



Aaron Meyers, Site Acquisition  
c/o New Cingular Wireless, PCS LLC (AT&T)  
Centerline Communications, LLC  
750 W. Center St., Floor 3  
West Bridgewater, MA 02379  
Mobile: (774) 420-4202  
[ameyers@clinellc.com](mailto:ameyers@clinellc.com)

DATE October 4, 2018

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

**RE: Notice of Exempt Modification // Site Number: CT2517  
17 Cottage Road Madison, CT 06443 (Site Name: Madison Cottage Road)  
N 41.2.75858 // W -72.561382**

Dear Ms. Bachman:

New Cingular Wireless, PCS, LLC (“AT&T”) currently maintains nine (9) antennas at the 127-foot level of the existing 130-foot Monopole tower at 17 Cottage Road, Madison, CT 06443. The tower is owned by SBA Communications Corp.. The property is owned by Paul Stonehart. AT&T now intends to replace three (3) Antennas, add three (3) Remote Radio Units, and add one (1) Surge Arrestor for its LTE upgrade. This equipment would be installed at the 127-foot level of the tower.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Tom Banisch, First Selectman, as well as the tower owner, SBA Communications Corp., and the ground owner, Paul Stonehart.

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

Attached to accommodate this filing are construction drawings dated March 15, 2018 by Hudson Design Group, LLC, a structural analysis dated August 30, 2018 by Tower Engineering Solutions, a mount analysis dated January 10, 2018 by Hudson Design Group, LLC, and an Emissions Analysis Report dated February 27, 2018 by Centerline Communications, LLC.

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading as shown in the attached structural analysis by Tower Engineering Solutions, dated August 30, 2018

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

Sincerely,

---

Aaron Meyers, Site Acquisition  
c/o New Cingular Wireless, PCS LLC (AT&T)  
Centerline Communications, LLC  
750 W. Center St., Floor 3  
West Bridgewater, MA 02379  
Mobile: (774) 420-4202  
[ameyers@centerlincommunications.com](mailto:ameyers@centerlincommunications.com)

#### Attachments

cc: Tom Banisch, First Selectman - as elected official  
SBA Communications Corp. – as tower owner  
Paul Stonehart – as property owner  
David Anderson – as town Planner



# Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT2517

FA#: 10546793

Madison Cottage Road

17 Cottage Road

Madison, CT 6443

**February 27, 2018**

**Centerline Communications Project Number: 950012-034**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>8.44 %</b>



February 27, 2018

AT&T Mobility – New England  
Attn: John Benedetto, RF Manager  
550 Cochituate Road  
Suite 550 – 13&14  
Framingham, MA 06040

### Emissions Analysis for Site: **CT2517 – Madison Cottage Road**

Centerline Communications, LLC (“Centerline”) was directed to analyze the proposed AT&T facility located at **17 Cottage Road, Madison, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

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

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limits for the 700 and 850 MHz Bands are approximately  $467 \mu\text{W}/\text{cm}^2$  and  $567 \mu\text{W}/\text{cm}^2$  respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) 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 performed for the proposed AT&T Wireless antenna facility located at **17 Cottage Road, Madison, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T 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.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	1	30
LTE	700 MHz (Band 14)	4	40
LTE	2300 MHz (WCS)	4	30
LTE	700 MHz	2	40
LTE	1900 MHz (PCS)	4	40

*Table 1: Channel Data Table*



The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. 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.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Powerwave P90-15-XLH-RR	127
A	2	Quintel QS46512-2	127
A	3	Commscope SBNHH-1D65A	127
B	1	Powerwave P90-15-XLH-RR	127
B	2	Quintel QS46512-2	127
B	3	Commscope SBNHH-1D65A	127
C	1	Powerwave P90-15-XLH-RR	127
C	2	Quintel QS46512-2	127
C	3	Commscope SBNHH-1D65A	127

*Table 2: Antenna Data*

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

## RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC’s allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Powerwave P90-15-XLH-RR	850 MHz	12.4	1	30	521.34	0.23
Antenna A2	Quintel QS46512-2	700 MHz (Band 14) / 2300 MHz (WCS)	10.55 / 14.05	8	280	4,865.18	1.70
Antenna A3	Commscope SBNHH-1D65A	700 MHz / 1900 MHz (PCS)	10.85 / 14.55	6	240	5,534.58	1.63
Sector A Composite MPE%							<b>3.56</b>
Antenna B1	Powerwave P90-15-XLH-RR	850 MHz	12.4	1	30	521.34	0.23
Antenna B2	Quintel QS46512-2	700 MHz (Band 14) / 2300 MHz (WCS)	10.55 / 14.05	8	280	4,865.18	1.70
Antenna B3	Commscope SBNHH-1D65A	700 MHz / 1900 MHz (PCS)	10.85 / 14.55	6	240	5,534.58	1.63
Sector B Composite MPE%							<b>3.56</b>
Antenna C1	Powerwave P90-15-XLH-RR	850 MHz	12.4	1	30	521.34	0.23
Antenna C2	Quintel QS46512-2	700 MHz (Band 14) / 2300 MHz (WCS)	10.55 / 14.05	8	280	4,865.18	1.70
Antenna C3	Commscope SBNHH-1D65A	700 MHz / 1900 MHz (PCS)	10.85 / 14.55	6	240	5,534.58	1.63
Sector C Composite MPE%							<b>3.56</b>

*Table 3: AT&T Emissions Levels*





The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

<b>Site Composite MPE%</b>	
<b>Carrier</b>	<b>MPE%</b>
AT&T – Max Sector Value	<b>3.56 %</b>
T-Mobile	0.03 %
Verizon Wireless	4.85 %
<b>Site Total MPE %:</b>	<b>8.44 %</b>

*Table 4: All Carrier MPE Contributions*

AT&T Sector A Total:	3.56 %
AT&T Sector B Total:	3.56 %
AT&T Sector C Total:	3.56 %
<b>Site Total:</b>	<b>8.44 %</b>

*Table 5: Site MPE Summary*

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

AT&T _ Frequency Band / Technology Max Power Values (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
AT&T 850 MHz UMTS (Antenna 1)	1	521.34	127	1.28	850 MHz	567	0.23%
AT&T 700 MHz LTE – Band 14 (Antenna 2)	4	454.00	127	4.46	700 MHz	467	0.95%
AT&T 2300 MHz (WCS) LTE (Antenna 2)	4	762.29	127	7.49	2300 MHz (WCS)	1000	0.75%
AT&T 700 MHz LTE (Antenna 3)	2	486.47	127	2.39	700 MHz	467	0.51%
AT&T 1900 MHz (PCS) LTE (Antenna 3)	4	1,140.41	127	11.20	1900 MHz (PCS)	1000	1.12%
						<b>Total:</b>	<b>3.56 %</b>

*Table 6: AT&T Maximum Sector MPE Power Values*



## Summary

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

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

AT&T Sector	Power Density Value (%)
Sector A:	3.56 %
Sector B:	3.56 %
Sector C:	3.56 %
AT&T Maximum Total (per sector):	3.56 %
Site Total:	8.44 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **8.44 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

A handwritten signature in black ink, appearing to read 'Scott Heffernan', is positioned above the printed name.

Scott Heffernan  
RF Engineering Director  
**Centerline Communications, LLC**  
95 Ryan Drive, Suite 1  
Raynham, MA 02767



January 10, 2018



Centerline Communications, LLC  
97 Ryan Drive Suite 1  
Raynham, MA 02767

RE:	Site Number:	CT2517 (LTE 2C/3C)
	FA Number:	10546793
	PACE Number:	MRCTB022813
	PTN Number:	2051A0ACLA
	Site Name:	Madison Cottage Road
	Site Address:	17 Cottage Road Madison, CT 06443

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by Centerline to perform a structural assessment on the existing antenna mount to determine their capability of supporting the following additional equipment loading:

- **(3) QS46512-2 Antennas (in place of existing three P90-15-XLH-RR Antennas) (1 per sector).**
- **(2) B14 4478 RRHs (1 per alpha and beta sector).**
- **(3) RRUS-32 RRHs (1 per sector).**

Based on our assessment, we have determined that the existing antenna mount **IS CAPABLE** of supporting the proposed installation with the following modification:

- **Install new handrail kit, SitePro1 P/N HRK-12 (or approved equal).**

See the latest HDG construction drawings for proposed equipment and locations.

This analysis was conducted in accordance with the International Building Code 2012 with 2005 Connecticut Supplement with 2016 Amendments, and the EIA/TIA-222-G, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures.

This determination was based on the following limitations and assumptions:

1. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities. Contractor is to perform a pre-inspection to confirm.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. All the components supporting the AT&T antennas mounts are assumed to be designed to all applicable codes and designed for identical to or larger than the currently proposed loads.
5. The existing mounts have been adequately secured to the tower structure per the mount manufacturer's specifications.
6. All components pertaining to AT&T's mounts must be tightened and re-plumbed prior to installation of new appurtenances.

Please feel free to contact our office should you have any questions.

Respectfully Submitted,  
Hudson Design Group LLC

Michael Cabral  
Structural Dept. Head



Daniel P. Hamm, PE  
Principal



**Tower Engineering Solutions**

Phone (972) 483-0607, Fax (972) 975-9615  
1320 Greenway Drive, Suite 600, Irving, Texas 75038

---

## Structural Analysis Report

Existing 130 ft Rohn Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT13615-A

Customer Site Name: Madison 7, CT

Carrier Name: AT&T

Carrier Site ID / Name: CT2517 / Madison

Site Location: 17 Cottage Road

Madison, Connecticut

New Haven County

Latitude: 41.275916

Longitude: -72.561444

### Analysis Result:

Max Structural Usage: 72.8% [Pass]

Max Foundation Usage: 61.0% [Pass]

Additional Usage Caused by New Mount/Mount Modification : N/A

Report Prepared By : Linfeng Chen





**Tower Engineering Solutions**

Phone (972) 483-0607, Fax (972) 975-9615  
1320 Greenway Drive, Suite 600, Irving, Texas 75038

---

## **Structural Analysis Report**

**Existing 130 ft Rohn Monopole**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT13615-A**

**Customer Site Name: Madison 7, CT**

**Carrier Name: AT&T**

**Carrier Site ID / Name: CT2517 / Madison**

**Site Location: 17 Cottage Road**

**Madison, Connecticut**

**New Haven County**

**Latitude: 41.275916**

**Longitude: -72.561444**

### **Analysis Result:**

**Max Structural Usage: 72.8% [Pass]**

**Max Foundation Usage: 61.0% [Pass]**

**Additional Usage Caused by New Mount/Mount Modification : N/A**

**Report Prepared By : Linfeng Chen**

## Introduction

The purpose of this report is to summarize the analysis results on the 130 ft Rohn 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>	Radian Communication Services, Drawing No. A070592 1-3 dated 10/1/2007.
<b>Foundation Drawing</b>	Radian Communication Services, Drawing No. A070593 1-3 dated 10/1/2007.
<b>Geotechnical Report</b>	JGI, Project No. J2075395 dated 9/10/2007.
<b>Modification Drawings</b>	N/A

## Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-G. 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>Wind Speed Used in the Analysis:</b>	Ultimate Design Wind Speed $V_{ult} = 130.0$ mph (3-Sec. Gust)/ Nominal Design Wind Speed $V_{asd} = 101.0$ mph (3-Sec. Gust)
<b>Wind Speed with Ice:</b>	50 mph (3-Sec. Gust) with 3/4" radial ice concurrent
<b>Operational Wind Speed:</b>	60 mph + 0" Radial ice
<b>Standard/Codes:</b>	ANSI/TIA/EIA 222-G / 2012 IBC / 2016 Connecticut State Building Code
<b>Exposure Category:</b>	C
<b>Structure Class:</b>	II
<b>Topographic Category:</b>	1
<b>Crest Height:</b>	0 ft
<b>Seismic Parameters:</b>	$S_S = 0.173$ , $S_1 = 0.06$

This structural analysis is based upon the tower being classified as a Structure Class II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

## 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
-	127.0	6	Powerwave - P90-15-XLH-RR - Panel	Platform w/ Hand Rail Handrail kit Site Pro HRK-14-U (1) Collar Mount	(12) 1-5/8" (1) 1/2" Fiber (2) 3/4" DC (1) 3" Flex Conduit	AT&T
-		3	Andrew - SBNHH-1D65A - Panel			
-		6	Powerwave TT19-08BP111-001 TMA			
-		3	Ericsson RRUS-11 RRH			
-		3	Ericsson RRUS-32 RRH			
-		6	Powerwave CM1007-DBPXBC-003 Diplexer			
-		1	Raycap DC6-48-60-18-8F Surge			
9		117.0	3			
10	3		Ericsson Air 21 B4A B2P			
11	3		Ericsson KRY 112 144 TMAs			
12	107.0	3	Commscope SBNHH-1D65B Panel	(1) Low Profile Platform	(10) 1-5/8" Coax (2) 1-5/8" Fiber	Verizon
13		3	Antel BXA-70063-6CF-2 Panel			
14		6	Commscope SBNHH-1D65B Panel			
15		3	Alcatel Lucent RRH2x60-700 RRU			
16		3	Alcatel Lucent RRH2X60-PCS RRU			
17		3	Alcatel Lucent RRH4x45AWS RRU			
18		2	Rfs Celwave DB-T1-6Z-8AB-0Z ODU			
19	97.0	3	Commscope NNVV-65B-R4 - Panel	(1) Perfect 10 low profile platform w/ handrails PV-LPP12M-HR-B	(3) 1.619" Hybrid	Sprint Nextel
20		3	Nokia AAHC - MIMO - Panel			
21		3	ALU 1900 RRHs			
22		6	ALU 800 MHz 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	127.0	3	Ericsson RRUS-11	Platform w/ Hand Rail Handrail kit Site Pro HRK-14-U (1) Collar Mount	(12) 1-5/8" (2) 1/2" Fiber (4) 3/4" DC	AT&T
2		3	Powerwave P90-15-XLH-RR - Panel			
3		2	Raycap DC6-48-60-18-8F			
4		3	Quintel QS46512-2 - Panel			
5		6	Cci TPX-070821 TTA			
6		3	Ericsson RRUS 32			
7		3	Andrew SBNHH-1D65A - Panel			
8		3	Ericsson RRUS-32			

See the attached coax layout for the line placement considered in the analysis.



## **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>49.5%</b>	<b>68.8%</b>	<b>72.8%</b>
Pass/Fail	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>

## **Foundations**

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	3127.9	33.6	47.5

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-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.6228 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-G 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 and/or 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 Ratio 49.46% at 0.0ft

**Structure:** CT13615-A-SBA  
**Site Name:** Madison 7, CT  
**Height:** 130.00 (ft)  
**Base Elev:** 0.000 (ft)

**Code:** EIA/TIA-222-G  
**Exposure:** C  
**Gh:** 1.1

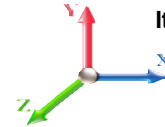
8/30/2018



Page: 1

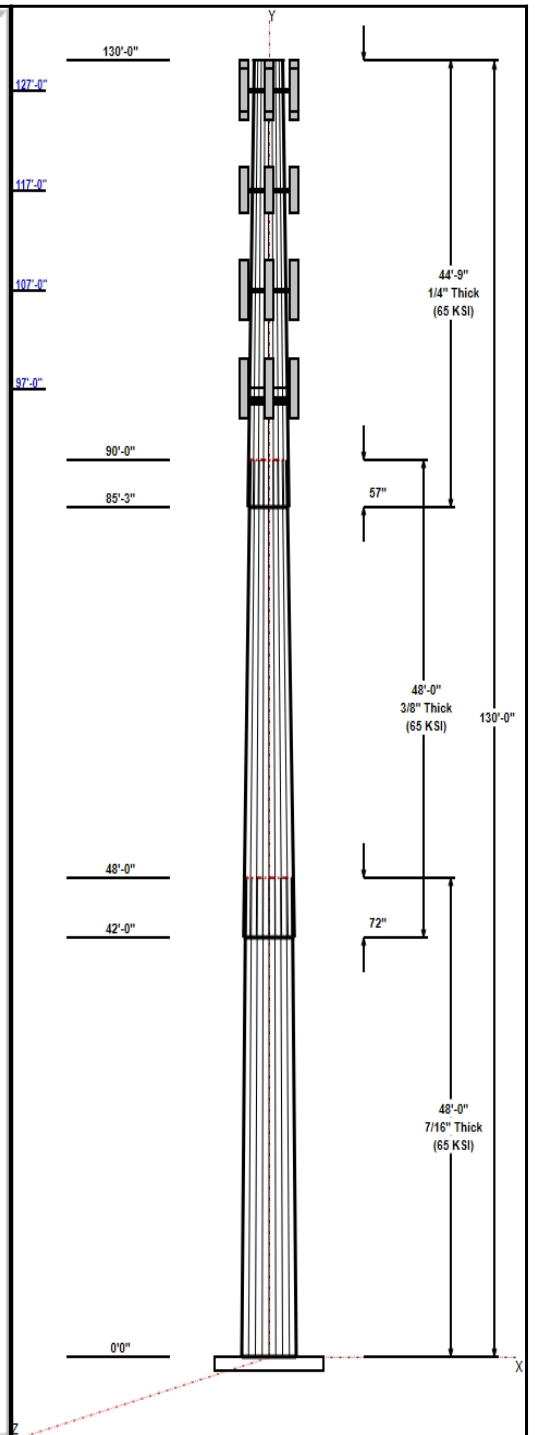
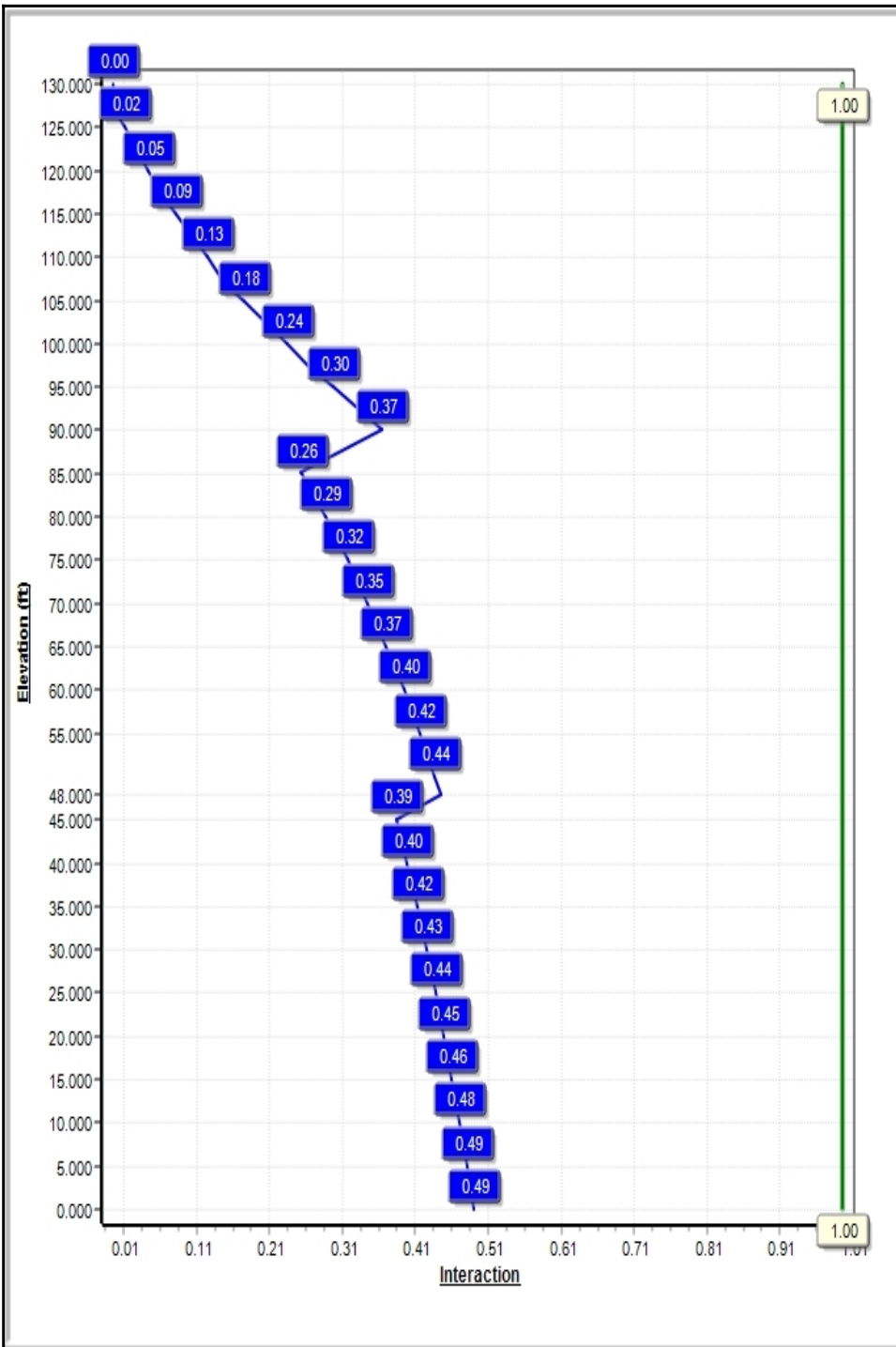
**Dead Load Factor:** 1.20  
**Wind Load Factor:** 1.60

**Load Case : 1.2D + 1.6W 101 mph Wind**



**Iterations:** 20

*Copyright © 2018 by Tower Engineering Solutions, LLC. All rights reserved.*



## Structure: CT13615-A-SBA

**Type:** Tapered  
**Site Name:** Madison 7, CT  
**Height:** 130.00 (ft)  
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.24800

8/30/2018

Page: 2



### Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	48.00	46.10	58.00	0.438		0.24800	65
2	48.00	36.43	48.33	0.375	Slip	0.24800	65
3	44.75	27.01	38.11	0.250	Slip	0.24800	65

### Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
127.00	127.00	3	Quintel QS46512-2	AT&T
127.00	127.00	6	Cci TPX-070821	AT&T
127.00	127.00	3	Ericsson RRUS 32	AT&T
127.00	127.00	3	Andrew SBNHH-1D65A	AT&T
127.00	127.00	1	Platform w/ Hand Rail	AT&T
127.00	127.00	3	Ericsson RRUS-32	AT&T
127.00	127.00	3	Ericsson RRUS-11	AT&T
127.00	127.00	3	Powerwave	AT&T
127.00	127.00	2	Raycap DC6-48-60-18-8F	AT&T
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	T-Mobile
117.00	117.00	1	12.5' Low Profile Platform	T-Mobile
107.00	107.00	1	Low Profile Platform	Verizon
107.00	107.00	3	SBNHH-1D65B	Verizon
107.00	107.00	3	BXA-70063-6CF-2	Verizon
107.00	107.00	6	SBNHH-1D65B	Verizon
107.00	107.00	3	RRH2x60-700	Verizon
107.00	107.00	3	RRH2X60-PCS	Verizon
107.00	107.00	3	RRH4x45AWS	Verizon
107.00	107.00	2	DB-T1-6Z-8AB-OZ	Verizon
97.00	97.00	3	NNVV-65B-R4	Sprint Nextel
97.00	97.00	3	AAHC	Sprint Nextel
97.00	97.00	3	1900MHz RRH (65MHz)	Sprint Nextel
97.00	97.00	6	800 MHz RRH	Sprint Nextel
97.00	97.00	1	PV-LPP12M-HR-B	Sprint Nextel

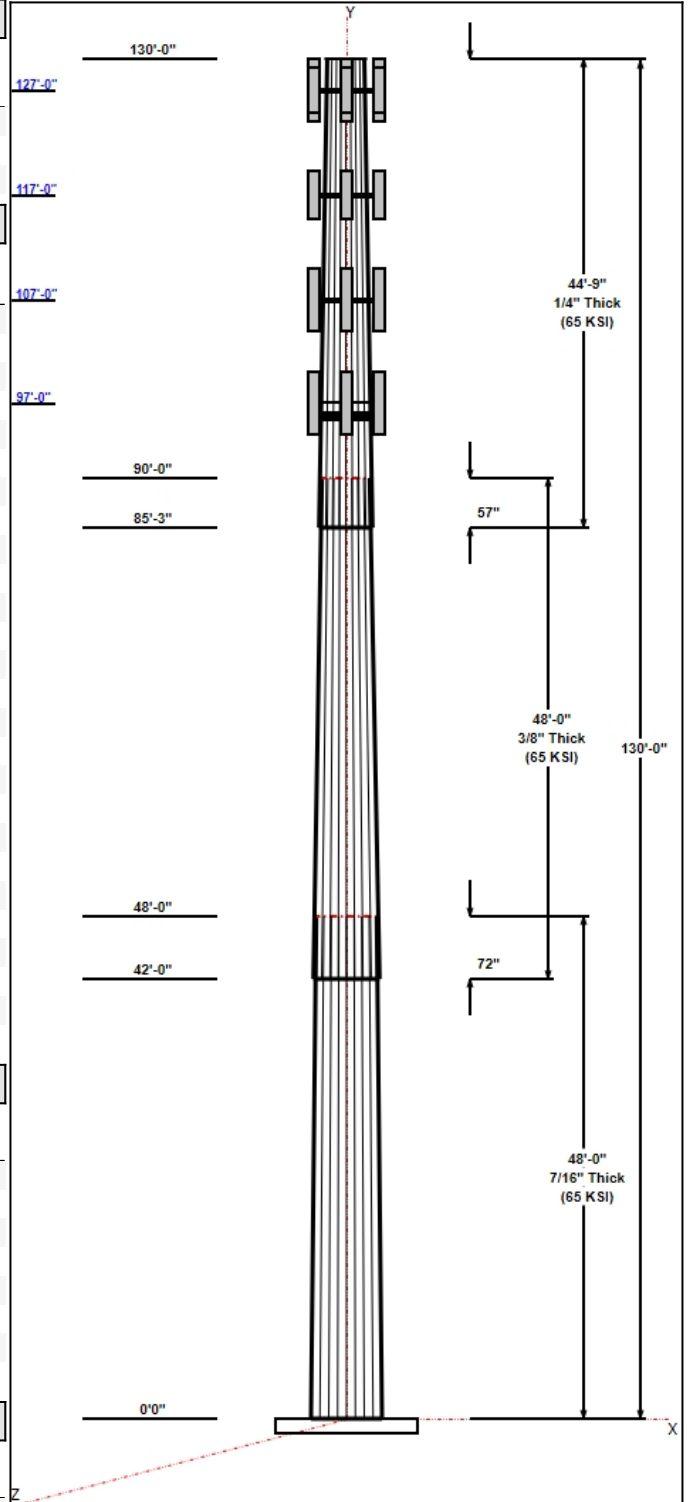
### Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	127.00	Inside	1 5/8"	AT&T
0.00	127.00	Inside	1/2" Fiber	AT&T
0.00	127.00	Inside	3/4" DC Power	AT&T
0.00	117.00	Inside	1 5/8"	T-Mobile
0.00	117.00	Inside	1 5/8" Fiber	T-Mobile
0.00	107.00	Inside	1 5/8" Coax	Verizon
0.00	107.00	Inside	1 5/8" Fiber	Verizon
0.00	97.00	Outside	1.619" Hybrid	Sprint Nextel

### Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
26	1.5" F1554 105	105.0	Radial

### Base Plate



## Structure: CT13615-A-SBA

**Type:** Tapered  
**Site Name:** Madison 7, CT  
**Height:** 130.00 (ft)  
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.24800

8/30/2018

Page: 3



Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
1.7500	67.0	50.0	Round

### Reactions

Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 101 mph Wind	3127.8	33.6	47.5
0.9D + 1.6W 101 mph Wind	3110.2	33.6	35.6
1.2D + 1.0Di + 1.0Wi 50 mph Wind	793.5	8.7	71.9
1.2D + 1.0E	94.3	1.0	47.5
0.9D + 1.0E	93.8	1.0	35.6
1.0D + 1.0W 60 mph Wind	687.5	7.4	39.6

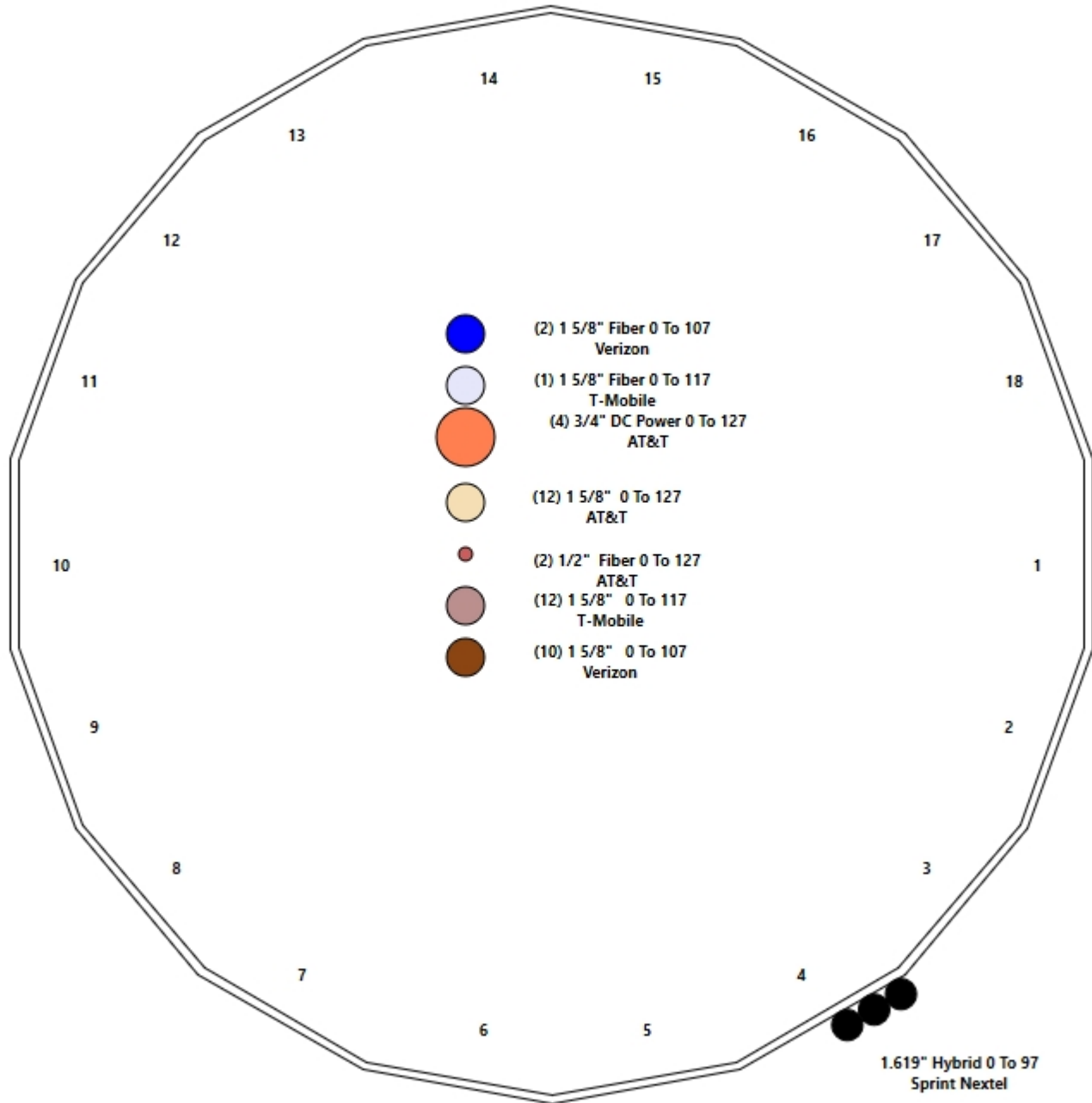
# Structure: CT13615-A-SBA - Coax Line Placement

**Type:** Monopole  
**Site Name:** Madison 7, CT  
**Height:** 130.00 (ft)

8/30/2018



Page: 4



## Shaft Properties

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 5

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	48.000	0.4375	65		0.00	11,705
2	18	48.000	0.3750	65	Slip	72.00	8,166
3	18	44.750	0.2500	65	Slip	57.00	3,904
<b>Total Shaft Weight:</b>							<b>23,775</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	58.00	0.00	79.93	33461.19	21.97	132.57	46.10	48.00	63.40	16698.8	17.17	105.3	0.248000
2	48.33	42.00	57.08	16587.69	21.32	128.89	36.43	90.00	42.91	7048.10	15.72	97.15	0.248000
3	38.11	85.25	30.04	5439.48	25.47	152.43	27.01	130.00	21.23	1921.07	17.64	108.0	0.248000



## Load Summary

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 6

### 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	127.00	Quintel QS46512-2	3	75.00	5.55	0.96	232.82	6.552	0.96	0.00	0.00
2	127.00	Cci TPX-070821	6	12.60	0.81	0.68	30.38	1.457	0.67	0.00	0.00
3	127.00	Ericsson RRUS 32	3	53.00	2.74	0.67	139.21	3.456	0.67	0.00	0.00
4	127.00	Andrew SBNHH-1D65A	3	33.50	5.88	0.83	188.73	6.941	0.83	0.00	0.00
5	127.00	Platform w/ Hand Rail	1	1600.00	32.00	1.00	3665.18	59.462	1.00	0.00	0.00
6	127.00	Ericsson RRUS-32	3	77.00	3.87	0.67	188.33	4.092	0.67	0.00	0.00
7	127.00	Ericsson RRUS-11	3	55.00	4.42	0.67	143.47	5.895	0.67	0.00	0.00
8	127.00	Powerwave P90-15-XLH-RR	3	53.00	8.16	0.75	215.33	10.916	0.77	0.00	0.00
9	127.00	Raycap DC6-48-60-18-8F	2	32.80	1.47	1.00	93.60	2.158	1.00	0.00	0.00
10	117.00	Air 21 B2A B4P	3	91.50	6.09	0.86	255.46	7.159	0.88	0.00	0.00
11	117.00	Air 21 B4A B2P	3	90.40	6.09	0.86	254.36	7.159	0.88	0.00	0.00
12	117.00	KRY 112 144	3	11.00	0.41	0.70	21.52	0.874	0.72	0.00	0.00
13	117.00	12.5' Low Profile Platform	1	1600.00	25.55	1.00	3302.39	31.576	1.00	0.00	0.00
14	107.00	Low Profile Platform	1	1200.00	25.00	1.00	2212.35	45.247	1.00	0.00	0.00
15	107.00	SBNHH-1D65B	3	40.60	8.08	0.83	234.27	9.326	0.85	0.00	0.00
16	107.00	BXA-70063-6CF-2	3	17.00	7.57	0.73	160.37	10.242	0.75	0.00	0.00
17	107.00	SBNHH-1D65B	6	40.60	8.08	0.83	234.27	9.326	0.85	0.00	0.00
18	107.00	RRH2x60-700	3	60.00	3.50	0.67	144.39	4.263	0.67	0.00	0.00
19	107.00	RRH2X60-PCS	3	55.00	2.20	0.67	136.08	2.813	0.67	0.00	0.00
20	107.00	RRH4x45AWS	3	60.00	2.71	0.67	138.07	3.932	0.67	0.00	0.00
21	107.00	DB-T1-6Z-8AB-0Z	2	18.90	4.80	0.71	157.03	5.643	0.73	0.00	0.00
22	97.00	NNVV-65B-R4	3	77.40	12.27	0.74	350.78	13.664	0.74	0.00	0.00
23	97.00	AAHC	3	104.00	4.20	0.75	226.78	4.993	0.75	0.00	0.00
24	97.00	1900MHz RRH (65MHz)	3	60.00	2.77	0.67	139.88	3.984	0.67	0.00	0.00
25	97.00	800 MHz RRH	6	53.00	2.49	0.67	123.81	3.585	0.67	0.00	0.00
26	97.00	PV-LPP12M-HR-B	1	1870.00	44.00	1.00	3619.63	96.930	1.00	0.00	0.00
<b>Totals:</b>			<b>77</b>	<b>10,050.80</b>			<b>25,141.07</b>				

### Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	127.00	(12) 1 5/8"	0.00	Inside
0.00	127.00	(2) 1/2" Fiber	0.00	Inside
0.00	127.00	(4) 3/4" DC Power	0.00	Inside
0.00	117.00	(12) 1 5/8"	0.00	Inside
0.00	117.00	(1) 1 5/8" Fiber	0.00	Inside
0.00	107.00	(10) 1 5/8" Coax	0.00	Inside
0.00	107.00	(2) 1 5/8" Fiber	0.00	Inside
0.00	97.00	(3) 1.619" Hybrid	1.62	Outside

## Shaft Section Properties

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 7

**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	Fpy (ksi)	S (in <sup>3</sup> )	Weight (lb)
0.00		0.4375	58.000	79.930	33461.2	21.97	132.57	75.6	1136.	0.0
5.00		0.4375	56.760	78.208	31345.0	21.47	129.74	76.2	1087.	1345.3
10.00		0.4375	55.520	76.486	29320.0	20.97	126.90	76.7	1040.	1316.0
15.00		0.4375	54.280	74.764	27384.1	20.47	124.07	77.3	993.7	1286.7
20.00		0.4375	53.040	73.043	25535.3	19.97	121.23	77.9	948.2	1257.4
25.00		0.4375	51.800	71.321	23771.7	19.47	118.40	78.5	903.9	1228.1
30.00		0.4375	50.560	69.599	22091.3	18.97	115.57	79.1	860.6	1198.8
35.00		0.4375	49.320	67.877	20491.9	18.47	112.73	79.7	818.4	1169.5
40.00		0.4375	48.080	66.155	18971.7	17.97	109.90	80.3	777.2	1140.2
42.00	Bot - Section 2	0.4375	47.584	65.466	18385.3	17.77	108.76	80.5	761.0	447.9
45.00		0.4375	46.840	64.433	17528.6	17.47	107.06	80.9	737.1	1241.2
48.00	Top - Section 1	0.3750	46.846	55.310	15091.1	20.62	124.92	0.0	0.0	1221.6
50.00		0.3750	46.350	54.720	14613.0	20.38	123.60	77.4	621.0	374.4
55.00		0.3750	45.110	53.244	13462.3	19.80	120.29	78.1	587.8	918.4
60.00		0.3750	43.870	51.768	12373.5	19.22	116.99	78.8	555.5	893.3
65.00		0.3750	42.630	50.292	11345.1	18.63	113.68	79.5	524.2	868.2
70.00		0.3750	41.390	48.816	10375.4	18.05	110.37	80.2	493.7	843.1
75.00		0.3750	40.150	47.340	9462.5	17.47	107.07	80.9	464.2	818.0
80.00		0.3750	38.910	45.865	8604.8	16.89	103.76	81.5	435.6	792.9
85.00		0.3750	37.670	44.389	7800.6	16.30	100.45	82.2	407.9	767.8
85.25	Bot - Section 3	0.3750	37.608	44.315	7761.8	16.27	100.29	82.3	406.5	37.7
90.00	Top - Section 2	0.2500	36.930	29.105	4947.3	24.64	147.72	0.0	0.0	1182.9
95.00		0.2500	35.690	28.121	4462.4	23.76	142.76	73.5	246.3	486.8
97.00		0.2500	35.194	27.727	4277.6	23.41	140.78	73.9	239.4	190.0
100.00		0.2500	34.450	27.137	4010.2	22.89	137.80	74.5	229.3	280.0
105.00		0.2500	33.210	26.153	3589.6	22.01	132.84	75.5	212.9	453.3
107.00		0.2500	32.714	25.759	3430.0	21.66	130.86	75.9	206.5	176.6
110.00		0.2500	31.970	25.169	3199.5	21.14	127.88	76.5	197.1	259.9
115.00		0.2500	30.730	24.185	2838.8	20.26	122.92	77.6	181.9	419.9
117.00		0.2500	30.234	23.791	2702.4	19.91	120.94	78.0	176.1	163.3
120.00		0.2500	29.490	23.201	2506.2	19.39	117.96	78.6	167.4	239.9
125.00		0.2500	28.250	22.217	2200.7	18.51	113.00	79.6	153.4	386.4
127.00		0.2500	27.754	21.824	2085.8	18.16	111.02	80.0	148.0	149.9
130.00		0.2500	27.010	21.233	1921.1	17.64	108.04	80.7	140.1	219.8

**23775.2**

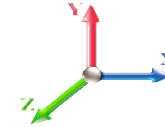
## Wind Loading - Shaft

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



**Load Case:** 1.2D + 1.6W 101 mph Wind

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.60



**Iterations** 20

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		1.00	0.85	21.088	23.20	457.01	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	21.088	23.20	447.24	0.650	0.000	5.00	24.277	15.78	585.7	0.0	1614.3
10.00		1.00	0.85	21.088	23.20	437.47	0.650	0.000	5.00	23.753	15.44	573.0	0.0	1579.2
15.00		1.00	0.85	21.088	23.20	427.70	0.650	0.000	5.00	23.228	15.10	560.4	0.0	1544.0
20.00		1.00	0.90	22.375	24.61	430.49	0.650	0.000	5.00	22.703	14.76	581.1	0.0	1508.9
25.00		1.00	0.95	23.451	25.80	430.42	0.650	0.000	5.00	22.179	14.42	595.0	0.0	1473.7
30.00		1.00	0.98	24.369	26.81	428.26	0.650	0.000	5.00	21.654	14.08	603.7	0.0	1438.6
35.00		1.00	1.01	25.172	27.69	424.59	0.650	0.000	5.00	21.129	13.73	608.5	0.0	1403.4
40.00		1.00	1.04	25.890	28.48	419.77	0.650	0.000	5.00	20.605	13.39	610.3	0.0	1368.2
42.00	Bot - Section 2	1.00	1.05	26.157	28.77	417.58	0.650	0.000	2.00	8.095	5.26	242.2	0.0	537.5
45.00		1.00	1.07	26.540	29.19	414.05	0.650	0.000	3.00	12.175	7.91	369.7	0.0	1489.5
48.00	Top - Section 1	1.00	1.08	26.903	29.59	410.25	0.650	0.000	3.00	11.987	7.79	368.9	0.0	1466.0
50.00		1.00	1.09	27.135	29.85	414.29	0.650	0.000	2.00	7.886	5.13	244.8	0.0	449.3
55.00		1.00	1.12	27.685	30.45	407.27	0.650	0.000	5.00	19.348	12.58	612.8	0.0	1102.1
60.00		1.00	1.14	28.197	31.02	399.72	0.650	0.000	5.00	18.823	12.24	607.2	0.0	1072.0
65.00		1.00	1.16	28.676	31.54	391.71	0.650	0.000	5.00	18.299	11.89	600.3	0.0	1041.9
70.00		1.00	1.17	29.127	32.04	383.29	0.650	0.000	5.00	17.774	11.55	592.3	0.0	1011.7
75.00		1.00	1.19	29.553	32.51	374.52	0.650	0.000	5.00	17.250	11.21	583.2	0.0	981.6
80.00		1.00	1.21	29.958	32.95	365.43	0.650	0.000	5.00	16.725	10.87	573.2	0.0	951.5
85.00		1.00	1.22	30.342	33.38	356.05	0.650	0.000	5.00	16.200	10.53	562.3	0.0	921.3
85.25	Bot - Section 3	1.00	1.22	30.361	33.40	355.57	0.650	0.000	0.25	0.796	0.52	27.7	0.0	45.3
90.00	Top - Section 2	1.00	1.24	30.710	33.78	346.40	0.650	0.000	4.75	15.080	9.80	529.8	0.0	1419.5
95.00		1.00	1.25	31.061	34.17	341.30	0.650	0.000	5.00	15.363	9.99	545.9	0.0	584.2
97.00	Appurtenance(s)	1.00	1.26	31.198	34.32	337.30	0.650	0.000	2.00	5.998	3.90	214.1	0.0	228.0
100.00		1.00	1.27	31.399	34.54	331.23	0.650	0.000	3.00	8.840	5.75	317.5	0.0	336.0
105.00		1.00	1.28	31.723	34.89	320.95	0.650	0.000	5.00	14.313	9.30	519.4	0.0	544.0
107.00	Appurtenance(s)	1.00	1.28	31.849	35.03	316.79	0.650	0.000	2.00	5.578	3.63	203.3	0.0	212.0
110.00		1.00	1.29	32.035	35.24	310.48	0.650	0.000	3.00	8.210	5.34	300.9	0.0	311.9
115.00		1.00	1.30	32.336	35.57	299.84	0.650	0.000	5.00	13.264	8.62	490.7	0.0	503.8
117.00	Appurtenance(s)	1.00	1.31	32.454	35.70	295.54	0.650	0.000	2.00	5.159	3.35	191.5	0.0	195.9
120.00		1.00	1.32	32.627	35.89	289.03	0.650	0.000	3.00	7.581	4.93	283.0	0.0	287.8
125.00		1.00	1.33	32.909	36.20	278.07	0.650	0.000	5.00	12.215	7.94	459.9	0.0	463.6
127.00	Appurtenance(s)	1.00	1.33	33.019	36.32	273.65	0.650	0.000	2.00	4.739	3.08	179.0	0.0	179.8
130.00		1.00	1.34	33.182	36.50	266.97	0.650	0.000	3.00	6.951	4.52	263.9	0.0	263.7
<b>Totals:</b>									<b>130.00</b>			<b>14,600.9</b>		<b>28,530.3</b>

## Discrete Appurtenance Forces

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 9

**Load Case:** 1.2D + 1.6W 101 mph Wind

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.60



**Iterations** 20

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	127.00	Andrew SBNHH-1D65A	3	33.019	36.321	0.66	0.80	11.71	120.60	0.000	0.000	680.68	0.00	0.00
2	127.00	Ericsson RRUS-11	3	33.019	36.321	0.54	0.80	7.11	198.00	0.000	0.000	413.03	0.00	0.00
3	127.00	Powerwave	3	33.019	36.321	0.60	0.80	14.69	190.80	0.000	0.000	853.57	0.00	0.00
4	127.00	Raycap DC6-48-60-18-8F	2	33.019	36.321	1.00	1.00	2.94	78.72	0.000	0.000	170.85	0.00	0.00
5	127.00	Ericsson RRUS 32	3	33.019	36.321	0.54	0.80	4.41	190.80	0.000	0.000	256.04	0.00	0.00
6	127.00	Platform w/ Hand Rail	1	33.019	36.321	1.00	1.00	32.00	1920.00	0.000	0.000	1859.62	0.00	0.00
7	127.00	Ericsson RRUS-32	3	33.019	36.321	0.54	0.80	6.22	277.20	0.000	0.000	361.64	0.00	0.00
8	127.00	Quintel QS46512-2	3	33.019	36.321	0.77	0.80	12.79	270.00	0.000	0.000	743.11	0.00	0.00
9	127.00	Cci TPX-070821	6	33.019	36.321	0.54	0.80	2.64	90.72	0.000	0.000	153.64	0.00	0.00
10	117.00	12.5' Low Profile Platform	1	32.454	35.699	1.00	1.00	25.55	1920.00	0.000	0.000	1459.38	0.00	0.00
11	117.00	KRY 112 144	3	32.454	35.699	0.56	0.80	0.69	39.60	0.000	0.000	39.34	0.00	0.00
12	117.00	Air 21 B4A B2P	3	32.454	35.699	0.69	0.80	12.57	325.44	0.000	0.000	717.97	0.00	0.00
13	117.00	Air 21 B2A B4P	3	32.454	35.699	0.69	0.80	12.57	329.40	0.000	0.000	717.97	0.00	0.00
14	107.00	DB-T1-6Z-8AB-OZ	2	31.849	35.034	0.57	0.80	5.45	45.36	0.000	0.000	305.65	0.00	0.00
15	107.00	BXA-70063-6CF-2	3	31.849	35.034	0.58	0.80	13.26	61.20	0.000	0.000	743.43	0.00	0.00
16	107.00	Low Profile Platform	1	31.849	35.034	1.00	1.00	25.00	1440.00	0.000	0.000	1401.35	0.00	0.00
17	107.00	SBNHH-1D65B	3	31.849	35.034	0.66	0.80	16.10	146.16	0.000	0.000	902.21	0.00	0.00
18	107.00	RRH4x45AWS	3	31.849	35.034	0.54	0.80	4.36	216.00	0.000	0.000	244.27	0.00	0.00
19	107.00	SBNHH-1D65B	6	31.849	35.034	0.66	0.80	32.19	292.32	0.000	0.000	1804.42	0.00	0.00
20	107.00	RRH2x60-700	3	31.849	35.034	0.54	0.80	5.63	216.00	0.000	0.000	315.47	0.00	0.00
21	107.00	RRH2X60-PCS	3	31.849	35.034	0.54	0.80	3.54	198.00	0.000	0.000	198.30	0.00	0.00
22	97.00	PV-LPP12M-HR-B	1	31.198	34.318	1.00	1.00	44.00	2244.00	0.000	0.000	2415.96	0.00	0.00
23	97.00	800 MHz RRH	6	31.198	34.318	0.50	0.75	7.51	381.60	0.000	0.000	412.21	0.00	0.00
24	97.00	1900MHz RRH (65MHz)	3	31.198	34.318	0.50	0.75	4.18	216.00	0.000	0.000	229.28	0.00	0.00
25	97.00	AAHC	3	31.198	34.318	0.56	0.75	7.09	374.40	0.000	0.000	389.16	0.00	0.00
26	97.00	NNVV-65B-R4	3	31.198	34.318	0.55	0.75	20.43	278.64	0.000	0.000	1121.75	0.00	0.00

**Totals:** 12,060.96

18,910.31

## Total Applied Force Summary

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 10

**Load Case:** 1.2D + 1.6W 101 mph Wind

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.60



**Iterations** 20

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		585.66	1908.92	0.00	0.00
10.00		573.01	1873.77	0.00	0.00
15.00		560.35	1838.62	0.00	0.00
20.00		581.13	1803.46	0.00	0.00
25.00		595.00	1768.31	0.00	0.00
30.00		603.66	1733.15	0.00	0.00
35.00		608.46	1698.00	0.00	0.00
40.00		610.27	1662.85	0.00	0.00
42.00		242.23	655.30	0.00	0.00
45.00		369.67	1666.22	0.00	0.00
48.00		368.91	1642.71	0.00	0.00
50.00		244.81	567.13	0.00	0.00
55.00		612.79	1396.73	0.00	0.00
60.00		607.20	1366.60	0.00	0.00
65.00		600.31	1336.47	0.00	0.00
70.00		592.26	1306.33	0.00	0.00
75.00		583.19	1276.20	0.00	0.00
80.00		573.19	1246.07	0.00	0.00
85.00		562.34	1215.94	0.00	0.00
85.25		27.66	60.01	0.00	0.00
90.00		529.80	1699.37	0.00	0.00
95.00		545.89	878.77	0.00	0.00
97.00	(16) attachments	4782.44	3840.52	0.00	0.00
100.00		317.52	502.00	0.00	0.00
105.00		519.44	820.60	0.00	0.00
107.00	(24) attachments	6118.36	2937.65	0.00	0.00
110.00		300.89	432.54	0.00	0.00
115.00		490.67	704.82	0.00	0.00
117.00	(10) attachments	3126.18	2890.74	0.00	0.00
120.00		282.95	359.54	0.00	0.00
125.00		459.86	583.17	0.00	0.00
127.00	(27) attachments	5671.19	3564.48	0.00	0.00
130.00		263.86	263.72	0.00	0.00
<b>Totals:</b>		<b>33,511.17</b>	<b>47,500.70</b>	<b>0.00</b>	<b>0.00</b>

## Linear Appurtenance Segment Forces (Factored)

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

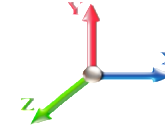


Page: 11

**Load Case:** 1.2D + 1.6W 101 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60



**Iterations** 20

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.028	0.000	21.088	0.00	18.00
10.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.028	0.000	21.088	0.00	18.00
15.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.029	0.000	21.088	0.00	18.00
20.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.030	0.000	22.375	0.00	18.00
25.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.030	0.000	23.451	0.00	18.00
30.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.031	0.000	24.369	0.00	18.00
35.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.032	0.000	25.172	0.00	18.00
40.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.033	0.000	25.890	0.00	18.00
42.00	1.619" Hybrid	Yes	2.00	0.000	1.62	0.27	0.00	0.033	0.000	26.157	0.00	7.20
45.00	1.619" Hybrid	Yes	3.00	0.000	1.62	0.41	0.00	0.034	0.000	26.540	0.00	10.80
48.00	1.619" Hybrid	Yes	3.00	0.000	1.62	0.41	0.00	0.034	0.000	26.903	0.00	10.80
50.00	1.619" Hybrid	Yes	2.00	0.000	1.62	0.27	0.00	0.034	0.000	27.135	0.00	7.20
55.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.035	0.000	27.685	0.00	18.00
60.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.036	0.000	28.197	0.00	18.00
65.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.037	0.000	28.676	0.00	18.00
70.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.038	0.000	29.127	0.00	18.00
75.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.039	0.000	29.553	0.00	18.00
80.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.040	0.000	29.958	0.00	18.00
85.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.042	0.000	30.342	0.00	18.00
85.25	1.619" Hybrid	Yes	0.25	0.000	1.62	0.03	0.00	0.042	0.000	30.361	0.00	0.90
90.00	1.619" Hybrid	Yes	4.75	0.000	1.62	0.64	0.00	0.043	0.000	30.710	0.00	17.10
95.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.044	0.000	31.061	0.00	18.00
97.00	1.619" Hybrid	Yes	2.00	0.000	1.62	0.27	0.00	0.045	0.000	31.198	0.00	7.20
<b>Totals:</b>											<b>0.0</b>	<b>349.2</b>

## Calculated Forces

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	<b>8/30/2018</b>
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

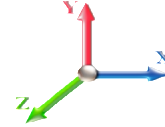


Page: 12

**Load Case:** 1.2D + 1.6W 101 mph Wind

**Iterations** 20

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.60



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-47.46	-33.57	0.00	-3127.7	0.00	3127.78	5435.95	2717.97	12860.7	6439.91	0.00	0.000	0.000	0.495
5.00	-45.48	-33.08	0.00	-2959.9	0.00	2959.95	5360.22	2680.11	12406.3	6212.37	0.07	-0.129	0.000	0.485
10.00	-43.53	-32.60	0.00	-2794.5	0.00	2794.55	5282.67	2641.34	11955.5	5986.66	0.28	-0.260	0.000	0.475
15.00	-41.62	-32.13	0.00	-2631.5	0.00	2631.54	5203.30	2601.65	11508.7	5762.93	0.62	-0.392	0.000	0.465
20.00	-39.75	-31.62	0.00	-2470.9	0.00	2470.91	5122.11	2561.06	11066.1	5541.30	1.10	-0.524	0.000	0.454
25.00	-37.92	-31.10	0.00	-2312.7	0.00	2312.79	5039.10	2519.55	10628.0	5321.92	1.72	-0.657	0.000	0.442
30.00	-36.12	-30.56	0.00	-2157.3	0.00	2157.30	4954.26	2477.13	10194.7	5104.94	2.48	-0.791	0.000	0.430
35.00	-34.36	-30.00	0.00	-2004.5	0.00	2004.51	4867.60	2433.80	9766.46	4890.49	3.39	-0.925	0.000	0.417
40.00	-32.66	-29.42	0.00	-1854.4	0.00	1854.49	4779.12	2389.56	9343.53	4678.71	4.43	-1.059	0.000	0.403
42.00	-31.98	-29.20	0.00	-1795.6	0.00	1795.66	4743.22	2371.61	9175.92	4594.78	4.88	-1.114	0.000	0.398
45.00	-30.28	-28.84	0.00	-1708.0	0.00	1708.05	4688.82	2344.41	8926.23	4469.75	5.61	-1.195	0.000	0.389
48.00	-28.61	-28.47	0.00	-1621.5	0.00	1621.52	3840.55	1920.27	7332.01	3671.45	6.39	-1.276	0.000	0.449
50.00	-28.00	-28.26	0.00	-1564.5	0.00	1564.58	3813.07	1906.53	7201.22	3605.96	6.93	-1.330	0.000	0.441
55.00	-26.55	-27.68	0.00	-1423.2	0.00	1423.27	3743.08	1871.54	6876.85	3443.54	8.41	-1.476	0.000	0.421
60.00	-25.13	-27.10	0.00	-1284.8	0.00	1284.85	3671.28	1835.64	6556.42	3283.08	10.03	-1.619	0.000	0.398
65.00	-23.75	-26.52	0.00	-1149.3	0.00	1149.35	3597.66	1798.83	6240.20	3124.74	11.80	-1.759	0.000	0.375
70.00	-22.40	-25.94	0.00	-1016.7	0.00	1016.75	3522.21	1761.10	5928.48	2968.65	13.72	-1.895	0.000	0.349
75.00	-21.09	-25.36	0.00	-887.07	0.00	887.07	3444.94	1722.47	5621.53	2814.94	15.77	-2.025	0.000	0.321
80.00	-19.81	-24.78	0.00	-760.28	0.00	760.28	3365.85	1682.92	5319.64	2663.77	17.96	-2.149	0.000	0.292
85.00	-18.59	-24.19	0.00	-636.37	0.00	636.37	3284.94	1642.47	5023.09	2515.28	20.28	-2.264	0.000	0.259
85.25	-18.51	-24.18	0.00	-630.32	0.00	630.32	3280.84	1640.42	5008.41	2507.93	20.40	-2.270	0.000	0.257
90.00	-16.80	-23.61	0.00	-515.47	0.00	515.47	1897.08	948.54	2862.22	1433.24	22.71	-2.370	0.000	0.369
95.00	-15.91	-23.05	0.00	-397.43	0.00	397.43	1858.98	929.49	2709.28	1356.65	25.24	-2.462	0.000	0.302
97.00	-12.27	-18.11	0.00	-351.34	0.00	351.34	1843.23	921.61	2648.47	1326.20	26.28	-2.510	0.000	0.272
100.00	-11.75	-17.79	0.00	-297.00	0.00	297.00	1819.06	909.53	2557.69	1280.75	27.88	-2.575	0.000	0.239
105.00	-10.94	-17.24	0.00	-208.05	0.00	208.05	1777.32	888.66	2407.73	1205.66	30.63	-2.664	0.000	0.179
107.00	-8.29	-11.00	0.00	-173.56	0.00	173.56	1760.11	880.05	2348.27	1175.88	31.75	-2.694	0.000	0.152
110.00	-7.86	-10.69	0.00	-140.56	0.00	140.56	1733.75	866.88	2259.69	1131.52	33.46	-2.733	0.000	0.129
115.00	-7.17	-10.17	0.00	-87.13	0.00	87.13	1688.37	844.18	2113.84	1058.49	36.35	-2.784	0.000	0.087
117.00	-4.44	-6.90	0.00	-66.80	0.00	66.80	1669.70	834.85	2056.18	1029.62	37.52	-2.799	0.000	0.068
120.00	-4.09	-6.60	0.00	-46.09	0.00	46.09	1641.16	820.58	1970.46	986.70	39.29	-2.817	0.000	0.049
125.00	-3.53	-6.12	0.00	-13.06	0.00	13.06	1592.13	796.06	1829.84	916.28	42.25	-2.834	0.000	0.017
127.00	-0.25	-0.28	0.00	-0.83	0.00	0.83	1572.01	786.00	1774.43	888.53	43.43	-2.836	0.000	0.001
130.00	0.00	-0.26	0.00	0.00	0.00	0.00	1541.28	770.64	1692.26	847.39	45.22	-2.836	0.000	0.000

## Wind Loading - Shaft

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	<b>8/30/2018</b>
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

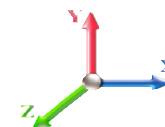


Page: 13

**Load Case:** 0.9D + 1.6W 101 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60



**Iterations** 20

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		1.00	0.85	21.088	23.20	457.01	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	21.088	23.20	447.24	0.650	0.000	5.00	24.277	15.78	585.7	0.0	1210.7
10.00		1.00	0.85	21.088	23.20	437.47	0.650	0.000	5.00	23.753	15.44	573.0	0.0	1184.4
15.00		1.00	0.85	21.088	23.20	427.70	0.650	0.000	5.00	23.228	15.10	560.4	0.0	1158.0
20.00		1.00	0.90	22.375	24.61	430.49	0.650	0.000	5.00	22.703	14.76	581.1	0.0	1131.6
25.00		1.00	0.95	23.451	25.80	430.42	0.650	0.000	5.00	22.179	14.42	595.0	0.0	1105.3
30.00		1.00	0.98	24.369	26.81	428.26	0.650	0.000	5.00	21.654	14.08	603.7	0.0	1078.9
35.00		1.00	1.01	25.172	27.69	424.59	0.650	0.000	5.00	21.129	13.73	608.5	0.0	1052.5
40.00		1.00	1.04	25.890	28.48	419.77	0.650	0.000	5.00	20.605	13.39	610.3	0.0	1026.2
42.00	Bot - Section 2	1.00	1.05	26.157	28.77	417.58	0.650	0.000	2.00	8.095	5.26	242.2	0.0	403.1
45.00		1.00	1.07	26.540	29.19	414.05	0.650	0.000	3.00	12.175	7.91	369.7	0.0	1117.1
48.00	Top - Section 1	1.00	1.08	26.903	29.59	410.25	0.650	0.000	3.00	11.987	7.79	368.9	0.0	1099.5
50.00		1.00	1.09	27.135	29.85	414.29	0.650	0.000	2.00	7.886	5.13	244.8	0.0	337.0
55.00		1.00	1.12	27.685	30.45	407.27	0.650	0.000	5.00	19.348	12.58	612.8	0.0	826.6
60.00		1.00	1.14	28.197	31.02	399.72	0.650	0.000	5.00	18.823	12.24	607.2	0.0	804.0
65.00		1.00	1.16	28.676	31.54	391.71	0.650	0.000	5.00	18.299	11.89	600.3	0.0	781.4
70.00		1.00	1.17	29.127	32.04	383.29	0.650	0.000	5.00	17.774	11.55	592.3	0.0	758.8
75.00		1.00	1.19	29.553	32.51	374.52	0.650	0.000	5.00	17.250	11.21	583.2	0.0	736.2
80.00		1.00	1.21	29.958	32.95	365.43	0.650	0.000	5.00	16.725	10.87	573.2	0.0	713.6
85.00		1.00	1.22	30.342	33.38	356.05	0.650	0.000	5.00	16.200	10.53	562.3	0.0	691.0
85.25	Bot - Section 3	1.00	1.22	30.361	33.40	355.57	0.650	0.000	0.25	0.796	0.52	27.7	0.0	34.0
90.00	Top - Section 2	1.00	1.24	30.710	33.78	346.40	0.650	0.000	4.75	15.080	9.80	529.8	0.0	1064.6
95.00		1.00	1.25	31.061	34.17	341.30	0.650	0.000	5.00	15.363	9.99	545.9	0.0	438.1
97.00	Appurtenance(s)	1.00	1.26	31.198	34.32	337.30	0.650	0.000	2.00	5.998	3.90	214.1	0.0	171.0
100.00		1.00	1.27	31.399	34.54	331.23	0.650	0.000	3.00	8.840	5.75	317.5	0.0	252.0
105.00		1.00	1.28	31.723	34.89	320.95	0.650	0.000	5.00	14.313	9.30	519.4	0.0	408.0
107.00	Appurtenance(s)	1.00	1.28	31.849	35.03	316.79	0.650	0.000	2.00	5.578	3.63	203.3	0.0	159.0
110.00		1.00	1.29	32.035	35.24	310.48	0.650	0.000	3.00	8.210	5.34	300.9	0.0	234.0
115.00		1.00	1.30	32.336	35.57	299.84	0.650	0.000	5.00	13.264	8.62	490.7	0.0	377.9
117.00	Appurtenance(s)	1.00	1.31	32.454	35.70	295.54	0.650	0.000	2.00	5.159	3.35	191.5	0.0	146.9
120.00		1.00	1.32	32.627	35.89	289.03	0.650	0.000	3.00	7.581	4.93	283.0	0.0	215.9
125.00		1.00	1.33	32.909	36.20	278.07	0.650	0.000	5.00	12.215	7.94	459.9	0.0	347.7
127.00	Appurtenance(s)	1.00	1.33	33.019	36.32	273.65	0.650	0.000	2.00	4.739	3.08	179.0	0.0	134.9
130.00		1.00	1.34	33.182	36.50	266.97	0.650	0.000	3.00	6.951	4.52	263.9	0.0	197.8
<b>Totals:</b>									<b>130.00</b>			<b>14,600.9</b>		<b>21,397.7</b>



## Discrete Appurtenance Forces

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

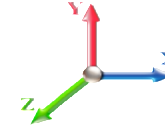


Page: 14

**Load Case:** 0.9D + 1.6W 101 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60



**Iterations** 20

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	127.00	Andrew SBNHH-1D65A	3	33.019	36.321	0.66	0.80	11.71	90.45	0.000	0.000	680.68	0.00	0.00
2	127.00	Ericsson RRUS-11	3	33.019	36.321	0.54	0.80	7.11	148.50	0.000	0.000	413.03	0.00	0.00
3	127.00	Powerwave	3	33.019	36.321	0.60	0.80	14.69	143.10	0.000	0.000	853.57	0.00	0.00
4	127.00	Raycap DC6-48-60-18-8F	2	33.019	36.321	1.00	1.00	2.94	59.04	0.000	0.000	170.85	0.00	0.00
5	127.00	Ericsson RRUS 32	3	33.019	36.321	0.54	0.80	4.41	143.10	0.000	0.000	256.04	0.00	0.00
6	127.00	Platform w/ Hand Rail	1	33.019	36.321	1.00	1.00	32.00	1440.00	0.000	0.000	1859.62	0.00	0.00
7	127.00	Ericsson RRUS-32	3	33.019	36.321	0.54	0.80	6.22	207.90	0.000	0.000	361.64	0.00	0.00
8	127.00	Quintel QS46512-2	3	33.019	36.321	0.77	0.80	12.79	202.50	0.000	0.000	743.11	0.00	0.00
9	127.00	Cci TPX-070821	6	33.019	36.321	0.54	0.80	2.64	68.04	0.000	0.000	153.64	0.00	0.00
10	117.00	12.5' Low Profile Platform	1	32.454	35.699	1.00	1.00	25.55	1440.00	0.000	0.000	1459.38	0.00	0.00
11	117.00	KRY 112 144	3	32.454	35.699	0.56	0.80	0.69	29.70	0.000	0.000	39.34	0.00	0.00
12	117.00	Air 21 B4A B2P	3	32.454	35.699	0.69	0.80	12.57	244.08	0.000	0.000	717.97	0.00	0.00
13	117.00	Air 21 B2A B4P	3	32.454	35.699	0.69	0.80	12.57	247.05	0.000	0.000	717.97	0.00	0.00
14	107.00	DB-T1-6Z-8AB-OZ	2	31.849	35.034	0.57	0.80	5.45	34.02	0.000	0.000	305.65	0.00	0.00
15	107.00	BXA-70063-6CF-2	3	31.849	35.034	0.58	0.80	13.26	45.90	0.000	0.000	743.43	0.00	0.00
16	107.00	Low Profile Platform	1	31.849	35.034	1.00	1.00	25.00	1080.00	0.000	0.000	1401.35	0.00	0.00
17	107.00	SBNHH-1D65B	3	31.849	35.034	0.66	0.80	16.10	109.62	0.000	0.000	902.21	0.00	0.00
18	107.00	RRH4x45AWS	3	31.849	35.034	0.54	0.80	4.36	162.00	0.000	0.000	244.27	0.00	0.00
19	107.00	SBNHH-1D65B	6	31.849	35.034	0.66	0.80	32.19	219.24	0.000	0.000	1804.42	0.00	0.00
20	107.00	RRH2x60-700	3	31.849	35.034	0.54	0.80	5.63	162.00	0.000	0.000	315.47	0.00	0.00
21	107.00	RRH2X60-PCS	3	31.849	35.034	0.54	0.80	3.54	148.50	0.000	0.000	198.30	0.00	0.00
22	97.00	PV-LPP12M-HR-B	1	31.198	34.318	1.00	1.00	44.00	1683.00	0.000	0.000	2415.96	0.00	0.00
23	97.00	800 MHz RRH	6	31.198	34.318	0.50	0.75	7.51	286.20	0.000	0.000	412.21	0.00	0.00
24	97.00	1900MHz RRH (65MHz)	3	31.198	34.318	0.50	0.75	4.18	162.00	0.000	0.000	229.28	0.00	0.00
25	97.00	AAHC	3	31.198	34.318	0.56	0.75	7.09	280.80	0.000	0.000	389.16	0.00	0.00
26	97.00	NNVV-65B-R4	3	31.198	34.318	0.55	0.75	20.43	208.98	0.000	0.000	1121.75	0.00	0.00

**Totals:** 9,045.72

**18,910.31**

## Total Applied Force Summary

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

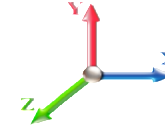


Page: 15

**Load Case:** 0.9D + 1.6W 101 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60



**Iterations** 20

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		585.66	1431.69	0.00	0.00
10.00		573.01	1405.33	0.00	0.00
15.00		560.35	1378.96	0.00	0.00
20.00		581.13	1352.60	0.00	0.00
25.00		595.00	1326.23	0.00	0.00
30.00		603.66	1299.87	0.00	0.00
35.00		608.46	1273.50	0.00	0.00
40.00		610.27	1247.13	0.00	0.00
42.00		242.23	491.47	0.00	0.00
45.00		369.67	1249.66	0.00	0.00
48.00		368.91	1232.04	0.00	0.00
50.00		244.81	425.35	0.00	0.00
55.00		612.79	1047.55	0.00	0.00
60.00		607.20	1024.95	0.00	0.00
65.00		600.31	1002.35	0.00	0.00
70.00		592.26	979.75	0.00	0.00
75.00		583.19	957.15	0.00	0.00
80.00		573.19	934.55	0.00	0.00
85.00		562.34	911.95	0.00	0.00
85.25		27.66	45.00	0.00	0.00
90.00		529.80	1274.53	0.00	0.00
95.00		545.89	659.08	0.00	0.00
97.00	(16) attachments	4782.44	2880.39	0.00	0.00
100.00		317.52	376.50	0.00	0.00
105.00		519.44	615.45	0.00	0.00
107.00	(24) attachments	6118.36	2203.24	0.00	0.00
110.00		300.89	324.40	0.00	0.00
115.00		490.67	528.62	0.00	0.00
117.00	(10) attachments	3126.18	2168.06	0.00	0.00
120.00		282.95	269.66	0.00	0.00
125.00		459.86	437.37	0.00	0.00
127.00	(27) attachments	5671.19	2673.36	0.00	0.00
130.00		263.86	197.79	0.00	0.00
	<b>Totals:</b>	<b>33,511.17</b>	<b>35,625.53</b>	<b>0.00</b>	<b>0.00</b>

## Linear Appurtenance Segment Forces (Factored)

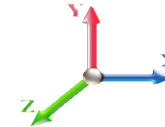
<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 16

**Load Case:** 0.9D + 1.6W 101 mph Wind

**Dead Load Factor** 0.90  
**Wind Load Factor** 1.60



**Iterations** 20

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.028	0.000	21.088	0.00	13.50
10.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.028	0.000	21.088	0.00	13.50
15.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.029	0.000	21.088	0.00	13.50
20.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.030	0.000	22.375	0.00	13.50
25.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.030	0.000	23.451	0.00	13.50
30.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.031	0.000	24.369	0.00	13.50
35.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.032	0.000	25.172	0.00	13.50
40.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.033	0.000	25.890	0.00	13.50
42.00	1.619" Hybrid	Yes	2.00	0.000	1.62	0.27	0.00	0.033	0.000	26.157	0.00	5.40
45.00	1.619" Hybrid	Yes	3.00	0.000	1.62	0.41	0.00	0.034	0.000	26.540	0.00	8.10
48.00	1.619" Hybrid	Yes	3.00	0.000	1.62	0.41	0.00	0.034	0.000	26.903	0.00	8.10
50.00	1.619" Hybrid	Yes	2.00	0.000	1.62	0.27	0.00	0.034	0.000	27.135	0.00	5.40
55.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.035	0.000	27.685	0.00	13.50
60.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.036	0.000	28.197	0.00	13.50
65.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.037	0.000	28.676	0.00	13.50
70.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.038	0.000	29.127	0.00	13.50
75.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.039	0.000	29.553	0.00	13.50
80.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.040	0.000	29.958	0.00	13.50
85.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.042	0.000	30.342	0.00	13.50
85.25	1.619" Hybrid	Yes	0.25	0.000	1.62	0.03	0.00	0.042	0.000	30.361	0.00	0.68
90.00	1.619" Hybrid	Yes	4.75	0.000	1.62	0.64	0.00	0.043	0.000	30.710	0.00	12.83
95.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.044	0.000	31.061	0.00	13.50
97.00	1.619" Hybrid	Yes	2.00	0.000	1.62	0.27	0.00	0.045	0.000	31.198	0.00	5.40
<b>Totals:</b>											<b>0.0</b>	<b>261.9</b>

## Calculated Forces

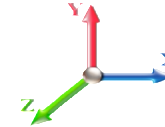
<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	<b>8/30/2018</b>
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 17

**Load Case:** 0.9D + 1.6W 101 mph Wind

**Dead Load Factor** 0.90  
**Wind Load Factor** 1.60



**Iterations** 20

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-35.59	-33.55	0.00	-3110.2	0.00	3110.22	5435.95	2717.97	12860.7	6439.91	0.00	0.000	0.000	0.490
5.00	-34.08	-33.04	0.00	-2942.4	0.00	2942.46	5360.22	2680.11	12406.3	6212.37	0.07	-0.129	0.000	0.480
10.00	-32.60	-32.54	0.00	-2777.2	0.00	2777.26	5282.67	2641.34	11955.5	5986.66	0.27	-0.258	0.000	0.470
15.00	-31.15	-32.04	0.00	-2614.5	0.00	2614.57	5203.30	2601.65	11508.7	5762.93	0.62	-0.389	0.000	0.460
20.00	-29.73	-31.52	0.00	-2454.3	0.00	2454.36	5122.11	2561.06	11066.1	5541.30	1.10	-0.521	0.000	0.449
25.00	-28.34	-30.98	0.00	-2296.7	0.00	2296.77	5039.10	2519.55	10628.0	5321.92	1.71	-0.653	0.000	0.437
30.00	-26.98	-30.42	0.00	-2141.9	0.00	2141.90	4954.26	2477.13	10194.7	5104.94	2.47	-0.786	0.000	0.425
35.00	-25.65	-29.85	0.00	-1989.8	0.00	1989.81	4867.60	2433.80	9766.46	4890.49	3.36	-0.919	0.000	0.412
40.00	-24.36	-29.26	0.00	-1840.5	0.00	1840.56	4779.12	2389.56	9343.53	4678.71	4.40	-1.052	0.000	0.399
42.00	-23.84	-29.03	0.00	-1782.0	0.00	1782.04	4743.22	2371.61	9175.92	4594.78	4.85	-1.106	0.000	0.393
45.00	-22.56	-28.67	0.00	-1694.9	0.00	1694.94	4688.82	2344.41	8926.23	4469.75	5.57	-1.187	0.000	0.384
48.00	-21.30	-28.30	0.00	-1608.9	0.00	1608.93	3840.55	1920.27	7332.01	3671.45	6.35	-1.267	0.000	0.444
50.00	-20.83	-28.08	0.00	-1552.3	0.00	1552.32	3813.07	1906.53	7201.22	3605.96	6.89	-1.321	0.000	0.436
55.00	-19.73	-27.50	0.00	-1411.9	0.00	1411.91	3743.08	1871.54	6876.85	3443.54	8.35	-1.466	0.000	0.416
60.00	-18.66	-26.91	0.00	-1274.4	0.00	1274.43	3671.28	1835.64	6556.42	3283.08	9.96	-1.608	0.000	0.393
65.00	-17.61	-26.32	0.00	-1139.9	0.00	1139.90	3597.66	1798.83	6240.20	3124.74	11.72	-1.746	0.000	0.370
70.00	-16.59	-25.73	0.00	-1008.3	0.00	1008.31	3522.21	1761.10	5928.48	2968.65	13.63	-1.881	0.000	0.345
75.00	-15.60	-25.15	0.00	-879.64	0.00	879.64	3444.94	1722.47	5621.53	2814.94	15.67	-2.010	0.000	0.317
80.00	-14.64	-24.58	0.00	-753.87	0.00	753.87	3365.85	1682.92	5319.64	2663.77	17.84	-2.133	0.000	0.288
85.00	-13.72	-23.99	0.00	-630.99	0.00	630.99	3284.94	1642.47	5023.09	2515.28	20.14	-2.248	0.000	0.255
85.25	-13.65	-23.98	0.00	-624.99	0.00	624.99	3280.84	1640.42	5008.41	2507.93	20.25	-2.253	0.000	0.254
90.00	-12.36	-23.42	0.00	-511.10	0.00	511.10	1897.08	948.54	2862.22	1433.24	22.55	-2.352	0.000	0.364
95.00	-11.70	-22.86	0.00	-394.01	0.00	394.01	1858.98	929.49	2709.28	1356.65	25.06	-2.444	0.000	0.297
97.00	-9.01	-17.97	0.00	-348.29	0.00	348.29	1843.23	921.61	2648.47	1326.20	26.10	-2.491	0.000	0.268
100.00	-8.63	-17.64	0.00	-294.40	0.00	294.40	1819.06	909.53	2557.69	1280.75	27.68	-2.555	0.000	0.235
105.00	-8.02	-17.10	0.00	-206.18	0.00	206.18	1777.32	888.66	2407.73	1205.66	30.41	-2.644	0.000	0.176
107.00	-6.09	-10.89	0.00	-171.97	0.00	171.97	1760.11	880.05	2348.27	1175.88	31.53	-2.674	0.000	0.150
110.00	-5.78	-10.58	0.00	-139.29	0.00	139.29	1733.75	866.88	2259.69	1131.52	33.22	-2.713	0.000	0.127
115.00	-5.27	-10.07	0.00	-86.38	0.00	86.38	1688.37	844.18	2113.84	1058.49	36.09	-2.763	0.000	0.085
117.00	-3.25	-6.84	0.00	-66.23	0.00	66.23	1669.70	834.85	2056.18	1029.62	37.25	-2.778	0.000	0.066
120.00	-2.99	-6.55	0.00	-45.70	0.00	45.70	1641.16	820.58	1970.46	986.70	39.00	-2.796	0.000	0.048
125.00	-2.58	-6.07	0.00	-12.96	0.00	12.96	1592.13	796.06	1829.84	916.28	41.94	-2.812	0.000	0.016
127.00	-0.18	-0.27	0.00	-0.82	0.00	0.82	1572.01	786.00	1774.43	888.53	43.12	-2.814	0.000	0.001
130.00	0.00	-0.26	0.00	0.00	0.00	0.00	1541.28	770.64	1692.26	847.39	44.89	-2.814	0.000	0.000

## Wind Loading - Shaft

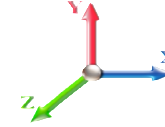
<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 18

**Load Case:** 1.2D + 1.0Di + 1.0Wi 50 mph Wind

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.00



**Iterations** 19

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		1.00	0.85	5.168	5.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	5.168	5.68	0.00	1.200	1.242	5.00	25.312	30.37	172.7	451.3	2065.6
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.331	5.00	24.862	29.83	169.6	474.1	2053.3
15.00		1.00	0.85	5.168	5.68	0.00	1.200	1.386	5.00	24.383	29.26	166.3	483.4	2027.4
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.427	5.00	23.892	28.67	172.9	486.8	1995.6
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.459	5.00	23.394	28.07	177.5	486.7	1960.4
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.486	5.00	22.892	27.47	180.5	484.4	1922.9
35.00		1.00	1.01	6.169	6.79	0.00	1.200	1.509	5.00	22.387	26.86	182.3	480.4	1883.8
40.00		1.00	1.04	6.345	6.98	0.00	1.200	1.529	5.00	21.879	26.25	183.2	475.2	1843.4
42.00	Bot - Section 2	1.00	1.05	6.410	7.05	0.00	1.200	1.537	2.00	8.607	10.33	72.8	189.1	726.6
45.00		1.00	1.07	6.504	7.15	0.00	1.200	1.547	3.00	12.949	15.54	111.2	285.7	1775.2
48.00	Top - Section 1	1.00	1.08	6.593	7.25	0.00	1.200	1.557	3.00	12.765	15.32	111.1	283.3	1749.2
50.00		1.00	1.09	6.650	7.32	0.00	1.200	1.564	2.00	8.407	10.09	73.8	187.7	637.0
55.00		1.00	1.12	6.785	7.46	0.00	1.200	1.579	5.00	20.664	24.80	185.1	461.6	1563.8
60.00		1.00	1.14	6.910	7.60	0.00	1.200	1.592	5.00	20.150	24.18	183.8	453.4	1525.4
65.00		1.00	1.16	7.028	7.73	0.00	1.200	1.605	5.00	19.637	23.56	182.2	444.7	1486.6
70.00		1.00	1.17	7.138	7.85	0.00	1.200	1.617	5.00	19.122	22.95	180.2	435.6	1447.3
75.00		1.00	1.19	7.243	7.97	0.00	1.200	1.628	5.00	18.607	22.33	177.9	426.1	1407.7
80.00		1.00	1.21	7.342	8.08	0.00	1.200	1.639	5.00	18.091	21.71	175.3	416.2	1367.7
85.00		1.00	1.22	7.436	8.18	0.00	1.200	1.649	5.00	17.574	21.09	172.5	406.0	1327.4
85.25	Bot - Section 3	1.00	1.22	7.441	8.18	0.00	1.200	1.649	0.25	0.865	1.04	8.5	20.3	65.6
90.00	Top - Section 2	1.00	1.24	7.526	8.28	0.00	1.200	1.658	4.75	16.393	19.67	162.9	380.7	1800.2
95.00		1.00	1.25	7.612	8.37	0.00	1.200	1.667	5.00	16.752	20.10	168.3	390.1	974.2
97.00	Appurtenance(s)	1.00	1.26	7.646	8.41	0.00	1.200	1.671	2.00	6.555	7.87	66.2	154.3	382.3
100.00		1.00	1.27	7.695	8.46	0.00	1.200	1.676	3.00	9.678	11.61	98.3	227.5	563.5
105.00		1.00	1.28	7.774	8.55	0.00	1.200	1.684	5.00	15.717	18.86	161.3	368.0	912.0
107.00	Appurtenance(s)	1.00	1.28	7.805	8.59	0.00	1.200	1.687	2.00	6.141	7.37	63.3	145.4	357.4
110.00		1.00	1.29	7.851	8.64	0.00	1.200	1.692	3.00	9.056	10.87	93.9	214.0	525.9
115.00		1.00	1.30	7.925	8.72	0.00	1.200	1.699	5.00	14.680	17.62	153.6	345.1	848.9
117.00	Appurtenance(s)	1.00	1.31	7.954	8.75	0.00	1.200	1.702	2.00	5.726	6.87	60.1	136.2	332.1
120.00		1.00	1.32	7.996	8.80	0.00	1.200	1.707	3.00	8.434	10.12	89.0	200.0	487.9
125.00		1.00	1.33	8.065	8.87	0.00	1.200	1.714	5.00	13.643	16.37	145.2	321.5	785.1
127.00	Appurtenance(s)	1.00	1.33	8.092	8.90	0.00	1.200	1.716	2.00	5.311	6.37	56.7	126.7	306.5
130.00		1.00	1.34	8.132	8.95	0.00	1.200	1.720	3.00	7.811	9.37	83.8	185.7	449.4
<b>Totals:</b>									<b>130.00</b>			<b>4,441.9</b>		<b>39,557.3</b>

## Discrete Appurtenance Forces

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 19

**Load Case:** 1.2D + 1.0Di + 1.0Wi 50 mph Wind

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.00



**Iterations** 19

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	127.00	Andrew SBNHH-1D65A	3	8.092	8.901	0.66	0.80	13.83	586.28	0.000	0.000	123.08	0.00	0.00
2	127.00	Ericsson RRUS-11	3	8.092	8.901	0.54	0.80	9.48	386.32	0.000	0.000	84.37	0.00	0.00
3	127.00	Powerwave	3	8.092	8.901	0.62	0.80	20.17	536.18	0.000	0.000	179.57	0.00	0.00
4	127.00	Raycap DC6-48-60-18-8F	2	8.092	8.901	1.00	1.00	4.32	164.92	0.000	0.000	38.42	0.00	0.00
5	127.00	Ericsson RRUS 32	3	8.092	8.901	0.54	0.80	5.56	449.43	0.000	0.000	49.46	0.00	0.00
6	127.00	Platform w/ Hand Rail	1	8.092	8.901	1.00	1.00	59.46	3385.18	0.000	0.000	529.29	0.00	0.00
7	127.00	Ericsson RRUS-32	3	8.092	8.901	0.54	0.80	6.58	611.20	0.000	0.000	58.57	0.00	0.00
8	127.00	Quintel QS46512-2	3	8.092	8.901	0.77	0.80	15.10	624.07	0.000	0.000	134.37	0.00	0.00
9	127.00	Cci TPX-070821	6	8.092	8.901	0.54	0.80	4.69	166.78	0.000	0.000	41.72	0.00	0.00
10	117.00	12.5' Low Profile Platform	1	7.954	8.749	1.00	1.00	31.58	3122.39	0.000	0.000	276.26	0.00	0.00
11	117.00	KRY 112 144	3	7.954	8.749	0.58	0.80	1.51	61.85	0.000	0.000	13.21	0.00	0.00
12	117.00	Air 21 B4A B2P	3	7.954	8.749	0.70	0.80	15.12	817.32	0.000	0.000	132.27	0.00	0.00
13	117.00	Air 21 B2A B4P	3	7.954	8.749	0.70	0.80	15.12	821.28	0.000	0.000	132.27	0.00	0.00
14	107.00	DB-T1-6Z-8AB-OZ	2	7.805	8.586	0.58	0.80	6.59	321.62	0.000	0.000	56.59	0.00	0.00
15	107.00	BXA-70063-6CF-2	3	7.805	8.586	0.60	0.80	18.44	363.81	0.000	0.000	158.29	0.00	0.00
16	107.00	Low Profile Platform	1	7.805	8.586	1.00	1.00	45.25	2152.35	0.000	0.000	388.49	0.00	0.00
17	107.00	SBNHH-1D65B	3	7.805	8.586	0.68	0.80	19.03	727.17	0.000	0.000	163.35	0.00	0.00
18	107.00	RRH4x45AWS	3	7.805	8.586	0.54	0.80	6.32	380.92	0.000	0.000	54.28	0.00	0.00
19	107.00	SBNHH-1D65B	6	7.805	8.586	0.68	0.80	38.05	1454.33	0.000	0.000	326.70	0.00	0.00
20	107.00	RRH2x60-700	3	7.805	8.586	0.54	0.80	6.85	408.87	0.000	0.000	58.86	0.00	0.00
21	107.00	RRH2X60-PCS	3	7.805	8.586	0.54	0.80	4.52	441.25	0.000	0.000	38.84	0.00	0.00
22	97.00	PV-LPP12M-HR-B	1	7.646	8.410	1.00	1.00	96.93	3813.63	0.000	0.000	815.22	0.00	0.00
23	97.00	800 MHz RRH	6	7.646	8.410	0.50	0.75	10.81	679.83	0.000	0.000	90.90	0.00	0.00
24	97.00	1900MHz RRH (65MHz)	3	7.646	8.410	0.50	0.75	6.01	383.93	0.000	0.000	50.52	0.00	0.00
25	97.00	AAHC	3	7.646	8.410	0.56	0.75	8.43	742.75	0.000	0.000	70.86	0.00	0.00
26	97.00	NNVV-65B-R4	3	7.646	8.410	0.55	0.75	22.75	901.37	0.000	0.000	191.34	0.00	0.00

**Totals:** 24,505.03

4,257.10

## Total Applied Force Summary

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 20

**Load Case:** 1.2D + 1.0Di + 1.0Wi 50 mph Wind

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.00



**Iterations** 19

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		172.67	2396.40	0.00	0.00
10.00		169.60	2387.11	0.00	0.00
15.00		166.34	2363.23	0.00	0.00
20.00		172.94	2332.91	0.00	0.00
25.00		177.48	2298.87	0.00	0.00
30.00		180.46	2262.36	0.00	0.00
35.00		182.30	2224.08	0.00	0.00
40.00		183.24	2184.45	0.00	0.00
42.00		72.83	863.10	0.00	0.00
45.00		111.18	1980.22	0.00	0.00
48.00		111.10	1954.50	0.00	0.00
50.00		73.80	773.93	0.00	0.00
55.00		185.07	1906.69	0.00	0.00
60.00		183.81	1868.88	0.00	0.00
65.00		182.16	1830.53	0.00	0.00
70.00		180.18	1791.72	0.00	0.00
75.00		177.89	1752.50	0.00	0.00
80.00		175.32	1712.91	0.00	0.00
85.00		172.50	1672.98	0.00	0.00
85.25		8.50	82.83	0.00	0.00
90.00		162.86	2128.91	0.00	0.00
95.00		168.33	1320.59	0.00	0.00
97.00	(16) attachments	1284.99	7042.44	0.00	0.00
100.00		98.30	729.48	0.00	0.00
105.00		161.29	1188.58	0.00	0.00
107.00	(24) attachments	1308.65	6718.32	0.00	0.00
110.00		93.85	646.51	0.00	0.00
115.00		153.56	1049.92	0.00	0.00
117.00	(10) attachments	614.13	5235.31	0.00	0.00
120.00		89.02	559.57	0.00	0.00
125.00		145.24	904.67	0.00	0.00
127.00	(27) attachments	1295.60	7264.69	0.00	0.00
130.00		83.85	449.40	0.00	0.00
	<b>Totals:</b>	<b>8,699.03</b>	<b>71,878.60</b>	<b>0.00</b>	<b>0.00</b>

## Linear Appurtenance Segment Forces (Factored)

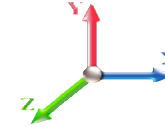
<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 21

**Load Case:** 1.2D + 1.0Di + 1.0Wi 50 mph Wind

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.00



**Iterations** 19

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1.619" Hybrid	Yes	5.00	0.000	1.62	1.71	0.00	0.028	0.000	5.168	0.00	54.17
10.00	1.619" Hybrid	Yes	5.00	0.000	1.62	1.78	0.00	0.028	0.000	5.168	0.00	57.25
15.00	1.619" Hybrid	Yes	5.00	0.000	1.62	1.83	0.00	0.029	0.000	5.168	0.00	59.21
20.00	1.619" Hybrid	Yes	5.00	0.000	1.62	1.86	0.00	0.030	0.000	5.483	0.00	60.66
25.00	1.619" Hybrid	Yes	5.00	0.000	1.62	1.89	0.00	0.030	0.000	5.747	0.00	61.84
30.00	1.619" Hybrid	Yes	5.00	0.000	1.62	1.91	0.00	0.031	0.000	5.972	0.00	62.83
35.00	1.619" Hybrid	Yes	5.00	0.000	1.62	1.93	0.00	0.032	0.000	6.169	0.00	63.69
40.00	1.619" Hybrid	Yes	5.00	0.000	1.62	1.95	0.00	0.033	0.000	6.345	0.00	64.45
42.00	1.619" Hybrid	Yes	2.00	0.000	1.62	0.78	0.00	0.033	0.000	6.410	0.00	25.89
45.00	1.619" Hybrid	Yes	3.00	0.000	1.62	1.18	0.00	0.034	0.000	6.504	0.00	39.08
48.00	1.619" Hybrid	Yes	3.00	0.000	1.62	1.18	0.00	0.034	0.000	6.593	0.00	39.31
50.00	1.619" Hybrid	Yes	2.00	0.000	1.62	0.79	0.00	0.034	0.000	6.650	0.00	26.30
55.00	1.619" Hybrid	Yes	5.00	0.000	1.62	1.99	0.00	0.035	0.000	6.785	0.00	66.32
60.00	1.619" Hybrid	Yes	5.00	0.000	1.62	2.00	0.00	0.036	0.000	6.910	0.00	66.85
65.00	1.619" Hybrid	Yes	5.00	0.000	1.62	2.01	0.00	0.037	0.000	7.028	0.00	67.34
70.00	1.619" Hybrid	Yes	5.00	0.000	1.62	2.02	0.00	0.038	0.000	7.138	0.00	67.80
75.00	1.619" Hybrid	Yes	5.00	0.000	1.62	2.03	0.00	0.039	0.000	7.243	0.00	68.24
80.00	1.619" Hybrid	Yes	5.00	0.000	1.62	2.04	0.00	0.040	0.000	7.342	0.00	68.64
85.00	1.619" Hybrid	Yes	5.00	0.000	1.62	2.05	0.00	0.042	0.000	7.436	0.00	69.03
85.25	1.619" Hybrid	Yes	0.25	0.000	1.62	0.10	0.00	0.042	0.000	7.441	0.00	3.45
90.00	1.619" Hybrid	Yes	4.75	0.000	1.62	1.95	0.00	0.043	0.000	7.526	0.00	65.93
95.00	1.619" Hybrid	Yes	5.00	0.000	1.62	2.06	0.00	0.044	0.000	7.612	0.00	69.75
97.00	1.619" Hybrid	Yes	2.00	0.000	1.62	0.83	0.00	0.045	0.000	7.646	0.00	27.96
<b>Totals:</b>											<b>0.0</b>	<b>1,256.0</b>



## Calculated Forces

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	<b>8/30/2018</b>
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

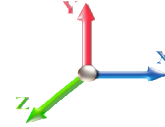


Page: 22

**Load Case:** 1.2D + 1.0Di + 1.0Wi 50 mph Wind

**Iterations** 19

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.00



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-71.88	-8.72	0.00	-793.52	0.00	793.52	5435.95	2717.97	12860.7	6439.91	0.00	0.000	0.000	0.136
5.00	-69.47	-8.59	0.00	-749.92	0.00	749.92	5360.22	2680.11	12406.3	6212.37	0.02	-0.033	0.000	0.134
10.00	-67.08	-8.45	0.00	-706.99	0.00	706.99	5282.67	2641.34	11955.5	5986.66	0.07	-0.066	0.000	0.131
15.00	-64.72	-8.32	0.00	-664.72	0.00	664.72	5203.30	2601.65	11508.7	5762.93	0.16	-0.099	0.000	0.128
20.00	-62.38	-8.18	0.00	-623.11	0.00	623.11	5122.11	2561.06	11066.1	5541.30	0.28	-0.133	0.000	0.125
25.00	-60.07	-8.03	0.00	-582.21	0.00	582.21	5039.10	2519.55	10628.0	5321.92	0.44	-0.166	0.000	0.121
30.00	-57.81	-7.88	0.00	-542.05	0.00	542.05	4954.26	2477.13	10194.7	5104.94	0.63	-0.200	0.000	0.118
35.00	-55.58	-7.72	0.00	-502.66	0.00	502.66	4867.60	2433.80	9766.46	4890.49	0.86	-0.233	0.000	0.114
40.00	-53.39	-7.55	0.00	-464.06	0.00	464.06	4779.12	2389.56	9343.53	4678.71	1.12	-0.267	0.000	0.110
42.00	-52.53	-7.49	0.00	-448.97	0.00	448.97	4743.22	2371.61	9175.92	4594.78	1.23	-0.281	0.000	0.109
45.00	-50.55	-7.38	0.00	-426.50	0.00	426.50	4688.82	2344.41	8926.23	4469.75	1.42	-0.301	0.000	0.106
48.00	-48.59	-7.28	0.00	-404.35	0.00	404.35	3840.55	1920.27	7332.01	3671.45	1.61	-0.321	0.000	0.123
50.00	-47.81	-7.22	0.00	-389.80	0.00	389.80	3813.07	1906.53	7201.22	3605.96	1.75	-0.335	0.000	0.121
55.00	-45.90	-7.05	0.00	-353.70	0.00	353.70	3743.08	1871.54	6876.85	3443.54	2.12	-0.371	0.000	0.115
60.00	-44.03	-6.88	0.00	-318.44	0.00	318.44	3671.28	1835.64	6556.42	3283.08	2.53	-0.406	0.000	0.109
65.00	-42.20	-6.71	0.00	-284.03	0.00	284.03	3597.66	1798.83	6240.20	3124.74	2.97	-0.441	0.000	0.103
70.00	-40.40	-6.54	0.00	-250.47	0.00	250.47	3522.21	1761.10	5928.48	2968.65	3.45	-0.475	0.000	0.096
75.00	-38.65	-6.37	0.00	-217.77	0.00	217.77	3444.94	1722.47	5621.53	2814.94	3.97	-0.507	0.000	0.089
80.00	-36.94	-6.20	0.00	-185.93	0.00	185.93	3365.85	1682.92	5319.64	2663.77	4.52	-0.537	0.000	0.081
85.00	-35.26	-6.02	0.00	-154.95	0.00	154.95	3284.94	1642.47	5023.09	2515.28	5.09	-0.565	0.000	0.072
85.25	-35.18	-6.02	0.00	-153.44	0.00	153.44	3280.84	1640.42	5008.41	2507.93	5.12	-0.567	0.000	0.072
90.00	-33.05	-5.84	0.00	-124.87	0.00	124.87	1897.08	948.54	2862.22	1433.24	5.70	-0.591	0.000	0.105
95.00	-31.73	-5.67	0.00	-95.65	0.00	95.65	1858.98	929.49	2709.28	1356.65	6.33	-0.613	0.000	0.088
97.00	-24.70	-4.32	0.00	-84.30	0.00	84.30	1843.23	921.61	2648.47	1326.20	6.59	-0.625	0.000	0.077
100.00	-23.97	-4.22	0.00	-71.36	0.00	71.36	1819.06	909.53	2557.69	1280.75	6.99	-0.640	0.000	0.069
105.00	-22.78	-4.05	0.00	-50.27	0.00	50.27	1777.32	888.66	2407.73	1205.66	7.67	-0.662	0.000	0.055
107.00	-16.08	-2.66	0.00	-42.17	0.00	42.17	1760.11	880.05	2348.27	1175.88	7.95	-0.669	0.000	0.045
110.00	-15.43	-2.57	0.00	-34.18	0.00	34.18	1733.75	866.88	2259.69	1131.52	8.37	-0.679	0.000	0.039
115.00	-14.39	-2.40	0.00	-21.35	0.00	21.35	1688.37	844.18	2113.84	1058.49	9.09	-0.691	0.000	0.029
117.00	-9.16	-1.73	0.00	-16.54	0.00	16.54	1669.70	834.85	2056.18	1029.62	9.38	-0.695	0.000	0.022
120.00	-8.60	-1.63	0.00	-11.37	0.00	11.37	1641.16	820.58	1970.46	986.70	9.82	-0.699	0.000	0.017
125.00	-7.70	-1.47	0.00	-3.22	0.00	3.22	1592.13	796.06	1829.84	916.28	10.56	-0.703	0.000	0.008
127.00	-0.45	-0.09	0.00	-0.27	0.00	0.27	1572.01	786.00	1774.43	888.53	10.85	-0.704	0.000	0.001
130.00	0.00	-0.08	0.00	0.00	0.00	0.00	1541.28	770.64	1692.26	847.39	11.29	-0.704	0.000	0.000

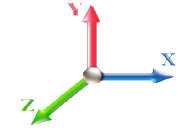
## Seismic Segment Forces (Factored)

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 23

<b>Load Case:</b> 1.2D + 1.0E				<b>Iterations</b> 17
<b>Gust Response Factor</b>	1.10	<b>Sds</b>	0.12	<b>Ss</b> 0.17
<b>Dead Load Factor</b>	1.20	<b>Seismic Load Factor</b>	1.00	<b>S1</b> 0.06
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.50	<b>SA</b> 0.02
				<b>Seismic Importance Factor</b> 1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1345.2	0.00	0.04	0.02	16.76	
10.00		1315.9	0.01	0.06	0.03	22.89	
15.00		1286.6	0.03	0.07	0.04	25.20	
20.00		1257.3	0.04	0.07	0.04	25.96	
25.00		1228.0	0.07	0.07	0.04	26.17	
30.00		1198.7	0.10	0.07	0.04	26.27	
35.00		1169.5	0.14	0.07	0.03	26.31	
40.00		1140.2	0.18	0.07	0.03	26.09	
42.00	Bot - Section 2	447.88	0.20	0.06	0.02	10.25	
45.00		1241.2	0.23	0.06	0.02	28.13	
48.00	Top - Section 1	1221.6	0.26	0.05	0.02	26.87	
50.00		374.41	0.28	0.05	0.01	7.95	
55.00		918.44	0.34	0.04	0.01	16.37	
60.00		893.33	0.40	0.02	0.01	10.56	
65.00		868.22	0.47	-0.01	0.01	2.81	
70.00		843.11	0.55	-0.03	0.01	-5.57	
75.00		818.00	0.63	-0.06	0.02	-12.66	
80.00		792.89	0.72	-0.09	0.03	-16.94	
85.00		767.78	0.81	-0.11	0.06	-17.85	
85.25	Bot - Section 3	37.73	0.81	-0.11	0.06	-0.88	
90.00	Top - Section 2	1182.9	0.91	-0.12	0.09	-24.76	
95.00		486.81	1.01	-0.11	0.14	-7.06	
97.00	Appurtenance(s)	3102.2	1.05	-0.09	0.16	-33.50	
100.00		280.03	1.12	-0.06	0.20	-1.13	
105.00		453.33	1.23	0.04	0.28	4.72	
107.00	Appurtenance(s)	2355.8	1.28	0.09	0.32	40.77	
110.00		259.95	1.35	0.20	0.39	7.51	
115.00		419.85	1.48	0.45	0.52	21.60	
117.00	Appurtenance(s)	2341.9	1.53	0.58	0.58	144.36	
120.00		239.86	1.61	0.81	0.68	18.76	
125.00		386.37	1.75	1.31	0.89	42.23	
127.00	Appurtenance(s)	2930.5	1.80	1.56	0.98	360.33	
130.00		219.77	1.89	1.98	1.14	31.82	
<b>Totals:</b>		<b>33,826.0</b>				<b>850.3</b>	<b>Total Wind: 33,511.2</b>

Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

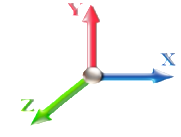
## Calculated Forces

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 24

<b>Load Case:</b> 1.2D + 1.0E										<b>Iterations</b> 17
<b>Gust Response Factor</b> 1.10					<b>Sds</b> 0.12					<b>Ss</b> 0.17
<b>Dead Load Factor</b> 1.20			<b>Seismic Load Factor</b> 1.00			<b>Sd1</b> 0.04			<b>S1</b> 0.06	
<b>Wind Load Factor</b> 0.00			<b>Structure Frequency</b> 0.50			<b>SA</b> 0.02			<b>Seismic Importance Factor</b> 1.00	



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-47.50	-0.97	0.00	-94.33	0.00	94.33	5435.95	2717.97	12860.7	6439.91	0.00	0.00	0.00	0.023
5.00	-45.59	-0.96	0.00	-89.47	0.00	89.47	5360.22	2680.11	12406.3	6212.37	0.00	0.00	0.00	0.023
10.00	-43.72	-0.94	0.00	-84.68	0.00	84.68	5282.67	2641.34	11955.5	5986.66	0.01	-0.01	0.00	0.022
15.00	-41.88	-0.92	0.00	-79.99	0.00	79.99	5203.30	2601.65	11508.7	5762.93	0.02	-0.01	0.00	0.022
20.00	-40.08	-0.89	0.00	-75.42	0.00	75.42	5122.11	2561.06	11066.1	5541.30	0.03	-0.02	0.00	0.021
25.00	-38.31	-0.87	0.00	-70.96	0.00	70.96	5039.10	2519.55	10628.0	5321.92	0.05	-0.02	0.00	0.021
30.00	-36.57	-0.84	0.00	-66.62	0.00	66.62	4954.26	2477.13	10194.7	5104.94	0.08	-0.02	0.00	0.020
35.00	-34.88	-0.82	0.00	-62.41	0.00	62.41	4867.60	2433.80	9766.46	4890.49	0.10	-0.03	0.00	0.020
40.00	-33.21	-0.79	0.00	-58.31	0.00	58.31	4779.12	2389.56	9343.53	4678.71	0.13	-0.03	0.00	0.019
42.00	-32.56	-0.78	0.00	-56.73	0.00	56.73	4743.22	2371.61	9175.92	4594.78	0.15	-0.03	0.00	0.019
45.00	-30.89	-0.76	0.00	-54.37	0.00	54.37	4688.82	2344.41	8926.23	4469.75	0.17	-0.04	0.00	0.019
48.00	-29.25	-0.73	0.00	-52.11	0.00	52.11	3840.55	1920.27	7332.01	3671.45	0.19	-0.04	0.00	0.022
50.00	-28.68	-0.72	0.00	-50.65	0.00	50.65	3813.07	1906.53	7201.22	3605.96	0.21	-0.04	0.00	0.022
55.00	-27.28	-0.71	0.00	-47.03	0.00	47.03	3743.08	1871.54	6876.85	3443.54	0.26	-0.05	0.00	0.021
60.00	-25.92	-0.70	0.00	-43.49	0.00	43.49	3671.28	1835.64	6556.42	3283.08	0.31	-0.05	0.00	0.020
65.00	-24.58	-0.70	0.00	-40.00	0.00	40.00	3597.66	1798.83	6240.20	3124.74	0.36	-0.06	0.00	0.020
70.00	-23.28	-0.70	0.00	-36.52	0.00	36.52	3522.21	1761.10	5928.48	2968.65	0.42	-0.06	0.00	0.019
75.00	-22.00	-0.70	0.00	-33.04	0.00	33.04	3444.94	1722.47	5621.53	2814.94	0.49	-0.06	0.00	0.018
80.00	-20.75	-0.70	0.00	-29.55	0.00	29.55	3365.85	1682.92	5319.64	2663.77	0.56	-0.07	0.00	0.017
85.00	-19.54	-0.70	0.00	-26.07	0.00	26.07	3284.94	1642.47	5023.09	2515.28	0.64	-0.07	0.00	0.016
85.25	-19.48	-0.70	0.00	-25.89	0.00	25.89	3280.84	1640.42	5008.41	2507.93	0.64	-0.07	0.00	0.016
90.00	-17.78	-0.70	0.00	-22.58	0.00	22.58	1897.08	948.54	2862.22	1433.24	0.72	-0.08	0.00	0.025
95.00	-16.90	-0.70	0.00	-19.10	0.00	19.10	1858.98	929.49	2709.28	1356.65	0.80	-0.08	0.00	0.023
97.00	-13.06	-0.69	0.00	-17.70	0.00	17.70	1843.23	921.61	2648.47	1326.20	0.84	-0.09	0.00	0.020
100.00	-12.56	-0.69	0.00	-15.63	0.00	15.63	1819.06	909.53	2557.69	1280.75	0.89	-0.09	0.00	0.019
105.00	-11.74	-0.69	0.00	-12.17	0.00	12.17	1777.32	888.66	2407.73	1205.66	0.99	-0.09	0.00	0.017
107.00	-8.80	-0.64	0.00	-10.80	0.00	10.80	1760.11	880.05	2348.27	1175.88	1.03	-0.10	0.00	0.014
110.00	-8.37	-0.63	0.00	-8.88	0.00	8.88	1733.75	866.88	2259.69	1131.52	1.09	-0.10	0.00	0.013
115.00	-7.66	-0.61	0.00	-5.71	0.00	5.71	1688.37	844.18	2113.84	1058.49	1.19	-0.10	0.00	0.010
117.00	-4.77	-0.46	0.00	-4.49	0.00	4.49	1669.70	834.85	2056.18	1029.62	1.23	-0.10	0.00	0.007
120.00	-4.41	-0.44	0.00	-3.11	0.00	3.11	1641.16	820.58	1970.46	986.70	1.30	-0.10	0.00	0.006
125.00	-3.83	-0.40	0.00	-0.89	0.00	0.89	1592.13	796.06	1829.84	916.28	1.41	-0.10	0.00	0.003
127.00	-0.26	-0.03	0.00	-0.10	0.00	0.10	1572.01	786.00	1774.43	888.53	1.45	-0.10	0.00	0.000
130.00	0.00	-0.03	0.00	0.00	0.00	0.00	1541.28	770.64	1692.26	847.39	1.52	-0.10	0.00	0.000

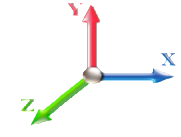
## Seismic Segment Forces (Factored)

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 25

<b>Load Case:</b> 0.9D + 1.0E				<b>Iterations</b> 17
<b>Gust Response Factor</b>	1.10	<b>Sds</b>	0.12	<b>Ss</b> 0.17
<b>Dead Load Factor</b>	0.90	<b>Seismic Load Factor</b>	1.00	<b>S1</b> 0.06
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.50	<b>SA</b> 0.02
				<b>Seismic Importance Factor</b> 1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1345.2	0.00	0.04	0.02	16.76	
10.00		1315.9	0.01	0.06	0.03	22.89	
15.00		1286.6	0.03	0.07	0.04	25.20	
20.00		1257.3	0.04	0.07	0.04	25.96	
25.00		1228.0	0.07	0.07	0.04	26.17	
30.00		1198.7	0.10	0.07	0.04	26.27	
35.00		1169.5	0.14	0.07	0.03	26.31	
40.00		1140.2	0.18	0.07	0.03	26.09	
42.00	Bot - Section 2	447.88	0.20	0.06	0.02	10.25	
45.00		1241.2	0.23	0.06	0.02	28.13	
48.00	Top - Section 1	1221.6	0.26	0.05	0.02	26.87	
50.00		374.41	0.28	0.05	0.01	7.95	
55.00		918.44	0.34	0.04	0.01	16.37	
60.00		893.33	0.40	0.02	0.01	10.56	
65.00		868.22	0.47	-0.01	0.01	2.81	
70.00		843.11	0.55	-0.03	0.01	-5.57	
75.00		818.00	0.63	-0.06	0.02	-12.66	
80.00		792.89	0.72	-0.09	0.03	-16.94	
85.00		767.78	0.81	-0.11	0.06	-17.85	
85.25	Bot - Section 3	37.73	0.81	-0.11	0.06	-0.88	
90.00	Top - Section 2	1182.9	0.91	-0.12	0.09	-24.76	
95.00		486.81	1.01	-0.11	0.14	-7.06	
97.00	Appurtenance(s)	3102.2	1.05	-0.09	0.16	-33.50	
100.00		280.03	1.12	-0.06	0.20	-1.13	
105.00		453.33	1.23	0.04	0.28	4.72	
107.00	Appurtenance(s)	2355.8	1.28	0.09	0.32	40.77	
110.00		259.95	1.35	0.20	0.39	7.51	
115.00		419.85	1.48	0.45	0.52	21.60	
117.00	Appurtenance(s)	2341.9	1.53	0.58	0.58	144.36	
120.00		239.86	1.61	0.81	0.68	18.76	
125.00		386.37	1.75	1.31	0.89	42.23	
127.00	Appurtenance(s)	2930.5	1.80	1.56	0.98	360.33	
130.00		219.77	1.89	1.98	1.14	31.82	
<b>Totals:</b>		<b>33,826.0</b>				<b>850.3</b>	<b>Total Wind: 33,511.2</b>

Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

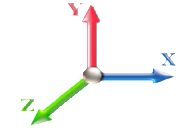
## Calculated Forces

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 26

<b>Load Case:</b> 0.9D + 1.0E						<b>Iterations</b> 17
<b>Gust Response Factor</b>	1.10			<b>Sds</b>	0.12	<b>Ss</b> 0.17
<b>Dead Load Factor</b>	0.90	<b>Seismic Load Factor</b>	1.00	<b>Sd1</b>	0.04	<b>S1</b> 0.06
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.50	<b>SA</b>	0.02	<b>Seismic Importance Factor</b> 1.00



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-35.63	-0.97	0.00	-93.76	0.00	93.76	5435.95	2717.97	12860.7	6439.91	0.00	0.00	0.00	0.021
5.00	-34.19	-0.96	0.00	-88.91	0.00	88.91	5360.22	2680.11	12406.3	6212.37	0.00	0.00	0.00	0.021
10.00	-32.79	-0.94	0.00	-84.13	0.00	84.13	5282.67	2641.34	11955.5	5986.66	0.01	-0.01	0.00	0.020
15.00	-31.41	-0.91	0.00	-79.45	0.00	79.45	5203.30	2601.65	11508.7	5762.93	0.02	-0.01	0.00	0.020
20.00	-30.06	-0.89	0.00	-74.88	0.00	74.88	5122.11	2561.06	11066.1	5541.30	0.03	-0.02	0.00	0.019
25.00	-28.73	-0.86	0.00	-70.44	0.00	70.44	5039.10	2519.55	10628.0	5321.92	0.05	-0.02	0.00	0.019
30.00	-27.43	-0.84	0.00	-66.12	0.00	66.12	4954.26	2477.13	10194.7	5104.94	0.07	-0.02	0.00	0.018
35.00	-26.16	-0.81	0.00	-61.93	0.00	61.93	4867.60	2433.80	9766.46	4890.49	0.10	-0.03	0.00	0.018
40.00	-24.91	-0.79	0.00	-57.86	0.00	57.86	4779.12	2389.56	9343.53	4678.71	0.13	-0.03	0.00	0.018
42.00	-24.42	-0.78	0.00	-56.28	0.00	56.28	4743.22	2371.61	9175.92	4594.78	0.15	-0.03	0.00	0.017
45.00	-23.17	-0.75	0.00	-53.94	0.00	53.94	4688.82	2344.41	8926.23	4469.75	0.17	-0.04	0.00	0.017
48.00	-21.94	-0.72	0.00	-51.69	0.00	51.69	3840.55	1920.27	7332.01	3671.45	0.19	-0.04	0.00	0.020
50.00	-21.51	-0.72	0.00	-50.24	0.00	50.24	3813.07	1906.53	7201.22	3605.96	0.21	-0.04	0.00	0.020
55.00	-20.46	-0.70	0.00	-46.66	0.00	46.66	3743.08	1871.54	6876.85	3443.54	0.26	-0.05	0.00	0.019
60.00	-19.44	-0.69	0.00	-43.15	0.00	43.15	3671.28	1835.64	6556.42	3283.08	0.31	-0.05	0.00	0.018
65.00	-18.44	-0.69	0.00	-39.69	0.00	39.69	3597.66	1798.83	6240.20	3124.74	0.36	-0.06	0.00	0.018
70.00	-17.46	-0.69	0.00	-36.24	0.00	36.24	3522.21	1761.10	5928.48	2968.65	0.42	-0.06	0.00	0.017
75.00	-16.50	-0.69	0.00	-32.79	0.00	32.79	3444.94	1722.47	5621.53	2814.94	0.49	-0.06	0.00	0.016
80.00	-15.56	-0.69	0.00	-29.34	0.00	29.34	3365.85	1682.92	5319.64	2663.77	0.56	-0.07	0.00	0.016
85.00	-14.65	-0.69	0.00	-25.88	0.00	25.88	3284.94	1642.47	5023.09	2515.28	0.63	-0.07	0.00	0.015
85.25	-14.61	-0.69	0.00	-25.71	0.00	25.71	3280.84	1640.42	5008.41	2507.93	0.64	-0.07	0.00	0.015
90.00	-13.33	-0.69	0.00	-22.43	0.00	22.43	1897.08	948.54	2862.22	1433.24	0.71	-0.08	0.00	0.023
95.00	-12.67	-0.69	0.00	-18.98	0.00	18.98	1858.98	929.49	2709.28	1356.65	0.80	-0.08	0.00	0.021
97.00	-9.79	-0.69	0.00	-17.60	0.00	17.60	1843.23	921.61	2648.47	1326.20	0.83	-0.08	0.00	0.019
100.00	-9.42	-0.69	0.00	-15.54	0.00	15.54	1819.06	909.53	2557.69	1280.75	0.88	-0.09	0.00	0.017
105.00	-8.80	-0.68	0.00	-12.11	0.00	12.11	1777.32	888.66	2407.73	1205.66	0.98	-0.09	0.00	0.015
107.00	-6.60	-0.64	0.00	-10.74	0.00	10.74	1760.11	880.05	2348.27	1175.88	1.02	-0.09	0.00	0.013
110.00	-6.27	-0.63	0.00	-8.83	0.00	8.83	1733.75	866.88	2259.69	1131.52	1.08	-0.10	0.00	0.011
115.00	-5.75	-0.61	0.00	-5.68	0.00	5.68	1688.37	844.18	2113.84	1058.49	1.18	-0.10	0.00	0.009
117.00	-3.58	-0.46	0.00	-4.47	0.00	4.47	1669.70	834.85	2056.18	1029.62	1.22	-0.10	0.00	0.006
120.00	-3.31	-0.44	0.00	-3.09	0.00	3.09	1641.16	820.58	1970.46	986.70	1.29	-0.10	0.00	0.005
125.00	-2.87	-0.40	0.00	-0.89	0.00	0.89	1592.13	796.06	1829.84	916.28	1.40	-0.10	0.00	0.003
127.00	-0.20	-0.03	0.00	-0.10	0.00	0.10	1572.01	786.00	1774.43	888.53	1.44	-0.10	0.00	0.000
130.00	0.00	-0.03	0.00	0.00	0.00	0.00	1541.28	770.64	1692.26	847.39	1.51	-0.10	0.00	0.000

## Wind Loading - Shaft

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	<b>8/30/2018</b>
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

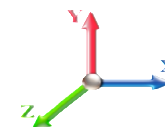


Page: 27

**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00



**Iterations** 19

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		1.00	0.85	7.442	8.19	271.49	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	7.442	8.19	265.69	0.650	0.000	5.00	24.277	15.78	129.2	0.0	1345.3
10.00		1.00	0.85	7.442	8.19	259.88	0.650	0.000	5.00	23.753	15.44	126.4	0.0	1316.0
15.00		1.00	0.85	7.442	8.19	254.08	0.650	0.000	5.00	23.228	15.10	123.6	0.0	1286.7
20.00		1.00	0.90	7.896	8.69	255.74	0.650	0.000	5.00	22.703	14.76	128.2	0.0	1257.4
25.00		1.00	0.95	8.276	9.10	255.70	0.650	0.000	5.00	22.179	14.42	131.2	0.0	1228.1
30.00		1.00	0.98	8.600	9.46	254.41	0.650	0.000	5.00	21.654	14.08	133.1	0.0	1198.8
35.00		1.00	1.01	8.883	9.77	252.23	0.650	0.000	5.00	21.129	13.73	134.2	0.0	1169.5
40.00		1.00	1.04	9.137	10.05	249.37	0.650	0.000	5.00	20.605	13.39	134.6	0.0	1140.2
42.00	Bot - Section 2	1.00	1.05	9.231	10.15	248.07	0.650	0.000	2.00	8.095	5.26	53.4	0.0	447.9
45.00		1.00	1.07	9.366	10.30	245.97	0.650	0.000	3.00	12.175	7.91	81.5	0.0	1241.2
48.00	Top - Section 1	1.00	1.08	9.494	10.44	243.71	0.650	0.000	3.00	11.987	7.79	81.4	0.0	1221.6
50.00		1.00	1.09	9.576	10.53	246.11	0.650	0.000	2.00	7.886	5.13	54.0	0.0	374.4
55.00		1.00	1.12	9.770	10.75	241.94	0.650	0.000	5.00	19.348	12.58	135.2	0.0	918.4
60.00		1.00	1.14	9.951	10.95	237.46	0.650	0.000	5.00	18.823	12.24	133.9	0.0	893.3
65.00		1.00	1.16	10.120	11.13	232.70	0.650	0.000	5.00	18.299	11.89	132.4	0.0	868.2
70.00		1.00	1.17	10.279	11.31	227.70	0.650	0.000	5.00	17.774	11.55	130.6	0.0	843.1
75.00		1.00	1.19	10.430	11.47	222.49	0.650	0.000	5.00	17.250	11.21	128.6	0.0	818.0
80.00		1.00	1.21	10.572	11.63	217.09	0.650	0.000	5.00	16.725	10.87	126.4	0.0	792.9
85.00		1.00	1.22	10.708	11.78	211.51	0.650	0.000	5.00	16.200	10.53	124.0	0.0	767.8
85.25	Bot - Section 3	1.00	1.22	10.715	11.79	211.23	0.650	0.000	0.25	0.796	0.52	6.1	0.0	37.7
90.00	Top - Section 2	1.00	1.24	10.838	11.92	205.78	0.650	0.000	4.75	15.080	9.80	116.9	0.0	1182.9
95.00		1.00	1.25	10.962	12.06	202.76	0.650	0.000	5.00	15.363	9.99	120.4	0.0	486.8
97.00	Appurtenance(s)	1.00	1.26	11.010	12.11	200.38	0.650	0.000	2.00	5.998	3.90	47.2	0.0	190.0
100.00		1.00	1.27	11.081	12.19	196.77	0.650	0.000	3.00	8.840	5.75	70.0	0.0	280.0
105.00		1.00	1.28	11.195	12.31	190.66	0.650	0.000	5.00	14.313	9.30	114.6	0.0	453.3
107.00	Appurtenance(s)	1.00	1.28	11.240	12.36	188.19	0.650	0.000	2.00	5.578	3.63	44.8	0.0	176.6
110.00		1.00	1.29	11.305	12.44	184.45	0.650	0.000	3.00	8.210	5.34	66.4	0.0	259.9
115.00		1.00	1.30	11.412	12.55	178.12	0.650	0.000	5.00	13.264	8.62	108.2	0.0	419.9
117.00	Appurtenance(s)	1.00	1.31	11.453	12.60	175.57	0.650	0.000	2.00	5.159	3.35	42.2	0.0	163.3
120.00		1.00	1.32	11.514	12.67	171.70	0.650	0.000	3.00	7.581	4.93	62.4	0.0	239.9
125.00		1.00	1.33	11.614	12.78	165.19	0.650	0.000	5.00	12.215	7.94	101.4	0.0	386.4
127.00	Appurtenance(s)	1.00	1.33	11.653	12.82	162.56	0.650	0.000	2.00	4.739	3.08	39.5	0.0	149.9
130.00		1.00	1.34	11.710	12.88	158.59	0.650	0.000	3.00	6.951	4.52	58.2	0.0	219.8
<b>Totals:</b>									<b>130.00</b>			<b>3,220.5</b>		<b>23,775.2</b>

## Discrete Appurtenance Forces

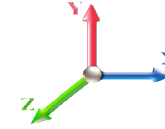
<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 28

**Load Case:** 1.0D + 1.0W 60 mph Wind

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



**Iterations** 19

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	127.00	Andrew SBNHH-1D65A	3	11.653	12.818	0.66	0.80	11.71	100.50	0.000	0.000	150.13	0.00	0.00
2	127.00	Ericsson RRUS-11	3	11.653	12.818	0.54	0.80	7.11	165.00	0.000	0.000	91.10	0.00	0.00
3	127.00	Powerwave	3	11.653	12.818	0.60	0.80	14.69	159.00	0.000	0.000	188.27	0.00	0.00
4	127.00	Raycap DC6-48-60-18-8F	2	11.653	12.818	1.00	1.00	2.94	65.60	0.000	0.000	37.68	0.00	0.00
5	127.00	Ericsson RRUS 32	3	11.653	12.818	0.54	0.80	4.41	159.00	0.000	0.000	56.47	0.00	0.00
6	127.00	Platform w/ Hand Rail	1	11.653	12.818	1.00	1.00	32.00	1600.00	0.000	0.000	410.17	0.00	0.00
7	127.00	Ericsson RRUS-32	3	11.653	12.818	0.54	0.80	6.22	231.00	0.000	0.000	79.76	0.00	0.00
8	127.00	Quintel QS46512-2	3	11.653	12.818	0.77	0.80	12.79	225.00	0.000	0.000	163.90	0.00	0.00
9	127.00	Cci TPX-070821	6	11.653	12.818	0.54	0.80	2.64	75.60	0.000	0.000	33.89	0.00	0.00
10	117.00	12.5' Low Profile Platform	1	11.453	12.598	1.00	1.00	25.55	1600.00	0.000	0.000	321.89	0.00	0.00
11	117.00	KRY 112 144	3	11.453	12.598	0.56	0.80	0.69	33.00	0.000	0.000	8.68	0.00	0.00
12	117.00	Air 21 B4A B2P	3	11.453	12.598	0.69	0.80	12.57	271.20	0.000	0.000	158.36	0.00	0.00
13	117.00	Air 21 B2A B4P	3	11.453	12.598	0.69	0.80	12.57	274.50	0.000	0.000	158.36	0.00	0.00
14	107.00	DB-T1-6Z-8AB-OZ	2	11.240	12.364	0.57	0.80	5.45	37.80	0.000	0.000	67.42	0.00	0.00
15	107.00	BXA-70063-6CF-2	3	11.240	12.364	0.58	0.80	13.26	51.00	0.000	0.000	163.98	0.00	0.00
16	107.00	Low Profile Platform	1	11.240	12.364	1.00	1.00	25.00	1200.00	0.000	0.000	309.09	0.00	0.00
17	107.00	SBNHH-1D65B	3	11.240	12.364	0.66	0.80	16.10	121.80	0.000	0.000	199.00	0.00	0.00
18	107.00	RRH4x45AWS	3	11.240	12.364	0.54	0.80	4.36	180.00	0.000	0.000	53.88	0.00	0.00
19	107.00	SBNHH-1D65B	6	11.240	12.364	0.66	0.80	32.19	243.60	0.000	0.000	398.00	0.00	0.00
20	107.00	RRH2x60-700	3	11.240	12.364	0.54	0.80	5.63	180.00	0.000	0.000	69.58	0.00	0.00
21	107.00	RRH2X60-PCS	3	11.240	12.364	0.54	0.80	3.54	165.00	0.000	0.000	43.74	0.00	0.00
22	97.00	PV-LPP12M-HR-B	1	11.010	12.111	1.00	1.00	44.00	1870.00	0.000	0.000	532.88	0.00	0.00
23	97.00	800 MHz RRH	6	11.010	12.111	0.50	0.75	7.51	318.00	0.000	0.000	90.92	0.00	0.00
24	97.00	1900MHz RRH (65MHz)	3	11.010	12.111	0.50	0.75	4.18	180.00	0.000	0.000	50.57	0.00	0.00
25	97.00	AAHC	3	11.010	12.111	0.56	0.75	7.09	312.00	0.000	0.000	85.84	0.00	0.00
26	97.00	NNVV-65B-R4	3	11.010	12.111	0.55	0.75	20.43	232.20	0.000	0.000	247.42	0.00	0.00

**Totals: 10,050.80**

**4,170.98**

## Total Applied Force Summary

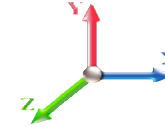
<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 29

**Load Case:** 1.0D + 1.0W 60 mph Wind

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



**Iterations** 19

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		129.18	1590.77	0.00	0.00
10.00		126.39	1561.47	0.00	0.00
15.00		123.59	1532.18	0.00	0.00
20.00		128.18	1502.88	0.00	0.00
25.00		131.24	1473.59	0.00	0.00
30.00		133.15	1444.29	0.00	0.00
35.00		134.21	1415.00	0.00	0.00
40.00		134.61	1385.70	0.00	0.00
42.00		53.43	546.08	0.00	0.00
45.00		81.54	1388.51	0.00	0.00
48.00		81.37	1368.93	0.00	0.00
50.00		54.00	472.61	0.00	0.00
55.00		135.16	1163.94	0.00	0.00
60.00		133.93	1138.83	0.00	0.00
65.00		132.41	1113.72	0.00	0.00
70.00		130.63	1088.61	0.00	0.00
75.00		128.63	1063.50	0.00	0.00
80.00		126.43	1038.39	0.00	0.00
85.00		124.03	1013.28	0.00	0.00
85.25		6.10	50.00	0.00	0.00
90.00		116.86	1416.14	0.00	0.00
95.00		120.41	732.31	0.00	0.00
97.00	(16) attachments	1054.85	3200.44	0.00	0.00
100.00		70.04	418.33	0.00	0.00
105.00		114.57	683.83	0.00	0.00
107.00	(24) attachments	1349.51	2448.05	0.00	0.00
110.00		66.37	360.45	0.00	0.00
115.00		108.23	587.35	0.00	0.00
117.00	(10) attachments	689.53	2408.95	0.00	0.00
120.00		62.41	299.62	0.00	0.00
125.00		101.43	485.97	0.00	0.00
127.00	(27) attachments	1250.88	2970.40	0.00	0.00
130.00		58.20	219.77	0.00	0.00
	<b>Totals:</b>	<b>7,391.45</b>	<b>39,583.92</b>	<b>0.00</b>	<b>0.00</b>



## Linear Appurtenance Segment Forces (Factored)

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 30

**Load Case:** 1.0D + 1.0W 60 mph Wind

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



**Iterations** 19

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.028	0.000	7.442	0.00	15.00
10.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.028	0.000	7.442	0.00	15.00
15.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.029	0.000	7.442	0.00	15.00
20.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.030	0.000	7.896	0.00	15.00
25.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.030	0.000	8.276	0.00	15.00
30.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.031	0.000	8.600	0.00	15.00
35.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.032	0.000	8.883	0.00	15.00
40.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.033	0.000	9.137	0.00	15.00
42.00	1.619" Hybrid	Yes	2.00	0.000	1.62	0.27	0.00	0.033	0.000	9.231	0.00	6.00
45.00	1.619" Hybrid	Yes	3.00	0.000	1.62	0.41	0.00	0.034	0.000	9.366	0.00	9.00
48.00	1.619" Hybrid	Yes	3.00	0.000	1.62	0.41	0.00	0.034	0.000	9.494	0.00	9.00
50.00	1.619" Hybrid	Yes	2.00	0.000	1.62	0.27	0.00	0.034	0.000	9.576	0.00	6.00
55.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.035	0.000	9.770	0.00	15.00
60.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.036	0.000	9.951	0.00	15.00
65.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.037	0.000	10.120	0.00	15.00
70.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.038	0.000	10.279	0.00	15.00
75.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.039	0.000	10.430	0.00	15.00
80.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.040	0.000	10.572	0.00	15.00
85.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.042	0.000	10.708	0.00	15.00
85.25	1.619" Hybrid	Yes	0.25	0.000	1.62	0.03	0.00	0.042	0.000	10.715	0.00	0.75
90.00	1.619" Hybrid	Yes	4.75	0.000	1.62	0.64	0.00	0.043	0.000	10.838	0.00	14.25
95.00	1.619" Hybrid	Yes	5.00	0.000	1.62	0.68	0.00	0.044	0.000	10.962	0.00	15.00
97.00	1.619" Hybrid	Yes	2.00	0.000	1.62	0.27	0.00	0.045	0.000	11.010	0.00	6.00
<b>Totals:</b>											<b>0.0</b>	<b>291.0</b>

## Calculated Forces

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	<b>8/30/2018</b>
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

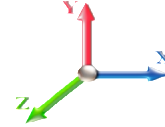


Page: 31

**Load Case:** 1.0D + 1.0W 60 mph Wind

**Iterations** 19

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



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-39.58	-7.40	0.00	-687.53	0.00	687.53	5435.95	2717.97	12860.7	6439.91	0.00	0.000	0.000	0.114
5.00	-37.99	-7.29	0.00	-650.52	0.00	650.52	5360.22	2680.11	12406.3	6212.37	0.02	-0.028	0.000	0.112
10.00	-36.42	-7.18	0.00	-614.07	0.00	614.07	5282.67	2641.34	11955.5	5986.66	0.06	-0.057	0.000	0.109
15.00	-34.89	-7.07	0.00	-578.16	0.00	578.16	5203.30	2601.65	11508.7	5762.93	0.14	-0.086	0.000	0.107
20.00	-33.38	-6.96	0.00	-542.80	0.00	542.80	5122.11	2561.06	11066.1	5541.30	0.24	-0.115	0.000	0.104
25.00	-31.90	-6.84	0.00	-508.00	0.00	508.00	5039.10	2519.55	10628.0	5321.92	0.38	-0.144	0.000	0.102
30.00	-30.46	-6.72	0.00	-473.79	0.00	473.79	4954.26	2477.13	10194.7	5104.94	0.55	-0.174	0.000	0.099
35.00	-29.04	-6.60	0.00	-440.19	0.00	440.19	4867.60	2433.80	9766.46	4890.49	0.74	-0.203	0.000	0.096
40.00	-27.65	-6.47	0.00	-407.21	0.00	407.21	4779.12	2389.56	9343.53	4678.71	0.97	-0.233	0.000	0.093
42.00	-27.10	-6.42	0.00	-394.28	0.00	394.28	4743.22	2371.61	9175.92	4594.78	1.07	-0.245	0.000	0.092
45.00	-25.71	-6.34	0.00	-375.03	0.00	375.03	4688.82	2344.41	8926.23	4469.75	1.23	-0.263	0.000	0.089
48.00	-24.34	-6.26	0.00	-356.02	0.00	356.02	4640.55	2320.27	8732.01	4367.15	1.40	-0.280	0.000	0.103
50.00	-23.87	-6.21	0.00	-343.50	0.00	343.50	4613.07	2306.53	8621.22	4305.96	1.52	-0.292	0.000	0.102
55.00	-22.70	-6.08	0.00	-312.46	0.00	312.46	4543.08	2271.54	8376.85	4143.54	1.85	-0.324	0.000	0.097
60.00	-21.56	-5.95	0.00	-282.06	0.00	282.06	4471.28	2235.64	8156.42	3983.08	2.20	-0.356	0.000	0.092
65.00	-20.45	-5.82	0.00	-252.30	0.00	252.30	4407.66	2198.83	7962.00	3832.74	2.59	-0.386	0.000	0.086
70.00	-19.35	-5.69	0.00	-223.19	0.00	223.19	4352.21	2161.10	7792.48	3688.65	3.01	-0.416	0.000	0.081
75.00	-18.29	-5.57	0.00	-194.72	0.00	194.72	4304.94	2122.47	7642.53	3549.94	3.47	-0.445	0.000	0.074
80.00	-17.25	-5.44	0.00	-166.89	0.00	166.89	4265.85	2082.92	7509.64	3423.77	3.95	-0.472	0.000	0.068
85.00	-16.24	-5.31	0.00	-139.69	0.00	139.69	4234.94	2042.47	7392.09	3308.28	4.45	-0.497	0.000	0.060
85.25	-16.18	-5.31	0.00	-138.37	0.00	138.37	4230.84	2040.42	7380.41	3297.93	4.48	-0.499	0.000	0.060
90.00	-14.77	-5.18	0.00	-113.16	0.00	113.16	4197.08	2008.54	7282.22	3193.24	4.99	-0.520	0.000	0.087
95.00	-14.04	-5.06	0.00	-87.24	0.00	87.24	4178.98	1999.49	7209.28	3156.65	5.54	-0.541	0.000	0.072
97.00	-10.84	-3.98	0.00	-77.12	0.00	77.12	4143.23	1921.61	7048.47	3026.20	5.77	-0.551	0.000	0.064
100.00	-10.43	-3.91	0.00	-65.19	0.00	65.19	4119.06	1909.53	6957.69	2980.75	6.13	-0.565	0.000	0.057
105.00	-9.74	-3.79	0.00	-45.66	0.00	45.66	4077.32	1888.66	6747.73	2856.66	6.73	-0.585	0.000	0.043
107.00	-7.31	-2.41	0.00	-38.09	0.00	38.09	4060.11	1880.05	6648.27	2775.88	6.98	-0.592	0.000	0.037
110.00	-6.95	-2.34	0.00	-30.85	0.00	30.85	4053.75	1866.88	6562.69	2711.52	7.35	-0.600	0.000	0.031
115.00	-6.36	-2.23	0.00	-19.13	0.00	19.13	4038.37	1844.18	6413.84	2558.49	7.99	-0.611	0.000	0.022
117.00	-3.96	-1.52	0.00	-14.67	0.00	14.67	4029.70	1834.85	6356.18	2492.62	8.24	-0.615	0.000	0.017
120.00	-3.66	-1.45	0.00	-10.12	0.00	10.12	4021.16	1820.58	6297.46	2426.70	8.63	-0.619	0.000	0.012
125.00	-3.18	-1.34	0.00	-2.87	0.00	2.87	4012.13	1796.06	6249.84	2360.28	9.28	-0.622	0.000	0.005
127.00	-0.22	-0.06	0.00	-0.18	0.00	0.18	4002.01	1786.00	6204.43	2293.53	9.54	-0.623	0.000	0.000
130.00	0.00	-0.06	0.00	0.00	0.00	0.00	1541.28	770.64	1692.26	847.39	9.93	-0.623	0.000	0.000

## Final Analysis Summary

<b>Structure:</b> CT13615-A-SBA	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 32

### Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 101 mph Wind	33.6	0.00	47.46	0.00	0.00	3127.78
0.9D + 1.6W 101 mph Wind	33.6	0.00	35.59	0.00	0.00	3110.22
1.2D + 1.0Di + 1.0Wi 50 mph Wind	8.7	0.00	71.88	0.00	0.00	793.52
1.2D + 1.0E	1.0	0.00	47.50	0.00	0.00	94.33
0.9D + 1.0E	1.0	0.00	35.63	0.00	0.00	93.76
1.0D + 1.0W 60 mph Wind	7.4	0.00	39.58	0.00	0.00	687.53

### Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 101 mph Wind	-47.46	-33.57	0.00	-3127.7	0.00	-3127.7	5435.95	2717.9	12860.7	6439.91	0.00	0.495
0.9D + 1.6W 101 mph Wind	-35.59	-33.55	0.00	-3110.2	0.00	-3110.2	5435.95	2717.9	12860.7	6439.91	0.00	0.490
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-71.88	-8.72	0.00	-793.52	0.00	-793.52	5435.95	2717.9	12860.7	6439.91	0.00	0.136
1.2D + 1.0E	-17.78	-0.70	0.00	-22.58	0.00	-22.58	1897.08	948.54	2862.22	1433.24	90.00	0.025
0.9D + 1.0E	-13.33	-0.69	0.00	-22.43	0.00	-22.43	1897.08	948.54	2862.22	1433.24	90.00	0.023
1.0D + 1.0W 60 mph Wind	-39.58	-7.40	0.00	-687.53	0.00	-687.53	5435.95	2717.9	12860.7	6439.91	0.00	0.114

## Base Plate Summary

<b>Structure:</b> CT13615-A-SB	<b>Code:</b> EIA/TIA-222-G	8/30/2018
<b>Site Name:</b> Madison 7, CT	<b>Exposure:</b> C	
<b>Height:</b> 130.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II
		Page: 33



Reactions	Base Plate	Anchor Bolts
Original Design	<b>Yield (ksi):</b> 50.00	<b>Bolt Circle:</b> 63.00
<b>Moment (kip-ft):</b> 5098.40	<b>Width (in):</b> 67.00	<b>Number Bolts:</b> 26.00
<b>Axial (kip):</b> 100.90	<b>Style:</b> Round	<b>Bolt Type:</b> 1.5" F1554 105
<b>Shear (kip):</b> 46.40	<b>Polygon Sides:</b> 0.00	<b>Bolt Diameter (in):</b> 1.50
Analysis	<b>Clip Length (in):</b> 0.00	<b>Yield (ksi):</b> 105.00
<b>Moment (kip-ft):</b> 3127.78	<b>Effective Len (in):</b> 9.42	<b>Ultimate (ksi):</b> 125.00
<b>Axial (kip):</b> 71.88	<b>Moment (kip-in):</b> 236.05	<b>Arrangement:</b> Radial
<b>Shear (kip):</b> 33.57	<b>Allow Stress (ksi):</b> 67.50	<b>Cluster Dist (in):</b> 0.00
	<b>Applied Stress (ksi):</b> 0.00	<b>Start Angle (deg):</b> 0.00
<b>Moment Design %:</b> 61.35	<b>Stress Ratio:</b> 0.73	<b>Compression</b>
		<b>Force (kip):</b> 94.42
		<b>Allowable (kip):</b> 141.00
		<b>Ratio:</b> 0.69
		<b>Tension</b>
		<b>Force (kip):</b> 88.89
		<b>Allowable (kip):</b> 141.00
		<b>Ratio:</b> 0.65



# Monopole Mat Foundation Design

Date

8/30/2018

<b>Customer Name:</b>	AT&T	<b>EIA/TIA Standard:</b>	EIA-222-G
<b>Site Name:</b>		<b>Structure Height (Ft.):</b>	130
<b>Site Number:</b>	CT13615-A-SBA	<b>Engineer Name:</b>	H. You
<b>Engr. Number:</b>	60487	<b>Engineer Login ID:</b>	

**Foundation Info Obtained from:**

Drawings/Calculations

**Structure Type:**

Monopole

**Analysis or Design?**

Analysis

**Base Reactions (Factored):**

Axial Load (Kips):	47.5	Shear Force (Kips):	33.6
Uplift Force (Kips):	0.0	Moment (Kips-ft):	3127.9

Allowable overstress %: 5.0%

**Foundation Geometries:**

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	7.5	Depth of Base BG (ft.):	4.0
Pier Height A. G. (ft.):	2.50	Thickness of Pad (ft):	3.50
Length of Pad (ft.):	26	Width of Pad (ft.):	26
Final Length of pad (ft)	26.0	Final width of pad (ft):	26.0
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 #:	5	
Qty. of Vertical Rebars:	32	Tie Spacing (in):	3.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	9	
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):	28	Qty. of Rebar in Pad (W):	28	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	28	Qty. of Rebar in Pad (W):	28	

Apply 1.35 factor for e/w Per G: 1.35

**Soil Design Parameters:**

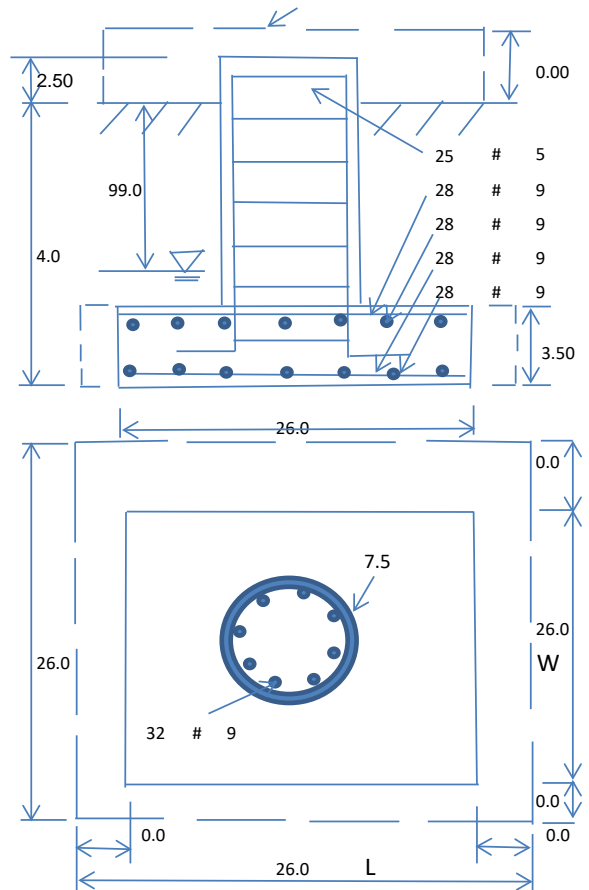
Soil Unit Weight (pcf):	110.0	Soil Buoyant Weight:	50.0	Pcf
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf
Ultimate Bearing Pressure (psf):	15000	Ultimate Skin Friction:	175	Psf
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No	
Consider soil hor. resist. for OTM.:	Yes	Reduction factor on the maximum soil bearing pressure:	1.00	
		Angle from Top of Pad:	30	
		Angle from Bottm of Pad:	25	
		Angle from Bottm of Pad:	25	

**Foundation Analysis and Design:**

Uplift Strength Reduction Factor:	0.75	Compression Strength Reduction Factor:	0.75
Total Dry Soil Volume (cu. Ft.):	315.91	Total Dry Soil Weight (Kips):	34.75
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	34.75	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	2498.54	Total Dry Concrete Weight (Kips):	374.78
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	374.78	Total Vertical Load on Base (Kips):	457.02

**Check Soil Capacities:**

Calculated Maxium Net Soil Pressure under the base (psf):	2116	<	Allowable Factored Soil Bearing (psf):	11250	0.19	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	5408.9	>	Design Factored Momont (kips-ft):	3288	0.61	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.65					OK!



Load/  
Capacity  
Ratio

**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:	1.00

Load/  
Capacity  
Ratio

(1) Concrete Pier:

Vertical Steel Rebar Area (sq. in./each):	1.00	Tie / Stirrup Area (sq. in./each):	0.31		
Calculated Moment Capacity (Mn,Kips-Ft):	5835.6	> Design Factored Moment (Mu, Kips-Ft)	3228.7	0.55	OK!
Calculated Shear Capacity (Kips):	1496.3	> Design Factored Shear (Kips):	33.6	0.02	OK!
Calculated Tension Capacity (Tn, Kips):	1728.0	> Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	11191.0	> Design Factored Axial Load (Pu Kips):	47.5	0.00	OK!
Moment & Axial Strength Combination:	0.55	OK! Check Tie Spacing (Design/Required):		0.25	OK!
Pier Reinforcement Ratio:	0.005	Reinforcement Ratio is satisfied per ACI			

(2).Concrete Pad:

One-Way Design Shear Capacity (L-Direction, Kips):	1137.7	> One-Way Factored Shear (L-D. Kips):	194.1	0.17	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1137.7	> One-Way Factored Shear (W-D., Kips)	194.1	0.17	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	1000.5	> One-Way Factored Shear (C-C, Kips):	186.1	0.19	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct. ):	0.0023	OK! Lower Steel Pad Reinf. Ratio (W-Direc	0.0023		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	4743.4	> Moment at Bottom ( L-Dir. K-Ft):	1164.5	0.25	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	4743.4	> Moment at Bottom ( W-Dir. K-Ft):	1164.5	0.25	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	6672.0	> Moment at Bottom ( C-C Dir. K-Ft):	1646.9	0.25	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct. ):	0.0023	OK! Upper Steel Reinf. Ratio (W-Dir. ):	0.0023		
Upper Steel Pad Moment Capacity (L-Direc. Kips-ft):	4743.4	> Moment at the top (L-Dir K-Ft):	470.6	0.10	OK!
Upper Steel Pad Moment Capacity (W-Direc. Kips-ft):	4743.4	> Moment at the top (W-Dir K-Ft):	470.6	0.10	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	6672.0	> Moment at the top (C-C Dir. K-Ft):	442.0	0.07	OK!

(3).Check Punching Shear Capacity due to Moment in the Pier:

Moment transferred by punching shear:	1251.2	k-ft.	Max. factored shear stress $v_{u,CD}$ :	2.1	Psi
Max. factored shear stress $v_{u,AB}$ :	6.8	Psi	Factored shear Strength $\phi v_n$ :	189.7	Psi
Max. factored shear stress $v_u$ :	6.8	Psi	Check Usage of Punching Shear Capacity:	0.04	OK!



**PROJECT INFORMATION**

SCOPE OF WORK: ITEMS TO BE MOUNTED ON THE MONOPOLE:

- NEW AT&T LTE ANTENNA (QS46512-2) @ POS. 3 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS-32 (WCS) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW SURGE ARRESTOR DC6-48-60-18-8F (TOTAL OF 1) WITH (2) DC POWER, (1) FIBER, & (1) ALARM CABLE.
- COAX JUMPERS (1) PER SECTOR, FROM EACH RRU (TOTAL OF 3).
- FIBER JUMPERS (1) PER SECTOR, FROM THE SQUID TO EACH RRU (TOTAL OF 3).
- NEW LOW BAND COMBINERS (DBC0061F1V51-2) (TYP. OF 1 PER SECTOR, TOTAL OF 3).

ITEMS TO BE MOUNTED @ EXISTING EQUIPMENT SHELTER:

- ADD (2) B14 TO GROUND; SECTORS A/C TO SHARE.
- INSTALL (3) INSERTS TO EXISTING DC12, & (1) FIBER TRAY; GROUNDING ISOLATION REQUIRED.
- BBU: SWAP DUS FOR (1) 5216.
- INSTALL (3) LOW BAND COMBINERS (DBC0061F1V51-2) FOR NEW LTE ANTENNA TO REPLACE EXISTING DIPLEXERS, & ADD (8) (APTDC-BDFDM-DB) SURGE ARRESTORS.
- INSTALL (1) 48V CONVERTER SHELF (LOWER DC12 TO MAKE ROOM) & INSTALL (4) CONVERTER MODULES, & (3) 30A BREAKERS IN NEW 48V CONVERTER SHELF.
- INSTALL (2) 150A BREAKERS TO EXISTING POWER PLANT.

ITEMS TO REMAIN:

- (6) ANTENNAS, (6) RRU'S, (1) SURGE ARRESTOR, (3) TWIN TMA'S, (12) COAX, (2) DC POWER CABLES, & (1) FIBER RUNS.

SQUID ALARMING (NOT TO BE DAISY CHAINED):

- THE 1ST SQUID INSTALLED WILL BE ALARMED TO THE LOWEST BAND (OR FIRST INSTALLED RRH/RRU ON THE ALPHA SECTOR, IN THE EVENT THE ALARM CABLE CANNOT BE CONNECTED TO ALPHA IT WILL BE ACCEPTABLE TO ALARM TO THE CLOSEST PHYSICAL SECTOR ON AN EXCEPTION BASIS.
- 2ND SQUID INSTALLED WILL BE ALARMED TO THE LOWEST BAND (OR FIRST INSTALLED) RRH/RRU ON THE BETA SECTOR.
- 3RD SQUID INSTALLED WILL BE ALARMED TO THE LOWEST BAND (OR FIRST INSTALLED) RRH/RRU ON THE GAMMA SECTOR.

FA: 10546793

SITE OWNER: SBA

SITE ID: CT13615-A-02 / MADISON 7, CT

SITE ADDRESS: 17 COTTAGE ROAD  
MADISON, CT 06443

LATITUDE: 41.275858° N 41° 16' 33.08" N

LONGITUDE: 72.561382° W 72° 33' 40.97" W

TYPE OF SITE: MONOPOLE / INDOOR EQUIPMENT

TOWER HEIGHT: 130'± A.G.L

RAD CENTER: 127'± A.G.L

CURRENT USE: TELECOMMUNICATIONS FACILITY

PROPOSED USE: TELECOMMUNICATIONS FACILITY

**DRAWING INDEX**

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	B
GN-1	GENERAL NOTES	B
A-1	COMPOUND & EQUIPMENT PLANS	B
A-2	ANTENNA LAYOUTS & ELEVATION	B
A-3	DETAILS	B
RF-1	RF-PLUMBING DIAGRAM	B
G-1	GROUNDING DETAILS	B



**SITE NUMBER: CT2517**

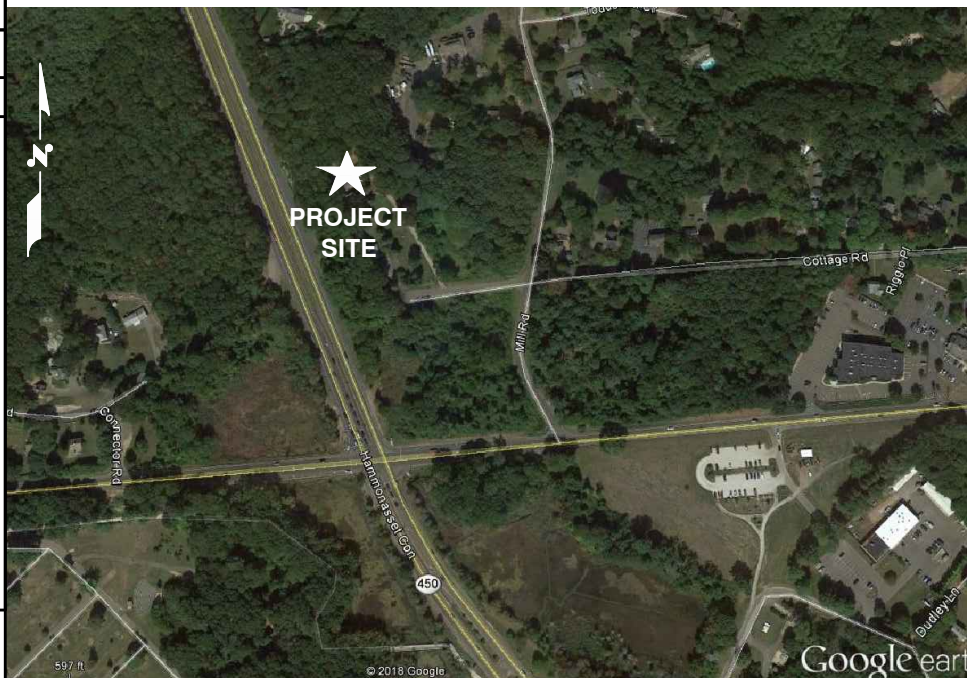
**SITE NAME: MADISON COTTAGE ROAD**

**PROJECT: LTE 3C/4C 2018 UPGRADE**

**VICINITY MAP**

**DIRECTIONS TO SITE:**

TURN LEFT ONTO CAPITAL BLVD. THEN 0.27 MILES TURN LEFT ONTO WEST ST. THEN 0.30 MILES MERGE ONTO I-91 S VIA THE RAMP ON THE LEFT TOWARD NEW HAVEN. THEN 1.41 MILES MERGE ONTO CT-9 S VIA EXIT 22S ON THE LEFT TOWARD MIDDLETOWN/OLD SAYBROOK. THEN 13.89 MILES TAKE THE CT-81 EXIT, EXIT 9, TOWARD KILLINGWORTH/CLINTON. THEN 0.24 MILES TURN RIGHT ONTO KILLINGWORTH RD/CT-81. CONTINUE TO FOLLOW CT-81. PASS THROUGH 1 ROUNDABOUT THEN 13.84 MILES TURN LEFT ONTO HULL ST/CT-81. HULL ST IS 0.2 MILES PAST SILVERBROOK LN THEN 0.09 MILES TAKE THE 1ST RIGHT ONTO W MAIN ST/US-1 S. CONTINUE TO FOLLOW US-1 S. MALONE'S SANDWICH AND COFFEE HOUSE IS ON THE CORNER THEN 1.70 MILES TURN RIGHT ONTO MILL RD. MILL RD IS 0.2 MILES PAST DUDLEY LN THEN 0.09 MILES TAKE THE 1ST LEFT ONTO COTTAGE RD. 17 COTTAGE RD IS ON THE RIGHT.



**GENERAL NOTES**

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
4. CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OR RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.

**72 HOURS**



**CALL BEFORE YOU DIG**



CALL TOLL FREE 1-800-922-4455

OR CALL 811

**UNDERGROUND SERVICE ALERT**

45 BEECHWOOD DRIVE  
NORTH ANDOVER, MA 01845  
TEL: (978) 557-5553  
FAX: (978) 336-5586

95 RYAN DRIVE  
RAYNHAM, MA 02767

**SITE NUMBER: CT2517**  
**SITE NAME: MADISON COTTAGE ROAD**

17 COTTAGE ROAD  
MADISON, CT 06443  
NEWHAVEN COUNTY

500 ENTERPRISE DRIVE, SUITE 3A  
ROCKY HILL, CT 06067

B		03/15/18	ISSUED FOR PERMITTING	AM	AT	UPH		AT&T
A		01/22/18	ISSUED FOR REVIEW	ET	AT	OPH		TITLE SHEET
NO.	DATE	REVISIONS		BY	CHK	APP'D	SITE NUMBER	DRAWING NUMBER
SCALE: AS SHOWN		DESIGNED BY: AT		DRAWN BY: RB			CT2517	T-1
								REV
								B

**GROUNDING NOTES**

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

**GENERAL NOTES**

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:  
 CONTRACTOR – SAI  
 SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)  
 OWNER – AT&T MOBILITY
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH LTE SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T SITES."
17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
20. APPLICABLE BUILDING CODES:  
 SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.  
 BUILDING CODE: IBC 2012 WITH 2016 CT BUILDING CODE AMENDMENTS  
 ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS  
 LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MANUAL OF STEEL CONSTRUCTION, ASD, FOURTEENTH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-G, STRUCTURAL STANDARDS FOR STEEL

EQUIPMENT AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

**ABBREVIATIONS**

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

45 BEECHWOOD DRIVE  
NORTH ANDOVER, MA 01845  
TEL: (978) 557-5553  
FAX: (978) 336-5586

95 RYAN DRIVE  
RAYNHAM, MA 02767

**SITE NUMBER: CT2517**  
**SITE NAME: MADISON COTTAGE ROAD**

17 COTTAGE ROAD  
MADISON, CT 06443  
NEWHAVEN COUNTY

500 ENTERPRISE DRIVE, SUITE 3A  
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
B	03/15/18	ISSUED FOR PERMITTING	AM	AT	UPH
A	01/22/18	ISSUED FOR REVIEW	ET	AT	UPH
SCALE: AS SHOWN		DESIGNED BY: AT	DRAWN BY: RB		



**AT&T**

GENERAL NOTES  
LTE 3C/4C

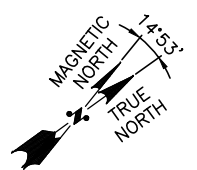
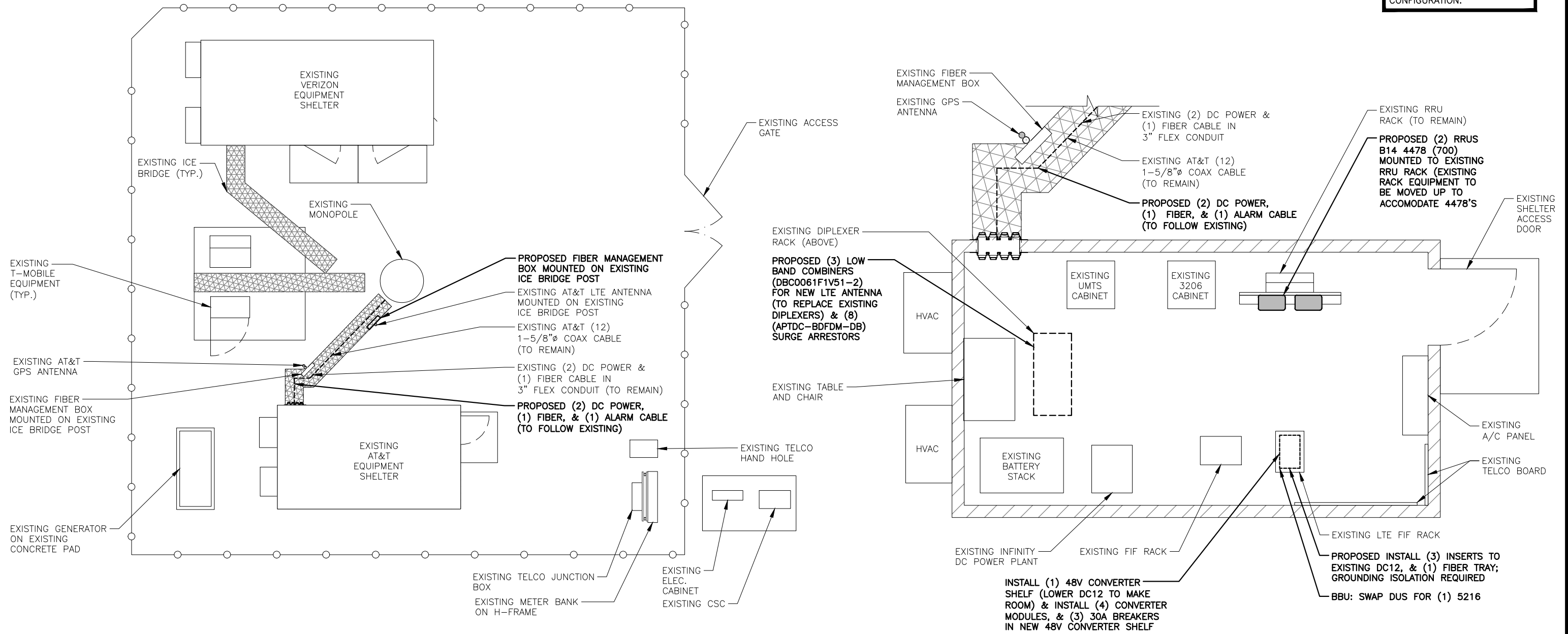
SITE NUMBER	DRAWING NUMBER	REV
CT2517	GN-1	B



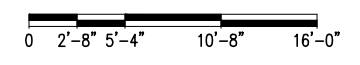
**NOTE:**  
AN ASSESSMENT FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: JANUARY 10, 2018

**NOTE:**  
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

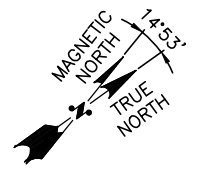
**NOTE:**  
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA CONFIGURATION.



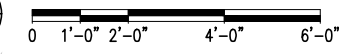
**COMPOUND PLAN**  
22x34 SCALE: 3/16"=1'-0"  
11x17 SCALE: 3/32"=1'-0"  
1 A-1



**POWER PANEL NOTE:**  
1. ADD (2) 150A BREAKERS IN EXISTING POWER PLANT



**EQUIPMENT PLAN**  
22x34 SCALE: 1/2"=1'-0"  
11x17 SCALE: 1/4"=1'-0"  
2 A-1



**HUDSON Design Group LLC**  
45 BEECHWOOD DRIVE  
NORTH ANDOVER, MA 01845  
TEL: (978) 557-5553  
FAX: (978) 336-5586

**CENTERLINE COMMUNICATIONS**  
95 RYAN DRIVE  
RAYNHAM, MA 02767

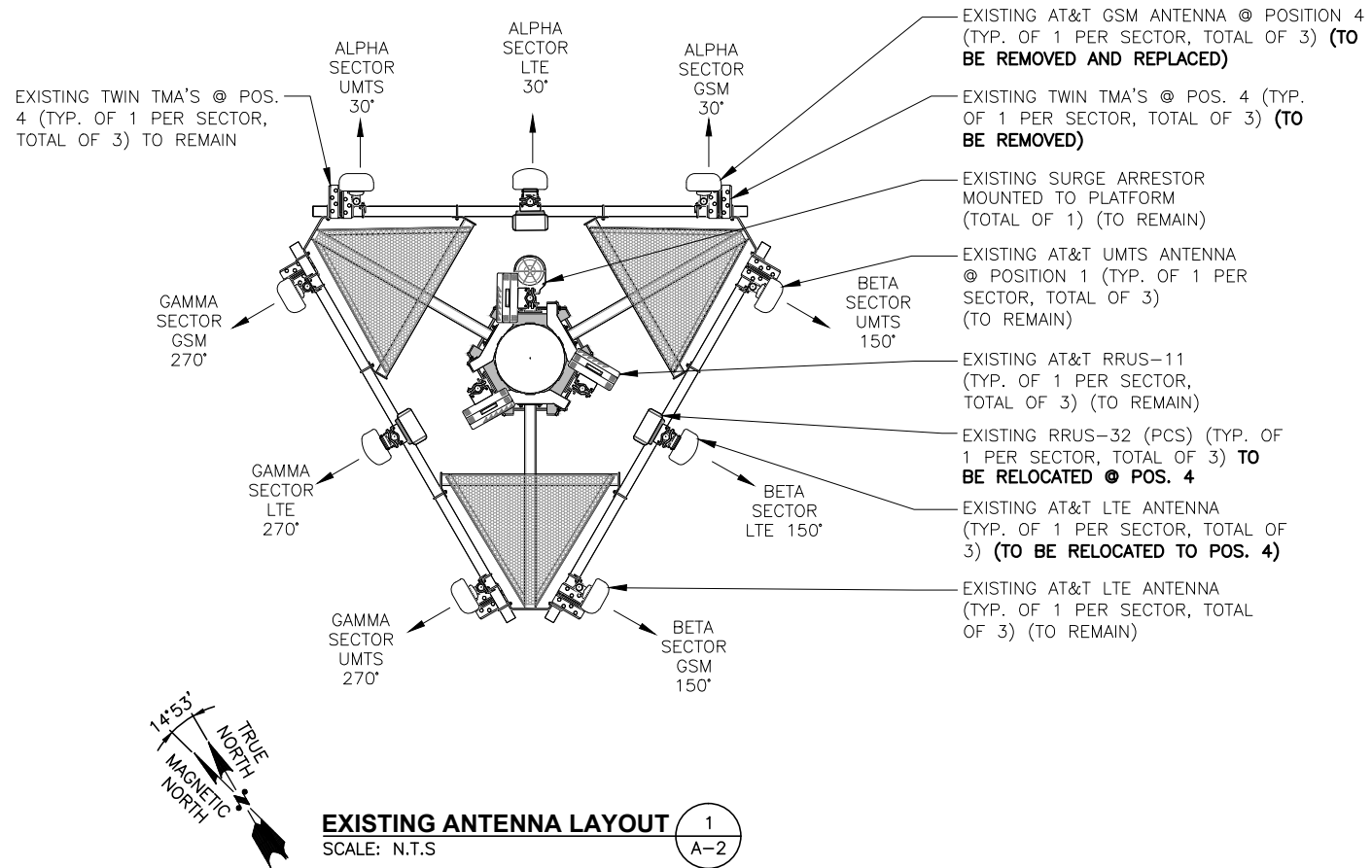
**SITE NUMBER: CT2517**  
**SITE NAME: MADISON COTTAGE ROAD**  
  
17 COTTAGE ROAD  
MADISON, CT 06443  
NEWHAVEN COUNTY

**at&t**  
500 ENTERPRISE DRIVE, SUITE 3A  
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
B	03/15/18	ISSUED FOR PERMITTING	AM	AT	UPH
A	01/22/18	ISSUED FOR REVIEW	ET	AT	UPH

SCALE: AS SHOWN  
DESIGNED BY: AT  
DRAWN BY: RB

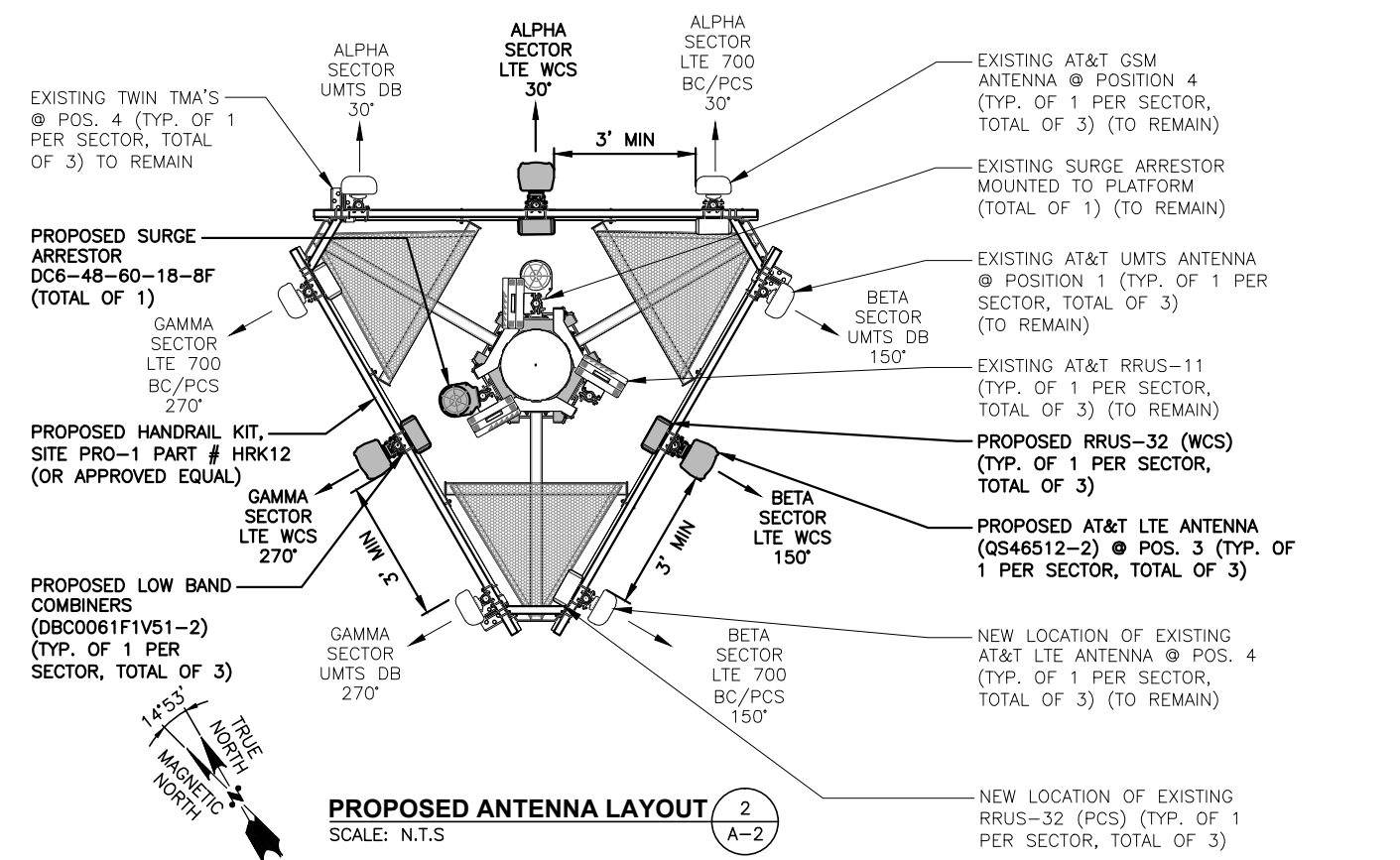
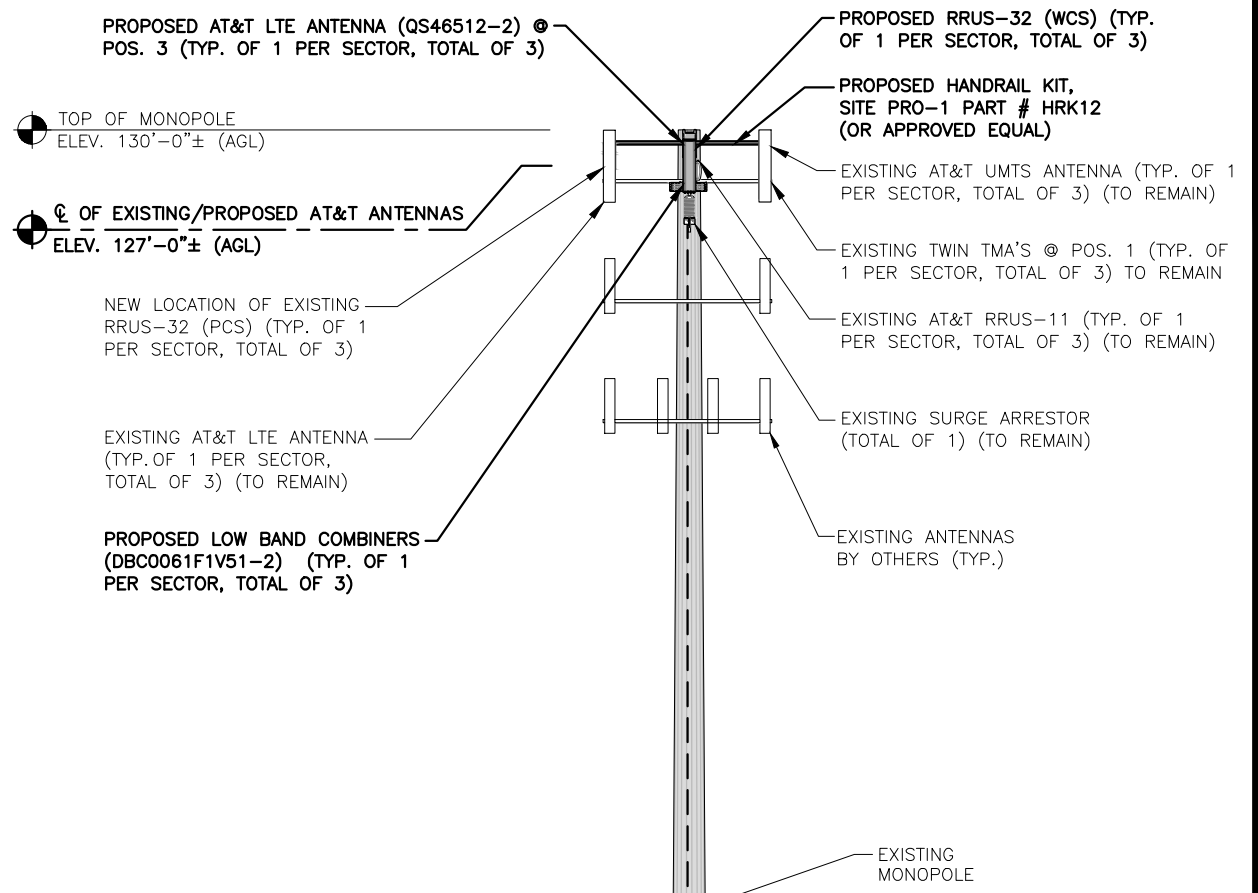
**AT&T**  
**COMPOUND & EQUIPMENT PLANS**  
**LTE 3C/4C**  
SITE NUMBER: CT2517  
DRAWING NUMBER: A-1  
REV: B



**NOTE:**  
AN ASSESSMENT FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: JANUARY 10, 2018

**NOTE:**  
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

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



**NOTE:**  
EXISTING GROUND EQUIPMENT NOT SHOW FOR CLARITY

**HUDSON Design Group LLC**  
45 BEECHWOOD DRIVE  
NORTH ANDOVER, MA 01845  
TEL: (978) 557-5553  
FAX: (978) 336-5586

**CENTERLINE COMMUNICATIONS**  
95 RYAN DRIVE  
RAYNHAM, MA 02767

**SITE NUMBER: CT2517**  
**SITE NAME: MADISON COTTAGE ROAD**  
17 COTTAGE ROAD  
MADISON, CT 06443  
NEWHAVEN COUNTY

**at&t**  
500 ENTERPRISE DRIVE, SUITE 3A  
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
B	03/15/18	ISSUED FOR PERMITTING	AM	AT	UPH
A	01/22/18	ISSUED FOR REVIEW	ET	AT	UPH

SCALE: AS SHOWN    DESIGNED BY: AT    DRAWN BY: RB

**STATE OF CONNECTICUT**  
**REGISTERED PROFESSIONAL ENGINEER**  
No. 2555  
*Paul J. C...*  
LICENSED

**AT&T**  
**ANTENNA LAYOUTS & ELEVATION**  
**LTE 3C/4C**  
SITE NUMBER: CT2517    DRAWING NUMBER: A-2    REV: B

**NOTE:**  
AN ASSESSMENT FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: JANUARY 10, 2018

**NOTE:**  
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

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

**FINAL ANTENNA SCHEDULE**

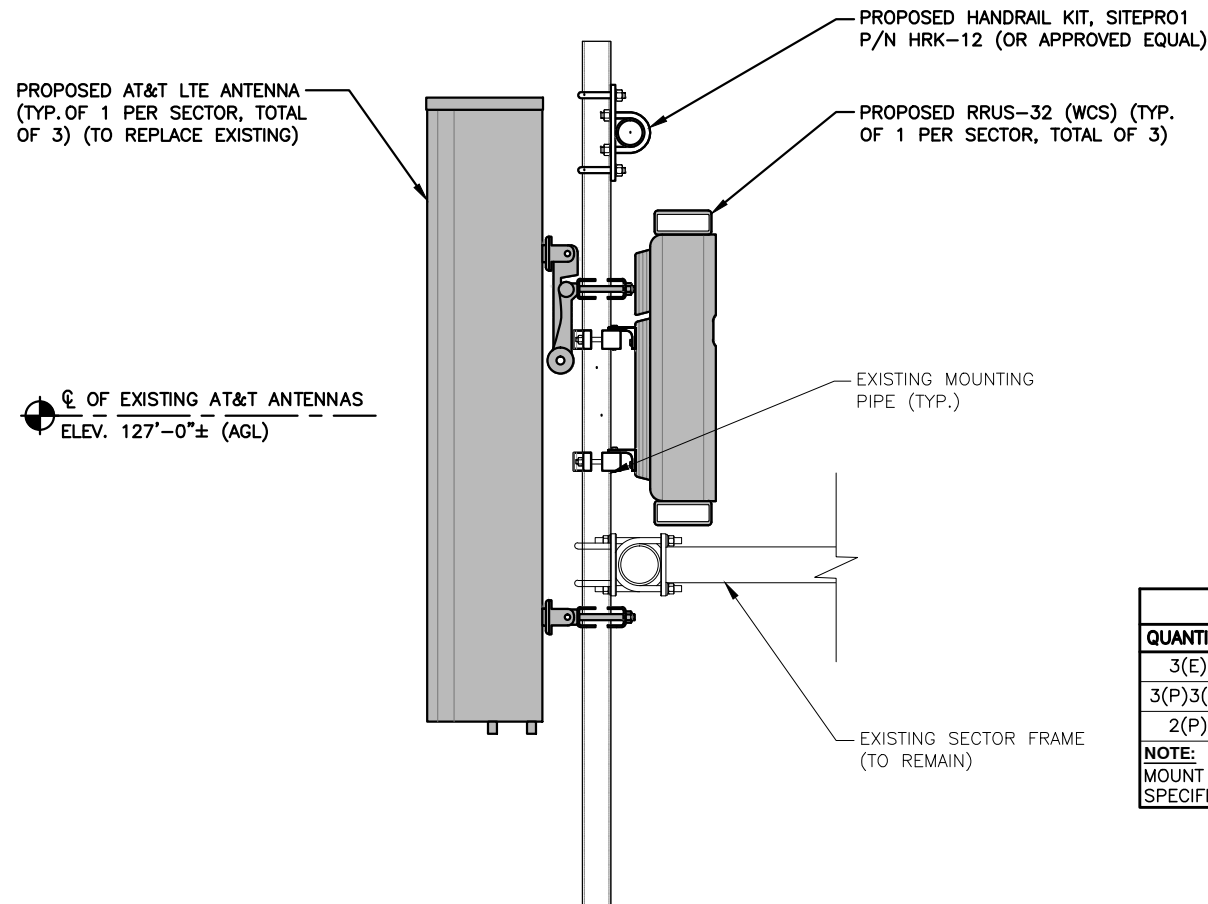
SECTOR	BAND	ANTENNA	SIZE (INCHES) (L X W X D)	RAD CENTER	AZIMUTH	COMBINERS	TMA'S	RRU'S	SIZE (INCHES) (L X W X D)	COAX JUMPERS	FIBER JUMPERS	COAX
ALPHA	UMTS DB	EXISTING	P90-15-XLH-RR	72X12X7.3	127'-0"±	30'	-	EXISTING	TT19-08BP111-001	EXISTING	-	(2)1-5/8"
	-	-	-	-	-	-	-	-	-	-	-	-
	LTE WCS	PROPOSED	QS46512-2	52X12X10.8	127'-0"±	30'	PROPOSED	DBC0061F1V51-2	-	PROPOSED (G) PROPOSED	RRUS-B14 4478 RRUS-32 (WCS)	15X13.2X7.4 27.2X12.1X7.0
LTE 700 BC /PCS	EXISTING	SBNHH-1D65A	55X11.9X7.1	127'-0"±	30'	-	-	-	EXISTING	RRUS-32 B2 (PCS) RRUS-11 (700)	-	-
BETA	UMTS DB	EXISTING	P90-15-XLH-RR	72X12X7.3	127'-0"±	150'	-	EXISTING	TT19-08BP111-001	EXISTING	-	(2)1-5/8"
	-	-	-	-	-	-	-	-	-	-	-	-
	LTE WCS	PROPOSED	QS46512-2	52X12X10.8	-	-	PROPOSED	DBC0061F1V51-2	-	PROPOSED (G) PROPOSED	RRUS-B14 4478 RRUS-32 (WCS)	15X13.2X7.4 27.2X12.1X7.0
LTE 700 BC /PCS	EXISTING	SBNHH-1D65A	55X11.9X7.1	127'-0"±	150'	-	-	-	EXISTING	RRUS-32 B2 (PCS) RRUS-11 (700)	-	-
GAMMA	UMTS DB	EXISTING	P90-15-XLH-RR	72X12X7.3	127'-0"±	270'	-	EXISTING	TT19-08BP111-001	EXISTING	-	(2)1-5/8"
	-	-	-	-	-	-	-	-	-	-	-	-
	LTE WCS	PROPOSED	QS46512-2	52X12X10.8	127'-0"±	270'	PROPOSED	DBC0061F1V51-2	-	PROPOSED	RRUS-32 (WCS)	27.2X12.1X7.0
LTE 700 BC /PCS	EXISTING	SBNHH-1D65A	55X11.9X7.1	127'-0"±	270'	-	-	-	EXISTING	RRUS-32 B2 (PCS) RRUS-11 (700)	-	-

**FINAL ANTENNA CONFIGURATION TABLE**

1  
A-3

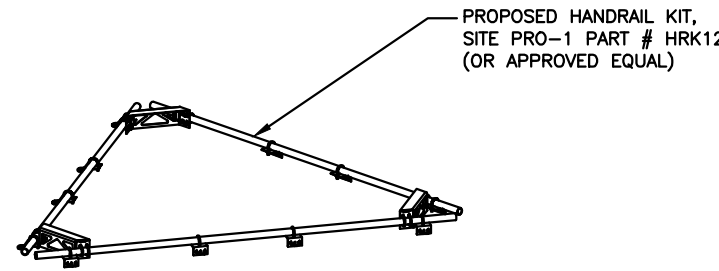
**\*\*FIBER JUMPER NOTE:**  
FIBER JUMPERS (1) PER SECTOR, FROM THE SQUID TO EACH RRU (TOTAL OF 3).

**\*COAX JUMPER NOTE:**  
COAX JUMPERS (1) PER SECTOR, FROM EACH RRU (TOTAL OF 3)



**PROPOSED LTE ANTENNA & RRH MOUNTING DETAIL**  
SCALE: N.T.S

2  
A-3



**PROPOSED HANDRAIL KIT**  
SCALE: N.T.S

3  
A-2

RRU CHART				
QUANTITY	MODEL	L	W	D
3(E)	RRUS-11	19.7"	17.0"	7.2"
3(P)3(E)	RRUS-32	27.2"	12.1"	7.0"
2(P)	B14.4478	15.0"	13.2"	7.4"

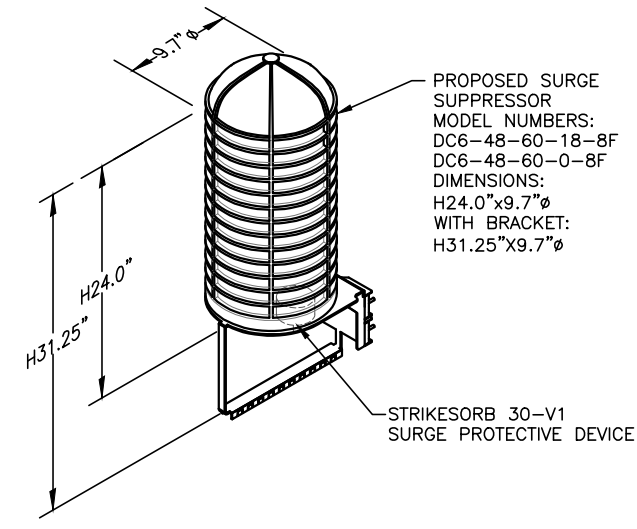
**NOTE:**  
MOUNT PER MANUFACTURER'S SPECIFICATIONS

PROPOSED RRU REFER TO THE FINAL RFDS AND CHART FOR QUANTITY, MODEL AND DIMENSIONS  
NOTE:  
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

**NOTE:**  
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER

**PROPOSED RRUS DETAIL**  
SCALE: N.T.S

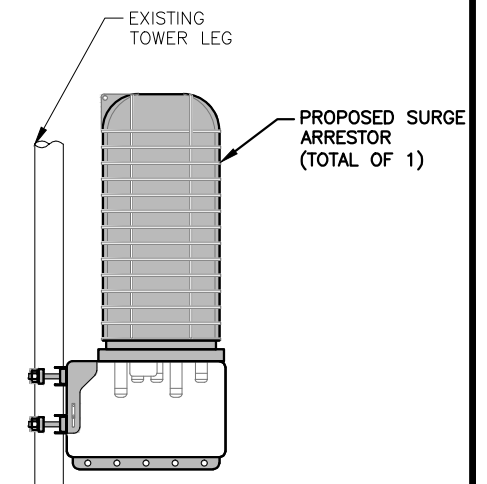
4  
A-3



**NOTE:**  
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

**DC SURGE SUPPRESSOR DETAIL**  
SCALE: N.T.S

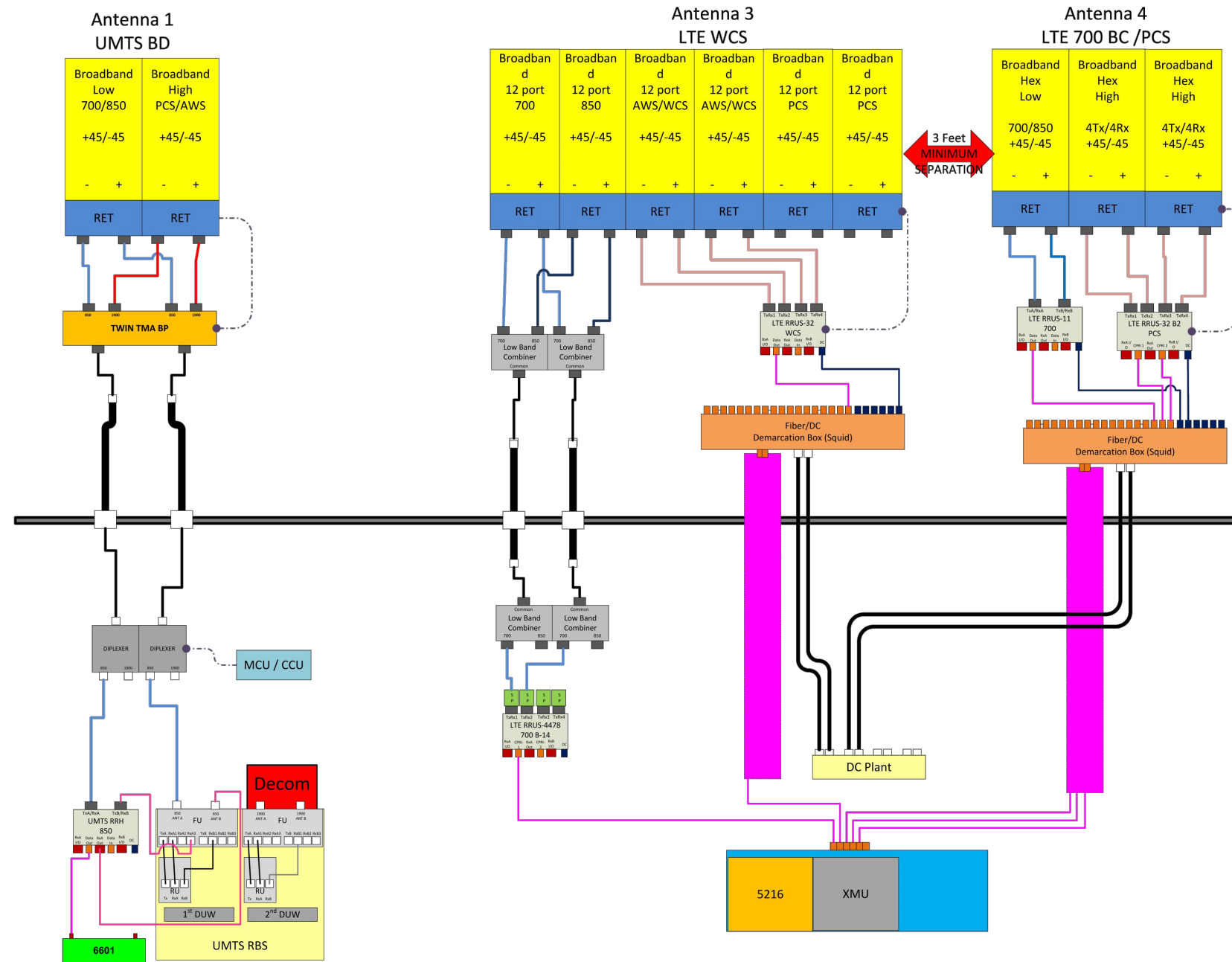
5  
A-3



**SURGE SUPPRESSOR MOUNTING DETAIL**  
SCALE: N.T.S

6  
A-3





**RF PLUMBING DIAGRAM**  
SCALE: N.T.S

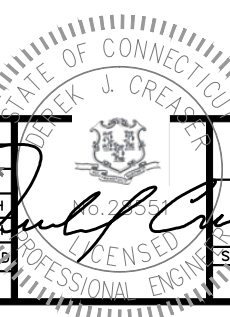
1  
RF-1

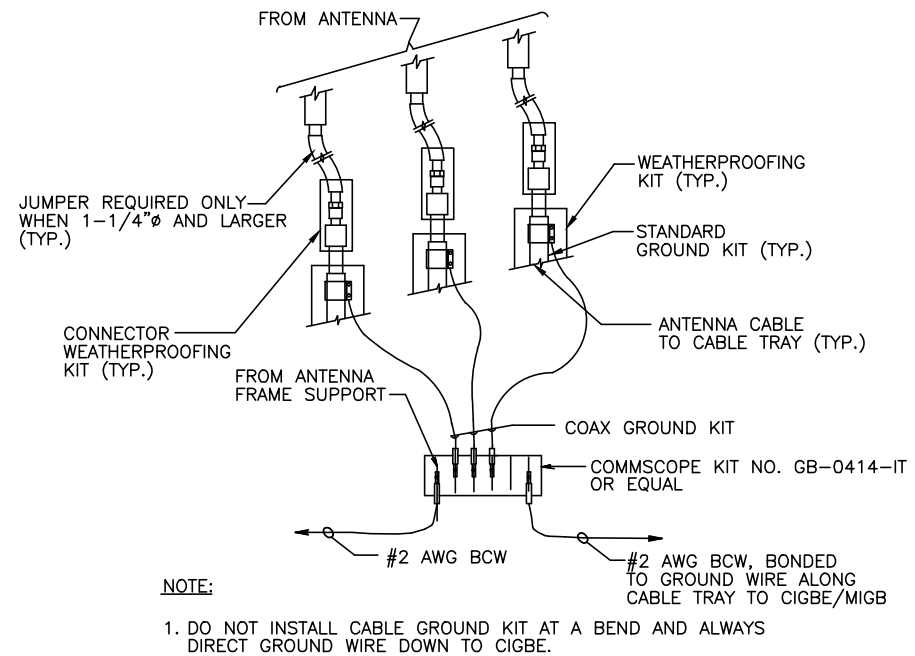
**NOTE:**  
1. CONTRACTOR TO CONFIRM ALL PARTS.  
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
B	03/15/18	ISSUED FOR PERMITTING	AM	AT	UPH
A	01/22/18	ISSUED FOR REVIEW	ET	AT	UPH

SCALE: AS SHOWN    DESIGNED BY: AT    DRAWN BY: RB





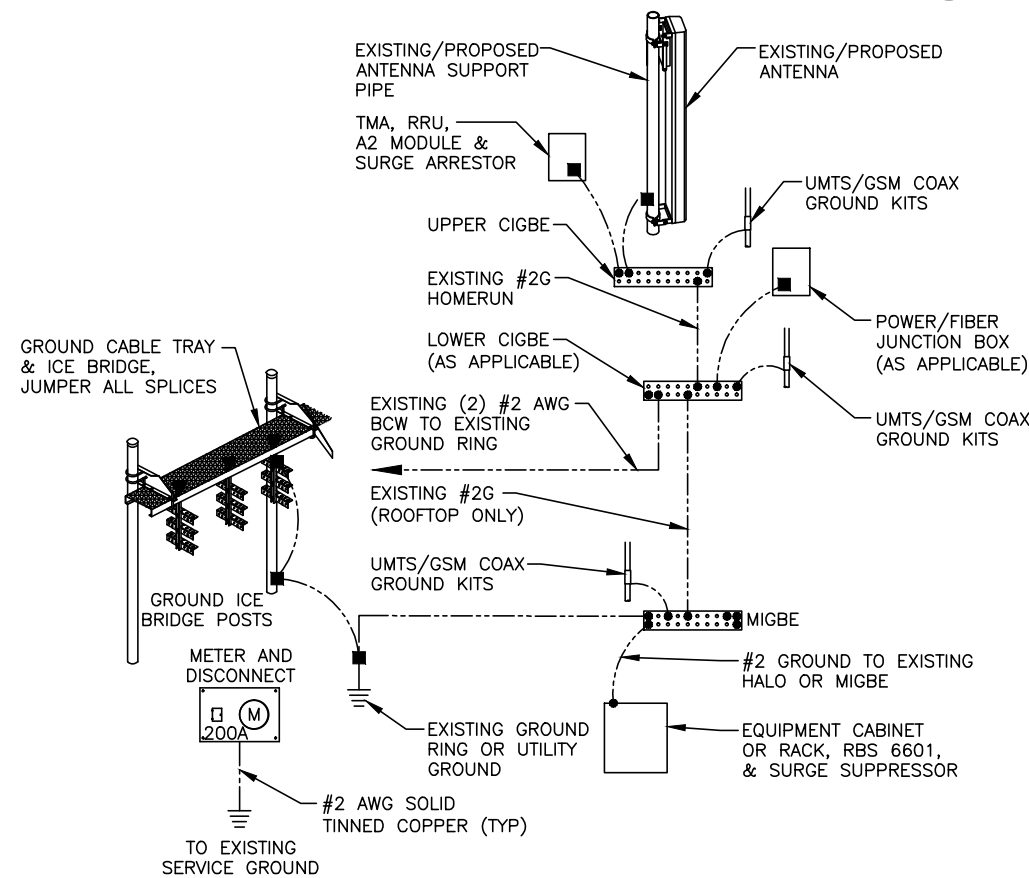
NOTE:

- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

**GROUND WIRE TO GROUND BAR CONNECTION DETAIL**

SCALE: N.T.S

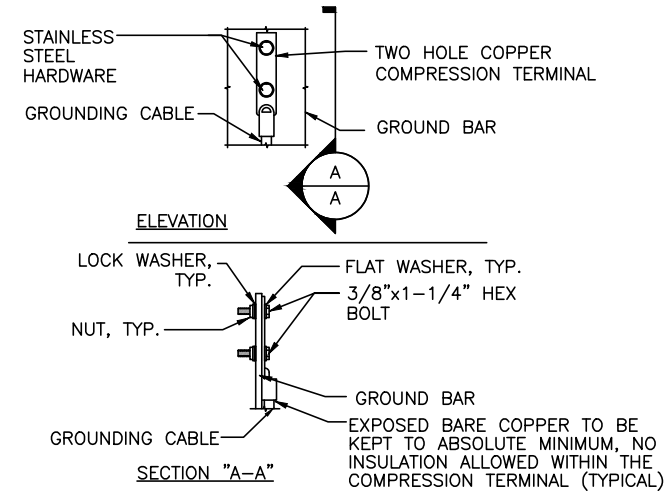
1  
G-1



**GROUNDING RISER DIAGRAM**

SCALE: N.T.S

2  
G-1



NOTE:

- "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
- OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATION.
- CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB

**TYPICAL GROUND BAR CONNECTION DETAIL**

SCALE: N.T.S

3  
G-1

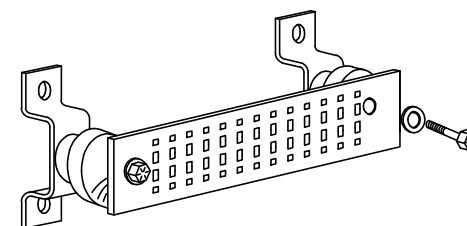
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

**SECTION "P" - SURGE PRODUCERS**

- CABLE ENTRY PORTS (HATCH PLATES) (#2)
- GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
- TELCO GROUND BAR
- COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
- +24V POWER SUPPLY RETURN BAR (#2)
- 48V POWER SUPPLY RETURN BAR (#2)
- RECTIFIER FRAMES.

**SECTION "A" - SURGE ABSORBERS**

- INTERIOR GROUND RING (#2)
- EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
- METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
- BUILDING STEEL (IF AVAILABLE) (#2)



**GROUND BAR - DETAIL**

SCALE: N.T.S

4  
G-1

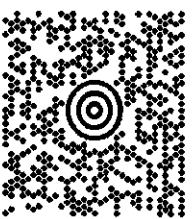
				AT&T	
				GROUNDING DETAILS	
				LTE 3C/4C	
NO.	DATE	REVISIONS	BY	CHK	APP'D
B	03/15/18	ISSUED FOR PERMITTING	AM	AT	UPH
A	01/22/18	ISSUED FOR REVIEW	ET	AT	UPH
SCALE: AS SHOWN			DESIGNED BY: AT	DRAWN BY: RB	
SITE NUMBER			DRAWING NUMBER		REV
CT2517			G-1		B

AARON MEYERS  
(774) 420-4202  
CENTERLINE COMMUNICATIONS, LLC  
750 WEST CENTER STREET  
WEST BRIDGEWATER MA 02379

1 LBS

1 OF 1

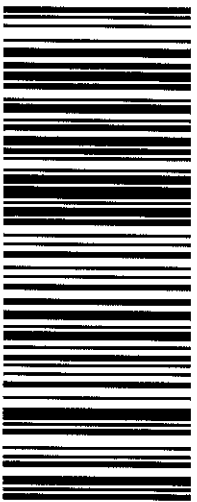
**SHIP TO:**  
TOM BANISCH  
SELECTMAN'S OFFICE  
8 CAMPUS DRIVE  
MADISON CT 06443



**CT 065 2-03**

**UPS GROUND**

TRACKING #: 1Z 9Y4 503 03 1826 0379



BILLING: P/P

XOL 18 09 09

NV45 03.0A 07/2018



TM

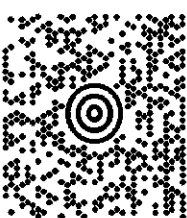
AARON MEYERS  
(774) 420-4202  
CENTERLINE COMMUNICATIONS, LLC  
750 WEST CENTER STREET  
WEST BRIDGEWATER MA 02379

1 LBS

1 OF 1

**SHIP TO:**

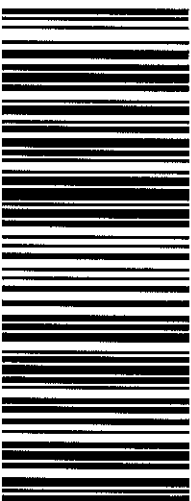
DAVID ANDERSON  
PLANNING & ZONING DEPT.  
8 CAMPUS DRIVE  
MADISON CT 06443



**CT 065 2-03**

**UPS GROUND**

TRACKING #: 1Z 9Y4 503 03 3256 5700



BILLING: P/P

XOL 18 09 09

NV45 03.0A 07/2018



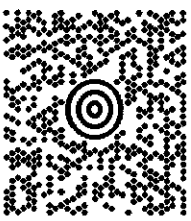
AARON MEYERS  
(774) 430-4202  
CENTERLINE COMMUNICATIONS, LLC  
750 WEST CENTER STREET  
WEST BRIDGEWATER MA 02379

1 LBS

1 OF 1

**SHIP TO:**

PAUL STONEHART  
17 COTTAGE ROAD  
MADISON CT 06443

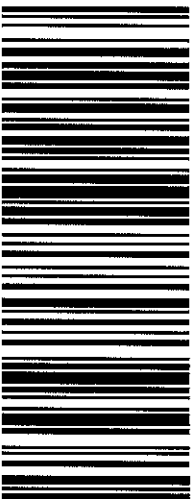


**CT 065 2-03**



**UPS GROUND**

TRACKING #: 1Z 9Y4 503 03 2472 9094



BILLING: P/P

XOL 18.09.09

NY45 03.0A.07/2018



TM



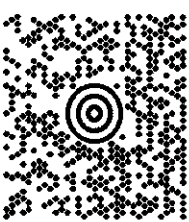
AARON MEYERS  
(774) 420-4202  
CENTERLINE COMMUNICATIONS, LLC  
750 WEST CENTER STREET  
WEST BRIDGEWATER MA 02379

1 LBS

1 OF 1

**SHIP TO:**

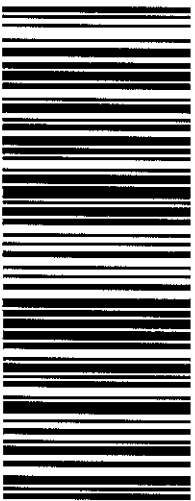
CARLA SHORTER  
SBA COMMUNICATIONS CORPORATION  
8051 CONGRESS AVENUE  
BOCA RATON FL 33487-1307



**FL 332 6-07**

**UPS GROUND**

TRACKING #: 1Z 9Y4 503 03 2358 5483



BILLING: P/P

XOL 18.09.09

NV4S 03.0A 07/2018

