



Filed by:

Kri Pelletier, Property Specialist - SBA Communications  
134 Flanders Rd., Suite 125, Westborough, MA 01581  
508.251.0720 x 3804 - kpelletier@sbsite.com

January 11, 2017

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

**Notice of Exempt Modification**

**151 Sand Hill Road, South Windsor, CT 06074**  
**41.8359919 N**  
**-72.5519989 W**  
**AT&T #: 10035389\_LTE**

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 170-foot level of the existing 188-foot Monopole Tower at 151 Sand Hill Road. The tower is owned by SBA Properties, Inc. The property is owned by the Town of South Windsor. AT&T does not propose any antenna work at this time. It does, however, intend to swap three (3) existing Remote Radio Units with (3) newer Remote Radio Units at the 170-foot level of the tower. AT&T's proposed full scope of work is as follows:

Remove:

- None

Remove and Replace:

- (3) LTE RRUs-11-A2 and replace with (3) RRUs-32 B2

Install:

- (1) Handrail kit HRK12

Existing Equipment to Remain (Including Entitlements):

- (3) Powerwave 770 Panel Antennas
- (3) CCI HPA 65R BUU H6 Panel Antennas
- (3) KMW AM-X-CD-6500 RET Panel Antennas
- (6) CCI-DTMABP7819VG12A TMAs
- (6) Ericsson RRUS11
- (12) Kathrein 782 10250 Diplexers
- (1) Nokia CS72199.01 LMU
- (3) CSS DBC 750 Combiners
- (1) Raycap DC6-48-60-18-8F Surge Cupperssor

- (3) CommscopeABT-DFDM-ADBH Bias Ts
- (12) 1-5/8" lines
- (1) 1/2" line
- (2) 3/4" DC
- (1) 1/2" Fiber inside (1) 3" Conduit

This facility was approved by the Town of South Windsor's Planning and Zoning Commission under Application #00-30P on 10/3/2000 after receiving a variance from the Zoning Board of Appeals on February 3, 2000. The approval included the condition that the tower be painted non-contrasting blue, gray or black, designed to collapse upon itself, must accommodate at least two additional users and all utilities were to be installed underground. This modification complies with the aforementioned conditions.

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 Carolyn Mirek, Mayor of the Town of South Windsor, as well as to Matthew Galligan, Town Manager for the Town of South Windsor/property owner. (Separate notice is not being sent to tower owner, as it belongs to SBA.)

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. §16.50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modification 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 modification will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,



Kri Pelletier

Property Specialist

SBA COMMUNICATIONS CORPORATION

134 Flanders Rd., Suite 125

Westborough, MA 01581

508.251.0720 x3804 + T

508.366.2610 + F

203.446.7700 + C

kpelletier@sbsite.com

Attachments



cc: Carolyn Mirek, Mayor of the Town of South Windsor—as elected official  
*Town Hall, 1540 Sullivan Ave, South Windsor, CT 06074*  
Matthew Galligan, Town Manager of the Town of South Windsor— as property owner  
*Town Hall, 1540 Sullivan Avenue, South Windsor, CT 06074*



**POWER DENSITY**  
**AT&T Site Inventory and Power Data**

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.37
Antenna A2	CCI HPA-65R-BUU-H6	700 MHz / 1900 MHz (PCS)	11.95 / 14.75	4	240	5,462.56	1.02
Antenna A3	KMW AM-X-CD-16-65-00T-RET	850 MHz / 1900 MHz (PCS)	13.85 / 15.25	4	120	3,465.76	0.61
Sector A Composite MPE%							<b>2.00</b>
Antenna B1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.37
Antenna B2	CCI HPA-65R-BUU-H6	700 MHz / 1900 MHz (PCS)	11.95 / 14.75	4	240	5,462.56	1.02
Antenna B3	KMW AM-X-CD-16-65-00T-RET	850 MHz / 1900 MHz (PCS)	13.85 / 15.25	4	120	3,465.76	0.61
Sector B Composite MPE%							<b>2.00</b>
Antenna C1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.37
Antenna C2	CCI HPA-65R-BUU-H6	700 MHz / 1900 MHz (PCS)	11.95 / 14.75	4	240	5,462.56	1.02
Antenna C3	KMW AM-X-CD-16-65-00T-RET	850 MHz / 1900 MHz (PCS)	13.85 / 15.25	4	120	3,465.76	0.61
Sector C Composite MPE%							<b>2.00</b>

*Table 3: AT&T Emissions Levels*

Site Composite MPE%	
Carrier	MPE %
AT&T – Max Sector Value	<b>2.00 %</b>
Town	0.77 %
Sprint	0.83 %
MetroPCS	0.22 %
Clearwire	0.09 %
Nextel	0.28 %
Verizon Wireless	2.87 %
T-Mobile	1.70 %
<b>Site Total MPE %:</b>	<b>8.76 %</b>

**151 SAND HILL ROAD**

**Location** 151 SAND HILL ROAD

**Mblu** 76/ 8/ / /

**Acct#** 79800151

**Owner** SOUTH WINDSOR TOWN OF 56

**Assessment** \$2,174,200

**Appraisal** \$3,105,900

**PID** 9762

**Building Count** 1

**Current Value**

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$2,789,300	\$316,600	\$3,105,900
Assessment			
Valuation Year	Improvements	Land	Total
2015	\$1,952,600	\$221,600	\$2,174,200

**Owner of Record**

**Owner** SOUTH WINDSOR TOWN OF 56  
**Co-Owner** POLICE FACILITY  
**Address** SAND HILL RD  
 SOUTH WINDSOR, CT 06074

**Sale Price** \$0  
**Certificate**  
**Book & Page** 184/ 171  
**Sale Date** 01/01/1845  
**Instrument** 00

**Ownership History**

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
SOUTH WINDSOR TOWN OF 56	\$0		184/ 171	00	01/01/1845

**Building Information**

**Building 1 : Section 1**

**Year Built:** 1984  
**Living Area:** 10,142  
**Replacement Cost:** \$3,074,294  
**Building Percent** 88  
**Good:**  
**Replacement Cost**  
**Less Depreciation:** \$2,705,400

**Building Photo**

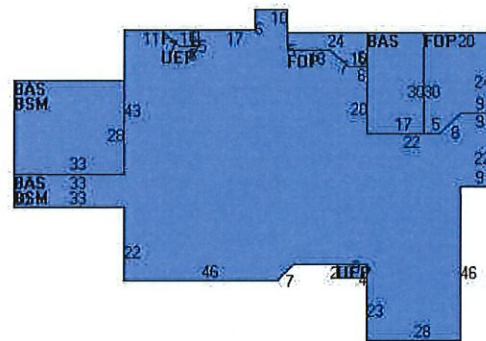
Building Attributes	
Field	Description
STYLE	Jail

MODEL	Comm/Ind
Grade	B
Stories:	1.00
Occupancy	1
Exterior Wall 1	Brick Veneer
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Tar & Gravel
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Quarry Tile
Interior Floor 2	Carpet
Heating Fuel	Oil
Heating Type	Forced Hot Air
% Central Air	100
Foundation	Poured Conc
Bldg Use	Exempt Comm
Total Rooms	0
Total Bedrms	0
Total Fixtures	58
% Wet Sprinkler	100
% Dry Sprinkler	
1st Floor Use	
Heat/AC	NONE
Frame Type	MASONRY
Baths/Plumbing	AVERAGE
% Finished	100
Class	C
Wall Height	9



(http://images.vgsi.com/photos/SouthWindsorCTPhotos/\00\00\71\25.JPG)

**Building Layout**



Building Sub-Areas (sq ft)			Legend	
Code	Description	Gross Area	Living Area	
BAS	First Floor	8,900	8,900	
FUS	Finished Upper Story	1,242	1,242	
BSM	Basement	8,390	0	
FOP	Open Porch	690	0	
UEP	Unfin. Enclosed Porch	78	0	
		19,300	10,142	

**Extra Features**

Extra Features				Legend
Code	Description	Size	Value	Bldg #
ELV1	Elevator Pass	2 STOPS	\$38,700	1
SPR1	Sprinklers-Wet	9632 S.F.	\$6,800	1

**Land**

**Land Use**

**Use Code** 920  
**Description** Exempt Comm

**Land Line Valuation**

**Size (Acres)** 5.31  
**Frontage** 0

**Zone** RR  
**Neighborhood** C400  
**Alt Land Appr** No  
**Category**

**Depth** 0  
**Assessed Value** \$221,600  
**Appraised Value** \$316,600

**Outbuildings**

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
PAV1	Paving	AS	Asphalt	42000 S.F.	\$31,500	1
LT1	Lights			10 UNITS	\$6,900	1

**Valuation History**

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$2,789,300	\$316,600	\$3,105,900
2014	\$2,789,300	\$316,600	\$3,105,900
2014	\$2,789,300	\$316,600	\$3,105,900

Assessment			
Valuation Year	Improvements	Land	Total
2015	\$1,952,600	\$221,600	\$2,174,200
2014	\$1,952,600	\$221,600	\$2,174,200
2014	\$1,952,600	\$221,600	\$2,174,200

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# Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT1139

S. Windsor Sand Hill Road  
151 Sand Hill Road  
South Windsor, CT 06074

**January 9, 2017**

**Centerline Communications Project Number: 950006-012**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>8.76 %</b>





January 9, 2017

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

### Emissions Analysis for Site: **CT1139 – S. Windsor Sand Hill Road**

Centerline Communications, LLC (“Centerline”) was directed to analyze the proposed AT&T facility located at **151 Sand Hill Road, South Windsor, 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 **151 Sand Hill Road, South Windsor, 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	2	30
UMTS	1900 MHz (PCS)	2	30
LTE	700 MHz	2	60
LTE	1900 MHz (PCS)	2	60
GSM	850 MHz	2	30
GSM	1900 MHz (PCS)	2	30

*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 and 1900 MHz (PCS) 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 7770	170
A	2	CCI HPA-65R-BUU-H6	170
A	3	KMW AM-X-CD-16-65-00T-RET	170
B	1	Powerwave 7770	170
B	2	CCI HPA-65R-BUU-H6	170
B	3	KMW AM-X-CD-16-65-00T-RET	170
C	1	Powerwave 7770	170
C	2	CCI HPA-65R-BUU-H6	170
C	3	KMW AM-X-CD-16-65-00T-RET	170

*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 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.37
Antenna A2	CCI HPA-65R-BUU-H6	700 MHz / 1900 MHz (PCS)	11.95 / 14.75	4	240	5,462.56	1.02
Antenna A3	KMW AM-X-CD-16-65-00T-RET	850 MHz / 1900 MHz (PCS)	13.85 / 15.25	4	120	3,465.76	0.61
Sector A Composite MPE%							<b>2.00</b>
Antenna B1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.37
Antenna B2	CCI HPA-65R-BUU-H6	700 MHz / 1900 MHz (PCS)	11.95 / 14.75	4	240	5,462.56	1.02
Antenna B3	KMW AM-X-CD-16-65-00T-RET	850 MHz / 1900 MHz (PCS)	13.85 / 15.25	4	120	3,465.76	0.61
Sector B Composite MPE%							<b>2.00</b>
Antenna C1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.37
Antenna C2	CCI HPA-65R-BUU-H6	700 MHz / 1900 MHz (PCS)	11.95 / 14.75	4	240	5,462.56	1.02
Antenna C3	KMW AM-X-CD-16-65-00T-RET	850 MHz / 1900 MHz (PCS)	13.85 / 15.25	4	120	3,465.76	0.61
Sector C Composite MPE%							<b>2.00</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>2.00 %</b>
Town	0.77 %
Sprint	0.83 %
MetroPCS	0.22 %
Clearwire	0.09 %
Nextel	0.28 %
Verizon Wireless	2.87 %
T-Mobile	1.70 %
<b>Site Total MPE %:</b>	<b>8.76 %</b>

*Table 4: All Carrier MPE Contributions*

AT&T Sector A Total:	2.00 %
AT&T Sector B Total:	2.00 %
AT&T Sector C Total:	2.00 %
<b>Site Total:</b>	
	<b>8.76 %</b>

*Table 5: Site MPE Summary*



Per FCC OET 65, 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	# 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	2	414.12	170	1.11	850 MHz	567	0.20%
AT&T 1900 MHz (PCS) UMTS	2	656.33	170	1.75	1900 MHz (PCS)	1000	0.18%
AT&T 700 MHz LTE	2	940.05	170	2.51	700 MHz	467	0.54%
AT&T 1900 MHz (PCS) LTE	2	1,791.23	170	4.79	1900 MHz (PCS)	1000	0.48%
AT&T 850 MHz GSM	2	727.98	170	1.95	850 MHz	567	0.34%
AT&T 1900 MHz (PCS) GSM	2	1,004.90	170	2.69	1900 MHz (PCS)	1000	0.27%
						Total:	2.00%

*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:	2.00 %
Sector B:	2.00 %
Sector C:	2.00 %
AT&T Maximum Total (per sector):	2.00 %
Site Total:	8.76 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **8.76 %** 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 contact information.

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





**Tower Engineering Solutions**

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

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**Structural Analysis Report**

**Existing 187 ft SABRE Monopole**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT07824-S**

**Customer Site Name: South Windsor**

**Carrier Name: AT&T**

**Carrier Site ID / Name: USID # 59386 FA# 10035389 / S. Windsor-Sand Hill R**

**Site Location: 151 Sand Hill Road**

**South Windsor, Connecticut**

**Hartford County**

**Latitude: 41.836000**

**Longitude: -72.552000**

**Analysis Result:**

**Max Structural Usage: 62.6% [Pass]**

**Max Foundation Usage: 83% [Pass]**

**Report Prepared By : Jarryd Tibbetts**



## Introduction

The purpose of this report is to summarize the analysis results on the 187 ft SABRE Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

## Sources of Information

<b>Tower Drawings</b>	Tower Drawing prepared by Sabre, Job #02-10062 dated 11/1/01
<b>Foundation Drawing</b>	Foundation Drawing prepared by Sabre, Job #02-10062 dated 10/11/01
<b>Geotechnical Report</b>	Geotechnical Report prepared by Dr. Clarence Welti, dated 9/29/00
<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>	97.0 mph (3-Sec. Gust)
<b>Wind Speed with Ice:</b>	50 mph (3-Sec. Gust) with 1" 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>	$S_5 = 0.178g$ , $S_1 = 0.064g$

## Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	187.0	1	Telewave - ANT450F6 - Whip	Low Profile Platform	(4) 1/2" (3) 7/8"	Town of South Windsor
2		2	Telewave - ANT900D6-9 - Whip			
3		2	Decibel - DB201 - Whip			
4		2	Scala - MF-900B - Dish			
5	170.0	3	Powerwave - 7770 - Panel	Low Profile Platform	(12) 1 5/8" (1) 1/2" with (2) 3/4" DC (1) 1/2" Fiber inside (1) 3" Conduit	AT&T
6		3	CCI - HPA-65R-BUU-H6 - Panel			
7		3	KMW - AM-X-CD-6500T-RET			
8		6	CCI - DTMABP7819VG12A - TMA/TTA			
9		6	Ericsson - RRUS 11 - RRU			
10		3	Ericsson - RRUS A2 - RRU			
12		12	Kathrein - 782 10250 - Diplexer			
13		1	Nokia - CS72188.01 - LMU			
14		3	CSS - DBC-750 - Combiners			
15		1	Raycap - DC6-48-60-18-8F - Surge Suppressor			
16	160.0	3	Commscope - ABT-DFDM-ADBH - Bias T's	Platform w/ Hand Rail	(12) 1 5/8" (1) 1 5/8" Fiber	T-Mobile
17		3	Ericsson - AIR 21 B2A B4P - Panel			
18		3	Ericsson - AIR 21 B4A B2P - Panel			
19		3	Commscope - LNX-6515DS - Panel			
20		3	Ericsson - Double TMA 17/21 - TMA/TTA			
21	3	Ericsson - S11B12 - RRU				
22	140.0	1	RFS - DB-T1-6Z-8AB-0Z - Surge Suppressor	Low Profile Platform	(12) 1 5/8" (1) 1 5/8" Hybrid (1) 1/2"	Verizon
23		6	RFS - FD9R6004/2C-3L - Diplexer			
24		6	Commscope - HBXX-6517DS-A2M - Panel			
25		6	Alcatel Lucent - KS24019 - GPS			
26		3	Commscope - LNX-6514DS-A1M - Panel			
27		3	Commscope - LNX-6514DS-VTM - Panel			
28		3	Alcatel Lucent - RRH2x40-07-U - RRU			
29	3	Alcatel Lucent - RRH2x60-1900 - RRU				
30	130.0	3	Alcatel Lucent - 1900MHz - RRH	Low Profile Platform	(1) 0.7" Fiber (3) 1-1/4"	Sprint
31		3	Alcatel Lucent - 800 MHz - RRH			
32		3	Alcatel Lucent - 800MHz - Filter			
33		4	RFS - ACU-A20-N - RET			
34		3	RFS - APXVSP18-C-A20 - Panel			
35		3	RFS - APXVTM14-C-120 - Panel			
36		3	RF Filters			
37	3	Alcatel Lucent - TD-RRH8x20-25 - RRU				
38	92.0	1	Telewave - ANT150D3 - Whip	Low Profile Platform	(6) 1/2"	Town of South Windsor
39		1	Telewave - ANT4506-9 - Whip			
40		1	Telewave - ANT450Y10-WR - Yagi			
41		1	Decibel - DB205 - Whip			
42		2	Scala - MF-900B - Dish			

## 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
5	170.0	3	Powerwave - 7770 - Panel	Low Profile Platform w/ HRK12	(12) 1 5/8" (1) 1/2" with (2) 3/4" DC (1) 1/2" Fiber inside (1) 3" Conduit	AT&T
6		3	CCI - HPA-65R-BUU-H6 - Panel			
7		3	KMW - AM-X-CD-6500T-RET - Panel			
8		6	CCI - DTMABP7819VG12A - TMA/TTA			
9		6	Ericsson - RRUS 11 - RRU			
11		3	Ericsson - RRUS-32 B2 - RRU			
12		12	Kathrein - 782 10250 - Diplexer			
13		1	Nokia - CS72188.01 - LMU			
14		3	CSS - DBC-750 - Combiners			
15		1	Raycap - DC6-48-60-18-8F - Surge Suppressor			
16		3	Commscope - ABT-DFDM-ADBH - Bias T's			

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

## **Analysis Results**

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

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	<b>62.6%</b>	<b>59.4%</b>	<b>53.4%</b>
Pass/Fail	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>

## **Foundations**

	Moment (Kip-Ft)	Shear (Kips)
Original Design Reactions	6540.5	47.9
Analysis Reactions	5709.3	45.3
Factored Reactions*	8829.6	64.7
% of Design Reactions	64.7%	70.0%

\* Per section 15.5.1 of the TIA-222-G standard, factored reactions were obtained by multiplying a 1.35 factor to the original design reactions.

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 1.2567 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 62.62% at 0.0ft

**Structure:** CT07824-S-SBA  
**Site Name:** South Windsor  
**Height:** 187.00 (ft)  
**Base Elev:** 1.000 (ft)

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

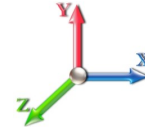
12/16/2016



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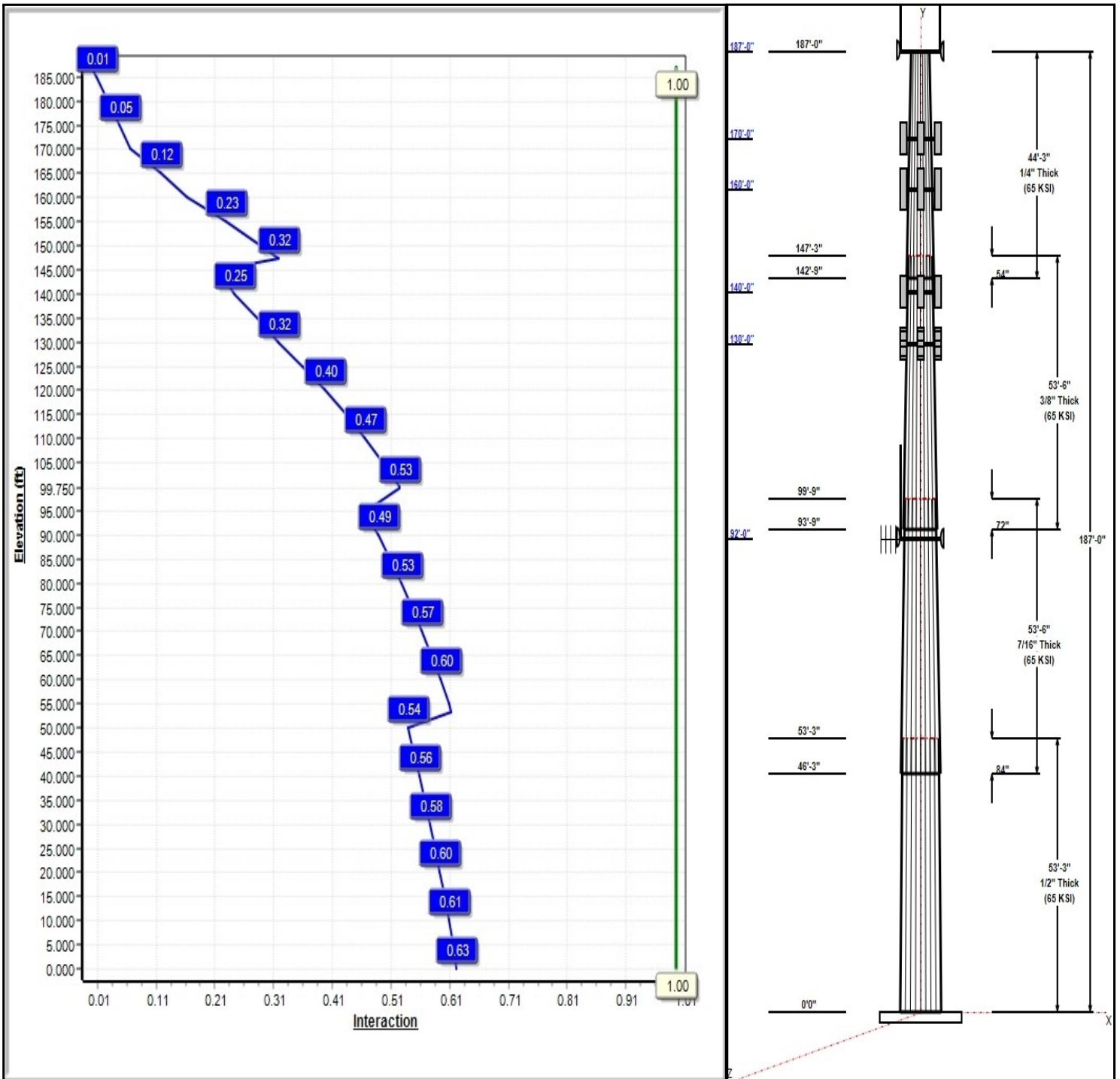
**Dead Load Factor:** 1.20  
**Wind Load Factor:** 1.60

**Load Case : 1.2D + 1.6W 97 mph Wind**



**Iterations:** 25

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# Structure: CT07824-S-SBA

**Type:** Tapered  
**Site Name:** South Windsor  
**Height:** 187.00 (ft)  
**Base Elev:** 1.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.22997

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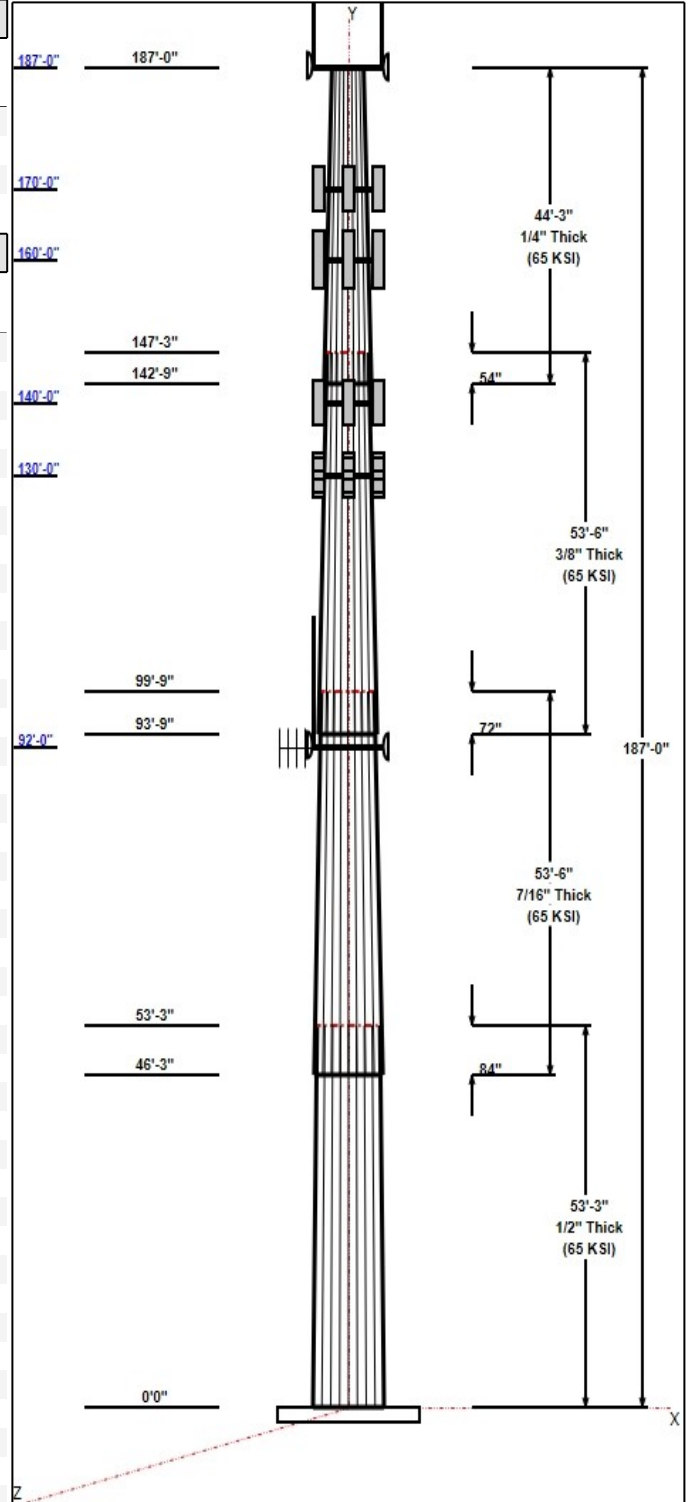


### Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	53.25	52.63	64.88	0.500		0.22997	65
2	53.50	42.82	55.12	0.438	Slip	0.22997	65
3	53.50	32.64	44.95	0.375	Slip	0.22997	65
4	44.25	24.00	34.18	0.250	Slip	0.22997	65

### Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
187.00	187.00	2	MF-900B	Town of South
187.00	189.04	2	ANT900D6-9	Town of South
187.00	190.92	1	ANT450F6	Town of South
187.00	191.75	2	DB201	Town of South
187.00	187.00	1	Low Profile Platform	Town of South
187.00	187.00	1	6' Lightning rod	
170.00	170.00	3	HPA-65R-BUU-H6	AT&T
170.00	170.00	1	CS72188.01	AT&T
170.00	170.00	3	RRUS-32 B2	AT&T
170.00	170.00	1	Low Profile Platform w/	AT&T
170.00	170.00	3	7770	AT&T
170.00	170.00	3	AM-X-CD-6500T-RET	AT&T
170.00	170.00	6	DTMABP7819VG12A	AT&T
170.00	170.00	6	RRUS 11	AT&T
170.00	170.00	12	782 10250	AT&T
170.00	170.00	3	DBC-750	AT&T
170.00	170.00	1	DC6-48-60-18-8F	AT&T
170.00	170.00	3	ABT-DFDM-ADBH	AT&T
160.00	160.00	3	AIR 21 B2A B4P	T-Mobile
160.00	160.00	3	AIR 21 B4A B2P	T-Mobile
160.00	160.00	3	LNx-6515DS	T-Mobile
160.00	160.00	3	Double TMA 17/21	T-Mobile
160.00	160.00	3	S11B12	T-Mobile
160.00	160.00	1	Platform w/ Hand Rail	T-Mobile
140.00	140.00	3	LNx-6514DS-VTM	Verizon
140.00	140.00	6	FD9R6004/2C-3L	Verizon
140.00	140.00	1	DB-T1-6Z-8AB-0Z	Verizon
140.00	140.00	6	KS-24019	Verizon
140.00	140.00	1	Low Profile Platform	Verizon
140.00	140.00	6	HBXX-6517DS-A2M	Verizon
140.00	140.00	3	LNx-6514DS-A1M	Verizon
140.00	140.00	3	RRH2x40-07-U	Verizon
140.00	140.00	3	RRH2x60-1900	Verizon
130.00	130.00	3	APXVSP18-C-A20	Sprint
130.00	130.00	3	APXVTM14-C-120	Sprint
130.00	130.00	3	TD-RRH8x20-25	Sprint
130.00	130.00	3	1900MHz RRH	Sprint
130.00	130.00	3	800 MHz RRH	Sprint
130.00	130.00	3	800MHz Filter	Sprint
130.00	130.00	3	RF Filters	Sprint
130.00	130.00	4	ACU-A20-N	Sprint
130.00	130.00	1	Low Profile Platform	Sprint
92.00	92.00	2	MF-900B	Town of South
92.00	95.00	1	ANT4506-9	Town of South
92.00	97.00	1	ANT150D3	Town of South



## Structure: CT07824-S-SBA

**Type:** Tapered  
**Site Name:** South Windsor  
**Height:** 187.00 (ft)  
**Base Elev:** 1.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.22997

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92.00	92.00	1	ANT450Y10-WR	Town of South
92.00	101.00	1	DB205	Town of South
92.00	92.00	1	Low Profile Platform	Town of South

### Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	187.00	Inside	1/2" Coax	Town of South
0.00	187.00	Inside	7/8" Coax	Town of South
0.00	170.00	Inside	1 5/8" Coax	AT&T
0.00	170.00	Inside	1/2"	AT&T
0.00	170.00	Inside	1/2" Fiber	AT&T
0.00	170.00	Inside	3" Conduit	AT&T
0.00	170.00	Inside	3/4" DC	AT&T
0.00	160.00	Inside	1 5/8" Coax	T-Mobile
0.00	160.00	Inside	1 5/8" Hybrid	T-Mobile
0.00	140.00	Inside	1 5/8" Coax	Verizon
0.00	140.00	Inside	1 5/8" Hybrid	Verizon
0.00	140.00	Inside	1/2" Coax	Verizon
0.00	130.00	Inside	0.7" Fiber	Sprint
0.00	130.00	Inside	1-1/4" Hybrid	Sprint
0.00	92.00	Inside	1/2" Coax	Town of South

### Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
26	2.25" 18J	75.0	Radial

### Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.5000	78.0	60.0	Round

### Reactions

Load Case	Moment	Shear	Axial
1.2D + 1.6W 97 mph Wind	5709.3	45.3	73.9
0.9D + 1.6W 97 mph Wind	5649.6	45.2	55.4
1.2D + 1.0Di + 1.0Wi 50 mph Wind	2051.3	15.4	119.7
1.2D + 1.0E	161.4	1.3	73.9
0.9D + 1.0E	159.6	1.3	55.4
1.0D + 1.0W 60 mph Wind	1357.2	10.8	61.6

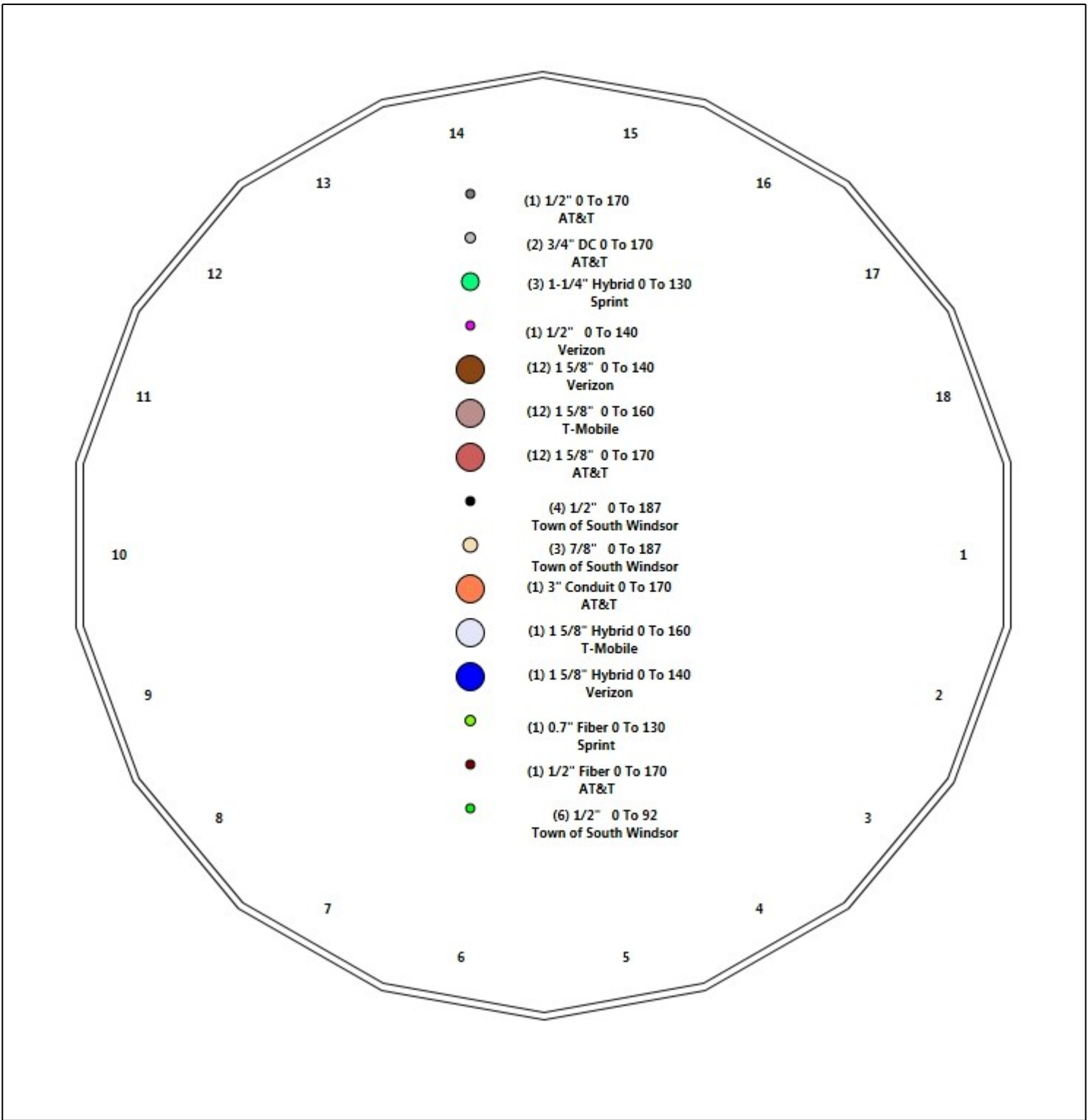
# Structure: CT07824-S-SBA - Coax Line Placement

**Type:** Monopole  
**Site Name:** South Windsor  
**Height:** 187.00 (ft)

12/16/2016



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## Shaft Properties

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	53.250	0.5000	65		0.00	16,752
2	18	53.500	0.4375	65	Slip	84.00	12,268
3	18	53.500	0.3750	65	Slip	72.00	8,324
4	18	44.250	0.2500	65	Slip	54.00	3,445
<b>Total Shaft Weight:</b>							<b>40,789</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	64.88	0.00	102.1	53501.66	21.47	129.76	52.63	53.25	82.73	28410.2	17.15	105.2	0.229973
2	55.12	46.25	75.93	28683.85	20.80	125.99	42.82	99.75	58.84	13351.6	15.85	97.86	0.229973
3	44.95	93.75	53.05	13313.85	19.72	119.85	32.64	147.25	38.40	5051.60	13.94	87.04	0.229973
4	34.18	142.7	26.92	3914.66	22.69	136.71	24.00	187.00	18.84	1343.00	15.52	96.00	0.229973

## Load Summary

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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### Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
1	187.00	MF-900B	2	13.00	3.45	1.00	166.21	36.699	1.00	1.00	0.00
2	187.00	ANT900D6-9	2	11.00	0.98	1.00	62.89	4.260	1.00	0.00	2.04
3	187.00	ANT450F6	1	21.00	1.86	1.00	87.88	5.722	1.00	0.00	3.92
4	187.00	DB201	2	25.00	3.54	1.00	174.30	18.389	1.00	0.00	4.75
5	187.00	Low Profile Platform	1	1500.00	22.00	1.00	3285.07	46.087	1.00	0.00	0.00
6	187.00	6' Lightning rod	1	6.50	0.38	1.00	56.01	1.863	1.00	0.00	0.00
7	170.00	HPA-65R-BUU-H6	3	51.00	9.66	0.81	405.64	11.544	0.81	0.00	0.00
8	170.00	CS72188.01	1	0.32	0.12	1.00	2.86	0.393	1.00	0.00	0.00
9	170.00	RRUS-32 B2	3	60.00	2.74	0.81	189.09	3.752	0.83	0.00	0.00
10	170.00	Low Profile Platform w/ HRK12	1	1700.00	27.70	1.00	3704.00	57.741	1.00	0.00	0.00
11	170.00	7770	3	35.00	5.50	0.75	232.43	6.972	0.75	0.00	0.00
12	170.00	AM-X-CD-6500T-RET	3	48.50	8.02	0.78	267.72	11.794	0.78	0.00	0.00
13	170.00	DTMABP7819VG12A	6	19.18	1.14	0.68	53.62	2.180	0.70	0.00	0.00
14	170.00	RRUS 11	6	55.00	2.52	0.71	185.27	3.427	0.72	0.00	0.00
15	170.00	782 10250	12	6.40	0.52	0.98	23.67	1.289	0.98	0.00	0.00
16	170.00	DBC-750	3	4.88	0.51	0.59	18.16	1.225	0.63	0.00	0.00
17	170.00	DC6-48-60-18-8F	1	32.80	1.47	1.00	118.95	2.416	1.00	0.00	0.00
18	170.00	ABT-DFDM-ADBH	3	1.14	0.05	0.98	4.26	0.310	0.98	0.00	0.00
19	160.00	AIR 21 B2A B4P	3	91.50	6.09	0.83	333.58	7.597	0.83	0.00	0.00
20	160.00	AIR 21 B4A B2P	3	90.30	6.09	0.83	332.38	7.597	0.83	0.00	0.00
21	160.00	LNx-6515DS	3	50.30	11.46	0.84	355.70	15.832	0.84	0.00	0.00
22	160.00	Double TMA 17/21	3	11.00	0.41	0.72	25.48	1.048	0.75	0.00	0.00
23	160.00	S11B12	3	51.00	2.52	0.71	180.25	3.421	0.72	0.00	0.00
24	160.00	Platform w/ Hand Rail	1	1600.00	32.00	1.00	4419.67	69.496	1.00	0.00	0.00
25	140.00	LNx-6514DS-VTM	3	33.10	8.09	0.80	264.61	11.794	0.82	0.00	0.00
26	140.00	FD9R6004/2C-3L	6	3.10	0.36	0.75	13.74	0.947	0.77	0.00	0.00
27	140.00	DB-T1-6Z-8AB-OZ	1	21.40	4.10	1.00	178.58	5.162	1.00	0.00	0.00
28	140.00	KS-24019	6	0.50	0.12	1.00	9.31	0.392	1.00	0.00	0.00
29	140.00	Low Profile Platform	1	1500.00	22.00	1.00	3234.45	45.404	1.00	0.00	0.00
30	140.00	HBXX-6517DS-A2M	6	40.80	8.55	0.77	274.35	12.418	0.79	0.00	0.00
31	140.00	LNx-6514DS-A1M	3	38.40	8.17	0.83	271.99	11.911	0.85	0.00	0.00
32	140.00	RRH2x40-07-U	3	50.70	2.23	0.78	128.60	3.637	0.80	0.00	0.00
33	140.00	RRH2x60-1900	3	19.50	1.51	0.90	106.39	2.266	0.91	0.00	0.00
34	130.00	APXVSP18-C-A20	3	57.00	8.02	0.83	284.37	11.695	0.85	0.00	0.00
35	130.00	APXVTM14-C-120	3	56.00	6.34	0.79	280.65	7.834	0.81	0.00	0.00
36	130.00	TD-RRH8x20-25	3	70.00	4.05	0.69	225.04	5.146	0.71	0.00	0.00
37	130.00	1900MHz RRH	3	44.00	3.80	0.88	187.59	5.628	0.89	0.00	0.00
38	130.00	800 MHz RRH	3	53.00	2.49	0.92	150.29	3.994	0.93	0.00	0.00
39	130.00	800MHz Filter	3	8.80	0.78	0.69	32.01	1.631	0.71	0.00	0.00
40	130.00	RF Filters	3	15.50	0.93	0.67	61.42	1.512	0.69	0.00	0.00
41	130.00	ACU-A20-N	4	1.00	0.14	0.79	6.65	0.530	0.81	0.00	0.00
42	130.00	Low Profile Platform	1	1500.00	22.00	1.00	3221.74	45.232	1.00	0.00	0.00
43	92.00	MF-900B	2	13.00	3.45	1.00	155.80	34.440	1.00	1.00	0.00
44	92.00	ANT4506-9	1	18.00	2.77	1.00	122.90	6.622	1.00	0.00	3.00
45	92.00	ANT150D3	1	18.00	2.18	1.00	110.97	12.978	1.00	0.00	5.00
46	92.00	ANT450Y10-WR	1	5.00	0.49	1.00	30.77	1.927	1.00	0.00	0.00
47	92.00	DB205	1	38.00	1.80	1.00	111.64	9.860	1.00	0.00	9.00
48	92.00	Low Profile Platform	1	1500.00	22.00	1.00	3163.75	44.450	1.00	0.00	0.00
<b>Totals:</b>			<b>135</b>	<b>13,199.16</b>			<b>39,508.95</b>				

## 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		

## Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	187.00	(4) 1/2" Coax	0.00	Inside
0.00	187.00	(3) 7/8" Coax	0.00	Inside
0.00	170.00	(12) 1 5/8" Coax	0.00	Inside
0.00	170.00	(1) 1/2"	0.00	Inside
0.00	170.00	(1) 1/2" Fiber	0.00	Inside
0.00	170.00	(1) 3" Conduit	0.00	Inside
0.00	170.00	(2) 3/4" DC	0.00	Inside
0.00	160.00	(12) 1 5/8" Coax	0.00	Inside
0.00	160.00	(1) 1 5/8" Hybrid	0.00	Inside
0.00	140.00	(12) 1 5/8" Coax	0.00	Inside
0.00	140.00	(1) 1 5/8" Hybrid	0.00	Inside
0.00	140.00	(1) 1/2" Coax	0.00	Inside
0.00	130.00	(1) 0.7" Fiber	0.00	Inside
0.00	130.00	(3) 1-1/4" Hybrid	0.00	Inside
0.00	92.00	(6) 1/2" Coax	0.00	Inside

## Shaft Section Properties

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**Increment Length:** 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in^3)	Weight (lb)
0.00		0.5000	64.880	102.167	53501.7	21.47	129.76	76.1	1624.	0.0
5.00		0.5000	63.730	100.343	50685.8	21.06	127.46	76.6	1566.	1722.7
10.00		0.5000	62.580	98.518	47970.6	20.66	125.16	77.1	1509.	1691.7
15.00		0.5000	61.430	96.693	45354.1	20.25	122.86	77.6	1454.	1660.6
20.00		0.5000	60.281	94.868	42834.5	19.85	120.56	78.1	1399.	1629.6
25.00		0.5000	59.131	93.044	40410.0	19.44	118.26	78.5	1346.	1598.6
30.00		0.5000	57.981	91.219	38078.8	19.04	115.96	79.0	1293.	1567.5
35.00		0.5000	56.831	89.394	35839.0	18.63	113.66	79.5	1242.	1536.5
40.00		0.5000	55.681	87.569	33688.7	18.23	111.36	80.0	1191.	1505.4
45.00		0.5000	54.531	85.744	31626.3	17.82	109.06	80.4	1142.	1474.4
46.25	Bot - Section 2	0.5000	54.244	85.288	31124.2	17.72	108.49	80.6	1130.	363.7
50.00		0.5000	53.381	83.920	29649.8	17.41	106.76	80.9	1094.	2040.8
53.25	Top - Section 1	0.4375	53.509	73.694	26224.3	20.16	122.31	0.0	0.0	1742.2
55.00		0.4375	53.106	73.135	25632.3	19.99	121.39	77.9	950.7	437.2
60.00		0.4375	51.957	71.538	23989.8	19.53	118.76	78.4	909.4	1230.7
65.00		0.4375	50.807	69.941	22419.1	19.07	116.13	79.0	869.1	1203.6
70.00		0.4375	49.657	68.345	20918.5	18.60	113.50	79.5	829.7	1176.4
75.00		0.4375	48.507	66.748	19486.4	18.14	110.87	80.1	791.2	1149.2
80.00		0.4375	47.357	65.151	18121.2	17.68	108.24	80.6	753.7	1122.1
85.00		0.4375	46.207	63.555	16821.3	17.21	105.62	81.2	717.0	1094.9
90.00		0.4375	45.057	61.958	15585.1	16.75	102.99	81.7	681.3	1067.7
92.00		0.4375	44.597	61.319	15108.1	16.56	101.94	81.9	667.2	419.5
93.75	Bot - Section 3	0.4375	44.195	60.761	14698.7	16.40	101.02	82.1	655.1	363.5
95.00		0.4375	43.908	60.361	14410.9	16.29	100.36	82.2	646.4	482.5
99.75	Top - Section 2	0.3750	43.565	51.405	12115.2	19.07	116.17	0.0	0.0	1804.8
100.00		0.3750	43.508	51.337	12066.9	19.05	116.02	79.0	546.3	43.7
105.00		0.3750	42.358	49.968	11127.3	18.51	112.95	79.6	517.4	861.8
110.00		0.3750	41.208	48.600	10237.8	17.97	109.89	80.3	489.3	838.5
115.00		0.3750	40.058	47.231	9397.1	17.42	106.82	80.9	462.0	815.2
120.00		0.3750	38.908	45.862	8603.6	16.88	103.76	81.5	435.5	791.9
125.00		0.3750	37.758	44.494	7856.2	16.34	100.69	82.2	409.8	768.7
130.00		0.3750	36.608	43.125	7153.3	15.80	97.62	82.5	384.9	745.4
135.00		0.3750	35.459	41.757	6493.6	15.26	94.56	82.5	360.7	722.1
140.00		0.3750	34.309	40.388	5875.9	14.72	91.49	82.5	337.3	698.8
142.75	Bot - Section 4	0.3750	33.676	39.635	5553.4	14.42	89.80	82.5	324.8	374.4
145.00		0.3750	33.159	39.020	5298.5	14.18	88.42	82.5	314.7	505.6
147.25	Top - Section 3	0.2500	33.141	26.098	3567.2	21.96	132.57	0.0	0.0	497.8
150.00		0.2500	32.509	25.597	3365.4	21.52	130.04	76.1	203.9	241.9
155.00		0.2500	31.359	24.684	3018.2	20.71	125.44	77.0	189.6	427.7
160.00		0.2500	30.209	23.772	2695.7	19.90	120.84	78.0	175.8	412.2
165.00		0.2500	29.059	22.859	2397.1	19.09	116.24	79.0	162.5	396.7
170.00		0.2500	27.910	21.947	2121.4	18.27	111.64	79.9	149.7	381.2
175.00		0.2500	26.760	21.035	1867.7	17.46	107.04	80.9	137.5	365.6
180.00		0.2500	25.610	20.122	1635.0	16.65	102.44	81.8	125.7	350.1
185.00		0.2500	24.460	19.210	1422.5	15.84	97.84	82.5	114.5	334.6
187.00		0.2500	24.000	18.845	1343.0	15.52	96.00	82.5	110.2	129.5

**40789.2**

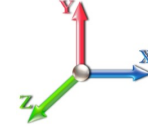
## Wind Loading - Shaft

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (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 97 mph Wind

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



**Iterations** 25

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	19.450	21.40	490.97	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	19.450	21.40	482.27	0.650	0.000	5.00	27.207	17.68	605.4	0.0	2067.3
10.00		1.00	0.85	19.450	21.40	473.57	0.650	0.000	5.00	26.721	17.37	594.6	0.0	2030.0
15.00		1.00	0.86	19.690	21.66	467.73	0.650	0.000	5.00	26.234	17.05	590.9	0.0	1992.8
20.00		1.00	0.91	20.851	22.94	472.30	0.650	0.000	5.00	25.748	16.74	614.2	0.0	1955.5
25.00		1.00	0.95	21.810	23.99	473.83	0.650	0.000	5.00	25.261	16.42	630.3	0.0	1918.3
30.00		1.00	0.99	22.632	24.90	473.30	0.650	0.000	5.00	24.775	16.10	641.4	0.0	1881.0
35.00		1.00	1.02	23.356	25.69	471.27	0.650	0.000	5.00	24.288	15.79	649.0	0.0	1843.8
40.00		1.00	1.05	24.004	26.40	468.10	0.650	0.000	5.00	23.802	15.47	653.6	0.0	1806.5
45.00		1.00	1.07	24.593	27.05	464.02	0.650	0.000	5.00	23.315	15.15	656.0	0.0	1769.2
46.25	Bot - Section 2	1.00	1.08	24.732	27.21	462.88	0.650	0.000	1.25	5.753	3.74	162.8	0.0	436.5
50.00		1.00	1.10	25.133	27.65	459.20	0.650	0.000	3.75	17.353	11.28	499.0	0.0	2449.0
53.25	Top - Section 1	1.00	1.11	25.462	28.01	455.72	0.650	0.000	3.25	14.818	9.63	431.6	0.0	2090.7
55.00		1.00	1.12	25.633	28.20	461.35	0.650	0.000	1.75	7.894	5.13	231.5	0.0	524.6
60.00		1.00	1.14	26.099	28.71	455.44	0.650	0.000	5.00	22.226	14.45	663.6	0.0	1476.9
65.00		1.00	1.16	26.535	29.19	449.07	0.650	0.000	5.00	21.739	14.13	659.9	0.0	1444.3
70.00		1.00	1.18	26.946	29.64	442.30	0.650	0.000	5.00	21.253	13.81	655.1	0.0	1411.7
75.00		1.00	1.19	27.335	30.07	435.16	0.650	0.000	5.00	20.766	13.50	649.4	0.0	1379.1
80.00		1.00	1.21	27.704	30.47	427.70	0.650	0.000	5.00	20.280	13.18	642.7	0.0	1346.5
85.00		1.00	1.23	28.056	30.86	419.96	0.650	0.000	5.00	19.793	12.87	635.3	0.0	1313.9
90.00		1.00	1.24	28.391	31.23	411.95	0.650	0.000	5.00	19.307	12.55	627.1	0.0	1281.3
92.00	Appurtenance(s)	1.00	1.25	28.522	31.37	408.68	0.650	0.000	2.00	7.586	4.93	247.5	0.0	503.4
93.75	Bot - Section 3	1.00	1.25	28.634	31.50	405.79	0.650	0.000	1.75	6.574	4.27	215.4	0.0	436.2
95.00		1.00	1.25	28.713	31.58	403.70	0.650	0.000	1.25	4.739	3.08	155.7	0.0	579.0
99.75	Top - Section 2	1.00	1.27	29.006	31.91	395.67	0.650	0.000	4.75	17.730	11.52	588.3	0.0	2165.7
100.00		1.00	1.27	29.021	31.92	402.17	0.650	0.000	0.25	0.921	0.60	30.6	0.0	52.4
105.00		1.00	1.28	29.318	32.25	393.54	0.650	0.000	5.00	18.165	11.81	609.2	0.0	1034.2
110.00		1.00	1.29	29.604	32.56	384.72	0.650	0.000	5.00	17.678	11.49	598.7	0.0	1006.2
115.00		1.00	1.31	29.880	32.87	375.72	0.650	0.000	5.00	17.192	11.17	587.7	0.0	978.3
120.00		1.00	1.32	30.147	33.16	366.56	0.650	0.000	5.00	16.705	10.86	576.1	0.0	950.3
125.00		1.00	1.33	30.405	33.45	357.25	0.650	0.000	5.00	16.219	10.54	564.1	0.0	922.4
130.00	Appurtenance(s)	1.00	1.34	30.655	33.72	347.79	0.650	0.000	5.00	15.732	10.23	551.7	0.0	894.4
135.00		1.00	1.35	30.898	33.99	338.20	0.650	0.000	5.00	15.246	9.91	538.9	0.0	866.5
140.00	Appurtenance(s)	1.00	1.36	31.133	34.25	328.48	0.650	0.000	5.00	14.759	9.59	525.7	0.0	838.6
142.75	Bot - Section 4	1.00	1.37	31.260	34.39	323.08	0.650	0.000	2.75	7.910	5.14	282.9	0.0	449.3
145.00		1.00	1.37	31.362	34.50	318.63	0.650	0.000	2.25	6.458	4.20	231.7	0.0	606.8
147.25	Top - Section 3	1.00	1.37	31.464	34.61	314.17	0.650	0.000	2.25	6.359	4.13	228.9	0.0	597.3
150.00		1.00	1.38	31.586	34.74	313.50	0.650	0.000	2.75	7.638	4.97	276.0	0.0	290.2
155.00		1.00	1.39	31.803	34.98	303.45	0.650	0.000	5.00	13.511	8.78	491.6	0.0	513.3
160.00	Appurtenance(s)	1.00	1.40	32.015	35.22	293.29	0.650	0.000	5.00	13.025	8.47	477.0	0.0	494.7
165.00		1.00	1.41	32.222	35.44	283.04	0.650	0.000	5.00	12.538	8.15	462.2	0.0	476.0
170.00	Appurtenance(s)	1.00	1.42	32.424	35.67	272.69	0.650	0.000	5.00	12.052	7.83	447.0	0.0	457.4
175.00		1.00	1.43	32.621	35.88	262.25	0.650	0.000	5.00	11.565	7.52	431.6	0.0	438.8
180.00		1.00	1.43	32.814	36.10	251.72	0.650	0.000	5.00	11.079	7.20	415.9	0.0	420.1
185.00		1.00	1.44	33.003	36.30	241.11	0.650	0.000	5.00	10.592	6.88	399.9	0.0	401.5
187.00	Appurtenance(s)	1.00	1.45	33.077	36.38	236.84	0.650	0.000	2.00	4.101	2.67	155.2	0.0	155.4



## Wind Loading - Shaft

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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Totals: 187.00

21,582.7

48,947.1

## Discrete Appurtenance Forces

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**Load Case:** 1.2D + 1.6W 97 mph Wind

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



**Iterations** 25

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	187.00	ANT450F6	1	33.221	36.543	1.00	1.00	1.86	25.20	0.000	3.917	108.75	0.00	425.95
2	187.00	MF-900B	2	33.077	36.385	1.00	1.00	6.90	31.20	2.015	0.000	401.69	505.98	0.00
3	187.00	ANT900D6-9	2	33.152	36.468	1.00	1.00	1.96	26.40	0.000	2.042	114.36	0.00	233.49
4	187.00	6' Lightning rod	1	33.077	36.385	1.00	1.00	0.38	7.80	0.000	0.000	22.12	0.00	0.00
5	187.00	DB201	2	33.251	36.576	1.00	1.00	7.08	60.00	0.000	4.750	414.34	0.00	1968.11
6	187.00	Low Profile Platform	1	33.077	36.385	1.00	1.00	22.00	1800.00	0.000	0.000	1280.75	0.00	0.00
7	170.00	HPA-65R-BUU-H6	3	32.424	35.666	0.65	0.80	18.80	183.60	0.000	0.000	1072.96	0.00	0.00
8	170.00	CS72188.01	1	32.424	35.666	0.80	0.80	0.10	0.38	0.000	0.000	5.48	0.00	0.00
9	170.00	RRUS-32 B2	3	32.424	35.666	0.65	0.80	5.33	216.00	0.000	0.000	303.96	0.00	0.00
10	170.00	Low Profile Platform w/	1	32.424	35.666	1.00	1.00	27.70	2040.00	0.000	0.000	1580.72	0.00	0.00
11	170.00	7770	3	32.424	35.666	0.60	0.80	9.89	126.00	0.000	0.000	564.20	0.00	0.00
12	170.00	AM-X-CD-6500T-RET	3	32.424	35.666	0.62	0.80	15.03	174.60	0.000	0.000	857.85	0.00	0.00
13	170.00	DTMABP7819VG12A	6	32.424	35.666	0.55	0.80	3.73	138.10	0.000	0.000	212.96	0.00	0.00
14	170.00	782 10250	12	32.424	35.666	0.78	0.80	4.89	92.16	0.000	0.000	279.17	0.00	0.00
15	170.00	DBC-750	3	32.424	35.666	0.48	0.80	0.73	17.57	0.000	0.000	41.49	0.00	0.00
16	170.00	DC6-48-60-18-8F	1	32.424	35.666	0.80	0.80	1.18	39.36	0.000	0.000	67.11	0.00	0.00
17	170.00	ABT-DFDM-ADBH	3	32.424	35.666	0.78	0.80	0.12	4.10	0.000	0.000	6.68	0.00	0.00
18	170.00	RRUS 11	6	32.424	35.666	0.57	0.80	8.61	396.00	0.000	0.000	491.47	0.00	0.00
19	160.00	LNx-6515DS	3	32.015	35.216	0.67	0.80	22.99	181.08	0.000	0.000	1295.59	0.00	0.00
20	160.00	AIR 21 B2A B4P	3	32.015	35.216	0.66	0.80	12.07	329.40	0.000	0.000	680.26	0.00	0.00
21	160.00	AIR 21 B4A B2P	3	32.015	35.216	0.66	0.80	12.07	325.08	0.000	0.000	680.26	0.00	0.00
22	160.00	Platform w/ Hand Rail	1	32.015	35.216	1.00	1.00	32.00	1920.00	0.000	0.000	1803.08	0.00	0.00
23	160.00	Double TMA 17/21	3	32.015	35.216	0.58	0.80	0.71	39.60	0.000	0.000	39.98	0.00	0.00
24	160.00	S11B12	3	32.015	35.216	0.56	0.80	4.27	183.60	0.000	0.000	240.59	0.00	0.00
25	140.00	RRH2x60-1900	3	31.133	34.247	0.72	0.80	3.26	70.20	0.000	0.000	178.72	0.00	0.00
26	140.00	KS-24019	6	31.133	34.247	0.80	0.80	0.58	3.60	0.000	0.000	31.56	0.00	0.00
27	140.00	LNx-6514DS-VTM	3	31.133	34.247	0.64	0.80	15.53	119.16	0.000	0.000	851.11	0.00	0.00
28	140.00	FD9R6004/2C-3L	6	31.133	34.247	0.60	0.80	1.30	22.32	0.000	0.000	71.01	0.00	0.00
29	140.00	DB-T1-6Z-8AB-OZ	1	31.133	34.247	0.80	0.80	3.28	25.68	0.000	0.000	179.73	0.00	0.00
30	140.00	RRH2x40-07-U	3	31.133	34.247	0.62	0.80	4.17	182.52	0.000	0.000	228.74	0.00	0.00
31	140.00	Low Profile Platform	1	31.133	34.247	1.00	1.00	22.00	1800.00	0.000	0.000	1205.48	0.00	0.00
32	140.00	HBXX-6517DS-A2M	6	31.133	34.247	0.62	0.80	31.60	293.76	0.000	0.000	1731.55	0.00	0.00
33	140.00	LNx-6514DS-A1M	3	31.133	34.247	0.66	0.80	16.27	138.24	0.000	0.000	891.76	0.00	0.00
34	130.00	APXVSP18-C-A20	3	30.655	33.720	0.66	0.80	15.98	205.20	0.000	0.000	861.94	0.00	0.00
35	130.00	APXVTM14-C-120	3	30.655	33.720	0.63	0.80	12.02	201.60	0.000	0.000	648.54	0.00	0.00
36	130.00	TD-RRH8x20-25	3	30.655	33.720	0.55	0.80	6.71	252.00	0.000	0.000	361.85	0.00	0.00
37	130.00	1900MHz RRH	3	30.655	33.720	0.70	0.80	8.03	158.40	0.000	0.000	433.00	0.00	0.00
38	130.00	800MHz Filter	3	30.655	33.720	0.55	0.80	1.29	31.68	0.000	0.000	69.69	0.00	0.00
39	130.00	800 MHz RRH	3	30.655	33.720	0.74	0.80	5.50	190.80	0.000	0.000	296.63	0.00	0.00
40	130.00	RF Filters	3	30.655	33.720	0.54	0.80	1.50	55.80	0.000	0.000	80.68	0.00	0.00
41	130.00	ACU-A20-N	4	30.655	33.720	0.63	0.80	0.35	4.80	0.000	0.000	19.09	0.00	0.00
42	130.00	Low Profile Platform	1	30.655	33.720	1.00	1.00	22.00	1800.00	0.000	0.000	1186.95	0.00	0.00
43	92.00	Low Profile Platform	1	28.522	31.374	1.00	1.00	22.00	1800.00	0.000	0.000	1104.36	0.00	0.00
44	92.00	DB205	1	29.082	31.990	0.80	0.80	1.44	45.60	0.000	9.000	73.70	0.00	663.34
45	92.00	ANT450Y10-WR	1	28.522	31.374	0.80	0.80	0.39	6.00	0.000	0.000	19.68	0.00	0.00
46	92.00	ANT150D3	1	28.838	31.722	0.80	0.80	1.74	21.60	0.000	5.000	88.52	0.00	442.58
47	92.00	ANT4506-9	1	28.713	31.584	0.80	0.80	2.22	21.60	0.000	3.000	111.99	0.00	335.96

## Discrete Appurtenance Forces

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II
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48	92.00 MF-900B	2	28.522	31.374	0.80	0.80	5.52	31.20	2.887	0.000	277.09	499.96	0.00
<b>Totals:</b>											<b>15,838.99</b>	<b>23,569.19</b>	

## Total Applied Force Summary

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

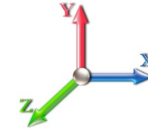


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**Load Case:** 1.2D + 1.6W 97 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60



**Iterations** 25

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		605.39	2361.00	0.00	0.00
10.00		594.56	2323.75	0.00	0.00
15.00		590.95	2286.49	0.00	0.00
20.00		614.16	2249.23	0.00	0.00
25.00		630.27	2211.98	0.00	0.00
30.00		641.45	2174.72	0.00	0.00
35.00		648.96	2137.47	0.00	0.00
40.00		653.62	2100.21	0.00	0.00
45.00		655.96	2062.96	0.00	0.00
46.25		162.77	509.92	0.00	0.00
50.00		498.95	2669.28	0.00	0.00
53.25		431.64	2281.59	0.00	0.00
55.00		231.48	627.41	0.00	0.00
60.00		663.59	1770.58	0.00	0.00
65.00		659.92	1737.98	0.00	0.00
70.00		655.15	1705.38	0.00	0.00
75.00		649.39	1672.79	0.00	0.00
80.00		642.74	1640.19	0.00	0.00
85.00		635.28	1607.59	0.00	0.00
90.00		627.08	1574.99	0.00	0.00
92.00	(7) attachments	1922.87	2546.87	499.96	1441.88
93.75		215.36	536.96	0.00	0.00
95.00		155.66	650.99	0.00	0.00
99.75		588.34	2439.26	0.00	0.00
100.00		30.58	66.84	0.00	0.00
105.00		609.24	1322.11	0.00	0.00
110.00		598.71	1294.17	0.00	0.00
115.00		587.65	1266.22	0.00	0.00
120.00		576.12	1238.28	0.00	0.00
125.00		564.13	1210.34	0.00	0.00
130.00	(26) attachments	4510.09	4082.68	0.00	0.00
135.00		538.88	1134.88	0.00	0.00
140.00	(32) attachments	5895.33	3762.42	0.00	0.00
142.75		282.88	551.57	0.00	0.00
145.00		231.69	690.43	0.00	0.00
147.25		228.89	681.00	0.00	0.00
150.00		276.01	392.51	0.00	0.00
155.00		491.57	699.22	0.00	0.00
160.00	(16) attachments	5216.78	3659.36	0.00	0.00
165.00		462.18	580.49	0.00	0.00
170.00	(45) attachments	5931.08	3989.73	0.00	0.00
175.00		431.59	451.97	0.00	0.00
180.00		415.88	433.34	0.00	0.00
185.00		399.91	414.72	0.00	0.00
187.00	(9) attachments	2497.18	2111.27	505.98	2627.55

## Total Applied Force Summary

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Totals:</b>	<u>45,151.88</u>	<u>73,913.14</u>	<u>1,005.95</u>	<u>4,069.43</u>
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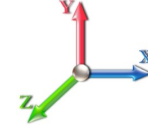
## Wind Loading - Shaft

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



**Load Case:** 0.9D + 1.6W 97 mph Wind

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



**Iterations** 24

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	19.450	21.40	490.97	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	19.450	21.40	482.27	0.650	0.000	5.00	27.207	17.68	605.4	0.0	1550.5
10.00		1.00	0.85	19.450	21.40	473.57	0.650	0.000	5.00	26.721	17.37	594.6	0.0	1522.5
15.00		1.00	0.86	19.690	21.66	467.73	0.650	0.000	5.00	26.234	17.05	590.9	0.0	1494.6
20.00		1.00	0.91	20.851	22.94	472.30	0.650	0.000	5.00	25.748	16.74	614.2	0.0	1466.6
25.00		1.00	0.95	21.810	23.99	473.83	0.650	0.000	5.00	25.261	16.42	630.3	0.0	1438.7
30.00		1.00	0.99	22.632	24.90	473.30	0.650	0.000	5.00	24.775	16.10	641.4	0.0	1410.8
35.00		1.00	1.02	23.356	25.69	471.27	0.650	0.000	5.00	24.288	15.79	649.0	0.0	1382.8
40.00		1.00	1.05	24.004	26.40	468.10	0.650	0.000	5.00	23.802	15.47	653.6	0.0	1354.9
45.00		1.00	1.07	24.593	27.05	464.02	0.650	0.000	5.00	23.315	15.15	656.0	0.0	1326.9
46.25	Bot - Section 2	1.00	1.08	24.732	27.21	462.88	0.650	0.000	1.25	5.753	3.74	162.8	0.0	327.4
50.00		1.00	1.10	25.133	27.65	459.20	0.650	0.000	3.75	17.353	11.28	499.0	0.0	1836.7
53.25	Top - Section 1	1.00	1.11	25.462	28.01	455.72	0.650	0.000	3.25	14.818	9.63	431.6	0.0	1568.0
55.00		1.00	1.12	25.633	28.20	461.35	0.650	0.000	1.75	7.894	5.13	231.5	0.0	393.5
60.00		1.00	1.14	26.099	28.71	455.44	0.650	0.000	5.00	22.226	14.45	663.6	0.0	1107.7
65.00		1.00	1.16	26.535	29.19	449.07	0.650	0.000	5.00	21.739	14.13	659.9	0.0	1083.2
70.00		1.00	1.18	26.946	29.64	442.30	0.650	0.000	5.00	21.253	13.81	655.1	0.0	1058.8
75.00		1.00	1.19	27.335	30.07	435.16	0.650	0.000	5.00	20.766	13.50	649.4	0.0	1034.3
80.00		1.00	1.21	27.704	30.47	427.70	0.650	0.000	5.00	20.280	13.18	642.7	0.0	1009.9
85.00		1.00	1.23	28.056	30.86	419.96	0.650	0.000	5.00	19.793	12.87	635.3	0.0	985.4
90.00		1.00	1.24	28.391	31.23	411.95	0.650	0.000	5.00	19.307	12.55	627.1	0.0	961.0
92.00	Appurtenance(s)	1.00	1.25	28.522	31.37	408.68	0.650	0.000	2.00	7.586	4.93	247.5	0.0	377.5
93.75	Bot - Section 3	1.00	1.25	28.634	31.50	405.79	0.650	0.000	1.75	6.574	4.27	215.4	0.0	327.1
95.00		1.00	1.25	28.713	31.58	403.70	0.650	0.000	1.25	4.739	3.08	155.7	0.0	434.3
99.75	Top - Section 2	1.00	1.27	29.006	31.91	395.67	0.650	0.000	4.75	17.730	11.52	588.3	0.0	1624.3
100.00		1.00	1.27	29.021	31.92	402.17	0.650	0.000	0.25	0.921	0.60	30.6	0.0	39.3
105.00		1.00	1.28	29.318	32.25	393.54	0.650	0.000	5.00	18.165	11.81	609.2	0.0	775.6
110.00		1.00	1.29	29.604	32.56	384.72	0.650	0.000	5.00	17.678	11.49	598.7	0.0	754.7
115.00		1.00	1.31	29.880	32.87	375.72	0.650	0.000	5.00	17.192	11.17	587.7	0.0	733.7
120.00		1.00	1.32	30.147	33.16	366.56	0.650	0.000	5.00	16.705	10.86	576.1	0.0	712.7
125.00		1.00	1.33	30.405	33.45	357.25	0.650	0.000	5.00	16.219	10.54	564.1	0.0	691.8
130.00	Appurtenance(s)	1.00	1.34	30.655	33.72	347.79	0.650	0.000	5.00	15.732	10.23	551.7	0.0	670.8
135.00		1.00	1.35	30.898	33.99	338.20	0.650	0.000	5.00	15.246	9.91	538.9	0.0	649.9
140.00	Appurtenance(s)	1.00	1.36	31.133	34.25	328.48	0.650	0.000	5.00	14.759	9.59	525.7	0.0	628.9
142.75	Bot - Section 4	1.00	1.37	31.260	34.39	323.08	0.650	0.000	2.75	7.910	5.14	282.9	0.0	337.0
145.00		1.00	1.37	31.362	34.50	318.63	0.650	0.000	2.25	6.458	4.20	231.7	0.0	455.1
147.25	Top - Section 3	1.00	1.37	31.464	34.61	314.17	0.650	0.000	2.25	6.359	4.13	228.9	0.0	448.0
150.00		1.00	1.38	31.586	34.74	313.50	0.650	0.000	2.75	7.638	4.97	276.0	0.0	217.7
155.00		1.00	1.39	31.803	34.98	303.45	0.650	0.000	5.00	13.511	8.78	491.6	0.0	385.0
160.00	Appurtenance(s)	1.00	1.40	32.015	35.22	293.29	0.650	0.000	5.00	13.025	8.47	477.0	0.0	371.0
165.00		1.00	1.41	32.222	35.44	283.04	0.650	0.000	5.00	12.538	8.15	462.2	0.0	357.0
170.00	Appurtenance(s)	1.00	1.42	32.424	35.67	272.69	0.650	0.000	5.00	12.052	7.83	447.0	0.0	343.0
175.00		1.00	1.43	32.621	35.88	262.25	0.650	0.000	5.00	11.565	7.52	431.6	0.0	329.1
180.00		1.00	1.43	32.814	36.10	251.72	0.650	0.000	5.00	11.079	7.20	415.9	0.0	315.1
185.00		1.00	1.44	33.003	36.30	241.11	0.650	0.000	5.00	10.592	6.88	399.9	0.0	301.1
187.00	Appurtenance(s)	1.00	1.45	33.077	36.38	236.84	0.650	0.000	2.00	4.101	2.67	155.2	0.0	116.5

## Wind Loading - Shaft

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Totals:</b>	<b>187.00</b>	<b>21,582.7</b>	<b>36,710.3</b>
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## Discrete Appurtenance Forces

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**Load Case:** 0.9D + 1.6W 97 mph Wind

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



**Iterations** 24

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	187.00	ANT450F6	1	33.221	36.543	1.00	1.00	1.86	18.90	0.000	3.917	108.75	0.00	425.95
2	187.00	MF-900B	2	33.077	36.385	1.00	1.00	6.90	23.40	2.015	0.000	401.69	505.98	0.00
3	187.00	ANT900D6-9	2	33.152	36.468	1.00	1.00	1.96	19.80	0.000	2.042	114.36	0.00	233.49
4	187.00	6' Lightning rod	1	33.077	36.385	1.00	1.00	0.38	5.85	0.000	0.000	22.12	0.00	0.00
5	187.00	DB201	2	33.251	36.576	1.00	1.00	7.08	45.00	0.000	4.750	414.34	0.00	1968.11
6	187.00	Low Profile Platform	1	33.077	36.385	1.00	1.00	22.00	1350.00	0.000	0.000	1280.75	0.00	0.00
7	170.00	HPA-65R-BUU-H6	3	32.424	35.666	0.65	0.80	18.80	137.70	0.000	0.000	1072.96	0.00	0.00
8	170.00	CS72188.01	1	32.424	35.666	0.80	0.80	0.10	0.29	0.000	0.000	5.48	0.00	0.00
9	170.00	RRUS-32 B2	3	32.424	35.666	0.65	0.80	5.33	162.00	0.000	0.000	303.96	0.00	0.00
10	170.00	Low Profile Platform w/	1	32.424	35.666	1.00	1.00	27.70	1530.00	0.000	0.000	1580.72	0.00	0.00
11	170.00	7770	3	32.424	35.666	0.60	0.80	9.89	94.50	0.000	0.000	564.20	0.00	0.00
12	170.00	AM-X-CD-6500T-RET	3	32.424	35.666	0.62	0.80	15.03	130.95	0.000	0.000	857.85	0.00	0.00
13	170.00	DTMABP7819VG12A	6	32.424	35.666	0.55	0.80	3.73	103.57	0.000	0.000	212.96	0.00	0.00
14	170.00	782 10250	12	32.424	35.666	0.78	0.80	4.89	69.12	0.000	0.000	279.17	0.00	0.00
15	170.00	DBC-750	3	32.424	35.666	0.48	0.80	0.73	13.18	0.000	0.000	41.49	0.00	0.00
16	170.00	DC6-48-60-18-8F	1	32.424	35.666	0.80	0.80	1.18	29.52	0.000	0.000	67.11	0.00	0.00
17	170.00	ABT-DFDM-ADBH	3	32.424	35.666	0.78	0.80	0.12	3.08	0.000	0.000	6.68	0.00	0.00
18	170.00	RRUS 11	6	32.424	35.666	0.57	0.80	8.61	297.00	0.000	0.000	491.47	0.00	0.00
19	160.00	LNx-6515DS	3	32.015	35.216	0.67	0.80	22.99	135.81	0.000	0.000	1295.59	0.00	0.00
20	160.00	AIR 21 B2A B4P	3	32.015	35.216	0.66	0.80	12.07	247.05	0.000	0.000	680.26	0.00	0.00
21	160.00	AIR 21 B4A B2P	3	32.015	35.216	0.66	0.80	12.07	243.81	0.000	0.000	680.26	0.00	0.00
22	160.00	Platform w/ Hand Rail	1	32.015	35.216	1.00	1.00	32.00	1440.00	0.000	0.000	1803.08	0.00	0.00
23	160.00	Double TMA 17/21	3	32.015	35.216	0.58	0.80	0.71	29.70	0.000	0.000	39.98	0.00	0.00
24	160.00	S11B12	3	32.015	35.216	0.56	0.80	4.27	137.70	0.000	0.000	240.59	0.00	0.00
25	140.00	RRH2x60-1900	3	31.133	34.247	0.72	0.80	3.26	52.65	0.000	0.000	178.72	0.00	0.00
26	140.00	KS-24019	6	31.133	34.247	0.80	0.80	0.58	2.70	0.000	0.000	31.56	0.00	0.00
27	140.00	LNx-6514DS-VTM	3	31.133	34.247	0.64	0.80	15.53	89.37	0.000	0.000	851.11	0.00	0.00
28	140.00	FD9R6004/2C-3L	6	31.133	34.247	0.60	0.80	1.30	16.74	0.000	0.000	71.01	0.00	0.00
29	140.00	DB-T1-6Z-8AB-OZ	1	31.133	34.247	0.80	0.80	3.28	19.26	0.000	0.000	179.73	0.00	0.00
30	140.00	RRH2x40-07-U	3	31.133	34.247	0.62	0.80	4.17	136.89	0.000	0.000	228.74	0.00	0.00
31	140.00	Low Profile Platform	1	31.133	34.247	1.00	1.00	22.00	1350.00	0.000	0.000	1205.48	0.00	0.00
32	140.00	HBXX-6517DS-A2M	6	31.133	34.247	0.62	0.80	31.60	220.32	0.000	0.000	1731.55	0.00	0.00
33	140.00	LNx-6514DS-A1M	3	31.133	34.247	0.66	0.80	16.27	103.68	0.000	0.000	891.76	0.00	0.00
34	130.00	APXVSP18-C-A20	3	30.655	33.720	0.66	0.80	15.98	153.90	0.000	0.000	861.94	0.00	0.00
35	130.00	APXVTM14-C-120	3	30.655	33.720	0.63	0.80	12.02	151.20	0.000	0.000	648.54	0.00	0.00
36	130.00	TD-RRH8x20-25	3	30.655	33.720	0.55	0.80	6.71	189.00	0.000	0.000	361.85	0.00	0.00
37	130.00	1900MHz RRH	3	30.655	33.720	0.70	0.80	8.03	118.80	0.000	0.000	433.00	0.00	0.00
38	130.00	800MHz Filter	3	30.655	33.720	0.55	0.80	1.29	23.76	0.000	0.000	69.69	0.00	0.00
39	130.00	800 MHz RRH	3	30.655	33.720	0.74	0.80	5.50	143.10	0.000	0.000	296.63	0.00	0.00
40	130.00	RF Filters	3	30.655	33.720	0.54	0.80	1.50	41.85	0.000	0.000	80.68	0.00	0.00
41	130.00	ACU-A20-N	4	30.655	33.720	0.63	0.80	0.35	3.60	0.000	0.000	19.09	0.00	0.00
42	130.00	Low Profile Platform	1	30.655	33.720	1.00	1.00	22.00	1350.00	0.000	0.000	1186.95	0.00	0.00
43	92.00	Low Profile Platform	1	28.522	31.374	1.00	1.00	22.00	1350.00	0.000	0.000	1104.36	0.00	0.00
44	92.00	DB205	1	29.082	31.990	0.80	0.80	1.44	34.20	0.000	9.000	73.70	0.00	663.34
45	92.00	ANT450Y10-WR	1	28.522	31.374	0.80	0.80	0.39	4.50	0.000	0.000	19.68	0.00	0.00
46	92.00	ANT150D3	1	28.838	31.722	0.80	0.80	1.74	16.20	0.000	5.000	88.52	0.00	442.58
47	92.00	ANT4506-9	1	28.713	31.584	0.80	0.80	2.22	16.20	0.000	3.000	111.99	0.00	335.96

## Discrete Appurtenance Forces

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II
		<b>Page:</b> 19



48	92.00 MF-900B	2	28.522	31.374	0.80	0.80	5.52	23.40	2.887	0.000	277.09	499.96	0.00
<b>Totals:</b>											<b>11,879.24</b>	<b>23,569.19</b>	

## Total Applied Force Summary

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

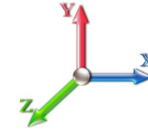


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**Load Case:** 0.9D + 1.6W 97 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60



**Iterations** 24

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		605.39	1770.75	0.00	0.00
10.00		594.56	1742.81	0.00	0.00
15.00		590.95	1714.87	0.00	0.00
20.00		614.16	1686.93	0.00	0.00
25.00		630.27	1658.98	0.00	0.00
30.00		641.45	1631.04	0.00	0.00
35.00		648.96	1603.10	0.00	0.00
40.00		653.62	1575.16	0.00	0.00
45.00		655.96	1547.22	0.00	0.00
46.25		162.77	382.44	0.00	0.00
50.00		498.95	2001.96	0.00	0.00
53.25		431.64	1711.19	0.00	0.00
55.00		231.48	470.55	0.00	0.00
60.00		663.59	1327.94	0.00	0.00
65.00		659.92	1303.49	0.00	0.00
70.00		655.15	1279.04	0.00	0.00
75.00		649.39	1254.59	0.00	0.00
80.00		642.74	1230.14	0.00	0.00
85.00		635.28	1205.69	0.00	0.00
90.00		627.08	1181.24	0.00	0.00
92.00	(7) attachments	1922.87	1910.15	499.96	1441.88
93.75		215.36	402.72	0.00	0.00
95.00		155.66	488.24	0.00	0.00
99.75		588.34	1829.45	0.00	0.00
100.00		30.58	50.13	0.00	0.00
105.00		609.24	991.58	0.00	0.00
110.00		598.71	970.62	0.00	0.00
115.00		587.65	949.67	0.00	0.00
120.00		576.12	928.71	0.00	0.00
125.00		564.13	907.76	0.00	0.00
130.00	(26) attachments	4510.09	3062.01	0.00	0.00
135.00		538.88	851.16	0.00	0.00
140.00	(32) attachments	5895.33	2821.82	0.00	0.00
142.75		282.88	413.67	0.00	0.00
145.00		231.69	517.82	0.00	0.00
147.25		228.89	510.75	0.00	0.00
150.00		276.01	294.38	0.00	0.00
155.00		491.57	524.42	0.00	0.00
160.00	(16) attachments	5216.78	2744.52	0.00	0.00
165.00		462.18	435.37	0.00	0.00
170.00	(45) attachments	5931.08	2992.30	0.00	0.00
175.00		431.59	338.98	0.00	0.00
180.00		415.88	325.01	0.00	0.00
185.00		399.91	311.04	0.00	0.00
187.00	(9) attachments	2497.18	1583.45	505.98	2627.55

## Total Applied Force Summary

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Totals:</b>	<u>45,151.88</u>	<u>55,434.85</u>	<u>1,005.95</u>	<u>4,069.43</u>
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## Calculated Forces

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



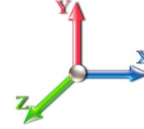
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**Load Case:** 0.9D + 1.6W 97 mph Wind

**Iterations** 24

**Dead Load Factor** 0.90

**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	-55.37	-45.22	-0.99	-5649.5	-0.01	5649.59	7001.91	3500.96	18524.4	9276.01	0.00	0.000	0.000	0.617
5.00	-53.49	-44.76	-0.99	-5423.4	-0.01	5423.47	6919.93	3459.96	17978.0	9002.40	0.08	-0.147	0.000	0.610
10.00	-51.63	-44.29	-0.99	-5199.7	-0.01	5199.70	6836.37	3418.19	17435.4	8730.69	0.31	-0.296	0.000	0.603
15.00	-49.81	-43.82	-0.99	-4978.2	-0.01	4978.26	6751.25	3375.63	16896.9	8461.01	0.71	-0.447	0.000	0.596
20.00	-48.01	-43.32	-0.99	-4759.1	-0.01	4759.17	6664.57	3332.28	16362.6	8193.47	1.26	-0.600	0.000	0.588
25.00	-46.24	-42.79	-0.99	-4542.5	-0.01	4542.58	6576.31	3288.16	15832.7	7928.16	1.97	-0.754	0.000	0.580
30.00	-44.50	-42.25	-0.99	-4328.6	-0.01	4328.61	6486.49	3243.25	15307.6	7665.22	2.84	-0.910	0.000	0.572
35.00	-42.80	-41.69	-0.99	-4117.3	-0.01	4117.36	6395.11	3197.55	14787.5	7404.75	3.88	-1.068	0.000	0.563
40.00	-41.12	-41.12	-0.99	-3908.9	-0.01	3908.90	6302.15	3151.08	14272.4	7146.85	5.09	-1.228	0.000	0.554
45.00	-39.52	-40.50	-0.99	-3703.2	-0.01	3703.28	6207.63	3103.82	13762.8	6891.65	6.46	-1.388	0.000	0.544
46.25	-39.08	-40.39	-0.99	-3652.6	-0.01	3652.66	6183.76	3091.88	13636.3	6828.29	6.83	-1.430	0.000	0.541
50.00	-37.01	-39.91	-0.99	-3501.2	-0.01	3501.22	6111.55	3055.77	13258.8	6639.26	8.00	-1.552	0.000	0.534
53.25	-35.26	-39.48	-1.00	-3371.5	-0.01	3371.52	5153.03	2576.51	11233.0	5624.85	9.09	-1.659	0.000	0.606
55.00	-34.71	-39.31	-1.00	-3302.4	-0.02	3302.43	5126.51	2563.25	11089.7	5553.12	9.71	-1.718	0.000	0.602
60.00	-33.29	-38.71	-1.00	-3105.9	-0.02	3105.90	5049.68	2524.84	10683.1	5349.50	11.61	-1.896	0.000	0.587
65.00	-31.89	-38.10	-1.00	-2912.3	-0.02	2912.37	4971.29	2485.64	10280.5	5147.92	13.69	-2.074	-0.001	0.572
70.00	-30.52	-37.49	-1.00	-2721.8	-0.02	2721.87	4891.33	2445.66	9882.29	4948.49	15.96	-2.253	-0.001	0.557
75.00	-29.18	-36.88	-1.00	-2534.4	-0.02	2534.41	4809.80	2404.90	9488.55	4751.33	18.41	-2.432	-0.001	0.540
80.00	-27.86	-36.27	-1.00	-2350.0	-0.02	2350.00	4726.70	2363.35	9099.56	4556.54	21.06	-2.610	-0.001	0.522
85.00	-26.58	-35.66	-1.00	-2168.6	-0.03	2168.63	4642.04	2321.02	8715.55	4364.25	23.88	-2.787	-0.001	0.503
90.00	-25.36	-35.03	-1.00	-1990.3	-0.03	1990.31	4555.82	2277.91	8336.73	4174.56	26.90	-2.963	-0.001	0.483
92.00	-23.51	-33.04	-0.50	-1918.8	0.00	1918.80	4520.89	2260.44	8186.70	4099.44	28.15	-3.034	-0.001	0.473
93.75	-23.09	-32.83	-0.50	-1860.9	0.00	1860.98	4490.12	2245.06	8056.16	4034.07	29.28	-3.097	-0.001	0.467
95.00	-22.55	-32.69	-0.50	-1819.9	0.00	1819.95	4468.02	2234.01	7963.33	3987.58	30.09	-3.141	-0.001	0.462
99.75	-20.71	-32.03	-0.50	-1664.7	-0.01	1664.70	3653.35	1826.67	6478.28	3243.96	33.30	-3.305	-0.001	0.519
100.00	-20.61	-32.03	-0.50	-1656.6	-0.01	1656.69	3649.96	1824.98	6463.57	3236.59	33.48	-3.314	-0.001	0.518
105.00	-19.55	-31.42	-0.50	-1496.5	-0.01	1496.55	3581.25	1790.63	6171.38	3090.28	37.04	-3.499	-0.001	0.490
110.00	-18.52	-30.82	-0.50	-1339.4	-0.01	1339.44	3510.98	1755.49	5883.11	2945.93	40.81	-3.681	-0.001	0.460
115.00	-17.53	-30.23	-0.50	-1185.3	-0.01	1185.32	3439.14	1719.57	5598.97	2803.65	44.75	-3.856	-0.001	0.428
120.00	-16.55	-29.64	-0.50	-1034.1	-0.02	1034.19	3365.73	1682.87	5319.21	2663.56	48.88	-4.024	-0.001	0.394
125.00	-15.61	-29.05	-0.50	-886.02	-0.02	886.02	3290.76	1645.38	5044.03	2525.77	53.18	-4.183	-0.001	0.356
130.00	-12.83	-24.36	-0.50	-740.77	-0.02	740.77	3204.00	1602.00	4758.48	2382.78	57.64	-4.330	-0.001	0.315
135.00	-11.97	-23.78	-0.50	-618.99	-0.03	618.99	3102.32	1551.16	4459.76	2233.19	62.24	-4.465	-0.002	0.281
140.00	-9.60	-17.70	-0.50	-500.09	-0.03	500.09	3000.64	1500.32	4170.72	2088.46	66.98	-4.588	-0.002	0.243
142.75	-9.19	-17.39	-0.50	-451.43	-0.03	451.43	2944.72	1472.36	4015.87	2010.92	69.64	-4.651	-0.002	0.228
145.00	-8.68	-17.12	-0.50	-412.30	-0.03	412.30	2898.96	1449.48	3891.36	1948.57	71.84	-4.701	-0.002	0.215
147.25	-8.17	-16.86	-0.50	-373.77	-0.03	373.77	1774.96	887.48	2399.50	1201.53	74.07	-4.748	-0.002	0.316
150.00	-7.88	-16.57	-0.50	-327.40	-0.03	327.40	1752.91	876.46	2323.79	1163.62	76.82	-4.803	-0.002	0.286
155.00	-7.37	-16.05	-0.50	-244.53	-0.04	244.53	1711.62	855.81	2187.55	1095.40	81.91	-4.924	-0.002	0.228
160.00	-5.07	-10.63	-0.50	-164.26	-0.04	164.26	1668.76	834.38	2053.31	1028.18	87.12	-5.020	-0.002	0.163
165.00	-4.66	-10.13	-0.50	-111.13	-0.04	111.13	1624.34	812.17	1921.31	962.08	92.41	-5.093	-0.003	0.119
170.00	-2.21	-3.96	-0.50	-60.47	-0.04	60.47	1578.35	789.17	1791.75	897.21	97.76	-5.144	-0.003	0.069
175.00	-1.91	-3.50	-0.50	-40.67	-0.04	40.67	1530.79	765.40	1664.88	833.68	103.16	-5.177	-0.003	0.050
180.00	-1.62	-3.06	-0.50	-23.17	-0.04	23.17	1481.67	740.83	1540.90	771.60	108.59	-5.202	-0.004	0.031
185.00	-1.35	-2.63	-0.50	-7.89	-0.05	7.89	1427.20	713.60	1416.30	709.20	114.04	-5.215	-0.004	0.012
187.00	0.00	-2.50	-0.51	-2.63	0.00	2.63	1400.09	700.04	1362.73	682.38	116.22	-5.217	-0.004	0.004

## Wind Loading - Shaft

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



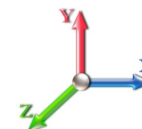
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**Load Case:** 1.2D + 1.0Di + 1.0Wi 50 mph Wind

**Iterations** 25

**Dead Load Factor** 1.20

**Wind Load Factor** 1.00



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	1.410	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	1.687	5.00	28.613	34.34	195.2	691.1	2758.4
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.792	5.00	28.214	33.86	192.5	722.5	2752.6
15.00		1.00	0.86	5.232	5.76	0.00	1.200	1.860	5.00	27.784	33.34	191.9	737.5	2730.3
20.00		1.00	0.91	5.540	6.09	0.00	1.200	1.912	5.00	27.341	32.81	199.9	744.7	2700.2
25.00		1.00	0.95	5.795	6.37	0.00	1.200	1.953	5.00	26.889	32.27	205.7	747.2	2665.4
30.00		1.00	0.99	6.013	6.61	0.00	1.200	1.988	5.00	26.431	31.72	209.8	746.5	2627.6
35.00		1.00	1.02	6.206	6.83	0.00	1.200	2.017	5.00	25.969	31.16	212.7	743.6	2587.4
40.00		1.00	1.05	6.378	7.02	0.00	1.200	2.044	5.00	25.505	30.61	214.7	739.0	2545.5
45.00		1.00	1.07	6.534	7.19	0.00	1.200	2.068	5.00	25.038	30.05	216.0	732.9	2502.2
46.25 Bot - Section 2		1.00	1.08	6.571	7.23	0.00	1.200	2.073	1.25	6.185	7.42	53.6	182.8	619.3
50.00		1.00	1.10	6.678	7.35	0.00	1.200	2.089	3.75	18.659	22.39	164.5	552.9	3001.9
53.25 Top - Section 1		1.00	1.11	6.765	7.44	0.00	1.200	2.102	3.25	15.957	19.15	142.5	475.9	2566.5
55.00		1.00	1.12	6.811	7.49	0.00	1.200	2.109	1.75	8.509	10.21	76.5	255.2	779.8
60.00		1.00	1.14	6.934	7.63	0.00	1.200	2.127	5.00	23.998	28.80	219.7	720.4	2197.2
65.00		1.00	1.16	7.050	7.76	0.00	1.200	2.144	5.00	23.526	28.23	218.9	710.8	2155.1
70.00		1.00	1.18	7.160	7.88	0.00	1.200	2.159	5.00	23.052	27.66	217.9	700.7	2112.4
75.00		1.00	1.19	7.263	7.99	0.00	1.200	2.174	5.00	22.578	27.09	216.5	690.0	2069.1
80.00		1.00	1.21	7.361	8.10	0.00	1.200	2.188	5.00	22.103	26.52	214.8	678.8	2025.3
85.00		1.00	1.23	7.454	8.20	0.00	1.200	2.201	5.00	21.627	25.95	212.8	667.2	1981.1
90.00		1.00	1.24	7.544	8.30	0.00	1.200	2.214	5.00	21.151	25.38	210.6	655.2	1936.5
92.00 Appurtenance(s)		1.00	1.25	7.578	8.34	0.00	1.200	2.218	2.00	8.326	9.99	83.3	260.1	763.5
93.75 Bot - Section 3		1.00	1.25	7.608	8.37	0.00	1.200	2.222	1.75	7.223	8.67	72.5	226.1	662.3
95.00		1.00	1.25	7.629	8.39	0.00	1.200	2.225	1.25	5.202	6.24	52.4	163.3	742.3
99.75 Top - Section 2		1.00	1.27	7.707	8.48	0.00	1.200	2.236	4.75	19.500	23.40	198.4	609.3	2775.0
100.00		1.00	1.27	7.711	8.48	0.00	1.200	2.237	0.25	1.014	1.22	10.3	32.0	84.5
105.00		1.00	1.28	7.790	8.57	0.00	1.200	2.248	5.00	20.038	24.05	206.0	627.8	1661.9
110.00		1.00	1.29	7.866	8.65	0.00	1.200	2.258	5.00	19.560	23.47	203.1	614.5	1620.8
115.00		1.00	1.31	7.939	8.73	0.00	1.200	2.268	5.00	19.082	22.90	200.0	601.1	1579.3
120.00		1.00	1.32	8.010	8.81	0.00	1.200	2.277	5.00	18.603	22.32	196.7	587.3	1537.6
125.00		1.00	1.33	8.079	8.89	0.00	1.200	2.287	5.00	18.124	21.75	193.3	573.4	1495.7
130.00 Appurtenance(s)		1.00	1.34	8.145	8.96	0.00	1.200	2.296	5.00	17.645	21.17	189.7	559.2	1453.6
135.00		1.00	1.35	8.210	9.03	0.00	1.200	2.304	5.00	17.166	20.60	186.0	544.8	1411.3
140.00 Appurtenance(s)		1.00	1.36	8.272	9.10	0.00	1.200	2.313	5.00	16.686	20.02	182.2	530.2	1368.8
142.75 Bot - Section 4		1.00	1.37	8.306	9.14	0.00	1.200	2.317	2.75	8.972	10.77	98.4	287.2	736.5
145.00		1.00	1.37	8.333	9.17	0.00	1.200	2.321	2.25	7.328	8.79	80.6	235.2	842.0
147.25 Top - Section 3		1.00	1.37	8.360	9.20	0.00	1.200	2.324	2.25	7.231	8.68	79.8	232.2	829.5
150.00		1.00	1.38	8.392	9.23	0.00	1.200	2.329	2.75	8.706	10.45	96.4	279.3	569.6
155.00		1.00	1.39	8.450	9.30	0.00	1.200	2.336	5.00	15.458	18.55	172.4	492.8	1006.0
160.00 Appurtenance(s)		1.00	1.40	8.506	9.36	0.00	1.200	2.343	5.00	14.978	17.97	168.2	477.5	972.2
165.00		1.00	1.41	8.561	9.42	0.00	1.200	2.351	5.00	14.497	17.40	163.8	462.2	938.2
170.00 Appurtenance(s)		1.00	1.42	8.615	9.48	0.00	1.200	2.358	5.00	14.016	16.82	159.4	446.7	904.1
175.00		1.00	1.43	8.667	9.53	0.00	1.200	2.364	5.00	13.535	16.24	154.9	431.0	869.8
180.00		1.00	1.43	8.719	9.59	0.00	1.200	2.371	5.00	13.055	15.67	150.2	415.2	835.4
185.00		1.00	1.44	8.769	9.65	0.00	1.200	2.378	5.00	12.573	15.09	145.5	399.3	800.8
187.00 Appurtenance(s)		1.00	1.45	8.789	9.67	0.00	1.200	2.380	2.00	4.894	5.87	56.8	157.2	312.6

## Wind Loading - Shaft

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Totals:</b>	<b>187.00</b>	<b>7,287.0</b>	<b>72,087.1</b>
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## Discrete Appurtenance Forces

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 25

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	187.00	ANT450F6	1	8.827	9.710	1.00	1.00	5.72	78.08	0.000	3.917	55.56	0.00	217.61
2	187.00	MF-900B	2	8.789	9.668	1.00	1.00	73.40	273.22	2.015	0.000	709.59	1430.1	0.00
3	187.00	ANT900D6-9	2	8.809	9.690	1.00	1.00	8.52	108.38	0.000	2.042	82.55	0.00	168.53
4	187.00	6' Lightning rod	1	8.789	9.668	1.00	1.00	1.86	52.01	0.000	0.000	18.01	0.00	0.00
5	187.00	DB201	2	8.835	9.718	1.00	1.00	36.78	295.81	0.000	4.750	357.43	0.00	1697.79
6	187.00	Low Profile Platform	1	8.789	9.668	1.00	1.00	46.09	3285.07	0.000	0.000	445.54	0.00	0.00
7	170.00	HPA-65R-BUU-H6	3	8.615	9.477	0.65	0.80	22.55	1247.51	0.000	0.000	213.71	0.00	0.00
8	170.00	CS72188.01	1	8.615	9.477	0.80	0.80	0.31	1.50	0.000	0.000	2.98	0.00	0.00
9	170.00	RRUS-32 B2	3	8.615	9.477	0.66	0.80	7.47	603.27	0.000	0.000	70.82	0.00	0.00
10	170.00	Low Profile Platform w/	1	8.615	9.477	1.00	1.00	57.74	3944.00	0.000	0.000	547.19	0.00	0.00
11	170.00	7770	3	8.615	9.477	0.60	0.80	12.62	718.30	0.000	0.000	119.56	0.00	0.00
12	170.00	AM-X-CD-6500T-RET	3	8.615	9.477	0.63	0.80	22.19	692.77	0.000	0.000	210.30	0.00	0.00
13	170.00	DTMABP7819VG12A	6	8.615	9.477	0.56	0.80	7.29	299.25	0.000	0.000	69.10	0.00	0.00
14	170.00	782 10250	12	8.615	9.477	0.79	0.80	12.15	256.25	0.000	0.000	115.15	0.00	0.00
15	170.00	DBC-750	3	8.615	9.477	0.50	0.80	1.85	50.80	0.000	0.000	17.50	0.00	0.00
16	170.00	DC6-48-60-18-8F	1	8.615	9.477	0.80	0.80	1.93	101.95	0.000	0.000	18.31	0.00	0.00
17	170.00	ABT-DFDM-ADBH	3	8.615	9.477	0.79	0.80	0.73	12.21	0.000	0.000	6.93	0.00	0.00
18	170.00	RRUS 11	6	8.615	9.477	0.58	0.80	11.86	1177.59	0.000	0.000	112.41	0.00	0.00
19	160.00	LNx-6515DS	3	8.506	9.357	0.67	0.80	31.92	911.84	0.000	0.000	298.66	0.00	0.00
20	160.00	AIR 21 B2A B4P	3	8.506	9.357	0.67	0.80	15.19	1055.64	0.000	0.000	142.11	0.00	0.00
21	160.00	AIR 21 B4A B2P	3	8.506	9.357	0.67	0.80	15.19	1051.32	0.000	0.000	142.11	0.00	0.00
22	160.00	Platform w/ Hand Rail	1	8.506	9.357	1.00	1.00	69.50	4139.67	0.000	0.000	650.28	0.00	0.00
23	160.00	Double TMA 17/21	3	8.506	9.357	0.60	0.80	1.88	76.61	0.000	0.000	17.56	0.00	0.00
24	160.00	S11B12	3	8.506	9.357	0.57	0.80	5.88	571.36	0.000	0.000	55.01	0.00	0.00
25	140.00	RRH2x60-1900	3	8.272	9.099	0.73	0.80	4.95	330.88	0.000	0.000	45.03	0.00	0.00
26	140.00	KS-24019	6	8.272	9.099	0.80	0.80	1.88	45.67	0.000	0.000	17.14	0.00	0.00
27	140.00	LNx-6514DS-VTM	3	8.272	9.099	0.66	0.80	23.21	663.69	0.000	0.000	211.21	0.00	0.00
28	140.00	FD9R6004/2C-3L	6	8.272	9.099	0.62	0.80	3.50	72.34	0.000	0.000	31.86	0.00	0.00
29	140.00	DB-T1-6Z-8AB-0Z	1	8.272	9.099	0.80	0.80	4.13	153.16	0.000	0.000	37.58	0.00	0.00
30	140.00	RRH2x40-07-U	3	8.272	9.099	0.64	0.80	6.98	365.82	0.000	0.000	63.54	0.00	0.00
31	140.00	Low Profile Platform	1	8.272	9.099	1.00	1.00	45.40	3234.45	0.000	0.000	413.15	0.00	0.00
32	140.00	HBXX-6517DS-A2M	6	8.272	9.099	0.63	0.80	47.09	1392.63	0.000	0.000	428.47	0.00	0.00
33	140.00	LNx-6514DS-A1M	3	8.272	9.099	0.68	0.80	24.30	687.51	0.000	0.000	221.10	0.00	0.00
34	130.00	APXVSP18-C-A20	3	8.145	8.960	0.68	0.80	23.86	738.81	0.000	0.000	213.75	0.00	0.00
35	130.00	APXVTM14-C-120	3	8.145	8.960	0.65	0.80	15.23	875.54	0.000	0.000	136.45	0.00	0.00
36	130.00	TD-RRHx20-25	3	8.145	8.960	0.57	0.80	8.77	717.13	0.000	0.000	78.56	0.00	0.00
37	130.00	1900MHz RRH	3	8.145	8.960	0.71	0.80	12.02	495.58	0.000	0.000	107.72	0.00	0.00
38	130.00	800MHz Filter	3	8.145	8.960	0.57	0.80	2.78	86.30	0.000	0.000	24.90	0.00	0.00
39	130.00	800 MHz RRH	3	8.145	8.960	0.74	0.80	8.92	419.36	0.000	0.000	79.88	0.00	0.00
40	130.00	RF Filters	3	8.145	8.960	0.55	0.80	2.50	193.57	0.000	0.000	22.43	0.00	0.00
41	130.00	ACU-A20-N	4	8.145	8.960	0.65	0.80	1.37	22.20	0.000	0.000	12.32	0.00	0.00
42	130.00	Low Profile Platform	1	8.145	8.960	1.00	1.00	45.23	3221.74	0.000	0.000	405.26	0.00	0.00
43	92.00	Low Profile Platform	1	7.578	8.336	1.00	1.00	44.45	3163.75	0.000	0.000	370.54	0.00	0.00
44	92.00	DB205	1	7.727	8.500	0.80	0.80	7.89	102.64	0.000	9.000	67.04	0.00	603.39
45	92.00	ANT450Y10-WR	1	7.578	8.336	0.80	0.80	1.54	25.97	0.000	0.000	12.85	0.00	0.00
46	92.00	ANT150D3	1	7.662	8.429	0.80	0.80	10.38	93.67	0.000	5.000	87.51	0.00	437.53
47	92.00	ANT4506-9	1	7.629	8.392	0.80	0.80	5.30	102.90	0.000	3.000	44.45	0.00	133.36



## Discrete Appurtenance Forces

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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48	92.00 MF-900B	2	7.578	8.336	0.80	0.80	55.10	252.39	2.887	0.000	459.35	1326.0	0.00
<b>Totals:</b>											<b>38,462.11</b>	<b>8,070.45</b>	

## Total Applied Force Summary

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 25

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		195.19	3052.11	0.00	0.00
10.00		192.47	3046.30	0.00	0.00
15.00		191.88	3024.01	0.00	0.00
20.00		199.94	2993.91	0.00	0.00
25.00		205.68	2959.16	0.00	0.00
30.00		209.80	2921.26	0.00	0.00
35.00		212.73	2881.09	0.00	0.00
40.00		214.73	2839.17	0.00	0.00
45.00		215.96	2795.87	0.00	0.00
46.25		53.65	692.72	0.00	0.00
50.00		164.48	3222.17	0.00	0.00
53.25		142.50	2757.45	0.00	0.00
55.00		76.50	882.62	0.00	0.00
60.00		219.67	2490.94	0.00	0.00
65.00		218.94	2448.82	0.00	0.00
70.00		217.86	2406.08	0.00	0.00
75.00		216.46	2362.80	0.00	0.00
80.00		214.77	2319.03	0.00	0.00
85.00		212.81	2274.83	0.00	0.00
90.00		210.62	2230.23	0.00	0.00
92.00	(7) attachments	1125.02	4622.33	1326.09	1174.28
93.75		72.53	763.07	0.00	0.00
95.00		52.39	814.33	0.00	0.00
99.75		198.38	3048.54	0.00	0.00
100.00		10.32	98.87	0.00	0.00
105.00		206.04	1949.88	0.00	0.00
110.00		203.09	1908.71	0.00	0.00
115.00		199.97	1867.28	0.00	0.00
120.00		196.69	1825.60	0.00	0.00
125.00		193.27	1783.69	0.00	0.00
130.00	(26) attachments	1270.98	8511.81	0.00	0.00
135.00		186.02	1679.68	0.00	0.00
140.00	(32) attachments	1651.27	8583.30	0.00	0.00
142.75		98.37	838.73	0.00	0.00
145.00		80.60	925.66	0.00	0.00
147.25		79.79	913.22	0.00	0.00
150.00		96.44	671.82	0.00	0.00
155.00		172.42	1191.99	0.00	0.00
160.00	(16) attachments	1473.91	8964.58	0.00	0.00
165.00		163.83	1042.66	0.00	0.00
170.00	(45) attachments	1663.36	10113.91	0.00	0.00
175.00		154.86	882.98	0.00	0.00
180.00		150.24	848.57	0.00	0.00
185.00		145.54	814.04	0.00	0.00
187.00	(9) attachments	1725.45	4410.40	1430.12	2083.93

## Total Applied Force Summary

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Struct Class:</b> II	Page: 28



<b>Totals:</b>	15,357.43	<del>119,676.2</del> 3	2,756.20	3,258.21
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## Calculated Forces

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

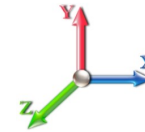


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**Load Case:** 1.2D + 1.0Di + 1.0Wi 50 mph Wind

**Iterations** 25

**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	-119.6	-15.41	-2.75	-2051.3	-0.03	2051.31	7001.91	3500.96	18524.4	9276.01	0.00	0.000	0.000	0.238
5.00	-116.6	-15.33	-2.75	-1974.2	-0.03	1974.24	6919.93	3459.96	17978.0	9002.40	0.03	-0.054	0.000	0.236
10.00	-113.5	-15.24	-2.75	-1897.6	-0.03	1897.61	6836.37	3418.19	17435.4	8730.69	0.11	-0.108	0.000	0.234
15.00	-110.5	-15.15	-2.75	-1821.4	-0.03	1821.41	6751.25	3375.63	16896.9	8461.01	0.26	-0.163	0.000	0.232
20.00	-107.5	-15.04	-2.75	-1745.6	-0.03	1745.68	6664.57	3332.28	16362.6	8193.47	0.46	-0.219	0.000	0.229
25.00	-104.5	-14.93	-2.75	-1670.4	-0.03	1670.46	6576.31	3288.16	15832.7	7928.16	0.72	-0.276	0.000	0.227
30.00	-101.5	-14.81	-2.75	-1595.8	-0.03	1595.82	6486.49	3243.25	15307.6	7665.22	1.04	-0.333	-0.001	0.224
35.00	-98.69	-14.68	-2.75	-1521.7	-0.03	1521.79	6395.11	3197.55	14787.5	7404.75	1.42	-0.391	-0.001	0.221
40.00	-95.84	-14.54	-2.75	-1448.4	-0.03	1448.41	6302.15	3151.08	14272.4	7146.85	1.86	-0.450	-0.001	0.218
45.00	-93.04	-14.36	-2.75	-1375.7	-0.03	1375.71	6207.63	3103.82	13762.8	6891.65	2.36	-0.510	-0.001	0.215
46.25	-92.34	-14.35	-2.75	-1357.7	-0.03	1357.76	6183.76	3091.88	13636.3	6828.29	2.50	-0.525	-0.001	0.214
50.00	-89.11	-14.22	-2.75	-1303.9	-0.03	1303.95	6111.55	3055.77	13258.8	6639.26	2.93	-0.571	-0.001	0.211
53.25	-86.34	-14.10	-2.75	-1257.7	-0.03	1257.73	5153.03	2576.51	11233.0	5624.85	3.33	-0.611	-0.001	0.240
55.00	-85.45	-14.08	-2.75	-1233.0	-0.03	1233.06	5126.51	2563.25	11089.7	5553.12	3.56	-0.633	-0.001	0.239
60.00	-82.95	-13.93	-2.75	-1162.6	-0.04	1162.67	5049.68	2524.84	10683.1	5349.50	4.26	-0.699	-0.001	0.234
65.00	-80.48	-13.77	-2.75	-1093.0	-0.04	1093.05	4971.29	2485.64	10280.5	5147.92	5.03	-0.766	-0.001	0.229
70.00	-78.07	-13.61	-2.75	-1024.2	-0.04	1024.21	4891.33	2445.66	9882.29	4948.49	5.87	-0.833	-0.002	0.223
75.00	-75.69	-13.45	-2.75	-956.16	-0.04	956.16	4809.80	2404.90	9488.55	4751.33	6.77	-0.901	-0.002	0.217
80.00	-73.36	-13.28	-2.75	-888.93	-0.04	888.93	4726.70	2363.35	9099.56	4556.54	7.75	-0.968	-0.002	0.211
85.00	-71.07	-13.11	-2.75	-822.53	-0.04	822.53	4642.04	2321.02	8715.55	4364.25	8.80	-1.035	-0.002	0.204
90.00	-68.84	-12.91	-2.75	-756.98	-0.04	756.98	4555.82	2277.91	8336.73	4174.56	9.92	-1.102	-0.002	0.196
92.00	-64.23	-11.73	-1.43	-729.98	-0.02	729.98	4520.89	2260.44	8186.70	4099.44	10.39	-1.129	-0.003	0.192
93.75	-63.47	-11.66	-1.43	-709.46	-0.02	709.46	4490.12	2245.06	8056.16	4034.07	10.81	-1.153	-0.003	0.190
95.00	-62.65	-11.64	-1.43	-694.88	-0.02	694.88	4468.02	2234.01	7963.33	3987.58	11.11	-1.170	-0.003	0.188
99.75	-59.60	-11.41	-1.43	-639.60	-0.02	639.60	3653.35	1826.67	6478.28	3243.96	12.31	-1.232	-0.003	0.214
100.00	-59.49	-11.44	-1.43	-636.75	-0.02	636.75	3649.96	1824.98	6463.57	3236.59	12.37	-1.236	-0.003	0.213
105.00	-57.53	-11.26	-1.43	-579.57	-0.02	579.57	3581.25	1790.63	6171.38	3090.28	13.71	-1.307	-0.003	0.204
110.00	-55.61	-11.08	-1.43	-523.28	-0.03	523.28	3510.98	1755.49	5883.11	2945.93	15.12	-1.378	-0.003	0.194
115.00	-53.74	-10.90	-1.43	-467.89	-0.03	467.89	3439.14	1719.57	5598.97	2803.65	16.60	-1.447	-0.003	0.183
120.00	-51.91	-10.71	-1.43	-413.41	-0.03	413.41	3365.73	1682.87	5319.21	2663.56	18.15	-1.513	-0.004	0.171
125.00	-50.12	-10.52	-1.43	-359.86	-0.03	359.86	3290.76	1645.38	5044.03	2525.77	19.77	-1.577	-0.004	0.158
130.00	-41.64	-9.06	-1.43	-307.23	-0.03	307.23	3204.00	1602.00	4758.48	2382.78	21.45	-1.638	-0.004	0.142
135.00	-39.95	-8.86	-1.43	-261.95	-0.04	261.95	3102.32	1551.16	4459.76	2233.19	23.20	-1.694	-0.004	0.130
140.00	-31.42	-6.97	-1.43	-217.65	-0.04	217.65	3000.64	1500.32	4170.72	2088.46	25.00	-1.747	-0.005	0.115
142.75	-30.58	-6.86	-1.43	-198.47	-0.04	198.47	2944.72	1472.36	4015.87	2010.92	26.02	-1.775	-0.005	0.109
145.00	-29.66	-6.76	-1.43	-183.03	-0.04	183.03	2898.96	1449.48	3891.36	1948.57	26.86	-1.797	-0.005	0.104
147.25	-28.74	-6.67	-1.43	-167.81	-0.04	167.81	1774.96	887.48	2399.50	1201.53	27.71	-1.818	-0.005	0.156
150.00	-28.07	-6.57	-1.43	-149.47	-0.04	149.47	1752.91	876.46	2323.79	1163.62	28.76	-1.842	-0.005	0.145
155.00	-26.88	-6.38	-1.43	-116.62	-0.04	116.62	1711.62	855.81	2187.55	1095.40	30.72	-1.899	-0.006	0.122
160.00	-17.96	-4.62	-1.43	-84.70	-0.04	84.70	1668.76	834.38	2053.31	1028.18	32.74	-1.946	-0.007	0.093
165.00	-16.93	-4.43	-1.43	-61.59	-0.05	61.59	1624.34	812.17	1921.31	962.08	34.80	-1.985	-0.007	0.074
170.00	-6.87	-2.42	-1.43	-39.43	-0.05	39.43	1578.35	789.17	1791.75	897.21	36.89	-2.015	-0.008	0.048
175.00	-6.00	-2.24	-1.43	-27.32	-0.05	27.32	1530.79	765.40	1664.88	833.68	39.02	-2.037	-0.009	0.037
180.00	-5.15	-2.06	-1.43	-16.14	-0.05	16.14	1481.67	740.83	1540.90	771.60	41.16	-2.054	-0.010	0.024
185.00	-4.35	-1.88	-1.43	-5.85	-0.05	5.85	1427.20	713.60	1416.30	709.20	43.32	-2.063	-0.012	0.011
187.00	0.00	-1.73	-1.43	-2.08	0.00	2.08	1400.09	700.04	1362.73	682.38	44.18	-2.065	-0.012	0.003

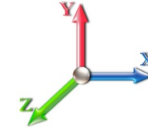
## Seismic Segment Forces (Factored)

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Load Case:</b> 1.2D + 1.0E					<b>Iterations</b> 21
<b>Gust Response Factor</b>	1.10			<b>Sds</b> 0.12	<b>Ss</b> 0.18
<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>	0.31	<b>SA</b> 0.01	<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	0.01	0.00	0.00	
5.00		1722.7	0.00	0.03	0.02	24.94	
10.00		1691.6	0.01	0.05	0.03	32.50	
15.00		1660.6	0.01	0.06	0.03	36.05	
20.00		1629.6	0.02	0.07	0.04	37.63	
25.00		1598.5	0.04	0.07	0.04	38.22	
30.00		1567.5	0.05	0.07	0.04	38.34	
35.00		1536.4	0.07	0.07	0.04	38.32	
40.00		1505.4	0.09	0.07	0.04	38.30	
45.00		1474.3	0.11	0.07	0.04	38.32	
46.25	Bot - Section 2	363.74	0.12	0.07	0.03	9.51	
50.00		2040.8	0.14	0.07	0.03	54.23	
53.25	Top - Section 1	1742.2	0.16	0.07	0.03	46.91	
55.00		437.17	0.17	0.07	0.03	11.84	
60.00		1230.7	0.20	0.06	0.02	33.72	
65.00		1203.5	0.23	0.06	0.02	32.79	
70.00		1176.3	0.27	0.05	0.02	30.95	
75.00		1149.2	0.31	0.04	0.01	27.73	
80.00		1122.0	0.35	0.03	0.01	22.64	
85.00		1094.9	0.40	0.02	0.01	15.33	
90.00		1067.7	0.44	0.00	0.01	5.95	
92.00	Appurtenance(s)	2024.4	0.46	0.00	0.01	3.50	
93.75	Bot - Section 3	363.48	0.48	-0.01	0.01	-0.64	
95.00		482.50	0.49	-0.01	0.01	-2.06	
99.75	Top - Section 2	1804.7	0.54	-0.03	0.01	-24.45	
100.00		43.70	0.55	-0.03	0.01	-0.61	
105.00		861.80	0.60	-0.05	0.01	-19.05	
110.00		838.51	0.66	-0.07	0.02	-23.29	
115.00		815.23	0.72	-0.09	0.03	-25.18	
120.00		791.94	0.78	-0.11	0.05	-25.02	
125.00		768.66	0.85	-0.12	0.07	-23.16	
130.00	Appurtenance(s)	3162.2	0.92	-0.12	0.09	-84.38	
135.00		722.09	0.99	-0.11	0.13	-15.41	
140.00	Appurtenance(s)	2911.7	1.06	-0.09	0.17	-41.19	
142.75	Bot - Section 4	374.42	1.10	-0.07	0.19	-3.52	
145.00		505.63	1.14	-0.04	0.21	-2.59	
147.25	Top - Section 3	497.77	1.18	-0.02	0.24	-0.23	
150.00		241.87	1.22	0.02	0.27	1.39	
155.00		427.74	1.30	0.12	0.34	7.92	
160.00	Appurtenance(s)	2894.5	1.39	0.26	0.42	96.09	
165.00		396.69	1.47	0.44	0.51	19.77	
170.00	Appurtenance(s)	3237.7	1.56	0.67	0.62	221.78	
175.00		365.64	1.66	0.96	0.75	32.62	
180.00		350.12	1.75	1.33	0.90	39.23	
185.00		334.60	1.85	1.78	1.07	45.85	
187.00	Appurtenance(s)	1754.9	1.89	1.98	1.14	259.10	

## Seismic Segment Forces (Factored)

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**Totals:** 53,988.4

1,050.7

**Total Wind:** 45,151.9

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

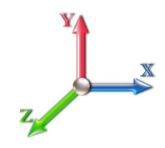
## Calculated Forces

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Load Case: 1.2D + 1.0E</b>										<b>Iterations</b> 21	
<b>Gust Response Factor</b>	1.10						<b>Sds</b>	0.12		<b>Ss</b>	0.18
<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>	0.31	<b>SA</b>	0.01	<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	-73.91	-1.34	0.00	-161.40	0.00	161.40	7001.91	3500.96	18524.4	9276.01	0.00	0.00	0.00	0.028
5.00	-71.55	-1.32	0.00	-154.68	0.00	154.68	6919.93	3459.96	17978.0	9002.40	0.00	0.00	0.00	0.028
10.00	-69.23	-1.30	0.00	-148.06	0.00	148.06	6836.37	3418.19	17435.4	8730.69	0.01	-0.01	0.00	0.027
15.00	-66.94	-1.26	0.00	-141.58	0.00	141.58	6751.25	3375.63	16896.9	8461.01	0.02	-0.01	0.00	0.027
20.00	-64.69	-1.23	0.00	-135.26	0.00	135.26	6664.57	3332.28	16362.6	8193.47	0.04	-0.02	0.00	0.026
25.00	-62.48	-1.20	0.00	-129.10	0.00	129.10	6576.31	3288.16	15832.7	7928.16	0.06	-0.02	0.00	0.026
30.00	-60.31	-1.16	0.00	-123.12	0.00	123.12	6486.49	3243.25	15307.6	7665.22	0.08	-0.03	0.00	0.025
35.00	-58.17	-1.13	0.00	-117.31	0.00	117.31	6395.11	3197.55	14787.5	7404.75	0.11	-0.03	0.00	0.025
40.00	-56.07	-1.09	0.00	-111.67	0.00	111.67	6302.15	3151.08	14272.4	7146.85	0.14	-0.03	0.00	0.025
45.00	-54.00	-1.06	0.00	-106.20	0.00	106.20	6207.63	3103.82	13762.8	6891.65	0.18	-0.04	0.00	0.024
46.25	-53.49	-1.05	0.00	-104.88	0.00	104.88	6183.76	3091.88	13636.3	6828.29	0.19	-0.04	0.00	0.024
50.00	-50.83	-0.99	0.00	-100.95	0.00	100.95	6111.55	3055.77	13258.8	6639.26	0.23	-0.04	0.00	0.024
53.25	-48.54	-0.95	0.00	-97.72	0.00	97.72	5153.03	2576.51	11233.0	5624.85	0.26	-0.05	0.00	0.027
55.00	-47.92	-0.94	0.00	-96.06	0.00	96.06	5126.51	2563.25	11089.7	5553.12	0.28	-0.05	0.00	0.027
60.00	-46.15	-0.91	0.00	-91.37	0.00	91.37	5049.68	2524.84	10683.1	5349.50	0.33	-0.05	0.00	0.026
65.00	-44.41	-0.88	0.00	-86.83	0.00	86.83	4971.29	2485.64	10280.5	5147.92	0.39	-0.06	0.00	0.026
70.00	-42.70	-0.85	0.00	-82.44	0.00	82.44	4891.33	2445.66	9882.29	4948.49	0.46	-0.06	0.00	0.025
75.00	-41.03	-0.82	0.00	-78.20	0.00	78.20	4809.80	2404.90	9488.55	4751.33	0.53	-0.07	0.00	0.025
80.00	-39.39	-0.80	0.00	-74.09	0.00	74.09	4726.70	2363.35	9099.56	4556.54	0.60	-0.08	0.00	0.025
85.00	-37.78	-0.79	0.00	-70.08	0.00	70.08	4642.04	2321.02	8715.55	4364.25	0.69	-0.08	0.00	0.024
90.00	-36.21	-0.78	0.00	-66.14	0.00	66.14	4555.82	2277.91	8336.73	4174.56	0.77	-0.09	0.00	0.024
92.00	-33.66	-0.78	0.00	-64.57	0.00	64.57	4520.89	2260.44	8186.70	4099.44	0.81	-0.09	0.00	0.023
93.75	-33.12	-0.78	0.00	-63.22	0.00	63.22	4490.12	2245.06	8056.16	4034.07	0.84	-0.09	0.00	0.023
95.00	-32.47	-0.78	0.00	-62.25	0.00	62.25	4468.02	2234.01	7963.33	3987.58	0.87	-0.09	0.00	0.023
99.75	-30.03	-0.77	0.00	-58.55	0.00	58.55	3653.35	1826.67	6478.28	3243.96	0.96	-0.10	0.00	0.026
100.00	-29.97	-0.78	0.00	-58.36	0.00	58.36	3649.96	1824.98	6463.57	3236.59	0.97	-0.10	0.00	0.026
105.00	-28.64	-0.78	0.00	-54.48	0.00	54.48	3581.25	1790.63	6171.38	3090.28	1.08	-0.11	0.00	0.026
110.00	-27.35	-0.78	0.00	-50.59	0.00	50.59	3510.98	1755.49	5883.11	2945.93	1.19	-0.11	0.00	0.025
115.00	-26.08	-0.78	0.00	-46.69	0.00	46.69	3439.14	1719.57	5598.97	2803.65	1.31	-0.12	0.00	0.024
120.00	-24.84	-0.78	0.00	-42.80	0.00	42.80	3365.73	1682.87	5319.21	2663.56	1.44	-0.13	0.00	0.023
125.00	-23.63	-0.78	0.00	-38.90	0.00	38.90	3290.76	1645.38	5044.03	2525.77	1.58	-0.13	0.00	0.023
130.00	-19.55	-0.77	0.00	-35.01	0.00	35.01	3204.00	1602.00	4758.48	2382.78	1.72	-0.14	0.00	0.021
135.00	-18.42	-0.77	0.00	-31.15	0.00	31.15	3102.32	1551.16	4459.76	2233.19	1.87	-0.15	0.00	0.020
140.00	-14.65	-0.76	0.00	-27.29	0.00	27.29	3000.64	1500.32	4170.72	2088.46	2.03	-0.15	0.00	0.018
142.75	-14.10	-0.76	0.00	-25.19	0.00	25.19	2944.72	1472.36	4015.87	2010.92	2.12	-0.16	0.00	0.017
145.00	-13.41	-0.76	0.00	-23.48	0.00	23.48	2898.96	1449.48	3891.36	1948.57	2.19	-0.16	0.00	0.017
147.25	-12.73	-0.76	0.00	-21.77	0.00	21.77	1774.96	887.48	2399.50	1201.53	2.27	-0.16	0.00	0.025
150.00	-12.34	-0.76	0.00	-19.68	0.00	19.68	1752.91	876.46	2323.79	1163.62	2.36	-0.16	0.00	0.024
155.00	-11.64	-0.75	0.00	-15.89	0.00	15.89	1711.62	855.81	2187.55	1095.40	2.54	-0.17	0.00	0.021
160.00	-7.98	-0.64	0.00	-12.14	0.00	12.14	1668.76	834.38	2053.31	1028.18	2.72	-0.18	0.00	0.017
165.00	-7.40	-0.62	0.00	-8.92	0.00	8.92	1624.34	812.17	1921.31	962.08	2.91	-0.18	0.00	0.014
170.00	-3.41	-0.39	0.00	-5.81	0.00	5.81	1578.35	789.17	1791.75	897.21	3.11	-0.19	0.00	0.009
175.00	-2.96	-0.35	0.00	-3.87	0.00	3.87	1530.79	765.40	1664.88	833.68	3.31	-0.19	0.00	0.007
180.00	-2.52	-0.31	0.00	-2.10	0.00	2.10	1481.67	740.83	1540.90	771.60	3.51	-0.19	0.00	0.004
185.00	-2.11	-0.27	0.00	-0.53	0.00	0.53	1427.20	713.60	1416.30	709.20	3.72	-0.20	0.00	0.002
187.00	0.00	-0.26	0.00	0.00	0.00	0.00	1400.09	700.04	1362.73	682.38	3.80	-0.20	0.00	0.000

## Calculated Forces

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II





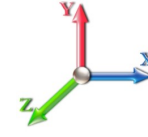
## Seismic Segment Forces (Factored)

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Load Case:</b> 0.9D + 1.0E					<b>Iterations</b> 21
<b>Gust Response Factor</b>	1.10			<b>Sds</b>	0.12
<b>Dead Load Factor</b>	0.90	<b>Seismic Load Factor</b>	1.00	<b>Sd1</b>	0.04
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.31	<b>SA</b>	0.01
				<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	0.01	0.00	0.00	
5.00		1722.7	0.00	0.03	0.02	24.94	
10.00		1691.6	0.01	0.05	0.03	32.50	
15.00		1660.6	0.01	0.06	0.03	36.05	
20.00		1629.6	0.02	0.07	0.04	37.63	
25.00		1598.5	0.04	0.07	0.04	38.22	
30.00		1567.5	0.05	0.07	0.04	38.34	
35.00		1536.4	0.07	0.07	0.04	38.32	
40.00		1505.4	0.09	0.07	0.04	38.30	
45.00		1474.3	0.11	0.07	0.04	38.32	
46.25	Bot - Section 2	363.74	0.12	0.07	0.03	9.51	
50.00		2040.8	0.14	0.07	0.03	54.23	
53.25	Top - Section 1	1742.2	0.16	0.07	0.03	46.91	
55.00		437.17	0.17	0.07	0.03	11.84	
60.00		1230.7	0.20	0.06	0.02	33.72	
65.00		1203.5	0.23	0.06	0.02	32.79	
70.00		1176.3	0.27	0.05	0.02	30.95	
75.00		1149.2	0.31	0.04	0.01	27.73	
80.00		1122.0	0.35	0.03	0.01	22.64	
85.00		1094.9	0.40	0.02	0.01	15.33	
90.00		1067.7	0.44	0.00	0.01	5.95	
92.00	Appurtenance(s)	2024.4	0.46	0.00	0.01	3.50	
93.75	Bot - Section 3	363.48	0.48	-0.01	0.01	-0.64	
95.00		482.50	0.49	-0.01	0.01	-2.06	
99.75	Top - Section 2	1804.7	0.54	-0.03	0.01	-24.45	
100.00		43.70	0.55	-0.03	0.01	-0.61	
105.00		861.80	0.60	-0.05	0.01	-19.05	
110.00		838.51	0.66	-0.07	0.02	-23.29	
115.00		815.23	0.72	-0.09	0.03	-25.18	
120.00		791.94	0.78	-0.11	0.05	-25.02	
125.00		768.66	0.85	-0.12	0.07	-23.16	
130.00	Appurtenance(s)	3162.2	0.92	-0.12	0.09	-84.38	
135.00		722.09	0.99	-0.11	0.13	-15.41	
140.00	Appurtenance(s)	2911.7	1.06	-0.09	0.17	-41.19	
142.75	Bot - Section 4	374.42	1.10	-0.07	0.19	-3.52	
145.00		505.63	1.14	-0.04	0.21	-2.59	
147.25	Top - Section 3	497.77	1.18	-0.02	0.24	-0.23	
150.00		241.87	1.22	0.02	0.27	1.39	
155.00		427.74	1.30	0.12	0.34	7.92	
160.00	Appurtenance(s)	2894.5	1.39	0.26	0.42	96.09	
165.00		396.69	1.47	0.44	0.51	19.77	
170.00	Appurtenance(s)	3237.7	1.56	0.67	0.62	221.78	
175.00		365.64	1.66	0.96	0.75	32.62	
180.00		350.12	1.75	1.33	0.90	39.23	
185.00		334.60	1.85	1.78	1.07	45.85	
187.00	Appurtenance(s)	1754.9	1.89	1.98	1.14	259.10	

## Seismic Segment Forces (Factored)

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**Totals:** 53,988.4

1,050.7

**Total Wind:** 45,151.9

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

## Calculated Forces

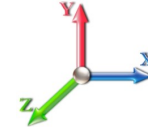
<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



**Load Case:** 0.9D + 1.0E

**Iterations** 21

<b>Gust Response Factor</b> 1.10	<b>Sds</b> 0.12	<b>Ss</b> 0.18
<b>Dead Load Factor</b> 0.90	<b>Seismic Load Factor</b> 1.00	<b>Sd1</b> 0.04
<b>Wind Load Factor</b> 0.00	<b>Structure Frequency</b> 0.31	<b>SA</b> 0.01
	<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	-55.43	-1.34	0.00	-159.60	0.00	159.60	7001.91	3500.96	18524.4	9276.01	0.00	0.00	0.00	0.025
5.00	-53.66	-1.32	0.00	-152.89	0.00	152.89	6919.93	3459.96	17978.0	9002.40	0.00	0.00	0.00	0.025
10.00	-51.92	-1.29	0.00	-146.28	0.00	146.28	6836.37	3418.19	17435.4	8730.69	0.01	-0.01	0.024	0.024
15.00	-50.21	-1.26	0.00	-139.82	0.00	139.82	6751.25	3375.63	16896.9	8461.01	0.02	-0.01	0.024	0.024
20.00	-48.52	-1.23	0.00	-133.52	0.00	133.52	6664.57	3332.28	16362.6	8193.47	0.04	-0.02	0.024	0.024
25.00	-46.86	-1.19	0.00	-127.39	0.00	127.39	6576.31	3288.16	15832.7	7928.16	0.06	-0.02	0.023	0.023
30.00	-45.23	-1.15	0.00	-121.44	0.00	121.44	6486.49	3243.25	15307.6	7665.22	0.08	-0.03	0.023	0.023
35.00	-43.63	-1.12	0.00	-115.66	0.00	115.66	6395.11	3197.55	14787.5	7404.75	0.11	-0.03	0.022	0.022
40.00	-42.05	-1.08	0.00	-110.07	0.00	110.07	6302.15	3151.08	14272.4	7146.85	0.14	-0.03	0.022	0.022
45.00	-40.50	-1.05	0.00	-104.65	0.00	104.65	6207.63	3103.82	13762.8	6891.65	0.18	-0.04	0.022	0.022
46.25	-40.12	-1.04	0.00	-103.34	0.00	103.34	6183.76	3091.88	13636.3	6828.29	0.19	-0.04	0.022	0.022
50.00	-38.12	-0.98	0.00	-99.45	0.00	99.45	6111.55	3055.77	13258.8	6639.26	0.22	-0.04	0.021	0.021
53.25	-36.41	-0.94	0.00	-96.25	0.00	96.25	5153.03	2576.51	11233.0	5624.85	0.26	-0.05	0.024	0.024
55.00	-35.94	-0.93	0.00	-94.61	0.00	94.61	5126.51	2563.25	11089.7	5553.12	0.27	-0.05	0.024	0.024
60.00	-34.61	-0.90	0.00	-89.97	0.00	89.97	5049.68	2524.84	10683.1	5349.50	0.33	-0.05	0.024	0.024
65.00	-33.31	-0.86	0.00	-85.49	0.00	85.49	4971.29	2485.64	10280.5	5147.92	0.39	-0.06	0.023	0.023
70.00	-32.03	-0.84	0.00	-81.17	0.00	81.17	4891.33	2445.66	9882.29	4948.49	0.45	-0.06	0.023	0.023
75.00	-30.77	-0.81	0.00	-76.99	0.00	76.99	4809.80	2404.90	9488.55	4751.33	0.52	-0.07	0.023	0.023
80.00	-29.54	-0.79	0.00	-72.95	0.00	72.95	4726.70	2363.35	9099.56	4556.54	0.60	-0.07	0.022	0.022
85.00	-28.34	-0.77	0.00	-69.01	0.00	69.01	4642.04	2321.02	8715.55	4364.25	0.68	-0.08	0.022	0.022
90.00	-27.15	-0.77	0.00	-65.14	0.00	65.14	4555.82	2277.91	8336.73	4174.56	0.76	-0.09	0.022	0.022
92.00	-25.24	-0.76	0.00	-63.61	0.00	63.61	4520.89	2260.44	8186.70	4099.44	0.80	-0.09	0.021	0.021
93.75	-24.84	-0.76	0.00	-62.27	0.00	62.27	4490.12	2245.06	8056.16	4034.07	0.83	-0.09	0.021	0.021
95.00	-24.35	-0.76	0.00	-61.32	0.00	61.32	4468.02	2234.01	7963.33	3987.58	0.86	-0.09	0.021	0.021
99.75	-22.52	-0.76	0.00	-57.69	0.00	57.69	3653.35	1826.67	6478.28	3243.96	0.95	-0.10	0.024	0.024
100.00	-22.47	-0.76	0.00	-57.50	0.00	57.50	3649.96	1824.98	6463.57	3236.59	0.96	-0.10	0.024	0.024
105.00	-21.48	-0.76	0.00	-53.69	0.00	53.69	3581.25	1790.63	6171.38	3090.28	1.06	-0.10	0.023	0.023
110.00	-20.51	-0.76	0.00	-49.87	0.00	49.87	3510.98	1755.49	5883.11	2945.93	1.18	-0.11	0.023	0.023
115.00	-19.56	-0.76	0.00	-46.05	0.00	46.05	3439.14	1719.57	5598.97	2803.65	1.30	-0.12	0.022	0.022
120.00	-18.63	-0.76	0.00	-42.23	0.00	42.23	3365.73	1682.87	5319.21	2663.56	1.42	-0.12	0.021	0.021
125.00	-17.72	-0.76	0.00	-38.41	0.00	38.41	3290.76	1645.38	5044.03	2525.77	1.56	-0.13	0.021	0.021
130.00	-14.66	-0.76	0.00	-34.58	0.00	34.58	3204.00	1602.00	4758.48	2382.78	1.70	-0.14	0.019	0.019
135.00	-13.81	-0.76	0.00	-30.79	0.00	30.79	3102.32	1551.16	4459.76	2233.19	1.85	-0.14	0.018	0.018
140.00	-10.99	-0.75	0.00	-26.99	0.00	26.99	3000.64	1500.32	4170.72	2088.46	2.00	-0.15	0.017	0.017
142.75	-10.58	-0.75	0.00	-24.92	0.00	24.92	2944.72	1472.36	4015.87	2010.92	2.09	-0.15	0.016	0.016
145.00	-10.06	-0.75	0.00	-23.23	0.00	23.23	2898.96	1449.48	3891.36	1948.57	2.16	-0.16	0.015	0.015
147.25	-9.55	-0.75	0.00	-21.54	0.00	21.54	1774.96	887.48	2399.50	1201.53	2.24	-0.16	0.023	0.023
150.00	-9.25	-0.75	0.00	-19.48	0.00	19.48	1752.91	876.46	2323.79	1163.62	2.33	-0.16	0.022	0.022
155.00	-8.73	-0.74	0.00	-15.73	0.00	15.73	1711.62	855.81	2187.55	1095.40	2.50	-0.17	0.019	0.019
160.00	-5.98	-0.64	0.00	-12.03	0.00	12.03	1668.76	834.38	2053.31	1028.18	2.68	-0.18	0.015	0.015
165.00	-5.55	-0.62	0.00	-8.85	0.00	8.85	1624.34	812.17	1921.31	962.08	2.87	-0.18	0.013	0.013
170.00	-2.56	-0.38	0.00	-5.77	0.00	5.77	1578.35	789.17	1791.75	897.21	3.07	-0.19	0.008	0.008
175.00	-2.22	-0.35	0.00	-3.84	0.00	3.84	1530.79	765.40	1664.88	833.68	3.26	-0.19	0.006	0.006
180.00	-1.89	-0.31	0.00	-2.08	0.00	2.08	1481.67	740.83	1540.90	771.60	3.46	-0.19	0.004	0.004
185.00	-1.58	-0.26	0.00	-0.53	0.00	0.53	1427.20	713.60	1416.30	709.20	3.66	-0.19	0.002	0.002
187.00	0.00	-0.26	0.00	0.00	0.00	0.00	1400.09	700.04	1362.73	682.38	3.75	-0.19	0.000	0.000

## Calculated Forces

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

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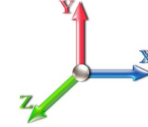
## Wind Loading - Shaft

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 23

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	303.70	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	298.31	0.650	0.000	5.00	27.207	17.68	144.8	0.0	1722.7
10.00		1.00	0.85	7.442	8.19	292.93	0.650	0.000	5.00	26.721	17.37	142.2	0.0	1691.7
15.00		1.00	0.86	7.534	8.29	289.32	0.650	0.000	5.00	26.234	17.05	141.3	0.0	1660.6
20.00		1.00	0.91	7.978	8.78	292.15	0.650	0.000	5.00	25.748	16.74	146.9	0.0	1629.6
25.00		1.00	0.95	8.345	9.18	293.09	0.650	0.000	5.00	25.261	16.42	150.7	0.0	1598.6
30.00		1.00	0.99	8.659	9.53	292.76	0.650	0.000	5.00	24.775	16.10	153.4	0.0	1567.5
35.00		1.00	1.02	8.936	9.83	291.51	0.650	0.000	5.00	24.288	15.79	155.2	0.0	1536.5
40.00		1.00	1.05	9.184	10.10	289.55	0.650	0.000	5.00	23.802	15.47	156.3	0.0	1505.4
45.00		1.00	1.07	9.410	10.35	287.02	0.650	0.000	5.00	23.315	15.15	156.9	0.0	1474.4
46.25	Bot - Section 2	1.00	1.08	9.463	10.41	286.32	0.650	0.000	1.25	5.753	3.74	38.9	0.0	363.7
50.00		1.00	1.10	9.616	10.58	284.04	0.650	0.000	3.75	17.353	11.28	119.3	0.0	2040.8
53.25	Top - Section 1	1.00	1.11	9.742	10.72	281.89	0.650	0.000	3.25	14.818	9.63	103.2	0.0	1742.2
55.00		1.00	1.12	9.807	10.79	285.37	0.650	0.000	1.75	7.894	5.13	55.4	0.0	437.2
60.00		1.00	1.14	9.986	10.98	281.72	0.650	0.000	5.00	22.226	14.45	158.7	0.0	1230.7
65.00		1.00	1.16	10.153	11.17	277.78	0.650	0.000	5.00	21.739	14.13	157.8	0.0	1203.6
70.00		1.00	1.18	10.310	11.34	273.59	0.650	0.000	5.00	21.253	13.81	156.7	0.0	1176.4
75.00		1.00	1.19	10.459	11.50	269.17	0.650	0.000	5.00	20.766	13.50	155.3	0.0	1149.2
80.00		1.00	1.21	10.600	11.66	264.56	0.650	0.000	5.00	20.280	13.18	153.7	0.0	1122.1
85.00		1.00	1.23	10.734	11.81	259.77	0.650	0.000	5.00	19.793	12.87	151.9	0.0	1094.9
90.00		1.00	1.24	10.863	11.95	254.81	0.650	0.000	5.00	19.307	12.55	150.0	0.0	1067.7
92.00	Appurtenance(s)	1.00	1.25	10.913	12.00	252.79	0.650	0.000	2.00	7.586	4.93	59.2	0.0	419.5
93.75	Bot - Section 3	1.00	1.25	10.956	12.05	251.00	0.650	0.000	1.75	6.574	4.27	51.5	0.0	363.5
95.00		1.00	1.25	10.986	12.08	249.71	0.650	0.000	1.25	4.739	3.08	37.2	0.0	482.5
99.75	Top - Section 2	1.00	1.27	11.098	12.21	244.74	0.650	0.000	4.75	17.730	11.52	140.7	0.0	1804.8
100.00		1.00	1.27	11.104	12.21	248.77	0.650	0.000	0.25	0.921	0.60	7.3	0.0	43.7
105.00		1.00	1.28	11.218	12.34	243.43	0.650	0.000	5.00	18.165	11.81	145.7	0.0	861.8
110.00		1.00	1.29	11.327	12.46	237.97	0.650	0.000	5.00	17.678	11.49	143.2	0.0	838.5
115.00		1.00	1.31	11.432	12.58	232.40	0.650	0.000	5.00	17.192	11.17	140.5	0.0	815.2
120.00		1.00	1.32	11.534	12.69	226.74	0.650	0.000	5.00	16.705	10.86	137.8	0.0	791.9
125.00		1.00	1.33	11.633	12.80	220.98	0.650	0.000	5.00	16.219	10.54	134.9	0.0	768.7
130.00	Appurtenance(s)	1.00	1.34	11.729	12.90	215.13	0.650	0.000	5.00	15.732	10.23	131.9	0.0	745.4
135.00		1.00	1.35	11.822	13.00	209.19	0.650	0.000	5.00	15.246	9.91	128.9	0.0	722.1
140.00	Appurtenance(s)	1.00	1.36	11.912	13.10	203.18	0.650	0.000	5.00	14.759	9.59	125.7	0.0	698.8
142.75	Bot - Section 4	1.00	1.37	11.961	13.16	199.84	0.650	0.000	2.75	7.910	5.14	67.6	0.0	374.4
145.00		1.00	1.37	12.000	13.20	197.09	0.650	0.000	2.25	6.458	4.20	55.4	0.0	505.6
147.25	Top - Section 3	1.00	1.37	12.038	13.24	194.33	0.650	0.000	2.25	6.359	4.13	54.7	0.0	497.8
150.00		1.00	1.38	12.085	13.29	193.92	0.650	0.000	2.75	7.638	4.97	66.0	0.0	241.9
155.00		1.00	1.39	12.168	13.39	187.70	0.650	0.000	5.00	13.511	8.78	117.6	0.0	427.7
160.00	Appurtenance(s)	1.00	1.40	12.249	13.47	181.42	0.650	0.000	5.00	13.025	8.47	114.1	0.0	412.2
165.00		1.00	1.41	12.328	13.56	175.08	0.650	0.000	5.00	12.538	8.15	110.5	0.0	396.7
170.00	Appurtenance(s)	1.00	1.42	12.406	13.65	168.67	0.650	0.000	5.00	12.052	7.83	106.9	0.0	381.2
175.00		1.00	1.43	12.481	13.73	162.22	0.650	0.000	5.00	11.565	7.52	103.2	0.0	365.6
180.00		1.00	1.43	12.555	13.81	155.70	0.650	0.000	5.00	11.079	7.20	99.5	0.0	350.1
185.00		1.00	1.44	12.627	13.89	149.14	0.650	0.000	5.00	10.592	6.88	95.6	0.0	334.6
187.00	Appurtenance(s)	1.00	1.45	12.656	13.92	146.50	0.650	0.000	2.00	4.101	2.67	37.1	0.0	129.5

## Wind Loading - Shaft

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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Totals: 187.00

5,161.1

40,789.2

## Discrete Appurtenance Forces

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 23

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	187.00	ANT450F6	1	12.711	13.982	1.00	1.00	1.86	21.00	0.000	3.917	26.01	0.00	101.86
2	187.00	MF-900B	2	12.656	13.921	1.00	1.00	6.90	26.00	2.015	0.000	96.06	193.60	0.00
3	187.00	ANT900D6-9	2	12.685	13.953	1.00	1.00	1.96	22.00	0.000	2.042	27.35	0.00	55.84
4	187.00	6' Lightning rod	1	12.656	13.921	1.00	1.00	0.38	6.50	0.000	0.000	5.29	0.00	0.00
5	187.00	DB201	2	12.722	13.995	1.00	1.00	7.08	50.00	0.000	4.750	99.08	0.00	470.64
6	187.00	Low Profile Platform	1	12.656	13.921	1.00	1.00	22.00	1500.00	0.000	0.000	306.27	0.00	0.00
7	170.00	HPA-65R-BUU-H6	3	12.406	13.646	0.65	0.80	18.80	153.00	0.000	0.000	256.58	0.00	0.00
8	170.00	CS72188.01	1	12.406	13.646	0.80	0.80	0.10	0.32	0.000	0.000	1.31	0.00	0.00
9	170.00	RRUS-32 B2	3	12.406	13.646	0.65	0.80	5.33	180.00	0.000	0.000	72.69	0.00	0.00
10	170.00	Low Profile Platform w/	1	12.406	13.646	1.00	1.00	27.70	1700.00	0.000	0.000	378.00	0.00	0.00
11	170.00	7770	3	12.406	13.646	0.60	0.80	9.89	105.00	0.000	0.000	134.92	0.00	0.00
12	170.00	AM-X-CD-6500T-RET	3	12.406	13.646	0.62	0.80	15.03	145.50	0.000	0.000	205.14	0.00	0.00
13	170.00	DTMABP7819VG12A	6	12.406	13.646	0.55	0.80	3.73	115.08	0.000	0.000	50.93	0.00	0.00
14	170.00	782 10250	12	12.406	13.646	0.78	0.80	4.89	76.80	0.000	0.000	66.76	0.00	0.00
15	170.00	DBC-750	3	12.406	13.646	0.48	0.80	0.73	14.64	0.000	0.000	9.92	0.00	0.00
16	170.00	DC6-48-60-18-8F	1	12.406	13.646	0.80	0.80	1.18	32.80	0.000	0.000	16.05	0.00	0.00
17	170.00	ABT-DFDM-ADBH	3	12.406	13.646	0.78	0.80	0.12	3.42	0.000	0.000	1.60	0.00	0.00
18	170.00	RRUS 11	6	12.406	13.646	0.57	0.80	8.61	330.00	0.000	0.000	117.53	0.00	0.00
19	160.00	LNx-6515DS	3	12.249	13.474	0.67	0.80	22.99	150.90	0.000	0.000	309.82	0.00	0.00
20	160.00	AIR 21 B2A B4P	3	12.249	13.474	0.66	0.80	12.07	274.50	0.000	0.000	162.67	0.00	0.00
21	160.00	AIR 21 B4A B2P	3	12.249	13.474	0.66	0.80	12.07	270.90	0.000	0.000	162.67	0.00	0.00
22	160.00	Platform w/ Hand Rail	1	12.249	13.474	1.00	1.00	32.00	1600.00	0.000	0.000	431.18	0.00	0.00
23	160.00	Double TMA 17/21	3	12.249	13.474	0.58	0.80	0.71	33.00	0.000	0.000	9.56	0.00	0.00
24	160.00	S11B12	3	12.249	13.474	0.56	0.80	4.27	153.00	0.000	0.000	57.53	0.00	0.00
25	140.00	RRH2x60-1900	3	11.912	13.103	0.72	0.80	3.26	58.50	0.000	0.000	42.74	0.00	0.00
26	140.00	KS-24019	6	11.912	13.103	0.80	0.80	0.58	3.00	0.000	0.000	7.55	0.00	0.00
27	140.00	LNx-6514DS-VTM	3	11.912	13.103	0.64	0.80	15.53	99.30	0.000	0.000	203.53	0.00	0.00
28	140.00	FD9R6004/2C-3L	6	11.912	13.103	0.60	0.80	1.30	18.60	0.000	0.000	16.98	0.00	0.00
29	140.00	DB-T1-6Z-8AB-0Z	1	11.912	13.103	0.80	0.80	3.28	21.40	0.000	0.000	42.98	0.00	0.00
30	140.00	RRH2x40-07-U	3	11.912	13.103	0.62	0.80	4.17	152.10	0.000	0.000	54.70	0.00	0.00
31	140.00	Low Profile Platform	1	11.912	13.103	1.00	1.00	22.00	1500.00	0.000	0.000	288.27	0.00	0.00
32	140.00	HBXX-6517DS-A2M	6	11.912	13.103	0.62	0.80	31.60	244.80	0.000	0.000	414.07	0.00	0.00
33	140.00	LNx-6514DS-A1M	3	11.912	13.103	0.66	0.80	16.27	115.20	0.000	0.000	213.25	0.00	0.00
34	130.00	APXVSP18-C-A20	3	11.729	12.902	0.66	0.80	15.98	171.00	0.000	0.000	206.12	0.00	0.00
35	130.00	APXVTM14-C-120	3	11.729	12.902	0.63	0.80	12.02	168.00	0.000	0.000	155.09	0.00	0.00
36	130.00	TD-RRH8x20-25	3	11.729	12.902	0.55	0.80	6.71	210.00	0.000	0.000	86.53	0.00	0.00
37	130.00	1900MHz RRH	3	11.729	12.902	0.70	0.80	8.03	132.00	0.000	0.000	103.54	0.00	0.00
38	130.00	800MHz Filter	3	11.729	12.902	0.55	0.80	1.29	26.40	0.000	0.000	16.66	0.00	0.00
39	130.00	800 MHz RRH	3	11.729	12.902	0.74	0.80	5.50	159.00	0.000	0.000	70.93	0.00	0.00
40	130.00	RF Filters	3	11.729	12.902	0.54	0.80	1.50	46.50	0.000	0.000	19.29	0.00	0.00
41	130.00	ACU-A20-N	4	11.729	12.902	0.63	0.80	0.35	4.00	0.000	0.000	4.57	0.00	0.00
42	130.00	Low Profile Platform	1	11.729	12.902	1.00	1.00	22.00	1500.00	0.000	0.000	283.84	0.00	0.00
43	92.00	Low Profile Platform	1	10.913	12.004	1.00	1.00	22.00	1500.00	0.000	0.000	264.09	0.00	0.00
44	92.00	DB205	1	11.127	12.240	0.80	0.80	1.44	38.00	0.000	9.000	17.63	0.00	158.63
45	92.00	ANT450Y10-WR	1	10.913	12.004	0.80	0.80	0.39	5.00	0.000	0.000	4.71	0.00	0.00
46	92.00	ANT150D3	1	11.034	12.137	0.80	0.80	1.74	18.00	0.000	5.000	21.17	0.00	105.84
47	92.00	ANT4506-9	1	10.986	12.085	0.80	0.80	2.22	18.00	0.000	3.000	26.78	0.00	80.34

## Discrete Appurtenance Forces

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II
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48	92.00 MF-900B	2	10.913	12.004	0.80	0.80	5.52	26.00	2.887	0.000	66.26	191.29	0.00
<b>Totals:</b>											<b>13,199.16</b>	<b>5,636.17</b>	



## Total Applied Force Summary

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

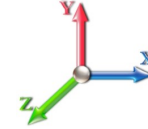


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**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00



**Iterations** 23

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		144.77	1967.50	0.00	0.00
10.00		142.18	1936.45	0.00	0.00
15.00		141.31	1905.41	0.00	0.00
20.00		146.87	1874.36	0.00	0.00
25.00		150.72	1843.32	0.00	0.00
30.00		153.39	1812.27	0.00	0.00
35.00		155.19	1781.22	0.00	0.00
40.00		156.30	1750.18	0.00	0.00
45.00		156.86	1719.13	0.00	0.00
46.25		38.92	424.93	0.00	0.00
50.00		119.32	2224.40	0.00	0.00
53.25		103.22	1901.32	0.00	0.00
55.00		55.36	522.84	0.00	0.00
60.00		158.69	1475.48	0.00	0.00
65.00		157.81	1448.32	0.00	0.00
70.00		156.67	1421.15	0.00	0.00
75.00		155.29	1393.99	0.00	0.00
80.00		153.70	1366.82	0.00	0.00
85.00		151.92	1339.66	0.00	0.00
90.00		149.96	1312.49	0.00	0.00
92.00	(7) attachments	459.82	2122.39	191.29	344.80
93.75		51.50	447.47	0.00	0.00
95.00		37.22	542.49	0.00	0.00
99.75		140.69	2032.72	0.00	0.00
100.00		7.31	55.70	0.00	0.00
105.00		145.69	1101.76	0.00	0.00
110.00		143.17	1078.47	0.00	0.00
115.00		140.53	1055.19	0.00	0.00
120.00		137.77	1031.90	0.00	0.00
125.00		134.90	1008.62	0.00	0.00
130.00	(26) attachments	1078.51	3402.23	0.00	0.00
135.00		128.86	945.74	0.00	0.00
140.00	(32) attachments	1409.77	3135.35	0.00	0.00
142.75		67.65	459.64	0.00	0.00
145.00		55.41	575.36	0.00	0.00
147.25		54.74	567.50	0.00	0.00
150.00		66.00	327.09	0.00	0.00
155.00		117.55	582.69	0.00	0.00
160.00	(16) attachments	1247.50	3049.46	0.00	0.00
165.00		110.52	483.74	0.00	0.00
170.00	(45) attachments	1418.32	3324.78	0.00	0.00
175.00		103.21	376.64	0.00	0.00
180.00		99.45	361.12	0.00	0.00
185.00		95.63	345.60	0.00	0.00
187.00	(9) attachments	597.16	1759.39	193.60	628.33

## Total Applied Force Summary

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Totals:</b>	<b>10,797.29</b>	<b>61,594.28</b>	<b>384.89</b>	<b>973.13</b>
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## Calculated Forces

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	<b>12/16/2016</b>
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

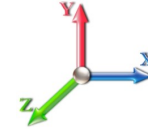


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**Load Case:** 1.0D + 1.0W 60 mph Wind

**Iterations** 23

**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	-61.59	-10.82	-0.38	-1357.1	0.00	1357.18	7001.91	3500.96	18524.4	9276.01	0.00	0.000	0.000	0.155
5.00	-59.62	-10.71	-0.38	-1303.1	0.00	1303.10	6919.93	3459.96	17978.0	9002.40	0.02	-0.035	0.000	0.153
10.00	-57.67	-10.60	-0.38	-1249.5	0.00	1249.56	6836.37	3418.19	17435.4	8730.69	0.08	-0.071	0.000	0.152
15.00	-55.76	-10.49	-0.38	-1196.5	0.00	1196.56	6751.25	3375.63	16896.9	8461.01	0.17	-0.107	0.000	0.150
20.00	-53.88	-10.38	-0.38	-1144.1	0.00	1144.11	6664.57	3332.28	16362.6	8193.47	0.30	-0.144	0.000	0.148
25.00	-52.03	-10.25	-0.38	-1092.2	0.00	1092.23	6576.31	3288.16	15832.7	7928.16	0.47	-0.181	0.000	0.146
30.00	-50.21	-10.13	-0.38	-1040.9	0.00	1040.97	6486.49	3243.25	15307.6	7665.22	0.68	-0.219	0.000	0.144
35.00	-48.43	-10.00	-0.38	-990.34	0.00	990.34	6395.11	3197.55	14787.5	7404.75	0.93	-0.257	0.000	0.141
40.00	-46.67	-9.86	-0.38	-940.36	0.00	940.36	6302.15	3151.08	14272.4	7146.85	1.22	-0.295	0.000	0.139
45.00	-44.95	-9.72	-0.38	-891.04	0.00	891.04	6207.63	3103.82	13762.8	6891.65	1.55	-0.334	0.000	0.137
46.25	-44.52	-9.69	-0.38	-878.90	0.00	878.90	6183.76	3091.88	13636.3	6828.29	1.64	-0.344	0.000	0.136
50.00	-42.29	-9.58	-0.38	-842.57	0.00	842.57	6111.55	3055.77	13258.8	6639.26	1.92	-0.373	0.000	0.134
53.25	-40.39	-9.47	-0.38	-811.44	0.00	811.44	5153.03	2576.51	11233.0	5624.85	2.19	-0.399	0.000	0.152
55.00	-39.86	-9.44	-0.38	-794.86	0.00	794.86	5126.51	2563.25	11089.7	5553.12	2.34	-0.413	0.000	0.151
60.00	-38.38	-9.29	-0.38	-747.69	0.00	747.69	5049.68	2524.84	10683.1	5349.50	2.79	-0.456	0.000	0.147
65.00	-36.93	-9.15	-0.38	-701.22	0.00	701.22	4971.29	2485.64	10280.5	5147.92	3.29	-0.499	0.000	0.144
70.00	-35.50	-9.01	-0.38	-655.46	0.00	655.46	4891.33	2445.66	9882.29	4948.49	3.84	-0.542	0.000	0.140
75.00	-34.10	-8.87	-0.38	-610.41	0.00	610.41	4809.80	2404.90	9488.55	4751.33	4.43	-0.585	0.000	0.136
80.00	-32.73	-8.72	-0.38	-566.09	0.00	566.09	4726.70	2363.35	9099.56	4556.54	5.06	-0.628	0.000	0.131
85.00	-31.38	-8.58	-0.38	-522.48	0.00	522.48	4642.04	2321.02	8715.55	4364.25	5.74	-0.671	0.000	0.126
90.00	-30.07	-8.43	-0.38	-479.59	0.00	479.59	4555.82	2277.91	8336.73	4174.56	6.47	-0.713	0.000	0.121
92.00	-27.95	-7.95	-0.19	-462.39	0.00	462.39	4520.89	2260.44	8186.70	4099.44	6.77	-0.730	0.000	0.119
93.75	-27.50	-7.90	-0.19	-448.47	0.00	448.47	4490.12	2245.06	8056.16	4034.07	7.04	-0.745	0.000	0.117
95.00	-26.96	-7.87	-0.19	-438.60	0.00	438.60	4468.02	2234.01	7963.33	3987.58	7.24	-0.756	0.000	0.116
99.75	-24.92	-7.71	-0.19	-401.24	0.00	401.24	3653.35	1826.67	6478.28	3243.96	8.01	-0.795	0.000	0.131
100.00	-24.86	-7.71	-0.19	-399.31	0.00	399.31	3649.96	1824.98	6463.57	3236.59	8.05	-0.797	0.000	0.130
105.00	-23.76	-7.57	-0.19	-360.77	0.00	360.77	3581.25	1790.63	6171.38	3090.28	8.91	-0.842	0.000	0.123
110.00	-22.68	-7.42	-0.19	-322.94	0.00	322.94	3510.98	1755.49	5883.11	2945.93	9.82	-0.886	0.000	0.116
115.00	-21.62	-7.28	-0.19	-285.83	0.00	285.83	3439.14	1719.57	5598.97	2803.65	10.77	-0.928	0.000	0.108
120.00	-20.58	-7.14	-0.19	-249.42	0.00	249.42	3365.73	1682.87	5319.21	2663.56	11.76	-0.969	0.000	0.100
125.00	-19.57	-7.00	-0.19	-213.71	0.00	213.71	3290.76	1645.38	5044.03	2525.77	12.80	-1.007	-0.001	0.091
130.00	-16.19	-5.87	-0.19	-178.71	0.00	178.71	3204.00	1602.00	4758.48	2382.78	13.87	-1.043	-0.001	0.080
135.00	-15.24	-5.73	-0.19	-149.35	0.00	149.35	3102.32	1551.16	4459.76	2233.19	14.98	-1.075	-0.001	0.072
140.00	-12.13	-4.27	-0.19	-120.68	0.00	120.68	3000.64	1500.32	4170.72	2088.46	16.13	-1.105	-0.001	0.062
142.75	-11.67	-4.20	-0.19	-108.94	0.00	108.94	2944.72	1472.36	4015.87	2010.92	16.77	-1.120	-0.001	0.058
145.00	-11.10	-4.13	-0.19	-99.50	0.00	99.50	2898.96	1449.48	3891.36	1948.57	17.30	-1.132	-0.001	0.055
147.25	-10.53	-4.07	-0.19	-90.21	0.00	90.21	1774.96	887.48	2399.50	1201.53	17.83	-1.144	-0.001	0.081
150.00	-10.20	-4.00	-0.19	-79.02	0.00	79.02	1752.91	876.46	2323.79	1163.62	18.50	-1.157	-0.001	0.074
155.00	-9.62	-3.87	-0.19	-59.03	0.00	59.03	1711.62	855.81	2187.55	1095.40	19.72	-1.186	-0.001	0.060
160.00	-6.60	-2.56	-0.19	-39.66	0.00	39.66	1668.76	834.38	2053.31	1028.18	20.98	-1.209	-0.001	0.043
165.00	-6.12	-2.45	-0.19	-26.83	0.00	26.83	1624.34	812.17	1921.31	962.08	22.26	-1.227	-0.001	0.032
170.00	-2.82	-0.96	-0.19	-14.61	0.00	14.61	1578.35	789.17	1791.75	897.21	23.55	-1.239	-0.001	0.018
175.00	-2.45	-0.85	-0.19	-9.82	0.00	9.82	1530.79	765.40	1664.88	833.68	24.85	-1.247	-0.001	0.013
180.00	-2.09	-0.74	-0.19	-5.59	0.00	5.59	1481.67	740.83	1540.90	771.60	26.16	-1.253	-0.001	0.009
185.00	-1.75	-0.64	-0.19	-1.90	0.00	1.90	1427.20	713.60	1416.30	709.20	27.47	-1.256	-0.002	0.004
187.00	0.00	-0.60	-0.19	-0.63	0.00	0.63	1400.09	700.04	1362.73	682.38	28.00	-1.257	-0.002	0.001

## Final Analysis Summary

<b>Structure:</b> CT07824-S-SBA	<b>Code:</b> EIA/TIA-222-G	12/16/2016
<b>Site Name:</b> South Windsor	<b>Exposure:</b> C	
<b>Height:</b> 187.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 1.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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### Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 97 mph Wind	45.3	0.00	73.85	0.01	0.99	5709.29
0.9D + 1.6W 97 mph Wind	45.2	0.00	55.37	0.01	0.99	5649.59
1.2D + 1.0Di + 1.0Wi 50 mph Wind	15.4	0.00	119.67	0.03	2.75	2051.31
1.2D + 1.0E	1.3	0.00	73.91	0.00	0.00	161.40
0.9D + 1.0E	1.3	0.00	55.43	0.00	0.00	159.60
1.0D + 1.0W 60 mph Wind	10.8	0.00	61.59	0.00	0.38	1357.18

### 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 97 mph Wind	-73.85	-45.25	-0.99	-5709.2	-0.01	-5709.2	7001.91	3500.9	18524.4	9276.01	0.00	0.626
0.9D + 1.6W 97 mph Wind	-55.37	-45.22	-0.99	-5649.5	-0.01	-5649.5	7001.91	3500.9	18524.4	9276.01	0.00	0.617
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-86.34	-14.10	-2.75	-1257.7	-0.03	-1257.7	5153.03	2576.5	11233.0	5624.85	53.25	0.240
1.2D + 1.0E	-73.91	-1.34	0.00	-161.40	0.00	-161.40	7001.91	3500.9	18524.4	9276.01	0.00	0.028
0.9D + 1.0E	-55.43	-1.34	0.00	-159.60	0.00	-159.60	7001.91	3500.9	18524.4	9276.01	0.00	0.025
1.0D + 1.0W 60 mph Wind	-61.59	-10.82	-0.38	-1357.1	0.00	-1357.1	7001.91	3500.9	18524.4	9276.01	0.00	0.155



# Monopole Mat Foundation Design

Date  
12/16/2016

<b>Customer Name:</b>	AT&T	<b>EIA/TIA Standard:</b>	EIA-222-G
<b>Site Name:</b>	South Windsor	<b>Structure Height (Ft.):</b>	187
<b>Site Number:</b>	CT07824-S-SBA	<b>Engineer Name:</b>	J. Tibbetts
<b>Engr. Number:</b>	28451	<b>Engineer Login ID:</b>	

**Foundation Info Obtained from:**

Drawings/Calculations

**Structure Type:**

Monopole

**Analysis or Design?**

Analysis

**Base Reactions (Factored):**

Axial Load (Kips):	73.9	Shear Force (Kips):	45.3
Uplift Force (Kips):	0.0	Moment (Kips-ft):	5709.3

Allowable overstress %: 5.0%

**Foundation Geometries:**

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	8.0	Depth of Base BG (ft.):	12.0
Pier Height A. G. (ft.):	1.00	Thickness of Pad (ft):	2.50
Length of Pad (ft.):	24.5	Width of Pad (ft.):	24.5

Final Length of pad (ft)	24.5	Final width of pad (ft):	24.5
Control Value for Cell D18:	0	Control Value for Cell F18:	0

**Material Properties and Rebar Info:**

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	10	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	36	Tie Spacing (in):	6.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	10	
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):	42	Qty. of Rebar in Pad (W):	42
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Rebar at the top of the concrete pad:

Qty. of Rebar in Pad (L):	42	Qty. of Rebar in Pad (W):	42
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Apply 1.35 factor for e/w Per G: 1.35

**Soil Design Parameters:**

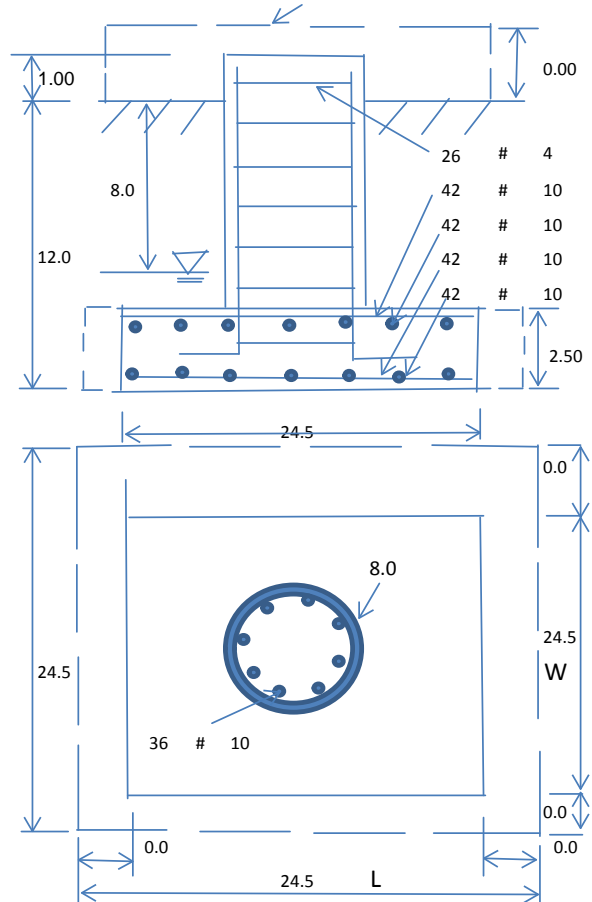
Soil Unit Weight (pcf):	120.0	Soil Buoyant Weight:	50.0	Pcf	
Water Table B.G.S. (ft):	8.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad: 30
Ultimate Bearing Pressure (psf):	8000	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad: 25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad: 25
Consider soil hori. force for O.T.M.:	No	Reduction factor on the maximum soil bearing pressure:	1.00		

**Foundation Analysis and Design:**

Uplift Strength Reduction Factor:	0.75	Compression Strength Reduction Factor:	0.75
Total Dry Soil Volume (cu. Ft.):	4399.88	Total Dry Soil Weight (Kips):	527.99
Total Buoyant Soil Volume (cu. Ft.):	889.38	Total Buoyant Soil Weight (Kips):	44.47
Total Effective Soil Weight (Kips):	572.45	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	452.39	Total Dry Concrete Weight (Kips):	67.86
Total Buoyant Concrete Volume (cu. Ft.):	1576.02	Total Buoyant Concrete Weight (Kips):	138.06
Total Effective Concrete Weight (Kips):	205.92	Total Vertical Load on Base (Kips):	852.22

**Check Soil Capacities:**

Calculated Maxium Net Soil Pressure under the base (psf):	4972	<	Allowable Factored Soil Bearing (psf):	6000	0.83	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	9450.7	>	Design Factored Momont (kips-ft):	6298	0.67	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.50					OK!



**Check the capacities of Reinforcing Concrete:**

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75
Strength reduction factor (Axial compression):	0.65	Wind Load Factor on Concrete Design:	1.00

Load/  
Capacity  
Ratio

(1) Concrete Pier:

Vertical Steel Rebar Area (sq. in./each):	1.27	Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	8929.3	> Design Factored Moment (Mu, Kips-Ft)	6185.0	0.69	OK!
Calculated Shear Capacity (Kips):	993.9	> Design Factored Shear (Kips):	45.3	0.05	OK!
Calculated Tension Capacity (Tn, Kips):	2468.9	> Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	12716.4	> Design Factored Axial Load (Pu Kips):	73.9	0.01	OK!
Moment & Axial Strength Combination(Pu/Pn+Mu/Mn):	0.70	OK! Check Tie Spacing (Design/Required):		0.5	OK!
Pier Reinforcement Ratio:	0.006	Reinforcement Ratio is satisfied per ACI			

(2).Concrete Pad:

One-Way Design Shear Capacity (L-Direction, Kips):	735.6	> One-Way Factored Shear (L-D. Kips):	410.3	0.56	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	735.6	> One-Way Factored Shear (W-D., Kips)	410.3	0.56	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	800.1	> One-Way Factored Shear (C-C, Kips):	645.6	0.81	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct. ):	0.0069	OK! Lower Steel Pad Reinf. Ratio (W-Direc	0.0069		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	5946.5	> Moment at Bottom ( L-Direct. K-Ft):	1241.5	0.21	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	5946.5	> Moment at Bottom ( W-Direct. K-Ft):	1241.5	0.21	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	8246.5	> Moment at Bottom ( C-C Dir. K-Ft):	1755.7	0.21	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct. ):	0.0069	OK! Upper Steel Reinf. Ratio (W-Direct. ):	0.0069		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	5946.5	> Moment at the top (L-Dir Kips-Ft):	783.6	0.13	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	5946.5	> Moment at the top (W-Dir Kips-Ft):	783.6	0.13	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	8246.5	> Moment at the top (C-C Direc. K-Ft):	595.9	0.07	OK!

**PROJECT TEAM**

**SITE ACQUISITION & ZONING:**  
 SBA COMMUNICATIONS CORP.  
 134 FLANDERS ROAD, SUITE 125  
 WESTBOROUGH, MA 01581

**ENGINEERING:**  
 TRYLON TSF  
 1825 W. WALNUT HILL LANE SUITE 302  
 IRVING, TX 75038  
 PHONE: 1-855-669-5421

**RF ENGINEER:**  
 AT&T MOBILITY - NEW ENGLAND  
 550 COCHITUATE ROAD  
 SUITE 550 13 & 14  
 FRAMINGHAM, MA 01701  
 CAMERON SYME  
 508-596-7146  
 cs6970@att.com

**CONSTRUCTION MANAGEMENT:**  
 EMPIRE TELECOM  
 16 ESQUIRE ROAD  
 BILLERICA, MA 01821  
 GRZEGORZ "GREG" DORMAN  
 484-683-1750  
 gdorman@empiretelecomm.com

**TOWER OWNER:**  
 SBA PROPERTIES, LLC

**SBA SITE ID:** CT07824-S  
**SBA SITE NAME:** SOUTH WINDSOR  
**SBA REGIONAL SITE MANAGER:** STEPHEN ROTH  
 (860)539-4920  
 sroth@sbasite.com

**GENERAL NOTES**

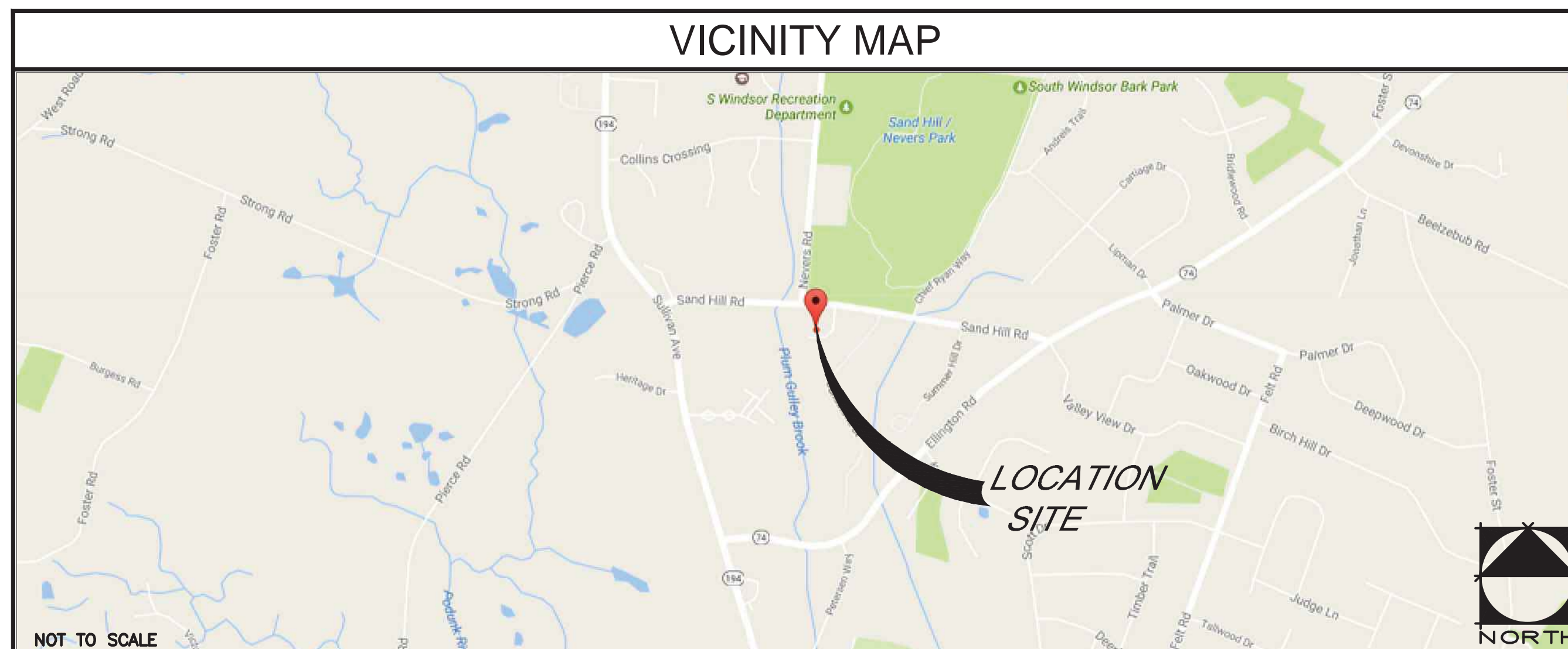
**DO NOT SCALE DRAWINGS**  
 CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.  
 THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

**SITE INFORMATION**

**LATITUDE:** 41° 50' 9.57084" N  
**LONGITUDE:** -72° 33' 7.19604" W  
**LAT./LONG. TYPE:** NAD 83  
**GROUND ELEVATION:** N/A  
**APN/UPC:** N/A  
**AREA OF CONSTRUCTION:** EXISTING  
**ZONING/JURISDICTION:** UNKNOWN  
**CURRENT ZONING:** UNKNOWN  
**EXISTING USE:** UNMANNED TELECOMMUNICATIONS FACILITY  
**COUNTY:** HARTFORD  
**HANDICAP REQUIREMENTS:** FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED.



**LTE MULTI CARRIER RRU ADD  
 CT1139  
 S. WINDSOR SAND HILL RD  
 151 SAND HILL ROAD  
 SOUTH WINDSOR, CT 06074  
 FA CODE: 10035389**



**DRIVING DIRECTIONS**

TAKE EXIT 62 OFF RT 84 EAST, BUCKLAND ST. AND TURN LEFT. CONTINUE PAST BUCKLAND HILLS MALL CONTINUE STRAIGHT THROUGH INTERSECTION OF RT 194/RT 74, CONTINUE STRAIGHT ON RT 194 TO STOP LIGHT AT SAND HILL ROAD AND TURN RIGHT CONTINUE A SHORT DISTANCE UP TO THE SOUTH WINDSOR POLICE DEPT. CELL SITE LOCATED IN BACK.

**CODE COMPLIANCE**

**BUILDING CODE:** 2012 ICC INTERNATIONAL BUILDING CODE (IBC)  
**ELECTRICAL CODE:** 2014 NFPA-70 NATIONAL ELECTRICAL CODE (NEC)  
 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.  
 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.



CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800-922-4455 OR DIAL 811

**APPROVALS**

AT&T (RF): \_\_\_\_\_ DATE: \_\_\_\_\_  
 AT&T (CONST.): \_\_\_\_\_ DATE: \_\_\_\_\_  
 AT&T (OPS): \_\_\_\_\_ DATE: \_\_\_\_\_  
 TOWER OWNER: \_\_\_\_\_ DATE: \_\_\_\_\_

**JURISDICTIONAL APPROVAL**

BASED ON INFORMATION PROVIDED BY AT&T REGULATORY COMPLIANCE PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS CONSIDERED AN ELIGIBLE FACILITY UNDER THE MIDDLE CLASS TAX RELIEF AND JOB CREATION ACT OF 2012, 47 USC 1455(A), SECTION 6409(A), AND IS SUBJECT TO AN ELIGIBLE FACILITY REQUEST, EXPEDITED REVIEW AND LIMITED/PARTIAL ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW OR ADMINISTRATIVE REVIEW).

**PROJECT DESCRIPTION**

THIS PROJECT WILL BE COMPRISED OF:  
**CHANGES ON THE EXISTING MONOPINE TOWER:**  
 • REMOVE (3) EXISTING RRUS-11+RRUS-A2, (1) PER SECTOR FOR (3) SECTORS.  
 • INSTALL (3) NEW RRUS-32 B2, (1) PER SECTOR FOR (3) SECTORS.  
 • REUSE (1) EXISTING FIBER TRUNK.  
 • REUSE (2) EXISTING DC TRUNK.  
 • REUSE (1) EXISTING DC/FIBER SQUID.  
 • REUSE (12) EXISTING RF CABLES.  
 • INSTALL MOUNT REINFORCING @ 170.0'

SHEET	DESCRIPTION
T-1	TITLE SHEET
GN-1	GROUNDING & GENERAL NOTES
A-1	SITE PLAN
A-2	EQUIPMENT LAYOUT
A-3	ANTENNA LAYOUTS & TOWER ELEVATION
A-4	DETAILS
G-1	GROUNDING, ONE-LINE DIAGRAM & DETAILS
S-1	MOUNT REINFORCING @ 170.0'



550 COCHITUATE ROAD  
 FRAMINGHAM, MA 01701

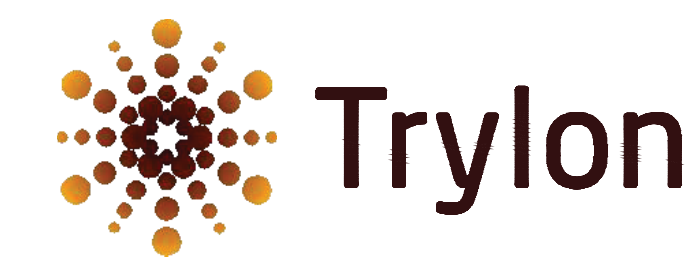


16 ESQUIRE ROAD  
 BILLERICA, MA 01821



SBA COMMUNICATIONS CORP.  
 134 FLANDERS ROAD, SUITE  
 125 WESTBOROUGH, MA 01581

PLANS PREPARED BY:

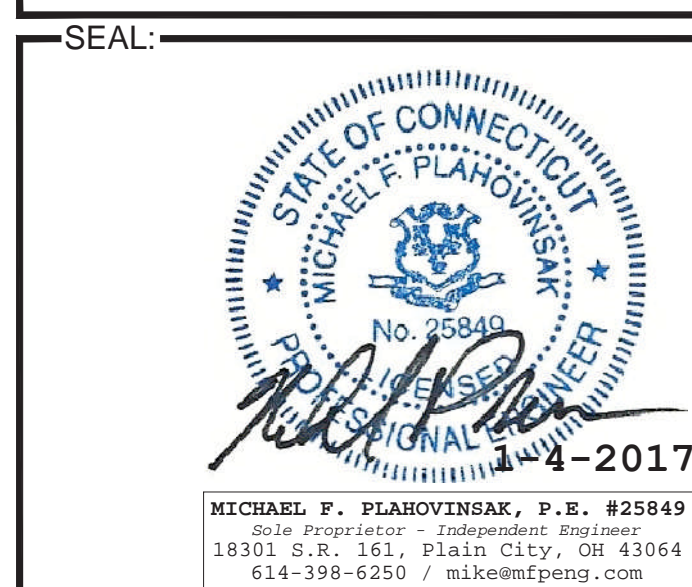


1825 W. WALNUT HILL LANE SUITE 302  
 IRVING, TX 5038  
 1-855-669-5421

NO.	DATE	DESCRIPTION	BY
1	12/13/2016	PRELIMINARY CD'S	AC
2	01/03/2016	MOUNT REINFORCING ADDED	DBG

SITE INFORMATION:

**CT1139  
 S. WINDSOR SAND HILL RD  
 FA CODE: 10035389**  
 151 SAND HILL ROAD  
 SOUTH WINDSOR, CT 06074



SHEET TITLE:  
**TITLE SHEET**  
 SHEET NUMBER:  
**T-1**

**GENERAL NOTES:**

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
  - CONTRACTOR - EMPIRE TELECOM
  - SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)
  - OWNER - AT&T MOBILITY
  - OEM - ORIGINAL EQUIPMENT MANUFACTURER
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. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
7. 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.
8. 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. ROUTING OF TRENCHING SHALL BE APPROVED BY CONTRACTOR
9. 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.
10. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OFF ALL SCR1 'AP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
11. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
12. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
13. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS UNLESS OTHERWISE SPECIFIED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
14. 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). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
15. CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741-000-3APS-A00Z-00002, "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
16. 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.
17. 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 MAY NEED TO BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
18. SINCE THE CELL SITE MAY BE 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 REQUIRED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
19. 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.
  - INTERNATIONAL BUILDING CODE: IBC 2009 WITH LOCAL & COUNTY AMENDMENTS
  - NATIONAL ELECTRICAL CODE: NEC 2011 WITH LOCAL & COUNTY AMENDMENTS
  - FIRE/LIFE SAFETY CODE: NFPA-101 2009 WITH LOCAL & COUNTY AMENDMENTS
20. 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, THIRTEENTH EDITION
  - AMERICAN SOCIETY OF TESTING OF MATERIALS, ASTM
  - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA-222-G-1), STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
  - TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
  - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OSHA
  - INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVELY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
  - TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS
21. 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.

**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. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH 25471-000-3PS-EG00-0001, DESIGN & TESTING OF FACILITY GROUNDING FOR CELL SITES.
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 WITH STAINLESS STEEL HARDWARE TO THE BRIDGE AND THE TOWER 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 AND TRAY SHALL BE GROUND AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
13. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV-G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE CHANGED FROM 2 AWG TO 2/0 AWG. IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM EIGHT FEET (8') TO TEN FEET (10').
14. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE 1/2" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50.



550 COCHITUATE ROAD  
FRAMINGHAM, MA 01701

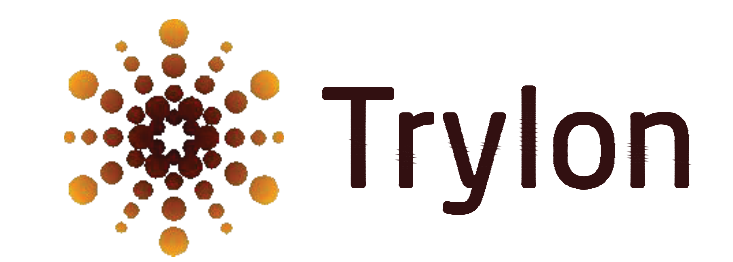


16 ESQUIRE ROAD  
BILLERICA, MA 01821



SBA COMMUNICATIONS CORP.  
134 FLANDERS ROAD, SUITE  
125 WESTBOROUGH, MA 01581

PLANS PREPARED BY:



1825 W. WALNUT HILL LANE SUITE 302  
IRVING, TX 5038  
1-855-669-5421

NO.	DATE	DESCRIPTION	BY
1	12/13/2016	PRELIMINARY CD'S	AC
2	01/03/2016	MOUNT REINFORCING ADDED	DBG

SITE INFORMATION:

CT1139  
S. WINDSOR SAND HILL RD  
FA CODE: 10035389

151 SAND HILL ROAD  
SOUTH WINDSOR, CT 06074

SEAL:



SHEET TITLE:

GENERAL NOTES  
&  
GROUNDING NOTES

SHEET NUMBER:

GN-1





550 COCHITUATE ROAD  
FRAMINGHAM, MA 01701

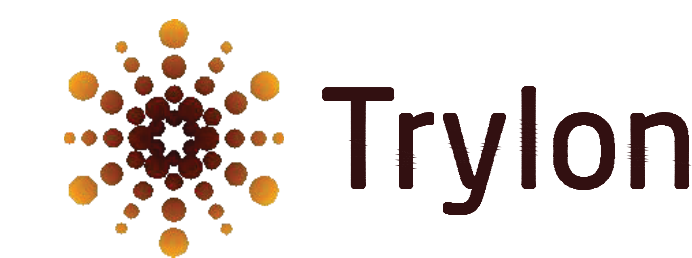


16 ESQUIRE ROAD  
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125 WESTBOROUGH, MA 01581

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SOUTH WINDSOR, CT 06074

SEAL:



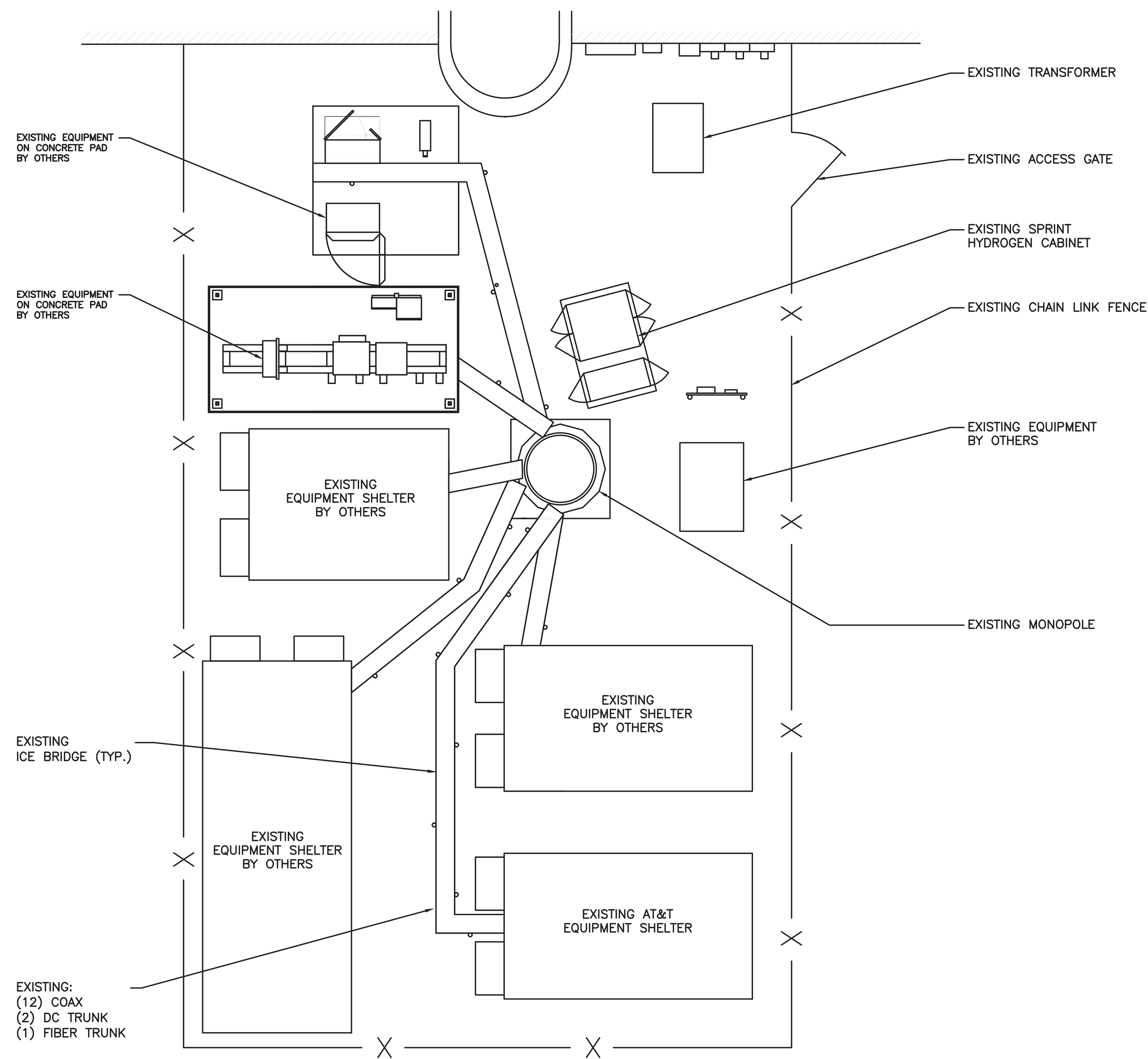
MICHAEL F. FLAHOVINSAK, P.E. #25849  
Sole Proprietor - Independent Engineer  
18301 S.R. 161, Plain City, OH 43064  
614-398-6250 / mike@mpeng.com

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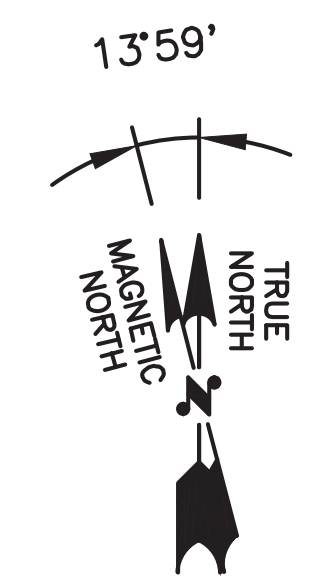
SITE PLAN

SHEET NUMBER:

A-1



EXISTING:  
(12) COAX  
(2) DC TRUNK  
(1) FIBER TRUNK





550 COCHITUATE ROAD  
FRAMINGHAM, MA 01701

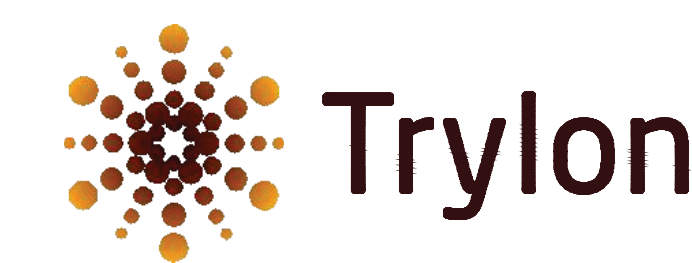


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BILLERICA, MA 01821



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134 FLANDERS ROAD, SUITE  
125 WESTBOROUGH, MA 01581

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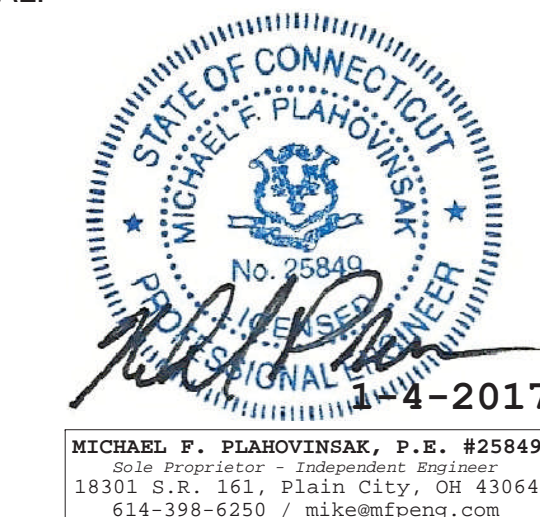
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151 SAND HILL ROAD  
SOUTH WINDSOR, CT 06074

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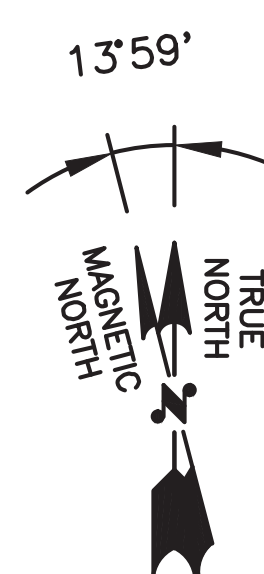
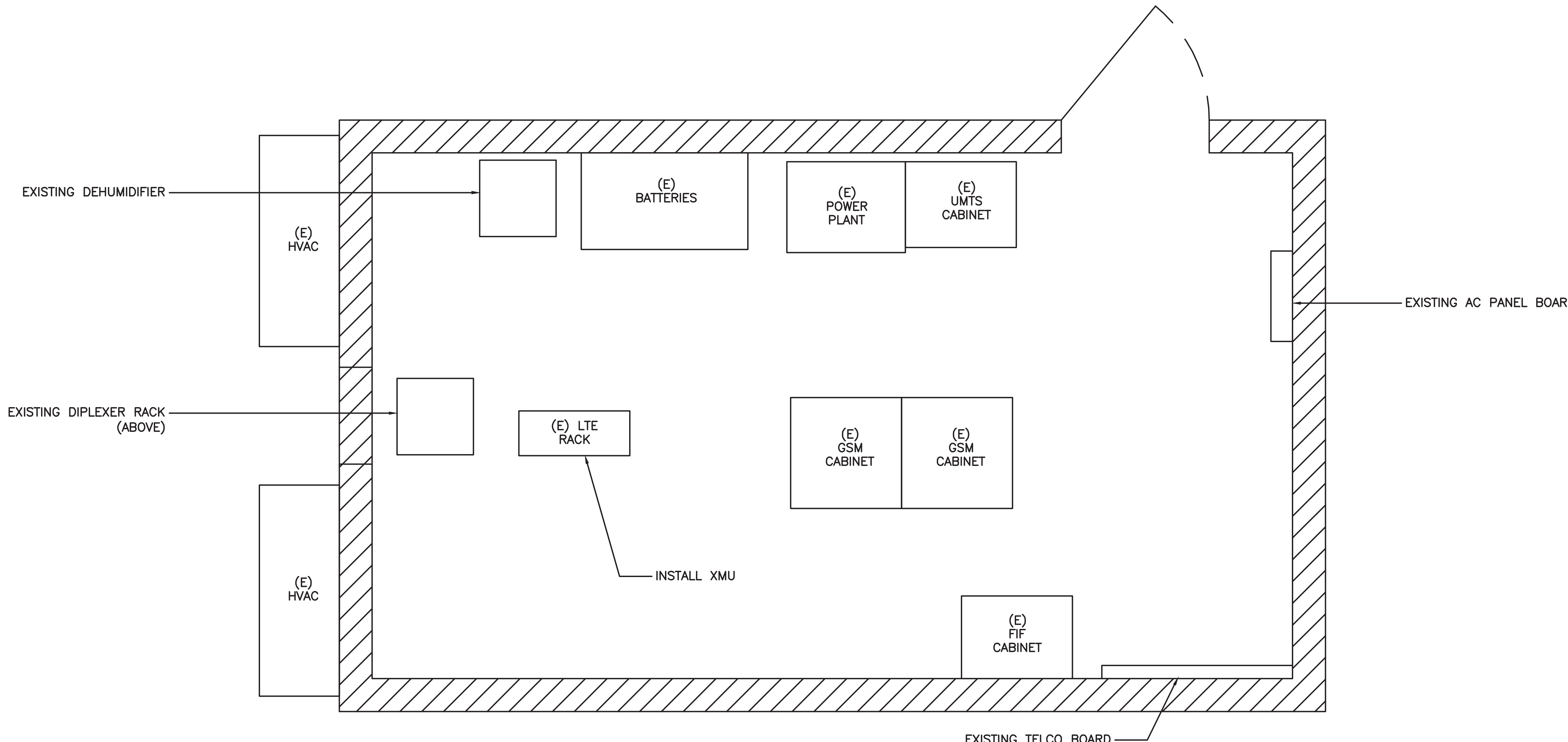


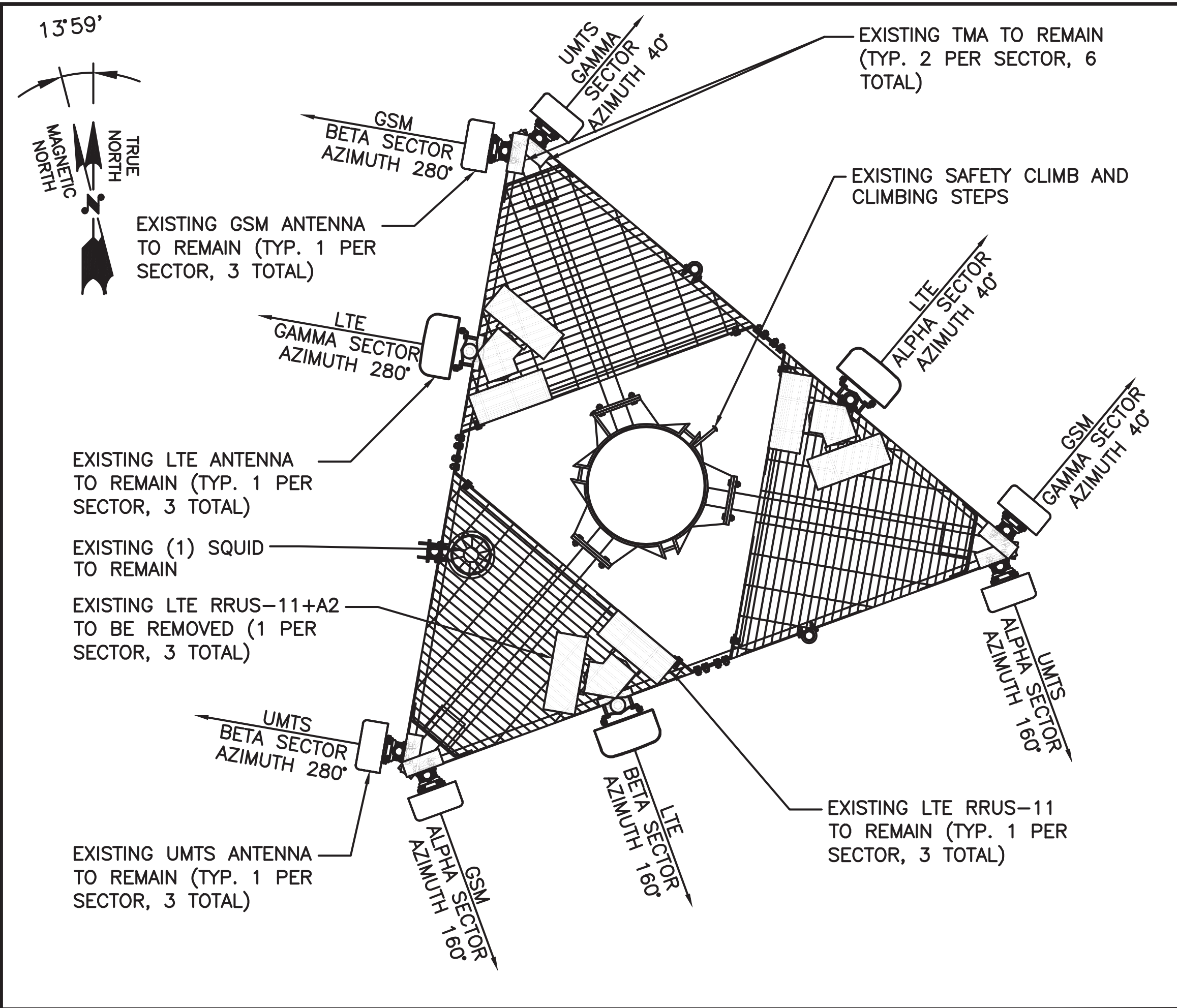
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EQUIPMENT LAYOUTS

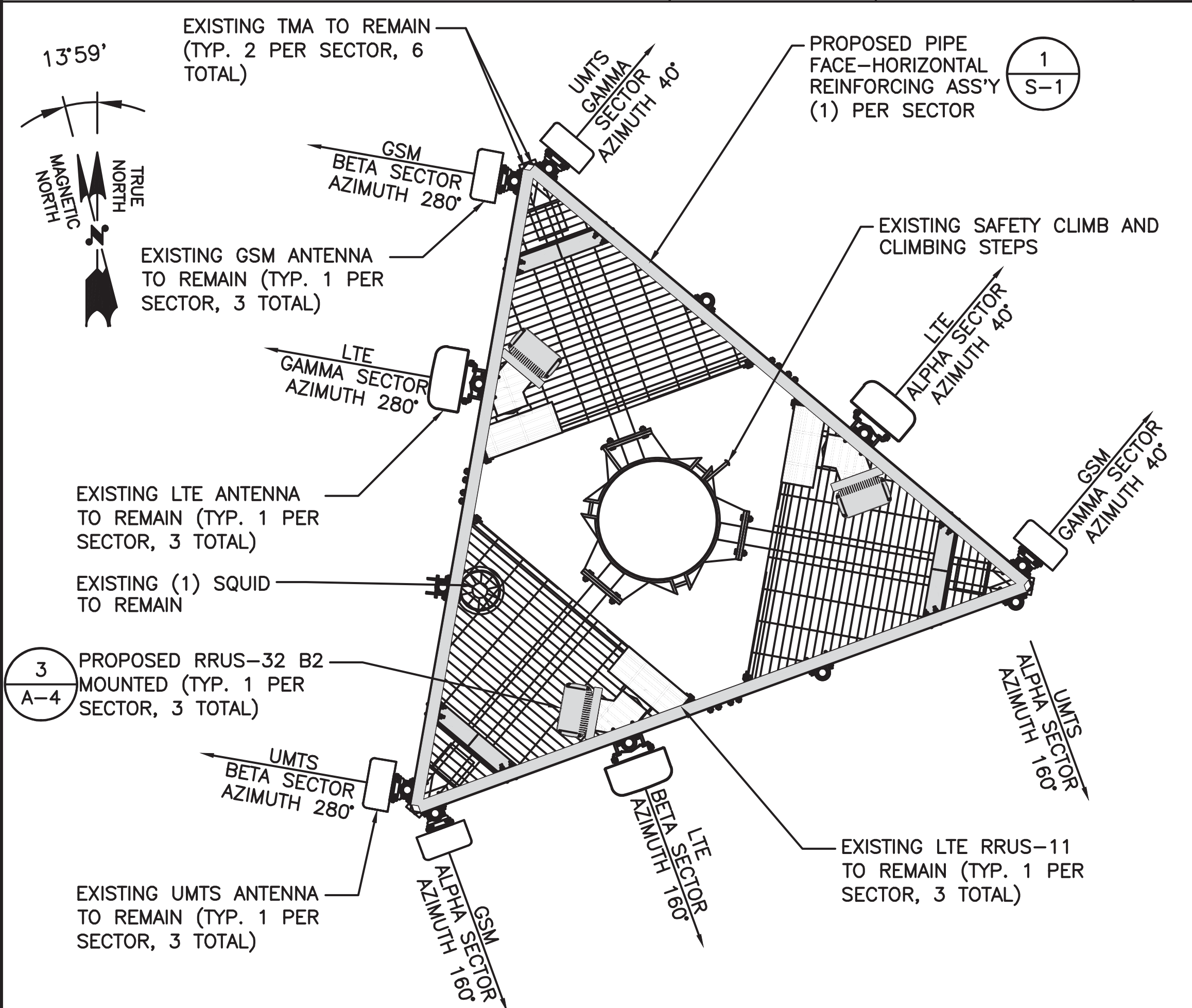
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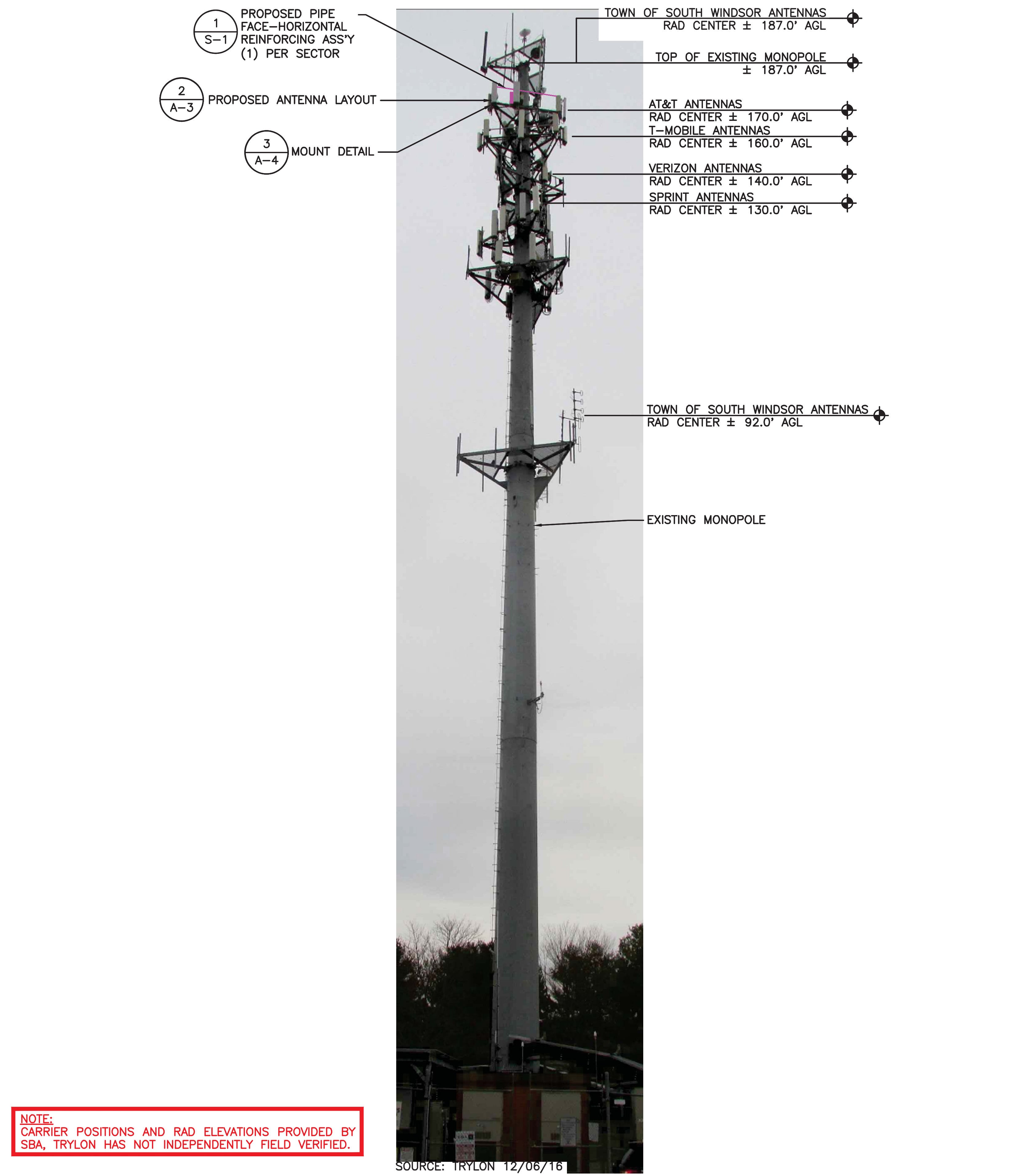


EXISTING ANTENNA LAYOUT  
 22"x34" SCALE: 1/2" = 1'-0"  
 11"x17" SCALE: 1/4" = 1'-0"  
 1



PROPOSED ANTENNA LAYOUT  
 22"x34" SCALE: 1/2" = 1'-0"  
 11"x17" SCALE: 1/4" = 1'-0"  
 2

**SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):**  
 GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.



**NOTE:**  
 CARRIER POSITIONS AND RAD ELEVATIONS PROVIDED BY SBA, TRYLON HAS NOT INDEPENDENTLY FIELD VERIFIED.

PROPOSED ELEVATION  
 NTS 3



550 COCHITUATE ROAD  
 FRAMINGHAM, MA 01701



16 ESQUIRE ROAD  
 BILLERICA, MA 01821



SBA COMMUNICATIONS CORP.  
 134 FLANDERS ROAD, SUITE  
 125 WESTBOROUGH, MA 01581

PLANS PREPARED BY:



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 1-855-669-5421

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 S. WINDSOR SAND HILL RD  
 FA CODE: 10035389  
 151 SAND HILL ROAD  
 SOUTH WINDSOR, CT 06074



SHEET TITLE:  
 ANTENNA LAYOUTS,  
 TOWER ELEVATIONS &  
 MOUNTING DETAILS

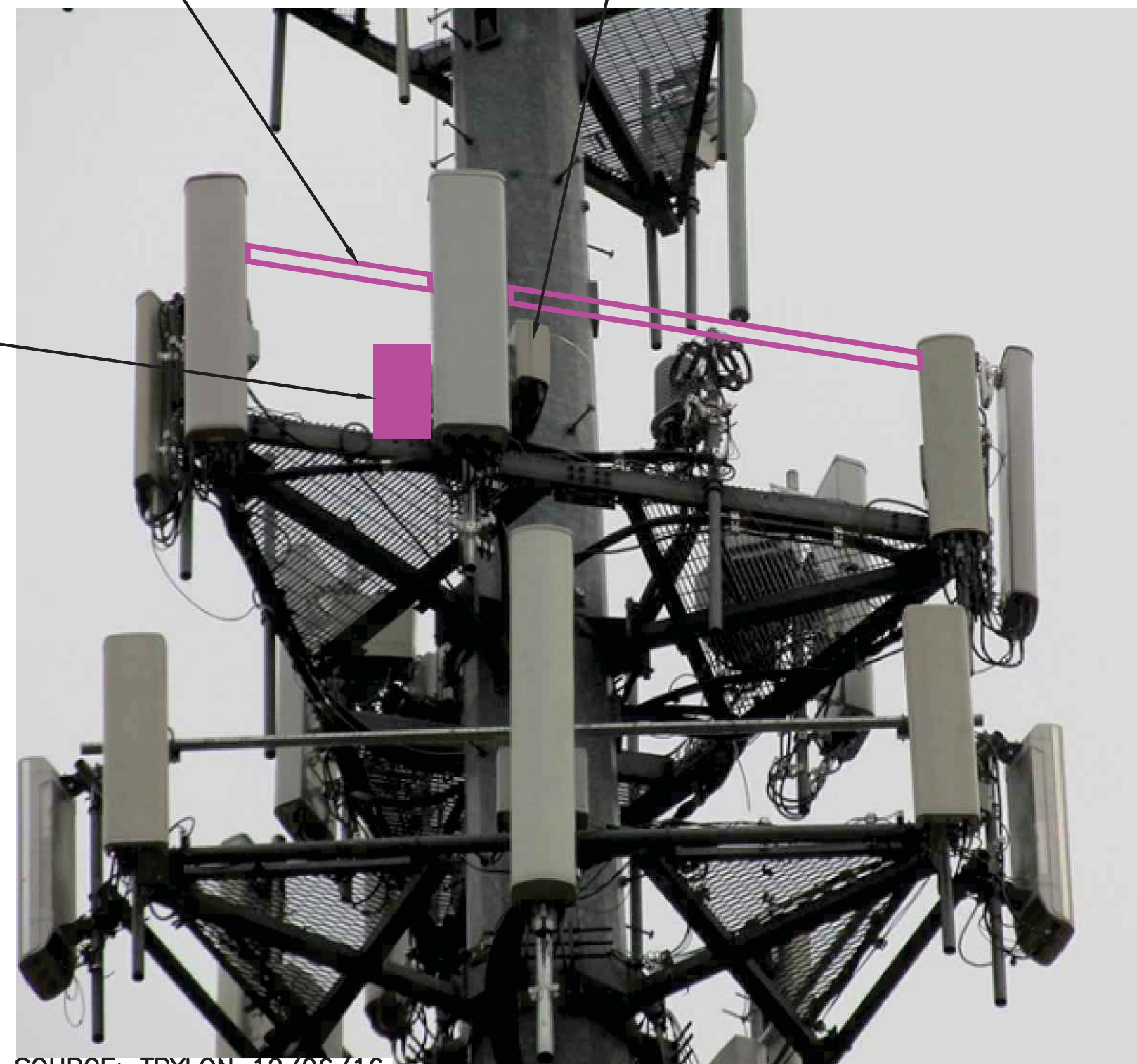
SHEET NUMBER:  
 A-3

1  
S-1  
PROPOSED PIPE  
FACE-HORIZONTAL  
REINFORCING ASS'Y  
(1) PER SECTOR

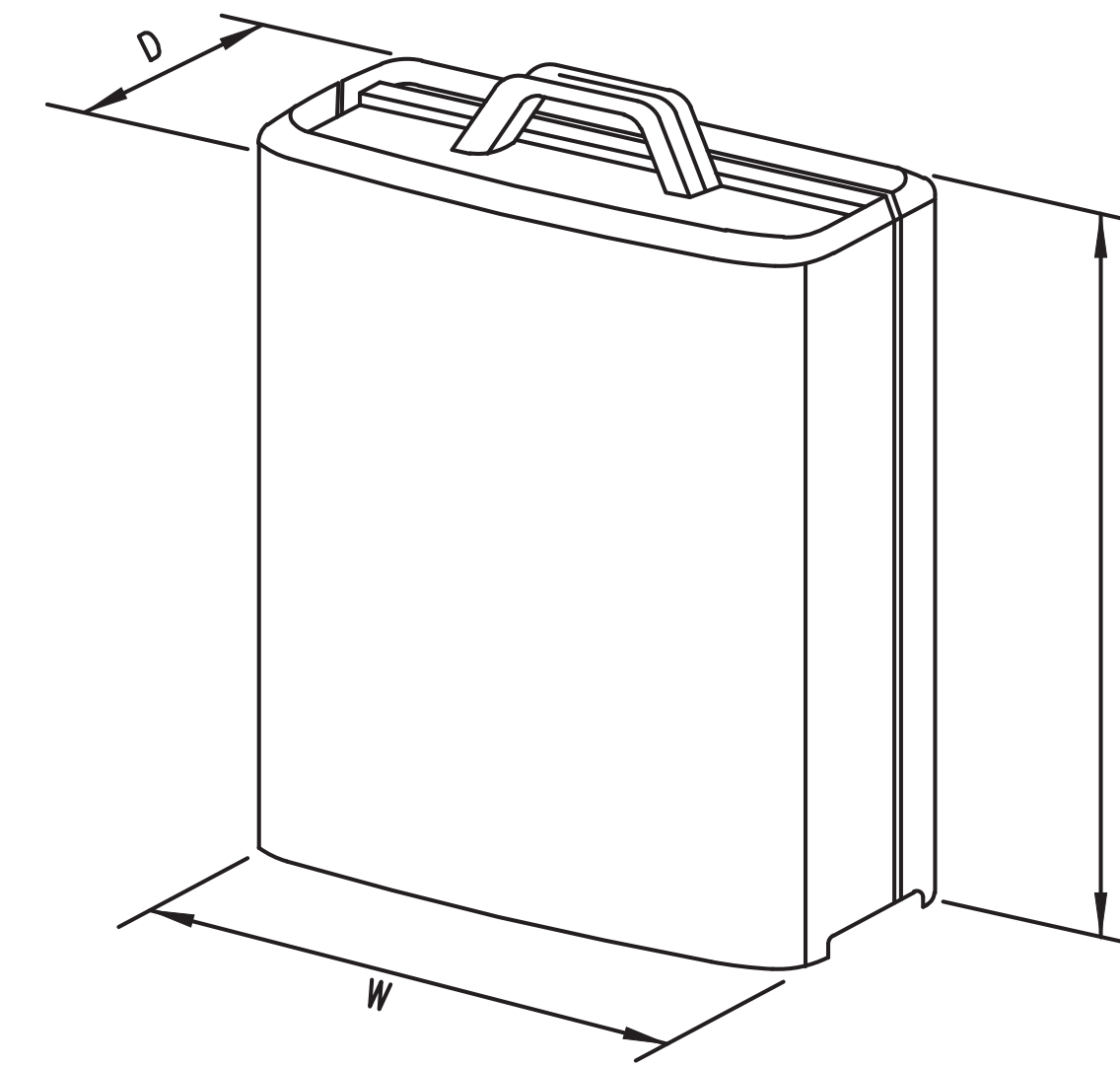
EXISTING LTE RRUS-11  
TO REMAIN (TYP. 1 PER  
SECTOR, 3 TOTAL)

PROPOSED LTE RRUS-32  
B2 (TYP. 1 PER SECTOR,  
3 TOTAL)

3  
A-4



SOURCE: TRYLON 12/06/16



MODEL	H x W x D	WEIGHT
RRUS-32 B2	20.9" x 9.5" x 3.3"	77 lbs.



PLANS PREPARED BY:

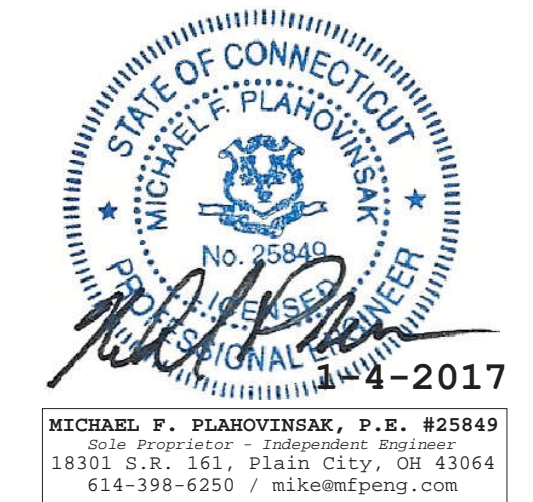


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SOUTH WINDSOR, CT 06074

SEAL:



SHEET TITLE:

DETAILS

SHEET NUMBER:

A-4

RRUS MOUNT DETAILS

N.T.S 1

RRUS DETAILS

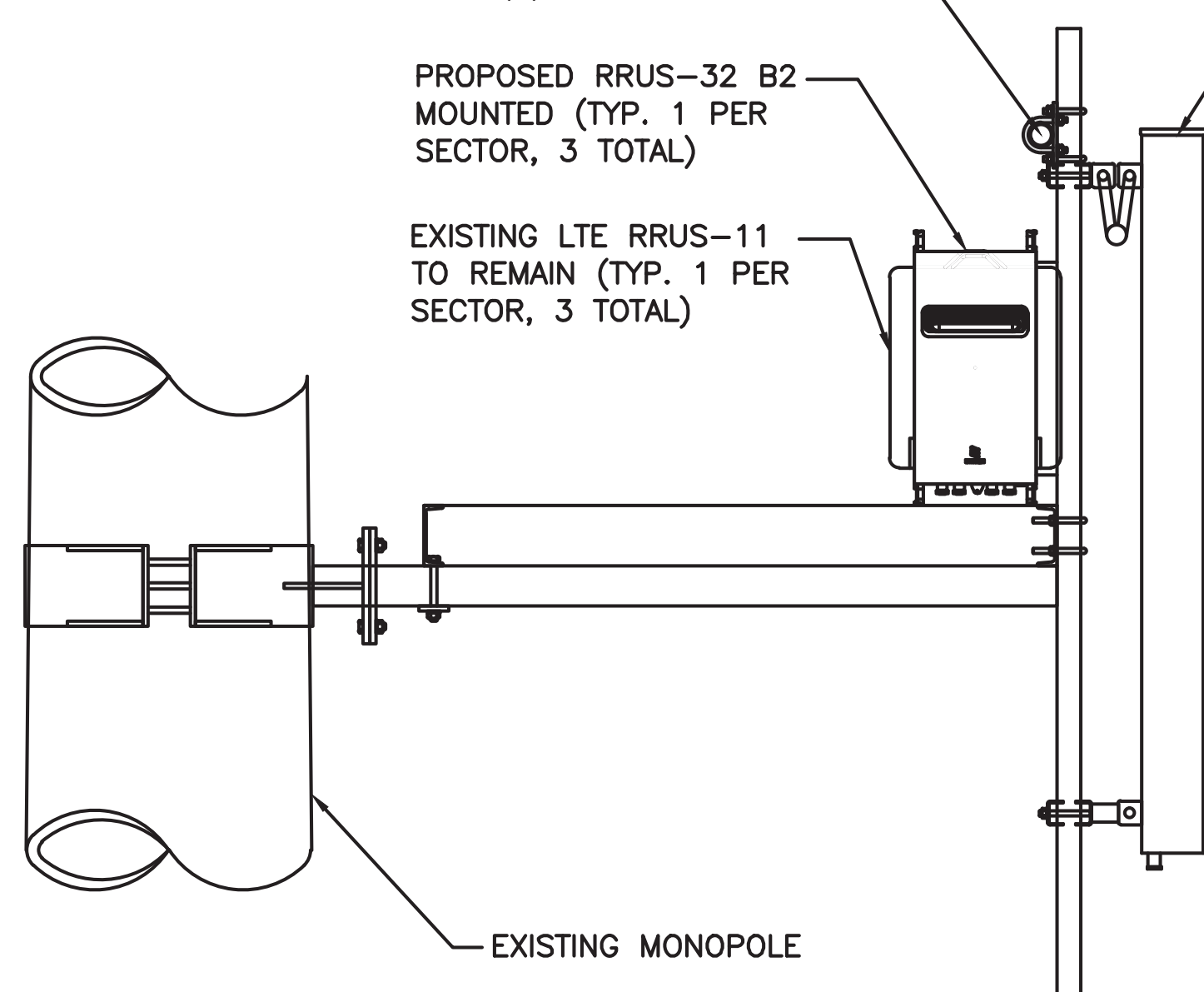
N.T.S 2

1  
S-1  
PROPOSED PIPE  
FACE-HORIZONTAL  
REINFORCING ASS'Y  
(1) PER SECTOR

PROPOSED RRUS-32 B2  
MOUNTED (TYP. 1 PER  
SECTOR, 3 TOTAL)

EXISTING LTE RRUS-11  
TO REMAIN (TYP. 1 PER  
SECTOR, 3 TOTAL)

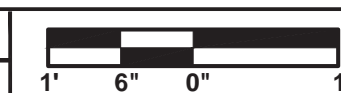
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TO REMAIN (TYP. 1 PER  
SECTOR, 3 TOTAL)



EXISTING MONOPOLE

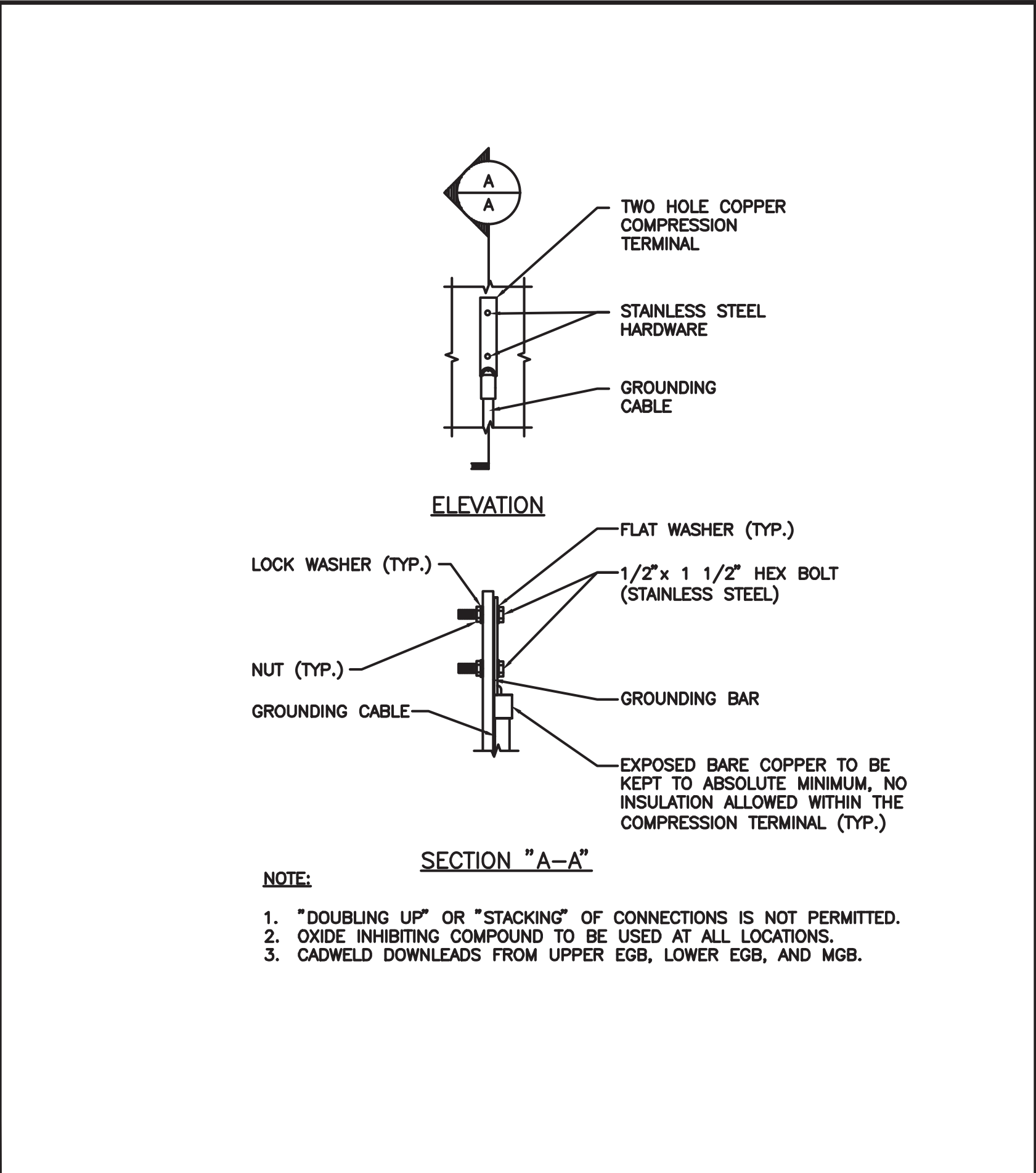
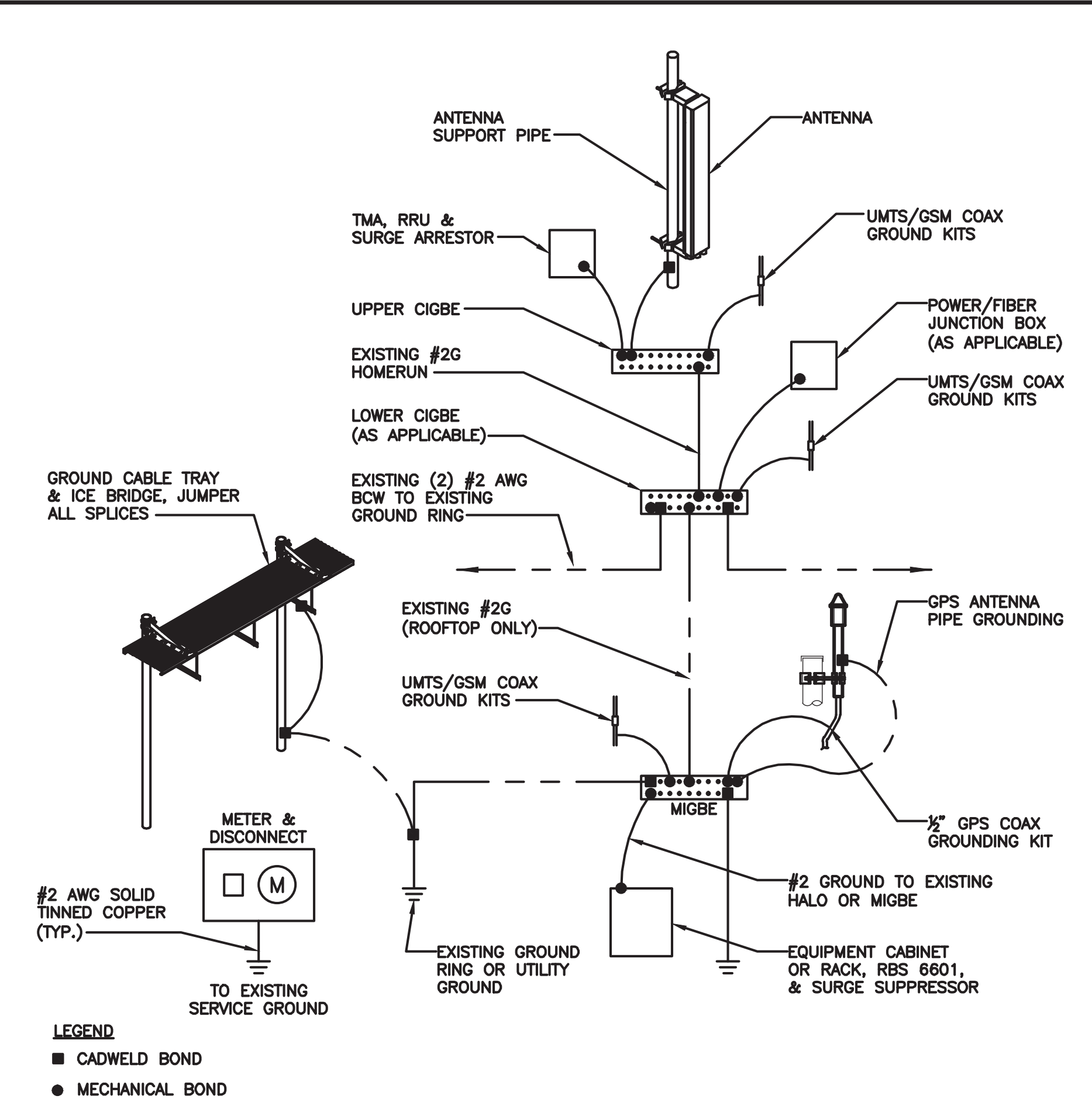
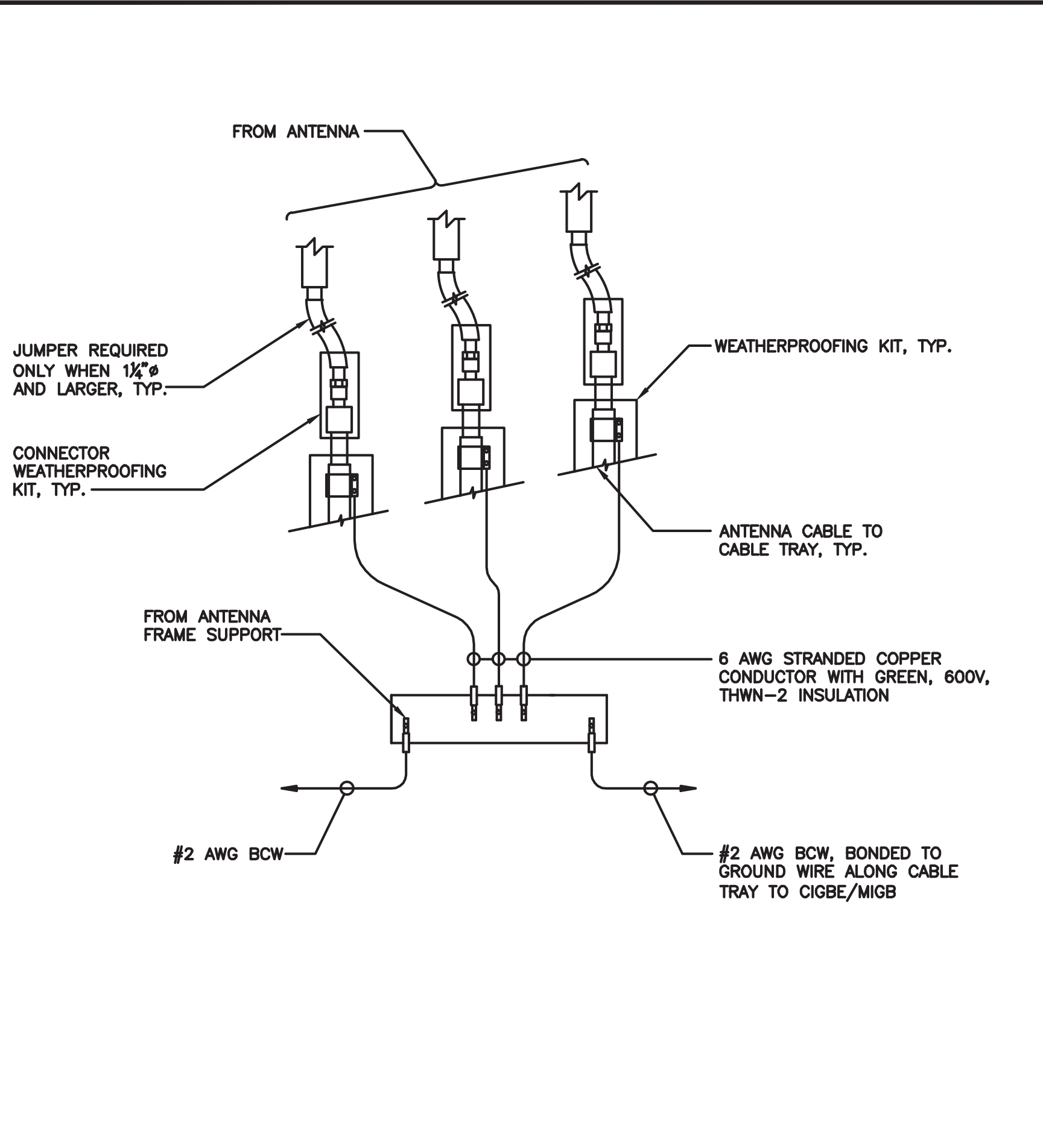
MOUNTING DETAIL

22"x34" SCALE: 3/4" = 1'-0"  
11"x17" SCALE: 3/8" = 1'-0"



3

N.T.S 4



GROUND WIRE TO GROUND BAR CONNECTION DETAILS

N.T.S 1

GROUND RISER DIAGRAM

N.T.S 2

TYPICAL GROUND BAR CONNECTION DETAILS

N.T.S 3

550 COCHITUATE ROAD  
FRAMINGHAM, MA 01701

16 ESQUIRE ROAD  
BILLERICA, MA 01821

SBA COMMUNICATIONS CORP.  
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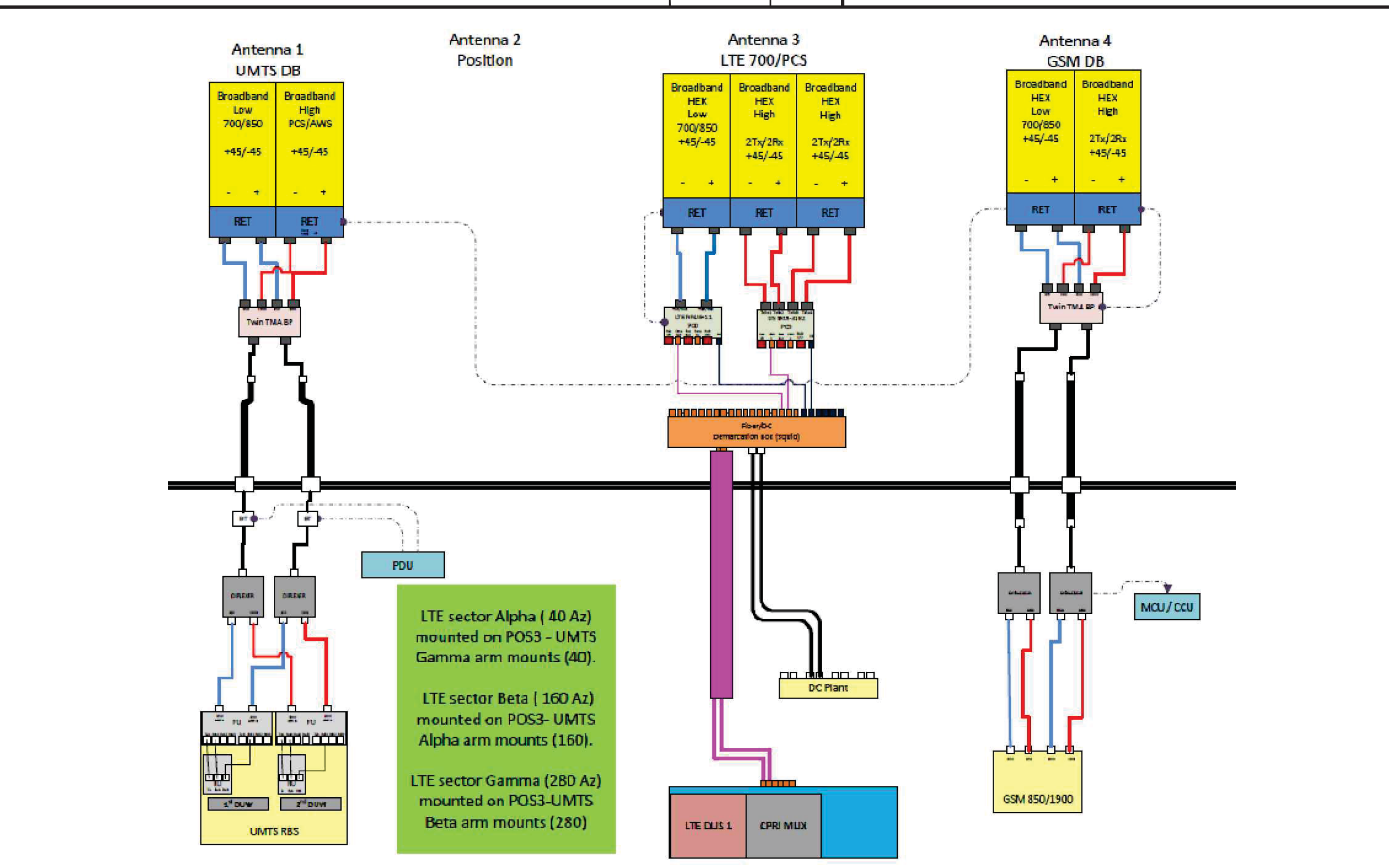
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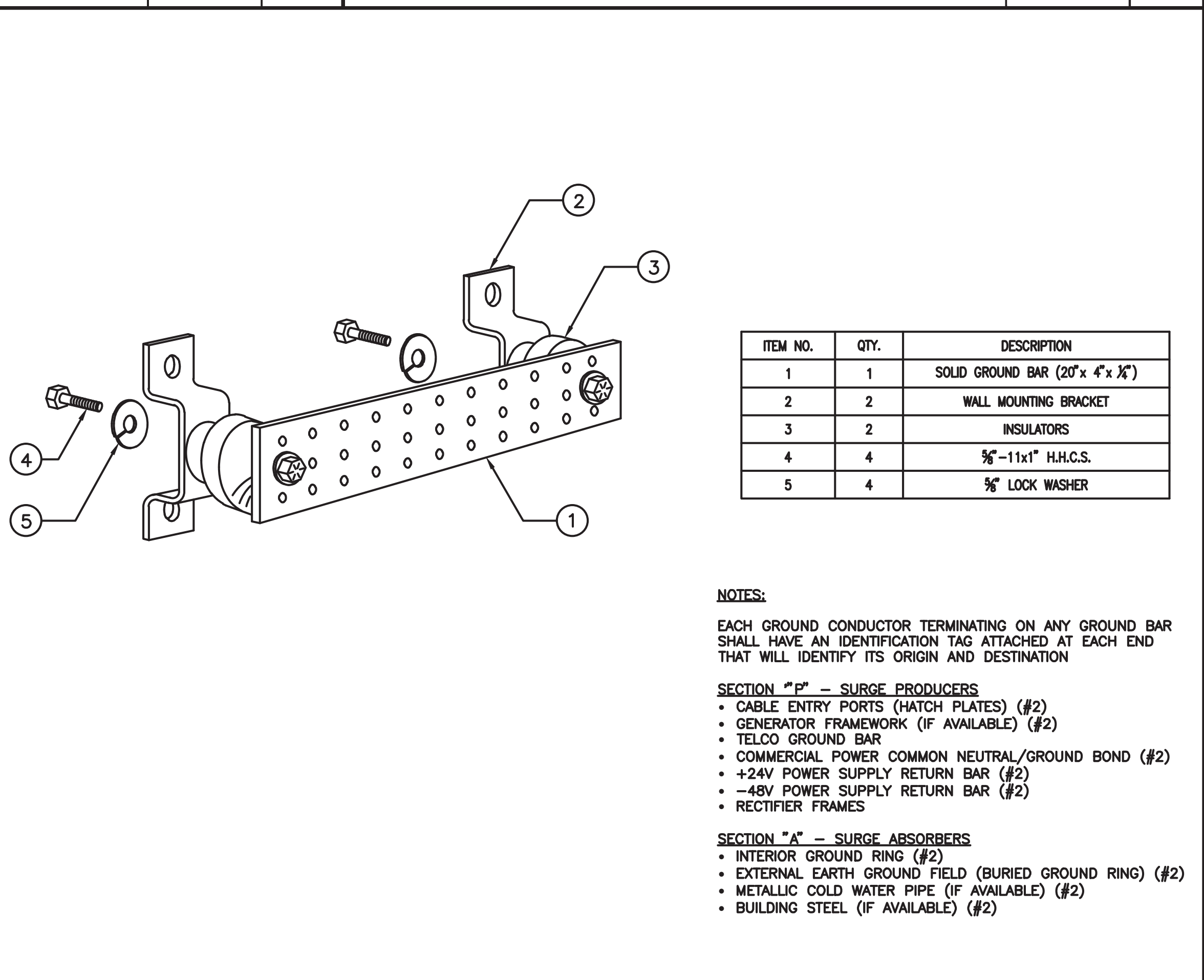
SEAL:

2017



RUN WIRING DIAGRAM

N.T.S 4



GROUND BAR DETAILS

N.T.S 5

SHEET TITLE:

GROUNDING, ONE-LINE DIAGRAM & DETAILS

SHEET NUMBER:

G-1



550 COCHITUATE ROAD  
FRAMINGHAM, MA 01701



16 ESQUIRE ROAD  
BILLERICA, MA 01821



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SOUTH WINDSOR, CT 06074

SEAL:



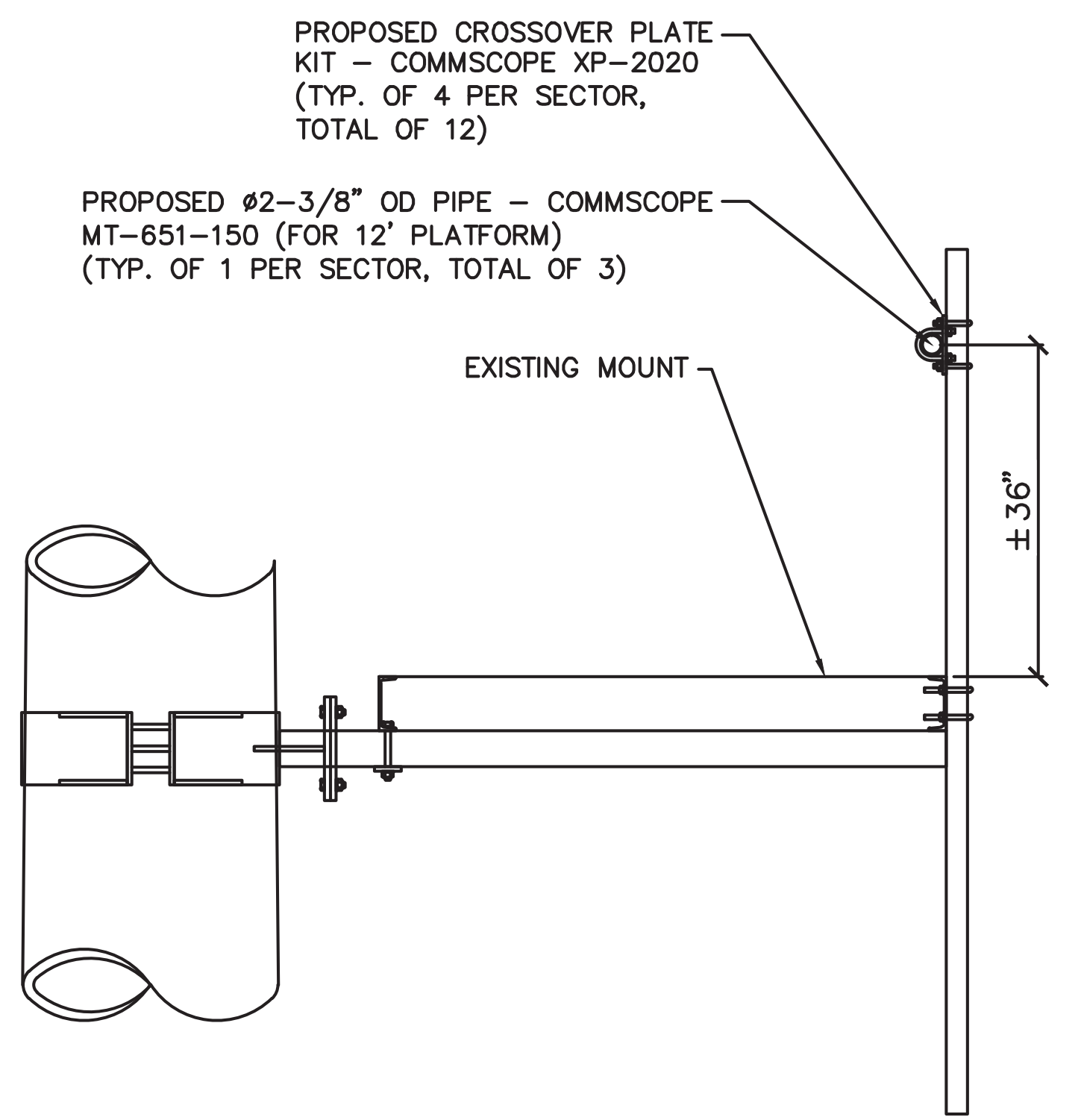
MICHAEL F. PLACHOVINSKAS, P.E. #25840  
Solo Practitioner - Independent Engineer  
18901 S.R. 151, Plain City, OH 43064  
614-388-6200 / mfb@mfpe.com

SHEET TITLE:

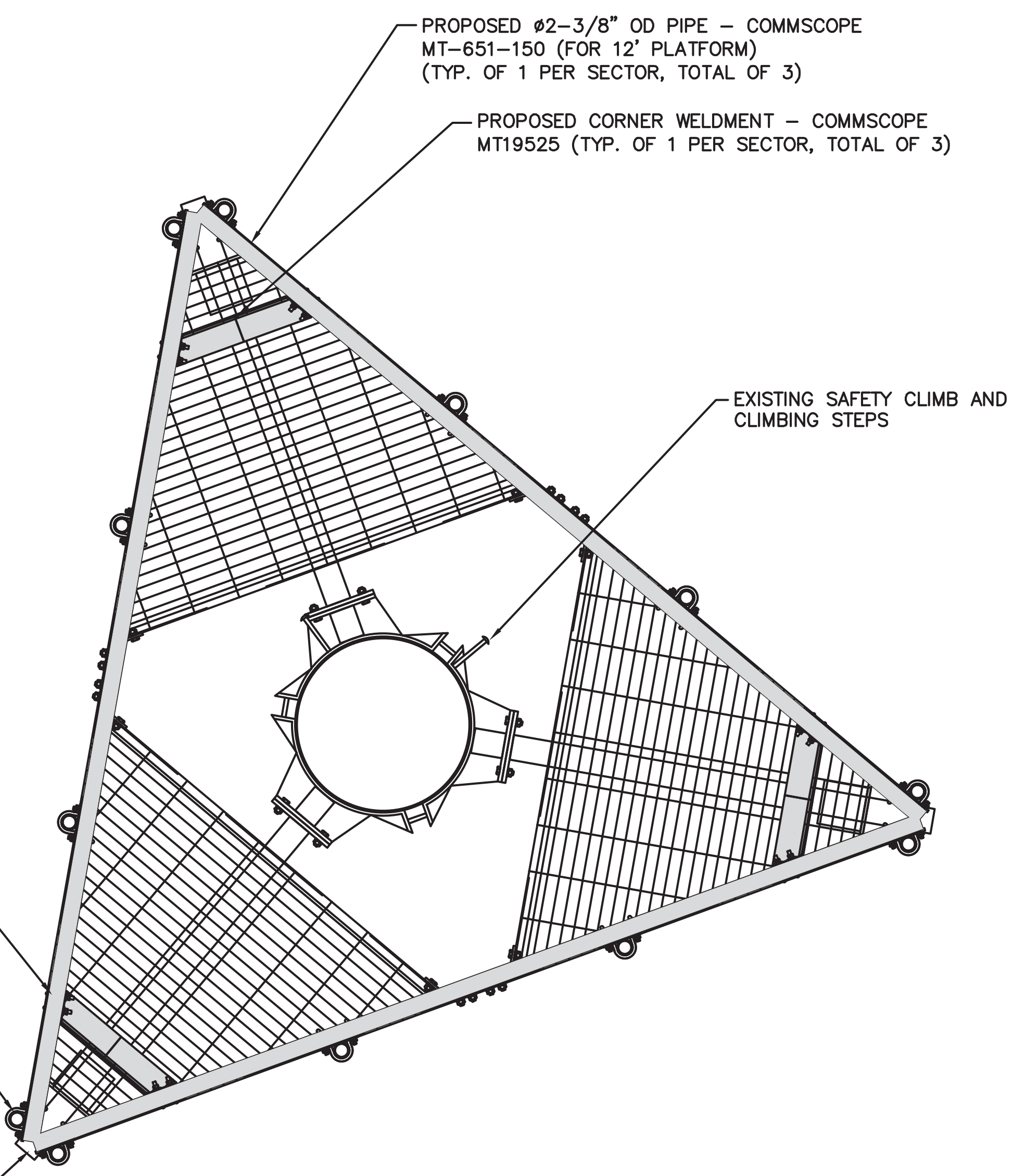
MOUNT REINFORCING @ 170.0'

SHEET NUMBER:

S-1



ELEVATION VIEW



PLAN VIEW

PROPOSED 1/2" x 2-1/2" x 4"  
GALV U-BOLT - COMMSCOPE  
GUB-4240  
(TYP. OF 4 PER SECTOR,  
TOTAL OF 12)

PROPOSED CROSSOVER PLATE  
KIT - COMMSCOPE XP-2020  
(TYP. OF 4 PER SECTOR,  
TOTAL OF 12)

EXISTING MOUNT

