Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

July 26, 2022

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

RE: **Tower Share Application-T-Mobile: CTHA621A**
Crown Site ID#842867
497 Middle Turnpike, Storrs Mansfield, CT 06268
Latitude: 41° 49' 32.81" / Longitude: -72° 16' 54.46"

Dear Ms. Bachman:

T-Mobile proposes to install nine (9) antennas, six (6) remote radios, one (1) microwave dish at the 88-foot mount on the existing 120-foot monopole tower located at 497 Middle Turnpike, Storrs Mansfield CT. T-Mobile to also install, three (3) Hybrid cables, four (4) ½" coaxial cables. One (1) new antenna mount w/ pipes. T-Mobile to add equipment cabinets and one (1) new 50kw Diesel generator on a new 10' x 15' concrete pad within the existing compound space. The property is owned by CMC Storrs SVP LLC and the tower is owned by Crown Castle. 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.

Panned Modification:

Tower:

Installed New:
(3) Ericsson 6419 B41 Antennas
(3) RFS APXVAALL24_43-C-NA20 Antennas
(3) Commscope W-65A-R1 Antennas
(1) Andrew VHLP2-11-2GR
(3) Ericsson-Radio 4460 B25+ B66 RRU
(3) Ericsson-Radio 4480_TMOV2
(2) Hybrid Cable (6x24)
(4) Coaxial Cable (1/2")
(1) VFA10-HD Platform Mount w/ pipes

Ground:
Install New:
(1) B160 & (1) B160 Battery Cabinets
(2) PSU 4813 Voltage Booster
(1.) 6160 Cabinet
(1.) CSR IXRe Router
(2^) RP 6651

(1) 50KW SSM Diesel Generator
(1.) Canopy
(2) H-Frames
(4^) LED Luminare Work Lights
Ice Bridge

The facility was approved by the Connecticut Siting Council, Docket No. 247 on September 12, 2003.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50aa of T-Mobile intent to share a telecommunication facility pursuant to R.C.S.A. § 16-50j-88. In accordance with R.C.S.A. § 16-50j-88, a copy of this letter is being sent to Toni Moran, Mayor, Town of Mansfield CT, Jillene Woodmansee, Planning & Zoning Enforcement, Town of Mansfield CT. CMC Storrs SVP LLC is the property owner and Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower. The total Height of the tower is 120' and T-Mobile antennas will be placed at he 88' mount height of the 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.

Connecticut General Statute 16-50aa indicates the Council must approve the share use of telecommunication facility provided it finds the shared use is technically, legally, environmentally and economically feasible and meets public safety concerns.

A. Technical Feasibility. The existing monopole has been deemed structurally capable of supporting the T-Mobile proposed loading. The structural analysis is included in the package.

B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this support tower in Storrs Mansfield. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit T-Mobile to obtain a building permit for the proposed installation.

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of T-Mobile equipment at the 88-foot level of the existing 120-foot tower would have an insignificant visual impact on the area around the tower. T-Mobile ground equipment would be installed within the existing facility compound. T-Mobile shared use

would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced of the radio frequency emissions would not increase to a level at or above the Federal Communications Commission safety standard.

D. Economic Feasibility. T-Mobile has authorization to collocate their antennas on the cell tower.

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting T-Mobile proposed loading. T-Mobile is not aware of any public safety concerns relative to the proposed sharing of the existing tower. T-Mobile intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of residents and individuals traveling through Storrs Mansfield.

For the foregoing reasons, T-Mobile respectfully submits that the proposed Tower Share to the above-reference telecommunications facility. Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,

Jeffrey Barbadora
Site Acquisition Specialist
1800 W. Park Drive
Westborough, MA 01581
(781) 970-0053
Jeff.Barbadora@crowncastle.com

Attachments
cc:

Toni Moran, Mayor
Town of Mansfield
4 South Eagleville Road
Storrs Mansfield, CT 06268
860-429-3330

Jillene Woodmansee, Planning & Zoning Enforcement
Town of Mansfield
4 South Eagleville Road
Storrs Mansfield, CT 06268
860-429-3330

CMC Storrs SPV LLC, Property Owner
1 Harbor Point Rd Unit 1855
Stamford, CT 06902

Crown Castle – Tower Owner

DOCKET NO. 247 – AT&T Wireless PCS, LLC d/b/a AT&T Wireless application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility in Mansfield, Connecticut.	}	Connecticut
	}	Siting
	}	Council

September 12, 2003

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to AT&T Wireless PCS, LLC (AT&T) for the construction, maintenance and operation of a wireless telecommunications facility at proposed Site A-1 located at 497 Middle Turnpike, Mansfield, Connecticut. We deny certification of the proposed Site B located off Cedar Swamp Road, Mansfield, Connecticut.

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

1. There shall be a minimal shift in the tower's location in a southerly direction to the extent necessary to keep the tower's setback radius within the host property's boundaries.
2. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of AT&T and other entities, both public and private, but such tower shall not exceed a height of 120 feet above ground level.
3. Construction activities shall be conducted between November 1 and April 1 in order to minimize possible disturbance of any *Clemmys insculpta* (wood turtles) in the vicinity of the site.
4. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include:

    a. a detailed site development plan that depicts the location of the access road, compound, tower, and utility line;
    b. specifications for the tower, tower foundation, antennas, equipment building, and security fence;
    c. construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

5. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power densities of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall provide a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

6. Upon the establishment of any new state or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

7. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. Should the local municipality have a need to locate antennas on this tower, the Certificate Holder shall provide appropriate space on the tower with no lease charges.

8. If the facility does not initially provide wireless services within one year of completion of construction or ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

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

10. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved.

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

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

The parties and intervenors to this proceeding are:

Applicant

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

Its Representative

Christopher B. Fisher, Esq.
Cuddy & Feder & Worby LLP
90 Maple Avenue
White Plains, NY 10601
(914) 761-1300
(914) 761-6405 - fax

497 MIDDLE TPKE

Location	497 MIDDLE TPKE	**Mblu**	8/ 14/ 19/ /
Acct#	8 14 19	**Owner**	CMC STORRS SPV LLC
PBN		**Assessment**	$820,700
Appraisal	$1,172,300	**PID**	5973
Building Count	2		

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$574,600	$597,700	$1,172,300

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$402,300	$418,400	$820,700

Owner of Record

Owner	CMC STORRS SPV LLC	**Sale Price**	$1,100,000
Co-Owner	ATTN JZ INVESTMENTS INC	**Certificate**	
Address	1 HARBOR POINT RD UNIT 1855 STAMFORD, CT 06902	**Book & Page**	799/538
		Sale Date	12/21/2018
		Instrument	81

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
CMC STORRS SPV LLC	$1,100,000		799/538	81	12/21/2018
BRODIN ANN TRUSTEE OF THE	$0		763/988		05/14/2014
BRODIN ANN TRUSTEE OF THE	$0		757/131	01	09/06/2013
BRODIN BERNARD R	$58,000		699/309	00	12/21/2010
BRODIN BERNARD R EST OF	$0		185/259		12/12/1980

Building Information

Building 1 : Section 1

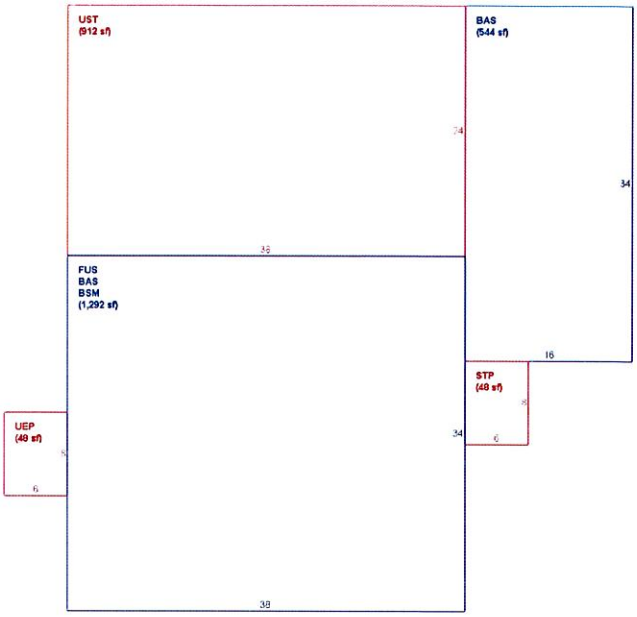
Year Built:	1928
Living Area:	3,128
Replacement Cost:	$268,286
Building Percent Good:	43
Replacement Cost Less Depreciation:	$115,400

Building Attributes	
Field	**Description**
STYLE	Store
MODEL	Comm/Ind
Grade	D
Stories:	2
Occupancy	2.00
Exterior Wall 1	Stucco on Mas.
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Carpet
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Hot Water
AC Type	Unit/AC
Struct Class	
Bldg Use	Commercial Improv
Usrfld 215	
Usrfld 216	
Usrfld 217	
Usrfld 218	
Usrfld 219	
1st Floor Use:	
Heat/AC	HEAT/AC SPLIT
Frame Type	MASONRY
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	AVERAGE
Wall Height	10.00
Usrfld 214	

Building Photo

Building Photo
(https://images.vgsi.com/photos/MansfieldCTPhotos//\00\00\92\52.JPG)

Building Layout



(ParcelSketch.ashx?pid=5973&bid=5973)

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1,836	1,836
FUS	Finished Upper Story	1,292	1,292
BSM	Basement	1,292	0
STP	Stoop	48	0
UEP	Utility Enclosed Porch	48	0
UST	Utility Storage	912	0
		5,428	3,128

Building 2 : Section 1

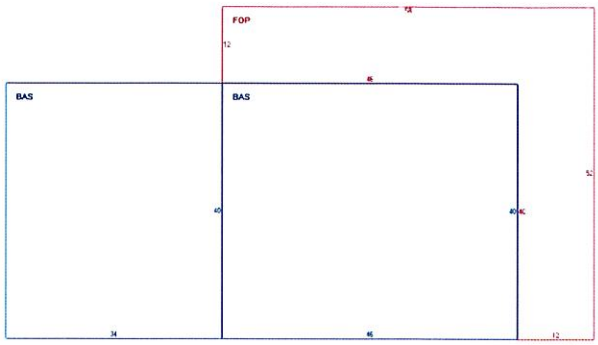
Year Built:	1996
Living Area:	3,200
Replacement Cost:	$278,875
Building Percent Good:	74
Replacement Cost Less Depreciation:	$206,400

Building Attributes : Bldg 2 of 2	
Field	**Description**
STYLE	Store
MODEL	Comm/Ind
Grade	C-
Stories:	1
Occupancy	1.00
Exterior Wall 1	Vinyl
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Carpet
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Forced Air
AC Type	Central
Struct Class	
Bldg Use	Commercial Improv
Usrfld 215	
Usrfld 216	
Usrfld 217	
Usrfld 218	
Usrfld 219	
1st Floor Use:	
Heat/AC	HEAT/AC PKGS
Frame Type	WOOD FRAME
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	AVERAGE
Wall Height	10.00
Usrfld 214	

Building Photo

Building Photo
(https://images.vgsi.com/photos/MansfieldCTPhotos//default.jpg)

Building Layout



(ParcelSketch.ashx?pid=5973&bid=10227)

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	3,200	3,200
FOP	Framed Open Porch	1,176	0
		4,376	3,200

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	201
Description	Commercial Improv
Zone	RAR90
Neighborhood	C100
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	30.88
Frontage	
Depth	
Assessed Value	$418,400
Appraised Value	$597,700

Outbuildings

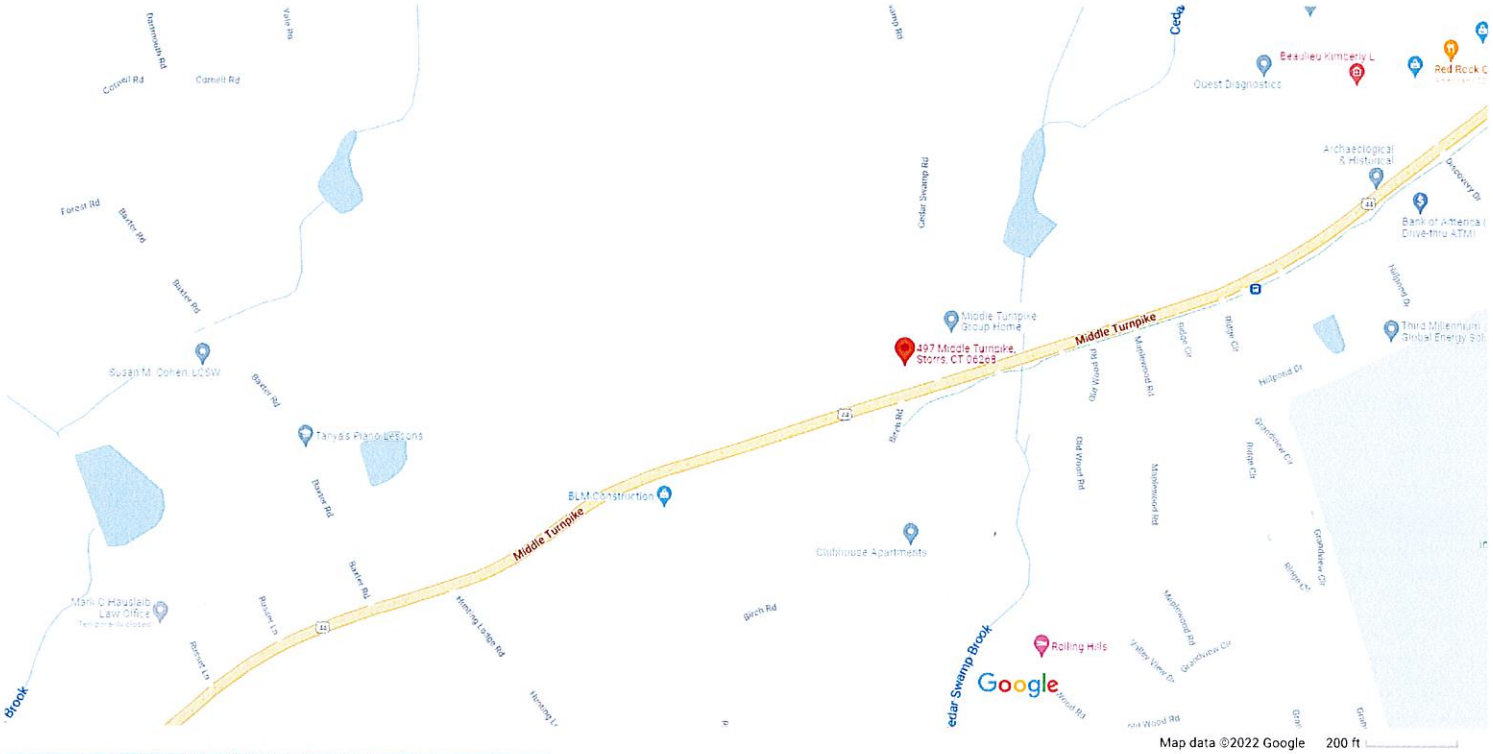
Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	Paving			9000.00 S.F.	$8,100	1
SHD1	Shed			80.00 S.F.	$700	2
FGR1	Garage			1024.00 S.F.	$17,200	1
GLF2	Golf Course Fair			9.00 HOLES	$226,800	2

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$591,700	$597,700	$1,189,400
2017	$591,700	$597,700	$1,189,400
2016	$591,700	$597,700	$1,189,400

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$414,200	$418,400	$832,600
2017	$414,200	$418,400	$832,600
2016	$414,200	$418,400	$832,600

497 Middle Turnpike



497 Middle Turnpike

Storrs, CT 06268
Building

Directions Save Nearby Send to phone Share

Photos

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Wednesday, July 27, 2022 10:35 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 777493119617: Your package has been delivered

Hi. Your package was delivered Wed, 07/27/2022 at 10:34am.

Delivered to 4 SOUTH EAGLEVILLE ROAD, STORRS MANSFIELD, CT 06268
Received by A.AMY

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 777493119617

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Mansfield Toni Moran 4 South Eagleville Road STORRS MANSFIELD, CT, US, 06268
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Tue 7/26/2022 05:33 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	STORRS MANSFIELD, CT, US, 06268
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	0.50 LB
SERVICE TYPE	FedEx Priority Overnight

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Wednesday, July 27, 2022 10:36 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 777493152671: Your package has been delivered

Hi. Your package was delivered Wed, 07/27/2022 at 10:34am.

Delivered to 4 SOUTH EAGLEVILLE ROAD, STORRS MANSFIELD, CT 06268
Received by A.AMY

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 777493152671

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Mansfield Jillene Woodmansee, Planning & Zo 4 South Eagleville Road STORRS MANSFIELD, CT, US, 06268
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Tue 7/26/2022 05:33 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	STORRS MANSFIELD, CT, US, 06268
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	0.50 LB
SERVICE TYPE	FedEx Priority Overnight

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Wednesday, July 27, 2022 10:54 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 777493186279: Your package has been delivered

Hi. Your package was delivered Wed, 07/27/2022 at 10:52am.

Delivered to 100 WASHINGTON BLVD 500, STAMFORD, CT 06902
Received by J.JASMIN

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 777493186279

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	CMC Storrs SPV LLC Property Owner 1 Harbor Point Road Unit 1855 STAMFORD, CT, US, 06902
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Tue 7/26/2022 05:33 PM
DELIVERED TO	Residence
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	STAMFORD, CT, US, 06902
SPECIAL HANDLING	Deliver Weekday Residential Delivery
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	0.50 LB
SERVICE TYPE	FedEx Priority Overnight

CROWN CASTLE

1800 W Park Dr r2nd Floor
Westborough, Town of, MA 01581

Phone: (781) 970-0053
Fax: (724) 416-6120
www.crowncastle.com

Crown Castle Letter of Authorization

CT - CONNECTICUT SITING COUNCIL
Connecticut Siting Council
TEN FRANKLIN SQUARE
NEW BRITAIN, CT 06902

Re: Application for Zoning/Building Permit
Crown Castle telecommunications site at: 497 MIDDLE TURNPIKE, STORRS MANSFIELD, CT 06268

CCATT LLC ("Crown Castle") hereby authorizes T-MOBILE, including their Agent, to act as our Agent in the processing of all zoning applications, building permits and approvals through the CT - CONNECTICUT SITING COUNCIL for the existing wireless communications site described below:

Crown Site ID/Name:	**842867/MANSFIELD FOUR CORNERS**
Customer Site ID:	**CTHA621A/**
Site Address:	**497 MIDDLE TURNPIKE, STORRS MANSFIELD, CT 06268**
APN:	**MANS-000008-000014-000019**

Crown Castle

By: _____ Date: 7/26/2022

Jeff Barbadora
Real Estate Specialist

Date: **May 13, 2022**

Trylon
1825 W. Walnut Hill Lane,
Suite 302
Irving, TX 75038
214-930-1730

Subject:	**Mount Analysis Report**	
Carrier Designation:	**T-Mobile Equipment Change-Out**	
	Carrier Site Number:	CTHA621A
	Carrier Site Name:	CTHA621_ATC_Monopole_Ashford
Crown Castle Designation:	**BU Number:**	842867
	Site Name:	Mansfield Four Corners
	JDE Job Number:	712283
	Order Number:	611795 Rev. 0
Engineering Firm Designation:	**Trylon Report Designation:**	208911
Site Data:	**497 Middle Turnpike, Storrs Mansfield, Tolland County, CT, 06268** **Latitude 41°49'32.81" Longitude -72°16'54.46"**	
Structure Information:	**Tower Height & Type:**	**120.0 ft Monopole**
	Mount Elevation:	**88.0 ft**
	Mount Width & Type:	**10.5 ft Sector Frames**

Trylon is pleased to submit this **"Mount Analysis Report"** to determine the structural integrity of T-Mobile's 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 for fall protection or rigging is not part of this document.

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

Sector Frames **Sufficient***
***Sufficient upon completion of the changes listed in the 'Recommendations' section of this report.**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Ioana Gurgu

Respectfully Submitted by:
Cliff Abernathy, P.E.

TABLE OF CONTENTS

1) INTRODUCTION

This is a proposed 3 sector 10.5 ft Sector Frames, designed by Site Pro 1.

2) ANALYSIS CRITERIA

Building Code:	2015 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	125 mph
Exposure Category:	B
Topographic Factor at Base:	1.00
Topographic Factor at Mount:	1.00
Ice Thickness:	2.00 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.175
Seismic S_1:	0.064
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
88.0	88.0	3	Commscope	VV-65A-R1_TMO	10.5 ft Sector Frames **[Site Pro 1, VFA10-HD w/ MSFAA]**
		3	Ericsson	AIR 6419 B41_TMO	
		3	RFS/Celwave	APXVAALL24_43-U-NA20_TMO	
		1	Andrew	VHLP2-11-2GR	
		3	Ericsson	RADIO 4460 B2/B25 B66_TMO	
		3	Ericsson	Radio 4480_TMOV2	
		1	Ceragon	FIBEAIR IP-20C	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	611795, Rev. 0	CCI Sites
Structural Analysis Report	B+T Group	9931550	CCI Sites
Mount Manufacturer Drawings	Site Pro 1	VFA10-HD3L4NP	Trylon
Asslembly Drawings	Site Pro 1	MSFAA	Trylon

3.1) Analysis Method

RISA-3D (Version 17.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

A tool internally developed, using Microsoft Excel, by Trylon 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 E).

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) The 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) Prior structural modifications to the tower mounting system are assumed to be installed as shown per available data.
6) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

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

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity (Sector Frames, All Sectors)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1, 2, 3	Mount Pipe(s)	MP2	88.0	37.0	Pass
	Horizontal(s)	H1		22.0	Pass
	Standoff(s)	M78		22.0	Pass
	Bracing(s)	M3		10.5	Pass
	Plate(s)	M16		51.2	Pass
	Tieback(s)	M171		7.4	Pass
	Mount Connection(s)	-		33.2	Pass

Structure Rating (max from all components) =	**51.2%**

Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
2) See additional documentation in "Appendix D – Additional Calculations" for detailed mount connection calculations.
3) Rating per TIA-222-H, Section 15.5

4.1) Recommendations

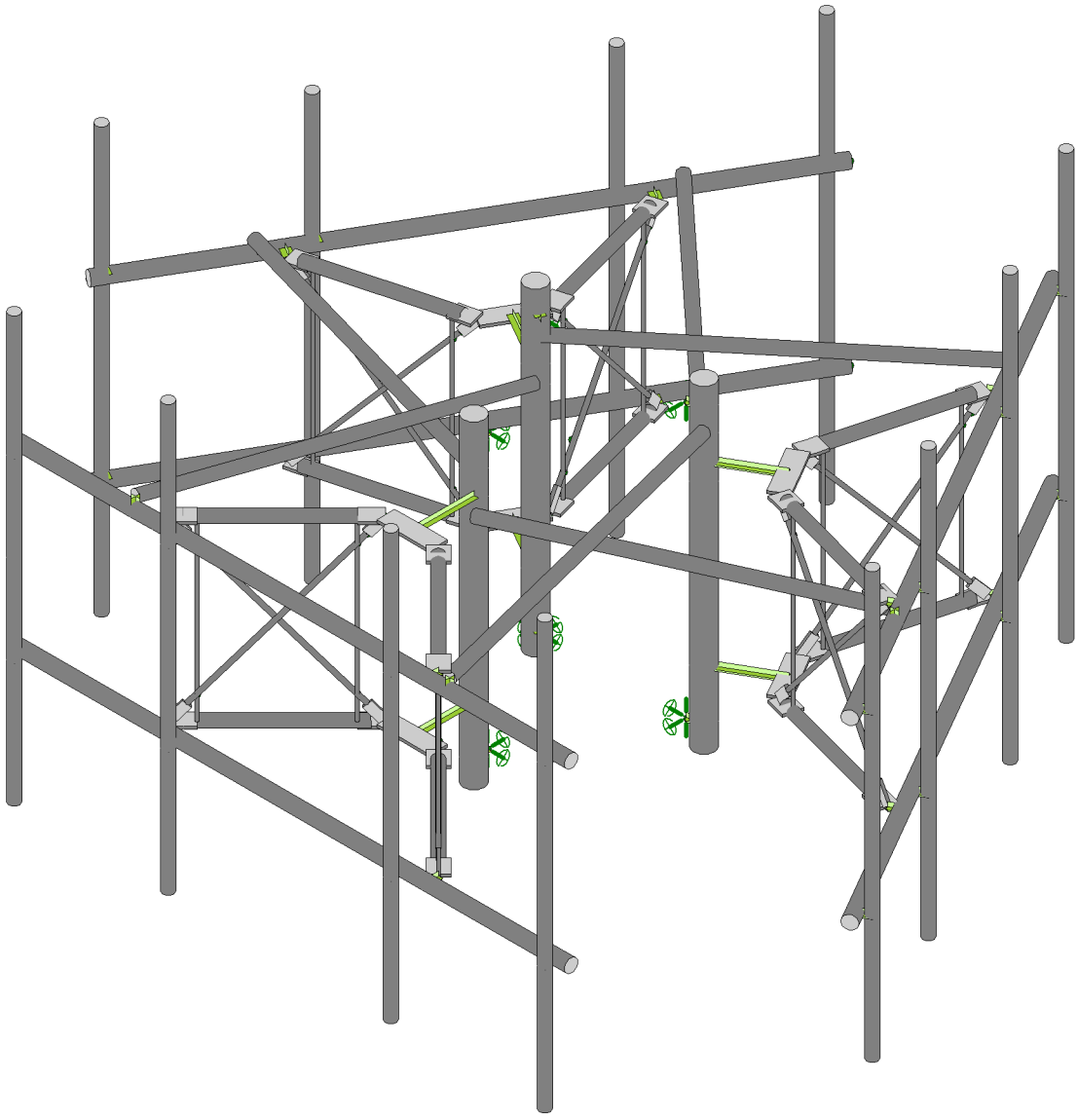
The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the proposed mount listed below must be installed.

1. Install Site Pro 1, VFA10-HD.
2. Install Site Pro 1, MSFAA.
3. Install 2.375" O.D., Sch.40, 8-ft. long antenna pipes.
4. Install tiebacks as recommended in Manufacturer Drawings (Tie-back Position 2).

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

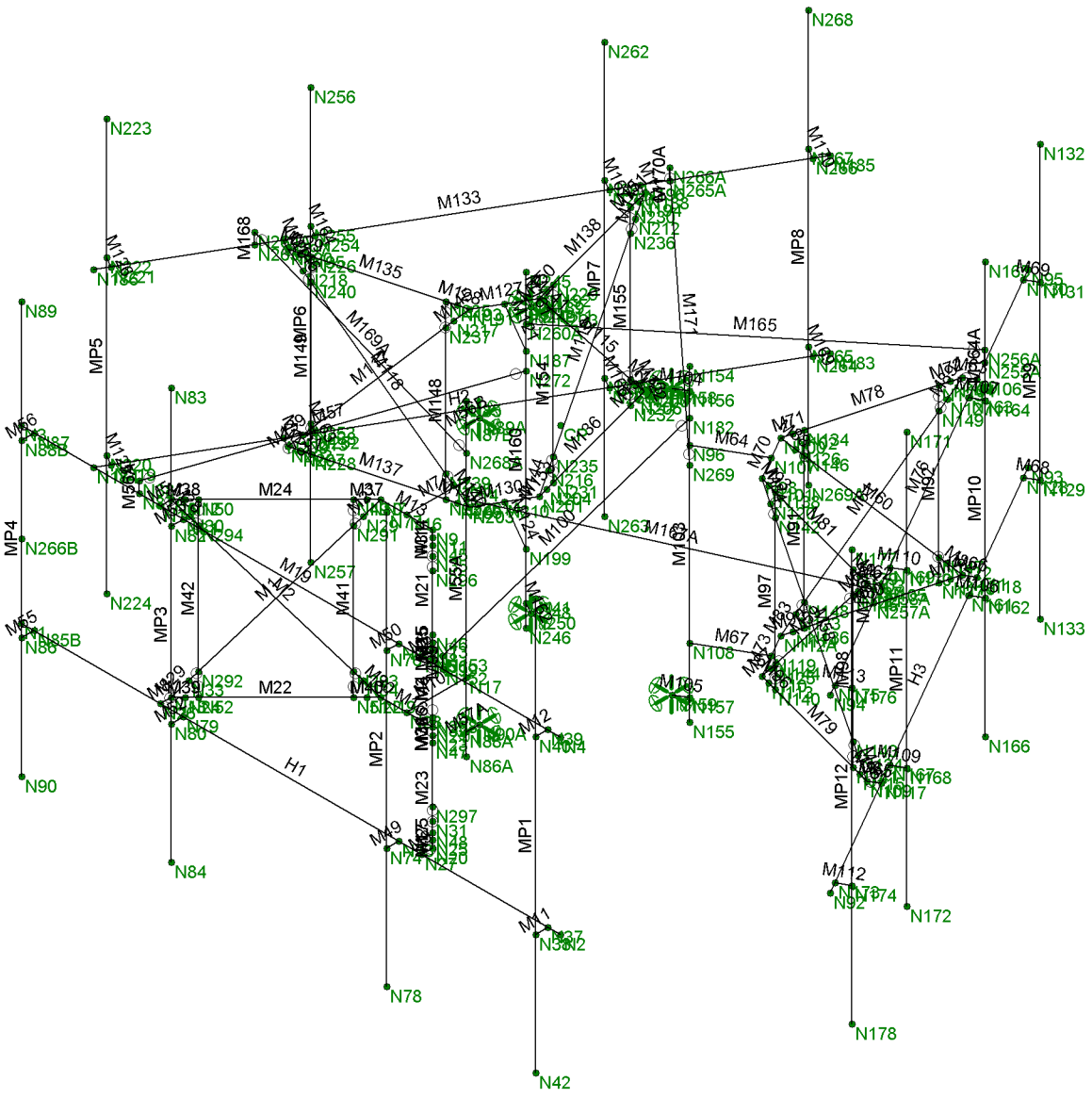
APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

Trylon	842867	SK - 1
IG		May 13, 2022 at 2:28 PM
208911		842867_loaded.r3d



Envelope Only Solution

Trylon	842867	SK - 2
IG		May 13, 2022 at 2:28 PM
208911		842867_loaded.r3d

APPENDIX B

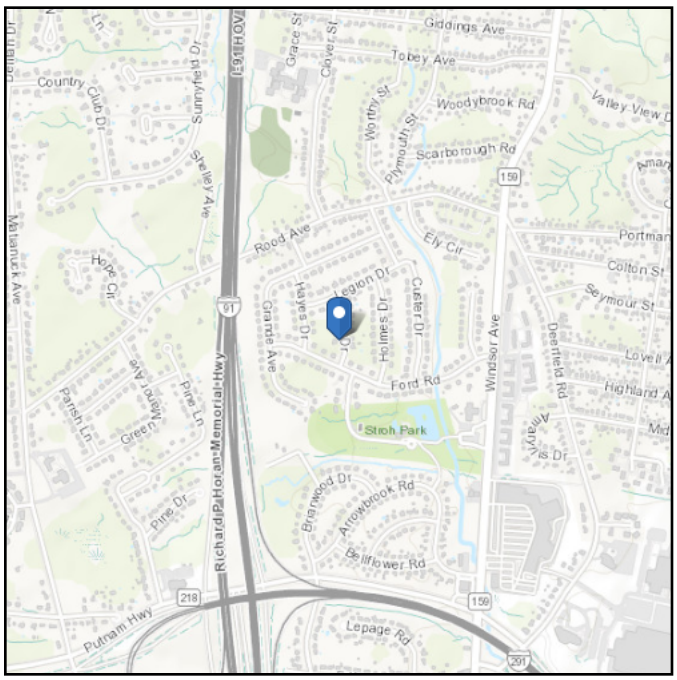
SOFTWARE INPUT CALCULATIONS

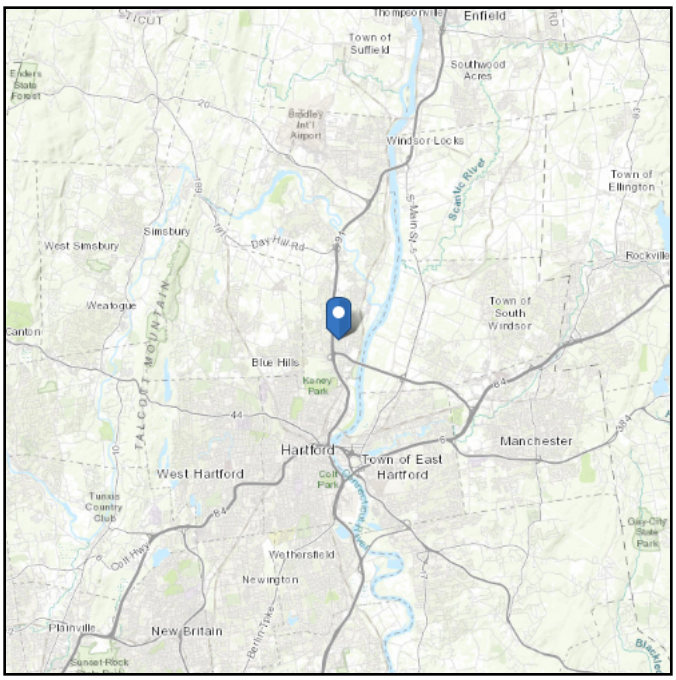
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 82.41 ft (NAVD 88)
Latitude: 41.825781
Longitude: -72.661786





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: Fri May 13 2022

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

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

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

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Trylon
1825 W. Walnut Hill Lane Suite 120
Irving, TX 75038

TIA LOAD CALCULATOR 2.2

PROJECT DATA	
Job Code:	208911
Carrier Site ID:	CTHA621A
Carrier Site Name:	IA621_ATC_Monopole_Ash

CODES AND STANDARDS	
Building Code:	2015 IBC
Local Building Code:	2018 CSBC
Design Standard:	TIA-222-H

STRUCTURE DETAILS		
Mount Type:	Sector Frame	--
Mount Elevation:	88.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	120.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	B	--
Site Class:	D - Stiff Soil	--
Ground Elevation:	559.18	ft.

TOPOGRAPHIC DATA		
Topographic Category:	1.00	--
Topographic Feature:	N/A	--
Crest Point Elevation:	0.00	ft.
Base Point Elevation:	0.00	ft.
Crest to Mid-Height (L/2):	0.00	ft.
Distance from Crest (x):	0.00	ft.
Base Topo Factor (K_{zt}):	1.00	--
Mount Topo Factor (K_{zt}):	1.00	--

WIND PARAMETERS		
Design Wind Speed:	125	mph
Wind Escalation Factor (K_s):	1.00	--
Velocity Coefficient (K_z):	0.95	--
Directionality Factor (K_d):	0.95	--
Gust Effect Factor (Gh):	1.00	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	35.48	psf
Ground Elevation Factor (K_e):	0.98	--

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness (t_i):	2.00	in
Importance Factor (I_i):	1.00	--
Ice Velocity Pressure (q_{zi}):	6.57	psf
Mount Ice Thickness (t_{iz}):	2.21	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	63.86	psf
Round Member Pressure:	38.32	psf
Ice Wind Pressure:	7.10	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel .(S_s):	0.175	g
1 Second Accel (S_1):	0.064	g
Short Period Des. (S_{DS}):	0.19	g
1 Second Des. (S_{D1}):	0.10	g
Short Period Coeff. (F_a):	1.60	--
1 Second Coeff. (F_v):	2.40	--
Response Coefficient (Cs):	0.09	--
Amplification Factor (A_S):	1.20	--

LOAD COMBINATIONS [LRFD]

#	Description
1	1.4DL
2	1.2DL + 1WL 0 AZI
3	1.2DL + 1WL 30 AZI
4	1.2DL + 1WL 45 AZI
5	1.2DL + 1WL 60 AZI
6	1.2DL + 1WL 90 AZI
7	1.2DL + 1WL 120 AZI
8	1.2DL + 1WL 135 AZI
9	1.2DL + 1WL 150 AZI
10	1.2DL + 1WL 180 AZI
11	1.2DL + 1WL 210 AZI
12	1.2DL + 1WL 225 AZI
13	1.2DL + 1WL 240 AZI
14	1.2DL + 1WL 270 AZI
15	1.2DL + 1WL 300 AZI
16	1.2DL + 1WL 315 AZI
17	1.2DL + 1WL 330 AZI
18	0.9DL + 1WL 0 AZI
19	0.9DL + 1WL 30 AZI
20	0.9DL + 1WL 45 AZI
21	0.9DL + 1WL 60 AZI
22	0.9DL + 1WL 90 AZI
23	0.9DL + 1WL 120 AZI
24	0.9DL + 1WL 135 AZI
25	0.9DL + 1WL 150 AZI
26	0.9DL + 1WL 180 AZI
27	0.9DL + 1WL 210 AZI
28	0.9DL + 1WL 225 AZI
29	0.9DL + 1WL 240 AZI
30	0.9DL + 1WL 270 AZI
31	0.9DL + 1WL 300 AZI
32	0.9DL + 1WL 315 AZI
33	0.9DL + 1WL 330 AZI
34	1.2DL + 1DLi + 1WLi 0 AZI
35	1.2DL + 1DLi + 1WLi 30 AZI
36	1.2DL + 1DLi + 1WLi 45 AZI
37	1.2DL + 1DLi + 1WLi 60 AZI
38	1.2DL + 1DLi + 1WLi 90 AZI
39	1.2DL + 1DLi + 1WLi 120 AZI
40	1.2DL + 1DLi + 1WLi 135 AZI
41	1.2DL + 1DLi + 1WLi 150 AZI

#	Description
42	1.2DL + 1DLi + 1WLi 180 AZI
43	1.2DL + 1DLi + 1WLi 210 AZI
44	1.2DL + 1DLi + 1WLi 225 AZI
45	1.2DL + 1DLi + 1WLi 240 AZI
46	1.2DL + 1DLi + 1WLi 270 AZI
47	1.2DL + 1DLi + 1WLi 300 AZI
48	1.2DL + 1DLi + 1WLi 315 AZI
49	1.2DL + 1DLi + 1WLi 330 AZI
50	(1.2+0.2Sds) + 1.0E 0 AZI
51	(1.2+0.2Sds) + 1.0E 30 AZI
52	(1.2+0.2Sds) + 1.0E 45 AZI
53	(1.2+0.2Sds) + 1.0E 60 AZI
54	(1.2+0.2Sds) + 1.0E 90 AZI
55	(1.2+0.2Sds) + 1.0E 120 AZI
56	(1.2+0.2Sds) + 1.0E 135 AZI
57	(1.2+0.2Sds) + 1.0E 150 AZI
58	(1.2+0.2Sds) + 1.0E 180 AZI
59	(1.2+0.2Sds) + 1.0E 210 AZI
60	(1.2+0.2Sds) + 1.0E 225 AZI
61	(1.2+0.2Sds) + 1.0E 240 AZI
62	(1.2+0.2Sds) + 1.0E 270 AZI
63	(1.2+0.2Sds) + 1.0E 300 AZI
64	(1.2+0.2Sds) + 1.0E 315 AZI
65	(1.2+0.2Sds) + 1.0E 330 AZI
66	(0.9-0.2Sds) + 1.0E 0 AZI
67	(0.9-0.2Sds) + 1.0E 30 AZI
68	(0.9-0.2Sds) + 1.0E 45 AZI
69	(0.9-0.2Sds) + 1.0E 60 AZI
70	(0.9-0.2Sds) + 1.0E 90 AZI
71	(0.9-0.2Sds) + 1.0E 120 AZI
72	(0.9-0.2Sds) + 1.0E 135 AZI
73	(0.9-0.2Sds) + 1.0E 150 AZI
74	(0.9-0.2Sds) + 1.0E 180 AZI
75	(0.9-0.2Sds) + 1.0E 210 AZI
76	(0.9-0.2Sds) + 1.0E 225 AZI
77	(0.9-0.2Sds) + 1.0E 240 AZI
78	(0.9-0.2Sds) + 1.0E 270 AZI
79	(0.9-0.2Sds) + 1.0E 300 AZI
80	(0.9-0.2Sds) + 1.0E 315 AZI
81	(0.9-0.2Sds) + 1.0E 330 AZI
82-88	1.2D + 1.5 Lv1

#	Description
89	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP1
90	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP1
91	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP1
92	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP1
93	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP1
94	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP1
95	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP1
96	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP1
97	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP1
98	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP1
99	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP1
100	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP1
101	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP1
102	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP1
103	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP1
104	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP1
105	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP2
106	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP2
107	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP2
108	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP2
109	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP2
110	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP2
111	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP2
112	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP2
113	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP2
114	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP2
115	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP2
116	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP2
117	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP2
118	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP2
119	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP2
120	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP2

#	Description
121	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP3
122	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP3
123	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP3
124	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP3
125	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP3
126	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP3
127	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP3
128	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP3
129	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP3
130	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP3
131	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP3
132	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP3
133	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP3
134	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP3
135	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP3
136	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP3
137	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP4
138	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP4
139	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP4
140	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP4
141	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP4
142	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP4
143	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP4
144	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP4
145	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP4
146	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP4
147	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP4
148	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP4
149	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP4
150	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP4
151	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP4
152	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP4

*This page shows an example of maintenance loads for (4) pipes, the number of mount pipe LCs may vary per site

EQUIPMENT LOADING

Appurtenance Name	Qty.	Elevation [ft]	--	EPA_N (ft2)	EPA_T (ft2)	Weight (lbs)
VHLP2-11-2GR	1	88	No Ice	5.68	2.87	31.00
--	--	--	w/ Ice	6.57	3.57	239.97
VV-65A-R1_TMO	3	88	No Ice	4.48	1.74	33.30
--	--	--	w/ Ice	6.46	3.51	185.50
AIR 6419 B41_TMO	3	88	No Ice	7	2.83	96.50
--	--	--	w/ Ice	9.29	4.66	226.64
APXVAALL24_43-U-NA20_TMO	3	88	No Ice	14.67	5.32	149.90
--	--	--	w/ Ice	17.86	8.13	558.62
FIBEAIR IP-20C	1	88	No Ice	0.68	0.29	14.33
--	--	--	w/ Ice	1.04	0.57	38.39
RADIO 4460 B2/B25 B66_TMO	3	88	No Ice	2.14	1.69	109.00
--	--	--	w/ Ice	2.72	2.22	121.87
Radio 4480_TMOV2	3	88	No Ice	2.88	1.40	81.00
--	--	--	w/ Ice	3.55	1.94	121.12
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
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			No Ice			
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			No Ice			
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			No Ice			
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			No Ice			
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			No Ice			
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			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			

EQUIPMENT LOADING [CONT.]

Appurtenance Name	Qty.	Elevation [ft]	--	EPA $_N$ (ft2)	EPA $_T$ (ft2)	Weight (lbs)
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			

EQUIPMENT WIND CALCULATIONS

Appurtenance Name	Qty.	Elevation [ft]	K_{zt}	K_z	K_d	t_d	q_z [psf]	q_{zi} [psf]
VHLP2-11-2GR	1	88	1.00	0.95	0.95	2.21	35.48	5.68
VV-65A-R1_TMO	3	88	1.00	0.95	0.95	2.21	35.48	5.68
AIR 6419 B41_TMO	3	88	1.00	0.95	0.95	2.21	35.48	5.68
XVAALL24_43-U-NA20_T	3	88	1.00	0.95	0.95	2.21	35.48	5.68
FIBEAIR IP-20C	1	88	1.00	0.95	0.95	2.21	35.48	5.68
ADIO 4460 B2/B25 B66_TM	3	88	1.00	0.95	0.95	2.21	35.48	5.68
Radio 4480_TMOV2	3	88	1.00	0.95	0.95	2.21	35.48	5.68

EQUIPMENT LATERAL WIND FORCE CALCULATIONS

Appurtenance Name	Qty.	--	0° 180°	30° 210°	60° 240°	90° 270°	120° 300°	150° 330°
VHLP2-11-2GR	1	No Ice	149.69	93.04	130.81	74.15	130.81	93.04
--	--	w/ Ice	33.58	22.08	29.75	18.24	29.75	22.08
VV-65A-R1_TMO	3	No Ice	143.06	77.44	121.18	55.56	121.18	77.44
--	--	w/ Ice	33.00	21.72	29.24	17.96	29.24	21.72
AIR 6419 B41_TMO	3	No Ice	223.53	123.66	190.24	90.37	190.24	123.66
--	--	w/ Ice	47.45	29.71	41.54	23.79	41.54	29.71
APXVAALL24_43-U-NA20_TMC	3	No Ice	468.45	244.52	393.81	169.88	393.81	244.52
--	--	w/ Ice	91.24	53.96	78.81	41.53	78.81	53.96
FIBEAIR IP-20C	1	No Ice	21.84	12.43	18.71	9.30	18.71	12.43
--	--	w/ Ice	5.32	3.51	4.71	2.90	4.71	3.51
RADIO 4460 B2/B25 B66_TMO	3	No Ice	68.31	57.45	64.69	53.83	64.69	57.45
--	--	w/ Ice	13.89	11.96	13.25	11.32	13.25	11.96
Radio 4480_TMOV2	3	No Ice	91.91	56.44	80.09	44.61	80.09	56.44
--	--	w/ Ice	18.13	11.98	16.08	9.93	16.08	11.98
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
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		No Ice						
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		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						

EQUIPMENT LATERAL WIND FORCE CALCULATIONS [CONT.]

Appurtenance Name	*Qty.*	--	*0° 180°*	*30° 210°*	*60° 240°*	*90° 270°*	*120° 300°*	*150° 330°*
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
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		No Ice						
--	--	w/ Ice						
		No Ice						
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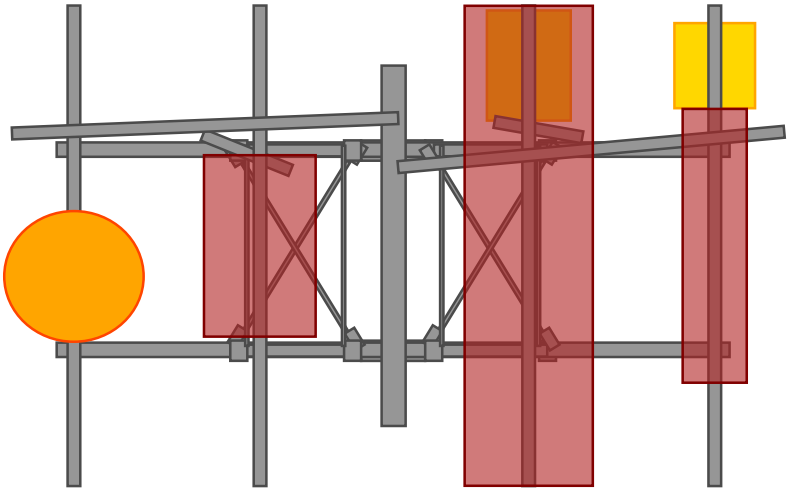
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						

EQUIPMENT SEISMIC FORCE CALCULATIONS

Appurtenance Name	*Qty.*	*Elevation [ft]*	*Weight [lbs]*	F_p [lbs]
VHLP2-11-2GR	1	88	31	3.47
VV-65A-R1_TMO	3	88	33.3	3.73
AIR 6419 B41_TMO	3	88	96.5	10.81
APXVAALL24_43-U-NA20_TMO	3	88	149.9	16.79
FIBEAIR IP-20C	1	88	14.33	1.60
RADIO 4460 B2/B25 B66_TMO	3	88	109	12.21
Radio 4480_TMOV2	3	88	81	9.07

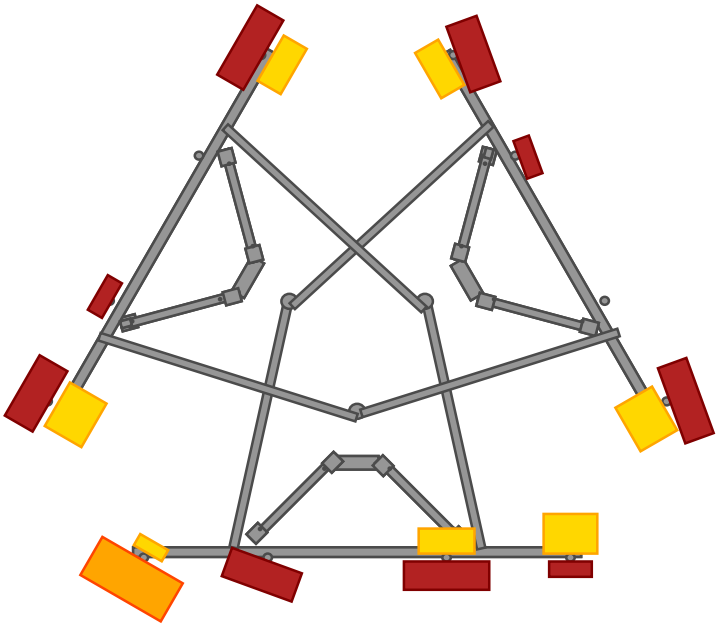
ELEVATION VIEW



*these drawings are intended to show approximate locations of equipment on the mount and should not be used to determine exact placement of equipment or additional hardware

**Elevation View Shows Only One Sector

PLAN VIEW



1825 W. Walnut Hill Lane, Suite 120
Irving, Texas 75038

Equipment Name	Total Quantity	Antenna Centerline	Mount Pipe Positions	Equipment Azimuths
VHLP2-11-2GR	1	88	MP4	0
VV-65A-R1_TMO	3	88	MP1/MP6/MP10	330/90/220
AIR 6419 B41_TMO	3	88	MP3/MP5/MP9	350/90/220
APXVAALL24_43-U-NA20_TMO	3	88	MP2/MP8/MP12	330/90/220
FIBEAIR IP-20C	1	88	MP4	0
RADIO 4460 B2/B25 B66_TMO	3	88	MP1/MP5/MP12	330/90/210
Radio 4480_TMOV2	3	88	MP2/MP8/MP9	330/90/210

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

(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)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Z
Global Member Orientation Plane	XY
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 15th(360-16): LRFD
Cold Formed Steel Code	AISI S100-16: LRFD
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)

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?	No
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 7-16
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	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]	Yield[ksi]	Fu[ksi]
1	A653 SS Gr33	29500	11346	.3	.65	.49	33	45
2	A653 SS Gr50/1	29500	11346	.3	.65	.49	50	65

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design L...	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	PIPE_4.0	PIPE_4.0	Beam	Pipe	A53 Gr.B	Typical	2.96	6.82	6.82	13.6
2	Pipe 2.375"x0.154"	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	Pipe 2.875"x0.203"	PIPE_2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
4	SR 3/4"	3/4	Beam	BAR	A36 Gr.36	Typical	.442	.016	.016	.031
5	Plate 4"x0.625"	PL 4"x0.625"	Beam	RECT	A36 Gr.36	Typical	2.5	.081	3.333	.293
6	SR 5/8"	S.R. 5/8	Beam	BAR	A36 Gr.36	Typical	.307	.007	.007	.015
7	D Plate	PL 2"x0.625"	Beam	RECT	A36 Gr.36	Typical	1.25	.041	.417	.131

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF1	162T125-18	Beam	None	A653 SS ...	Typical	.078	.013	.042	9e-6

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N5						
2	N17						
3	N85						
4	N86A						
5	N87B						
6	N88A						
7	N89A	Reaction	Reaction	Reaction	Reaction	Reaction	
8	N90A	Reaction	Reaction	Reaction	Reaction	Reaction	
9	CP						
10	N96						
11	N108						
12	N154						
13	N155						
14	N156						
15	N157						
16	N158	Reaction	Reaction	Reaction	Reaction	Reaction	
17	N159	Reaction	Reaction	Reaction	Reaction	Reaction	
18	N182						
19	N187						
20	N199						
21	N245						
22	N246						
23	N247						
24	N248						
25	N249	Reaction	Reaction	Reaction	Reaction	Reaction	
26	N250	Reaction	Reaction	Reaction	Reaction	Reaction	
27	N272						
28	N260A						
29	N261A						
30	N268A						
31	N269						

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
1	Self Weight	DL			-1		26			
2	Structure Wind X	WLX						171		
3	Structure Wind Y	WLY						171		
4	Wind Load 0 AZI	WLX					52			
5	Wind Load 30 AZI	None					52			
6	Wind Load 45 AZI	None					52			
7	Wind Load 60 AZI	None					52			
8	Wind Load 90 AZI	WLY					52			
9	Wind Load 120 AZI	None					52			
10	Wind Load 135 AZI	None					52			

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
11	Wind Load 150 AZI	None					52			
12	Ice Weight	OL1					26	171		
13	Ice Structure Wind X	OL2						171		
14	Ice Structure Wind Y	OL3						171		
15	Ice Wind Load 0 AZI	OL2					52			
16	Ice Wind Load 30 AZI	None					52			
17	Ice Wind Load 45 AZI	None					52			
18	Ice Wind Load 60 AZI	None					52			
19	Ice Wind Load 90 AZI	OL3					52			
20	Ice Wind Load 120 AZI	None					52			
21	Ice Wind Load 135 AZI	None					52			
22	Ice Wind Load 150 AZI	None					52			
23	Seismic Load X	ELX	-.112				26			
24	Seismic Load Y	ELY		-.112			26			
25	Live Load 1 (Lv)	None					1			
26	Live Load 2 (Lv)	None					1			
27	Live Load 3 (Lv)	None					1			
28	Live Load 4 (Lv)	None					1			
29	Live Load 5 (Lv)	None					1			
30	Live Load 6 (Lv)	None					1			
31	Live Load 7 (Lv)	None					1			
32	Live Load 8 (Lv)	None					1			
33	Live Load 9 (Lv)	None					1			
34	Maintenance Load 1 (Lm)	None					1			
35	Maintenance Load 2 (Lm)	None					1			
36	Maintenance Load 3 (Lm)	None					1			
37	Maintenance Load 4 (Lm)	None					1			
38	Maintenance Load 5 (Lm)	None					1			
39	Maintenance Load 6 (Lm)	None					1			
40	Maintenance Load 7 (Lm)	None					1			
41	Maintenance Load 8 (Lm)	None					1			
42	Maintenance Load 9 (Lm)	None					1			
43	Maintenance Load 10 (Lm)	None					1			
44	Maintenance Load 11 (Lm)	None					1			
45	Maintenance Load 12 (Lm)	None					1			

Load Combinations

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.4DL	Yes	Y		DL	1.4																				
2	1.2DL + 1WL 0 AZI	Yes	Y		DL	1.2	2	1	3		4	1														
3	1.2DL + 1WL 30 AZI	Yes	Y		DL	1.2	2	.866	3	.5	5	1														
4	1.2DL + 1WL 45 AZI	Yes	Y		DL	1.2	2	.707	3	.707	6	1														
5	1.2DL + 1WL 60 AZI	Yes	Y		DL	1.2	2	.5	3	.866	7	1														
6	1.2DL + 1WL 90 AZI	Yes	Y		DL	1.2	2		3	1	8	1														
7	1.2DL + 1WL 120 AZI	Yes	Y		DL	1.2	2	-.5	3	.866	9	1														
8	1.2DL + 1WL 135 AZI	Yes	Y		DL	1.2	2	-.707	3	.707	10	1														
9	1.2DL + 1WL 150 AZI	Yes	Y		DL	1.2	2	-.866	3	.5	11	1														
10	1.2DL + 1WL 180 AZI	Yes	Y		DL	1.2	2	-1	3		4	-1														
11	1.2DL + 1WL 210 AZI	Yes	Y		DL	1.2	2	-.866	3	-.5	5	-1														
12	1.2DL + 1WL 225 AZI	Yes	Y		DL	1.2	2	-.707	3	-.707	6	-1														

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
13	1.2DL + 1WL 240 AZI	Yes	Y		DL	1.2	2	-.5	3	-.866	7	-1														
14	1.2DL + 1WL 270 AZI	Yes	Y		DL	1.2	2		3	-1	8	-1														
15	1.2DL + 1WL 300 AZI	Yes	Y		DL	1.2	2	.5	3	-.866	9	-1														
16	1.2DL + 1WL 315 AZI	Yes	Y		DL	1.2	2	.707	3	-.707	10	-1														
17	1.2DL + 1WL 330 AZI	Yes	Y		DL	1.2	2	.866	3	-.5	11	-1														
18	0.9DL + 1WL 0 AZI	Yes	Y		DL	.9	2	1	3		4	1														
19	0.9DL + 1WL 30 AZI	Yes	Y		DL	.9	2	.866	3	.5	5	1														
20	0.9DL + 1WL 45 AZI	Yes	Y		DL	.9	2	.707	3	.707	6	1														
21	0.9DL + 1WL 60 AZI	Yes	Y		DL	.9	2	.5	3	.866	7	1														
22	0.9DL + 1WL 90 AZI	Yes	Y		DL	.9	2		3	1	8	1														
23	0.9DL + 1WL 120 AZI	Yes	Y		DL	.9	2	-.5	3	.866	9	1														
24	0.9DL + 1WL 135 AZI	Yes	Y		DL	.9	2	-.707	3	.707	10	1														
25	0.9DL + 1WL 150 AZI	Yes	Y		DL	.9	2	-.866	3	.5	11	1														
26	0.9DL + 1WL 180 AZI	Yes	Y		DL	.9	2	-1	3		4	-1														
27	0.9DL + 1WL 210 AZI	Yes	Y		DL	.9	2	-.866	3	-.5	5	-1														
28	0.9DL + 1WL 225 AZI	Yes	Y		DL	.9	2	-.707	3	-.707	6	-1														
29	0.9DL + 1WL 240 AZI	Yes	Y		DL	.9	2	-.5	3	-.866	7	-1														
30	0.9DL + 1WL 270 AZI	Yes	Y		DL	.9	2		3	-1	8	-1														
31	0.9DL + 1WL 300 AZI	Yes	Y		DL	.9	2	.5	3	-.866	9	-1														
32	0.9DL + 1WL 315 AZI	Yes	Y		DL	.9	2	.707	3	-.707	10	-1														
33	0.9DL + 1WL 330 AZI	Yes	Y		DL	.9	2	.866	3	-.5	11	-1														
34	1.2DL + 1DLi + 1WLi 0 ...	Yes	Y		DL	1.2	OL1	1	13	1	14		15	1												
35	1.2DL + 1DLi + 1WLi 30...	Yes	Y		DL	1.2	OL1	1	13	.866	14	.5	16	1												
36	1.2DL + 1DLi + 1WLi 45...	Yes	Y		DL	1.2	OL1	1	13	.707	14	.707	17	1												
37	1.2DL + 1DLi + 1WLi 60...	Yes	Y		DL	1.2	OL1	1	13	.5	14	.866	18	1												
38	1.2DL + 1DLi + 1WLi 90...	Yes	Y		DL	1.2	OL1	1	13		14	1	19	1												
39	1.2DL + 1DLi + 1WLi 12...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	.866	20	1												
40	1.2DL + 1DLi + 1WLi 13...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	.707	21	1												
41	1.2DL + 1DLi + 1WLi 15...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	.5	22	1												
42	1.2DL + 1DLi + 1WLi 18...	Yes	Y		DL	1.2	OL1	1	13	-1	14		15	-1												
43	1.2DL + 1DLi + 1WLi 21...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	-.5	16	-1												
44	1.2DL + 1DLi + 1WLi 22...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	-.707	17	-1												
45	1.2DL + 1DLi + 1WLi 24...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	-.866	18	-1												
46	1.2DL + 1DLi + 1WLi 27...	Yes	Y		DL	1.2	OL1	1	13		14	-1	19	-1												
47	1.2DL + 1DLi + 1WLi 30...	Yes	Y		DL	1.2	OL1	1	13	.5	14	-.866	20	-1												
48	1.2DL + 1DLi + 1WLi 31...	Yes	Y		DL	1.2	OL1	1	13	.707	14	-.707	21	-1												
49	1.2DL + 1DLi + 1WLi 33...	Yes	Y		DL	1.2	OL1	1	13	.866	14	-.5	22	-1												
50	(1.2+0.2Sds)DL + 1E 0 ...	Yes	Y		DL	1.2...	23	1	24																	
51	(1.2+0.2Sds)DL + 1E 3...	Yes	Y		DL	1.2...	23	.866	24	.5																
52	(1.2+0.2Sds)DL + 1E 4...	Yes	Y		DL	1.2...	23	.707	24	.707																
53	(1.2+0.2Sds)DL + 1E 6...	Yes	Y		DL	1.2...	23	.5	24	.866																
54	(1.2+0.2Sds)DL + 1E 9...	Yes	Y		DL	1.2...	23		24	1																
55	(1.2+0.2Sds)DL + 1E 1...	Yes	Y		DL	1.2...	23	-.5	24	.866																
56	(1.2+0.2Sds)DL + 1E 1...	Yes	Y		DL	1.2...	23	-.707	24	.707																
57	(1.2+0.2Sds)DL + 1E 1...	Yes	Y		DL	1.2...	23	-.866	24	.5																
58	(1.2+0.2Sds)DL + 1E 1...	Yes	Y		DL	1.2...	23	-1	24																	
59	(1.2+0.2Sds)DL + 1E 2...	Yes	Y		DL	1.2...	23	-.866	24	-.5																
60	(1.2+0.2Sds)DL + 1E 2...	Yes	Y		DL	1.2...	23	-.707	24	-.707																
61	(1.2+0.2Sds)DL + 1E 2...	Yes	Y		DL	1.2...	23	-.5	24	-.866																
62	(1.2+0.2Sds)DL + 1E 2...	Yes	Y		DL	1.2...	23		24	-1																
63	(1.2+0.2Sds)DL + 1E 3...	Yes	Y		DL	1.2...	23	.5	24	-.866																
64	(1.2+0.2Sds)DL + 1E 3...	Yes	Y		DL	1.2...	23	.707	24	-.707																

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
65	(1.2+0.2Sds)DL + 1E 3...	Yes	Y		DL	1.2...	23	.866	24	-.5																
66	(0.9-0.2Sds)DL + 1E 0 ...	Yes	Y		DL	.863	23	1	24																	
67	(0.9-0.2Sds)DL + 1E 30...	Yes	Y		DL	.863	23	.866	24	.5																
68	(0.9-0.2Sds)DL + 1E 45...	Yes	Y		DL	.863	23	.707	24	.707																
69	(0.9-0.2Sds)DL + 1E 60...	Yes	Y		DL	.863	23	.5	24	.866																
70	(0.9-0.2Sds)DL + 1E 90...	Yes	Y		DL	.863	23		24	1																
71	(0.9-0.2Sds)DL + 1E 12...	Yes	Y		DL	.863	23	-.5	24	.866																
72	(0.9-0.2Sds)DL + 1E 13...	Yes	Y		DL	.863	23	-.707	24	.707																
73	(0.9-0.2Sds)DL + 1E 15...	Yes	Y		DL	.863	23	-.866	24	.5																
74	(0.9-0.2Sds)DL + 1E 18...	Yes	Y		DL	.863	23	-1	24																	
75	(0.9-0.2Sds)DL + 1E 21...	Yes	Y		DL	.863	23	-.866	24	-.5																
76	(0.9-0.2Sds)DL + 1E 22...	Yes	Y		DL	.863	23	-.707	24	-.707																
77	(0.9-0.2Sds)DL + 1E 24...	Yes	Y		DL	.863	23	-.5	24	-.866																
78	(0.9-0.2Sds)DL + 1E 27...	Yes	Y		DL	.863	23		24	-1																
79	(0.9-0.2Sds)DL + 1E 30...	Yes	Y		DL	.863	23	.5	24	-.866																
80	(0.9-0.2Sds)DL + 1E 31...	Yes	Y		DL	.863	23	.707	24	-.707																
81	(0.9-0.2Sds)DL + 1E 33...	Yes	Y		DL	.863	23	.866	24	-.5																
82	1.2DL + 1Lv1	Yes	Y		DL	1.2	25	1.5																		
83	1.2DL + 1Lv2	Yes	Y		DL	1.2	26	1.5																		
84	1.2DL + 1Lv3	Yes	Y		DL	1.2	27	1.5																		
85	1.2DL + 1Lv4	Yes	Y		DL	1.2	28	1.5																		
86	1.2DL + 1Lv5	Yes	Y		DL	1.2	29	1.5																		
87	1.2DL + 1Lv6	Yes	Y		DL	1.2	30	1.5																		
88	1.2DL + 1Lv7	Yes	Y		DL	1.2	31	1.5																		
89	1.2DL + 1Lv8	Yes	Y		DL	1.2	32	1.5																		
90	1.2DL + 1Lv9	Yes	Y		DL	1.2	33	1.5																		
91	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.058	3		4	.058												
92	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.05	3	.029	5	.058												
93	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.041	3	.041	6	.058												
94	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.029	3	.05	7	.058												
95	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2		3	.058	8	.058												
96	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.029	3	.05	9	.058												
97	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.041	3	.041	10	.058												
98	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.05	3	.029	11	.058												
99	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.058	3		4	-.058												
100	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.05	3	-.029	5	-.058												
101	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.041	3	-.041	6	-.058												
102	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.029	3	-.05	7	-.058												
103	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2		3	-.058	8	-.058												
104	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.029	3	-.05	9	-.058												
105	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.041	3	-.041	10	-.058												
106	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.05	3	-.029	11	-.058												
107	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.058	3		4	.058												
108	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.05	3	.029	5	.058												
109	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.041	3	.041	6	.058												
110	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.029	3	.05	7	.058												
111	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2		3	.058	8	.058												
112	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.029	3	.05	9	.058												
113	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.041	3	.041	10	.058												
114	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.05	3	.029	11	.058												
115	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.058	3		4	-.058												
116	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.05	3	-.029	5	-.058												

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
117	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.041	3	-.041	6	-.058										
118	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.029	3	-.05	7	-.058										
119	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2		3	-.058	8	-.058										
120	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.029	3	-.05	9	-.058										
121	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.041	3	-.041	10	-.058										
122	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.05	3	-.029	11	-.058										
123	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.058	3		4	.058										
124	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.05	3	.029	5	.058										
125	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.041	3	.041	6	.058										
126	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.029	3	.05	7	.058										
127	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2		3	.058	8	.058										
128	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.029	3	.05	9	.058										
129	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.041	3	.041	10	.058										
130	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.05	3	.029	11	.058										
131	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.058	3		4	-.058										
132	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.05	3	-.029	5	-.058										
133	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.041	3	-.041	6	-.058										
134	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.029	3	-.05	7	-.058										
135	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2		3	-.058	8	-.058										
136	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.029	3	-.05	9	-.058										
137	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.041	3	-.041	10	-.058										
138	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.05	3	-.029	11	-.058										
139	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	.058	3		4	.058										
140	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	.05	3	.029	5	.058										
141	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	.041	3	.041	6	.058										
142	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	.029	3	.05	7	.058										
143	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2		3	.058	8	.058										
144	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	-.029	3	.05	9	.058										
145	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	-.041	3	.041	10	.058										
146	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	-.05	3	.029	11	.058										
147	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	-.058	3		4	-.058										
148	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	-.05	3	-.029	5	-.058										
149	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	-.041	3	-.041	6	-.058										
150	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	-.029	3	-.05	7	-.058										
151	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2		3	-.058	8	-.058										
152	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	.029	3	-.05	9	-.058										
153	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	.041	3	-.041	10	-.058										
154	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	.05	3	-.029	11	-.058										
155	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	.058	3		4	.058										
156	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	.05	3	.029	5	.058										
157	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	.041	3	.041	6	.058										
158	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	.029	3	.05	7	.058										
159	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2		3	.058	8	.058										
160	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	-.029	3	.05	9	.058										
161	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	-.041	3	.041	10	.058										
162	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	-.05	3	.029	11	.058										
163	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	-.058	3		4	-.058										
164	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	-.05	3	-.029	5	-.058										
165	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	-.041	3	-.041	6	-.058										
166	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	-.029	3	-.05	7	-.058										
167	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2		3	-.058	8	-.058										
168	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	.029	3	-.05	9	-.058										

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
169	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	.041	3	-.041	10	-.058										
170	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	.05	3	-.029	11	-.058										
171	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	.058	3		4	.058										
172	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	.05	3	.029	5	.058										
173	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	.041	3	.041	6	.058										
174	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	.029	3	.05	7	.058										
175	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2		3	.058	8	.058										
176	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	-.029	3	.05	9	.058										
177	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	-.041	3	.041	10	.058										
178	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	-.05	3	.029	11	.058										
179	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	-.058	3		4	-.058										
180	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	-.05	3	-.029	5	-.058										
181	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	-.041	3	-.041	6	-.058										
182	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	-.029	3	-.05	7	-.058										
183	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2		3	-.058	8	-.058										
184	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	.029	3	-.05	9	-.058										
185	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	.041	3	-.041	10	-.058										
186	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	.05	3	-.029	11	-.058										
187	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.058	3		4	.058										
188	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.05	3	.029	5	.058										
189	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.041	3	.041	6	.058										
190	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.029	3	.05	7	.058										
191	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2		3	.058	8	.058										
192	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.029	3	.05	9	.058										
193	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.041	3	.041	10	.058										
194	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.05	3	.029	11	.058										
195	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.058	3		4	-.058										
196	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.05	3	-.029	5	-.058										
197	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.041	3	-.041	6	-.058										
198	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.029	3	-.05	7	-.058										
199	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2		3	-.058	8	-.058										
200	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.029	3	-.05	9	-.058										
201	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.041	3	-.041	10	-.058										
202	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.05	3	-.029	11	-.058										
203	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.058	3		4	.058										
204	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.05	3	.029	5	.058										
205	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.041	3	.041	6	.058										
206	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.029	3	.05	7	.058										
207	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2		3	.058	8	.058										
208	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.029	3	.05	9	.058										
209	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.041	3	.041	10	.058										
210	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.05	3	.029	11	.058										
211	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.058	3		4	-.058										
212	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.05	3	-.029	5	-.058										
213	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.041	3	-.041	6	-.058										
214	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.029	3	-.05	7	-.058										
215	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2		3	-.058	8	-.058										
216	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.029	3	-.05	9	-.058										
217	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.041	3	-.041	10	-.058										
218	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.05	3	-.029	11	-.058										
219	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.058	3		4	.058										
220	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.05	3	.029	5	.058										

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
221	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.041	3	.041	6	.058										
222	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.029	3	.05	7	.058										
223	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2		3	.058	8	.058										
224	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.029	3	.05	9	.058										
225	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.041	3	.041	10	.058										
226	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.05	3	.029	11	.058										
227	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.058	3		4	-.058										
228	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.05	3	-.029	5	-.058										
229	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.041	3	-.041	6	-.058										
230	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.029	3	-.05	7	-.058										
231	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2		3	-.058	8	-.058										
232	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.029	3	-.05	9	-.058										
233	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.041	3	-.041	10	-.058										
234	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.05	3	-.029	11	-.058										
235	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	.058	3		4	.058										
236	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	.05	3	.029	5	.058										
237	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	.041	3	.041	6	.058										
238	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	.029	3	.05	7	.058										
239	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2		3	.058	8	.058										
240	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	-.029	3	.05	9	.058										
241	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	-.041	3	.041	10	.058										
242	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	-.05	3	.029	11	.058										
243	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	-.058	3		4	-.058										
244	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	-.05	3	-.029	5	-.058										
245	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	-.041	3	-.041	6	-.058										
246	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	-.029	3	-.05	7	-.058										
247	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2		3	-.058	8	-.058										
248	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	.029	3	-.05	9	-.058										
249	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	.041	3	-.041	10	-.058										
250	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	.05	3	-.029	11	-.058										
251	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	.058	3		4	.058										
252	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	.05	3	.029	5	.058										
253	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	.041	3	.041	6	.058										
254	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	.029	3	.05	7	.058										
255	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2		3	.058	8	.058										
256	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	-.029	3	.05	9	.058										
257	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	-.041	3	.041	10	.058										
258	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	-.05	3	.029	11	.058										
259	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	-.058	3		4	-.058										
260	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	-.05	3	-.029	5	-.058										
261	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	-.041	3	-.041	6	-.058										
262	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	-.029	3	-.05	7	-.058										
263	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2		3	-.058	8	-.058										
264	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	.029	3	-.05	9	-.058										
265	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	.041	3	-.041	10	-.058										
266	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	.05	3	-.029	11	-.058										
267	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	.058	3		4	.058										
268	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	.05	3	.029	5	.058										
269	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	.041	3	.041	6	.058										
270	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	.029	3	.05	7	.058										
271	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2		3	.058	8	.058										
272	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	-.029	3	.05	9	.058										

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
273	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	-.041	3	.041	10	.058										
274	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	-.05	3	.029	11	.058										
275	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	-.058	3		4	-.058										
276	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	-.05	3	-.029	5	-.058										
277	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	-.041	3	-.041	6	-.058										
278	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	-.029	3	-.05	7	-.058										
279	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2		3	-.058	8	-.058										
280	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	.029	3	-.05	9	-.058										
281	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	.041	3	-.041	10	-.058										
282	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	.05	3	-.029	11	-.058										

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N89A	max	360.622	19	1266.611	24	2089.024	43	1281.336	24	438.931	27	0	282
2		min	-2629.305	43	-1562.463	16	308.105	18	-1412.389	16	-444.37	3	0	1
3	N90A	max	3146.182	34	1038.238	96	2068.174	49	545.495	32	618.697	2	0	282
4		min	-208.833	26	-663.117	152	329.004	25	-652.729	8	-406.965	26	0	1
5	N158	max	1486.445	5	469.764	21	1918.799	49	765.809	21	1139.367	29	0	282
6		min	-1082.711	29	-2351.6	45	305.998	22	-801.637	13	-1147.992	5	0	1
7	N159	max	207.027	33	2706.429	38	1881.991	37	475.259	30	402.126	21	0	282
8		min	-1339.642	162	-240.196	30	345.629	28	-691.704	6	-444.24	13	0	1
9	N249	max	1485.146	46	1989.462	38	1912.79	39	473.15	11	534.877	10	0	282
10		min	-889.707	22	-537.021	31	309.27	31	-451.715	19	-493.808	18	0	1
11	N250	max	232.079	19	44.5	22	1884.115	42	443.391	14	352.798	19	0	282
12		min	-1799.992	42	-2265.843	46	355.539	30	-282.827	22	-484.85	11	0	1
13	Totals:	max	4148.754	18	4144.812	6	11533.499	42						
14		min	-4148.757	10	-4144.808	14	2435.937	66						

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

	Member	Shape	Code Check	Loc[in]	LC	She...	Loc[in]	Dir	L...	phi*Pn...	phi*Pn...	phi*M...	phi*M...	...	Eqn
1	M16	PL 4"x0.625"	.538	6	36	.104	6	y	35	76418...	81000	1054.6...	6750	1...	H1-1b
2	M73	PL 4"x0.625"	.513	6	37	.130	6	y	38	76418...	81000	1054.6...	6750	1...	H1-1b
3	M13	PL 4"x0.625"	.503	6	45	.092	6	y	1...	76418...	81000	1054.6...	6750	1	H1-1b
4	M130	PL 4"x0.625"	.496	6	42	.128	6	y	42	76418...	81000	1054.6...	6750	1...	H1-1b
5	M70	PL 4"x0.625"	.470	6	45	.116	6	y	46	76418...	81000	1054.6...	6750	1	H1-1b
6	M127	PL 4"x0.625"	.443	6	34	.111	6	y	34	76418...	81000	1054.6...	6750	1	H1-1b
7	MP12	PIPE_2.0	.389	28	45	.051	68		36	14916...	32130	1871.6...	1871.6...	3...	H1-1b
8	MP2	PIPE_2.0	.380	28	10	.065	28		9	14916...	32130	1871.6...	1871.6...	1	H1-1b
9	MP8	PIPE_2.0	.377	28	34	.051	68		41	14916...	32130	1871.6...	1871.6...	4...	H1-1b
10	MP5	PIPE_2.0	.314	68	224	.043	68		2...	14916...	32130	1871.6...	1871.6...	4...	H1-1b
11	MP9	PIPE_2.0	.306	68	158	.042	68		1...	14916...	32130	1871.6...	1871.6...	4...	H1-1b
12	MP1	PIPE_2.0	.282	68	105	.038	68		93	14916...	32130	1871.6...	1871.6...	1	H1-1b
13	MP4	PIPE_2.0	.251	68	153	.033	68		1...	14916...	32130	1871.6...	1871.6...	4...	H1-1b
14	M98	S.R. 5/8	.238	35	37	.068	35		42	2503.0...	9940.19	103.542	103.542	4...	H1-1b
15	M133	PIPE_2.5	.231	27.563	13	.136	26.25		5	41048...	50715	3596.25	3596.25	1	H1-1b
16	M78	PIPE_2.0	.231	2.187	13	.041	27.812		44	29810...	32130	1871.6...	1871.6...	1	H1-1b
17	M155	S.R. 5/8	.230	35	42	.057	35		46	2503.0...	9940.19	103.542	103.542	1	H1-1b
18	H3	PIPE_2.5	.224	31.5	38	.108	31.5		7	41048...	50715	3596.25	3596.25	1	H1-1b
19	M36	S.R. 5/8	.222	35	34	.046	35		40	2503.0...	9940.19	103.542	103.542	3...	H1-1b

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

	Member	Shape	Code Check	Loc[in]	LC	She...	Loc[in]	Dir	L...	phi*Pn...	phi*Pn...	phi*M...	phi*M...	...	Eqn
20	M24	PIPE_2.0	.222	27.812	15	.053	2.187		46	29810...	32130	1871.6...	1871.6...	1	H1-1b
21	M21	PIPE_2.0	.219	2.188	15	.073	27.813		35	29810...	32130	1871.6...	1871.6...	1	H1-1b
22	M76	PIPE_2.5	.219	31.5	38	.155	98.438		13	41048...	50715	3596.25	3596.25	1	H1-1b
23	H2	PIPE_2.5	.216	31.5	42	.110	31.5		13	41048...	50715	3596.25	3596.25	1	H1-1b
24	MP10	PIPE_2.0	.215	28	36	.056	28		5	14916...	32130	1871.6...	1871.6...	1	H1-1b
25	MP6	PIPE_2.0	.210	28	40	.048	28		7	14916...	32130	1871.6...	1871.6...	1	H1-1b
26	M81	PIPE_2.0	.205	27.812	13	.046	2.187		35	29810...	32130	1871.6...	1871.6...	1	H1-1b
27	M138	PIPE_2.0	.205	27.812	7	.046	2.187		40	29810...	32130	1871.6...	1871.6...	1	H1-1b
28	M149	S.R. 5/8	.192	35	231	.064	35		42	2503.0...	9940.19	103.542	103.542	1	H1-1b
29	M135	PIPE_2.0	.192	2.187	15	.042	27.812		49	29810...	32130	1871.6...	1871.6...	1	H1-1b
30	H1	PIPE_2.5	.188	94.5	101	.068	87.938		9	41048...	50715	3596.25	3596.25	1	H1-1b
31	M92	S.R. 5/8	.184	35	162	.055	35		38	2503.0...	9940.19	103.542	103.542	4...	H1-1b
32	M94	PL 4"x0.625"	.184	4.512	37	.075	4.512	y	1...	79311...	81000	1054.6...	6750	1...	H1-1b
33	M35	S.R. 5/8	.182	35	41	.063	40		41	2503.0...	9940.19	103.542	103.542	1	H1-1b
34	M97	S.R. 5/8	.181	35	34	.084	35		34	2503.0...	9940.19	103.542	103.542	1	H1-1b
35	M19	PIPE_2.5	.180	94.5	92	.169	98.438		9	41048...	50715	3596.25	3596.25	1	H1-1b
36	MP11	PIPE_2.0	.180	28	44	.045	28		9	14916...	32130	1871.6...	1871.6...	4...	H1-1b
37	M151	PL 4"x0.625"	.179	4.512	42	.073	4.512	y	2...	79311...	81000	1054.6...	6750	1...	H1-1b
38	MP7	PIPE_2.0	.179	68	48	.054	28		14	14916...	32130	1871.6...	1871.6...	1	H1-1b
39	M55A	PIPE_4.0	.173	56.25	34	.124	10.5		16	83097...	93240	10631...	10631...	1...	H1-1b
40	M154	S.R. 5/8	.173	35	38	.073	35		38	2503.0...	9940.19	103.542	103.542	1	H1-1b
41	M15	PL 4"x0.625"	.170	4.512	35	.125	2.209	y	35	79311...	81000	1054.6...	6750	1	H1-1b
42	M42	S.R. 5/8	.167	35	152	.036	40		35	2503.0...	9940.19	103.542	103.542	1	H1-1b
43	M95	PL 4"x0.625"	.164	4.512	49	.076	4.512	y	2...	79311...	81000	1054.6...	6750	1...	H1-1b
44	M152	PL 4"x0.625"	.157	4.512	38	.075	4.512	y	2...	79311...	81000	1054.6...	6750	1...	H1-1b
45	M103	PIPE_4.0	.155	56.25	38	.121	10.5		13	83097...	93240	10631...	10631...	3...	H1-1b
46	M160	PIPE_4.0	.155	56.25	43	.113	66.75		43	83097...	93240	10631...	10631...	1	H1-1b
47	M17	PL 4"x0.625"	.153	4.512	41	.127	4.512	y	42	79311...	81000	1054.6...	6750	1	H1-1b
48	M148	S.R. 5/8	.152	35	34	.086	35		34	2503.0...	9940.19	103.542	103.542	3...	H1-1b
49	M91	S.R. 5/8	.144	35	45	.077	35		46	2503.0...	9940.19	103.542	103.542	2...	H1-1b
50	M129	PL 4"x0.625"	.141	4.512	232	.074	4.512	y	2...	79311...	81000	1054.6...	6750	1	H1-1b
51	M41	S.R. 5/8	.140	35	46	.070	40		43	2503.0...	9940.19	103.542	103.542	3...	H1-1b
52	M131	PL 4"x0.625"	.138	2.209	231	.075	2.209	y	2...	79311...	81000	1054.6...	6750	1	H1-1b
53	M72	PL 4"x0.625"	.135	4.512	163	.073	4.512	y	1...	79311...	81000	1054.6...	6750	1	H1-1b
54	M93	PL 4"x0.625"	.135	2.303	36	.075	2.303	y	1...	79311...	81000	1054.6...	6750	1	H1-1b
55	M150	PL 4"x0.625"	.135	2.303	40	.073	2.303	y	2...	79311...	81000	1054.6...	6750	1	H1-1b
56	M14	PL 4"x0.625"	.134	2.303	47	.125	0	y	35	79311...	81000	1054.6...	6750	1	H1-1b
57	M74	PL 4"x0.625"	.133	2.209	162	.074	2.209	y	1...	79311...	81000	1054.6...	6750	1	H1-1b
58	M34	PL 4"x0.625"	.132	2.209	38	.127	2.209	y	42	79311...	81000	1054.6...	6750	1	H1-1b
59	MP3	PIPE_2.0	.128	28	7	.053	28		7	14916...	32130	1871.6...	1871.6...	1	H1-1b
60	M96	PL 4"x0.625"	.124	2.209	36	.076	2.209	y	2...	79311...	81000	1054.6...	6750	1...	H1-1b
61	M39	PL 4"x0.625"	.123	2.209	152	.085	4.512	y	49	79311...	81000	1054.6...	6750	1...	H1-1b
62	M38	PL 4"x0.625"	.122	4.512	154	.085	4.512	y	45	79311...	81000	1054.6...	6750	1	H1-1b
63	M153	PL 4"x0.625"	.120	2.209	41	.075	2.209	y	2...	79311...	81000	1054.6...	6750	1...	H1-1b
64	M37	PL 4"x0.625"	.119	2.303	46	.085	2.303	y	45	79311...	81000	1054.6...	6750	1	H1-1b
65	M71	PL 4"x0.625"	.114	2.303	44	.073	2.303	y	1...	79311...	81000	1054.6...	6750	1...	H1-1b
66	M128	PL 4"x0.625"	.113	2.303	48	.074	2.303	y	2...	79311...	81000	1054.6...	6750	1...	H1-1b
67	M3	3/4	.110	41.25	42	.044	41.708		48	4419.0...	14320.8	184.32	184.32	3...	H1-1b*
68	M40	PL 4"x0.625"	.102	2.209	36	.085	4.512	y	49	79311...	81000	1054.6...	6750	1	H1-1b
69	M58	3/4	.099	2.75	47	.047	2.292		43	4419.0...	14320.8	184.32	184.32	3...	H1-1b*
70	M23	PIPE_2.0	.098	27.813	98	.073	27.813		42	29810...	32130	1871.6...	1871.6...	2...	H1-1b
71	M79	PIPE_2.0	.098	27.812	216	.044	27.812		47	29810...	32130	1871.6...	1871.6...	2...	H1-1b

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

	Member	Shape	Code Check	Loc[in]	LC	She...	Loc[in]	Dir	L...	phi*Pn...	phi*Pn...	phi*M...	phi*M...	...	Eqn
72	M147	PL 4"x0.625"	.097	2.209	39	.075	4.512	y	2...	79311...	81000	1054.6...	6750	1...	H1-1b
73	M90	PL 4"x0.625"	.096	2.209	35	.074	4.511	y	1...	79311...	81000	1054.6...	6750	1...	H1-1b
74	M115	3/4	.096	2.75	37	.044	2.292		36	4419.0...	14320.8	184.32	184.32	3...	H1-1b*
75	M136	PIPE_2.0	.094	27.812	270	.044	27.812		37	29810...	32130	1871.6...	1871.6...	2...	H1-1b
76	M137	PIPE_2.0	.090	27.812	231	.041	27.812		2...	29810...	32130	1871.6...	1871.6...	2...	H1-1b
77	M22	PIPE_2.0	.087	2.187	39	.049	27.812		48	29810...	32130	1871.6...	1871.6...	1	H1-1b
78	M80	PIPE_2.0	.086	27.812	162	.040	27.812		1...	29810...	32130	1871.6...	1871.6...	2...	H1-1b
79	M171	PIPE_2.0	.078	76.095	30	.050	0		41	19839...	32130	1871.6...	1871.6...	1...	H1-1b*
80	M117	3/4	.073	41.25	230	.034	41.708		42	4419.0...	14320.8	184.32	184.32	3...	H1-1b*
81	M1	3/4	.072	2.75	43	.031	2.292		34	4419.0...	14320.8	184.32	184.32	3...	H1-1b*
82	M60	3/4	.071	41.25	160	.032	41.708		1...	4419.0...	14320.8	184.32	184.32	3...	H1-1b*
83	M165	PIPE_2.0	.069	75.86	22	.044	75.86		1...	19898...	32130	1871.6...	1871.6...	1...	H1-1b*
84	M167A	PIPE_2.0	.068	76.095	25	.051	76.095		36	19839...	32130	1871.6...	1871.6...	1...	H1-1b*
85	M87	PL 2"x0.625"	.066	4.46	34	.021	0	y	36	39953...	40500	527.345	1687.5	1	H1-1b
86	M84	PL 2"x0.625"	.063	0	42	.018	4.46	y	43	39953...	40500	527.345	1687.5	1	H1-1b
87	M26	PL 2"x0.625"	.061	0	40	.019	4.46	y	39	39953...	40500	527.345	1687.5	1	H1-1b
88	M144	PL 2"x0.625"	.061	4.46	39	.020	0	y	42	39953...	40500	527.345	1687.5	1	H1-1b
89	M31	PL 2"x0.625"	.060	4.46	34	.017	0	y	48	39953...	40500	527.345	1687.5	1	H1-1b
90	M100	PIPE_2.0	.060	75.86	32	.044	0		92	19898...	32130	1871.6...	1871.6...	1...	H1-1b*
91	M86	PL 2"x0.625"	.058	4.46	34	.010	4.46	y	2...	39953...	40500	527.345	1687.5	1...	H1-1b
92	M141	PL 2"x0.625"	.057	0	46	.017	4.46	y	36	39953...	40500	527.345	1687.5	1	H1-1b
93	M169A	PIPE_2.0	.057	75.86	27	.046	75.86		2...	19898...	32130	1871.6...	1871.6...	1...	H1-1b*
94	M32	PL 2"x0.625"	.057	4.46	39	.016	4.46	y	38	39953...	40500	527.345	1687.5	1...	H1-1b
95	M85	PL 2"x0.625"	.056	0	34	.015	4.46	y	5	39953...	40500	527.345	1687.5	1...	H1-1b
96	M140	PL 2"x0.625"	.054	0	34	.015	4.46	y	49	39953...	40500	527.345	1687.5	1	H1-1b
97	M57	PIPE_2.0	.053	38.047	46	.036	0		1...	19839...	32130	1871.6...	1871.6...	1...	H1-1b
98	M143	PL 2"x0.625"	.053	4.46	38	.010	4.46	y	2...	39953...	40500	527.345	1687.5	1...	H1-1b
99	M145	PL 2"x0.625"	.053	4.46	42	.013	0	y	41	39953...	40500	527.345	1687.5	1	H1-1b
100	M142	PL 2"x0.625"	.051	0	46	.012	0	y	7	39953...	40500	527.345	1687.5	1...	H1-1b
101	M30	PL 2"x0.625"	.050	4.46	44	.014	0	y	45	39953...	40500	527.345	1687.5	1	H1-1b
102	M25	PL 2"x0.625"	.049	0	47	.014	0	y	39	39953...	40500	527.345	1687.5	1...	H1-1b
103	M83	PL 2"x0.625"	.049	0	45	.014	4.46	y	42	39953...	40500	527.345	1687.5	1	H1-1b
104	M88	PL 2"x0.625"	.048	4.46	38	.013	0	y	1...	39953...	40500	527.345	1687.5	1	H1-1b
105	M27	PL 2"x0.625"	.048	0	34	.012	4.46	y	34	39953...	40500	527.345	1687.5	1	H1-1b
106	M146	PL 2"x0.625"	.047	4.46	42	.012	0	y	15	39953...	40500	527.345	1687.5	1...	H1-1b
107	M139	PL 2"x0.625"	.046	0	34	.010	0	y	38	39953...	40500	527.345	1687.5	1...	H1-1b
108	M89	PL 2"x0.625"	.042	4.46	38	.011	4.46	y	35	39953...	40500	527.345	1687.5	1...	H1-1b
109	M82	PL 2"x0.625"	.041	0	46	.010	0	y	36	39953...	40500	527.345	1687.5	1...	H1-1b
110	M28	PL 2"x0.625"	.039	0	45	.013	4.46	y	15	39953...	40500	527.345	1687.5	1...	H1-1b
111	M29	PL 2"x0.625"	.036	4.46	43	.009	4.46	y	1...	39953...	40500	527.345	1687.5	1...	H1-1b
112	M59	3/4	.010	41.708	29	.054	41.708		35	4419.0...	14320.8	184.32	184.32	3...	H1-1b*
113	M2	3/4	.010	44	24	.037	41.708		45	4419.0...	14320.8	184.32	184.32	1	H1-1b*
114	M116	3/4	.006	41.708	18	.051	41.708		41	4419.0...	14320.8	184.32	184.32	3...	H1-1b*
115	M4	3/4	.002	2.292	26	.050	2.292		39	4419.0...	14320.8	184.32	184.32	2...	H1-1b*
116	M61	3/4	.000	0	282	.037	2.292		43	4419.0...	14320.8	184.32	184.32	1	H1-1a
117	M118	3/4	.000	0	282	.040	2.292		49	4419.0...	14320.8	184.32	184.32	1	H1-1a

Envelope AISI S100-16: LRFD Cold Formed Steel Code Checks

Member	Shape	Code ...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pn[lb]	phi*Tn[lb]	phi*Mny...	phi*Mnz...	phi*V...	phi*V...	Cb	Eqn
No Data to Print ...																

APPENDIX D

ADDITIONAL CALCULATIONS

Trylon

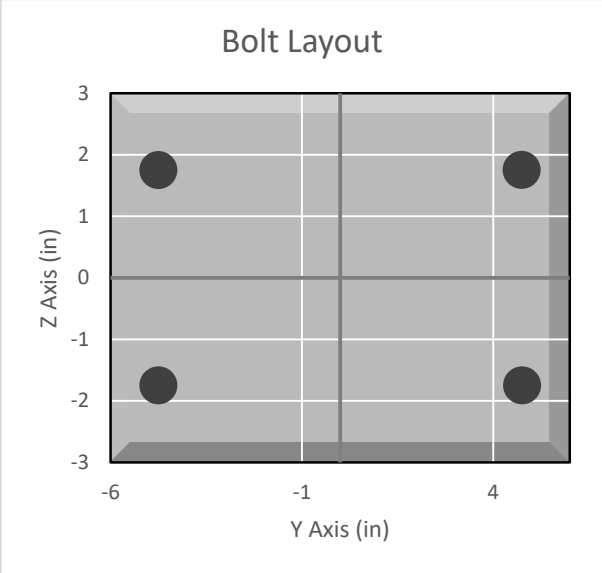
Analysis date: 5/13/2022

BOLT TOOL 1.5.2

Project Data	
Job Code:	208911
Carrier Site ID:	CTHA621A
Carrier Site Name:	A621_ATC_Monopole_Ash

Code	
Design Standard:	TIA-222-H
Slip Check:	Yes
Pretension Standard:	TIA-222-H

Bolt Properties		
Connection Type:	Threaded Rod	
Diameter:	0.625	in
Grade:	SAE J429 Gr.	--
Yield Strength (Fy):	57	ksi
Ultimate Strength (Fu):	74	ksi
Number of Bolts:	4	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	9.5	in



Connection Description
Mount to MSFAA Pipe

Bolt Check*		
Tensile Capacity (ϕT_n):	12543.1	lbs
Shear Capacity (ϕV_n):	8513.6	lbs
Tension Force (T_u):	4372.0	lbs
Shear Force (V_u):	549.0	lbs
Tension Usage:	33.2%	--
Shear Usage:	6.1%	--
Interaction:	33.2%	Pass
Controlling Member:	M7	--
Controlling LC:	41	--

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

Slip Check*		
Sliding Capacity (ϕR_{ns}):	13430.6	lbs
Torsion Capacity (ϕR_{nr}):	5316.3	lb-ft
Sliding Force (V_{us}):	1900.7	lbs
Torsional Force (T_{ur}):	137.6	lb-ft
Sliding Usage:	13.5%	--
Torsion Usage:	2.7%	--
Interaction:	13.8%	Pass
Controlling Member:	M7	--
Controlling LC:	43	--

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

Trylon

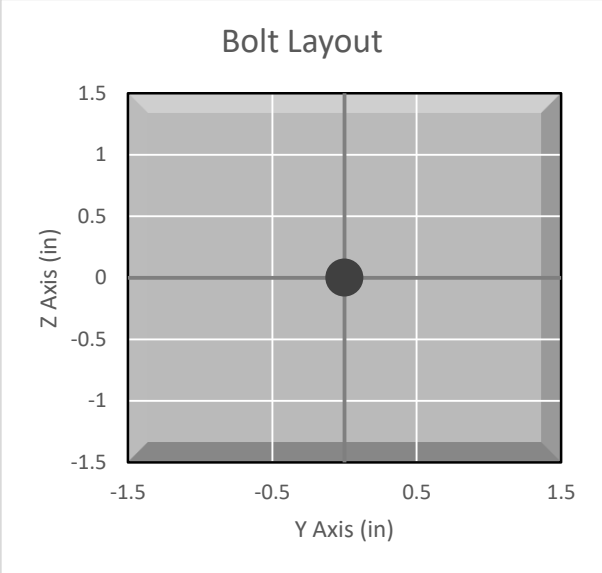
Analysis date: 5/13/2022

BOLT TOOL 1.5.2

Project Data	
Job Code:	208911
Carrier Site ID:	CTHA621A
Carrier Site Name:	A621_ATC_Monopole_Ash

Code	
Design Standard:	TIA-222-H
Slip Check:	No
Pretension Standard:	AISC

Bolt Properties		
Connection Type:	Bolt	
Diameter:	0.75	in
Grade:	A325	--
Yield Strength (Fy):	92	ksi
Ultimate Strength (Fu):	120	ksi
Number of Bolts:	1	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	-	in



Connection Description
1 Bolt Connection

Bolt Check*		
Tensile Capacity (ϕT_n):	30101.4	lbs
Shear Capacity (ϕV_n):	19880.4	lbs
Tension Force (T_u):	1997.5	lbs
Shear Force (V_u):	2828.4	lbs
Tension Usage:	6.3%	--
Shear Usage:	13.5%	--
Interaction:	13.5%	Pass
Controlling Member:	M10	--
Controlling LC:	34	--

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

Trylon

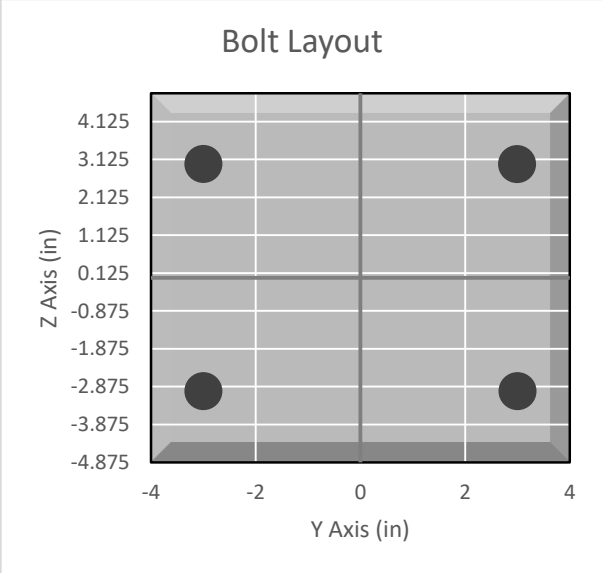
Analysis date: 5/13/2022

BOLT TOOL 1.5.2

Project Data	
Job Code:	208911
Carrier Site ID:	CTHA621A
Carrier Site Name:	A621_ATC_Monopole_Ash

Code	
Design Standard:	TIA-222-H
Slip Check:	Yes
Pretension Standard:	TIA-222-H

Bolt Properties		
Connection Type:	Threaded Rod	
Diameter:	0.625	in
Grade:	SAE J429 Gr.	--
Yield Strength (Fy):	57	ksi
Ultimate Strength (Fu):	74	ksi
Number of Bolts:	4	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	6	in



Connection Description
Mast Pipe to Collar

Bolt Check*		
Tensile Capacity (ϕT_n):	12543.1	lbs
Shear Capacity (ϕV_n):	8513.6	lbs
Tension Force (T_u):	891.9	lbs
Shear Force (V_u):	1392.5	lbs
Tension Usage:	6.8%	--
Shear Usage:	15.6%	--
Interaction:	15.6%	Pass
Controlling Member:	M104	--
Controlling LC:	13	--

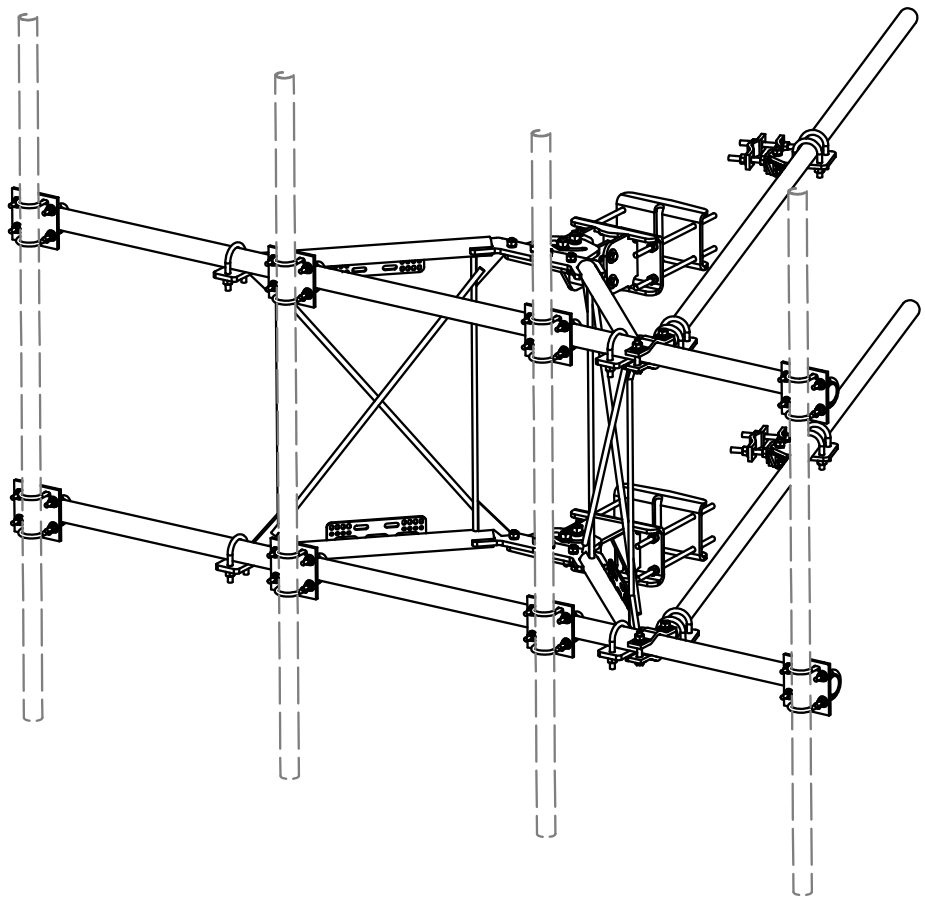
**Rating per TIA-222-H Section 15.5*

Slip Check*		
Sliding Capacity (ϕR_{ns}):	13148.6	lbs
Torsion Capacity (ϕR_{nr}):	3287.2	lb-ft
Sliding Force (V_{us}):	2089.0	lbs
Torsional Force (T_{ur}):	145.7	lb-ft
Sliding Usage:	15.1%	--
Torsion Usage:	4.8%	--
Interaction:	15.9%	Pass
Controlling Member:	M56B	--
Controlling LC:	43	--

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

APPENDIX E

SUPPLEMENTAL DRAWINGS



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	20.04	40.09
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	8	SCX2	CROSSOVER PLATE	7 in	4.80	38.37
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	P2126	2-3/8" X 126" (2" SCH. 40) GALVANIZED PIPE	126 in	40.75	81.50
14	2	P30126	2-7/8" O.D. X 126" SCH. 40 PIPE	126 in	64.63	129.25
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.)		1.57	12.54
20	4	G58R-12	5/8" x 12" THREADED ROD (HDG.)		1.05	4.18
21	4	G58R-8	5/8" x 8" THREADED ROD (HDG.)		0.70	2.79
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	4	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	1.08
28	8	A582114	5/8" x 2-1/4" HDG A325 HEX BOLT	2 1/4 in	0.31	2.50
29	25	G58FW	5/8" HDG USS FLATWASHER	1/8 in	0.07	1.76
30	66	G58LW	5/8" HDG LOCKWASHER		0.03	1.72
31	71	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	9.22
32	32	X-UB1300	1/2" X 3" X 5" X 2" GALV U-BOLT		0.74	23.64
33	16	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.60	9.56
34	64	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	2.18
35	64	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	0.89
36	64	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	4.58
					TOTAL WT. #	713.44

REVISION HISTORY				
REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
D	UPDATED BCAM VERSION 1 TO BCAM VERSION 2		CEK	6/29/2018
C	UPDATED PIN LEG CONNECTION T0 BCAM CONNECTION		CEK	12/14/2017
B	CHANGED TIE-BACK BACK CONNECTION		CEK	7/28/2017
A	CHANGED TIE-BACK FRONT CONNECTION		CEK	2/2/2017

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
10' 6" HEAVY DUTY
V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

SITE PRO 1
A valmont COMPANY

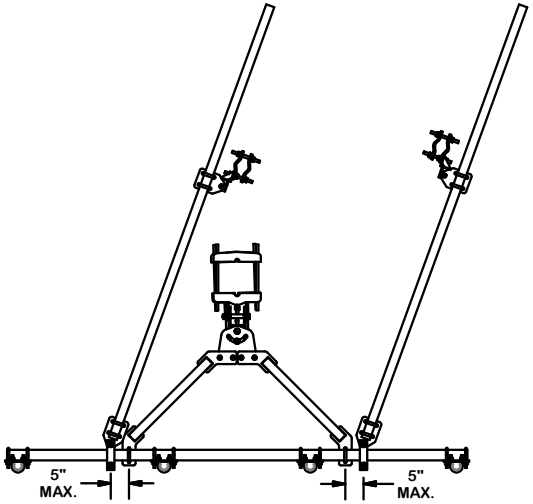
Engineering Support Team:
1-888-753-7446

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

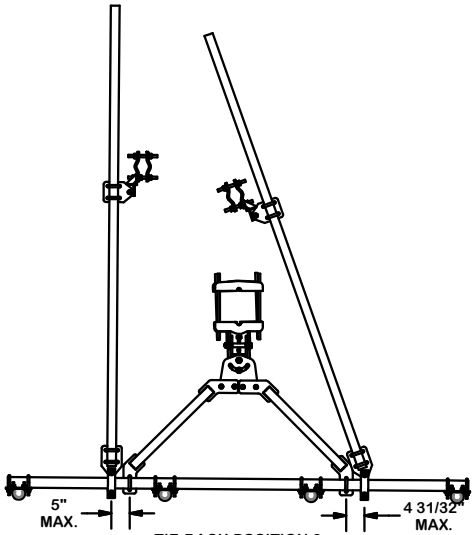
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	CEK 1/25/2017		VFA10-HD	1 OF 5

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 6/29/2018	VFA10-HD

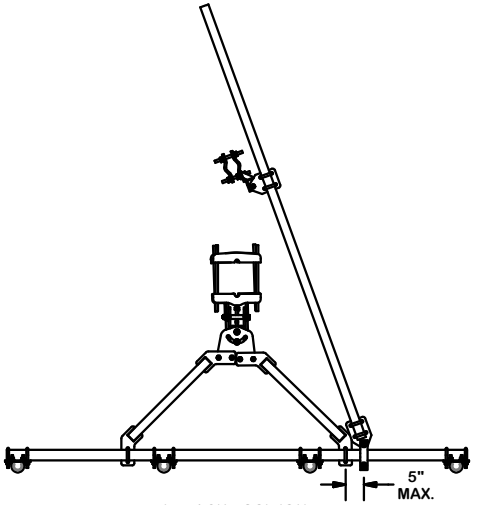
TIE-BACK POSITIONS



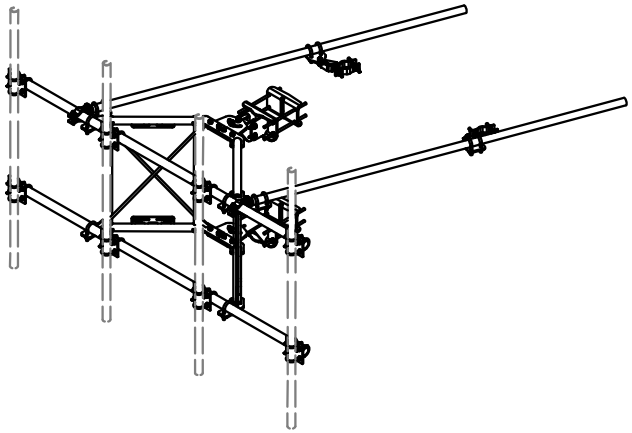
TIE-BACK POSITION 1
-20° / +20° TOP PARALLEL

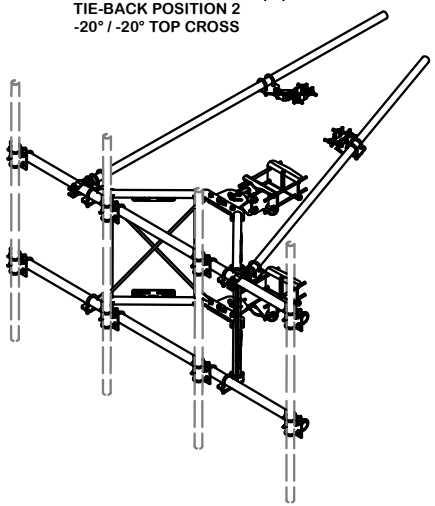


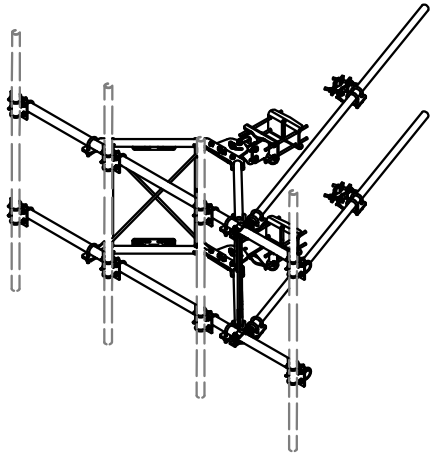
TIE-BACK POSITION 2
-20° / -20° TOP CROSS



TIE-BACK POSITION 3
-20° SAME SIDE STACKED







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REVISION HISTORY

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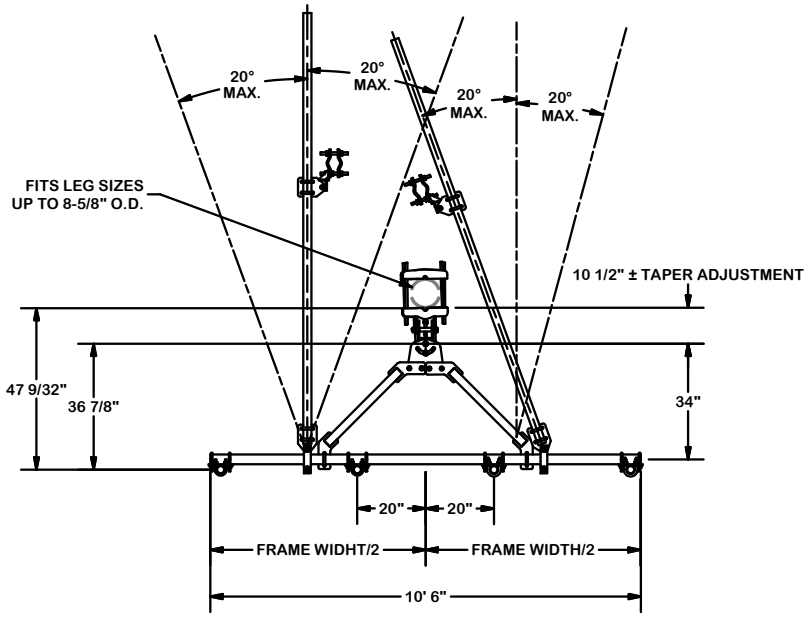
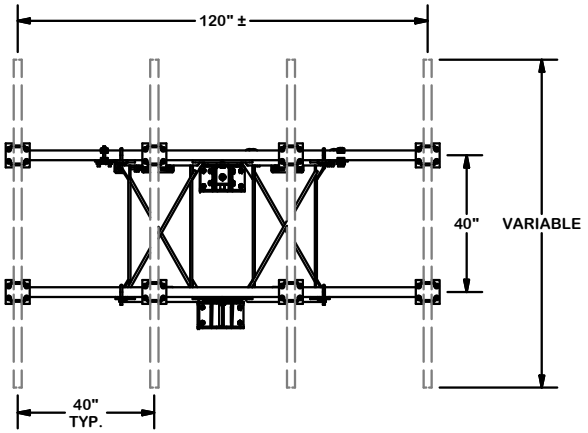
	CEK 1/25/2017		VFA10-HD

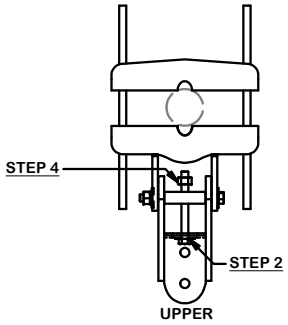
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 6/29/2018	VFA10-HD

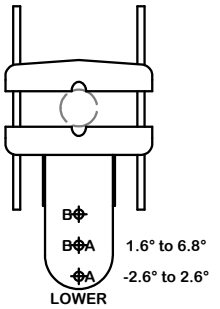


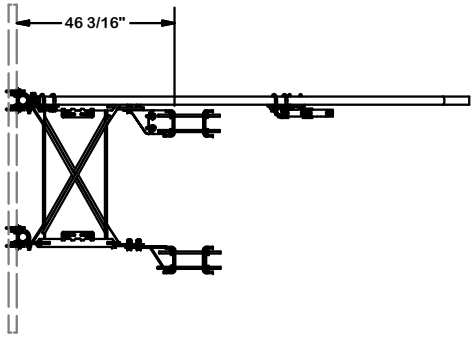


ANGLE CALIBRATING PROCEDURE:

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.







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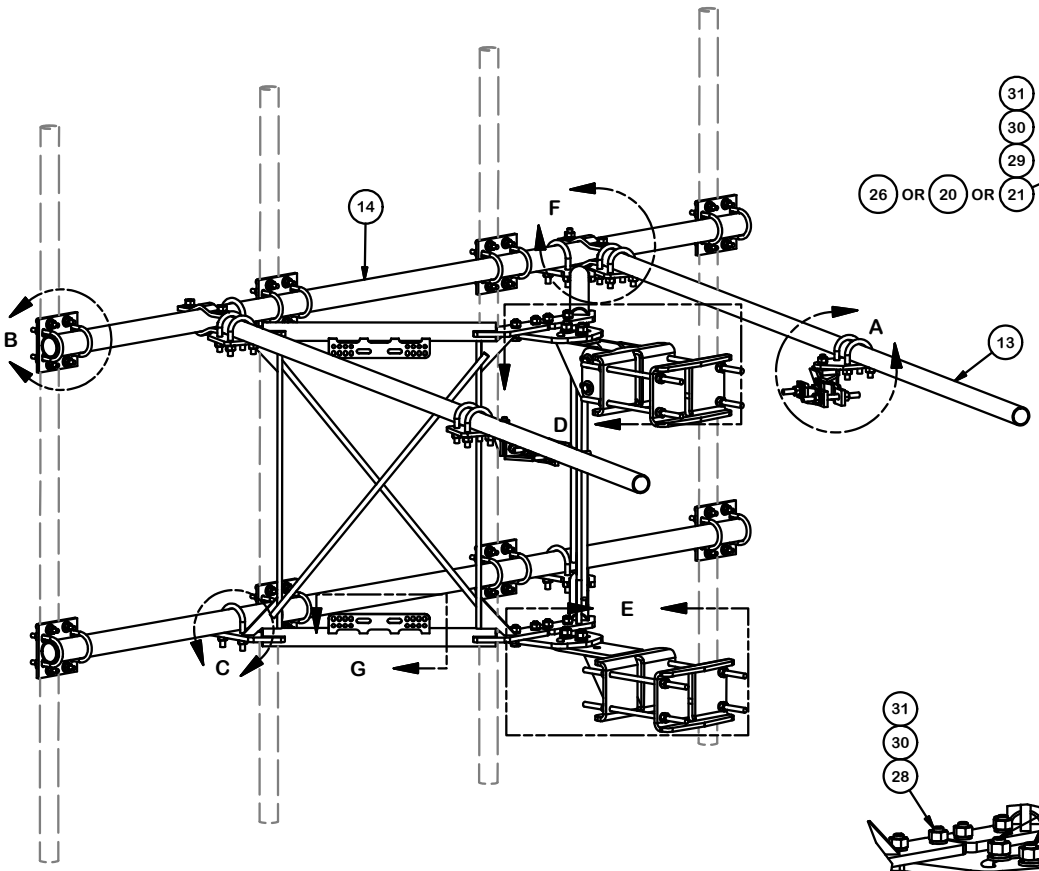
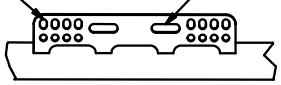
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 6/29/2018	VFA10-HD



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



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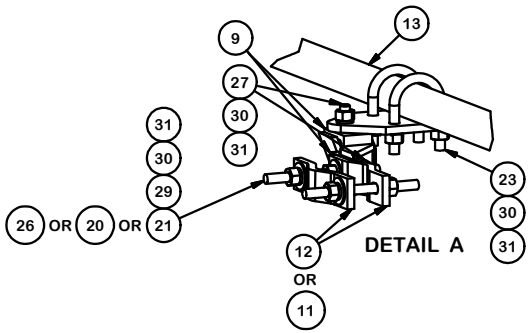

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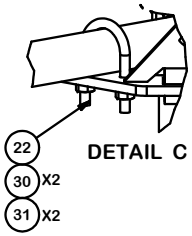

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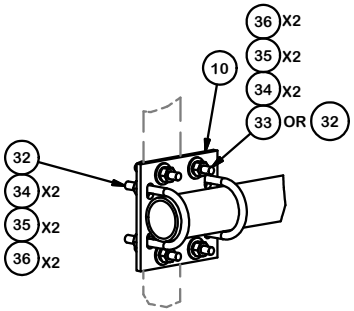

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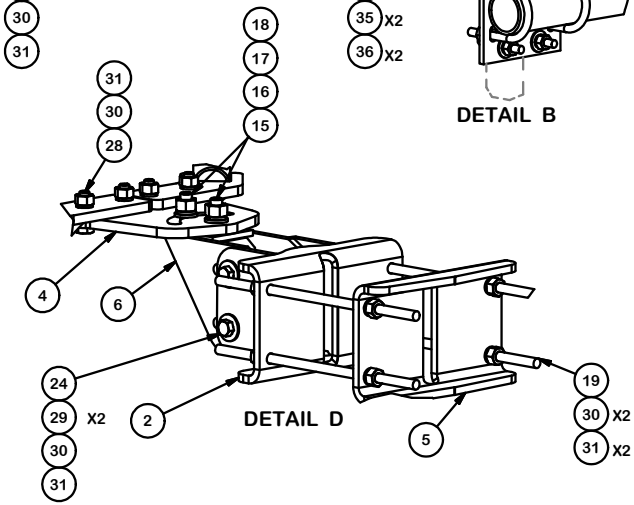

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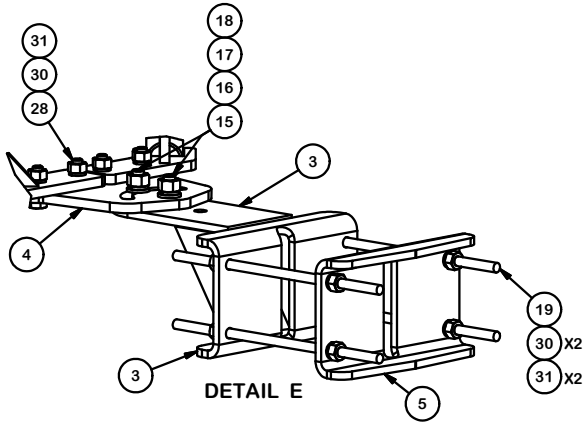

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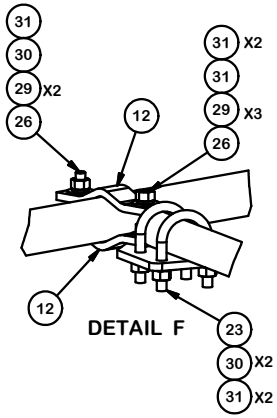


DETAIL F

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
D	UPDATED BCAM VERSION 1 TO BCAM VERSION 2		CEK	6/29/2018
C	UPDATED PIN LEG CONNECTION T0 BCAM CONNECTION		CEK	12/14/2017
B	CHANGED TIE-BACK BACK CONNECTION		CEK	7/28/2017
A	CHANGED TIE-BACK FRONT CONNECTION		CEK	2/2/2017

REVISION HISTORY

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
10' 6" HEAVY DUTY
V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

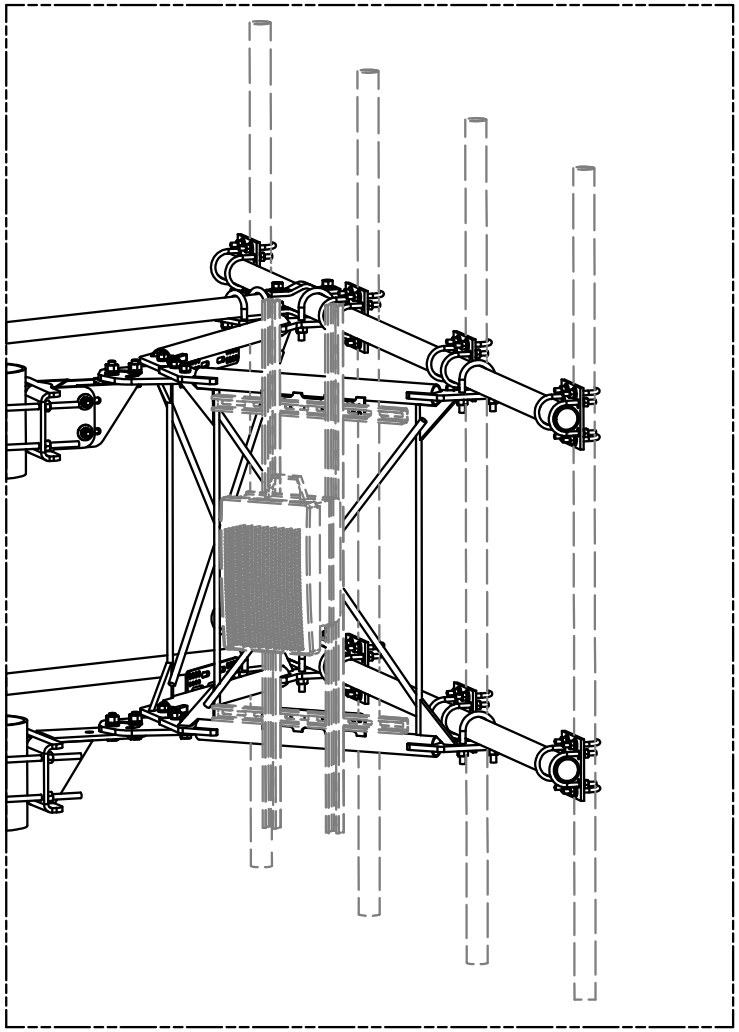
SITE PRO 1
A valmont COMPANY

Engineering Support Team:
1-888-753-7446

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

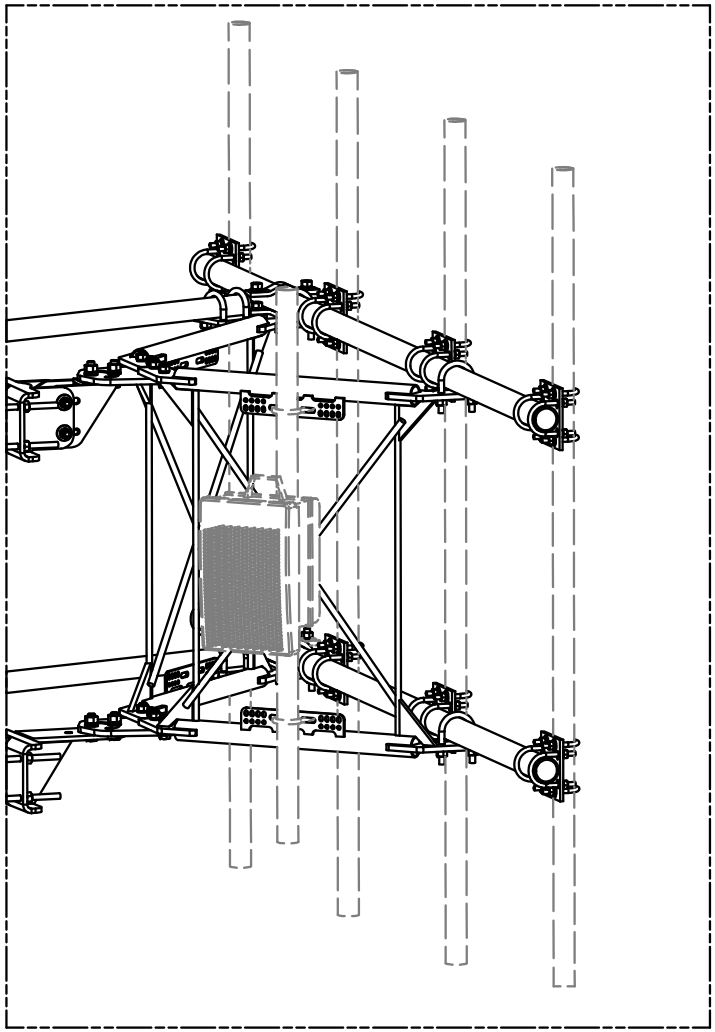
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 1/25/2017		VFA10-HD

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 6/29/2018	VFA10-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
D	UPDATED BCAM VERSION 1 TO BCAM VERSION 2		CEK	6/29/2018
C	UPDATED PIN LEG CONNECTION T0 BCAM CONNECTION		CEK	12/14/2017
B	CHANGED TIE-BACK BACK CONNECTION		CEK	7/28/2017
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DESCRIPTION
10' 6" HEAVY DUTY
V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

SITE PRO 1
A valmont COMPANY

Engineering
Support Team:
1-888-753-7446

Locations:
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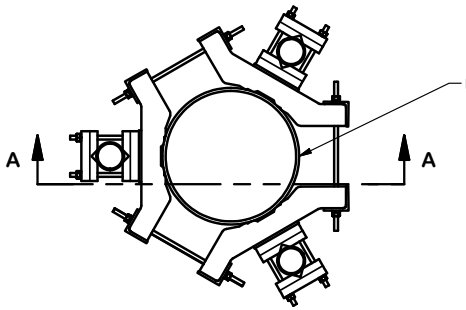
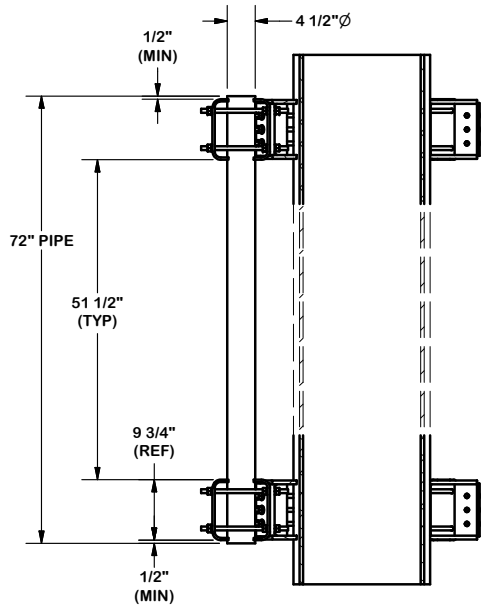
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 1/25/2017		VFA10-HD

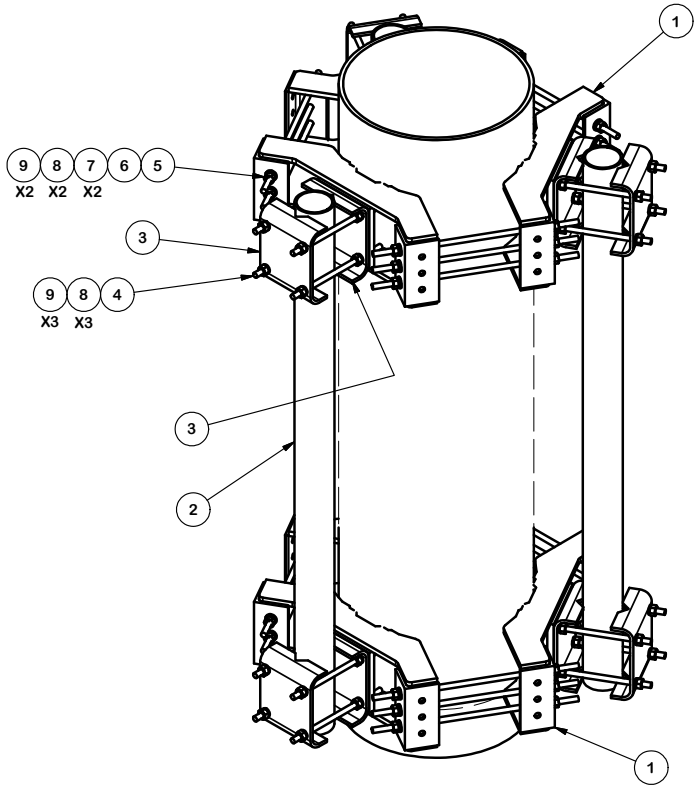
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 6/29/2018	VFA10-HD

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT
1	6	X-LWRM	RING MOUNT WELDMENT		68.16	408.96
2	3	P472	4-1/2" X 72" SCH. 40 GALVANIZED PIPE	72 in	64.89	194.68
3	12	X-214130	BENT PLATE V-CLAMP	12 5/8 in	11.43	137.16
4	24	G58R-14	5/8" x 14" THREADED ROD (HDG.)	14 in	0.40	9.57
5	18	G58R-48	5/8" x 48" THREADED ROD (HDG.)	48 in	.55	9.90
6	18	G58R-24	5/8" x 24" THREADED ROD (HDG.)	24 in	.55	9.90
7	36	A58FW	5/8" HDG A325 FLATWASHER		.03	1.08
8	108	G58LW	5/8" HDG LOCKWASHER		0.03	3.24
9	108	A58NUT	5/8" HDG A325 HEX NUT		0.13	14.04
					TOTAL WT. #	788.53





SECTION A-A



TOLERANCE NOTES

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SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
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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: MONOPOLE SECTOR FRAME ATTACHMENT ASSEMBLY

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.
	KC8 3/18/2016	3RD PARTY	MSFAA
CLASS / SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
01 / 01	CUSTOMER	BMC 5/2/2016	MSFAA

Date: **May 17, 2022**

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Site Number:	CTHA621A
Crown Castle Designation:	**BU Number:**	842867
	Site Name:	Mansfield Four Corners
	JDE Job Number:	712283
	Work Order Number:	2114129
	Order Number:	611795 Rev. 0
Engineering Firm Designation:	**B+T Group Project Number:**	151918.004.01
Site Data:	**497 Middle Turnpike, Storrs Mansfield, Tolland County, CT** **Latitude *41° 49' 32.81"*, Longitude *-72° 16' 54.46"*** **120 Foot - Monopole Tower**	

B+T Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

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

LC7: Proposed Equipment Configuration **Sufficient Capacity – 59.2%**

This analysis utilizes an ultimate 3-second gust wind speed of 119 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Massood Sattari

Respectfully submitted by: B+T Engineering, Inc.
COA: PEC.0001564; Expires: 02/10/2023

Chad E. Tuttle, P.E.

tnxTower Report - version 8.1.1.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 120 ft. Monopole tower designed by PennSummit Tubular, LLC, In November of 2003

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	119 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
88.0	88.0	3	Site Pro 1	VFA10-HD-NLB	3 4	1-5/8 1/2
		1	Andrew	VHLP2-11-2GR		
		1	Ceragon	FIBEAIR IP-20C		
		3	Commscope	VV-65A-R1_TMO		
		3	Ericsson	AIR 6419 B41_TMO		
		3	Ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	Ericsson	Radio 4480_TMOV2		
		3	RFS Celwave	APXVAALL24_43-U-NA20_TMO		

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)
122.0	122.0	1	Andrew	SBNH-1D6565C	12 2 1	1-1/4 7/8 3/8
		2	CCI Antennas	HPA-65R-BUU-H6		
		1	CCI Antennas	HPA-65R-BUU-H8		
		3	Ericsson	RRUS 11		
		3	Ericsson	RRUS 32 B2		
		3	Kathrein	78211056		
		2	KMW Comm.	AM-X-CD-16-65-00T-RET		
		6	Powerwave Tech.	7020.00		
		3	Powerwave Tech.	7770.00		
		6	Powerwave Tech.	LGP 17201		
		1	Raycap	DC6-48-60-18-8F		
		1	--	Platform Mount [LP 303-1_HR-1]		
109.0	109.0	3	Commscope	LNX-8513DS-VTM	8	1-5/8
		3	Commscope	NHH-65B-R2B		
		3	Commscope	NHHSS-65B-R2B		
		1	Raycap	RVZDC-3315-PF-48		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		1	Raycap	RVZDC-6627-PF-48		
		3	Samsung Telecomm.	CBRS RT4401-48A		
		3	Samsung Telecomm.	MT6407-77A		
		3	Samsung Telecomm.	RFV01U-D1A		
		3	Samsung Telecomm.	RFV01U-D2A		
		1	--	Platform Mount [LP 303-1]		
		1	--	Side Arm Mount [SO 102-3]		
99.0	99.0	3	Fujitsu	TA08025-B604	1	1-1/2
		3	Fujitsu	TA08025-B605		
		3	JMA Wireless	MX08FRO665-21		
		1	Raycap	RDIDC-9181-PF-48		
		1	--	Commscope MC-PK8-DSH (1)		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Tower Manufacturer Drawing	5214860	CCI Sites
Foundation Drawing	4858941	CCI Sites
Geotech Report	4713232	CCI Sites
Crown CAD Package	Date: 05/12/2022	CCI Sites

3.1) Analysis Method

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

3.2) Assumptions

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

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group 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	120 - 70.75	Pole	TP32.28x18x0.188	1	-18.358	1130.766	59.2	Pass
L2	70.75 - 34.75	Pole	TP42.35x30.745x0.313	2	-25.170	2468.371	42.8	Pass
L3	34.75 - 0	Pole	TP51.8x40.202x0.375	3	-36.690	3759.735	39.3	Pass
							Summary	
						Pole (L1)	59.2	Pass
						Rating =	59.2	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	Base	33.4	Pass
1,2	Base Plate	Base	29.8	Pass
1,2	Base Foundation (Structure)	Base	47.2	Pass
1,2	Base Foundation (Soil Interaction)	Base	51.0	Pass

Structure Rating (max from all components) =	**59.2%**

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.
2) Rating per TIA-222-H Section 15.5.

4.1) Recommendations

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

The result of the tilt and twist values for a 60 mph 3-second gust service wind speed per the TIA-222-H Standard are given below:

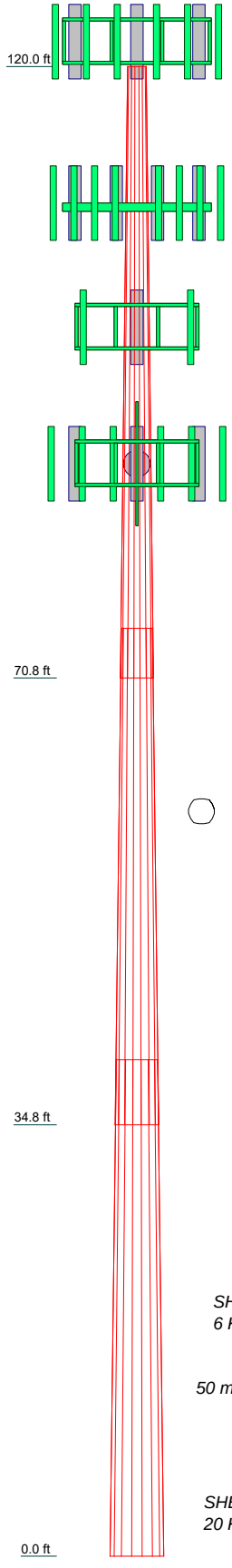
Table 6 – Proposed Equipment Tilt-Sway Results for 60 mph Service Wind – LC7

Elevation (ft)	*Dish Model*	*Diameter (ft)*	*Tilt (°)*	*Twist (°)*
88.0	VHLP2-11-2GR	2.175	0.630	0.000

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	49.250	18	0.188	4.000	18.000	32.280	A607-65	2.5
2	40.000	18	0.313	5.250	30.745	42.350		4.9
3	40.000	18	0.375		40.202	51.800		7.4
								14.8



ALL REACTIONS ARE FACTORED

AXIAL 63 K

SHEAR 6 K

MOMENT 537 kip-ft

TORQUE 0 kip-ft

50 mph WIND - 1.500 in ICE

AXIAL 37 K

SHEAR 20 K

MOMENT 1729 kip-ft

TORQUE 0 kip-ft

REACTIONS - 119 mph WIND

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 119 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TIA-222-H Annex S
9. TOWER RATING: 59.2%

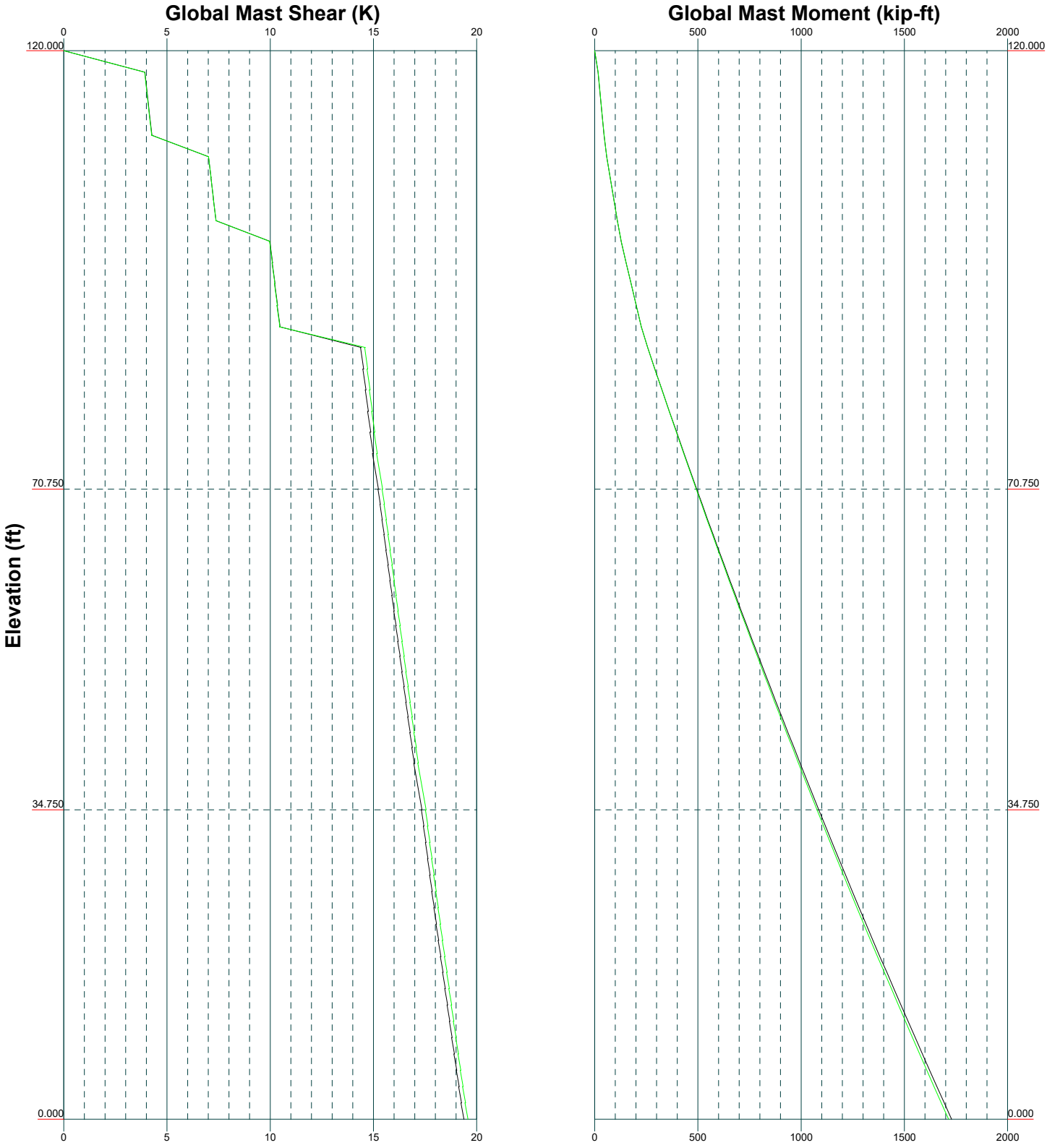
B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 151918.004.01- Mansfield Four Corners, CT (BU# 84286)		
Project:		
Client: Crown Castle	Drawn by: R AITHAL	App'd:
Code: TIA-222-H	Date: 05/17/22	Scale: NTS
Path:		Dwg No. E-1

TIA-222-H - 119 mph/50 mph 1.500 in Ice Exposure B

Maximum Values

Vx Vz Mx Mz



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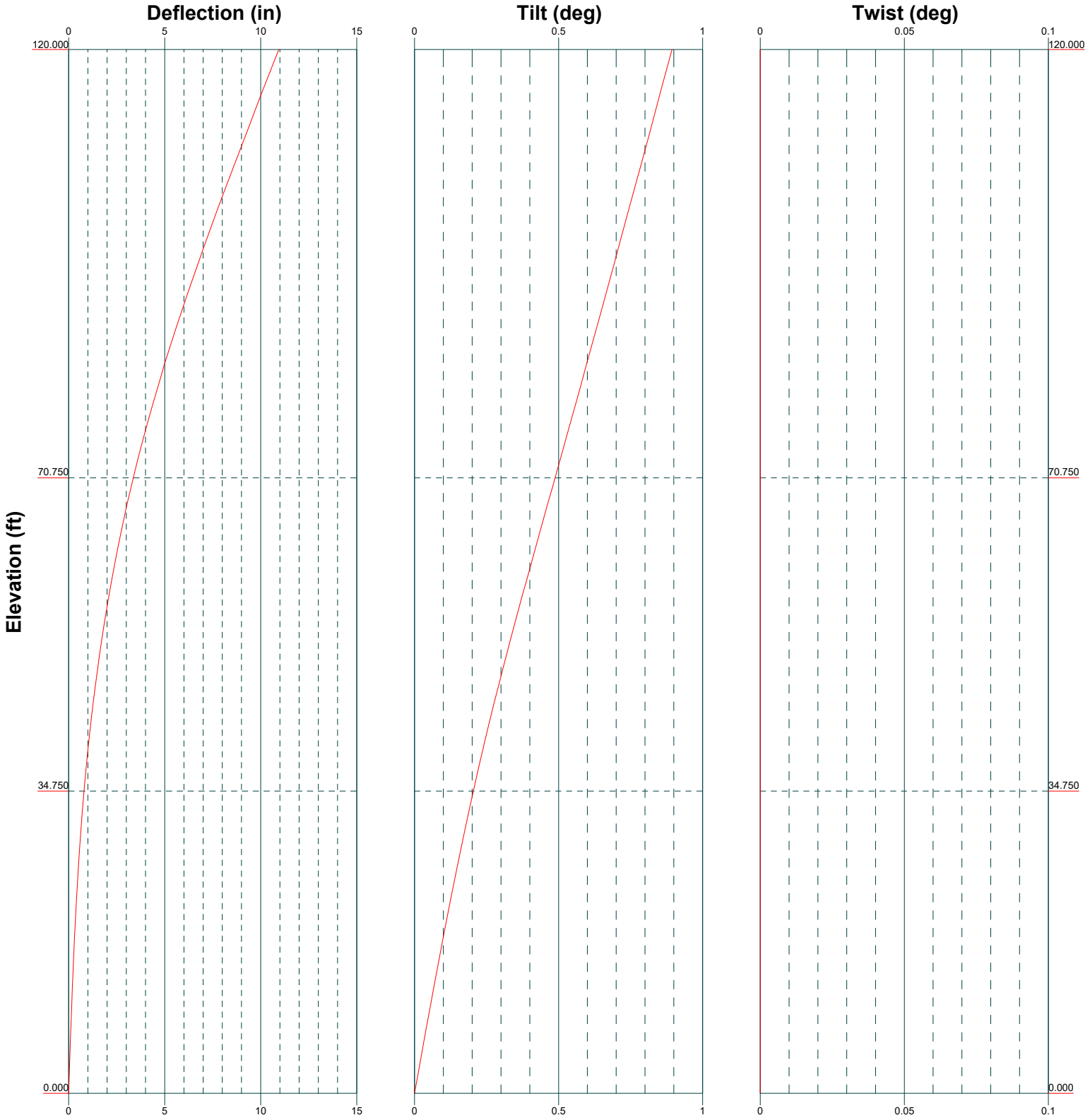
Job: 151918.004.01- Mansfield Four Corners, CT (BU# 84286			
Project:			
Client: Crown Castle	Drawn by: R AITHAL	App'd:	
Code: TIA-222-H	Date: 05/17/22	Scale: NTS	
Path:		Dwg No. E-4	

TIA-222-H - Service - 60 mph

Maximum Values



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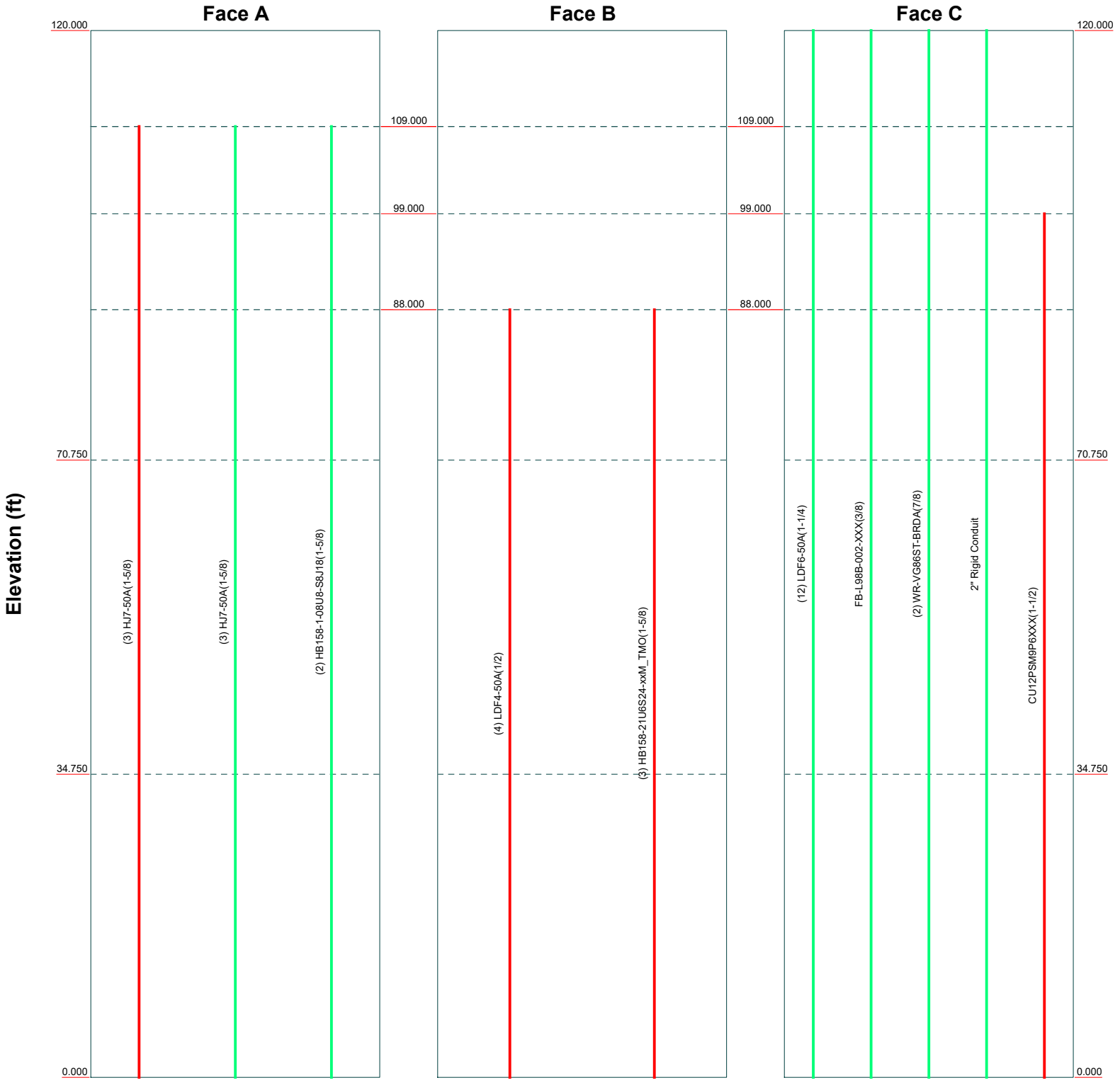
Job: 151918.004.01- Mansfield Four Corners, CT (BU# 84286			
Project:			
Client: Crown Castle	Drawn by: R AITHAL	App'd:	
Code: TIA-222-H	Date: 05/17/22	Scale: NTS	
Path:		Dwg No. E-5	

Feed Line Distribution Chart
0' - 120'

Round | Flat | App In Face | App Out Face | Truss Leg



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Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: ***151918.004.01- Mansfield Four Corners, CT (BU# 84286***)		
Project:		
Client: Crown Castle	Drawn by: R AITHAL	App'd:
Code: TIA-222-H	Date: 05/17/22	Scale: NTS
Path:		Dwg No. E-7

Tower Input Data

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

Tower is located in Tolland County, Connecticut.
Tower base elevation above sea level: 559.000 ft.
Basic wind speed of 119 mph.
Risk Category II.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.000 ft.
Nominal ice thickness of 1.500 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
TIA-222-H Annex S.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
Maximum demand-capacity ratio is: 1.05.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	120.000-70.750	49.250	4.000	18	18.000	32.280	0.188	0.750	A607-65 (65 ksi)
L2	70.750-34.750	40.000	5.250	18	30.745	42.350	0.313	1.250	A607-65 (65 ksi)
L3	34.750-0.000	40.000		18	40.202	51.800	0.375	1.500	A607-65 (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	18.249	10.601	424.933	6.323	9.144	46.471	850.425	5.301	2.838	15.136
	32.749	19.099	2485.171	11.393	16.398	151.551	4973.612	9.551	5.351	28.54
L2	32.350	30.185	3531.962	10.804	15.619	226.139	7068.571	15.096	4.861	15.556
	42.955	41.696	9309.043	14.923	21.514	432.701	18630.335	20.852	6.904	22.092
L3	42.310	47.404	9499.575	14.139	20.423	465.151	19011.650	23.706	6.416	17.108
	52.541	61.209	20450.246	18.256	26.314	777.150	40927.401	30.610	8.457	22.551

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 120.000-70.750				1	1	1			
L2 70.750-34.750				1	1	1			
L3 34.750-0.000				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 klf
*										
HJ7-50A(1-5/8)	A	No	Surface Ar (CaAa)	109.000 - 0.000	3	3	-0.100 -0.010	1.980		0.001
*										
CU12PSM9P6XXX(1-1/2)	C	No	Surface Ar (CaAa)	99.000 - 0.000	1	1	-0.470 -0.450	1.600		0.002
*										
LDF4-50A(1/2)	B	No	Surface Ar (CaAa)	88.000 - 0.000	4	4	-0.110 -0.080	0.625		0.000
HB158-21U6S24-xxM_TMO(1-5/8)	B	No	Surface Ar (CaAa)	88.000 - 0.000	3	3	-0.160 -0.070	1.996		0.003
*										

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 klf
*									
LDF6-50A(1-1/4)	C	No	No	Inside Pole	120.000 - 0.000	12	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
FB-L98B-002-XXX(3/8)	C	No	No	Inside Pole	120.000 - 0.000	1	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
							2" Ice	0.000	0.000
WR-VG86ST-BRD A(7/8)	C	No	No	Inside Pole	120.000 - 0.000	2	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
2" Rigid Conduit	C	No	No	Inside Pole	120.000 - 0.000	1	No Ice	0.000	0.003
							1/2" Ice	0.000	0.003
							1" Ice	0.000	0.003
							2" Ice	0.000	0.003
HJ7-50A(1-5/8)	A	No	No	Inside Pole	109.000 - 0.000	3	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
HB158-1-08U8-S8J 18(1-5/8)	A	No	No	Inside Pole	109.000 - 0.000	2	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
*									

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	120.000-70.750	A	0.000	0.000	22.721	0.000	0.338
		B	0.000	0.000	14.642	0.000	0.140
		C	0.000	0.000	4.520	0.000	0.629
L2	70.750-34.750	A	0.000	0.000	21.384	0.000	0.318
		B	0.000	0.000	30.557	0.000	0.292
		C	0.000	0.000	5.760	0.000	0.496
L3	34.750-0.000	A	0.000	0.000	20.642	0.000	0.307
		B	0.000	0.000	29.496	0.000	0.281
		C	0.000	0.000	5.560	0.000	0.479

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	120.000-70.750	A	1.415	0.000	0.000	41.931	0.000	0.754
		B		0.000	0.000	30.506	0.000	0.427
		C		0.000	0.000	12.514	0.000	0.776
L2	70.750-34.750	A	1.335	0.000	0.000	39.464	0.000	0.710
		B		0.000	0.000	63.665	0.000	0.891
		C		0.000	0.000	15.947	0.000	0.684
L3	34.750-0.000	A	1.191	0.000	0.000	37.401	0.000	0.661
		B		0.000	0.000	60.069	0.000	0.820
		C		0.000	0.000	14.840	0.000	0.645

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	120.000-70.750	-0.647	-2.097	-0.190	-1.724
L2	70.750-34.750	0.996	-3.615	1.378	-2.992
L3	34.750-0.000	1.085	-3.913	1.526	-3.362

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
L1	9	HJ7-50A(1-5/8)	70.75 - 109.00	1.0000	1.0000
L1	14	CU12PSM9P6XXX(1-1/2)	70.75 - 99.00	1.0000	1.0000
L1	16	LDF4-50A(1/2)	70.75 - 88.00	1.0000	1.0000
L1	17	HB158-21U6S24-xxM_TMO (1-5/8)	70.75 - 88.00	1.0000	1.0000
L2	9	HJ7-50A(1-5/8)	34.75 - 70.75	1.0000	1.0000
L2	14	CU12PSM9P6XXX(1-1/2)	34.75 - 70.75	1.0000	1.0000
L2	16	LDF4-50A(1/2)	34.75 - 70.75	1.0000	1.0000
L2	17	HB158-21U6S24-xxM_TMO (1-5/8)	34.75 - 70.75	1.0000	1.0000
L3	9	HJ7-50A(1-5/8)	0.00 - 34.75	1.0000	1.0000
L3	14	CU12PSM9P6XXX(1-1/2)	0.00 - 34.75	1.0000	1.0000
L3	16	LDF4-50A(1/2)	0.00 - 34.75	1.0000	1.0000
L3	17	HB158-21U6S24-xxM_TMO (1-5/8)	0.00 - 34.75	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
*									
7770.00 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.746 6.179 6.607 7.488	4.254 5.014 5.711 7.155	0.055 0.103 0.157 0.287
7770.00 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.746 6.179 6.607 7.488	4.254 5.014 5.711 7.155	0.055 0.103 0.157 0.287
7770.00 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.746 6.179 6.607 7.488	4.254 5.014 5.711 7.155	0.055 0.103 0.157 0.287
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	9.220 9.980 10.760 12.360	6.250 6.960 7.700 9.220	0.074 0.143 0.224 0.420
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	9.220 9.980 10.760 12.360	6.250 6.960 7.700 9.220	0.074 0.143 0.224 0.420
HPA-65R-BUU-H8 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	12.250 13.190 14.160 16.140	8.330 9.230 10.150 12.050	0.105 0.194 0.297 0.543
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.630 5.060 5.510 6.430	3.270 3.690 4.120 5.000	0.074 0.133 0.203 0.376
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.630 5.060 5.510 6.430	3.270 3.690 4.120 5.000	0.074 0.133 0.203 0.376
SBNH-1D6565C w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.560 6.070 6.590 7.650	4.470 4.970 5.470 6.520	0.085 0.167 0.262 0.495
(2) 7020.00	A	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.102 0.147 0.199 0.326	0.175 0.239 0.311 0.476	0.002 0.005 0.009 0.022
(2) 7020.00	B	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.102 0.147 0.199 0.326	0.175 0.239 0.311 0.476	0.002 0.005 0.009 0.022
(2) 7020.00	C	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.102 0.147 0.199 0.326	0.175 0.239 0.311 0.476	0.002 0.005 0.009 0.022
(2) LGP 17201	A	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.668 1.829 1.997 2.356	0.467 0.568 0.675 0.912	0.031 0.042 0.055 0.089
(2) LGP 17201	B	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.668 1.829 1.997 2.356	0.467 0.568 0.675 0.912	0.031 0.042 0.055 0.089

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) LGP 17201	C	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.668 1.829 1.997 2.356	0.467 0.568 0.675 0.912	0.031 0.042 0.055 0.089
RRUS 32 B2	A	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.731 2.953 3.182 3.663	1.668 1.855 2.049 2.458	0.053 0.074 0.098 0.157
RRUS 32 B2	B	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.731 2.953 3.182 3.663	1.668 1.855 2.049 2.458	0.053 0.074 0.098 0.157
RRUS 32 B2	C	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.731 2.953 3.182 3.663	1.668 1.855 2.049 2.458	0.053 0.074 0.098 0.157
78211056	A	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.147 0.199 0.258 0.399	0.048 0.080 0.119 0.219	0.002 0.003 0.006 0.014
78211056	B	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.147 0.199 0.258 0.399	0.048 0.080 0.119 0.219	0.002 0.003 0.006 0.014
78211056	C	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.147 0.199 0.258 0.399	0.048 0.080 0.119 0.219	0.002 0.003 0.006 0.014
DC6-48-60-18-8F	A	From Leg	1.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.212 1.892 2.105 2.570	1.212 1.892 2.105 2.570	0.033 0.055 0.080 0.138
RRUS 11	A	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.784 2.992 3.207 3.658	1.187 1.334 1.490 1.833	0.048 0.068 0.092 0.150
RRUS 11	B	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.784 2.992 3.207 3.658	1.187 1.334 1.490 1.833	0.048 0.068 0.092 0.150
RRUS 11	C	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.784 2.992 3.207 3.658	1.187 1.334 1.490 1.833	0.048 0.068 0.092 0.150
6' x 2" Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
6' x 2" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
6' x 2" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
6' x 2" Mount Pipe	A	From Leg	1.000	0.000	122.000	No Ice	1.425	1.425	0.022

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
			0.000 0.000			1/2" Ice 1" Ice 2" Ice	1.925 2.294 3.060	1.925 2.294 3.060	0.033 0.048 0.090
Platform Mount [LP 303-1_HR-1]	C	None		0.000	122.000	No Ice 1/2" Ice 1" Ice 2" Ice	17.090 21.470 25.720 33.960	17.090 21.470 25.720 33.960	1.495 1.881 2.346 3.518
*									
LNX-8513DS-VTM w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	109.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.490 4.890 5.710	3.300 3.680 4.060 4.870	0.065 0.128 0.202 0.384
LNX-8513DS-VTM w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	109.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.490 4.890 5.710	3.300 3.680 4.060 4.870	0.065 0.128 0.202 0.384
LNX-8513DS-VTM w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	109.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.490 4.890 5.710	3.300 3.680 4.060 4.870	0.065 0.128 0.202 0.384
NHH-65B-R2B w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	109.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.480 4.880 5.700	3.290 3.670 4.060 4.860	0.069 0.132 0.205 0.385
NHH-65B-R2B w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	109.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.480 4.880 5.700	3.290 3.670 4.060 4.860	0.069 0.132 0.205 0.385
NHH-65B-R2B w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	109.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.480 4.880 5.700	3.290 3.670 4.060 4.860	0.069 0.132 0.205 0.385
NHHSS-65B-R2B w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	109.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.890 4.270 4.650 5.430	3.140 3.500 3.870 4.630	0.091 0.154 0.227 0.407
NHHSS-65B-R2B w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	109.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.890 4.270 4.650 5.430	3.140 3.500 3.870 4.630	0.091 0.154 0.227 0.407
NHHSS-65B-R2B w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	109.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.890 4.270 4.650 5.430	3.140 3.500 3.870 4.630	0.091 0.154 0.227 0.407
MT6407-77A w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	109.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.907 5.256 5.615 6.362	2.682 3.145 3.624 4.631	0.096 0.136 0.180 0.288
MT6407-77A w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	109.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.907 5.256 5.615 6.362	2.682 3.145 3.624 4.631	0.096 0.136 0.180 0.288
MT6407-77A w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	109.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.907 5.256 5.615 6.362	2.682 3.145 3.624 4.631	0.096 0.136 0.180 0.288
RFV01U-D1A	A	From Leg	4.000	0.000	109.000	No Ice	1.875	1.250	0.084

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1/2" Ice	2.045	1.393	0.103
			0.000			1" Ice	2.223	1.543	0.124
						2" Ice	2.601	1.865	0.175
RFV01U-D1A	B	From Leg	4.000	0.000	109.000	No Ice	1.875	1.250	0.084
			0.000			1/2" Ice	2.045	1.393	0.103
			0.000			1" Ice	2.223	1.543	0.124
						2" Ice	2.601	1.865	0.175
RFV01U-D1A	C	From Leg	4.000	0.000	109.000	No Ice	1.875	1.250	0.084
			0.000			1/2" Ice	2.045	1.393	0.103
			0.000			1" Ice	2.223	1.543	0.124
						2" Ice	2.601	1.865	0.175
CBRS RT4401-48A	A	From Leg	4.000	0.000	109.000	No Ice	0.991	0.496	0.019
			0.000			1/2" Ice	1.120	0.596	0.026
			0.000			1" Ice	1.255	0.704	0.036
						2" Ice	1.549	0.942	0.062
CBRS RT4401-48A	B	From Leg	4.000	0.000	109.000	No Ice	0.991	0.496	0.019
			0.000			1/2" Ice	1.120	0.596	0.026
			0.000			1" Ice	1.255	0.704	0.036
						2" Ice	1.549	0.942	0.062
CBRS RT4401-48A	C	From Leg	4.000	0.000	109.000	No Ice	0.991	0.496	0.019
			0.000			1/2" Ice	1.120	0.596	0.026
			0.000			1" Ice	1.255	0.704	0.036
						2" Ice	1.549	0.942	0.062
RVZDC-3315-PF-48	A	From Leg	4.000	0.000	109.000	No Ice	4.063	2.989	0.027
			0.000			1/2" Ice	4.321	3.223	0.063
			0.000			1" Ice	4.587	3.465	0.103
						2" Ice	5.141	3.970	0.196
RVZDC-6627-PF-48	B	From Leg	4.000	0.000	109.000	No Ice	3.792	2.514	0.032
			0.000			1/2" Ice	4.044	2.727	0.063
			0.000			1" Ice	4.303	2.947	0.099
						2" Ice	4.844	3.417	0.181
RFV01U-D2A	A	From Leg	4.000	0.000	109.000	No Ice	1.875	1.013	0.070
			0.000			1/2" Ice	2.045	1.145	0.087
			0.000			1" Ice	2.223	1.284	0.106
						2" Ice	2.601	1.585	0.153
RFV01U-D2A	B	From Leg	4.000	0.000	109.000	No Ice	1.875	1.013	0.070
			0.000			1/2" Ice	2.045	1.145	0.087
			0.000			1" Ice	2.223	1.284	0.106
						2" Ice	2.601	1.585	0.153
RFV01U-D2A	C	From Leg	4.000	0.000	109.000	No Ice	1.875	1.013	0.070
			0.000			1/2" Ice	2.045	1.145	0.087
			0.000			1" Ice	2.223	1.284	0.106
						2" Ice	2.601	1.585	0.153
Side Arm Mount [SO 102-3]	C	None		0.000	109.000	No Ice	3.600	3.600	0.075
						1/2" Ice	4.180	4.180	0.105
						1" Ice	4.750	4.750	0.135
						2" Ice	5.900	5.900	0.195
Platform Mount [LP 303-1]	C	None		0.000	109.000	No Ice	14.690	14.690	1.250
						1/2" Ice	18.010	18.010	1.569
						1" Ice	21.340	21.340	1.942
						2" Ice	28.080	28.080	2.852
*									
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.000	0.000	99.000	No Ice	8.010	4.230	0.108
			0.000			1/2" Ice	8.520	4.690	0.194
			0.000			1" Ice	9.040	5.160	0.292
						2" Ice	10.110	6.120	0.522
MX08FRO665-21 w/ Mount	B	From Leg	4.000	0.000	99.000	No Ice	8.010	4.230	0.108

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Pipe			0.000			1/2" Ice	8.520	4.690	0.194
			0.000			1" Ice	9.040	5.160	0.292
						2" Ice	10.110	6.120	0.522
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.000	0.000	99.000	No Ice	8.010	4.230	0.108
			0.000			1/2" Ice	8.520	4.690	0.194
			0.000			1" Ice	9.040	5.160	0.292
						2" Ice	10.110	6.120	0.522
TA08025-B605	A	From Leg	4.000	0.000	99.000	No Ice	1.964	1.129	0.075
			0.000			1/2" Ice	2.138	1.267	0.093
			0.000			1" Ice	2.320	1.411	0.114
						2" Ice	2.705	1.723	0.164
TA08025-B605	B	From Leg	4.000	0.000	99.000	No Ice	1.964	1.129	0.075
			0.000			1/2" Ice	2.138	1.267	0.093
			0.000			1" Ice	2.320	1.411	0.114
						2" Ice	2.705	1.723	0.164
TA08025-B605	C	From Leg	4.000	0.000	99.000	No Ice	1.964	1.129	0.075
			0.000			1/2" Ice	2.138	1.267	0.093
			0.000			1" Ice	2.320	1.411	0.114
						2" Ice	2.705	1.723	0.164
TA08025-B604	A	From Leg	4.000	0.000	99.000	No Ice	1.964	0.981	0.064
			0.000			1/2" Ice	2.138	1.112	0.081
			0.000			1" Ice	2.320	1.250	0.100
						2" Ice	2.705	1.548	0.148
TA08025-B604	B	From Leg	4.000	0.000	99.000	No Ice	1.964	0.981	0.064
			0.000			1/2" Ice	2.138	1.112	0.081
			0.000			1" Ice	2.320	1.250	0.100
						2" Ice	2.705	1.548	0.148
TA08025-B604	C	From Leg	4.000	0.000	99.000	No Ice	1.964	0.981	0.064
			0.000			1/2" Ice	2.138	1.112	0.081
			0.000			1" Ice	2.320	1.250	0.100
						2" Ice	2.705	1.548	0.148
RDIDC-9181-PF-48	B	From Leg	4.000	0.000	99.000	No Ice	2.012	1.168	0.022
			0.000			1/2" Ice	2.189	1.311	0.040
			0.000			1" Ice	2.373	1.461	0.060
						2" Ice	2.763	1.784	0.110
(2) 8' x 2" Mount Pipe	A	From Leg	4.000	0.000	99.000	No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
(2) 8' x 2" Mount Pipe	B	From Leg	4.000	0.000	99.000	No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
(2) 8' x 2" Mount Pipe	C	From Leg	4.000	0.000	99.000	No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
Commscope MC-PK8-DSH	C	None		0.000	99.000	No Ice	34.240	34.240	1.749
						1/2" Ice	62.950	62.950	2.099
						1" Ice	91.660	91.660	2.450
						2" Ice	149.080	149.080	3.151
*									
VV-65A-R1_TMO w/ Mount Pipe	A	From Leg	4.000	0.000	88.000	No Ice	4.460	2.690	0.054
			0.000			1/2" Ice	4.910	3.100	0.097
			0.000			1" Ice	5.360	3.520	0.149
						2" Ice	6.320	4.410	0.281
VV-65A-R1_TMO w/ Mount	B	From Leg	4.000	0.000	88.000	No Ice	4.460	2.690	0.054

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Pipe			0.000			1/2" Ice	4.910	3.100	0.097
			0.000			1" Ice	5.360	3.520	0.149
						2" Ice	6.320	4.410	0.281
VV-65A-R1_TMO w/ Mount Pipe	C	From Leg	4.000	0.000	88.000	No Ice	4.460	2.690	0.054
			0.000			1/2" Ice	4.910	3.100	0.097
			0.000			1" Ice	5.360	3.520	0.149
						2" Ice	6.320	4.410	0.281
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	A	From Leg	4.000	0.000	88.000	No Ice	14.690	6.870	0.183
			0.000			1/2" Ice	15.460	7.550	0.311
			0.000			1" Ice	16.230	8.250	0.453
						2" Ice	17.820	9.670	0.782
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	B	From Leg	4.000	0.000	88.000	No Ice	14.690	6.870	0.183
			0.000			1/2" Ice	15.460	7.550	0.311
			0.000			1" Ice	16.230	8.250	0.453
						2" Ice	17.820	9.670	0.782
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	C	From Leg	4.000	0.000	88.000	No Ice	14.690	6.870	0.183
			0.000			1/2" Ice	15.460	7.550	0.311
			0.000			1" Ice	16.230	8.250	0.453
						2" Ice	17.820	9.670	0.782
AIR 6419 B41_TMO w/ Mount Pipe	A	From Leg	4.000	0.000	88.000	No Ice	6.580	3.500	0.111
			0.000			1/2" Ice	7.060	3.900	0.162
			0.000			1" Ice	7.570	4.320	0.220
						2" Ice	8.620	5.200	0.359
AIR 6419 B41_TMO w/ Mount Pipe	B	From Leg	4.000	0.000	88.000	No Ice	6.580	3.500	0.111
			0.000			1/2" Ice	7.060	3.900	0.162
			0.000			1" Ice	7.570	4.320	0.220
						2" Ice	8.620	5.200	0.359
AIR 6419 B41_TMO w/ Mount Pipe	C	From Leg	4.000	0.000	88.000	No Ice	6.580	3.500	0.111
			0.000			1/2" Ice	7.060	3.900	0.162
			0.000			1" Ice	7.570	4.320	0.220
						2" Ice	8.620	5.200	0.359
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.000	0.000	88.000	No Ice	2.139	1.686	0.109
			0.000			1/2" Ice	2.321	1.850	0.131
			0.000			1" Ice	2.511	2.022	0.156
						2" Ice	2.912	2.387	0.217
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.000	0.000	88.000	No Ice	2.139	1.686	0.109
			0.000			1/2" Ice	2.321	1.850	0.131
			0.000			1" Ice	2.511	2.022	0.156
						2" Ice	2.912	2.387	0.217
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.000	0.000	88.000	No Ice	2.139	1.686	0.109
			0.000			1/2" Ice	2.321	1.850	0.131
			0.000			1" Ice	2.511	2.022	0.156
						2" Ice	2.912	2.387	0.217
(2) Radio 4480_TMOV2	A	From Leg	4.000	0.000	88.000	No Ice	2.878	1.397	0.081
			0.000			1/2" Ice	3.091	1.558	0.103
			0.000			1" Ice	3.312	1.727	0.128
						2" Ice	3.775	2.090	0.188
Radio 4480_TMOV2	B	From Leg	4.000	0.000	88.000	No Ice	2.878	1.397	0.081
			0.000			1/2" Ice	3.091	1.558	0.103
			0.000			1" Ice	3.312	1.727	0.128
						2" Ice	3.775	2.090	0.188
FIBEAIR IP-20C	C	From Leg	4.000	0.000	88.000	No Ice	0.684	0.291	0.014
			0.000			1/2" Ice	0.788	0.367	0.020
			0.000			1" Ice	0.900	0.449	0.027
						2" Ice	1.146	0.637	0.048
8' x 2.375" Mount Pipe	B	From Leg	4.000	0.000	88.000	No Ice	1.900	1.900	0.061
			0.000			1/2" Ice	2.728	2.728	0.075

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1" Ice	3.401	3.401	0.095
						2" Ice	4.396	4.396	0.150
8' x 2.375" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	88.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.900 2.728 3.401 4.396	1.900 2.728 3.401 4.396	0.061 0.075 0.095 0.150
(2) 10.5'x2-3/8" Horizontal Pipe	A	None		0.000	88.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.494 3.572 4.667 6.317	2.494 3.572 4.667 6.317	0.041 0.059 0.085 0.157
(2) 10.5'x2-3/8" Horizontal Pipe	B	None		0.000	88.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.494 3.572 4.667 6.317	2.494 3.572 4.667 6.317	0.041 0.059 0.085 0.157
(2) 10.5'x2-3/8" Horizontal Pipe	C	None		0.000	88.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.494 3.572 4.667 6.317	2.494 3.572 4.667 6.317	0.041 0.059 0.085 0.157
Pipe Mount [PM 602-3]	C	None		0.000	88.000	No Ice 1/2" Ice 1" Ice 2" Ice	6.670 7.700 8.740 10.900	6.670 7.700 8.740 10.900	0.279 0.344 0.423 0.628
VFA10-HD	A	None		0.000	88.000	No Ice 1/2" Ice 1" Ice 2" Ice	12.100 18.300 23.800 34.800	12.100 18.300 23.800 34.800	0.633 0.770 0.970 1.370
VFA10-HD	B	None		0.000	88.000	No Ice 1/2" Ice 1" Ice 2" Ice	12.100 18.300 23.800 34.800	12.100 18.300 23.800 34.800	0.633 0.770 0.970 1.370
VFA10-HD	C	None		0.000	88.000	No Ice 1/2" Ice 1" Ice 2" Ice	12.100 18.300 23.800 34.800	12.100 18.300 23.800 34.800	0.633 0.770 0.970 1.370
* *									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP2-11-2GR	A	Paraboloid w/o Radome	From Leg	4.000 0.000 0.000	0.000		88.000	2.175	No Ice 1/2" Ice 1" Ice 2" Ice	3.720 4.010 4.300 4.880	0.030 0.030 0.040 0.068
*											

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
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	120 - 70.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-37.844	-0.774	1.309
			Max. Mx	8	-18.366	-431.414	0.167
			Max. My	2	-18.358	-0.015	433.110
			Max. Vy	8	14.988	-431.414	0.167
			Max. Vx	14	15.186	-0.959	-432.746
			Max. Torque	14			-0.512
L2	70.75 - 34.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-47.848	-1.269	1.960
			Max. Mx	8	-25.176	-986.904	-0.551
			Max. My	14	-25.170	-2.234	-994.653
			Max. Vy	8	16.981	-986.904	-0.551
			Max. Vx	14	17.178	-2.234	-994.653
			Max. Torque	23			-0.393
L3	34.75 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-63.454	-2.034	2.909
			Max. Mx	8	-36.690	-1714.018	-1.301
			Max. My	14	-36.690	-3.778	-1728.875
			Max. Vy	8	19.383	-1714.018	-1.301
			Max. Vx	14	19.577	-3.778	-1728.875
			Max. Torque	23			-0.393

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	63.454	0.006	5.913
	Max. H_x	20	36.698	19.369	0.029
	Max. H_z	2	36.698	0.028	19.501
	Max. M_x	2	1725.586	0.028	19.501
	Max. M_z	8	1714.018	-19.369	-0.026
	Max. Torsion	7	0.334	-16.780	9.717
	Min. Vert	7	27.523	-16.780	9.717
	Min. H_x	8	36.698	-19.369	-0.026
	Min. H_z	14	36.698	-0.028	-19.563
	Min. M_x	14	-1728.875	-0.028	-19.563
	Min. M_z	20	-1711.658	19.369	0.029
	Min. Torsion	23	-0.393	16.808	9.766

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	30.582	0.000	0.000	-0.928	-0.948	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	36.698	-0.028	-19.501	-1725.586	1.415	0.055
0.9 Dead+1.0 Wind 0 deg - No Ice	27.523	-0.028	-19.501	-1710.533	1.699	0.062
1.2 Dead+1.0 Wind 30 deg - No Ice	36.698	9.688	-16.857	-1491.681	-857.830	-0.249
0.9 Dead+1.0 Wind 30 deg - No	27.523	9.688	-16.857	-1478.623	-850.188	-0.245

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Ice						
1.2 Dead+1.0 Wind 60 deg - No Ice	36.698	16.780	-9.717	-860.335	-1485.052	-0.334
0.9 Dead+1.0 Wind 60 deg - No Ice	27.523	16.780	-9.717	-852.680	-1472.037	-0.334
1.2 Dead+1.0 Wind 90 deg - No Ice	36.698	19.369	0.026	1.301	-1714.018	-0.292
0.9 Dead+1.0 Wind 90 deg - No Ice	27.523	19.369	0.026	1.582	-1699.045	-0.296
1.2 Dead+1.0 Wind 120 deg - No Ice	36.698	16.781	9.914	875.997	-1485.208	-0.194
0.9 Dead+1.0 Wind 120 deg - No Ice	27.523	16.781	9.914	868.807	-1472.192	-0.200
1.2 Dead+1.0 Wind 150 deg - No Ice	36.698	9.683	16.982	1500.794	-857.545	-0.035
0.9 Dead+1.0 Wind 150 deg - No Ice	27.523	9.683	16.982	1488.251	-849.904	-0.042
1.2 Dead+1.0 Wind 180 deg - No Ice	36.698	0.028	19.563	1728.875	-3.777	-0.052
0.9 Dead+1.0 Wind 180 deg - No Ice	27.523	0.028	19.563	1714.381	-3.453	-0.058
1.2 Dead+1.0 Wind 210 deg - No Ice	36.698	-9.635	16.954	1498.202	850.688	-0.056
0.9 Dead+1.0 Wind 210 deg - No Ice	27.523	-9.635	16.954	1485.679	843.690	-0.060
1.2 Dead+1.0 Wind 240 deg - No Ice	36.698	-16.753	9.866	871.503	1480.255	0.139
0.9 Dead+1.0 Wind 240 deg - No Ice	27.523	-16.753	9.866	864.347	1467.866	0.139
1.2 Dead+1.0 Wind 270 deg - No Ice	36.698	-19.369	-0.029	-3.892	1711.658	0.289
0.9 Dead+1.0 Wind 270 deg - No Ice	27.523	-19.369	-0.029	-3.570	1697.293	0.293
1.2 Dead+1.0 Wind 300 deg - No Ice	36.698	-16.808	-9.766	-864.831	1485.284	0.386
0.9 Dead+1.0 Wind 300 deg - No Ice	27.523	-16.808	-9.766	-857.141	1472.858	0.393
1.2 Dead+1.0 Wind 330 deg - No Ice	36.698	-9.736	-16.884	-1494.275	859.963	0.343
0.9 Dead+1.0 Wind 330 deg - No Ice	27.523	-9.736	-16.884	-1481.197	852.895	0.350
1.2 Dead+1.0 Ice+1.0 Temp	63.454	0.000	-0.000	-2.909	-2.034	-0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	63.454	-0.006	-5.913	-537.497	-1.580	-0.003
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	63.454	2.944	-5.115	-465.271	-268.183	-0.054
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	63.454	5.099	-2.950	-269.623	-462.942	-0.058
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	63.454	5.886	0.005	-2.528	-534.081	-0.039
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	63.454	5.099	2.992	267.477	-462.942	-0.013
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	63.454	2.942	5.141	461.699	-268.057	0.017
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	63.454	0.006	5.927	532.668	-2.660	0.003
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	63.454	-2.933	5.136	461.159	262.882	-0.013
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	63.454	-5.093	2.982	266.542	458.163	0.015
1.2 Dead+1.0 Wind 270	63.454	-5.886	-0.006	-3.608	529.841	0.038

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
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	63.454	-5.105	-2.960	-270.559	459.242	0.055
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	63.454	-2.954	-5.120	-465.811	264.878	0.049
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	30.582	-0.007	-4.671	-411.901	-0.361	0.014
Dead+Wind 30 deg - Service	30.582	2.321	-4.038	-356.159	-205.121	-0.061
Dead+Wind 60 deg - Service	30.582	4.019	-2.328	-205.707	-354.589	-0.083
Dead+Wind 90 deg - Service	30.582	4.639	0.006	-0.377	-409.154	-0.074
Dead+Wind 120 deg - Service	30.582	4.020	2.375	208.067	-354.628	-0.049
Dead+Wind 150 deg - Service	30.582	2.319	4.068	356.959	-205.054	-0.011
Dead+Wind 180 deg - Service	30.582	0.007	4.686	411.313	-1.598	-0.014
Dead+Wind 210 deg - Service	30.582	-2.308	4.061	356.341	202.024	-0.013
Dead+Wind 240 deg - Service	30.582	-4.013	2.363	206.996	352.051	0.036
Dead+Wind 270 deg - Service	30.582	-4.639	-0.007	-1.614	407.196	0.074
Dead+Wind 300 deg - Service	30.582	-4.026	-2.339	-206.778	353.250	0.097
Dead+Wind 330 deg - Service	30.582	-2.332	-4.044	-356.778	204.234	0.085

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-30.582	0.000	0.000	30.582	0.000	0.000%
2	-0.028	-36.698	-19.501	0.028	36.698	19.501	0.000%
3	-0.028	-27.523	-19.501	0.028	27.523	19.501	0.000%
4	9.688	-36.698	-16.857	-9.688	36.698	16.857	0.000%
5	9.688	-27.523	-16.857	-9.688	27.523	16.857	0.000%
6	16.780	-36.698	-9.717	-16.780	36.698	9.717	0.000%
7	16.780	-27.523	-9.717	-16.780	27.523	9.717	0.000%
8	19.369	-36.698	0.026	-19.369	36.698	-0.026	0.000%
9	19.369	-27.523	0.026	-19.369	27.523	-0.026	0.000%
10	16.781	-36.698	9.914	-16.781	36.698	-9.914	0.000%
11	16.781	-27.523	9.914	-16.781	27.523	-9.914	0.000%
12	9.683	-36.698	16.982	-9.683	36.698	-16.982	0.000%
13	9.683	-27.523	16.982	-9.683	27.523	-16.982	0.000%
14	0.028	-36.698	19.563	-0.028	36.698	-19.563	0.000%
15	0.028	-27.523	19.563	-0.028	27.523	-19.563	0.000%
16	-9.635	-36.698	16.954	9.635	36.698	-16.954	0.000%
17	-9.635	-27.523	16.954	9.635	27.523	-16.954	0.000%
18	-16.753	-36.698	9.866	16.753	36.698	-9.866	0.000%
19	-16.753	-27.523	9.866	16.753	27.523	-9.866	0.000%
20	-19.369	-36.698	-0.029	19.369	36.698	0.029	0.000%
21	-19.369	-27.523	-0.029	19.369	27.523	0.029	0.000%
22	-16.808	-36.698	-9.766	16.808	36.698	9.766	0.000%
23	-16.808	-27.523	-9.766	16.808	27.523	9.766	0.000%
24	-9.736	-36.698	-16.884	9.736	36.698	16.884	0.000%
25	-9.736	-27.523	-16.884	9.736	27.523	16.884	0.000%
26	0.000	-63.454	0.000	-0.000	63.454	0.000	0.000%
27	-0.006	-63.454	-5.913	0.006	63.454	5.913	0.000%
28	2.944	-63.454	-5.115	-2.944	63.454	5.115	0.000%
29	5.099	-63.454	-2.950	-5.099	63.454	2.950	0.000%
30	5.886	-63.454	0.005	-5.886	63.454	-0.005	0.000%
31	5.099	-63.454	2.992	-5.099	63.454	-2.992	0.000%
32	2.942	-63.454	5.141	-2.942	63.454	-5.141	0.000%
33	0.006	-63.454	5.927	-0.006	63.454	-5.927	0.000%
34	-2.933	-63.454	5.136	2.933	63.454	-5.136	0.000%
35	-5.093	-63.454	2.982	5.093	63.454	-2.982	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
36	-5.886	-63.454	-0.006	5.886	63.454	0.006	0.000%
37	-5.105	-63.454	-2.960	5.105	63.454	2.960	0.000%
38	-2.954	-63.454	-5.120	2.954	63.454	5.120	0.000%
39	-0.007	-30.582	-4.671	0.007	30.582	4.671	0.000%
40	2.321	-30.582	-4.038	-2.321	30.582	4.038	0.000%
41	4.019	-30.582	-2.328	-4.019	30.582	2.328	0.000%
42	4.639	-30.582	0.006	-4.639	30.582	-0.006	0.000%
43	4.020	-30.582	2.375	-4.020	30.582	-2.375	0.000%
44	2.319	-30.582	4.068	-2.319	30.582	-4.068	0.000%
45	0.007	-30.582	4.686	-0.007	30.582	-4.686	0.000%
46	-2.308	-30.582	4.061	2.308	30.582	-4.061	0.000%
47	-4.013	-30.582	2.363	4.013	30.582	-2.363	0.000%
48	-4.639	-30.582	-0.007	4.639	30.582	0.007	0.000%
49	-4.026	-30.582	-2.339	4.026	30.582	2.339	0.000%
50	-2.332	-30.582	-4.044	2.332	30.582	4.044	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	0.00010119
3	Yes	4	0.00000001	0.00004727
4	Yes	5	0.00000001	0.00009699
5	Yes	5	0.00000001	0.00004670
6	Yes	5	0.00000001	0.00009966
7	Yes	5	0.00000001	0.00004808
8	Yes	4	0.00000001	0.00011321
9	Yes	4	0.00000001	0.00005868
10	Yes	5	0.00000001	0.00009885
11	Yes	5	0.00000001	0.00004760
12	Yes	5	0.00000001	0.00009872
13	Yes	5	0.00000001	0.00004758
14	Yes	4	0.00000001	0.00010231
15	Yes	4	0.00000001	0.00004836
16	Yes	5	0.00000001	0.00009756
17	Yes	5	0.00000001	0.00004706
18	Yes	5	0.00000001	0.00009796
19	Yes	5	0.00000001	0.00004726
20	Yes	4	0.00000001	0.00012012
21	Yes	4	0.00000001	0.00006462
22	Yes	5	0.00000001	0.00010014
23	Yes	5	0.00000001	0.00004835
24	Yes	5	0.00000001	0.00009721
25	Yes	5	0.00000001	0.00004680
26	Yes	4	0.00000001	0.00001040
27	Yes	5	0.00000001	0.00014007
28	Yes	5	0.00000001	0.00015074
29	Yes	5	0.00000001	0.00015054
30	Yes	5	0.00000001	0.00013914
31	Yes	5	0.00000001	0.00014960
32	Yes	5	0.00000001	0.00014928
33	Yes	5	0.00000001	0.00013828
34	Yes	5	0.00000001	0.00014810
35	Yes	5	0.00000001	0.00014814
36	Yes	5	0.00000001	0.00013795

37	Yes	5	0.00000001	0.00014964
38	Yes	5	0.00000001	0.00015013
39	Yes	4	0.00000001	0.00001785
40	Yes	4	0.00000001	0.00004138
41	Yes	4	0.00000001	0.00004390
42	Yes	4	0.00000001	0.00001809
43	Yes	4	0.00000001	0.00004185
44	Yes	4	0.00000001	0.00004239
45	Yes	4	0.00000001	0.00001778
46	Yes	4	0.00000001	0.00004152
47	Yes	4	0.00000001	0.00004129
48	Yes	4	0.00000001	0.00001802
49	Yes	4	0.00000001	0.00004389
50	Yes	4	0.00000001	0.00004108

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 70.75	10.938	39	0.893	0.001
L2	74.75 - 34.75	3.819	39	0.519	0.000
L3	40 - 0	1.026	39	0.239	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
122.000	7770.00 w/ Mount Pipe	39	10.938	0.893	0.001	42835
109.000	LNX-8513DS-VTM w/ Mount Pipe	39	9.009	0.803	0.001	19470
99.000	MX08FRO665-21 w/ Mount Pipe	39	7.319	0.721	0.001	10198
88.000	VHLP2-11-2GR	39	5.598	0.630	0.000	6692

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 70.75	45.895	14	3.748	0.004
L2	74.75 - 34.75	16.039	14	2.179	0.001
L3	40 - 0	4.308	14	1.004	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
122.000	7770.00 w/ Mount Pipe	14	45.895	3.748	0.006	10273
109.000	LNX-8513DS-VTM w/ Mount Pipe	14	37.809	3.371	0.004	4669
99.000	MX08FRO665-21 w/ Mount Pipe	14	30.720	3.026	0.003	2444
88.000	VHLP2-11-2GR	14	23.501	2.644	0.002	1603

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	120 - 70.75 (1)	TP32.28x18x0.188	49.250	0.000	0.0	18.409	-18.358	1076.920	0.017
L2	70.75 - 34.75 (2)	TP42.35x30.745x0.313	40.000	0.000	0.0	40.185	-25.170	2350.830	0.011
L3	34.75 - 0 (3)	TP51.8x40.202x0.375	40.000	0.000	0.0	61.209	-36.690	3580.700	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	120 - 70.75 (1)	TP32.28x18x0.188	433.110	718.722	0.603	0.000	718.722	0.000
L2	70.75 - 34.75 (2)	TP42.35x30.745x0.313	994.658	2271.917	0.438	0.000	2271.917	0.000
L3	34.75 - 0 (3)	TP51.8x40.202x0.375	1728.883	4303.925	0.402	0.000	4303.925	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	120 - 70.75 (1)	TP32.28x18x0.188	15.124	323.075	0.047	0.055	875.183	0.000
L2	70.75 - 34.75 (2)	TP42.35x30.745x0.313	17.178	705.250	0.024	0.052	2502.258	0.000
L3	34.75 - 0 (3)	TP51.8x40.202x0.375	19.577	1074.210	0.018	0.052	4837.758	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	120 - 70.75 (1)	0.017	0.603	0.000	0.047	0.000	0.622 ✔	1.050	4.8.2 ✔
L2	70.75 - 34.75 (2)	0.011	0.438	0.000	0.024	0.000	0.449 ✔	1.050	4.8.2 ✔
L3	34.75 - 0 (3)	0.010	0.402	0.000	0.018	0.000	0.412 ✔	1.050	4.8.2 ✔

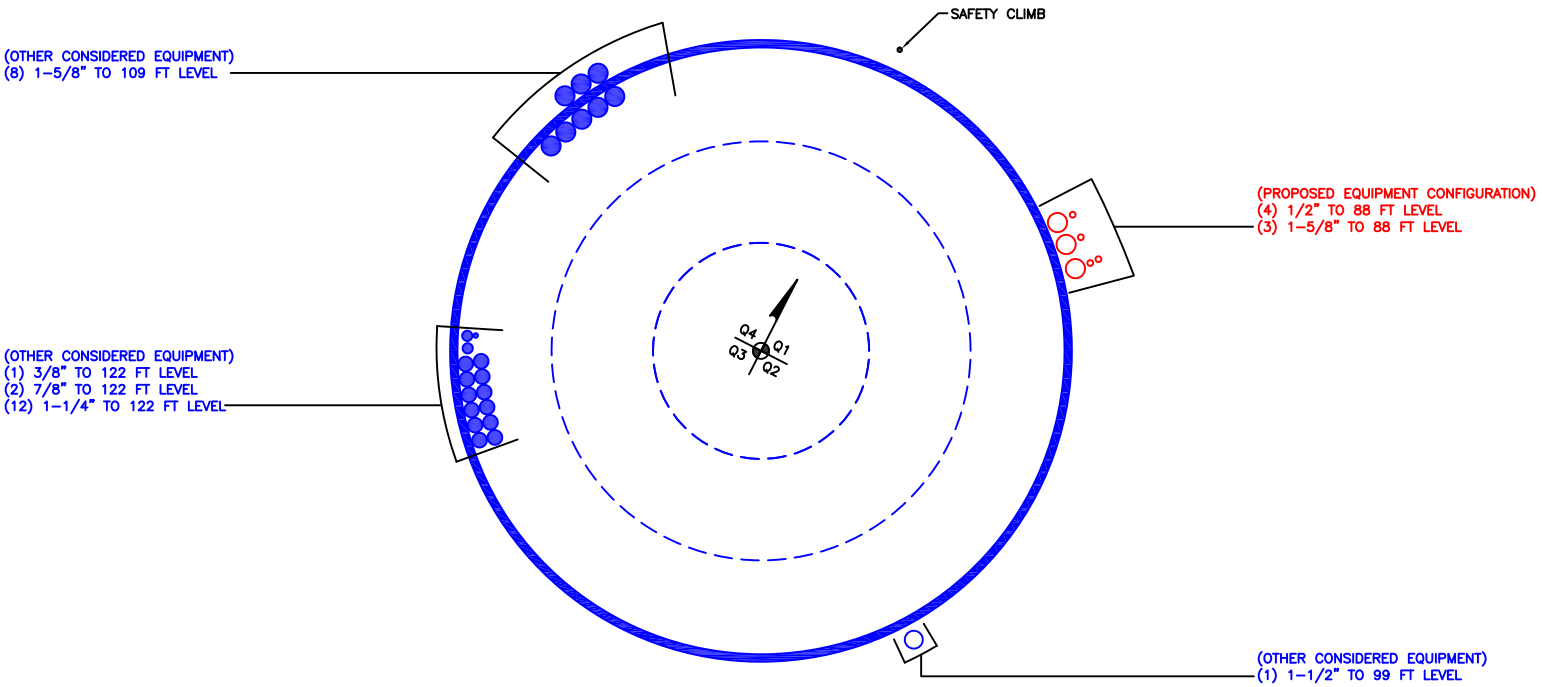
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	120 - 70.75	Pole	TP32.28x18x0.188	1	-18.358	1130.766	59.2	Pass
L2	70.75 - 34.75	Pole	TP42.35x30.745x0.313	2	-25.170	2468.371	42.8	Pass
L3	34.75 - 0	Pole	TP51.8x40.202x0.375	3	-36.690	3759.735	39.3	Pass
							Summary	
						Pole (L1)	59.2	Pass
						RATING =	**59.2**	**Pass**

Program Version 8.1.1.0

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 842867

APPENDIX C

ADDITIONAL CALCULATIONS

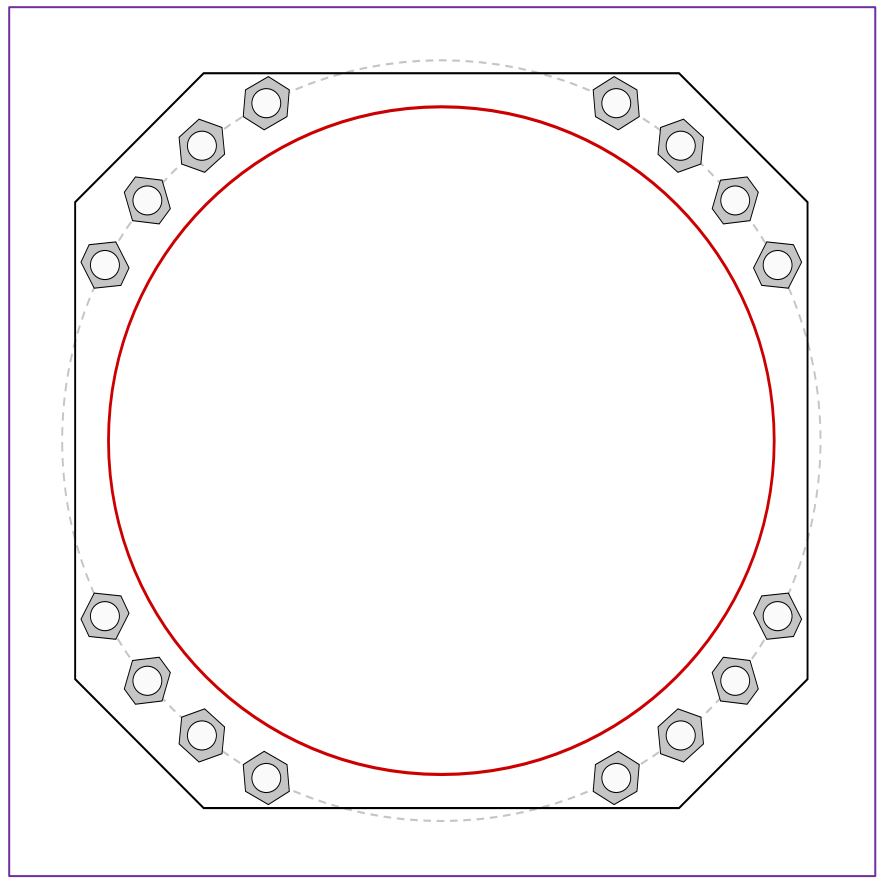
Monopole Base Plate Connection

Site Info	
BU #	842867
Site Name	NSFIELD FOUR CORNER
Order #	611795, Rev# 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1.25

Applied Loads	
Moment (kip-ft)	1728.88
Axial Force (kips)	36.69
Shear Force (kips)	19.58

**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 59" BC

Anchor Spacing: 6 in

Base Plate Data

57" W x 3" Plate (A572-55; Fy=55 ksi, Fu=70 ksi); Clip: 10 in

Stiffener Data

N/A

Pole Data

51.8" x 0.375" 18-sided pole (A607-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

Pu_t = 85.56	ϕPn_t = 243.75	**Stress Rating**
Vu = 1.22	ϕVn = 149.1	**33.4%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	15.47	(Flexural)
Allowable Stress (ksi):	49.5	
Stress Rating:	**29.8%**	**Pass**

Drilled Pier Foundation

BU # :	842867
Site Name:	MANSFIELD FOUR CORNE
Order Number:	611795, Rev# 0
TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	1728.88	
Axial Force (kips)	36.7	
Shear Force (kips)	19.56	

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

Pier Design Data		
Depth	19	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 19' below grade		
Pier Diameter	7	ft
Rebar Quantity	20	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	
Tie Spacing	18	in

Rebar & Pier Options
Embedded Pole Inputs
Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	5.31	-
Soil Safety Factor	2.48	-
Max Moment (kip-ft)	1860.60	-
Rating*	*51.0%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	364.19	-
End Bearing (kips)	115.45	-
Weight of Concrete (kips)	117.77	-
Total Capacity (kips)	479.65	-
Axial (kips)	154.47	-
Rating*	*30.7%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	5.24	-
Critical Moment (kip-ft)	1860.55	-
Critical Moment Capacity	4957.36	-
Rating*	*35.7%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	14.05	-
Critical Shear (kip)	286.64	-
Critical Shear Capacity	577.81	-
Rating*	*47.2%*	-

Structural Foundation Rating*	**47.2%**
Soil Interaction Rating*	**51.0%**

*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	☑
N/A	☐
Additional Longitudinal Rebar	
Input Effective Depths (else Actual):	☐
Shear Design Options	
Check Shear along Depth of Pier:	☑
Utilize Shear-Friction Methodology:	☐
Override Critical Depth:	☐

Go to Soil Calculations

Soil Profile

Groundwater Depth	13	# of Layers	6

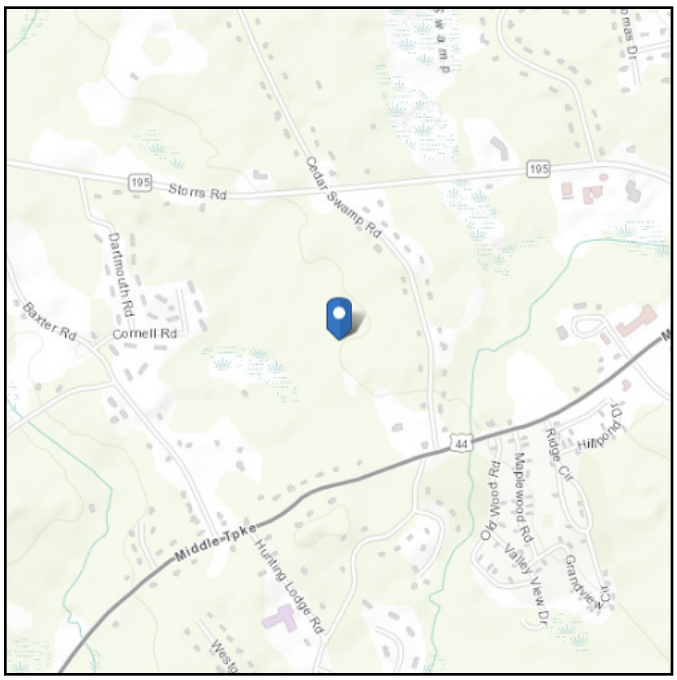
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3.5	3.5	130	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	3.5	5	1.5	130	150	0	32	0.675	0.675				72	Cohesionless
3	5	7	2	130	150	0	32	0.912	0.912				59	Cohesionless
4	7	10	3	130	150	0	32	1.223	1.223				52	Cohesionless
5	10	13	3	130	150	0	32	1.558	1.558				54	Cohesionless
6	13	19	6	67.6	87.6	0	32	1.817	1.817			4	41	Cohesionless

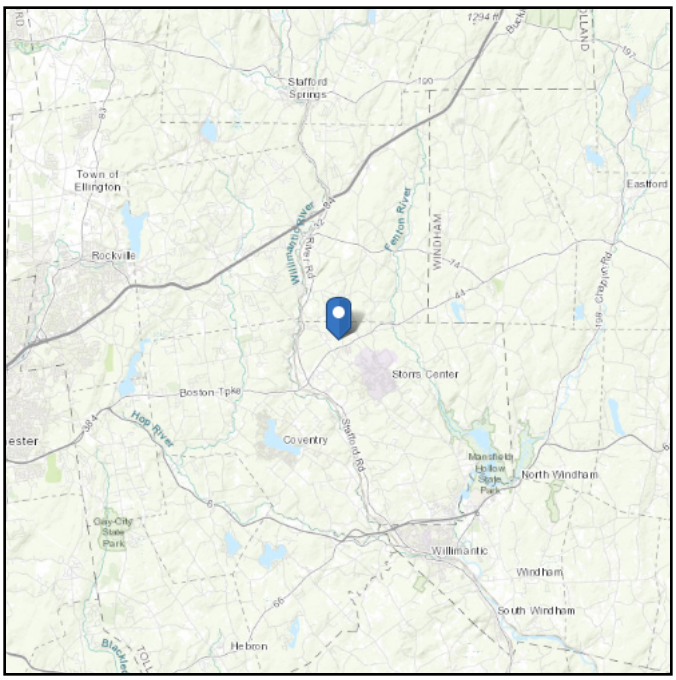
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 559.18 ft (NAVD 88)
Latitude: 41.825781
Longitude: -72.281794





Wind

Results:

Wind Speed	119 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	91 Vmph
100-year MRI	98 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Tue May 17 2022

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

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

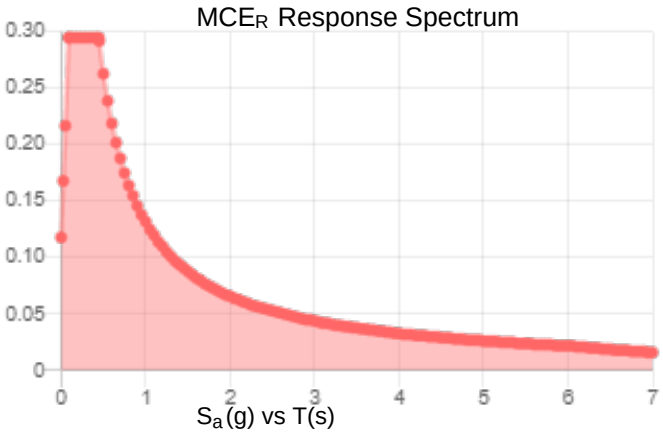
Seismic

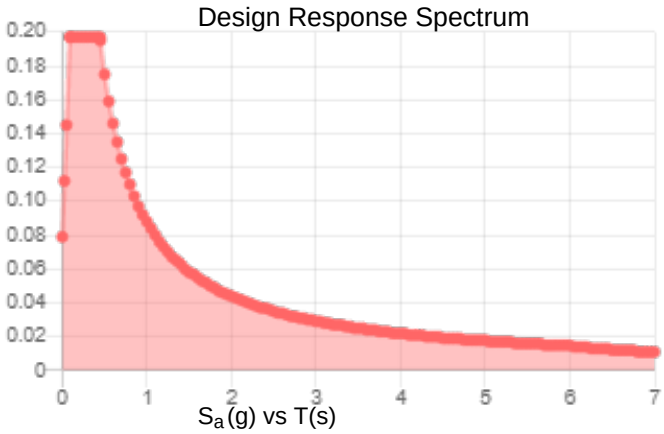
Site Soil Class: D - Default (see Section 11.4.3)

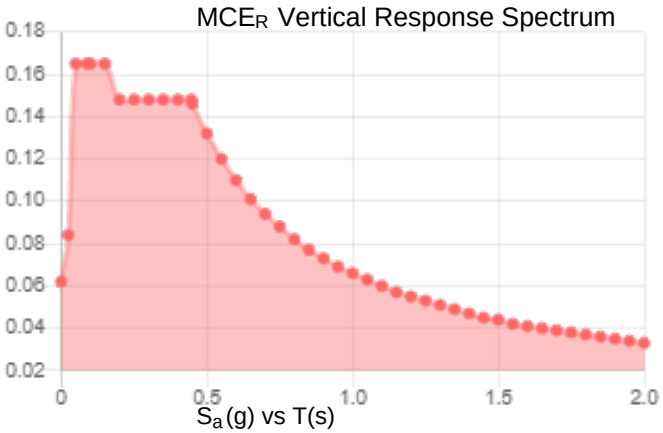
Results:

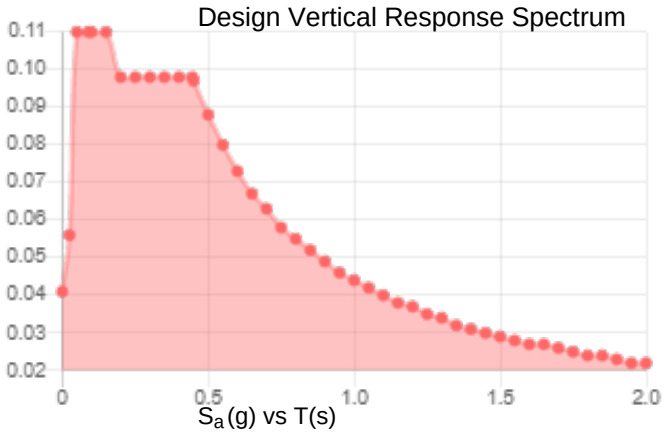
S_S :	0.184	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.099
F_v :	2.4	PGA_M :	0.158
S_{MS} :	0.295	F_{PGA} :	1.6
S_{M1} :	0.132	I_e :	1
S_{DS} :	0.197	C_v :	0.7

Seismic Design Category B









Data Accessed: **Tue May 17 2022**

Date Source:

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

Ice

Results:

Ice Thickness:	1.50 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Tue May 17 2022

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

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

Radio Frequency Exposure Analysis Report

June 8, 2022

Centerline on behalf of T-Mobile
Centerline Communications Project Number: N/A

T-Mobile Site Name: CTHA621_Crown_842867
Site Number: CTHA621A

Site Address: 497 Middle Turnpike, Storrs, CT 06268

Site Compliance Summary

T-Mobile Compliance Status:	Compliant
Cumulative Calculated Power Density (Ground Level):	9.46565 µW/cm^2
Cumulative General Population % MPE (Ground Level):	1.07279%

750 West Center Street | Suite 301 | West Bridgewater | MA | 02379

June 8, 2022

Centerline
Attn: Ryan Clark, Site Acquisition Consultant
750 W Center St, Suite 301
West Bridgewater, MA 02379

RF Exposure Analysis for Site: **CTHA621_Crown_842867**

Centerline Communications, LLC ("Centerline") was contracted to analyze the proposed T-Mobile facility at **497 Middle Turnpike, Storrs, CT 06268** for the purpose of determining whether the predictive exposure from the proposed facility is within specified federal limits.

All information used in this report was analyzed as a percentage of the Maximum Permissible Exposure (% MPE) limits as detailed in 47 CFR § 1.1310 as well as Federal Communications Commission (FCC) OET Bulletin 65 Edition 97-01. The FCC MPE limits are typically expressed in units of milliwatts per square centimeter (mW/cm^2) or microwatts per square centimeter ($\mu W/cm^2$). The exposure limits vary depending upon the frequencies being utilized. The General Population/Uncontrolled MPE limit (in mW/cm^2) for frequencies between 300 and 1500 is defined as frequency (in MHz) divided by 1500 ($f_{MHz}/1500$). Frequencies between 1500 and 100,000 MHz have a General Population/Uncontrolled MPE limit of 1 mW/cm^2 (1000 $\mu W/cm^2$). The calculated power density at each sample point divided by the limit at each calculated frequency provides a result in % MPE. Summing the calculated % MPE from all contributors provides a cumulative % MPE at a particular sample point. Wireless carriers use different frequency bands with varying MPE limits; therefore, it is useful to report results in terms of % MPE as opposed to power density.

All results were compared to the FCC radio frequency exposure rules as detailed in 47 CFR § 1.1307(b) to determine compliance with the 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.

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, 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.

Calculation Methodology

Centerline Communications, LLC has performed theoretical modeling of the site using a software tool, RoofMaster®, which incorporates calculation methodologies detailed in FCC OET 65. RoofMaster® uses a cylindrical model for conservative power density predictions within the near field of the antenna where the antenna pattern has not truly formed yet. Within this area power density values tend to decrease based upon an inverse distance function. At the point where it is appropriate for modeling to change from near-field calculations to far-field calculations, the power decreases inversely with the square of the distance. The modeling is based on worst-case assumptions in terms of transmitter power and duty cycle. No losses were included in the power calculations unless they were specifically provided for the project.

In OET 65, a far field model is presented to calculate the spatial peak power density. The RoofMaster® implementation of this model incorporates antenna manufacturer's horizontal and vertical pattern data to determine the power density in all directions. This model yields the power density at a single point in space. In order to determine the spatial power density for comparison to the FCC limits, the average of several points calculated within the human profile (0-6') must be conducted. RoofMaster® calculates seven power density values between 0-6' above the specified study plane and performs a linear spatial average.

Data & Results

The following table details the antennas and operating parameters for the T-Mobile antenna system as well as any other antenna systems at the site. This is based on antenna information provided by the client and data compiled from other sources where necessary. The data below was input into Roofmaster® to perform the theoretical exposure calculations at the Ground.

The theoretical calculations performed in Roofmaster® determine the cumulative exposure at all sample points at ground level (0-6' spatial average). The results from highest cumulative sample point at ground level surrounding the site are displayed in the table below. The contribution from directional antennas to the maximum cumulative totals varies greatly depending on location; therefore, the contribution from one antenna sector at the highest calculated exposure point may be greater or less than other sectors since sectorized directional antennas are pointed in different directions and there is not much overlapping exposure.

The contribution to the cumulative power density and % MPE for each antenna/frequency band is listed in the table. The cumulative power density and cumulative % MPE are displayed at the bottom of the table.

Maximum Calculated Cumulative Power Density (Location: approximately 243' NE of site)

Antenna ID	Make / Model	Frequency Band (MHz)	Antenna Gain (dBd)	Antenna Centerline (ft)	Channel Count	TX Power/ Channel (watts)	ERP (watts)	Calculated Power Density (µW/cm²)	General Population MPE Limit (µW/cm²)	General Population % MPE
T-Mobile A 1	ERICSSON SON_AIR6419 NR	3400	22.85	88.00	2.00	80.00	30840.40	0.03852	1000.00	0.00385
T-Mobile A 1	ERICSSON SON_AIR6419 LTE	3400	22.85	88.00	2.00	80.00	30840.40	0.03852	1000.00	0.00385
T-Mobile A 2	RFS APXVAALL24 43-U-NA20	700	13.65	88.00	2.00	40.00	1853.92	0.00088	466.67	0.00019
T-Mobile A 2	RFS APXVAALL24 43-U-NA20	600	12.95	88.00	4.00	60.00	4733.81	0.00075	400.00	0.00019
T-Mobile A 2	RFS APXVAALL24 43-U-NA20	600	12.95	88.00	2.00	40.00	1577.94	0.00025	400.00	0.00006
T-Mobile A 3	COMMSCOPE VV-65A-R1	1900	15.77	88.00	2.00	140.00	10572.02	0.00005	1000.00	0.00001
T-Mobile A 3	COMMSCOPE VV-65A-R1	2100	16.47	88.00	2.00	140.00	12421.04	0.00005	1000.00	0.00001
T-Mobile A 3	COMMSCOPE VV-65A-R1	1900	15.77	88.00	1.00	15.00	566.36	0.00000	1000.00	0.00000
T-Mobile B 4	ERICSSON SON_AIR6419 NR	3400	22.85	88.00	2.00	80.00	30840.40	2.84651	1000.00	0.28465
T-Mobile B 4	ERICSSON SON_AIR6419 LTE	3400	22.85	88.00	2.00	80.00	30840.40	2.84651	1000.00	0.28465
T-Mobile B 5	RFS APXVAALL24 43-U-NA20	700	13.65	88.00	2.00	40.00	1853.92	0.08230	466.67	0.01764
T-Mobile B 5	RFS APXVAALL24 43-U-NA20	600	12.95	88.00	4.00	60.00	4733.81	0.25053	400.00	0.06263
T-Mobile B 5	RFS APXVAALL24 43-U-NA20	600	12.95	88.00	2.00	40.00	1577.94	0.08351	400.00	0.02088
T-Mobile B 6	COMMSCOPE VV-65A-R1	1900	15.77	88.00	2.00	140.00	10572.02	0.22557	1000.00	0.02256
T-Mobile B 6	COMMSCOPE VV-65A-R1	2100	16.47	88.00	2.00	140.00	12421.04	0.26601	1000.00	0.02660
T-Mobile B 6	COMMSCOPE VV-65A-R1	1900	15.77	88.00	1.00	15.00	566.36	0.01208	1000.00	0.00121
T-Mobile C 7	ERICSSON SON_AIR6419 NR	3400	22.85	88.00	2.00	80.00	30840.40	0.00156	1000.00	0.00016
T-Mobile C 7	ERICSSON SON_AIR6419 LTE	3400	22.85	88.00	2.00	80.00	30840.40	0.00156	1000.00	0.00016
T-Mobile C 8	RFS APXVAALL24 43-U-NA20	700	13.65	88.00	2.00	40.00	1853.92	0.00009	466.67	0.00002
T-Mobile C 8	RFS APXVAALL24 43-U-NA20	600	12.95	88.00	4.00	60.00	4733.81	0.00019	400.00	0.00005
T-Mobile C 8	RFS APXVAALL24 43-U-NA20	600	12.95	88.00	2.00	40.00	1577.94	0.00006	400.00	0.00002
T-Mobile C 9	COMMSCOPE VV-65A-R1	1900	15.77	88.00	2.00	140.00	10572.02	0.00007	1000.00	0.00001
T-Mobile C 9	COMMSCOPE VV-65A-R1	2100	16.47	88.00	2.00	140.00	12421.04	0.00029	1000.00	0.00003
T-Mobile C 9	COMMSCOPE VV-65A-R1	1900	15.77	88.00	1.00	15.00	566.36	0.00000	1000.00	0.00000
AT&T A 10	POWERWAVE 7770 00	850	11.35	122.00	1.00	40.00	545.83	0.00083	566.67	0.00015
AT&T A 11	COMMSCOPE SBNH-1D6565C	700	13.65	122.00	4.00	40.00	3707.83	0.00112	466.67	0.00024
AT&T A 11	COMMSCOPE SBNH-1D6565C	1900	15.60	122.00	4.00	40.00	5809.25	0.00050	1000.00	0.00005
AT&T A 11	COMMSCOPE SBNH-1D6565C	2100	16.30	122.00	4.00	40.00	6825.27	0.00014	1000.00	0.00001
AT&T A 12	CCI HPA-65R-BUU-H6	850	12.74	122.00	4.00	40.00	3006.91	0.00050	566.67	0.00009
AT&T A 12	CCI HPA-65R-BUU-H6-	2300	14.77	122.00	4.00	25.00	2999.16	0.00015	1000.00	0.00002
AT&T B 13	POWERWAVE 7770 00	850	11.35	122.00	1.00	40.00	545.83	0.02738	566.67	0.00483
AT&T B 14	KMW AM-X-CD-16-65-00T-RET	700	13.15	122.00	4.00	40.00	3304.61	0.12413	466.67	0.02660
AT&T B 14	KMW AM-X-CD-16-65-00T-RET-	1900	14.85	122.00	4.00	40.00	4887.87	0.12939	1000.00	0.01294
AT&T B 14	KMW AM-X-CD-16-65-00T-RET-	2100	15.35	122.00	4.00	40.00	5484.28	0.13565	1000.00	0.01357

Antenna ID	Make / Model	Frequency Band (MHz)	Antenna Gain (dBd)	Antenna Centerline (ft)	Channel Count	TX Power/ Channel (watts)	ERP (watts)	Calculated Power Density (μW/cm²)	General Population MPE Limit (μW/cm²)	General Population % MPE
AT&T B 15	CCI HPA-65R-BUU-H6	850	12.74	122.00	4.00	40.00	3006.91	0.12422	566.67	0.02192
AT&T B 15	CCI HPA-65R-BUU-H6-	2300	14.77	122.00	4.00	25.00	2999.16	0.08632	1000.00	0.00863
AT&T C 16	POWERWAVE 7770 00	850	11.35	122.00	1.00	40.00	545.83	0.00021	566.67	0.00004
AT&T C 17	KMW AM-X-CD-16-65-00T-RET	700	13.15	122.00	4.00	40.00	3304.61	0.00002	466.67	0.00000
AT&T C 17	KMW AM-X-CD-16-65-00T-RET-	1900	14.85	122.00	4.00	40.00	4887.87	0.00004	1000.00	0.00000
AT&T C 17	KMW AM-X-CD-16-65-00T-RET-	2100	15.35	122.00	4.00	40.00	5484.28	0.00004	1000.00	0.00000
AT&T C 18	CCI HPA-65R-BUU-H8	850	14.35	122.00	4.00	40.00	4356.32	0.00052	566.67	0.00009
AT&T C 18	CCI HPA-65R-BUU-H8-	2300	14.95	122.00	4.00	25.00	3126.08	0.00017	1000.00	0.00002
Verizon A 19	COMMSCOPE LNX-8513DS-VTM	850	12.66	109.00	7.00	20.00	2581.83	0.00158	566.67	0.00028
Verizon A 20	COMMSCOPE NHH-65B-R2B	700	12.29	109.00	2.00	40.00	1355.47	0.00082	466.67	0.00018
Verizon A 20	COMMSCOPE NHH-65B-R2B	850	12.70	109.00	2.00	40.00	1489.67	0.00022	566.67	0.00004
Verizon A 20	COMMSCOPE NHH-65B-R2B	1900	15.65	109.00	4.00	40.00	5876.52	0.00030	1000.00	0.00003
Verizon A 21	COMMSCOPE NHHSS-65B-R2BT2	700	12.49	109.00	2.00	40.00	1419.35	0.00018	466.67	0.00004
Verizon A 21	COMMSCOPE NHHSS-65B-R2BT2	850	13.39	109.00	2.00	40.00	1746.18	0.00011	566.67	0.00002
Verizon A 21	COMMSCOPE NHHSS-65B-R2BT2	2100	15.89	109.00	4.00	40.00	6210.41	0.00042	1000.00	0.00004
Verizon A 22	SAMSUNG SON_MT6407	3700	23.34	109.00	4.00	50.00	43154.89	0.03439	1000.00	0.00344
Verizon A 23	SAMSUNG RT4401-48A	3600	8.40	109.00	4.00	5.00	138.37	0.00019	1000.00	0.00002
Verizon B 24	COMMSCOPE LNX-8513DS-VTM	850	12.66	109.00	7.00	20.00	2581.83	0.10652	566.67	0.01880
Verizon B 25	COMMSCOPE NHH-65B-R2B	700	12.29	109.00	2.00	40.00	1355.47	0.08188	466.67	0.01755
Verizon B 25	COMMSCOPE NHH-65B-R2B	850	12.70	109.00	2.00	40.00	1489.67	0.08875	566.67	0.01566
Verizon B 25	COMMSCOPE NHH-65B-R2B	1900	15.65	109.00	4.00	40.00	5876.52	0.15427	1000.00	0.01543
Verizon B 26	COMMSCOPE NHHSS-65B-R2BT2	700	12.49	109.00	2.00	40.00	1419.35	0.08004	466.67	0.01715
Verizon B 26	COMMSCOPE NHHSS-65B-R2BT2	850	13.39	109.00	2.00	40.00	1746.18	0.08641	566.67	0.01525
Verizon B 26	COMMSCOPE NHHSS-65B-R2BT2	2100	15.89	109.00	4.00	40.00	6210.41	0.17016	1000.00	0.01702
Verizon B 27	SAMSUNG SON_MT6407	3700	23.34	109.00	4.00	50.00	43154.89	1.27753	1000.00	0.12775
Verizon B 28	SAMSUNG RT4401-48A	3600	8.40	109.00	4.00	5.00	138.37	0.02403	1000.00	0.00240
Verizon C 29	COMMSCOPE LNX-8513DS-VTM	850	12.66	109.00	7.00	20.00	2581.83	0.00024	566.67	0.00004
Verizon C 30	COMMSCOPE NHH-65B-R2B	700	12.29	109.00	2.00	40.00	1355.47	0.00020	466.67	0.00004
Verizon C 30	COMMSCOPE NHH-65B-R2B	850	12.70	109.00	2.00	40.00	1489.67	0.00000	566.67	0.00000
Verizon C 30	COMMSCOPE NHH-65B-R2B	1900	15.65	109.00	4.00	40.00	5876.52	0.00003	1000.00	0.00000
Verizon C 31	COMMSCOPE NHHSS-65B-R2BT2	700	12.49	109.00	2.00	40.00	1419.35	0.00004	466.67	0.00001
Verizon C 31	COMMSCOPE NHHSS-65B-R2BT2	850	13.39	109.00	2.00	40.00	1746.18	0.00001	566.67	0.00000

Antenna ID	Make / Model	Frequency Band (MHz)	Antenna Gain (dBd)	Antenna Centerline (ft)	Channel Count	TX Power/ Channel (watts)	ERP (watts)	Calculated Power Density (µW/cm²)	General Population MPE Limit (µW/cm²)	General Population % MPE
Verizon C 31	COMMSCOPE NHHSS-65B-R2BT2	2100	15.89	109.00	4.00	40.00	6210.41	0.00089	1000.00	0.00009
Verizon C 32	SAMSUNG SON_MT6407	3700	23.34	109.00	4.00	50.00	43154.89	0.02927	1000.00	0.00293
Verizon C 33	SAMSUNG RT4401-48A	3600	8.40	109.00	4.00	5.00	138.37	0.00003	1000.00	0.00000
							Cumulative Power Density:	**9.46565 µW/cm²**	**Cumulative % MPE:**	**1.07279%**

Summary

The theoretical calculations performed for this analysis yielded cumulative power density totals in all areas at Ground that are within the allowable federal limits for public exposure to RF energy. Therefore, the site is **Compliant** with FCC rules and regulations.

Michelle Stone

Michelle Stone
RF EME Technical Writer II
Centerline Communications, LLC

T-Mobile

T-MOBILE SITE NUMBER: CTHA621A
T-MOBILE SITE NAME: CTHA621_ATC_MONOPOLE_ASHFORD
SITE TYPE: MONOPOLE
TOWER HEIGHT: 120'-0"
BUSINESS UNIT #: 842867
SITE ADDRESS: 497 MIDDLE TURNPIKE STORRS MANSFIELD, CT 06268
COUNTY: TOLLAND
JURISDICTION: TOWN OF TOLLAND

UP30819A_COVERAGE STRATEGY: 67E5998E_1xAIR+1OP+1QP

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	MANSFIELD FOUR CORNERS
SITE ADDRESS:	497 MIDDLE TURNPIKE STORRS MANSFIELD, CT 06268
COUNTY:	TOLLAND
MAP/PARCEL #:	TBD
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.82578000° (41° 49' 32.81")
LONGITUDE:	72.28179000° (-72° 16' 54.46")
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	600 FT
CURRENT ZONING:	TBD
JURISDICTION:	TOWN OF TOLLAND
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	TBD
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 12920 SE 38TH STREET BELLEVUE, WA 98006
ELECTRIC PROVIDER:	---- ----
TELCO PROVIDER:	---- ----

PROJECT TEAM

A&E FIRM:	INFINIGY 500 WEST OFFICE CENTER DR. SUITE 150, FORT WASHINGTON, PA 19034
CROWN CASTLE USA INC. DISTRICT CONTACTS:	3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065
	TRICIA PELON - PROJECT MANAGER TRICIA.PELON@CROWNCASTLE.COM
	CHRISTOPHER P MILLER - CONSTRUCTION MANAGER CHRISP.MILLER@CROWNCASTLE.COM

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1	SITE PLAN & ENLARGED SITE PLAN
C-2	ELEVATION & ANTENNA PLANS
C-3	ANTENNA & CABLE SCHEDULE
C-4	PLUMBING DIAGRAM
C-5	ANTENNA EQUIPMENT SPECS
C-6	RAN EQUIPMENT SPECS & DETAILS
C-7	GENERATOR INSTALLATION DETAILS
C-8	GROUND EQUIPMENT SUPPORT DETAILS
C-9	CANOPY DETAILS
C-10	ANTENNA MOUNTING DETAIL
C-11	GENERATOR SPECS
E-1	AC PANEL SCHEDULES & ONE LINE DIAGRAM
E-2	UTILITY ROUTING
G-1	TYPICAL GROUNDING SCHEMATIC
G-2	ANTENNA GROUNDING DIAGRAM
G-3	GROUNDING DETAILS I
G-4	GROUNDING DETAILS II

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 22X34. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

PROJECT DESCRIPTION

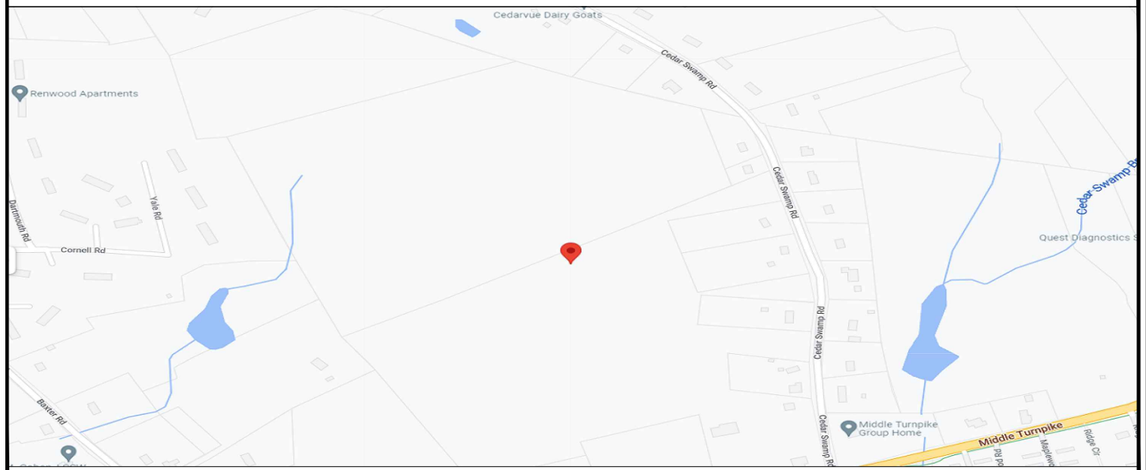
THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

TOWER SCOPE OF WORK:
- INSTALL (9) ANTENNAS
- INSTALL (6) RRHS
- INSTALL (3) 6X24 HYBRID CABLES
- INSTALL (4) 1/2" COAX CABLES
- INSTALL (3) VFA10-HD ANTENNA MOUNT
- INSTALL (1) MSFAA
- INSTALL 2.375" O.D., SCH.40, 8-FT. LONG ANTENNA PIPES
- INSTALL TIE-BACK

GROUND SCOPE OF WORK:
- INSTALL 10'X15' CONCRETE PAD
- INSTALL (1) 6160 & (1) B160 BATTERY CABINET
- INSTALL (1) IXRE ROUTER IN (P) CABINET
- INSTALL (2) PSU4813 BOOSTER IN (P) CABINET
- INSTALL (2) RP 6651 IN (P) CABINET
- INSTALL (1) 50KW SSM DIESEL GENERATOR
- INSTALL ICE BRIDGE
- INSTALL (2) H-FRAMES W/ ASSOCIATED EQUIPMENT
- INSTALL (1) CANOPY
- INSTALL (4) LED LUMINARE WORK LIGHTS

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 IBC
MECHANICAL	2015 IMC
ELECTRICAL	2017 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	B+T GROUP
DATED:	05/17/2022
MOUNT ANALYSIS:	TRYLON
DATED:	05/13/2022
RFDS REVISION:	1
DATED:	3/15/2022
ORDER ID:	611795
REVISION:	0

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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.

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REV	DATE	DRWN	DESCRIPTION	DES./QA
A	06/16/2022	RCD	PRELIMINARY	SS
0	07/13/2022	RCD	100% FINALS	SS

STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER

07/13/2022

SHEET NUMBER: T-1

REVISION: 0

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED– NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800–788–7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
2. "LOOK UP" – CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT:
THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD CED–STD–10253, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA–322 (LATEST EDITION).
5. ALL SITE WORK TO COMPLY WITH QAS–STD–10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE," 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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T-MOBILE SITE NUMBER:
CTHA621A

BU #: **842867**
MANSFIELD FOUR CORNERS

497 MIDDLE TURNPIKE
STORRS MANSFIELD, CT 06268

EXISTING 120'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	06/16/2022	RCD	PRELIMINARY	SS
0	07/13/2022	RCD	100% FINALS	SS

SHUHEI SAKANOUE
34916

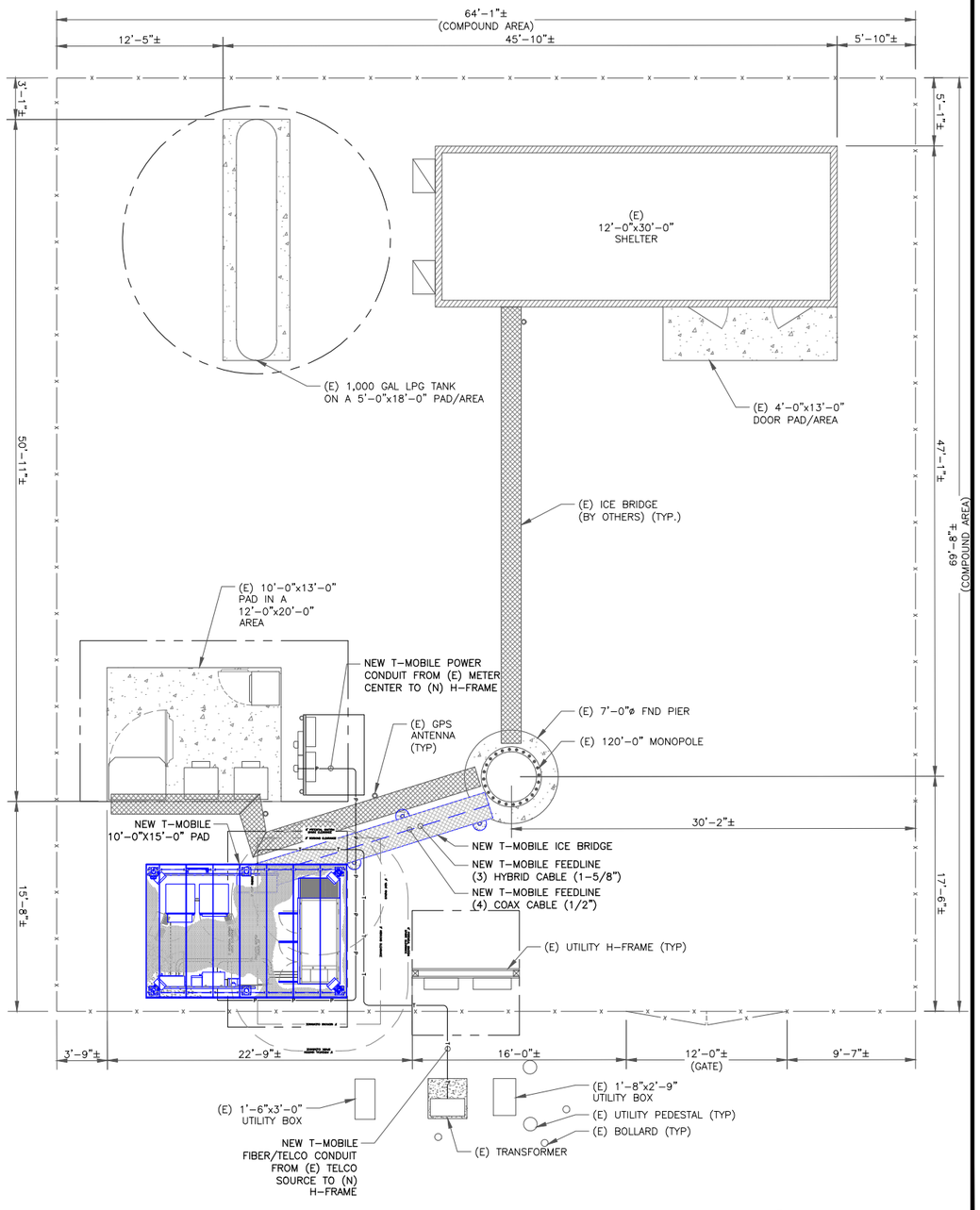
07/13/2022

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

SHEET NUMBER:	REVISION:
T-2	0

NOTE:

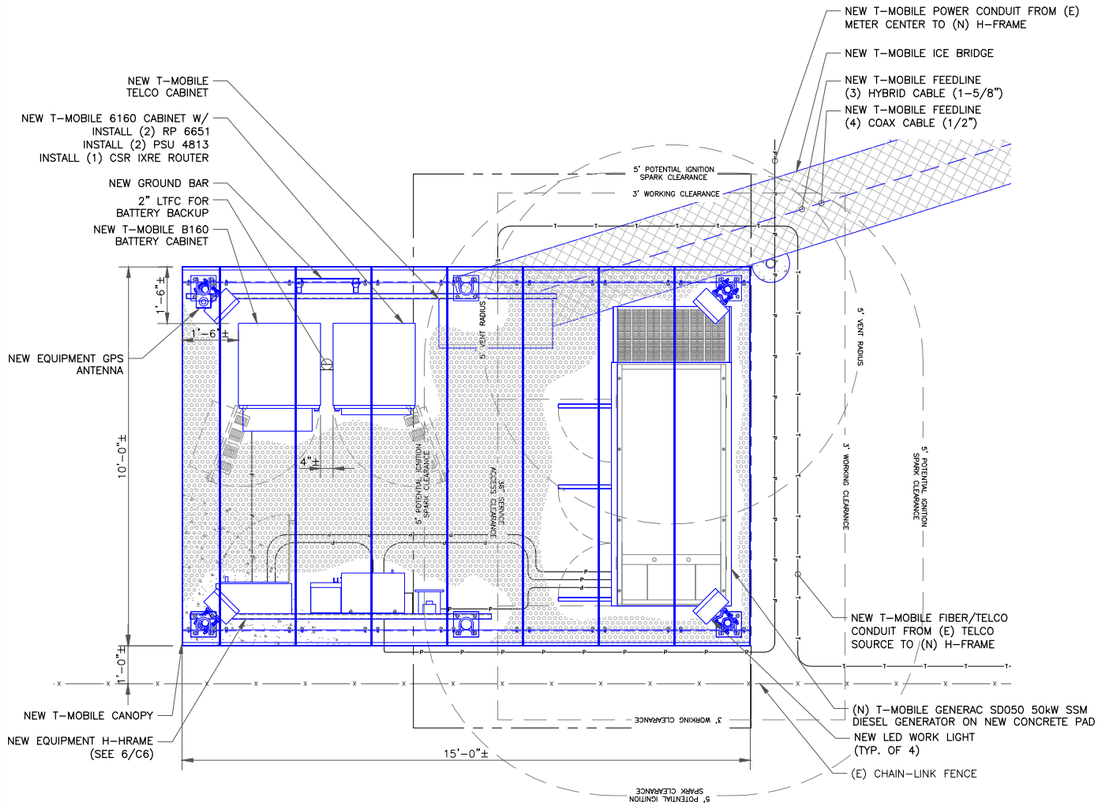
1. PLANS BASED ON SITE PLAN PROVIDED BY TOWER OWNER AND SITE VISIT PERFORMED BY INFINIGY. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING T–MOBILE EQUIPMENT.



1 SITE PLAN

SCALE: 4' 2' 0 4' 3/16"=1'–0" (FULL SIZE) 3/32"=1'–0" (11x17)

N



2 ENLARGED SITE PLAN

SCALE: 2' 1' 0 2' 1/2"=1'–0" (FULL SIZE) 1/4"=1'–0" (11x17)

N

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STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER

07/13/2022

SHEET NUMBER: C-1

REVISION: 0

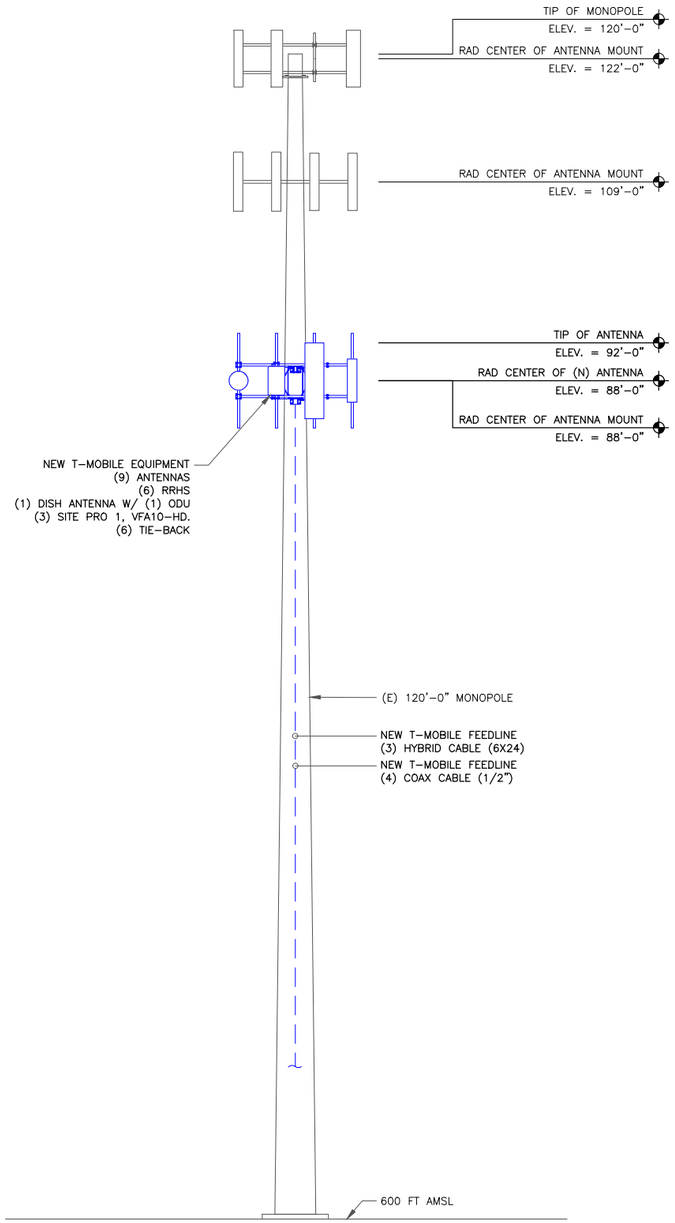
NOTES:

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 MOUNT STRUCTURE AND ASSUMES NO RESPONSIBILITY FOR THEIR STRUCTURAL INTEGRITY REGARDING PROPOSED LOADINGS. FINAL INSTALLATION SHALL COMPLY WITH RESULTS OF PASSING STRUCTURAL ANALYSES PERFORMED BY OTHERS.

T-MOBILE EQUIPMENT

ANTENNA CL: 88'-0"
MOUNT CL: 88'-0"

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

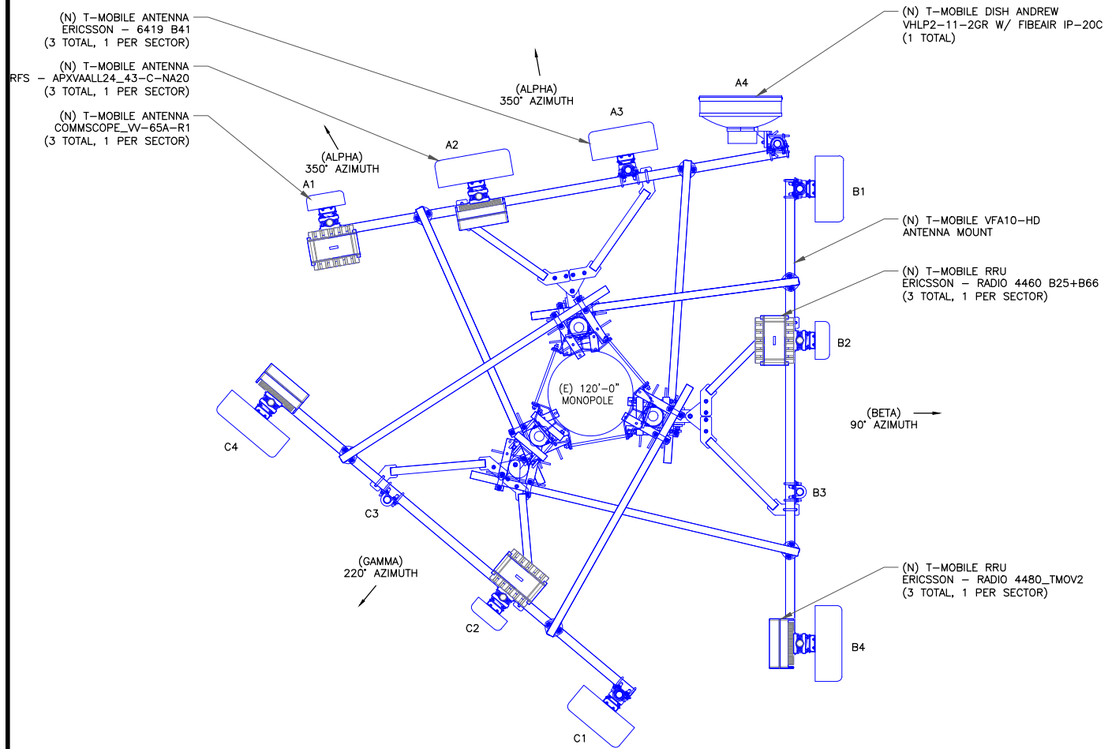


1 FINAL ELEVATION

SCALE: 8' 6' 4' 2' 0 8' 1/8"=1'-0" (FULL SIZE) 1/16"=1'-0" (11x17)

NOTES:

1. *A STRUCTURAL EVALUATION OF THE T-MOBILE ANTENNA MOUNTS HAS BEEN PERFORMED BY B+T GROUP. REFER TO ANTENNA MOUNT STRUCTURAL ANALYSIS 05/17/2022 TBD PRIOR TO CONSTRUCTION.*
2. *THE SITEPRO1 SECTOR MOUNT (PART# VF10-HD) HAS SUFFICIENT CAPACITY TO CARRY THE PROPOSED LOADING CONFIGURATION.*
3. *INFINIGY HAS NOT EVALUATED THE TOWER FOR THIS SITE AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY. CONTRACTOR TO COORDINATE LOADING WITH RF ENGINEER. REFER TO STRUCTURAL ANALYSIS PERFORMED BY OTHERS PRIOR TO CONSTRUCTION.*



2 FINAL ANTENNA LAYOUT

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

N

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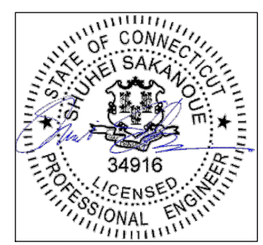


07/13/2022

SHEET NUMBER: C-2

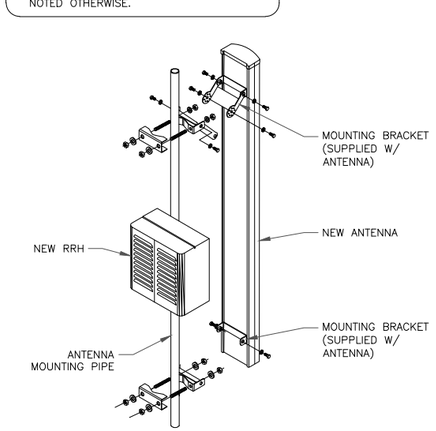
REVISION: 0

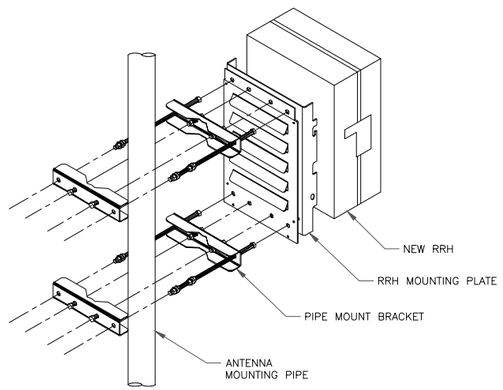
ANTENNA SCHEDULE										
SECTOR	POS.	TECHNOLOGY	RAD CENTER	AZIMUTH	ANTENNA MANUFACTURER	ANTENNA MODEL	MECH. TILT	ELECT. TILT	TOWER MOUNTED EQUIPMENT	FEEDLINE TYPE
ALPHA	A1	L2100, L1900, G1900	88'-0"	350°	COMMSCOPE	COMMSCOPE - VV-65A-R1	2	2/2	(1) ERICSSON - RRUS 4460 B25+B66	(3) HYBRID CABLE (6X24) (4) COAX CABLE (1/2")
ALPHA	A2	L700, L600, N600	88'-0"	350°	RFS	APXVAALL24_43-C-NA20	2	2/2/2/2	(1) ERICSSON - RRUS 4480 B71+B85	
ALPHA	A3	L2500, N2500	88'-0"	350°	ERICSSON	ERICSSON - AIR6419 B41	2	2/2	--	
ALPHA	A4	--	88'-0"	0°	ANDREW	VHLP2-11-2GR	--	--	(1) FIBEAIR IP-20C ODU	
BETA	B1	L2500, N2500	88'-0"	90°	ERICSSON	ERICSSON - AIR6419 B41	2	2/2	--	HYBRID CABLE (SHARED) COAX CABLE (SHARED)
BETA	B2	L2100, L1900, G1900	88'-0"	90°	COMMSCOPE	COMMSCOPE - VV-65A-R1	2	2/2	(1) ERICSSON - RRUS 4460 B25+B66	
BETA	B3	--	--	--	--	--	--	--	--	
BETA	B4	L700, L600, N600	88'-0"	90°	RFS	APXVAALL24_43-C-NA20	2	2/2/2/2	(1) ERICSSON - RRUS 4480 B71+B85	
GAMMA	C1	L2500, N2500	88'-0"	220°	ERICSSON	ERICSSON - AIR6419 B41	2	2/2	--	HYBRID CABLE (SHARED) COAX CABLE (SHARED)
GAMMA	C2	L2100, L1900, G1900	88'-0"	220°	COMMSCOPE	COMMSCOPE - VV-65A-R1	2	2/2	(1) ERICSSON - RRUS 4460 B25+B66	
GAMMA	C3	--	--	--	--	--	--	--	--	
GAMMA	C4	L700, L600, N600	88'-0"	220°	RFS	APXVAALL24_43-C-NA20	2	2/2/2/2	(1) ERICSSON - RRUS 4480 B71+B85	

1 ANTENNA AND CABLE SCHEDULE
SCALE: NOT TO SCALE

INSTALLER NOTES:

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





NOTE:

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

2 ANTENNA WITH RRH MOUNTING DETAIL
SCALE: NOT TO SCALE

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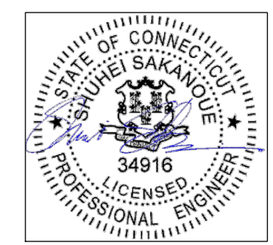

07/13/2022

SHEET NUMBER: C-3

REVISION: 0

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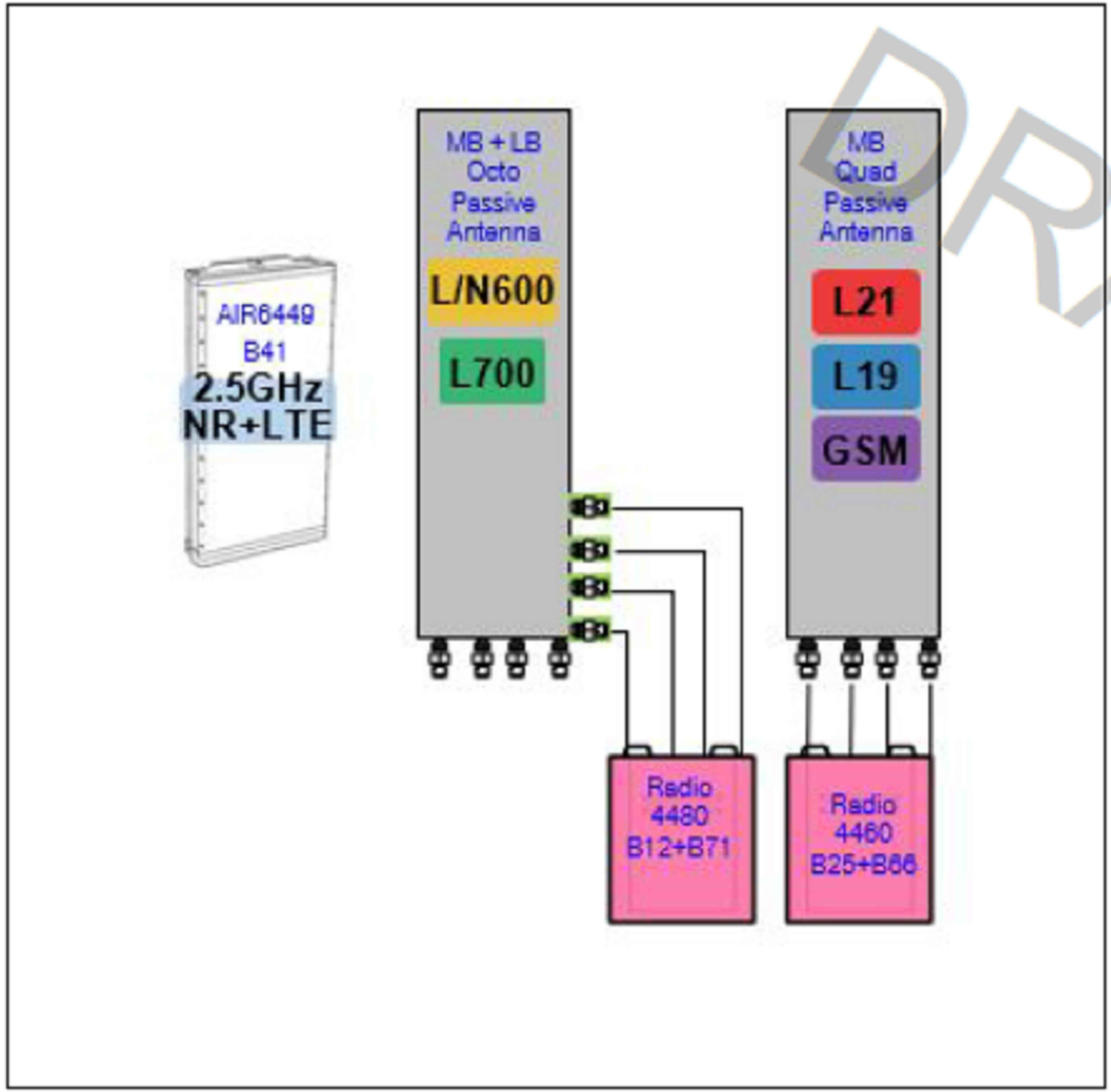

1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

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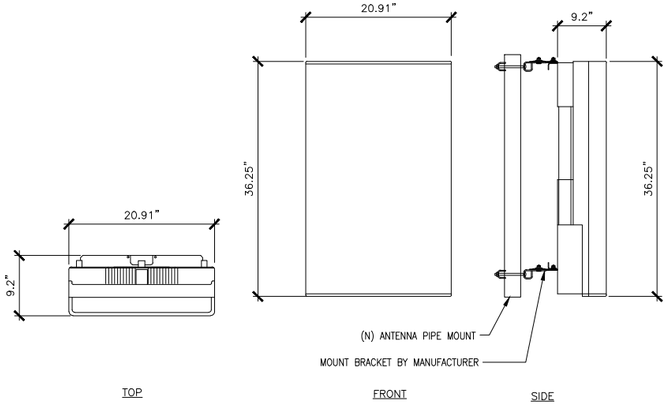
STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED
PROFESSIONAL ENGINEER

07/13/2022

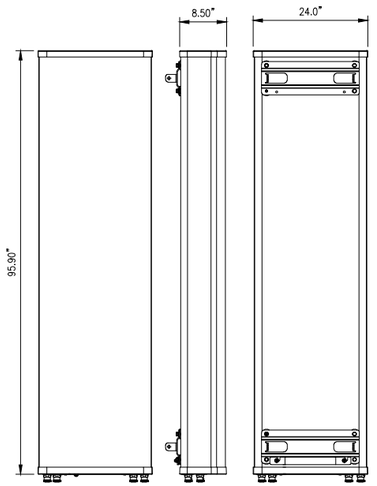
SHEET NUMBER: C-4

REVISION: 0

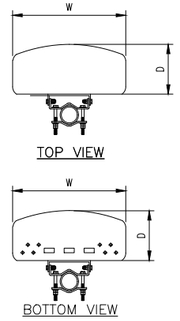
MANUFACTURER: ERICSSON
MODEL: AIR6419 B41
WEIGHT: 96.50 LBS (W/ MOUNT BRACKET 113)
DIMENSIONS: 36.25"H. X 20.91"W. X 9.2"D.
FREQUENCY: REFER TO RF DATA SHEET



1 (N) AIR 6419 B41 ANTENNA SPEC
SCALE: NOT TO SCALE



700MHz RFS ANTENNAS	
MODEL	WEIGHT (lb)
(8') APXVAALL24_43-UNA20	149.90
WEIGHT W/ MOUNTING BRACKET (lb):	154



2 (N) APXVAALL24_43-UNA20 ANTENNA SPEC
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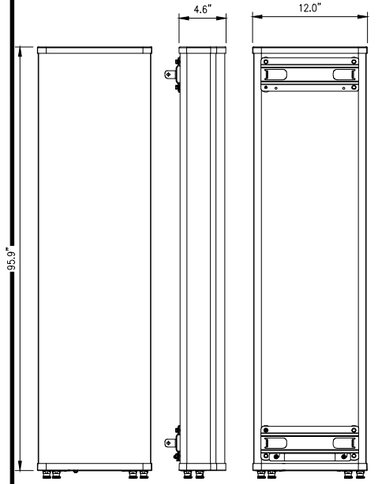
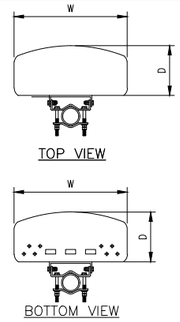


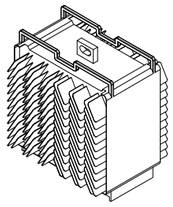
COMMSCOPE ANTENNAS	
MODEL	WEIGHT (lb)
VV-65A-R1	33.3
WEIGHT W/ MOUNTING BRACKET (lb):	–

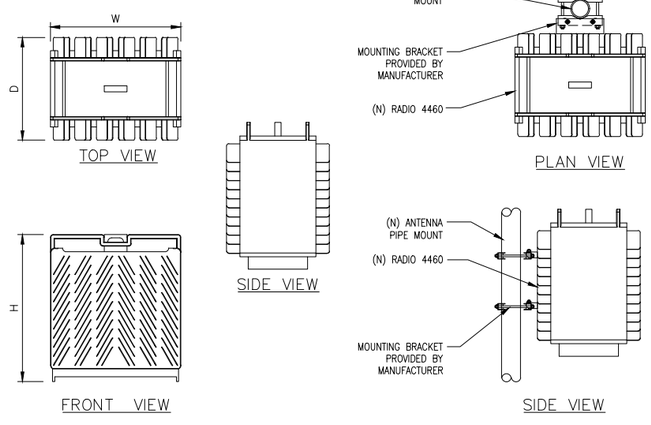


3 (N) COMMSCOPE – VV-65A-R1 ANTENNA SPEC
SCALE: NOT TO SCALE

ERICSSON RADIO-4460 B25 B66

DIMENSIONS, WxDxH:	17.0"x15.1"x11.9"
MAX OUTPUT POWER:	4x80W (2x(2x80W))
TOTAL WEIGHT:	109 lbs
TEMPERATURE:	-40° TO 55° C

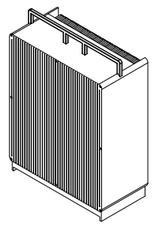


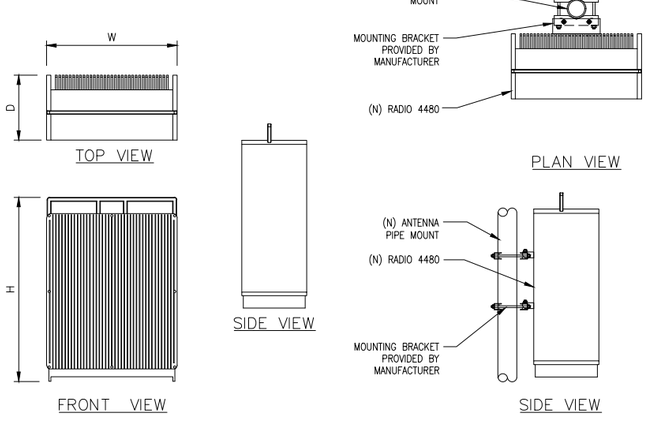


4 (N) RADIO 4460 SPEC
SCALE: NOT TO SCALE

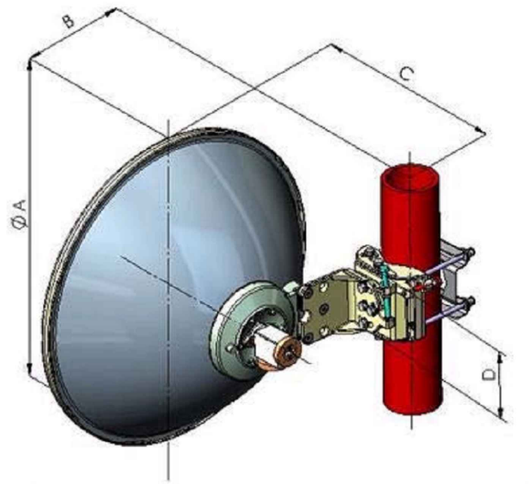
ERICSSON RADIO-4480 B71 B85

DIMENSIONS, WxDxH:	21.8"x15.7"x7.5"
MAX OUTPUT POWER:	4x80W (2x(2x80W))
TOTAL WEIGHT:	93 lbs
TEMPERATURE:	-40° TO 55° C





5 (N) RADIO 4480 SPEC
SCALE: NOT TO SCALE



Dimensions in inches (mm)				
Antenna Size, ft (m)	A	B	C	D
2	26.1 (662)	14.1 (358)	12.3 (313)	5.9 (150)

6 (N) VHLP2-11-2GR DISH SPEC
SCALE: NOT TO SCALE

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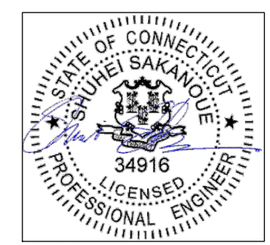
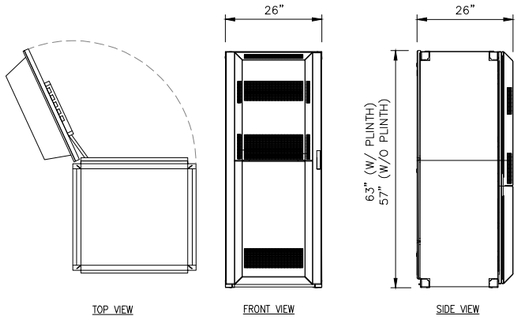


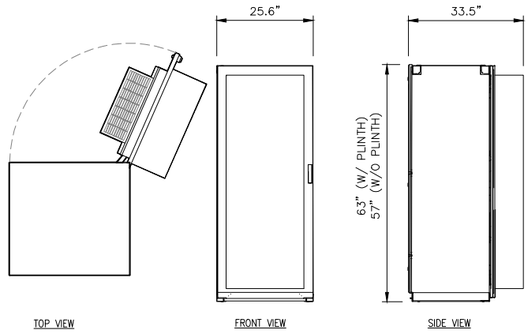
07/13/2022

SHEET NUMBER:	REVISION:
C-5	0



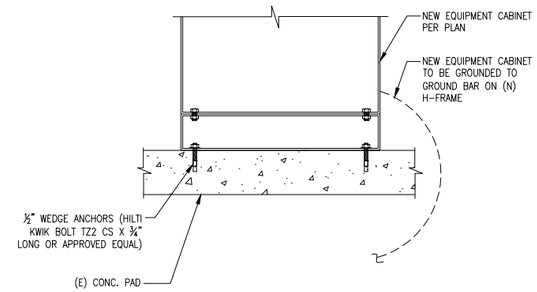
ERICSSON MODEL NO.:	B160
RACK SPACE:	19U
DIMENSIONS, HxWxD:	63"x26"x26" (W/ 6" PLINTH)
CABINET WEIGHT, EMPTY:	485 LBS
MAXIMUM WEIGHT:	2100± LBS

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

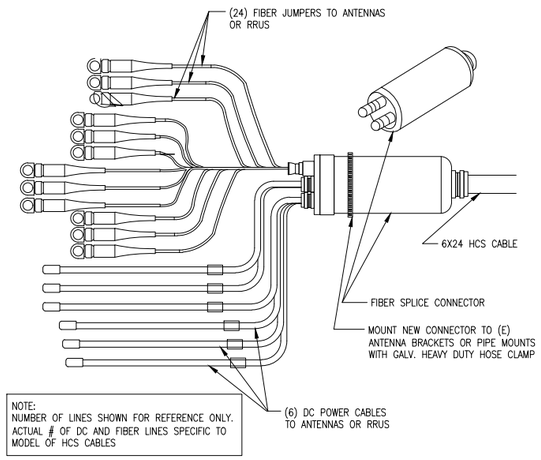


ERICSSON MODEL NO.:	6160
RACK SPACE:	19U
DIMENSIONS, HxWxD:	63"x25.6"x25.6" (W/ 6" PLINTH)
CABINET WEIGHT, EMPTY:	410 LBS
MAXIMUM WEIGHT:	770± LBS

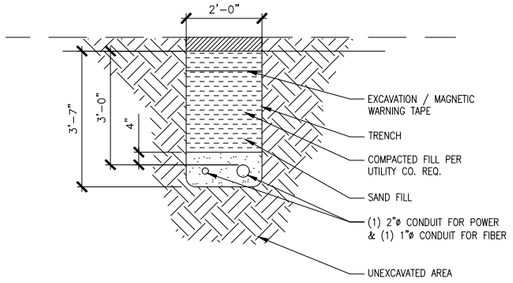
2 (N) 6160 CABINET DETAIL
SCALE: NOT TO SCALE



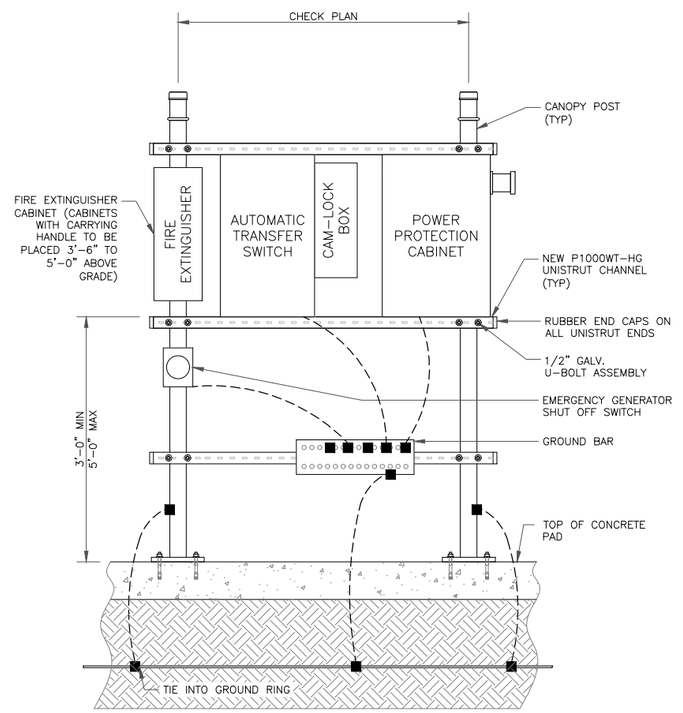
3 (N) EQUIPMENT CABINET MOUNTING DETAIL
SCALE: NOT TO SCALE



4 (N) 6X24 HCS CABLE DETAIL
SCALE: NOT TO SCALE



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



6 H-FRAME DETAIL
SCALE: NOT TO SCALE

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BU #: **842867**
MANSFIELD FOUR CORNERS

497 MIDDLE TURNPIKE
STORRS MANSFIELD, CT 06268

EXISTING 120'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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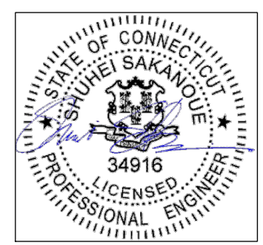
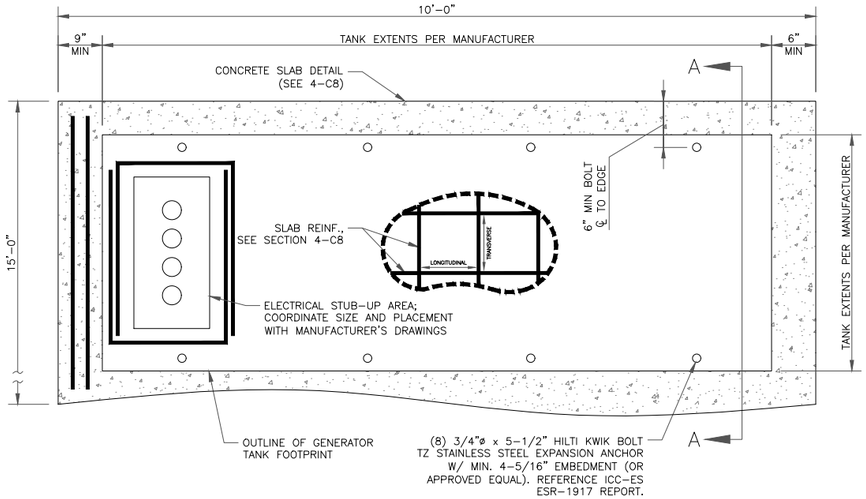
0	07/13/2022	RCD	100% FINALS	SS



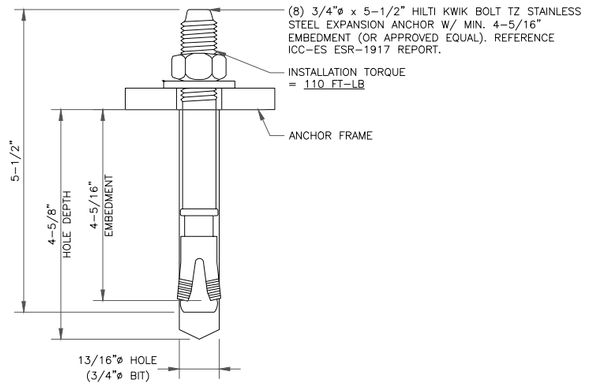
07/13/2022

SHEET NUMBER: C-6
REVISION: 0



1 GENERATOR PAD DETAIL
SCALE: NOT TO SCALE

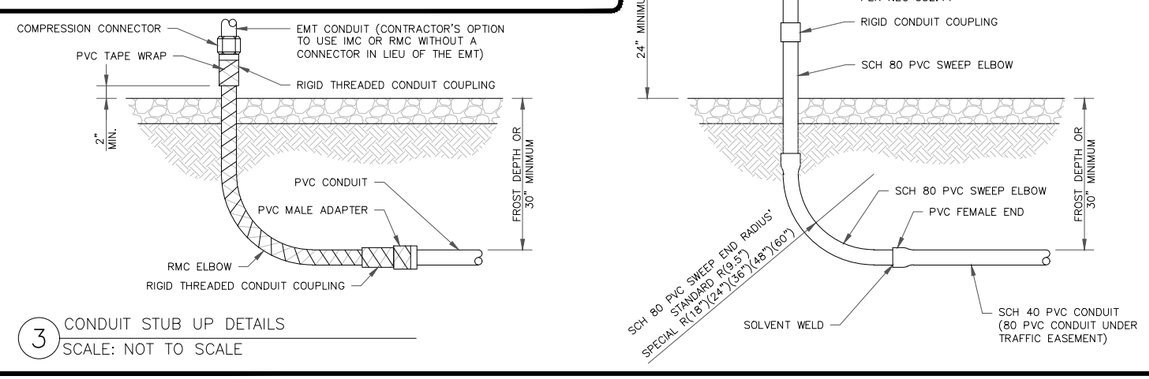
INSTALLER NOTE:
PER CBC 1705.12.6, PERIODIC SPECIAL INSPECTION OF ANCHORAGE FOR STANDBY POWER SYSTEMS IS REQUIRED



2 TYPICAL ANCHOR DETAIL
SCALE: NOT TO SCALE

INSTALLER NOTES:

ALL METAL CONDUIT INSTALLED IN DIRECT CONTACT WITH THE EARTH SHALL BE CONSIDERED TO BE INSTALLED IN A SEVERELY CORROSIVE ENVIRONMENT AND IS REQUIRED TO HAVE SUPPLEMENTAL PROTECTION AGAINST CORROSION (NEC ARTICLE 342.10(B) & 344.10(B)(1)). THIS PROTECTION SHALL EITHER BE AN APPROVED MANUFACTURER INSTALLED PROTECTIVE COATING ON THE CONDUIT OR SHALL BE (2) LAYERS OF 10 MIL PVC PIPE WRAP TAPE INSTALLED USING OPPOSING SPIRAL WRAPS. ON VERTICAL PIPE THE OUTSIDE LAYER OF TAPE SHALL BE WRAPPED SO AS TO PROVIDE SHEDDING OF WATER (i.e. TAPE SHOULD WRAP IN AN UPWARD DIRECTION WITH LOWER WRAP BEING BENEATH THE WRAP ABOVE). SPIRAL WRAPS SHALL HAVE A MINIMUM OF 1/4" OVERLAP WITH THE PRECEDING TAPE WRAP. ANY OTHER METHODS OF CORROSION PROTECTION SHALL REQUIRE APPROVAL BY THE ENGINEER OF RECORD PRIOR TO BEING USED.



3 CONDUIT STUB UP DETAILS
SCALE: NOT TO SCALE

STRUCTURAL DESIGN NOTES:

ALL LOADS DERIVED FROM REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE, ASCE 7.

BUILDING & COMMUNICATION STRUCTURES:

1. WIND LOADS: IBC 2018 & ASCE 7-16
   V = 94 MPH ULTIMATE WIND SPEED
   EXPOSURE CATEGORY = C; TOPOGRAPHIC CATEGORY = 1.
   IMPORTANCE FACTOR = 1.0.
2. SEISMIC LOADS: IBC 2018 & ASCE 7-16
   STRUCTURE CLASS = II; SITE CLASS = D.
   SS = 0.36 ; S1 = 0.188 ; SDS = 0.363

CONCRETE NOTES:

1. PRIOR TO EXCAVATION, CHECK THE AREA FOR UNDERGROUND FACILITIES.
2. ALL CONCRETE SHALL BE IN ACCORDANCE WITH CHAPTER 19 OF THE IBC & ACI 318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", LATEST EDITION & HAVE THE FOLLOWING PROPERTIES:
   A MINIMUM 7-DAY COMPRESSIVE STRENGTH (f'c) OF 2,500 PSI.
   B CEMENT SHALL BE "LOW-ALKALI" TYPE IIA (MODERATE SULFATE RESISTANCE, AIR ENTRAINING) CONFORMING TO ASTM C150.
   C MAXIMUM WATER/CEMENT RATIO OF 0.45 AND AIR-ENTRAINED 4% TO 7%.
   D CONCRETE PROPORTIONING SHALL BE DESIGNED BY AN APPROVED LABORATORY. TOLERANCES IN ACCORDANCE WITH ACI 117. COPIES OF CONCRETE MIX SHALL BE SUBMITTED TO THE CROWN CASTLE CONSTRUCTION MANAGER FOR REVIEW PRIOR TO PLACEMENT.
   E ALL AGGREGATE USED IN CONCRETE SHALL CONFORM TO ASTM C33. USE ONLY AGGREGATES KNOWN NOT TO CAUSE EXCESSIVE SHRINKAGE. MAXIMUM AGGREGATE SIZE TO BE 3/4".
   F MAXIMUM SLUMP: REFER TO GEOTECHNICAL REPORT FOR CONFIRMATION OF ANY ASSUMPTIONS MADE DURING DESIGN.
3. FORMWORK FOR CONCRETE SHALL CONFORM TO ACI 347. TOLERANCES FOR FINISHED CONCRETE SURFACES SHALL MEET CLASS-C REQUIREMENTS. IN NO CASE SHALL FINISHED CONCRETE SURFACES EXCEED THE FOLLOWING VALUES AS MEASURED FROM NEAT PLAN LINES AND FINISHED GRADES: ± 1/4" VERTICAL, ± 1" HORIZONTAL.
4. CHAMFER ALL EXPOSED CORNERS AND FILLET ENTRANT ANGLES 3/4" U.N.O.
5. CONCRETE FINISHING: CONCRETE SURFACES SHALL BE FINISHED IN ACCORDANCE WITH ACI. PROVIDE ROUGH FINISH FOR ALL SURFACES NOT EXPOSED TO VIEW AND SMOOTH FINISH FOR ALL OTHERS, U.N.O.
6. STEEL REINFORCEMENT AND CONCRETE SHOULD BE PLACED IMMEDIATELY UPON COMPLETION OF THE FOUNDATION EXCAVATION. CONTRACTOR SHALL NOT ALLOW A COLD JOINT TO FORM IN THE CONCRETE. PORTION AT GRADE SHOULD BE FORMED. TEMPORARY CASING MAY BE REQUIRED TO PREVENT CAVING PRIOR TO CONCRETE PLACEMENT.

REINFORCING STEEL NOTES:

1. ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615. VERTICAL/HORIZONTAL BARS SHALL BE GRADE 60; TIES OR STIRRUPS SHALL BE A MINIMUM OF GRADE 40. ALL REINFORCING STEEL SHALL HAVE 3" (± 3/8") OF CONCRETE COVER, U.N.O.
2. ALL BAR BENDS, HOOKS, SPLICES AND OTHER REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ACI 315.
3. ALL BARS SHALL BE SPLICED WITH A MINIMUM LAP OF 48 BAR DIAMETERS. LAP SPLICES OF DEFORMED BARS IN TENSION ZONES SHALL BE CLASS-B SPLICES. WELDING OF BARS IS NOT PERMITTED.
4. AT ALL CORNERS AND WALL INTERSECTIONS, PROVIDE BENT HORIZONTAL BARS TO MATCH THE HORIZONTAL REINFORCING STEEL.
5. PROVIDE VERTICAL DOWELS IN FOOTINGS AND AT CONSTRUCTION JOINTS TO MATCH VERTICAL REINFORCING BAR SIZE AND SPACING.
6. ACI-APPROVED PLASTIC-COATED BAR CHAIRS OR PRECAST CONCRETE BLOCKS SHALL BE PROVIDED FOR SUPPORT OF ALL GRADE-CAST REINFORCING STEEL & SHALL BE SUFFICIENT IN NUMBER TO PREVENT SAGGING. METAL CLIPS OR SUPPORTS SHALL NOT BE PLACED IN CONTACT WITH THE FORMS OR THE SUB-GRADE.
7. DOWELS AND ANCHOR BOLTS SHALL BE WIRED OR OTHERWISE HELD IN CORRECT POSITION PRIOR TO PLACING CONCRETE. IN NO CASE SHALL DOWELS OR ANCHOR BOLTS BE "STABBED" INTO FRESHLY-POURED CONCRETE.

FOUNDATION NOTES:

1. THE CONTRACTOR SHALL READ THE GEOTECHNICAL REPORT AND SHALL CONSULT THE GEOTECHNICAL ENGINEER AS NECESSARY PRIOR TO CONSTRUCTION.
2. THE GEOTECHNICAL ENGINEER (OR INSPECTOR) SHALL INSPECT THE EXCAVATION PRIOR TO THE PLACEMENT OF CONCRETE AND SHALL PROVIDE A NOTICE OF INSPECTION FOR THE BUILDING INSPECTOR FOR REVIEW AND RECORDS PURPOSES.
3. THE CONTRACTOR SHALL DETERMINE THE MEANS AND METHODS NECESSARY TO SUPPORT THE EXCAVATION DURING CONSTRUCTION.
4. REBAR AT BOTTOM OF FOUNDATIONS SHALL BE BONDED TO SITE GROUNDING SYSTEM (WHEN APPLICABLE). SEE ADDITIONAL DETAILS ON APPROVED A&E CONSTRUCTION DRAWINGS.
5. ALL FOOTINGS TO BE PLACED ON FIRM, UNDISTURBED, INORGANIC MATERIAL. PROOF ROLL SUB-GRADE PRIOR TO PLACING CONCRETE WHERE THE MATERIAL HAS BEEN DISTURBED BY EQUIPMENT. UNACCEPTABLE/DISTURBED MATERIAL SHALL BE OVER-EXCAVATED AND REPLACED WITH "LEAN CONCRETE FILL". THE GEOTECHNICAL REPORT SHALL BE REVIEWED AND ADHERED TO FOR SPECIFIC RECOMMENDATIONS.
6. STRUCTURAL BACKFILL SHALL BE GRANULAR FREE-DRAINING MATERIAL FREE OF DEBRIS, ORGANICS, REFUSE AND OTHERWISE DELETERIOUS MATERIALS. MATERIAL SHALL BE PLACED IN LIFTS NO GREATER THAN 6" IN DEPTH AND COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED PER ASTM D1557 (MODIFIED PROCTOR). THE GEOTECHNICAL REPORT SHALL BE REVIEWED AND ADHERED TO FOR SPECIFIC RECOMMENDATIONS.

SOIL NOTES:

1. FOUNDATION DESIGN BASED ON THE PRESUMPTIVE MINIMUM SOIL PARAMETERS IN ACCORDANCE WITH THE IBC, CBC AND TIA. WHEN A SITE SPECIFIC GEOTECHNICAL REPORT IS AVAILABLE ON CCISITES AND THE ENGINEER AND THE CONTRACTOR SHALL ADHERE TO ALL RECOMMENDATIONS PROVIDED THEREIN.
2. ALL FOUNDATIONS TO BE PLACED ON FIRM, UNDISTURBED, INORGANIC MATERIAL. PROOF ROLL SUB-GRADE PRIOR TO PLACING CONCRETE WHERE THE MATERIAL HAS BEEN DISTURBED BY EQUIPMENT. UNACCEPTABLE/DISTURBED MATERIAL SHALL BE OVER-EXCAVATED AND REPLACED WITH STRUCTURAL BACKFILL.
3. STRUCTURAL BACKFILL SHALL BE GRANULAR FREE-DRAINING MATERIAL FREE OF DEBRIS, ORGANICS, REFUSE AND OTHERWISE DELETERIOUS MATERIALS. MATERIAL SHALL BE PLACED IN LIFTS NO GREATER THAN 6" IN DEPTH AND COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED PER ASTM D1557 (MODIFIED PROCTOR). THE GEOTECHNICAL REPORT SHALL BE REVIEWED AND ADHERED TO FOR SPECIFIC RECOMMENDATIONS.

MECHANICAL ANCHOR NOTES:

1. HILTI PRODUCTS MUST BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS, AS INCLUDED IN THE ADHESIVE PACKAGING.
2. CONTRACTOR SHALL AVOID DRILLING HOLES IN VERTICAL/HORIZONTAL REINFORCING BARS.
3. HOLES MUST BE WIRE BRUSHED AND BLASTED WITH COMPRESSED AIR PRIOR TO INSTALLATION. TEMPERATURES/METHODS/WORKING TIME/ETC. ARE TO BE IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS.
4. REFERENCE ICC-ES ESR-1917 REPORT.

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T-MOBILE SITE NUMBER:
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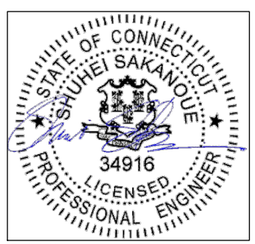
BU #: **842867**
MANSFIELD FOUR CORNERS

497 MIDDLE TURNPIKE
STORRS MANSFIELD, CT 06268

EXISTING 120'-0" MONOPOLE

ISSUED FOR:

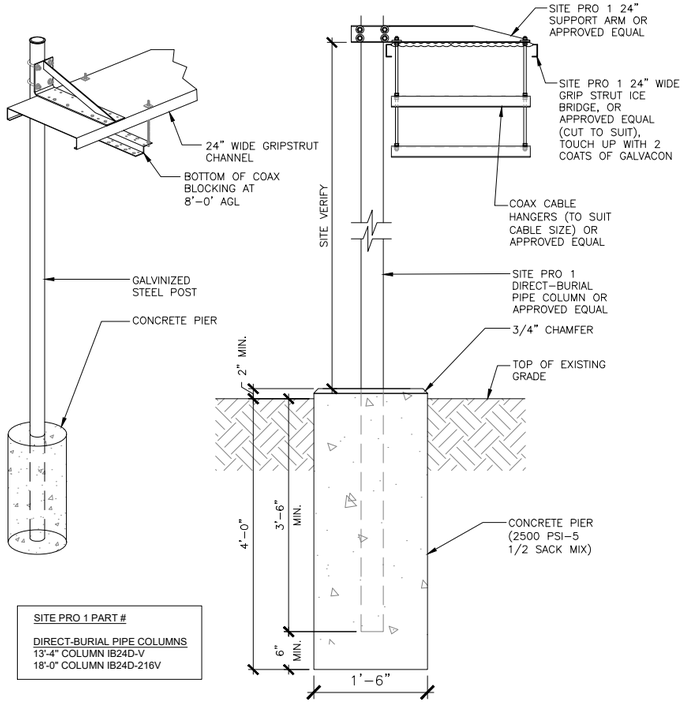
REV	DATE	DRWN	DESCRIPTION	DES./QA
A	06/16/2022	RCD	PRELIMINARY	SS
0	07/13/2022	RCD	100% FINALS	SS



07/13/2022

SHEET NUMBER: C-7

REVISION: 0

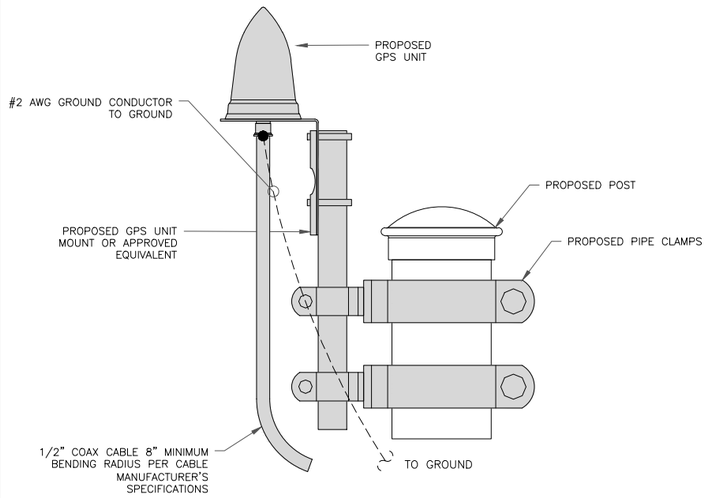


1 CABLE BRIDGE DETAIL
SCALE: NOT TO SCALE

2 NOT USED
SCALE: NOT TO SCALE

INSTALLER NOTES:

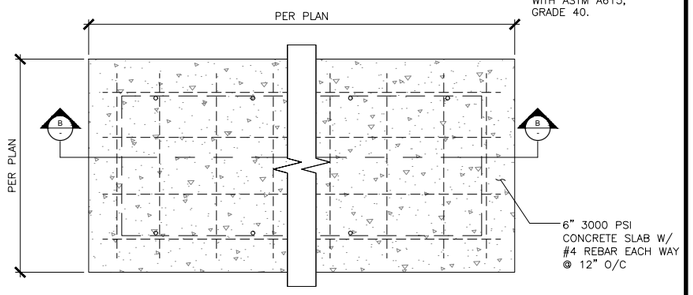
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



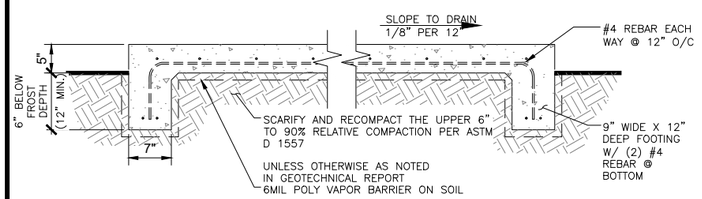
3 GPS DETAILS
SCALE: NOT TO SCALE

NOTES:

1. CONCRETE SHALL ATTAIN A COMPRESSIVE STRENGTH OF f'c=3,000 PSI MINIMUM AT 28 DAYS.
2. ALL REINFORCING STEEL SHALL COMPLY WITH ASTM A615, GRADE 40.



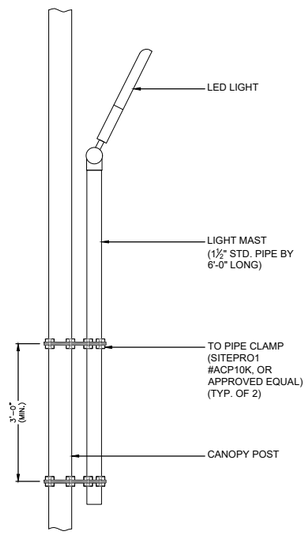
PLAN VIEW



SECTION B-B

4 (N) CONCRETE PAD DETAIL
SCALE: NOT TO SCALE

5 NOT USED
SCALE: NOT TO SCALE



6 LED LIGHT DETAIL
SCALE: NOT TO SCALE

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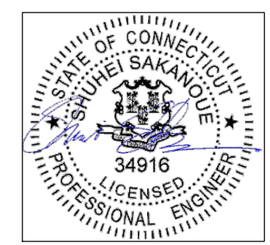
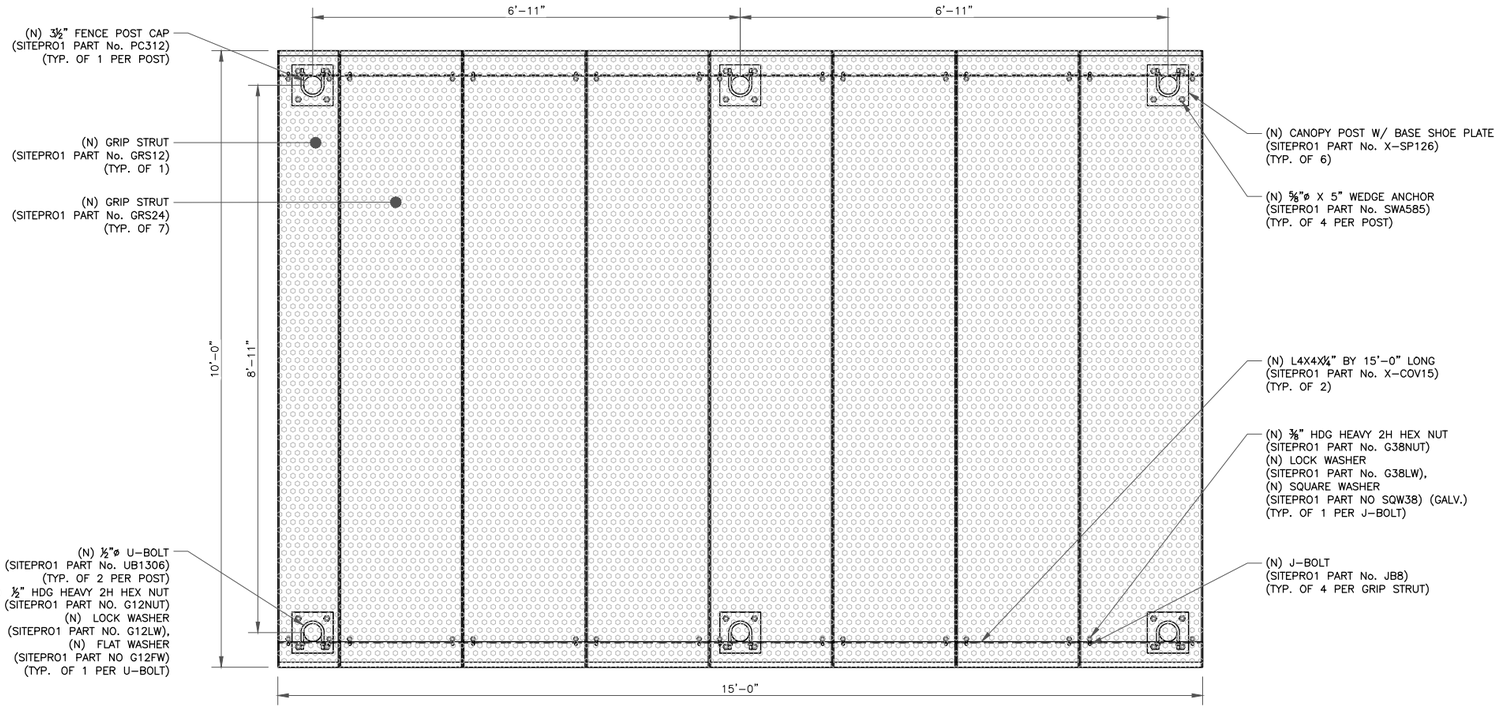
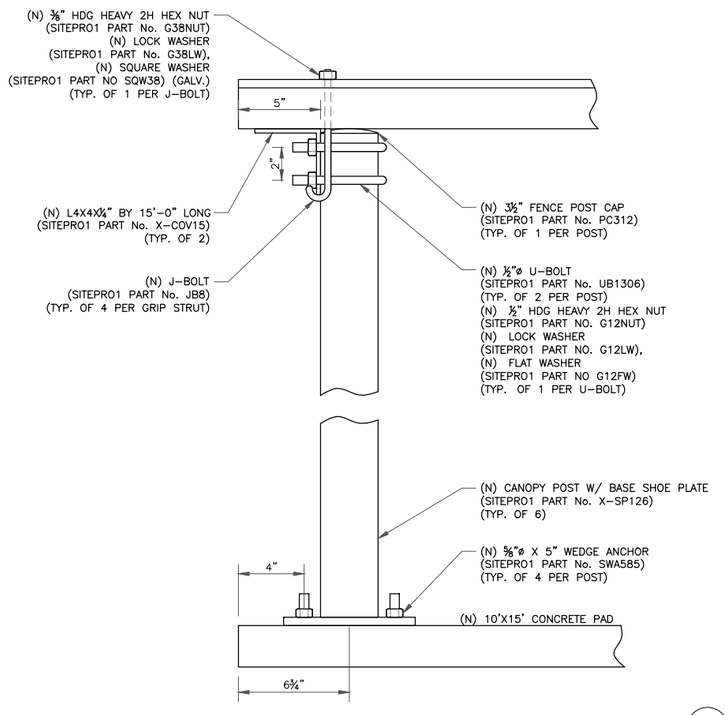


07/13/2022

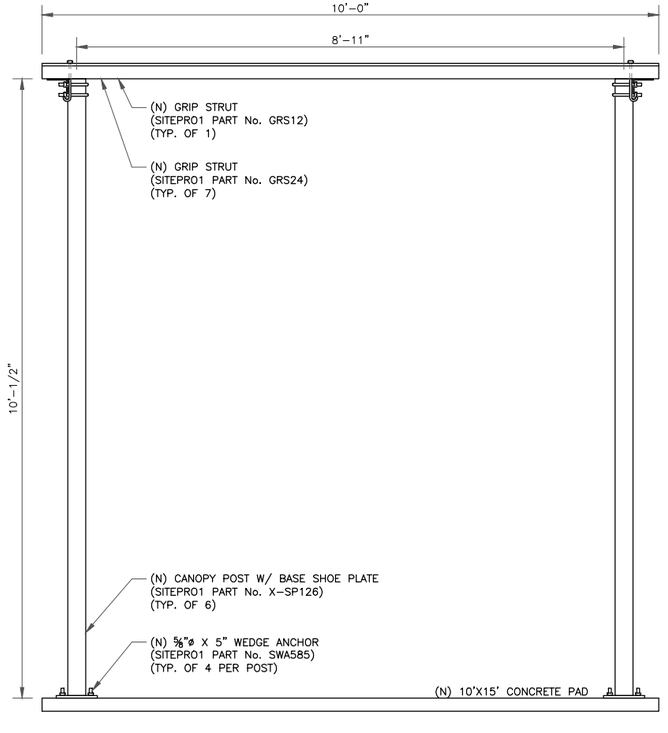
SHEET NUMBER: C-8

REVISION: 0





1 CANOPY DETAIL
SCALE: NOT TO SCALE



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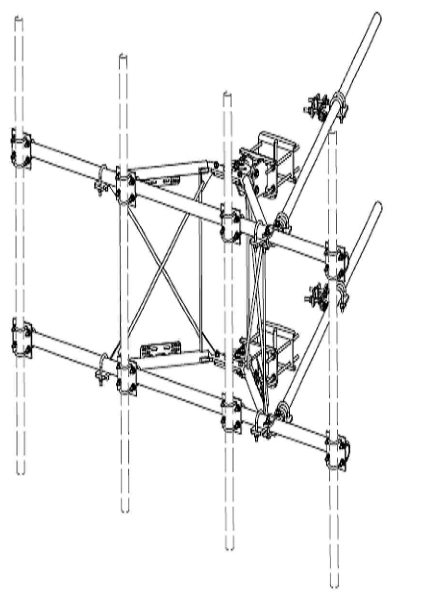
STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER
07/13/2022

SHEET NUMBER: C-9
REVISION: 0



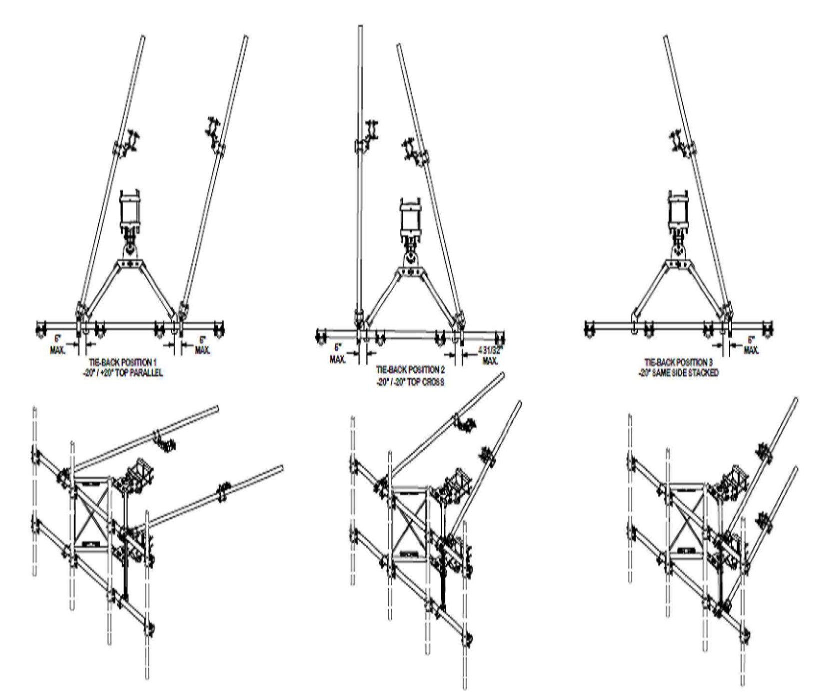
PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	X-VFAW	SUPPORT ARM		71.41	142.81
2	1	X-HDCAMTBW	CLAMP WELDMENT FOR BCAM-HD		33.86	33.86
3	1	X-MHTPHD	MULTI-HOLE TAPER PLATE WELDMENT		36.24	36.24
4	2	X-VFAPL4	VFA-HD PIVOT PLATE	12 in	15.88	31.77
5	2	X-LCBP4	BENT BACKING PLATE	13 in	20.04	40.09
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	8	SCX2	CROSSOVER PLATE	7 in	4.80	38.37
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	P2126	2-3/8" X 126" (2" SCH. 40) GALVANIZED PIPE	126 in	40.75	81.50
14	2	P30126	2-7/8" O.D. X 126" SCH. 40 PIPE	126 in	64.63	129.25
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.)		1.57	12.54
20	4	G58R-12	5/8" x 12" THREADED ROD (HDG.)		1.05	4.18
21	4	G58R-8	5/8" x 8" THREADED ROD (HDG.)		0.70	2.79
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	4	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	1.08
28	8	A582114	5/8" x 2-1/4" HDG A325 HEX BOLT	2 1/4 in	0.31	2.50
29	25	G58FW	5/8" HDG USS FLATWASHER	1/8 in	0.07	1.76
30	55	G58LW	5/8" HDG LOCKWASHER		0.03	1.72
31	71	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	9.22
32	32	X-UB1300	1/2" X 3" X 5" X 2" GALV U-BOLT		0.74	23.64
33	16	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.60	9.56
34	64	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	2.18
35	64	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	0.89
36	64	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	4.58
					TOTAL WT. #	713.44

TOLERANCE NOTES

10' 6" HEAVY DUTY V-FRAME ASSEMBLY WITH TWO STIFF ARMS

VFA10-HD

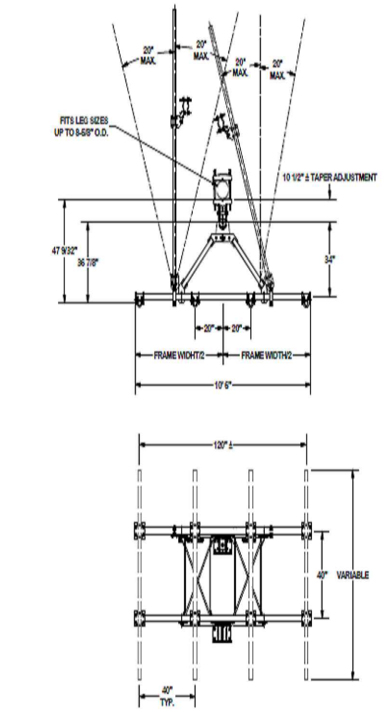
TIE-BACK POSITIONS



TOLERANCE NOTES

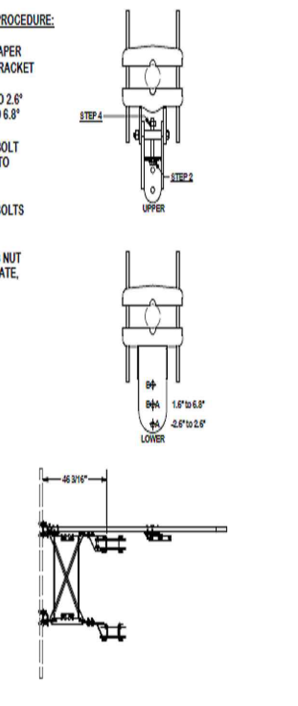
10' 6" HEAVY DUTY V-FRAME ASSEMBLY WITH TWO STIFF ARMS

VFA10-HD



ANGLE CALIBRATING PROCEDURE:

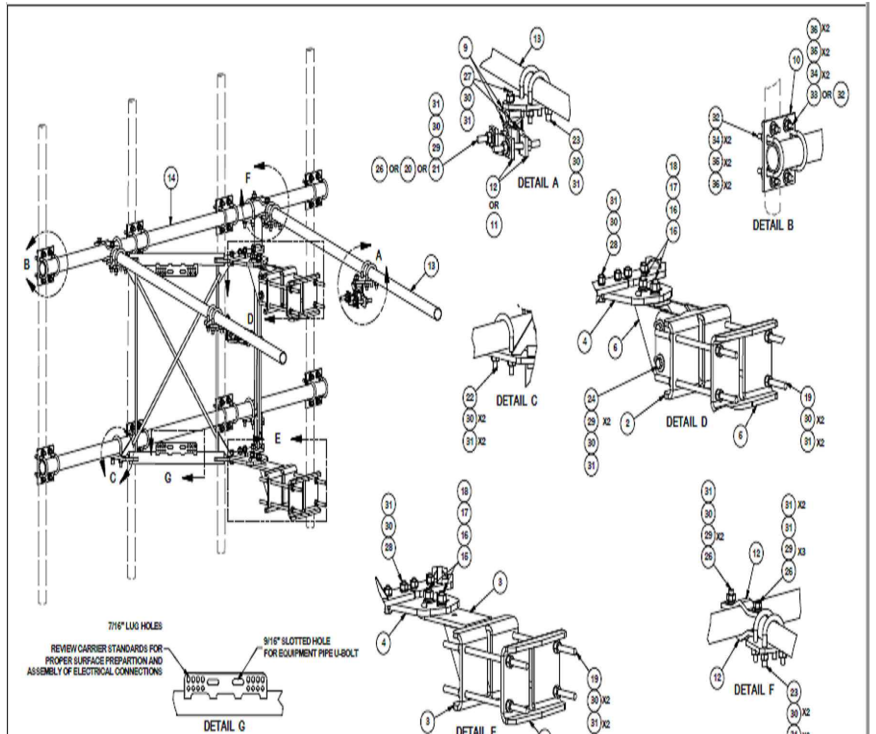
1. MEASURE TOWER TAPER AND PICK LOWER BRACKET HOLE:
   - HOLE A = -2.6° TO 2.6°
   - HOLE B = 1.6° TO 6.8°
2. USE CALIBRATING BOLT TO ADJUST FRAME TO DESIRED TAPER
3. TORQUE LOCKING BOLTS TO 100 ft.-lbs.
4. ADVANCE LOCKING NUT TO POSITIONING PLATE, THEN TIGHTEN.



TOLERANCE NOTES

10' 6" HEAVY DUTY V-FRAME ASSEMBLY WITH TWO STIFF ARMS

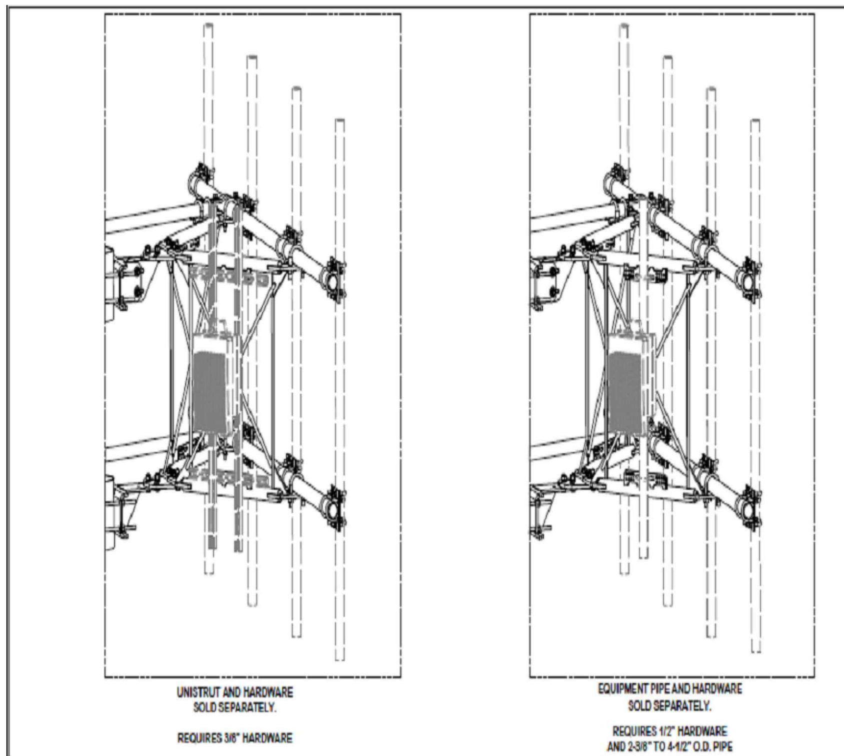
VFA10-HD



TOLERANCE NOTES

10' 6" HEAVY DUTY V-FRAME ASSEMBLY WITH TWO STIFF ARMS

VFA10-HD

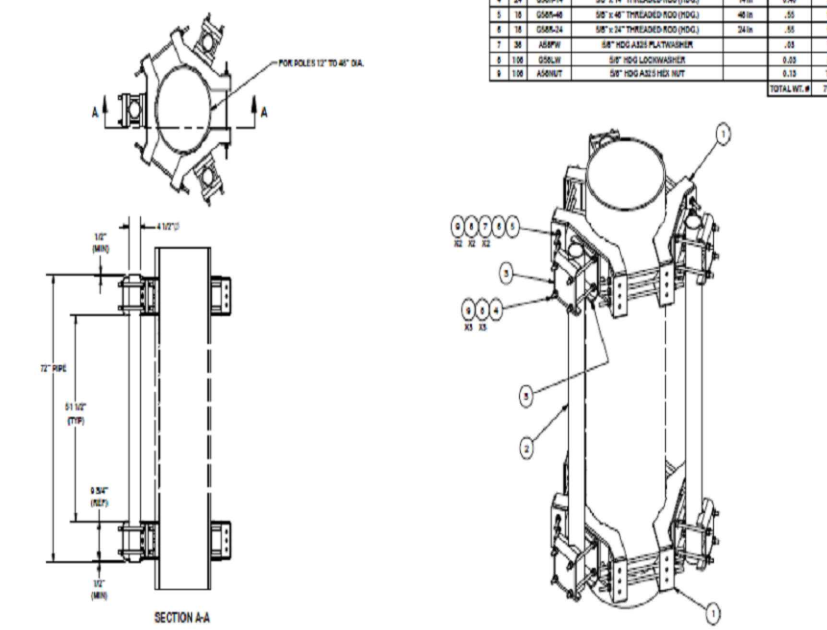


TOLERANCE NOTES

10' 6" HEAVY DUTY V-FRAME ASSEMBLY WITH TWO STIFF ARMS

VFA10-HD

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT
1	6	X-LWRM	RING MOUNT WELDMENT		68.16	408.96
2	3	P472	4-1/2" X 72" SCH. 40 GALVANIZED PIPE	72 in	64.89	194.66
3	12	X-214930	BENT PLATE V-CLAMP	12 5/8 in	11.43	137.16
4	24	G58R-14	5/8" x 14" THREADED ROD (HDG.)	14 in	0.40	9.57
5	18	G58R-48	5/8" x 48" THREADED ROD (HDG.)	48 in	.55	9.90
6	18	G58R-24	5/8" x 24" THREADED ROD (HDG.)	24 in	.55	9.90
7	36	A58FW	5/8" HDG A325 FLATWASHER		.03	1.08
8	108	G58LW	5/8" HDG LOCKWASHER		0.03	3.24
9	108	A58NUT	5/8" HDG A325 HEX NUT		0.13	14.04
					TOTAL WT. #	788.53



TOLERANCE NOTES

MONOPOLE SECTOR FRAME ATTACHMENT ASSEMBLY

MSFAA

1 MOUNTING DETAIL
SCALE: NOT TO SCALE

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MANSFIELD FOUR CORNERS

497 MIDDLE TURNPIKE
STORRS MANSFIELD, CT 06268

EXISTING 120'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	06/16/2022	RCD	PRELIMINARY	SS
0	07/13/2022	RCD	100% FINALS	SS

STATE OF CONNECTICUT
SHUHEI SAKANOUE
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LICENSED PROFESSIONAL ENGINEER

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SHEET NUMBER: C-10

REVISION: 0

SD050

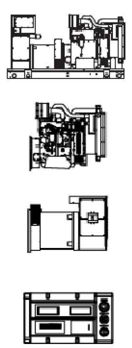
CUSTOM MODEL

GENERAC | INDUSTRIAL POWER

Industrial Diesel Generator Set

EPA Emissions Certification: Tier III

Standby Power Rating
50KW 60 Hz



features	benefits
Generator Set	
PROTOTYPE & TORSIONALLY TESTED	PROVIDES A PROVEN UNIT
UL2200 TESTED	ENSURES A QUALITY PRODUCT
RHINOCOAT PAINT SYSTEM	IMPROVES RESISTANCE TO ELEMENTS
SOUND LEVEL 2 ENCLOSURE	71dbA @ 7 METERS (23FT)
Engine	
EPA TIER CERTIFIED	ENVIRONMENTALLY FRIENDLY
INDUSTRIAL TESTED, GENERAC APPROVED	ENSURES INDUSTRIAL STANDARDS
POWER-MATCHED OUTPUT	ENGINEERED FOR PERFORMANCE
INDUSTRIAL GRADE	IMPROVES LONGEVITY AND RELIABILITY
Alternator	
TWO-THIRDS PITCH	ELIMINATES HARMFUL 3RD HARMONIC
LAYER WOUND ROTOR & STATOR	IMPROVES COOLING
CLASS H MATERIALS	HEAT TOLERANT DESIGN
DIGITAL 3-PHASE VOLTAGE CONTROL	FAST AND ACCURATE RESPONSE
Controls	
ENCAPSULATED BOARD W/ SEALED HARNESS	EASY, AFFORDABLE REPLACEMENT
4-20mA VOLTAGE-TO-CURRENT SENSORS	NOISE RESISTANT 24/7 MONITORING
SURFACE-MOUNT TECHNOLOGY	PROVIDES VIBRATION RESISTANCE
ADVANCED DIAGNOSTICS & COMMUNICATIONS	HARDENED RELIABILITY

primary codes and standards

NEMA

SD050 application and engineering data

ENGINE SPECIFICATIONS

General

Make	Iveco / FPT
EPA Emissions Compliance	Tier III
EPA Emissions Reference	See Emissions Data Sheet
Cylinder #	4
Type	Diesel
Displacement - L (cu. in.)	4.5 (274)
Bore - mm (in.)	105 (4.1)
Stroke - mm (in.)	132 (5.2)
Compression Ratio	17.5:1
Intake Air Method	Turbocharged
Cylinder Head Type	2 Valve
Piston Type	Aluminum
Crankshaft Type	Forged Steel
Engine Block Type	Cast Iron / Wet Sleeve

Engine Governing

Governor	Electronic Isochronous
Frequency Regulation (Steady State)	+/- 0.25%

Lubrication System

Oil Pump Type	Gear
Oil Filter Type	Full Flow
Crankcase Capacity - L (gal)(qts)	13.6 (3.6) (14.4)

Cooling System

Cooling System Type	Closed
Water Pump	Belt Driven Centrifugal
Fan Type	Pusher
Fan Blade Number	2538 (10)
Fan Diameter (in.)	26
Coolant Heater Wattage	1500
Coolant Heater Standard Voltage	120

Fuel System

Fuel Type	Ultra Low Sulfur Diesel Fuel
Fuel Specifications	ASTM
Fuel Filtering (microns)	5
Fuel Inject Pump Make	Standyne
Fuel Pump Type	Engine Driven Gear
Injector Type	Mechanical
Engine Type	Direct Injection
Fuel Supply Line - mm (in.)	1/4 inch Npt
Fuel Return Line - mm (in.)	1/4 inch Npt

Engine Electrical System

System Voltage	12VDC
Battery Charging Alternator	90 Amp
Battery Size (at 0 oC)	Optima Redtop
Battery Group	34
Battery Voltage	12VC
Ground Polarity	Negative

ALTERNATOR SPECIFICATIONS

Standard Model	390
Poles	4
Field Type	Revolving
Insulation Class - Rotor	H
Insulation Class - Stator	H
Total Harmonic Distortion	≤ 3.5%
Telephone Interference Factor (TIF)	< 50
Standard Excitation	PMG
Bearings	Single Sealed Cartridge
Coupling	Direct, Flexible Disc
Load Capacity - Standby	100%
Load Capacity - Prime	100%
Prototype Short Circuit Test	Y

Voltage Regulator Type	Digital
Number of Sensed Phases	All
Regulation Accuracy (Steady State)	+/- 0.25%

CODES AND STANDARDS COMPLIANCE (WHERE APPLICABLE)

NFPA 99
NFPA 110
ISO 8528-5
ISO 1708A.5
ISO 3046
BS5514
SAE J1349
DIN6271
IEEE C62.41 TESTING
NEMA ICS 1

Rating Definitions:
Standby – Applicable for a varying emergency load for the duration of a utility power outage with no overload capability. (Max. load factor = 70%)
Prime – Applicable for supplying power to a varying load in lieu of utility for an unlimited amount of running time. (Max. load factor = 80%) A 10% overload capacity is available for 1 out of every 12 hours.

SD050 operating data (60Hz)

POWER RATINGS (kW)

	STANDBY		
Single-Phase 120/240VAC @1.0pf	50	Amps:	208
Three-Phase 120/208VAC @0.8pf	-	Amps:	-
Three-Phase 120/240VAC @0.8pf	-	Amps:	-
Three-Phase 277/480VAC @0.8pf	-	Amps:	-
Three-Phase 346/600VAC @0.8pf	-	Amps:	-

NOTE: Generator output limited to 200A.

STARTING CAPABILITIES (sKVA)

sKVA vs. Voltage Dip

Alternator*	kW	480VAC 10%	15%	20%	25%	30%	35%	208/240VAC 10%	15%	20%	25%	30%	35%
Standard	50	-	-	-	-	-	-	26	39	52	65	77	90
Upsize 1		-	-	-	-	-	-	-	-	-	-	-	-
Upsize 2		-	-	-	-	-	-	-	-	-	-	-	-

*All Generac industrial alternators utilize Class H insulation materials. Standard alternator provides less than or equal to Class B temperature rise. Upsize 1 provides less than or equal to Class B temperature rise. Upsize 2 provides less than or equal

FUEL

Fuel Pump Lift - in (m): 36(.9)

Fuel Consumption Rates

Percent Load	STANDBY gph	lph
25%	1.52	5.75
50%	2.33	8.82
75%	3.08	11.65
100%	4.15	15.71

COOLING

Coolant System Capacity - Gal (L): 4.5 (17.44)

Maximum Radiator Backpressure: 1.5" H_2O Column

		STANDBY
Coolant Flow per Minute	gpm (lpm)	32.7(123.8)
Heat rejection to Coolant	BTU/min	123,000
Inlet Air	cfm (m3/min)	6,360 (180.0)
Max. Operating Radiator Air Temp	F° (C°)	122(50)
Max. Operating Ambient Temperature	F° (C°)	122(50)

COMBUSTION AIR REQUIREMENTS

		STANDBY	
Intake Flow at Rated Power	cfm (m3/min)	247	(7.00)

EXHAUST

Exhaust Outlet Size (Open Set): 3.0"

Maximum Backpressure (Post-Silencer): 1.5" Hg

		STANDBY
Exhaust Flow (Rated Output)	cfm (m3/hr)	534(906.7)
Maximum Backpressure	inHg (Kpa)	1.5 (5.1)
Exhaust Temp (Rated Output)	°F (°C)	930(498.8)

ENGINE

		STANDBY
Rated Engine Speed	rpm	1800
Horsepower at Rated kW	hp	93
Temperature Deration		Consult Factory
Altitude Deration		Consult Factory

* CA units include aftertreatment

Deration – Operational characteristics consider maximum ambient conditions. Derate factors may apply under atypical site conditions. Please consult a Generac Power Systems Industrial Dealer for additional details. All performance ratings in accordance with ISO3046, BS5514, ISO8528 and DIN6271 standards.

SD050 standard features and options

GENERATOR SET

Genset Vibration Isolation	Std
Factory Testing	Std
Extended warranty	Std
Padlockable Doors	Std
Steel Enclosure (Enclosed Models)	Std
Remote Emergency Shutdown	Opt

ENGINE SYSTEM

General	
Oil Drain Extension	Std
Air Cleaner	Std
Industrial Exhaust Silencer (Open Sets, ship loose)	Std
Critical Exhaust Silencer (Enclosed Sets)	Std
Stainless steel flexible exhaust connection	Std
Fuel System	
Primary Fuel Filter with Water Separator	Std
Flexible Fuel Lines	Std
UL142 Fuel Tank, 48 Hr Runtime	Std
2 Gal Overflow Containment with Alarm	Std
Cooling System	
120VAC Coolant Heater (3-wire connection cord)	Std
50%/50% Coolant	Std
Level 1 Guarding (Open Sets)	Std
Closed Coolant Recovery System	Std
UV/Ozone resistant hoses	Std
Factory-Installed Radiator	Std
Radiator Drain Extension	Std
Fan guard	Std
Radiator duct adapter (Open Sets)	Std
Engine Electrical System	
Battery charging alternator	Std
Battery cables	Std
Battery tray	Std
75W 120VAC Battery heater	Std
Solenoid activated starter motor	Std
10A UL float/equalize battery charger	Std
Weather Resistant electrical connections	Std
Duplex GFCI Convenience Outlet	Std

ALTERNATOR SYSTEM

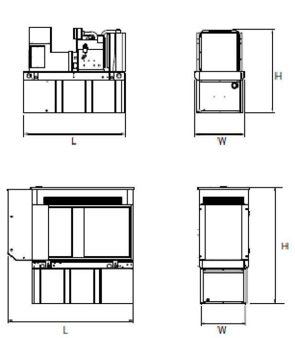
UL2200 GENprotect™	Std
100% Rated 200A Main Line Circuit Breaker	Std

CONTROL SYSTEM

Control Panel	
Digital H Control Panel - Dual 4x20 Display	Std
Programmable Crank Limiter	Std
7-Day Programmable Exerciser (requires H-Transfer Switch)	Std
Special Applications Programmable PLC	Std
RS-232	Std
RS-485	Std
All-Phase Sensing DVR	Std
Full System Status	Std
Utility Monitoring (Req. H-Transfer Switch)	Std
2-Wire Start Compatible	Std
Power Output (kW)	Std
Power Factor	Std
Reactive Power	Std
All phase AC Voltage	Std
All phase Currents	Std
Oil Pressure	Std
Coolant Temperature	Std
Coolant Level	Std
Low Fuel Pressure Indication	Std
Engine Speed	Std
Battery Voltage	Std
Frequency	Std
Date/Time Fault History (Event Log)	Std
UL2200 GENprotect™	Std
Low-Speed Exercise	Opt
Isochronous Governor Control	Std
-40deg C - 70deg C Operation	Std
Weather Resistant Electrical Connections	Std
Audible Alarms and Shutdowns	Std
Not in Auto (Flashing Light)	Std
On/Off/Manual Switch	Std
E-Stop (Red Mushroom-Type)	Std
Remote E-Stop (Break Glass-Type, Surface Mount)	-
Remote E-Stop (Red Mushroom-Type, Surface Mount)	-
Remote E-Stop (Red Mushroom-Type, Flush Mount)	-
NFPA 110 Level I and II (Programmable)	Std
Remote Communication - RS232	Std
Alarms (Programmable Tolerances, Pre-Alarms and Shutdowns)	
Low Fuel	Std
Oil Pressure (Pre-programmed Low Pressure Shutdown)	Std
Coolant Temperature (Pre-programmed High Temp Shutdo	Std
Coolant Level (Pre-programmed Low Level Shutdown)	Std
Engine Speed (Pre-programmed Overspeed Shutdown)	Std
Voltage (Pre-programmed Overvoltage Shutdown)	Std
Battery Voltage	Std

Other Options
Single Side Service

SD050 dimensions, weights and sound levels



OPEN SET

RUNTIME HOURS (TANK SIZE)	CAPACITY (GAL)	TANK VOLUME	L	W	H	WT	dBA*
-	-	-	-	-	-	-	84
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
48	210	210	76	38	87	3400	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	

LEVEL 2 SOUND ENCLOSURE

RUNTIME HOURS (TANK SIZE)	CAPACITY (GAL)	TANK VOLUME	L	W	H	WT	dBA*
-	-	-	-	-	-	-	71
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
48	210	210	94.8	38	99	3935	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	

*Required gallons based on 100% of standby rating. Weights consider steel enclosure and are without fuel in tank. Sound levels measured at 23ft (7m) and does not account for ambient site conditions.

YOUR FACTORY RECOGNIZED GENERAC INDUSTRIAL DEALER

Specification characteristics may change without notice. Dimensions and weights are for preliminary purposes only. Please consult a Generac Power Systems Industrial Dealer for detailed installation drawings.

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T-MOBILE SITE NUMBER:
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BU #: **842867**
MANSFIELD FOUR CORNERS

497 MIDDLE TURNPIKE
STORRS MANSFIELD, CT 06268

EXISTING 120'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	06/16/2022	RCD	PRELIMINARY	SS
0	07/13/2022	RCD	100% FINALS	SS

STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER

07/13/2022

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SHEET NUMBER:	REVISION:
C-11	0

PANELBOARD "T-MOBILE" SCHEDULE

MAIN: 200 AMP MAIN BREAKER			**VOLTAGE/PHASE**: 120/240V, 1-PHASE, 3-WIRE								
MOUNTING: H-FRAME			**ENCLOSURE**: NEMA 3R						**SURGE PROTECTION DEVICE**: YES		
BUS: 200 AMP			**MANUFACTURER**: V.I.F.						**MODEL NUMBER**: V.I.F.		
DESCRIPTION	LOAD (VA)	C or NC	C/B	CIR No.	LOAD (VA) A-PHASE	LOAD (VA) B-PHASE	CIR No.	C/B	C or NC	LOAD (VA)	DESCRIPTION
SURGE SUPPRESSION	1	NC	60	1	1921		2	20	NC	1920	GEN BLOCK HEATER
	1			3		1921	4	20	NC	1920	GEN BATT CHARGER
6160	7000	C	100	5	7200		6	20	NC	200	LIGHT
	7000			7		7180	8	20	NC	180	GFI
6161 GFI	180	NC	20	9	360		10	20	NC	180	TELCO GFI
				11		0	12				
				13	0		14				
				15		0	16				
				17	0		18				
				19		0	20				
				21	0		22				
				23		0	24				
BASE LOAD (VA) =					9481	9101					
25% OF CONTINUOUS LOAD (VA) =					1750	1750					
TOTAL LOAD (VA) =					11231	10851					
TOTAL LOAD (A) =					94	90					

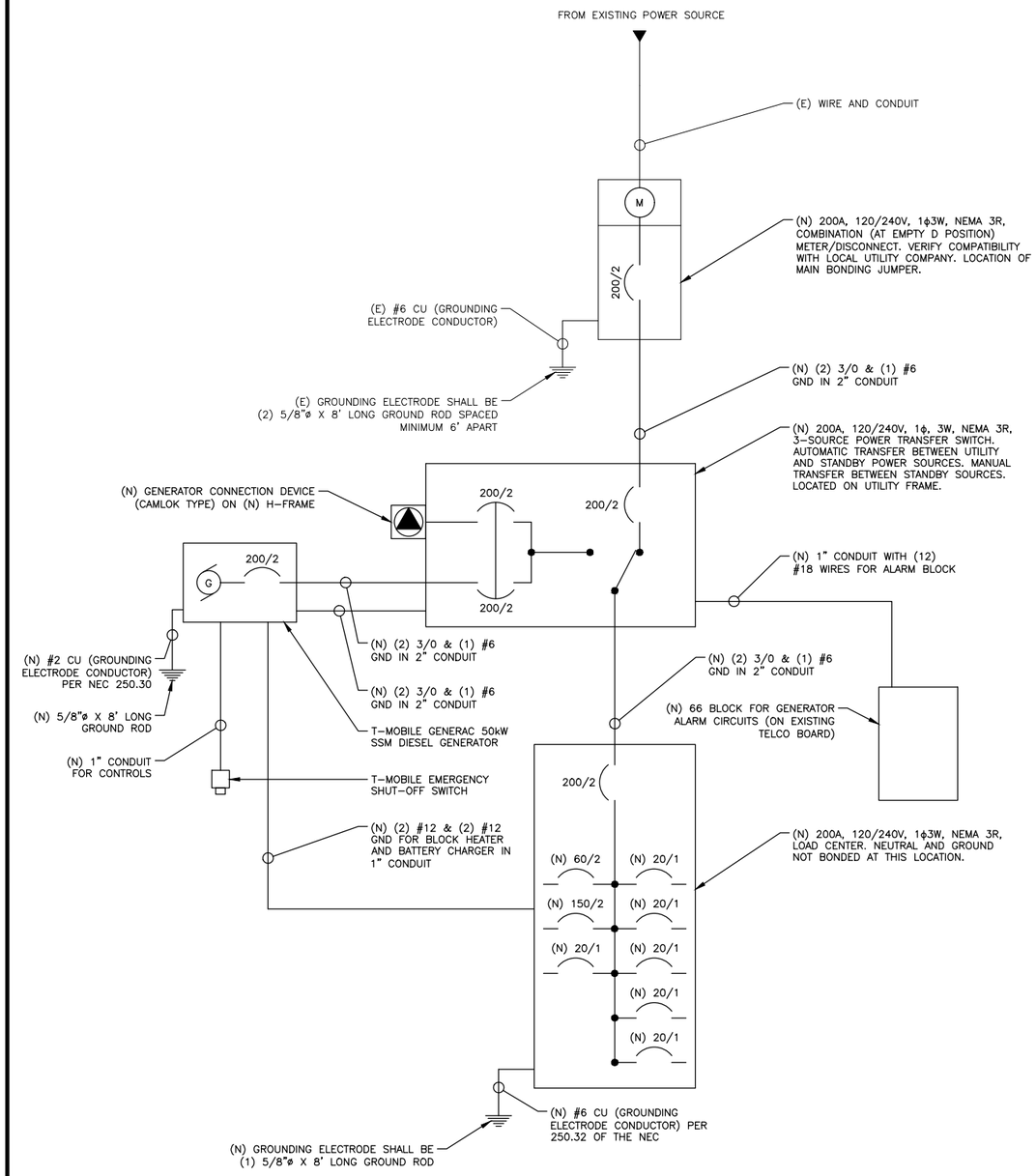
C = CONTINUOUS LOAD; NC = NON-CONTINUOUS LOAD

ALL LOADS ARE EXISTING UNLESS NOTED OTHERWISE.

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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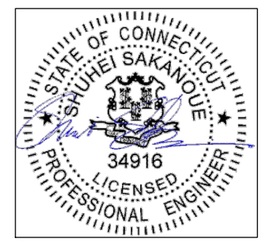
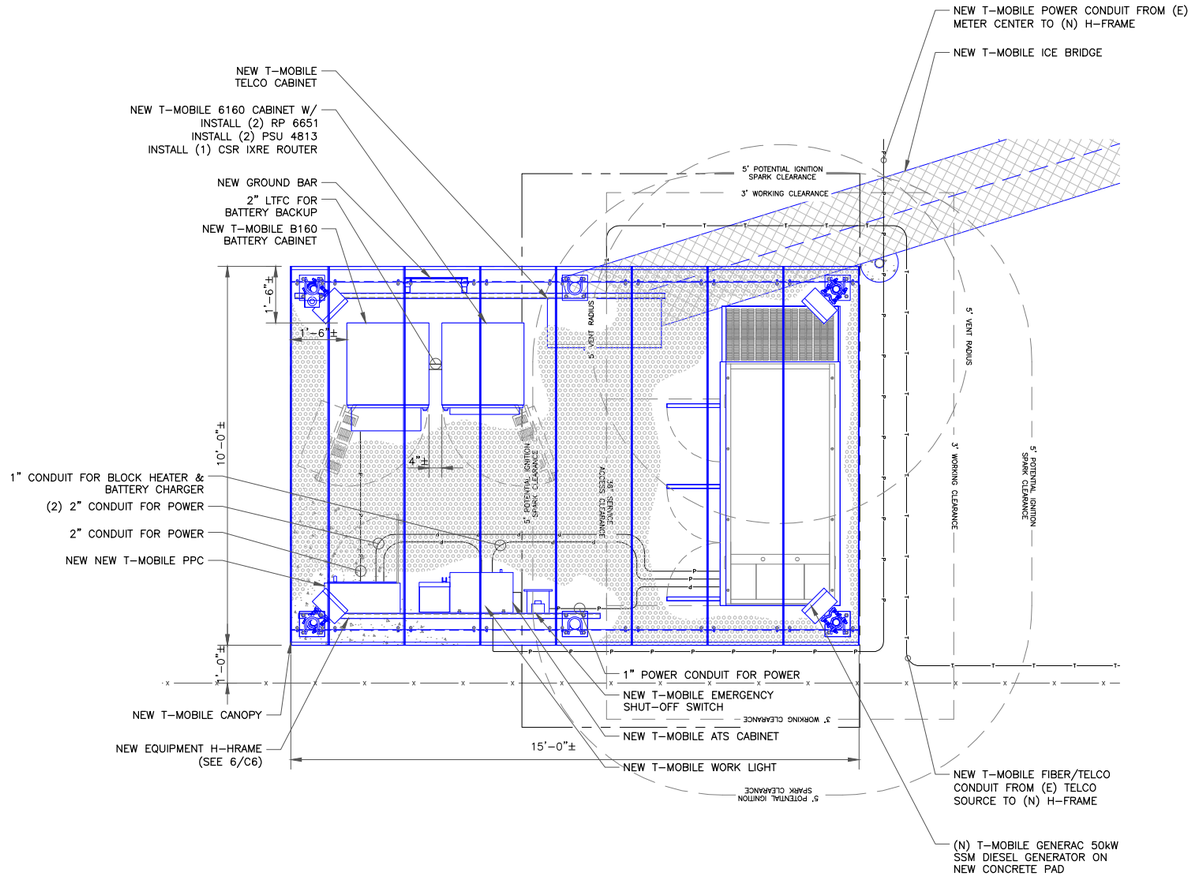


07/13/2022

SHEET NUMBER: E-1

REVISION: 0



NOTE:

NEW CONDUIT ROUTING IS SCHEMATIC ONLY, CONTRACTOR SHALL DETERMINE SUITABLE ROUTING IN FIELD.

ELECTRICAL DISTRIBUTION:	TELCO DISTRIBUTION:
• (1) 2" FROM POWER SOURCE TO ATS (FOR POWER) • (2) 2" FROM ATS TO GEN (FOR POWER) • (1) 2" FROM ATS TO PPC (FOR POWER) • (1) 1" FROM PPC TO GEN (FOR GEN BATT CHARGER & GEN BLOCK HEATER) • (1) 2" FROM PPC TO 6160 (FOR POWER) • (1) 2" FROM 6160 TO B160 (FOR DISTRIBUTION) • (1) 1" FROM GEN TO EMERGENCY STOP (FOR CONTROLS)	• (1) 2" FROM TELCO SOURCE TO TELCO CAB (FOR TELCO) • (1) 1" FROM ATS TO TELCO CAB (FOR ALARM) • (1) 1" FROM TELCO CAB TO 6160 (FOR TELCO)

1 UTILITY ROUTING
SCALE: NOT TO SCALE

N

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MANSFIELD FOUR CORNERS

497 MIDDLE TURNPIKE
STORRS MANSFIELD, CT 06268

EXISTING 120'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	06/16/2022	RCD	PRELIMINARY	SS
0	07/13/2022	RCD	100% FINALS	SS

STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER

07/13/2022

SHEET NUMBER: E-2

REVISION: 0

GROUNDING PLAN LEGEND:

--- GROUND WIRE

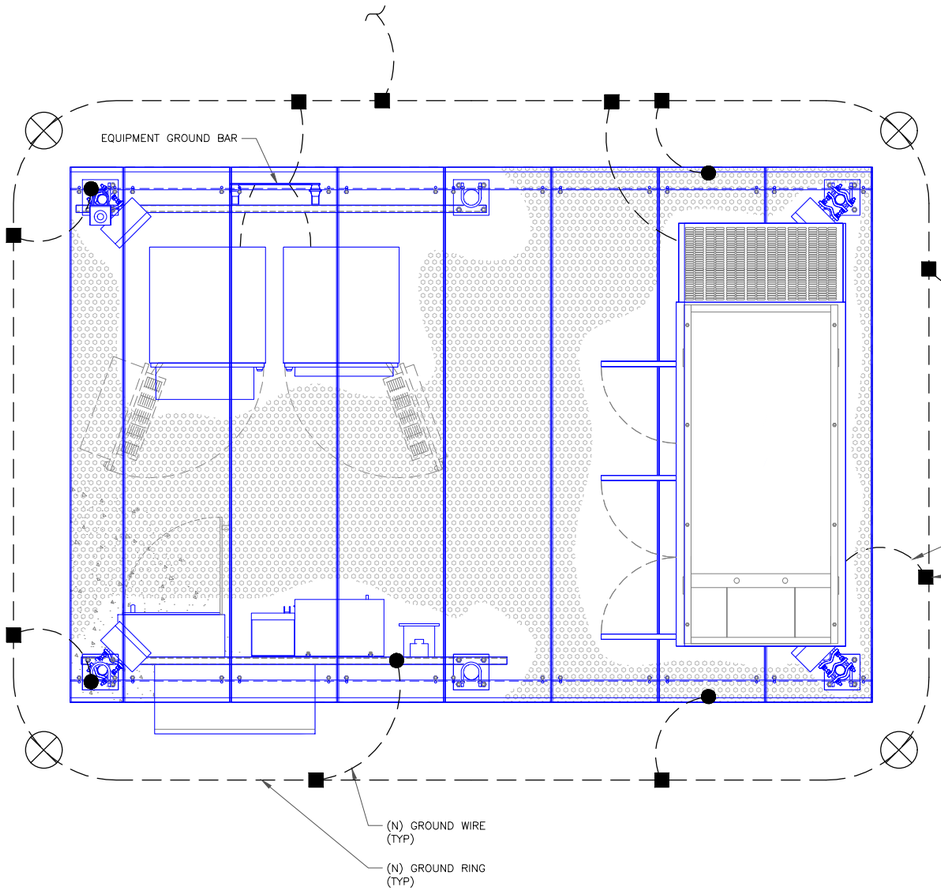
■ EXOTHERMIC WELD

● MECHANICAL CONNECTION

⊗ NEW GROUND ROD, 5/8"ø x10'

GROUNDING NOTES:

1. IF MORE THAN 20' FROM EXISTING GROUND RING, INSTALL GROUND ROD (5/8" x 10'). ROD SPACING: 8' MAX. TOP OF ROD AND GROUND WIRE TO BE AT GROUND RING DEPTH BELOW FROST LINE.
2. ALL GROUND CONDUCTORS SHALL BE COPPER, 75 DEGREES C RATED, AND CONDUCTOR INSULATION BE THWN OR THHN.
3. GROUND FAULT PROTECTION REQUIRED FOR UTILITY RECEPTACLES.
4. GENERATOR NEUTRAL SHALL NOT BE GROUNDED AT THE GENERATOR. REFER TO SINGLE LINE DETAIL
5. EQUIPMENT LOCATED OUTSIDE OR EXPOSED TO MOISTURE SHALL BE NEMA 3R RATED.



1 TYPICAL GROUNDING SCHEMATIC
SCALE: NOT TO SCALE

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T-MOBILE SITE NUMBER:
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BU #: **842867**
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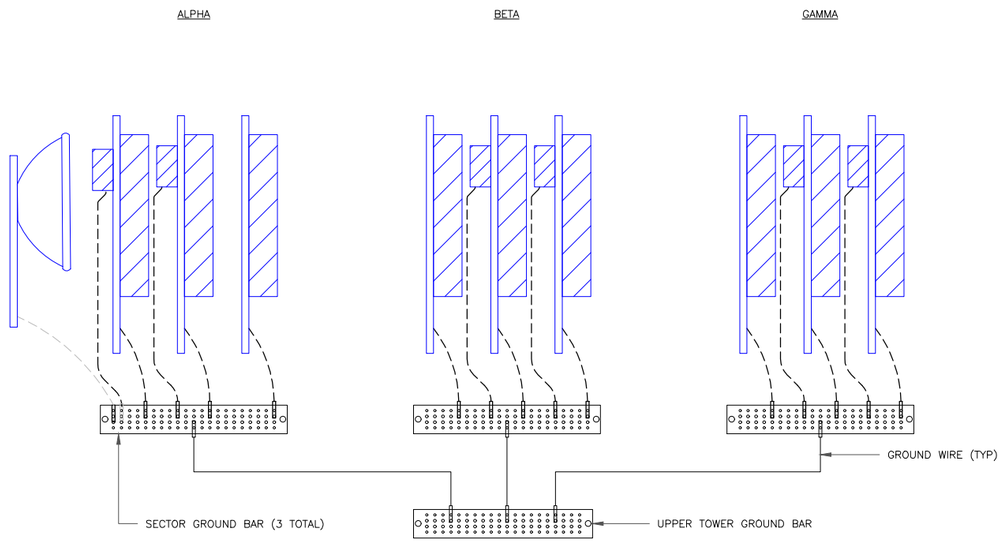
SHEET NUMBER: G-1

REVISION: 0



NOTES:

1. ALL NEW GROUNDS TO BE #6 STRANDED COPPER WITH GREEN INSULATION UNLESS NOTED OTHERWISE.
2. TOWER TO BE USED AS COMMON GROUND PATH, NO ISOLATED GROUND LEADS UPPER BUSS TO LOWER BUSS

1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

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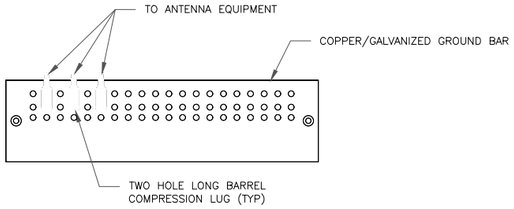
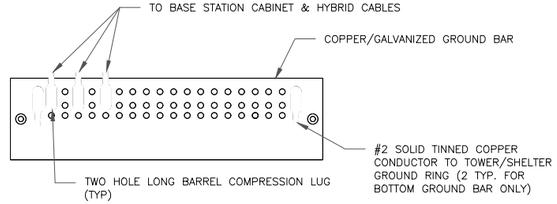


NOTES:

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.

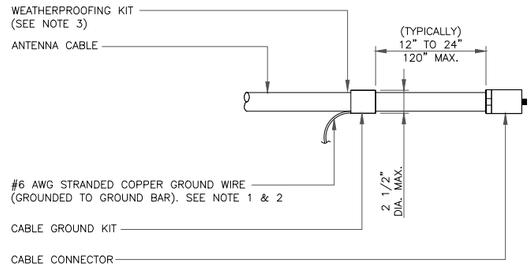
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



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.

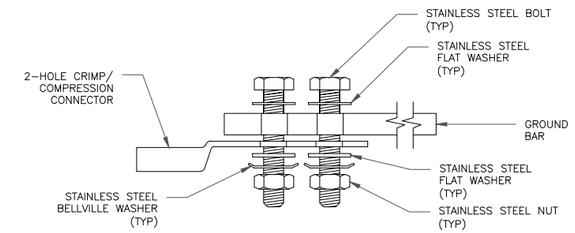
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



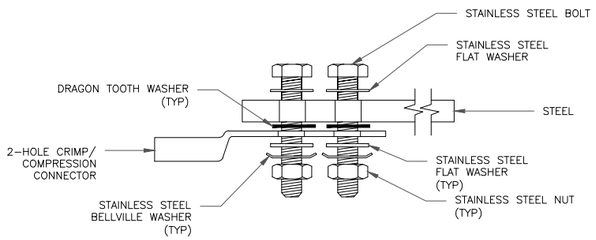
NOTES:

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.

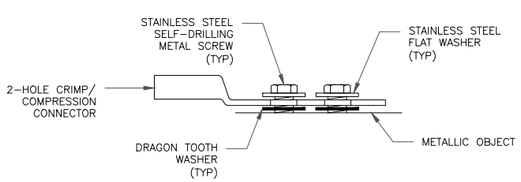
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

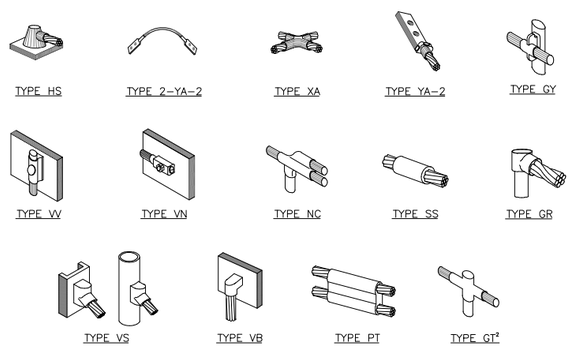


SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

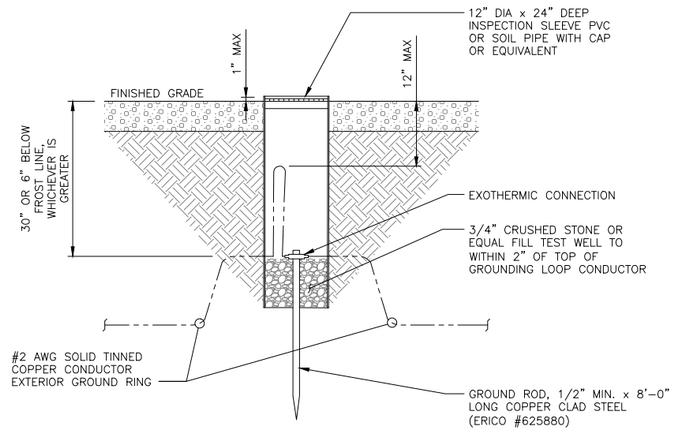
4 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTE:

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

5 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE



6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

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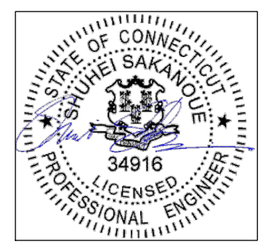

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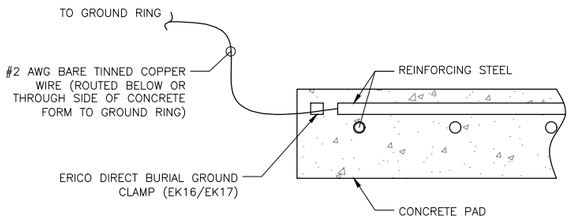
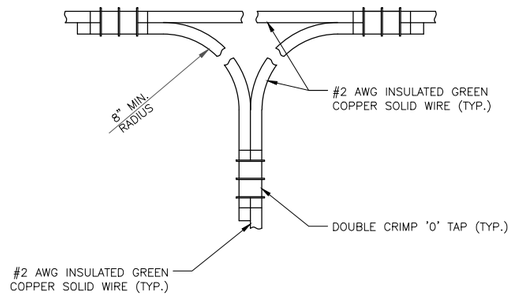


1 REBAR GROUNDING DETAIL
SCALE: NOT TO SCALE



2 CONNECTION TO GROUND RING
SCALE: NOT TO SCALE

3 NOT USED
SCALE: NOT TO SCALE

4 NOT USED
SCALE: NOT TO SCALE

5 NOT USED
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

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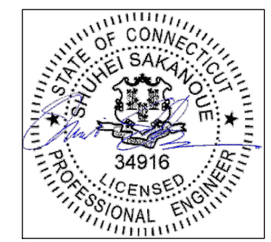

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