Transcend Wireless

10 Industrial Avenue,
Suite 3
Mahwah, NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

July 22, 2019

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

**Notice of Exempt Modification**
**6 Mountain Road, Washington CT**
**Latitude 41.66913889**
**Longitude -73.36527778**
**T-Mobile site: CTNH371A / L600**

Dear Ms. Bachman:

T-Mobile currently maintains (6) antennas at the 136 foot level of the existing 169 -foot monopole tower at 6 Mountain Road in Washington CT. The monopole is owned by American Tower and the property is owned by Ray H.Underwood. T-Mobile now intends to replace 3 of its existing antennas with (3) 600/700 MHz antennas. The new antennas would be installed at the 136 foot level of the tower.

**Planned Modifications:**

**Remove:**
**TMAs**
(3) ATMAA14120-1A20 TTAs

**Remove and Replace:**
**Antennas:**
3 LNX-6515DS-VTM (REMOVE) - APXVAARR24_43-U-NA20 (REPLACE) 600 MHz / 700 MHz
**RRUs:**
Ericsson RRUS-11 B12 (REMOVE) - Ericsson RADIO 4449 B12/71 (REPLACE)

**Existing to Remain:**
**Antennas/TMAs/RRUs/coax:**
(3) RFS APXV18-206516S-C-A20
(3) Ericsson RRUS-11 B2
(1) 1-5/8" Hybrid

**Install New:**
**Coax Cables:**
(2) 1-5/8" Hybrid

This facility was approved by Docket 332 by the Siting Council September 25, 2007, with no record of conditions that would restrict exempt modifications. Therefore, this modification complies with the aforementioned approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to The Honorable Mark E. Lyon, First Selectman and Shelley White, Land Use Administrator.

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,

*Elizabeth Jamieson*

Elizabeth Jamieson
Transcend Wireless
10 Industrial Ave., Suite 3
Mahwah, New Jersey 07430
860-605-7808
EJamieson@TranscendWireless.com

cc:
The Honorable Mark E. Lyon, First Selectman
Shelley White, Land Use Administrator
American Tower, Tower Owner
Ray H. Underwood., Property Owner

# Exhibit A

## Original Facility Approval

| | | |
|---|---|---|
| **DOCKET NO. 332** – 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 telecommunications facility located at 6 Mountain Road or 167 New Milford Turnpike, Washington, Connecticut. | } | Connecticut<br>Siting<br>Council<br>September 25, 2007 |

**Decision and Order**

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility, including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate, either alone or cumulatively with other effects, when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application, and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Cellco Partnership d/b/a Verizon Wireless, hereinafter referred to as the Certificate Holder, for a telecommunications facility at Site 1 located at 6 Mountain Road, Washington, Connecticut. The Council denies certification of Site 2, located at 167 New Milford Turnpike, Washington, 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 Verizon Wireless, New Cingular Wireless d/b/a AT&T and other entities, both public and private, but such tower shall not exceed a height of 160 feet above ground level. The height at the top of the antennas shall not exceed 160 feet above ground level.

2. All antennas shall be installed on the tower in an exterior, flush-mount configuration.

3. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
   a) a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas, equipment compound, radio equipment, access road, utility line, and landscaping; and
   b) construction plans for site clearing, grading, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

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

5. 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.

6. 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.

7. The Certificate Holder shall provide reasonable space on the tower for no compensation for any Town of Washington public safety services (police, fire and medical services), provided such use can be accommodated and is compatible with the structural integrity of the tower.

8. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed and providing wireless services within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), 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. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline.

9. Any request for extension of the time period referred to in Condition 8 shall be filed with the Council not later than 60 days prior to the expiration date of this Certificate and shall be served on all parties and intervenors, as listed in the service list. Any proposed modifications to this Decision and Order shall likewise be so served.

10. If the facility ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

11. The Certificate Holder shall remove any nonfunctioning antenna, and associated antenna mounting equipment, within 60 days of the date the antenna ceased to function.

12. In accordance with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council with written notice two weeks prior to the commencement of site construction activities. In addition, the Certificate Holder shall provide the Council with written notice of the completion of site construction and the commencement of site operation.

Pursuant to General Statutes § 16-50p, the Council hereby directs 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 Waterbury Republican-American and the New Milford Spectrum.

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

The parties and intervenors to this proceeding are:

| **Applicant** | **Its Representative** |
|---|---|
| Cellco Partnership d/b/a<br>Verizon Wireless | Kenneth C. Baldwin, Esq.<br>Robinson & Cole LLP<br>280 Trumbull Street<br>Hartford, CT 06103-3597<br><br>Sandy Carter, Regulatory Manager<br>Verizon Wireless<br>99 East River Drive<br>East Hartford, CT 06108 |
| **Party** | **Its Representative** |
| Town of Washington | Steven R. Smart, Esq.<br>Riefberg, Smart, Donohue & NeJames, P.C.<br>9 Old Sugar Hollow Road<br>Danbury, CT 06810 |
| **Intervenor** | **Its Representative** |
| New Cingular Wireless PCS, LLC<br>d/b/a AT&T | Christopher B. Fisher, Esq.<br>Cuddy & Feder LLP<br>445 Hamilton Avenue, 14th Floor<br>White Plains, NY 10601 |
| **Intervenor** | |
| Malina McNamara<br>76 Mygatt Road<br>New Preston, CT 06777 | |

## CERTIFICATION

The undersigned members of the Connecticut Siting Council (Council) hereby certify that they have heard this case, or read the record thereof, **DOCKET NO. 332** – 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 telecommunications facility located at 6 Mountain Road or 167 New Milford Turnpike, Washington, Connecticut, and voted as follows to approve proposed Site 1 located at 6 Mountain Road, Washington, Connecticut, and deny certification of the proposed Site 2, 167 New Milford Turnpike, Washington, Connecticut:

| **Council Members** | **Vote Cast** |
|---|---|
| Daniel F. Caruso, Chairman | Yes |
| Colin C. Tait, Vice Chairman | Yes |
| Commissioner Donald W. Downes<br>Designee: Gerald J. Heffernan | Yes |
| Commissioner Gina McCarthy<br>Designee: Brian J. Emerick | Yes |
| Philip T. Ashton | Yes |
| Daniel P. Lynch, Jr. | Yes |
| James J. Murphy, Jr. | Yes |
| Dr. Barbara Currier Bell | Yes |
| Edward S. Wilensky | Yes |

Dated at New Britain, Connecticut, September 25, 2007.

**STATE OF CONNECTICUT )**

**ss. New Britain, Connecticut :**

**COUNTY OF HARTFORD )**

I hereby certify that the foregoing is a true and correct copy of the Findings of Fact, Opinion, and Decision and Order issued by the Connecticut Siting Council, State of Connecticut.

**ATTEST:**

S. Derek Phelps
Executive Director
Connecticut Siting Council

I certify that a copy of the Findings of Fact, Opinion, and Decision and Order in Docket No. 332 has been forwarded by Certified First Class Return Receipt Requested mail on September 28, 2007, to all parties and intervenors of record as listed on the attached service list, dated June 22, 2007.

**ATTEST:**

Lisa A. Fontaine
Administrative Assistant
Connecticut Siting Council

Date: June 22, 2007



**LIST OF PARTIES AND INTERVENORS**
**SERVICE LIST**

| Status Granted | Status Holder (name, address & phone number) | Representative (name, address & phone number) |
|---|---|---|
| **Applicant** | Cellco Partnership d/b/a<br>Verizon Wireless | Kenneth C. Baldwin, Esq.<br>Robinson & Cole LLP<br>280 Trumbull Street<br>Hartford, CT 06103-3597<br>(860) 275-8200<br>(860) 275-8299 fax<br>kbaldwin@rc.com<br><br>Sandy Carter, Regulatory Manager<br>Verizon Wireless<br>99 East River Drive<br>East Hartford, CT 06108<br>(860) 803-8219<br>alexandria.carter@verizonwireless.com |
| **Party**<br>(granted on<br>5/1/07) | Town of Washington | Steven R. Smart, Esq.<br>Riefberg, Smart, Donohue & NeJames, P.C.<br>9 Old Sugar Hollow Road<br>Danbury, CT 06810<br>(203) 748-9259<br>(203) 796-7584 fax<br>ssmart@rsdn.com<br><br>The Honorable Richard C. Sears<br>First Selectman<br>Washington Town Hall<br>P.O. Box 383, 2 Bryan Plaza<br>Washington Depot, CT 06794<br>(860) 868-2259<br>(860) 868-3103 fax<br>First.selectman@washingtonct.org |
| **Intervenor**<br>(granted on<br>05/22/07) | New Cingular Wireless PCS, LLC<br>d/b/a AT&T | Christopher B. Fisher, Esq.<br>Cuddy & Feder LLP<br>445 Hamilton Avenue, 14th Floor<br>White Plains, NY 10601<br>(914) 761-1300<br>(914) 761-6405 fax<br>cfisher@cuddyfeder.com |

**LIST OF PARTIES AND INTERVENORS**
**SERVICE LIST**

| Status Granted | Status Holder (name, address & phone number) | Representative (name, address & phone number) |
|---|---|---|
| **Intervenor (granted 06/21/07)** | Malina McNamara<br>76 Mygatt Road<br>New Preston, CT 06777<br>(860) 868-7996<br>(860) 868-0203 fax<br>Mmcnamara1955@charter.net | |

# Exhibit B

**Property card**

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The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2018.


Information on the Property Records for the Municipality of Washington was last updated on 7/20/2019.

## Parcel Information

| | | | | | |
|---|---|---|---|---|---|
| Location: | 6 MOUNTAIN RD | Property Use: | Residential | Primary Use: | Residential |
| Unique ID: | 2228 | Map Block Lot: | 07-02-83 | Acres: | 32.08 |
| 490 Acres: | 29.08 | Zone: | R-1 | Volume / Page: | 0240/1114 |
| Developers Map / Lot: | 1305/B/1075 (SubLot) | Census: | | | |

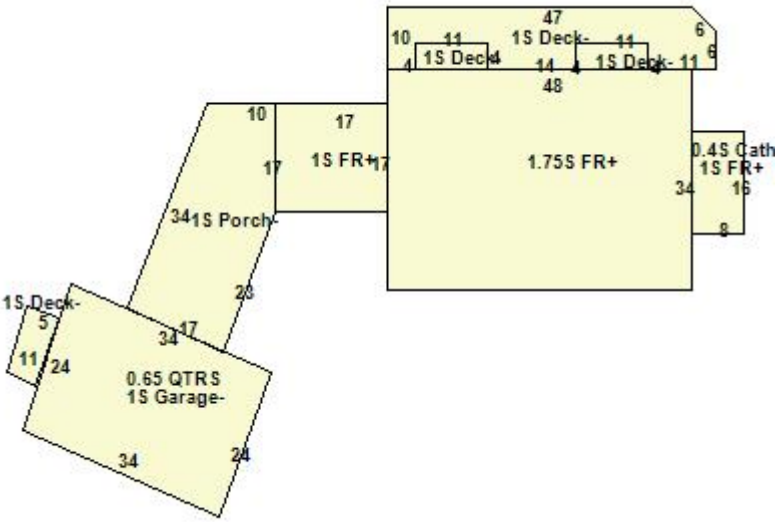
## Value Information

| | Appraised Value | Assessed Value |
|---|---|---|
| Land | 720,690 | 204,870 |
| Buildings | 568,480 | 397,940 |
| Detached Outbuildings | 16,961 | 11,870 |
| Total | 1,306,131 | 614,680 |

## Owner's Information

| Owner's Data |
| --- |
| UNDERWOOD H RAY + CAROL A TTES<br>CAROL A UNDERWOOD REVOCABLE TRUST AGR...<br>PO BOX 2427<br>NEW PRESTON CT 06777 |

## Building 1




| | | | | | |
| --- | --- | --- | --- | --- | --- |
| Building Use: | Single Family | Style: | Cape | Living Area: | 3,808 |
| Stories: | 1.75 | Construction: | Wood Frame | Year Built: | 1992 |
| Total Rooms: | 11 | Bedrooms: | 5 | Full Baths: | 4 |

| | | | | | |
|---|---|---|---|---|---|
| Half Baths: | 0 | Fireplaces: | 0 | Heating: | FHA |
| Fuel: | Oil | Cooling Percent: | 100% | Basement Area: | 2,054 |
| Basement Finished Area: | 0 | Basement Garages: | 0 | Roof Material: | Arch Shingles |
| Siding: | Clapboards | Units: | One with Accessory Apt. | | |

## Special Features

## Attached Components

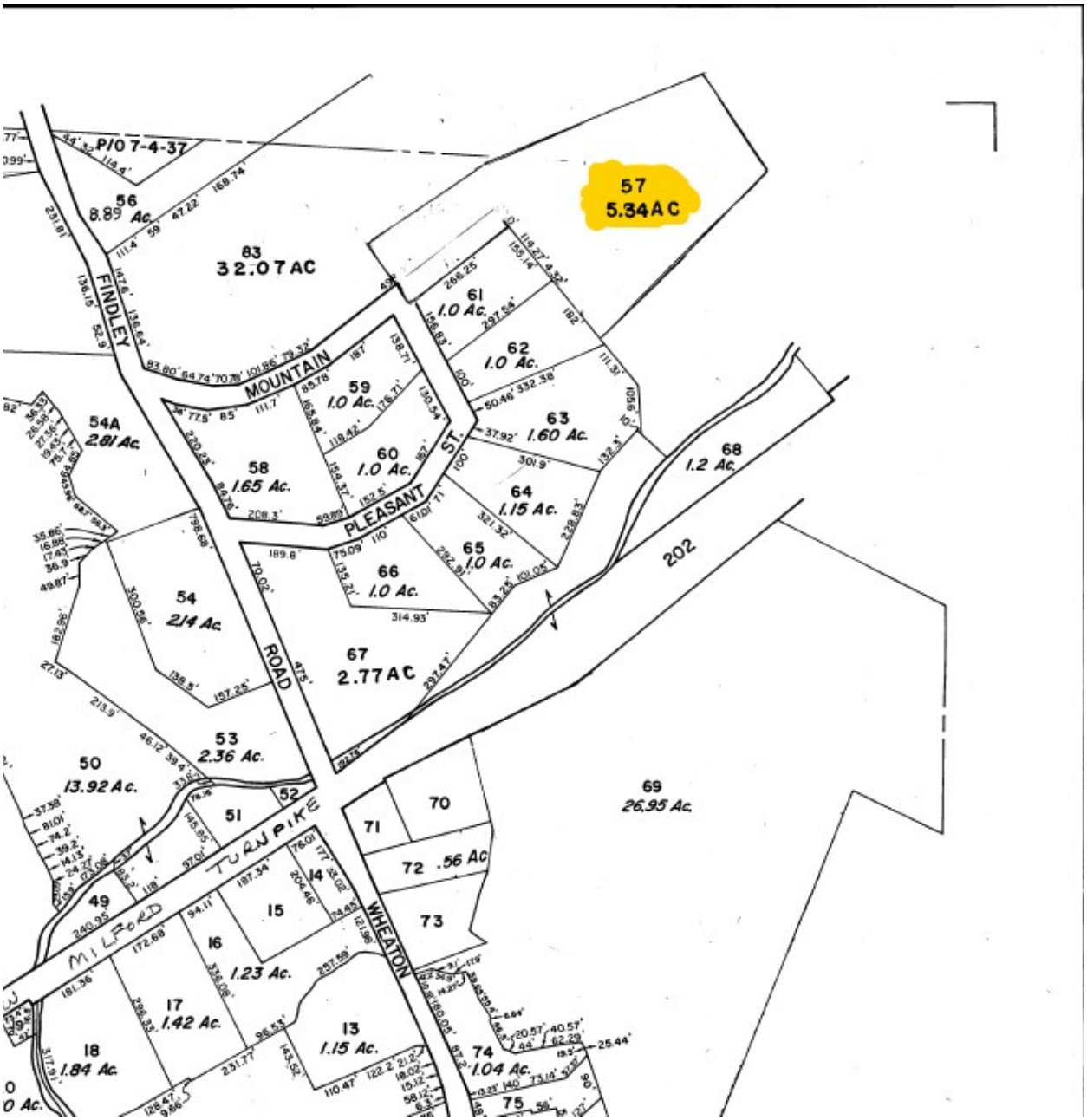
| Type: | Year Built: | Area: |
|---|---|---|
| Cathedral Ceiling | 1992 | 51 |
| Wood Deck | 2000 | 411 |
| Wood Deck | 2000 | 44 |
| Wood Deck | 2000 | 45 |
| Wood Deck | 1992 | 59 |
| Frame Garage | 2000 | 810 |
| Open Porch | 2000 | 557 |

## Detached Outbuildings

| Type: | Year Built: | Area: |
|---|---|---|
| Fencing | 2007 | 200 |
| Generator | 2007 | 1 |
| Towers | 2007 | 1 |
| Utility Building | 2007 | 240 |
| Utility Building | 2007 | 240 |

## Owner History - Sales

| Owner Name | Volume | Page | Sale Date | Deed Type | Valid Sale | Sale Price |
|---|---|---|---|---|---|---|
| UNDERWOOD H RAY + CAROL A TTES | 0240 | 1114 | 06/06/2018 | Quit Claim | No | $0 |
| UNDERWOOD H RAY + CAROL A TTES | 0240 | 1112 | 06/06/2018 | Quit Claim | No | $0 |
| UNDERWOOD H RAY + CAROL A | | | 06/28/2017 | | No | $0 |

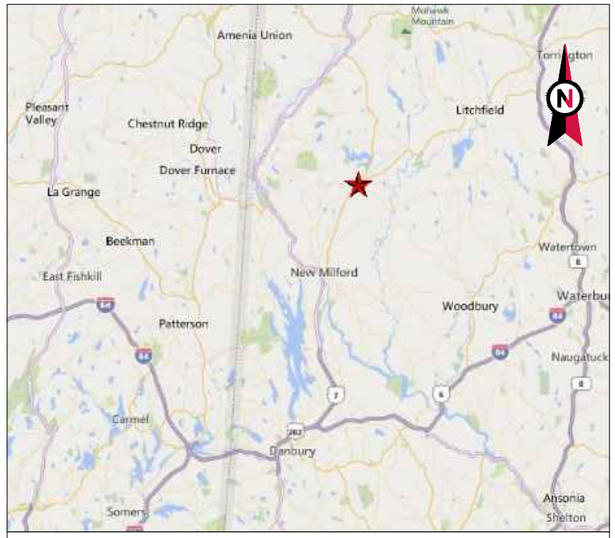



## 6 MOUNTAIN ROAD

## TOWN OF WASHTINGON

# Exhibit C

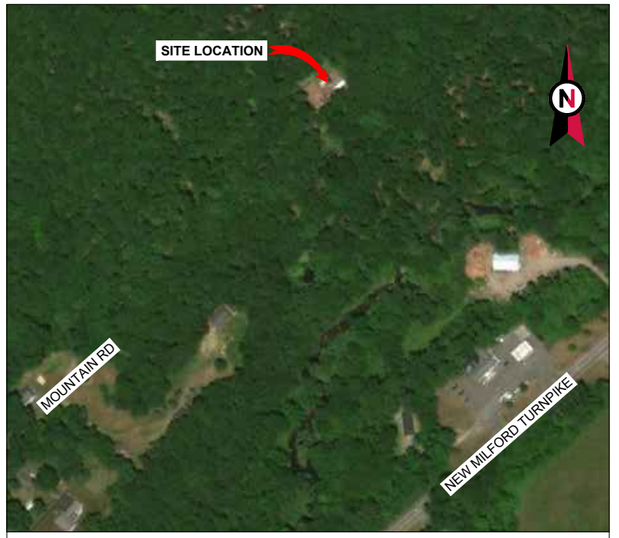
## Construction Drawings




VICINITY MAP

AMERICAN TOWER®

ATC SITE NAME: WASHINGTON NORTH CT
ATC SITE NUMBER: 413782
T-MOBILE SITE ID: CTNH371A
SITE ADDRESS: 6 MOUNTAIN ROAD
NEW PRESTON, CT 06777




LOCATION MAP

# T-MOBILE L600 ANTENNA AMENDMENT
# 67D07A 6102 MUAC CONFIGURATION

## COMPLIANCE CODE

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. INTERNATIONAL BUILDING CODE (IBC)
2. NATIONAL ELECTRIC CODE (NEC)
3. LOCAL BUILDING CODE
4. CITY/COUNTY ORDINANCES

## UTILITY COMPANIES

POWER COMPANY: EVERSOURCE
PHONE: (888) 783-6617

TELEPHONE COMPANY: AT&T
PHONE: (866) 593-1383

811 Know what's below. Call before you dig.

## PROJECT SUMMARY

SITE ADDRESS:

6 MOUNTAIN ROAD
NEW PRESTON, CT 06777
COUNTY: LITCHFIELD

1A CERTIFICATE SUMMARY:

LATITUDE: 41° 40' 08.926" N
LONGITUDE: 73° 21' 55.017" W
GROUND ELEVATION: 693' AMSL
TOWER HEIGHT: 160' AGL
HIGHEST APPURTENANCE: 160' AGL

## PROJECT TEAM

TOWER OWNER:

AMERICAN TOWER
10 PRESIDENTIAL WAY
WOBURN, MA 01801

APPLICANT:

T-MOBILE NORTHEAST LLC
15 COMMERCE WAY
NORTON, MA 02766

ENGINEER:

ATC TOWER SERVICES, LLC
3500 REGENCY PKWY STE 100
CARY, NC 27518

PROPERTY OWNER:

CAROL A UNDERWOOD
PO BOX 2427
MARBLE DALE, CT, 06777

## PROJECT DESCRIPTION

THE PROPOSED PROJECT INCLUDES MODIFYING GROUND BASED AND TOWER MOUNTED EQUIPMENT AS INDICATED PER BELOW:

REMOVE (3) PANELS AND (3) RRUs

INSTALL (3) NEW PANELS, (3) RRUs, AND (2) 1-5/8" HYBRID CABLE

EXISTING (3) PANELS, (3) RRUs, (3) T-ARMS, AND (1) 1-5/8" HYBRID CABLES TO REMAIN

## PROJECT NOTES

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.

## PROJECT LOCATION DIRECTIONS

HEAD EAST ON I-84 E, USE THE LEFT LANE TO TAKE EXIT 7 FOR US 7 N/US 202 E TOWARD BROOKFIELD/NEW MILFORD, CONTINUE ONTO US-202 E/US-7 N CONTINUE TO FOLLOW US-7 N, CONTINUE ONTO US-202 E, TAKE GROVE ST TO EAST ST, TURN RIGHT ONTO STILL RIVER DR, STILL RIVER DR TURNS SLIGHTLY LEFT AND BECOMES GROVE ST/LOWER GROVE ST, CONTINUE TO FOLLOW GROVE ST, TAKE US-202 E TO FINDLAY RD IN WASHINGTON, CONTINUE ONTO EAST ST, CONTINUE ONTO POPLAR ST, CONTINUE ONTO US-202 E/PARK LANE RD, CONTINUE TO FOLLOW US-202 E, CONTINUE ON FINDLAY RD. DRIVE TO MOUNTAIN RD, TURN LEFT ONTO FINDLAY RD, TURN RIGHT ONTO MOUNTAIN RD

## SHEET INDEX

| SHEET NO: | DESCRIPTION: | REV: | DATE: | BY: |
|---|---|---|---|---|
| G-001 | TITLE SHEET | 1 | 07/18/19 | LR |
| G-002 | GENERAL NOTES | 0 | 06/04/19 | EF |
| C-101 | DETAILED SITE PLAN & TOWER ELEVATION | 1 | 07/18/19 | LR |
| C-501 | ANTENNA INFORMATION & SCHEDULE | 1 | 07/18/19 | LR |
| E-501 | GROUNDING DETAILS | 0 | 06/04/19 | EF |
| R-601 | SUPPLEMENTAL | | | |
| R-602 | SUPPLEMENTAL | | | |
| R-603 | SUPPLEMENTAL | | | |

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



| REV. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| 0 | FOR CONSTRUCTION | EF | 06/04/19 |
| 1 | MA UPDATE | LR | 07/18/19 |
| | | | |
| | | | |
| | | | |

ATC SITE NUMBER:
413782

ATC SITE NAME:
WASHINGTON NORTH CT

SITE ADDRESS:
6 MOUNTAIN ROAD
NEW PRESTON, CT 06777

SEAL:


Authorized by "EOR"
Jul 19 2019 9:38 AM

T-Mobile esign

| | |
|---|---|
| DRAWN BY: | EF |
| APPROVED BY: | PB |
| DATE DRAWN: | 06/04/19 |
| ATC JOB NO: | 12951831 |

TITLE SHEET

| SHEET NUMBER: | REVISION: |
|---|---|
| G-001 | 1 |

## GENERAL CONSTRUCTION NOTES:

1. ALL WORK SHALL CONFORM TO ALL CURRENT APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING ANSI/EIA/TIA-222, AND COMPLY WITH ATC MASTER SPECIFICATIONS.
2. CONTRACTOR SHALL CONTACT LOCAL 811 FOR IDENTIFICATION OF UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS.
4. 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.
5. DO NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.
6. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
7. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
8. CONTRACTOR SHALL BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
9. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES, GROUNDS DRAINS, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.
10. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE T-MOBILE WIRELESS REP PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE T-MOBILE WIRELESS REP PRIOR TO PROCEEDING.
11. EACH CONTRACTOR SHALL COOPERATE WITH THE T-MOBILE WIRELESS REP, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
12. CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OF THIS PROJECT TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE T-MOBILE WIRELESS CONSTRUCTION MANAGER.
13. ALL CABLE/CONDUIT ENTRY/EXIT PORTS SHALL BE WEATHERPROOFED DURING INSTALLATION USING A SILICONE SEALANT.
14. WHERE EXISTING CONDITIONS DO NOT MATCH THOSE SHOWN IN THIS PLAN SET, CONTRACTOR SHALL NOTIFY THE T-MOBILE WIRELESS REP IMMEDIATELY.
15. CONTRACTOR SHALL ENSURE ALL SUBCONTRACTORS ARE PROVIDED WITH A COMPLETE AND CURRENT SET OF DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
16. CONTRACTOR SHALL REMOVE ALL RUBBISH AND DEBRIS FROM THE SITE AT THE END OF EACH DAY.
17. CONTRACTOR SHALL COORDINATE WORK SCHEDULE WITH LANDLORD AND TAKE PRECAUTIONS TO MINIMIZE IMPACT AND DISRUPTION OF OTHER OCCUPANTS OF THE FACILITY.
18. CONTRACTOR SHALL FURNISH T-MOBILE WIRELESS WITH A PDF MARKED UP AS-BUILT SET OF DRAWINGS UPON COMPLETION OF WORK.
19. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH T-MOBILE WIRELESS 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.
20. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH T-MOBILE WIRELESS REP TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY CONTRACTOR. ALL REQUIRED PERMITS NOT OBTAINED BY T-MOBILE WIRELESS MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.
21. CONTRACTOR SHALL INSTALL ALL SITE SIGNAGE IN ACCORDANCE WITH T-MOBILE WIRELESS SPECIFICATIONS AND REQUIREMENTS.
22. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO T-MOBILE WIRELESS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
23. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO T-MOBILE WIRELESS SPECIFICATIONS, AND AS SHOWN IN THESE PLANS.
24. 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.
25. CONTRACTOR SHALL NOTIFY T-MOBILE WIRELESS 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.
26. 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.
27. 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 NEGLECT ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, OR BY THE ELEMENTS DUE TO NEGLECT 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.
28. 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 WIRELESS REP. ANY WORK FOUND BY THE T-MOBILE WIRELESS REP TO BE OF INFERIOR QUALITY AND/OR WORKMANSHIP SHALL BE REPLACED AND/OR REWORKED AT CONTRACTOR EXPENSE UNTIL APPROVAL IS OBTAINED.
29. 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.

## STRUCTURAL STEEL NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
2. STRUCTURAL STEEL ROLLED SHAPES, PLATES AND BARS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:
   A. ASTM A-572, GRADE 50 - ALL W SHAPES, UNLESS NOTED OR A992 OTHERWISE
   B. ASTM A-36 - ALL OTHER ROLLED SHAPES, PLATES AND BARS UNLESS NOTED OTHERWISE.
   C. ASTM A-500, GRADE B - HSS SECTION (SQUARE, RECTANGULAR, AND ROUND)
   D. ASTM A-325, TYPE SC OR N - ALL BOLTS FOR CONNECTING STRUCTURAL MEMBERS
   E. ASTM F-1554 07 - ALL ANCHOR BOLTS, UNLESS NOTED OTHERWISE
3. ALL EXPOSED STRUCTURAL STEEL MEMBERS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION PER ASTM A123. EXPOSED STEEL HARDWARE AND ANCHOR BOLTS SHALL BE GALVANIZED PER ASTM A153 OR B695.
4. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.
5. DO NOT DRILL HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
6. CONNECTIONS:
   A. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.1.
   B. ALL WELDS SHALL BE INSPECTED VISUALLY. 25% OF WELDS SHALL BE INSPECTED WITH DYE PENETRANT OR MAGNETIC PARTICLE TO MEET THE ACCEPTANCE CRITERIA OF AWS D1.1. REPAIR ALL WELDS AS NECESSARY.
   C. INSPECTION SHALL BE PERFORMED BY AN AWS CERTIFIED WELD INSPECTOR.
   D. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE BURNING/WELDING PERMITS AS REQUIRED BY LOCAL GOVERNING AUTHORITY AND IF REQUIRED SHALL HAVE FIRE DEPARTMENT DETAIL FOR ANY WELDING ACTIVITY.
   E. ALL ELECTRODES TO BE LOW HYDROGEN, MATCHING FILLER METAL, PER AWS D1.1, UNLESS NOTED OTHERWISE.
   F. MINIMUM WELD SIZE TO BE 0.1875 INCH FILLET WELDS, UNLESS NOTED OTHERWISE.
   G. PRIOR TO FIELD WELDING GALVANIZING MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING ½" BEYOND ALL FIELD WELD SURFACES. AFTER WELD AND WELD INSPECTION IS COMPLETE, REPAIR ALL GROUND AND WELDED SURFACES WITH ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS RECOMMENDATIONS.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| REV. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| 0 | FOR CONSTRUCTION | EF | 06/04/19 |
| | | | |
| | | | |
| | | | |
| | | | |

ATC SITE NUMBER:
413782

ATC SITE NAME:
WASHINGTON NORTH CT

SITE ADDRESS:
6 MOUNTAIN ROAD
NEW PRESTON, CT 06777

SEAL:


Authorized by "EOR"
Jul 19 2019 9:38 AM

T-Mobile esign

| | |
|---|---|
| DRAWN BY: | EF |
| APPROVED BY: | PB |
| DATE DRAWN: | 06/04/19 |
| ATC JOB NO: | 12951831 |

GENERAL NOTES

| SHEET NUMBER: | REVISION: |
|---|---|
| G-002 | 0 |

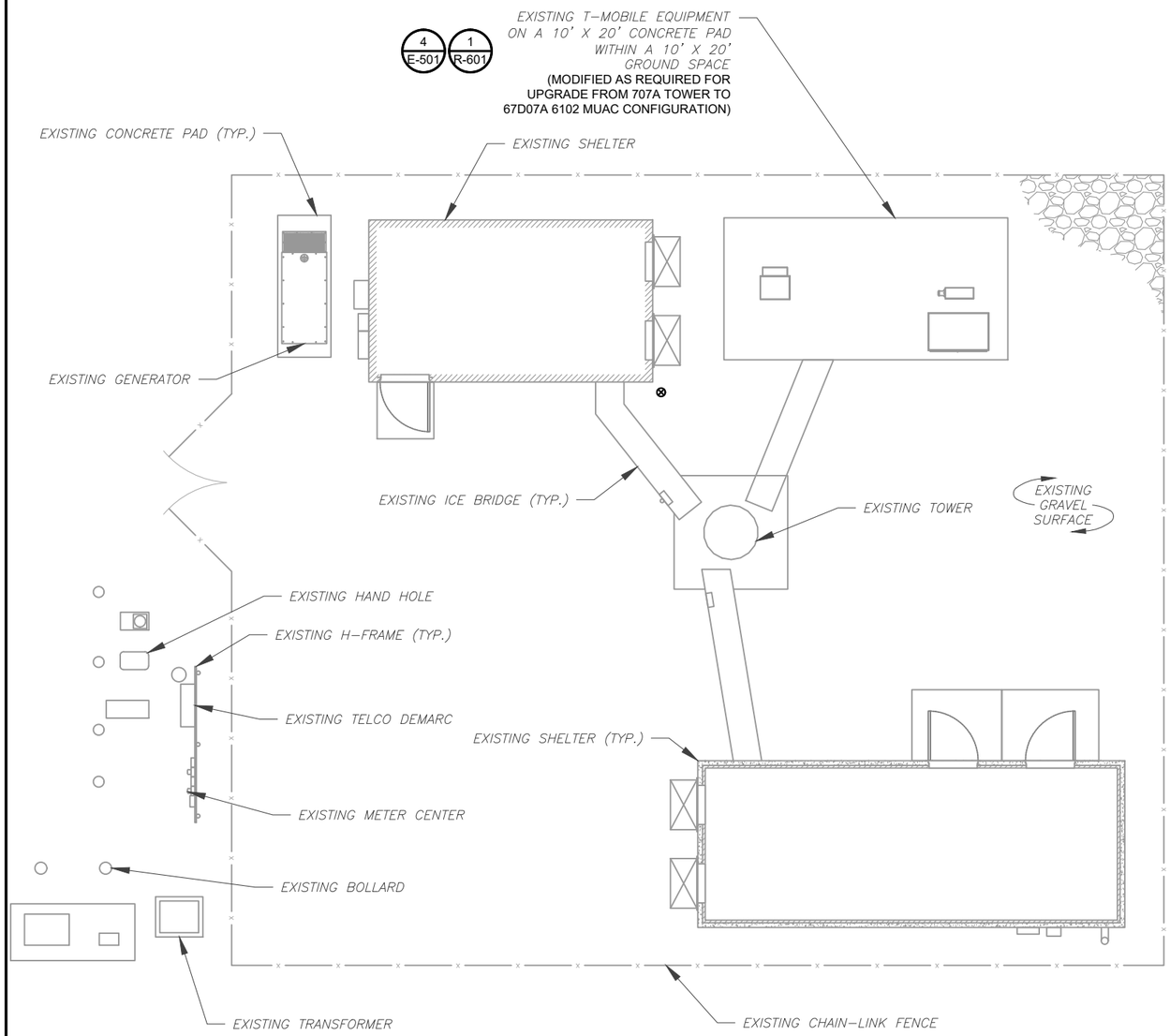
SITE PLAN NOTES:

1. 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.

2. 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.

3. THIS PROJECT INCLUDES NO INSTALL OR MODIFICATION AT GRADE.

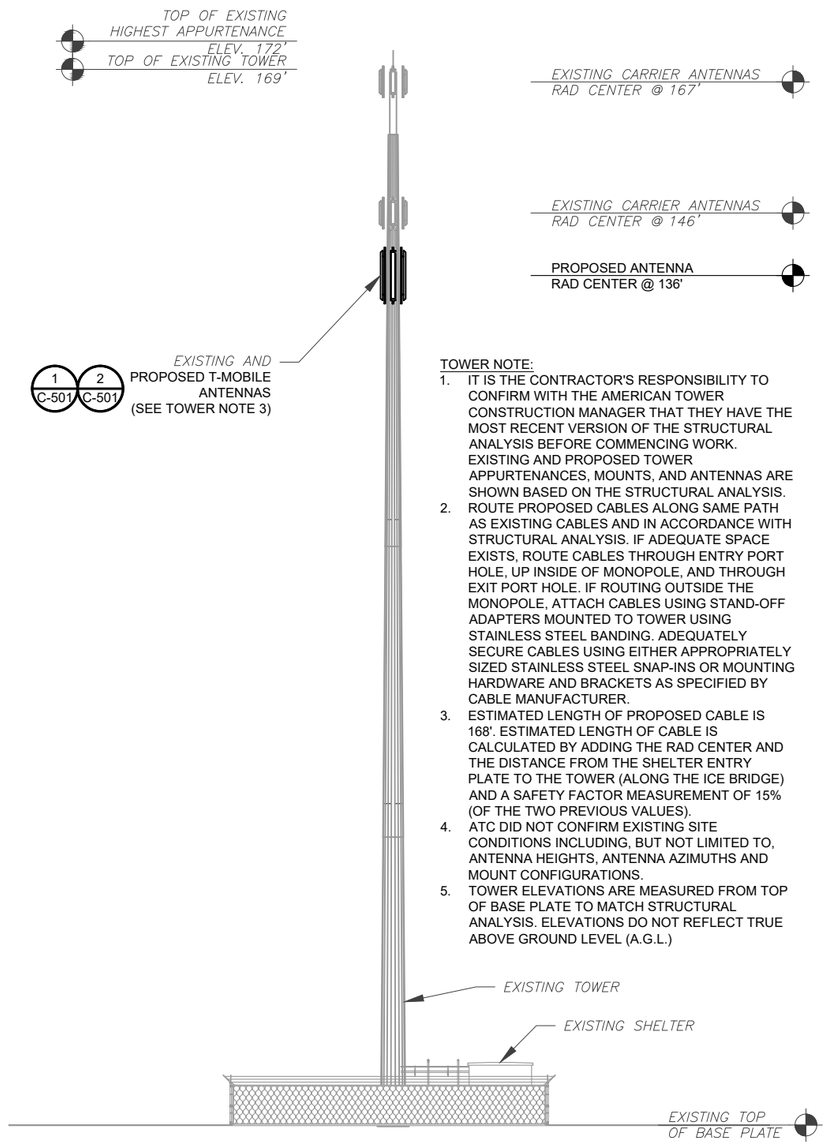
PER MOUNT ANALYSIS COMPLETED BY CLS ENGINEERING, DATED 07-03-19, THE EXISTING MOUNT CAN ADEQUATELY SUPPORT THE PROPOSED LOADING




1 DETAILED SITE PLAN

0 10' 20'

SCALE: 1"=10' (11X17)
1"=5' (22X34)




TOWER NOTE:

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM WITH THE AMERICAN TOWER CONSTRUCTION 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.
2. 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.
3. ESTIMATED LENGTH OF PROPOSED CABLE IS 168'. ESTIMATED LENGTH OF CABLE IS CALCULATED BY ADDING THE RAD CENTER AND THE DISTANCE FROM THE SHELTER ENTRY PLATE TO THE TOWER (ALONG THE ICE BRIDGE) AND A SAFETY FACTOR MEASUREMENT OF 15% (OF THE TWO PREVIOUS VALUES).
4. ATC DID NOT CONFIRM EXISTING SITE CONDITIONS INCLUDING, BUT NOT LIMITED TO, ANTENNA HEIGHTS, ANTENNA AZIMUTHS AND MOUNT CONFIGURATIONS.
5. TOWER ELEVATIONS ARE MEASURED FROM TOP OF BASE PLATE TO MATCH STRUCTURAL ANALYSIS. ELEVATIONS DO NOT REFLECT TRUE ABOVE GROUND LEVEL (A.G.L.)

2 TOWER ELEVATION
SCALE: NOT TO SCALE

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| 0 | FOR CONSTRUCTION | EF | 06/04/19 |
| 1 | MA UPDATE | LR | 07/18/19 |
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| | | | |

ATC SITE NUMBER:
413782

ATC SITE NAME:
WASHINGTON NORTH CT

SITE ADDRESS:
6 MOUNTAIN ROAD
NEW PRESTON, CT 06777

SEAL:


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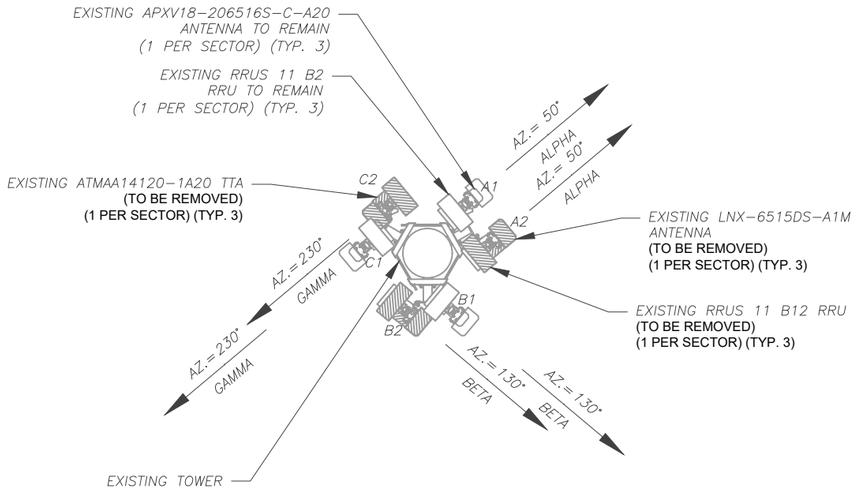
| APPROVED BY: | PB |
| DATE DRAWN: | 06/04/19 |
| ATC JOB NO: | 12951831 |

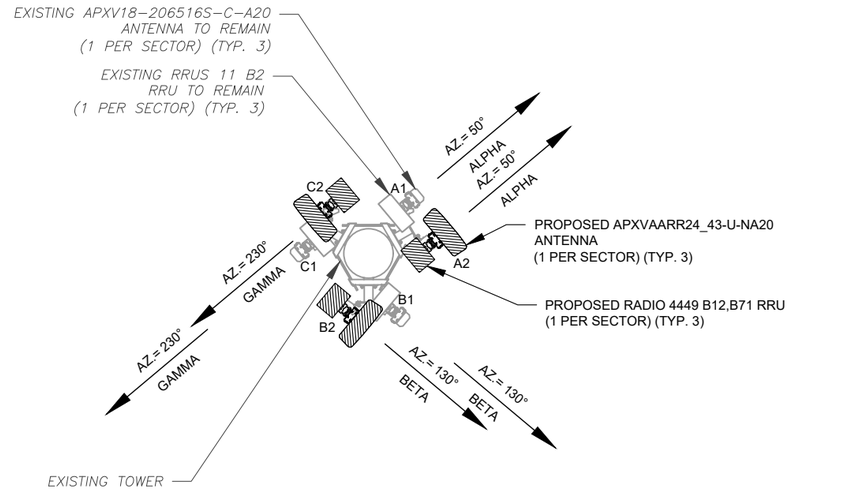
DETAILED SITE PLAN & TOWER ELEVATION

| SHEET NUMBER: | REVISION: |
|---|---|
| C-101 | 1 |




1 EXISTING ANTENNA PLAN

PER MOUNT ANALYSIS COMPLETED BY CLS ENGINEERING, DATED 07-03-19, THE EXISTING MOUNT CAN ADEQUATELY SUPPORT THE PROPOSED LOADING




2 FINAL ANTENNA PLAN

EXISTING ANTENNA / EQUIPMENT SCHEDULE

| SECTOR | ANT. | MANUFACTURER (MODEL #) | RAD CENTER | AZIMUTH (TN) | MECH. D-TILT | ELEC. D-TILT | ADDITIONAL TOWER MOUNTED EQUIPMENT |
|---|---|---|---|---|---|---|---|
| *ALPHA* | *A1* | *APXV18-206516S-C-A20* | *136'-0"* | *50°* | *0°* | *2°* | *RRUS 11 B2* |
| *ALPHA* | *A2* | *LNX-6515DS-A1M* | *136'-0"* | *50°* | *0°* | *2°* | *RRUS 11 B12 ATMAA14120-1A20* |
| *BETA* | *B1* | *APXV18-206516S-C-A20* | *136'-0"* | *50°* | *0°* | *2°* | *RRUS 11 B2* |
| *BETA* | *B2* | *LNX-6515DS-A1M* | *136'-0"* | *50°* | *0°* | *2°* | *RRUS 11 B12 ATMAA14120-1A20* |
| *GAMMA* | *C1* | *APXV18-206516S-C-A20* | *136'-0"* | *50°* | *0°* | *2°* | *RRUS 11 B2* |
| *GAMMA* | *C2* | *LNX-6515DS-A1M* | *136'-0"* | *50°* | *0°* | *2°* | *RRUS 11 B12 ATMAA14120-1A20* |

NOTES

1. BASED ON APPROVED ATC APPLICATION 12927146, DATED 04/01/2019. CONFIRM WITH T-MOBILE REP FOR APPLICABLE UPDATES/REVISIONS AND MOST RECENT RFDS FOR NSN CONFIGURATION (CONFIG). GC TO CAP ALL UNUSED PORTS.
2. ATC HAS NOT YET VERIFIED ANY EXISTING ANTENNA CONFIG OR MOUNT CONFIG. CONTRACTOR TO VERIFY MOUNT CONFIG HAS SUFFICIENT SPACE FOR PROPOSED LESSEE EQUIPMENT (EQUIP) (I.E. CLEARANCES, MOUNT PIPE, SUFFICIENT LENGTH, ETC.) ATC DID NOT ANALYZE ANTENNA MOUNT TO DETERMINE ADEQUATE STRUCTURAL CAPACITY FOR ANY LESSEE LOADING.
3. ALL PROPOSED EQUIP INCLUDING ANTENNAS, COAX, ETC. SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS ON FILE WITH ATC'S CM.
4. CONFIRM SPACING OF PROPOSED EQUIP DOES NOT CAUSE TOWER CONFLICTS NOR IMPEDE TOWER CLIMBING PEGS.
5. POSITIONS START WITH FIRST PIPE ON THE LEFT SIDE (AS VIEWED FROM BEHIND THE MOUNT).

FINAL ANTENNA / EQUIPMENT SCHEDULE

| SECTOR | ANT. | MANUFACTURER (MODEL #) | RAD CENTER | AZIMUTH (TN) | MECH. D-TILT | ELEC. D-TILT | ADDITIONAL TOWER MOUNTED EQUIPMENT |
|---|---|---|---|---|---|---|---|
| *ALPHA* | *A1* | *APXV18-206516S-C-A20* | *136'-0"* | *50°* | *0°* | *2°* | *RRUS 11 B2* |
| ALPHA | A2 | APXVAARR24_43-U-NA20 | 136'-0" | 50° | 0° | 2° | RADIO 4449 B12,B71 |
| *BETA* | *B1* | *APXV18-206516S-C-A20* | *136'-0"* | *130°* | *0°* | *2°* | *RRUS 11 B2* |
| BETA | B2 | APXVAARR24_43-U-NA20 | 136'-0" | 130° | 0° | 2° | RADIO 4449 B12,B71 |
| *GAMMA* | *C1* | *APXV18-206516S-C-A20* | *136'-0"* | *230°* | *0°* | *2°* | *RRUS 11 B2* |
| GAMMA | C2 | APXVAARR24_43-U-NA20 | 136'-0" | 230° | 0° | 2° | RADIO 4449 B12,B71 |

| CURRENT FIBER DISTRIBUTION/OVP BOX | | CURRENT CABLING SUMMARY | | |
|---|---|---|---|---|
| MODEL NUMBER | STATUS | COAX | HYBRID | STATUS |
| – | – | – | *(1) 1-5/8"* | *RMN* |
| – | – | – | – | – |

STATUS ABBREVIATIONS
RMV: TO BE REMOVED
*RMN:* TO REMAIN
REL: TO BE RELOCATED
DSC: TO BE DISCONNECTED & REMAIN
ADD: TO BE ADDED

3 ANTENNA SCHEDULE

CABLE LENGTHS FOR JUMPERS
FIBER DISTRIBUTION/OVP TO RRU: 15'
RRU TO COMBINER: 10'
COMBINER TO ANTENNA: 10'

| PROPOSED FIBER DISTRIBUTION/OVP BOX | | PROPOSED CABLING SUMMARY | | |
|---|---|---|---|---|
| MODEL NUMBER | STATUS | COAX | HYBRID | STATUS |
| - | - | - | *(1) 1-5/8"* | *RMN* |
| - | - | - | (2) 1-5/8" | ADD |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CARY, NC 27518
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COA: PEC.0001553




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| 0 | FOR CONSTRUCTION | EF | 06/04/19 |
| 1 | MA UPDATE | LR | 07/18/19 |
| | | | |
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| | | | |

ATC SITE NUMBER:
413782

ATC SITE NAME:
WASHINGTON NORTH CT

SITE ADDRESS:
6 MOUNTAIN ROAD
NEW PRESTON, CT 06777

SEAL:


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Jul 19 2019 9:38 AM

T-Mobile

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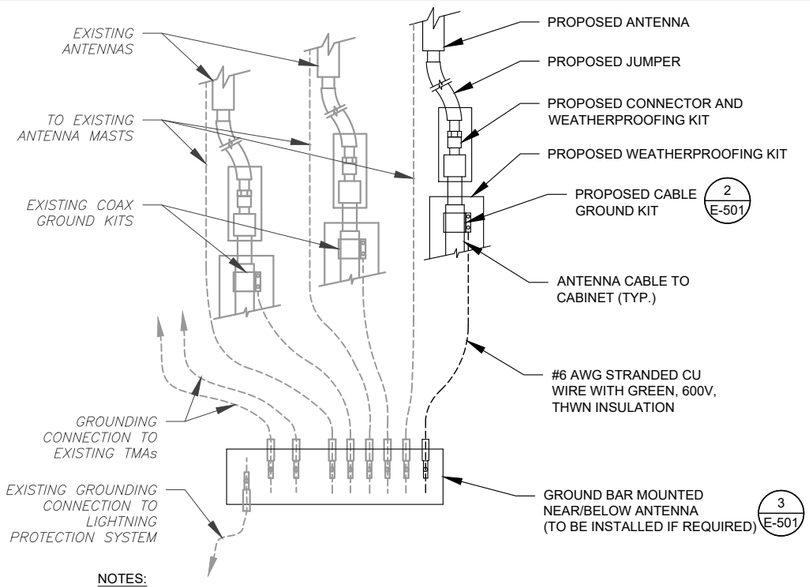
| DRAWN BY: | EF |
| APPROVED BY: | PB |
| DATE DRAWN: | 06/04/19 |
| ATC JOB NO: | 12951831 |

ANTENNA INFORMATION & SCHEDULE

| SHEET NUMBER: | REVISION: |
|---|---|
| C-501 | 1 |

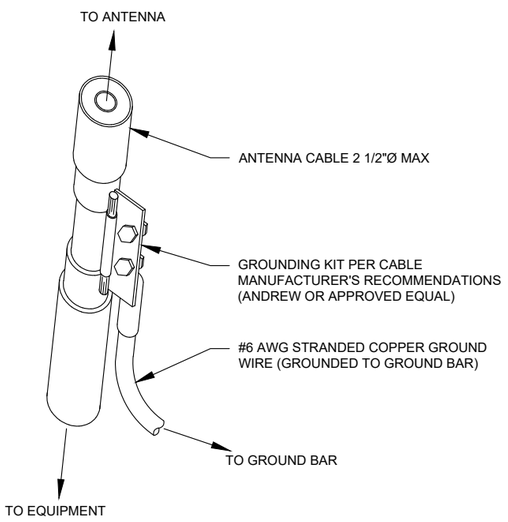



NOTES:

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: NOT TO SCALE

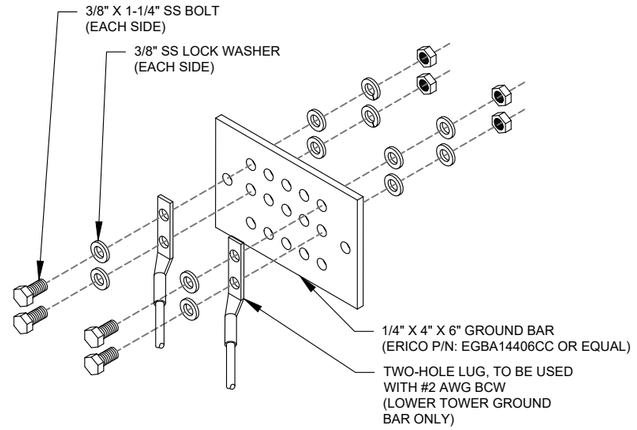



GROUND KIT NOTES:

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: NOT TO SCALE




GROUND BAR NOTES:

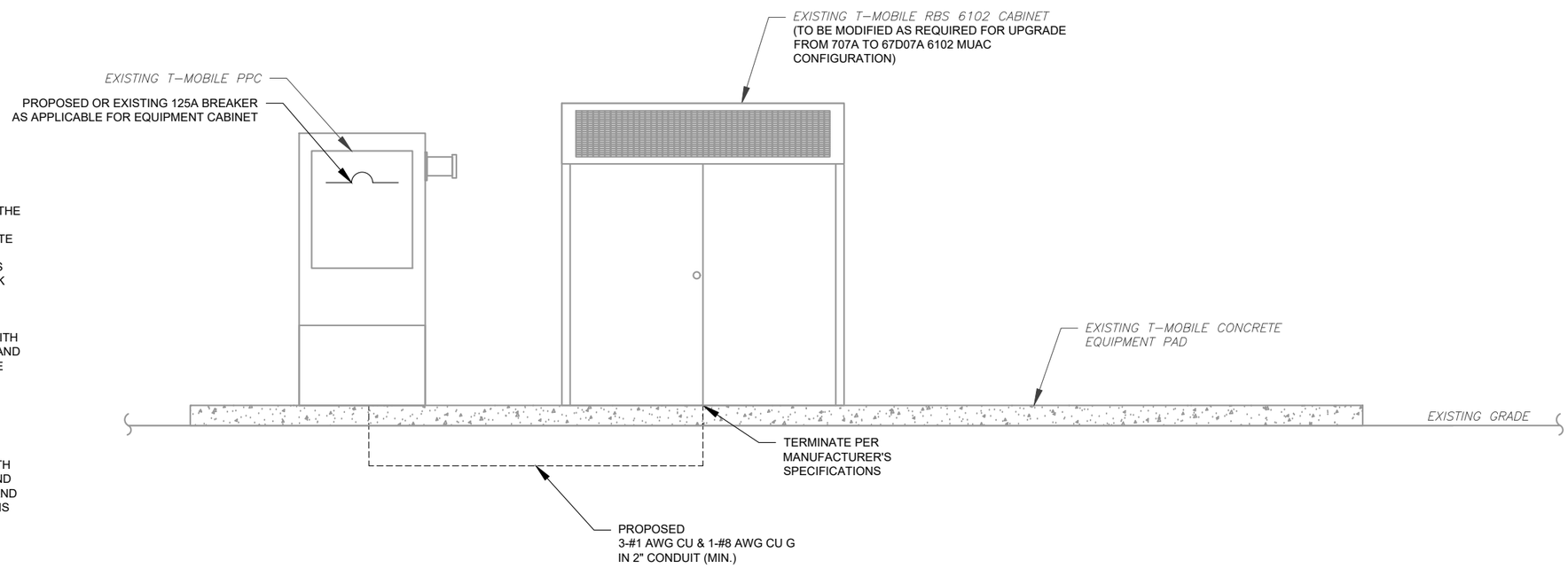
1. GROUND BAR KITS COME WITH ALL HARDWARE, NUTS, BOLTS, WASHERS, ETC. EXCEPT THE STRUCTURAL MOUNTING MEMBER(S).
2. GROUND BAR TO BE BONDED DIRECTLY TO TOWER.

## 3 TOWER GROUND BAR DETAIL

SCALE: NOT TO SCALE

ELECTRICAL NOTES:

1. THIS DIAGRAM 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.
2. 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.
3. ATC HAS NOT YET 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.




## 4 ELECTRICAL UPGRADE DIAGRAM

SCALE: NOT TO SCALE

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| 0 | FOR CONSTRUCTION | EF | 06/04/19 |
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| | | | |
| | | | |

ATC SITE NUMBER:
413782

ATC SITE NAME:
WASHINGTON NORTH CT

SITE ADDRESS:
6 MOUNTAIN ROAD
NEW PRESTON, CT 06777

SEAL:


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| DRAWN BY: | EF |
| APPROVED BY: | PB |
| DATE DRAWN: | 06/04/19 |
| ATC JOB NO: | 12951831 |

GROUNDING DETAILS

SHEET NUMBER: E-501

REVISION: 0

| Existing RAN Equipment | | |
|---|---|---|
| Template: 707A Tower | | |
| Enclosure | 1 | 2 |
| Enclosure Type | Ancillary Equipment | RBS 6102 MU AC |
| Baseband | | DUW30 (U1900) DUS41 (L1900, L700) |
| Hybrid Cable System | Ericsson 6x12 HCS *Select Length & AWG* (x2) | |

| Proposed RAN Equipment | | |
|---|---|---|
| Template: 67D07A 6102 MUAC | | |
| Enclosure | 1 | 2 |
| Enclosure Type | Ancillary Equipment | RBS 6102 MU AC |
| Baseband | | DUW30 (U1900) BB 6630 (L1900, L700, L600) BB 6630 (N600 (DARK)) |
| Hybrid Cable System | Ericsson 6x12 HCS *Select Length & AWG* (x3) | |

**RAN Scope of Work:**

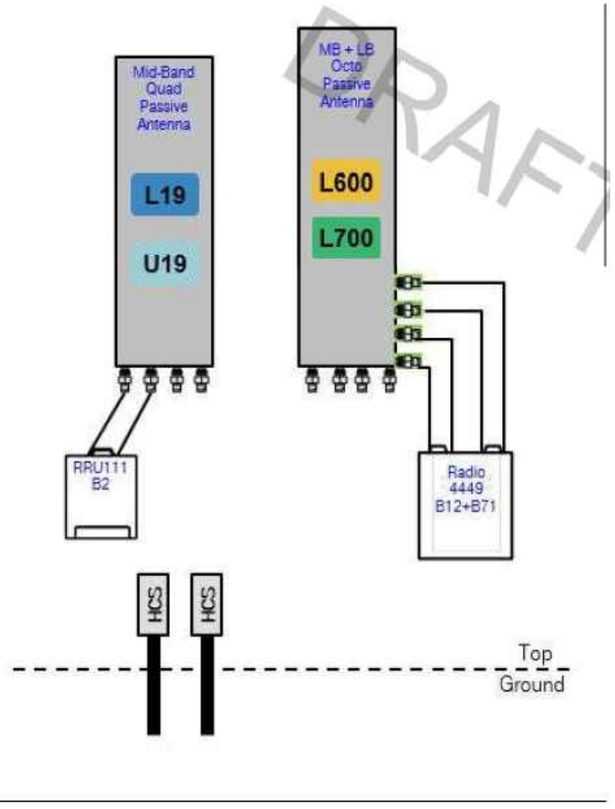
Replace (1) DU with (1) BB6630 for LTE.
Install (1) BB6630 for future 5G N600.

Add (1) 6X12 HCS.
Existing: (2) 6X12 HCS.

Rad Center: 136 Feet.

1 CABINET CONFIGURATION
SCALE: NOT TO SCALE

67D07A_1QP+1OP.JPG




2 ANTENNA CONFIGURATION
SCALE: NOT TO SCALE

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

SUPPLEMENTAL

| SHEET NUMBER: | REVISION: |
|---|---|
| R-601 | 0 |

# Mount Analysis of Existing T-Arms for American Tower on behalf of T-Mobile
## 413782 - Washington North CT
## Project #: 12927146
**T-Mobile Site ID: CTNH371A**
**Program: L600**

**CLS Engineering PLLC Project #41124-12927146-01-MA-R2**
**July 3, 2019**

| | |
|---|---|
| MOUNT DESCRIPTION | Existing T-Arms at 136 ft AGL |
| ANTENNA ELEVATION | Nominal Rad. Elevation of 136 ft AGL |
| SITE DESCRIPTION | 168.6 ft Monopole |
| SITE ADDRESS | 6 Mountain Road, New Preston, CT 06777-1518, Litchfield County |
| GPS COORDINATES | 41.669147, -73.365281 |
| ANALYSIS STANDARD | 2015 IBC / 2018 Connecticut State Building Code / TIA-222-G |
| LOADING CRITERIA | 120 mph, $V_{ult}$ / 93 mph, $V_{asd}$ (3-Second Gust) w/o ice & 40 mph (3-Second Gust) w/ 0.75" Ice |

■ **ANALYSIS RESULT:** **Pass**

| | | |
|---|---|---|
| MEMBER USAGE | 30% | Pass |

Prepared by:
**Jennifer Soza**

Reviewed and Approved by:
**Tyler M. Barker, P.E.**

STATE OF CONNECTICUT · TYLER M BARKER · No. 32402 · LICENSED PROFESSIONAL ENGINEER

Tyler M. Barker
CLS Engineering, PLLC
Director of Engineering
PE # 32402 Exp. 1/31/2020
COA # PEC.0001833 Exp. 8/14/2019

IdenTrust part of HID Global
Digitally signed by Tyler Barker
DN: c=US, o=Telamon Corporation, ou=A01427E0000016A4525ADF800001D17, cn=Tyler Barker
Date: 2019.07.03 21:59:19 -04'00'





## ■ INTRODUCTION
The proposed equipment is to be mounted to the existing T-Arms. This proposed mounting configuration was analyzed using RISA-3D, a commercially available finite element analysis software package. A selection of input and output from our analysis is attached to the end of this report.

## ■ STRUCTURAL DOCUMENTS PROVIDED

| | |
|---|---|
| STRUCTURAL DATA | Site photos, dated October 31, 2018 |
| PREVIOUS ANALYSES | Structural Analysis by ATC, Engineering #OAA701488_C3_01, dated April 20, 2017 |
| LOADING DATA | ATC Application, Project #12927146, dated April 29, 2019 |

## ■ ANALYSIS CRITERIA

| | |
|---|---|
| STANDARD | 2015 IBC / 2018 Connecticut State Building Code / TIA-222-G |
| BASIC WIND SPEED | 120 mph, $V_{ult}$ / 93 mph, $V_{asd}$ (3-Second Gust) |
| BASIC WIND SPEED W/ ICE | 40 mph (3-Second Gust) w/ 0.75" Radial Ice (Escalating) |
| EXPOSURE CATEGORY | C |
| MAX. TOPOGRAPHIC FACTOR, $K_{zt}$ | 1.00 |
| RISK CATEGORY | II |
| MAINTENANCE LIVE LOAD | $L_M$: 500 lb |

## ■ FINAL EQUIPMENT

| ELEVATION (ft) | | ANTENNAS | |
|---|---|---|---|
| MOUNT | RAD. | # | NAME |
| 136.0 | 136.0 | 3 | Ericsson RRUS 11 B2 |
| | | 3 | Ericsson RADIO 4449 B12/B71 |
| | | 3 | RFS Celwave APXVAARR24_43-U-NA20 |
| | | 3 | RFS Celwave APXV18-206516S-C-A20 |

## ■ RESULTS SUMMARY

| COMPONENT | PEAK USAGE | RESULT |
|---|---|---|
| Connection Plates | 30% | Pass |
| Mount Pipes | 27% | Pass |
| Stand-Off Horizontals | 8% | Pass |

## ■ CONCLUSION AND RECOMMENDATIONS
According to our structural analysis, the mounts have been found to **PASS**. The mounting configuration considered in this analysis is capable of supporting the referenced loading pursuant to applicable standards.

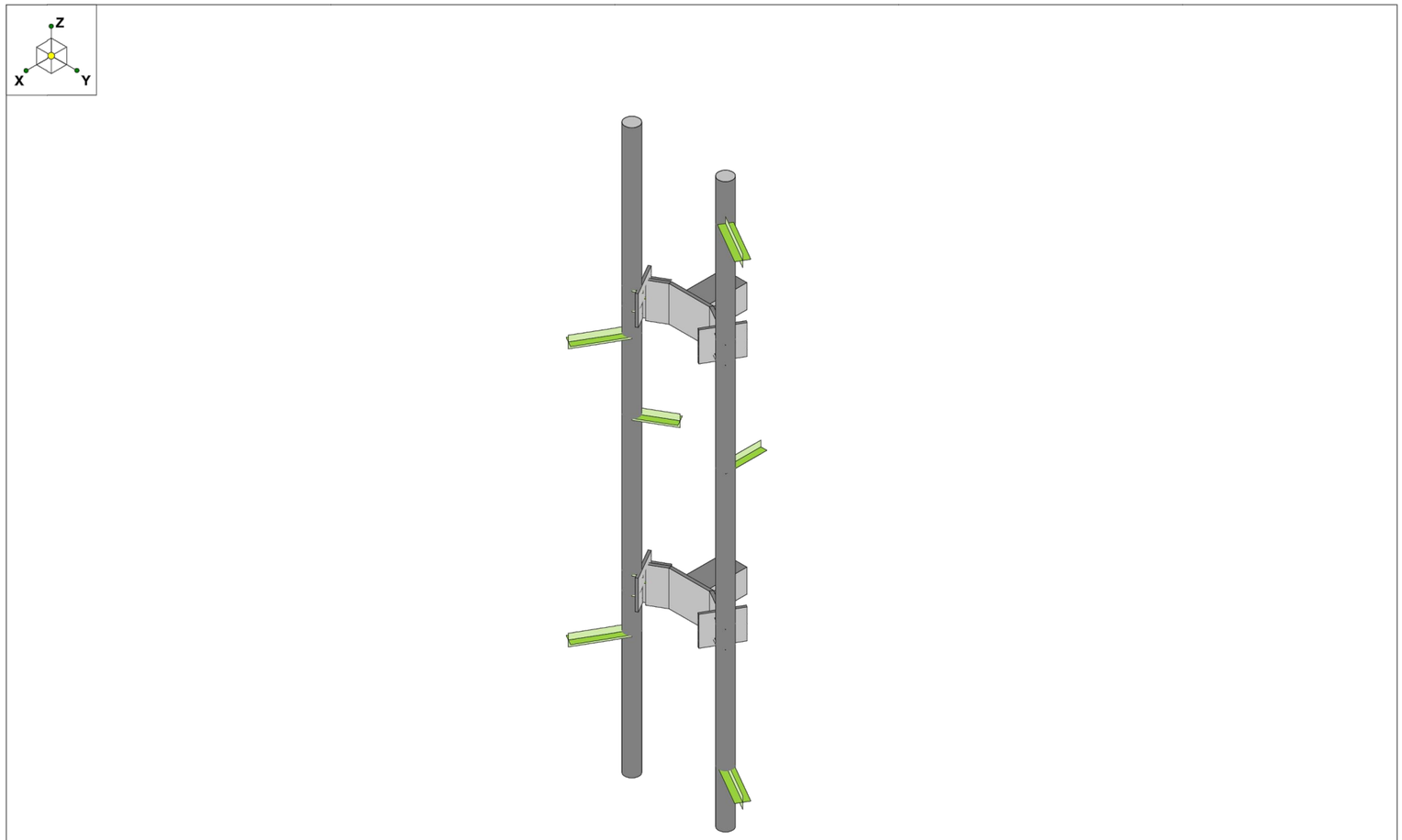


1 MOUNT ANALYSIS
SCALE: NOT TO SCALE

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 VERYIFY THEY HAVE THE MOST RECENT MOUNT ANALYSIS PRIOR TO CONTRUCTION.

SUPPLEMENTAL

SHEET NUMBER: R-602
REVISION: 0




Envelope Only Solution

| | | |
|---|---|---|
| CLS | 41124-12927146-Washington North CT | SK - 1 |
| BP | | July 3, 2019 at 10:30 AM |
| 41124-12927146-01-MA-R2 | Rendered | 41124-12927146-01-MA-R2.r3d |

1 MOUNT ANALYSIS
SCALE: NOT TO SCALE

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 VERYIFY THEY HAVE THE MOST RECENT MOUNT ANALYSIS PRIOR TO CONTRUCTION.

SUPPLEMENTAL

| SHEET NUMBER: | REVISION: |
|---|---|
| R-603 | 0 |

# Exhibit D

## Structural Analysis Report

AMERICAN TOWER®
CORPORATION

# Structural Analysis Report

| | | |
|---|---|---|
| **Structure** | : | **168.6 ft Monopole** |
| **ATC Site Name** | : | **Washington North CT, CT** |
| **ATC Site Number** | : | **413782** |
| **Engineering Number** | : | **12927146_C3_02** |
| **Proposed Carrier** | : | **T-MOBILE** |
| **Carrier Site Name** | : | **Mountain RD - Verizon Colo** |
| **Carrier Site Number** | : | **CTNH371A** |
| **Site Location** | : | **6 Mountain Road**<br>**New Preston, CT 06777-1518**<br>**41.669100,-73.365300** |
| **County** | : | **Litchfield** |
| **Date** | : | **May 23, 2019** |
| **Max Usage** | : | **92%** |
| **Result** | : | **Pass** |

Prepared By:
Jennifer Yu
Structural Engineer I

Jennifer Yu

Reviewed By:


Authorized by "EOR"
Jul 10 2019 9:22 AM cosign

**COA: PEC.0001553**

AMERICAN TOWER®
CORPORATION

## Table of Contents

## Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 168.6 ft monopole to reflect the change in loading by T-MOBILE.

## Supporting Documents

| | |
|---|---|
| **Tower Drawings** | EEI Job #15143, dated October 24, 2007 |
| **Foundation Drawing** | EEI Job #15143, dated October 24, 2007 |
| **Geotechnical Report** | JGI Project #J2075402, dated October 10, 2007 |
| **Modifications** | Centek Project #13046, Rev 3, dated August 19, 2013 |

## 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.

| | |
|---|---|
| **Basic Wind Speed:** | 93 mph (3-Second Gust, Vasd) / 120 mph (3-Second Gust, Vult) |
| **Basic Wind Speed w/ Ice:** | 40 mph (3-Second Gust) w/ 3/4" radial ice concurrent |
| **Code:** | ANSI/TIA-222-G / 2015 IBC / 2018 Connecticut State Building Code |
| **Structure Class:** | II |
| **Exposure Category:** | B |
| **Topographic Category:** | 1 |
| **Crest Height:** | 0 ft |
| **Spectral Response:** | Ss = 0.19, $S_1$ = 0.06 |
| **Site Class:** | D - Stiff Soil |

## 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 contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

**Existing and Reserved Equipment**

| Elev.[1] (ft) | Qty | Antenna | Mount Type | Lines | Carrier |
|---|---|---|---|---|---|
| 167.0 | 12 | Generic RCU (Remote Control Unit) | Flush | (1) 0.39" (10mm) Fiber Trunk<br>(2) 0.78" (19.7mm) 8 AWG 6<br>(12) 1 5/8" Coax | AT&T MOBILITY |
| | 6 | Powerwave Allgon TT08-19DB111-001 | | | |
| | 1 | Raycap DC6-48-60-18-8F ("Squid") | | | |
| | 6 | Ericsson RRUS 11 B2 | | | |
| | 1 | KMW AM-X-CD-17-65-00T-RET | | | |
| | 3 | Powerwave Allgon P90-14-XLH-RR (7.3" Depth) | | | |
| | 2 | Kathrein Scala 800-10864K | | | |
| 157.0 | 3 | Andrew DBXNH-6565A-VTM | Stand-Off | (12) 1 5/8" Coax | VERIZON WIRELESS |
| 146.0 | 3 | Antel BXA-70063/6CF __ 2° | Stand-Off | (6) 1 5/8" Coax | |
| | 1 | VZW Unused Reserve: 10800 sq in | | | |
| 136.0 | 3 | Ericsson RRUS 11 B2 | T-Arm | - | T-MOBILE |
| | 3 | RFS APXV18-206516S-C-A20 | | | |

**Equipment to be Removed**

| Elev.[1] (ft) | Qty | Antenna | Mount Type | Lines | Carrier |
|---|---|---|---|---|---|
| 136.0 | 1 | Generic E-911 GPS | - | (2) 1 5/8" Hybriflex | T-MOBILE |
| | 3 | Commscope LNX-6515DS-A1M (96.6" Height) | | | |
| | 3 | Ericsson RRUS 11 B12 | | | |
| | 3 | RFS ATMAA1412D-1A20 | | | |

**Proposed Equipment**

| Elev.[1] (ft) | Qty | Antenna | Mount Type | Lines | Carrier |
|---|---|---|---|---|---|
| 136.0 | 3 | Ericsson Radio 4449 B12,B71 | T-Arm | (3) 1 5/8" (1.63"-41.3mm) Fiber | T-MOBILE |
| | 3 | RFS APXVAARR24_43-U-NA20 | | | |

[1] Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.

Install proposed lines inside the pole shaft.

## Structure Usages

| Structural Component | Controlling Usage | Pass/Fail |
|---|---|---|
| Anchor Bolts | 46% | Pass |
| Shaft | 92% | Pass |
| Base Plate | 30% | Pass |

## Foundations

| Reaction Component | Original Design Reactions | Analysis Reactions | % of Design |
|---|---|---|---|
| Moment (Kips-Ft) | 2,398.5 | 2,117.9 | 88% |
| Shear (Kips) | 23.6 | 17.8 | 75% |

The structure base reactions resulting from this analysis are acceptable when compared to those shown on the original structure drawings, therefore no modification or reinforcement of the foundation will be required.

## Deflection and Sway*

| Antenna Elevation (ft) | Antenna | Carrier | Deflection (ft) | Sway (Rotation) (°) |
|---|---|---|---|---|
| 136.0 | Ericsson Radio 4449 B12,B71 | T-MOBILE | 2.340 | 2.156 |
| | RFS APXVAARR24_43-U-NA20 | | | |

***Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-G**

## 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:

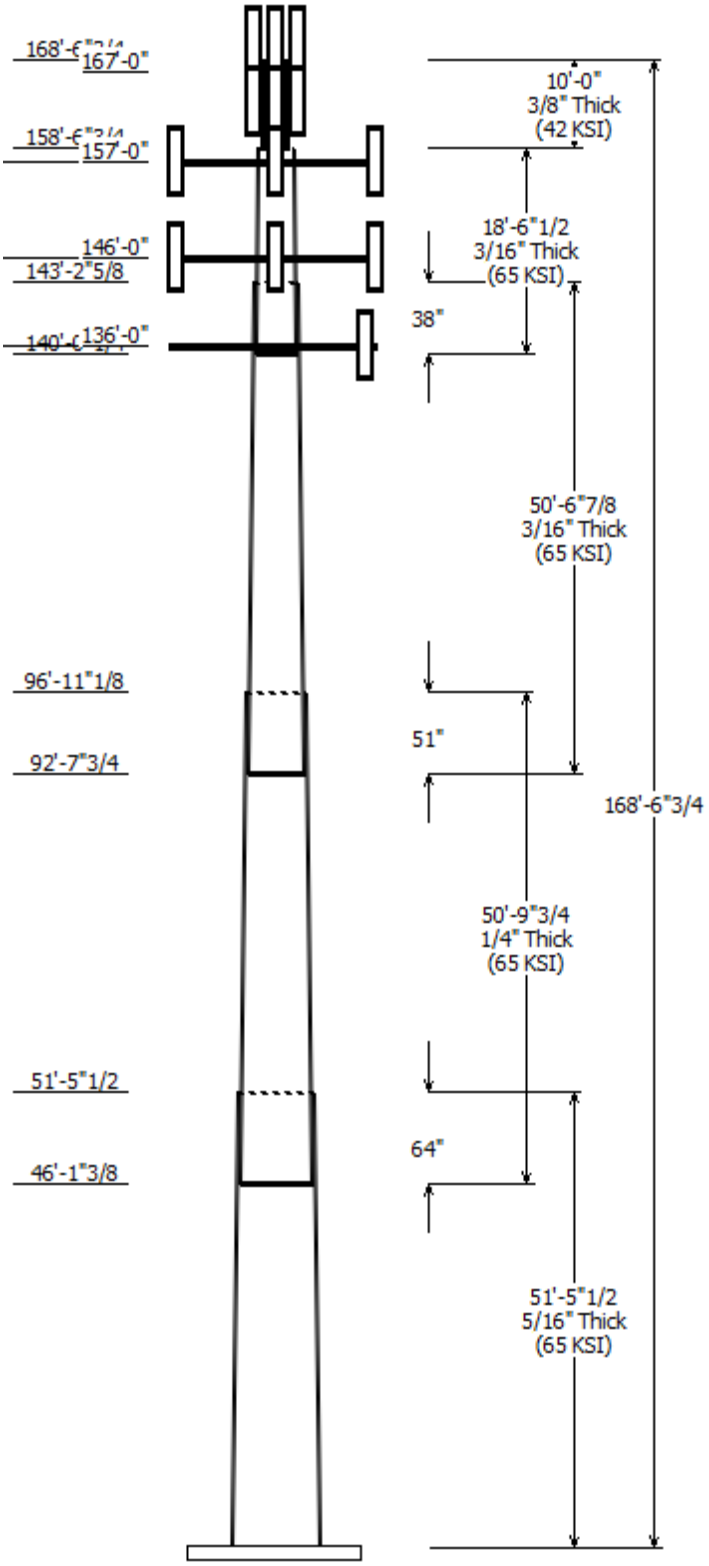
- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

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.

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 Service, PLLC, 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 Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.




## Job Information

| | | | |
|---|---|---|---|
| Pole : | 413782 | Code: | ANSI/TIA-222-G |
| Location : | Washington North CT, CT | | |
| Description : | 159 ft EEI Monopole | | |
| Client : | T-MOBILE | Struct Class : | II |
| Shape : | 18 Sides | Exposure : | B |
| Height : | 168.56 (ft) | Topo : | 1 |
| Base Elev (ft): | 0.00 | | |
| Taper: | 0.190776 (in/ft) | | |

## Sections Properties

| Shaft Section | Length (ft) | Diameter (in) Accross Flats Top | Bottom | Thick (in) | Joint Type | Overlap Length (in) | Shape | Steel Grade (ksi) |
|---|---|---|---|---|---|---|---|---|
| 1 | 51.458 | 37.18 | 47.00 | 0.313 | | 0.000 | 18 Sides | 65 |
| 2 | 50.810 | 29.00 | 38.70 | 0.250 | Slip Joint | 64.094 | 18 Sides | 65 |
| 3 | 50.573 | 20.55 | 30.20 | 0.188 | Slip Joint | 51.375 | 18 Sides | 65 |
| 4 | 18.542 | 18.00 | 21.53 | 0.188 | Slip Joint | 38.375 | 18 Sides | 65 |
| 5 | 10.000 | 12.75 | 12.75 | 0.375 | Butt Joint | 0.000 | Round | 42 |

## Discrete Appurtenance

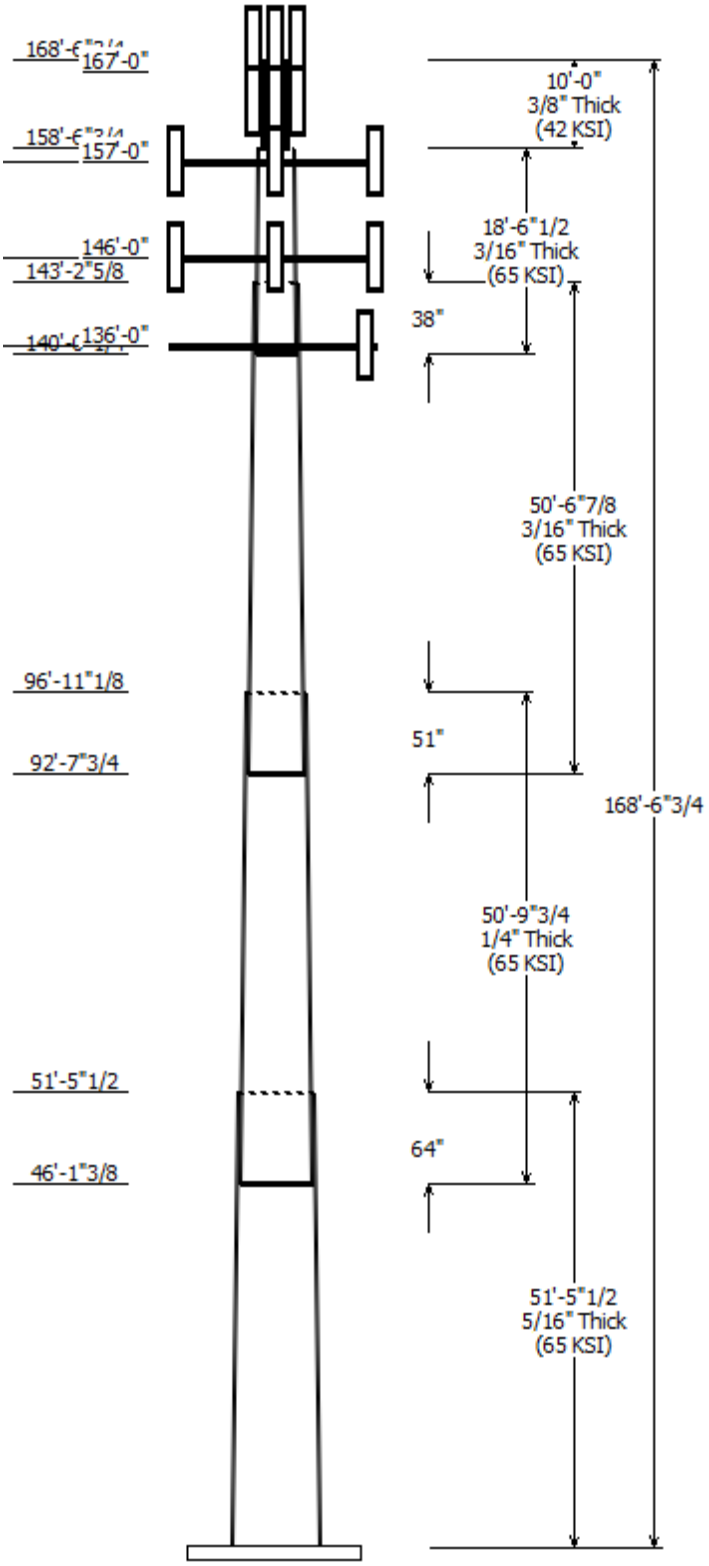
| Attach Elev (ft) | Force Elev (ft) | Qty | Description |
|---|---|---|---|
| 167.000 | 164.000 | 2 | Kathrein Scala 800-10864K |
| 167.000 | 168.000 | 3 | Powerwave Allgon P90-14- |
| 167.000 | 164.000 | 1 | KMW AM-X-CD-17-65-00T-RET |
| 167.000 | 164.000 | 6 | Ericsson RRUS 11 B2 |
| 167.000 | 164.000 | 1 | Raycap DC6-48-60-18-8F |
| 167.000 | 164.000 | 6 | Powerwave Allgon TT08- |
| 167.000 | 164.000 | 12 | Generic RCU (Remote Control |
| 157.000 | 157.000 | 3 | Stand-Off |
| 157.000 | 157.000 | 3 | Andrew DBXNH-6565A-VTM |
| 146.000 | 146.000 | 3 | Stand-Off |
| 146.000 | 146.000 | 1 | VZW Unused Reserve: 10800 |
| 146.000 | 146.000 | 3 | Antel BXA-70063/6CF __ 2° |
| 136.000 | 136.000 | 3 | Flat T-Arm |
| 136.000 | 136.000 | 3 | RFS APXVAARR24_43-U-NA20 |
| 136.000 | 136.000 | 3 | RFS APXV18-206516S-C-A20 |
| 136.000 | 136.000 | 3 | Ericsson RRUS 11 B12 |
| 136.000 | 136.000 | 3 | Ericsson Radio 4449 B12,B71 |

## Linear Appurtenance

| Elev (ft) From | To | Description | Exposed To Wind |
|---|---|---|---|
| 0.000 | 136.0 | 1 5/8" (1.63"- | No |
| 0.000 | 146.0 | 1 5/8" Coax | No |
| 0.000 | 157.0 | 1 5/8" Coax | No |
| 0.000 | 167.0 | 0.39" (10mm) | Yes |
| 0.000 | 167.0 | 0.78" (19.7mm) 8 | Yes |
| 0.000 | 167.0 | 1 5/8" Coax | Yes |
| 0.000 | 167.0 | 1 5/8" Coax | Yes |

## Load Cases

| | |
|---|---|
| 1.2D + 1.6W | 93 mph with No Ice |
| 0.9D + 1.6W | 93 mph with No Ice (Reduced DL) |
| 1.2D + 1.0Di + 1.0Wi | 40 mph with 0.75 in Radial Ice |
| (1.2 + 0.2Sds) * DL + E | Seismic Equivalent Lateral Forces Method |
| (1.2 + 0.2Sds) * DL + E | Seismic Equivalent Modal Analysis Method |
| (0.9 - 0.2Sds) * DL + E | Seismic (Reduced DL) Equivalent Lateral |
| (0.9 - 0.2Sds) * DL + E | Seismic (Reduced DL) Equivalent Modal |
| 1.0D + 1.0W | Serviceability 60 mph |

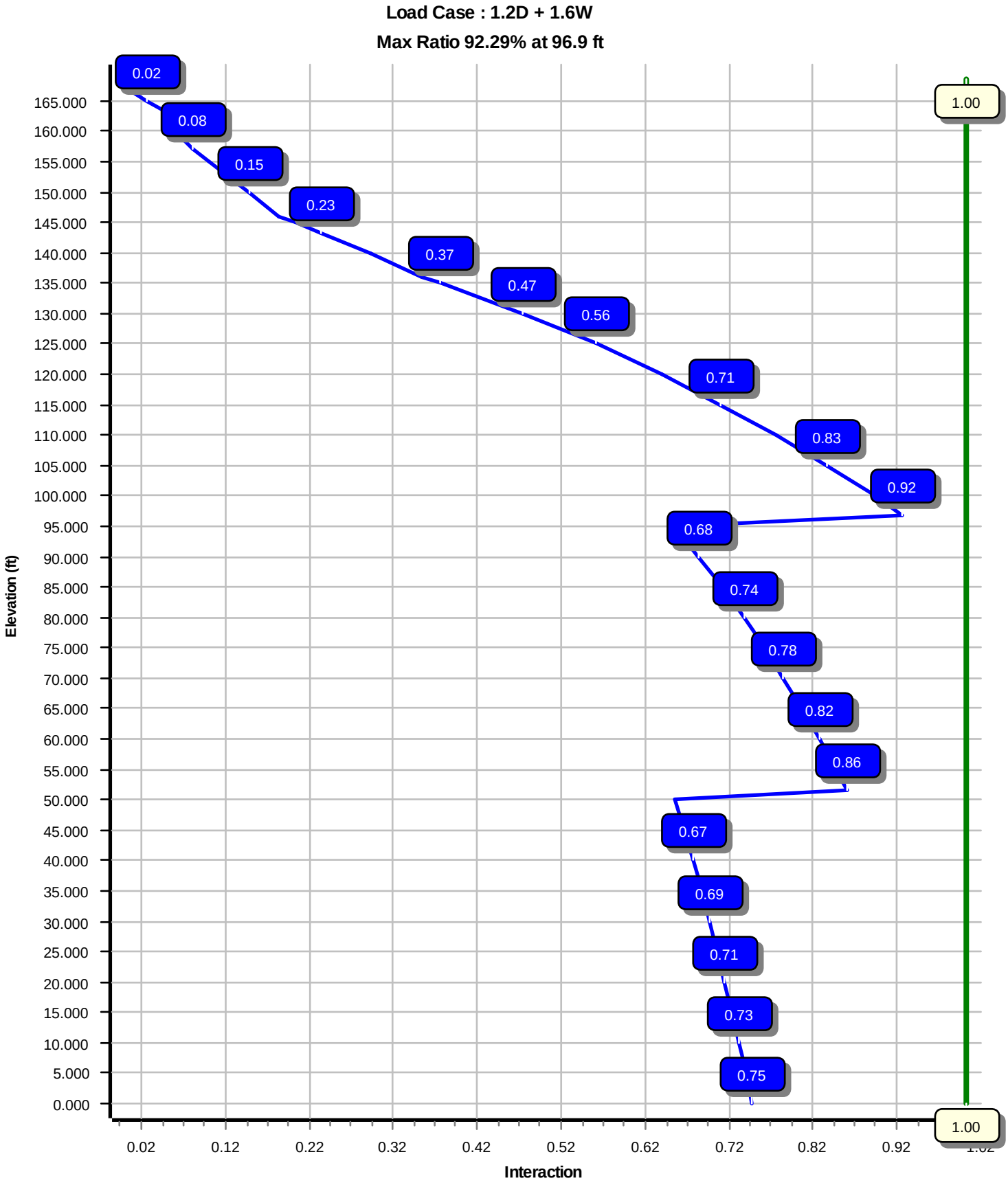



## Reactions

| Load Case | Moment (kip-ft) | Shear (kip) | Axial (kip) |
|---|---|---|---|
| 1.2D + 1.6W | 2117.91 | 17.78 | 29.39 |
| 0.9D + 1.6W | 2034.71 | 17.43 | 22.04 |
| 1.2D + 1.0Di + 1.0Wi | 1047.65 | 10.17 | 52.27 |
| (1.2 + 0.2Sds) * DL + E ELFM | 130.22 | 0.96 | 29.27 |
| (1.2 + 0.2Sds) * DL + E EMAM | 132.86 | 1.17 | 29.27 |
| (0.9 - 0.2Sds) * DL + E ELFM | 127.53 | 0.96 | 20.28 |
| (0.9 - 0.2Sds) * DL + E EMAM | 129.97 | 1.17 | 20.28 |
| 1.0D + 1.0W | 533.85 | 4.53 | 24.52 |

## Dish Deflections

| Load Case | Attach Elev (ft) | Deflection (in) | Rotation (deg) |
|---|---|---|---|
| | 0.00 | 0.000 | 0.000 |


Load Case : 1.2D + 1.6W
Max Ratio 92.29% at 96.9 ft
0.02
0.08
0.15
0.23
0.37
0.47
0.56
0.71
0.83
0.92
0.68
0.74
0.78
0.82
0.86
0.67
0.69
0.71
0.73
0.75
1.00
1.00
165.000
160.000
155.000
150.000
145.000
140.000
135.000
130.000
125.000
120.000
115.000
110.000
105.000
100.000
95.000
90.000
85.000
80.000
75.000
70.000
65.000
60.000
55.000
50.000
45.000
40.000
35.000
30.000
25.000
20.000
15.000
10.000
5.000
0.000
Elevation (ft)
0.02
0.12
0.22
0.32
0.42
0.52
0.62
0.72
0.82
0.92
Interaction

Site Number: 413782 Code: ANSI/TIA-222-G 

Site Name: Washington North CT, CT Engineering Number:12927146_C3_02 5/23/2019 8:22:17 AM

Customer: T-MOBILE

## Analysis Parameters

| | | | |
|---|---|---|---|
| Location : | Litchfield County, CT | Height (ft) : | 168.5625 |
| Code : | ANSI/TIA-222-G | Base Diameter (in) : | 47.00 |
| Shape : | 18 Sides. Sect 5: Round | Top Diameter (in) : | 12.75 |
| Pole Type : | Custom | Taper (in/ft) : | 0.191 |
| Pole Manfacturer : | EEI | Rotation (deg) : | 0.00 |

## Ice & Wind Parameters

| | | | |
|---|---|---|---|
| Structure Class: | II | Design Wind Speed Without Ice: | 93 mph |
| Exposure Category: | B | Design Wind Speed With Ice: | 40 mph |
| Topographic Category: | 1 | Operational Wind Speed: | 60 mph |
| Crest Height: | 0 ft | Design Ice Thickness: | 0.75 in |

## Seismic Parameters

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | Equivalent Modal Analysis & Equivalent Lateral Force Methods | | | | |
| Site Class: | D - Stiff Soil | | | | |
| Period Based on Rayleigh Method (sec): | 2.91 | | | | |
| $T_L$ (sec): | 6 | p: | 1.3 | $C_s$: | 0.030 |
| $S_s$: | 0.190 | $S_1$: | 0.060 | $C_s$ Max: | 0.030 |
| $F_a$: | 1.600 | $F_v$: | 2.400 | $C_s$ Min: | 0.030 |
| $S_{ds}$: | 0.203 | $S_{d1}$: | 0.096 | | |

## Load Cases

| | |
|---|---|
| 1.2D + 1.6W | 93 mph with No Ice |
| 0.9D + 1.6W | 93 mph with No Ice (Reduced DL) |
| 1.2D + 1.0Di + 1.0Wi | 40 mph with 0.75 in Radial Ice |
| (1.2 + 0.2Sds) * DL + E ELFM | Seismic Equivalent Lateral Forces Method |
| (1.2 + 0.2Sds) * DL + E EMAM | Seismic Equivalent Modal Analysis Method |
| (0.9 - 0.2Sds) * DL + E ELFM | Seismic (Reduced DL) Equivalent Lateral Forces Method |
| (0.9 - 0.2Sds) * DL + E EMAM | Seismic (Reduced DL) Equivalent Modal Analysis Method |
| 1.0D + 1.0W | Serviceability 60 mph |

## Shaft Section Properties

| Sect Info | Length (ft) | Thick (in) | Fy (ksi) | Joint Type | Slip Joint Len (in) | Weight (lb) | Bottom Dia (in) | Bottom Elev (ft) | Bottom Area (in²) | Bottom Ix (in⁴) | Bottom W/t Ratio | Bottom D/t Ratio | Top Dia (in) | Top Elev (ft) | Top Area (in²) | Top Ix (in⁴) | Top W/t Ratio | Top D/t Ratio | Taper (in/ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-18 | 51.458 | 0.3125 | 65 | | 0.00 | 7,256 | 47.00 | 0.00 | 46.31 | 12752.5 | 25.11 | 150.40 | 37.18 | 51.46 | 36.57 | 6281.0 | 19.57 | 118.99 | 0.190776 |
| 2-18 | 50.810 | 0.2500 | 65 | Slip | 64.09 | 4,610 | 38.70 | 46.12 | 30.51 | 5699.5 | 25.89 | 154.81 | 29.00 | 96.93 | 22.82 | 2384.4 | 19.05 | 116.03 | 0.190776 |
| 3-18 | 50.573 | 0.1875 | 65 | Slip | 51.38 | 2,580 | 30.20 | 92.65 | 17.86 | 2032.7 | 26.99 | 161.07 | 20.55 | 143.22 | 12.12 | 635.0 | 17.92 | 109.61 | 0.190776 |
| 4-18 | 18.542 | 0.1875 | 65 | Slip | 38.38 | 735 | 21.53 | 140.02 | 12.71 | 731.7 | 18.84 | 114.87 | 18.00 | 158.56 | 10.60 | 424.9 | 15.52 | 96.00 | 0.190776 |
| 5-R | 10.000 | 0.3750 | 42 | Butt | 0.00 | 496 | 12.75 | 158.56 | 14.58 | 279.3 | 0.00 | 34.00 | 12.75 | 168.56 | 14.58 | 279.3 | 0.00 | 34.00 | 0.000000 |
| | | | | Shaft Weight | | 15,677 | | | | | | | | | | | | | |

## Discrete Appurtenance Properties

| Attach Elev (ft) | Description | Qty | Ka | Vert Ecc (ft) | No Ice Weight (lb) | No Ice EPAa (sf) | No Ice Orientation Factor | Ice Weight (lb) | Ice EPAa (sf) | Ice Orientation Factor |
|---|---|---|---|---|---|---|---|---|---|---|
| 167.00 | Generic RCU (Remote Control | 12 | 1.00 | -3.000 | 1.00 | 0.140 | 1.00 | 6.60 | 0.479 | 1.00 |
| 167.00 | Powerwave Allgon TT08- | 6 | 1.00 | -3.000 | 22.00 | 0.790 | 0.50 | 48.89 | 1.431 | 0.50 |
| 167.00 | Raycap DC6-48-60-18-8F | 1 | 1.00 | -3.000 | 31.80 | 1.470 | 1.00 | 94.25 | 2.177 | 1.00 |
| 167.00 | Ericsson RRUS 11 B2 | 6 | 1.00 | -3.000 | 50.70 | 2.790 | 0.50 | 123.99 | 3.900 | 0.50 |
| 167.00 | KMW AM-X-CD-17-65-00T-RET | 1 | 1.00 | -3.000 | 30.80 | 4.990 | 1.00 | 143.94 | 6.880 | 1.00 |
| 167.00 | Powerwave Allgon P90-14-XLH- | 3 | 1.00 | 1.000 | 30.00 | 5.070 | 0.69 | 153.68 | 6.965 | 0.69 |
| 167.00 | Kathrein Scala 800-10864K | 2 | 1.00 | -3.000 | 55.10 | 7.120 | 0.74 | 210.91 | 9.304 | 0.74 |
| 157.00 | Stand-Off | 3 | 1.00 | 0.000 | 75.00 | 2.500 | 0.67 | 111.79 | 3.814 | 0.67 |
| 157.00 | Andrew DBXNH-6565A-VTM | 3 | 0.80 | 0.000 | 34.20 | 5.370 | 0.69 | 161.45 | 7.353 | 0.69 |
| 146.00 | Stand-Off | 3 | 1.00 | 0.000 | 75.00 | 2.500 | 0.67 | 111.54 | 3.805 | 0.67 |
| 146.00 | Antel BXA-70063/6CF __ 2° | 3 | 1.00 | 0.000 | 17.00 | 7.570 | 0.65 | 158.28 | 10.325 | 0.65 |
| 146.00 | VZW Unused Reserve: 10800 sq | 1 | 0.80 | 0.000 | 1,199.00 | 75.000 | 0.90 | 2,033.46 | 127.197 | 0.90 |
| 136.00 | Ericsson Radio 4449 B12,B71 | 3 | 0.80 | 0.000 | 74.00 | 1.640 | 0.50 | 129.53 | 2.477 | 0.50 |
| 136.00 | Ericsson RRUS 11 B12 | 3 | 0.80 | 0.000 | 50.70 | 2.790 | 0.50 | 122.52 | 3.877 | 0.50 |
| 136.00 | RFS APXV18-206516S-C-A20 | 3 | 0.80 | 0.000 | 18.70 | 3.620 | 0.67 | 88.07 | 5.464 | 0.67 |
| 136.00 | Flat T-Arm | 3 | 0.67 | 0.000 | 250.00 | 12.900 | 0.67 | 457.31 | 21.012 | 0.67 |
| 136.00 | RFS APXVAARR24_43-U-NA20 | 3 | 0.80 | 0.000 | 127.90 | 20.240 | 0.63 | 517.31 | 23.918 | 0.63 |
| Totals | Num Loadings:17 | 59 | | | 4,077.50 | | | 9,844.39 | | |

## Linear Appurtenance Properties

Load Case Azimuth (deg) :

| Elev From (ft) | Elev To (ft) | Qty | Description | Coax Dia (in) | Coax Wt (lb/ft) | Flat | Max Coax / Row | Dist Between Rows (in) | Dist Between Cols (in) | Azimuth (deg) | Dist From Face (in) | Exposed To Wind | Carrier |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 167.00 | 1 | 0.39" (10mm) Fiber | 0.39 | 0.06 | N | 1 | 0.00 | 0.00 | 260 | 0.78 | Y | AT&T MOBILITY |
| 0.00 | 167.00 | 2 | 0.78" (19.7mm) 8 AWG | 0.78 | 0.59 | N | 2 | 1.00 | 1.00 | 260 | 0.00 | Y | AT&T MOBILITY |
| 0.00 | 167.00 | 6 | 1 5/8" Coax | 1.98 | 0.82 | N | 6 | 1.00 | 1.00 | 140 | 0.00 | Y | AT&T MOBILITY |
| 0.00 | 167.00 | 6 | 1 5/8" Coax | 1.98 | 0.82 | N | 6 | 1.00 | 1.00 | 240 | 0.00 | Y | AT&T MOBILITY |
| 0.00 | 157.00 | 12 | 1 5/8" Coax | 1.98 | 0.82 | N | 0 | 0.00 | 0.00 | 0 | 0.00 | N | VERIZON WIRELESS |
| 0.00 | 146.00 | 6 | 1 5/8" Coax | 1.98 | 0.82 | N | 0 | 0.00 | 0.00 | 0 | 0.00 | N | VERIZON WIRELESS |
| 0.00 | 136.00 | 3 | 1 5/8" (1.63"-41.3mm) | 1.63 | 1.61 | N | 0 | 0.00 | 0.00 | 0 | 0.00 | N | T-MOBILE |

## Segment Properties (Max Len : 5. ft)

| Seg Top Elev (ft) | Description | Thick (in) | Flat Dia (in) | Area ($in^2$) | Ix ($in^4$) | W/t Ratio | D/t Ratio | F'y (ksi) | S ($in^3$) | Z ($in^3$) | Weight (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 0.3125 | 47.000 | 46.306 | 12,752.5 | 25.11 | 150.40 | 71.9 | 534.4 | 0.0 | 0.0 |
| 5.00 | | 0.3125 | 46.046 | 45.360 | 11,986.7 | 24.57 | 147.35 | 72.5 | 512.7 | 0.0 | 779.8 |
| 10.00 | | 0.3125 | 45.092 | 44.414 | 11,252.2 | 24.03 | 144.30 | 73.1 | 491.5 | 0.0 | 763.7 |
| 15.00 | | 0.3125 | 44.138 | 43.468 | 10,548.4 | 23.49 | 141.24 | 73.8 | 470.7 | 0.0 | 747.6 |
| 20.00 | | 0.3125 | 43.184 | 42.522 | 9,874.5 | 22.96 | 138.19 | 74.4 | 450.4 | 0.0 | 731.5 |
| 25.00 | | 0.3125 | 42.231 | 41.576 | 9,229.9 | 22.42 | 135.14 | 75.0 | 430.5 | 0.0 | 715.4 |
| 30.00 | | 0.3125 | 41.277 | 40.630 | 8,614.1 | 21.88 | 132.09 | 75.7 | 411.0 | 0.0 | 699.3 |
| 35.00 | | 0.3125 | 40.323 | 39.684 | 8,026.2 | 21.34 | 129.03 | 76.3 | 392.0 | 0.0 | 683.2 |
| 40.00 | | 0.3125 | 39.369 | 38.738 | 7,465.7 | 20.80 | 125.98 | 76.9 | 373.5 | 0.0 | 667.1 |
| 45.00 | | 0.3125 | 38.415 | 37.792 | 6,932.0 | 20.26 | 122.93 | 77.6 | 355.4 | 0.0 | 651.0 |
| 46.12 | Bot - Section 2 | 0.3125 | 38.202 | 37.580 | 6,816.3 | 20.14 | 122.25 | 77.7 | 351.4 | 0.0 | 143.3 |
| 50.00 | | 0.3125 | 37.461 | 36.846 | 6,424.3 | 19.73 | 119.88 | 78.2 | 337.8 | 0.0 | 890.9 |
| 51.46 | Top - Section 1 | 0.2500 | 37.683 | 29.702 | 5,258.3 | 25.17 | 150.73 | 71.8 | 274.8 | 0.0 | 330.1 |
| 55.00 | | 0.2500 | 37.007 | 29.166 | 4,978.7 | 24.69 | 148.03 | 72.4 | 265.0 | 0.0 | 354.7 |
| 60.00 | | 0.2500 | 36.053 | 28.409 | 4,601.1 | 24.02 | 144.21 | 73.2 | 251.4 | 0.0 | 489.8 |
| 65.00 | | 0.2500 | 35.100 | 27.652 | 4,243.0 | 23.35 | 140.40 | 73.9 | 238.1 | 0.0 | 476.9 |
| 70.00 | | 0.2500 | 34.146 | 26.895 | 3,904.1 | 22.67 | 136.58 | 74.7 | 225.2 | 0.0 | 464.0 |
| 75.00 | | 0.2500 | 33.192 | 26.138 | 3,583.6 | 22.00 | 132.77 | 75.5 | 212.7 | 0.0 | 451.2 |
| 80.00 | | 0.2500 | 32.238 | 25.381 | 3,281.3 | 21.33 | 128.95 | 76.3 | 200.5 | 0.0 | 438.3 |
| 85.00 | | 0.2500 | 31.284 | 24.625 | 2,996.4 | 20.65 | 125.14 | 77.1 | 188.6 | 0.0 | 425.4 |
| 90.00 | | 0.2500 | 30.330 | 23.868 | 2,728.5 | 19.98 | 121.32 | 77.9 | 177.2 | 0.0 | 412.5 |
| 92.65 | Bot - Section 3 | 0.2500 | 29.825 | 23.467 | 2,593.4 | 19.63 | 119.30 | 78.3 | 171.3 | 0.0 | 213.1 |
| 95.00 | | 0.2500 | 29.376 | 23.111 | 2,477.1 | 19.31 | 117.50 | 78.7 | 166.1 | 0.0 | 328.6 |
| 96.93 | Top - Section 2 | 0.1875 | 29.384 | 17.375 | 1,871.2 | 26.22 | 156.71 | 70.6 | 125.4 | 0.0 | 265.2 |
| 100.0 | | 0.1875 | 28.797 | 17.026 | 1,760.7 | 25.67 | 153.59 | 71.2 | 120.4 | 0.0 | 179.9 |
| 105.0 | | 0.1875 | 27.843 | 16.458 | 1,590.4 | 24.77 | 148.50 | 72.3 | 112.5 | 0.0 | 284.8 |
| 110.0 | | 0.1875 | 26.890 | 15.891 | 1,431.5 | 23.88 | 143.41 | 73.3 | 104.9 | 0.0 | 275.2 |
| 115.0 | | 0.1875 | 25.936 | 15.323 | 1,283.5 | 22.98 | 138.32 | 74.4 | 97.5 | 0.0 | 265.5 |
| 120.0 | | 0.1875 | 24.982 | 14.755 | 1,146.0 | 22.08 | 133.24 | 75.4 | 90.4 | 0.0 | 255.9 |
| 125.0 | | 0.1875 | 24.028 | 14.188 | 1,018.8 | 21.19 | 128.15 | 76.5 | 83.5 | 0.0 | 246.2 |
| 130.0 | | 0.1875 | 23.074 | 13.620 | 901.3 | 20.29 | 123.06 | 77.5 | 76.9 | 0.0 | 236.6 |
| 135.0 | | 0.1875 | 22.120 | 13.052 | 793.3 | 19.39 | 117.97 | 78.6 | 70.6 | 0.0 | 226.9 |
| 136.0 | | 0.1875 | 21.929 | 12.939 | 772.7 | 19.21 | 116.96 | 78.8 | 69.4 | 0.0 | 44.2 |
| 140.0 | | 0.1875 | 21.166 | 12.485 | 694.2 | 18.49 | 112.89 | 79.6 | 64.6 | 0.0 | 173.0 |
| 140.0 | Bot - Section 4 | 0.1875 | 21.162 | 12.482 | 693.8 | 18.49 | 112.87 | 79.7 | 64.6 | 0.0 | 0.9 |
| 143.2 | Top - Section 3 | 0.1875 | 20.927 | 12.342 | 670.7 | 18.27 | 111.61 | 79.9 | 63.1 | 0.0 | 270.1 |
| 145.0 | | 0.1875 | 20.587 | 12.140 | 638.3 | 17.95 | 109.80 | 80.3 | 61.1 | 0.0 | 74.2 |
| 146.0 | | 0.1875 | 20.397 | 12.027 | 620.6 | 17.77 | 108.78 | 80.5 | 59.9 | 0.0 | 41.1 |
| 150.0 | | 0.1875 | 19.634 | 11.572 | 552.9 | 17.05 | 104.71 | 81.3 | 55.5 | 0.0 | 160.6 |
| 155.0 | | 0.1875 | 18.680 | 11.005 | 475.5 | 16.16 | 99.62 | 82.4 | 50.1 | 0.0 | 192.1 |
| 157.0 | | 0.1875 | 18.298 | 10.778 | 446.6 | 15.80 | 97.59 | 82.6 | 48.1 | 0.0 | 74.1 |
| 158.5 | Top - Section 4 | 0.1875 | 18.000 | 10.600 | 424.9 | 15.52 | 96.00 | 82.6 | 46.5 | 0.0 | 56.8 |
| 158.5 | Bot - Section 5 | 0.3750 | 12.750 | 14.579 | 279.3 | 0.00 | 34.00 | 42.0 | 43.8 | 57.4 | |
| 160.0 | | 0.3750 | 12.750 | 14.579 | 279.3 | 0.00 | 34.00 | 42.0 | 43.8 | 57.4 | 71.3 |
| 165.0 | | 0.3750 | 12.750 | 14.579 | 279.3 | 0.00 | 34.00 | 42.0 | 43.8 | 57.4 | 248.0 |
| 167.0 | | 0.3750 | 12.750 | 14.579 | 279.3 | 0.00 | 34.00 | 42.0 | 43.8 | 57.4 | 99.2 |
| 168.5 | | 0.3750 | 12.750 | 14.579 | 279.3 | 0.00 | 34.00 | 42.0 | 43.8 | 57.4 | 77.5 |
| | | | | | | | | | | | 15,677.0 |

Site Number: 413782 Code: ANSI/TIA-222-G 

Site Name: Washington North CT, CT Engineering Number:12927146_C3_02 5/23/2019 8:22:17 AM

Customer: T-MOBILE

**Load Case:** 1.2D + 1.6W 93 mph with No Ice 33 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :1.20

Wind Load Factor :1.60

## Applied Segment Forces Summary

| | | Shaft Forces | | Discrete Forces | | | | Linear Forces | | Sum of Forces | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seg Elev (ft) | Description | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Torsion MY (lb-ft) | Moment MZ (lb) |
| 0.00 | | 165.8 | 0.0 | | | | | 0.0 | 0.0 | 165.8 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 328.2 | 935.8 | | | | | 0.0 | 184.0 | 328.2 | 1,119.8 | 0.0 | 0.0 |
| 10.00 | | 321.4 | 916.5 | | | | | 0.0 | 184.0 | 321.4 | 1,100.5 | 0.0 | 0.0 |
| 15.00 | | 314.6 | 897.1 | | | | | 0.0 | 184.0 | 314.6 | 1,081.2 | 0.0 | 0.0 |
| 20.00 | | 307.8 | 877.8 | | | | | 0.0 | 184.0 | 307.8 | 1,061.8 | 0.0 | 0.0 |
| 25.00 | | 301.0 | 858.5 | | | | | 0.0 | 184.0 | 301.0 | 1,042.5 | 0.0 | 0.0 |
| 30.00 | | 297.7 | 839.2 | | | | | 0.0 | 184.0 | 297.7 | 1,023.2 | 0.0 | 0.0 |
| 35.00 | | 300.3 | 819.9 | | | | | 0.0 | 184.0 | 300.3 | 1,003.9 | 0.0 | 0.0 |
| 40.00 | | 304.7 | 800.6 | | | | | 0.0 | 184.0 | 304.7 | 984.6 | 0.0 | 0.0 |
| 45.00 | | 187.6 | 781.2 | | | | | 0.0 | 184.0 | 187.6 | 965.3 | 0.0 | 0.0 |
| 46.12 | Bot - Section 2 | 155.9 | 171.9 | | | | | 0.0 | 41.1 | 155.9 | 213.0 | 0.0 | 0.0 |
| 50.00 | | 167.2 | 1,069.1 | | | | | 0.0 | 142.9 | 167.2 | 1,212.0 | 0.0 | 0.0 |
| 51.46 | Top - Section 1 | 156.8 | 396.1 | | | | | 0.0 | 53.7 | 156.8 | 449.8 | 0.0 | 0.0 |
| 55.00 | | 268.0 | 425.7 | | | | | 0.0 | 130.3 | 268.0 | 556.0 | 0.0 | 0.0 |
| 60.00 | | 313.4 | 587.7 | | | | | 0.0 | 184.0 | 313.4 | 771.8 | 0.0 | 0.0 |
| 65.00 | | 312.2 | 572.3 | | | | | 0.0 | 184.0 | 312.2 | 756.3 | 0.0 | 0.0 |
| 70.00 | | 310.2 | 556.8 | | | | | 0.0 | 184.0 | 310.2 | 740.9 | 0.0 | 0.0 |
| 75.00 | | 307.5 | 541.4 | | | | | 0.0 | 184.0 | 307.5 | 725.4 | 0.0 | 0.0 |
| 80.00 | | 304.2 | 525.9 | | | | | 0.0 | 184.0 | 304.2 | 710.0 | 0.0 | 0.0 |
| 85.00 | | 300.4 | 510.5 | | | | | 0.0 | 184.0 | 300.4 | 694.5 | 0.0 | 0.0 |
| 90.00 | | 227.2 | 495.0 | | | | | 0.0 | 184.0 | 227.2 | 679.0 | 0.0 | 0.0 |
| 92.65 | Bot - Section 3 | 147.7 | 255.7 | | | | | 0.0 | 97.4 | 147.7 | 353.1 | 0.0 | 0.0 |
| 95.00 | | 126.4 | 394.3 | | | | | 0.0 | 86.6 | 126.4 | 480.9 | 0.0 | 0.0 |
| 96.93 | Top - Section 2 | 146.2 | 318.3 | | | | | 0.0 | 70.9 | 146.2 | 389.2 | 0.0 | 0.0 |
| 100.00 | | 233.0 | 215.8 | | | | | 0.0 | 113.1 | 233.0 | 328.9 | 0.0 | 0.0 |
| 105.00 | | 286.4 | 341.8 | | | | | 0.0 | 184.0 | 286.4 | 525.8 | 0.0 | 0.0 |
| 110.00 | | 286.2 | 330.2 | | | | | 0.0 | 184.0 | 286.2 | 514.2 | 0.0 | 0.0 |
| 115.00 | | 286.5 | 318.6 | | | | | 0.0 | 184.0 | 286.5 | 502.7 | 0.0 | 0.0 |
| 120.00 | | 286.4 | 307.0 | | | | | 0.0 | 184.0 | 286.4 | 491.1 | 0.0 | 0.0 |
| 125.00 | | 285.8 | 295.5 | | | | | 0.0 | 184.0 | 285.8 | 479.5 | 0.0 | 0.0 |
| 130.00 | | 284.6 | 283.9 | | | | | 0.0 | 184.0 | 284.6 | 467.9 | 0.0 | 0.0 |
| 135.00 | | 170.2 | 272.3 | | | | | 0.0 | 184.0 | 170.2 | 456.3 | 0.0 | 0.0 |
| 136.00 | Appurtenance(s) | 140.9 | 53.1 | 2,361.2 | 0.0 | 0.0 | 1,876.7 | 0.0 | 36.8 | 2,502.1 | 1,966.5 | 0.0 | 0.0 |
| 140.00 | | 113.2 | 207.6 | | | | | 0.0 | 124.0 | 113.2 | 331.7 | 0.0 | 0.0 |
| 140.02 | Bot - Section 4 | 91.6 | 1.1 | | | | | 0.0 | 0.6 | 91.6 | 1.7 | 0.0 | 0.0 |
| 143.22 | Top - Section 3 | 141.0 | 324.2 | | | | | 0.0 | 99.2 | 141.0 | 423.3 | 0.0 | 0.0 |
| 145.00 | | 77.9 | 89.0 | | | | | 0.0 | 55.2 | 77.9 | 144.3 | 0.0 | 0.0 |
| 146.00 | Appurtenance(s) | 139.5 | 49.3 | 3,007.7 | 0.0 | 0.0 | 1,770.0 | 0.0 | 31.0 | 3,147.2 | 1,850.3 | 0.0 | 0.0 |
| 150.00 | | 250.2 | 192.7 | | | | | 0.0 | 100.4 | 250.2 | 293.1 | 0.0 | 0.0 |
| 155.00 | | 216.7 | 230.5 | | | | | 0.0 | 125.5 | 216.7 | 356.0 | 0.0 | 0.0 |
| 157.00 | Appurtenance(s) | 138.0 | 88.9 | 579.2 | 0.0 | 0.0 | 393.1 | 31.5 | 50.2 | 748.7 | 532.3 | 0.0 | 0.0 |
| 158.56 | Top - Section 4 | 98.3 | 68.2 | | | | | 24.9 | 20.8 | 123.2 | 89.0 | 0.0 | 0.0 |
| 160.00 | | 172.3 | 85.6 | | | | | 23.2 | 19.1 | 195.5 | 104.7 | 0.0 | 0.0 |
| 165.00 | | 187.9 | 297.7 | | | | | 81.2 | 66.5 | 269.1 | 364.1 | 0.0 | 0.0 |
| 167.00 | Appurtenance(s) | 75.0 | 119.1 | 1,684.9 | 0.0 | -3,273.6 | 853.2 | 32.7 | 26.6 | 1,792.6 | 998.9 | 0.0 | 0.0 |
| 168.56 | | 21.1 | 93.0 | | | | | 0.0 | 0.0 | 21.1 | 93.0 | 0.0 | 0.0 |

Load Case: 1.2D + 1.6W 93 mph with No Ice 33 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :1.20
Wind Load Factor :1.60

| | | | | |
|---|---|---|---|---|
| Totals: | 17,881.2 | 29,429.8 | 0.00 | 0.00 |

Load Case: 1.2D + 1.6W 93 mph with No Ice 33 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :1.20
Wind Load Factor :1.60

## Calculated Forces

| 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 | -29.39 | -17.78 | 0.00 | -2,117.91 | 0.00 | 2,117.91 | 2,995.17 | 1,497.58 | 5,752.58 | 2,880.56 | 0.00 | 0.00 | 0.745 |
| 5.00 | -28.20 | -17.56 | 0.00 | -2,029.04 | 0.00 | 2,029.04 | 2,959.81 | 1,479.91 | 5,567.76 | 2,788.02 | 0.12 | -0.23 | 0.737 |
| 10.00 | -27.03 | -17.34 | 0.00 | -1,941.24 | 0.00 | 1,941.24 | 2,923.38 | 1,461.69 | 5,383.76 | 2,695.88 | 0.49 | -0.47 | 0.729 |
| 15.00 | -25.88 | -17.13 | 0.00 | -1,854.52 | 0.00 | 1,854.52 | 2,885.88 | 1,442.94 | 5,200.69 | 2,604.21 | 1.11 | -0.71 | 0.721 |
| 20.00 | -24.75 | -16.91 | 0.00 | -1,768.88 | 0.00 | 1,768.88 | 2,847.29 | 1,423.65 | 5,018.68 | 2,513.07 | 1.98 | -0.95 | 0.713 |
| 25.00 | -23.64 | -16.70 | 0.00 | -1,684.32 | 0.00 | 1,684.32 | 2,807.63 | 1,403.81 | 4,837.86 | 2,422.53 | 3.11 | -1.20 | 0.704 |
| 30.00 | -22.55 | -16.47 | 0.00 | -1,600.85 | 0.00 | 1,600.85 | 2,766.89 | 1,383.44 | 4,658.36 | 2,332.64 | 4.50 | -1.45 | 0.695 |
| 35.00 | -21.49 | -16.24 | 0.00 | -1,518.48 | 0.00 | 1,518.48 | 2,725.06 | 1,362.53 | 4,480.31 | 2,243.49 | 6.16 | -1.71 | 0.685 |
| 40.00 | -20.44 | -16.00 | 0.00 | -1,437.26 | 0.00 | 1,437.26 | 2,682.17 | 1,341.08 | 4,303.83 | 2,155.12 | 8.09 | -1.97 | 0.675 |
| 45.00 | -19.43 | -15.83 | 0.00 | -1,357.25 | 0.00 | 1,357.25 | 2,638.19 | 1,319.10 | 4,129.06 | 2,067.60 | 10.30 | -2.24 | 0.664 |
| 46.12 | -19.19 | -15.72 | 0.00 | -1,339.56 | 0.00 | 1,339.56 | 2,628.22 | 1,314.11 | 4,090.25 | 2,048.17 | 10.83 | -2.30 | 0.661 |
| 50.00 | -17.95 | -15.54 | 0.00 | -1,278.54 | 0.00 | 1,278.54 | 2,593.14 | 1,296.57 | 3,956.11 | 1,981.00 | 12.79 | -2.51 | 0.652 |
| 51.46 | -17.47 | -15.41 | 0.00 | -1,255.87 | 0.00 | 1,255.87 | 1,919.32 | 959.66 | 2,955.63 | 1,480.01 | 13.57 | -2.59 | 0.858 |
| 55.00 | -16.85 | -15.20 | 0.00 | -1,201.29 | 0.00 | 1,201.29 | 1,899.39 | 949.70 | 2,871.79 | 1,438.03 | 15.57 | -2.79 | 0.845 |
| 60.00 | -16.01 | -14.94 | 0.00 | -1,125.32 | 0.00 | 1,125.32 | 1,870.33 | 935.17 | 2,753.97 | 1,379.03 | 18.67 | -3.12 | 0.825 |
| 65.00 | -15.19 | -14.67 | 0.00 | -1,050.64 | 0.00 | 1,050.64 | 1,840.20 | 920.10 | 2,636.91 | 1,320.41 | 22.12 | -3.46 | 0.804 |
| 70.00 | -14.38 | -14.40 | 0.00 | -977.29 | 0.00 | 977.29 | 1,808.98 | 904.49 | 2,520.72 | 1,262.23 | 25.92 | -3.80 | 0.782 |
| 75.00 | -13.60 | -14.13 | 0.00 | -905.29 | 0.00 | 905.29 | 1,776.69 | 888.34 | 2,405.54 | 1,204.56 | 30.08 | -4.14 | 0.759 |
| 80.00 | -12.83 | -13.85 | 0.00 | -834.66 | 0.00 | 834.66 | 1,743.32 | 871.66 | 2,291.50 | 1,147.45 | 34.60 | -4.49 | 0.735 |
| 85.00 | -12.08 | -13.56 | 0.00 | -765.43 | 0.00 | 765.43 | 1,708.87 | 854.43 | 2,178.71 | 1,090.98 | 39.48 | -4.84 | 0.709 |
| 90.00 | -11.36 | -13.33 | 0.00 | -697.62 | 0.00 | 697.62 | 1,673.34 | 836.67 | 2,067.32 | 1,035.20 | 44.73 | -5.18 | 0.681 |
| 92.65 | -10.98 | -13.19 | 0.00 | -662.35 | 0.00 | 662.35 | 1,654.10 | 827.05 | 2,008.98 | 1,005.98 | 47.65 | -5.37 | 0.665 |
| 95.00 | -10.48 | -13.04 | 0.00 | -631.31 | 0.00 | 631.31 | 1,636.74 | 818.37 | 1,957.44 | 980.18 | 50.33 | -5.54 | 0.651 |
| 96.93 | -10.07 | -12.89 | 0.00 | -606.18 | 0.00 | 606.18 | 1,103.35 | 551.67 | 1,325.55 | 663.76 | 52.59 | -5.67 | 0.923 |
| 100.00 | -9.69 | -12.68 | 0.00 | -566.57 | 0.00 | 566.57 | 1,091.13 | 545.56 | 1,284.38 | 643.14 | 56.31 | -5.89 | 0.890 |
| 105.00 | -9.11 | -12.41 | 0.00 | -503.17 | 0.00 | 503.17 | 1,070.38 | 535.19 | 1,217.67 | 609.74 | 62.70 | -6.32 | 0.834 |
| 110.00 | -8.54 | -12.13 | 0.00 | -441.14 | 0.00 | 441.14 | 1,048.55 | 524.27 | 1,151.42 | 576.56 | 69.53 | -6.74 | 0.774 |
| 115.00 | -7.99 | -11.84 | 0.00 | -380.51 | 0.00 | 380.51 | 1,025.64 | 512.82 | 1,085.75 | 543.68 | 76.80 | -7.15 | 0.708 |
| 120.00 | -7.47 | -11.54 | 0.00 | -321.32 | 0.00 | 321.32 | 1,001.65 | 500.83 | 1,020.79 | 511.15 | 84.48 | -7.54 | 0.637 |
| 125.00 | -6.96 | -11.23 | 0.00 | -263.62 | 0.00 | 263.62 | 976.59 | 488.30 | 956.67 | 479.05 | 92.55 | -7.90 | 0.558 |
| 130.00 | -6.48 | -10.92 | 0.00 | -207.45 | 0.00 | 207.45 | 950.45 | 475.22 | 893.52 | 447.42 | 100.98 | -8.23 | 0.471 |
| 135.00 | -6.03 | -10.70 | 0.00 | -152.84 | 0.00 | 152.84 | 923.23 | 461.61 | 831.46 | 416.35 | 109.73 | -8.52 | 0.374 |
| 136.00 | -4.44 | -7.95 | 0.00 | -142.14 | 0.00 | 142.14 | 917.66 | 458.83 | 819.19 | 410.21 | 111.52 | -8.57 | 0.352 |
| 140.00 | -4.11 | -7.79 | 0.00 | -110.35 | 0.00 | 110.35 | 894.93 | 447.47 | 770.63 | 385.89 | 118.75 | -8.76 | 0.291 |
| 140.02 | -4.12 | -7.71 | 0.00 | -110.19 | 0.00 | 110.19 | 894.81 | 447.41 | 770.38 | 385.76 | 118.79 | -8.76 | 0.291 |
| 143.22 | -3.71 | -7.51 | 0.00 | -85.55 | 0.00 | 85.55 | 887.67 | 443.84 | 755.59 | 378.35 | 124.68 | -8.89 | 0.231 |
| 145.00 | -3.57 | -7.41 | 0.00 | -72.18 | 0.00 | 72.18 | 877.23 | 438.62 | 734.36 | 367.72 | 127.99 | -8.95 | 0.201 |
| 146.00 | -2.23 | -4.02 | 0.00 | -64.77 | 0.00 | 64.77 | 871.31 | 435.66 | 722.52 | 361.80 | 129.86 | -8.98 | 0.182 |
| 150.00 | -1.97 | -3.73 | 0.00 | -48.70 | 0.00 | 48.70 | 847.20 | 423.60 | 675.75 | 338.38 | 137.40 | -9.08 | 0.146 |
| 155.00 | -1.65 | -3.46 | 0.00 | -30.07 | 0.00 | 30.07 | 816.09 | 408.05 | 618.71 | 309.81 | 146.93 | -9.18 | 0.099 |
| 157.00 | -1.24 | -2.63 | 0.00 | -23.15 | 0.00 | 23.15 | 800.73 | 400.36 | 594.40 | 297.64 | 150.77 | -9.22 | 0.079 |
| 158.56 | -1.17 | -2.50 | 0.00 | -19.03 | 0.00 | 19.03 | 787.55 | 393.77 | 574.90 | 287.88 | 153.77 | -9.24 | 0.068 |
| 158.56 | -1.17 | -2.50 | 0.00 | -19.03 | 0.00 | 19.03 | 551.08 | 275.54 | 275.63 | 180.95 | 153.77 | -9.24 | 0.107 |
| 160.00 | -1.10 | -2.29 | 0.00 | -15.44 | 0.00 | 15.44 | 551.08 | 275.54 | 275.63 | 180.95 | 156.55 | -9.25 | 0.087 |
| 165.00 | -0.78 | -1.97 | 0.00 | -3.99 | 0.00 | 3.99 | 551.08 | 275.54 | 275.63 | 180.95 | 166.22 | -9.30 | 0.024 |
| 167.00 | -0.09 | -0.04 | 0.00 | -0.06 | 0.00 | 0.06 | 551.08 | 275.54 | 275.63 | 180.95 | 170.11 | -9.31 | 0.000 |
| 168.56 | 0.00 | -0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 551.08 | 275.54 | 275.63 | 180.95 | 173.14 | -9.31 | 0.000 |

Site Number: 413782 Code: ANSI/TIA-222-G 

Site Name: Washington North CT, CT Engineering Number:12927146_C3_02 5/23/2019 8:22:20 AM

Customer: T-MOBILE

**Load Case:** 0.9D + 1.6W — 93 mph with No Ice (Reduced DL) — 33 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :0.90

Wind Load Factor :1.60

## Applied Segment Forces Summary

| | | Shaft Forces | | Discrete Forces | | | | Linear Forces | | Sum of Forces | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seg Elev (ft) | Description | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Torsion MY (lb-ft) | Moment MZ (lb) |
| 0.00 | | 165.8 | 0.0 | | | | | 0.0 | 0.0 | 165.8 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 328.2 | 701.8 | | | | | 0.0 | 138.0 | 328.2 | 839.8 | 0.0 | 0.0 |
| 10.00 | | 321.4 | 687.3 | | | | | 0.0 | 138.0 | 321.4 | 825.4 | 0.0 | 0.0 |
| 15.00 | | 314.6 | 672.9 | | | | | 0.0 | 138.0 | 314.6 | 810.9 | 0.0 | 0.0 |
| 20.00 | | 307.8 | 658.4 | | | | | 0.0 | 138.0 | 307.8 | 796.4 | 0.0 | 0.0 |
| 25.00 | | 301.0 | 643.9 | | | | | 0.0 | 138.0 | 301.0 | 781.9 | 0.0 | 0.0 |
| 30.00 | | 297.7 | 629.4 | | | | | 0.0 | 138.0 | 297.7 | 767.4 | 0.0 | 0.0 |
| 35.00 | | 300.3 | 614.9 | | | | | 0.0 | 138.0 | 300.3 | 752.9 | 0.0 | 0.0 |
| 40.00 | | 304.7 | 600.4 | | | | | 0.0 | 138.0 | 304.7 | 738.4 | 0.0 | 0.0 |
| 45.00 | | 187.6 | 585.9 | | | | | 0.0 | 138.0 | 187.6 | 723.9 | 0.0 | 0.0 |
| 46.12 | Bot - Section 2 | 155.9 | 128.9 | | | | | 0.0 | 30.8 | 155.9 | 159.8 | 0.0 | 0.0 |
| 50.00 | | 167.2 | 801.8 | | | | | 0.0 | 107.2 | 167.2 | 909.0 | 0.0 | 0.0 |
| 51.46 | Top - Section 1 | 156.8 | 297.1 | | | | | 0.0 | 40.3 | 156.8 | 337.3 | 0.0 | 0.0 |
| 55.00 | | 268.0 | 319.3 | | | | | 0.0 | 97.8 | 268.0 | 417.0 | 0.0 | 0.0 |
| 60.00 | | 313.4 | 440.8 | | | | | 0.0 | 138.0 | 313.4 | 578.8 | 0.0 | 0.0 |
| 65.00 | | 312.2 | 429.2 | | | | | 0.0 | 138.0 | 312.2 | 567.2 | 0.0 | 0.0 |
| 70.00 | | 310.2 | 417.6 | | | | | 0.0 | 138.0 | 310.2 | 555.6 | 0.0 | 0.0 |
| 75.00 | | 307.5 | 406.0 | | | | | 0.0 | 138.0 | 307.5 | 544.1 | 0.0 | 0.0 |
| 80.00 | | 304.2 | 394.4 | | | | | 0.0 | 138.0 | 304.2 | 532.5 | 0.0 | 0.0 |
| 85.00 | | 300.4 | 382.9 | | | | | 0.0 | 138.0 | 300.4 | 520.9 | 0.0 | 0.0 |
| 90.00 | | 227.2 | 371.3 | | | | | 0.0 | 138.0 | 227.2 | 509.3 | 0.0 | 0.0 |
| 92.65 | Bot - Section 3 | 147.7 | 191.8 | | | | | 0.0 | 73.0 | 147.7 | 264.8 | 0.0 | 0.0 |
| 95.00 | | 126.4 | 295.7 | | | | | 0.0 | 65.0 | 126.4 | 360.7 | 0.0 | 0.0 |
| 96.93 | Top - Section 2 | 146.2 | 238.7 | | | | | 0.0 | 53.2 | 146.2 | 291.9 | 0.0 | 0.0 |
| 100.00 | | 233.0 | 161.9 | | | | | 0.0 | 84.8 | 233.0 | 246.7 | 0.0 | 0.0 |
| 105.00 | | 284.0 | 256.4 | | | | | 0.0 | 138.0 | 284.0 | 394.4 | 0.0 | 0.0 |
| 110.00 | | 278.0 | 247.7 | | | | | 0.0 | 138.0 | 278.0 | 385.7 | 0.0 | 0.0 |
| 115.00 | | 271.5 | 239.0 | | | | | 0.0 | 138.0 | 271.5 | 377.0 | 0.0 | 0.0 |
| 120.00 | | 264.7 | 230.3 | | | | | 0.0 | 138.0 | 264.7 | 368.3 | 0.0 | 0.0 |
| 125.00 | | 257.6 | 221.6 | | | | | 0.0 | 138.0 | 257.6 | 359.6 | 0.0 | 0.0 |
| 130.00 | | 250.2 | 212.9 | | | | | 0.0 | 138.0 | 250.2 | 350.9 | 0.0 | 0.0 |
| 135.00 | | 147.4 | 204.2 | | | | | 0.0 | 138.0 | 147.4 | 342.2 | 0.0 | 0.0 |
| 136.00 | Appurtenance(s) | 119.2 | 39.8 | 2,361.2 | 0.0 | 0.0 | 1,407.5 | 0.0 | 27.6 | 2,480.4 | 1,474.9 | 0.0 | 0.0 |
| 140.00 | | 95.6 | 155.7 | | | | | 0.0 | 93.0 | 95.6 | 248.7 | 0.0 | 0.0 |
| 140.02 | Bot - Section 4 | 75.9 | 0.8 | | | | | 0.0 | 0.5 | 75.9 | 1.3 | 0.0 | 0.0 |
| 143.22 | Top - Section 3 | 116.8 | 243.1 | | | | | 0.0 | 74.4 | 116.8 | 317.5 | 0.0 | 0.0 |
| 145.00 | | 64.2 | 66.8 | | | | | 0.0 | 41.4 | 64.2 | 108.2 | 0.0 | 0.0 |
| 146.00 | Appurtenance(s) | 113.0 | 37.0 | 3,007.7 | 0.0 | 0.0 | 1,327.5 | 0.0 | 23.3 | 3,120.8 | 1,387.8 | 0.0 | 0.0 |
| 150.00 | | 198.8 | 144.5 | | | | | 0.0 | 75.3 | 198.8 | 219.9 | 0.0 | 0.0 |
| 155.00 | | 186.7 | 172.9 | | | | | 0.0 | 94.1 | 186.7 | 267.0 | 0.0 | 0.0 |
| 157.00 | Appurtenance(s) | 138.0 | 66.7 | 579.2 | 0.0 | 0.0 | 294.8 | 31.5 | 37.7 | 748.7 | 399.2 | 0.0 | 0.0 |
| 158.56 | Top - Section 4 | 98.3 | 51.1 | | | | | 24.9 | 15.6 | 123.2 | 66.7 | 0.0 | 0.0 |
| 160.00 | | 172.3 | 64.2 | | | | | 23.2 | 14.3 | 195.5 | 78.5 | 0.0 | 0.0 |
| 165.00 | | 187.9 | 223.2 | | | | | 81.2 | 49.9 | 269.1 | 273.1 | 0.0 | 0.0 |
| 167.00 | Appurtenance(s) | 75.0 | 89.3 | 1,684.9 | 0.0 | -3,273.6 | 639.9 | 32.7 | 19.9 | 1,792.6 | 749.1 | 0.0 | 0.0 |
| 168.56 | | 21.1 | 69.8 | | | | | 0.0 | 0.0 | 21.1 | 69.8 | 0.0 | 0.0 |

Site Number: 413782 Code: ANSI/TIA-222-G 
Site Name: Washington North CT, CT Engineering Number:12927146_C3_02 5/23/2019 8:22:23 AM
Customer: T-MOBILE

Load Case: 0.9D + 1.6W 93 mph with No Ice (Reduced DL) 33 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :0.90
Wind Load Factor :1.60

| | | | | |
|---|---|---|---|---|
| Totals: | 17,548.0 | 22,072.4 | 0.00 | 0.00 |

Site Number: 413782 Code: ANSI/TIA-222-G 

Site Name: Washington North CT, CT Engineering Number:12927146_C3_02 5/23/2019 8:22:23 AM

Customer: T-MOBILE

Load Case: 0.9D + 1.6W 93 mph with No Ice (Reduced DL) 33 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :0.90

Wind Load Factor :1.60

## Calculated Forces

| 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 | -22.04 | -17.43 | 0.00 | -2,034.71 | 0.00 | 2,034.71 | 2,995.17 | 1,497.58 | 5,752.58 | 2,880.56 | 0.00 | 0.00 | 0.714 |
| 5.00 | -21.13 | -17.18 | 0.00 | -1,947.59 | 0.00 | 1,947.59 | 2,959.81 | 1,479.91 | 5,567.76 | 2,788.02 | 0.12 | -0.22 | 0.706 |
| 10.00 | -20.24 | -16.93 | 0.00 | -1,861.70 | 0.00 | 1,861.70 | 2,923.38 | 1,461.69 | 5,383.76 | 2,695.88 | 0.47 | -0.45 | 0.698 |
| 15.00 | -19.37 | -16.69 | 0.00 | -1,777.03 | 0.00 | 1,777.03 | 2,885.88 | 1,442.94 | 5,200.69 | 2,604.21 | 1.06 | -0.68 | 0.689 |
| 20.00 | -18.51 | -16.45 | 0.00 | -1,693.59 | 0.00 | 1,693.59 | 2,847.29 | 1,423.65 | 5,018.68 | 2,513.07 | 1.90 | -0.91 | 0.681 |
| 25.00 | -17.66 | -16.21 | 0.00 | -1,611.36 | 0.00 | 1,611.36 | 2,807.63 | 1,403.81 | 4,837.86 | 2,422.53 | 2.98 | -1.15 | 0.672 |
| 30.00 | -16.83 | -15.96 | 0.00 | -1,530.33 | 0.00 | 1,530.33 | 2,766.89 | 1,383.44 | 4,658.36 | 2,332.64 | 4.32 | -1.39 | 0.662 |
| 35.00 | -16.02 | -15.71 | 0.00 | -1,450.52 | 0.00 | 1,450.52 | 2,725.06 | 1,362.53 | 4,480.31 | 2,243.49 | 5.91 | -1.64 | 0.653 |
| 40.00 | -15.22 | -15.45 | 0.00 | -1,371.96 | 0.00 | 1,371.96 | 2,682.17 | 1,341.08 | 4,303.83 | 2,155.12 | 7.75 | -1.89 | 0.642 |
| 45.00 | -14.47 | -15.28 | 0.00 | -1,294.70 | 0.00 | 1,294.70 | 2,638.19 | 1,319.10 | 4,129.06 | 2,067.60 | 9.87 | -2.14 | 0.632 |
| 46.12 | -14.28 | -15.15 | 0.00 | -1,277.63 | 0.00 | 1,277.63 | 2,628.22 | 1,314.11 | 4,090.25 | 2,048.17 | 10.38 | -2.20 | 0.629 |
| 50.00 | -13.34 | -14.98 | 0.00 | -1,218.81 | 0.00 | 1,218.81 | 2,593.14 | 1,296.57 | 3,956.11 | 1,981.00 | 12.25 | -2.40 | 0.621 |
| 51.46 | -12.97 | -14.84 | 0.00 | -1,196.97 | 0.00 | 1,196.97 | 1,919.32 | 959.66 | 2,955.63 | 1,480.01 | 13.00 | -2.48 | 0.816 |
| 55.00 | -12.51 | -14.61 | 0.00 | -1,144.42 | 0.00 | 1,144.42 | 1,899.39 | 949.70 | 2,871.79 | 1,438.03 | 14.91 | -2.67 | 0.803 |
| 60.00 | -11.86 | -14.33 | 0.00 | -1,071.38 | 0.00 | 1,071.38 | 1,870.33 | 935.17 | 2,753.97 | 1,379.03 | 17.87 | -2.99 | 0.783 |
| 65.00 | -11.24 | -14.05 | 0.00 | -999.73 | 0.00 | 999.73 | 1,840.20 | 920.10 | 2,636.91 | 1,320.41 | 21.17 | -3.31 | 0.763 |
| 70.00 | -10.62 | -13.77 | 0.00 | -929.47 | 0.00 | 929.47 | 1,808.98 | 904.49 | 2,520.72 | 1,262.23 | 24.80 | -3.63 | 0.742 |
| 75.00 | -10.02 | -13.48 | 0.00 | -860.63 | 0.00 | 860.63 | 1,776.69 | 888.34 | 2,405.54 | 1,204.56 | 28.78 | -3.96 | 0.720 |
| 80.00 | -9.44 | -13.20 | 0.00 | -793.22 | 0.00 | 793.22 | 1,743.32 | 871.66 | 2,291.50 | 1,147.45 | 33.09 | -4.28 | 0.697 |
| 85.00 | -8.87 | -12.91 | 0.00 | -727.24 | 0.00 | 727.24 | 1,708.87 | 854.43 | 2,178.71 | 1,090.98 | 37.75 | -4.61 | 0.672 |
| 90.00 | -8.32 | -12.68 | 0.00 | -662.70 | 0.00 | 662.70 | 1,673.34 | 836.67 | 2,067.32 | 1,035.20 | 42.75 | -4.94 | 0.645 |
| 92.65 | -8.04 | -12.53 | 0.00 | -629.16 | 0.00 | 629.16 | 1,654.10 | 827.05 | 2,008.98 | 1,005.98 | 45.54 | -5.12 | 0.631 |
| 95.00 | -7.66 | -12.39 | 0.00 | -599.67 | 0.00 | 599.67 | 1,636.74 | 818.37 | 1,957.44 | 980.18 | 48.10 | -5.28 | 0.617 |
| 96.93 | -7.34 | -12.24 | 0.00 | -575.79 | 0.00 | 575.79 | 1,103.35 | 551.67 | 1,325.55 | 663.76 | 50.26 | -5.41 | 0.875 |
| 100.00 | -7.06 | -12.02 | 0.00 | -538.19 | 0.00 | 538.19 | 1,091.13 | 545.56 | 1,284.38 | 643.14 | 53.80 | -5.61 | 0.844 |
| 105.00 | -6.61 | -11.75 | 0.00 | -478.08 | 0.00 | 478.08 | 1,070.38 | 535.19 | 1,217.67 | 609.74 | 59.89 | -6.03 | 0.791 |
| 110.00 | -6.18 | -11.47 | 0.00 | -419.36 | 0.00 | 419.36 | 1,048.55 | 524.27 | 1,151.42 | 576.56 | 66.41 | -6.43 | 0.734 |
| 115.00 | -5.76 | -11.20 | 0.00 | -362.01 | 0.00 | 362.01 | 1,025.64 | 512.82 | 1,085.75 | 543.68 | 73.33 | -6.81 | 0.672 |
| 120.00 | -5.36 | -10.92 | 0.00 | -306.03 | 0.00 | 306.03 | 1,001.65 | 500.83 | 1,020.79 | 511.15 | 80.65 | -7.19 | 0.605 |
| 125.00 | -4.97 | -10.65 | 0.00 | -251.43 | 0.00 | 251.43 | 976.59 | 488.30 | 956.67 | 479.05 | 88.35 | -7.53 | 0.530 |
| 130.00 | -4.61 | -10.38 | 0.00 | -198.18 | 0.00 | 198.18 | 950.45 | 475.22 | 893.52 | 447.42 | 96.38 | -7.85 | 0.448 |
| 135.00 | -4.26 | -10.20 | 0.00 | -146.30 | 0.00 | 146.30 | 923.23 | 461.61 | 831.46 | 416.35 | 104.73 | -8.12 | 0.356 |
| 136.00 | -3.14 | -7.54 | 0.00 | -136.10 | 0.00 | 136.10 | 917.66 | 458.83 | 819.19 | 410.21 | 106.43 | -8.17 | 0.335 |
| 140.00 | -2.89 | -7.41 | 0.00 | -105.95 | 0.00 | 105.95 | 894.93 | 447.47 | 770.63 | 385.89 | 113.32 | -8.35 | 0.278 |
| 140.02 | -2.89 | -7.34 | 0.00 | -105.80 | 0.00 | 105.80 | 894.81 | 447.41 | 770.38 | 385.76 | 113.36 | -8.35 | 0.278 |
| 143.22 | -2.59 | -7.18 | 0.00 | -82.32 | 0.00 | 82.32 | 887.67 | 443.84 | 755.59 | 378.35 | 118.97 | -8.47 | 0.221 |
| 145.00 | -2.48 | -7.10 | 0.00 | -69.53 | 0.00 | 69.53 | 877.23 | 438.62 | 734.36 | 367.72 | 122.14 | -8.53 | 0.192 |
| 146.00 | -1.57 | -3.81 | 0.00 | -62.43 | 0.00 | 62.43 | 871.31 | 435.66 | 722.52 | 361.80 | 123.92 | -8.56 | 0.174 |
| 150.00 | -1.38 | -3.59 | 0.00 | -47.17 | 0.00 | 47.17 | 847.20 | 423.60 | 675.75 | 338.38 | 131.11 | -8.66 | 0.141 |
| 155.00 | -1.14 | -3.36 | 0.00 | -29.24 | 0.00 | 29.24 | 816.09 | 408.05 | 618.71 | 309.81 | 140.20 | -8.76 | 0.096 |
| 157.00 | -0.86 | -2.56 | 0.00 | -22.51 | 0.00 | 22.51 | 800.73 | 400.36 | 594.40 | 297.64 | 143.86 | -8.79 | 0.077 |
| 158.56 | -0.81 | -2.43 | 0.00 | -18.51 | 0.00 | 18.51 | 787.55 | 393.77 | 574.90 | 287.88 | 146.73 | -8.81 | 0.065 |
| 158.56 | -0.81 | -2.43 | 0.00 | -18.51 | 0.00 | 18.51 | 551.08 | 275.54 | 275.63 | 180.95 | 146.73 | -8.81 | 0.104 |
| 160.00 | -0.76 | -2.23 | 0.00 | -15.02 | 0.00 | 15.02 | 551.08 | 275.54 | 275.63 | 180.95 | 149.37 | -8.83 | 0.084 |
| 165.00 | -0.53 | -1.92 | 0.00 | -3.89 | 0.00 | 3.89 | 551.08 | 275.54 | 275.63 | 180.95 | 158.61 | -8.87 | 0.022 |
| 167.00 | -0.07 | -0.03 | 0.00 | -0.05 | 0.00 | 0.05 | 551.08 | 275.54 | 275.63 | 180.95 | 162.31 | -8.88 | 0.000 |
| 168.56 | 0.00 | -0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 551.08 | 275.54 | 275.63 | 180.95 | 165.21 | -8.88 | 0.000 |

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph with 0.75 in Radial Ice 33 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00 Wind Importance Factor :1.00
Dead Load Factor :1.20 Ice Importance Factor :1.00
Wind Load Factor :1.00

## Applied Segment Forces Summary

| | | Shaft Forces | | Discrete Forces | | | | Linear Forces | | Sum of Forces | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seg Elev (ft) | Description | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Torsion MY (lb-ft) | Moment MZ (lb) |
| 0.00 | | 37.1 | 0.0 | | | | | 0.0 | 0.0 | 37.1 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 73.7 | 1,278.5 | | | | | 249.6 | 366.5 | 323.3 | 1,644.9 | 0.0 | 0.0 |
| 10.00 | | 72.6 | 1,292.3 | | | | | 195.5 | 383.0 | 268.0 | 1,675.2 | 0.0 | 0.0 |
| 15.00 | | 71.3 | 1,285.1 | | | | | 193.3 | 391.5 | 264.6 | 1,676.6 | 0.0 | 0.0 |
| 20.00 | | 70.0 | 1,271.0 | | | | | 190.8 | 397.4 | 260.8 | 1,668.4 | 0.0 | 0.0 |
| 25.00 | | 68.6 | 1,253.4 | | | | | 188.2 | 402.0 | 256.9 | 1,655.4 | 0.0 | 0.0 |
| 30.00 | | 68.0 | 1,233.6 | | | | | 185.6 | 405.7 | 253.6 | 1,639.3 | 0.0 | 0.0 |
| 35.00 | | 68.8 | 1,212.2 | | | | | 187.2 | 408.9 | 256.1 | 1,621.1 | 0.0 | 0.0 |
| 40.00 | | 70.0 | 1,189.6 | | | | | 192.1 | 411.7 | 262.1 | 1,601.4 | 0.0 | 0.0 |
| 45.00 | | 43.2 | 1,166.2 | | | | | 196.0 | 414.2 | 239.2 | 1,580.4 | 0.0 | 0.0 |
| 46.12 | Bot - Section 2 | 35.9 | 258.1 | | | | | 44.2 | 92.9 | 80.2 | 351.0 | 0.0 | 0.0 |
| 50.00 | | 38.6 | 1,368.4 | | | | | 154.8 | 323.6 | 193.4 | 1,692.1 | 0.0 | 0.0 |
| 51.46 | Top - Section 1 | 36.2 | 508.4 | | | | | 58.5 | 121.9 | 94.8 | 630.3 | 0.0 | 0.0 |
| 55.00 | | 62.0 | 695.0 | | | | | 144.3 | 296.7 | 206.3 | 991.6 | 0.0 | 0.0 |
| 60.00 | | 72.7 | 961.5 | | | | | 205.3 | 420.4 | 278.0 | 1,382.0 | 0.0 | 0.0 |
| 65.00 | | 72.6 | 939.8 | | | | | 206.7 | 422.2 | 279.3 | 1,362.0 | 0.0 | 0.0 |
| 70.00 | | 72.4 | 917.6 | | | | | 207.7 | 423.8 | 280.1 | 1,341.5 | 0.0 | 0.0 |
| 75.00 | | 72.0 | 895.2 | | | | | 208.2 | 425.4 | 280.2 | 1,320.6 | 0.0 | 0.0 |
| 80.00 | | 71.4 | 872.4 | | | | | 208.4 | 426.8 | 279.9 | 1,299.3 | 0.0 | 0.0 |
| 85.00 | | 70.8 | 849.4 | | | | | 208.3 | 428.2 | 279.1 | 1,277.6 | 0.0 | 0.0 |
| 90.00 | | 53.7 | 826.2 | | | | | 207.8 | 429.5 | 261.5 | 1,255.7 | 0.0 | 0.0 |
| 92.65 | Bot - Section 3 | 35.0 | 429.0 | | | | | 109.7 | 227.8 | 144.7 | 656.7 | 0.0 | 0.0 |
| 95.00 | | 29.9 | 548.5 | | | | | 97.4 | 202.9 | 127.4 | 751.5 | 0.0 | 0.0 |
| 96.93 | Top - Section 2 | 34.7 | 443.4 | | | | | 79.6 | 166.3 | 114.3 | 609.7 | 0.0 | 0.0 |
| 100.00 | | 55.5 | 412.0 | | | | | 127.6 | 265.6 | 183.1 | 677.6 | 0.0 | 0.0 |
| 105.00 | | 67.8 | 652.4 | | | | | 206.7 | 433.0 | 274.5 | 1,085.4 | 0.0 | 0.0 |
| 110.00 | | 66.7 | 632.3 | | | | | 205.3 | 434.1 | 271.9 | 1,066.4 | 0.0 | 0.0 |
| 115.00 | | 65.4 | 612.0 | | | | | 203.6 | 435.1 | 269.1 | 1,047.1 | 0.0 | 0.0 |
| 120.00 | | 64.1 | 591.6 | | | | | 201.8 | 436.1 | 266.0 | 1,027.7 | 0.0 | 0.0 |
| 125.00 | | 62.7 | 571.0 | | | | | 199.8 | 437.1 | 262.6 | 1,008.1 | 0.0 | 0.0 |
| 130.00 | | 61.2 | 550.3 | | | | | 197.7 | 438.0 | 258.9 | 988.4 | 0.0 | 0.0 |
| 135.00 | | 36.2 | 529.6 | | | | | 195.3 | 438.9 | 231.5 | 968.5 | 0.0 | 0.0 |
| 136.00 | Appurtenance(s) | 29.5 | 104.2 | 373.5 | 0.0 | 0.0 | 3,597.8 | 38.8 | 87.9 | 441.7 | 3,789.9 | 0.0 | 0.0 |
| 140.00 | | 23.6 | 406.1 | | | | | 154.1 | 328.7 | 177.7 | 734.8 | 0.0 | 0.0 |
| 140.02 | Bot - Section 4 | 18.8 | 2.1 | | | | | 0.8 | 1.7 | 19.6 | 3.8 | 0.0 | 0.0 |
| 143.22 | Top - Section 3 | 29.0 | 481.6 | | | | | 122.0 | 263.2 | 150.9 | 744.8 | 0.0 | 0.0 |
| 145.00 | | 16.0 | 175.6 | | | | | 68.1 | 146.8 | 84.1 | 322.3 | 0.0 | 0.0 |
| 146.00 | Appurtenance(s) | 28.2 | 97.6 | 562.6 | 0.0 | 0.0 | 2,731.3 | 38.1 | 82.4 | 628.9 | 2,911.3 | 0.0 | 0.0 |
| 150.00 | | 49.9 | 379.3 | | | | | 151.2 | 306.4 | 201.1 | 685.7 | 0.0 | 0.0 |
| 155.00 | | 38.1 | 454.0 | | | | | 186.4 | 383.8 | 224.5 | 837.7 | 0.0 | 0.0 |
| 157.00 | Appurtenance(s) | 19.0 | 176.9 | 95.5 | 0.0 | 0.0 | 731.3 | 73.7 | 153.7 | 188.1 | 1,061.9 | 0.0 | 0.0 |
| 158.56 | Top - Section 4 | 13.9 | 136.0 | | | | | 57.2 | 101.7 | 71.1 | 237.7 | 0.0 | 0.0 |
| 160.00 | | 25.4 | 130.3 | | | | | 44.6 | 93.7 | 70.0 | 223.9 | 0.0 | 0.0 |
| 165.00 | | 27.7 | 453.5 | | | | | 156.0 | 326.2 | 183.7 | 779.7 | 0.0 | 0.0 |
| 167.00 | Appurtenance(s) | 14.2 | 181.5 | 287.9 | 0.0 | -580.8 | 1,941.4 | 62.8 | 130.7 | 364.9 | 2,253.6 | 0.0 | 0.0 |
| 168.56 | | 6.2 | 141.9 | | | | | 0.0 | 0.0 | 6.2 | 141.9 | 0.0 | 0.0 |

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph with 0.75 in Radial Ice 33 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00 Wind Importance Factor :1.00
Dead Load Factor :1.20 Ice Importance Factor :1.00
Wind Load Factor :1.00

| | | | | |
|---|---|---|---|---|
| Totals: | 10,150.9 | 52,282.4 | 0.00 | 0.00 |

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph with 0.75 in Radial Ice 33 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00 Wind Importance Factor :1.00
Dead Load Factor :1.20 Ice Importance Factor :1.00
Wind Load Factor :1.00

## Calculated Forces

| 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 | -52.27 | -10.17 | 0.00 | -1,047.65 | 0.00 | 1,047.65 | 2,995.17 | 1,497.58 | 5,752.58 | 2,880.56 | 0.00 | 0.00 | 0.381 |
| 5.00 | -50.61 | -9.94 | 0.00 | -996.82 | 0.00 | 996.82 | 2,959.81 | 1,479.91 | 5,567.76 | 2,788.02 | 0.06 | -0.11 | 0.375 |
| 10.00 | -48.91 | -9.77 | 0.00 | -947.10 | 0.00 | 947.10 | 2,923.38 | 1,461.69 | 5,383.76 | 2,695.88 | 0.24 | -0.23 | 0.368 |
| 15.00 | -47.22 | -9.59 | 0.00 | -898.26 | 0.00 | 898.26 | 2,885.88 | 1,442.94 | 5,200.69 | 2,604.21 | 0.55 | -0.35 | 0.361 |
| 20.00 | -45.53 | -9.41 | 0.00 | -850.30 | 0.00 | 850.30 | 2,847.29 | 1,423.65 | 5,018.68 | 2,513.07 | 0.97 | -0.46 | 0.354 |
| 25.00 | -43.86 | -9.23 | 0.00 | -803.23 | 0.00 | 803.23 | 2,807.63 | 1,403.81 | 4,837.86 | 2,422.53 | 1.52 | -0.58 | 0.347 |
| 30.00 | -42.21 | -9.05 | 0.00 | -757.06 | 0.00 | 757.06 | 2,766.89 | 1,383.44 | 4,658.36 | 2,332.64 | 2.20 | -0.70 | 0.340 |
| 35.00 | -40.57 | -8.86 | 0.00 | -711.81 | 0.00 | 711.81 | 2,725.06 | 1,362.53 | 4,480.31 | 2,243.49 | 3.00 | -0.82 | 0.332 |
| 40.00 | -38.95 | -8.66 | 0.00 | -667.51 | 0.00 | 667.51 | 2,682.17 | 1,341.08 | 4,303.83 | 2,155.12 | 3.93 | -0.95 | 0.324 |
| 45.00 | -37.37 | -8.44 | 0.00 | -624.23 | 0.00 | 624.23 | 2,638.19 | 1,319.10 | 4,129.06 | 2,067.60 | 4.98 | -1.07 | 0.316 |
| 46.12 | -37.01 | -8.39 | 0.00 | -614.81 | 0.00 | 614.81 | 2,628.22 | 1,314.11 | 4,090.25 | 2,048.17 | 5.24 | -1.10 | 0.314 |
| 50.00 | -35.31 | -8.21 | 0.00 | -582.22 | 0.00 | 582.22 | 2,593.14 | 1,296.57 | 3,956.11 | 1,981.00 | 6.17 | -1.20 | 0.308 |
| 51.46 | -34.67 | -8.14 | 0.00 | -570.26 | 0.00 | 570.26 | 1,919.32 | 959.66 | 2,955.63 | 1,480.01 | 6.54 | -1.23 | 0.403 |
| 55.00 | -33.67 | -7.98 | 0.00 | -541.44 | 0.00 | 541.44 | 1,899.39 | 949.70 | 2,871.79 | 1,438.03 | 7.49 | -1.32 | 0.394 |
| 60.00 | -32.28 | -7.75 | 0.00 | -501.55 | 0.00 | 501.55 | 1,870.33 | 935.17 | 2,753.97 | 1,379.03 | 8.95 | -1.47 | 0.381 |
| 65.00 | -30.90 | -7.51 | 0.00 | -462.80 | 0.00 | 462.80 | 1,840.20 | 920.10 | 2,636.91 | 1,320.41 | 10.57 | -1.62 | 0.367 |
| 70.00 | -29.55 | -7.27 | 0.00 | -425.23 | 0.00 | 425.23 | 1,808.98 | 904.49 | 2,520.72 | 1,262.23 | 12.35 | -1.77 | 0.353 |
| 75.00 | -28.22 | -7.02 | 0.00 | -388.87 | 0.00 | 388.87 | 1,776.69 | 888.34 | 2,405.54 | 1,204.56 | 14.28 | -1.92 | 0.339 |
| 80.00 | -26.92 | -6.77 | 0.00 | -353.76 | 0.00 | 353.76 | 1,743.32 | 871.66 | 2,291.50 | 1,147.45 | 16.37 | -2.06 | 0.324 |
| 85.00 | -25.63 | -6.50 | 0.00 | -319.93 | 0.00 | 319.93 | 1,708.87 | 854.43 | 2,178.71 | 1,090.98 | 18.61 | -2.21 | 0.308 |
| 90.00 | -24.38 | -6.24 | 0.00 | -287.41 | 0.00 | 287.41 | 1,673.34 | 836.67 | 2,067.32 | 1,035.20 | 21.00 | -2.35 | 0.292 |
| 92.65 | -23.72 | -6.10 | 0.00 | -270.90 | 0.00 | 270.90 | 1,654.10 | 827.05 | 2,008.98 | 1,005.98 | 22.33 | -2.43 | 0.284 |
| 95.00 | -22.97 | -5.96 | 0.00 | -256.54 | 0.00 | 256.54 | 1,636.74 | 818.37 | 1,957.44 | 980.18 | 23.54 | -2.50 | 0.276 |
| 96.93 | -22.36 | -5.85 | 0.00 | -245.05 | 0.00 | 245.05 | 1,103.35 | 551.67 | 1,325.55 | 663.76 | 24.56 | -2.56 | 0.390 |
| 100.00 | -21.67 | -5.69 | 0.00 | -227.08 | 0.00 | 227.08 | 1,091.13 | 545.56 | 1,284.38 | 643.14 | 26.23 | -2.64 | 0.373 |
| 105.00 | -20.59 | -5.42 | 0.00 | -198.65 | 0.00 | 198.65 | 1,070.38 | 535.19 | 1,217.67 | 609.74 | 29.09 | -2.81 | 0.345 |
| 110.00 | -19.52 | -5.15 | 0.00 | -171.55 | 0.00 | 171.55 | 1,048.55 | 524.27 | 1,151.42 | 576.56 | 32.13 | -2.98 | 0.316 |
| 115.00 | -18.48 | -4.88 | 0.00 | -145.80 | 0.00 | 145.80 | 1,025.64 | 512.82 | 1,085.75 | 543.68 | 35.33 | -3.14 | 0.286 |
| 120.00 | -17.46 | -4.60 | 0.00 | -121.42 | 0.00 | 121.42 | 1,001.65 | 500.83 | 1,020.79 | 511.15 | 38.70 | -3.28 | 0.255 |
| 125.00 | -16.45 | -4.31 | 0.00 | -98.45 | 0.00 | 98.45 | 976.59 | 488.30 | 956.67 | 479.05 | 42.21 | -3.42 | 0.222 |
| 130.00 | -15.48 | -4.02 | 0.00 | -76.89 | 0.00 | 76.89 | 950.45 | 475.22 | 893.52 | 447.42 | 45.86 | -3.54 | 0.188 |
| 135.00 | -14.52 | -3.75 | 0.00 | -56.77 | 0.00 | 56.77 | 923.23 | 461.61 | 831.46 | 416.35 | 49.63 | -3.65 | 0.152 |
| 136.00 | -10.76 | -3.07 | 0.00 | -53.03 | 0.00 | 53.03 | 917.66 | 458.83 | 819.19 | 410.21 | 50.39 | -3.67 | 0.141 |
| 140.00 | -10.04 | -2.85 | 0.00 | -40.74 | 0.00 | 40.74 | 894.93 | 447.47 | 770.63 | 385.89 | 53.49 | -3.74 | 0.117 |
| 140.02 | -10.04 | -2.84 | 0.00 | -40.68 | 0.00 | 40.68 | 894.81 | 447.41 | 770.38 | 385.76 | 53.51 | -3.74 | 0.117 |
| 143.22 | -9.30 | -2.64 | 0.00 | -31.60 | 0.00 | 31.60 | 887.67 | 443.84 | 755.59 | 378.35 | 56.03 | -3.79 | 0.094 |
| 145.00 | -8.98 | -2.54 | 0.00 | -26.89 | 0.00 | 26.89 | 877.23 | 438.62 | 734.36 | 367.72 | 57.45 | -3.81 | 0.083 |
| 146.00 | -6.12 | -1.72 | 0.00 | -24.35 | 0.00 | 24.35 | 871.31 | 435.66 | 722.52 | 361.80 | 58.24 | -3.82 | 0.074 |
| 150.00 | -5.45 | -1.48 | 0.00 | -17.45 | 0.00 | 17.45 | 847.20 | 423.60 | 675.75 | 338.38 | 61.46 | -3.86 | 0.058 |
| 155.00 | -4.63 | -1.20 | 0.00 | -10.05 | 0.00 | 10.05 | 816.09 | 408.05 | 618.71 | 309.81 | 65.52 | -3.89 | 0.038 |
| 157.00 | -3.58 | -0.94 | 0.00 | -7.65 | 0.00 | 7.65 | 800.73 | 400.36 | 594.40 | 297.64 | 67.15 | -3.90 | 0.030 |
| 158.56 | -3.35 | -0.86 | 0.00 | -6.18 | 0.00 | 6.18 | 787.55 | 393.77 | 574.90 | 287.88 | 68.43 | -3.91 | 0.026 |
| 158.56 | -3.35 | -0.86 | 0.00 | -6.18 | 0.00 | 6.18 | 551.08 | 275.54 | 275.63 | 180.95 | 68.43 | -3.91 | 0.040 |
| 160.00 | -3.13 | -0.77 | 0.00 | -4.95 | 0.00 | 4.95 | 551.08 | 275.54 | 275.63 | 180.95 | 69.61 | -3.92 | 0.033 |
| 165.00 | -2.36 | -0.53 | 0.00 | -1.09 | 0.00 | 1.09 | 551.08 | 275.54 | 275.63 | 180.95 | 73.72 | -3.93 | 0.010 |
| 167.00 | -0.14 | -0.02 | 0.00 | -0.02 | 0.00 | 0.02 | 551.08 | 275.54 | 275.63 | 180.95 | 75.36 | -3.93 | 0.000 |
| 168.56 | 0.00 | -0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 551.08 | 275.54 | 275.63 | 180.95 | 76.65 | -3.93 | 0.000 |

Load Case: 1.0D + 1.0W Serviceability 60 mph 31 Iterations

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

## Applied Segment Forces Summary

| | | Shaft Forces | | Discrete Forces | | | | Linear Forces | | Sum of Forces | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seg Elev (ft) | Description | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Torsion MY (lb-ft) | Moment MZ (lb) |
| 0.00 | | 43.1 | 0.0 | | | | | 0.0 | 0.0 | 43.1 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 85.4 | 779.8 | | | | | 0.0 | 153.4 | 85.4 | 933.2 | 0.0 | 0.0 |
| 10.00 | | 83.6 | 763.7 | | | | | 0.0 | 153.4 | 83.6 | 917.1 | 0.0 | 0.0 |
| 15.00 | | 81.8 | 747.6 | | | | | 0.0 | 153.4 | 81.8 | 901.0 | 0.0 | 0.0 |
| 20.00 | | 80.1 | 731.5 | | | | | 0.0 | 153.4 | 80.1 | 884.9 | 0.0 | 0.0 |
| 25.00 | | 78.3 | 715.4 | | | | | 0.0 | 153.4 | 78.3 | 868.8 | 0.0 | 0.0 |
| 30.00 | | 77.4 | 699.3 | | | | | 0.0 | 153.4 | 77.4 | 852.7 | 0.0 | 0.0 |
| 35.00 | | 78.1 | 683.2 | | | | | 0.0 | 153.4 | 78.1 | 836.6 | 0.0 | 0.0 |
| 40.00 | | 79.3 | 667.1 | | | | | 0.0 | 153.4 | 79.3 | 820.5 | 0.0 | 0.0 |
| 45.00 | | 48.8 | 651.0 | | | | | 0.0 | 153.4 | 48.8 | 804.4 | 0.0 | 0.0 |
| 46.12 | Bot - Section 2 | 40.5 | 143.3 | | | | | 0.0 | 34.3 | 40.5 | 177.5 | 0.0 | 0.0 |
| 50.00 | | 43.5 | 890.9 | | | | | 0.0 | 119.1 | 43.5 | 1,010.0 | 0.0 | 0.0 |
| 51.46 | Top - Section 1 | 40.8 | 330.1 | | | | | 0.0 | 44.7 | 40.8 | 374.8 | 0.0 | 0.0 |
| 55.00 | | 69.7 | 354.7 | | | | | 0.0 | 108.6 | 69.7 | 463.3 | 0.0 | 0.0 |
| 60.00 | | 81.5 | 489.8 | | | | | 0.0 | 153.4 | 81.5 | 643.1 | 0.0 | 0.0 |
| 65.00 | | 81.2 | 476.9 | | | | | 0.0 | 153.4 | 81.2 | 630.3 | 0.0 | 0.0 |
| 70.00 | | 80.7 | 464.0 | | | | | 0.0 | 153.4 | 80.7 | 617.4 | 0.0 | 0.0 |
| 75.00 | | 80.0 | 451.2 | | | | | 0.0 | 153.4 | 80.0 | 604.5 | 0.0 | 0.0 |
| 80.00 | | 79.1 | 438.3 | | | | | 0.0 | 153.4 | 79.1 | 591.6 | 0.0 | 0.0 |
| 85.00 | | 78.2 | 425.4 | | | | | 0.0 | 153.4 | 78.2 | 578.7 | 0.0 | 0.0 |
| 90.00 | | 59.1 | 412.5 | | | | | 0.0 | 153.4 | 59.1 | 565.9 | 0.0 | 0.0 |
| 92.65 | Bot - Section 3 | 38.4 | 213.1 | | | | | 0.0 | 81.1 | 38.4 | 294.2 | 0.0 | 0.0 |
| 95.00 | | 32.9 | 328.6 | | | | | 0.0 | 72.2 | 32.9 | 400.8 | 0.0 | 0.0 |
| 96.93 | Top - Section 2 | 38.0 | 265.2 | | | | | 0.0 | 59.1 | 38.0 | 324.3 | 0.0 | 0.0 |
| 100.00 | | 60.6 | 179.9 | | | | | 0.0 | 94.2 | 60.6 | 274.1 | 0.0 | 0.0 |
| 105.00 | | 73.9 | 284.8 | | | | | 0.0 | 153.4 | 73.9 | 438.2 | 0.0 | 0.0 |
| 110.00 | | 72.3 | 275.2 | | | | | 0.0 | 153.4 | 72.3 | 428.5 | 0.0 | 0.0 |
| 115.00 | | 70.6 | 265.5 | | | | | 0.0 | 153.4 | 70.6 | 418.9 | 0.0 | 0.0 |
| 120.00 | | 68.9 | 255.9 | | | | | 0.0 | 153.4 | 68.9 | 409.2 | 0.0 | 0.0 |
| 125.00 | | 67.0 | 246.2 | | | | | 0.0 | 153.4 | 67.0 | 399.6 | 0.0 | 0.0 |
| 130.00 | | 65.1 | 236.6 | | | | | 0.0 | 153.4 | 65.1 | 389.9 | 0.0 | 0.0 |
| 135.00 | | 38.3 | 226.9 | | | | | 0.0 | 153.4 | 38.3 | 380.2 | 0.0 | 0.0 |
| 136.00 | Appurtenance(s) | 31.0 | 44.2 | 614.3 | 0.0 | 0.0 | 1,563.9 | 0.0 | 30.7 | 645.3 | 1,638.8 | 0.0 | 0.0 |
| 140.00 | | 24.9 | 173.0 | | | | | 0.0 | 103.4 | 24.9 | 276.4 | 0.0 | 0.0 |
| 140.02 | Bot - Section 4 | 19.8 | 0.9 | | | | | 0.0 | 0.5 | 19.8 | 1.4 | 0.0 | 0.0 |
| 143.22 | Top - Section 3 | 30.4 | 270.1 | | | | | 0.0 | 82.6 | 30.4 | 352.8 | 0.0 | 0.0 |
| 145.00 | | 16.7 | 74.2 | | | | | 0.0 | 46.0 | 16.7 | 120.2 | 0.0 | 0.0 |
| 146.00 | Appurtenance(s) | 29.4 | 41.1 | 782.4 | 0.0 | 0.0 | 1,475.0 | 0.0 | 25.8 | 811.9 | 1,542.0 | 0.0 | 0.0 |
| 150.00 | | 51.7 | 160.6 | | | | | 0.0 | 83.7 | 51.7 | 244.3 | 0.0 | 0.0 |
| 155.00 | | 48.6 | 192.1 | | | | | 0.0 | 104.6 | 48.6 | 296.7 | 0.0 | 0.0 |
| 157.00 | Appurtenance(s) | 35.9 | 74.1 | 150.7 | 0.0 | 0.0 | 327.6 | 8.2 | 41.8 | 194.8 | 443.6 | 0.0 | 0.0 |
| 158.56 | Top - Section 4 | 25.6 | 56.8 | | | | | 6.5 | 17.3 | 32.0 | 74.1 | 0.0 | 0.0 |
| 160.00 | | 44.8 | 71.3 | | | | | 6.0 | 15.9 | 50.9 | 87.2 | 0.0 | 0.0 |
| 165.00 | | 48.9 | 248.0 | | | | | 21.1 | 55.4 | 70.0 | 303.4 | 0.0 | 0.0 |
| 167.00 | Appurtenance(s) | 19.5 | 99.2 | 438.3 | 0.0 | -851.6 | 711.0 | 8.5 | 22.2 | 466.3 | 832.4 | 0.0 | 0.0 |
| 168.56 | | 5.5 | 77.5 | | | | | 0.0 | 0.0 | 5.5 | 77.5 | 0.0 | 0.0 |

Load Case: 1.0D + 1.0W Serviceability 60 mph 31 Iterations

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

| | | | | |
|---|---|---|---|---|
| Totals: | 4,565.05 | 24,524.9 | 0.00 | 0.00 |

Load Case: 1.0D + 1.0W Serviceability 60 mph 31 Iterations

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

## Calculated Forces

| 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 | -24.52 | -4.53 | 0.00 | -533.85 | 0.00 | 533.85 | 2,995.17 | 1,497.58 | 5,752.58 | 2,880.56 | 0.00 | 0.00 | 0.194 |
| 5.00 | -23.58 | -4.47 | 0.00 | -511.19 | 0.00 | 511.19 | 2,959.81 | 1,479.91 | 5,567.76 | 2,788.02 | 0.03 | -0.06 | 0.191 |
| 10.00 | -22.66 | -4.41 | 0.00 | -488.82 | 0.00 | 488.82 | 2,923.38 | 1,461.69 | 5,383.76 | 2,695.88 | 0.12 | -0.12 | 0.189 |
| 15.00 | -21.76 | -4.35 | 0.00 | -466.77 | 0.00 | 466.77 | 2,885.88 | 1,442.94 | 5,200.69 | 2,604.21 | 0.28 | -0.18 | 0.187 |
| 20.00 | -20.87 | -4.29 | 0.00 | -445.02 | 0.00 | 445.02 | 2,847.29 | 1,423.65 | 5,018.68 | 2,513.07 | 0.50 | -0.24 | 0.184 |
| 25.00 | -20.00 | -4.23 | 0.00 | -423.58 | 0.00 | 423.58 | 2,807.63 | 1,403.81 | 4,837.86 | 2,422.53 | 0.78 | -0.30 | 0.182 |
| 30.00 | -19.14 | -4.17 | 0.00 | -402.43 | 0.00 | 402.43 | 2,766.89 | 1,383.44 | 4,658.36 | 2,332.64 | 1.13 | -0.37 | 0.179 |
| 35.00 | -18.30 | -4.10 | 0.00 | -381.59 | 0.00 | 381.59 | 2,725.06 | 1,362.53 | 4,480.31 | 2,243.49 | 1.55 | -0.43 | 0.177 |
| 40.00 | -17.47 | -4.04 | 0.00 | -361.07 | 0.00 | 361.07 | 2,682.17 | 1,341.08 | 4,303.83 | 2,155.12 | 2.04 | -0.50 | 0.174 |
| 45.00 | -16.67 | -3.99 | 0.00 | -340.87 | 0.00 | 340.87 | 2,638.19 | 1,319.10 | 4,129.06 | 2,067.60 | 2.59 | -0.56 | 0.171 |
| 46.12 | -16.49 | -3.96 | 0.00 | -336.41 | 0.00 | 336.41 | 2,628.22 | 1,314.11 | 4,090.25 | 2,048.17 | 2.73 | -0.58 | 0.171 |
| 50.00 | -15.48 | -3.92 | 0.00 | -321.03 | 0.00 | 321.03 | 2,593.14 | 1,296.57 | 3,956.11 | 1,981.00 | 3.22 | -0.63 | 0.168 |
| 51.46 | -15.10 | -3.88 | 0.00 | -315.31 | 0.00 | 315.31 | 1,919.32 | 959.66 | 2,955.63 | 1,480.01 | 3.41 | -0.65 | 0.221 |
| 55.00 | -14.63 | -3.82 | 0.00 | -301.56 | 0.00 | 301.56 | 1,899.39 | 949.70 | 2,871.79 | 1,438.03 | 3.92 | -0.70 | 0.217 |
| 60.00 | -13.98 | -3.75 | 0.00 | -282.44 | 0.00 | 282.44 | 1,870.33 | 935.17 | 2,753.97 | 1,379.03 | 4.70 | -0.79 | 0.212 |
| 65.00 | -13.35 | -3.68 | 0.00 | -263.67 | 0.00 | 263.67 | 1,840.20 | 920.10 | 2,636.91 | 1,320.41 | 5.57 | -0.87 | 0.207 |
| 70.00 | -12.73 | -3.61 | 0.00 | -245.24 | 0.00 | 245.24 | 1,808.98 | 904.49 | 2,520.72 | 1,262.23 | 6.52 | -0.96 | 0.201 |
| 75.00 | -12.12 | -3.54 | 0.00 | -227.18 | 0.00 | 227.18 | 1,776.69 | 888.34 | 2,405.54 | 1,204.56 | 7.57 | -1.04 | 0.195 |
| 80.00 | -11.52 | -3.47 | 0.00 | -209.48 | 0.00 | 209.48 | 1,743.32 | 871.66 | 2,291.50 | 1,147.45 | 8.70 | -1.13 | 0.189 |
| 85.00 | -10.94 | -3.39 | 0.00 | -192.14 | 0.00 | 192.14 | 1,708.87 | 854.43 | 2,178.71 | 1,090.98 | 9.93 | -1.21 | 0.183 |
| 90.00 | -10.37 | -3.34 | 0.00 | -175.17 | 0.00 | 175.17 | 1,673.34 | 836.67 | 2,067.32 | 1,035.20 | 11.25 | -1.30 | 0.175 |
| 92.65 | -10.08 | -3.30 | 0.00 | -166.34 | 0.00 | 166.34 | 1,654.10 | 827.05 | 2,008.98 | 1,005.98 | 11.99 | -1.35 | 0.171 |
| 95.00 | -9.68 | -3.26 | 0.00 | -158.58 | 0.00 | 158.58 | 1,636.74 | 818.37 | 1,957.44 | 980.18 | 12.66 | -1.39 | 0.168 |
| 96.93 | -9.35 | -3.22 | 0.00 | -152.29 | 0.00 | 152.29 | 1,103.35 | 551.67 | 1,325.55 | 663.76 | 13.23 | -1.43 | 0.238 |
| 100.00 | -9.07 | -3.17 | 0.00 | -142.39 | 0.00 | 142.39 | 1,091.13 | 545.56 | 1,284.38 | 643.14 | 14.17 | -1.48 | 0.230 |
| 105.00 | -8.63 | -3.10 | 0.00 | -126.55 | 0.00 | 126.55 | 1,070.38 | 535.19 | 1,217.67 | 609.74 | 15.77 | -1.59 | 0.216 |
| 110.00 | -8.20 | -3.03 | 0.00 | -111.05 | 0.00 | 111.05 | 1,048.55 | 524.27 | 1,151.42 | 576.56 | 17.50 | -1.69 | 0.200 |
| 115.00 | -7.78 | -2.96 | 0.00 | -95.90 | 0.00 | 95.90 | 1,025.64 | 512.82 | 1,085.75 | 543.68 | 19.33 | -1.80 | 0.184 |
| 120.00 | -7.37 | -2.89 | 0.00 | -81.11 | 0.00 | 81.11 | 1,001.65 | 500.83 | 1,020.79 | 511.15 | 21.26 | -1.90 | 0.166 |
| 125.00 | -6.97 | -2.82 | 0.00 | -66.66 | 0.00 | 66.66 | 976.59 | 488.30 | 956.67 | 479.05 | 23.30 | -1.99 | 0.146 |
| 130.00 | -6.57 | -2.75 | 0.00 | -52.56 | 0.00 | 52.56 | 950.45 | 475.22 | 893.52 | 447.42 | 25.42 | -2.07 | 0.124 |
| 135.00 | -6.19 | -2.70 | 0.00 | -38.80 | 0.00 | 38.80 | 923.23 | 461.61 | 831.46 | 416.35 | 27.63 | -2.14 | 0.100 |
| 136.00 | -4.58 | -2.00 | 0.00 | -36.10 | 0.00 | 36.10 | 917.66 | 458.83 | 819.19 | 410.21 | 28.08 | -2.16 | 0.093 |
| 140.00 | -4.30 | -1.97 | 0.00 | -28.11 | 0.00 | 28.11 | 894.93 | 447.47 | 770.63 | 385.89 | 29.91 | -2.20 | 0.078 |
| 140.02 | -4.30 | -1.95 | 0.00 | -28.07 | 0.00 | 28.07 | 894.81 | 447.41 | 770.38 | 385.76 | 29.92 | -2.20 | 0.078 |
| 143.22 | -3.95 | -1.90 | 0.00 | -21.84 | 0.00 | 21.84 | 887.67 | 443.84 | 755.59 | 378.35 | 31.40 | -2.24 | 0.062 |
| 145.00 | -3.83 | -1.88 | 0.00 | -18.45 | 0.00 | 18.45 | 877.23 | 438.62 | 734.36 | 367.72 | 32.24 | -2.25 | 0.055 |
| 146.00 | -2.32 | -1.01 | 0.00 | -16.57 | 0.00 | 16.57 | 871.31 | 435.66 | 722.52 | 361.80 | 32.71 | -2.26 | 0.048 |
| 150.00 | -2.08 | -0.95 | 0.00 | -12.52 | 0.00 | 12.52 | 847.20 | 423.60 | 675.75 | 338.38 | 34.62 | -2.29 | 0.039 |
| 155.00 | -1.78 | -0.89 | 0.00 | -7.76 | 0.00 | 7.76 | 816.09 | 408.05 | 618.71 | 309.81 | 37.03 | -2.31 | 0.027 |
| 157.00 | -1.35 | -0.68 | 0.00 | -5.97 | 0.00 | 5.97 | 800.73 | 400.36 | 594.40 | 297.64 | 38.00 | -2.32 | 0.022 |
| 158.56 | -1.28 | -0.64 | 0.00 | -4.91 | 0.00 | 4.91 | 787.55 | 393.77 | 574.90 | 287.88 | 38.76 | -2.33 | 0.019 |
| 158.56 | -1.28 | -0.64 | 0.00 | -4.91 | 0.00 | 4.91 | 551.08 | 275.54 | 275.63 | 180.95 | 38.76 | -2.33 | 0.029 |
| 160.00 | -1.19 | -0.59 | 0.00 | -3.98 | 0.00 | 3.98 | 551.08 | 275.54 | 275.63 | 180.95 | 39.46 | -2.33 | 0.024 |
| 165.00 | -0.89 | -0.51 | 0.00 | -1.03 | 0.00 | 1.03 | 551.08 | 275.54 | 275.63 | 180.95 | 41.91 | -2.34 | 0.007 |
| 167.00 | -0.08 | -0.01 | 0.00 | -0.01 | 0.00 | 0.01 | 551.08 | 275.54 | 275.63 | 180.95 | 42.89 | -2.34 | 0.000 |
| 168.56 | 0.00 | -0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 551.08 | 275.54 | 275.63 | 180.95 | 43.66 | -2.34 | 0.000 |

## Equivalent Lateral Forces Method Analysis

(Based on ASCE7-10 Chapters 11, 12, 15)

| | | |
|---|---|---|
| Spectral Response Acceleration for Short Period ($S_s$): | 0.19 | |
| Spectral Response Acceleration at 1.0 Second Period ($S_1$): | 0.06 | |
| Long-Period Transition Period ($T_L$): | 6 | |
| Importance Factor ($I_E$): | 1.00 | |
| Site Coefficient $F_a$: | 1.60 | |
| Site Coeffiecient $F_v$: | 2.40 | |
| Response Modification Coefficient (R): | 1.50 | |
| Design Spectral Response Acceleration at Short Period ($S_{ds}$): | 0.20 | |
| Design Spectral Response Acceleration at 1.0 Second Period ($S_{d1}$): | 0.10 | |
| Seismic Response Coefficient ($C_s$): | 0.03 | |
| Upper Limit $C_s$ | 0.03 | |
| Lower Limit $C_s$ | 0.03 | |
| Period based on Rayleigh Method (sec): | 2.91 | |
| Redundancy Factor (p): | 1.30 | |
| Seismic Force Distribution Exponent (k): | 2.00 | |
| Total Unfactored Dead Load: | 24.52 | k |
| Seismic Base Shear (E): | 0.96 | k |

Load Case (1.2 + 0.2Sds) * DL + E ELFM Seismic Equivalent Lateral Forces Method

| Segment | Height Above Base (ft) | Weight (lb) | $W_z$ (lb-ft) | $C_{vx}$ | Horizontal Force (lb) | Vertical Force (lb) |
|---|---|---|---|---|---|---|
| 45 | 167.78 | 78 | 2,182 | 0.010 | 9 | 96 |
| 44 | 166.00 | 121 | 3,345 | 0.015 | 14 | 151 |
| 43 | 162.50 | 303 | 8,013 | 0.036 | 34 | 376 |
| 42 | 159.28 | 87 | 2,213 | 0.010 | 10 | 108 |
| 41 | 157.78 | 74 | 1,846 | 0.008 | 8 | 92 |
| 40 | 156.00 | 116 | 2,822 | 0.013 | 12 | 144 |
| 39 | 152.50 | 297 | 6,899 | 0.031 | 30 | 368 |
| 38 | 148.00 | 244 | 5,351 | 0.024 | 23 | 303 |
| 37 | 145.50 | 67 | 1,417 | 0.006 | 6 | 83 |
| 36 | 144.11 | 120 | 2,497 | 0.011 | 11 | 149 |
| 35 | 141.62 | 353 | 7,075 | 0.032 | 30 | 438 |
| 34 | 140.01 | 1 | 28 | 0.000 | 0 | 2 |
| 33 | 138.00 | 276 | 5,263 | 0.024 | 23 | 343 |
| 32 | 135.50 | 75 | 1,375 | 0.006 | 6 | 93 |
| 31 | 132.50 | 380 | 6,676 | 0.030 | 29 | 472 |
| 30 | 127.50 | 390 | 6,338 | 0.029 | 27 | 484 |
| 29 | 122.50 | 400 | 5,996 | 0.027 | 26 | 496 |
| 28 | 117.50 | 409 | 5,650 | 0.025 | 24 | 508 |
| 27 | 112.50 | 419 | 5,301 | 0.024 | 23 | 520 |
| 26 | 107.50 | 429 | 4,952 | 0.022 | 21 | 532 |
| 25 | 102.50 | 438 | 4,604 | 0.021 | 20 | 544 |
| 24 | 98.46 | 274 | 2,657 | 0.012 | 11 | 340 |
| 23 | 95.96 | 324 | 2,987 | 0.013 | 13 | 402 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 22 | 93.82 | 401 | 3,528 | 0.016 | 15 | 497 |
| 21 | 91.32 | 294 | 2,454 | 0.011 | 11 | 365 |
| 20 | 87.50 | 566 | 4,332 | 0.020 | 19 | 702 |
| 19 | 82.50 | 579 | 3,939 | 0.018 | 17 | 718 |
| 18 | 77.50 | 592 | 3,553 | 0.016 | 15 | 734 |
| 17 | 72.50 | 605 | 3,177 | 0.014 | 14 | 750 |
| 16 | 67.50 | 617 | 2,813 | 0.013 | 12 | 766 |
| 15 | 62.50 | 630 | 2,462 | 0.011 | 11 | 782 |
| 14 | 57.50 | 643 | 2,126 | 0.010 | 9 | 798 |
| 13 | 53.23 | 463 | 1,313 | 0.006 | 6 | 575 |
| 12 | 50.73 | 375 | 965 | 0.004 | 4 | 465 |
| 11 | 48.06 | 1,010 | 2,333 | 0.010 | 10 | 1,253 |
| 10 | 45.56 | 178 | 368 | 0.002 | 2 | 220 |
| 9 | 42.50 | 804 | 1,453 | 0.007 | 6 | 998 |
| 8 | 37.50 | 820 | 1,154 | 0.005 | 5 | 1,018 |
| 7 | 32.50 | 837 | 884 | 0.004 | 4 | 1,038 |
| 6 | 27.50 | 853 | 645 | 0.003 | 3 | 1,058 |
| 5 | 22.50 | 869 | 440 | 0.002 | 2 | 1,078 |
| 4 | 17.50 | 885 | 271 | 0.001 | 1 | 1,098 |
| 3 | 12.50 | 901 | 141 | 0.001 | 1 | 1,118 |
| 2 | 7.50 | 917 | 52 | 0.000 | 0 | 1,138 |
| 1 | 2.50 | 933 | 6 | 0.000 | 0 | 1,158 |
| Generic RCU (Remote | 167.00 | 12 | 335 | 0.002 | 1 | 15 |
| Powerwave Allgon TT0 | 167.00 | 132 | 3,681 | 0.017 | 16 | 164 |
| Raycap DC6-48-60-18- | 167.00 | 32 | 887 | 0.004 | 4 | 39 |
| Ericsson RRUS 11 B2 | 167.00 | 304 | 8,484 | 0.038 | 37 | 377 |
| KMW AM-X-CD-17-65-00 | 167.00 | 31 | 859 | 0.004 | 4 | 38 |
| Powerwave Allgon P90 | 167.00 | 90 | 2,510 | 0.011 | 11 | 112 |
| Kathrein Scala 800-1 | 167.00 | 110 | 3,073 | 0.014 | 13 | 137 |
| Stand-Off | 157.00 | 225 | 5,546 | 0.025 | 24 | 279 |
| Andrew DBXNH-6565A-V | 157.00 | 103 | 2,529 | 0.011 | 11 | 127 |
| Stand-Off | 146.00 | 225 | 4,796 | 0.022 | 21 | 279 |
| Antel BXA-70063/6CF | 146.00 | 51 | 1,087 | 0.005 | 5 | 63 |
| VZW Unused Reserve: | 146.00 | 1,199 | 25,558 | 0.115 | 110 | 1,487 |
| Ericsson Radio 4449 | 136.00 | 222 | 4,106 | 0.018 | 18 | 275 |
| Ericsson RRUS 11 B12 | 136.00 | 152 | 2,813 | 0.013 | 12 | 189 |
| RFS APXV18-206516S-C | 136.00 | 56 | 1,038 | 0.005 | 4 | 70 |
| Flat T-Arm | 136.00 | 750 | 13,872 | 0.062 | 60 | 930 |
| RFS APXVAARR24_43-U- | 136.00 | 384 | 7,097 | 0.032 | 31 | 476 |
| | | 24,525 | 222,168 | 1.000 | 956 | 30,424 |

Load Case (0.9 - 0.2Sds) * DL + E ELFM Seismic (Reduced DL) Equivalent Lateral Forces Method

| Segment | Height Above Base (ft) | Weight (lb) | $W_z$ (lb-ft) | $C_{vx}$ | Horizontal Force (lb) | Vertical Force (lb) |
|---|---|---|---|---|---|---|
| 45 | 167.78 | 78 | 2,182 | 0.010 | 9 | 67 |
| 44 | 166.00 | 121 | 3,345 | 0.015 | 14 | 104 |
| 43 | 162.50 | 303 | 8,013 | 0.036 | 34 | 261 |
| 42 | 159.28 | 87 | 2,213 | 0.010 | 10 | 75 |
| 41 | 157.78 | 74 | 1,846 | 0.008 | 8 | 64 |
| 40 | 156.00 | 116 | 2,822 | 0.013 | 12 | 100 |
| 39 | 152.50 | 297 | 6,899 | 0.031 | 30 | 255 |
| 38 | 148.00 | 244 | 5,351 | 0.024 | 23 | 210 |
| 37 | 145.50 | 67 | 1,417 | 0.006 | 6 | 58 |
| 36 | 144.11 | 120 | 2,497 | 0.011 | 11 | 103 |
| 35 | 141.62 | 353 | 7,075 | 0.032 | 30 | 303 |
| 34 | 140.01 | 1 | 28 | 0.000 | 0 | 1 |
| 33 | 138.00 | 276 | 5,263 | 0.024 | 23 | 238 |
| 32 | 135.50 | 75 | 1,375 | 0.006 | 6 | 64 |
| 31 | 132.50 | 380 | 6,676 | 0.030 | 29 | 327 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 30 | 127.50 | 390 | 6,338 | 0.029 | 27 | 335 |
| 29 | 122.50 | 400 | 5,996 | 0.027 | 26 | 343 |
| 28 | 117.50 | 409 | 5,650 | 0.025 | 24 | 352 |
| 27 | 112.50 | 419 | 5,301 | 0.024 | 23 | 360 |
| 26 | 107.50 | 429 | 4,952 | 0.022 | 21 | 368 |
| 25 | 102.50 | 438 | 4,604 | 0.021 | 20 | 377 |
| 24 | 98.46 | 274 | 2,657 | 0.012 | 11 | 236 |
| 23 | 95.96 | 324 | 2,987 | 0.013 | 13 | 279 |
| 22 | 93.82 | 401 | 3,528 | 0.016 | 15 | 344 |
| 21 | 91.32 | 294 | 2,454 | 0.011 | 11 | 253 |
| 20 | 87.50 | 566 | 4,332 | 0.020 | 19 | 486 |
| 19 | 82.50 | 579 | 3,939 | 0.018 | 17 | 497 |
| 18 | 77.50 | 592 | 3,553 | 0.016 | 15 | 508 |
| 17 | 72.50 | 605 | 3,177 | 0.014 | 14 | 520 |
| 16 | 67.50 | 617 | 2,813 | 0.013 | 12 | 531 |
| 15 | 62.50 | 630 | 2,462 | 0.011 | 11 | 542 |
| 14 | 57.50 | 643 | 2,126 | 0.010 | 9 | 553 |
| 13 | 53.23 | 463 | 1,313 | 0.006 | 6 | 398 |
| 12 | 50.73 | 375 | 965 | 0.004 | 4 | 322 |
| 11 | 48.06 | 1,010 | 2,333 | 0.010 | 10 | 868 |
| 10 | 45.56 | 178 | 368 | 0.002 | 2 | 153 |
| 9 | 42.50 | 804 | 1,453 | 0.007 | 6 | 691 |
| 8 | 37.50 | 820 | 1,154 | 0.005 | 5 | 705 |
| 7 | 32.50 | 837 | 884 | 0.004 | 4 | 719 |
| 6 | 27.50 | 853 | 645 | 0.003 | 3 | 733 |
| 5 | 22.50 | 869 | 440 | 0.002 | 2 | 747 |
| 4 | 17.50 | 885 | 271 | 0.001 | 1 | 761 |
| 3 | 12.50 | 901 | 141 | 0.001 | 1 | 774 |
| 2 | 7.50 | 917 | 52 | 0.000 | 0 | 788 |
| 1 | 2.50 | 933 | 6 | 0.000 | 0 | 802 |
| Generic RCU (Remote | 167.00 | 12 | 335 | 0.002 | 1 | 10 |
| Powerwave Allgon TT0 | 167.00 | 132 | 3,681 | 0.017 | 16 | 113 |
| Raycap DC6-48-60-18- | 167.00 | 32 | 887 | 0.004 | 4 | 27 |
| Ericsson RRUS 11 B2 | 167.00 | 304 | 8,484 | 0.038 | 37 | 261 |
| KMW AM-X-CD-17-65-00 | 167.00 | 31 | 859 | 0.004 | 4 | 26 |
| Powerwave Allgon P90 | 167.00 | 90 | 2,510 | 0.011 | 11 | 77 |
| Kathrein Scala 800-1 | 167.00 | 110 | 3,073 | 0.014 | 13 | 95 |
| Stand-Off | 157.00 | 225 | 5,546 | 0.025 | 24 | 193 |
| Andrew DBXNH-6565A-V | 157.00 | 103 | 2,529 | 0.011 | 11 | 88 |
| Stand-Off | 146.00 | 225 | 4,796 | 0.022 | 21 | 193 |
| Antel BXA-70063/6CF | 146.00 | 51 | 1,087 | 0.005 | 5 | 44 |
| VZW Unused Reserve: | 146.00 | 1,199 | 25,558 | 0.115 | 110 | 1,031 |
| Ericsson Radio 4449 | 136.00 | 222 | 4,106 | 0.018 | 18 | 191 |
| Ericsson RRUS 11 B12 | 136.00 | 152 | 2,813 | 0.013 | 12 | 131 |
| RFS APXV18-206516S-C | 136.00 | 56 | 1,038 | 0.005 | 4 | 48 |
| Flat T-Arm | 136.00 | 750 | 13,872 | 0.062 | 60 | 645 |
| RFS APXVAARR24_43-U- | 136.00 | 384 | 7,097 | 0.032 | 31 | 330 |
| | | 24,525 | 222,168 | 1.000 | 956 | 21,078 |

Load Case (1.2 + 0.2Sds) * DL + E ELFM Seismic Equivalent Lateral Forces Method

Calculated Forces

| 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 | -29.27 | -0.96 | 0.00 | -130.22 | 0.00 | 130.22 | 2,995.17 | 1,497.58 | 5,752.58 | 2,880.56 | 0.00 | 0.00 | 0.055 |
| 5.00 | -28.13 | -0.97 | 0.00 | -125.42 | 0.00 | 125.42 | 2,959.81 | 1,479.91 | 5,567.76 | 2,788.02 | 0.01 | -0.01 | 0.054 |
| 10.00 | -27.01 | -0.97 | 0.00 | -120.59 | 0.00 | 120.59 | 2,923.38 | 1,461.69 | 5,383.76 | 2,695.88 | 0.03 | -0.03 | 0.054 |
| 15.00 | -25.91 | -0.98 | 0.00 | -115.73 | 0.00 | 115.73 | 2,885.88 | 1,442.94 | 5,200.69 | 2,604.21 | 0.07 | -0.04 | 0.053 |
| 20.00 | -24.83 | -0.98 | 0.00 | -110.85 | 0.00 | 110.85 | 2,847.29 | 1,423.65 | 5,018.68 | 2,513.07 | 0.12 | -0.06 | 0.053 |
| 25.00 | -23.78 | -0.98 | 0.00 | -105.95 | 0.00 | 105.95 | 2,807.63 | 1,403.81 | 4,837.86 | 2,422.53 | 0.19 | -0.07 | 0.052 |
| 30.00 | -22.74 | -0.98 | 0.00 | -101.03 | 0.00 | 101.03 | 2,766.89 | 1,383.44 | 4,658.36 | 2,332.64 | 0.28 | -0.09 | 0.052 |
| 35.00 | -21.72 | -0.98 | 0.00 | -96.11 | 0.00 | 96.11 | 2,725.06 | 1,362.53 | 4,480.31 | 2,243.49 | 0.38 | -0.11 | 0.051 |
| 40.00 | -20.72 | -0.98 | 0.00 | -91.20 | 0.00 | 91.20 | 2,682.17 | 1,341.08 | 4,303.83 | 2,155.12 | 0.50 | -0.12 | 0.050 |
| 45.00 | -20.50 | -0.98 | 0.00 | -86.29 | 0.00 | 86.29 | 2,638.19 | 1,319.10 | 4,129.06 | 2,067.60 | 0.64 | -0.14 | 0.050 |
| 46.12 | -19.25 | -0.97 | 0.00 | -85.19 | 0.00 | 85.19 | 2,628.22 | 1,314.11 | 4,090.25 | 2,048.17 | 0.68 | -0.14 | 0.049 |
| 50.00 | -18.78 | -0.97 | 0.00 | -81.41 | 0.00 | 81.41 | 2,593.14 | 1,296.57 | 3,956.11 | 1,981.00 | 0.80 | -0.16 | 0.048 |
| 51.46 | -18.21 | -0.97 | 0.00 | -80.00 | 0.00 | 80.00 | 1,919.32 | 959.66 | 2,955.63 | 1,480.01 | 0.85 | -0.16 | 0.064 |
| 55.00 | -17.41 | -0.96 | 0.00 | -76.58 | 0.00 | 76.58 | 1,899.39 | 949.70 | 2,871.79 | 1,438.03 | 0.97 | -0.18 | 0.062 |
| 60.00 | -16.63 | -0.95 | 0.00 | -71.78 | 0.00 | 71.78 | 1,870.33 | 935.17 | 2,753.97 | 1,379.03 | 1.17 | -0.20 | 0.061 |
| 65.00 | -15.86 | -0.94 | 0.00 | -67.01 | 0.00 | 67.01 | 1,840.20 | 920.10 | 2,636.91 | 1,320.41 | 1.39 | -0.22 | 0.059 |
| 70.00 | -15.11 | -0.93 | 0.00 | -62.29 | 0.00 | 62.29 | 1,808.98 | 904.49 | 2,520.72 | 1,262.23 | 1.63 | -0.24 | 0.058 |
| 75.00 | -14.38 | -0.92 | 0.00 | -57.63 | 0.00 | 57.63 | 1,776.69 | 888.34 | 2,405.54 | 1,204.56 | 1.89 | -0.26 | 0.056 |
| 80.00 | -13.66 | -0.90 | 0.00 | -53.03 | 0.00 | 53.03 | 1,743.32 | 871.66 | 2,291.50 | 1,147.45 | 2.18 | -0.28 | 0.054 |
| 85.00 | -12.96 | -0.89 | 0.00 | -48.51 | 0.00 | 48.51 | 1,708.87 | 854.43 | 2,178.71 | 1,090.98 | 2.48 | -0.31 | 0.052 |
| 90.00 | -12.59 | -0.88 | 0.00 | -44.07 | 0.00 | 44.07 | 1,673.34 | 836.67 | 2,067.32 | 1,035.20 | 2.82 | -0.33 | 0.050 |
| 92.65 | -12.09 | -0.86 | 0.00 | -41.74 | 0.00 | 41.74 | 1,654.10 | 827.05 | 2,008.98 | 1,005.98 | 3.00 | -0.34 | 0.049 |
| 95.00 | -11.69 | -0.85 | 0.00 | -39.71 | 0.00 | 39.71 | 1,636.74 | 818.37 | 1,957.44 | 980.18 | 3.17 | -0.35 | 0.048 |
| 96.93 | -11.35 | -0.84 | 0.00 | -38.07 | 0.00 | 38.07 | 1,103.35 | 551.67 | 1,325.55 | 663.76 | 3.31 | -0.36 | 0.068 |
| 100.00 | -10.81 | -0.82 | 0.00 | -35.50 | 0.00 | 35.50 | 1,091.13 | 545.56 | 1,284.38 | 643.14 | 3.55 | -0.37 | 0.065 |
| 105.00 | -10.28 | -0.80 | 0.00 | -31.40 | 0.00 | 31.40 | 1,070.38 | 535.19 | 1,217.67 | 609.74 | 3.95 | -0.40 | 0.061 |
| 110.00 | -9.76 | -0.78 | 0.00 | -27.41 | 0.00 | 27.41 | 1,048.55 | 524.27 | 1,151.42 | 576.56 | 4.39 | -0.43 | 0.057 |
| 115.00 | -9.25 | -0.75 | 0.00 | -23.53 | 0.00 | 23.53 | 1,025.64 | 512.82 | 1,085.75 | 543.68 | 4.85 | -0.45 | 0.052 |
| 120.00 | -8.75 | -0.73 | 0.00 | -19.76 | 0.00 | 19.76 | 1,001.65 | 500.83 | 1,020.79 | 511.15 | 5.33 | -0.47 | 0.047 |
| 125.00 | -8.27 | -0.70 | 0.00 | -16.13 | 0.00 | 16.13 | 976.59 | 488.30 | 956.67 | 479.05 | 5.84 | -0.50 | 0.042 |
| 130.00 | -7.80 | -0.67 | 0.00 | -12.64 | 0.00 | 12.64 | 950.45 | 475.22 | 893.52 | 447.42 | 6.37 | -0.52 | 0.036 |
| 135.00 | -7.71 | -0.66 | 0.00 | -9.30 | 0.00 | 9.30 | 923.23 | 461.61 | 831.46 | 416.35 | 6.92 | -0.53 | 0.031 |
| 136.00 | -5.42 | -0.49 | 0.00 | -8.64 | 0.00 | 8.64 | 917.66 | 458.83 | 819.19 | 410.21 | 7.04 | -0.54 | 0.027 |
| 140.00 | -5.42 | -0.49 | 0.00 | -6.67 | 0.00 | 6.67 | 894.93 | 447.47 | 770.63 | 385.89 | 7.49 | -0.55 | 0.023 |
| 140.02 | -4.98 | -0.46 | 0.00 | -6.65 | 0.00 | 6.65 | 894.81 | 447.41 | 770.38 | 385.76 | 7.49 | -0.55 | 0.023 |
| 143.22 | -4.84 | -0.45 | 0.00 | -5.18 | 0.00 | 5.18 | 887.67 | 443.84 | 755.59 | 378.35 | 7.86 | -0.56 | 0.019 |
| 145.00 | -4.75 | -0.44 | 0.00 | -4.38 | 0.00 | 4.38 | 877.23 | 438.62 | 734.36 | 367.72 | 8.07 | -0.56 | 0.017 |
| 146.00 | -2.62 | -0.26 | 0.00 | -3.94 | 0.00 | 3.94 | 871.31 | 435.66 | 722.52 | 361.80 | 8.19 | -0.56 | 0.014 |
| 150.00 | -2.25 | -0.23 | 0.00 | -2.89 | 0.00 | 2.89 | 847.20 | 423.60 | 675.75 | 338.38 | 8.66 | -0.57 | 0.011 |
| 155.00 | -2.11 | -0.22 | 0.00 | -1.74 | 0.00 | 1.74 | 816.09 | 408.05 | 618.71 | 309.81 | 9.26 | -0.57 | 0.008 |
| 157.00 | -1.61 | -0.17 | 0.00 | -1.30 | 0.00 | 1.30 | 800.73 | 400.36 | 594.40 | 297.64 | 9.50 | -0.58 | 0.006 |
| 158.56 | -1.50 | -0.16 | 0.00 | -1.04 | 0.00 | 1.04 | 787.55 | 393.77 | 574.90 | 287.88 | 9.69 | -0.58 | 0.006 |
| 158.56 | -1.50 | -0.16 | 0.00 | -1.04 | 0.00 | 1.04 | 551.08 | 275.54 | 275.63 | 180.95 | 9.69 | -0.58 | 0.008 |
| 160.00 | -1.13 | -0.12 | 0.00 | -0.81 | 0.00 | 0.81 | 551.08 | 275.54 | 275.63 | 180.95 | 9.87 | -0.58 | 0.007 |
| 165.00 | -0.98 | -0.10 | 0.00 | -0.21 | 0.00 | 0.21 | 551.08 | 275.54 | 275.63 | 180.95 | 10.48 | -0.58 | 0.003 |
| 167.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 551.08 | 275.54 | 275.63 | 180.95 | 10.72 | -0.58 | 0.000 |
| 168.56 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 551.08 | 275.54 | 275.63 | 180.95 | 10.91 | -0.58 | 0.000 |

Load Case (0.9 - 0.2Sds) * DL + E ELFM Seismic (Reduced DL) Equivalent Lateral Forces Method

Calculated Forces

| 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 | -20.28 | -0.96 | 0.00 | -127.53 | 0.00 | 127.53 | 2,995.17 | 1,497.58 | 5,752.58 | 2,880.56 | 0.00 | 0.00 | 0.051 |
| 5.00 | -19.49 | -0.96 | 0.00 | -122.74 | 0.00 | 122.74 | 2,959.81 | 1,479.91 | 5,567.76 | 2,788.02 | 0.01 | -0.01 | 0.051 |
| 10.00 | -18.71 | -0.97 | 0.00 | -117.93 | 0.00 | 117.93 | 2,923.38 | 1,461.69 | 5,383.76 | 2,695.88 | 0.03 | -0.03 | 0.050 |
| 15.00 | -17.95 | -0.97 | 0.00 | -113.10 | 0.00 | 113.10 | 2,885.88 | 1,442.94 | 5,200.69 | 2,604.21 | 0.07 | -0.04 | 0.050 |
| 20.00 | -17.21 | -0.97 | 0.00 | -108.25 | 0.00 | 108.25 | 2,847.29 | 1,423.65 | 5,018.68 | 2,513.07 | 0.12 | -0.06 | 0.049 |
| 25.00 | -16.47 | -0.97 | 0.00 | -103.40 | 0.00 | 103.40 | 2,807.63 | 1,403.81 | 4,837.86 | 2,422.53 | 0.19 | -0.07 | 0.049 |
| 30.00 | -15.75 | -0.97 | 0.00 | -98.54 | 0.00 | 98.54 | 2,766.89 | 1,383.44 | 4,658.36 | 2,332.64 | 0.27 | -0.09 | 0.048 |
| 35.00 | -15.05 | -0.97 | 0.00 | -93.68 | 0.00 | 93.68 | 2,725.06 | 1,362.53 | 4,480.31 | 2,243.49 | 0.37 | -0.10 | 0.047 |
| 40.00 | -14.36 | -0.97 | 0.00 | -88.83 | 0.00 | 88.83 | 2,682.17 | 1,341.08 | 4,303.83 | 2,155.12 | 0.49 | -0.12 | 0.047 |
| 45.00 | -14.20 | -0.97 | 0.00 | -84.00 | 0.00 | 84.00 | 2,638.19 | 1,319.10 | 4,129.06 | 2,067.60 | 0.63 | -0.14 | 0.046 |
| 46.12 | -13.34 | -0.96 | 0.00 | -82.92 | 0.00 | 82.92 | 2,628.22 | 1,314.11 | 4,090.25 | 2,048.17 | 0.66 | -0.14 | 0.046 |
| 50.00 | -13.01 | -0.95 | 0.00 | -79.21 | 0.00 | 79.21 | 2,593.14 | 1,296.57 | 3,956.11 | 1,981.00 | 0.78 | -0.15 | 0.045 |
| 51.46 | -12.61 | -0.95 | 0.00 | -77.81 | 0.00 | 77.81 | 1,919.32 | 959.66 | 2,955.63 | 1,480.01 | 0.83 | -0.16 | 0.059 |
| 55.00 | -12.06 | -0.94 | 0.00 | -74.45 | 0.00 | 74.45 | 1,899.39 | 949.70 | 2,871.79 | 1,438.03 | 0.95 | -0.17 | 0.058 |
| 60.00 | -11.52 | -0.93 | 0.00 | -69.75 | 0.00 | 69.75 | 1,870.33 | 935.17 | 2,753.97 | 1,379.03 | 1.14 | -0.19 | 0.057 |
| 65.00 | -10.99 | -0.92 | 0.00 | -65.08 | 0.00 | 65.08 | 1,840.20 | 920.10 | 2,636.91 | 1,320.41 | 1.35 | -0.21 | 0.055 |
| 70.00 | -10.47 | -0.91 | 0.00 | -60.46 | 0.00 | 60.46 | 1,808.98 | 904.49 | 2,520.72 | 1,262.23 | 1.59 | -0.23 | 0.054 |
| 75.00 | -9.96 | -0.90 | 0.00 | -55.91 | 0.00 | 55.91 | 1,776.69 | 888.34 | 2,405.54 | 1,204.56 | 1.84 | -0.26 | 0.052 |
| 80.00 | -9.46 | -0.88 | 0.00 | -51.42 | 0.00 | 51.42 | 1,743.32 | 871.66 | 2,291.50 | 1,147.45 | 2.12 | -0.28 | 0.050 |
| 85.00 | -8.98 | -0.86 | 0.00 | -47.01 | 0.00 | 47.01 | 1,708.87 | 854.43 | 2,178.71 | 1,090.98 | 2.42 | -0.30 | 0.048 |
| 90.00 | -8.72 | -0.85 | 0.00 | -42.68 | 0.00 | 42.68 | 1,673.34 | 836.67 | 2,067.32 | 1,035.20 | 2.75 | -0.32 | 0.046 |
| 92.65 | -8.38 | -0.84 | 0.00 | -40.42 | 0.00 | 40.42 | 1,654.10 | 827.05 | 2,008.98 | 1,005.98 | 2.93 | -0.33 | 0.045 |
| 95.00 | -8.10 | -0.83 | 0.00 | -38.45 | 0.00 | 38.45 | 1,636.74 | 818.37 | 1,957.44 | 980.18 | 3.09 | -0.34 | 0.044 |
| 96.93 | -7.86 | -0.81 | 0.00 | -36.85 | 0.00 | 36.85 | 1,103.35 | 551.67 | 1,325.55 | 663.76 | 3.23 | -0.35 | 0.063 |
| 100.00 | -7.49 | -0.80 | 0.00 | -34.35 | 0.00 | 34.35 | 1,091.13 | 545.56 | 1,284.38 | 643.14 | 3.46 | -0.36 | 0.060 |
| 105.00 | -7.12 | -0.77 | 0.00 | -30.37 | 0.00 | 30.37 | 1,070.38 | 535.19 | 1,217.67 | 609.74 | 3.85 | -0.39 | 0.056 |
| 110.00 | -6.76 | -0.75 | 0.00 | -26.50 | 0.00 | 26.50 | 1,048.55 | 524.27 | 1,151.42 | 576.56 | 4.27 | -0.41 | 0.052 |
| 115.00 | -6.41 | -0.73 | 0.00 | -22.74 | 0.00 | 22.74 | 1,025.64 | 512.82 | 1,085.75 | 543.68 | 4.72 | -0.44 | 0.048 |
| 120.00 | -6.06 | -0.70 | 0.00 | -19.10 | 0.00 | 19.10 | 1,001.65 | 500.83 | 1,020.79 | 511.15 | 5.19 | -0.46 | 0.043 |
| 125.00 | -5.73 | -0.67 | 0.00 | -15.59 | 0.00 | 15.59 | 976.59 | 488.30 | 956.67 | 479.05 | 5.69 | -0.48 | 0.038 |
| 130.00 | -5.40 | -0.64 | 0.00 | -12.22 | 0.00 | 12.22 | 950.45 | 475.22 | 893.52 | 447.42 | 6.20 | -0.50 | 0.033 |
| 135.00 | -5.34 | -0.64 | 0.00 | -9.00 | 0.00 | 9.00 | 923.23 | 461.61 | 831.46 | 416.35 | 6.74 | -0.52 | 0.027 |
| 136.00 | -3.76 | -0.48 | 0.00 | -8.36 | 0.00 | 8.36 | 917.66 | 458.83 | 819.19 | 410.21 | 6.85 | -0.52 | 0.024 |
| 140.00 | -3.76 | -0.48 | 0.00 | -6.45 | 0.00 | 6.45 | 894.93 | 447.47 | 770.63 | 385.89 | 7.29 | -0.53 | 0.021 |
| 140.02 | -3.45 | -0.44 | 0.00 | -6.44 | 0.00 | 6.44 | 894.81 | 447.41 | 770.38 | 385.76 | 7.29 | -0.53 | 0.021 |
| 143.22 | -3.35 | -0.43 | 0.00 | -5.01 | 0.00 | 5.01 | 887.67 | 443.84 | 755.59 | 378.35 | 7.65 | -0.54 | 0.017 |
| 145.00 | -3.29 | -0.43 | 0.00 | -4.24 | 0.00 | 4.24 | 877.23 | 438.62 | 734.36 | 367.72 | 7.85 | -0.54 | 0.015 |
| 146.00 | -1.82 | -0.25 | 0.00 | -3.82 | 0.00 | 3.82 | 871.31 | 435.66 | 722.52 | 361.80 | 7.97 | -0.55 | 0.013 |
| 150.00 | -1.56 | -0.22 | 0.00 | -2.80 | 0.00 | 2.80 | 847.20 | 423.60 | 675.75 | 338.38 | 8.43 | -0.55 | 0.010 |
| 155.00 | -1.46 | -0.21 | 0.00 | -1.68 | 0.00 | 1.68 | 816.09 | 408.05 | 618.71 | 309.81 | 9.01 | -0.56 | 0.007 |
| 157.00 | -1.12 | -0.16 | 0.00 | -1.26 | 0.00 | 1.26 | 800.73 | 400.36 | 594.40 | 297.64 | 9.24 | -0.56 | 0.006 |
| 158.56 | -1.04 | -0.15 | 0.00 | -1.01 | 0.00 | 1.01 | 787.55 | 393.77 | 574.90 | 287.88 | 9.43 | -0.56 | 0.005 |
| 158.56 | -1.04 | -0.15 | 0.00 | -1.01 | 0.00 | 1.01 | 551.08 | 275.54 | 275.63 | 180.95 | 9.43 | -0.56 | 0.007 |
| 160.00 | -0.78 | -0.12 | 0.00 | -0.79 | 0.00 | 0.79 | 551.08 | 275.54 | 275.63 | 180.95 | 9.60 | -0.56 | 0.006 |
| 165.00 | -0.68 | -0.10 | 0.00 | -0.20 | 0.00 | 0.20 | 551.08 | 275.54 | 275.63 | 180.95 | 10.18 | -0.56 | 0.002 |
| 167.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 551.08 | 275.54 | 275.63 | 180.95 | 10.42 | -0.56 | 0.000 |
| 168.56 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 551.08 | 275.54 | 275.63 | 180.95 | 10.61 | -0.56 | 0.000 |

## Equivalent Modal Analysis Method

(Based on ASCE7-10 Chapters 11, 12 & 15 and ANSI/TIA-G, section 2.7)

| | |
|---|---|
| Spectral Response Acceleration for Short Period ($S_s$): | 0.19 |
| Spectral Response Acceleration at 1.0 Second Period ($S_1$): | 0.06 |
| Importance Factor ($I_E$): | 1.00 |
| Site Coefficient $F_a$: | 1.60 |
| Site Coefficient $F_v$ | 2.40 |
| Response Modification Coefficient (R): | 1.50 |
| Design Spectral Response Acceleration at Short Period ($S_{ds}$): | 0.20 |
| Desing Spectral Response Acceleration at 1.0 Second Period ($S_{d1}$): | 0.10 |
| Period Based on Rayleigh Method (sec): | 2.91 |
| Redundancy Factor (p): | 1.30 |

## Load Case (1.2 + 0.2Sds) * DL + E EMAM Seismic Equivalent Modal Analysis Method

| Segment | Height Above Base (ft) | Weight (lb) | a | b | c | Saz | Horizontal Force (lb) | Vertical Force (lb) |
|---|---|---|---|---|---|---|---|---|
| 45 | 167.78 | 78 | 1.873 | 1.889 | 1.107 | 0.369 | 25 | 96 |
| 44 | 166.00 | 121 | 1.833 | 1.693 | 1.035 | 0.343 | 36 | 151 |
| 43 | 162.50 | 303 | 1.756 | 1.348 | 0.904 | 0.293 | 77 | 376 |
| 42 | 159.28 | 87 | 1.688 | 1.076 | 0.796 | 0.250 | 19 | 108 |
| 41 | 157.78 | 74 | 1.656 | 0.962 | 0.749 | 0.232 | 15 | 92 |
| 40 | 156.00 | 116 | 1.619 | 0.838 | 0.696 | 0.210 | 21 | 144 |
| 39 | 152.50 | 297 | 1.547 | 0.623 | 0.600 | 0.170 | 44 | 368 |
| 38 | 148.00 | 244 | 1.457 | 0.401 | 0.493 | 0.124 | 26 | 303 |
| 37 | 145.50 | 67 | 1.408 | 0.300 | 0.440 | 0.100 | 6 | 83 |
| 36 | 144.11 | 120 | 1.381 | 0.250 | 0.413 | 0.088 | 9 | 149 |
| 35 | 141.62 | 353 | 1.334 | 0.171 | 0.367 | 0.067 | 20 | 438 |
| 34 | 140.01 | 1 | 1.304 | 0.126 | 0.340 | 0.054 | 0 | 2 |
| 33 | 138.00 | 276 | 1.267 | 0.077 | 0.308 | 0.039 | 9 | 343 |
| 32 | 135.50 | 75 | 1.221 | 0.026 | 0.271 | 0.022 | 1 | 93 |
| 31 | 132.50 | 380 | 1.168 | -0.023 | 0.232 | 0.003 | 1 | 472 |
| 30 | 127.50 | 390 | 1.081 | -0.080 | 0.176 | -0.023 | -8 | 484 |
| 29 | 122.50 | 400 | 0.998 | -0.110 | 0.130 | -0.043 | -15 | 496 |
| 28 | 117.50 | 409 | 0.918 | -0.121 | 0.095 | -0.056 | -20 | 508 |
| 27 | 112.50 | 419 | 0.842 | -0.118 | 0.067 | -0.064 | -23 | 520 |
| 26 | 107.50 | 429 | 0.769 | -0.105 | 0.045 | -0.064 | -24 | 532 |
| 25 | 102.50 | 438 | 0.699 | -0.087 | 0.030 | -0.058 | -22 | 544 |
| 24 | 98.46 | 274 | 0.645 | -0.069 | 0.020 | -0.048 | -12 | 340 |
| 23 | 95.96 | 324 | 0.613 | -0.057 | 0.016 | -0.041 | -11 | 402 |
| 22 | 93.82 | 401 | 0.586 | -0.048 | 0.013 | -0.033 | -11 | 497 |
| 21 | 91.32 | 294 | 0.555 | -0.036 | 0.010 | -0.023 | -6 | 365 |
| 20 | 87.50 | 566 | 0.509 | -0.020 | 0.007 | -0.007 | -3 | 702 |
| 19 | 82.50 | 579 | 0.453 | 0.001 | 0.006 | 0.014 | 7 | 718 |
| 18 | 77.50 | 592 | 0.400 | 0.018 | 0.007 | 0.032 | 16 | 734 |
| 17 | 72.50 | 605 | 0.350 | 0.033 | 0.009 | 0.046 | 24 | 750 |
| 16 | 67.50 | 617 | 0.303 | 0.045 | 0.012 | 0.054 | 29 | 766 |
| 15 | 62.50 | 630 | 0.260 | 0.054 | 0.016 | 0.059 | 32 | 782 |
| 14 | 57.50 | 643 | 0.220 | 0.060 | 0.021 | 0.062 | 34 | 798 |
| 13 | 53.23 | 463 | 0.188 | 0.064 | 0.025 | 0.062 | 25 | 575 |
| 12 | 50.73 | 375 | 0.171 | 0.066 | 0.027 | 0.062 | 20 | 465 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 11 | 48.06 | 1,010 | 0.154 | 0.068 | 0.030 | 0.061 | 54 | 1,253 |
| 10 | 45.56 | 178 | 0.138 | 0.069 | 0.032 | 0.061 | 9 | 220 |
| 9 | 42.50 | 804 | 0.120 | 0.070 | 0.034 | 0.060 | 42 | 998 |
| 8 | 37.50 | 820 | 0.094 | 0.071 | 0.038 | 0.059 | 42 | 1,018 |
| 7 | 32.50 | 837 | 0.070 | 0.072 | 0.041 | 0.058 | 42 | 1,038 |
| 6 | 27.50 | 853 | 0.050 | 0.071 | 0.042 | 0.056 | 42 | 1,058 |
| 5 | 22.50 | 869 | 0.034 | 0.069 | 0.041 | 0.055 | 41 | 1,078 |
| 4 | 17.50 | 885 | 0.020 | 0.064 | 0.038 | 0.052 | 40 | 1,098 |
| 3 | 12.50 | 901 | 0.010 | 0.055 | 0.032 | 0.047 | 36 | 1,118 |
| 2 | 7.50 | 917 | 0.004 | 0.040 | 0.023 | 0.037 | 29 | 1,138 |
| 1 | 2.50 | 933 | 0.000 | 0.016 | 0.009 | 0.018 | 14 | 1,158 |
| Generic RCU (Remote | 167.00 | 12 | 1.855 | 1.801 | 1.075 | 0.357 | 4 | 15 |
| Powerwave Allgon TT0 | 167.00 | 132 | 1.855 | 1.801 | 1.075 | 0.357 | 41 | 164 |
| Raycap DC6-48-60-18- | 167.00 | 32 | 1.855 | 1.801 | 1.075 | 0.357 | 10 | 39 |
| Ericsson RRUS 11 B2 | 167.00 | 304 | 1.855 | 1.801 | 1.075 | 0.357 | 94 | 377 |
| KMW AM-X-CD-17-65-00 | 167.00 | 31 | 1.855 | 1.801 | 1.075 | 0.357 | 10 | 38 |
| Powerwave Allgon P90 | 167.00 | 90 | 1.855 | 1.801 | 1.075 | 0.357 | 28 | 112 |
| Kathrein Scala 800-1 | 167.00 | 110 | 1.855 | 1.801 | 1.075 | 0.357 | 34 | 137 |
| Stand-Off | 157.00 | 225 | 1.640 | 0.906 | 0.725 | 0.222 | 43 | 279 |
| Andrew DBXNH-6565A- | 157.00 | 103 | 1.640 | 0.906 | 0.725 | 0.222 | 20 | 127 |
| Stand-Off | 146.00 | 225 | 1.418 | 0.319 | 0.450 | 0.105 | 20 | 279 |
| Antel BXA-70063/6CF | 146.00 | 51 | 1.418 | 0.319 | 0.450 | 0.105 | 5 | 63 |
| VZW Unused Reserve: | 146.00 | 1,199 | 1.418 | 0.319 | 0.450 | 0.105 | 109 | 1,487 |
| Ericsson Radio 4449 | 136.00 | 222 | 1.230 | 0.035 | 0.278 | 0.025 | 5 | 275 |
| Ericsson RRUS 11 B12 | 136.00 | 152 | 1.230 | 0.035 | 0.278 | 0.025 | 3 | 189 |
| RFS APXV18-206516S-C | 136.00 | 56 | 1.230 | 0.035 | 0.278 | 0.025 | 1 | 70 |
| Flat T-Arm | 136.00 | 750 | 1.230 | 0.035 | 0.278 | 0.025 | 16 | 930 |
| RFS APXVAARR24_43-U- | 136.00 | 384 | 1.230 | 0.035 | 0.278 | 0.025 | 8 | 476 |
| | | 24,525 | 60.435 | 25.461 | 21.557 | 6.238 | 1,184 | 30,424 |

Load Case (0.9 - 0.2Sds) * DL + E EMAM Seismic (Reduced DL) Equivalent Modal Analysis Method

| Segment | Height Above Base (ft) | Weight (lb) | a | b | c | Saz | Horizontal Force (lb) | Vertical Force (lb) |
|---|---|---|---|---|---|---|---|---|
| 45 | 167.78 | 78 | 1.873 | 1.889 | 1.107 | 0.369 | 25 | 67 |
| 44 | 166.00 | 121 | 1.833 | 1.693 | 1.035 | 0.343 | 36 | 104 |
| 43 | 162.50 | 303 | 1.756 | 1.348 | 0.904 | 0.293 | 77 | 261 |
| 42 | 159.28 | 87 | 1.688 | 1.076 | 0.796 | 0.250 | 19 | 75 |
| 41 | 157.78 | 74 | 1.656 | 0.962 | 0.749 | 0.232 | 15 | 64 |
| 40 | 156.00 | 116 | 1.619 | 0.838 | 0.696 | 0.210 | 21 | 100 |
| 39 | 152.50 | 297 | 1.547 | 0.623 | 0.600 | 0.170 | 44 | 255 |
| 38 | 148.00 | 244 | 1.457 | 0.401 | 0.493 | 0.124 | 26 | 210 |
| 37 | 145.50 | 67 | 1.408 | 0.300 | 0.440 | 0.100 | 6 | 58 |
| 36 | 144.11 | 120 | 1.381 | 0.250 | 0.413 | 0.088 | 9 | 103 |
| 35 | 141.62 | 353 | 1.334 | 0.171 | 0.367 | 0.067 | 20 | 303 |
| 34 | 140.01 | 1 | 1.304 | 0.126 | 0.340 | 0.054 | 0 | 1 |
| 33 | 138.00 | 276 | 1.267 | 0.077 | 0.308 | 0.039 | 9 | 238 |
| 32 | 135.50 | 75 | 1.221 | 0.026 | 0.271 | 0.022 | 1 | 64 |
| 31 | 132.50 | 380 | 1.168 | -0.023 | 0.232 | 0.003 | 1 | 327 |
| 30 | 127.50 | 390 | 1.081 | -0.080 | 0.176 | -0.023 | -8 | 335 |
| 29 | 122.50 | 400 | 0.998 | -0.110 | 0.130 | -0.043 | -15 | 343 |
| 28 | 117.50 | 409 | 0.918 | -0.121 | 0.095 | -0.056 | -20 | 352 |
| 27 | 112.50 | 419 | 0.842 | -0.118 | 0.067 | -0.064 | -23 | 360 |
| 26 | 107.50 | 429 | 0.769 | -0.105 | 0.045 | -0.064 | -24 | 368 |
| 25 | 102.50 | 438 | 0.699 | -0.087 | 0.030 | -0.058 | -22 | 377 |
| 24 | 98.46 | 274 | 0.645 | -0.069 | 0.020 | -0.048 | -12 | 236 |
| 23 | 95.96 | 324 | 0.613 | -0.057 | 0.016 | -0.041 | -11 | 279 |
| 22 | 93.82 | 401 | 0.586 | -0.048 | 0.013 | -0.033 | -11 | 344 |
| 21 | 91.32 | 294 | 0.555 | -0.036 | 0.010 | -0.023 | -6 | 253 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 20 | 87.50 | 566 | 0.509 | -0.020 | 0.007 | -0.007 | -3 | 486 |
| 19 | 82.50 | 579 | 0.453 | 0.001 | 0.006 | 0.014 | 7 | 497 |
| 18 | 77.50 | 592 | 0.400 | 0.018 | 0.007 | 0.032 | 16 | 508 |
| 17 | 72.50 | 605 | 0.350 | 0.033 | 0.009 | 0.046 | 24 | 520 |
| 16 | 67.50 | 617 | 0.303 | 0.045 | 0.012 | 0.054 | 29 | 531 |
| 15 | 62.50 | 630 | 0.260 | 0.054 | 0.016 | 0.059 | 32 | 542 |
| 14 | 57.50 | 643 | 0.220 | 0.060 | 0.021 | 0.062 | 34 | 553 |
| 13 | 53.23 | 463 | 0.188 | 0.064 | 0.025 | 0.062 | 25 | 398 |
| 12 | 50.73 | 375 | 0.171 | 0.066 | 0.027 | 0.062 | 20 | 322 |
| 11 | 48.06 | 1,010 | 0.154 | 0.068 | 0.030 | 0.061 | 54 | 868 |
| 10 | 45.56 | 178 | 0.138 | 0.069 | 0.032 | 0.061 | 9 | 153 |
| 9 | 42.50 | 804 | 0.120 | 0.070 | 0.034 | 0.060 | 42 | 691 |
| 8 | 37.50 | 820 | 0.094 | 0.071 | 0.038 | 0.059 | 42 | 705 |
| 7 | 32.50 | 837 | 0.070 | 0.072 | 0.041 | 0.058 | 42 | 719 |
| 6 | 27.50 | 853 | 0.050 | 0.071 | 0.042 | 0.056 | 42 | 733 |
| 5 | 22.50 | 869 | 0.034 | 0.069 | 0.041 | 0.055 | 41 | 747 |
| 4 | 17.50 | 885 | 0.020 | 0.064 | 0.038 | 0.052 | 40 | 761 |
| 3 | 12.50 | 901 | 0.010 | 0.055 | 0.032 | 0.047 | 36 | 774 |
| 2 | 7.50 | 917 | 0.004 | 0.040 | 0.023 | 0.037 | 29 | 788 |
| 1 | 2.50 | 933 | 0.000 | 0.016 | 0.009 | 0.018 | 14 | 802 |
| Generic RCU (Remote | 167.00 | 12 | 1.855 | 1.801 | 1.075 | 0.357 | 4 | 10 |
| Powerwave Allgon TT0 | 167.00 | 132 | 1.855 | 1.801 | 1.075 | 0.357 | 41 | 113 |
| Raycap DC6-48-60-18- | 167.00 | 32 | 1.855 | 1.801 | 1.075 | 0.357 | 10 | 27 |
| Ericsson RRUS 11 B2 | 167.00 | 304 | 1.855 | 1.801 | 1.075 | 0.357 | 94 | 261 |
| KMW AM-X-CD-17-65-00 | 167.00 | 31 | 1.855 | 1.801 | 1.075 | 0.357 | 10 | 26 |
| Powerwave Allgon P90 | 167.00 | 90 | 1.855 | 1.801 | 1.075 | 0.357 | 28 | 77 |
| Kathrein Scala 800-1 | 167.00 | 110 | 1.855 | 1.801 | 1.075 | 0.357 | 34 | 95 |
| Stand-Off | 157.00 | 225 | 1.640 | 0.906 | 0.725 | 0.222 | 43 | 193 |
| Andrew DBXNH-6565A- | 157.00 | 103 | 1.640 | 0.906 | 0.725 | 0.222 | 20 | 88 |
| Stand-Off | 146.00 | 225 | 1.418 | 0.319 | 0.450 | 0.105 | 20 | 193 |
| Antel BXA-70063/6CF | 146.00 | 51 | 1.418 | 0.319 | 0.450 | 0.105 | 5 | 44 |
| VZW Unused Reserve: | 146.00 | 1,199 | 1.418 | 0.319 | 0.450 | 0.105 | 109 | 1,031 |
| Ericsson Radio 4449 | 136.00 | 222 | 1.230 | 0.035 | 0.278 | 0.025 | 5 | 191 |
| Ericsson RRUS 11 B12 | 136.00 | 152 | 1.230 | 0.035 | 0.278 | 0.025 | 3 | 131 |
| RFS APXV18-206516S-C | 136.00 | 56 | 1.230 | 0.035 | 0.278 | 0.025 | 1 | 48 |
| Flat T-Arm | 136.00 | 750 | 1.230 | 0.035 | 0.278 | 0.025 | 16 | 645 |
| RFS APXVAARR24_43-U- | 136.00 | 384 | 1.230 | 0.035 | 0.278 | 0.025 | 8 | 330 |
| | | 24,525 | 60.435 | 25.461 | 21.557 | 6.238 | 1,184 | 21,078 |

Load Case (1.2 + 0.2Sds) * DL + E EMAM Seismic Equivalent Modal Analysis Method

Calculated Forces

| 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 | -29.27 | -1.17 | 0.00 | -132.86 | 0.00 | 132.86 | 2,995.17 | 1,497.58 | 5,752.58 | 2,880.56 | 0.00 | 0.00 | 0.056 |
| 5.00 | -28.13 | -1.15 | 0.00 | -127.00 | 0.00 | 127.00 | 2,959.81 | 1,479.91 | 5,567.76 | 2,788.02 | 0.01 | -0.01 | 0.055 |
| 10.00 | -27.01 | -1.12 | 0.00 | -121.25 | 0.00 | 121.25 | 2,923.38 | 1,461.69 | 5,383.76 | 2,695.88 | 0.03 | -0.03 | 0.054 |
| 15.00 | -25.91 | -1.09 | 0.00 | -115.65 | 0.00 | 115.65 | 2,885.88 | 1,442.94 | 5,200.69 | 2,604.21 | 0.07 | -0.04 | 0.053 |
| 20.00 | -24.83 | -1.05 | 0.00 | -110.21 | 0.00 | 110.21 | 2,847.29 | 1,423.65 | 5,018.68 | 2,513.07 | 0.12 | -0.06 | 0.053 |
| 25.00 | -23.78 | -1.02 | 0.00 | -104.96 | 0.00 | 104.96 | 2,807.63 | 1,403.81 | 4,837.86 | 2,422.53 | 0.19 | -0.07 | 0.052 |
| 30.00 | -22.74 | -0.98 | 0.00 | -99.88 | 0.00 | 99.88 | 2,766.89 | 1,383.44 | 4,658.36 | 2,332.64 | 0.28 | -0.09 | 0.051 |
| 35.00 | -21.72 | -0.94 | 0.00 | -94.99 | 0.00 | 94.99 | 2,725.06 | 1,362.53 | 4,480.31 | 2,243.49 | 0.38 | -0.11 | 0.050 |
| 40.00 | -20.72 | -0.90 | 0.00 | -90.29 | 0.00 | 90.29 | 2,682.17 | 1,341.08 | 4,303.83 | 2,155.12 | 0.51 | -0.12 | 0.050 |
| 45.00 | -20.50 | -0.90 | 0.00 | -85.77 | 0.00 | 85.77 | 2,638.19 | 1,319.10 | 4,129.06 | 2,067.60 | 0.64 | -0.14 | 0.049 |
| 46.12 | -19.25 | -0.84 | 0.00 | -84.77 | 0.00 | 84.77 | 2,628.22 | 1,314.11 | 4,090.25 | 2,048.17 | 0.68 | -0.14 | 0.049 |
| 50.00 | -18.78 | -0.82 | 0.00 | -81.50 | 0.00 | 81.50 | 2,593.14 | 1,296.57 | 3,956.11 | 1,981.00 | 0.80 | -0.16 | 0.048 |
| 51.46 | -18.21 | -0.80 | 0.00 | -80.30 | 0.00 | 80.30 | 1,919.32 | 959.66 | 2,955.63 | 1,480.01 | 0.85 | -0.16 | 0.064 |
| 55.00 | -17.41 | -0.77 | 0.00 | -77.46 | 0.00 | 77.46 | 1,899.39 | 949.70 | 2,871.79 | 1,438.03 | 0.97 | -0.18 | 0.063 |
| 60.00 | -16.63 | -0.74 | 0.00 | -73.61 | 0.00 | 73.61 | 1,870.33 | 935.17 | 2,753.97 | 1,379.03 | 1.17 | -0.20 | 0.062 |
| 65.00 | -15.86 | -0.72 | 0.00 | -69.91 | 0.00 | 69.91 | 1,840.20 | 920.10 | 2,636.91 | 1,320.41 | 1.39 | -0.22 | 0.062 |
| 70.00 | -15.11 | -0.69 | 0.00 | -66.33 | 0.00 | 66.33 | 1,808.98 | 904.49 | 2,520.72 | 1,262.23 | 1.63 | -0.24 | 0.061 |
| 75.00 | -14.38 | -0.68 | 0.00 | -62.86 | 0.00 | 62.86 | 1,776.69 | 888.34 | 2,405.54 | 1,204.56 | 1.89 | -0.27 | 0.060 |
| 80.00 | -13.66 | -0.68 | 0.00 | -59.45 | 0.00 | 59.45 | 1,743.32 | 871.66 | 2,291.50 | 1,147.45 | 2.18 | -0.29 | 0.060 |
| 85.00 | -12.96 | -0.68 | 0.00 | -56.07 | 0.00 | 56.07 | 1,708.87 | 854.43 | 2,178.71 | 1,090.98 | 2.50 | -0.31 | 0.059 |
| 90.00 | -12.59 | -0.69 | 0.00 | -52.66 | 0.00 | 52.66 | 1,673.34 | 836.67 | 2,067.32 | 1,035.20 | 2.84 | -0.34 | 0.058 |
| 92.65 | -12.10 | -0.70 | 0.00 | -50.84 | 0.00 | 50.84 | 1,654.10 | 827.05 | 2,008.98 | 1,005.98 | 3.04 | -0.35 | 0.058 |
| 95.00 | -11.69 | -0.71 | 0.00 | -49.19 | 0.00 | 49.19 | 1,636.74 | 818.37 | 1,957.44 | 980.18 | 3.22 | -0.37 | 0.057 |
| 96.93 | -11.35 | -0.72 | 0.00 | -47.82 | 0.00 | 47.82 | 1,103.35 | 551.67 | 1,325.55 | 663.76 | 3.37 | -0.38 | 0.082 |
| 100.00 | -10.81 | -0.75 | 0.00 | -45.59 | 0.00 | 45.59 | 1,091.13 | 545.56 | 1,284.38 | 643.14 | 3.62 | -0.40 | 0.081 |
| 105.00 | -10.28 | -0.77 | 0.00 | -41.85 | 0.00 | 41.85 | 1,070.38 | 535.19 | 1,217.67 | 609.74 | 4.05 | -0.43 | 0.078 |
| 110.00 | -9.76 | -0.80 | 0.00 | -37.98 | 0.00 | 37.98 | 1,048.55 | 524.27 | 1,151.42 | 576.56 | 4.52 | -0.47 | 0.075 |
| 115.00 | -9.25 | -0.82 | 0.00 | -33.99 | 0.00 | 33.99 | 1,025.64 | 512.82 | 1,085.75 | 543.68 | 5.03 | -0.50 | 0.072 |
| 120.00 | -8.75 | -0.84 | 0.00 | -29.88 | 0.00 | 29.88 | 1,001.65 | 500.83 | 1,020.79 | 511.15 | 5.57 | -0.54 | 0.067 |
| 125.00 | -8.27 | -0.84 | 0.00 | -25.70 | 0.00 | 25.70 | 976.59 | 488.30 | 956.67 | 479.05 | 6.15 | -0.57 | 0.062 |
| 130.00 | -7.80 | -0.84 | 0.00 | -21.48 | 0.00 | 21.48 | 950.45 | 475.22 | 893.52 | 447.42 | 6.77 | -0.61 | 0.056 |
| 135.00 | -7.70 | -0.84 | 0.00 | -17.26 | 0.00 | 17.26 | 923.23 | 461.61 | 831.46 | 416.35 | 7.42 | -0.64 | 0.050 |
| 136.00 | -5.42 | -0.78 | 0.00 | -16.42 | 0.00 | 16.42 | 917.66 | 458.83 | 819.19 | 410.21 | 7.56 | -0.64 | 0.046 |
| 140.00 | -5.42 | -0.78 | 0.00 | -13.32 | 0.00 | 13.32 | 894.93 | 447.47 | 770.63 | 385.89 | 8.10 | -0.66 | 0.041 |
| 140.02 | -4.98 | -0.75 | 0.00 | -13.30 | 0.00 | 13.30 | 894.81 | 447.41 | 770.38 | 385.76 | 8.11 | -0.66 | 0.040 |
| 143.22 | -4.83 | -0.74 | 0.00 | -10.90 | 0.00 | 10.90 | 887.67 | 443.84 | 755.59 | 378.35 | 8.56 | -0.68 | 0.034 |
| 145.00 | -4.75 | -0.74 | 0.00 | -9.57 | 0.00 | 9.57 | 877.23 | 438.62 | 734.36 | 367.72 | 8.81 | -0.69 | 0.031 |
| 146.00 | -2.62 | -0.55 | 0.00 | -8.84 | 0.00 | 8.84 | 871.31 | 435.66 | 722.52 | 361.80 | 8.96 | -0.69 | 0.027 |
| 150.00 | -2.25 | -0.50 | 0.00 | -6.63 | 0.00 | 6.63 | 847.20 | 423.60 | 675.75 | 338.38 | 9.54 | -0.71 | 0.022 |
| 155.00 | -2.11 | -0.48 | 0.00 | -4.11 | 0.00 | 4.11 | 816.09 | 408.05 | 618.71 | 309.81 | 10.29 | -0.72 | 0.016 |
| 157.00 | -1.61 | -0.40 | 0.00 | -3.15 | 0.00 | 3.15 | 800.73 | 400.36 | 594.40 | 297.64 | 10.59 | -0.72 | 0.013 |
| 158.56 | -1.50 | -0.38 | 0.00 | -2.53 | 0.00 | 2.53 | 787.55 | 393.77 | 574.90 | 287.88 | 10.83 | -0.73 | 0.011 |
| 158.56 | -1.50 | -0.38 | 0.00 | -2.53 | 0.00 | 2.53 | 551.08 | 275.54 | 275.63 | 180.95 | 10.83 | -0.73 | 0.017 |
| 160.00 | -1.13 | -0.30 | 0.00 | -1.99 | 0.00 | 1.99 | 551.08 | 275.54 | 275.63 | 180.95 | 11.05 | -0.73 | 0.013 |
| 165.00 | -0.97 | -0.26 | 0.00 | -0.51 | 0.00 | 0.51 | 551.08 | 275.54 | 275.63 | 180.95 | 11.82 | -0.74 | 0.005 |
| 167.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 551.08 | 275.54 | 275.63 | 180.95 | 12.13 | -0.74 | 0.000 |
| 168.56 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 551.08 | 275.54 | 275.63 | 180.95 | 12.37 | -0.74 | 0.000 |

Load Case (0.9 - 0.2Sds) * DL + E EMAM Seismic (Reduced DL) Equivalent Modal Analysis Method

Calculated Forces

| 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 | -20.28 | -1.17 | 0.00 | -129.97 | 0.00 | 129.97 | 2,995.17 | 1,497.58 | 5,752.58 | 2,880.56 | 0.00 | 0.00 | 0.052 |
| 5.00 | -19.49 | -1.15 | 0.00 | -124.12 | 0.00 | 124.12 | 2,959.81 | 1,479.91 | 5,567.76 | 2,788.02 | 0.01 | -0.01 | 0.051 |
| 10.00 | -18.71 | -1.11 | 0.00 | -118.38 | 0.00 | 118.38 | 2,923.38 | 1,461.69 | 5,383.76 | 2,695.88 | 0.03 | -0.03 | 0.050 |
| 15.00 | -17.95 | -1.08 | 0.00 | -112.81 | 0.00 | 112.81 | 2,885.88 | 1,442.94 | 5,200.69 | 2,604.21 | 0.07 | -0.04 | 0.050 |
| 20.00 | -17.21 | -1.04 | 0.00 | -107.42 | 0.00 | 107.42 | 2,847.29 | 1,423.65 | 5,018.68 | 2,513.07 | 0.12 | -0.06 | 0.049 |
| 25.00 | -16.47 | -1.00 | 0.00 | -102.21 | 0.00 | 102.21 | 2,807.63 | 1,403.81 | 4,837.86 | 2,422.53 | 0.19 | -0.07 | 0.048 |
| 30.00 | -15.75 | -0.97 | 0.00 | -97.19 | 0.00 | 97.19 | 2,766.89 | 1,383.44 | 4,658.36 | 2,332.64 | 0.27 | -0.09 | 0.047 |
| 35.00 | -15.05 | -0.93 | 0.00 | -92.36 | 0.00 | 92.36 | 2,725.06 | 1,362.53 | 4,480.31 | 2,243.49 | 0.38 | -0.10 | 0.047 |
| 40.00 | -14.36 | -0.89 | 0.00 | -87.72 | 0.00 | 87.72 | 2,682.17 | 1,341.08 | 4,303.83 | 2,155.12 | 0.49 | -0.12 | 0.046 |
| 45.00 | -14.20 | -0.88 | 0.00 | -83.29 | 0.00 | 83.29 | 2,638.19 | 1,319.10 | 4,129.06 | 2,067.60 | 0.63 | -0.14 | 0.046 |
| 46.12 | -13.34 | -0.83 | 0.00 | -82.30 | 0.00 | 82.30 | 2,628.22 | 1,314.11 | 4,090.25 | 2,048.17 | 0.66 | -0.14 | 0.045 |
| 50.00 | -13.01 | -0.81 | 0.00 | -79.09 | 0.00 | 79.09 | 2,593.14 | 1,296.57 | 3,956.11 | 1,981.00 | 0.78 | -0.15 | 0.045 |
| 51.46 | -12.62 | -0.78 | 0.00 | -77.92 | 0.00 | 77.92 | 1,919.32 | 959.66 | 2,955.63 | 1,480.01 | 0.83 | -0.16 | 0.059 |
| 55.00 | -12.06 | -0.75 | 0.00 | -75.14 | 0.00 | 75.14 | 1,899.39 | 949.70 | 2,871.79 | 1,438.03 | 0.95 | -0.17 | 0.059 |
| 60.00 | -11.52 | -0.72 | 0.00 | -71.38 | 0.00 | 71.38 | 1,870.33 | 935.17 | 2,753.97 | 1,379.03 | 1.14 | -0.19 | 0.058 |
| 65.00 | -10.99 | -0.69 | 0.00 | -67.78 | 0.00 | 67.78 | 1,840.20 | 920.10 | 2,636.91 | 1,320.41 | 1.35 | -0.21 | 0.057 |
| 70.00 | -10.47 | -0.67 | 0.00 | -64.30 | 0.00 | 64.30 | 1,808.98 | 904.49 | 2,520.72 | 1,262.23 | 1.59 | -0.24 | 0.057 |
| 75.00 | -9.96 | -0.66 | 0.00 | -60.94 | 0.00 | 60.94 | 1,776.69 | 888.34 | 2,405.54 | 1,204.56 | 1.84 | -0.26 | 0.056 |
| 80.00 | -9.46 | -0.65 | 0.00 | -57.65 | 0.00 | 57.65 | 1,743.32 | 871.66 | 2,291.50 | 1,147.45 | 2.13 | -0.28 | 0.056 |
| 85.00 | -8.98 | -0.66 | 0.00 | -54.38 | 0.00 | 54.38 | 1,708.87 | 854.43 | 2,178.71 | 1,090.98 | 2.43 | -0.31 | 0.055 |
| 90.00 | -8.72 | -0.66 | 0.00 | -51.10 | 0.00 | 51.10 | 1,673.34 | 836.67 | 2,067.32 | 1,035.20 | 2.77 | -0.33 | 0.055 |
| 92.65 | -8.38 | -0.68 | 0.00 | -49.34 | 0.00 | 49.34 | 1,654.10 | 827.05 | 2,008.98 | 1,005.98 | 2.96 | -0.34 | 0.054 |
| 95.00 | -8.10 | -0.69 | 0.00 | -47.75 | 0.00 | 47.75 | 1,636.74 | 818.37 | 1,957.44 | 980.18 | 3.13 | -0.36 | 0.054 |
| 96.93 | -7.86 | -0.70 | 0.00 | -46.42 | 0.00 | 46.42 | 1,103.35 | 551.67 | 1,325.55 | 663.76 | 3.28 | -0.37 | 0.077 |
| 100.00 | -7.49 | -0.72 | 0.00 | -44.27 | 0.00 | 44.27 | 1,091.13 | 545.56 | 1,284.38 | 643.14 | 3.52 | -0.38 | 0.076 |
| 105.00 | -7.12 | -0.75 | 0.00 | -40.66 | 0.00 | 40.66 | 1,070.38 | 535.19 | 1,217.67 | 609.74 | 3.94 | -0.42 | 0.073 |
| 110.00 | -6.76 | -0.77 | 0.00 | -36.92 | 0.00 | 36.92 | 1,048.55 | 524.27 | 1,151.42 | 576.56 | 4.40 | -0.45 | 0.070 |
| 115.00 | -6.41 | -0.79 | 0.00 | -33.06 | 0.00 | 33.06 | 1,025.64 | 512.82 | 1,085.75 | 543.68 | 4.89 | -0.49 | 0.067 |
| 120.00 | -6.06 | -0.81 | 0.00 | -29.09 | 0.00 | 29.09 | 1,001.65 | 500.83 | 1,020.79 | 511.15 | 5.42 | -0.52 | 0.063 |
| 125.00 | -5.73 | -0.82 | 0.00 | -25.05 | 0.00 | 25.05 | 976.59 | 488.30 | 956.67 | 479.05 | 5.98 | -0.56 | 0.058 |
| 130.00 | -5.40 | -0.82 | 0.00 | -20.97 | 0.00 | 20.97 | 950.45 | 475.22 | 893.52 | 447.42 | 6.58 | -0.59 | 0.053 |
| 135.00 | -5.33 | -0.82 | 0.00 | -16.89 | 0.00 | 16.89 | 923.23 | 461.61 | 831.46 | 416.35 | 7.22 | -0.62 | 0.046 |
| 136.00 | -3.75 | -0.76 | 0.00 | -16.07 | 0.00 | 16.07 | 917.66 | 458.83 | 819.19 | 410.21 | 7.35 | -0.62 | 0.043 |
| 140.00 | -3.75 | -0.76 | 0.00 | -13.05 | 0.00 | 13.05 | 894.93 | 447.47 | 770.63 | 385.89 | 7.88 | -0.65 | 0.038 |
| 140.02 | -3.45 | -0.73 | 0.00 | -13.03 | 0.00 | 13.03 | 894.81 | 447.41 | 770.38 | 385.76 | 7.88 | -0.65 | 0.038 |
| 143.22 | -3.34 | -0.72 | 0.00 | -10.69 | 0.00 | 10.69 | 887.67 | 443.84 | 755.59 | 378.35 | 8.32 | -0.66 | 0.032 |
| 145.00 | -3.29 | -0.72 | 0.00 | -9.40 | 0.00 | 9.40 | 877.23 | 438.62 | 734.36 | 367.72 | 8.57 | -0.67 | 0.029 |
| 146.00 | -1.81 | -0.54 | 0.00 | -8.68 | 0.00 | 8.68 | 871.31 | 435.66 | 722.52 | 361.80 | 8.71 | -0.67 | 0.026 |
| 150.00 | -1.56 | -0.49 | 0.00 | -6.52 | 0.00 | 6.52 | 847.20 | 423.60 | 675.75 | 338.38 | 9.28 | -0.69 | 0.021 |
| 155.00 | -1.46 | -0.47 | 0.00 | -4.05 | 0.00 | 4.05 | 816.09 | 408.05 | 618.71 | 309.81 | 10.01 | -0.70 | 0.015 |
| 157.00 | -1.11 | -0.39 | 0.00 | -3.10 | 0.00 | 3.10 | 800.73 | 400.36 | 594.40 | 297.64 | 10.30 | -0.71 | 0.012 |
| 158.56 | -1.04 | -0.37 | 0.00 | -2.49 | 0.00 | 2.49 | 787.55 | 393.77 | 574.90 | 287.88 | 10.53 | -0.71 | 0.010 |
| 158.56 | -1.04 | -0.37 | 0.00 | -2.49 | 0.00 | 2.49 | 551.08 | 275.54 | 275.63 | 180.95 | 10.53 | -0.71 | 0.016 |
| 160.00 | -0.78 | -0.29 | 0.00 | -1.96 | 0.00 | 1.96 | 551.08 | 275.54 | 275.63 | 180.95 | 10.75 | -0.71 | 0.012 |
| 165.00 | -0.67 | -0.25 | 0.00 | -0.51 | 0.00 | 0.51 | 551.08 | 275.54 | 275.63 | 180.95 | 11.49 | -0.72 | 0.004 |
| 167.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 551.08 | 275.54 | 275.63 | 180.95 | 11.79 | -0.72 | 0.000 |
| 168.56 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 551.08 | 275.54 | 275.63 | 180.95 | 12.03 | -0.72 | 0.000 |

## Analysis Summary

| | Reactions | | | | | | Max Usage | |
|---|---|---|---|---|---|---|---|---|
| Load Case | 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 + 1.6W | 17.78 | 0.00 | 29.39 | 0.00 | 0.00 | 2117.91 | 96.93 | 0.92 |
| 0.9D + 1.6W | 17.43 | 0.00 | 22.04 | 0.00 | 0.00 | 2034.71 | 96.93 | 0.87 |
| 1.2D + 1.0Di + 1.0Wi | 10.17 | 0.00 | 52.27 | 0.00 | 0.00 | 1047.65 | 51.46 | 0.40 |
| (1.2 + 0.2Sds) * DL + E ELFM | 0.96 | 0.00 | 29.27 | 0.00 | 0.00 | 130.22 | 96.93 | 0.07 |
| (1.2 + 0.2Sds) * DL + E EMAM | 1.17 | 0.00 | 29.27 | 0.00 | 0.00 | 132.86 | 96.93 | 0.08 |
| (0.9 - 0.2Sds) * DL + E ELFM | 0.96 | 0.00 | 20.28 | 0.00 | 0.00 | 127.53 | 96.93 | 0.06 |
| (0.9 - 0.2Sds) * DL + E EMAM | 1.17 | 0.00 | 20.28 | 0.00 | 0.00 | 129.97 | 96.93 | 0.08 |
| 1.0D + 1.0W | 4.53 | 0.00 | 24.52 | 0.00 | 0.00 | 533.85 | 96.93 | 0.24 |

# Base Plate & Anchor Rod Analysis

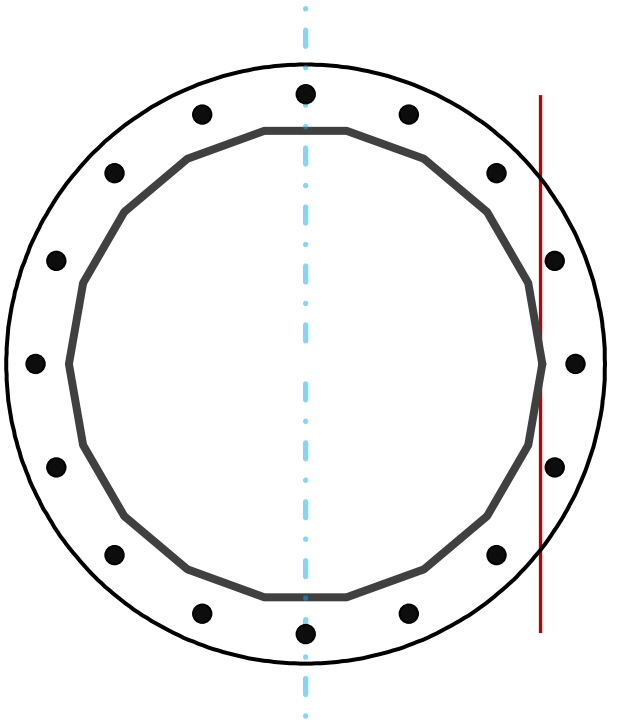
| Pole Dimensions | | |
|---|---|---|
| Number of Sides | 18 | - |
| Diameter | 47 | in |
| Thickness | 0.3125 | in |
| Orientation Offset | | ° |

| Base Reactions | | |
|---|---|---|
| Moment, Mu | 2117.9 | k-ft |
| Axial, Pu | 29.4 | k |
| Shear, Vu | 17.8 | k |
| Neutral Axis | 270 | ° |

| Report Capacities | | |
|---|---|---|
| Component | Capacity | Result |
| Base Plate | 30% | Pass |
| Anchor Rods | 46% | Pass |
| Dwyidag | - | - |

| Base Plate | | |
|---|---|---|
| Shape | Round | - |
| Diameter, ø | 61 | in |
| Thickness | 2 1/2 | in |
| Grade | A572-50 | - |
| Yield Strength, Fy | 50 | ksi |
| Tensile Strength, Fu | 65 | ksi |
| Clip | N/A | in |
| Orientation Offset | | ° |
| Anchor Rod Detail | d | η=0.5 |
| Clear Distance | 3 | in |
| Applied Moment, Mu | 799.3 | k |
| Bending Stress, ϕMn | 2629.9 | k |

| Original Anchor Rods | | |
|---|---|---|
| Arrangement | Radial | - |
| Quantity | 16 | - |
| Diameter, ø | 2 1/4 | in |
| Bolt Circle | 55 | in |
| Grade | A615-75 | |
| Yield Strength, Fy | 75 | ksi |
| Tensile Strength, Fu | 100 | ksi |
| Spacing | 10.8 | in |
| Orientation Offset | | ° |
| Applied Force, Pu | 117.3 | k |
| Anchor Rods, ϕPn | 259.8 | k |



# Calculations for Monopole Base Plate & Anchor Rod Analysis

**Reaction Distribution**

| Reaction | Shear Vu | Moment Mu | Factor |
|---|---|---|---|
| - | k | k-ft | - |
| Base Forces | 17.8 | 2117.9 | 1.00 |
| Anchor Rod Forces | 17.8 | 2117.9 | 1.00 |
| Additional Bolt (Grp1) Forces | 0.0 | 0.0 | 0.00 |
| Additional Bolt (Grp2) Forces | 0.0 | 0.0 | 0.00 |
| Dywidag Forces | 0.0 | 0.0 | 0.00 |
| Stiffener Forces | 0.0 | 0.0 | 0.00 |

**Geometric Properties**

| Section | Gross Area | Net Area | Individual Inertia | Threads per Inch | Moment of Inertia |
|---|---|---|---|---|---|
| - | $in^2$ | $in^2$ | $in^4$ | # | $in^4$ |
| Pole | 45.6030 | 2.5335 | 0.0827 | | 12426.72 |
| Bolt | 3.9761 | 3.2477 | 0.8393 | 4.5 | 19661.95 |
| Bolt1 | 0.0000 | 0.0000 | 0.0000 | 0 | 0.00 |
| Bolt2 | 0.0000 | 0.0000 | 0.0000 | 0 | 0.00 |
| Dywidag | 0.0000 | 0.0000 | 0.0000 | | 0.00 |
| Stiffener | 0.0000 | 0.0000 | 0.0000 | | 0.00 |

| Base Plate | | |
|---|---|---|
| Shape | Round | - |
| Diameter, D | 61 | in |
| Thickness, t | 2.5 | in |
| Yield Strength, Fy | 50 | ksi |
| Tensile Strength, Fu | 65 | ksi |
| Base Plate Chord | 38.884 | in |
| Detail Type | d | - |
| Detail Factor | 0.50 | - |
| Clear Distance | 3 | - |

| Anchor Rods | | |
|---|---|---|
| Anchor Rod Quantity, N | 16 | - |
| Rod Diameter, d | 2.25 | in |
| Bolt Circle, BC | 55 | in |
| Yield Strength, Fy | 75 | ksi |
| Tensile Strength, Fu | 100 | ksi |
| Applied Axial, Pu | 117.3 | k |
| Applied Shear, Vu | 0.7 | k |
| Compressive Capacity, ϕPn | 259.8 | k |
| Tensile Capacity, ϕRnt | 0.451 | OK |
| Interaction Capacity | 0.457 | OK |

| External Base Plate | | |
|---|---|---|
| Chord Length AA | 32.404 | in |
| Additional AA | 5.000 | in |
| Section Modulus, Z | 58.443 | $in^3$ |
| Applied Moment, Mu | 799.3 | k-ft |
| Bending Capacity, ϕMn | 2629.9 | k-ft |
| Capacity, Mu/ϕMn | 0.304 | OK |
| | | |
| Chord Length AB | 31.303 | in |
| Additional AB | 5.000 | in |
| Section Modulus, Z | 56.723 | $in^3$ |
| Applied Moment, Mu | 676.8 | k-ft |
| Bending Capacity, ϕMn | 2552.5 | k-ft |
| Capacity, Mu/ϕMn | 0.265 | OK |
| | | |
| Bend Line Length | 35.100 | in |
| Additional Bend Line | 0.000 | in |
| Section Modulus, Z | 54.843 | $in^3$ |
| Applied Moment, Mu | 179.7 | k-ft |
| Bending Capacity, ϕMn | 2467.9 | k-ft |
| Capacity, Mu/ϕMn | 0.073 | OK |

| Internal Base Plate | | |
|---|---|---|
| Arc Length | 0.000 | in |
| Section Modulus, Z | 0.000 | $in^3$ |
| Moment Arm | 0.000 | in |
| Applied Moment, Mu | 0.0 | k-ft |
| Bending Capacity, ϕMn | 0.0 | k-ft |
| Capacity, Mu/ϕMn | | |

# Exhibit E

## Mount Analysis

# Mount Analysis of Existing T-Arms for American Tower on behalf of T-Mobile
## 413782 - Washington North CT
## Project #: 12927146
**T-Mobile Site ID: CTNH371A**
**Program: L600**

**CLS Engineering PLLC Project #41124-12927146-01-MA-R2**
**July 3, 2019**

| | |
|---|---|
| **MOUNT DESCRIPTION** | Existing T-Arms at 136 ft AGL |
| **ANTENNA ELEVATION** | Nominal Rad. Elevation of 136 ft AGL |
| **SITE DESCRIPTION** | 168.6 ft Monopole |
| **SITE ADDRESS** | 6 Mountain Road, New Preston, CT 06777-1518, Litchfield County |
| **GPS COORDINATES** | 41.669147, -73.365281 |
| **ANALYSIS STANDARD** | 2015 IBC / 2018 Connecticut State Building Code / TIA-222-G |
| **LOADING CRITERIA** | 120 mph, $V_{ult}$ / 93 mph, $V_{asd}$ (3-Second Gust) w/o ice & 40 mph (3-Second Gust) w/ 0.75" Ice |

■ **ANALYSIS RESULT:** **Pass**

| | | |
|---|---|---|
| **MEMBER USAGE** | **30%** | **Pass** |

Prepared by:
**Jennifer Soza**

Reviewed and Approved by:
**Tyler M. Barker, P.E.**

STATE OF CONNECTICUT
TYLER M BARKER
No. 32402
LICENSED
PROFESSIONAL ENGINEER

Tyler M. Barker
CLS Engineering, PLLC
Director of Engineering
PE # 32402 Exp. 1/31/2020
COA # PEC.001833 Exp. 8/14/2019

IdenTrust part of HID Global
Digitally signed by Tyler Barker
DN: c=US, o=Telamon Corporation, ou=A01427E0000016A4525ADF800001D17, cn=Tyler Barker
Date: 2019.07.03 21:59:19 -04'00'

## ■ INTRODUCTION

The proposed equipment is to be mounted to the existing T-Arms. This proposed mounting configuration was analyzed using RISA-3D, a commercially available finite element analysis software package. A selection of input and output from our analysis is attached to the end of this report.

## ■ STRUCTURAL DOCUMENTS PROVIDED

| | |
|---|---|
| **STRUCTURAL DATA** | Site photos, dated October 31, 2018 |
| **PREVIOUS ANALYSES** | Structural Analysis by ATC, Engineering #OAA701488_C3_01, dated April 20, 2017 |
| **LOADING DATA** | ATC Application, Project #12927146, dated April 29, 2019 |

## ■ ANALYSIS CRITERIA

| | |
|---|---|
| **STANDARD** | 2015 IBC / 2018 Connecticut State Building Code / TIA-222-G |
| **BASIC WIND SPEED** | 120 mph, $V_{ult}$ / 93 mph, $V_{asd}$ (3-Second Gust) |
| **BASIC WIND SPEED W/ ICE** | 40 mph (3-Second Gust) w/ 0.75" Radial Ice (Escalating) |
| **EXPOSURE CATEGORY** | C |
| **MAX. TOPOGRAPHIC FACTOR, $K_{zt}$** | 1.00 |
| **RISK CATEGORY** | II |
| **MAINTENANCE LIVE LOAD** | $L_M$: 500 lb |

## ■ FINAL EQUIPMENT

| **ELEVATION (ft)** | | **ANTENNAS** | |
|---|---|---|---|
| **MOUNT** | **RAD.** | **#** | **NAME** |
| 136.0 | 136.0 | 3 | Ericsson RRUS 11 B2 |
| | | 3 | Ericsson RADIO 4449 B12/B71 |
| | | 3 | RFS Celwave APXVAARR24_43-U-NA20 |
| | | 3 | RFS Celwave APXV18-206516S-C-A20 |

## ■ RESULTS SUMMARY

| **COMPONENT** | **PEAK USAGE** | **RESULT** |
|---|---|---|
| Connection Plates | 30% | Pass |
| Mount Pipes | 27% | Pass |
| Stand-Off Horizontals | 8% | Pass |

## ■ CONCLUSION AND RECOMMENDATIONS

According to our structural analysis, the mounts have been found to **PASS.** The mounting configuration considered in this analysis is capable of supporting the referenced loading pursuant to applicable standards.

## ■ ASSUMPTIONS AND CONDITIONS

This analysis is inclusive of the antenna supporting frames/mounts and all recorded connections that will support the equipment listed in this report. It considers only the theoretical capacity of structural components and it is not a condition assessment. The validity of the analysis may be dependent on the accuracy of structural information supplied by others. The client is responsible for verifying this information. If any provided information is revised after completion of this analysis, CLS Engineering PLLC should be notified immediately to revise results.

This analysis assumes the following:

1. The tower or other superstructure and mounts (if existing) were properly constructed as per the original design and have been properly maintained in accordance with applicable code standards.
2. Member sizes and strengths are accurate as supplied or are assumed as stated in the calculations.
3. In the absence of sufficient design information, all welds and connections are assumed to develop at least the capacity of the connected member, unless otherwise stated in this analysis.
4. All prior structural modifications, if any, are assumed to be correctly installed and fully effective.
5. The loading configuration is complete and accurate as supplied and/or as modeled in the previous analysis. All appurtenances are assumed to be properly installed and supported as per manufacturer requirements.
6. Some conservative assumptions may be used regarding appurtenances and their projected areas based on careful interpretation of data supplied, previous experience and standard industry practice.

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of the report. All opinions and conclusions contained herein are subject to revision based upon receipt of new or updated information. All services are provided exercising a level of care and diligence equivalent to the standard of our profession. No warranty or guarantee, either expressed or implied, is offered. All services are confidential in nature and this report will not be released to any other party without the client's consent. The use of this analysis is limited to the expressed purpose for which it was commissioned and it may not be reused, copied or disseminated for any other purpose without consent from CLS Engineering PLLC.

All services were performed, results obtained and recommendations made in accordance with generally accepted engineering principles and practices. CLS Engineering PLLC is not responsible for the conclusions, opinions or recommendations made by others based on the information supplied in this analysis.

It is not possible to have the fully detailed information necessary to perform a complete and thorough analysis of every structural sub-component of an existing structure. The structural analysis by CLS Engineering PLLC verifies the adequacy of the primary members of the structure. CLS Engineering PLLC provides a limited scope of service in that we cannot verify the adequacy of every weld, bolt, gusset, etc.

## Wind & Ice Loading

| | | | |
|---|---|---|---|
| **Nominal Mount Elevation (AGL), $z_{mount}$** | 136 ft | **$K_a$** | 0.90 |
| **Nominal Rad Elevation (AGL), $z_{rad}$** | 136 ft | **$K_d$** | 0.95 |
| **Elevation AMSL (ft)** | - | **$K_e$** | - |
| **TIA Standard** | G | **$K_z$** | 1.35 |
| **Basic Wind Speed, $V_{ult}$ (bare)** | 120 mph | **$K_{zt}$** | 1.00 |
| **Basic Wind Speed, V (ice)** | 40 mph | **$K_s$** | - |
| **Design Ice Thickness, $t_i$** | 3/4 in | **$t_{iz}$** | 1.73 in |
| **Exposure Category** | C | **$G_h$** | 1.00 |
| **Risk Category** | II | **$q_z$ (bare)** | 47.3 psf |
| **Seismic Response Coeff., $C_s$** | - | **$q_z$ (ice)** | 5.3 psf |

## Live Loading

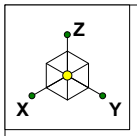
| | |
|---|---|
| At Mount Pipes, $L_M$ | 500 lb |
| Joint Labels Considered | M1 |
| | M2 |
| | |
| | |
| | |

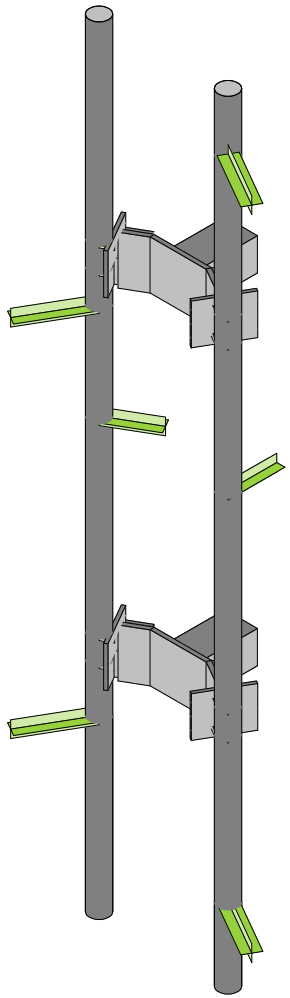
## Member Distributed Loading

| Section Set Label | Shape Label | $F_A$ (lb/ft) | | Ice Wt. (lb/ft) |
|---|---|---|---|---|
| | | Bare | Ice | |
| Mount Pipe 2.0 | PIPE_2.0 | 10.11 | 2.76 | 8.66 |
| MPConnection Plate | 0.38 X 6 Plate | 42.56 | 4.48 | 12.22 |
| Offset Horizontal Plate | 0.5 x 6 Plate | 42.56 | 4.48 | 12.39 |
| Offset Side Plate | 0.38 X 6 Plate | 42.56 | 4.48 | 12.22 |
| Offsett Tube | HSS4X4X4 | 28.37 | 1.87 | 14.40 |

## Appurtenances

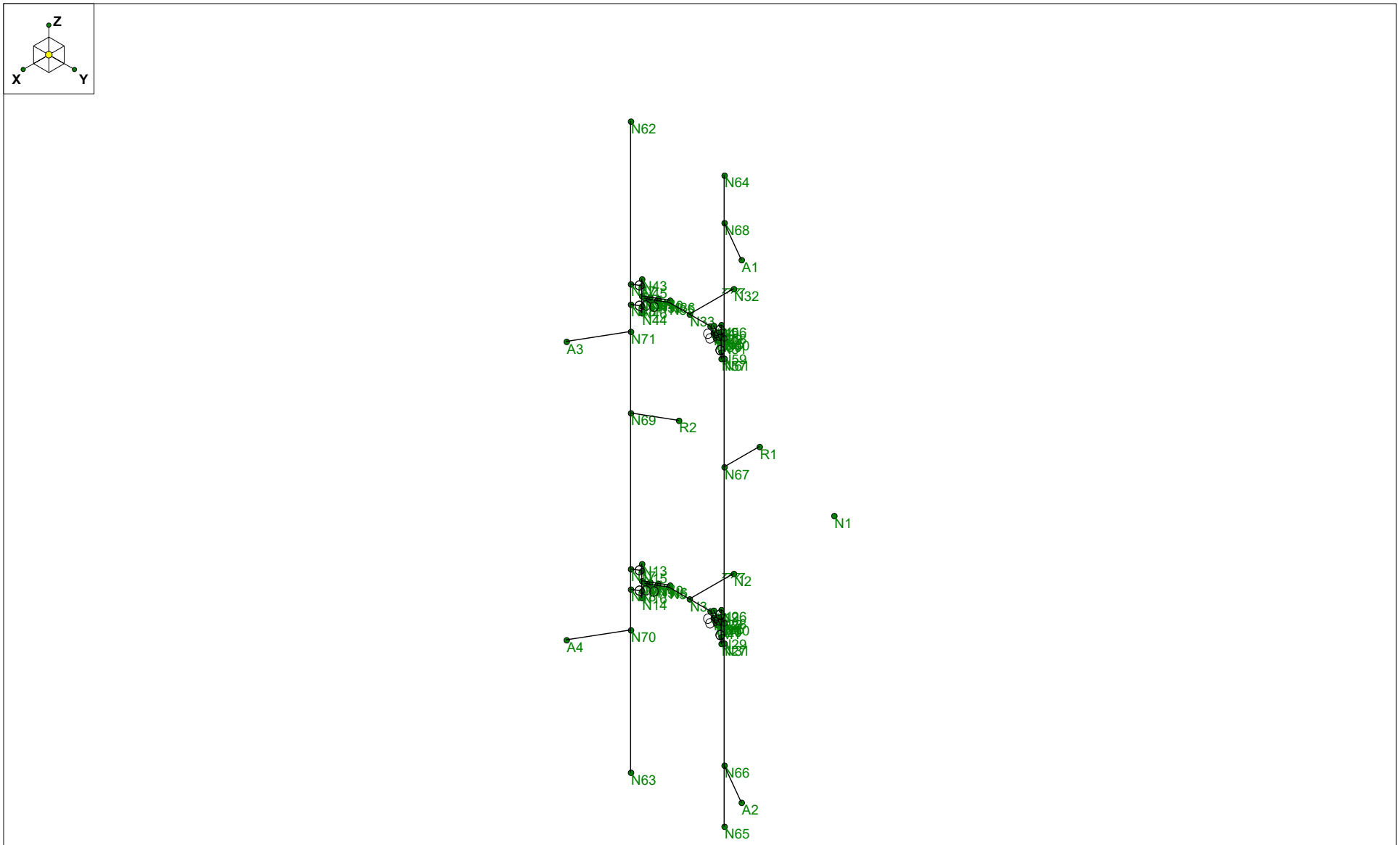
| Appurtenance Model | Status | Azimuth Offset (°, ↻) | Rad Elev. Override (ft) | Swap Width & Depth | Area Factor | | Qty. | Total Qty. Override | 0° Joints | | Height (in) | Width (in) | Depth (in) | Weight (Bare) (lb) | Shape | Weight of Ice (lb) | $EPA_A$ (Bare) ($ft^2$) | | $EPA_A$ (Ice) ($ft^2$) | | $F_A$ (Bare) (lb) | | $F_A$ (Ice) (lb) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Front | Side | 0° | | 1 | 2 | | | | | | | N | T | N | T | N | T | N | T |
| APXVAARR24_43-U-NA20 | | -60 | | ☐ | | | 1 | ***3*** | A1 | A2 | 0 | 0 | 0 | 153.3 | Generic | 389.16 | 14.67 | 5.32 | 17.30 | 7.64 | 624.33 | 226.41 | 81.79 | 36.11 |
| APXV18-206516S-C-A20 | | 60 | | ☐ | | | 1 | ***3*** | A3 | A4 | 0 | 0 | 0 | 18.7 | Generic | 69.40 | 2.56 | 1.21 | 4.08 | 2.66 | 108.95 | 51.50 | 19.30 | 12.59 |
| RRUS 11 B2 | | | | ☐ | 0.67 | | 1 | ***3*** | R1 | | 20 | 17 | 7 | 50.7 | Flat | 72.14 | 1.90 | 1.18 | 2.68 | 2.04 | 80.79 | 50.31 | 12.67 | 9.67 |
| RADIO 4449 B12/B71 | | | | ☑ | | | 1 | ***3*** | R2 | | 15 | 13.2 | 10.4 | 75 | Flat | 59.47 | 1.30 | 1.65 | 2.13 | 2.56 | 55.33 | 70.22 | 10.08 | 12.11 |



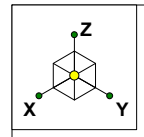
Envelope Only Solution

| | | |
|---|---|---|
| CLS | 41124-12927146-Washington North CT | SK - 1 |
| BP | | July 3, 2019 at 10:30 AM |
| 41124-12927146-01-MA-R2 | Rendered | 41124-12927146-01-MA-R2.r3d |




Envelope Only Solution

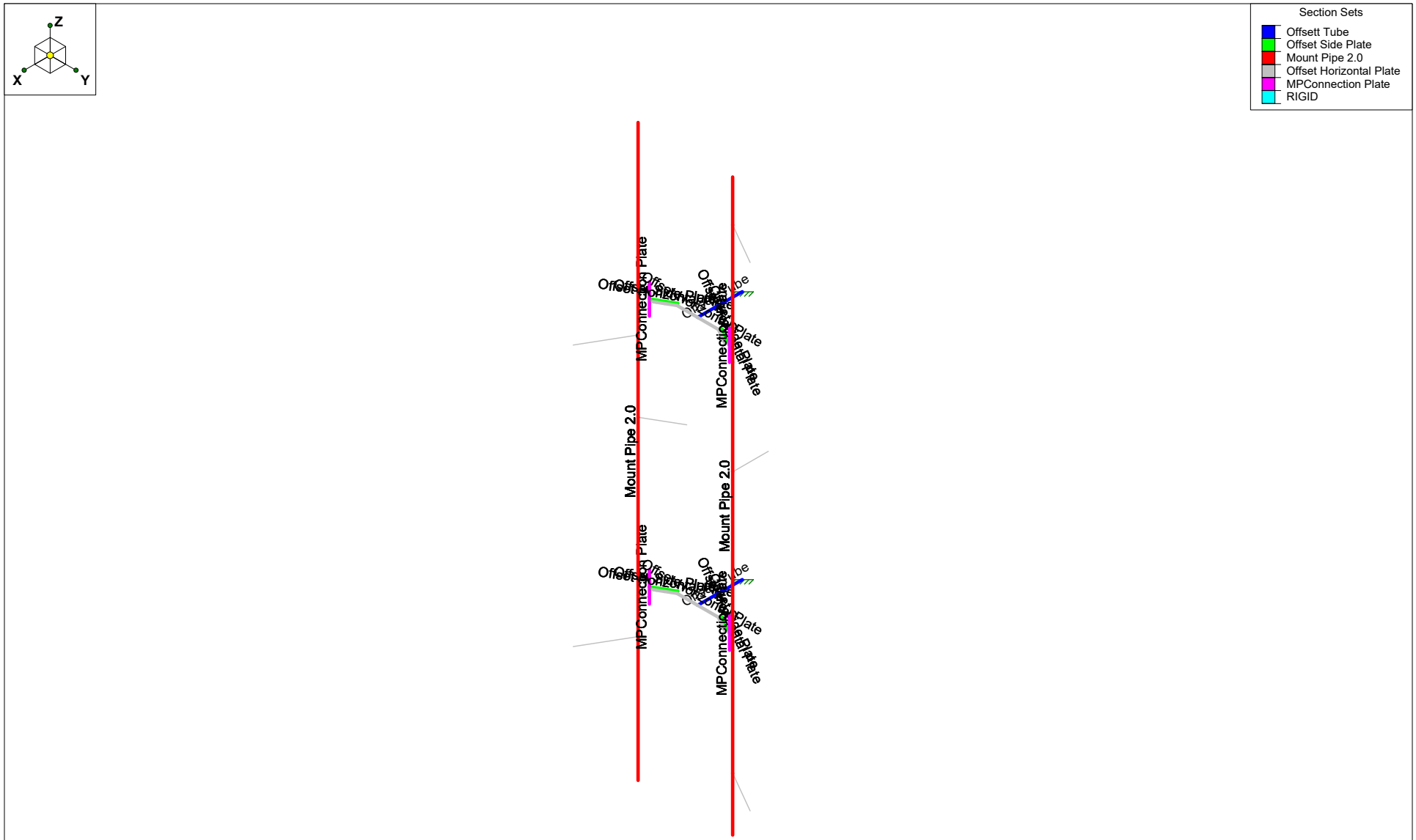
| | | |
|---|---|---|
| CLS | 41124-12927146-Washington North CT | SK - 2 |
| BP | | July 3, 2019 at 10:30 AM |
| 41124-12927146-01-MA-R2 | Joint Labels | 41124-12927146-01-MA-R2.r3d |





Envelope Only Solution

| | | |
|---|---|---|
| CLS | 41124-12927146-Washington North CT | SK - 3 |
| BP | | July 3, 2019 at 10:30 AM |
| 41124-12927146-01-MA-R2 | Member Labels | 41124-12927146-01-MA-R2.r3d |




Envelope Only Solution

| | | |
|---|---|---|
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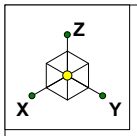
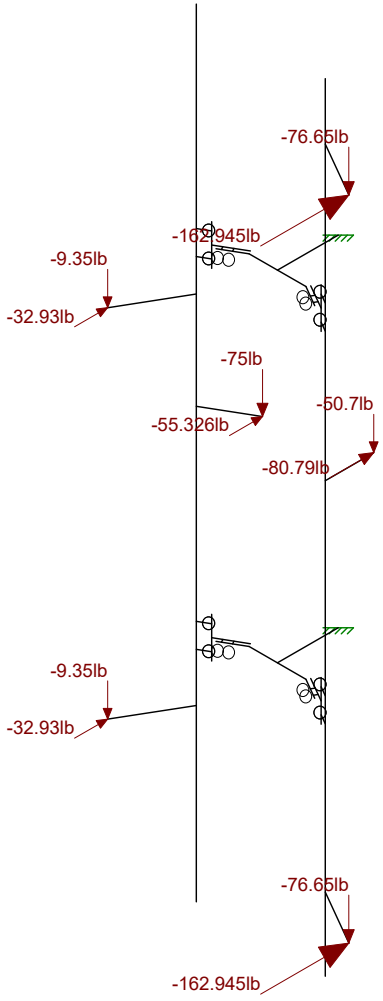
| BP | | July 3, 2019 at 10:30 AM |
| 41124-12927146-01-MA-R2 | Section Sets | 41124-12927146-01-MA-R2.r3d |




Loads: LC 1, DISPLAY (1.0D + 1.0W_0°)
Envelope Only Solution

| | | |
|---|---|---|
| CLS | | SK - 5 |
| BP | 41124-12927146-Washington North CT | July 3, 2019 at 10:31 AM |
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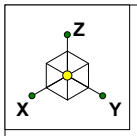
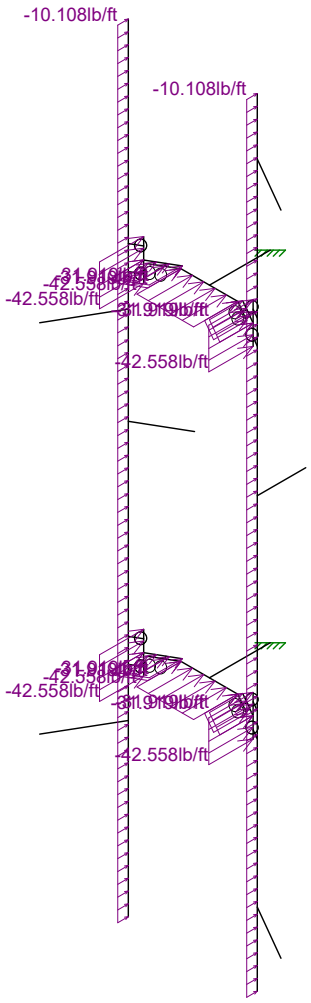
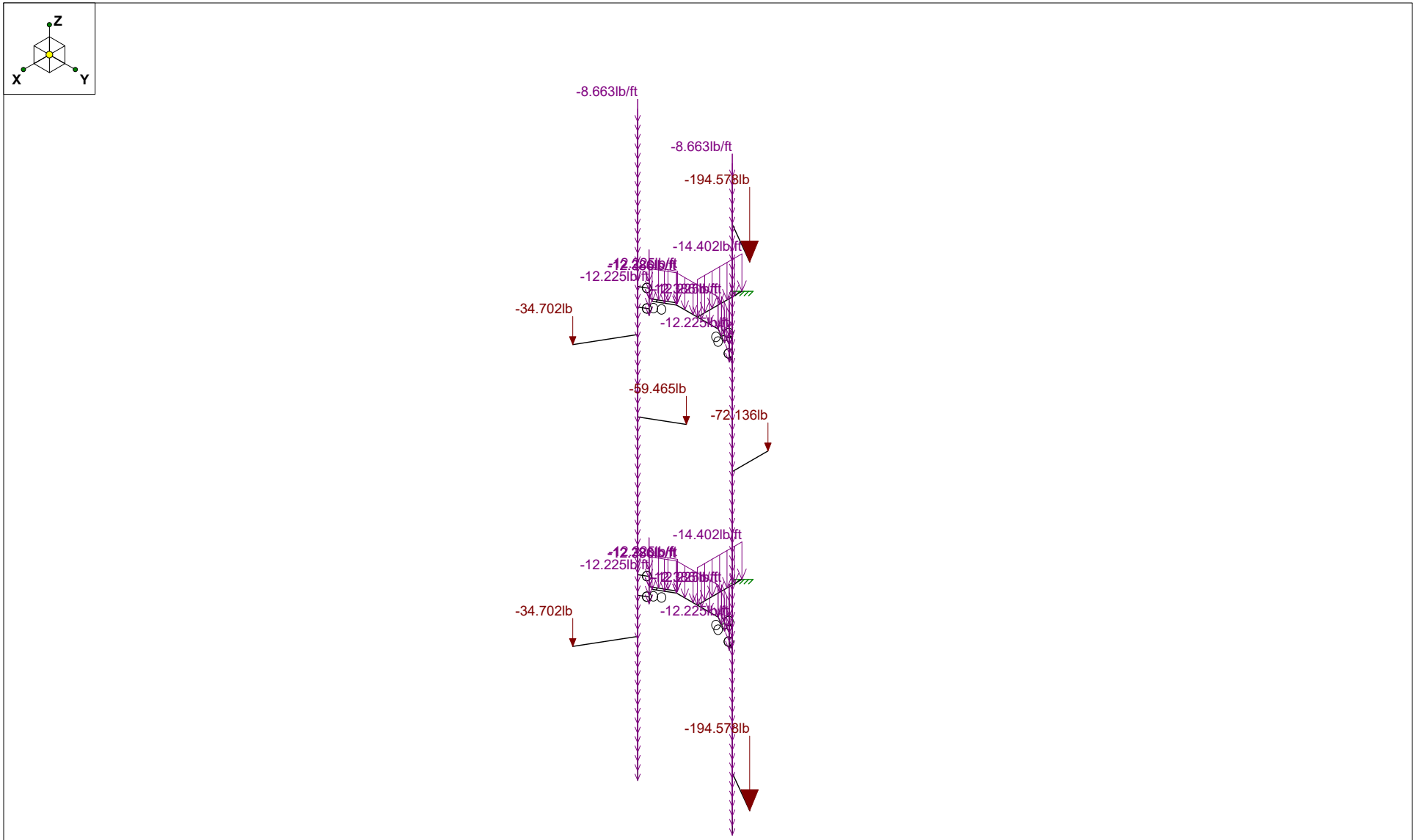


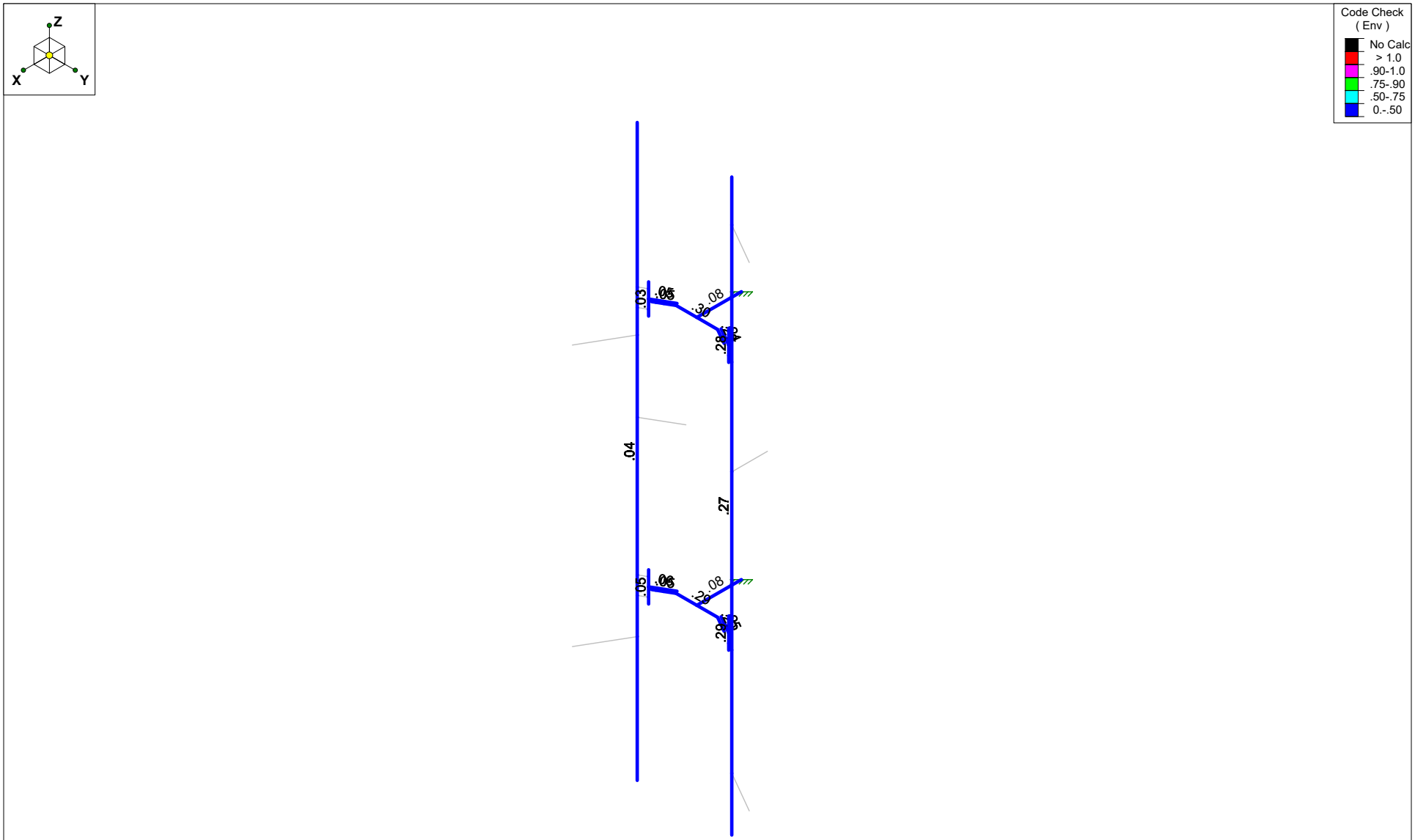

Loads: BLC 4, Structure Wind 0°
Envelope Only Solution

| | | |
|---|---|---|
| CLS | | SK - 6 |
| BP | 41124-12927146-Washington North CT | July 3, 2019 at 10:31 AM |
| 41124-12927146-01-MA-R2 | Distributed Load - Normal Wind | 41124-12927146-01-MA-R2.r3d |



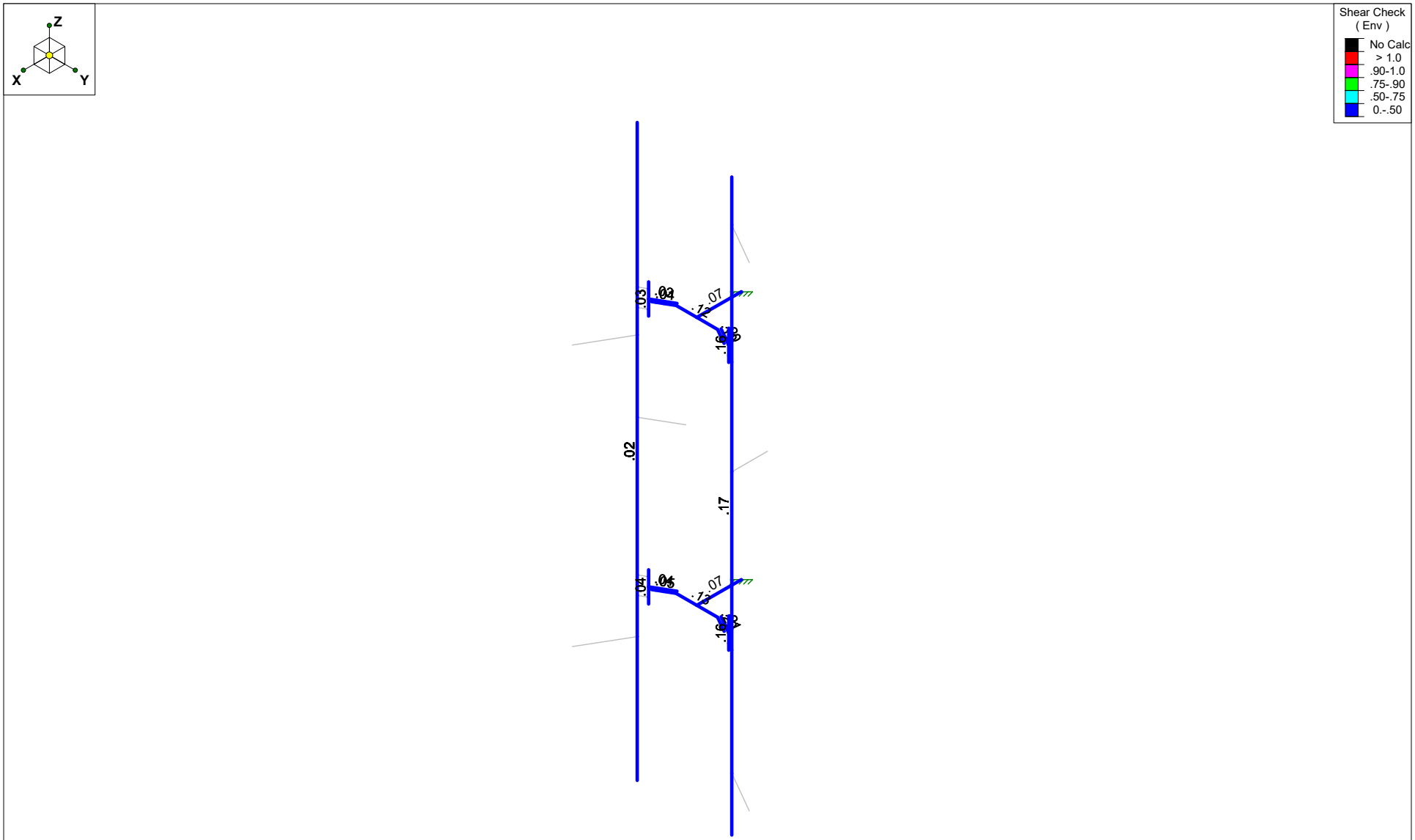

Loads: BLC 2, Ice Dead
Envelope Only Solution

| | | |
|---|---|---|
| CLS | 41124-12927146-Washington North CT | SK - 7 |
| BP | | July 3, 2019 at 10:31 AM |
| 41124-12927146-01-MA-R2 | Ice Dead Loads | 41124-12927146-01-MA-R2.r3d |




Member Code Checks Displayed (Enveloped)
Envelope Only Solution

| | | |
|---|---|---|
| CLS | | SK - 8 |
| BP | 41124-12927146-Washington North CT | July 3, 2019 at 10:31 AM |
| 41124-12927146-01-MA-R2 | Envelope Member Unity Check Results - Bending | 41124-12927146-01-MA-R2.r3d |




Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

| | | |
|---|---|---|
| CLS | 41124-12927146-Washington North CT | SK - 9 |
| BP | | July 3, 2019 at 10:31 AM |
| 41124-12927146-01-MA-R2 | Envelope Member Check Results - Shear | 41124-12927146-01-MA-R2.r3d |

## Basic Load Cases

| | BLC Description | Category | X Gravi.. | Y Gravi.. | Z Gravity | Joint | Point | Distributed | Area(Member) | Surfac... |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Dead | DL | | | -1 | 6 | | | | |
| 2 | Ice Dead | RL | | | | 6 | | 18 | | |
| 4 | Structure Wind 0° | None | | | | | | 16 | | |
| 5 | Structure Wind 30° | None | | | | | | 36 | | |
| 6 | Structure Wind 45° | None | | | | | | 36 | | |
| 7 | Structure Wind 60° | None | | | | | | 28 | | |
| 8 | Structure Wind 90° | None | | | | | | 16 | | |
| 9 | Structure Wind 120° | None | | | | | | 28 | | |
| 10 | Structure Wind 135° | None | | | | | | 36 | | |
| 11 | Structure Wind 150° | None | | | | | | 36 | | |
| 12 | Structure Wind w/ Ice 0° | None | | | | | | 16 | | |
| 13 | Structure Wind w/ Ice 30° | None | | | | | | 36 | | |
| 14 | Structure Wind w/ Ice 45° | None | | | | | | 36 | | |
| 15 | Structure Wind w/ Ice 60° | None | | | | | | 28 | | |
| 16 | Structure Wind w/ Ice 90° | None | | | | | | 16 | | |
| 17 | Structure Wind w/ Ice 120° | None | | | | | | 28 | | |
| 18 | Structure Wind w/ Ice 135° | None | | | | | | 36 | | |
| 19 | Structure Wind w/ Ice 150° | None | | | | | | 36 | | |
| 20 | Antenna Wind 0° | None | | | | 6 | | | | |
| 21 | Antenna Wind 30° | None | | | | 12 | | | | |
| 22 | Antenna Wind 45° | None | | | | 12 | | | | |
| 23 | Antenna Wind 60° | None | | | | 12 | | | | |
| 24 | Antenna Wind 90° | None | | | | 6 | | | | |
| 25 | Antenna Wind 120° | None | | | | 12 | | | | |
| 26 | Antenna Wind 135° | None | | | | 12 | | | | |
| 27 | Antenna Wind 150° | None | | | | 12 | | | | |
| 28 | Antenna Wind w/ Ice 0° | None | | | | 6 | | | | |
| 29 | Antenna Wind w/ Ice 30° | None | | | | 12 | | | | |
| 30 | Antenna Wind w/ Ice 45° | None | | | | 12 | | | | |
| 31 | Antenna Wind w/ Ice 60° | None | | | | 12 | | | | |
| 32 | Antenna Wind w/ Ice 90° | None | | | | 6 | | | | |
| 33 | Antenna Wind w/ Ice 120° | None | | | | 12 | | | | |
| 34 | Antenna Wind w/ Ice 135° | None | | | | 12 | | | | |
| 35 | Antenna Wind w/ Ice 150° | None | | | | 12 | | | | |
| 39 | Maintenance Live 500 (1) | OL1 | | | | 1 | | | | |
| 40 | Maintenance Live 500 (2) | OL2 | | | | 1 | | | | |

## Load Combinations

| | Description | S... | P... | S... | BLC | Factor | BLC | Factor | BLC | Factor | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DISPLAY (1.0D + ... | Y... | Y | | DL | 1 | 20 | 1 | | | | | | | | | | | | | | | | |
| 2 | 1.4D | Y... | Y | | DL | 1.4 | | | | | | | | | | | | | | | | | | |
| 3 | 1.2D + 1.0W_0° | Y... | Y | | DL | 1.2 | 4 | 1 | 20 | 1 | | | | | | | | | | | | | | |
| 4 | 1.2D + 1.0W_30° | Y... | Y | | DL | 1.2 | 5 | 1 | 21 | 1 | | | | | | | | | | | | | | |
| 5 | 1.2D + 1.0W_45° | Y... | Y | | DL | 1.2 | 6 | 1 | 22 | 1 | | | | | | | | | | | | | | |
| 6 | 1.2D + 1.0W_60° | Y... | Y | | DL | 1.2 | 7 | 1 | 23 | 1 | | | | | | | | | | | | | | |
| 7 | 1.2D + 1.0W_90° | Y... | Y | | DL | 1.2 | 8 | 1 | 24 | 1 | | | | | | | | | | | | | | |
| 8 | 1.2D + 1.0W_120° | Y... | Y | | DL | 1.2 | 9 | 1 | 25 | 1 | | | | | | | | | | | | | | |
| 9 | 1.2D + 1.0W_135° | Y... | Y | | DL | 1.2 | 10 | 1 | 26 | 1 | | | | | | | | | | | | | | |
| 10 | 1.2D + 1.0W_150° | Y... | Y | | DL | 1.2 | 11 | 1 | 27 | 1 | | | | | | | | | | | | | | |
| 11 | 1.2D + 1.0W_180° | Y... | Y | | DL | 1.2 | 4 | -1 | 20 | -1 | | | | | | | | | | | | | | |
| 12 | 1.2D + 1.0W_210° | Y... | Y | | DL | 1.2 | 5 | -1 | 21 | -1 | | | | | | | | | | | | | | |
| 13 | 1.2D + 1.0W_225° | Y... | Y | | DL | 1.2 | 6 | -1 | 22 | -1 | | | | | | | | | | | | | | |
| 14 | 1.2D + 1.0W_240° | Y... | Y | | DL | 1.2 | 7 | -1 | 23 | -1 | | | | | | | | | | | | | | |
| 15 | 1.2D + 1.0W_270° | Y... | Y | | DL | 1.2 | 8 | -1 | 24 | -1 | | | | | | | | | | | | | | |

## Load Combinations (Continued)

| | Description | S... | P... | S... | BLC | Factor | BLC | Factor | BLC | Factor | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 1.2D + 1.0W_300° | Y... | Y | | DL | 1.2 | 9 | -1 | 25 | -1 | | | | | | | | | | | | | | |
| 17 | 1.2D + 1.0W_315° | Y... | Y | | DL | 1.2 | 10 | -1 | 26 | -1 | | | | | | | | | | | | | | |
| 18 | 1.2D + 1.0W_330° | Y... | Y | | DL | 1.2 | 11 | -1 | 27 | -1 | | | | | | | | | | | | | | |
| 19 | 1.2D + 1.0Di + 1.0... | Y... | Y | | DL | 1.2 | 12 | 1 | 28 | 1 | RL | 1 | | | | | | | | | | | | |
| 20 | 1.2D + 1.0Di + 1.0... | Y... | Y | | DL | 1.2 | 13 | 1 | 29 | 1 | RL | 1 | | | | | | | | | | | | |
| 21 | 1.2D + 1.0Di + 1.0... | Y... | Y | | DL | 1.2 | 14 | 1 | 30 | 1 | RL | 1 | | | | | | | | | | | | |
| 22 | 1.2D + 1.0Di + 1.0... | Y... | Y | | DL | 1.2 | 15 | 1 | 31 | 1 | RL | 1 | | | | | | | | | | | | |
| 23 | 1.2D + 1.0Di + 1.0... | Y... | Y | | DL | 1.2 | 16 | 1 | 32 | 1 | RL | 1 | | | | | | | | | | | | |
| 24 | 1.2D + 1.0Di + 1.0... | Y... | Y | | DL | 1.2 | 17 | 1 | 33 | 1 | RL | 1 | | | | | | | | | | | | |
| 25 | 1.2D + 1.0Di + 1.0... | Y... | Y | | DL | 1.2 | 18 | 1 | 34 | 1 | RL | 1 | | | | | | | | | | | | |
| 26 | 1.2D + 1.0Di + 1.0... | Y... | Y | | DL | 1.2 | 19 | 1 | 35 | 1 | RL | 1 | | | | | | | | | | | | |
| 27 | 1.2D + 1.0Di + 1.0... | Y... | Y | | DL | 1.2 | 12 | -1 | 28 | -1 | RL | 1 | | | | | | | | | | | | |
| 28 | 1.2D + 1.0Di + 1.0... | Y... | Y | | DL | 1.2 | 13 | -1 | 29 | -1 | RL | 1 | | | | | | | | | | | | |
| 29 | 1.2D + 1.0Di + 1.0... | Y... | Y | | DL | 1.2 | 14 | -1 | 30 | -1 | RL | 1 | | | | | | | | | | | | |
| 30 | 1.2D + 1.0Di + 1.0... | Y... | Y | | DL | 1.2 | 15 | -1 | 31 | -1 | RL | 1 | | | | | | | | | | | | |
| 31 | 1.2D + 1.0Di + 1.0... | Y... | Y | | DL | 1.2 | 16 | -1 | 32 | -1 | RL | 1 | | | | | | | | | | | | |
| 32 | 1.2D + 1.0Di + 1.0... | Y... | Y | | DL | 1.2 | 17 | -1 | 33 | -1 | RL | 1 | | | | | | | | | | | | |
| 33 | 1.2D + 1.0Di + 1.0... | Y... | Y | | DL | 1.2 | 18 | -1 | 34 | -1 | RL | 1 | | | | | | | | | | | | |
| 34 | 1.2D + 1.0Di + 1.0... | Y... | Y | | DL | 1.2 | 19 | -1 | 35 | -1 | RL | 1 | | | | | | | | | | | | |
| 35 | 1.2D + 1.5Lm_1 +... | Y... | Y | | DL | 1.2 | 4 | .066 | 20 | .066 | O... | 1.5 | | | | | | | | | | | | |
| 36 | 1.2D + 1.5Lm_1 +... | Y... | Y | | DL | 1.2 | 5 | .066 | 21 | .066 | O... | 1.5 | | | | | | | | | | | | |
| 37 | 1.2D + 1.5Lm_1 +... | Y... | Y | | DL | 1.2 | 6 | .066 | 22 | .066 | O... | 1.5 | | | | | | | | | | | | |
| 38 | 1.2D + 1.5Lm_1 +... | Y... | Y | | DL | 1.2 | 7 | .066 | 23 | .066 | O... | 1.5 | | | | | | | | | | | | |
| 39 | 1.2D + 1.5Lm_1 +... | Y... | Y | | DL | 1.2 | 8 | .066 | 24 | .066 | O... | 1.5 | | | | | | | | | | | | |
| 40 | 1.2D + 1.5Lm_1 +... | Y... | Y | | DL | 1.2 | 9 | .066 | 25 | .066 | O... | 1.5 | | | | | | | | | | | | |
| 41 | 1.2D + 1.5Lm_1 +... | Y... | Y | | DL | 1.2 | 10 | .066 | 26 | .066 | O... | 1.5 | | | | | | | | | | | | |
| 42 | 1.2D + 1.5Lm_1 +... | Y... | Y | | DL | 1.2 | 11 | .066 | 27 | .066 | O... | 1.5 | | | | | | | | | | | | |
| 43 | 1.2D + 1.5Lm_1 +... | Y... | Y | | DL | 1.2 | 4 | -.066 | 20 | -.066 | O... | 1.5 | | | | | | | | | | | | |
| 44 | 1.2D + 1.5Lm_1 +... | Y... | Y | | DL | 1.2 | 5 | -.066 | 21 | -.066 | O... | 1.5 | | | | | | | | | | | | |
| 45 | 1.2D + 1.5Lm_1 +... | Y... | Y | | DL | 1.2 | 6 | -.066 | 22 | -.066 | O... | 1.5 | | | | | | | | | | | | |
| 46 | 1.2D + 1.5Lm_1 +... | Y... | Y | | DL | 1.2 | 7 | -.066 | 23 | -.066 | O... | 1.5 | | | | | | | | | | | | |
| 47 | 1.2D + 1.5Lm_1 +... | Y... | Y | | DL | 1.2 | 8 | -.066 | 24 | -.066 | O... | 1.5 | | | | | | | | | | | | |
| 48 | 1.2D + 1.5Lm_1 +... | Y... | Y | | DL | 1.2 | 9 | -.066 | 25 | -.066 | O... | 1.5 | | | | | | | | | | | | |
| 49 | 1.2D + 1.5Lm_1 +... | Y... | Y | | DL | 1.2 | 10 | -.066 | 26 | -.066 | O... | 1.5 | | | | | | | | | | | | |
| 50 | 1.2D + 1.5Lm_1 +... | Y... | Y | | DL | 1.2 | 11 | -.066 | 27 | -.066 | O... | 1.5 | | | | | | | | | | | | |
| 51 | 1.2D + 1.5Lm_2 +... | Y... | Y | | DL | 1.2 | 4 | .066 | 20 | .066 | O... | 1.5 | | | | | | | | | | | | |
| 52 | 1.2D + 1.5Lm_2 +... | Y... | Y | | DL | 1.2 | 5 | .066 | 21 | .066 | O... | 1.5 | | | | | | | | | | | | |
| 53 | 1.2D + 1.5Lm_2 +... | Y... | Y | | DL | 1.2 | 6 | .066 | 22 | .066 | O... | 1.5 | | | | | | | | | | | | |
| 54 | 1.2D + 1.5Lm_2 +... | Y... | Y | | DL | 1.2 | 7 | .066 | 23 | .066 | O... | 1.5 | | | | | | | | | | | | |
| 55 | 1.2D + 1.5Lm_2 +... | Y... | Y | | DL | 1.2 | 8 | .066 | 24 | .066 | O... | 1.5 | | | | | | | | | | | | |
| 56 | 1.2D + 1.5Lm_2 +... | Y... | Y | | DL | 1.2 | 9 | .066 | 25 | .066 | O... | 1.5 | | | | | | | | | | | | |
| 57 | 1.2D + 1.5Lm_2 +... | Y... | Y | | DL | 1.2 | 10 | .066 | 26 | .066 | O... | 1.5 | | | | | | | | | | | | |
| 58 | 1.2D + 1.5Lm_2 +... | Y... | Y | | DL | 1.2 | 11 | .066 | 27 | .066 | O... | 1.5 | | | | | | | | | | | | |
| 59 | 1.2D + 1.5Lm_2 +... | Y... | Y | | DL | 1.2 | 4 | -.066 | 20 | -.066 | O... | 1.5 | | | | | | | | | | | | |
| 60 | 1.2D + 1.5Lm_2 +... | Y... | Y | | DL | 1.2 | 5 | -.066 | 21 | -.066 | O... | 1.5 | | | | | | | | | | | | |
| 61 | 1.2D + 1.5Lm_2 +... | Y... | Y | | DL | 1.2 | 6 | -.066 | 22 | -.066 | O... | 1.5 | | | | | | | | | | | | |
| 62 | 1.2D + 1.5Lm_2 +... | Y... | Y | | DL | 1.2 | 7 | -.066 | 23 | -.066 | O... | 1.5 | | | | | | | | | | | | |
| 63 | 1.2D + 1.5Lm_2 +... | Y... | Y | | DL | 1.2 | 8 | -.066 | 24 | -.066 | O... | 1.5 | | | | | | | | | | | | |
| 64 | 1.2D + 1.5Lm_2 +... | Y... | Y | | DL | 1.2 | 9 | -.066 | 25 | -.066 | O... | 1.5 | | | | | | | | | | | | |
| 65 | 1.2D + 1.5Lm_2 +... | Y... | Y | | DL | 1.2 | 10 | -.066 | 26 | -.066 | O... | 1.5 | | | | | | | | | | | | |
| 66 | 1.2D + 1.5Lm_2 +... | Y... | Y | | DL | 1.2 | 11 | -.066 | 27 | -.066 | O... | 1.5 | | | | | | | | | | | | |

## Hot Rolled Steel Properties

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

## Hot Rolled Steel Section Sets

| | Label | Shape | Type | Design List | Material | Design R... | A [in2] | Iyy [in4] | Izz [in4] | J [in4] |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Offsett Tube | HSS4X4X4 | Beam | None | A36 Gr.36 | Typical | 3.37 | 7.8 | 7.8 | 12.8 |
| 2 | Offset Side Plate | 0.38 X 6 Plate | Beam | None | A36 Gr.36 | Typical | 2.28 | .027 | 6.84 | .105 |
| 3 | Mount Pipe 2.0 | PIPE 2.0 | Beam | None | A53 Gr.B | Typical | 1.02 | .627 | .627 | 1.25 |
| 4 | Offset Horizontal Plate | 0.5 x 6 Plate | Beam | None | A36 Gr.36 | Typical | 3 | .063 | 9 | .237 |
| 5 | MPConnection Plate | 0.38 X 6 Plate | Beam | None | A36 Gr.36 | Typical | 2.28 | .027 | 6.84 | .105 |

## Hot Rolled Steel Design Parameters

| | Label | Shape | Length[in] | Lbyy[in] | Lbzz[in] | Lcomp top[in] | Lcomp bot[in] | L-torq... | Kyy | Kzz | Cb | Function |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M1 | Mount Pipe ... | 96 | | | Lbyy | | | | | | Lateral |
| 2 | M2 | Mount Pipe ... | 96 | | | Lbyy | | | | | | Lateral |
| 3 | M3 | MPConnecti... | 5 | | | Lbyy | | | | | | Lateral |
| 4 | M4 | MPConnecti... | 5 | | | Lbyy | | | | | | Lateral |
| 5 | M5 | MPConnecti... | 5 | | | Lbyy | | | | | | Lateral |
| 6 | M6 | MPConnecti... | 5 | | | Lbyy | | | | | | Lateral |
| 7 | M7 | Offset Horiz... | 7 | | | Lbyy | | | | | | Lateral |
| 8 | M8 | Offset Horiz... | 3 | | | Lbyy | | | | | | Lateral |
| 9 | M9 | Offset Horiz... | 3 | | | Lbyy | | | | | | Lateral |
| 10 | M10 | Offset Horiz... | 7 | | | Lbyy | | | | | | Lateral |
| 11 | M11 | Offset Horiz... | 3 | | | Lbyy | | | | | | Lateral |
| 12 | M12 | Offset Horiz... | 3 | | | Lbyy | | | | | | Lateral |
| 13 | M13 | Offset Side ... | 3.5 | | | Lbyy | | | | | | Lateral |
| 14 | M14 | Offset Side ... | 3.5 | | | Lbyy | | | | | | Lateral |
| 15 | M15 | Offset Side ... | 3.5 | | | Lbyy | | | | | | Lateral |
| 16 | M16 | Offset Side ... | 3.5 | | | Lbyy | | | | | | Lateral |
| 17 | M17 | Offsett Tube | 7.5 | | | Lbyy | | | 2.1 | 2.1 | | Lateral |
| 18 | M18 | Offsett Tube | 7.5 | | | Lbyy | | | 2.1 | 2.1 | | Lateral |

## Envelope Joint Reactions

| | Joint | | X [lb] | LC | Y [lb] | LC | Z [lb] | LC | MX [lb-ft] | LC | MY [lb-ft] | LC | MZ [lb-ft] | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | N2 | max | 469.749 | 18 | 559.687 | 15 | 1130.029 | 8 | 312.232 | 9 | 355.447 | 16 | 522.975 | 15 |
| 2 | | min | -443.885 | 10 | -486.494 | 7 | -664.214 | 16 | -212.421 | 17 | -695.227 | 8 | -476.687 | 7 |
| 3 | N32 | max | 435.216 | 18 | 471.441 | 15 | 1158.216 | 16 | 328.657 | 17 | 346.487 | 8 | 467.028 | 15 |
| 4 | | min | -461.08 | 10 | -544.635 | 7 | -636.028 | 8 | -233.499 | 9 | -718.016 | 16 | -503.757 | 7 |
| 5 | Totals: | max | 904.965 | 18 | 1031.128 | 15 | 1302.256 | 32 | | | | | | |
| 6 | | min | -904.965 | 10 | -1031.129 | 7 | 411.668 | 1 | | | | | | |

## Envelope AISC 14th(360-10): LRFD Steel Code Checks

| | Member | Shape | Code Check | Loc[in] | LC | Shear Check | Loc[in] | Dir | LC | phi*Pn... | phi*Pn... | phi*Mn... | phi*Mn..... | | Eqn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M10 | 0.5 x 6 Plate | .302 | 3.5 | 18 | .123 | 7 | y | 10 | 85880... | 97200 | 1012.5 | 12150 | ... | H1-1b |
| 2 | M7 | 0.5 x 6 Plate | .294 | 3.5 | 10 | .132 | 7 | y | 18 | 85880... | 97200 | 1012.5 | 12150 | ... | H1-1b |
| 3 | M4 | 0.38 X 6 Plate | .294 | 2.5 | 16 | .161 | 2.5 | y | 11 | 66218... | 73872 | 584.82 | 9234 | ... | H1-1b |

## *Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)*

| | Member | Shape | Code Check | Loc[in] | LC | Shear Check | Loc[in] | Dir | LC | phi*Pn... | phi*Pn... | phi*Mn... | phi*Mn... | ... | Eqn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | M6 | 0.38 X 6 Plate | .280 | 2.5 | 8 | .162 | 2.5 | y | 3 | 66218.... | 73872 | 584.82 | 9234 | ... | H1-1b |
| 5 | M2 | PIPE 2.0 | .273 | 70.737 | 16 | .169 | 68.211 | | 15 | 14916.... | 32130 | 1871.6... | 1871.6... | .... | H1-1b |
| 6 | M14 | 0.38 X 6 Plate | .245 | 2.579 | 18 | .209 | 3.5 | y | 15 | 70017.... | 73872 | 584.82 | 9234 | ... | H1-1b |
| 7 | M16 | 0.38 X 6 Plate | .243 | 2.579 | 18 | .204 | 3.5 | y | 7 | 70017.... | 73872 | 584.82 | 9234 | ... | H1-1b |
| 8 | M12 | 0.5 x 6 Plate | .199 | 0 | 3 | .190 | 1.5 | y | 7 | 95014.... | 97200 | 1012.5 | 12150 | ... | H1-1b |
| 9 | M9 | 0.5 x 6 Plate | .197 | 0 | 11 | .199 | 1.5 | y | 15 | 95014.... | 97200 | 1012.5 | 12150 | ... | H1-1b |
| 10 | M18 | HSS4X4X4 | .080 | 0 | 15 | .069 | 0 | y | 17 | 10857... | 109188 | 12663 | 12663 | ... | H1-1b |
| 11 | M17 | HSS4X4X4 | .080 | 0 | 7 | .067 | 0 | y | 9 | 10857... | 109188 | 12663 | 12663 | ... | H1-1b |
| 12 | M13 | 0.38 X 6 Plate | .057 | 2.579 | 7 | .041 | 2.579 | y | 58 | 70017.... | 73872 | 584.82 | 9234 | ... | H1-1b |
| 13 | M15 | 0.38 X 6 Plate | .055 | 2.579 | 7 | .030 | 2.579 | y | 55 | 70017.... | 73872 | 584.82 | 9234 | ... | H1-1b |
| 14 | M8 | 0.5 x 6 Plate | .053 | 0 | 16 | .055 | 0 | y | 58 | 95014.... | 97200 | 1012.5 | 12150 | ... | H1-1b |
| 15 | M11 | 0.5 x 6 Plate | .051 | 0 | 8 | .041 | 1.5 | y | 55 | 95014.... | 97200 | 1012.5 | 12150 | ... | H1-1b |
| 16 | M3 | 0.38 X 6 Plate | .046 | 2.5 | 51 | .035 | 2.5 | y | 7 | 66218.... | 73872 | 584.82 | 9234 | ... | H1-1b |
| 17 | M1 | PIPE 2.0 | .037 | 42.947 | 7 | .024 | 70.737 | | 7 | 14916.... | 32130 | 1871.6... | 1871.6... | .... | H1-1b |
| 18 | M5 | 0.38 X 6 Plate | .033 | 1.053 | 61 | .032 | 2.5 | y | 7 | 66218.... | 73872 | 584.82 | 9234 | ... | H1-1b |

# Exhibit E

## Power Density/RF Emissions Report

EBI Consulting

environmental | engineering | due diligence

# RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
# EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CTNH371A

MountainRd- Verizon Colo
6 Mountain Road
Washington, Connecticut 06793

**June 12, 2019**

**EBI Project Number: 6219002198**

| **Site Compliance Summary** | |
|---|---|
| Compliance Status: | **COMPLIANT** |
| Site total MPE% of FCC general population allowable limit: | **5.22%** |

21 B Street, Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

June 12, 2019

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

Emissions Analysis for Site: CTNH371A - MountainRd- Verizon Colo

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **6 Mountain Road** in **Washington, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

## CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 6 Mountain Road in Washington, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation

are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

6) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antennas used in this modeling are the RFS APXV18-206516S-C-A20 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s) in Sector A, the RFS APXV18-206516S-C-A20 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s) in Sector B, the RFS APXV18-206516S-C-A20 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is 136 feet above ground level (AGL).

9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

# T-Mobile Site Inventory and Power Data

| Sector: | A | Sector: | B | Sector: | C |
|---|---|---|---|---|---|
| Antenna #: | 1 | Antenna #: | 1 | Antenna #: | 1 |
| Make / Model: | RFS APXV18-206516S-C-A20 | Make / Model: | RFS APXV18-206516S-C-A20 | Make / Model: | RFS APXV18-206516S-C-A20 |
| Frequency Bands: | 1900 MHz / 1900 MHz | Frequency Bands: | 1900 MHz / 1900 MHz | Frequency Bands: | 1900 MHz / 1900 MHz |
| Gain: | 16.3 dBd / 16.3 dBd | Gain: | 16.3 dBd / 16.3 dBd | Gain: | 16.3 dBd / 16.3 dBd |
| Height (AGL): | 136 feet | Height (AGL): | 136 feet | Height (AGL): | 136 feet |
| Channel Count: | 4 | Channel Count: | 4 | Channel Count: | 4 |
| Total TX Power (W): | 180 Watts | Total TX Power (W): | 180 Watts | Total TX Power (W): | 180 Watts |
| ERP (W): | 7,678.43 | ERP (W): | 7,678.43 | ERP (W): | 7,678.43 |
| Antenna A1 MPE %: | **1.49%** | Antenna B1 MPE %: | **1.49%** | Antenna C1 MPE %: | **1.49%** |
| Antenna #: | **2** | Antenna #: | **2** | Antenna #: | **2** |
| Make / Model: | RFS APXVAARR24_43-U-NA20 | Make / Model: | RFS APXVAARR24_43-U-NA20 | Make / Model: | RFS APXVAARR24_43-U-NA20 |
| Frequency Bands: | 600 MHz / 700 MHz | Frequency Bands: | 600 MHz / 700 MHz | Frequency Bands: | 600 MHz / 700 MHz |
| Gain: | 12.95 dBd / 13.35 dBd | Gain: | 12.95 dBd / 13.35 dBd | Gain: | 12.95 dBd / 13.35 dBd |
| Height (AGL): | 136 feet | Height (AGL): | 136 feet | Height (AGL): | 136 feet |
| Channel Count: | 4 | Channel Count: | 4 | Channel Count: | 4 |
| Total TX Power (W): | 120 Watts | Total TX Power (W): | 120 Watts | Total TX Power (W): | 120 Watts |
| ERP (W): | 2,481.08 | ERP (W): | 2,481.08 | ERP (W): | 2,481.08 |
| Antenna A2 MPE %: | **1.12%** | Antenna B2 MPE %: | **1.12%** | Antenna C2 MPE %: | **1.12%** |

| Site Composite MPE % | |
|---|---|
| **Carrier** | **MPE %** |
| T-Mobile (Max at Sector A): | 2.61% |
| Verizon | 1.75% |
| AT&T | 0.86% |
| **Site Total MPE % :** | 5.22% |

| T-Mobile MPE % Per Sector | |
|---|---|
| T-Mobile Sector A Total: | 2.61% |
| T-Mobile Sector B Total: | 2.61% |
| T-Mobile Sector C Total: | 2.61% |
| | |
| Site Total MPE % : | 5.22% |

## T-Mobile Maximum MPE Power Values (Sector A)

| T-Mobile Frequency Band / Technology (Sector A) | # Channels | Watts ERP (Per Channel) | Height (feet) | Total Power Density (μW/cm²) | Frequency (MHz) | Allowable MPE (μW/cm²) | Calculated % MPE |
|---|---|---|---|---|---|---|---|
| T-Mobile 1900 MHz UMTS | 2 | 1279.74 | 136.0 | 4.97 | 1900 MHz UMTS | 1000 | 0.50% |
| T-Mobile 1900 MHz LTE | 2 | 2559.48 | 136.0 | 9.95 | 1900 MHz LTE | 1000 | 0.99% |
| T-Mobile 600 MHz LTE | 2 | 591.73 | 136.0 | 2.30 | 600 MHz LTE | 400 | 0.58% |
| T-Mobile 700 MHz LTE | 2 | 648.82 | 136.0 | 2.52 | 700 MHz LTE | 467 | 0.54% |
| | | | | | | **Total:** | **2.61%** |

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

## Summary

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

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

| T-Mobile Sector | Power Density Value (%) |
|---|---|
| Sector A: | 2.61% |
| Sector B: | 2.61% |
| Sector C: | 2.61% |
| T-Mobile Maximum MPE % (Sector A): | 2.61% |
| | |
| Site Total: | 5.22% |
| | |
| Site Compliance Status: | **COMPLIANT** |

The anticipated composite MPE value for this site assuming all carriers present is **5.22%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

# Exhibit G

## Mailing Receipts/Proof of Notice

**UPS Internet Shipping: View/Print Label**

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialog box that appears. Note: If your browser does not support this function select Print from the File menu to print the label.

2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. **GETTING YOUR SHIPMENT TO UPS**
   **Customers with a Daily Pickup**
   Your driver will pickup your shipment(s) as usual.

   **Customers without a Daily Pickup**
   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the 'Find Locations' Quick link at ups.com.
   Schedule a same day or future day Pickup to have a UPS driver pickup all of your Internet Shipping packages.
   Hand the package to any UPS driver in your area.

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THE UPS STORE
120 E MAIN ST
RAMSEY ,NJ 07446

UPS Access Point™
POSTNET NY137
74 LAFAYETTE AVE
SUFFERN ,NY 10901

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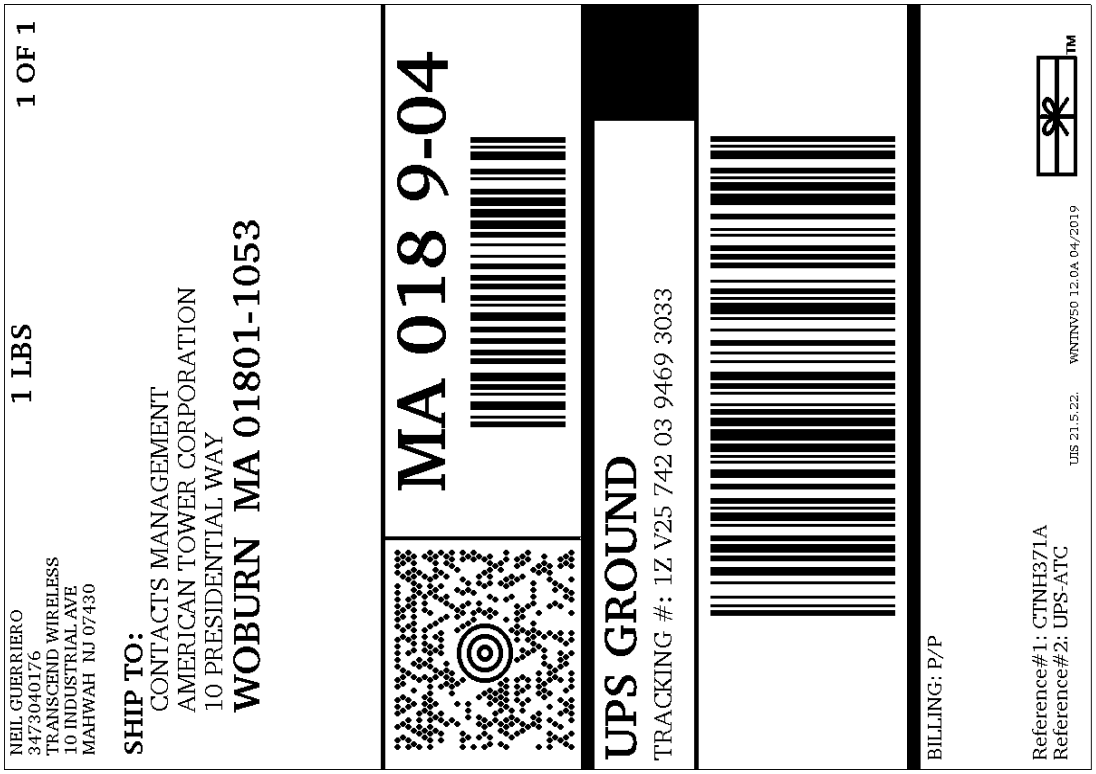

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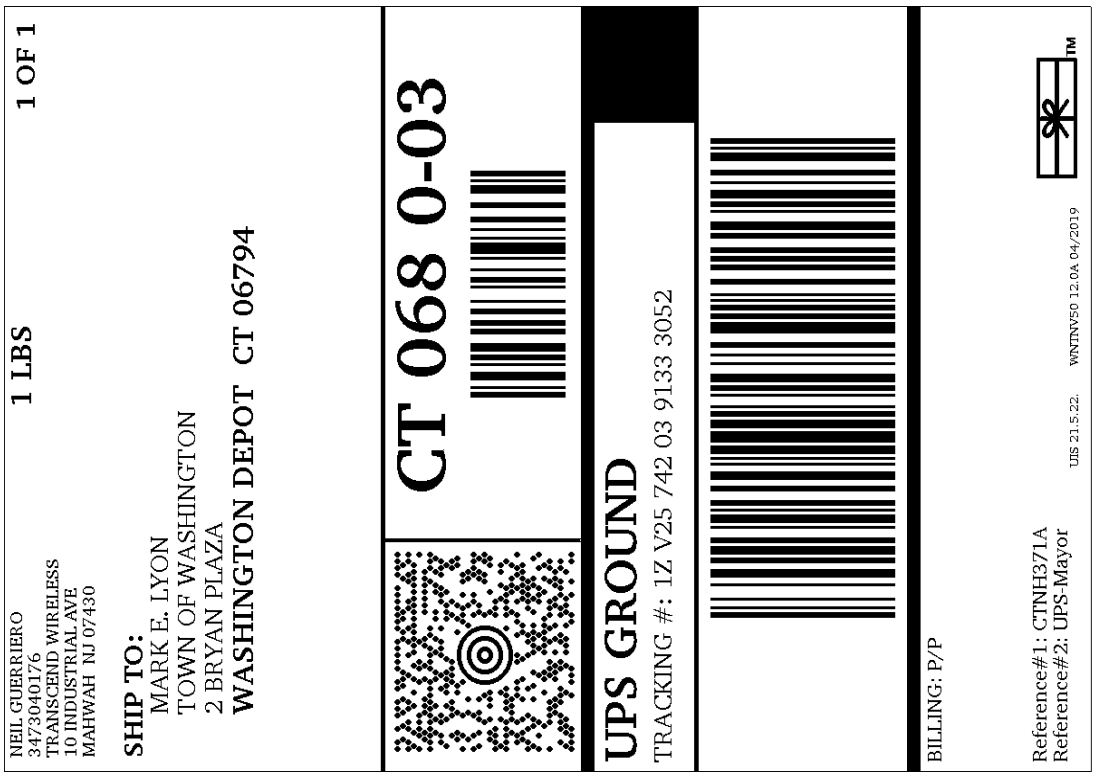

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