



Filed by:

*Kri Pelletier, Property Specialist - SBA Communications  
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March 29, 2016

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 - CT1139**

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 now intends to swap three (3) existing LTE antennas with three (3) new LTE antennas. These antennas would be installed at the 170-foot level of the tower. AT&T also intends to:

Remove:

- (3) KMW AM-X-CD-16-65 panel antennas (Reserved Entitlement)

Remove and Replace:

- Remove (3) KMW AM-X-CD-16-65 panel antennas and replace with (3) new CCI HPA-65R-BUU-H6 panel antennas

Install:

- (3) RRUS A2 Modules
- (1) 1/2" Fiber Cable

Existing Equipment to Remain (Entitlements):

- All Existing Equipment located within existing Equipment shelter
- (3) Powerwave 7770 panel antenna
- (3) KMW AM-X-CD-16-65 panel antennas
- (6) Ericsson RRUS-11 Remote Radio Unit
- (6) CCI DTMABP - TMA/TTA
- (12) Kathrein 782 Diplexer
- (3) CSS DBC Diplexer/Combiner
- (3) Commscope ABT-DRDM Bias-T



- (1) Raycap DC6 Surge Suppressor
- (12) 1-5/8" Coax Lines
- (1) 3" conduit with fiber/DC power cables listed below:
  - (1) 1/2" Fiber Cable
  - (2) 3/4" DC Power Cable

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 the Honorable Saud Anwar, Mayor of the Town of South Windsor, as well as the 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

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508.366.2610 + F  
203.446.7700 + C  
kpelletier@sbsite.com

Attachments



cc: The Honorable Saud Anwar, Mayor of the Town of South Windsor—as elected official  
*Town Hall, 1540 Sullivan Ave, South Windsor, CT 06074*  
The Town of South Windsor— as property owner  
*c/o Town Manager, Town Hall, 1540 Sullivan Avenue, South Windsor, CT 06074*





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

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Powerwave 7770.00	Make / Model:	Powerwave 7770.00	Make / Model:	Powerwave 7770.00
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	170 feet	Height (AGL):	170 feet	Height (AGL):	170 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A1 MPE%	0.37	Antenna B1 MPE%	0.37	Antenna C1 MPE%	0.37
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	CCI HPA-65R-BUU-H16	Make / Model:	CCI HPA-65R-BUU-H16	Make / Model:	CCI HPA-65R-BUU-H16
Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd
Height (AGL):	170 feet	Height (AGL):	170 feet	Height (AGL):	170 feet
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	5,462.56	ERP (W):	5,462.56	ERP (W):	5,462.56
Antenna A2 MPE%	1.02	Antenna B2 MPE%	1.02	Antenna C2 MPE%	1.02
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	KMW AM-X-CD-16-65-00T-RET	Make / Model:	KMW AM-X-CD-16-65-00T-RET	Make / Model:	KMW AM-X-CD-16-65-00T-RET
Gain:	13.85 / 15.254 dBd	Gain:	13.85 / 15.254 dBd	Gain:	13.85 / 15.254 dBd
Height (AGL):	170 feet	Height (AGL):	170 feet	Height (AGL):	170 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	3,465.76	ERP (W):	3,465.76	ERP (W):	3,465.76
Antenna A3 MPE%	0.61	Antenna B3 MPE%	0.61	Antenna C3 MPE%	0.61

Site Composite MPE%	
Carrier	MPE%
AT&T – Max per sector	2.00 %
Town	0.77 %
Sprint	0.84 %
MetroPCS	0.22 %
Clearwire	0.09 %
Nextel	0.28 %
Verizon Wireless	2.87 %
T-Mobile	1.70 %
<b>Site Total MPE %:</b>	<b>8.77 %</b>

AT&T Sector 1 Total:	2.00 %
AT&T Sector 2 Total:	2.00 %
AT&T Sector 3 Total:	2.00 %
<b>Site Total:</b>	<b>8.77 %</b>

AT&T_ Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (µW/cm <sup>2</sup> )	Frequency (MHz)	Allowable MPE (µW/cm <sup>2</sup> )	Calculated % MPE
AT&T 850 MHz UMTS	2	414.12	170	1.11	850	567	0.20 %
&T 1900 MHz (PCS) UMTS	2	656.33	170	1.75	1900	1000	0.18 %
AT&T 850 MHz LTE	2	940.05	170	2.51	700	467	0.54 %
T&T 1900 MHz (PCS) LTE	2	1791.23	170	4.79	1900	1000	0.48 %
AT&T 850 MHz GSM	2	727.98	170	1.95	850	567	0.34 %
T&T 1900 MHz (PCS) GSM	2	1004.90	170	2.69	1900	1000	0.27 %
						<b>Total:</b>	<b>2.00 %</b>



**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: FA# 10035389 USID# 59386**

**Site Location: 151 Sand Hill Road**

**South Windsor, Connecticut**

**Hartford County**

**Latitude: 41.836000**

**Longitude: -72.552000**

**Analysis Result:**

**Max Structural Usage: 70.5% [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 analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-F. In accordance with this standard, the structure was analyzed using **TESPoles**, a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

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

## Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	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 - 7770.00 - Panel	Low Profile Platform	(12) 1 5/8" with (2) 3/4" DC (1) 1/2" Fiber inside (1) 3" Conduit	AT&T
7		9	KMW - AM-X-CD-16-65-00T-RET - Panel			
8		6	CCI - DTMABP7819VG12A - TMA/TTA			
9		6	Ericsson - RRUS 11 - RRU			
11		12	Kathrein - 782 10250 - Diplexer			
13		3	CSS - DBC-750 - Diplexer			
14		1	Raycap - DC6-48-60-18-8F - Surge Suppressor			
15		3	Andrew - ABT-DFDM-ADBH - Surge Arrestor			
16	160.0	3	Ericsson - AIR 21 B2A B4P - Panel	Platform w/ Hand Rail	(12) 1 5/8" (1) 1 5/8" Fiber	T-Mobile
17		3	Ericsson - AIR 21 B4A B2P - Panel			
18		3	Commscope - LNX-6515DS - Panel			
19		3	Ericsson - Double TMA 17/21 - TMA/TTA			
20		3	Ericsson - S11B12 - RRU			
21	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
22		6	RFS - FD9R6004/2C-3L - Diplexer			
23		6	Commscope - HBXX-6517DS-A2M - Panel			
24		6	Alcatel Lucent - KS24019 - GPS			
25		3	Commscope - LNX-6514DS-A1M - Panel			
26		3	Commscope - LNX-6514DS-VTM - Panel			
27		3	Alcatel Lucent - RRH2x40-07-U - RRU			
28		3	Alcatel Lucent - RRH2x60-1900 - RRU			
29	130.0	3	Alcatel Lucent - 1900MHz - RRH	Low Profile Platform	(1) 0.7" Fiber (3) 1-1/4"	Sprint
30		3	Alcatel Lucent - 800 MHz - RRH			
31		3	Alcatel Lucent - 800MHz - Filter			
32		4	RFS - ACU-A20-N - RET			
33		3	RFS - APXVSP18-C-A20 - Panel			
34		3	RFS - APXVTM14-C-120 - Panel			
35		3	RF Filters			
36		3	Alcatel Lucent - TD-RRH8x20-25 - RRU			
37	92.0	1	Telewave - ANT150D3 - Whip	Low Profile Platform	(6) 1/2"	Town of South Windsor
38		1	Telewave - ANT4506-9 - Whip			
39		1	Telewave - ANT450Y10-WR - Yagi			
40		1	Decibel - DB205 - Whip			
41		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	(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			
11		12	Kathrein - 782 10250 - Diplexer			
12		1	Nokia - CS72188.01 - LMU			
13		3	CSS - DBC-750 - Combiners			
14		1	Raycap - DC6-48-60-18-8F - Surge Suppressor			
15		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>70.5%</b>	<b>64.4%</b>	<b>60.0%</b>
Pass/Fail	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>

## **Foundations**

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Original Design Reactions	6540.5	47.9	82.8
Analysis Reactions	4800.2	37.3	66.8

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):**

Maximum twist and sway of the microwave dishes under the operational wind speed as specified in the Analysis Criteria are listed in the table below:

Elevation (ft)	Dish	Carrier	Twist (deg)	Sway (deg)
187.0	Scala - MF-900B - Dish	Town of South	0.002	1.756
92.0	Scala - MF-900B - Dish	Windsor	0.000	1.021

It is recommended that the carrier reviews the twist and sway values of the microwave dishes.

### **Conclusions**

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

## Standard Conditions

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

## Usage Diagram - Max Stress 70.5% at 53.3ft

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

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

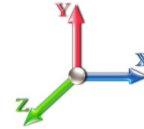
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Dead Load Factor: 1.00  
 Wind Load Factor: 1.00

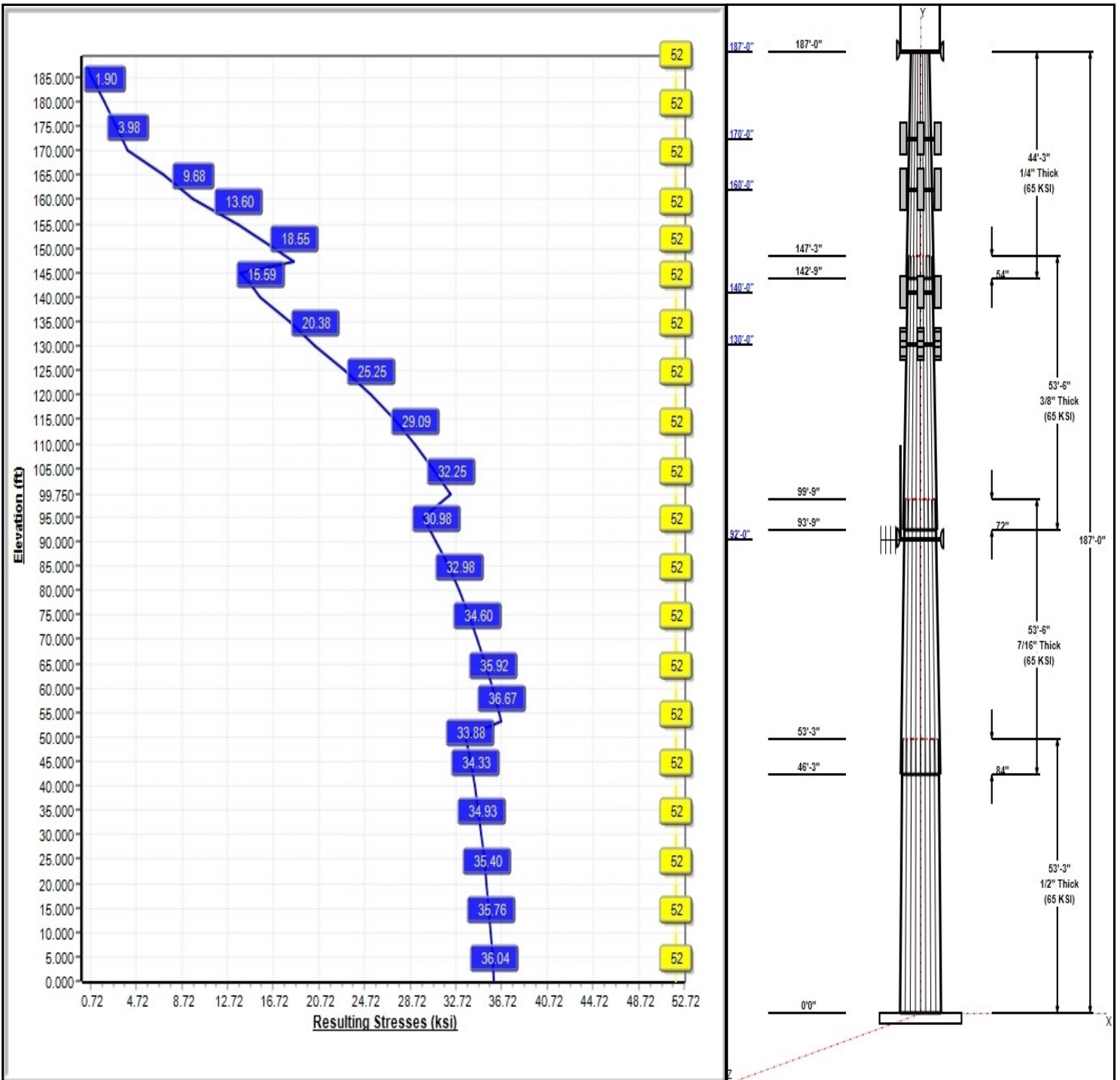
**Load Case : 80 mph Wind with 0 in Ice**



**Iterations:** 25

**52** Allowable Stress  
**37** Resulting Stress

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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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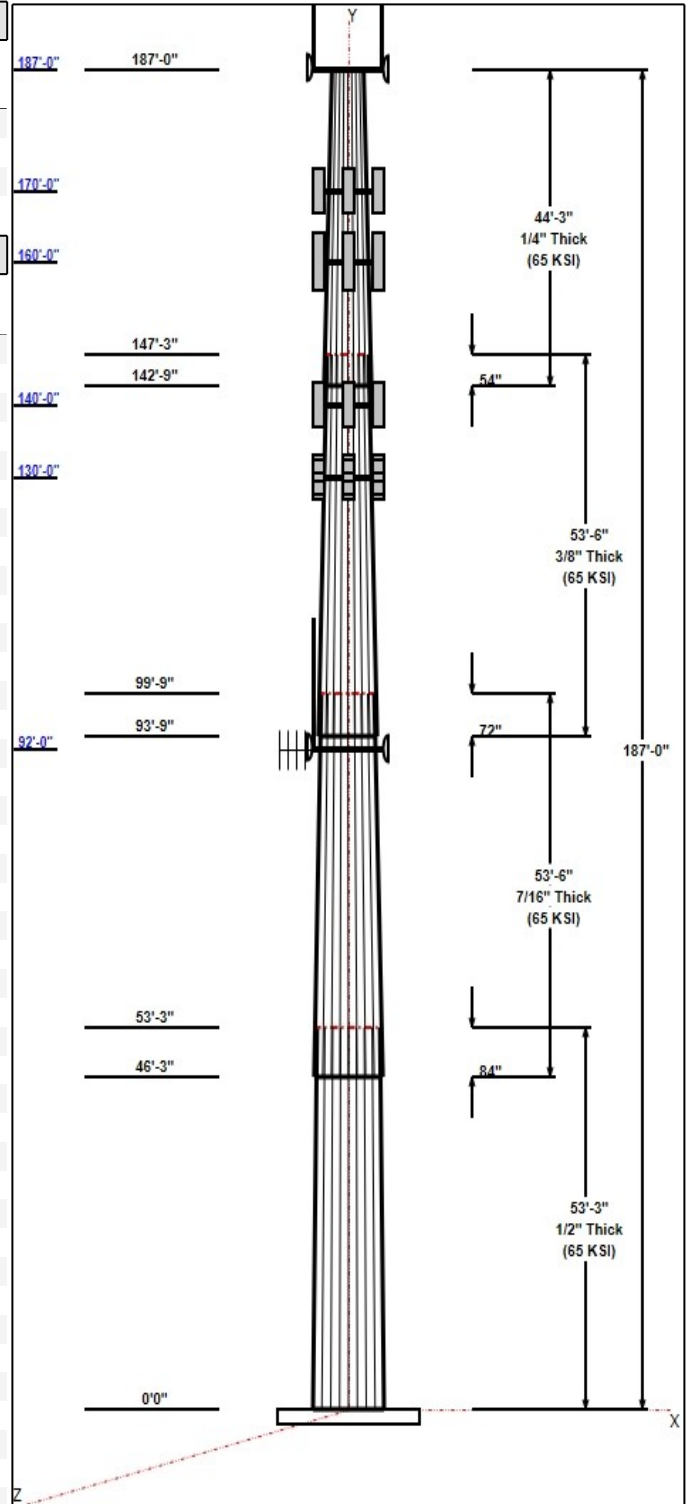


### Shaft Properties

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	1	6' Lightning rod	
187.00	190.92	1	ANT450F6	Town of South
187.00	189.04	2	ANT900D6-9	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	2	MF-900B	Town of South
170.00	170.00	3	7770.00	AT&T
170.00	170.00	12	782 10250	AT&T
170.00	170.00	3	ABT-DFDM-ADBH	AT&T
170.00	170.00	3	AM-X-CD-6500T-RET	AT&T
170.00	170.00	1	CS72188.01	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	6	DTMABP7819VG12A	AT&T
170.00	170.00	3	HPA-65R-BUU-H6	AT&T
170.00	170.00	1	Low Profile Platform	AT&T
170.00	170.00	6	RRUS 11	AT&T
170.00	170.00	3	RRUS A2 Module	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	Double TMA 17/21	T-Mobile
160.00	160.00	3	LNx-6515DS	T-Mobile
160.00	160.00	1	Platform w/ Hand Rail	T-Mobile
160.00	160.00	3	S11B12	T-Mobile
140.00	140.00	1	DB-T1-6Z-8AB-0Z	Verizon
140.00	140.00	6	FD9R6004/2C-3L	Verizon
140.00	140.00	6	HBXX-6517DS-A2M	Verizon
140.00	140.00	6	KS-24019	Verizon
140.00	140.00	3	LNx-6514DS-A1M	Verizon
140.00	140.00	3	LNx-6514DS-VTM	Verizon
140.00	140.00	1	Low Profile Platform	Verizon
140.00	140.00	3	RRH2x40-07-U	Verizon
140.00	140.00	3	RRH2x60-1900	Verizon
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	4	ACU-A20-N	Sprint
130.00	130.00	3	APXVSP18-C-A20	Sprint
130.00	130.00	3	APXVTM14-C-120	Sprint
130.00	130.00	1	Low Profile Platform	Sprint
130.00	130.00	3	RF Filters	Sprint
130.00	130.00	3	TD-RRH8x20-25	Sprint
92.00	97.00	1	ANT150D3	Town of South
92.00	95.00	1	ANT4506-9	Town of South
92.00	92.00	1	ANT450Y10-WR	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	101.00	1	DB205	Town of South
92.00	92.00	1	Low Profile Platform	Town of South
92.00	92.00	2	MF-900B	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
80 mph Wind with 0" Ice	4800.2	37.3	56.8
69.28 mph Wind with 0.5" Ice	4197.6	31.7	66.8
50 mph Wind with 0" Ice	1876.4	14.6	56.9

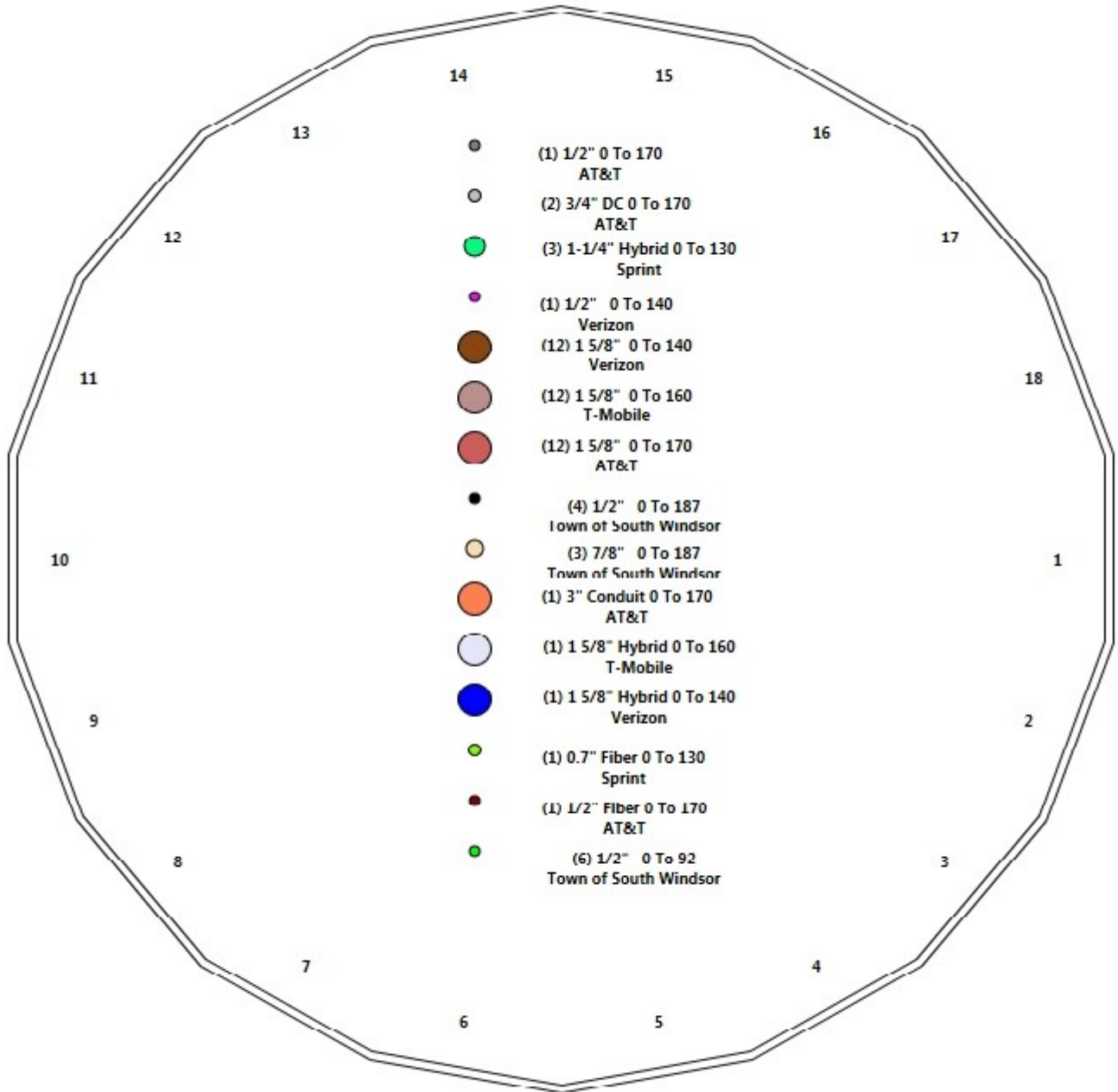
# Structure: CT07824-S-SBA - Coax Line Placement

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

3/11/2016



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## Shaft Properties

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

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

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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	53.250	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	105.27	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	147.2	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	187.0	18.84	1343.00	15.52	96.00	0.229973



## Loading Summary

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

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

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### Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
1	187.00	6' Lightning rod	1	6.50	0.38	1.00	11.80	0.980	1.00	0.00	0.00
2	187.00	ANT450F6	1	21.00	1.86	1.00	35.00	2.670	1.00	0.00	3.92
3	187.00	ANT900D6-9	2	11.00	0.98	1.00	21.90	1.670	1.00	0.00	2.04
4	187.00	DB201	2	25.00	3.54	1.00	56.40	6.660	1.00	0.00	4.75
5	187.00	Low Profile Platform	1	1500.00	22.00	1.00	1800.00	27.000	1.00	0.00	0.00
6	187.00	MF-900B	2	13.00	3.45	1.00	45.20	10.430	1.00	1.00	0.00
7	170.00	7770.00	3	35.00	5.88	0.75	64.92	6.250	0.75	0.00	0.00
8	170.00	782 10250	12	6.40	0.52	0.98	10.00	0.620	0.98	0.00	0.00
9	170.00	ABT-DFDM-ADBH	3	1.14	0.05	0.98	1.56	0.080	0.98	0.00	0.00
10	170.00	AM-X-CD-6500T-RET	3	48.50	8.26	0.78	95.00	9.080	0.78	0.00	0.00
11	170.00	CS72188.01	1	0.32	0.20	1.00	1.74	0.250	1.00	0.00	0.00
12	170.00	DBC-750	3	4.88	0.51	0.59	7.08	0.590	0.63	0.00	0.00
13	170.00	DC6-48-60-18-8F	1	32.80	4.32	1.00	56.36	4.560	1.00	0.00	0.00
14	170.00	DTMABP7819VG12A	6	19.18	1.59	0.68	26.76	1.740	0.70	0.00	0.00
15	170.00	HPA-65R-BUU-H6	3	51.00	10.36	0.81	108.40	10.850	0.81	0.00	0.00
16	170.00	Low Profile Platform	1	1500.00	22.00	1.00	1800.00	27.000	1.00	0.00	0.00
17	170.00	RRUS 11	6	55.00	2.94	0.71	69.41	3.140	0.72	0.00	0.00
18	170.00	RRUS A2 Module	3	21.10	1.87	0.63	29.36	2.030	0.65	0.00	0.00
19	160.00	AIR 21 B2A B4P	3	91.50	6.52	0.83	128.79	6.900	0.83	0.00	0.00
20	160.00	AIR 21 B4A B2P	3	90.30	6.52	0.83	127.59	6.900	0.83	0.00	0.00
21	160.00	Double TMA 17/21	3	11.00	0.41	0.72	13.14	0.490	0.75	0.00	0.00
22	160.00	LNx-6515DS	3	50.30	11.45	0.84	112.11	11.920	0.84	0.00	0.00
23	160.00	Platform w/ Hand Rail	1	1600.00	32.00	1.00	2200.00	40.000	1.00	0.00	0.00
24	160.00	S11B12	3	51.00	3.31	0.71	67.07	3.520	0.72	0.00	0.00
25	140.00	DB-T1-6Z-8AB-OZ	1	21.40	4.78	1.00	51.10	5.040	1.00	0.00	0.00
26	140.00	FD9R6004/2C-3L	6	3.10	0.36	0.75	5.40	0.500	0.77	0.00	0.00
27	140.00	HBXX-6517DS-A2M	6	40.80	8.73	0.77	91.20	9.590	0.79	0.00	0.00
28	140.00	KS-24019	6	0.50	0.12	1.00	2.30	0.180	1.00	0.00	0.00
29	140.00	LNx-6514DS-A1M	3	38.40	8.41	0.83	88.90	9.240	0.85	0.00	0.00
30	140.00	LNx-6514DS-VTM	3	33.10	8.33	0.80	83.10	9.150	0.82	0.00	0.00
31	140.00	Low Profile Platform	1	1500.00	22.00	1.00	1800.00	27.000	1.00	0.00	0.00
32	140.00	RRH2x40-07-U	3	50.70	2.23	0.78	67.50	2.540	0.80	0.00	0.00
33	140.00	RRH2x60-1900	3	19.50	1.76	0.90	48.40	1.930	0.91	0.00	0.00
34	130.00	1900MHz RRH	3	44.00	3.80	0.88	75.20	4.200	0.89	0.00	0.00
35	130.00	800 MHz RRH	3	53.00	2.49	0.92	74.10	2.820	0.93	0.00	0.00
36	130.00	800MHz Filter	3	8.80	0.78	0.69	13.80	0.960	0.71	0.00	0.00
37	130.00	ACU-A20-N	4	1.00	0.14	0.79	2.30	0.220	0.81	0.00	0.00
38	130.00	APXVSP18-C-A20	3	57.00	8.26	0.83	106.50	9.080	0.85	0.00	0.00
39	130.00	APXVTM14-C-120	3	56.00	6.90	0.79	91.90	7.290	0.81	0.00	0.00
40	130.00	Low Profile Platform	1	1500.00	22.00	1.00	1800.00	27.000	1.00	0.00	0.00
41	130.00	RF Filters	3	15.50	1.09	0.67	22.00	1.270	0.69	0.00	0.00
42	130.00	TD-RRH8x20-25	3	70.00	4.72	0.69	92.00	4.970	0.71	0.00	0.00
43	92.00	ANT150D3	1	18.00	2.18	1.00	38.90	4.620	1.00	0.00	5.00
44	92.00	ANT4506-9	1	18.00	2.77	1.00	41.60	3.630	1.00	0.00	3.00
45	92.00	ANT450Y10-WR	1	5.00	0.49	1.00	10.80	0.820	1.00	0.00	0.00
46	92.00	DB205	1	38.00	1.80	1.00	54.60	3.610	1.00	0.00	9.00
47	92.00	Low Profile Platform	1	1500.00	22.00	1.00	1800.00	27.000	1.00	0.00	0.00
48	92.00	MF-900B	2	13.00	3.45	1.00	45.20	10.430	1.00	1.00	0.00
<b>Totals:</b>			<b>135</b>	<b>12,882.46</b>			<b>17,694.18</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	No Ice		Ice		Exposed
			Weight (lb/ft)	CaAa (sf/ft)	Weight (lb/ft)	CaAa (sf/ft)	
0.00	187.00	(4) 1/2" Coax	0.32	0.00	0.00	0.00	Inside
0.00	187.00	(3) 7/8" Coax	1.04	0.00	0.00	0.00	Inside
0.00	170.00	(12) 1 5/8" Coax	1.04	0.00	0.00	0.00	Inside
0.00	170.00	(1) 1/2"	0.16	0.00	0.00	0.00	Inside
0.00	170.00	(1) 1/2" Fiber	0.16	0.00	0.00	0.00	Inside
0.00	170.00	(1) 3" Conduit	4.83	0.00	0.00	0.00	Inside
0.00	170.00	(2) 3/4" DC	0.40	0.00	0.00	0.00	Inside
0.00	160.00	(12) 1 5/8" Coax	1.04	0.00	0.00	0.00	Inside
0.00	160.00	(1) 1 5/8" Hybrid	3.30	0.00	0.00	0.00	Inside
0.00	140.00	(12) 1 5/8" Coax	1.04	0.00	0.00	0.00	Inside
0.00	140.00	(1) 1 5/8" Hybrid	3.30	0.00	0.00	0.00	Inside
0.00	140.00	(1) 1/2" Coax	0.48	0.00	0.00	0.00	Inside
0.00	130.00	(1) 0.7" Fiber	0.40	0.00	0.00	0.00	Inside
0.00	130.00	(3) 1-1/4" Hybrid	2.86	0.00	0.00	0.00	Inside
0.00	92.00	(6) 1/2" Coax	0.32	0.00	0.00	0.00	Inside
<b>Totals:</b>			<b>3,197.32</b>		<b>0.00</b>		

## Shaft Section Properties

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

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

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**Increment Length:** 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Weight (lb)
0.00		0.5000	64.880	102.167	53501.7	21.47	129.76	65	52	0.0
5.00		0.5000	63.730	100.343	50685.8	21.06	127.46	65	52	1722.7
10.00		0.5000	62.580	98.518	47970.6	20.66	125.16	65	52	1691.7
15.00		0.5000	61.430	96.693	45354.1	20.25	122.86	65	52	1660.6
20.00		0.5000	60.281	94.868	42834.5	19.85	120.56	65	52	1629.6
25.00		0.5000	59.131	93.044	40410.0	19.44	118.26	65	52	1598.6
30.00		0.5000	57.981	91.219	38078.8	19.04	115.96	65	52	1567.5
35.00		0.5000	56.831	89.394	35839.0	18.63	113.66	65	52	1536.5
40.00		0.5000	55.681	87.569	33688.7	18.23	111.36	65	52	1505.4
45.00		0.5000	54.531	85.744	31626.3	17.82	109.06	65	52	1474.4
46.25	Bot - Section 2	0.5000	54.244	85.288	31124.2	17.72	108.49	65	52	363.7
50.00		0.5000	53.381	83.920	29649.8	17.41	106.76	65	52	2040.8
53.25	Top - Section 1	0.4375	53.509	73.694	26224.3	20.16	122.31	65	52	1742.2
55.00		0.4375	53.106	73.135	25632.3	19.99	121.39	65	52	437.2
60.00		0.4375	51.957	71.538	23989.8	19.53	118.76	65	52	1230.7
65.00		0.4375	50.807	69.941	22419.1	19.07	116.13	65	52	1203.6
70.00		0.4375	49.657	68.345	20918.5	18.60	113.50	65	52	1176.4
75.00		0.4375	48.507	66.748	19486.4	18.14	110.87	65	52	1149.2
80.00		0.4375	47.357	65.151	18121.2	17.68	108.24	65	52	1122.1
85.00		0.4375	46.207	63.555	16821.3	17.21	105.62	65	52	1094.9
90.00		0.4375	45.057	61.958	15585.1	16.75	102.99	65	52	1067.7
92.00		0.4375	44.597	61.319	15108.1	16.56	101.94	65	52	419.5
93.75	Bot - Section 3	0.4375	44.195	60.761	14698.7	16.40	101.02	65	52	363.5
95.00		0.4375	43.908	60.361	14410.9	16.29	100.36	65	52	482.5
99.75	Top - Section 2	0.3750	43.565	51.405	12115.2	19.07	116.17	65	52	1804.8
100.00		0.3750	43.508	51.337	12066.9	19.05	116.02	65	52	43.7
105.00		0.3750	42.358	49.968	11127.3	18.51	112.95	65	52	861.8
110.00		0.3750	41.208	48.600	10237.8	17.97	109.89	65	52	838.5
115.00		0.3750	40.058	47.231	9397.1	17.42	106.82	65	52	815.2
120.00		0.3750	38.908	45.862	8603.6	16.88	103.76	65	52	791.9
125.00		0.3750	37.758	44.494	7856.2	16.34	100.69	65	52	768.7
130.00		0.3750	36.608	43.125	7153.3	15.80	97.62	65	52	745.4
135.00		0.3750	35.459	41.757	6493.6	15.26	94.56	65	52	722.1
140.00		0.3750	34.309	40.388	5875.9	14.72	91.49	65	52	698.8
142.75	Bot - Section 4	0.3750	33.676	39.635	5553.4	14.42	89.80	65	52	374.4
145.00		0.3750	33.159	39.020	5298.5	14.18	88.42	65	52	505.6
147.25	Top - Section 3	0.2500	33.141	26.098	3567.2	21.96	132.57	65	52	497.8
150.00		0.2500	32.509	25.597	3365.4	21.52	130.04	65	52	241.9
155.00		0.2500	31.359	24.684	3018.2	20.71	125.44	65	52	427.7
160.00		0.2500	30.209	23.772	2695.7	19.90	120.84	65	52	412.2
165.00		0.2500	29.059	22.859	2397.1	19.09	116.24	65	52	396.7
170.00		0.2500	27.910	21.947	2121.4	18.27	111.64	65	52	381.2
175.00		0.2500	26.760	21.035	1867.7	17.46	107.04	65	52	365.6
180.00		0.2500	25.610	20.122	1635.0	16.65	102.44	65	52	350.1
185.00		0.2500	24.460	19.210	1422.5	15.84	97.84	65	52	334.6
187.00		0.2500	24.000	18.845	1343.0	15.52	96.00	65	52	129.5

**40789.2**

## Wind Loading - Shaft

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

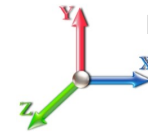
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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

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



**Iterations:** 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		0.00	1.00	16.384	27.69	432.53	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	16.384	27.69	424.87	0.650	0.000	5.00	26.794	17.42	482.2	0.0	1722.7
10.00		0.00	1.00	16.384	27.69	417.20	0.650	0.000	5.00	26.315	17.10	473.6	0.0	1691.7
15.00		0.00	1.00	16.384	27.69	409.54	0.650	0.000	5.00	25.836	16.79	465.0	0.0	1660.6
20.00		0.00	1.00	16.384	27.69	401.87	0.650	0.000	5.00	25.356	16.48	456.4	0.0	1629.6
25.00		0.00	1.00	16.384	27.69	394.20	0.650	0.000	5.00	24.877	16.17	447.7	0.0	1598.6
30.00		0.00	1.00	16.384	27.69	386.54	0.650	0.000	5.00	24.398	15.86	439.1	0.0	1567.5
35.00		0.00	1.03	16.796	28.39	383.61	0.650	0.000	5.00	23.919	15.55	441.3	0.0	1536.5
40.00		0.00	1.06	17.432	29.46	382.90	0.650	0.000	5.00	23.440	15.24	448.9	0.0	1505.4
45.00		0.00	1.10	18.015	30.45	381.21	0.650	0.000	5.00	22.961	14.92	454.4	0.0	1474.4
46.25	Bot - Section 2	0.00	1.11	18.153	30.68	380.65	0.650	0.000	1.25	5.665	3.68	113.0	0.0	363.7
50.00		0.00	1.13	18.554	31.36	378.71	0.650	0.000	3.75	17.090	11.11	348.3	0.0	2040.8
53.25	Top - Section 1	0.00	1.15	18.884	31.91	376.72	0.650	0.000	3.25	14.593	9.49	302.7	0.0	1742.2
55.00		0.00	1.16	19.056	32.21	381.83	0.650	0.000	1.75	7.774	5.05	162.7	0.0	437.2
60.00		0.00	1.19	19.528	33.00	378.15	0.650	0.000	5.00	21.888	14.23	469.5	0.0	1230.7
65.00		0.00	1.22	19.972	33.75	373.97	0.650	0.000	5.00	21.409	13.92	469.7	0.0	1203.6
70.00		0.00	1.24	20.393	34.46	369.34	0.650	0.000	5.00	20.930	13.60	468.9	0.0	1176.4
75.00		0.00	1.27	20.794	35.14	364.31	0.650	0.000	5.00	20.451	13.29	467.1	0.0	1149.2
80.00		0.00	1.29	21.176	35.79	358.93	0.650	0.000	5.00	19.972	12.98	464.6	0.0	1122.1
85.00		0.00	1.31	21.541	36.40	353.22	0.650	0.000	5.00	19.493	12.67	461.3	0.0	1094.9
90.00		0.00	1.34	21.892	37.00	347.22	0.650	0.000	5.00	19.013	12.36	457.2	0.0	1067.7
92.00	Appurtenance(s)	0.00	1.34	22.028	37.23	344.75	0.650	0.000	2.00	7.471	4.86	180.8	0.0	419.5
93.75	Bot - Section 3	0.00	1.35	22.146	37.43	342.55	0.650	0.000	1.75	6.474	4.21	157.5	0.0	363.5
95.00		0.00	1.36	22.229	37.57	340.96	0.650	0.000	1.25	4.667	3.03	114.0	0.0	482.5
99.75	Top - Section 2	0.00	1.38	22.538	38.09	334.78	0.650	0.000	4.75	17.461	11.35	432.3	0.0	1804.8
100.00		0.00	1.38	22.554	38.12	340.31	0.650	0.000	0.25	0.907	0.59	22.5	0.0	43.7
105.00		0.00	1.40	22.867	38.65	333.61	0.650	0.000	5.00	17.889	11.63	449.4	0.0	861.8
110.00		0.00	1.41	23.171	39.16	326.70	0.650	0.000	5.00	17.410	11.32	443.1	0.0	838.5
115.00		0.00	1.43	23.464	39.65	319.59	0.650	0.000	5.00	16.930	11.00	436.4	0.0	815.2
120.00		0.00	1.45	23.749	40.14	312.29	0.650	0.000	5.00	16.451	10.69	429.2	0.0	791.9
125.00		0.00	1.47	24.025	40.60	304.82	0.650	0.000	5.00	15.972	10.38	421.5	0.0	768.7
130.00	Appurtenance(s)	0.00	1.48	24.294	41.06	297.19	0.650	0.000	5.00	15.493	10.07	413.5	0.0	745.4
135.00		0.00	1.50	24.555	41.50	289.40	0.650	0.000	5.00	15.014	9.76	405.0	0.0	722.1
140.00	Appurtenance(s)	0.00	1.51	24.810	41.93	281.46	0.650	0.000	5.00	14.535	9.45	396.1	0.0	698.8
142.75	Bot - Section 4	0.00	1.52	24.947	42.16	277.03	0.650	0.000	2.75	7.790	5.06	213.5	0.0	374.4
145.00		0.00	1.53	25.058	42.35	273.38	0.650	0.000	2.25	6.360	4.13	175.1	0.0	505.6
147.25	Top - Section 3	0.00	1.54	25.168	42.53	269.71	0.650	0.000	2.25	6.263	4.07	173.1	0.0	497.8
150.00		0.00	1.54	25.300	42.76	269.32	0.650	0.000	2.75	7.522	4.89	209.1	0.0	241.9
155.00		0.00	1.56	25.537	43.16	261.00	0.650	0.000	5.00	13.306	8.65	373.3	0.0	427.7
160.00	Appurtenance(s)	0.00	1.57	25.768	43.55	252.57	0.650	0.000	5.00	12.827	8.34	363.1	0.0	412.2
165.00		0.00	1.59	25.994	43.93	244.02	0.650	0.000	5.00	12.348	8.03	352.6	0.0	396.7
170.00	Appurtenance(s)	0.00	1.60	26.215	44.30	235.36	0.650	0.000	5.00	11.869	7.71	341.8	0.0	381.2
175.00		0.00	1.61	26.432	44.67	226.59	0.650	0.000	5.00	11.389	7.40	330.7	0.0	365.6
180.00		0.00	1.63	26.645	45.03	217.73	0.650	0.000	5.00	10.910	7.09	319.3	0.0	350.1
185.00		0.00	1.64	26.853	45.38	208.76	0.650	0.000	5.00	10.431	6.78	307.7	0.0	334.6
187.00	Appurtenance(s)	0.00	1.64	26.935	45.52	205.15	0.650	0.000	2.00	4.038	2.62	119.5	0.0	129.5
<b>Totals:</b>									<b>187.00</b>			<b>15,873.5</b>		<b>40,789.2</b>



## Discrete Appurtenance Forces

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

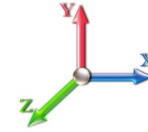
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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

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



**Iterations:** 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	187.00	ANT900D6-9	2	27.018	45.661	1.00	1.96	22.00	0.000	2.042	89.50	0.00	182.72
2	187.00	6' Lightning rod	1	26.935	45.520	1.00	0.38	6.50	0.000	0.000	17.30	0.00	0.00
3	187.00	ANT450F6	1	27.094	45.789	1.00	1.86	21.00	0.000	3.917	85.17	0.00	333.58
4	187.00	MF-900B	2	26.935	45.520	1.00	6.90	26.00	2.015	0.000	314.09	633.03	0.00
5	187.00	DB201	2	27.128	45.846	1.00	7.08	50.00	0.000	4.750	324.59	0.00	1541.80
6	187.00	Low Profile Platform	1	26.935	45.520	1.00	22.00	1500.00	0.000	0.000	1001.45	0.00	0.00
7	170.00	7770.00	3	26.215	44.304	0.75	13.21	105.00	0.000	0.000	585.36	0.00	0.00
8	170.00	782 10250	12	26.215	44.304	0.98	6.12	76.80	0.000	0.000	270.93	0.00	0.00
9	170.00	ABT-DFDM-ADBH	3	26.215	44.304	0.98	0.15	3.42	0.000	0.000	6.49	0.00	0.00
10	170.00	AM-X-CD-6500T-RET	3	26.215	44.304	0.78	19.35	145.50	0.000	0.000	857.43	0.00	0.00
11	170.00	CS72188.01	1	26.215	44.304	1.00	0.20	0.32	0.000	0.000	8.86	0.00	0.00
12	170.00	DBC-750	3	26.215	44.304	0.59	0.91	14.64	0.000	0.000	40.26	0.00	0.00
13	170.00	DC6-48-60-18-8F	1	26.215	44.304	1.00	4.32	32.80	0.000	0.000	191.39	0.00	0.00
14	170.00	HPA-65R-BUU-H6	3	26.215	44.304	0.81	25.21	153.00	0.000	0.000	1116.73	0.00	0.00
15	170.00	Low Profile Platform	1	26.215	44.304	1.00	22.00	1500.00	0.000	0.000	974.69	0.00	0.00
16	170.00	RRUS 11	6	26.215	44.304	0.71	12.56	330.00	0.000	0.000	556.45	0.00	0.00
17	170.00	RRUS A2 Module	3	26.215	44.304	0.63	3.55	63.30	0.000	0.000	157.33	0.00	0.00
18	170.00	DTMABP7819VG12A	6	26.215	44.304	0.68	6.51	115.08	0.000	0.000	288.26	0.00	0.00
19	160.00	Double TMA 17/21	3	25.768	43.548	0.72	0.89	33.00	0.000	0.000	38.62	0.00	0.00
20	160.00	AIR 21 B2A B4P	3	25.768	43.548	0.83	16.16	274.50	0.000	0.000	703.58	0.00	0.00
21	160.00	AIR 21 B4A B2P	3	25.768	43.548	0.83	16.16	270.90	0.000	0.000	703.58	0.00	0.00
22	160.00	S11B12	3	25.768	43.548	0.71	7.01	153.00	0.000	0.000	305.30	0.00	0.00
23	160.00	LNx-6515DS	3	25.768	43.548	0.84	28.72	150.90	0.000	0.000	1250.55	0.00	0.00
24	160.00	Platform w/ Hand Rail	1	25.768	43.548	1.00	32.00	1600.00	0.000	0.000	1393.53	0.00	0.00
25	140.00	RRH2x60-1900	3	24.810	41.928	0.90	4.75	58.50	0.000	0.000	199.24	0.00	0.00
26	140.00	KS-24019	6	24.810	41.928	1.00	0.72	3.00	0.000	0.000	30.19	0.00	0.00
27	140.00	DB-T1-6Z-8AB-OZ	1	24.810	41.928	1.00	4.78	21.40	0.000	0.000	200.42	0.00	0.00
28	140.00	FD9R6004/2C-3L	6	24.810	41.928	0.75	1.62	18.60	0.000	0.000	67.92	0.00	0.00
29	140.00	HBXX-6517DS-A2M	6	24.810	41.928	0.77	40.33	244.80	0.000	0.000	1691.08	0.00	0.00
30	140.00	RRH2x40-07-U	3	24.810	41.928	0.78	5.22	152.10	0.000	0.000	218.79	0.00	0.00
31	140.00	LNx-6514DS-A1M	3	24.810	41.928	0.83	20.94	115.20	0.000	0.000	878.02	0.00	0.00
32	140.00	LNx-6514DS-VTM	3	24.810	41.928	0.80	19.99	99.30	0.000	0.000	838.23	0.00	0.00
33	140.00	Low Profile Platform	1	24.810	41.928	1.00	22.00	1500.00	0.000	0.000	922.42	0.00	0.00
34	130.00	1900MHz RRH	3	24.294	41.056	0.88	10.03	132.00	0.000	0.000	411.88	0.00	0.00
35	130.00	800 MHz RRH	3	24.294	41.056	0.92	6.87	159.00	0.000	0.000	282.16	0.00	0.00
36	130.00	800MHz Filter	3	24.294	41.056	0.69	1.61	26.40	0.000	0.000	66.29	0.00	0.00
37	130.00	ACU-A20-N	4	24.294	41.056	0.79	0.44	4.00	0.000	0.000	18.16	0.00	0.00
38	130.00	APXVTM14-C-120	3	24.294	41.056	0.79	16.35	168.00	0.000	0.000	671.39	0.00	0.00
39	130.00	APXVSPP18-C-A20	3	24.294	41.056	0.83	20.57	171.00	0.000	0.000	844.42	0.00	0.00
40	130.00	Low Profile Platform	1	24.294	41.056	1.00	22.00	1500.00	0.000	0.000	903.24	0.00	0.00
41	130.00	RF Filters	3	24.294	41.056	0.67	2.19	46.50	0.000	0.000	89.95	0.00	0.00
42	130.00	TD-RRH8x20-25	3	24.294	41.056	0.69	9.77	210.00	0.000	0.000	401.14	0.00	0.00
43	92.00	MF-900B	2	22.028	37.228	1.00	6.90	26.00	2.887	0.000	256.87	741.56	0.00
44	92.00	Low Profile Platform	1	22.028	37.228	1.00	22.00	1500.00	0.000	0.000	819.02	0.00	0.00
45	92.00	DB205	1	22.617	38.224	1.00	1.80	38.00	0.000	9.000	68.80	0.00	619.22
46	92.00	ANT450Y10-WR	1	22.028	37.228	1.00	0.49	5.00	0.000	0.000	18.24	0.00	0.00
47	92.00	ANT4506-9	1	22.229	37.567	1.00	2.77	18.00	0.000	3.000	104.06	0.00	312.18
48	92.00	ANT150D3	1	22.360	37.789	1.00	2.18	18.00	0.000	5.000	82.38	0.00	411.90

## Discrete Appurtenance Forces

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

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

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**Totals:** 12,882.46

21,365.74

## Total Applied Force Summary

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

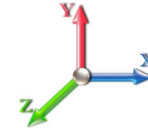
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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

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



**Iterations:** 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		482.23	1826.20	0.00	0.00
10.00		473.61	1795.15	0.00	0.00
15.00		464.98	1764.11	0.00	0.00
20.00		456.36	1733.06	0.00	0.00
25.00		447.74	1702.02	0.00	0.00
30.00		439.11	1670.97	0.00	0.00
35.00		441.33	1639.92	0.00	0.00
40.00		448.86	1608.88	0.00	0.00
45.00		454.38	1577.83	0.00	0.00
46.25		112.98	389.61	0.00	0.00
50.00		348.32	2118.42	0.00	0.00
53.25		302.73	1809.48	0.00	0.00
55.00		162.74	473.38	0.00	0.00
60.00		469.53	1334.18	0.00	0.00
65.00		469.71	1307.02	0.00	0.00
70.00		468.88	1279.85	0.00	0.00
75.00		467.14	1252.69	0.00	0.00
80.00		464.57	1225.52	0.00	0.00
85.00		461.26	1198.36	0.00	0.00
90.00		457.24	1171.19	0.00	0.00
92.00	(7) appurtenances	1530.16	2065.87	741.56	1343.31
93.75		157.51	399.14	0.00	0.00
95.00		113.96	507.97	0.00	0.00
99.75		432.29	1901.52	0.00	0.00
100.00		22.47	48.79	0.00	0.00
105.00		449.36	963.66	0.00	0.00
110.00		443.12	940.37	0.00	0.00
115.00		436.39	917.09	0.00	0.00
120.00		429.18	893.80	0.00	0.00
125.00		421.53	870.52	0.00	0.00
130.00	(26) appurtenances	4102.09	3264.13	0.00	0.00
135.00		404.98	807.64	0.00	0.00
140.00	(32) appurtenances	5442.45	2997.25	0.00	0.00
142.75		213.48	408.21	0.00	0.00
145.00		175.05	533.29	0.00	0.00
147.25		173.14	525.43	0.00	0.00
150.00		209.07	275.67	0.00	0.00
155.00		373.26	489.19	0.00	0.00
160.00	(16) appurtenances	4758.24	2955.96	0.00	0.00
165.00		352.58	436.44	0.00	0.00
170.00	(45) appurtenances	5395.96	2960.78	0.00	0.00
175.00		330.70	372.44	0.00	0.00
180.00		319.34	356.92	0.00	0.00
185.00		307.70	341.40	0.00	0.00
187.00	(9) appurtenances	1951.57	1757.71	633.03	2058.10
<b>Totals:</b>		<b>37,239.25</b>	<b>56,869.02</b>	<b>1,374.59</b>	<b>3,401.41</b>

## Resulting Forces and Deflections

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

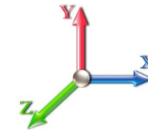
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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

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



**Iterations:** 25

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-37.303	-56.827	0.000	-0.011	-1.363	-4800.198	0.000	0.000	0.000	0.000	0.000
5.00	-36.940	-54.920	0.000	-0.011	-1.363	-4613.686	-0.067	0.000	0.067	-0.125	0.000
10.00	-36.579	-53.045	0.000	-0.012	-1.363	-4428.992	-0.267	0.000	0.267	-0.252	0.000
15.00	-36.220	-51.202	0.000	-0.012	-1.363	-4246.102	-0.600	0.000	0.600	-0.381	0.000
20.00	-35.863	-49.391	0.000	-0.012	-1.363	-4065.008	-1.069	0.000	1.069	-0.511	0.000
25.00	-35.508	-47.611	0.000	-0.013	-1.363	-3885.697	-1.675	0.000	1.675	-0.643	0.000
30.00	-35.156	-45.863	0.000	-0.014	-1.363	-3708.157	-2.421	0.000	2.421	-0.777	0.000
35.00	-34.796	-44.147	0.000	-0.014	-1.363	-3532.379	-3.307	0.000	3.307	-0.912	0.000
40.00	-34.421	-42.464	0.000	-0.015	-1.364	-3358.402	-4.336	0.000	4.336	-1.049	0.000
45.00	-33.998	-40.844	0.000	-0.015	-1.364	-3186.298	-5.509	0.000	5.509	-1.187	0.000
46.25	-33.927	-40.415	0.000	-0.016	-1.364	-3143.801	-5.824	0.000	5.824	-1.222	0.000
50.00	-33.597	-38.247	0.000	-0.017	-1.364	-3016.578	-6.827	0.000	6.827	-1.328	0.000
53.25	-33.297	-36.404	0.000	-0.017	-1.364	-2907.388	-7.764	0.000	7.764	-1.420	-0.001
55.00	-33.186	-35.875	0.000	-0.019	-1.364	-2849.120	-8.294	0.000	8.294	-1.471	-0.001
60.00	-32.774	-34.466	0.000	-0.021	-1.365	-2683.191	-9.917	0.000	9.917	-1.624	-0.001
65.00	-32.355	-33.087	0.000	-0.022	-1.365	-2519.325	-11.702	0.000	11.702	-1.779	-0.001
70.00	-31.930	-31.737	0.000	-0.024	-1.365	-2357.554	-13.648	0.000	13.648	-1.933	-0.001
75.00	-31.502	-30.416	0.000	-0.026	-1.366	-2197.905	-15.756	0.000	15.756	-2.088	-0.001
80.00	-31.070	-29.125	0.000	-0.029	-1.366	-2040.398	-18.026	0.000	18.026	-2.243	-0.001
85.00	-30.635	-27.865	0.001	-0.031	-1.367	-1885.051	-20.458	0.001	20.458	-2.397	-0.001
90.00	-30.178	-26.658	0.001	-0.033	-1.367	-1731.877	-23.050	0.001	23.050	-2.550	-0.001
92.00	-28.581	-24.634	0.001	0.000	-0.626	-1670.179	-24.132	0.001	24.132	-2.612	-0.001
93.75	-28.425	-24.220	0.001	-0.001	-0.626	-1620.163	-25.099	0.001	25.099	-2.666	-0.001
95.00	-28.325	-23.673	0.001	-0.002	-0.626	-1584.633	-25.803	0.001	25.803	-2.705	-0.001
99.75	-27.829	-21.758	0.001	-0.004	-0.626	-1450.092	-28.566	0.001	28.566	-2.847	-0.001
100.00	-27.837	-21.669	0.001	-0.005	-0.626	-1443.134	-28.716	0.001	28.716	-2.855	-0.001
105.00	-27.397	-20.653	0.001	-0.008	-0.627	-1303.952	-31.793	0.001	31.793	-3.017	-0.001
110.00	-26.957	-19.665	0.001	-0.011	-0.627	-1166.971	-35.037	0.001	35.037	-3.175	-0.002
115.00	-26.518	-18.705	0.001	-0.014	-0.628	-1032.190	-38.444	0.002	38.444	-3.328	-0.002
120.00	-26.081	-17.774	0.001	-0.018	-0.628	-899.602	-42.007	0.002	42.007	-3.474	-0.002
125.00	-25.645	-16.871	0.001	-0.021	-0.628	-769.201	-45.719	0.002	45.719	-3.612	-0.002
130.00	-21.372	-13.832	0.001	-0.025	-0.629	-640.977	-49.570	0.002	49.570	-3.740	-0.002
135.00	-20.939	-13.012	0.001	-0.028	-0.629	-534.121	-53.548	0.003	53.548	-3.856	-0.002
140.00	-15.319	-10.372	0.001	-0.031	-0.629	-429.426	-57.642	0.003	57.642	-3.962	-0.002
142.75	-15.086	-9.967	0.001	-0.033	-0.629	-387.298	-59.939	0.003	59.939	-4.016	-0.002
145.00	-14.881	-9.437	0.001	-0.034	-0.629	-353.355	-61.841	0.004	61.841	-4.059	-0.002
147.25	-14.678	-8.914	0.001	-0.035	-0.630	-319.873	-63.763	0.004	63.763	-4.100	-0.002
150.00	-14.461	-8.634	0.001	-0.037	-0.630	-279.510	-66.136	0.004	66.136	-4.146	-0.002
155.00	-14.066	-8.151	0.001	-0.040	-0.630	-207.207	-70.533	0.005	70.533	-4.249	-0.003
160.00	-9.106	-5.549	0.000	-0.042	-0.631	-136.878	-75.026	0.005	75.026	-4.330	-0.003
165.00	-8.726	-5.133	0.000	-0.045	-0.631	-91.347	-79.591	0.006	79.591	-4.390	-0.003
170.00	-3.120	-2.594	0.000	-0.047	-0.631	-47.716	-84.209	0.007	84.209	-4.431	-0.004
175.00	-2.762	-2.248	0.000	-0.048	-0.631	-32.117	-88.861	0.009	88.861	-4.458	-0.004
180.00	-2.416	-1.916	0.000	-0.048	-0.631	-18.307	-93.536	0.010	93.536	-4.477	-0.005
185.00	-2.083	-1.600	0.000	-0.049	-0.631	-6.224	-98.227	0.012	98.227	-4.488	-0.005
187.00	-1.952	0.000	0.000	0.000	-0.633	-2.058	0.000	0.000	100.106	-4.490	-0.006

## Resulting Stresses

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

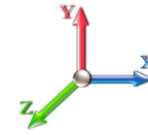
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

3/11/2016  
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**Load Case:** 80 mph Wind with 0" Ice

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



**Iterations:** 25

### Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvT Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.56	0.74	0.00	0.01	0.00	35.47	36.04	52.0	0.693
5.00	0.55	0.74	0.00	0.01	0.00	35.34	35.91	52.0	0.691
10.00	0.54	0.75	0.00	0.01	0.00	35.20	35.76	52.0	0.688
15.00	0.53	0.75	0.00	0.01	0.00	35.04	35.59	52.0	0.685
20.00	0.52	0.76	0.00	0.01	0.00	34.85	35.40	52.0	0.681
25.00	0.51	0.77	0.00	0.01	0.00	34.64	35.18	52.0	0.677
30.00	0.50	0.78	0.00	0.01	0.00	34.40	34.93	52.0	0.672
35.00	0.49	0.78	0.00	0.01	0.00	34.13	34.65	52.0	0.667
40.00	0.48	0.79	0.00	0.01	0.00	33.82	34.33	52.0	0.660
45.00	0.48	0.80	0.00	0.01	0.00	33.47	33.98	52.0	0.654
46.25	0.47	0.80	0.00	0.01	0.00	33.38	33.88	52.0	0.652
50.00	0.46	0.81	0.00	0.01	0.00	33.09	33.57	52.0	0.646
53.25	0.49	0.91	0.00	0.01	0.00	36.14	36.67	52.0	0.705
55.00	0.49	0.91	0.00	0.01	0.00	35.96	36.49	52.0	0.702
60.00	0.48	0.92	0.00	0.01	0.00	35.41	35.92	52.0	0.691
65.00	0.47	0.93	0.00	0.01	0.00	34.78	35.30	52.0	0.679
70.00	0.46	0.94	0.00	0.01	0.00	34.10	34.60	52.0	0.666
75.00	0.46	0.95	0.00	0.01	0.00	33.33	33.83	52.0	0.651
80.00	0.45	0.96	0.00	0.01	0.00	32.49	32.98	52.0	0.634
85.00	0.44	0.97	0.00	0.01	0.00	31.55	32.03	52.0	0.616
90.00	0.43	0.98	0.00	0.01	0.00	30.51	30.98	52.0	0.596
92.00	0.40	0.94	0.00	0.01	0.00	30.04	30.48	52.0	0.586
93.75	0.40	0.94	0.00	0.01	0.00	29.68	30.12	52.0	0.579
95.00	0.39	0.95	0.00	0.01	0.00	29.42	29.85	52.0	0.574
99.75	0.42	1.09	0.00	0.01	0.00	31.77	32.25	52.0	0.620
100.00	0.42	1.09	0.00	0.01	0.00	31.70	32.18	52.0	0.619
105.00	0.41	1.11	0.00	0.01	0.00	30.24	30.72	52.0	0.591
110.00	0.40	1.12	0.00	0.01	0.00	28.62	29.09	52.0	0.560
115.00	0.40	1.13	0.00	0.01	0.00	26.81	27.28	52.0	0.525
120.00	0.39	1.15	0.00	0.01	0.00	24.79	25.25	52.0	0.486
125.00	0.38	1.16	0.00	0.01	0.00	22.52	22.99	52.0	0.442
130.00	0.32	1.00	0.00	0.01	0.00	19.99	20.38	52.0	0.392
135.00	0.31	1.01	0.00	0.01	0.00	17.77	18.17	52.0	0.350
140.00	0.26	0.76	0.00	0.01	0.00	15.28	15.59	52.0	0.300
142.75	0.25	0.77	0.00	0.01	0.00	14.31	14.62	52.0	0.281
145.00	0.24	0.77	0.00	0.01	0.00	13.47	13.78	52.0	0.265
147.25	0.34	1.13	0.00	0.02	0.00	18.11	18.55	52.0	0.357
150.00	0.34	1.14	0.00	0.02	0.00	16.45	16.91	52.0	0.325
155.00	0.33	1.15	0.00	0.02	0.00	13.12	13.60	52.0	0.262
160.00	0.23	0.77	0.00	0.02	0.00	9.35	9.68	52.0	0.186
165.00	0.22	0.77	0.00	0.02	0.00	6.75	7.11	52.0	0.137
170.00	0.12	0.29	0.00	0.03	0.00	3.82	3.98	52.0	0.077
175.00	0.11	0.26	0.00	0.03	0.00	2.80	2.95	52.0	0.057
180.00	0.10	0.24	0.00	0.03	0.00	1.75	1.90	52.0	0.037
185.00	0.08	0.22	0.00	0.03	0.01	0.65	0.85	52.0	0.016
187.00	0.00	0.21	0.00	0.03	0.00	0.22	0.48	52.0	0.009

## Wind Loading - Shaft

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

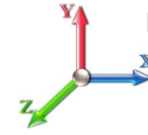
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

3/11/2016  
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**Load Case:** 69.28 mph Wind with 0.5" Ice

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



**Iterations:** 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		0.00	1.00	12.287	20.77	374.57	0.650	0.500	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	12.287	20.77	367.94	0.650	0.500	5.00	27.210	17.69	367.3	198.2	1920.9
10.00		0.00	1.00	12.287	20.77	361.30	0.650	0.500	5.00	26.731	17.38	360.8	194.6	1886.3
15.00		0.00	1.00	12.287	20.77	354.66	0.650	0.500	5.00	26.252	17.06	354.3	191.1	1851.7
20.00		0.00	1.00	12.287	20.77	348.02	0.650	0.500	5.00	25.773	16.75	347.9	187.6	1817.2
25.00		0.00	1.00	12.287	20.77	341.38	0.650	0.500	5.00	25.294	16.44	341.4	184.0	1782.6
30.00		0.00	1.00	12.287	20.77	334.74	0.650	0.500	5.00	24.815	16.13	334.9	180.5	1748.0
35.00		0.00	1.03	12.597	21.29	332.21	0.650	0.500	5.00	24.336	15.82	336.7	176.9	1713.4
40.00		0.00	1.06	13.073	22.09	331.59	0.650	0.500	5.00	23.857	15.51	342.6	173.4	1678.8
45.00		0.00	1.10	13.510	22.83	330.12	0.650	0.500	5.00	23.378	15.20	347.0	169.8	1644.2
46.25	Bot - Section 2	0.00	1.11	13.614	23.01	329.64	0.650	0.500	1.25	5.770	3.75	86.3	42.2	406.0
50.00		0.00	1.13	13.915	23.52	327.96	0.650	0.500	3.75	17.402	11.31	266.0	126.7	2167.5
53.25	Top - Section 1	0.00	1.15	14.162	23.93	326.24	0.650	0.500	3.25	14.864	9.66	231.2	108.3	1850.6
55.00		0.00	1.16	14.291	24.15	330.66	0.650	0.500	1.75	7.920	5.15	124.3	57.9	495.1
60.00		0.00	1.19	14.645	24.75	327.48	0.650	0.500	5.00	22.305	14.50	358.8	161.9	1392.6
65.00		0.00	1.22	14.978	25.31	323.86	0.650	0.500	5.00	21.826	14.19	359.1	158.3	1361.9
70.00		0.00	1.24	15.294	25.85	319.85	0.650	0.500	5.00	21.347	13.88	358.6	154.8	1331.2
75.00		0.00	1.27	15.594	26.35	315.49	0.650	0.500	5.00	20.867	13.56	357.5	151.2	1300.4
80.00		0.00	1.29	15.881	26.84	310.83	0.650	0.500	5.00	20.388	13.25	355.7	147.7	1269.7
85.00		0.00	1.31	16.155	27.30	305.89	0.650	0.500	5.00	19.909	12.94	353.3	144.1	1239.0
90.00		0.00	1.34	16.418	27.75	300.69	0.650	0.500	5.00	19.430	12.63	350.4	140.6	1208.3
92.00	Appurtenance(s)	0.00	1.34	16.520	27.92	298.55	0.650	0.500	2.00	7.638	4.96	138.6	55.7	475.1
93.75	Bot - Section 3	0.00	1.35	16.609	28.07	296.65	0.650	0.500	1.75	6.620	4.30	120.8	48.3	411.8
95.00		0.00	1.36	16.671	28.17	295.27	0.650	0.500	1.25	4.771	3.10	87.4	34.8	517.3
99.75	Top - Section 2	0.00	1.38	16.902	28.57	289.92	0.650	0.500	4.75	17.857	11.61	331.5	129.2	1933.9
100.00		0.00	1.38	16.914	28.59	294.71	0.650	0.500	0.25	0.928	0.60	17.2	6.8	50.5
105.00		0.00	1.40	17.150	28.98	288.91	0.650	0.500	5.00	18.305	11.90	344.9	132.2	994.0
110.00		0.00	1.41	17.377	29.37	282.92	0.650	0.500	5.00	17.826	11.59	340.3	128.7	967.2
115.00		0.00	1.43	17.597	29.74	276.76	0.650	0.500	5.00	17.347	11.28	335.3	125.2	940.4
120.00		0.00	1.45	17.811	30.10	270.44	0.650	0.500	5.00	16.868	10.96	330.0	121.6	913.5
125.00		0.00	1.47	18.018	30.45	263.97	0.650	0.500	5.00	16.389	10.65	324.4	118.1	886.7
130.00	Appurtenance(s)	0.00	1.48	18.219	30.79	257.36	0.650	0.500	5.00	15.910	10.34	318.4	114.5	859.9
135.00		0.00	1.50	18.415	31.12	250.62	0.650	0.500	5.00	15.431	10.03	312.1	111.0	833.0
140.00	Appurtenance(s)	0.00	1.51	18.606	31.44	243.74	0.650	0.500	5.00	14.952	9.72	305.6	107.4	806.2
142.75	Bot - Section 4	0.00	1.52	18.709	31.62	239.91	0.650	0.500	2.75	8.019	5.21	164.8	58.0	432.4
145.00		0.00	1.53	18.792	31.76	236.75	0.650	0.500	2.25	6.547	4.26	135.2	47.4	553.1
147.25	Top - Section 3	0.00	1.54	18.875	31.90	233.56	0.650	0.500	2.25	6.450	4.19	133.7	46.7	544.5
150.00		0.00	1.54	18.974	32.07	233.23	0.650	0.500	2.75	7.752	5.04	161.6	56.0	297.9
155.00		0.00	1.56	19.151	32.37	226.03	0.650	0.500	5.00	13.723	8.92	288.7	98.3	526.0
160.00	Appurtenance(s)	0.00	1.57	19.325	32.66	218.72	0.650	0.500	5.00	13.243	8.61	281.1	94.8	507.0
165.00		0.00	1.59	19.494	32.95	211.32	0.650	0.500	5.00	12.764	8.30	273.3	91.2	487.9
170.00	Appurtenance(s)	0.00	1.60	19.660	33.23	203.82	0.650	0.500	5.00	12.285	7.99	265.3	87.7	468.8
175.00		0.00	1.61	19.823	33.50	196.23	0.650	0.500	5.00	11.806	7.67	257.1	84.1	449.8
180.00		0.00	1.63	19.982	33.77	188.55	0.650	0.500	5.00	11.327	7.36	248.6	80.6	430.7
185.00		0.00	1.64	20.138	34.03	180.79	0.650	0.500	5.00	10.848	7.05	240.0	77.0	411.6
187.00	Appurtenance(s)	0.00	1.64	20.200	34.14	177.66	0.650	0.500	2.00	4.205	2.73	93.3	30.2	159.7
<b>Totals:</b>									<b>187.00</b>			<b>12,183.6</b>	<b>45,924.4</b>	



## Discrete Appurtenance Forces

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

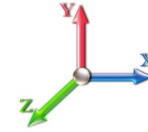
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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

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



**Iterations:** 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	187.00	ANT900D6-9	2	20.263	34.244	1.00	3.34	43.80	0.000	2.042	114.37	0.00	233.52
2	187.00	6' Lightning rod	1	20.200	34.138	1.00	0.98	11.80	0.000	0.000	33.46	0.00	0.00
3	187.00	ANT450F6	1	20.319	34.340	1.00	2.67	35.00	0.000	3.917	91.69	0.00	359.11
4	187.00	MF-900B	2	20.200	34.138	1.00	20.86	90.40	2.015	0.000	712.12	1435.2	0.00
5	187.00	DB201	2	20.345	34.382	1.00	13.32	112.80	0.000	4.750	457.97	0.00	2175.38
6	187.00	Low Profile Platform	1	20.200	34.138	1.00	27.00	1800.00	0.000	0.000	921.73	0.00	0.00
7	170.00	7770.00	3	19.660	33.226	0.75	14.14	194.76	0.000	0.000	469.73	0.00	0.00
8	170.00	782 10250	12	19.660	33.226	0.98	7.31	120.00	0.000	0.000	242.75	0.00	0.00
9	170.00	ABT-DFDM-ADBH	3	19.660	33.226	0.98	0.24	4.68	0.000	0.000	7.84	0.00	0.00
10	170.00	AM-X-CD-6500T-RET	3	19.660	33.226	0.78	21.36	285.00	0.000	0.000	709.58	0.00	0.00
11	170.00	CS72188.01	1	19.660	33.226	1.00	0.25	1.74	0.000	0.000	8.31	0.00	0.00
12	170.00	DBC-750	3	19.660	33.226	0.63	1.11	21.24	0.000	0.000	36.93	0.00	0.00
13	170.00	DC6-48-60-18-8F	1	19.660	33.226	1.00	4.56	56.36	0.000	0.000	151.51	0.00	0.00
14	170.00	HPA-65R-BUU-H6	3	19.660	33.226	0.81	26.50	325.20	0.000	0.000	880.35	0.00	0.00
15	170.00	Low Profile Platform	1	19.660	33.226	1.00	27.00	1800.00	0.000	0.000	897.11	0.00	0.00
16	170.00	RRUS 11	6	19.660	33.226	0.72	13.58	416.46	0.000	0.000	451.33	0.00	0.00
17	170.00	RRUS A2 Module	3	19.660	33.226	0.65	3.95	88.08	0.000	0.000	131.32	0.00	0.00
18	170.00	DTMABP7819VG12A	6	19.660	33.226	0.70	7.28	160.56	0.000	0.000	241.78	0.00	0.00
19	160.00	Double TMA 17/21	3	19.325	32.659	0.75	1.10	39.42	0.000	0.000	35.81	0.00	0.00
20	160.00	AIR 21 B2A B4P	3	19.325	32.659	0.83	17.24	386.37	0.000	0.000	563.14	0.00	0.00
21	160.00	AIR 21 B4A B2P	3	19.325	32.659	0.83	17.24	382.77	0.000	0.000	563.14	0.00	0.00
22	160.00	S11B12	3	19.325	32.659	0.72	7.56	201.21	0.000	0.000	246.93	0.00	0.00
23	160.00	LNx-6515DS	3	19.325	32.659	0.84	30.04	336.33	0.000	0.000	981.02	0.00	0.00
24	160.00	Platform w/ Hand Rail	1	19.325	32.659	1.00	40.00	2200.00	0.000	0.000	1306.36	0.00	0.00
25	140.00	RRH2x60-1900	3	18.606	31.444	0.91	5.27	145.20	0.000	0.000	165.68	0.00	0.00
26	140.00	KS-24019	6	18.606	31.444	1.00	1.08	13.80	0.000	0.000	33.96	0.00	0.00
27	140.00	DB-T1-6Z-8AB-OZ	1	18.606	31.444	1.00	5.04	51.10	0.000	0.000	158.48	0.00	0.00
28	140.00	FD9R6004/2C-3L	6	18.606	31.444	0.77	2.31	32.40	0.000	0.000	72.64	0.00	0.00
29	140.00	HBXX-6517DS-A2M	6	18.606	31.444	0.79	45.46	547.20	0.000	0.000	1429.36	0.00	0.00
30	140.00	RRH2x40-07-U	3	18.606	31.444	0.80	6.10	202.50	0.000	0.000	191.69	0.00	0.00
31	140.00	LNx-6514DS-A1M	3	18.606	31.444	0.85	23.56	266.70	0.000	0.000	740.89	0.00	0.00
32	140.00	LNx-6514DS-VTM	3	18.606	31.444	0.82	22.51	249.30	0.000	0.000	707.78	0.00	0.00
33	140.00	Low Profile Platform	1	18.606	31.444	1.00	27.00	1800.00	0.000	0.000	849.00	0.00	0.00
34	130.00	1900MHz RRH	3	18.219	30.790	0.89	11.21	225.60	0.000	0.000	345.28	0.00	0.00
35	130.00	800 MHz RRH	3	18.219	30.790	0.93	7.87	222.30	0.000	0.000	242.25	0.00	0.00
36	130.00	800MHz Filter	3	18.219	30.790	0.71	2.04	41.40	0.000	0.000	62.96	0.00	0.00
37	130.00	ACU-A20-N	4	18.219	30.790	0.81	0.71	9.20	0.000	0.000	21.95	0.00	0.00
38	130.00	APXVTM14-C-120	3	18.219	30.790	0.81	17.71	275.70	0.000	0.000	545.44	0.00	0.00
39	130.00	APXVSP18-C-A20	3	18.219	30.790	0.85	23.15	319.50	0.000	0.000	712.92	0.00	0.00
40	130.00	Low Profile Platform	1	18.219	30.790	1.00	27.00	1800.00	0.000	0.000	831.34	0.00	0.00
41	130.00	RF Filters	3	18.219	30.790	0.69	2.63	66.00	0.000	0.000	80.94	0.00	0.00
42	130.00	TD-RRH8x20-25	3	18.219	30.790	0.71	10.59	276.00	0.000	0.000	325.95	0.00	0.00
43	92.00	MF-900B	2	16.520	27.919	1.00	20.86	90.40	2.887	0.000	582.40	1681.3	0.00
44	92.00	Low Profile Platform	1	16.520	27.919	1.00	27.00	1800.00	0.000	0.000	753.82	0.00	0.00
45	92.00	DB205	1	16.962	28.666	1.00	3.61	54.60	0.000	9.000	103.48	0.00	931.36
46	92.00	ANT450Y10-WR	1	16.520	27.919	1.00	0.82	10.80	0.000	0.000	22.89	0.00	0.00
47	92.00	ANT4506-9	1	16.671	28.174	1.00	3.63	41.60	0.000	3.000	102.27	0.00	306.81
48	92.00	ANT150D3	1	16.769	28.340	1.00	4.62	38.90	0.000	5.000	130.93	0.00	654.66

## Discrete Appurtenance Forces

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

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

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**Totals:** 17,694.18

19,470.63

## Total Applied Force Summary

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

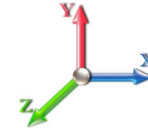
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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

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



**Iterations:** 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		367.28	2024.40	0.00	0.00
10.00		360.81	1989.80	0.00	0.00
15.00		354.34	1955.21	0.00	0.00
20.00		347.87	1920.61	0.00	0.00
25.00		341.41	1886.02	0.00	0.00
30.00		334.94	1851.42	0.00	0.00
35.00		336.74	1816.83	0.00	0.00
40.00		342.61	1782.24	0.00	0.00
45.00		346.95	1747.64	0.00	0.00
46.25		86.29	431.84	0.00	0.00
50.00		266.00	2245.14	0.00	0.00
53.25		231.25	1917.81	0.00	0.00
55.00		124.34	531.28	0.00	0.00
60.00		358.83	1496.05	0.00	0.00
65.00		359.11	1465.34	0.00	0.00
70.00		358.64	1434.62	0.00	0.00
75.00		357.47	1403.91	0.00	0.00
80.00		355.68	1373.20	0.00	0.00
85.00		353.32	1342.48	0.00	0.00
90.00		350.43	1311.77	0.00	0.00
92.00	(7) appurtenances	1834.41	2552.83	1681.32	1892.83
93.75		120.78	447.41	0.00	0.00
95.00		87.37	542.80	0.00	0.00
99.75		331.55	2030.70	0.00	0.00
100.00		17.24	55.58	0.00	0.00
105.00		344.85	1095.90	0.00	0.00
110.00		340.28	1069.07	0.00	0.00
115.00		335.33	1042.24	0.00	0.00
120.00		330.02	1015.40	0.00	0.00
125.00		324.38	988.57	0.00	0.00
130.00	(26) appurtenances	3487.46	4197.44	0.00	0.00
135.00		312.15	918.60	0.00	0.00
140.00	(32) appurtenances	4655.07	4199.96	0.00	0.00
142.75		164.81	466.22	0.00	0.00
145.00		135.15	580.72	0.00	0.00
147.25		133.73	572.14	0.00	0.00
150.00		161.57	331.69	0.00	0.00
155.00		288.69	587.49	0.00	0.00
160.00	(16) appurtenances	3977.55	4114.52	0.00	0.00
165.00		273.34	527.65	0.00	0.00
170.00	(45) appurtenances	4493.87	3982.66	0.00	0.00
175.00		257.08	456.56	0.00	0.00
180.00		248.63	437.49	0.00	0.00
185.00		239.98	418.42	0.00	0.00
187.00	(9) appurtenances	2424.65	2256.25	1435.23	2768.01
<b>Totals:</b>		<b>31,654.24</b>	<b>66,815.92</b>	<b>3,116.55</b>	<b>4,660.84</b>

## Resulting Forces and Deflections

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

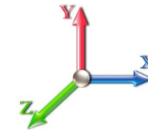
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

3/11/2016  
 Page: 19



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

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



**Iterations:** 25

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-31.720	-66.785	0.000	-0.028	-3.095	-4197.596	0.000	0.000	0.000	0.000	0.000
5.00	-31.475	-64.700	0.000	-0.029	-3.095	-4039.001	-0.059	0.000	0.059	-0.109	0.000
10.00	-31.231	-62.651	0.000	-0.029	-3.095	-3881.628	-0.234	0.000	0.234	-0.221	0.000
15.00	-30.988	-60.636	0.000	-0.030	-3.095	-3725.476	-0.525	0.000	0.525	-0.333	0.000
20.00	-30.745	-58.656	0.000	-0.030	-3.095	-3570.542	-0.936	0.000	0.936	-0.448	0.000
25.00	-30.502	-56.711	0.000	-0.032	-3.095	-3416.822	-1.468	0.000	1.468	-0.564	0.000
30.00	-30.260	-54.801	0.000	-0.033	-3.096	-3264.314	-2.122	0.000	2.122	-0.681	-0.001
35.00	-30.011	-52.926	0.000	-0.034	-3.096	-3113.015	-2.899	0.000	2.899	-0.801	-0.001
40.00	-29.750	-51.086	0.000	-0.036	-3.096	-2962.963	-3.803	0.000	3.803	-0.921	-0.001
45.00	-29.439	-49.305	0.000	-0.036	-3.096	-2814.217	-4.833	0.000	4.833	-1.043	-0.001
46.25	-29.398	-48.843	0.000	-0.038	-3.097	-2777.419	-5.111	0.000	5.111	-1.075	-0.001
50.00	-29.159	-46.559	0.001	-0.040	-3.097	-2667.180	-5.993	0.000	5.993	-1.168	-0.001
53.25	-28.936	-44.615	0.001	-0.040	-3.097	-2572.416	-6.816	0.000	6.816	-1.250	-0.001
55.00	-28.870	-44.041	0.001	-0.044	-3.098	-2521.778	-7.283	0.000	7.283	-1.294	-0.001
60.00	-28.577	-42.486	0.001	-0.047	-3.098	-2377.431	-8.712	0.000	8.712	-1.430	-0.001
65.00	-28.278	-40.963	0.001	-0.050	-3.099	-2234.548	-10.283	0.000	10.283	-1.567	-0.002
70.00	-27.973	-39.472	0.001	-0.054	-3.100	-2093.163	-11.998	0.001	11.998	-1.704	-0.002
75.00	-27.664	-38.013	0.001	-0.058	-3.100	-1953.300	-13.857	0.001	13.857	-1.842	-0.002
80.00	-27.350	-36.587	0.001	-0.062	-3.101	-1814.985	-15.860	0.001	15.860	-1.979	-0.002
85.00	-27.033	-35.194	0.001	-0.067	-3.102	-1678.237	-18.007	0.001	18.007	-2.116	-0.002
90.00	-26.689	-33.852	0.001	-0.070	-3.103	-1543.074	-20.297	0.001	20.297	-2.253	-0.003
92.00	-24.783	-31.352	0.001	-0.004	-1.422	-1487.804	-21.252	0.002	21.252	-2.308	-0.003
93.75	-24.666	-30.892	0.001	-0.006	-1.422	-1444.435	-22.107	0.002	22.107	-2.356	-0.003
95.00	-24.600	-30.319	0.001	-0.008	-1.422	-1413.603	-22.729	0.002	22.729	-2.391	-0.003
99.75	-24.214	-28.276	0.001	-0.012	-1.422	-1296.757	-25.173	0.002	25.173	-2.518	-0.003
100.00	-24.232	-28.189	0.001	-0.014	-1.423	-1290.703	-25.305	0.002	25.305	-2.525	-0.003
105.00	-23.906	-27.050	0.001	-0.020	-1.424	-1169.544	-28.027	0.002	28.027	-2.670	-0.003
110.00	-23.578	-25.941	0.001	-0.026	-1.424	-1050.016	-30.899	0.003	30.899	-2.812	-0.003
115.00	-23.250	-24.862	0.001	-0.032	-1.425	-932.126	-33.918	0.003	33.918	-2.949	-0.004
120.00	-22.920	-23.814	0.001	-0.038	-1.425	-815.880	-37.078	0.004	37.078	-3.082	-0.004
125.00	-22.590	-22.797	0.001	-0.045	-1.426	-701.280	-40.373	0.004	40.373	-3.207	-0.004
130.00	-18.906	-18.768	0.001	-0.052	-1.427	-588.330	-43.795	0.005	43.795	-3.324	-0.004
135.00	-18.572	-17.836	0.001	-0.058	-1.427	-493.802	-47.333	0.006	47.333	-3.432	-0.005
140.00	-13.688	-13.909	0.001	-0.064	-1.428	-400.942	-50.979	0.006	50.979	-3.530	-0.005
142.75	-13.505	-13.444	0.001	-0.067	-1.428	-363.300	-53.026	0.007	53.026	-3.580	-0.005
145.00	-13.343	-12.863	0.001	-0.069	-1.428	-332.913	-54.723	0.007	54.723	-3.621	-0.005
147.25	-13.182	-12.291	0.001	-0.071	-1.428	-302.891	-56.438	0.008	56.438	-3.659	-0.005
150.00	-13.015	-11.954	0.001	-0.075	-1.430	-266.641	-58.557	0.008	58.557	-3.703	-0.006
155.00	-12.706	-11.367	0.001	-0.080	-1.430	-201.568	-62.489	0.010	62.489	-3.802	-0.006
160.00	-8.471	-7.518	0.001	-0.086	-1.431	-138.038	-66.514	0.011	66.514	-3.882	-0.007
165.00	-8.169	-7.003	0.001	-0.090	-1.431	-95.684	-70.611	0.013	70.611	-3.944	-0.008
170.00	-3.412	-3.339	0.000	-0.094	-1.431	-54.842	-74.765	0.015	74.765	-3.988	-0.009
175.00	-3.125	-2.900	0.000	-0.096	-1.432	-37.783	-78.956	0.018	78.956	-4.019	-0.010
180.00	-2.847	-2.480	0.000	-0.098	-1.432	-22.159	-83.175	0.021	83.175	-4.042	-0.011
185.00	-2.578	-2.079	0.000	-0.100	-1.432	-7.924	-87.413	0.024	87.413	-4.055	-0.012
187.00	-2.425	0.000	0.000	0.000	-1.435	-2.768	0.000	0.000	89.111	-4.058	-0.012

## Resulting Stresses

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

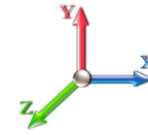
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

3/11/2016  
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**Load Case:** 69.28 mph Wind with 0.5" Ice

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



**Iterations:** 25

### Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvT Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.65	0.63	0.00	0.01	0.00	31.01	31.69	52.0	0.610
5.00	0.64	0.63	0.00	0.01	0.00	30.94	31.61	52.0	0.608
10.00	0.64	0.64	0.00	0.01	0.00	30.85	31.51	52.0	0.606
15.00	0.63	0.65	0.00	0.01	0.00	30.74	31.39	52.0	0.604
20.00	0.62	0.65	0.00	0.01	0.00	30.61	31.25	52.0	0.601
25.00	0.61	0.66	0.00	0.01	0.00	30.46	31.09	52.0	0.598
30.00	0.60	0.67	0.00	0.01	0.00	30.28	30.91	52.0	0.595
35.00	0.59	0.68	0.00	0.01	0.00	30.08	30.69	52.0	0.590
40.00	0.58	0.68	0.00	0.02	0.00	29.84	30.44	52.0	0.586
45.00	0.58	0.69	0.00	0.02	0.00	29.56	30.16	52.0	0.580
46.25	0.57	0.69	0.00	0.02	0.00	29.49	30.09	52.0	0.579
50.00	0.55	0.70	0.00	0.02	0.00	29.26	29.84	52.0	0.574
53.25	0.61	0.79	0.00	0.02	0.00	31.98	32.61	52.0	0.627
55.00	0.60	0.80	0.00	0.02	0.00	31.83	32.47	52.0	0.625
60.00	0.59	0.81	0.00	0.02	0.00	31.37	32.00	52.0	0.616
65.00	0.59	0.81	0.00	0.02	0.00	30.85	31.47	52.0	0.605
70.00	0.58	0.82	0.00	0.02	0.00	30.27	30.89	52.0	0.594
75.00	0.57	0.84	0.00	0.02	0.00	29.62	30.23	52.0	0.582
80.00	0.56	0.85	0.00	0.02	0.00	28.90	29.50	52.0	0.567
85.00	0.55	0.86	0.00	0.03	0.00	28.09	28.68	52.0	0.552
90.00	0.55	0.87	0.00	0.03	0.00	27.18	27.77	52.0	0.534
92.00	0.51	0.81	0.00	0.01	0.00	26.76	27.31	52.0	0.525
93.75	0.51	0.82	0.00	0.01	0.00	26.46	27.01	52.0	0.520
95.00	0.50	0.82	0.00	0.01	0.00	26.24	26.78	52.0	0.515
99.75	0.55	0.95	0.00	0.02	0.00	28.41	29.01	52.0	0.558
100.00	0.55	0.95	0.00	0.02	0.00	28.35	28.95	52.0	0.557
105.00	0.54	0.96	0.00	0.02	0.00	27.12	27.72	52.0	0.533
110.00	0.53	0.98	0.00	0.02	0.00	25.75	26.34	52.0	0.507
115.00	0.53	0.99	0.00	0.02	0.00	24.21	24.80	52.0	0.477
120.00	0.52	1.01	0.00	0.02	0.00	22.48	23.07	52.0	0.444
125.00	0.51	1.02	0.00	0.02	0.00	20.53	21.12	52.0	0.406
130.00	0.44	0.88	0.00	0.02	0.00	18.34	18.84	52.0	0.363
135.00	0.43	0.90	0.00	0.02	0.00	16.43	16.93	52.0	0.326
140.00	0.34	0.68	0.00	0.03	0.00	14.26	14.66	52.0	0.282
142.75	0.34	0.69	0.00	0.03	0.00	13.42	13.82	52.0	0.266
145.00	0.33	0.69	0.00	0.03	0.00	12.69	13.08	52.0	0.252
147.25	0.47	1.02	0.00	0.04	0.00	17.14	17.71	52.0	0.341
150.00	0.47	1.02	0.00	0.04	0.00	15.69	16.26	52.0	0.313
155.00	0.46	1.04	0.00	0.05	0.01	12.76	13.35	52.0	0.257
160.00	0.32	0.72	0.00	0.05	0.01	9.42	9.83	52.0	0.189
165.00	0.31	0.72	0.00	0.05	0.01	7.07	7.49	52.0	0.144
170.00	0.15	0.31	0.00	0.06	0.01	4.40	4.59	52.0	0.088
175.00	0.14	0.30	0.00	0.06	0.01	3.30	3.49	52.0	0.067
180.00	0.12	0.29	0.00	0.07	0.01	2.11	2.32	52.0	0.045
185.00	0.11	0.27	0.00	0.08	0.01	0.83	1.11	52.0	0.021
187.00	0.00	0.26	0.00	0.08	0.00	0.30	0.66	52.0	0.013

## Wind Loading - Shaft

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

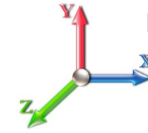
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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

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



**Iterations:** 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		0.00	1.00	6.400	10.82	270.33	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	6.400	10.82	265.54	0.650	0.000	5.00	26.794	17.42	188.4	0.0	1722.7
10.00		0.00	1.00	6.400	10.82	260.75	0.650	0.000	5.00	26.315	17.10	185.0	0.0	1691.7
15.00		0.00	1.00	6.400	10.82	255.96	0.650	0.000	5.00	25.836	16.79	181.6	0.0	1660.6
20.00		0.00	1.00	6.400	10.82	251.17	0.650	0.000	5.00	25.356	16.48	178.3	0.0	1629.6
25.00		0.00	1.00	6.400	10.82	246.38	0.650	0.000	5.00	24.877	16.17	174.9	0.0	1598.6
30.00		0.00	1.00	6.400	10.82	241.59	0.650	0.000	5.00	24.398	15.86	171.5	0.0	1567.5
35.00		0.00	1.03	6.561	11.09	239.76	0.650	0.000	5.00	23.919	15.55	172.4	0.0	1536.5
40.00		0.00	1.06	6.809	11.51	239.31	0.650	0.000	5.00	23.440	15.24	175.3	0.0	1505.4
45.00		0.00	1.10	7.037	11.89	238.25	0.650	0.000	5.00	22.961	14.92	177.5	0.0	1474.4
46.25	Bot - Section 2	0.00	1.11	7.091	11.98	237.91	0.650	0.000	1.25	5.665	3.68	44.1	0.0	363.7
50.00		0.00	1.13	7.248	12.25	236.69	0.650	0.000	3.75	17.090	11.11	136.1	0.0	2040.8
53.25	Top - Section 1	0.00	1.15	7.377	12.47	235.45	0.650	0.000	3.25	14.593	9.49	118.3	0.0	1742.2
55.00		0.00	1.16	7.444	12.58	238.64	0.650	0.000	1.75	7.774	5.05	63.6	0.0	437.2
60.00		0.00	1.19	7.628	12.89	236.34	0.650	0.000	5.00	21.888	14.23	183.4	0.0	1230.7
65.00		0.00	1.22	7.802	13.18	233.73	0.650	0.000	5.00	21.409	13.92	183.5	0.0	1203.6
70.00		0.00	1.24	7.966	13.46	230.84	0.650	0.000	5.00	20.930	13.60	183.2	0.0	1176.4
75.00		0.00	1.27	8.123	13.73	227.69	0.650	0.000	5.00	20.451	13.29	182.5	0.0	1149.2
80.00		0.00	1.29	8.272	13.98	224.33	0.650	0.000	5.00	19.972	12.98	181.5	0.0	1122.1
85.00		0.00	1.31	8.415	14.22	220.76	0.650	0.000	5.00	19.493	12.67	180.2	0.0	1094.9
90.00		0.00	1.34	8.552	14.45	217.01	0.650	0.000	5.00	19.013	12.36	178.6	0.0	1067.7
92.00	Appurtenance(s)	0.00	1.34	8.605	14.54	215.47	0.650	0.000	2.00	7.471	4.86	70.6	0.0	419.5
93.75	Bot - Section 3	0.00	1.35	8.651	14.62	214.09	0.650	0.000	1.75	6.474	4.21	61.5	0.0	363.5
95.00		0.00	1.36	8.683	14.67	213.10	0.650	0.000	1.25	4.667	3.03	44.5	0.0	482.5
99.75	Top - Section 2	0.00	1.38	8.804	14.88	209.23	0.650	0.000	4.75	17.461	11.35	168.9	0.0	1804.8
100.00		0.00	1.38	8.810	14.89	212.69	0.650	0.000	0.25	0.907	0.59	8.8	0.0	43.7
105.00		0.00	1.40	8.933	15.10	208.51	0.650	0.000	5.00	17.889	11.63	175.5	0.0	861.8
110.00		0.00	1.41	9.051	15.30	204.19	0.650	0.000	5.00	17.410	11.32	173.1	0.0	838.5
115.00		0.00	1.43	9.166	15.49	199.74	0.650	0.000	5.00	16.930	11.00	170.5	0.0	815.2
120.00		0.00	1.45	9.277	15.68	195.18	0.650	0.000	5.00	16.451	10.69	167.6	0.0	791.9
125.00		0.00	1.47	9.385	15.86	190.51	0.650	0.000	5.00	15.972	10.38	164.7	0.0	768.7
130.00	Appurtenance(s)	0.00	1.48	9.490	16.04	185.74	0.650	0.000	5.00	15.493	10.07	161.5	0.0	745.4
135.00		0.00	1.50	9.592	16.21	180.87	0.650	0.000	5.00	15.014	9.76	158.2	0.0	722.1
140.00	Appurtenance(s)	0.00	1.51	9.691	16.38	175.91	0.650	0.000	5.00	14.535	9.45	154.7	0.0	698.8
142.75	Bot - Section 4	0.00	1.52	9.745	16.47	173.15	0.650	0.000	2.75	7.790	5.06	83.4	0.0	374.4
145.00		0.00	1.53	9.788	16.54	170.86	0.650	0.000	2.25	6.360	4.13	68.4	0.0	505.6
147.25	Top - Section 3	0.00	1.54	9.831	16.61	168.57	0.650	0.000	2.25	6.263	4.07	67.6	0.0	497.8
150.00		0.00	1.54	9.883	16.70	168.32	0.650	0.000	2.75	7.522	4.89	81.7	0.0	241.9
155.00		0.00	1.56	9.975	16.86	163.13	0.650	0.000	5.00	13.306	8.65	145.8	0.0	427.7
160.00	Appurtenance(s)	0.00	1.57	10.066	17.01	157.86	0.650	0.000	5.00	12.827	8.34	141.8	0.0	412.2
165.00		0.00	1.59	10.154	17.16	152.51	0.650	0.000	5.00	12.348	8.03	137.7	0.0	396.7
170.00	Appurtenance(s)	0.00	1.60	10.240	17.31	147.10	0.650	0.000	5.00	11.869	7.71	133.5	0.0	381.2
175.00		0.00	1.61	10.325	17.45	141.62	0.650	0.000	5.00	11.389	7.40	129.2	0.0	365.6
180.00		0.00	1.63	10.408	17.59	136.08	0.650	0.000	5.00	10.910	7.09	124.7	0.0	350.1
185.00		0.00	1.64	10.489	17.73	130.48	0.650	0.000	5.00	10.431	6.78	120.2	0.0	334.6
187.00	Appurtenance(s)	0.00	1.64	10.522	17.78	128.22	0.650	0.000	2.00	4.038	2.62	46.7	0.0	129.5
<b>Totals:</b>									<b>187.00</b>			<b>6,200.6</b>		<b>40,789.2</b>



## Discrete Appurtenance Forces

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

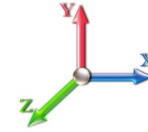
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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

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



**Iterations:** 23

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	187.00	ANT900D6-9	2	10.554	17.836	1.00	1.96	22.00	0.000	2.042	34.96	0.00	71.38
2	187.00	6' Lightning rod	1	10.522	17.781	1.00	0.38	6.50	0.000	0.000	6.76	0.00	0.00
3	187.00	ANT450F6	1	10.584	17.886	1.00	1.86	21.00	0.000	3.917	33.27	0.00	130.30
4	187.00	MF-900B	2	10.522	17.781	1.00	6.90	26.00	2.015	0.000	122.69	247.28	0.00
5	187.00	DB201	2	10.597	17.909	1.00	7.08	50.00	0.000	4.750	126.79	0.00	602.27
6	187.00	Low Profile Platform	1	10.522	17.781	1.00	22.00	1500.00	0.000	0.000	391.19	0.00	0.00
7	170.00	7770.00	3	10.240	17.306	0.75	13.21	105.00	0.000	0.000	228.66	0.00	0.00
8	170.00	782 10250	12	10.240	17.306	0.98	6.12	76.80	0.000	0.000	105.83	0.00	0.00
9	170.00	ABT-DFDM-ADBH	3	10.240	17.306	0.98	0.15	3.42	0.000	0.000	2.53	0.00	0.00
10	170.00	AM-X-CD-6500T-RET	3	10.240	17.306	0.78	19.35	145.50	0.000	0.000	334.93	0.00	0.00
11	170.00	CS72188.01	1	10.240	17.306	1.00	0.20	0.32	0.000	0.000	3.46	0.00	0.00
12	170.00	DBC-750	3	10.240	17.306	0.59	0.91	14.64	0.000	0.000	15.73	0.00	0.00
13	170.00	DC6-48-60-18-8F	1	10.240	17.306	1.00	4.32	32.80	0.000	0.000	74.76	0.00	0.00
14	170.00	HPA-65R-BUU-H6	3	10.240	17.306	0.81	25.21	153.00	0.000	0.000	436.22	0.00	0.00
15	170.00	Low Profile Platform	1	10.240	17.306	1.00	22.00	1500.00	0.000	0.000	380.74	0.00	0.00
16	170.00	RRUS 11	6	10.240	17.306	0.71	12.56	330.00	0.000	0.000	217.36	0.00	0.00
17	170.00	RRUS A2 Module	3	10.240	17.306	0.63	3.55	63.30	0.000	0.000	61.46	0.00	0.00
18	170.00	DTMABP7819VG12A	6	10.240	17.306	0.68	6.51	115.08	0.000	0.000	112.60	0.00	0.00
19	160.00	Double TMA 17/21	3	10.066	17.011	0.72	0.89	33.00	0.000	0.000	15.09	0.00	0.00
20	160.00	AIR 21 B2A B4P	3	10.066	17.011	0.83	16.16	274.50	0.000	0.000	274.84	0.00	0.00
21	160.00	AIR 21 B4A B2P	3	10.066	17.011	0.83	16.16	270.90	0.000	0.000	274.84	0.00	0.00
22	160.00	S11B12	3	10.066	17.011	0.71	7.01	153.00	0.000	0.000	119.26	0.00	0.00
23	160.00	LNx-6515DS	3	10.066	17.011	0.84	28.72	150.90	0.000	0.000	488.50	0.00	0.00
24	160.00	Platform w/ Hand Rail	1	10.066	17.011	1.00	32.00	1600.00	0.000	0.000	544.35	0.00	0.00
25	140.00	RRH2x60-1900	3	9.691	16.378	0.90	4.75	58.50	0.000	0.000	77.83	0.00	0.00
26	140.00	KS-24019	6	9.691	16.378	1.00	0.72	3.00	0.000	0.000	11.79	0.00	0.00
27	140.00	DB-T1-6Z-8AB-OZ	1	9.691	16.378	1.00	4.78	21.40	0.000	0.000	78.29	0.00	0.00
28	140.00	FD9R6004/2C-3L	6	9.691	16.378	0.75	1.62	18.60	0.000	0.000	26.53	0.00	0.00
29	140.00	HBXX-6517DS-A2M	6	9.691	16.378	0.77	40.33	244.80	0.000	0.000	660.58	0.00	0.00
30	140.00	RRH2x40-07-U	3	9.691	16.378	0.78	5.22	152.10	0.000	0.000	85.47	0.00	0.00
31	140.00	LNx-6514DS-A1M	3	9.691	16.378	0.83	20.94	115.20	0.000	0.000	342.98	0.00	0.00
32	140.00	LNx-6514DS-VTM	3	9.691	16.378	0.80	19.99	99.30	0.000	0.000	327.43	0.00	0.00
33	140.00	Low Profile Platform	1	9.691	16.378	1.00	22.00	1500.00	0.000	0.000	360.32	0.00	0.00
34	130.00	1900MHz RRH	3	9.490	16.038	0.88	10.03	132.00	0.000	0.000	160.89	0.00	0.00
35	130.00	800 MHz RRH	3	9.490	16.038	0.92	6.87	159.00	0.000	0.000	110.22	0.00	0.00
36	130.00	800MHz Filter	3	9.490	16.038	0.69	1.61	26.40	0.000	0.000	25.89	0.00	0.00
37	130.00	ACU-A20-N	4	9.490	16.038	0.79	0.44	4.00	0.000	0.000	7.10	0.00	0.00
38	130.00	APXVTM14-C-120	3	9.490	16.038	0.79	16.35	168.00	0.000	0.000	262.26	0.00	0.00
39	130.00	APXVSP18-C-A20	3	9.490	16.038	0.83	20.57	171.00	0.000	0.000	329.85	0.00	0.00
40	130.00	Low Profile Platform	1	9.490	16.038	1.00	22.00	1500.00	0.000	0.000	352.83	0.00	0.00
41	130.00	RF Filters	3	9.490	16.038	0.67	2.19	46.50	0.000	0.000	35.14	0.00	0.00
42	130.00	TD-RRH8x20-25	3	9.490	16.038	0.69	9.77	210.00	0.000	0.000	156.69	0.00	0.00
43	92.00	MF-900B	2	8.605	14.542	1.00	6.90	26.00	2.887	0.000	100.34	289.67	0.00
44	92.00	Low Profile Platform	1	8.605	14.542	1.00	22.00	1500.00	0.000	0.000	319.93	0.00	0.00
45	92.00	DB205	1	8.835	14.931	1.00	1.80	38.00	0.000	9.000	26.88	0.00	241.88
46	92.00	ANT450Y10-WR	1	8.605	14.542	1.00	0.49	5.00	0.000	0.000	7.13	0.00	0.00
47	92.00	ANT4506-9	1	8.683	14.675	1.00	2.77	18.00	0.000	3.000	40.65	0.00	121.95
48	92.00	ANT150D3	1	8.735	14.761	1.00	2.18	18.00	0.000	5.000	32.18	0.00	160.90

## Discrete Appurtenance Forces

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

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

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**Totals:** 12,882.46

**8,345.99**

## Total Applied Force Summary

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

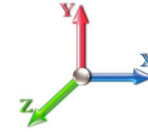
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

3/11/2016  
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**Load Case:** 50 mph Wind with 0" Ice

**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		188.37	1826.20	0.00	0.00
10.00		185.00	1795.15	0.00	0.00
15.00		181.63	1764.11	0.00	0.00
20.00		178.27	1733.06	0.00	0.00
25.00		174.90	1702.02	0.00	0.00
30.00		171.53	1670.97	0.00	0.00
35.00		172.39	1639.92	0.00	0.00
40.00		175.34	1608.88	0.00	0.00
45.00		177.49	1577.83	0.00	0.00
46.25		44.13	389.61	0.00	0.00
50.00		136.06	2118.42	0.00	0.00
53.25		118.25	1809.48	0.00	0.00
55.00		63.57	473.38	0.00	0.00
60.00		183.41	1334.18	0.00	0.00
65.00		183.48	1307.02	0.00	0.00
70.00		183.15	1279.85	0.00	0.00
75.00		182.48	1252.69	0.00	0.00
80.00		181.47	1225.52	0.00	0.00
85.00		180.18	1198.36	0.00	0.00
90.00		178.61	1171.19	0.00	0.00
92.00	(7) appurtenances	597.72	2065.87	289.67	524.73
93.75		61.53	399.14	0.00	0.00
95.00		44.51	507.97	0.00	0.00
99.75		168.86	1901.52	0.00	0.00
100.00		8.78	48.79	0.00	0.00
105.00		175.53	963.66	0.00	0.00
110.00		173.09	940.37	0.00	0.00
115.00		170.46	917.09	0.00	0.00
120.00		167.65	893.80	0.00	0.00
125.00		164.66	870.52	0.00	0.00
130.00	(26) appurtenances	1602.38	3264.13	0.00	0.00
135.00		158.20	807.64	0.00	0.00
140.00	(32) appurtenances	2125.96	2997.25	0.00	0.00
142.75		83.39	408.21	0.00	0.00
145.00		68.38	533.29	0.00	0.00
147.25		67.63	525.43	0.00	0.00
150.00		81.67	275.67	0.00	0.00
155.00		145.80	489.19	0.00	0.00
160.00	(16) appurtenances	1858.69	2955.96	0.00	0.00
165.00		137.73	436.44	0.00	0.00
170.00	(45) appurtenances	2107.80	2960.78	0.00	0.00
175.00		129.18	372.44	0.00	0.00
180.00		124.74	356.92	0.00	0.00
185.00		120.19	341.40	0.00	0.00
187.00	(9) appurtenances	762.33	1757.71	247.28	803.95
<b>Totals:</b>		<b>14,546.58</b>	<b>56,869.02</b>	<b>536.95</b>	<b>1,328.67</b>

## Resulting Forces and Deflections

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

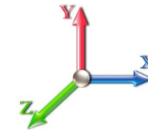
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

3/11/2016  
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**Load Case:** 50 mph Wind with 0" Ice

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



**Iterations:** 23

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-14.571	-56.863	0.000	-0.002	-0.536	-1876.377	0.000	0.000	0.000	0.000	0.000
5.00	-14.429	-55.024	0.000	-0.002	-0.536	-1803.525	-0.026	0.000	0.026	-0.049	0.000
10.00	-14.288	-53.217	0.000	-0.002	-0.536	-1731.382	-0.104	0.000	0.104	-0.099	0.000
15.00	-14.148	-51.441	0.000	-0.002	-0.536	-1659.944	-0.235	0.000	0.235	-0.149	0.000
20.00	-14.009	-49.696	0.000	-0.002	-0.536	-1589.206	-0.418	0.000	0.418	-0.200	0.000
25.00	-13.871	-47.982	0.000	-0.002	-0.536	-1519.163	-0.655	0.000	0.655	-0.251	0.000
30.00	-13.734	-46.299	0.000	-0.002	-0.536	-1449.811	-0.946	0.000	0.946	-0.304	0.000
35.00	-13.593	-44.647	0.000	-0.002	-0.536	-1381.144	-1.293	0.000	1.293	-0.357	0.000
40.00	-13.447	-43.027	0.000	-0.002	-0.536	-1313.180	-1.695	0.000	1.695	-0.410	0.000
45.00	-13.282	-41.443	0.000	-0.002	-0.536	-1245.944	-2.154	0.000	2.154	-0.464	0.000
46.25	-13.255	-41.047	0.000	-0.002	-0.536	-1229.341	-2.277	0.000	2.277	-0.478	0.000
50.00	-13.127	-38.921	0.000	-0.003	-0.536	-1179.636	-2.669	0.000	2.669	-0.519	0.000
53.25	-13.009	-37.107	0.000	-0.003	-0.536	-1136.975	-3.035	0.000	3.035	-0.555	0.000
55.00	-12.967	-36.625	0.000	-0.003	-0.536	-1114.209	-3.243	0.000	3.243	-0.575	0.000
60.00	-12.806	-35.279	0.000	-0.003	-0.536	-1049.376	-3.877	0.000	3.877	-0.635	0.000
65.00	-12.644	-33.961	0.000	-0.003	-0.536	-985.345	-4.575	0.000	4.575	-0.695	0.000
70.00	-12.479	-32.671	0.000	-0.004	-0.536	-922.128	-5.336	0.000	5.336	-0.756	0.000
75.00	-12.312	-31.408	0.000	-0.004	-0.536	-859.734	-6.161	0.000	6.161	-0.817	0.000
80.00	-12.145	-30.172	0.000	-0.004	-0.536	-798.173	-7.048	0.000	7.048	-0.877	0.000
85.00	-11.976	-28.964	0.000	-0.005	-0.536	-737.451	-8.000	0.000	8.000	-0.937	0.000
90.00	-11.798	-27.788	0.000	-0.005	-0.537	-677.573	-9.014	0.000	9.014	-0.997	0.000
92.00	-11.174	-25.728	0.000	0.000	-0.247	-653.453	-9.437	0.000	9.437	-1.021	0.000
93.75	-11.113	-25.327	0.000	0.000	-0.247	-633.899	-9.815	0.000	9.815	-1.043	-0.001
95.00	-11.075	-24.813	0.000	0.000	-0.247	-620.008	-10.090	0.000	10.090	-1.058	-0.001
99.75	-10.882	-22.909	0.000	-0.001	-0.247	-567.402	-11.171	0.000	11.171	-1.114	-0.001
100.00	-10.885	-22.854	0.000	-0.001	-0.247	-564.682	-11.230	0.000	11.230	-1.117	-0.001
105.00	-10.715	-21.882	0.000	-0.001	-0.247	-510.256	-12.434	0.000	12.434	-1.180	-0.001
110.00	-10.544	-20.935	0.000	-0.002	-0.247	-456.684	-13.703	0.000	13.703	-1.242	-0.001
115.00	-10.374	-20.011	0.000	-0.002	-0.247	-403.965	-15.036	0.000	15.036	-1.301	-0.001
120.00	-10.204	-19.112	0.000	-0.003	-0.247	-352.099	-16.430	0.000	16.430	-1.359	-0.001
125.00	-10.035	-18.236	0.000	-0.003	-0.247	-301.080	-17.883	0.000	17.883	-1.413	-0.001
130.00	-8.363	-15.006	0.000	-0.004	-0.247	-250.908	-19.390	0.000	19.390	-1.463	-0.001
135.00	-8.195	-14.197	0.000	-0.004	-0.247	-209.092	-20.947	0.000	20.947	-1.508	-0.001
140.00	-5.996	-11.254	0.000	-0.005	-0.247	-168.117	-22.550	0.000	22.550	-1.550	-0.001
142.75	-5.905	-10.847	0.000	-0.005	-0.247	-151.629	-23.449	0.001	23.449	-1.571	-0.001
145.00	-5.825	-10.314	0.000	-0.005	-0.247	-138.343	-24.193	0.001	24.193	-1.588	-0.001
147.25	-5.746	-9.789	0.000	-0.005	-0.247	-125.237	-24.945	0.001	24.945	-1.604	-0.001
150.00	-5.661	-9.512	0.000	-0.006	-0.247	-109.436	-25.875	0.001	25.875	-1.622	-0.001
155.00	-5.507	-9.024	0.000	-0.006	-0.247	-81.131	-27.596	0.001	27.596	-1.662	-0.001
160.00	-3.566	-6.122	0.000	-0.006	-0.247	-53.595	-29.355	0.001	29.355	-1.694	-0.001
165.00	-3.417	-5.689	0.000	-0.007	-0.247	-35.767	-31.142	0.001	31.142	-1.717	-0.001
170.00	-1.222	-2.793	0.000	-0.007	-0.247	-18.682	-32.950	0.001	32.950	-1.734	-0.001
175.00	-1.082	-2.424	0.000	-0.007	-0.247	-12.574	-34.771	0.001	34.771	-1.744	-0.002
180.00	-0.946	-2.071	0.000	-0.007	-0.247	-7.167	-36.602	0.002	36.602	-1.752	-0.002
185.00	-0.816	-1.734	0.000	-0.007	-0.247	-2.436	-38.439	0.002	38.439	-1.756	-0.002
187.00	-0.762	0.000	0.000	0.000	-0.247	-0.804	0.000	0.000	39.174	-1.756	-0.002

## Resulting Stresses

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

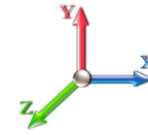
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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

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



**Iterations:** 23

### Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvT Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.56	0.29	0.00	0.00	0.00	13.86	14.43	52.0	0.278
5.00	0.55	0.29	0.00	0.00	0.00	13.82	14.37	52.0	0.277
10.00	0.54	0.29	0.00	0.00	0.00	13.76	14.31	52.0	0.275
15.00	0.53	0.29	0.00	0.00	0.00	13.70	14.24	52.0	0.274
20.00	0.52	0.30	0.00	0.00	0.00	13.63	14.16	52.0	0.272
25.00	0.52	0.30	0.00	0.00	0.00	13.54	14.07	52.0	0.271
30.00	0.51	0.30	0.00	0.00	0.00	13.45	13.97	52.0	0.269
35.00	0.50	0.31	0.00	0.00	0.00	13.34	13.85	52.0	0.267
40.00	0.49	0.31	0.00	0.00	0.00	13.22	13.73	52.0	0.264
45.00	0.48	0.31	0.00	0.00	0.00	13.09	13.58	52.0	0.261
46.25	0.48	0.31	0.00	0.00	0.00	13.05	13.55	52.0	0.261
50.00	0.46	0.32	0.00	0.00	0.00	12.94	13.41	52.0	0.258
53.25	0.50	0.36	0.00	0.00	0.00	14.13	14.65	52.0	0.282
55.00	0.50	0.36	0.00	0.00	0.00	14.06	14.58	52.0	0.280
60.00	0.49	0.36	0.00	0.00	0.00	13.85	14.35	52.0	0.276
65.00	0.49	0.36	0.00	0.00	0.00	13.60	14.10	52.0	0.271
70.00	0.48	0.37	0.00	0.00	0.00	13.34	13.83	52.0	0.266
75.00	0.47	0.37	0.00	0.00	0.00	13.04	13.52	52.0	0.260
80.00	0.46	0.38	0.00	0.00	0.00	12.71	13.19	52.0	0.254
85.00	0.46	0.38	0.00	0.00	0.00	12.34	12.82	52.0	0.247
90.00	0.45	0.38	0.00	0.00	0.00	11.93	12.40	52.0	0.239
92.00	0.42	0.37	0.00	0.00	0.00	11.75	12.19	52.0	0.234
93.75	0.42	0.37	0.00	0.00	0.00	11.61	12.05	52.0	0.232
95.00	0.41	0.37	0.00	0.00	0.00	11.51	11.94	52.0	0.230
99.75	0.45	0.43	0.00	0.00	0.00	12.43	12.90	52.0	0.248
100.00	0.45	0.43	0.00	0.00	0.00	12.40	12.87	52.0	0.248
105.00	0.44	0.43	0.00	0.00	0.00	11.83	12.30	52.0	0.237
110.00	0.43	0.44	0.00	0.00	0.00	11.20	11.65	52.0	0.224
115.00	0.42	0.44	0.00	0.00	0.00	10.49	10.94	52.0	0.211
120.00	0.42	0.45	0.00	0.00	0.00	9.70	10.15	52.0	0.195
125.00	0.41	0.45	0.00	0.00	0.00	8.82	9.26	52.0	0.178
130.00	0.35	0.39	0.00	0.00	0.00	7.82	8.20	52.0	0.158
135.00	0.34	0.40	0.00	0.00	0.00	6.96	7.33	52.0	0.141
140.00	0.28	0.30	0.00	0.00	0.00	5.98	6.28	52.0	0.121
142.75	0.27	0.30	0.00	0.00	0.00	5.60	5.90	52.0	0.113
145.00	0.26	0.30	0.00	0.00	0.00	5.27	5.56	52.0	0.107
147.25	0.38	0.44	0.00	0.01	0.00	7.09	7.50	52.0	0.144
150.00	0.37	0.45	0.00	0.01	0.00	6.44	6.86	52.0	0.132
155.00	0.37	0.45	0.00	0.01	0.00	5.14	5.56	52.0	0.107
160.00	0.26	0.30	0.00	0.01	0.00	3.66	3.95	52.0	0.076
165.00	0.25	0.30	0.00	0.01	0.00	2.64	2.94	52.0	0.057
170.00	0.13	0.11	0.00	0.01	0.00	1.50	1.64	52.0	0.032
175.00	0.12	0.10	0.00	0.01	0.00	1.10	1.23	52.0	0.024
180.00	0.10	0.09	0.00	0.01	0.00	0.68	0.81	52.0	0.016
185.00	0.09	0.09	0.00	0.01	0.00	0.26	0.39	52.0	0.007
187.00	0.00	0.08	0.00	0.01	0.00	0.09	0.19	52.0	0.004

## Final Analysis Summary

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

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

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### Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
80 mph Wind with 0" Ice	37.3	0.00	56.83	0.01	1.36	4800.20
69.28 mph Wind with 0.5" Ice	31.7	0.00	66.78	0.03	3.09	4197.60
50 mph Wind with 0" Ice	14.6	0.00	56.86	0.00	0.54	1876.38

### Max Stresses

Load Case	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvT Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	Combined Stress (ksi)	Allowable Stress (ksi)	Elev (ft)	Stress Ratio
80 mph Wind with 0" Ice	0.49	0.91	0.00	0.01	0.00	36.14	36.67	52.0	53.25	0.705
69.28 mph Wind with 0.5" Ice	0.61	0.79	0.00	0.02	0.00	31.98	32.61	52.0	53.25	0.627
50 mph Wind with 0" Ice	0.50	0.36	0.00	0.00	0.00	14.13	14.65	52.0	53.25	0.282





# Monopole Mat Foundation Design

Date  
3/11/2016

<b>Customer Name:</b>	AT&T	<b>EIA/TIA Standard:</b>	EIA-222-F
<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>	21068	<b>Engineer Login ID:</b>	

**Foundation Info Obtained from:**

Drawings/Calculations
Monopole
Analysis

**Structure Type:**

**Analysis or Design?**

**Base Reactions (Unfactored)**

Axial Load (Kips):	58.8	Shear Force (Kips):	37.3
Uplift Force (Kips):	0.0	Moment (Kips-ft):	4800.2

Allowable overstress %: 5.0%

**Foundation Geometries:**

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
Rebar at the top of the concrete pad:			
Qty. of Rebar in Pad (L):	42	Qty. of Rebar in Pad (W):	42

Apply 1.35 factor for e/w Per G: 1.35

**Soil Design Parameters:**

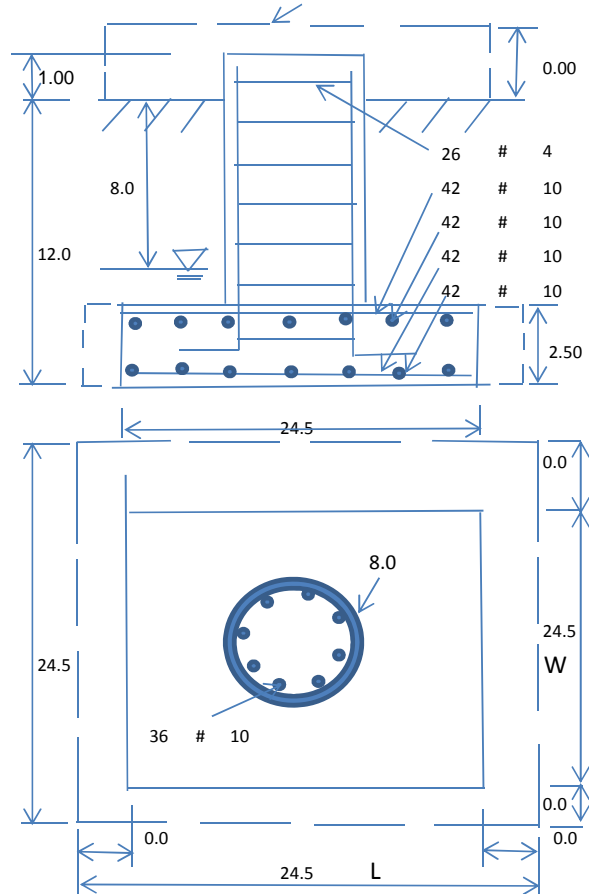
Soil Unit Weight (pcf):	120.0	Soil Buoyant Weight:	50.0	Pcf
Water Table B.G.S. (ft):	8.0	Unit Weight of Water:	62.4	pcf
Allowable Net Soil Bearing (psf):	8000	Allowable Skin Friction:	0	Psf
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No	
Consider soil hori. force for O.T.M.: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

**Foundation Analysis and Design:**

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):	837.20

**Check Soil Capacities:**

Calculated Maxium Net Soil Pressure under the base (psf):	4136	<	Allowable Soil Bearing (psf):	8000	0.52	OK!
Allowable Foundation Overturning Resistance (SF=1.5, kips-ft.):	6810.9	>	Applied Momont (kips-ft):	5285	0.78	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.93					OK!



**Check the capacities of Reinforcing Concrete:**

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

Load/  
Capacity  
Ratio

(1) Concrete Pier:

Vertical Steel Rebar Area (sq. in./each):	1.27	Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	8929.3	> Design Factored Moment (Mu, Kips-Ft)	6749.4	0.76	OK!
Calculated Shear Capacity (Kips):	993.9	> Design Factored Shear (Kips):	48.5	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):	76.5	0.01	OK!
Moment & Axial Strength Combination(Pu/Pn+Mu/Mn):	0.76	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):	437.5	0.59	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	735.6	> One-Way Factored Shear (W-D., Kips)	437.5	0.59	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	800.1	> One-Way Factored Shear (C-C, Kips):	663.0	0.83	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):	1018.5	0.17	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	5946.5	> Moment at Bottom ( W-Direct. K-Ft):	1018.5	0.17	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	8246.5	> Moment at Bottom ( C-C Dir. K-Ft):	1440.3	0.17	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):	635.4	0.11	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	5946.5	> Moment at the top (W-Dir Kips-Ft):	635.4	0.11	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	8246.5	> Moment at the top (C-C Direc. K-Ft):	902.0	0.11	OK!

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

AT&T Existing Facility

Site ID: CT1139

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

**January 19, 2016**

**EBI Project Number: 6216000144**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general public allowable limit:	<b>8.77 %</b>

January 19, 2016

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure 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 done 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.

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

- 1) 2 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 2 UMTS channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 LTE channels (700 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 4) 2 LTE channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 5) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 6) 2 GSM channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

- 7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 8) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 9) The antennas used in this modeling are the **Powerwave 7770.00, CCI HPA-65R-BUU-H6 and the KMW AM-X-CD-16-65-00T-RET** 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.
- 10) The antenna mounting height centerline of the proposed antennas is **170 feet** above ground level (AGL).
- 11) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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



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

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Powerwave 7770.00	Make / Model:	Powerwave 7770.00	Make / Model:	Powerwave 7770.00
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	170 feet	Height (AGL):	170 feet	Height (AGL):	170 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A1 MPE%	<b>0.37</b>	Antenna B1 MPE%	<b>0.37</b>	Antenna C1 MPE%	<b>0.37</b>
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	CCI HPA-65R-BUU-H6	Make / Model:	CCI HPA-65R-BUU-H6	Make / Model:	CCI HPA-65R-BUU-H6
Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd
Height (AGL):	170 feet	Height (AGL):	170 feet	Height (AGL):	170 feet
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	5,462.56	ERP (W):	5,462.56	ERP (W):	5,462.56
Antenna A2 MPE%	<b>1.02</b>	Antenna B2 MPE%	<b>1.02</b>	Antenna C2 MPE%	<b>1.02</b>
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	KMW AM-X-CD-16-65- 00T-RET	Make / Model:	KMW AM-X-CD-16-65- 00T-RET	Make / Model:	KMW AM-X-CD-16-65- 00T-RET
Gain:	13.85 / 15.254 dBd	Gain:	13.85 / 15.254 dBd	Gain:	13.85 / 15.254 dBd
Height (AGL):	170 feet	Height (AGL):	170 feet	Height (AGL):	170 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	3,465.76	ERP (W):	3,465.76	ERP (W):	3,465.76
Antenna A3 MPE%	<b>0.61</b>	Antenna B3 MPE%	<b>0.61</b>	Antenna C3 MPE%	<b>0.61</b>

Site Composite MPE%	
Carrier	MPE%
AT&T – Max per sector	<b>2.00 %</b>
Town	0.77 %
Sprint	0.84 %
MetroPCS	0.22 %
Clearwire	0.09 %
Nextel	0.28 %
Verizon Wireless	2.87 %
T-Mobile	1.70 %
<b>Site Total MPE %:</b>	<b>8.77 %</b>

AT&T Sector 1 Total:	2.00 %
AT&T Sector 2 Total:	2.00 %
AT&T Sector 3 Total:	2.00 %
<b>Site Total:</b>	<b>8.77 %</b>

AT&T _ Per Sector	# 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	567	0.20 %
AT&T 1900 MHz (PCS) UMTS	2	656.33	170	1.75	1900	1000	0.18 %
AT&T 850 MHz LTE	2	940.05	170	2.51	700	467	0.54 %
AT&T 1900 MHz (PCS) LTE	2	1791.23	170	4.79	1900	1000	0.48 %
AT&T 850 MHz GSM	2	727.98	170	1.95	850	567	0.34 %
AT&T 1900 MHz (PCS) GSM	2	1004.90	170	2.69	1900	1000	0.27 %
						<b>Total:</b>	<b>2.00 %</b>

## Summary

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

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

AT&T Sector	Power Density Value (%)
Sector 1:	2.00 %
Sector 2:	2.00 %
Sector 3 :	2.00 %
AT&T Maximum Total (per sector):	2.00 %
Site Total:	8.77 %
Site Compliance Status:	<b>COMPLIANT</b>

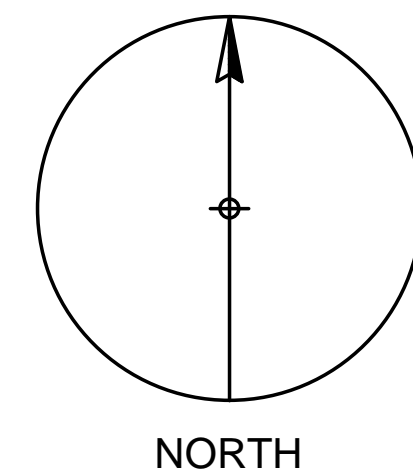
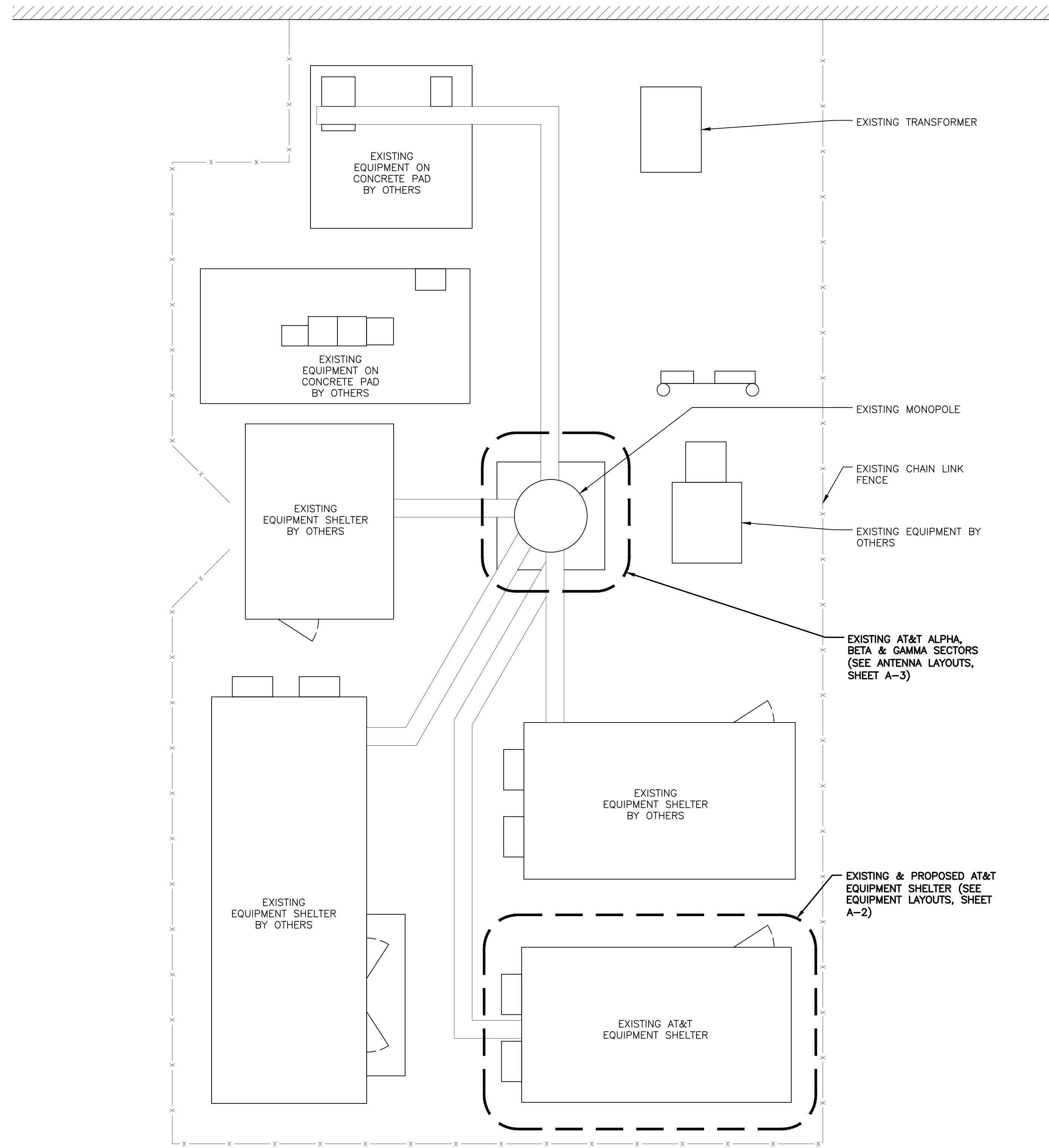
The anticipated composite MPE value for this site assuming all carriers present is **8.77%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

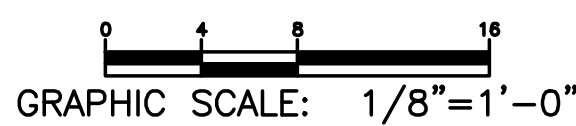


Scott Heffernan  
RF Engineering Director

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



**COMPOUND LAYOUT**  
SCALE: 3/16" = 1'-0"



NOTE:  
CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.

**COM-EX**  
Consultants  
115 ROUTE 46  
SUITE E39  
MOUNTAIN LAKES, NJ 07046  
PHONE: 862.209.4300  
FAX: 862.209.4301

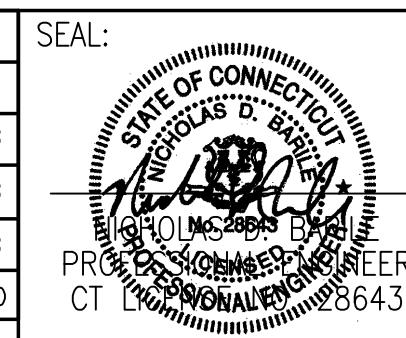
**EMPIRE**  
telecom  
16 ESQUIRE ROAD  
BILLERICA, MA 01821

**SITE NUMBER: CTV1139**  
**SITE NAME: SOUTH WINDSOR**  
**SAND HILL RD**  
151 SAND HILL ROAD  
SOUTH WINDSOR, CT 06074  
HARTFORD COUNTY

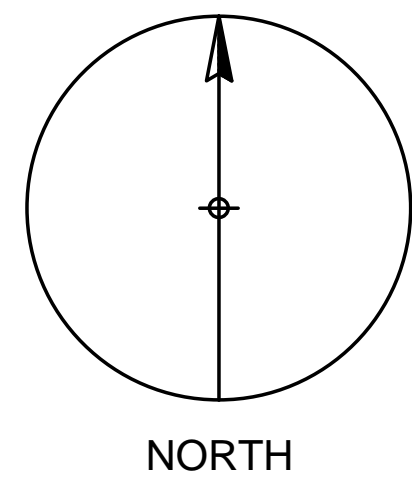
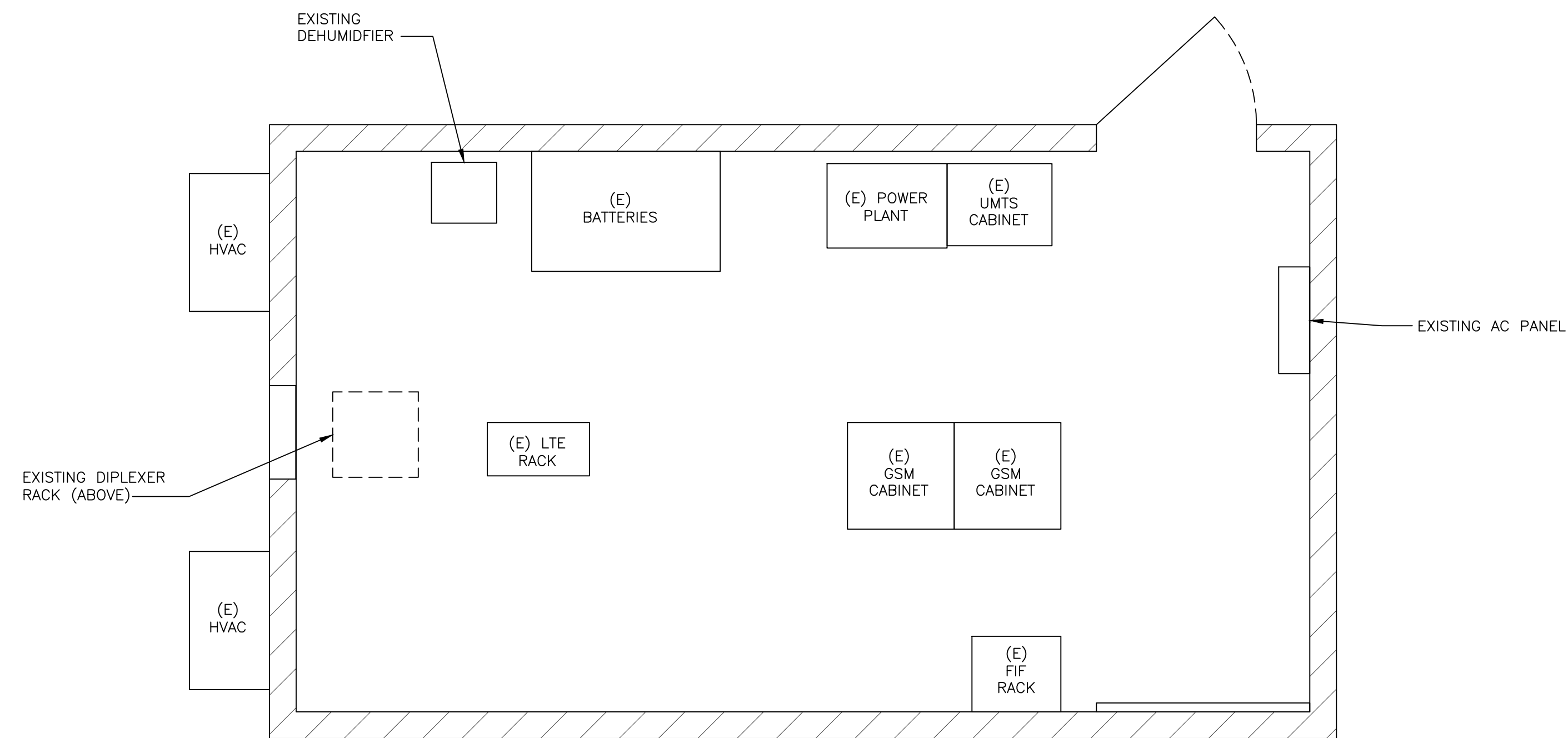
 **at&t**  
MOBILITY  
550 COCHITUATE ROAD  
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
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1	03/25/16	REVISED PER RFDS	NJM	NDB	NDB
0	01/27/16	ISSUED AS FINAL	NJM	NDB	NDB

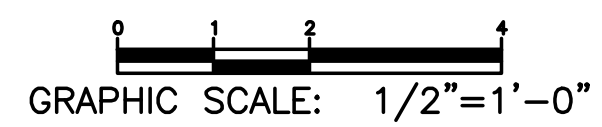
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AT&T		
DRAWING TITLE:		
COMPOUND LAYOUT		
JOB NUMBER	DRAWING NUMBER	REV
15106-EMP	A-1	2



**EXISTING EQUIPMENT LAYOUT**  
SCALE: 1/2" = 1'-0"



NO GROUND EQUIPMENT MODIFICATIONS ARE BEING MADE AS PART OF THIS SCOPE. EXISTING GROUND EQUIPMENT CONFIGURATION TO REMAIN.

**COM-EX**  
Consultants  
115 ROUTE 46  
SUITE E39  
MOUNTAIN LAKES, NJ 07046  
PHONE: 862.209.4300  
FAX: 862.209.4301

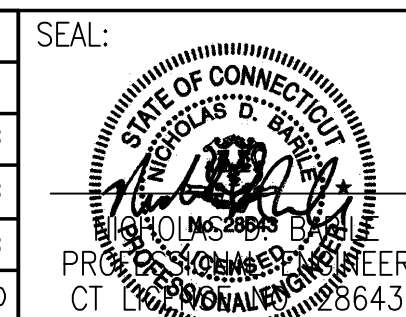
**EMPIRE**  
telecom  
16 ESQUIRE ROAD  
BILLERICA, MA 01821

**SITE NUMBER: CTV1139**  
**SITE NAME: SOUTH WINDSOR**  
**SAND HILL RD**  
151 SAND HILL ROAD  
SOUTH WINDSOR, CT 06074  
HARTFORD COUNTY

 **at&t**  
MOBILITY  
550 COCHITUATE ROAD  
FRAMINGHAM, MA 01701

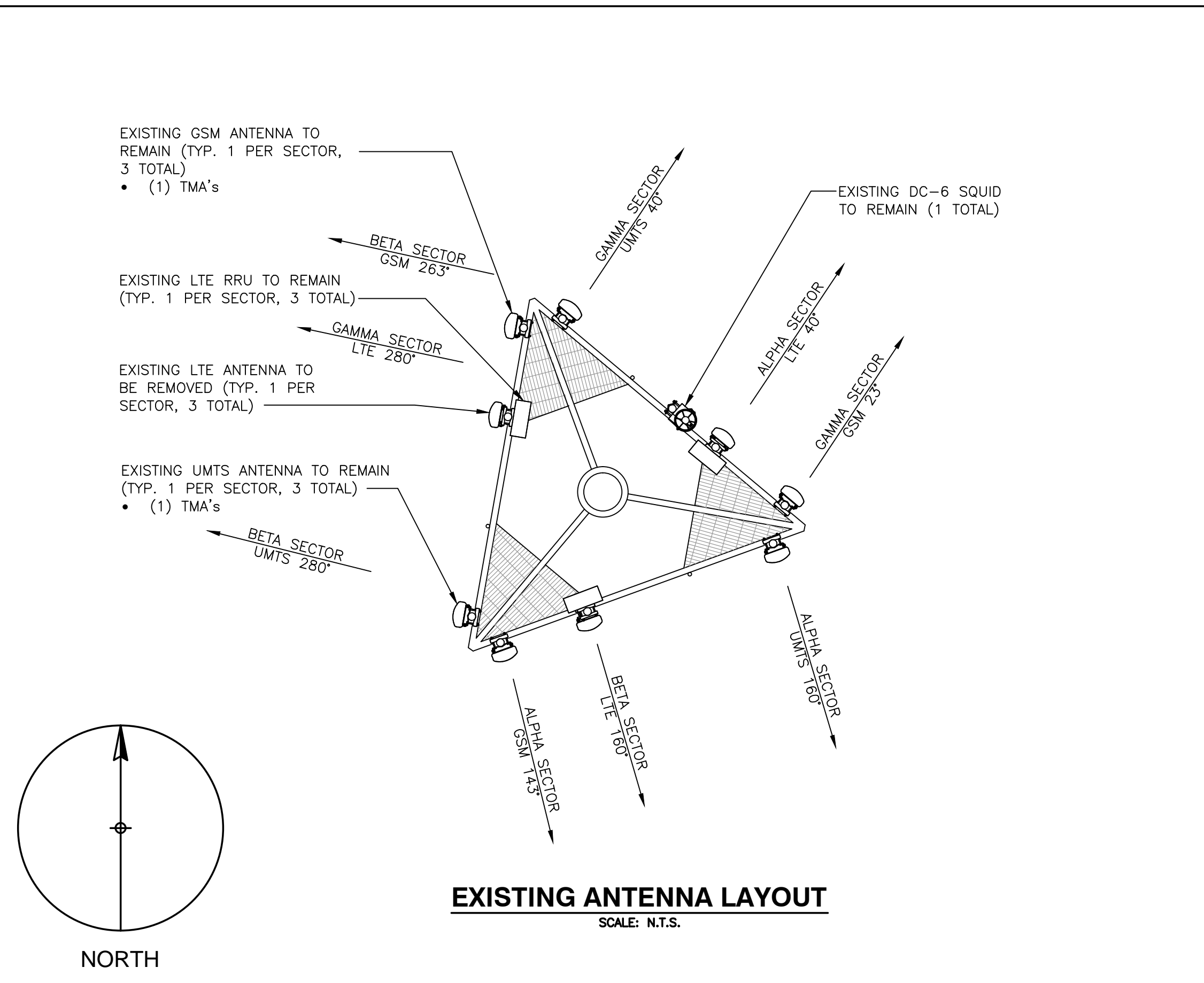
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1	03/25/16	REVISED PER RFDS	NJM	NDB	NDB
0	01/27/16	ISSUED AS FINAL	NJM	NDB	NDB

SCALE: AS SHOWN      DESIGNED BY: NJM      DRAWN BY: NJM

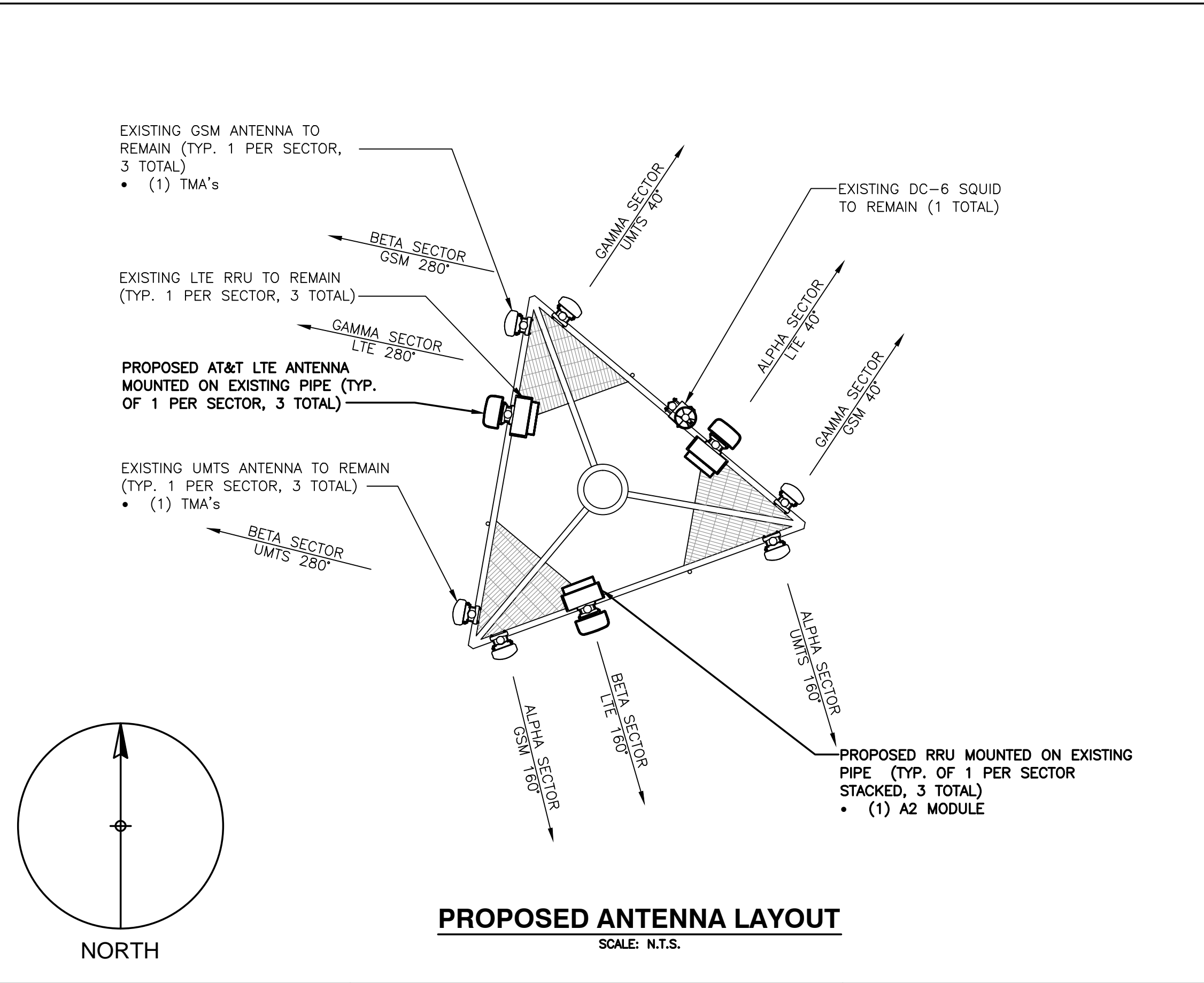


AT&T		
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EQUIPMENT LAYOUT		
JOB NUMBER	DRAWING NUMBER	REV
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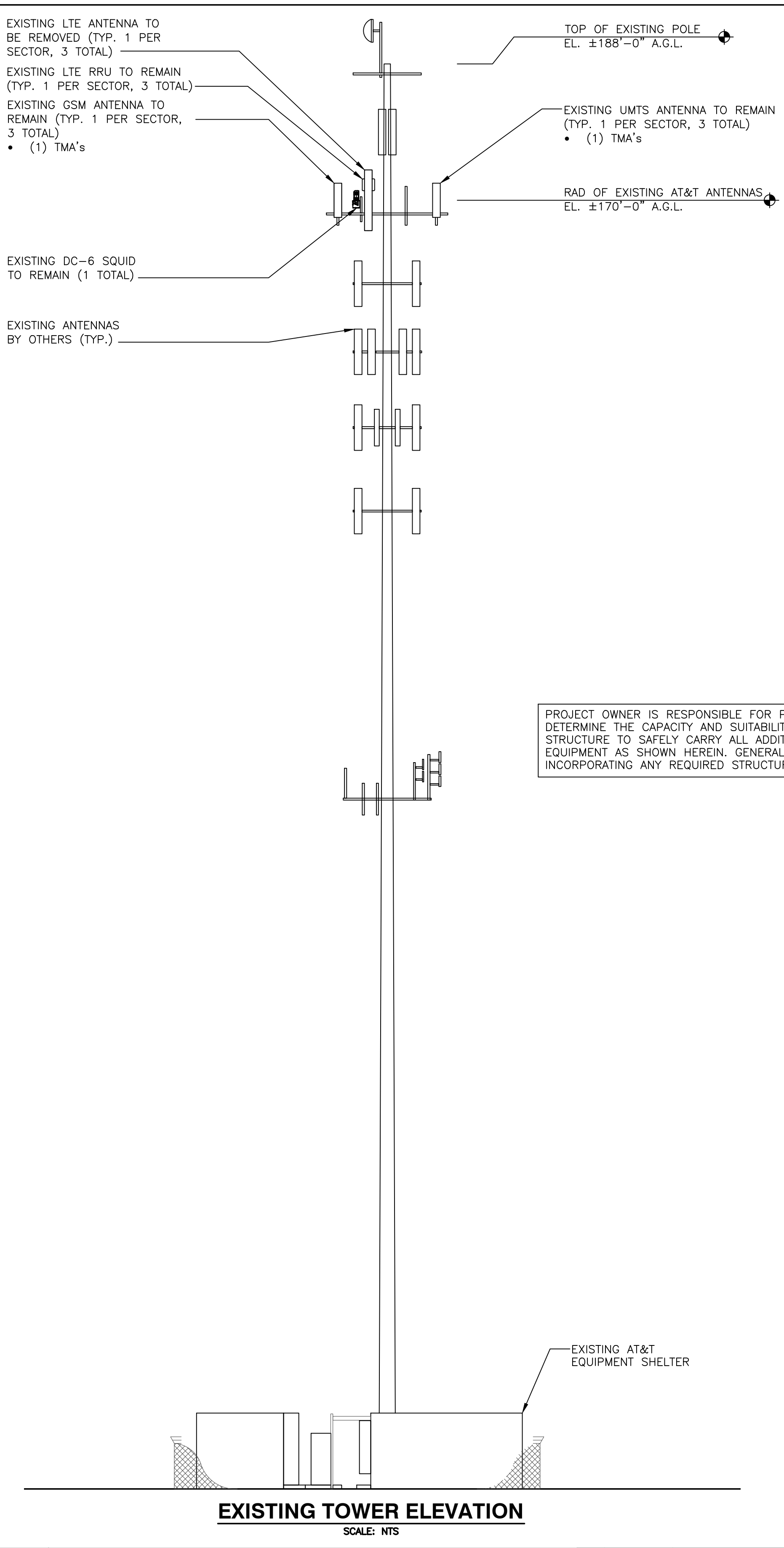




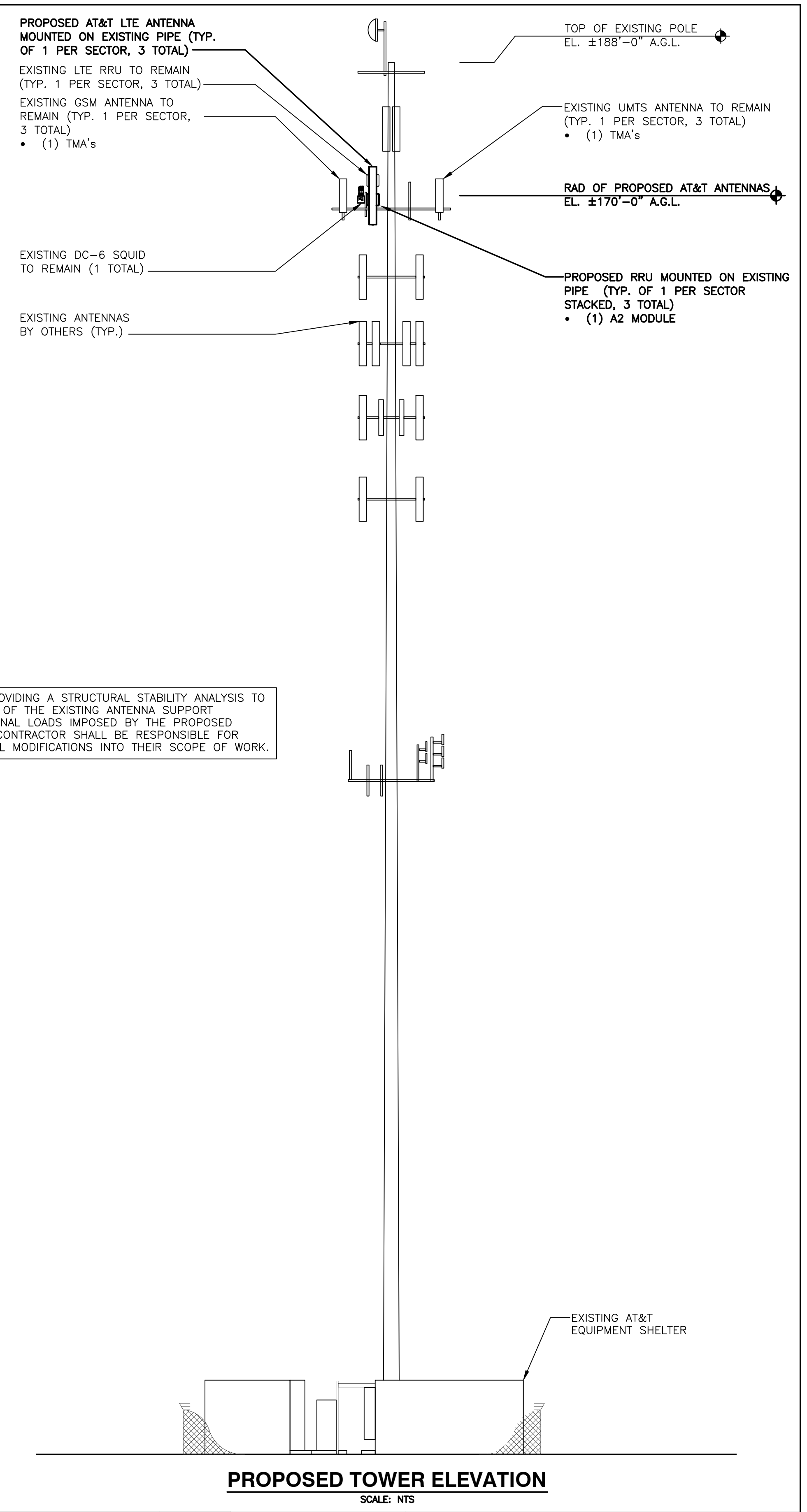
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SCALE: N.T.S.



**PROPOSED ANTENNA LAYOUT**  
SCALE: N.T.S.



**EXISTING TOWER ELEVATION**  
SCALE: NTS



**PROPOSED TOWER ELEVATION**  
SCALE: NTS

**COM-EX**  
Consultants  
115 ROUTE 46  
SUITE E39  
MOUNTAIN LAKES, NJ 07046  
PHONE: 862.209.4300  
FAX: 862.209.4301

**EMPIRE**  
telecom  
16 ESQUIRE ROAD  
BILLERICA, MA 01821

**SITE NUMBER: CTV1139**  
**SITE NAME: SOUTH WINDSOR**  
**SAND HILL RD**  
151 SAND HILL ROAD  
SOUTH WINDSOR, CT 06074  
HARTFORD COUNTY

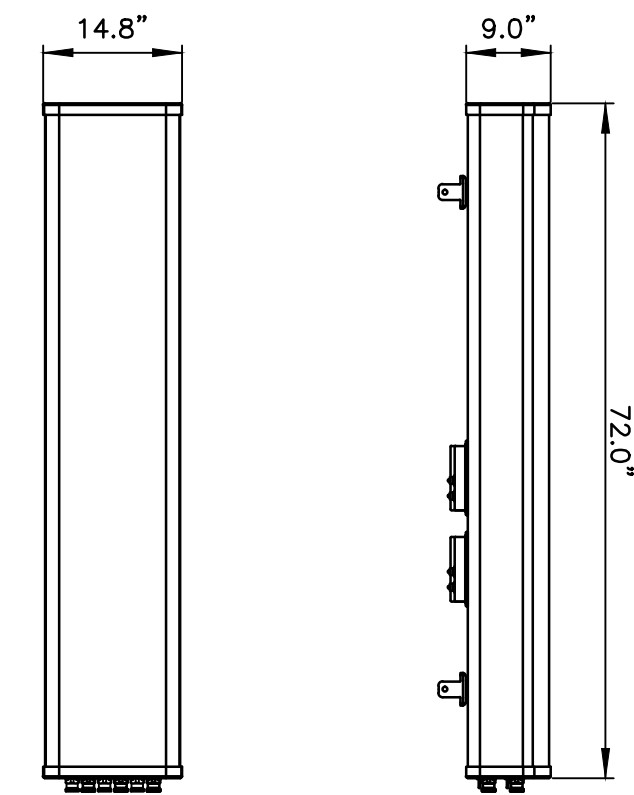
**at&t**  
MOBILITY  
550 COCHITUATE ROAD  
FRAMINGHAM, MA 01701

2	03/28/16	REVISED PER CLIENT COMMENTS	NJM	NDB	NDB
1	03/25/16	REVISED PER RFDS	NJM	NDB	NDB
0	01/27/16	ISSUED AS FINAL	NJM	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: NJM	DRAWN BY: NJM		

SEAL:  
STATE OF CONNECTICUT  
PROFESSIONAL ENGINEER  
CT LICENSE NO. 28643

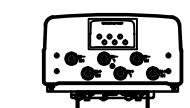
**AT&T**  
DRAWING TITLE:  
**ANTENNA LAYOUTS & ELEVATIONS**

JOB NUMBER	DRAWING NUMBER	REV
15106-EMP	A-3	2



FRONT VIEW

SIDE VIEW

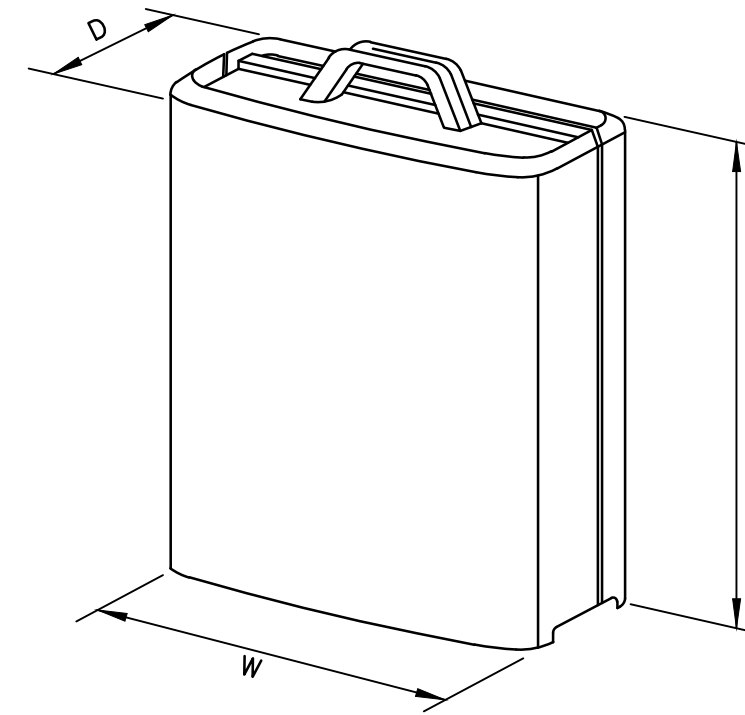


BOTTOM VIEW

MANUFACTURER	CCI
MODEL	HPA-65R-BUU-H6
WEIGHT	51.0 LBS

**LTE ANTENNA DETAIL**

SCALE: N.T.S.

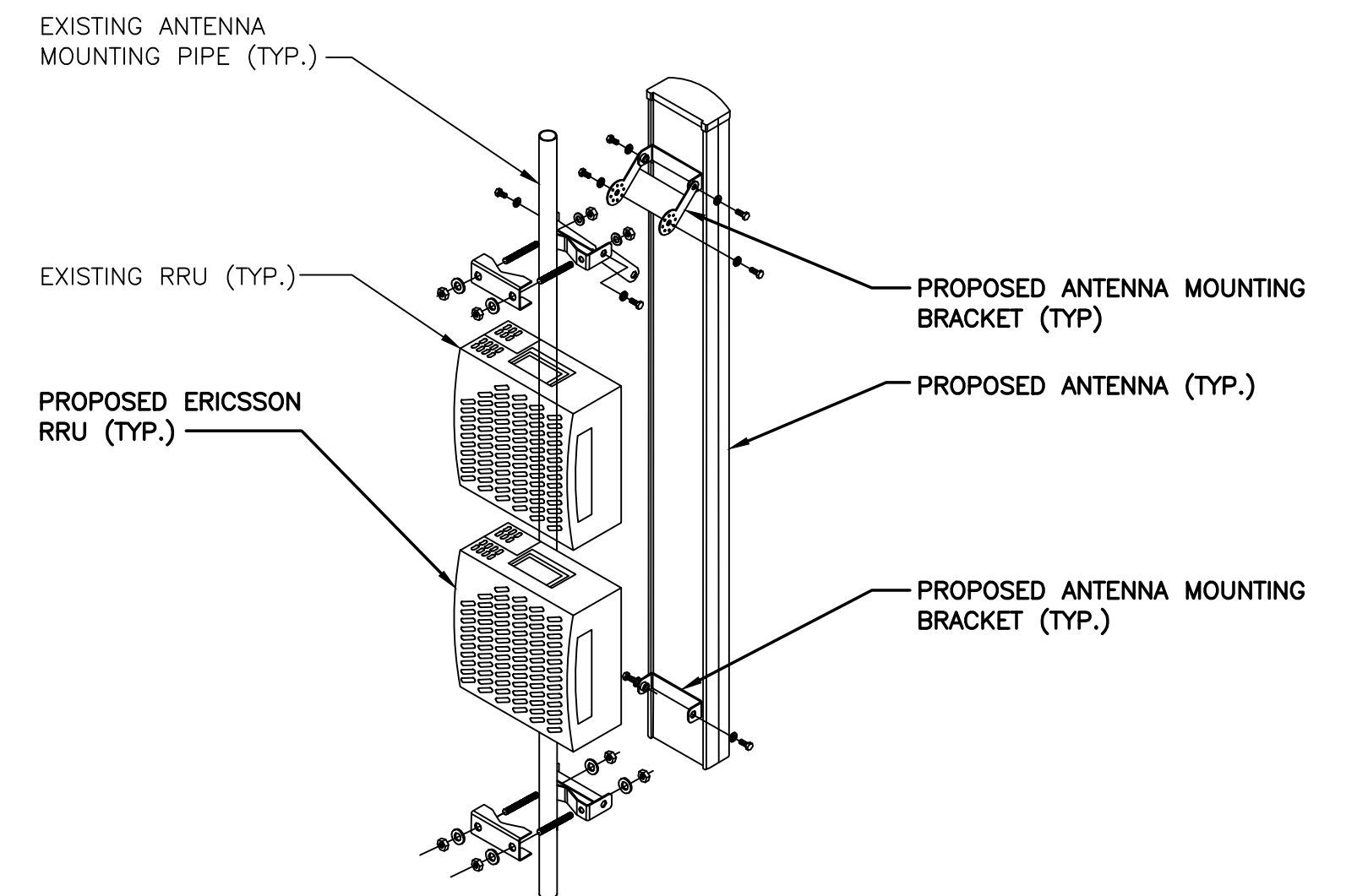


MODEL	L x W x H	WEIGHT
*RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS

\*DENOTES EXISTING.

**RRUS DETAIL**

SCALE: N.T.S.



**ANTENNA AND RRU MOUNTING DETAIL**

SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770.00.850.06	55"x11"x5"
	A2	-	-	-
	A3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	A4	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
BETA	B1	POWERWAVE	7770.00.850.06	55"x11"x5"
	B2	-	-	-
	B3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	B4	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
GAMMA	G1	POWERWAVE	7770.00.850.06	55"x11"x5"
	G2	-	-	-
	G3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	G4	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"

FINAL ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770.00.850.06	55"x11"x5"
	A2	-	-	-
	A3	CCI	HPA-65R-BUU-H6	72"x14.8"x9"
	A4	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
BETA	B1	POWERWAVE	7770.00.850.06	55"x11"x5"
	B2	-	-	-
	B3	CCI	HPA-65R-BUU-H6	72"x14.8"x9"
	B4	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
GAMMA	G1	POWERWAVE	7770.00.850.06	55"x11"x5"
	G2	-	-	-
	G3	CCI	HPA-65R-BUU-H6	72"x14.8"x9"
	G4	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"

PROPOSED RRU SCHEDULE

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	ERICSSON	RRUS-11	20.4"x18.5"x9.5"	A2 MODULE	-
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	-	-
	-	-	-	-	-
BETA	ERICSSON	RRUS-11	20.4"x18.5"x9.5"	A2 MODULE	-
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	-	-
	-	-	-	-	-
GAMMA	ERICSSON	RRUS-11	20.4"x18.5"x9.5"	A2 MODULE	-
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	-	-
	-	-	-	-	-

PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.

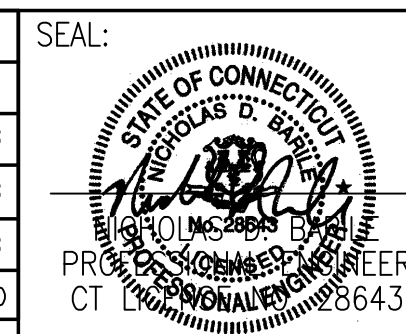


**SITE NUMBER: CTV1139**  
**SITE NAME: SOUTH WINDSOR**  
**SAND HILL RD**  
 151 SAND HILL ROAD  
 SOUTH WINDSOR, CT 06074  
 HARTFORD COUNTY



NO.	DATE	REVISIONS	BY	CHK	APP'D
2	03/28/16	REVISED PER CLIENT COMMENTS	NJM	NDB	NDB
1	03/25/16	REVISED PER RFDS	NJM	NDB	NDB
0	01/27/16	ISSUED AS FINAL	NJM	NDB	NDB

SCALE: AS SHOWN    DESIGNED BY: NJM    DRAWN BY: NJM



<b>AT&amp;T</b>		
DRAWING TITLE: <b>DETAILS</b>		
JOB NUMBER 15106-EMP	DRAWING NUMBER A-4	REV 2