

10 INDUSTRIAL AVE,  
SUITE 3  
MIDDLETOWN NJ 07430

PHONE: 201.684.0055  
FAX: 201.684.0066



December 8th, 2023

Members of the Siting Council  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

RE: Notice of Exempt Modification  
191 Middle Haddam Road, Portland, CT 06480  
Latitude: 41.56229196  
Longitude: -72.57380339  
T-Mobile Site#: CT11696E - Anchor

Dear Ms. Bachman:

T-Mobile currently maintains three (3) antennas at the 139-foot level of the existing 143-foot Monopine at 191 Middle Haddam Road in Portland, CT. The 143-foot monopole is owned by American Tower. The property is owned and operated by Philip & Tina Knowlton. T-Mobile now intends to add six (6) antennas at the 139-foot level of the existing tower. The antennas support 5G services. T-Mobile will be installing the associated ground equipment within their existing ground space.

**Planned Modifications:**

**Tower:**

Install New:

- (3) AIR 6419 B41 Antennas
- (3) VV-65A-R1 Antennas
- (3) Radio 4460 B25 B66

To Be Removed:

- (6) 1 5/8" Coax Cables
- (3) APX16DWV Antennas
- (6) RRUS 11

To Remain:

- (3) APXVAALL24\_43-U-NA20 Antennas
- (3) Radio 4480 B71
- (3) 1.99 Hybrid Cables

**Ground:**

Install New:

(1) 6160 Power Enclosure and (1) B160 Battery Cabinet. Install (1) RP 6651, (1) CSR IXRE V2. Remove (2) RBS 6201 ODE Cabinet.

This facility was approved by the Connecticut Siting Council in Docket 206 dated July 11, 2002. This project does not violate any of the conditions of this approval.

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 First Selectman Ryan Curley, Elected Official, and Dan Bourret, Development Planner, as well as the tower and property owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modifications 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 Communications Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

**Eric Breun**

Transcend Wireless

Cell: 201-658-7728

Email: [ebreun@transcendwireless.com](mailto:ebreun@transcendwireless.com)

Attachments

cc: Ryan Curley - First Selectman of Portland

Dan Bourret - Development Planner

American Tower - Tower Owner

Philip & Tina Knowlton - Property Owner

**Hello, your package has been delivered.**

**Delivery Date:** Wednesday, 12/06/2023

**Delivery Time:** 12:00 PM

**Signed by:** MICHELLE C

## TRANSCEND WIRELESS

<b>Tracking Number:</b>	<a href="#">1ZV257420395060492</a>
<b>Ship To:</b>	FIRST SELECTMAN RYAN CURLEY 33 EAST MAIN STREET PORTLAND, CT 06480 US
<b>Number of Packages:</b>	1
<b>UPS Service:</b>	UPS Ground
<b>Package Weight:</b>	1.0 LBS
<b>Reference Number:</b>	CT11696E

**Hello, your package has been delivered.**

**Delivery Date:** Wednesday, 12/06/2023

**Delivery Time:** 12:09 PM

**Left At:** OTHER-RELEAS

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## TRANSCEND WIRELESS

<b>Tracking Number:</b>	<a href="#">1ZV257420397100515</a>
<b>Ship To:</b>	PHILIP AND TINA KNOWLTON 191 MIDDLE HADDAM ROAD EAST HAMPTON, CT 06456 US
<b>Number of Packages:</b>	1
<b>UPS Service:</b>	UPS Ground
<b>Package Weight:</b>	1.0 LBS
<b>Reference Number:</b>	CT11696E

**Hello, your package has been delivered.**

**Delivery Date:** Wednesday, 12/06/2023

**Delivery Time:** 12:09 PM

**Left At:** DOCK

**Signed by:** ARIEL

**TRANSCEND WIRELESS**

**Tracking Number:** [1ZV257420399070483](#)

**Ship To:** AMERICAN TOWER CORPORATION  
10 PRESIDENTIAL WAY  
WOBURN, MA 01801  
US

**Number of Packages:** 1

**UPS Service:** UPS Ground

**Package Weight:** 3.0 LBS

**Reference Number:** CTNH543A CT11696E

**Reference Number:** CTNH416A

**Hello, your package has been delivered.**

**Delivery Date:** Wednesday, 12/06/2023

**Delivery Time:** 11:59 AM

**Signed by:** HOLLY M

**TRANSCEND WIRELESS**

**Tracking Number:** [1ZV257420396070505](#)

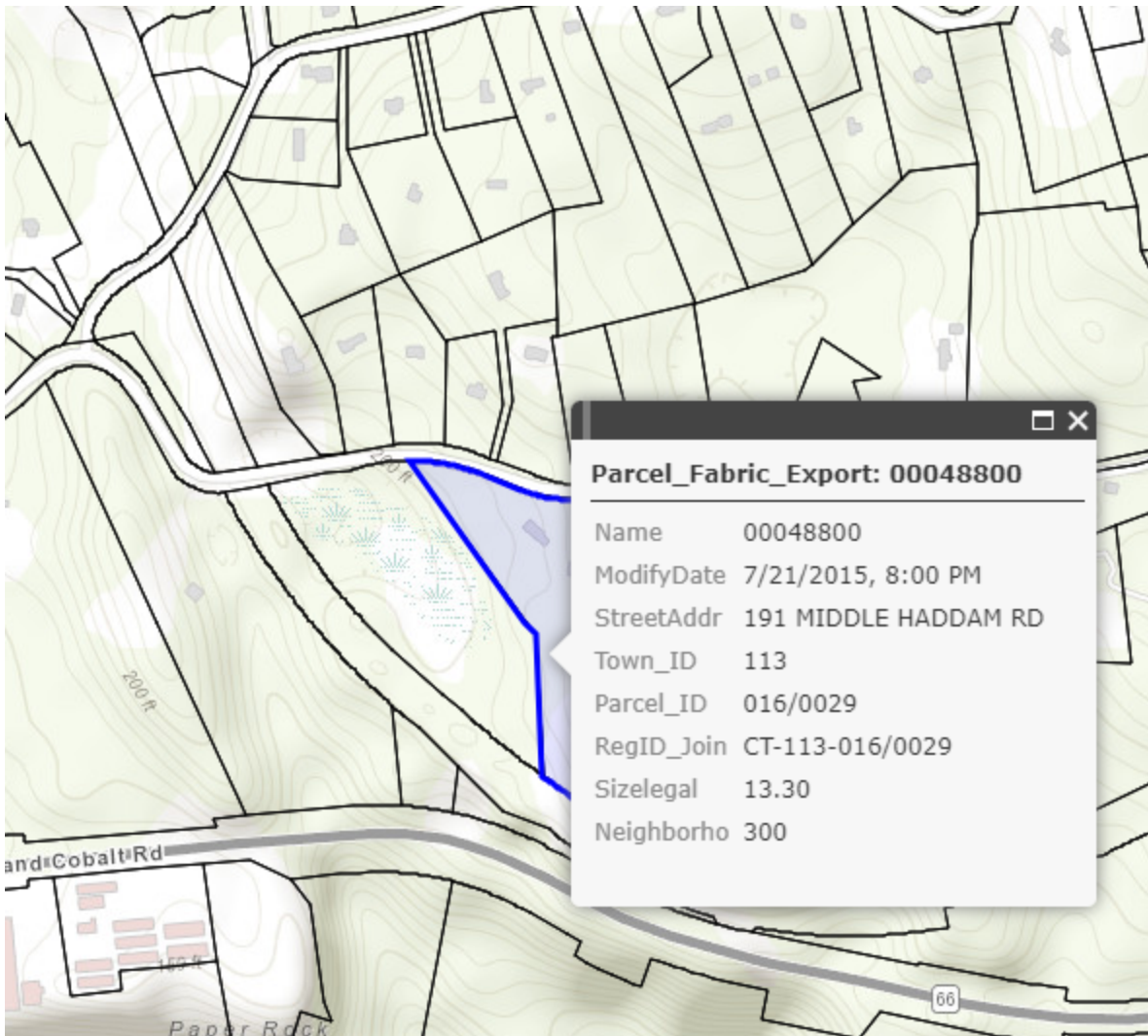
**Ship To:** DAN BOURRET  
33 EAST MAIN STREET  
PORTLAND, CT 06480  
US

**Number of Packages:** 1

**UPS Service:** UPS Ground

**Package Weight:** 1.0 LBS

**Reference Number:** CT11696E



Location Address	191 MIDDLE HADDAM RD
Map-Lot Number	016-0029
Alternate ID	00048800
Property Class_Zoning	RR
Property Class_User8	
State Class Code	100
Land Use	(101) Single Family Residence
Neighborhood	300
Zoning	RR
Town Clerk Map Survey	2532
Total Acres	13.3
Vol/Page	147/264

[Assessor Map Link](#)

## Owner

Owner  
KNOWLTON PHILIP B JR & TINA S  
191 MIDDLE HADDAM RD  
PORTLAND CT 06480 1734

## Valuation

### 2023 GRAND LIST

	Appraised Values	Assessed Values
Current Land	\$141,800	\$99,260
Current Building	\$182,500	\$127,750
Current Total	\$324,300	\$227,010

Effective Date of Value: 10/01/2022 REVALUATION

## Valuation History

Grand List	Appraised Land Value	Appraised Improvements Value	Appraised Total Value	Assessed Land Value	Assessed Improvements Value	Assessed Total Value
2023	\$141,800	\$182,500	\$324,300	\$99,260	\$127,750	\$227,010
2022	\$141,800	\$182,500	\$324,300	\$99,260	\$127,750	\$227,010
2021	\$141,800	\$182,500	\$324,300	\$99,260	\$127,750	\$227,010
2020	\$157,000	\$158,600	\$315,600	\$109,900	\$111,020	\$220,920
2019	\$157,000	\$158,600	\$315,600	\$109,900	\$111,020	\$220,920
2018	\$157,000	\$158,600	\$315,600	\$109,900	\$111,020	\$220,920
2017	\$157,000	\$158,600	\$315,600	\$109,900	\$111,020	\$220,920

## Land

Descr	Acres	Land Val
EXCESS	9.0000	\$64,800
REAR	3.3000	\$4,950
PRIMARY	1.0000	\$72,000

Total Acres:

13.3000

Total Land-Value:

\$141,750

## Residential

Card	1	Year Built	1963
Stories	1.5	Year Remodeled	0
Exterior Wall	AL/VINYL	Total Rooms	8
Style	CAPE	Bedrooms	3
Square Feet	1953	Full Baths	1
Basement	FULL	Half Baths	1
Heating Fuel Type	OIL	Additional Fixtures	0
Physical Condition	3	Fireplace	0
Attic	NONE	Prefab Fireplace	1

## Other Dwelling Features

Card 1  
Basement Finished Rec Rm Area 263  
Basement Finished Living Area 0  
Basement Garage

Misc Desc 1  
Note 1  
Note 2 AB2 COND DUE TO FURNACE

## Accessory Information

Card 1

							Columns ▾
Descr	Full Description	Year	Size	Area	MD%	Value	
▶ FLAT BARN	FLAT BARN	1963	1 x 1984	1,984	0	\$26,040	
▶ FLAT BARN	FLAT BARN	1963	1 x 336	336	0	\$4,410	
▶ POULTRY	1S FRAME OR METAL POULTRY HSE	1963	1 x 108	108	0	\$90	
▶ FRAME SHED	FRAME UTILITY SHED	1963	1 x 200	200	0	\$130	
▶ FRAME SHED	FRAME UTILITY SHED	1963	1 x 432	432	0	\$270	

## Permits

Date	Number	Purpose	Description
10/22/2007	9054	BLDG	32X20 HOOP&FURN
08/18/2004	7941	BLDG	RELOC10X12 CHIC
06/26/2003	7452	BLDG	REROOF

<b>DOCKET NO. 206</b> - Crown Atlantic Company LLC and Cellco Partnership d/b/a Verizon Wireless application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a cellular telecommunications facility at 191 Middle Haddam Road, Portland, Connecticut.	}	Connecticut
	}	Siting
	}	Council
		July 11, 2002

## 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 at the proposed prime site in Portland, Connecticut, 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 Crown Atlantic Company LLC and Cellco Partnership d/b/a Verizon Wireless for the construction, maintenance and operation of a cellular telecommunications facility at the proposed prime site located at 191 Middle Haddam Road, Portland, Connecticut. We deny certification of the proposed alternate site located at 191 Middle Haddam Road, Portland, 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 Cellco and other entities, both public and private, but such tower shall not exceed a height of 130 feet above ground level unless the need for other wireless telecommunications providers require a height greater than 130 feet, which if approved by the Council through a petition pursuant to Sections 16-50j-38 through 16-50j-40 of the Regulations of Connecticut State Agencies, shall authorize the extension of the tower to a maximum height of 180 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 submitted to and approved by the Council prior to the commencement of facility construction and shall include: a final site plan(s) for site development to include the location for the tower 180 feet west of the east property boundary and 180 feet north of the south property boundary that incorporates the tower radius within the lessor's property, tower foundation, antennas, equipment building, security fence, access road, utility line, and landscaping plan. The Certificate holder shall provide plans for either an architecturally treated equipment building or security fence. The D&M Plan shall also include construction plans to be submitted prior to construction for site clearing, water drainage, and erosion and sedimentation control consistent with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

3. The Certificate Holder shall provide a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.
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. Following completion of construction, if the facility does not initially provide, or permanently ceases to provide wireless telecommunications services following completion of construction, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment within sixty days or reapply for any continued or new use to the Council before any such use is made.
7. Any antenna that becomes obsolete and ceases to function shall be removed within sixty days after such antennas become obsolete and ceases to function.
8. Unless otherwise approved by the Council, this Decision and Order shall be void if construction and operation authorized herein is not completed within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved.

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

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 party to this proceeding is:

Crown Atlantic Company LLC

And Cellco Partnership d/b/a

Verizon Wireless

Robert Stanford, Project Manager

Crown Atlantic Company LLC

703 Hebron Avenue

Glastonbury, CT 06033

Kenneth C. Baldwin, Esq.

Robinson & Cole LLP

280 Trumbull Street

Hartford, CT 06103-3597

9. If the facility does not initially provide, or permanently ceases to provide cellular services following completion of construction, 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.
  
10. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antenna becomes obsolete and ceases to function, unless such antenna is necessary to maintain the architectural appearance of the tower and is so ordered to remain on the tower by the Council.
  
11. Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three years of the effective date of this Decision and Order or within three years after all appeals to this Decision and Order have been resolved.

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

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

The parties and intervenors to this proceeding are:

**Applicant**

Litchfield Acquisition Corporation d/b/a  
AT&T Wireless Services Its Representatives

**Its Representative**

Douglas A. Cohen, Esq.  
Brown, Rudnick, Freed & Gesmer, P.C.  
185 Asylum Street, CityPlace I  
Hartford, CT 06103-3402  
(860) 509-6511  
Mitchell Holmgren  
Site Development Coordinator  
AT&T Wireless Services  
15 East Midland Avenue  
Paramus, NJ 07652  
(203) 967-3130

**Party**

Town of Sharon

**Its Representative**

Robert Moeller  
First Selectman  
P.O. Box 385, 63 Main Street  
Sharon, CT 06069  
(860) 364-5789

**Intervenor**

Springwich Cellular Limited Partnership

**Its Representative**

Peter J. Tyrrell  
Senior Counsel  
Springwich Cellular Limited Partnership  
500 Enterprise Drive  
Rocky Hill, CT 06067-3900  
(860) 513-7673

**Intervenor**

Nextel Communications of the Mid-Atlantic,  
Inc. d/b/a Nextel Communication

**Its Representative**

Christopher B. Fisher  
Cuddy, Feder & Worby  
90 Maple Avenue  
White Plains, NY 10601-5196  
(914) 761-1300

**Intervenors**

Mary I. Whitehead  
P.O. Box 1235  
Sharon, CT 06069  
Hartford, CT 06103  
Laurance and Carol Rand  
30 Morey Road **SERVICE WAIVED**  
Sharon, CT 06069

Fred and Judith Schwerin  
44 Morey Road **SERVICE WAIVED**  
Sharon, CT 06069

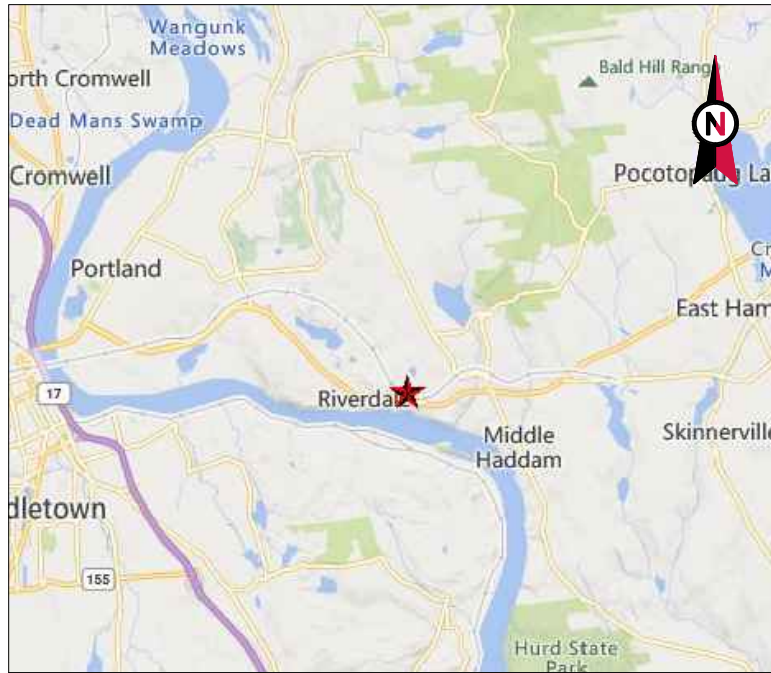
Toni Tucker  
6 Herb Road **SERVICE WAIVED**  
Sharon, CT 06069

José and Grace Noyes  
12 Herb Road **SERVICE WAIVED**  
Sharon, CT 06069

Melvin Elliott  
59 Northrop Road **SERVICE WAIVED**  
Sharon, CT 06069

**Its Representative**

Raymond J. Devlin, Jr.  
Law Offices of Raymond J. Devlin, Jr.  
100 Pearl Street, 14th Floor  
(860) 249-0691



VICINITY MAP




**AMERICAN TOWER®**

ATC SITE NAME: MIDDLE HADDAM ROAD-CROWN CT  
 ATC SITE NUMBER: 411257  
 T-MOBILE SITE NAME: CT696/VERIZON PORTLAND\_ET  
 T-MOBILE SITE NUMBER: CT11696E  
 SITE ADDRESS: 191 MIDDLE HADDAM RD  
 PORTLAND, CT 06480  
 SITE CLASS: MONOPOLE



LOCATION MAP

**T-MOBILE ANCHOR AMENDMENT PLAN  
 67E5D998E 6160 CONFIGURATION**



**AMERICAN TOWER®**  
**A.T. ENGINEERING SERVICES LLC**  
 3500 REGENCY PARKWAY  
 SUITE 100  
 CARY, NC 27518  
 PHONE: (919) 468-0112  
 PEC.0001553

THE USE AND PUBLICATION OF THESE DRAWINGS SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH THEY ARE PREPARED. ANY USE OR DISCLOSURE OTHER THAN THAT WHICH RELATES TO AMERICAN TOWER OR THE SPECIFIED CARRIER IS STRICTLY PROHIBITED. NEITHER THE ARCHITECT NOR THE ENGINEER WILL BE PROVIDING ON-SITE CONSTRUCTION REVIEW OF THIS PROJECT. CONTRACTOR(S) MUST VERIFY ALL DIMENSIONS AND ADVISE AMERICAN TOWER OR THE SPECIFIED CARRIER OF ANY DISCREPANCIES. ANY PRIOR ISSUANCE OF THIS DRAWING IS SUPERSEDED BY THE LATEST VERSION.

REV.	DESCRIPTION	BY	DATE
△0	FOR CONSTRUCTION	VAR	11/29/2023
△1			
△2			
△3			
△4			

ATC SITE NUMBER:  
**411257**  
 ATC SITE NAME:  
 MIDDLE HADDAM ROAD-CROWN  
 CT  
 T-MOBILE SITE NAME:  
 CT696/VERIZON PORTLAND\_ET  
 SITE ADDRESS:  
 191 MIDDLE HADDAM RD  
 PORTLAND, CT 06480

SEAL:



Digitally signed  
 Scott Wirgau  
 by Scott Wirgau  
 Date:  
 2023.11.30  
 14:08:11 -05'00'

**T-Mobile**

ATC PROJ. #: 14529796\_G0  
 CUST. ID: CT696/VERIZON PORTLAND\_ET  
 CUST. #: CT11696E

**TITLE SHEET**

SHEET NUMBER:  
**G-001**

REVISION:  
**0**

COMPLIANCE CODE	PROJECT SUMMARY	PROJECT DESCRIPTION	SHEET INDEX				
ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNMENT AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.  1. 2020 NFPA 70, NATIONAL ELECTRIC CODE (NEC) 2. 2022 CONNECTICUT STATE BUILDING CODE 3. 2021 INTERNATIONAL BUILDING CODE (IBC)  <u>DESIGN CRITERIA FROM TOWER STRUCTURAL ANALYSIS:</u> BASIC WIND SPEED: 130 mph BASIC WIND SPEED W/ ICE: 50 mph W/ 1" ICE CODE(S): ANSITIA-222-H / 2021 IBC / 2022 CONNECTICUT STATE BUILDING CODE  EXPOSURE CATEGORY: B RISK CATEGORY: II TOPO FACTOR PROCEDURE: METHOD 1 TOPOGRAPHIC CATEGORY: 1 FEATURE: N/A SPECTRAL RESPONSE: S <sub>s</sub> =0.21, S <sub>r</sub> =0.06 SITE CLASS: D - STIFF SOIL - DEFAULT  INFORMATION TAKEN FROM STRUCTURAL ANALYSIS COMPLETED BY ATC, DATED 10/20/23.	<u>SITE ADDRESS:</u> 191 MIDDLE HADDAM RD PORTLAND, CT 06480 COUNTY: MIDDLESEX  <u>GEOGRAPHIC COORDINATES:</u> LATITUDE: 41.56229196 LONGITUDE: -72.57380339 GROUND ELEVATION: 250' AMSL	THE PROPOSED PROJECT INCLUDES MODIFYING GROUND BASED AND TOWER MOUNTED EQUIPMENT AS INDICATED PER BELOW:  <u>TOWER WORK:</u> REMOVE (3) TMA(s), AND (6) 1-5/8" COAX CABLE(s) INSTALL MOUNT MODIFICATIONS, (6) ANTENNA(s), AND (3) RRU(s) EXISTING (3) ANTENNA(s), (3) RRU(s), AND (3) 1.99" HYBRID TRUNK 6/24 4AWG CABLE(s) TO REMAIN  <u>GROUND WORK:</u> REMOVE (1) PSU 4813 VR4A, AND (2) RBS 6201 ODE CABINET(s) INSTALL (1) RP 6651, (1) CSR IXRE V2, (1) ENCLOSURE 6160 AC V1 CABINET, AND (1) B160 BATTERY CABINET EXISTING (1) BB 6630, (1) DUG20, (1) RP 6651 TO BE RELOCATED	SHEET NO:	DESCRIPTION:	REV:	DATE:	BY:
	<u>PROJECT TEAM</u>  <u>TOWER OWNER:</u> AMERICAN TOWER 10 PRESIDENTIAL WAY WOBURN, MA 01801  <u>ENGINEER:</u> ATC TOWER SERVICES, LLC 3500 REGENCY PKWY STE 100 CARY, NC 27518  <u>PROPERTY OWNER:</u> PHILIP B KNOWLTON 191 MIDDLE HADDAM RD PORTLAND, CT 06480  <u>APPLICANT:</u> T-MOBILE	<u>PROJECT NOTES</u> 1. THE FACILITY IS UNMANNED. 2. A TECHNICIAN WILL VISIT THE SITE APPROXIMATELY ONCE A MONTH FOR ROUTINE INSPECTION AND MAINTENANCE. 3. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT LAND DISTURBANCE OR EFFECT OF STORM WATER DRAINAGE. 4. NO SANITARY SEWER, POTABLE WATER OR TRASH DISPOSAL IS REQUIRED. 5. HANDICAP ACCESS IS NOT REQUIRED. 6. THE PROJECT DEPICTED IN THESE PLANS QUALIFIES AS AN ELIGIBLE FACILITIES REQUEST ENTITLED TO EXPEDITED REVIEW UNDER 47 U.S.C. § 1455(A) AS A MODIFICATION OF AN EXISTING WIRELESS TOWER THAT INVOLVES THE COLLOCATION, REMOVAL, AND/OR REPLACEMENT OF TRANSMISSION EQUIPMENT THAT IS NOT A SUBSTANTIAL CHANGE UNDER CFR § 1.61000 (B)(7).	G-001	TITLE SHEET	0	11/29/2023	VAR
<u>UTILITY COMPANIES</u>  POWER COMPANY: EVERSOURCE PHONE: (800) 286-2000  TELEPHONE COMPANY: UNKNOWN PHONE: N/A		<u>PROJECT LOCATION DIRECTIONS</u>  START OUT GOING EAST ON EAST RIVER DR. TOWARD PITKIN ST. MERGE ONTO CT-15 S/WILBUR CROSS HIGHWAY/US-5 S 1.0 MILES. MERGE ONTO I-91 VIA EXIT NUMBER 86 TOWARD NEW HAVEN/NY CITY...MERGE ONTO CT-9 VIA EXIT NUMBER 22S-ON THE LEFT-TOWARD MIDDLETOWN/OLD SAYBROOK...TURN RIGHT ONTO CT-17/ST JOHN'S SQ. CONTINUE TO FOLLOW CT-17...TURN SLIGHT RIGHT ONTO CT -66 E/CT-17 N. MARLBOROUGH ST. CONTINUE TO FOLLOW CT-66E...TURN SLIGHT LEFT ONTO MIDDLE HADDAM RD....END AT 191 MIDDLE HADDAM RD. PORTLAND CT.	G-002	GENERAL NOTES	0	11/29/2023	VAR
			C-101	DETAILED SITE PLAN	0	11/29/2023	VAR
			C-102	DETAILED EQUIPMENT PLAN	0	11/29/2023	VAR
			C-201	TOWER ELEVATION	0	11/29/2023	VAR
			C-401	ANTENNA INFORMATION & SCHEDULE	0	11/29/2023	VAR
			C-501	CONSTRUCTION DETAILS	0	11/29/2023	VAR
			E-501	GROUNDING DETAILS	0	11/29/2023	VAR
			R-601	SUPPLEMENTAL			
			R-602	SUPPLEMENTAL			
			R-603	SUPPLEMENTAL			
			R-604	SUPPLEMENTAL			
			R-605	SUPPLEMENTAL			
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			R-608	SUPPLEMENTAL			
			R-609	SUPPLEMENTAL			
			R-610	SUPPLEMENTAL			

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**GENERAL CONSTRUCTION NOTES:**

1. OWNER FURNISHED MATERIALS, T-MOBILE "THE COMPANY" WILL PROVIDE AND THE CONTRACTOR WILL INSTALL
  - A. BTS EQUIPMENT FRAME (PLATFORM) AND ICEBRIDGE SHELTER (GROUND BUILD/CO-LOCATE ONLY)
  - B. AC/TELCO INTERFACE BOX (PPC)
  - C. ICE BRIDGE (CABLE TRAY WITH COVER) (GROUND BUILD/CO-LOCATE ONLY, GC TO FURNISH AND INSTALL FOR ROOFTOP INSTALLATION)
  - D. TOWERS, MONOPOLES
  - E. TOWER LIGHTING
  - F. GENERATORS & LIQUID PROPANE TANK
  - G. ANTENNA STANDARD BRACKETS, FRAMES AND PIPES FOR MOUNTING
  - H. ANTENNAS (INSTALLED BY OTHERS)
  - I. TRANSMISSION LINE
  - J. TRANSMISSION LINE JUMPERS
  - K. TRANSMISSION LINE CONNECTORS WITH WEATHERPROOFING KITS
  - L. TRANSMISSION LINE GROUND KITS
  - M. HANGERS
  - N. HOISTING GRIPS
  - O. BTS EQUIPMENT
2. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL OTHER MATERIALS FOR THE COMPLETE INSTALLATION OF THE SITE INCLUDING, BUT NOT LIMITED TO, SUCH MATERIALS AS FENCING, STRUCTURAL STEEL SUPPORTING SUB-FRAME FOR PLATFORM, ROOFING LABOR AND MATERIALS, GROUNDING RINGS, GROUNDING WIRES, COPPER-CLAD OR XIT CHEMICAL GROUND ROD(S), BUSS BARS, TRANSFORMERS AND DISCONNECT SWITCHES WHERE APPLICABLE, TEMPORARY ELECTRICAL POWER, CONDUIT, LANDSCAPING COMPOUND STONE, CRANES, CORE DRILLING, SLEEPERS AND RUBBER MATTING, REBAR, CONCRETE CAISSONS, PADS AND/OR AUGER MOUNTS, MISCELLANEOUS FASTENERS, CABLE TRAYS, NON-STANDARD ANTENNA FRAMES AND ALL OTHER MATERIAL AND LABOR REQUIRED TO COMPLETE THE JOB ACCORDING TO THE DRAWINGS AND SPECIFICATIONS. IT IS THE POSITION OF T-MOBILE TO APPLY FOR PERMITTING AND CONTRACTOR RESPONSIBLE FOR PICKUP AND PAYMENT OF REQUIRED PERMITS.
3. ALL WORK SHALL CONFORM TO ALL CURRENT APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING ANSI/EIA/TIA-222, AND COMPLY WITH ATC CONSTRUCTION SPECIFICATIONS.
4. CONTRACTOR SHALL CONTACT LOCAL 811 FOR IDENTIFICATION OF UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS.
6. ALL DIMENSIONS TO, OF, AND ON EXISTING BUILDINGS, DRAINAGE STRUCTURES, AND SITE IMPROVEMENTS SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.
7. DO NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.
8. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
9. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
10. CONTRACTOR SHALL BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
11. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES, GROUNDS DRAINS, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.
12. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE T-MOBILE REP PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE T-MOBILE REP PRIOR TO PROCEEDING.
13. EACH CONTRACTOR SHALL COOPERATE WITH THE T-MOBILE REP, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
14. CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OF THIS PROJECT TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE T-MOBILE CONSTRUCTION MANAGER.
15. ALL CABLE/CONDUIT ENTRY/EXIT PORTS SHALL BE WEATHERPROOFED DURING INSTALLATION USING A SILICONE SEALANT.
16. WHERE EXISTING CONDITIONS DO NOT MATCH THOSE SHOWN IN THIS PLAN SET, CONTRACTOR SHALL NOTIFY THE T-MOBILE REP AND ENGINEER OF RECORD IMMEDIATELY.
17. CONTRACTOR SHALL ENSURE ALL SUBCONTRACTORS ARE PROVIDED WITH A COMPLETE AND CURRENT SET OF DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
18. CONTRACTOR SHALL REMOVE ALL RUBBISH AND DEBRIS FROM THE SITE AT THE END OF EACH DAY.
19. CONTRACTOR SHALL COORDINATE WORK SCHEDULE WITH AMERICAN TOWER CORPORATION (ATC) AND TAKE PRECAUTIONS TO MINIMIZE IMPACT AND DISRUPTION OF OTHER OCCUPANTS OF THE FACILITY.
20. CONTRACTOR SHALL FURNISH T-MOBILE AND AMERICAN TOWER CORPORATION (ATC) WITH A PDF MARKED UP AS-BUILT SET OF DRAWINGS UPON COMPLETION OF WORK.
21. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH T-MOBILE REP TO DETERMINE WHAT, IF ANY, ITEMS WILL BE PROVIDED. ALL ITEMS NOT PROVIDED SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. CONTRACTOR WILL INSTALL ALL ITEMS PROVIDED.

22. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH T-MOBILE REP TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY CONTRACTOR. ALL REQUIRED PERMITS NOT OBTAINED BY T-MOBILE MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.
23. CONTRACTOR SHALL INSTALL ALL SITE SIGNAGE IN ACCORDANCE WITH T-MOBILE SPECIFICATIONS AND REQUIREMENTS.
24. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO T-MOBILE FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
25. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO T-MOBILE SPECIFICATIONS, AND AS SHOWN IN THESE PLANS.
26. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
27. CONTRACTOR SHALL NOTIFY T-MOBILE REP A MINIMUM OF 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACKFILLING ANY UNDERGROUND UTILITIES, FOUNDATIONS OR SEALING ANY WALL, FLOOR OR ROOF PENETRATIONS FOR ENGINEERING REVIEW AND APPROVAL.
28. WHEN THE PROJECT SCOPE REQUIRES THE USE OF THE SAFETY CLIMB, THE GENERAL CONTRACTOR SHALL ENSURE THE SAFETY CLIMB IS FREE OF OBSTRUCTIONS, NOT RUBBING ON OR TRAPPED BY ANY INSTALLED CUSTOMER EQUIPMENT, IS VISUALLY TAUT, MEETS MANUFACTURER INSTALLATION SPECIFICATIONS, AND IS FIRMLY SECURED AT ALL CABLE GUIDE LOCATIONS UPON PROJECT COMPLETION.
29. COMPLETION OF PROJECT SHALL NOT OBSTRUCT, TRAP, LOOSEN, OR OTHERWISE CAUSE FAILURE TO MEET MANUFACTURER INSTALLATION REQUIREMENTS FOR THE SAFETY CLIMB.
30. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SAFETY INCLUDING COMPLIANCE WITH ALL APPLICABLE OSHA STANDARDS AND RECOMMENDATIONS AND SHALL PROVIDE ALL NECESSARY SAFETY DEVICES INCLUDING PPE AND PPM AND CONSTRUCTION DEVICES SUCH AS WELDING AND FIRE PREVENTION, TEMPORARY SHORING, SCAFFOLDING, TRENCH BOXES/SLOPING, BARRIERS, ETC.
31. THE CONTRACTOR SHALL PROTECT AT HIS OWN EXPENSE, ALL EXISTING FACILITIES AND SUCH OF HIS NEW WORK LIABLE TO INJURY DURING THE CONSTRUCTION PERIOD. ANY DAMAGE CAUSED BY NEGLIGENCE ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, OR BY THE ELEMENTS DUE TO NEGLIGENCE ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, EITHER TO THE EXISTING WORK, OR TO HIS WORK OR THE WORK OF ANY OTHER CONTRACTOR, SHALL BE REPAIRED AT HIS EXPENSE TO THE OWNER'S SATISFACTION.
32. ALL WORK SHALL BE INSTALLED IN A FIRST CLASS, NEAT AND WORKMANLIKE MANNER BY MECHANICS SKILLED IN THE TRADE INVOLVED. THE QUALITY OF WORKMANSHIP SHALL BE SUBJECT TO THE APPROVAL OF THE T-MOBILE REP. ANY WORK FOUND BY THE T-MOBILE REP TO BE OF INFERIOR QUALITY AND/OR WORKMANSHIP SHALL BE REPLACED AND/OR REWORKED AT CONTRACTOR EXPENSE UNTIL APPROVAL IS OBTAINED.
33. IN ORDER TO ESTABLISH STANDARDS OF QUALITY AND PERFORMANCE, ALL TYPES OF MATERIALS LISTED HEREINAFTER BY MANUFACTURER'S NAMES AND/OR MANUFACTURER'S CATALOG NUMBER SHALL BE PROVIDED BY THESE MANUFACTURERS AS SPECIFIED.
34. T-MOBILE FURNISHED EQUIPMENT SHALL BE PICKED-UP AT THE T-MOBILE WAREHOUSE, NO LATER THAN 48HR AFTER BEING NOTIFIED INSURED, STORED, UNCRATE, PROTECTED AND INSTALLED BY THE CONTRACTOR WITH ALL APPURTENANCES REQUIRED TO PLACE THE EQUIPMENT IN OPERATION, READY FOR USE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE EQUIPMENT AFTER PICKING IT UP.
35. T-MOBILE OR HIS ARCHITECT/ENGINEER RESERVES THE RIGHT TO REJECT ANY EQUIPMENT OR MATERIALS WHICH, IN HIS OWN OPINION ARE NOT IN COMPLIANCE WITH THE CONTRACT DOCUMENTS, EITHER BEFORE OR AFTER INSTALLATION AND THE EQUIPMENT SHALL BE REPLACED WITH EQUIPMENT CONFORMING TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS BY THE CONTRACTOR AT NO COST TO T-MOBILE OR THEIR ARCHITECT/ENGINEER.

**SPECIAL CONSTRUCTION**

**ANTENNA INSTALLATION NOTES:**

1. WORK INCLUDED:
  - A. ANTENNA AND COAXIAL/HYBRID CABLES ARE FURNISHED BY T-MOBILE UNDER A SEPARATE CONTRACT. THE CONTRACTOR SHALL ASSIST ANTENNA INSTALLATION CONTRACTOR IN TERMS OF COORDINATION AND SITE ACCESS. ERECTION SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF PERSONNEL.
  - B. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND T-MOBILE SPECIFICATIONS.
  - C. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS.
  - D. INSTALL FURNISHED GALVANIZED STEEL OR ALUMINUM WAVEGUIDE.
  - E. INSTALL COAXIAL/HYBRID CABLES AND TERMINATING BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTIONS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS. TERMINATE ALL COAXIAL/HYBRID CABLE THREE (3) FEET IN EXCESS OF ENTRY PORT LOCATION UNLESS OTHERWISE STATED.
2. ANTENNA AND COAXIAL/HYBRID CABLE GROUNDING:
  - A. ALL EXTERIOR #6 GREEN GROUND WIRE "DAISY CHAIN" CONNECTIONS ARE TO BE WEATHER SEALED WITH RFS CONNECTORS/SPLICE WEATHERPROOFING KIT #221213 OR EQUAL.

B. ALL COAXIAL/HYBRID CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF COAXIAL/HYBRID CABLE (NOT WITHIN BENDS)

**ALL DISCREPANCIES FROM WHAT IS SHOWN ON THESE CONSTRUCTION DRAWINGS SHALL BE COMMUNICATED TO ATC ENGINEERING IMMEDIATELY FOR CORRECTION OR RE-DESIGN. FAILURE TO COMMUNICATE DIRECTLY WITH ATC ENGINEERING OR ANY CHANGES FROM THE DESIGN CONDUCTED WITHOUT PRIOR APPROVAL FROM ATC ENGINEERING SHALL BE THE SOLE RESPONSIBILITY OF THE GENERAL CONTRACTOR.**



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 PEC.0001553

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REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	VAR	11/29/2023

ATC SITE NUMBER:  
**411257**  
 ATC SITE NAME:  
**MIDDLE HADDAM ROAD-CROWN CT**  
 T-MOBILE SITE NAME:  
**CT696/VERIZON PORTLAND\_ET**  
 SITE ADDRESS:  
 191 MIDDLE HADDAM RD  
 PORTLAND, CT 06480



Digitally Signed: 2023-11-30



ATC PROJ. #:	14529796_GO
CUST. ID:	CT696/VERIZON PORTLAND_ET
CUST. #:	CT11696E

**GENERAL NOTES**

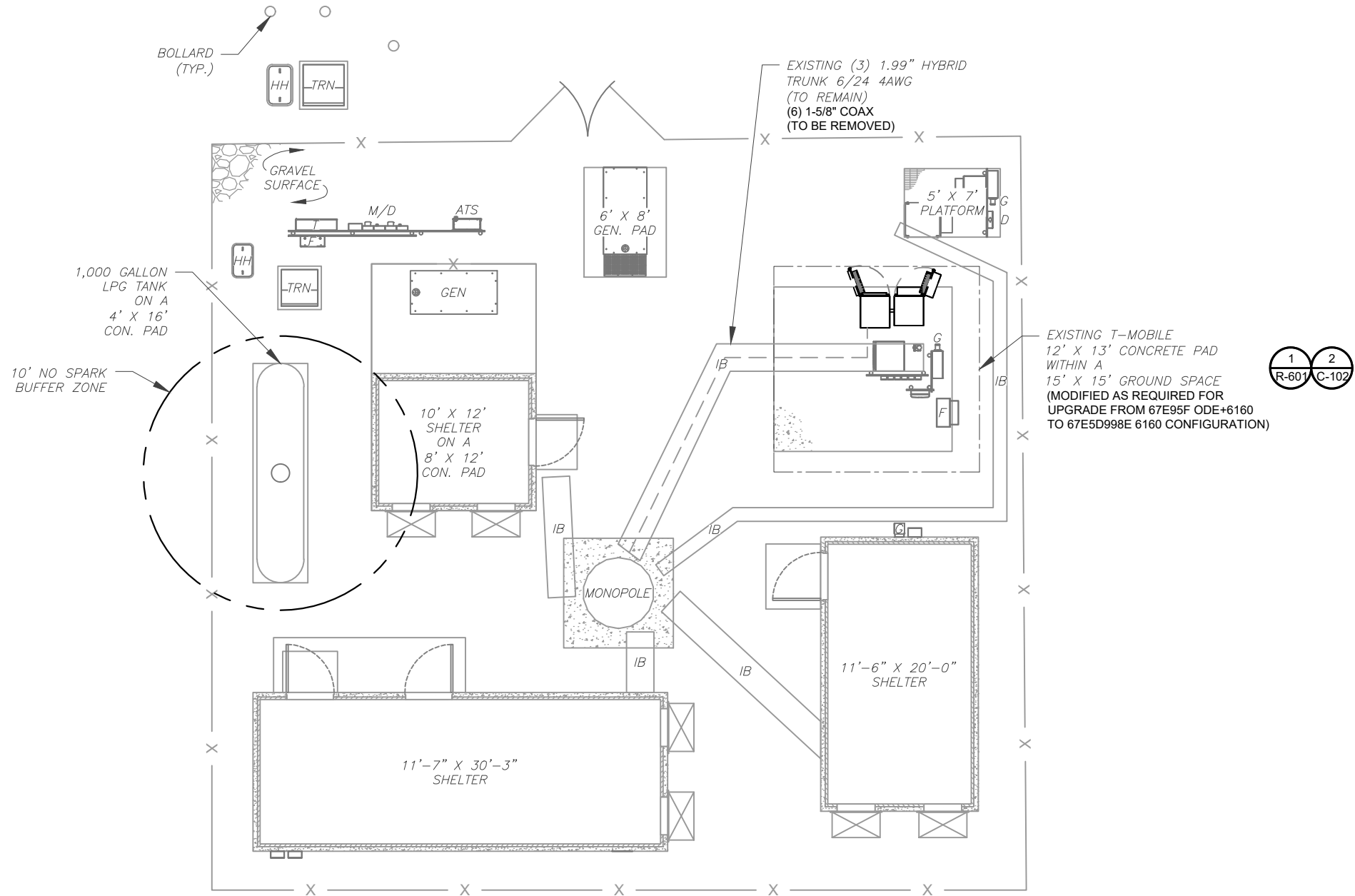
SHEET NUMBER: <b>G-002</b>	REVISION: <b>0</b>
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**SITE PLAN NOTES:**

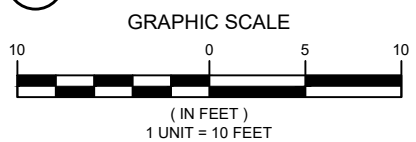
- THIS SITE PLAN REPRESENTS THE BEST PRESENT KNOWLEDGE AVAILABLE TO THE ENGINEER AT THE TIME OF THIS DESIGN. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO CONSTRUCTION AND VERIFY ALL EXISTING CONDITIONS RELATED TO THE SCOPE OF WORK FOR THIS PROJECT.
- ICE BRIDGE, CABLE LADDER, COAX PORT, AND COAX CABLE ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL CONFIRM THE EXACT LOCATION OF ALL PROPOSED AND EXISTING EQUIPMENT AND STRUCTURES DEPICTED ON THIS PLAN. BEFORE UTILIZING EXISTING CABLE SUPPORTS, COAX PORTS, INSTALLING NEW PORTS OR ANY OTHER EQUIPMENT, CONTRACTOR SHALL VERIFY ALL ASPECTS OF THE COMPONENTS MEET THE ATC SPECIFICATIONS.
- NO ELECTRICAL SCOPE IS INCLUDED IN THIS PROJECT.



**LEGEND**

- ⊗ GROUNDING TEST WELL
- ATS AUTOMATIC TRANSFER SWITCH
- B BOLLARD
- CSC CELL SITE CABINET
- D DISCONNECT
- E ELECTRICAL
- F FIBER
- GEN GENERATOR
- G GENERATOR RECEPTACLE
- HH, V HAND HOLE, VAULT
- IB ICE BRIDGE
- K KENTROX BOX
- LC LIGHTING CONTROL
- M METER
- PB PULL BOX
- PP POWER POLE
- T TELCO
- TRN TRANSFORMER
- CHAINLINK FENCE

**1 DETAILED SITE PLAN**



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 T-MOBILE SITE NAME:  
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 SITE ADDRESS:  
 191 MIDDLE HADDAM RD  
 PORTLAND, CT 06480



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ATC PROJ. #:	14529796_G0
CUST. ID:	CT696/VERIZON PORTLAND_ET
CUST. #:	CT11696E

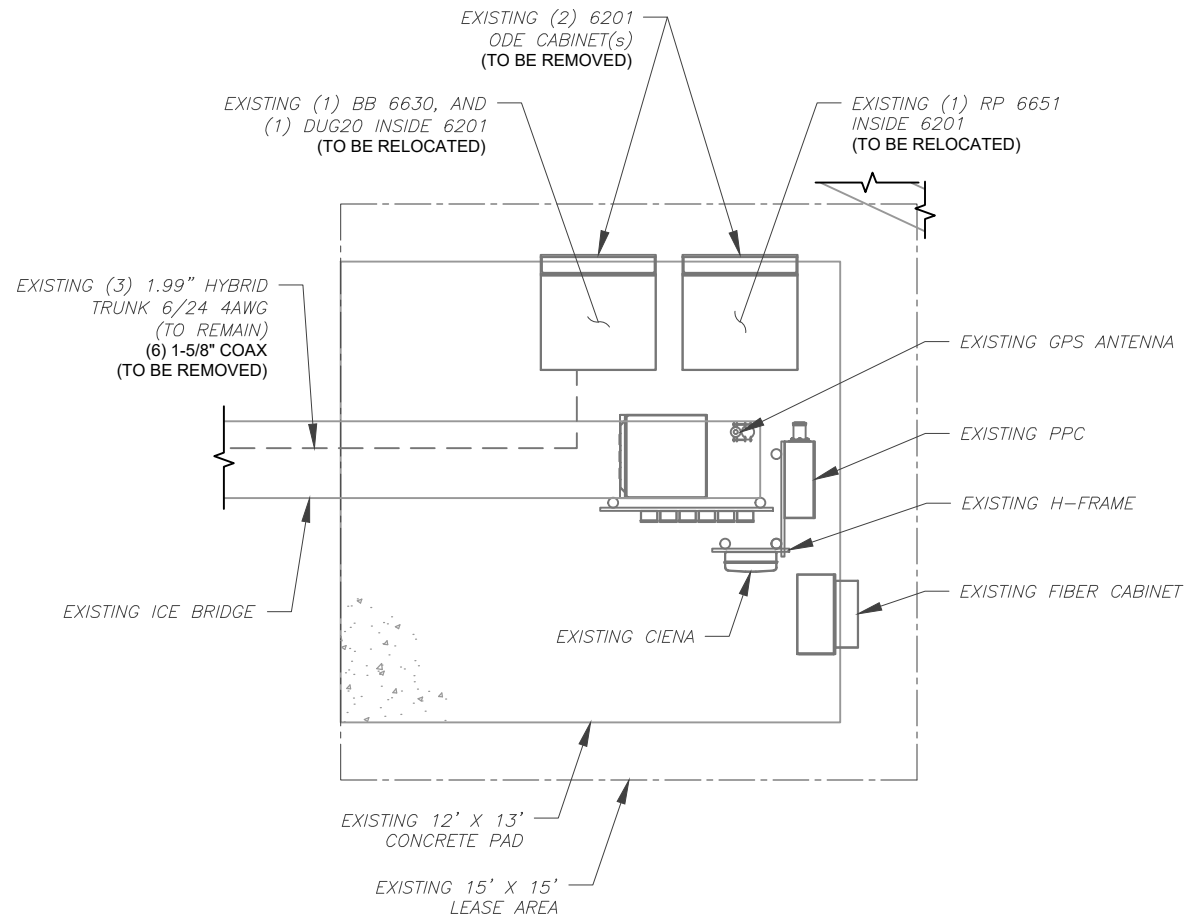
**DETAILED SITE PLAN**

SHEET NUMBER: <b>C-101</b>	REVISION: <b>0</b>
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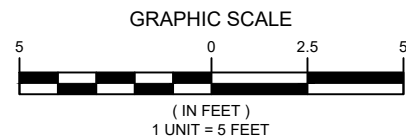
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**SITE PLAN NOTES:**

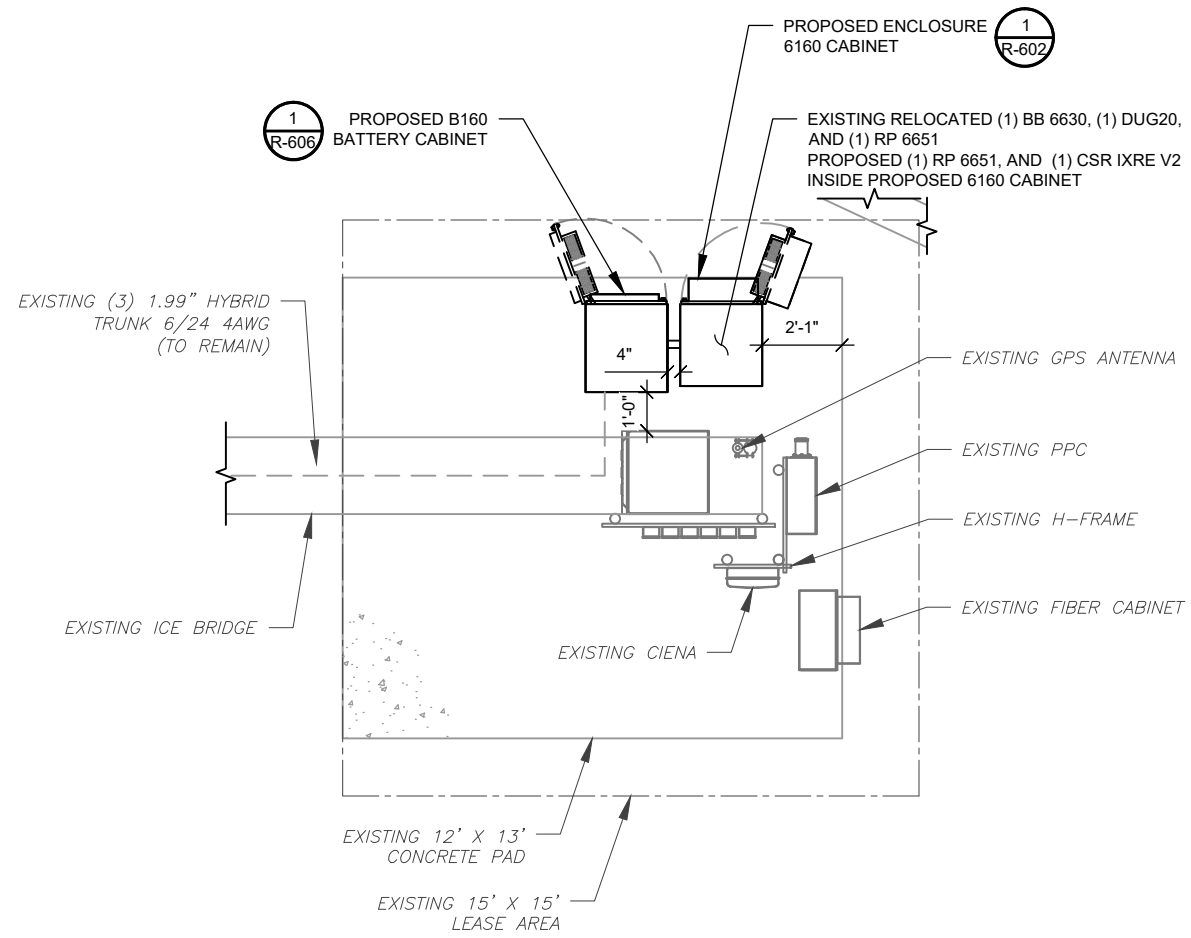
1. CONTRACTOR TO VERIFY THERE IS NO LIVE AAV FIBER RUNNING THROUGH EXISTING DEAD EQUIPMENT. IF SO, THIS WILL NEED TO BE RERUN THROUGH CONDUIT PRIOR TO REMOVING DEAD 2G (6201 CABS) EQUIPMENT.
2. ALL OPEN PORTS NEED TO BE SEALED / WEATHERPROOFED PROPERLY
3. ALL UNNEEDED / EXCESS EQUIPMENT AND GARBAGE TO BE REMOVED FROM EQUIPMENT AREA. DISPOSE OF MATERIALS PROPERLY OFF SITE.



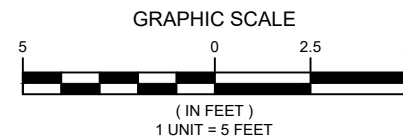
**1** EXISTING GROUND EQUIPMENT LAYOUT



**T-MOBILE CM APPROVAL REQUIRED BEFORE INSTALLING CABINETS.**



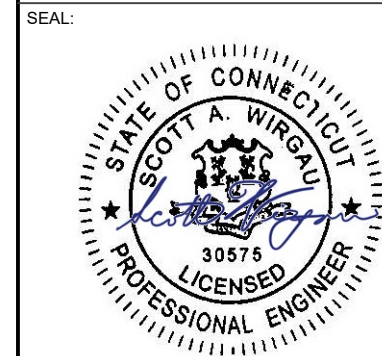
**2** PROPOSED GROUND EQUIPMENT LAYOUT



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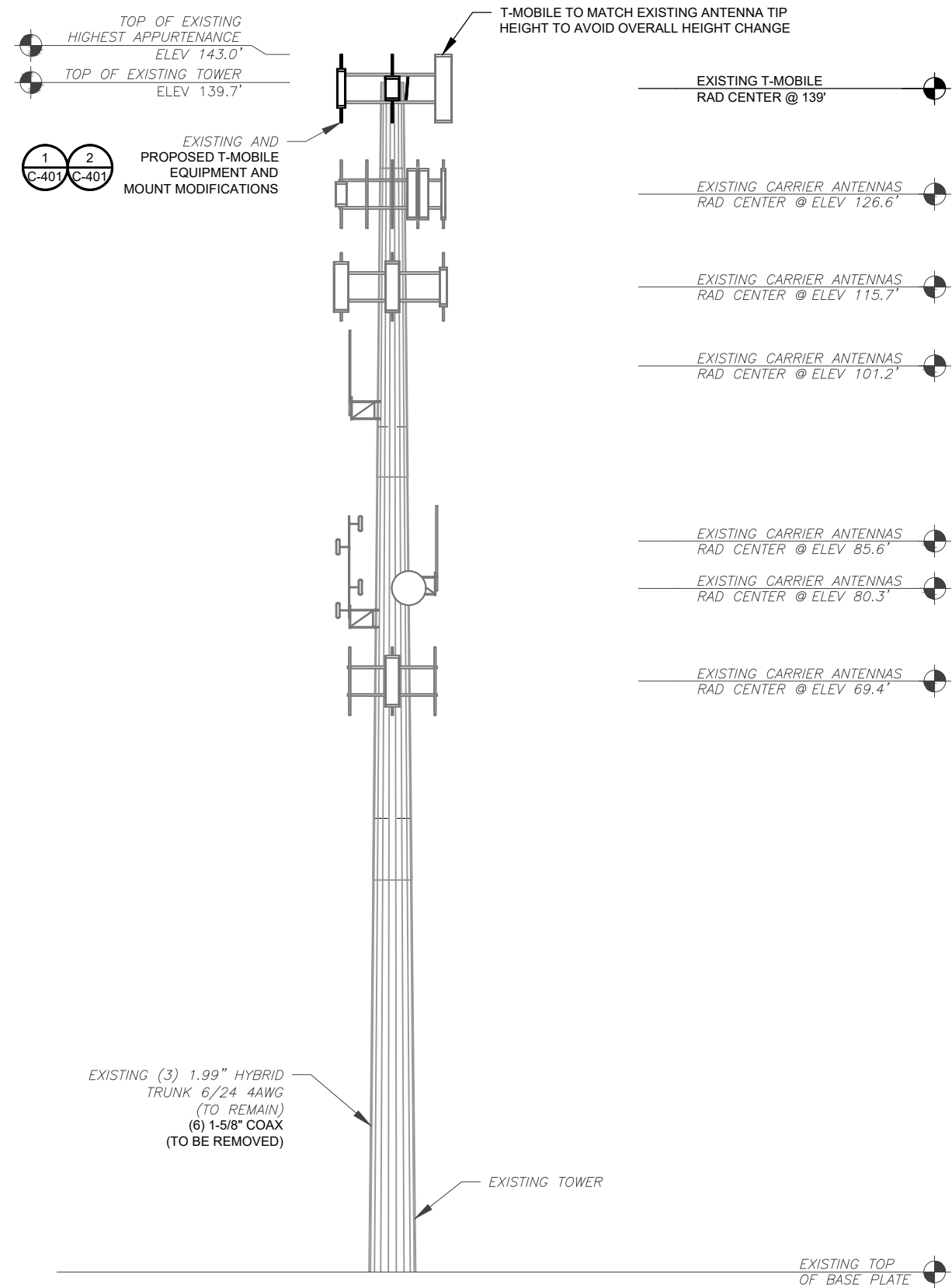
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CUST. ID: CT696/VERIZON PORTLAND\_ET  
CUST. #: CT11696E

**DETAILED EQUIPMENT PLAN**

SHEET NUMBER:  
**C-102**  
REVISION:  
**0**



PER MOUNT ANALYSIS COMPLETED BY ATC, DATED 10/05/23, THE EXISTING MOUNT MUST BE MODIFIED TO ADEQUATELY SUPPORT THE PROPOSED LOADING. THE MOUNT MODIFICATION DETAILED AT THE END OF THIS PLAN SET, MUST BE INSTALLED PRIOR TO THE INSTALLATION OF THE PROPOSED ANTENNAS AND OTHER EQUIPMENT.

- TOWER NOTE:**
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM WITH THE PROJECT MANAGER THAT THEY HAVE THE MOST RECENT VERSION OF THE STRUCTURAL ANALYSIS BEFORE COMMENCING WORK. EXISTING AND PROPOSED TOWER APPURTENANCES, MOUNTS, AND ANTENNAS ARE SHOWN BASED ON THE STRUCTURAL ANALYSIS.
  - WHERE APPLICABLE, ALL NEW ANTENNAS, EQUIPMENT, MOUNTS, CABLING, ETC. SHALL BE PAINTED/SOCKED TO MATCH EXISTING EQUIPMENT IN ACCORDANCE WITH FAA, JURISDICTION, AND/OR OTHER LOCAL REQUIREMENTS.
  - ROUTE PROPOSED CABLES ALONG SAME PATH AS EXISTING CABLES AND IN ACCORDANCE WITH STRUCTURAL ANALYSIS. IF ADEQUATE SPACE EXISTS, ROUTE CABLES THROUGH ENTRY PORT HOLE, UP INSIDE OF MONOPOLE, AND THROUGH EXIT PORT HOLE. IF ROUTING OUTSIDE THE MONOPOLE, ATTACH CABLES USING STAND-OFF ADAPTERS MOUNTED TO TOWER USING STAINLESS STEEL BANDING. ADEQUATELY SECURE CABLES USING EITHER APPROPRIATELY SIZED STAINLESS STEEL SNAP-INS OR MOUNTING HARDWARE AND BRACKETS AS SPECIFIED BY CABLE MANUFACTURER.
  - TOWER ELEVATIONS ARE MEASURED FROM TOP OF BASE PLATE TO MATCH STRUCTURAL ANALYSIS. ELEVATIONS DO NOT REFLECT TRUE ABOVE GROUND LEVEL (A.G.L.)
  - TOWER ELEVATION DEPICTION MAY NOT REFLECT ALL EQUIPMENT INCLUDED IN STRUCTURAL ANALYSIS. REFER TO STRUCTURAL ANALYSIS FOR FULL TOWER LOADING.

**1 TOWER ELEVATION**  
SCALE: N.T.S.



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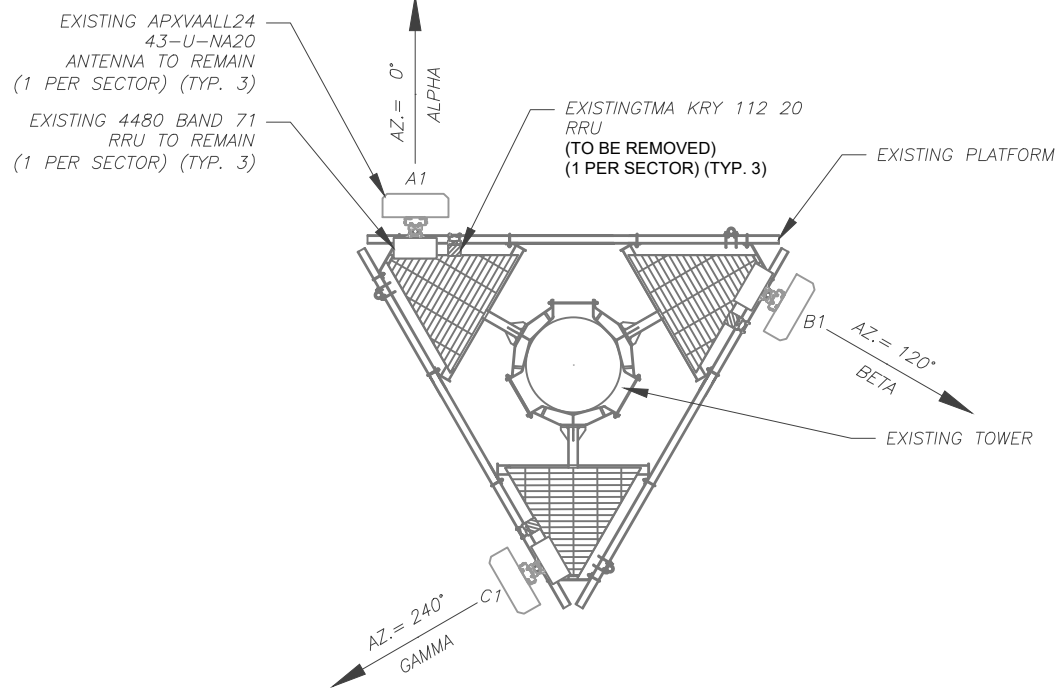


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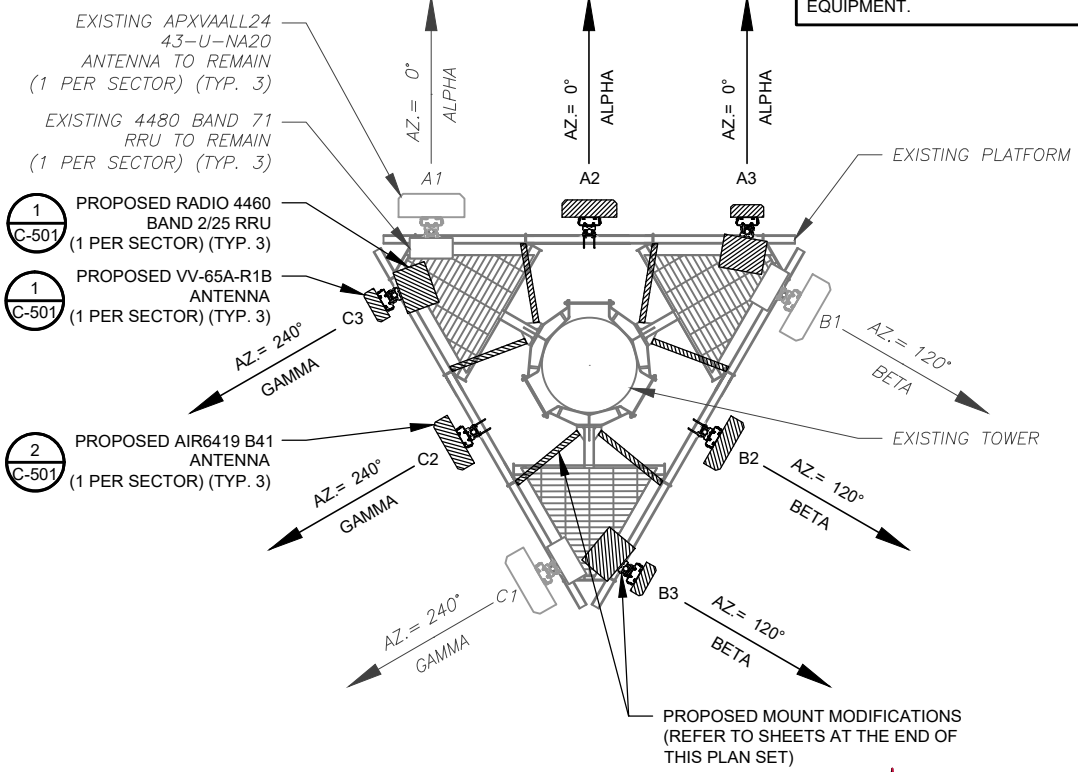
**TOWER ELEVATION**

SHEET NUMBER: <b>C-201</b>	REVISION: <b>0</b>
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1 EXISTING ANTENNA PLAN  
SCALE: N.T.S.



2 FINAL ANTENNA PLAN  
SCALE: N.T.S.

PER MOUNT ANALYSIS COMPLETED BY ATC, DATED 10/05/23, THE EXISTING MOUNT MUST BE MODIFIED TO ADEQUATELY SUPPORT THE PROPOSED LOADING. THE MOUNT MODIFICATION DETAILED AT THE END OF THIS PLAN SET, MUST BE INSTALLED PRIOR TO THE INSTALLATION OF THE PROPOSED ANTENNAS AND OTHER EQUIPMENT.

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ATC PROJ. #: 14529796\_G0  
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CUST. #: CT11696E

**ANTENNA INFORMATION & SCHEDULE**

SHEET NUMBER:  
**C-401**  
REVISION:  
**0**

EXISTING ANTENNA SCHEDULE									
LOCATION			ANTENNA SUMMARY				NON ANTENNA SUMMARY		
SECTOR	RAD	AZ	POS	ANTENNA	BAND	MECH/ELEC D-TILT	STATUS	ADDITIONAL TOWER MOUNTED EQUIPMENT	STATUS
ALPHA	139'	0°	A1	APXVAALL24 43-U-NA20	L700, N600, L600, G1900, L1900, L2100	0° / 2°	RMN	4480 BAND 71 KRY 112 20	RMN RMV
BETA	139'	120°	B1	APXVAALL24 43-U-NA20	L700, N600, L600, G1900, L1900, L2100	0° / 2°	RMN	4480 BAND 71 KRY 112 20	RMN RMV
GAMMA	139'	240°	C1	APXVAALL24 43-U-NA20	L700, N600, L600, G1900, L1900, L2100	0° / 2°	RMN	4480 BAND 71 KRY 112 20	RMN RMV

**NOTES**

- CONFIRM WITH T-MOBILE REP FOR APPLICABLE UPDATES/REVISIONS AND MOST RECENT RFDS FOR NSN CONFIGURATION (CONFIG). GC TO CAP ALL UNUSED PORTS.
- CONFIRM SPACING OF PROPOSED EQUIP DOES NOT CAUSE TOWER CONFLICTS NOR IMPEDE TOWER CLIMBING PEGS.

**STATUS ABBREVIATIONS**

RMV: TO BE REMOVED  
RMN: TO REMAIN  
REL: TO BE RELOCATED  
ADD: TO BE ADDED

**CABLE LENGTHS FOR JUMPERS**

JUNCTION BOX TO RRU: 15'  
RRU TO ANTENNA: 10'

FINAL ANTENNA SCHEDULE									
LOCATION			ANTENNA SUMMARY				NON ANTENNA SUMMARY		
SECTOR	RAD	AZ	POS	ANTENNA	BAND	MECH/ELEC D-TILT	STATUS	ADDITIONAL TOWER MOUNTED EQUIPMENT	STATUS
ALPHA	139'	0°	A1	APXVAALL24 43-U-NA20	L700, N600, L600	0° / 2°	RMN	4480 BAND 71	RMN
			A2	AIR 6419 B41	N2500	-	ADD	-	-
			A3	VV-65A-R1	N1900, G1900, L1900, L2100	-	ADD	4460 BAND 2/25	ADD
BETA	139'	120°	B1	APXVAALL24 43-U-NA20	L700, N600, L600	0° / 2°	RMN	4480 BAND 71	RMN
			B2	AIR 6419 B41	N2500	-	ADD	-	-
			B3	VV-65A-R1	N1900, G1900, L1900, L2100	-	ADD	4460 BAND 2/25	ADD
GAMMA	139'	240°	C1	APXVAALL24 43-U-NA20	L700, N600, L600	0° / 2°	RMN	4480 BAND 71	RMN
			C2	AIR 6419 B41	N2500	-	ADD	-	-
			C3	VV-65A-R1	N1900, G1900, L1900, L2100	-	ADD	4460 BAND 2/25	ADD

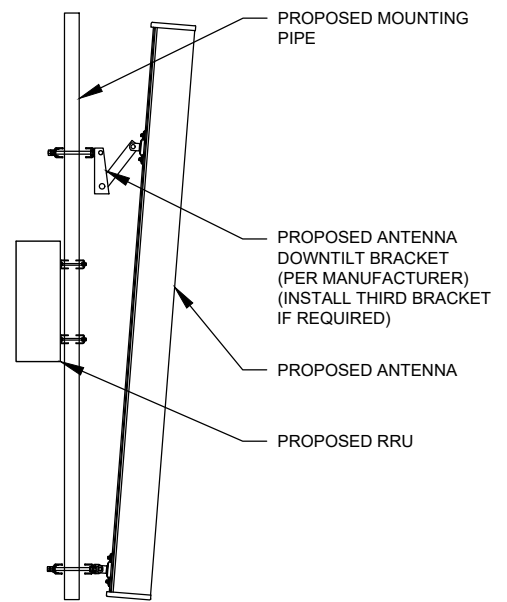
EXISTING FIBER DISTRIBUTION/OVP BOX		EXISTING CABLING SUMMARY	
MODEL NUMBER	STATUS	CABLE QTY, SIZE, TYPE	STATUS
-	-	(3) 1.99" HYBRID TRUNK 6/24 4AWG	RMN
-	-	(6) 1-5/8" COAX	RMV

3 EQUIPMENT SCHEDULES

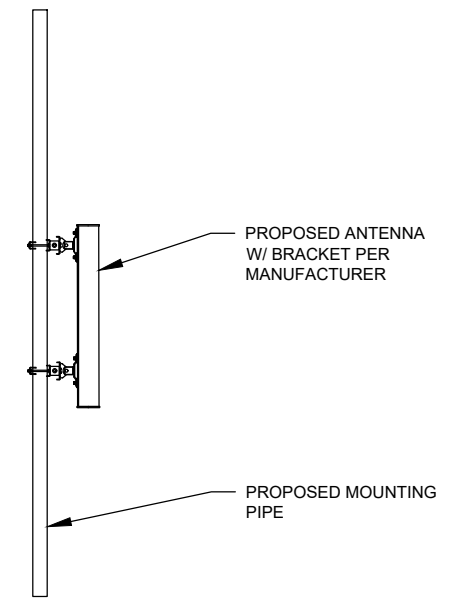
FINAL FIBER DISTRIBUTION / OVP BOX		FINAL CABLING SUMMARY	
MODEL NUMBER	STATUS	CABLE QTY, SIZE, TYPE	STATUS
-	-	(3) 1.99" HYBRID TRUNK 6/24 4AWG	RMN
-	-	---	-

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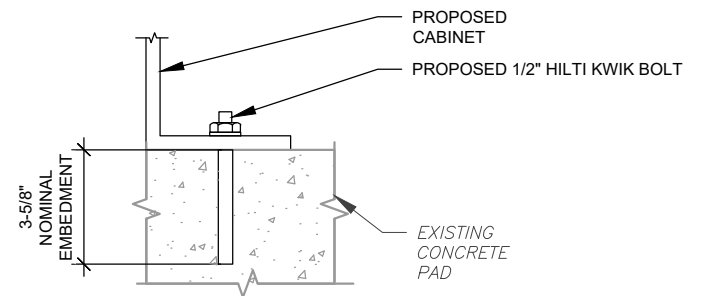
EXISTING/PROPOSED MOUNTS AND/OR MOUNT MODIFICATIONS NOT SHOWN FOR CLARITY. REFER TO ANTENNA PLANS, MOUNT ANALYSES AND/OR MOUNT MODIFICATION DOCUMENTS FOR ADDITIONAL DETAIL.



1 PROPOSED ANTENNA MOUNTING DETAIL - TYPICAL  
 SCALE: N.T.S.



2 PROPOSED 5G ANTENNA MOUNTING DETAIL - TYPICAL  
 SCALE: N.T.S.



NOTE:  
 INSTALL HILTI KWIK BOLT ANCHORS STRICTLY PER INSTALLATION INSTRUCTIONS INCLUDED WITH PRODUCT OR FOUND ONLINE AT WWW.US.HILTI.COM. PROPER INSTALLATION IS CRITICAL FOR FULL PERFORMANCE.

3 CABINET ATTACHMENT DETAIL  
 SCALE: N.T.S.



**AMERICAN TOWER®**  
**A.T. ENGINEERING SERVICES LLC**  
 3500 REGENCY PARKWAY  
 SUITE 100  
 CARY, NC 27518  
 PHONE: (919) 468-0112  
 PEC.0001553

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REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	VAR	11/29/2023

ATC SITE NUMBER:  
**411257**  
 ATC SITE NAME:  
**MIDDLE HADDAM ROAD-CROWN CT**  
 T-MOBILE SITE NAME:  
**CT696/VERIZON PORTLAND\_ET**  
 SITE ADDRESS:  
 191 MIDDLE HADDAM RD  
 PORTLAND, CT 06480



Digitally Signed: 2023-11-30

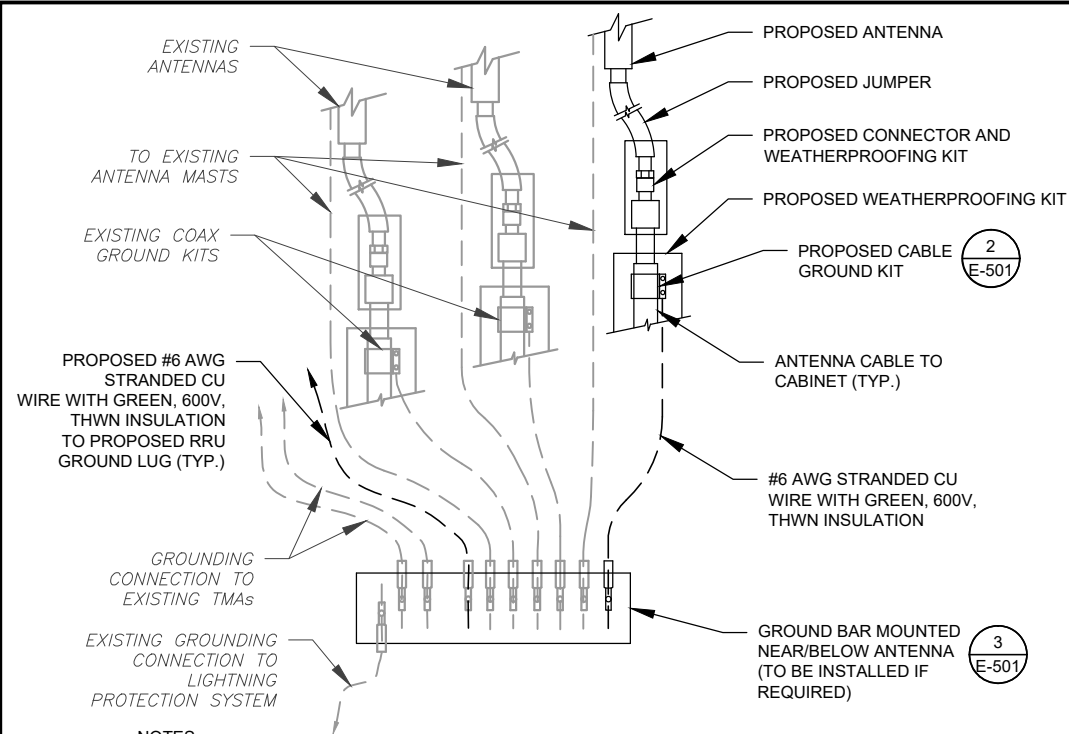


ATC PROJ. #:	14529796_G0
CUST. ID:	CT696/VERIZON PORTLAND_ET
CUST. #:	CT11696E

**CONSTRUCTION DETAILS**

SHEET NUMBER:	REVISION:
<b>C-501</b>	<b>0</b>

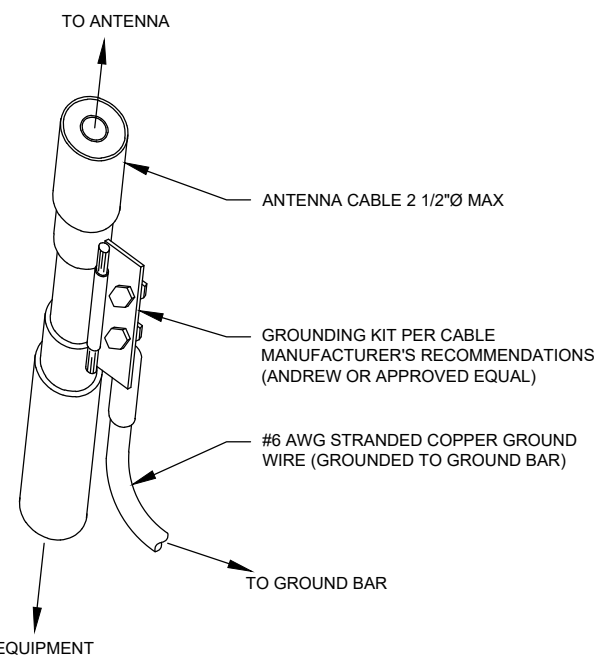
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**NOTES:**

1. THIS DETAIL IS INTENDED TO SHOW THE GENERAL GROUNDING REQUIREMENTS. SLIGHT ADJUSTMENTS MAY BE REQUIRED BASED ON EXISTING SITE CONDITIONS. THE CONTRACTOR SHALL MAKE FIELD ADJUSTMENTS AS NEEDED AND INFORM THE CONSTRUCTION MANAGER OF ANY CONFLICTS.
2. SITE GROUNDING SHALL COMPLY WITH T-MOBILE GROUNDING STANDARDS, LATEST EDITION, AND COMPLY WITH T-MOBILE GROUNDING CHECKLIST, LATEST VERSION. WHEN NATIONAL AND LOCAL GROUNDING CODES ARE MORE STRINGENT THEY SHALL GOVERN.

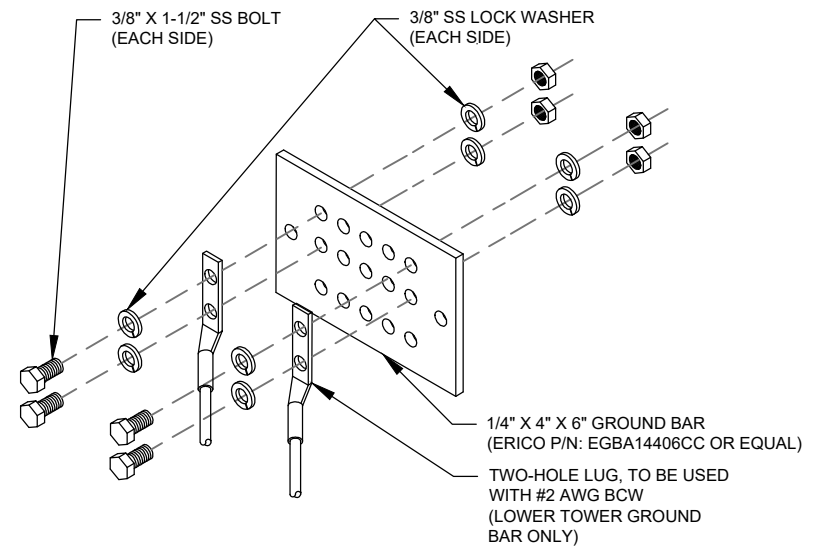
**1 TYPICAL ANTENNA GROUNDING DIAGRAM**  
SCALE: N.T.S.



**GROUND KIT NOTES:**

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. CONTRACTOR SHALL PROVIDE WEATHERPROOFING KIT (ANDREW PART NUMBER 221213) AND INSTALL/TAPE PER MANUFACTURER'S SPECIFICATIONS.

**2 CABLE GROUND KIT CONNECTION DETAIL**  
SCALE: N.T.S.



**GROUND BAR NOTES:**

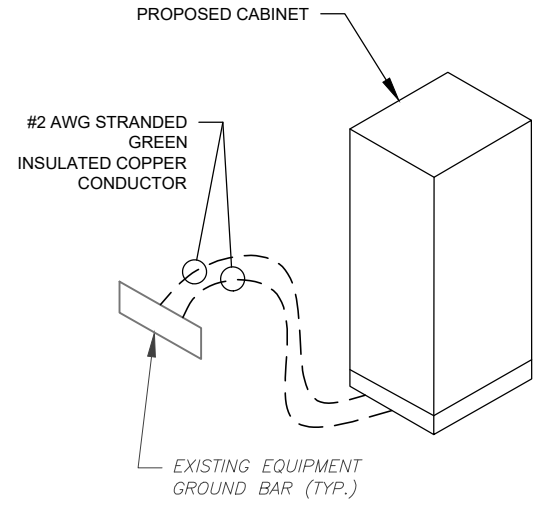
1. GROUND BAR KITS COME WITH ALL HARDWARE, NUTS, BOLTS, WASHERS, ETC. EXCEPT THE STRUCTURAL MOUNTING MEMBER(S).
2. GROUND BAR TO BE BONDED DIRECTLY TO TOWER.

**3 TOWER GROUND BAR DETAIL**  
SCALE: N.T.S.

**ELECTRICAL NOTES:**

1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE T-MOBILE REPRESENTATIVE AND LOCAL UTILITY COMPANY FOR THE INSTALLATION OF CONDUITS, CONDUCTORS, BREAKERS, DISCONNECTS, OR ANY OTHER EQUIPMENT REQUIRED FOR ELECTRICAL SERVICE. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH LATEST EDITION OF THE STATE AND NATIONAL CODES, ORDINANCES AND REGULATIONS APPLICABLE TO THIS PROJECT.
2. ATC HAS NOT VERIFIED ANY EXISTING T-MOBILE GROUND EQUIPMENT OR ELECTRICAL LOADING. PROPOSED WORK BASED ON INSTALLATION CONFIGURATION PROVIDED BY T-MOBILE. CONTRACTOR TO VERIFY EXISTING T-MOBILE PANEL HAS SUFFICIENT SPACE FOR PROPOSED BREAKER. PROPOSED CABLE AND CONDUIT SHALL BE MINIMUM SIZE PER BELOW IN CHART.
3. FOR SPECIFIC CABINET / ANCILLARY EQUIPMENT WIRING REQUIREMENTS, THE T-MOBILE CONTRACTOR SHOULD REFERENCE DESIGN DOCUMENTS PROVIDED BY T-MOBILE FOR THIS CURRENT PROJECT CONFIGURATION, IN ACCORDANCE WITH LOCAL JURISDICTION REQUIREMENTS & NEC STANDARDS & PRACTICES.

VOLTS	OCPD SIZE	WIRE SIZE	GROUND	CONDUIT
120/240V OR 120/208V	80A/2P	3-#3 AWG	#8 AWG	1-1/4"
	100/2P	3-#2 AWG	#8 AWG	1-1/4"
	125A/2P	3-#3/0 AWG	#6 AWG	2"
	150A/2P	3-#3/0 AWG	#6 AWG	2"
240V OR 208V	200A/2P	3-#3/0 AWG	#6 AWG	2"
	80A/2P	2-#3 AWG	#8 AWG	1-1/4"
	100/2P	2-#2 AWG	#8 AWG	1-1/4"
	125A/2P	2-#3/0 AWG	#6 AWG	2"
	150A/2P	2-#3/0 AWG	#6 AWG	2"
	200A/2P	2-#3/0 AWG	#6 AWG	2"



**4 CABINET GROUNDING DETAIL**  
SCALE: N.T.S.

STANDARD CONDUIT USE TABLE			
CONDUIT TYPE	USE CASE	LOCATION	USE CASE EXAMPLE
RMC (METALLIC)	AC, DC COMM	ABOVE GROUND	ABOVE GROUND PPC TO SSC
PVC	AC POWER	UNDERGROUND	UNDERGROUND PPC TO SSC OR BACKHAUL TRANSPORT HUB TO SSC
LFMC	AC, DC, COMM	MAX 6' PER CONDUIT RUN, ABOVE GROUND ONLY	TIGHT LOCATIONS BETWEEN HUB AND CONDUIT BUT NOT TO BE USED WHERE IT CAN BE STEPPED ON
EMT	INDOOR AC, DC COMM	INDOOR NOT EXPOSED TO THE OUTDOOR ENVIRONMENT (MUST BE DRY)	CIRCUIT PANEL TO JUNCTION BOX
LFNC	GROUND WIRE	CONCEALING AND PROTECTING BTCW RISERS ONLY	GROUND RING TO MGB OR SSC

EXCEPTION CONDUIT USE TABLE			
CONDUIT TYPE	USE CASE	LOCATION	USE CASE EXAMPLE
EMT (NOT PREFERRED)	OUTDOOR DC, COMM	OUTDOOR WHEN USED WITH WATERTIGHT HUBS ONLY	BETWEEN EQUIPMENT AND BATTERY CABINET OR EQUIPMENT TO EQUIPMENT CABINETS FOR INTER CABINET CONNECTION
RMC NONMETALLIC (ALUMINUM)	OUTDOOR/INDOOR PER NEC GUIDLINES	ABOVE GROUND	MAY BE USED AS A LOWER COST ALTERNATIVE TO METALLIC RMC, MUST MEET OR EXCEED FEDERAL SPEC: WW-C-540C, UL-6A, ANSI C80.5, NEC 344.10 (A) ALLOWS THE USE OF EITHER ALUMINUM OR GALVANIZED FITTINGS

**4 CONDUIT USE TABLES**

**6 ELECTRICAL NOTES**

**AMERICAN TOWER®**  
**A.T. ENGINEERING SERVICES LLC**  
 3500 REGENCY PARKWAY  
 SUITE 100  
 CARY, NC 27518  
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REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	VAR	11/29/2023

ATC SITE NUMBER:  
**411257**  
 ATC SITE NAME:  
**MIDDLE HADDAM ROAD-CROWN CT**  
 T-MOBILE SITE NAME:  
**CT696/VERIZON PORTLAND\_ET**  
 SITE ADDRESS:  
 191 MIDDLE HADDAM RD  
 PORTLAND, CT 06480

SEAL:

Digitally Signed: 2023-11-30



ATC PROJ. #: 14529796\_G0  
 CUST. ID: CT696/VERIZON PORTLAND\_ET  
 CUST. #: CT11696E

**GROUNDING DETAILS**

SHEET NUMBER:  
**E-501**  
 REVISION:  
**0**

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**Existing RAN Equipment**

Template: 67E95F ODE+6160

Enclosure	1	2
Enclosure Type	RBS 6201 ODE	RBS 6201 ODE
Radio	RUS01 B2 (x3) L1900 G1900	RUS01 B4 (x6) L2100
Baseband	BB 6630 L1900 L2100	DUG20 G1900
Hybrid Cable System		RP 6651 N600 L600 L700
		Hybrid Trunk 6/24 4AWG 60m (x3) PSU 4813 vR4A (Kit)

**Proposed RAN Equipment**

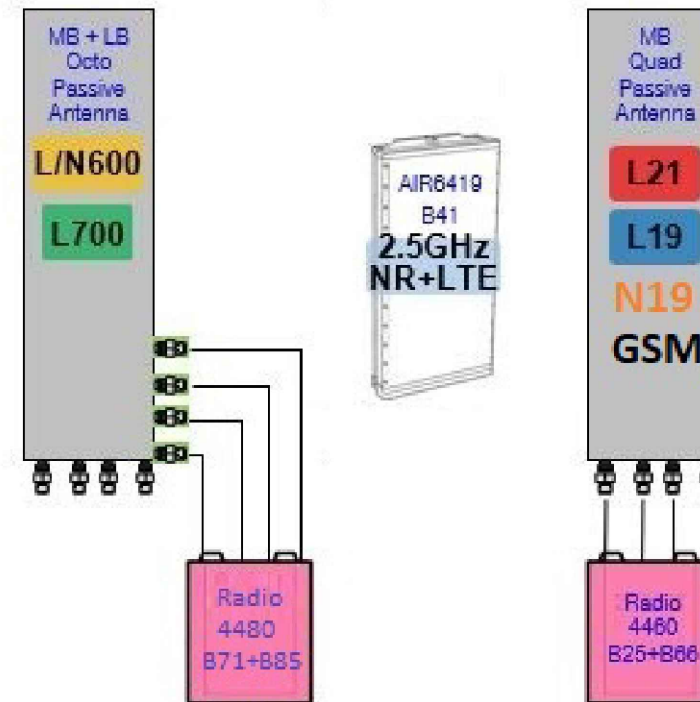
Template: 67E5D998E 6160

Enclosure	1	2
Enclosure Type	Enclosure 6160 AC V1	B160
Baseband	BB 6630 N1900 L1900 L2100	DUG20 G1900
Transport System	RBS6601	RP 6651 N2500
Hybrid Cable System	RP 6651 N600 L600 L700	
	CSR IXRe V2 (Gen2)	
	Hybrid Trunk 6/24 4AWG 60m (x3) PSU 4813 vR4A (Kit)	

**RAN Scope of Work:**

Remove all unused equipment's from cabinet.  
 Remove existing Cabinets.  
 Add (1) 6160 and (1) B160 cabinets.  
 Add (1) RP6651 for NR2500  
 Add (1) IXRe router to 6160.  
 Add (1) RBS 6601 for DUG.  
 Reuse existing (1) Hybrid Trunk 6/24 4AWG 60m and add (2) Hybrid Trunk 6/24 4AWG . Total of 3.  
 Scoping notes:  
 Cabinet consolidation due space issue.

1 CABINET CONFIGURATION



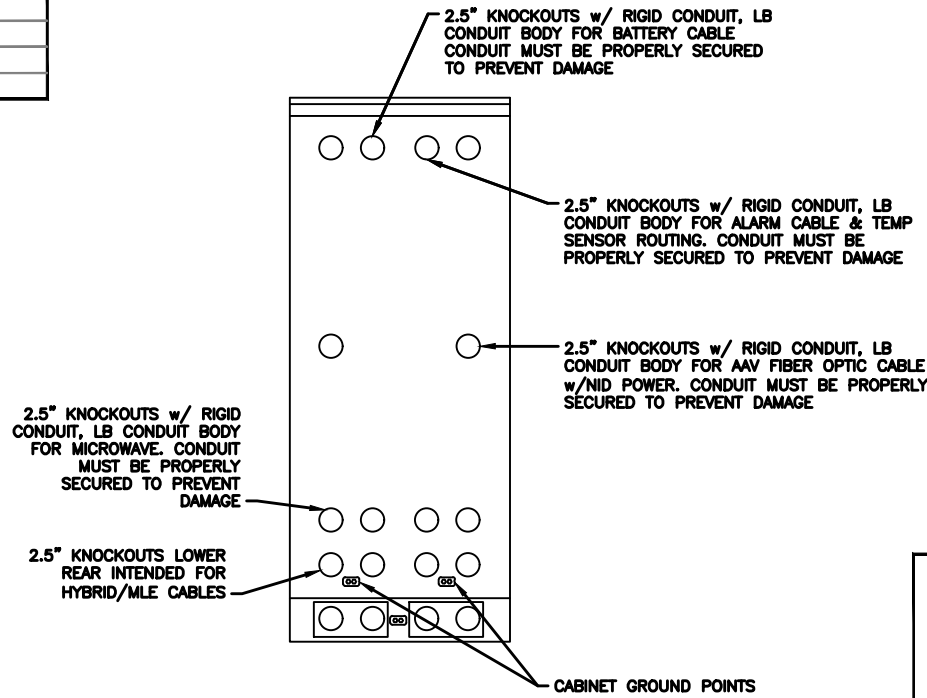
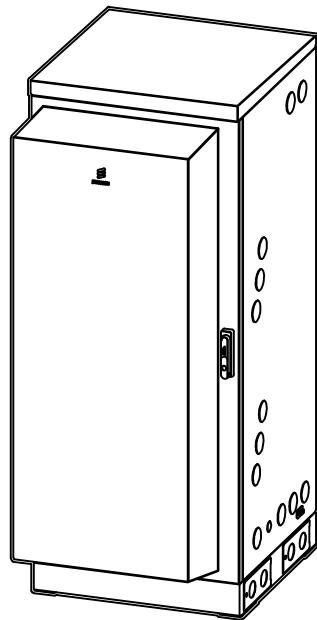
2 ANTENNA CONFIGURATION

SUPPLEMENTAL

SHEET NUMBER: R-601 REVISION: 0

NOTE: THIS SHEET CREATED BY OTHERS AND PROVIDED BY REQUEST OF CUSTOMER WITHOUT EDIT.

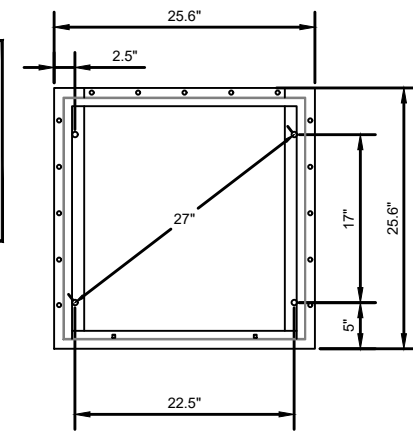
MANUFACTURER:	ERICSSON
MODEL:	6160 SITE SUPPORT CABINET
DIMENSIONS:	63" x 25.6" x 33.6" (H x W x D)
WEIGHT:	373 LBS



REAR VIEW

**NOTE:**

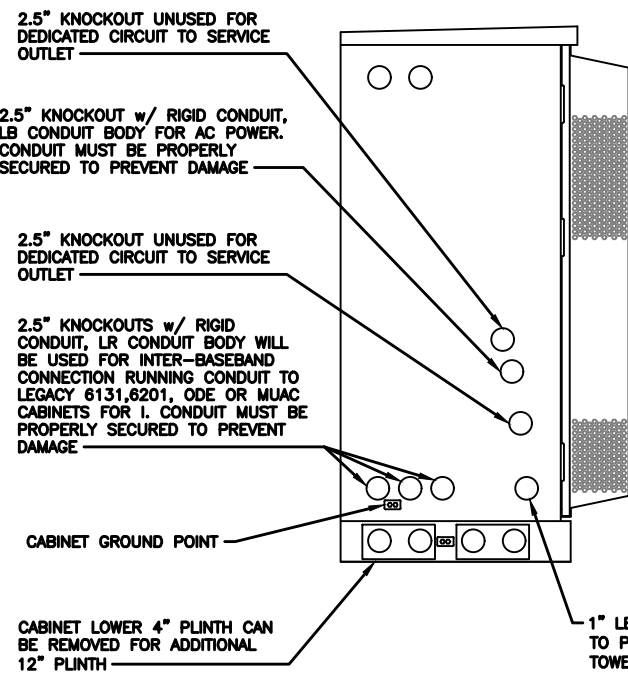
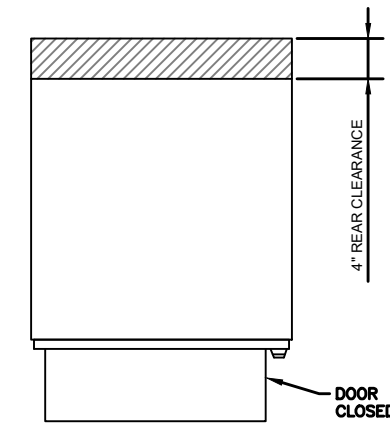
- CORRECT KNOCKOUT TOOL REQUIRED FOR PUNCHING KNOCKOUTS. DO NOT DRILL THROUGH KNOCKOUTS
- CONDUIT MUST BE PROPERLY SECURED TO PREVENT DAMAGE TO CABINETS AND OR CABLING



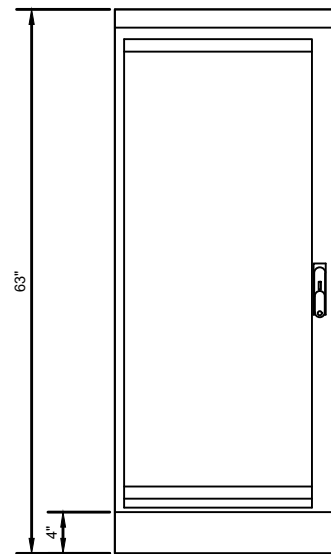
BOLT DOWN PATTERN

**GROUNDING NOTE:**

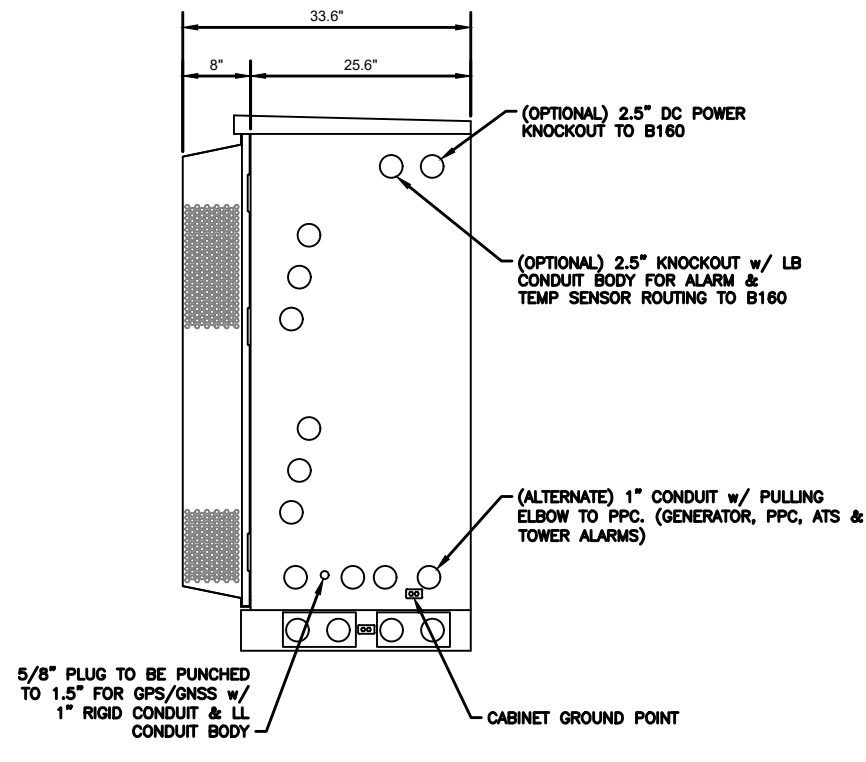
"CABINET GROUNDING TO USE A SINGLE, #2 BTCW CONDUCTOR, W/ 2-HOLE, 1" C-C, LONG BARREL, WINDOW LUG, IN 3/4" LFNC TO GROUND RING. PLINTH GROUNDING IS NOT REQUIRED."



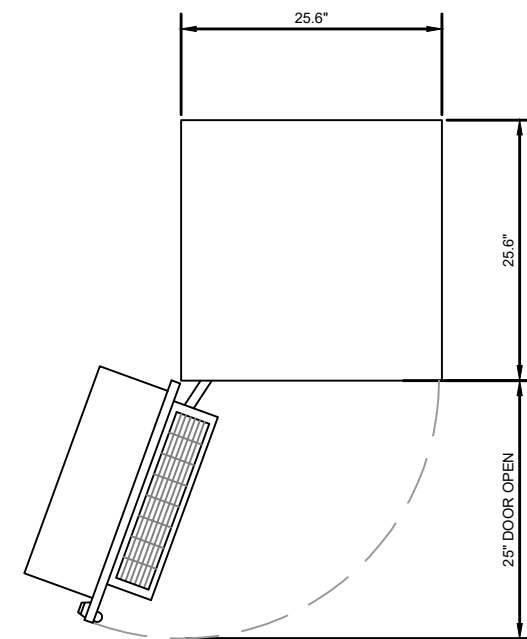
LEFT VIEW



FRONT VIEW

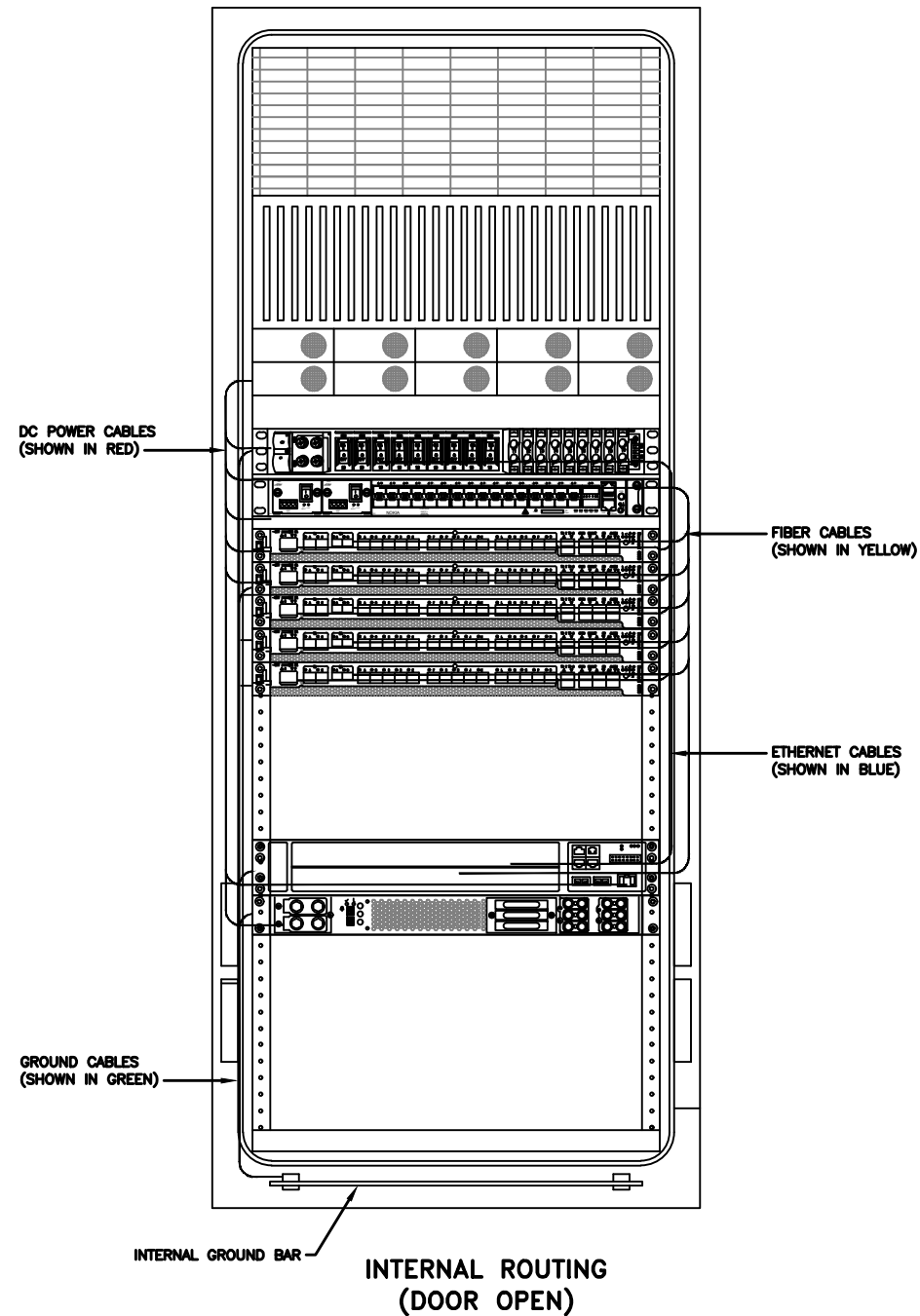


RIGHT VIEW

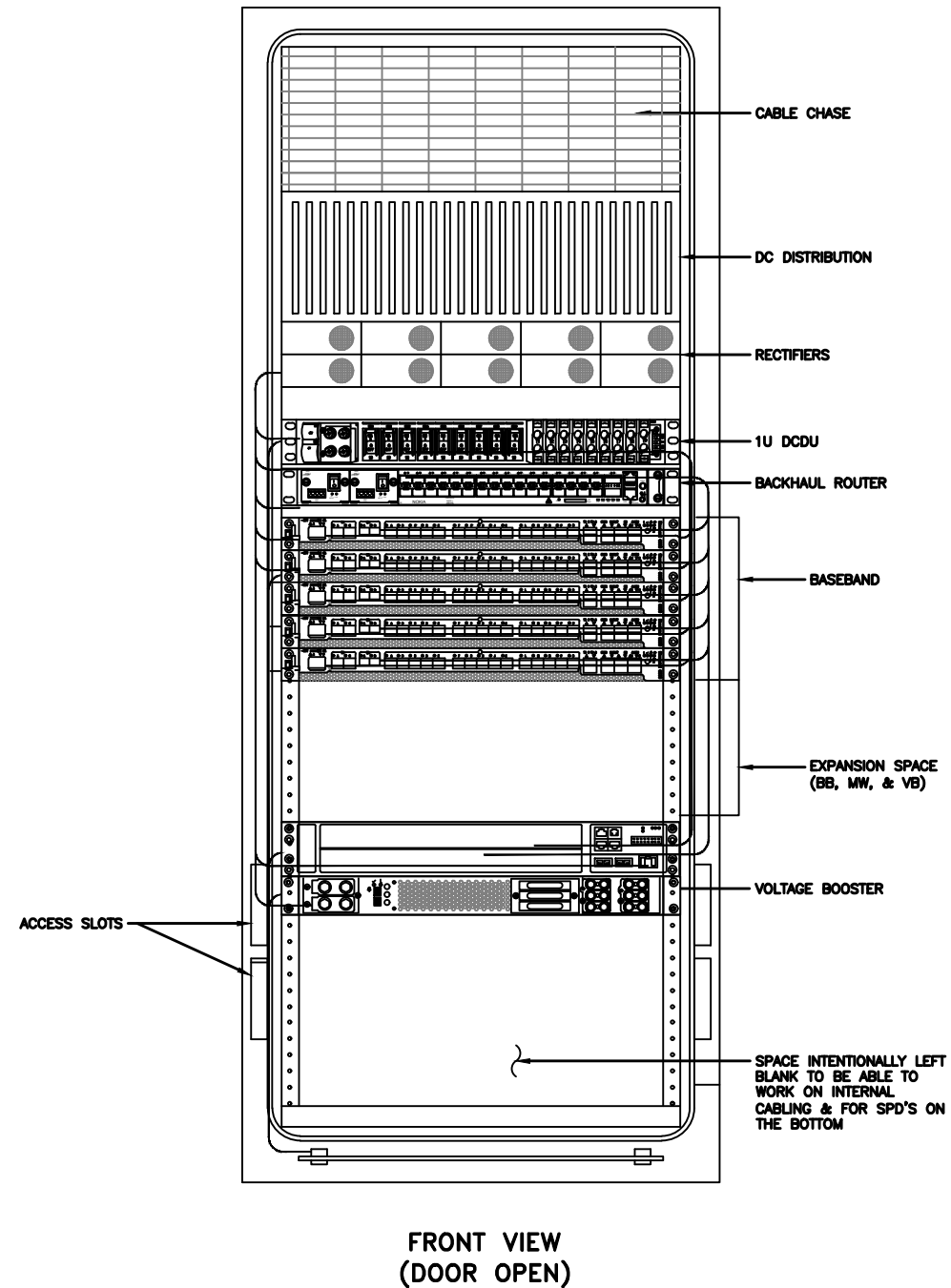


PLAN VIEW





RACK ASSIGNMENTS	
RU SLOTS	DESCRIPTION
1	DC DISTRIBUTION
2	
3	
4	
5	RECTIFIER SHELF
6	
7	FIBER BOX
8	DCDU
9	BACKHAUL ROUTER
10	
11	1ST BASEBAND
12	2ND BASEBAND
13	3RD BASEBAND
14	4TH BASEBAND
15	5TH BASEBAND
16	EXPANSION
17	
18	
19	EXPANSION / LEGACY BASEBAND / VOLTAGE BOOSTER
20	
21	VOLTAGE BOOSTER
22	VOLTAGE BOOSTER
23	OPEN SPACE FOR SPD ACCESS
24	
25	

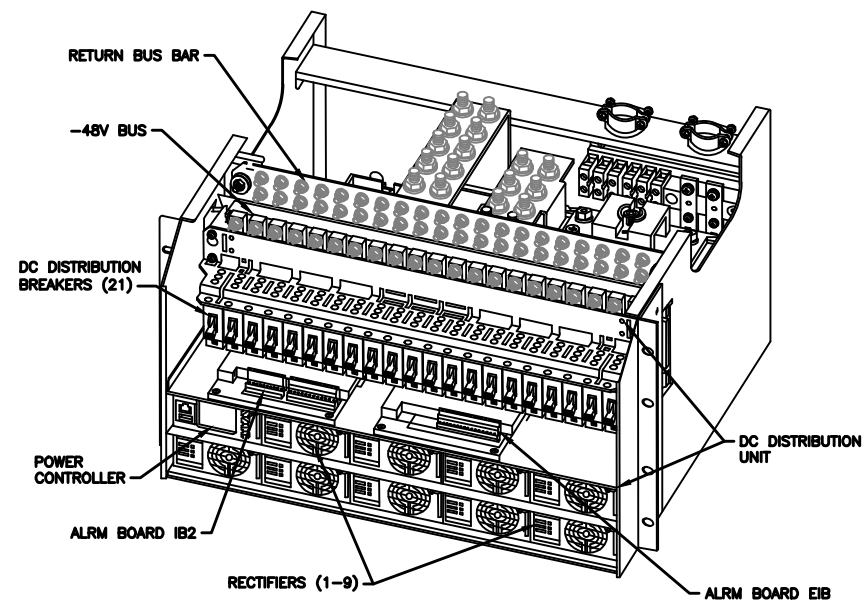


NOTE: THIS SHEET WAS CREATED BY OTHERS AND PROVIDED AT THE REQUEST OF THE CUSTOMER WITHOUT EDIT.

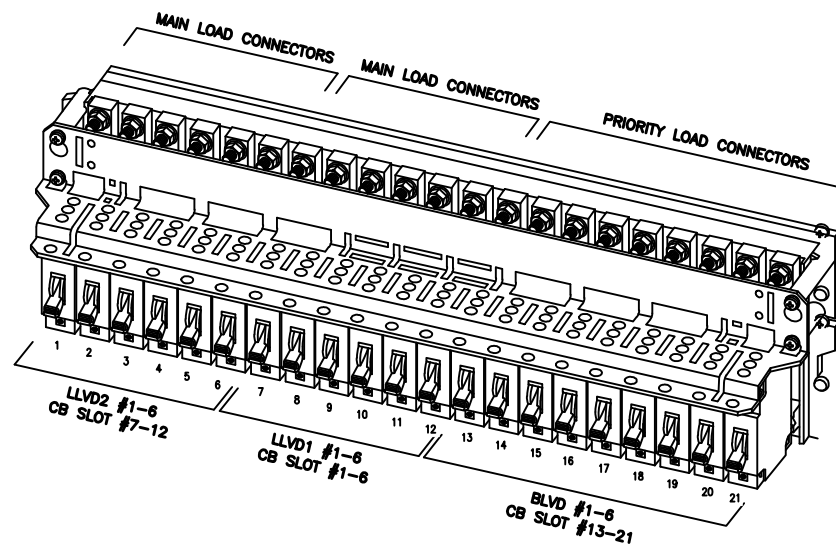
**NOTE:**  
THIS IS FOR REFERENCE ONLY, CHECK  
FOR SPECIFIC DETAIL IN T-MOBILE  
CABINET SPECIFIC INSTALLATION GUIDES

Breaker Allocation for E6160					
CB SLOT	Ckt #	w/ DCU Prior to availability of the 4460 and 4480	w/ DCU Later Design Post-4460 and Post-4480	w/ DCU 4 and 6 Sector designs	
1	1	Router PS-2*/Future		Radio 4460 B25/66 ζ-1	
2	2	Future		Radio 4460 B25/66 ζ-2	
3	LVD1	PSU 4813 feeding B25/66 α, β and γ (AIR 1641s)		PSU 4813 feeding B41-δ & B71/12-δ (Air 6449s and Radio 4480s)	
4	4				
5	5	PSU 4813 feeding B41 α, β and γ (Air 6449s)			
6	6				
7	LVD2	PSU 4813 feeding B71/12 α, β and γ (Radio 4449s)	PSU 4813 feeding B71/12 α, β and γ (Radio 4480s)		
8		2			
9	45.1V	Future	Radio 4460 B25/66 δ-1		
10		3	Radio 4460 B25/66 δ-2		
11		4	Radio 4460 B25/66 ε-1		
12		5	Radio 4460 B25/66 ε-2		
13	BLVD	Router PS-1			
14		1	Radio 4415 B25/66 α	Radio 4460 B25/66 α-1	
15		2	Radio 4415 B25/66 β	Radio 4460 B25/66 α-2	
16		3	Radio 4415 B25/66 γ	Radio 4460 B25/66 β-1	
17		4	PSU 4813 feeding B2/25 α, β and γ (Radio 4424s)	Radio 4460 B25/66 β-2	
18		5	Future	Radio 4460 B25/66 γ-1	
19		6	Future	Radio 4460 B25/66 γ-2	
20		7	DCDU		
21		8	AAV		

Sector Identification  
α = Alpha, β = Beta, γ = Gamma, δ = Delta, ε = Epsilon, ζ = Zeta



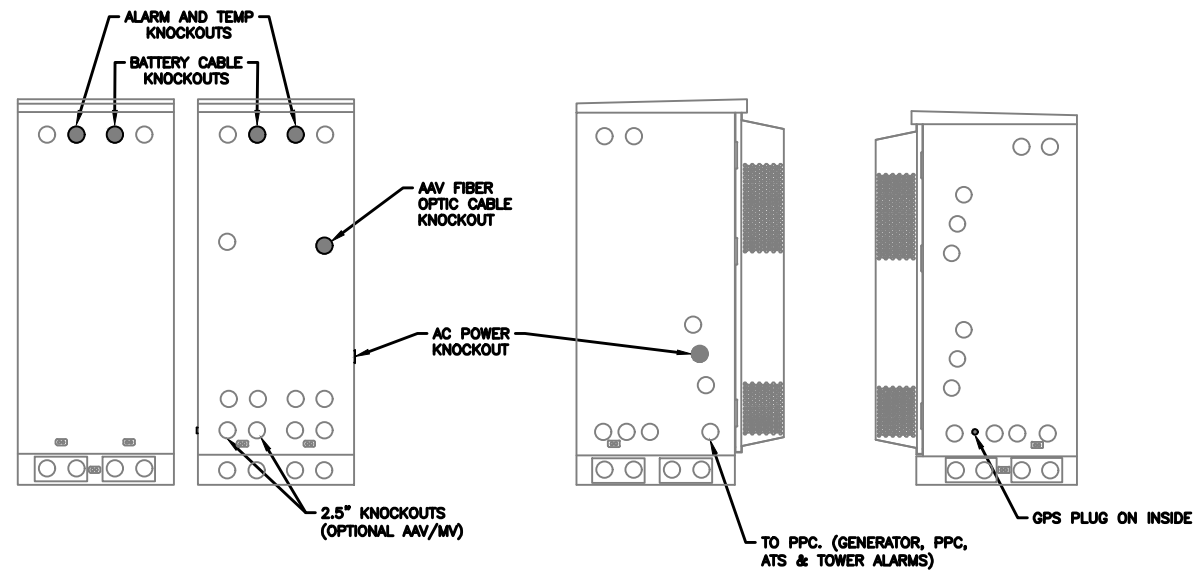
**POWER SUBRACK**



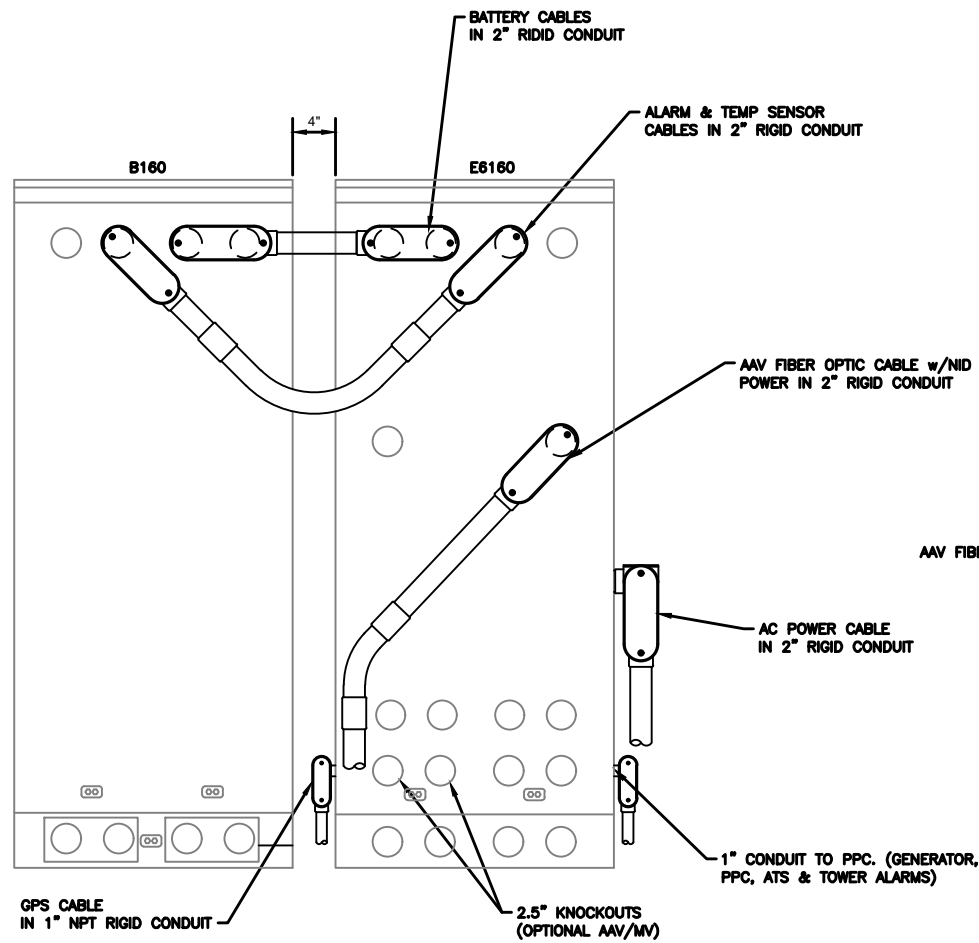
**DC DISTRIBUTION**

**NOTE:**

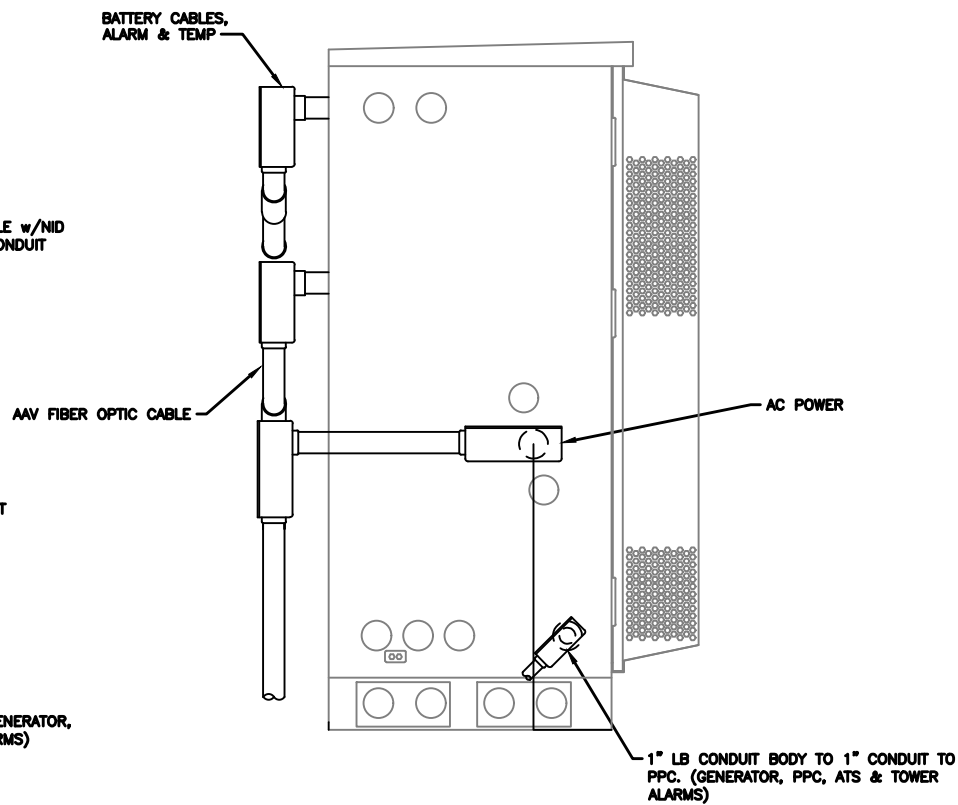
1. ALL CONDUIT AND FITTING ENTRANCES INTO CABINETS AND ENCLOSURES MUST UTILIZE MYERS OR EQUIVALENT HUBS OR SEALING WASHERS TO PREVENT WATER ENTRY/SEEPAGE INTO CABINETS AND ENCLOSURES.
2. (LIQUIDFLEX) FLEXIBLE METALLIC CONDUIT (LFMC) & ASSOCIATED FITTINGS CAN BE USED AS NEEDED BUT ONLY FOR TIGHT CONDUIT BENDS AND RUNS SUBJECT TO UL AND NEC LIMITATIONS. 6' MAX PER CONDUIT RUN.
3. POWER CONDUIT BODY ATTACHED WITH SHORT NIPPLE AND SEALING WASHER INSIDE & OUT. (FOR DOOR HOOD CLEARANCE)
4. PULLING ELBOWS MAY BE USED IN LIEU OF A CONDUIT BODIES WHEN CLEARANCE IS LIMITED.
5. ALL EXTERNAL ALARM CONDUITS ARE TO TERMINATE AT THE PPC WITH A SINGLE 1" ALARM CONDUIT TO THE 6160.
6. (DO NOT USE CHASE NIPPLES) CONDUIT SHOULD HAVE SEALING WASHERS INSIDE AND OUT w/ LOCK NUT AND CAP.



CONDUIT LOCATIONS

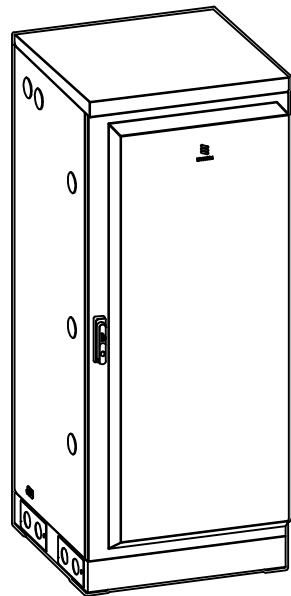


REAR VIEW



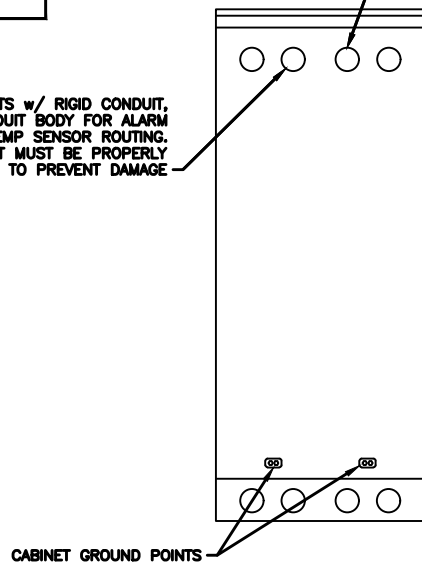
SIDE VIEW

MANUFACTURER:	ERICSSON
MODEL:	B160 BATTERY CABINET
DIMENSIONS:	63" x 25.6" x 29.5" (H x W x D)
WEIGHT:	295 LBS (WITHOUT BATTERIES)

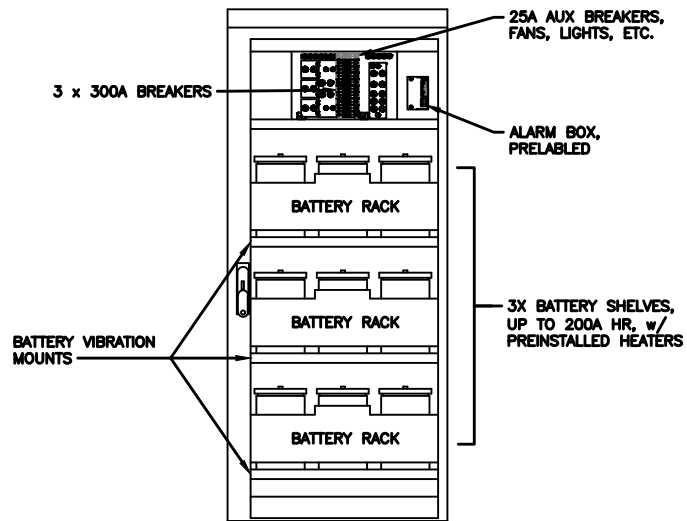


2.5" KNOCKOUTS w/ RIGID CONDUIT, LB CONDUIT BODY FOR ALARM CABLE & TEMP SENSOR ROUTING. CONDUIT MUST BE PROPERLY SECURED TO PREVENT DAMAGE

2.5" KNOCKOUTS w/ RIGID CONDUIT, LB CONDUIT BODY FOR BATTERY CABLE CONDUIT MUST BE PROPERLY SECURED TO PREVENT DAMAGE

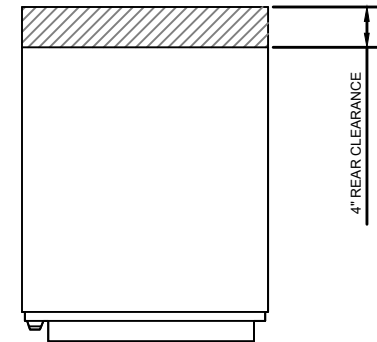


REAR VIEW



FRONT VIEW (DOOR OPEN)

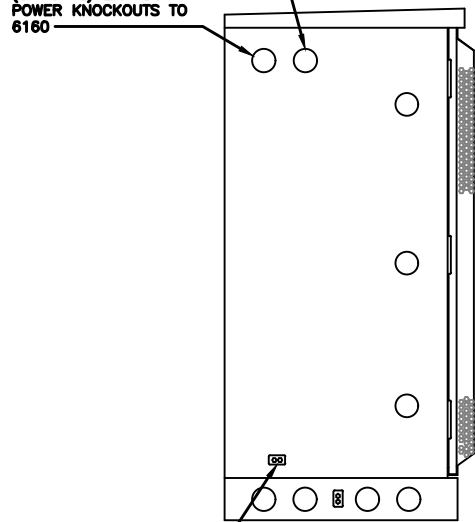
NOTE:  
 • CORRECT KNOCKOUT TOOL REQUIRED FOR PUNCHING KNOCKOUTS. DO NOT DRILL THROUGH KNOCKOUTS  
 • CONDUIT MUST BE PROPERLY SECURED TO PREVENT DAMAGE TO CABINETS AND OR CABLING



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

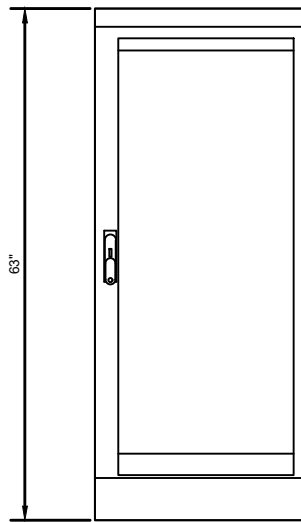
(OPTIONAL) 2.5" KNOCKOUTS FOR ALARM & TEMP SENSOR ROUTING TO 6160

(OPTIONAL) 2.5" DC POWER KNOCKOUTS TO 6160

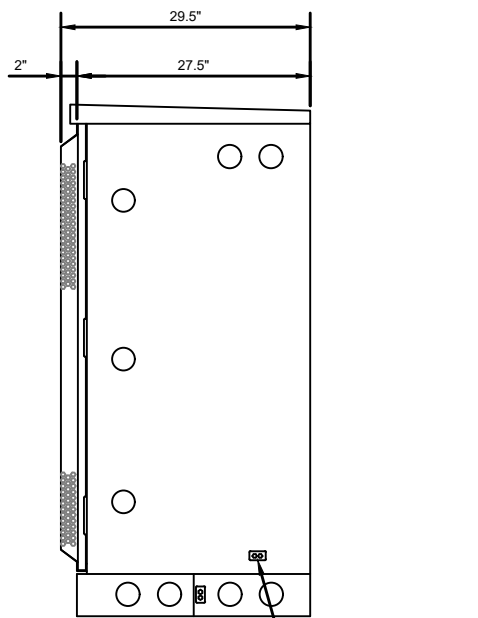


CABINET GROUND POINT

LEFT VIEW

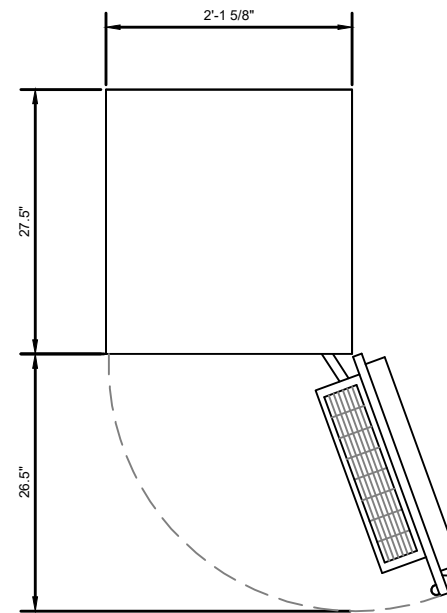


FRONT VIEW



CABINET GROUND POINT

RIGHT VIEW

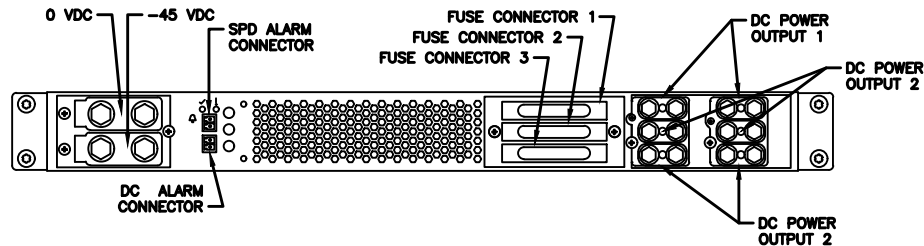
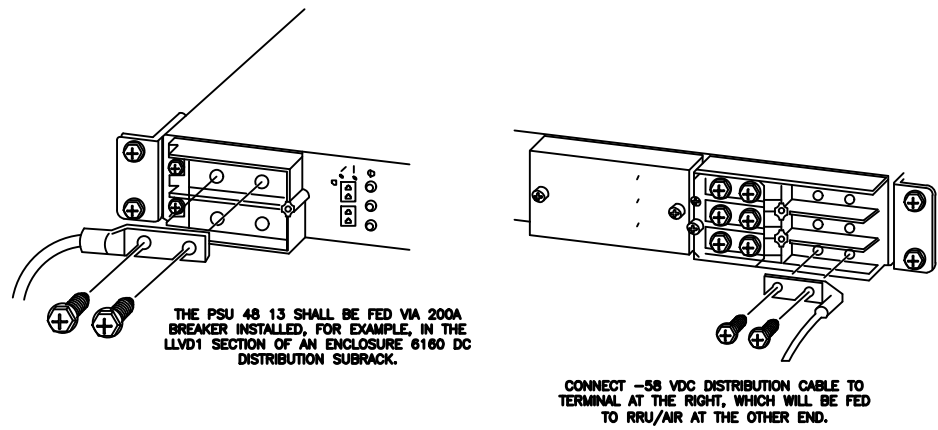
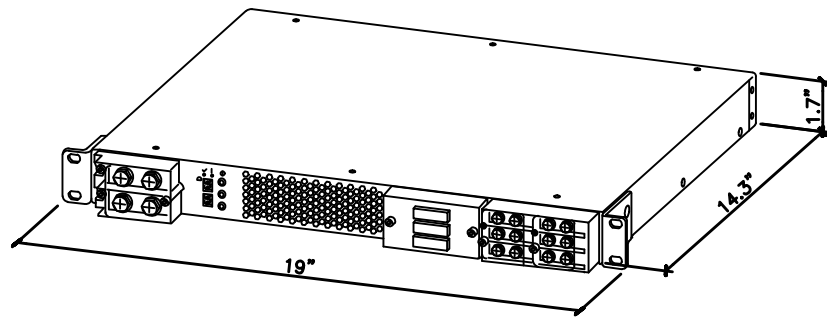


PLAN VIEW

B160 ERICSSON SITE SUPPORT BATTERY CABINET

MANUFACTURER: ERICSSON  
 MODEL: PSU 48 13  
 WEIGHT: 17.1 LBS  
 DIMENSIONS: 19"x 1.7"x 14.3"

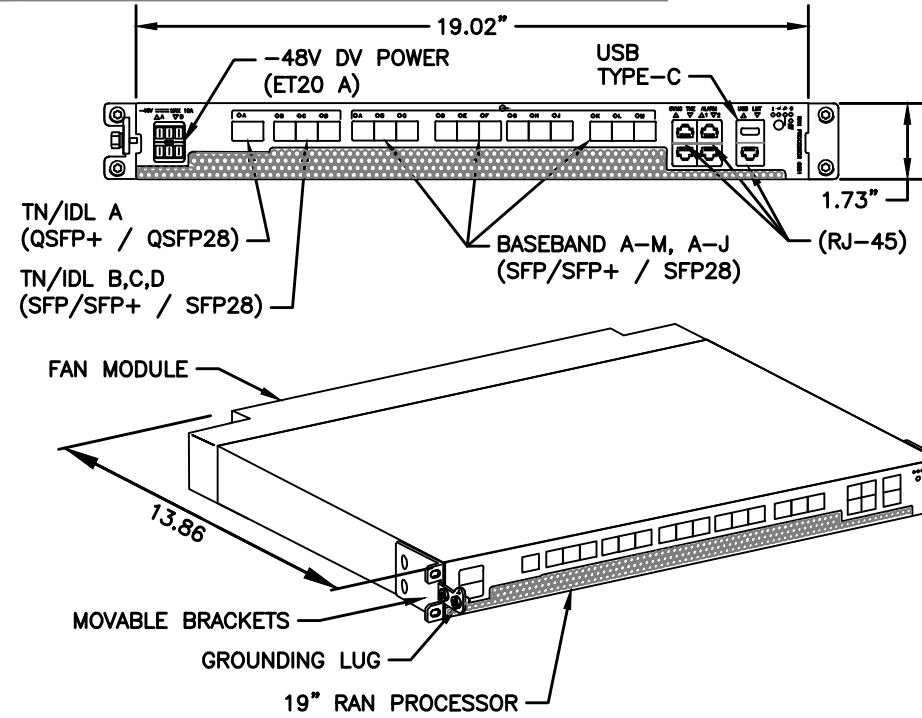
NEEDED INSTALL KIT (PICK 1)  
 34133 PSU4813 INSTALL KIT FOR RBS61XX  
 34134 PSU4813 INSTALL KIT FOR PBC6200  
 34135 PSU4813 INSTALL KIT FOR 6X60/RBS6230



1 SKU# 34132 - PSU 48 13

SCALE: N.T.S.

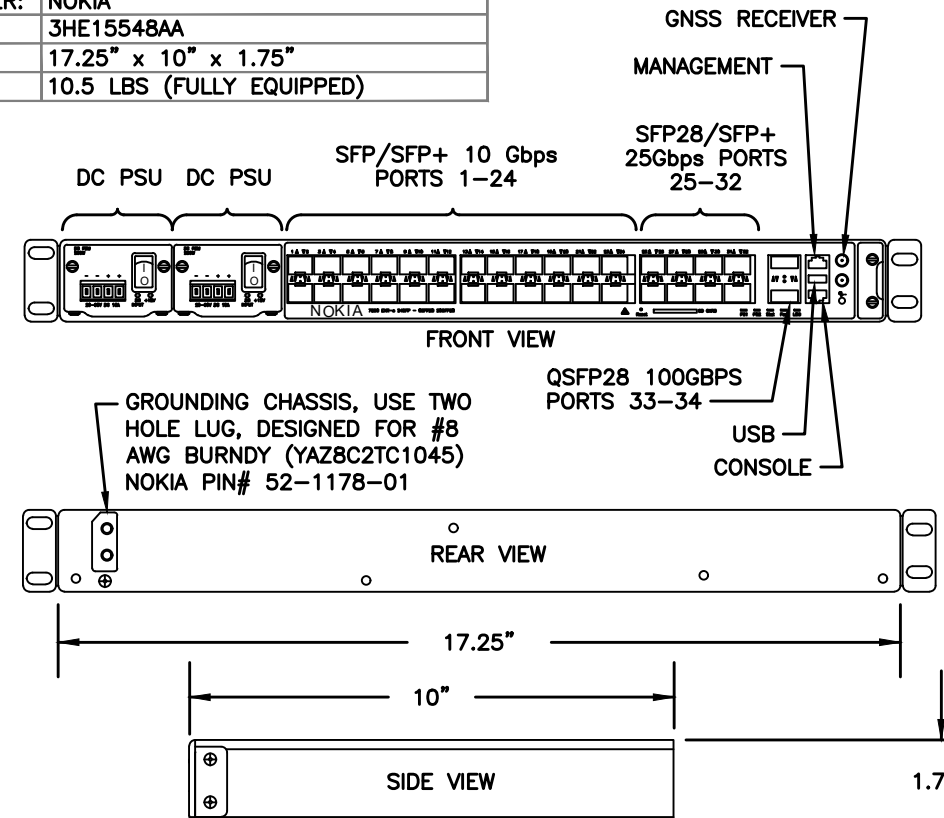
MANUFACTURER: ERICSSON  
 MODEL: 6651 RAN PROCESSOR (KDU1370093/11)  
 DIMENSIONS: 1.73" X 19.02" X 13.86" (H" X W" X D")  
 WEIGHT: 16.98 LBS



2 34553 - ERICSSON 6651 RAN PROCESSOR

SCALE: N.T.S.

MANUFACTURER: NOKIA  
 MODEL: 3HE15548AA  
 DIMENSIONS: 17.25" x 10" x 1.75"  
 WEIGHT: 10.5 LBS (FULLY EQUIPPED)



3 34097 - NOKIA 7250 IXR-e ROUTER w/ GNSS

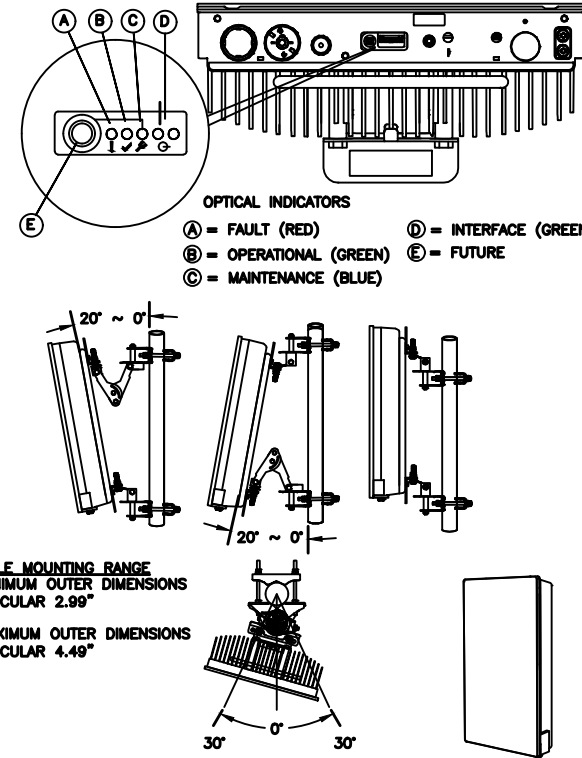
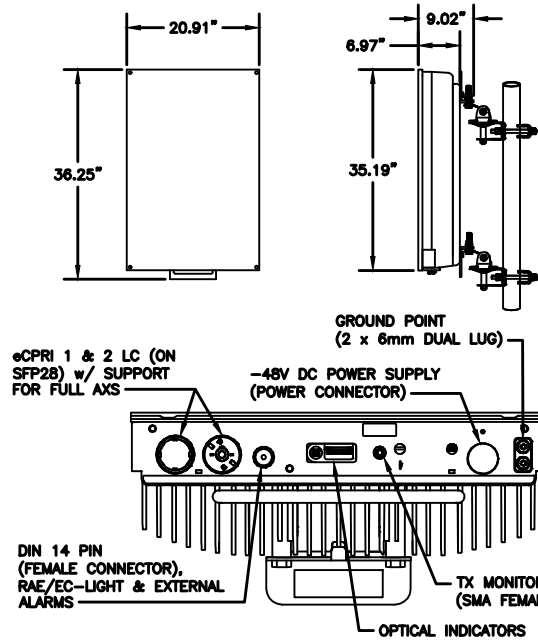
SCALE: N.T.S.

NOTE: THIS SHEET CREATED BY OTHERS AND PROVIDED BY REQUEST OF CUSTOMER WITHOUT EDIT.

SUPPLEMENTAL

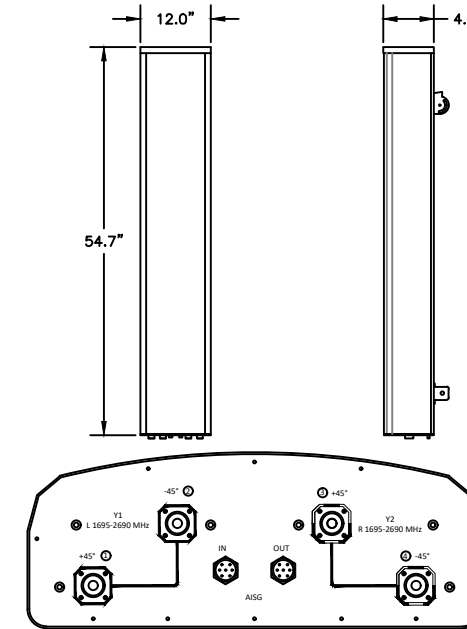
SHEET NUMBER: R-607  
 REVISION: 0

MANUFACTURER:	ERICSSON
MODEL:	AIR 6419 B41 (2.5GHz M-MIMO)
DIMENSIONS:	36.25" x 20.91" x 9.02" NOT TO EXCEED (H x W x D)
WEIGHT:	83 LBS (EXCLUDING MOUNTING KIT)
MOUNT WEIGHT:	13.5 LBS (SXX109 2016/1)



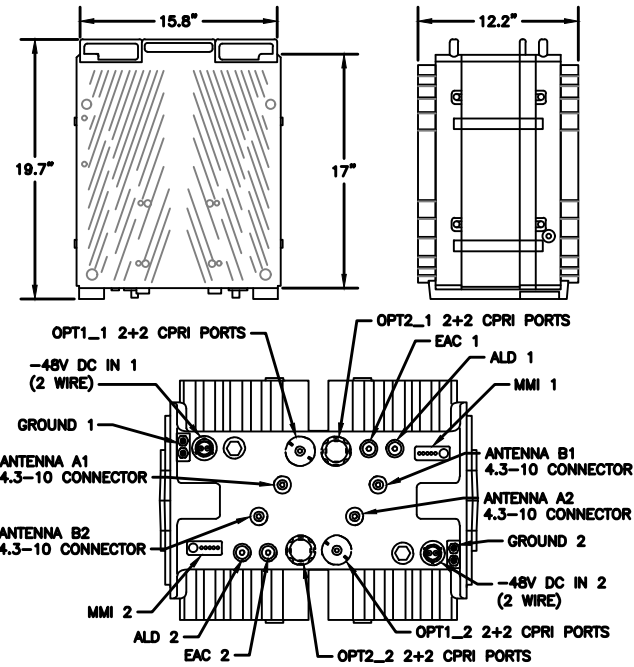
1 34552 - ERICSSON AIR 6419 BAND 41  
SCALE: N.T.S.

MANUFACTURER:	COMMSCOPE
MODEL:	VV-65A-R1
DIMENSIONS:	54.7" x 12.1" x 4.6" (H x W x D)
WEIGHT:	24.7 LB
INTERFACE:	4-PORT 4.3-10 FEMALE
MOUNTING KIT:	600899A-2 (INCLUDED) WEIGHT: 8.6 LB



2 34401 - COMMSCOPE VV-65A-R1  
SCALE: N.T.S.

MANUFACTURER:	ERICSSON
MODEL:	4460 RADIO B2/25 B66 (KRC 161 912/3)
DIMENSIONS:	19.7" x 15.8" x 12.2" (H" x W" x D")
WEIGHT:	109 LBS
BRACKET WEIGHT:	4.8 LBS (ERS HEAVY #SXX1255993/1)



3 34373 - ERICSSON 4460 RADIO B2/25 B66  
SCALE: N.T.S.

SUPPLEMENTAL

SHEET NUMBER:

R-608

REVISION:

0

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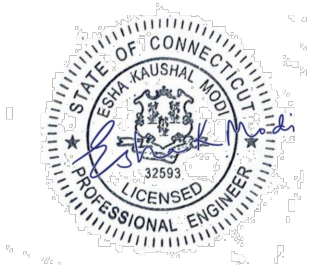


Eng. Number 14529796\_C9\_04  
 October 3, 2023  
 Page 3

## Post Modification Mount Analysis Report

**ATC Asset Name** : Middle Haddam Road-CROWN CT  
**ATC Asset Number** : 411257  
**Engineering Number** : 14529796\_C9\_04  
**Mount Elevation** : 137.5 ft  
**Proposed Carrier** : T-Mobile  
**Carrier Site Name** : CT696/Verizon Portland\_ET  
**Carrier Site Number** : CT11696E  
**Site Location** : 191 Middle Haddam Rd  
 Portland, CT 06480-1767  
 41.5623, -72.5738  
**County** : Middlesex  
**Date** : October 3, 2023  
**Max Usage** : 95%  
**Analysis Result** : Contingent Pass

Prepared By:  
 Max Carter  
 Structural Engineer II



Digitally Signed: 2023-10-05

COA: PEC.0001553

A.T. Engineering Service, PLLC - 3500 Regency Parkway, Suite 100 - Cary, NC 27518 - 919.468.0112 Office - 919.466.5414 Fax - www.americantower.com

A.T. Engineering Service, PLLC - 3500 Regency Parkway, Suite 100 - Cary, NC 27518 - 919.468.0112 Office - 919.466.5414 Fax - www.americantower.com

### Introduction

The purpose of this report is to summarize results of the mount analysis performed for T-Mobile at 137.5 ft.

### Supporting Documents

<b>Previous Analysis:</b>	Telamon CLS Project #14097396_C8_01, dated May 4, 2022
<b>Radio Frequency Data Sheet:</b>	RFDS ID #CT11696E, dated August 8, 2023
<b>Reference Photos:</b>	Site photos from 2023

### Analysis

This mount was analyzed using American Tower Corporation's Mount Analysis Program and RISA-3D

<b>Basic Wind Speed:</b>	130 mph (3-Second Gust)
<b>Basic Wind Speed w/ Ice:</b>	50 mph (3-Second Gust) w/ 1.00" radial ice concurrent
<b>Codes:</b>	ANSI/TIA-222-H / 2021 IBC / 2022 Connecticut State Building Code
<b>Exposure Category:</b>	B
<b>Risk Category:</b>	II
<b>Topographic Factor Procedure:</b>	Method 2
<b>Feature:</b>	Flat
<b>Crest Height (H):</b>	0 ft
<b>Crest Length (L):</b>	0 ft
<b>Spectral Response:</b>	Ss = 0.21, S1 = 0.056
<b>Site Class:</b>	D - Stiff Soil
<b>Live Loads:</b>	Lm = 500 lbs

\* Based on experience, it has been determined that the Lv load cases will not control over Lm load cases in platform mount analyses. Therefore, these load cases have been excluded from this analysis.

### Conclusion

Based on the analysis results, the antenna mount meets the requirements per the applicable codes listed above provided the modifications listed below are completed:

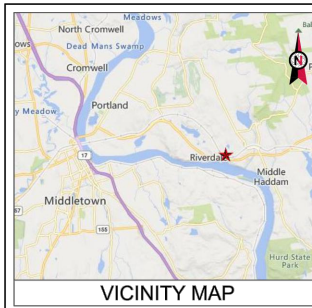
- Install modification per ATC Drawing #14529796\_C9\_04

If you have any questions or require additional information, please reach out to your American Tower contact. If you do not have an American Tower contact and have an Engineering question, please contact MountAnalysis@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

NOTE: THIS SHEET WAS CREATED BY OTHERS AND PROVIDED AT THE REQUEST OF THE CUSTOMER WITHOUT EDIT. PLEASE REFERENCE THE MOUNT ANALYSIS REPORT FOR COMPLETE MOUNT ANALYSIS CALCULATIONS AND DETAILS. SUPPLEMENTAL PAGES INCLUDED IN THE CONSTRUCTION DRAWINGS ARE FOR REFERENCE ONLY. GENERAL CONTRACTOR IS TO VERIFY THEY HAVE THE MOST RECENT MOUNT ANALYSIS PRIOR TO CONSTRUCTION.

SUPPLEMENTAL

SHEET NUMBER: <b>R-609</b>	REVISION: <b>0</b>
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**AMERICAN TOWER®**  
SITE NAME: MIDDLE HADDAM ROAD-CROWN CT  
SITE NUMBER: 411257  
ATC PROJECT NUMBER: 14529796\_C9\_04  
SITE ADDRESS: 191 MIDDLE HADDAM RD  
PORTLAND, CT 06480



**AMERICAN TOWER®**  
A.T. ENGINEERING SERVICE, PLLC  
3000 REGENCY PARKWAY  
SUITE 100  
CARY, NC 27519  
PHONE: 919-468-6112  
COA: PEC-0001503

THESE DRAWINGS AND/OR THE ACCOMPANYING SPECIFICATIONS ARE PREPARED BY AMERICAN TOWER FOR THE PROJECT AND ARE NOT TO BE USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN PERMISSION OF AMERICAN TOWER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND ABIDING BY ALL REQUIRED PERMITS.

REV. DESCRIPTION BY DATE  
1. FIRST ISSUE SEP 100423

ATC SITE NUMBER: 411257  
ATC SITE NAME: MIDDLE HADDAM ROAD-CROWN CT  
CONNECTICUT  
SITE ADDRESS: 191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

**MOUNT REINFORCEMENT DRAWINGS  
PREPARED FOR T-MOBILE**

PROJECT TEAM	PROJECT INFORMATION	SHEET	SHEET TITLE	REV.	
<b>TOWER OWNER</b> AMERICAN TOWER 10 PRESIDENTIAL WAY WOBURN, MA 01801	THE PROJECT DESCRIBED IN THESE PLANS IS BASED ON THE RECOMMENDATIONS OUTLINED IN THE STRUCTURAL ANALYSIS COMPLETED UNDER PROJECT NUMBER HSDFW_C9_01 DATED 09/18/2023. SATISFACTORY COMPLETION OF THIS WORK INDICATED IN THESE PLANS WILL RESULT IN THE STRUCTURE MEETING THE REQUIREMENTS OF THE SPECIFICATIONS UNDER WHICH THE STRUCTURE WAS COMPLETED.  THE PROJECT DESCRIBED IN THESE PLANS QUALIFIES AS AN ELIGIBLE PROJECT FOR REQUEST FOR REVIEW UNDER 47 U.S.C. § 1453(a) AS A MODIFICATION OF AN EXISTING WIRELESS TOWER THAT INVOLVES THE COLLOCATION, REMOVAL, AND/OR REPLACEMENT OF TRANSMISSION EQUIPMENT THAT IS NOT A SUBSTANTIAL CHANGE UNDER 47 U.S.C. § 1453 (b)(7).	G-001	COVER	0	
<b>ENGINEERED BY</b> ATC TOWER SERVICES 3000 REGENCY PARKWAY, SUITE 100 CARY, NC 27519		<b>PROJECT NOTE</b>	G-002	IBC GENERAL NOTES & MOUNT MODIFICATION INSPECTION	0
<b>CARRIER INFORMATION</b> CARRIER: T-MOBILE CARRIER SITE NAME: CTW/VERIZON PORTLAND, LT CARRIER SITE NUMBER: CT11986		<b>COMPLIANCE CODE</b>	S-101	MODIFICATION PROFILE & SAFETY CLIMB LAYOUT	0
<b>811 Know what's Below. Call before you dig.</b>	<b>PROJECT LOCATION GEOGRAPHIC COORDINATES</b> LATITUDE: 41.8224711 LONGITUDE: -72.8779911	R-901	POST MODIFICATION MOUNT ANALYSIS REPORT	--	

**Esha Modi**  
11/27/23-04/24  
Mod 11/27/23-04/24

Digitally signed by Esha Modi  
DN: cn=Esha Modi, o=American Tower Corporation

Drawn by: SEP  
Approved by: MJC  
Date Drawn: 10/04/23  
ATC Job No.: 14529796\_C9\_04

COVER

SHEET NUMBER: G-001 REVISION: 0

**GENERAL**

1. ALL WORK TO BE COMPLETED PER APPLICABLE LOCAL, STATE, FEDERAL CODES AND ORDINANCES AND COMPLY WITH ATC CONSTRUCTION SPECIFICATIONS FOR WIRELESS TOWER SITES. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND ABIDING BY ALL REQUIRED PERMITS.
2. ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN TOWER AND FOUNDATION CONSTRUCTION.
3. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD IMMEDIATELY OF ANY INSTALLATION INTERFERENCES. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. DETAILS NOT SPECIFICALLY SHOWN ON THE DRAWINGS SHALL FOLLOW SIMILAR DETAILS FOR THIS JOB.
4. ANY SUBSTITUTIONS SHALL CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS, AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL SUBSTITUTIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
5. ANY MANUFACTURED DESIGN ELEMENTS SHALL CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS AND SHOULD BE SIMILAR TO THOSE SHOWN. THESE DESIGN ELEMENTS MUST BE STAMPED BY AN ENGINEER PROFESSIONALLY REGISTERED IN THE STATE OF THE PROJECT, AND SUBMITTED TO THE ENGINEER OF RECORD FOR APPROVAL PRIOR TO FABRICATION.
6. ALL WORK SHALL BE DONE IN ACCORDANCE WITH LOCAL CODES AND OSHA SAFETY REGULATIONS.
7. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY, PER ANCHOR-302 AND ANCHISEE 414.6, TO PROVIDE A COMPLETE AND STABLE STRUCTURE AS SHOWN ON THESE DRAWINGS.
8. CONTRACTORS PROPOSED INSTALLATION SHALL NOT INTERFERE, NOR DENY ACCESS TO ANY EXISTING OPERATIONAL AND SAFETY EQUIPMENT.

**WELDING**

1. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.
2. ALL WELDS SHALL BE INSPECTED VISUALLY IF DIRECTED BY ENGINEER OF RECORD. 25% OF WELDS SHALL BE INSPECTED WITH ULTRASONIC OR MAGNETIC PARTICLE METHODS. (NOTES IF REPAIRABLE DEFECTS ARE FOUND TO MEET THE ACCEPTABLE CRITERIA OF AWS D1.1, REPAIR ALL WELDS AS NECESSARY. 100% OF ALL TAIL TRIMMING WELDS SHALL BE INSPECTED WITH EITHER ULTRASONIC OR MAGNETIC PARTICLE METHODS.)
3. INSPECTION SHALL BE PERFORMED BY AN AWS CERTIFIED WELD INSPECTOR.
4. ALL ELECTRODES TO BE LOW HYDROGEN, MATCHING FILLER AND/OR BASE METAL, PER AWS D1.1, UNLESS NOTED OTHERWISE.
5. IN CASES WHERE BASE METAL GRADE IS UNKNOWN, ALL WELDING ON LATTICE TOWERS SHALL BE DONE WITH ER70X ELECTRODES. ALL WELDING ON POLE STRUCTURES SHALL BE DONE WITH ER70X ELECTRODES. ALL WELDING ON TOWER STRUCTURES SHALL BE DONE WITH ER70X ELECTRODES, UNLESS NOTED OTHERWISE.
6. PRIOR TO FIELD WELDING GALVANIZED MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING UP TO BEYOND ALL FIELD WELD SURFACES. AFTER WELD AND WELD INSPECTION IS COMPLETE, REPAIR ALL CRACKS AND WELDED SURFACES WITH ERIC GALVANITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS RECOMMENDATIONS.

**PAINT**

1. AIR REQUIRED. CLEAN AND PAINT PROPOSED STEEL ACCORDING TO FAA ADVISORY CIRCULAR AC 70/7466-1L.

**BOLT TIGHTENING PROCEDURE**

1. STRUCTURAL CONNECTIONS TO BE ASSEMBLED AND INSPECTED IN ACCORDANCE WITH RISC SPECIFICATIONS.
2. ALL BOLTS WARE AREAS ARE INSTALLED VERTICALLY UNLESS OTHERWISE NOTED. SHALL BE INSTALLED AND TIGHTENED PER SECTION 8.2.1 THROUGH 8.2.4 OF THE RISC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS PER THE FOLLOWING GUIDELINES:  
a. FOR ALL BOLTS 1" DIAMETER AND LESS.  
i. DIRECT TENSION INDICATING (DTI) BOLTS WELDED WASHERS SHALL BE INSTALLED AND TIGHTENED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS TO ACHIEVE DESIRED LEVEL OF BOLT PRE-TENSION.  
ii. FOR ALL BOLTS EXCEEDING 1" DIAMETER AND ALL OTHER HIGH-STRENGTH BOLTS, ONE OF THE FOLLOWING METHODS SHALL BE USED:  
i. DIRECT TENSION INDICATING (DTI) BOLTS WELDED WASHERS SHALL BE INSTALLED AND TIGHTENED PER MANUFACTURER SPECIFICATIONS TO ACHIEVE DESIRED LEVEL OF BOLT PRE-TENSION.  
ii. RISC TURNOFF-TURN METHOD: PRIOR TO APPLICATION OF TURN-OFF-NUT PRE-TENSIONING, ALL BOLTS IN THE CONNECTION SHALL BE BROUGHT TO A BUNG TIGHT CONDITION AS DEFINED IN RISC SECTION 6.1 AND MATCH-MARKING OF THE NUTS AND PROTRUDING END OF THE BOLTS MUST BE IMPLEMENTED FOR ALL BOLTS IN THE CONNECTION.

**MODIFICATION INSPECTION NOTES**

THE MOUNT MODIFICATION INSPECTION (MMI) PROCEDURE IS INTENDED TO CONFIRM THAT CONSTRUCTION AND INSTALLATION MEETS ENGINEERING DESIGN, ATC PROCEDURES AND ATC STANDARD SPECIFICATIONS FOR WIRELESS TOWER SITES.

TO ENSURE THAT THE REQUIREMENTS OF THE MMI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR SUBMIT ALL REQUIRED PHOTOGRAPHS AND DRAWINGS TO AMERICAN TOWER CORPORATION (ATC).

**GENERAL CONTRACTOR**

THE GENERAL CONTRACTOR IS REQUIRED TO:

- REVIEW THE REQUIREMENTS OF THE MMI CHECKLIST.
- UNDERSTAND ALL INSPECTION REQUIREMENTS.
- THE GENERAL CONTRACTOR SHALL PERFORM AND RECORD THE INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MMI CHECKLIST.

**BOLT LENGTHS UP TO AND INCLUDING FOUR DIAMETERS**

NUT	BOLT LENGTH	+10 TURN BEYOND BUNG TIGHT
1/2"	BOLTS UP TO AND INCLUDING 2 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
3/8"	BOLTS UP TO AND INCLUDING 2 1/2 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1/4"	BOLTS UP TO AND INCLUDING 3 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1"	BOLTS UP TO AND INCLUDING 4 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/4"	BOLTS UP TO AND INCLUDING 4 1/2 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/2"	BOLTS UP TO AND INCLUDING 5 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 3/4"	BOLTS UP TO AND INCLUDING 5 1/2 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 3/8"	BOLTS UP TO AND INCLUDING 6 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/2"	BOLTS UP TO AND INCLUDING 6 1/2 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/4"	BOLTS UP TO AND INCLUDING 7 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/2"	BOLTS UP TO AND INCLUDING 7 1/2 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/4"	BOLTS UP TO AND INCLUDING 8 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/2"	BOLTS UP TO AND INCLUDING 8 1/2 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 3/4"	BOLTS UP TO AND INCLUDING 9 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/2"	BOLTS UP TO AND INCLUDING 9 1/2 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/2"	BOLTS UP TO AND INCLUDING 10 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT

**BOLT LENGTHS OVER FOUR DIAMETERS BUT NOT EXCEEDING EIGHT DIAMETERS**

NUT	BOLT LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/2"	BOLTS 2.25 TO 4 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/2"	BOLTS 2.75 TO 4 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 3/8"	BOLTS 3.25 TO 4 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 3/8"	BOLTS 3.75 TO 4 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/4"	BOLTS 4.25 TO 4 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/4"	BOLTS 4.75 TO 4 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 3/4"	BOLTS 5.25 TO 4 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 3/4"	BOLTS 5.75 TO 4 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/2"	BOLTS 6.25 TO 4 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/2"	BOLTS 6.75 TO 4 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/4"	BOLTS 7.25 TO 4 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/4"	BOLTS 7.75 TO 4 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/2"	BOLTS 8.25 TO 4 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/2"	BOLTS 8.75 TO 4 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT
1 1/2"	BOLTS 9.25 TO 4 INCH LENGTH	+10 TURN BEYOND BUNG TIGHT

**MAXIMUM ALLOWABLE ANGLE CLIP**

AREA OF ANGLE TO BE CLIP

5 X 5 X MAX.

**INSPECTION DOCUMENT**

INSPECTION DOCUMENT	DESCRIPTION	INSPECTION TESTING REQUIRED	RESPONSIBILITY
ON-SITE COLD GALVANIZING VERIFICATION REPORT	PHOTOGRAPHIC EVIDENCE OF COLD GALVANIZING TYPE AND APPLICATION IN ALL APPLICABLE LOCATIONS TO BE INCLUDED WITHIN THE MMI REPORT	✓	GC
GC AS-BUILT DRAWINGS WITH CONSTRUCTION RED LINES	"AS-BUILT" DRAWINGS INDICATING ANY APPROVED CHANGES TO ENGINEERED PLANS TO MMI FOR APPROVAL/REVIEW AND INCLUSION IN MMI REPORT	✓	GC
PHOTOGRAPHS	PHOTOGRAPHIC EVIDENCE OF MOUNT MODIFICATION INSPECTION, ON SITE REEXAMINATION, AND ITEMS FAILING INSPECTION & REQUIRING FOLLOW UP TO BE INCLUDED WITHIN THE MMI REPORT. COMPLETE PHOTO LOG IS TO BE SUBMITTED WITHIN MMI REPORT.	✓	GC

**MOUNT MODIFICATION INSPECTION CHECKLIST**

INSPECTION DOCUMENT	DESCRIPTION	INSPECTION TESTING REQUIRED	RESPONSIBILITY
ON-SITE COLD GALVANIZING VERIFICATION REPORT	PHOTOGRAPHIC EVIDENCE OF COLD GALVANIZING TYPE AND APPLICATION IN ALL APPLICABLE LOCATIONS TO BE INCLUDED WITHIN THE MMI REPORT	✓	GC
GC AS-BUILT DRAWINGS WITH CONSTRUCTION RED LINES	"AS-BUILT" DRAWINGS INDICATING ANY APPROVED CHANGES TO ENGINEERED PLANS TO MMI FOR APPROVAL/REVIEW AND INCLUSION IN MMI REPORT	✓	GC
PHOTOGRAPHS	PHOTOGRAPHIC EVIDENCE OF MOUNT MODIFICATION INSPECTION, ON SITE REEXAMINATION, AND ITEMS FAILING INSPECTION & REQUIRING FOLLOW UP TO BE INCLUDED WITHIN THE MMI REPORT. COMPLETE PHOTO LOG IS TO BE SUBMITTED WITHIN MMI REPORT.	✓	GC

**GENERAL CONTRACTOR**

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- REVIEW THE REQUIREMENTS OF THE MMI CHECKLIST.
- UNDERSTAND ALL INSPECTION REQUIREMENTS.
- THE GENERAL CONTRACTOR SHALL PERFORM AND RECORD THE INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MMI CHECKLIST.

**AMERICAN TOWER®**  
A.T. ENGINEERING SERVICE, PLLC  
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SUITE 100  
CARY, NC 27519  
PHONE: 919-468-6112  
COA: PEC-0001503

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REV. DESCRIPTION BY DATE  
1. FIRST ISSUE SEP 100423

ATC SITE NUMBER: 411257  
ATC SITE NAME: MIDDLE HADDAM ROAD-CROWN CT  
CONNECTICUT  
SITE ADDRESS: 191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

**Esha Modi**  
11/27/23-04/24  
Mod 11/27/23-04/24

Digitally signed by Esha Modi  
DN: cn=Esha Modi, o=American Tower Corporation

Drawn by: SEP  
Approved by: MJC  
Date Drawn: 10/04/23  
ATC Job No.: 14529796\_C9\_04

**IBC GENERAL NOTES & MOUNT MODIFICATION INSPECTION**

SHEET NUMBER: G-002 REVISION: 0

**MOUNT MODIFICATION TOP VIEW**

**MOUNT MODIFICATION ISOMETRIC VIEW**

**MOUNT MODIFICATION FRONT VIEW**

**SAFETY CLIMB LOCATION**

REINFORCEMENT MATERIALS LIST (ALL SECTIONS)

QUANTITY REQUIRED	MANUFACTURER	PART NUMBER	DESCRIPTION	LENGTH (FT)	PART WEIGHT (LB)	WEIGHT (LB)	NOTES
2	SPR PRO 1	HSR-K-03	CROSSOVER KIT (CLAMP STYLE)	4'-0"	17.0	34.0	
2	SPR PRO 1	HSR-K-02	HANDRAIL TO STANDBY REINFORCEMENT KIT	6'-0"	4.0	12.0	

1. CONTRACTOR TO INSTALL MOUNT MODIFICATIONS PER THE MANUFACTURERS SPECIFICATION. MODIFICATIONS SHALL NOT OBSTRUCT, INTERFERE, OR BLOCK EXISTING SAFETY CLIMB SYSTEM. IF ANY OF THESE OCCURS DURING INSTALLATION LISTED THE AMERICAN TOWER PER INBOX PER AMERICANTOWER.COM

2. IN THE EVENT A PROPOSED MODIFICATION PART LISTED IN THE DRAWINGS IS NOT AVAILABLE, AN APPROVED EQUIVALENT MAY BE SUBSTITUTED. FOR APPROVAL OF EQUIVALENT PART OR QUESTIONS PLEASE CONTACT AMERICAN TOWER PER INBOX AT PERAMERICANTOWER.COM.

**AMERICAN TOWER®**  
A.T. ENGINEERING SERVICE, PLLC  
3000 REGENCY PARKWAY  
SUITE 100  
CARY, NC 27519  
PHONE: 919-468-6112  
COA: PEC-0001503

THESE DRAWINGS AND/OR THE ACCOMPANYING SPECIFICATIONS ARE PREPARED BY AMERICAN TOWER FOR THE PROJECT AND ARE NOT TO BE USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN PERMISSION OF AMERICAN TOWER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND ABIDING BY ALL REQUIRED PERMITS.

REV. DESCRIPTION BY DATE  
1. FIRST ISSUE SEP 100423

ATC SITE NUMBER: 411257  
ATC SITE NAME: MIDDLE HADDAM ROAD-CROWN CT  
CONNECTICUT  
SITE ADDRESS: 191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

**Esha Modi**  
11/27/23-10/05  
Mod 11/27/23-10/05

Digitally signed by Esha Modi  
DN: cn=Esha Modi, o=American Tower Corporation

Drawn by: SEP  
Approved by: MJC  
Date Drawn: 10/04/23  
ATC Job No.: 14529796\_C9\_04

**MODIFICATION PROFILE & SAFETY CLIMB LAYOUT**

SHEET NUMBER: S-101 REVISION: 0

**Option 1 - Modify; Estimate for T-Mobile @ 411257 (Middle Haddam Road/CROWN CT) -- 14529796\_C9\_04**

**Option 2 - Replace; Estimate for T-Mobile @ 411257 (Middle Haddam Road/CROWN CT) -- 14529796\_C9\_04**

**Site Data and Design Parameters**

Asset ID: 411257  
Asset Name: Middle Haddam Road/CROWN CT  
State: Connecticut  
County: Middlesex  
City: Portland  
Falling Analysis Eng #: 14529796\_C9\_01  
Mod. Drawing Eng #: 14529796\_C9\_04

**Design and Design**

Mount Analysis Date: 9/18/2023 / GW  
Design Date: 10/04/2023 / MIC  
Checked Date: /  
Designer: (Pre/Cur/Mat/Util): /  
Software: HSA  
Tower Type: Monopole 18-sided  
Mount Type: Platform w/ Handrails

**Comms**

# of FANs: 1  
Carrier: T-Mobile

**Building Codes**

TIA/EIC: ANSI/TIA-222-B / 2021 B3  
Local: 2022 Connecticut State Building Code

Falling Analysis % Code: 133% / TIA-222-B  
Post Mod % / Controlling Member: 95% / Horizontal  
Usage Limit % / Reason: 105% / N/A

Any modification design comments or assumptions? No (including notes to the estimator)

**Modification Summary**

Item #	Scope Item	Estimated Modification Cost
1	Install 2" Dia x 16' MP w/ Site Pro 1 SCR-01 crossovers on All (3) sectors (1 at position 2)	
2	Replace existing MP w/ 2" Dia x 16' MP w/ Site Pro 1 SCR-01 crossovers on All (3) sectors (1 at position 3)	
3	Install Site Pro 1 HSR-K-03 handrail reinforcement kit	

**Estimated Modification Cost**: \$17,000

**Tower Info**

Tower Number: 411257  
Tower Name: Middle Haddam Road/CROWN CT  
State: Connecticut

**Project Requirements**

Design TIA Code: Unknown  
Current TIA Code: ANSI/TIA-222-H  
IBC: 2021 IBC  
Other: 2022 Connecticut State Building Code

**Project Information**

Carrier: T-Mobile  
Structure Type: Monopole

**Recommended Mount Replacement**

Site Pro 1 VTAJSD-07  
Estimated Replacement Cost: \$ 36,000.00

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A.T. ENGINEERING SERVICE, PLLC  
3000 REGENCY PARKWAY  
SUITE 100  
CARY, NC 27519  
PHONE: 919-468-6112  
COA: PEC-0001503

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REV. DESCRIPTION BY DATE  
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ATC SITE NUMBER: 411257  
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SITE ADDRESS: 191 MIDDLE HADDAM RD  
PORTLAND, CT 06480

**Esha Modi**  
11/27/23-04/24  
Mod 11/27/23-04/24

Digitally signed by Esha Modi  
DN: cn=Esha Modi, o=American Tower Corporation

Drawn by: SEP  
Approved by: MJC  
Date Drawn: 10/04/23  
ATC Job No.: 14529796\_C9\_04

**IBC GENERAL NOTES & MOUNT MODIFICATION INSPECTION**

SHEET NUMBER: R-901 REVISION: 0

**1 MOUNT MODIFICATIONS**

**SUPPLEMENTAL**  
SHEET NUMBER: R-610  
REVISION: 0

NOTE: THIS SHEET WAS CREATED BY OTHERS AND PROVIDED AT THE REQUEST OF THE CUSTOMER WITHOUT EDIT. PLEASE REFERENCE THE MOUNT ANALYSIS REPORT FOR COMPLETE MOUNT ANALYSIS CALCULATIONS AND DETAILS. SUPPLEMENTAL PAGES INCLUDED IN THE CONSTRUCTION DRAWINGS ARE FOR REFERENCE ONLY. GENERAL CONTRACTOR IS TO VERIFY THEY HAVE THE MOST RECENT MOUNT ANALYSIS PRIOR TO CONSTRUCTION.

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**AMERICAN TOWER®**  
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## Mount Analysis Report

**ATC Asset Name** : Middle Haddam Road-CROWN CT  
**ATC Asset Number** : 411257  
**Engineering Number** : 14529796\_C8\_01  
**Mount Elevation** : 137.5 ft  
**Proposed Carrier** : T-Mobile  
**Carrier Site Name** : CT696/Verizon Portland\_ET  
**Carrier Site Number** : CT11696E  
**Site Location** : 191 Middle Haddam Rd  
Portland, CT 06480-1767  
41.562292, -72.573803  
**County** : Middlesex  
**Date** : September 18, 2023  
**Max Usage** : 153%  
**Analysis Result** : Fail

Prepared By:  
Garrett Williams  
Structural Engineer I

*Garrett Williams*



**COA: PEC.0001553**

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Conclusion..... 3

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Equipment Layout..... 7

Standard Conditions ..... Attached

Calculations..... Attached

## Introduction

The purpose of this report is to summarize results of the mount analysis performed for T-Mobile at 137.5 ft.

## Supporting Documents

<b>Previous Analysis:</b>	Telamon CLS Project #14097396_C8_01, dated May 4, 2022
<b>Radio Frequency Data Sheet:</b>	RFDS ID #CT11696E, dated August 8, 2023
<b>Reference Photos:</b>	Site photos from 2023

## Analysis

This mount was analyzed using American Tower Corporation's Mount Analysis Program and RISA-3D

<b>Basic Wind Speed:</b>	130 mph (3-Second Gust)
<b>Basic Wind Speed w/ Ice:</b>	50 mph (3-Second Gust) w/ 1.00" radial ice concurrent
<b>Codes:</b>	ANSI/TIA-222-H / 2021 IBC / 2018 Connecticut State Building Code
<b>Exposure Category:</b>	B
<b>Risk Category:</b>	II
<b>Topographic Factor Procedure:</b>	Method 2
<b>Feature:</b>	Flat
<b>Crest Height (H):</b>	0 ft
<b>Crest Length (L):</b>	0 ft
<b>Spectral Response:</b>	Ss = 0.21, S1 = 0.056
<b>Site Class:</b>	D - Stiff Soil
<b>Live Loads:</b>	Lm = 500 lbs

\*Live Load(s) reduction is confirmed to either not govern or not be applicable

\* Based on experience, it has been determined that the Lv load cases will not control over Lm load cases in platform mount analyses. Therefore, these load cases have been excluded from this analysis.

## Conclusion

Based on the analysis results, the antenna mount does not meet the requirements per the applicable codes listed above. Modifications to be designed in subsequent service to address below failures:

- Install P2 (2.375" x 60") antenna mounting pipe (Mount Pipe A2, B2, & C2) with Site Pro 1 SCX7-U (or approved equivalent) crossover plate kits.
- Replace Mount Pipe(s) A3, B3, & C3 with P2 (2.375" x 96") antenna mounting pipe with Site Pro 1 SCX7-U (or approved equivalent) crossover plate kits.
- Horizontals (H019, H020, H021, H037, H038, H039, H040, H041, H042, H055, H056, H057)

If you have any questions or require additional information, please reach out to your American Tower contact. If you do not have an American Tower contact and have an Engineering question, please contact [MountAnalysis@americantower.com](mailto:MountAnalysis@americantower.com). Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

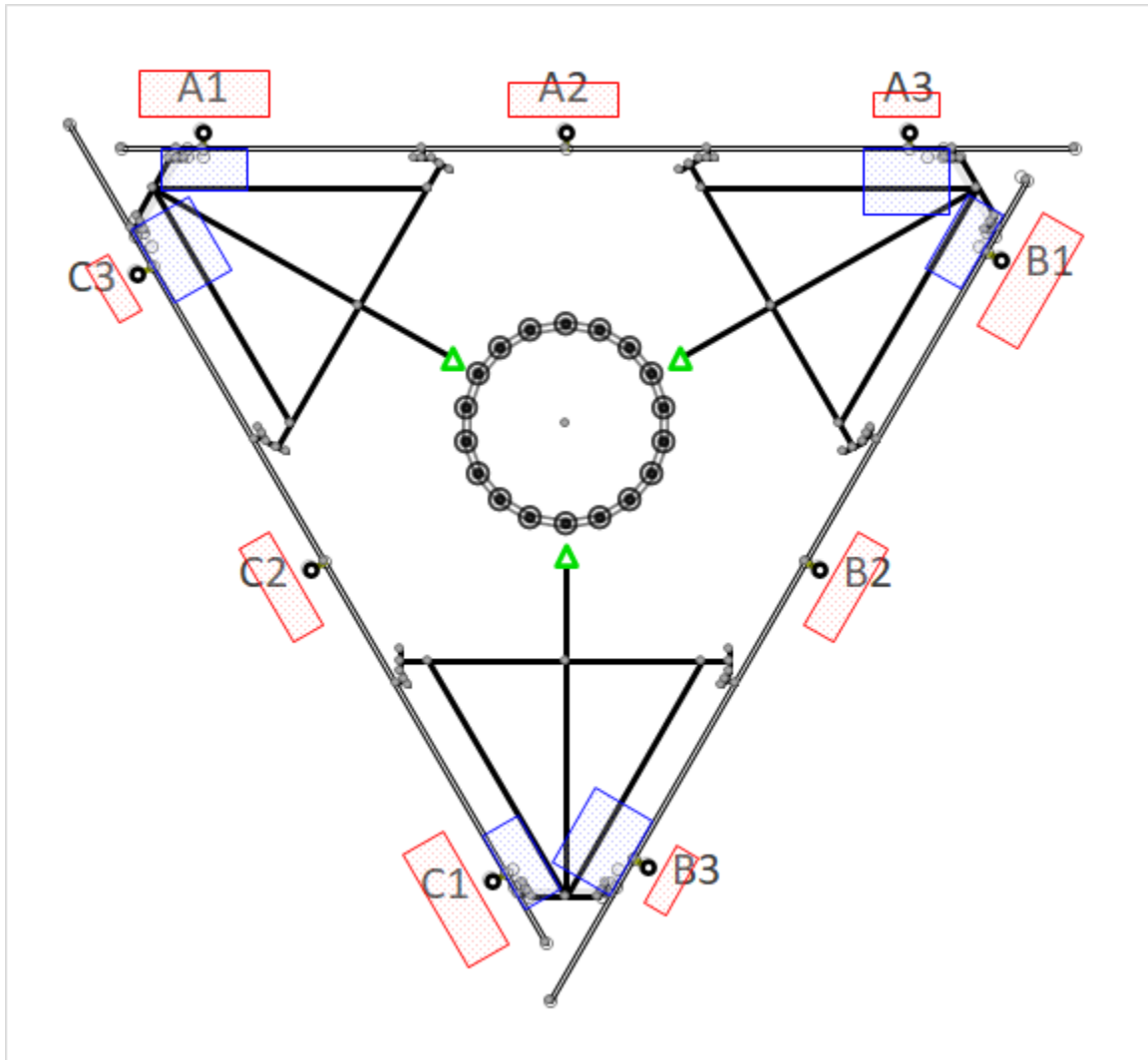
**Application Loading**

Mount Centerline (ft)	Equipment Centerline (ft)	Qty	Equipment Manufacturer & Model
137.5	139.0	3	Commscope VV-65A-R1B
		3	Ericsson AIR 6419 B41
		3	RFS APXVAALL24 43-U-NA20
		3	Ericsson 4460 BAND 2/25
		3	Ericsson 4480 BAND 71

**Structure Usages**

Structural Component	Controlling Usage	Pass/Fail
Horizontals	153%	Fail
Mount Pipes	66%	Pass
Plate Conn Check	65%	Pass

**Mount Layout**



**Equipment Position Table**

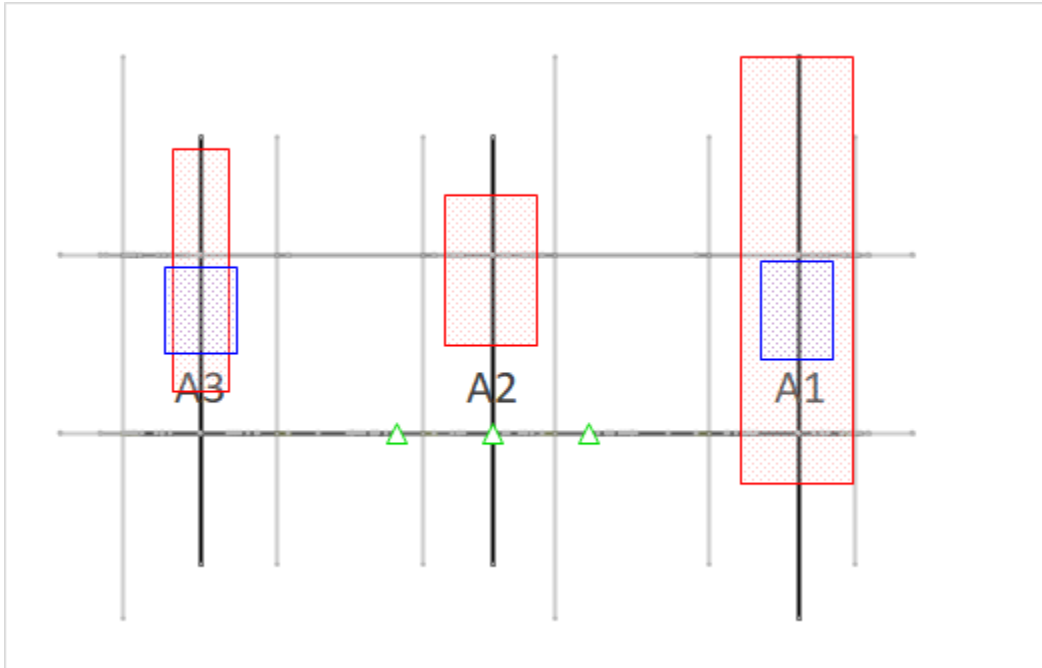
MP	RAD Center (ft)	Qty.	Antenna Model
A1	139.0	1	RFS APXVAALL24 43-U-NA20
	139.0	1	Ericsson 4480 BAND 71
A2	139.0	1	Ericsson AIR 6419 B41
A3	139.0	1	Commscope VV-65A-R1B
	139.0	1	Ericsson 4460 BAND 2/25
B1	139.0	1	RFS APXVAALL24 43-U-NA20
	139.0	1	Ericsson 4480 BAND 71
B2	139.0	1	Ericsson AIR 6419 B41
B3	139.0	1	Commscope VV-65A-R1B
	139.0	1	Ericsson 4460 BAND 2/25

**Equipment Position Table Cont.**

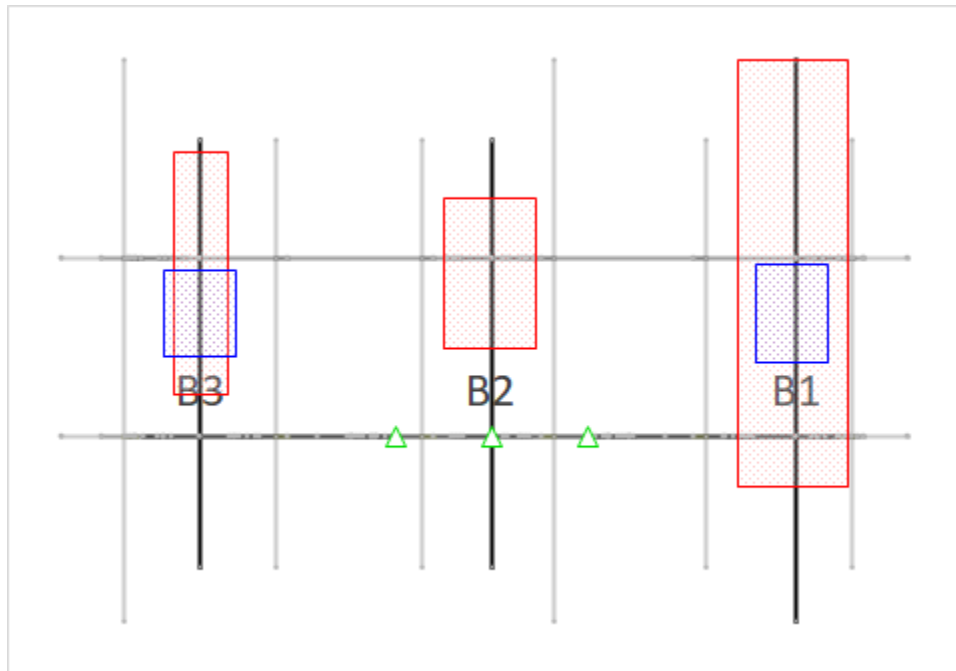
MP	RAD Center (ft)	Qty.	Antenna Model
C1	139.0	1	RFS APXVAALL24 43-U-NA20
	139.0	1	Ericsson 4480 BAND 71
C2	139.0	1	Ericsson AIR 6419 B41
C3	139.0	1	Commscope VV-65A-R1B
	139.0	1	Ericsson 4460 BAND 2/25

**Equipment Layout**

**Front View - Alpha**

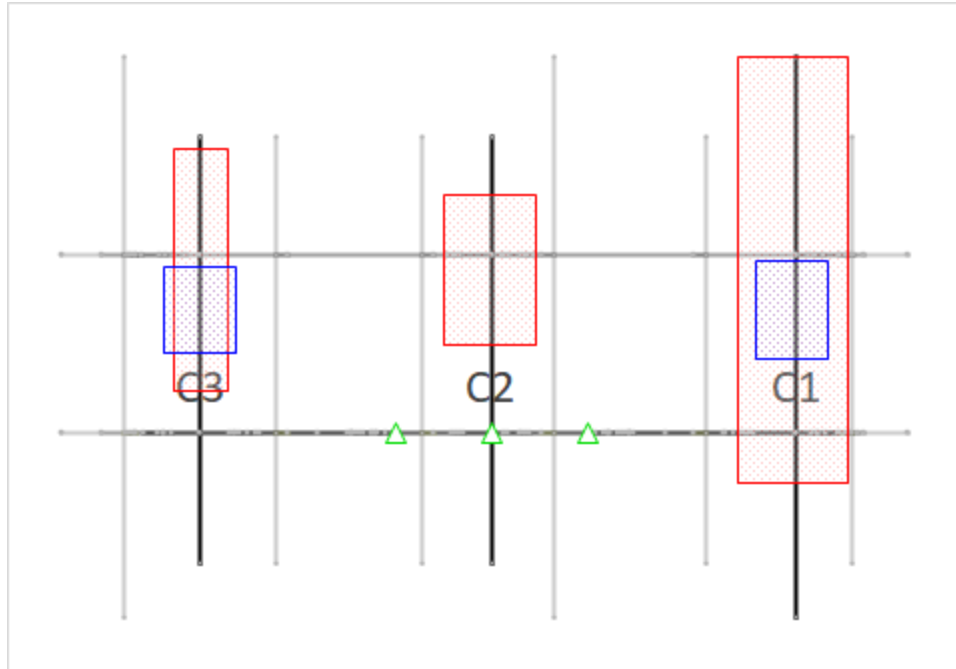


**Front View - Beta**



**Equipment Layout Cont.**

**Front View - Gamma**







## **Standard Conditions**

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding equipment, mounts, and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

All connections are to be verified for condition and tightness by the installation contractor preceding any changes to the appurtenance mounting system and/or equipment attached to it.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

Installation of all equipment and steel should be confirmed not to cause tower conflicts nor impede the tower climbing pegs.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.



**Site Number:** 411257  
**Project Number:** 14529796\_C8\_01  
**Carrier:** T-Mobile  
**Mount Elevation:** 137.5 ft  
**Date:** 9/18/2023

## Mount Analysis Force Calculations

Wind & Ice Load Calculations			
Velocity Pressure Coefficient	$K_z$	1.08	
Topographic Factor	$K_{zt}$	1.00	
Rooftop Wind Speed-up Factor	$K_s$	1.00	
Shielding Factor	$K_a$	0.90	
Ground Elevation Factor	$K_e$	0.99	
Wind Direction Probability Factor	$K_d$	0.95	
Basic Wind Speed	$V$	130	mph
Velocity Pressure	$q_z$	44.1	psf
Height Escalation Factor	$K_{iz}$	1.15	
Thickness of Radial Glaze Ice	$T_{iz}$	1.15	in

Seismic Load Calculations			
Short Period DSRAP	$S_{DS}$	0.224	
1 Second DSRAP	$S_{D1}$	0.090	
Importance Factor	$I$	1.0	
Response Modification Coefficient	$R$	2.0	
Seismic Response Coefficient	$C_s$	0.112	
Amplification Factor	$A$	1.0	
Total Weight	$W$	2599.5	lbs
Total Shear Force	$V_s$	291.1	lbs
Horizontal Seismic Load	$E_h$	291.1	lbs
Vertical Seismic Load	$E_v$	116.5	lbs

Antenna Calculations (Elevations per Application/RFDS)*								
Equipment	Height	Width	Depth	Weight	$EPA_N$	$EPA_T$	$EPA_{Ni}$	$EPA_{Ti}$
Model #	in	in	in	lbs	sqft	sqft	sqft	sqft
Commscope VV-65A-R1B	54.7	12.0	4.6	24.7	5.89	1.34	7.31	2.09
Ericsson AIR 6419 B41	33.6	20.0	6.3	68.5	5.60	0.86	6.67	1.26
RFS APXVAALL24 43-U-NA20	95.9	24.0	8.5	122.8	20.24	3.40	22.72	4.42
Ericsson 4460 BAND 2/25	19.6	15.7	12.1	109.0	2.56	1.98	3.29	2.63
Ericsson 4480 BAND 71	22.0	15.7	7.5	81.0	2.88	1.40	3.65	2.02

\* Equipment with EPA values N/A were not considered in the mount analysis

## Mount-to-Tower Connection Analysis

### Applied Loads from RISA 3D

Controlling Load Combination	6	
Node Label/ Orientation (Degrees)	N006	300
Force in X	$F_x$	2515.8 lbs
Force in Y	$F_y$	2340.2 lbs
Force in Z	$F_z$	-1494.8 lbs
Moment about X	$M_x$	-3366.2 lb-ft
Moment about Y	$M_y$	-149.6 lb-ft
Moment about Z	$M_z$	-6098.6 lb-ft

### Bolt Shear and Tensile Capacity

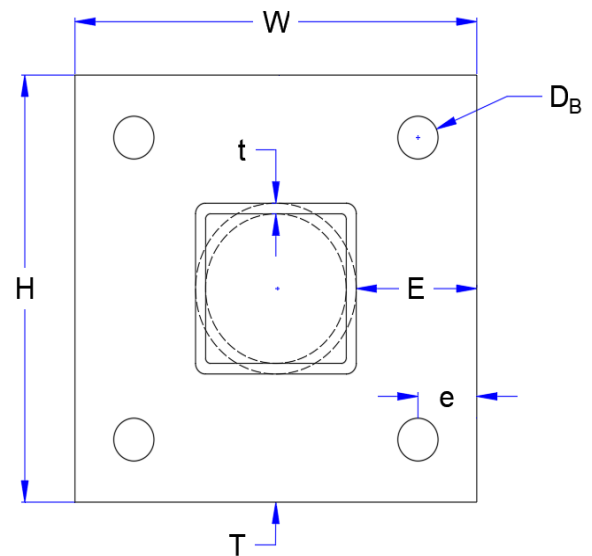
Bolt Quantity	$n$	4
Bolt Diameter	$D_B$	5/8 in
Bolt Horiz. Edge Distance	$e_h$	1 1/2 in
Bolt Vert. Edge Distance	$e_v$	1 1/2 in
Bolt Grade		A325
Bolt $F_y$	$F_{y_B}$	92 ksi
Bolt $F_u$	$F_{u_B}$	120 ksi
Applied Shear	$V_u$	0.92 k
Applied Tension	$T_u$	5.23 k
Tensile Strength	$\phi T_n$	20.3 k
Shear Strength	$\phi V_n$	13.8 k
Interaction Capacity	$(V_u/\phi V_n)^2 + (T_u/\phi T_n)^2$	7% Pass

### Plate Flexural Capacity

Plate Height	$H$	10 in
Plate Width	$W$	10 in
Plate Thickness	$T$	5/8 in
Plate Grade		A36
Plate $F_y$	$F_{y_p}$	36 ksi
Plate $F_u$	$F_{u_p}$	58 ksi
Shear Capacity	$\phi V_n$	58.1 k
Applied Moment	$M_u$	8.3 k-in
Flexural Strength	$\phi M_n$	13.6 k-in
Flexural Capacity	$M_u/\phi M_n$	61% Pass

### Base Metal Checks

Minimum Base Metal Thickness	0.206 in
Controlling Base Metal Thickness	0.250 in

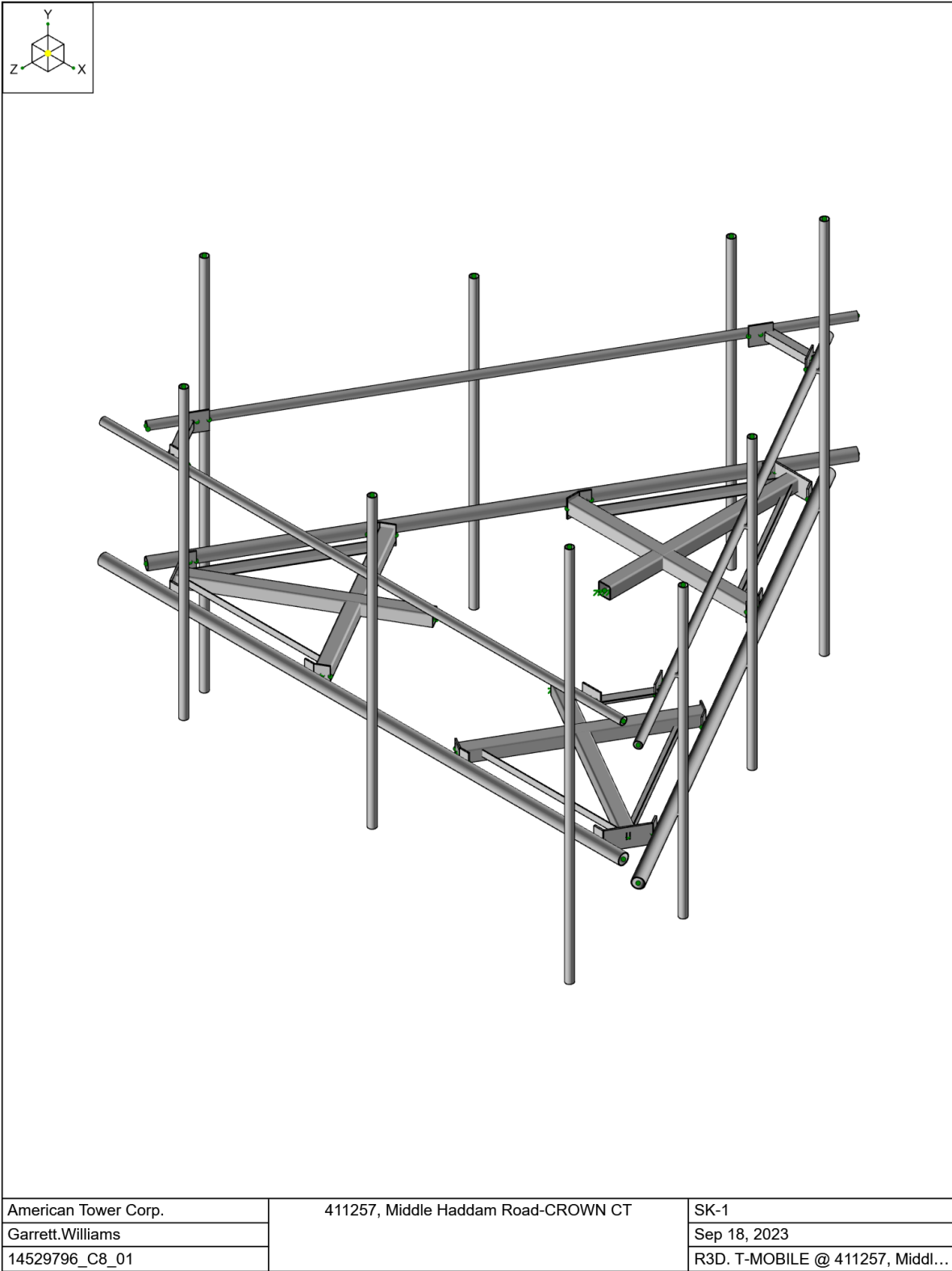


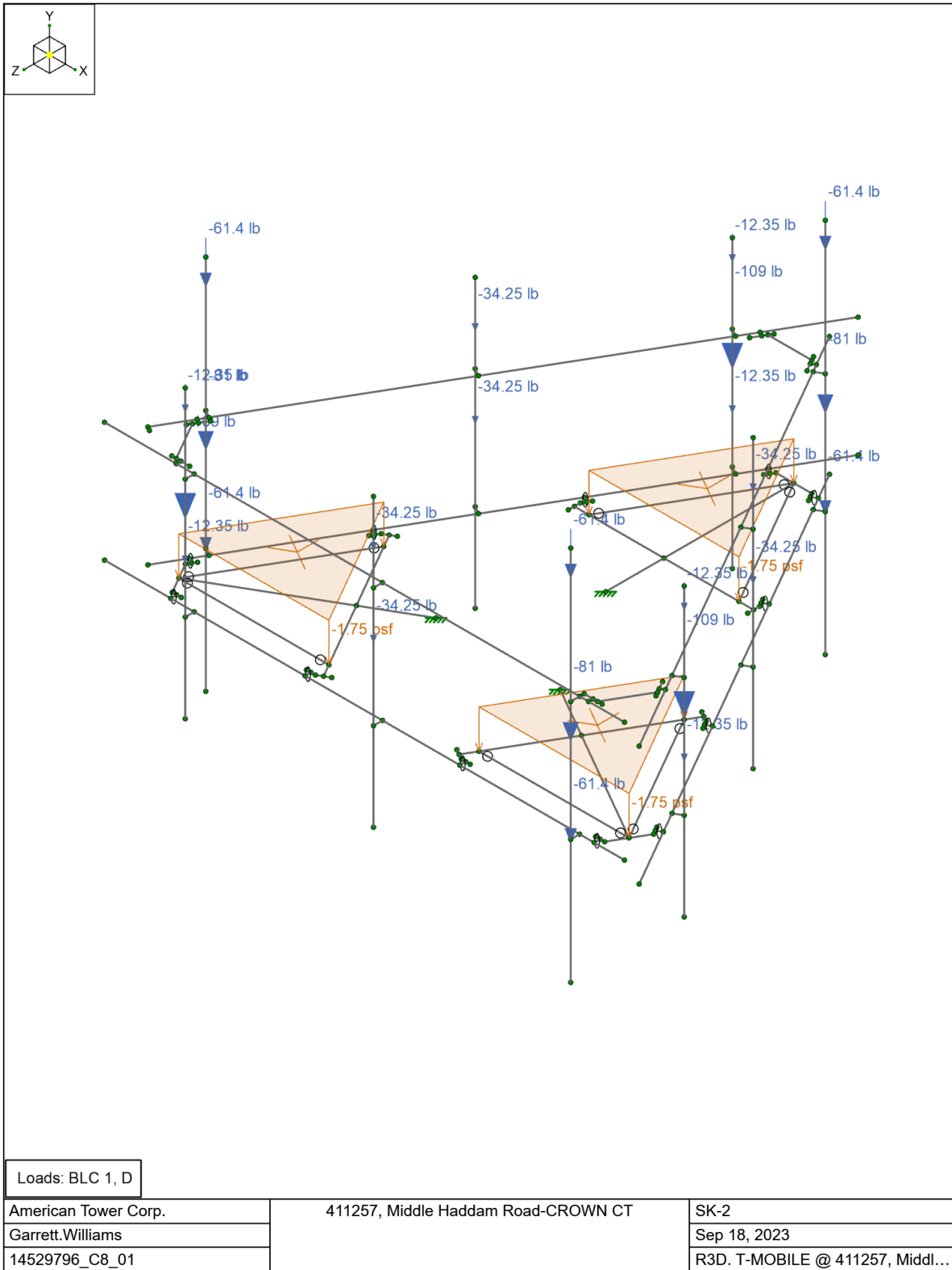
### Weld Capacity

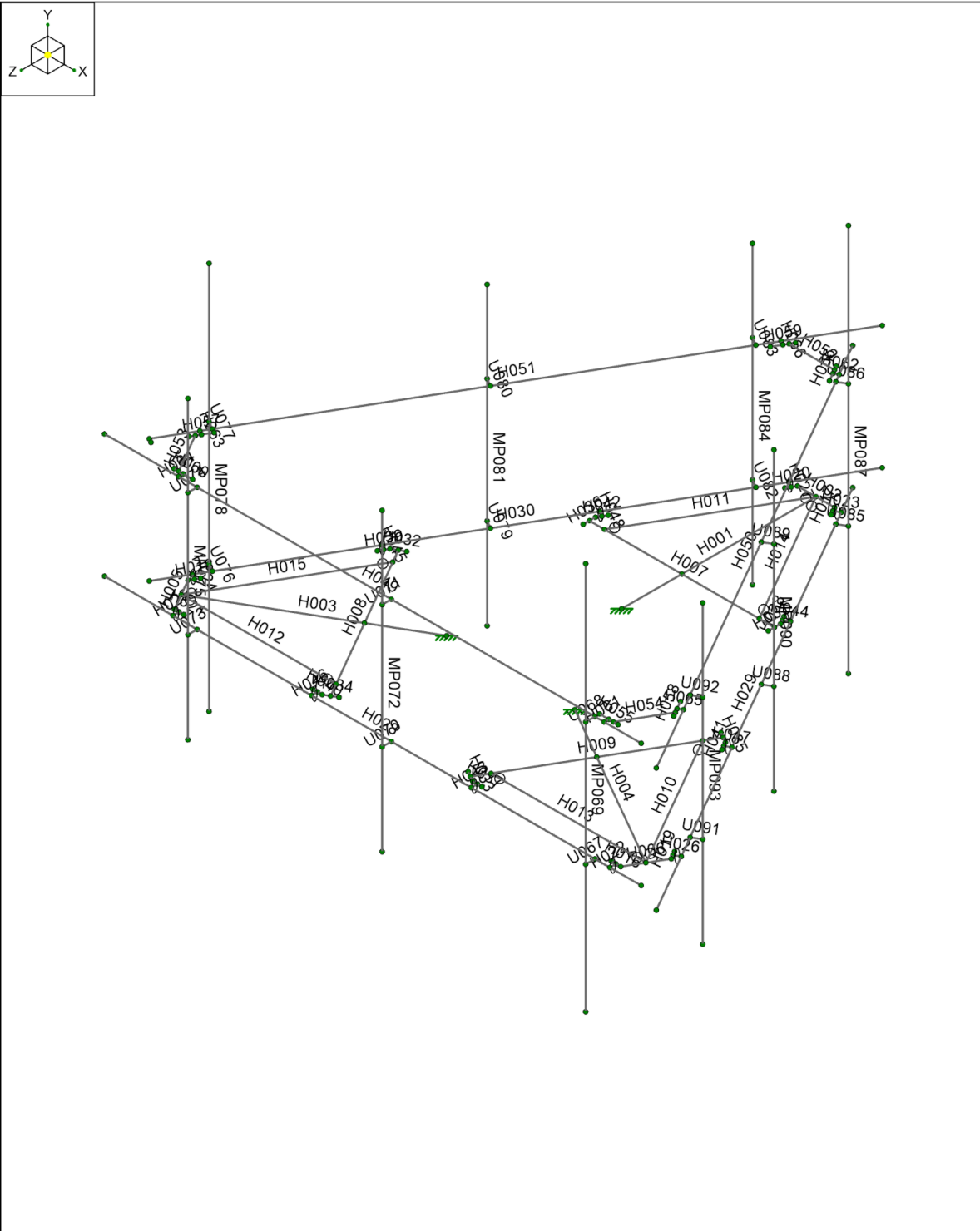
Standoff Type	Tube	
Standoff Member	HSS4x4x4	
Member Edge Distance	$E$	3 in
Member Height	$h$	4 in
Member Width	$w$	4 in
Member Thickness	$t$	0.250 in
Member Grade		A53 Gr. B
Member $F_y$	$F_{y_M}$	35 ksi
Member $F_u$	$F_{u_M}$	60 ksi
Weld Size	$a$	1/4 in
Weld Section Modulus	$S$	3.9 in <sup>3</sup>
Applied Weld Stress	$\sigma_u$	20.6 ksi
Capacity Weld Stress	$\phi \sigma_n$	31.5 ksi
Weld Utilization	$\sigma_u/\phi \sigma_n$	65% Pass

### Prying Action Considerations

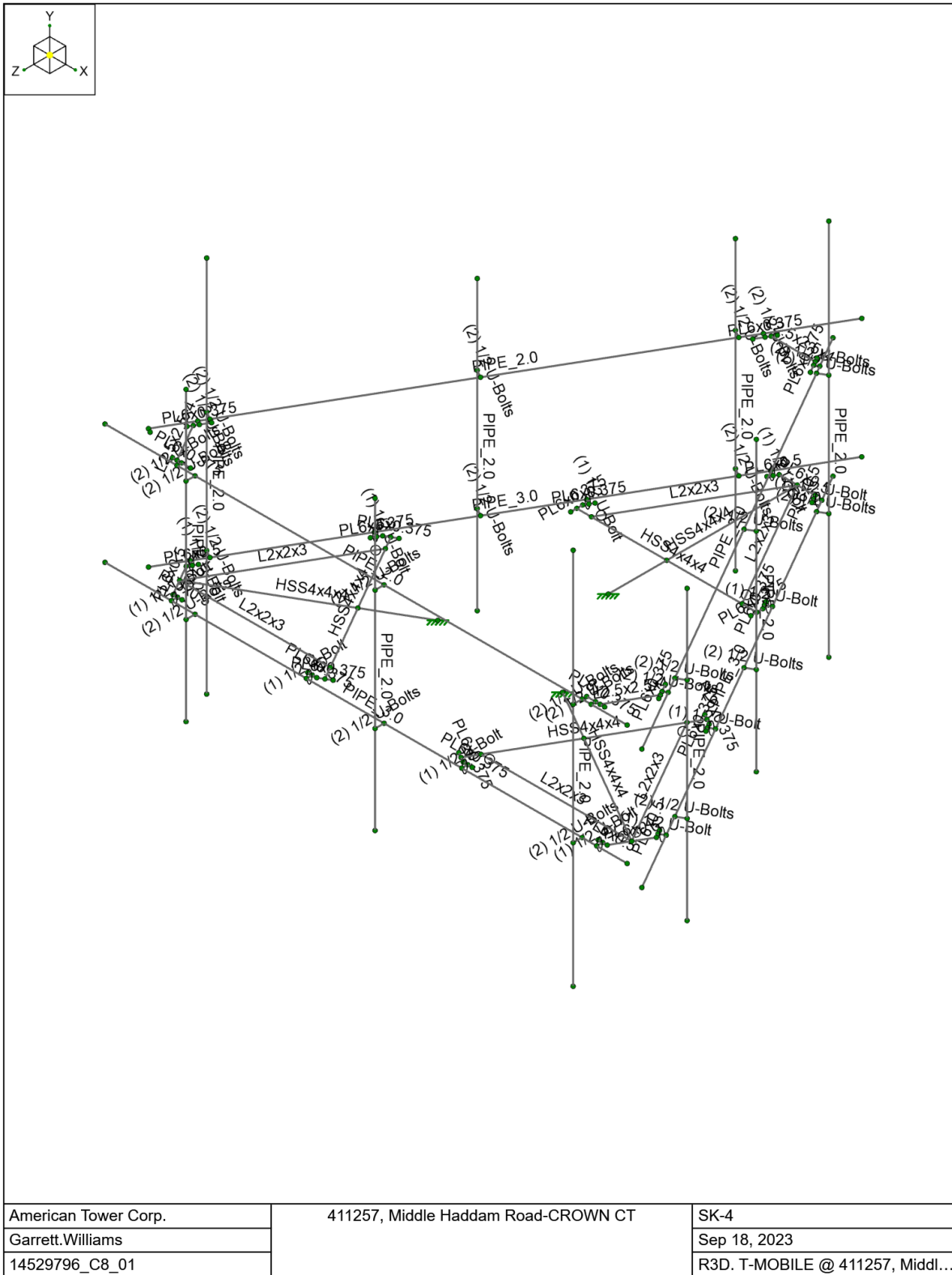
Moment Arm	$b$	1.58 in
Effective Moment Arm	$b'$	1.27 in
Tributary Length	$p$	4.30 in
Effective Edge Distance	$a'$	1.81 in
Minimum Thickness	$t_{min}$	0.25 in
No Prying Thickness	$t_{np}$	0.34 in
Min Bolt Strength Thickness	$t_c$	0.68 k-in

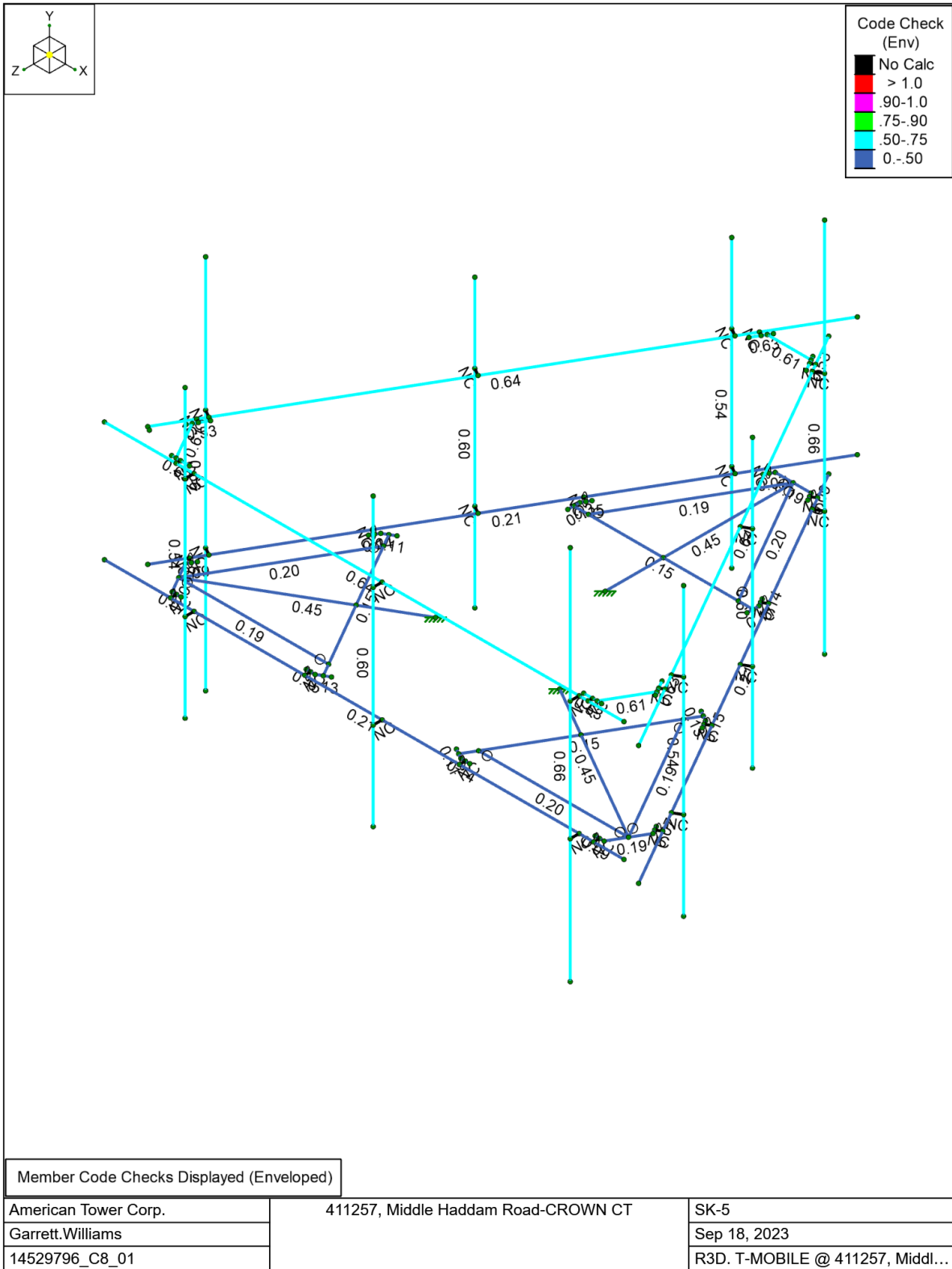




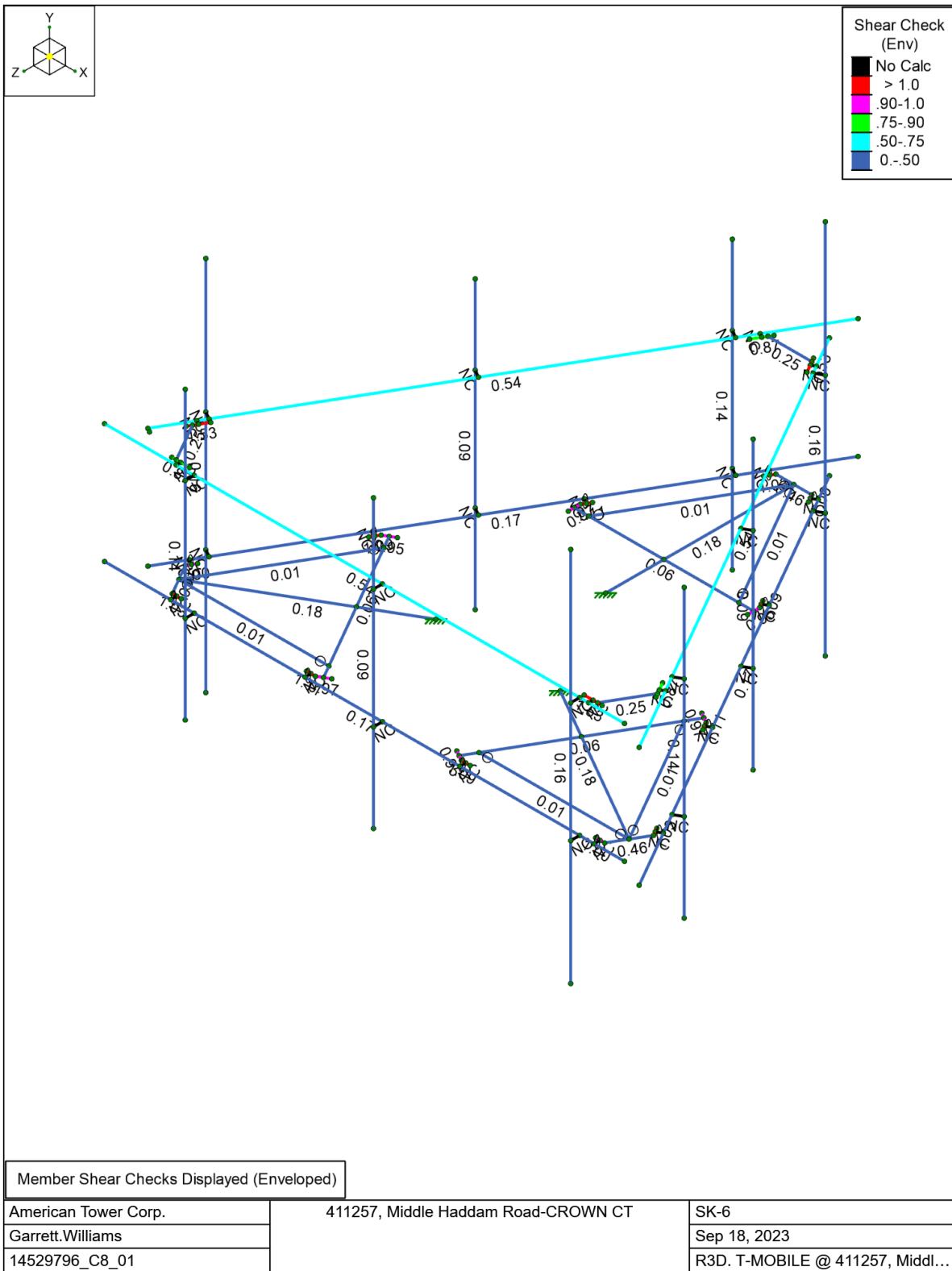


American Tower Corp.	411257, Middle Haddam Road-CROWN CT	SK-3
Garrett.Williams		Sep 18, 2023
14529796_C8_01		R3D. T-MOBILE @ 411257, Middl...











Company : American Tower Corp.  
 Designer : Garrett.Williams  
 Job Number : 14529796\_C8\_01  
 Model Name : 411257, Middle Haddam Road-C...

9/18/2023  
 1:53:17 PM  
 Checked By : -

**Basic Load Cases**

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Member)
1	D	DL		-1			24		3
2	Di	IL					24	57	3
3	W 0	WL					24	93	
4	W 30	WL					48	186	
5	W 60	WL					48	186	
6	W 90	WL					24	93	
7	W 120	WL					48	186	
8	W 150	WL					48	186	
9	W 180	WL					24	93	
10	W 210	WL					48	186	
11	W 240	WL					48	186	
12	W 270	WL					24	93	
13	W 300	WL					48	186	
14	W 330	WL					48	186	
15	Wi 0	WL					24	93	
16	Wi 30	WL					48	186	
17	Wi 60	WL					48	186	
18	Wi 90	WL					24	93	
19	Wi 120	WL					48	186	
20	Wi 150	WL					48	186	
21	Wi 180	WL					24	93	
22	Wi 210	WL					48	186	
23	Wi 240	WL					48	186	
24	Wi 270	WL					24	93	
25	Wi 300	WL					48	186	
26	Wi 330	WL					48	186	
27	Ws 0	WL					24	93	
28	Ws 30	WL					48	186	
29	Ws 60	WL					48	186	
30	Ws 90	WL					24	93	
31	Ws 120	WL					48	186	
32	Ws 150	WL					48	186	
33	Ws 180	WL					24	93	
34	Ws 210	WL					48	186	
35	Ws 240	WL					48	186	
36	Ws 270	WL					24	93	
37	Ws 300	WL					48	186	
38	Ws 330	WL					48	186	
39	Ev -Y	ELY		-0.045			24		3
40	Eh -Z	ELZ			-0.112		24		3
41	Eh -X	ELX	-0.112				24		3
42	Lm (1)	LL				1			
43	Lm (2)	LL				1			
44	Lm (3)	LL				1			
45	Lm (4)	LL				1			
46	Lm (5)	LL				1			
47	Lm (6)	LL				1			
48	Lm (7)	LL				1			
49	Lm (8)	LL				1			
50	Lm (9)	LL				1			
51	BLC 1 Transient Area Loads	None						97	
52	BLC 2 Transient Area Loads	None						97	
53	BLC 39 Transient Area Loads	None						97	
54	BLC 40 Transient Area Loads	None						97	
55	BLC 41 Transient Area Loads	None						97	



**Load Combinations**

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4D	Yes	Y	DL	1.4						
2	1.2D + 1.0W [0°]	Yes	Y	DL	1.2	3	1				
3	1.2D + 1.0W [30°]	Yes	Y	DL	1.2	4	1				
4	1.2D + 1.0W [60°]	Yes	Y	DL	1.2	5	1				
5	1.2D + 1.0W [90°]	Yes	Y	DL	1.2	6	1				
6	1.2D + 1.0W [120°]	Yes	Y	DL	1.2	7	1				
7	1.2D + 1.0W [150°]	Yes	Y	DL	1.2	8	1				
8	1.2D + 1.0W [180°]	Yes	Y	DL	1.2	9	1				
9	1.2D + 1.0W [210°]	Yes	Y	DL	1.2	10	1				
10	1.2D + 1.0W [240°]	Yes	Y	DL	1.2	11	1				
11	1.2D + 1.0W [270°]	Yes	Y	DL	1.2	12	1				
12	1.2D + 1.0W [300°]	Yes	Y	DL	1.2	13	1				
13	1.2D + 1.0W [330°]	Yes	Y	DL	1.2	14	1				
14	0.9D + 1.0W [0°]	Yes	Y	DL	0.9	3	1				
15	0.9D + 1.0W [30°]	Yes	Y	DL	0.9	4	1				
16	0.9D + 1.0W [60°]	Yes	Y	DL	0.9	5	1				
17	0.9D + 1.0W [90°]	Yes	Y	DL	0.9	6	1				
18	0.9D + 1.0W [120°]	Yes	Y	DL	0.9	7	1				
19	0.9D + 1.0W [150°]	Yes	Y	DL	0.9	8	1				
20	0.9D + 1.0W [180°]	Yes	Y	DL	0.9	9	1				
21	0.9D + 1.0W [210°]	Yes	Y	DL	0.9	10	1				
22	0.9D + 1.0W [240°]	Yes	Y	DL	0.9	11	1				
23	0.9D + 1.0W [270°]	Yes	Y	DL	0.9	12	1				
24	0.9D + 1.0W [300°]	Yes	Y	DL	0.9	13	1				
25	0.9D + 1.0W [330°]	Yes	Y	DL	0.9	14	1				
26	1.2D + 1.0Di + 1.0Wi [0°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	15	1		
27	1.2D + 1.0Di + 1.0Wi [30°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	16	1		
28	1.2D + 1.0Di + 1.0Wi [60°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	17	1		
29	1.2D + 1.0Di + 1.0Wi [90°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	18	1		
30	1.2D + 1.0Di + 1.0Wi [120°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	19	1		
31	1.2D + 1.0Di + 1.0Wi [150°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	20	1		
32	1.2D + 1.0Di + 1.0Wi [180°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	21	1		
33	1.2D + 1.0Di + 1.0Wi [210°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	22	1		
34	1.2D + 1.0Di + 1.0Wi [240°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	23	1		
35	1.2D + 1.0Di + 1.0Wi [270°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	24	1		
36	1.2D + 1.0Di + 1.0Wi [300°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	25	1		
37	1.2D + 1.0Di + 1.0Wi [330°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	26	1		
38	1.2D + 1.0Ev + 1.0Eh [0°]	Yes	Y	DL	1.2	ELY	1	ELZ	1	ELX	0.001
39	1.2D + 1.0Ev + 1.0Eh [30°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.866	ELX	0.5
40	1.2D + 1.0Ev + 1.0Eh [60°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.5	ELX	0.866
41	1.2D + 1.0Ev + 1.0Eh [90°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.001	ELX	1
42	1.2D + 1.0Ev + 1.0Eh [120°]	Yes	Y	DL	1.2	ELY	1	ELZ	-0.5	ELX	0.866
43	1.2D + 1.0Ev + 1.0Eh [150°]	Yes	Y	DL	1.2	ELY	1	ELZ	-0.866	ELX	0.5
44	1.2D + 1.0Ev + 1.0Eh [180°]	Yes	Y	DL	1.2	ELY	1	ELZ	-1	ELX	0.001
45	1.2D + 1.0Ev + 1.0Eh [210°]	Yes	Y	DL	1.2	ELY	1	ELZ	-0.866	ELX	-0.5
46	1.2D + 1.0Ev + 1.0Eh [240°]	Yes	Y	DL	1.2	ELY	1	ELZ	-0.5	ELX	-0.866
47	1.2D + 1.0Ev + 1.0Eh [270°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.001	ELX	-1
48	1.2D + 1.0Ev + 1.0Eh [300°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.5	ELX	-0.866
49	1.2D + 1.0Ev + 1.0Eh [330°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.866	ELX	-0.5
50	0.9D + 1.0Ev + 1.0Eh [0°]	Yes	Y	DL	0.9	ELY	1	ELZ	1	ELX	0.001
51	0.9D + 1.0Ev + 1.0Eh [30°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.866	ELX	0.5
52	0.9D + 1.0Ev + 1.0Eh [60°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.5	ELX	0.866
53	0.9D + 1.0Ev + 1.0Eh [90°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.001	ELX	1
54	0.9D + 1.0Ev + 1.0Eh [120°]	Yes	Y	DL	0.9	ELY	1	ELZ	-0.5	ELX	0.866
55	0.9D + 1.0Ev + 1.0Eh [150°]	Yes	Y	DL	0.9	ELY	1	ELZ	-0.866	ELX	0.5



**Load Combinations (Continued)**

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
56	0.9D + 1.0Ev + 1.0Eh [180°]	Yes	Y	DL	0.9	ELY	1	ELZ	-1	ELX	0.001
57	0.9D + 1.0Ev + 1.0Eh [210°]	Yes	Y	DL	0.9	ELY	1	ELZ	-0.866	ELX	-0.5
58	0.9D + 1.0Ev + 1.0Eh [240°]	Yes	Y	DL	0.9	ELY	1	ELZ	-0.5	ELX	-0.866
59	0.9D + 1.0Ev + 1.0Eh [270°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.001	ELX	-1
60	0.9D + 1.0Ev + 1.0Eh [300°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.5	ELX	-0.866
61	0.9D + 1.0Ev + 1.0Eh [330°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.866	ELX	-0.5
62	1.2D + 1.5Lm(1) + 1.0Wm [0°]	Yes	Y	DL	1.2	42	1.5	27	1		
63	1.2D + 1.5Lm(1) + 1.0Wm [30°]	Yes	Y	DL	1.2	42	1.5	28	1		
64	1.2D + 1.5Lm(1) + 1.0Wm [60°]	Yes	Y	DL	1.2	42	1.5	29	1		
65	1.2D + 1.5Lm(1) + 1.0Wm [90°]	Yes	Y	DL	1.2	42	1.5	30	1		
66	1.2D + 1.5Lm(1) + 1.0Wm [120°]	Yes	Y	DL	1.2	42	1.5	31	1		
67	1.2D + 1.5Lm(1) + 1.0Wm [150°]	Yes	Y	DL	1.2	42	1.5	32	1		
68	1.2D + 1.5Lm(1) + 1.0Wm [180°]	Yes	Y	DL	1.2	42	1.5	33	1		
69	1.2D + 1.5Lm(1) + 1.0Wm [210°]	Yes	Y	DL	1.2	42	1.5	34	1		
70	1.2D + 1.5Lm(1) + 1.0Wm [240°]	Yes	Y	DL	1.2	42	1.5	35	1		
71	1.2D + 1.5Lm(1) + 1.0Wm [270°]	Yes	Y	DL	1.2	42	1.5	36	1		
72	1.2D + 1.5Lm(1) + 1.0Wm [300°]	Yes	Y	DL	1.2	42	1.5	37	1		
73	1.2D + 1.5Lm(1) + 1.0Wm [330°]	Yes	Y	DL	1.2	42	1.5	38	1		
74	1.2D + 1.5Lm(2) + 1.0Wm [0°]	Yes	Y	DL	1.2	43	1.5	27	1		
75	1.2D + 1.5Lm(2) + 1.0Wm [30°]	Yes	Y	DL	1.2	43	1.5	28	1		
76	1.2D + 1.5Lm(2) + 1.0Wm [60°]	Yes	Y	DL	1.2	43	1.5	29	1		
77	1.2D + 1.5Lm(2) + 1.0Wm [90°]	Yes	Y	DL	1.2	43	1.5	30	1		
78	1.2D + 1.5Lm(2) + 1.0Wm [120°]	Yes	Y	DL	1.2	43	1.5	31	1		
79	1.2D + 1.5Lm(2) + 1.0Wm [150°]	Yes	Y	DL	1.2	43	1.5	32	1		
80	1.2D + 1.5Lm(2) + 1.0Wm [180°]	Yes	Y	DL	1.2	43	1.5	33	1		
81	1.2D + 1.5Lm(2) + 1.0Wm [210°]	Yes	Y	DL	1.2	43	1.5	34	1		
82	1.2D + 1.5Lm(2) + 1.0Wm [240°]	Yes	Y	DL	1.2	43	1.5	35	1		
83	1.2D + 1.5Lm(2) + 1.0Wm [270°]	Yes	Y	DL	1.2	43	1.5	36	1		
84	1.2D + 1.5Lm(2) + 1.0Wm [300°]	Yes	Y	DL	1.2	43	1.5	37	1		
85	1.2D + 1.5Lm(2) + 1.0Wm [330°]	Yes	Y	DL	1.2	43	1.5	38	1		
86	1.2D + 1.5Lm(3) + 1.0Wm [0°]	Yes	Y	DL	1.2	44	1.5	27	1		
87	1.2D + 1.5Lm(3) + 1.0Wm [30°]	Yes	Y	DL	1.2	44	1.5	28	1		
88	1.2D + 1.5Lm(3) + 1.0Wm [60°]	Yes	Y	DL	1.2	44	1.5	29	1		
89	1.2D + 1.5Lm(3) + 1.0Wm [90°]	Yes	Y	DL	1.2	44	1.5	30	1		
90	1.2D + 1.5Lm(3) + 1.0Wm [120°]	Yes	Y	DL	1.2	44	1.5	31	1		
91	1.2D + 1.5Lm(3) + 1.0Wm [150°]	Yes	Y	DL	1.2	44	1.5	32	1		
92	1.2D + 1.5Lm(3) + 1.0Wm [180°]	Yes	Y	DL	1.2	44	1.5	33	1		
93	1.2D + 1.5Lm(3) + 1.0Wm [210°]	Yes	Y	DL	1.2	44	1.5	34	1		
94	1.2D + 1.5Lm(3) + 1.0Wm [240°]	Yes	Y	DL	1.2	44	1.5	35	1		
95	1.2D + 1.5Lm(3) + 1.0Wm [270°]	Yes	Y	DL	1.2	44	1.5	36	1		
96	1.2D + 1.5Lm(3) + 1.0Wm [300°]	Yes	Y	DL	1.2	44	1.5	37	1		
97	1.2D + 1.5Lm(3) + 1.0Wm [330°]	Yes	Y	DL	1.2	44	1.5	38	1		
98	1.2D + 1.5Lm(4) + 1.0Wm [0°]	Yes	Y	DL	1.2	45	1.5	27	1		
99	1.2D + 1.5Lm(4) + 1.0Wm [30°]	Yes	Y	DL	1.2	45	1.5	28	1		
100	1.2D + 1.5Lm(4) + 1.0Wm [60°]	Yes	Y	DL	1.2	45	1.5	29	1		
101	1.2D + 1.5Lm(4) + 1.0Wm [90°]	Yes	Y	DL	1.2	45	1.5	30	1		
102	1.2D + 1.5Lm(4) + 1.0Wm [120°]	Yes	Y	DL	1.2	45	1.5	31	1		
103	1.2D + 1.5Lm(4) + 1.0Wm [150°]	Yes	Y	DL	1.2	45	1.5	32	1		
104	1.2D + 1.5Lm(4) + 1.0Wm [180°]	Yes	Y	DL	1.2	45	1.5	33	1		
105	1.2D + 1.5Lm(4) + 1.0Wm [210°]	Yes	Y	DL	1.2	45	1.5	34	1		
106	1.2D + 1.5Lm(4) + 1.0Wm [240°]	Yes	Y	DL	1.2	45	1.5	35	1		
107	1.2D + 1.5Lm(4) + 1.0Wm [270°]	Yes	Y	DL	1.2	45	1.5	36	1		
108	1.2D + 1.5Lm(4) + 1.0Wm [300°]	Yes	Y	DL	1.2	45	1.5	37	1		
109	1.2D + 1.5Lm(4) + 1.0Wm [330°]	Yes	Y	DL	1.2	45	1.5	38	1		
110	1.2D + 1.5Lm(5) + 1.0Wm [0°]	Yes	Y	DL	1.2	46	1.5	27	1		



**Load Combinations (Continued)**

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
111	1.2D + 1.5Lm(5) + 1.0Wm [30°]	Yes	Y	DL	1.2	46	1.5	28	1		
112	1.2D + 1.5Lm(5) + 1.0Wm [60°]	Yes	Y	DL	1.2	46	1.5	29	1		
113	1.2D + 1.5Lm(5) + 1.0Wm [90°]	Yes	Y	DL	1.2	46	1.5	30	1		
114	1.2D + 1.5Lm(5) + 1.0Wm [120°]	Yes	Y	DL	1.2	46	1.5	31	1		
115	1.2D + 1.5Lm(5) + 1.0Wm [150°]	Yes	Y	DL	1.2	46	1.5	32	1		
116	1.2D + 1.5Lm(5) + 1.0Wm [180°]	Yes	Y	DL	1.2	46	1.5	33	1		
117	1.2D + 1.5Lm(5) + 1.0Wm [210°]	Yes	Y	DL	1.2	46	1.5	34	1		
118	1.2D + 1.5Lm(5) + 1.0Wm [240°]	Yes	Y	DL	1.2	46	1.5	35	1		
119	1.2D + 1.5Lm(5) + 1.0Wm [270°]	Yes	Y	DL	1.2	46	1.5	36	1		
120	1.2D + 1.5Lm(5) + 1.0Wm [300°]	Yes	Y	DL	1.2	46	1.5	37	1		
121	1.2D + 1.5Lm(5) + 1.0Wm [330°]	Yes	Y	DL	1.2	46	1.5	38	1		
122	1.2D + 1.5Lm(6) + 1.0Wm [0°]	Yes	Y	DL	1.2	47	1.5	27	1		
123	1.2D + 1.5Lm(6) + 1.0Wm [30°]	Yes	Y	DL	1.2	47	1.5	28	1		
124	1.2D + 1.5Lm(6) + 1.0Wm [60°]	Yes	Y	DL	1.2	47	1.5	29	1		
125	1.2D + 1.5Lm(6) + 1.0Wm [90°]	Yes	Y	DL	1.2	47	1.5	30	1		
126	1.2D + 1.5Lm(6) + 1.0Wm [120°]	Yes	Y	DL	1.2	47	1.5	31	1		
127	1.2D + 1.5Lm(6) + 1.0Wm [150°]	Yes	Y	DL	1.2	47	1.5	32	1		
128	1.2D + 1.5Lm(6) + 1.0Wm [180°]	Yes	Y	DL	1.2	47	1.5	33	1		
129	1.2D + 1.5Lm(6) + 1.0Wm [210°]	Yes	Y	DL	1.2	47	1.5	34	1		
130	1.2D + 1.5Lm(6) + 1.0Wm [240°]	Yes	Y	DL	1.2	47	1.5	35	1		
131	1.2D + 1.5Lm(6) + 1.0Wm [270°]	Yes	Y	DL	1.2	47	1.5	36	1		
132	1.2D + 1.5Lm(6) + 1.0Wm [300°]	Yes	Y	DL	1.2	47	1.5	37	1		
133	1.2D + 1.5Lm(6) + 1.0Wm [330°]	Yes	Y	DL	1.2	47	1.5	38	1		
134	1.2D + 1.5Lm(7) + 1.0Wm [0°]	Yes	Y	DL	1.2	48	1.5	27	1		
135	1.2D + 1.5Lm(7) + 1.0Wm [30°]	Yes	Y	DL	1.2	48	1.5	28	1		
136	1.2D + 1.5Lm(7) + 1.0Wm [60°]	Yes	Y	DL	1.2	48	1.5	29	1		
137	1.2D + 1.5Lm(7) + 1.0Wm [90°]	Yes	Y	DL	1.2	48	1.5	30	1		
138	1.2D + 1.5Lm(7) + 1.0Wm [120°]	Yes	Y	DL	1.2	48	1.5	31	1		
139	1.2D + 1.5Lm(7) + 1.0Wm [150°]	Yes	Y	DL	1.2	48	1.5	32	1		
140	1.2D + 1.5Lm(7) + 1.0Wm [180°]	Yes	Y	DL	1.2	48	1.5	33	1		
141	1.2D + 1.5Lm(7) + 1.0Wm [210°]	Yes	Y	DL	1.2	48	1.5	34	1		
142	1.2D + 1.5Lm(7) + 1.0Wm [240°]	Yes	Y	DL	1.2	48	1.5	35	1		
143	1.2D + 1.5Lm(7) + 1.0Wm [270°]	Yes	Y	DL	1.2	48	1.5	36	1		
144	1.2D + 1.5Lm(7) + 1.0Wm [300°]	Yes	Y	DL	1.2	48	1.5	37	1		
145	1.2D + 1.5Lm(7) + 1.0Wm [330°]	Yes	Y	DL	1.2	48	1.5	38	1		
146	1.2D + 1.5Lm(8) + 1.0Wm [0°]	Yes	Y	DL	1.2	49	1.5	27	1		
147	1.2D + 1.5Lm(8) + 1.0Wm [30°]	Yes	Y	DL	1.2	49	1.5	28	1		
148	1.2D + 1.5Lm(8) + 1.0Wm [60°]	Yes	Y	DL	1.2	49	1.5	29	1		
149	1.2D + 1.5Lm(8) + 1.0Wm [90°]	Yes	Y	DL	1.2	49	1.5	30	1		
150	1.2D + 1.5Lm(8) + 1.0Wm [120°]	Yes	Y	DL	1.2	49	1.5	31	1		
151	1.2D + 1.5Lm(8) + 1.0Wm [150°]	Yes	Y	DL	1.2	49	1.5	32	1		
152	1.2D + 1.5Lm(8) + 1.0Wm [180°]	Yes	Y	DL	1.2	49	1.5	33	1		
153	1.2D + 1.5Lm(8) + 1.0Wm [210°]	Yes	Y	DL	1.2	49	1.5	34	1		
154	1.2D + 1.5Lm(8) + 1.0Wm [240°]	Yes	Y	DL	1.2	49	1.5	35	1		
155	1.2D + 1.5Lm(8) + 1.0Wm [270°]	Yes	Y	DL	1.2	49	1.5	36	1		
156	1.2D + 1.5Lm(8) + 1.0Wm [300°]	Yes	Y	DL	1.2	49	1.5	37	1		
157	1.2D + 1.5Lm(8) + 1.0Wm [330°]	Yes	Y	DL	1.2	49	1.5	38	1		
158	1.2D + 1.5Lm(9) + 1.0Wm [0°]	Yes	Y	DL	1.2	50	1.5	27	1		
159	1.2D + 1.5Lm(9) + 1.0Wm [30°]	Yes	Y	DL	1.2	50	1.5	28	1		
160	1.2D + 1.5Lm(9) + 1.0Wm [60°]	Yes	Y	DL	1.2	50	1.5	29	1		
161	1.2D + 1.5Lm(9) + 1.0Wm [90°]	Yes	Y	DL	1.2	50	1.5	30	1		
162	1.2D + 1.5Lm(9) + 1.0Wm [120°]	Yes	Y	DL	1.2	50	1.5	31	1		
163	1.2D + 1.5Lm(9) + 1.0Wm [150°]	Yes	Y	DL	1.2	50	1.5	32	1		
164	1.2D + 1.5Lm(9) + 1.0Wm [180°]	Yes	Y	DL	1.2	50	1.5	33	1		
165	1.2D + 1.5Lm(9) + 1.0Wm [210°]	Yes	Y	DL	1.2	50	1.5	34	1		



**Load Combinations (Continued)**

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
166	1.2D + 1.5Lm(9) + 1.0Wm [240°]	Yes	Y	DL	1.2	50	1.5	35	1		
167	1.2D + 1.5Lm(9) + 1.0Wm [270°]	Yes	Y	DL	1.2	50	1.5	36	1		
168	1.2D + 1.5Lm(9) + 1.0Wm [300°]	Yes	Y	DL	1.2	50	1.5	37	1		
169	1.2D + 1.5Lm(9) + 1.0Wm [330°]	Yes	Y	DL	1.2	50	1.5	38	1		

**Member Primary Data**

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	H001	N002	N003		HSS4x4x4	Beam	None	A500 Gr. B [SQR]	Typical
2	H002	N004	N005		PL6x0.5	Beam	None	A36	Typical
3	H003	N006	N012		HSS4x4x4	Beam	None	A500 Gr. B [SQR]	Typical
4	H004	N007	N013		HSS4x4x4	Beam	None	A500 Gr. B [SQR]	Typical
5	H005	N008	N010		PL6x0.5	Beam	None	A36	Typical
6	H006	N009	N011		PL6x0.5	Beam	None	A36	Typical
7	H007	N015	N016		HSS4x4x4	Beam	None	A500 Gr. B [SQR]	Typical
8	H008	N021	N023		HSS4x4x4	Beam	None	A500 Gr. B [SQR]	Typical
9	H009	N022	N024		HSS4x4x4	Beam	None	A500 Gr. B [SQR]	Typical
10	H010	N033	N013		L2x2x3	Beam	None	A36	Typical
11	H011	N034	N003		L2x2x3	Beam	None	A36	Typical
12	H012	N029	N012		L2x2x3	Beam	None	A36	Typical
13	H013	N030	N013	270	L2x2x3	Beam	None	A36	Typical
14	H014	N031	N003	270	L2x2x3	Beam	None	A36	Typical
15	H015	N032	N012	270	L2x2x3	Beam	None	A36	Typical
16	H016	N009	N036		PL6x0.5	Beam	None	A36	Typical
17	H017	N004	N042		PL6x0.5	Beam	None	A36	Typical
18	H018	N008	N043		PL6x0.5	Beam	None	A36	Typical
19	H019	N011	N048		PL6x0.5	Beam	None	A36	Typical
20	H020	N005	N049		PL6x0.5	Beam	None	A36	Typical
21	H021	N010	N037		PL6x0.5	Beam	None	A36	Typical
22	H022	N038	N040		(1) 1/2 U-Bolt	Beam	None	SAE J429 Gr. 2	Typical
23	H023	N044	N050		(1) 1/2 U-Bolt	Beam	None	SAE J429 Gr. 2	Typical
24	H024	N045	N051		(1) 1/2 U-Bolt	Beam	None	SAE J429 Gr. 2	Typical
25	H025	N039	N041		(1) 1/2 U-Bolt	Beam	None	SAE J429 Gr. 2	Typical
26	H026	N046	N052		(1) 1/2 U-Bolt	Beam	None	SAE J429 Gr. 2	Typical
27	H027	N047	N053		(1) 1/2 U-Bolt	Beam	None	SAE J429 Gr. 2	Typical
28	H028	N017	N018		PIPE 3.0	Beam	None	A53 Gr. B	Typical
29	H029	N025	N027		PIPE 3.0	Beam	None	A53 Gr. B	Typical
30	H030	N026	N028		PIPE 3.0	Beam	None	A53 Gr. B	Typical
31	H031	N054	N055		PL6x0.375	Beam	None	A36	Typical
32	H032	N056	N058		PL6x0.375	Beam	None	A36	Typical
33	H033	N057	N059		PL6x0.375	Beam	None	A36	Typical
34	H034	N060	N062		PL6x0.375	Beam	None	A36	Typical
35	H035	N061	N063		PL6x0.375	Beam	None	A36	Typical
36	H036	N064	N035		PL6x0.375	Beam	None	A36	Typical
37	H037	N059	N065		PL6x0.375	Beam	None	A36	Typical
38	H038	N055	N071		PL6x0.375	Beam	None	A36	Typical
39	H039	N058	N072		PL6x0.375	Beam	None	A36	Typical
40	H040	N062	N066		PL6x0.375	Beam	None	A36	Typical
41	H041	N063	N073		PL6x0.375	Beam	None	A36	Typical
42	H042	N035	N074		PL6x0.375	Beam	None	A36	Typical
43	H043	N067	N069		(1) 1/2 U-Bolt	Beam	None	SAE J429 Gr. 2	Typical
44	H044	N075	N079		(1) 1/2 U-Bolt	Beam	None	SAE J429 Gr. 2	Typical
45	H045	N076	N080		(1) 1/2 U-Bolt	Beam	None	SAE J429 Gr. 2	Typical
46	H046	N068	N070		(1) 1/2 U-Bolt	Beam	None	SAE J429 Gr. 2	Typical
47	H047	N077	N081		(1) 1/2 U-Bolt	Beam	None	SAE J429 Gr. 2	Typical
48	H048	N078	N082		(1) 1/2 U-Bolt	Beam	None	SAE J429 Gr. 2	Typical



**Member Primary Data (Continued)**

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
49	H049	N083	N084		PIPE 2.0	Beam	None	A53 Gr. B	Typical
50	H050	N085	N087		PIPE 2.0	Beam	None	A53 Gr. B	Typical
51	H051	N086	N088		PIPE 2.0	Beam	None	A53 Gr. B	Typical
52	H052	N094	N095	90	L2.5x2.5x4	Beam	None	A36	Typical
53	H053	N091	N092	90	L2.5x2.5x4	Beam	None	A36	Typical
54	H054	N090	N093	90	L2.5x2.5x4	Beam	None	A36	Typical
55	H055	N096	N099		PL6x0.375	Beam	None	A36	Typical
56	H056	N097	N100		PL6x0.375	Beam	None	A36	Typical
57	H057	N098	N101		PL6x0.375	Beam	None	A36	Typical
58	H058	N103	N106		PL6x0.375	Beam	None	A36	Typical
59	H059	N104	N107		PL6x0.375	Beam	None	A36	Typical
60	H060	N102	N105		PL6x0.375	Beam	None	A36	Typical
61	H061	N108	N114		(2) 1/2 U-Bolts	Beam	None	SAE J429 Gr. 2	Typical
62	H062	N109	N115		(2) 1/2 U-Bolts	Beam	None	SAE J429 Gr. 2	Typical
63	H063	N110	N116		(2) 1/2 U-Bolts	Beam	None	SAE J429 Gr. 2	Typical
64	H064	N111	N117		(2) 1/2 U-Bolts	Beam	None	SAE J429 Gr. 2	Typical
65	H065	N112	N118		(2) 1/2 U-Bolts	Beam	None	SAE J429 Gr. 2	Typical
66	H066	N113	N119		(2) 1/2 U-Bolts	Beam	None	SAE J429 Gr. 2	Typical
67	U067	N120	N129		(2) 1/2 U-Bolts	Beam	None	A36	Typical
68	U068	N130	N131		(2) 1/2 U-Bolts	Beam	None	A36	Typical
69	MP069	N132	N133		PIPE 2.0	Column	None	A53 Gr. B	Typical
70	U070	N122	N134		(2) 1/2 U-Bolts	Beam	None	A36	Typical
71	U071	N135	N136		(2) 1/2 U-Bolts	Beam	None	A36	Typical
72	MP072	N137	N138		PIPE 2.0	Column	None	A53 Gr. B	Typical
73	U073	N121	N139		(2) 1/2 U-Bolts	Beam	None	A36	Typical
74	U074	N140	N141		(2) 1/2 U-Bolts	Beam	None	A36	Typical
75	MP075	N142	N143		PIPE 2.0	Column	None	A53 Gr. B	Typical
76	U076	N124	N144		(2) 1/2 U-Bolts	Beam	None	A36	Typical
77	U077	N145	N146		(2) 1/2 U-Bolts	Beam	None	A36	Typical
78	MP078	N147	N148		PIPE 2.0	Column	None	A53 Gr. B	Typical
79	U079	N126	N149		(2) 1/2 U-Bolts	Beam	None	A36	Typical
80	U080	N150	N151		(2) 1/2 U-Bolts	Beam	None	A36	Typical
81	MP081	N152	N153		PIPE 2.0	Column	None	A53 Gr. B	Typical
82	U082	N128	N154		(2) 1/2 U-Bolts	Beam	None	A36	Typical
83	U083	N155	N156		(2) 1/2 U-Bolts	Beam	None	A36	Typical
84	MP084	N157	N158		PIPE 2.0	Column	None	A53 Gr. B	Typical
85	U085	N123	N159		(2) 1/2 U-Bolts	Beam	None	A36	Typical
86	U086	N160	N161		(2) 1/2 U-Bolts	Beam	None	A36	Typical
87	MP087	N162	N163		PIPE 2.0	Column	None	A53 Gr. B	Typical
88	U088	N125	N164		(2) 1/2 U-Bolts	Beam	None	A36	Typical
89	U089	N165	N166		(2) 1/2 U-Bolts	Beam	None	A36	Typical
90	MP090	N167	N168		PIPE 2.0	Column	None	A53 Gr. B	Typical
91	U091	N127	N169		(2) 1/2 U-Bolts	Beam	None	A36	Typical
92	U092	N170	N171		(2) 1/2 U-Bolts	Beam	None	A36	Typical
93	MP093	N172	N173		PIPE 2.0	Column	None	A53 Gr. B	Typical

**Hot Rolled Steel Design Parameters**

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Lcomp top [in]	L-Torque [in]	K y-y	K z-z	Function
1	H001	HSS4x4x4	63				Lbyy	1	1	Lateral
2	H002	PL6x0.5	12				Lbyy	0.65	0.65	Lateral
3	H003	HSS4x4x4	63				Lbyy	1	1	Lateral
4	H004	HSS4x4x4	63				Lbyy	1	1	Lateral
5	H005	PL6x0.5	12				Lbyy	0.65	0.65	Lateral
6	H006	PL6x0.5	12				Lbyy	0.65	0.65	Lateral
7	H007	HSS4x4x4	60				Lbyy	0.65	0.65	Lateral



**Hot Rolled Steel Design Parameters (Continued)**

Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Lcomp top [in]	L-Torque [in]	K y-y	K z-z	Function
8	H008	HSS4x4x4	60			Lbyy	0.65	0.65	Lateral
9	H009	HSS4x4x4	60			Lbyy	0.65	0.65	Lateral
10	H010	L2x2x3	50.229			Lbyy	1	1	Lateral
11	H011	L2x2x3	50.229			Lbyy	1	1	Lateral
12	H012	L2x2x3	50.229			Lbyy	1	1	Lateral
13	H013	L2x2x3	50.229			Lbyy	1	1	Lateral
14	H014	L2x2x3	50.229			Lbyy	1	1	Lateral
15	H015	L2x2x3	50.229			Lbyy	1	1	Lateral
16	H016	PL6x0.5	3			Lbyy	1	1	Lateral
17	H017	PL6x0.5	3			Lbyy	1	1	Lateral
18	H018	PL6x0.5	3			Lbyy	1	1	Lateral
19	H019	PL6x0.5	3			Lbyy	1	1	Lateral
20	H020	PL6x0.5	3			Lbyy	1	1	Lateral
21	H021	PL6x0.5	3			Lbyy	1	1	Lateral
22	H022	(1) 1/2 U-Bolt	2			Lbyy	0.65	0.65	Lateral
23	H023	(1) 1/2 U-Bolt	2			Lbyy	0.65	0.65	Lateral
24	H024	(1) 1/2 U-Bolt	2			Lbyy	0.65	0.65	Lateral
25	H025	(1) 1/2 U-Bolt	2			Lbyy	0.65	0.65	Lateral
26	H026	(1) 1/2 U-Bolt	2			Lbyy	0.65	0.65	Lateral
27	H027	(1) 1/2 U-Bolt	2			Lbyy	0.65	0.65	Lateral
28	H028	PIPE 3.0	174			Lbyy	1	1	Lateral
29	H029	PIPE 3.0	174			Lbyy	1	1	Lateral
30	H030	PIPE 3.0	174			Lbyy	1	1	Lateral
31	H031	PL6x0.375	4			Lbyy	0.65	0.65	Lateral
32	H032	PL6x0.375	4			Lbyy	0.65	0.65	Lateral
33	H033	PL6x0.375	4			Lbyy	0.65	0.65	Lateral
34	H034	PL6x0.375	4			Lbyy	0.65	0.65	Lateral
35	H035	PL6x0.375	4			Lbyy	0.65	0.65	Lateral
36	H036	PL6x0.375	4			Lbyy	0.65	0.65	Lateral
37	H037	PL6x0.375	3			Lbyy	1	1	Lateral
38	H038	PL6x0.375	3			Lbyy	1	1	Lateral
39	H039	PL6x0.375	3			Lbyy	1	1	Lateral
40	H040	PL6x0.375	3			Lbyy	1	1	Lateral
41	H041	PL6x0.375	3			Lbyy	1	1	Lateral
42	H042	PL6x0.375	3			Lbyy	1	1	Lateral
43	H043	(1) 1/2 U-Bolt	1.965			Lbyy	0.65	0.65	Lateral
44	H044	(1) 1/2 U-Bolt	1.965			Lbyy	0.65	0.65	Lateral
45	H045	(1) 1/2 U-Bolt	1.965			Lbyy	0.65	0.65	Lateral
46	H046	(1) 1/2 U-Bolt	1.965			Lbyy	0.65	0.65	Lateral
47	H047	(1) 1/2 U-Bolt	1.965			Lbyy	0.65	0.65	Lateral
48	H048	(1) 1/2 U-Bolt	1.965			Lbyy	0.65	0.65	Lateral
49	H049	PIPE 2.0	174			Lbyy	0.65	0.65	Lateral
50	H050	PIPE 2.0	174			Lbyy	0.65	0.65	Lateral
51	H051	PIPE 2.0	174			Lbyy	0.65	0.65	Lateral
52	H052	L2.5x2.5x4	14.71			Lbyy	0.65	0.65	Lateral
53	H053	L2.5x2.5x4	14.71			Lbyy	0.65	0.65	Lateral
54	H054	L2.5x2.5x4	14.71			Lbyy	0.65	0.65	Lateral
55	H055	PL6x0.375	6			Lbyy	0.65	0.65	Lateral
56	H056	PL6x0.375	6			Lbyy	0.65	0.65	Lateral
57	H057	PL6x0.375	6			Lbyy	0.65	0.65	Lateral
58	H058	PL6x0.375	6			Lbyy	0.65	0.65	Lateral
59	H059	PL6x0.375	6			Lbyy	0.65	0.65	Lateral
60	H060	PL6x0.375	6			Lbyy	0.65	0.65	Lateral
61	H061	(2) 1/2 U-Bolts	1.5			Lbyy	0.65	0.65	Lateral
62	H062	(2) 1/2 U-Bolts	1.5			Lbyy	0.65	0.65	Lateral





**Hot Rolled Steel Design Parameters (Continued)**

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Lcomp top [in]	L-Torque [in]	K y-y	K z-z	Function
63	H063	(2) 1/2 U-Bolts	1.5			Lbyy		0.65	0.65	Lateral
64	H064	(2) 1/2 U-Bolts	1.5			Lbyy		0.65	0.65	Lateral
65	H065	(2) 1/2 U-Bolts	1.5			Lbyy		0.65	0.65	Lateral
66	H066	(2) 1/2 U-Bolts	1.5			Lbyy		0.65	0.65	Lateral
67	U067	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
68	U068	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
69	MP069	PIPE_2.0	126	Segment	Segment	Lbyy	Segment	2.1	2.1	Lateral
70	U070	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
71	U071	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
72	MP072	PIPE_2.0	96	Segment	Segment	Lbyy	Segment	2.1	2.1	Lateral
73	U073	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
74	U074	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
75	MP075	PIPE_2.0	96	Segment	Segment	Lbyy	Segment	2.1	2.1	Lateral
76	U076	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
77	U077	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
78	MP078	PIPE_2.0	126	Segment	Segment	Lbyy	Segment	2.1	2.1	Lateral
79	U079	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
80	U080	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
81	MP081	PIPE_2.0	96	Segment	Segment	Lbyy	Segment	2.1	2.1	Lateral
82	U082	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
83	U083	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
84	MP084	PIPE_2.0	96	Segment	Segment	Lbyy	Segment	2.1	2.1	Lateral
85	U085	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
86	U086	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
87	MP087	PIPE_2.0	126	Segment	Segment	Lbyy	Segment	2.1	2.1	Lateral
88	U088	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
89	U089	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
90	MP090	PIPE_2.0	96	Segment	Segment	Lbyy	Segment	2.1	2.1	Lateral
91	U091	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
92	U092	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
93	MP093	PIPE_2.0	96	Segment	Segment	Lbyy	Segment	2.1	2.1	Lateral

**Node Boundary Conditions**

	Node Label	X [lb/in]	Y [lb/in]	Z [lb/in]	X Rot [k-in/rad]	Y Rot [k-in/rad]	Z Rot [k-in/rad]
1	N002	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N006	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N007	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

**Member Advanced Data**

	Label	I Release	J Release	Physical	Deflection Ratio Options	Activation	Seismic DR
1	H001			Yes	N/A		None
2	H002			Yes	N/A		None
3	H003			Yes	N/A		None
4	H004			Yes	N/A		None
5	H005			Yes	N/A		None
6	H006			Yes	N/A		None
7	H007			Yes	N/A		None
8	H008			Yes	N/A		None
9	H009			Yes	N/A		None
10	H010	BenPIN	BenPIN	Yes	N/A		None
11	H011	BenPIN	BenPIN	Yes	N/A		None
12	H012	BenPIN	BenPIN	Yes	N/A		None
13	H013	BenPIN	BenPIN	Yes	N/A		None



Company : American Tower Corp.  
 Designer : Garrett.Williams  
 Job Number : 14529796\_C8\_01  
 Model Name : 411257, Middle Haddam Road-C...

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**Member Advanced Data (Continued)**

	Label	I Release	J Release	Physical	Deflection Ratio Options	Activation	Seismic DR
14	H014	BenPIN	BenPIN	Yes	N/A		None
15	H015	BenPIN	BenPIN	Yes	N/A		None
16	H016			Yes	N/A		None
17	H017			Yes	N/A		None
18	H018			Yes	N/A		None
19	H019			Yes	N/A		None
20	H020			Yes	N/A		None
21	H021			Yes	N/A		None
22	H022		OOOXOO	Yes	N/A	Exclude	None
23	H023		OOOXOO	Yes	N/A	Exclude	None
24	H024		OOOXOO	Yes	N/A	Exclude	None
25	H025		OOOXOO	Yes	N/A	Exclude	None
26	H026		OOOXOO	Yes	N/A	Exclude	None
27	H027		OOOXOO	Yes	N/A	Exclude	None
28	H028			Yes	N/A		None
29	H029			Yes	N/A		None
30	H030			Yes	N/A		None
31	H031			Yes	N/A		None
32	H032			Yes	N/A		None
33	H033			Yes	N/A		None
34	H034			Yes	N/A		None
35	H035			Yes	N/A		None
36	H036			Yes	N/A		None
37	H037			Yes	N/A		None
38	H038			Yes	N/A		None
39	H039			Yes	N/A		None
40	H040			Yes	N/A		None
41	H041			Yes	N/A		None
42	H042			Yes	N/A		None
43	H043		OOOXOO	Yes	N/A	Exclude	None
44	H044		OOOXOO	Yes	N/A	Exclude	None
45	H045		OOOXOO	Yes	N/A	Exclude	None
46	H046		OOOXOO	Yes	N/A	Exclude	None
47	H047		OOOXOO	Yes	N/A	Exclude	None
48	H048		OOOXOO	Yes	N/A	Exclude	None
49	H049			Yes	N/A		None
50	H050			Yes	N/A		None
51	H051			Yes	N/A		None
52	H052			Yes	N/A		None
53	H053			Yes	N/A		None
54	H054			Yes	N/A		None
55	H055			Yes	N/A		None
56	H056			Yes	N/A		None
57	H057			Yes	N/A		None
58	H058			Yes	N/A		None
59	H059			Yes	N/A		None
60	H060			Yes	N/A		None
61	H061			Yes	N/A	Exclude	None
62	H062			Yes	N/A	Exclude	None
63	H063			Yes	N/A	Exclude	None
64	H064			Yes	N/A	Exclude	None
65	H065			Yes	N/A	Exclude	None
66	H066			Yes	N/A	Exclude	None
67	U067			Yes	N/A	Exclude	None
68	U068			Yes	N/A	Exclude	None



Company : American Tower Corp.  
 Designer : Garrett.Williams  
 Job Number : 14529796\_C8\_01  
 Model Name : 411257, Middle Haddam Road-C...

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**Member Advanced Data (Continued)**

	Label	I Release	J Release	Physical	Deflection Ratio Options	Activation	Seismic DR
69	MP069			Yes	** NA **		None
70	U070			Yes	N/A	Exclude	None
71	U071			Yes	N/A	Exclude	None
72	MP072			Yes	** NA **		None
73	U073			Yes	N/A	Exclude	None
74	U074			Yes	N/A	Exclude	None
75	MP075			Yes	** NA **		None
76	U076			Yes	N/A	Exclude	None
77	U077			Yes	N/A	Exclude	None
78	MP078			Yes	** NA **		None
79	U079			Yes	N/A	Exclude	None
80	U080			Yes	N/A	Exclude	None
81	MP081			Yes	** NA **		None
82	U082			Yes	N/A	Exclude	None
83	U083			Yes	N/A	Exclude	None
84	MP084			Yes	** NA **		None
85	U085			Yes	N/A	Exclude	None
86	U086			Yes	N/A	Exclude	None
87	MP087			Yes	** NA **		None
88	U088			Yes	N/A	Exclude	None
89	U089			Yes	N/A	Exclude	None
90	MP090			Yes	** NA **		None
91	U091			Yes	N/A	Exclude	None
92	U092			Yes	N/A	Exclude	None
93	MP093			Yes	** NA **		None

**Hot Rolled Steel Properties**

	Label	E [psi]	G [psi]	Nu	Therm. Coeff. [1e <sup>5</sup> F <sup>-1</sup> ]	Density [lb/ft <sup>3</sup> ]	Yield [psi]	Ry	Fu [psi]	Rt
1	A500 Gr. B [SQR]	2.9e+07	1.115e+07	0.3	0.65	490	46000	1.4	58000	1.3
2	A36	2.9e+07	1.115e+07	0.3	0.65	490	36000	1.5	58000	1.2
3	SAE J429 Gr. 2	2.9e+07	1.115e+07	0.3	0.65	490	57000	1.1	74000	1.1
4	A53 Gr. B	2.9e+07	1.115e+07	0.3	0.65	490	35000	1.6	60000	1.2

**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		
1	N002	max	1568.019	17	2386.384	26	2928.736	14	6964.772	2	2249.199	23	1864.364	11
2		min	-1571.877	23	-560.254	20	-2949.851	8	-2399.523	20	-2244.397	17	-1834.342	17
3	N006	max	2517.961	18	2386.393	30	1509.005	12	1332.951	14	2249.169	15	2127.62	24
4		min	-2534.914	12	-560.232	24	-1496.136	18	-3591.34	8	-2244.367	21	-6098.642	6
5	N007	max	2574.289	4	2386.395	34	1718.12	2	1613.863	14	2249.157	19	5964.524	10
6		min	-2554.669	22	-560.232	16	-1709.935	20	-3924.302	8	-2244.355	25	-2028.307	16
7	Totals:	max	5620.283	17	6374.207	32	6067.533	14						
8		min	-5620.283	23	2279.328	14	-6067.533	20						

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

Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	Lcphi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn	
1	H001	HSS4x4x4	0.45	0	2	0.177	0	z	11	124317.885	139518	16180.5	16180.5	2.171 H1-1b
2	H002	PL6x0.5	0.19	6	12	0.465	12	y	10	83348.625	97200	1012.5	12150	1.206 H1-1b
3	H003	HSS4x4x4	0.45	0	6	0.177	0	z	3	124317.885	139518	16180.5	16180.5	2.171 H1-1b
4	H004	HSS4x4x4	0.45	0	10	0.177	0	z	7	124317.885	139518	16180.5	16180.5	2.171 H1-1b
5	H005	PL6x0.5	0.19	6	4	0.465	12	y	2	83348.625	97200	1012.5	12150	1.206 H1-1b
6	H006	PL6x0.5	0.19	6	8	0.465	12	y	6	83348.625	97200	1012.5	12150	1.206 H1-1b



Company : American Tower Corp.  
 Designer : Garrett.Williams  
 Job Number : 14529796\_C8\_01  
 Model Name : 411257, Middle Haddam Road-C...

9/18/2023  
 1:53:17 PM  
 Checked By : -

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

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	
7	H007	HSS4x4x4	0.153	30	2	0.058	4.375	z	13	133484.923	139518	16180.5	16180.5	1.297	H1-1b
8	H008	HSS4x4x4	0.153	30	6	0.058	4.375	z	5	133484.923	139518	16180.5	16180.5	1.297	H1-1b
9	H009	HSS4x4x4	0.153	30	10	0.058	4.375	z	9	133484.923	139518	16180.5	16180.5	1.297	H1-1b
10	H010	L2x2x3	0.189	25.115	11	0.013	50.229	z	7	9724.796	23392.8	557.717	1071.536	1.133	H2-1
11	H011	L2x2x3	0.189	25.115	3	0.013	50.229	z	11	9724.796	23392.8	557.717	1071.536	1.133	H2-1
12	H012	L2x2x3	0.189	25.115	7	0.013	50.229	z	3	9724.796	23392.8	557.717	1071.536	1.133	H2-1
13	H013	L2x2x3	0.201	25.115	9	0.013	50.229	y	13	9724.796	23392.8	557.717	1071.538	1.133	H2-1
14	H014	L2x2x3	0.201	25.115	13	0.013	50.229	y	5	9724.796	23392.8	557.717	1071.538	1.133	H2-1
15	H015	L2x2x3	0.201	25.115	5	0.013	50.229	y	9	9724.796	23392.8	557.717	1071.538	1.133	H2-1
16	H016	PL6x0.5	0.092	1.5	2	0.998	1.5	y	2	95014.386	97200	1012.5	12150	3	H1-1b
17	H017	PL6x0.5	0.092	1.5	6	0.998	1.5	y	6	95014.386	97200	1012.5	12150	3	H1-1b
18	H018	PL6x0.5	0.092	1.5	10	0.998	1.5	y	10	95014.386	97200	1012.5	12150	3	H1-1b
19	H019	PL6x0.5	0.074	1.5	6	1.032	1.5	y	6	95014.386	97200	1012.5	12150	3	H1-1b
20	H020	PL6x0.5	0.074	1.5	10	1.032	1.5	y	10	95014.386	97200	1012.5	12150	3	H1-1b
21	H021	PL6x0.5	0.074	1.5	2	1.032	1.5	y	2	95014.386	97200	1012.5	12150	3	H1-1b
22	H028	PIPE 3.0	0.215	143.187	10	0.165	150.437	z	2	21266.02	65205	5748.75	5748.75	1.379	H1-1b
23	H029	PIPE 3.0	0.215	143.187	2	0.165	150.437	z	6	21266.02	65205	5748.75	5748.75	1.379	H1-1b
24	H030	PIPE 3.0	0.215	143.187	6	0.165	150.437	z	10	21266.02	65205	5748.75	5748.75	1.379	H1-1b
25	H031	PL6x0.375	0.114	2	11	0.954	2	y	6	70719.442	72900	569.531	9112.5	1.337	H1-1b
26	H032	PL6x0.375	0.114	2	3	0.954	2	y	10	70719.442	72900	569.531	9112.5	1.337	H1-1b
27	H033	PL6x0.375	0.114	2	7	0.954	2	y	2	70719.442	72900	569.531	9112.5	1.337	H1-1b
28	H034	PL6x0.375	0.127	2	9	0.967	2	y	2	70719.442	72900	569.531	9112.5	1.341	H1-1b
29	H035	PL6x0.375	0.127	2	13	0.967	2	y	6	70719.442	72900	569.531	9112.5	1.341	H1-1b
30	H036	PL6x0.375	0.127	2	5	0.967	2	y	10	70719.442	72900	569.531	9112.5	1.341	H1-1b
31	H037	PL6x0.375	0.144	1.5	13	1.095	0	y	8	70011.374	72900	569.531	9112.5	3	H1-1b
32	H038	PL6x0.375	0.144	1.5	5	1.095	0	y	12	70011.374	72900	569.531	9112.5	3	H1-1b
33	H039	PL6x0.375	0.144	1.5	9	1.095	0	y	4	70011.374	72900	569.531	9112.5	3	H1-1b
34	H040	PL6x0.375	0.151	1.5	3	1.115	0	y	8	70011.374	72900	569.531	9112.5	3	H1-1b
35	H041	PL6x0.375	0.151	1.5	7	1.115	0	y	12	70011.374	72900	569.531	9112.5	3	H1-1b
36	H042	PL6x0.375	0.151	1.5	11	1.115	0	y	4	70011.374	72900	569.531	9112.5	3	H1-1b
37	H049	PIPE 2.0	0.636	14.5	2	0.541	12.687	z	2	11073.43	32130	1871.625	1871.625	2.224	H3-6
38	H050	PIPE 2.0	0.636	14.5	6	0.541	12.687	z	6	11073.43	32130	1871.625	1871.625	2.224	H3-6
39	H051	PIPE 2.0	0.636	14.5	10	0.541	12.687	z	10	11073.43	32130	1871.625	1871.625	2.224	H3-6
40	H052	L2.5x2.5x4	0.613	0	6	0.246	14.71	z	5	37765.457	38556	1113.554	2537.388	1.5	H2-1
41	H053	L2.5x2.5x4	0.613	0	10	0.246	14.71	z	9	37765.457	38556	1113.554	2537.388	1.5	H2-1
42	H054	L2.5x2.5x4	0.613	0	2	0.246	14.71	z	13	37765.457	38556	1113.554	2537.388	1.5	H2-1
43	H055	PL6x0.375	0.531	3	3	1.531	1.5	y	2	68085.235	72900	569.531	9112.5	1.391	H1-1b
44	H056	PL6x0.375	0.531	3	7	1.531	1.5	y	6	68085.235	72900	569.531	9112.5	1.391	H1-1b
45	H057	PL6x0.375	0.531	3	11	1.531	1.5	y	10	68085.235	72900	569.531	9112.5	1.391	H1-1b
46	H058	PL6x0.375	0.628	1.5	9	0.865	1.5	y	7	68085.235	72900	569.531	9112.5	1.745	H1-1b
47	H059	PL6x0.375	0.628	1.5	13	0.865	1.5	y	11	68085.235	72900	569.531	9112.5	1.745	H1-1b
48	H060	PL6x0.375	0.628	1.5	5	0.865	1.5	y	3	68085.235	72900	569.531	9112.5	1.745	H1-1b
49	MP069	PIPE 2.0	0.657	43.312	2	0.162	44.625	z	9	15528.311	32130	1871.625	1871.625	1.701	H1-1b
50	MP072	PIPE 2.0	0.599	66	4	0.092	66	z	7	17855.085	32130	1871.625	1871.625	2.323	H1-1b
51	MP075	PIPE 2.0	0.543	66	10	0.14	66	z	9	17855.085	32130	1871.625	1871.625	3	H1-1b
52	MP078	PIPE 2.0	0.657	43.312	10	0.162	44.625	z	5	15528.311	32130	1871.625	1871.625	2.04	H1-1b
53	MP081	PIPE 2.0	0.599	66	12	0.092	66	z	3	17855.085	32130	1871.625	1871.625	3	H1-1b
54	MP084	PIPE 2.0	0.543	66	6	0.14	66	z	5	17855.085	32130	1871.625	1871.625	2.145	H1-1b
55	MP087	PIPE 2.0	0.657	43.312	6	0.162	44.625	z	13	15528.311	32130	1871.625	1871.625	2.089	H1-1b
56	MP090	PIPE 2.0	0.599	66	8	0.092	66	z	11	17855.085	32130	1871.625	1871.625	3	H1-1b
57	MP093	PIPE 2.0	0.543	66	2	0.14	66	z	13	17855.085	32130	1871.625	1871.625	2.251	H1-1b



**AMERICAN TOWER®**  
CORPORATION

## Structural Analysis Report

**Structure** : 139 ft Monopole  
**ATC Asset Name** : Middle Haddam Road-CROWN CT  
**ATC Asset Number** : 411257  
**Engineering Number** : 14529796\_C3\_03  
**Proposed Carrier** : T-MOBILE  
**Carrier Site Name** : CT696/Verizon Portland\_ET  
**Carrier Site Number** : CT11696E  
**Site Location** : 191 Middle Haddam Rd  
Portland, CT 06480-1767  
41.5623° N, 72.5738° W  
**County** : Middlesex  
**Date** : October 19, 2023  
**Max Usage** : 67%  
**Analysis Result** : Pass

Created By:  
Bezakulu Mamo  
Structural Engineer I



Digitally signed by  
**Esha Modi**  
Esha Modi  
Date: 2023.10.20  
13:48:24 -04'00'

**COA: PEC.0001553**



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## Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 139 ft Monopole tower to reflect the change in loading by T-MOBILE.

## Supporting Documents

<b>Tower:</b>	EI Job #12477 Revision II, dated May 13, 2004 Mapping by HTS, ATC Site #411257, dated March 24, 2016
<b>Foundation:</b>	Mapping by TPS Report #TPS-CT-257, dated October 22, 2015
<b>Geotechnical:</b>	CHA Project #11869.1011.1502, dated September 23, 2002

## Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

<b>Basic Wind Speed:</b>	130 mph (3-second gust)
<b>Basic Wind Speed w/ Ice:</b>	50 mph (3-second gust) w/ 1.00" radial ice concurrent
<b>Code(s):</b>	ANSI/TIA-222-H / 2021 IBC / 2022 Connecticut State Building Code
<b>Exposure Category:</b>	B
<b>Risk Category:</b>	II
<b>Topographic Factor Procedure:</b>	Method 1
<b>Topographic Category:</b>	1
<b>Spectral Response:</b>	$S_s = 0.21$ , $S_1 = 0.06$
<b>Site Class:</b>	D - Stiff Soil - Default

## Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please reach out to your American Tower contact. If you do not have an American Tower contact and have an Engineering question, please contact [Engineering@americantower.com](mailto:Engineering@americantower.com). Please include the American Tower asset name, asset number, and engineering number in the subject line for any questions.

### Structure Usages

Structural Component	Usage	Control	Result
Pole Shaft	67.2%	1.2D + 1.0W	Pass
Serviceability Usage	19.7%	1.0D + 1.0W	Pass
Upper Flange Plate @ 128.5 ft	8.4%	Bolts	Pass
Base Plate @ 0.0 ft	49.7%	Rods	Pass
Pier	11.6%	Moment [Soil]	Pass

### Maximum Reactions

Foundation	Moment (k-ft)	Axial (k)	Shear (k)
Monopole Base	4,016.3	61.7	40.7

*\*Reactions shown reflect the results from the Load Case with maximum Moment*

Structure base reactions were analyzed using available geotechnical and foundation information.



**T-MOBILE Final Loading**

Elev (ft)	Qty	Equipment	Lines
139.0	3	Commscope VV-65A-R1B	(3) 1.99" (50.7mm) Hybrid
	3	Ericsson 4460 BAND 2/25	
	3	Ericsson 4480 BAND 71	
	3	Ericsson AIR 6419 B41	
	3	RFS APXVAALL24 43-U-NA20	
138.0	1	Low Profile Platform	-
137.2	3	Ericsson KRY 112 20	-

**Other Existing/Reserved Loading**

Elev (ft)	Qty	Equipment	Lines	Carrier
138.0	1	10' Omni	-	VERIZON WIRELESS
134.0	1	Unused Reserve (16529.3200 sqin)	-	VERIZON WIRELESS
128.0	1	Low Profile Platform	(16) 1 5/8" Coax (2) 1 5/8" Hybriflex	VERIZON WIRELESS
	1	Raycap RCMDC-6627-PF-48		
	2	Kaelus KA-6030		
	2	RFS APL866513-44T0		
	3	Commscope CBC78T-DS-43-2X		
	3	Mount Reinforcement		
	3	Samsung B2/B66A RRH-BR049		
	3	Samsung B5/B13 RRH-BR04C		
	3	Samsung MT6407-77A		
	4	Decibel DB846H80E-SX		
119.0	6	Commscope JAHH-65B-R3B	(2) 0.39" (10mm) Fiber Trunk (4) 0.78" (19.7mm) 8 AWG 6 (12) 1 5/8" Coax (1) 1/2" Coax (4) 3" conduit	AT&T MOBILITY
	3	CCI DMP65R-BU6DA		
	3	Commscope NNH4-65B-R6		
	3	Ericsson RRUS 4449 B5, B12		
	3	Ericsson Radio 8843 - B2 + B66A		
	3	Powerwave Allgon 7770.00		
117.0	1	Platform with Handrails	-	AT&T MOBILITY
113.6	2	Raycap DC6-48-60-18-8F	-	AT&T MOBILITY
104.0	1	RFI Antennas CC807-08	(1) 1/2" Coax	CITY OF MIDDLETOWN, CT
100.0	1	Bird DS428E83I01T	(1) 1/2" Coax (1) 7/8" Coax	CITY OF MIDDLETOWN, CT
95.0	3	Side Arm	-	CITY OF MIDDLETOWN, CT
87.0	1	RFI Antennas CC807-08	(1) 7/8" Coax	CITY OF MIDDLETOWN, CT
80.0	1	RFI Antennas OA20-41-DIN	(1) 7/8" Coax	CITY OF MIDDLETOWN, CT
	2	Radio Waves HP3-11	(2) EW90	
69.0	1	Commscope RDIDC-9181-PF-48	(1) 1.60" (40.6mm) Hybrid	DISH WIRELESS L.L.C.
	1	Platform with Handrails		
	3	Fujitsu TA08025-B604		
	3	Fujitsu TA08025-B605		
	3	JMA Wireless MX08FRO665-21		

(If table breaks across pages, please see previous page for data in merged cells)



## **Standard Conditions**

All engineering services performed by A.T. Engineering Services LLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding antenna, mounts, and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Services LLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Services LLC and used in the performance of our engineering services is correct and complete.

All assets of American Tower Corporation, its affiliates, and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and A.T. Engineering Services LLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

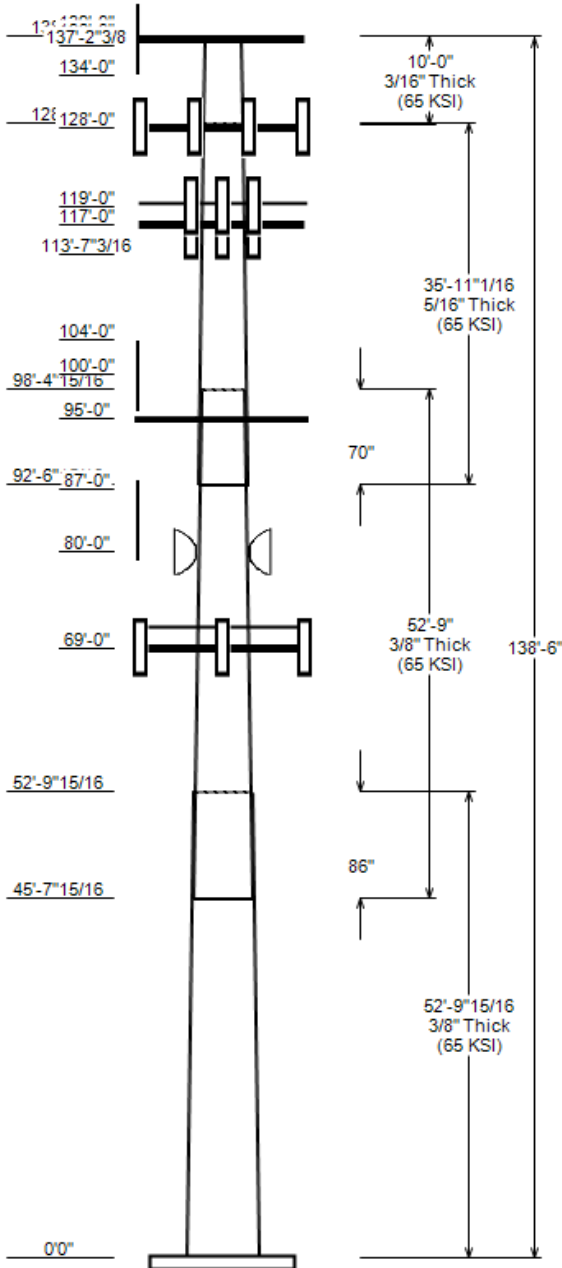
All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Services LLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

**ANALYSIS PARAMETERS**

Nominal Wind: 130 mph	Ice Wind: 50 mph w/ 1" ice	Service Wind: 60 mph
Risk Category: II	Exposure: B	S <sub>s</sub> : 0.21 S <sub>i</sub> : 0.056
Topo Category: 1	Topo Factor: Method 1	Topo Feature:
Structure Height: 138.5 ft	Base Elevation: 0.00 ft	Structure Type: Taper
Base Diameter: 64.38 in	Base Rotation: 0°	Taper: 0.2460 (in/ft)

**POLE SECTION PROPERTIES**

Section	Length (ft)	Flat Diameter (in)		Thick (in)	Joint Type	Joint Length (in)	Pole Shape	Yield Strength (ksi)
		Top	Bottom					
1	52.830	51.41	64.38	0.375		0.000	18 Sides	65
2	52.750	40.97	53.92	0.375	Slip Joint	86.000	18 Sides	65
3	35.920	34.20	43.02	0.312	Slip Joint	70.000	18 Sides	65
4	10.000	31.75	34.20	0.188	Butt Joint	0.000	18 Sides	65



**DISCRETE APPURTENANCE**

Elev (ft)	Description
139.0	(3) Ericsson 4460 BAND 2/25
139.0	(3) Ericsson 4480 BAND 71
139.0	(3) Ericsson AIR 6419 B41
139.0	(3) Commscope VV-65A-R1B
139.0	(3) RFS APXVAALL24 43-U-NA20
138.0	(1) Generic 10' Omni
138.0	(1) Generic Round Low Profile Plat
137.2	(3) Ericsson KRY 112 20
134.0	(1) Unused Reserve (16529.3200 sqi
134.0	(1) Unused Reserve (16529.3200 sqi
128.0	(3) Commscope CBC78T-DS-43-2X
128.0	(2) Kaelus KA-6030
128.0	(3) Samsung B5/B13 RRH-BR04C
128.0	(3) Samsung B2/B66A RRH-BR049
128.0	(2) RFS APL866513-44T0
128.0	(1) Raycap RCMDC-6627-PF-48
128.0	(3) Samsung MT6407-77A
128.0	(3) Generic Mount Reinforcement
128.0	(4) Decibel DB846H80E-SX
128.0	(6) Commscope JAHH-65B-R3B
128.0	(1) Generic Flat Low Profile Platf
119.0	(6) Powerwave Allgon LGP21401
119.0	(3) Ericsson Radio 8843 - B2 + B66
119.0	(3) Ericsson RRUS 4449 B5, B12
119.0	(3) Powerwave Allgon 7770.00
119.0	(3) Commscope NNH4-65B-R6
119.0	(3) CCI DMP65R-BU6DA
117.0	(1) Generic Round Platform with Ha
113.6	(2) Raycap DC6-48-60-18-8F
104.0	(1) RFI Antennas CC807-08
100.0	(1) Bird DS428E83101T
95.0	(3) Flat Side Arm
87.0	(1) RFI Antennas CC807-08
80.0	(1) RFI Antennas OA20-41-DIN
80.0	(2) Radio Waves HP3-11
69.0	(1) Commscope RDIDC-9181-PF-48
69.0	(3) Fujitsu TA08025-B604
69.0	(3) Fujitsu TA08025-B605
69.0	(3) JMA Wireless MX08FRO665-21
69.0	(1) Generic Flat Platform with Han

**LINEAR APPURTENANCE**

Elev To (ft)	Description
139.0	(3) 1.99" (50.7mm) Hybrid
128.0	(2) 1 5/8" Hybriflex
128.0	(16) 1 5/8" Coax
119.0	(3) 3" conduit
119.0	(1) 3" conduit
119.0	(1) 1/2" Coax
119.0	(12) 1 5/8" Coax
119.0	(4) 0.78" (19.7mm) 8 AWG 6
119.0	(2) 0.39" (10mm) Fiber Trunk
104.0	(1) 1/2" Coax
100.0	(1) 7/8" Coax
100.0	(1) 1/2" Coax
87.0	(1) 7/8" Coax
80.0	(2) EW90
80.0	(1) 7/8" Coax
69.0	(1) 1.60" (40.6mm) Hybrid

**DISH SERVICEABILITY**

Load Case	Elevation (ft)	Deflection (in)	Rotation (°)
1.0D + 1.0W	80.00	3.576	0.411

**GLOBAL BASE REACTIONS**

Load Case	Moment (kip-ft)	Axial (kip)	Shear (kip)
1.2D + 1.0W	4016.30	61.67	40.73
0.9D + 1.0W	3987.76	46.24	40.71
1.2D + 1.0Di + 1.0Wi	797.66	82.04	8.10
1.2D + 1.0Ev + 1.0Eh	188.34	62.00	1.73
0.9D - 1.0Ev + 1.0Eh	186.64	42.59	1.73
1.0D + 1.0W	762.09	51.43	7.76

ANALYSIS PARAMETERS

<b>Location:</b>	Middlesex County,CT	<b>Height:</b>	138.5 ft
<b>Type and Shape:</b>	Taper, 18 Sides	<b>Base Diameter:</b>	64.38 in
<b>Manufacturer:</b>	EEL	<b>Top Diameter:</b>	31.75 in
<b>K<sub>d</sub> (non-service):</b>	0.95	<b>Taper:</b>	0.2460 in/ft
<b>K<sub>e</sub>:</b>	0.99	<b>Rotation:</b>	0.000°

ICE & WIND PARAMETERS

<b>Risk Category:</b>	II	<b>Design Wind Speed:</b>	130 mph
<b>Exposure Category:</b>	B	<b>Design Wind Speed w/ Ice:</b>	50 mph
<b>Topo Factor Procedure:</b>	Method 1	<b>Design Ice Thickness:</b>	1.00 in
<b>Topographic Category:</b>	1	<b>Service Wind Speed:</b>	60 mph
<b>Crest Height:</b>	0 ft	<b>HMSL:</b>	250.00 ft

SEISMIC PARAMETERS

<b>Analysis Method:</b>	Equivalent Lateral Force Method		
<b>Site Class:</b>	D - Stiff Soil	<b>Period Based on Rayleigh Method (sec):</b>	1.78
<b>T<sub>L</sub> (sec):</b>	6	<b>P:</b>	1
<b>S<sub>s</sub>:</b>	0.210	<b>S<sub>1</sub>:</b>	0.056
<b>F<sub>a</sub>:</b>	1.600	<b>F<sub>v</sub>:</b>	2.400
<b>S<sub>ds</sub>:</b>	0.224	<b>S<sub>d1</sub>:</b>	0.090
		<b>C<sub>s</sub>:</b>	0.034
		<b>C<sub>s</sub> Max:</b>	0.034
		<b>C<sub>s</sub> Min:</b>	0.030

LOAD CASES

1.2D + 1.0W	130 mph Wind with No Ice
0.9D + 1.0W	130 mph Wind with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph Wind with 1" Radial Ice
1.2D + 1.0Ev + 1.0Eh	Seismic
0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)
1.0D + 1.0W	60 mph Wind with No Ice

SHAFT SECTION PROPERTIES

Section	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Joint Len (in)	Weight (lb)	Bottom						Top											
							Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Taper (in/ft)					
1-18	52.83	0.3750	65		0.00	12,307	64.38	0.000	76.18	39,429.1	28.86	171.68	51.41	52.83	60.74	19,987.	22.76	137.09	0.2455					
2-18	52.75	0.3750	65	Slip	86.00	10,055	53.92	45.660	63.73	23,083.3	23.94	143.78	40.97	98.41	48.31	10,057.	17.85	109.25	0.2455					
3-18	35.92	0.3125	65	Slip	70.00	4,643	43.02	92.580	42.36	9,764.3	22.87	137.68	34.20	128.50	33.62	4,878.8	17.89	109.46	0.2455					
4-18	10.00	0.1875	65	Butt	0.00	664	34.20	128.500	20.24	2,959.8	30.76	182.43	31.75	138.50	18.78	2,364.1	28.45	169.33	0.2455					
<b>Total Shaft Weight</b>						<b>27,669</b>																		

DISCRETE APPURTENANCE PROPERTIES

Attach Elev (ft)	Description	Qty	Ka	Vert Ecc (ft)	No Ice			Ice									
					Weight (lb)	EPAa (sf)	Orientation Factor	Weight (lb)	EPAa (sf)	Orientation Factor							
139.00	RFS APXVAALL24 43-U-NA20	3	0.75	0.000	122.80	20.243	0.63	380.89	22.701	0.63							
139.00	Ericsson AIR 6419 B41	3	0.75	0.000	68.50	5.600	0.60	148.56	6.650	0.60							
139.00	Commscope VV-65A-R1B	3	0.75	0.000	24.70	5.887	0.63	102.15	7.289	0.63							
139.00	Ericsson 4480 BAND 71	3	0.80	0.000	81.00	2.878	0.67	131.44	3.622	0.67							
139.00	Ericsson 4460 BAND 2/25	3	0.75	0.000	109.00	2.564	0.67	167.57	3.262	0.67							
138.00	Generic Round Low Profile Plat	1	1.00	0.000	1875.00	21.700	1.00	2411.37	34.416	1.00							
138.00	Generic 10' Omni	1	1.00	0.000	25.00	3.000	1.00	75.27	5.384	1.00							
137.20	Ericsson KRY 112 20	3	0.80	0.000	12.10	0.449	0.50	22.45	0.782	0.50							
134.00	Unused Reserve (16529.3200 sqi	1	0.80	0.000	1177.80	114.787	0.90	1718.97	167.529	0.90							
128.00	Samsung B5/B13 RRH-BR04C	3	0.80	0.000	70.30	1.875	0.50	107.87	2.468	0.50							
128.00	RFS APL866513-44T0	2	0.80	0.000	15.70	4.050	0.82	93.81	4.637	0.82							
128.00	Raycap RCMDC-6627-PF-48	1	0.80	0.000	32.00	4.056	1.00	115.47	4.952	1.00							
128.00	Samsung MT6407-77A	3	0.80	0.000	81.60	4.709	0.61	148.54	5.707	0.61							
128.00	Generic Mount Reinforcement	3	1.00	0.000	200.00	4.980	1.00	327.10	8.245	1.00							
128.00	Decibel DB846H80E-SX	4	0.80	0.000	16.00	5.867	0.73	112.31	5.776	0.73							
128.00	Commscope JAHH-65B-R3B	6	0.80	0.000	60.60	9.113	0.69	193.46	10.935	0.69							
128.00	Kaelus KA-6030	2	0.80	0.000	17.60	0.963	0.50	33.08	1.392	0.50							
128.00	Commscope CBC78T-DS-43-2X	3	0.80	0.000	20.70	0.552	0.50	35.21	0.886	0.50							
128.00	Generic Flat Low Profile Platf	1	1.00	0.000	1875.00	26.100	1.00	2406.88	38.639	1.00							
128.00	Samsung B2/B66A RRH-BR049	3	0.80	0.000	84.40	1.875	0.50	126.30	2.468	0.50							
119.00	CCI DMP65R-BU6DA	3	0.75	0.000	79.40	12.709	0.63	247.41	14.528	0.63							
119.00	Commscope NNH4-65B-R6	3	0.75	0.000	89.70	12.271	0.64	253.58	14.100	0.64							
119.00	Powerwave Allgon 7770.00	3	0.75	-2.000	35.00	5.508	0.65	109.14	6.894	0.65							
119.00	Ericsson Radio 8843 - B2 + B66	3	0.75	0.000	71.90	1.650	0.50	112.08	2.203	0.50							
119.00	Ericsson RRUS 4449 B5, B12	3	0.75	0.000	71.00	1.969	0.50	113.03	2.577	0.50							
119.00	Powerwave Allgon LGP21401	6	0.75	-2.000	14.10	1.104	0.50	30.37	1.569	0.50							
117.00	Generic Round Platform with Ha	1	1.00	0.000	2500.00	27.200	1.00	3554.57	43.115	1.00							
113.60	Raycap DC6-48-60-18-8F	2	0.75	-2.000	20.00	1.260	1.00	54.16	1.687	1.00							
104.00	RFI Antennas CC807-08	1	1.00	-2.000	24.30	2.855	1.00	71.25	5.039	1.00							
100.00	Bird DS428E83101T	1	1.00	0.000	8.90	0.465	1.00	20.09	0.769	1.00							
95.00	Flat Side Arm	3	1.00	0.000	150.00	6.300	0.67	196.62	7.867	0.67							
87.00	RFI Antennas CC807-08	1	1.00	-1.000	24.30	2.855	1.00	70.46	5.002	1.00							
80.00	Radio Waves HP3-11	2	1.00	0.000	50.00	8.918	1.00	163.86	10.014	1.00							
80.00	RFI Antennas OA20-41-DIN	1	1.00	2.000	28.00	4.410	1.00	104.23	8.408	1.00							
69.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	3594.85	55.325	1.00							
69.00	Fujitsu TA08025-B604	3	0.75	0.000	63.90	1.962	0.50	99.84	2.529	0.50							
69.00	Fujitsu TA08025-B605	3	0.75	0.000	75.00	1.962	0.50	113.61	2.529	0.50							
69.00	Commscope RDIDC-9181-PF-48	1	0.75	0.000	21.90	1.867	1.00	56.97	2.422	1.00							
69.00	JMA Wireless MX08FRO665-21	3	0.75	0.000	64.50	12.489	0.64	222.91	14.221	0.64							
<b>Totals</b>		<b>Row Count: 39</b>				<b>96</b>			<b>15,537.50</b>				<b>26,181.32</b>				

LINEAR APPURTENANCE PROPERTIES

Load Case Azimuth (deg): 0.00

Elev From (ft)	Elev To (ft)	Qty	Description	Diameter (in)	Weight (lb/ft)	Flat	Max/Row	Distance Between Rows(in)	Distance Between Cols(in)	Azimuth (deg)	Distance From Face (in)	Exposed To Wind	Carrier
0.00	139.00	3	1.99" (50.7mm) Hybrid	1.99	1.9	N	0	0	0	0	0	N	T-MOBILE
0.00	128.00	16	1 5/8" Coax	1.98	0.82	N	6	0.5	0.5	90	0.5	Y	VERIZON WIRELESS
0.00	128.00	2	1 5/8" Hybriflex	1.98	1.3	N	0	0	0	0	0	N	VERIZON WIRELESS

LINEAR APPURTENANCE PROPERTIES

Load Case Azimuth (deg): 0.00

Elev From (ft)	Elev To (ft)	Qty	Description	Diameter (in)	Weight (lb/ft)	Flat	Max/Row	Distance Between Rows(in)	Distance Between Cols(in)	Azimuth (deg)	Distance From Face (in)	Exposed To Wind	Carrier
0.00	119.00	12	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	119.00	4	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	119.00	3	3" conduit	3.5	7.58	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	119.00	2	0.39" (10mm) Fiber Tr	0.39	0.06	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	119.00	1	3" conduit	3.5	7.58	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	119.00	1	1/2" Coax	0.63	0.15	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	104.00	1	1/2" Coax	0.63	0.15	N	0	0	0	0	0	N	CITY OF MIDDLETOWN, C
0.00	100.00	1	7/8" Coax	1.09	0.33	N	0	0	0	0	0	N	CITY OF MIDDLETOWN, C
0.00	100.00	1	1/2" Coax	0.63	0.15	N	0	0	0	0	0	N	CITY OF MIDDLETOWN, C
0.00	87.00	1	7/8" Coax	1.09	0.33	N	0	0	0	0	0	N	CITY OF MIDDLETOWN, C
0.00	80.00	2	EW90	1.32	0.32	N	0	0	0	0	0	N	CITY OF MIDDLETOWN, C
0.00	80.00	1	7/8" Coax	1.09	0.33	N	0	0	0	0	0	N	CITY OF MIDDLETOWN, C
0.00	69.00	1	1.60" (40.6mm) Hybrid	1.6	2.34	N	0	0	0	0	0	N	DISH WIRELESS L.L.C.

SEGMENT PROPERTIES

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	F'y (ksi)	S (in <sup>3</sup> )	Z (in <sup>3</sup> )	Weight (lb)
0.00		0.3750	64.380	76.179	39,429.10	28.86	171.68	67.5	1206.3	0.0	0.0
5.00		0.3750	63.152	74.718	37,203.60	28.28	168.41	68.1	1160.3	0.0	1,283.7
10.00		0.3750	61.925	73.257	35,063.50	27.71	165.13	68.8	1115.2	0.0	1,258.8
15.00		0.3750	60.697	71.796	33,007.00	27.13	161.86	69.5	1071.1	0.0	1,234.0
20.00		0.3750	59.470	70.335	31,032.60	26.55	158.59	70.2	1027.8	0.0	1,209.1
25.00		0.3750	58.242	68.874	29,138.50	25.98	155.31	70.8	985.4	0.0	1,184.2
30.00		0.3750	57.014	67.412	27,323.10	25.40	152.04	71.5	943.9	0.0	1,159.4
35.00		0.3750	55.787	65.951	25,584.70	24.82	148.76	72.2	903.3	0.0	1,134.5
40.00		0.3750	54.559	64.490	23,921.60	24.24	145.49	72.9	863.6	0.0	1,109.7
45.00		0.3750	53.331	63.029	22,332.20	23.67	142.22	73.6	824.8	0.0	1,084.8
45.66	Bot - Section 2	0.3750	53.169	62.835	22,126.80	23.59	141.78	73.7	819.7	0.0	142.0
50.00		0.3750	52.104	61.568	20,814.90	23.09	138.94	74.2	786.8	0.0	1,849.0
52.83	Top - Section 1	0.3750	52.159	61.634	20,881.50	23.11	139.09	74.2	788.5	0.0	1,186.4
55.00		0.3750	51.626	61.000	20,243.60	22.86	137.67	74.5	772.3	0.0	452.8
60.00		0.3750	50.399	59.538	18,823.50	22.29	134.40	75.2	735.6	0.0	1,025.4
65.00		0.3750	49.171	58.077	17,471.40	21.71	131.12	75.9	699.8	0.0	1,000.6
69.00		0.3750	48.189	56.908	16,437.60	21.25	128.50	76.4	671.8	0.0	782.5
70.00		0.3750	47.943	56.616	16,185.60	21.13	127.85	76.5	664.9	0.0	193.1
75.00		0.3750	46.716	55.155	14,964.60	20.56	124.58	77.2	630.9	0.0	950.8
80.00		0.3750	45.488	53.694	13,806.50	19.98	121.30	77.9	597.8	0.0	926.0
85.00		0.3750	44.261	52.233	12,709.80	19.40	118.03	78.6	565.6	0.0	901.1
87.00		0.3750	43.769	51.648	12,287.90	19.17	116.72	78.9	553.0	0.0	353.5
90.00		0.3750	43.033	50.772	11,672.80	18.82	114.75	79.3	534.3	0.0	522.8
92.58	Bot - Section 3	0.3750	42.399	50.018	11,160.40	18.53	113.07	79.6	518.4	0.0	442.4
95.00		0.3750	41.805	49.311	10,693.70	18.25	111.48	79.9	503.8	0.0	755.4
98.41	Top - Section 2	0.3125	41.592	40.943	8,814.60	22.06	133.10	75.5	417.4	0.0	1,047.3
100.00		0.3125	41.203	40.556	8,567.40	21.84	131.85	75.7	409.5	0.0	220.0
104.00		0.3125	40.221	39.582	7,964.80	21.28	128.71	76.4	390.0	0.0	545.4
105.00		0.3125	39.975	39.339	7,818.70	21.15	127.92	76.5	385.2	0.0	134.3
110.00		0.3125	38.747	38.121	7,115.00	20.45	123.99	77.3	361.7	0.0	658.9
113.60		0.3125	37.864	37.245	6,635.30	19.95	121.16	77.9	345.2	0.0	461.6
115.00		0.3125	37.520	36.904	6,454.70	19.76	120.06	78.2	338.8	0.0	176.6
117.00		0.3125	37.029	36.417	6,202.50	19.48	118.49	78.5	329.9	0.0	249.5
119.00		0.3125	36.538	35.930	5,957.00	19.21	116.92	78.8	321.1	0.0	246.2
120.00		0.3125	36.292	35.686	5,836.70	19.07	116.13	79	316.8	0.0	121.8
125.00		0.3125	35.065	34.468	5,259.40	18.37	112.21	79.8	295.4	0.0	596.8
128.00		0.3125	34.328	33.738	4,932.00	17.96	109.85	80.3	283.0	0.0	348.1
128.50	Top - Section 3	0.3125	34.205	33.616	4,878.80	17.89	109.46	80.4	280.9	0.0	57.3
128.50	Bot - Section 4	0.1875	34.205	20.244	2,959.80	30.76	182.43	65.2	170.4	0.0	
130.00		0.1875	33.837	20.025	2,864.70	30.41	180.46	65.6	166.8	0.0	102.8
134.00		0.1875	32.855	19.440	2,621.10	29.49	175.23	66.7	157.1	0.0	268.6

SEGMENT PROPERTIES

Seg Top Elev (ft)	Description	(Max Length: 5 ft)	Thick (in)	Flat Dia (in)	Area (in²)	Ix (in⁴)	W/t Ratio	D/t Ratio	Fy (ksi)	S (in³)	Z (in³)	Weight (lb)
135.00			0.1875	32.609	19.294	2,562.50	29.26	173.92	67	154.8	0.0	65.9
137.20			0.1875	32.069	18.973	2,436.50	28.75	171.04	67.6	149.6	0.0	143.2
138.00			0.1875	31.873	18.856	2,391.80	28.56	169.99	67.8	147.8	0.0	51.5
138.50			0.1875	31.750	18.783	2,364.10	28.45	169.33	67.9	146.7	0.0	32.0
<b>Total:</b>												<b>27,669.8</b>

CALCULATED FORCES

Load Case: 1.2D + 1.0W			130 mph Wind with No Ice										21 Iterations	
Gust Response Factor: 1.10														
Dead load Factor: 1.20														
Wind Load Factor: 1.00														
Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio	
0.00	-61.67	-40.73	0.00	-4,016.3	0.00	4,016.30	4,624.80	1,336.95	7,728.54	6,102.72	0	0	0.672	
5.00	-59.62	-40.23	0.00	-3,812.6	0.00	3,812.65	4,581.75	1,311.30	7,434.94	5,929.27	0.08	-0.14	0.657	
10.00	-57.60	-39.72	0.00	-3,611.5	0.00	3,611.53	4,536.92	1,285.66	7,147.03	5,755.76	0.3	-0.28	0.641	
15.00	-55.61	-39.20	0.00	-3,413.0	0.00	3,412.95	4,490.29	1,260.02	6,864.80	5,582.30	0.68	-0.43	0.625	
20.00	-53.66	-38.68	0.00	-3,217.0	0.00	3,216.95	4,441.89	1,234.37	6,588.26	5,409.05	1.2	-0.57	0.608	
25.00	-51.74	-38.16	0.00	-3,023.6	0.00	3,023.55	4,391.70	1,208.73	6,317.40	5,236.13	1.87	-0.71	0.590	
30.00	-49.86	-37.62	0.00	-2,832.8	0.00	2,832.77	4,339.72	1,183.09	6,052.23	5,063.69	2.7	-0.85	0.572	
35.00	-48.00	-37.06	0.00	-2,644.7	0.00	2,644.67	4,285.96	1,157.45	5,792.74	4,891.85	3.67	-1	0.553	
40.00	-46.18	-36.46	0.00	-2,459.4	0.00	2,459.39	4,230.41	1,131.80	5,538.94	4,720.76	4.79	-1.14	0.533	
45.00	-44.43	-36.10	0.00	-2,277.1	0.00	2,277.08	4,173.07	1,106.16	5,290.83	4,550.55	6.06	-1.28	0.512	
45.66	-44.17	-35.79	0.00	-2,253.1	0.00	2,253.13	4,165.33	1,102.76	5,258.34	4,528.04	6.24	-1.3	0.509	
50.00	-41.54	-35.29	0.00	-2,097.9	0.00	2,097.90	4,113.95	1,080.52	5,048.40	4,381.36	7.48	-1.42	0.490	
52.83	-39.86	-34.94	0.00	-1,998.0	0.00	1,998.03	4,116.65	1,081.67	5,059.17	4,388.93	8.34	-1.5	0.466	
55.00	-39.09	-34.46	0.00	-1,922.2	0.00	1,922.22	4,090.47	1,070.54	4,955.61	4,315.83	9.04	-1.56	0.456	
60.00	-37.40	-33.75	0.00	-1,750.0	0.00	1,749.95	4,028.87	1,044.90	4,721.08	4,148.28	10.74	-1.69	0.432	
65.00	-35.74	-33.09	0.00	-1,581.2	0.00	1,581.20	3,965.49	1,019.26	4,492.23	3,982.07	12.58	-1.81	0.407	
69.00	-30.78	-29.95	0.00	-1,448.8	0.00	1,448.83	3,913.49	998.74	4,313.24	3,850.16	14.15	-1.91	0.385	
70.00	-30.45	-29.51	0.00	-1,418.9	0.00	1,418.88	3,900.32	993.61	4,269.06	3,817.34	14.55	-1.94	0.380	
75.00	-28.88	-28.74	0.00	-1,271.3	0.00	1,271.33	3,833.36	967.97	4,051.59	3,654.23	16.64	-2.06	0.356	
80.00	-27.23	-27.02	0.00	-1,127.3	0.00	1,127.26	3,764.62	942.33	3,839.79	3,492.87	18.86	-2.17	0.331	
85.00	-25.75	-26.44	0.00	-992.2	0.00	992.18	3,694.09	916.69	3,633.69	3,333.39	21.19	-2.28	0.305	
87.00	-25.14	-25.92	0.00	-939.3	0.00	939.30	3,665.38	906.43	3,552.83	3,270.16	22.16	-2.32	0.295	
90.00	-24.27	-25.45	0.00	-861.6	0.00	861.56	3,621.78	891.04	3,433.26	3,175.95	23.64	-2.39	0.279	
92.58	-23.53	-25.03	0.00	-795.9	0.00	795.89	3,583.76	877.81	3,332.07	3,095.54	24.94	-2.44	0.264	
95.00	-21.92	-23.95	0.00	-735.3	0.00	735.30	3,547.68	865.40	3,238.53	3,020.66	26.19	-2.48	0.250	
98.41	-20.40	-23.48	0.00	-653.6	0.00	653.56	2,780.48	718.55	2,679.07	2,362.30	27.99	-2.55	0.285	
100.00	-20.00	-23.00	0.00	-616.3	0.00	616.29	2,763.68	711.77	2,628.75	2,325.70	28.84	-2.58	0.273	
104.00	-19.02	-22.43	0.00	-524.3	0.00	524.29	2,720.52	694.67	2,504.01	2,233.97	31.03	-2.65	0.243	
105.00	-18.79	-21.93	0.00	-501.9	0.00	501.86	2,709.55	690.40	2,473.30	2,211.17	31.59	-2.67	0.235	
110.00	-17.62	-21.17	0.00	-392.2	0.00	392.19	2,653.64	669.03	2,322.58	2,097.99	34.43	-2.75	0.195	
113.60	-16.75	-20.63	0.00	-316.0	0.00	315.96	2,612.27	653.64	2,217.00	2,017.41	36.53	-2.8	0.164	
115.00	-16.44	-20.33	0.00	-287.1	0.00	287.08	2,595.94	647.66	2,176.60	1,986.29	37.35	-2.82	0.152	
117.00	-13.06	-18.57	0.00	-246.4	0.00	246.41	2,572.36	639.11	2,119.53	1,942.06	38.54	-2.84	0.133	
119.00	-11.39	-15.89	0.00	-209.3	0.00	209.28	2,548.49	630.56	2,063.23	1,898.09	39.74	-2.87	0.115	
120.00	-11.24	-15.38	0.00	-193.4	0.00	193.39	2,536.45	626.29	2,035.36	1,876.21	40.34	-2.88	0.108	
125.00	-10.42	-14.67	0.00	-116.5	0.00	116.50	2,475.18	604.92	1,898.85	1,767.88	43.37	-2.91	0.071	
128.00	-5.68	-9.09	0.00	-72.5	0.00	72.49	2,437.56	592.10	1,819.22	1,703.78	45.21	-2.93	0.045	
128.50	-5.61	-8.99	0.00	-68.0	0.00	67.95	2,431.23	589.96	1,806.12	1,693.17	45.51	-2.93	0.043	
128.50	-5.61	-8.99	0.00	-68.0	0.00	67.95	1,188.40	355.28	1,091.56	833.74	45.51	-2.93	0.087	
130.00	-5.49	-8.71	0.00	-54.5	0.00	54.46	1,182.87	351.44	1,068.05	820.83	46.44	-2.94	0.072	
134.00	-3.95	-4.40	0.00	-19.6	0.00	19.62	1,167.35	341.18	1,006.62	786.29	48.9	-2.95	0.028	
135.00	-3.87	-4.24	0.00	-15.2	0.00	15.22	1,163.30	338.62	991.55	777.64	49.52	-2.95	0.023	
137.20	-3.65	-4.06	0.00	-5.9	0.00	5.88	1,154.12	332.97	958.79	758.57	50.88	-2.95	0.011	
138.00	-1.37	-2.68	0.00	-2.6	0.00	2.63	1,150.69	330.92	947.01	751.64	51.38	-2.96	0.005	
138.50	0.00	-2.61	0.00	-1.3	0.00	1.29	1,148.53	329.64	939.69	747.30	51.69	-2.96	0.002	

CALCULATED FORCES

Load Case: 0.9D + 1.0W

130 mph Wind with No Ice (Reduced DL)

21 Iterations

Gust Response Factor: 1.10  
 Dead Load Factor: 0.90  
 Wind Load Factor: 1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-46.24	-40.71	0.00	-3,987.8	0.00	3,987.76	4,624.80	1,336.95	7,728.54	6,102.72	0	0	0.664
5.00	-44.68	-40.17	0.00	-3,784.2	0.00	3,784.21	4,581.75	1,311.30	7,434.94	5,929.27	0.08	-0.14	0.649
10.00	-43.14	-39.62	0.00	-3,583.4	0.00	3,583.37	4,536.92	1,285.66	7,147.03	5,755.76	0.3	-0.28	0.633
15.00	-41.63	-39.08	0.00	-3,385.2	0.00	3,385.25	4,490.29	1,260.02	6,864.80	5,582.30	0.67	-0.42	0.617
20.00	-40.14	-38.53	0.00	-3,189.9	0.00	3,189.87	4,441.89	1,234.37	6,588.26	5,409.05	1.19	-0.56	0.600
25.00	-38.68	-37.97	0.00	-2,997.2	0.00	2,997.24	4,391.70	1,208.73	6,317.40	5,236.13	1.86	-0.71	0.582
30.00	-37.25	-37.41	0.00	-2,807.4	0.00	2,807.38	4,339.72	1,183.09	6,052.23	5,063.69	2.67	-0.85	0.564
35.00	-35.84	-36.82	0.00	-2,620.3	0.00	2,620.33	4,285.96	1,157.45	5,792.74	4,891.85	3.64	-0.99	0.545
40.00	-34.46	-36.21	0.00	-2,436.2	0.00	2,436.21	4,230.41	1,131.80	5,538.94	4,720.76	4.75	-1.13	0.525
45.00	-33.13	-35.84	0.00	-2,255.2	0.00	2,255.17	4,173.07	1,106.16	5,290.83	4,550.55	6.01	-1.27	0.505
45.66	-32.93	-35.52	0.00	-2,231.4	0.00	2,231.40	4,165.33	1,102.76	5,258.34	4,528.04	6.19	-1.29	0.502
50.00	-30.95	-35.01	0.00	-2,077.4	0.00	2,077.36	4,113.95	1,080.52	5,048.40	4,381.36	7.42	-1.41	0.483
52.83	-29.67	-34.66	0.00	-1,978.3	0.00	1,978.27	4,116.65	1,081.67	5,059.17	4,388.93	8.27	-1.49	0.459
55.00	-29.09	-34.16	0.00	-1,903.1	0.00	1,903.07	4,090.47	1,070.54	4,955.61	4,315.83	8.96	-1.55	0.449
60.00	-27.81	-33.45	0.00	-1,732.2	0.00	1,732.25	4,028.87	1,044.90	4,721.08	4,148.28	10.65	-1.67	0.426
65.00	-26.56	-32.79	0.00	-1,565.0	0.00	1,565.01	3,965.49	1,019.26	4,492.23	3,982.07	12.48	-1.8	0.401
69.00	-22.85	-29.67	0.00	-1,433.9	0.00	1,433.87	3,913.49	998.74	4,313.24	3,850.16	14.03	-1.9	0.379
70.00	-22.60	-29.23	0.00	-1,404.2	0.00	1,404.20	3,900.32	993.61	4,269.06	3,817.34	14.43	-1.92	0.375
75.00	-21.42	-28.46	0.00	-1,258.0	0.00	1,258.05	3,833.36	967.97	4,051.59	3,654.23	16.5	-2.04	0.351
80.00	-20.18	-26.74	0.00	-1,115.4	0.00	1,115.40	3,764.62	942.33	3,839.79	3,492.87	18.7	-2.15	0.326
85.00	-19.07	-26.16	0.00	-981.7	0.00	981.72	3,694.09	916.69	3,633.69	3,333.39	21.01	-2.26	0.300
87.00	-18.61	-25.64	0.00	-929.4	0.00	929.40	3,665.38	906.43	3,552.83	3,270.16	21.96	-2.3	0.290
90.00	-17.96	-25.18	0.00	-852.5	0.00	852.48	3,621.78	891.04	3,433.26	3,175.95	23.43	-2.36	0.274
92.58	-17.40	-24.76	0.00	-787.5	0.00	787.52	3,583.76	877.81	3,332.07	3,095.54	24.72	-2.42	0.260
95.00	-16.20	-23.69	0.00	-727.6	0.00	727.59	3,547.68	865.40	3,238.53	3,020.66	25.96	-2.46	0.246
98.41	-15.06	-23.24	0.00	-646.7	0.00	646.72	2,780.48	718.55	2,679.07	2,362.30	27.74	-2.52	0.280
100.00	-14.76	-22.76	0.00	-609.8	0.00	609.85	2,763.68	711.77	2,628.75	2,325.70	28.59	-2.55	0.269
104.00	-14.02	-22.19	0.00	-518.8	0.00	518.83	2,720.52	694.67	2,504.01	2,233.97	30.76	-2.63	0.238
105.00	-13.85	-21.69	0.00	-496.6	0.00	496.64	2,709.55	690.40	2,473.30	2,211.17	31.31	-2.65	0.231
110.00	-12.98	-20.94	0.00	-388.2	0.00	388.18	2,653.64	669.03	2,322.58	2,097.99	34.13	-2.73	0.191
113.60	-12.33	-20.41	0.00	-312.8	0.00	312.78	2,612.27	653.64	2,217.00	2,017.41	36.2	-2.78	0.161
115.00	-12.10	-20.11	0.00	-284.2	0.00	284.21	2,595.94	647.66	2,176.60	1,986.29	37.02	-2.79	0.149
117.00	-9.58	-18.39	0.00	-244.0	0.00	243.99	2,572.36	639.11	2,119.53	1,942.06	38.2	-2.82	0.130
119.00	-8.36	-15.73	0.00	-207.2	0.00	207.21	2,548.49	630.56	2,063.23	1,898.09	39.38	-2.84	0.113
120.00	-8.25	-15.22	0.00	-191.5	0.00	191.48	2,536.45	626.29	2,035.36	1,876.21	39.98	-2.85	0.106
125.00	-7.64	-14.52	0.00	-115.4	0.00	115.36	2,475.18	604.92	1,898.85	1,767.88	42.98	-2.89	0.069
128.00	-4.15	-9.01	0.00	-71.8	0.00	71.80	2,437.56	592.10	1,819.22	1,703.78	44.8	-2.9	0.044
128.50	-4.10	-8.91	0.00	-67.3	0.00	67.29	2,431.23	589.96	1,806.12	1,693.17	45.1	-2.9	0.042
128.50	-4.10	-8.91	0.00	-67.3	0.00	67.29	1,188.40	355.28	1,091.56	833.74	45.1	-2.9	0.085
130.00	-4.01	-8.63	0.00	-53.9	0.00	53.93	1,182.87	351.44	1,068.05	820.83	46.01	-2.91	0.070
134.00	-2.91	-4.35	0.00	-19.4	0.00	19.39	1,167.35	341.18	1,006.62	786.29	48.46	-2.92	0.027
135.00	-2.85	-4.19	0.00	-15.0	0.00	15.05	1,163.30	338.62	991.55	777.64	49.07	-2.92	0.022
137.20	-2.69	-4.01	0.00	-5.8	0.00	5.83	1,154.12	332.97	958.79	758.57	50.42	-2.93	0.010
138.00	-0.99	-2.66	0.00	-2.6	0.00	2.62	1,150.69	330.92	947.01	751.64	50.91	-2.93	0.004
138.50	0.00	-2.61	0.00	-1.3	0.00	1.29	1,148.53	329.64	939.69	747.30	51.21	-2.93	0.002



CALCULATED FORCES

Load Case: 1.2D + 1.0Di + 1.0Wi													50 mph Wind with 1" Radial Ice		20 Iterations	
Gust Response Factor:		1.10		Ice Dead Load Factor			1.00			Ice Importance Factor			1.00			
Dead Load Factor:		1.20														
Wind Load Factor:		1.00														
Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio			
0.00	-82.04	-8.10	0.00	-797.7	0.00	797.66	4,624.80	1,336.95	7,728.54	6,102.72	0	0	0.148			
5.00	-79.67	-7.98	0.00	-757.2	0.00	757.18	4,581.75	1,311.30	7,434.94	5,929.27	0.02	-0.03	0.145			
10.00	-77.29	-7.87	0.00	-717.3	0.00	717.27	4,536.92	1,285.66	7,147.03	5,755.76	0.06	-0.06	0.142			
15.00	-74.93	-7.76	0.00	-677.9	0.00	677.93	4,490.29	1,260.02	6,864.80	5,582.30	0.13	-0.08	0.138			
20.00	-72.59	-7.64	0.00	-639.2	0.00	639.16	4,441.89	1,234.37	6,588.26	5,409.05	0.24	-0.11	0.135			
25.00	-70.28	-7.53	0.00	-600.9	0.00	600.94	4,391.70	1,208.73	6,317.40	5,236.13	0.37	-0.14	0.131			
30.00	-67.99	-7.42	0.00	-563.3	0.00	563.29	4,339.72	1,183.09	6,052.23	5,063.69	0.54	-0.17	0.127			
35.00	-65.74	-7.30	0.00	-526.2	0.00	526.20	4,285.96	1,157.45	5,792.74	4,891.85	0.73	-0.2	0.123			
40.00	-63.52	-7.18	0.00	-489.7	0.00	489.69	4,230.41	1,131.80	5,538.94	4,720.76	0.95	-0.23	0.119			
45.00	-61.33	-7.10	0.00	-453.8	0.00	453.80	4,173.07	1,106.16	5,290.83	4,550.55	1.2	-0.25	0.114			
45.66	-61.04	-7.04	0.00	-449.1	0.00	449.09	4,165.33	1,102.76	5,258.34	4,528.04	1.24	-0.26	0.114			
50.00	-58.06	-6.94	0.00	-418.5	0.00	418.54	4,113.95	1,080.52	5,048.40	4,381.36	1.49	-0.28	0.110			
52.83	-56.13	-6.87	0.00	-398.9	0.00	398.89	4,116.65	1,081.67	5,059.17	4,388.93	1.66	-0.3	0.105			
55.00	-55.20	-6.78	0.00	-384.0	0.00	383.98	4,090.47	1,070.54	4,955.61	4,315.83	1.8	-0.31	0.103			
60.00	-53.09	-6.64	0.00	-350.1	0.00	350.10	4,028.87	1,044.90	4,721.08	4,148.28	2.14	-0.34	0.098			
65.00	-51.02	-6.51	0.00	-316.9	0.00	316.91	3,965.49	1,019.26	4,492.23	3,982.07	2.5	-0.36	0.092			
69.00	-44.22	-5.91	0.00	-290.9	0.00	290.87	3,913.49	998.74	4,313.24	3,850.16	2.81	-0.38	0.087			
70.00	-43.82	-5.83	0.00	-285.0	0.00	284.97	3,900.32	993.61	4,269.06	3,817.34	2.89	-0.39	0.086			
75.00	-41.83	-5.68	0.00	-255.8	0.00	255.83	3,833.36	967.97	4,051.59	3,654.23	3.31	-0.41	0.081			
80.00	-39.49	-5.36	0.00	-227.3	0.00	227.32	3,764.62	942.33	3,839.79	3,492.87	3.75	-0.43	0.076			
85.00	-37.58	-5.25	0.00	-200.6	0.00	200.55	3,694.09	916.69	3,633.69	3,333.39	4.22	-0.45	0.070			
87.00	-36.76	-5.14	0.00	-190.0	0.00	190.05	3,665.38	906.43	3,552.83	3,270.16	4.41	-0.46	0.068			
90.00	-35.64	-5.06	0.00	-174.6	0.00	174.62	3,621.78	891.04	3,433.26	3,175.95	4.71	-0.48	0.065			
92.58	-34.68	-4.98	0.00	-161.6	0.00	161.57	3,583.76	877.81	3,332.07	3,095.54	4.97	-0.49	0.062			
95.00	-32.73	-4.79	0.00	-149.5	0.00	149.51	3,547.68	865.40	3,238.53	3,020.66	5.22	-0.5	0.059			
98.41	-30.92	-4.70	0.00	-133.2	0.00	133.17	2,780.48	718.55	2,679.07	2,362.30	5.58	-0.51	0.068			
100.00	-30.38	-4.62	0.00	-125.7	0.00	125.71	2,763.68	711.77	2,628.75	2,325.70	5.75	-0.52	0.065			
104.00	-29.01	-4.50	0.00	-107.2	0.00	107.23	2,720.52	694.67	2,504.01	2,233.97	6.18	-0.53	0.059			
105.00	-28.69	-4.42	0.00	-102.7	0.00	102.73	2,709.55	690.40	2,473.30	2,211.17	6.3	-0.53	0.057			
110.00	-27.10	-4.29	0.00	-80.6	0.00	80.62	2,653.64	669.03	2,322.58	2,097.99	6.87	-0.55	0.049			
113.60	-25.88	-4.19	0.00	-65.2	0.00	65.17	2,612.27	653.64	2,217.00	2,017.41	7.29	-0.56	0.042			
115.00	-25.45	-4.14	0.00	-59.3	0.00	59.30	2,595.94	647.66	2,176.60	1,986.29	7.45	-0.57	0.040			
117.00	-21.01	-3.75	0.00	-51.0	0.00	51.02	2,572.36	639.11	2,119.53	1,942.06	7.69	-0.57	0.034			
119.00	-17.84	-3.26	0.00	-43.5	0.00	43.52	2,548.49	630.56	2,063.23	1,898.09	7.93	-0.57	0.030			
120.00	-17.59	-3.18	0.00	-40.3	0.00	40.26	2,536.45	626.29	2,035.36	1,876.21	8.05	-0.58	0.028			
125.00	-16.36	-3.06	0.00	-24.4	0.00	24.35	2,475.18	604.92	1,898.85	1,767.88	8.66	-0.58	0.020			
128.00	-8.77	-1.95	0.00	-15.2	0.00	15.18	2,437.56	592.10	1,819.22	1,703.78	9.03	-0.59	0.013			
128.50	-8.67	-1.92	0.00	-14.2	0.00	14.20	2,431.23	589.96	1,806.12	1,693.17	9.09	-0.59	0.012			
128.50	-8.67	-1.92	0.00	-14.2	0.00	14.20	1,188.40	355.28	1,091.56	833.74	9.09	-0.59	0.024			
130.00	-8.46	-1.85	0.00	-11.3	0.00	11.32	1,182.87	351.44	1,068.05	820.83	9.27	-0.59	0.021			
134.00	-6.09	-0.90	0.00	-3.9	0.00	3.92	1,167.35	341.18	1,006.62	786.29	9.77	-0.59	0.010			
135.00	-5.96	-0.86	0.00	-3.0	0.00	3.01	1,163.30	338.62	991.55	777.64	9.89	-0.59	0.009			
137.20	-5.60	-0.81	0.00	-1.1	0.00	1.12	1,154.12	332.97	958.79	758.57	10.16	-0.59	0.006			
138.00	-2.76	-0.48	0.00	-0.5	0.00	0.47	1,150.69	330.92	947.01	751.64	10.26	-0.59	0.003			
138.50	0.00	-0.45	0.00	-0.2	0.00	0.22	1,148.53	329.64	939.69	747.30	10.33	-0.59	0.000			

CALCULATED FORCES

Load Case: 1.0D + 1.0W

60 mph Wind with No Ice

20 Iterations

Gust Response Factor: 1.10  
 Dead load Factor: 1.00  
 Wind Load Factor: 1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-51.43	-7.76	0.00	-762.1	0.00	762.09	4,624.80	1,336.95	7,728.54	6,102.72	0	0	0.136
5.00	-49.80	-7.66	0.00	-723.3	0.00	723.30	4,581.75	1,311.30	7,434.94	5,929.27	0.01	-0.03	0.133
10.00	-48.20	-7.56	0.00	-685.0	0.00	685.00	4,536.92	1,285.66	7,147.03	5,755.76	0.06	-0.05	0.130
15.00	-46.62	-7.46	0.00	-647.2	0.00	647.22	4,490.29	1,260.02	6,864.80	5,582.30	0.13	-0.08	0.126
20.00	-45.06	-7.35	0.00	-609.9	0.00	609.94	4,441.89	1,234.37	6,588.26	5,409.05	0.23	-0.11	0.123
25.00	-43.53	-7.25	0.00	-573.2	0.00	573.18	4,391.70	1,208.73	6,317.40	5,236.13	0.36	-0.13	0.119
30.00	-42.03	-7.14	0.00	-536.9	0.00	536.94	4,339.72	1,183.09	6,052.23	5,063.69	0.51	-0.16	0.116
35.00	-40.55	-7.03	0.00	-501.2	0.00	501.22	4,285.96	1,157.45	5,792.74	4,891.85	0.7	-0.19	0.112
40.00	-39.09	-6.92	0.00	-466.0	0.00	466.05	4,230.41	1,131.80	5,538.94	4,720.76	0.91	-0.22	0.108
45.00	-37.66	-6.85	0.00	-431.5	0.00	431.46	4,173.07	1,106.16	5,290.83	4,550.55	1.15	-0.24	0.104
45.66	-37.47	-6.79	0.00	-426.9	0.00	426.92	4,165.33	1,102.76	5,258.34	4,528.04	1.18	-0.25	0.103
50.00	-35.33	-6.69	0.00	-397.5	0.00	397.48	4,113.95	1,080.52	5,048.40	4,381.36	1.42	-0.27	0.099
52.83	-33.95	-6.62	0.00	-378.5	0.00	378.54	4,116.65	1,081.67	5,059.17	4,388.93	1.58	-0.28	0.095
55.00	-33.34	-6.53	0.00	-364.2	0.00	364.17	4,090.47	1,070.54	4,955.61	4,315.83	1.71	-0.3	0.093
60.00	-31.97	-6.40	0.00	-331.5	0.00	331.51	4,028.87	1,044.90	4,721.08	4,148.28	2.04	-0.32	0.088
65.00	-30.63	-6.27	0.00	-299.5	0.00	299.53	3,965.49	1,019.26	4,492.23	3,982.07	2.39	-0.34	0.083
69.00	-26.44	-5.68	0.00	-274.4	0.00	274.44	3,913.49	998.74	4,313.24	3,850.16	2.68	-0.36	0.078
70.00	-26.18	-5.59	0.00	-268.8	0.00	268.77	3,900.32	993.61	4,269.06	3,817.34	2.76	-0.37	0.077
75.00	-24.90	-5.44	0.00	-240.8	0.00	240.81	3,833.36	967.97	4,051.59	3,654.23	3.16	-0.39	0.072
80.00	-23.52	-5.12	0.00	-213.5	0.00	213.52	3,764.62	942.33	3,839.79	3,492.87	3.58	-0.41	0.067
85.00	-22.29	-5.01	0.00	-187.9	0.00	187.94	3,694.09	916.69	3,633.69	3,333.39	4.02	-0.43	0.062
87.00	-21.78	-4.91	0.00	-177.9	0.00	177.93	3,665.38	906.43	3,552.83	3,270.16	4.2	-0.44	0.060
90.00	-21.06	-4.82	0.00	-163.2	0.00	163.20	3,621.78	891.04	3,433.26	3,175.95	4.48	-0.45	0.057
92.58	-20.45	-4.74	0.00	-150.8	0.00	150.77	3,583.76	877.81	3,332.07	3,095.54	4.73	-0.46	0.054
95.00	-19.09	-4.54	0.00	-139.3	0.00	139.30	3,547.68	865.40	3,238.53	3,020.66	4.97	-0.47	0.052
98.41	-17.82	-4.45	0.00	-123.8	0.00	123.82	2,780.48	718.55	2,679.07	2,362.30	5.31	-0.48	0.059
100.00	-17.49	-4.36	0.00	-116.8	0.00	116.76	2,763.68	711.77	2,628.75	2,325.70	5.47	-0.49	0.057
104.00	-16.66	-4.25	0.00	-99.3	0.00	99.33	2,720.52	694.67	2,504.01	2,233.97	5.88	-0.5	0.051
105.00	-16.47	-4.15	0.00	-95.1	0.00	95.08	2,709.55	690.40	2,473.30	2,211.17	5.99	-0.51	0.049
110.00	-15.49	-4.01	0.00	-74.3	0.00	74.32	2,653.64	669.03	2,322.58	2,097.99	6.53	-0.52	0.041
113.60	-14.75	-3.91	0.00	-59.9	0.00	59.88	2,612.27	653.64	2,217.00	2,017.41	6.93	-0.53	0.035
115.00	-14.49	-3.85	0.00	-54.4	0.00	54.41	2,595.94	647.66	2,176.60	1,986.29	7.08	-0.53	0.033
117.00	-11.61	-3.52	0.00	-46.7	0.00	46.71	2,572.36	639.11	2,119.53	1,942.06	7.31	-0.54	0.029
119.00	-10.12	-3.01	0.00	-39.7	0.00	39.67	2,548.49	630.56	2,063.23	1,898.09	7.53	-0.54	0.025
120.00	-9.97	-2.91	0.00	-36.7	0.00	36.66	2,536.45	626.29	2,035.36	1,876.21	7.65	-0.54	0.023
125.00	-9.27	-2.78	0.00	-22.1	0.00	22.08	2,475.18	604.92	1,898.85	1,767.88	8.22	-0.55	0.016
128.00	-5.10	-1.72	0.00	-13.7	0.00	13.74	2,437.56	592.10	1,819.22	1,703.78	8.57	-0.55	0.010
128.50	-5.04	-1.71	0.00	-12.9	0.00	12.88	2,431.23	589.96	1,806.12	1,693.17	8.63	-0.56	0.010
128.50	-5.04	-1.71	0.00	-12.9	0.00	12.88	1,188.40	355.28	1,091.56	833.74	8.63	-0.56	0.020
130.00	-4.93	-1.65	0.00	-10.3	0.00	10.32	1,182.87	351.44	1,068.05	820.83	8.8	-0.56	0.017
134.00	-3.46	-0.83	0.00	-3.7	0.00	3.71	1,167.35	341.18	1,006.62	786.29	9.27	-0.56	0.008
135.00	-3.39	-0.80	0.00	-2.9	0.00	2.88	1,163.30	338.62	991.55	777.64	9.39	-0.56	0.007
137.20	-3.20	-0.77	0.00	-1.1	0.00	1.12	1,154.12	332.97	958.79	758.57	9.65	-0.56	0.004
138.00	-1.25	-0.51	0.00	-0.5	0.00	0.50	1,150.69	330.92	947.01	751.64	9.74	-0.56	0.002
138.50	0.00	-0.50	0.00	-0.2	0.00	0.25	1,148.53	329.64	939.69	747.30	9.8	-0.56	0.000

EQUIVALENT LATERAL FORCES METHOD ANALYSIS

(Based on ASCE7-16 Chapters 11, 12 and 15)

Spectral Response Acceleration for Short Period ( $S_s$ ):	0.210
Spectral Response Acceleration at 1.0 Second Period ( $S_1$ ):	0.056
Long-Period Transition Period ( $T_L$ – Seconds):	6
Importance Factor ( $I_e$ ):	1.000
Site Coefficient $F_a$ :	1.600
Site Coefficient $F_v$ :	2.400
Response Modification Coefficient (R):	1.500
Design Spectral Response Acceleration at Short Period ( $S_{ds}$ ):	0.224
Design Spectral Response Acceleration at 1.0 Second Period ( $S_{d1}$ ):	0.090
Seismic Response Coefficient ( $C_s$ ):	0.034
Upper Limit $C_s$ :	0.034
Lower Limit $C_s$ :	0.030
Period based on Rayleigh Method (sec):	1.780
Redundancy Factor ( $\rho$ ):	1.000
Seismic Force Distribution Exponent ( $k$ ):	1.640
Total Unfactored Dead Load:	51.430 k
Seismic Base Shear (E):	1.720 k

SEISMIC FORCES

Segment	Seismic	Height Above Base (ft)	Weight (lb)	$W_z$ (lb-ft)	$C_{vx}$	Horizontal Force (lb)	Vertical Force (lb)
43		138.25	35	113	0.002	3	43
42		137.6	56	181	0.002	4	70
41		136.1	156	494	0.007	12	194
40		134.5	72	223	0.003	5	89
39		132	291	879	0.012	21	363
38		129.25	111	324	0.004	8	139
37		128.25	60	173	0.002	4	75
36		126.5	412	1,160	0.016	27	513
35		122.5	704	1,878	0.026	44	876
34		119.5	143	367	0.005	9	178
33		118	375	940	0.013	22	466
32		116	378	922	0.013	22	470
31		114.3	267	635	0.009	15	332
30		111.8	693	1,591	0.022	38	862
29		107.5	980	2,110	0.029	50	1,220
28		104.5	198	408	0.006	10	247
27		102	803	1,586	0.022	37	999
26		99.2067	323	609	0.008	14	402
25		96.7067	1,269	2,296	0.032	54	1,579
24		93.79	912	1,570	0.022	37	1,136
23		91.29	610	1,004	0.014	24	759
22		88.5	717	1,122	0.015	27	893
21		86	484	722	0.010	17	602
20		82.5	1,227	1,711	0.023	40	1,527
19		77.5	1,257	1,582	0.022	37	1,564
18		72.5	1,282	1,446	0.020	34	1,595
17		69.5	259	273	0.004	6	323
16		67	1,056	1,047	0.014	25	1,315
15		62.5	1,343	1,187	0.016	28	1,672
14		57.5	1,368	1,055	0.014	25	1,703
13		53.915	601	417	0.006	10	749
12		51.415	1,380	886	0.012	21	1,718
11		47.8317	2,146	1,223	0.017	29	2,671
10		45.3317	187	98	0.001	2	233
9		42.5	1,427	670	0.009	16	1,777
8		37.5	1,452	555	0.008	13	1,808
7		32.5	1,477	447	0.006	11	1,838
6		27.5	1,502	345	0.005	8	1,869

SEISMIC FORCES

1.2D + 1.0Ev + 1.0Eh	Seismic	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
Segment							
5		22.5	1,527	253	0.004	6	1,900
4		17.5	1,551	170	0.002	4	1,931
3		12.5	1,576	99	0.001	2	1,962
2		7.5	1,601	44	0.001	1	1,993
1		2.5	1,626	7	0.000	0	2,024
Ericsson 4460 BAND 2/25		138.5	327	1,067	0.015	25	407
Ericsson 4480 BAND 71		138.5	243	793	0.011	19	302
Ericsson AIR 6419 B41		138.5	206	670	0.009	16	256
Commscope VV-65A-R1B		138.5	74	242	0.003	6	92
RFS APXVAALL24 43-U-NA20		138.5	368	1,202	0.016	28	459
Generic 10' Omni		138	25	81	0.001	2	31
Generic Round Low Profile Platform		138	1,875	6,081	0.083	144	2,334
Ericsson KRY 112 20		137.2	36	117	0.002	3	45
Unused Reserve (16529.3200 sqin)		134	1,178	3,640	0.050	86	1,466
Commscope CBC78T-DS-43-2X		128	62	178	0.002	4	77
Kaelus KA-6030		128	35	101	0.001	2	44
Samsung B2/B66A RRH-BR049		128	253	726	0.010	17	315
Samsung B5/B13 RRH-BR04C		128	211	605	0.008	14	263
RFS APL866513-44T0		128	31	90	0.001	2	39
Raycap RCMDC-6627-PF-48		128	32	92	0.001	2	40
Samsung MT6407-77A		128	245	702	0.010	17	305
Generic Mount Reinforcement		128	600	1,720	0.024	41	747
Decibel DB846H80E-SX		128	64	183	0.002	4	80
Commscope JAHH-65B-R3B		128	364	1,042	0.014	25	453
Generic Flat Low Profile Platform		128	1,875	5,375	0.074	127	2,334
Powerwave Allgon LGP21401		119	85	215	0.003	5	105
Ericsson Radio 8843 - B2 + B66A		119	216	549	0.008	13	269
Ericsson RRUS 4449 B5, B12		119	213	542	0.007	13	265
Powerwave Allgon 7770.00		119	105	267	0.004	6	131
Commscope NNH4-65B-R6		119	269	684	0.009	16	335
CCI DMP65R-BU6DA		119	238	606	0.008	14	297
Generic Round Platform with Handrails		117	2,500	6,184	0.085	146	3,112
Raycap DC6-48-60-18-8F		113.6	40	94	0.001	2	50
RFI Antennas CC807-08		104	24	50	0.001	1	30
RFI Antennas CC807-08		87	24	37	0.000	1	30
Bird DS428E83I01T		100	9	17	0.000	0	11
Flat Side Arm		95	450	791	0.011	19	560
RFI Antennas OA20-41-DIN		80	28	37	0.000	1	35
Radio Waves HP3-11		80	100	133	0.002	3	124
Commscope RDIDC-9181-PF-48		69	22	23	0.000	1	27
Fujitsu TA08025-B605		69	225	234	0.003	6	280
Fujitsu TA08025-B604		69	192	199	0.003	5	239
JMA Wireless MX08FRO665-21		69	194	201	0.003	5	241
Generic Flat Platform with Handrails		69	2,500	2,600	0.036	61	3,112
<b>Totals:</b>			<b>51,432</b>	<b>72,990</b>	<b>1.000</b>	<b>1,725</b>	<b>64,023</b>

SEISMIC FORCES

0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
Segment							
43		138.25	35	113	0.002	3	30
42		137.6	56	181	0.002	4	48
41		136.1	156	494	0.007	12	133
40		134.5	72	223	0.003	5	61
39		132	291	879	0.012	21	249
38		129.25	111	324	0.004	8	95
37		128.25	60	173	0.002	4	51
36		126.5	412	1,160	0.016	27	353
35		122.5	704	1,878	0.026	44	602
34		119.5	143	367	0.005	9	123
33		118	375	940	0.013	22	320

SEISMIC FORCES

0.9D - 1.0Ev + 1.0Eh

Seismic (Reduced DL)

Segment	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
32	116	378	922	0.013	22	323
31	114.3	267	635	0.009	15	228
30	111.8	693	1,591	0.022	38	592
29	107.5	980	2,110	0.029	50	838
28	104.5	198	408	0.006	10	170
27	102	803	1,586	0.022	37	687
26	99.2067	323	609	0.008	14	276
25	96.7067	1,269	2,296	0.032	54	1,085
24	93.79	912	1,570	0.022	37	780
23	91.29	610	1,004	0.014	24	521
22	88.5	717	1,122	0.015	27	613
21	86	484	722	0.010	17	414
20	82.5	1,227	1,711	0.023	40	1,049
19	77.5	1,257	1,582	0.022	37	1,075
18	72.5	1,282	1,446	0.020	34	1,096
17	69.5	259	273	0.004	6	222
16	67	1,056	1,047	0.014	25	903
15	62.5	1,343	1,187	0.016	28	1,148
14	57.5	1,368	1,055	0.014	25	1,170
13	53.915	601	417	0.006	10	514
12	51.415	1,380	886	0.012	21	1,180
11	47.8317	2,146	1,223	0.017	29	1,835
10	45.3317	187	98	0.001	2	160
9	42.5	1,427	670	0.009	16	1,221
8	37.5	1,452	555	0.008	13	1,242
7	32.5	1,477	447	0.006	11	1,263
6	27.5	1,502	345	0.005	8	1,284
5	22.5	1,527	253	0.004	6	1,306
4	17.5	1,551	170	0.002	4	1,327
3	12.5	1,576	99	0.001	2	1,348
2	7.5	1,601	44	0.001	1	1,369
1	2.5	1,626	7	0.000	0	1,391
Ericsson 4460 BAND 2/25	138.5	327	1,067	0.015	25	280
Ericsson 4480 BAND 71	138.5	243	793	0.011	19	208
Ericsson AIR 6419 B41	138.5	206	670	0.009	16	176
Commscope VV-65A-R1B	138.5	74	242	0.003	6	63
RFS APXVAALL24 43-U-NA20	138.5	368	1,202	0.016	28	315
Generic 10' Omni	138	25	81	0.001	2	21
Generic Round Low Profile Platform	138	1,875	6,081	0.083	144	1,604
Ericsson KRY 112 20	137.2	36	117	0.002	3	31
Unused Reserve (16529.3200 sqin)	134	1,178	3,640	0.050	86	1,007
Commscope CBC78T-DS-43-2X	128	62	178	0.002	4	53
Kaelus KA-6030	128	35	101	0.001	2	30
Samsung B2/B66A RRH-BR049	128	253	726	0.010	17	217
Samsung B5/B13 RRH-BR04C	128	211	605	0.008	14	180
RFS APL866513-44T0	128	31	90	0.001	2	27
Raycap RCMD-6627-PF-48	128	32	92	0.001	2	27
Samsung MT6407-77A	128	245	702	0.010	17	209
Generic Mount Reinforcement	128	600	1,720	0.024	41	513
Decibel DB846H80E-SX	128	64	183	0.002	4	55
Commscope JAHH-65B-R3B	128	364	1,042	0.014	25	311
Generic Flat Low Profile Platform	128	1,875	5,375	0.074	127	1,604
Powerwave Allgon LGP21401	119	85	215	0.003	5	72
Ericsson Radio 8843 - B2 + B66A	119	216	549	0.008	13	184
Ericsson RRUS 4449 B5, B12	119	213	542	0.007	13	182
Powerwave Allgon 7770.00	119	105	267	0.004	6	90
Commscope NNH4-65B-R6	119	269	684	0.009	16	230
CCI DMP65R-BU6DA	119	238	606	0.008	14	204
Generic Round Platform with Handrails	117	2,500	6,184	0.085	146	2,138
Raycap DC6-48-60-18-8F	113.6	40	94	0.001	2	34
RFI Antennas CC807-08	104	24	50	0.001	1	21

SEISMIC FORCES

0.9D - 1.0Ev + 1.0Eh

Seismic (Reduced DL)

Segment	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
RFI Antennas CC807-08	87	24	37	0.000	1	21
Bird DS428E83I01T	100	9	17	0.000	0	8
Flat Side Arm	95	450	791	0.011	19	385
RFI Antennas OA20-41-DIN	80	28	37	0.000	1	24
Radio Waves HP3-11	80	100	133	0.002	3	86
Commscope RDIDC-9181-PF-48	69	22	23	0.000	1	19
Fujitsu TA08025-B605	69	225	234	0.003	6	192
Fujitsu TA08025-B604	69	192	199	0.003	5	164
JMA Wireless MX08FRO665-21	69	194	201	0.003	5	165
Generic Flat Platform with Handrails	69	2,500	2,600	0.036	61	2,138
<b>Totals:</b>		<b>51,432</b>	<b>72,990</b>	<b>1.000</b>	<b>1,725</b>	<b>43,985</b>

1.2D + 1.0Ev + 1.0Eh

Seismic

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-62.00	-1.73	0.00	-188.34	0.00	188.34	4,624.80	1,336.95	7,729	6,102.72	0.00	0.00	0.04
5.00	-60.01	-1.73	0.00	-179.71	0.00	179.71	4,581.75	1,311.30	7,435	5,929.27	0.00	-0.01	0.04
10.00	-58.04	-1.74	0.00	-171.04	0.00	171.04	4,536.92	1,285.66	7,147	5,755.76	0.01	-0.01	0.04
15.00	-56.11	-1.74	0.00	-162.36	0.00	162.36	4,490.29	1,260.02	6,865	5,582.30	0.03	-0.02	0.04
20.00	-54.21	-1.74	0.00	-153.66	0.00	153.66	4,441.89	1,234.37	6,588	5,409.05	0.06	-0.03	0.04
25.00	-52.34	-1.74	0.00	-144.97	0.00	144.97	4,391.70	1,208.73	6,317	5,236.13	0.09	-0.03	0.04
30.00	-50.50	-1.73	0.00	-136.29	0.00	136.29	4,339.72	1,183.09	6,052	5,063.69	0.13	-0.04	0.04
35.00	-48.69	-1.72	0.00	-127.64	0.00	127.64	4,285.96	1,157.45	5,793	4,891.85	0.17	-0.05	0.04
40.00	-46.92	-1.71	0.00	-119.03	0.00	119.03	4,230.41	1,131.80	5,539	4,720.76	0.23	-0.05	0.04
45.00	-46.68	-1.71	0.00	-110.48	0.00	110.48	4,173.07	1,106.16	5,291	4,550.55	0.29	-0.06	0.04
45.66	-44.01	-1.68	0.00	-109.35	0.00	109.35	4,165.33	1,102.76	5,258	4,528.04	0.30	-0.06	0.04
50.00	-42.30	-1.66	0.00	-102.06	0.00	102.06	4,113.95	1,080.52	5,048	4,381.36	0.36	-0.07	0.03
52.83	-41.55	-1.65	0.00	-97.35	0.00	97.35	4,116.65	1,081.67	5,059	4,388.93	0.40	-0.07	0.03
55.00	-39.84	-1.63	0.00	-93.76	0.00	93.76	4,090.47	1,070.54	4,956	4,315.83	0.43	-0.07	0.03
60.00	-38.17	-1.60	0.00	-85.62	0.00	85.62	4,028.87	1,044.90	4,721	4,148.28	0.51	-0.08	0.03
65.00	-36.86	-1.58	0.00	-77.60	0.00	77.60	3,965.49	1,019.26	4,492	3,982.07	0.60	-0.09	0.03
69.00	-32.64	-1.49	0.00	-71.28	0.00	71.28	3,913.49	998.74	4,313	3,850.16	0.68	-0.09	0.03
70.00	-31.04	-1.46	0.00	-69.78	0.00	69.78	3,900.32	993.61	4,269	3,817.34	0.70	-0.09	0.03
75.00	-29.48	-1.42	0.00	-62.50	0.00	62.50	3,833.36	967.97	4,052	3,654.23	0.80	-0.10	0.03
80.00	-27.79	-1.38	0.00	-55.40	0.00	55.40	3,764.62	942.33	3,840	3,492.87	0.90	-0.10	0.02
85.00	-27.19	-1.36	0.00	-48.52	0.00	48.52	3,694.09	916.69	3,634	3,333.39	1.02	-0.11	0.02
87.00	-26.26	-1.33	0.00	-45.80	0.00	45.80	3,665.38	906.43	3,553	3,270.16	1.06	-0.11	0.02
90.00	-25.50	-1.31	0.00	-41.81	0.00	41.81	3,621.78	891.04	3,433	3,175.95	1.13	-0.12	0.02
92.58	-24.37	-1.27	0.00	-38.44	0.00	38.44	3,583.76	877.81	3,332	3,095.54	1.20	-0.12	0.02
95.00	-22.23	-1.19	0.00	-35.36	0.00	35.36	3,547.68	865.40	3,239	3,020.66	1.26	-0.12	0.02
98.41	-21.83	-1.18	0.00	-31.29	0.00	31.29	2,780.48	718.55	2,679	2,362.30	1.34	-0.12	0.02
100.00	-20.82	-1.14	0.00	-29.43	0.00	29.43	2,763.68	711.77	2,629	2,325.70	1.39	-0.12	0.02
104.00	-20.54	-1.13	0.00	-24.87	0.00	24.87	2,720.52	694.67	2,504	2,233.97	1.49	-0.13	0.02
105.00	-19.32	-1.08	0.00	-23.74	0.00	23.74	2,709.55	690.40	2,473	2,211.17	1.52	-0.13	0.02
110.00	-18.46	-1.04	0.00	-18.36	0.00	18.36	2,653.64	669.03	2,323	2,097.99	1.66	-0.13	0.02
113.60	-18.08	-1.02	0.00	-14.62	0.00	14.62	2,612.27	653.64	2,217	2,017.41	1.76	-0.14	0.01
115.00	-17.61	-1.00	0.00	-13.19	0.00	13.19	2,595.94	647.66	2,177	1,986.29	1.80	-0.14	0.01
117.00	-14.03	-0.82	0.00	-11.20	0.00	11.20	2,572.36	639.11	2,120	1,942.06	1.85	-0.14	0.01
119.00	-12.45	-0.74	0.00	-9.55	0.00	9.55	2,548.49	630.56	2,063	1,898.09	1.91	-0.14	0.01
120.00	-11.57	-0.70	0.00	-8.81	0.00	8.81	2,536.45	626.29	2,035	1,876.21	1.94	-0.14	0.01
125.00	-11.06	-0.67	0.00	-5.34	0.00	5.34	2,475.18	604.92	1,899	1,767.88	2.09	-0.14	0.01
128.00	-6.29	-0.40	0.00	-3.34	0.00	3.34	2,437.56	592.10	1,819	1,703.78	2.18	-0.14	0.01
128.50	-6.15	-0.39	0.00	-3.14	0.00	3.14	2,431.23	589.96	1,806	1,693.17	2.19	-0.14	0.00
128.50	-6.15	-0.39	0.00	-3.14	0.00	3.14	1,188.40	355.28	1,092	833.74	2.19	-0.14	0.01
130.00	-5.79	-0.37	0.00	-2.56	0.00	2.56	1,182.87	351.44	1,068	820.83	2.23	-0.14	0.01
134.00	-4.23	-0.27	0.00	-1.09	0.00	1.09	1,167.35	341.18	1,007	786.29	2.35	-0.14	0.01
135.00	-4.04	-0.26	0.00	-0.82	0.00	0.82	1,163.30	338.62	992	777.64	2.38	-0.14	0.01
137.20	-3.92	-0.25	0.00	-0.25	0.00	0.25	1,154.12	332.97	959	758.57	2.45	-0.14	0.00

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
138.00	-1.52	-0.10	0.00	-0.05	0.00	0.05	1,150.69	330.92	947	751.64	2.47	-0.14	0.00
138.50	0.00	-0.09	0.00	0.00	0.00	0.00	1,148.53	329.64	940	747.30	2.49	-0.14	0.00

0.9D - 1.0Ev + 1.0Eh Seismic (Reduced DL)

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-42.59	-1.73	0.00	-186.64	0.00	186.64	4,624.80	1,336.95	7,729	6,102.72	0.00	0.00	0.04
5.00	-41.22	-1.73	0.00	-178.01	0.00	178.01	4,581.75	1,311.30	7,435	5,929.27	0.00	-0.01	0.04
10.00	-39.88	-1.73	0.00	-169.36	0.00	169.36	4,536.92	1,285.66	7,147	5,755.76	0.01	-0.01	0.04
15.00	-38.55	-1.73	0.00	-160.71	0.00	160.71	4,490.29	1,260.02	6,865	5,582.30	0.03	-0.02	0.04
20.00	-37.24	-1.73	0.00	-152.05	0.00	152.05	4,441.89	1,234.37	6,588	5,409.05	0.06	-0.03	0.04
25.00	-35.96	-1.73	0.00	-143.40	0.00	143.40	4,391.70	1,208.73	6,317	5,236.13	0.09	-0.03	0.04
30.00	-34.70	-1.72	0.00	-134.77	0.00	134.77	4,339.72	1,183.09	6,052	5,063.69	0.13	-0.04	0.04
35.00	-33.45	-1.71	0.00	-126.19	0.00	126.19	4,285.96	1,157.45	5,793	4,891.85	0.17	-0.05	0.03
40.00	-32.23	-1.69	0.00	-117.65	0.00	117.65	4,230.41	1,131.80	5,539	4,720.76	0.23	-0.05	0.03
45.00	-32.07	-1.69	0.00	-109.17	0.00	109.17	4,173.07	1,106.16	5,291	4,550.55	0.29	-0.06	0.03
45.66	-30.24	-1.67	0.00	-108.05	0.00	108.05	4,165.33	1,102.76	5,258	4,528.04	0.29	-0.06	0.03
50.00	-29.06	-1.65	0.00	-100.83	0.00	100.83	4,113.95	1,080.52	5,048	4,381.36	0.35	-0.07	0.03
52.83	-28.54	-1.64	0.00	-96.17	0.00	96.17	4,116.65	1,081.67	5,059	4,388.93	0.39	-0.07	0.03
55.00	-27.37	-1.61	0.00	-92.62	0.00	92.62	4,090.47	1,070.54	4,956	4,315.83	0.43	-0.07	0.03
60.00	-26.22	-1.59	0.00	-84.56	0.00	84.56	4,028.87	1,044.90	4,721	4,148.28	0.51	-0.08	0.03
65.00	-25.32	-1.56	0.00	-76.63	0.00	76.63	3,965.49	1,019.26	4,492	3,982.07	0.59	-0.09	0.03
69.00	-22.42	-1.48	0.00	-70.38	0.00	70.38	3,913.49	998.74	4,313	3,850.16	0.67	-0.09	0.02
70.00	-21.32	-1.44	0.00	-68.91	0.00	68.91	3,900.32	993.61	4,269	3,817.34	0.69	-0.09	0.02
75.00	-20.25	-1.40	0.00	-61.71	0.00	61.71	3,833.36	967.97	4,052	3,654.23	0.79	-0.10	0.02
80.00	-19.09	-1.36	0.00	-54.69	0.00	54.69	3,764.62	942.33	3,840	3,492.87	0.89	-0.10	0.02
85.00	-18.68	-1.34	0.00	-47.89	0.00	47.89	3,694.09	916.69	3,634	3,333.39	1.01	-0.11	0.02
87.00	-18.04	-1.31	0.00	-45.21	0.00	45.21	3,665.38	906.43	3,553	3,270.16	1.05	-0.11	0.02
90.00	-17.52	-1.29	0.00	-41.27	0.00	41.27	3,621.78	891.04	3,433	3,175.95	1.12	-0.11	0.02
92.58	-16.74	-1.25	0.00	-37.94	0.00	37.94	3,583.76	877.81	3,332	3,095.54	1.18	-0.12	0.02
95.00	-15.27	-1.18	0.00	-34.91	0.00	34.91	3,547.68	865.40	3,239	3,020.66	1.24	-0.12	0.02
98.41	-15.00	-1.16	0.00	-30.89	0.00	30.89	2,780.48	718.55	2,679	2,362.30	1.33	-0.12	0.02
100.00	-14.30	-1.12	0.00	-29.04	0.00	29.04	2,763.68	711.77	2,629	2,325.70	1.37	-0.12	0.02
104.00	-14.11	-1.11	0.00	-24.54	0.00	24.54	2,720.52	694.67	2,504	2,233.97	1.48	-0.13	0.02
105.00	-13.27	-1.06	0.00	-23.43	0.00	23.43	2,709.55	690.40	2,473	2,211.17	1.50	-0.13	0.02
110.00	-12.68	-1.02	0.00	-18.12	0.00	18.12	2,653.64	669.03	2,323	2,097.99	1.64	-0.13	0.01
113.60	-12.42	-1.01	0.00	-14.43	0.00	14.43	2,612.27	653.64	2,217	2,017.41	1.74	-0.13	0.01
115.00	-12.09	-0.98	0.00	-13.02	0.00	13.02	2,595.94	647.66	2,177	1,986.29	1.78	-0.13	0.01
117.00	-9.64	-0.81	0.00	-11.05	0.00	11.05	2,572.36	639.11	2,120	1,942.06	1.83	-0.14	0.01
119.00	-8.55	-0.73	0.00	-9.43	0.00	9.43	2,548.49	630.56	2,063	1,898.09	1.89	-0.14	0.01
120.00	-7.95	-0.69	0.00	-8.70	0.00	8.70	2,536.45	626.29	2,035	1,876.21	1.92	-0.14	0.01
125.00	-7.60	-0.66	0.00	-5.27	0.00	5.27	2,475.18	604.92	1,899	1,767.88	2.06	-0.14	0.01
128.00	-4.32	-0.39	0.00	-3.29	0.00	3.29	2,437.56	592.10	1,819	1,703.78	2.15	-0.14	0.00
128.50	-4.23	-0.38	0.00	-3.10	0.00	3.10	2,431.23	589.96	1,806	1,693.17	2.17	-0.14	0.00
128.50	-4.23	-0.38	0.00	-3.10	0.00	3.10	1,188.40	355.28	1,092	833.74	2.17	-0.14	0.01
130.00	-3.98	-0.36	0.00	-2.52	0.00	2.52	1,182.87	351.44	1,068	820.83	2.21	-0.14	0.01
134.00	-2.91	-0.27	0.00	-1.08	0.00	1.08	1,167.35	341.18	1,007	786.29	2.33	-0.14	0.00
135.00	-2.77	-0.26	0.00	-0.81	0.00	0.81	1,163.30	338.62	992	777.64	2.36	-0.14	0.00
137.20	-2.70	-0.25	0.00	-0.25	0.00	0.25	1,154.12	332.97	959	758.57	2.42	-0.14	0.00
138.00	-1.04	-0.10	0.00	-0.05	0.00	0.05	1,150.69	330.92	947	751.64	2.44	-0.14	0.00
138.50	0.00	-0.09	0.00	0.00	0.00	0.00	1,148.53	329.64	940	747.30	2.46	-0.14	0.00

ANALYSIS SUMMARY

Load Case	Base Reactions						Max Usage	
	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.0W	40.73	0.00	61.67	0.00	0.00	4016.30	0.00	0.67
0.9D + 1.0W	40.71	0.00	46.24	0.00	0.00	3987.76	0.00	0.66
1.2D + 1.0Di + 1.0Wi	8.10	0.00	82.04	0.00	0.00	797.66	0.00	0.15
1.2D + 1.0Ev + 1.0Eh	1.74	0.00	62.00	0.00	0.00	188.34	0.00	0.04
0.9D - 1.0Ev + 1.0Eh	1.73	0.00	42.59	0.00	0.00	186.64	0.00	0.04
1.0D + 1.0W	7.76	0.00	51.43	0.00	0.00	762.09	0.00	0.14



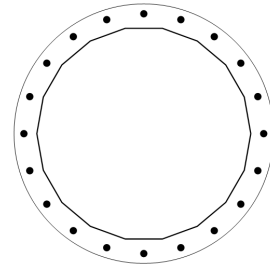
**BASE PLATE ANALYSIS @ 0 FT**

**APPLIED REACTIONS**

Moment (k-ft)	Axial (k)	Shear (k)
4016.3	61.67	40.73

**PLATE PARAMETERS (ID# 3727)**

Width:	79	in
Shape:	Round	
Thickness:	2.25	in
Grade:	A572-60	
Yield Strength:	60	ksi
Tensile Strength:	75	ksi
Rod Detail Type:	d	
Clear Distance	4	in
Base Weld Size:	0.125	in
Orientation Offset:	-	°
Analysis Type:	Plastic	
Neutral Axis:	252	°



**ANCHOR ROD PARAMETERS**

Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	F <sub>y</sub> (ksi)	F <sub>u</sub> (ksi)	Spacing (in)	Offset (°)
Original [ID#8078]	Radial	20	2.25	73	A615-75	75	100	-	-

**COMPONENT PROPERTIES**

Component	ID	Gross Area (in <sup>2</sup> )	Net Area (in <sup>2</sup> )	Individual Inertia (in <sup>4</sup> )	Moment of Inertia (in <sup>4</sup> )	Threads/in
Pole	64.38"ø x 0.375" (18 Sides)	75.0219	-	-	38420.73	-
Bolt Group	Original (20) 2.25"ø	3.9761	3.2477	0.8393	40228.39	4.5

**REACTION DISTRIBUTION**

Component	ID	Moment M <sub>u</sub> (k-ft)	Axial Load P <sub>u</sub> (k)	Shear V <sub>u</sub> (k)	Moment Factor
Pole	64.38"ø x 0.375" (18 Sides)	4016.3	61.67	40.73	1.000
Bolt Group	Original (20) 2.25"ø	4016.3	-	40.73	1.000

**BASE PLATE BEND LINE ANALYSIS @ 0 FT**

**POLE PROPERTIES**

Flat-to-Flat Diameter:	64.50	in	Flat Width:	11.374	in
Point-to-Point Diameter:	65.50	in	Flat Radians:	0.349	rad
Orientation Offset:	-	°			

**PLATE PROPERTIES**

Neutral Axis:	252	°
Bend Line Limits:	5.475 to 0.179	rad

Bend Line	Chord Length (in)	Additional Length (in)	Section Modulus (in <sup>3</sup> )	Applied Moment M <sub>u</sub> (k-in)	Moment Capacity ΦM <sub>n</sub> (k-in)	Flexure Result M <sub>u</sub> /ΦM <sub>n</sub>
Flats	40.921	0.00	51.791	734.2	2796.7	26.3%
Corners	39.309	0.00	49.750	531.9	2686.5	19.8%
Circumferential	49.153	0.00	62.209	991.0	3359.3	29.5%

**PLASTIC ANCHOR ROD ANALYSIS**

Class	Group Quantity	Rod Diameter (in)	Applied Axial Load P <sub>u</sub> (k)	Applied Shear Load V <sub>u</sub> (k)	Compressive Capacity ΦP <sub>n</sub> (k)	Interaction Result
Original	20	2.25	114.7	3.2	243.6	49.7%

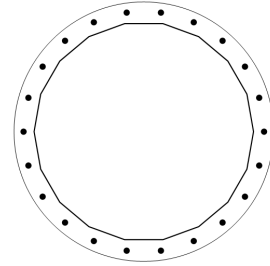
**UPPER FLANGE PLATE ANALYSIS @ 128.5 FT**

**APPLIED REACTIONS**

Moment (k-ft)	Axial (k)	Shear (k)
67.95	5.61	8.99

**PLATE PARAMETERS (ID# 2224)**

Width:	41	in
Shape:	Round	
Thickness:	1	in
Grade:	A572-60	
Yield Strength:	60	ksi
Tensile Strength:	75	ksi
Base Weld Size:	0.125	in
Orientation Offset:	-	°
Analysis Type:	Plastic	
Neutral Axis:	90	°



**FLANGE BOLT PARAMETERS**

Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	F <sub>y</sub> (ksi)	F <sub>u</sub> (ksi)	Spacing (in)	Offset (°)
Original [ID#8079]	Radial	22	1	38	A325	92	120	-	-

**COMPONENT PROPERTIES**

Component	ID	Gross Area (in <sup>2</sup> )	Net Area (in <sup>2</sup> )	Individual Inertia (in <sup>4</sup> )	Moment of Inertia (in <sup>4</sup> )	Threads/in
Pole	34.2052"ø x 0.1875" (18 Sides)	19.9365	-	-	2884.06	-
Bolt Group	Original (22) 1"ø	0.7854	0.6057	0.0292	2250.41	8.0

**REACTION DISTRIBUTION**

Component	ID	Moment M <sub>u</sub> (k-ft)	Axial Load P <sub>u</sub> (k)	Shear V <sub>u</sub> (k)	Moment Factor
Pole	34.2052"ø x 0.1875" (18 Sides)	68.0	5.61	8.99	1.000
Bolt Group	Original (22) 1"ø	68.0	-	8.99	1.000

**UPPER FLANGE PLATE BEND LINE ANALYSIS @ 128.5 FT**

**POLE PROPERTIES**

Flat-to-Flat Diameter:	34.33	in
Point-to-Point Diameter:	34.86	in
Orientation Offset:	-	°

Flat Width:	6.053	in
Flat Radians:	0.349	rad

**PLATE PROPERTIES**

Neutral Axis:	90	°
Bend Line Limits:	2.682 to 3.601	rad

Bend Line	Chord Length (in)	Additional Length (in)	Section Modulus (in <sup>3</sup> )	Applied Moment M <sub>u</sub> (k-in)	Moment Capacity ΦM <sub>n</sub> (k-in)	Flexure Result M <sub>u</sub> /ΦM <sub>n</sub>
Flats	19.688	0.00	4.922	9.0	265.8	3.4%
Corners	18.734	0.00	4.684	5.7	252.9	2.3%
Circumferential	23.541	0.00	5.885	11.8	317.8	3.7%

**PLASTIC FLANGE BOLT ANALYSIS**

Class	Group Quantity	Bolt Diameter (in)	Applied Axial Load P <sub>u</sub> (k)	Applied Shear Load V <sub>u</sub> (k)	Compressive Capacity ΦP <sub>n</sub> (k)	Interaction Result
Original	22	1	3.7	0.6	54.5	8.4%

## PIER FOUNDATION ANALYSIS

### GLOBAL REACTIONS

Moment (k-ft)	Axial (k)	Shear (k)
4,016.30	61.67	40.73

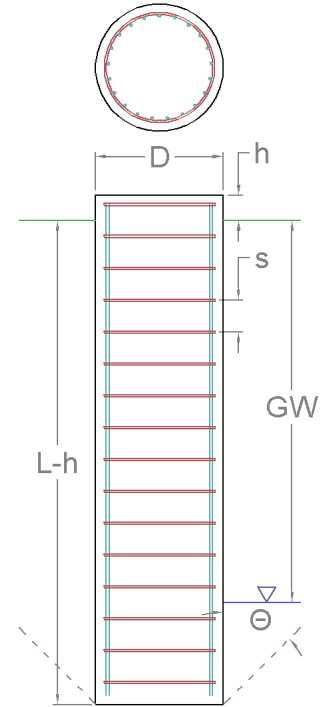
### FOUNDATION PARAMETERS

Pier Diameter:	D	8.00	ft
Pier Embedment Depth:	L-h	18.5	ft
Pier Height above Grade:	h	0.50	ft

### SOIL PARAMETERS

Water Table Depth [BGL]:      GW      -      ft

Layer Depth (ft)	Unit Weight	Cohesion	Friction Angle	Ultimate Skin Friction	Ultimate Net Bearing	
						Top
0	2	105	0	0	0	
2	4	140	11,323	0	0	
4	9	140	13,483	6,067	0	
9	19.5	140	16,171	7,277	44,429	



### SOIL STRENGTH ANALYSIS

Volume of Concrete (ft³)	Buoyant Weight of Concrete (k)	Skin Friction Resistance (k)	Inflection Point [BGL] (ft)
955.04	143.26	2,499.87	10.79

### SOIL MOMENT ANALYSIS

Total Lateral Resistance (k)	Moment at Inflection Point, $M_u$ (k-ft)	Additional Resistance (k-ft)	Nominal Moment Capacity, $\Phi M_n$ (k-ft)	Soil Moment Usage, $M_u / \Phi M_n$
13,306.50	4,476.19	0.00	38,592.16	11.6% <span style="float: right; color: green;">✓</span>

### SOIL COMPRESSION ANALYSIS

Compressive Bearing Resistance (k)	Compressive Force, $P_u$ (k)	Additional Resistance (k)	Nominal Compressive Capacity, $\Phi P_n$ (k)	Soil Compressive Usage, $P_u / \Phi P_n$
2,233.25	77.05	0.00	3,549.83	2.2% <span style="float: right; color: green;">✓</span>

<b>RAN Template:</b> 67E5D998E 6160	<b>A&amp;L Template:</b> 67E5998E_1xAIR+1OP+1QP
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Section 1 - Site Information

<b>Site ID:</b> CT11696E	<b>Site Name:</b> CT696/Verizon Portland_ET	<b>Latitude:</b> 41.56443501
<b>Status:</b> Preliminary	<b>Site Class:</b> Monopole	<b>Longitude:</b> -72.5736105
<b>Version:</b> 6	<b>Site Type:</b> Structure Non Building	<b>Address:</b> 191 Middle Haddam Rd
<b>Project Type:</b> Anchor	<b>Plan Year:</b> 2023	<b>City, State:</b> Portland, CT
<b>Approved:</b> 08/07/2023 5:54:44 PM	<b>Market:</b> CONNECTICUT CT	<b>Region:</b> NORTHEAST
<b>Approved By:</b> Marissa.Flores164@T-Mobile.com	<b>Vendor:</b> Ericsson	
<b>Last Modified:</b> 08/07/2023 5:54:44 PM	<b>Landlord:</b> American Tower	
<b>Last Modified By:</b> Marissa.Flores164@T-Mobile.com		

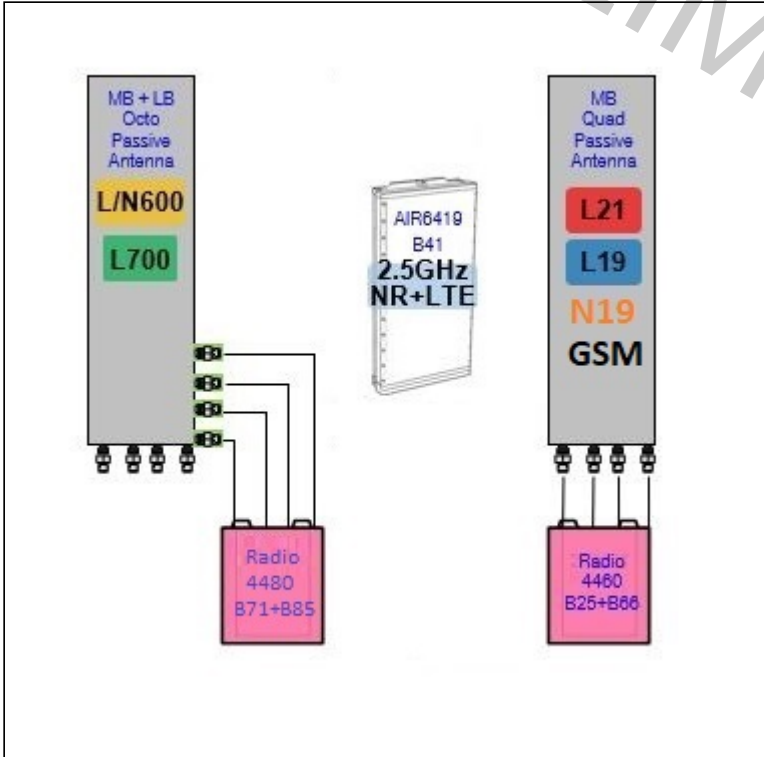
<b>RAN Template:</b> 67E5D998E 6160		<b>AL Template:</b> 67E5998E_1xAIR+1OP+1QP		
<b>Sector Count:</b> 3	<b>Antenna Count:</b> 9	<b>Coax Line Count:</b> 0	<b>TMA Count:</b> 0	<b>RRU Count:</b> 6

Section 2 - Existing Template Images

----- This section is intentionally blank. -----

Section 3 - Proposed Template Images

67E5D998E\_OP+AIR+QP with GSM.jpg



Notes:

PRELIMINARY

Section 4 - Siteplan Images

----- This section is intentionally blank. -----

PRELIMINARY

PRELIMINARY

<b>RAN Template:</b> 67E5D998E 6160	<b>A&amp;L Template:</b> 67E5998E_1xAIR+1OP+1QP
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Section 5 - RAN Equipment

**Existing RAN Equipment**

Template: 67E95F ODE+6160

Enclosure	1	2
<b>Enclosure Type</b>	RBS 6201 ODE	RBS 6201 ODE
<b>Radio</b>	RUS01 B2 (x3) L1900 G1900 RUS01 B4 (x6) L2100	
<b>Baseband</b>	BB 6630 L1900 L2100 DUG20 G1900	RP 6651 N600 L600 L700
<b>Hybrid Cable System</b>		Hybrid Trunk 6/24 4AWG 60m (x3) PSU 4813 vR4A (Kit)

**Proposed RAN Equipment**

Template: 67E5D998E 6160

Enclosure	1	2
<b>Enclosure Type</b>	Enclosure 6160 AC V1	B160
<b>Baseband</b>	BB 6630 N1900 L1900 L2100 DUG20 G1900 RBS6601 RP 6651 N2500 RP 6651 N600 L600 L700	
<b>Transport System</b>	CSR IXRe V2 (Gen2)	
<b>Hybrid Cable System</b>	Hybrid Trunk 6/24 4AWG 60m (x3) PSU 4813 vR4A (Kit)	

**RAN Scope of Work:**

Remove all unused equipment's from cabinet.  
 Remove existing Cabinets.  
 Add (1) 6160 and (1) B160 cabinets.  
 Add (1) RP6651 for NR2500  
 Add (1) IXRe router to 6160.  
 Add (1) RBS 6601 for DUG.  
 Reuse existing (1) Hybrid Trunk 6/24 4AWG 60m and add (2) Hybrid Trunk 6/24 4AWG . Total of 3.  
 Scoping notes:  
 Cabinet consolidation due space issue.

PRE

<b>RAN Template:</b> 67E5D998E 6160	<b>A&amp;L Template:</b> 67E5998E_1xAIR+1OP+1QP
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Section 6 - A&L Equipment

Existing Template: 67E95F\_10P  
Proposed Template: 67E5998E\_1xAIR+1OP+1QP

Sector 1 (Existing) view from behind

<b>Coverage Type</b>	A - Outdoor Macro			
<b>Antenna</b>	1			
<b>Antenna Model</b>	RFS - APXVAALL24_43-U-NA20 (Octo)			
<b>Azimuth</b>	0			
<b>M. Tilt</b>	0			
<b>Height (ft)</b>	137			
<b>Ports</b>	<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P4</b>
<b>Active Tech</b>	L700 N600 L600	L700 N600 L600	G1900 L1900 L2100	
<b>Dark Tech</b>				
<b>Restricted Tech</b>				
<b>Decomm. Tech</b>				
<b>E. Tilt</b>	2			
<b>Cables</b>			1-5/8" Coax - 210 ft. (x2)	
<b>TMA's</b>			Generic Style 4 - PCS+AWS (At Antenna)	
<b>Diplexer / Combiners</b>			Generic AWS/PCS Diplexer (At Cabinet)	
<b>Radio</b>	Radio 4480 B71+B85 (At Antenna)	Radio 4480 B71+B85 (At Antenna)		
<b>Sector Equipment</b>				

Unconnected Equipment:

Cable: 1-5/8" Coax - 210 ft. (x2)

Scope of Work:

CT11696E  
Use existing cabinet 6201.  
Replacing BB6630 used for L7 with RP6651 for low band(L7/L6/N6).  
Add PSU 4813  
Add three (3) 60m meter Hybrid.  
Adding RFS - APXVAALL24\_43-U-NA20 and moving Low and Mid Band here  
Adding 4480s Radio at the antenna for low band.  
Existing BB 6630 with L2100 / L1900 remains  
Height and azimuth of site remain same.

\*A dashed border indicates shared connected equipment. Any shared equipment, besides the first, is denoted with the SHARED keyword.



<b>RAN Template:</b> 67E5D998E 6160	<b>A&amp;L Template:</b> 67E5998E_1xAIR+1OP+1QP
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Sector 1 (Proposed) view from behind									
<b>Coverage Type</b>	A - Outdoor Macro								
<b>Antenna</b>	1			2			3		
<b>Antenna Model</b>	RFS - APXVAALL24_43-U-NA20 (Octo)			AIR 6419 B41 (Active Antenna - Massive MIMO)			Commscope_VV-65A-R1 (Quad)		
<b>Azimuth</b>	0			0			0		
<b>M. Tilt</b>	0			0			0		
<b>Height (ft)</b>	137			137			137		
<b>Ports</b>	<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P4</b>	<b>P5</b>	<b>P6</b>	<b>P7</b>	<b>P8</b>	
<b>Active Tech</b>	L700 L600 N600	L700 L600 N600			N2500	N2500	N1900 G1900 L1900 L2100	N1900 L1900 L2100	
<b>Dark Tech</b>									
<b>Restricted Tech</b>									
<b>Decomm. Tech</b>									
<b>E. Tilt</b>	2	2							
<b>Cables</b>	Coax Jumper (x2) Fiber Jumper (x2)	Fiber Jumper (x2) Coax Jumper (x2)			Fiber Jumper (x4)	Fiber Jumper (x4)	Coax Jumper (x2) Fiber Jumper (x2)	Fiber Jumper (x2) Coax Jumper (x2)	
<b>TMA</b>									
<b>Diplexer / Combiners</b>									
<b>Radio</b>	Radio 4480 B71+B85 (At Antenna)	Radio 4480 B71+B85 (At Antenna)					Radio 4460 B25+B66 (At Antenna)	Radio 4460 B25+B66 (At Antenna)	
<b>Sector Equipment</b>									

**Unconnected Equipment:**

**Scope of Work:**

Add VV-65A-R1 at P3.  
Add AIR6419 at P2.  
Add (1) 4460 Radio and connect it to quad antenna at P3.  
Remove all unused coax/TMAs.

\*A dashed border indicates shared connected equipment. Any shared equipment, besides the first, is denoted with the SHARED keyword.

<b>RAN Template:</b> 67E5D998E 6160	<b>A&amp;L Template:</b> 67E5998E_1xAIR+1OP+1QP
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Sector 2 (Existing) view from behind				
<b>Coverage Type</b>	A - Outdoor Macro			
<b>Antenna</b>	1			
<b>Antenna Model</b>	RFS - APXVAALL24_43-U-NA20 (Octo)			
<b>Azimuth</b>	120			
<b>M. Tilt</b>	0			
<b>Height (ft)</b>	137			
<b>Ports</b>	<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P4</b>
<b>Active Tech</b>	L600 N600 L700	L600 N600 L700	L2100 L1900 G1900	
<b>Dark Tech</b>				
<b>Restricted Tech</b>				
<b>Decomm. Tech</b>				
<b>E. Tilt</b>	2			
<b>Cables</b>			1-5/8" Coax - 210 ft. (x2)	
<b>TMA's</b>			Generic Style 4 - PCS+AWS (At Antenna)	
<b>Diplexer / Combiners</b>			Generic AWS/PCS Diplexer (At Cabinet)	
<b>Radio</b>	Radio 4480 B71+B85 (At Antenna)	Radio 4480 B71+B85 (At Antenna)		
<b>Sector Equipment</b>				

**Unconnected Equipment:**

Cable: 1-5/8" Coax - 210 ft. (x2)

**Scope of Work:**

CT11696E  
Use existing cabinet 6201.  
Replacing BB6630 used for L7 with RP6651 for low band(L7/L6/N6).  
Add PSU 4813  
Add three (3) 60m meter Hybrid.  
Adding RFS - APXVAALL24\_43-U-NA20 and moving Low and Mid Band here  
Adding 4480s Radio at the antenna for low band.  
Existing BB 6630 with L2100 / L1900 remains  
Height and azimuth of site remain same.

\*A dashed border indicates shared connected equipment. Any shared equipment, besides the first, is denoted with the SHARED keyword.

<b>RAN Template:</b> 67E5D998E 6160	<b>A&amp;L Template:</b> 67E5998E_1xAIR+1OP+1QP
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Sector 2 (Proposed) view from behind									
Coverage Type	A - Outdoor Macro								
Antenna	1			2			3		
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)			AIR 6419 B41 (Active Antenna - Massive MIMO)			Commscope_VV-65A-R1 (Quad)		
Azimuth	120			120			120		
M. Tilt	0			0			0		
Height (ft)	137			137			137		
Ports	P1	P2	P3	P4	P5	P6	P7	P8	
Active Tech	L600 L700 N600	L600 L700 N600			N2500	N2500	L1900 G1900 L2100 N1900	L1900 L2100 N1900	
Dark Tech									
Restricted Tech									
Decomm. Tech									
E. Tilt	2	2							
Cables	Coax Jumper (x2) Fiber Jumper (x2)	Fiber Jumper (x2) Coax Jumper (x2)			Fiber Jumper (x4)	Fiber Jumper (x4)	Coax Jumper (x2) Fiber Jumper (x2)	Fiber Jumper (x2) Coax Jumper (x2)	
TMA									
Diplexer / Combiners									
Radio	Radio 4480 B71+B85 (At Antenna)	Radio 4480 B71+B85 (At Antenna)					Radio 4460 B25+B66 (At Antenna)	Radio 4460 B25+B66 (At Antenna)	
Sector Equipment									
<b>Unconnected Equipment:</b>									
<b>Scope of Work:</b>									
Add VV-65A-R1 at P3. Add AIR6419 at P2. Add (1) 4460 Radio and connect it to quad antenna at P3. Remove all unused coax/TMAs.									
*A dashed border indicates shared connected equipment. Any shared equipment, besides the first, is denoted with the SHARED keyword.									

<b>RAN Template:</b> 67E5D998E 6160	<b>A&amp;L Template:</b> 67E5998E_1xAIR+1OP+1QP
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Sector 3 (Existing) view from behind				
<b>Coverage Type</b>	A - Outdoor Macro			
<b>Antenna</b>	1			
<b>Antenna Model</b>	RFS - APXVAALL24_43-U-NA20 (Octo)			
<b>Azimuth</b>	240			
<b>M. Tilt</b>	0			
<b>Height (ft)</b>	137			
<b>Ports</b>	<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P4</b>
<b>Active Tech</b>	L700 L600 N600	L700 L600 N600	L1900 L2100 G1900	
<b>Dark Tech</b>				
<b>Restricted Tech</b>				
<b>Decomm. Tech</b>				
<b>E. Tilt</b>	2			
<b>Cables</b>			1-5/8" Coax - 210 ft. (x2)	
<b>TMA's</b>			Generic Style 4 - PCS+AWS (At Antenna)	
<b>Diplexer / Combiners</b>			Generic AWS/PCS Diplexer (At Cabinet)	
<b>Radio</b>	Radio 4480 B71+B85 (At Antenna)	Radio 4480 B71+B85 (At Antenna)		
<b>Sector Equipment</b>				

**Unconnected Equipment:**

Cable: 1-5/8" Coax - 210 ft. (x2)

**Scope of Work:**

CT11696E  
 Use existing cabinet 6201.  
 Replacing BB6630 used for L7 with RP6651 for low band(L7/L6/N6).  
 Add PSU 4813  
 Add three (3) 60m meter Hybrid.  
 Adding RFS - APXVAALL24\_43-U-NA20 and moving Low and Mid Band here  
 Adding 4480s Radio at the antenna for low band.  
 Existing BB 6630 with L2100 / L1900 remains  
 Height and azimuth of site remain same.

\*A dashed border indicates shared connected equipment. Any shared equipment, besides the first, is denoted with the SHARED keyword.

<b>RAN Template:</b> 67E5D998E 6160	<b>A&amp;L Template:</b> 67E5998E_1xAIR+1OP+1QP
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Sector 3 (Proposed) view from behind									
<b>Coverage Type</b>	A - Outdoor Macro								
<b>Antenna</b>	1			2			3		
<b>Antenna Model</b>	RFS - APXVAALL24_43-U-NA20 (Octo)			AIR 6419 B41 (Active Antenna - Massive MIMO)			Commscope_VV-65A-R1 (Quad)		
<b>Azimuth</b>	240			240			240		
<b>M. Tilt</b>	0			0			0		
<b>Height (ft)</b>	137			137			137		
<b>Ports</b>	<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P4</b>	<b>P5</b>	<b>P6</b>	<b>P7</b>	<b>P8</b>	
<b>Active Tech</b>	N600 L600 L700	N600 L600 L700			N2500	N2500	G1900 L1900 L2100 N1900	L1900 L2100 N1900	
<b>Dark Tech</b>									
<b>Restricted Tech</b>									
<b>Decomm. Tech</b>									
<b>E. Tilt</b>	2	2							
<b>Cables</b>	Coax Jumper (x2) Fiber Jumper (x2)	Fiber Jumper (x2) Coax Jumper (x2)			Fiber Jumper (x4)	Fiber Jumper (x4)	Coax Jumper (x2) Fiber Jumper (x2)	Fiber Jumper (x2) Coax Jumper (x2)	
<b>TMA</b>									
<b>Diplexer / Combiners</b>									
<b>Radio</b>	Radio 4480 B71+B85 (At Antenna)	Radio 4480 B71+B85 (At Antenna)					Radio 4460 B25+B66 (At Antenna)	Radio 4460 B25+B66 (At Antenna)	
<b>Sector Equipment</b>									
<b>Unconnected Equipment:</b>									
<b>Scope of Work:</b>									
Add VV-65A-R1 at P3. Add AIR6419 at P2. Add (1) 4460 Radio and connect it to quad antenna at P3. Remove all unused coax/TMAs.									
*A dashed border indicates shared connected equipment. Any shared equipment, besides the first, is denoted with the SHARED keyword.									

# Radio Frequency Exposure Analysis Report

November 29, 2023

T-Mobile

Site Name: Portland S CT

Site Number: CT11696E

Site Address: 191 Middle Haddam Rd., Portland, CT 06480-1767



**Michael Fischer, P.E.**  
**Registered Professional Engineer (Electrical)**  
**Connecticut License Number 33928**  
**Expires January 31, 2024**

Signed 30 November 2023

## Site Compliance Summary

<b>T-Mobile Compliance Status:</b>	Compliant
<b>Cumulative Calculated Power Density (Ground Level):</b>	22.65110 $\mu\text{W}/\text{cm}^2$
<b>Cumulative General Population % MPE (Ground Level):</b>	2.26528%



November 29, 2023

Centerline  
Attn: Peter Fales, Vice President – Site Acquisition  
750 W Center St, Suite 301  
West Bridgewater, MA 02379

RF Exposure Analysis for Site: **Portland S CT**

Centerline was contracted to analyze the proposed T-Mobile facility at **191 Middle Haddam Rd., Portland, CT 06480-1767** for the purpose of determining whether the predictive exposure from the proposed facility is within specified federal limits.

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

All results were compared to the FCC radio frequency exposure rules as detailed in 47 CFR § 1.1307(b) to determine compliance with the MPE limits for General Population/Uncontrolled environments as defined below.

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

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits, as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means. Additional details can be found in FCC OET 65.



## **Calculation Methodology**

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

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





## **Data & Results**

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

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

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



**Maximum Calculated Cumulative Power Density (Location: approximately 387' NNE of site)**

Antenna ID	Make / Model	Frequency Band (MHz)	Antenna Gain (dBd)	Antenna Centerline (ft)	Channel Count	TX Power/ Channel (watts)	ERP (watts)	Calculated Power Density ( $\mu\text{W}/\text{cm}^2$ )	General Population MPE Limit ( $\mu\text{W}/\text{cm}^2$ )	General Population % MPE
T-Mobile A 1	COMMSCOPE VV-65A-R1B	1900	15.15	139.00	4.00	35.00	4582.77	0.00010	1000.00	0.00001
T-Mobile A 1	COMMSCOPE VV-65A-R1B	1900	15.15	139.00	4.00	40.00	5237.45	0.00011	1000.00	0.00001
T-Mobile A 1	COMMSCOPE VV-65A-R1B	1900	15.15	139.00	2.00	10.00	654.68	0.00001	1000.00	0.00000
T-Mobile A 1	COMMSCOPE VV-65A-R1B	2100	15.80	139.00	4.00	60.00	9124.55	0.00018	1000.00	0.00002
T-Mobile A 2	RFS APXVAALL24 43-U-NA20	700	13.65	139.00	4.00	20.00	1853.92	0.00006	466.67	0.00001
T-Mobile A 2	RFS APXVAALL24 43-U-NA20	600	12.95	139.00	4.00	60.00	4733.81	0.00018	400.00	0.00004
T-Mobile A 3	ERICSSON SON_AIR6419	2500	15.55	139.00	1.00	30.00	1076.77	0.00011	1000.00	0.00001
T-Mobile A 3	ERICSSON SON_AIR6419	2500	15.55	139.00	1.00	30.00	1076.77	0.00011	1000.00	0.00001
T-Mobile A 3	ERICSSON SON_AIR6419	2500	22.05	139.00	1.00	90.00	14429.21	11.03065	1000.00	1.10307
T-Mobile A 3	ERICSSON SON_AIR6419	2500	22.05	139.00	1.00	90.00	14429.21	11.03065	1000.00	1.10307
T-Mobile B 4	COMMSCOPE VV-65A-R1B	1900	15.15	139.00	4.00	35.00	4582.77	0.00000	1000.00	0.00000
T-Mobile B 4	COMMSCOPE VV-65A-R1B	1900	15.15	139.00	4.00	40.00	5237.45	0.00000	1000.00	0.00000
T-Mobile B 4	COMMSCOPE VV-65A-R1B	1900	15.15	139.00	2.00	10.00	654.68	0.00000	1000.00	0.00000
T-Mobile B 4	COMMSCOPE VV-65A-R1B	2100	15.80	139.00	4.00	60.00	9124.55	0.00000	1000.00	0.00000
T-Mobile B 5	RFS APXVAALL24 43-U-NA20	700	13.65	139.00	4.00	20.00	1853.92	0.00000	466.67	0.00000
T-Mobile B 5	RFS APXVAALL24 43-U-NA20	600	12.95	139.00	4.00	60.00	4733.81	0.00000	400.00	0.00000
T-Mobile B 6	ERICSSON SON_AIR6419	2500	15.55	139.00	1.00	30.00	1076.77	0.00000	1000.00	0.00000
T-Mobile B 6	ERICSSON SON_AIR6419	2500	15.55	139.00	1.00	30.00	1076.77	0.00000	1000.00	0.00000
T-Mobile B 6	ERICSSON SON_AIR6419	2500	22.05	139.00	1.00	90.00	14429.21	0.05267	1000.00	0.00527
T-Mobile B 6	ERICSSON SON_AIR6419	2500	22.05	139.00	1.00	90.00	14429.21	0.05267	1000.00	0.00527
T-Mobile C 7	COMMSCOPE VV-65A-R1B	1900	15.15	139.00	4.00	35.00	4582.77	0.00000	1000.00	0.00000
T-Mobile C 7	COMMSCOPE VV-65A-R1B	1900	15.15	139.00	4.00	160.00	5237.45	0.00000	1000.00	0.00000
T-Mobile C 7	COMMSCOPE VV-65A-R1B	1900	15.15	139.00	2.00	20.00	654.68	0.00000	1000.00	0.00000
T-Mobile C 7	COMMSCOPE VV-65A-R1B	2100	15.80	139.00	4.00	240.00	9124.55	0.00000	1000.00	0.00000
T-Mobile C 8	RFS APXVAALL24 43-U-NA20	700	13.65	139.00	4.00	80.00	1853.92	0.00000	466.67	0.00000
T-Mobile C 8	RFS APXVAALL24 43-U-NA20	600	12.95	139.00	4.00	240.00	4733.81	0.00000	400.00	0.00000
T-Mobile C 9	ERICSSON SON_AIR6419	2500	15.55	139.00	1.00	30.00	1076.77	0.00000	1000.00	0.00000
T-Mobile C 9	ERICSSON SON_AIR6419	2500	15.55	139.00	1.00	30.00	1076.77	0.00000	1000.00	0.00000
T-Mobile C 9	ERICSSON SON_AIR6419	2500	22.05	139.00	1.00	90.00	14429.21	0.23801	1000.00	0.02380
T-Mobile C 9	ERICSSON SON_AIR6419	2500	22.05	139.00	1.00	90.00	14429.21	0.23801	1000.00	0.02380
Unknown A 10	GENERIC OMNI	450	5.96	138.00	1.00	25.25	99.60	0.00000	300.00	0.00000
Verizon A 11	RFS APL866513-42T6	850	12.60	128.00	0.00	0.00	0.00 (Not in Use)	0.00000	566.67	0.00000
Verizon A 12	COMMSCOPE JAHH-65B-R3B	700	12.11	128.00	2.00	80.00	1300.44	0.00008	466.67	0.00002
Verizon A 12	COMMSCOPE JAHH-65B-R3B	850	12.81	128.00	2.00	80.00	1527.88	0.00009	566.67	0.00002
Verizon A 12	COMMSCOPE JAHH-65B-R3B	1900	16.09	128.00	4.00	160.00	6503.09	0.00018	1000.00	0.00002



Antenna ID	Make / Model	Frequency Band (MHz)	Antenna Gain (dBd)	Antenna Centerline (ft)	Channel Count	TX Power/ Channel (watts)	ERP (watts)	Calculated Power Density ( $\mu\text{W}/\text{cm}^2$ )	General Population MPE Limit ( $\mu\text{W}/\text{cm}^2$ )	General Population % MPE
Verizon A 13	COMMSCOPE JAHH-65B-R3B	700	12.11	128.00	2.00	80.00	1300.44	0.00008	466.67	0.00002
Verizon A 13	COMMSCOPE JAHH-65B-R3B	850	12.81	128.00	2.00	80.00	1527.88	0.00009	566.67	0.00002
Verizon A 13	COMMSCOPE JAHH-65B-R3B	2100	15.94	128.00	4.00	160.00	6282.32	0.00017	1000.00	0.00002
Verizon A 14	Samsung SON_MT6407	3700	23.45	128.00	2.00	200.00	44261.89	0.00492	1000.00	0.00049
Verizon A 15	RFS APL866513-42T6	850	12.60	128.00	0.00	0.00	0.00 (Not in Use)	0.00000	566.67	0.00000
Verizon B 16	COMMSCOPE DB846H80E-SX	850	13.95	128.00	0.00	0.00	0.00 (Not in Use)	0.00000	566.67	0.00000
Verizon B 17	COMMSCOPE JAHH-65B-R3B	700	12.11	128.00	2.00	80.00	1300.44	0.00000	466.67	0.00000
Verizon B 17	COMMSCOPE JAHH-65B-R3B	850	12.81	128.00	2.00	80.00	1527.88	0.00000	566.67	0.00000
Verizon B 17	COMMSCOPE JAHH-65B-R3B	1900	16.09	128.00	4.00	160.00	6503.09	0.00000	1000.00	0.00000
Verizon B 18	COMMSCOPE JAHH-65B-R3B	700	12.11	128.00	2.00	80.00	1300.44	0.00000	466.67	0.00000
Verizon B 18	COMMSCOPE JAHH-65B-R3B	850	12.81	128.00	2.00	80.00	1527.88	0.00000	566.67	0.00000
Verizon B 18	COMMSCOPE JAHH-65B-R3B	2100	15.94	128.00	4.00	160.00	6282.32	0.00000	1000.00	0.00000
Verizon B 19	Samsung SON_MT6407	3700	23.45	128.00	2.00	200.00	44261.89	0.00011	1000.00	0.00001
Verizon C 20	COMMSCOPE DB846H80E-SX	850	13.95	128.00	0.00	0.00	0.00 (Not in Use)	0.00000	566.67	0.00000
Verizon C 21	COMMSCOPE DB846H80E-SX	850	13.95	128.00	0.00	0.00	0.00 (Not in Use)	0.00000	566.67	0.00000
Verizon C 22	COMMSCOPE JAHH-65B-R3B	700	12.11	128.00	2.00	80.00	1300.44	0.00000	466.67	0.00000
Verizon C 22	COMMSCOPE JAHH-65B-R3B	850	12.81	128.00	2.00	80.00	1527.88	0.00000	566.67	0.00000
Verizon C 22	COMMSCOPE JAHH-65B-R3B	1900	16.09	128.00	4.00	160.00	6503.09	0.00000	1000.00	0.00000
Verizon C 23	COMMSCOPE JAHH-65B-R3B	700	12.11	128.00	2.00	80.00	1300.44	0.00000	466.67	0.00000
Verizon C 23	COMMSCOPE JAHH-65B-R3B	850	12.81	128.00	2.00	80.00	1527.88	0.00000	566.67	0.00000
Verizon C 23	COMMSCOPE JAHH-65B-R3B	2100	15.94	128.00	4.00	160.00	6282.32	0.00000	1000.00	0.00000
Verizon C 24	Samsung SON_MT6407	3700	23.45	128.00	2.00	200.00	44261.89	0.00011	1000.00	0.00001
Verizon C 25	COMMSCOPE DB846H80E-SX	850	13.95	128.00	0.00	0.00	0.00 (Not in Use)	0.00000	566.67	0.00000
AT&T A 26	POWERWAVE 7770 00	850	11.35	119.00	0.00	0.00	0.00 (Not in Use)	0.00000	566.67	0.00000
AT&T A 27	CCI DMP65R-BU6D	700	11.75	119.00	4.00	160.00	2393.98	0.00015	466.67	0.00003
AT&T A 27	CCI DMP65R-BU6D	850	11.45	119.00	4.00	160.00	2234.19	0.00015	566.67	0.00003
AT&T A 27	CCI DMP65R-BU6D	2300	14.15	119.00	4.00	100.00	2600.16	0.00007	1000.00	0.00001
AT&T A 28	COMMSCOPE NNH4-65B-R6	1900	14.15	119.00	4.00	160.00	4160.26	0.00018	1000.00	0.00002
AT&T A 28	COMMSCOPE NNH4-65B-R6	2100	14.35	119.00	4.00	160.00	4356.32	0.00016	1000.00	0.00002
AT&T B 29	POWERWAVE 7770 00	850	11.35	119.00	0.00	0.00	0.00 (Not in Use)	0.00000	566.67	0.00000
AT&T B 30	CCI DMP65R-BU6D	700	11.75	119.00	4.00	160.00	2393.98	0.00000	466.67	0.00000
AT&T B 30	CCI DMP65R-BU6D	850	11.45	119.00	4.00	160.00	2234.19	0.00000	566.67	0.00000
AT&T B 30	CCI DMP65R-BU6D	2300	14.15	119.00	4.00	100.00	2600.16	0.00000	1000.00	0.00000
AT&T B 31	COMMSCOPE NNH4-65B-R6	1900	14.15	119.00	4.00	160.00	4160.26	0.00000	1000.00	0.00000
AT&T B 31	COMMSCOPE NNH4-65B-R6	2100	14.35	119.00	4.00	160.00	4356.32	0.00000	1000.00	0.00000



Antenna ID	Make / Model	Frequency Band (MHz)	Antenna Gain (dBd)	Antenna Centerline (ft)	Channel Count	TX Power/ Channel (watts)	ERP (watts)	Calculated Power Density ( $\mu\text{W}/\text{cm}^2$ )	General Population MPE Limit ( $\mu\text{W}/\text{cm}^2$ )	General Population % MPE
AT&T C 32	POWERWAVE 7770 00	850	11.35	119.00	0.00	0.00	0.00 (Not in Use)	0.00000	566.67	0.00000
AT&T C 33	CCI DMP65R-BU6D	700	11.75	119.00	4.00	160.00	2393.98	0.00000	466.67	0.00000
AT&T C 33	CCI DMP65R-BU6D	850	11.45	119.00	4.00	160.00	2234.19	0.00000	566.67	0.00000
AT&T C 33	CCI DMP65R-BU6D	2300	14.15	119.00	4.00	100.00	2600.16	0.00000	1000.00	0.00000
AT&T C 34	COMMSCOPE NNH4-65B-R6	1900	14.15	119.00	4.00	160.00	4160.26	0.00000	1000.00	0.00000
AT&T C 34	COMMSCOPE NNH4-65B-R6	2100	14.35	119.00	4.00	160.00	4356.32	0.00000	1000.00	0.00000
City of Middletown 35	GENERIC OMNI	850	5.96	104.00	1.00	25.25	99.60	0.00001	566.67	0.00000
City of Middletown 36	GENERIC OMNI	850	5.96	100.00	1.00	25.25	99.60	0.00001	566.67	0.00000
City of Middletown 37	GENERIC OMNI	850	5.96	87.00	1.00	25.25	99.60	0.00001	566.67	0.00000
City of Middletown 38	GENERIC OMNI	850	5.96	80.00	1.00	25.25	99.60	0.00001	566.67	0.00000
City of Middletown 39	GENERIC MICROWAVE	11000	38.65	80.00	1.00	0.10	732.82	0.00000	1000.00	0.00000
City of Middletown 40	GENERIC MICROWAVE	11000	38.65	80.00	1.00	0.10	732.82	0.00000	1000.00	0.00000
Dish A 41	JMA MX08FRO665-21	700	12.05	69.00	4.00	120.00	1923.89	0.00006	466.67	0.00001
Dish A 42	JMA MX08FRO665-21	600	11.35	69.00	4.00	120.00	1637.50	0.00006	400.00	0.00001
Dish A 43	JMA MX08FRO665-21	2007	15.75	69.00	4.00	160.00	6013.40	0.00008	1000.00	0.00001
Dish A 44	JMA MX08FRO665-21	2100	16.75	69.00	4.00	160.00	7570.42	0.00007	1000.00	0.00001
Dish B 45	JMA MX08FRO665-21	700	12.05	69.00	4.00	120.00	1923.89	0.00014	466.67	0.00003
Dish B 46	JMA MX08FRO665-21	600	11.35	69.00	4.00	120.00	1637.50	0.00015	400.00	0.00004
Dish B 47	JMA MX08FRO665-21	2007	15.75	69.00	4.00	160.00	6013.40	0.00021	1000.00	0.00002
Dish B 48	JMA MX08FRO665-21	2100	16.75	69.00	4.00	160.00	7570.42	0.00023	1000.00	0.00002
Dish C 49	JMA MX08FRO665-21	700	12.05	69.00	4.00	120.00	1923.89	0.00000	466.67	0.00000
Dish C 50	JMA MX08FRO665-21	600	11.35	69.00	4.00	120.00	1637.50	0.00000	400.00	0.00000
Dish C 51	JMA MX08FRO665-21	2007	15.75	69.00	4.00	160.00	6013.40	0.00000	1000.00	0.00000
Dish C 52	JMA MX08FRO665-21	2100	16.75	69.00	4.00	160.00	7570.42	0.00000	1000.00	0.00000
							<b>Cumulative Power Density:</b>	<b>22.65110 <math>\mu\text{W}/\text{cm}^2</math></b>	<b>Cumulative % MPE:</b>	<b>2.26528%</b>



## Summary

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

*Michelle Stone*

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