

October 7, 2015

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

RE: Notice of Exempt Modification  
58A Montano Road  
Glastonbury, CT 06033  
N 41.69944  
W -72.56400  
T-Mobile Site #: CTHA083C\_L700

Members of the Siting Council:

On behalf of T-Mobile, SBA Communications is submitting an exempt modification application to the Connecticut Siting council for modification of existing equipment at a tower facility located at 58A Montano Road, Glastonbury, CT.

The 58A Montano Road facility consists of a 119' Monopole Tower owned and operated by SBA Towers II, LLC. In order to accommodate technological changes and enhance system performance in the State of Connecticut, T-Mobile plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the chief elected official of the municipality in which the affected cell site is located, Richard Johnson Town Manager of Glastonbury, as well as the property owner, Rose Marie Shaw.

As part of T-Mobile's L700 project, T-Mobile desires to upgrade their equipment to meet the new standards of 4G technology. The new equipment will allow customers to download files and browse the internet at a high rate of speed while also allowing their phones to be compatible with the latest 4G technology.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in T-Mobile's operations at the site along with the required fee of \$625.

The changes to the facility do not constitute modifications as defined in Connecticut General Statutes (“C.G.S.”) Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The overall height of the structure will be unaffected.
2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound other than the new equipment cabinets.
3. The proposed changes will not increase the noise level at the existing facility by six decibels or more.
4. The changes in radio frequency power density will not increase the calculated “worst case” power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons, SBA Communications on behalf of T-Mobile, respectfully submits that he proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at 508.251.0720 x 3804 with any questions you may have concerning this matter.

Thank you,



Kri Pelletier  
SBA Communications Corporation  
33 Boston Post Road West Suite 320  
Marlborough, MA 01752  
508-251-0720 x 3804 + T  
508-251-1755 + F  
203-446-7700 + C  
[kpelletier@sbsite.com](mailto:kpelletier@sbsite.com)



# T-Mobile

## Equipment Modification

58A Montano Road, Glastonbury, CT 06033  
Site number CTHA083C\_L700

**Tower Owner:** SBA Towers II, LLC

**Equipment Configuration:** Monopole

### Current and/or approved:

- (3) Ericsson - AIR 21 B2A B4P - Panel
- (3) Ericsson - AIR 21 B4A B2P - Panel
- (3) Ericsson - KRY 112 144/1 - TMA/TTA
- (12) 1-5/8" Feedlines
- (1) 1-5/8" Fiber

### Final Configuration:

- (3) Ericsson - AIR 21 B2A B4P - Panel
- (3) Ericsson - AIR 21 B4A B2P - Panel
- (3) Commscope - LNX-6515DS-A1M - Panel
- (3) Ericsson - KRY 112 144/1 - TMA/TTA
- (3) Ericsson - S11B12 - RRU
- (12) 1-5/8" lines
- (1) 1-5/8" Fiber

### Structural Information:

The attached structural analysis demonstrates that the tower and foundation will have adequate structural capacity to accommodate the proposed modifications.

### Power Density:

The anticipated Maximum Composite contributions from the T-Mobile facility are 3.26% of the allowable FCC established general public limit. The anticipated composite MPE value for this site assuming all carriers present is 6.03% of the allowable FCC established general public limit sampled at the ground level.

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	3.26 %
Clearwire	0.15 %
AT&T	2.62 %
<b>Site Total MPE %:</b>	<b>6.03 %</b>





October 7, 2015

Mr. Richard Johnson  
Town Manager  
Town of Glastonbury  
2155 Main Street  
Glastonbury, CT 06033

RE: Telecommunications Facility @ 58A Montano Road, Glastonbury, CT

Dear Mr. Johnson,

In order to accommodate technological changes and enhance system performance in the State of Connecticut, T-Mobile will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies (R.C.S.A.) Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review T-Mobile's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter to the Siting Council fully describes T-Mobile's proposal for the referenced cell site. However, if you have any questions or require any further information on our plans or the Siting Council's procedures, please call me at 508.251.0720 x 3804.

Thank you,

Kri Pelletier  
SBA Communications Company  
33 Boston Post Road West Suite 320  
Marlborough, MA 01752  
508-251-0720 x 3804 + T  
508-251-1755 + F  
203-446-7700 + C  
[kpelletier@sbsite.com](mailto:kpelletier@sbsite.com)



October 7, 2015

Ms. Rose Marie Shaw  
58 Montano Road  
Glastonbury CT 06033

RE: Telecommunications Facility @ 58A Montano Road, Glastonbury, CT

Dear Ms. Shaw:

In order to accommodate technological changes and enhance system performance in the State of Connecticut, T-Mobile will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies (R.C.S.A.) Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review T-Mobile's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter to the Siting Council fully describes T-Mobile's proposal for the referenced cell site. However, if you have any questions or require any further information on our plans or the Siting Council's procedures, please call me at 508.251.0720 x 3804.

Thank you,

A handwritten signature in blue ink, appearing to read "Kri Pelletier", is positioned below the "Thank you," text.

Kri Pelletier  
SBA Communications Company  
33 Boston Post Road West Suite 320  
Marlborough, MA 01752  
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RADIO FREQUENCY EMISSIONS ANALYSIS REPORT  
EVALUATION OF HUMAN EXPOSURE POTENTIAL  
TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CTHA083C

HA083/ Opta-Montano Rd FT  
58 Montano Road  
Glastonbury, CT 06033

**October 6, 2015**

**EBI Project Number: 6215005004**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general public allowable limit:	<b>6.03 %</b>

October 6, 2015

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

Emissions Analysis for Site: **CTHA083C – HA083/ Opta-Montano Rd FT**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **58 Montano Road, Glastonbury, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

## **CALCULATIONS**

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **58 Montano Road, Glastonbury, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

- 1) 2 GSM / UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel
- 2) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 4) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.
- 5) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.



- 6) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 7) The antennas used in this modeling are the **Ericsson AIR21 (B4A/B2P & B2A/B4P)** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 (B4A/B2P & B2A/B4P)** have a maximum gain of **15.9 dBd** at their main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 8) The antenna mounting height centerline of the proposed antennas is **117 feet** above ground level (AGL).
- 9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

### T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	117	Height (AGL):	117	Height (AGL):	117
Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	1.36	Antenna B1 MPE%	1.36	Antenna C1 MPE%	1.36
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B2A/B4P□	Make / Model:	Ericsson AIR21 B2A/B4P□	Make / Model:	Ericsson AIR21 B2A/B4P□
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	117	Height (AGL):	117	Height (AGL):	117
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	1.36	Antenna B2 MPE%	1.36	Antenna C2 MPE%	1.36
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	117	Height (AGL):	117	Height (AGL):	117
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.54	Antenna B3 MPE%	0.54	Antenna C3 MPE%	0.54

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	3.26 %
Clearwire	0.15 %
AT&T	2.62 %
<b>Site Total MPE %:</b>	<b>6.03 %</b>

T-Mobile Sector 1 Total:	3.26 %
T-Mobile Sector 2 Total:	3.26 %
T-Mobile Sector 3 Total:	3.26 %
<b>Site Total:</b>	<b>6.03 %</b>

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm <sup>2</sup> )	Frequency (MHz)	Allowable MPE (μW/cm <sup>2</sup> )	Calculated % MPE
T-Mobile 2100 MHz (AWS) LTE	2	2334.27	117	13.62	2100	1000	1.36 %
T-Mobile 700 MHz LTE	1	865.21	117	2.52	700	467	0.54 %
T-Mobile 1900 MHz (PCS) GSM/UMTS	2	1167.14	117	6.81	1900	1000	0.68 %
T-Mobile 2100 MHz (AWS) UMTS	2	1167.14	117	6.81	2100	1000	0.68 %
						<b>Total:</b>	<b>3.26%</b>

## Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector 1:	3.26 %
Sector 2:	3.26 %
Sector 3 :	3.26 %
T-Mobile Per Sector Maximum:	3.26 %
Site Total:	6.03 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **6.03%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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



**Scott Heffernan**  
RF Engineering Director

**EBI Consulting**  
21 B Street  
Burlington, MA 01803



**Tower Engineering Solutions**

Phone (972) 483-0607, Fax (972) 975-9615  
8445 Freepoint Parkway, Suite 375, Irving, Texas 75063

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**Structural Analysis Report**

**Existing 119 ft SABRE Monopole**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT13555-S**

**Customer Site Name: Montano**

**Carrier Name: T-Mobile**

**Carrier Site Number: CTHA083C**

**Carrier Site Name: N/A**

**Site Location: 58A Montano Road**

**Glastonbury, Connecticut**

**Hartford County**

**Latitude: 41.699444**

**Longitude: -72.564000**

**Analysis Result:**

**Max Structural Usage: 50.1% [Pass]**

**Max Foundation Usage: 56% [Pass]**

**Report Prepared By : Jarryd Tibbetts**





## Introduction

The purpose of this report is to summarize the analysis results on the 119 ft SABRE Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

## Sources of Information

<b>Tower Drawings</b>	Tower Drawing prepared by Sabre, Job #09-11137 dated 11/19/08
<b>Foundation Drawing</b>	Foundation Drawing prepared by Sabre, Job #09-11137 dated 11/19/08
<b>Geotechnical Report</b>	Geotechnical Report prepared by TES, Project #082695.01 dated 10/27/08
<b>Modification Drawings</b>	N/A

## Analysis Criteria

The analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-F. In accordance with this standard, the structure was analyzed using **TESPoles**, a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

<b>Basic Wind Speed Used in the Analysis:</b>	80.0 mph (Fastest mile)
<b>Basic Wind Speed with Ice:</b>	69 mph (Fastest mile) with 1/2" radial ice concurrent
<b>Operational Wind Speed:</b>	50 mph + 0" Radial ice
<b>Standard/Codes:</b>	ANSI/TIA/EIA 222-F / 2005 Connecticut State Building Code

## Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	117.0	3	Ericsson - AIR 21 B2A B4P - Panel	Low Profile Platform	(12) 1 5/8" (1) 1 5/8" Fiber	T-Mobile
2		3	Ericsson - AIR 21 B4A B2P - Panel			
4		3	Ericsson - KRY 112 144/1 - TMA/TTA			
6	110.0	3	Argus - LLPX310R - Panel	Pipe Mounts	(2) 1/2" (3) 1/4" (3) 5/8"	Clearwire
7		1	Andrew - VHLP2-18 - Dish			
8		1	Andrew - VHLP2.5-18 - Dish			
9	100.0	4	Raycap - DC6-48-60-18-8F - Squid	Platform w/ Hand Rail	(2) 1/2" Fiber (8) 3/4" DC (3) 3/8" RET	New Cingular
10		12	CCI - HPA-65R-BUU-H8 - Panel			
11		3	Ericsson - RRU E2 - RRU			
12		3	Ericsson - RRU-32 - RRU			
13		9	Ericsson - RRUS 11 - RRU			
14		6	Ericsson - RRUS 12 - RRU			
15		6	Ericsson - RRUS A2 - RRU			
16	90.0	3	Alcatel Lucent - B13 RRH4x30 - RRH	Low Profile Platform	(2) 1 5/8" Hybrid	Verizon
17		2	RFS - DB-T1-6Z-8AB-0Z - ODU			
18		6	Andrew - HBXX-6517DS-A2M - Panel			
19		6	Andrew - LNX-6514DS-A1M - Panel			
20		3	Alcatel Lucent - RRH2X60-AWS - RRH			
21		3	Alcatel Lucent - RRH2x60-PCS - RRH			

## Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	117.0	3	Ericsson - AIR 21 B2A B4P - Panel	Platform w/ Hand Rail	(12) 1 5/8" (1) 1 5/8" Fiber	T-Mobile
2		3	Ericsson - AIR 21 B4A B2P - Panel			
3		3	Commscope - LNX-6515DS-A1M - Panel			
4		3	Ericsson - KRY 112 144/1 - TMA/TTA			
5		3	Ericsson - S11B12 - RRU			

All transmission lines are considered running inside of the pole shafts.

## **Analysis Results**

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	<b>50.1%</b>	<b>47.9%</b>	<b>42.4%</b>
Pass/Fail	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>

## **Foundations**

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Original Design Reactions	5405.0	52.8	60.8
Analysis Reactions	2494.8	28.1	41.6
% of Design Reactions	46.2%	53.1%	68.5%

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

### **Operational Condition (Rigidity):**

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-F for the installed antennas. Maximum twist/sway at the elevation of the proposed equipment is 0.7331 degrees under the operational wind speed as specified in the Analysis Criteria.

### **Conclusions**

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the ANSI/TIA/EIA 222-F Standard under the design basic wind speed as specified in the Analysis Criteria.



## Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC**. Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.
2. The analysis is based on the presumption that the tower members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.
3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion.
4. An initial tension of 10% of the break strength on all the existing guy wires was assumed in all the structural analyses of guyed towers unless different values were provided by the client. **TES** cannot take responsibility for the deviations in the analysis results because of differences in the initial tension forces of the existing guy wires.
5. Secondary component or connection secondary components, welds and bolts are assumed to be able to carry their intended original design loads. **TES** cannot take responsibility for verification of the adequacy on the connections, bolts and welds present in the structure.
6. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed or/and ice loads are different from the minimum values recommended by the EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.
7. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.
8. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.
9. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

## Usage Diagram - Max Stress 50.1% at 0.0ft

**Structure:** CT13555-S-SBA  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69

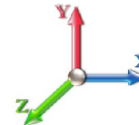
9/29/2015



Page: 1

**Dead Load Factor:** 1.00  
**Wind Load Factor:** 1.00

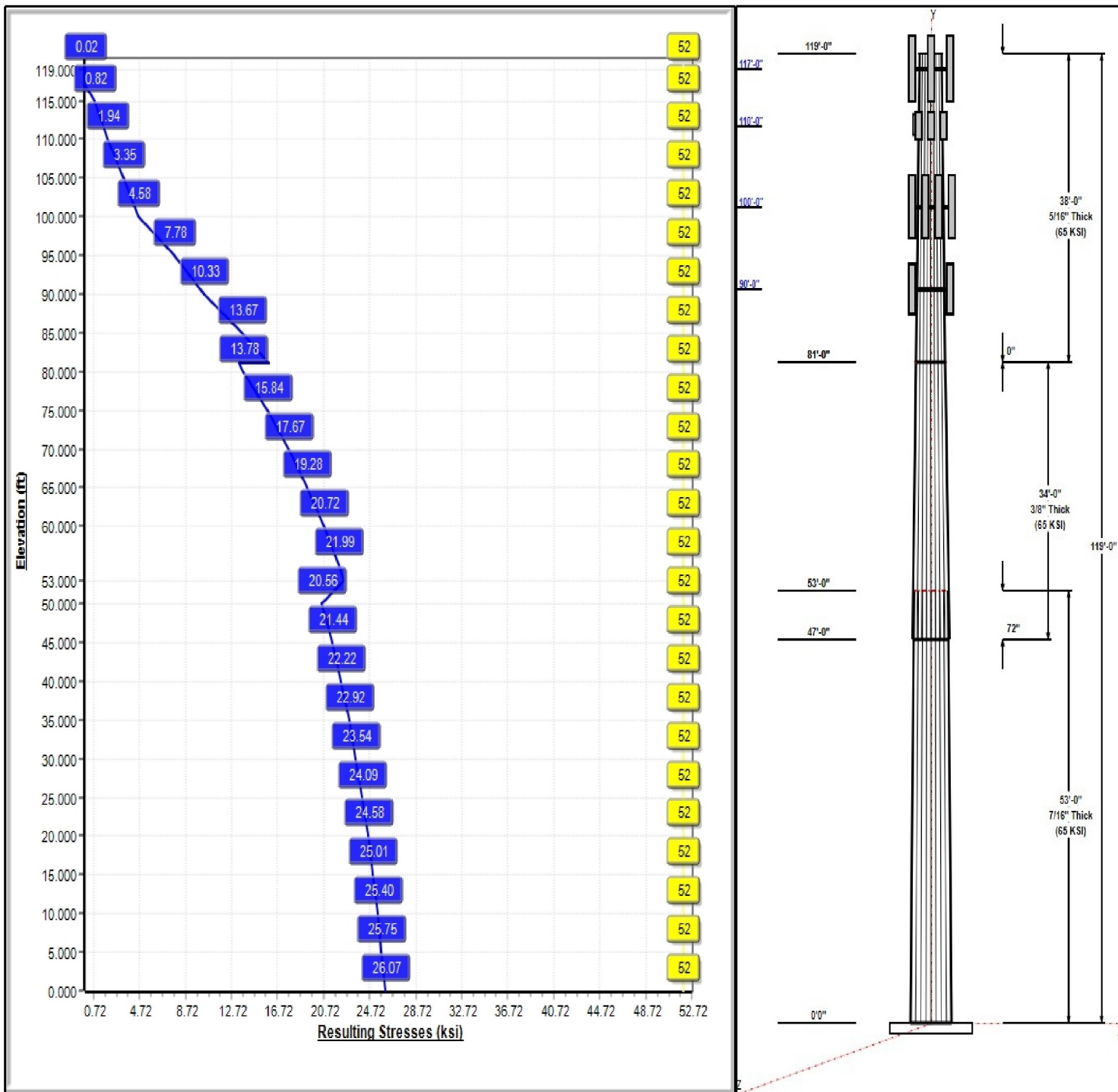
**Load Case : 80 mph Wind with 0 in Ice**



**Iterations:** 18

52 Allowable Stress  
26 Resulting Stress

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## Structure: CT13555-S-SBA

**Type:** Tapered  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.26403

9/29/2015

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### Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	53.00	44.82	58.81	0.438		0.26403	65
2	34.00	38.17	47.15	0.375	Slip	0.26403	65
3	38.00	28.14	38.17	0.313	Butt	0.26403	65

### Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
117.00	117.00	1	6' Lightning rod	
117.00	117.00	3	AIR 21 B2A B4P	T-Mobile
117.00	117.00	3	AIR 21 B4A B2P	T-Mobile
117.00	117.00	3	KRY 112 144/1	T-Mobile
117.00	117.00	3	LNx-6515DS-A1M	T-Mobile
117.00	117.00	1	Platform w/ Hand Rail	T-Mobile
117.00	117.00	3	S11B12	T-Mobile
110.00	110.00	1	Flush Mount	Clearwire
110.00	110.00	3	LLPX310R	Clearwire
110.00	110.00	1	VHLP2-18	Clearwire
110.00	110.00	1	VHLP2.5-18	Clearwire
100.00	100.00	4	DC6-48-60-18-8F	New Cingular
100.00	100.00	12	HPA-65R-BUU-H8	New Cingular
100.00	100.00	1	Platform w/ Hand Rail	New Cingular
100.00	100.00	3	RRU E2	New Cingular
100.00	100.00	3	RRU-32	New Cingular
100.00	100.00	9	RRUS 11	New Cingular
100.00	100.00	6	RRUS 12	New Cingular
100.00	100.00	6	RRUS A2	New Cingular
90.00	90.00	3	B13 RRH4x30	Verizon
90.00	90.00	2	DB-T1-6Z-8AB-0Z	Verizon
90.00	90.00	6	HBXX-6517DS-A2M	Verizon
90.00	90.00	6	LNx-6514DS-A1M	Verizon
90.00	90.00	1	Low Profile Platform	Verizon
90.00	90.00	3	RRH2X60-AWS	Verizon
90.00	90.00	3	RRH2x60-PCS	Verizon

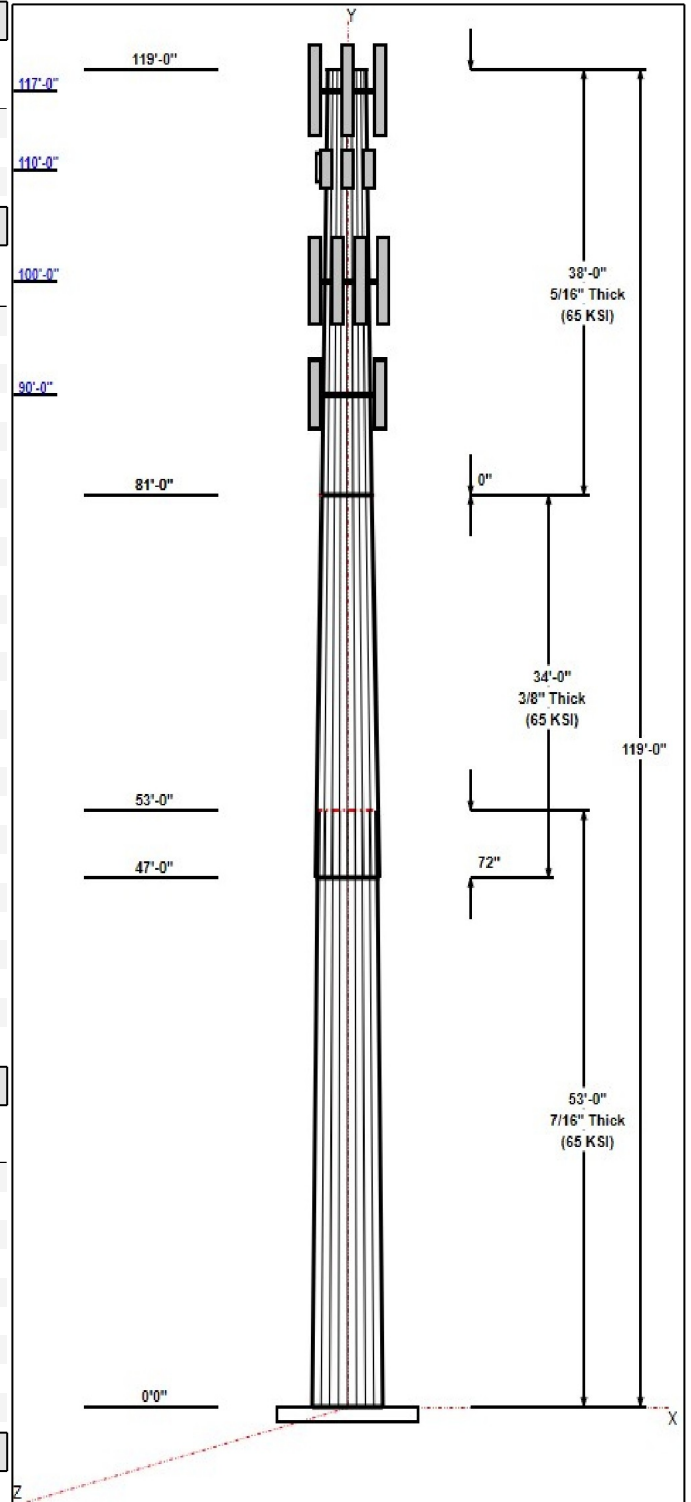
### Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	117.00	Inside	1 5/8" Coax	T-Mobile
0.00	117.00	Inside	1 5/8" Hybrid Cable	T-Mobile
0.00	110.00	Inside	1/2" Coax	Clearwire
0.00	110.00	Inside	1/4" Coax	Clearwire
0.00	110.00	Inside	5/8" Hybrid Cable	Clearwire
0.00	100.00	Inside	1/2" Coax	New Cingular
0.00	100.00	Inside	3/4" DC	New Cingular
0.00	100.00	Inside	3/8" Fiber	New Cingular
0.00	90.00	Inside	1 5/8" Hybrid Cable	Verizon

### Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
20	2.25" 18J	75.0	Cluster

### Base Plate



**Structure: CT13555-S-SBA**

**Type:** Tapered  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.26403

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Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
3.2500	66.0	50.0	Clipped

**Reactions**

Load Case	Moment	Shear	Axial
80 mph Wind with 0" Ice	2494.8	28.1	34.1
69.28 mph Wind with 0.5" Ice	2023.0	22.5	41.6
50 mph Wind with 0" Ice	974.7	11.0	34.1



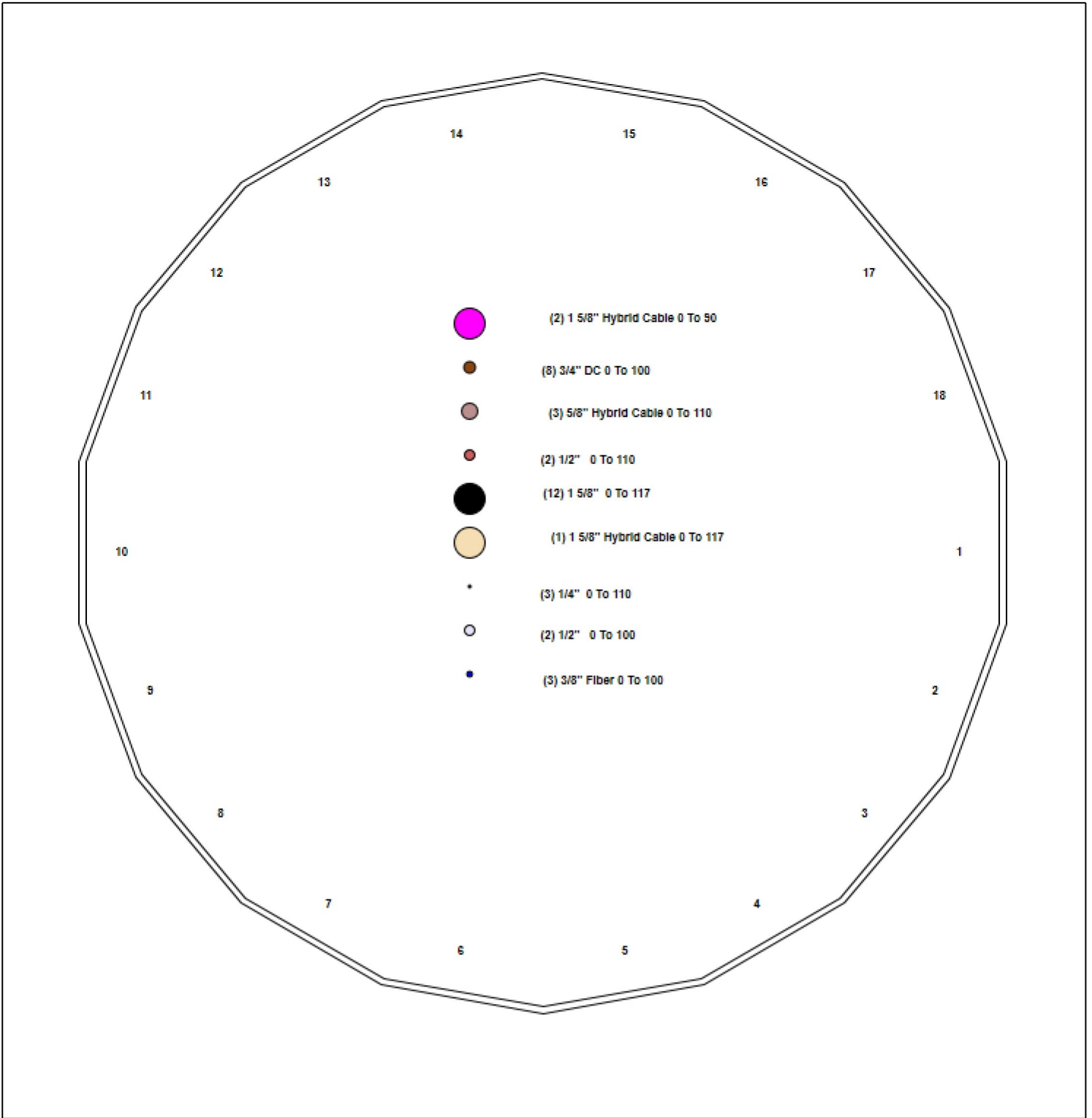
# Structure: CT13555-S-SBA - Coax Line Placement

Type: Monopole  
Site Name: Montano  
Height: 119.00 (ft)

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## Shaft Properties

**Structure:** CT13555-S-SBA  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	53.000	0.4375	65		0.00	12,866
2	18	34.000	0.3750	65	Slip	72.00	5,823
3	18	38.000	0.3125	65	Flange	0.00	4,212
<b>Total Shaft Weight:</b>							<b>22,901</b>

### Bottom

### Top

Sec. No.	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Taper
1	58.81	0.00	81.05	34893.72	22.29	134.4	44.82	53.00	61.62	15333.6	16.65	102.4	0.264034
2	47.15	47.00	55.67	15389.65	20.75	125.7	38.17	81.00	44.99	8120.67	16.53	101.7	0.264034
3	38.17	81.00	37.55	6800.85	20.12	122.1	28.14	119.0	27.60	2700.33	14.46	90.04	0.264034

## Loading Summary

**Structure:** CT13555-S-SBA  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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### Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
1	117.0	6' Lightning rod	1	6.50	0.38	1.00	11.80	0.980	1.00	0.00	0.00
2	117.0	AIR 21 B2A B4P	3	91.50	6.52	0.83	129.20	6.970	0.83	0.00	0.00
3	117.0	AIR 21 B4A B2P	3	90.30	6.52	0.83	128.10	6.970	0.83	0.00	0.00
4	117.0	KRY 112 144/1	3	11.00	0.41	0.72	14.10	0.550	0.75	0.00	0.00
5	117.0	LNx-6515DS-A1M	3	50.30	11.45	0.84	115.60	12.34	0.84	0.00	0.00
6	117.0	Platform w/ Hand Rail	1	1600.00	32.00	1.00	2200.00	40.00	1.00	0.00	0.00
7	117.0	S11B12	3	51.00	3.31	0.71	67.10	3.520	0.72	0.00	0.00
8	110.0	Flush Mount	1	350.00	5.00	1.00	450.00	6.000	1.00	0.00	0.00
9	110.0	LLPX310R	3	28.60	4.83	0.75	54.50	5.360	0.77	0.00	0.00
10	110.0	VHLP2-18	1	27.00	4.68	1.00	55.00	5.050	1.00	0.00	0.00
11	110.0	VHLP2.5-18	1	47.60	8.43	1.00	97.00	8.920	1.00	0.00	0.00
12	100.0	DC6-48-60-18-8F	4	31.80	1.47	1.00	49.50	1.670	1.00	0.00	0.00
13	100.0	HPA-65R-BUU-H8	12	68.00	13.30	0.80	137.00	13.90	0.82	0.00	0.00
14	100.0	Platform w/ Hand Rail	1	1600.00	40.00	1.00	2200.00	40.00	1.00	0.00	0.00
15	100.0	RRU E2	3	21.20	1.86	0.62	31.40	2.150	0.64	0.00	0.00
16	100.0	RRU-32	3	77.00	3.87	0.87	103.50	4.300	0.88	0.00	0.00
17	100.0	RRUS 11	9	50.70	2.94	0.76	66.00	3.140	0.78	0.00	0.00
18	100.0	RRUS 12	6	57.30	3.27	0.70	73.00	3.480	0.72	0.00	0.00
19	100.0	RRUS A2	6	21.20	1.86	0.62	31.40	2.150	0.64	0.00	0.00
20	90.00	B13 RRH4x30	3	57.20	2.52	0.88	72.45	2.710	0.88	0.00	0.00
21	90.00	DB-T1-6Z-8AB-0Z	2	44.00	5.60	1.00	71.06	5.870	1.00	0.00	0.00
22	90.00	HBXX-6517DS-A2M	6	47.00	8.74	0.80	93.81	9.230	0.80	0.00	0.00
23	90.00	LNx-6514DS-A1M	6	38.80	8.41	0.82	85.41	8.890	0.82	0.00	0.00
24	90.00	Low Profile Platform	1	1500.00	25.00	1.00	1800.00	27.00	1.00	0.00	0.00
25	90.00	RRH2X60-AWS	3	55.00	3.78	0.77	75.35	4.050	0.78	0.00	0.00
26	90.00	RRH2x60-PCS	3	55.00	2.35	0.78	67.79	2.530	0.79	0.00	0.00
<b>Totals:</b>			<b>91</b>	<b>9,368.70</b>			<b>13,670.91</b>				

### Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	No Ice		Ice		Exposed
			Weight (lb/ft)	CaAa (sf/ft)	Weight (lb/ft)	CaAa (sf/ft)	
0.00	117.0	(12) 1 5/8" Coax	1.04	0.00	0.00	0.00	Inside
0.00	117.0	(1) 1 5/8" Hybrid Cable	3.30	0.00	0.00	0.00	Inside
0.00	110.0	(2) 1/2" Coax	0.16	0.00	0.00	0.00	Inside
0.00	110.0	(3) 1/4" Coax	0.04	0.00	0.00	0.00	Inside
0.00	110.0	(3) 5/8" Hybrid Cable	1.56	0.00	0.00	0.00	Inside
0.00	100.0	(2) 1/2" Coax	0.48	0.00	0.00	0.00	Inside
0.00	100.0	(8) 3/4" DC	4.80	0.00	0.00	0.00	Inside
0.00	100.0	(3) 3/8" Fiber	0.48	0.00	0.00	0.00	Inside
0.00	90.00	(2) 1 5/8" Hybrid Cable	6.60	0.00	0.00	0.00	Inside
<b>Totals:</b>			<b>1,871.93</b>		<b>0.00</b>		

## Shaft Section Properties

**Structure:** CT13555-S-SBA  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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**Increment Length:** 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Weight (lb)
0.00		0.4375	58.810	81.055	34893.7	22.29	134.42	65	52	0.0
5.00		0.4375	57.490	79.221	32579.4	21.76	131.41	65	52	1363.5
10.00		0.4375	56.170	77.388	30369.7	21.23	128.39	65	52	1332.3
15.00		0.4375	54.849	75.555	28262.2	20.70	125.37	65	52	1301.1
20.00		0.4375	53.529	73.722	26254.6	20.16	122.35	65	52	1269.9
25.00		0.4375	52.209	71.889	24344.4	19.63	119.34	65	52	1238.7
30.00		0.4375	50.889	70.056	22529.1	19.10	116.32	65	52	1207.5
35.00		0.4375	49.569	68.223	20806.4	18.57	113.30	65	52	1176.3
40.00		0.4375	48.249	66.389	19173.9	18.04	110.28	65	52	1145.1
45.00		0.4375	46.928	64.556	17629.0	17.50	107.27	65	52	1113.9
47.00	Bot - Section 2	0.4375	46.400	63.823	17035.1	17.29	106.06	65	52	436.8
50.00		0.4375	45.608	62.723	16169.5	16.97	104.25	65	52	1209.4
53.00	Top - Section 1	0.3750	45.566	53.787	13878.3	20.01	121.51	65	52	1188.6
55.00		0.3750	45.038	53.158	13397.5	19.77	120.10	65	52	363.9
60.00		0.3750	43.718	51.587	12244.2	19.15	116.58	65	52	891.1
65.00		0.3750	42.398	50.016	11159.1	18.53	113.06	65	52	864.3
70.00		0.3750	41.078	48.445	10140.1	17.90	109.54	65	52	837.6
75.00		0.3750	39.757	46.873	9185.1	17.28	106.02	65	52	810.9
80.00		0.3750	38.437	45.302	8292.0	16.66	102.50	65	52	784.1
81.00	Top - Section 2	0.0000	0.000	0.000	0.0	NAN	NAN	0	0	153.6
81.00	Bot - Section 3	0.3750	38.173	44.988	8120.7	16.54	101.80	65	52	
85.00		0.3125	37.117	36.504	6247.4	19.53	118.77	65	52	504.0
90.00		0.3125	35.797	35.195	5599.0	18.79	114.55	65	52	609.9
95.00		0.3125	34.477	33.886	4997.0	18.04	110.33	65	52	587.7
100.00		0.3125	33.157	32.576	4439.8	17.30	106.10	65	52	565.4
105.00		0.3125	31.836	31.267	3925.7	16.55	101.88	65	52	543.1
110.00		0.3125	30.516	29.957	3452.9	15.81	97.65	65	52	520.8
115.00		0.3125	29.196	28.648	3019.6	15.06	93.43	65	52	498.6
117.00		0.3125	28.668	28.124	2857.0	14.77	91.74	65	52	193.2
119.00		0.3125	28.140	27.600	2700.3	14.47	90.05	65	52	189.6
										<b>22901.0</b>



## Wind Loading - Shaft

**Structure:** CT13555-S-SBA  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

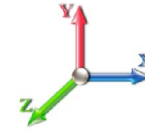
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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**Load Case:** 80 mph Wind with 0" Ice

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations:** 18

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		0.00	1.00	16.384	27.69	392.07	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	16.384	27.69	383.27	0.650	0.000	5.00	24.229	15.75	436.1	0.0	1363.5
10.00		0.00	1.00	16.384	27.69	374.46	0.650	0.000	5.00	23.679	15.39	426.2	0.0	1332.3
15.00		0.00	1.00	16.384	27.69	365.66	0.650	0.000	5.00	23.129	15.03	416.3	0.0	1301.1
20.00		0.00	1.00	16.384	27.69	356.86	0.650	0.000	5.00	22.579	14.68	406.4	0.0	1269.9
25.00		0.00	1.00	16.384	27.69	348.06	0.650	0.000	5.00	22.029	14.32	396.5	0.0	1238.7
30.00		0.00	1.00	16.384	27.69	339.26	0.650	0.000	5.00	21.479	13.96	386.6	0.0	1207.5
35.00		0.00	1.02	16.662	28.16	333.25	0.650	0.000	5.00	20.929	13.60	383.1	0.0	1176.3
40.00		0.00	1.06	17.310	29.25	330.62	0.650	0.000	5.00	20.379	13.25	387.5	0.0	1145.1
45.00		0.00	1.09	17.902	30.25	327.03	0.650	0.000	5.00	19.829	12.89	389.9	0.0	1113.9
47.00	Bot - Section 2	0.00	1.11	18.126	30.63	325.37	0.650	0.000	2.00	7.777	5.06	154.9	0.0	436.8
50.00		0.00	1.13	18.449	31.18	322.65	0.650	0.000	3.00	11.689	7.60	236.9	0.0	1209.4
53.00	Top - Section 1	0.00	1.14	18.759	31.70	319.70	0.650	0.000	3.00	11.491	7.47	236.8	0.0	1188.6
55.00		0.00	1.16	18.959	32.04	322.98	0.650	0.000	2.00	7.550	4.91	157.2	0.0	363.9
60.00		0.00	1.19	19.436	32.85	317.44	0.650	0.000	5.00	18.491	12.02	394.8	0.0	891.1
65.00		0.00	1.21	19.885	33.61	311.39	0.650	0.000	5.00	17.941	11.66	391.9	0.0	864.3
70.00		0.00	1.24	20.311	34.33	304.91	0.650	0.000	5.00	17.391	11.30	388.0	0.0	837.6
75.00		0.00	1.26	20.715	35.01	298.03	0.650	0.000	5.00	16.841	10.95	383.2	0.0	810.9
80.00		0.00	1.29	21.101	35.66	290.80	0.650	0.000	5.00	16.291	10.59	377.6	0.0	784.1
81.00	Top - Section 2	0.00	1.29	21.176	35.79	289.32	0.650	0.000	1.00	3.192	2.07	74.3	0.0	153.6
85.00		0.00	1.31	21.469	36.28	283.26	0.650	0.000	4.00	12.548	8.16	295.9	0.0	504.0
90.00	Appurtenance(s)	0.00	1.33	21.823	36.88	275.42	0.650	0.000	5.00	15.190	9.87	364.2	0.0	609.9
95.00		0.00	1.35	22.163	37.45	267.32	0.650	0.000	5.00	14.640	9.52	356.4	0.0	587.7
100.00	Appurtenance(s)	0.00	1.37	22.490	38.01	258.98	0.650	0.000	5.00	14.090	9.16	348.1	0.0	565.4
105.00		0.00	1.39	22.806	38.54	250.41	0.650	0.000	5.00	13.540	8.80	339.2	0.0	543.1
110.00	Appurtenance(s)	0.00	1.41	23.111	39.06	241.62	0.650	0.000	5.00	12.990	8.44	329.8	0.0	520.8
115.00		0.00	1.43	23.406	39.56	232.64	0.650	0.000	5.00	12.440	8.09	319.9	0.0	498.6
117.00	Appurtenance(s)	0.00	1.44	23.522	39.75	229.00	0.650	0.000	2.00	4.822	3.13	124.6	0.0	193.2
119.00		0.00	1.44	23.636	39.94	225.32	0.650	0.000	2.00	4.734	3.08	122.9	0.0	189.6
<b>Totals:</b>									<b>119.00</b>			<b>9,025.0</b>		<b>22,901.0</b>

## Discrete Appurtenance Forces

**Structure:** CT13555-S-SB  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

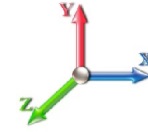
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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**Load Case:** 80 mph Wind with 0" Ice

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations:** 18

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	117.00	AIR 21 B4A B2P	3	23.522	39.752	0.83	16.16	270.90	0.000	0.000	642.25	0.00	0.00
2	117.00	6' Lightning rod	1	23.522	39.752	1.00	0.38	6.50	0.000	0.000	15.11	0.00	0.00
3	117.00	AIR 21 B2A B4P	3	23.522	39.752	0.83	16.16	274.50	0.000	0.000	642.25	0.00	0.00
4	117.00	S11B12	3	23.522	39.752	0.71	7.01	153.00	0.000	0.000	278.68	0.00	0.00
5	117.00	KRY 112 144/1	3	23.522	39.752	0.72	0.89	33.00	0.000	0.000	35.25	0.00	0.00
6	117.00	LNx-6515DS-A1M	3	23.522	39.752	0.84	28.72	150.90	0.000	0.000	1141.53	0.00	0.00
7	117.00	Platform w/ Hand Rail	1	23.522	39.752	1.00	32.00	1600.00	0.000	0.000	1272.05	0.00	0.00
8	110.00	VHLP2.5-18	1	23.111	39.057	1.00	8.43	47.60	0.000	0.000	329.25	0.00	0.00
9	110.00	VHLP2-18	1	23.111	39.057	1.00	4.68	27.00	0.000	0.000	182.79	0.00	0.00
10	110.00	LLPX310R	3	23.111	39.057	0.75	10.87	85.80	0.000	0.000	424.45	0.00	0.00
11	110.00	Flush Mount	1	23.111	39.057	1.00	5.00	350.00	0.000	0.000	195.29	0.00	0.00
12	100.00	RRUS A2	6	22.490	38.008	0.62	6.92	127.20	0.000	0.000	262.98	0.00	0.00
13	100.00	RRUS 12	6	22.490	38.008	0.70	13.73	343.80	0.000	0.000	522.00	0.00	0.00
14	100.00	RRUS 11	9	22.490	38.008	0.76	20.11	456.30	0.000	0.000	764.32	0.00	0.00
15	100.00	RRU E2	3	22.490	38.008	0.62	3.46	63.60	0.000	0.000	131.49	0.00	0.00
16	100.00	Platform w/ Hand Rail	1	22.490	38.008	1.00	40.00	1600.00	0.000	0.000	1520.32	0.00	0.00
17	100.00	HPA-65R-BUU-H8	12	22.490	38.008	0.80	127.68	816.00	0.000	0.000	4852.85	0.00	0.00
18	100.00	DC6-48-60-18-8F	4	22.490	38.008	1.00	5.88	127.20	0.000	0.000	223.49	0.00	0.00
19	100.00	RRU-32	3	22.490	38.008	0.87	10.10	231.00	0.000	0.000	383.91	0.00	0.00
20	90.00	HBXX-6517DS-A2M	6	21.823	36.881	0.80	41.95	282.00	0.000	0.000	1547.22	0.00	0.00
21	90.00	B13 RRH4x30	3	21.823	36.881	0.88	6.62	171.60	0.000	0.000	243.97	0.00	0.00
22	90.00	DB-T1-6Z-8AB-OZ	2	21.823	36.881	1.00	11.20	88.00	0.000	0.000	413.07	0.00	0.00
23	90.00	RRH2x60-PCS	3	21.823	36.881	0.78	5.52	165.00	0.000	0.000	203.59	0.00	0.00
24	90.00	LNx-6514DS-A1M	6	21.823	36.881	0.82	41.43	232.80	0.000	0.000	1527.89	0.00	0.00
25	90.00	Low Profile Platform	1	21.823	36.881	1.00	25.00	1500.00	0.000	0.000	922.02	0.00	0.00
26	90.00	RRH2X60-AWS	3	21.823	36.881	0.77	8.74	165.00	0.000	0.000	322.45	0.00	0.00
<b>Totals:</b>								<b>9,368.70</b>			<b>19,000.48</b>		

## Total Applied Force Summary

**Structure:** CT13555-S-SB  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

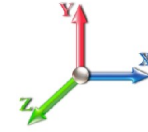
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

9/29/2015  
 Page: 10



**Load Case:** 80 mph Wind with 0" Ice

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations:** 18

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		436.07	1455.78	0.00	0.00
10.00		426.17	1424.60	0.00	0.00
15.00		416.27	1393.41	0.00	0.00
20.00		406.37	1362.22	0.00	0.00
25.00		396.47	1331.03	0.00	0.00
30.00		386.57	1299.84	0.00	0.00
35.00		383.06	1268.65	0.00	0.00
40.00		387.49	1237.46	0.00	0.00
45.00		389.94	1206.27	0.00	0.00
47.00		154.86	473.78	0.00	0.00
50.00		236.89	1264.82	0.00	0.00
53.00		236.78	1243.97	0.00	0.00
55.00		157.24	400.84	0.00	0.00
60.00		394.78	983.39	0.00	0.00
65.00		391.90	956.66	0.00	0.00
70.00		388.01	929.92	0.00	0.00
75.00		383.22	903.19	0.00	0.00
80.00		377.60	876.46	0.00	0.00
81.00		74.25	172.08	0.00	0.00
85.00		295.94	577.85	0.00	0.00
90.00	(24) appurtenances	5544.36	3306.67	0.00	0.00
95.00		356.43	646.99	0.00	0.00
100.00	(44) appurtenances	9009.47	4389.81	0.00	0.00
105.00		339.21	573.63	0.00	0.00
110.00	(6) appurtenances	1461.56	1061.75	0.00	0.00
115.00		319.86	520.25	0.00	0.00
117.00	(17) appurtenances	4151.73	2690.66	0.00	0.00
119.00		122.91	189.62	0.00	0.00
<b>Totals:</b>		<b>28,025.43</b>	<b>34,141.59</b>	<b>0.00</b>	<b>0.00</b>

## Resulting Forces and Deflections

**Structure:** CT13555-S-SB  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

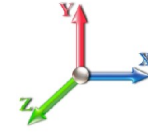
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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**Load Case:** 80 mph Wind with 0" Ice

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations:** 18

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-28.056	-34.116	0.000	0.000	0.000	-2494.8	0.000	0.000	0.000	0.000	0.000
5.00	-27.675	-32.613	0.000	0.000	0.000	-2354.5	-0.054	0.000	0.054	-0.099	0.000
10.00	-27.300	-31.142	0.000	0.000	0.000	-2216.1	-0.211	0.000	0.211	-0.199	0.000
15.00	-26.930	-29.703	0.000	0.000	0.000	-2079.6	-0.474	0.000	0.474	-0.299	0.000
20.00	-26.565	-28.296	0.000	0.000	0.000	-1945.0	-0.843	0.000	0.843	-0.401	0.000
25.00	-26.206	-26.922	0.000	0.000	0.000	-1812.1	-1.317	0.000	1.317	-0.502	0.000
30.00	-25.853	-25.580	0.000	0.000	0.000	-1681.1	-1.899	0.000	1.899	-0.604	0.000
35.00	-25.498	-24.270	0.000	0.000	0.000	-1551.9	-2.588	0.000	2.588	-0.706	0.000
40.00	-25.135	-22.994	0.000	0.000	0.000	-1424.4	-3.383	0.000	3.383	-0.808	0.000
45.00	-24.754	-21.763	0.000	0.000	0.000	-1298.7	-4.284	0.000	4.284	-0.909	0.000
47.00	-24.610	-21.270	0.000	0.000	0.000	-1249.2	-4.675	0.000	4.675	-0.950	0.000
50.00	-24.373	-19.983	0.000	0.000	0.000	-1175.4	-5.292	0.000	5.292	-1.011	0.000
53.00	-24.130	-18.723	0.000	0.000	0.000	-1102.2	-5.947	0.000	5.947	-1.071	0.000
55.00	-23.989	-18.294	0.000	0.000	0.000	-1054.0	-6.405	0.000	6.405	-1.111	0.000
60.00	-23.605	-17.276	0.000	0.000	0.000	-934.08	-7.627	0.000	7.627	-1.217	0.000
65.00	-23.220	-16.288	0.000	0.000	0.000	-816.06	-8.957	0.000	8.957	-1.318	0.000
70.00	-22.835	-15.331	0.000	0.000	0.000	-699.96	-10.391	0.000	10.391	-1.415	0.000
75.00	-22.451	-14.404	0.000	0.000	0.000	-585.78	-11.924	0.000	11.924	-1.505	0.000
80.00	-22.061	-13.520	0.000	0.000	0.000	-473.53	-13.546	0.000	13.546	-1.587	0.000
81.00	-21.991	-13.335	0.000	0.000	0.000	-451.47	-13.881	0.000	13.881	-1.603	0.000
85.00	-21.693	-12.742	0.000	0.000	0.000	-363.51	-15.250	0.000	15.250	-1.660	0.000
90.00	-16.063	-9.583	0.000	0.000	0.000	-255.04	-17.030	0.000	17.030	-1.731	0.000
95.00	-15.694	-8.935	0.000	0.000	0.000	-174.73	-18.874	0.000	18.874	-1.785	0.000
100.00	-6.553	-4.828	0.000	0.000	0.000	-96.262	-20.767	0.000	20.767	-1.824	0.000
105.00	-6.198	-4.263	0.000	0.000	0.000	-63.495	-22.692	0.000	22.692	-1.849	0.000
110.00	-4.703	-3.249	0.000	0.000	0.000	-32.507	-24.639	0.000	24.639	-1.867	0.000
115.00	-4.367	-2.739	0.000	0.000	0.000	-8.991	-26.600	0.000	26.600	-1.875	0.000
117.00	-0.129	-0.185	0.000	0.000	0.000	-0.258	-27.385	0.000	27.385	-1.876	0.000
119.00	-0.123	0.000	0.000	0.000	0.000	0.000	0.000	0.000	28.171	-1.876	0.000

## Resulting Stresses

**Structure:** CT13555-S-SBA  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

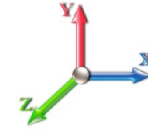
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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**Load Case:** 80 mph Wind with 0" Ice

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations:** 18

### Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvT Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.42	0.70	0.00	0.00	0.00	25.62	26.07	52.0	0.501
5.00	0.41	0.70	0.00	0.00	0.00	25.31	25.75	52.0	0.495
10.00	0.40	0.71	0.00	0.00	0.00	24.97	25.40	52.0	0.489
15.00	0.39	0.72	0.00	0.00	0.00	24.59	25.01	52.0	0.481
20.00	0.38	0.73	0.00	0.00	0.00	24.16	24.58	52.0	0.473
25.00	0.37	0.73	0.00	0.00	0.00	23.68	24.09	52.0	0.463
30.00	0.37	0.74	0.00	0.00	0.00	23.14	23.54	52.0	0.453
35.00	0.36	0.75	0.00	0.00	0.00	22.53	22.92	52.0	0.441
40.00	0.35	0.76	0.00	0.00	0.00	21.84	22.22	52.0	0.428
45.00	0.34	0.77	0.00	0.00	0.00	21.06	21.44	52.0	0.413
47.00	0.33	0.78	0.00	0.00	0.00	20.73	21.11	52.0	0.406
50.00	0.32	0.78	0.00	0.00	0.00	20.20	20.56	52.0	0.396
53.00	0.35	0.90	0.00	0.00	0.00	22.05	22.45	52.0	0.432
55.00	0.34	0.91	0.00	0.00	0.00	21.59	21.99	52.0	0.423
60.00	0.33	0.92	0.00	0.00	0.00	20.32	20.72	52.0	0.399
65.00	0.33	0.94	0.00	0.00	0.00	18.89	19.28	52.0	0.371
70.00	0.32	0.95	0.00	0.00	0.00	17.28	17.67	52.0	0.340
75.00	0.31	0.97	0.00	0.00	0.00	15.45	15.84	52.0	0.305
80.00	0.30	0.98	0.00	0.00	0.00	13.37	13.78	52.0	0.265
81.00	0.30	0.99	0.00	0.00	0.00	12.93	13.34	52.0	0.257
81.00	0.30	0.99	0.00	0.00	0.00	12.93	13.34	52.0	0.306
85.00	0.35	1.20	0.00	0.00	0.00	13.16	13.67	52.0	0.263
90.00	0.27	0.92	0.00	0.00	0.00	9.93	10.33	52.0	0.199
95.00	0.26	0.93	0.00	0.00	0.00	7.34	7.78	52.0	0.150
100.00	0.15	0.41	0.00	0.00	0.00	4.38	4.58	52.0	0.088
105.00	0.14	0.40	0.00	0.00	0.00	3.14	3.35	52.0	0.064
110.00	0.11	0.32	0.00	0.00	0.00	1.75	1.94	52.0	0.037
115.00	0.10	0.31	0.00	0.00	0.00	0.53	0.82	52.0	0.016
117.00	0.01	0.01	0.00	0.00	0.00	0.02	0.03	52.0	0.001
119.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	52.0	0.000

## Wind Loading - Shaft

**Structure:** CT13555-S-SBA  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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**Load Case:** 69.28 mph Wind with 0.5" Ice

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations:** 17

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		0.00	1.00	12.287	20.77	339.53	0.650	0.500	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	12.287	20.77	331.91	0.650	0.500	5.00	24.646	16.02	332.7	178.9	1542.4
10.00		0.00	1.00	12.287	20.77	324.29	0.650	0.500	5.00	24.096	15.66	325.2	174.9	1507.1
15.00		0.00	1.00	12.287	20.77	316.66	0.650	0.500	5.00	23.546	15.30	317.8	170.8	1471.9
20.00		0.00	1.00	12.287	20.77	309.04	0.650	0.500	5.00	22.996	14.95	310.4	166.7	1436.6
25.00		0.00	1.00	12.287	20.77	301.42	0.650	0.500	5.00	22.446	14.59	303.0	162.6	1401.3
30.00		0.00	1.00	12.287	20.77	293.80	0.650	0.500	5.00	21.895	14.23	295.5	158.6	1366.1
35.00		0.00	1.02	12.496	21.12	288.59	0.650	0.500	5.00	21.345	13.87	293.0	154.5	1330.8
40.00		0.00	1.06	12.982	21.94	286.32	0.650	0.500	5.00	20.795	13.52	296.5	150.4	1295.6
45.00		0.00	1.09	13.426	22.69	283.21	0.650	0.500	5.00	20.245	13.16	298.6	146.4	1260.3
47.00	Bot - Section 2	0.00	1.11	13.594	22.97	281.77	0.650	0.500	2.00	7.944	5.16	118.6	57.9	494.7
50.00		0.00	1.13	13.836	23.38	279.42	0.650	0.500	3.00	11.939	7.76	181.5	86.8	1296.2
53.00	Top - Section 1	0.00	1.14	14.068	23.78	276.86	0.650	0.500	3.00	11.741	7.63	181.4	85.3	1273.9
55.00		0.00	1.16	14.218	24.03	279.70	0.650	0.500	2.00	7.717	5.02	120.5	56.2	420.1
60.00		0.00	1.19	14.576	24.63	274.90	0.650	0.500	5.00	18.908	12.29	302.7	136.4	1027.5
65.00		0.00	1.21	14.913	25.20	269.67	0.650	0.500	5.00	18.357	11.93	300.7	132.4	996.7
70.00		0.00	1.24	15.232	25.74	264.05	0.650	0.500	5.00	17.807	11.57	298.0	128.3	965.9
75.00		0.00	1.26	15.536	26.26	258.10	0.650	0.500	5.00	17.257	11.22	294.5	124.2	935.1
80.00		0.00	1.29	15.825	26.74	251.84	0.650	0.500	5.00	16.707	10.86	290.4	120.1	904.3
81.00	Top - Section 2	0.00	1.29	15.881	26.84	250.55	0.650	0.500	1.00	3.275	2.13	57.1	23.9	177.5
85.00		0.00	1.31	16.101	27.21	245.30	0.650	0.500	4.00	12.882	8.37	227.8	92.9	596.9
90.00	Appurtenance(s)	0.00	1.33	16.366	27.66	238.52	0.650	0.500	5.00	15.607	10.14	280.6	112.0	721.9
95.00		0.00	1.35	16.621	28.09	231.50	0.650	0.500	5.00	15.057	9.79	274.9	107.9	695.6
100.00	Appurtenance(s)	0.00	1.37	16.866	28.50	224.27	0.650	0.500	5.00	14.507	9.43	268.8	103.9	669.2
105.00		0.00	1.39	17.103	28.90	216.85	0.650	0.500	5.00	13.957	9.07	262.2	99.8	642.9
110.00	Appurtenance(s)	0.00	1.41	17.332	29.29	209.25	0.650	0.500	5.00	13.407	8.71	255.3	95.7	616.5
115.00		0.00	1.43	17.554	29.67	201.47	0.650	0.500	5.00	12.857	8.36	247.9	91.6	590.2
117.00	Appurtenance(s)	0.00	1.44	17.640	29.81	198.31	0.650	0.500	2.00	4.989	3.24	96.7	36.0	229.2
119.00		0.00	1.44	17.726	29.96	195.13	0.650	0.500	2.00	4.901	3.19	95.4	35.4	225.0
<b>Totals:</b>								<b>119.00</b>				<b>6,927.9</b>		<b>26,091.4</b>



## Discrete Appurtenance Forces

**Structure:** CT13555-S-SB  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

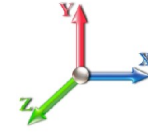
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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 Page: 14



**Load Case:** 69.28 mph Wind with 0.5" Ice

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations:** 17

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	117.00	AIR 21 B4A B2P	3	17.640	29.812	0.83	17.42	384.30	0.000	0.000	519.27	0.00	0.00
2	117.00	6' Lightning rod	1	17.640	29.812	1.00	0.98	11.80	0.000	0.000	29.22	0.00	0.00
3	117.00	AIR 21 B2A B4P	3	17.640	29.812	0.83	17.42	387.60	0.000	0.000	519.27	0.00	0.00
4	117.00	S11B12	3	17.640	29.812	0.72	7.56	201.30	0.000	0.000	225.41	0.00	0.00
5	117.00	KRY 112 144/1	3	17.640	29.812	0.75	1.23	42.30	0.000	0.000	36.70	0.00	0.00
6	117.00	LNx-6515DS-A1M	3	17.640	29.812	0.84	31.10	346.80	0.000	0.000	927.06	0.00	0.00
7	117.00	Platform w/ Hand Rail	1	17.640	29.812	1.00	40.00	2200.00	0.000	0.000	1192.48	0.00	0.00
8	110.00	VHLP2.5-18	1	17.332	29.291	1.00	8.92	97.00	0.000	0.000	261.28	0.00	0.00
9	110.00	VHLP2-18	1	17.332	29.291	1.00	5.05	55.00	0.000	0.000	147.92	0.00	0.00
10	110.00	LLPX310R	3	17.332	29.291	0.77	12.38	163.50	0.000	0.000	362.67	0.00	0.00
11	110.00	Flush Mount	1	17.332	29.291	1.00	6.00	450.00	0.000	0.000	175.75	0.00	0.00
12	100.00	RRUS A2	6	16.866	28.504	0.64	8.26	188.40	0.000	0.000	235.33	0.00	0.00
13	100.00	RRUS 12	6	16.866	28.504	0.72	15.03	438.00	0.000	0.000	428.52	0.00	0.00
14	100.00	RRUS 11	9	16.866	28.504	0.78	22.04	594.00	0.000	0.000	628.31	0.00	0.00
15	100.00	RRU E2	3	16.866	28.504	0.64	4.13	94.20	0.000	0.000	117.67	0.00	0.00
16	100.00	Platform w/ Hand Rail	1	16.866	28.504	1.00	40.00	2200.00	0.000	0.000	1140.17	0.00	0.00
17	100.00	HPA-65R-BUU-H8	12	16.866	28.504	0.82	136.78	1644.00	0.000	0.000	3898.70	0.00	0.00
18	100.00	DC6-48-60-18-8F	4	16.866	28.504	1.00	6.68	198.00	0.000	0.000	190.41	0.00	0.00
19	100.00	RRU-32	3	16.866	28.504	0.88	11.35	310.50	0.000	0.000	323.58	0.00	0.00
20	90.00	HBXX-6517DS-A2M	6	16.366	27.659	0.80	44.47	562.86	0.000	0.000	1230.00	0.00	0.00
21	90.00	B13 RRH4x30	3	16.366	27.659	0.88	7.16	217.35	0.000	0.000	198.11	0.00	0.00
22	90.00	DB-T1-6Z-8AB-OZ	2	16.366	27.659	1.00	11.74	142.12	0.000	0.000	324.72	0.00	0.00
23	90.00	RRH2x60-PCS	3	16.366	27.659	0.79	6.02	203.37	0.000	0.000	166.48	0.00	0.00
24	90.00	LNx-6514DS-A1M	6	16.366	27.659	0.82	43.90	512.46	0.000	0.000	1214.20	0.00	0.00
25	90.00	Low Profile Platform	1	16.366	27.659	1.00	27.00	1800.00	0.000	0.000	746.79	0.00	0.00
26	90.00	RRH2X60-AWS	3	16.366	27.659	0.78	9.51	226.05	0.000	0.000	263.13	0.00	0.00
<b>Totals:</b>								<b>13,670.91</b>			<b>15,503.12</b>		

## Total Applied Force Summary

**Structure:** CT13555-S-SB  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

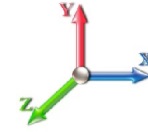
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

9/29/2015  
 Page: 15



**Load Case:** 69.28 mph Wind with 0.5" Ice

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations:** 17

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		332.66	1634.72	0.00	0.00
10.00		325.23	1599.46	0.00	0.00
15.00		317.81	1564.20	0.00	0.00
20.00		310.38	1528.94	0.00	0.00
25.00		302.96	1493.67	0.00	0.00
30.00		295.54	1458.41	0.00	0.00
35.00		293.00	1423.15	0.00	0.00
40.00		296.55	1387.89	0.00	0.00
45.00		298.58	1352.62	0.00	0.00
47.00		118.63	531.66	0.00	0.00
50.00		181.45	1351.57	0.00	0.00
53.00		181.44	1329.25	0.00	0.00
55.00		120.53	457.05	0.00	0.00
60.00		302.74	1119.83	0.00	0.00
65.00		300.73	1089.03	0.00	0.00
70.00		297.97	1058.22	0.00	0.00
75.00		294.51	1027.41	0.00	0.00
80.00		290.43	996.61	0.00	0.00
81.00		57.14	195.95	0.00	0.00
85.00		227.84	670.71	0.00	0.00
90.00	(24) appurtenances	4424.01	4478.48	0.00	0.00
95.00		274.91	754.92	0.00	0.00
100.00	(44) appurtenances	7231.47	6395.67	0.00	0.00
105.00		262.22	673.41	0.00	0.00
110.00	(6) appurtenances	1202.87	1412.56	0.00	0.00
115.00		247.91	611.89	0.00	0.00
117.00	(17) appurtenances	3546.06	3811.96	0.00	0.00
119.00		95.43	224.97	0.00	0.00
<b>Totals:</b>		<b>22,431.01</b>	<b>41,634.22</b>	<b>0.00</b>	<b>0.00</b>

## Resulting Forces and Deflections

**Structure:** CT13555-S-SB  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

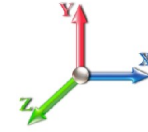
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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 Page: 16



**Load Case:** 69.28 mph Wind with 0.5" Ice

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations:** 17

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-22.460	-41.618	0.000	0.000	0.000	-2022.9	0.000	0.000	0.000	0.000	0.000
5.00	-22.183	-39.952	0.000	0.000	0.000	-1910.6	-0.044	0.000	0.044	-0.080	0.000
10.00	-21.908	-38.322	0.000	0.000	0.000	-1799.7	-0.171	0.000	0.171	-0.161	0.000
15.00	-21.638	-36.728	0.000	0.000	0.000	-1690.2	-0.385	0.000	0.385	-0.243	0.000
20.00	-21.371	-35.170	0.000	0.000	0.000	-1582.0	-0.684	0.000	0.684	-0.325	0.000
25.00	-21.107	-33.648	0.000	0.000	0.000	-1475.1	-1.070	0.000	1.070	-0.408	0.000
30.00	-20.846	-32.162	0.000	0.000	0.000	-1369.6	-1.542	0.000	1.542	-0.491	0.000
35.00	-20.585	-30.712	0.000	0.000	0.000	-1265.4	-2.102	0.000	2.102	-0.574	0.000
40.00	-20.316	-29.298	0.000	0.000	0.000	-1162.5	-2.749	0.000	2.749	-0.657	0.000
45.00	-20.029	-27.929	0.000	0.000	0.000	-1060.9	-3.482	0.000	3.482	-0.740	0.000
47.00	-19.923	-27.384	0.000	0.000	0.000	-1020.8	-3.800	0.000	3.800	-0.773	0.000
50.00	-19.745	-26.018	0.000	0.000	0.000	-961.11	-4.302	0.000	4.302	-0.823	0.000
53.00	-19.562	-24.678	0.000	0.000	0.000	-901.87	-4.836	0.000	4.836	-0.872	0.000
55.00	-19.460	-24.202	0.000	0.000	0.000	-862.75	-5.209	0.000	5.209	-0.905	0.000
60.00	-19.173	-23.059	0.000	0.000	0.000	-765.46	-6.204	0.000	6.204	-0.991	0.000
65.00	-18.883	-21.949	0.000	0.000	0.000	-669.59	-7.288	0.000	7.288	-1.075	0.000
70.00	-18.593	-20.872	0.000	0.000	0.000	-575.18	-8.458	0.000	8.458	-1.154	0.000
75.00	-18.302	-19.828	0.000	0.000	0.000	-482.22	-9.708	0.000	9.708	-1.228	0.000
80.00	-18.002	-18.826	0.000	0.000	0.000	-390.71	-11.033	0.000	11.033	-1.296	0.000
81.00	-17.951	-18.621	0.000	0.000	0.000	-372.71	-11.306	0.000	11.306	-1.309	0.000
85.00	-17.724	-17.940	0.000	0.000	0.000	-300.90	-12.424	0.000	12.424	-1.356	0.000
90.00	-13.205	-13.558	0.000	0.000	0.000	-212.28	-13.878	0.000	13.878	-1.415	0.000
95.00	-12.920	-12.801	0.000	0.000	0.000	-146.26	-15.387	0.000	15.387	-1.460	0.000
100.00	-5.529	-6.592	0.000	0.000	0.000	-81.662	-16.936	0.000	16.936	-1.493	0.000
105.00	-5.251	-5.924	0.000	0.000	0.000	-54.016	-18.511	0.000	18.511	-1.514	0.000
110.00	-4.012	-4.543	0.000	0.000	0.000	-27.760	-20.106	0.000	20.106	-1.529	0.000
115.00	-3.748	-3.938	0.000	0.000	0.000	-7.699	-21.713	0.000	21.713	-1.537	0.000
117.00	-0.101	-0.222	0.000	0.000	0.000	-0.203	-22.357	0.000	22.357	-1.537	0.000
119.00	-0.095	0.000	0.000	0.000	0.000	0.000	0.000	0.000	23.001	-1.537	0.000

## Resulting Stresses

**Structure:** CT13555-S-SBA  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

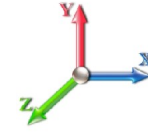
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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**Load Case:** 69.28 mph Wind with 0.5" Ice

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations:** 17

### Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvT Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	f Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.51	0.56	0.00	0.00	0.00	20.77	21.31	52.0	0.410
5.00	0.50	0.56	0.00	0.00	0.00	20.54	21.07	52.0	0.405
10.00	0.50	0.57	0.00	0.00	0.00	20.28	20.80	52.0	0.400
15.00	0.49	0.58	0.00	0.00	0.00	19.99	20.50	52.0	0.394
20.00	0.48	0.58	0.00	0.00	0.00	19.65	20.15	52.0	0.388
25.00	0.47	0.59	0.00	0.00	0.00	19.28	19.77	52.0	0.380
30.00	0.46	0.60	0.00	0.00	0.00	18.85	19.34	52.0	0.372
35.00	0.45	0.61	0.00	0.00	0.00	18.37	18.85	52.0	0.363
40.00	0.44	0.62	0.00	0.00	0.00	17.82	18.30	52.0	0.352
45.00	0.43	0.63	0.00	0.00	0.00	17.21	17.67	52.0	0.340
47.00	0.43	0.63	0.00	0.00	0.00	16.94	17.40	52.0	0.335
50.00	0.41	0.63	0.00	0.00	0.00	16.52	16.97	52.0	0.326
53.00	0.46	0.73	0.00	0.00	0.00	18.04	18.54	52.0	0.357
55.00	0.46	0.74	0.00	0.00	0.00	17.67	18.17	52.0	0.350
60.00	0.45	0.75	0.00	0.00	0.00	16.65	17.15	52.0	0.330
65.00	0.44	0.76	0.00	0.00	0.00	15.50	15.99	52.0	0.308
70.00	0.43	0.77	0.00	0.00	0.00	14.20	14.69	52.0	0.283
75.00	0.42	0.79	0.00	0.00	0.00	12.72	13.21	52.0	0.254
80.00	0.42	0.80	0.00	0.00	0.00	11.03	11.53	52.0	0.222
81.00	0.41	0.80	0.00	0.00	0.00	10.67	11.18	52.0	0.215
81.00	0.41	0.80	0.00	0.00	0.00	10.67	11.18	52.0	0.257
85.00	0.49	0.98	0.00	0.00	0.00	10.89	11.51	52.0	0.221
90.00	0.39	0.76	0.00	0.00	0.00	8.27	8.75	52.0	0.168
95.00	0.38	0.77	0.00	0.00	0.00	6.15	6.66	52.0	0.128
100.00	0.20	0.34	0.00	0.00	0.00	3.72	3.96	52.0	0.076
105.00	0.19	0.34	0.00	0.00	0.00	2.67	2.92	52.0	0.056
110.00	0.15	0.27	0.00	0.00	0.00	1.49	1.71	52.0	0.033
115.00	0.14	0.26	0.00	0.00	0.00	0.45	0.75	52.0	0.014
117.00	0.01	0.01	0.00	0.00	0.00	0.01	0.02	52.0	0.000
119.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	52.0	0.000

## Wind Loading - Shaft

**Structure:** CT13555-S-SBA  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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**Load Case:** 50 mph Wind with 0" Ice

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations:** 17

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		0.00	1.00	6.400	10.82	245.04	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	6.400	10.82	239.54	0.650	0.000	5.00	24.229	15.75	170.3	0.0	1363.5
10.00		0.00	1.00	6.400	10.82	234.04	0.650	0.000	5.00	23.679	15.39	166.5	0.0	1332.3
15.00		0.00	1.00	6.400	10.82	228.54	0.650	0.000	5.00	23.129	15.03	162.6	0.0	1301.1
20.00		0.00	1.00	6.400	10.82	223.04	0.650	0.000	5.00	22.579	14.68	158.7	0.0	1269.9
25.00		0.00	1.00	6.400	10.82	217.54	0.650	0.000	5.00	22.029	14.32	154.9	0.0	1238.7
30.00		0.00	1.00	6.400	10.82	212.04	0.650	0.000	5.00	21.479	13.96	151.0	0.0	1207.5
35.00		0.00	1.02	6.509	11.00	208.28	0.650	0.000	5.00	20.929	13.60	149.6	0.0	1176.3
40.00		0.00	1.06	6.762	11.43	206.64	0.650	0.000	5.00	20.379	13.25	151.4	0.0	1145.1
45.00		0.00	1.09	6.993	11.82	204.39	0.650	0.000	5.00	19.829	12.89	152.3	0.0	1113.9
47.00	Bot - Section 2	0.00	1.11	7.080	11.97	203.35	0.650	0.000	2.00	7.777	5.06	60.5	0.0	436.8
50.00		0.00	1.13	7.207	12.18	201.66	0.650	0.000	3.00	11.689	7.60	92.5	0.0	1209.4
53.00	Top - Section 1	0.00	1.14	7.328	12.38	199.81	0.650	0.000	3.00	11.491	7.47	92.5	0.0	1188.6
55.00		0.00	1.16	7.406	12.52	201.87	0.650	0.000	2.00	7.550	4.91	61.4	0.0	363.9
60.00		0.00	1.19	7.592	12.83	198.40	0.650	0.000	5.00	18.491	12.02	154.2	0.0	891.1
65.00		0.00	1.21	7.768	13.13	194.62	0.650	0.000	5.00	17.941	11.66	153.1	0.0	864.3
70.00		0.00	1.24	7.934	13.41	190.57	0.650	0.000	5.00	17.391	11.30	151.6	0.0	837.6
75.00		0.00	1.26	8.092	13.68	186.27	0.650	0.000	5.00	16.841	10.95	149.7	0.0	810.9
80.00		0.00	1.29	8.242	13.93	181.75	0.650	0.000	5.00	16.291	10.59	147.5	0.0	784.1
81.00	Top - Section 2	0.00	1.29	8.272	13.98	180.82	0.650	0.000	1.00	3.192	2.07	29.0	0.0	153.6
85.00		0.00	1.31	8.387	14.17	177.04	0.650	0.000	4.00	12.548	8.16	115.6	0.0	504.0
90.00	Appurtenance(s)	0.00	1.33	8.525	14.41	172.14	0.650	0.000	5.00	15.190	9.87	142.2	0.0	609.9
95.00		0.00	1.35	8.657	14.63	167.08	0.650	0.000	5.00	14.640	9.52	139.2	0.0	587.7
100.00	Appurtenance(s)	0.00	1.37	8.785	14.85	161.86	0.650	0.000	5.00	14.090	9.16	136.0	0.0	565.4
105.00		0.00	1.39	8.908	15.06	156.50	0.650	0.000	5.00	13.540	8.80	132.5	0.0	543.1
110.00	Appurtenance(s)	0.00	1.41	9.028	15.26	151.01	0.650	0.000	5.00	12.990	8.44	128.8	0.0	520.8
115.00		0.00	1.43	9.143	15.45	145.40	0.650	0.000	5.00	12.440	8.09	124.9	0.0	498.6
117.00	Appurtenance(s)	0.00	1.44	9.188	15.53	143.12	0.650	0.000	2.00	4.822	3.13	48.7	0.0	193.2
119.00		0.00	1.44	9.233	15.60	140.83	0.650	0.000	2.00	4.734	3.08	48.0	0.0	189.6
<b>Totals:</b>									<b>119.00</b>			<b>3,525.4</b>		<b>22,901.0</b>

## Discrete Appurtenance Forces

**Structure:** CT13555-S-SB  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

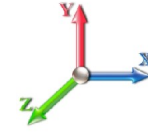
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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**Load Case:** 50 mph Wind with 0" Ice

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations:** 17

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	117.00	AIR 21 B4A B2P	3	9.188	15.528	0.83	16.16	270.90	0.000	0.000	250.88	0.00	0.00
2	117.00	6' Lightning rod	1	9.188	15.528	1.00	0.38	6.50	0.000	0.000	5.90	0.00	0.00
3	117.00	AIR 21 B2A B4P	3	9.188	15.528	0.83	16.16	274.50	0.000	0.000	250.88	0.00	0.00
4	117.00	S11B12	3	9.188	15.528	0.71	7.01	153.00	0.000	0.000	108.86	0.00	0.00
5	117.00	KRY 112 144/1	3	9.188	15.528	0.72	0.89	33.00	0.000	0.000	13.77	0.00	0.00
6	117.00	LNx-6515DS-A1M	3	9.188	15.528	0.84	28.72	150.90	0.000	0.000	445.91	0.00	0.00
7	117.00	Platform w/ Hand Rail	1	9.188	15.528	1.00	32.00	1600.00	0.000	0.000	496.90	0.00	0.00
8	110.00	VHLP2.5-18	1	9.028	15.257	1.00	8.43	47.60	0.000	0.000	128.61	0.00	0.00
9	110.00	VHLP2-18	1	9.028	15.257	1.00	4.68	27.00	0.000	0.000	71.40	0.00	0.00
10	110.00	LLPX310R	3	9.028	15.257	0.75	10.87	85.80	0.000	0.000	165.80	0.00	0.00
11	110.00	Flush Mount	1	9.028	15.257	1.00	5.00	350.00	0.000	0.000	76.28	0.00	0.00
12	100.00	RRUS A2	6	8.785	14.847	0.62	6.92	127.20	0.000	0.000	102.73	0.00	0.00
13	100.00	RRUS 12	6	8.785	14.847	0.70	13.73	343.80	0.000	0.000	203.91	0.00	0.00
14	100.00	RRUS 11	9	8.785	14.847	0.76	20.11	456.30	0.000	0.000	298.56	0.00	0.00
15	100.00	RRU E2	3	8.785	14.847	0.62	3.46	63.60	0.000	0.000	51.36	0.00	0.00
16	100.00	Platform w/ Hand Rail	1	8.785	14.847	1.00	40.00	1600.00	0.000	0.000	593.87	0.00	0.00
17	100.00	HPA-65R-BUU-H8	12	8.785	14.847	0.80	127.68	816.00	0.000	0.000	1895.64	0.00	0.00
18	100.00	DC6-48-60-18-8F	4	8.785	14.847	1.00	5.88	127.20	0.000	0.000	87.30	0.00	0.00
19	100.00	RRU-32	3	8.785	14.847	0.87	10.10	231.00	0.000	0.000	149.96	0.00	0.00
20	90.00	HBXX-6517DS-A2M	6	8.525	14.407	0.80	41.95	282.00	0.000	0.000	604.38	0.00	0.00
21	90.00	B13 RRH4x30	3	8.525	14.407	0.88	6.62	171.60	0.000	0.000	95.30	0.00	0.00
22	90.00	DB-T1-6Z-8AB-OZ	2	8.525	14.407	1.00	11.20	88.00	0.000	0.000	161.35	0.00	0.00
23	90.00	RRH2x60-PCS	3	8.525	14.407	0.78	5.52	165.00	0.000	0.000	79.53	0.00	0.00
24	90.00	LNx-6514DS-A1M	6	8.525	14.407	0.82	41.43	232.80	0.000	0.000	596.83	0.00	0.00
25	90.00	Low Profile Platform	1	8.525	14.407	1.00	25.00	1500.00	0.000	0.000	360.16	0.00	0.00
26	90.00	RRH2X60-AWS	3	8.525	14.407	0.77	8.74	165.00	0.000	0.000	125.96	0.00	0.00
<b>Totals:</b>								<b>9,368.70</b>			<b>7,422.06</b>		



## Total Applied Force Summary

**Structure:** CT13555-S-SB  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

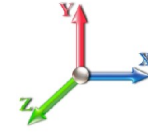
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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**Load Case:** 50 mph Wind with 0" Ice

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations:** 17

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		170.34	1455.78	0.00	0.00
10.00		166.47	1424.60	0.00	0.00
15.00		162.61	1393.41	0.00	0.00
20.00		158.74	1362.22	0.00	0.00
25.00		154.87	1331.03	0.00	0.00
30.00		151.00	1299.84	0.00	0.00
35.00		149.63	1268.65	0.00	0.00
40.00		151.37	1237.46	0.00	0.00
45.00		152.32	1206.27	0.00	0.00
47.00		60.49	473.78	0.00	0.00
50.00		92.53	1264.82	0.00	0.00
53.00		92.49	1243.97	0.00	0.00
55.00		61.42	400.84	0.00	0.00
60.00		154.21	983.39	0.00	0.00
65.00		153.09	956.66	0.00	0.00
70.00		151.57	929.92	0.00	0.00
75.00		149.70	903.19	0.00	0.00
80.00		147.50	876.46	0.00	0.00
81.00		29.01	172.08	0.00	0.00
85.00		115.60	577.85	0.00	0.00
90.00	(24) appurtenances	2165.76	3306.67	0.00	0.00
95.00		139.23	646.99	0.00	0.00
100.00	(44) appurtenances	3519.32	4389.81	0.00	0.00
105.00		132.50	573.63	0.00	0.00
110.00	(6) appurtenances	570.92	1061.75	0.00	0.00
115.00		124.94	520.25	0.00	0.00
117.00	(17) appurtenances	1621.77	2690.66	0.00	0.00
119.00		48.01	189.62	0.00	0.00
<b>Totals:</b>		<b>10,947.43</b>	<b>34,141.59</b>	<b>0.00</b>	<b>0.00</b>

## Resulting Forces and Deflections

**Structure:** CT13555-S-SB  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

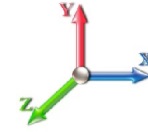
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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**Load Case:** 50 mph Wind with 0" Ice

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations:** 17

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-10.959	-34.138	0.000	0.000	0.000	-974.65	0.000	0.000	0.000	0.000	0.000
5.00	-10.810	-32.675	0.000	0.000	0.000	-919.86	-0.021	0.000	0.021	-0.039	0.000
10.00	-10.664	-31.243	0.000	0.000	0.000	-865.81	-0.083	0.000	0.083	-0.078	0.000
15.00	-10.519	-29.843	0.000	0.000	0.000	-812.49	-0.185	0.000	0.185	-0.117	0.000
20.00	-10.377	-28.474	0.000	0.000	0.000	-759.90	-0.329	0.000	0.329	-0.156	0.000
25.00	-10.237	-27.136	0.000	0.000	0.000	-708.01	-0.515	0.000	0.515	-0.196	0.000
30.00	-10.099	-25.830	0.000	0.000	0.000	-656.83	-0.742	0.000	0.742	-0.236	0.000
35.00	-9.961	-24.555	0.000	0.000	0.000	-606.34	-1.011	0.000	1.011	-0.276	0.000
40.00	-9.819	-23.311	0.000	0.000	0.000	-556.53	-1.322	0.000	1.322	-0.316	0.000
45.00	-9.670	-22.101	0.000	0.000	0.000	-507.44	-1.674	0.000	1.674	-0.355	0.000
47.00	-9.614	-21.625	0.000	0.000	0.000	-488.10	-1.826	0.000	1.826	-0.371	0.000
50.00	-9.522	-20.357	0.000	0.000	0.000	-459.26	-2.068	0.000	2.068	-0.395	0.000
53.00	-9.427	-19.110	0.000	0.000	0.000	-430.69	-2.324	0.000	2.324	-0.419	0.000
55.00	-9.372	-18.705	0.000	0.000	0.000	-411.84	-2.502	0.000	2.502	-0.434	0.000
60.00	-9.222	-17.716	0.000	0.000	0.000	-364.98	-2.980	0.000	2.980	-0.475	0.000
65.00	-9.072	-16.755	0.000	0.000	0.000	-318.87	-3.500	0.000	3.500	-0.515	0.000
70.00	-8.922	-15.821	0.000	0.000	0.000	-273.51	-4.060	0.000	4.060	-0.553	0.000
75.00	-8.772	-14.914	0.000	0.000	0.000	-228.90	-4.659	0.000	4.659	-0.588	0.000
80.00	-8.620	-14.036	0.000	0.000	0.000	-185.04	-5.293	0.000	5.293	-0.620	0.000
81.00	-8.593	-13.862	0.000	0.000	0.000	-176.42	-5.423	0.000	5.423	-0.626	0.000
85.00	-8.477	-13.282	0.000	0.000	0.000	-142.04	-5.958	0.000	5.958	-0.649	0.000
90.00	-6.277	-9.998	0.000	0.000	0.000	-99.666	-6.654	0.000	6.654	-0.676	0.000
95.00	-6.133	-9.351	0.000	0.000	0.000	-68.281	-7.375	0.000	7.375	-0.698	0.000
100.00	-2.561	-5.004	0.000	0.000	0.000	-37.617	-8.114	0.000	8.114	-0.713	0.000
105.00	-2.422	-4.432	0.000	0.000	0.000	-24.812	-8.867	0.000	8.867	-0.723	0.000
110.00	-1.838	-3.377	0.000	0.000	0.000	-12.703	-9.628	0.000	9.628	-0.729	0.000
115.00	-1.706	-2.859	0.000	0.000	0.000	-3.514	-10.394	0.000	10.394	-0.733	0.000
117.00	-0.050	-0.189	0.000	0.000	0.000	-0.101	-10.701	0.000	10.701	-0.733	0.000
119.00	-0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.008	-0.733	0.000

## Resulting Stresses

**Structure:** CT13555-S-SBA  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

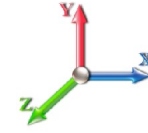
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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**Load Case:** 50 mph Wind with 0" Ice

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations:** 17

### Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvt Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.42	0.27	0.00	0.00	0.00	10.01	10.44	52.0	0.201
5.00	0.41	0.28	0.00	0.00	0.00	9.89	10.31	52.0	0.198
10.00	0.40	0.28	0.00	0.00	0.00	9.76	10.17	52.0	0.196
15.00	0.39	0.28	0.00	0.00	0.00	9.61	10.01	52.0	0.193
20.00	0.39	0.28	0.00	0.00	0.00	9.44	9.84	52.0	0.189
25.00	0.38	0.29	0.00	0.00	0.00	9.25	9.64	52.0	0.185
30.00	0.37	0.29	0.00	0.00	0.00	9.04	9.42	52.0	0.181
35.00	0.36	0.29	0.00	0.00	0.00	8.80	9.17	52.0	0.177
40.00	0.35	0.30	0.00	0.00	0.00	8.53	8.90	52.0	0.171
45.00	0.34	0.30	0.00	0.00	0.00	8.23	8.59	52.0	0.165
47.00	0.34	0.30	0.00	0.00	0.00	8.10	8.46	52.0	0.163
50.00	0.32	0.31	0.00	0.00	0.00	7.89	8.23	52.0	0.158
53.00	0.36	0.35	0.00	0.00	0.00	8.62	8.99	52.0	0.173
55.00	0.35	0.36	0.00	0.00	0.00	8.44	8.81	52.0	0.169
60.00	0.34	0.36	0.00	0.00	0.00	7.94	8.31	52.0	0.160
65.00	0.33	0.37	0.00	0.00	0.00	7.38	7.74	52.0	0.149
70.00	0.33	0.37	0.00	0.00	0.00	6.75	7.11	52.0	0.137
75.00	0.32	0.38	0.00	0.00	0.00	6.04	6.39	52.0	0.123
80.00	0.31	0.38	0.00	0.00	0.00	5.23	5.58	52.0	0.107
81.00	0.31	0.38	0.00	0.00	0.00	5.05	5.40	52.0	0.104
81.00	0.31	0.38	0.00	0.00	0.00	5.05	5.40	52.0	0.124
85.00	0.36	0.47	0.00	0.00	0.00	5.14	5.56	52.0	0.107
90.00	0.28	0.36	0.00	0.00	0.00	3.88	4.21	52.0	0.081
95.00	0.28	0.36	0.00	0.00	0.00	2.87	3.21	52.0	0.062
100.00	0.15	0.16	0.00	0.00	0.00	1.71	1.89	52.0	0.036
105.00	0.14	0.16	0.00	0.00	0.00	1.23	1.39	52.0	0.027
110.00	0.11	0.12	0.00	0.00	0.00	0.68	0.83	52.0	0.016
115.00	0.10	0.12	0.00	0.00	0.00	0.21	0.37	52.0	0.007
117.00	0.01	0.00	0.00	0.00	0.00	0.01	0.01	52.0	0.000
119.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	52.0	0.000

## Final Analysis Summary

**Structure:** CT13555-S-SBA  
**Site Name:** Montano  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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### Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	t MZ (ft-kips)
80 mph Wind with 0" Ice	28.1	0.00	34.12	0.00	0.00	2494.81
69.28 mph Wind with 0.5" Ice	22.5	0.00	41.62	0.00	0.00	2022.99
50 mph Wind with 0" Ice	11.0	0.00	34.14	0.00	0.00	974.66

### Max Stresses

Load Case	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvT Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	Combined Stress (ksi)	Allowable Stress (ksi)	Elev (ft)	Stress Ratio
80 mph Wind with 0" Ice	0.42	0.70	0.00	0.00	0.00	25.62	26.07	52.0	0.00	0.501
69.28 mph Wind with 0.5" Ice	0.51	0.56	0.00	0.00	0.00	20.77	21.31	52.0	0.00	0.410
50 mph Wind with 0" Ice	0.42	0.27	0.00	0.00	0.00	10.01	10.44	52.0	0.00	0.201



# Monopole Mat Foundation Design

Date  
9/29/2015

<b>Customer Name:</b>	T-Mobile	<b>EIA/TIA Standard:</b>	EIA-222-F
<b>Site Name:</b>	Montano	<b>Structure Height (Ft.):</b>	119
<b>Site Number:</b>	CT13555-S-SBA	<b>Engineer Name:</b>	J. Tibbetts
<b>Engr. Number:</b>	17786	<b>Engineer Login ID:</b>	

**Foundation Info Obtained from:**

Drawings/Calculations
Monopole
Analysis

**Structure Type:**

**Analysis or Design?**

**Base Reactions (Unfactored)**

Axial Load (Kips):	41.6	Shear Force (Kips):	28.1
Uplift Force (Kips):	0.0	Moment (Kips-ft):	2494.8

Allowable overstress %: 5.0%

**Foundation Geometries:**

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	7.0	Depth of Base BG (ft.):	6.0
Pier Height A. G. (ft.):	1.00	Thickness of Pad (ft):	2.00
Length of Pad (ft.):	26.5	Width of Pad (ft.):	26.5

Final Length of pad (ft)	26.5	Final width of pad (ft):	26.5
Control Value for Cell D18:	0	Control Value for Cell F18:	0

**Material Properties and Rebar Info:**

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	9	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	36	Tie Spacing (in):	12.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	8	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	45	Qty. of Rebar in Pad (W):	45	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	45	Qty. of Rebar in Pad (W):	45	

Apply 1.35 factor for e/w Per G: 1.35

**Soil Design Parameters:**

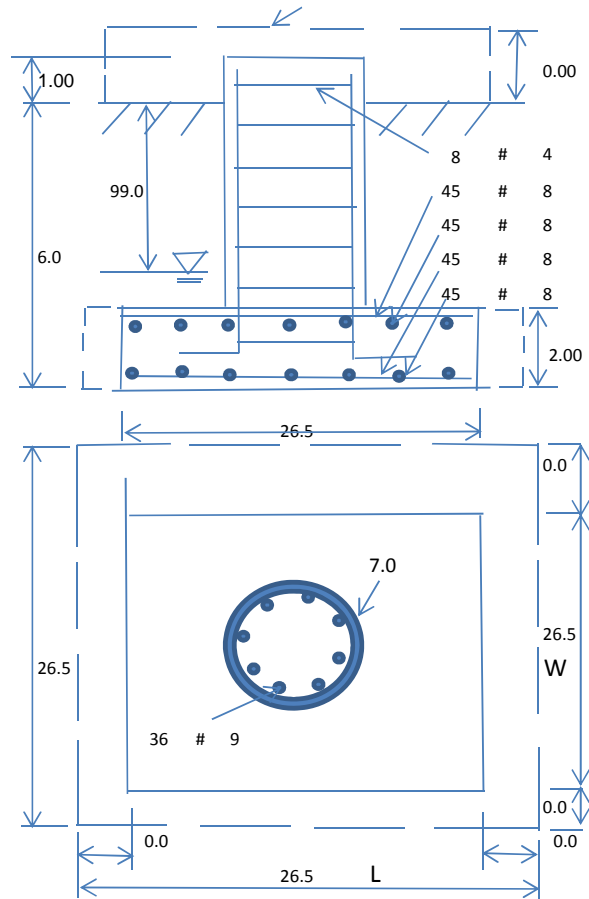
Soil Unit Weight (pcf):	110.0	Soil Buoyant Weight:	50.0	Pcf	
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad: 30
Allowable Net Soil Bearing (psf):	3500	Allowable Skin Friction:	1200	Psf	Angle from Bottm of Pad: 25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad: 25
Consider soil hori. force for O.T.M.:	No	Reduction factor on the maximum soil bearing pressure:	1.00		

**Foundation Analysis and Design:**

Total Dry Soil Volume (cu. Ft.):	2655.06	Total Dry Soil Weight (Kips):	292.06
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	292.06	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	1596.92	Total Dry Concrete Weight (Kips):	239.54
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	239.54	Total Vertical Load on Base (Kips):	573.20

**Check Soil Capacities:**

Calculated Maxium Net Soil Pressure under the base (psf):	1425	<	Allowable Soil Bearing (psf):	3500	0.41	OK!
Allowable Foundation Overturning Resistance (SF=1.5, kips-ft.):	5063.2	>	Applied Momont (kips-ft):	2692	0.53	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.82					OK!



**Check the capacities of Reinforcing Concrete:**

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75	
Strength reduction factor (Axial compression):	0.65	Wind Load Factor on Concrete Design:	1.30	

Load/  
Capacity  
Ratio

(1) Concrete Pier:

Vertical Steel Rebar Area (sq. in./each):	1.00	Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	6090.2	> Design Factored Moment (Mu, Kips-Ft):	3425.9	0.56	OK!
Calculated Shear Capacity (Kips):	660.1	> Design Factored Shear (Kips):	36.5	0.06	OK!
Calculated Tension Capacity (Tn, Kips):	1944.0	> Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	9734.2	> Design Factored Axial Load (Pu Kips):	54.1	0.01	OK!
Moment & Axial Strength Combination(Pu/Pn+Mu/Mn):	0.57	OK! Check Tie Spacing (Design/Required):		1	OK!
Pier Reinforcement Ratio:	0.006	Reinforcement Ratio is satisfied per ACI			

(2).Concrete Pad:

One-Way Design Shear Capacity (L-Direction, Kips):	618.4	> One-Way Factored Shear (L-D. Kips):	208.8	0.34	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	618.4	> One-Way Factored Shear (W-D., Kips)	208.8	0.34	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	711.3	> One-Way Factored Shear (C-C, Kips):	273.8	0.39	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct. ):	0.0055	OK! Lower Steel Pad Reinf. Ratio (W-Direc	0.0055		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	3121.7	> Moment at Bottom ( L-Direct. K-Ft):	645.7	0.21	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	3121.7	> Moment at Bottom ( W-Direct. K-Ft):	645.7	0.21	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	4363.5	> Moment at Bottom ( C-C Dir. K-Ft):	913.2	0.21	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct. ):	0.0055	OK! Upper Steel Reinf. Ratio (W-Direct. ):	0.0055		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	3121.7	> Moment at the top (L-Dir Kips-Ft):	493.5	0.16	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	3121.7	> Moment at the top (W-Dir Kips-Ft):	493.5	0.16	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	4363.5	> Moment at the top (C-C Direc. K-Ft):	603.2	0.14	OK!





Pier Foundation Design For Monopole			Date
Customer Name:	T-Mobile	EIA/TIA Standard:	EIA-222-F
Site Name:	Montano	Structure Height (Ft.):	119
Site Number:	CT13555-S-SBA	Engineer Name:	J. Tibbetts
Engr. Number:	17786	Engineer Login ID:	

**Foundation Info Obtained from:**

Drawings/Calculations	Acceptable overstress ( $\leq 5.0\%$ )
Structure Type:	Monopole
Analysis or Design?	Analysis

**Base Reactions (Unfactored)**

Axial Load (Kips):	41.6	Shear Force (Kips):	28.1
Uplift Force (Kips):	0.0	Moment (Kips-ft):	2494.8

**Foundation Geometries:**

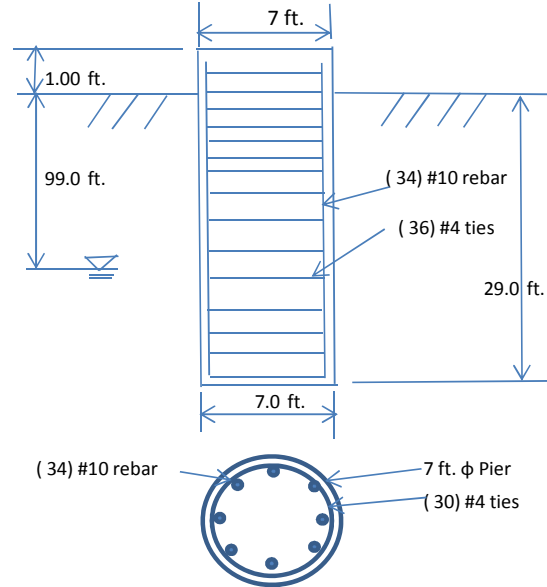
Mods required -Yes/No ?:	No		ft.
Diameter of Pier (ft.):	7.0	Depth of Base B. G. S. :	29.0 ft.
Pier Height A. G. (ft.):	1.00		

**Material Properties and Reabr Info:**

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000 ksi
Vertical bar yield (ksi):	60	Tie steel yield strength:	60 ksi
Vertical Rebar Size #:	10	Tie / Stirrup Size #:	4
Qty. of Vertical Rebars:	34	Tie Spacing:	12.0 in.
Concrete Cover (in.):	3	Concrete unit weight:	150.0 pcf

**Soil Design Parameters:**

Water Table B.G.S. (ft):	99.0	Unit weight of water:	62.4 psf
Ratio of Uplift/Axial Skin Friction:	1.0	Pullout failure Angle:	30 (°)
Skin Frictions are to be obtained from:	Soil Report		



**Monopole Pier Foundation**

Depth of Layers (ft)		$\gamma_{soil}$ (pcf)	$\phi$ (°)	Cohesion (psf)	Allowable Skin Friction (psf)	Allowable Bearing (psf)	Soil Types					
Top	Bottom											
0.0	3.0	100	0	0	0	0	Sand					
3.0	25.0	110	33	0	500	3000	Sand					
25.0	50.0	105	30	0	800	4000	Sand					
50.0	55.0	100	30	0	800	4000	Sand					

Soil weight Increase Factor for bouyant soils (1.0 to 1.15): 1.1

**Foundation Analysis and Design:**

Total Dry Soil Volume from Conical Failure (cu. Ft.):	13814	Dry Soil Weight from Conical Failure:	1468	Kips
Total Buoyant Soil Volume from Conical Failure (cu. Ft.):	0	Buoyant Soil Weight from Conical Failure (K	0	Kips
Total Dry Concrete Volume (cu. Ft.):	1155	Total Dry Concrete Weight:	173.2	Kips
Total Buoyant Concrete Volume (cu. Ft.):	0.0	Total Buoyant Concrete Weight:	0.00	Kips
Total Effective Concrete Weight (Kips):	173.2	Total Effective Soil Weight:	1468.0	Kips
Total Effective Vertical Load on Base (Kips):	96.2			

**Check Soil Capacities:**

Allowable Foundation Overturning Resistance (kips-ft.):	7164.4	>	Applied Moment (kips-ft):	3069	Usage	0.43	OK!
Factor of Safety of Passive Soil Resistance against Moment:	4.67	OK!					

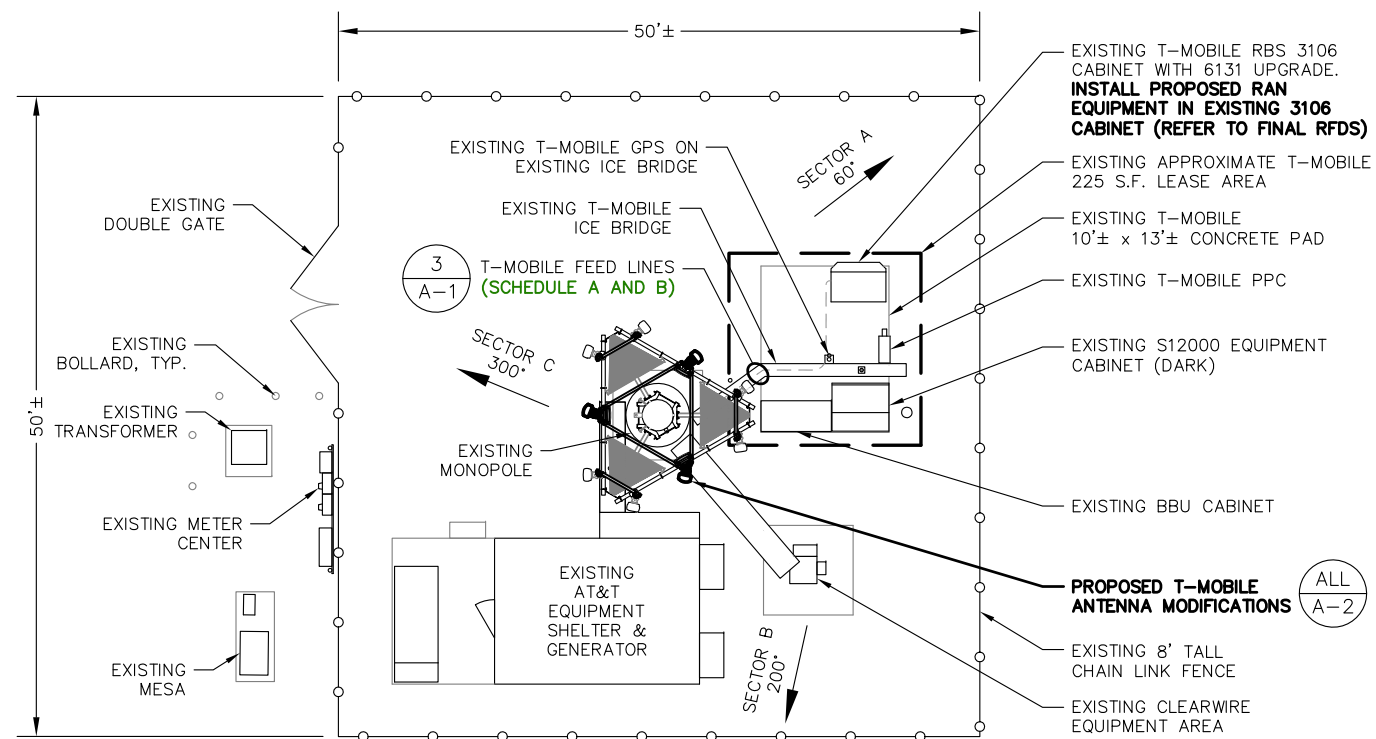
**Check the capacities of Reinforceing Concrete:**

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75
Strength reduction factor (Axial compression):	0.65	Wind Load Factor on Concrete Design:	1.30

Reinforcing Concrete Pier:

Vertical Steel Rebar Area (sq. in./each):	1.27	Tie / Stirrup Area (sq. in./each):	0.20	Usage	
Calculated Moment Capacity (Mn,Kips-Ft):	7293	>	Design Factored Moment (Mu, K-Ft):	3405.8	0.47 OK!
Calculated Shear Capacity (Kips):	1120.9	>	Design Factored Shear (Kips):	309.8	0.28 OK!
Calculated Tension Capacity (Tn, Kips):	2331.7	>	Design Factored Tension (Tu Kips):	0.0	0.00 OK!
Calculated Compression Capacity (Pn, Kips):	9722	>	Design Factored Axial Load (Pu Kips):	54.1	0.01 OK!
Moment & Axial Strength Combination(Tu/Tn+Mu/Mn):	0.47	OK!	Max. Allowable Tie/Stirrup Spacing:	12.00	in.
Pier Reinforcement Ratio:	0.008	Reinforcement Ratio is satisfied per ACI			



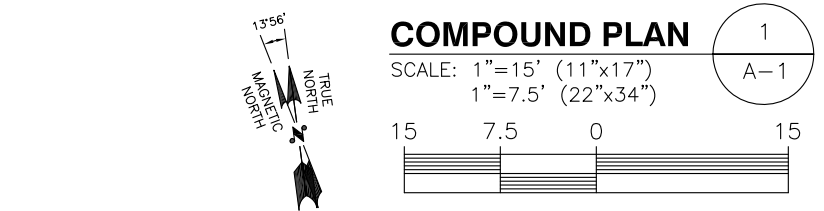


**ANTENNA MOUNT STRUCTURAL ASSESSMENT REQUIREMENT:**  
 ENGINEER OF RECORD HAS MADE A VISUAL ASSESSMENT ONLY AND DETERMINED THAT THE EXISTING ANTENNA MOUNT SHALL BE REPLACED OR MODIFIED TO ACCOMMODATE ANY ADDITIONAL EQUIPMENT LOADS. STRUCTURAL DESIGNS AND DETAILS AS SHOWN HEREIN FOR STRUCTURAL MODIFICATIONS OF THE EXISTING ANTENNA MOUNT ARE PRELIMINARY ONLY AND FINAL CONSTRUCTION DETAILS ARE SUBJECT TO CHANGE PENDING THE COMPLETION OF AN ANTENNA MOUNT STRUCTURAL ASSESSMENT.

**STRUCTURAL NOTES:**  
 PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO TOWER STRUCTURAL ANALYSIS PROVIDED BY SBA TO DETERMINE IF THERE ARE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS FOR TOWER TOP EQUIPMENT AND FOR CABLE BUNDLING, SHIELDING, MOUNTING, OR RELOCATION ARRANGEMENTS

**SPECIAL WORK NOTE:**  
 CONTRACTOR TO REPAIR EXISTING GROUNDING LINES/BARS AT GROUND EQUIPMENT LEVEL, AS REQUIRED.

☉ OF T-MOBILE ANTENNAS  
 EXISTING ELEV.= 117'± AGL (SBA DATABASE)  
 PROPOSED ELEV.= 115'± AGL  
 ALL 1-3  
 A-2 A-3



FEEDLINE SCHEDULE	FEEDLINE DESCRIPTION	LOCATION
A	EXISTING: TO REMAIN (12) 1-5/8" COAX AND (1) HYBRID FIBER TO 117' RAD	INSIDE MONOPOLE TO RAD
B	PROPOSED: USE EXISTING HYBRID FOR FIBER TO 115' RAD	INSIDE MONOPOLE TO RAD

EXISTING T-MOBILE RBS 3106 CABINET WITH 6131 UPGRADE. INSTALL PROPOSED RAN EQUIPMENT IN EXISTING 3106 CABINET (REFER TO FINAL RFDS)  
 EXISTING T-MOBILE PPC  
 EXISTING T-MOBILE GPS ON EXISTING ICE BRIDGE  
 EXISTING S12000 EQUIPMENT CABINET (DARK)  
 T-MOBILE FEED LINES (3 A-1)  
 EXISTING BBU CABINET

EXISTING (12) 1-5/8" COAX & (1) HYBRID FIBER CABLE ACROSS EXISTING ICE BRIDGE & UP INSIDE MONOPOLE, ALL TO REMAIN (REFER TO SBA-PROVIDED STRUCTURAL ANALYSIS FOR SPECIAL FEEDLINE INSTALLATION REQUIREMENTS, STACKING, BUNDLING, SHIELDING, MOUNTING AND RELOCATION OF EXISTING OR PROPOSED FEEDLINES)



IMAGE SOURCE: PROTERRA 08/29/15

**EQUIPMENT PHOTO DETAIL**  
 SCALE: N.T.S.

2  
 A-1



IMAGE SOURCE: PROTERRA 08/29/15

**FEEDLINE PHOTO DETAIL AT TOWER BASE**  
 SCALE: N.T.S.

3  
 A-1



IMAGE SOURCE: PROTERRA 08/29/15

**PARTIAL ELEVATION PHOTO DETAIL**  
 SCALE: N.T.S.

FEEDLINE SCHEDULE A  
 FEEDLINE SCHEDULE B

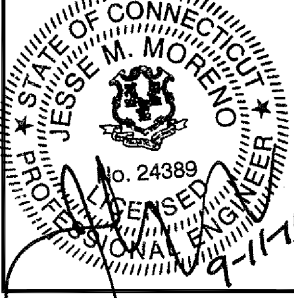
**T-Mobile**  
 T-MOBILE NORTHEAST LLC  
 35 GRIFFIN ROAD SOUTH  
 BLOOMFIELD, CT 06002  
 TEL: (860) 648-1116

**SBA**

SBA COMMUNICATIONS CORP.  
 33 BOSTON POST ROAD WEST, SUITE 320  
 MARLBOROUGH, MA 01752 TEL: (508) 251-0720

**ProTerra**  
 DESIGN GROUP, LLC

4 Bay Road, Building A  
 Suite 200  
 Hadley, MA 01035 Ph: (413) 320-4918



CHECKED BY: JMM/TEJ  
 APPROVED BY: JMM/TEJ

**SUBMITTALS**

REV.	DATE	DESCRIPTION	BY
0	09/11/15	ISSUED FOR CONSTRUCTION	BLM

SITE NUMBER:  
 CTHA083C  
 SITE NAME:  
 HA083 / OPTA-MONTANO RD\_FT  
 SITE ADDRESS:  
 58 MONTANO ROAD  
 GLASTONBURY, CT 06033  
 HARTFORD COUNTY

SHEET TITLE  
 COMPOUND & ELEVATION PLAN

SHEET NUMBER  
 A-1





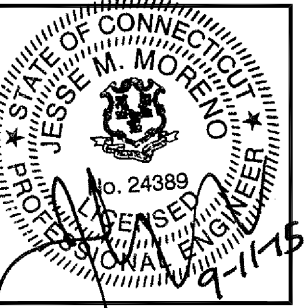
**T-MOBILE NORTHEAST LLC**  
 35 GRIFFIN ROAD SOUTH  
 BLOOMFIELD, CT 06002  
 TEL: (860) 648-1116



SBA COMMUNICATIONS CORP.  
 33 BOSTON POST ROAD WEST, SUITE 320  
 MARLBOROUGH, MA 01752 TEL: (508) 251-0720



4 Bay Road, Building A  
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0	09/11/15	ISSUED FOR CONSTRUCTION	BLM

SITE NUMBER:  
**CTHA083C**  
 SITE NAME:  
**HA083 / OPTA-MONTANO RD\_FT**  
 SITE ADDRESS:  
 58 MONTANO ROAD  
 GLASTONBURY, CT 06033  
 HARTFORD COUNTY

SHEET TITLE  
**EXISTING & PROPOSED ANTENNA PLAN**

SHEET NUMBER  
**A-2**

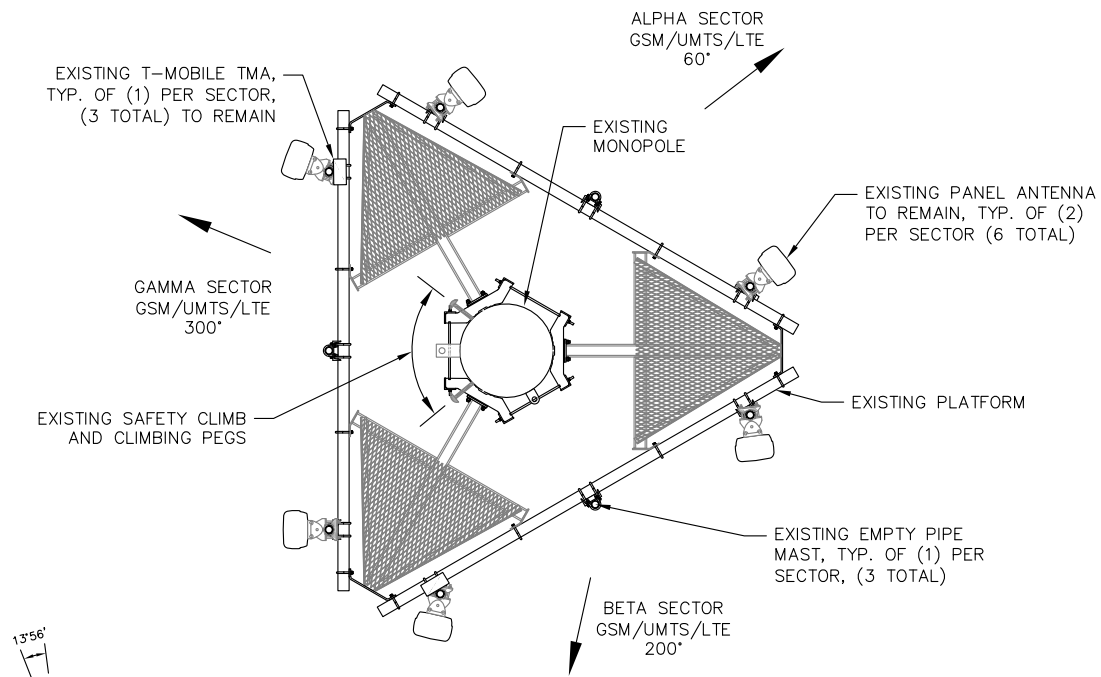
**ANTENNA MOUNT STRUCTURAL ASSESSMENT REQUIREMENT:**

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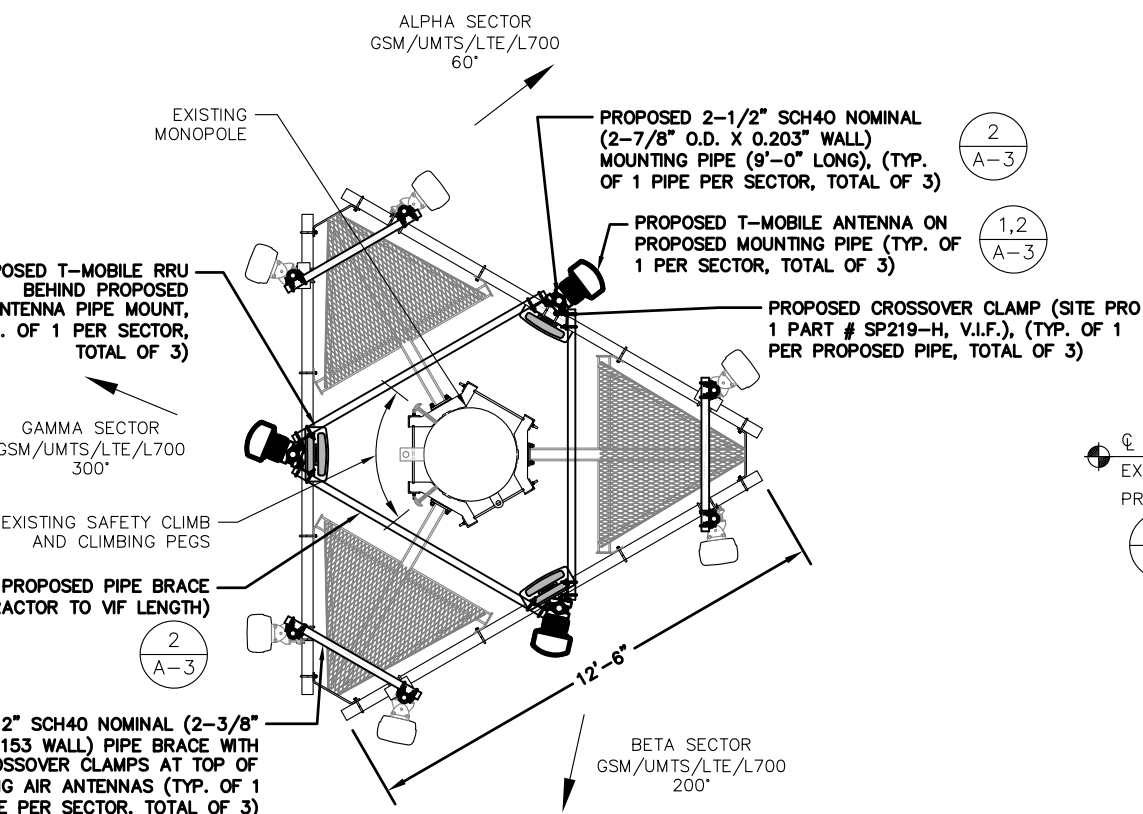
**NOTE:**  
 REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



**EXISTING ANTENNA PLAN**

SCALE: N.T.S.

1  
A-2



**PROPOSED ANTENNA PLAN**

SCALE: N.T.S.

2  
A-2

**NOTE:**  
 ALL PIPE TO BE SCH40 GALVANIZED  
 ASTM A53 GRADE B (35 KSI)

1,2  
A-3  
PROPOSED T-MOBILE ANTENNA ON PROPOSED MOUNTING PIPE (TYP. OF 1 PER SECTOR, TOTAL OF 3)

2  
A-3  
PROPOSED PIPE BRACE (CONTRACTOR TO VIF LENGTH)

6  
A-3  
PROPOSED 2" SCH40 NOMINAL (2-3/8" O.D. X 0.153 WALL) PIPE BRACE WITH CROSSOVER CLAMPS AT TOP OF EXISTING AIR ANTENNAS (TYP. OF 1 BRACE PER SECTOR, TOTAL OF 3)

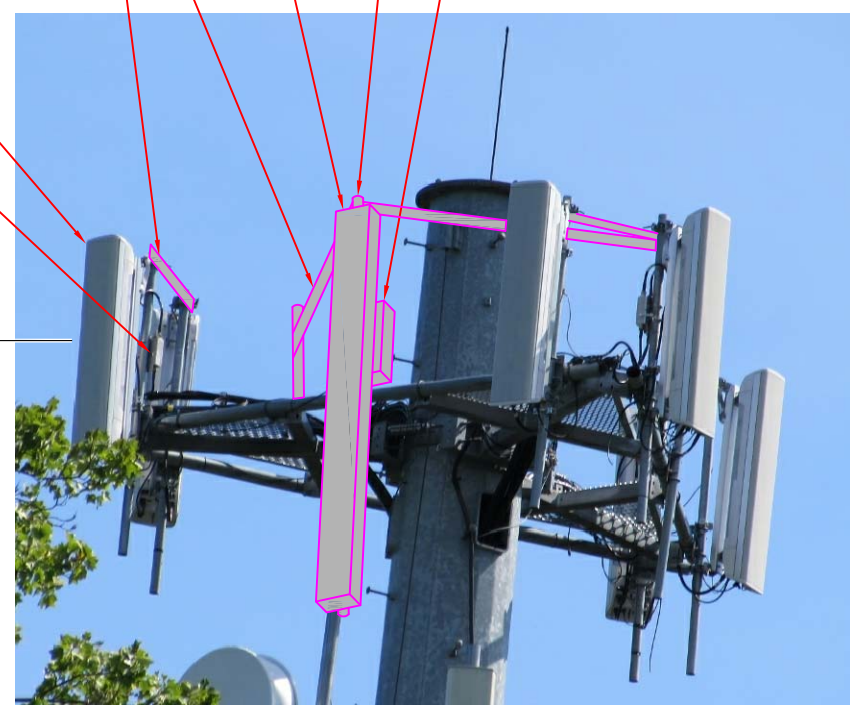
EXISTING PANEL ANTENNA TO REMAIN, TYP. OF (2) PER SECTOR (6 TOTAL)  
 EXISTING T-MOBILE TMA, TYP. OF (1) PER SECTOR, (3 TOTAL) TO REMAIN

☉ OF T-MOBILE ANTENNAS  
 EXISTING ELEV. (GSM/UMTS/LTE)= 117'± AGL (SBA DATABASE)  
 PROPOSED ELEV. (L700)= 115'± AGL

2  
A-2  
1,2  
A-3

2  
A-3  
PROPOSED 2-1/2" SCH40 NOMINAL (2-7/8" O.D. X 0.203" WALL) MOUNTING PIPE (9'-0" LONG), (TYP. OF 1 PIPE PER SECTOR, TOTAL OF 3)

2,3  
A-3  
PROPOSED T-MOBILE RRU BEHIND PROPOSED ANTENNA PIPE MOUNT, (TYP. OF 1 PER SECTOR, TOTAL OF 3)

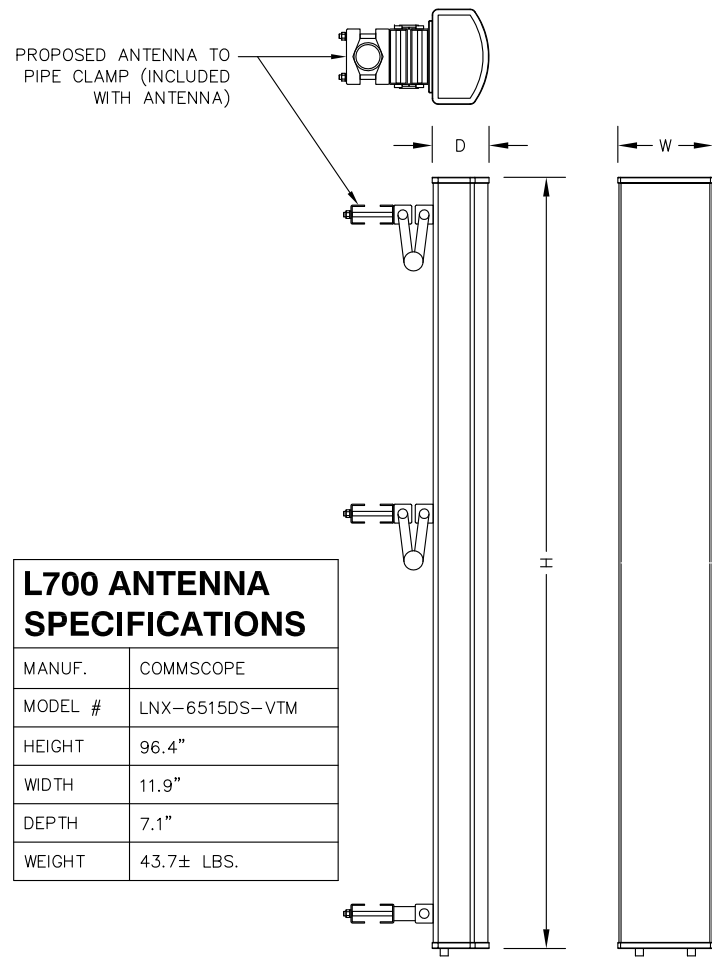


**ANTENNA PHOTO DETAIL**

SCALE: N.T.S.

3  
A-2

IMAGE SOURCE: PROTERRA 08/29/15  
 NOTE: ONE SECTOR SHOWN FOR CLARITY



**L700 ANTENNA SPECIFICATIONS**

MANUF.	COMMSCOPE
MODEL #	LNx-6515DS-VTM
HEIGHT	96.4"
WIDTH	11.9"
DEPTH	7.1"
WEIGHT	43.7± LBS.

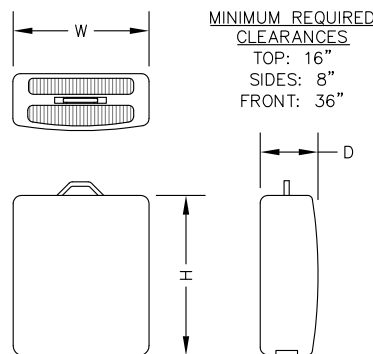
**L700 ANTENNA DETAIL**

SCALE: N.T.S.

1  
A-3

**RRU SPECIFICATIONS**

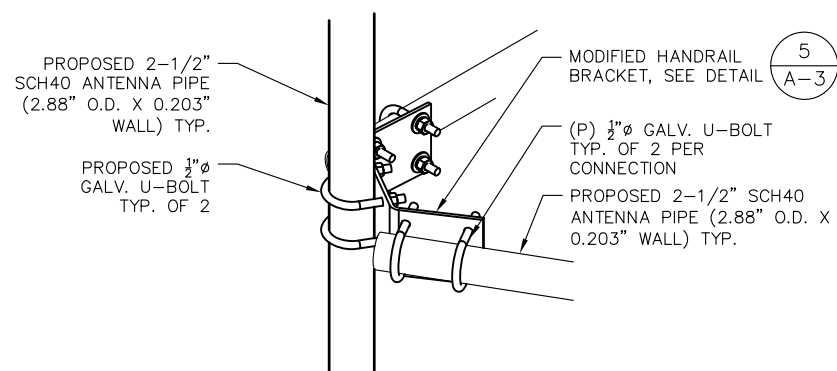
MANUF.	ERICSSON
MODEL #	RRU11 B12
HEIGHT	20"
WIDTH	17"
DEPTH	7"
WEIGHT	50.7 LBS.



**REMOTE RADIO UNIT (RRU)**

SCALE: N.T.S.

3  
A-3



**ANTENNA BRACE DETAIL (TOP)**

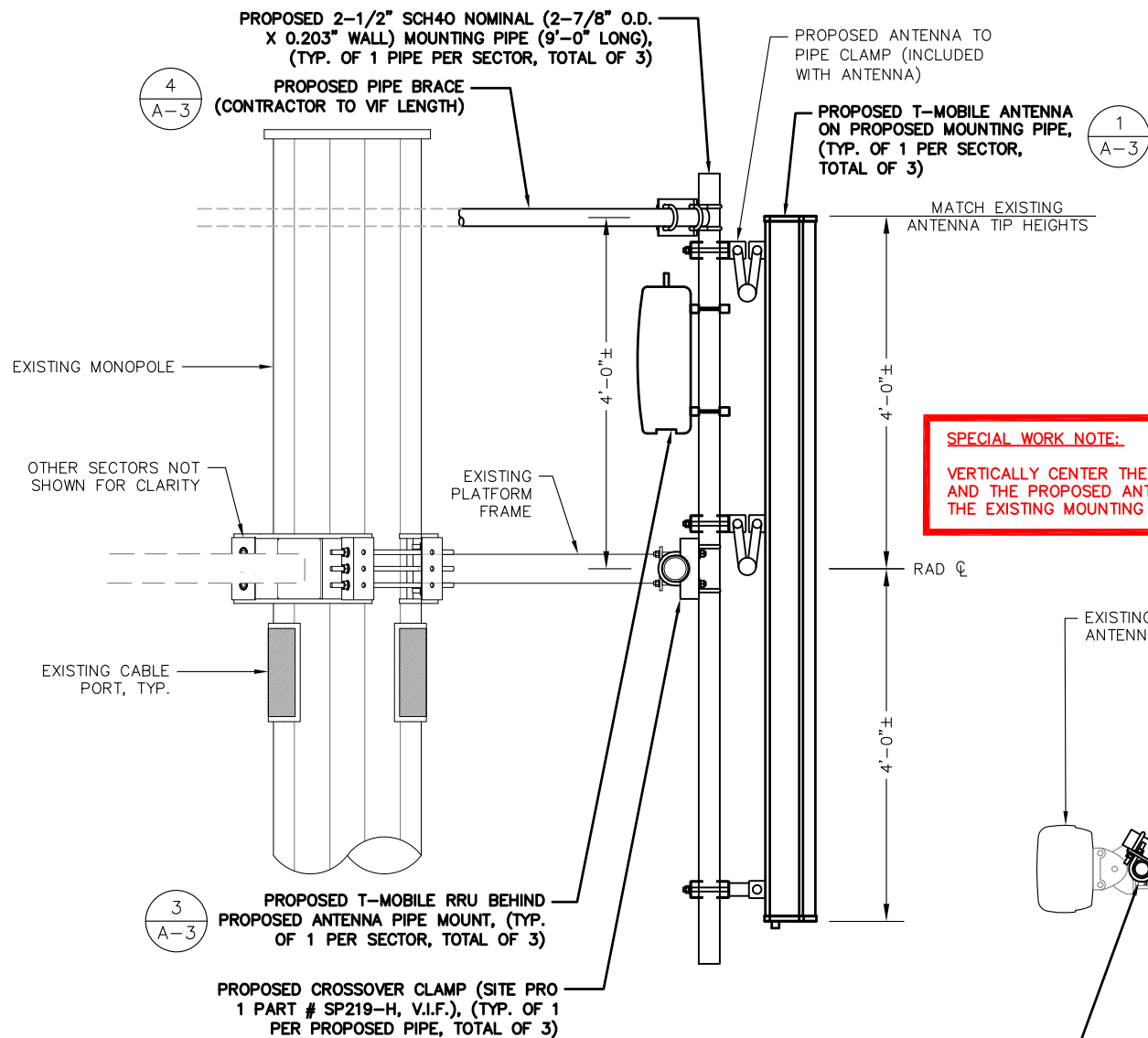
SCALE: N.T.S.

4  
A-3

**HANDRAIL BRACKET MODIFICATION DETAIL**

SCALE: N.T.S.

5  
A-3

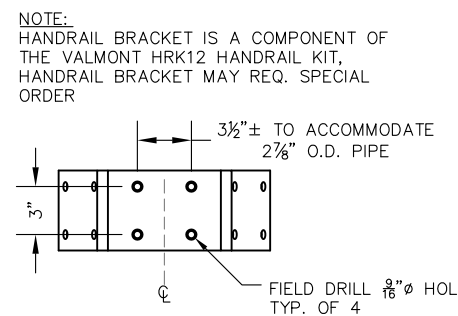


**PROPOSED ANTENNA MOUNTING DETAIL**

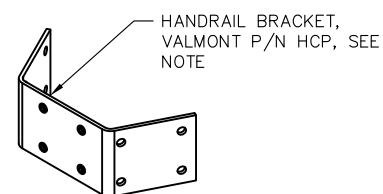
SCALE: N.T.S.

2  
A-3

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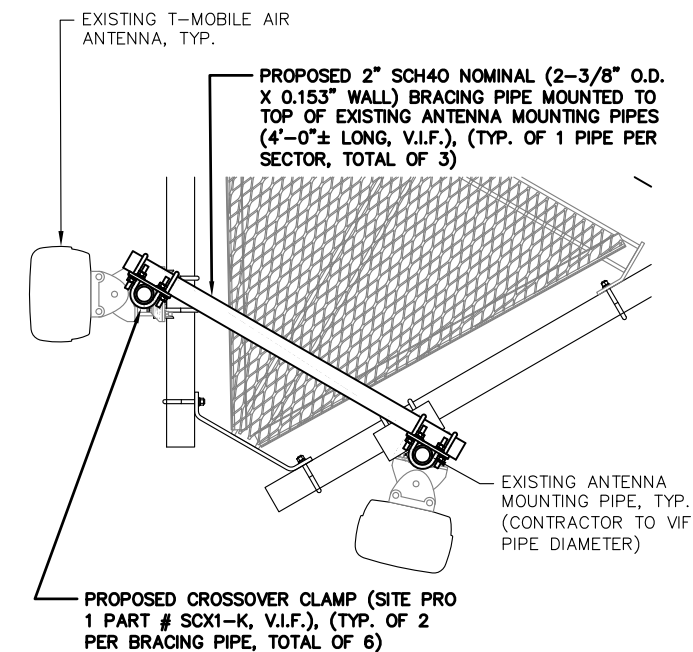
3 EA REQ'D



**PROPOSED AIR ANTENNA BRACE DETAIL**

SCALE: N.T.S.

6  
A-3



**SPECIAL WORK NOTE:**  
VERTICALLY CENTER THE PIPE MAST AND THE PROPOSED ANTENNAS ON THE EXISTING MOUNTING RAIL

**T-Mobile**  
T-MOBILE NORTHEAST LLC  
35 GRIFFIN ROAD SOUTH  
BLOOMFIELD, CT 06002  
TEL: (860) 648-1116

**SBA**  
SBA COMMUNICATIONS CORP.  
33 BOSTON POST ROAD WEST, SUITE 320  
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DESIGN GROUP, LLC  
4 Bay Road, Building A  
Suite 200  
Hadley, MA 01035 Ph: (413) 320-4918

STATE OF CONNECTICUT  
JESSE M. MORENO  
No. 24389  
PROFESSIONAL ENGINEER  
9-1175

CHECKED BY: JMM/TEJ  
APPROVED BY: JMM/TEJ

**SUBMITTALS**

REV.	DATE	DESCRIPTION	BY
0	09/11/15	ISSUED FOR CONSTRUCTION	BLM

SITE NUMBER:  
CTHA083C  
SITE NAME:  
HA083 / OPTA-MONTANO RD\_FT  
SITE ADDRESS:  
58 MONTANO ROAD  
GLASTONBURY, CT 06033  
HARTFORD COUNTY

SHEET TITLE  
DETAILS

SHEET NUMBER  
A-3