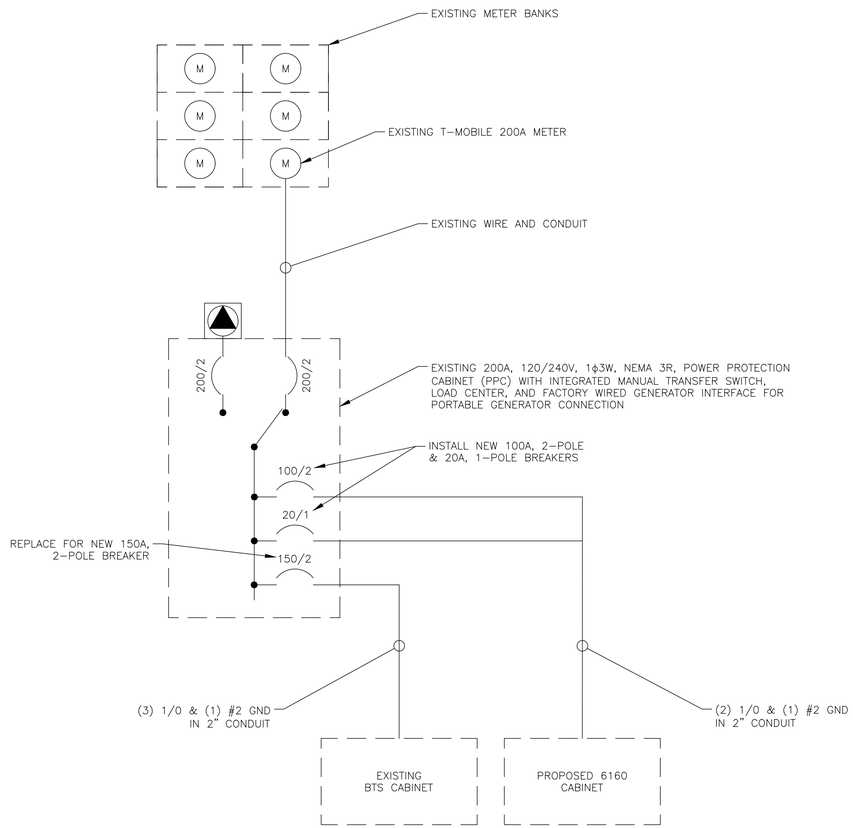
MAIN: 200A MAIN BREAKER			**VOTAGE/PHASE:** 120/240V, 1-PHASE, 3-WIRE						**SHORT CIRCUIT CURRENT RATING:** --		
MOUNTING: INSIDE PPC ENCLOSURE			**ENCLOSURE:** NEMA 3R						**SURGE PROTECTION DEVICE:** YES		
					PHASE LOADS (VA)						
DESCRIPTION	LOAD (VA)	C or NC	C/B	CIR No.	A	B	CIR No.	C/B	C or NC	LOAD (VA)	DESCRIPTION
SURGE ARRESTOR	0	NC	60	1	180		2	20	NC	180	TELCO GFI
	0	NC		3		0	4	60	C	0	BTS 1 (DISCONNECTED)
RBS6131	**9500**	**C**	**150**	**5**	9500		6		C	0	
	9500	**C**		**7**		11500	8	**100**	**C**	**2000**	**6160***
				9	2000		10		**C**	**2000**	
				11		0	12				
				13	0		14				
				15		0	16				
BLANK				17	0		18				BLANK
				19		0	20				
				21	0		22				
				23		0	24				

BASE LOAD (VA) =	11680	11500	C = CONTINUOUS LOAD; NC = NON-CONTINUOUS LOAD
25% OF CONTINUOUS LOAD (VA) =	2875	2875	*INDICATES NEW LOAD. ALL OTHER LOADS ARE EXISTING.
TOTAL LOAD (VA) =	14555	14375	NEW BREAKER TO BE SAME TYPE AND HAVE SAME AIC RATING AS
TOTAL LOAD (A) =	122	120	EXISTING. CUSTOMER HAS NOT PROVIDED LOADS FOR EQUIPMENT
			CABINETS THEREFORE THE CABINET LOADS SHOWN ARE ESTIMATED

1 AC PANEL SCHEDULE
SCALE: NOT TO SCALE

NOTES:

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



2 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

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T-MOBILE SITE NUMBER:
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BU #: **801487**
CT SUFFIELD 3 CAC 801487

848 EAST STREET
SUFFIELD, CT 06078

EXISTING 166'-0" MONOPOLE

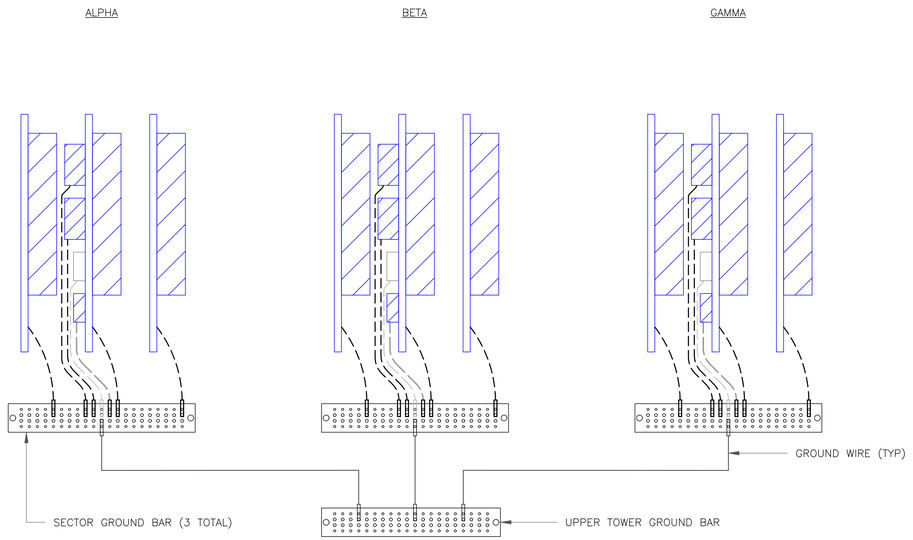
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	10/31/20	RCD	PRELIMINARY	SS
0	11/03/20	SS	FINAL	SS
1	11/24/20	BMM	CONDUIT LAYOUT ADD	SS

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 27344
12/11/20
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER: E-1

REVISION: 1



NOTE:

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

1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
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T-MOBILE SITE NUMBER:
CTHA160A

BU #: **801487**
CT SUFFIELD 3 CAC 801487

848 EAST STREET
SUFFIELD, CT 06078

EXISTING 166'-0" MONOPOLE

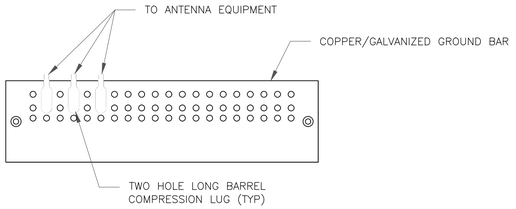
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	10/31/20	RCD	PRELIMINARY	SS
0	11/03/20	SS	FINAL	SS
1	11/24/20	BMM	CONDUIT LAYOUT ADD	SS

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 27844
12/11/20
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER: G-1

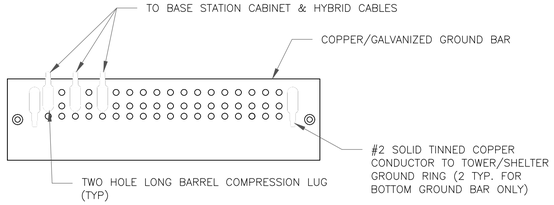
REVISION: 1



NOTES:

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

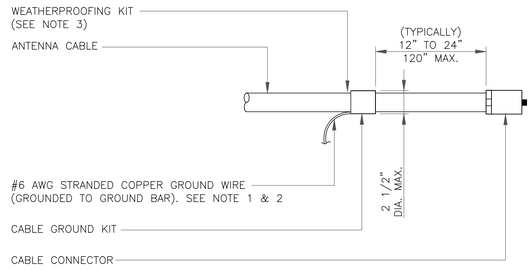
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

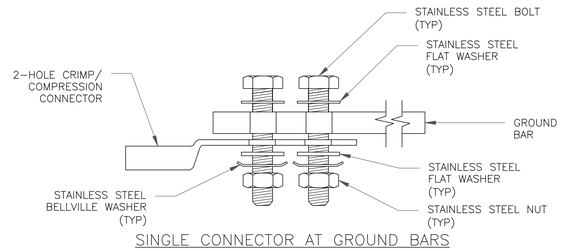
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



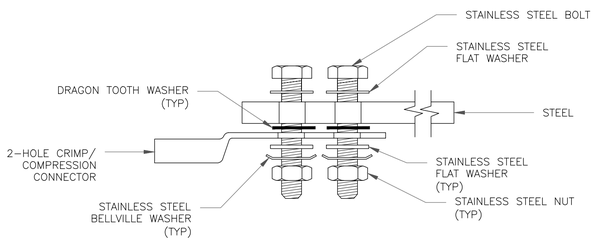
NOTES:

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

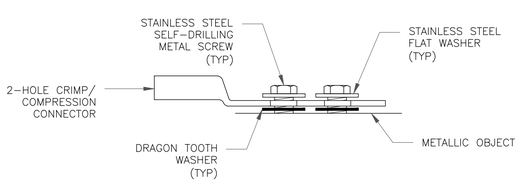
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

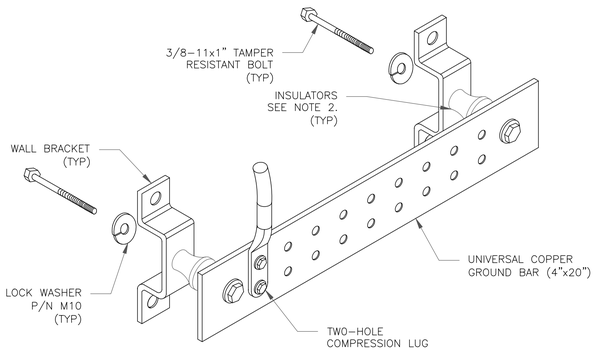


SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

4 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

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

5 GROUND BAR DETAIL
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

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0	11/03/20	SS	FINAL	SS
1	11/24/20	BMM	CONDUIT LAYOUT ADD	SS

SHEET NUMBER: G-2

REVISION: 1

Exhibit D

Structural Analysis Report

Date: **October 20, 2020**

Stephanie Lipscomb
Crown Castle
370 Mallory Station Rd
Franklin, TN 37067

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CTHA160A
Crown Castle Designation:	**Crown Castle BU Number:**	801487
	Crown Castle Site Name:	CT SUFFIELD 3 CAC 801487
	Crown Castle JDE Job Number:	620130
	Crown Castle Work Order Number:	1891496
	Crown Castle Order Number:	529729 Rev. 0
Engineering Firm Designation:	**Crown Castle Project Number:**	1891496
Site Data:	**848 East Street, Suffield, Hartford County, CT** **Latitude *41° 57' 25.2"*, Longitude *-72° 37' 32.6"*** **165.5 Foot - Monopole Tower**	

Dear Stephanie Lipscomb,

Crown Castle 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**

This analysis utilizes an ultimate 3-second gust wind speed of 120 mph as required by the 2015 International Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Carol Ng, E.I.T. / NAP

Respectfully submitted by:

Terry P Styran
2020.10.21 16:14:12
-04'00'

Terry P. Styran, P.E.
Senior Project Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 165.5 ft Monopole tower designed by FWT INC.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	120
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	2 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)
162.0	163.0	3	commscope	SDX1926Q-43	10	1-5/8
		3	ericsson	AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe		
		3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe		
		3	ericsson	RADIO 4415 B66A_CCIV2		
		3	ericsson	RADIO 4449 B71 B85A_ T-MOBILE		
	162.0	3	tower mounts	VFA8-HD (8' sector frame)		
	161.0	3	ericsson	KRY 112 144/1		
	160.0	3	rfs celwave	APXVAALL24_43-U-NA20_ TMO w/ Mount Pipe		

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)
150.0	153.0	3	alcatel lucent	B13 RRH 4X30	14	1-5/8
		3	alcatel lucent	B4 RRH2X60-4R		
		6	antel	LPA-80080/6CF w/ Mount Pipe		
		6	commscope	SBNHH-1D65B w/ Mount Pipe		
		2	raycap	RHSDC-3315-PF-48		
	150.0	1	tower mounts	Platform Mount [LP 304-1]		
145.0	145.0	3	kathrein	742 213 w/ Mount Pipe	6	1-5/8
		1	tower mounts	Pipe Mount [PM 601-3]		
136.0	139.0	1	dragonwave	A-ANT-18G-2-C	3	1/2
		1	dragonwave	A-ANT-23G-1-C		
	136.0	2	dragonwave	HORIZON COMPACT		
		1	samsung telecommunications	WIMAX DAP HEAD		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		1	tower mounts	Pipe Mount [PM 601-3]		
		1	tower mounts	Side Arm Mount [SO 104-3]		
	134.0	1	kathrein	840 10054 w/ Mount Pipe		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clough, Harbour & Associates LLP	2373668	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	FWT	1118795	CCISITES
4-TOWER MANUFACTURER DRAWINGS	FWT	961597	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were maintained in accordance with the TIA-222 Standard.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	165.5 - 136.83	Pole	TP24.279x17x0.1875	1	-6.76	851.26	41.6	Pass
L2	136.83 - 95.5	Pole	TP34.4x23.0992x0.3125	2	-13.35	2007.19	47.2	Pass
L3	95.5 - 47	Pole	TP46.06x32.6322x0.375	3	-24.30	3228.94	48.3	Pass
L4	47 - 0	Pole	TP57.275x43.7899x0.375	4	-40.55	4160.03	56.2	Pass
							Summary	
						Pole (L4)	56.2	Pass
						Rating =	56.2	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	49.6	Pass
1	Base Plate	0	24.6	Pass
1	Base Foundation (Structure)	0	55.6	Pass
1	Base Foundation (Soil Interaction)	0	34.8	Pass

Structure Rating (max from all components) =	56.2%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

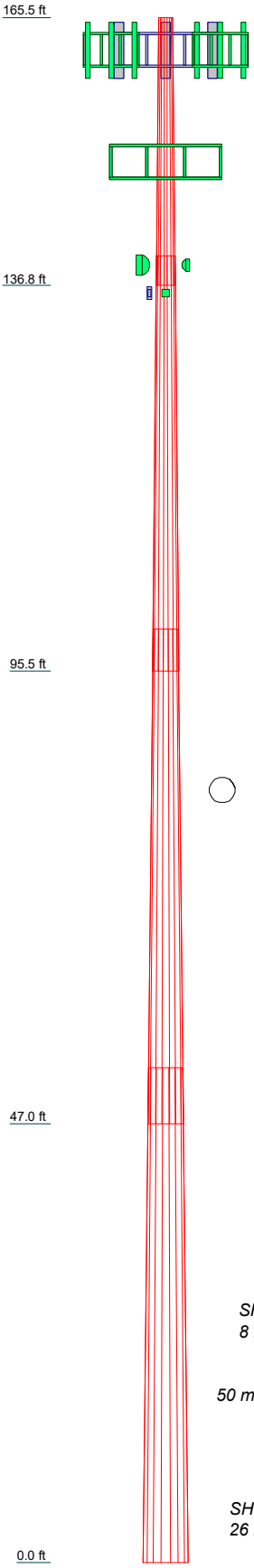
4.1) Recommendations

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

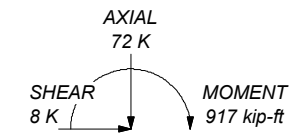
APPENDIX A

TNXTOWER OUTPUT

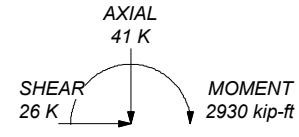
Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	28.67	18	0.1875	3.17	17.0000	24.2790		1.2
2	44.50	18	0.3125	4.50	23.0992	34.4000		4.3
3	53.00	18	0.3750	6.00	32.6322	46.0600		8.4
4	53.00	18	0.3750		43.7899	57.2750		10.8
							A572-65	24.6



ALL REACTIONS ARE FACTORED



TORQUE 0 kip-ft
50 mph WIND - 2.0000 in ICE



TORQUE 1 kip-ft
REACTIONS - 120 mph WIND

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 120 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 2.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 56.2%

CROWN CASTLE
The Pathway to Possible

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: (724) 416-2000
FAX:

Job: ***BU# 801487***			
Project:			
Client: Crown Castle	Drawn by: Carol Ng		App'd:
Code: TIA-222-H	Date: 10/20/20		Scale: NTS
Path: C:\Users\cng\Desktop\Working from Home 2020\801487\WO 1891496 - SA\Prod\801487_RPA.er			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:

3) Tower is located in Hartford County, Connecticut.
4) Tower base elevation above sea level: 115.00 ft.
5) Basic wind speed of 120 mph.
6) Risk Category II.
7) Exposure Category C.
8) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
9) Topographic Category: 1.
10) Crest Height: 0.00 ft.
11) Nominal ice thickness of 2.0000 in.
12) Ice thickness is considered to increase with height.
13) Ice density of 56 pcf.
14) A wind speed of 50 mph is used in combination with ice.
15) Temperature drop of 50 °F.
16) Deflections calculated using a wind speed of 60 mph.
17) A non-linear (P-delta) analysis was used.
18) Pressures are calculated at each section.
19) Stress ratio used in pole design is 1.05.
20) Tower analysis based on target reliabilities in accordance with Annex S.
21) Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
22) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		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*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	165.50-136.83	28.67	3.17	18	17.0000	24.2790	0.1875	0.7500	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L2	136.83-95.50	44.50	4.50	18	23.0992	34.4000	0.3125	1.2500	A572-65 (65 ksi)
L3	95.50-47.00	53.00	6.00	18	32.6322	46.0600	0.3750	1.5000	A572-65 (65 ksi)
L4	47.00-0.00	53.00		18	43.7899	57.2750	0.3750	1.5000	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	17.2333	10.0055	357.3078	5.9684	8.6360	41.3742	715.0858	5.0037	2.6620	14.197
	24.6246	14.3375	1051.3254	8.5525	12.3337	85.2398	2104.0342	7.1701	3.9431	21.03
L2	24.2247	22.6015	1482.6447	8.0893	11.7344	126.3505	2967.2402	11.3029	3.5155	11.249
	34.8825	33.8105	4963.4065	12.1011	17.4752	284.0257	9933.3440	16.9085	5.5044	17.614
L3	34.2355	38.3942	5047.2688	11.4513	16.5772	304.4711	10101.1789	19.2007	5.0833	13.555
	46.7127	54.3766	14338.2625	16.2182	23.3985	612.7861	28695.3917	27.1935	7.4466	19.857
L4	45.9577	51.6746	12305.2736	15.4123	22.2453	553.1639	24626.7387	25.8422	7.0470	18.792
	58.1007	67.7252	27702.0839	20.1995	29.0957	952.1023	55440.6188	33.8690	9.4204	25.121

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 165.50-136.83				1	1	1			
L2 136.83-95.50				1	1	1			
L3 95.50-47.00				1	1	1			
L4 47.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
*** FSJ4-50B(1/2") ***	C	No	Surface Ar (CaAa)	136.00 - 0.00	3	3	-0.500 -0.450	0.5200		0.14

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
AL7-50(1-5/8")	C	No	No	Inside Pole	162.00 - 0.00	10	No Ice	0.00	0.52
							1/2" Ice	0.00	0.52
							1" Ice	0.00	0.52

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
							2" Ice	0.00	0.52
***									
AVA7-50(1-5/8")	C	No	No	Inside Pole	150.00 - 0.00	12	No Ice	0.00	0.70
							1/2" Ice	0.00	0.70
							1" Ice	0.00	0.70
							2" Ice	0.00	0.70
HB158-1-08U8-S8J18(1-5/8")	C	No	No	Inside Pole	150.00 - 0.00	2	No Ice	0.00	1.30
							1/2" Ice	0.00	1.30
							1" Ice	0.00	1.30
							2" Ice	0.00	1.30
***									
LCF158-50J(1-5/8")	C	No	No	Inside Pole	145.00 - 0.00	6	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
							2" Ice	0.00	0.92
***									

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	165.50-136.83	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.32
L2	136.83-95.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	6.318	0.000	0.91
L3	95.50-47.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.566	0.000	1.07
L4	47.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.332	0.000	1.04

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	165.50-136.83	A	1.978	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.32
L2	136.83-95.50	A	1.926	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	27.928	0.000	1.23
L3	95.50-47.00	A	1.834	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	32.813	0.000	1.43
L4	47.00-0.00	A	1.644	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	30.714	0.000	1.36

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	165.50-136.83	0.0000	0.0000	0.0000	0.0000
L2	136.83-95.50	0.9785	0.6355	1.8485	1.2004
L3	95.50-47.00	1.0103	0.6561	2.0350	1.3215
L4	47.00-0.00	1.0206	0.6628	2.1165	1.3745

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L2	8	FSJ4-50B(1/2")	95.50 - 136.00	1.0000	1.0000
L3	8	FSJ4-50B(1/2")	47.00 - 95.50	1.0000	1.0000
L4	8	FSJ4-50B(1/2")	0.00 - 47.00	1.0000	1.0000

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
162									
KRY 112 144/1	A	From Leg	4.00 0.00 -1.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
KRY 112 144/1	B	From Leg	4.00 0.00 -1.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
KRY 112 144/1	C	From Leg	4.00 0.00 -1.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.09 7.56 8.02 8.97	6.39 7.25 7.99 9.53	0.19 0.26 0.33 0.49
AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.09 7.56 8.02 8.97	6.39 7.25 7.99 9.53	0.19 0.26 0.33 0.49
AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	C	From Leg	4.00 0.00	0.0000	162.00	No Ice 1/2"	7.09 7.56	6.39 7.25	0.19 0.26

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
			1.00			Ice	8.02	7.99	0.33
						1" Ice	8.97	9.53	0.49
						2" Ice			
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Leg	4.00 0.00 -2.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.48 21.23 21.99 23.44	10.87 12.39 13.94 16.29	0.18 0.32 0.46 0.79
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	B	From Leg	4.00 0.00 -2.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.48 21.23 21.99 23.44	10.87 12.39 13.94 16.29	0.18 0.32 0.46 0.79
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	C	From Leg	4.00 0.00 -2.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.48 21.23 21.99 23.44	10.87 12.39 13.94 16.29	0.18 0.32 0.46 0.79
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	162.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	5.87 6.23 6.61 7.38	3.27 3.73 4.20 5.20	0.13 0.18 0.23 0.36
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	162.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	5.87 6.23 6.61 7.38	3.27 3.73 4.20 5.20	0.13 0.18 0.23 0.36
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	162.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	5.87 6.23 6.61 7.38	3.27 3.73 4.20 5.20	0.13 0.18 0.23 0.36
SDX1926Q-43	A	From Leg	4.00 0.00 1.00	0.0000	162.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	0.24 0.31 0.38 0.55	0.10 0.14 0.19 0.32	0.01 0.01 0.01 0.02
SDX1926Q-43	B	From Leg	4.00 0.00 1.00	0.0000	162.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	0.24 0.31 0.38 0.55	0.10 0.14 0.19 0.32	0.01 0.01 0.01 0.02
SDX1926Q-43	C	From Leg	4.00 0.00 1.00	0.0000	162.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	0.24 0.31 0.38 0.55	0.10 0.14 0.19 0.32	0.01 0.01 0.01 0.02
RADIO 4415 B66A_CCIV2	A	From Leg	4.00 0.00 1.00	0.0000	162.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	2.04 2.22 2.40 2.80	1.19 1.34 1.50 1.83	0.06 0.07 0.09 0.14
RADIO 4415 B66A_CCIV2	B	From Leg	4.00 0.00 1.00	0.0000	162.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	2.04 2.22 2.40 2.80	1.19 1.34 1.50 1.83	0.06 0.07 0.09 0.14
RADIO 4415 B66A_CCIV2	C	From Leg	4.00 0.00 1.00	0.0000	162.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	2.04 2.22 2.40 2.80	1.19 1.34 1.50 1.83	0.06 0.07 0.09 0.14
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.00 0.00	0.0000	162.00	No Ice 1/2"	1.97 2.15	1.59 1.75	0.07 0.09

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
			1.00			Ice	2.33	1.92	0.12
						1" Ice	2.72	2.28	0.17
						2" Ice			
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.00 0.00 1.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.15 2.33 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.00 0.00 1.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.15 2.33 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
Sector Mount [SM 308-3]	C	None		0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.73 29.32 37.85 54.81	20.73 29.32 37.85 54.81	0.38 0.81 1.37 2.94
10' x 2.375" Horizontal Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.38 3.41 4.45 5.91	0.01 0.05 0.10 0.24	0.04 0.05 0.08 0.15
10' x 2.375" Horizontal Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.38 3.41 4.45 5.91	0.01 0.05 0.10 0.24	0.04 0.05 0.08 0.15
10' x 2.375" Horizontal Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.38 3.41 4.45 5.91	0.01 0.05 0.10 0.24	0.04 0.05 0.08 0.15
153									
(2) LPA-80080/6CF w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.56 5.11 5.61 6.65	10.26 11.43 12.31 14.13	0.05 0.11 0.19 0.36
(2) LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.56 5.11 5.61 6.65	10.26 11.43 12.31 14.13	0.05 0.11 0.19 0.36
(2) LPA-80080/6CF w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.56 5.11 5.61 6.65	10.26 11.43 12.31 14.13	0.05 0.11 0.19 0.36
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
B4 RRH2X60-4R	A	From Leg	4.00	0.0000	150.00	No Ice	3.36	2.00	0.06

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
			0.00			1/2"	3.61	2.24	0.08
			3.00			Ice	3.88	2.48	0.10
						1" Ice	4.42	2.97	0.17
						2" Ice			
B4 RRH2X60-4R	B	From Leg	4.00	0.0000	150.00	No Ice	3.36	2.00	0.06
			0.00			1/2"	3.61	2.24	0.08
			3.00			Ice	3.88	2.48	0.10
						1" Ice	4.42	2.97	0.17
						2" Ice			
B4 RRH2X60-4R	C	From Leg	4.00	0.0000	150.00	No Ice	3.36	2.00	0.06
			0.00			1/2"	3.61	2.24	0.08
			3.00			Ice	3.88	2.48	0.10
						1" Ice	4.42	2.97	0.17
						2" Ice			
B13 RRH 4X30	A	From Leg	4.00	0.0000	150.00	No Ice	2.06	1.32	0.06
			0.00			1/2"	2.24	1.48	0.07
			3.00			Ice	2.43	1.64	0.09
						1" Ice	2.84	2.00	0.14
						2" Ice			
B13 RRH 4X30	B	From Leg	4.00	0.0000	150.00	No Ice	2.06	1.32	0.06
			0.00			1/2"	2.24	1.48	0.07
			3.00			Ice	2.43	1.64	0.09
						1" Ice	2.84	2.00	0.14
						2" Ice			
B13 RRH 4X30	C	From Leg	4.00	0.0000	150.00	No Ice	2.06	1.32	0.06
			0.00			1/2"	2.24	1.48	0.07
			3.00			Ice	2.43	1.64	0.09
						1" Ice	2.84	2.00	0.14
						2" Ice			
(2) RHSDC-3315-PF-48	C	From Leg	4.00	0.0000	150.00	No Ice	3.36	2.19	0.03
			0.00			1/2"	3.60	2.39	0.06
			3.00			Ice	3.84	2.61	0.09
						1" Ice	4.34	3.05	0.17
						2" Ice			
Platform Mount [LP 304-1]	C	None		0.0000	150.00	No Ice	17.49	17.49	1.35
						1/2"	21.37	21.37	1.71
						Ice	25.28	25.28	2.13
						1" Ice	33.17	33.17	3.16
						2" Ice			
145									
742 213 w/ Mount Pipe	A	From Face	1.00	0.0000	145.00	No Ice	3.54	2.98	0.05
			0.00			1/2"	4.13	3.57	0.09
			0.00			Ice	4.74	4.17	0.14
						1" Ice	6.01	5.42	0.27
						2" Ice			
742 213 w/ Mount Pipe	B	From Face	1.00	0.0000	145.00	No Ice	3.54	2.98	0.05
			0.00			1/2"	4.13	3.57	0.09
			0.00			Ice	4.74	4.17	0.14
						1" Ice	6.01	5.42	0.27
						2" Ice			
742 213 w/ Mount Pipe	C	From Face	1.00	0.0000	145.00	No Ice	3.54	2.98	0.05
			0.00			1/2"	4.13	3.57	0.09
			0.00			Ice	4.74	4.17	0.14
						1" Ice	6.01	5.42	0.27
						2" Ice			
Pipe Mount [PM 601-3]	C	None		0.0000	145.00	No Ice	3.17	3.17	0.20
						1/2"	3.79	3.79	0.23
						Ice	4.42	4.42	0.28
						1" Ice	5.76	5.76	0.40
						2" Ice			
136									
840 10054 w/ Mount Pipe	A	From Face	1.00	0.0000	136.00	No Ice	4.44	1.94	0.05
			0.00			1/2"	4.88	2.32	0.08
			-2.00			Ice	5.34	2.72	0.12
						1" Ice	6.31	3.57	0.22

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
						2" Ice			
WIMAX DAP HEAD	A	From Face	1.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.55 1.70 1.87 2.22	0.68 0.80 0.92 1.19	0.03 0.04 0.06 0.09
HORIZON COMPACT	A	From Face	1.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.72 0.83 0.94 1.19	0.37 0.45 0.54 0.74	0.01 0.02 0.03 0.05
HORIZON COMPACT	C	From Face	1.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.72 0.83 0.94 1.19	0.37 0.45 0.54 0.74	0.01 0.02 0.03 0.05
Side Arm Mount [SO 104-3]	C	None		0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.62 3.30 3.98 5.35	2.62 3.30 3.98 5.35	0.29 0.41 0.53 0.77
Pipe Mount [PM 601-3]	C	None		0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.17 3.79 4.42 5.76	3.17 3.79 4.42 5.76	0.20 0.23 0.28 0.40
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Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
A-ANT-23G-1-C	B	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 3.00	0.0000		136.00	1.27	No Ice 1/2" Ice 1" Ice 2" Ice	1.28 1.45 1.62 1.96	0.02 0.03 0.04 0.08
A-ANT-18G-2-C	C	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 3.00	0.0000		136.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice	3.72 4.01 4.30 4.88	0.03 0.04 0.05 0.07
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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

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	165.5 - 136.83	Pole	Max Tension	8	0.00	0.00	0.00
			Max. Compression	26	-23.49	1.57	-0.91
			Max. Mx	20	-6.76	194.19	-0.69
			Max. My	14	-6.78	0.82	-193.36
			Max. Vy	8	12.16	-193.59	0.40
			Max. Vx	2	-12.10	-0.29	193.01
			Max. Torque	25			0.85
L2	136.83 - 95.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.44	2.41	-1.28
			Max. Mx	8	-13.35	-779.94	1.41
			Max. My	2	-13.37	-2.05	771.84
			Max. Vy	8	16.51	-779.94	1.41
			Max. Vx	2	-16.31	-2.05	771.84
			Max. Torque	25			1.25

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L3	95.5 - 47	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.15	2.45	-1.92
			Max. Mx	8	-24.30	-1666.08	2.13
			Max. My	2	-24.31	-3.93	1648.23
			Max. Vy	8	21.25	-1666.08	2.13
			Max. Vx	2	-21.04	-3.93	1648.23
			Max. Torque	25			1.25
L4	47 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-72.41	2.45	-2.74
			Max. Mx	8	-40.55	-2929.87	2.92
			Max. My	2	-40.55	-6.03	2901.22
			Max. Vy	8	26.24	-2929.87	2.92
			Max. Vx	2	-26.04	-6.03	2901.22
			Max. Torque	25			1.24

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	36	72.41	7.83	0.00
	Max. H_x	20	40.57	26.19	0.00
	Max. H_z	2	40.57	-0.04	26.02
	Max. M_x	2	2901.22	-0.04	26.02
	Max. M_z	8	2929.87	-26.22	0.02
	Max. Torsion	25	1.24	13.14	22.52
	Min. Vert	17	30.43	13.09	-22.50
	Min. H_x	8	40.57	-26.22	0.02
	Min. H_z	15	30.43	0.01	-26.00
	Min. M_x	14	-2899.80	0.01	-26.00
	Min. M_z	20	-2926.61	26.19	0.00
	Min. Torsion	13	-1.23	-13.09	-22.53

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	33.81	0.00	0.00	0.23	0.42	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	40.57	0.04	-26.02	-2901.22	-6.03	-1.06
0.9 Dead+1.0 Wind 0 deg - No Ice	30.43	0.04	-26.02	-2872.80	-6.09	-1.07
1.2 Dead+1.0 Wind 30 deg - No Ice	40.57	13.14	-22.52	-2511.69	-1469.59	-0.67
0.9 Dead+1.0 Wind 30 deg - No Ice	30.43	13.14	-22.52	-2487.09	-1455.27	-0.67
1.2 Dead+1.0 Wind 60 deg - No Ice	40.57	22.70	-13.00	-1449.39	-2537.61	-0.15
0.9 Dead+1.0 Wind 60 deg - No Ice	30.43	22.70	-13.00	-1435.22	-2512.81	-0.15
1.2 Dead+1.0 Wind 90 deg - No Ice	40.57	26.22	-0.02	-2.92	-2929.87	0.41
0.9 Dead+1.0 Wind 90 deg - No Ice	30.43	26.22	-0.02	-2.95	-2901.22	0.41
1.2 Dead+1.0 Wind 120 deg - No Ice	40.57	22.73	12.95	1441.33	-2540.15	0.89
0.9 Dead+1.0 Wind 120 deg - No Ice	30.43	22.73	12.95	1427.12	-2515.32	0.89
1.2 Dead+1.0 Wind 150 deg - No Ice	40.57	13.09	22.53	2512.46	-1461.50	1.23

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 150 deg - No Ice	30.43	13.09	22.53	2487.72	-1447.28	1.23
1.2 Dead+1.0 Wind 180 deg - No Ice	40.57	-0.01	26.00	2899.80	2.94	1.09
0.9 Dead+1.0 Wind 180 deg - No Ice	30.43	-0.01	26.00	2871.24	2.76	1.10
1.2 Dead+1.0 Wind 210 deg - No Ice	40.57	-13.09	22.50	2508.56	1463.87	0.68
0.9 Dead+1.0 Wind 210 deg - No Ice	30.43	-13.09	22.50	2483.85	1449.34	0.68
1.2 Dead+1.0 Wind 240 deg - No Ice	40.57	-22.67	12.96	1445.07	2534.57	0.18
0.9 Dead+1.0 Wind 240 deg - No Ice	30.43	-22.67	12.96	1430.80	2509.52	0.18
1.2 Dead+1.0 Wind 270 deg - No Ice	40.57	-26.19	-0.00	0.76	2926.61	-0.41
0.9 Dead+1.0 Wind 270 deg - No Ice	30.43	-26.19	-0.00	0.67	2897.72	-0.41
1.2 Dead+1.0 Wind 300 deg - No Ice	40.57	-22.71	-12.99	-1446.63	2538.71	-0.94
0.9 Dead+1.0 Wind 300 deg - No Ice	30.43	-22.71	-12.99	-1432.50	2513.63	-0.95
1.2 Dead+1.0 Wind 330 deg - No Ice	40.57	-13.14	-22.52	-2510.61	1469.34	-1.24
0.9 Dead+1.0 Wind 330 deg - No Ice	30.43	-13.14	-22.52	-2486.02	1454.77	-1.24
1.2 Dead+1.0 Ice+1.0 Temp	72.41	-0.00	0.00	2.74	2.45	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	72.41	0.01	-7.79	-905.76	1.11	-0.25
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	72.41	3.92	-6.75	-783.83	-456.18	-0.16
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	72.41	6.78	-3.89	-451.17	-789.97	-0.05
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	72.41	7.83	-0.00	2.09	-912.41	0.08
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	72.41	6.79	3.88	454.78	-790.48	0.20
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	72.41	3.91	6.75	789.54	-454.14	0.28
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	72.41	-0.00	7.79	910.99	3.14	0.26
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	72.41	-3.91	6.74	788.70	459.63	0.17
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	72.41	-6.78	3.89	455.65	794.20	0.05
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	72.41	-7.83	-0.00	2.96	916.61	-0.09
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	72.41	-6.79	-3.89	-450.51	795.11	-0.21
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	72.41	-3.92	-6.75	-783.56	461.00	-0.28
Dead+Wind 0 deg - Service	33.81	0.01	-6.13	-679.28	-1.09	-0.25
Dead+Wind 30 deg - Service	33.81	3.09	-5.30	-588.06	-343.85	-0.16
Dead+Wind 60 deg - Service	33.81	5.35	-3.06	-339.28	-593.99	-0.04
Dead+Wind 90 deg - Service	33.81	6.17	-0.00	-0.51	-685.86	0.10
Dead+Wind 120 deg - Service	33.81	5.35	3.05	337.73	-594.58	0.21
Dead+Wind 150 deg - Service	33.81	3.08	5.31	588.58	-341.95	0.29
Dead+Wind 180 deg - Service	33.81	-0.00	6.12	679.29	1.01	0.26
Dead+Wind 210 deg - Service	33.81	-3.08	5.30	587.67	343.16	0.16
Dead+Wind 240 deg - Service	33.81	-5.34	3.05	338.61	593.92	0.04
Dead+Wind 270 deg - Service	33.81	-6.17	-0.00	0.35	685.74	-0.10
Dead+Wind 300 deg - Service	33.81	-5.35	-3.06	-338.63	594.89	-0.23

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
Dead+Wind 330 deg - Service	33.81	-3.09	-5.30	-587.81	344.44	-0.29

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	-33.81	0.00	0.00	33.81	0.00	0.000%
2	0.04	-40.57	-26.02	-0.04	40.57	26.02	0.000%
3	0.04	-30.43	-26.02	-0.04	30.43	26.02	0.000%
4	13.14	-40.57	-22.52	-13.14	40.57	22.52	0.000%
5	13.14	-30.43	-22.52	-13.14	30.43	22.52	0.000%
6	22.70	-40.57	-13.00	-22.70	40.57	13.00	0.000%
7	22.70	-30.43	-13.00	-22.70	30.43	13.00	0.000%
8	26.22	-40.57	-0.02	-26.22	40.57	0.02	0.000%
9	26.22	-30.43	-0.02	-26.22	30.43	0.02	0.000%
10	22.73	-40.57	12.95	-22.73	40.57	-12.95	0.000%
11	22.73	-30.43	12.95	-22.73	30.43	-12.95	0.000%
12	13.09	-40.57	22.53	-13.09	40.57	-22.53	0.000%
13	13.09	-30.43	22.53	-13.09	30.43	-22.53	0.000%
14	-0.01	-40.57	26.00	0.01	40.57	-26.00	0.000%
15	-0.01	-30.43	26.00	0.01	30.43	-26.00	0.000%
16	-13.09	-40.57	22.50	13.09	40.57	-22.50	0.000%
17	-13.09	-30.43	22.50	13.09	30.43	-22.50	0.000%
18	-22.67	-40.57	12.96	22.67	40.57	-12.96	0.000%
19	-22.67	-30.43	12.96	22.67	30.43	-12.96	0.000%
20	-26.19	-40.57	-0.00	26.19	40.57	0.00	0.000%
21	-26.19	-30.43	-0.00	26.19	30.43	0.00	0.000%
22	-22.71	-40.57	-12.99	22.71	40.57	12.99	0.000%
23	-22.71	-30.43	-12.99	22.71	30.43	12.99	0.000%
24	-13.14	-40.57	-22.52	13.14	40.57	22.52	0.000%
25	-13.14	-30.43	-22.52	13.14	30.43	22.52	0.000%
26	0.00	-72.41	0.00	0.00	72.41	-0.00	0.000%
27	0.01	-72.41	-7.79	-0.01	72.41	7.79	0.000%
28	3.92	-72.41	-6.75	-3.92	72.41	6.75	0.000%
29	6.78	-72.41	-3.89	-6.78	72.41	3.89	0.000%
30	7.83	-72.41	-0.00	-7.83	72.41	0.00	0.000%
31	6.79	-72.41	3.88	-6.79	72.41	-3.88	0.000%
32	3.91	-72.41	6.75	-3.91	72.41	-6.75	0.000%
33	-0.00	-72.41	7.79	0.00	72.41	-7.79	0.000%
34	-3.91	-72.41	6.74	3.91	72.41	-6.74	0.000%
35	-6.78	-72.41	3.89	6.78	72.41	-3.89	0.000%
36	-7.83	-72.41	-0.00	7.83	72.41	0.00	0.000%
37	-6.79	-72.41	-3.89	6.79	72.41	3.89	0.000%
38	-3.92	-72.41	-6.75	3.92	72.41	6.75	0.000%
39	0.01	-33.81	-6.13	-0.01	33.81	6.13	0.000%
40	3.09	-33.81	-5.30	-3.09	33.81	5.30	0.000%
41	5.35	-33.81	-3.06	-5.35	33.81	3.06	0.000%
42	6.17	-33.81	-0.00	-6.17	33.81	0.00	0.000%
43	5.35	-33.81	3.05	-5.35	33.81	-3.05	0.000%
44	3.08	-33.81	5.31	-3.08	33.81	-5.31	0.000%
45	-0.00	-33.81	6.12	0.00	33.81	-6.12	0.000%
46	-3.08	-33.81	5.30	3.08	33.81	-5.30	0.000%
47	-5.34	-33.81	3.05	5.34	33.81	-3.05	0.000%
48	-6.17	-33.81	-0.00	6.17	33.81	0.00	0.000%
49	-5.35	-33.81	-3.06	5.35	33.81	3.06	0.000%
50	-3.09	-33.81	-5.30	3.09	33.81	5.30	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	0.00081923
3	Yes	4	0.00000001	0.00049988
4	Yes	5	0.00000001	0.00086269
5	Yes	5	0.00000001	0.00037285
6	Yes	5	0.00000001	0.00087782
7	Yes	5	0.00000001	0.00038017
8	Yes	4	0.00000001	0.00042222
9	Yes	4	0.00000001	0.00021508
10	Yes	5	0.00000001	0.00089093
11	Yes	5	0.00000001	0.00038718
12	Yes	5	0.00000001	0.00084547
13	Yes	5	0.00000001	0.00036518
14	Yes	5	0.00000001	0.00004576
15	Yes	4	0.00000001	0.00062836
16	Yes	5	0.00000001	0.00088776
17	Yes	5	0.00000001	0.00038535
18	Yes	5	0.00000001	0.00086957
19	Yes	5	0.00000001	0.00037624
20	Yes	4	0.00000001	0.00049734
21	Yes	4	0.00000001	0.00027147
22	Yes	5	0.00000001	0.00085233
23	Yes	5	0.00000001	0.00036793
24	Yes	5	0.00000001	0.00090215
25	Yes	5	0.00000001	0.00039234
26	Yes	4	0.00000001	0.00003487
27	Yes	5	0.00000001	0.00051748
28	Yes	5	0.00000001	0.00080804
29	Yes	5	0.00000001	0.00081435
30	Yes	5	0.00000001	0.00051865
31	Yes	5	0.00000001	0.00082802
32	Yes	5	0.00000001	0.00080998
33	Yes	5	0.00000001	0.00052223
34	Yes	5	0.00000001	0.00084302
35	Yes	5	0.00000001	0.00083623
36	Yes	5	0.00000001	0.00052547
37	Yes	5	0.00000001	0.00081973
38	Yes	5	0.00000001	0.00083876
39	Yes	4	0.00000001	0.00006131
40	Yes	4	0.00000001	0.00031058
41	Yes	4	0.00000001	0.00032918
42	Yes	4	0.00000001	0.00003375
43	Yes	4	0.00000001	0.00035104
44	Yes	4	0.00000001	0.00029736
45	Yes	4	0.00000001	0.00006601
46	Yes	4	0.00000001	0.00034579
47	Yes	4	0.00000001	0.00032363
48	Yes	4	0.00000001	0.00003543
49	Yes	4	0.00000001	0.00030391
50	Yes	4	0.00000001	0.00036330

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	165.5 - 136.83	24.281	48	1.4069	0.0033
L2	140 - 95.5	17.009	48	1.2505	0.0024
L3	100 - 47	8.231	48	0.8182	0.0009
L4	53 - 0	2.232	48	0.3951	0.0003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
162.00	KRY 112 144/1	48	23.248	1.3890	0.0033	25650
150.00	(2) LPA-80080/6CF w/ Mount Pipe	48	19.761	1.3221	0.0028	8274
145.00	742 213 w/ Mount Pipe	48	18.361	1.2888	0.0027	6255
139.00	A-ANT-23G-1-C	48	16.745	1.2421	0.0024	5141
136.00	840 10054 w/ Mount Pipe	48	15.968	1.2156	0.0023	5103

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	165.5 - 136.83	103.631	8	6.0029	0.0138
L2	140 - 95.5	72.653	8	5.3389	0.0101
L3	100 - 47	35.187	8	3.4983	0.0037
L4	53 - 0	9.541	8	1.6892	0.0012

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
162.00	KRY 112 144/1	8	99.232	5.9271	0.0142	6161
150.00	(2) LPA-80080/6CF w/ Mount Pipe	8	84.383	5.6431	0.0123	1985
145.00	742 213 w/ Mount Pipe	8	78.417	5.5017	0.0115	1500
139.00	A-ANT-23G-1-C	8	71.529	5.3034	0.0105	1231
136.00	840 10054 w/ Mount Pipe	8	68.216	5.1907	0.0099	1220

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	165.5 - 136.83 (1)	TP24.279x17x0.1875	28.67	0.00	0.0	13.8585	-6.76	810.72	0.008
L2	136.83 - 95.5 (2)	TP34.4x23.0992x0.3125	44.50	0.00	0.0	32.6770	-13.35	1911.61	0.007
L3	95.5 - 47 (3)	TP46.06x32.6322x0.375	53.00	0.00	0.0	52.5672	-24.30	3075.18	0.008
L4	47 - 0 (4)	TP57.275x43.7899x0.375	53.00	0.00	0.0	67.7252	-40.55	3961.93	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	165.5 - 136.83 (1)	TP24.279x17x0.1875	194.52	456.93	0.426	0.00	456.93	0.000
L2	136.83 - 95.5 (2)	TP34.4x23.0992x0.3125	779.94	1599.37	0.488	0.00	1599.37	0.000
L3	95.5 - 47 (3)	TP46.06x32.6322x0.375	1666.08	3342.78	0.498	0.00	3342.78	0.000
L4	47 - 0 (4)	TP57.275x43.7899x0.375	2929.87	5057.02	0.579	0.00	5057.02	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	165.5 - 136.83 (1)	TP24.279x17x0.1875	12.18	243.22	0.050	0.00	496.00	0.000
L2	136.83 - 95.5 (2)	TP34.4x23.0992x0.3125	16.51	573.48	0.029	0.41	1654.58	0.000
L3	95.5 - 47 (3)	TP46.06x32.6322x0.375	21.25	922.55	0.023	0.41	3568.20	0.000
L4	47 - 0 (4)	TP57.275x43.7899x0.375	26.24	1188.58	0.022	0.41	5922.70	0.000

Pole Interaction Design Data

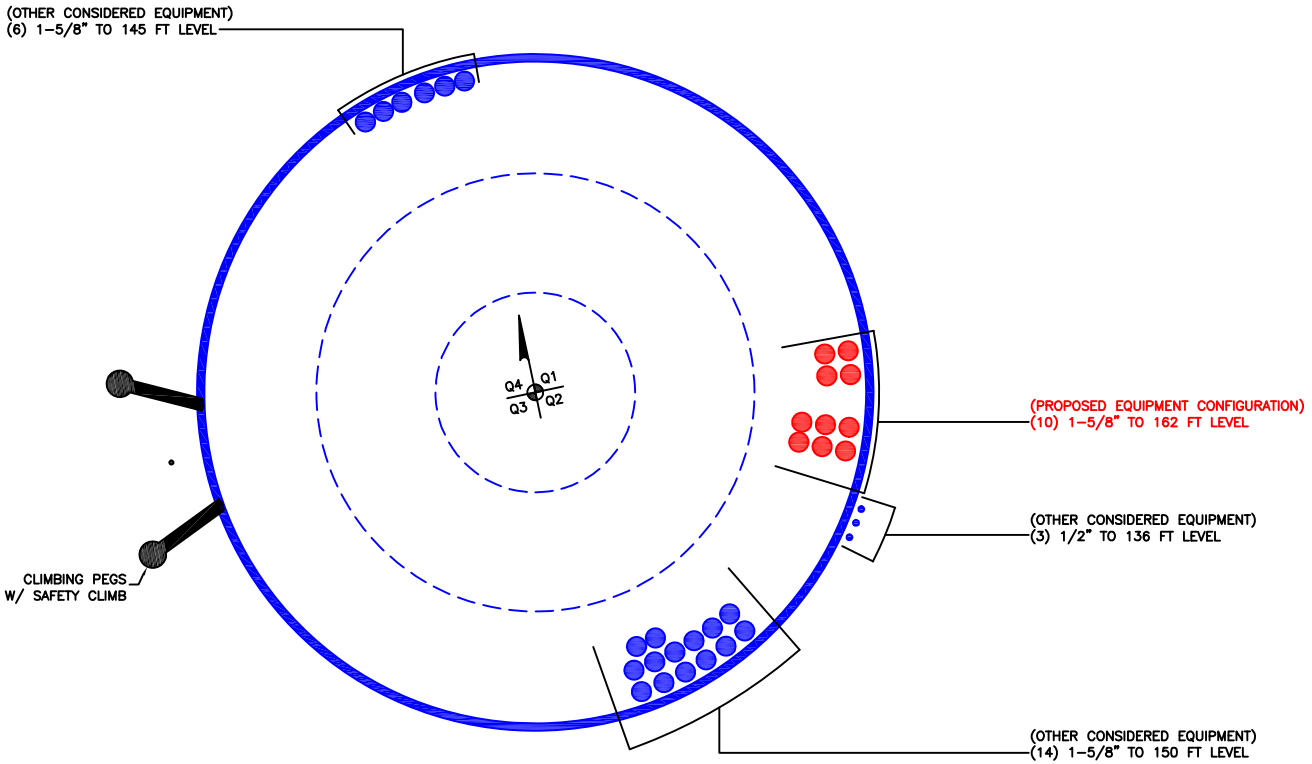
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	165.5 - 136.83 (1)	0.008	0.426	0.000	0.050	0.000	0.437	1.050	4.8.2
L2	136.83 - 95.5 (2)	0.007	0.488	0.000	0.029	0.000	0.495	1.050	4.8.2
L3	95.5 - 47 (3)	0.008	0.498	0.000	0.023	0.000	0.507	1.050	4.8.2
L4	47 - 0 (4)	0.010	0.579	0.000	0.022	0.000	0.590	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	165.5 - 136.83	Pole	TP24.279x17x0.1875	1	-6.76	851.26	41.6	Pass
L2	136.83 - 95.5	Pole	TP34.4x23.0992x0.3125	2	-13.35	2007.19	47.2	Pass
L3	95.5 - 47	Pole	TP46.06x32.6322x0.375	3	-24.30	3228.94	48.3	Pass
L4	47 - 0	Pole	TP57.275x43.7899x0.375	4	-40.55	4160.03	56.2	Pass
							Summary	
						Pole (L4)	56.2	Pass
						RATING =	**56.2**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT)
(6) 1-5/8" TO 145 FT LEVEL
Q4
Q1
Q3
Q2
(PROPOSED EQUIPMENT CONFIGURATION)
(10) 1-5/8" TO 162 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(3) 1/2" TO 136 FT LEVEL
CLIMBING PEGS
W/ SAFETY CLIMB
(OTHER CONSIDERED EQUIPMENT)
(14) 1-5/8" TO 150 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

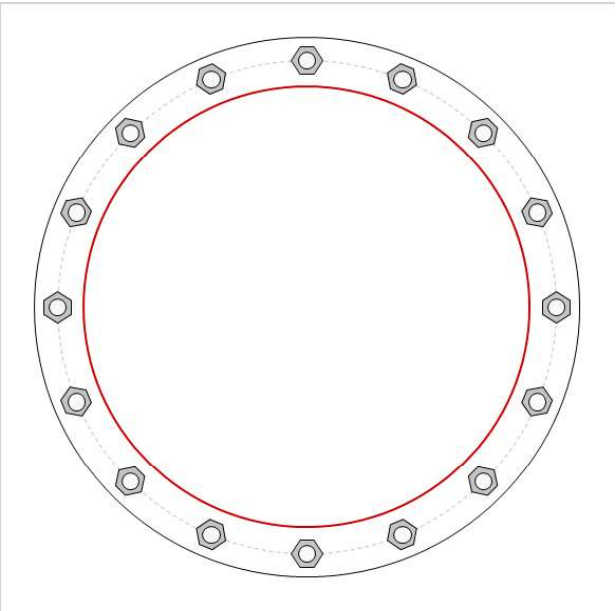
Monopole Base Plate Connection

Site Info	
BU #	801487
Site Name	SUFFIELD 3 CAC 80148
Order #	529729 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1.5

Applied Loads	
Moment (kip-ft)	2929.87
Axial Force (kips)	40.55
Shear Force (kips)	26.24

**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 64" BC

Base Plate Data

70" OD x 2.75" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

N/A

Pole Data

57.275" 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 = 139.8	ϕPn_c = 268.39	**Stress Rating**
Vu = 1.64	ϕVn = 120.77	**49.6%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	13.96	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**24.6%**	**Pass**

Pier and Pad Foundation

BU # :	801487
Site Name:	CT SUFFIELD 3 C/
App. Number:	529729 Rev. 0

TIA-222 Revision:	H
Tower Type:	Monopole

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

Superstructure Analysis Reactions		
Compression, P_{comp}:	40.57	kips
Base Shear, Vu_comp:	26.22	kips
Moment, M_u:	2929.87	ft-kips
Tower Height, **H**:	165.5	ft
BP Dist. Above Fdn, bp_{dist}:	3.75	in

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, **dpier**:	7.5	ft
Ext. Above Grade, **E**:	0.5	ft
Pier Rebar Size, **Sc**:	9	
Pier Rebar Quantity, **mc**:	38	
Pier Tie/Spiral Size, **St**:	5	
Pier Tie/Spiral Quantity, **mt**:	9	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	6.5	ft
Pad Width, **W**:	30	ft
Pad Thickness, **T**:	2.5	ft
Pad Rebar Size (Bottom), **Sp**:	9	
Pad Rebar Quantity (Bottom), **mp**:	29	
Pad Clear Cover, cc_{pad}:	3	in

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

Soil Properties		
Total Soil Unit Weight, γ:	120	pcf
Ultimate Gross Bearing, Qult:	6.000	ksf
Cohesion, **Cu**:	0.750	ksf
Friction Angle, φ:	0	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:		
Neglected Depth, **N**:	3.75	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	15	ft

<--Toggle between Gross and Net

Foundation Analysis Checks	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	628.83	26.22	**4.0%**	**Pass**
Bearing Pressure (ksf)	4.50	1.57	**33.2%**	**Pass**
*Overturning (kip*ft)*	8974.68	3121.60	**34.8%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	6474.67	3047.86	**44.8%**	**Pass**
Pier Compression (kip)	21089.12	76.35	**0.3%**	**Pass**
*Pad Flexure (kip*ft)*	3179.02	1095.08	**32.8%**	**Pass**
Pad Shear - 1-way (kips)	748.54	147.78	**18.8%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.039	**22.8%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	3133.22	1828.72	**55.6%**	**Pass**

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

Soil Rating*:	**34.8%**
Structural Rating*:	**55.6%**

Version 3.4.0

Drilled Pier Foundation

BU # :	801487
Site Name:	CT SUFFIELD 3 CAC
Order Number:	529729 Rev. 0

TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	2929.87	
Axial Force (kips)	40.57	
Shear Force (kips)	26.22	

Material Properties		
Concrete Strength, f'c:	3	ksi
Rebar Strength, Fy:	60	ksi
Tie Yield Strength, Fyt:	40	ksi

Pier Design Data		
Depth	24	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 24' below grade		
Pier Diameter	7.5	ft
Rebar Quantity	21	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	
Tie Spacing		in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	5.66	-
Soil Safety Factor	2.43	-
Max Moment (kip-ft)	3059.65	-
Rating*	*52.1%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	398.70	-
End Bearing (kips)	198.80	-
Weight of Concrete (kips)	165.04	-
Total Capacity (kips)	597.51	-
Axial (kips)	205.61	-
Rating*	*32.8%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	5.41	-
Critical Moment (kip-ft)	3059.11	-
Critical Moment Capacity	5664.78	-
Rating*	*51.4%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	17.13	-
Critical Shear (kip)	343.22	-
Critical Shear Capacity	594.61	-
Rating*	*55.0%*	-

Soil Interaction Rating*	**52.1%**
Structural Foundation Rating*	**55.0%**

*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	☑
N/A	☐
Shear Design Options	
Check Shear along Depth of Pier:	☑
Utilize Shear-Friction Methodology:	☐

Go to Soil Calculations

Soil Profile

Groundwater Depth	15	# of Layers	3

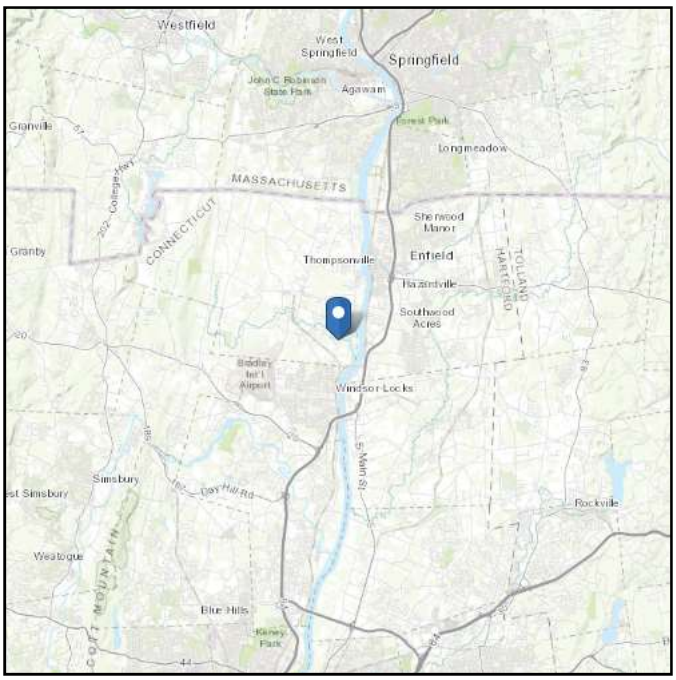
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3.75	3.75	115	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	3.75	6.3	2.55	120	150	0.75	0	0.413	0.413					Cohesive
3	6.3	24	17.7	57.6	87.6	0	32	1.215	1.215			6	95	Cohesionless

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 115.47 ft (NAVD 88)
Latitude: 41.957
Longitude: -72.625722



Wind

Results:

Wind Speed:	120 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	92 Vmph
100-year MRI	99 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:	Thu Oct 15 2020

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.

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Thu Oct 15 2020

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.

BU:	801487	Structure:	A
WO:	1891496		
Order:	529729	Rev:	0

Location

	Decimal Degrees		Deg	Min	Sec
Lat:	41.957000	+	41	57	25.20
Long:	-72.625722	-	72	37	32.60

Code and Site Parameters

Seismic Design Code:	ASCE 7-10	
Site Soil:	D	Stiff Soil (Default)
Risk Category:	II	

USGS Seismic Reference			
	S_S:	0.1760	g
	S_1:	0.0650	g
	T_L:	6	s

Seismic Design Category Determination

Importance Factor, I_e:	1
Acceleration-based site coefficient, F_a:	1.6000
Velocity-based site coefficient, F_v:	2.4000

Design spectral response acceleration short period, S_{DS}:	0.1877	g
Design spectral response acceleration 1 s period, S_{D1}:	0.1040	g

Seismic Design Category Based on S_{DS}:	B
Seismic Design Category Based on S_{D1}:	B
Seismic Design Category Based on S_1:	N/A

Controlling Seismic Design Category:	B

Exhibit E

Mount Analysis

PAUL J. FORD & COMPANY

Date: October 15, 2020

Darcy Tarr
Crown Castle
6325 Ardrey Kell Road
Charlotte, NC 28277

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679

Subject:	**Mount Replacement Report**	
Carrier Designation:	***T-Mobile* Equipment Change-out**	
	Carrier Site Number:	N/A
	Carrier Site Name:	CTHA160A
Crown Castle Designation:	**Crown Castle BU Number:**	801487
	Crown Castle Site Name:	CT SUFFIELD 3 CAC 801487
	Crown Castle JDE Job Number:	620130
	Crown Castle Purchase Order Number:	1577489
	Crown Castle Order Number:	529729 Rev. 0
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	A37520-2233.001.7190
Site Data:	**848 EAST STREET, SUFFIELD, Hartford County, CT 06078** **Latitude 41.957°, Longitude -72.625722°**	
Structure Information:	**Tower Height & Type:**	**166 Foot Monopole**
	Mount Elevation:	**162 Foot**
	Mount Type:	**(3) Sector 8 Foot Sector Frame**

Dear Darcy Tarr,

Paul J Ford and Company is pleased to submit this "Mount Replacement Report" to determine the structural integrity of the TMobile antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned 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 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:

8' Sector Frame **SUFFICIENT***

***The mount has sufficient capacity once the modifications, as described in Section 4.1 Recommendations of this report, are completed.**

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

Respectfully submitted by:

Jaime Acuna
Structural Designer
jacuna@pauljford.com
BKK

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER

Justin T. Kline
2020.10.15
12:00:47-04'00'

TABLE OF CONTENTS

1) INTRODUCTION

The proposed mount / mounts under consideration is a (3) sector 8' Sector Frame VFA8-HD, designed by SitePro 1.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	120 mph
Exposure Category:	C
Topographic Factor at Base:	1.00
Topographic Factor at Mount:	1.00
Ice Thickness:	2.0 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.176
Seismic S_1:	0.064
Maintenance Loading Wind Speed:	30 mph
Maintenance Load at Mid/End-Points, L_v:	250 lb
Maintenance Load at Mount Pipes, L_m:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
162	163	3	ERICSSON	AIR 32 B2A B66AA_T-MOBILE	(3) sector- 8' Sector Frame VFA8-HD
		3	ERICSSON	AIR6449 B41_T-MOBILE	
		3	COMMSCOPE	SDX1926Q-43	
		3	ERICSSON	RADIO 4415 B66A_CCIV2	
		3	ERICSSON	RADIO 4449 B71 B85A_T-MOBILE	
	161	3	ERICSSON	KRY 112 144/1	
	160	3	RFS CELWAVE	APXVAALL24_43-U-NA20_TMO	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Mount Manufacturer Drawings	Model #: VFA8-HD Dated: 12/13/2017	-	SitePro1
Order	ID: 529729 Rev. 0 Dated: 10/07/2020	-	CCISites
Radio Frequency Data Sheet	RFDS ID #: CTHA160A Version 6.00, Dated: 9/20/2020	-	Crown Castle

3.1) Analysis Method

RISA-3D (version 17.0.3), 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.

A tool internally developed, using Microsoft Excel, by Paul J. Ford and Company 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 analysis of the existing tower or the effect of the mount attachment to the tower is not within the current scope of work.*
2) *The antenna mounting system was properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer's specifications and all bolts are tightened as specified by the manufacturer and AISC requirements.*
3) *The configuration of antennas, mounts, and other appurtenances are as specified in Table 1.*
4) *All member connections have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report. All U-Bolt connections have been properly tightened. This analysis will be required to be revised if the existing conditions in the field differ from those shown in the above referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.*
5) *Steel grades are as follows, unless noted otherwise:*
   - *a) Channel, Solid Round, Angle, Unistrut* — *ASTM A53 (GR 35)*
   - *b) Pipe* — *ASTM A53 (GR 35)*
   - *c) HSS (Rectangular), Plate* — *Q235 Gr B (Fy = 34 ksi, Fu = 58 ksi)*
   - *d) HSS (Round)* — *ASTM A53 (GR 35)*
   - *e) Connection Bolts* — *ASTM A325*
   - *f) Threaded Rods* — *SAE J429 (GR2)*
   - *g) U-Bolts* — *SAE J429 (GR2)*
6) *Proposed equipment is to be installed in the locations specified in Appendix A. Any changes to the proposed equipment locations will render this report invalid.*

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

4) ANALYSIS RESULTS

Table 3 - Mount Component Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2,3	Face Horizontals	162	24.9	Pass
1,2,3	Standoff Members		18.0	Pass
1,2,3	Tie Backs		4.2	Pass
1,2,3	Bracing Members		79.0	Pass
1,2,3	Mount Pipes		98.1	Pass
1,2,3	Mount to Tower Connection		15.1	Pass

Mount Rating (max from all components) =	98.1%

Notes:
1) See additional documentation in "Appendix B – Software Analysis Output" for calculations supporting the % capacity consumed.
2) Rating per TIA-222-H, Section 15.5
3) All sectors are typical.

4.1) Recommendations

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

- Mount Replacement, SitePro1 model: VFA8-HD

Beyond the mount replacement, no structural modifications are required at this time, provided that the above-listed changes are implemented.

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING MOUNTS BY PAUL J. FORD AND COMPANY

1) It is the responsibility of the client to ensure that the information provided to Paul J. Ford and Company is accurate and complete. Paul J. Ford and Company will rely on the accuracy and completeness of such information in performing or furnishing services under this project.

2) If the existing conditions are not as represented on the referenced drawings and/or documents, Paul J. Ford and Company should be contacted immediately to evaluate the significance of the deviation.

3) The mount has been analyzed according to the minimum design loads recommended by the Reference Standard. If additional design loads are required, Paul J. Ford and Company should be made aware of this prior to the start of the project.

4) The standard of care for all Professional Engineering Services performed or furnished by Paul J. Ford and Company under this project will be the skill and care used by members of the Consultant's profession practicing under similar circumstances at the same time and in the same locality.

5) All Services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Paul J. Ford and Company is not responsible for the conclusions, opinions and/or recommendations made by others based on the information supplied herein.

****

APPENDIX A

SOFTWARE INPUT CALCULATION

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

Project Number: 37520-2233.001.7190
Date: 10/15/2020
Engineer: JAB

Mount Loading per TIA-222-H (Version v3.0 - Effective 9/14/2020)

Structure & Wind Speed

Structure Type =	Mount	Ultimate Wind Speed =	120	mph
		Ice Wind Speed =	50	mph
Mount Type =	1 Sector	Service Wind Speed =	30	mph
Mount Centerline (z) =	162.00	ft Non-Op Wind Speed =	-	mph
Risa $^{C}/_{L}$ Y-Coordinate =	20.00	in Op Wind Speed =	-	mph
		Ice Thickness =	2	in

Topography

Risk Category =	II	
Exposure Category =	C	
Topographic Category =	1	
Structure Base Height (Z_s) =	115.5	ft
Crest Height (H) =		ft

Velocity Pressure Coefficients

z_g =	900 ft	(Table 2-4)
α' =	9.50	(Table 2-4)
K_z =	1.40	(Section 2.6.5.2)
K_{zmin} = 0.85		
K_{zcalc} = 1.40		
K_{zmax} = 2.01		
	Override	
K_{zt} =	1.00	(Section 2.6.6.2.1)
K_d =	0.95	(Section 16.6)
K_e =	1.00	(Section 2.6.8)
G_h =	1.00	(Section 16.6)
K_{es} =	1.0	(Annex S - Wind Force)
q_z =	48.86 psf	(Section 2.6.11.6)

Ice Loading

h =	0.00	in (Bar Grating Height)
I_i =	1.00	(Table 2-3)
K_{es} =	1.0	(Annex S - Ice)
q_{iz} =	8.52 psf	(Section 2.6.11.6)
K_{iz} =	1.17	(Section 2.6.10)
t_z =	2.34 in	(Section 2.6.10)
W_i =	10.94 psf	(Grating Ice Weight)

Wind Pressure

		Override
K_a =	0.9	(on all Appurt. / Member Forces)
$(q_z)(G_h)(K_{es})$ =	48.86 psf	
$(q_{iz})(G_h)(K_{es})$ =	8.52 psf	(Ice)

Analysis Settings

Analysis Scope =	Client	File Suffix =	_Client.r3d
Analysis Wind Direction Increment =	30°		
EPA Calculation Method =	TIA		
Construction Duration =			

Maintenance Point Loads

	Load	Label	Node #
L_{m1} =	500 lbs	N21	21
L_{m2} =	500 lbs	N27	27
L_{m3} =	500 lbs	N33	33
L_{m4} =	500 lbs		-

	Load	Label	Node #
L_{v1} =	250 lbs	N9	9
L_{v2} =	250 lbs	N10	10
L_{v3} =	250 lbs	N27	27
L_{v4} =	250 lbs		-

Risa3D Source: G:\TOWER\375_Crown_Castle\2020\37520-2233_801487_CT SUFFIELD 3 CAC 80148\37520-2233.001.7190_MA_1193203\RISA 3D_SECTOR FRAME\37520-2233.001.7190.r3d (31 Total Populated Members)

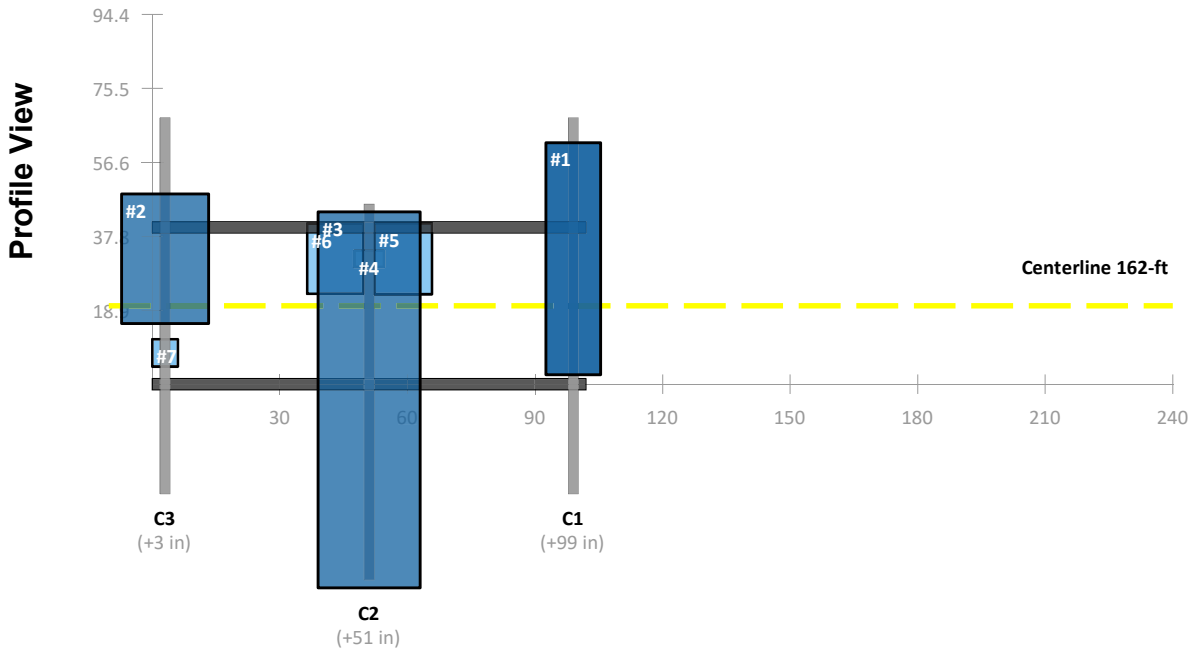
Antennas

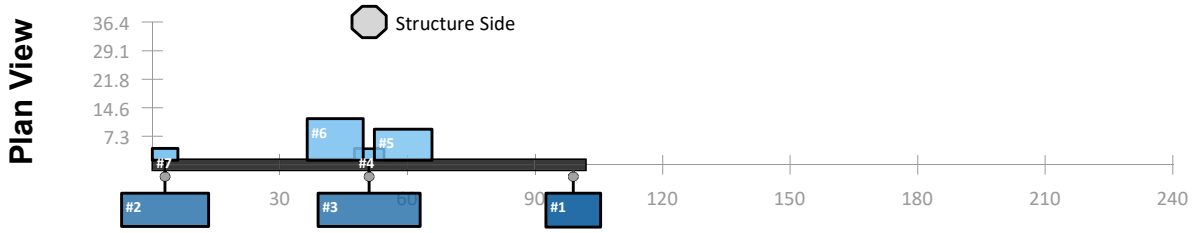
Item	Include Loading	Status	Mounting Location	Manufacturer	Antenna	Height (in)	Width (in)	Depth (in)	Flat or Round	Weight (lbs)	Sector / Face	Position	Quantity	Orientation	Use tnxTower C_AA_A (CFD)	Top/Bottom Mounting Point Spacing	Override Spacing (in)	Max Antenna C/L (ft)	Min Antenna C/L (ft)	Antenna C/L (ft)	Antenna Top Mount Location from Mount Pipe Bottom (in)	Antenna Bottom Mount Location from Mount Pipe Bottom (in)	Override Top Antenna Mounting Location (in)	Override Bottom Antenna Mounting Location (in)	Normal Wind Force per Antenna (lbs)	Transverse Wind Force per Antenna (lbs)
1	Yes	Proposed	Mount	ERICSSON	AIR 32 B2A B66AA_T-MOBILE	59.25	12.87	8.7	Flat	171.96	C	1	1	Normal	No	53.25		163.781	160.219	163	86.63	33.38			301.186	219.036
2	Yes	Proposed	Mount	ERICSSON	AIR6449 B41_T-MOBILE	33.11	20.51	8.54	Flat	114.63	C	3	1	Normal	No	27.11		164.870	159.130	163	73.56	46.45			248.833	108.894
3	Yes	Proposed	Mount	RFS CELWAVE	APXVAALL24_43-U-NA20_TMO	95.9	24	8.5	Flat	149.9	C	2	1	Normal	No	89.90		160.421	159.913	160	90.95	1.05			890.083	384.002
4	Yes	Proposed	Mount	COMMSCOPE	SDX1926Q-43	4.173	6.929	2.913	Flat	6.17	C	2	1	Normal	No	1.00		164.125	156.208	163	82.50	81.50			10.595	4.454
5	Yes	Proposed	Mount	ERICSSON	RADIO 4415 B66A_CCIV2	18.1	13.5	7.9	Flat	56.2	C	2	1	Normal	No	12.10		163.663	156.671	163	88.05	75.95			89.535	52.395
6	Yes	Proposed	Mount	ERICSSON	RADIO 4449 B71 B85A_T-MOBILE	17.91	13.2	10.63	Flat	73.21	C	2	1	Normal	No	11.91		163.670	156.663	163	87.96	76.05			86.627	69.761
7	Yes	Existing	Mount	ERICSSON	KRY 112 144/1	7	6	3	Flat	11	C	3	1	Normal	No	1.00		165.958	158.042	161	36.50	35.50			15.390	7.695

Dishes

Item	Include Loading	Status	Mounting Location	Manufacturer	Microwave Dish	Dia (in)	Dish Type	Weight (lbs)	Sector / Face	Position	Top/Bottom Mounting Point Spacing	Override Spacing (in)	Max Dish C/L (ft)	Min Dish C/L (ft)	Dish C/L (ft)	Dish Top Mount Location from Mount Pipe Bottom	Dish Bottom Mount Location from Mount Pipe Bottom	Override Top Dish Mounting Location (in)	Override Bottom Dish Mounting Location (in)

Sector C
(typical in all sectors)





Ref ID	Type	Manufacturer	Model	Height (in)	Width (in)	Depth (in)	Center Line (ft)	Mount Pipe	Horizontal Offset (in)	Lateral Offset (in)
#1	Antenna	ERICSSON	AIR 32 B2A B66AA_T-MOBILE	59.25	12.87	8.70	163.00	C1	0.00	3.00
#2	Antenna	ERICSSON	AIR6449 B41_T-MOBILE	33.11	20.51	8.54	163.00	C3	0.00	3.00
#3	Antenna	RFS CELWAVE	APXVAALL24_43-U-NA20_TMO	95.90	24.00	8.50	160.00	C2	0.00	3.00
#4	TME/RRH	COMMSCOPE	SDX1926Q-43	4.17	6.93	2.91	163.00	C2	0.00	-3.00
#5	TME/RRH	ERICSSON	RADIO 4415 B66A_CCIV2	18.10	13.50	7.90	163.00	C2	8.00	-3.00
#6	TME/RRH	ERICSSON	RADIO 4449 B71 B85A_T-MOBILE	17.91	13.20	10.63	163.00	C2	-8.00	-3.00
#7	TME/RRH	ERICSSON	KRY 112 144/1	7.00	6.00	3.00	161.00	C3	0.00	-3.00

1. A 6" tolerance for proposed equipment is acceptable.

2. Contractor to verify location of existing equipment prior to installation of proposed equipment. Notify for any deviations.

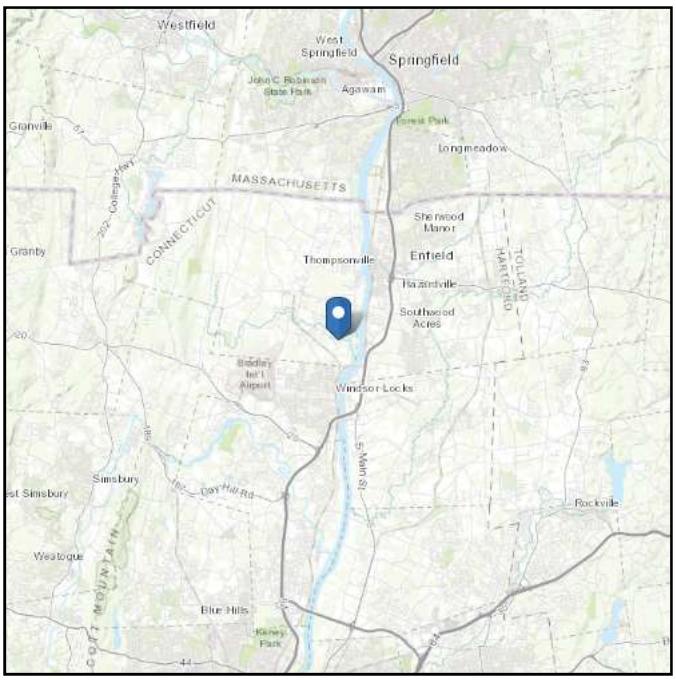
3. Install shall not cause harm to the structure, climbing facility, safety climb, or any system installed on the structure

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 115.47 ft (NAVD 88)
Latitude: 41.957
Longitude: -72.625722



Wind

Results:

Wind Speed:	120 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	92 Vmph
100-year MRI	99 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:	Mon Oct 12 2020

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.

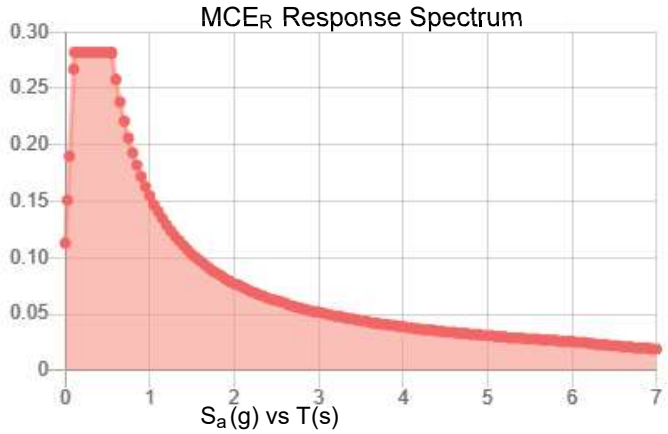
Seismic

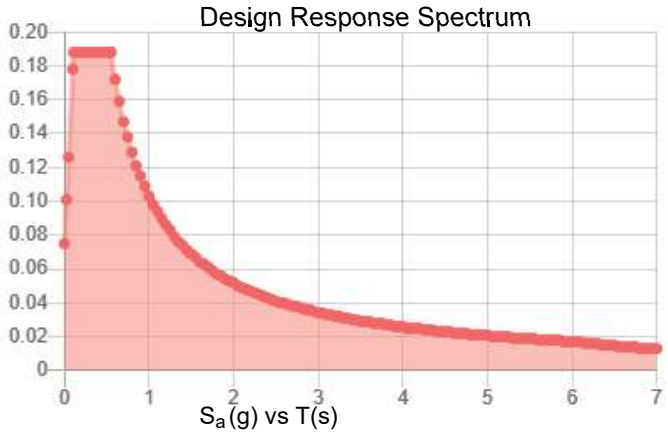
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.176	S_{DS} :	0.188
S_1 :	0.064	S_{D1} :	0.103
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.087
S_{MS} :	0.282	PGA_M :	0.139
S_{M1} :	0.155	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Mon Oct 12 2020

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:

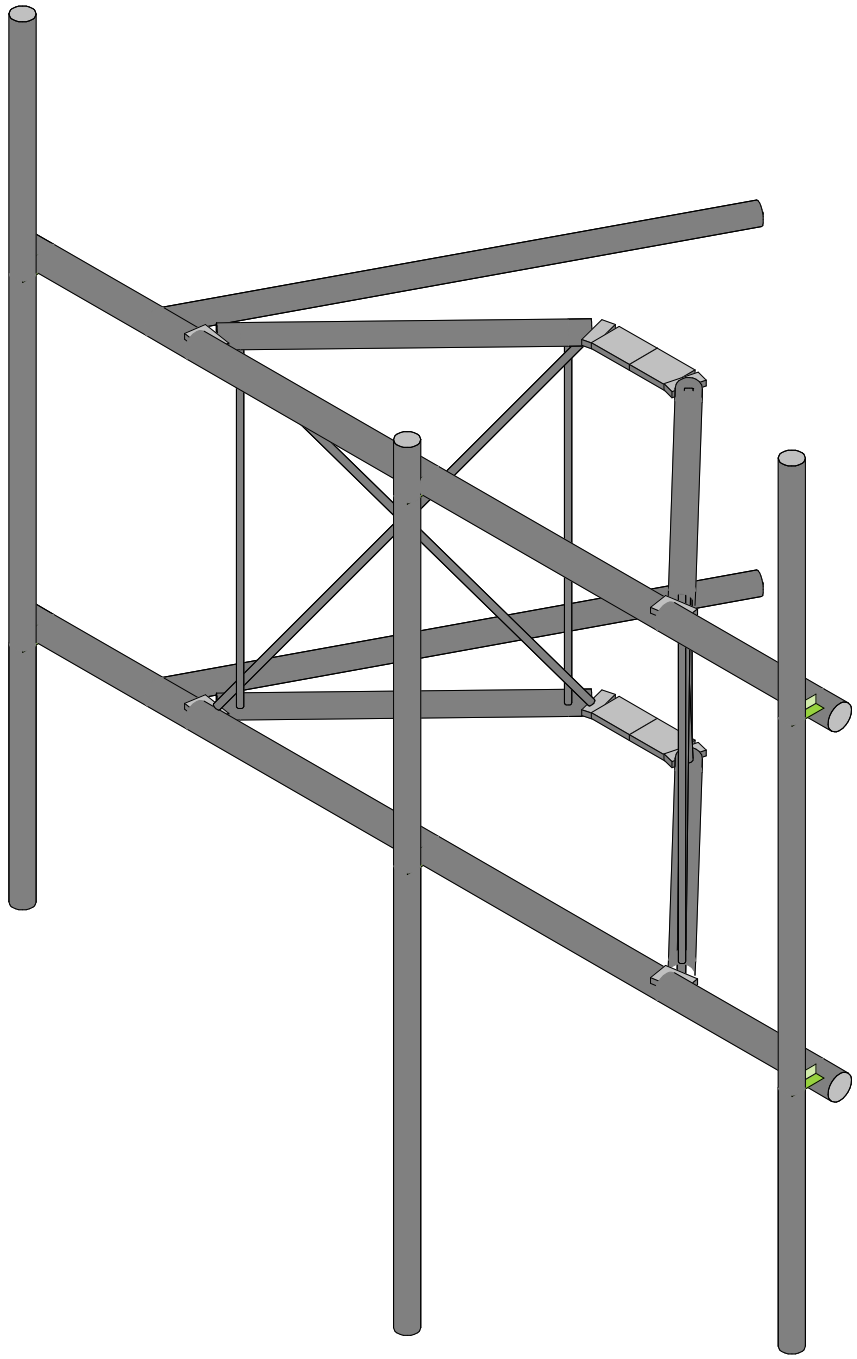
Ice Thickness:	1.00 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Mon Oct 12 2020

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 B

SOFTWARE ANALYSIS OUTPUT



Envelope Only Solution

Paul J. Ford and Company	BU# 801487 / CT SUFFIELD 3 CAC 801487	SK - 1
JAB		Oct 15, 2020 at 8:22 AM
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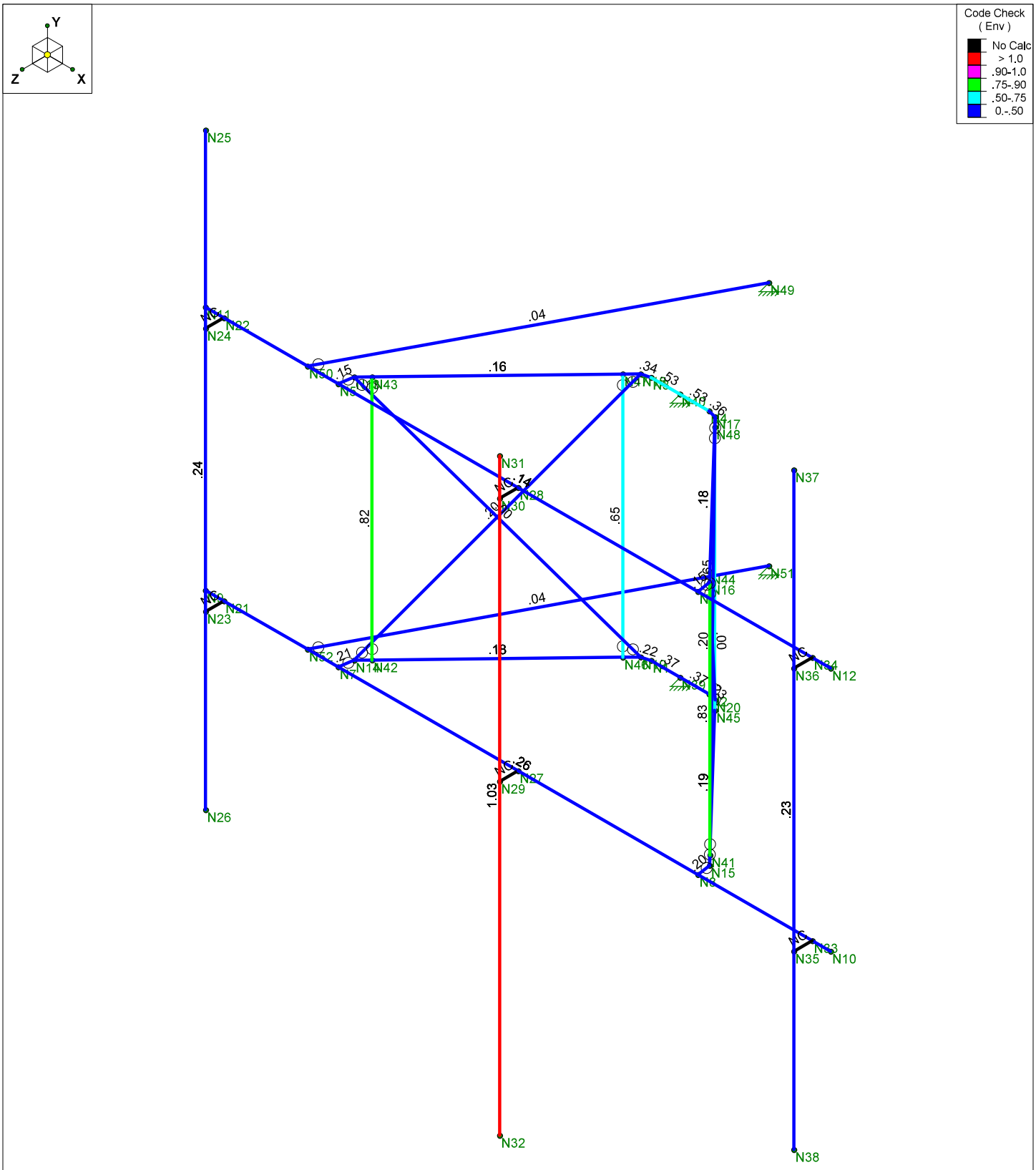

Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Paul J. Ford and Company	BU# 801487 / CT SUFFIELD 3 CAC 801487	SK - 2
JAB		Oct 15, 2020 at 8:31 AM
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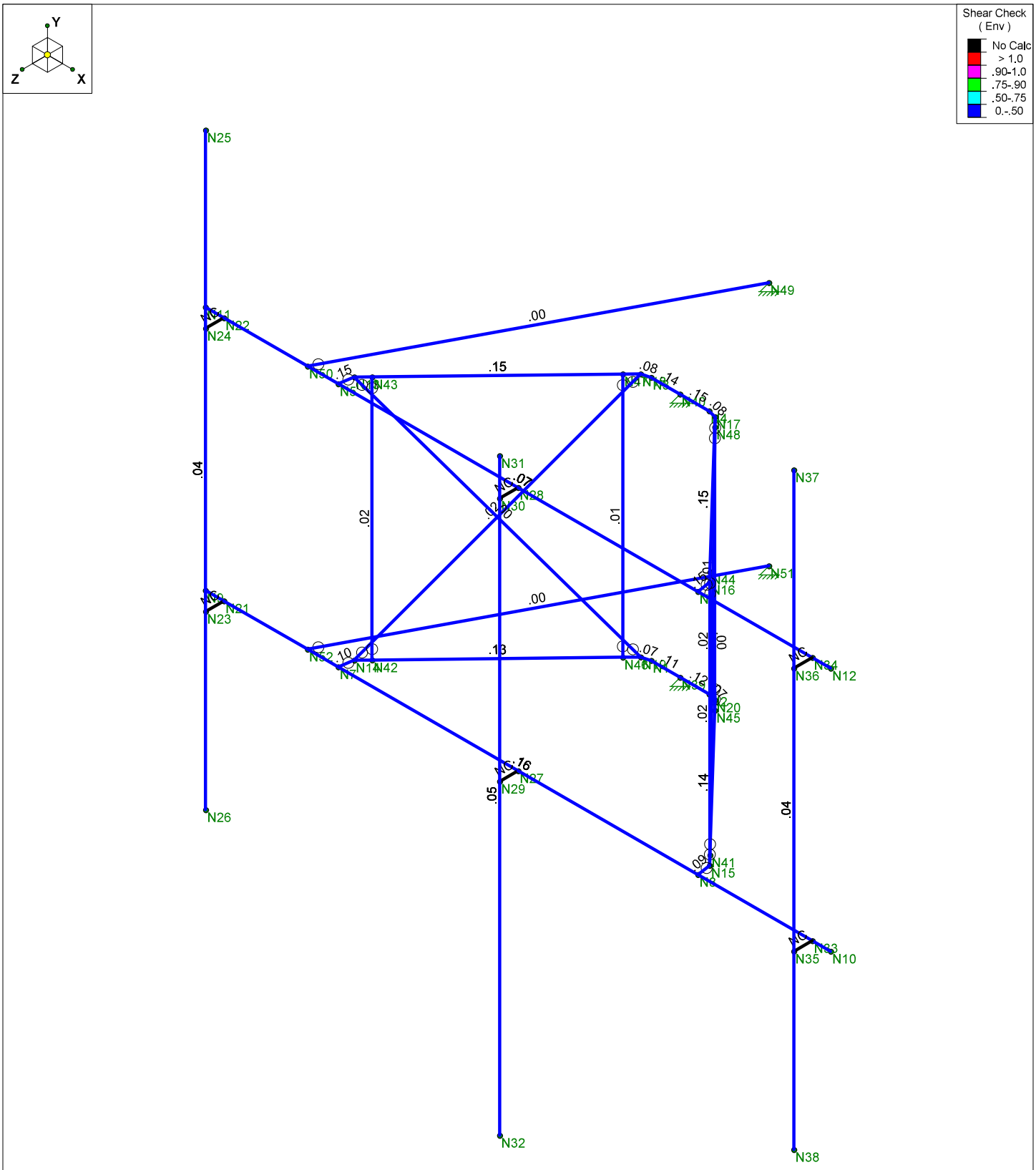


Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Paul J. Ford and Company	BU# 801487 / CT SUFFIELD 3 CAC 801487	SK - 3
JAB		Oct 15, 2020 at 8:32 AM
37520-2233.001.7190		37520-2233.001.7190_Client.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	None
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	None

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1...	Density[k/f...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
3	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
4	A53 Gr. B	29000	11154	.3	.65	.49	35	1.5	60	1.2
5	Q235 Gr B	29000	11154	.3	.65	.49	34	1.5	58	1.2

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
1	BR8	N18	N14			.75 Dia.	None	None	A53 Gr. B	Typical
2	BR7	N19	N13			.75 Dia.	None	None	A53 Gr. B	Typical
3	BR5	N20	N16			.75 Dia.	None	None	A53 Gr. B	Typical
4	BR6	N15	N17			.75 Dia.	None	None	A53 Gr. B	Typical
5	BR2	N47	N46			.625 Dia.	None	None	A53 Gr. B	Typical
6	BR1	N43	N42			.625 Dia.	None	None	A53 Gr. B	Typical
7	BR3	N48	N45			.625 Dia.	None	None	A53 Gr. B	Typical
8	BR4	N44	N41			.625 Dia.	None	None	A53 Gr. B	Typical
9	J2	N2	N39		90	.625 x 3.5"	None	None	Q235 Gr B	Typical
10	N6	N1	N19		90	.625 x 3.5"	None	None	Q235 Gr B	Typical
11	N8	N2	N20		90	.625 x 3.5"	None	None	Q235 Gr B	Typical
12	J4	N4	N40		90	.625 x 3.5"	None	None	Q235 Gr B	Typical
13	N2	N3	N18		90	.625 x 3.5"	None	None	Q235 Gr B	Typical
14	N3	N4	N17		90	.625 x 3.5"	None	None	Q235 Gr B	Typical
15	P1	N5	N13		90	.625 x 3.5"	None	None	Q235 Gr B	Typical
16	P6	N6	N16		90	.625 x 3.5"	None	None	Q235 Gr B	Typical
17	P4	N7	N14		90	.625 x 3.5"	None	None	Q235 Gr B	Typical
18	P8	N8	N15		90	.625 x 3.5"	None	None	Q235 Gr B	Typical
19	M45	N39	N1		90	.625 x 3.5"	None	None	Q235 Gr B	Typical
20	M46	N40	N3		90	.625 x 3.5"	None	None	Q235 Gr B	Typical
21	SO3	N20	N15			PIPE_2.0	None	None	A53 Gr. B	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
22	SO1	N19	N14			PIPE_2.0	None	None	A53 Gr. B	Typical
23	SO2	N18	N13			PIPE_2.0	None	None	A53 Gr. B	Typical
24	SO4	N17	N16			PIPE_2.0	None	None	A53 Gr. B	Typical
25	C3	N26	N25			PIPE_2.0	None	None	A53 Gr. B	Typical
26	C2	N32	N31			PIPE_2.0	None	None	A53 Gr. B	Typical
27	C1	N38	N37			PIPE_2.0	None	None	A53 Gr. B	Typical
28	T1	N50	N49			PIPE_2.0	None	None	A53 Gr. B	Typical
29	CBC1	N9	N10			PIPE_2.5	None	None	A53 Gr. B	Typical
30	CBC2	N11	N12			PIPE_2.5	None	None	A53 Gr. B	Typical
31	M62	N22	N24			RIGID	None	None	RIGID	Typical
32	M63	N21	N23			RIGID	None	None	RIGID	Typical
33	M65	N28	N30			RIGID	None	None	RIGID	Typical
34	M66	N27	N29			RIGID	None	None	RIGID	Typical
35	M71	N34	N36			RIGID	None	None	RIGID	Typical
36	M72	N33	N35			RIGID	None	None	RIGID	Typical
37	M39	N52	N51			PIPE_2.0	None	None	A53 Gr. B	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	BR8	BenPIN	BenPIN				Yes	** NA **			None
2	BR7	BenPIN	BenPIN			Tension ...	Yes	** NA **			None
3	BR5	BenPIN	BenPIN			Tension ...	Yes	** NA **			None
4	BR6	BenPIN	BenPIN				Yes	** NA **			None
5	BR2	BenPIN	BenPIN				Yes	** NA **			None
6	BR1	BenPIN	BenPIN				Yes	** NA **			None
7	BR3	BenPIN	BenPIN				Yes	** NA **			None
8	BR4	BenPIN	BenPIN				Yes	** NA **			None
9	J2						Yes	** NA **			None
10	N6						Yes	** NA **			None
11	N8						Yes	** NA **			None
12	J4						Yes	** NA **			None
13	N2						Yes	** NA **			None
14	N3						Yes	** NA **			None
15	P1	BenPIN					Yes	** NA **			None
16	P6	BenPIN					Yes	** NA **			None
17	P4	BenPIN					Yes	** NA **			None
18	P8	BenPIN					Yes	** NA **			None
19	M45						Yes	** NA **			None
20	M46						Yes	** NA **			None
21	SO3						Yes	** NA **			None
22	SO1						Yes	** NA **			None
23	SO2						Yes	** NA **			None
24	SO4						Yes	** NA **			None
25	C3						Yes	** NA **			None
26	C2						Yes	** NA **			None
27	C1						Yes	** NA **			None
28	T1	BenPIN					Yes	** NA **			None
29	CBC1						Yes	** NA **			None
30	CBC2						Yes	** NA **			None
31	M62						Yes	** NA **			None
32	M63						Yes	** NA **			None
33	M65						Yes	** NA **			None
34	M66						Yes	** NA **			None
35	M71						Yes	** NA **			None
36	M72						Yes	** NA **			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
37	M39	BenPIN					Yes	** NA **			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	BR8	.75 Dia.	51.891			Lbyy						Lateral
2	BR7	.75 Dia.	51.891			Lbyy						Lateral
3	BR5	.75 Dia.	51.89			Lbyy						Lateral
4	BR6	.75 Dia.	51.89			Lbyy						Lateral
5	BR2	.625 Dia.	40			Lbyy						Lateral
6	BR1	.625 Dia.	40			Lbyy						Lateral
7	BR3	.625 Dia.	40			Lbyy						Lateral
8	BR4	.625 Dia.	40			Lbyy						Lateral
9	J2	.625 x 3.5"	4.725			Lbyy						Lateral
10	N6	.625 x 3.5"	1.396			Lbyy						Lateral
11	N8	.625 x 3.5"	1.393			Lbyy						Lateral
12	J4	.625 x 3.5"	4.725			Lbyy						Lateral
13	N2	.625 x 3.5"	1.396			Lbyy						Lateral
14	N3	.625 x 3.5"	1.393			Lbyy						Lateral
15	P1	.625 x 3.5"	2.284			Lbyy						Lateral
16	P6	.625 x 3.5"	2.284			Lbyy						Lateral
17	P4	.625 x 3.5"	2.284			Lbyy						Lateral
18	P8	.625 x 3.5"	2.284			Lbyy						Lateral
19	M45	.625 x 3.5"	4.725			Lbyy						Lateral
20	M46	.625 x 3.5"	4.725			Lbyy						Lateral
21	SO3	PIPE_2.0	33.054			Lbyy						Lateral
22	SO1	PIPE_2.0	33.056			Lbyy						Lateral
23	SO2	PIPE_2.0	33.056			Lbyy						Lateral
24	SO4	PIPE_2.0	33.054			Lbyy						Lateral
25	C3	PIPE_2.0	96									Lateral
26	C2	PIPE_2.0	96									Lateral
27	C1	PIPE_2.0	96									Lateral
28	T1	PIPE_2.0	55.779									Lateral
29	CBC1	PIPE_2.5	102			Lbyy						Lateral
30	CBC2	PIPE_2.5	102			Lbyy						Lateral
31	M39	PIPE_2.0	55.779									Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(M...	Surface...
1	Dead	None		-1.1			14			
2	Wind 0	None					28	62		
3	Wind 30	None					28	62		
4	Wind 60	None					28	62		
5	Wind 90	None					28	62		
6	Wind 120	None					28	62		
7	Wind 150	None					28	62		
8	Ice Load	None					14	31		
9	Ice 0	None					28	62		
10	Ice 30	None					28	62		
11	Ice 60	None					28	62		
12	Ice 90	None					28	62		
13	Ice 120	None					28	62		
14	Ice 150	None					28	62		
15	Lm1	None				1				
16	Lm2	None				1				

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut..	Area(M...	Surface...
17	Lm3	None				1				
18	Lm4	None				1				
19	Lv1	None				1				
20	Lv2	None				1				
21	Lv3	None				1				
22	Lv4	None				1				

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4 D	Yes	Y		1	1.4																		
2	1.2 D + 1.0 Wo @ 0	Yes	Y		1	1.2	2	1																
3	1.2 D + 1.0 Wo @ 30	Yes	Y		1	1.2	3	1																
4	1.2 D + 1.0 Wo @ 60	Yes	Y		1	1.2	4	1																
5	1.2 D + 1.0 Wo @ 90	Yes	Y		1	1.2	5	1																
6	1.2 D + 1.0 Wo @ 120	Yes	Y		1	1.2	6	1																
7	1.2 D + 1.0 Wo @ 150	Yes	Y		1	1.2	7	1																
8	1.2 D + 1.0 Wo @ 180	Yes	Y		1	1.2	2	-1																
9	1.2 D + 1.0 Wo @ 210	Yes	Y		1	1.2	3	-1																
10	1.2 D + 1.0 Wo @ 240	Yes	Y		1	1.2	4	-1																
11	1.2 D + 1.0 Wo @ 270	Yes	Y		1	1.2	5	-1																
12	1.2 D + 1.0 Wo @ 300	Yes	Y		1	1.2	6	-1																
13	1.2 D + 1.0 Wo @ 330	Yes	Y		1	1.2	7	-1																
14	1.2 D + 1.0 Di + 1.0 Wi @...	Yes	Y		1	1.2	8	1	9	1														
15	1.2 D + 1.0 Di + 1.0 Wi @...	Yes	Y		1	1.2	8	1	10	1														
16	1.2 D + 1.0 Di + 1.0 Wi @...	Yes	Y		1	1.2	8	1	11	1														
17	1.2 D + 1.0 Di + 1.0 Wi @...	Yes	Y		1	1.2	8	1	12	1														
18	1.2 D + 1.0 Di + 1.0 Wi @...	Yes	Y		1	1.2	8	1	13	1														
19	1.2 D + 1.0 Di + 1.0 Wi @...	Yes	Y		1	1.2	8	1	14	1														
20	1.2 D + 1.0 Di + 1.0 Wi @...	Yes	Y		1	1.2	8	1	9	-1														
21	1.2 D + 1.0 Di + 1.0 Wi @...	Yes	Y		1	1.2	8	1	10	-1														
22	1.2 D + 1.0 Di + 1.0 Wi @...	Yes	Y		1	1.2	8	1	11	-1														
23	1.2 D + 1.0 Di + 1.0 Wi @...	Yes	Y		1	1.2	8	1	12	-1														
24	1.2 D + 1.0 Di + 1.0 Wi @...	Yes	Y		1	1.2	8	1	13	-1														
25	1.2 D + 1.0 Di + 1.0 Wi @...	Yes	Y		1	1.2	8	1	14	-1														
26	1.2 D + 1.5 Lm1 + 1.0 W...	Yes	Y		1	1.2	15	1.5	2	.063														
27	1.2 D + 1.5 Lm1 + 1.0 W...	Yes	Y		1	1.2	15	1.5	3	.063														
28	1.2 D + 1.5 Lm1 + 1.0 W...	Yes	Y		1	1.2	15	1.5	4	.063														
29	1.2 D + 1.5 Lm1 + 1.0 W...	Yes	Y		1	1.2	15	1.5	5	.063														
30	1.2 D + 1.5 Lm1 + 1.0 W...	Yes	Y		1	1.2	15	1.5	6	.063														
31	1.2 D + 1.5 Lm1 + 1.0 W...	Yes	Y		1	1.2	15	1.5	7	.063														
32	1.2 D + 1.5 Lm1 + 1.0 W...	Yes	Y		1	1.2	15	1.5	2	.063														
33	1.2 D + 1.5 Lm1 + 1.0 W...	Yes	Y		1	1.2	15	1.5	3	.063														
34	1.2 D + 1.5 Lm1 + 1.0 W...	Yes	Y		1	1.2	15	1.5	4	.063														
35	1.2 D + 1.5 Lm1 + 1.0 W...	Yes	Y		1	1.2	15	1.5	5	.063														
36	1.2 D + 1.5 Lm1 + 1.0 W...	Yes	Y		1	1.2	15	1.5	6	.063														
37	1.2 D + 1.5 Lm1 + 1.0 W...	Yes	Y		1	1.2	15	1.5	7	.063														
38	1.2 D + 1.5 Lm2 + 1.0 W...	Yes	Y		1	1.2	16	1.5	2	.063														
39	1.2 D + 1.5 Lm2 + 1.0 W...	Yes	Y		1	1.2	16	1.5	3	.063														
40	1.2 D + 1.5 Lm2 + 1.0 W...	Yes	Y		1	1.2	16	1.5	4	.063														
41	1.2 D + 1.5 Lm2 + 1.0 W...	Yes	Y		1	1.2	16	1.5	5	.063														
42	1.2 D + 1.5 Lm2 + 1.0 W...	Yes	Y		1	1.2	16	1.5	6	.063														
43	1.2 D + 1.5 Lm2 + 1.0 W...	Yes	Y		1	1.2	16	1.5	7	.063														
44	1.2 D + 1.5 Lm2 + 1.0 W...	Yes	Y		1	1.2	16	1.5	2	.063														
45	1.2 D + 1.5 Lm2 + 1.0 W...	Yes	Y		1	1.2	16	1.5	3	.063														
46	1.2 D + 1.5 Lm2 + 1.0 W...	Yes	Y		1	1.2	16	1.5	4	.063														

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
47	1.2 D + 1.5 Lm2 + 1.0 W...	Yes	Y		1	1.2	16	1.5	5	.063														
48	1.2 D + 1.5 Lm2 + 1.0 W...	Yes	Y		1	1.2	16	1.5	6	.063														
49	1.2 D + 1.5 Lm2 + 1.0 W...	Yes	Y		1	1.2	16	1.5	7	.063														
50	1.2 D + 1.5 Lm3 + 1.0 W...	Yes	Y		1	1.2	17	1.5	2	.063														
51	1.2 D + 1.5 Lm3 + 1.0 W...	Yes	Y		1	1.2	17	1.5	3	.063														
52	1.2 D + 1.5 Lm3 + 1.0 W...	Yes	Y		1	1.2	17	1.5	4	.063														
53	1.2 D + 1.5 Lm3 + 1.0 W...	Yes	Y		1	1.2	17	1.5	5	.063														
54	1.2 D + 1.5 Lm3 + 1.0 W...	Yes	Y		1	1.2	17	1.5	6	.063														
55	1.2 D + 1.5 Lm3 + 1.0 W...	Yes	Y		1	1.2	17	1.5	7	.063														
56	1.2 D + 1.5 Lm3 + 1.0 W...	Yes	Y		1	1.2	17	1.5	2	.063														
57	1.2 D + 1.5 Lm3 + 1.0 W...	Yes	Y		1	1.2	17	1.5	3	.063														
58	1.2 D + 1.5 Lm3 + 1.0 W...	Yes	Y		1	1.2	17	1.5	4	.063														
59	1.2 D + 1.5 Lm3 + 1.0 W...	Yes	Y		1	1.2	17	1.5	5	.063														
60	1.2 D + 1.5 Lm3 + 1.0 W...	Yes	Y		1	1.2	17	1.5	6	.063														
61	1.2 D + 1.5 Lm3 + 1.0 W...	Yes	Y		1	1.2	17	1.5	7	.063														
62	1.2 D + 1.5 Lm4 + 1.0 W...	Yes	Y		1	1.2	18	1.5	2	.063														
63	1.2 D + 1.5 Lm4 + 1.0 W...	Yes	Y		1	1.2	18	1.5	3	.063														
64	1.2 D + 1.5 Lm4 + 1.0 W...	Yes	Y		1	1.2	18	1.5	4	.063														
65	1.2 D + 1.5 Lm4 + 1.0 W...	Yes	Y		1	1.2	18	1.5	5	.063														
66	1.2 D + 1.5 Lm4 + 1.0 W...	Yes	Y		1	1.2	18	1.5	6	.063														
67	1.2 D + 1.5 Lm4 + 1.0 W...	Yes	Y		1	1.2	18	1.5	7	.063														
68	1.2 D + 1.5 Lm4 + 1.0 W...	Yes	Y		1	1.2	18	1.5	2	-.0...														
69	1.2 D + 1.5 Lm4 + 1.0 W...	Yes	Y		1	1.2	18	1.5	3	-.0...														
70	1.2 D + 1.5 Lm4 + 1.0 W...	Yes	Y		1	1.2	18	1.5	4	-.0...														
71	1.2 D + 1.5 Lm4 + 1.0 W...	Yes	Y		1	1.2	18	1.5	5	-.0...														
72	1.2 D + 1.5 Lm4 + 1.0 W...	Yes	Y		1	1.2	18	1.5	6	-.0...														
73	1.2 D + 1.5 Lm4 + 1.0 W...	Yes	Y		1	1.2	18	1.5	7	-.0...														
74	1.2 D + 1.5 Lv1	Yes	Y		1	1.2	19	1.5																
75	1.2 D + 1.5 Lv2	Yes	Y		1	1.2	20	1.5																
76	1.2 D + 1.5 Lv3	Yes	Y		1	1.2	21	1.5																
77	1.2 D + 1.5 Lv4	Yes	Y		1	1.2	22	1.5																
78	1.0 D	Yes	Y		1	1																		

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	N40	max	937.443	10	2267.428	14	669.885	3	0	78	0	78	0	78
2		min	-1061.917	4	588.72	78	-2623.069	21	0	1	0	1	0	1
3	N39	max	1348.193	10	1241.677	20	2727.398	15	0	78	0	78	0	78
4		min	-1222.656	4	263.165	2	-1160.421	9	0	1	0	1	0	1
5	N49	max	522.05	4	42.518	16	950.663	10	0	78	0	78	0	78
6		min	-494.403	10	8.879	78	-1009.303	4	0	1	0	1	0	1
7	N51	max	441.419	4	42.255	16	904.276	10	0	78	0	78	0	78
8		min	-470.129	10	8.869	78	-854.745	4	0	1	0	1	0	1
9	Totals:	max	1378.073	12	3542.322	21	2272.674	2						
10		min	-1378.073	6	921.555	78	-2272.674	8						

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

	Member	Shape	Code Check	Loc[in]	LC	Sh...	Loc[in]	.....	phi*Pnc [...	phi*Pnt [lb]	phi*Mn...	phi*Mn...	Cb	Eqn
1	C2	PIPE 2.0	1.029	50	8	.053	50		14916.096	32130	1.872	1.872	4.3...	H1-...
2	BR4	.625 Dia.	.830	24.167	14	.017	0		1057.552	9664.074	.101	.101	1	H1-...
3	BR1	.625 Dia.	.818	24.167	14	.016	0		1057.552	9664.074	.101	.101	1	H1-...
4	BR2	.625 Dia.	.652	24.167	19	.007	0		1057.552	9664.074	.101	.101	1.1...	H1-...
5	BR3	.625 Dia.	.650	24.167	21	.009	0		1057.552	9664.074	.101	.101	1.1...	H1-...
6	M46	.625 x 3.5"	.531	0	21	.141	0	y	64693.777	66937.5	.872	4.881	1.5...	H1-...

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

	Member	Shape	Code Check	Loc[in]	LC	Sh...	Loc[in]	.....	...	phi*Pnc [...	phi*Pnt [lb]	phi*Mn...	phi*Mn...	Cb	Eqn
7	J4	.625 x 3.5"	.529	4.725	21	.149	0	y	...	64693.777	66937.5	.872	4.881	1.4...	H1-...
8	M45	.625 x 3.5"	.372	0	15	.115	0	y	...	64693.777	66937.5	.872	4.881	1.5...	H1-...
9	J2	.625 x 3.5"	.371	4.725	15	.120	4.725	y	...	64693.777	66937.5	.872	4.881	1.4...	H1-...
10	N3	.625 x 3.5"	.358	1.393	56	.081	0	y	...	66739.33	66937.5	.872	4.881	1.1...	H1-...
11	N2	.625 x 3.5"	.339	1.396	32	.082	1.396	y	...	66738.549	66937.5	.872	4.881	1.1...	H1-...
12	CBC1	PIPE_2.5	.262	51	7	.165	22.312		2	28077.408	50715	3.596	3.596	1.4...	H1-...
13	C3	PIPE_2.0	.239	28	2	.039	28		...	14916.096	32130	1.872	1.872	3.5...	H1-...
14	C1	PIPE_2.0	.234	28	61	.040	28		...	14916.096	32130	1.872	1.872	4.4...	H1-...
15	N8	.625 x 3.5"	.230	1.393	56	.072	0	y	...	66739.33	66937.5	.872	4.881	1.1...	H1-...
16	N6	.625 x 3.5"	.223	1.396	36	.068	0	y	...	66738.549	66937.5	.872	4.881	1.2	H1-...
17	P4	.625 x 3.5"	.209	2.284	18	.103	2.284	y	9	66406.19	66937.5	.872	4.881	1.6...	H1-...
18	P8	.625 x 3.5"	.204	2.284	20	.093	2.284	y	7	66406.19	66937.5	.872	4.881	1.6...	H1-...
19	BR6	.75 Dia.	.203	25.945	24	.020	51.89		...	1303.155	13916.259	.174	.174	1.1...	H1-...
20	BR8	.75 Dia.	.202	25.946	16	.024	51.891		4	1303.092	13916.259	.174	.174	1.1...	H1-...
21	SO3	PIPE_2.0	.189	2.066	56	.136	33.054		...	29336.067	32130	1.872	1.872	1.7...	H1-...
22	SO1	PIPE_2.0	.182	2.066	34	.134	33.056		...	29335.75	32130	1.872	1.872	1.7...	H1-...
23	SO4	PIPE_2.0	.179	0	58	.153	31.333		...	29336.067	32130	1.872	1.872	2.8...	H1-...
24	SO2	PIPE_2.0	.160	0	32	.152	31.335		...	29335.75	32130	1.872	1.872	2.7...	H1-...
25	P1	.625 x 3.5"	.151	2.284	15	.151	2.284	y	...	66406.19	66937.5	.872	4.881	1.6...	H1-...
26	P6	.625 x 3.5"	.146	2.284	14	.151	0	y	...	66406.19	66937.5	.872	4.881	1.6...	H1-...
27	CBC2	PIPE_2.5	.138	22.312	3	.071	21.25		...	28077.408	50715	3.596	3.596	1.2...	H1-...
28	T1	PIPE_2.0	.044	0	10	.004	55.779		...	24797.366	32130	1.872	1.872	1.1...	H1-...
29	M39	PIPE_2.0	.042	0	10	.004	55.779		...	24797.366	32130	1.872	1.872	1.1...	H1-...
30	BR7	.75 Dia.	.000	0	78	.000	0		...	1303.092	13916.259	.174	.174	1	H1-...
31	BR5	.75 Dia.	.000	0	78	.000	0		...	1303.155	13916.259	.174	.174	1	H1-...

APPENDIX C

ADDITIONAL CALCULATIONS

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

Project # 37520-0890.002.7190
By JAB
Date: 10/15/20
v3.6, Effective 08/10/2020

MOUNT TO TOWER CONNECTION CHECKS-LRFD

TIA Rev.	H-15.5	AISC	15th
Mount Type	1-Sector	Checks	Bolts

REACTIONS FROM RISA-3D

NODE	LC	Horizontal Shear (k)	Vertical Shear (k)	Axial along member(k)	Moment about horizontal axis (ft-k)	Moment about Vertical axis (ft-k)	Torque (ft-k)
N40	10	2.62	1.06	2.27	0.00	0.00	0.00

Pinned condition-no moment and torque to be considered

Bolt Information	Type	Dia (in)	Quantity	Vertical Bolt spacing (D) (in)	Horizontal Bolt spacing (B) (in)
	A325N	0.75	1	1	1

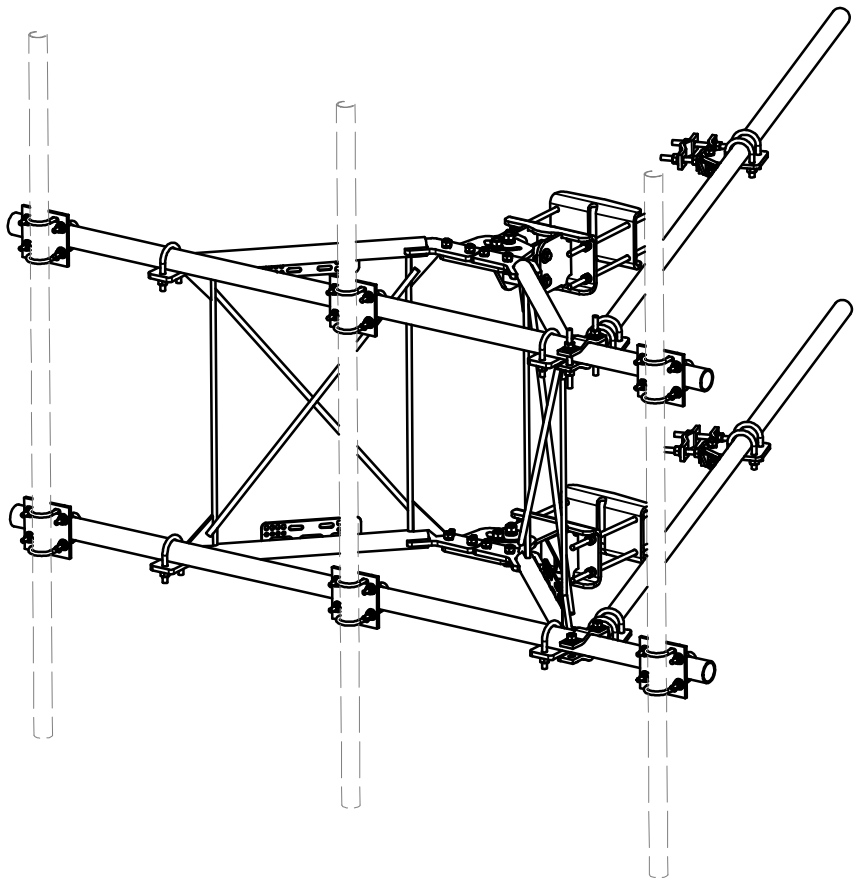
CHECKS	Forces	Strength	Rating
TENSION (K)	2.27	29.8	7.6%
		Reduced Tensile Rating	-
SHEAR (k)	2.83	17.9	15.8%

Note: Tension reduction not required if tension or shear capacity < 30%

Controlling Rating per TIA-222-H Section 15.5:	15.1%

APPENDIX D

MANUFACTURER DRAWINGS (FOR REFERENCE ONLY)



PARTS LIST

ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	X-VFAW	SUPPORT ARM		71.41	142.81
2	1	X-HDCAMTBW	CLAMP WELDMENT FOR BCAM-HD		33.86	33.86
3	1	X-MHTPHD	MULTI-HOLE TAPER PLATE WELDMENT		36.24	36.24
4	2	X-VFAPL4	VFA-HD PIVOT PLATE	12 in	15.88	31.77
5	2	X-LCBP4	BENT BACKING PLATE	13 in	19.00	38.01
6	1	X-HDCAMSS	ANGLE ADJUSTMENT WELDMENT FOR BCAM-HD		16.39	16.39
7	4	X-SPTB	SLIDING PIPE TIE BACK PLATE	5 1/2 in	5.87	23.49
8	1	X-HDCAMSP	POSITIONING PLATE WELDMENT FOR BCAM-HD		2.58	2.58
9	4	X-TBCA	TIE BACK CLIP ANGLE		2.01	8.02
10	6	SCX2	CROSSOVER PLATE	7 in	4.80	28.78
11	4	MCP	CLAMP HALF 1/2" THICK, 11-5/8" LONG	12 1/16 in	3.59	14.37
12	8	DCP	1/2" THICK, 5-3/4" CNTER TO CENTER CLAMP HALF	8 1/8 in	2.36	18.90
13	2	P30108	2-7/8" O.D. X 108" SCH. 40 PIPE	108 in	52.32	104.63
14	2	P2126	2-3/8" X 126" (2" SCH. 40) GALVANIZED PIPE	126 in	40.75	81.50
15	4	A34212	3/4" x 2-1/2" UNC HEX BOLT (A325)	2 1/2 in	0.48	1.92
16	4	G34FW	3/4" HDG USS FLATWASHER		0.06	0.24
17	4	G34LW	3/4" HDG LOCKWASHER		0.04	0.17
18	4	G34NUT	3/4" HDG HEAVY 2H HEX NUT		0.21	0.85
19	8	G58R-18	5/8" x 18" THREADED ROD (HDG.)	18 in	0.40	3.19
20	4	G58R-12	5/8" x 12" THREADED ROD (HDG.)		1.05	4.18
21	6	G58R-8	5/8" x 8" THREADED ROD (HDG.)		0.70	4.18
22	4	X-UB5300	5/8" X 3" X 5-1/4" X 2-1/2" U-BOLT (HDG.)		1.15	4.60
23	8	X-UB5258	5/8" X 2-5/8" X 4-1/2" X 2" U-BOLT (HDG.)		1.00	8.00
24	2	G5807	5/8" x 7" HDG HEX BOLT GR5 FULL THREAD	7 in	0.70	1.41
25	1	G5806	5/8" x 6" HDG HEX BOLT GR5 FULL THREAD	6 in	0.62	0.62
26	8	G5804	5/8" x 4" HDG HEX BOLT GR5		0.44	3.55
27	8	A582114	5/8" x 2-1/4" HDG A325 HEX BOLT	2 1/4 in	0.31	2.50
28	4	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	1.08
29	25	G58FW	5/8" HDG USS FLATWASHER	1/8 in	0.07	1.76
30	68	G58LW	5/8" HDG LOCKWASHER		0.03	1.77
31	73	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	9.48
32	24	X-UB1300	1/2" X 3" X 5" X 2" GALV U-BOLT		0.74	17.73
33	12	X-UB1212	1/2" X 2" X 3" X 1-1/4" U-BOLT (HDG.)		0.60	7.17
34	48	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	1.64
35	48	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	0.67
36	48	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	3.44
					TOTAL WT. #	670.51

REVISION HISTORY

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
C	UPDATED BCAM VERSION 1 TO BCAM VERSION 2		CEK	6/29/2018
B	UPDATED PIN LEG CONNECTION TO BCAM CONNECTION		CEK	12/13/2017
A	CHANGED TIE-BACK BACK CONNECTION		CEK	7/27/2017

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")*

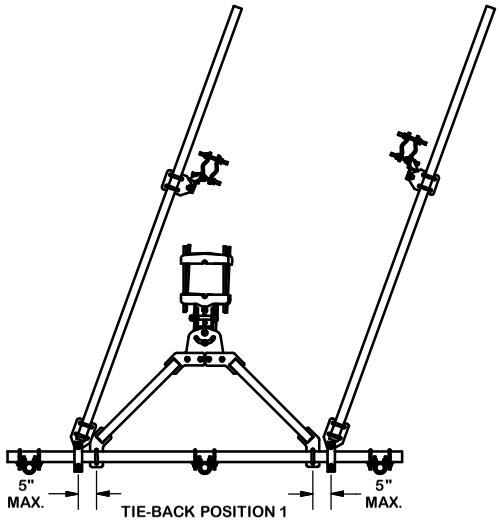
DESCRIPTION
8' HEAVY DUTY
V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

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

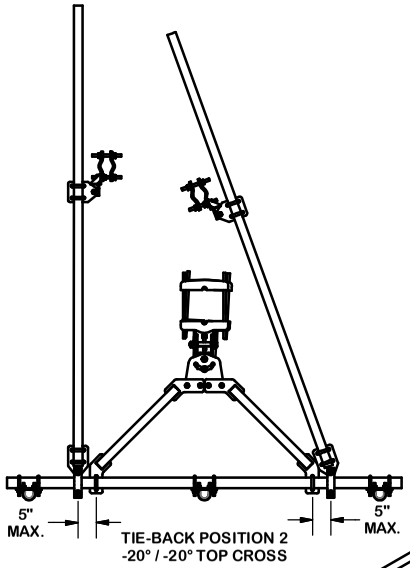
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 1/25/2017		VFA8-HD

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 12/13/2017	VFA8-HD

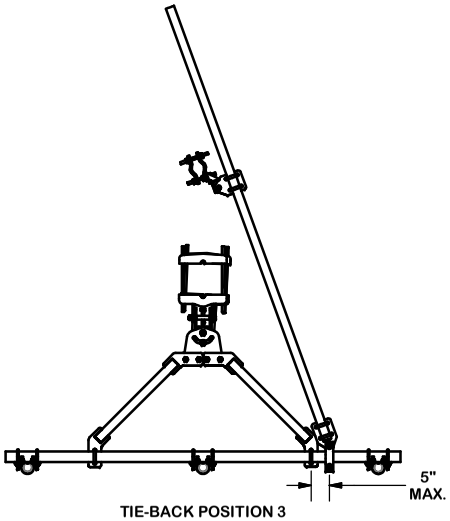
TIE-BACK POSITIONS



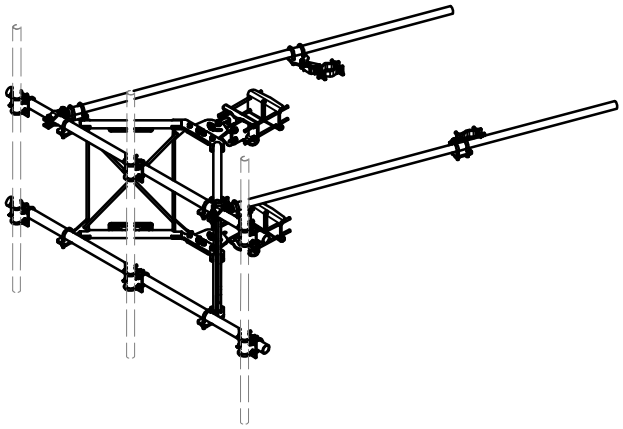
TIE-BACK POSITION 1
-20° / +20° TOP PARALLEL

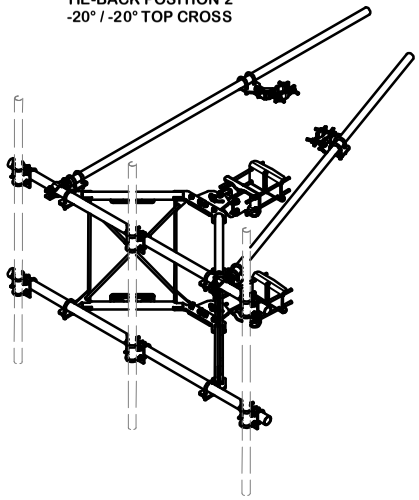


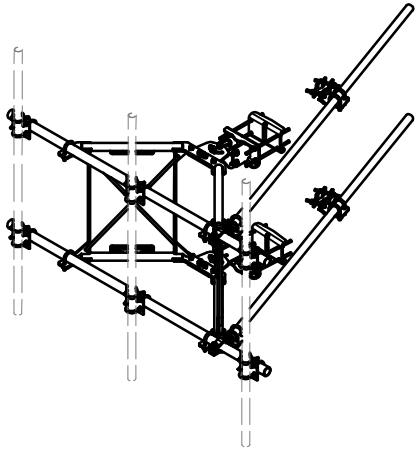
TIE-BACK POSITION 2
-20° / -20° TOP CROSS



TIE-BACK POSITION 3
-20° SAME SIDE STACKED







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REVISION HISTORY

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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
8' HEAVY DUTY
V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

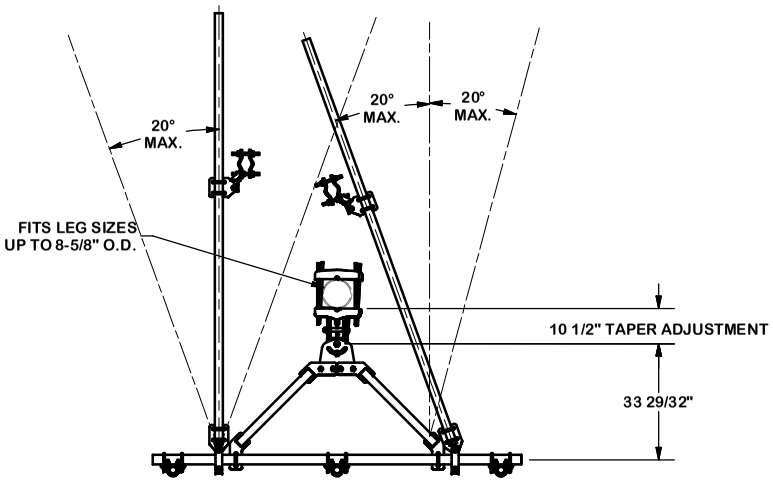
SITE PRO 1
A valmont COMPANY

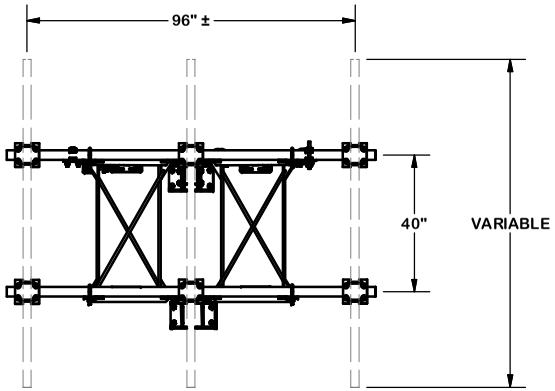
Engineering Support Team:
1-888-753-7446

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

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 1/25/2017		VFA8-HD

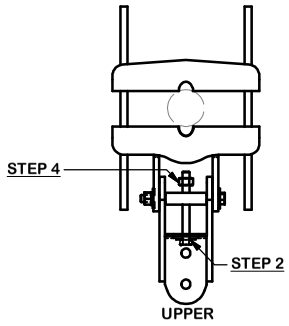
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 12/13/2017	VFA8-HD

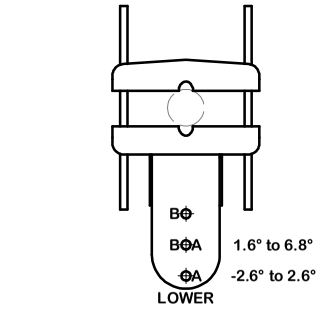


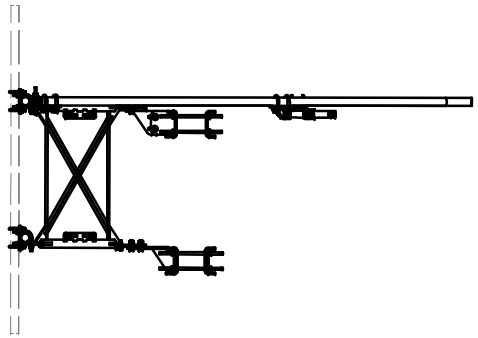


ANGLE CALIBRATING PROCEDURE:

1. MEASURE TOWER TAPER AND PICK LOWER BRACKET HOLE:
   - HOLE A = -2.6° TO 2.6°
   - HOLE B = 1.6° TO 6.8°
2. USE CALIBRATING BOLT TO ADJUST FRAME TO DESIRED TAPER
3. TORQUE LOCKING BOLTS TO 100 ft.-lbs.
4. ADVANCE LOCKING NUT TO POSITIONING PLATE, THEN TIGHTEN.







REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
C	UPDATED BCAM VERSION 1 TO BCAM VERSION 2		CEK	6/29/2018
B	UPDATED PIN LEG CONNECTION TO BCAM CONNECTION		CEK	12/13/2017
A	CHANGED TIE-BACK BACK CONNECTION		CEK	7/27/2017

REVISION HISTORY

TOLERANCE NOTES

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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: 8' HEAVY DUTY V-FRAME ASSEMBLY WITH TWO STIFF ARMS

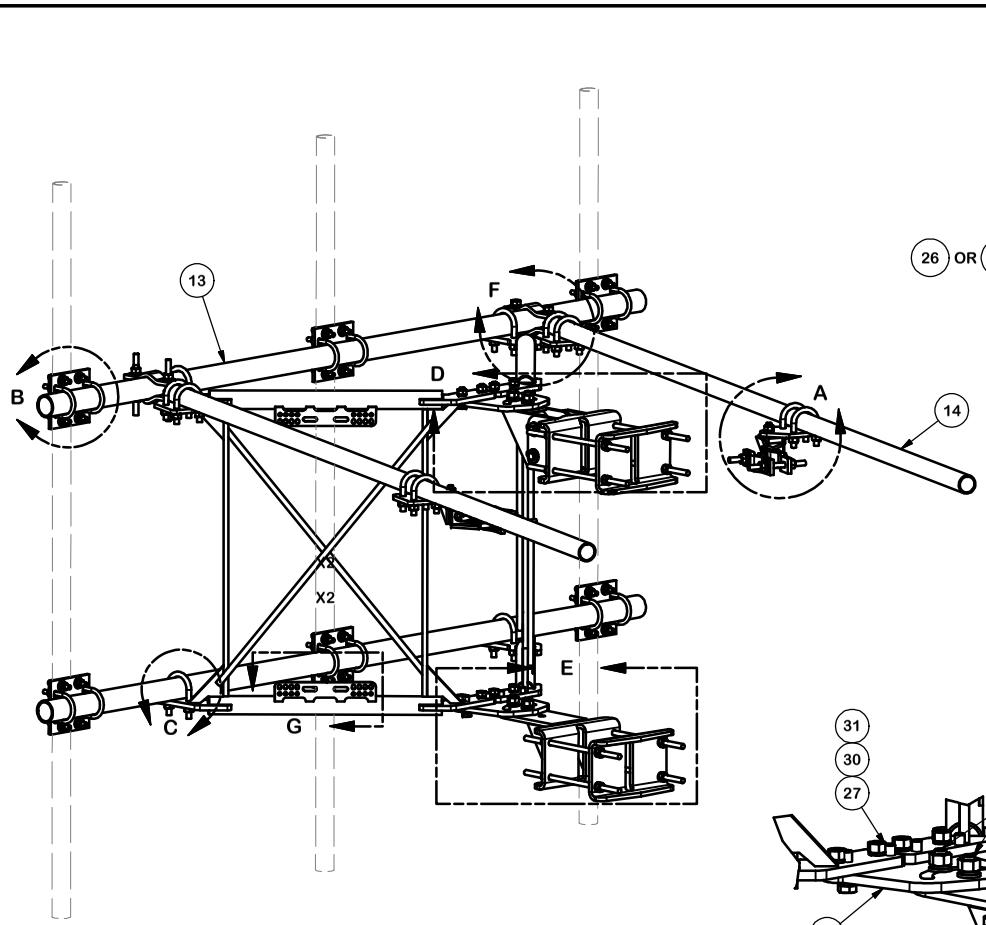
SITE PRO 1 — A valmont COMPANY

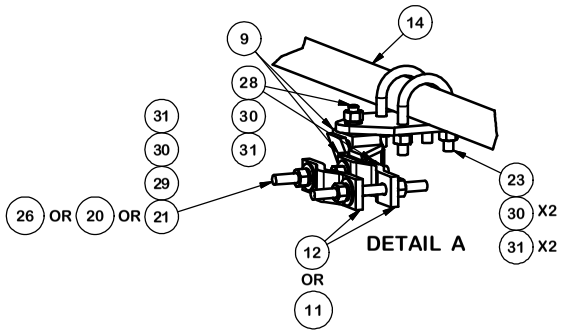
Engineering Support Team: 1-888-753-7446

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

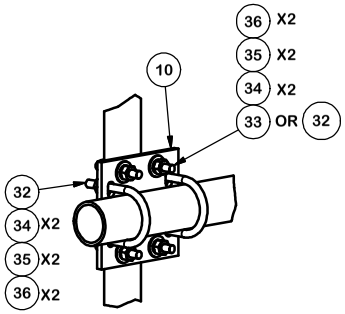
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 1/25/2017		VFA8-HD

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 12/13/2017	VFA8-HD





DETAIL A



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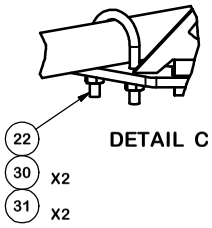

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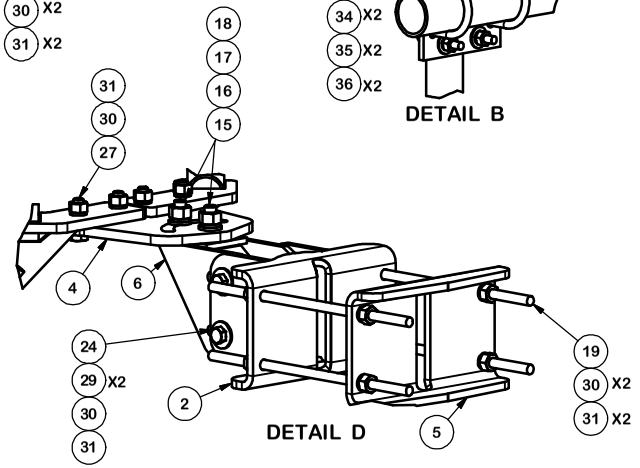
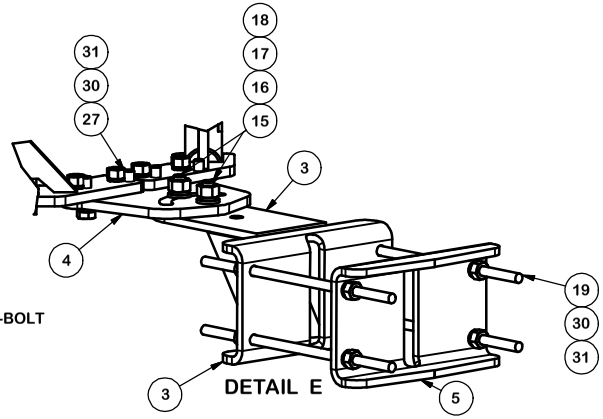
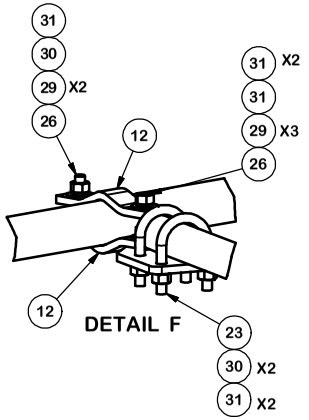


DETAIL D



DETAIL E

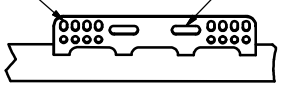


DETAIL F

7/16" LUG HOLES

REVIEW CARRIER STANDARDS FOR PROPER SURFACE PREPARTION AND ASSEMBLY OF ELECTRICAL CONNECTIONS

9/16" SLOTTED HOLE FOR EQUIPMENT PIPE U-BOLT



DETAIL G

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
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REVISION HISTORY

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DESCRIPTION
8' HEAVY DUTY
V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

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
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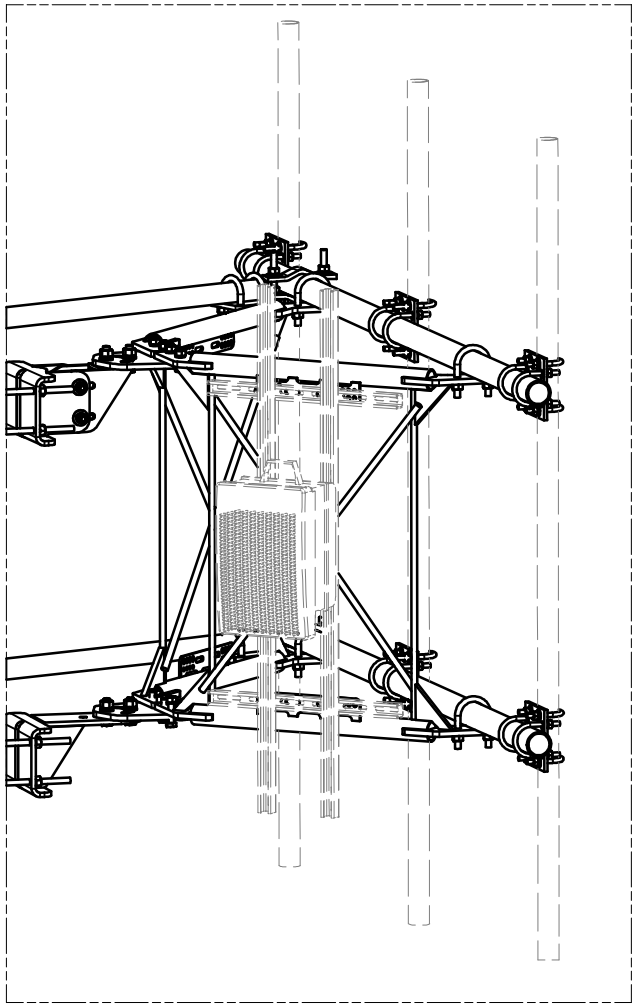
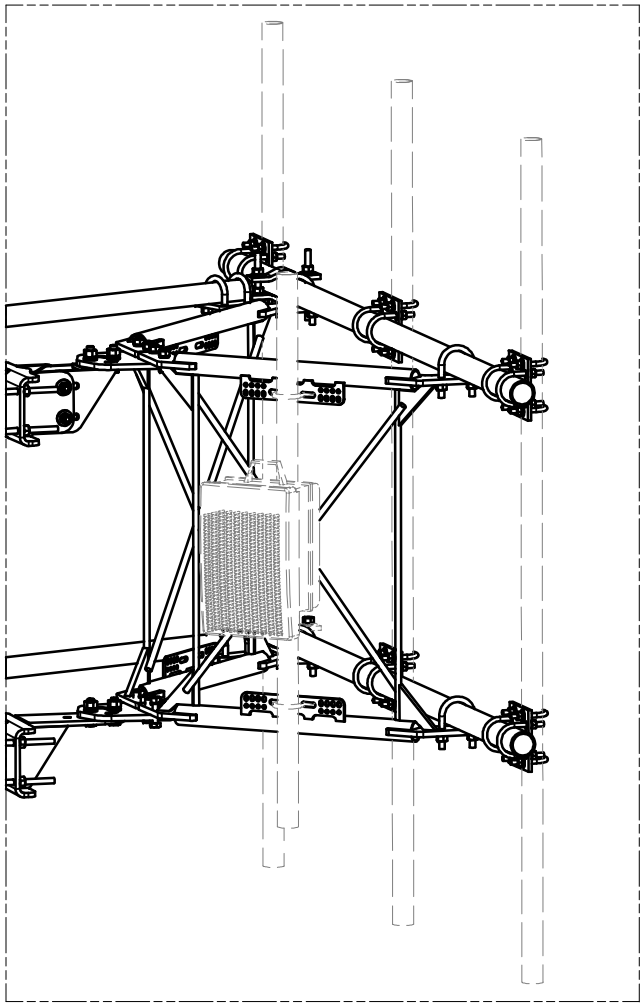
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 1/25/2017		VFA8-HD

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 12/13/2017	VFA8-HD



UNISTRUT AND HARDWARE
SOLD SEPARATELY.

REQUIRES 3/8" HARDWARE



EQUIPMENT PIPE AND HARDWARE
SOLD SEPARATELY.

REQUIRES 1/2" HARDWARE
AND 2-3/8" TO 4-1/2" O.D. PIPE

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
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81	02	CUSTOMER	BMC 12/13/2017	VFA8-HD

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: CTHA160A

HA160/Crown Suffield MP
848 East Street South
Suffield, Connecticut 06078

October 28, 2020

EBI Project Number: 6220005612

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**10.76%**

October 28, 2020

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

Emissions Analysis for Site: CTHA160A - HA160/Crown Suffield MP

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **848 East Street South** in **Suffield, 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 848 East Street South in Suffield, 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 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 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.

5) 2 UMTS channels (AWS Band - 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 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) 2 LTE channels (BRS Band - 2500 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

8) 2 NR channels (BRS Band - 2500 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

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) 0 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 centerlines of the proposed antennas are 160 feet and 163 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:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32
Frequency Bands:	1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 2100 MHz
Gain:	15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.85 dBd
Height (AGL):	163 feet	Height (AGL):	163 feet	Height (AGL):	163 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	8,728.31	ERP (W):	8,728.31	ERP (W):	8,728.31
Antenna A1 MPE %:	**1.18%**	Antenna B1 MPE %:	**1.18%**	Antenna C1 MPE %:	**1.18%**
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 / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 16.45 dBd
Height (AGL):	160 feet	Height (AGL):	160 feet	Height (AGL):	160 feet
Channel Count:	9	Channel Count:	9	Channel Count:	9
Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts
ERP (W):	11,010.27	ERP (W):	11,010.27	ERP (W):	11,010.27
Antenna A2 MPE %:	**2.35%**	Antenna B2 MPE %:	**2.35%**	Antenna C2 MPE %:	**2.35%**
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:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd
Height (AGL):	163 feet	Height (AGL):	163 feet	Height (AGL):	163 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts
ERP (W):	25,651.93	ERP (W):	25,651.93	ERP (W):	25,651.93
Antenna A3 MPE %:	**3.47%**	Antenna B3 MPE %:	**3.47%**	Antenna C3 MPE %:	**3.47%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	7.00%
Clearwire	0.11%
Metro PCS	0.63%
Verizon	3.02%
Site Total MPE % :	10.76%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	7.00%
T-Mobile Sector B Total:	7.00%
T-Mobile Sector C Total:	7.00%
Site Total MPE % :	10.76%

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 1900 MHz LTE	2	2056.61	163.0	5.57	1900 MHz LTE	1000	0.56%
T-Mobile 2100 MHz LTE	2	2307.55	163.0	6.24	2100 MHz LTE	1000	0.62%
T-Mobile 600 MHz LTE	2	591.73	160.0	1.66	600 MHz LTE	400	0.42%
T-Mobile 600 MHz NR	1	1577.94	160.0	2.22	600 MHz NR	400	0.55%
T-Mobile 700 MHz LTE	2	695.22	160.0	1.95	700 MHz LTE	467	0.42%
T-Mobile 1900 MHz LTE	2	2104.51	160.0	5.91	1900 MHz LTE	1000	0.59%
T-Mobile 2100 MHz UMTS	2	1324.71	160.0	3.72	2100 MHz UMTS	1000	0.37%
T-Mobile 2500 MHz LTE	2	6412.98	163.0	17.36	2500 MHz LTE	1000	1.74%
T-Mobile 2500 MHz NR	2	6412.98	163.0	17.36	2500 MHz NR	1000	1.74%
						Total:	**7.00%**

• 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:	7.00%
Sector B:	7.00%
Sector C:	7.00%
T-Mobile Maximum MPE % (Sector A):	7.00%
Site Total:	10.76%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **10.76%** 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.