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

January 30, 2024

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

RE: **Notice of Exempt Modification for T-Mobile: CT11501E**
Crown Site ID# 842856
122 Jonathan Trumbull Highway (Route 6), Andover, CT 06232
Latitude: 41° 45′ 0.46″ / Longitude: -72° 24′ 9.63″

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 140-foot mount on the existing 149-foot monopole tower located at 122 Jonathan Trumbull Highway, Andover, CT. The property is owned by ASC Real Estate Inc, and the tower is owned by Crown Castle. T-Mobile now intends to replace three (3) antennas, three (3) remote radios and ancillary equipment at the 140ft level. This modification/proposal includes hardware that is both 4G (LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times.

Panned Modification:

Tower:

Install New:
(3) Ericsson – Air 6419 B41Antennas
(3) Ericsson – 4460 B25+B66 Radios
(3) RF Cellwave – HB158-21U6S24-xxM - Hybrid Cables

Remove:
(3) RFS – APX16DWV-16DWV-S-E-A20 Antennas
(3) Generic Twin Style 1A PCS TMAs
(1) Ericsson – HCS 6x12 4AWG Hybrid Cables
(9) Andrew LDF7-50A Coaxial Cables
(3) AVA7-50 Coaxial Cables
(3) T-Arm Sector Mounts

Ground:

Install New:
(1) Ericsson – 6160 AC V1 Enclosure
(2) (1) Ericsson- B160 Enclosure

The facility was approved by the Connecticut Siting Council Docket No. 242 on October 14, 2003.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Jeffrey J. Maguire, First Selectman, Town of Andover, Jim Hallisey, Zoning Agent, Town of Andover. ASC Real Estate Inc, 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.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,

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

Attachments
cc:

Jeffrey J. Maguire, First Selectman
Town of Andover
17 School Road
Andover, CT 06232
(860) 742-4035

Jim Hallisey, Zoning Agent
Town of Andover
17 School Road
Andover, CT 06232
(860) 742-4035

ASC Real Estate Inc
PO BOX 122
Andover, CT 06232

Crown Castle - Tower Owner

DOCKET NO. 242 - AT&T Wireless PCS, LLC d/b/a AT&T Wireless application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at one of two sites at 122 Route 6 (Andover Sportsmen Club), Andover, Connecticut.	Connecticut Siting Council
	October 14, 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 d/b/a AT&T Wireless for the construction, maintenance and operation of a wireless telecommunications facility at Site A at the Andover Sportsmen Club, 122 Route 6, Andover, Connecticut. The Council denies certification of Site B, also located at 122 Route 6, Andover, Connecticut.

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

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of AT&T Wireless PCS, LLC and Omnipoint Holdings, Inc. d/b/a T-Mobile and other entities, both public and private, but such tower shall not exceed a height of 150 feet above ground level.

2. Panel antennas shall be installed on the monopole using a flush mount design.

3. Site preparation and construction activities shall occur during the time period of November 1 through March 31 to reduce potential impacts to populations of the Wood Turtle *(Clemmys insculpta)*, a State Species of Special Concern.

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, utility line, erosion and sedimentation control features, and landscaping;

    b. specifications for the tower, tower foundation, antennas, equipment building, and security fence; and
    c. construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

5. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of electromagnetic radio frequency power density is submitted to the

Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

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. The Certificate Holder shall provide space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.

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 ceases to function.

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

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

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

The parties and intervenors to this proceeding are:

Applicant	**Its Representative**
AT&T Wireless PCS, LLC d/b/a AT&T Wireless	Christopher B. Fisher, Esq. Cuddy & Feder LLP 90 Maple Avenue White Plains, New York 10601 (914) 761-1300
Party	**Its Representative**
Tower Ventures II, LLC	Julie Donaldson Kohler, Esq. Hurwitz & Sagarin, LLC 147 N. Broad Street Milford, CT 06460 (203) 877-8000
Party	**Its Representative**
Town of Andover	First Selectman Andover Town Office Building 17 School Road, P.O. Box 328

Andover, CT 06232-0328
(860) 742-7305

Intervenor

Omnipoint Holdings, Inc.
d/b/a T-Mobile

Its Representative

Stephen J. Humes, Esq.
Diane W. Whitney, Esq.
LeBoeuf, Lamb, Greene & MacRae
Goodwin Square
225 Asylum Street
Hartford, CT 06103

Content Last Modified on 10/17/2003 4:34:53 PM

122 ROUTE 6

Location	122 ROUTE 6	**Mblu**	28/ 5/ 4/ /
Acct#	530	**Owner**	ASC REAL ESTATE INC
Assessment	$400,810	**Appraisal**	$634,200
PID	530	**Building Count**	2

Current Value

Appraisal

Valuation Year	Improvements	Land	Total
2021	$288,500	$345,700	$634,200

Assessment

Valuation Year	Improvements	Land	Total
2021	$201,950	$198,860	$400,810

Owner of Record

Owner	ASC REAL ESTATE INC	**Sale Price**	$0
Co-Owner	ANDOVER SPORTSMANS CLUB	**Certificate**	
Address	P O BOX 122 ANDOVER, CT 06232	**Book & Page**	0020/0572
		Sale Date	05/18/1967

Ownership History

Ownership History

Owner	Sale Price	Certificate	Book & Page	Sale Date
ASC REAL ESTATE INC	$0		0020/0572	05/18/1967

Building Information

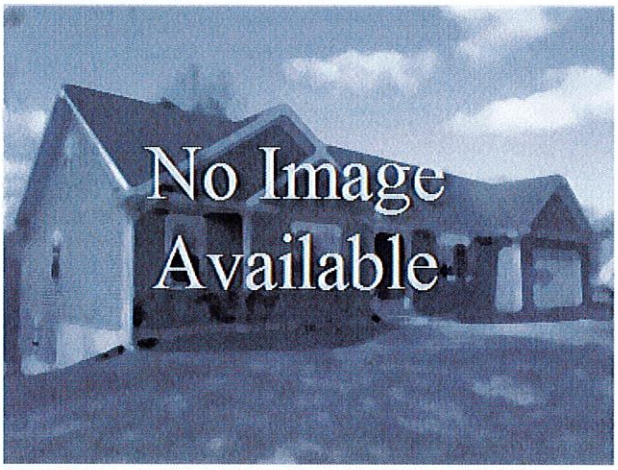
Building 1 : Section 1

Year Built:	1950
Living Area:	1,789
Replacement Cost:	$207,184
Building Percent Good:	67
Replacement Cost Less Depreciation:	$138,800

Building Attributes

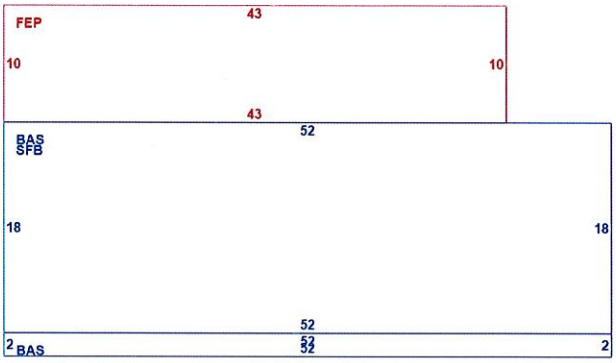
Field	Description
Style:	Clubs/Lodges
Model	Commercial
Grade	C
Stories:	1
Occupancy	1.00
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Asph/F Gls/Cmp
Interior Wall 1	Drywall/Sheet
Interior Wall 2	
Interior Floor 1	Vinyl/Asphalt
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Hot Air-no Duc
AC Type	Central
Struct Class	
Bldg Use	Fratnl Org
Total Rooms	
Total Bedrms	00
Total Baths	2.5
1st Floor Use:	3530
Heat/AC	NONE
Frame Type	WOOD FRAME
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	AVERAGE
Wall Height	8.00
% Comn Wall	0.00

Building Photo



(https://images.vgsi.com/photos2/AndoverCTPhotos//default.jpg)

Building Layout



(ParcelSketch.ashx?pid=530&bid=530)

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	1,040	1,040
SFB	Base, Semi-Finished	936	749
FEP	Porch, Enclosed, Finished	430	0
		2,406	1,789

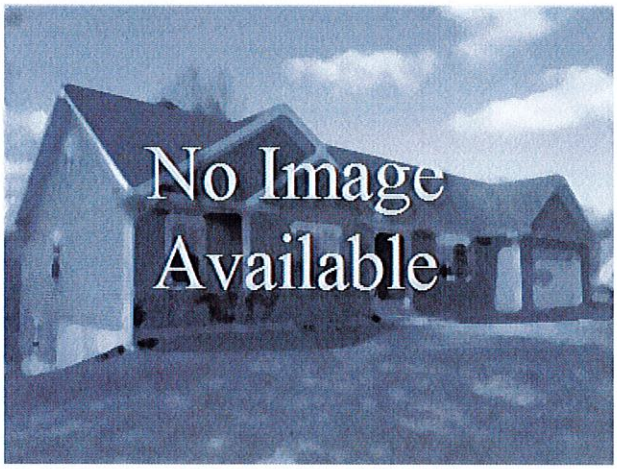
Building 2 : Section 1

Year Built: 1990
Living Area: 896
Replacement Cost: $147,064
Building Percent Good: 77
Replacement Cost Less Depreciation: $113,200

Building Attributes : Bldg 2 of 2	
Field	Description
Style:	Clubs/Lodges
Model	Commercial

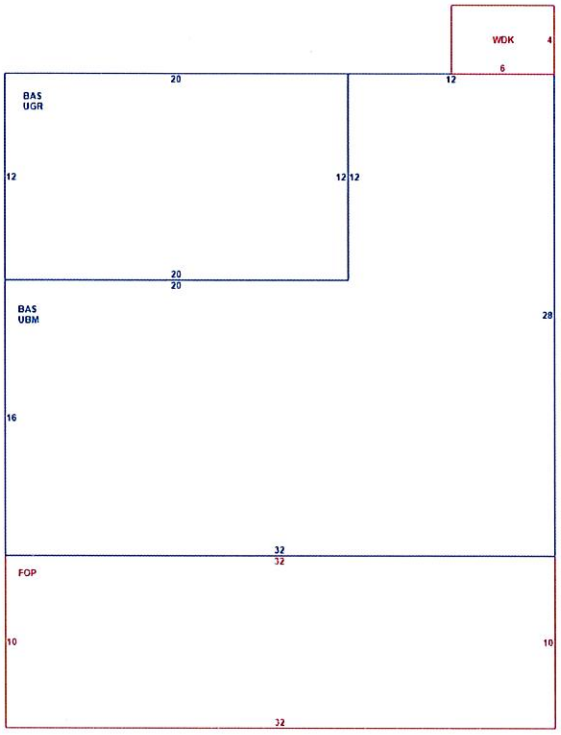
Grade	C
Stories:	1
Occupancy	
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Asph/F Gls/Cmp
Interior Wall 1	Drywall/Sheet
Interior Wall 2	
Interior Floor 1	Carpet
Interior Floor 2	
Heating Fuel	Solar Assisted
Heating Type	Hot Water
AC Type	Partial
Struct Class	
Bldg Use	Fratnl Org
Total Rooms	
Total Bedrms	00
Total Baths	2
1st Floor Use:	
Heat/AC	NONE
Frame Type	WOOD FRAME
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	AVERAGE
Wall Height	8.00
% Comn Wall	

Building Photo



(https://images.vgsi.com/photos2/AndoverCTPhotos//default.jpg)

Building Layout



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Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	896	896
FOP	Porch, Open, Finished	320	0
UBM	Basement, Unfinished	656	0
UGR	Garage, Unfinished	240	0
WDK	Deck, Wood	24	0
		2,136	896

Extra Features

Extra Features — Legend

Code	Description	Size	Value	Bldg #
A/C	Air Condition	896.00 UNITS	$1,400	2

Land

Land Use

Use Code	3530
Description	Fratnl Org
Zone	ARD
Neighborhood	C1
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	67.13
Frontage	0
Depth	0
Assessed Value	$198,860
Appraised Value	$345,700

Outbuildings

Outbuildings — Legend

Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FN3	Fence-6' Chain			290.00 L.F.	$2,000	1
SHD1	Shed Frame			320.00 S.F.	$2,900	2
LT4	Lights (4)			4.00 UNITS	$2,600	2
SHD5	Shed			64.00 S.F.	$900	1
LT1	Lights (1)			10.00 UNITS	$2,000	2
PAV1	Paving-Asphalt			1344.00 S.F.	$600	1
BRN8	Pole Barn			1540.00 S.F.	$5,400	1
SHD5	Shed			180.00 S.F.	$3,800	2
PAT1	Patio Av			360.00 S.F.	$500	2
SHD1	Shed Frame			100.00 S.F.	$600	1
SHD1	Shed Frame			360.00 S.F.	$2,200	1
PAV1	Paving-Asphalt			840.00 S.F.	$400	1
SHD1	Shed Frame			300.00 S.F.	$1,800	1
SHD1	Shed Frame			240.00 S.F.	$2,900	1
SHD1	Shed Frame			320.00 S.F.	$2,900	2
SHD1	Shed Frame			200.00 S.F.	$1,800	2
SHD1	Shed Frame			200.00 S.F.	$1,800	2

Valuation History

Appraisal

Valuation Year	Improvements	Land	Total
2021	$288,500	$345,700	$634,200
2020	$239,100	$347,700	$586,800
2015	$107,800	$334,000	$441,800

Assessment

Valuation Year	Improvements	Land	Total
2021	$201,950	$198,860	$400,810
2020	$167,500	$193,840	$361,340
2015	$138,200	$171,050	$309,250

122 US-6

Map data ©2024 Google 200 ft

122 US-6

Building

Directions Save Nearby Send to phone Share

122 US-6, Andover, CT 06232

From: TrackingUpdates@fedex.com
To: Barbadora, Jeff
Subject: FedEx Shipment 775050763977: Your package has been delivered
Date: Monday, February 5, 2024 10:08:35 AM

Hi. Your package was delivered Mon, 02/05/2024 at 10:01am.

Delivered to 17 SCHOOL RD, ANDOVER, CT 06232
Received by C.LEE

OBTAIN PROOF OF DELIVERY

How was your delivery ?

TRACKING NUMBER	775050763977
FROM	Crown Castle 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Andover Jeffrey Maguire, First Selectman 17 School Road ANDOVER, CT, US, 06232
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Fri 2/02/2024 05:29 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	ANDOVER, CT, US, 06232
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	0.50 LB
SERVICE TYPE	FedEx Priority Overnight®

From: TrackingUpdates@fedex.com
To: Barbadora, Jeff
Subject: FedEx Shipment 775050816080: Your package has been delivered
Date: Monday, February 5, 2024 10:08:34 AM

Hi. Your package was delivered Mon, 02/05/2024 at 10:01am.

Delivered to 17 SCHOOL RD, ANDOVER, CT 06232
Received by C.LEE

OBTAIN PROOF OF DELIVERY

How was your delivery ?

TRACKING NUMBER	775050816080
FROM	Crown Castle 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Andover Jim Hallisey, Zoning Agent 17 School Road ANDOVER, CT, US, 06232
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Fri 2/02/2024 05:29 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	ANDOVER, CT, US, 06232
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	SOS

USPS Tracking®

FAQs >

Remove ×

Tracking Number:

EI916986475US

Copy Add to Informed Delivery (https://informeddelivery.usps.com/)

Scheduled Delivery by

SATURDAY

3 February 2024 ⓘ

by

6:00pm ⓘ

Your item was picked up at the post office at 11:27 am on February 3, 2024 in ANDOVER, CT 06232. The item was signed for by A WRIGHT.

Get More Out of USPS Tracking:

USPS Tracking Plus®

Delivered

Delivered, Individual Picked Up at Post Office

ANDOVER, CT 06232
February 3, 2024, 11:27 am

Available for Pickup

ANDOVER
335 ROUTE 6
ANDOVER CT 06232-9998
M-F 0830-1630; SAT 0830-1200
February 3, 2024, 11:25 am

Arrived at Post Office

ANDOVER, CT 06232
February 3, 2024, 11:25 am

Arrived at USPS Regional Origin Facility

Feedback

BOSTON MA DISTRIBUTION CENTER
February 2, 2024, 7:06 pm

Departed Post Office
FRAMINGHAM, MA 01701
February 2, 2024, 5:02 pm

USPS in possession of item
FRAMINGHAM, MA 01701
February 2, 2024, 3:21 pm

Hide Tracking History

What Do USPS Tracking Statuses Mean? (https://faq.usps.com/s/article/Where-is-my-package)

Text & Email Updates

Proof of Delivery

To request a Proof of Delivery email with full details including a delivery address, **sign in to your USPS.com® account. >**

For a Proof of Delivery email without a delivery address, provide your name and email address below.

*Indicates a required field

*First Name

First

M.I.

*Last Name

Last

*Email Proof of Delivery to up to three addresses

email123@mail.com

Add Another Email +

Request Email

USPS Tracking Plus®

Product Information

See Less

Track Another Package

Enter tracking or barcode numbers

Need More Help?

Contact USPS Tracking support for further assistance.

FAQs

Date: **December 15, 2023**

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Site Number:	CT11501E
	Site Name:	CT501/ATT Andover - Prime
Crown Castle Designation:	**BU Number:**	842856
	Site Name:	ANDOVER NORTH
	JDE Job Number:	752562
	Work Order Number:	2256458
	Order Number:	655744 Rev. 1
Engineering Firm Designation:	**Crown Castle Project Number**	2256458
Site Data:	**122 Jonathan Trumbull Highway (route 6), Andover, Tolland County, CT**	
	Latitude: *41° 45' 0.46"* Longitude: *-72° 24' 9.63"*	
	149 ft - Monopole Tower	

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

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

LC7: Proposed Equipment Configuration **Sufficient Capacity - 96.6%**

This analysis utilizes an ultimate 3-second gust wind speed of 119 mph as required by the 2022 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Matthew Schmitt

Respectfully submitted by:

Sudarshan Kasera

Digitally signed by Sudarshan C Kasera
Date: 2023.12.18 10:56:24 -05'00'

Sudarshan C Kasera
Senior Project Engineer

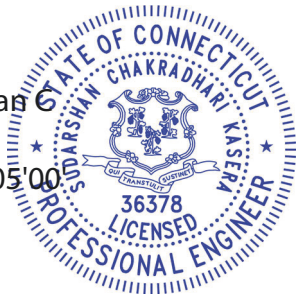


TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 149 ft Monopole Tower designed by Engineered Endeavors, Inc.. The tower has been modified in the past to accommodate additional loading.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	119 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.50 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)
140	140	3	ericsson	AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe	3	1-5/8
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		1	site pro 1	RMQP-496 + HRK12		

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)
149	149	3	cci antennas	DMP65R-BU6D w/ Mount Pipe	6 1 2	1-1/4 3/8 7/8
		3	cci antennas	HPA65R-BU6A w/ Mount Pipe		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 8843 B2/B66A		
		1	raycap	DC6-48-60-18-8F		
130	130	12	commscope	NHH-65B-R2B w/ Mount Pipe	2	1-5/8
		2	kaelus	BSF0020F3V1		
		1	rfs celwave	DB-C1-12C-24AB-0Z		
		6	samsung telecommunications	RFV01U-D1A		
		6	samsung telecommunications	RFV01U-D2A		
		1	site pro 1	RMV5-SQNP w/ PRK-SFS and HRK12		
120	120	3	fujitsu	TA08025-B604	1	1-1/2
		3	fujitsu	TA08025-B605		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		3	jma wireless	MX08FRO665-21 w/ Mount Pipe		
		1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Commscope MC-PK8-DSH		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	4713186	CCISITES
4-POST-MODIFICATION INSPECTION	4713189	CCISITES
4-POST-MODIFICATION INSPECTION	6003147	CCISITES
4-POST-MODIFICATION INSPECTION	10135443	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	4529267	CCISITES
4-TOWER MANUFACTURER DRAWINGS	4713188	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	4713190	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	5760149	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	9631497	CCISITES

3.1) Analysis Method

tnxTower (version 8.2.2.0), 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.

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
149 - 144	Pole	TP22.426x21.5x0.1875	Pole	6.4	Pass
144 - 139	Pole	TP23.352x22.426x0.1875	Pole	12.7	Pass
139 - 134	Pole	TP24.278x23.352x0.1875	Pole	21.4	Pass

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
134 - 129	Pole	TP25.204x24.278x0.1875	Pole	30.7	Pass
129 - 127.39	Pole	TP26.202x25.204x0.1875	Pole	34.3	Pass
127.39 - 122.39	Pole	TP26.043x25.128x0.1875	Pole	46.0	Pass
122.39 - 117.39	Pole	TP26.958x26.043x0.1875	Pole	57.7	Pass
117.39 - 112.39	Pole	TP27.873x26.958x0.1875	Pole	69.1	Pass
112.39 - 107.39	Pole	TP28.788x27.873x0.1875	Pole	79.7	Pass
107.39 - 102.39	Pole	TP29.703x28.788x0.1875	Pole	89.4	Pass
102.39 - 98.5	Pole	TP30.415x29.703x0.1875	Pole	96.6	Pass
98.5 - 98.25	Pole + Reinf.	TP30.46x30.415x0.3438	Reinf. 2 Tension Rupture	77.5	Pass
98.25 - 93.25	Pole + Reinf.	TP31.375x30.46x0.3375	Reinf. 2 Tension Rupture	84.4	Pass
93.25 - 88.25	Pole + Reinf.	TP32.29x31.375x0.3313	Reinf. 2 Tension Rupture	90.7	Pass
88.25 - 83.87	Pole + Reinf.	TP33.96x32.29x0.3313	Reinf. 2 Tension Rupture	96.0	Pass
83.87 - 78.13	Pole	TP33.763x32.716x0.25	Pole	86.8	Pass
78.13 - 73.13	Pole	TP34.675x33.763x0.25	Pole	91.0	Pass
73.13 - 69.92	Pole	TP35.259x34.675x0.25	Pole	93.6	Pass
69.92 - 69.67	Pole + Reinf.	TP35.305x35.259x0.5	Reinf. 3 Tension Rupture	66.3	Pass
69.67 - 64.67	Pole + Reinf.	TP36.216x35.305x0.4875	Reinf. 3 Tension Rupture	69.2	Pass
64.67 - 59.67	Pole + Reinf.	TP37.127x36.216x0.4875	Reinf. 3 Tension Rupture	71.9	Pass
59.67 - 57.25	Pole + Reinf.	TP37.568x37.127x0.4813	Reinf. 3 Tension Rupture	73.2	Pass
57.25 - 57	Pole + Reinf.	TP37.614x37.568x0.4188	Reinf. 1 Tension Rupture	85.2	Pass
57 - 52	Pole + Reinf.	TP38.525x37.614x0.4125	Reinf. 1 Tension Rupture	88.0	Pass
52 - 48.76	Pole + Reinf.	TP40.121x38.525x0.4125	Reinf. 1 Tension Rupture	89.7	Pass
48.76 - 42.24	Pole	TP39.803x38.616x0.3125	Pole	84.7	Pass
42.24 - 37.24	Pole	TP40.714x39.803x0.3125	Pole	86.7	Pass
37.24 - 32.24	Pole	TP41.625x40.714x0.3125	Pole	88.6	Pass
32.24 - 27.24	Pole	TP42.536x41.625x0.3125	Pole	90.4	Pass
27.24 - 22.24	Pole	TP43.447x42.536x0.3125	Pole	92.1	Pass
22.24 - 17.25	Pole	TP44.357x43.447x0.3125	Pole	93.8	Pass
17.25 - 17	Pole + Reinf.	TP44.403x44.357x0.4375	Pole	74.9	Pass
17 - 12	Pole + Reinf.	TP45.314x44.403x0.4313	Pole	76.5	Pass
12 - 7	Pole + Reinf.	TP46.225x45.314x0.4313	Pole	78.1	Pass
7 - 5.25	Pole + Reinf.	TP46.543x46.225x0.4313	Pole	78.6	Pass
5.25 - 5	Pole + Reinf.	TP46.589x46.543x0.6	Reinf. 7 Compression	80.6	Pass
5 - 0	Pole + Reinf.	TP47.5x46.589x0.5875	Reinf. 7 Compression	81.8	Pass
				Summary	
			Pole	96.6	Pass
			Reinforcement	96.0	Pass
			Overall	96.6	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	81.5	Pass
1	Base Plate	0	92.0	Pass
1	Base Foundation (Structural)	0	62.1	Pass
1	Base Foundation (Soil)	0	83.1	Pass

Structure Rating (max from all components) =	96.6%

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

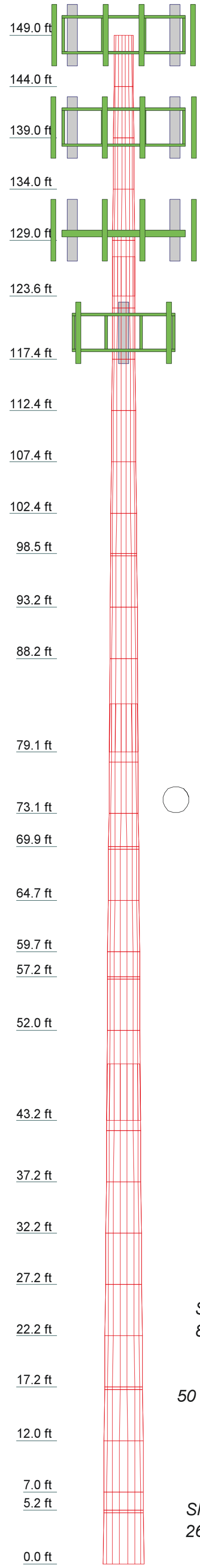
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	18	0.188		21.500	22.426	A572-65	0.2
2	5.00	18	0.188		22.426	23.352		0.2
3	5.00	18	0.188		23.352	24.278		0.2
4	5.00	18	0.188		24.278	25.204		0.2
5	5.00	18	0.188	3.78	25.204	26.202		0.3
6	[illegible]	18	0.188		[illegible]	[illegible]		0.3
7	5.00	18	0.188		26.043	26.958		0.3
8	5.00	18	0.188		26.958	27.873		0.3
9	5.00	18	0.188		27.873	28.788		0.3
10	5.00	18	0.188		28.788	29.703		0.3
11	[illegible]	18	0.188		29.703	[illegible]		0.2
12	[illegible]	18	[illegible]		[illegible]	[illegible]		0.0
13	5.00	18	[illegible]		[illegible]	[illegible]		0.5
14	5.00	18	0.331		31.375	32.290		0.5
15	[illegible]	18	0.331	4.75	32.290	33.960		1.0
16	[illegible]	18	0.250		32.716	33.763		0.5
17	5.00	18	0.250		33.763	34.675		0.5
18	[illegible]	18	0.250		[illegible]	[illegible]		0.3
19	[illegible]	18	[illegible]		[illegible]	[illegible]		0.0
20	5.00	18	0.487		[illegible]	[illegible]		0.9
21	5.00	18	0.487		36.216	37.127		0.9
22	[illegible]	18	[illegible]		[illegible]	[illegible]		0.4
23	[illegible]	18	[illegible]		[illegible]	[illegible]		0.0
24	5.00	18	0.412		[illegible]	[illegible]		0.8
25	[illegible]	18	0.412	5.52	38.525	40.121		1.5
26	[illegible]	18	0.312		38.616	39.803		0.9
27	5.00	18	0.312		39.803	40.714		0.7
28	5.00	18	0.312		40.714	41.625		0.7
29	5.00	18	0.312		41.625	42.536		0.7
30	5.00	18	0.312		42.536	43.447		0.7
31	4.99	18	0.312		43.447	44.357		0.7
32	[illegible]	18	[illegible]		[illegible]	[illegible]		0.1
33	5.00	18	0.431		[illegible]	45.314		1.3
34	5.00	18	0.431		45.314	46.225		1.3
35	[illegible]	18	[illegible]		[illegible]	[illegible]		[illegible]
36	[illegible]	18	[illegible]		[illegible]	[illegible]		[illegible]
37	5.00	18	[illegible]		[illegible]	[illegible]		1.4
								19.7



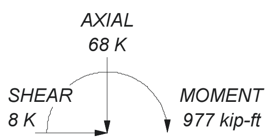
MATERIAL STRENGTH

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

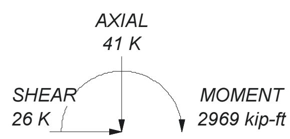
TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure C 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 0.00 ft
8. TOWER RATING: 96.6%

ALL REACTIONS ARE FACTORED



TORQUE 1 kip-ft
50 mph WIND - 1.500 in ICE



TORQUE 5 kip-ft
REACTIONS - 119 mph WIND

CROWN CASTLE The Foundation for a Wireless World	*Crown Castle* 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2000 FAX:	Job: **BU# 842856** Project: Client: Crown Castle — Drawn by: Matthew Schmitt — App'd: Code: TIA-222-H — Date: 12/15/23 — Scale: NTS Path: C:\SAPI Work Area\842856\WO 2256458 - SA\Prod\842856.eri — Dwg No. E-1

Tower Input Data

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

Tower is located in Tolland County, Connecticut.
Tower base elevation above sea level: 496.00 ft.
Basic wind speed of 119 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
TOWER RATING: 96.6%.
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		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Horizontals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Consider Moments - Diagonals	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
	Use Moment Magnification		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Stress Ratios		Retension Guys To Initial Tension		Offset Girt At Foundation
√	Use Code Safety Factors - Guys	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Escalate Ice	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Always Use Max Kz	√	Project Wind Area of Appurtenances		Use TIA-222-H Bracing Resist. Exemption
	Use Special Wind Profile		Alternative Appurt. EPA Calculation		Use TIA-222-H Tension Splice Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Poles
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination	√	Include Shear-Torsion Interaction
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Always Use Sub-Critical Flow
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Use Top Mounted Sockets
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Pole Without Linear Attachments
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole With Shroud Or No Appurtenances
	Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules		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	149.00-144.00	5.00	0.00	18	21.500	22.426	0.188	0.750	A572-65 (65 ksi)
L2	144.00-139.00	5.00	0.00	18	22.426	23.352	0.188	0.750	A572-65 (65 ksi)
L3	139.00-134.00	5.00	0.00	18	23.352	24.278	0.188	0.750	A572-65 (65 ksi)
L4	134.00-129.00	5.00	0.00	18	24.278	25.204	0.188	0.750	A572-65 (65 ksi)
L5	129.00-123.61	5.39	3.78	18	25.204	26.202	0.188	0.750	A572-65 (65 ksi)
L6	123.61-122.39	5.00	0.00	18	25.128	26.043	0.188	0.750	A572-65 (65 ksi)
L7	122.39-117.39	5.00	0.00	18	26.043	26.958	0.188	0.750	A572-65 (65 ksi)
L8	117.39-112.39	5.00	0.00	18	26.958	27.873	0.188	0.750	A572-65 (65 ksi)
L9	112.39-107.39	5.00	0.00	18	27.873	28.788	0.188	0.750	A572-65 (65 ksi)
L10	107.39-102.39	5.00	0.00	18	28.788	29.703	0.188	0.750	A572-65 (65 ksi)
L11	102.39-98.50	3.89	0.00	18	29.703	30.415	0.188	0.750	A572-65 (65 ksi)
L12	98.50-98.25	0.25	0.00	18	30.415	30.460	0.344	1.375	A572-65 (65 ksi)
L13	98.25-93.25	5.00	0.00	18	30.460	31.375	0.338	1.350	A572-65 (65 ksi)
L14	93.25-88.25	5.00	0.00	18	31.375	32.290	0.331	1.325	A572-65 (65 ksi)
L15	88.25-79.13	9.12	4.75	18	32.290	33.960	0.331	1.325	A572-65 (65 ksi)
L16	79.13-78.13	5.75	0.00	18	32.716	33.763	0.250	1.000	A572-65 (65 ksi)
L17	78.13-73.13	5.00	0.00	18	33.763	34.675	0.250	1.000	A572-65 (65 ksi)
L18	73.13-69.92	3.21	0.00	18	34.675	35.259	0.250	1.000	A572-65 (65 ksi)
L19	69.92-69.67	0.25	0.00	18	35.259	35.305	0.500	2.000	A572-65 (65 ksi)
L20	69.67-64.67	5.00	0.00	18	35.305	36.216	0.487	1.950	A572-65 (65 ksi)
L21	64.67-59.67	5.00	0.00	18	36.216	37.127	0.487	1.950	A572-65 (65 ksi)
L22	59.67-57.25	2.42	0.00	18	37.127	37.568	0.481	1.925	A572-65 (65 ksi)
L23	57.25-57.00	0.25	0.00	18	37.568	37.614	0.419	1.675	A572-65 (65 ksi)
L24	57.00-52.00	5.00	0.00	18	37.614	38.525	0.412	1.650	A572-65 (65 ksi)
L25	52.00-43.24	8.76	5.52	18	38.525	40.121	0.412	1.650	A572-65 (65 ksi)
L26	43.24-42.24	6.52	0.00	18	38.616	39.803	0.312	1.250	A572-65 (65 ksi)
L27	42.24-37.24	5.00	0.00	18	39.803	40.714	0.312	1.250	A572-65 (65 ksi)
L28	37.24-32.24	5.00	0.00	18	40.714	41.625	0.312	1.250	A572-65 (65 ksi)
L29	32.24-27.24	5.00	0.00	18	41.625	42.536	0.312	1.250	A572-65 (65 ksi)
L30	27.24-22.24	5.00	0.00	18	42.536	43.447	0.312	1.250	A572-65 (65 ksi)
L31	22.24-17.25	4.99	0.00	18	43.447	44.357	0.312	1.250	A572-65

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
									(65 ksi)
L32	17.25-17.00	0.25	0.00	18	44.357	44.403	0.438	1.750	A572-65
									(65 ksi)
L33	17.00-12.00	5.00	0.00	18	44.403	45.314	0.431	1.725	A572-65
									(65 ksi)
L34	12.00-7.00	5.00	0.00	18	45.314	46.225	0.431	1.725	A572-65
									(65 ksi)
L35	7.00-5.25	1.75	0.00	18	46.225	46.543	0.431	1.725	A572-65
									(65 ksi)
L36	5.25-5.00	0.25	0.00	18	46.543	46.589	0.600	2.400	A572-65
									(65 ksi)
L37	5.00-0.00	5.00		18	46.589	47.500	0.588	2.350	A572-65
									(65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	21.803	12.684	727.862	7.566	10.922	66.642	1456.681	6.343	3.454	18.421
	22.743	13.235	826.923	7.895	11.392	72.585	1654.933	6.619	3.617	19.291
L2	22.743	13.235	826.923	7.895	11.392	72.585	1654.933	6.619	3.617	19.291
	23.683	13.786	934.587	8.223	11.863	78.783	1870.404	6.894	3.780	20.16
L3	23.683	13.786	934.587	8.223	11.863	78.783	1870.404	6.894	3.780	20.16
	24.624	14.337	1051.213	8.552	12.333	85.234	2103.810	7.170	3.943	21.029
L4	24.624	14.337	1051.213	8.552	12.333	85.234	2103.810	7.170	3.943	21.029
	25.564	14.888	1177.159	8.881	12.804	91.939	2355.868	7.445	4.106	21.898
L5	25.564	14.888	1177.159	8.881	12.804	91.939	2355.868	7.445	4.106	21.898
	26.577	15.482	1323.723	9.235	13.311	99.448	2649.188	7.742	4.282	22.835
L6	26.188	14.843	1166.401	8.854	12.765	91.376	2334.337	7.423	4.092	21.827
	26.416	15.387	1299.554	9.179	13.230	98.230	2600.818	7.695	4.254	22.686
L7	26.416	15.387	1299.554	9.179	13.230	98.230	2600.818	7.695	4.254	22.686
	27.345	15.932	1442.473	9.503	13.695	105.332	2886.844	7.967	4.415	23.544
L8	27.345	15.932	1442.473	9.503	13.695	105.332	2886.844	7.967	4.415	23.544
	28.274	16.476	1595.504	9.828	14.159	112.681	3193.107	8.240	4.576	24.403
L9	28.274	16.476	1595.504	9.828	14.159	112.681	3193.107	8.240	4.576	24.403
	29.203	17.021	1758.992	10.153	14.624	120.279	3520.299	8.512	4.737	25.262
L10	29.203	17.021	1758.992	10.153	14.624	120.279	3520.299	8.512	4.737	25.262
	30.132	17.565	1933.284	10.478	15.089	128.124	3869.113	8.784	4.898	26.121
L11	30.132	17.565	1933.284	10.478	15.089	128.124	3869.113	8.784	4.898	26.121
	30.855	17.989	2076.502	10.731	15.451	134.396	4155.736	8.996	5.023	26.789
L12	30.831	32.809	3748.188	10.675	15.451	242.592	7501.308	16.408	4.748	13.812
	30.877	32.859	3765.323	10.691	15.474	243.335	7535.600	16.433	4.756	13.836
L13	30.878	32.268	3699.164	10.694	15.474	239.059	7403.196	16.137	4.767	14.124
	31.807	33.249	4046.620	11.018	15.939	253.887	8098.565	16.627	4.928	14.602
L14	31.808	32.639	3974.083	11.021	15.939	249.336	7953.395	16.323	4.939	14.91
	32.737	33.601	4335.960	11.345	16.404	264.331	8677.626	16.804	5.100	15.397
L15	32.737	33.601	4335.960	11.345	16.404	264.331	8677.626	16.804	5.100	15.397
	34.433	35.357	5051.550	11.938	17.252	292.817	10109.748	17.682	5.394	16.284
L16	34.061	25.762	3430.738	11.526	16.620	206.423	6865.990	12.883	5.318	21.272
	34.246	26.593	3773.470	11.897	17.152	220.004	7551.904	13.299	5.502	22.009
L17	34.246	26.593	3773.470	11.897	17.152	220.004	7551.904	13.299	5.502	22.009
	35.171	27.316	4089.718	12.221	17.615	232.176	8184.817	13.661	5.663	22.651
L18	35.171	27.316	4089.718	12.221	17.615	232.176	8184.817	13.661	5.663	22.651
	35.765	27.780	4301.648	12.428	17.912	240.158	8608.957	13.893	5.766	23.063
L19	35.726	55.163	8420.302	12.340	17.912	470.100	16851.684	27.587	5.326	10.651
	35.772	55.235	8453.457	12.356	17.935	471.342	16918.037	27.623	5.334	10.667
L20	35.774	53.874	8251.004	12.360	17.935	460.054	16512.865	26.942	5.356	10.986
	36.700	55.284	8915.938	12.684	18.398	484.620	17843.607	27.647	5.516	11.315

Section	Tip Dia.	Area	I	r	C	I/C	J	It/Q	w	w/t
	in	in^2	in^4	in	in	in^3	in^4	in^2	in	
L21	36.700	55.284	8915.938	12.684	18.398	484.620	17843.607	27.647	5.516	11.315
	37.625	56.694	9615.669	13.007	18.861	509.826	19243.990	28.352	5.676	11.644
L22	37.626	55.976	9497.249	13.009	18.861	503.547	19006.996	27.994	5.687	11.818
	38.074	56.650	9844.292	13.166	19.085	515.820	19701.537	28.330	5.765	11.979
L23	38.083	49.376	8609.191	13.188	19.085	451.104	17229.711	24.693	5.875	14.03
	38.130	49.437	8640.906	13.204	19.108	452.217	17293.182	24.723	5.883	14.049
L24	38.131	48.707	8516.229	13.207	19.108	445.692	17043.664	24.358	5.894	14.289
	39.056	49.900	9157.487	13.530	19.571	467.916	18327.024	24.955	6.054	14.677
L25	39.056	49.900	9157.487	13.530	19.571	467.916	18327.024	24.955	6.054	14.677
	40.676	51.989	10356.716	14.097	20.382	508.142	20727.059	26.000	6.335	15.358
L26	40.184	37.992	7042.027	13.598	19.617	358.980	14093.321	19.000	6.246	19.988
	40.369	39.170	7717.470	14.019	20.220	381.676	15445.095	19.589	6.455	20.657
L27	40.369	39.170	7717.470	14.019	20.220	381.676	15445.095	19.589	6.455	20.657
	41.294	40.073	8264.002	14.343	20.683	399.560	16538.877	20.040	6.616	21.17
L28	41.294	40.073	8264.002	14.343	20.683	399.560	16538.877	20.040	6.616	21.17
	42.219	40.977	8835.745	14.666	21.146	417.853	17683.117	20.492	6.776	21.683
L29	42.219	40.977	8835.745	14.666	21.146	417.853	17683.117	20.492	6.776	21.683
	43.144	41.881	9433.270	14.989	21.608	436.556	18878.952	20.944	6.936	22.196
L30	43.144	41.881	9433.270	14.989	21.608	436.556	18878.952	20.944	6.936	22.196
	44.069	42.784	10057.143	15.313	22.071	455.669	20127.520	21.396	7.097	22.709
L31	44.069	42.784	10057.143	15.313	22.071	455.669	20127.520	21.396	7.097	22.709
	44.993	43.687	10707.004	15.636	22.533	475.163	21428.097	21.847	7.257	23.222
L32	44.974	60.988	14862.542	15.591	22.533	659.580	29744.641	30.500	7.037	16.084
	45.020	61.051	14908.835	15.608	22.556	660.956	29837.287	30.531	7.045	16.102
L33	45.021	60.187	14702.120	15.610	22.556	651.792	29423.585	30.099	7.056	16.361
	45.946	61.434	15635.012	15.933	23.019	679.214	31290.597	30.723	7.216	16.733
L34	45.946	61.434	15635.012	15.933	23.019	679.214	31290.597	30.723	7.216	16.733
	46.871	62.681	16606.556	16.257	23.482	707.201	33234.963	31.347	7.377	17.105
L35	46.871	62.681	16606.556	16.257	23.482	707.201	33234.963	31.347	7.377	17.105
	47.195	63.118	16955.873	16.370	23.644	717.130	33934.056	31.565	7.433	17.235
L36	47.169	87.495	23332.731	16.310	23.644	986.833	46696.164	43.756	7.136	11.893
	47.215	87.581	23402.201	16.326	23.667	988.803	46835.195	43.799	7.144	11.906
L37	47.217	85.780	22933.345	16.331	23.667	968.993	45896.866	42.898	7.166	12.197
	48.142	87.479	24323.047	16.654	24.130	1008.000	48678.099	43.748	7.326	12.47

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft^2	in					in	in	in
L1 149.00-144.00				1	1	1			
L2 144.00-139.00				1	1	1			
L3 139.00-134.00				1	1	1			
L4 134.00-129.00				1	1	1			
L5 129.00-123.61				1	1	1			
L6 123.61-122.39				1	1	1			
L7 122.39-117.39				1	1	1			
L8 117.39-112.39				1	1	1			
L9 112.39-107.39				1	1	1			
L10 107.39-102.39				1	1	1			
L11 102.39-98.50				1	1	1			
L12 98.50-				1	1	0.959145			

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
98.25									
L13 98.25-93.25				1	1	0.964288			
L14 93.25-88.25				1	1	0.970367			
L15 88.25-79.13				1	1	0.96048			
L16 79.13-78.13				1	1	1			
L17 78.13-73.13				1	1	1			
L18 73.13-69.92				1	1	1			
L19 69.92-69.67				1	1	0.944901			
L20 69.67-64.67				1	1	0.957152			
L21 64.67-59.67				1	1	0.946102			
L22 59.67-57.25				1	1	0.953008			
L23 57.25-57.00				1	1	0.963839			
L24 57.00-52.00				1	1	0.969379			
L25 52.00-43.24				1	1	0.963836			
L26 43.24-42.24				1	1	1			
L27 42.24-37.24				1	1	1			
L28 37.24-32.24				1	1	1			
L29 32.24-27.24				1	1	1			
L30 27.24-22.24				1	1	1			
L31 22.24-17.25				1	1	1			
L32 17.25-17.00				1	1	1.20773			
L33 17.00-12.00				1	1	1.2149			
L34 12.00-7.00				1	1	1.20515			
L35 7.00-5.25				1	1	1.20182			
L36 5.25-5.00				1	1	0.926587			
L37 5.00-0.00				1	1	0.938002			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
****										
CCI-AFP-060100	A	No	Surface Af (CaAa)	59.75 - 44.75	1	1	0.100 0.250	6.000	14.000	0.00

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
CCI-AFP-060100	B	No	Surface Af (CaAa)	59.75 - 44.75	1	1	0.100 0.250	6.000	14.000	0.00
CCI-AFP-060100	C	No	Surface Af (CaAa)	59.75 - 44.75	1	1	0.100 0.250	6.000	14.000	0.00
***										
CCI-AFP-045100	A	No	Surface Af (CaAa)	100.50 - 80.50	1	1	0.300 0.400	4.500	11.000	0.00
CCI-AFP-045100	B	No	Surface Af (CaAa)	100.50 - 80.50	1	1	0.300 0.400	4.500	11.000	0.00
CCI-AFP-045100	C	No	Surface Af (CaAa)	100.50 - 80.50	1	1	0.300 0.400	4.500	11.000	0.00
******** *** ***										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
HB158-21U6S24-xxM_TMO(1-5/8)	A	No	No	Inside Pole	140.00 - 0.00	3	No Ice 1/2'' Ice 1'' Ice 2'' Ice	0.00 0.00 0.00 0.00	2.50 2.50 2.50 2.50
***									
HB158-1-13U6-S6F18 (1-5/8'')	C	No	No	Inside Pole	130.00 - 0.00	2	No Ice 1/2'' Ice 1'' Ice 2'' Ice	0.00 0.00 0.00 0.00	1.90 1.90 1.90 1.90
***									
LDF6-50A(1-1/4)	B	No	No	Inside Pole	149.00 - 0.00	6	No Ice 1/2'' Ice 1'' Ice 2'' Ice	0.00 0.00 0.00 0.00	0.60 0.60 0.60 0.60
FB-L98B-034-XXX(3/8)	B	No	No	Inside Pole	149.00 - 0.00	1	No Ice 1/2'' Ice 1'' Ice 2'' Ice	0.00 0.00 0.00 0.00	0.06 0.06 0.06 0.06
WR-VG66ST-BRD(7/8)	B	No	No	Inside Pole	149.00 - 0.00	2	No Ice 1/2'' Ice 1'' Ice 2'' Ice	0.00 0.00 0.00 0.00	0.91 0.91 0.91 0.91
***									
CU12PSM9P6XXX(1-1/2)	C	No	No	Inside Pole	120.00 - 0.00	1	No Ice 1/2'' Ice 1'' Ice 2'' Ice	0.00 0.00 0.00 0.00	2.35 2.35 2.35 2.35
***									

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	149.00-144.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.00
L2	144.00-139.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.00
L3	139.00-134.00	A	0.000	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.00
L4	134.00-129.00	A	0.000	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.00
L5	129.00-123.61	A	0.000	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.02
L6	123.61-122.39	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.00
L7	122.39-117.39	A	0.000	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.03
L8	117.39-112.39	A	0.000	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.03
L9	112.39-107.39	A	0.000	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.03
L10	107.39-102.39	A	0.000	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.03
L11	102.39-98.50	A	0.000	0.000	1.500	0.000	0.03
		B	0.000	0.000	1.500	0.000	0.02
		C	0.000	0.000	1.500	0.000	0.02
L12	98.50-98.25	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.00
L13	98.25-93.25	A	0.000	0.000	3.750	0.000	0.04
		B	0.000	0.000	3.750	0.000	0.03
		C	0.000	0.000	3.750	0.000	0.03
L14	93.25-88.25	A	0.000	0.000	3.750	0.000	0.04
		B	0.000	0.000	3.750	0.000	0.03
		C	0.000	0.000	3.750	0.000	0.03
L15	88.25-79.13	A	0.000	0.000	5.812	0.000	0.07
		B	0.000	0.000	5.812	0.000	0.05
		C	0.000	0.000	5.812	0.000	0.06
L16	79.13-78.13	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.01
L17	78.13-73.13	A	0.000	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.03
L18	73.13-69.92	A	0.000	0.000	0.000	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.000	0.000	0.02
L19	69.92-69.67	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L20	69.67-64.67	A	0.000	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.03
L21	64.67-59.67	A	0.000	0.000	0.080	0.000	0.04
		B	0.000	0.000	0.080	0.000	0.03

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
		C	0.000	0.000	0.080	0.000	0.03
L22	59.67-57.25	A	0.000	0.000	2.420	0.000	0.02
		B	0.000	0.000	2.420	0.000	0.01
		C	0.000	0.000	2.420	0.000	0.01
L23	57.25-57.00	A	0.000	0.000	0.250	0.000	0.00
		B	0.000	0.000	0.250	0.000	0.00
		C	0.000	0.000	0.250	0.000	0.00
L24	57.00-52.00	A	0.000	0.000	5.000	0.000	0.04
		B	0.000	0.000	5.000	0.000	0.03
		C	0.000	0.000	5.000	0.000	0.03
L25	52.00-43.24	A	0.000	0.000	7.250	0.000	0.07
		B	0.000	0.000	7.250	0.000	0.05
		C	0.000	0.000	7.250	0.000	0.05
L26	43.24-42.24	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.01
L27	42.24-37.24	A	0.000	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.03
L28	37.24-32.24	A	0.000	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.03
L29	32.24-27.24	A	0.000	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.03
L30	27.24-22.24	A	0.000	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.03
L31	22.24-17.25	A	0.000	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.03
L32	17.25-17.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L33	17.00-12.00	A	0.000	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.03
L34	12.00-7.00	A	0.000	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.03
L35	7.00-5.25	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.01
L36	5.25-5.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L37	5.00-0.00	A	0.000	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.03

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	149.00-144.00	A	1.480	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.00
L2	144.00-139.00	A	1.475	0.000	0.000	0.000	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03

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
		C		0.000	0.000	0.000	0.000	0.00
L3	139.00-134.00	A	1.469	0.000	0.000	0.000	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.00
L4	134.00-129.00	A	1.464	0.000	0.000	0.000	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.00
L5	129.00-123.61	A	1.458	0.000	0.000	0.000	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.02
L6	123.61-122.39	A	1.454	0.000	0.000	0.000	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.00
L7	122.39-117.39	A	1.451	0.000	0.000	0.000	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.03
L8	117.39-112.39	A	1.444	0.000	0.000	0.000	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.03
L9	112.39-107.39	A	1.438	0.000	0.000	0.000	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.03
L10	107.39-102.39	A	1.431	0.000	0.000	0.000	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.03
L11	102.39-98.50	A	1.425	0.000	0.000	2.070	0.000	0.05
		B		0.000	0.000	2.070	0.000	0.04
		C		0.000	0.000	2.070	0.000	0.04
L12	98.50-98.25	A	1.422	0.000	0.000	0.259	0.000	0.00
		B		0.000	0.000	0.259	0.000	0.00
		C		0.000	0.000	0.259	0.000	0.00
L13	98.25-93.25	A	1.418	0.000	0.000	5.168	0.000	0.08
		B		0.000	0.000	5.168	0.000	0.07
		C		0.000	0.000	5.168	0.000	0.08
L14	93.25-88.25	A	1.411	0.000	0.000	5.161	0.000	0.08
		B		0.000	0.000	5.161	0.000	0.07
		C		0.000	0.000	5.161	0.000	0.08
L15	88.25-79.13	A	1.399	0.000	0.000	7.981	0.000	0.14
		B		0.000	0.000	7.981	0.000	0.12
		C		0.000	0.000	7.981	0.000	0.12
L16	79.13-78.13	A	1.391	0.000	0.000	0.000	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.01
L17	78.13-73.13	A	1.385	0.000	0.000	0.000	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.03
L18	73.13-69.92	A	1.378	0.000	0.000	0.000	0.000	0.02
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.02
L19	69.92-69.67	A	1.374	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L20	69.67-64.67	A	1.369	0.000	0.000	0.000	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.03
L21	64.67-59.67	A	1.358	0.000	0.000	0.097	0.000	0.04
		B		0.000	0.000	0.097	0.000	0.03
		C		0.000	0.000	0.097	0.000	0.03
L22	59.67-57.25	A	1.350	0.000	0.000	2.944	0.000	0.04
		B		0.000	0.000	2.944	0.000	0.04
		C		0.000	0.000	2.944	0.000	0.04
L23	57.25-57.00	A	1.347	0.000	0.000	0.304	0.000	0.00

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
		B		0.000	0.000	0.304	0.000	0.00
		C		0.000	0.000	0.304	0.000	0.00
L24	57.00-52.00	A	1.341	0.000	0.000	6.079	0.000	0.09
		B		0.000	0.000	6.079	0.000	0.08
		C		0.000	0.000	6.079	0.000	0.08
L25	52.00-43.24	A	1.323	0.000	0.000	8.801	0.000	0.14
		B		0.000	0.000	8.801	0.000	0.12
		C		0.000	0.000	8.801	0.000	0.12
L26	43.24-42.24	A	1.308	0.000	0.000	0.000	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.01
L27	42.24-37.24	A	1.299	0.000	0.000	0.000	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.03
L28	37.24-32.24	A	1.282	0.000	0.000	0.000	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.03
L29	32.24-27.24	A	1.262	0.000	0.000	0.000	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.03
L30	27.24-22.24	A	1.239	0.000	0.000	0.000	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.03
L31	22.24-17.25	A	1.211	0.000	0.000	0.000	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.03
L32	17.25-17.00	A	1.194	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L33	17.00-12.00	A	1.174	0.000	0.000	0.000	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.03
L34	12.00-7.00	A	1.126	0.000	0.000	0.000	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.03
L35	7.00-5.25	A	1.077	0.000	0.000	0.000	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.01
L36	5.25-5.00	A	1.058	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L37	5.00-0.00	A	0.985	0.000	0.000	0.000	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.03

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	149.00-144.00	0.000	0.000	0.000	0.000
L2	144.00-139.00	0.000	0.000	0.000	0.000
L3	139.00-134.00	0.000	0.000	0.000	0.000
L4	134.00-129.00	0.000	0.000	0.000	0.000
L5	129.00-123.61	0.000	0.000	0.000	0.000
L6	123.61-122.39	0.000	0.000	0.000	0.000
L7	122.39-117.39	0.000	0.000	0.000	0.000
L8	117.39-112.39	0.000	0.000	0.000	0.000

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L9	112.39-107.39	0.000	0.000	0.000	0.000
L10	107.39-102.39	0.000	0.000	0.000	0.000
L11	102.39-98.50	0.000	0.000	0.000	0.000
L12	98.50-98.25	0.000	0.000	0.000	0.000
L13	98.25-93.25	0.000	0.000	0.000	0.000
L14	93.25-88.25	0.000	0.000	0.000	0.000
L15	88.25-79.13	0.000	0.000	0.000	0.000
L16	79.13-78.13	0.000	0.000	0.000	0.000
L17	78.13-73.13	0.000	0.000	0.000	0.000
L18	73.13-69.92	0.000	0.000	0.000	0.000
L19	69.92-69.67	0.000	0.000	0.000	0.000
L20	69.67-64.67	0.000	0.000	0.000	0.000
L21	64.67-59.67	0.000	0.000	0.000	0.000
L22	59.67-57.25	0.000	0.000	0.000	0.000
L23	57.25-57.00	0.000	0.000	0.000	0.000
L24	57.00-52.00	0.000	0.000	0.000	0.000
L25	52.00-43.24	0.000	0.000	0.000	0.000
L26	43.24-42.24	0.000	0.000	0.000	0.000
L27	42.24-37.24	0.000	0.000	0.000	0.000
L28	37.24-32.24	0.000	0.000	0.000	0.000
L29	32.24-27.24	0.000	0.000	0.000	0.000
L30	27.24-22.24	0.000	0.000	0.000	0.000
L31	22.24-17.25	0.000	0.000	0.000	0.000
L32	17.25-17.00	0.000	0.000	0.000	0.000
L33	17.00-12.00	0.000	0.000	0.000	0.000
L34	12.00-7.00	0.000	0.000	0.000	0.000
L35	7.00-5.25	0.000	0.000	0.000	0.000
L36	5.25-5.00	0.000	0.000	0.000	0.000
L37	5.00-0.00	0.000	0.000	0.000	0.000

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
L11	14	CCI-AFP-045100	98.50 - 100.50	1.0000	1.0000
L11	15	CCI-AFP-045100	98.50 - 100.50	1.0000	1.0000
L11	16	CCI-AFP-045100	98.50 - 100.50	1.0000	1.0000
L12	14	CCI-AFP-045100	98.25 - 98.50	1.0000	1.0000
L12	15	CCI-AFP-045100	98.25 - 98.50	1.0000	1.0000
L12	16	CCI-AFP-045100	98.25 - 98.50	1.0000	1.0000
L13	14	CCI-AFP-045100	93.25 - 98.25	1.0000	1.0000
L13	15	CCI-AFP-045100	93.25 - 98.25	1.0000	1.0000
L13	16	CCI-AFP-045100	93.25 - 98.25	1.0000	1.0000
L14	14	CCI-AFP-045100	88.25 - 93.25	1.0000	1.0000
L14	15	CCI-AFP-045100	88.25 - 93.25	1.0000	1.0000
L14	16	CCI-AFP-045100	88.25 - 93.25	1.0000	1.0000
L15	14	CCI-AFP-045100	80.50 - 88.25	1.0000	1.0000
L15	15	CCI-AFP-045100	80.50 - 88.25	1.0000	1.0000
L15	16	CCI-AFP-045100	80.50 - 88.25	1.0000	1.0000
L21	10	CCI-AFP-060100	59.67 - 59.75	1.0000	1.0000
L21	11	CCI-AFP-060100	59.67 - 59.75	1.0000	1.0000
L21	12	CCI-AFP-060100	59.67 - 59.75	1.0000	1.0000
L22	10	CCI-AFP-060100	57.25 - 59.67	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L22	11	CCI-AFP-060100	57.25 - 59.67	1.0000	1.0000
L22	12	CCI-AFP-060100	57.25 - 59.67	1.0000	1.0000
L23	10	CCI-AFP-060100	57.00 - 57.25	1.0000	1.0000
L23	11	CCI-AFP-060100	57.00 - 57.25	1.0000	1.0000
L23	12	CCI-AFP-060100	57.00 - 57.25	1.0000	1.0000
L24	10	CCI-AFP-060100	52.00 - 57.00	1.0000	1.0000
L24	11	CCI-AFP-060100	52.00 - 57.00	1.0000	1.0000
L24	12	CCI-AFP-060100	52.00 - 57.00	1.0000	1.0000
L25	10	CCI-AFP-060100	44.75 - 52.00	1.0000	1.0000
L25	11	CCI-AFP-060100	44.75 - 52.00	1.0000	1.0000
L25	12	CCI-AFP-060100	44.75 - 52.00	1.0000	1.0000

Effective Width of Flat Linear Attachments / Feed Lines

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L11	14	CCI-AFP-045100	98.50 - 100.50	Auto	0.0000
L11	15	CCI-AFP-045100	98.50 - 100.50	Auto	0.0000
L11	16	CCI-AFP-045100	98.50 - 100.50	Auto	0.0000
L12	14	CCI-AFP-045100	98.25 - 98.50	Auto	0.0000
L12	15	CCI-AFP-045100	98.25 - 98.50	Auto	0.0000
L12	16	CCI-AFP-045100	98.25 - 98.50	Auto	0.0000
L13	14	CCI-AFP-045100	93.25 - 98.25	Auto	0.0000
L13	15	CCI-AFP-045100	93.25 - 98.25	Auto	0.0000
L13	16	CCI-AFP-045100	93.25 - 98.25	Auto	0.0000
L14	14	CCI-AFP-045100	88.25 - 93.25	Auto	0.0000
L14	15	CCI-AFP-045100	88.25 - 93.25	Auto	0.0000
L14	16	CCI-AFP-045100	88.25 - 93.25	Auto	0.0000
L15	14	CCI-AFP-045100	80.50 - 88.25	Auto	0.0000
L15	15	CCI-AFP-045100	80.50 - 88.25	Auto	0.0000
L15	16	CCI-AFP-045100	80.50 - 88.25	Auto	0.0000
L21	10	CCI-AFP-060100	59.67 - 59.75	Auto	0.0541
L21	11	CCI-AFP-060100	59.67 - 59.75	Auto	0.0541
L21	12	CCI-AFP-060100	59.67 - 59.75	Auto	0.0541
L22	10	CCI-AFP-060100	57.25 - 59.67	Auto	0.0456
L22	11	CCI-AFP-060100	57.25 - 59.67	Auto	0.0456
L22	12	CCI-AFP-060100	57.25 - 59.67	Auto	0.0456
L23	10	CCI-AFP-060100	57.00 - 57.25	Auto	0.0202
L23	11	CCI-AFP-060100	57.00 - 57.25	Auto	0.0202
L23	12	CCI-AFP-060100	57.00 - 57.25	Auto	0.0202
L24	10	CCI-AFP-060100	52.00 - 57.00	Auto	0.0058
L24	11	CCI-AFP-060100	52.00 - 57.00	Auto	0.0058
L24	12	CCI-AFP-060100	52.00 - 57.00	Auto	0.0058
L25	10	CCI-AFP-060100	44.75 - 52.00	Auto	0.0000
L25	11	CCI-AFP-060100	44.75 - 52.00	Auto	0.0000
L25	12	CCI-AFP-060100	44.75 - 52.00	Auto	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
DMP65R-BU6D w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	149.00
DMP65R-BU6D w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	149.00
DMP65R-BU6D w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	149.00
HPA65R-BU6A w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	149.00
HPA65R-BU6A w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	149.00
HPA65R-BU6A w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	149.00
RRUS 4449 B5/B12	A	From Leg	4.00 0.00 0.00	0.0000	149.00
RRUS 4449 B5/B12	B	From Leg	4.00 0.00 0.00	0.0000	149.00
RRUS 4449 B5/B12	C	From Leg	4.00 0.00 0.00	0.0000	149.00
RRUS 8843 B2/B66A	A	From Leg	4.00 0.00 0.00	0.0000	149.00
RRUS 8843 B2/B66A	B	From Leg	4.00 0.00 0.00	0.0000	149.00
RRUS 8843 B2/B66A	C	From Leg	4.00 0.00 0.00	0.0000	149.00
DC6-48-60-18-8F	A	From Leg	4.00 0.00 0.00	0.0000	149.00
Sabre C10855721C 12' Platform Mount	C	None		0.0000	149.00
(2) 10' x 2'' Mount Pipe	A	From Leg	4.00 0.00 4.00	0.0000	149.00
(2) 10' x 2'' Mount Pipe	B	From Leg	4.00 0.00 4.00	0.0000	149.00
(2) 10' x 2'' Mount Pipe	C	From Leg	4.00 0.00 4.00	0.0000	149.00
*					
AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	140.00
AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe	B	From Leg	4.00 0.00	0.0000	140.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft
			0.00		
AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	140.00
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.00 0.00 0.00	0.0000	140.00
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.00 0.00 0.00	0.0000	140.00
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.00 0.00 0.00	0.0000	140.00
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.00 0.00 0.00	0.0000	140.00
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.00 0.00 0.00	0.0000	140.00
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.00 0.00 0.00	0.0000	140.00
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	140.00
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	140.00
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	140.00
site pro 1 RMQP-496 + HRK12	C	None		0.0000	140.00
(2) 8' x 2'' Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	140.00
(2) 8' x 2'' Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	140.00
(2) 8' x 2'' Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	140.00
* *					
BSF0020F3V1	A	From Leg	4.00 0.00 0.00	0.0000	130.00
BSF0020F3V1	B	From Leg	4.00 0.00 0.00	0.0000	130.00
(4) NHH-65B-R2B w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	130.00
(4) NHH-65B-R2B w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	130.00
(4) NHH-65B-R2B w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	130.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft
DB-C1-12C-24AB-0Z	A	From Leg	4.00 0.00 0.00	0.0000	130.00
(2) RFV01U-D1A	A	From Leg	4.00 0.00 0.00	0.0000	130.00
(2) RFV01U-D1A	B	From Leg	4.00 0.00 0.00	0.0000	130.00
(2) RFV01U-D1A	C	From Leg	4.00 0.00 0.00	0.0000	130.00
(2) RFV01U-D2A	A	From Leg	4.00 0.00 0.00	0.0000	130.00
(2) RFV01U-D2A	B	From Leg	4.00 0.00 0.00	0.0000	130.00
(2) RFV01U-D2A	C	From Leg	4.00 0.00 0.00	0.0000	130.00
Site Pro1 RMV5-SQNP w/ PRK-SFS and HRK12	C	None		0.0000	130.00
(2) 10' horizontal x 2'' Pipe Mount	A	From Leg	3.00 0.00 2.00	0.0000	130.00
(2) 10' horizontal x 2'' Pipe Mount	B	From Leg	3.00 0.00 2.00	0.0000	130.00
(2) 10' horizontal x 2'' Pipe Mount	C	From Leg	3.00 0.00 2.00	0.0000	130.00
(2) Dual Antenna Bracket	A	From Leg	3.00 0.00 0.00	0.0000	130.00
(2) Dual Antenna Bracket	B	From Leg	3.00 0.00 0.00	0.0000	130.00
(2) Dual Antenna Bracket	C	From Leg	3.00 0.00 0.00	0.0000	130.00
* MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	120.00
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	120.00
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	120.00
TA08025-B604	A	From Leg	4.00 0.00 0.00	0.0000	120.00
TA08025-B604	B	From Leg	4.00 0.00 0.00	0.0000	120.00
TA08025-B604	C	From Leg	4.00	0.0000	120.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
			0.00 0.00		
TA08025-B605	A	From Leg	4.00 0.00 0.00	90.0000	120.00
TA08025-B605	B	From Leg	4.00 0.00 0.00	90.0000	120.00
TA08025-B605	C	From Leg	4.00 0.00 0.00	90.0000	120.00
RDIDC-9181-PF-48	A	From Face	2.00 0.00 0.00	0.0000	120.00
Commscope MC-PK8-DSH	C	None		0.0000	120.00
3' Vertical x 3''x 3'' Angle Mount **	A	From Face	2.00 0.00 0.00	0.0000	120.00

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

Comb. No.	Description
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	149 - 144	Pole	Max Tension	26	0.00	-0.00	-0.00
			Max. Compression	26	-8.96	0.00	0.42
			Max. Mx	20	-3.86	25.83	0.24
			Max. My	2	-3.86	0.00	25.95
			Max. Vy	20	-4.93	25.83	0.24
			Max. Vx	2	-4.93	0.00	25.95
			Max. Torque	24			-1.31
L2	144 - 139	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-16.95	0.00	0.43
			Max. Mx	20	-7.27	55.48	0.44
			Max. My	2	-7.27	0.00	55.61
			Max. Vy	20	-9.37	55.48	0.44
			Max. Vx	2	-9.37	0.00	55.61
			Max. Torque	16			-2.94
L3	139 - 134	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-17.54	0.01	0.46
			Max. Mx	20	-7.60	103.29	0.41
			Max. My	2	-7.60	0.00	103.43
			Max. Vy	20	-9.76	103.29	0.41
			Max. Vx	2	-9.76	0.00	103.43
			Max. Torque	16			-2.94
L4	134 - 129	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.17	-0.20	1.41
			Max. Mx	8	-11.06	-157.53	0.68
			Max. My	2	-11.04	-0.09	157.87
			Max. Vy	20	-14.14	157.32	0.68
			Max. Vx	2	-14.20	-0.09	157.87
			Max. Torque	24			-4.48
L5	129 - 123.612	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.38	-0.20	1.42
			Max. Mx	8	-11.18	-180.42	0.67
			Max. My	2	-11.17	-0.09	180.85
			Max. Vy	20	-14.27	180.22	0.67
			Max. Vx	2	-14.32	-0.09	180.85

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	24			-4.48
L6	123.612 - 122.388	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.46	-0.19	1.45
			Max. Mx	8	-11.81	-252.82	0.64
			Max. My	2	-11.80	-0.09	253.51
			Max. Vy	20	-14.69	252.61	0.64
			Max. Vx	2	-14.74	-0.09	253.51
			Max. Torque	24			-4.48
L7	122.388 - 117.388	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.56	0.34	1.79
			Max. Mx	20	-15.01	334.97	0.84
			Max. My	2	-15.00	0.15	335.98
			Max. Vy	20	-18.03	334.97	0.84
			Max. Vx	2	-18.07	0.15	335.98
			Max. Torque	17			-5.40
L8	117.388 - 112.388	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.26	0.34	1.83
			Max. Mx	20	-15.52	425.94	0.81
			Max. My	2	-15.51	0.15	427.13
			Max. Vy	20	-18.38	425.94	0.81
			Max. Vx	2	-18.41	0.15	427.13
			Max. Torque	17			-5.40
L9	112.388 - 107.388	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.98	0.35	1.86
			Max. Mx	20	-16.06	518.61	0.79
			Max. My	2	-16.05	0.15	519.98
			Max. Vy	20	-18.71	518.61	0.79
			Max. Vx	2	-18.75	0.15	519.98
			Max. Torque	17			-5.40
L10	107.388 - 102.388	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.72	0.36	1.89
			Max. Mx	20	-16.62	612.95	0.77
			Max. My	2	-16.61	0.15	614.50
			Max. Vy	20	-19.05	612.95	0.77
			Max. Vx	2	-19.08	0.15	614.50
			Max. Torque	17			-5.39
L11	102.388 - 98.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.36	0.36	1.91
			Max. Mx	20	-17.07	687.44	0.76
			Max. My	2	-17.07	0.15	689.14
			Max. Vy	20	-19.30	687.44	0.76
			Max. Vx	2	-19.34	0.15	689.14
			Max. Torque	17			-5.38
L12	98.5 - 98.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.42	0.36	1.92
			Max. Mx	20	-17.13	692.26	0.75
			Max. My	2	-17.12	0.15	693.97
			Max. Vy	20	-19.31	692.26	0.75
			Max. Vx	2	-19.36	0.15	693.97
			Max. Torque	17			-5.38
L13	98.25 - 93.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.60	0.36	1.93
			Max. Mx	20	-17.93	789.81	0.74
			Max. My	2	-17.93	0.16	791.70
			Max. Vy	20	-19.72	789.81	0.74
			Max. Vx	2	-19.76	0.16	791.70
			Max. Torque	17			-5.38

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L14	93.25 - 88.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.79	0.37	1.95
			Max. Mx	20	-18.76	889.39	0.73
			Max. My	2	-18.76	0.16	891.46
			Max. Vy	20	-20.13	889.39	0.73
			Max. Vx	2	-20.16	0.16	891.46
			Max. Torque	17			-5.38
L15	88.25 - 79.128	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.84	0.37	1.96
			Max. Mx	20	-19.50	978.21	0.72
			Max. My	2	-19.50	0.16	980.44
			Max. Vy	20	-20.48	978.21	0.72
			Max. Vx	2	-20.52	0.16	980.44
			Max. Torque	17			-5.37
L16	79.128 - 78.128	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.97	0.37	1.96
			Max. Mx	20	-20.94	1097.39	0.70
			Max. My	2	-20.93	0.16	1099.84
			Max. Vy	20	-21.02	1097.39	0.70
			Max. Vx	2	-21.05	0.16	1099.84
			Max. Torque	17			-5.37
L17	78.128 - 73.128	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.94	0.37	1.96
			Max. Mx	20	-21.72	1203.24	0.69
			Max. My	2	-21.72	0.16	1205.86
			Max. Vy	20	-21.35	1203.24	0.69
			Max. Vx	2	-21.39	0.16	1205.86
			Max. Torque	17			-5.37
L18	73.128 - 69.92	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.57	0.37	1.96
			Max. Mx	20	-22.24	1272.03	0.69
			Max. My	2	-22.23	0.16	1274.77
			Max. Vy	20	-21.57	1272.03	0.69
			Max. Vx	2	-21.61	0.16	1274.77
			Max. Torque	17			-5.36
L19	69.92 - 69.67	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.64	0.37	1.96
			Max. Mx	20	-22.31	1277.42	0.69
			Max. My	2	-22.31	0.16	1280.17
			Max. Vy	20	-21.58	1277.42	0.69
			Max. Vx	2	-21.62	0.16	1280.17
			Max. Torque	17			-5.36
L20	69.67 - 64.67	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.14	0.37	1.96
			Max. Mx	20	-23.54	1386.38	0.68
			Max. My	2	-23.54	0.16	1389.31
			Max. Vy	20	-22.02	1386.38	0.68
			Max. Vx	2	-22.06	0.16	1389.31
			Max. Torque	17			-5.36
L21	64.67 - 59.67	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-47.66	0.37	1.96
			Max. Mx	20	-24.80	1497.52	0.68
			Max. My	2	-24.79	0.16	1500.63
			Max. Vy	20	-22.45	1497.52	0.68
			Max. Vx	2	-22.49	0.16	1500.63
			Max. Torque	17			-5.36
L22	59.67 - 57.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.47	0.37	1.96
			Max. Mx	20	-25.41	1552.09	0.67
			Max. My	2	-25.40	0.16	1555.29

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	20	-22.66	1552.09	0.67
			Max. Vx	2	-22.70	0.16	1555.29
			Max. Torque	17			-5.35
L23	57.25 - 57	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.55	0.37	1.96
			Max. Mx	20	-25.47	1557.76	0.67
			Max. My	2	-25.47	0.16	1560.96
			Max. Vy	20	-22.68	1557.76	0.67
			Max. Vx	2	-22.72	0.16	1560.96
			Max. Torque	17			-5.35
L24	57 - 52	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.12	0.37	1.96
			Max. Mx	20	-26.64	1672.12	0.67
			Max. My	2	-26.63	0.16	1675.51
			Max. Vy	20	-23.09	1672.12	0.67
			Max. Vx	2	-23.12	0.16	1675.51
			Max. Torque	17			-5.35
L25	52 - 43.243	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.13	0.37	1.96
			Max. Mx	20	-27.40	1747.29	0.66
			Max. My	2	-27.40	0.17	1750.79
			Max. Vy	20	-23.34	1747.29	0.66
			Max. Vx	2	-23.38	0.17	1750.79
			Max. Torque	17			-5.35
L26	43.243 - 42.243	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.35	0.37	1.96
			Max. Mx	20	-29.76	1901.33	0.66
			Max. My	2	-29.75	0.17	1905.06
			Max. Vy	20	-23.94	1901.33	0.66
			Max. Vx	2	-23.97	0.17	1905.06
			Max. Torque	17			-5.35
L27	42.243 - 37.243	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.60	0.37	1.96
			Max. Mx	20	-30.81	2021.70	0.66
			Max. My	2	-30.81	0.17	2025.61
			Max. Vy	20	-24.25	2021.70	0.66
			Max. Vx	2	-24.28	0.17	2025.61
			Max. Torque	17			-5.35
L28	37.243 - 32.243	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.88	0.37	1.96
			Max. Mx	20	-31.88	2143.58	0.66
			Max. My	2	-31.88	0.17	2147.67
			Max. Vy	20	-24.54	2143.58	0.66
			Max. Vx	2	-24.58	0.17	2147.67
			Max. Torque	17			-5.34
L29	32.243 - 27.243	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.18	0.37	1.96
			Max. Mx	20	-32.98	2266.92	0.66
			Max. My	2	-32.98	0.17	2271.18
			Max. Vy	20	-24.83	2266.92	0.66
			Max. Vx	2	-24.86	0.17	2271.18
			Max. Torque	17			-5.34
L30	27.243 - 22.243	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-59.50	0.37	1.96
			Max. Mx	20	-34.09	2391.62	0.66
			Max. My	2	-34.09	0.17	2396.05
			Max. Vy	20	-25.09	2391.62	0.66

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	2	-25.13	0.17	2396.05
			Max. Torque	17			-5.34
L31	22.243 - 17.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.83	0.37	1.96
			Max. Mx	20	-35.23	2517.41	0.67
			Max. My	2	-35.23	0.17	2522.01
			Max. Vy	20	-25.34	2517.41	0.67
			Max. Vx	2	-25.38	0.17	2522.01
			Max. Torque	17			-5.34
L32	17.25 - 17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.93	0.37	1.96
			Max. Mx	20	-35.33	2523.74	0.67
			Max. My	2	-35.33	0.17	2528.35
			Max. Vy	20	-25.33	2523.74	0.67
			Max. Vx	2	-25.37	0.17	2528.35
			Max. Torque	17			-5.34
L33	17 - 12	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.89	0.37	1.96
			Max. Mx	20	-37.05	2651.09	0.67
			Max. My	2	-37.05	0.17	2655.87
			Max. Vy	20	-25.63	2651.09	0.67
			Max. Vx	2	-25.66	0.17	2655.87
			Max. Torque	17			-5.34
L34	12 - 7	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.85	0.37	1.96
			Max. Mx	20	-38.79	2779.83	0.67
			Max. My	2	-38.79	0.17	2784.78
			Max. Vy	20	-25.90	2779.83	0.67
			Max. Vx	2	-25.94	0.17	2784.78
			Max. Torque	17			-5.34
L35	7 - 5.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-65.54	0.37	1.96
			Max. Mx	20	-39.40	2825.22	0.67
			Max. My	2	-39.40	0.17	2830.23
			Max. Vy	20	-26.01	2825.22	0.67
			Max. Vx	2	-26.04	0.17	2830.23
			Max. Torque	17			-5.34
L36	5.25 - 5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-65.65	0.37	1.96
			Max. Mx	20	-39.51	2831.72	0.67
			Max. My	2	-39.51	0.17	2836.74
			Max. Vy	20	-26.00	2831.72	0.67
			Max. Vx	2	-26.04	0.17	2836.74
			Max. Torque	17			-5.34
L37	5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.71	0.37	1.96
			Max. Mx	20	-41.36	2962.50	0.68
			Max. My	2	-41.36	0.17	2967.69
			Max. Vy	20	-26.33	2962.50	0.68
			Max. Vx	2	-26.36	0.17	2967.69
			Max. Torque	17			-5.34

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	67.71	0.00	8.13
	Max. H_x	20	41.37	26.31	0.00

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. H_z	2	41.37	0.00	26.35
	Max. M_x	2	2967.69	0.00	26.35
	Max. M_z	8	2962.16	-26.31	0.00
	Max. Torsion	5	5.34	-13.16	22.79
	Min. Vert	5	31.03	-13.16	22.79
	Min. H_x	8	41.37	-26.31	0.00
	Min. H_z	14	41.37	0.00	-26.35
	Min. M_x	14	-2966.54	0.00	-26.35
	Min. M_z	20	-2962.50	26.31	0.00
	Min. Torsion	17	-5.34	13.16	-22.79

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	34.47	0.00	0.00	-0.42	0.13	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	41.37	0.00	-26.35	-2967.69	0.17	-0.14
0.9 Dead+1.0 Wind 0 deg - No Ice	31.03	0.00	-26.35	-2916.23	0.12	-0.15
1.2 Dead+1.0 Wind 30 deg - No Ice	41.37	13.16	-22.79	-2566.63	-1481.50	-5.33
0.9 Dead+1.0 Wind 30 deg - No Ice	31.03	13.16	-22.79	-2522.12	-1455.89	-5.34
1.2 Dead+1.0 Wind 60 deg - No Ice	41.37	22.78	-13.15	-1480.91	-2563.89	-0.97
0.9 Dead+1.0 Wind 60 deg - No Ice	31.03	22.78	-13.15	-1455.16	-2519.60	-0.97
1.2 Dead+1.0 Wind 90 deg - No Ice	41.37	26.31	0.00	-0.68	-2962.16	3.64
0.9 Dead+1.0 Wind 90 deg - No Ice	31.03	26.31	0.00	-0.49	-2910.99	3.66
1.2 Dead+1.0 Wind 120 deg - No Ice	41.37	22.81	13.17	1482.61	-2568.76	-0.83
0.9 Dead+1.0 Wind 120 deg - No Ice	31.03	22.81	13.17	1457.12	-2524.39	-0.82
1.2 Dead+1.0 Wind 150 deg - No Ice	41.37	13.18	22.83	2570.50	-1484.09	-5.08
0.9 Dead+1.0 Wind 150 deg - No Ice	31.03	13.18	22.83	2526.18	-1458.50	-5.08
1.2 Dead+1.0 Wind 180 deg - No Ice	41.37	0.00	26.35	2966.54	0.17	0.14
0.9 Dead+1.0 Wind 180 deg - No Ice	31.03	0.00	26.35	2915.40	0.12	0.15
1.2 Dead+1.0 Wind 210 deg - No Ice	41.37	-13.16	22.79	2565.61	1481.60	5.33
0.9 Dead+1.0 Wind 210 deg - No Ice	31.03	-13.16	22.79	2521.38	1455.97	5.34
1.2 Dead+1.0 Wind 240 deg - No Ice	41.37	-22.78	13.15	1479.79	2564.21	0.97
0.9 Dead+1.0 Wind 240 deg - No Ice	31.03	-22.78	13.15	1454.35	2519.83	0.97
1.2 Dead+1.0 Wind 270 deg - No Ice	41.37	-26.31	0.00	-0.68	2962.50	-3.64
0.9 Dead+1.0 Wind 270 deg - No Ice	31.03	-26.31	0.00	-0.49	2911.23	-3.66
1.2 Dead+1.0 Wind 300 deg - No Ice	41.37	-22.81	-13.17	-1483.73	2569.11	0.83

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.0 Wind 300 deg - No Ice	31.03	-22.81	-13.17	-1457.94	2524.64	0.82
1.2 Dead+1.0 Wind 330 deg - No Ice	41.37	-13.18	-22.83	-2571.52	1484.65	5.08
0.9 Dead+1.0 Wind 330 deg - No Ice	31.03	-13.18	-22.83	-2526.92	1458.91	5.08
1.2 Dead+1.0 Ice+1.0 Temp	67.71	-0.00	-0.00	-1.96	0.37	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	67.71	-0.00	-8.13	-977.01	0.40	-0.02
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	67.71	4.06	-7.04	-845.64	-486.61	-1.09
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	67.71	7.04	-4.06	-488.89	-842.67	-0.28
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	67.71	8.13	-0.00	-2.16	-973.46	0.61
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	67.71	7.04	4.07	485.23	-843.74	-0.26
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	67.71	4.07	7.05	842.45	-487.20	-1.05
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	67.71	-0.00	8.13	972.73	0.40	0.02
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	67.71	-4.06	7.04	841.38	487.38	1.09
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	67.71	-7.04	4.06	484.61	843.47	0.28
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	67.71	-8.13	-0.00	-2.16	974.26	-0.61
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	67.71	-7.04	-4.07	-489.51	844.55	0.26
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	67.71	-4.07	-7.05	-846.72	488.04	1.06
Dead+Wind 0 deg - Service	34.47	0.00	-6.31	-704.62	0.14	-0.04
Dead+Wind 30 deg - Service	34.47	3.15	-5.46	-609.45	-351.46	-1.31
Dead+Wind 60 deg - Service	34.47	5.45	-3.15	-351.78	-608.35	-0.24
Dead+Wind 90 deg - Service	34.47	6.30	0.00	-0.48	-702.86	0.89
Dead+Wind 120 deg - Service	34.47	5.46	3.15	351.51	-609.51	-0.21
Dead+Wind 150 deg - Service	34.47	3.16	5.47	609.68	-352.12	-1.24
Dead+Wind 180 deg - Service	34.47	0.00	6.31	703.67	0.14	0.04
Dead+Wind 210 deg - Service	34.47	-3.15	5.46	608.51	351.73	1.31
Dead+Wind 240 deg - Service	34.47	-5.45	3.15	350.84	608.63	0.24
Dead+Wind 270 deg - Service	34.47	-6.30	0.00	-0.48	703.15	-0.89
Dead+Wind 300 deg - Service	34.47	-5.46	-3.15	-352.46	609.79	0.21
Dead+Wind 330 deg - Service	34.47	-3.16	-5.47	-610.62	352.42	1.24

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-34.47	0.00	0.00	34.47	0.00	0.000%
2	0.00	-41.37	-26.35	0.00	41.37	26.35	0.000%
3	0.00	-31.03	-26.35	0.00	31.03	26.35	0.000%
4	13.16	-41.37	-22.79	-13.16	41.37	22.79	0.000%
5	13.16	-31.03	-22.79	-13.16	31.03	22.79	0.000%
6	22.78	-41.37	-13.15	-22.78	41.37	13.15	0.000%
7	22.78	-31.03	-13.15	-22.78	31.03	13.15	0.000%
8	26.31	-41.37	0.00	-26.31	41.37	0.00	0.000%
9	26.31	-31.03	0.00	-26.31	31.03	0.00	0.000%
10	22.81	-41.37	13.17	-22.81	41.37	-13.17	0.000%
11	22.81	-31.03	13.17	-22.81	31.03	-13.17	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
12	13.18	-41.37	22.83	-13.18	41.37	-22.83	0.000%
13	13.18	-31.03	22.83	-13.18	31.03	-22.83	0.000%
14	0.00	-41.37	26.35	0.00	41.37	-26.35	0.000%
15	0.00	-31.03	26.35	0.00	31.03	-26.35	0.000%
16	-13.16	-41.37	22.79	13.16	41.37	-22.79	0.000%
17	-13.16	-31.03	22.79	13.16	31.03	-22.79	0.000%
18	-22.78	-41.37	13.15	22.78	41.37	-13.15	0.000%
19	-22.78	-31.03	13.15	22.78	31.03	-13.15	0.000%
20	-26.31	-41.37	0.00	26.31	41.37	0.00	0.000%
21	-26.31	-31.03	0.00	26.31	31.03	0.00	0.000%
22	-22.81	-41.37	-13.17	22.81	41.37	13.17	0.000%
23	-22.81	-31.03	-13.17	22.81	31.03	13.17	0.000%
24	-13.18	-41.37	-22.83	13.18	41.37	22.83	0.000%
25	-13.18	-31.03	-22.83	13.18	31.03	22.83	0.000%
26	0.00	-67.71	0.00	0.00	67.71	0.00	0.000%
27	0.00	-67.71	-8.13	0.00	67.71	8.13	0.000%
28	4.06	-67.71	-7.04	-4.06	67.71	7.04	0.000%
29	7.04	-67.71	-4.06	-7.04	67.71	4.06	0.000%
30	8.13	-67.71	0.00	-8.13	67.71	0.00	0.000%
31	7.04	-67.71	4.07	-7.04	67.71	-4.07	0.000%
32	4.07	-67.71	7.05	-4.07	67.71	-7.05	0.000%
33	0.00	-67.71	8.13	0.00	67.71	-8.13	0.000%
34	-4.06	-67.71	7.04	4.06	67.71	-7.04	0.000%
35	-7.04	-67.71	4.06	7.04	67.71	-4.06	0.000%
36	-8.13	-67.71	0.00	8.13	67.71	0.00	0.000%
37	-7.04	-67.71	-4.07	7.04	67.71	4.07	0.000%
38	-4.07	-67.71	-7.05	4.07	67.71	7.05	0.000%
39	0.00	-34.47	-6.31	0.00	34.47	6.31	0.000%
40	3.15	-34.47	-5.46	-3.15	34.47	5.46	0.000%
41	5.45	-34.47	-3.15	-5.45	34.47	3.15	0.000%
42	6.30	-34.47	0.00	-6.30	34.47	0.00	0.000%
43	5.46	-34.47	3.15	-5.46	34.47	-3.15	0.000%
44	3.16	-34.47	5.47	-3.16	34.47	-5.47	0.000%
45	0.00	-34.47	6.31	0.00	34.47	-6.31	0.000%
46	-3.15	-34.47	5.46	3.15	34.47	-5.46	0.000%
47	-5.45	-34.47	3.15	5.45	34.47	-3.15	0.000%
48	-6.30	-34.47	0.00	6.30	34.47	0.00	0.000%
49	-5.46	-34.47	-3.15	5.46	34.47	3.15	0.000%
50	-3.16	-34.47	-5.47	3.16	34.47	5.47	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00073984
3	Yes	5	0.00000001	0.00028116
4	Yes	7	0.00000001	0.00051371
5	Yes	7	0.00000001	0.00011434
6	Yes	7	0.00000001	0.00056207
7	Yes	7	0.00000001	0.00012741
8	Yes	6	0.00000001	0.00063903
9	Yes	6	0.00000001	0.00022142
10	Yes	7	0.00000001	0.00054740
11	Yes	7	0.00000001	0.00012337
12	Yes	7	0.00000001	0.00060451
13	Yes	7	0.00000001	0.00013866
14	Yes	5	0.00000001	0.00073948

15	Yes	5	0.00000001	0.00028108
16	Yes	7	0.00000001	0.00060544
17	Yes	7	0.00000001	0.00013913
18	Yes	7	0.00000001	0.00054465
19	Yes	7	0.00000001	0.00012279
20	Yes	6	0.00000001	0.00063889
21	Yes	6	0.00000001	0.00022136
22	Yes	7	0.00000001	0.00056236
23	Yes	7	0.00000001	0.00012726
24	Yes	7	0.00000001	0.00051686
25	Yes	7	0.00000001	0.00011499
26	Yes	4	0.00000001	0.00052317
27	Yes	7	0.00000001	0.00082319
28	Yes	8	0.00000001	0.00023768
29	Yes	8	0.00000001	0.00024339
30	Yes	7	0.00000001	0.00082061
31	Yes	8	0.00000001	0.00023828
32	Yes	8	0.00000001	0.00024611
33	Yes	7	0.00000001	0.00081515
34	Yes	8	0.00000001	0.00024631
35	Yes	8	0.00000001	0.00023804
36	Yes	7	0.00000001	0.00082183
37	Yes	8	0.00000001	0.00024426
38	Yes	8	0.00000001	0.00023891
39	Yes	5	0.00000001	0.00015018
40	Yes	6	0.00000001	0.00009953
41	Yes	6	0.00000001	0.00011652
42	Yes	5	0.00000001	0.00050259
43	Yes	6	0.00000001	0.00010794
44	Yes	6	0.00000001	0.00014319
45	Yes	5	0.00000001	0.00014972
46	Yes	6	0.00000001	0.00014453
47	Yes	6	0.00000001	0.00010693
48	Yes	5	0.00000001	0.00050296
49	Yes	6	0.00000001	0.00011654
50	Yes	6	0.00000001	0.00010024

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		*°*	*°*
L1	149 - 144	31.098	50	1.8799	0.0187
L2	144 - 139	29.133	50	1.8739	0.0179
L3	139 - 134	27.178	50	1.8590	0.0171
L4	134 - 129	25.245	50	1.8321	0.0158
L5	129 - 123.612	23.346	50	1.7933	0.0145
L6	127.388 - 122.388	22.743	50	1.7779	0.0140
L7	122.388 - 117.388	20.898	50	1.7409	0.0130
L8	117.388 - 112.388	19.112	50	1.6689	0.0115
L9	112.388 - 107.388	17.408	50	1.5843	0.0099
L10	107.388 - 102.388	15.798	50	1.4891	0.0084
L11	102.388 - 98.5	14.292	50	1.3856	0.0071
L12	98.5 - 98.25	13.199	50	1.3004	0.0062
L13	98.25 - 93.25	13.131	50	1.2974	0.0062
L14	93.25 - 88.25	11.806	50	1.2327	0.0056
L15	88.25 - 79.128	10.551	50	1.1645	0.0050
L16	83.873 - 78.128	9.511	50	1.1032	0.0045
L17	78.128 - 73.128	8.213	50	1.0446	0.0041
L18	73.128 - 69.92	7.171	50	0.9458	0.0035
L19	69.92 - 69.67	6.557	50	0.8818	0.0031

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L20	69.67 - 64.67	6.511	50	0.8793	0.0031
L21	64.67 - 59.67	5.618	50	0.8269	0.0028
L22	59.67 - 57.25	4.779	50	0.7743	0.0026
L23	57.25 - 57	4.393	50	0.7486	0.0025
L24	57 - 52	4.354	50	0.7455	0.0025
L25	52 - 43.243	3.606	50	0.6838	0.0022
L26	48.76 - 42.243	3.156	50	0.6439	0.0020
L27	42.243 - 37.243	2.309	50	0.5882	0.0018
L28	37.243 - 32.243	1.736	50	0.5052	0.0015
L29	32.243 - 27.243	1.251	50	0.4229	0.0012
L30	27.243 - 22.243	0.850	50	0.3413	0.0010
L31	22.243 - 17.25	0.535	50	0.2605	0.0007
L32	17.25 - 17	0.305	50	0.1807	0.0005
L33	17 - 12	0.295	50	0.1778	0.0005
L34	12 - 7	0.139	50	0.1201	0.0003
L35	7 - 5.25	0.043	50	0.0631	0.0002
L36	5.25 - 5	0.024	50	0.0436	0.0001
L37	5 - 0	0.022	50	0.0415	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	DMP65R-BU6D w/ Mount Pipe	50	31.098	1.8799	0.0187	27169
140.00	AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe	50	27.568	1.8629	0.0173	15555
130.00	BSF0020F3V1	50	23.722	1.8024	0.0148	7325
120.00	MX08FRO665-21 w/ Mount Pipe	50	20.035	1.7106	0.0124	4159

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	149 - 144	130.962	2	7.9343	0.0769
L2	144 - 139	122.693	2	7.9092	0.0738
L3	139 - 134	114.470	2	7.8465	0.0704
L4	134 - 129	106.336	2	7.7333	0.0649
L5	129 - 123.612	98.346	2	7.5694	0.0596
L6	127.388 - 122.388	95.810	2	7.5046	0.0575
L7	122.388 - 117.388	88.042	2	7.3484	0.0535
L8	117.388 - 112.388	80.525	2	7.0450	0.0470
L9	112.388 - 107.388	73.351	2	6.6880	0.0405
L10	107.388 - 102.388	66.572	2	6.2864	0.0346
L11	102.388 - 98.5	60.230	2	5.8493	0.0293
L12	98.5 - 98.25	55.622	2	5.4896	0.0254
L13	98.25 - 93.25	55.336	2	5.4765	0.0253
L14	93.25 - 88.25	49.756	24	5.2036	0.0228
L15	88.25 - 79.128	44.469	24	4.9153	0.0204
L16	83.873 - 78.128	40.090	24	4.6564	0.0185
L17	78.128 - 73.128	34.621	24	4.4086	0.0168
L18	73.128 - 69.92	30.229	24	3.9912	0.0143
L19	69.92 - 69.67	27.642	24	3.7213	0.0128

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L20	69.67 - 64.67	27.448	24	3.7105	0.0128
L21	64.67 - 59.67	23.682	24	3.4892	0.0116
L22	59.67 - 57.25	20.148	24	3.2672	0.0106
L23	57.25 - 57	18.521	24	3.1583	0.0101
L24	57 - 52	18.356	24	3.1455	0.0100
L25	52 - 43.243	15.201	24	2.8848	0.0089
L26	48.76 - 42.243	13.302	24	2.7162	0.0082
L27	42.243 - 37.243	9.733	24	2.4811	0.0073
L28	37.243 - 32.243	7.320	24	2.1309	0.0061
L29	32.243 - 27.243	5.271	24	1.7835	0.0050
L30	27.243 - 22.243	3.584	24	1.4391	0.0039
L31	22.243 - 17.25	2.256	24	1.0982	0.0029
L32	17.25 - 17	1.284	24	0.7615	0.0019
L33	17 - 12	1.244	24	0.7495	0.0019
L34	12 - 7	0.587	24	0.5062	0.0012
L35	7 - 5.25	0.183	24	0.2660	0.0006
L36	5.25 - 5	0.101	24	0.1835	0.0004
L37	5 - 0	0.091	24	0.1749	0.0004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	DMP65R-BU6D w/ Mount Pipe	2	130.962	7.9343	0.0769	6737
140.00	AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe	2	116.109	7.8631	0.0712	3833
130.00	BSF0020F3V1	2	99.930	7.6080	0.0608	1797
120.00	MX08FRO665-21 w/ Mount Pipe	2	84.414	7.2206	0.0507	1016

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	149 - 144 (1)	TP22.426x21.5x0.188	5.00	0.00	0.0	13.235	-3.86	774.23	0.005
L2	144 - 139 (2)	TP23.352x22.426x0.188	5.00	0.00	0.0	13.786	-7.26	806.47	0.009
L3	139 - 134 (3)	TP24.278x23.352x0.188	5.00	0.00	0.0	14.337	-7.60	838.71	0.009
L4	134 - 129 (4)	TP25.204x24.278x0.188	5.00	0.00	0.0	14.888	-11.05	870.95	0.013
L5	129 - 123.612 (5)	TP26.202x25.204x0.188	5.39	0.00	0.0	15.066	-11.18	881.35	0.013
L6	123.612 - 122.388 (6)	TP26.043x25.128x0.188	5.00	0.00	0.0	15.387	-11.80	900.15	0.013
L7	122.388 - 117.388 (7)	TP26.958x26.043x0.188	5.00	0.00	0.0	15.932	-15.00	932.00	0.016
L8	117.388 - 112.388 (8)	TP27.873x26.958x0.188	5.00	0.00	0.0	16.476	-15.51	963.86	0.016
L9	112.388 - 107.388 (9)	TP28.788x27.873x0.188	5.00	0.00	0.0	17.021	-16.05	995.72	0.016
L10	107.388 -	TP29.703x28.788x0.188	5.00	0.00	0.0	17.565	-16.61	1027.58	0.016

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	102.388 (10)								
L11	102.388 - 98.5 (11)	TP30.415x29.703x0.188	3.89	0.00	0.0	17.989	-17.06	1052.35	0.016
L12	98.5 - 98.25 (12)	TP30.46x30.415x0.344	0.25	0.00	0.0	32.859	-17.12	1922.25	0.009
L13	98.25 - 93.25 (13)	TP31.375x30.46x0.338	5.00	0.00	0.0	33.249	-17.92	1945.04	0.009
L14	93.25 - 88.25 (14)	TP32.29x31.375x0.331	5.00	0.00	0.0	33.601	-18.75	1965.68	0.010
L15	88.25 - 79.128 (15)	TP33.96x32.29x0.331	9.12	0.00	0.0	34.444	-19.50	2014.95	0.010
L16	79.128 - 78.128 (16)	TP33.763x32.716x0.25	5.75	0.00	0.0	26.593	-20.93	1555.68	0.013
L17	78.128 - 73.128 (17)	TP34.675x33.763x0.25	5.00	0.00	0.0	27.316	-21.72	1597.98	0.014
L18	73.128 - 69.92 (18)	TP35.259x34.675x0.25	3.21	0.00	0.0	27.780	-22.23	1625.12	0.014
L19	69.92 - 69.67 (19)	TP35.305x35.259x0.5	0.25	0.00	0.0	55.235	-22.31	3231.27	0.007
L20	69.67 - 64.67 (20)	TP36.216x35.305x0.488	5.00	0.00	0.0	55.284	-23.54	3234.10	0.007
L21	64.67 - 59.67 (21)	TP37.127x36.216x0.488	5.00	0.00	0.0	56.694	-24.79	3316.58	0.007
L22	59.67 - 57.25 (22)	TP37.568x37.127x0.481	2.42	0.00	0.0	56.650	-25.40	3314.03	0.008
L23	57.25 - 57 (23)	TP37.614x37.568x0.419	0.25	0.00	0.0	49.437	-25.47	2892.04	0.009
L24	57 - 52 (24)	TP38.525x37.614x0.413	5.00	0.00	0.0	49.900	-26.63	2919.15	0.009
L25	52 - 43.243 (25)	TP40.121x38.525x0.413	8.76	0.00	0.0	50.673	-27.40	2964.37	0.009
L26	43.243 - 42.243 (26)	TP39.803x38.616x0.313	6.52	0.00	0.0	39.170	-29.75	2291.43	0.013
L27	42.243 - 37.243 (27)	TP40.714x39.803x0.313	5.00	0.00	0.0	40.073	-30.80	2344.29	0.013
L28	37.243 - 32.243 (28)	TP41.625x40.714x0.313	5.00	0.00	0.0	40.977	-31.88	2397.15	0.013
L29	32.243 - 27.243 (29)	TP42.536x41.625x0.313	5.00	0.00	0.0	41.881	-32.97	2450.02	0.013
L30	27.243 - 22.243 (30)	TP43.447x42.536x0.313	5.00	0.00	0.0	42.784	-34.09	2502.88	0.014
L31	22.243 - 17.25 (31)	TP44.357x43.447x0.313	4.99	0.00	0.0	43.687	-35.23	2555.67	0.014
L32	17.25 - 17 (32)	TP44.403x44.357x0.438	0.25	0.00	0.0	61.051	-35.33	3571.48	0.010
L33	17 - 12 (33)	TP45.314x44.403x0.431	5.00	0.00	0.0	61.434	-37.05	3593.91	0.010
L34	12 - 7 (34)	TP46.225x45.314x0.431	5.00	0.00	0.0	62.681	-38.79	3666.86	0.011
L35	7 - 5.25 (35)	TP46.543x46.225x0.431	1.75	0.00	0.0	63.118	-39.40	3692.39	0.011
L36	5.25 - 5 (36)	TP46.589x46.543x0.6	0.25	0.00	0.0	87.581	-39.51	5123.51	0.008
L37	5 - 0 (37)	TP47.5x46.589x0.588	5.00	0.00	0.0	87.479	-41.36	5117.52	0.008

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	149 - 144 (1)	TP22.426x21.5x0.188	25.94	422.86	0.061	0.00	422.86	0.000
L2	144 - 139 (2)	TP23.352x22.426x0.188	55.60	452.93	0.123	0.00	452.93	0.000
L3	139 - 134 (3)	TP24.278x23.352x0.188	103.42	483.48	0.214	0.00	483.48	0.000
L4	134 - 129 (4)	TP25.204x24.278x0.188	157.83	514.46	0.307	0.00	514.46	0.000
L5	129 - 123.612	TP26.202x25.204x0.188	180.77	524.53	0.345	0.00	524.53	0.000

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 $\frac{M_{uy}}{\phi M_{ny}}$
	(5)							
L6	123.612 - 122.388 (6)	TP26.043x25.128x0.188	253.40	542.84	0.467	0.00	542.84	0.000
L7	122.388 - 117.388 (7)	TP26.958x26.043x0.188	336.01	574.11	0.585	0.00	574.11	0.000
L8	117.388 - 112.388 (8)	TP27.873x26.958x0.188	427.23	605.63	0.705	0.00	605.63	0.000
L9	112.388 - 107.388 (9)	TP28.788x27.873x0.188	520.15	637.35	0.816	0.00	637.35	0.000
L10	107.388 - 102.388 (10)	TP29.703x28.788x0.188	614.74	669.22	0.919	0.00	669.22	0.000
L11	102.388 - 98.5 (11)	TP30.415x29.703x0.188	689.43	694.06	0.993	0.00	694.06	0.000
L12	98.5 - 98.25 (12)	TP30.46x30.415x0.344	694.27	1506.55	0.461	0.00	1506.55	0.000
L13	98.25 - 93.25 (13)	TP31.375x30.46x0.338	792.07	1571.88	0.504	0.00	1571.88	0.000
L14	93.25 - 88.25 (14)	TP32.29x31.375x0.331	891.89	1630.72	0.547	0.00	1630.72	0.000
L15	88.25 - 79.128 (15)	TP33.96x32.29x0.331	980.93	1703.49	0.576	0.00	1703.49	0.000
L16	79.128 - 78.128 (16)	TP33.763x32.716x0.25	1100.42	1228.92	0.895	0.00	1228.92	0.000
L17	78.128 - 73.128 (17)	TP34.675x33.763x0.25	1206.51	1283.78	0.940	0.00	1283.78	0.000
L18	73.128 - 69.92 (18)	TP35.259x34.675x0.25	1275.46	1319.19	0.967	0.00	1319.19	0.000
L19	69.92 - 69.67 (19)	TP35.305x35.259x0.5	1280.87	2918.19	0.439	0.00	2918.19	0.000
L20	69.67 - 64.67 (20)	TP36.216x35.305x0.488	1390.08	3000.41	0.463	0.00	3000.41	0.000
L21	64.67 - 59.67 (21)	TP37.127x36.216x0.488	1501.47	3156.46	0.476	0.00	3156.46	0.000
L22	59.67 - 57.25 (22)	TP37.568x37.127x0.481	1556.15	3193.57	0.487	0.00	3193.57	0.000
L23	57.25 - 57 (23)	TP37.614x37.568x0.419	1561.83	2799.79	0.558	0.00	2799.79	0.000
L24	57 - 52 (24)	TP38.525x37.614x0.413	1676.45	2896.98	0.579	0.00	2896.98	0.000
L25	52 - 43.243 (25)	TP40.121x38.525x0.413	1751.78	2987.93	0.586	0.00	2987.93	0.000
L26	43.243 - 42.243 (26)	TP39.803x38.616x0.313	1906.13	2177.53	0.875	0.00	2177.53	0.000
L27	42.243 - 37.243 (27)	TP40.714x39.803x0.313	2026.75	2261.48	0.896	0.00	2261.48	0.000
L28	37.243 - 32.243 (28)	TP41.625x40.714x0.313	2148.88	2346.11	0.916	0.00	2346.11	0.000
L29	32.243 - 27.243 (29)	TP42.536x41.625x0.313	2272.46	2431.36	0.935	0.00	2431.36	0.000
L30	27.243 - 22.243 (30)	TP43.447x42.536x0.313	2397.40	2517.18	0.952	0.00	2517.18	0.000
L31	22.243 - 17.25 (31)	TP44.357x43.447x0.313	2523.43	2603.39	0.969	0.00	2603.39	0.000
L32	17.25 - 17 (32)	TP44.403x44.357x0.438	2529.77	4036.43	0.627	0.00	4036.43	0.000
L33	17 - 12 (33)	TP45.314x44.403x0.431	2657.36	4110.14	0.647	0.00	4110.14	0.000
L34	12 - 7 (34)	TP46.225x45.314x0.431	2786.33	4256.31	0.655	0.00	4256.31	0.000
L35	7 - 5.25 (35)	TP46.543x46.225x0.431	2831.80	4307.83	0.657	0.00	4307.83	0.000
L36	5.25 - 5 (36)	TP46.589x46.543x0.6	2838.31	6121.93	0.464	0.00	6121.93	0.000
L37	5 - 0 (37)	TP47.5x46.589x0.588	2969.32	6240.78	0.476	0.00	6240.78	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	149 - 144 (1)	TP22.426x21.5x0.188	4.93	232.27	0.021	1.31	452.35	0.003
L2	144 - 139 (2)	TP23.352x22.426x0.188	9.38	241.94	0.039	2.94	490.81	0.006
L3	139 - 134 (3)	TP24.278x23.352x0.188	9.76	251.61	0.039	2.94	530.84	0.006
L4	134 - 129 (4)	TP25.204x24.278x0.188	14.17	261.29	0.054	4.33	572.43	0.008
L5	129 - 123.612 (5)	TP26.202x25.204x0.188	14.30	264.40	0.054	4.33	586.18	0.007
L6	123.612 - 122.388 (6)	TP26.043x25.128x0.188	14.74	270.04	0.055	4.48	611.46	0.007
L7	122.388 - 117.388 (7)	TP26.958x26.043x0.188	18.08	279.60	0.065	5.15	655.50	0.008
L8	117.388 - 112.388 (8)	TP27.873x26.958x0.188	18.43	289.16	0.064	5.14	701.08	0.007
L9	112.388 - 107.388 (9)	TP28.788x27.873x0.188	18.77	298.72	0.063	5.14	748.19	0.007
L10	107.388 - 102.388 (10)	TP29.703x28.788x0.188	19.10	308.27	0.062	5.13	796.83	0.006
L11	102.388 - 98.5 (11)	TP30.415x29.703x0.188	19.35	315.70	0.061	5.13	835.71	0.006
L12	98.5 - 98.25 (12)	TP30.46x30.415x0.344	19.37	576.68	0.034	5.13	1520.96	0.003
L13	98.25 - 93.25 (13)	TP31.375x30.46x0.338	19.77	583.51	0.034	5.12	1586.07	0.003
L14	93.25 - 88.25 (14)	TP32.29x31.375x0.331	20.18	589.71	0.034	5.12	1650.47	0.003
L15	88.25 - 79.128 (15)	TP33.96x32.29x0.331	20.53	604.49	0.034	5.12	1734.25	0.003
L16	79.128 - 78.128 (16)	TP33.763x32.716x0.25	21.07	466.70	0.045	5.11	1369.75	0.004
L17	78.128 - 73.128 (17)	TP34.675x33.763x0.25	21.40	479.39	0.045	5.11	1445.25	0.004
L18	73.128 - 69.92 (18)	TP35.259x34.675x0.25	21.62	487.54	0.044	5.11	1494.76	0.003
L19	69.92 - 69.67 (19)	TP35.305x35.259x0.5	21.63	969.38	0.022	5.10	2954.71	0.002
L20	69.67 - 64.67 (20)	TP36.216x35.305x0.488	22.07	970.23	0.023	5.10	3035.78	0.002
L21	64.67 - 59.67 (21)	TP37.127x36.216x0.488	22.50	994.98	0.023	5.10	3192.61	0.002
L22	59.67 - 57.25 (22)	TP37.568x37.127x0.481	22.71	994.21	0.023	5.10	3229.10	0.002
L23	57.25 - 57 (23)	TP37.614x37.568x0.419	22.73	867.61	0.026	5.10	2826.13	0.002
L24	57 - 52 (24)	TP38.525x37.614x0.413	23.14	875.74	0.026	5.10	2922.98	0.002
L25	52 - 43.243 (25)	TP40.121x38.525x0.413	23.39	889.31	0.026	5.09	3014.26	0.002
L26	43.243 - 42.243 (26)	TP39.803x38.616x0.313	23.99	687.43	0.035	5.09	2377.39	0.002
L27	42.243 - 37.243 (27)	TP40.714x39.803x0.313	24.30	703.29	0.035	5.09	2488.35	0.002
L28	37.243 - 32.243 (28)	TP41.625x40.714x0.313	24.59	719.15	0.034	5.09	2601.83	0.002
L29	32.243 - 27.243 (29)	TP42.536x41.625x0.313	24.88	735.00	0.034	5.09	2717.85	0.002
L30	27.243 - 22.243 (30)	TP43.447x42.536x0.313	25.14	750.86	0.033	5.08	2836.40	0.002
L31	22.243 - 17.25 (31)	TP44.357x43.447x0.313	25.39	766.70	0.033	5.08	2957.31	0.002
L32	17.25 - 17 (32)	TP44.403x44.357x0.438	25.38	1071.44	0.024	5.08	4125.31	0.001
L33	17 - 12 (33)	TP45.314x44.403x0.431	25.67	1078.17	0.024	5.08	4237.82	0.001
L34	12 - 7 (34)	TP46.225x45.314x0.431	25.95	1100.06	0.024	5.08	4411.61	0.001
L35	7 - 5.25 (35)	TP46.543x46.225x0.431	26.06	1107.72	0.024	5.08	4473.26	0.001
L36	5.25 - 5 (36)	TP46.589x46.543x0.6	26.05	1537.05	0.017	5.08	6190.46	0.001

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 $\frac{T_u}{\phi T_n}$
L37	5 - 0 (37)	TP47.5x46.589x0.588	26.37	1535.25	0.017	5.08	6307.38	0.001

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	149 - 144 (1)	0.005	0.061	0.000	0.021	0.003	0.067	1.050	
L2	144 - 139 (2)	0.009	0.123	0.000	0.039	0.006	0.134	1.050	
L3	139 - 134 (3)	0.009	0.214	0.000	0.039	0.006	0.225	1.050	
L4	134 - 129 (4)	0.013	0.307	0.000	0.054	0.008	0.323	1.050	
L5	129 - 123.612 (5)	0.013	0.345	0.000	0.054	0.007	0.361	1.050	
L6	123.612 - 122.388 (6)	0.013	0.467	0.000	0.055	0.007	0.484	1.050	
L7	122.388 - 117.388 (7)	0.016	0.585	0.000	0.065	0.008	0.607	1.050	
L8	117.388 - 112.388 (8)	0.016	0.705	0.000	0.064	0.007	0.727	1.050	
L9	112.388 - 107.388 (9)	0.016	0.816	0.000	0.063	0.007	0.837	1.050	
L10	107.388 - 102.388 (10)	0.016	0.919	0.000	0.062	0.006	0.939	1.050	
L11	102.388 - 98.5 (11)	0.016	0.993	0.000	0.061	0.006	1.014	1.050	
L12	98.5 - 98.25 (12)	0.009	0.461	0.000	0.034	0.003	0.471	1.050	
L13	98.25 - 93.25 (13)	0.009	0.504	0.000	0.034	0.003	0.514	1.050	
L14	93.25 - 88.25 (14)	0.010	0.547	0.000	0.034	0.003	0.558	1.050	
L15	88.25 - 79.128 (15)	0.010	0.576	0.000	0.034	0.003	0.587	1.050	
L16	79.128 - 78.128 (16)	0.013	0.895	0.000	0.045	0.004	0.911	1.050	
L17	78.128 - 73.128 (17)	0.014	0.940	0.000	0.045	0.004	0.956	1.050	
L18	73.128 - 69.92 (18)	0.014	0.967	0.000	0.044	0.003	0.983	1.050	
L19	69.92 - 69.67 (19)	0.007	0.439	0.000	0.022	0.002	0.446	1.050	
L20	69.67 - 64.67 (20)	0.007	0.463	0.000	0.023	0.002	0.471	1.050	
L21	64.67 - 59.67 (21)	0.007	0.476	0.000	0.023	0.002	0.484	1.050	
L22	59.67 - 57.25 (22)	0.008	0.487	0.000	0.023	0.002	0.496	1.050	
L23	57.25 - 57 (23)	0.009	0.558	0.000	0.026	0.002	0.567	1.050	
L24	57 - 52 (24)	0.009	0.579	0.000	0.026	0.002	0.589	1.050	
L25	52 - 43.243 (25)	0.009	0.586	0.000	0.026	0.002	0.596	1.050	
L26	43.243 - 42.243 (26)	0.013	0.875	0.000	0.035	0.002	0.890	1.050	
L27	42.243 - 37.243 (27)	0.013	0.896	0.000	0.035	0.002	0.911	1.050	
L28	37.243 - 32.243 (28)	0.013	0.916	0.000	0.034	0.002	0.931	1.050	

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L29	32.243 - 27.243 (29)	0.013	0.935	0.000	0.034	0.002	0.949	1.050	
L30	27.243 - 22.243 (30)	0.014	0.952	0.000	0.033	0.002	0.967	1.050	
L31	22.243 - 17.25 (31)	0.014	0.969	0.000	0.033	0.002	0.984	1.050	
L32	17.25 - 17 (32)	0.010	0.627	0.000	0.024	0.001	0.637	1.050	
L33	17 - 12 (33)	0.010	0.647	0.000	0.024	0.001	0.657	1.050	
L34	12 - 7 (34)	0.011	0.655	0.000	0.024	0.001	0.666	1.050	
L35	7 - 5.25 (35)	0.011	0.657	0.000	0.024	0.001	0.669	1.050	
L36	5.25 - 5 (36)	0.008	0.464	0.000	0.017	0.001	0.472	1.050	
L37	5 - 0 (37)	0.008	0.476	0.000	0.017	0.001	0.484	1.050	

Section Capacity Table

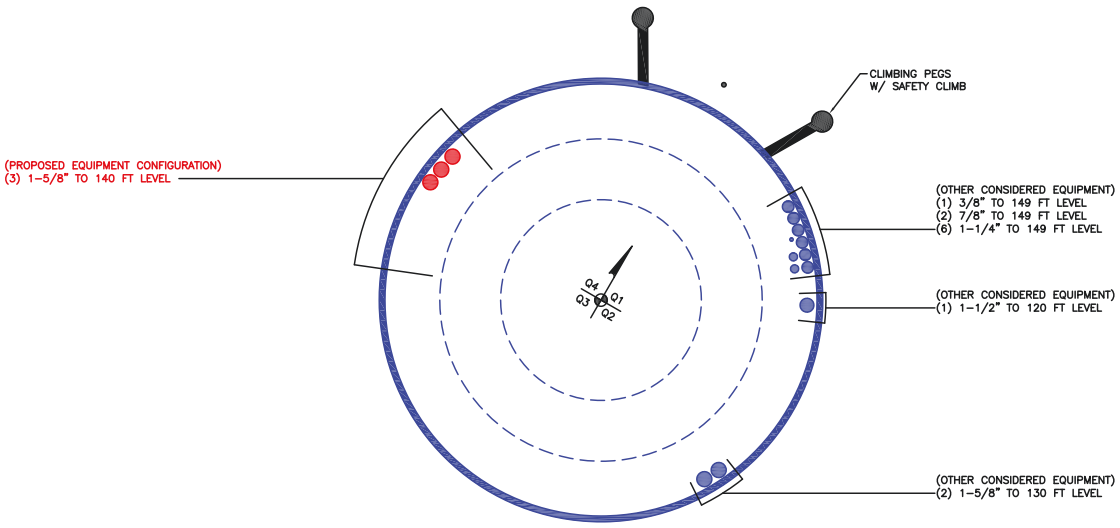
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	149 - 144	Pole	TP22.426x21.5x0.188	1	-3.86	812.94	6.4	Pass
L2	144 - 139	Pole	TP23.352x22.426x0.188	2	-7.26	846.79	12.7	Pass
L3	139 - 134	Pole	TP24.278x23.352x0.188	3	-7.60	880.65	21.4	Pass
L4	134 - 129	Pole	TP25.204x24.278x0.188	4	-11.05	914.50	30.8	Pass
L5	129 - 123.612	Pole	TP26.202x25.204x0.188	5	-11.18	925.41	34.4	Pass
L6	123.612 - 122.388	Pole	TP26.043x25.128x0.188	6	-11.80	945.15	46.1	Pass
L7	122.388 - 117.388	Pole	TP26.958x26.043x0.188	7	-15.00	978.61	57.8	Pass
L8	117.388 - 112.388	Pole	TP27.873x26.958x0.188	8	-15.51	1012.06	69.2	Pass
L9	112.388 - 107.388	Pole	TP28.788x27.873x0.188	9	-16.05	1045.50	79.7	Pass
L10	107.388 - 102.388	Pole	TP29.703x28.788x0.188	10	-16.61	1078.96	89.5	Pass
L11	102.388 - 98.5	Pole	TP30.415x29.703x0.188	11	-17.06	1104.97	96.6	Pass
L12	98.5 - 98.25	Pole	TP30.46x30.415x0.344	12	-17.12	2018.36	44.9	Pass
L13	98.25 - 93.25	Pole	TP31.375x30.46x0.338	13	-17.92	2042.29	49.0	Pass
L14	93.25 - 88.25	Pole	TP32.29x31.375x0.331	14	-18.75	2063.96	53.1	Pass
L15	88.25 - 79.128	Pole	TP33.96x32.29x0.331	15	-19.50	2115.70	55.9	Pass
L16	79.128 - 78.128	Pole	TP33.763x32.716x0.25	16	-20.93	1633.46	86.8	Pass
L17	78.128 - 73.128	Pole	TP34.675x33.763x0.25	17	-21.72	1677.88	91.0	Pass
L18	73.128 - 69.92	Pole	TP35.259x34.675x0.25	18	-22.23	1706.38	93.6	Pass
L19	69.92 - 69.67	Pole	TP35.305x35.259x0.5	19	-22.31	3392.83	42.5	Pass
L20	69.67 - 64.67	Pole	TP36.216x35.305x0.488	20	-23.54	3395.80	44.9	Pass
L21	64.67 - 59.67	Pole	TP37.127x36.216x0.488	21	-24.79	3482.41	46.1	Pass
L22	59.67 - 57.25	Pole	TP37.568x37.127x0.481	22	-25.40	3479.73	47.2	Pass
L23	57.25 - 57	Pole	TP37.614x37.568x0.419	23	-25.47	3036.64	54.0	Pass
L24	57 - 52	Pole	TP38.525x37.614x0.413	24	-26.63	3065.11	56.1	Pass
L25	52 - 43.243	Pole	TP40.121x38.525x0.413	25	-27.40	3112.59	56.8	Pass
L26	43.243 - 42.243	Pole	TP39.803x38.616x0.313	26	-29.75	2406.00	84.7	Pass
L27	42.243 - 37.243	Pole	TP40.714x39.803x0.313	27	-30.80	2461.50	86.7	Pass
L28	37.243 - 32.243	Pole	TP41.625x40.714x0.313	28	-31.88	2517.01	88.6	Pass
L29	32.243 - 27.243	Pole	TP42.536x41.625x0.313	29	-32.97	2572.52	90.4	Pass
L30	27.243 - 22.243	Pole	TP43.447x42.536x0.313	30	-34.09	2628.02	92.1	Pass
L31	22.243 - 17.25	Pole	TP44.357x43.447x0.313	31	-35.23	2683.45	93.7	Pass
L32	17.25 - 17	Pole	TP44.403x44.357x0.438	32	-35.33	3750.05	60.7	Pass
L33	17 - 12	Pole	TP45.314x44.403x0.431	33	-37.05	3773.61	62.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L34	12 - 7	Pole	TP46.225x45.314x0.431	34	-38.79	3850.20	63.4	Pass
L35	7 - 5.25	Pole	TP46.543x46.225x0.431	35	-39.40	3877.01	63.7	Pass
L36	5.25 - 5	Pole	TP46.589x46.543x0.6	36	-39.51	5379.69	44.9	Pass
L37	5 - 0	Pole	TP47.5x46.589x0.588	37	-41.36	5373.40	46.1	Pass
							Summary	
						Pole (L11)	96.6	Pass
						RATING =	**96.6**	**Pass**

***NOTE: Above stress ratios for reinforced sections are approximate. More exact calculations are presented in Appendix C.**

APPENDIX B

BASE LEVEL DRAWING


CLIMBING PEGS
W/ SAFETY CLIMB
(PROPOSED EQUIPMENT CONFIGURATION)
(3) 1-5/8" TO 140 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 3/8" TO 149 FT LEVEL
(2) 7/8" TO 149 FT LEVEL
(6) 1-1/4" TO 149 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 1-1/2" TO 120 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(2) 1-5/8" TO 130 FT LEVEL
Q4
Q3
Q1
Q2

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- H

Site BU: 842856

Work Order: 2256458

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	149	25.388	3.776	18	21.5	26.2021	0.1875	Auto	A572-65
2	127.388	48.26	4.745	18	25.13	33.9598	0.1875	Auto	A572-65
3	83.873	40.63	5.517	18	32.72	40.1211	0.25	Auto	A572-65
4	48.76	48.76	0	18	38.62	47.5	0.3125	Auto	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	47.25	57.25	plate	CCI-AFP-060100	3																		
2	82.5	98.5	plate	CCI-AFP-045100	3																		
3	57.25	69.92	plate	CCI-AFP-065125	3																		
4	5.25	17.25	plate	CFP-080125	2																		
5	5.25	17.25	plate	WCFP-080125	1																		
6	0	5.25	plate	TS 1	4	-3.1		1.8							-3.1		1.8						
7	0	5.25	plate	TS 2	2							3.13									3.13		
8	0	5.25	plate	TS 2	2							-3.1									-3.1		
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in2)	Bolt Hole Size (in)	Reinforcement Material
1	6	1	6	0.5	PC 8.8 - M20 (100)	30	PC 8.8 - M20 (100)	30.000	16.000	4.750	1.1875	A572-65
2	4.5	1	4.5	0.5	PC 8.8 - M20 (100)	24	PC 8.8 - M20 (100)	24.000	20.000	3.250	1.1875	A572-65
3	6.5	1.25	8.125	0.625	PC 8.8 - M20 (100)	42	PC 8.8 - M20 (100)	42.000	19.000	6.563	1.1875	A572-65
4	8	1.25	10	0.625	PC 8.8 - M20 (100)	48	PC 8.8 - M20 (100)	48.000	17.000	8.438	1.1875	A572-65
5	8	1.25	10	0.625	Welded	n/a	PC 8.8 - M20 (100)	48.000	17.000	8.438	1.1875	A572-65
6	0.75	6.5	4.875	3.25	Welded	n/a	Welded	n/a	0.000	4.875	0.0000	A572-50
7	0.75	5.25	3.9375	2.625	Welded	n/a	Welded	n/a	0.000	3.938	0.0000	A572-50
8	0.75	5.25	3.9375	2.625	Welded	n/a	Welded	n/a	0.000	3.938	0.0000	A572-50

Connection Details for Custom Reinforcements

Reinforcement	End	# Bolts	N or X	Bolt Spacing (in)	Edge Dist (in)	Weld Grade (ksi)	Transverse (Horiz.) Weld Type	Horiz. Weld Length (in)	Horiz. Groove Depth (in)	Horiz. Groove Angle (deg)	Horiz. Fillet Size (in)	Vertical Weld Length (in)	Vertical Fillet Size (in)	Rev H Connection Capacity (kip)
CFP-080125	Top	16	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	16	N	3	3	-	-	-	-	-	-	-	-	-
WCFP-080125	Top	16	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	80	None	-	-	-	-	59.5	0.313	-
TS 1	Top	-	-	-	-	80	None	-	-	-	-	60	0.313	-
	Bottom	-	-	-	-	80	CJP Groove	11.5	0.375	45	0.25	-	-	-
TS 2	Top	-	-	-	-	80	None	-	-	-	-	60	0.313	-
	Bottom	-	-	-	-	80	CJP Groove	10.5	0.375	45	0.25	-	-	-

TNX Geometry Input

Increment (ft): 5 Export to TNX

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	149 - 144	5		18	21.500	22.426	0.1875	A572-65	1.000
2	144 - 139	5		18	22.426	23.352	0.1875	A572-65	1.000
3	139 - 134	5		18	23.352	24.278	0.1875	A572-65	1.000
4	134 - 129	5		18	24.278	25.204	0.1875	A572-65	1.000
5	129 - 127.388	5.388	3.776	18	25.204	26.202	0.1875	A572-65	1.000
6	127.388 - 122.388	5		18	25.128	26.043	0.1875	A572-65	1.000
7	122.388 - 117.388	5		18	26.043	26.958	0.1875	A572-65	1.000
8	117.388 - 112.388	5		18	26.958	27.873	0.1875	A572-65	1.000
9	112.388 - 107.388	5		18	27.873	28.788	0.1875	A572-65	1.000
10	107.388 - 102.388	5		18	28.788	29.703	0.1875	A572-65	1.000
11	102.388 - 98.5	3.888		18	29.703	30.415	0.1875	A572-65	1.000
12	98.5 - 98.25	0.25		18	30.415	30.460	0.34375	A572-65	0.959
13	98.25 - 93.25	5		18	30.460	31.375	0.3375	A572-65	0.964
14	93.25 - 88.25	5		18	31.375	32.290	0.33125	A572-65	0.970
15	88.25 - 83.873	9.122	4.745	18	32.290	33.960	0.33125	A572-65	0.960
16	83.873 - 78.128	5.745		18	32.716	33.763	0.25	A572-65	1.000
17	78.128 - 73.128	5		18	33.763	34.675	0.25	A572-65	1.000
18	73.128 - 69.92	3.208		18	34.675	35.259	0.25	A572-65	1.000
19	69.92 - 69.67	0.25		18	35.259	35.305	0.5	A572-65	0.945
20	69.67 - 64.67	5		18	35.305	36.216	0.4875	A572-65	0.957
21	64.67 - 59.67	5		18	36.216	37.127	0.4875	A572-65	0.946
22	59.67 - 57.25	2.42		18	37.127	37.568	0.48125	A572-65	0.953
23	57.25 - 57	0.25		18	37.568	37.614	0.41875	A572-65	0.964
24	57 - 52	5		18	37.614	38.525	0.4125	A572-65	0.969
25	52 - 48.76	8.757	5.517	18	38.525	40.121	0.4125	A572-65	0.964
26	48.76 - 42.243	6.517		18	38.616	39.803	0.3125	A572-65	1.000
27	42.243 - 37.243	5		18	39.803	40.714	0.3125	A572-65	1.000
28	37.243 - 32.243	5		18	40.714	41.625	0.3125	A572-65	1.000
29	32.243 - 27.243	5		18	41.625	42.536	0.3125	A572-65	1.000
30	27.243 - 22.243	5		18	42.536	43.447	0.3125	A572-65	1.000
31	22.243 - 17.25	4.993		18	43.447	44.357	0.3125	A572-65	1.000
32	17.25 - 17	0.25		18	44.357	44.403	0.4375	A572-65	1.208
33	17 - 12	5		18	44.403	45.314	0.43125	A572-65	1.215
34	12 - 7	5		18	45.314	46.225	0.43125	A572-65	1.205
35	7 - 5.25	1.75		18	46.225	46.543	0.43125	A572-65	1.202
36	5.25 - 5	0.25		18	46.543	46.589	0.6	A572-65	0.927
37	5 - 0	5		18	46.589	47.500	0.5875	A572-65	0.938

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	149 - 144	3.86	25.95	4.93
2	144 - 139	7.27	55.61	9.37
3	139 - 134	7.60	103.43	9.76
4	134 - 129	11.04	157.87	14.20
5	129 - 127.388	11.17	180.85	14.32
6	127.388 - 122.388	11.80	253.51	14.74
7	122.388 - 117.388	15.00	336.01	18.08
8	117.388 - 112.388	15.51	427.23	18.43
9	112.388 - 107.388	16.05	520.15	18.77
10	107.388 - 102.388	16.61	614.74	19.10
11	102.388 - 98.5	17.06	689.43	19.35
12	98.5 - 98.25	17.12	694.27	19.37
13	98.25 - 93.25	17.92	792.07	19.77
14	93.25 - 88.25	18.75	891.90	20.18
15	88.25 - 83.873	19.50	980.94	20.53
16	83.873 - 78.128	20.93	1100.41	21.07
17	78.128 - 73.128	21.72	1206.51	21.40
18	73.128 - 69.92	22.23	1275.46	21.62
19	69.92 - 69.67	22.31	1280.87	21.63
20	69.67 - 64.67	23.54	1390.08	22.07
21	64.67 - 59.67	24.79	1501.47	22.50
22	59.67 - 57.25	25.40	1556.15	22.71
23	57.25 - 57	25.47	1561.83	22.73
24	57 - 52	26.63	1676.45	23.14
25	52 - 48.76	27.40	1751.77	23.39
26	48.76 - 42.243	29.75	1906.14	23.99
27	42.243 - 37.243	30.80	2026.75	24.30
28	37.243 - 32.243	31.88	2148.88	24.59
29	32.243 - 27.243	32.97	2272.46	24.88
30	27.243 - 22.243	34.09	2397.40	25.14
31	22.243 - 17.25	35.23	2523.43	25.39
32	17.25 - 17	35.33	2529.77	25.38
33	17 - 12	37.05	2657.36	25.67
34	12 - 7	38.79	2786.33	25.95
35	7 - 5.25	39.40	2831.80	26.06
36	5.25 - 5	39.51	2838.31	26.05
37	5 - 0	41.36	2969.32	26.37

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
149 - 144	Pole	TP22.426x21.5x0.1875	Pole	6.4%	Pass
144 - 139	Pole	TP23.352x22.426x0.1875	Pole	12.7%	Pass
139 - 134	Pole	TP24.278x23.352x0.1875	Pole	21.4%	Pass
134 - 129	Pole	TP25.204x24.278x0.1875	Pole	30.7%	Pass
129 - 127.39	Pole	TP26.202x25.204x0.1875	Pole	34.3%	Pass
127.39 - 122.39	Pole	TP26.043x25.128x0.1875	Pole	46.0%	Pass
122.39 - 117.39	Pole	TP26.958x26.043x0.1875	Pole	57.7%	Pass
117.39 - 112.39	Pole	TP27.873x26.958x0.1875	Pole	69.1%	Pass
112.39 - 107.39	Pole	TP28.788x27.873x0.1875	Pole	79.7%	Pass
107.39 - 102.39	Pole	TP29.703x28.788x0.1875	Pole	89.4%	Pass
102.39 - 98.5	Pole	TP30.415x29.703x0.1875	Pole	96.6%	Pass
98.5 - 98.25	Pole + Reinf.	TP30.46x30.415x0.3438	Reinf. 2 Tension Rupture	77.5%	Pass
98.25 - 93.25	Pole + Reinf.	TP31.375x30.46x0.3375	Reinf. 2 Tension Rupture	84.4%	Pass
93.25 - 88.25	Pole + Reinf.	TP32.29x31.375x0.3313	Reinf. 2 Tension Rupture	90.7%	Pass
88.25 - 83.87	Pole + Reinf.	TP33.96x32.29x0.3313	Reinf. 2 Tension Rupture	96.0%	Pass
83.87 - 78.13	Pole	TP33.763x32.716x0.25	Pole	86.8%	Pass
78.13 - 73.13	Pole	TP34.675x33.763x0.25	Pole	91.0%	Pass
73.13 - 69.92	Pole	TP35.259x34.675x0.25	Pole	93.6%	Pass
69.92 - 69.67	Pole + Reinf.	TP35.305x35.259x0.5	Reinf. 3 Tension Rupture	66.3%	Pass
69.67 - 64.67	Pole + Reinf.	TP36.216x35.305x0.4875	Reinf. 3 Tension Rupture	69.2%	Pass
64.67 - 59.67	Pole + Reinf.	TP37.127x36.216x0.4875	Reinf. 3 Tension Rupture	71.9%	Pass
59.67 - 57.25	Pole + Reinf.	TP37.568x37.127x0.4813	Reinf. 3 Tension Rupture	73.2%	Pass
57.25 - 57	Pole + Reinf.	TP37.614x37.568x0.4188	Reinf. 1 Tension Rupture	85.2%	Pass
57 - 52	Pole + Reinf.	TP38.525x37.614x0.4125	Reinf. 1 Tension Rupture	88.0%	Pass
52 - 48.76	Pole + Reinf.	TP40.121x38.525x0.4125	Reinf. 1 Tension Rupture	89.7%	Pass
48.76 - 42.24	Pole	TP39.803x38.616x0.3125	Pole	84.7%	Pass
42.24 - 37.24	Pole	TP40.714x39.803x0.3125	Pole	86.7%	Pass
37.24 - 32.24	Pole	TP41.625x40.714x0.3125	Pole	88.6%	Pass
32.24 - 27.24	Pole	TP42.536x41.625x0.3125	Pole	90.4%	Pass
27.24 - 22.24	Pole	TP43.447x42.536x0.3125	Pole	92.1%	Pass
22.24 - 17.25	Pole	TP44.357x43.447x0.3125	Pole	93.8%	Pass
17.25 - 17	Pole + Reinf.	TP44.403x44.357x0.4375	Pole	74.9%	Pass
17 - 12	Pole + Reinf.	TP45.314x44.403x0.4313	Pole	76.5%	Pass
12 - 7	Pole + Reinf.	TP46.225x45.314x0.4313	Pole	78.1%	Pass
7 - 5.25	Pole + Reinf.	TP46.543x46.225x0.4313	Pole	78.6%	Pass
5.25 - 5	Pole + Reinf.	TP46.589x46.543x0.6	Reinf. 7 Compression	80.6%	Pass
5 - 0	Pole + Reinf.	TP47.5x46.589x0.5875	Reinf. 7 Compression	81.8%	Pass
				Summary	
			Pole	96.6%	Pass
			Reinforcement	96.0%	Pass
			Overall	96.6%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*								
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8
149 - 144	827	n/a	827	13.23	n/a	13.23	6.4%								
144 - 139	934	n/a	934	13.79	n/a	13.79	12.7%								
139 - 134	1051	n/a	1051	14.34	n/a	14.34	21.4%								
134 - 129	1177	n/a	1177	14.89	n/a	14.89	30.7%								
129 - 127.39	1219	n/a	1219	15.07	n/a	15.07	34.3%								
127.39 - 122.39	1299	n/a	1299	15.39	n/a	15.39	46.0%								
122.39 - 117.39	1442	n/a	1442	15.93	n/a	15.93	57.7%								
117.39 - 112.39	1595	n/a	1595	16.48	n/a	16.48	69.1%								
112.39 - 107.39	1758	n/a	1758	17.02	n/a	17.02	79.7%								
107.39 - 102.39	1933	n/a	1933	17.56	n/a	17.56	89.4%								
102.39 - 98.5	2076	n/a	2076	17.99	n/a	17.99	96.6%								
98.5 - 98.25	2085	1682	3767	18.02	13.50	31.52	52.9%		77.5%						
98.25 - 93.25	2280	1781	4061	18.56	13.50	32.06	58.5%		84.4%						
93.25 - 88.25	2487	1882	4369	19.10	13.50	32.60	63.8%		90.7%						
88.25 - 83.87	2677	1973	4651	19.58	13.50	33.08	68.5%		96.0%						
83.87 - 78.13	3772	n/a	3772	26.59	n/a	26.59	86.8%								
78.13 - 73.13	4088	n/a	4088	27.31	n/a	27.31	91.0%								
73.13 - 69.92	4300	n/a	4300	27.78	n/a	27.78	93.6%								
69.92 - 69.67	4317	4116	8433	27.82	24.38	52.19	47.3%			66.3%					
69.67 - 64.67	4662	4321	8984	28.54	24.38	52.91	50.0%			69.2%					
64.67 - 59.67	5026	4532	9558	29.26	24.38	53.64	52.5%			71.9%					
59.67 - 57.25	5208	4636	9844	29.61	24.38	53.99	53.8%			73.2%					
57.25 - 57	5227	3383	8610	29.65	18.00	47.65	61.8%	85.2%							
57 - 52	5619	3543	9162	30.37	18.00	48.37	64.5%	88.0%							
52 - 48.76	5883	3649	9532	30.84	18.00	48.84	66.2%	89.7%							
48.76 - 42.24	7715	n/a	7715	39.17	n/a	39.17	84.7%								
42.24 - 37.24	8261	n/a	8261	40.07	n/a	40.07	86.7%								
37.24 - 32.24	8833	n/a	8833	40.98	n/a	40.98	88.6%								
32.24 - 27.24	9430	n/a	9430	41.88	n/a	41.88	90.4%								
27.24 - 22.24	10053	n/a	10053	42.78	n/a	42.78	92.1%								
22.24 - 17.25	10703	n/a	10703	43.69	n/a	43.69	93.8%								
17.25 - 17	11127	4001	15128	43.73	30.00	73.73	74.9%				63.6%	73.8%			
17 - 12	11821	4167	15988	44.63	30.00	74.63	76.5%				64.8%	75.0%			
12 - 7	12559	4415	16974	45.54	30.00	75.54	78.1%				65.9%	76.1%			
7 - 5.25	12819	4476	17295	45.85	30.00	75.85	78.6%				66.2%	76.4%			
5.25 - 5	12414	10966	23381	45.90	35.25	81.15	51.7%						78.7%	80.6%	78.1%
5 - 0	13162	11362	24524	46.80	35.25	82.05	53.0%						80.0%	81.8%	79.3%

Note: Section capacity checked using 5 degree increments.
Rating per TIA-222-H Section 15.5.

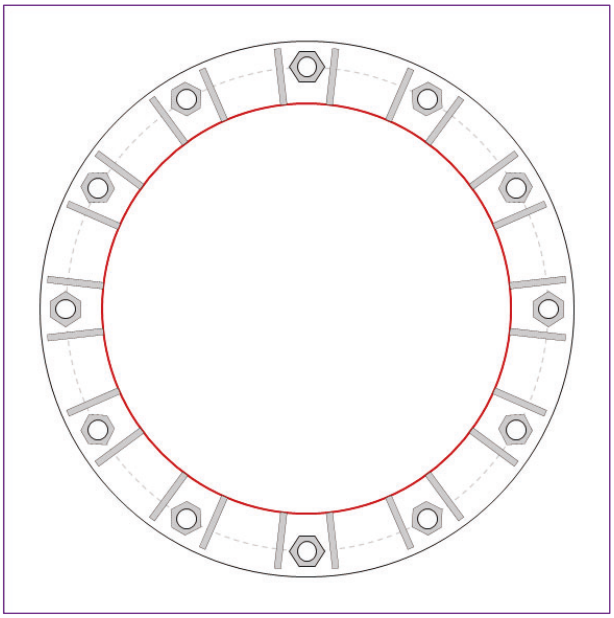
Monopole Base Plate Connection

Site Info	
BU #	842856
Site Name	ANDOVER NORTH
Order #	655744 REV. 1

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

Applied Loads	
Moment (kip-ft)	2969.32
Axial Force (kips)	41.36
Shear Force (kips)	26.37

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(12) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 56" BC

Base Plate Data

62" OD x 1.5" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

(24) 13"H x 6.5"W x 0.75"T, Notch: 0.75"
plate: Fy= 50 ksi ; weld: Fy= 80 ksi
horiz. weld: 0.375" groove, 45° dbl bevel, 0.25" fillet
vert. weld: 0.3125" fillet

Pole Data

47.5" x 0.3125" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary		*(units of kips, kip-in)*
Pu_t = 208.51	ϕPn_t = 243.75	**Stress Rating**
Vu = 2.2	ϕVn = 149.1	**81.5%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary		
Max Stress (ksi):	52.17	(Roark's Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**92.0%**	**Pass**

Stiffener Summary		
Horizontal Weld:	**44.8%**	**Pass**
Vertical Weld:	**51.0%**	**Pass**
Plate Flexure+Shear:	**23.3%**	**Pass**
Plate Tension+Shear:	**46.9%**	**Pass**
Plate Compression:	**61.7%**	**Pass**
Pole Summary		
Punching Shear:	**20.6%**	**Pass**

Pier and Pad Foundation

BU # :	842856
Site Name:	ANDOVER NORTH
App. Number:	655744 REV. 1

TIA-222 Revision:	H
Tower Type:	Monopole

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

Superstructure Analysis Reactions		
Compression, P_{comp}:	41.37	kips
Base Shear, Vu_comp:	26.36	kips
Moment, M_u:	2969.33	ft-kips
Tower Height, **H**:	149	ft
BP Dist. Above Fdn, bp_{dist}:	4.25	in

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, **dpier**:	6.5	ft
Ext. Above Grade, **E**:	1	ft
Pier Rebar Size, **Sc**:	8	
Pier Rebar Quantity, **mc**:	40	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	5	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	6.5	ft
Pad Width, W_1:	20.5	ft
Pad Thickness, **T**:	3	ft
Pad Rebar Size (Top dir.2), Sp_{top2}:	8	
Pad Rebar Quantity (Top dir. 2), mp_{top2}:	21	
Pad Rebar Size (Bottom dir. 2), Sp_2:	8	
Pad Rebar Quantity (Bottom dir. 2), mp_2:	25	
Pad Clear Cover, cc_{pad}:	3	in

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

Soil Properties		
Total Soil Unit Weight, γ:	115	pcf
Ultimate Gross Bearing, Qult:	18.000	ksf
Cohesion, **Cu**:		ksf
Friction Angle, φ:	36	degrees
SPT Blow Count, N_{blows}:	47	
Base Friction, μ:		
Neglected Depth, **N**:	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	N/A	ft

<--Toggle between Gross and Net

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating***	**Check**
Lateral (Sliding) (kips)	224.16	26.36	**11.2%**	**Pass**
Bearing Pressure (ksf)	13.50	4.42	**32.7%**	**Pass**
*Overturning (kip*ft)*	3823.32	3176.37	**83.1%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	4734.61	3087.95	**62.1%**	**Pass**
Pier Compression (kip)	21120.36	68.25	**0.3%**	**Pass**
*Pad Flexure (kip*ft)*	2736.60	1615.81	**56.2%**	**Pass**
Pad Shear - 1-way (kips)	735.13	292.78	**37.9%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.190	0.000	**0.0%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	3755.83	1852.77	**47.0%**	**Pass**

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

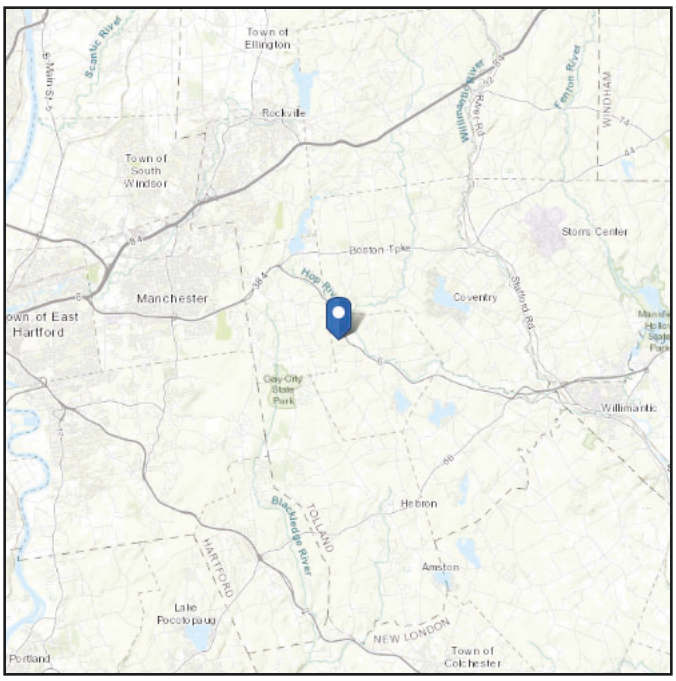
Structural Rating*:	**62.1%**
Soil Rating*:	**83.1%**

Version 5.0.2

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	41.750128
Risk Category:	II	**Longitude:**	-72.402675
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	495.7566207165736 ft (NAVD 88)



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:	Fri Dec 15 2023

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.

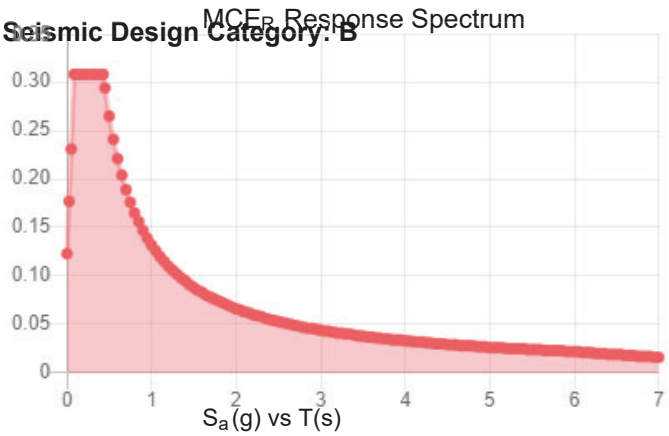
Seismic

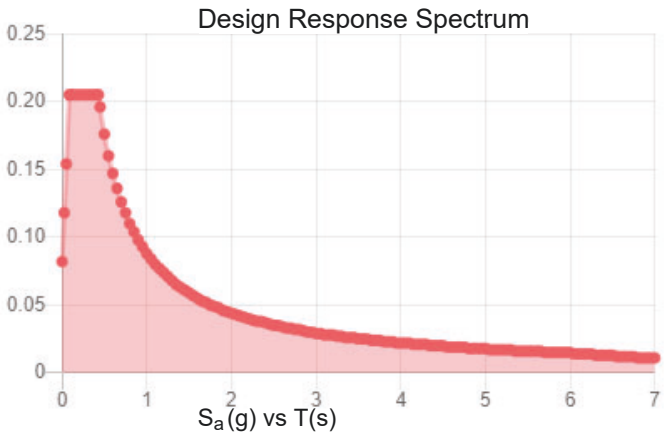
Site Soil Class: D - Default (see Section 11.4.3)

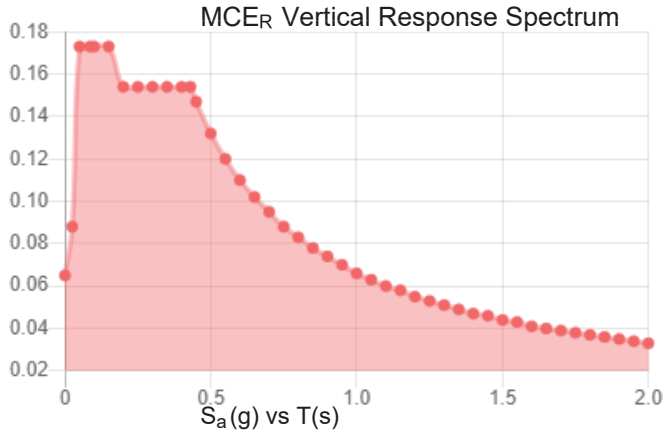
Results:

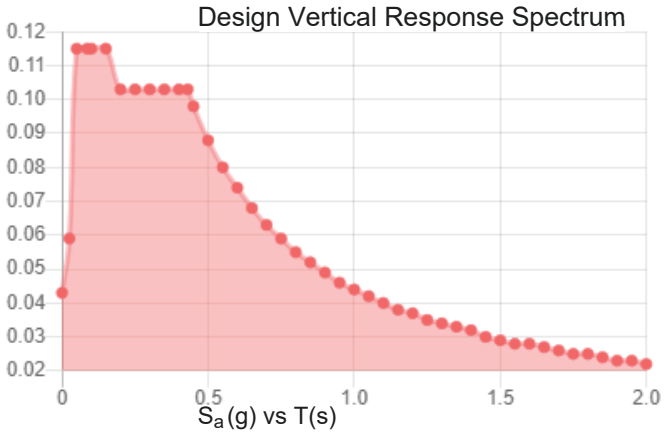
S_S :	0.193	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.104
F_v :	2.4	PGA_M :	0.166
S_{MS} :	0.308	F_{PGA} :	1.591
S_{M1} :	0.132	I_e :	1
S_{DS} :	0.205	C_v :	0.7

Seismic Design Category: B









Data Accessed: **Fri Dec 15 2023**

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:	Fri Dec 15 2023

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.

Date: **September 9, 2023**

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

Subject:	**Mount Replacement Analysis Report**	
Carrier Designation:	**T-Mobile Equipment Change-Out**	
	Carrier Site Number:	CT11501E
	Carrier Site Name:	CT501/ATT Andover - Prime
Crown Castle Designation:	**BU Number:**	842856
	Site Name:	ANDOVER NORTH
	JDE Job Number:	752562
	Order Number:	655744 Rev. 0
Engineering Firm Designation:	**Trylon Report Designation:**	231497
Site Data:	**122 Jonathan Trumbull Highway (Route 6), Andover, Tolland County, CT, 06232**	
	Latitude 41°45'0.46" Longitude -72°24'9.63"	
Structure Information:	**Tower Height & Type:**	**149.0 ft Monopole**
	Mount Elevation:	**140.0 ft**
	Mount Width & Type:	**12.5 ft Platform**

Trylon is pleased to submit this **"Mount Replacement 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:

Platform **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 119 mph as required by the 2022 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Steve Mustaro, P.E.

Respectfully Submitted by:
Matthew Jamerson, P.E.

Matthew Jamerson

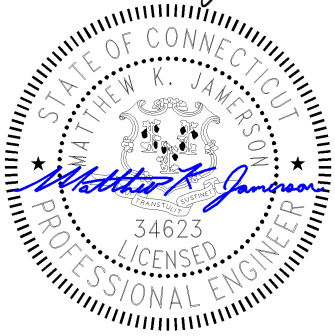


TABLE OF CONTENTS

1) INTRODUCTION

This is an existing three sector 12.5 ft Platform, designed by Site Pro 1.

2) ANALYSIS CRITERIA

Building Code:	2021 IBC / 2022 CTSBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	119 mph
Exposure Category:	C
Topographic Factor at Base:	1.0
Topographic Factor at Mount:	1.0
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.193
Seismic S_1:	0.055
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
140.0	140.0	3	ERICSSON	AIR 6419 B41_TMO_CCIV2	12.5 ft Platform [Site Pro 1 RMQP-496 with HRK12]
		3	RFS/CELWAVE	APXVAARR24_43-U-NA20	
		3	ERICSSON	RADIO 4449 B71 B85A_T-MOBILE	
		3	ERICSSON	RADIO 4460 B2/B25 B66_TMO	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	655744 Rev. 0	CCI Sites
Mount Manufacturer Drawings	Site Pro 1	RMQP-4XX	Trylon
Mount Manufacturer Drawings	Site Pro 1	HRK12	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 (Platform, Worst Case Sector)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1, 2, 3, 4	Mount Pipe(s)	MP4	140.0	41.8	Pass
	Horizontal(s)	H1		18.6	Pass
	Standoff(s)	M1		37.7	Pass
	Bracing(s)	M73		32.5	Pass
	Handrail(s)	M57		30.1	Pass
	Mount Connection(s)	-		30.4	Pass

Structure Rating (max from all components) =	41.8%

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) All sectors are typical
4) Rating per TIA-222-H, Section 15.5

4.1) Recommendations

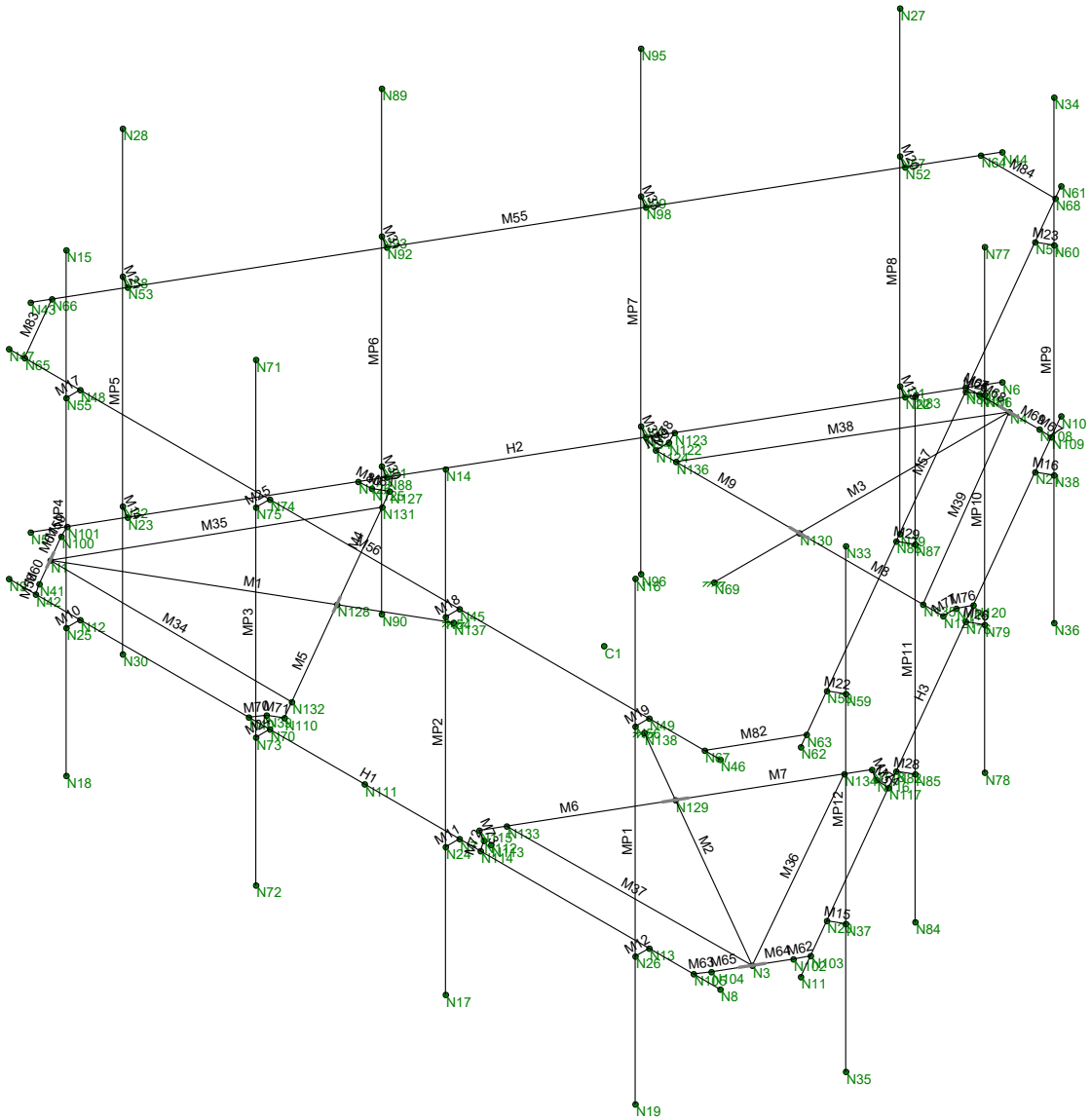
The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the proposed mount listed below must be installed.

1. Site Pro 1 RMQP-496 with HRK12. Install handrail kit 42” above platform.

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	842856	Wireframe
SMM		Sept 8, 2023 at 11:25 AM
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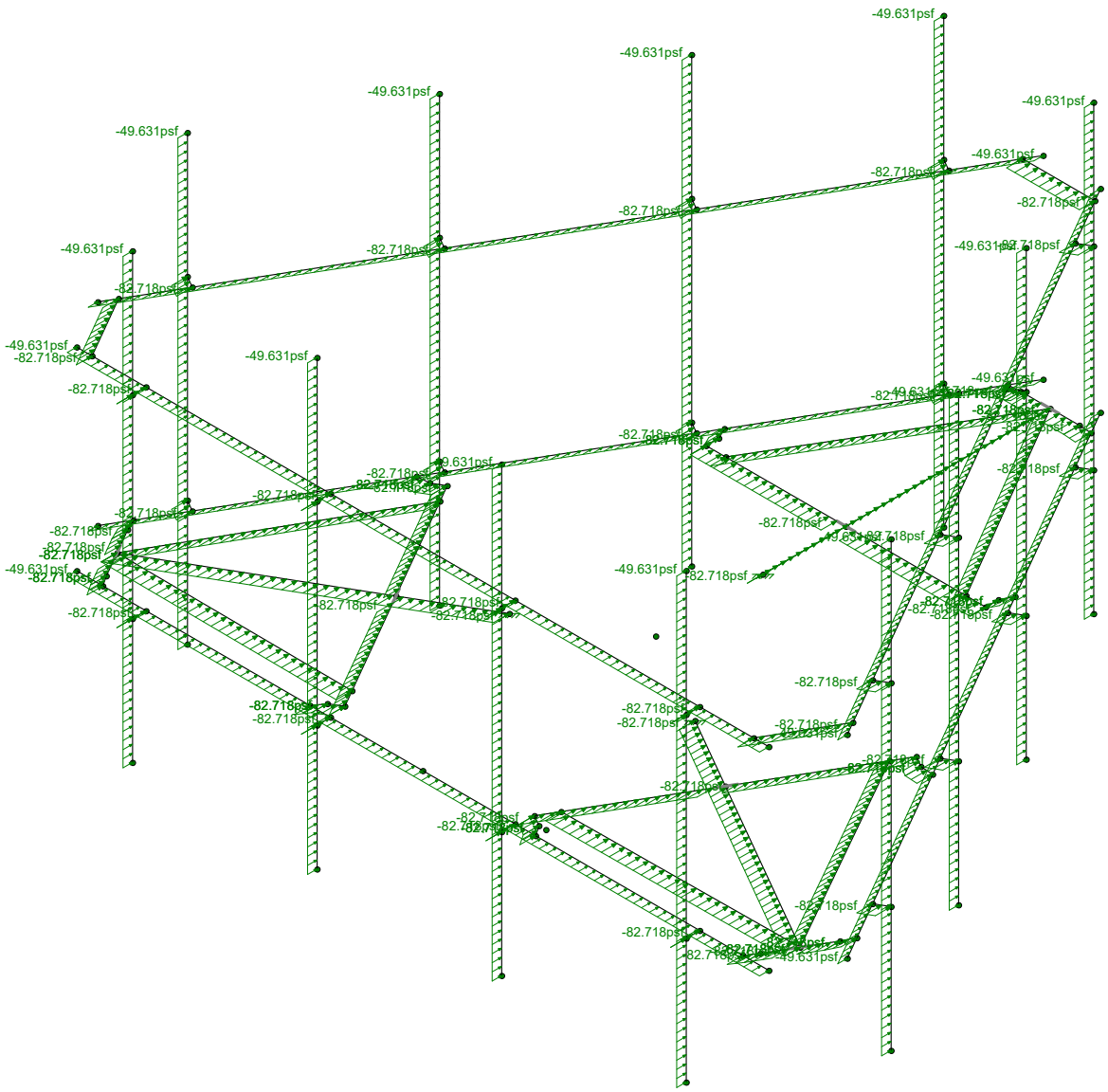

Loads: BLC 2, Structure Wind Z
Envelope Only Solution

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SMM		Sept 8, 2023 at 11:25 AM
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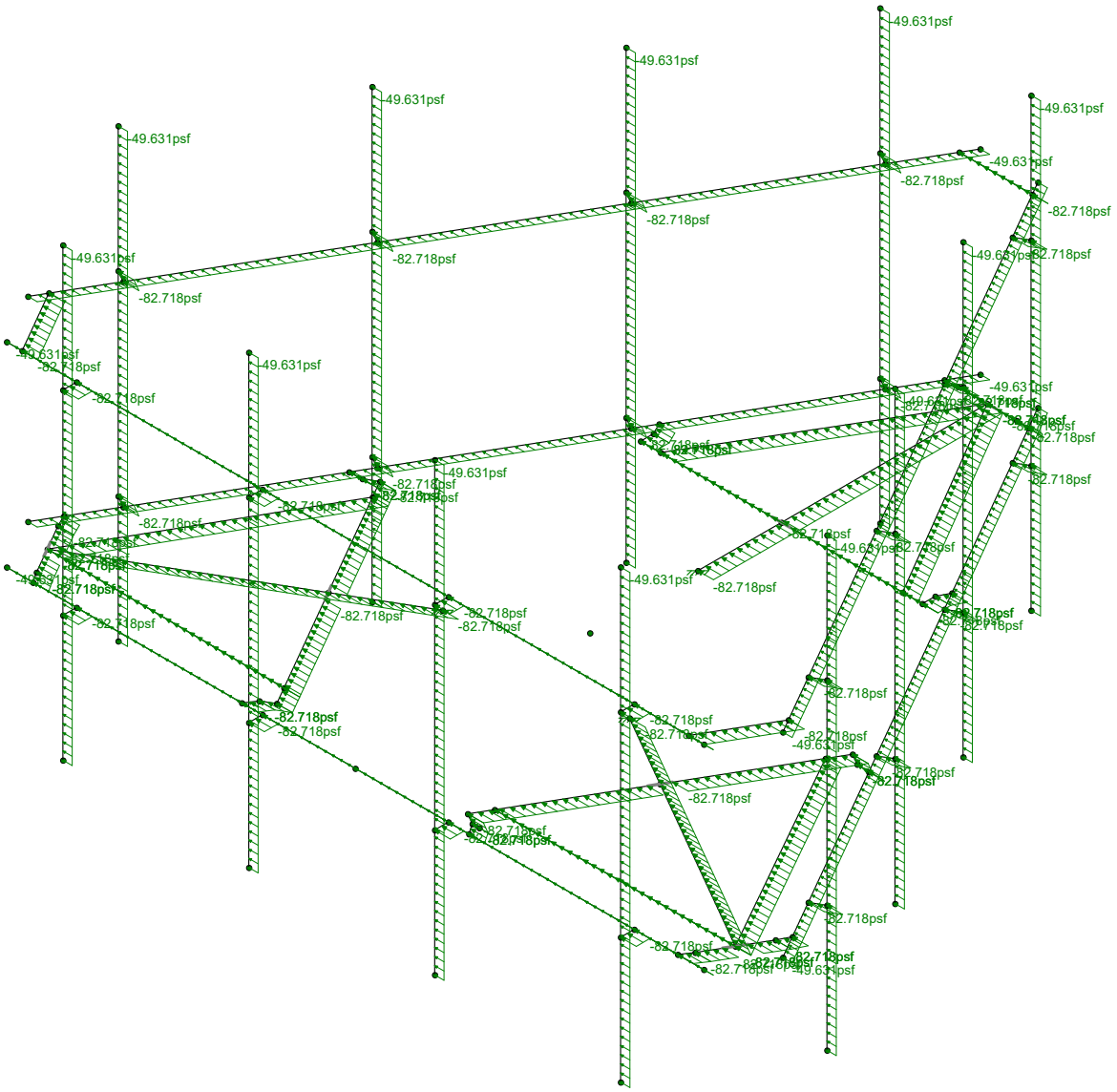

Loads: BLC 3, Structure Wind X
Envelope Only Solution

Trylon	842856	Wind Loads
SMM		Sept 8, 2023 at 11:25 AM
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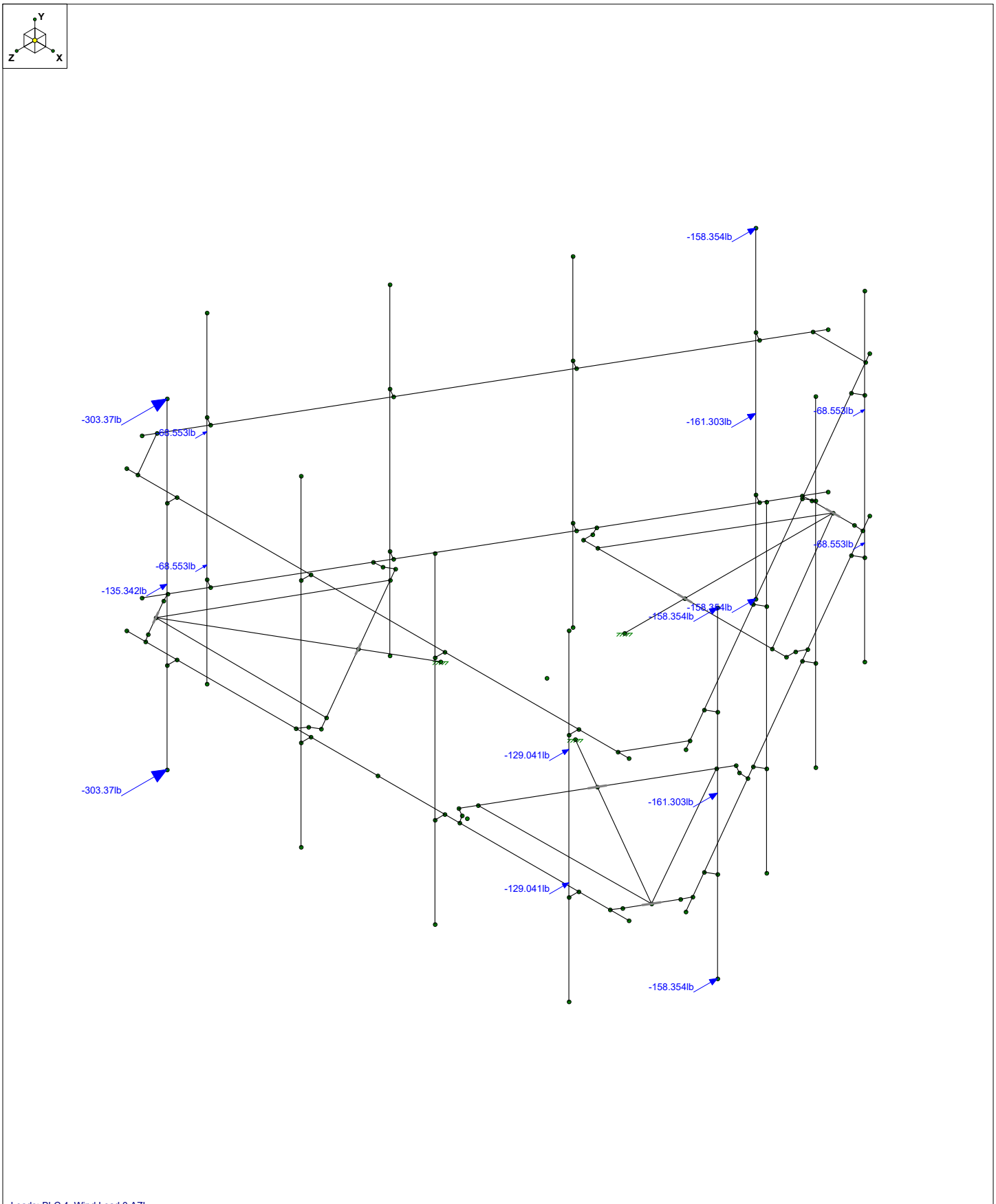

Loads: BLC 4, Wind Load 0 AZI
Envelope Only Solution

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SMM		Sept 8, 2023 at 11:25 AM
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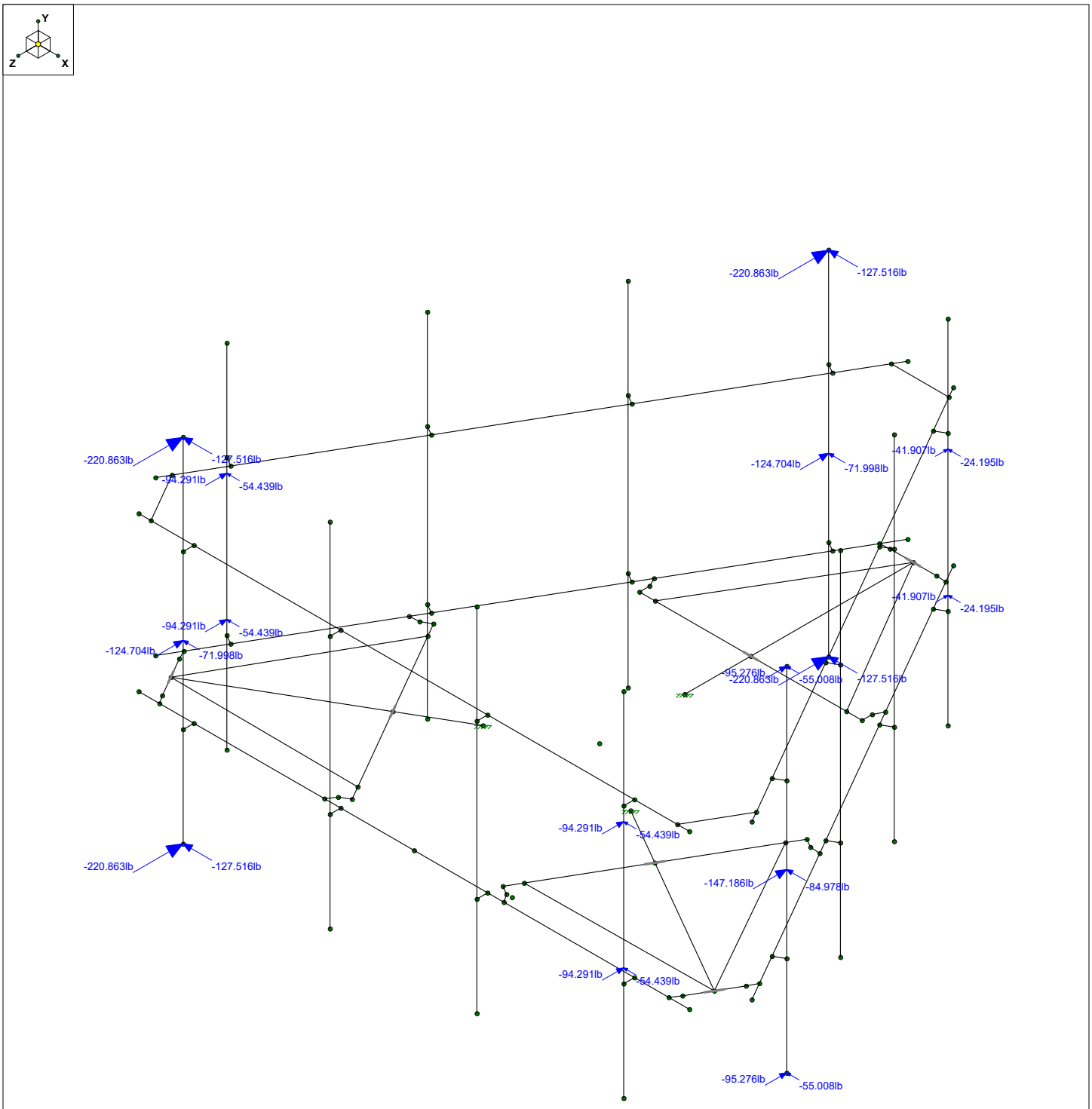

Loads: BLC 5, Wind Load 30 AZI
Envelope Only Solution

Trylon	842856	Wind Loads
SMM		Sept 8, 2023 at 11:25 AM
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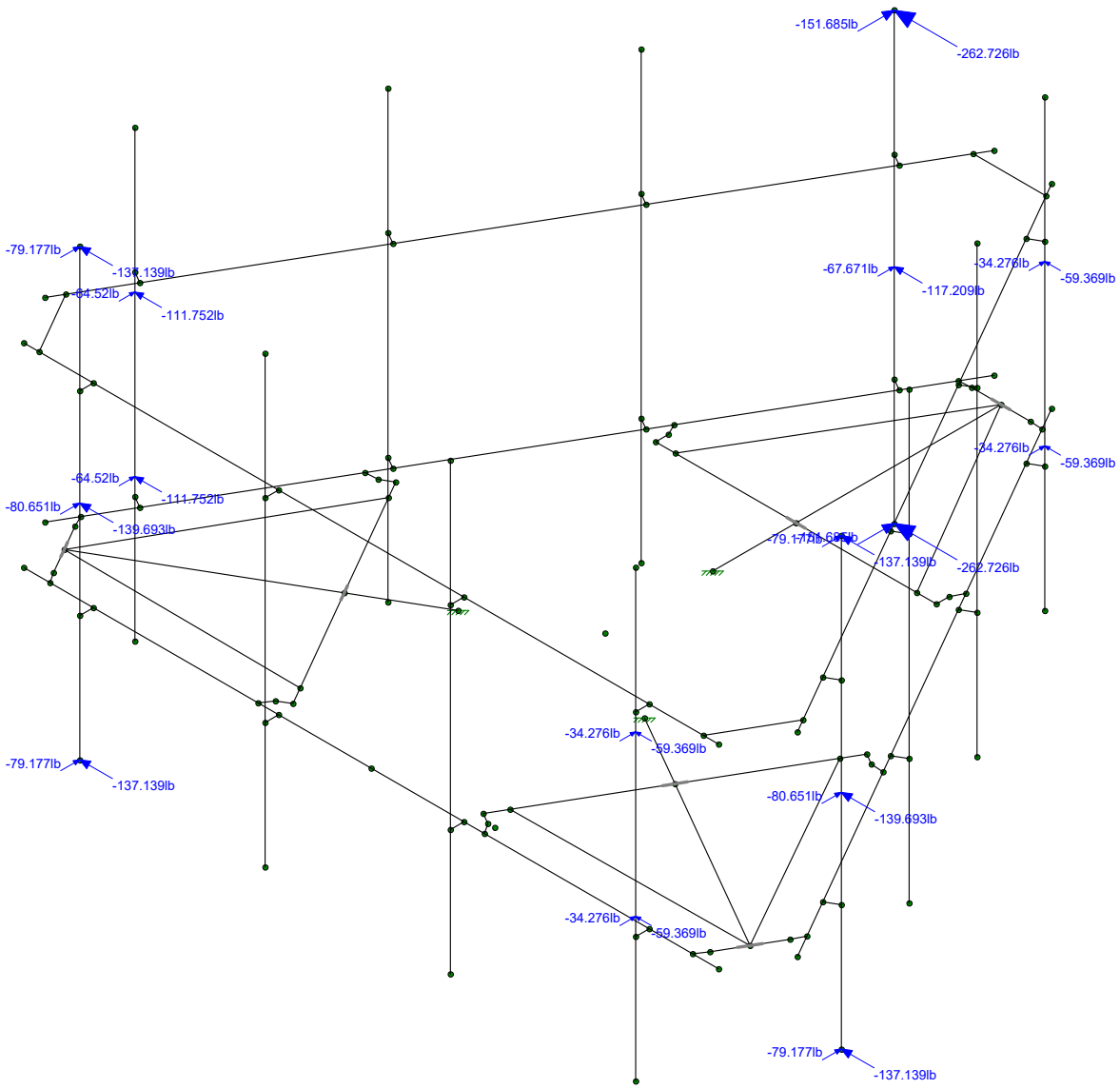

Loads: BLC 7, Wind Load 60 AZI
Envelope Only Solution

Trylon	842856	Wind Loads
SMM		Sept 8, 2023 at 11:25 AM
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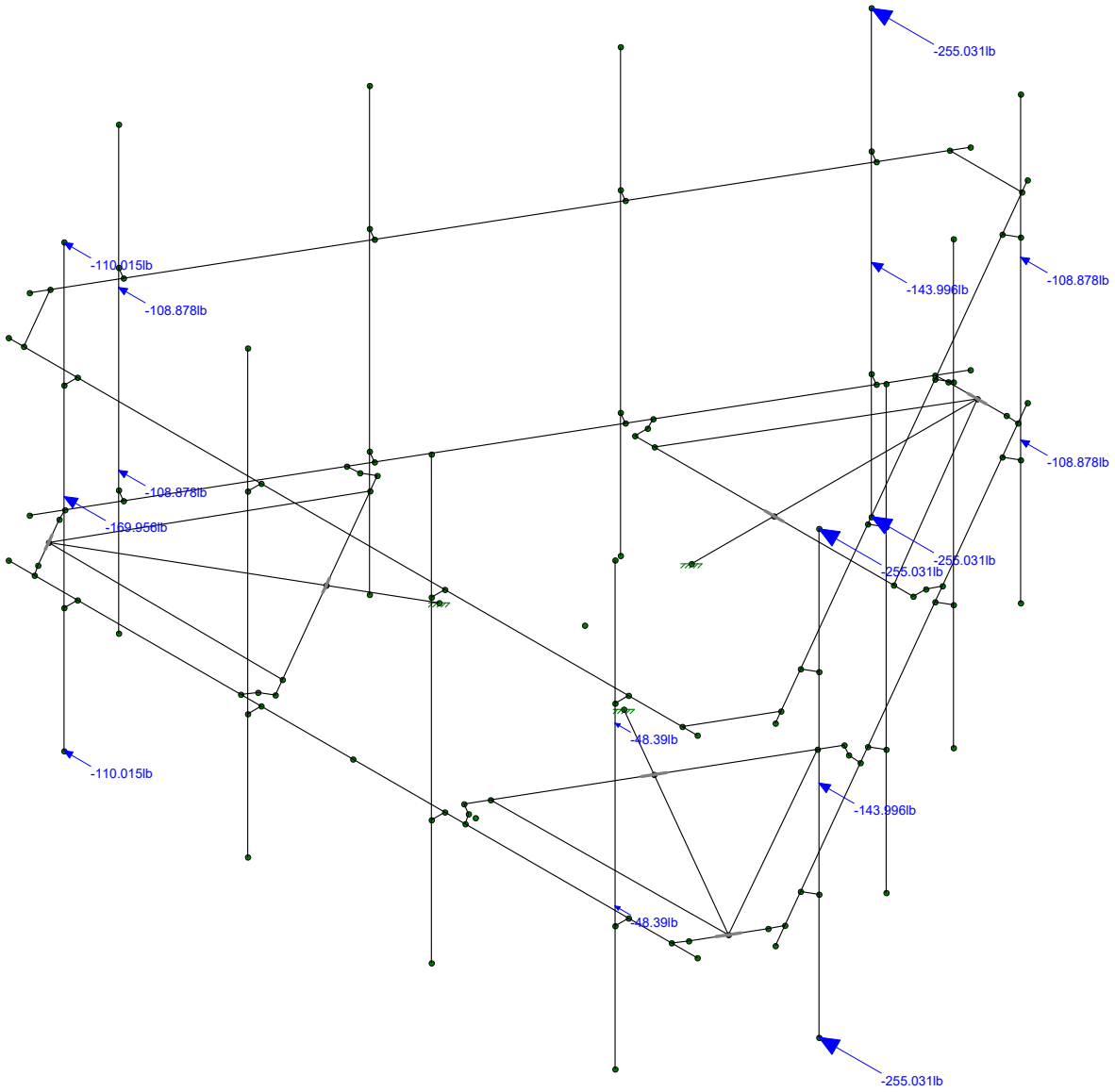

Loads: BLC 8, Wind Load 90 AZI
Envelope Only Solution

Trylon	842856	Wind Loads
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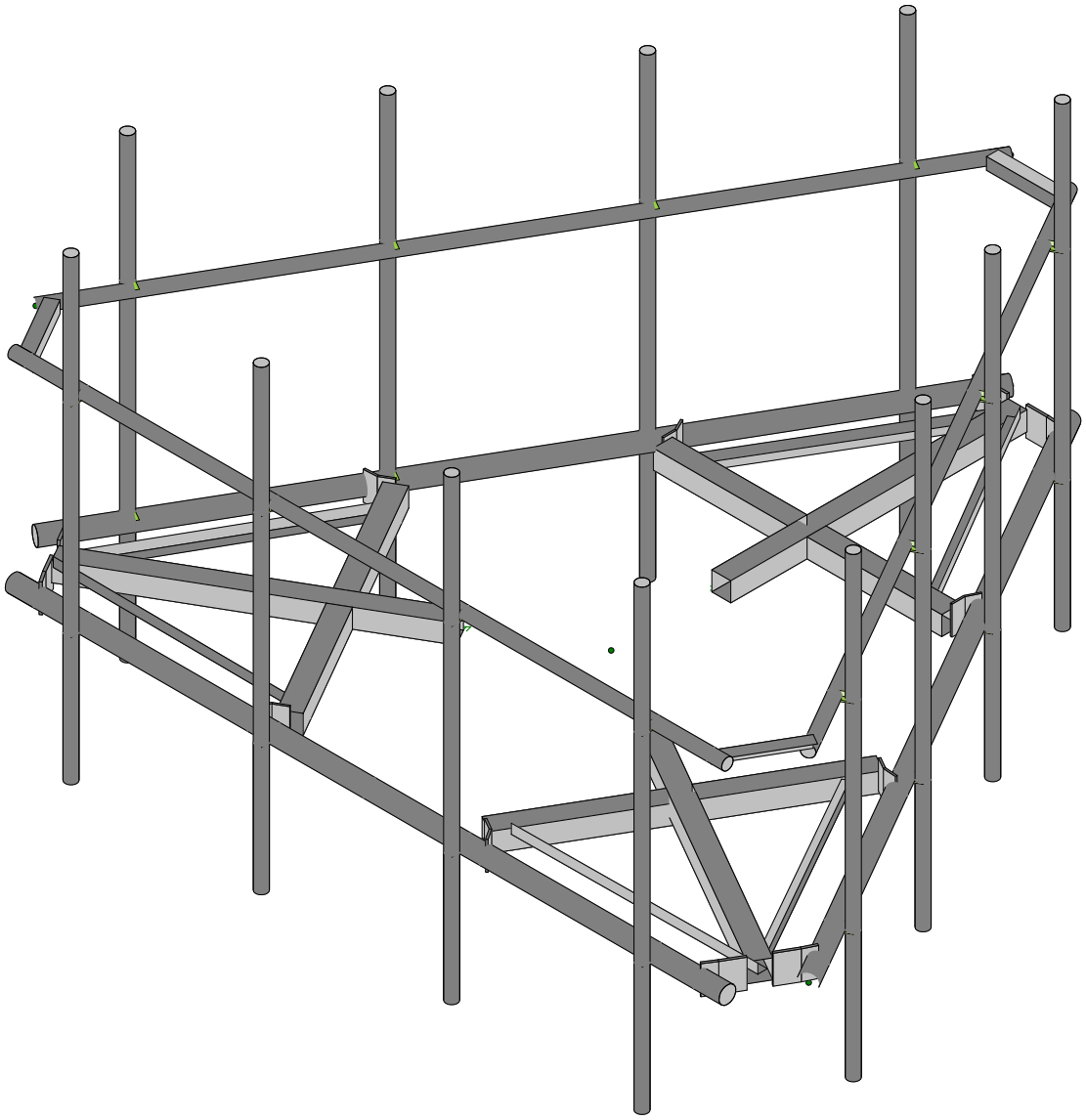


Envelope Only Solution

Trylon	842856	Render
SMM		Sept 8, 2023 at 11:26 AM
231497		842856_loaded.r3d

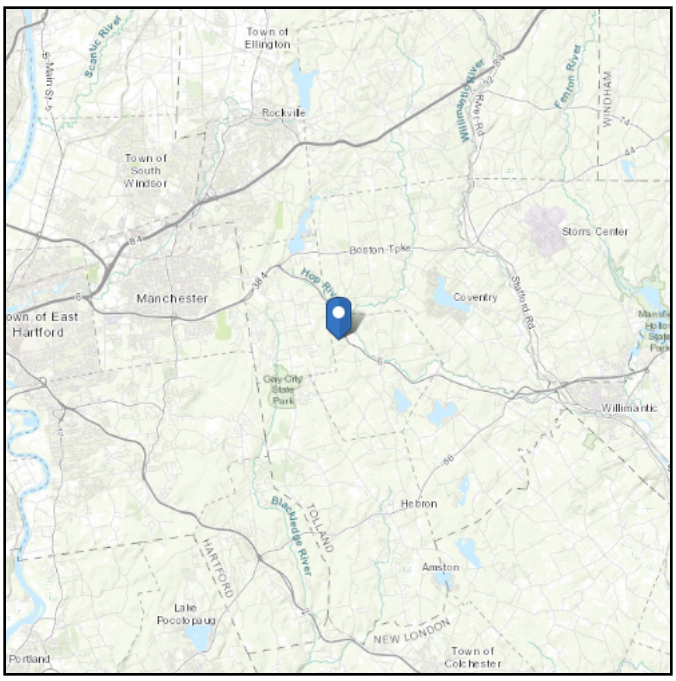
APPENDIX B

SOFTWARE INPUT CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	41.750128
Risk Category:	II	**Longitude:**	-72.402675
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	495.7566207165736 ft (NAVD 88)



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:	Fri Sep 08 2023

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

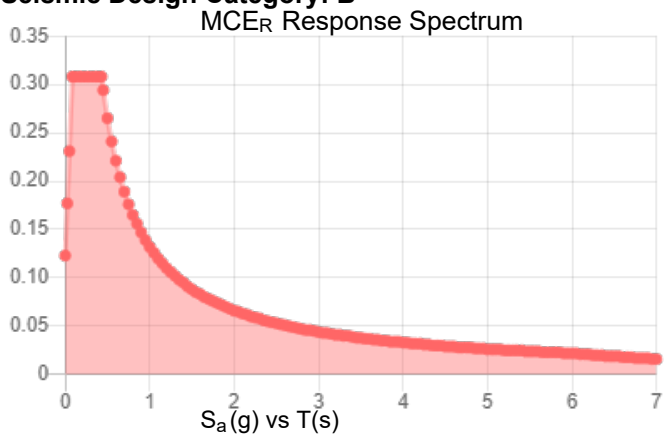
D - Default (see Section 11.4.3)

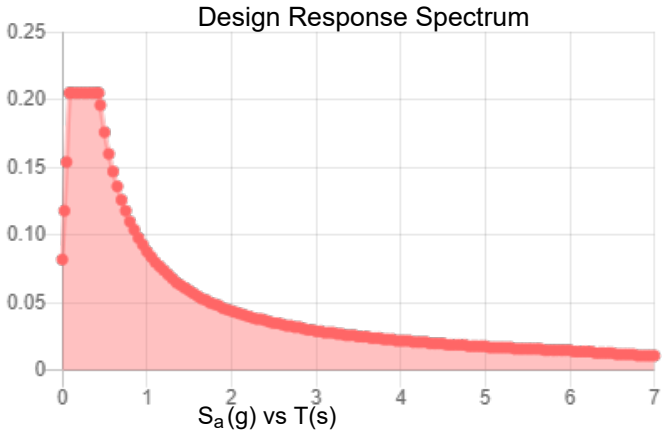
Site Soil Class:

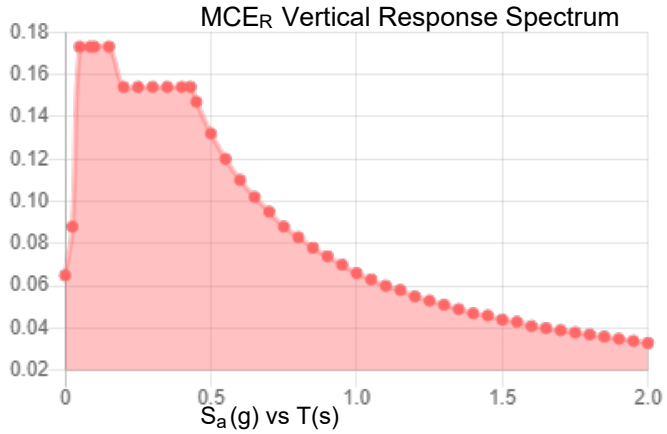
Results:

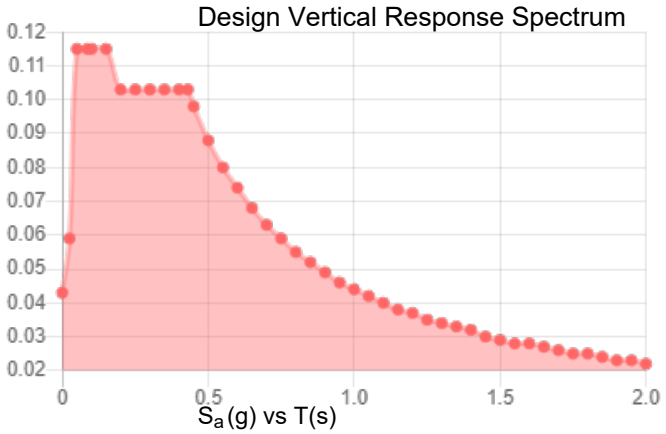
S_S :	0.193	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.104
F_v :	2.4	PGA_M :	0.166
S_{MS} :	0.308	F_{PGA} :	1.591
S_{M1} :	0.132	I_e :	1
S_{DS} :	0.205	C_v :	0.7

Seismic Design Category: B









Data Accessed: **Fri Sep 08 2023**

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:	Fri Sep 08 2023

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.

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

TIA LOAD CALCULATOR 2.2

PROJECT DATA	
Job Code:	231497
Carrier Site ID:	BU 842856
Carrier Site Name:	ANDOVER NORTH

CODES AND STANDARDS	
Building Code:	2021 IBC
Local Building Code:	2022 CTSBC
Design Standard:	TIA-222-H

STRUCTURE DETAILS		
Mount Type:	Platform	--
Mount Elevation:	140.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	149.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	C	--
Site Class:	D - Default	--
Ground Elevation:	495.8	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:	119	mph
Wind Escalation Factor (K_s):	1.00	--
Velocity Coefficient (K_z):	1.36	--
Directionality Factor (K_d):	0.95	--
Gust Effect Factor (Gh):	1.00	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	45.95	psf
Ground Elevation Factor (K_e):	0.98	--

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness (t_i):	1.50	in
Importance Factor (I_i):	1.00	--
Ice Velocity Pressure (q_{zi}):	6.90	psf
Mount Ice Thickness (t_{iz}):	1.73	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	82.72	psf
Round Member Pressure:	49.63	psf
Ice Wind Pressure:	7.45	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel .(S_s):	0.19	g
1 Second Accel (S_1):	0.06	g
Short Period Des. (S_{DS}):	0.21	g
1 Second Des. (S_{D1}):	0.09	g
Short Period Coeff. (F_a):	1.60	--
1 Second Coeff. (F_v):	2.40	--
Response Coefficient (Cs):	0.10	--
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)
AIR 6419 B41_TMO_CCIV2	3	140	No Ice	6.24	2.34	81.84
--	--	--	w/ Ice	7.85	3.62	151.67
APXVAARR24_43-U-NA20	3	140	No Ice	14.67	5.32	128.00
--	--	--	w/ Ice	17.04	7.41	427.17
RADIO 4449 B71 B85A_T-MOBILE	3	140	No Ice	1.97	1.59	73.21
--	--	--	w/ Ice	2.40	1.99	81.31
RADIO 4460 B2/B25 B66_TMO	3	140	No Ice	2.14	1.69	109.00
--	--	--	w/ Ice	2.58	2.09	90.23
			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			
--	--	--	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]
AIR 6419 B41_TMO_CCIV2	3	140	1.00	1.36	0.95	1.73	45.95	8.11
APXVAARR24_43-U-NA20	3	140	1.00	1.36	0.95	1.73	45.95	8.11
DIO 4449 B71 B85A_T-MOI	3	140	1.00	1.36	0.95	1.73	45.95	8.11
ADIO 4460 B2/B25 B66_TM	3	140	1.00	1.36	0.95	1.73	45.95	8.11

EQUIPMENT LATERAL WIND FORCE CALCULATIONS

Appurtenance Name	Qty.	--	0° 180°	30° 210°	60° 240°	90° 270°	120° 300°	150° 330°
AIR 6419 B41_TMO_CCIV2	3	No Ice	258.08	137.11	217.76	96.78	217.76	137.11
--	--	w/ Ice	57.31	34.14	49.59	26.41	49.59	34.14
APXVAARR24_43-U-NA20	3	No Ice	606.74	316.71	510.06	220.03	510.06	316.71
--	--	w/ Ice	124.40	71.65	106.82	54.07	106.82	71.65
ADIO 4449 B71 B85A_T-MOBIL	3	No Ice	81.48	69.58	77.52	65.62	77.52	69.58
--	--	w/ Ice	17.54	15.27	16.78	14.51	16.78	15.27
RADIO 4460 B2/B25 B66_TMO	3	No Ice	88.47	74.41	83.79	69.72	83.79	74.41
--	--	w/ Ice	18.85	16.16	17.96	15.26	17.96	16.16
		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						

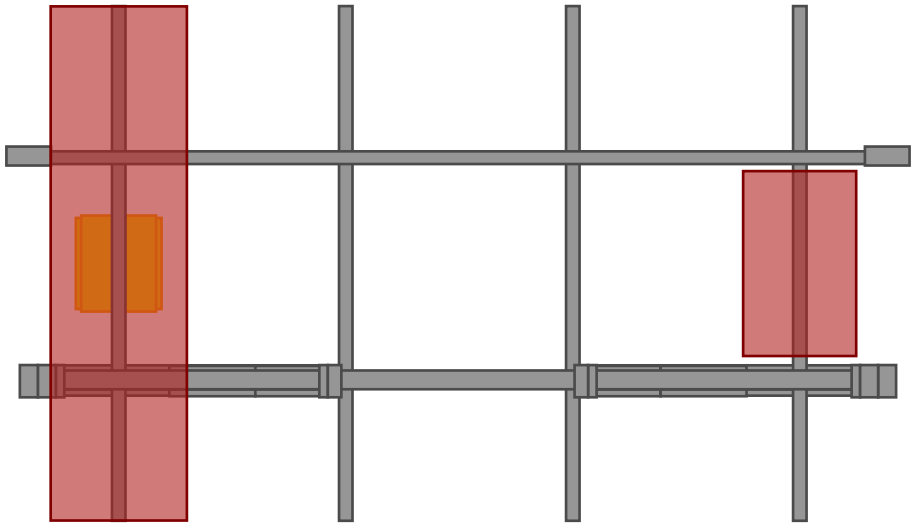
EQUIPMENT LATERAL WIND FORCE CALCULATIONS [CONT.]

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						
--	--	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 SEISMIC FORCE CALCULATIONS

Appurtenance Name	Qty.	Elevation [ft]	Weight [lbs]	F_p [lbs]
AIR 6419 B41_TMO_CCIV2	3	140	81.84	10.11
APXVAARR24_43-U-NA20	3	140	128	15.81
RADIO 4449 B71 B85A_T-MOBILE	3	140	73.21	9.04
RADIO 4460 B2/B25 B66_TMO	3	140	109	13.46

ELEVATION VIEW

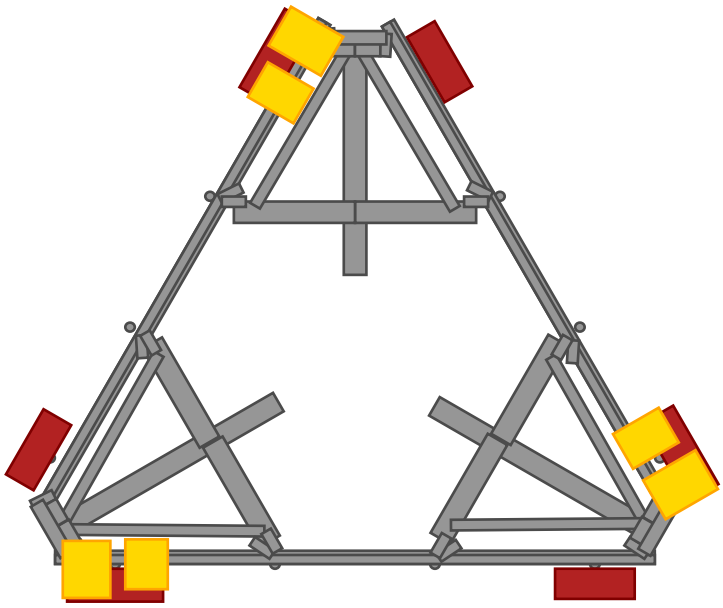


MP4 MP3 MP2 MP1

*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
AIR 6419 B41_TMO_CCIV2	3	140	MP1/MP5/MP9	0/120/240
APXVAARR24_43-U-NA20	3	140	MP4/MP8/MP12	0/120/240
RADIO 4449 B71 B85A_T-MOBILE	3	140	MP4/MP8/MP12	90/210/330
RADIO 4460 B2/B25 B66_TMO	3	140	MP4/MP8/MP12	270/30/150

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	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	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	None

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	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 7-10
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1...	Density[k/ft^3]	Yield[psi]	Ry	Fu[psi]	Rt
1	A992	29000	11154	.3	.65	.49	50000	1.1	65000	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36000	1.5	58000	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50000	1.1	65000	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42000	1.4	58000	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46000	1.4	58000	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35000	1.6	60000	1.2
7	A1085	29000	11154	.3	.65	.49	50000	1.4	65000	1.3
8	Q235-GB	29000	11154	.3	.65	.49	35000	1.5	58000	1.2
9	Q345	29000	11154	.3	.65	.49	36000	1.1	58000	1.1

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]	Yield[psi]	Fu[psi]
1	A653 SS Gr33	29500	11346	.3	.65	.49	33000	45000
2	A653 SS Gr50/1	29500	11346	.3	.65	.49	50000	65000

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Standoffs	HSS4X4X4	Beam	None	A500 Gr.B Rect	Typical	3.37	7.8	7.8	12.8
2	Horizontals	PIPE_3.0	Beam	None	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
3	Platform Angle	L2x2x3	Beam	None	A36 Gr.36	Typical	.722	.271	.271	.009
4	Mount Pipe	PIPE_2.0	Column	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
5	Corner Plate	6"x1/2" Plate	Beam	None	A36 Gr.36	Typical	3	.063	9	.237

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
6	Handrail Horizontal	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
7	Angle Handrail Corn...	L2.5x2.5x4	Beam	None	A36 Gr.36	Typical	1.19	.692	.692	.026
8	Platform Braces	HSS4X4X4	Beam	None	A36 Gr.36	Typical	3.37	7.8	7.8	12.8
9	Connection Plates	PL6x.375	Beam	None	A36 Gr.36	Typical	2.25	.026	6.75	.101
10	Kickers	L2.5x2.5x8	Beam	None	A36 Gr.36	Typical	2.26	1.22	1.22	.188

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF1A	8CU1.25X0...	Beam	None	A653 SS Gr33	Typical	.581	.057	4.41	.00063

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	N69	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N137	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N138	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Self Weight	DL		-1			18		3	
2	Structure Wind Z	WLZ						84		
3	Structure Wind X	WLX						84		
4	Wind Load 0 AZI	WLZ					36			
5	Wind Load 30 AZI	None					36			
6	Wind Load 45 AZI	None					36			
7	Wind Load 60 AZI	None					36			
8	Wind Load 90 AZI	WLX					36			
9	Wind Load 120 AZI	None					36			
10	Wind Load 135 AZI	None					36			
11	Wind Load 150 AZI	None					36			
12	Ice Weight	OL1					18	84	3	
13	Ice Structure Wind Z	OL2						84		
14	Ice Structure Wind X	OL3						84		
15	Ice Wind Load 0 AZI	OL2					36			
16	Ice Wind Load 30 AZI	None					36			
17	Ice Wind Load 45 AZI	None					36			
18	Ice Wind Load 60 AZI	None					36			
19	Ice Wind Load 90 AZI	OL3					36			
20	Ice Wind Load 120 AZI	None					36			
21	Ice Wind Load 135 AZI	None					36			
22	Ice Wind Load 150 AZI	None					36			
23	Seismic Load Z	ELZ			-.124		18			
24	Seismic Load X	ELX	-.124				18			
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			

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
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			
46	BLC 1 Transient Area Loads	None						21		
47	BLC 12 Transient Area Loads	None						21		

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														
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														

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...
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 + 1W Li 0 ...	Yes	Y		DL	1.2	OL1	1	13	1	14		15	1												
35	1.2DL + 1DLi + 1W Li 3...	Yes	Y		DL	1.2	OL1	1	13	.866	14	.5	16	1												
36	1.2DL + 1DLi + 1W Li 4...	Yes	Y		DL	1.2	OL1	1	13	.707	14	.707	17	1												
37	1.2DL + 1DLi + 1W Li 6...	Yes	Y		DL	1.2	OL1	1	13	.5	14	.866	18	1												
38	1.2DL + 1DLi + 1W Li 9...	Yes	Y		DL	1.2	OL1	1	13		14	1	19	1												
39	1.2DL + 1DLi + 1W Li 1...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	.866	20	1												
40	1.2DL + 1DLi + 1W Li 1...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	.707	21	1												
41	1.2DL + 1DLi + 1W Li 1...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	.5	22	1												
42	1.2DL + 1DLi + 1W Li 1...	Yes	Y		DL	1.2	OL1	1	13	-1	14		15	-1												
43	1.2DL + 1DLi + 1W Li 2...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	-.5	16	-1												
44	1.2DL + 1DLi + 1W Li 2...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	-.707	17	-1												
45	1.2DL + 1DLi + 1W Li 2...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	-.866	18	-1												
46	1.2DL + 1DLi + 1W Li 2...	Yes	Y		DL	1.2	OL1	1	13		14	-1	19	-1												
47	1.2DL + 1DLi + 1W Li 3...	Yes	Y		DL	1.2	OL1	1	13	.5	14	-.866	20	-1												
48	1.2DL + 1DLi + 1W Li 3...	Yes	Y		DL	1.2	OL1	1	13	.707	14	-.707	21	-1												
49	1.2DL + 1DLi + 1W Li 3...	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																
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	.859	23	1	24																	
67	(0.9-0.2Sds)DL + 1E 3...	Yes	Y		DL	.859	23	.866	24	.5																
68	(0.9-0.2Sds)DL + 1E 4...	Yes	Y		DL	.859	23	.707	24	.707																
69	(0.9-0.2Sds)DL + 1E 6...	Yes	Y		DL	.859	23	.5	24	.866																
70	(0.9-0.2Sds)DL + 1E 9...	Yes	Y		DL	.859	23		24	1																
71	(0.9-0.2Sds)DL + 1E 1...	Yes	Y		DL	.859	23	-.5	24	.866																
72	(0.9-0.2Sds)DL + 1E 1...	Yes	Y		DL	.859	23	-.707	24	.707																
73	(0.9-0.2Sds)DL + 1E 1...	Yes	Y		DL	.859	23	-.866	24	.5																
74	(0.9-0.2Sds)DL + 1E 1...	Yes	Y		DL	.859	23	-1	24																	
75	(0.9-0.2Sds)DL + 1E 2...	Yes	Y		DL	.859	23	-.866	24	-.5																
76	(0.9-0.2Sds)DL + 1E 2...	Yes	Y		DL	.859	23	-.707	24	-.707																
77	(0.9-0.2Sds)DL + 1E 2...	Yes	Y		DL	.859	23	-.5	24	-.866																
78	(0.9-0.2Sds)DL + 1E 2...	Yes	Y		DL	.859	23		24	-1																
79	(0.9-0.2Sds)DL + 1E 3...	Yes	Y		DL	.859	23	.5	24	-.866																
80	(0.9-0.2Sds)DL + 1E 3...	Yes	Y		DL	.859	23	.707	24	-.707																
81	(0.9-0.2Sds)DL + 1E 3...	Yes	Y		DL	.859	23	.866	24	-.5																

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...
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	.064	3		4	.064												
92	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.055	3	.032	5	.064												
93	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.045	3	.045	6	.064												
94	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.032	3	.055	7	.064												
95	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2		3	.064	8	.064												
96	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.032	3	.055	9	.064												
97	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.045	3	.045	10	.064												
98	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.055	3	.032	11	.064												
99	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.064	3		4	-.064												
100	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.055	3	-.032	5	-.064												
101	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.045	3	-.045	6	-.064												
102	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.032	3	-.055	7	-.064												
103	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2		3	-.064	8	-.064												
104	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.032	3	-.055	9	-.064												
105	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.045	3	-.045	10	-.064												
106	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.055	3	-.032	11	-.064												
107	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.064	3		4	.064												
108	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.055	3	.032	5	.064												
109	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.045	3	.045	6	.064												
110	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.032	3	.055	7	.064												
111	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2		3	.064	8	.064												
112	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.032	3	.055	9	.064												
113	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.045	3	.045	10	.064												
114	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.055	3	.032	11	.064												
115	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.064	3		4	-.064												
116	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.055	3	-.032	5	-.064												
117	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.045	3	-.045	6	-.064												
118	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.032	3	-.055	7	-.064												
119	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2		3	-.064	8	-.064												
120	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.032	3	-.055	9	-.064												
121	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.045	3	-.045	10	-.064												
122	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.055	3	-.032	11	-.064												
123	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.064	3		4	.064												
124	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.055	3	.032	5	.064												
125	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.045	3	.045	6	.064												
126	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.032	3	.055	7	.064												
127	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2		3	.064	8	.064												
128	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.032	3	.055	9	.064												
129	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.045	3	.045	10	.064												
130	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.055	3	.032	11	.064												
131	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.064	3		4	-.064												
132	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.055	3	-.032	5	-.064												
133	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.045	3	-.045	6	-.064												

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...
134	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	36	1.5	2	-.032	3	-.055	7	-.064												
135	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	36	1.5	2		3	-.064	8	-.064												
136	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	36	1.5	2	.032	3	-.055	9	-.064												
137	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	36	1.5	2	.045	3	-.045	10	-.064												
138	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	36	1.5	2	.055	3	-.032	11	-.064												
139	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	37	1.5	2	.064	3		4	.064												
140	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	37	1.5	2	.055	3	.032	5	.064												
141	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	37	1.5	2	.045	3	.045	6	.064												
142	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	37	1.5	2	.032	3	.055	7	.064												
143	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	37	1.5	2		3	.064	8	.064												
144	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	37	1.5	2	-.032	3	.055	9	.064												
145	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	37	1.5	2	-.045	3	.045	10	.064												
146	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	37	1.5	2	-.055	3	.032	11	.064												
147	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	37	1.5	2	-.064	3		4	-.064												
148	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	37	1.5	2	-.055	3	-.032	5	-.064												
149	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	37	1.5	2	-.045	3	-.045	6	-.064												
150	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	37	1.5	2	-.032	3	-.055	7	-.064												
151	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	37	1.5	2		3	-.064	8	-.064												
152	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	37	1.5	2	.032	3	-.055	9	-.064												
153	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	37	1.5	2	.045	3	-.045	10	-.064												
154	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	37	1.5	2	.055	3	-.032	11	-.064												
155	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	38	1.5	2	.064	3		4	.064												
156	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	38	1.5	2	.055	3	.032	5	.064												
157	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	38	1.5	2	.045	3	.045	6	.064												
158	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	38	1.5	2	.032	3	.055	7	.064												
159	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	38	1.5	2		3	.064	8	.064												
160	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	38	1.5	2	-.032	3	.055	9	.064												
161	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	38	1.5	2	-.045	3	.045	10	.064												
162	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	38	1.5	2	-.055	3	.032	11	.064												
163	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	38	1.5	2	-.064	3		4	-.064												
164	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	38	1.5	2	-.055	3	-.032	5	-.064												
165	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	38	1.5	2	-.045	3	-.045	6	-.064												
166	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	38	1.5	2	-.032	3	-.055	7	-.064												
167	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	38	1.5	2		3	-.064	8	-.064												
168	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	38	1.5	2	.032	3	-.055	9	-.064												
169	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	38	1.5	2	.045	3	-.045	10	-.064												
170	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	38	1.5	2	.055	3	-.032	11	-.064												
171	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	39	1.5	2	.064	3		4	.064												
172	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	39	1.5	2	.055	3	.032	5	.064												
173	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	39	1.5	2	.045	3	.045	6	.064												
174	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	39	1.5	2	.032	3	.055	7	.064												
175	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	39	1.5	2		3	.064	8	.064												
176	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	39	1.5	2	-.032	3	.055	9	.064												
177	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	39	1.5	2	-.045	3	.045	10	.064												
178	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	39	1.5	2	-.055	3	.032	11	.064												
179	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	39	1.5	2	-.064	3		4	-.064												
180	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	39	1.5	2	-.055	3	-.032	5	-.064												
181	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	39	1.5	2	-.045	3	-.045	6	-.064												
182	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	39	1.5	2	-.032	3	-.055	7	-.064												
183	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	39	1.5	2		3	-.064	8	-.064												
184	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	39	1.5	2	.032	3	-.055	9	-.064												
185	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	39	1.5	2	.045	3	-.045	10	-.064												

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...
186	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	.055	3	-.032	11	-.064												
187	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.064	3		4	.064												
188	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.055	3	.032	5	.064												
189	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.045	3	.045	6	.064												
190	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.032	3	.055	7	.064												
191	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2		3	.064	8	.064												
192	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.032	3	.055	9	.064												
193	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.045	3	.045	10	.064												
194	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.055	3	.032	11	.064												
195	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.064	3		4	-.064												
196	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.055	3	-.032	5	-.064												
197	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.045	3	-.045	6	-.064												
198	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.032	3	-.055	7	-.064												
199	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2		3	-.064	8	-.064												
200	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.032	3	-.055	9	-.064												
201	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.045	3	-.045	10	-.064												
202	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.055	3	-.032	11	-.064												
203	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.064	3		4	.064												
204	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.055	3	.032	5	.064												
205	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.045	3	.045	6	.064												
206	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.032	3	.055	7	.064												
207	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2		3	.064	8	.064												
208	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.032	3	.055	9	.064												
209	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.045	3	.045	10	.064												
210	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.055	3	.032	11	.064												
211	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.064	3		4	-.064												
212	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.055	3	-.032	5	-.064												
213	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.045	3	-.045	6	-.064												
214	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.032	3	-.055	7	-.064												
215	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2		3	-.064	8	-.064												
216	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.032	3	-.055	9	-.064												
217	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.045	3	-.045	10	-.064												
218	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.055	3	-.032	11	-.064												
219	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.064	3		4	.064												
220	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.055	3	.032	5	.064												
221	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.045	3	.045	6	.064												
222	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.032	3	.055	7	.064												
223	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2		3	.064	8	.064												
224	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.032	3	.055	9	.064												
225	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.045	3	.045	10	.064												
226	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.055	3	.032	11	.064												
227	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.064	3		4	-.064												
228	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.055	3	-.032	5	-.064												
229	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.045	3	-.045	6	-.064												
230	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.032	3	-.055	7	-.064												
231	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2		3	-.064	8	-.064												
232	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.032	3	-.055	9	-.064												
233	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.045	3	-.045	10	-.064												
234	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.055	3	-.032	11	-.064												
235	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	.064	3		4	.064												
236	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	.055	3	.032	5	.064												
237	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	.045	3	.045	6	.064												

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...
238	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	43	1.5	2	.032	3	.055	7	.064												
239	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	43	1.5	2		3	.064	8	.064												
240	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	43	1.5	2	-.032	3	.055	9	.064												
241	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	43	1.5	2	-.045	3	.045	10	.064												
242	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	43	1.5	2	-.055	3	.032	11	.064												
243	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	43	1.5	2	-.064	3		4	-.064												
244	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	43	1.5	2	-.055	3	-.032	5	-.064												
245	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	43	1.5	2	-.045	3	-.045	6	-.064												
246	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	43	1.5	2	-.032	3	-.055	7	-.064												
247	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	43	1.5	2		3	-.064	8	-.064												
248	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	43	1.5	2	.032	3	-.055	9	-.064												
249	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	43	1.5	2	.045	3	-.045	10	-.064												
250	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	43	1.5	2	.055	3	-.032	11	-.064												
251	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	44	1.5	2	.064	3		4	.064												
252	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	44	1.5	2	.055	3	.032	5	.064												
253	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	44	1.5	2	.045	3	.045	6	.064												
254	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	44	1.5	2	.032	3	.055	7	.064												
255	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	44	1.5	2		3	.064	8	.064												
256	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	44	1.5	2	-.032	3	.055	9	.064												
257	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	44	1.5	2	-.045	3	.045	10	.064												
258	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	44	1.5	2	-.055	3	.032	11	.064												
259	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	44	1.5	2	-.064	3		4	-.064												
260	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	44	1.5	2	-.055	3	-.032	5	-.064												
261	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	44	1.5	2	-.045	3	-.045	6	-.064												
262	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	44	1.5	2	-.032	3	-.055	7	-.064												
263	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	44	1.5	2		3	-.064	8	-.064												
264	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	44	1.5	2	.032	3	-.055	9	-.064												
265	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	44	1.5	2	.045	3	-.045	10	-.064												
266	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	44	1.5	2	.055	3	-.032	11	-.064												
267	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	45	1.5	2	.064	3		4	.064												
268	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	45	1.5	2	.055	3	.032	5	.064												
269	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	45	1.5	2	.045	3	.045	6	.064												
270	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	45	1.5	2	.032	3	.055	7	.064												
271	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	45	1.5	2		3	.064	8	.064												
272	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	45	1.5	2	-.032	3	.055	9	.064												
273	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	45	1.5	2	-.045	3	.045	10	.064												
274	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	45	1.5	2	-.055	3	.032	11	.064												
275	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	45	1.5	2	-.064	3		4	-.064												
276	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	45	1.5	2	-.055	3	-.032	5	-.064												
277	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	45	1.5	2	-.045	3	-.045	6	-.064												
278	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	45	1.5	2	-.032	3	-.055	7	-.064												
279	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	45	1.5	2		3	-.064	8	-.064												
280	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	45	1.5	2	.032	3	-.055	9	-.064												
281	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	45	1.5	2	.045	3	-.045	10	-.064												
282	1.2DL + 1.5Lm + 1Wm ..	Yes	Y		DL	1.2	45	1.5	2	.055	3	-.032	11	-.064												

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	N69	max	1076.425	22	2894.379	34	2166.247	18	6321.27	34	1375.758	30	643.29	231
2		min	-1078.445	14	-74.274	26	-2242.882	10	-652.878	26	-1382.643	6	-793.859	271

Envelope Joint Reactions (Continued)

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
3	N137	max	1847.243	23	2889.731	39	1429.819	2	431.288	33	1113.421	19	537.943	31
4		min	-1912.572	15	-60.965	31	-1389.664	26	-3374.273	41	-1120.117	11	-5360.241	39
5	N138	max	1949.922	5	2889.744	45	1225.561	4	436.675	19	1113.355	25	5571.987	45
6		min	-1882.361	29	-60.954	21	-1188.987	28	-3010.527	43	-1120.215	17	-543.632	21
7	Totals:	max	4611.722	22	8013.616	34	4736.898	18						
8		min	-4611.73	14	2102.379	74	-4736.903	10						

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

	Member	Shape	Code..	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [..	phi*Pnt [l..	phi*Mn y...	phi*Mn z...	Cb	Eqn
1	MP4	PIPE_2.0	.439	27	10	.120	27		10	14916.096	32130	1871.625	1871.625	4....	H1-1b
2	MP8	PIPE_2.0	.436	27	5	.118	27		5	14916.096	32130	1871.625	1871.625	1....	H1-1b
3	MP12	PIPE_2.0	.409	69	15	.119	27		15	14916.096	32130	1871.625	1871.625	1....	H1-1b
4	M1	HSS4X4X4	.396	0	39	.102	0	y	211	131968....	139518	16180.5	16180.5	1	H1-1b
5	M2	HSS4X4X4	.395	0	45	.102	0	y	248	131968....	139518	16180.5	16180.5	1	H1-1b
6	M3	HSS4X4X4	.393	0	35	.102	0	y	270	131968....	139518	16180.5	16180.5	1	H1-1b
7	MP5	PIPE_2.0	.366	69	2	.095	69		3	14916.096	32130	1871.625	1871.625	3....	H1-1b
8	MP1	PIPE_2.0	.366	69	8	.098	69		9	14916.096	32130	1871.625	1871.625	4....	H1-1b
9	MP9	PIPE_2.0	.366	69	13	.097	69		14	14916.096	32130	1871.625	1871.625	4....	H1-1b
10	MP11	PIPE_2.0	.351	69	4	.044	69		4	14916.096	32130	1871.625	1871.625	3....	H1-1b
11	MP7	PIPE_2.0	.347	69	10	.041	69		9	14916.096	32130	1871.625	1871.625	3....	H1-1b
12	MP3	PIPE_2.0	.341	69	15	.040	69		14	14916.096	32130	1871.625	1871.625	4....	H1-1b
13	MP10	PIPE_2.0	.319	69	12	.045	69		15	14916.096	32130	1871.625	1871.625	3....	H1-1b
14	M57	PIPE_2.0	.316	14.063	8	.233	4.688		8	25978.809	32130	1871.625	1871.625	1	H1-1b
15	MP6	PIPE_2.0	.316	69	2	.047	69		4	14916.096	32130	1871.625	1871.625	3....	H1-1b
16	MP2	PIPE_2.0	.308	69	7	.047	69		10	14916.096	32130	1871.625	1871.625	4....	H1-1b
17	M55	PIPE_2.0	.305	15.625	11	.227	4.687		13	25978.809	32130	1871.625	1871.625	1	H1-1b
18	M56	PIPE_2.0	.303	14.062	2	.227	4.687		2	25978.809	32130	1871.625	1871.625	1	H1-1b
19	M83	L2.5x2.5x4	.281	0	2	.120	15.731	y	2	36453.477	38556	1113.554	2537.388	2....	H2-1
20	M84	L2.5x2.5x4	.278	15.731	13	.120	0	z	13	36453.532	38556	1113.554	2537.388	2....	H2-1
21	M82	L2.5x2.5x4	.277	0	8	.120	15.731	y	8	36453.477	38556	1113.554	2537.388	2....	H2-1
22	M74	PL6x.375	.211	2.704	6	.116	0	y	8	70544.2	72900	569.533	9112.5	1....	H1-1b
23	M80	PL6x.375	.201	2.704	14	.161	0	y	43	70544.2	72900	569.533	9112.5	1....	H1-1b
24	H1	PIPE_3.0	.195	98.437	45	.107	51.562		2	59302.836	65205	5748.75	5748.75	1	H1-1b
25	H3	PIPE_3.0	.195	98.438	34	.104	51.563		7	59302.836	65205	5748.75	5748.75	1	H1-1b
26	H2	PIPE_3.0	.194	98.437	39	.105	51.562		13	59302.836	65205	5748.75	5748.75	1	H1-1b
27	M78	PL6x.375	.191	2.704	11	.116	0	y	13	70544.2	72900	569.533	9112.5	1....	H1-1b
28	M70	PL6x.375	.189	2.704	17	.116	0	y	2	70544.2	72900	569.533	9112.5	1....	H1-1b
29	M76	PL6x.375	.181	2.704	9	.162	0	y	38	70544.2	72900	569.533	9112.5	1....	H1-1b
30	M72	PL6x.375	.178	2.704	3	.162	0	y	49	70544.2	72900	569.533	9112.5	1....	H1-1b
31	M34	L2x2x3	.174	51.353	25	.010	51.353	z	36	9346.076	23392.8	557.717	1197.345	2....	H2-1
32	M36	L2x2x3	.164	51.353	30	.010	51.353	z	41	9346.076	23392.8	557.717	1195.266	2....	H2-1
33	M38	L2x2x3	.163	51.353	20	.010	51.353	z	46	9346.157	23392.8	557.717	1239.29	3....	H2-1
34	M7	HSS4X4X4	.158	0	46	.051	0	y	47	136307....	139518	16180.5	16180.5	1....	H1-1b
35	M61	6"x1/2" Plate	.158	0	6	.080	4.338	y	43	92686.458	97200	1012.5	12150	1....	H1-1b
36	M5	HSS4X4X4	.158	0	40	.051	0	y	42	136307....	139518	16180.5	16180.5	1....	H1-1b
37	M9	HSS4X4X4	.158	0	35	.051	0	y	36	136307....	139518	16180.5	16180.5	1....	H1-1b
38	M69	6"x1/2" Plate	.157	0	17	.080	4.338	y	38	92687.058	97200	1012.5	12150	1....	H1-1b
39	M4	HSS4X4X4	.157	28.301	38	.043	4.127	z	5	136307....	139518	16180.5	16180.5	1....	H1-1b
40	M6	HSS4X4X4	.156	28.301	44	.045	4.127	z	10	136307....	139518	16180.5	16180.5	1....	H1-1b
41	M8	HSS4X4X4	.156	28.3	49	.044	4.127	z	15	136307....	139518	16180.5	16180.5	1....	H1-1b

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

	Member	Shape	Code..	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [..	phi*Pnt [l..	phi*Mn y...	phi*Mn z...	Cb	Eqn
42	M37	L2x2x3	.155	51.353	27	.010	51.353	y	49	9346.209	23392.8	557.717	1093.641	1....	H2-1
43	M65	6"x1/2" Plate	.155	0	11	.080	4.338	y	49	92686.455	97200	1012.5	12150	1....	H1-1b
44	M68	6"x1/2" Plate	.151	4.338	2	.089	4.338	y	47	92685.858	97200	1012.5	12150	1....	H1-1b
45	M60	6"x1/2" Plate	.150	4.338	8	.088	4.338	y	37	92686.458	97200	1012.5	12150	1....	H1-1b
46	M64	6"x1/2" Plate	.149	4.338	13	.088	4.338	y	42	92686.461	97200	1012.5	12150	1....	H1-1b
47	M35	L2x2x3	.145	51.353	22	.010	51.353	y	43	9346.21	23392.8	557.717	1092.333	1....	H2-1
48	M39	L2x2x3	.143	51.353	16	.010	51.353	y	38	9346.27	23392.8	557.717	1093.215	1....	H2-1
49	M67	6"x1/2" Plate	.143	2.704	17	.103	2.704	y	6	95420.398	97200	1012.5	12150	1....	H1-1b
50	M59	6"x1/2" Plate	.143	2.704	6	.102	2.704	y	11	95420.398	97200	1012.5	12150	1....	H1-1b
51	M63	6"x1/2" Plate	.141	2.704	11	.103	2.704	y	17	95420.398	97200	1012.5	12150	1....	H1-1b
52	M66	6"x1/2" Plate	.126	2.704	2	.076	0	y	47	95420.398	97200	1012.5	12150	1....	H1-1b
53	M62	6"x1/2" Plate	.124	2.704	13	.076	0	y	42	95420.398	97200	1012.5	12150	1....	H1-1b
54	M81	PL6x.375	.123	2.75	6	.336	2.75	y	12	70464.934	72900	569.533	9112.5	1....	H1-1b
55	M58	6"x1/2" Plate	.122	2.704	8	.076	0	y	36	95420.398	97200	1012.5	12150	1....	H1-1b
56	M75	PL6x.375	.115	2.75	14	.292	2.75	y	8	70464.934	72900	569.533	9112.5	1....	H1-1b
57	M77	PL6x.375	.108	2.75	17	.339	2.75	y	6	70464.934	72900	569.533	9112.5	1....	H1-1b
58	M73	PL6x.375	.103	2.75	11	.341	2.75	y	17	70464.934	72900	569.533	9112.5	1....	H1-1b
59	M79	PL6x.375	.100	2.75	3	.292	2.75	y	14	70465.57	72900	569.533	9112.5	1....	H1-1b
60	M71	PL6x.375	.096	2.75	8	.294	2.75	y	3	70464.934	72900	569.533	9112.5	1....	H1-1b

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

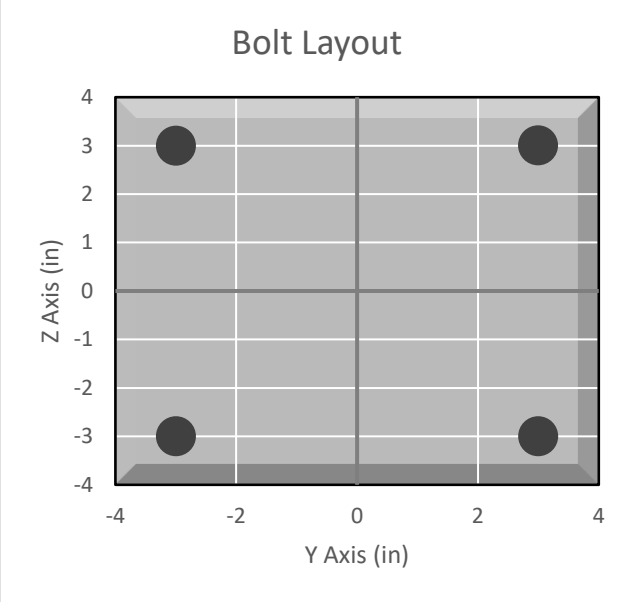
Analysis date: 9/8/2023

BOLT TOOL 1.5.3

Project Data	
Job Code:	231497
Carrier Site ID:	BU 842856
Carrier Site Name:	ANDOVER NORTH

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

Bolt Properties		
Connection Type:	Bolt	
Diameter:	0.625	in
Grade:	A325	--
Yield Strength (Fy):	92	ksi
Ultimate Strength (Fu):	120	ksi
Number of Bolts:	4	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	-	in



Connection Description
Standoff to Collar

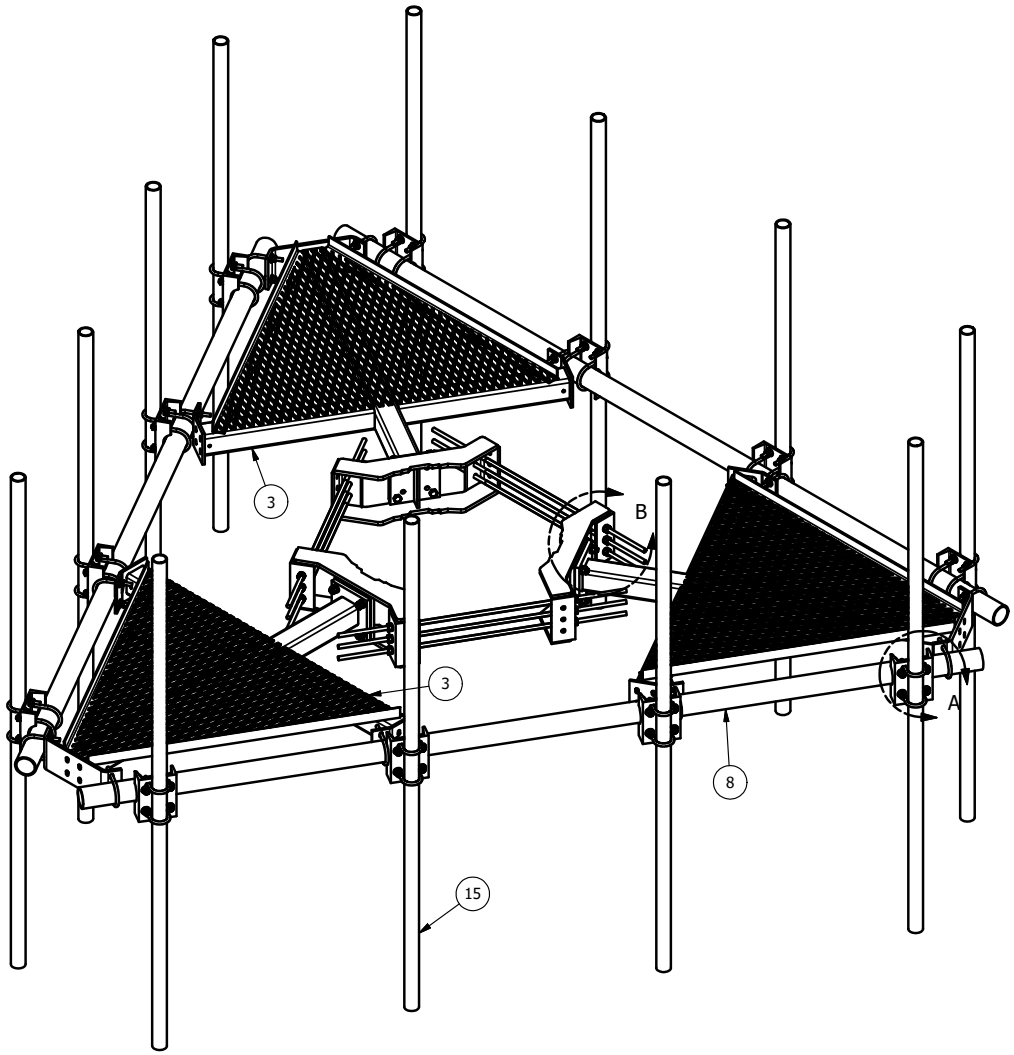
Bolt Check*		
Tensile Capacity (ϕT_n):	20340.1	lbs
Shear Capacity (ϕV_n):	13805.8	lbs
Tension Force (T_u):	6484.4	lbs
Shear Force (V_u):	623.6	lbs
Tension Usage:	30.4%	--
Shear Usage:	4.3%	--
Interaction:	30.4%	Pass
Controlling Member:	M1	--
Controlling LC:	39	--

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

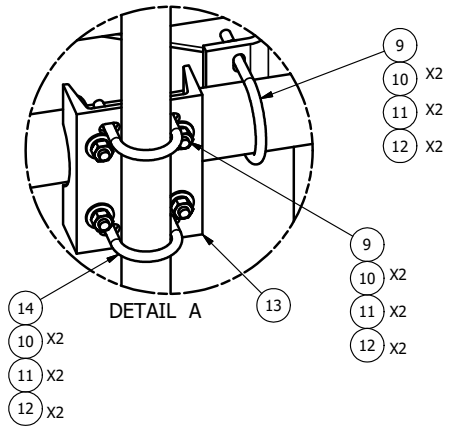
1825 W. Walnut Hill Lane, Suite 120
Irving, Texas 75038

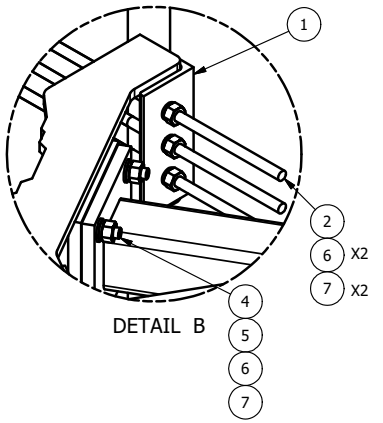
APPENDIX E

SUPPLEMENTAL DRAWINGS



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-LWRM	RING MOUNT WELDMENT		68.81	206.42
2	9	G58R-48	5/8" x 48" THREADED ROD (HDG.)		0.40	3.59
2	9	G58R-24	5/8" x 24" THREADED ROD (HDG.)		0.40	3.59
3	3	X-SV196	LOW PROFILE PLATFORM CORNER		212.10	636.31
4	12	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2.75	0.36	4.27
5	12	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.41
6	30	G58LW	5/8" HDG LOCKWASHER		0.03	0.78
7	30	A58NUT	5/8" HDG A325 HEX NUT		0.13	3.90
8	3	P3150	3-1/2" X 150" SCH 40 GALVANIZED PIPE	150.000 in	94.80	284.40
9	36	X-UB1306	1/2" X 3-5/8" X 6" X 3" U-BOLT (HDG.)		0.26	9.25
10	120	G12FW	1/2" HDG USS FLATWASHER		0.03	4.09
11	120	G12LW	1/2" HDG LOCKWASHER		0.01	1.67
12	120	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	8.60
13	12	X-SP219	SMALL SUPPORT CROSS PLATE	8.250 in	8.61	103.33
14	24	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.26	6.17
15	12	B	ANTENNA MOUNTING PIPE	C	D	E





2-3/8" O.D. VERTICAL MOUNTING PIPES					
ASSEMBLY NO. "A"	PART NO. "B"	LENGTH, "C"	UNIT WEIGHT, "D"	NET WEIGHT, "E"	TOTAL WEIGHT
RMQP-463	P263	63"	20.18	242.16	1591.11
RMQP-472	P272	72"	23.07	276.84	1625.79
RMQP-484	P284	84"	26.91	322.92	1671.87
RMQP-496	P296	96"	30.76	369.12	1718.07
RMQP-4126	P2126	126"	40.75	489.00	1837.95

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	ADDED 10' 6" ANTENNA MOUNTING PIPES		CEK	7/9/2015

REVISION HISTORY

TOLERANCE NOTE

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
LOW PROFILE CO-LOCATION PLATFORM
FOR 12 ANTENNAS WITH 12' 6" FACE WIDTH
FOR 12" - 38" DIAMETER POLES

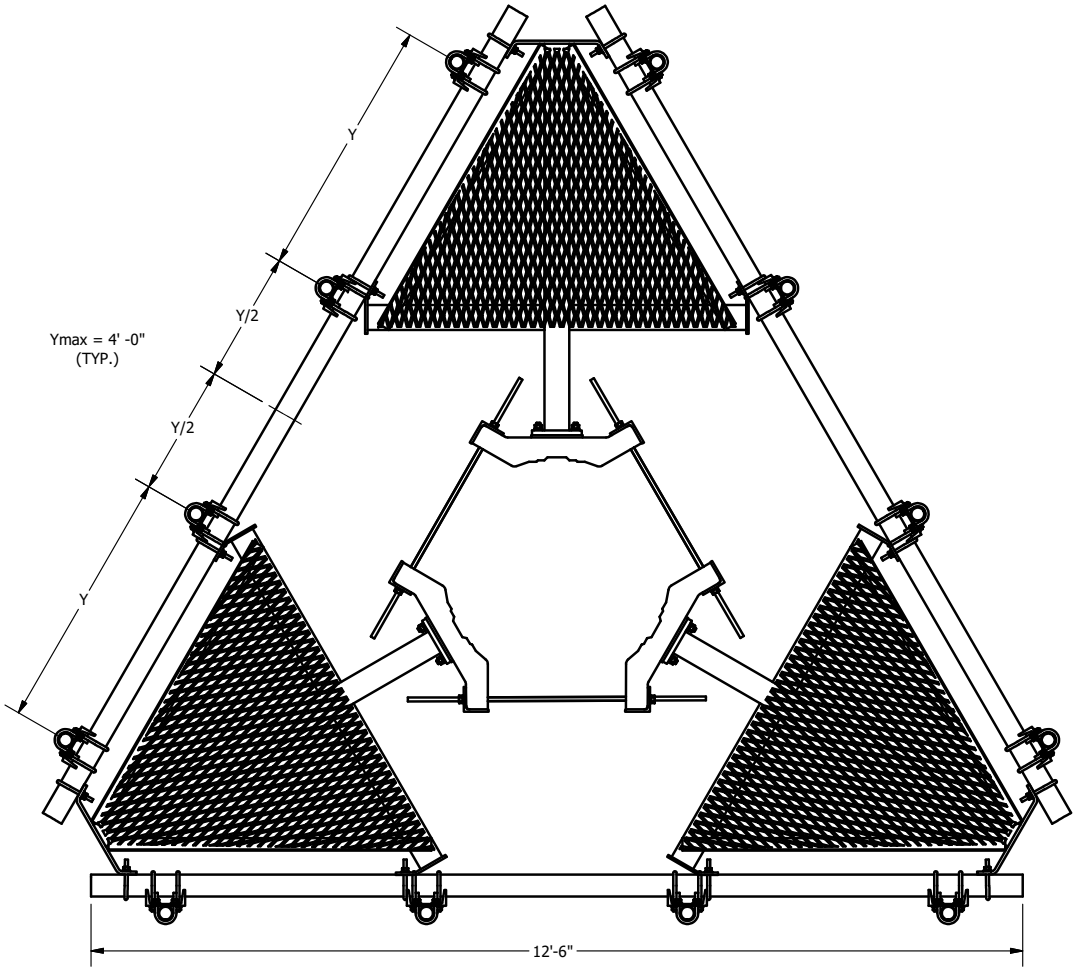
SITE PRO 1 — A valmont COMPANY

Engineering Support Team: 1-888-753-7446

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

DRAWN BY	CPD NO.	DRAWING USAGE	PART NO.
CEK 1/20/2012	semb	CUSTOMER	SEE ASSEMBLY NO. "A"

ENG. APPROVAL	CHECKED BY	DWG. NO.
	BMC 7/9/2015	RMQP-4XX



TOLERANCE NOTE

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")

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	ADDED 10' 6" ANTENNA MOUNTING PIPES		CEK	7/9/2015

REVISION HISTORY

DESCRIPTION
LOW PROFILE CO-LOCATION PLATFORM
FOR 12 ANTENNAS WITH 12' 6" FACE WIDTH
FOR 12" - 38" DIAMETER POLES

DRAWN BY	CPD NO.	DRAWING USAGE
CEK 1/20/2012	semb	CUSTOMER

ENG. APPROVAL

CHECKED BY: BMC 7/9/2015

SITE PRO 1
A valmont COMPANY

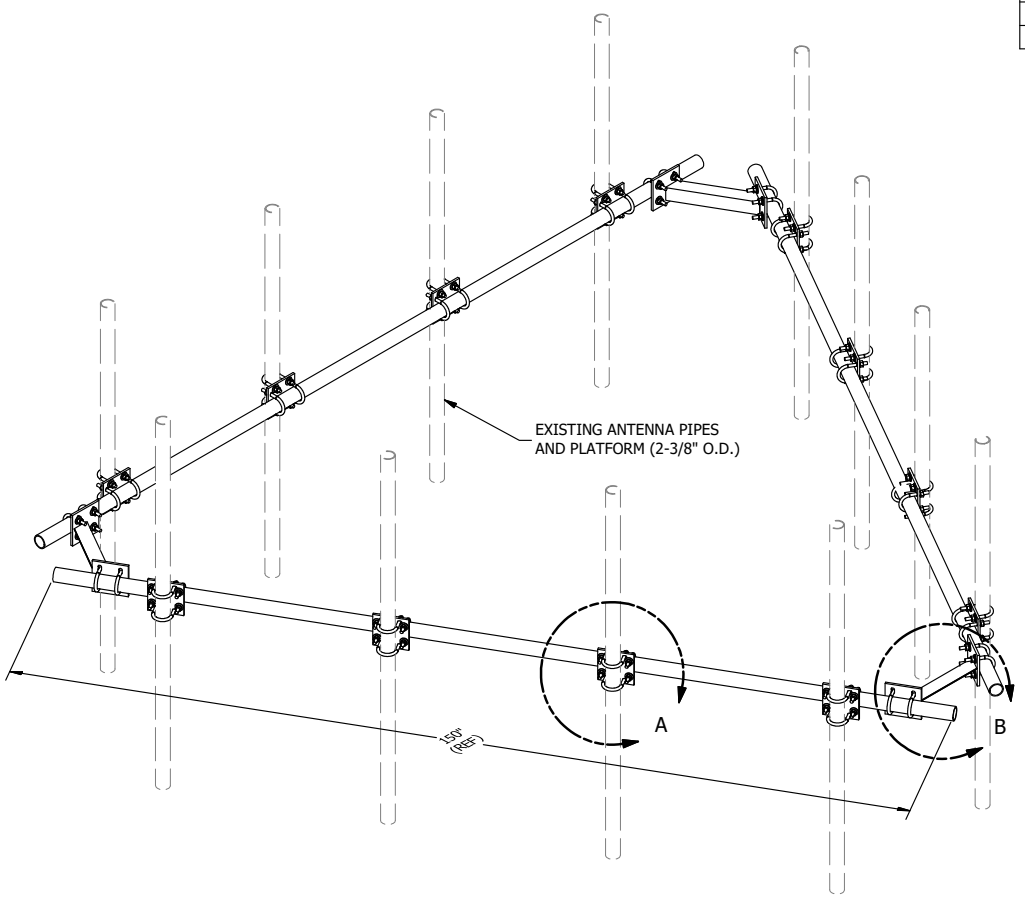
Engineering Support Team:
1-888-753-7446

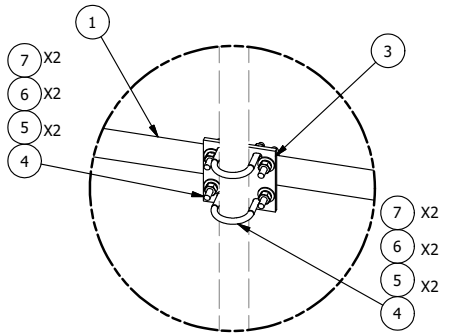
Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

PART NO.: SEE ASSEMBLY NO. "A"

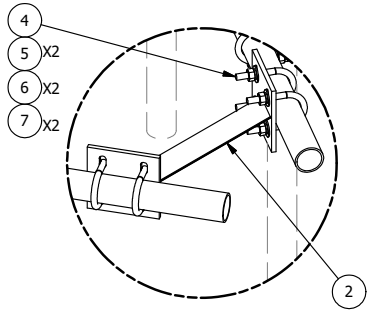
DWG. NO.: RMQP-4XX

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	P2150	2-3/8" O.D. X 150" SCH 40 GALVANIZED PIPE	150 in	45.77	137.31
2	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
3	12	SCX1	CROSSOVER PLATE 2-3/8" X 2-3/8"	6 in	3.71	44.50
4	60	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.63	37.51
5	120	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	4.09
6	120	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	1.67
7	120	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	8.60
					TOTAL WT. #	272.43





DETAIL A



DETAIL B

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")*

REVISION HISTORY				
REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	REPLACED HCP WITH X-AHCP		CEK	7/10/2014

DESCRIPTION: **HANDRAIL KIT FOR 12'-6" FACE**

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 5/30/2012		HRK12

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	BMC 7/13/2014	HRK12

FOX HILL TELECOM

Radio Frequency Emissions Analysis Report

T-Mobile

Site ID: CT11501E

ATT Andover - Prime
122 Jonathan Trumbull Highway (route 6)
Andover, CT 06232

January 31, 2024

Fox Hill Telecom Project Number: 240044

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	15.45 %

January 31, 2024

T-MOBILE
Attn: RF Manager
35 Griffin Road South
Bloomfield, CT 06009

Emissions Analysis for Site: **CT11501E – ATT Andover - Prime**

Fox Hill Telecom, Inc ("Fox Hill") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **122 Jonathan Trumbull Highway (route 6), Andover, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

General population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz & 700 MHz bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2500 MHz (BRS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed upgrades to the T-MOBILE antenna facility located at **122 Jonathan Trumbull Highway (route 6), Andover, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65 for far field modeling calculations.

In OET-65, plane wave power densities in the Far Field of an antenna are calculated by considering antenna gain and reflective waves that would contribute to exposure.

Since the radiation pattern of an antenna has developed in the **Far Field** region the power gain in specific directions needs to be considered in exposure predictions to yield an Effective Radiated Power (ERP) in each specific direction from the antenna. Also, since the vertical radiation pattern of the antenna is considered, the exposure calculations would most likely be reduced significantly at ground level, resulting in a more realistic estimate of the actual exposure levels. To determine a worst-case scenario at each point along the calculation radials, each point was calculated using the antenna gain value at each angle of incident and compared against the result using an isotropic radiator at the antenna height with the greater of the two used to yield the more pessimistic far field value for each point along the calculation radial.

Additionally, to model a truly "worst case" prediction of exposure levels at or near a surface, such as at ground-level or on a rooftop, reflection off the surface of antenna radiation power can be assumed, resulting in a potential 1.6 times increase in power density in calculating far field power density values.

With these factors Considered, the worst case **Far Field prediction model** utilized in this analysis is determined by the following equation:

Equation 9 per FCC OET65 for Far Field Modeling

$$S = \frac{33.4\ ERP}{R^2}$$

S = Power Density (in μw/cm^2)
ERP = Effective Radiated Power from antenna (watts)
R = Distance from the antenna (meters)

Predicted far field power density values for all carriers identified in this report were calculated 6 feet above the ground level and are displayed as a percentage of the applicable FCC standards. All emissions values for other carriers were calculated using the same Far Field model outlined above, using industry standard radio configurations and frequency band selection based upon available licenses in this geographic area for emissions contribution estimates.

For each T-Mobile sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
LTE / 5G NR	600 MHz	4	40
LTE	700 MHz	2	20
LTE	1900 MHz (PCS)	4	35
5G	1900 MHz (PCS)	4	40
GSM	1900 MHz (PCS)	2	10
LTE	2100 MHz (AWS)	4	60
LTE / 5G NR	2500 MHz (BRS)	8	30

Table 1: Channel Data Table

The following T-Mobile antennas listed in *Table 2* were used in the modeling for transmission in the 600 MHz, 700 MHz, 1900 MHz (PCS), 2100 MHz (AWS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	RFS APXVAARR24_43-U-NA20	140
A	2	Ericsson AIR6419 B41	140
B	1	RFS APXVAARR24_43-U-NA20	140
B	2	Ericsson AIR6419 B41	140
C	1	RFS APXVAARR24_43-U-NA20	140
C	2	Ericsson AIR6419 B41	140

Table 2: Antenna Data

All calculations were done with respect to uncontrolled / general population threshold limits.

RESULTS

Per the calculations completed for the proposed T-MOBILE configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	13.65 / 13.85 / 16.65 / 16.95	20	760	26,130.46	2.07
Antenna A2	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	240	33,900.90	1.91
						Sector A Composite MPE%	**3.98**
Antenna B1	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	13.65 / 13.85 / 16.65 / 16.95	20	760	26,130.46	2.07
Antenna B2	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	240	33,900.90	1.91
						Sector B Composite MPE%	**3.98**
Antenna C1	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	13.65 / 13.85 / 16.65 / 16.95	20	760	26,130.46	2.07
Antenna C2	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	240	33,900.90	1.91
						Sector C Composite MPE%	**3.98**

Table 3: T-MOBILE Emissions Levels

The Following table (*table 4*) shows all additional identified carriers on site and their emissions contribution estimates, along with the newly calculated maximum T-MOBILE MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three T-Mobile sectors have the same configuration yielding the same results for all three sectors. *Table 5* below shows a summary for each T-MOBILE Sector as well as the composite estimated MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
T-MOBILE – Max Per Sector Value	**3.98 %**
Verizon Wireless	4.44 %
AT&T	4.42 %
Dish	2.61 %
Site Total MPE %:	**15.45 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	3.98 %
T-MOBILE Sector B Total:	3.98 %
T-MOBILE Sector C Total:	3.98 %
Site Total:	15.45 %

Table 5: Site MPE Summary

Table 6 below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated T-MOBILE sector(s). For this site, all three T-Mobile sectors have the same configuration yielding the same results for all three sectors.

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 600 MHz LTE / 5G NR	4	926.96	140	3.20	600 MHz	400	0.80%
T-Mobile 700 MHz LTE	2	485.32	140	0.79	700 MHz	467	0.17%
T-Mobile 1900 MHz (PCS) LTE	4	1,618.33	140	2.80	1900 MHz (PCS)	1000	0.28%
T-Mobile 1900 MHz (PCS) 5G	4	1,849.52	140	3.20	1900 MHz (PCS)	1000	0.32%
T-Mobile 1900 MHz (PCS) GSM	2	462.38	140	0.20	1900 MHz (PCS)	1000	0.02%
T-Mobile 2100 MHz (AWS) LTE	4	2,972.70	140	4.80	2100 MHz (AWS)	1000	0.48%
T-Mobile 2500 MHz (BRS) LTE / 5G NR	8	4,237.61	140	19.10	2500 MHz (BRS)	1000	1.91%
						Total:	**3.98 %**

Table 6: T-MOBILE Maximum Sector MPE Power Values

Summary

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

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

T-MOBILE Sector	Power Density Value (%)
Sector A:	3.98 %
Sector B:	3.98 %
Sector C:	3.98 %
T-MOBILE Maximum Total (per sector):	3.98 %
Site Total:	15.45 %
Site Compliance Status:	**COMPLIANT**

The estimated composite MPE value for this site assuming all carriers present is **15.45 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon the far field calculations performed for all carriers identified in this report.

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

Scott Heffernan
Principal RF Engineer
Fox Hill Telecom, Inc
Worcester, MA 01609
(978)660-3998

THE COMPOUND AUDIT WAS COMPLETED ON 09/20/2023, THE CONSTRUCTION DRAWING REFLECT CONDITIONS AT TIME OF AUDIT.

T-Mobile

T-MOBILE SITE NUMBER: CT11501E
T-MOBILE SITE NAME: CT501/ATT ANDOVER - PRIME
T-MOBILE PROJECT: ANCHOR
T-MOBILE RAN: 67D5D998E 6160
T-MOBILE A&L: 67D5998E_1xAIR+1OP+1QP

BUSINESS UNIT #: 842856
SITE ADDRESS: 122 JONATHAN TRUMBULL HIGHWAY (ROUTE 6) ANDOVER, CT 06232
COUNTY: TOLLAND
SITE TYPE: MONOPOLE TOWER
TOWER HEIGHT: 149'-0"

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	ANDOVER NORTH
BU NUMBER:	842856
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 1001 PINNACLE POINT DRIVE COLUMBIA SC, 29223
SITE ADDRESS:	122 JONATHAN TRUMBULL HIGHWAY (ROUTE 6)
COUNTY:	ANDOVER, CT 06232 TOLLAND
LATITUDE:	41° 45' 0.46" / 41.75012319°
LONGITUDE:	-72° 24' 9.63" / -72.4027072°
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	496'+/- AMSL
AREA OF CONSTRUCTION:	EXISTING
CURRENT ZONING:	----
MAP/PARCEL #:	09013001-28/005/000004
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	ASC REAL ESTATE INC ANDOVER SPORTSMANS CLUB P O BOX 122 ANDOVER, CT 06232
JURISDICTION:	CT - TOWN OF ANDOVER P.O. BOX 328 ANDOVER, CT 06232
ELECTRIC PROVIDER:	NORTHEAST UTILITIES ----
TELCO PROVIDER:	LIGHTTOWER ----

PROJECT TEAM

A&E FIRM:	P. MARSHALL & ASSOCIATES, LLC 3545 WHITEHALL PARK DRIVE, SUITE 450 CHARLOTTE, NC 28273 PROJECT ENGINEER - TREVOR MCALLISTER 478-542-3291
CROWN CASTLE USA INC. DISTRICT CONTACTS:	1500 CORPORATE DRIVE CANONSBURG, PA 15317 Tricia Pelon - PROJECT MANAGER Tricia.Pelon@crowncastle.com Israel Carey - CONSTRUCTION MANAGER Israel.Carey@crowncastle.com Jennifer Mersing - AES Jennifer.Mersing@crowncastle.com

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

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1.1	COMPOUND PLAN
C-1.2	EXISTING EQUIPMENT PLAN
C-1.3	FINAL EQUIPMENT PLAN
C-2	TOWER ELEVATIONS
C-3	ANTENNA PLANS
C-4	FINAL EQUIPMENT SCHEDULE
C-5.1	TOWER EQUIPMENT DETAILS & SPECIFICATIONS
C-5.2	TOWER EQUIPMENT DETAILS & SPECIFICATIONS
C-6.1	ENCLOSURE CLEARANCES
C-6.2	SITE SUPPORT CABINET SPECIFICATIONS
C-6.3	BATTERY CABINET SPECIFICATIONS
C-7	RF PLUMBING DIAGRAM
E-1	PANEL SCHEDULES & ONE-LINE DIAGRAM
E-2	UTILITY ROUTING & GROUNDING PLAN
G-1	TYPICAL GROUNDING SCHEMATIC
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS
ATTACHED	PROPOSED MOUNT SPECIFICATIONS

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.

CALL CONNECTICUT ONE CALL (800) 922-4455 CBYD.COM CALL 2 WORKING DAYS BEFORE YOU DIG! 811

PROJECT DESCRIPTION

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

TOWER SCOPE OF WORK:
- REMOVE (3) RFS - APX16DWV-16DWV-S-E-A20 ANTENNAS
- REMOVE (3) GENERIC TWIN STYLE 1A - PCS TMAs
- REMOVE (1) ERICSSON - HCS 6X12 4AWG HYBRID CABLES
- REMOVE (9) ANDREW - LDF7-50A COAX CABLES
- REMOVE (3) ANDREW - AVA7-50 COAX CABLES
- REMOVE (3) 5.5' T-ARM SECTOR MOUNTS
- INSTALL (1) SITE PRO 1 - RMQP-496 PLATFORM MOUNT
- INSTALL (3) ERICSSON - AIR 6419 B41 (ACTIVE ANTENNA - MASSIVE MIMO) ANTENNAS
- INSTALL (3) ERICSSON - RADIO 4460 B25+B66 RADIOS
- INSTALL (3) ERICSSON - HB158-21U6S24-xxM HYBRID CABLES

GROUND SCOPE OF WORK:
- INSTALL (1) ERICSSON - 6160 AC V1 ENCLOSURE
- INSTALL (1) ERICSSON - B160 ENCLOSURE

EXISTING T-MOBILE ELECTRIC SERVICE:
METER AND DISCONNECT: 200A 120/240V~1PH
PPC: NORTHERN TECHNOLOGIES, INC. 200A 120/240V~1PH, FAULT CURRENT RATING 65kA, 200A GENERATOR PLUG, 200A MAXIMUM BRANCH CIRCUIT SIZE & 24 AC BREAKER POSITIONS.

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	2021 IBC
MECHANICAL	2021 IMC
ELECTRICAL	2020 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	BY OTHERS
DATED:	----
MOUNT ANALYSIS:	TRYLON # 231497
DATED:	09/08/2023
RFDS REVISION:	3
DATED:	08/03/2026
ORDER ID:	655744
REVISION:	0
PM&A PROJECT NUMBER:	23CCTCTM-0002

T-Mobile

CROWN CASTLE

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE, SUITE 450
CHARLOTTE, NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11501E

BU #: **842856**
CROWN CASTLE SITE NAME:
ANDOVER NORTH

122 JONATHAN TRUMBULL HIGHWAY (ROUTE 6)
ANDOVER, CT 06232

EXISTING 149'-0"
MONOPOLE TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	01/05/2024	SMS	FINAL	JS

STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER: T-1
REVISION: 0

T-MOBILE_NATIONAL_ANCHOR

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. UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 PVC ON STRAIGHTS AND SCHEDULE 80 PVC UNDER ALL TRAFFIC EASEMENTS AND ALL ELBOWS/90s. ABOVE GRADE CONDUIT TO BE SCH 80 PVC OR IMC/RMC CONDUIT. EMT IS ALLOWED AT STUB UP LOCATIONS AND INDOORS ONLY.
18. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON–PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER–ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY–COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3R (OR BETTER) FOR EXTERIOR LOCATIONS.
25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY–COATED OR NON–CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR CROWN CASTLE USA INC. BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "T–MOBILE".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

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

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

APWA UNIFORM COLOR CODE:

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

ABBREVIATIONS:

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

T-Mobile

CROWN CASTLE

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE, SUITE 450
CHARLOTTE, NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11501E

BU #: **842856**
CROWN CASTLE SITE NAME:
ANDOVER NORTH

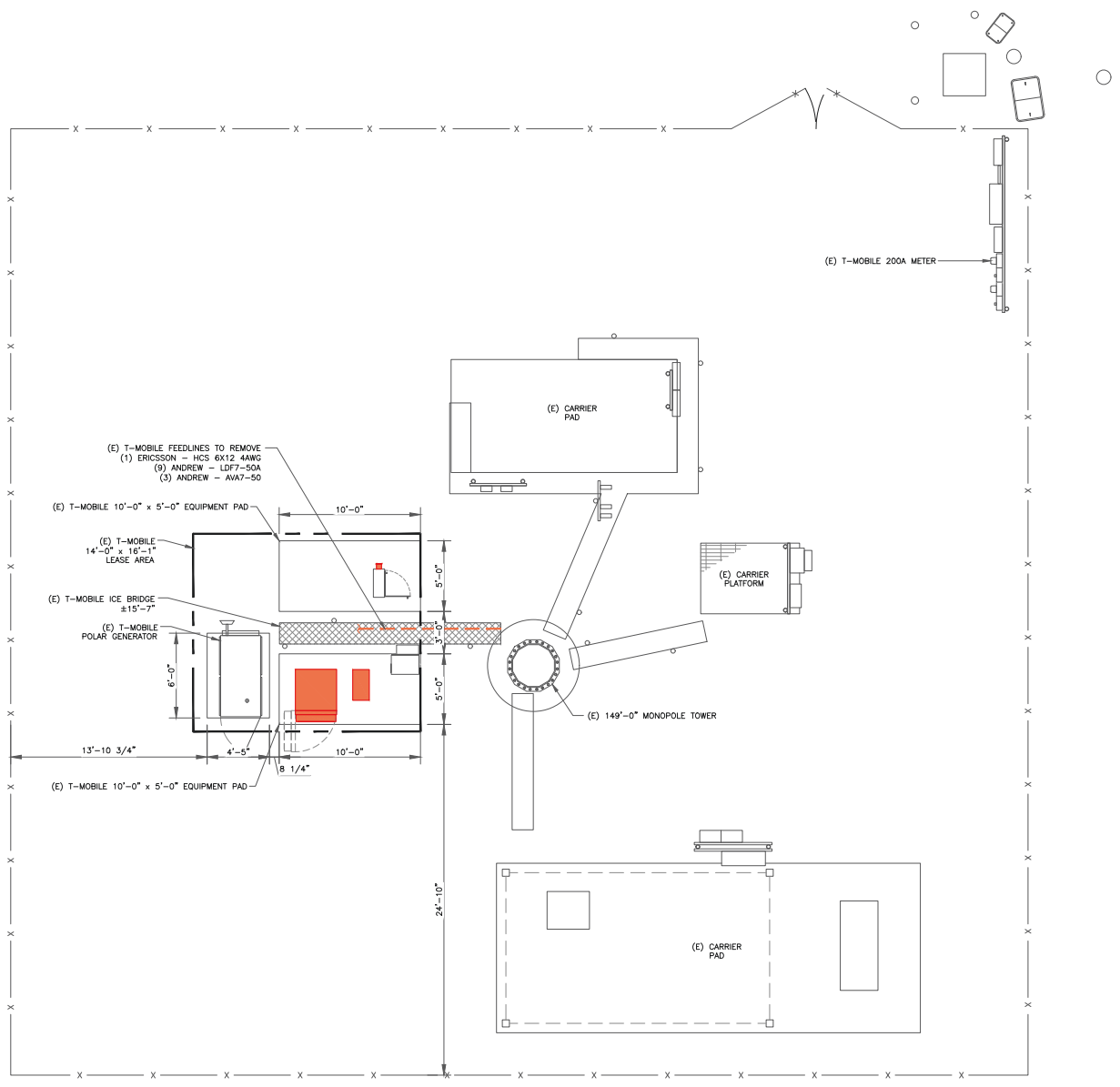
122 JONATHAN TRUMBULL HIGHWAY (ROUTE 6)
ANDOVER, CT 06232

EXISTING 149'-0" MONOPOLE TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	01/05/2024	SMS	FINAL	JS

STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER



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

N

EQUIPMENT LEGEND:
- EXISTING
- TO BE RELOCATED/REMOVED
- NEW/RELOCATED

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CROWN CASTLE

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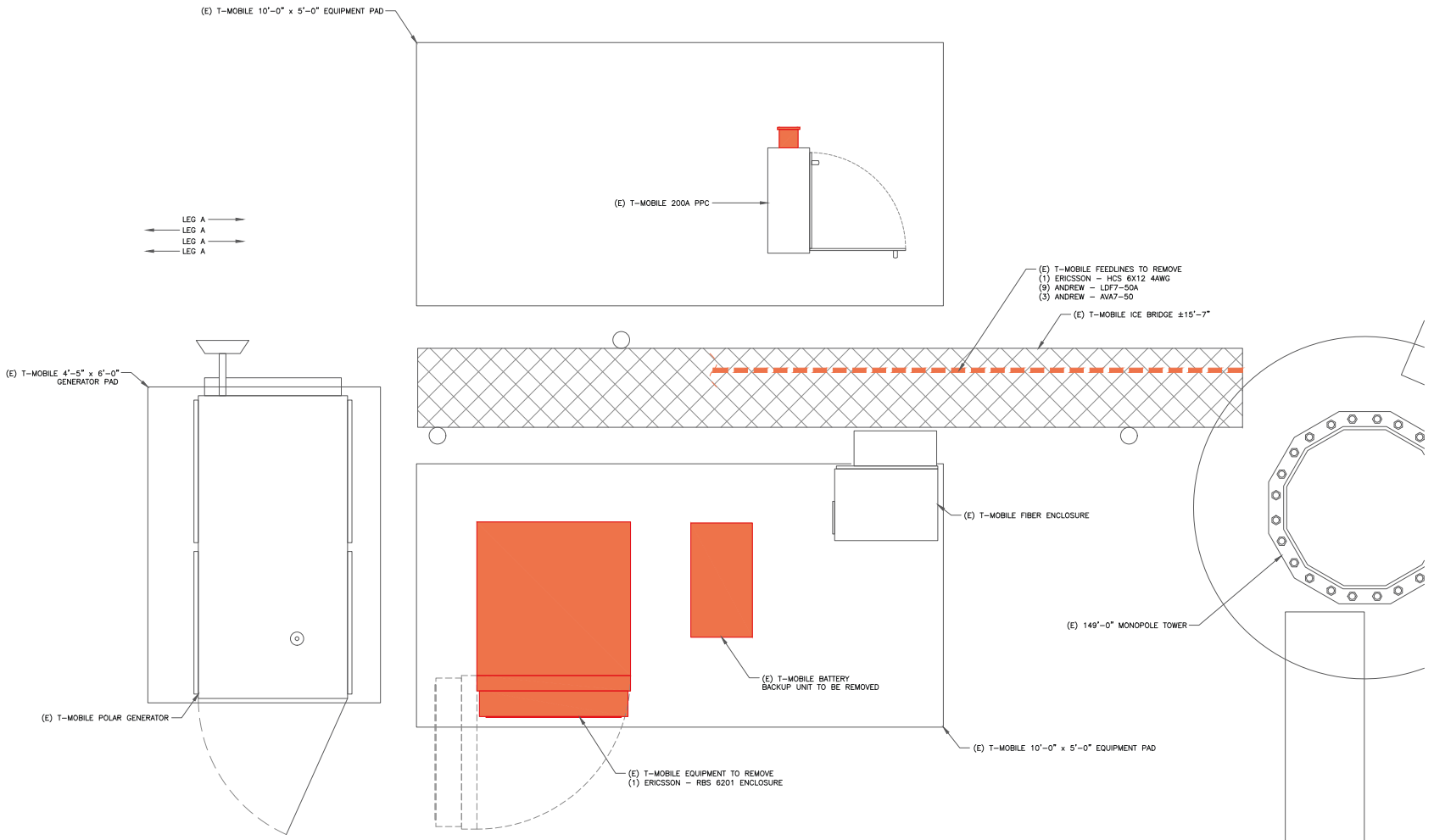
STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER:	REVISION:
C-1.1	0

T-MOBILE_NATIONAL_ANCHOR

EQUIPMENT LEGEND:
- EXISTING
- TO BE RELOCATED/REMOVED
- NEW/RELOCATED



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

N

T-MOBILE_NATIONAL_ANCHOR

T-Mobile

CROWN CASTLE

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE, SUITE 450
CHARLOTTE, NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11501E

BU #: **842856**
CROWN CASTLE SITE NAME:
ANDOVER NORTH

122 JONATHAN TRUMBULL HIGHWAY (ROUTE 6)
ANDOVER, CT 06232

EXISTING 149'-0" MONOPOLE TOWER

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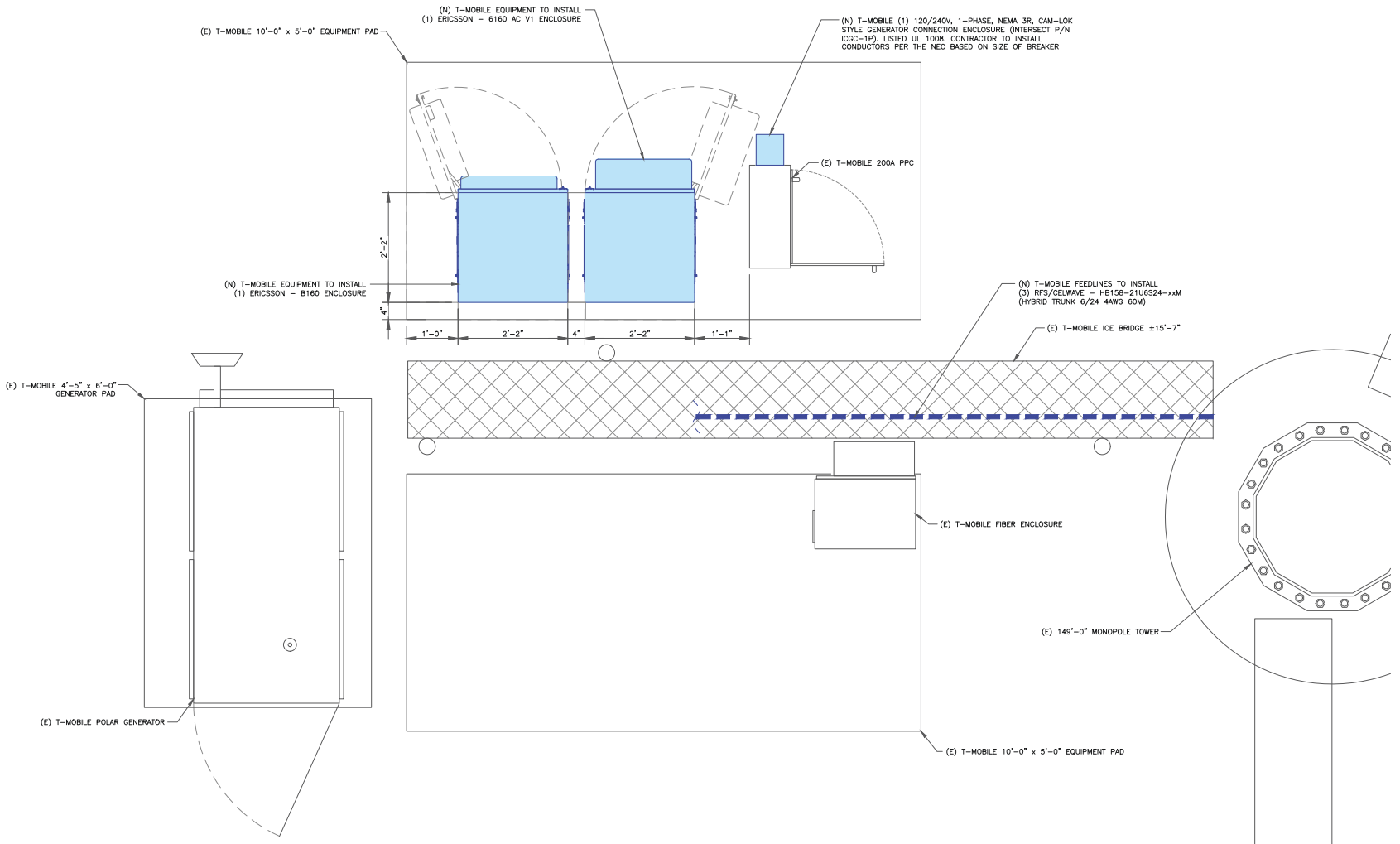
0	01/05/2024	SMS	FINAL	JS

STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER:	REVISION:
C-1.2	0

EQUIPMENT LEGEND:

- EXISTING
- TO BE RELOCATED/REMOVED
- NEW/RELOCATED



1 FINAL EQUIPMENT PLAN

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

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CROWN CASTLE SITE NAME:
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122 JONATHAN TRUMBULL HIGHWAY (ROUTE 6)
ANDOVER, CT 06232

EXISTING 149'-0" MONOPOLE TOWER

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REV	DATE	DRWN	DESCRIPTION	DES./QA
0	01/05/2024	SMS	FINAL	JS

STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER:	REVISION:
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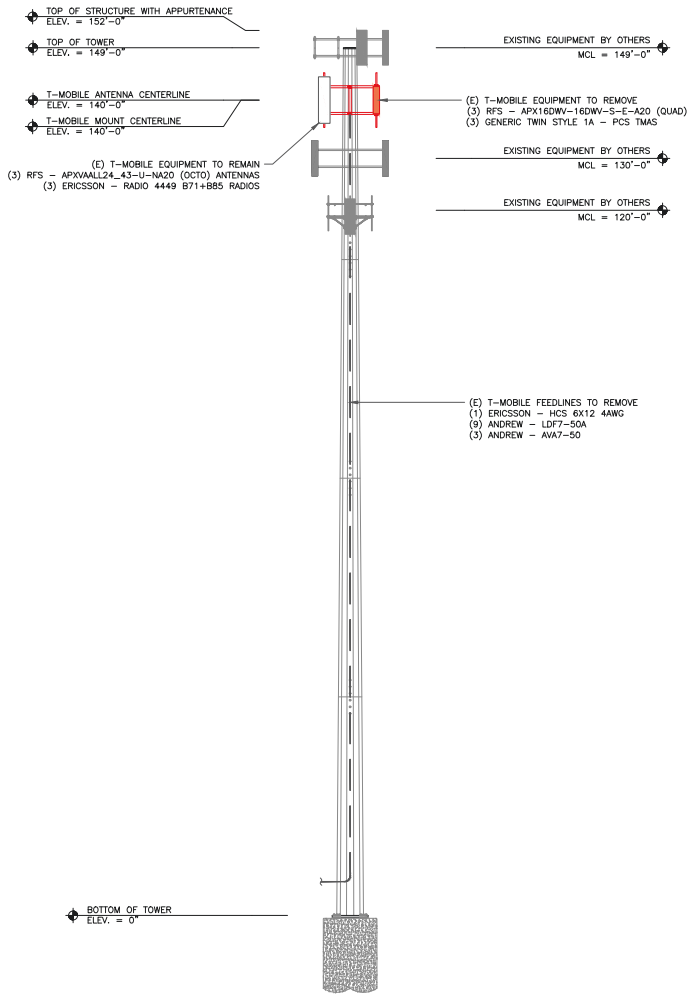
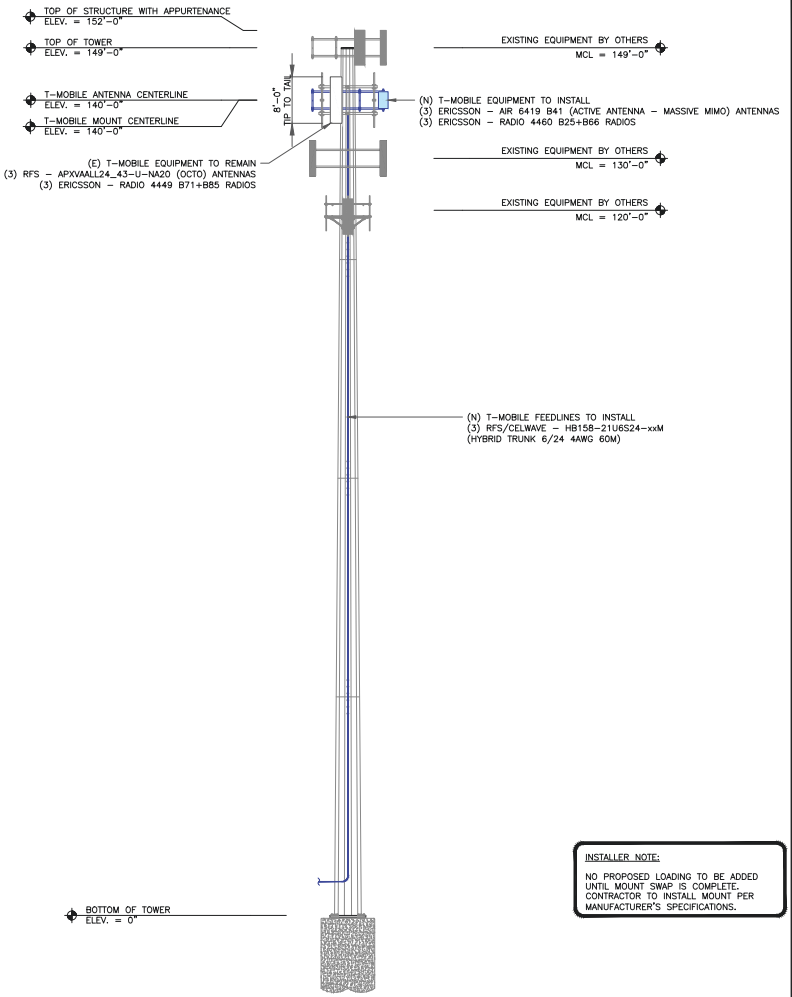


1 EXISTING TOWER ELEVATION

SCALE: 8' 4' 0' 8' 3/32"=1'-0" (FULL SIZE) 3/64"=1'-0" (11x17)



2 FINAL TOWER ELEVATION

SCALE: 8' 4' 0' 8' 3/32"=1'-0" (FULL SIZE) 3/64"=1'-0" (11x17)

EQUIPMENT LEGEND:

- EXISTING
- TO BE RELOCATED/REMOVED
- NEW/RELOCATED

INSTALLER NOTE:

NO PROPOSED LOADING TO BE ADDED UNTIL MOUNT SWAP IS COMPLETE. CONTRACTOR TO INSTALL MOUNT PER MANUFACTURER'S SPECIFICATIONS.

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CROWN CASTLE

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE, SUITE 450
CHARLOTTE, NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11501E

BU #: **842856**
CROWN CASTLE SITE NAME:
ANDOVER NORTH

122 JONATHAN TRUMBULL HIGHWAY (ROUTE 6)
ANDOVER, CT 06232

EXISTING 149'-0" MONOPOLE TOWER

ISSUED FOR:

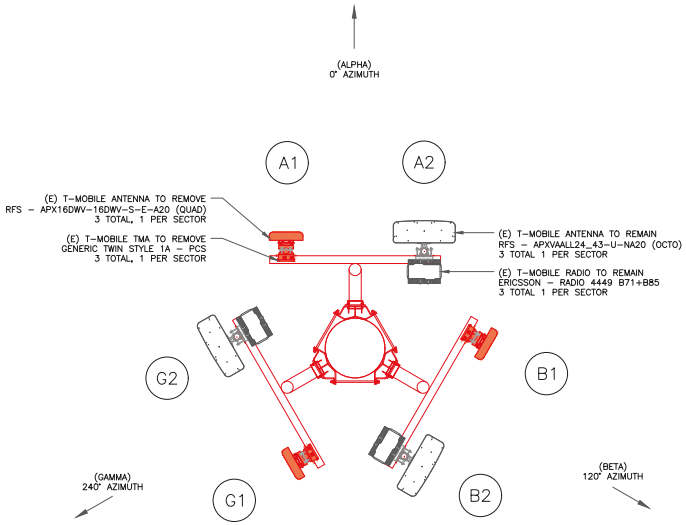
REV	DATE	DRWN	DESCRIPTION	DES./QA
0	01/05/2024	SMS	FINAL	JS

STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER: C-2

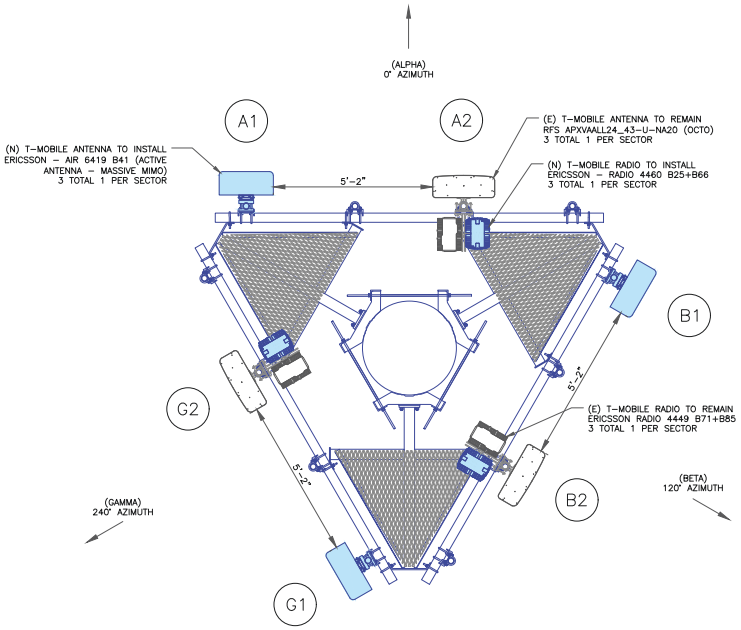
REVISION: 0

T-MOBILE_NATIONAL_ANCHOR



1 EXISTING ANTENNA PLAN

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



2 FINAL ANTENNA PLAN

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

EQUIPMENT LEGEND:

- EXISTING
- TO BE RELOCATED/REMOVED
- NEW/RELOCATED

INSTALLER NOTE:

NO PROPOSED LOADING TO BE ADDED UNTIL MOUNT SWAP IS COMPLETE. CONTRACTOR TO INSTALL MOUNT PER MANUFACTURER'S SPECIFICATIONS.

T-Mobile

CROWN CASTLE

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LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER:	REVISION:
C-3	0

T-MOBILE_NATIONAL_ANCHOR

FINAL EQUIPMENT SCHEDULE
(VERIFY WITH CURRENT RFDS)

POSITION	ANTENNA				RADIO			DIPLEXER			TMA		SURGE PROTECTION		CABLES			
	TECH	STATUS/MANUFACTURER MODEL	AZIMUTH	RAD CENTER	QTY.	STATUS/MODEL	LOCATION	QTY.	STATUS	LOCATION	QTY.	STATUS	QTY.	STATUS/MODEL	QTY.	STATUS/TYPE	SIZE	LENGTH
ALPHA																		
A1	–	(N) ERICSSON – AIR6419 B41 (ACTIVE ANTENNA–MASSIVE MIMO)	0°	140'–0"	–	–	–	–	–	–	–	–	–	–	1	(N) HYBRID	1 5/8"	190'–0"
–	–	–	–°	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
A2	–	(E) RFS – APXVAARR24_43–U–NA20 (OCTO)	0°	140'–0"	1 1	(E) 4449 B71+B85 (N) 4460 B25+B66	TOWER	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–°	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BETA																		
B1	–	(N) ERICSSON – AIR6419 B41 (ACTIVE ANTENNA–MASSIVE MIMO)	120°	140'–0"	–	–	–	–	–	–	–	–	–	–	1	(N) HYBRID	1–5/8""	190'–0"
–	–	–	–°	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
B2	–	(E) RFS – APXVAARR24_43–U–NA20 (OCTO)	120°	140'–0"	1 1	(E) 4449 B71+B85 (N) 4460 B25+B66	TOWER	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–°	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GAMMA																		
G1	–	(N) ERICSSON – AIR6419 B41 (ACTIVE ANTENNA–MASSIVE MIMO)	240°	140'–0"	–	–	–	–	–	–	–	–	–	–	1	(N) HYBRID	1–5/8""	190'–0"
–	–	–	–°	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
G2	–	(E) RFS – APXVAARR24_43–U–NA20 (OCTO)	240°	140'–0"	1 1	(E) 4449 B71+B85 (N) 4460 B25+B66	TOWER	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–°	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
														UNUSED FEEDLINES	–	–	–	–
															–	–	–	–

1 FINAL EQUIPMENT SCHEDULE
SCALE: NOT TO SCALE

T-MOBILE_NATIONAL_ANCHOR

T-Mobile

CROWN CASTLE

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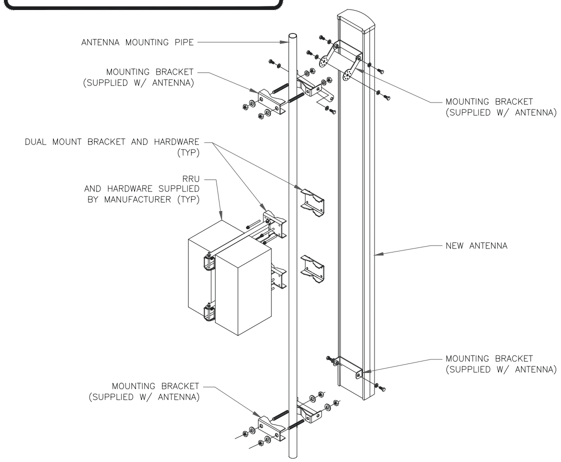
STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER: C-4
REVISION: 0

INSTALLER NOTES:

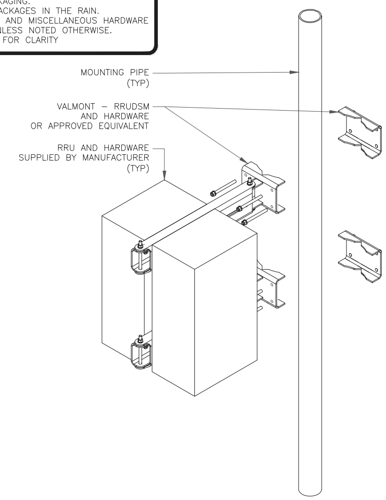
1. COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRUs RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING.
2. DO NOT OPEN RRU PACKAGES IN THE RAIN.
3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.



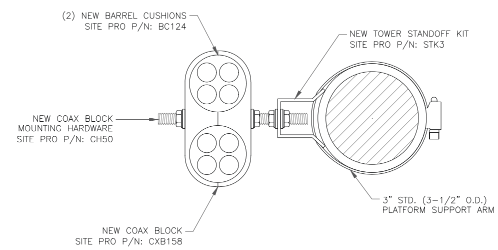
1 MOUNTING DETAIL
SCALE: NOT TO SCALE

INSTALLER NOTES:

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



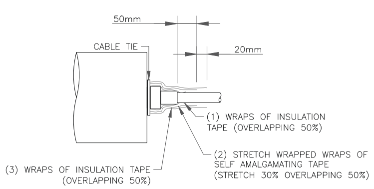
2 RRU MOUNTING DETAIL
SCALE: NOT TO SCALE



3 RF JUMPER DETAIL
SCALE: NOT TO SCALE

INSTALLER NOTE:

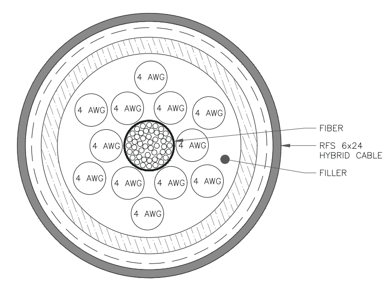
JUMPERS TO BE TORQUED TO 221.27 IN/LBS



4 RF JUMPER CONNECTION
SCALE: NOT TO SCALE

5 NOT USED
SCALE: NOT TO SCALE

PARAMETER	VALUE
NOMINAL DIAMETER (INCHES)	1.79
CROSS SECTION AREA (SQUARE INCHES)	3.13
JACKET COLOR	BLACK
WEIGHT PER LINEAR FOOT (POUNDS)	2.5



6 6x24 HYBRID TRUNK CROSS SECTION
SCALE: NOT TO SCALE

SKU#: N/A

T-Mobile

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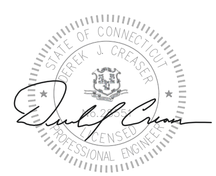
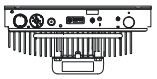


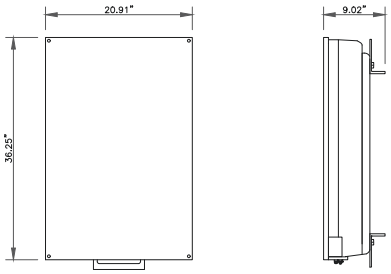
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER: C-5.1
REVISION: 0

T-MOBILE_NATIONAL_ANCHOR

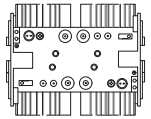
MANUFACTURER:	ERICSSON
MODEL:	AIR 6419 B41 (2.5GHz M-MIMO)
DIMENSIONS (HxWxD):	36.25"x20.91"x9.02"
WEIGHT:	83 LBS
BAND:	B41
MOUNTING KIT:	SXK109 2016/1

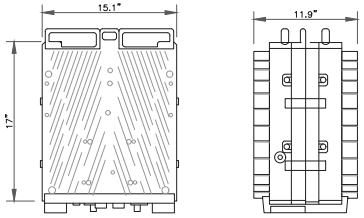




1 ERICSSON / AIR 6419 B41
SCALE: NOT TO SCALE

MANUFACTURER:	ERICSSON
MODEL:	4460 RADIO (KRC 161 912/3)
DIMENSIONS (HxWxD):	17"x15.1"x11.9"
WEIGHT:	109 LBS
BAND:	B2/B25 B66 DUAL BAND





2 ERICCSON / 4460 RADIO
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

T-Mobile

CROWN CASTLE

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EXISTING 149'-0"
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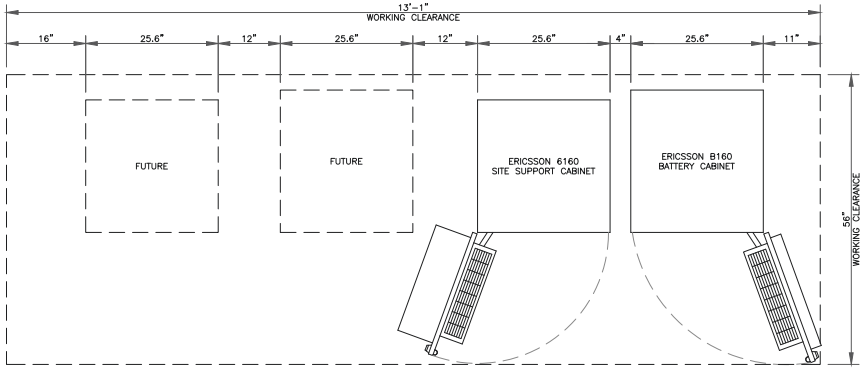
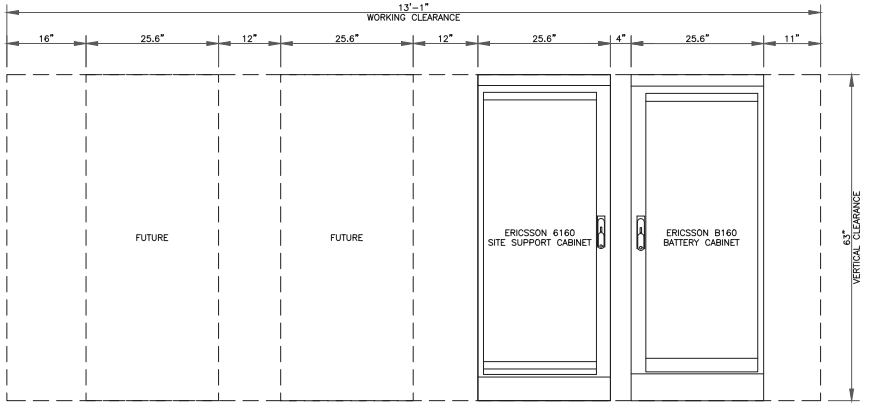
SHEET NUMBER: C-5.2
REVISION: 0

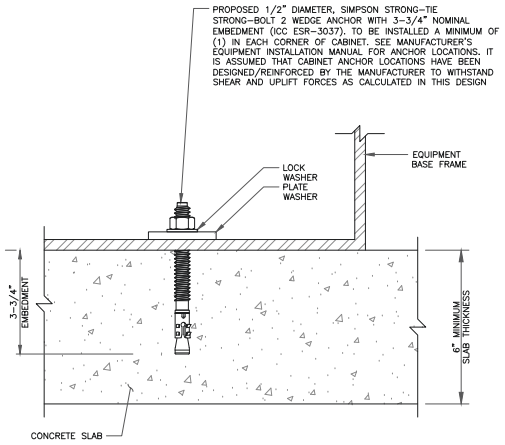
T-MOBILE_NATIONAL_ANCHOR



1 PLAN VIEW WORKING CLEARANCE 6160 & B160 LAYOUT
SCALE: NOT TO SCALE

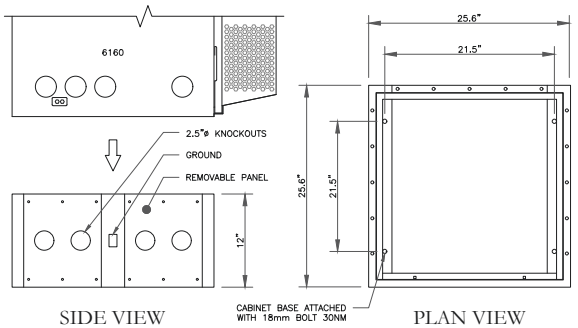


2 ELEVATION VIEW WORKING CLEARANCE 6160 & B160 LAYOUT
SCALE: NOT TO SCALE



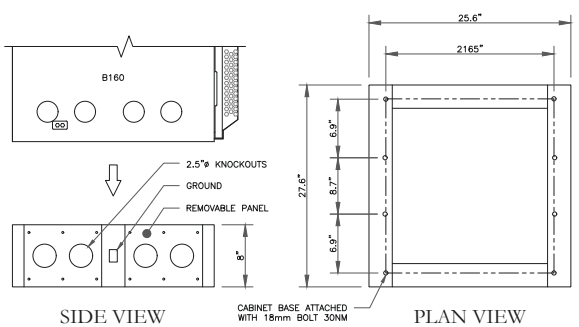
3 TYPICAL ANCHOR BOLT DETAIL
SCALE: NOT TO SCALE

MANUFACTURER:	ERICSSON
MODEL:	6160 12" BASE FRAME (SKK 125 5009/1)
DIMENSIONS (HxWxD):	12"x25.6"x25.6"
T-MOBILE SKU#	T.B.D.



4 ERICSSON 6160 PLINTH DETAIL
SCALE: NOT TO SCALE

MANUFACTURER:	ERICSSON
MODEL:	B160 BASE FRAME (SKU 125 5010/1)
DIMENSIONS (HxWxD):	8"x27.5"x25.6"
T-MOBILE SKU#	T.B.D.



5 ERICSSON B160 PLINTH DETAIL
SCALE: NOT TO SCALE

T-MOBILE_NATIONAL_ANCHOR

T-Mobile

CROWN CASTLE

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STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER: C-6.1
REVISION: 0

MANUFACTURER:	ERICSSON
MODEL:	(UT6160_ENCL_AC) V1 CABINET
DIMENSIONS (HxWxD):	63"x25.6"x33.6"
WEIGHT:	373 LBS
SKU #:	T.B.D.

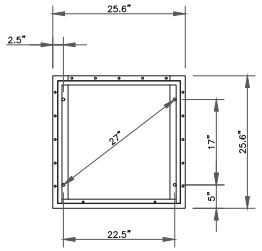
NOTE:

CORRECT KNOCKOUT TOOL REQUIRED FOR PUNCHING KNOCKOUTS. DO NOT DRILL THROUGH KNOCKOUTS

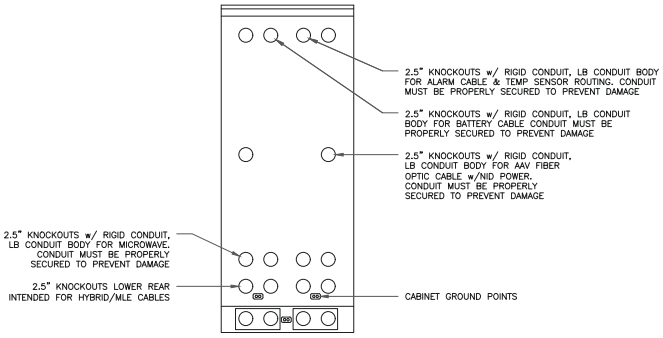
CONDUIT MUST BE PROPERLY SECURED TO PREVENT DAMAGE TO CABINETS AND OR CABLING

GROUNDING NOTE:

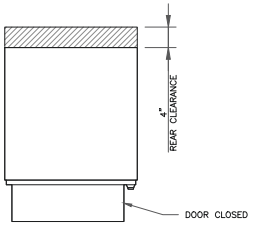
CABINET GROUNDING TO USE A SINGLE, #2 BTCW CONDUCTOR, W/ 2-HOLE, 1" C-C, LONG BARREL, WINDOW LUG, IN 3/4" LFNC TO GROUND RING. PLINTH GROUNDING IS NOT REQUIRED.



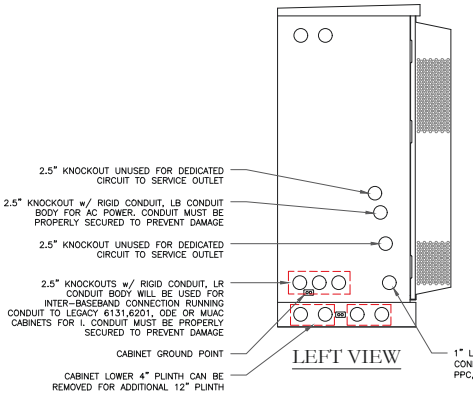
BOLT DOWN PATTERN



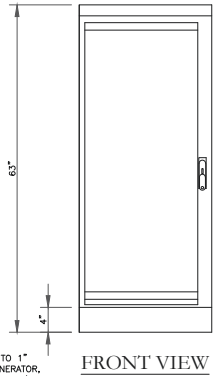
REAR VIEW



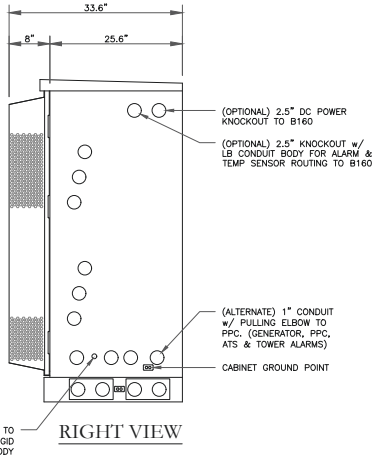
PLAN VIEW



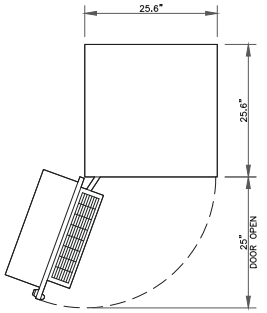
LEFT VIEW



FRONT VIEW



RIGHT VIEW



DOOR SWING

1 6160 ERICSSON SITE SUPPORT CABINET
SCALE: 1"=1'-0" (FULL SIZE) 1/2"=1'-0" (11x17)

T-MOBILE_NATIONAL_ANCHOR

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EXISTING 149'-0" MONOPOLE TOWER

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SHEET NUMBER:	REVISION:
C-6.2	0

MANUFACTURER:	ERICSSON
MODEL:	B160 BATTERY CABINET
DIMENSIONS (HxWxD):	63"x25.6"x29.5"
WEIGHT:	295 LBS
SKU #:	T.B.D.

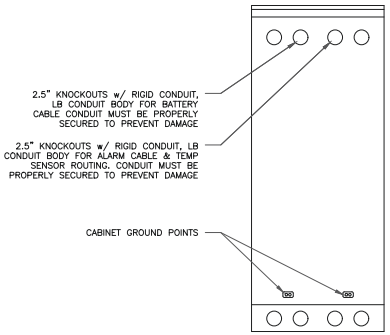
NOTE:

CORRECT KNOCKOUT TOOL REQUIRED FOR PUNCHING KNOCKOUTS. DO NOT DRILL THROUGH KNOCKOUTS

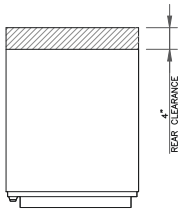
CONDUIT MUST BE PROPERLY SECURED TO PREVENT DAMAGE TO CABINETS AND OR CABLING

GROUNDING NOTE:

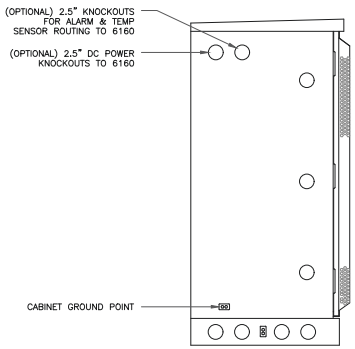
CABINET GROUNDING TO USE A SINGLE, #2 BTCW CONDUCTOR, W/ 2-HOLE, 1" C-C, LONG BARREL, WINDOW LUG, IN 3/4" LFNC TO GROUND RING. PLINTH GROUNDING IS NOT REQUIRED.



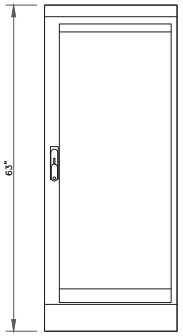
REAR VIEW



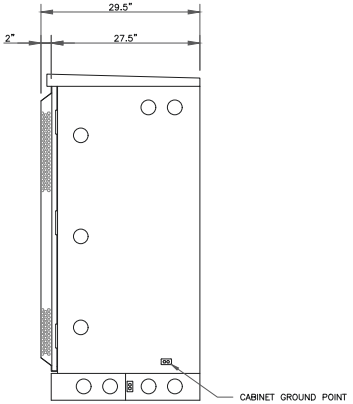
PLAN VIEW



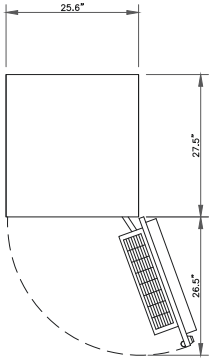
LEFT VIEW



FRONT VIEW



RIGHT VIEW



DOOR SWING

1 ERICSSON B160 BATTERY CABINET
SCALE: 1"=1'-0" (FULL SIZE) 1/2"=1'-0" (11x17)

T-MOBILE_NATIONAL_ANCHOR

T-Mobile

CROWN CASTLE

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE, SUITE 450
CHARLOTTE, NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11501E

BU #: **842856**
CROWN CASTLE SITE NAME:
ANDOVER NORTH

122 JONATHAN TRUMBULL HIGHWAY (ROUTE 6)
ANDOVER, CT 06232

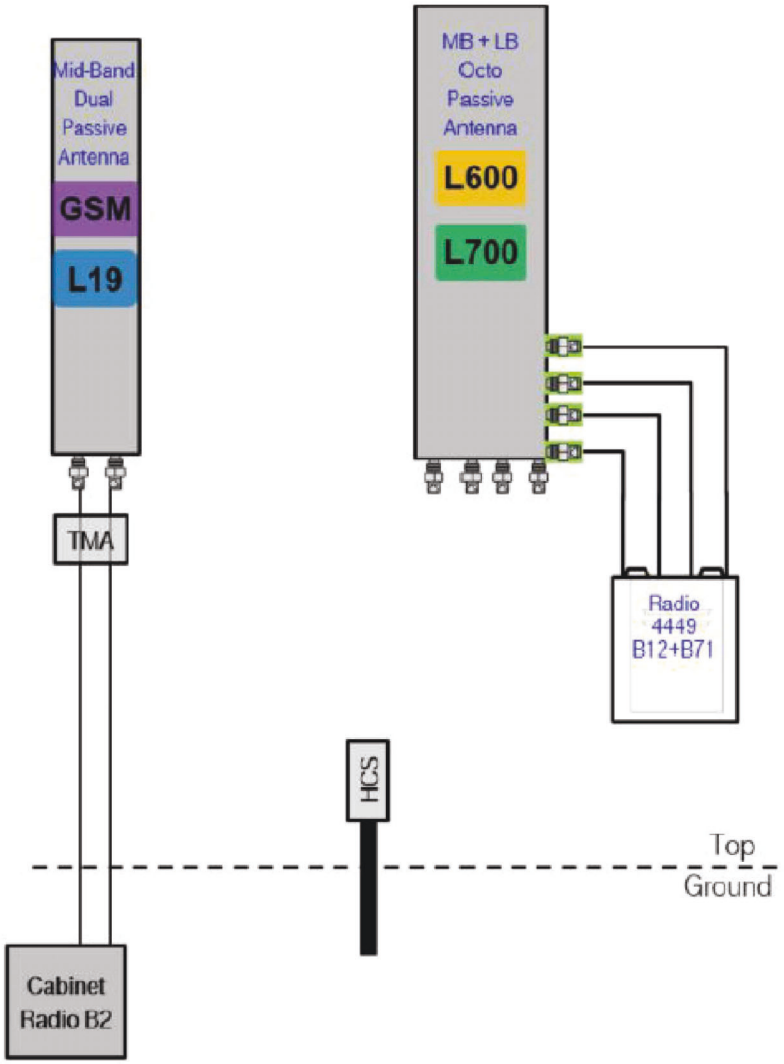
EXISTING 149'-0" MONOPOLE TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	01/05/2024	SMS	FINAL	JS

SHEET NUMBER:	REVISION:
C-6.3	0

NEW RF CONFIGURATION:
(INFORMATION PROVIDED BY CLIENT)
67D5D998E 6160



T-MOBILE_NATIONAL_ANCHOR

T-Mobile

CROWN CASTLE

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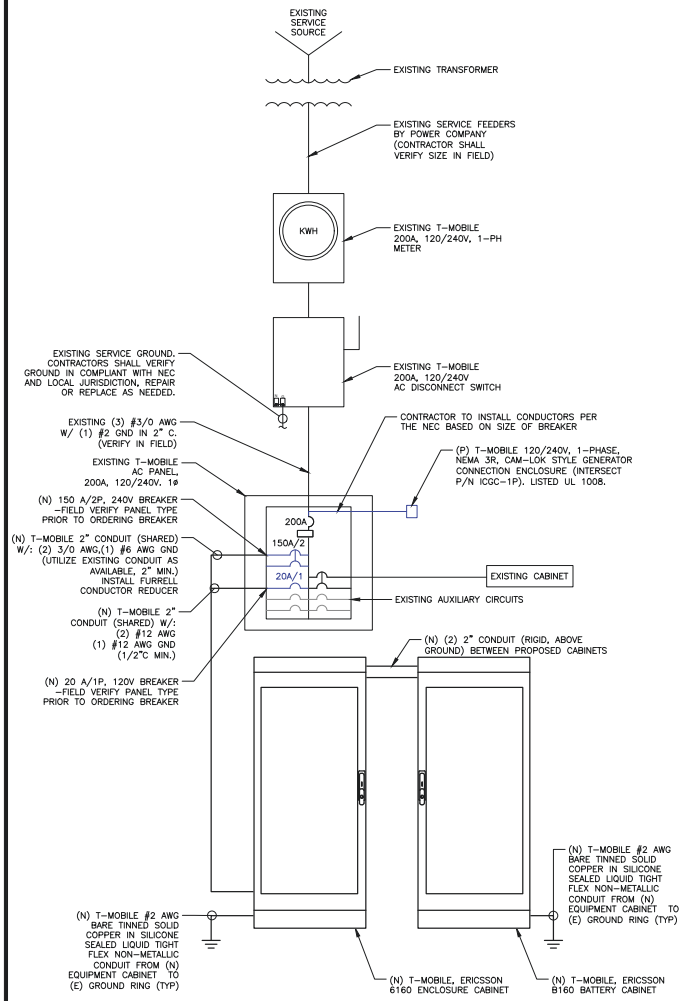
STATE OF CONNECTICUT
DEREK J CREASER
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER:	REVISION:
C-7	0



1 ONE-LINE DIAGRAM
SCALE: NOT TO SCALE

T-MOBILE SITE #:			LOCATION:			VOLTAGE:	240/120 1Ø			MOUNTING / ENCLOSURE:		EXISTING /	NEMA 3R		
CT11501E (EXISTING)			H-FRAME			MAIN C/B:	200	AMPS		AVAIL. FAULT CURRENT:	EXISTING				
9/29/2023						BUS RATING:	200	AMPS		SHORT CIRCUIT RATING:	EXISTING				

AMPS/ POLES	WIRE & CONDUIT	TYPE	DESCRIPTION	KVA	CKT	A	B	CKT	KVA	DESCRIPTION	TYPE	WIRE & CONDUIT	AMPS/ POLES
60/2	EXISTING	EQ	SURGE PROTECTION	0.10	1	0.28		2	0.18	TELCO GFI RECEPTACLE	R	EXISTING	20/1
-	-	EQ	-	0.10	3		0.10	4		EMPTY			
20/1	EXISTING	EQ	FIBER	1.92	5	1.92		6		EMPTY			
100/2	EXISTING	EQ	MAIN BTS UNIT	3.12	7		3.12	8		EMPTY			
-	-	EQ	-	3.12	9	3.12		10		EMPTY			
			EMPTY		11			12		EMPTY			
			EMPTY		13			14		EMPTY			
			EMPTY		15			16		EMPTY			
			EMPTY		17			18		EMPTY			
			EMPTY		19			20		EMPTY			
			EMPTY		21			22		EMPTY			
			EMPTY		23			24		EMPTY			
				PHASE TOTAL		5.3	3.2	KVA					
										TOTAL CONNECTED LOAD	8.5	kVA	36 A
										TOTAL DEMAND LOAD	8.5	kVA	36 A

LOAD TYPE	DESCRIPTION	CONN. LOAD KVA	CONN. LOAD AMPS	DEMAND FACTOR	DESIGN LOAD KVA	DESIGN LOAD AMPS
L	LIGHTING	0.0	0.0	1.25	0.0	0.0
R	RECEPTACLE	0.2	0.8	NEC	0.2	0.8
M	MOTOR	0.0	0.0	NEC	0.0	0.0
H	HEATING	0.0	0.0	1.00	0.0	0.0
AC	HVAC	0.0	0.0	1.00	0.0	0.0
EQ	EQUIPMENT	8.4	34.8	1.00	8.4	34.8
E	EXISTING	0.0	0.0	1.25	0.0	0.0

* ALL EQUIPMENT LOADS CONSIDERED CONTINUOUS LOADS

NOTES:

DEPICTED LOAD BASED ON ASSUMPTIONS OF EQUIPMENT INSTALLED AND WAS NOT V.I.F. NOTIFY E.O.R. OF ANY DISCREPANCIES PRIOR TO INSTALLATION OF PROPOSED EQUIPMENT.

2 EXISTING PANEL SCHEDULE
SCALE: NOT TO SCALE

T-MOBILE SITE #:			LOCATION:			VOLTAGE:	240/120 1Ø			MOUNTING / ENCLOSURE:		EXISTING /	NEMA 3R		
CT11501E (PROPOSED)			H-FRAME			MAIN C/B:	200	AMPS		AVAIL. FAULT CURRENT:	EXISTING				
9/29/2023						BUS RATING:	200	AMPS		SHORT CIRCUIT RATING:	EXISTING				

AMPS/ POLES	WIRE & CONDUIT	TYPE	DESCRIPTION	KVA	CKT	A	B	CKT	KVA	DESCRIPTION	TYPE	WIRE & CONDUIT	AMPS/ POLES
60/2	EXISTING	EQ	SURGE PROTECTION	0.10	1	0.28		2	0.18	TELCO GFI RECEPTACLE	R	EXISTING	20/1
-	-	EQ	-	0.10	3		2.71	4	**2.61**	**(N) 6160**	**EQ**	**2#3/0, 1#2G, 2"C**	**150/2**
20/1	EXISTING	EQ	FIBER	1.92	5	4.53		6	**2.61**	-	**EQ**	-	-
100/2	EXISTING	EQ	MAIN BTS UNIT	3.12	7		3.12	8	**0.00**	-	**EQ**	-	-
-	-	EQ	-	3.12	9	3.12		10	**0.00**	-	**EQ**	-	-
			EMPTY		11		0.18	12	**0.18**	**(N) 6160 GFCI**	**R**	**2#12, 1#12G, 1/2"C**	**20/1**
			EMPTY		13			14		EMPTY			
			EMPTY		15			16		EMPTY			
			EMPTY		17			18		EMPTY			
			EMPTY		19			20		EMPTY			
			EMPTY		21			22		EMPTY			
			EMPTY		23			24		EMPTY			
				PHASE TOTAL		7.9	6.0	KVA					
										TOTAL CONNECTED LOAD	13.9	kVA	58 A
										TOTAL DEMAND LOAD	13.9	kVA	58 A

LOAD TYPE	DESCRIPTION	CONN. LOAD KVA	CONN. LOAD AMPS	DEMAND FACTOR	DESIGN LOAD KVA	DESIGN LOAD AMPS
L	LIGHTING	0.0	0.0	1.25	0.0	0.0
R	RECEPTACLE	0.4	1.5	NEC	0.4	1.5
M	MOTOR	0.0	0.0	NEC	0.0	0.0
H	HEATING	0.0	0.0	1.00	0.0	0.0
AC	HVAC	0.0	0.0	1.00	0.0	0.0
EQ	EQUIPMENT	13.6	56.6	1.00	13.6	56.6
E	EXISTING	0.0	0.0	1.25	0.0	0.0

* ALL EQUIPMENT LOADS CONSIDERED CONTINUOUS LOADS

NOTES:

DEPICTED LOAD BASED ON ASSUMPTIONS OF EQUIPMENT INSTALLED AND WAS NOT V.I.F. NOTIFY E.O.R. OF ANY DISCREPANCIES PRIOR TO INSTALLATION OF PROPOSED EQUIPMENT.

3 FINAL PANEL SCHEDULE
SCALE: NOT TO SCALE

T-Mobile

CROWN CASTLE

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE, SUITE 450
CHARLOTTE, NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11501E

BU #: **842856**
CROWN CASTLE SITE NAME:
ANDOVER NORTH

122 JONATHAN TRUMBULL HIGHWAY (ROUTE 6)
ANDOVER, CT 06232

EXISTING 149'-0" MONOPOLE TOWER

ISSUED FOR:

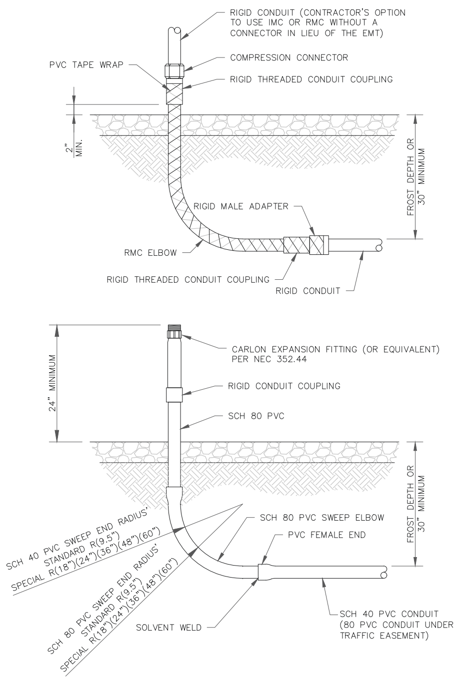
REV	DATE	DRWN	DESCRIPTION	DES./QA
0	01/05/2024	SMS	FINAL	JS

SHEET NUMBER:	REVISION:
E-1	0

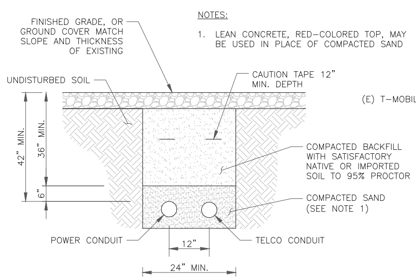
T-MOBILE_NATIONAL_ANCHOR

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.



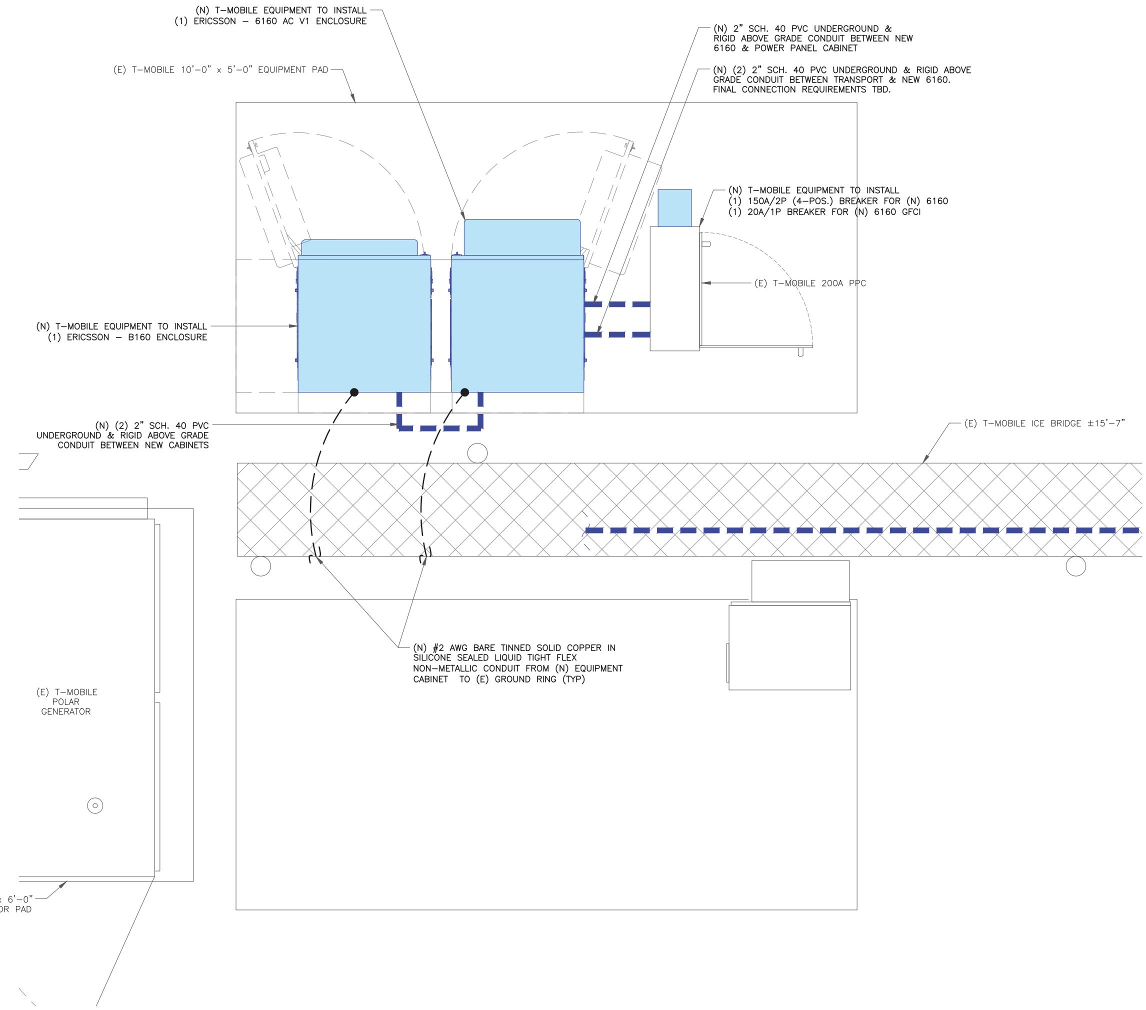
1 CONDUIT STUB UP DETAILS
SCALE: NOT TO SCALE



NOTES:

1. LEAN CONCRETE, RED-COLORED TOP, MAY BE USED IN PLACE OF COMPACTED SAND

2 TRENCH DETAIL
SCALE: NOT TO SCALE



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

T-Mobile

CROWN CASTLE

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE, SUITE 450
CHARLOTTE, NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11501E

BU #: **842856**
CROWN CASTLE SITE NAME:
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122 JONATHAN TRUMBULL HIGHWAY (ROUTE 6)
ANDOVER, CT 06232

EXISTING 149'-0" MONOPOLE TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	01/05/2024	SMS	FINAL	JS

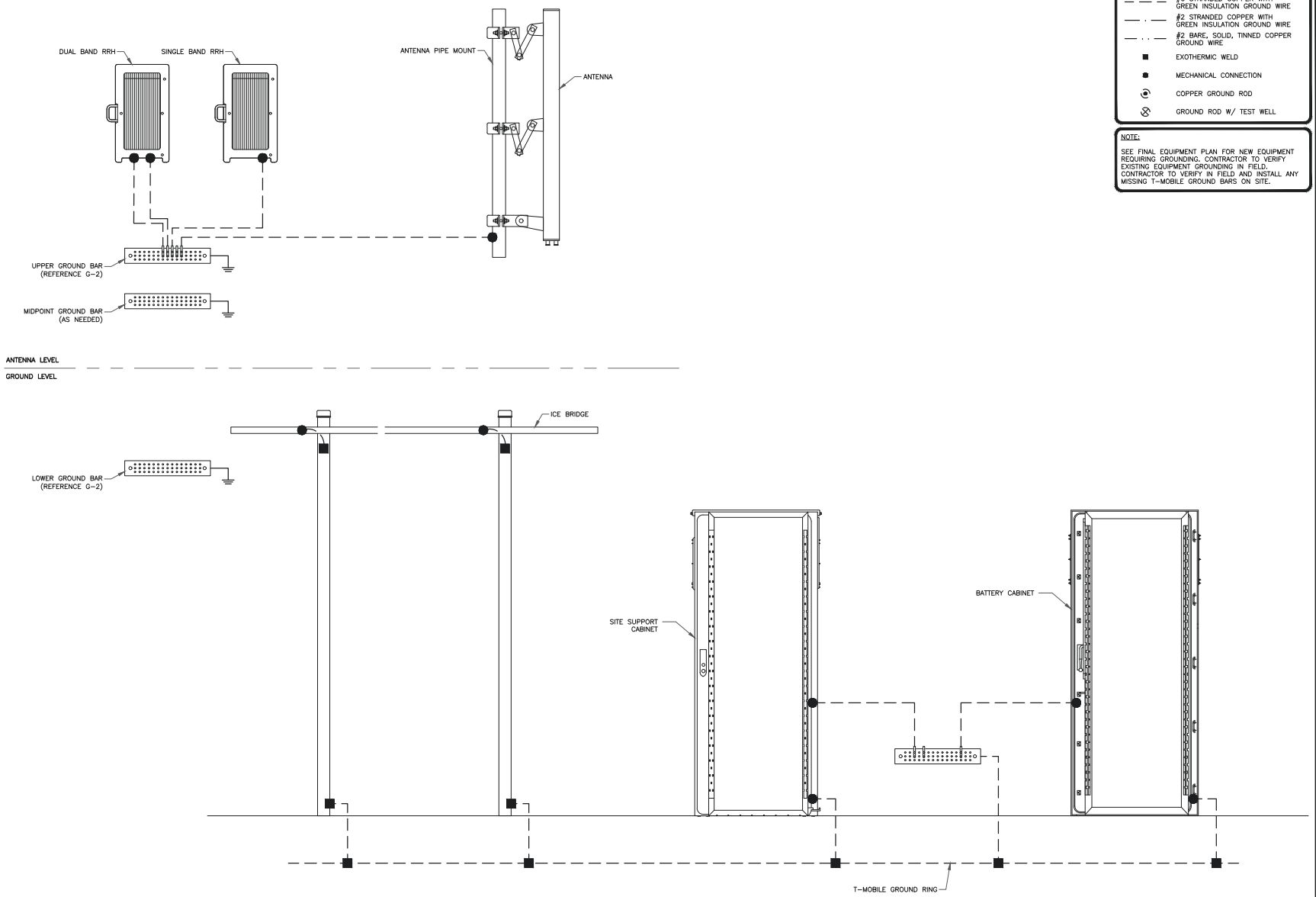
STATE OF CONNECTICUT · DEREK J. CREASER · LICENSED PROFESSIONAL ENGINEER

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: E-2

REVISION: 0

T-MOBILE_NATIONAL_ANCHOR



1 TYPICAL FINAL GROUNDING SCHEMATIC
SCALE: NOT TO SCALE

GROUNDING PLAN LEGEND:

- #6 STRANDED COPPER WITH GREEN INSULATION GROUND WIRE
- #2 STRANDED COPPER WITH GREEN INSULATION GROUND WIRE
- #2 BARE, SOLID, TINNED COPPER GROUND WIRE
- EXOTHERMIC WELD
- MECHANICAL CONNECTION
- COPPER GROUND ROD
- GROUND ROD W/ TEST WELL

NOTE:

SEE FINAL EQUIPMENT PLAN FOR NEW EQUIPMENT REQUIRING GROUNDING. CONTRACTOR TO VERIFY EXISTING EQUIPMENT GROUNDING IN FIELD. CONTRACTOR TO VERIFY IN FIELD AND INSTALL ANY MISSING T-MOBILE GROUND BARS ON SITE.

T-Mobile

CROWN CASTLE

P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE, SUITE 450
CHARLOTTE, NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11501E

BU #: **842856**
CROWN CASTLE SITE NAME:
ANDOVER NORTH

122 JONATHAN TRUMBULL HIGHWAY (ROUTE 6)
ANDOVER, CT 06232

EXISTING 149'-0"
MONOPOLE TOWER

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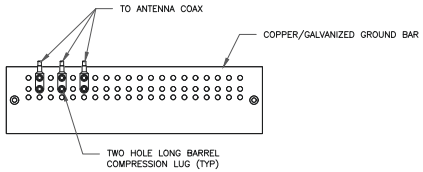
STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER:	REVISION:
G-1	0

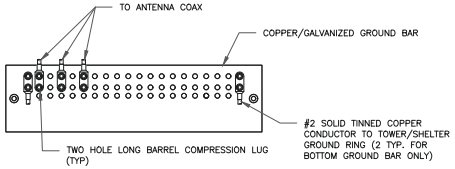
T-MOBILE_NATIONAL_ANCHOR



NOTES:

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

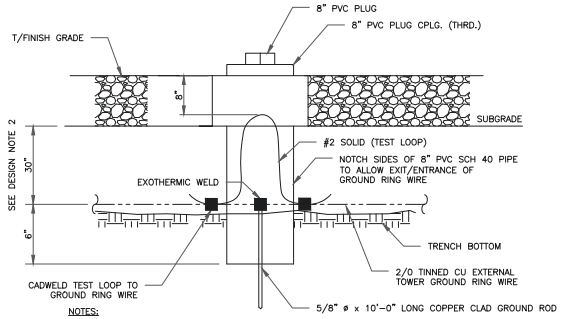
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

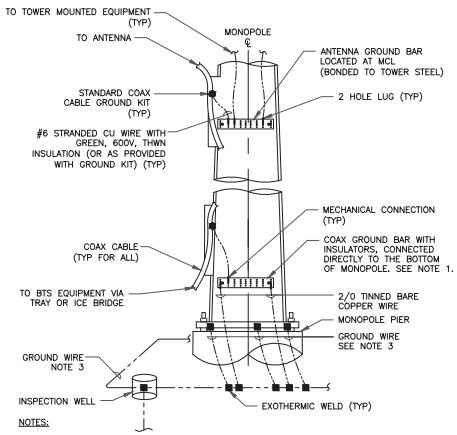
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

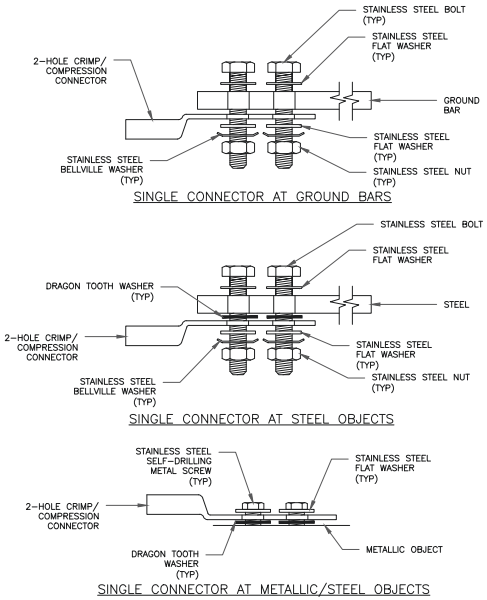
3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



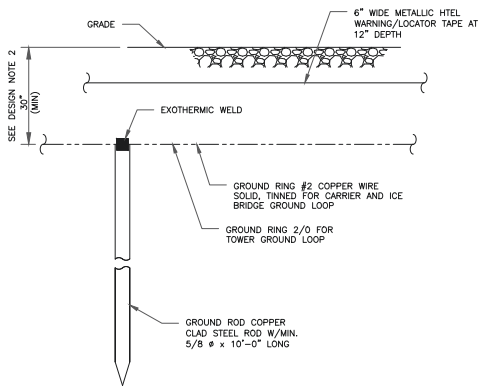
NOTES:

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

4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

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

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

T-MOBILE

CROWN CASTLE

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T-MOBILE SITE NUMBER:
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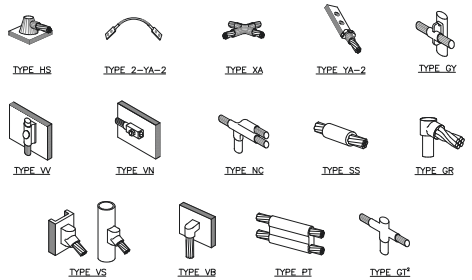
STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER: G-2
REVISION: 0

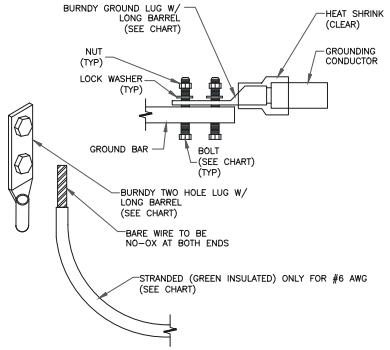


NOTE:

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

1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE

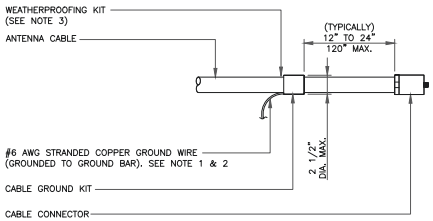
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



NOTES:

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

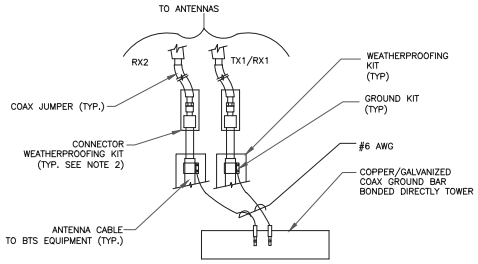
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



NOTES:

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

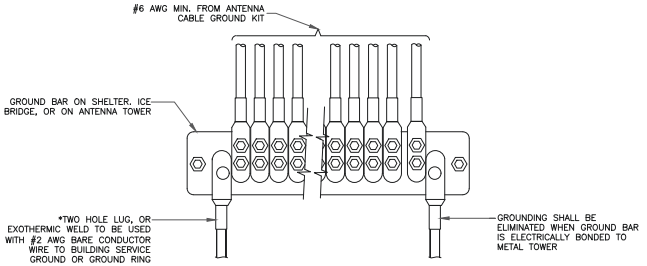
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



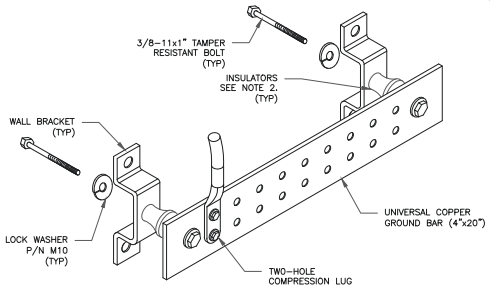
NOTES:

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

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



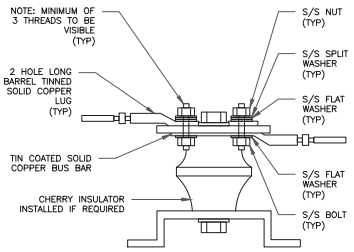
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



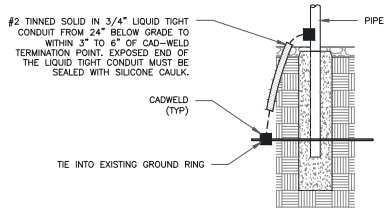
NOTES:

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

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

T-MOBILE

CROWN CASTLE

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE, SUITE 450
CHARLOTTE, NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11501E

BU #: **842856**
CROWN CASTLE SITE NAME:
ANDOVER NORTH

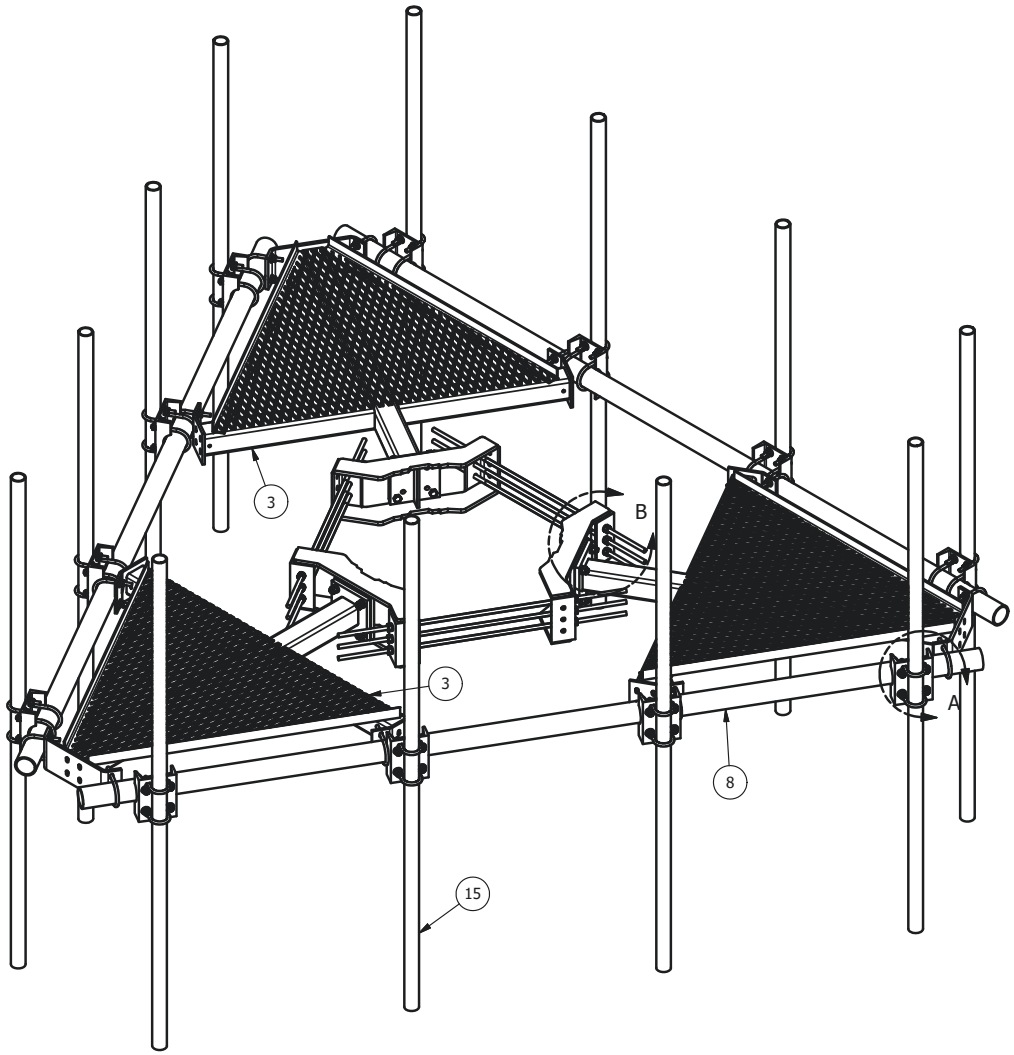
122 JONATHAN TRUMBULL HIGHWAY (ROUTE 6)
ANDOVER, CT 06232

EXISTING 149'-0"
MONOPOLE TOWER

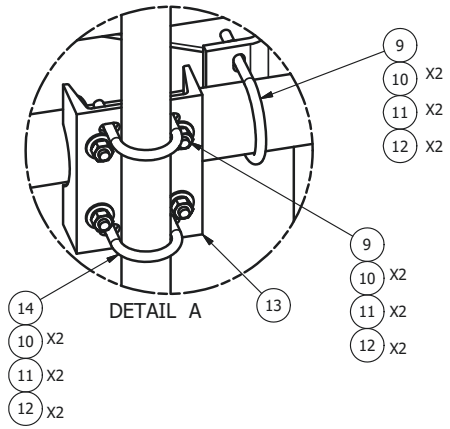
ISSUED FOR:

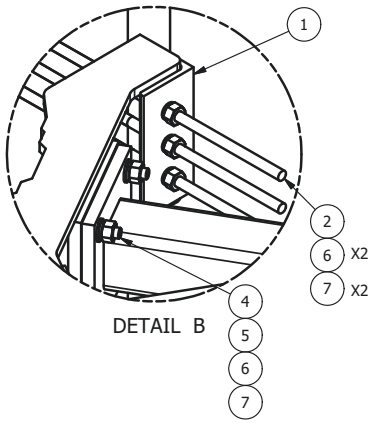
REV	DATE	DRWN	DESCRIPTION	DES./QA
0	01/05/2024	SMS	FINAL	JS

SHEET NUMBER:	REVISION:
G-3	0



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-LWRM	RING MOUNT WELDMENT		68.81	206.42
2	9	G58R-48	5/8" x 48" THREADED ROD (HDG.)		0.40	3.59
2	9	G58R-24	5/8" x 24" THREADED ROD (HDG.)		0.40	3.59
3	3	X-SV196	LOW PROFILE PLATFORM CORNER		212.10	636.31
4	12	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2.75	0.36	4.27
5	12	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.41
6	30	G58LW	5/8" HDG LOCKWASHER		0.03	0.78
7	30	A58NUT	5/8" HDG A325 HEX NUT		0.13	3.90
8	3	P3150	3-1/2" X 150" SCH 40 GALVANIZED PIPE	150.000 in	94.80	284.40
9	36	X-UB1306	1/2" X 3-5/8" X 6" X 3" U-BOLT (HDG.)		0.26	9.25
10	120	G12FW	1/2" HDG USS FLATWASHER		0.03	4.09
11	120	G12LW	1/2" HDG LOCKWASHER		0.01	1.67
12	120	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	8.60
13	12	X-SP219	SMALL SUPPORT CROSS PLATE	8.250 in	8.61	103.33
14	24	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.26	6.17
15	12	B	ANTENNA MOUNTING PIPE	C	D	E





2-3/8" O.D. VERTICAL MOUNTING PIPES					
ASSEMBLY NO. "A"	PART NO. "B"	LENGTH, "C"	UNIT WEIGHT, "D"	NET WEIGHT, "E"	TOTAL WEIGHT
RMQP-463	P263	63"	20.18	242.16	1591.11
RMQP-472	P272	72"	23.07	276.84	1625.79
RMQP-484	P284	84"	26.91	322.92	1671.87
RMQP-496	P296	96"	30.76	369.12	1718.07
RMQP-4126	P2126	126"	40.75	489.00	1837.95

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	ADDED 10' 6" ANTENNA MOUNTING PIPES		CEK	7/9/2015

REVISION HISTORY

TOLERANCE NOTE

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
LOW PROFILE CO-LOCATION PLATFORM
FOR 12 ANTENNAS WITH 12' 6" FACE WIDTH
FOR 12" - 38" DIAMETER POLES

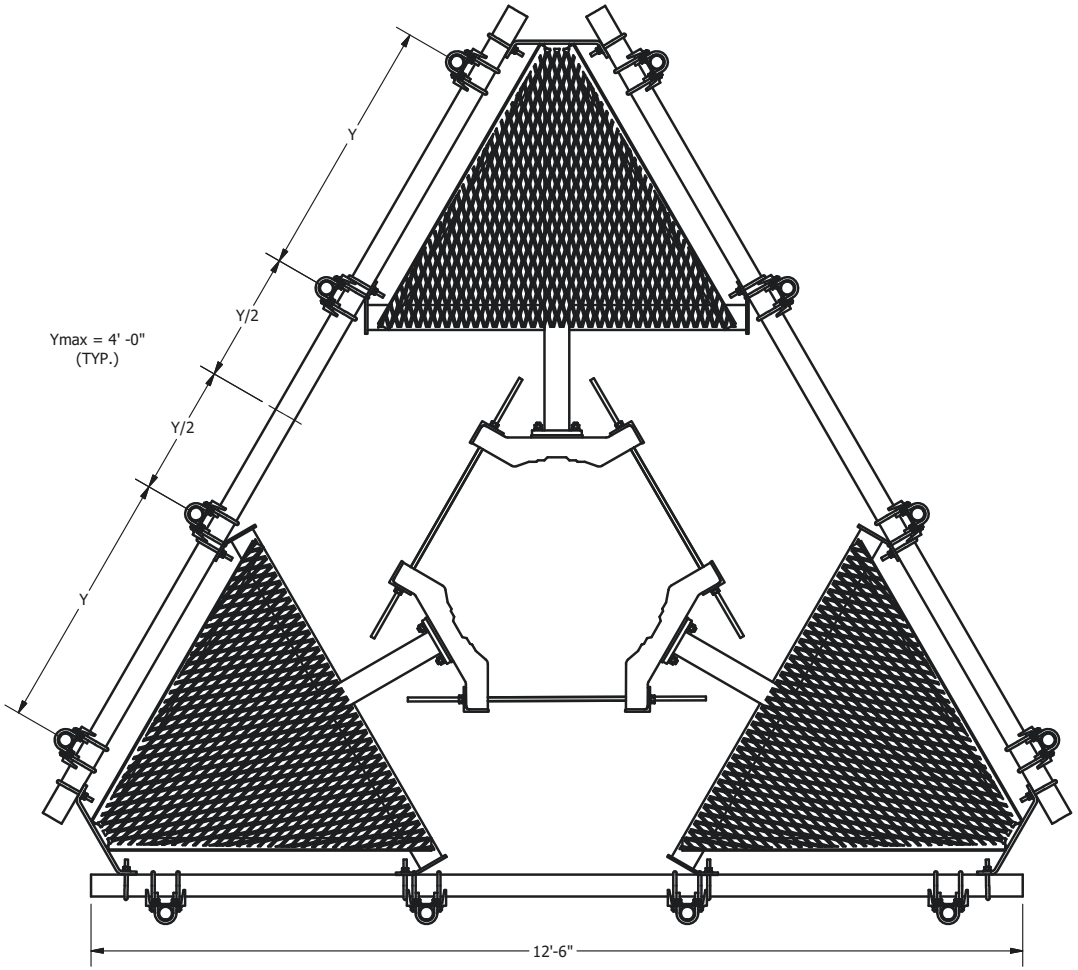
SITE PRO 1
A valmont COMPANY

Engineering Support Team:
1-888-753-7446

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

DRAWN BY	CPD NO.	DRAWING USAGE	PART NO.
CEK 1/20/2012	semb	CUSTOMER	SEE ASSEMBLY NO. "A"

ENG. APPROVAL	CHECKED BY	DWG. NO.
	BMC 7/9/2015	RMQP-4XX



TOLERANCE NOTE

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")

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	ADDED 10' 6" ANTENNA MOUNTING PIPES		CEK	7/9/2015

REVISION HISTORY

DESCRIPTION
LOW PROFILE CO-LOCATION PLATFORM
FOR 12 ANTENNAS WITH 12' 6" FACE WIDTH
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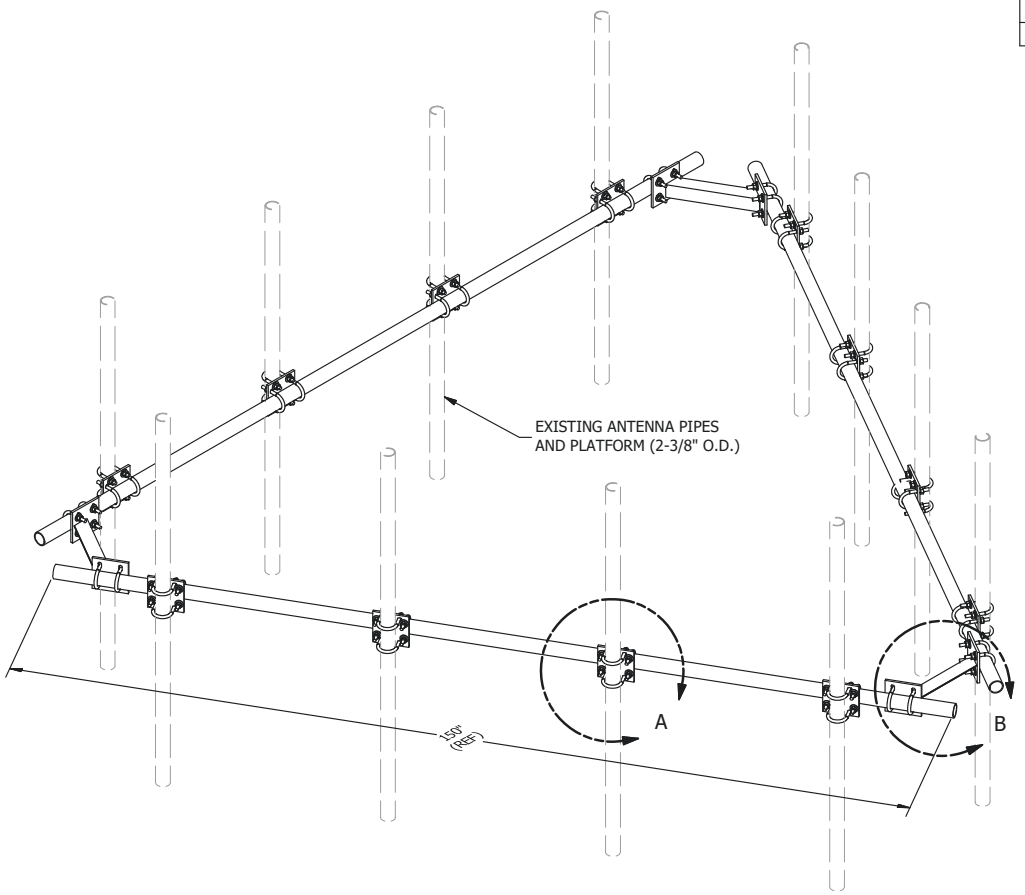
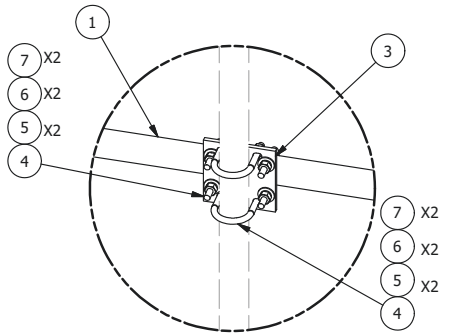
DRAWN BY	CPD NO.	DRAWING USAGE	PART NO.
CEK 1/20/2012	semb	CUSTOMER	SEE ASSEMBLY NO. "A"

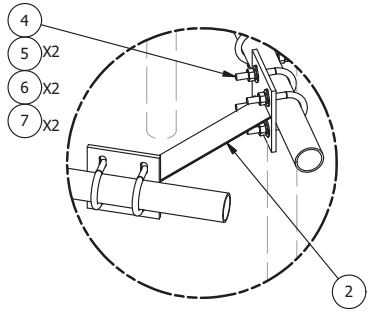
ENG. APPROVAL	CHECKED BY	DWG. NO.
	BMC 7/9/2015	RMQP-4XX

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	P2150	2-3/8" O.D. X 150" SCH 40 GALVANIZED PIPE	150 in	45.77	137.31
2	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
3	12	SCX1	CROSSOVER PLATE 2-3/8" X 2-3/8"	6 in	3.71	44.50
4	60	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.63	37.51
5	120	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	4.09
6	120	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	1.67
7	120	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	8.60
					TOTAL WT. #	272.43





DETAIL A



DETAIL B

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	REPLACED HCP WITH X-AHCP		CEK	7/10/2014

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: **HANDRAIL KIT FOR 12'-6" FACE**

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 5/30/2012		HRK12

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	BMC 7/13/2014	HRK12