



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

January 11, 2024

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

RE: **Notice of Exempt Modification for T-Mobile: CTNL140B**  
**Crown Site ID# 857013**  
**280 Ross Road, Killingly, CT 06239**  
**Latitude: 41° 46' 17.49" / Longitude: -71° 51' 20.39"**

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 110-foot mount on the existing 119-foot monopole tower located at 280 Ross Road, Killingly, CT. The property is owned by Snake Meadow Club 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 110ft 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 B41
- (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) RFS/Celwave-HB114-U6S12-XXX-LI Hybrid Cable
- (6) Andrew LDF-50A Coaxial Cables
- (6) AVA7-50 Coaxial Cables

**Ground:**

Install New:

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

Melanie A. Bachman

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Remove:

- (1) RBS-6102 MUAC Enclosure
- (1.) Batter Back up Unit


The facility was approved by the Connecticut Siting Council Docket NO.283 on June 23, 2004.

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 Mary Calorio – Town Manager, Town of Killingly, Ann-Marie Aubrey – Director of Planning and Development, Town of Killingly. Snake Meadow Club 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  
Site Acquisition Specialist  
1800 W. Park Drive  
Westborough, MA 01581  
(781) 970-0053  
Jeff.Barbadora@crowncastle.com

Melanie A. Bachman

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Attachments

cc:

Mary Calorio – Town Manager  
Town of Killingly  
172 Main Street  
Killingly, CT 06239  
860-779-5335

Ann-Marie Aubrey – Director of Planning and Development  
Town of Killingly  
172 Main Street  
Killingly, CT 06239  
860-779-5313

Snake Meadow Club Inc  
c/o Paul Chase  
PO BOX 236  
Central Village, CT 06332-0236

Crown Castle - Tower Owner

The Assessor's office is responsible for the maintenance of records on the ownership of properties. These assessments are computed at 70% of the estimated market value as of the 10/1/2023 Revaluation prior to any informal hearings. In conjunction with the 2023 revaluation assessment notices, you may review your new assessment with a representative of Tyler Technologies by scheduling an informal hearing. Informal hearings will be held by appointment only.



Information on the Property Records for the Municipality of Killingly was last updated on 11/30/2023.



### Parcel Information

Location:	280 ROSS RD	Property Use:	Vacant Land	Primary Use:	PA490
Unique ID:	1365	Map Block Lot:	256-2	Acres:	7.8000
490 Acres:	7.30	Zone:	RD	Volume / Page:	0625/0206
Developers Map / Lot:		Census:	9041-4062		
Location:	280 ROSS RD	Property Use:	Vacant Land	Primary Use:	PA490

Unique ID:	1365	Map Block Lot:	256-2	Acres:	7.8000
490 Acres:	7.30	Zone:	RD	Volume / Page:	0625/0206
Developers Map / Lot:		Census:	9041-4062		

### Value Information

	Appraised Value	Assessed Value
Land	70,470	39,570
Buildings	0	0
Detached Outbuildings	282,000	197,400
Total	352,470	236,970

### Owner's Information

Owner's Data
SNAKE MEADOW CLUB INC % PAUL CHASE PO BOX 236 CENTRAL VILLAGE, CT 06332-0236

### Detached Outbuildings

Type:	Year Built:	Length:	Width:	Area:
Chain Fence	0000	0.00	0.00	1
Cell Tower	2018	300.00	1.00	300

## Owner History - Sales

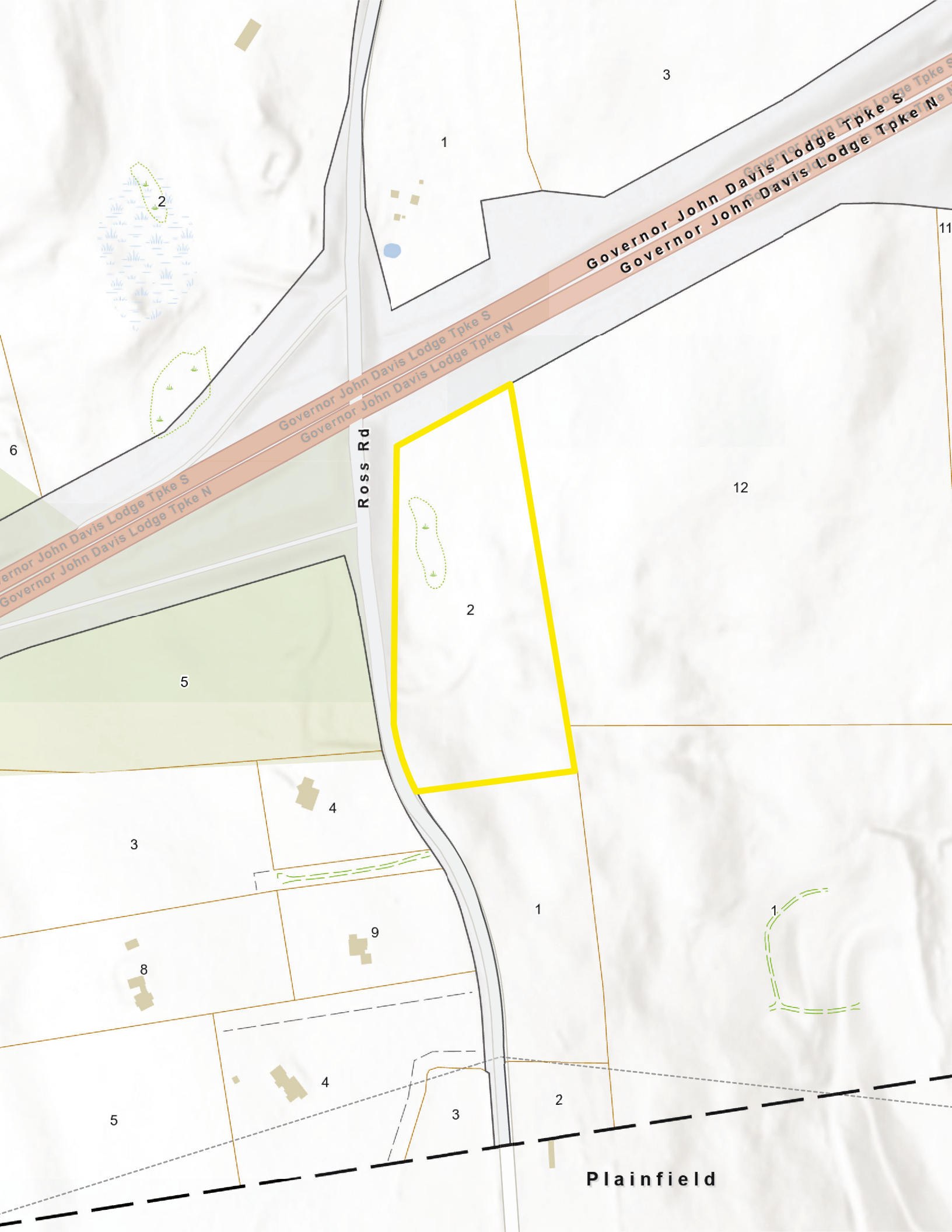
Owner Name	Volume	Page	Sale Date	Deed Type	Sale Price
	0000	0000	04/01/1995		\$40,000

## Building Permits

Permit Number	Permit Type	Date Opened	Reason
22-591	T:BUSINESS PERSONAL PROPERTY	08/17/2022	DISH WIRELESS TO INSTALL 3 ANTENNAS & ASSOC CABINET EQUIP TO EXISTING CELL TOWER COMPOUND
21-000575	T:BUSINESS PERSONAL PROPERTY	04/28/2021	TMOBILE TO REMV & RPL 3 EXISTING ANTENNAS W/3 NEW ANTENNAS
26488	Generator	11/30/2018	INSTALL DC GENERATOR ON EXISTING CONCRETE PAD
25597	Electrical	10/06/2017	CELLULAR FACILITY CABINET - 100 AMP SVC FROM EXISTING METER BANK FOR SMARTSKY NETWORKS
25494	T:BUSINESS PERSONAL PROPERTY	08/18/2017	INSTALL 2 HIGH CAPACITY SECTOR MOUNTS, 6 ANTENNAS, 6 REMOTE RADIO HEADS, SURGE PROTECTION 7/8" HYBRI
24777	T:COMMERCIAL REPLACT	09/27/2016	VERIZON WIRELESS TO REPL ALL 12 ANTENNA PANELS & ADD REMOTE RADIO HEADS TO EXISTING CELL TOWER
23754	T:BUSINESS PERSONAL PROPERTY	07/14/2015	INSTALL 3 NEW ANTENNAES, 3 NEW BIAS TEES, 6 COAX LINES & 1 CABINET AT EXIST SITE
23750	T:BUSINESS PERSONAL PROPERTY	07/13/2015	REFACE ANTENNA PANELS W/NEW MODELS & ADD REMOTE RADIO HEADS
22123	T:BUSINESS PERSONAL PROPERTY	11/30/2012	AT&T SITE MODIFICATIONS-ADD 3 ANTENNAS, 6 RRH'S & SURGE ARRESTOR TO EXISTING

Permit Number	Permit Type	Date Opened	Reason
19933	Electrical	04/13/2009	NVC NEW 200 AMP SVC
19903	T:BUSINESS PERSONAL PROPERTY	03/13/2009	MODIFY TOWERS, ADD ANTENNAS, PLACE EQUIP BLDG ON CONCRETE PAD
18229	T:BUSINESS PERSONAL PROPERTY	08/17/2006	CBLD WIRELESS F
17776	Commercial	02/10/2006	MONOPOLE & TELECOM
17925	T:BUILDING	04/06/2003	TELE EQU NVC RE

Information Published With Permission From The Assessor



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Governor John Davis Lodge Tpke S  
Governor John Davis Lodge Tpke N

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Governor John Davis Lodge Tpke S  
Governor John Davis Lodge Tpke N

Ross Rd

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Plainfield



# Connecticut Siting Council<sup>(/CSC)</sup>

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**DOCKET NO. 283** – New Cingular Wireless PCS,LLC Certificate of Environmental Compatibility and Public need for the construction, maintenance and operation of a wireless telecommunications facility at 280 Ross Road in Killingly, Connecticut.

} Connecticut

} Siting

} Council

June 23, 2004

## Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to AT&T Wireless PCS, LLC d/b/a AT&T Wireless for the construction, maintenance and operation of a wireless telecommunications facility at Site C, located at 280 Ross Road, Killingly, Connecticut. The Council denies certification of Site A and Site B located at 25 Klocek Road, Killingly, 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 and other entities, both public and private, but such tower shall not exceed a height of 120 feet above ground level. The height at the top of the antennas shall not exceed 123 feet above ground level.
2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Killingly, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
  - a. comments from the Town of Killingly regarding the type of tower to be constructed;
  - b. a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas, equipment building, access road, utility line, and landscaping; and
  - c. construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.
3. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case

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

4. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.
5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

6. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.
7. If the facility does not initially provide wireless services within one year of completion of construction or ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.
8. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.
9. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved. Any request for extension of this period shall be filed with the Council not later than sixty days prior to expiration date of this Certificate and shall be served on all parties and intervenors, as listed in the service list. Any proposed modifications to this Decision and Order shall likewise be so served.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the [Norwich Bulletin](#).

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:

<b><u>Applicant</u></b>	<b><u>Its Representative</u></b>
AT&T Wireless PCS, LLC d/b/a AT&T Wireless	Christopher B. Fisher, Esq. Lucia Chiochio, Esq. Cuddy & Feder LLP

**Barbadora, Jeff**

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<b>TO</b>	Town of Killingly Mary Calorio - Town Manager 172 Main Street KILLINGLY, CT, US, 06239
<b>REFERENCE</b>	799001.7680
<b>SHIPPER REFERENCE</b>	799001.7680
<b>SHIP DATE</b>	Thu 1/11/2024 06:43 PM
<b>DELIVERED TO</b>	Receptionist/Front Desk
<b>PACKAGING TYPE</b>	FedEx Envelope
<b>ORIGIN</b>	WESTBOROUGH, MA, US, 01581
<b>DESTINATION</b>	KILLINGLY, CT, US, 06239
<b>NUMBER OF PIECES</b>	1
<b>TOTAL SHIPMENT WEIGHT</b>	0.50 LB
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**Barbadora, Jeff**

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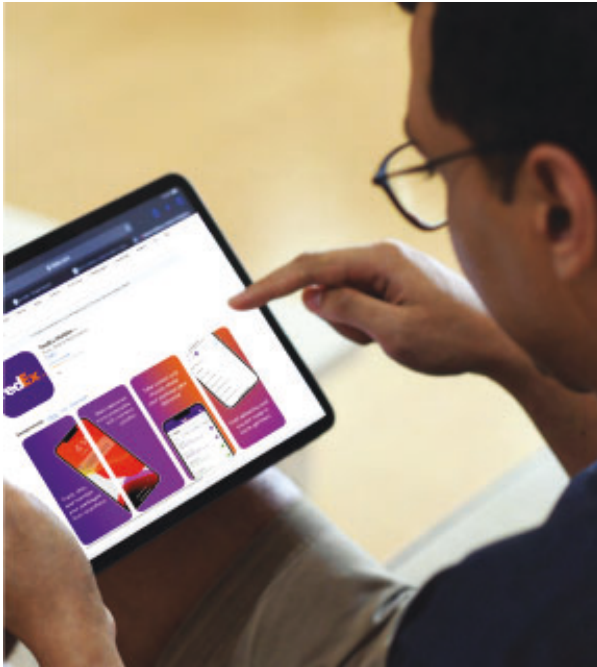
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<b>FROM</b>	Crown Castle 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
<b>TO</b>	Town of Killingly Ann-Marie Aubrey - Dir of Planning 172 Main Street KILLINGLY, CT, US, 06239
<b>REFERENCE</b>	799001.7680
<b>SHIPPER REFERENCE</b>	799001.7680
<b>SHIP DATE</b>	Thu 1/11/2024 06:43 PM
<b>DELIVERED TO</b>	Receptionist/Front Desk
<b>PACKAGING TYPE</b>	FedEx Envelope
<b>ORIGIN</b>	WESTBOROUGH, MA, US, 01581
<b>DESTINATION</b>	KILLINGLY, CT, US, 06239
<b>NUMBER OF PIECES</b>	1
<b>TOTAL SHIPMENT WEIGHT</b>	0.50 LB
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# 12

January  
2024 ⓘ

by

**6:00pm** ⓘ

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**To:** [Jeff Barbadora](mailto:Jeff.Barbadora); [Barbadora\\_Jeff](mailto:Barbadora_Jeff)  
**Date:** Wednesday, January 17, 2024 11:13:52 AM

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Date: **September 12, 2023**

# INFINIGY

Infinigy  
500 West Office Center Drive, Suite 150  
Fort Washington, PA 19034  
(518) 690-0790  
structural@infinigy.com

**Subject:** **Mount Analysis Report**

**Carrier Designation:** **T-Mobile Anchor**  
**Carrier Site Number:** CTNL140B  
**Carrier Site Name:** NL140/Cingular Ross Rd\_MP

**Crown Castle Designation:** **Crown Castle BU Number:** 857013  
**Crown Castle Site Name:** KILLINGLY ROSS ROAD  
**Crown Castle JDE Job Number:** 752564  
**Crown Castle Order Number:** 655747 Rev. 0

**Engineering Firm Designation:** **Infinigy Report Designation:** 1039-Z0001-B

**Site Data:** **280 Ross Road, Killingly, Windham County, CT, 06239**  
**Latitude 41°46'17.59" Longitude -71°51'20.39"**

**Structure Information:** **Tower Height & Type:** **119.0 ft Monopole**  
**Mount Elevation:** **108.0 ft**  
**Mount Type:** **14.4 ft Platform**

Infinigy is pleased to submit this “**Mount Analysis Report**” to determine the structural integrity of T-Mobile’s antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

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

## Platform

## Sufficient

This analysis utilizes an ultimate 3-second gust wind speed of 123 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: Christopher H. Lee, P.E., M.S.

Respectfully Submitted by: Emmanuel Poulin, P.E.

[structural@infinigy.com](mailto:structural@infinigy.com)



09/13/23

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**1) INTRODUCTION**

This is an existing 3 sector 14.4 ft Platform.

**2) ANALYSIS CRITERIA**

**Building Code:** 2021 IBC / 2022 Connecticut State Building Code  
**TIA-222 Revision:** TIA-222-H  
**Risk Category:** II  
**Ultimate Wind Speed:** 123 mph  
**Exposure Category:** B  
**Topographic Factor at Base:** 1.0  
**Topographic Factor at Mount:** 1.0  
**Ice Thickness:** 1.0 in  
**Wind Speed with Ice:** 50 mph  
**Seismic S<sub>s</sub>:** 0.186  
**Seismic S<sub>1</sub>:** 0.054  
**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
108.0	110.0	3	Ericsson	AIR 6419 B41 TMO CCIV2	14.4 ft Platform
		3	RFS/Celwave	APXVAALL24 43-U-NA20 TMO	
		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	655747 Rev. 0	CCI Sites
Loading Document	T-Mobile	RFDS Version: 4	TSA
Previous Mount Analysis	Infinigy	9494793	CCI Sites

### 3.1) Analysis Method

RISA-3D (Version 21.0.1), 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.

Infinigy Mount Analysis Tool V2.3.4, a tool internally developed by Infinigy, was used to calculate wind loading on all appurtenances, dishes and mount members for various loading cases. Selected output from the analysis is included in Appendix B "Software Input Calculations".

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *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. Infinigy 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, All Sectors)**

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1, 2	Mount Pipe(s)	MP3	108.0	54.6	Pass
	Horizontal(s)	MH2		16.9	Pass
	Standoff(s)	MS2		75.7	Pass
	Handrail(s)	MR2		49.8	Pass
	Support Angle(s)	M19		93.2	Pass
	Mount Connection(s)	-		28.4	Pass

<b>Structure Rating (max from all components) =</b>	<b>93.2%</b>
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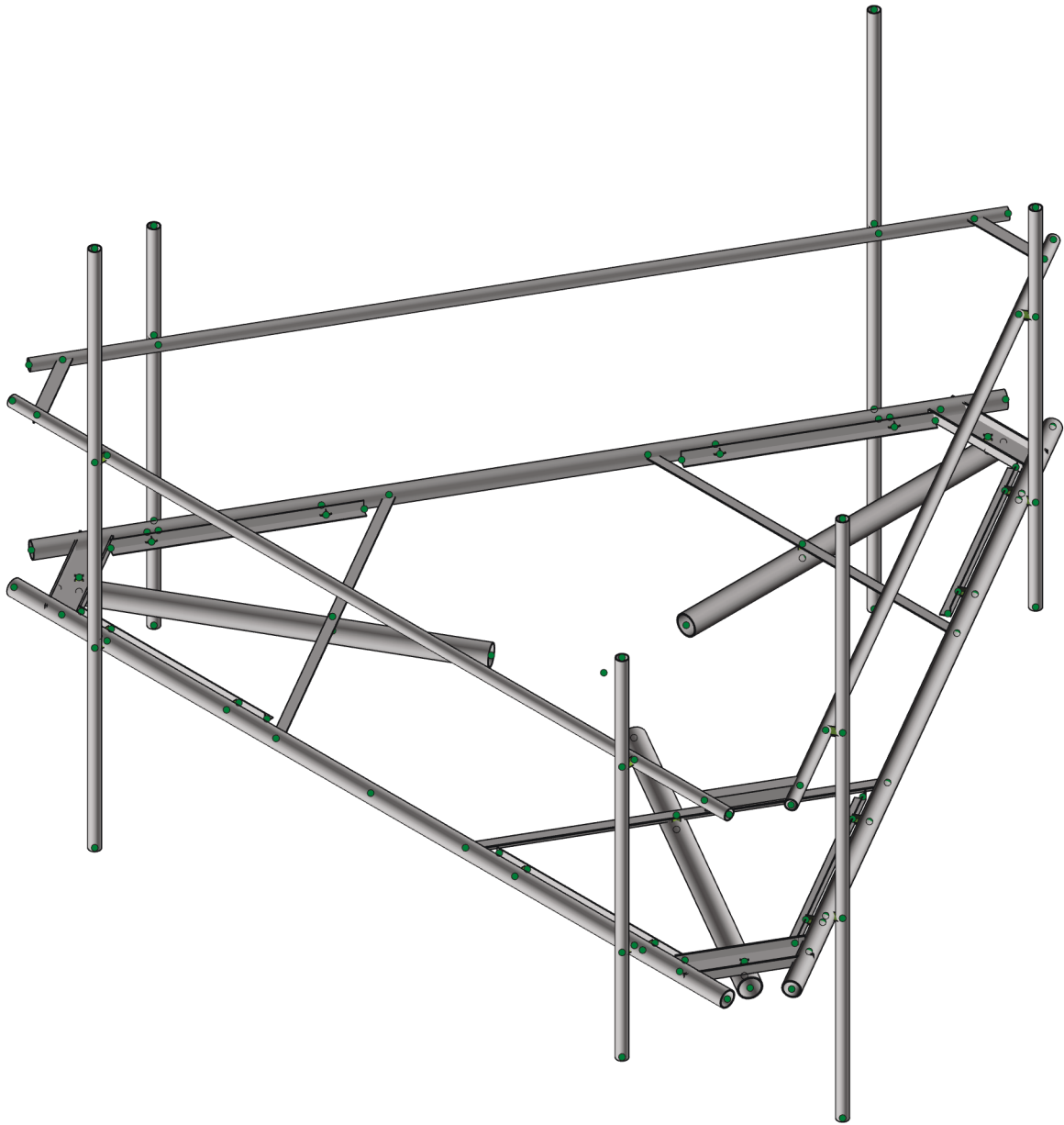
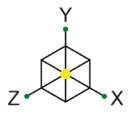
Notes:

- 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.

**4.1) Recommendations**

The mount has sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

**APPENDIX A**  
**WIRE FRAME AND RENDERED MODELS**



Infinigy Engineering

CL

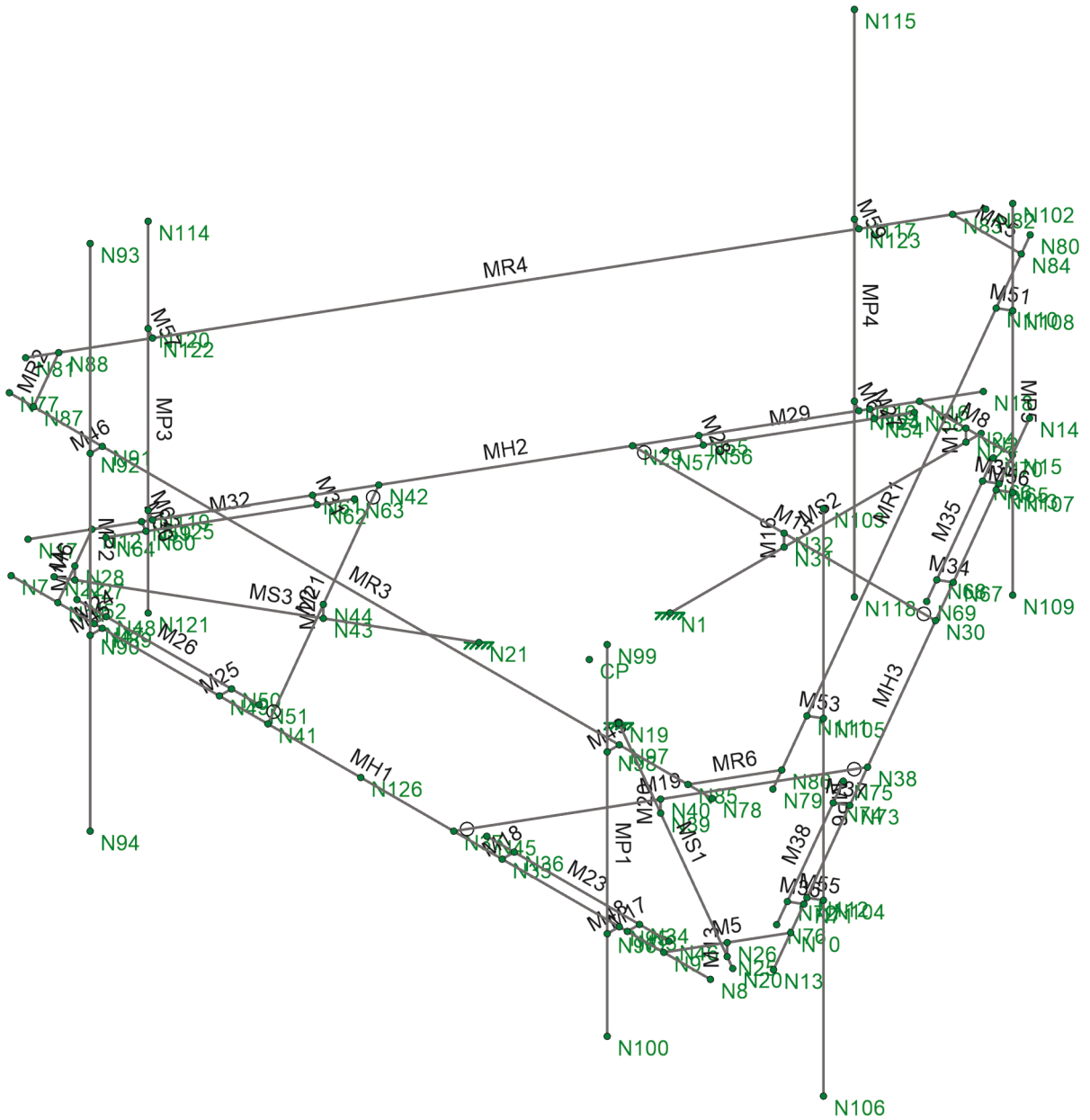
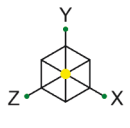
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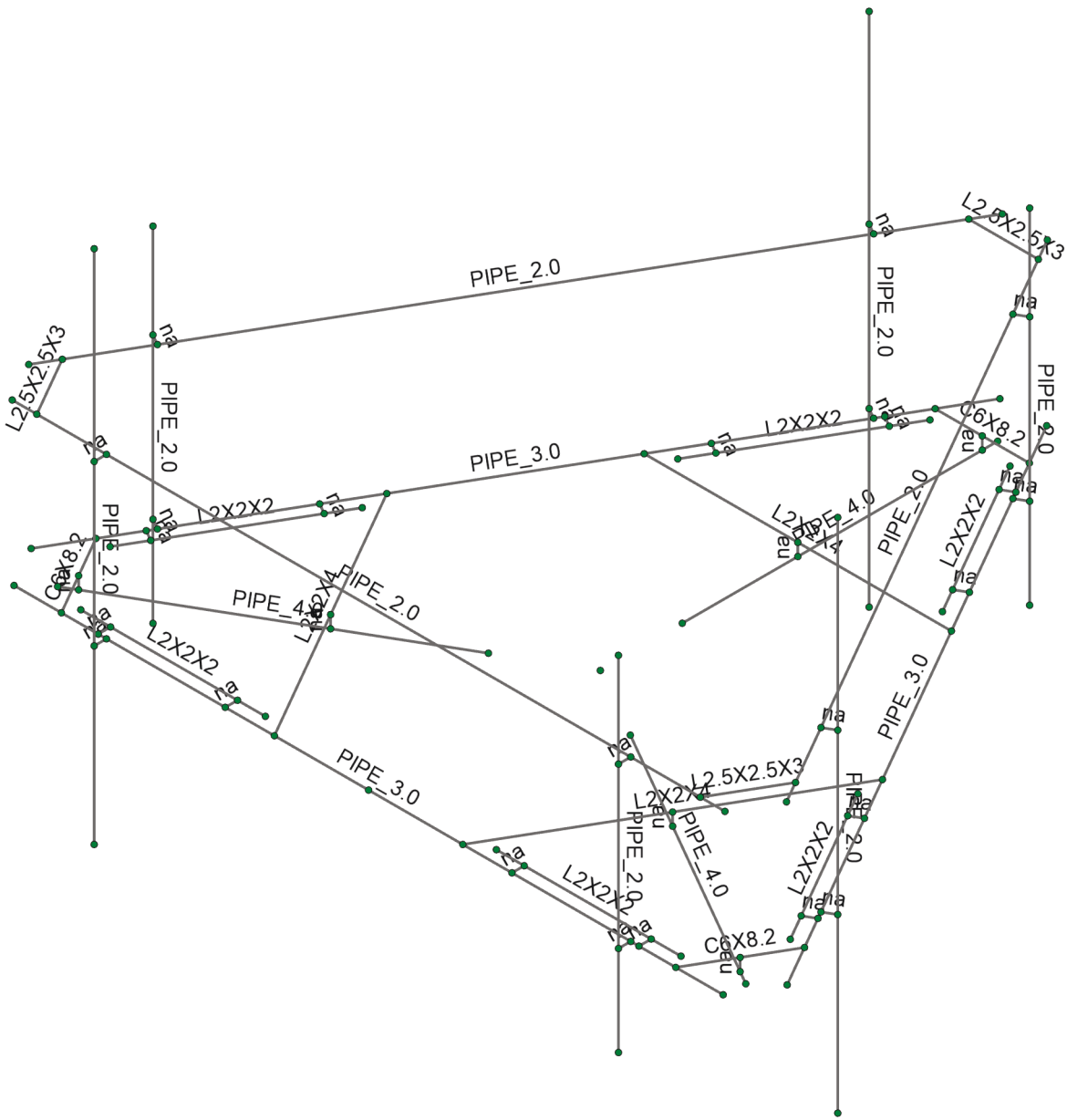
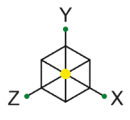
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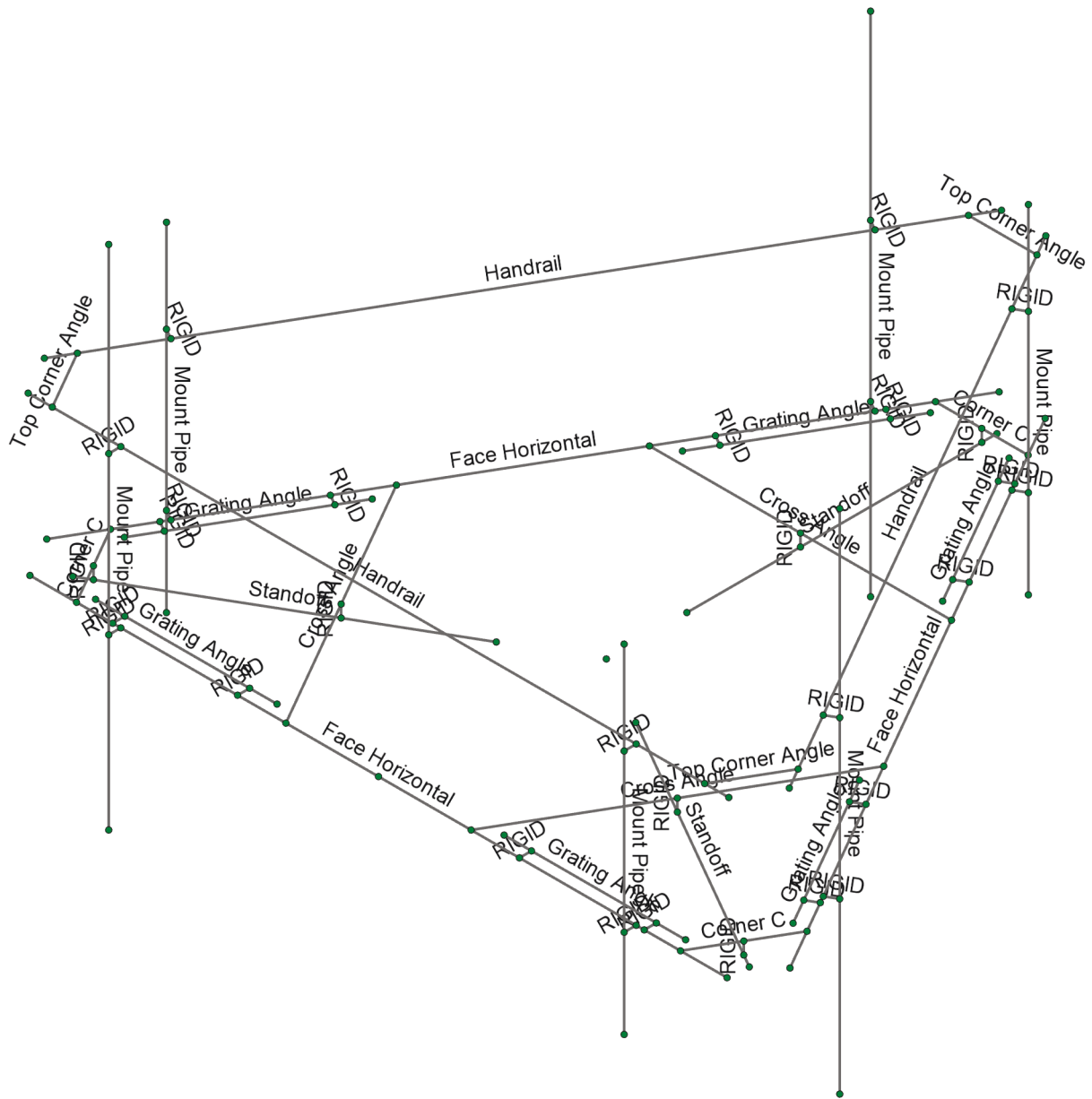


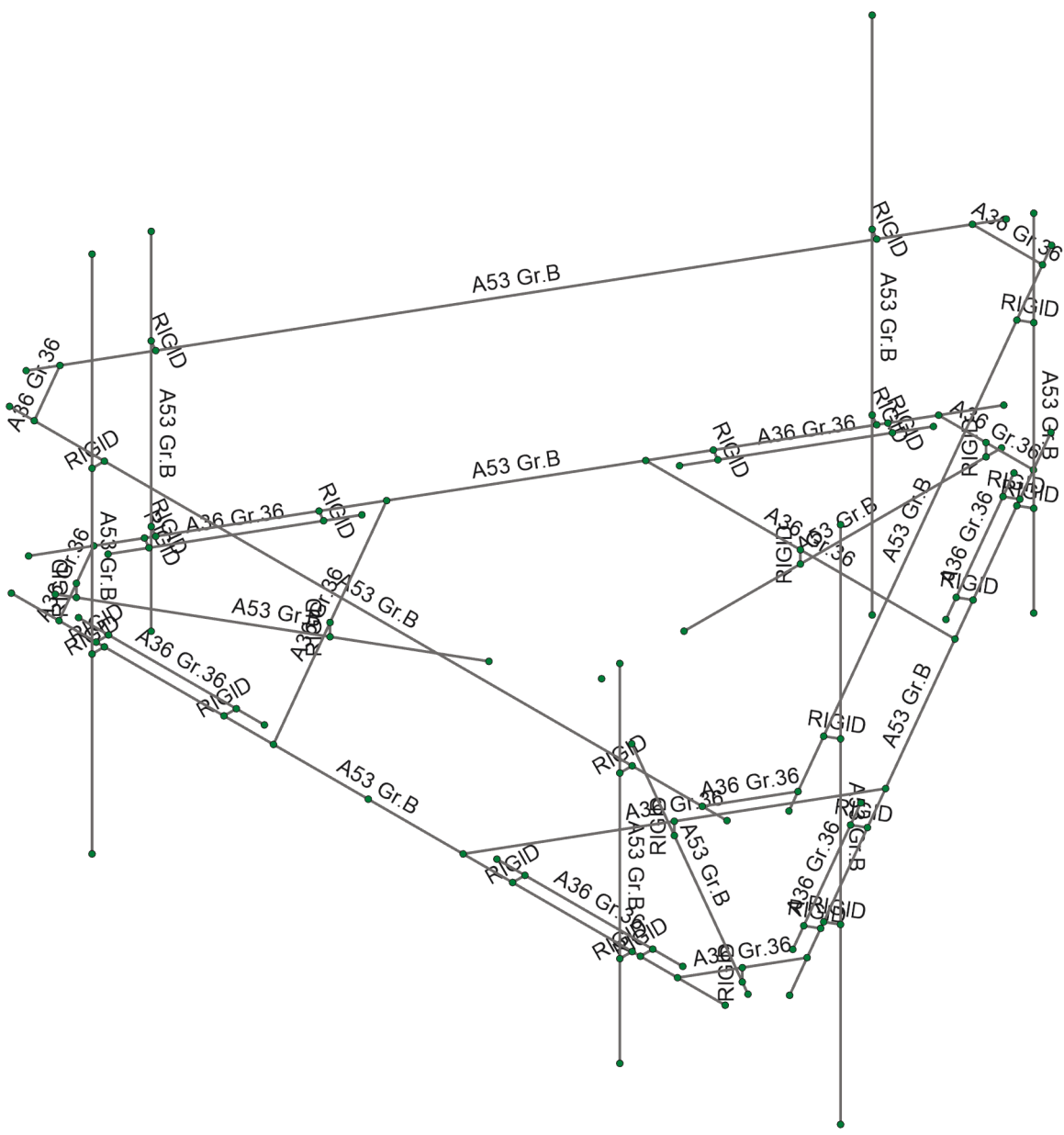


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1039-Z0001-B

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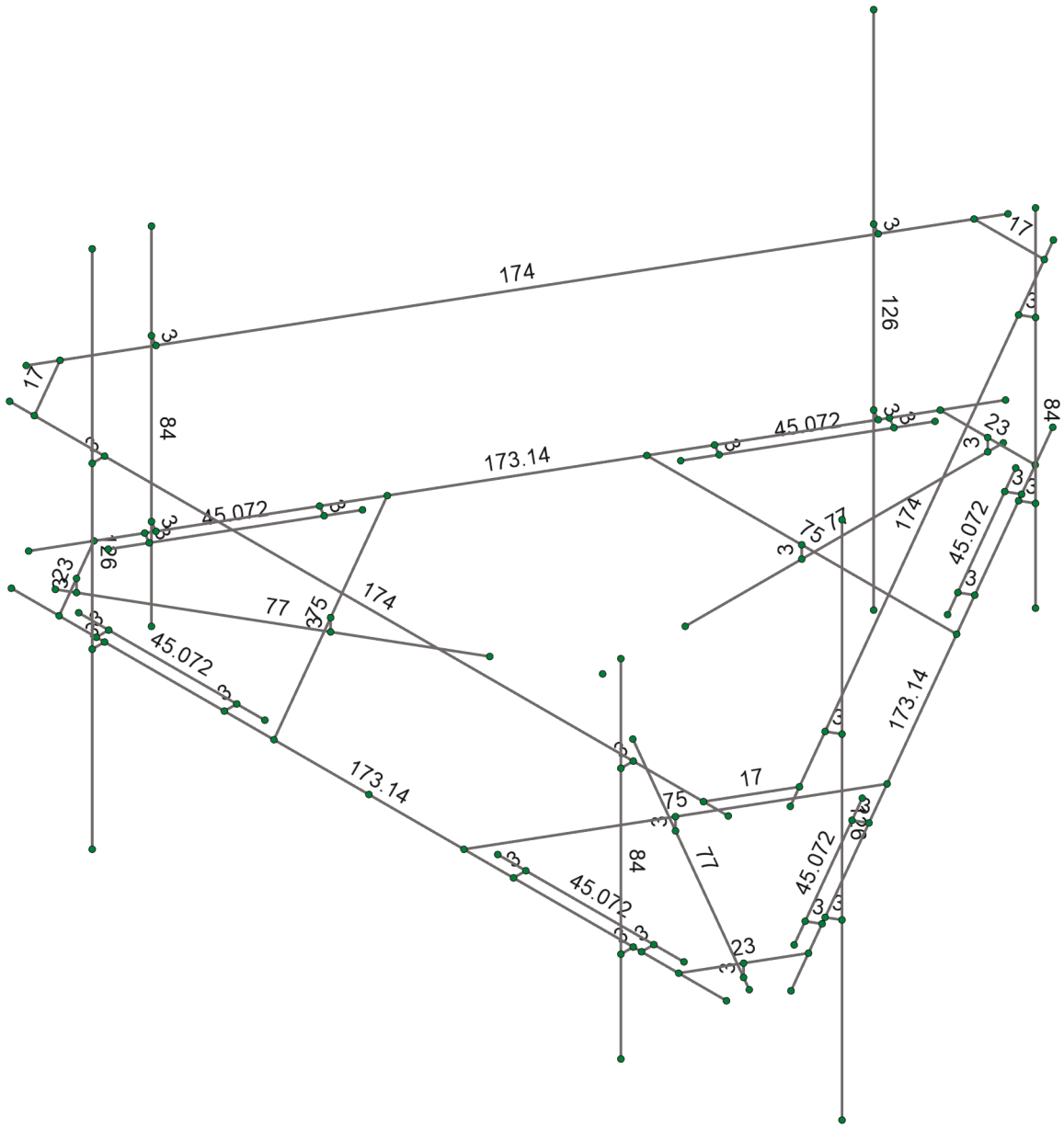




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1039-Z0001-B

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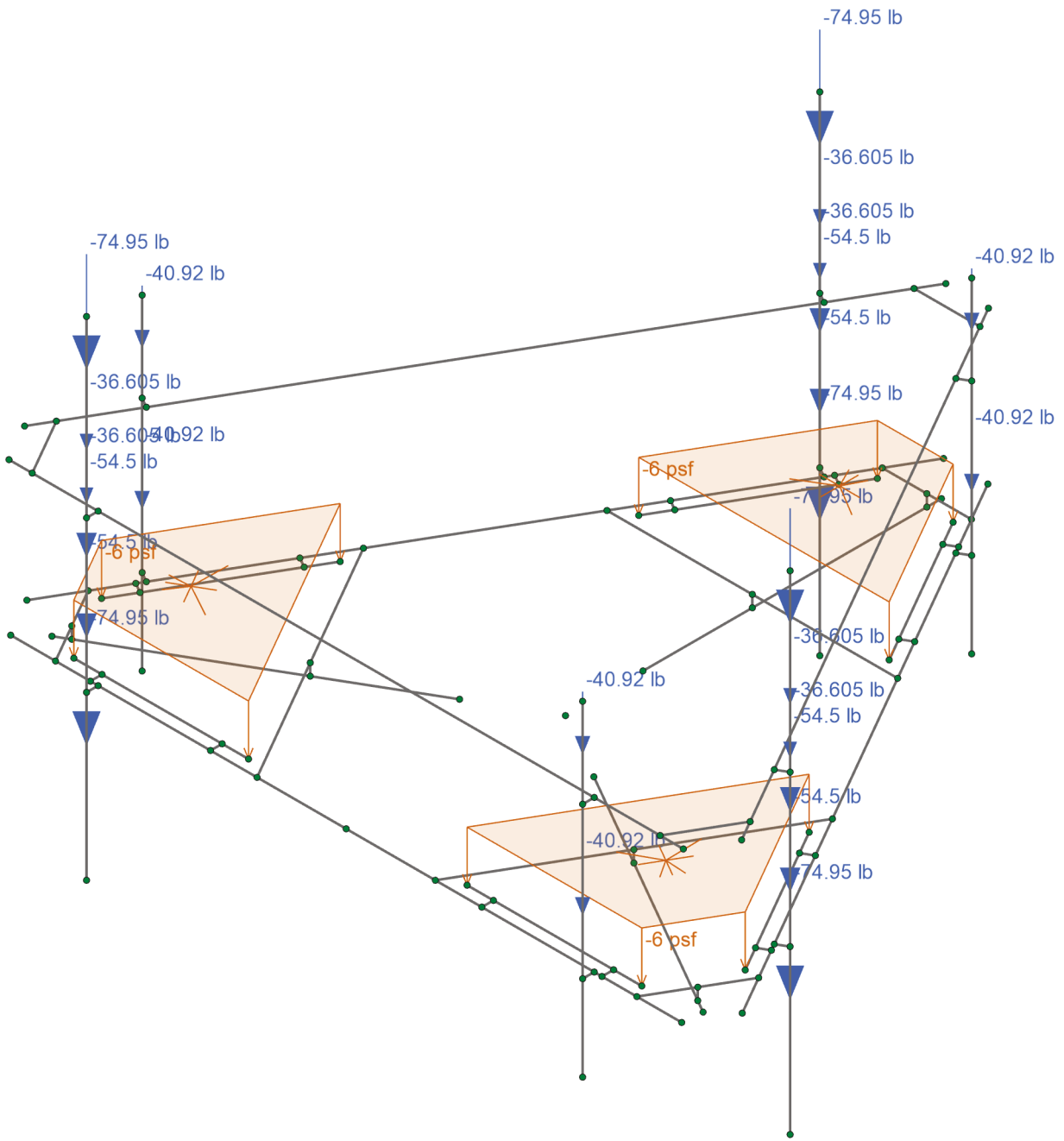
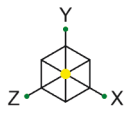
Member Length (in) Displayed

Infinigy Engineering
CL
1039-Z0001-B

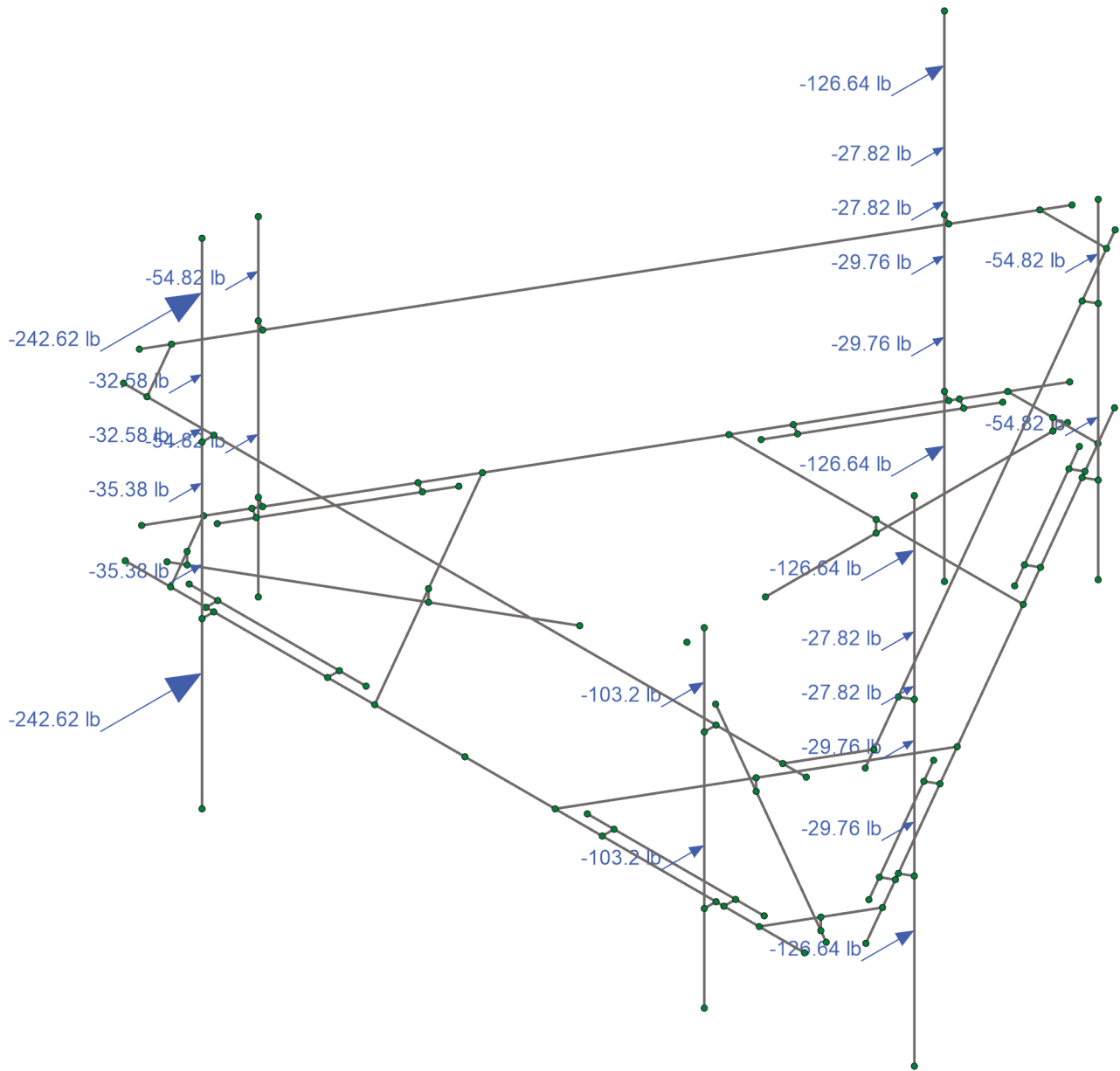
857013
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Length
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857013_loaded.r3d





Loads: BLC 1, Self Weight		
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CL		Sep 12, 2023 at 06:48 AM
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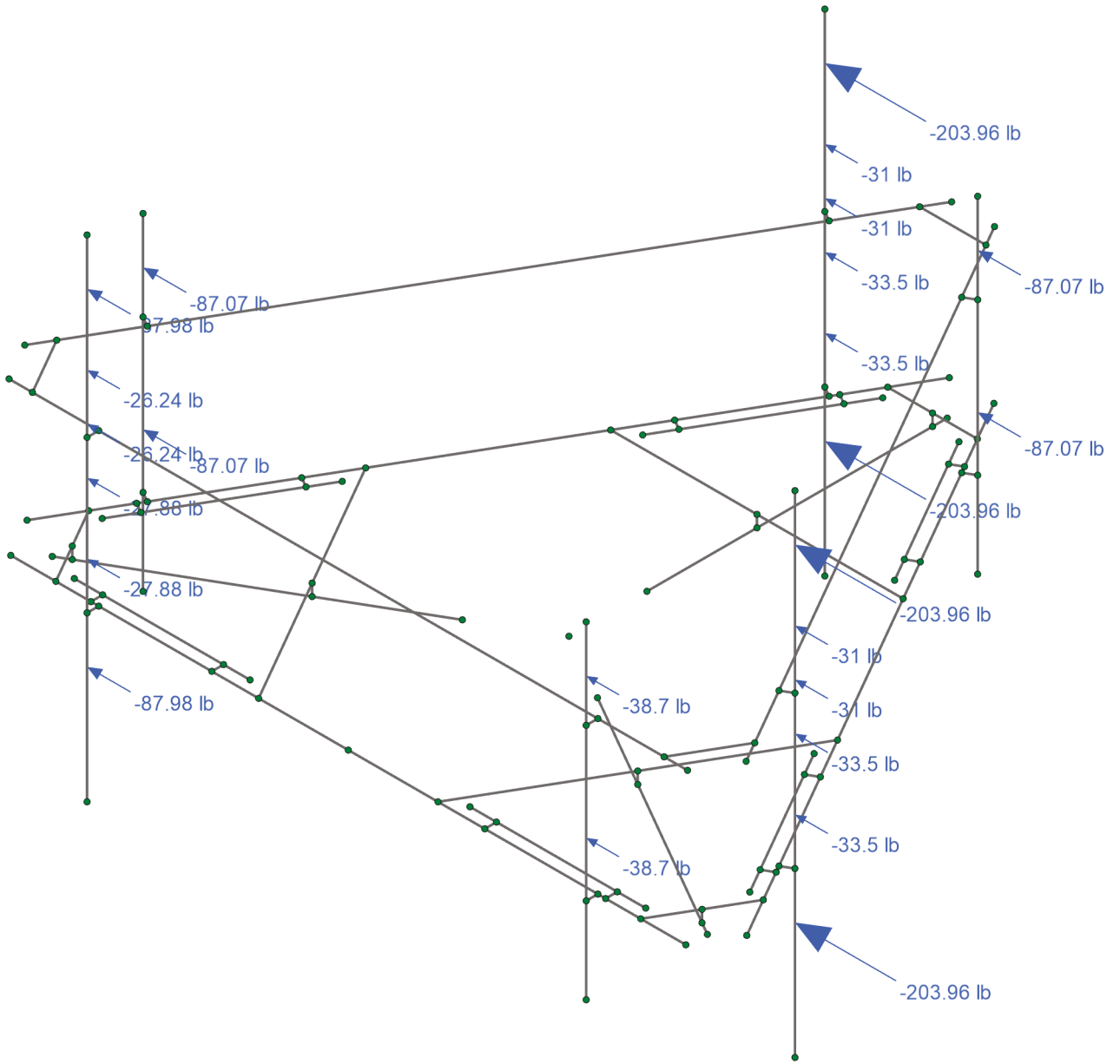
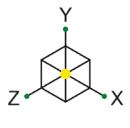


Loads: BLC 2, Wind Load AZI 0

Infinigy Engineering  
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Wind Loading 0  
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Loads: BLC 5, Wind Load AZI 90

Infinigy Engineering

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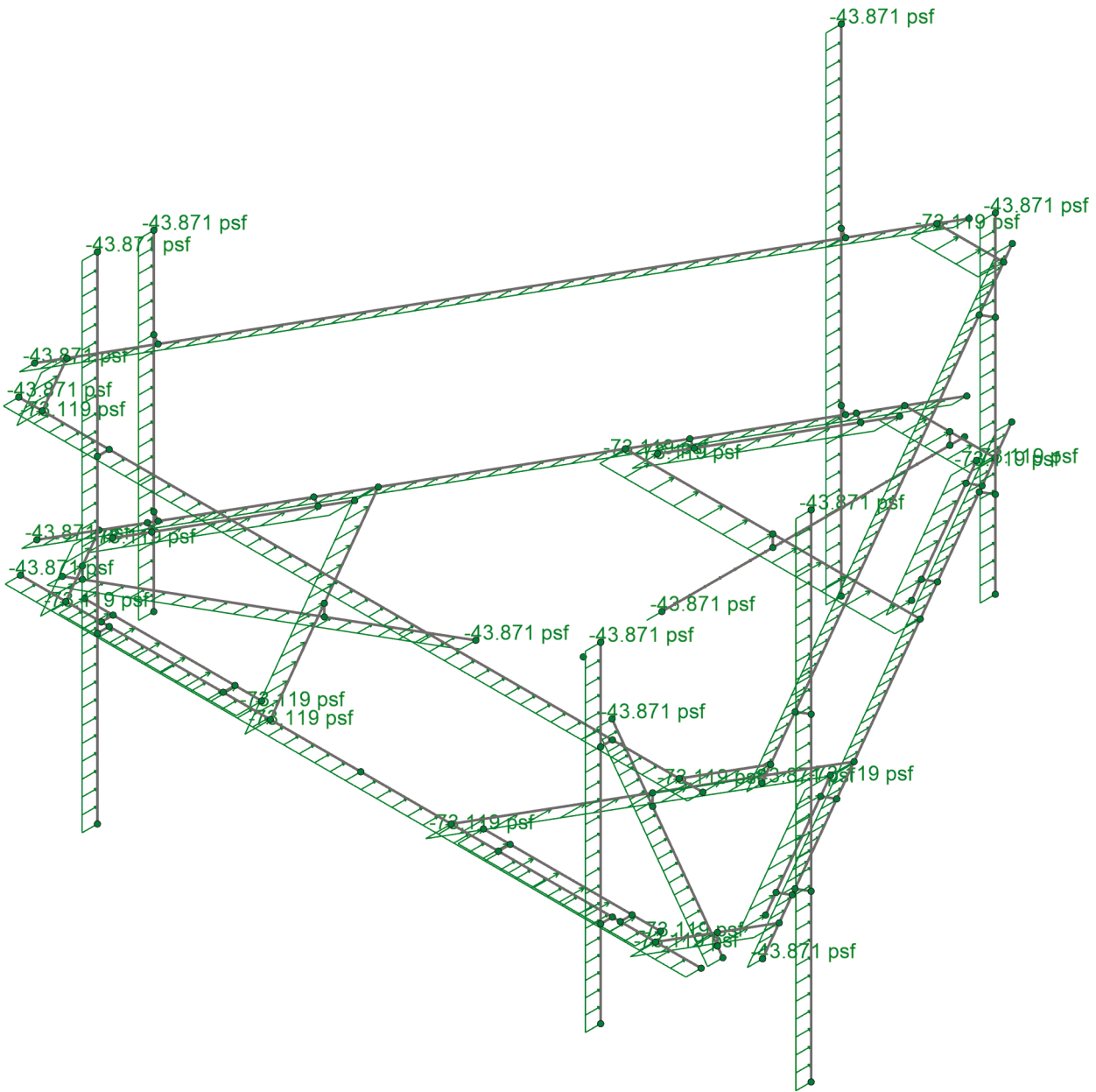
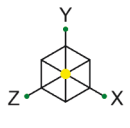
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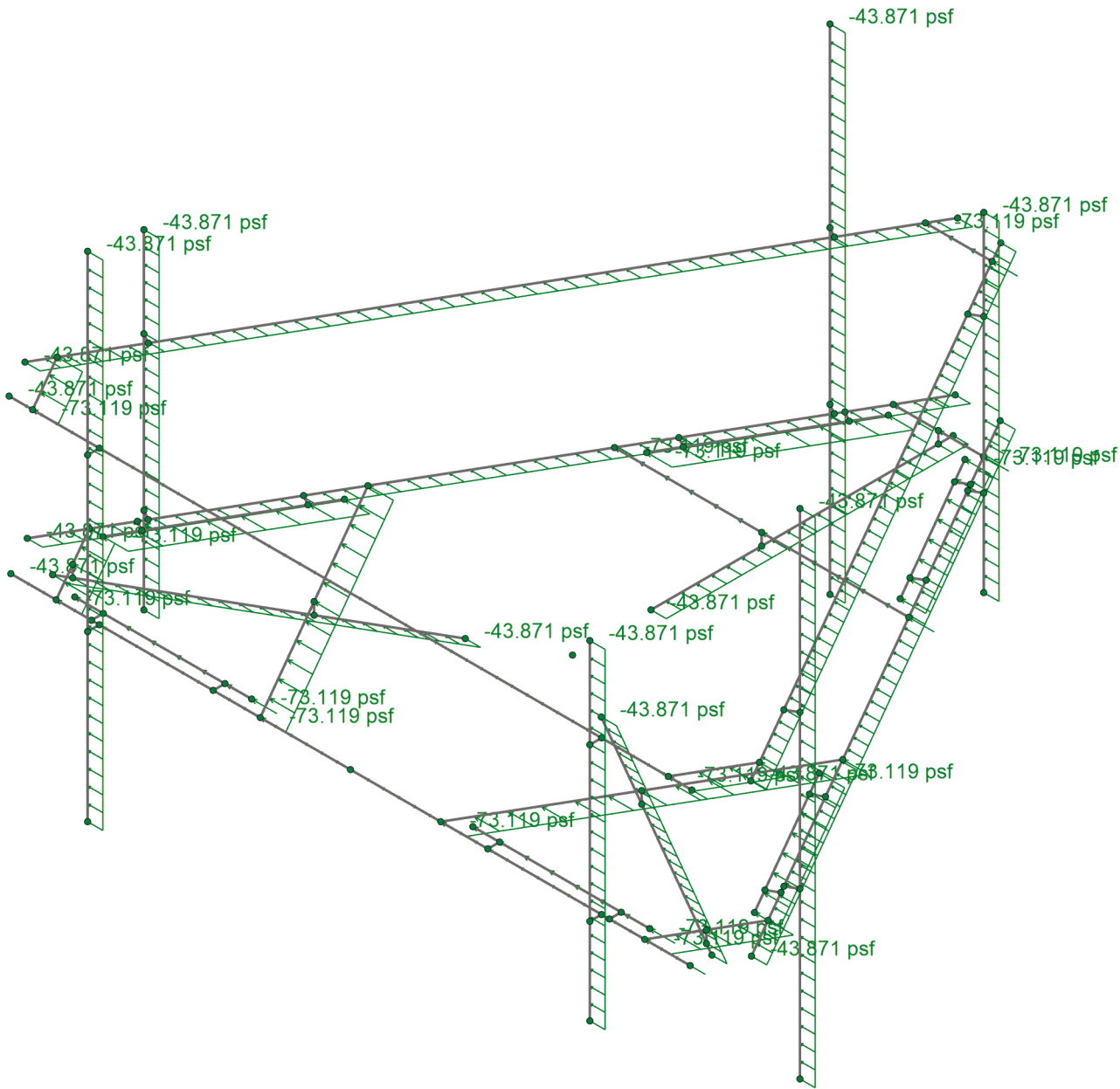
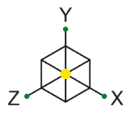
Wind Loading 90

Sep 12, 2023 at 06:48 AM

857013\_loaded.r3d



Loads: BLC 14, Distr. Wind Load Z		
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CL		Sep 12, 2023 at 06:48 AM
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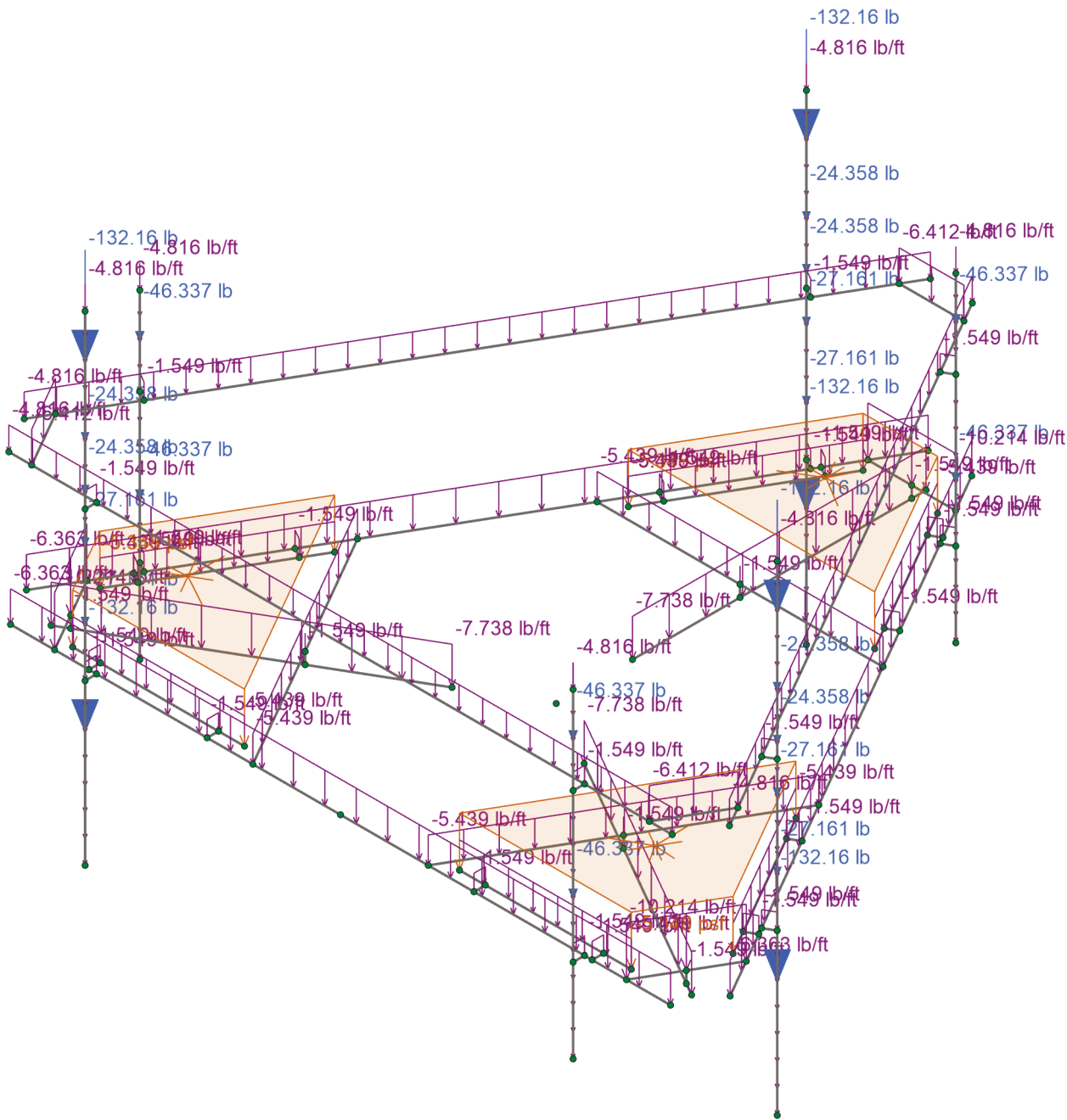


Loads: BLC 15, Distr. Wind Load X

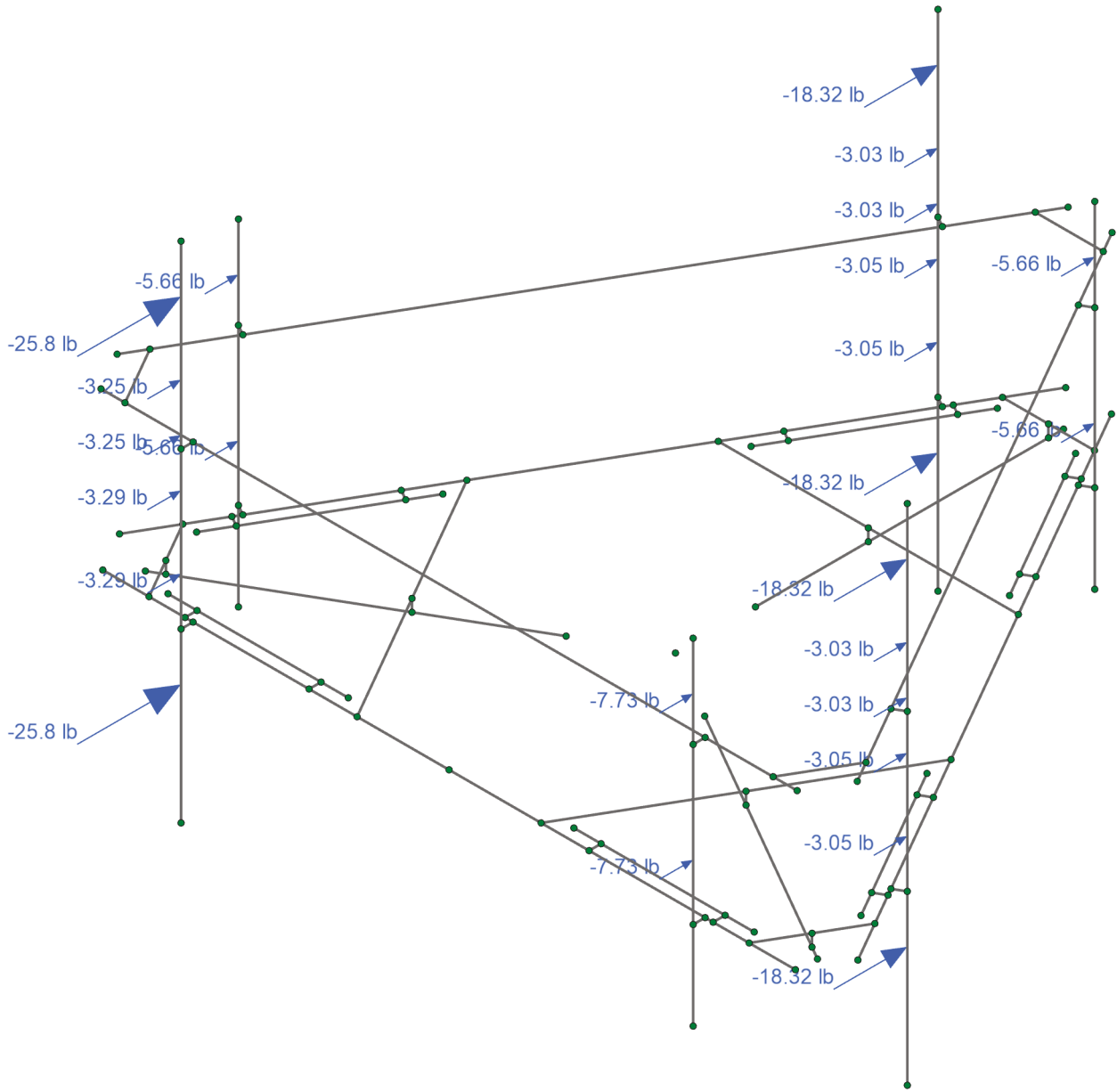
Infinigy Engineering  
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 1039-Z0001-B

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Dist. Wind Loading 90  
 Sep 12, 2023 at 06:48 AM  
 857013\_loaded.r3d



Loads: BLC 16, Ice Weight		
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CL		Sep 12, 2023 at 06:49 AM
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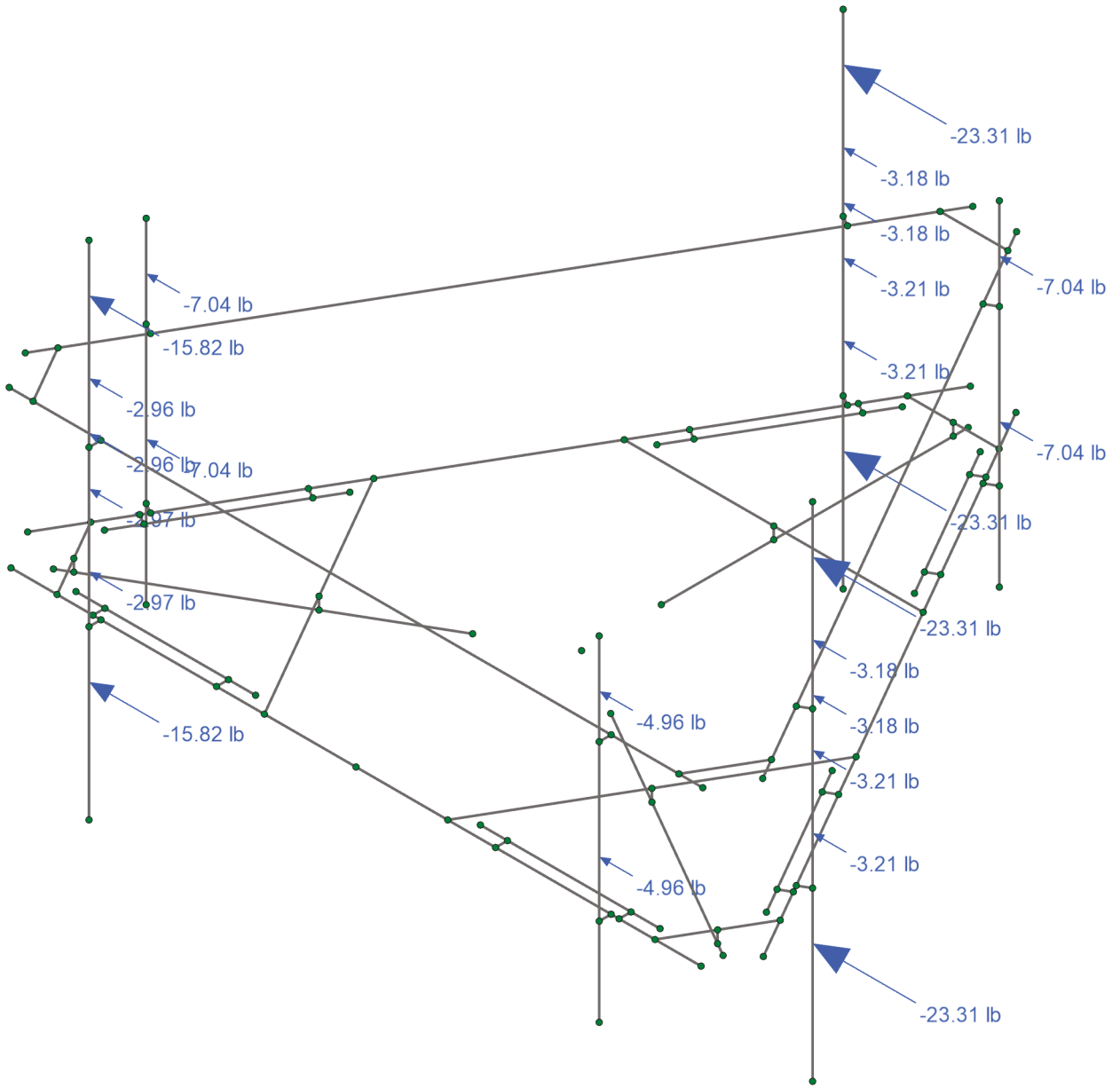


Loads: BLC 17, Ice Wind Load AZI 0

Infinigy Engineering  
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 1039-Z0001-B

857013

Ice Wind Loading 0  
 Sep 12, 2023 at 06:49 AM  
 857013\_loaded.r3d



Loads: BLC 20, Ice Wind Load AZI 90

Infinigy Engineering

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Ice Wind Loading 90

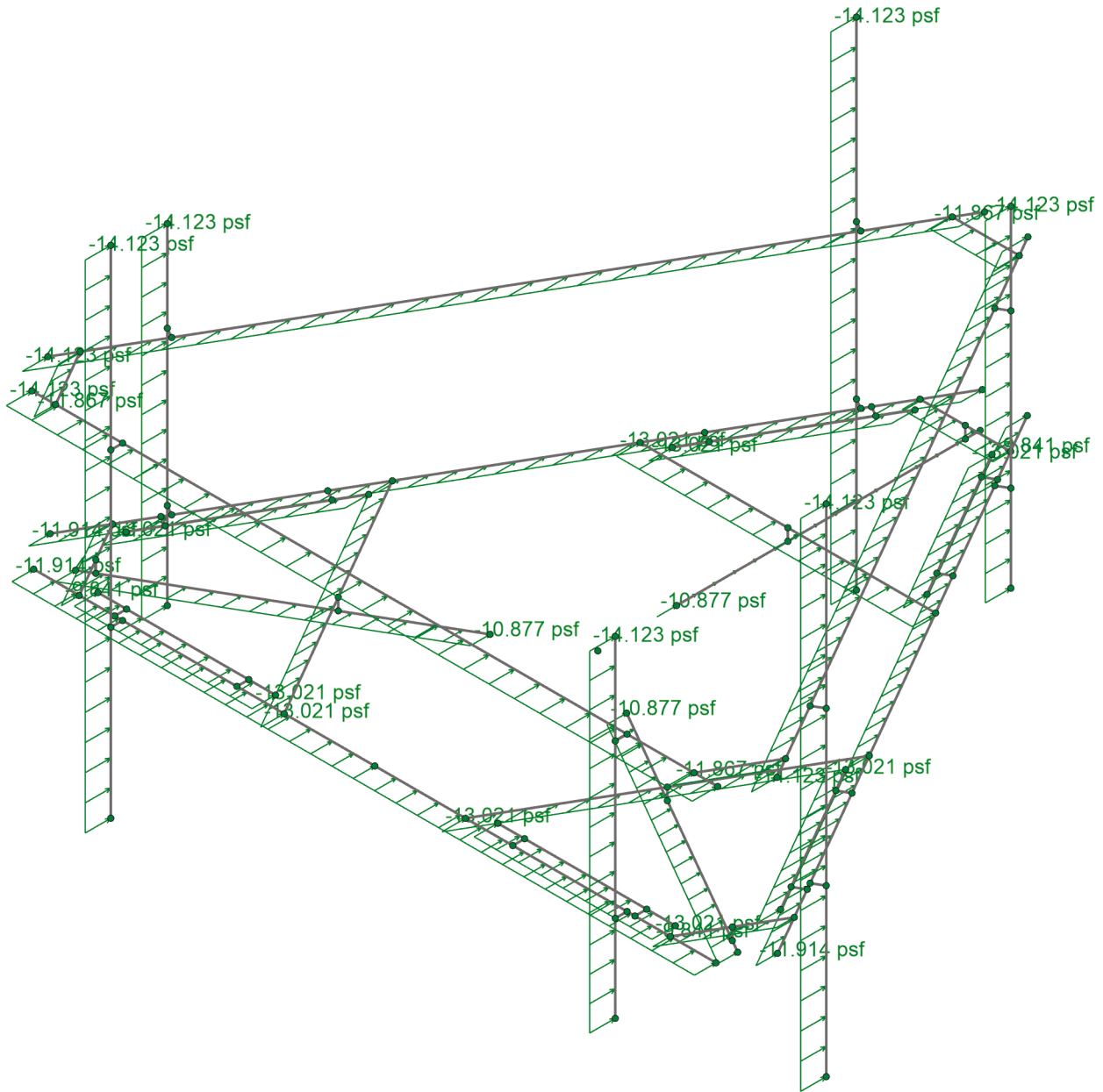
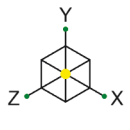
CL

Sep 12, 2023 at 06:49 AM

1039-Z0001-B

857013\_loaded.r3d





Loads: BLC 29, Distr. Ice Wind Load Z

Infinigy Engineering

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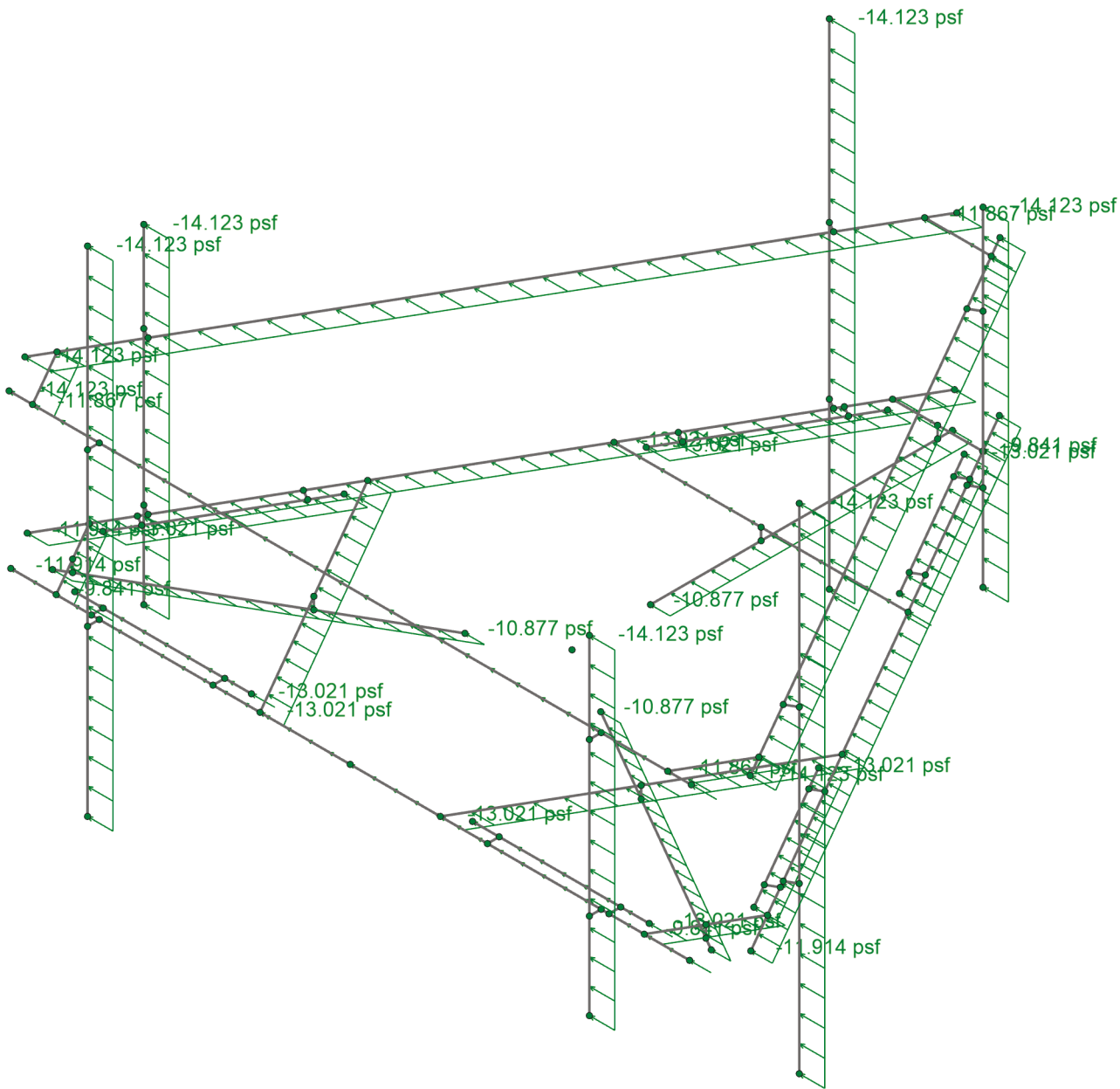
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CL

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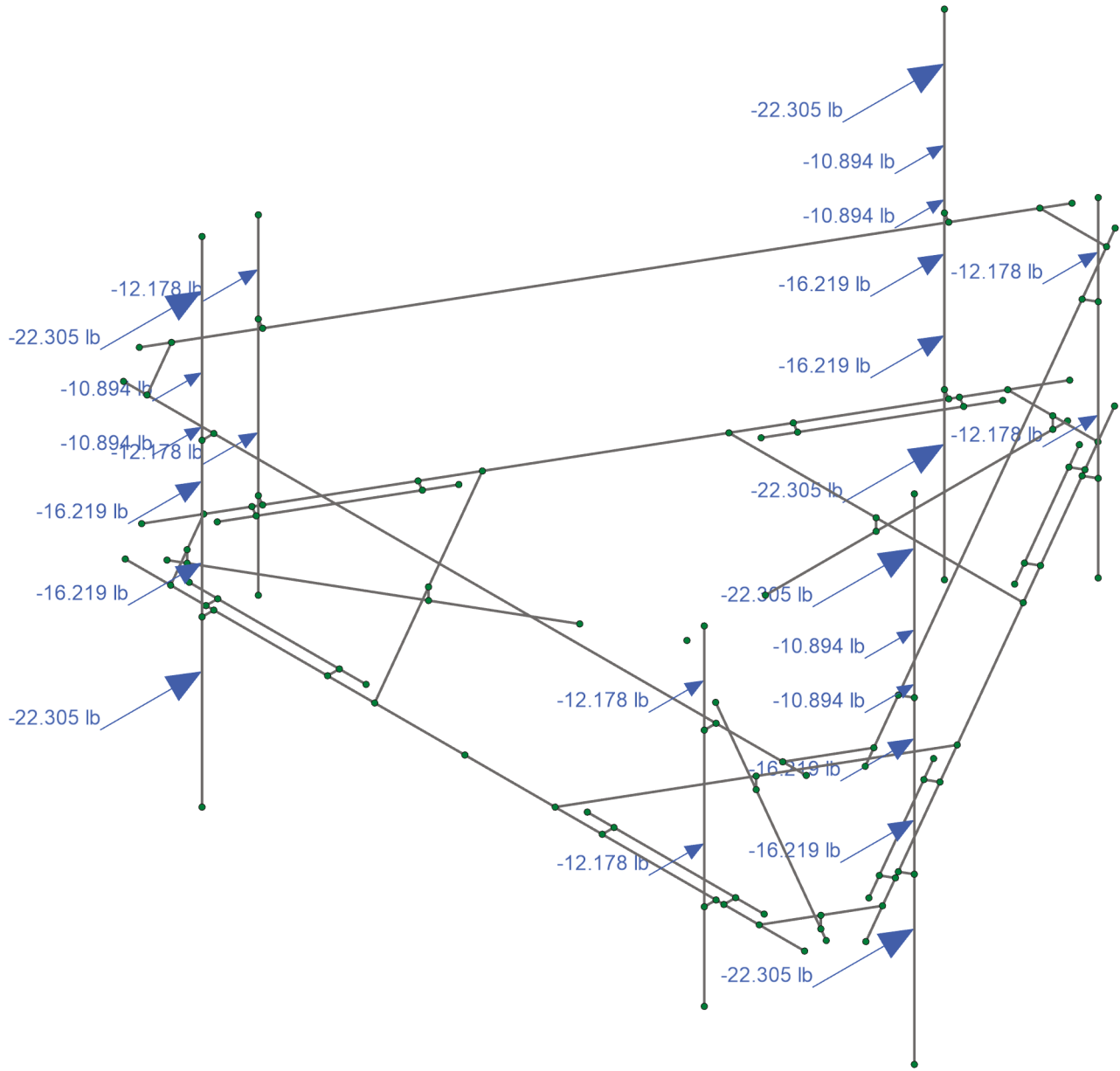


Loads: BLC 30, Distr. Ice Wind Load X

Infinigy Engineering  
CL  
1039-Z0001-B

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Dist. Ice Wind Loading 90  
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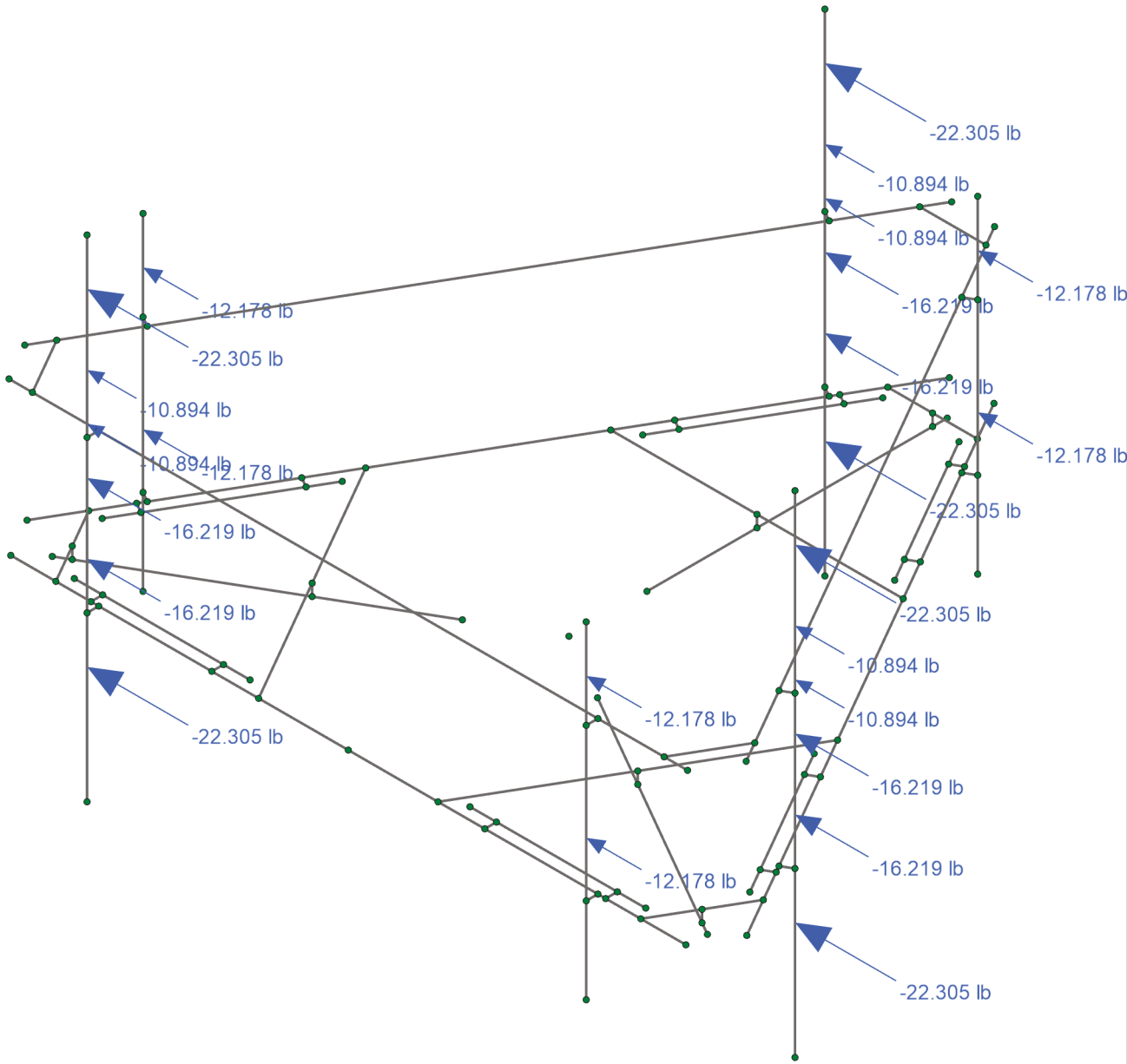
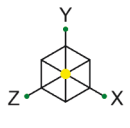


Loads: BLC 31, Seismic Load Z

Infinigy Engineering  
 CL  
 1039-Z0001-B

857013

Seismic Loading 0  
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Loads: BLC 32, Seismic Load X

Infinigy Engineering

CL

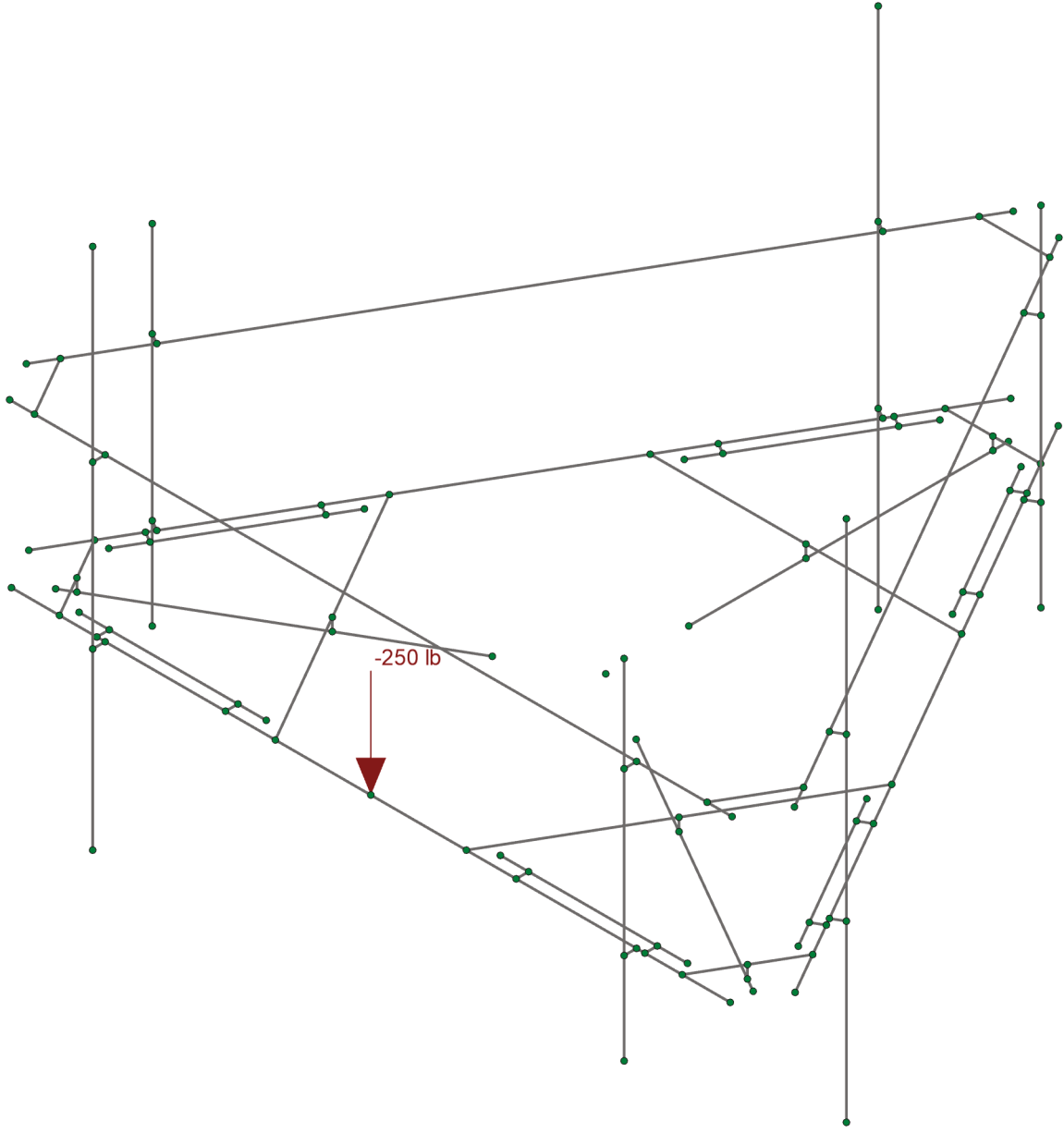
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857013

Seismic Loading 90

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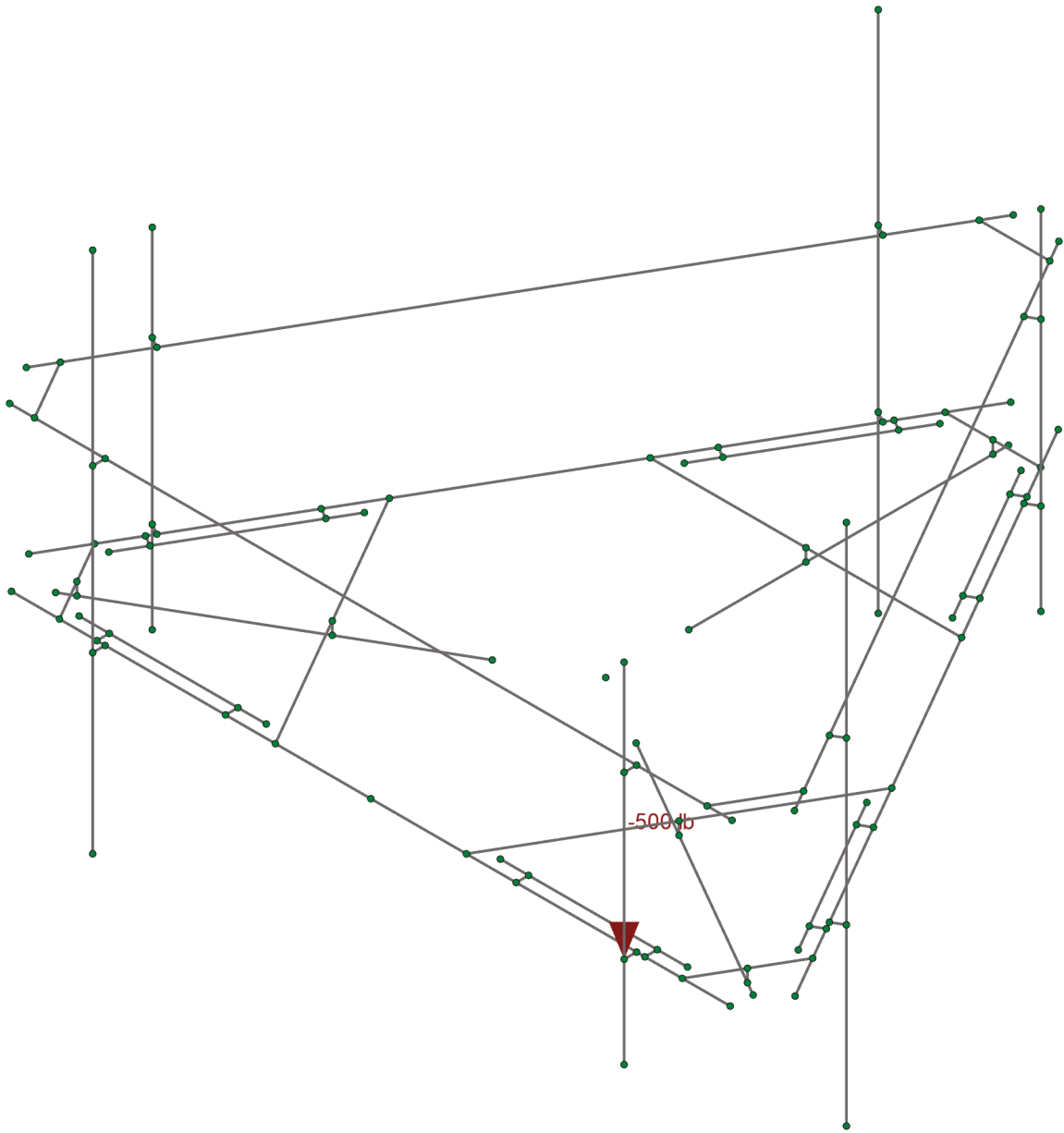
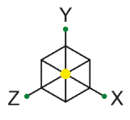


Loads: BLC 33, Service Live Loads

Infinigy Engineering  
CL  
1039-Z0001-B

857013

Service Load  
Sep 12, 2023 at 06:50 AM  
857013\_loaded.r3d



Loads: BLC 35, Maintenance Load Lm2

Infinigy Engineering

857013

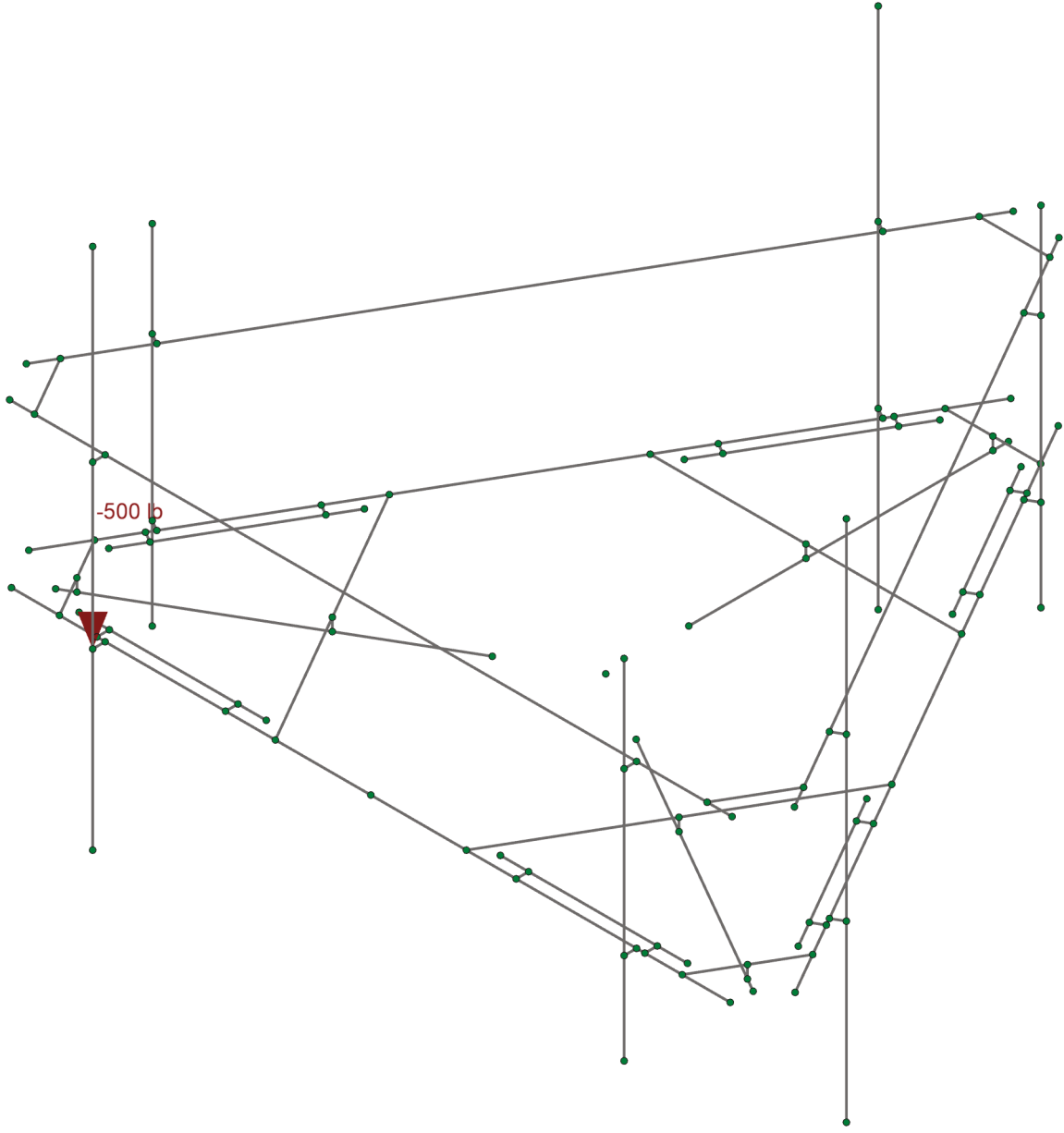
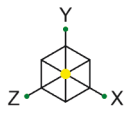
Maintenance Load 1

CL

Sep 12, 2023 at 06:50 AM

1039-Z0001-B

857013\_loaded.r3d



Loads: BLC 34, Maintenance Load Lm1

Infinigy Engineering  
CL  
1039-Z0001-B

857013

Maintenance Load 2  
Sep 12, 2023 at 06:51 AM  
857013\_loaded.r3d

**APPENDIX B**  
**SOFTWARE INPUT CALCULATIONS**



## Program Inputs

PROJECT INFORMATION		
Site Name:	KILLINGLY ROSS ROAD	
Carrier:	T-Mobile	
Engineer:	Chris Lee, PE	

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	B	
Topo Factor Procedure:	Method 1, Category 1	
Site Class:	D - Stiff Soil (Assumed)	
Ground Elevation:	456.76	ft *Rev H

MOUNT INFORMATION		
Mount Type:	Platform	
Num Sectors:	3	
Centerline AGL:	108.00	ft
Tower Height AGL:	119.00	ft

TOPOGRAPHIC DATA		
Topo Feature:	N/A	
Slope Distance:	N/A	ft
Crest Distance:	N/A	ft
Crest Height:	N/A	ft

FACTORS		
Directionality Fact. ( $K_d$ ):	0.950	
Ground Ele. Factor ( $K_e$ ):	0.984	*Rev H Only
Rooftop Speed-Up ( $K_z$ ):	1.000	*Rev H Only
Topographic Factor ( $K_{zt}$ ):	1.000	
Height Esc. Fact. ( $K_{id}$ ):	1.126	
Gust Effect Factor ( $G_e$ ):	1.000	
Shielding Factor ( $K_s$ ):	0.900	
Velocity Pressure Co. ( $K_z$ ):	1.010	(Mount Elev)

CODE STANDARDS		
Building Code:	2021 IBC	
TIA Standard:	TIA-222-H	
ASCE Standard:	ASCE 7-16	

WIND AND ICE DATA		
Ultimate Wind ( $V_{ult}$ ):	123	mph
Design Wind ( $V$ ):	N/A	mph
Ice Wind ( $V_{ice}$ ):	50	mph
Base Ice Thickness ( $t_b$ ):	1.0	in
Radial Ice Thickness ( $t_r$ ):	1.126	in
Flat Pressure:	73.119	psf
Round Pressure:	43.871	psf
Ice Wind Pressure:	7.250	psf

SEISMIC DATA		
Short-Period Accel. ( $S_s$ ):	0.186	g
1-Second Accel. ( $S_1$ ):	0.054	g
Short-Period Design ( $S_{DS}$ ):	0.198	
1-Second Design ( $S_{D1}$ ):	0.086	
Short-Period Coeff. ( $F_a$ ):	1.600	
1-Second Coeff. ( $F_v$ ):	2.400	
Amplification Factor ( $A_s$ ):	3.000	
Response Mod. Coeff. (R):	2.000	
Seismic Importance ( $I_e$ ):	1.000	
Seismic Response Co. ( $C_s$ ):	0.099	
Total App. Weight:	413.950	lb
Total Shear Force ( $V_s$ ):	41.064	lb
Hor. Seismic Load ( $E_h$ ):	41.064	lb
Vert. Seismic Load ( $E_v$ ):	16.426	lb *

\*For reference only. Per TIA rev H section 16.7,  $E_v$  is not applicable to mounts

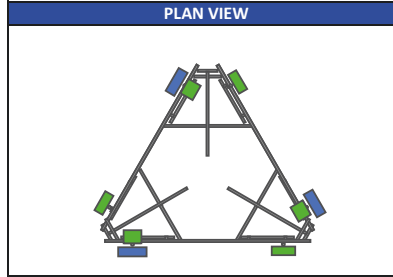
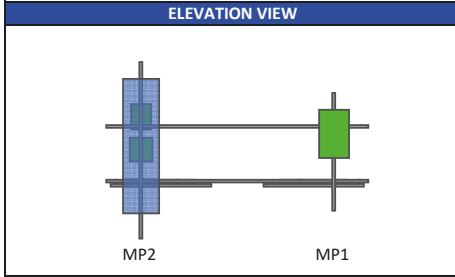
# INFINIGY

Infinigy Load Calculator V2.3.4

**Program Inputs**



Infinigy Load Calculator V2.3.4



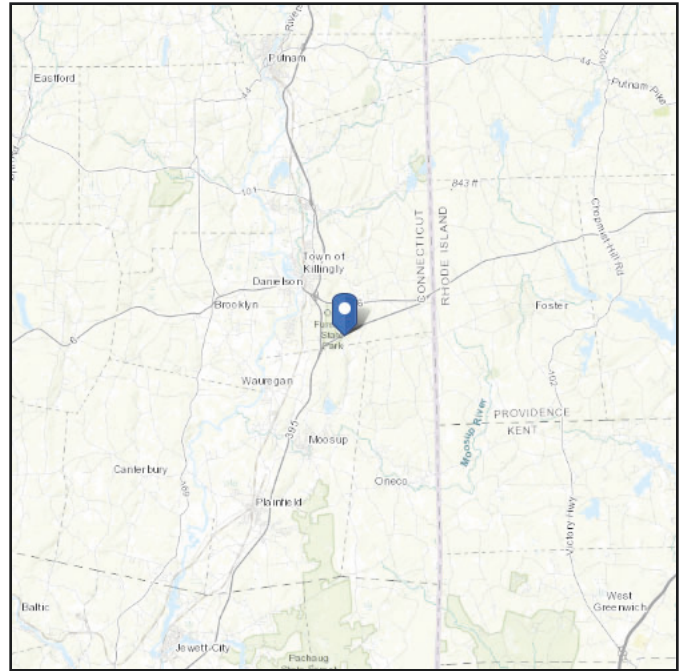
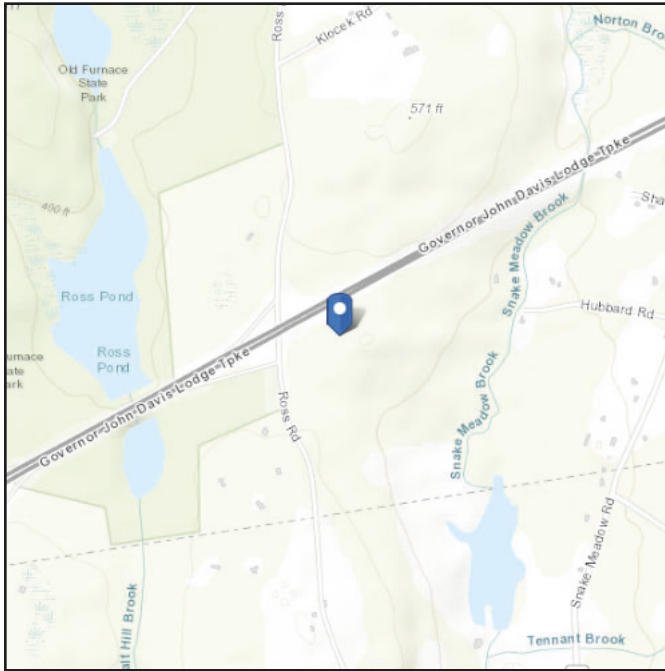
APPURTENANCE INFORMATION										
Appurtenance Name	Elevation	Qty.	Height (in)	Width (in)	Depth (in)	Weight (lbs)	EPA <sub>N</sub> (ft <sup>2</sup> )	EPA <sub>T</sub> (ft <sup>2</sup> )	Member (α sector)	
ERICSSON AIR 6419 B41_TMO_CCIV2	110.0	3	34.49	19.92	7.99	81.84	6.24	2.34	MP1	
RFS/CELWAVE APXVAALL24_43-U-NA20_TMO	110.0	3	95.90	24.00	8.50	149.90	14.67	5.32	MP2	
ERICSSON RADIO 4449 B71 B85A_T-MOBILE	110.0	3	17.91	13.20	10.63	73.21	1.97	1.59	MP2	
ERICSSON RADIO 4460 B2/B25 B66_TMO	110.0	3	17.00	15.10	11.90	109.00	2.14	1.69	MP2	

# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

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

**Latitude:** 41.771553  
**Longitude:** -71.855664  
**Elevation:** 456.758999360382 ft (NAVD 88)



## Wind

### Results:

Wind Speed	123 Vmph
10-year MRI	75 Vmph
25-year MRI	85 Vmph
50-year MRI	95 Vmph
100-year MRI	100 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: Mon Sep 11 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).

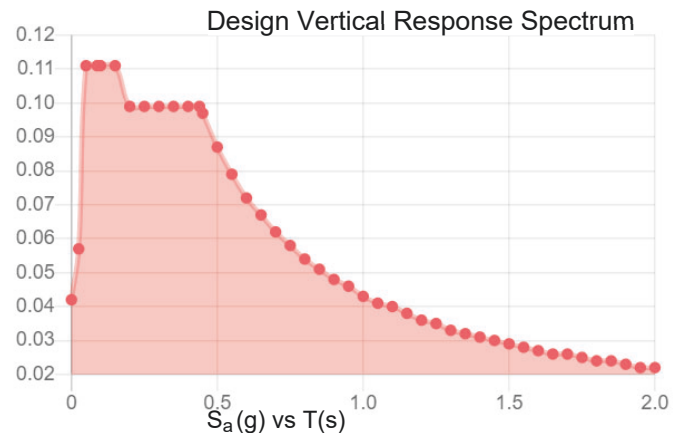
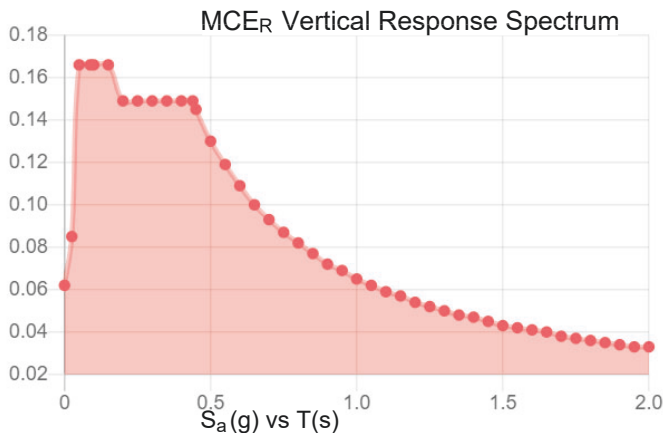
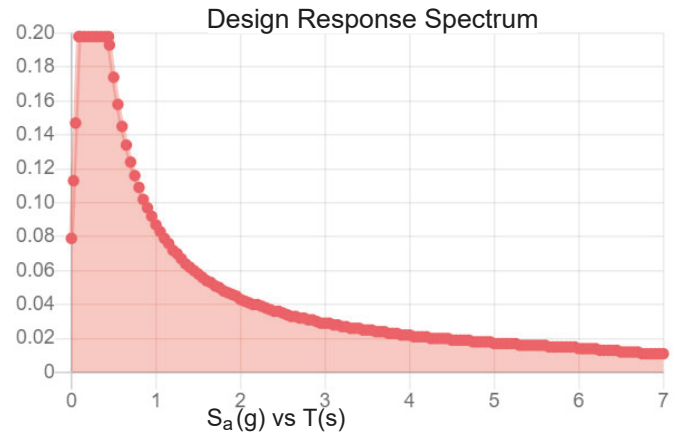
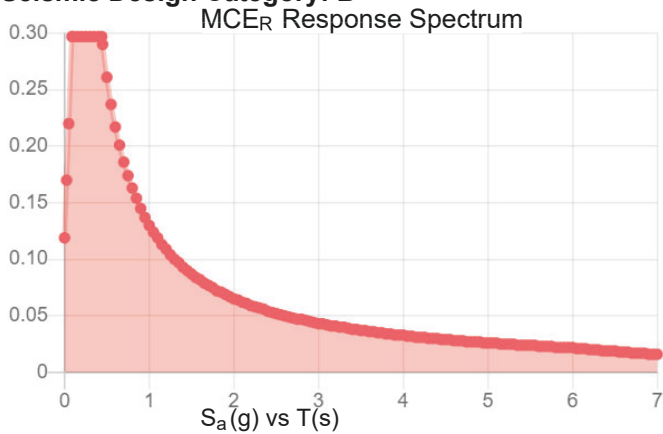
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

**Site Soil Class:**

**Results:**

$S_s$ :	0.186	$S_{D1}$ :	0.087
$S_1$ :	0.054	$T_L$ :	6
$F_a$ :	1.6	PGA :	0.101
$F_v$ :	2.4	PGA <sub>M</sub> :	0.161
$S_{MS}$ :	0.297	$F_{PGA}$ :	1.599
$S_{M1}$ :	0.13	$I_e$ :	1
$S_{DS}$ :	0.198	$C_v$ :	0.7

**Seismic Design Category: B**



**Data Accessed:** Mon Sep 11 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

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### Results:

Ice Thickness: 1.00 in.  
Concurrent Temperature: 15 F  
Gust Speed 50 mph

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

**Date Accessed:** Mon Sep 11 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.

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

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

**APPENDIX C**  
**SOFTWARE ANALYSIS OUTPUT**

**Member Primary Data**

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	MS2	N1	N2		Standoff	Beam	Pipe	A53 Gr.B	Typical
2	MH1	N7	N8		Face Horizontal	Beam	Pipe	A53 Gr.B	Typical
3	M5	N9	N10	270	Corner C	Beam	Channel	A36 Gr.36	Typical
4	M6	N11	N12	270	Corner C	Beam	Channel	A36 Gr.36	Typical
5	MH3	N13	N14		Face Horizontal	Beam	Pipe	A53 Gr.B	Typical
6	M8	N15	N16	270	Corner C	Beam	Channel	A36 Gr.36	Typical
7	MH2	N17	N18		Face Horizontal	Beam	Pipe	A53 Gr.B	Typical
8	MS1	N19	N20		Standoff	Beam	Pipe	A53 Gr.B	Typical
9	MS3	N21	N22		Standoff	Beam	Pipe	A53 Gr.B	Typical
10	M12	N23	N24		RIGID	None	None	RIGID	Typical
11	M13	N25	N26		RIGID	None	None	RIGID	Typical
12	M14	N27	N28		RIGID	None	None	RIGID	Typical
13	M15	N29	N30	90	Cross Angle	Beam	Single Angle	A36 Gr.36	Typical
14	M16	N31	N32		RIGID	None	None	RIGID	Typical
15	M17	N33	N34		RIGID	None	None	RIGID	Typical
16	M18	N35	N36		RIGID	None	None	RIGID	Typical
17	M19	N37	N38	90	Cross Angle	Beam	Single Angle	A36 Gr.36	Typical
18	M20	N39	N40		RIGID	None	None	RIGID	Typical
19	M21	N41	N42	90	Cross Angle	Beam	Single Angle	A36 Gr.36	Typical
20	M22	N43	N44		RIGID	None	None	RIGID	Typical
21	M23	N46	N45		Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
22	M24	N47	N48		RIGID	None	None	RIGID	Typical
23	M25	N49	N50		RIGID	None	None	RIGID	Typical
24	M26	N51	N52		Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
25	M27	N53	N54		RIGID	None	None	RIGID	Typical
26	M28	N55	N56		RIGID	None	None	RIGID	Typical
27	M29	N57	N58		Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
28	M30	N59	N60		RIGID	None	None	RIGID	Typical
29	M31	N61	N62		RIGID	None	None	RIGID	Typical
30	M32	N64	N63		Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
31	M33	N65	N66		RIGID	None	None	RIGID	Typical
32	M34	N67	N68		RIGID	None	None	RIGID	Typical
33	M35	N70	N69		Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
34	M36	N71	N72		RIGID	None	None	RIGID	Typical
35	M37	N73	N74		RIGID	None	None	RIGID	Typical
36	M38	N75	N76		Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
37	MR3	N77	N78		Handrail	Beam	Pipe	A53 Gr.B	Typical
38	MR1	N79	N80		Handrail	Beam	Pipe	A53 Gr.B	Typical
39	MR4	N81	N82		Handrail	Beam	Pipe	A53 Gr.B	Typical
40	MR5	N83	N84	90	Top Corner Angle	Beam	Single Angle	A36 Gr.36	Typical
41	MR6	N85	N86	180	Top Corner Angle	Beam	Single Angle	A36 Gr.36	Typical
42	MR2	N87	N88	90	Top Corner Angle	Beam	Single Angle	A36 Gr.36	Typical
43	M45	N89	N90		RIGID	None	None	RIGID	Typical
44	M46	N91	N92		RIGID	None	None	RIGID	Typical
45	MP2	N93	N94		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
46	M48	N95	N96		RIGID	None	None	RIGID	Typical
47	M49	N97	N98		RIGID	None	None	RIGID	Typical
48	MP1	N99	N100		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
49	M51	N110	N108		RIGID	None	None	RIGID	Typical
50	MP6	N103	N106		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
51	M53	N111	N105		RIGID	None	None	RIGID	Typical
52	MP5	N102	N109		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
53	M55	N112	N104		RIGID	None	None	RIGID	Typical
54	M56	N113	N107		RIGID	None	None	RIGID	Typical
55	M57	N122	N120		RIGID	None	None	RIGID	Typical

**Member Primary Data (Continued)**

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
56	MP4	N115	N118		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
57	M59	N123	N117		RIGID	None	None	RIGID	Typical
58	MP3	N114	N121		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
59	M61	N124	N116		RIGID	None	None	RIGID	Typical
60	M62	N125	N119		RIGID	None	None	RIGID	Typical

**Material Take-Off**

	Material	Size	Pieces	Length[in]	Weight[LB]
0	General Members				
1	RIGID		30	90	0
2	Total General		30	90	0
3					
4	Hot Rolled Steel				
5	A36 Gr.36	L2.5X2.5X3	3	51	13.03
6	A36 Gr.36	L2X2X2	6	270.4	37.652
7	A36 Gr.36	L2X2X4	3	225	60.229
8	A36 Gr.36	C6X8.2	3	69	46.763
9	A53 Gr.B	PIPE 2.0	9	1152	333.2
10	A53 Gr.B	PIPE 3.0	3	519.4	304.889
11	A53 Gr.B	PIPE 4.0	3	231	193.89
12	Total HR Steel		30	2517.9	989.654

**Basic Load Cases**

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Member)
1	Self Weight	DL		-1			24		3
2	Wind Load AZI 0	WLZ					48		
3	Wind Load AZI 30	None					48		
4	Wind Load AZI 60	None					48		
5	Wind Load AZI 90	WLX					48		
6	Wind Load AZI 120	None					48		
7	Wind Load AZI 150	None					48		
8	Wind Load AZI 180	None					48		
9	Wind Load AZI 210	None					48		
10	Wind Load AZI 240	None					48		
11	Wind Load AZI 270	None					48		
12	Wind Load AZI 300	None					48		
13	Wind Load AZI 330	None					48		
14	Distr. Wind Load Z	WLZ						60	
15	Distr. Wind Load X	WLX						60	
16	Ice Weight	OL1					24	60	3
17	Ice Wind Load AZI 0	OL2					48		
18	Ice Wind Load AZI 30	None					48		
19	Ice Wind Load AZI 60	None					48		
20	Ice Wind Load AZI 90	OL3					48		
21	Ice Wind Load AZI 120	None					48		
22	Ice Wind Load AZI 150	None					48		
23	Ice Wind Load AZI 180	None					48		
24	Ice Wind Load AZI 210	None					48		
25	Ice Wind Load AZI 240	None					48		
26	Ice Wind Load AZI 270	None					48		
27	Ice Wind Load AZI 300	None					48		
28	Ice Wind Load AZI 330	None					48		
29	Distr. Ice Wind Load Z	OL2						60	



**Basic Load Cases (Continued)**

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Member)
30	Distr. Ice Wind Load X	OL3						60	
31	Seismic Load Z	ELZ			-0.298		24		
32	Seismic Load X	ELX	-0.298				24		
33	Service Live Loads	LL				1			
34	Maintenance Load Lm1	LL				1			
35	Maintenance Load Lm2	LL				1			
36	Maintenance Load Lm3	LL				1			
37	Maintenance Load Lm4	LL				1			
38	Maintenance Load Lm5	LL				1			
39	Maintenance Load Lm6	LL				1			
40	BLC 1 Transient Area Loads	None						93	
41	BLC 16 Transient Area Loads	None						93	

**Load Combinations**

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4DL	Yes	Y	1	1.4								
2	1.2DL + 1WL AZI 0	Yes	Y	1	1.2	2	1	14	1	15			
3	1.2DL + 1WL AZI 30	Yes	Y	1	1.2	3	1	14	0.866	15	0.5		
4	1.2DL + 1WL AZI 60	Yes	Y	1	1.2	4	1	14	0.5	15	0.866		
5	1.2DL + 1WL AZI 90	Yes	Y	1	1.2	5	1	14		15	1		
6	1.2DL + 1WL AZI 120	Yes	Y	1	1.2	6	1	14	-0.5	15	0.866		
7	1.2DL + 1WL AZI 150	Yes	Y	1	1.2	7	1	14	-0.866	15	0.5		
8	1.2DL + 1WL AZI 180	Yes	Y	1	1.2	8	1	14	-1	15			
9	1.2DL + 1WL AZI 210	Yes	Y	1	1.2	9	1	14	-0.866	15	-0.5		
10	1.2DL + 1WL AZI 240	Yes	Y	1	1.2	10	1	14	-0.5	15	-0.866		
11	1.2DL + 1WL AZI 270	Yes	Y	1	1.2	11	1	14		15	-1		
12	1.2DL + 1WL AZI 300	Yes	Y	1	1.2	12	1	14	0.5	15	-0.866		
13	1.2DL + 1WL AZI 330	Yes	Y	1	1.2	13	1	14	0.866	15	-0.5		
14	0.9DL + 1WL AZI 0	Yes	Y	1	0.9	2	1	14	1	15			
15	0.9DL + 1WL AZI 30	Yes	Y	1	0.9	3	1	14	0.866	15	0.5		
16	0.9DL + 1WL AZI 60	Yes	Y	1	0.9	4	1	14	0.5	15	0.866		
17	0.9DL + 1WL AZI 90	Yes	Y	1	0.9	5	1	14		15	1		
18	0.9DL + 1WL AZI 120	Yes	Y	1	0.9	6	1	14	-0.5	15	0.866		
19	0.9DL + 1WL AZI 150	Yes	Y	1	0.9	7	1	14	-0.866	15	0.5		
20	0.9DL + 1WL AZI 180	Yes	Y	1	0.9	8	1	14	-1	15			
21	0.9DL + 1WL AZI 210	Yes	Y	1	0.9	9	1	14	-0.866	15	-0.5		
22	0.9DL + 1WL AZI 240	Yes	Y	1	0.9	10	1	14	-0.5	15	-0.866		
23	0.9DL + 1WL AZI 270	Yes	Y	1	0.9	11	1	14		15	-1		
24	0.9DL + 1WL AZI 300	Yes	Y	1	0.9	12	1	14	0.5	15	-0.866		
25	0.9DL + 1WL AZI 330	Yes	Y	1	0.9	13	1	14	0.866	15	-0.5		
26	1.2D + 1.0Di	Yes	Y	1	1.2	16	1						
27	1.2D + 1.0Di + 1.0Wi AZI 0	Yes	Y	1	1.2	16	1	17	1	29	1	30	
28	1.2D + 1.0Di + 1.0Wi AZI 30	Yes	Y	1	1.2	16	1	18	1	29	0.866	30	0.5
29	1.2D + 1.0Di + 1.0Wi AZI 60	Yes	Y	1	1.2	16	1	19	1	29	0.5	30	0.866
30	1.2D + 1.0Di + 1.0Wi AZI 90	Yes	Y	1	1.2	16	1	20	1	29		30	1
31	1.2D + 1.0Di + 1.0Wi AZI 120	Yes	Y	1	1.2	16	1	21	1	29	-0.5	30	0.866
32	1.2D + 1.0Di + 1.0Wi AZI 150	Yes	Y	1	1.2	16	1	22	1	29	-0.866	30	0.5
33	1.2D + 1.0Di + 1.0Wi AZI 180	Yes	Y	1	1.2	16	1	23	1	29	-1	30	
34	1.2D + 1.0Di + 1.0Wi AZI 210	Yes	Y	1	1.2	16	1	24	1	29	-0.866	30	-0.5
35	1.2D + 1.0Di + 1.0Wi AZI 240	Yes	Y	1	1.2	16	1	25	1	29	-0.5	30	-0.866
36	1.2D + 1.0Di + 1.0Wi AZI 270	Yes	Y	1	1.2	16	1	26	1	29		30	-1
37	1.2D + 1.0Di + 1.0Wi AZI 300	Yes	Y	1	1.2	16	1	27	1	29	0.5	30	-0.866
38	1.2D + 1.0Di + 1.0Wi AZI 330	Yes	Y	1	1.2	16	1	28	1	29	0.866	30	-0.5
39	(1.2 + 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	1.24	31	1	32					
40	(1.2 + 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	1.24	31	0.866	32	0.5				

**Load Combinations (Continued)**

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
41	(1.2 + 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	1.24	31	0.5	32	0.866				
42	(1.2 + 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	1.24	31		32	1				
43	(1.2 + 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	1.24	31	-0.5	32	0.866				
44	(1.2 + 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	1.24	31	-0.866	32	0.5				
45	(1.2 + 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	1.24	31	-1	32					
46	(1.2 + 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	1.24	31	-0.866	32	-0.5				
47	(1.2 + 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	1.24	31	-0.5	32	-0.866				
48	(1.2 + 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	1.24	31		32	-1				
49	(1.2 + 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	1.24	31	0.5	32	-0.866				
50	(1.2 + 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	1.24	31	0.866	32	-0.5				
51	(0.9 - 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	0.86	31	1	32					
52	(0.9 - 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	0.86	31	0.866	32	0.5				
53	(0.9 - 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	0.86	31	0.5	32	0.866				
54	(0.9 - 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	0.86	31		32	1				
55	(0.9 - 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	0.86	31	-0.5	32	0.866				
56	(0.9 - 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	0.86	31	-0.866	32	0.5				
57	(0.9 - 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	0.86	31	-1	32					
58	(0.9 - 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	0.86	31	-0.866	32	-0.5				
59	(0.9 - 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	0.86	31	-0.5	32	-0.866				
60	(0.9 - 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	0.86	31		32	-1				
61	(0.9 - 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	0.86	31	0.5	32	-0.866				
62	(0.9 - 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	0.86	31	0.866	32	-0.5				
63	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 0	Yes	Y	1	1	2	0.238	14	0.238	15		33	1.5
64	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 30	Yes	Y	1	1	3	0.238	14	0.206	15	0.119	33	1.5
65	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 60	Yes	Y	1	1	4	0.238	14	0.119	15	0.206	33	1.5
66	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 90	Yes	Y	1	1	5	0.238	14		15	0.238	33	1.5
67	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 120	Yes	Y	1	1	6	0.238	14	-0.119	15	0.206	33	1.5
68	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 150	Yes	Y	1	1	7	0.238	14	-0.206	15	0.119	33	1.5
69	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 180	Yes	Y	1	1	8	0.238	14	-0.238	15		33	1.5
70	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 210	Yes	Y	1	1	9	0.238	14	-0.206	15	-0.119	33	1.5
71	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 240	Yes	Y	1	1	10	0.238	14	-0.119	15	-0.206	33	1.5
72	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 270	Yes	Y	1	1	11	0.238	14		15	-0.238	33	1.5
73	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 300	Yes	Y	1	1	12	0.238	14	0.119	15	-0.206	33	1.5
74	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 330	Yes	Y	1	1	13	0.238	14	0.206	15	-0.119	33	1.5
75	1.2DL + 1.5LL	Yes	Y	1	1.2	33	1.5						
76	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	34	1.5	2	0.059	14	0.059	15	
77	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	34	1.5	3	0.059	14	0.052	15	0.03
78	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	34	1.5	4	0.059	14	0.03	15	0.052
79	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	34	1.5	5	0.059	14		15	0.059
80	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	34	1.5	6	0.059	14	-0.03	15	0.052
81	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	34	1.5	7	0.059	14	-0.052	15	0.03
82	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	34	1.5	8	0.059	14	-0.059	15	
83	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	34	1.5	9	0.059	14	-0.052	15	-0.03
84	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	34	1.5	10	0.059	14	-0.03	15	-0.052
85	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	34	1.5	11	0.059	14		15	-0.059
86	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	34	1.5	12	0.059	14	0.03	15	-0.052
87	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	34	1.5	13	0.059	14	0.052	15	-0.03
88	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	35	1.5	2	0.059	14	0.059	15	
89	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	35	1.5	3	0.059	14	0.052	15	0.03
90	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	35	1.5	4	0.059	14	0.03	15	0.052
91	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	35	1.5	5	0.059	14		15	0.059
92	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	35	1.5	6	0.059	14	-0.03	15	0.052
93	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	35	1.5	7	0.059	14	-0.052	15	0.03
94	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	35	1.5	8	0.059	14	-0.059	15	
95	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	35	1.5	9	0.059	14	-0.052	15	-0.03

**Load Combinations (Continued)**

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
96	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	35	1.5	10	0.059	14	-0.03	15	-0.052
97	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	35	1.5	11	0.059	14		15	-0.059
98	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	35	1.5	12	0.059	14	0.03	15	-0.052
99	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	35	1.5	13	0.059	14	0.052	15	-0.03
100	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	36	1.5	2	0.059	14	0.059	15	
101	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	36	1.5	3	0.059	14	0.052	15	0.03
102	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	36	1.5	4	0.059	14	0.03	15	0.052
103	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	36	1.5	5	0.059	14		15	0.059
104	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	36	1.5	6	0.059	14	-0.03	15	0.052
105	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	36	1.5	7	0.059	14	-0.052	15	0.03
106	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	36	1.5	8	0.059	14	-0.059	15	
107	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	36	1.5	9	0.059	14	-0.052	15	-0.03
108	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	36	1.5	10	0.059	14	-0.03	15	-0.052
109	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	36	1.5	11	0.059	14		15	-0.059
110	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	36	1.5	12	0.059	14	0.03	15	-0.052
111	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	36	1.5	13	0.059	14	0.052	15	-0.03
112	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	37	1.5	2	0.059	14	0.059	15	
113	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	37	1.5	3	0.059	14	0.052	15	0.03
114	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	37	1.5	4	0.059	14	0.03	15	0.052
115	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	37	1.5	5	0.059	14		15	0.059
116	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	37	1.5	6	0.059	14	-0.03	15	0.052
117	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	37	1.5	7	0.059	14	-0.052	15	0.03
118	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	37	1.5	8	0.059	14	-0.059	15	
119	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	37	1.5	9	0.059	14	-0.052	15	-0.03
120	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	37	1.5	10	0.059	14	-0.03	15	-0.052
121	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	37	1.5	11	0.059	14		15	-0.059
122	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	37	1.5	12	0.059	14	0.03	15	-0.052
123	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	37	1.5	13	0.059	14	0.052	15	-0.03
124	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	38	1.5	2	0.059	14	0.059	15	
125	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	38	1.5	3	0.059	14	0.052	15	0.03
126	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	38	1.5	4	0.059	14	0.03	15	0.052
127	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	38	1.5	5	0.059	14		15	0.059
128	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	38	1.5	6	0.059	14	-0.03	15	0.052
129	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	38	1.5	7	0.059	14	-0.052	15	0.03
130	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	38	1.5	8	0.059	14	-0.059	15	
131	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	38	1.5	9	0.059	14	-0.052	15	-0.03
132	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	38	1.5	10	0.059	14	-0.03	15	-0.052
133	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	38	1.5	11	0.059	14		15	-0.059
134	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	38	1.5	12	0.059	14	0.03	15	-0.052
135	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	38	1.5	13	0.059	14	0.052	15	-0.03
136	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	39	1.5	2	0.059	14	0.059	15	
137	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	39	1.5	3	0.059	14	0.052	15	0.03
138	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	39	1.5	4	0.059	14	0.03	15	0.052
139	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	39	1.5	5	0.059	14		15	0.059
140	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	39	1.5	6	0.059	14	-0.03	15	0.052
141	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	39	1.5	7	0.059	14	-0.052	15	0.03
142	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	39	1.5	8	0.059	14	-0.059	15	
143	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	39	1.5	9	0.059	14	-0.052	15	-0.03
144	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	39	1.5	10	0.059	14	-0.03	15	-0.052
145	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	39	1.5	11	0.059	14		15	-0.059
146	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	39	1.5	12	0.059	14	0.03	15	-0.052
147	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	39	1.5	13	0.059	14	0.052	15	-0.03



**Envelope Node Reactions**

Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC	
0	N1	max	884.923	17	1959.907	27	-1557.163	14	7492.849	27	1580.597	11	1513.24	23
1		min	-888.741	11	316.815	20	-9146.696	33	11.456	20	-1565.093	17	-1740.29	5
2	N21	max	-1417.65	18	1958.13	31	4616.047	38	538.756	14	1202.642	15	-59.122	23
3		min	-7904.911	37	323.342	24	592.766	20	-4112.749	82	-1219.225	9	-6348.677	30
4	N19	max	7907.295	29	1972.063	35	4609.657	28	439.79	14	1278.867	7	6573.355	36
5		min	1479.761	22	334.525	16	717.086	22	-3864.966	94	-1277.297	13	10.636	17
6	Totals:	max	3355.219	5	5695.962	29	3466.906	14						
7		min	-3355.215	23	2096.371	59	-3466.909	8						

**Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks**

Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn	
0	M19	L2X2X4	0.932	37.5	33	0.06	37.5	z	38	18657.095	30585.6	690.934	1501.793	1	H2-1
1	M21	L2X2X4	0.925	37.5	29	0.06	37.5	z	34	18657.095	30585.6	690.934	1501.793	1	H2-1
2	M15	L2X2X4	0.922	37.5	28	0.059	37.5	z	30	18657.095	30585.6	690.934	1501.793	1	H2-1
3	MS2	PIPE 4.0	0.757	0	27	0.23	0		5	81734.03	93240	10631.25	10631.25	1	H1-1b
4	MS3	PIPE 4.0	0.756	0	31	0.224	0		9	81734.03	93240	10631.25	10631.25	1	H1-1b
5	MS1	PIPE 4.0	0.751	0	35	0.219	0		13	81734.03	93240	10631.25	10631.25	1	H1-1b
6	M6	C6X8.2	0.691	11.5	33	0.443	11.5	y	34	70285.703	77436	2107.841	13932	1.366	H1-1b
7	M8	C6X8.2	0.689	11.5	29	0.441	11.5	y	30	70285.703	77436	2107.841	13932	1.365	H1-1b
8	M5	C6X8.2	0.67	11.5	37	0.435	11.5	y	38	70285.703	77436	2107.841	13932	1.367	H1-1b
9	MP3	PIPE 2.0	0.546	61.25	8	0.178	61.25		3	17855.085	32130	1871.625	1871.625	1	H1-1b
10	MP5	PIPE 2.0	0.545	61.25	4	0.182	61.25		11	17855.085	32130	1871.625	1871.625	1	H1-1b
11	MP1	PIPE 2.0	0.529	61.25	12	0.183	61.25		7	17855.085	32130	1871.625	1871.625	1	H1-1b
12	MP4	PIPE 2.0	0.508	84	12	0.192	84		4	8922.084	32130	1871.625	1871.625	1	H1-1b
13	MP6	PIPE 2.0	0.502	84	8	0.192	84		12	8922.084	32130	1871.625	1871.625	1	H1-1b
14	MR2	L2.5X2.5X3	0.498	17	8	0.159	17	z	2	27173.99	29192.4	872.574	1971.83	1.028	H2-1
15	MR6	L2.5X2.5X3	0.49	0	12	0.158	0	y	6	27173.99	29192.4	872.574	1971.83	1.008	H2-1
16	MP2	PIPE 2.0	0.489	84	4	0.196	84		8	8922.084	32130	1871.625	1871.625	1	H1-1b
17	MR5	L2.5X2.5X3	0.476	17	4	0.159	17	z	10	27173.99	29192.4	872.574	1971.83	1.039	H2-1
18	MR1	PIPE 2.0	0.358	21.75	13	0.228	7.25		6	4678.524	32130	1871.625	1871.625	1	H1-1b
19	MR3	PIPE 2.0	0.358	21.75	9	0.234	7.25		2	4678.524	32130	1871.625	1871.625	1	H1-1b
20	MR4	PIPE 2.0	0.356	152.25	5	0.23	166.75		10	4678.524	32130	1871.625	1871.625	1	H1-1b
21	MH2	PIPE 3.0	0.169	149.694	7	0.116	12.625		3	21477.804	65205	5748.75	5748.75	1	H1-1b
22	MH3	PIPE 3.0	0.169	23.446	3	0.117	160.515		11	21477.804	65205	5748.75	5748.75	1	H1-1b
23	MH1	PIPE 3.0	0.166	23.446	11	0.119	160.515		7	21477.804	65205	5748.75	5748.75	1	H1-1b
24	M23	L2X2X2	0.164	38.029	12	0.008	38.029	y	37	7903.562	15908.4	402.563	742.322	1.5	H2-1
25	M32	L2X2X2	0.163	38.029	8	0.008	38.029	y	32	7903.562	15908.4	402.563	742.322	1.5	H2-1
26	M38	L2X2X2	0.162	25.822	4	0.009	7.042	y	30	7903.562	15908.4	396.008	675.933	1.077	H2-1
27	M35	L2X2X2	0.161	38.029	4	0.008	38.029	y	29	7903.562	15908.4	402.563	742.322	1.5	H2-1
28	M29	L2X2X2	0.157	25.353	8	0.009	7.042	y	34	7903.562	15908.4	396.008	676.201	1.078	H2-1
29	M26	L2X2X2	0.15	26.292	12	0.009	7.042	y	37	7903.562	15908.4	396.008	680.659	1.1	H2-1

**APPENDIX D**  
**ADDITIONAL CALCUATIONS**

# INFINIGY<sup>8</sup>

## Bolt Calculation Tool, V1.6.5

PROJECT DATA	
Site Name:	KILLINGLY ROSS ROAD
Site Number:	857013
Connection Description:	Standoff to Collar

ENVELOPE BOLT LOADS		
(LC124 MS2) Bolt Tension:	5766.84	lbs
(LC5 MS2) Bolt Shear:	1563.12	lbs

MAX BOLT USAGE LOADS <sup>1</sup>		
Bolt Tension:	5766.84	lbs
Bolt Shear:	800.91	lbs

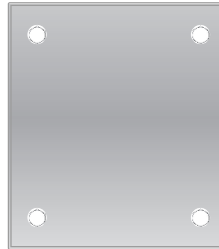
BOLT PROPERTIES		
Bolt Type:	Bolt	-
Bolt Diameter:	0.625	in
Bolt Grade:	A325	-
# of Bolts:	4	-
Threads Excluded?	No	-

<sup>1</sup> Max bolt usage loads correspond to Load combination #124 on member MS2 in RISA-3D, which causes the maximum demand on the bolts.

LC	Axial lb	y Shear lb	Z Shear lb	Torque lb-ft	y-y Moment lb-ft	z-z Moment lb-ft
(LC124 MS2)	5645.99	1731.41	-17.46	616.38	78.21	7100.13
(LC5 MS2)	4292.84	992.50	888.07	1740.29	-1563.35	7100.13

Member Information	
I nodes of MS2, MS1, MS3,	

BOLT CHECK		
Tensile Strength	20340.15	
Shear Strength	13805.83	
Max Tensile Usage	28.4%	
Max Shear Usage	11.3%	
Interaction Check (Max Usage)	0.08	≤1.05
Result	Pass	





MORRISON HERSHFIELD

Date: **September 15, 2023**

Morrison Hershfield  
1455 Lincoln Parkway, Suite 500  
Atlanta, GA 30346  
(770) 379-8500

**Subject:** **Structural Analysis Report**

**Carrier Designation:** **T-Mobile Co-Locate**  
**Site Number:** CTNL140B  
**Site Name:** NL140/Cingular Ross Rd\_MP

**Crown Castle Designation:** **BU Number:** 857013  
**Site Name:** Killingly Ross Road  
**JDE Job Number:** 752564  
**Work Order Number:** 2256441  
**Order Number:** 655747 Rev. 0

**Engineering Firm Designation:** **Morrison Hershfield Project Number:** CN6-958R5 / 2300001

**Site Data:** **280 Ross Road, Killingly, Windham County, CT 06239**  
**Latitude 41° 46' 17.59", Longitude -71° 51' 20.39"**  
**119 Foot - Monopole Tower**

Morrison Hershfield is pleased to submit this “**Structural Analysis Report**” to determine the structural integrity of the above-mentioned tower.

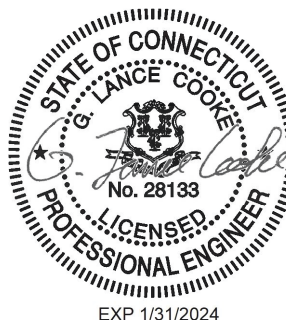
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Proposed Equipment Configuration **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2022 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Respectfully submitted by:

G. Lance Cooke, P.E. (CT License No. PEN.0028133)  
Senior Engineer



Digitally signed by G.  
Lance Cooke  
Date: 2023.09.15  
17:43:13+05'30'

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tnxTower Output

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## 1) INTRODUCTION

This tower is a 119 ft monopole tower, and the original drawings are not available. A tower mapping was performed by GPD Group, in January of 2009. The tower geometry and member sizes have been obtained from the above-mentioned report and are considered to be accurate.

## 2) ANALYSIS CRITERIA

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	125 mph
<b>Exposure Category:</b>	B
<b>Topographic Factor:</b>	1
<b>Ice Thickness:</b>	1 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Service Wind Speed:</b>	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)
108.0	110.0	3	ericsson	AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe	3	1-5/8
		3	rfs/celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	ericsson	RADIO 4460 B2/B25 B66_TMO		
	108.0	1	-	Platform Mount [LP 304-1_HR-1]		

**Table 2 - Other Considered Equipment**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
119.0	121.0	3	kmw communications	AM-X-CD-17-65-00T-RET w/ Mount Pipe	12	1-5/8 7/8 1/2
		6	powerwave technologies	7770.00 w/ Mount Pipe		
		6	ericsson	RRUS 11 B12		
		6	powerwave technologies	LGP21401		
		6	powerwave technologies	LGP21901		
		1	raycap	DC6-48-60-18-8F		
	119.0	1	-	Platform Mount [LP 1202-1]		
100.0	100.0	6	antel	LPA-80080/6CF w/ Mount Pipe	13	1-5/8
		3	samsung telecommunications	MT6407-77A w/ Mount Pipe		
		6	commscope	JAHH-65B-R3B		
		3	commscope	CBC78T-DS-43-2X		
		2	raycap	RXXDC-3315-PF-48		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
100.0	100.0	3	samsung telecommunications	RF4439D-25A	-	-
		3	samsung telecommunications	RF4440D-13A		
		3	-	Dual Antenna Mounting Kit		
		1	-	Platform Mount [LP 303-1_KCKR-HR-1]		
85.0	85.0	6	cci antennas	BFA8F-A5A W/RRH w/ Mount Pipe	1	7/8
		1	raycap	RHDCD-1390-PF-48		
		6	raycap	RHDCD-3441-P-48-NA		
		2	-	Sector Mount [SM 502-1]		
75.0	75.0	3	jma wireless	MX08FRO665-21 w/ Mount Pipe	1	1-3/8
		3	fujitsu	TA08025-B604		
		3	fujitsu	TA08025-B605		
		1	raycap	RDIDC-9181-PF-48		
		1	-	Commscope MC-PK8-DSH		

### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

Document	Reference	Source
4-GEOTECHNICAL REPORTS	4908007	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	4908012	CCISITES
4-TOWER MANUFACTURER DRAWINGS	4908008	CCISITES

#### 3.1) Analysis Method

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

#### 3.2) Assumptions

- 1) 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. Morrison Hershfield should be notified to determine the effect on the structural integrity of the tower.

#### 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	119 - 84.33	Pole	TP29.03x19.0986x0.5	1	-18.59	2061.37	18.1	Pass
L2	84.33 - 45.5	Pole	TP39.15x26.9902x0.625	2	-36.45	3479.77	30.0	Pass
L3	45.5 - 0	Pole	TP50.9295x36.4996x0.6875	3	-59.62	5180.22	32.6	Pass
							Summary	
						Pole (L3)	32.6	Pass
						Rating =	32.6	Pass

**Table 5 - Tower Component Stresses vs. Capacity – LC7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	40.7	Pass
1	Base Plate		58.4	Pass
1	Base Foundation (Structure)	0	37.2	Pass
1	Base Foundation (Soil Interaction)		31.3	Pass

<b>Structure Rating (max from all components) =</b>	<b>58.4%*</b>
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Notes:

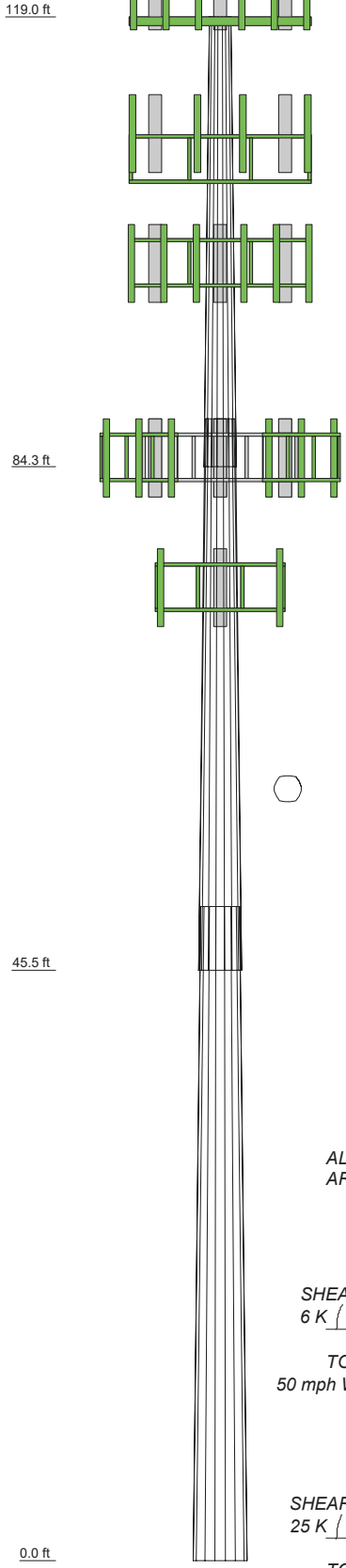
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) \*Rating per TIA-222-H, Section 15.5.

#### 4.1) Recommendations

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

**APPENDIX A**  
**TNXTOWER OUTPUT**

Section	1	2	3	4
Length (ft)	34.67	42.46	50.39	119.0
Number of Sides	18	18	18	18
Thickness (in)	0.5000	0.6250	0.6875	0.5000
Socket Length (ft)	3.63	4.89	36.4996	4.89
Top Dia (in)	19.0986	26.9902	36.4996	19.0986
Bot Dia (in)	29.0300	39.1500	50.9295	29.0300
Grade	A572-50	A572-50	A572-50	A572-50
Weight (K)	4.4	9.3	16.1	29.8



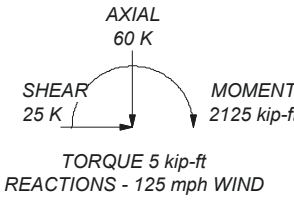
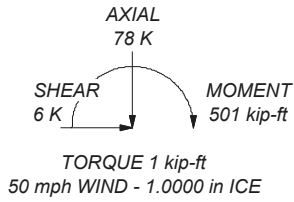
**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi			

**TOWER DESIGN NOTES**

1. Tower is located in Windham County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 32.6%

ALL REACTIONS ARE FACTORED



**Morrison Hershfield**  
 1455 Lincoln Parkway, Suite 500  
 Atlanta, GA 30346  
 Phone: (770) 379-8500  
 FAX: (770) 379-8501

Job: <b>CN6-958R5 / 2300001</b>		
Project: <b>857013 / Killingly Ross Road</b>		
Client: <b>Crown Castle USA</b>	Drawn by: <b>KCM</b>	App'd:
Code: <b>TIA-222-H</b>	Date: <b>09/15/23</b>	Scale: <b>NTS</b>
Path:		Dwg No. <b>E-1</b>

## 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 Windham County, Connecticut.  
 Tower base elevation above sea level: 457.00 ft.  
 Basic wind speed of 125 mph.  
 Risk Category II.  
 Exposure Category B.  
 Simplified Topographic Factor Procedure for wind speed-up calculations is used.  
 Topographic Category: 1.  
 Crest Height: 0.00 ft.  
 Nominal ice thickness of 1.0000 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.  
 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

- |  |   |  |
|--|---|--|
| <ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>√ Use Code Stress Ratios</li> <li>√ Use Code Safety Factors - Guys</li> <li>Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <li>Include Bolts In Member Capacity</li> <li>Leg Bolts Are At Top Of Section</li> <li>Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>SR Members Have Cut Ends</li> <li>SR Members Are Concentric</li> </ul> | <ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>√ Assume Rigid Index Plate</li> <li>√ Use Clear Spans For Wind Area</li> <li>Use Clear Spans For KL/r</li> <li>Retension Guys To Initial Tension</li> <li>√ Bypass Mast Stability Checks</li> <li>√ Use Azimuth Dish Coefficients</li> <li>√ Project Wind Area of Appurt.</li> <li>Autocalc Torque Arm Areas</li> <li>Add IBC .6D+W Combination</li> <li>Sort Capacity Reports By Component</li> <li>Triangulate Diamond Inner Bracing</li> <li>Treat Feed Line Bundles As Cylinder</li> <li>Ignore KL/ry For 60 Deg. Angle Legs</li> </ul> | <ul style="list-style-type: none"> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>Calculate Redundant Bracing Forces</li> <li>Ignore Redundant Members in FEA</li> <li>SR Leg Bolts Resist Compression</li> <li>All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>√ Consider Feed Line Torque</li> <li>Include Angle Block Shear Check</li> <li>Use TIA-222-H Bracing Resist. Exemption</li> <li>Use TIA-222-H Tension Splice Exemption</li> </ul> <p style="text-align: center; background-color: #e0e0e0; margin: 5px 0;">Poles</p> <ul style="list-style-type: none"> <li>√ Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> <li>Pole Without Linear Attachments</li> <li>Pole With Shroud Or No Appurtenances</li> <li>Outside and Inside Corner Radii Are Known</li> </ul> |
|--|---|--|

## Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	119.00-84.33	34.67	3.63	18	19.0986	29.0300	0.5000	2.0000	A572-50 (50 ksi)
L2	84.33-45.50	42.46	4.89	18	26.9902	39.1500	0.6250	2.5000	A572-50 (50 ksi)
L3	45.50-0.00	50.39		18	36.4996	50.9295	0.6875	2.7500	A572-50 (50 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L1	19.3161	29.5160	1289.8952	6.6025	9.7021	132.9503	2581.4878	14.7608	2.4814	4.963
	29.4007	45.2771	4656.0720	10.1282	14.7472	315.7250	9318.2707	22.6429	4.2293	8.459
L2	28.3657	52.3019	4593.2064	9.3596	13.7110	335.0014	9192.4566	26.1559	3.6503	5.84
	39.6575	76.4240	14330.2027	13.6764	19.8882	720.5379	28679.2614	38.2192	5.7904	9.265
L3	38.3785	78.1464	12662.1055	12.7133	18.5418	682.8955	25340.8720	39.0806	5.2139	7.584
	51.6091	109.6343	34963.7360	17.8359	25.8722	1351.4025	69973.4782	54.8276	7.7536	11.278

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontal	Double Angle Stitch Bolt Spacing Redundants
ft	ft <sup>2</sup>	in					in	in	in
L1 119.00-84.33				1	1	1			
L2 84.33-45.50				1	1	1			
L3 45.50-0.00				1	1	1			

### Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter r	Perimeter r	Weight plf
*****										
Safety Line 3/8"	C	No	Surface Ar (CaAa)	119.00 - 12.50	1	1	0.000	0.3750		0.22
Step Pegs	C	No	Surface Ar (CaAa)	119.00 - 12.50	1	1	-0.050 0.050	0.7050		1.80
*****										
EUCAHYBRID 78-12C6-24MM5(7/8)	A	No	Surface Ar (CaAa)	85.00 - 5.00	1	1	-0.500 -0.500	1.1000		0.73
*****										

### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
*****									
LDF4-50A(1/2)	C	No	No	Inside Pole	119.00 - 3.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
LDF5-50A(7/8)	C	No	No	Inside Pole	119.00 - 3.00	2	No Ice	0.00	0.33
							1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33
LDF7-50A(1-5/8)	C	No	No	Inside Pole	119.00 - 3.00	12	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
*****									
***									
HB158-21U6S24-xxM_TMO(1-5/8)	C	No	No	Inside Pole	108.00 - 0.00	3	No Ice	0.00	2.50
							1/2" Ice	0.00	2.50
							1" Ice	0.00	2.50
*****									
HJ7-50A(1-5/8)	B	No	No	Inside Pole	100.00 - 7.00	12	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04
HB158-1-08U8-S8J18(1-5/8)	B	No	No	Inside Pole	100.00 - 7.00	1	No Ice	0.00	1.30
							1/2" Ice	0.00	1.30
							1" Ice	0.00	1.30
*****									

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
CU12PSM9P8XXX (1-3/8)	A	No	No	Inside Pole	75.00 - 0.00	1	No Ice	0.00	1.66
							1/2" Ice	0.00	1.66
							1" Ice	0.00	1.66
*****									

### Feed Line/Linear Appurtenances Section Areas

Tower Section n	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L1	119.00-84.33	A	0.000	0.000	0.074	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.22
		C	0.000	0.000	3.744	0.000	0.62
L2	84.33-45.50	A	0.000	0.000	4.271	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.54
		C	0.000	0.000	4.194	0.000	0.78
L3	45.50-0.00	A	0.000	0.000	4.455	0.000	0.11
		B	0.000	0.000	0.000	0.000	0.53
		C	0.000	0.000	3.564	0.000	0.86

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L1	119.00-84.33	A	0.950	0.000	0.000	0.201	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.22
		C		0.000	0.000	16.923	0.000	0.74
L2	84.33-45.50	A	0.909	0.000	0.000	11.651	0.000	0.17
		B		0.000	0.000	0.000	0.000	0.54
		C		0.000	0.000	18.954	0.000	0.92
L3	45.50-0.00	A	0.816	0.000	0.000	11.814	0.000	0.20
		B		0.000	0.000	0.000	0.000	0.53
		C		0.000	0.000	15.557	0.000	0.97

### Feed Line Center of Pressure

Section	Elevation ft	CP <sub>X</sub> in	CP <sub>Z</sub> in	CP <sub>X</sub> Ice in	CP <sub>Z</sub> Ice in
L1	119.00-84.33	-0.0174	0.8463	-0.0242	1.9396
L2	84.33-45.50	-0.7225	1.2242	-1.0312	2.5016
L3	45.50-0.00	-0.6519	0.9573	-0.9569	1.9547

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 <sub>a</sub> No Ice	K <sub>a</sub> Ice
L1	2	Safety Line 3/8"	84.33 - 119.00	1.0000	1.0000
L1	3	Step Pegs	84.33 - 119.00	1.0000	1.0000
L1	19	EUCAHYBRID 78-12C6-24MM5(7/8)	84.33 - 85.00	1.0000	1.0000
L2	2	Safety Line 3/8"	45.50 - 84.33	1.0000	1.0000
L2	3	Step Pegs	45.50 - 84.33	1.0000	1.0000
L2	19	EUCAHYBRID 78-12C6-24MM5(7/8)	45.50 - 84.33	1.0000	1.0000
L3	2	Safety Line 3/8"	12.50 - 45.50	1.0000	1.0000
L3	3	Step Pegs	12.50 - 45.50	1.0000	1.0000
L3	19	EUCAHYBRID 78-12C6-24MM5(7/8)	5.00 - 45.50	1.0000	1.0000



### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement  ft	C <sub>AA</sub> Front  ft <sup>2</sup>	C <sub>AA</sub> Side  ft <sup>2</sup>	Weight  K
*****								
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	119.00	No Ice 3.39 1/2" Ice 3.75 1" Ice 4.12	2.32 2.66 3.02	0.06 0.10 0.15
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	119.00	No Ice 3.39 1/2" Ice 3.75 1" Ice 4.12	2.32 2.66 3.02	0.06 0.10 0.15
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	119.00	No Ice 3.39 1/2" Ice 3.75 1" Ice 4.12	2.32 2.66 3.02	0.06 0.10 0.15
AM-X-CD-17-65-00T-RET w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	119.00	No Ice 6.09 1/2" Ice 6.66 1" Ice 7.24	4.31 4.86 5.42	0.09 0.17 0.26
AM-X-CD-17-65-00T-RET w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	119.00	No Ice 6.09 1/2" Ice 6.66 1" Ice 7.24	4.31 4.86 5.42	0.09 0.17 0.26
AM-X-CD-17-65-00T-RET w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	119.00	No Ice 6.09 1/2" Ice 6.66 1" Ice 7.24	4.31 4.86 5.42	0.09 0.17 0.26
(2) LGP21401	A	From Leg	4.00 0.00 2.00	0.0000	119.00	No Ice 1.10 1/2" Ice 1.24 1" Ice 1.38	0.21 0.27 0.35	0.01 0.02 0.03
(2) LGP21401	B	From Leg	4.00 0.00 2.00	0.0000	119.00	No Ice 1.10 1/2" Ice 1.24 1" Ice 1.38	0.21 0.27 0.35	0.01 0.02 0.03
(2) LGP21401	C	From Leg	4.00 0.00 2.00	0.0000	119.00	No Ice 1.10 1/2" Ice 1.24 1" Ice 1.38	0.21 0.27 0.35	0.01 0.02 0.03
(2) RRUS 11 B12	A	From Leg	4.00 0.00 2.00	0.0000	119.00	No Ice 2.83 1/2" Ice 3.04 1" Ice 3.26	1.18 1.33 1.48	0.05 0.07 0.10
(2) RRUS 11 B12	B	From Leg	4.00 0.00 2.00	0.0000	119.00	No Ice 2.83 1/2" Ice 3.04 1" Ice 3.26	1.18 1.33 1.48	0.05 0.07 0.10
(2) RRUS 11 B12	C	From Leg	4.00 0.00 2.00	0.0000	119.00	No Ice 2.83 1/2" Ice 3.04 1" Ice 3.26	1.18 1.33 1.48	0.05 0.07 0.10
(2) LGP21901	A	From Leg	4.00 0.00 2.00	0.0000	119.00	No Ice 0.23 1/2" Ice 0.29 1" Ice 0.36	0.16 0.21 0.28	0.01 0.01 0.01
(2) LGP21901	B	From Leg	4.00 0.00 2.00	0.0000	119.00	No Ice 0.23 1/2" Ice 0.29 1" Ice 0.36	0.16 0.21 0.28	0.01 0.01 0.01
(2) LGP21901	C	From Leg	4.00 0.00 2.00	0.0000	119.00	No Ice 0.23 1/2" Ice 0.29 1" Ice 0.36	0.16 0.21 0.28	0.01 0.01 0.01
DC6-48-60-18-8F	C	From Leg	4.00 0.00 2.00	0.0000	119.00	No Ice 0.92 1/2" Ice 1.46 1" Ice 1.64	0.92 1.46 1.64	0.02 0.04 0.06
8' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1.90 1/2" Ice 2.73 1" Ice 3.40	1.90 2.73 3.40	0.03 0.04 0.06
8' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1.90 1/2" Ice 2.73 1" Ice 3.40	1.90 2.73 3.40	0.03 0.04 0.06
8' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1.90 1/2" Ice 2.73 1" Ice 3.40	1.90 2.73 3.40	0.03 0.04 0.06
Platform Mount [LP 1202- 1]	C	None		0.0000	119.00	No Ice 23.61 1/2" Ice 28.39 1" Ice 33.20	23.61 28.39 33.20	3.40 4.08 4.83

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
Platform Mount [LP 304-1_HR-1]	C	None		0.0000	108.00	No Ice	21.41	21.41	1.60
						1/2" Ice	26.62	26.62	2.06
						1" Ice	31.66	31.66	2.60
***									
AIR 6419	A	From Leg	4.00	0.0000	108.00	No Ice	5.79	2.97	0.10
B41_TMO_CCIV2 w/ Mount Pipe			0.00			1/2" Ice	6.24	3.34	0.14
			2.00			1" Ice	6.71	3.73	0.19
AIR 6419	B	From Leg	4.00	0.0000	108.00	No Ice	5.79	2.97	0.10
B41_TMO_CCIV2 w/ Mount Pipe			0.00			1/2" Ice	6.24	3.34	0.14
			2.00			1" Ice	6.71	3.73	0.19
AIR 6419	C	From Leg	4.00	0.0000	108.00	No Ice	5.79	2.97	0.10
B41_TMO_CCIV2 w/ Mount Pipe			0.00			1/2" Ice	6.24	3.34	0.14
			2.00			1" Ice	6.71	3.73	0.19
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Leg	4.00	0.0000	108.00	No Ice	14.69	6.87	0.18
			0.00			1/2" Ice	15.46	7.55	0.31
			2.00			1" Ice	16.23	8.25	0.45
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	B	From Leg	4.00	0.0000	108.00	No Ice	14.69	6.87	0.18
			0.00			1/2" Ice	15.46	7.55	0.31
			2.00			1" Ice	16.23	8.25	0.45
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	C	From Leg	4.00	0.0000	108.00	No Ice	14.69	6.87	0.18
			0.00			1/2" Ice	15.46	7.55	0.31
			2.00			1" Ice	16.23	8.25	0.45
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.00	0.0000	108.00	No Ice	1.97	1.59	0.07
			0.00			1/2" Ice	2.15	1.75	0.09
			2.00			1" Ice	2.33	1.92	0.12
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.00	0.0000	108.00	No Ice	1.97	1.59	0.07
			0.00			1/2" Ice	2.15	1.75	0.09
			2.00			1" Ice	2.33	1.92	0.12
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.00	0.0000	108.00	No Ice	1.97	1.59	0.07
			0.00			1/2" Ice	2.15	1.75	0.09
			2.00			1" Ice	2.33	1.92	0.12
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.00	0.0000	108.00	No Ice	2.14	1.69	0.11
			0.00			1/2" Ice	2.32	1.85	0.13
			2.00			1" Ice	2.51	2.02	0.16
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.00	0.0000	108.00	No Ice	2.14	1.69	0.11
			0.00			1/2" Ice	2.32	1.85	0.13
			2.00			1" Ice	2.51	2.02	0.16
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.00	0.0000	108.00	No Ice	2.14	1.69	0.11
			0.00			1/2" Ice	2.32	1.85	0.13
			2.00			1" Ice	2.51	2.02	0.16
*****									
(2) LPA-80080/6CF w/ Mount Pipe	A	From Leg	4.00	0.0000	100.00	No Ice	3.02	7.80	0.06
			0.00			1/2" Ice	3.57	8.42	0.12
			0.00			1" Ice	4.14	9.06	0.19
(2) LPA-80080/6CF w/ Mount Pipe	B	From Leg	4.00	0.0000	100.00	No Ice	3.02	7.80	0.06
			0.00			1/2" Ice	3.57	8.42	0.12
			0.00			1" Ice	4.14	9.06	0.19
(2) LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.00	0.0000	100.00	No Ice	3.02	7.80	0.06
			0.00			1/2" Ice	3.57	8.42	0.12
			0.00			1" Ice	4.14	9.06	0.19
RXXDC-3315-PF-48	B	From Leg	4.00	0.0000	100.00	No Ice	3.71	2.19	0.02
			0.00			1/2" Ice	3.95	2.39	0.05
			0.00			1" Ice	4.20	2.61	0.09
Platform Mount [LP 303-1_KCKR-HR-1]	C	None		0.0000	100.00	No Ice	28.31	28.31	1.77
						1/2" Ice	35.69	35.69	2.30
						1" Ice	43.11	43.11	2.94
***									
MT6407-77A w/ Mount Pipe	A	From Leg	4.00	0.0000	100.00	No Ice	5.94	3.10	0.10
			0.00			1/2" Ice	6.47	3.55	0.13
			0.00			1" Ice	7.02	4.02	0.18
MT6407-77A w/ Mount Pipe	B	From Leg	4.00	0.0000	100.00	No Ice	5.94	3.10	0.10
			0.00			1/2" Ice	6.47	3.55	0.13
			0.00			1" Ice	7.02	4.02	0.18
MT6407-77A w/ Mount Pipe	C	From Leg	4.00	0.0000	100.00	No Ice	5.94	3.10	0.10
			0.00			1/2" Ice	6.47	3.55	0.13

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> <sub>Front</sub>	C <sub>AA</sub> <sub>Side</sub>	Weight	
			Horz	Lateral						ft
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
(2) JAHH-65B-R3B	A	From Leg	0.00			1" Ice	7.02	4.02	0.18	
			4.00		0.0000	100.00	No Ice	5.29	3.05	0.06
			0.00				1/2" Ice	5.75	3.48	0.12
(2) JAHH-65B-R3B	B	From Leg	0.00			1" Ice	6.22	3.93	0.19	
			4.00		0.0000	100.00	No Ice	5.29	3.05	0.06
			0.00				1/2" Ice	5.75	3.48	0.12
(2) JAHH-65B-R3B	C	From Leg	0.00			1" Ice	6.22	3.93	0.19	
			4.00		0.0000	100.00	No Ice	5.29	3.05	0.06
			0.00				1/2" Ice	5.75	3.48	0.12
RF4439D-25A	A	From Leg	0.00			1" Ice	6.22	3.93	0.19	
			4.00		0.0000	100.00	No Ice	1.87	1.25	0.07
			0.00				1/2" Ice	2.03	1.39	0.09
(2) RF4439D-25A	B	From Leg	0.00			1" Ice	2.21	1.54	0.11	
			4.00		0.0000	100.00	No Ice	1.87	1.25	0.07
			0.00				1/2" Ice	2.03	1.39	0.09
CBC78T-DS-43-2X	A	From Leg	0.00			1" Ice	2.21	1.54	0.11	
			4.00		0.0000	100.00	No Ice	0.37	0.51	0.02
			0.00				1/2" Ice	0.45	0.60	0.03
CBC78T-DS-43-2X	B	From Leg	0.00			1" Ice	0.53	0.70	0.04	
			4.00		0.0000	100.00	No Ice	0.37	0.51	0.02
			0.00				1/2" Ice	0.45	0.60	0.03
CBC78T-DS-43-2X	C	From Leg	0.00			1" Ice	0.53	0.70	0.04	
			4.00		0.0000	100.00	No Ice	0.37	0.51	0.02
			0.00				1/2" Ice	0.45	0.60	0.03
(2) RF4440D-13A	A	From Leg	0.00			1" Ice	0.53	0.70	0.04	
			4.00		0.0000	100.00	No Ice	1.87	1.13	0.07
			0.00				1/2" Ice	2.03	1.27	0.09
RF4440D-13A	C	From Leg	0.00			1" Ice	2.21	1.41	0.11	
			4.00		0.0000	100.00	No Ice	1.87	1.13	0.07
			0.00				1/2" Ice	2.03	1.27	0.09
RXXDC-3315-PF-48	A	From Leg	0.00			1" Ice	2.21	1.41	0.11	
			4.00		0.0000	100.00	No Ice	3.71	2.19	0.02
			0.00				1/2" Ice	3.95	2.39	0.05
(2) 8' x 2" Mount Pipe	A	From Leg	0.00			1" Ice	4.20	2.61	0.09	
			4.00		0.0000	100.00	No Ice	1.90	1.90	0.03
			0.00				1/2" Ice	2.73	2.73	0.04
(2) 8' x 2" Mount Pipe	B	From Leg	0.00			1" Ice	3.40	3.40	0.06	
			4.00		0.0000	100.00	No Ice	1.90	1.90	0.03
			0.00				1/2" Ice	2.73	2.73	0.04
(2) 8' x 2" Mount Pipe	C	From Leg	0.00			1" Ice	3.40	3.40	0.06	
			4.00		0.0000	100.00	No Ice	1.90	1.90	0.03
			0.00				1/2" Ice	2.73	2.73	0.04
Dual Antenna Mounting Kit	A	From Leg	0.00			1" Ice	3.40	3.40	0.06	
			4.00		0.0000	100.00	No Ice	1.32	1.32	0.07
			0.00				1/2" Ice	1.58	1.58	0.08
Dual Antenna Mounting Kit	B	From Leg	0.00			1" Ice	1.84	1.84	0.09	
			4.00		0.0000	100.00	No Ice	1.32	1.32	0.07
			0.00				1/2" Ice	1.58	1.58	0.08
Dual Antenna Mounting Kit	C	From Leg	0.00			1" Ice	1.84	1.84	0.09	
			4.00		0.0000	100.00	No Ice	1.32	1.32	0.07
			0.00				1/2" Ice	1.58	1.58	0.08
*****			0.00			1" Ice	1.84	1.84	0.09	
(3) BFA8F-A5A W/RRH w/ Mount Pipe	A	From Leg	4.00		0.0000	85.00	No Ice	15.85	5.69	0.16
			0.00				1/2" Ice	16.62	6.28	0.27
			0.00				1" Ice	17.40	6.88	0.39
(3) BFA8F-A5A W/RRH w/ Mount Pipe	B	From Leg	4.00		0.0000	85.00	No Ice	15.85	5.69	0.16
			0.00				1/2" Ice	16.62	6.28	0.27
			0.00				1" Ice	17.40	6.88	0.39
(3) RHCDC-3441-P-48-NA	A	From Leg	4.00		0.0000	85.00	No Ice	0.49	0.19	0.00
			0.00				1/2" Ice	0.57	0.25	0.01
			0.00				1" Ice	0.67	0.33	0.01
(3) RHCDC-3441-P-48-NA	B	From Leg	4.00		0.0000	85.00	No Ice	0.49	0.19	0.00
			0.00				1/2" Ice	0.57	0.25	0.01
			0.00				1" Ice	0.67	0.33	0.01

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> <sub>Front</sub>	C <sub>AA</sub> <sub>Side</sub>	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
RHDCD-1390-PF-48	A	From Leg	4.00		0.0000	85.00	No Ice	3.18	1.20	0.02
			0.00				1/2" Ice	3.41	1.35	0.04
			0.00				1" Ice	3.63	1.50	0.07
Sector Mount [SM 502-1]	A	From Leg	2.00		0.0000	85.00	No Ice	15.40	11.11	0.56
			0.00				1/2" Ice	21.17	16.35	0.76
			0.00				1" Ice	26.86	21.52	1.02
Sector Mount [SM 502-1]	B	From Leg	2.00		0.0000	85.00	No Ice	15.40	11.11	0.56
			0.00				1/2" Ice	21.17	16.35	0.76
			0.00				1" Ice	26.86	21.52	1.02
Pipe Mount [PM 601-3]	C	None			0.0000	85.00	No Ice	3.17	3.17	0.20
							1/2" Ice	3.79	3.79	0.23
							1" Ice	4.42	4.42	0.28
*****										
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00		0.0000	75.00	No Ice	8.01	4.23	0.11
			0.00				1/2" Ice	8.52	4.69	0.19
			0.00				1" Ice	9.04	5.16	0.29
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00		0.0000	75.00	No Ice	8.01	4.23	0.11
			0.00				1/2" Ice	8.52	4.69	0.19
			0.00				1" Ice	9.04	5.16	0.29
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00		0.0000	75.00	No Ice	8.01	4.23	0.11
			0.00				1/2" Ice	8.52	4.69	0.19
			0.00				1" Ice	9.04	5.16	0.29
TA08025-B604	A	From Leg	4.00		0.0000	75.00	No Ice	1.96	0.98	0.06
			0.00				1/2" Ice	2.14	1.11	0.08
			0.00				1" Ice	2.32	1.25	0.10
TA08025-B604	B	From Leg	4.00		0.0000	75.00	No Ice	1.96	0.98	0.06
			0.00				1/2" Ice	2.14	1.11	0.08
			0.00				1" Ice	2.32	1.25	0.10
TA08025-B604	C	From Leg	4.00		0.0000	75.00	No Ice	1.96	0.98	0.06
			0.00				1/2" Ice	2.14	1.11	0.08
			0.00				1" Ice	2.32	1.25	0.10
TA08025-B605	A	From Leg	4.00		0.0000	75.00	No Ice	1.96	1.13	0.08
			0.00				1/2" Ice	2.14	1.27	0.09
			0.00				1" Ice	2.32	1.41	0.11
TA08025-B605	B	From Leg	4.00		0.0000	75.00	No Ice	1.96	1.13	0.08
			0.00				1/2" Ice	2.14	1.27	0.09
			0.00				1" Ice	2.32	1.41	0.11
TA08025-B605	C	From Leg	4.00		0.0000	75.00	No Ice	1.96	1.13	0.08
			0.00				1/2" Ice	2.14	1.27	0.09
			0.00				1" Ice	2.32	1.41	0.11
RDIDC-9181-PF-48	A	From Leg	4.00		0.0000	75.00	No Ice	2.01	1.17	0.02
			0.00				1/2" Ice	2.19	1.31	0.04
			0.00				1" Ice	2.37	1.46	0.06
(2) 8' x 2" Mount Pipe	A	From Leg	4.00		0.0000	75.00	No Ice	1.90	1.90	0.03
			0.00				1/2" Ice	2.73	2.73	0.04
			0.00				1" Ice	3.40	3.40	0.06
(2) 8' x 2" Mount Pipe	B	From Leg	4.00		0.0000	75.00	No Ice	1.90	1.90	0.03
			0.00				1/2" Ice	2.73	2.73	0.04
			0.00				1" Ice	3.40	3.40	0.06
(2) 8' x 2" Mount Pipe	C	From Leg	4.00		0.0000	75.00	No Ice	1.90	1.90	0.03
			0.00				1/2" Ice	2.73	2.73	0.04
			0.00				1" Ice	3.40	3.40	0.06
Commscope MC-PK8-DSH	C	None			0.0000	75.00	No Ice	34.24	34.24	1.75
							1/2" Ice	62.95	62.95	2.10
							1" Ice	91.66	91.66	2.45
*****										

## Load Combinations

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

## Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	119 - 84.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.64	-0.88	0.93
			Max. Mx	8	-18.60	-250.18	0.09
			Max. My	2	-18.59	0.07	251.32
			Max. Vy	8	12.41	-250.18	0.09
			Max. Vx	2	-12.48	0.07	251.32
			Max. Torque	24			
L2	84.33 - 45.5	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L3	45.5 - 0	Pole	Max. Compression	26	-52.18	-9.75	6.62
			Max. Mx	8	-36.48	-932.20	-16.40
			Max. My	2	-36.46	14.84	957.80
			Max. Vy	8	20.36	-932.20	-16.40
			Max. Vx	2	-21.12	14.84	957.80
			Max. Torque	25			-4.87
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-77.72	-9.58	6.41
			Max. Mx	8	-59.62	-2039.87	-44.04
			Max. My	2	-59.62	42.41	2103.17
			Max. Vy	8	23.63	-2039.87	-44.04
			Max. Vx	2	-24.37	42.41	2103.17
			Max. Torque	25			-4.86

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	77.72	-0.00	0.00
	Max. H <sub>x</sub>	20	59.63	23.61	0.54
	Max. H <sub>z</sub>	2	59.63	0.54	24.35
	Max. M <sub>x</sub>	2	2103.17	0.54	24.35
	Max. M <sub>z</sub>	8	2039.87	-23.61	-0.54
	Max. Torsion	13	4.86	-12.27	-21.36
	Min. Vert	19	44.72	20.18	-11.71
	Min. H <sub>x</sub>	8	59.63	-23.61	-0.54
	Min. H <sub>z</sub>	14	59.63	-0.54	-24.35
	Min. M <sub>x</sub>	14	-2096.57	-0.54	-24.35
	Min. M <sub>z</sub>	20	-2029.99	23.61	0.54
	Min. Torsion	25	-4.86	12.27	21.36

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	49.69	0.00	0.00	-2.68	-4.01	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	59.63	-0.54	-24.35	-2103.17	42.41	3.98
0.9 Dead+1.0 Wind 0 deg - No Ice	44.72	-0.54	-24.35	-2088.27	43.39	3.98
1.2 Dead+1.0 Wind 30 deg - No Ice	59.63	11.34	-20.82	-1798.18	-981.40	2.03
0.9 Dead+1.0 Wind 30 deg - No Ice	44.72	11.34	-20.82	-1785.31	-973.55	2.03
1.2 Dead+1.0 Wind 60 deg - No Ice	59.63	20.18	-11.71	-1012.25	-1743.58	-0.46
0.9 Dead+1.0 Wind 60 deg - No Ice	44.72	20.18	-11.71	-1004.62	-1730.63	-0.46
1.2 Dead+1.0 Wind 90 deg - No Ice	59.63	23.61	0.54	44.04	-2039.87	-2.83
0.9 Dead+1.0 Wind 90 deg - No Ice	44.72	23.61	0.54	44.61	-2024.95	-2.83
1.2 Dead+1.0 Wind 120 deg - No Ice	59.63	20.72	12.64	1087.64	-1790.89	-4.44
0.9 Dead+1.0 Wind 120 deg - No Ice	44.72	20.72	12.64	1081.22	-1777.65	-4.44
1.2 Dead+1.0 Wind 150 deg - No Ice	59.63	12.27	21.36	1838.91	-1063.38	-4.86
0.9 Dead+1.0 Wind 150 deg - No Ice	44.72	12.27	21.36	1827.45	-1055.03	-4.86
1.2 Dead+1.0 Wind 180 deg - No Ice	59.63	0.54	24.35	2096.57	-52.27	-3.98
0.9 Dead+1.0 Wind 180 deg - No Ice	44.72	0.54	24.35	2083.38	-50.70	-3.98
1.2 Dead+1.0 Wind 210 deg - No Ice	59.63	-11.34	20.82	1791.59	971.53	-2.03
0.9 Dead+1.0 Wind 210 deg - No Ice	44.72	-11.34	20.82	1780.42	966.24	-2.03
1.2 Dead+1.0 Wind 240 deg - No Ice	59.63	-20.18	11.71	1005.65	1733.70	0.46
0.9 Dead+1.0 Wind 240 deg - No Ice	44.72	-20.18	11.71	999.74	1723.31	0.46
1.2 Dead+1.0 Wind 270 deg - No Ice	59.63	-23.61	-0.54	-50.63	2029.99	2.83
0.9 Dead+1.0 Wind 270 deg - No Ice	44.72	-23.61	-0.54	-49.49	2017.63	2.83
1.2 Dead+1.0 Wind 300 deg - No Ice	59.63	-20.72	-12.64	-1094.23	1781.02	4.44
0.9 Dead+1.0 Wind 300 deg - No Ice	44.72	-20.72	-12.64	-1086.10	1770.34	4.44
1.2 Dead+1.0 Wind 330 deg - No Ice	59.63	-12.27	-21.36	-1845.50	1053.52	4.86

Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overturning Moment, M <sub>x</sub>	Overturning Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.0 Wind 330 deg - No Ice	44.72	-12.27	-21.36	-1832.33	1047.72	4.86
1.2 Dead+1.0 Ice+1.0 Temp	77.72	0.00	-0.00	-6.41	-9.58	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	77.72	-0.09	-5.88	-501.18	-1.56	0.86
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	77.72	2.80	-5.04	-430.84	-244.42	0.45
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	77.72	4.93	-2.86	-246.80	-424.38	-0.09
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	77.72	5.75	0.09	1.64	-493.22	-0.61
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	77.72	5.03	3.02	247.90	-432.49	-0.96
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	77.72	2.95	5.13	426.00	-258.48	-1.05
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	77.72	0.09	5.88	488.22	-17.79	-0.86
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	77.72	-2.80	5.04	417.89	225.07	-0.45
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	77.72	-4.93	2.86	233.85	405.03	0.09
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	77.72	-5.75	-0.09	-14.59	473.87	0.61
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	77.72	-5.03	-3.02	-260.85	413.14	0.96
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	77.72	-2.95	-5.13	-438.95	239.12	1.05
Dead+Wind 0 deg - Service	49.69	-0.12	-5.28	-456.60	6.15	0.86
Dead+Wind 30 deg - Service	49.69	2.46	-4.52	-390.68	-215.14	0.44
Dead+Wind 60 deg - Service	49.69	4.38	-2.54	-220.80	-379.88	-0.10
Dead+Wind 90 deg - Service	49.69	5.12	0.12	7.50	-443.92	-0.61
Dead+Wind 120 deg - Service	49.69	4.50	2.74	233.07	-390.11	-0.96
Dead+Wind 150 deg - Service	49.69	2.66	4.64	395.45	-232.86	-1.05
Dead+Wind 180 deg - Service	49.69	0.12	5.28	451.14	-14.32	-0.86
Dead+Wind 210 deg - Service	49.69	-2.46	4.52	385.22	206.97	-0.44
Dead+Wind 240 deg - Service	49.69	-4.38	2.54	215.35	371.71	0.10
Dead+Wind 270 deg - Service	49.69	-5.12	-0.12	-12.96	435.75	0.61
Dead+Wind 300 deg - Service	49.69	-4.50	-2.74	-238.52	381.94	0.96
Dead+Wind 330 deg - Service	49.69	-2.66	-4.64	-400.91	224.69	1.05

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-49.69	0.00	0.00	49.69	0.00	0.000%
2	-0.54	-59.63	-24.35	0.54	59.63	24.35	0.000%
3	-0.54	-44.72	-24.35	0.54	44.72	24.35	0.000%
4	11.34	-59.63	-20.82	-11.34	59.63	20.82	0.000%
5	11.34	-44.72	-20.82	-11.34	44.72	20.82	0.000%
6	20.18	-59.63	-11.71	-20.18	59.63	11.71	0.000%
7	20.18	-44.72	-11.71	-20.18	44.72	11.71	0.000%
8	23.61	-59.63	0.54	-23.61	59.63	-0.54	0.000%
9	23.61	-44.72	0.54	-23.61	44.72	-0.54	0.000%
10	20.72	-59.63	12.64	-20.72	59.63	-12.64	0.000%
11	20.72	-44.72	12.64	-20.72	44.72	-12.64	0.000%
12	12.27	-59.63	21.36	-12.27	59.63	-21.36	0.000%
13	12.27	-44.72	21.36	-12.27	44.72	-21.36	0.000%
14	0.54	-59.63	24.35	-0.54	59.63	-24.35	0.000%
15	0.54	-44.72	24.35	-0.54	44.72	-24.35	0.000%
16	-11.34	-59.63	20.82	11.34	59.63	-20.82	0.000%
17	-11.34	-44.72	20.82	11.34	44.72	-20.82	0.000%
18	-20.18	-59.63	11.71	20.18	59.63	-11.71	0.000%
19	-20.18	-44.72	11.71	20.18	44.72	-11.71	0.000%
20	-23.61	-59.63	-0.54	23.61	59.63	0.54	0.000%
21	-23.61	-44.72	-0.54	23.61	44.72	0.54	0.000%
22	-20.72	-59.63	-12.64	20.72	59.63	12.64	0.000%
23	-20.72	-44.72	-12.64	20.72	44.72	12.64	0.000%
24	-12.27	-59.63	-21.36	12.27	59.63	21.36	0.000%
25	-12.27	-44.72	-21.36	12.27	44.72	21.36	0.000%
26	0.00	-77.72	0.00	-0.00	77.72	0.00	0.000%
27	-0.09	-77.72	-5.88	0.09	77.72	5.88	0.000%
28	2.80	-77.72	-5.04	-2.80	77.72	5.04	0.000%
29	4.93	-77.72	-2.86	-4.93	77.72	2.86	0.000%
30	5.75	-77.72	0.09	-5.75	77.72	-0.09	0.000%
31	5.03	-77.72	3.02	-5.03	77.72	-3.02	0.000%
32	2.95	-77.72	5.13	-2.95	77.72	-5.13	0.000%
33	0.09	-77.72	5.88	-0.09	77.72	-5.88	0.000%
34	-2.80	-77.72	5.04	2.80	77.72	-5.04	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
35	-4.93	-77.72	2.86	4.93	77.72	-2.86	0.000%
36	-5.75	-77.72	-0.09	5.75	77.72	0.09	0.000%
37	-5.03	-77.72	-3.02	5.03	77.72	3.02	0.000%
38	-2.95	-77.72	-5.13	2.95	77.72	5.13	0.000%
39	-0.12	-49.69	-5.28	0.12	49.69	5.28	0.000%
40	2.46	-49.69	-4.52	-2.46	49.69	4.52	0.000%
41	4.38	-49.69	-2.54	-4.38	49.69	2.54	0.000%
42	5.12	-49.69	0.12	-5.12	49.69	-0.12	0.000%
43	4.50	-49.69	2.74	-4.50	49.69	-2.74	0.000%
44	2.66	-49.69	4.64	-2.66	49.69	-4.64	0.000%
45	0.12	-49.69	5.28	-0.12	49.69	-5.28	0.000%
46	-2.46	-49.69	4.52	2.46	49.69	-4.52	0.000%
47	-4.38	-49.69	2.54	4.38	49.69	-2.54	0.000%
48	-5.12	-49.69	-0.12	5.12	49.69	0.12	0.000%
49	-4.50	-49.69	-2.74	4.50	49.69	2.74	0.000%
50	-2.66	-49.69	-4.64	2.66	49.69	4.64	0.000%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00028868
3	Yes	4	0.00000001	0.00020042
4	Yes	4	0.00000001	0.00078316
5	Yes	4	0.00000001	0.00053476
6	Yes	4	0.00000001	0.00070232
7	Yes	4	0.00000001	0.00047840
8	Yes	4	0.00000001	0.00019285
9	Yes	4	0.00000001	0.00013420
10	Yes	4	0.00000001	0.00067025
11	Yes	4	0.00000001	0.00045599
12	Yes	5	0.00000001	0.00003509
13	Yes	4	0.00000001	0.00069316
14	Yes	4	0.00000001	0.00035821
15	Yes	4	0.00000001	0.00024858
16	Yes	4	0.00000001	0.00059640
17	Yes	4	0.00000001	0.00040771
18	Yes	4	0.00000001	0.00064327
19	Yes	4	0.00000001	0.00044129
20	Yes	4	0.00000001	0.00025892
21	Yes	4	0.00000001	0.00018027
22	Yes	4	0.00000001	0.00096257
23	Yes	4	0.00000001	0.00066191
24	Yes	4	0.00000001	0.00065596
25	Yes	4	0.00000001	0.00044644
26	Yes	4	0.00000001	0.00001867
27	Yes	4	0.00000001	0.00036301
28	Yes	4	0.00000001	0.00037474
29	Yes	4	0.00000001	0.00037209
30	Yes	4	0.00000001	0.00035960
31	Yes	4	0.00000001	0.00037117
32	Yes	4	0.00000001	0.00036945
33	Yes	4	0.00000001	0.00034469
34	Yes	4	0.00000001	0.00034003
35	Yes	4	0.00000001	0.00033493
36	Yes	4	0.00000001	0.00033222
37	Yes	4	0.00000001	0.00035895
38	Yes	4	0.00000001	0.00036826
39	Yes	4	0.00000001	0.00001481
40	Yes	4	0.00000001	0.00001443
41	Yes	4	0.00000001	0.00001095
42	Yes	4	0.00000001	0.00001073
43	Yes	4	0.00000001	0.00001582
44	Yes	4	0.00000001	0.00002309
45	Yes	4	0.00000001	0.00001511



46	Yes	4	0.00000001	0.00000948
47	Yes	4	0.00000001	0.00000894
48	Yes	4	0.00000001	0.00001094
49	Yes	4	0.00000001	0.00002109
50	Yes	4	0.00000001	0.00001676

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119 - 84.33	5.921	50	0.4203	0.0025
L2	87.96 - 45.5	3.337	50	0.3577	0.0025
L3	50.39 - 0	1.082	50	0.2028	0.0009

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
119.00	(2) 7770.00 w/ Mount Pipe	50	5.921	0.4203	0.0025	104499
108.00	Platform Mount [LP 304-1_HR-1]	50	4.970	0.4031	0.0026	47500
100.00	(2) LPA-80080/6CF w/ Mount Pipe	50	4.296	0.3882	0.0026	27500
85.00	(3) BFA8F-A5A W/RRH w/ Mount Pipe	50	3.115	0.3483	0.0024	16090
75.00	MX08FRO665-21 w/ Mount Pipe	50	2.414	0.3110	0.0020	13872

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119 - 84.33	27.382	24	1.9398	0.0116
L2	87.96 - 45.5	15.436	24	1.6507	0.0116
L3	50.39 - 0	5.004	24	0.9385	0.0040

### Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
119.00	(2) 7770.00 w/ Mount Pipe	24	27.382	1.9398	0.0116	23157
108.00	Platform Mount [LP 304-1_HR-1]	24	22.989	1.8598	0.0121	10526
100.00	(2) LPA-80080/6CF w/ Mount Pipe	24	19.872	1.7905	0.0123	6093
85.00	(3) BFA8F-A5A W/RRH w/ Mount Pipe	24	14.409	1.6074	0.0113	3547
75.00	MX08FRO665-21 w/ Mount Pipe	24	11.169	1.4370	0.0095	3030

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	$L_u$ ft	Kl/r	A in <sup>2</sup>	$P_u$ K	$\phi P_n$ K	Ratio $\frac{P_u}{\phi P_n}$
L1	119 - 84.33 (1)	TP29.03x19.0986x0.5	34.67	0.00	0.0	43.6269	-18.59	1963.21	0.009
L2	84.33 - 45.5 (2)	TP39.15x26.9902x0.625	42.46	0.00	0.0	73.6459	-36.45	3314.07	0.011
L3	45.5 - 0 (3)	TP50.9295x36.4996x0.6875	50.39	0.00	0.0	109.6340	-59.62	4933.54	0.012

### Pole Bending Design Data

Section No.	Elevation ft	Size	$M_{ux}$ kip-ft	$\phi M_{nx}$ kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	$M_{uy}$ kip-ft	$\phi M_{ny}$ kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	119 - 84.33 (1)	TP29.03x19.0986x0.5	251.32	1395.13	0.180	0.00	1395.13	0.000
L2	84.33 - 45.5 (2)	TP39.15x26.9902x0.625	965.23	3184.70	0.303	0.00	3184.70	0.000
L3	45.5 - 0 (3)	TP50.9295x36.4996x0.6875	2125.03	6436.05	0.330	0.00	6436.05	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	119 - 84.33 (1)	TP29.03x19.0986x0.5	12.48	588.96	0.021	0.32	1417.90	0.000
L2	84.33 - 45.5 (2)	TP39.15x26.9902x0.625	21.41	994.22	0.022	4.86	3232.39	0.002
L3	45.5 - 0 (3)	TP50.9295x36.4996x0.6875	24.65	1480.06	0.017	4.86	6512.19	0.001

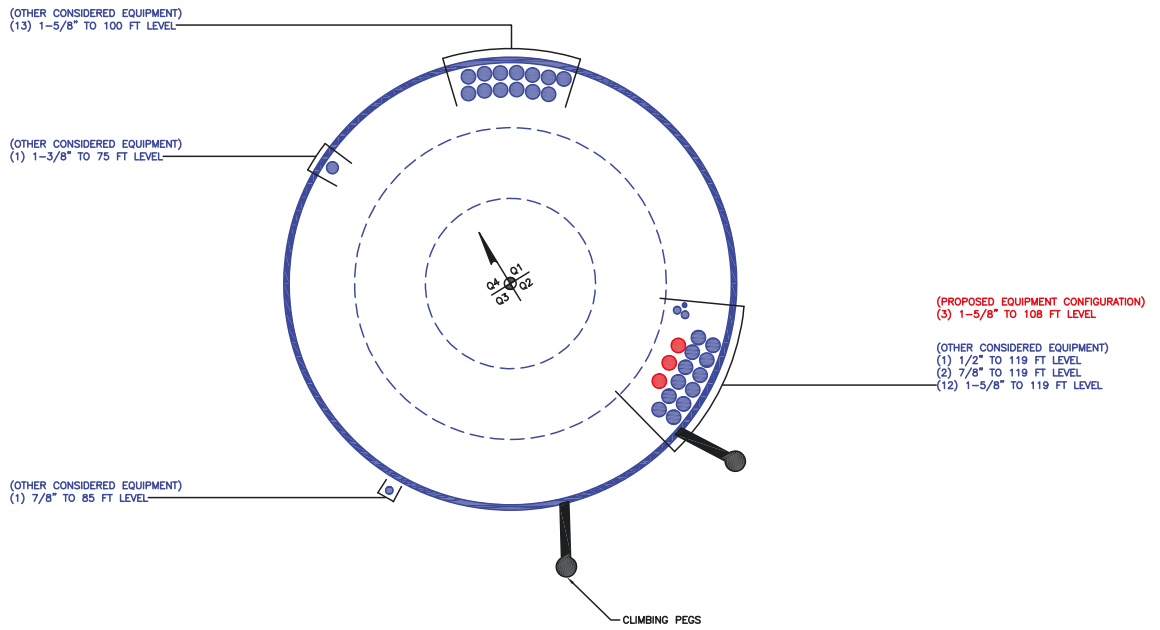
### Pole Interaction Design Data

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	119 - 84.33 (1)	0.009	0.180	0.000	0.021	0.000	0.190	1.050	4.8.2
L2	84.33 - 45.5 (2)	0.011	0.303	0.000	0.022	0.002	0.315	1.050	4.8.2
L3	45.5 - 0 (3)	0.012	0.330	0.000	0.017	0.001	0.343	1.050	4.8.2

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail	
L1	119 - 84.33	Pole	TP29.03x19.0986x0.5	1	-18.59	2061.37	18.1	Pass	
L2	84.33 - 45.5	Pole	TP39.15x26.9902x0.625	2	-36.45	3479.77	30.0	Pass	
L3	45.5 - 0	Pole	TP50.9295x36.4996x0.6875	3	-59.62	5180.22	32.6	Pass	
							Summary		
							Pole (L3)	32.6	Pass
							<b>RATING =</b>	<b>32.6</b>	<b>Pass</b>

**APPENDIX B**  
**BASE LEVEL DRAWING**



**APPENDIX C**  
**ADDITIONAL CALCULATIONS**

# Monopole Base Plate Connection

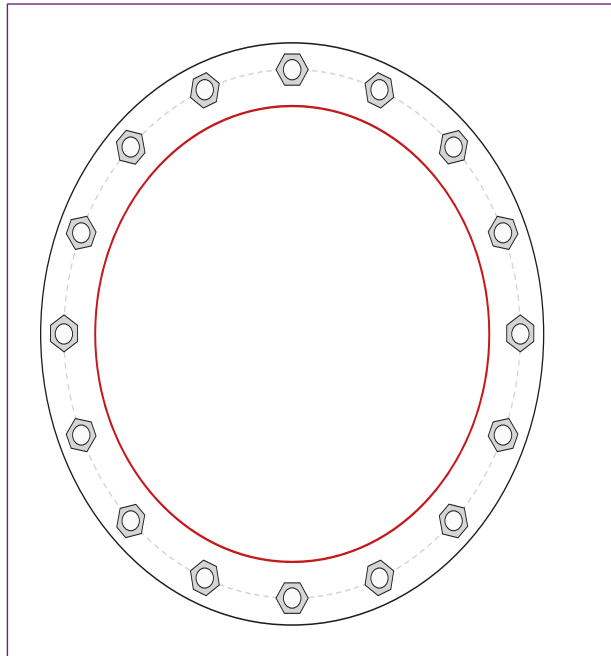


Site Info	
BU #	857013
Site Name	Killingly Ross Road
Order #	655747 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
$l_{ar}$ (in)	1

Applied Loads	
Moment (kip-ft)	2125.03
Axial Force (kips)	59.62
Shear Force (kips)	24.65

\*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
(16) 2-1/4" $\phi$ bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 59" BC
Base Plate Data
65" OD x 2" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)
Stiffener Data
N/A
Pole Data
50.9295" x 0.6875" 18-sided pole (A572-50; Fy=50 ksi, Fu=65 ksi)

Anchor Rod Summary	<i>(units of kips, kip-in)</i>	
$Pu_t = 104.26$	$\phi Pn_t = 243.75$	<b>Stress Rating</b>
$Vu = 1.54$	$\phi Vn = 149.1$	<b>40.7%</b>
$Mu = n/a$	$\phi Mn = n/a$	<b>Pass</b>
Base Plate Summary		
Max Stress (ksi):	27.57	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	<b>58.3%</b>	<b>Pass</b>

# Pier and Pad Foundation



BU #: 857013  
 Site Name: Killingly Ross Road  
 App. Number: 655747 Rev. 0

TIA-222 Revision: H  
 Tower Type: Monopole

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

Superstructure Analysis Reactions		
Compression, $P_{comp}$ :	59.63	kips
Base Shear, $V_u_{comp}$ :	24.63	kips
Moment, $M_u$ :	2125.04	ft-kips
Tower Height, $H$ :	119	ft
BP Dist. Above Fdn, $bp_{dist}$ :	3.25	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	353.77	24.63	6.6%	Pass
<i>Bearing Pressure (ksf)</i>	11.25	1.87	15.9%	Pass
<i>Overturning (kip*ft)</i>	7405.19	2316.44	31.3%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	7576.21	2235.88	28.1%	Pass
<i>Pier Compression (kip)</i>	23390.64	99.32	0.4%	Pass
<i>Pad Flexure (kip*ft)</i>	2730.73	797.75	27.8%	Pass
<i>Pad Shear - 1-way (kips)</i>	776.40	123.45	15.1%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.164	0.025	14.5%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	3437.16	1341.53	37.2%	Pass

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$ :	7	ft
Ext. Above Grade, $E$ :	0.5	ft
Pier Rebar Size, $Sc$ :	10	
Pier Rebar Quantity, $mc$ :	39	
Pier Tie/Spiral Size, $St$ :	3	
Pier Tie/Spiral Quantity, $mt$ :	4	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, $cc_{pier}$ :	3	in

\*Rating per TIA-222-H Section 15.5

Structural Rating*:	37.2%
Soil Rating*:	31.3%

Pad Properties		
Depth, $D$ :	7	ft
Pad Width, $W_1$ :	25	ft
Pad Thickness, $T$ :	3	ft
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, $F_y$ :	60	ksi
Concrete Compressive Strength, $F'_c$ :	3	ksi
Dry Concrete Density, $\delta_c$ :	150	pcf

Soil Properties		
Total Soil Unit Weight, $\gamma$ :	125	pcf
Ultimate Gross Bearing, $Q_{ult}$ :	15.000	ksf
Cohesion, $C_u$ :	0.000	ksf
Friction Angle, $\phi$ :	38	degrees
SPT Blow Count, $N_{blows}$ :	44	
Base Friction, $\mu$ :	0.45	
Neglected Depth, $N$ :	4.17	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, $gw$ :	N/A	ft

<--Toggle between Gross and Net

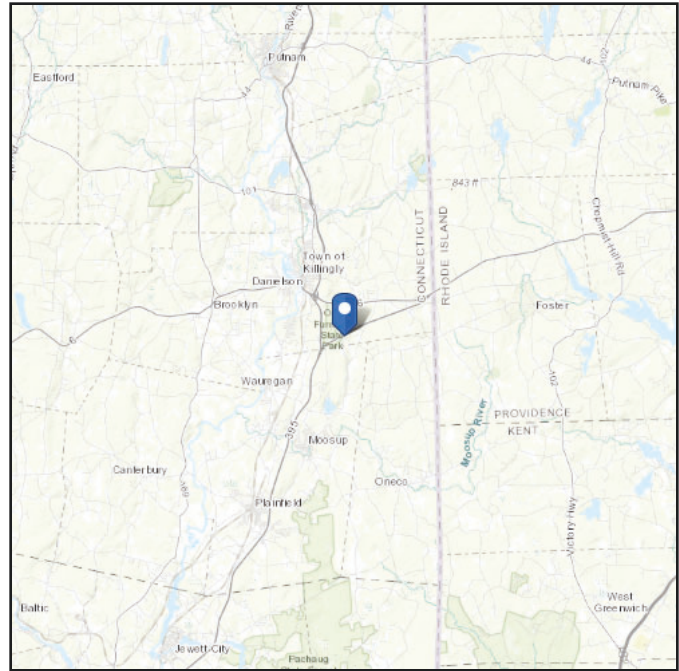
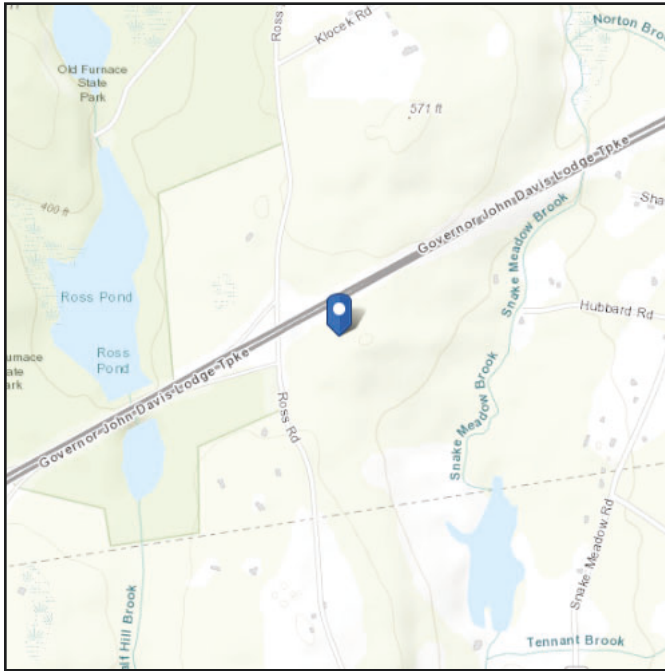
Seismic Design Category: B

# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

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

**Latitude:** 41.771553  
**Longitude:** -71.855664  
**Elevation:** 456.758999360382 ft (NAVD 88)



## Wind

### Results:

Wind Speed	123 Vmph
10-year MRI	75 Vmph
25-year MRI	85 Vmph
50-year MRI	95 Vmph
100-year MRI	100 Vmph

125 mph Ultimate Wind Speed per Windham County Exception.

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 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.

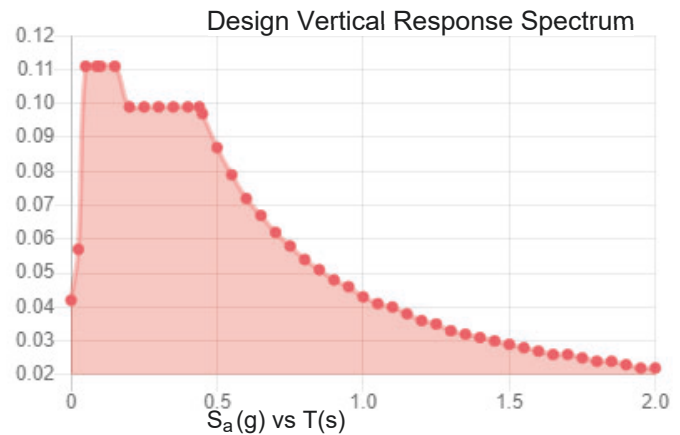
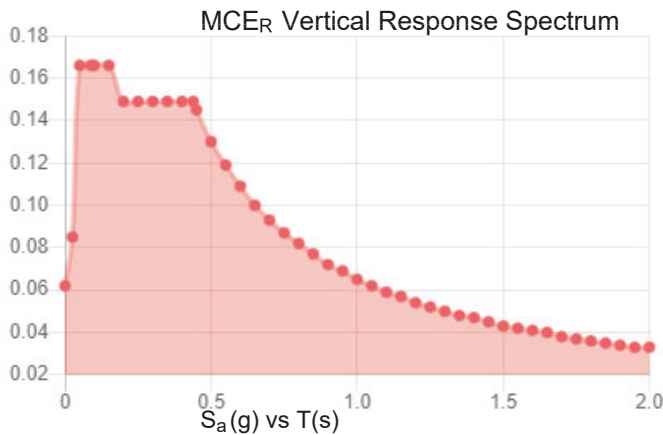
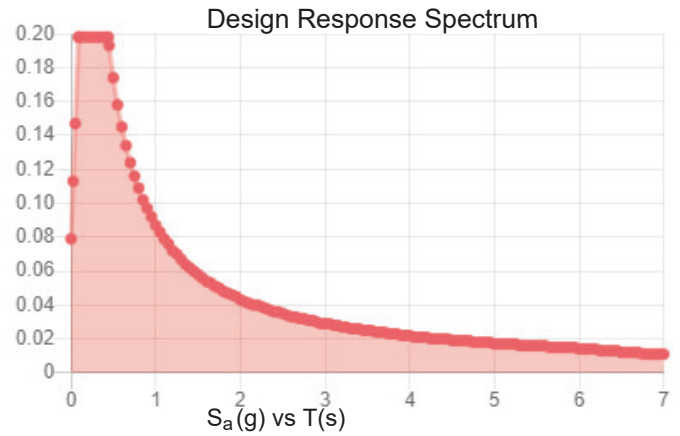
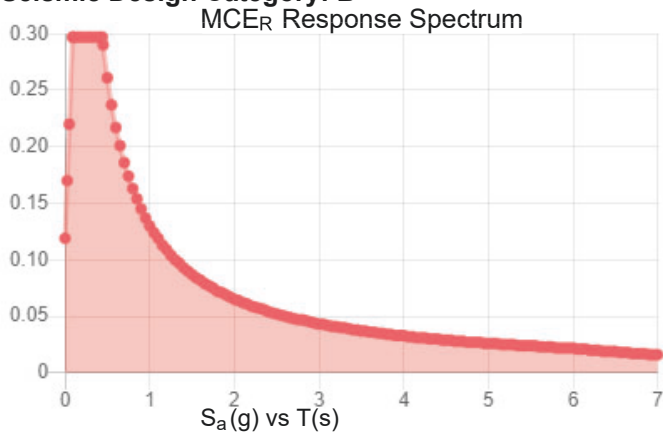


**Site Soil Class:**

**Results:**

$S_s$ :	0.186	$S_{D1}$ :	0.087
$S_1$ :	0.054	$T_L$ :	6
$F_a$ :	1.6	PGA :	0.101
$F_v$ :	2.4	PGA <sub>M</sub> :	0.161
$S_{MS}$ :	0.297	$F_{PGA}$ :	1.599
$S_{M1}$ :	0.13	$I_e$ :	1
$S_{DS}$ :	0.198	$C_v$ :	0.7

**Seismic Design Category: B**



**Data Accessed:**

**Fri Sep 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: 1.00 in.  
Concurrent Temperature: 15 F  
Gust Speed 50 mph

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

**Date Accessed:** Fri Sep 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.

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Date: **September 12, 2023**

# INFINIGY

Infinigy  
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Fort Washington, PA 19034  
(518) 690-0790  
structural@infinigy.com

**Subject:** **Mount Analysis Report**

**Carrier Designation:** **T-Mobile Anchor**  
**Carrier Site Number:** CTNL140B  
**Carrier Site Name:** NL140/Cingular Ross Rd\_MP

**Crown Castle Designation:** **Crown Castle BU Number:** 857013  
**Crown Castle Site Name:** KILLINGLY ROSS ROAD  
**Crown Castle JDE Job Number:** 752564  
**Crown Castle Order Number:** 655747 Rev. 0

**Engineering Firm Designation:** **Infinigy Report Designation:** 1039-Z0001-B

**Site Data:** **280 Ross Road, Killingly, Windham County, CT, 06239**  
**Latitude 41°46'17.59" Longitude -71°51'20.39"**

**Structure Information:** **Tower Height & Type:** **119.0 ft Monopole**  
**Mount Elevation:** **108.0 ft**  
**Mount Type:** **14.4 ft Platform**

Infinigy is pleased to submit this “**Mount Analysis Report**” to determine the structural integrity of T-Mobile’s antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

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

## Platform

## Sufficient

This analysis utilizes an ultimate 3-second gust wind speed of 123 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: Christopher H. Lee, P.E., M.S.

Respectfully Submitted by: Emmanuel Poulin, P.E.

[structural@infinigy.com](mailto:structural@infinigy.com)



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Wire Frame and Rendered Models

### 6) APPENDIX B

Software Input Calculations

### 7) APPENDIX C

Software Analysis Output

### 8) APPENDIX D

Additional Calculations

**1) INTRODUCTION**

This is an existing 3 sector 14.4 ft Platform.

**2) ANALYSIS CRITERIA**

**Building Code:** 2021 IBC / 2022 Connecticut State Building Code  
**TIA-222 Revision:** TIA-222-H  
**Risk Category:** II  
**Ultimate Wind Speed:** 123 mph  
**Exposure Category:** B  
**Topographic Factor at Base:** 1.0  
**Topographic Factor at Mount:** 1.0  
**Ice Thickness:** 1.0 in  
**Wind Speed with Ice:** 50 mph  
**Seismic S<sub>s</sub>:** 0.186  
**Seismic S<sub>1</sub>:** 0.054  
**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
108.0	110.0	3	Ericsson	AIR 6419 B41 TMO CCIV2	14.4 ft Platform
		3	RFS/Celwave	APXVAALL24 43-U-NA20 TMO	
		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	655747 Rev. 0	CCI Sites
Loading Document	T-Mobile	RFDS Version: 4	TSA
Previous Mount Analysis	Infinigy	9494793	CCI Sites

### 3.1) Analysis Method

RISA-3D (Version 21.0.1), 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.

Infinigy Mount Analysis Tool V2.3.4, a tool internally developed by Infinigy, was used to calculate wind loading on all appurtenances, dishes and mount members for various loading cases. Selected output from the analysis is included in Appendix B "Software Input Calculations".

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *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. Infinigy 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, All Sectors)**

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1, 2	Mount Pipe(s)	MP3	108.0	54.6	Pass
	Horizontal(s)	MH2		16.9	Pass
	Standoff(s)	MS2		75.7	Pass
	Handrail(s)	MR2		49.8	Pass
	Support Angle(s)	M19		93.2	Pass
	Mount Connection(s)	-		28.4	Pass

<b>Structure Rating (max from all components) =</b>	<b>93.2%</b>
---	--------------

Notes:

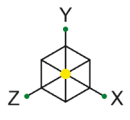
- 1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
- 2) See additional documentation in "Appendix D - Additional Calculations" for detailed mount connection calculations.

**4.1) Recommendations**

The mount has sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

**APPENDIX A**  
**WIRE FRAME AND RENDERED MODELS**





Infinigy Engineering

CL

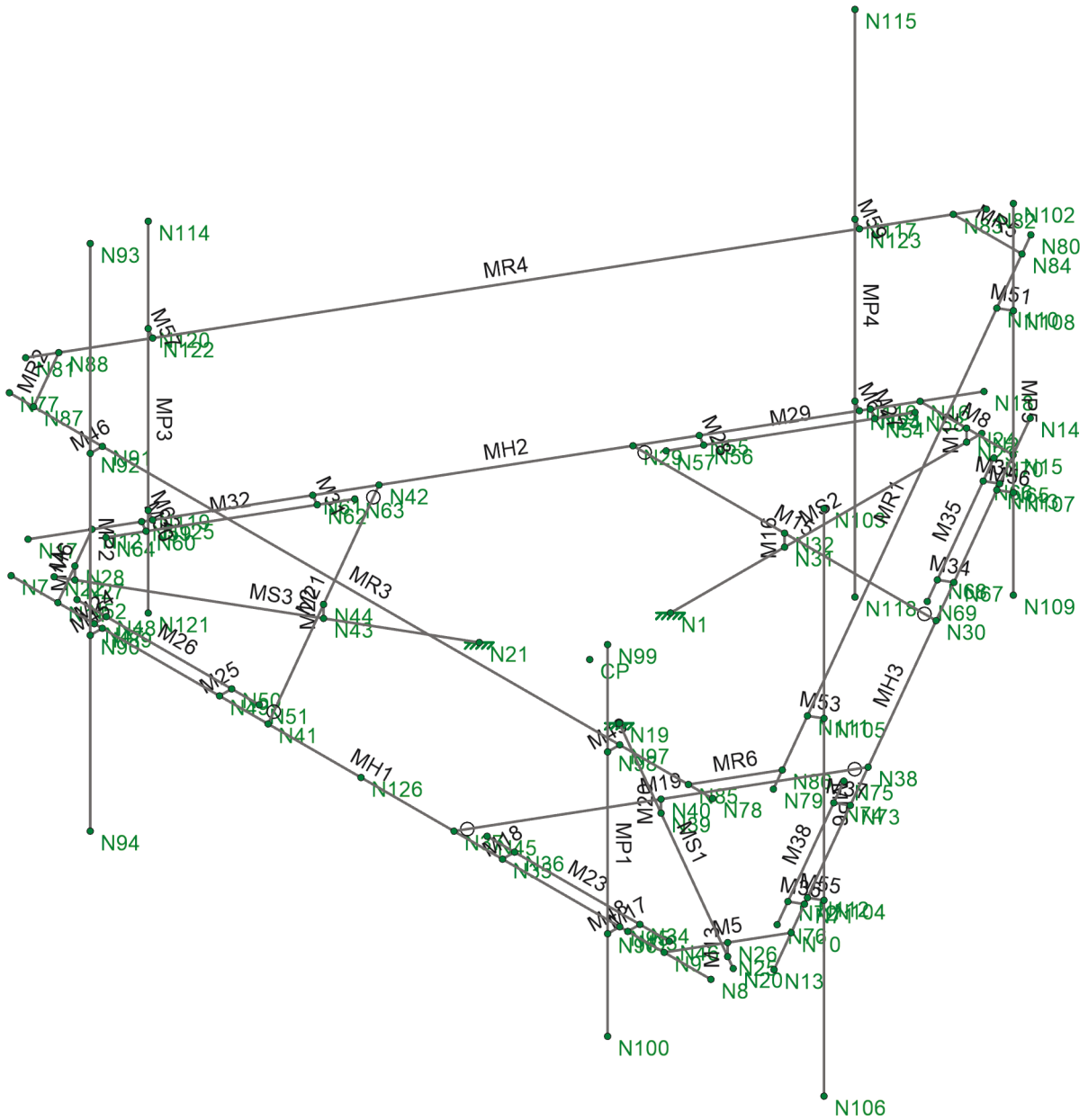
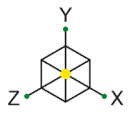
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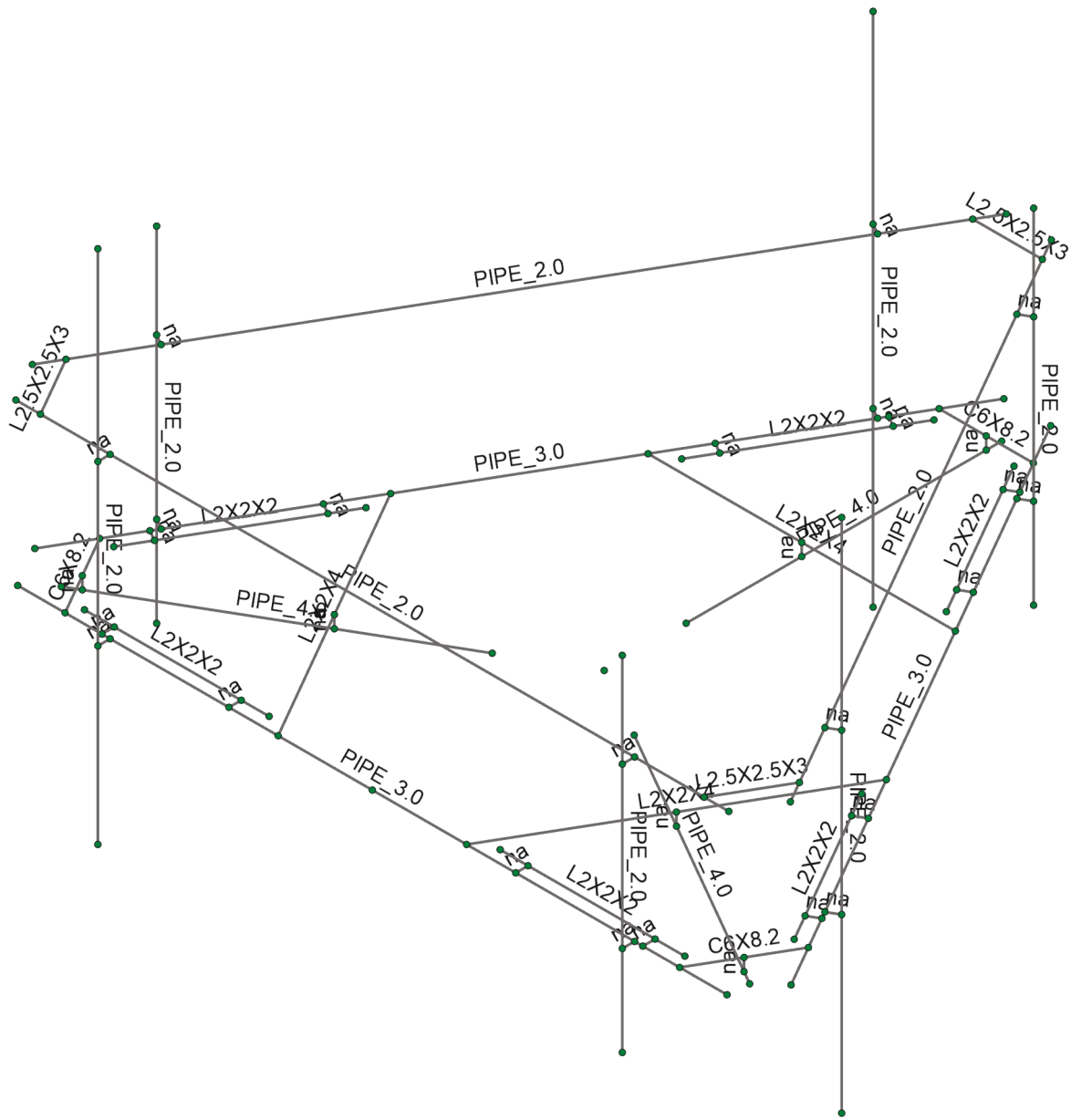
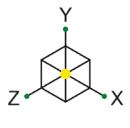
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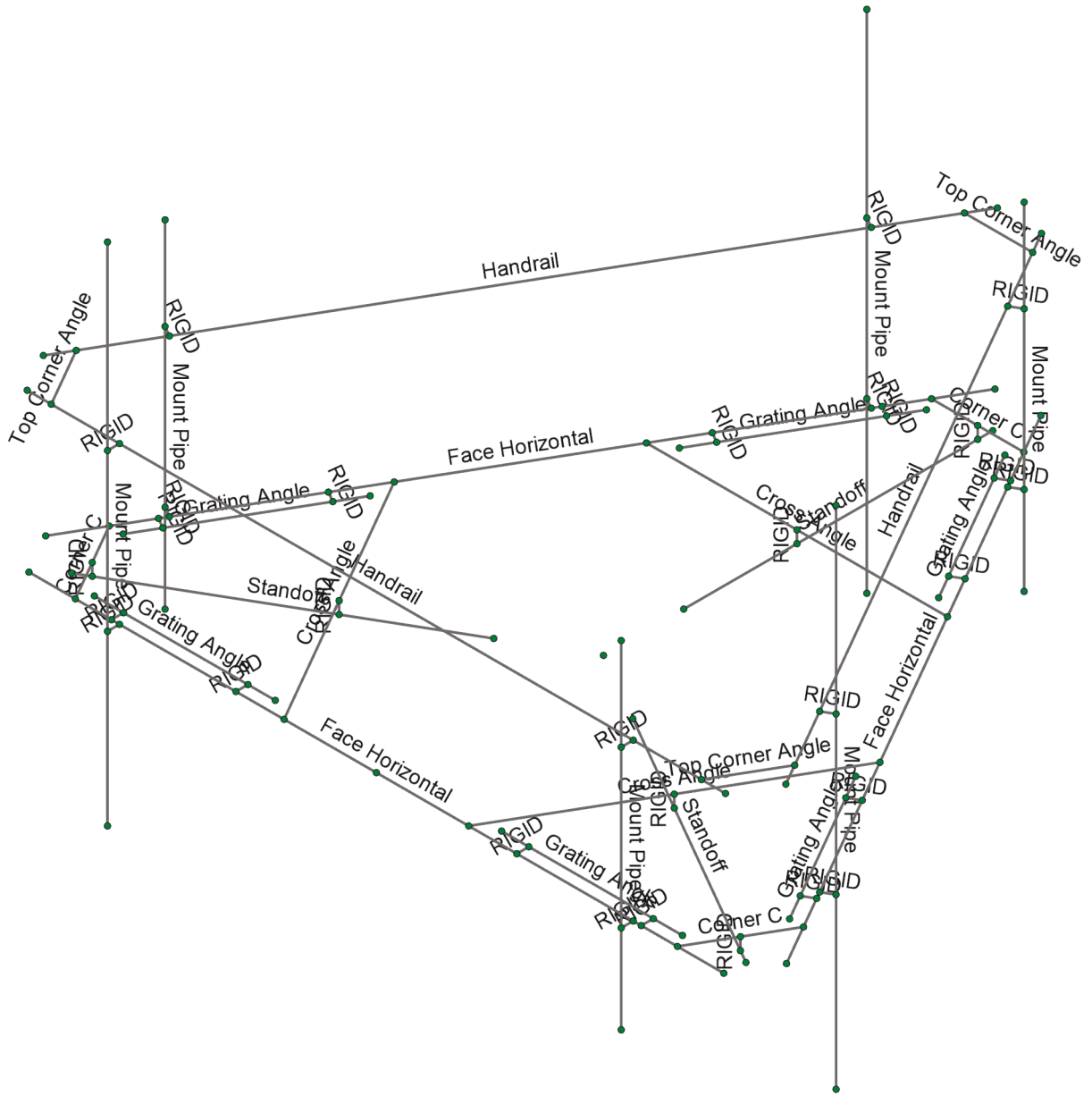
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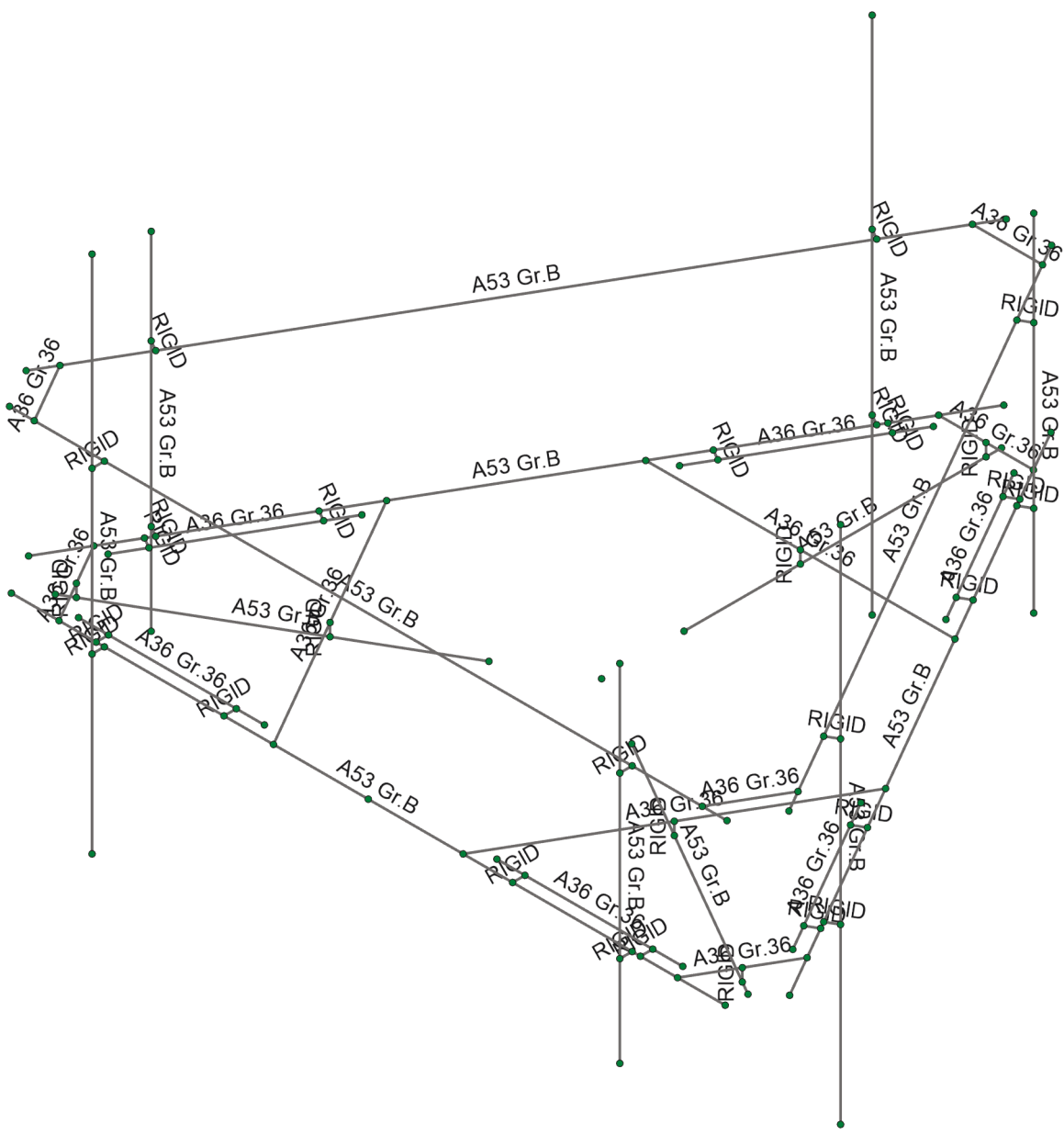
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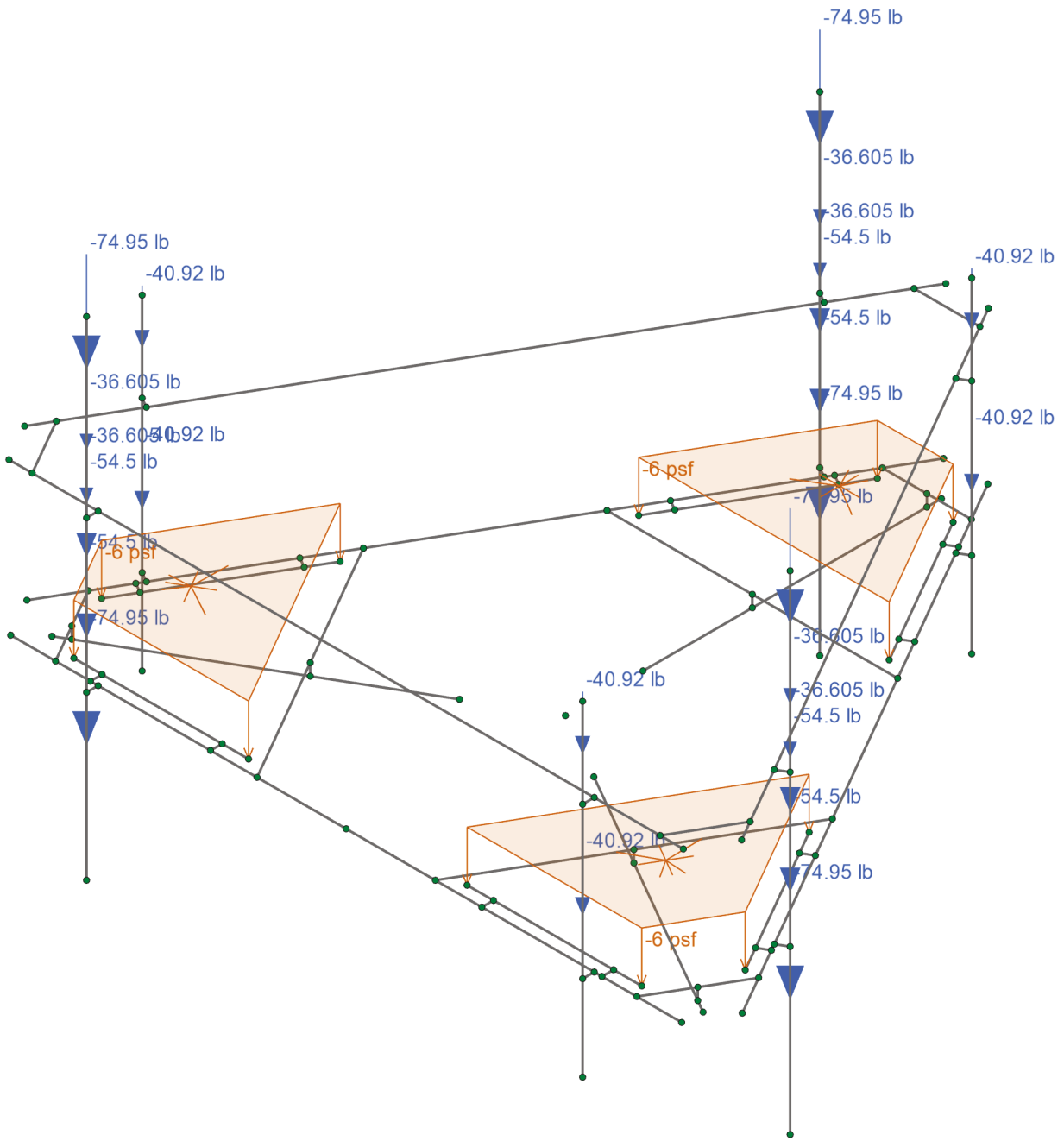
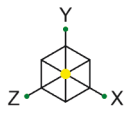


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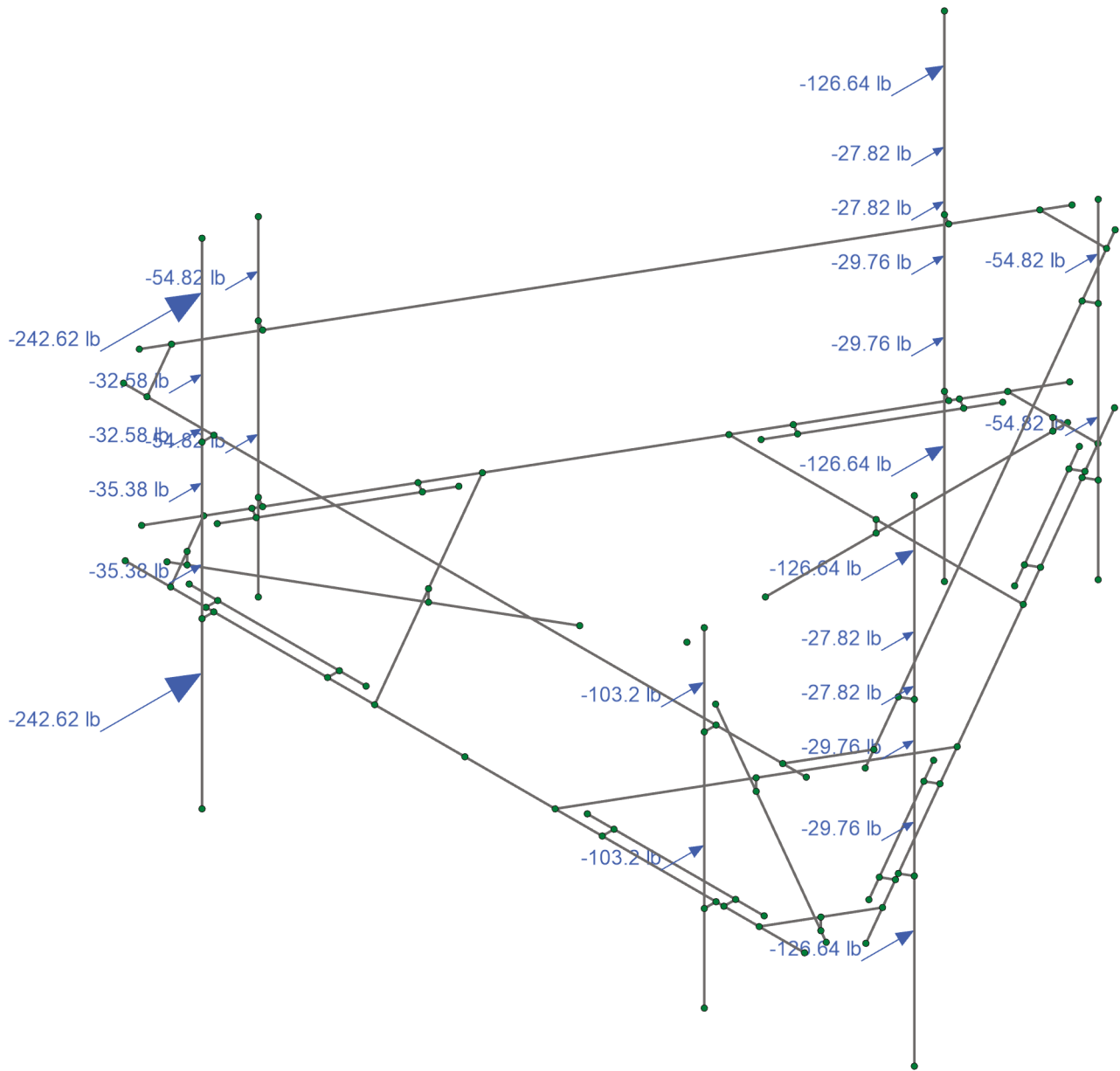
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Loads: BLC 1, Self Weight		
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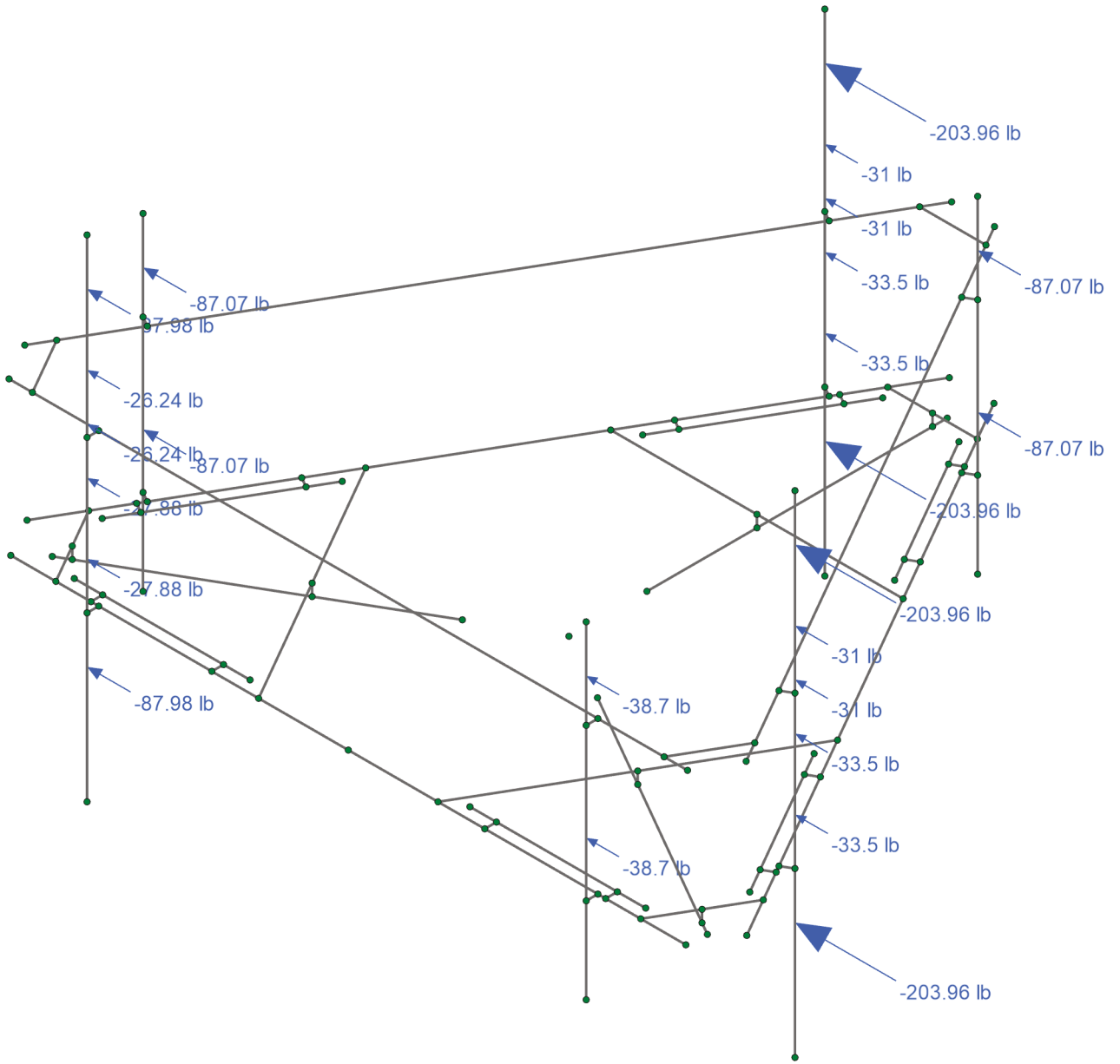
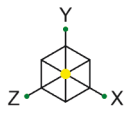
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Infinigy Engineering  
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 1039-Z0001-B

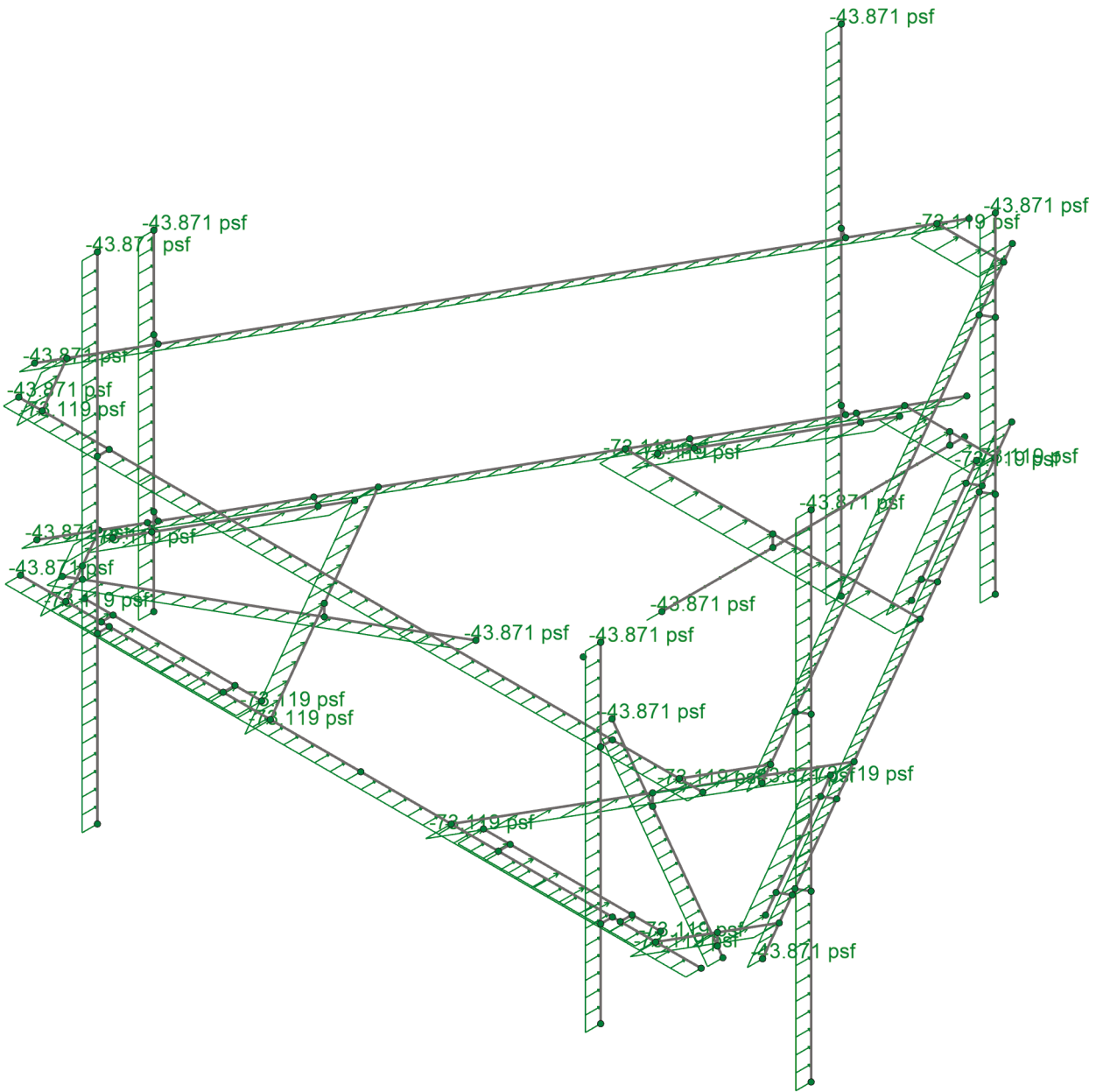
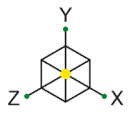
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Loads: BLC 5, Wind Load AZI 90		
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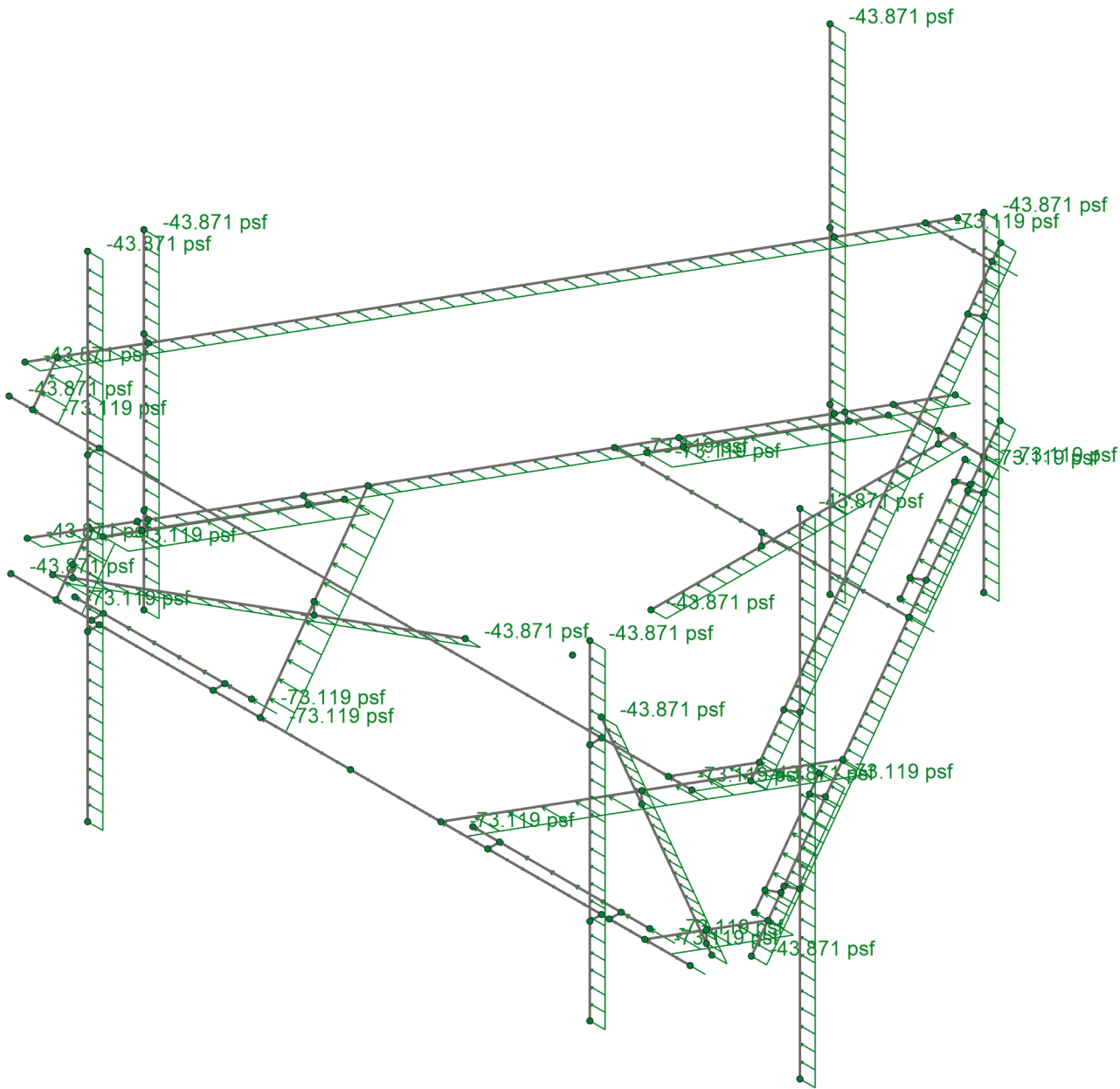
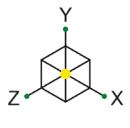


Loads: BLC 14, Distr. Wind Load Z

Infinigy Engineering  
CL  
1039-Z0001-B

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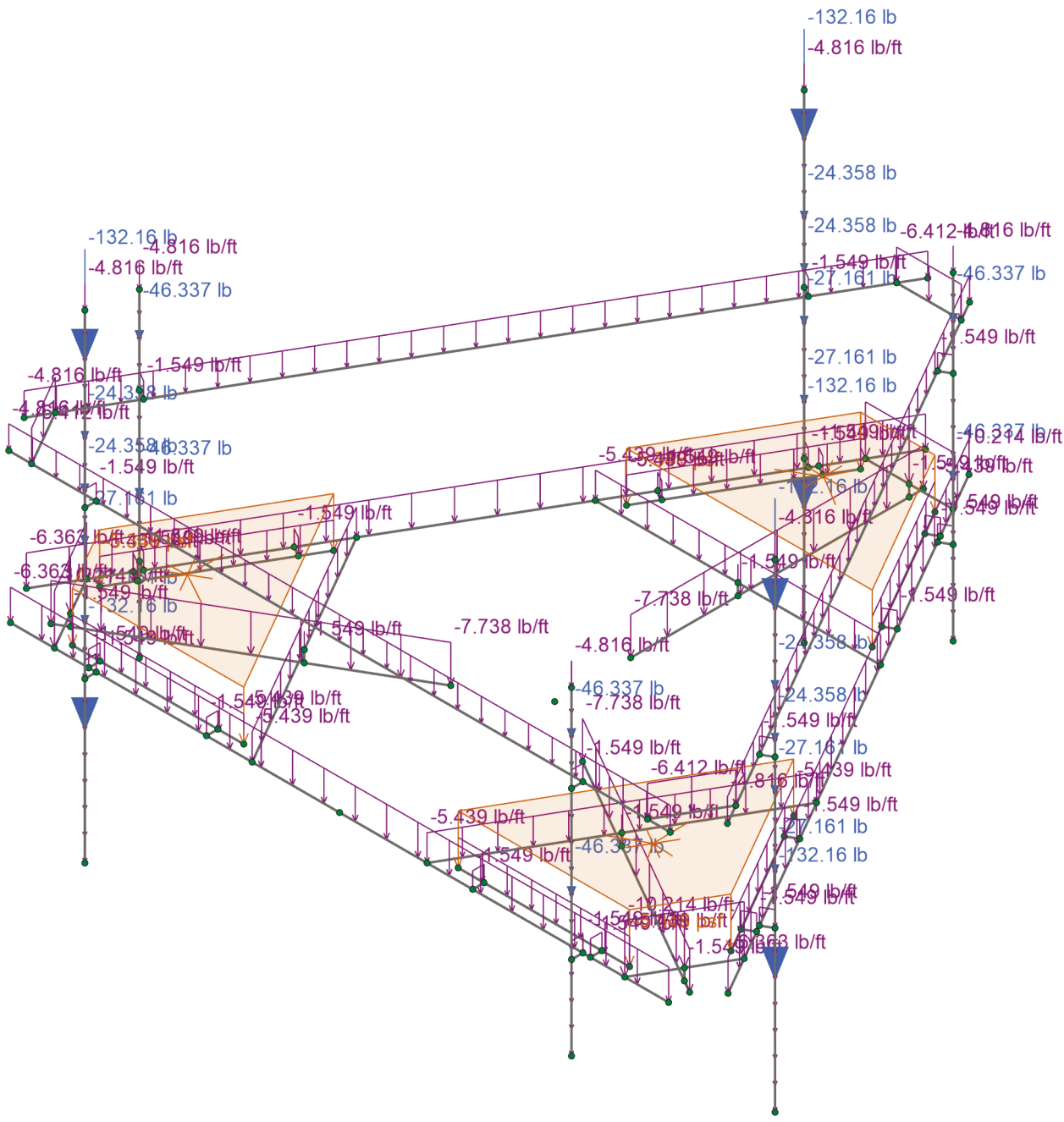


Loads: BLC 15, Distr. Wind Load X

Infinigy Engineering  
 CL  
 1039-Z0001-B

857013

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Loads: BLC 16, Ice Weight

Infinigy Engineering

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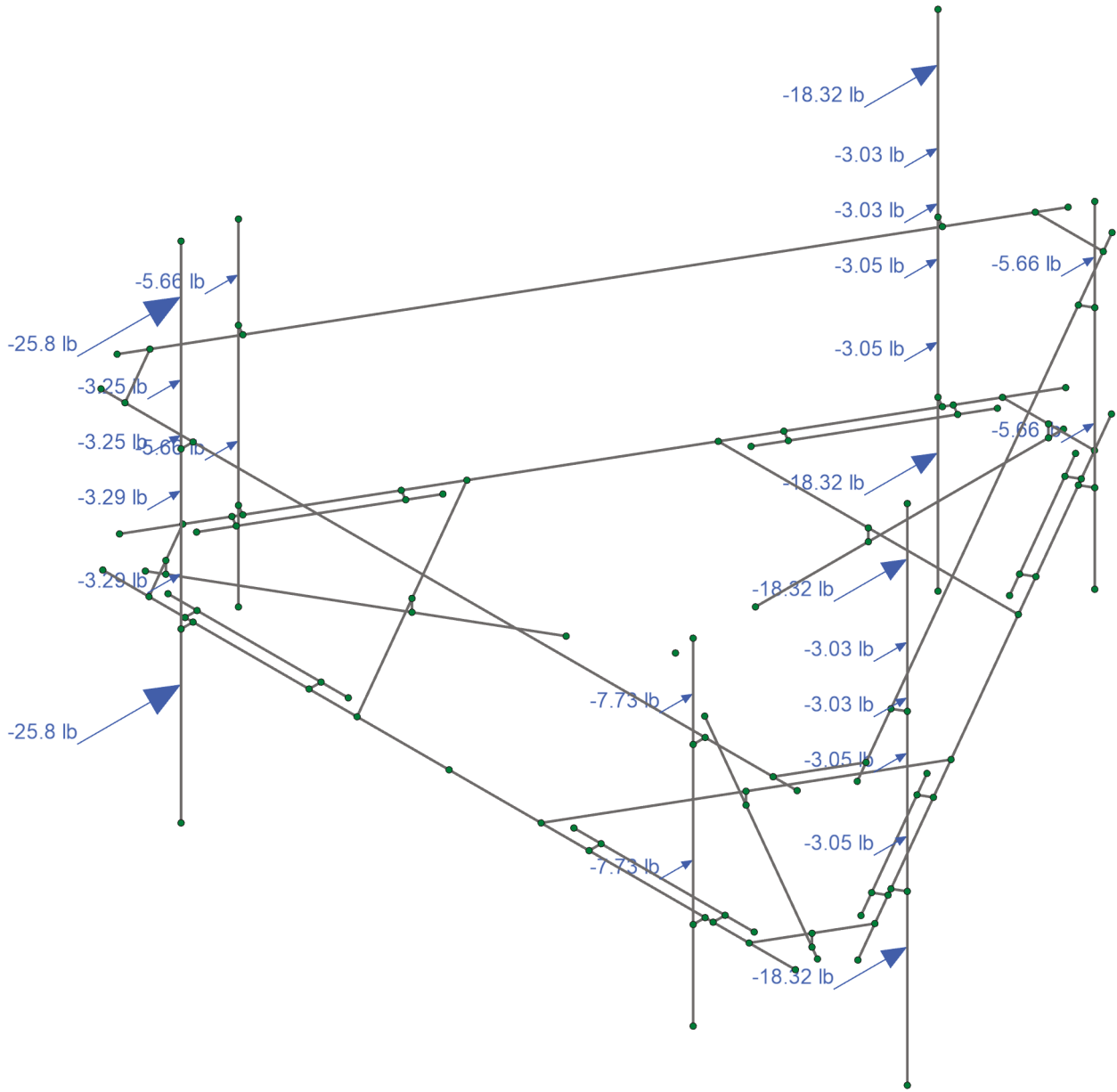
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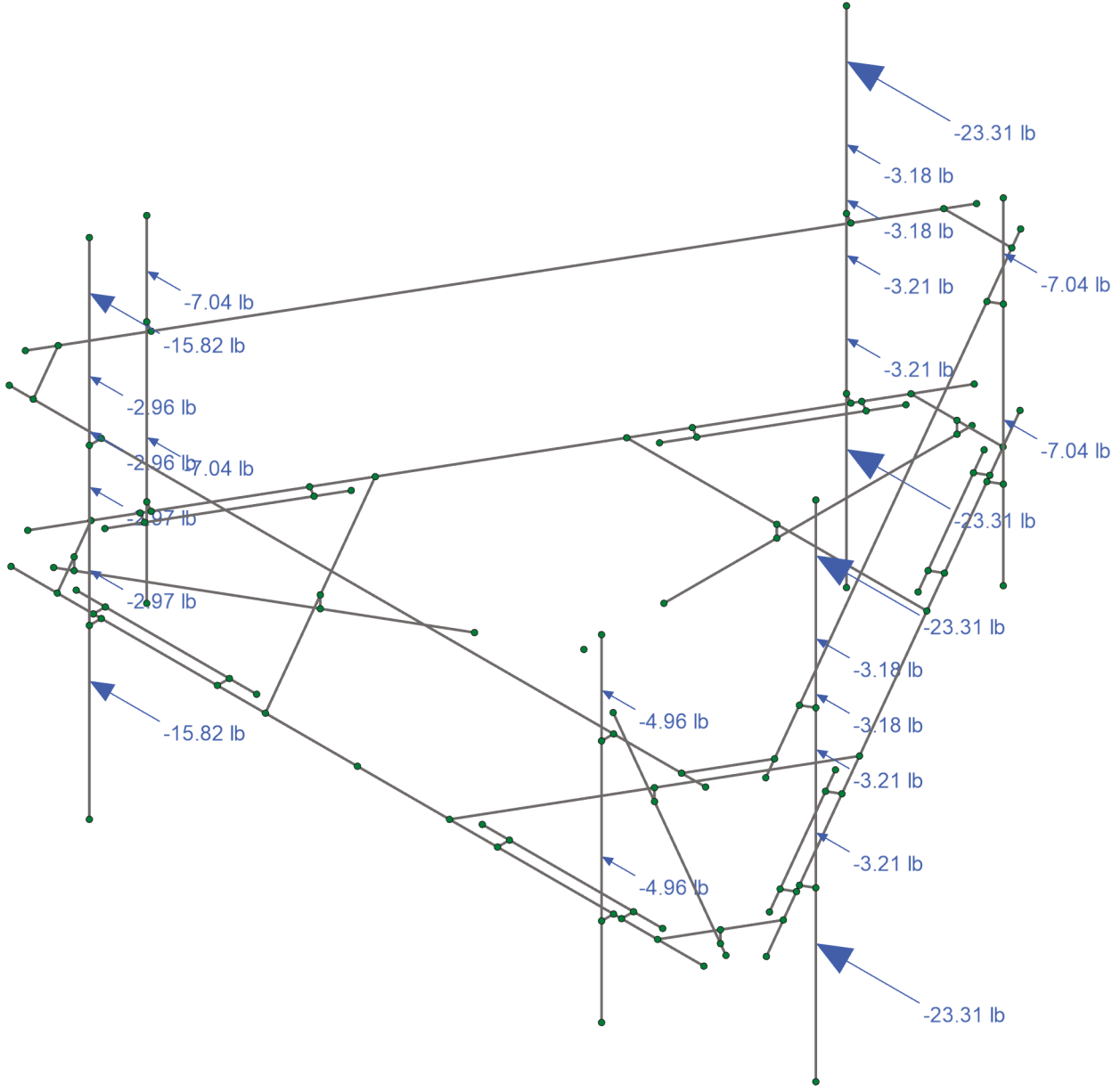


Loads: BLC 17, Ice Wind Load AZI 0

Infinigy Engineering  
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 1039-Z0001-B

857013

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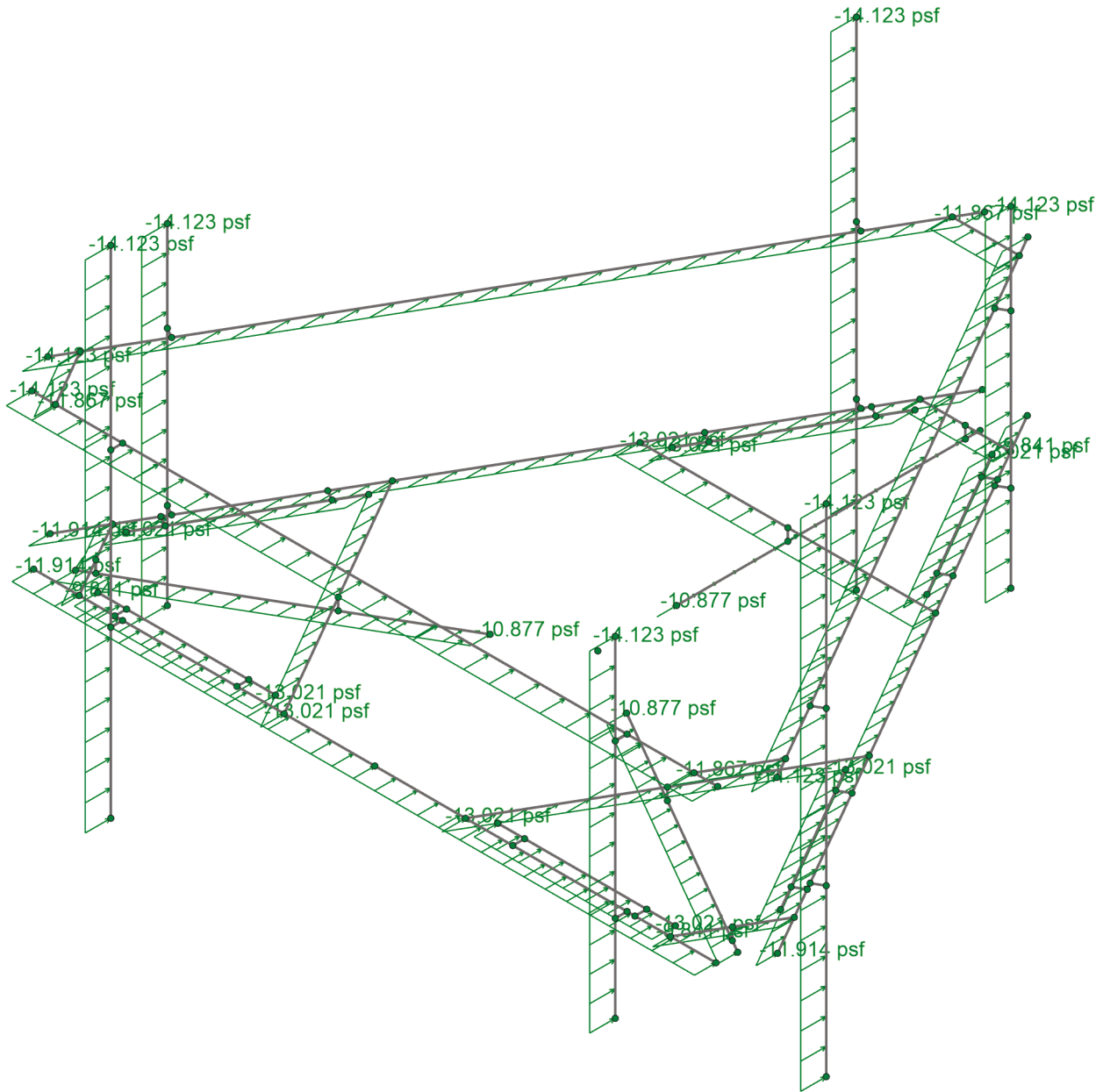
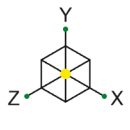


Loads: BLC 20, Ice Wind Load AZI 90

Infinigy Engineering  
CL  
1039-Z0001-B

857013

Ice Wind Loading 90  
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Loads: BLC 29, Distr. Ice Wind Load Z

Infinigy Engineering

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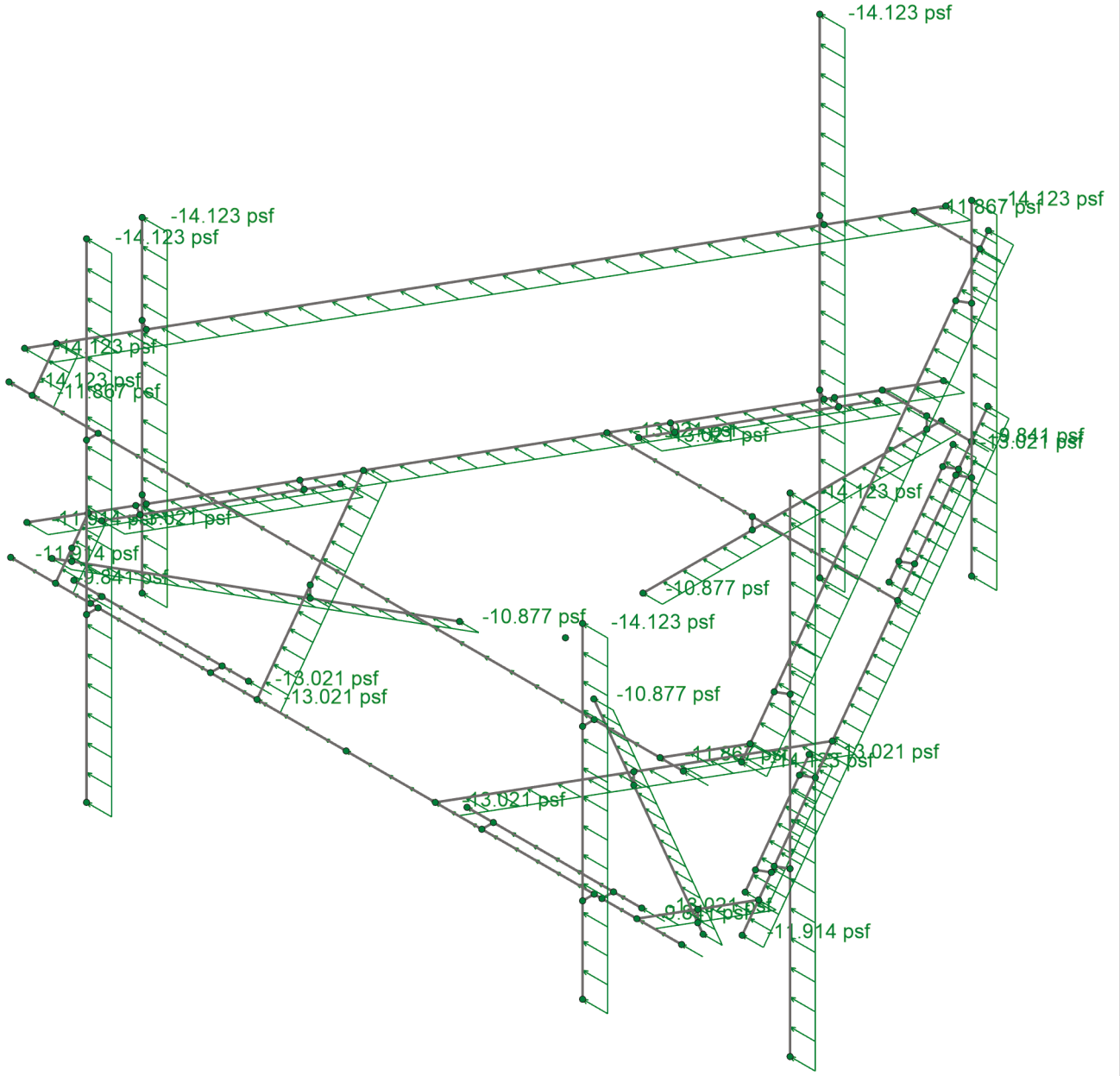
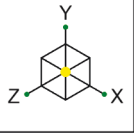
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CL

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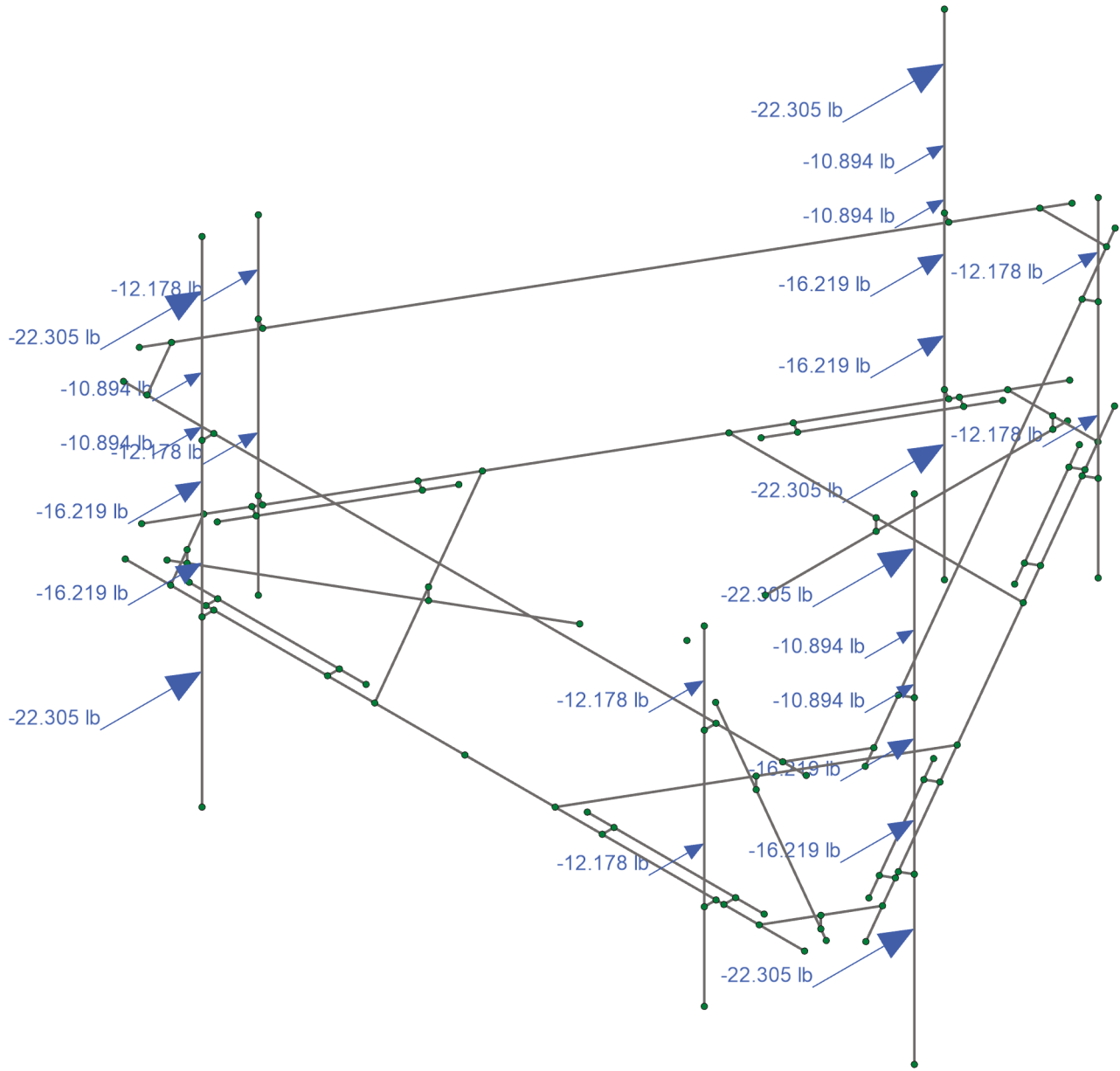
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Loads: BLC 30, Distr. Ice Wind Load X		
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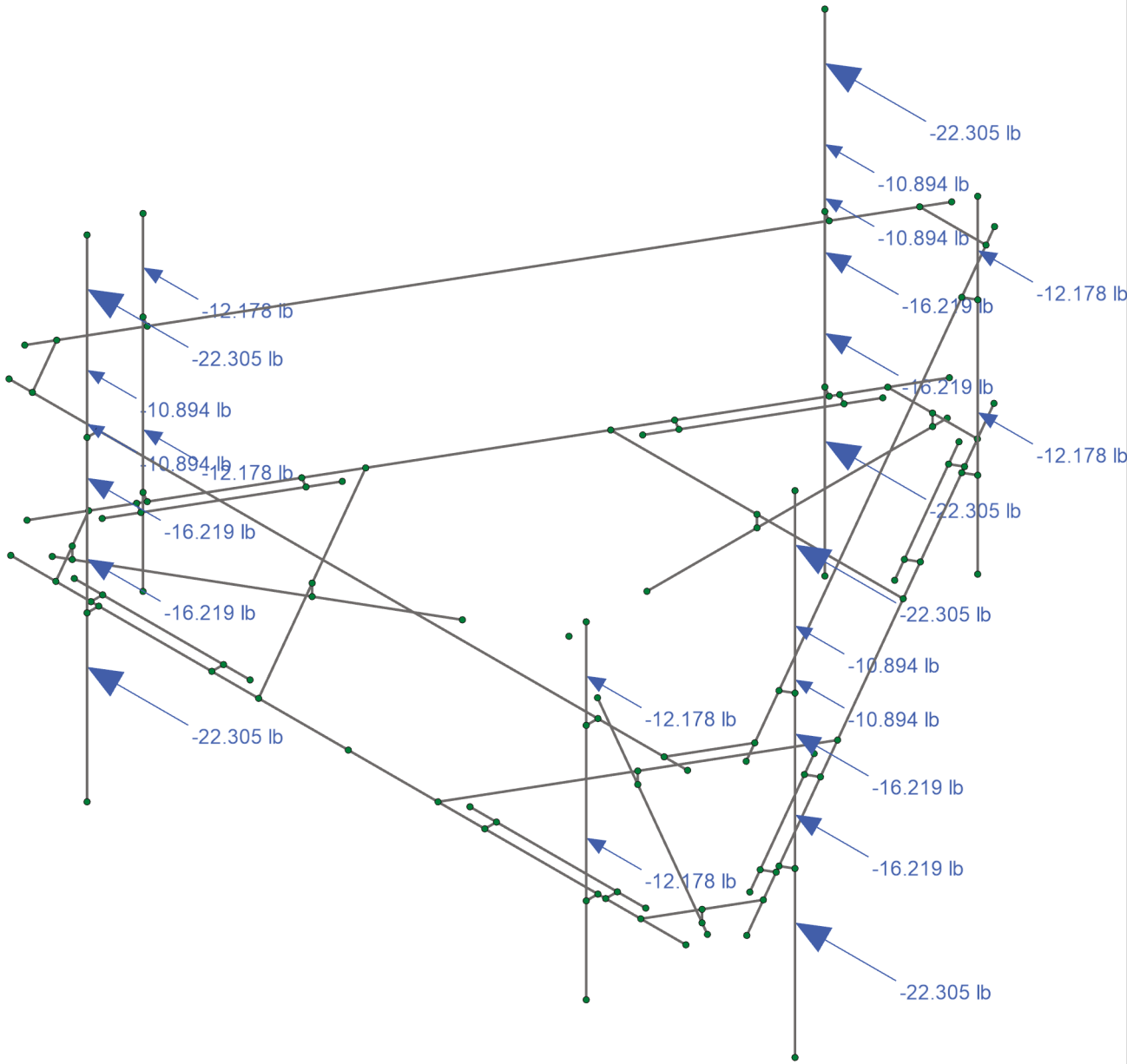
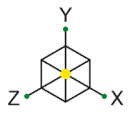


Loads: BLC 31, Seismic Load Z

Infinigy Engineering  
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1039-Z0001-B

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Loads: BLC 32, Seismic Load X

Infinigy Engineering

CL

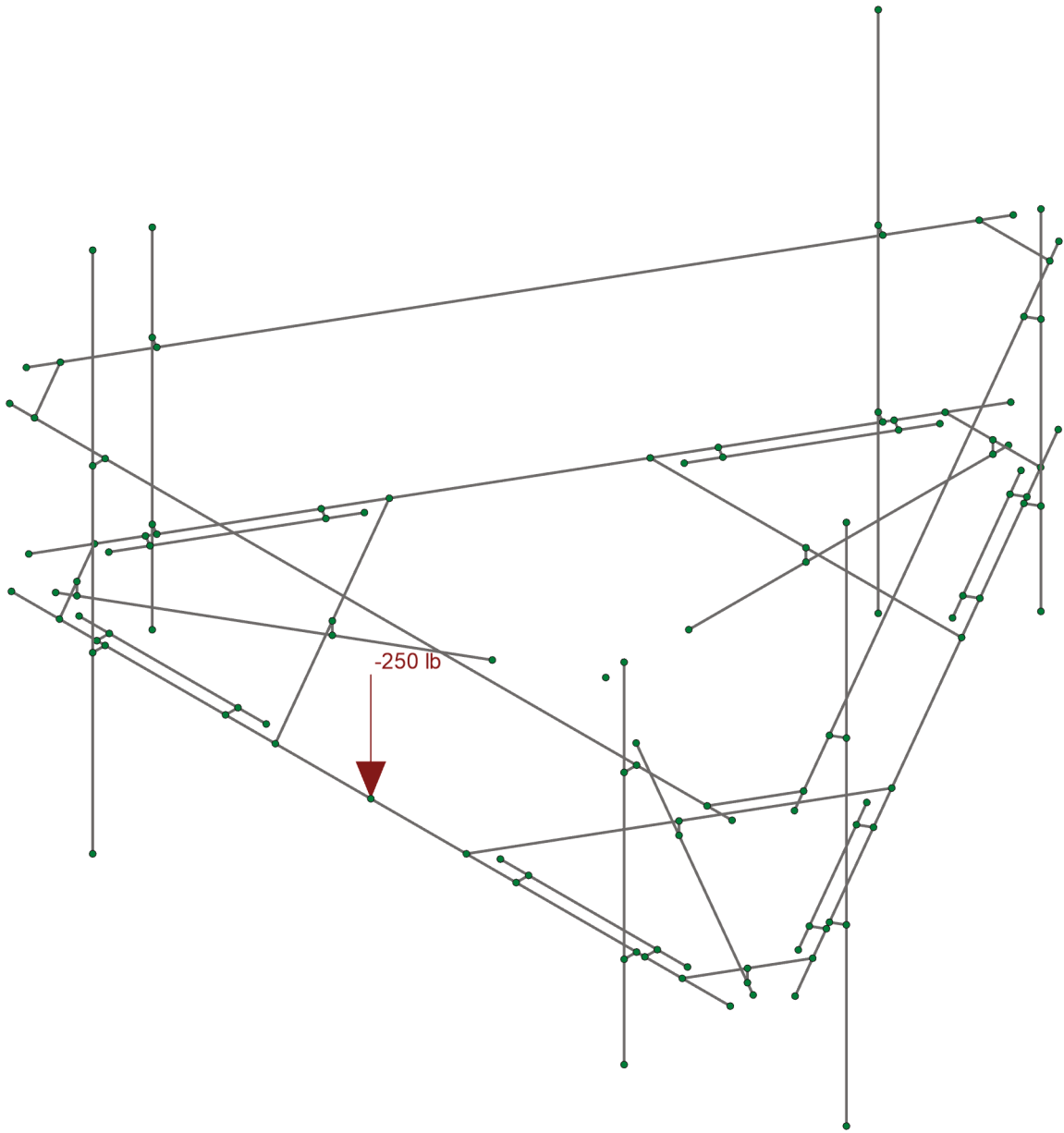
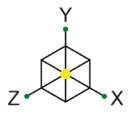
1039-Z0001-B

857013

Seismic Loading 90

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Loads: BLC 33, Service Live Loads

Infinigy Engineering

857013

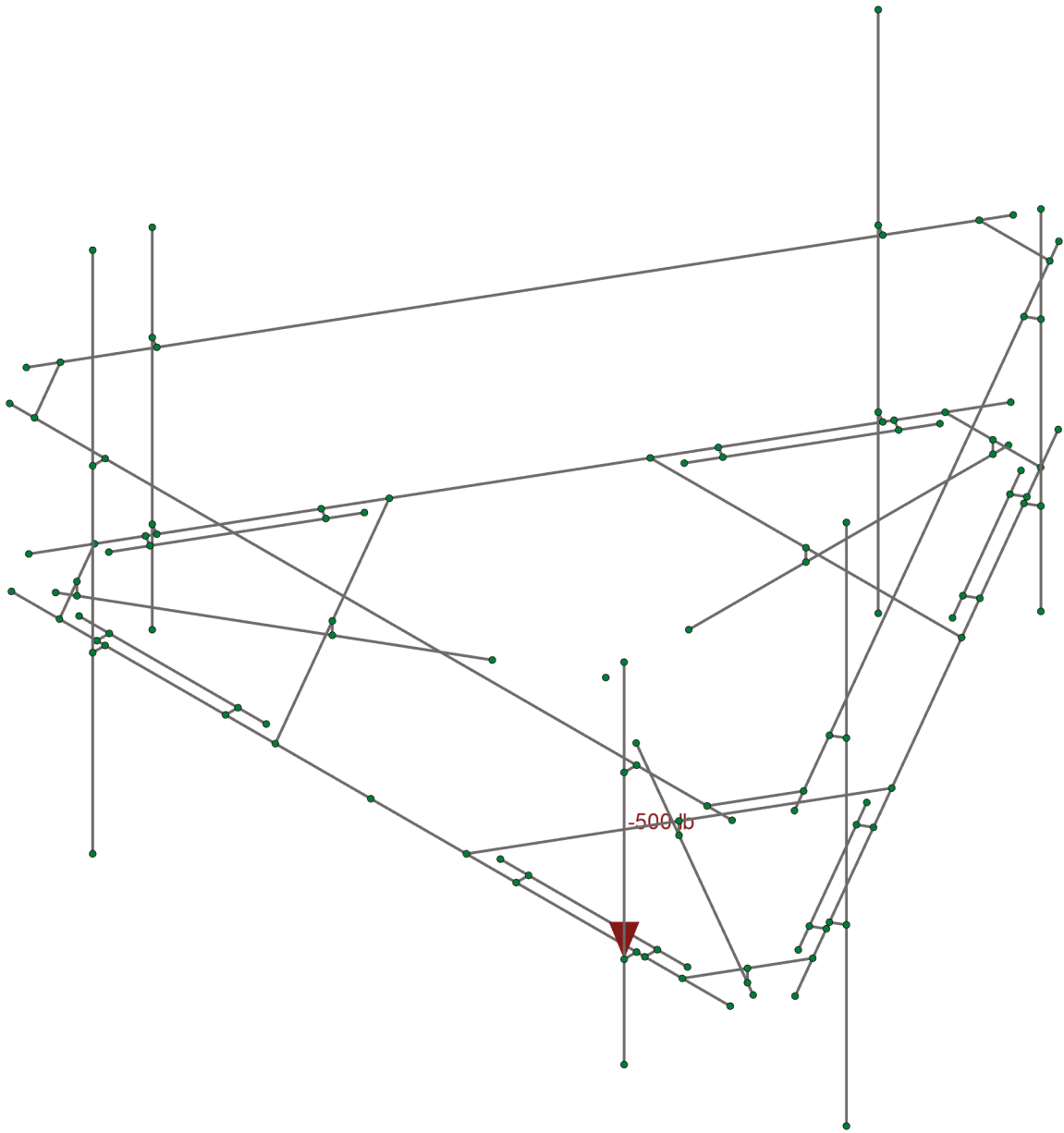
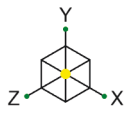
Service Load

CL

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Loads: BLC 35, Maintenance Load Lm2

Infinigy Engineering

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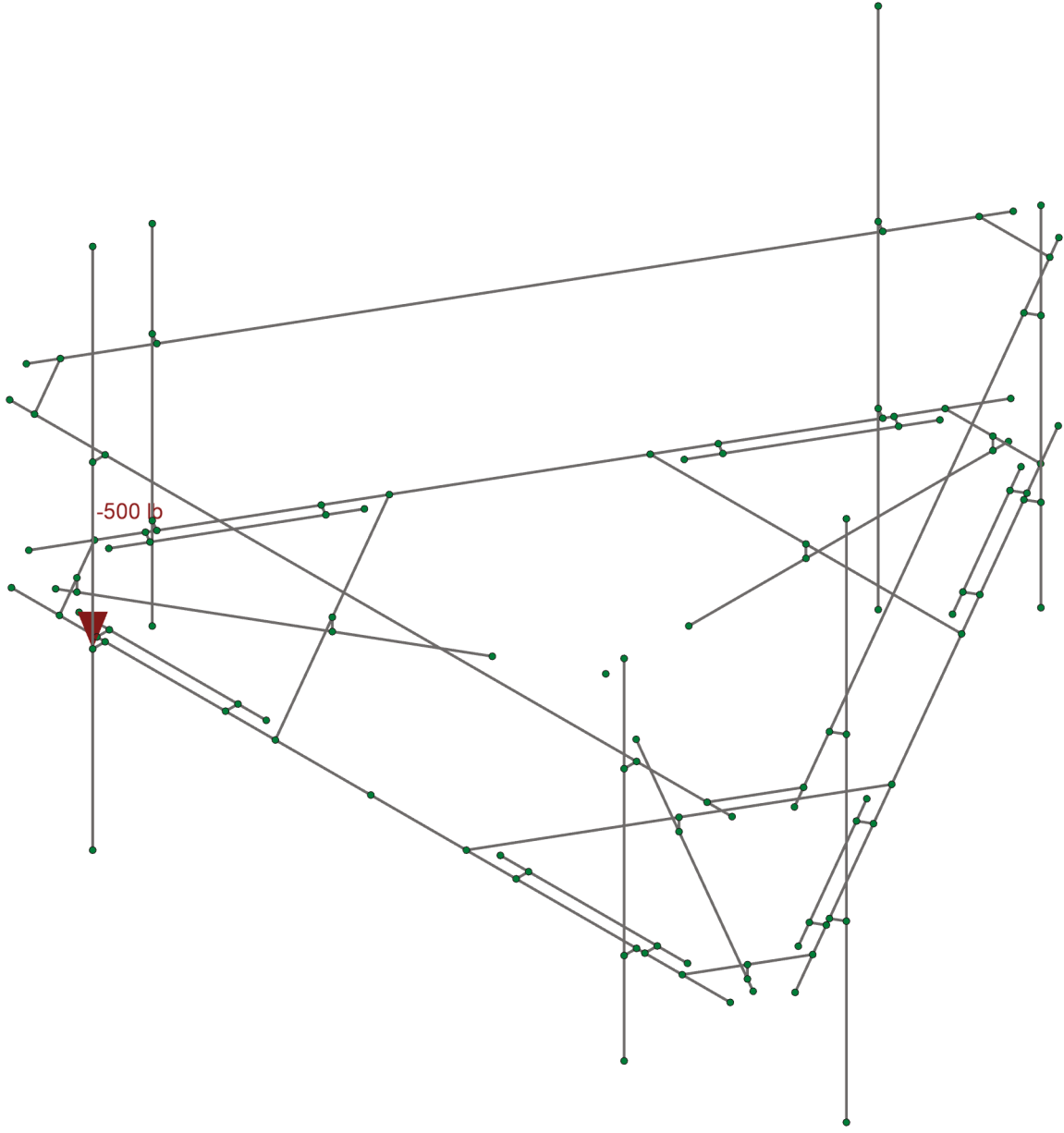
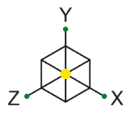
Maintenance Load 1

CL

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1039-Z0001-B

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Loads: BLC 34, Maintenance Load Lm1

Infinigy Engineering  
CL  
1039-Z0001-B

857013

Maintenance Load 2  
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**APPENDIX B**  
**SOFTWARE INPUT CALCULATIONS**

## Program Inputs

PROJECT INFORMATION		
Site Name:	KILLINGLY ROSS ROAD	
Carrier:	T-Mobile	
Engineer:	Chris Lee, PE	

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	B	
Topo Factor Procedure:	Method 1, Category 1	
Site Class:	D - Stiff Soil (Assumed)	
Ground Elevation:	456.76	ft *Rev H

MOUNT INFORMATION		
Mount Type:	Platform	
Num Sectors:	3	
Centerline AGL:	108.00	ft
Tower Height AGL:	119.00	ft

TOPOGRAPHIC DATA		
Topo Feature:	N/A	
Slope Distance:	N/A	ft
Crest Distance:	N/A	ft
Crest Height:	N/A	ft

FACTORS		
Directionality Fact. ( $K_d$ ):	0.950	
Ground Ele. Factor ( $K_e$ ):	0.984	*Rev H Only
Rooftop Speed-Up ( $K_z$ ):	1.000	*Rev H Only
Topographic Factor ( $K_{zt}$ ):	1.000	
Height Esc. Fact. ( $K_{id}$ ):	1.126	
Gust Effect Factor ( $G_e$ ):	1.000	
Shielding Factor ( $K_s$ ):	0.900	
Velocity Pressure Co. ( $K_z$ ):	1.010	(Mount Elev)

CODE STANDARDS		
Building Code:	2021 IBC	
TIA Standard:	TIA-222-H	
ASCE Standard:	ASCE 7-16	

WIND AND ICE DATA		
Ultimate Wind ( $V_{ult}$ ):	123	mph
Design Wind ( $V$ ):	N/A	mph
Ice Wind ( $V_{ice}$ ):	50	mph
Base Ice Thickness ( $t_b$ ):	1.0	in
Radial Ice Thickness ( $t_r$ ):	1.126	in
Flat Pressure:	73.119	psf
Round Pressure:	43.871	psf
Ice Wind Pressure:	7.250	psf

SEISMIC DATA		
Short-Period Accel. ( $S_s$ ):	0.186	g
1-Second Accel. ( $S_1$ ):	0.054	g
Short-Period Design ( $S_{DS}$ ):	0.198	
1-Second Design ( $S_{D1}$ ):	0.086	
Short-Period Coeff. ( $F_a$ ):	1.600	
1-Second Coeff. ( $F_v$ ):	2.400	
Amplification Factor ( $A_s$ ):	3.000	
Response Mod. Coeff. (R):	2.000	
Seismic Importance ( $I_e$ ):	1.000	
Seismic Response Co. ( $C_s$ ):	0.099	
Total App. Weight:	413.950	lb
Total Shear Force ( $V_s$ ):	41.064	lb
Hor. Seismic Load ( $E_h$ ):	41.064	lb
Vert. Seismic Load ( $E_v$ ):	16.426	lb *

\*For reference only. Per TIA rev H section 16.7,  $E_v$  is not applicable to mounts

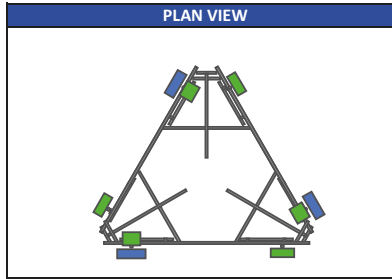
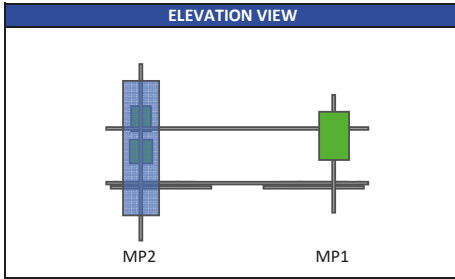
# INFINIGY

Infinigy Load Calculator V2.3.4

**Program Inputs**

**INFINIGY**

Infinigy Load Calculator V2.3.4



APPURTENANCE INFORMATION										
Appurtenance Name	Elevation	Qty.	Height (in)	Width (in)	Depth (in)	Weight (lbs)	EPA <sub>N</sub> (ft <sup>2</sup> )	EPA <sub>T</sub> (ft <sup>2</sup> )	Member (α sector)	
ERICSSON AIR 6419 B41_TMO_CCIV2	110.0	3	34.49	19.92	7.99	81.84	6.24	2.34	MP1	
RFS/CELWAVE APXVAALL24_43-U-NA20_TMO	110.0	3	95.90	24.00	8.50	149.90	14.67	5.32	MP2	
ERICSSON RADIO 4449 B71 B85A_T-MOBILE	110.0	3	17.91	13.20	10.63	73.21	1.97	1.59	MP2	
ERICSSON RADIO 4460 B2/B25 B66_TMO	110.0	3	17.00	15.10	11.90	109.00	2.14	1.69	MP2	

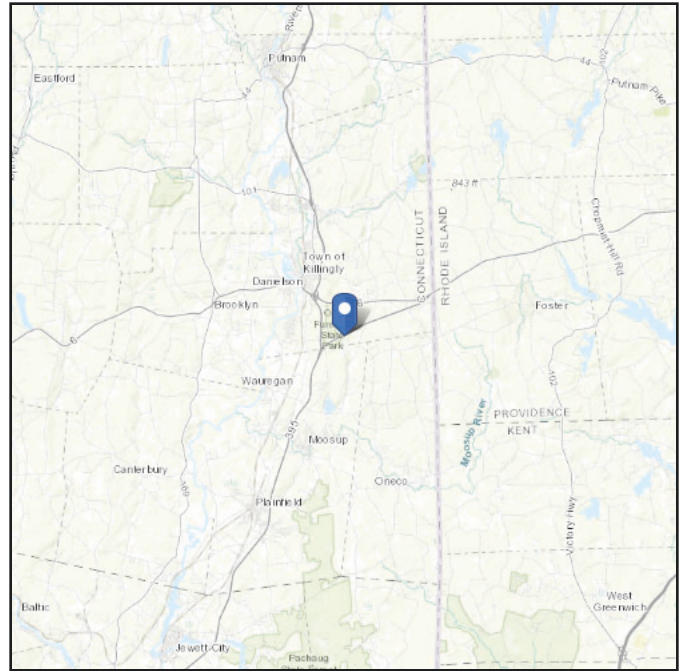
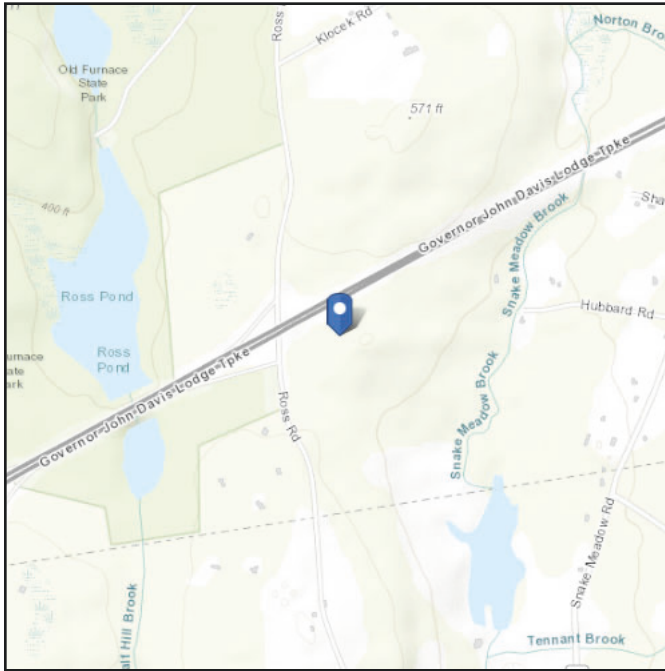


# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

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

**Latitude:** 41.771553  
**Longitude:** -71.855664  
**Elevation:** 456.758999360382 ft (NAVD 88)



## Wind

### Results:

Wind Speed	123 Vmph
10-year MRI	75 Vmph
25-year MRI	85 Vmph
50-year MRI	95 Vmph
100-year MRI	100 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: Mon Sep 11 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).

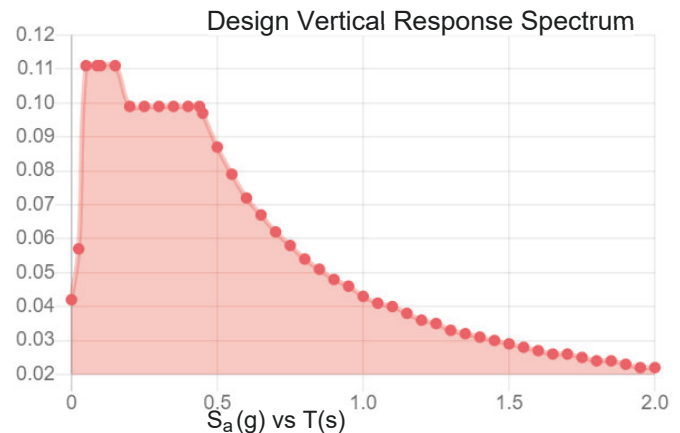
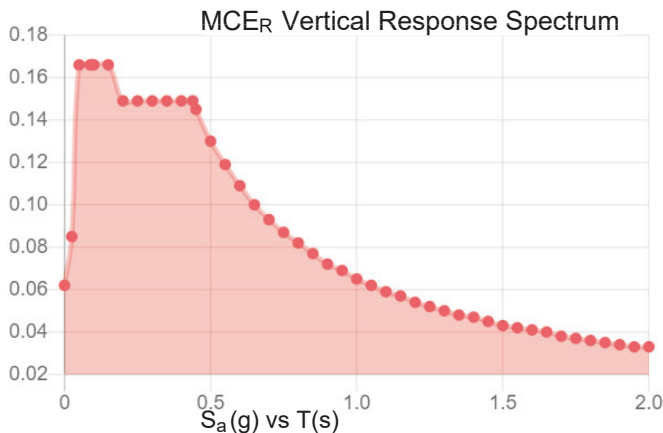
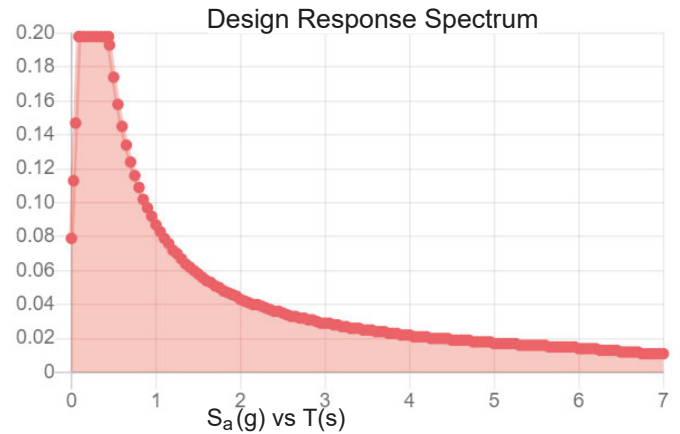
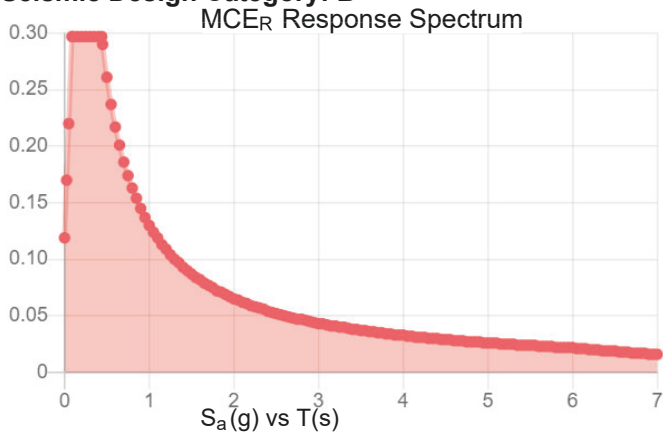
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

**Site Soil Class:**

**Results:**

$S_s$ :	0.186	$S_{D1}$ :	0.087
$S_1$ :	0.054	$T_L$ :	6
$F_a$ :	1.6	PGA :	0.101
$F_v$ :	2.4	PGA <sub>M</sub> :	0.161
$S_{MS}$ :	0.297	$F_{PGA}$ :	1.599
$S_{M1}$ :	0.13	$I_e$ :	1
$S_{DS}$ :	0.198	$C_v$ :	0.7

**Seismic Design Category: B**



**Data Accessed:** Mon Sep 11 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: 1.00 in.  
Concurrent Temperature: 15 F  
Gust Speed 50 mph

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

**Date Accessed:** Mon Sep 11 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.

---

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**APPENDIX C**  
**SOFTWARE ANALYSIS OUTPUT**

**Member Primary Data**

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	MS2	N1	N2		Standoff	Beam	Pipe	A53 Gr.B	Typical
2	MH1	N7	N8		Face Horizontal	Beam	Pipe	A53 Gr.B	Typical
3	M5	N9	N10	270	Corner C	Beam	Channel	A36 Gr.36	Typical
4	M6	N11	N12	270	Corner C	Beam	Channel	A36 Gr.36	Typical
5	MH3	N13	N14		Face Horizontal	Beam	Pipe	A53 Gr.B	Typical
6	M8	N15	N16	270	Corner C	Beam	Channel	A36 Gr.36	Typical
7	MH2	N17	N18		Face Horizontal	Beam	Pipe	A53 Gr.B	Typical
8	MS1	N19	N20		Standoff	Beam	Pipe	A53 Gr.B	Typical
9	MS3	N21	N22		Standoff	Beam	Pipe	A53 Gr.B	Typical
10	M12	N23	N24		RIGID	None	None	RIGID	Typical
11	M13	N25	N26		RIGID	None	None	RIGID	Typical
12	M14	N27	N28		RIGID	None	None	RIGID	Typical
13	M15	N29	N30	90	Cross Angle	Beam	Single Angle	A36 Gr.36	Typical
14	M16	N31	N32		RIGID	None	None	RIGID	Typical
15	M17	N33	N34		RIGID	None	None	RIGID	Typical
16	M18	N35	N36		RIGID	None	None	RIGID	Typical
17	M19	N37	N38	90	Cross Angle	Beam	Single Angle	A36 Gr.36	Typical
18	M20	N39	N40		RIGID	None	None	RIGID	Typical
19	M21	N41	N42	90	Cross Angle	Beam	Single Angle	A36 Gr.36	Typical
20	M22	N43	N44		RIGID	None	None	RIGID	Typical
21	M23	N46	N45		Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
22	M24	N47	N48		RIGID	None	None	RIGID	Typical
23	M25	N49	N50		RIGID	None	None	RIGID	Typical
24	M26	N51	N52		Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
25	M27	N53	N54		RIGID	None	None	RIGID	Typical
26	M28	N55	N56		RIGID	None	None	RIGID	Typical
27	M29	N57	N58		Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
28	M30	N59	N60		RIGID	None	None	RIGID	Typical
29	M31	N61	N62		RIGID	None	None	RIGID	Typical
30	M32	N64	N63		Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
31	M33	N65	N66		RIGID	None	None	RIGID	Typical
32	M34	N67	N68		RIGID	None	None	RIGID	Typical
33	M35	N70	N69		Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
34	M36	N71	N72		RIGID	None	None	RIGID	Typical
35	M37	N73	N74		RIGID	None	None	RIGID	Typical
36	M38	N75	N76		Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
37	MR3	N77	N78		Handrail	Beam	Pipe	A53 Gr.B	Typical
38	MR1	N79	N80		Handrail	Beam	Pipe	A53 Gr.B	Typical
39	MR4	N81	N82		Handrail	Beam	Pipe	A53 Gr.B	Typical
40	MR5	N83	N84	90	Top Corner Angle	Beam	Single Angle	A36 Gr.36	Typical
41	MR6	N85	N86	180	Top Corner Angle	Beam	Single Angle	A36 Gr.36	Typical
42	MR2	N87	N88	90	Top Corner Angle	Beam	Single Angle	A36 Gr.36	Typical
43	M45	N89	N90		RIGID	None	None	RIGID	Typical
44	M46	N91	N92		RIGID	None	None	RIGID	Typical
45	MP2	N93	N94		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
46	M48	N95	N96		RIGID	None	None	RIGID	Typical
47	M49	N97	N98		RIGID	None	None	RIGID	Typical
48	MP1	N99	N100		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
49	M51	N110	N108		RIGID	None	None	RIGID	Typical
50	MP6	N103	N106		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
51	M53	N111	N105		RIGID	None	None	RIGID	Typical
52	MP5	N102	N109		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
53	M55	N112	N104		RIGID	None	None	RIGID	Typical
54	M56	N113	N107		RIGID	None	None	RIGID	Typical
55	M57	N122	N120		RIGID	None	None	RIGID	Typical

**Member Primary Data (Continued)**

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
56	MP4	N115	N118		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
57	M59	N123	N117		RIGID	None	None	RIGID	Typical
58	MP3	N114	N121		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
59	M61	N124	N116		RIGID	None	None	RIGID	Typical
60	M62	N125	N119		RIGID	None	None	RIGID	Typical

**Material Take-Off**

	Material	Size	Pieces	Length[in]	Weight[LB]
0	General Members				
1	RIGID		30	90	0
2	Total General		30	90	0
3					
4	Hot Rolled Steel				
5	A36 Gr.36	L2.5X2.5X3	3	51	13.03
6	A36 Gr.36	L2X2X2	6	270.4	37.652
7	A36 Gr.36	L2X2X4	3	225	60.229
8	A36 Gr.36	C6X8.2	3	69	46.763
9	A53 Gr.B	PIPE 2.0	9	1152	333.2
10	A53 Gr.B	PIPE 3.0	3	519.4	304.889
11	A53 Gr.B	PIPE 4.0	3	231	193.89
12	Total HR Steel		30	2517.9	989.654

**Basic Load Cases**

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Member)
1	Self Weight	DL		-1			24		3
2	Wind Load AZI 0	WLZ					48		
3	Wind Load AZI 30	None					48		
4	Wind Load AZI 60	None					48		
5	Wind Load AZI 90	WLX					48		
6	Wind Load AZI 120	None					48		
7	Wind Load AZI 150	None					48		
8	Wind Load AZI 180	None					48		
9	Wind Load AZI 210	None					48		
10	Wind Load AZI 240	None					48		
11	Wind Load AZI 270	None					48		
12	Wind Load AZI 300	None					48		
13	Wind Load AZI 330	None					48		
14	Distr. Wind Load Z	WLZ						60	
15	Distr. Wind Load X	WLX						60	
16	Ice Weight	OL1					24	60	3
17	Ice Wind Load AZI 0	OL2					48		
18	Ice Wind Load AZI 30	None					48		
19	Ice Wind Load AZI 60	None					48		
20	Ice Wind Load AZI 90	OL3					48		
21	Ice Wind Load AZI 120	None					48		
22	Ice Wind Load AZI 150	None					48		
23	Ice Wind Load AZI 180	None					48		
24	Ice Wind Load AZI 210	None					48		
25	Ice Wind Load AZI 240	None					48		
26	Ice Wind Load AZI 270	None					48		
27	Ice Wind Load AZI 300	None					48		
28	Ice Wind Load AZI 330	None					48		
29	Distr. Ice Wind Load Z	OL2						60	



**Basic Load Cases (Continued)**

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Member)
30	Distr. Ice Wind Load X	OL3						60	
31	Seismic Load Z	ELZ			-0.298		24		
32	Seismic Load X	ELX	-0.298				24		
33	Service Live Loads	LL				1			
34	Maintenance Load Lm1	LL				1			
35	Maintenance Load Lm2	LL				1			
36	Maintenance Load Lm3	LL				1			
37	Maintenance Load Lm4	LL				1			
38	Maintenance Load Lm5	LL				1			
39	Maintenance Load Lm6	LL				1			
40	BLC 1 Transient Area Loads	None						93	
41	BLC 16 Transient Area Loads	None						93	

**Load Combinations**

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4DL	Yes	Y	1	1.4								
2	1.2DL + 1WL AZI 0	Yes	Y	1	1.2	2	1	14	1	15			
3	1.2DL + 1WL AZI 30	Yes	Y	1	1.2	3	1	14	0.866	15	0.5		
4	1.2DL + 1WL AZI 60	Yes	Y	1	1.2	4	1	14	0.5	15	0.866		
5	1.2DL + 1WL AZI 90	Yes	Y	1	1.2	5	1	14		15	1		
6	1.2DL + 1WL AZI 120	Yes	Y	1	1.2	6	1	14	-0.5	15	0.866		
7	1.2DL + 1WL AZI 150	Yes	Y	1	1.2	7	1	14	-0.866	15	0.5		
8	1.2DL + 1WL AZI 180	Yes	Y	1	1.2	8	1	14	-1	15			
9	1.2DL + 1WL AZI 210	Yes	Y	1	1.2	9	1	14	-0.866	15	-0.5		
10	1.2DL + 1WL AZI 240	Yes	Y	1	1.2	10	1	14	-0.5	15	-0.866		
11	1.2DL + 1WL AZI 270	Yes	Y	1	1.2	11	1	14		15	-1		
12	1.2DL + 1WL AZI 300	Yes	Y	1	1.2	12	1	14	0.5	15	-0.866		
13	1.2DL + 1WL AZI 330	Yes	Y	1	1.2	13	1	14	0.866	15	-0.5		
14	0.9DL + 1WL AZI 0	Yes	Y	1	0.9	2	1	14	1	15			
15	0.9DL + 1WL AZI 30	Yes	Y	1	0.9	3	1	14	0.866	15	0.5		
16	0.9DL + 1WL AZI 60	Yes	Y	1	0.9	4	1	14	0.5	15	0.866		
17	0.9DL + 1WL AZI 90	Yes	Y	1	0.9	5	1	14		15	1		
18	0.9DL + 1WL AZI 120	Yes	Y	1	0.9	6	1	14	-0.5	15	0.866		
19	0.9DL + 1WL AZI 150	Yes	Y	1	0.9	7	1	14	-0.866	15	0.5		
20	0.9DL + 1WL AZI 180	Yes	Y	1	0.9	8	1	14	-1	15			
21	0.9DL + 1WL AZI 210	Yes	Y	1	0.9	9	1	14	-0.866	15	-0.5		
22	0.9DL + 1WL AZI 240	Yes	Y	1	0.9	10	1	14	-0.5	15	-0.866		
23	0.9DL + 1WL AZI 270	Yes	Y	1	0.9	11	1	14		15	-1		
24	0.9DL + 1WL AZI 300	Yes	Y	1	0.9	12	1	14	0.5	15	-0.866		
25	0.9DL + 1WL AZI 330	Yes	Y	1	0.9	13	1	14	0.866	15	-0.5		
26	1.2D + 1.0Di	Yes	Y	1	1.2	16	1						
27	1.2D + 1.0Di + 1.0Wi AZI 0	Yes	Y	1	1.2	16	1	17	1	29	1	30	
28	1.2D + 1.0Di + 1.0Wi AZI 30	Yes	Y	1	1.2	16	1	18	1	29	0.866	30	0.5
29	1.2D + 1.0Di + 1.0Wi AZI 60	Yes	Y	1	1.2	16	1	19	1	29	0.5	30	0.866
30	1.2D + 1.0Di + 1.0Wi AZI 90	Yes	Y	1	1.2	16	1	20	1	29		30	1
31	1.2D + 1.0Di + 1.0Wi AZI 120	Yes	Y	1	1.2	16	1	21	1	29	-0.5	30	0.866
32	1.2D + 1.0Di + 1.0Wi AZI 150	Yes	Y	1	1.2	16	1	22	1	29	-0.866	30	0.5
33	1.2D + 1.0Di + 1.0Wi AZI 180	Yes	Y	1	1.2	16	1	23	1	29	-1	30	
34	1.2D + 1.0Di + 1.0Wi AZI 210	Yes	Y	1	1.2	16	1	24	1	29	-0.866	30	-0.5
35	1.2D + 1.0Di + 1.0Wi AZI 240	Yes	Y	1	1.2	16	1	25	1	29	-0.5	30	-0.866
36	1.2D + 1.0Di + 1.0Wi AZI 270	Yes	Y	1	1.2	16	1	26	1	29		30	-1
37	1.2D + 1.0Di + 1.0Wi AZI 300	Yes	Y	1	1.2	16	1	27	1	29	0.5	30	-0.866
38	1.2D + 1.0Di + 1.0Wi AZI 330	Yes	Y	1	1.2	16	1	28	1	29	0.866	30	-0.5
39	(1.2 + 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	1.24	31	1	32					
40	(1.2 + 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	1.24	31	0.866	32	0.5				



**Load Combinations (Continued)**

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
41	(1.2 + 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	1.24	31	0.5	32	0.866				
42	(1.2 + 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	1.24	31		32	1				
43	(1.2 + 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	1.24	31	-0.5	32	0.866				
44	(1.2 + 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	1.24	31	-0.866	32	0.5				
45	(1.2 + 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	1.24	31	-1	32					
46	(1.2 + 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	1.24	31	-0.866	32	-0.5				
47	(1.2 + 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	1.24	31	-0.5	32	-0.866				
48	(1.2 + 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	1.24	31		32	-1				
49	(1.2 + 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	1.24	31	0.5	32	-0.866				
50	(1.2 + 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	1.24	31	0.866	32	-0.5				
51	(0.9 - 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	0.86	31	1	32					
52	(0.9 - 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	0.86	31	0.866	32	0.5				
53	(0.9 - 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	0.86	31	0.5	32	0.866				
54	(0.9 - 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	0.86	31		32	1				
55	(0.9 - 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	0.86	31	-0.5	32	0.866				
56	(0.9 - 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	0.86	31	-0.866	32	0.5				
57	(0.9 - 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	0.86	31	-1	32					
58	(0.9 - 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	0.86	31	-0.866	32	-0.5				
59	(0.9 - 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	0.86	31	-0.5	32	-0.866				
60	(0.9 - 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	0.86	31		32	-1				
61	(0.9 - 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	0.86	31	0.5	32	-0.866				
62	(0.9 - 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	0.86	31	0.866	32	-0.5				
63	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 0	Yes	Y	1	1	2	0.238	14	0.238	15		33	1.5
64	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 30	Yes	Y	1	1	3	0.238	14	0.206	15	0.119	33	1.5
65	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 60	Yes	Y	1	1	4	0.238	14	0.119	15	0.206	33	1.5
66	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 90	Yes	Y	1	1	5	0.238	14		15	0.238	33	1.5
67	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 120	Yes	Y	1	1	6	0.238	14	-0.119	15	0.206	33	1.5
68	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 150	Yes	Y	1	1	7	0.238	14	-0.206	15	0.119	33	1.5
69	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 180	Yes	Y	1	1	8	0.238	14	-0.238	15		33	1.5
70	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 210	Yes	Y	1	1	9	0.238	14	-0.206	15	-0.119	33	1.5
71	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 240	Yes	Y	1	1	10	0.238	14	-0.119	15	-0.206	33	1.5
72	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 270	Yes	Y	1	1	11	0.238	14		15	-0.238	33	1.5
73	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 300	Yes	Y	1	1	12	0.238	14	0.119	15	-0.206	33	1.5
74	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 330	Yes	Y	1	1	13	0.238	14	0.206	15	-0.119	33	1.5
75	1.2DL + 1.5LL	Yes	Y	1	1.2	33	1.5						
76	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	34	1.5	2	0.059	14	0.059	15	
77	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	34	1.5	3	0.059	14	0.052	15	0.03
78	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	34	1.5	4	0.059	14	0.03	15	0.052
79	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	34	1.5	5	0.059	14		15	0.059
80	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	34	1.5	6	0.059	14	-0.03	15	0.052
81	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	34	1.5	7	0.059	14	-0.052	15	0.03
82	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	34	1.5	8	0.059	14	-0.059	15	
83	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	34	1.5	9	0.059	14	-0.052	15	-0.03
84	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	34	1.5	10	0.059	14	-0.03	15	-0.052
85	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	34	1.5	11	0.059	14		15	-0.059
86	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	34	1.5	12	0.059	14	0.03	15	-0.052
87	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	34	1.5	13	0.059	14	0.052	15	-0.03
88	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	35	1.5	2	0.059	14	0.059	15	
89	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	35	1.5	3	0.059	14	0.052	15	0.03
90	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	35	1.5	4	0.059	14	0.03	15	0.052
91	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	35	1.5	5	0.059	14		15	0.059
92	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	35	1.5	6	0.059	14	-0.03	15	0.052
93	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	35	1.5	7	0.059	14	-0.052	15	0.03
94	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	35	1.5	8	0.059	14	-0.059	15	
95	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	35	1.5	9	0.059	14	-0.052	15	-0.03



**Load Combinations (Continued)**

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
96	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	35	1.5	10	0.059	14	-0.03	15	-0.052
97	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	35	1.5	11	0.059	14		15	-0.059
98	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	35	1.5	12	0.059	14	0.03	15	-0.052
99	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	35	1.5	13	0.059	14	0.052	15	-0.03
100	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	36	1.5	2	0.059	14	0.059	15	
101	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	36	1.5	3	0.059	14	0.052	15	0.03
102	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	36	1.5	4	0.059	14	0.03	15	0.052
103	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	36	1.5	5	0.059	14		15	0.059
104	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	36	1.5	6	0.059	14	-0.03	15	0.052
105	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	36	1.5	7	0.059	14	-0.052	15	0.03
106	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	36	1.5	8	0.059	14	-0.059	15	
107	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	36	1.5	9	0.059	14	-0.052	15	-0.03
108	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	36	1.5	10	0.059	14	-0.03	15	-0.052
109	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	36	1.5	11	0.059	14		15	-0.059
110	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	36	1.5	12	0.059	14	0.03	15	-0.052
111	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	36	1.5	13	0.059	14	0.052	15	-0.03
112	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	37	1.5	2	0.059	14	0.059	15	
113	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	37	1.5	3	0.059	14	0.052	15	0.03
114	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	37	1.5	4	0.059	14	0.03	15	0.052
115	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	37	1.5	5	0.059	14		15	0.059
116	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	37	1.5	6	0.059	14	-0.03	15	0.052
117	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	37	1.5	7	0.059	14	-0.052	15	0.03
118	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	37	1.5	8	0.059	14	-0.059	15	
119	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	37	1.5	9	0.059	14	-0.052	15	-0.03
120	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	37	1.5	10	0.059	14	-0.03	15	-0.052
121	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	37	1.5	11	0.059	14		15	-0.059
122	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	37	1.5	12	0.059	14	0.03	15	-0.052
123	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	37	1.5	13	0.059	14	0.052	15	-0.03
124	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	38	1.5	2	0.059	14	0.059	15	
125	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	38	1.5	3	0.059	14	0.052	15	0.03
126	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	38	1.5	4	0.059	14	0.03	15	0.052
127	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	38	1.5	5	0.059	14		15	0.059
128	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	38	1.5	6	0.059	14	-0.03	15	0.052
129	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	38	1.5	7	0.059	14	-0.052	15	0.03
130	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	38	1.5	8	0.059	14	-0.059	15	
131	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	38	1.5	9	0.059	14	-0.052	15	-0.03
132	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	38	1.5	10	0.059	14	-0.03	15	-0.052
133	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	38	1.5	11	0.059	14		15	-0.059
134	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	38	1.5	12	0.059	14	0.03	15	-0.052
135	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	38	1.5	13	0.059	14	0.052	15	-0.03
136	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	39	1.5	2	0.059	14	0.059	15	
137	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	39	1.5	3	0.059	14	0.052	15	0.03
138	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	39	1.5	4	0.059	14	0.03	15	0.052
139	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	39	1.5	5	0.059	14		15	0.059
140	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	39	1.5	6	0.059	14	-0.03	15	0.052
141	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	39	1.5	7	0.059	14	-0.052	15	0.03
142	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	39	1.5	8	0.059	14	-0.059	15	
143	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	39	1.5	9	0.059	14	-0.052	15	-0.03
144	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	39	1.5	10	0.059	14	-0.03	15	-0.052
145	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	39	1.5	11	0.059	14		15	-0.059
146	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	39	1.5	12	0.059	14	0.03	15	-0.052
147	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	39	1.5	13	0.059	14	0.052	15	-0.03

**Envelope Node Reactions**

Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC	
0	N1	max	884.923	17	1959.907	27	-1557.163	14	7492.849	27	1580.597	11	1513.24	23
1		min	-888.741	11	316.815	20	-9146.696	33	11.456	20	-1565.093	17	-1740.29	5
2	N21	max	-1417.65	18	1958.13	31	4616.047	38	538.756	14	1202.642	15	-59.122	23
3		min	-7904.911	37	323.342	24	592.766	20	-4112.749	82	-1219.225	9	-6348.677	30
4	N19	max	7907.295	29	1972.063	35	4609.657	28	439.79	14	1278.867	7	6573.355	36
5		min	1479.761	22	334.525	16	717.086	22	-3864.966	94	-1277.297	13	10.636	17
6	Totals:	max	3355.219	5	5695.962	29	3466.906	14						
7		min	-3355.215	23	2096.371	59	-3466.909	8						

**Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks**

Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn	
0	M19	L2X2X4	0.932	37.5	33	0.06	37.5	z	38	18657.095	30585.6	690.934	1501.793	1	H2-1
1	M21	L2X2X4	0.925	37.5	29	0.06	37.5	z	34	18657.095	30585.6	690.934	1501.793	1	H2-1
2	M15	L2X2X4	0.922	37.5	28	0.059	37.5	z	30	18657.095	30585.6	690.934	1501.793	1	H2-1
3	MS2	PIPE 4.0	0.757	0	27	0.23	0		5	81734.03	93240	10631.25	10631.25	1	H1-1b
4	MS3	PIPE 4.0	0.756	0	31	0.224	0		9	81734.03	93240	10631.25	10631.25	1	H1-1b
5	MS1	PIPE 4.0	0.751	0	35	0.219	0		13	81734.03	93240	10631.25	10631.25	1	H1-1b
6	M6	C6X8.2	0.691	11.5	33	0.443	11.5	y	34	70285.703	77436	2107.841	13932	1.366	H1-1b
7	M8	C6X8.2	0.689	11.5	29	0.441	11.5	y	30	70285.703	77436	2107.841	13932	1.365	H1-1b
8	M5	C6X8.2	0.67	11.5	37	0.435	11.5	y	38	70285.703	77436	2107.841	13932	1.367	H1-1b
9	MP3	PIPE 2.0	0.546	61.25	8	0.178	61.25		3	17855.085	32130	1871.625	1871.625	1	H1-1b
10	MP5	PIPE 2.0	0.545	61.25	4	0.182	61.25		11	17855.085	32130	1871.625	1871.625	1	H1-1b
11	MP1	PIPE 2.0	0.529	61.25	12	0.183	61.25		7	17855.085	32130	1871.625	1871.625	1	H1-1b
12	MP4	PIPE 2.0	0.508	84	12	0.192	84		4	8922.084	32130	1871.625	1871.625	1	H1-1b
13	MP6	PIPE 2.0	0.502	84	8	0.192	84		12	8922.084	32130	1871.625	1871.625	1	H1-1b
14	MR2	L2.5X2.5X3	0.498	17	8	0.159	17	z	2	27173.99	29192.4	872.574	1971.83	1.028	H2-1
15	MR6	L2.5X2.5X3	0.49	0	12	0.158	0	y	6	27173.99	29192.4	872.574	1971.83	1.008	H2-1
16	MP2	PIPE 2.0	0.489	84	4	0.196	84		8	8922.084	32130	1871.625	1871.625	1	H1-1b
17	MR5	L2.5X2.5X3	0.476	17	4	0.159	17	z	10	27173.99	29192.4	872.574	1971.83	1.039	H2-1
18	MR1	PIPE 2.0	0.358	21.75	13	0.228	7.25		6	4678.524	32130	1871.625	1871.625	1	H1-1b
19	MR3	PIPE 2.0	0.358	21.75	9	0.234	7.25		2	4678.524	32130	1871.625	1871.625	1	H1-1b
20	MR4	PIPE 2.0	0.356	152.25	5	0.23	166.75		10	4678.524	32130	1871.625	1871.625	1	H1-1b
21	MH2	PIPE 3.0	0.169	149.694	7	0.116	12.625		3	21477.804	65205	5748.75	5748.75	1	H1-1b
22	MH3	PIPE 3.0	0.169	23.446	3	0.117	160.515		11	21477.804	65205	5748.75	5748.75	1	H1-1b
23	MH1	PIPE 3.0	0.166	23.446	11	0.119	160.515		7	21477.804	65205	5748.75	5748.75	1	H1-1b
24	M23	L2X2X2	0.164	38.029	12	0.008	38.029	y	37	7903.562	15908.4	402.563	742.322	1.5	H2-1
25	M32	L2X2X2	0.163	38.029	8	0.008	38.029	y	32	7903.562	15908.4	402.563	742.322	1.5	H2-1
26	M38	L2X2X2	0.162	25.822	4	0.009	7.042	y	30	7903.562	15908.4	396.008	675.933	1.077	H2-1
27	M35	L2X2X2	0.161	38.029	4	0.008	38.029	y	29	7903.562	15908.4	402.563	742.322	1.5	H2-1
28	M29	L2X2X2	0.157	25.353	8	0.009	7.042	y	34	7903.562	15908.4	396.008	676.201	1.078	H2-1
29	M26	L2X2X2	0.15	26.292	12	0.009	7.042	y	37	7903.562	15908.4	396.008	680.659	1.1	H2-1

**APPENDIX D**  
**ADDITIONAL CALCUATIONS**

# INFINIGY

## Bolt Calculation Tool, V1.6.5

PROJECT DATA	
Site Name:	KILLINGLY ROSS ROAD
Site Number:	857013
Connection Description:	Standoff to Collar

ENVELOPE BOLT LOADS		
(LC124 MS2) Bolt Tension:	5766.84	lbs
(LC5 MS2) Bolt Shear:	1563.12	lbs

MAX BOLT USAGE LOADS <sup>1</sup>		
Bolt Tension:	5766.84	lbs
Bolt Shear:	800.91	lbs

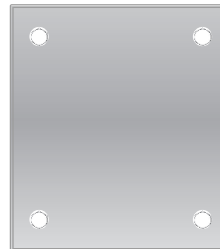
BOLT PROPERTIES		
Bolt Type:	Bolt	-
Bolt Diameter:	0.625	in
Bolt Grade:	A325	-
# of Bolts:	4	-
Threads Excluded?	No	-

<sup>1</sup> Max bolt usage loads correspond to Load combination #124 on member MS2 in RISA-3D, which causes the maximum demand on the bolts.

LC	Axial lb	y Shear lb	Z Shear lb	Torque lb-ft	y-y Moment lb-ft	z-z Moment lb-ft
(LC124 MS2)	5645.99	1731.41	-17.46	616.38	78.21	7100.13
(LC5 MS2)	4292.84	992.50	888.07	1740.29	-1563.35	7100.13

Member Information	
I nodes of MS2, MS1, MS3,	

BOLT CHECK		
Tensile Strength	20340.15	
Shear Strength	13805.83	
Max Tensile Usage	28.4%	
Max Shear Usage	11.3%	
Interaction Check (Max Usage)	0.08	≤1.05
Result	Pass	





FOX HILL TELECOM

## Radio Frequency Emissions Analysis Report

# T Mobile™

Site ID: CTNL140B

NL140/CingularRossRd\_MP  
280 Ross Road  
Killingly, CT 06239

September 29, 2023

Fox Hill Telecom Project Number: 230999

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	25.99 %



September 29, 2023

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

## Emissions Analysis for Site: **CTNL140B – NL140/CingularRossRd\_MP**

Fox Hill Telecom, Inc (“Fox Hill”) was directed to analyze the proposed upgrades to the T-MOBILE facility located at **280 Ross Road, Killingly, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The number of  $\mu\text{W}/\text{cm}^2$  calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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



FOX HILL TELECOM

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 **280 Ross Road, Killingly, 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

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

S = Power Density (in  $\mu\text{w}/\text{cm}^2$ )

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	2	60
LTE	700 MHz	2	20
LTE / 5G NR	1900 MHz (PCS)	4	40
GSM	1900 MHz (PCS)	1	15
LTE	2100 MHz (AWS)	4	40
LTE / 5G NR	2500 MHz (BRS)	8	20

*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 APXVAALL24 43-U-NA20	110
A	2	Ericsson AIR6419 B41	110
B	1	RFS APXVAALL24 43-U-NA20	110
B	2	Ericsson AIR6419 B41	110
C	1	RFS APXVAALL24 43-U-NA20	110
C	2	Ericsson AIR6419 B41	110

*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 APXVAALL24 43-U-NA20	600 MHz / 700 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	13.65 / 13.85 / 16.65 / 16.95	13	495	19,770.39	2.39
Antenna A2	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	160	22,600.60	2.12
Sector A Composite MPE%							<b>4.51</b>
Antenna B1	RFS APXVAALL24 43-U-NA20	600 MHz / 700 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	13.65 / 13.85 / 16.65 / 16.95	13	495	19,770.39	2.39
Antenna B2	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	160	22,600.60	2.12
Sector B Composite MPE%							<b>4.51</b>
Antenna C1	RFS APXVAALL24 43-U-NA20	600 MHz / 700 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	13.65 / 13.85 / 16.65 / 16.95	13	495	19,770.39	2.39
Antenna C2	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	160	22,600.60	2.12
Sector C Composite MPE%							<b>4.51</b>

*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.

<b>Site Composite MPE%</b>	
<b>Carrier</b>	<b>MPE%</b>
T-MOBILE – Max Per Sector Value	<b>4.51 %</b>
AT&T	6.83 %
Verizon Wireless	7.08 %
Dish	7.14 %
SmartSky	0.43 %
<b>Site Total MPE %:</b>	<b>25.99 %</b>

*Table 4: All Carrier MPE Contributions*

T-MOBILE Sector A Total:	4.51 %
T-MOBILE Sector B Total:	4.51 %
T-MOBILE Sector C Total:	4.51 %
<b>Site Total:</b>	<b>25.99 %</b>

*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 ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
T-Mobile 600 MHz LTE / 5G NR	2	1,390.44	110	4.00	600 MHz	400	1.00%
T-Mobile 700 MHz LTE	2	485.32	110	1.31	700 MHz	467	0.28%
T-Mobile 1900 MHz (PCS) LTE / 5G NR	4	1,849.52	110	5.30	1900 MHz (PCS)	1000	0.53%
T-Mobile 1900 MHz (PCS) GSM	1	693.57	110	0.50	1900 MHz (PCS)	1000	0.05%
T-Mobile 2100 MHz (AWS) LTE	4	1,981.80	110	5.30	2100 MHz (AWS)	1000	0.53%
T-Mobile 2500 MHz (BRS) LTE / 5G NR	8	2,825.08	110	21.20	2500 MHz (BRS)	1000	2.12%
						<b>Total:</b>	<b>4.51 %</b>

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:	4.51 %
Sector B:	4.51 %
Sector C:	4.51 %
T-MOBILE Maximum Total (per sector):	4.51 %
Site Total:	25.99 %
Site Compliance Status:	<b>COMPLIANT</b>

The estimated composite MPE value for this site assuming all carriers present is **25.99 %** 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 COMPOND AVOID WAS COMPLETED ON 09/29/2023. THE CONSTRUCTION DRAWING REFLECTS CONDITIONS AT TIME OF AVOID.



**T-MOBILE SITE NUMBER:** CTNL140B  
**T-MOBILE SITE NAME:** NL140/CINGULAR ROSS RD\_MP  
**T-MOBILE PROJECT:** ANCHOR  
**T-MOBILE RAN:** 67D5D998E 6160  
**T-MOBILE A&L:** 67D5998E\_1xAIR+1OP+1QP

**BUSINESS UNIT #:** 857013  
**SITE ADDRESS:** 280 ROSS RD  
 KILLINGLY, CT 06239  
**COUNTY:** WINDHAM  
**SITE TYPE:** MONOPOLE  
**TOWER HEIGHT:** 119'-0"



3545 WHITEHALL PARK DRIVE, SUITE 450  
 CHARLOTTE, NORTH CAROLINA 28273

**T-MOBILE SITE NUMBER:**  
 CTNL140B  
**BU #:** 857013  
**CROWN CASTLE SITE NAME:**  
 KILLINGLY ROSS ROAD  
 280 ROSS RD  
 KILLINGLY, CT 06239  
 EXISTING 119'-0"  
 MONOPOLE

ISSUED FOR:			
REV	DATE	DRWN	DESCRIPTION
0	12/26/2023	SMS	FINAL
1	09/29/2024	JR	REWORKED RFI'S

**SITE INFORMATION**

**CROWN CASTLE USA INC.**  
 SITE NAME: KILLINGLY ROSS ROAD  
 BU NUMBER: 857013  
**TOWER OWNER:** CROWN CASTLE  
 2800 CORPORATE DRIVE  
 CANONSBURG, PA 15317  
**CARRIER/APPLICANT:** T-MOBILE  
 100 PINNACLE POINT DRIVE  
 COLUMBIA SC, 29223  
**SITE ADDRESS:** 280 ROSS RD  
 KILLINGLY, CT 06239  
**COUNTY:** WINDHAM  
**LATITUDE:** 41° 40' 17.59" / 41.771391  
**LONGITUDE:** -71° 51' 20.39" / -71.855831  
**LAT/LONG TYPE:** NAD83  
**GROUND ELEVATION:** 452' / AMSL  
**AREA OF CONSTRUCTION:** EXISTING  
**CURRENT ZONING:** ---  
**MAP/PARCEL #:** 09013001-28/005/000004  
**OCCUPANCY CLASSIFICATION:** U  
**TYPE OF CONSTRUCTION:** HB  
**ADA COMPLIANCE:** FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION  
**PROPERTY OWNER:** ASC REAL ESTATE INC  
 P O BOX 122  
 ANDOVER, CT 06232  
**JURISDICTION:** CT - TOWN OF KILLINGLY  
 172 MAIN STREET  
 KILLINGLY, CT 06239  
**ELECTRIC PROVIDER:** NORTHEAST UTILITIES  
**TELCO PROVIDER:** LIGHTTOWER

**DRAWING INDEX**

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1.1	COMPOND 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

**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 (5) RFS - APX16DWV16DWV-S-E-A20 (QUAD) ANTENNAS
- REMOVE (3) GENERIC TWIN STYLE 1A - PCS TRIM
- REMOVE (1) RFS/CEL/WAVE - 1HB144/6812-XXX-L HYBRID CABLE
- REMOVE (6) ANDREW - LDF7-50A COAX CABLES
- REMOVE (6) ANDREW - AVA7-50 COAX CABLES
- INSTALL (5) ERICSSON - AIR 6419 B41 (ACTIVE) ANTENNA - MASSIVE MIMO) ANTENNAS
- INSTALL (5) ERICSSON - 4460 R25 +B66 RADIOS
- INSTALL (5) RFS/CEL/WAVE / 1HB158-21U624-xxM HYBRID CABLES

**GROUND SCOPE OF WORK:**

- REMOVE (1) ERICSSON - RBS 6201 ODE ENCLOSURE
- REMOVE (1) BATTERY BACKUP UNIT
- INSTALL (1) ERICSSON - 6160 AC V1 ENCLOSURE
- INSTALL (1) ERICSSON - R160 ENCLOSURE

**LOCATION MAP**



**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 AUTHORITY. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

CODE TYPE	CODE
BUILDING	2021 IRC
MECHANICAL	2021 IMC
ELECTRICAL	2020 NEC

**REFERENCE DOCUMENTS:**

STRUCTURAL ANALYSIS: MORRISON HERSHFELD #  
 CN6-95885/2300001  
 DATED: 09/15/2023

MOUNT ANALYSIS: INFENGY # 1039-Z0001-B  
 DATED: 09/12/2023

RFDS REVISION: 4  
 DATED: 08/03/2023

ORDER ID: 655747  
 REVISION: 0  
 PMA& PROJECT NUMBER: 23CCTCTM-001



IT IS A VIOLATION OF LAW FOR ANY PERSON, OTHER THAN THE ENGINEER UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER:	REVISION:
T-1	1

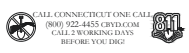
**PROJECT TEAM**

**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:**  
 Tricia Polon - PROJECT MANAGER  
 Tricia.Polon@crowncastle.com  
 Israel Coney - CONSTRUCTION MANAGER  
 Israel.Coney@crowncastle.com  
 Jennifer Mesing - A/E/S  
 Jennifer.Mesing@crowncastle.com

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

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 2X34. 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.



EXISTING T-MOBILE ELECTRIC SERVICE WITH AND UNDER CONDUIT: 200A 120/240V-1PH  
 PVC; NORTHERN TECHNOLOGIES, INC. 200A 120/240V-1PH FAULT CURRENT RATING 65A, 200A GENERATOR PLECC, 200A MAXIMUM BRANCH CIRCUIT SIZE & 24 AC BREAKER POSITIONS.

T-MOBILE NATIONAL ANCHOR

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

- 1. NOTICE TO PROCEED - WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER...
2. 'LOOK UP' - CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT...
3. PRIOR TO THE START OF CONSTRUCTION ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED...
4. ALL CONSTRUCTION MEANS AND METHODS, INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS...
5. ALL SITE WORK TO COMPLY WITH GAS-ST5-1004B 'INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE'...

- 11. ALL SITE WORK SHALL BE AS NOTICED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS, LATEST APPROVED REVISION...
12. THE CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIALS, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK...
13. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES...
14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE...
15. THE SITE SHALL BE GRASSED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE GARNER'S EQUIPMENT AND TOWER AREA...
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 DELIMITED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY...
18. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DRAINAGE...
19. THE CONTRACTOR SHALL PRETECT EXISTING IMPROVEMENTS, FURNISHES, CURBS, LANDSCAPING AND STRUCTURES...
20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COPAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY...
21. ALL FILL OR EMBANKMENT MATERIALS SHALL BE PLACED ON FREEZE-GROUND...
22. ALL ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT...

GREENFIELD GROUNDING NOTES:

- 1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER CEST'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE...
2. THE CONTRACTOR SHALL PERFORM IFTT FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND #1) FOR GROUND ELECTRODE SYSTEMS...
3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY...
4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING...
5. METAL FABRYRY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUNDING...
6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES...
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 TINED COPPER UNLESS OTHERWISE INDICATED...
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUIT SHALL NOT BE USED FOR GROUNDING CONNECTIONS...
10. USE OF #80 BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN #4 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 COMPS...
13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELDED CONNECTIONS...
14. BRIDGE BONDING CONNECTIONS SHALL BE EXPERIMENTALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR...
15. APPROVED ANTI-OXIDANT COMINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS...
16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE WELDED WITH A CORROSION RESISTANT MATERIAL...
17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOLDS, FRAMES AND SUPPORTS SHALL...
18. BOND ALL METALS EXCEPT #4 BENDS OF MAIN GROUND RING WITH (1) #2 BARE STEEL TINED COPPER GROUND CONDUIT...
19. GROUND CONDUCTORS SHALL BE FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE BOLTED TO NON-METALLIC SUBJECTS...
20. METAL SUPPORT CLIPS OR SLICETS THROUGH WALLS OR FLOORS...
21. ALL GROUNDING CONDUCTORS SHALL BE BONDED TO EACH END OF THE METAL CONDUIT...
22. ALL GROUNDING CONDUCTORS SHALL BE BONDED TO EACH END OF THE METAL CONDUIT...
23. BUILDS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE BONDED TO EACH END OF THE METAL CONDUIT...
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GENERAL NOTES:

- 1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY: CONTRACTOR - GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION...
2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPETENCE NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS...
3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE, THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION...
4. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND APPROACHES...
5. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION...
6. THE CONTRACTOR SHALL VERIFY THE DIMENSIONS, MEASUREMENTS AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS...
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES...
8. ALL MATERIALS FURNISHED AND INSTALLED SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS...
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY APPROVALS...
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30. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY APPROVALS...

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

- 1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A118, ASTM A118 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE...
2. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES...
3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS...
4. UNLESS OTHERWISE NOTED OTHERWISE, NO MORE THAN 40 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT...
5. ALL CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL CONTAIN AN EXTRAING ADMIXTURE...
6. ALL CONCRETE SHALL BE PLACED IN ACCORDANCE WITH THE ACI 309 CHAPTER 4.2.4...
7. A DOUBLED EDGE OR 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE...
8. #4 BARS AND SMALLER - 60 ksi...
9. #5 BARS AND LARGER - 70 ksi...
10. #6 BARS AND LARGER - 80 ksi...
11. #8 BARS AND LARGER - 90 ksi...
12. #10 BARS AND LARGER - 100 ksi...
13. #12 BARS AND LARGER - 110 ksi...
14. #14 BARS AND LARGER - 120 ksi...
15. #16 BARS AND LARGER - 130 ksi...
16. #18 BARS AND LARGER - 140 ksi...
17. #20 BARS AND LARGER - 150 ksi...
18. #22 BARS AND LARGER - 160 ksi...
19. #24 BARS AND LARGER - 170 ksi...
20. #28 BARS AND LARGER - 180 ksi...
21. #32 BARS AND LARGER - 190 ksi...
22. #36 BARS AND LARGER - 200 ksi...
23. #42 BARS AND LARGER - 210 ksi...
24. #48 BARS AND LARGER - 220 ksi...
25. #54 BARS AND LARGER - 230 ksi...
26. #60 BARS AND LARGER - 240 ksi...
27. #66 BARS AND LARGER - 250 ksi...
28. #72 BARS AND LARGER - 260 ksi...
29. #78 BARS AND LARGER - 270 ksi...
30. #84 BARS AND LARGER - 280 ksi...

ELECTRICAL INSTALLATION NOTES:

- 1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PRECIPITATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES/ORDINANCES...
2. CONDUIT ROUTINGS ARE SHOWN; CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED...
3. WIRING, RACEWAYS 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...
5. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABELS OF APPROVAL...
6. ALL DISBURSEMENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED...
7. ALL DISBURSEMENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED...
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20. ALL DISBURSEMENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED...
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22. ALL DISBURSEMENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED...
23. ALL DISBURSEMENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED...
24. ALL DISBURSEMENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED...
25. ALL DISBURSEMENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED...
26. ALL DISBURSEMENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED...
27. ALL DISBURSEMENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED...
28. ALL DISBURSEMENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED...
29. ALL DISBURSEMENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED...
30. ALL DISBURSEMENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED...

CONDUCTOR COLOR CODE:

Table with columns: SYSTEM, CONDUCTOR, COLOR. Lists conductor types like 120/240V, 120/208V, 277/480V and their corresponding colors (White, Black, Red, Blue, Green, Orange, Purple, Grey, Green-Grey, Black).

AWPA UNIFORM COLOR CODE:

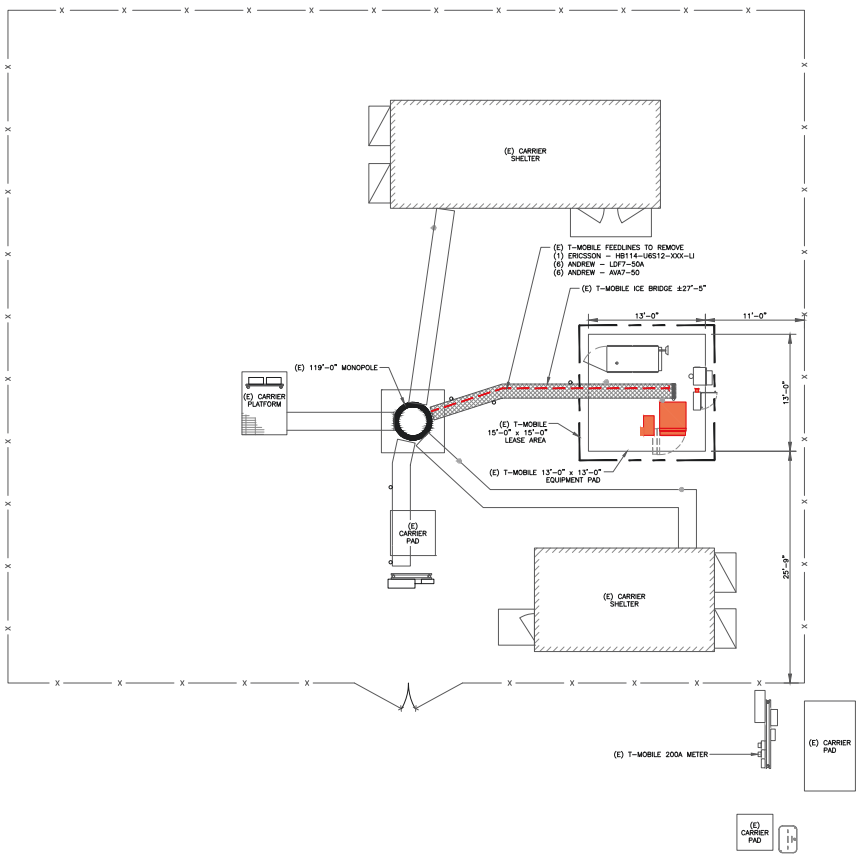
Table with columns: Color Name, Description. Lists colors like White (Temporary Excavation), Yellow (Proposed Survey Markings), Red (Electric Power Lines, Cables, Conduit, and Lighting Cables), Orange (Gas, Oil, Steam, Petroleum, or Gaseous Conduits or Signal Lines, Cables, or Conduit and Traffic Loops), Blue (Potable Water), Purple (Reclaimed Water, Irrigation, and Slurry Lines), Green (Sewers and Drain Lines).

ABBREVIATIONS:

- ANT - ANTENNA
EXT - EXISTING
FIF - FACILITY INTERFACE FRAME
GEN - GENERATOR
GMS - GLOBAL POSITIONING SYSTEM
GSM - GLOBAL SYSTEM FOR MOBILE TELEPHONE COMMUNICATIONS
HFC - HIGH FREQUENCY CARRIER
MIR - MICROWAVE
NFC - NATIONAL ELECTRIC CODE
NF - NATIONAL FIRE PROTECTION ASSOCIATION
NFP - NATIONAL FIRE PLANET
QTY - QUANTITY
REC - RECTIFIER
RST - RADIO BASE STATION
RET - REMOTE ELECTRIC TTY
RFD - RADIO FREQUENCY DATA SHEET
RRR - REMOTE RADIO HEAD
RMT - REMOTE MOUNTED AMPLIFIER
SND - SMART INTEGRATED DEVICE
TMR - TOWER MOUNTED ANTENNA
TYP - TYPICAL
UNL - UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
W.P. - WORK POINT

Advertisement for T-Mobile featuring T-Mobile logo, Crown Castle logo, PMA logo, and contact information: 3545 WHITEHALL PARK DRIVE, SUITE 450, CHARLOTTE, NORTH CAROLINA 28271. Includes T-Mobile site number CTNL140B, BU #: 857013, CROWN CASTLE SITE NAME: KILLINGLY ROSS ROAD, 280 ROSS RD, KILLINGLY, CT 06239. Includes a 'DATE ISSUED FOR' table and a seal of the State of Connecticut.





**EQUIPMENT LEGEND:**

□	EXISTING
□	TO BE RELOCATED/REMOVED
□	NEW/RELOCATED



**T-MOBILE SITE NUMBER:**  
CTNLI40B

**BU #:** 857013

**CROWN CASTLE SITE NAME:**  
KILLINGLY ROSS ROAD

280 ROSS RD  
KILLINGLY, CT 06239

EXISTING 119'-0"  
MONOPOLE

**ISSUED FOR:**

REV.	DATE	DRWN.	DESCRIPTION	DES./CHK.
0	12/26/2023	SMS	FINAL	JS
1	05/02/2024	JS	REMOVED REFS	JS



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.

<b>SHEET NUMBER:</b> C-1.1	<b>REVISION:</b> 1
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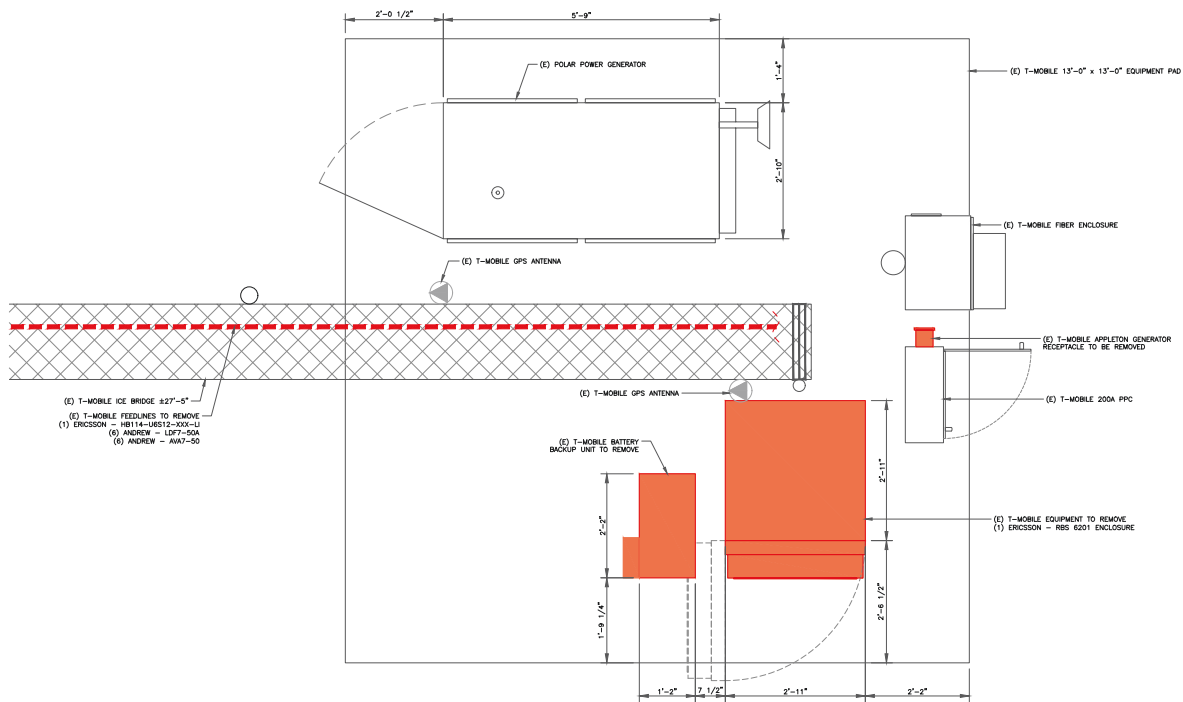
1 COMPOUND PLAN  
SCALE: 3/16"=1'-0" (FULL SIZE)  
1/32"=1'-0" (1:12)



T-MOBILE NATIONAL ANCHOR

**EQUIPMENT LEGEND:**

	EXISTING
	TO BE RELOCATED/REMOVED
	NEW/RELOCATED



- (E) T-MOBILE ICE BRIDGE #27'-6"
- (E) T-MOBILE FEEDLINES TO REMOVE
- (1) ERICSSON - HB114-14612-XXX-12
- (6) ANDREW - L877-50A
- (6) ANDREW - AH47-50

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



3545 WHITEHALL PARK DRIVE, SUITE 450  
 CHARLOTTE, NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:  
**CTNL140B**  
 BU #: 857013  
 CROWN CASTLE SITE  
 NAME:  
**KILLINGLY ROSS ROAD**  
 280 ROSS RD  
 KILLINGLY, CT 06239  
 EXISTING 119'-0"  
 MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DESIGN
0	12/20/2023	SMS	FINAL	JS
1	05/02/2024	JS	REMOVED REFS	JS

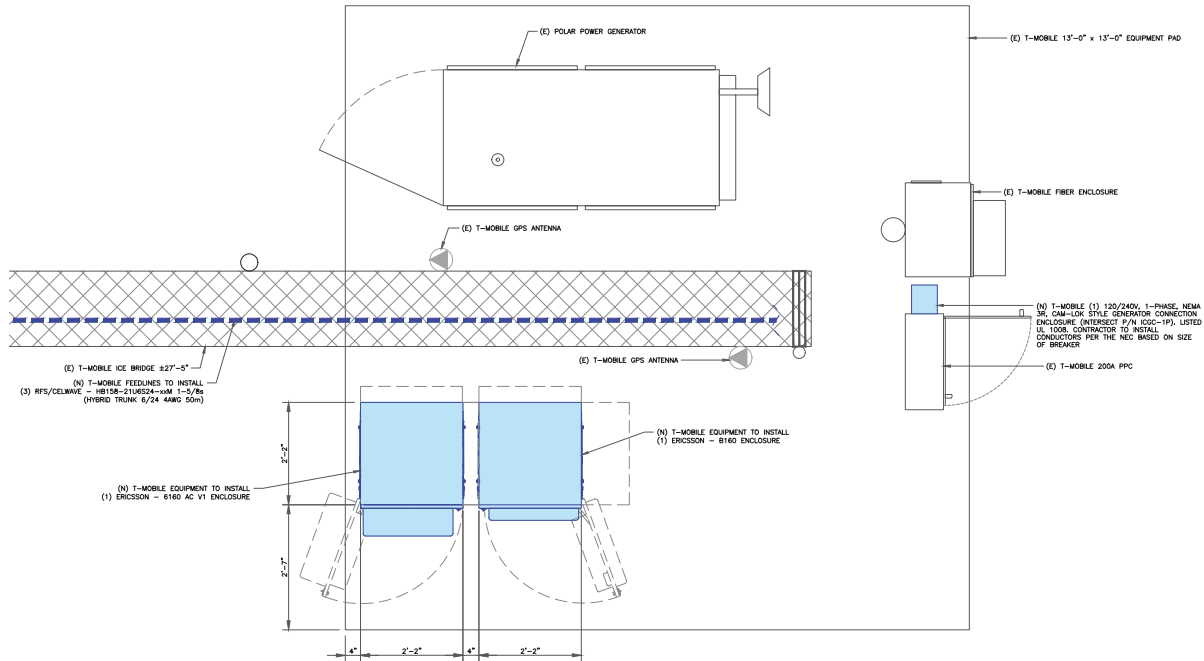


IT IS A VIOLATION OF LAW FOR ANY PERSON,  
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 OF A LICENSED PROFESSIONAL ENGINEER,  
 TO ALTER THIS DOCUMENT.

SHEET NUMBER: <b>C-1.2</b>	REVISION: <b>1</b>
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**EQUIPMENT LEGEND:**

	EXISTING
	TO BE RELOCATED/REMOVED
	NEW/RELOCATED



T-MOBILE SITE NUMBER:  
**CTNLI40B**

BU #: **857013**

CROWN CASTLE SITE  
NAME:  
**KILLINGLY ROSS ROAD**

280 ROSS RD  
KILLINGLY, CT 06239

EXISTING 119'-0"  
MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES. QTY
0	12/20/2023	SMS	FINAL	JS
1	05/02/2024	JS	REMOVED RFI'S	JS



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.

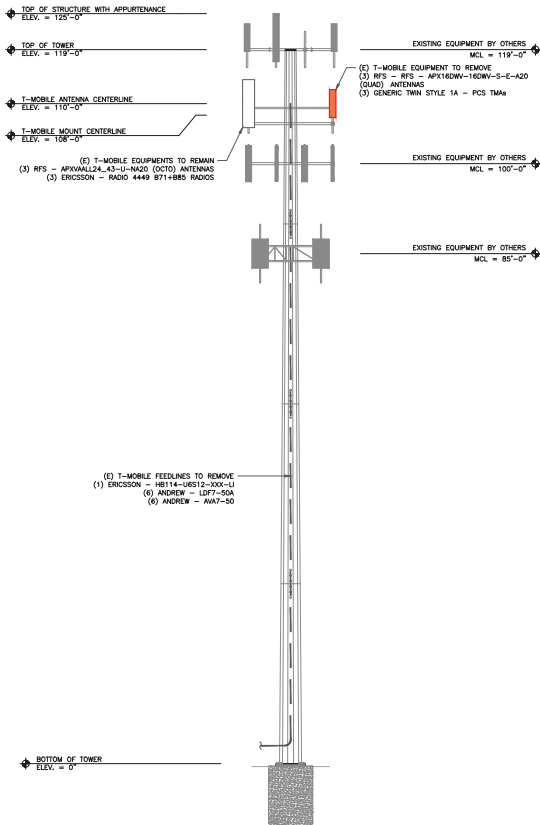
SHEET NUMBER: <b>C-1.3</b>	REVISION: <b>1</b>
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1 FINAL EQUIPMENT PLAN  
SCALE: 1"=1'-0" (SHEET SIZE) 1/2"=1'-0" (11x17)

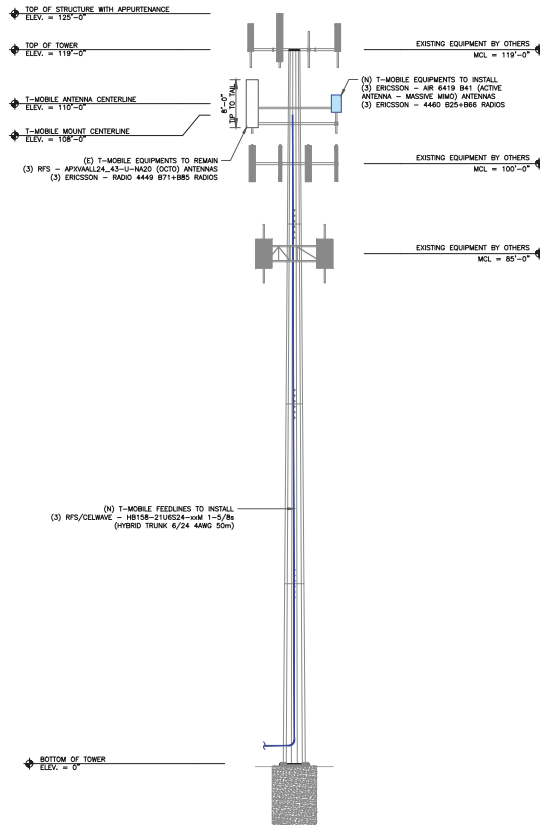


T-MOBILE NATIONAL ANCHOR

T-MOBILE NATIONAL ANCHOR



1 EXISTING TOWER ELEVATION  
 SCALE: 1/8"=1'-0" (FULL SIZE)  
 1/16"=1'-0" (1 IN 16)



2 FINAL TOWER ELEVATION  
 SCALE: 1/8"=1'-0" (FULL SIZE)  
 1/16"=1'-0" (1 IN 16)

**EQUIPMENT LEGEND:**

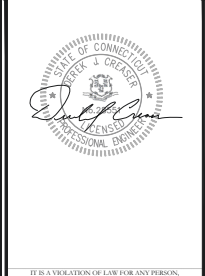
- EXISTING
- TO BE RELOCATED/REMOVED
- NEW/RELOCATED



**T-MOBILE SITE NUMBER:**  
 CTNLI40B  
**BU #:** 857013  
**CROWN CASTLE SITE NAME:**  
 KILLINGLY ROSS ROAD  
 280 ROSS RD  
 KILLINGLY, CT 06239  
 EXISTING 119'-0"  
 MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./CHK
0	12/26/2013	SMS	FINAL	JS
1	05/02/2014	JS	REMOVED FEEDS	JS



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<b>SHEET NUMBER:</b> C-2	<b>REVISION:</b> 1
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T-MOBILE NATIONAL ANCHOR

**EQUIPMENT LEGEND:**

	EXISTING
	TO BE RELOCATED/REMOVED
	NEW/RELOCATED



T-MOBILE SITE NUMBER:  
CTNLI40B

BU #: 857013  
CROWN CASTLE SITE  
NAME:  
KILLINGLY ROSS ROAD

280 ROSS RD  
KILLINGLY, CT 06239

EXISTING 119'-0"  
MONOPOLE

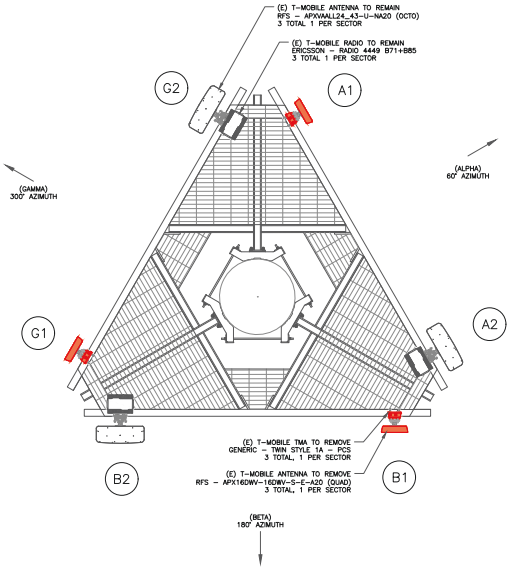
**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES/CHK
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1	05/02/2014	JS	REWORKED RFRS	JS

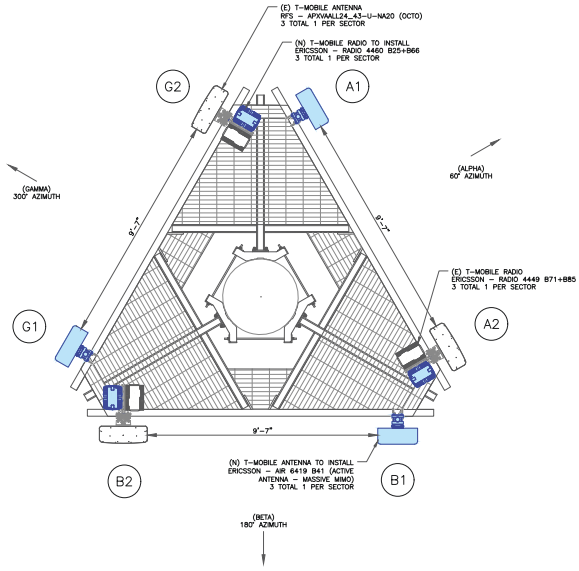


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SHEET NUMBER: **C-3** REVISION: **1**



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



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



3545 WHITEHALL PARK DRIVE, SUITE 450  
CHARLOTTE, NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:  
**CTNLI40B**

BU #: **857013**  
CROWN CASTLE SITE  
NAME:  
**KILLINGLY ROSS ROAD**

280 ROSS RD  
KILLINGLY, CT 06239

EXISTING 119'-0"  
MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DESIGN
0	12/20/2023	SMS	FINAL	JS
1	05/02/2024	JS	REMOVED RFDS	JS



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OF A LICENSED PROFESSIONAL ENGINEER,  
TO ALTER THIS DOCUMENT.

SHEET NUMBER: **C-4** REVISION: **1**

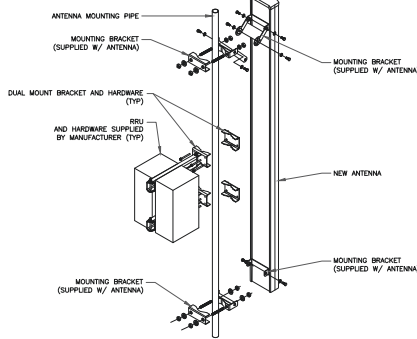
**FINAL EQUIPMENT SCHEDULE  
(VERIFY WITH CURRENT RFDS)**

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	L2500, H2500	(N) ERICSSON -- AIR6419 B41 (ACTIVE ANTENNA--MASSIVE MIMO)	60°	110'-0"	--	--	--	--	--	--	--	--	--	--	1	(N) HYBRID	1 5/8"	160'-0"	
A2	3700,L800 N800, L1150, L1900, S1900, N1900	(E) RFS -- AFDWALL24_43-U--NA20 (OCTO)	60°	110'-0"	1 1	(E) 4449 871+885 (N) 4460 825+866	TOWER	--	--	--	--	--	--	--	--	--	--	--	
BETA																			
B1	L2500, H2500	(N) ERICSSON -- AIR6419 B41 (ACTIVE ANTENNA--MASSIVE MIMO)	180°	110'-0"	--	--	--	--	--	--	--	--	--	--	1	(N) HYBRID	1 5/8"	160'-0"	
B2	3700,L800 N800, L1150, L1900, S1900, N1900	(E) RFS -- AFDWALL24_43-U--NA20 (OCTO)	60°	110'-0"	1 1	(E) 4449 871+885 (N) 4460 825+866	TOWER	--	--	--	--	--	--	--	--	--	--	--	
GAMMA																			
G1	L2500, H2500	(N) ERICSSON -- AIR6419 B41 (ACTIVE ANTENNA--MASSIVE MIMO)	300°	110'-0"	--	--	--	--	--	--	--	--	--	--	1	(N) HYBRID	1 5/8"	160'-0"	
G2	3700,L800 N800, L1150, L1900, S1900, N1900	(E) RFS -- AFDWALL24_43-U--NA20 (OCTO)	300°	110'-0"	1 1	(E) 4449 871+885 (N) 4460 825+866	TOWER	--	--	--	--	--	--	--	--	--	--	--	
														UNUSED FEEDLINES	--	--	--	--	--
														UNUSED FEEDLINES	--	--	--	--	--

**1** FINAL EQUIPMENT SCHEDULE  
SCALE: NOT TO SCALE

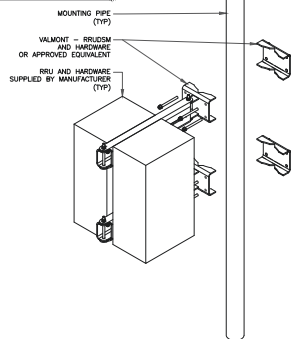
T-MOBILE NATIONAL ANCHOR

**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 GALVANNEZED UNLESS NOTED OTHERWISE.

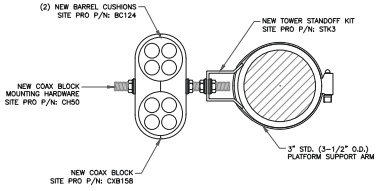


① MOUNTING DETAIL  
 SCALE: NOT TO SCALE

**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 GALVANNEZED UNLESS NOTED OTHERWISE.  
 4. ANTENNA NOT SHOWN FOR CLARITY

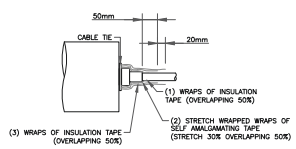


② RRU MOUNTING DETAIL  
 SCALE: NOT TO SCALE



③ RF JUMPER DETAIL  
 SCALE: NOT TO SCALE

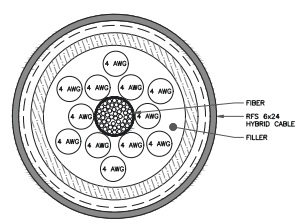
**INSTALLER NOTE:**  
 JUMPERS TO BE TORQUED TO 221.27 IN./LBS



④ RF JUMPER CONNECTION  
 SCALE: NOT TO SCALE

⑤ NOT USED  
 SCALE: NOT TO SCALE

PARAMETER	VALUE
NOMINAL DIAMETER (INCHES)	1.75
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



3545 WHITEHALL PARK DRIVE, SUITE 450  
 CHARLOTTE, NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:  
**CTNLI40B**  
 BU #: 857013  
 CROWN CASTLE SITE  
 NAME:  
**KILLINGLY ROSS ROAD**  
 280 ROSS RD  
 KILLINGLY, CT 06239  
 EXISTING 119'-0"  
 MONOPOLE

**ISSUED FOR:**

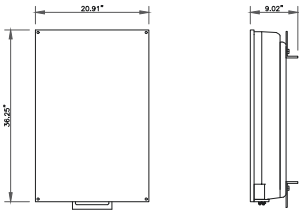
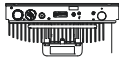
REV	DATE	DRWN	DESCRIPTION	DES./CHK
0	12/20/2023	SMS	FINAL	JS
1	05/02/2024	JS	RE-REVISED FOR	JS



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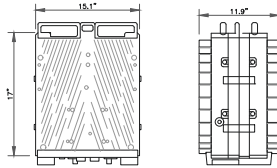
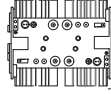
SHEET NUMBER: **C-5.1** REVISION: **1**  
 SKU#: N/A

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:	SIX109 2016/1



① ERICSSON / AIR 6419 B41  
SCALE: NOT TO SCALE

MANUFACTURER:	ERICSSON
MODEL:	4460 RADIO (MRC 161 912/3)
DIMENSIONS (HxWxD):	17.51"x15.11"x9.02"
WEIGHT:	109 LBS
BAND:	62/625 B66 DUAL BAND



② ERICSSON / 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**

**PMA & ASSOCIATES**

3545 WHITEHALL PARK DRIVE, SUITE 450  
CHARLOTTE, NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:  
**CTNLI40B**

BU #: **857013**  
CROWN CASTLE SITE  
NAME:  
**KILLINGLY ROSS ROAD**

280 ROSS RD  
KILLINGLY, CT 06239

EXISTING 119'-0"  
MONOPOLE

ISSUED FOR:				
REV	DATE	DRWN	DESCRIPTION	DESIGN
0	12/20/2013	SMB	FINAL	JS
1	07/02/2014	JS	REMOVED #1016	JS



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OF A LICENSED PROFESSIONAL ENGINEER,  
TO ALTER THIS DOCUMENT.

SHEET NUMBER: <b>C-5.2</b>	REVISION: <b>1</b>
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T-MOBILE NATIONAL ANCHOR



**T Mobile**

**CROWN CASTLE**

**PMA & ASSOCIATES**

3545 WHITEHALL PARK DRIVE, SUITE 450  
CHARLOTTE, NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:  
**CTNLI40B**

BU #: **857013**  
CROWN CASTLE SITE  
NAME:  
**KILLINGLY ROSS ROAD**

280 ROSS RD  
KILLINGLY, CT 06239

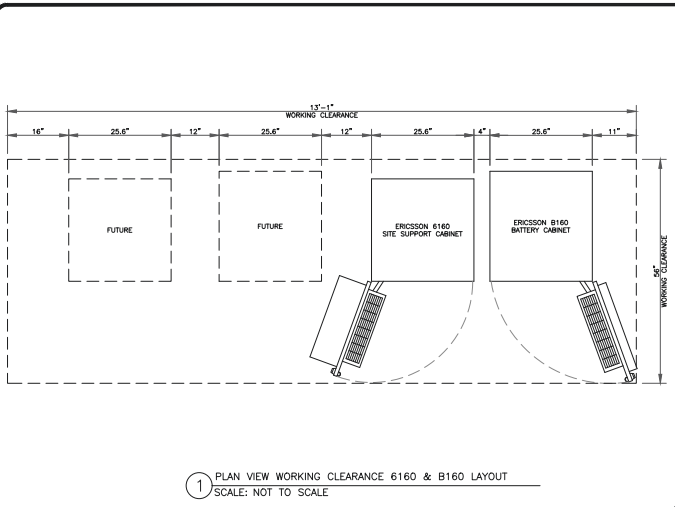
EXISTING 119'-0"  
MONOPOLE

ISSUED FOR:			
REV	DATE	DRWN	DESCRIPTION
0	12/20/2023	SMI	FINAL
1	05/02/2024	JR	REWORKED NOTES

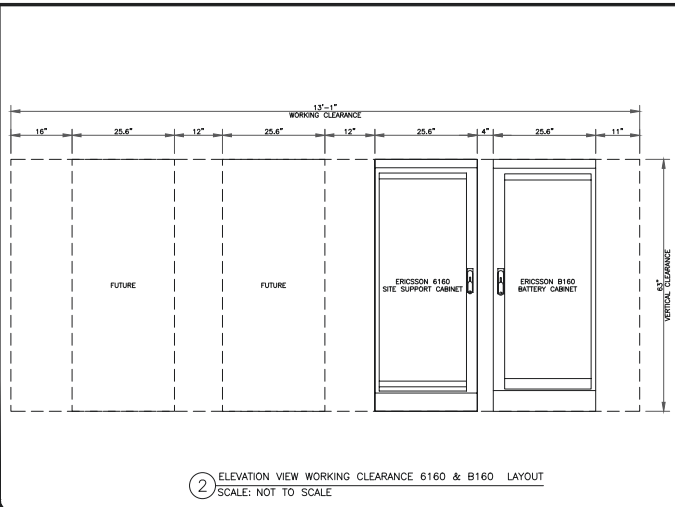


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TO ALTER THIS DOCUMENT.

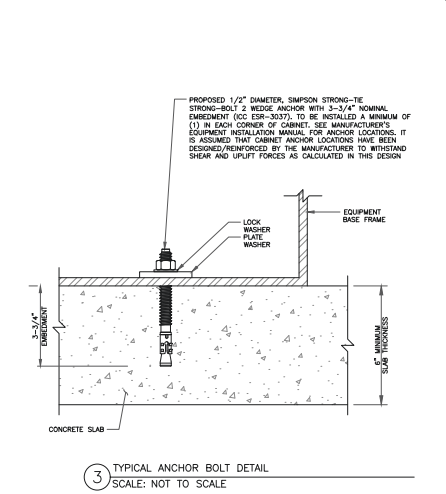
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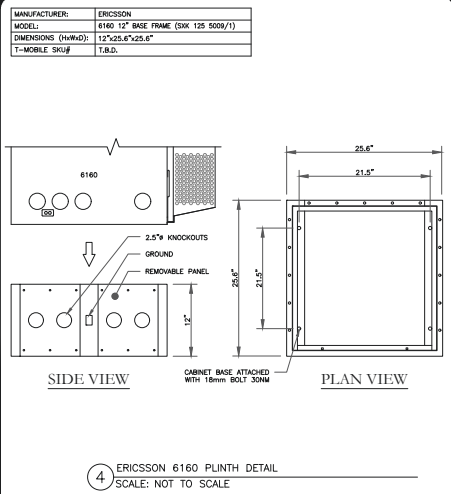
1 PLAN VIEW WORKING CLEARANCE 6160 & B160 LAYOUT  
SCALE: NOT TO SCALE



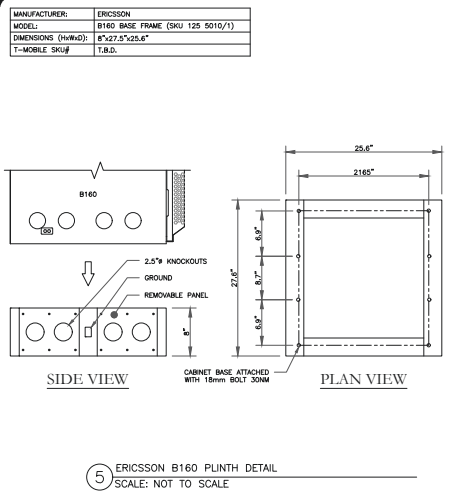
2 ELEVATION VIEW WORKING CLEARANCE 6160 & B160 LAYOUT  
SCALE: NOT TO SCALE



3 TYPICAL ANCHOR BOLT DETAIL  
SCALE: NOT TO SCALE



4 ERICSSON 6160 PLINTH DETAIL  
SCALE: NOT TO SCALE

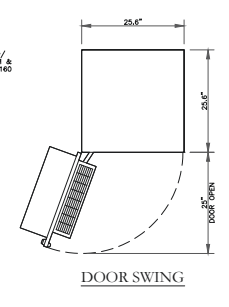
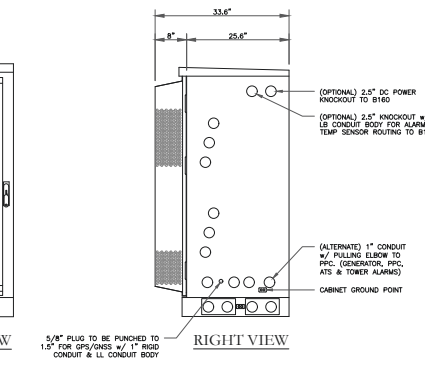
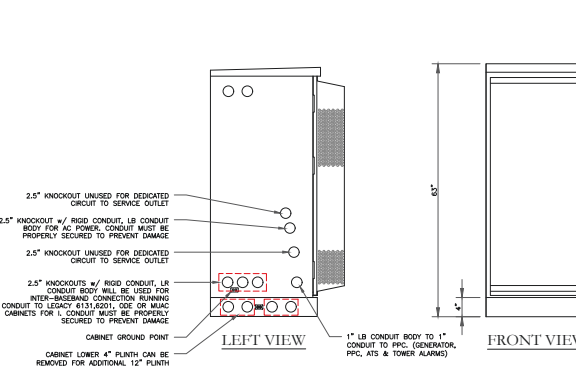
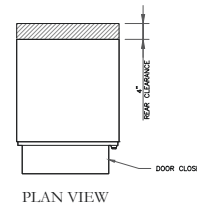
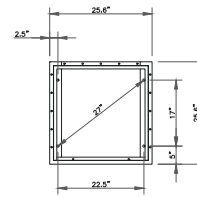
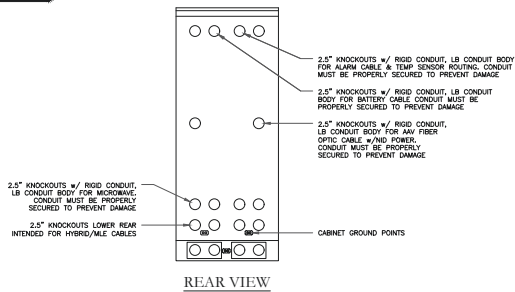


5 ERICSSON B160 PLINTH DETAIL  
SCALE: NOT TO SCALE

T-MOBILE NATIONAL ANCHOR

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 BROWN CONDUCTOR, W/ 2-HOLE, 1" C-G LONG BARREL WINDOW LUG. IN 3/4" EPC TO GROUND RING. PLINTH GROUNDING IS NOT REQUIRED.



① 6160 ERICSSON SITE SUPPORT CABINET  
SCALE: 1"=1'-0" (PUAL SIZE) 1/8"=1'-0" (11x17)

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

T-MOBILE SITE NUMBER:  
**CTNL140B**

BU #: **857013**  
CROWN CASTLE SITE  
NAME:  
**KILLINGLY ROSS ROAD**  
280 ROSS RD  
KILLINGLY, CT 06239  
EXISTING 119'-0"  
MONOPOLE

ISSUED FOR:				
REV	DATE	DRWN	DESCRIPTION	DES./CHK
0	12/20/2023	SMS	FINAL	JS
1	05/02/2024	JS	REWORKED REVIS	JS

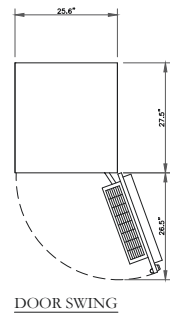
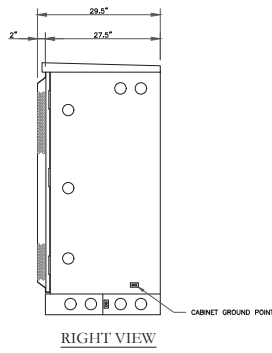
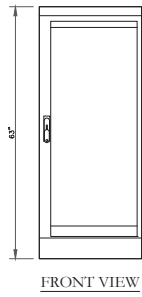
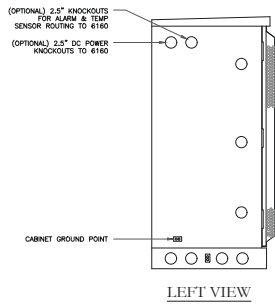
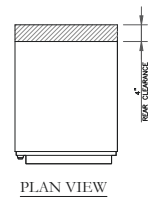
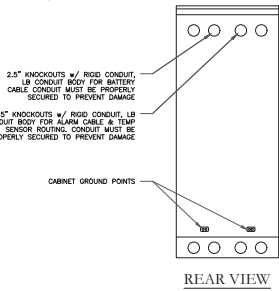
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SHEET NUMBER: **C-6.2** REVISION: **1**

T-MOBILE NATIONAL ANCHOR

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  
CABINET MUST BE PROPERLY SECURED TO PREVENT DAMAGE TO CABINETS AND/OR CABLING  
GROUNDING NOTE:  
CABINET GROUNDING TO USE A SINGLE, #2 BROWN CONDUCTOR, W/ 2-HOLE, 1" C-C LONG BARREL WINDOW LOC. IN 3/4" FROM TO GROUND RING. PLANT GROUNDING IS NOT REQUIRED.

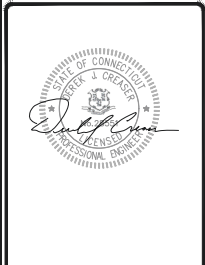


1 ERICSSON B160 BATTERY CABINET  
SCALE: 1"=1'-0" (P.L. 3/20) 1/8"=1'-0" (11/17)



T-MOBILE SITE NUMBER:  
CTNLI40B  
BU #: 857013  
CROWN CASTLE SITE  
NAME:  
KILLINGLY ROSS ROAD  
280 ROSS RD  
KILLINGLY, CT 06239  
EXISTING 119'-0"  
MONOPOLE

ISSUED FOR:			
REV	DATE	DRWN	DESCRIPTION
0	12/20/2023	SMB	FINAL
1	05/02/2024	JS	REVISION #1015

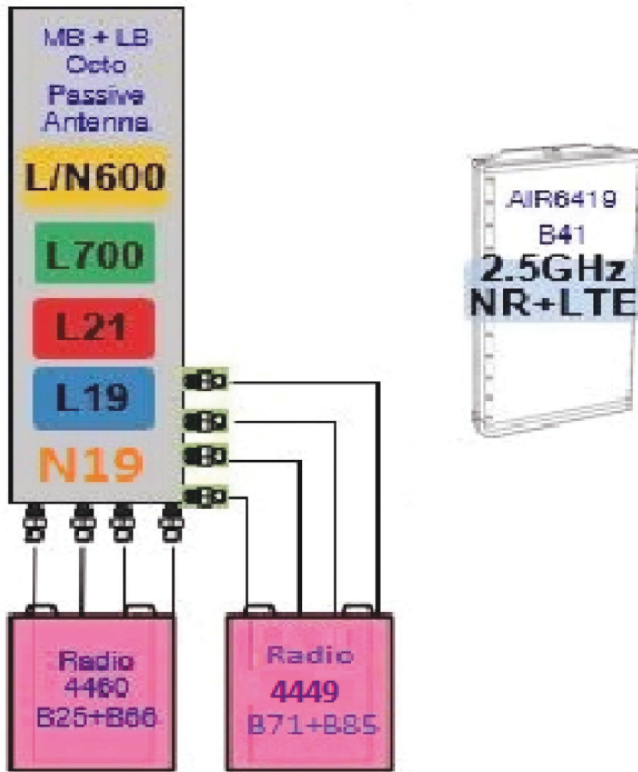


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SHEET NUMBER: C-6.3	REVISION: 1
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T-MOBILE NATIONAL ANCHOR

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



3545 WHITEHALL PARK DRIVE, SUITE 450  
 CHARLOTTE, NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:  
 CTNLI40B  
 BU #: 857013  
 CROWN CASTLE SITE  
 NAME:  
 KILLINGLY ROSS ROAD  
 280 ROSS RD  
 KILLINGLY, CT 06239  
 EXISTING 119'-0"  
 MONOPOLE

ISSUED FOR:

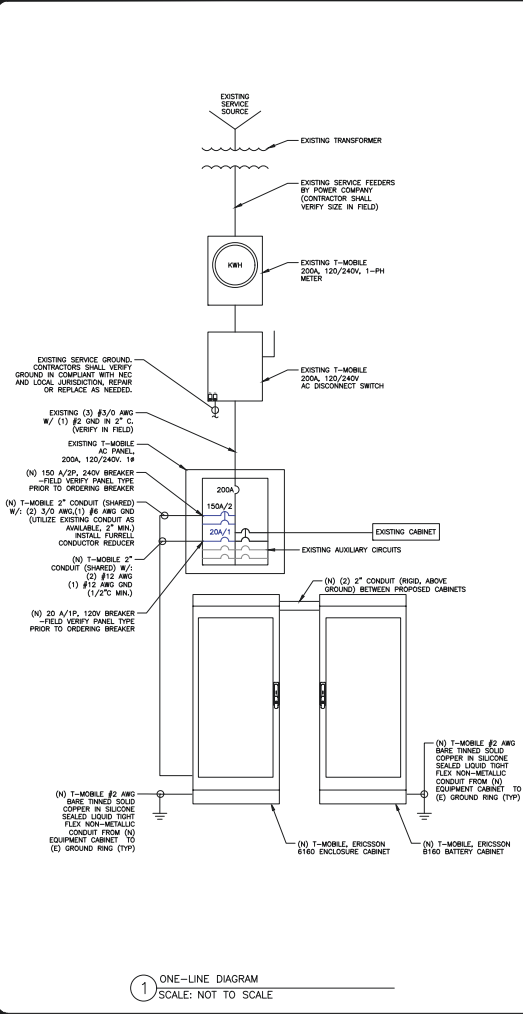
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1	05/02/2024	JS	REMOVED RFRS	JS



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SHEET NUMBER: **C-7** REVISION: **1**

T-MOBILE NATIONAL ANCHOR



**2 EXISTING PANEL SCHEDULE**  
SCALE: NOT TO SCALE

T-MOBILE SITE #:		LOCATION:		VOLTAGE: 240/120 1Ø		MOUNTING / ENCLOSURE:		EXISTING / NEMA 3R					
CTNL140B (EXISTING)		H-FRAME		MAIN C/R: 200		AVAIL FAULT CURRENT: EXISTING		EXISTING					
9/28/2023				BUS RATING: 200		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	E	ATS	0.10	1	0.60		2	0.50	LIGHT/GFCI	R	EXISTING	20/1
								4		EMPTY			
100/2	EXISTING	EQ	RBS 6201	4.80	5	4.80		6		EMPTY			
								8		EMPTY			
								10		EMPTY			
								12		EMPTY			
								14		EMPTY			
								16		EMPTY			
								18		EMPTY			
								20		EMPTY			
								22		EMPTY			
								24		EMPTY			
				PHASE TOTAL	5.4		4.9						
										TOTAL CONNECTED LOAD	10.3	KVA	43 A
										TOTAL DEMAND LOAD	10.4	KVA	43 A

LOAD TYPE DESCRIPTION CONN. LOAD DEMAND FACTOR DESIGN LOAD  
KVA AMPS KVA AMPS  
L LIGHTING 0.0 0.0 1.25 0.0 0.0  
R RECEPTACLE 0.5 2.1 NEC 0.5 2.1  
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 9.6 40.0 1.00 9.6 40.0  
E EXISTING 0.2 0.8 1.25 0.3 1.0  
\* ALL EQUIPMENT LOADS CONSIDERED CONTINUOUS LOADS

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

**3 FINAL PANEL SCHEDULE**  
SCALE: NOT TO SCALE

T-MOBILE SITE #:		LOCATION:		VOLTAGE: 240/120 1Ø		MOUNTING / ENCLOSURE:		EXISTING / NEMA 3R					
CTNL140B (PROPOSED)		H-FRAME		MAIN C/R: 200		AVAIL FAULT CURRENT: EXISTING		EXISTING					
9/28/2023				BUS RATING: 200		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	E	ATS	0.10	1	0.60		2	0.50	LIGHT/GFCI	R	EXISTING	20/1
								4	2.61	(N) E160	EQ	2#3/0, 1#2G, 2" C	150/2
								6	2.61		EQ		
								8	0.00		EQ		
								10	0.00		EQ		
								12	0.18	(N) E160 GFCI	R	2#12, 1#12G, 1/2" C	20/1
								14		EMPTY			
								16		EMPTY			
								18		EMPTY			
								20		EMPTY			
								22		EMPTY			
								24		EMPTY			
				PHASE TOTAL	8.0		7.7						
										TOTAL CONNECTED LOAD	15.7	KVA	65 A
										TOTAL DEMAND LOAD	15.8	KVA	66 A

LOAD TYPE DESCRIPTION CONN. LOAD DEMAND FACTOR DESIGN LOAD  
KVA AMPS KVA AMPS  
L LIGHTING 0.0 0.0 1.25 0.0 0.0  
R RECEPTACLE 0.7 2.8 NEC 0.7 2.8  
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 14.8 61.8 1.00 14.8 61.8  
E EXISTING 0.2 0.8 1.25 0.3 1.0  
\* ALL EQUIPMENT LOADS CONSIDERED CONTINUOUS LOADS

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

**T Mobile**

**CROWN CASTLE**

**PMA & ASSOCIATES**  
F. MARSHALL & ASSOCIATES  
3545 WHITEHALL PARK DRIVE, SUITE 450  
CHARLOTTE, NORTH CAROLINA 28271

T-MOBILE SITE NUMBER:  
**CTNL140B**

BU #: 857013  
CROWN CASTLE SITE NAME:  
**KILLINGLY ROSS ROAD**

280 ROSS RD  
KILLINGLY, CT 06239

EXISTING 119'-0" MONOPOLE

**ISSUED FOR:**

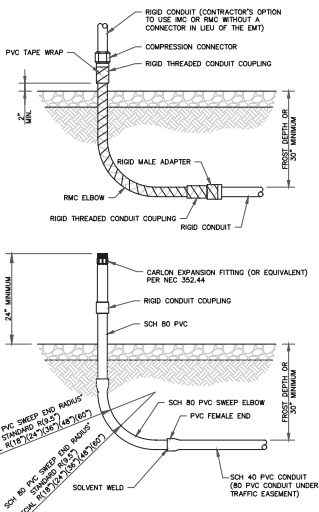
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0	12/20/2023	SMR	FINAL	1
1	09/20/2024	JS	REVISIONS	1

**Professional Engineer Seal:**  
STATE OF CONNECTICUT  
F. MARSHALL & ASSOCIATES  
F. MARSHALL & ASSOCIATES  
1000 WASHINGTON BLVD  
SUITE 450  
CHARLOTTE, NC 28271

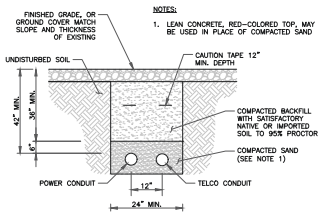
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SHEET NUMBER: **E-1** REVISION: **1**

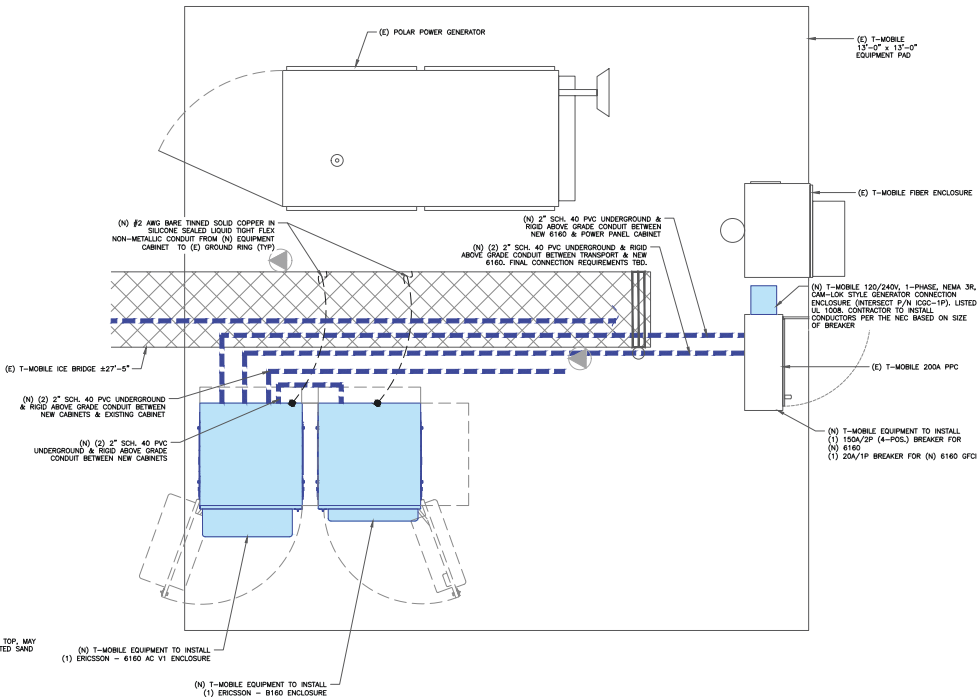
**INSTALLER NOTES:**  
 ALL METAL CONDUIT INSTALLED IN DIRECT CONTACT WITH THE EARTH SHALL BE CONSIDERED TO BE INSTALLED IN A SEVERELY CORROSIVE ENVIRONMENT AND IS REQUIRED TO HAVE SUPPLEMENTAL PROTECTION AGAINST CORROSION (NEC ARTICLE 342.10(B) & 344.10(B)(1)). THIS PROTECTION SHALL EITHER BE AN APPROVED 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



2 TRENCH DETAIL  
 SCALE: NOT TO SCALE



1 COMPOUND PLAN  
 SCALE: 1/4\"/>

**T Mobile**

**CROWN CASTLE**

**PMA & ASSOCIATES**  
 3545 WHITEHALL PARK DRIVE, SUITE 450  
 CHARLOTTE, NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:  
**CTNL140B**

BU #: 857013  
 CROWN CASTLE SITE  
 NAME:  
**KILLINGLY ROSS ROAD**  
 280 ROSS RD  
 KILLINGLY, CT 06239  
 EXISTING 119'-0" MONOPOLE

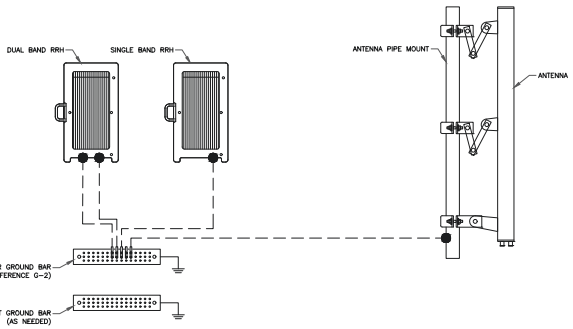
ISSUED FOR:			
REV	DATE	DRWN	DESCRIPTION
0	12/20/2013	SMR	FINAL
1	05/02/2014	JR	REVISIONS

UNIVERSITY OF CONNECTICUT  
 BREX & CREAGER  
 REGISTERED PROFESSIONAL ENGINEER  
 LICENSE NO. 10000

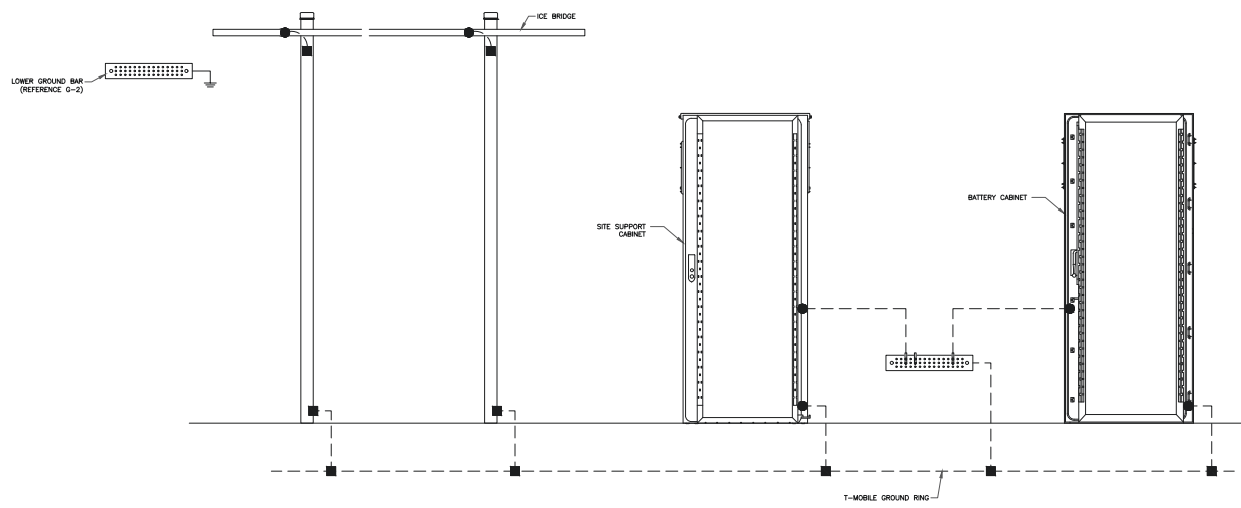
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SHEET NUMBER: **E-2** REVISION: **1**

T-MOBILE NATIONAL ANCHOR



ANTENNA LEVEL  
GROUND LEVEL



1 TYPICAL FINAL GROUNDING SCHEMATIC  
SCALE: NOT TO SCALE

**GROUNDING PLAN LEGEND**

- #2 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 SITE NUMBER:  
**CTNLI40B**

BU #: 857013  
CROWN CASTLE SITE  
NAME:  
**KILLINGLY ROSS ROAD**

280 ROSS RD  
KILLINGLY, CT 06239

EXISTING 119'-0"  
MONOPOLE

**ISSUED FOR:**

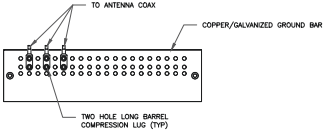
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0	12/20/2023	SMS	FINAL	JS
1	09/02/2024	JS	REMOVED REVISIONS	JS



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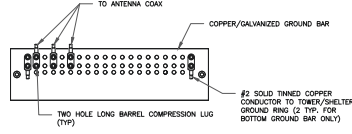
SHEET NUMBER: **G-1** REVISION: **1**

T-MOBILE NATIONAL ANCHOR



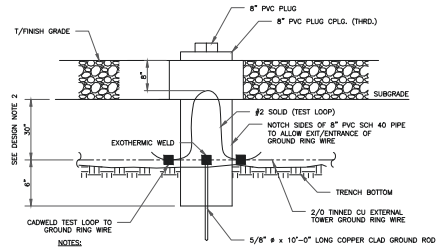
- NOTES:
1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
  2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
  3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO ANTENNA MOUNT STEEL.

1 ANTENNA SECTOR GROUND BAR DETAIL  
SCALE: NOT TO SCALE



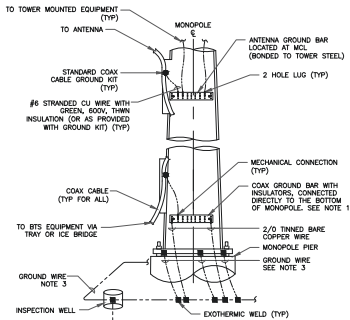
- NOTES:
1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
  2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL. (TOWER ONLY).
  3. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

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



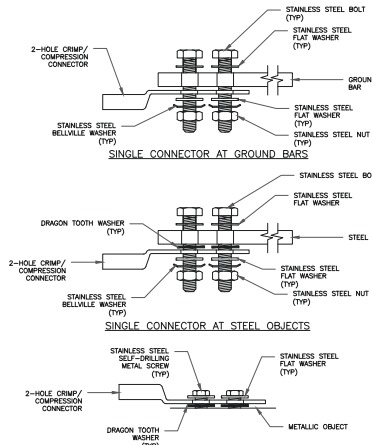
- NOTES:
1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL.
  2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D).

3 INSPECTION WELL DETAIL  
SCALE: NOT TO SCALE

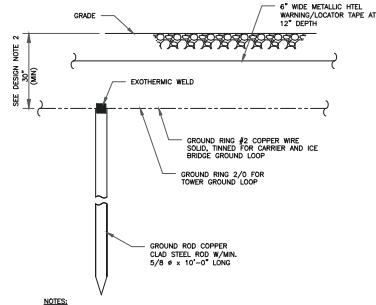


- NOTES:
1. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATIONS AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET ON THE TOWER SHALL HAVE GROUND KITS AT THE MIDDLEPOINT, PROVIDED AS REQUIRED.
  2. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN 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 NFPA 70A 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

PMA & ASSOCIATES

3545 WHITEHALL PARK DRIVE, SUITE 450  
CHARLOTTE, NORTH CAROLINA 28271

T-MOBILE SITE NUMBER:  
CTNL140B

BU #: 857013  
CROWN CASTLE SITE  
NAME:  
KILLINGLY ROSS ROAD

280 ROSS RD  
KILLINGLY, CT 06239

EXISTING 119'-0"  
MONOPOLE

ISSUED FOR:				
REV.	DATE	DRWN.	DESCRIPTION	DES./CHK.
0	12/26/2023	SMS	FINAL	JS
1	05/02/2024	JS	REWORKED DETAILS	JS

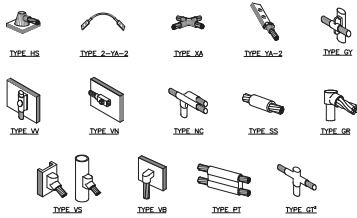


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SHEET NUMBER: **G-2** REVISION: **1**

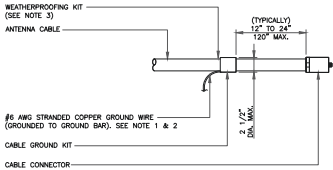
T-MOBILE NATIONAL ANCHOR





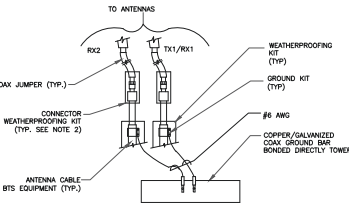
NOTE:  
 1. EXERCISE EXOTHERMIC "MOLD TYPES" SHOWN HERE ARE EXAMPLES. CONSULT WITH CONSTRUCTION MANAGER FOR SPECIFIC MOLDS TO BE USED FOR THIS PROJECT.  
 2. MOLD TYPE ONLY TO BE USED BELOW GRADE WHEN CONNECTING GROUND RING TO GROUND ROD.

1 CADWELD GROUNDING CONNECTIONS  
 SCALE: NOT TO SCALE



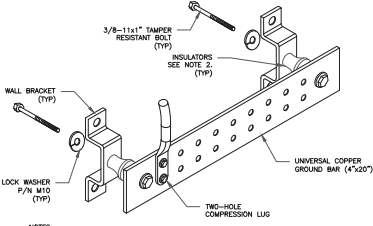
WEATHERPROOFING KIT (SEE NOTE 3)  
 ANTENNA CABLE  
 (TYPICALLY) 1/2" TO 2 1/2" MAX.  
 #6 AWG STRANDED COPPER GROUND WIRE (GROUNDED TO GROUND BAR). SEE NOTE 1 & 2  
 CABLE GROUND KIT  
 CABLE CONNECTOR  
 WEATHERPROOFING KIT (TYP. SEE NOTE 2)  
 #6 AWG  
 COPPER/GALVANIZED COAK GROUND BAR BONDED DIRECTLY TOWER

3 CABLE GROUND KIT CONNECTION  
 SCALE: NOT TO SCALE



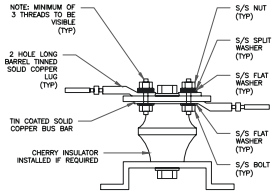
TO ANTENNA  
 RX2 TX1/RX1  
 COAX JUMPER (TYP.)  
 WEATHERPROOFING KIT (TYP.)  
 GROUND KIT (TYP.)  
 #6 AWG  
 COPPER/GALVANIZED COAK GROUND BAR BONDED DIRECTLY TOWER  
 ANTENNA CABLE TO BTS EQUIPMENT (TYP.)

4 GROUND CABLE CONNECTION  
 SCALE: NOT TO SCALE



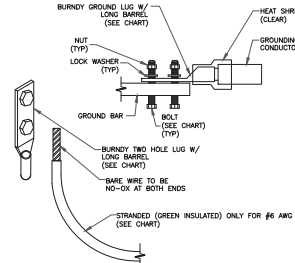
3/8"-11x1" JAMPER RESISTANT BOLT (TYP.)  
 INSULATORS (SEE NOTE 2, TYP.)  
 WALL BRACKET (TYP.)  
 LOCK WASHER P/N #10 (TYP.)  
 UNIVERSAL COPPER GROUND BAR (#4x20")  
 TWO-HOLE COMPRESSION LUG

6 GROUND BAR DETAIL  
 SCALE: NOT TO SCALE



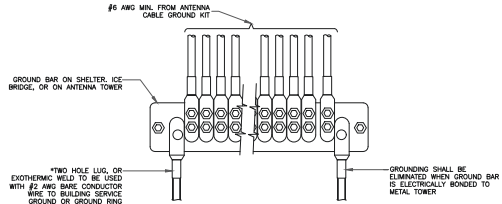
7 LUG DETAIL  
 SCALE: NOT TO SCALE

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

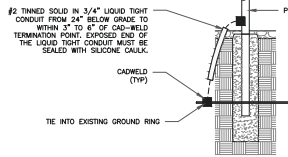


NOTE:  
 1. ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER, GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.  
 BURNDY TWO HOLE LUG W/ LONG BARREL (SEE CHART)  
 HEAT SHRINK (CLEAR)  
 GROUNDING CONDUCTOR  
 NUT (TYP.)  
 LOCK WASHER (TYP.)  
 GROUND BAR  
 BOLT (SEE CHART) (TYP.)  
 BURNDY TWO HOLE LUG W/ LONG BARREL (SEE CHART)  
 BARE WIRE TO BE NO-OK AT BOTH ENDS  
 STRANDED (GREEN INSULATED) ONLY FOR #6 AWG (SEE CHART)

2 MECHANICAL LUG CONNECTION  
 SCALE: NOT TO SCALE



5 GROUNDWIRE INSTALLATION  
 SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL  
 SCALE: NOT TO SCALE



T-MOBILE SITE NUMBER:  
 CTNLI40B  
 BU #: 857013  
 CROWN CASTLE SITE  
 NAME:  
 KILLINGLY ROSS ROAD  
 280 ROSS RD  
 KILLINGLY, CT 06239  
 EXISTING 119'-0"  
 MONOPOLE

REV	DATE	DRWN	DESCRIPTION	DES./CHK
0	12/26/2023	SMS	FINAL	JS
1	05/02/2024	JS	REWORKED REVIS	JS



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

SHEET NUMBER: **G-3** REVISION: **1**