Alex Murshteyn, Site Acquisition Consultant
c/o Cellco Partnership d/b/a Verizon Wireless
Centerline Communications, LLC
750 West Center Street, Floor 3
West Bridgewater, MA 02379
Mobile: (508) 821-0159
AMurshteyn@centerlinecommunications.com

January 10, 2019

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

**RE: Notice of Exempt Modification // Site: Colchester S 2 CT (ATC: 302465)**
**355 Route 85 (New London Road), Colchester, CT 06415**
**N 41.5448 // W 72.3048**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless currently maintains 12 antennas at the 163-foot mount on the existing 180-foot monopole tower, located at 355 New London Rd (aka State Route 85), Colchester, CT. The Council approved Verizon Wireless use of the existing tower in 2016. The tower is owned by American Tower. The property is owned by M & J Auto Recycling Inc. Verizon Wireless now intends to remove all of its existing antennas to replace with 6 and install them on side-by-side mounts for the LTE (700/850/1900/2100 MHz) replacements for its PCS/AWS/LTE upgrade. Additionally, Verizon Wireless will replace all of its remote radio head units (RRUs) with 6 new RRUs, install 1 new over-voltage protector (OVP) and remove and upgrade certain cabling; altogether updating leased equipment rights, as reflected by the final configuration outlined in the structural analysis and proposed hereby.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Arthur Shilosky, First Selectman for the Town of Colchester, its Town Planner Randall Benson, including for the Planning & Zoning Department, American Tower, the tower owner, and to the ground owner M & J Auto Recycling Inc.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2). Enclosed to accommodate this filing are construction drawings dated December 3, 2018 and a structural analysis dated December 20, 2018 by A.T. Engineering Service, PLLC, a structural mount analysis by Trylon Engineering Services dated

December 4, 2018 and radio frequency (RF) analysis table showing worst-case RF emission calculation by Verizon Wireless RF Design Engineering.

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 new 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, as shown in the attached structural analyses by A.T. Engineering Service, PLLC, dated December 20, 2018 and Trylon, dated December 4, 2018.

For the foregoing reasons, Verizon Wireless 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,

Alex Murshteyn, Site Acquisition Consultant
c/o Cellco Partnership d/b/a Verizon Wireless
Centerline Communications, LLC
750 West Center Street, Floor 3
West Bridgewater, MA 02379
Mobile: (508) 821-0159
AMurshteyn@centerlinecommunications.com

Attachments

cc: Arthur Shilosky, First Selectman - as chief elected official
Randall Benson, Town Planner c/o Planning & Zoning Department - as P&Z official
American Tower Corporation - as tower owner
M & J Auto Recycling Inc - as property owner

CENTERLINE COMMUNICATIONS, LLC
750 WEST CENTER STREET
WEST BRIDGEWATER MA 02379

**1 LBS**

**1 OF 1**

DWT: 14,10,1

**SHIP TO:**

ART SHILOSKY, FIRST SELECTMAN
TOWN OF COLCHSETER
127 NORWICH AVENUE
**COLCHESTER CT 06415-1230**

# CT 063 0-01

## UPS GROUND

TRACKING #: 1Z 9Y4 503 03 3952 6203

BILLING: P/P

Reference#1: 302465 aka Colchester S 2 CT
Reference#2: CSC EM - CEO

UIS 21.0.21. WNTNV50 06.0A 10/2018

CENTERLINE COMMUNICATIONS, LLC
750 WEST CENTER STREET
WEST BRIDGEWATER MA 02379

**1 LBS**

**1 OF 1**

DWT: 14,10,1

**SHIP TO:**

RANDALL BENSON, TOWN PLANNER
C/O PLANNING & ZONING DEPARTMENT
127 NORWICH AVENUE
**COLCHESTER CT 06415-1230**

# CT 063 0-01

## UPS GROUND

TRACKING #: 1Z 9Y4 503 03 2803 9591

BILLING: P/P

Reference#1: 302465 aka Colchester S 2 CT
Reference#2: CSC EM - P&Z

UIS 21.0.21. WNTNV50 06.0A 10/2018

™

CENTERLINE COMMUNICATIONS, LLC
750 WEST CENTER STREET
WEST BRIDGEWATER MA 02379

**1 LBS**

**1 OF 1**

DWT: 14,10,1

**SHIP TO:**
BLAKE E. PAYNTER
AMERICAN TOWER CORPORATION
NETWORK DEVELOPMENT - NORTHEAST
10 PRESIDENTIAL WAY
**WOBURN MA 01801-1053**

# MA 018 9-04

## UPS GROUND

TRACKING #: 1Z 9Y4 503 03 3117 8425

BILLING: P/P

Reference#1: 302465/Colchester, 302535/Milford
Reference#2: CSC EM - TO

UIS 21.0.21. WNTNV50 06.0A 10/2018

CENTERLINE COMMUNICATIONS, LLC
750 WEST CENTER STREET
WEST BRIDGEWATER MA 02379

**1 LBS**

**1 OF 1**

DWT: 14,10,1

**SHIP TO:**

M & J AUTO RECYCLING INC
ATTN: MICHAEL BEEBE SR
P O BOX 908
355 ROUTE 85
**COLCHESTER CT 06415-1830**

# CT 063 0-01

## UPS GROUND

TRACKING #: 1Z 9Y4 503 03 2360 5817

BILLING: P/P

Reference#1: 302465 aka Colchester S 2 CT
Reference#2: CSC EM - PO

UIS 21.0.21. WNTNV50 06.0A 10/2018

AMERICAN TOWER®
CORPORATION

# Structural Analysis Report

| | | |
|---|---|---|
| **Structure** | : | **180 ft Monopole** |
| **ATC Site Name** | : | **Colchester CT 6, CT** |
| **ATC Site Number** | : | **302465** |
| **Engineering Number** | : | **12637527_C3_01** |
| **Proposed Carrier** | : | **Verizon Wireless** |
| **Carrier Site Name** | : | **Colchester S 2 CT** |
| **Carrier Site Number** | : | **15267839** |
| **Site Location** | : | **355 Route 85**<br>**Colchester, CT 06415-1825**<br>**41.544800,-72.304900** |
| **County** | : | **New London** |
| **Date** | : | **December 20, 2018** |
| **Max Usage** | : | **66%** |
| **Result** | : | **Pass** |

Prepared By:
Zackaryah Hughes
Structural Engineer I

Zackaryah Hughes

Reviewed By:

STATE OF CONNECTICUT
ESHA KAUSHAL MODI
32595
LICENSED
PROFESSIONAL ENGINEER

Authorized by "EOR"
Dec 21 2018 4:01 PM 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 180 ft monopole to reflect the change in loading by Verizon.

## Supporting Documents

| | |
|---|---|
| **Tower Drawings** | Valmont order # 17494-98, dated June 8, 1998 |
| **Foundation Drawing** | Valmont drawing # 17494-S-01 dated July 10, 1998 |
| **Geotechnical Report** | Tectonic Engineering Consultants W.O. 1170.C877 dated June 5, 1998 |

## 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:** | 101 mph (3-Second Gust, $V_{asd}$) / 130 mph (3-second Gust, $V_{ult}$) |
| **Basic Wind Speed w/ Ice:** | 50 mph (3-Second Gust) w/ 3/4" radial ice concurrent |
| **Code:** | ANSI/TIA-222-G / 2012 IBC / 2016 Connecticut State Building Code |
| **Structure Class:** | II |
| **Exposure Category:** | B |
| **Topographic Category:** | 1 |
| **Crest Height:** | 0 ft |
| **Spectral Response:** | Ss = 0.17, $S_1$ = 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

| Elevation[1] (ft) | | Qty | Antenna | Mount Type | Lines | Carrier |
|---|---|---|---|---|---|---|
| Mount | RAD | | | | | |
| 180.0 | 180.0 | 6 | Alcatel-Lucent RRH2x50-08 | T-Arms | (6) 1 5/8" Coax<br>(4) 1 1/4" Hybriflex | Sprint Nextel |
| | | 3 | Alcatel-Lucent 1900MHz 4x45 RRH | | | |
| | | 3 | Alcatel-Lucent TD-RRH8x20-25 w/ Solar Shield | | | |
| | | 3 | RFS APXVTM14-ALU-I20 | | | |
| | | 3 | Commscope NNVV-65B-R4 | | | |
| 169.0 | 172.0 | 2 | 6' Omni | Standoff Mounts | (2) 0.405" Coax | Other |
| 163.0 | 163.0 | 3 | Samsung B2/B66A RRH-BR049 | Platform w/ Handrails | (2) 1 5/8" Hybriflex | Verizon |
| | | 3 | Samsung B5/B13 RRH-BR04C | | | |
| | | 2 | RFS DB-B1-6C-12AB-0Z | | | |
| | | 6 | Commscope JAHH-65B-R3B | | | |
| 153.0 | 153.0 | 6 | LGP LGP21903 | Low Profile Platform | (12) 1 1/4" Coax<br>(2) 0.78" 8 AWG 6<br>(1) 0.39" Fiber Trunk<br>(1) 3" Conduit | AT&T Mobility |
| | | 6 | Powerwave LGP21401 | | | |
| | | 1 | Raycap DC6-48-60-18-8F (23.5" Height) | | | |
| | | 3 | Ericsson RRUS-11 800MHz | | | |
| | | 6 | Powerwave 7770.00 | | | |
| | | 1 | KMW AM-X-CD-16-65-00T-RET (54") | | | |
| | | 2 | Powerwave P65-17-XLH-RR | | | |
| 138.0 | 138.0 | 3 | Ericsson RRUS 11 B12 | Platform w/ Handrails | (1) 1 1/4" Hybriflex<br>(1) 1" Hybrid | T-Mobile |
| | | 3 | Ericsson RRUS 11 B2 | | | |
| | | 3 | Ericsson RRUS 11 B4 | | | |
| | | 3 | RFS APX16DWV-16DWVS-E-A20 | | | |
| | | 3 | Commscope LNX-6515DS-A1M (96.6" Height) | | | |

## Equipment to be Removed

| Elevation[1] (ft) | | Qty | Antenna | Mount Type | Lines | Carrier |
|---|---|---|---|---|---|---|
| Mount | RAD | | | | | |
| 163.0 | 163.0 | 1 | MicroPulse GPS-QBW-26N | - | (1) 1/2" Coax | Verizon |
| | | 3 | Commscope LNX-6514DS-A1M | | | |

## Proposed Equipment

| Elevation[1] (ft) | | Qty | Antenna | Mount Type | Lines | Carrier |
|---|---|---|---|---|---|---|
| Mount | RAD | | | | | |
| No loading considered as proposed | | | | | | |

**[1]Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).**

## Structure Usages

| Structural Component | Controlling Usage | Pass/Fail |
|---|---|---|
| Anchor Bolts | 55% | Pass |
| Shaft | 64% | Pass |
| Base Plate | 39% | Pass |

## Foundations

| Reaction Component | Original Design Reactions | Factored Design Reactions* | Analysis Reactions | % of Design |
|---|---|---|---|---|
| Moment (Kips-Ft) | 4,932.4 | 6,658.7 | 4,216.5 | 63% |
| Shear (Kips) | 41.5 | 56.0 | 37.2 | 66% |

*** The design reactions are factored by 1.35 per ANSI/TIA-222-G, Sec. 15.5.1**

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) (°) |
|---|---|---|---|---|
| 163.0 | - | Verizon Wireless | 1.600 | 1.176 |

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

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## 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:

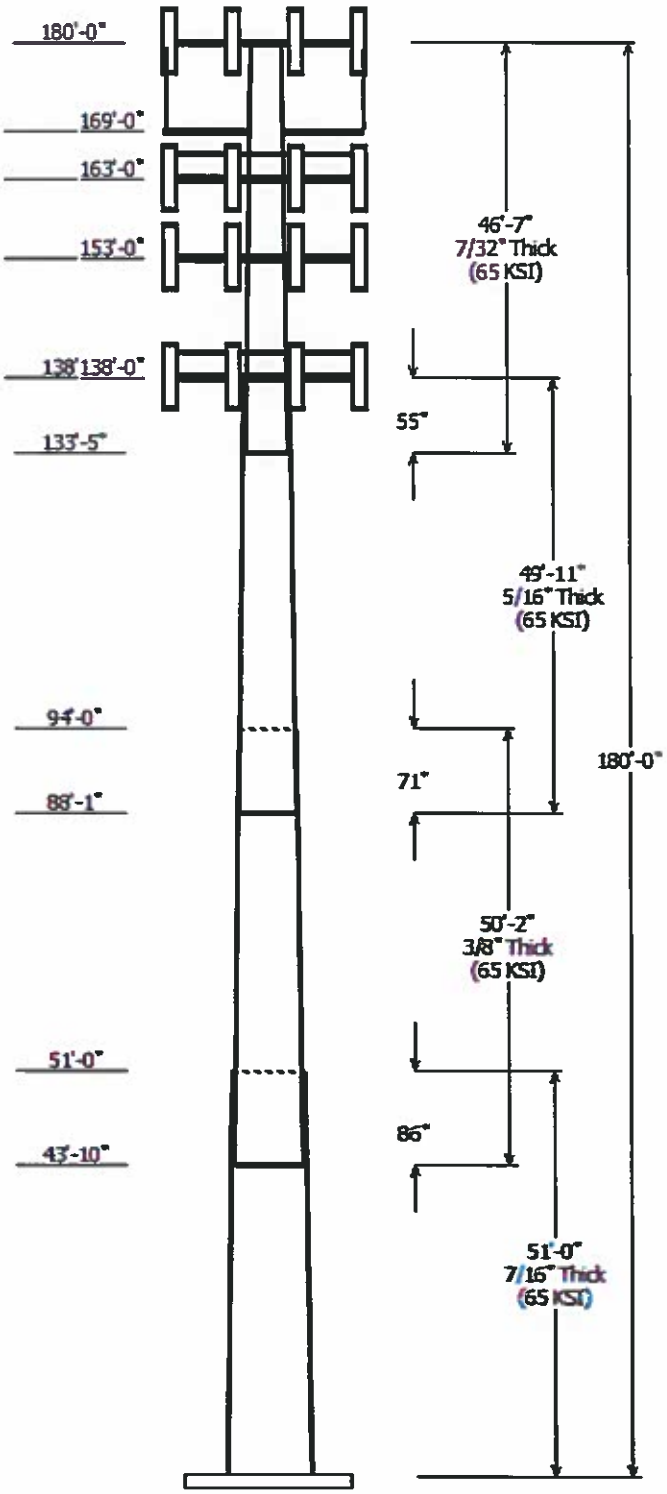
- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

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 : 302465 | | Code: ANSI/TIA-222-G | |
| Location : Colchester CT 6, CT | | | |
| Description : 180 ft Valmont Monopole | | | |
| Client : VERIZON WIRELESS | | Struct Class : | II |
| Shape : 12 Sides | | Exposure : | B |
| Height : 180.00 (ft) | | Topo : | 1 |
| Base Elev (ft): 0.00 | | | |
| Taper: 0.260792 in/ft | | | |

## Sections Properties

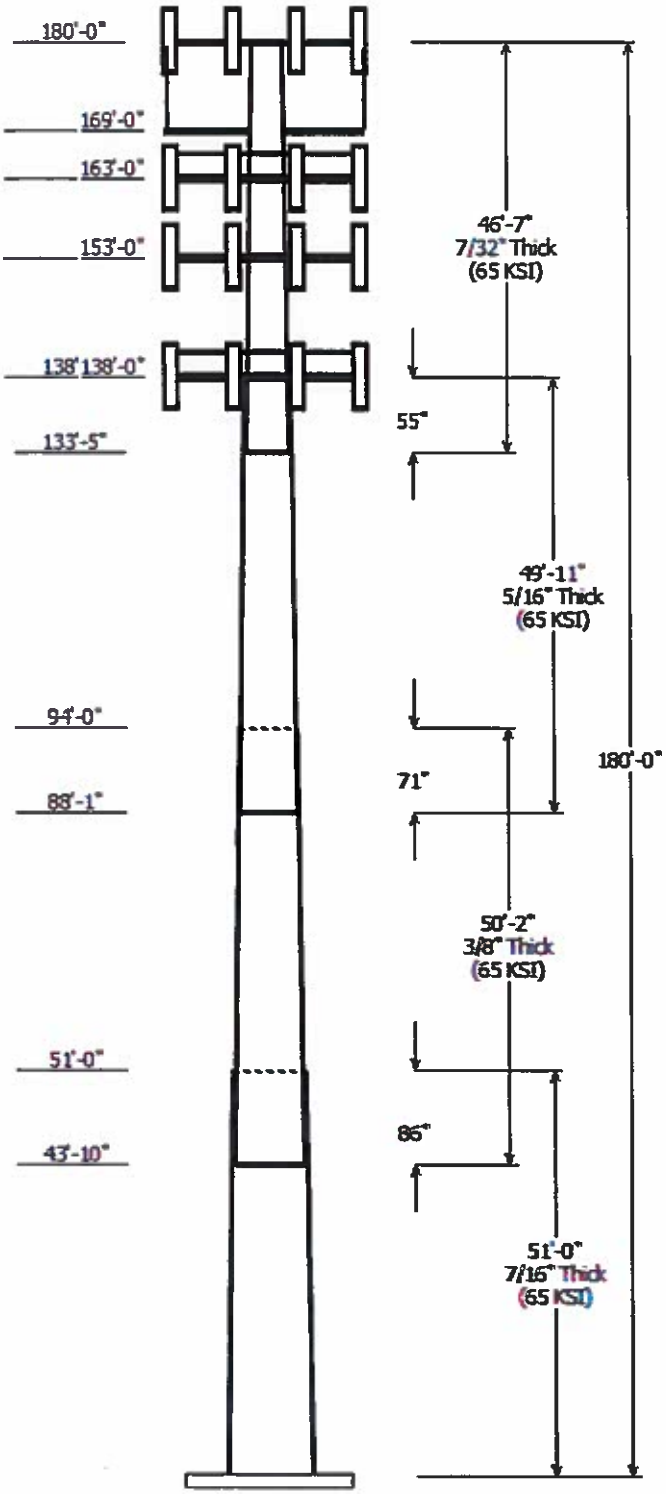
| Shaft Section | Length (ft) | Diameter (in) Accross Flats Top | Bottom | Thick (in) | Joint Type | Overlap Length (in) | Shape | Steel Grade (ksi) |
|---|---|---|---|---|---|---|---|---|
| 1 | 51.000 | 50.70 | 64.00 | 0.438 | | 0.000 | 12 Sides | 65 |
| 2 | 50.167 | 40.23 | 53.31 | 0.375 | Slip Joint | 86.000 | 12 Sides | 65 |
| 3 | 49.917 | 29.38 | 42.40 | 0.313 | Slip Joint | 71.000 | 12 Sides | 65 |
| 4 | 46.583 | 18.87 | 31.01 | 0.219 | Slip Joint | 55.000 | 12 Sides | 65 |

## Discrete Appurtenance

| Attach Elev (ft) | Force Elev (ft) | Qty | Description |
|---|---|---|---|
| 180.000 | 180.000 | 3 | Commscope NNVV-65B-R4 |
| 180.000 | 180.000 | 3 | Alcatel-Lucent TD-RRH8x20-25 |
| 180.000 | 180.000 | 3 | RFS APXVTM14-ALU-I20 |
| 180.000 | 180.000 | 6 | Alcatel-Lucent RRH2x50-08 |
| 180.000 | 180.000 | 3 | Alcatel-Lucent 1900 MHz 4x45 |
| 180.000 | 180.000 | 3 | Round T-Arm |
| 169.000 | 169.000 | 2 | Standoff Mounts |
| 169.000 | 172.000 | 2 | 6' Omni |
| 163.000 | 163.000 | 1 | Round Platform w/ Handrails |
| 163.000 | 163.000 | 6 | Commscope JAHH-65B-R3B |
| 163.000 | 163.000 | 2 | RFS DB-B1-6C-12AB-0Z |
| 163.000 | 163.000 | 3 | Samsung B5/B13 RRH-BR04C |
| 163.000 | 163.000 | 3 | Samsung B2/B66A RRH-BR049 |
| 153.000 | 153.000 | 1 | Round Low Profile Platform |
| 153.000 | 153.000 | 2 | Powerwave Allgon P65-17- |
| 153.000 | 153.000 | 1 | KMW AM-X-CD-16-65-00T-RET |
| 153.000 | 153.000 | 6 | Powerwave Allgon 7770.00 |
| 153.000 | 153.000 | 3 | Ericsson RRUS-11 800 MHz |
| 153.000 | 153.000 | 1 | Raycap DC6-48-60-18-8F (23.5" |
| 153.000 | 153.000 | 6 | Powerwave Allgon LGP21401 |
| 153.000 | 153.000 | 6 | LGP Allgon LGP21903 |
| 138.000 | 138.000 | 1 | Round Platform w/ Handrails |
| 138.000 | 138.000 | 3 | Commscope LNX-6515DS-A1M |
| 138.000 | 138.000 | 3 | RFS APX16DWV-16DWVS-E-A20 |
| 138.000 | 138.000 | 3 | Ericsson RRUS 11 B2 |
| 138.000 | 138.000 | 3 | Ericsson RRUS 11 B4 |
| 138.000 | 138.000 | 3 | Ericsson RRUS 11 B12 |

## Linear Appurtenance

| Elev (ft) From | To | Description | Exposed To Wind |
|---|---|---|---|
| 0.000 | 138.0 | 1 1/4" Hybriflex | No |
| 0.000 | 138.0 | 1" Hybrid | No |
| 0.000 | 153.0 | 0.39" Fiber Trunk | No |
| 0.000 | 153.0 | 0.78" 8 AWG 6 | No |
| 0.000 | 153.0 | 1 1/4" Coax | No |
| 0.000 | 153.0 | 3" Conduit | No |
| 0.000 | 163.0 | 1 5/8" Hybriflex | No |
| 0.000 | 169.0 | 0.405" Coax | No |
| 0.000 | 180.0 | 1 1/4" Hybriflex | No |




| | | | | |
|---|---|---|---|---|
| 0.000 | 180.0 | 1 5/8" | Coax | No |

## Load Cases

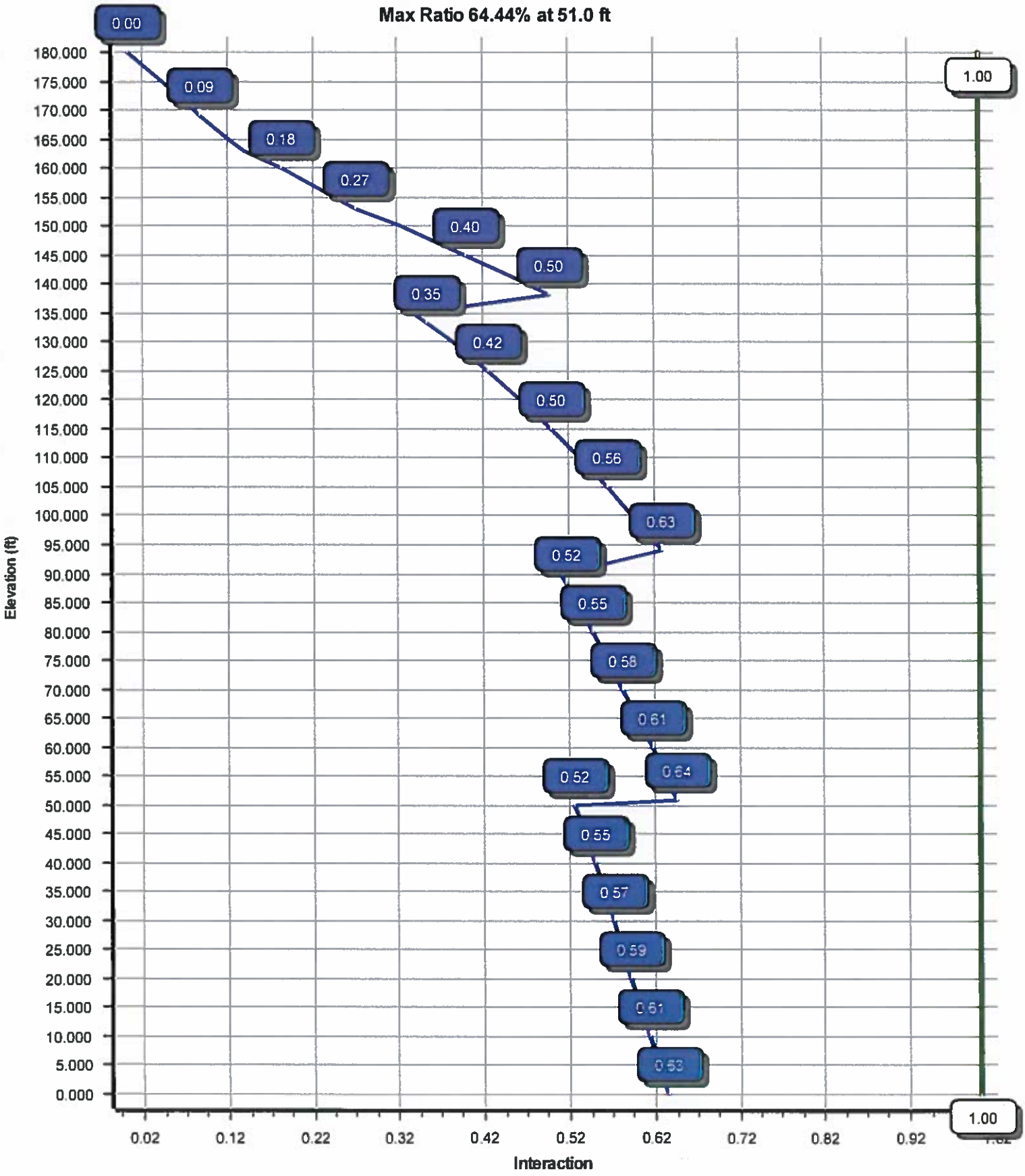
| | |
|---|---|
| 1.2D + 1.6W | 101 mph with No Ice |
| 0.9D + 1.6W | 101 mph with No Ice (Reduced DL) |
| 1.2D + 1.0Di + 1.0Wi | 50 mph with 0.75 in Radial Ice |
| (1.2 + 0.2Sds) * DL + E | Seismic Equivalent Lateral Forces Method |
| (1.2 + 0.2Sds) * DL + E | Seismic Equivalent Modal Analysis Method |
| (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 | 4216.51 | 37.24 | 56.44 |
| 0.9D + 1.6W | 4174.88 | 37.22 | 42.32 |
| 1.2D + 1.0Di + 1.0Wi | 925.40 | 7.72 | 83.74 |
| (1.2 + 0.2Sds) * DL + E ELFM | 201.45 | 1.41 | 56.16 |
| (1.2 + 0.2Sds) * DL + E EMAM | 218.36 | 1.71 | 56.16 |
| (0.9 - 0.2Sds) * DL + E ELFM | 198.91 | 1.41 | 39.20 |
| (0.9 - 0.2Sds) * DL + E EMAM | 215.25 | 1.71 | 39.20 |
| 1.0D + 1.0W | 924.74 | 8.21 | 47.07 |

## 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 64.44% at 51.0 ft
0.00
0.09
0.18
0.27
0.40
0.50
0.35
0.42
0.50
0.56
0.63
0.52
0.55
0.58
0.61
0.52
0.64
0.55
0.57
0.59
0.61
0.63
1.00
1.00
180.000
175.000
170.000
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:** | **302465** | **Code: ANSI/TIA-222-G** |  |
| **Site Name:** | **Colchester CT 6, CT** | **Engineering Number:12637527_C3_01** | **12/20/2018 4:57:40 PM** |
| **Customer:** | **VERIZON WIRELESS** | | |

## Analysis Parameters

| | | | |
|---|---|---|---|
| **Location :** | **NEW LONDON County, CT** | **Height (ft) :** | **180** |
| **Code :** | **ANSI/TIA-222-G** | **Base Diameter (in) :** | **64.00** |
| **Shape :** | **12 Sides** | **Top Diameter (in) :** | **18.87** |
| **Pole Type :** | **Taper** | **Taper (in/ft) :** | **0.261** |
| **Pole Manfacturer :** | **Valmont** | **Rotation (deg) :** | **0.00** |

## Ice & Wind Parameters

| | | | |
|---|---|---|---|
| **Structure Class:** | **II** | **Design Wind Speed Without Ice:** | **101 mph** |
| **Exposure Category:** | **B** | **Design Wind Speed With Ice:** | **50 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):** | **2.41** | | | | |
| **$T_L$ (sec):** | **6** | **p:** | **1** | **$C_s$:** | **0.030** |
| **$S_s$:** | **0.172** | **$S_1$:** | **0.061** | **$C_s$ Max:** | **0.030** |
| **$F_a$:** | **1.600** | **$F_v$:** | **2.400** | **$C_s$ Min:** | **0.030** |
| **$S_{ds}$:** | **0.183** | **$S_{d1}$:** | **0.098** | | |

## Load Cases

| | |
|---|---|
| **1.2D + 1.6W** | **101 mph with No Ice** |
| **0.9D + 1.6W** | **101 mph with No Ice (Reduced DL)** |
| **1.2D + 1.0Di + 1.0Wi** | **50 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** |

Site Number: 302465 Code: ANSI/TIA-222-G 

Site Name: Colchester CT 6, CT Engineering Number:12637527_C3_01 12/20/2018 4:57:40 PM

Customer: VERIZON WIRELESS

## 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-12 | 51.000 | 0.4375 | 65 | | 0.00 | 13,914 | 64.00 | 0.00 | 89.54 | 46176.7 | 36.52 | 146.29 | 50.70 | 51.00 | 70.81 | 22831.9 | 28.37 | 115.88 | 0.260792 |
| 2-12 | 50.167 | 0.3750 | 65 | Slip | 86.00 | 9,565 | 53.31 | 43.83 | 63.93 | 22872.5 | 35.42 | 142.18 | 40.23 | 94.00 | 48.13 | 9761.2 | 26.07 | 107.29 | 0.260792 |
| 3-12 | 49.917 | 0.3125 | 65 | Slip | 71.00 | 6,082 | 42.40 | 88.08 | 42.35 | 9577.7 | 33.68 | 135.69 | 29.38 | 138.00 | 29.25 | 3156.3 | 22.52 | 94.03 | 0.260792 |
| 4-12 | 46.583 | 0.2188 | 65 | Slip | 55.00 | 2,761 | 31.01 | 133.42 | 21.69 | 2626.8 | 35.32 | 141.80 | 18.87 | 180.00 | 13.14 | 583.3 | 20.43 | 86.26 | 0.260792 |
| | | | | Shaft Weight | | 32,321 | | | | | | | | | | | | | |

## Discrete Appurtenance Properties

| Attach Elev (ft) | Description | Qty | Distance From Face (ft) | Vert Ecc (ft) | No Ice Weight (lb) | No Ice EPAa (sf) | Orientation Factor |
|---|---|---|---|---|---|---|---|
| 180.00 | Alcatel-Lucent 1900 MHz 4x45 R | 3 | 0.000 | 0.000 | 60.00 | 2.320 | 0.50 |
| 180.00 | Alcatel-Lucent RRH2x50-08 | 6 | 0.000 | 0.000 | 52.90 | 1.700 | 0.50 |
| 180.00 | Alcatel-Lucent TD-RRH8x20-25 w | 3 | 0.000 | 0.000 | 70.00 | 4.050 | 0.50 |
| 180.00 | Commscope NNVV-65B-R4 | 3 | 0.000 | 0.000 | 77.40 | 12.270 | 0.64 |
| 180.00 | RFS APXVTM14-ALU-I20 | 3 | 0.000 | 0.000 | 56.20 | 6.340 | 0.66 |
| 180.00 | Round T-Arm | 3 | 0.000 | 0.000 | 250.00 | 9.700 | 0.67 |
| 169.00 | 6' Omni | 2 | 0.000 | 3.000 | 25.00 | 1.760 | 1.00 |
| 169.00 | Standoff Mounts | 2 | 0.000 | 0.000 | 150.00 | 5.200 | 1.00 |
| 163.00 | Commscope JAHH-65B-R3B | 6 | 0.000 | 0.000 | 60.60 | 9.110 | 0.69 |
| 163.00 | RFS DB-B1-6C-12AB-0Z | 2 | 0.000 | 0.000 | 21.40 | 2.510 | 0.67 |
| 163.00 | Round Platform w/ Handrails | 1 | 0.000 | 0.000 | 2000.00 | 27.200 | 1.00 |
| 163.00 | Samsung B2/B66A RRH-BR049 | 3 | 0.000 | 0.000 | 84.40 | 1.880 | 0.50 |
| 163.00 | Samsung B5/B13 RRH-BR04C | 3 | 0.000 | 0.000 | 70.30 | 1.880 | 0.50 |
| 153.00 | Ericsson RRUS-11 800 MHz | 3 | 0.000 | 0.000 | 54.00 | 2.520 | 0.50 |
| 153.00 | KMW AM-X-CD-16-65-00T-RET | 1 | 0.000 | 0.000 | 33.00 | 6.050 | 0.69 |
| 153.00 | LGP Allgon LGP21903 | 6 | 0.000 | 0.000 | 5.50 | 0.270 | 0.50 |
| 153.00 | Powerwave Allgon 7770.00 | 6 | 0.000 | 0.000 | 35.00 | 5.520 | 0.65 |
| 153.00 | Powerwave Allgon LGP21401 | 6 | 0.000 | 0.000 | 14.10 | 1.100 | 0.50 |
| 153.00 | Powerwave Allgon P65-17-XLH- | 2 | 0.000 | 0.000 | 59.00 | 11.470 | 0.67 |
| 153.00 | Raycap DC6-48-60-18-8F (23.5" | 1 | 0.000 | 0.000 | 20.00 | 1.110 | 1.00 |
| 153.00 | Round Low Profile Platform | 1 | 0.000 | 0.000 | 1500.00 | 21.700 | 1.00 |
| 138.00 | Commscope LNX-6515DS-A1M | 3 | 0.000 | 0.000 | 43.70 | 11.470 | 0.70 |
| 138.00 | Ericsson RRUS 11 B12 | 3 | 0.000 | 0.000 | 50.70 | 2.790 | 0.50 |
| 138.00 | Ericsson RRUS 11 B2 | 3 | 0.000 | 0.000 | 50.70 | 2.790 | 0.50 |
| 138.00 | Ericsson RRUS 11 B4 | 3 | 0.000 | 0.000 | 50.70 | 2.790 | 0.50 |
| 138.00 | RFS APX16DWV-16DWVS-E-A20 | 3 | 0.000 | 0.000 | 40.70 | 6.590 | 0.60 |
| 138.00 | Round Platform w/ Handrails | 1 | 0.000 | 0.000 | 2000.00 | 27.200 | 1.00 |
| Totals | Num Loadings:27 | 82 | | | 9948.80 | | |

## Linear Appurtenance Properties

| Elev From (ft) | Elev To (ft) | Qty | Description | Coax Diameter (in) | Coax Weight (lb/ft) | Flat | Projected Width (in) | Exposed To Wind | Carrier |
|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 180.00 | 4 | 1 1/4" Hybriflex Cable | 1.54 | 1.00 | N | 0.00 | N | Sprint Nextel |
| 0.00 | 180.00 | 6 | 1 5/8" Coax | 1.98 | 0.82 | N | 0.00 | N | Sprint Nextel |
| 0.00 | 169.00 | 2 | 0.405" Coax | 0.41 | 0.10 | N | 0.00 | N | Other |
| 0.00 | 163.00 | 2 | 1 5/8" Hybriflex | 1.98 | 1.30 | N | 0.00 | N | Verizon Wireless |
| 0.00 | 153.00 | 1 | 0.39" Fiber Trunk | 0.39 | 0.06 | N | 0.00 | N | AT&T Mobility |
| 0.00 | 153.00 | 2 | 0.78" 8 AWG 6 | 0.78 | 0.59 | N | 0.00 | N | AT&T Mobility |
| 0.00 | 153.00 | 12 | 1 1/4" Coax | 1.55 | 0.63 | N | 0.00 | N | AT&T Mobility |
| 0.00 | 153.00 | 1 | 3" Conduit | 3.50 | 7.58 | N | 0.00 | N | AT&T Mobility |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0.00 | 138.00 | 1 | 1 1/4" Hybriflex | 1.54 | 1.00 | N | 0.00 | N | T-Mobile |
| 0.00 | 138.00 | 1 | 1" Hybrid | 1.00 | 0.65 | N | 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 | | 0.4375 | 64.000 | 89.544 | 46,176.7 | 36.52 | 146.29 | 64.9 | 1393. | 0.0 | 0.0 |
| 5.00 | | 0.4375 | 62.696 | 87.707 | 43,392.7 | 35.72 | 143.31 | 65.8 | 1337. | 0.0 | 1,507.9 |
| 10.00 | | 0.4375 | 61.392 | 85.870 | 40,722.9 | 34.92 | 140.32 | 66.6 | 1281. | 0.0 | 1,476.6 |
| 15.00 | | 0.4375 | 60.088 | 84.033 | 38,165.0 | 34.12 | 137.34 | 67.5 | 1227. | 0.0 | 1,445.4 |
| 20.00 | | 0.4375 | 58.784 | 82.196 | 35,716.4 | 33.32 | 134.36 | 68.4 | 1173. | 0.0 | 1,414.1 |
| 25.00 | | 0.4375 | 57.480 | 80.359 | 33,374.9 | 32.52 | 131.38 | 69.2 | 1121. | 0.0 | 1,382.8 |
| 30.00 | | 0.4375 | 56.176 | 78.522 | 31,138.1 | 31.73 | 128.40 | 70.1 | 1070. | 0.0 | 1,351.6 |
| 35.00 | | 0.4375 | 54.872 | 76.685 | 29,003.4 | 30.93 | 125.42 | 71.0 | 1021. | 0.0 | 1,320.3 |
| 40.00 | | 0.4375 | 53.568 | 74.848 | 26,968.7 | 30.13 | 122.44 | 71.9 | 972.6 | 0.0 | 1,289.1 |
| 43.83 | Bot - Section 2 | 0.4375 | 52.569 | 73.440 | 25,474.8 | 29.52 | 120.16 | 72.5 | 936.2 | 0.0 | 967.1 |
| 45.00 | | 0.4375 | 52.264 | 73.011 | 25,031.4 | 29.33 | 119.46 | 72.7 | 925.2 | 0.0 | 543.8 |
| 50.00 | | 0.4375 | 50.960 | 71.174 | 23,189.2 | 28.53 | 116.48 | 73.6 | 879.1 | 0.0 | 2,294.6 |
| 51.00 | Top - Section 1 | 0.3750 | 51.450 | 61.673 | 20,534.7 | 34.08 | 137.20 | 67.5 | 771.0 | 0.0 | 452.0 |
| 55.00 | | 0.3750 | 50.406 | 60.413 | 19,302.0 | 33.34 | 134.42 | 68.4 | 739.8 | 0.0 | 830.9 |
| 60.00 | | 0.3750 | 49.103 | 58.838 | 17,831.8 | 32.41 | 130.94 | 69.4 | 701.6 | 0.0 | 1,014.5 |
| 65.00 | | 0.3750 | 47.799 | 57.264 | 16,438.2 | 31.47 | 127.46 | 70.4 | 664.4 | 0.0 | 987.7 |
| 70.00 | | 0.3750 | 46.495 | 55.689 | 15,119.2 | 30.54 | 123.99 | 71.4 | 628.2 | 0.0 | 960.9 |
| 75.00 | | 0.3750 | 45.191 | 54.115 | 13,872.7 | 29.61 | 120.51 | 72.4 | 593.0 | 0.0 | 934.1 |
| 80.00 | | 0.3750 | 43.887 | 52.540 | 12,696.7 | 28.68 | 117.03 | 73.4 | 558.9 | 0.0 | 907.3 |
| 85.00 | | 0.3750 | 42.583 | 50.966 | 11,589.1 | 27.75 | 113.55 | 74.5 | 525.8 | 0.0 | 880.5 |
| 88.08 | Bot - Section 3 | 0.3750 | 41.779 | 49.995 | 10,939.2 | 27.17 | 111.41 | 75.1 | 505.8 | 0.0 | 529.6 |
| 90.00 | | 0.3750 | 41.279 | 49.391 | 10,547.8 | 26.82 | 110.08 | 75.5 | 493.6 | 0.0 | 598.7 |
| 94.00 | Top - Section 2 | 0.3125 | 40.861 | 40.802 | 8,562.5 | 32.36 | 130.75 | 69.4 | 404.8 | 0.0 | 1,226.2 |
| 95.00 | | 0.3125 | 40.600 | 40.539 | 8,398.4 | 32.13 | 129.92 | 69.7 | 399.6 | 0.0 | 138.4 |
| 100.0 | | 0.3125 | 39.296 | 39.227 | 7,609.0 | 31.01 | 125.75 | 70.9 | 374.1 | 0.0 | 678.6 |
| 105.0 | | 0.3125 | 37.992 | 37.915 | 6,870.7 | 29.90 | 121.57 | 72.1 | 349.4 | 0.0 | 656.2 |
| 110.0 | | 0.3125 | 36.688 | 36.603 | 6,181.8 | 28.78 | 117.40 | 73.3 | 325.5 | 0.0 | 633.9 |
| 115.0 | | 0.3125 | 35.384 | 35.291 | 5,540.6 | 27.66 | 113.23 | 74.5 | 302.5 | 0.0 | 611.6 |
| 120.0 | | 0.3125 | 34.080 | 33.979 | 4,945.3 | 26.54 | 109.06 | 75.8 | 280.3 | 0.0 | 589.3 |
| 125.0 | | 0.3125 | 32.776 | 32.666 | 4,394.2 | 25.42 | 104.88 | 77.0 | 259.0 | 0.0 | 566.9 |
| 130.0 | | 0.3125 | 31.472 | 31.354 | 3,885.7 | 24.31 | 100.71 | 78.2 | 238.5 | 0.0 | 544.6 |
| 133.4 | Bot - Section 4 | 0.3125 | 30.581 | 30.458 | 3,561.8 | 23.54 | 97.86 | 79.0 | 225.0 | 0.0 | 359.3 |
| 135.0 | | 0.3125 | 30.168 | 30.042 | 3,418.0 | 23.19 | 96.54 | 79.4 | 218.9 | 0.0 | 279.1 |
| 138.0 | Top - Section 3 | 0.2188 | 29.823 | 20.853 | 2,332.7 | 33.85 | 136.33 | 67.8 | 151.1 | 0.0 | 518.3 |
| 140.0 | | 0.2188 | 29.302 | 20.485 | 2,211.6 | 33.21 | 133.95 | 68.5 | 145.8 | 0.0 | 140.7 |
| 145.0 | | 0.2188 | 27.998 | 19.567 | 1,927.3 | 31.62 | 127.99 | 70.2 | 133.0 | 0.0 | 340.7 |
| 150.0 | | 0.2188 | 26.694 | 18.648 | 1,668.4 | 30.02 | 122.03 | 72.0 | 120.7 | 0.0 | 325.1 |
| 153.0 | | 0.2188 | 25.911 | 18.097 | 1,524.8 | 29.06 | 118.45 | 73.0 | 113.7 | 0.0 | 187.6 |
| 155.0 | | 0.2188 | 25.390 | 17.730 | 1,433.8 | 28.42 | 116.07 | 73.7 | 109.1 | 0.0 | 121.9 |
| 160.0 | | 0.2188 | 24.086 | 16.811 | 1,222.3 | 26.82 | 110.11 | 75.5 | 98.0 | 0.0 | 293.8 |
| 163.0 | | 0.2188 | 23.303 | 16.260 | 1,106.0 | 25.87 | 106.53 | 76.5 | 91.7 | 0.0 | 168.8 |
| 165.0 | | 0.2188 | 22.782 | 15.893 | 1,032.7 | 25.23 | 104.15 | 77.2 | 87.6 | 0.0 | 109.4 |
| 169.0 | | 0.2188 | 21.739 | 15.158 | 896.0 | 23.95 | 99.38 | 78.6 | 79.6 | 0.0 | 211.3 |
| 170.0 | | 0.2188 | 21.478 | 14.974 | 863.8 | 23.63 | 98.18 | 78.9 | 77.7 | 0.0 | 51.3 |
| 175.0 | | 0.2188 | 20.174 | 14.056 | 714.4 | 22.03 | 92.22 | 80.7 | 68.4 | 0.0 | 247.0 |
| 180.0 | | 0.2188 | 18.870 | 13.137 | 583.3 | 20.43 | 86.26 | 81.9 | 59.7 | 0.0 | 231.3 |
| | | | | | | | | | | | 32,320.8 |

Site Number: 302465 | Code: ANSI/TIA-222-G | 

Site Name: Colchester CT 6, CT | Engineering Number:12637527_C3_01 | 12/20/2018 4:57:41 PM

Customer: VERIZON WIRELESS

**Load Case:** 1.2D + 1.6W | 101 mph with No Ice | 25 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 | | 417.6 | 0.0 | | | | | 0.0 | 0.0 | 417.6 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 826.6 | 1,809.4 | | | | | 0.0 | 178.5 | 826.6 | 1,988.0 | 0.0 | 0.0 |
| 10.00 | | 809.4 | 1,771.9 | | | | | 0.0 | 178.5 | 809.4 | 1,950.5 | 0.0 | 0.0 |
| 15.00 | | 792.2 | 1,734.4 | | | | | 0.0 | 178.5 | 792.2 | 1,913.0 | 0.0 | 0.0 |
| 20.00 | | 775.0 | 1,696.9 | | | | | 0.0 | 178.5 | 775.0 | 1,875.5 | 0.0 | 0.0 |
| 25.00 | | 757.8 | 1,659.4 | | | | | 0.0 | 178.5 | 757.8 | 1,838.0 | 0.0 | 0.0 |
| 30.00 | | 749.4 | 1,621.9 | | | | | 0.0 | 178.5 | 749.4 | 1,800.5 | 0.0 | 0.0 |
| 35.00 | | 756.1 | 1,584.4 | | | | | 0.0 | 178.5 | 756.1 | 1,762.9 | 0.0 | 0.0 |
| 40.00 | | 676.6 | 1,546.9 | | | | | 0.0 | 178.5 | 676.6 | 1,725.4 | 0.0 | 0.0 |
| 43.83 | Bot - Section 2 | 386.9 | 1,160.6 | | | | | 0.0 | 136.9 | 386.9 | 1,297.4 | 0.0 | 0.0 |
| 45.00 | | 485.5 | 652.5 | | | | | 0.0 | 41.7 | 485.5 | 694.2 | 0.0 | 0.0 |
| 50.00 | | 472.9 | 2,753.5 | | | | | 0.0 | 178.5 | 472.9 | 2,932.1 | 0.0 | 0.0 |
| 51.00 | Top - Section 1 | 395.3 | 542.4 | | | | | 0.0 | 35.7 | 395.3 | 578.1 | 0.0 | 0.0 |
| 55.00 | | 711.6 | 997.0 | | | | | 0.0 | 142.8 | 711.6 | 1,139.9 | 0.0 | 0.0 |
| 60.00 | | 789.6 | 1,217.4 | | | | | 0.0 | 178.5 | 789.6 | 1,395.9 | 0.0 | 0.0 |
| 65.00 | | 786.4 | 1,185.2 | | | | | 0.0 | 178.5 | 786.4 | 1,363.8 | 0.0 | 0.0 |
| 70.00 | | 781.4 | 1,153.1 | | | | | 0.0 | 178.5 | 781.4 | 1,331.6 | 0.0 | 0.0 |
| 75.00 | | 774.6 | 1,120.9 | | | | | 0.0 | 178.5 | 774.6 | 1,299.5 | 0.0 | 0.0 |
| 80.00 | | 766.2 | 1,088.8 | | | | | 0.0 | 178.5 | 766.2 | 1,267.3 | 0.0 | 0.0 |
| 85.00 | | 613.1 | 1,056.6 | | | | | 0.0 | 178.5 | 613.1 | 1,235.2 | 0.0 | 0.0 |
| 88.08 | Bot - Section 3 | 377.8 | 635.6 | | | | | 0.0 | 110.1 | 377.8 | 745.7 | 0.0 | 0.0 |
| 90.00 | | 446.3 | 718.4 | | | | | 0.0 | 68.4 | 446.3 | 786.9 | 0.0 | 0.0 |
| 94.00 | Top - Section 2 | 375.4 | 1,471.4 | | | | | 0.0 | 142.8 | 375.4 | 1,614.3 | 0.0 | 0.0 |
| 95.00 | | 443.7 | 166.1 | | | | | 0.0 | 35.7 | 443.7 | 201.8 | 0.0 | 0.0 |
| 100.00 | | 731.3 | 814.3 | | | | | 0.0 | 178.5 | 731.3 | 992.8 | 0.0 | 0.0 |
| 105.00 | | 717.0 | 787.5 | | | | | 0.0 | 178.5 | 717.0 | 966.0 | 0.0 | 0.0 |
| 110.00 | | 701.6 | 760.7 | | | | | 0.0 | 178.5 | 701.6 | 939.2 | 0.0 | 0.0 |
| 115.00 | | 685.3 | 733.9 | | | | | 0.0 | 178.5 | 685.3 | 912.5 | 0.0 | 0.0 |
| 120.00 | | 668.2 | 707.1 | | | | | 0.0 | 178.5 | 668.2 | 885.7 | 0.0 | 0.0 |
| 125.00 | | 650.1 | 680.3 | | | | | 0.0 | 178.5 | 650.1 | 858.9 | 0.0 | 0.0 |
| 130.00 | | 533.9 | 653.5 | | | | | 0.0 | 178.5 | 533.9 | 832.1 | 0.0 | 0.0 |
| 133.42 | Bot - Section 4 | 312.2 | 431.2 | | | | | 0.0 | 122.0 | 312.2 | 553.2 | 0.0 | 0.0 |
| 135.00 | | 283.2 | 334.9 | | | | | 0.0 | 56.5 | 283.2 | 391.4 | 0.0 | 0.0 |
| 138.00 | Top - Section 3 | 305.3 | 622.0 | | | | | 0.0 | 107.1 | 305.3 | 729.1 | 0.0 | 0.0 |
| 140.00 | | 415.9 | 168.8 | | | | | 0.0 | 67.5 | 415.9 | 236.3 | 0.0 | 0.0 |
| 145.00 | | 579.4 | 408.9 | | | | | 0.0 | 168.6 | 579.4 | 577.5 | 0.0 | 0.0 |
| 150.00 | | 449.8 | 390.1 | | | | | 0.0 | 168.6 | 449.8 | 558.8 | 0.0 | 0.0 |
| 153.00 | Appurtenance(s) | 273.4 | 225.1 | 3,009.1 | 0.0 | 0.0 | 2,592.7 | 0.0 | 101.2 | 3,282.5 | 2,919.0 | 0.0 | 0.0 |
| 155.00 | | 370.2 | 146.3 | | | | | 0.0 | 28.1 | 370.2 | 174.4 | 0.0 | 0.0 |
| 160.00 | | 413.9 | 352.6 | | | | | 0.0 | 70.4 | 413.9 | 423.0 | 0.0 | 0.0 |
| 163.00 | Appurtenance(s) | 250.5 | 202.6 | 3,087.9 | 0.0 | 0.0 | 3,444.6 | 0.0 | 42.2 | 3,338.4 | 3,689.4 | 0.0 | 0.0 |
| 165.00 | | 290.7 | 131.3 | | | | | 0.0 | 21.9 | 290.7 | 153.2 | 0.0 | 0.0 |
| 169.00 | Appurtenance(s) | 238.7 | 253.6 | 698.7 | 0.0 | 532.0 | 420.0 | 0.0 | 43.8 | 937.3 | 717.4 | 0.0 | 0.0 |
| 170.00 | | 273.3 | 61.5 | | | | | 0.0 | 10.7 | 273.3 | 72.2 | 0.0 | 0.0 |
| 175.00 | | 440.5 | 296.4 | | | | | 0.0 | 53.5 | 440.5 | 349.9 | 0.0 | 0.0 |
| 180.00 | Appurtenance(s) | 214.1 | 277.6 | 2,819.3 | 0.0 | 0.0 | 2,229.8 | 0.0 | 53.5 | 3,033.3 | 2,561.0 | 0.0 | 0.0 |

**Load Case:** 1.2D + 1.6W — 101 mph with No Ice — 25 Iterations

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

| | | | | |
|---|---|---|---|---|
| Totals: | 34,581.0 | 53,230.0 | 0.00 | 0.00 |

Site Number: 302465 Code: ANSI/TIA-222-G 

Site Name: Colchester CT 6, CT Engineering Number:12637527_C3_01 12/20/2018 4:57:44 PM

Customer: VERIZON WIRELESS

**Load Case:** 1.2D + 1.6W 101 mph with No Ice 25 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 | -56.44 | -37.24 | 0.00 | -4,216.51 | 0.00 | 4,216.51 | 5,229.17 | 2,614.59 | 13,734.9 | 6,783.18 | 0.00 | 0.00 | 0.633 |
| 5.00 | -54.37 | -36.53 | 0.00 | -4,030.34 | 0.00 | 4,030.34 | 5,190.65 | 2,595.33 | 13,352.1 | 6,594.14 | 0.07 | -0.13 | 0.622 |
| 10.00 | -52.34 | -35.83 | 0.00 | -3,847.71 | 0.00 | 3,847.71 | 5,149.25 | 2,574.63 | 12,966.3 | 6,403.58 | 0.27 | -0.26 | 0.611 |
| 15.00 | -50.35 | -35.14 | 0.00 | -3,668.56 | 0.00 | 3,668.56 | 5,104.97 | 2,552.49 | 12,577.8 | 6,211.74 | 0.61 | -0.39 | 0.601 |
| 20.00 | -48.40 | -34.47 | 0.00 | -3,492.84 | 0.00 | 3,492.84 | 5,057.81 | 2,528.91 | 12,187.2 | 6,018.84 | 1.09 | -0.52 | 0.590 |
| 25.00 | -46.49 | -33.80 | 0.00 | -3,320.50 | 0.00 | 3,320.50 | 5,007.77 | 2,503.89 | 11,795.0 | 5,825.12 | 1.71 | -0.66 | 0.579 |
| 30.00 | -44.62 | -33.14 | 0.00 | -3,151.49 | 0.00 | 3,151.49 | 4,954.85 | 2,477.43 | 11,401.5 | 5,630.81 | 2.47 | -0.79 | 0.569 |
| 35.00 | -42.79 | -32.46 | 0.00 | -2,985.81 | 0.00 | 2,985.81 | 4,899.05 | 2,449.53 | 11,007.4 | 5,436.14 | 3.38 | -0.93 | 0.558 |
| 40.00 | -41.00 | -31.85 | 0.00 | -2,823.50 | 0.00 | 2,823.50 | 4,840.37 | 2,420.19 | 10,612.9 | 5,241.34 | 4.43 | -1.08 | 0.547 |
| 43.83 | -39.68 | -31.48 | 0.00 | -2,701.43 | 0.00 | 2,701.43 | 4,793.44 | 2,396.72 | 10,310.6 | 5,092.05 | 5.34 | -1.19 | 0.539 |
| 45.00 | -38.94 | -31.05 | 0.00 | -2,664.70 | 0.00 | 2,664.70 | 4,778.81 | 2,389.41 | 10,218.7 | 5,046.65 | 5.64 | -1.22 | 0.536 |
| 50.00 | -35.97 | -30.56 | 0.00 | -2,509.47 | 0.00 | 2,509.47 | 4,714.38 | 2,357.19 | 9,825.18 | 4,852.29 | 7.00 | -1.37 | 0.525 |
| 51.00 | -35.37 | -30.20 | 0.00 | -2,478.91 | 0.00 | 2,478.91 | 3,748.95 | 1,874.48 | 7,908.80 | 3,905.86 | 7.29 | -1.40 | 0.644 |
| 55.00 | -34.17 | -29.55 | 0.00 | -2,358.11 | 0.00 | 2,358.11 | 3,716.58 | 1,858.29 | 7,679.21 | 3,792.47 | 8.52 | -1.52 | 0.631 |
| 60.00 | -32.71 | -28.81 | 0.00 | -2,210.39 | 0.00 | 2,210.39 | 3,673.53 | 1,836.77 | 7,390.96 | 3,650.12 | 10.20 | -1.69 | 0.615 |
| 65.00 | -31.29 | -28.08 | 0.00 | -2,066.32 | 0.00 | 2,066.32 | 3,627.60 | 1,813.80 | 7,101.75 | 3,507.29 | 12.06 | -1.86 | 0.598 |
| 70.00 | -29.90 | -27.34 | 0.00 | -1,925.92 | 0.00 | 1,925.92 | 3,578.79 | 1,789.39 | 6,812.03 | 3,364.21 | 14.11 | -2.03 | 0.581 |
| 75.00 | -28.55 | -26.61 | 0.00 | -1,789.20 | 0.00 | 1,789.20 | 3,527.09 | 1,763.55 | 6,522.29 | 3,221.11 | 16.33 | -2.21 | 0.564 |
| 80.00 | -27.23 | -25.88 | 0.00 | -1,656.15 | 0.00 | 1,656.15 | 3,472.52 | 1,736.26 | 6,232.99 | 3,078.24 | 18.74 | -2.39 | 0.546 |
| 85.00 | -25.96 | -25.28 | 0.00 | -1,526.76 | 0.00 | 1,526.76 | 3,415.07 | 1,707.53 | 5,944.59 | 2,935.81 | 21.33 | -2.56 | 0.528 |
| 88.08 | -25.20 | -24.91 | 0.00 | -1,448.83 | 0.00 | 1,448.83 | 3,378.20 | 1,689.10 | 5,767.41 | 2,848.31 | 23.02 | -2.68 | 0.516 |
| 90.00 | -24.38 | -24.47 | 0.00 | -1,401.09 | 0.00 | 1,401.09 | 3,354.74 | 1,677.37 | 5,657.58 | 2,794.06 | 24.11 | -2.75 | 0.509 |
| 94.00 | -22.75 | -24.05 | 0.00 | -1,303.21 | 0.00 | 1,303.21 | 2,549.41 | 1,274.70 | 4,268.23 | 2,107.92 | 26.48 | -2.89 | 0.628 |
| 95.00 | -22.52 | -23.65 | 0.00 | -1,279.16 | 0.00 | 1,279.16 | 2,541.91 | 1,270.95 | 4,228.10 | 2,088.10 | 27.09 | -2.93 | 0.622 |
| 100.00 | -21.49 | -22.94 | 0.00 | -1,160.92 | 0.00 | 1,160.92 | 2,502.69 | 1,251.34 | 4,027.08 | 1,988.82 | 30.27 | -3.14 | 0.593 |
| 105.00 | -20.48 | -22.25 | 0.00 | -1,046.22 | 0.00 | 1,046.22 | 2,460.58 | 1,230.29 | 3,825.85 | 1,889.44 | 33.66 | -3.34 | 0.562 |
| 110.00 | -19.51 | -21.56 | 0.00 | -934.99 | 0.00 | 934.99 | 2,415.60 | 1,207.80 | 3,624.86 | 1,790.18 | 37.27 | -3.55 | 0.531 |
| 115.00 | -18.57 | -20.88 | 0.00 | -827.20 | 0.00 | 827.20 | 2,367.74 | 1,183.87 | 3,424.59 | 1,691.27 | 41.10 | -3.75 | 0.497 |
| 120.00 | -17.66 | -20.22 | 0.00 | -722.80 | 0.00 | 722.80 | 2,317.00 | 1,158.50 | 3,225.50 | 1,592.95 | 45.13 | -3.95 | 0.462 |
| 125.00 | -16.79 | -19.56 | 0.00 | -621.72 | 0.00 | 621.72 | 2,263.38 | 1,131.69 | 3,028.06 | 1,495.45 | 49.37 | -4.14 | 0.423 |
| 130.00 | -15.95 | -19.01 | 0.00 | -523.91 | 0.00 | 523.91 | 2,206.88 | 1,103.44 | 2,832.75 | 1,398.99 | 53.81 | -4.33 | 0.382 |
| 133.42 | -15.39 | -18.68 | 0.00 | -458.96 | 0.00 | 458.96 | 2,166.61 | 1,083.30 | 2,700.75 | 1,333.80 | 56.95 | -4.45 | 0.352 |
| 135.00 | -15.00 | -18.39 | 0.00 | -429.38 | 0.00 | 429.38 | 2,147.49 | 1,073.75 | 2,640.03 | 1,303.81 | 58.43 | -4.51 | 0.337 |
| 138.00 | -11.27 | -14.79 | 0.00 | -374.22 | 0.00 | 374.22 | 1,272.33 | 636.17 | 1,555.73 | 768.31 | 61.30 | -4.61 | 0.496 |
| 140.00 | -11.04 | -14.38 | 0.00 | -344.65 | 0.00 | 344.65 | 1,262.76 | 631.38 | 1,516.62 | 749.00 | 63.24 | -4.67 | 0.469 |
| 145.00 | -10.46 | -13.79 | 0.00 | -272.76 | 0.00 | 272.76 | 1,236.82 | 618.41 | 1,418.37 | 700.48 | 68.24 | -4.87 | 0.398 |
| 150.00 | -9.92 | -13.31 | 0.00 | -203.82 | 0.00 | 203.82 | 1,208.00 | 604.00 | 1,319.78 | 651.79 | 73.43 | -5.05 | 0.321 |
| 153.00 | -7.29 | -9.79 | 0.00 | -163.88 | 0.00 | 163.88 | 1,189.33 | 594.66 | 1,260.67 | 622.60 | 76.63 | -5.14 | 0.270 |
| 155.00 | -7.13 | -9.42 | 0.00 | -144.29 | 0.00 | 144.29 | 1,176.30 | 588.15 | 1,221.34 | 603.17 | 78.80 | -5.20 | 0.246 |
| 160.00 | -6.73 | -8.98 | 0.00 | -97.19 | 0.00 | 97.19 | 1,141.72 | 570.86 | 1,123.49 | 554.85 | 84.30 | -5.32 | 0.181 |
| 163.00 | -3.37 | -5.32 | 0.00 | -70.25 | 0.00 | 70.25 | 1,119.59 | 559.80 | 1,065.27 | 526.10 | 87.66 | -5.38 | 0.137 |
| 165.00 | -3.24 | -5.01 | 0.00 | -59.62 | 0.00 | 59.62 | 1,104.26 | 552.13 | 1,026.73 | 507.06 | 89.92 | -5.41 | 0.121 |
| 169.00 | -2.61 | -4.01 | 0.00 | -39.03 | 0.00 | 39.03 | 1,072.22 | 536.11 | 950.40 | 469.37 | 94.47 | -5.47 | 0.086 |
| 170.00 | -2.56 | -3.74 | 0.00 | -35.01 | 0.00 | 35.01 | 1,063.92 | 531.96 | 931.50 | 460.03 | 95.62 | -5.48 | 0.079 |
| 175.00 | -2.26 | -3.27 | 0.00 | -16.33 | 0.00 | 16.33 | 1,020.70 | 510.35 | 838.29 | 414.00 | 101.37 | -5.52 | 0.042 |
| 180.00 | 0.00 | -3.03 | 0.00 | 0.00 | 0.00 | 0.00 | 968.36 | 484.18 | 742.77 | 366.83 | 107.15 | -5.54 | 0.000 |

**Load Case:** 0.9D + 1.6W — 101 mph with No Ice (Reduced DL) — 25 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

| Seg Elev (ft) | Description | Shaft Forces Wind FX (lb) | Shaft Forces Dead Load (lb) | Discrete Forces Wind FX (lb) | Discrete Forces Torsion MY (lb-ft) | Discrete Forces Moment MZ (lb-ft) | Discrete Forces Dead Load (lb) | Linear Forces Wind FX (lb) | Linear Forces Dead Load (lb) | Sum of Forces Wind FX (lb) | Sum of Forces Dead Load (lb) | Sum of Forces Torsion MY (lb-ft) | Sum of Forces Moment MZ (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 417.6 | 0.0 | | | | | 0.0 | 0.0 | 417.6 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 826.6 | 1,357.1 | | | | | 0.0 | 133.9 | 826.6 | 1,491.0 | 0.0 | 0.0 |
| 10.00 | | 809.4 | 1,328.9 | | | | | 0.0 | 133.9 | 809.4 | 1,462.9 | 0.0 | 0.0 |
| 15.00 | | 792.2 | 1,300.8 | | | | | 0.0 | 133.9 | 792.2 | 1,434.7 | 0.0 | 0.0 |
| 20.00 | | 775.0 | 1,272.7 | | | | | 0.0 | 133.9 | 775.0 | 1,406.6 | 0.0 | 0.0 |
| 25.00 | | 757.8 | 1,244.6 | | | | | 0.0 | 133.9 | 757.8 | 1,378.5 | 0.0 | 0.0 |
| 30.00 | | 749.4 | 1,216.4 | | | | | 0.0 | 133.9 | 749.4 | 1,350.3 | 0.0 | 0.0 |
| 35.00 | | 756.1 | 1,188.3 | | | | | 0.0 | 133.9 | 756.1 | 1,322.2 | 0.0 | 0.0 |
| 40.00 | | 676.6 | 1,160.2 | | | | | 0.0 | 133.9 | 676.6 | 1,294.1 | 0.0 | 0.0 |
| 43.83 | Bot - Section 2 | 386.9 | 870.4 | | | | | 0.0 | 102.7 | 386.9 | 973.1 | 0.0 | 0.0 |
| 45.00 | | 485.5 | 489.4 | | | | | 0.0 | 31.2 | 485.5 | 520.6 | 0.0 | 0.0 |
| 50.00 | | 472.9 | 2,065.2 | | | | | 0.0 | 133.9 | 472.9 | 2,199.1 | 0.0 | 0.0 |
| 51.00 | Top - Section 1 | 395.3 | 406.8 | | | | | 0.0 | 26.8 | 395.3 | 433.5 | 0.0 | 0.0 |
| 55.00 | | 711.6 | 747.8 | | | | | 0.0 | 107.1 | 711.6 | 854.9 | 0.0 | 0.0 |
| 60.00 | | 789.6 | 913.0 | | | | | 0.0 | 133.9 | 789.6 | 1,046.9 | 0.0 | 0.0 |
| 65.00 | | 786.4 | 888.9 | | | | | 0.0 | 133.9 | 786.4 | 1,022.8 | 0.0 | 0.0 |
| 70.00 | | 781.4 | 864.8 | | | | | 0.0 | 133.9 | 781.4 | 998.7 | 0.0 | 0.0 |
| 75.00 | | 774.6 | 840.7 | | | | | 0.0 | 133.9 | 774.6 | 974.6 | 0.0 | 0.0 |
| 80.00 | | 766.2 | 816.6 | | | | | 0.0 | 133.9 | 766.2 | 950.5 | 0.0 | 0.0 |
| 85.00 | | 613.1 | 792.5 | | | | | 0.0 | 133.9 | 613.1 | 926.4 | 0.0 | 0.0 |
| 88.08 | Bot - Section 3 | 377.8 | 476.7 | | | | | 0.0 | 82.6 | 377.8 | 559.2 | 0.0 | 0.0 |
| 90.00 | | 446.3 | 538.8 | | | | | 0.0 | 51.3 | 446.3 | 590.2 | 0.0 | 0.0 |
| 94.00 | Top - Section 2 | 375.4 | 1,103.6 | | | | | 0.0 | 107.1 | 375.4 | 1,210.7 | 0.0 | 0.0 |
| 95.00 | | 443.7 | 124.6 | | | | | 0.0 | 26.8 | 443.7 | 151.3 | 0.0 | 0.0 |
| 100.00 | | 731.3 | 610.7 | | | | | 0.0 | 133.9 | 731.3 | 744.6 | 0.0 | 0.0 |
| 105.00 | | 717.0 | 590.6 | | | | | 0.0 | 133.9 | 717.0 | 724.5 | 0.0 | 0.0 |
| 110.00 | | 701.6 | 570.5 | | | | | 0.0 | 133.9 | 701.6 | 704.4 | 0.0 | 0.0 |
| 115.00 | | 685.3 | 550.4 | | | | | 0.0 | 133.9 | 685.3 | 684.3 | 0.0 | 0.0 |
| 120.00 | | 668.2 | 530.3 | | | | | 0.0 | 133.9 | 668.2 | 664.3 | 0.0 | 0.0 |
| 125.00 | | 650.1 | 510.3 | | | | | 0.0 | 133.9 | 650.1 | 644.2 | 0.0 | 0.0 |
| 130.00 | | 533.9 | 490.2 | | | | | 0.0 | 133.9 | 533.9 | 624.1 | 0.0 | 0.0 |
| 133.42 | Bot - Section 4 | 312.2 | 323.4 | | | | | 0.0 | 91.5 | 312.2 | 414.9 | 0.0 | 0.0 |
| 135.00 | | 283.2 | 251.2 | | | | | 0.0 | 42.4 | 283.2 | 293.6 | 0.0 | 0.0 |
| 138.00 | Top - Section 3 | 305.3 | 466.5 | | | | | 0.0 | 80.3 | 305.3 | 546.9 | 0.0 | 0.0 |
| 140.00 | | 415.9 | 126.6 | | | | | 0.0 | 50.6 | 415.9 | 177.2 | 0.0 | 0.0 |
| 145.00 | | 579.4 | 306.6 | | | | | 0.0 | 126.5 | 579.4 | 433.1 | 0.0 | 0.0 |
| 150.00 | | 449.8 | 292.6 | | | | | 0.0 | 126.5 | 449.8 | 419.1 | 0.0 | 0.0 |
| 153.00 | Appurtenance(s) | 273.4 | 168.8 | 3,009.1 | 0.0 | 0.0 | 1,944.5 | 0.0 | 75.9 | 3,282.5 | 2,189.2 | 0.0 | 0.0 |
| 155.00 | | 370.2 | 109.7 | | | | | 0.0 | 21.1 | 370.2 | 130.8 | 0.0 | 0.0 |
| 160.00 | | 413.9 | 264.5 | | | | | 0.0 | 52.8 | 413.9 | 317.2 | 0.0 | 0.0 |
| 163.00 | Appurtenance(s) | 250.5 | 151.9 | 3,087.9 | 0.0 | 0.0 | 2,583.4 | 0.0 | 31.7 | 3,338.4 | 2,767.0 | 0.0 | 0.0 |
| 165.00 | | 290.7 | 98.5 | | | | | 0.0 | 16.4 | 290.7 | 114.9 | 0.0 | 0.0 |
| 169.00 | Appurtenance(s) | 238.7 | 190.2 | 698.7 | 0.0 | 532.0 | 315.0 | 0.0 | 32.9 | 937.3 | 538.0 | 0.0 | 0.0 |
| 170.00 | | 273.3 | 46.1 | | | | | 0.0 | 8.0 | 273.3 | 54.2 | 0.0 | 0.0 |
| 175.00 | | 440.5 | 222.3 | | | | | 0.0 | 40.1 | 440.5 | 262.4 | 0.0 | 0.0 |
| 180.00 | Appurtenance(s) | 214.1 | 208.2 | 2,819.3 | 0.0 | 0.0 | 1,672.4 | 0.0 | 40.1 | 3,033.3 | 1,920.7 | 0.0 | 0.0 |

**Load Case:** 0.9D + 1.6W — 101 mph with No Ice (Reduced DL) — 25 Iterations

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

| | | | | |
|---|---|---|---|---|
| Totals: | 34,581.0 | 39,922.5 | 0.00 | 0.00 |

Site Number: 302465 | Code: ANSI/TIA-222-G | 

Site Name: Colchester CT 6, CT | Engineering Number:12637527_C3_01 | 12/20/2018 4:57:48 PM

Customer: VERIZON WIRELESS

**Load Case:** 0.9D + 1.6W | 101 mph with No Ice (Reduced DL) | 25 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 | -42.32 | -37.22 | 0.00 | -4,174.88 | 0.00 | 4,174.88 | 5,229.17 | 2,614.59 | 13,734.9 | 6,783.18 | 0.00 | 0.00 | 0.624 |
| 5.00 | -40.75 | -36.48 | 0.00 | -3,988.79 | 0.00 | 3,988.79 | 5,190.65 | 2,595.33 | 13,352.1 | 6,594.14 | 0.07 | -0.13 | 0.613 |
| 10.00 | -39.21 | -35.75 | 0.00 | -3,806.39 | 0.00 | 3,806.39 | 5,149.25 | 2,574.63 | 12,966.3 | 6,403.58 | 0.27 | -0.25 | 0.602 |
| 15.00 | -37.70 | -35.04 | 0.00 | -3,627.62 | 0.00 | 3,627.62 | 5,104.97 | 2,552.49 | 12,577.8 | 6,211.74 | 0.60 | -0.38 | 0.592 |
| 20.00 | -36.22 | -34.34 | 0.00 | -3,452.42 | 0.00 | 3,452.42 | 5,057.81 | 2,528.91 | 12,187.2 | 6,018.84 | 1.08 | -0.52 | 0.581 |
| 25.00 | -34.77 | -33.65 | 0.00 | -3,280.73 | 0.00 | 3,280.73 | 5,007.77 | 2,503.89 | 11,795.0 | 5,825.12 | 1.69 | -0.65 | 0.570 |
| 30.00 | -33.35 | -32.96 | 0.00 | -3,112.49 | 0.00 | 3,112.49 | 4,954.85 | 2,477.43 | 11,401.5 | 5,630.81 | 2.44 | -0.79 | 0.560 |
| 35.00 | -31.96 | -32.26 | 0.00 | -2,947.68 | 0.00 | 2,947.68 | 4,899.05 | 2,449.53 | 11,007.4 | 5,436.14 | 3.34 | -0.92 | 0.549 |
| 40.00 | -30.61 | -31.63 | 0.00 | -2,786.36 | 0.00 | 2,786.36 | 4,840.37 | 2,420.19 | 10,612.9 | 5,241.34 | 4.38 | -1.06 | 0.538 |
| 43.83 | -29.60 | -31.26 | 0.00 | -2,665.10 | 0.00 | 2,665.10 | 4,793.44 | 2,396.72 | 10,310.6 | 5,092.05 | 5.29 | -1.17 | 0.530 |
| 45.00 | -29.04 | -30.81 | 0.00 | -2,628.63 | 0.00 | 2,628.63 | 4,778.81 | 2,389.41 | 10,218.7 | 5,046.65 | 5.58 | -1.21 | 0.527 |
| 50.00 | -26.81 | -30.33 | 0.00 | -2,474.57 | 0.00 | 2,474.57 | 4,714.38 | 2,357.19 | 9,825.18 | 4,852.29 | 6.92 | -1.35 | 0.516 |
| 51.00 | -26.35 | -29.96 | 0.00 | -2,444.23 | 0.00 | 2,444.23 | 3,748.95 | 1,874.48 | 7,908.80 | 3,905.86 | 7.21 | -1.38 | 0.633 |
| 55.00 | -25.44 | -29.29 | 0.00 | -2,324.39 | 0.00 | 2,324.39 | 3,716.58 | 1,858.29 | 7,679.21 | 3,792.47 | 8.42 | -1.50 | 0.620 |
| 60.00 | -24.33 | -28.54 | 0.00 | -2,177.94 | 0.00 | 2,177.94 | 3,673.53 | 1,836.77 | 7,390.96 | 3,650.12 | 10.08 | -1.67 | 0.604 |
| 65.00 | -23.25 | -27.80 | 0.00 | -2,035.22 | 0.00 | 2,035.22 | 3,627.60 | 1,813.80 | 7,101.75 | 3,507.29 | 11.92 | -1.84 | 0.587 |
| 70.00 | -22.20 | -27.05 | 0.00 | -1,896.24 | 0.00 | 1,896.24 | 3,578.79 | 1,789.39 | 6,812.03 | 3,364.21 | 13.94 | -2.01 | 0.570 |
| 75.00 | -21.17 | -26.30 | 0.00 | -1,761.00 | 0.00 | 1,761.00 | 3,527.09 | 1,763.55 | 6,522.29 | 3,221.11 | 16.13 | -2.18 | 0.553 |
| 80.00 | -20.17 | -25.56 | 0.00 | -1,629.49 | 0.00 | 1,629.49 | 3,472.52 | 1,736.26 | 6,232.99 | 3,078.24 | 18.51 | -2.35 | 0.535 |
| 85.00 | -19.21 | -24.96 | 0.00 | -1,501.69 | 0.00 | 1,501.69 | 3,415.07 | 1,707.53 | 5,944.59 | 2,935.81 | 21.07 | -2.53 | 0.517 |
| 88.08 | -18.63 | -24.58 | 0.00 | -1,424.75 | 0.00 | 1,424.75 | 3,378.20 | 1,689.10 | 5,767.41 | 2,848.31 | 22.74 | -2.64 | 0.506 |
| 90.00 | -18.02 | -24.14 | 0.00 | -1,377.63 | 0.00 | 1,377.63 | 3,354.74 | 1,677.37 | 5,657.58 | 2,794.06 | 23.81 | -2.71 | 0.499 |
| 94.00 | -16.79 | -23.74 | 0.00 | -1,281.06 | 0.00 | 1,281.06 | 2,549.41 | 1,274.70 | 4,268.23 | 2,107.92 | 26.14 | -2.85 | 0.615 |
| 95.00 | -16.61 | -23.32 | 0.00 | -1,257.32 | 0.00 | 1,257.32 | 2,541.91 | 1,270.95 | 4,228.10 | 2,088.10 | 26.74 | -2.89 | 0.609 |
| 100.00 | -15.83 | -22.61 | 0.00 | -1,140.72 | 0.00 | 1,140.72 | 2,502.69 | 1,251.34 | 4,027.08 | 1,988.82 | 29.88 | -3.09 | 0.580 |
| 105.00 | -15.07 | -21.90 | 0.00 | -1,027.69 | 0.00 | 1,027.69 | 2,460.58 | 1,230.29 | 3,825.85 | 1,889.44 | 33.23 | -3.30 | 0.550 |
| 110.00 | -14.33 | -21.21 | 0.00 | -918.17 | 0.00 | 918.17 | 2,415.60 | 1,207.80 | 3,624.86 | 1,790.18 | 36.79 | -3.50 | 0.519 |
| 115.00 | -13.62 | -20.53 | 0.00 | -812.11 | 0.00 | 812.11 | 2,367.74 | 1,183.87 | 3,424.59 | 1,691.27 | 40.55 | -3.70 | 0.486 |
| 120.00 | -12.93 | -19.87 | 0.00 | -709.44 | 0.00 | 709.44 | 2,317.00 | 1,158.50 | 3,225.50 | 1,592.95 | 44.53 | -3.89 | 0.451 |
| 125.00 | -12.28 | -19.21 | 0.00 | -610.12 | 0.00 | 610.12 | 2,263.38 | 1,131.69 | 3,028.06 | 1,495.45 | 48.70 | -4.08 | 0.414 |
| 130.00 | -11.64 | -18.66 | 0.00 | -514.06 | 0.00 | 514.06 | 2,206.88 | 1,103.44 | 2,832.75 | 1,398.99 | 53.08 | -4.26 | 0.373 |
| 133.42 | -11.22 | -18.34 | 0.00 | -450.29 | 0.00 | 450.29 | 2,166.61 | 1,083.30 | 2,700.75 | 1,333.80 | 56.17 | -4.38 | 0.343 |
| 135.00 | -10.93 | -18.05 | 0.00 | -421.25 | 0.00 | 421.25 | 2,147.49 | 1,073.75 | 2,640.03 | 1,303.81 | 57.63 | -4.44 | 0.328 |
| 138.00 | -8.19 | -14.52 | 0.00 | -367.10 | 0.00 | 367.10 | 1,272.33 | 636.17 | 1,555.73 | 768.31 | 60.45 | -4.54 | 0.485 |
| 140.00 | -8.02 | -14.11 | 0.00 | -338.06 | 0.00 | 338.06 | 1,262.76 | 631.38 | 1,516.62 | 749.00 | 62.36 | -4.60 | 0.458 |
| 145.00 | -7.59 | -13.53 | 0.00 | -267.49 | 0.00 | 267.49 | 1,236.82 | 618.41 | 1,418.37 | 700.48 | 67.28 | -4.80 | 0.388 |
| 150.00 | -7.18 | -13.06 | 0.00 | -199.86 | 0.00 | 199.86 | 1,208.00 | 604.00 | 1,319.78 | 651.79 | 72.40 | -4.97 | 0.313 |
| 153.00 | -5.27 | -9.60 | 0.00 | -160.69 | 0.00 | 160.69 | 1,189.33 | 594.66 | 1,260.67 | 622.60 | 75.55 | -5.06 | 0.263 |
| 155.00 | -5.16 | -9.23 | 0.00 | -141.48 | 0.00 | 141.48 | 1,176.30 | 588.15 | 1,221.34 | 603.17 | 77.68 | -5.12 | 0.239 |
| 160.00 | -4.87 | -8.80 | 0.00 | -95.33 | 0.00 | 95.33 | 1,141.72 | 570.86 | 1,123.49 | 554.85 | 83.09 | -5.23 | 0.176 |
| 163.00 | -2.42 | -5.22 | 0.00 | -68.93 | 0.00 | 68.93 | 1,119.59 | 559.80 | 1,065.27 | 526.10 | 86.40 | -5.29 | 0.133 |
| 165.00 | -2.33 | -4.92 | 0.00 | -58.49 | 0.00 | 58.49 | 1,104.26 | 552.13 | 1,026.73 | 507.06 | 88.62 | -5.32 | 0.118 |
| 169.00 | -1.88 | -3.94 | 0.00 | -38.27 | 0.00 | 38.27 | 1,072.22 | 536.11 | 950.40 | 469.37 | 93.10 | -5.38 | 0.083 |
| 170.00 | -1.85 | -3.66 | 0.00 | -34.33 | 0.00 | 34.33 | 1,063.92 | 531.96 | 931.50 | 460.03 | 94.23 | -5.39 | 0.076 |
| 175.00 | -1.62 | -3.20 | 0.00 | -16.01 | 0.00 | 16.01 | 1,020.70 | 510.35 | 838.29 | 414.00 | 99.89 | -5.43 | 0.040 |
| 180.00 | 0.00 | -3.03 | 0.00 | 0.00 | 0.00 | 0.00 | 968.36 | 484.18 | 742.77 | 366.83 | 105.58 | -5.45 | 0.000 |

**Load Case:** 1.2D + 1.0Di + 1.0Wi — 50 mph with 0.75 in Radial Ice — 24 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

| Seg Elev (ft) | Description | Shaft Forces Wind FX (lb) | Shaft Forces Dead Load (lb) | Discrete Forces Wind FX (lb) | Discrete Forces Torsion MY (lb-ft) | Discrete Forces Moment MZ (lb-ft) | Discrete Forces Dead Load (lb) | Linear Forces Wind FX (lb) | Linear Forces Dead Load (lb) | Sum of Forces Wind FX (lb) | Sum of Forces Dead Load (lb) | Sum of Forces Torsion MY (lb-ft) | Sum of Forces Moment MZ (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 79.5 | 0.0 | | | | | 0.0 | 0.0 | 79.5 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 157.7 | 2,288.8 | | | | | 0.0 | 178.5 | 157.7 | 2,467.3 | 0.0 | 0.0 |
| 10.00 | | 155.0 | 2,297.1 | | | | | 0.0 | 178.5 | 155.0 | 2,475.7 | 0.0 | 0.0 |
| 15.00 | | 152.1 | 2,276.2 | | | | | 0.0 | 178.5 | 152.1 | 2,454.8 | 0.0 | 0.0 |
| 20.00 | | 149.1 | 2,245.8 | | | | | 0.0 | 178.5 | 149.1 | 2,424.3 | 0.0 | 0.0 |
| 25.00 | | 146.1 | 2,210.3 | | | | | 0.0 | 178.5 | 146.1 | 2,388.9 | 0.0 | 0.0 |
| 30.00 | | 144.8 | 2,171.8 | | | | | 0.0 | 178.5 | 144.8 | 2,350.4 | 0.0 | 0.0 |
| 35.00 | | 146.4 | 2,131.2 | | | | | 0.0 | 178.5 | 146.4 | 2,309.7 | 0.0 | 0.0 |
| 40.00 | | 131.2 | 2,088.9 | | | | | 0.0 | 178.5 | 131.2 | 2,267.4 | 0.0 | 0.0 |
| 43.83 | Bot - Section 2 | 75.1 | 1,573.2 | | | | | 0.0 | 136.9 | 75.1 | 1,710.1 | 0.0 | 0.0 |
| 45.00 | | 94.3 | 779.9 | | | | | 0.0 | 41.7 | 94.3 | 821.6 | 0.0 | 0.0 |
| 50.00 | | 91.9 | 3,290.1 | | | | | 0.0 | 178.5 | 91.9 | 3,468.7 | 0.0 | 0.0 |
| 51.00 | Top - Section 1 | 77.0 | 649.8 | | | | | 0.0 | 35.7 | 77.0 | 685.5 | 0.0 | 0.0 |
| 55.00 | | 138.7 | 1,420.5 | | | | | 0.0 | 142.8 | 138.7 | 1,563.4 | 0.0 | 0.0 |
| 60.00 | | 154.2 | 1,737.8 | | | | | 0.0 | 178.5 | 154.2 | 1,916.3 | 0.0 | 0.0 |
| 65.00 | | 153.9 | 1,696.6 | | | | | 0.0 | 178.5 | 153.9 | 1,875.2 | 0.0 | 0.0 |
| 70.00 | | 153.3 | 1,654.9 | | | | | 0.0 | 178.5 | 153.3 | 1,833.5 | 0.0 | 0.0 |
| 75.00 | | 152.3 | 1,612.8 | | | | | 0.0 | 178.5 | 152.3 | 1,791.3 | 0.0 | 0.0 |
| 80.00 | | 151.0 | 1,570.2 | | | | | 0.0 | 178.5 | 151.0 | 1,748.8 | 0.0 | 0.0 |
| 85.00 | | 121.1 | 1,527.3 | | | | | 0.0 | 178.5 | 121.1 | 1,705.9 | 0.0 | 0.0 |
| 88.08 | Bot - Section 3 | 74.7 | 922.0 | | | | | 0.0 | 110.1 | 74.7 | 1,032.1 | 0.0 | 0.0 |
| 90.00 | | 88.4 | 897.5 | | | | | 0.0 | 68.4 | 88.4 | 965.9 | 0.0 | 0.0 |
| 94.00 | Top - Section 2 | 74.4 | 1,837.4 | | | | | 0.0 | 142.8 | 74.4 | 1,980.3 | 0.0 | 0.0 |
| 95.00 | | 88.1 | 257.3 | | | | | 0.0 | 35.7 | 88.1 | 293.0 | 0.0 | 0.0 |
| 100.00 | | 145.5 | 1,257.6 | | | | | 0.0 | 178.5 | 145.5 | 1,436.1 | 0.0 | 0.0 |
| 105.00 | | 143.1 | 1,218.9 | | | | | 0.0 | 178.5 | 143.1 | 1,397.4 | 0.0 | 0.0 |
| 110.00 | | 140.5 | 1,180.0 | | | | | 0.0 | 178.5 | 140.5 | 1,358.5 | 0.0 | 0.0 |
| 115.00 | | 137.7 | 1,140.8 | | | | | 0.0 | 178.5 | 137.7 | 1,319.4 | 0.0 | 0.0 |
| 120.00 | | 134.7 | 1,101.5 | | | | | 0.0 | 178.5 | 134.7 | 1,280.1 | 0.0 | 0.0 |
| 125.00 | | 131.6 | 1,062.0 | | | | | 0.0 | 178.5 | 131.6 | 1,240.5 | 0.0 | 0.0 |
| 130.00 | | 108.4 | 1,022.3 | | | | | 0.0 | 178.5 | 108.4 | 1,200.8 | 0.0 | 0.0 |
| 133.42 | Bot - Section 4 | 63.6 | 677.2 | | | | | 0.0 | 122.0 | 63.6 | 799.2 | 0.0 | 0.0 |
| 135.00 | | 57.8 | 449.2 | | | | | 0.0 | 56.5 | 57.8 | 505.8 | 0.0 | 0.0 |
| 138.00 | Top - Section 3 | 62.4 | 833.8 | | | | | 0.0 | 107.1 | 62.4 | 940.9 | 0.0 | 0.0 |
| 140.00 | | 85.3 | 307.9 | | | | | 0.0 | 67.5 | 85.3 | 375.3 | 0.0 | 0.0 |
| 145.00 | | 119.3 | 742.8 | | | | | 0.0 | 168.6 | 119.3 | 911.5 | 0.0 | 0.0 |
| 150.00 | | 93.0 | 710.6 | | | | | 0.0 | 168.6 | 93.0 | 879.2 | 0.0 | 0.0 |
| 153.00 | Appurtenance(s) | 56.8 | 412.6 | 672.8 | 0.0 | 0.0 | 5,291.5 | 0.0 | 101.2 | 729.6 | 5,805.3 | 0.0 | 0.0 |
| 155.00 | | 77.3 | 269.2 | | | | | 0.0 | 28.1 | 77.3 | 297.3 | 0.0 | 0.0 |
| 160.00 | | 86.7 | 645.7 | | | | | 0.0 | 70.4 | 86.7 | 716.0 | 0.0 | 0.0 |
| 163.00 | Appurtenance(s) | 52.7 | 373.5 | 707.3 | 0.0 | 0.0 | 6,379.0 | 0.0 | 42.2 | 760.0 | 6,794.7 | 0.0 | 0.0 |
| 165.00 | | 61.5 | 243.1 | | | | | 0.0 | 21.9 | 61.5 | 265.0 | 0.0 | 0.0 |
| 169.00 | Appurtenance(s) | 50.6 | 468.0 | 169.8 | 0.0 | 142.9 | 684.8 | 0.0 | 43.8 | 220.4 | 1,196.6 | 0.0 | 0.0 |
| 170.00 | | 58.4 | 114.6 | | | | | 0.0 | 10.7 | 58.4 | 125.3 | 0.0 | 0.0 |
| 175.00 | | 94.7 | 547.4 | | | | | 0.0 | 53.5 | 94.7 | 600.9 | 0.0 | 0.0 |
| 180.00 | Appurtenance(s) | 46.3 | 514.4 | 587.7 | 0.0 | 0.0 | 5,096.1 | 0.0 | 53.5 | 634.0 | 5,664.0 | 0.0 | 0.0 |

**Load Case:** 1.2D + 1.0Di + 1.0Wi — 50 mph with 0.75 in Radial Ice — 24 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: | 7,095.39 | 77,639.8 | 0.00 | 0.00 |

Site Number: 302465 Code: ANSI/TIA-222-G 

Site Name: Colchester CT 6, CT Engineering Number:12637527_C3_01 12/20/2018 4:57:52 PM

Customer: VERIZON WIRELESS

**Load Case:** 1.2D + 1.0Di + 1.0Wi 50 mph with 0.75 in Radial Ice 24 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 | -83.74 | -7.72 | 0.00 | -925.40 | 0.00 | 925.40 | 5,229.17 | 2,614.59 | 13,734.9 | 6,783.18 | 0.00 | 0.00 | 0.152 |
| 5.00 | -81.27 | -7.60 | 0.00 | -886.81 | 0.00 | 886.81 | 5,190.65 | 2,595.33 | 13,352.1 | 6,594.14 | 0.02 | -0.03 | 0.150 |
| 10.00 | -78.79 | -7.48 | 0.00 | -848.80 | 0.00 | 848.80 | 5,149.25 | 2,574.63 | 12,966.3 | 6,403.58 | 0.06 | -0.06 | 0.148 |
| 15.00 | -76.33 | -7.37 | 0.00 | -811.39 | 0.00 | 811.39 | 5,104.97 | 2,552.49 | 12,577.8 | 6,211.74 | 0.13 | -0.09 | 0.146 |
| 20.00 | -73.90 | -7.25 | 0.00 | -774.56 | 0.00 | 774.56 | 5,057.81 | 2,528.91 | 12,187.2 | 6,018.84 | 0.24 | -0.11 | 0.143 |
| 25.00 | -71.51 | -7.14 | 0.00 | -738.30 | 0.00 | 738.30 | 5,007.77 | 2,503.89 | 11,795.0 | 5,825.12 | 0.38 | -0.15 | 0.141 |
| 30.00 | -69.16 | -7.02 | 0.00 | -702.60 | 0.00 | 702.60 | 4,954.85 | 2,477.43 | 11,401.5 | 5,630.81 | 0.54 | -0.18 | 0.139 |
| 35.00 | -66.84 | -6.91 | 0.00 | -667.48 | 0.00 | 667.48 | 4,899.05 | 2,449.53 | 11,007.4 | 5,436.14 | 0.75 | -0.21 | 0.136 |
| 40.00 | -64.57 | -6.80 | 0.00 | -632.95 | 0.00 | 632.95 | 4,840.37 | 2,420.19 | 10,612.9 | 5,241.34 | 0.98 | -0.24 | 0.134 |
| 43.83 | -62.86 | -6.73 | 0.00 | -606.88 | 0.00 | 606.88 | 4,793.44 | 2,396.72 | 10,310.6 | 5,092.05 | 1.18 | -0.26 | 0.132 |
| 45.00 | -62.04 | -6.66 | 0.00 | -599.03 | 0.00 | 599.03 | 4,778.81 | 2,389.41 | 10,218.7 | 5,046.65 | 1.25 | -0.27 | 0.132 |
| 50.00 | -58.57 | -6.57 | 0.00 | -565.73 | 0.00 | 565.73 | 4,714.38 | 2,357.19 | 9,825.18 | 4,852.29 | 1.55 | -0.30 | 0.129 |
| 51.00 | -57.88 | -6.51 | 0.00 | -559.16 | 0.00 | 559.16 | 3,748.95 | 1,874.48 | 7,908.80 | 3,905.86 | 1.61 | -0.31 | 0.159 |
| 55.00 | -56.31 | -6.39 | 0.00 | -533.14 | 0.00 | 533.14 | 3,716.58 | 1,858.29 | 7,679.21 | 3,792.47 | 1.89 | -0.34 | 0.156 |
| 60.00 | -54.39 | -6.26 | 0.00 | -501.18 | 0.00 | 501.18 | 3,673.53 | 1,836.77 | 7,390.96 | 3,650.12 | 2.26 | -0.38 | 0.152 |
| 65.00 | -52.52 | -6.13 | 0.00 | -469.88 | 0.00 | 469.88 | 3,627.60 | 1,813.80 | 7,101.75 | 3,507.29 | 2.68 | -0.42 | 0.148 |
| 70.00 | -50.68 | -6.00 | 0.00 | -439.23 | 0.00 | 439.23 | 3,578.79 | 1,789.39 | 6,812.03 | 3,364.21 | 3.14 | -0.46 | 0.145 |
| 75.00 | -48.89 | -5.87 | 0.00 | -409.24 | 0.00 | 409.24 | 3,527.09 | 1,763.55 | 6,522.29 | 3,221.11 | 3.63 | -0.50 | 0.141 |
| 80.00 | -47.13 | -5.73 | 0.00 | -379.91 | 0.00 | 379.91 | 3,472.52 | 1,736.26 | 6,232.99 | 3,078.24 | 4.17 | -0.54 | 0.137 |
| 85.00 | -45.43 | -5.62 | 0.00 | -351.25 | 0.00 | 351.25 | 3,415.07 | 1,707.53 | 5,944.59 | 2,935.81 | 4.76 | -0.58 | 0.133 |
| 88.08 | -44.39 | -5.55 | 0.00 | -333.92 | 0.00 | 333.92 | 3,378.20 | 1,689.10 | 5,767.41 | 2,848.31 | 5.14 | -0.60 | 0.130 |
| 90.00 | -43.43 | -5.47 | 0.00 | -323.28 | 0.00 | 323.28 | 3,354.74 | 1,677.37 | 5,657.58 | 2,794.06 | 5.38 | -0.62 | 0.129 |
| 94.00 | -41.44 | -5.39 | 0.00 | -301.39 | 0.00 | 301.39 | 2,549.41 | 1,274.70 | 4,268.23 | 2,107.92 | 5.92 | -0.65 | 0.159 |
| 95.00 | -41.15 | -5.32 | 0.00 | -296.00 | 0.00 | 296.00 | 2,541.91 | 1,270.95 | 4,228.10 | 2,088.10 | 6.06 | -0.66 | 0.158 |
| 100.00 | -39.71 | -5.19 | 0.00 | -269.40 | 0.00 | 269.40 | 2,502.69 | 1,251.34 | 4,027.08 | 1,988.82 | 6.77 | -0.71 | 0.151 |
| 105.00 | -38.31 | -5.06 | 0.00 | -243.45 | 0.00 | 243.45 | 2,460.58 | 1,230.29 | 3,825.85 | 1,889.44 | 7.54 | -0.76 | 0.144 |
| 110.00 | -36.95 | -4.93 | 0.00 | -218.14 | 0.00 | 218.14 | 2,415.60 | 1,207.80 | 3,624.86 | 1,790.18 | 8.36 | -0.80 | 0.137 |
| 115.00 | -35.63 | -4.81 | 0.00 | -193.47 | 0.00 | 193.47 | 2,367.74 | 1,183.87 | 3,424.59 | 1,691.27 | 9.23 | -0.85 | 0.129 |
| 120.00 | -34.35 | -4.68 | 0.00 | -169.44 | 0.00 | 169.44 | 2,317.00 | 1,158.50 | 3,225.50 | 1,592.95 | 10.15 | -0.90 | 0.121 |
| 125.00 | -33.11 | -4.55 | 0.00 | -146.05 | 0.00 | 146.05 | 2,263.38 | 1,131.69 | 3,028.06 | 1,495.45 | 11.11 | -0.94 | 0.112 |
| 130.00 | -31.90 | -4.45 | 0.00 | -123.28 | 0.00 | 123.28 | 2,206.88 | 1,103.44 | 2,832.75 | 1,398.99 | 12.13 | -0.99 | 0.103 |
| 133.42 | -31.11 | -4.38 | 0.00 | -108.09 | 0.00 | 108.09 | 2,166.61 | 1,083.30 | 2,700.75 | 1,333.80 | 12.84 | -1.02 | 0.095 |
| 135.00 | -30.60 | -4.32 | 0.00 | -101.16 | 0.00 | 101.16 | 2,147.49 | 1,073.75 | 2,640.03 | 1,303.81 | 13.18 | -1.03 | 0.092 |
| 138.00 | -23.57 | -3.46 | 0.00 | -88.19 | 0.00 | 88.19 | 1,272.33 | 636.17 | 1,555.73 | 768.31 | 13.84 | -1.05 | 0.133 |
| 140.00 | -23.20 | -3.38 | 0.00 | -81.28 | 0.00 | 81.28 | 1,262.76 | 631.38 | 1,516.62 | 749.00 | 14.28 | -1.07 | 0.127 |
| 145.00 | -22.28 | -3.26 | 0.00 | -64.39 | 0.00 | 64.39 | 1,236.82 | 618.41 | 1,418.37 | 700.48 | 15.43 | -1.12 | 0.110 |
| 150.00 | -21.41 | -3.16 | 0.00 | -48.10 | 0.00 | 48.10 | 1,208.00 | 604.00 | 1,319.78 | 651.79 | 16.62 | -1.16 | 0.092 |
| 153.00 | -15.62 | -2.32 | 0.00 | -38.62 | 0.00 | 38.62 | 1,189.33 | 594.66 | 1,260.67 | 622.60 | 17.36 | -1.18 | 0.075 |
| 155.00 | -15.32 | -2.24 | 0.00 | -33.99 | 0.00 | 33.99 | 1,176.30 | 588.15 | 1,221.34 | 603.17 | 17.85 | -1.19 | 0.069 |
| 160.00 | -14.60 | -2.14 | 0.00 | -22.79 | 0.00 | 22.79 | 1,141.72 | 570.86 | 1,123.49 | 554.85 | 19.12 | -1.22 | 0.054 |
| 163.00 | -7.83 | -1.24 | 0.00 | -16.37 | 0.00 | 16.37 | 1,119.59 | 559.80 | 1,065.27 | 526.10 | 19.89 | -1.23 | 0.038 |
| 165.00 | -7.56 | -1.17 | 0.00 | -13.89 | 0.00 | 13.89 | 1,104.26 | 552.13 | 1,026.73 | 507.06 | 20.41 | -1.24 | 0.034 |
| 169.00 | -6.37 | -0.93 | 0.00 | -9.06 | 0.00 | 9.06 | 1,072.22 | 536.11 | 950.40 | 469.37 | 21.46 | -1.26 | 0.025 |
| 170.00 | -6.25 | -0.87 | 0.00 | -8.13 | 0.00 | 8.13 | 1,063.92 | 531.96 | 931.50 | 460.03 | 21.72 | -1.26 | 0.024 |
| 175.00 | -5.65 | -0.76 | 0.00 | -3.80 | 0.00 | 3.80 | 1,020.70 | 510.35 | 838.29 | 414.00 | 23.04 | -1.27 | 0.015 |
| 180.00 | 0.00 | -0.63 | 0.00 | 0.00 | 0.00 | 0.00 | 968.36 | 484.18 | 742.77 | 366.83 | 24.37 | -1.27 | 0.000 |

**Load Case:** 1.0D + 1.0W Serviceability 60 mph 24 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 | | 92.1 | 0.0 | | | | | 0.0 | 0.0 | 92.1 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 182.3 | 1,507.9 | | | | | 0.0 | 148.8 | 182.3 | 1,656.6 | 0.0 | 0.0 |
| 10.00 | | 178.5 | 1,476.6 | | | | | 0.0 | 148.8 | 178.5 | 1,625.4 | 0.0 | 0.0 |
| 15.00 | | 174.7 | 1,445.4 | | | | | 0.0 | 148.8 | 174.7 | 1,594.1 | 0.0 | 0.0 |
| 20.00 | | 170.9 | 1,414.1 | | | | | 0.0 | 148.8 | 170.9 | 1,562.9 | 0.0 | 0.0 |
| 25.00 | | 167.2 | 1,382.8 | | | | | 0.0 | 148.8 | 167.2 | 1,531.6 | 0.0 | 0.0 |
| 30.00 | | 165.3 | 1,351.6 | | | | | 0.0 | 148.8 | 165.3 | 1,500.4 | 0.0 | 0.0 |
| 35.00 | | 166.8 | 1,320.3 | | | | | 0.0 | 148.8 | 166.8 | 1,469.1 | 0.0 | 0.0 |
| 40.00 | | 149.2 | 1,289.1 | | | | | 0.0 | 148.8 | 149.2 | 1,437.9 | 0.0 | 0.0 |
| 43.83 | Bot - Section 2 | 85.3 | 967.1 | | | | | 0.0 | 114.1 | 85.3 | 1,081.2 | 0.0 | 0.0 |
| 45.00 | | 107.1 | 543.8 | | | | | 0.0 | 34.7 | 107.1 | 578.5 | 0.0 | 0.0 |
| 50.00 | | 104.3 | 2,294.6 | | | | | 0.0 | 148.8 | 104.3 | 2,443.4 | 0.0 | 0.0 |
| 51.00 | Top - Section 1 | 87.2 | 452.0 | | | | | 0.0 | 29.8 | 87.2 | 481.7 | 0.0 | 0.0 |
| 55.00 | | 157.0 | 830.9 | | | | | 0.0 | 119.0 | 157.0 | 949.9 | 0.0 | 0.0 |
| 60.00 | | 174.2 | 1,014.5 | | | | | 0.0 | 148.8 | 174.2 | 1,163.3 | 0.0 | 0.0 |
| 65.00 | | 173.5 | 987.7 | | | | | 0.0 | 148.8 | 173.5 | 1,136.5 | 0.0 | 0.0 |
| 70.00 | | 172.3 | 960.9 | | | | | 0.0 | 148.8 | 172.3 | 1,109.7 | 0.0 | 0.0 |
| 75.00 | | 170.8 | 934.1 | | | | | 0.0 | 148.8 | 170.8 | 1,082.9 | 0.0 | 0.0 |
| 80.00 | | 169.0 | 907.3 | | | | | 0.0 | 148.8 | 169.0 | 1,056.1 | 0.0 | 0.0 |
| 85.00 | | 135.2 | 880.5 | | | | | 0.0 | 148.8 | 135.2 | 1,029.3 | 0.0 | 0.0 |
| 88.08 | Bot - Section 3 | 83.3 | 529.6 | | | | | 0.0 | 91.8 | 83.3 | 621.4 | 0.0 | 0.0 |
| 90.00 | | 98.4 | 598.7 | | | | | 0.0 | 57.0 | 98.4 | 655.7 | 0.0 | 0.0 |
| 94.00 | Top - Section 2 | 82.8 | 1,226.2 | | | | | 0.0 | 119.0 | 82.8 | 1,345.2 | 0.0 | 0.0 |
| 95.00 | | 97.9 | 138.4 | | | | | 0.0 | 29.8 | 97.9 | 168.1 | 0.0 | 0.0 |
| 100.00 | | 161.3 | 678.6 | | | | | 0.0 | 148.8 | 161.3 | 827.4 | 0.0 | 0.0 |
| 105.00 | | 158.1 | 656.2 | | | | | 0.0 | 148.8 | 158.1 | 805.0 | 0.0 | 0.0 |
| 110.00 | | 154.8 | 633.9 | | | | | 0.0 | 148.8 | 154.8 | 782.7 | 0.0 | 0.0 |
| 115.00 | | 151.2 | 611.6 | | | | | 0.0 | 148.8 | 151.2 | 760.4 | 0.0 | 0.0 |
| 120.00 | | 147.4 | 589.3 | | | | | 0.0 | 148.8 | 147.4 | 738.1 | 0.0 | 0.0 |
| 125.00 | | 143.4 | 566.9 | | | | | 0.0 | 148.8 | 143.4 | 715.7 | 0.0 | 0.0 |
| 130.00 | | 117.8 | 544.6 | | | | | 0.0 | 148.8 | 117.8 | 693.4 | 0.0 | 0.0 |
| 133.42 | Bot - Section 4 | 68.9 | 359.3 | | | | | 0.0 | 101.7 | 68.9 | 461.0 | 0.0 | 0.0 |
| 135.00 | | 62.5 | 279.1 | | | | | 0.0 | 47.1 | 62.5 | 326.2 | 0.0 | 0.0 |
| 138.00 | Top - Section 3 | 67.3 | 518.3 | | | | | 0.0 | 89.3 | 67.3 | 607.6 | 0.0 | 0.0 |
| 140.00 | | 91.7 | 140.7 | | | | | 0.0 | 56.2 | 91.7 | 196.9 | 0.0 | 0.0 |
| 145.00 | | 127.8 | 340.7 | | | | | 0.0 | 140.5 | 127.8 | 481.3 | 0.0 | 0.0 |
| 150.00 | | 99.2 | 325.1 | | | | | 0.0 | 140.5 | 99.2 | 465.6 | 0.0 | 0.0 |
| 153.00 | Appurtenance(s) | 60.3 | 187.6 | 663.7 | 0.0 | 0.0 | 2,160.6 | 0.0 | 84.3 | 724.0 | 2,432.5 | 0.0 | 0.0 |
| 155.00 | | 81.6 | 121.9 | | | | | 0.0 | 23.5 | 81.6 | 145.4 | 0.0 | 0.0 |
| 160.00 | | 91.3 | 293.8 | | | | | 0.0 | 58.6 | 91.3 | 352.5 | 0.0 | 0.0 |
| 163.00 | Appurtenance(s) | 55.3 | 168.8 | 681.1 | 0.0 | 0.0 | 2,870.5 | 0.0 | 35.2 | 736.3 | 3,074.5 | 0.0 | 0.0 |
| 165.00 | | 64.1 | 109.4 | | | | | 0.0 | 18.3 | 64.1 | 127.7 | 0.0 | 0.0 |
| 169.00 | Appurtenance(s) | 52.6 | 211.3 | 154.1 | 0.0 | 117.3 | 350.0 | 0.0 | 36.5 | 206.7 | 597.8 | 0.0 | 0.0 |
| 170.00 | | 60.3 | 51.3 | | | | | 0.0 | 8.9 | 60.3 | 60.2 | 0.0 | 0.0 |
| 175.00 | | 97.2 | 247.0 | | | | | 0.0 | 44.6 | 97.2 | 291.6 | 0.0 | 0.0 |
| 180.00 | Appurtenance(s) | 47.2 | 231.3 | 621.8 | 0.0 | 0.0 | 1,858.2 | 0.0 | 44.6 | 669.0 | 2,134.1 | 0.0 | 0.0 |

**Load Case:** 1.0D + 1.0W Serviceability 60 mph 24 Iterations

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

| | | | | |
|---|---|---|---|---|
| Totals: | 7,627.42 | 44,358.3 | 0.00 | 0.00 |

Site Number: 302465 Code: ANSI/TIA-222-G 

Site Name: Colchester CT 6, CT Engineering Number:12637527_C3_01 12/20/2018 4:57:56 PM

Customer: VERIZON WIRELESS

**Load Case:** 1.0D + 1.0W Serviceability 60 mph 24 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 | -47.07 | -8.21 | 0.00 | -924.74 | 0.00 | 924.74 | 5,229.17 | 2,614.59 | 13,734.9 | 6,783.18 | 0.00 | 0.00 | 0.145 |
| 5.00 | -45.41 | -8.05 | 0.00 | -883.69 | 0.00 | 883.69 | 5,190.65 | 2,595.33 | 13,352.1 | 6,594.14 | 0.02 | -0.03 | 0.143 |
| 10.00 | -43.78 | -7.89 | 0.00 | -843.44 | 0.00 | 843.44 | 5,149.25 | 2,574.63 | 12,966.3 | 6,403.58 | 0.06 | -0.06 | 0.140 |
| 15.00 | -42.18 | -7.74 | 0.00 | -803.99 | 0.00 | 803.99 | 5,104.97 | 2,552.49 | 12,577.8 | 6,211.74 | 0.13 | -0.08 | 0.138 |
| 20.00 | -40.61 | -7.58 | 0.00 | -765.31 | 0.00 | 765.31 | 5,057.81 | 2,528.91 | 12,187.2 | 6,018.84 | 0.24 | -0.11 | 0.135 |
| 25.00 | -39.08 | -7.43 | 0.00 | -727.39 | 0.00 | 727.39 | 5,007.77 | 2,503.89 | 11,795.0 | 5,825.12 | 0.37 | -0.14 | 0.133 |
| 30.00 | -37.57 | -7.28 | 0.00 | -690.23 | 0.00 | 690.23 | 4,954.85 | 2,477.43 | 11,401.5 | 5,630.81 | 0.54 | -0.17 | 0.130 |
| 35.00 | -36.10 | -7.13 | 0.00 | -653.81 | 0.00 | 653.81 | 4,899.05 | 2,449.53 | 11,007.4 | 5,436.14 | 0.74 | -0.20 | 0.128 |
| 40.00 | -34.66 | -6.99 | 0.00 | -618.15 | 0.00 | 618.15 | 4,840.37 | 2,420.19 | 10,612.9 | 5,241.34 | 0.97 | -0.24 | 0.125 |
| 43.83 | -33.58 | -6.91 | 0.00 | -591.34 | 0.00 | 591.34 | 4,793.44 | 2,396.72 | 10,310.6 | 5,092.05 | 1.17 | -0.26 | 0.123 |
| 45.00 | -33.00 | -6.81 | 0.00 | -583.28 | 0.00 | 583.28 | 4,778.81 | 2,389.41 | 10,218.7 | 5,046.65 | 1.24 | -0.27 | 0.122 |
| 50.00 | -30.55 | -6.71 | 0.00 | -549.20 | 0.00 | 549.20 | 4,714.38 | 2,357.19 | 9,825.18 | 4,852.29 | 1.53 | -0.30 | 0.120 |
| 51.00 | -30.07 | -6.63 | 0.00 | -542.49 | 0.00 | 542.49 | 3,748.95 | 1,874.48 | 7,908.80 | 3,905.86 | 1.60 | -0.31 | 0.147 |
| 55.00 | -29.12 | -6.48 | 0.00 | -515.98 | 0.00 | 515.98 | 3,716.58 | 1,858.29 | 7,679.21 | 3,792.47 | 1.87 | -0.33 | 0.144 |
| 60.00 | -27.95 | -6.32 | 0.00 | -483.58 | 0.00 | 483.58 | 3,673.53 | 1,836.77 | 7,390.96 | 3,650.12 | 2.24 | -0.37 | 0.140 |
| 65.00 | -26.81 | -6.15 | 0.00 | -451.99 | 0.00 | 451.99 | 3,627.60 | 1,813.80 | 7,101.75 | 3,507.29 | 2.64 | -0.41 | 0.136 |
| 70.00 | -25.70 | -5.99 | 0.00 | -421.21 | 0.00 | 421.21 | 3,578.79 | 1,789.39 | 6,812.03 | 3,364.21 | 3.09 | -0.45 | 0.132 |
| 75.00 | -24.61 | -5.83 | 0.00 | -391.26 | 0.00 | 391.26 | 3,527.09 | 1,763.55 | 6,522.29 | 3,221.11 | 3.58 | -0.48 | 0.128 |
| 80.00 | -23.55 | -5.67 | 0.00 | -362.12 | 0.00 | 362.12 | 3,472.52 | 1,736.26 | 6,232.99 | 3,078.24 | 4.10 | -0.52 | 0.124 |
| 85.00 | -22.52 | -5.53 | 0.00 | -333.79 | 0.00 | 333.79 | 3,415.07 | 1,707.53 | 5,944.59 | 2,935.81 | 4.67 | -0.56 | 0.120 |
| 88.08 | -21.90 | -5.45 | 0.00 | -316.73 | 0.00 | 316.73 | 3,378.20 | 1,689.10 | 5,767.41 | 2,848.31 | 5.04 | -0.59 | 0.118 |
| 90.00 | -21.24 | -5.35 | 0.00 | -306.28 | 0.00 | 306.28 | 3,354.74 | 1,677.37 | 5,657.58 | 2,794.06 | 5.28 | -0.60 | 0.116 |
| 94.00 | -19.90 | -5.26 | 0.00 | -284.86 | 0.00 | 284.86 | 2,549.41 | 1,274.70 | 4,268.23 | 2,107.92 | 5.80 | -0.63 | 0.143 |
| 95.00 | -19.73 | -5.17 | 0.00 | -279.60 | 0.00 | 279.60 | 2,541.91 | 1,270.95 | 4,228.10 | 2,088.10 | 5.93 | -0.64 | 0.142 |
| 100.00 | -18.90 | -5.02 | 0.00 | -253.73 | 0.00 | 253.73 | 2,502.69 | 1,251.34 | 4,027.08 | 1,988.82 | 6.63 | -0.69 | 0.135 |
| 105.00 | -18.09 | -4.86 | 0.00 | -228.64 | 0.00 | 228.64 | 2,460.58 | 1,230.29 | 3,825.85 | 1,889.44 | 7.37 | -0.73 | 0.128 |
| 110.00 | -17.31 | -4.71 | 0.00 | -204.32 | 0.00 | 204.32 | 2,415.60 | 1,207.80 | 3,624.86 | 1,790.18 | 8.16 | -0.78 | 0.121 |
| 115.00 | -16.55 | -4.56 | 0.00 | -180.76 | 0.00 | 180.76 | 2,367.74 | 1,183.87 | 3,424.59 | 1,691.27 | 9.00 | -0.82 | 0.114 |
| 120.00 | -15.81 | -4.42 | 0.00 | -157.94 | 0.00 | 157.94 | 2,317.00 | 1,158.50 | 3,225.50 | 1,592.95 | 9.88 | -0.86 | 0.106 |
| 125.00 | -15.09 | -4.27 | 0.00 | -135.85 | 0.00 | 135.85 | 2,263.38 | 1,131.69 | 3,028.06 | 1,495.45 | 10.81 | -0.91 | 0.098 |
| 130.00 | -14.40 | -4.15 | 0.00 | -114.49 | 0.00 | 114.49 | 2,206.88 | 1,103.44 | 2,832.75 | 1,398.99 | 11.78 | -0.95 | 0.088 |
| 133.42 | -13.94 | -4.08 | 0.00 | -100.30 | 0.00 | 100.30 | 2,166.61 | 1,083.30 | 2,700.75 | 1,333.80 | 12.47 | -0.97 | 0.082 |
| 135.00 | -13.61 | -4.02 | 0.00 | -93.83 | 0.00 | 93.83 | 2,147.49 | 1,073.75 | 2,640.03 | 1,303.81 | 12.80 | -0.99 | 0.078 |
| 138.00 | -10.30 | -3.23 | 0.00 | -81.78 | 0.00 | 81.78 | 1,272.33 | 636.17 | 1,555.73 | 768.31 | 13.42 | -1.01 | 0.115 |
| 140.00 | -10.11 | -3.14 | 0.00 | -75.32 | 0.00 | 75.32 | 1,262.76 | 631.38 | 1,516.62 | 749.00 | 13.85 | -1.02 | 0.109 |
| 145.00 | -9.63 | -3.01 | 0.00 | -59.61 | 0.00 | 59.61 | 1,236.82 | 618.41 | 1,418.37 | 700.48 | 14.94 | -1.07 | 0.093 |
| 150.00 | -9.16 | -2.91 | 0.00 | -44.54 | 0.00 | 44.54 | 1,208.00 | 604.00 | 1,319.78 | 651.79 | 16.08 | -1.10 | 0.076 |
| 153.00 | -6.74 | -2.14 | 0.00 | -35.82 | 0.00 | 35.82 | 1,189.33 | 594.66 | 1,260.67 | 622.60 | 16.78 | -1.12 | 0.063 |
| 155.00 | -6.60 | -2.06 | 0.00 | -31.54 | 0.00 | 31.54 | 1,176.30 | 588.15 | 1,221.34 | 603.17 | 17.26 | -1.14 | 0.058 |
| 160.00 | -6.25 | -1.96 | 0.00 | -21.25 | 0.00 | 21.25 | 1,141.72 | 570.86 | 1,123.49 | 554.85 | 18.46 | -1.16 | 0.044 |
| 163.00 | -3.19 | -1.16 | 0.00 | -15.36 | 0.00 | 15.36 | 1,119.59 | 559.80 | 1,065.27 | 526.10 | 19.20 | -1.18 | 0.032 |
| 165.00 | -3.06 | -1.10 | 0.00 | -13.04 | 0.00 | 13.04 | 1,104.26 | 552.13 | 1,026.73 | 507.06 | 19.69 | -1.18 | 0.028 |
| 169.00 | -2.47 | -0.88 | 0.00 | -8.53 | 0.00 | 8.53 | 1,072.22 | 536.11 | 950.40 | 469.37 | 20.69 | -1.20 | 0.020 |
| 170.00 | -2.41 | -0.82 | 0.00 | -7.65 | 0.00 | 7.65 | 1,063.92 | 531.96 | 931.50 | 460.03 | 20.94 | -1.20 | 0.019 |
| 175.00 | -2.12 | -0.71 | 0.00 | -3.57 | 0.00 | 3.57 | 1,020.70 | 510.35 | 838.29 | 414.00 | 22.20 | -1.21 | 0.011 |
| 180.00 | 0.00 | -0.67 | 0.00 | 0.00 | 0.00 | 0.00 | 968.36 | 484.18 | 742.77 | 366.83 | 23.47 | -1.21 | 0.000 |

## Equivalent Lateral Forces Method Analysis

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

| | |
|---|---|
| Spectral Response Acceleration for Short Period ($S_s$): | 0.17 |
| 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 Coefficient $F_v$: | 2.40 |
| Response Modification Coefficient (R): | 1.50 |
| Design Spectral Response Acceleration at Short Period ($S_{ds}$): | 0.18 |
| 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): | 2.41 |
| Redundancy Factor (p): | 1.00 |
| Seismic Force Distribution Exponent (k): | 1.96 |
| Total Unfactored Dead Load: | 47.07 k |
| Seismic Base Shear (E): | 1.41 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 | 177.50 | 276 | 6,928 | 0.017 | 25 | 341 |
| 44 | 172.50 | 292 | 6,923 | 0.017 | 25 | 361 |
| 43 | 169.50 | 60 | 1,381 | 0.003 | 5 | 74 |
| 42 | 167.00 | 248 | 5,523 | 0.014 | 20 | 306 |
| 41 | 164.00 | 128 | 2,746 | 0.007 | 10 | 158 |
| 40 | 161.50 | 204 | 4,258 | 0.011 | 15 | 252 |
| 39 | 157.50 | 352 | 7,005 | 0.018 | 25 | 436 |
| 38 | 154.00 | 145 | 2,765 | 0.007 | 10 | 180 |
| 37 | 151.50 | 272 | 5,008 | 0.013 | 18 | 336 |
| 36 | 147.50 | 466 | 8,139 | 0.020 | 29 | 576 |
| 35 | 142.50 | 481 | 7,864 | 0.020 | 28 | 595 |
| 34 | 139.00 | 197 | 3,064 | 0.008 | 11 | 243 |
| 33 | 136.50 | 608 | 9,127 | 0.023 | 32 | 751 |
| 32 | 134.21 | 326 | 4,740 | 0.012 | 17 | 403 |
| 31 | 131.71 | 461 | 6,457 | 0.016 | 23 | 570 |
| 30 | 127.50 | 693 | 9,115 | 0.023 | 32 | 858 |
| 29 | 122.50 | 716 | 8,700 | 0.022 | 31 | 885 |
| 28 | 117.50 | 738 | 8,269 | 0.021 | 29 | 913 |
| 27 | 112.50 | 760 | 7,824 | 0.020 | 28 | 940 |
| 26 | 107.50 | 783 | 7,369 | 0.019 | 26 | 968 |
| 25 | 102.50 | 805 | 6,905 | 0.017 | 25 | 996 |
| 24 | 97.50 | 827 | 6,435 | 0.016 | 23 | 1,023 |
| 23 | 94.50 | 168 | 1,230 | 0.003 | 4 | 208 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 22 | 92.00 | 1,345 | 9,339 | 0.024 | 33 | 1,664 |
| 21 | 89.04 | 656 | 4,270 | 0.011 | 15 | 811 |
| 20 | 86.54 | 621 | 3,828 | 0.010 | 14 | 768 |
| 19 | 82.50 | 1,029 | 5,774 | 0.015 | 21 | 1,273 |
| 18 | 77.50 | 1,056 | 5,242 | 0.013 | 19 | 1,306 |
| 17 | 72.50 | 1,083 | 4,718 | 0.012 | 17 | 1,339 |
| 16 | 67.50 | 1,110 | 4,204 | 0.011 | 15 | 1,372 |
| 15 | 62.50 | 1,136 | 3,704 | 0.009 | 13 | 1,405 |
| 14 | 57.50 | 1,163 | 3,220 | 0.008 | 11 | 1,439 |
| 13 | 53.00 | 950 | 2,242 | 0.006 | 8 | 1,175 |
| 12 | 50.50 | 482 | 1,035 | 0.003 | 4 | 596 |
| 11 | 47.50 | 2,443 | 4,655 | 0.012 | 17 | 3,022 |
| 10 | 44.42 | 578 | 966 | 0.002 | 3 | 715 |
| 9 | 41.92 | 1,081 | 1,613 | 0.004 | 6 | 1,337 |
| 8 | 37.50 | 1,438 | 1,725 | 0.004 | 6 | 1,778 |
| 7 | 32.50 | 1,469 | 1,332 | 0.003 | 5 | 1,817 |
| 6 | 27.50 | 1,500 | 981 | 0.002 | 3 | 1,856 |
| 5 | 22.50 | 1,532 | 676 | 0.002 | 2 | 1,894 |
| 4 | 17.50 | 1,563 | 422 | 0.001 | 2 | 1,933 |
| 3 | 12.50 | 1,594 | 223 | 0.001 | 1 | 1,971 |
| 2 | 7.50 | 1,625 | 84 | 0.000 | 0 | 2,010 |
| 1 | 2.50 | 1,657 | 10 | 0.000 | 0 | 2,049 |
| Alcatel-Lucent RRH2x | 180.00 | 317 | 8,191 | 0.021 | 29 | 393 |
| Alcatel-Lucent 1900 | 180.00 | 180 | 4,645 | 0.012 | 17 | 223 |
| Alcatel-Lucent TD-RR | 180.00 | 210 | 5,419 | 0.014 | 19 | 260 |
| RFS APXVTM14-ALU-I20 | 180.00 | 169 | 4,351 | 0.011 | 15 | 209 |
| Round T-Arm | 180.00 | 750 | 19,354 | 0.049 | 69 | 928 |
| Commscope NNVV-65B-R | 180.00 | 232 | 5,992 | 0.015 | 21 | 287 |
| 6' Omni | 169.00 | 50 | 1,141 | 0.003 | 4 | 62 |
| Standoff Mounts | 169.00 | 300 | 6,843 | 0.017 | 24 | 371 |
| Samsung B2/B66A RRH- | 163.00 | 253 | 5,381 | 0.014 | 19 | 313 |
| Samsung B5/B13 RRH-B | 163.00 | 211 | 4,482 | 0.011 | 16 | 261 |
| RFS DB-B1-6C-12AB-0Z | 163.00 | 43 | 910 | 0.002 | 3 | 53 |
| Commscope JAHH-65B-R | 163.00 | 364 | 7,728 | 0.019 | 27 | 450 |
| Round Platform w/ Ha | 163.00 | 2,000 | 42,507 | 0.107 | 151 | 2,473 |
| LGP Allgon LGP21903 | 153.00 | 33 | 620 | 0.002 | 2 | 41 |
| Powerwave Allgon LGP | 153.00 | 85 | 1,589 | 0.004 | 6 | 105 |
| Raycap DC6-48-60-18- | 153.00 | 20 | 376 | 0.001 | 1 | 25 |
| Ericsson RRUS-11 800 | 153.00 | 162 | 3,042 | 0.008 | 11 | 200 |
| Powerwave Allgon 777 | 153.00 | 210 | 3,943 | 0.010 | 14 | 260 |
| KMW AM-X-CD-16-65-00 | 153.00 | 33 | 620 | 0.002 | 2 | 41 |
| Powerwave Allgon P65 | 153.00 | 118 | 2,216 | 0.006 | 8 | 146 |
| Round Low Profile Pl | 153.00 | 1,500 | 28,167 | 0.071 | 100 | 1,855 |
| Ericsson RRUS 11 B12 | 138.00 | 152 | 2,334 | 0.006 | 8 | 188 |
| Ericsson RRUS 11 B4 | 138.00 | 152 | 2,334 | 0.006 | 8 | 188 |
| Ericsson RRUS 11 B2 | 138.00 | 152 | 2,334 | 0.006 | 8 | 188 |
| RFS APX16DWV-16DWVS- | 138.00 | 122 | 1,874 | 0.005 | 7 | 151 |
| Commscope LNX-6515DS | 138.00 | 131 | 2,012 | 0.005 | 7 | 162 |
| Round Platform w/ Ha | 138.00 | 2,000 | 30,691 | 0.077 | 109 | 2,473 |
| | | 47,068 | 397,130 | 1.000 | 1,412 | 58,208 |

**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 | 177.50 | 276 | 6,928 | 0.017 | 25 | 238 |
| 44 | 172.50 | 292 | 6,923 | 0.017 | 25 | 252 |
| 43 | 169.50 | 60 | 1,381 | 0.003 | 5 | 52 |
| 42 | 167.00 | 248 | 5,523 | 0.014 | 20 | 214 |
| 41 | 164.00 | 128 | 2,746 | 0.007 | 10 | 110 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 40 | 161.50 | 204 | 4,258 | 0.011 | 15 | 176 |
| 39 | 157.50 | 352 | 7,005 | 0.018 | 25 | 304 |
| 38 | 154.00 | 145 | 2,765 | 0.007 | 10 | 125 |
| 37 | 151.50 | 272 | 5,008 | 0.013 | 18 | 235 |
| 36 | 147.50 | 466 | 8,139 | 0.020 | 29 | 402 |
| 35 | 142.50 | 481 | 7,864 | 0.020 | 28 | 415 |
| 34 | 139.00 | 197 | 3,064 | 0.008 | 11 | 170 |
| 33 | 136.50 | 608 | 9,127 | 0.023 | 32 | 525 |
| 32 | 134.21 | 326 | 4,740 | 0.012 | 17 | 282 |
| 31 | 131.71 | 461 | 6,457 | 0.016 | 23 | 398 |
| 30 | 127.50 | 693 | 9,115 | 0.023 | 32 | 599 |
| 29 | 122.50 | 716 | 8,700 | 0.022 | 31 | 618 |
| 28 | 117.50 | 738 | 8,269 | 0.021 | 29 | 637 |
| 27 | 112.50 | 760 | 7,824 | 0.020 | 28 | 656 |
| 26 | 107.50 | 783 | 7,369 | 0.019 | 26 | 676 |
| 25 | 102.50 | 805 | 6,905 | 0.017 | 25 | 695 |
| 24 | 97.50 | 827 | 6,435 | 0.016 | 23 | 714 |
| 23 | 94.50 | 168 | 1,230 | 0.003 | 4 | 145 |
| 22 | 92.00 | 1,345 | 9,339 | 0.024 | 33 | 1,161 |
| 21 | 89.04 | 656 | 4,270 | 0.011 | 15 | 566 |
| 20 | 86.54 | 621 | 3,828 | 0.010 | 14 | 536 |
| 19 | 82.50 | 1,029 | 5,774 | 0.015 | 21 | 889 |
| 18 | 77.50 | 1,056 | 5,242 | 0.013 | 19 | 912 |
| 17 | 72.50 | 1,083 | 4,718 | 0.012 | 17 | 935 |
| 16 | 67.50 | 1,110 | 4,204 | 0.011 | 15 | 958 |
| 15 | 62.50 | 1,136 | 3,704 | 0.009 | 13 | 981 |
| 14 | 57.50 | 1,163 | 3,220 | 0.008 | 11 | 1,004 |
| 13 | 53.00 | 950 | 2,242 | 0.006 | 8 | 820 |
| 12 | 50.50 | 482 | 1,035 | 0.003 | 4 | 416 |
| 11 | 47.50 | 2,443 | 4,655 | 0.012 | 17 | 2,109 |
| 10 | 44.42 | 578 | 966 | 0.002 | 3 | 499 |
| 9 | 41.92 | 1,081 | 1,613 | 0.004 | 6 | 933 |
| 8 | 37.50 | 1,438 | 1,725 | 0.004 | 6 | 1,241 |
| 7 | 32.50 | 1,469 | 1,332 | 0.003 | 5 | 1,268 |
| 6 | 27.50 | 1,500 | 981 | 0.002 | 3 | 1,295 |
| 5 | 22.50 | 1,532 | 676 | 0.002 | 2 | 1,322 |
| 4 | 17.50 | 1,563 | 422 | 0.001 | 2 | 1,349 |
| 3 | 12.50 | 1,594 | 223 | 0.001 | 1 | 1,376 |
| 2 | 7.50 | 1,625 | 84 | 0.000 | 0 | 1,403 |
| 1 | 2.50 | 1,657 | 10 | 0.000 | 0 | 1,430 |
| Alcatel-Lucent RRH2x | 180.00 | 317 | 8,191 | 0.021 | 29 | 274 |
| Alcatel-Lucent 1900 | 180.00 | 180 | 4,645 | 0.012 | 17 | 155 |
| Alcatel-Lucent TD-RR | 180.00 | 210 | 5,419 | 0.014 | 19 | 181 |
| RFS APXVTM14-ALU-I20 | 180.00 | 169 | 4,351 | 0.011 | 15 | 146 |
| Round T-Arm | 180.00 | 750 | 19,354 | 0.049 | 69 | 647 |
| Commscope NNVV-65B-R | 180.00 | 232 | 5,992 | 0.015 | 21 | 200 |
| 6' Omni | 169.00 | 50 | 1,141 | 0.003 | 4 | 43 |
| Standoff Mounts | 169.00 | 300 | 6,843 | 0.017 | 24 | 259 |
| Samsung B2/B66A RRH- | 163.00 | 253 | 5,381 | 0.014 | 19 | 219 |
| Samsung B5/B13 RRH-B | 163.00 | 211 | 4,482 | 0.011 | 16 | 182 |
| RFS DB-B1-6C-12AB-0Z | 163.00 | 43 | 910 | 0.002 | 3 | 37 |
| Commscope JAHH-65B-R | 163.00 | 364 | 7,728 | 0.019 | 27 | 314 |
| Round Platform w/ Ha | 163.00 | 2,000 | 42,507 | 0.107 | 151 | 1,727 |
| LGP Allgon LGP21903 | 153.00 | 33 | 620 | 0.002 | 2 | 28 |
| Powerwave Allgon LGP | 153.00 | 85 | 1,589 | 0.004 | 6 | 73 |
| Raycap DC6-48-60-18- | 153.00 | 20 | 376 | 0.001 | 1 | 17 |
| Ericsson RRUS-11 800 | 153.00 | 162 | 3,042 | 0.008 | 11 | 140 |
| Powerwave Allgon 777 | 153.00 | 210 | 3,943 | 0.010 | 14 | 181 |
| KMW AM-X-CD-16-65-00 | 153.00 | 33 | 620 | 0.002 | 2 | 28 |
| Powerwave Allgon P65 | 153.00 | 118 | 2,216 | 0.006 | 8 | 102 |
| Round Low Profile Pl | 153.00 | 1,500 | 28,167 | 0.071 | 100 | 1,295 |
| Ericsson RRUS 11 B12 | 138.00 | 152 | 2,334 | 0.006 | 8 | 131 |
| Ericsson RRUS 11 B4 | 138.00 | 152 | 2,334 | 0.006 | 8 | 131 |
| Ericsson RRUS 11 B2 | 138.00 | 152 | 2,334 | 0.006 | 8 | 131 |

| | | | | | | |
|---|---|---|---|---|---|---|
| RFS APX16DWV-16DWVS- | 138.00 | 122 | 1,874 | 0.005 | 7 | 105 |
| Commscope LNX-6515DS | 138.00 | 131 | 2,012 | 0.005 | 7 | 113 |
| Round Platform w/ Ha | 138.00 | 2,000 | 30,691 | 0.077 | 109 | 1,727 |
| | | 47,068 | 397,130 | 1.000 | 1,412 | 40,634 |

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 | -56.16 | -1.41 | 0.00 | -201.45 | 0.00 | 201.45 | 5,229.17 | 2,614.59 | 13,734.9 | 6,783.18 | 0.00 | 0.00 | 0.040 |
| 5.00 | -54.15 | -1.42 | 0.00 | -194.38 | 0.00 | 194.38 | 5,190.65 | 2,595.33 | 13,352.1 | 6,594.14 | 0.00 | -0.01 | 0.040 |
| 10.00 | -52.18 | -1.42 | 0.00 | -187.29 | 0.00 | 187.29 | 5,149.25 | 2,574.63 | 12,966.3 | 6,403.58 | 0.01 | -0.01 | 0.039 |
| 15.00 | -50.24 | -1.43 | 0.00 | -180.17 | 0.00 | 180.17 | 5,104.97 | 2,552.49 | 12,577.8 | 6,211.74 | 0.03 | -0.02 | 0.039 |
| 20.00 | -48.35 | -1.43 | 0.00 | -173.03 | 0.00 | 173.03 | 5,057.81 | 2,528.91 | 12,187.2 | 6,018.84 | 0.05 | -0.03 | 0.038 |
| 25.00 | -46.49 | -1.43 | 0.00 | -165.88 | 0.00 | 165.88 | 5,007.77 | 2,503.89 | 11,795.0 | 5,825.12 | 0.08 | -0.03 | 0.038 |
| 30.00 | -44.68 | -1.43 | 0.00 | -158.73 | 0.00 | 158.73 | 4,954.85 | 2,477.43 | 11,401.5 | 5,630.81 | 0.12 | -0.04 | 0.037 |
| 35.00 | -42.90 | -1.43 | 0.00 | -151.58 | 0.00 | 151.58 | 4,899.05 | 2,449.53 | 11,007.4 | 5,436.14 | 0.16 | -0.05 | 0.037 |
| 40.00 | -41.56 | -1.43 | 0.00 | -144.43 | 0.00 | 144.43 | 4,840.37 | 2,420.19 | 10,612.9 | 5,241.34 | 0.22 | -0.05 | 0.036 |
| 43.83 | -40.85 | -1.42 | 0.00 | -138.97 | 0.00 | 138.97 | 4,793.44 | 2,396.72 | 10,310.6 | 5,092.05 | 0.26 | -0.06 | 0.036 |
| 45.00 | -37.82 | -1.41 | 0.00 | -137.30 | 0.00 | 137.30 | 4,778.81 | 2,389.41 | 10,218.7 | 5,046.65 | 0.28 | -0.06 | 0.035 |
| 50.00 | -37.23 | -1.41 | 0.00 | -130.26 | 0.00 | 130.26 | 4,714.38 | 2,357.19 | 9,825.18 | 4,852.29 | 0.34 | -0.07 | 0.035 |
| 51.00 | -36.05 | -1.40 | 0.00 | -128.86 | 0.00 | 128.86 | 3,748.95 | 1,874.48 | 7,908.80 | 3,905.86 | 0.36 | -0.07 | 0.043 |
| 55.00 | -34.62 | -1.39 | 0.00 | -123.26 | 0.00 | 123.26 | 3,716.58 | 1,858.29 | 7,679.21 | 3,792.47 | 0.42 | -0.08 | 0.042 |
| 60.00 | -33.21 | -1.38 | 0.00 | -116.30 | 0.00 | 116.30 | 3,673.53 | 1,836.77 | 7,390.96 | 3,650.12 | 0.51 | -0.09 | 0.041 |
| 65.00 | -31.84 | -1.37 | 0.00 | -109.39 | 0.00 | 109.39 | 3,627.60 | 1,813.80 | 7,101.75 | 3,507.29 | 0.60 | -0.09 | 0.040 |
| 70.00 | -30.50 | -1.36 | 0.00 | -102.55 | 0.00 | 102.55 | 3,578.79 | 1,789.39 | 6,812.03 | 3,364.21 | 0.70 | -0.10 | 0.039 |
| 75.00 | -29.19 | -1.34 | 0.00 | -95.77 | 0.00 | 95.77 | 3,527.09 | 1,763.55 | 6,522.29 | 3,221.11 | 0.82 | -0.11 | 0.038 |
| 80.00 | -27.92 | -1.32 | 0.00 | -89.08 | 0.00 | 89.08 | 3,472.52 | 1,736.26 | 6,232.99 | 3,078.24 | 0.94 | -0.12 | 0.037 |
| 85.00 | -27.15 | -1.31 | 0.00 | -82.48 | 0.00 | 82.48 | 3,415.07 | 1,707.53 | 5,944.59 | 2,935.81 | 1.07 | -0.13 | 0.036 |
| 88.08 | -26.34 | -1.29 | 0.00 | -78.44 | 0.00 | 78.44 | 3,378.20 | 1,689.10 | 5,767.41 | 2,848.31 | 1.16 | -0.14 | 0.035 |
| 90.00 | -24.68 | -1.26 | 0.00 | -75.96 | 0.00 | 75.96 | 3,354.74 | 1,677.37 | 5,657.58 | 2,794.06 | 1.22 | -0.14 | 0.035 |
| 94.00 | -24.47 | -1.26 | 0.00 | -70.92 | 0.00 | 70.92 | 2,549.41 | 1,274.70 | 4,268.23 | 2,107.92 | 1.34 | -0.15 | 0.043 |
| 95.00 | -23.44 | -1.23 | 0.00 | -69.67 | 0.00 | 69.67 | 2,541.91 | 1,270.95 | 4,228.10 | 2,088.10 | 1.37 | -0.15 | 0.043 |
| 100.00 | -22.45 | -1.21 | 0.00 | -63.50 | 0.00 | 63.50 | 2,502.69 | 1,251.34 | 4,027.08 | 1,988.82 | 1.53 | -0.16 | 0.041 |
| 105.00 | -21.48 | -1.19 | 0.00 | -57.44 | 0.00 | 57.44 | 2,460.58 | 1,230.29 | 3,825.85 | 1,889.44 | 1.71 | -0.17 | 0.039 |
| 110.00 | -20.54 | -1.16 | 0.00 | -51.51 | 0.00 | 51.51 | 2,415.60 | 1,207.80 | 3,624.86 | 1,790.18 | 1.90 | -0.19 | 0.037 |
| 115.00 | -19.63 | -1.13 | 0.00 | -45.72 | 0.00 | 45.72 | 2,367.74 | 1,183.87 | 3,424.59 | 1,691.27 | 2.10 | -0.20 | 0.035 |
| 120.00 | -18.74 | -1.10 | 0.00 | -40.06 | 0.00 | 40.06 | 2,317.00 | 1,158.50 | 3,225.50 | 1,592.95 | 2.31 | -0.21 | 0.033 |
| 125.00 | -17.88 | -1.07 | 0.00 | -34.56 | 0.00 | 34.56 | 2,263.38 | 1,131.69 | 3,028.06 | 1,495.45 | 2.54 | -0.22 | 0.031 |
| 130.00 | -17.31 | -1.05 | 0.00 | -29.22 | 0.00 | 29.22 | 2,206.88 | 1,103.44 | 2,832.75 | 1,398.99 | 2.77 | -0.23 | 0.029 |
| 133.42 | -16.91 | -1.03 | 0.00 | -25.65 | 0.00 | 25.65 | 2,166.61 | 1,083.30 | 2,700.75 | 1,333.80 | 2.94 | -0.24 | 0.027 |
| 135.00 | -16.16 | -0.99 | 0.00 | -24.02 | 0.00 | 24.02 | 2,147.49 | 1,073.75 | 2,640.03 | 1,303.81 | 3.02 | -0.24 | 0.026 |
| 138.00 | -12.57 | -0.82 | 0.00 | -21.04 | 0.00 | 21.04 | 1,272.33 | 636.17 | 1,555.73 | 768.31 | 3.17 | -0.24 | 0.037 |
| 140.00 | -11.97 | -0.79 | 0.00 | -19.40 | 0.00 | 19.40 | 1,262.76 | 631.38 | 1,516.62 | 749.00 | 3.27 | -0.25 | 0.035 |
| 145.00 | -11.39 | -0.76 | 0.00 | -15.43 | 0.00 | 15.43 | 1,236.82 | 618.41 | 1,418.37 | 700.48 | 3.54 | -0.26 | 0.031 |
| 150.00 | -11.06 | -0.75 | 0.00 | -11.62 | 0.00 | 11.62 | 1,208.00 | 604.00 | 1,319.78 | 651.79 | 3.81 | -0.27 | 0.027 |
| 153.00 | -8.21 | -0.58 | 0.00 | -9.38 | 0.00 | 9.38 | 1,189.33 | 594.66 | 1,260.67 | 622.60 | 3.99 | -0.27 | 0.022 |
| 155.00 | -7.77 | -0.55 | 0.00 | -8.22 | 0.00 | 8.22 | 1,176.30 | 588.15 | 1,221.34 | 603.17 | 4.10 | -0.28 | 0.020 |
| 160.00 | -7.52 | -0.54 | 0.00 | -5.46 | 0.00 | 5.46 | 1,141.72 | 570.86 | 1,123.49 | 554.85 | 4.40 | -0.28 | 0.016 |
| 163.00 | -3.81 | -0.29 | 0.00 | -3.85 | 0.00 | 3.85 | 1,119.59 | 559.80 | 1,065.27 | 526.10 | 4.58 | -0.29 | 0.011 |
| 165.00 | -3.51 | -0.27 | 0.00 | -3.27 | 0.00 | 3.27 | 1,104.26 | 552.13 | 1,026.73 | 507.06 | 4.70 | -0.29 | 0.010 |
| 169.00 | -3.00 | -0.23 | 0.00 | -2.19 | 0.00 | 2.19 | 1,072.22 | 536.11 | 950.40 | 469.37 | 4.94 | -0.29 | 0.007 |
| 170.00 | -2.64 | -0.21 | 0.00 | -1.95 | 0.00 | 1.95 | 1,063.92 | 531.96 | 931.50 | 460.03 | 5.00 | -0.29 | 0.007 |
| 175.00 | -2.30 | -0.18 | 0.00 | -0.91 | 0.00 | 0.91 | 1,020.70 | 510.35 | 838.29 | 414.00 | 5.31 | -0.30 | 0.004 |
| 180.00 | 0.00 | -0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 968.36 | 484.18 | 742.77 | 366.83 | 5.62 | -0.30 | 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 | -39.20 | -1.41 | 0.00 | -198.91 | 0.00 | 198.91 | 5,229.17 | 2,614.59 | 13,734.9 | 6,783.18 | 0.00 | 0.00 | 0.037 |
| 5.00 | -37.80 | -1.42 | 0.00 | -191.84 | 0.00 | 191.84 | 5,190.65 | 2,595.33 | 13,352.1 | 6,594.14 | 0.00 | -0.01 | 0.036 |
| 10.00 | -36.42 | -1.42 | 0.00 | -184.76 | 0.00 | 184.76 | 5,149.25 | 2,574.63 | 12,966.3 | 6,403.58 | 0.01 | -0.01 | 0.036 |
| 15.00 | -35.07 | -1.42 | 0.00 | -177.66 | 0.00 | 177.66 | 5,104.97 | 2,552.49 | 12,577.8 | 6,211.74 | 0.03 | -0.02 | 0.035 |
| 20.00 | -33.75 | -1.42 | 0.00 | -170.56 | 0.00 | 170.56 | 5,057.81 | 2,528.91 | 12,187.2 | 6,018.84 | 0.05 | -0.03 | 0.035 |
| 25.00 | -32.46 | -1.42 | 0.00 | -163.44 | 0.00 | 163.44 | 5,007.77 | 2,503.89 | 11,795.0 | 5,825.12 | 0.08 | -0.03 | 0.035 |
| 30.00 | -31.19 | -1.42 | 0.00 | -156.33 | 0.00 | 156.33 | 4,954.85 | 2,477.43 | 11,401.5 | 5,630.81 | 0.12 | -0.04 | 0.034 |
| 35.00 | -29.95 | -1.42 | 0.00 | -149.23 | 0.00 | 149.23 | 4,899.05 | 2,449.53 | 11,007.4 | 5,436.14 | 0.16 | -0.05 | 0.034 |
| 40.00 | -29.01 | -1.41 | 0.00 | -142.15 | 0.00 | 142.15 | 4,840.37 | 2,420.19 | 10,612.9 | 5,241.34 | 0.21 | -0.05 | 0.033 |
| 43.83 | -28.51 | -1.41 | 0.00 | -136.73 | 0.00 | 136.73 | 4,793.44 | 2,396.72 | 10,310.6 | 5,092.05 | 0.26 | -0.06 | 0.033 |
| 45.00 | -26.40 | -1.40 | 0.00 | -135.08 | 0.00 | 135.08 | 4,778.81 | 2,389.41 | 10,218.7 | 5,046.65 | 0.27 | -0.06 | 0.032 |
| 50.00 | -25.99 | -1.39 | 0.00 | -128.11 | 0.00 | 128.11 | 4,714.38 | 2,357.19 | 9,825.18 | 4,852.29 | 0.34 | -0.07 | 0.032 |
| 51.00 | -25.17 | -1.39 | 0.00 | -126.71 | 0.00 | 126.71 | 3,748.95 | 1,874.48 | 7,908.80 | 3,905.86 | 0.35 | -0.07 | 0.039 |
| 55.00 | -24.16 | -1.38 | 0.00 | -121.17 | 0.00 | 121.17 | 3,716.58 | 1,858.29 | 7,679.21 | 3,792.47 | 0.41 | -0.08 | 0.038 |
| 60.00 | -23.18 | -1.37 | 0.00 | -114.29 | 0.00 | 114.29 | 3,673.53 | 1,836.77 | 7,390.96 | 3,650.12 | 0.50 | -0.08 | 0.038 |
| 65.00 | -22.22 | -1.35 | 0.00 | -107.46 | 0.00 | 107.46 | 3,627.60 | 1,813.80 | 7,101.75 | 3,507.29 | 0.59 | -0.09 | 0.037 |
| 70.00 | -21.29 | -1.34 | 0.00 | -100.70 | 0.00 | 100.70 | 3,578.79 | 1,789.39 | 6,812.03 | 3,364.21 | 0.69 | -0.10 | 0.036 |
| 75.00 | -20.38 | -1.32 | 0.00 | -94.02 | 0.00 | 94.02 | 3,527.09 | 1,763.55 | 6,522.29 | 3,221.11 | 0.80 | -0.11 | 0.035 |
| 80.00 | -19.49 | -1.30 | 0.00 | -87.42 | 0.00 | 87.42 | 3,472.52 | 1,736.26 | 6,232.99 | 3,078.24 | 0.93 | -0.12 | 0.034 |
| 85.00 | -18.95 | -1.29 | 0.00 | -80.91 | 0.00 | 80.91 | 3,415.07 | 1,707.53 | 5,944.59 | 2,935.81 | 1.06 | -0.13 | 0.033 |
| 88.08 | -18.39 | -1.27 | 0.00 | -76.94 | 0.00 | 76.94 | 3,378.20 | 1,689.10 | 5,767.41 | 2,848.31 | 1.14 | -0.14 | 0.032 |
| 90.00 | -17.22 | -1.24 | 0.00 | -74.50 | 0.00 | 74.50 | 3,354.74 | 1,677.37 | 5,657.58 | 2,794.06 | 1.20 | -0.14 | 0.032 |
| 94.00 | -17.08 | -1.24 | 0.00 | -69.54 | 0.00 | 69.54 | 2,549.41 | 1,274.70 | 4,268.23 | 2,107.92 | 1.32 | -0.15 | 0.040 |
| 95.00 | -16.36 | -1.21 | 0.00 | -68.30 | 0.00 | 68.30 | 2,541.91 | 1,270.95 | 4,228.10 | 2,088.10 | 1.35 | -0.15 | 0.039 |
| 100.00 | -15.67 | -1.19 | 0.00 | -62.23 | 0.00 | 62.23 | 2,502.69 | 1,251.34 | 4,027.08 | 1,988.82 | 1.51 | -0.16 | 0.038 |
| 105.00 | -14.99 | -1.17 | 0.00 | -56.28 | 0.00 | 56.28 | 2,460.58 | 1,230.29 | 3,825.85 | 1,889.44 | 1.68 | -0.17 | 0.036 |
| 110.00 | -14.34 | -1.14 | 0.00 | -50.46 | 0.00 | 50.46 | 2,415.60 | 1,207.80 | 3,624.86 | 1,790.18 | 1.87 | -0.18 | 0.034 |
| 115.00 | -13.70 | -1.11 | 0.00 | -44.77 | 0.00 | 44.77 | 2,367.74 | 1,183.87 | 3,424.59 | 1,691.27 | 2.07 | -0.19 | 0.032 |
| 120.00 | -13.08 | -1.08 | 0.00 | -39.22 | 0.00 | 39.22 | 2,317.00 | 1,158.50 | 3,225.50 | 1,592.95 | 2.28 | -0.20 | 0.030 |
| 125.00 | -12.48 | -1.05 | 0.00 | -33.83 | 0.00 | 33.83 | 2,263.38 | 1,131.69 | 3,028.06 | 1,495.45 | 2.49 | -0.21 | 0.028 |
| 130.00 | -12.09 | -1.02 | 0.00 | -28.60 | 0.00 | 28.60 | 2,206.88 | 1,103.44 | 2,832.75 | 1,398.99 | 2.73 | -0.22 | 0.026 |
| 133.42 | -11.80 | -1.01 | 0.00 | -25.10 | 0.00 | 25.10 | 2,166.61 | 1,083.30 | 2,700.75 | 1,333.80 | 2.89 | -0.23 | 0.024 |
| 135.00 | -11.28 | -0.97 | 0.00 | -23.51 | 0.00 | 23.51 | 2,147.49 | 1,073.75 | 2,640.03 | 1,303.81 | 2.97 | -0.23 | 0.023 |
| 138.00 | -8.77 | -0.80 | 0.00 | -20.59 | 0.00 | 20.59 | 1,272.33 | 636.17 | 1,555.73 | 768.31 | 3.12 | -0.24 | 0.034 |
| 140.00 | -8.36 | -0.78 | 0.00 | -18.98 | 0.00 | 18.98 | 1,262.76 | 631.38 | 1,516.62 | 749.00 | 3.22 | -0.24 | 0.032 |
| 145.00 | -7.95 | -0.75 | 0.00 | -15.10 | 0.00 | 15.10 | 1,236.82 | 618.41 | 1,418.37 | 700.48 | 3.48 | -0.25 | 0.028 |
| 150.00 | -7.72 | -0.73 | 0.00 | -11.37 | 0.00 | 11.37 | 1,208.00 | 604.00 | 1,319.78 | 651.79 | 3.75 | -0.26 | 0.024 |
| 153.00 | -5.73 | -0.57 | 0.00 | -9.18 | 0.00 | 9.18 | 1,189.33 | 594.66 | 1,260.67 | 622.60 | 3.92 | -0.27 | 0.020 |
| 155.00 | -5.42 | -0.54 | 0.00 | -8.05 | 0.00 | 8.05 | 1,176.30 | 588.15 | 1,221.34 | 603.17 | 4.03 | -0.27 | 0.018 |
| 160.00 | -5.25 | -0.52 | 0.00 | -5.35 | 0.00 | 5.35 | 1,141.72 | 570.86 | 1,123.49 | 554.85 | 4.32 | -0.28 | 0.014 |
| 163.00 | -2.66 | -0.29 | 0.00 | -3.77 | 0.00 | 3.77 | 1,119.59 | 559.80 | 1,065.27 | 526.10 | 4.50 | -0.28 | 0.010 |
| 165.00 | -2.45 | -0.26 | 0.00 | -3.20 | 0.00 | 3.20 | 1,104.26 | 552.13 | 1,026.73 | 507.06 | 4.62 | -0.28 | 0.009 |
| 169.00 | -2.09 | -0.23 | 0.00 | -2.14 | 0.00 | 2.14 | 1,072.22 | 536.11 | 950.40 | 469.37 | 4.86 | -0.29 | 0.007 |
| 170.00 | -1.84 | -0.20 | 0.00 | -1.91 | 0.00 | 1.91 | 1,063.92 | 531.96 | 931.50 | 460.03 | 4.92 | -0.29 | 0.006 |
| 175.00 | -1.60 | -0.18 | 0.00 | -0.89 | 0.00 | 0.89 | 1,020.70 | 510.35 | 838.29 | 414.00 | 5.22 | -0.29 | 0.004 |
| 180.00 | 0.00 | -0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 968.36 | 484.18 | 742.77 | 366.83 | 5.52 | -0.29 | 0.000 |

## Equivalent Modal Forces Analysis

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

| | |
|---|---|
| Spectral Response Acceleration for Short Period ($S_s$): | 0.17 |
| 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 ($S_{ds}$): | 0.18 |
| Desing Spectral Response Acceleration at 1.0 Second Period ($S_{d1}$): | 0.10 |
| Period Based on Rayleigh Method (sec): | 2.41 |
| Redundancy Factor (p): | 1.00 |

**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 | 177.50 | 276 | 1.838 | 1.716 | 1.044 | 0.317 | 58 | 341 |
| 44 | 172.50 | 292 | 1.736 | 1.263 | 0.871 | 0.258 | 50 | 361 |
| 43 | 169.50 | 60 | 1.676 | 1.033 | 0.778 | 0.225 | 9 | 74 |
| 42 | 167.00 | 248 | 1.627 | 0.864 | 0.707 | 0.199 | 33 | 306 |
| 41 | 164.00 | 128 | 1.569 | 0.685 | 0.629 | 0.170 | 14 | 158 |
| 40 | 161.50 | 204 | 1.521 | 0.555 | 0.569 | 0.147 | 20 | 252 |
| 39 | 157.50 | 352 | 1.447 | 0.379 | 0.482 | 0.113 | 27 | 436 |
| 38 | 154.00 | 145 | 1.383 | 0.253 | 0.415 | 0.086 | 8 | 180 |
| 37 | 151.50 | 272 | 1.339 | 0.178 | 0.372 | 0.069 | 12 | 336 |
| 36 | 147.50 | 466 | 1.269 | 0.080 | 0.309 | 0.043 | 13 | 576 |
| 35 | 142.50 | 481 | 1.185 | -0.009 | 0.243 | 0.016 | 5 | 595 |
| 34 | 139.00 | 197 | 1.127 | -0.053 | 0.204 | 0.001 | 0 | 243 |
| 33 | 136.50 | 608 | 1.087 | -0.077 | 0.179 | -0.009 | -4 | 751 |
| 32 | 134.21 | 326 | 1.051 | -0.094 | 0.158 | -0.017 | -4 | 403 |
| 31 | 131.71 | 461 | 1.012 | -0.107 | 0.137 | -0.024 | -8 | 570 |
| 30 | 127.50 | 693 | 0.948 | -0.119 | 0.107 | -0.034 | -16 | 858 |
| 29 | 122.50 | 716 | 0.875 | -0.121 | 0.078 | -0.040 | -19 | 885 |
| 28 | 117.50 | 738 | 0.805 | -0.113 | 0.055 | -0.042 | -21 | 913 |
| 27 | 112.50 | 760 | 0.738 | -0.098 | 0.038 | -0.039 | -20 | 940 |
| 26 | 107.50 | 783 | 0.674 | -0.079 | 0.025 | -0.031 | -16 | 968 |
| 25 | 102.50 | 805 | 0.613 | -0.058 | 0.016 | -0.020 | -11 | 996 |
| 24 | 97.50 | 827 | 0.555 | -0.036 | 0.010 | -0.007 | -4 | 1,023 |
| 23 | 94.50 | 168 | 0.521 | -0.024 | 0.008 | 0.001 | 0 | 208 |
| 22 | 92.00 | 1,345 | 0.494 | -0.014 | 0.007 | 0.008 | 7 | 1,664 |
| 21 | 89.04 | 656 | 0.462 | -0.003 | 0.006 | 0.016 | 7 | 811 |
| 20 | 86.54 | 621 | 0.437 | 0.006 | 0.006 | 0.021 | 9 | 768 |
| 19 | 82.50 | 1,029 | 0.397 | 0.019 | 0.007 | 0.030 | 21 | 1,273 |
| 18 | 77.50 | 1,056 | 0.350 | 0.033 | 0.009 | 0.038 | 27 | 1,306 |
| 17 | 72.50 | 1,083 | 0.307 | 0.044 | 0.012 | 0.044 | 32 | 1,339 |
| 16 | 67.50 | 1,110 | 0.266 | 0.052 | 0.015 | 0.047 | 35 | 1,372 |
| 15 | 62.50 | 1,136 | 0.228 | 0.059 | 0.020 | 0.049 | 37 | 1,405 |
| 14 | 57.50 | 1,163 | 0.193 | 0.064 | 0.024 | 0.050 | 39 | 1,439 |
| 13 | 53.00 | 950 | 0.164 | 0.067 | 0.028 | 0.049 | 31 | 1,175 |
| 12 | 50.50 | 482 | 0.149 | 0.068 | 0.030 | 0.049 | 16 | 596 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 11 | 47.50 | 2,443 | 0.132 | 0.069 | 0.033 | 0.049 | 79 | 3,022 |
| 10 | 44.42 | 578 | 0.115 | 0.070 | 0.035 | 0.048 | 19 | 715 |
| 9 | 41.92 | 1,081 | 0.102 | 0.071 | 0.037 | 0.048 | 34 | 1,337 |
| 8 | 37.50 | 1,438 | 0.082 | 0.072 | 0.039 | 0.047 | 45 | 1,778 |
| 7 | 32.50 | 1,469 | 0.062 | 0.072 | 0.041 | 0.046 | 45 | 1,817 |
| 6 | 27.50 | 1,500 | 0.044 | 0.071 | 0.042 | 0.044 | 44 | 1,856 |
| 5 | 22.50 | 1,532 | 0.030 | 0.068 | 0.040 | 0.043 | 44 | 1,894 |
| 4 | 17.50 | 1,563 | 0.018 | 0.063 | 0.037 | 0.040 | 42 | 1,933 |
| 3 | 12.50 | 1,594 | 0.009 | 0.054 | 0.031 | 0.035 | 37 | 1,971 |
| 2 | 7.50 | 1,625 | 0.003 | 0.039 | 0.022 | 0.027 | 29 | 2,010 |
| 1 | 2.50 | 1,657 | 0.000 | 0.015 | 0.008 | 0.012 | 13 | 2,049 |
| Alcatel-Lucent RRH2x | 180.00 | 317 | 1.890 | 1.980 | 1.140 | 0.349 | 74 | 393 |
| Alcatel-Lucent 1900 | 180.00 | 180 | 1.890 | 1.980 | 1.140 | 0.349 | 42 | 223 |
| Alcatel-Lucent TD-RR | 180.00 | 210 | 1.890 | 1.980 | 1.140 | 0.349 | 49 | 260 |
| RFS APXVTM14-ALU-I20 | 180.00 | 169 | 1.890 | 1.980 | 1.140 | 0.349 | 39 | 209 |
| Round T-Arm | 180.00 | 750 | 1.890 | 1.980 | 1.140 | 0.349 | 174 | 928 |
| Commscope NNVV- | 180.00 | 232 | 1.890 | 1.980 | 1.140 | 0.349 | 54 | 287 |
| 6' Omni | 169.00 | 50 | 1.666 | 0.998 | 0.764 | 0.220 | 7 | 62 |
| Standoff Mounts | 169.00 | 300 | 1.666 | 0.998 | 0.764 | 0.220 | 44 | 371 |
| Samsung B2/B66A RRH- | 163.00 | 253 | 1.550 | 0.631 | 0.604 | 0.161 | 27 | 313 |
| Samsung B5/B13 RRH-B | 163.00 | 211 | 1.550 | 0.631 | 0.604 | 0.161 | 23 | 261 |
| RFS DB-B1-6C-12AB-0Z | 163.00 | 43 | 1.550 | 0.631 | 0.604 | 0.161 | 5 | 53 |
| Commscope JAHH-65B- | 163.00 | 364 | 1.550 | 0.631 | 0.604 | 0.161 | 39 | 450 |
| Round Platform w/ Ha | 163.00 | 2,000 | 1.550 | 0.631 | 0.604 | 0.161 | 214 | 2,473 |
| LGP Allgon LGP21903 | 153.00 | 33 | 1.366 | 0.222 | 0.397 | 0.079 | 2 | 41 |
| Powerwave Allgon LGP | 153.00 | 85 | 1.366 | 0.222 | 0.397 | 0.079 | 4 | 105 |
| Raycap DC6-48-60-18- | 153.00 | 20 | 1.366 | 0.222 | 0.397 | 0.079 | 1 | 25 |
| Ericsson RRUS-11 800 | 153.00 | 162 | 1.366 | 0.222 | 0.397 | 0.079 | 9 | 200 |
| Powerwave Allgon 777 | 153.00 | 210 | 1.366 | 0.222 | 0.397 | 0.079 | 11 | 260 |
| KMW AM-X-CD-16-65-00 | 153.00 | 33 | 1.366 | 0.222 | 0.397 | 0.079 | 2 | 41 |
| Powerwave Allgon P65 | 153.00 | 118 | 1.366 | 0.222 | 0.397 | 0.079 | 6 | 146 |
| Round Low Profile Pl | 153.00 | 1,500 | 1.366 | 0.222 | 0.397 | 0.079 | 79 | 1,855 |
| Ericsson RRUS 11 B12 | 138.00 | 152 | 1.111 | -0.064 | 0.194 | -0.004 | 0 | 188 |
| Ericsson RRUS 11 B4 | 138.00 | 152 | 1.111 | -0.064 | 0.194 | -0.004 | 0 | 188 |
| Ericsson RRUS 11 B2 | 138.00 | 152 | 1.111 | -0.064 | 0.194 | -0.004 | 0 | 188 |
| RFS APX16DWV- | 138.00 | 122 | 1.111 | -0.064 | 0.194 | -0.004 | 0 | 151 |
| Commscope LNX- | 138.00 | 131 | 1.111 | -0.064 | 0.194 | -0.004 | 0 | 162 |
| Round Platform w/ Ha | 138.00 | 2,000 | 1.111 | -0.064 | 0.194 | -0.004 | -5 | 2,473 |
| | | 47,068 | 70.650 | 25.502 | 23.690 | 6.166 | 1,718 | 58,208 |

**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 | 177.50 | 276 | 1.838 | 1.716 | 1.044 | 0.317 | 58 | 238 |
| 44 | 172.50 | 292 | 1.736 | 1.263 | 0.871 | 0.258 | 50 | 252 |
| 43 | 169.50 | 60 | 1.676 | 1.033 | 0.778 | 0.225 | 9 | 52 |
| 42 | 167.00 | 248 | 1.627 | 0.864 | 0.707 | 0.199 | 33 | 214 |
| 41 | 164.00 | 128 | 1.569 | 0.685 | 0.629 | 0.170 | 14 | 110 |
| 40 | 161.50 | 204 | 1.521 | 0.555 | 0.569 | 0.147 | 20 | 176 |
| 39 | 157.50 | 352 | 1.447 | 0.379 | 0.482 | 0.113 | 27 | 304 |
| 38 | 154.00 | 145 | 1.383 | 0.253 | 0.415 | 0.086 | 8 | 125 |
| 37 | 151.50 | 272 | 1.339 | 0.178 | 0.372 | 0.069 | 12 | 235 |
| 36 | 147.50 | 466 | 1.269 | 0.080 | 0.309 | 0.043 | 13 | 402 |
| 35 | 142.50 | 481 | 1.185 | -0.009 | 0.243 | 0.016 | 5 | 415 |
| 34 | 139.00 | 197 | 1.127 | -0.053 | 0.204 | 0.001 | 0 | 170 |
| 33 | 136.50 | 608 | 1.087 | -0.077 | 0.179 | -0.009 | -4 | 525 |
| 32 | 134.21 | 326 | 1.051 | -0.094 | 0.158 | -0.017 | -4 | 282 |
| 31 | 131.71 | 461 | 1.012 | -0.107 | 0.137 | -0.024 | -8 | 398 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 30 | 127.50 | 693 | 0.948 | -0.119 | 0.107 | -0.034 | -16 | 599 |
| 29 | 122.50 | 716 | 0.875 | -0.121 | 0.078 | -0.040 | -19 | 618 |
| 28 | 117.50 | 738 | 0.805 | -0.113 | 0.055 | -0.042 | -21 | 637 |
| 27 | 112.50 | 760 | 0.738 | -0.098 | 0.038 | -0.039 | -20 | 656 |
| 26 | 107.50 | 783 | 0.674 | -0.079 | 0.025 | -0.031 | -16 | 676 |
| 25 | 102.50 | 805 | 0.613 | -0.058 | 0.016 | -0.020 | -11 | 695 |
| 24 | 97.50 | 827 | 0.555 | -0.036 | 0.010 | -0.007 | -4 | 714 |
| 23 | 94.50 | 168 | 0.521 | -0.024 | 0.008 | 0.001 | 0 | 145 |
| 22 | 92.00 | 1,345 | 0.494 | -0.014 | 0.007 | 0.008 | 7 | 1,161 |
| 21 | 89.04 | 656 | 0.462 | -0.003 | 0.006 | 0.016 | 7 | 566 |
| 20 | 86.54 | 621 | 0.437 | 0.006 | 0.006 | 0.021 | 9 | 536 |
| 19 | 82.50 | 1,029 | 0.397 | 0.019 | 0.007 | 0.030 | 21 | 889 |
| 18 | 77.50 | 1,056 | 0.350 | 0.033 | 0.009 | 0.038 | 27 | 912 |
| 17 | 72.50 | 1,083 | 0.307 | 0.044 | 0.012 | 0.044 | 32 | 935 |
| 16 | 67.50 | 1,110 | 0.266 | 0.052 | 0.015 | 0.047 | 35 | 958 |
| 15 | 62.50 | 1,136 | 0.228 | 0.059 | 0.020 | 0.049 | 37 | 981 |
| 14 | 57.50 | 1,163 | 0.193 | 0.064 | 0.024 | 0.050 | 39 | 1,004 |
| 13 | 53.00 | 950 | 0.164 | 0.067 | 0.028 | 0.049 | 31 | 820 |
| 12 | 50.50 | 482 | 0.149 | 0.068 | 0.030 | 0.049 | 16 | 416 |
| 11 | 47.50 | 2,443 | 0.132 | 0.069 | 0.033 | 0.049 | 79 | 2,109 |
| 10 | 44.42 | 578 | 0.115 | 0.070 | 0.035 | 0.048 | 19 | 499 |
| 9 | 41.92 | 1,081 | 0.102 | 0.071 | 0.037 | 0.048 | 34 | 933 |
| 8 | 37.50 | 1,438 | 0.082 | 0.072 | 0.039 | 0.047 | 45 | 1,241 |
| 7 | 32.50 | 1,469 | 0.062 | 0.072 | 0.041 | 0.046 | 45 | 1,268 |
| 6 | 27.50 | 1,500 | 0.044 | 0.071 | 0.042 | 0.044 | 44 | 1,295 |
| 5 | 22.50 | 1,532 | 0.030 | 0.068 | 0.040 | 0.043 | 44 | 1,322 |
| 4 | 17.50 | 1,563 | 0.018 | 0.063 | 0.037 | 0.040 | 42 | 1,349 |
| 3 | 12.50 | 1,594 | 0.009 | 0.054 | 0.031 | 0.035 | 37 | 1,376 |
| 2 | 7.50 | 1,625 | 0.003 | 0.039 | 0.022 | 0.027 | 29 | 1,403 |
| 1 | 2.50 | 1,657 | 0.000 | 0.015 | 0.008 | 0.012 | 13 | 1,430 |
| Alcatel-Lucent RRH2x | 180.00 | 317 | 1.890 | 1.980 | 1.140 | 0.349 | 74 | 274 |
| Alcatel-Lucent 1900 | 180.00 | 180 | 1.890 | 1.980 | 1.140 | 0.349 | 42 | 155 |
| Alcatel-Lucent TD-RR | 180.00 | 210 | 1.890 | 1.980 | 1.140 | 0.349 | 49 | 181 |
| RFS APXVTM14-ALU-I20 | 180.00 | 169 | 1.890 | 1.980 | 1.140 | 0.349 | 39 | 146 |
| Round T-Arm | 180.00 | 750 | 1.890 | 1.980 | 1.140 | 0.349 | 174 | 647 |
| Commscope NNVV- | 180.00 | 232 | 1.890 | 1.980 | 1.140 | 0.349 | 54 | 200 |
| 6' Omni | 169.00 | 50 | 1.666 | 0.998 | 0.764 | 0.220 | 7 | 43 |
| Standoff Mounts | 169.00 | 300 | 1.666 | 0.998 | 0.764 | 0.220 | 44 | 259 |
| Samsung B2/B66A RRH- | 163.00 | 253 | 1.550 | 0.631 | 0.604 | 0.161 | 27 | 219 |
| Samsung B5/B13 RRH-B | 163.00 | 211 | 1.550 | 0.631 | 0.604 | 0.161 | 23 | 182 |
| RFS DB-B1-6C-12AB-0Z | 163.00 | 43 | 1.550 | 0.631 | 0.604 | 0.161 | 5 | 37 |
| Commscope JAHH-65B- | 163.00 | 364 | 1.550 | 0.631 | 0.604 | 0.161 | 39 | 314 |
| Round Platform w/ Ha | 163.00 | 2,000 | 1.550 | 0.631 | 0.604 | 0.161 | 214 | 1,727 |
| LGP Allgon LGP21903 | 153.00 | 33 | 1.366 | 0.222 | 0.397 | 0.079 | 2 | 28 |
| Powerwave Allgon LGP | 153.00 | 85 | 1.366 | 0.222 | 0.397 | 0.079 | 4 | 73 |
| Raycap DC6-48-60-18- | 153.00 | 20 | 1.366 | 0.222 | 0.397 | 0.079 | 1 | 17 |
| Ericsson RRUS-11 800 | 153.00 | 162 | 1.366 | 0.222 | 0.397 | 0.079 | 9 | 140 |
| Powerwave Allgon 777 | 153.00 | 210 | 1.366 | 0.222 | 0.397 | 0.079 | 11 | 181 |
| KMW AM-X-CD-16-65-00 | 153.00 | 33 | 1.366 | 0.222 | 0.397 | 0.079 | 2 | 28 |
| Powerwave Allgon P65 | 153.00 | 118 | 1.366 | 0.222 | 0.397 | 0.079 | 6 | 102 |
| Round Low Profile Pl | 153.00 | 1,500 | 1.366 | 0.222 | 0.397 | 0.079 | 79 | 1,295 |
| Ericsson RRUS 11 B12 | 138.00 | 152 | 1.111 | -0.064 | 0.194 | -0.004 | 0 | 131 |
| Ericsson RRUS 11 B4 | 138.00 | 152 | 1.111 | -0.064 | 0.194 | -0.004 | 0 | 131 |
| Ericsson RRUS 11 B2 | 138.00 | 152 | 1.111 | -0.064 | 0.194 | -0.004 | 0 | 131 |
| RFS APX16DWV- | 138.00 | 122 | 1.111 | -0.064 | 0.194 | -0.004 | 0 | 105 |
| Commscope LNX- | 138.00 | 131 | 1.111 | -0.064 | 0.194 | -0.004 | 0 | 113 |
| Round Platform w/ Ha | 138.00 | 2,000 | 1.111 | -0.064 | 0.194 | -0.004 | -5 | 1,727 |
| | | 47,068 | 70.650 | 25.502 | 23.690 | 6.166 | 1,718 | 40,634 |

**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 | -56.16 | -1.71 | 0.00 | -218.36 | 0.00 | 218.36 | 5,229.17 | 2,614.59 | 13,734.9 | 6,783.18 | 0.00 | 0.00 | 0.043 |
| 5.00 | -54.15 | -1.69 | 0.00 | -209.82 | 0.00 | 209.82 | 5,190.65 | 2,595.33 | 13,352.1 | 6,594.14 | 0.00 | -0.01 | 0.042 |
| 10.00 | -52.18 | -1.65 | 0.00 | -201.40 | 0.00 | 201.40 | 5,149.25 | 2,574.63 | 12,966.3 | 6,403.58 | 0.01 | -0.01 | 0.042 |
| 15.00 | -50.24 | -1.62 | 0.00 | -193.13 | 0.00 | 193.13 | 5,104.97 | 2,552.49 | 12,577.8 | 6,211.74 | 0.03 | -0.02 | 0.041 |
| 20.00 | -48.35 | -1.58 | 0.00 | -185.04 | 0.00 | 185.04 | 5,057.81 | 2,528.91 | 12,187.2 | 6,018.84 | 0.06 | -0.03 | 0.040 |
| 25.00 | -46.49 | -1.54 | 0.00 | -177.14 | 0.00 | 177.14 | 5,007.77 | 2,503.89 | 11,795.0 | 5,825.12 | 0.09 | -0.03 | 0.040 |
| 30.00 | -44.68 | -1.50 | 0.00 | -169.44 | 0.00 | 169.44 | 4,954.85 | 2,477.43 | 11,401.5 | 5,630.81 | 0.13 | -0.04 | 0.039 |
| 35.00 | -42.90 | -1.46 | 0.00 | -161.95 | 0.00 | 161.95 | 4,899.05 | 2,449.53 | 11,007.4 | 5,436.14 | 0.18 | -0.05 | 0.039 |
| 40.00 | -41.56 | -1.43 | 0.00 | -154.65 | 0.00 | 154.65 | 4,840.37 | 2,420.19 | 10,612.9 | 5,241.34 | 0.23 | -0.06 | 0.038 |
| 43.83 | -40.85 | -1.41 | 0.00 | -149.17 | 0.00 | 149.17 | 4,793.44 | 2,396.72 | 10,310.6 | 5,092.05 | 0.28 | -0.06 | 0.038 |
| 45.00 | -37.82 | -1.33 | 0.00 | -147.53 | 0.00 | 147.53 | 4,778.81 | 2,389.41 | 10,218.7 | 5,046.65 | 0.30 | -0.07 | 0.037 |
| 50.00 | -37.23 | -1.32 | 0.00 | -140.86 | 0.00 | 140.86 | 4,714.38 | 2,357.19 | 9,825.18 | 4,852.29 | 0.37 | -0.07 | 0.037 |
| 51.00 | -36.05 | -1.29 | 0.00 | -139.54 | 0.00 | 139.54 | 3,748.95 | 1,874.48 | 7,908.80 | 3,905.86 | 0.39 | -0.08 | 0.045 |
| 55.00 | -34.62 | -1.25 | 0.00 | -134.38 | 0.00 | 134.38 | 3,716.58 | 1,858.29 | 7,679.21 | 3,792.47 | 0.45 | -0.08 | 0.045 |
| 60.00 | -33.21 | -1.22 | 0.00 | -128.11 | 0.00 | 128.11 | 3,673.53 | 1,836.77 | 7,390.96 | 3,650.12 | 0.54 | -0.09 | 0.044 |
| 65.00 | -31.84 | -1.19 | 0.00 | -122.01 | 0.00 | 122.01 | 3,627.60 | 1,813.80 | 7,101.75 | 3,507.29 | 0.64 | -0.10 | 0.044 |
| 70.00 | -30.50 | -1.16 | 0.00 | -116.07 | 0.00 | 116.07 | 3,578.79 | 1,789.39 | 6,812.03 | 3,364.21 | 0.76 | -0.11 | 0.043 |
| 75.00 | -29.19 | -1.14 | 0.00 | -110.27 | 0.00 | 110.27 | 3,527.09 | 1,763.55 | 6,522.29 | 3,221.11 | 0.88 | -0.12 | 0.043 |
| 80.00 | -27.92 | -1.12 | 0.00 | -104.59 | 0.00 | 104.59 | 3,472.52 | 1,736.26 | 6,232.99 | 3,078.24 | 1.01 | -0.13 | 0.042 |
| 85.00 | -27.15 | -1.11 | 0.00 | -99.00 | 0.00 | 99.00 | 3,415.07 | 1,707.53 | 5,944.59 | 2,935.81 | 1.16 | -0.15 | 0.042 |
| 88.08 | -26.34 | -1.11 | 0.00 | -95.57 | 0.00 | 95.57 | 3,378.20 | 1,689.10 | 5,767.41 | 2,848.31 | 1.26 | -0.15 | 0.041 |
| 90.00 | -24.68 | -1.10 | 0.00 | -93.45 | 0.00 | 93.45 | 3,354.74 | 1,677.37 | 5,657.58 | 2,794.06 | 1.32 | -0.16 | 0.041 |
| 94.00 | -24.47 | -1.10 | 0.00 | -89.06 | 0.00 | 89.06 | 2,549.41 | 1,274.70 | 4,268.23 | 2,107.92 | 1.45 | -0.17 | 0.052 |
| 95.00 | -23.44 | -1.10 | 0.00 | -87.96 | 0.00 | 87.96 | 2,541.91 | 1,270.95 | 4,228.10 | 2,088.10 | 1.49 | -0.17 | 0.051 |
| 100.00 | -22.45 | -1.12 | 0.00 | -82.44 | 0.00 | 82.44 | 2,502.69 | 1,251.34 | 4,027.08 | 1,988.82 | 1.67 | -0.18 | 0.050 |
| 105.00 | -21.48 | -1.14 | 0.00 | -76.85 | 0.00 | 76.85 | 2,460.58 | 1,230.29 | 3,825.85 | 1,889.44 | 1.87 | -0.20 | 0.049 |
| 110.00 | -20.54 | -1.16 | 0.00 | -71.18 | 0.00 | 71.18 | 2,415.60 | 1,207.80 | 3,624.86 | 1,790.18 | 2.09 | -0.21 | 0.048 |
| 115.00 | -19.63 | -1.18 | 0.00 | -65.39 | 0.00 | 65.39 | 2,367.74 | 1,183.87 | 3,424.59 | 1,691.27 | 2.32 | -0.23 | 0.047 |
| 120.00 | -18.74 | -1.20 | 0.00 | -59.49 | 0.00 | 59.49 | 2,317.00 | 1,158.50 | 3,225.50 | 1,592.95 | 2.57 | -0.25 | 0.045 |
| 125.00 | -17.88 | -1.22 | 0.00 | -53.48 | 0.00 | 53.48 | 2,263.38 | 1,131.69 | 3,028.06 | 1,495.45 | 2.84 | -0.26 | 0.044 |
| 130.00 | -17.31 | -1.23 | 0.00 | -47.39 | 0.00 | 47.39 | 2,206.88 | 1,103.44 | 2,832.75 | 1,398.99 | 3.12 | -0.28 | 0.042 |
| 133.42 | -16.91 | -1.23 | 0.00 | -43.20 | 0.00 | 43.20 | 2,166.61 | 1,083.30 | 2,700.75 | 1,333.80 | 3.33 | -0.29 | 0.040 |
| 135.00 | -16.16 | -1.23 | 0.00 | -41.25 | 0.00 | 41.25 | 2,147.49 | 1,073.75 | 2,640.03 | 1,303.81 | 3.42 | -0.30 | 0.039 |
| 138.00 | -12.56 | -1.22 | 0.00 | -37.55 | 0.00 | 37.55 | 1,272.33 | 636.17 | 1,555.73 | 768.31 | 3.61 | -0.31 | 0.059 |
| 140.00 | -11.97 | -1.22 | 0.00 | -35.11 | 0.00 | 35.11 | 1,262.76 | 631.38 | 1,516.62 | 749.00 | 3.74 | -0.31 | 0.056 |
| 145.00 | -11.39 | -1.20 | 0.00 | -29.02 | 0.00 | 29.02 | 1,236.82 | 618.41 | 1,418.37 | 700.48 | 4.08 | -0.33 | 0.051 |
| 150.00 | -11.05 | -1.19 | 0.00 | -23.00 | 0.00 | 23.00 | 1,208.00 | 604.00 | 1,319.78 | 651.79 | 4.44 | -0.35 | 0.044 |
| 153.00 | -8.20 | -1.05 | 0.00 | -19.42 | 0.00 | 19.42 | 1,189.33 | 594.66 | 1,260.67 | 622.60 | 4.66 | -0.36 | 0.038 |
| 155.00 | -7.77 | -1.03 | 0.00 | -17.31 | 0.00 | 17.31 | 1,176.30 | 588.15 | 1,221.34 | 603.17 | 4.82 | -0.37 | 0.035 |
| 160.00 | -7.51 | -1.01 | 0.00 | -12.18 | 0.00 | 12.18 | 1,141.72 | 570.86 | 1,123.49 | 554.85 | 5.21 | -0.38 | 0.029 |
| 163.00 | -3.81 | -0.66 | 0.00 | -9.17 | 0.00 | 9.17 | 1,119.59 | 559.80 | 1,065.27 | 526.10 | 5.45 | -0.39 | 0.021 |
| 165.00 | -3.50 | -0.62 | 0.00 | -7.85 | 0.00 | 7.85 | 1,104.26 | 552.13 | 1,026.73 | 507.06 | 5.62 | -0.40 | 0.019 |
| 169.00 | -3.00 | -0.56 | 0.00 | -5.35 | 0.00 | 5.35 | 1,072.22 | 536.11 | 950.40 | 469.37 | 5.95 | -0.40 | 0.014 |
| 170.00 | -2.64 | -0.51 | 0.00 | -4.79 | 0.00 | 4.79 | 1,063.92 | 531.96 | 931.50 | 460.03 | 6.04 | -0.40 | 0.013 |
| 175.00 | -2.29 | -0.45 | 0.00 | -2.24 | 0.00 | 2.24 | 1,020.70 | 510.35 | 838.29 | 414.00 | 6.47 | -0.41 | 0.008 |
| 180.00 | 0.00 | -0.43 | 0.00 | 0.00 | 0.00 | 0.00 | 968.36 | 484.18 | 742.77 | 366.83 | 6.90 | -0.41 | 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 | -39.20 | -1.71 | 0.00 | -215.25 | 0.00 | 215.25 | 5,229.17 | 2,614.59 | 13,734.9 | 6,783.18 | 0.00 | 0.00 | 0.039 |
| 5.00 | -37.80 | -1.68 | 0.00 | -206.72 | 0.00 | 206.72 | 5,190.65 | 2,595.33 | 13,352.1 | 6,594.14 | 0.00 | -0.01 | 0.039 |
| 10.00 | -36.42 | -1.65 | 0.00 | -198.31 | 0.00 | 198.31 | 5,149.25 | 2,574.63 | 12,966.3 | 6,403.58 | 0.01 | -0.01 | 0.038 |
| 15.00 | -35.07 | -1.61 | 0.00 | -190.08 | 0.00 | 190.08 | 5,104.97 | 2,552.49 | 12,577.8 | 6,211.74 | 0.03 | -0.02 | 0.037 |
| 20.00 | -33.75 | -1.57 | 0.00 | -182.02 | 0.00 | 182.02 | 5,057.81 | 2,528.91 | 12,187.2 | 6,018.84 | 0.06 | -0.03 | 0.037 |
| 25.00 | -32.46 | -1.53 | 0.00 | -174.17 | 0.00 | 174.17 | 5,007.77 | 2,503.89 | 11,795.0 | 5,825.12 | 0.09 | -0.03 | 0.036 |
| 30.00 | -31.19 | -1.49 | 0.00 | -166.53 | 0.00 | 166.53 | 4,954.85 | 2,477.43 | 11,401.5 | 5,630.81 | 0.13 | -0.04 | 0.036 |
| 35.00 | -29.95 | -1.45 | 0.00 | -159.09 | 0.00 | 159.09 | 4,899.05 | 2,449.53 | 11,007.4 | 5,436.14 | 0.17 | -0.05 | 0.035 |
| 40.00 | -29.01 | -1.41 | 0.00 | -151.86 | 0.00 | 151.86 | 4,840.37 | 2,420.19 | 10,612.9 | 5,241.34 | 0.23 | -0.06 | 0.035 |
| 43.83 | -28.51 | -1.40 | 0.00 | -146.44 | 0.00 | 146.44 | 4,793.44 | 2,396.72 | 10,310.6 | 5,092.05 | 0.28 | -0.06 | 0.035 |
| 45.00 | -26.40 | -1.32 | 0.00 | -144.81 | 0.00 | 144.81 | 4,778.81 | 2,389.41 | 10,218.7 | 5,046.65 | 0.29 | -0.06 | 0.034 |
| 50.00 | -25.99 | -1.30 | 0.00 | -138.22 | 0.00 | 138.22 | 4,714.38 | 2,357.19 | 9,825.18 | 4,852.29 | 0.36 | -0.07 | 0.034 |
| 51.00 | -25.17 | -1.27 | 0.00 | -136.92 | 0.00 | 136.92 | 3,748.95 | 1,874.48 | 7,908.80 | 3,905.86 | 0.38 | -0.07 | 0.042 |
| 55.00 | -24.16 | -1.24 | 0.00 | -131.83 | 0.00 | 131.83 | 3,716.58 | 1,858.29 | 7,679.21 | 3,792.47 | 0.44 | -0.08 | 0.041 |
| 60.00 | -23.18 | -1.20 | 0.00 | -125.64 | 0.00 | 125.64 | 3,673.53 | 1,836.77 | 7,390.96 | 3,650.12 | 0.53 | -0.09 | 0.041 |
| 65.00 | -22.22 | -1.17 | 0.00 | -119.64 | 0.00 | 119.64 | 3,627.60 | 1,813.80 | 7,101.75 | 3,507.29 | 0.63 | -0.10 | 0.040 |
| 70.00 | -21.29 | -1.14 | 0.00 | -113.79 | 0.00 | 113.79 | 3,578.79 | 1,789.39 | 6,812.03 | 3,364.21 | 0.74 | -0.11 | 0.040 |
| 75.00 | -20.38 | -1.11 | 0.00 | -108.09 | 0.00 | 108.09 | 3,527.09 | 1,763.55 | 6,522.29 | 3,221.11 | 0.86 | -0.12 | 0.039 |
| 80.00 | -19.49 | -1.10 | 0.00 | -102.52 | 0.00 | 102.52 | 3,472.52 | 1,736.26 | 6,232.99 | 3,078.24 | 1.00 | -0.13 | 0.039 |
| 85.00 | -18.95 | -1.09 | 0.00 | -97.04 | 0.00 | 97.04 | 3,415.07 | 1,707.53 | 5,944.59 | 2,935.81 | 1.14 | -0.14 | 0.039 |
| 88.08 | -18.39 | -1.08 | 0.00 | -93.68 | 0.00 | 93.68 | 3,378.20 | 1,689.10 | 5,767.41 | 2,848.31 | 1.23 | -0.15 | 0.038 |
| 90.00 | -17.22 | -1.07 | 0.00 | -91.61 | 0.00 | 91.61 | 3,354.74 | 1,677.37 | 5,657.58 | 2,794.06 | 1.30 | -0.15 | 0.038 |
| 94.00 | -17.08 | -1.08 | 0.00 | -87.31 | 0.00 | 87.31 | 2,549.41 | 1,274.70 | 4,268.23 | 2,107.92 | 1.43 | -0.16 | 0.048 |
| 95.00 | -16.36 | -1.08 | 0.00 | -86.23 | 0.00 | 86.23 | 2,541.91 | 1,270.95 | 4,228.10 | 2,088.10 | 1.46 | -0.17 | 0.048 |
| 100.00 | -15.67 | -1.09 | 0.00 | -80.83 | 0.00 | 80.83 | 2,502.69 | 1,251.34 | 4,027.08 | 1,988.82 | 1.64 | -0.18 | 0.047 |
| 105.00 | -14.99 | -1.11 | 0.00 | -75.37 | 0.00 | 75.37 | 2,460.58 | 1,230.29 | 3,825.85 | 1,889.44 | 1.84 | -0.20 | 0.046 |
| 110.00 | -14.34 | -1.13 | 0.00 | -69.82 | 0.00 | 69.82 | 2,415.60 | 1,207.80 | 3,624.86 | 1,790.18 | 2.05 | -0.21 | 0.045 |
| 115.00 | -13.70 | -1.15 | 0.00 | -64.16 | 0.00 | 64.16 | 2,367.74 | 1,183.87 | 3,424.59 | 1,691.27 | 2.28 | -0.23 | 0.044 |
| 120.00 | -13.08 | -1.17 | 0.00 | -58.39 | 0.00 | 58.39 | 2,317.00 | 1,158.50 | 3,225.50 | 1,592.95 | 2.53 | -0.24 | 0.042 |
| 125.00 | -12.48 | -1.19 | 0.00 | -52.52 | 0.00 | 52.52 | 2,263.38 | 1,131.69 | 3,028.06 | 1,495.45 | 2.79 | -0.26 | 0.041 |
| 130.00 | -12.08 | -1.20 | 0.00 | -46.57 | 0.00 | 46.57 | 2,206.88 | 1,103.44 | 2,832.75 | 1,398.99 | 3.07 | -0.27 | 0.039 |
| 133.42 | -11.80 | -1.20 | 0.00 | -42.47 | 0.00 | 42.47 | 2,166.61 | 1,083.30 | 2,700.75 | 1,333.80 | 3.27 | -0.28 | 0.037 |
| 135.00 | -11.28 | -1.21 | 0.00 | -40.56 | 0.00 | 40.56 | 2,147.49 | 1,073.75 | 2,640.03 | 1,303.81 | 3.36 | -0.29 | 0.036 |
| 138.00 | -8.77 | -1.20 | 0.00 | -36.95 | 0.00 | 36.95 | 1,272.33 | 636.17 | 1,555.73 | 768.31 | 3.55 | -0.30 | 0.055 |
| 140.00 | -8.35 | -1.20 | 0.00 | -34.55 | 0.00 | 34.55 | 1,262.76 | 631.38 | 1,516.62 | 749.00 | 3.67 | -0.31 | 0.053 |
| 145.00 | -7.95 | -1.18 | 0.00 | -28.57 | 0.00 | 28.57 | 1,236.82 | 618.41 | 1,418.37 | 700.48 | 4.01 | -0.33 | 0.047 |
| 150.00 | -7.71 | -1.17 | 0.00 | -22.66 | 0.00 | 22.66 | 1,208.00 | 604.00 | 1,319.78 | 651.79 | 4.36 | -0.35 | 0.041 |
| 153.00 | -5.72 | -1.04 | 0.00 | -19.14 | 0.00 | 19.14 | 1,189.33 | 594.66 | 1,260.67 | 622.60 | 4.58 | -0.36 | 0.036 |
| 155.00 | -5.42 | -1.01 | 0.00 | -17.07 | 0.00 | 17.07 | 1,176.30 | 588.15 | 1,221.34 | 603.17 | 4.73 | -0.36 | 0.033 |
| 160.00 | -5.24 | -0.99 | 0.00 | -12.02 | 0.00 | 12.02 | 1,141.72 | 570.86 | 1,123.49 | 554.85 | 5.12 | -0.38 | 0.026 |
| 163.00 | -2.66 | -0.65 | 0.00 | -9.05 | 0.00 | 9.05 | 1,119.59 | 559.80 | 1,065.27 | 526.10 | 5.36 | -0.38 | 0.020 |
| 165.00 | -2.44 | -0.62 | 0.00 | -7.75 | 0.00 | 7.75 | 1,104.26 | 552.13 | 1,026.73 | 507.06 | 5.52 | -0.39 | 0.018 |
| 169.00 | -2.09 | -0.55 | 0.00 | -5.28 | 0.00 | 5.28 | 1,072.22 | 536.11 | 950.40 | 469.37 | 5.85 | -0.40 | 0.013 |
| 170.00 | -1.84 | -0.50 | 0.00 | -4.73 | 0.00 | 4.73 | 1,063.92 | 531.96 | 931.50 | 460.03 | 5.93 | -0.40 | 0.012 |
| 175.00 | -1.60 | -0.44 | 0.00 | -2.22 | 0.00 | 2.22 | 1,020.70 | 510.35 | 838.29 | 414.00 | 6.35 | -0.40 | 0.007 |
| 180.00 | 0.00 | -0.43 | 0.00 | 0.00 | 0.00 | 0.00 | 968.36 | 484.18 | 742.77 | 366.83 | 6.77 | -0.41 | 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 | 37.24 | 0.00 | 56.44 | 0.00 | 0.00 | 4216.51 | 51.00 | 0.64 |
| 0.9D + 1.6W | 37.22 | 0.00 | 42.32 | 0.00 | 0.00 | 4174.88 | 51.00 | 0.63 |
| 1.2D + 1.0Di + 1.0Wi | 7.72 | 0.00 | 83.74 | 0.00 | 0.00 | 925.40 | 94.00 | 0.16 |
| (1.2 + 0.2Sds) * DL + E ELFM | 1.41 | 0.00 | 56.16 | 0.00 | 0.00 | 201.45 | 94.00 | 0.04 |
| (1.2 + 0.2Sds) * DL + E EMAM | 1.71 | 0.00 | 56.16 | 0.00 | 0.00 | 218.36 | 138.00 | 0.06 |
| (0.9 - 0.2Sds) * DL + E ELFM | 1.41 | 0.00 | 39.20 | 0.00 | 0.00 | 198.91 | 94.00 | 0.04 |
| (0.9 - 0.2Sds) * DL + E EMAM | 1.71 | 0.00 | 39.20 | 0.00 | 0.00 | 215.25 | 138.00 | 0.05 |
| 1.0D + 1.0W | 8.21 | 0.00 | 47.07 | 0.00 | 0.00 | 924.74 | 51.00 | 0.15 |

# Base Plate & Anchor Rod Analysis

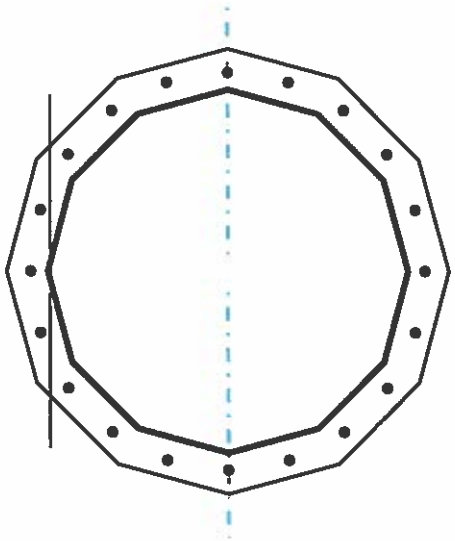
| Pole Dimensions | | |
|---|---|---|
| Number of Sides | 12 | - |
| Diameter | 64 | in |
| Thickness | 0.4375 | in |
| Orientation Offset | | ° |

| Base Reactions | | |
|---|---|---|
| Moment, Mu | 4216.5 | k-ft |
| Axial, Pu | 56.4 | k |
| Shear, Vu | 37.2 | k |
| Neutral Axis | 90 | ° |

| Report Capacities | | |
|---|---|---|
| Component | Capacity | Result |
| Base Plate | 39% | Pass |
| Anchor Rods | 55% | Pass |
| Dwyidag | - | - |

| Base Plate | | |
|---|---|---|
| Number of Sides | 12 | - |
| Diameter, ø | 78.76 | in |
| Thickness | 2 1/2 | in |
| Grade | A572-60 | - |
| Yield Strength, Fy | 60 | ksi |
| Tensile Strength, Fu | 75 | ksi |
| Clip | N/A | in |
| Orientation Offset | | ° |
| Anchor Rod Detail | d | η=0.5 |
| Clear Distance | 3 | in |
| Applied Moment, Mu | 1271.9 | k |
| Bending Stress, ϕMn | 3244.7 | k |

| Original Anchor Rods | | |
|---|---|---|
| Arrangement | Radial | - |
| Quantity | 20 | - |
| Diameter, ø | 2 1/4 | in |
| Bolt Circle | 72.76 | in |
| Grade | A615-75 | |
| Yield Strength, Fy | 75 | ksi |
| Tensile Strength, Fu | 100 | ksi |
| Spacing | 11.4 | in |
| Orientation Offset | 0 | ° |
| Applied Force, Pu | 141.8 | 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 | 37.2 | 4216.5 | 1.00 |
| Anchor Rod Forces | 37.2 | 4216.5 | 1.00 |
| Additional Bolt (Grp1) Forces | | | |
| Additional Bolt (Grp2) Forces | | | |
| Dywidag Forces | | | |
| Stiffener Forces | | | |

**Geometric Properties**

| Section | Gross Area | Net Area | Individual Inertia | Threads per Inch | Moment of Inertia |
|---|---|---|---|---|---|
| - | $in^2$ | $in^2$ | $in^4$ | # | $in^4$ |
| Pole | 86.3687 | 7.1974 | 0.4608 | | 43623.80 |
| Bolt | 3.9761 | 3.2477 | 0.8393 | 4.5 | 43000.10 |
| Bolt1 | | | | | |
| Bolt2 | | | | | |
| Dywidag | | | | | |
| Stiffener | | | | | |

| Base Plate | | |
|---|---|---|
| Shape | 12 | - |
| Width, W | 78.76 | in |
| Thickness, t | 2.5 | in |
| Yield Strength, Fy | 60 | ksi |
| Tensile Strength, Fu | 75 | ksi |
| Base Plate Chord | 45.904 | in |
| Detail Type | d | - |
| Detail Factor | 0.50 | - |
| Clear Distance | 3 | - |

| Anchor Rods | | |
|---|---|---|
| Anchor Rod Quantity, N | 20 | - |
| Rod Diameter, d | 2.25 | in |
| Bolt Circle, BC | 72.76 | in |
| Yield Strength, Fy | 75 | ksi |
| Tensile Strength, Fu | 100 | ksi |
| Applied Axial, Pu | 141.8 | k |
| Applied Shear, Vu | 0.0 | k |
| Compressive Capacity, ϕPn | 259.8 | k |
| Tensile Capacity, ϕRnt | 0.546 | OK |
| Interaction Capacity | 0.546 | OK |

**External Base Plate**

| | | |
|---|---|---|
| Chord Length AA | 47.133 | in |
| Additional AA | 5.000 | in |
| Section Modulus, Z | 81.459 | $in^3$ |
| Applied Moment, Mu | 1271.9 | k-ft |
| Bending Capacity, ϕMn | 4398.8 | k-ft |
| Capacity, Mu/ϕMn | 0.289 | OK |
| | | |
| Chord Length AB | 44.867 | in |
| Additional AB | 5.000 | in |
| Section Modulus, Z | 77.917 | $in^3$ |
| Applied Moment, Mu | 805.0 | k-ft |
| Bending Capacity, ϕMn | 4207.5 | k-ft |
| Capacity, Mu/ϕMn | 0.191 | OK |
| | | |
| Bend Line Length | 38.456 | in |
| Additional Bend Line | 0.000 | in |
| Section Modulus, Z | 60.087 | $in^3$ |
| Applied Moment, Mu | 1271.9 | k-ft |
| Bending Capacity, ϕMn | 3244.7 | k-ft |
| Capacity, Mu/ϕMn | 0.392 | 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 | | |

Trylon

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AMERICAN TOWER®

# Mount Analysis


**Michael F. Plahovinsak, P.E.**
*Sole Proprietor – Independent Engineer*
18301 SR 161, Plain City, Ohio
614-398-6250 / mike@mfpeng.com
**MFP Project #23218-329**

COLCHESTER CT 6

ATC SITE #302465

12/04/2018

PASS (47%)

# MOUNT ANALYSIS REPORT

**American Tower Corporation**
10 Presidential Way
Woburn, MA 01801

**Attention:** **Mr. Blake Paynter**

**Reference:** Analysis of the existing platform installed at 163-ft elevation.

| | |
|---|---|
| Trylon Job Number: | 143857 |
| ATC Asset Number: | 302465 |
| ATC Site Name: | Colchester CT 6 |
| Verizon Site ID: | PSLC# 468035 / PROJ# 15267839 |
| Verizon Site Name: | Colchester S 2 CT |
| Site Address: | 355 Route 85, Colchester City, New London County, CT 06415 |
| Tower Profile: | Monopole Tower |

**Dear Sir:**

We have been provided with RF information, photos and sketches of the structure for above-referenced site. Verizon is proposing to change the equipment configuration on the existing mounting hardware.

A revised antenna, coax and miscellaneous equipment schematic has been provided to us. We have been asked to evaluate this information to determine whether or not the existing mounting apparatus are adequate to safely support the proposed loading change. The structural evaluation refers to the existing platform installed at 163-ft elevation on the monopole tower located 355 Route 85, Colchester City, New London County, CT 06415.

The proposed changes were provided to us in the SOW application dated 11/15/2018. The antennas are located at 163-ft elevation on all sectors.

**The final configuration consists of:**

- (2) JAHH-65B-R3B antennas (72”x13.8”x8.2” – 60.6lbs.) mounted on a BSAMNT-SBS-2-2 dual antenna bracket on each sector in position #3,

Additional equipment:

- (1) B5/B13 RRH-BR04C, (1) B2/B66A RRHBR049 on each sector,
- (2) DB-B1-6C-12AB-0Z for all sectors.

The members dimensions that we considered in our evaluation are as per sketches and pictures provided by the site visit crew and as per Perfect Vision drawings (PV-LPP12-01 REV 5.SLDDRW). The structural members that we considered in our analysis are presented in the attached model sketches.

Steel grades have been assumed as follows, unless noted otherwise:

| | |
|---|---|
| Channel, Solid Round, Angle, Plate | ASTM A36 (GR 36) |
| HSS (Rectangular) | ASTM 500 (GR B-46) |
| Pipe | ASTM A53 (GR 35) |
| Connection Bolts | ASTM A325 |

## CONCLUSIONS AND RECOMMENDATIONS

Based on information provided, our calculations conclude that the existing Verizon platform, located at 163-ft elevation on the existing monopole tower at the specified address, is **ADEQUATE** to safely support the proposed equipment, subject to the attached Standard Conditions on page 3.

| Category | Classification |
|---|---|
| Mount Classification (w/ Ice, w/ Vertical Offset): | M1650R(800) - 2[22] |

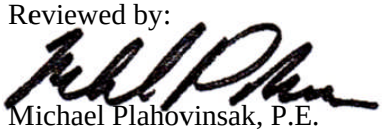
Should you have any questions, comments or require additional information, please do not hesitate to call.

Sincerely,

Analysis performed by:

Florin Ionescu

Reviewed by:



Michael Plahovinsak, P.E.

**Standard Conditions for Providing Structural Consulting Services on Existing Structures**

1. Mounting hardware is analyzed to the best of our ability using all information that is provided or can be obtained during fieldwork (if authorizes by client). If the existing conditions are not as we have represented in this analysis, we should be contacted to evaluate the significance of the deviation and revise the assessment accordingly.

2. The structural analysis has been performed assuming that hardware is in "like new" condition. No allowance was made for excessive corrosion, damaged or missing structural members, loose bolts, misaligned parts, or any reduction in strength due to the age or fatigue of the product.

3. The structural analysis provided is an assessment of the primary load carrying capacity of the hardware. We provide a limited scope of service. In some cases we cannot verify the capacity of every weld, plate, connection detail, etc. In some cases, structural fabrication details are unknown at the time of our analysis, and the detailed field measurement of some of the required details may not be possible. In instances where we cannot perform connection capacity calculations, it is assumed that the existing manufactured connections develop the full capacity of the primary members being connected.

4. We cannot be held responsible for mounting hardware that is installed improperly or hardware that is loose or has a tendency of working loose over the lifetime of the mounting hardware. Our analysis has been performed assuming fully tightened connections, and proper installation and symmetry of the mounting hardware per manufacturer's instructions.

5. The structural analysis has been performed using information currently provided by the client and potentially field verified. We have been provided with a mounting arrangement for all telecommunications equipment, including antennas RRH's, TMA's, RRU's, diplexers, surge protection devices, etc. Our analysis has been based upon a particular mounting arrangement. We are not responsible for deviations in the mounting arrangement that may occur over time. If deviations in equipment type or mounting arrangements are proposed, then we should be contacted to revise the recommendations of this structural report.

6. We cannot be held responsible for temporary and unbalanced loads on mounting hardware. Our analysis is based on a particular mounting arrangement or as-built field condition. We are not responsible for the methods and means of how the mounting arrangement is accomplished by the contractor. These methods and means may include rigging of equipment or hardware to lift and locate, temporary hanging of equipment in locations other than the final arrangement, movement and tie off of tower riggers, personnel, and their equipment, etc.

7. Steel grade and strength is unknown and cannot be field tested. We cannot be held responsible for equipment manufactured from inferior steel or bolts. Our analysis assumes that standard structural grade steel has been used by the equipment manufacturer for all assembled parts of the mounting apparatus. Acceptable steels and connection components are specified by the American Institute of Steel Construction. It is assumed all welded connections are performed in the shop under the latest American Welding Society Code. No field welds are permitted or assumed for the existing pre-manufactured equipment.

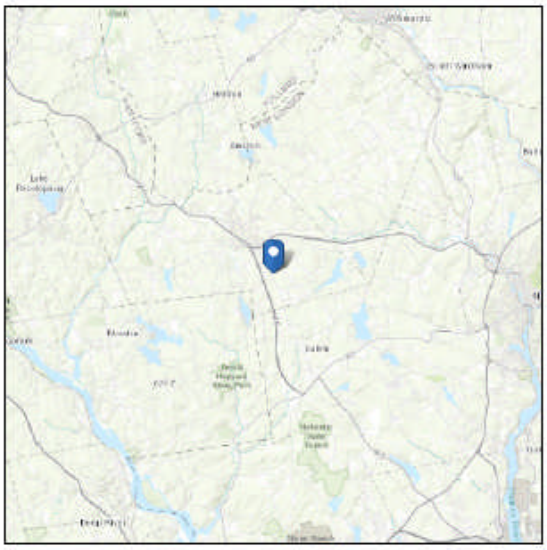
Trylon

# ASCE 7 Hazards Report

**Address:**
No Address at This Location

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

**Elevation:** 557.74 ft (NAVD 88)
**Latitude:** 41.54482
**Longitude:** -72.304891

## Wind

| | |
|---|---|
| **Results:** | 78 Vmph |
| Wind Speed: | 129 Vmph |
| 10-year MRI | 78 Vmph |
| 25-year MRI | 88 Vmph |
| 50-year MRI | 96 Vmph |
| 100-year MRI | 105 Vmph |
| **Data Source:** | ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014 |
| **Date Accessed:** | Mon Nov 12 2018 |

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

## Ice

**Results:**

| | |
|---|---|
| Ice Thickness: | 0.75 in. |
| Concurrent Temperature: | 15 F |
| Gust Speed: | 50 mph |
| **Data Source:** | Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8 |
| **Date Accessed:** | Mon Nov 12 2018 |

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

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

Trylon

**General Info**

| | |
|---|---|
| Site Code : | **302465** |
| Site Name : | **Colchester CT 6** |
| State | **Connecticut** |
| County | **New London** |
| Trylon job number: | **143857** |
| Design by: | **FI** |

Trylon
1825 W. Walnut Hill Lane Suite 302
Irving, TX 75038

**Analysis Criteria**

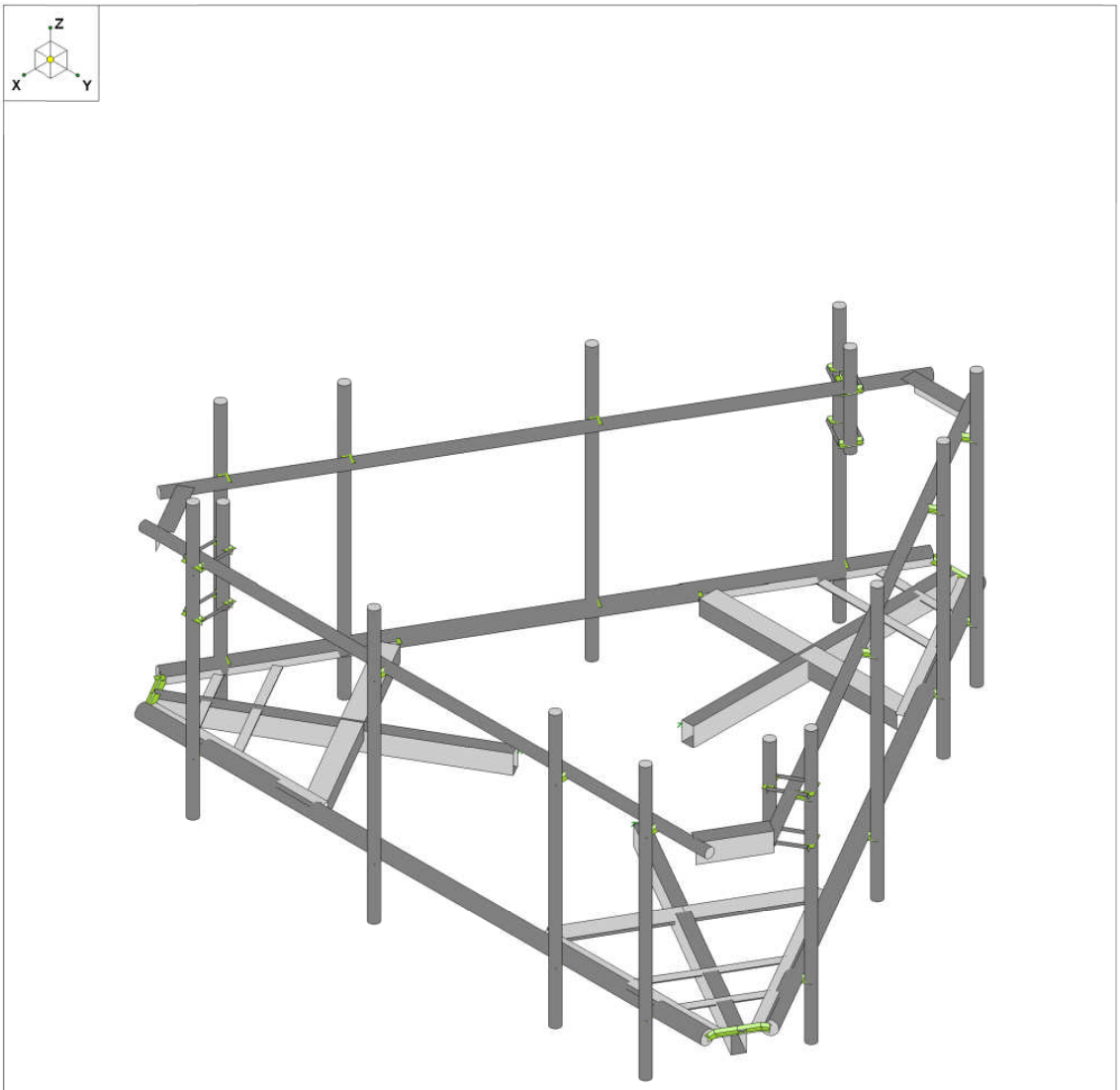
Standard 2015 IBC / ASCE 7-10 / TIA-222-G

The mount structural analysis was performed in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Supporting structure using a 3-second gust wind speed of 99.9 mph with no ice, 50.0 mph with 0.75 inch escalated ice thickness, Exposure Category C and Topographic Category 1 with a crest height of 0 ft.

In addition, the platform has been analysed for various live loading conditions consisting of a 250-pound man live load applied individually at the midpoint and cantilevered ends of horizontal members as well as a 500-pound man live load applied individually at mount pipe locations using a 3-second gust wind speed of 30 mph.

**Design Loads**

| Appurtenances | | | Dimensions | | | | | Wind Forces without ice | | | | Wind Forces with ice | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Manufacturer | Model | Height [in] | Width [in] | Thk. [in] | Weight [lbs] | ICE Weight [lbs] | 0° [lbs] | 30° [lbs] | 60° [lbs] | 90° [lbs] | 0° [lbs] | 30° [lbs] | 60° [lbs] | 90° [lbs] |
| 6 | Commscope | JAHH-65B-R3B | 72.0 | 13.8 | 8.2 | 63.3 | 229.8 | 310.4 | 283.8 | 230.5 | 203.8 | 99.4 | 92.5 | 78.9 | 72.1 |
| 3 | Samsung | B5/B13 RRH-BR04C | 15.0 | 15.0 | 8.1 | 70.3 | 50.5 | 63.9 | 56.5 | 41.8 | 34.5 | 24.4 | 22.1 | 17.6 | 15.3 |
| 3 | Samsung | B2/B66A RRHBR049 | 15.0 | 15.0 | 10.0 | 84.4 | 53.2 | 63.9 | 58.5 | 47.9 | 42.6 | 24.4 | 22.7 | 19.4 | 17.8 |
| 2 | RFS | DB-B1-6C-12AB-0Z | 25.7 | 15.7 | 10.3 | 21.4 | 94.4 | 74.7 | 84.6 | 104.6 | 114.6 | 28.6 | 31.4 | 37.1 | 39.9 |




Envelope Only Solution

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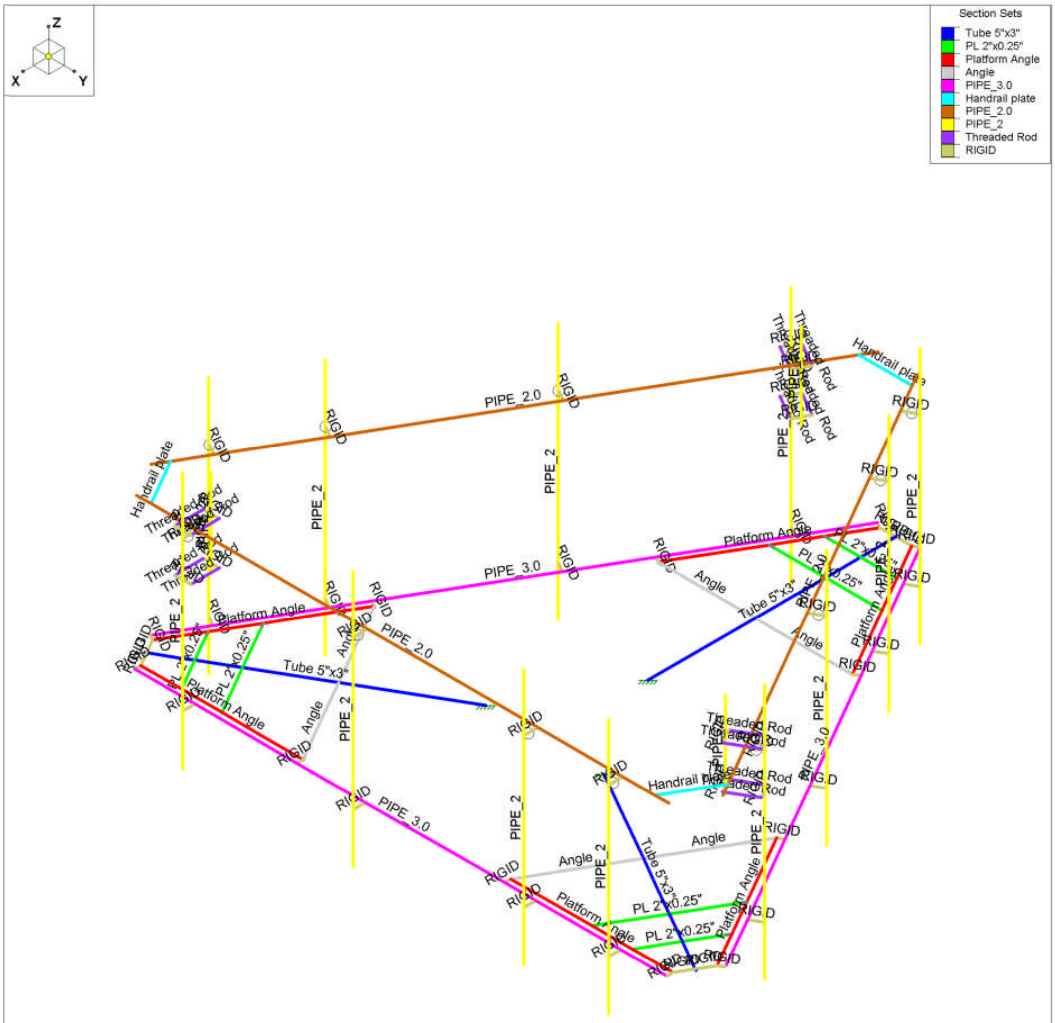
|---|---|---|
| Trylon | Colchester | SK - 1 |
| FI | | Dec 4, 2018 at 9:52 AM |
| 143857 | | Colchester.r3d |

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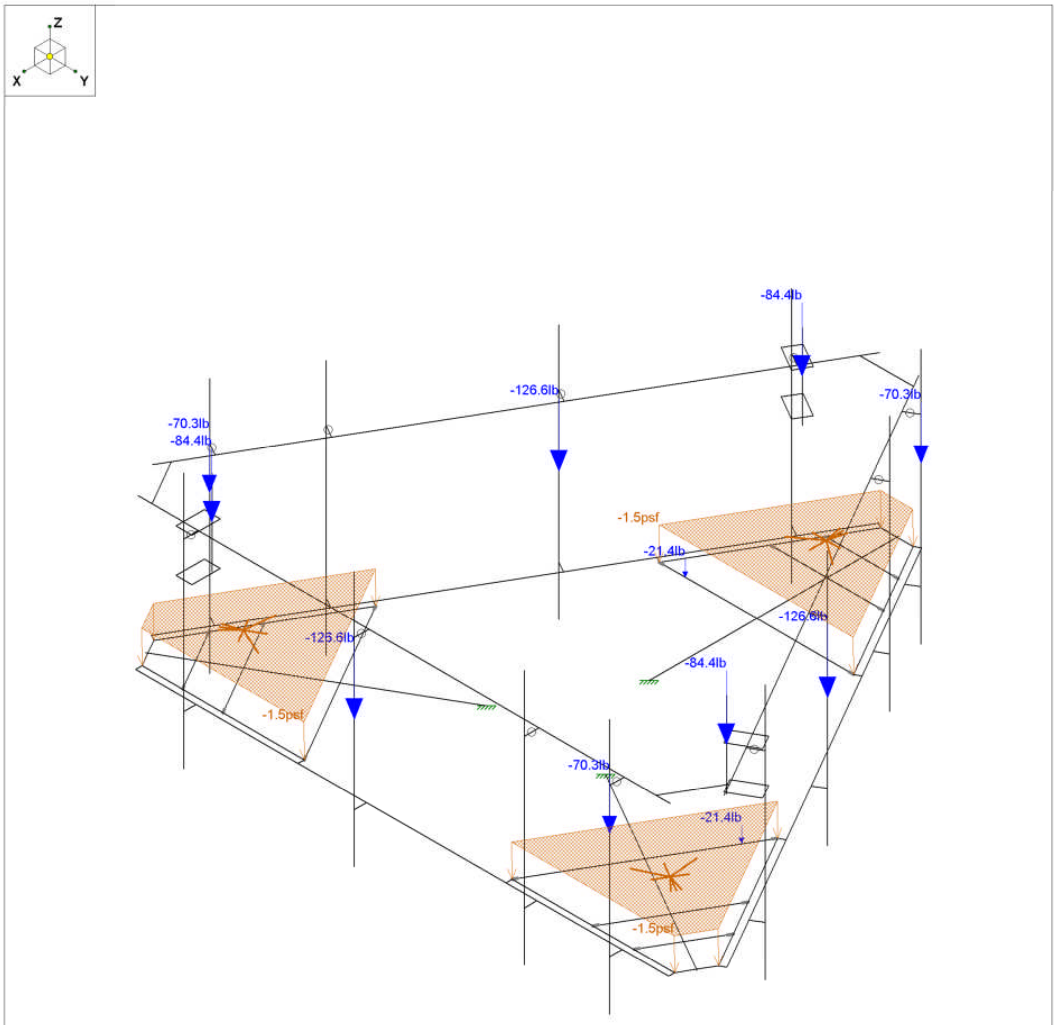
| 143857 | | Colchester.r3d |




Loads: BLC 2, Weights
Envelope Only Solution

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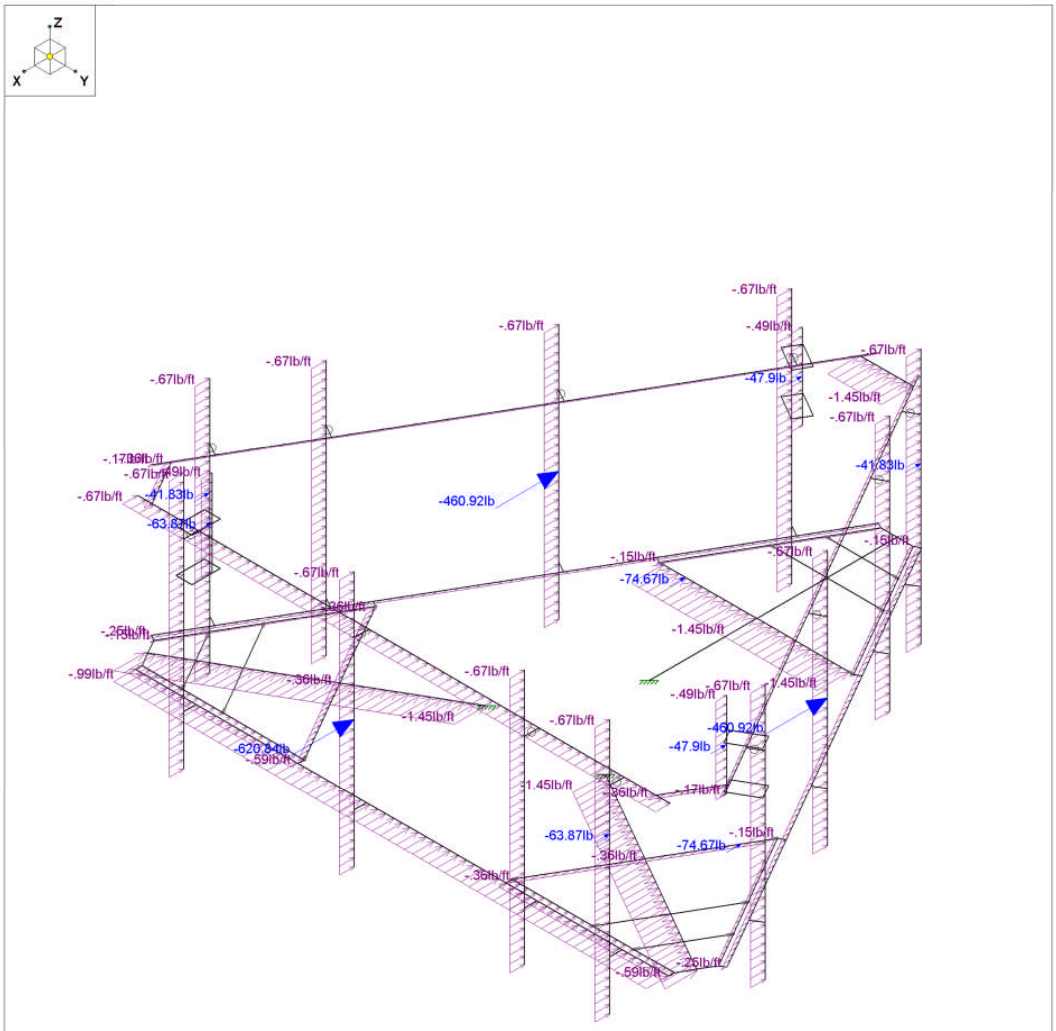
| 143857 | | Colchester.r3d |




Loads: BLC 4, Wind 0°
Envelope Only Solution

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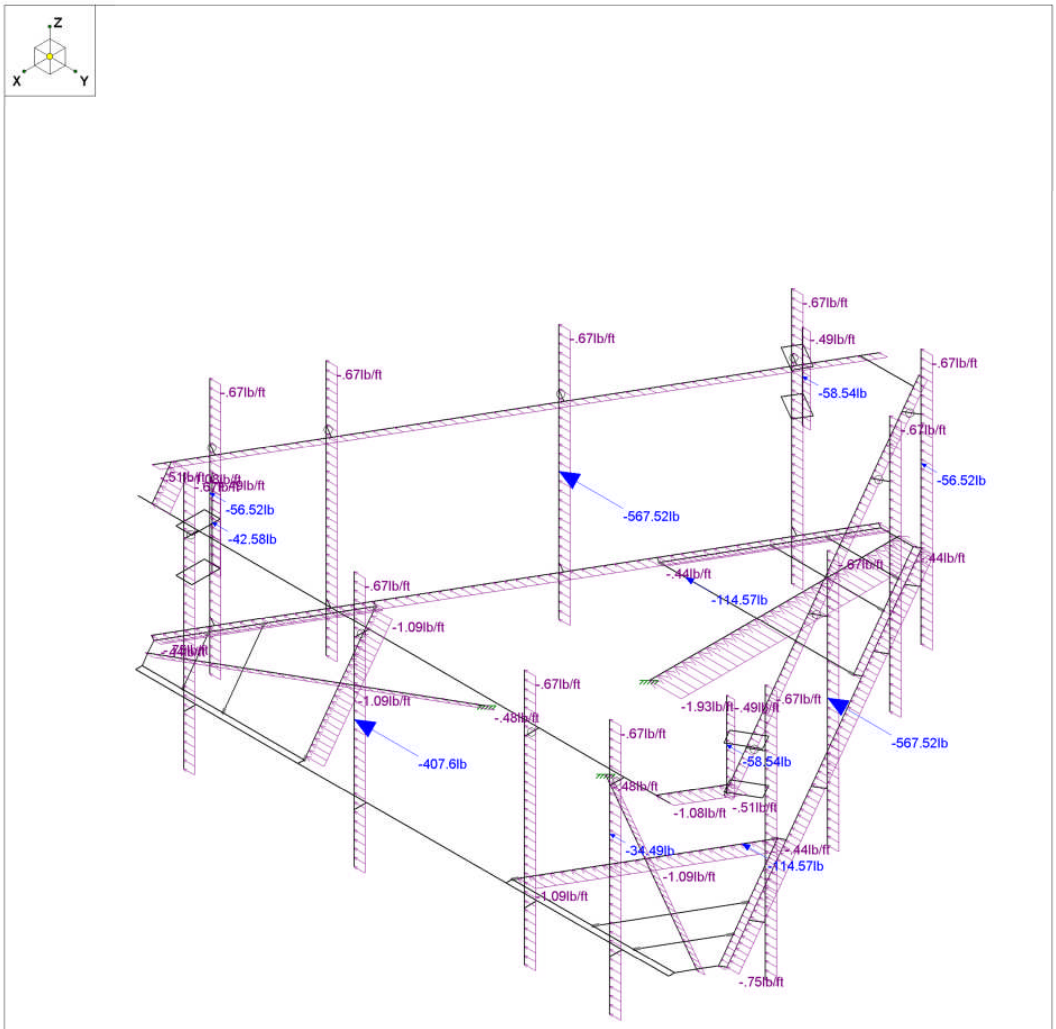
| FI | | Dec 4, 2018 at 9:53 AM |
| 143857 | | Colchester.r3d |




Loads: BLC 7, Wind 90°
Envelope Only Solution

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|---|---|---|
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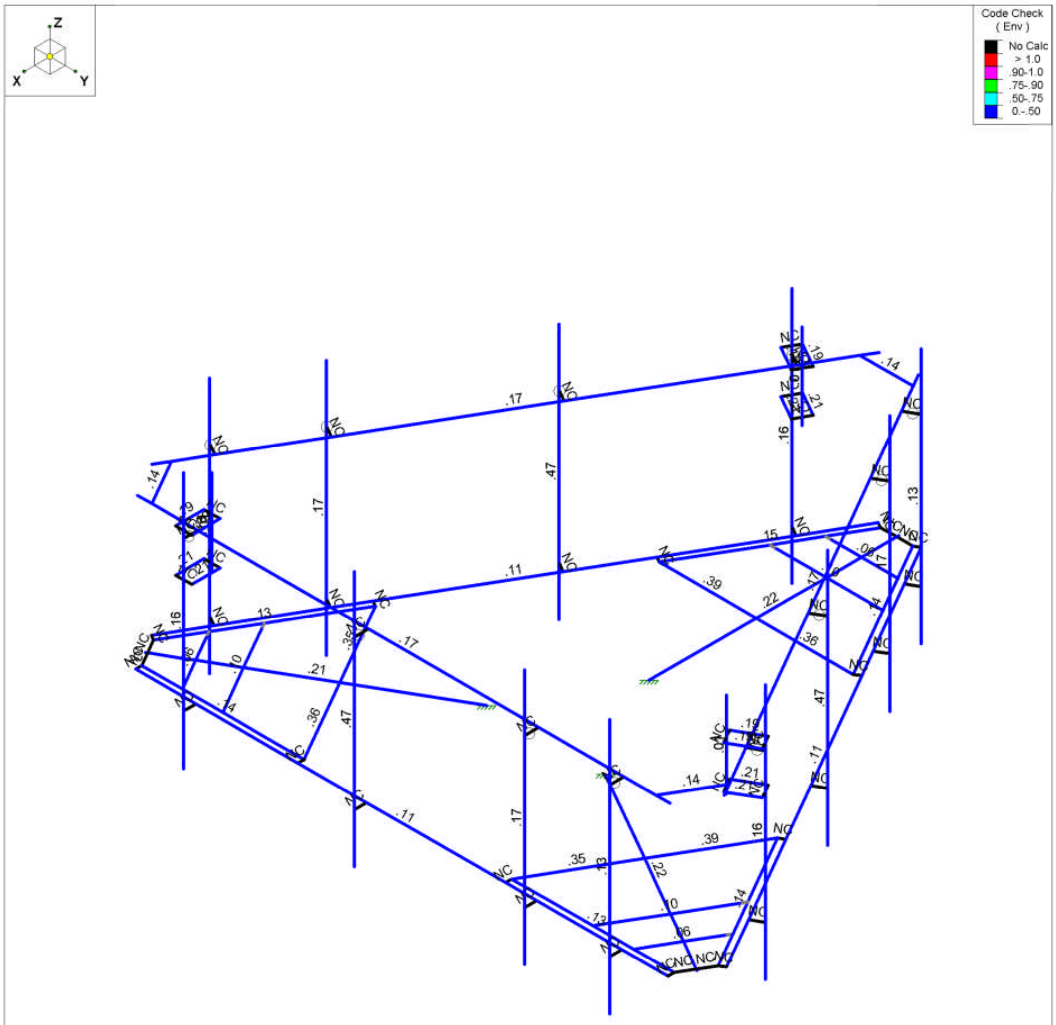
| 143857 | | Colchester.r3d |




| | | |
|---|---|---|
| Trylon | Colchester | SK - 6 |
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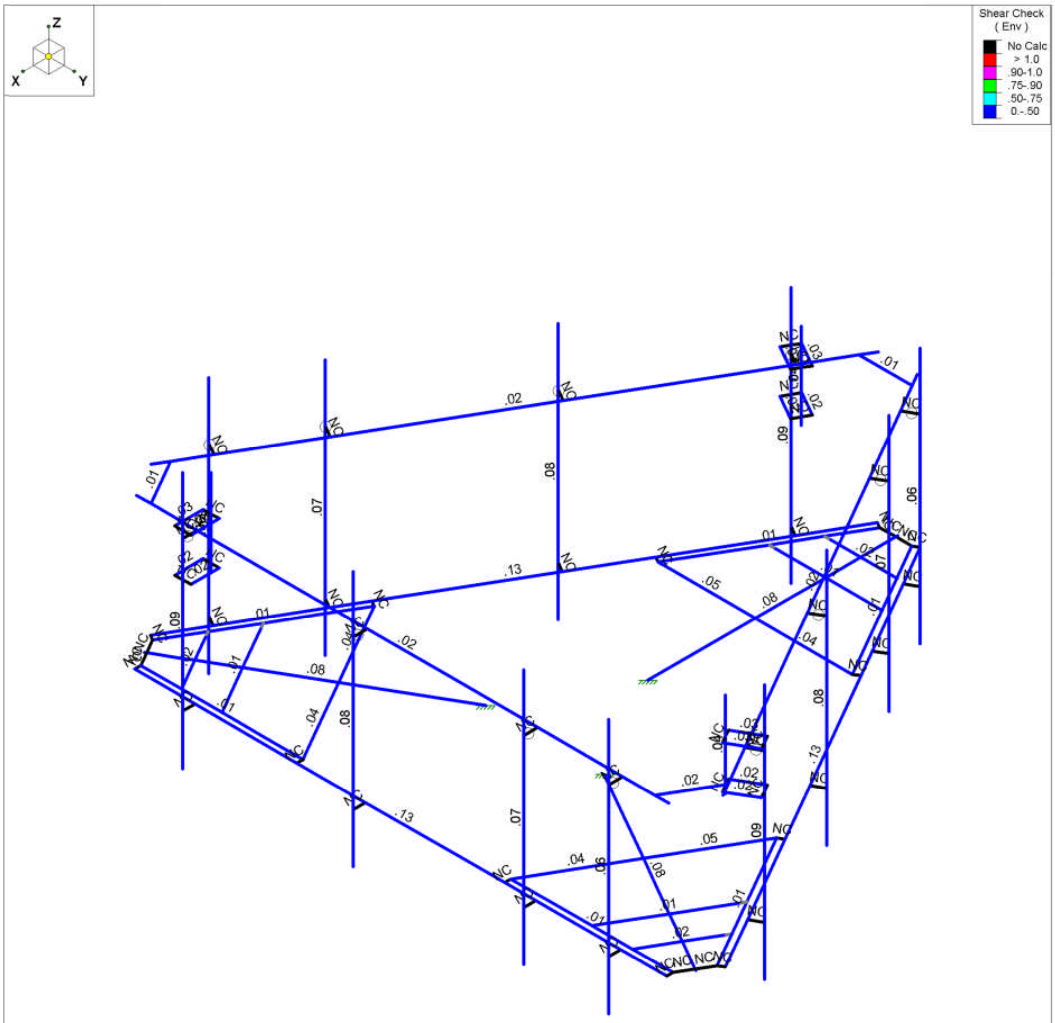
| 143857 | | Colchester.r3d |




| | | |
|---|---|---|
| Trylon | Colchester | SK - 7 |
| FI | | Dec 4, 2018 at 9:53 AM |
| 143857 | | Colchester.r3d |

**Site Name:** Colchester S 2 CT
**Cumulative Power Density**

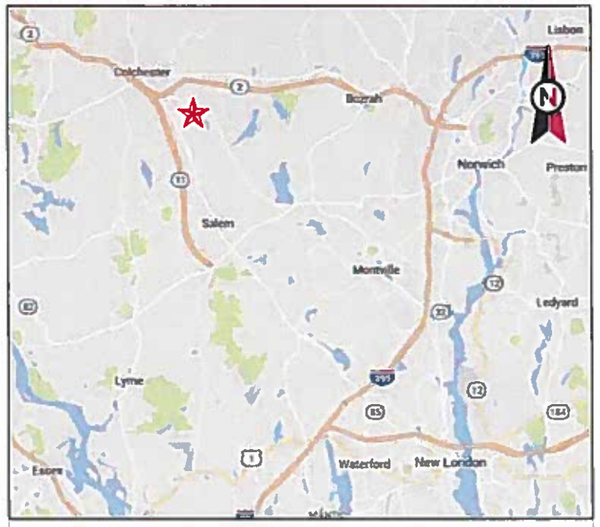
| Operator | Operating Frequency | Number of Trans. | ERP Per Trans. | Total ERP | Distance to Target | Calculated Power Density | Maximum Permissible Exposure* | Fraction of MPE |
|---|---|---|---|---|---|---|---|---|
| | (MHz) | | (watts) | (watts) | (feet) | (mW/cm^2) | (mW/cm^2) | (%) |
| VZW PCS | 1970 | 1 | 6749.57 | 6749.57 | 163 | 0.0914 | 1.0 | 9.14% |
| VZW Cellular | 869 | 1 | 1854.58 | 1854.58 | 163 | 0.0251 | 0.579333333 | 4.33% |
| VZW AWS | 2145 | 1 | 6906.78 | 6906.78 | 163 | 0.0935 | 1.0 | 9.35% |
| VZW 700 | 746 | 1 | 2749.6 | 2749.6 | 163 | 0.0372 | 0.497333333 | 7.48% |

**Total Percentage of Maximum Permissible Exposure** 30.30%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz
mW/cm^2 = milliwatts per square centimeter
ERP = Effective Radiated Power

Absolute worst case maximum values used, including the following assumptions:
1. closest accessible point is distance from antenna to base of pole;
2. continuous transmission from all available channels at full power for indefinite time period; and,
3. all RF energy is assumed to be directed solely to the base of the pole.




VICINITY MAP

# AMERICAN TOWER®

ATC SITE NAME: COLCHESTER CT 6
ATC SITE NUMBER: 302465
VERIZON SITE NAME: COLCHESTER S 2 CT
VERIZON SITE NUMBER:468035
SITE ADDRESS: 355 ROUTE 85
COLCHESTER, CT 06415

## VERIZON WIRELESS
## ANTENNA AMENDMENT DRAWINGS


LOCATION MAP

### 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

### PROJECT SUMMARY

SITE ADDRESS:

355 ROUTE 85
COLCHESTER, CT 06415
COUNTY: NEW LONDON

GEOGRAPHIC COORDINATES:

LATITUDE: 41.54481944
LONGITUDE: -72.30489167
GROUND ELEVATION: 559' AMSL

### PROJECT DESCRIPTION

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

REMOVE (12) PANELS, (6) RRUs, AND (2) 1-5/8" COAX CABLES

INSTALL (3) SIDE-BY-SIDE MOUNTS, (6) NEW PANELS, (6) RRUs, (1) 1-5/8" HYBRID CABLE, AND (1) OVP

EXISTING (1) 1-5/8" HYBRID CABLE, AND (1) OVP 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

FROM NEW LONDON, CT:

TAKE I 395 NORTH TO RT 2 WEST. FOLLOW RT WEST TO RT 85 SOUTH. FOLLOW RT 2 SOUTH TO DUTTON RD. TURN ON TO DUTTON RD AND ROAD GATE ON RIGHT.

### SHEET INDEX

| SHEET NO: | DESCRIPTION: | REV: | DATE: | BY: |
|---|---|---|---|---|
| G-001 | COVER SHEET | 0 | 12/03/18 | JMB |
| G-002 | GENERAL NOTES | 0 | 12/03/18 | JMB |
| C-101 | DETAILED SITE PLAN AND TOWER ELEVATION | 0 | 12/03/18 | JMB |
| C-501 | RF SCHEDULE AND ANTENNA INSTALLATION | 0 | 12/03/18 | JMB |
| C-502 | CONSTRUCTION DETAILS | 0 | 12/03/18 | JMB |

### UTILITY COMPANIES

POWER COMPANY: EVER SOURCE
PHONE: (877) 659-6326

TELEPHONE COMPANY: FRONTIER COMMUNICATIONS
PHONE: (800) 376-6843

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

### PROJECT TEAM

TOWER OWNER:

AMERICAN TOWER
10 PRESIDENTIAL WAY
WOBURN, MA 01801

ENGINEER:

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

PROPERTY OWNER:

M & J AUTO RECYCLING INC
ATTN: MICHAEL BEEBE SR
P O BOX 908 355 ROUTE 85
COLCHESTER, CT 06415-0908

APPLICANT:

VERIZON WIRELESS
20 ALEXANDER DRIVE, 2ND FLOOR
WALLINGFORD, CT 06492

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 | JMB | 12/03/18 |

ATC SITE NUMBER:
302465

ATC SITE NAME:
COLCHESTER CT 6

SITE ADDRESS:
355 ROUTE 85
COLCHESTER, CT 06415

SEAL:


Authorized by "EOR"
Dec 3 2018 6:35 PM
verizon esign

| | |
|---|---|
| DRAWN BY: | JMB |
| APPROVED BY: | SRF |
| DATE DRAWN: | 12/03/18 |
| ATC JOB NO: | 12623728 |
| CUSTOMER ID: | COLCHESTER S 2 CT |
| CUSTOMER #: | 468035 |

COVER SHEET

| SHEET NUMBER: | REVISION: |
|---|---|
| G-001 | 0 |

## 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 VERIZON WIRELESS REP PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE VERIZON WIRELESS REP PRIOR TO PROCEEDING.
11. EACH CONTRACTOR SHALL COOPERATE WITH THE VERIZON 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 VERIZON 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 VERIZON 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 VERIZON 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 VERIZON 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 VERIZON WIRELESS REP TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY CONTRACTOR. ALL REQUIRED PERMITS NOT OBTAINED BY VERIZON WIRELESS MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.
21. CONTRACTOR SHALL INSTALL ALL SITE SIGNAGE IN ACCORDANCE WITH VERIZON WIRELESS SPECIFICATIONS AND REQUIREMENTS.
22. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO VERIZON WIRELESS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
23. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO VERIZON 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 VERIZON 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 VERIZON WIRELESS REP. ANY WORK FOUND BY THE VERIZON 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.

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 | JMB | 12/03/18 |
| | | | |
| | | | |
| | | | |
| | | | |

ATC SITE NUMBER:
302465

ATC SITE NAME:
COLCHESTER CT 6

SITE ADDRESS:
355 ROUTE 85
COLCHESTER, CT 06415

SEAL: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Dec 3 2018 6:35 PM

verizon design

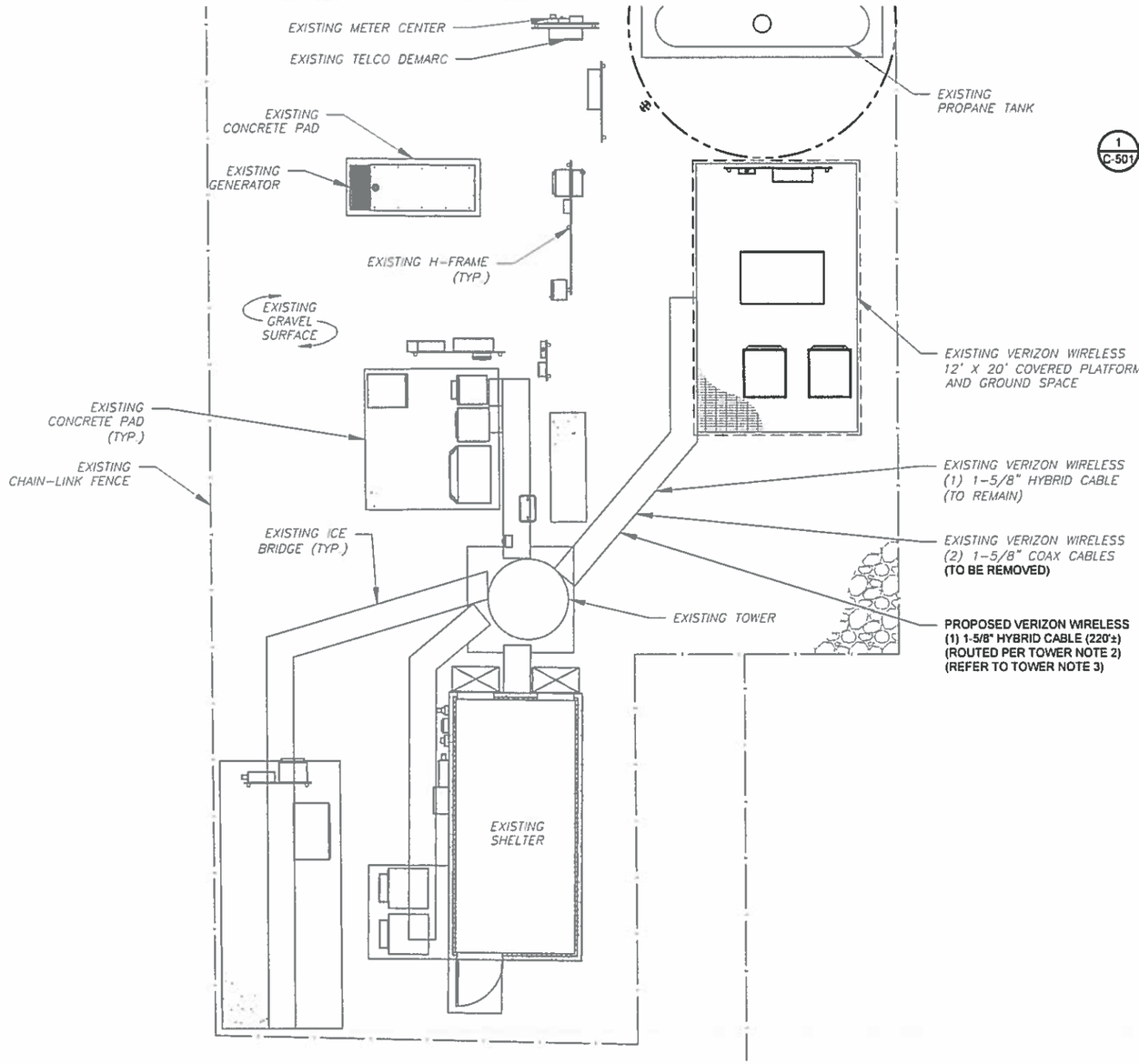
| | |
|---|---|
| DRAWN BY: | JMB |
| APPROVED BY: | SRF |
| DATE DRAWN: | 12/03/18 |
| ATC JOB NO: | 12623728 |
| CUSTOMER ID: | COLCHESTER S 2 CT |
| CUSTOMER #: | 468035 |

GENERAL NOTES

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

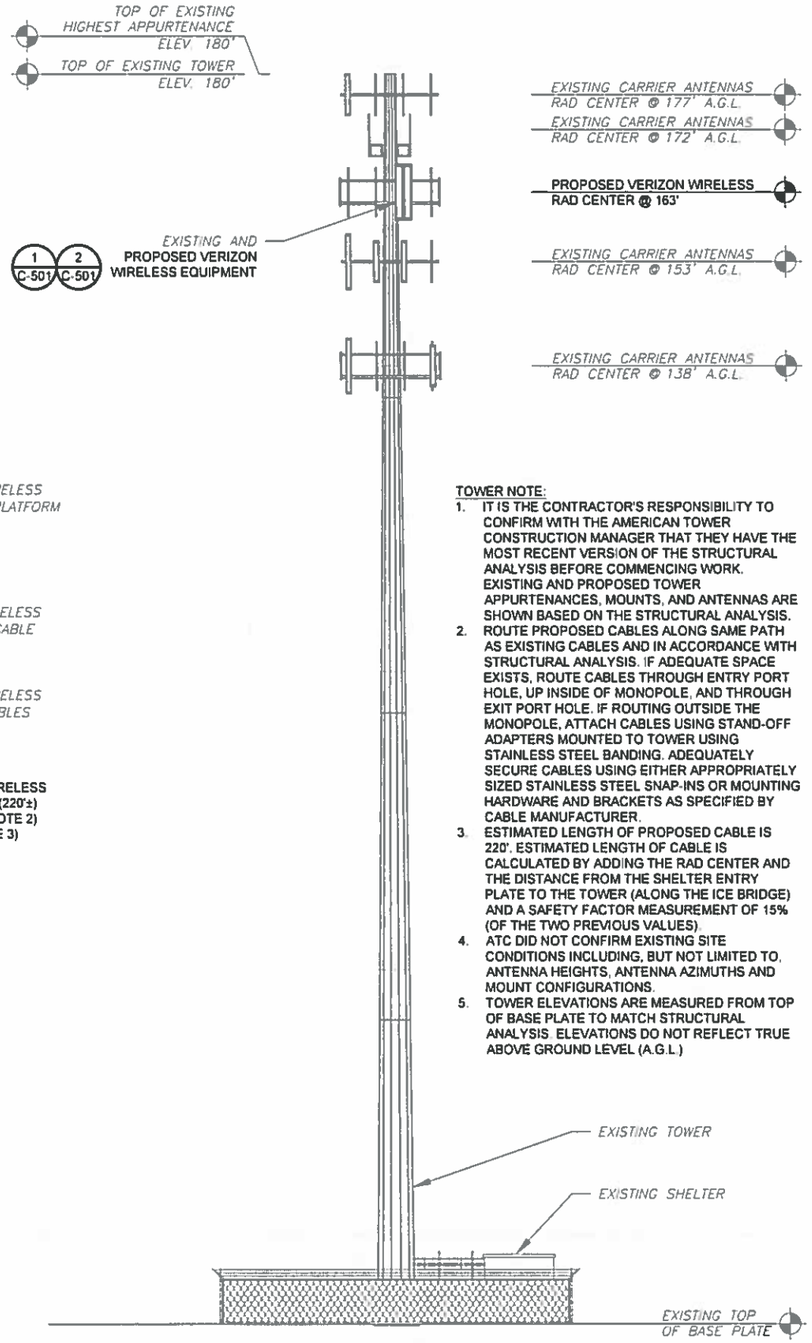
SITE PLAN NOTES:

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, CABLE SUPPORTS, AND CABLES ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL CONFIRM THE EXACT LOCATION OF ALL PROPOSED AND EXISTING EQUIPMENT AND STRUCTURES DEPICTED ON THIS PLAN. BEFORE INSTALLING NEW CABLE SUPPORT STRUCTURES, COAX PORTS, OR ANY OTHER EQUIPMENT, CONTRACTOR SHALL VERIFY ALL ASPECTS OF THE COMPONENTS MEET THE ATC SPECIFICATIONS.
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE ATC CONSTRUCTION MANAGER 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.




1 DETAILED SITE PLAN

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




2 TOWER ELEVATION

SCALE: NOT TO SCALE

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 220'. 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.)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| REV. | DESCRIPTION | BY | DATE |
|---|---|---|---|
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302465

ATC SITE NAME:
COLCHESTER CT 6

SITE ADDRESS:
355 ROUTE 85
COLCHESTER, CT 06415

SEAL:


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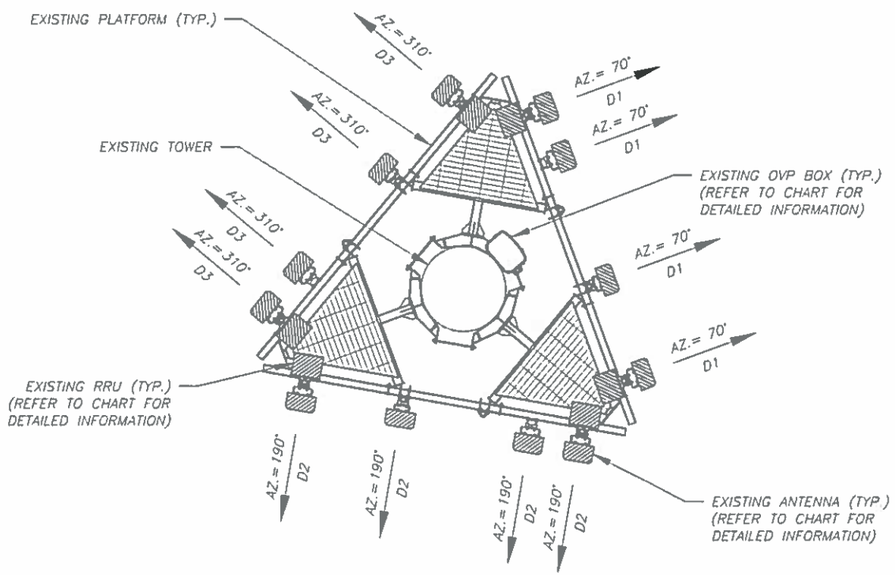
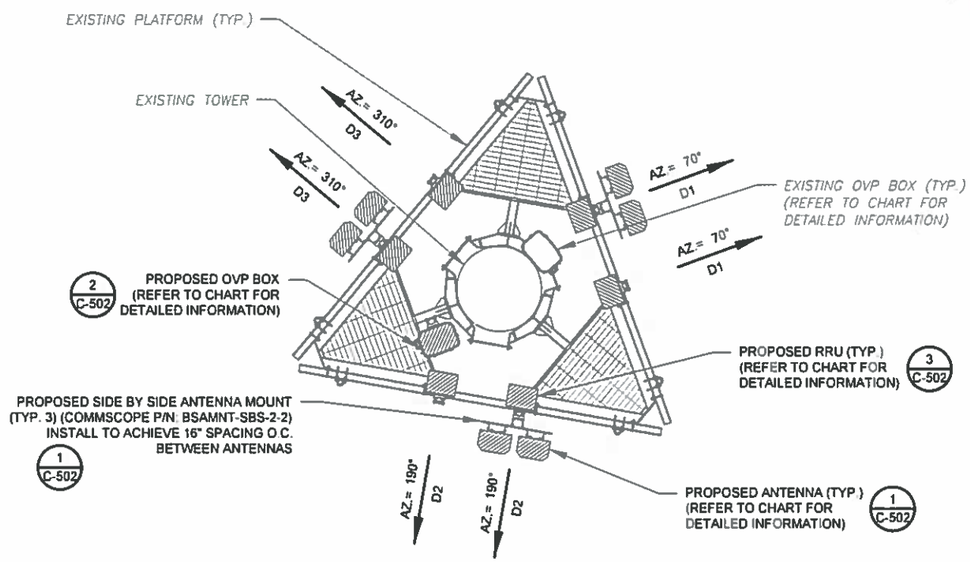
| | |
|---|---|
| DRAWN BY: | JMB |
| APPROVED BY: | SRF |
| DATE DRAWN: | 12/03/18 |
| ATC JOB NO: | 12623728 |
| CUSTOMER ID: | COLCHESTER S 2 CT |
| CUSTOMER #: | 468035 |

DETAILED SITE PLAN AND TOWER ELEVATION

| SHEET NUMBER: | REVISION: |
|---|---|
| C-101 | 0 |




1 CURRENT ANTENNA PLAN




2 PROPOSED ANTENNA PLAN

**CURRENT ANTENNA AND RF EQUIPMENT SCHEDULE**

| LOCATION | | | ANTENNA SUMMARY | | | | NON ANTENNA SUMMARY | | |
|---|---|---|---|---|---|---|---|---|---|
| SECTOR | RAD | AZ | POS | BAND | MODEL NUMBER | STATUS | POS | MODEL NUMBER | STATUS |
| D1 | 163' | 70° | 1 | LTE 700 | LNX-6514DS-A1M | RMV | 1 | RRH2X60 700 | RMV |
| | | | 2 | – | LNX-6514DS-A1M | RMV | 2 | – | – |
| | | | 3 | – | HBXX-6516DS-VTM | RMV | 3 | – | – |
| | | | 4 | LTE AWS | HBXX-6517DS-A2M | RMV | 4 | RRH2X60 AWS | RMV |
| | | | – | – | – | – | – | – | – |
| D2 | 163' | 190° | 1 | LTE 700 | LNX-6514DS-A1M | RMV | 1 | RRH2X60 700 | RMV |
| | | | 2 | – | LNX-6514DS-A1M | RMV | 2 | – | – |
| | | | 3 | – | HBXX-6516DS-VTM | RMV | 3 | – | – |
| | | | 4 | LTE AWS | HBXX-6517DS-A2M | RMV | 4 | RRH2X60 AWS | RMV |
| | | | – | – | – | – | – | – | – |
| D3 | 163' | 310° | 1 | LTE 700 | LNX-6514DS-A1M | RMV | 1 | RRH2X60 700 | RMV |
| | | | 2 | – | LNX-6514DS-A1M | RMV | 2 | – | – |
| | | | 3 | – | HBXX-6516DS-VTM | RMV | 3 | – | – |
| | | | 4 | LTE AWS | HBXX-6517DS-A2M | RMV | 4 | RRH2X60 AWS | RMV |
| | | | – | – | – | – | – | – | – |

**CURRENT FIBER DISTRIBUTION / OVP BOX**

| LOCATION | POS | BAND | MODEL NUMBER | STATUS |
|---|---|---|---|---|
| TOWER | – | – | (1) DB-B1-6C-12AB-0Z | RMN |
| – | – | – | – | – |

**CURRENT CABLING SUMMARY**

| COAX | HYBRID | STATUS |
|---|---|---|
| – | (1) 1-5/8" | RMN |
| (2) 1-5/8" | – | RMV |

**NOTES**

1. BASED ON APPROVED ATC APPLICATION 12616978 , DATED 10/10/18 CONFIRM WITH VERIZON WIRELESS REP FOR APPLICABLE UPDATES/REVISIONS AND MOST RECENT RFDS.
2. ATC HAS NOT YET VERIFIED ANY EXISTING ANTENNA CONFIGURATION OR MOUNT CONFIGURATION. CONTRACTOR TO VERIFY MOUNT CONFIGURATION HAS SUFFICIENT SPACE FOR PROPOSED LESSEE EQUIPMENT (I.E. CLEARANCES, MOUNT PIPE OR SUFFICIENT LENGTH, ETC.) ATC DID NOT ANALYZE ANTENNA MOUNT TO DETERMINE ADEQUATE STRUCTURAL CAPACITY FOR ANY LESSEE LOADING.
3. ALL PROPOSED EQUIPMENT INCLUDING ANTENNAS, COAX, ETC. SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS ON FILE WITH THE ATC CM.
4. CONFIRM SPACING OF PROPOSED EQUIPMENT 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).
6. CABLE LENGTHS SHOWN ESTIMATE MAXIMUM TYPICAL RUN AND INCORPORATE A 15% SAFETY FACTOR.

**PROPOSED ANTENNA AND RF EQUIPMENT SCHEDULE**

| LOCATION | | | ANTENNA SUMMARY | | | | NON ANTENNA SUMMARY | | |
|---|---|---|---|---|---|---|---|---|---|
| SECTOR | RAD | AZ | POS | BAND | MODEL NUMBER | STATUS | POS | MODEL NUMBER | STATUS |
| D1 | 163' | 70° | 1 | - | - | - | 1 | - | - |
| | | | 2 | LTE 700/850/PCS/AWS | (2) JAHH-65B-R3B | ADD | 2 | B5/B13 RRH-BR04C | ADD |
| | | | 3 | - | - | - | 3 | B2/B66A RRH-BR049 | ADD |
| | | | 4 | - | - | - | 4 | - | - |
| | | | - | - | - | - | - | - | - |
| D2 | 163' | 190° | 1 | - | - | - | 1 | - | - |
| | | | 2 | LTE 700/850/PCS/AWS | (2) JAHH-65B-R3B | ADD | 2 | B5/B13 RRH-BR04C | ADD |
| | | | 3 | - | - | - | 3 | B2/B66A RRH-BR049 | ADD |
| | | | 4 | - | - | - | 4 | - | - |
| | | | - | - | - | - | - | - | - |
| D3 | 163' | 310° | 1 | - | - | - | 1 | - | - |
| | | | 2 | LTE 700/850/PCS/AWS | (2) JAHH-65B-R3B | ADD | 2 | B5/B13 RRH-BR04C | ADD |
| | | | 3 | - | - | - | 3 | B2/B66A RRH-BR049 | ADD |
| | | | 4 | - | - | - | 4 | - | - |
| | | | - | - | - | - | - | - | - |

**PROPOSED FIBER DISTRIBUTION / OVP BOX**

| LOCATION | POS | BAND | MODEL NUMBER | STATUS |
|---|---|---|---|---|
| TOWER | – | – | (1) DB-B1-6C-12AB-0Z | RMN |
| - | - | - | (1) DB-B1-6C-12AB-0Z | ADD |

**PROPOSED CABLING SUMMARY**

| COAX | HYBRID | STATUS |
|---|---|---|
| – | (1) 1-5/8" | RMN |
| - | (1) 1-5/8" | ADD |

**STATUS ABBREVIATIONS**

RMV: TO BE REMOVED
RMN: TO REMAIN
REL: TO BE RELOCATED
DSC: TO BE DISCONNECTED AND TO REMAIN

**CABLE LENGTHS FOR FOR FIBER AND DC JUMPERS**

FROM FIBER DISTRIBUTION / OVP BOX TO RRU: 15' JUMPERS
FROM RRU TO ANTENNA: 10' JUMPERS

3 ANTENNA AND RF EQUIPMENT SCHEDULES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PHONE: (919) 468-0112
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| REV. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| 0 | FOR CONSTRUCTION | JMB | 12/03/18 |
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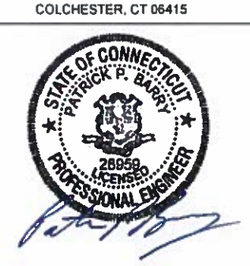
ATC SITE NUMBER:
302465

ATC SITE NAME:
COLCHESTER CT 6

SITE ADDRESS:
355 ROUTE 85
COLCHESTER, CT 06415

SEAL:

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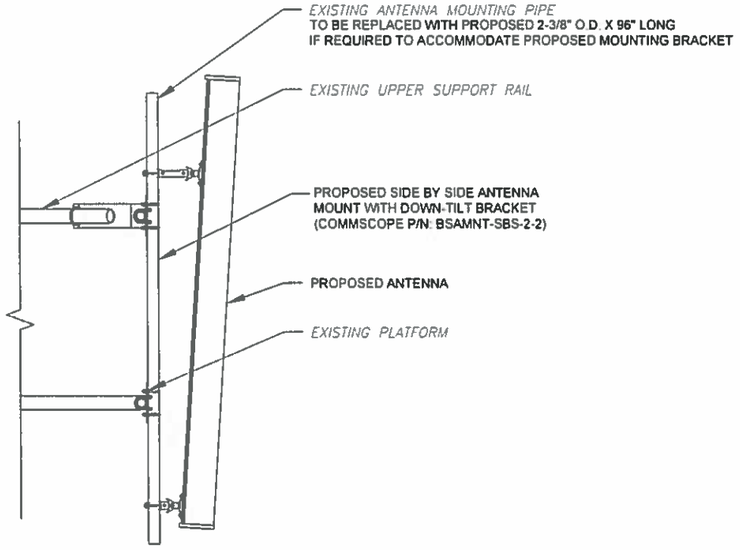
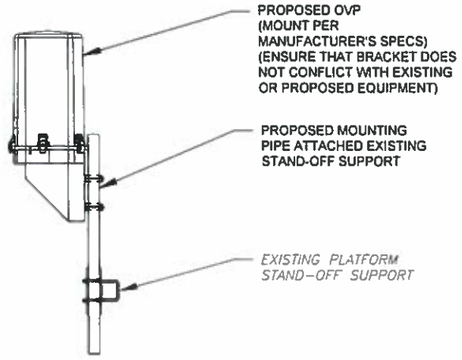
|---|---|
| DRAWN BY: | JMB |
| APPROVED BY: | SRF |
| DATE DRAWN: | 12/03/18 |
| ATC JOB NO: | 12623728 |
| CUSTOMER ID: | COLCHESTER S 2 CT |
| CUSTOMER #: | 468035 |

RF SCHEDULE AND ANTENNA INSTALLATION

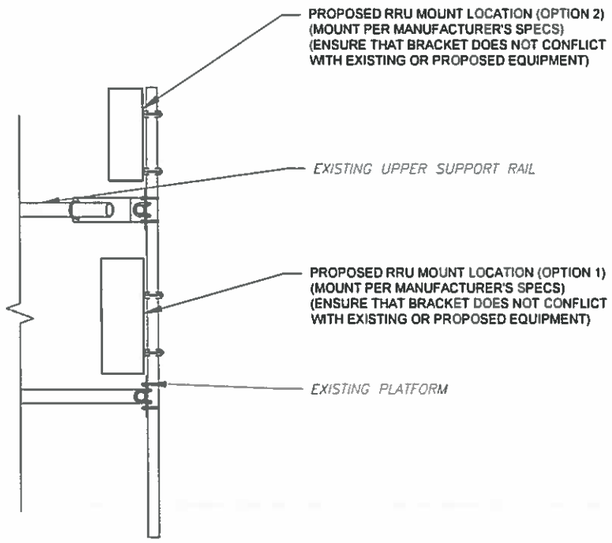
| SHEET NUMBER: | REVISION: |
|---|---|
| C-501 | 0 |



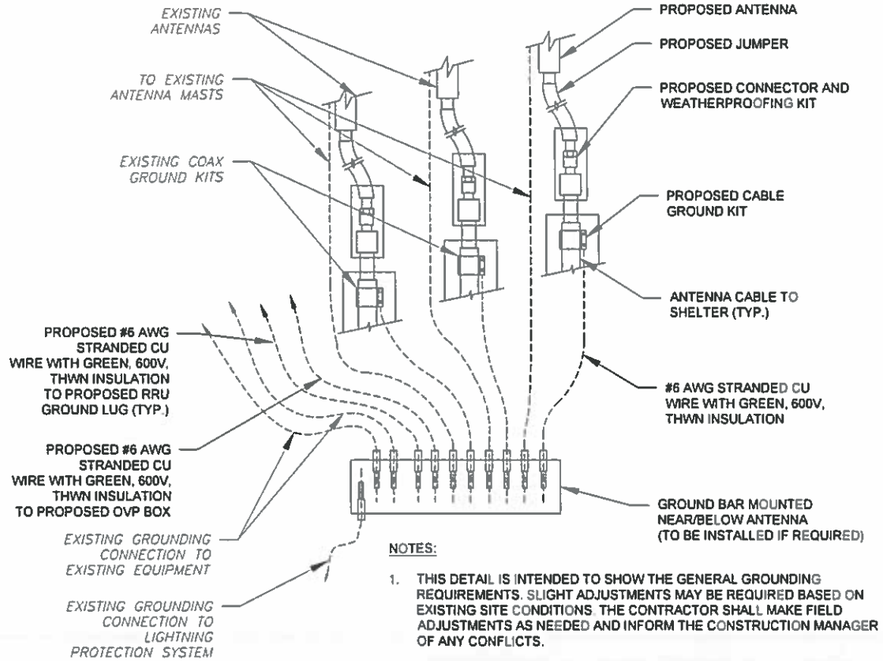

1 PROPOSED ANTENNA MOUNTING DETAIL - TYPICAL
SCALE: NOT TO SCALE




2 PROPOSED OVP MOUNTING
SCALE: NOT TO SCALE




3 PROPOSED RRU MOUNTING DETAIL - TYPICAL
SCALE: NOT TO SCALE




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 VERIZON WIRELESS GROUNDING STANDARDS, LATEST EDITION, AND COMPLY WITH VERIZON WIRELESS GROUNDING CHECKLIST, LATEST VERSION. WHEN NATIONAL AND LOCAL GROUNDING CODES ARE MORE STRINGENT THEY SHALL GOVERN.

4 TYPICAL ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

AMERICAN TOWER®
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CARY, NC 27518
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| REV. | DESCRIPTION | BY | DATE |
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ATC SITE NUMBER:
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COLCHESTER CT 6

SITE ADDRESS:
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| CUSTOMER ID: | COLCHESTER S 2 CT |
| CUSTOMER #: | 468035 |

CONSTRUCTION DETAILS

| SHEET NUMBER: | REVISION: |
|---|---|
| C-502 | 0 |