

June 22, 2017

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

**Notice of Exempt Modification**

**39 Ciro Road, North Branford, CT 06471**

**41 19 51.82 N**

**-72 45 22.22 W**

**T-Mobile #: CT11372B\_L700**

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 167-foot level of the existing 170-foot Monopole Tower at 39 Ciro Road, North Branford, CT. The tower is owned by SBA Properties, LLC. The property is owned by Joseph J. Casagrande, Jr. T-Mobile intends to add (3) new L700MHz antennas. These antennas would be installed at the 165-foot level of the tower. T-Mobile's full scope of proposed work is as follows:

Remove:

- None

Remove and Replace:

- (1) Pipe Mount with (1) Pipe Mount

Install:

- (3) Ericsson S11B12 RRUs
- (3) Commscope LNX 6515DS-A1M panel antennas (at 165')
- (1) Handrail Reinforcement Kit Site Pro #PRK-SFS
- (1) Bracing Reinforcement Kit Site Pro #PPK-HD

Existing Equipment to Remain (including entitlements):

- (3) Ericsson Air21 B2A/B4P panel antennas
- (3) Ericsson Air21 B4A/B2P panel antennas
- (3) Ericsson KRY 112 144 Double TMAs
- (12) 1-5/8" lines
- (1) 1-5/8" fiber



This facility was approved on June 18, 2001 by the North Branford Zoning Board of Appeals as Application #2000/01-24 for Use and Height Variance allowed for the construction of a 170' tower. Approval was seconded by the Inland Wetlands and Watercourses Agency on August 3, 2001. There were no conditions set forth. As such, this modification is in full compliance.

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 Town of Branford's Town Manager, Michael Paulhus, and Town Planner, Carey Duques, as well as the property owner, Joseph J. Casagrande, Jr. (Separate notice is not being sent to the 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 with certain modifications.

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

Sincerely,

Kri Pelletier  
Property Specialist  
SBA COMMUNICATIONS CORPORATION  
134 Flanders Rd., Suite 125  
Westborough, MA 01581

508.251.0720 x3804 + T

508.366.2610 + F

203.446.7700 + C

[kpelletier@sbsite.com](mailto:kpelletier@sbsite.com)

#### Attachments

- cc: Michael Paulhus -- Town Manager / with attachments  
*Town of North Branford, 909 Foxon Road, North Branford, CT 06471*  
Carey Duques -- Town Planner / with attachments  
*Town of North Branford, P&Z Dept., 909 Foxon Road, North Branford CT 06471*  
Joseph J. Casagrande, Jr. -- Property Owner / with attachments  
*4 Lochbourne Drive Clinton CT 06413*



## POWER DENSITY

### T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	167	Height (AGL):	167	Height (AGL):	167
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	0.65	Antenna B1 MPE%	0.65	Antenna C1 MPE%	0.65
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	167	Height (AGL):	167	Height (AGL):	167
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	6,117.82	ERP (W):	6,117.82	ERP (W):	6,117.82
Antenna A2 MPE%	0.85	Antenna B2 MPE%	0.85	Antenna C2 MPE%	0.85
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	167	Height (AGL):	167	Height (AGL):	167
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.26	Antenna B3 MPE%	0.26	Antenna C3 MPE%	0.26

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	1.75 %
AT&T	1.62 %
Sprint	0.20 %
Nextel	0.33 %
<b>Site Total MPE %:</b>	<b>3.90 %</b>

T-Mobile Sector A Total:	1.75 %
T-Mobile Sector B Total:	1.75 %
T-Mobile Sector C Total:	1.75 %
<b>Site Total:</b>	<b>3.90 %</b>

T-Mobile_Max 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
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	167	6.47	AWS - 2100 MHz	1000	0.65%
T-Mobile AWS - 2100 MHz UMTS	2	724.64	167	2.01	AWS - 2100 MHz	1000	0.20%
T-Mobile PCS - 1900 MHz UMTS	2	1,167.14	167	3.24	PCS - 1900 MHz	1000	0.32%
T-Mobile PCS - 1900 MHz GSM	2	1,167.14	167	3.24	PCS - 1900 MHz	1000	0.32%
T-Mobile 700 MHz LTE	1	865.21	167	1.20	700 MHz	467	0.26%
						<b>Total*:</b>	<b>1.75%</b>

\*NOTE: Totals may vary by 0.01% due to summing of remainders

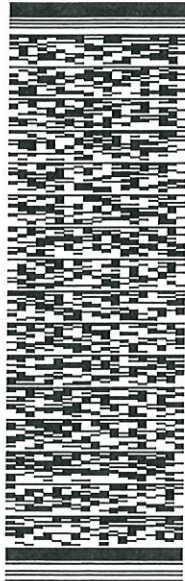
ORIGIN ID: BBEA (508) 614-0389  
RICK WOODS  
SEA NETWORK SERVICES INC  
334 FLANDERS ROAD  
SUITE 125  
WESTBOROUGH, MA 01581  
UNITED STATES US

SHIP DATE: 22 JUN 17  
ACT WT: 1.00 LB  
CAD: 105843304/NET3850  
BILL SENDER

TO MICHAEL PAULHUS, TOWN MANAGER  
TOWN OF NORTH BRANFORD  
909 FOXON RD

NORTH BRANFORD CT 06471  
(508) 251-0720 X 3804  
REF: 1058920096089  
PO: DEPT:

546J1/A50253C1



J171117021401uv

TRK# 7794 7153 3594  
0201  
FRI - 23 JUN 10:30A  
PRIORITY OVERNIGHT

EB RSPA

06471  
CT-US BDL



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ORIGIN ID:BBFA (508) 614-0389  
RICK WOODS  
99A NETWORK SERVICES INC  
34 FLANDERS ROAD  
SUITE 125  
WESTBOROUGH, MA 01581  
UNITED STATES US

SHIP DATE: 22 JUN 17  
ACT WGT: 1.00 LB  
CAD: 105843304/NET3850  
BILL SENDER

TO CAREY DUQUES - TOWN PLANNER

TOWN OF NORTH BRANFORD

PLANNING AND ZONING OFFICE

909 FOXON RD.

NORTH BRANFORD CT 06471

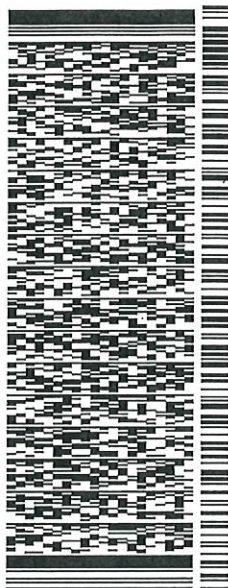
(508) 251-0720 X 3804

REF: 1056920096089

PO:

DEPT:

546J1/A50253C1



J171117021401uv

TRK# 7794 7156 2443  
0201

FRI - 23 JUN 10:30A  
PRIORITY OVERNIGHT

EB RSPA

06471  
CT-US BDL



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ORIGIN ID: BBEA (508) 614-0389  
RICK WOODS  
SBA NETWORK SERVICES INC  
734 FLANDERS ROAD  
SUITE 123  
WESTBOROUGH, MA 01581  
UNITED STATES US

SHIP DATE: 22 JUN 17  
ACT WT: 1.00 LB  
CAD: 105843304/NET3850  
BILL SENDER

TO JOSEPH CASAGRANDE JR.

4 LOCHBOURNE DRIVE

CLINTON CT 06413

(508) 251-0720 X 3804

REF: 1058920396089

INV:

PO:

DEPT:



J171117021401uv

546J1/A50263C1

TRK# 7794 7158 4070  
0201

FRI - 23 JUN 10:30A  
PRIORITY OVERNIGHT

EB RSPA

06413  
CT-US BDL



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**39 CIRO RD**

**Location** 39 CIRO RD **Mblu** 27/C 39F / /

**Acct#** 000629 **Owner** CASAGRANDE JOSEPH J JR

**Assessment** \$151,000 **Appraisal** \$215,600

**PID** 2083 **Building Count** 1

**Current Value**

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$52,600	\$163,000	\$215,600
Assessment			
Valuation Year	Improvements	Land	Total
2015	\$36,800	\$114,200	\$151,000

**Owner of Record**

**Owner** CASAGRANDE JOSEPH J JR **Sale Price** \$165,000

**Co-Owner** **Certificate**

**Address** 4 LOCHBOURNE DR **Book & Page** 326/ 604

CLINTON, CT 06413-1412 **Sale Date** 12/23/2002

**Instrument** 01

**Ownership History**

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
CASAGRANDE JOSEPH J JR	\$165,000		326/ 604	01	12/23/2002
CASAGRANDE PASQUALINA	\$0		271/ 303		06/25/1998
CASAGRANDE JOSEPH	\$0		092/ 202		05/07/1974

**Building Information**

**Building 1 : Section 1**

**Year Built:** 1974

**Living Area:** 2,562

**Replacement Cost:** \$112,004

**Building Percent** 47

**Good:**

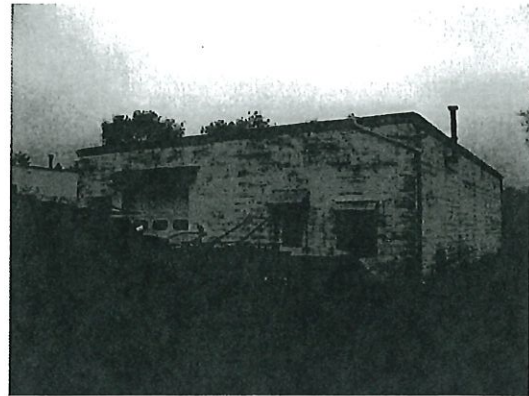
**Replacement Cost**

**Less Depreciation:** \$52,600

**Building Photo**

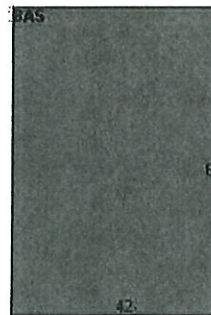
Building Attributes	
Field	Description

STYLE	Warehouse
MODEL	Ind or Comm
Grade	Low Cost
Stories:	1
Occupancy	1
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Tar & Gravel
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Hot Air-no Duc
AC Type	None
Bldg Use	COMM WHSE MDL-96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	3320
Heat/AC	NONE
Frame Type	MASONRY
Baths/Plumbing	AVERAGE
Ceiling/Wall	NONE
Rooms/Prtns	AVERAGE
Wall Height	14
% Corn Wall	0



(http://images.vgsi.com/photos/NorthBranfordCTPhotos/\00\00\52\91.jpg)

**Building Layout**



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	2,562	2,562
		2,562	2,562

**Extra Features**

Extra Features	Legend
No Data for Extra Features	

**Land**

**Land Use**

Use Code	3161
Description	COMM WHSE MDL-96
Zone	I2
Neighborhood	
Alt Land Appr Category	No

**Land Line Valuation**

Size (Acres)	2.48
Frontage	0
Depth	0
Assessed Value	\$114,200
Appraised Value	\$163,000



**Outbuildings**

Outbuildings	Legend
No Data for Outbuildings	

**Valuation History**

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$52,600	\$163,000	\$215,600
2014	\$35,900	\$311,300	\$347,200
2013	\$35,900	\$311,300	\$347,200

Assessment			
Valuation Year	Improvements	Land	Total
2015	\$36,800	\$114,200	\$151,000
2014	\$25,100	\$218,000	\$243,100
2013	\$25,100	\$218,000	\$243,100

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**39 CIRO RD**

**Location** 39 CIRO RD **Mblu** 27/C 39F/2 / /

**Acct#** 006000 **Owner** SBA PROPERTIES, LLC

**Assessment** \$241,900 **Appraisal** \$345,600

**PID** 102660 **Building Count** 1

**Current Value**

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$120,600	\$225,000	\$345,600
Assessment			
Valuation Year	Improvements	Land	Total
2015	\$84,400	\$157,500	\$241,900

**Owner of Record**

**Owner** SBA PROPERTIES, LLC **Sale Price** \$165,000

**Co-Owner** ATT. TAX DEPARTMENT - CT04066 **Certificate**

**Address** 8051 CONGRESS AVE **Book & Page** 326/ 604

BOCA RATON, FL 33487 **Sale Date** 12/23/2002

**Instrument** 01

**Ownership History**

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
SBA PROPERTIES, LLC	\$165,000		326/ 604	01	12/23/2002

**Building Information**

**Building 1 : Section 1**

**Year Built:**

**Living Area:** 0

**Replacement Cost:** \$0

**Building Percent Good:**

**Replacement Cost Less Depreciation:** \$0

**Building Photo**

Building Attributes	
Field	Description
Style	Outbuildings
Model	



Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	



(http://images.vgsl.com/photos/NorthBranfordCTPhotos/\00\00\72\02.jpg)

**Building Layout**

Building Layout

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

**Extra Features**

Extra Features	Legend
No Data for Extra Features	

**Land**

**Land Use**

Use Code 1060  
 Description AC LND IMP  
 Zone I2  
 Neighborhood  
 Alt Land Appr No  
 Category

**Land Line Valuation**

Size (Acres) 0  
 Frontage 0  
 Depth 0  
 Assessed Value \$157,500  
 Appraised Value \$225,000

**Outbuildings**

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
ELCB	ELECTRONIC COMM BLDG			240 S.F.	\$48,600	1
TW1	CELL TOWER			80 HEIGHT	\$72,000	1

**Valuation History**

--

<b>Appraisal</b>			
<b>Valuation Year</b>	<b>Improvements</b>	<b>Land</b>	<b>Total</b>
2015	\$120,600	\$225,000	\$345,600
2014	\$48,600	\$0	\$48,600
2013	\$48,600	\$0	\$48,600

<b>Assessment</b>			
<b>Valuation Year</b>	<b>Improvements</b>	<b>Land</b>	<b>Total</b>
2015	\$84,400	\$157,500	\$241,900
2014	\$34,000	\$0	\$34,000
2013	\$34,000	\$0	\$34,000

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

T-Mobile Existing Facility

Site ID: CT11372B

SBA N Branford East  
39 Ciro Road  
North Branford, CT 06471

**May 18, 2017**

**EBI Project Number: 6217002148**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general public allowable limit:	<b>3.90 %</b>



May 18, 2017

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

Emissions Analysis for Site: **CT11372B – SBA N Branford East**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **39 Ciro Road, North Branford, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limit for the 700 MHz Band is approximately 467  $\mu\text{W}/\text{cm}^2$ , and the general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) bands is 1000  $\mu\text{W}/\text{cm}^2$ . Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

## **CALCULATIONS**

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **39 Ciro Road, North Branford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 2 UMTS channels (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 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel
- 5) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

- 6) Since the 2100 MHz UMTS radios are ground mounted there are additional cabling losses accounted for. For each ground mounted 2100 MHz UMTS RF path an additional 2.07 dB of loss was factored into the calculations used for this analysis. This is based on manufacturers Specifications for 195 feet of 1-5/8" coax cable on each path.
- 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 6-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 **Ericsson AIR21 B4A/B2P** & **Ericsson AIR21 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-A1M** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B4A/B2P** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Ericsson AIR21 B2A/B4P** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope LNX-6515DS-A1M** has a maximum gain of **14.6 dBd** at its main lobe at 700 MHz. 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 **167 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.
- 12) All calculations were done with respect to uncontrolled / general public threshold limits.



**T-Mobile Site Inventory and Power Data**

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	167	Height (AGL):	167	Height (AGL):	167
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	0.65	Antenna B1 MPE%	0.65	Antenna C1 MPE%	0.65
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	167	Height (AGL):	167	Height (AGL):	167
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	6,117.82	ERP (W):	6,117.82	ERP (W):	6,117.82
Antenna A2 MPE%	0.85	Antenna B2 MPE%	0.85	Antenna C2 MPE%	0.85
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	167	Height (AGL):	167	Height (AGL):	167
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.26	Antenna B3 MPE%	0.26	Antenna C3 MPE%	0.26

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	1.75 %
AT&T	1.62 %
Sprint	0.20 %
Nextel	0.33 %
<b>Site Total MPE %:</b>	<b>3.90 %</b>

T-Mobile Sector A Total:	1.75 %
T-Mobile Sector B Total:	1.75 %
T-Mobile Sector C Total:	1.75 %
<b>Site Total:</b>	<b>3.90 %</b>

T-Mobile_Max 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
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	167	6.47	AWS - 2100 MHz	1000	0.65%
T-Mobile AWS - 2100 MHz UMTS	2	724.64	167	2.01	AWS - 2100 MHz	1000	0.20%
T-Mobile PCS - 1900 MHz UMTS	2	1,167.14	167	3.24	PCS - 1900 MHz	1000	0.32%
T-Mobile PCS - 1900 MHz GSM	2	1,167.14	167	3.24	PCS - 1900 MHz	1000	0.32%
T-Mobile 700 MHz LTE	1	865.21	167	1.20	700 MHz	467	0.26%
						<b>Total*:</b>	<b>1.75%</b>

\*NOTE: Totals may vary by 0.01% due to summing of remainders

## Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	1.75 %
Sector B:	1.75 %
Sector C:	1.75 %
T-Mobile Per Sector Maximum:	1.75 %
Site Total:	3.90 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **3.90%** 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.



**Tower Engineering Solutions**

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**Structural Analysis Report**

**Existing 170 ft. Nudd Corporation Monopole**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT04066-S**

**Customer Site Name: North Branford East**

**Carrier Name: T-Mobile**

**Carrier Site ID / Name: CT11372B / SBA N Branford East**

**Site Location: 39 Ciro Road**

**North Branford, Connecticut**

**New Haven County**

**Latitude: 41.331060**

**Longitude: -72.756172**

**Analysis Result:**

**Max Structural Usage: 51.3% [Pass]**

**Max Foundation Usage: 84% [Pass]**

**Report Prepared By : Stacey Hesselbein**





## Introduction

The purpose of this report is to summarize the analysis results on the 170 ft. Nudd Corporation 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>	Fred A. Nudd Corporation, Project # 01-8471-1 Dated 08/08/2001
<b>Foundation Drawing</b>	Fred A. Nudd Corporation, Project # 01-8471-1 Dated 08/08/2001
<b>Geotechnical Report</b>	Jaworski, Project # 01480G Dated 07/23/2001
<b>Modification Drawings</b>	N/A

## Analysis Criteria

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

<b>Wind Speed Used in the Analysis:</b>	Ultimate Design Wind Speed $V_{ult} = 130$ mph (3-Sec. Gust)/ Nominal Design Wind Speed $V_{asd} = 101.0$ mph (3-Sec. Gust)
<b>Wind Speed with Ice:</b>	50 mph (3-Sec. Gust) with 3/4" radial ice concurrent
<b>Operational Wind Speed:</b>	60 mph + 0" Radial ice
<b>Standard/Codes:</b>	ANSI/TIA/EIA 222-G / 2012 IBC / 2016 Connecticut State Building Code
<b>Exposure Category:</b>	C
<b>Structure Class:</b>	II
<b>Topographic Category:</b>	1
<b>Crest Height:</b>	0 ft.
<b>Seismic Parameters:</b>	$S_S = 0.178$ , $S_1 = 0.061$

## 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
-	167.0	3	Ericsson - AIR21 B2A/B4P - Panel	Low Profile Platform	(12) 1 5/8" (1) 1 5/8" Fiber	T-Mobile
-		3	Ericsson - AIR21 B4A/B2P - Panel			
-		3	Ericsson - KRY 112 114-1 - Double TMA			
6	147.0	6	Powerwave - 7770 - Panel	Low Profile Platform	(12) 1 5/8" (2) 1/2" DC (1) 3/8" Fiber	AT&T
7		3	KMW - AM-X-CD-16-65-00T - Panel			
8		6	Powerwave - LGP 21401 - TMA			
9		6	Ericsson - RRUS-11 800 MHz - RRU			
10		6	Powerwave - LGP 21903 - Diplexers			
11		1	Raycap - DC6-48-60-18-8F - SP			
12	137.0	3	RFS - APXVSP18-C-A20 - Panel	Low Profile Platform	(3) 1 1/4"	Sprint
13		3	RFS - APXVTM14-C-I20 - Panel			
14		3	ALU - 800MHz - RRH			
15		3	ALU - 1900MHz - RRH			
16		3	ALU - TD-RRH8x20-25 - RRU			
17		3	ALU - 800MHz Filter			
18		4	RFS - ACU-A20-N - RET			
19	75.0	1	GPS	(1) Standoff	(1) 1/2"	

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

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

Items	Elevation (ft.)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	167.0	3	Ericsson - AIR21 B2A/B4P - Panel	Low Profile Platform	(12) 1 5/8" (1) 1 5/8" Fiber	T-Mobile
2		3	Ericsson - AIR21 B4A/B2P - Panel			
3		3	Ericsson - KRY 112 144 - Double TMA			
4		3	Ericsson - S11B12 - RRU			
5	165.0	3	Commscope - LNX-6515DS-A1M - Panel			

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>51.3%</b>	<b>38.4%</b>	<b>79.3%</b>
Pass/Fail	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>

## **Foundations**

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	3850.9	34.4	79.5

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



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

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.8224 degrees under the operational wind speed as specified in the Analysis Criteria.

### **Conclusions**

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

### **Antenna Mount Note:**

The existing mount contributes no additional stress to the tower since it is existing on the tower.

## Standard Conditions

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

# Usage Diagram - Max Ratio 51.27% at 0.0ft

**Structure:** CT04066-S-SBA  
**Site Name:** North Branford East  
**Height:** 170.00 (ft)  
**Base Elev:** 0.000 (ft)

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

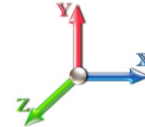
5/3/2017



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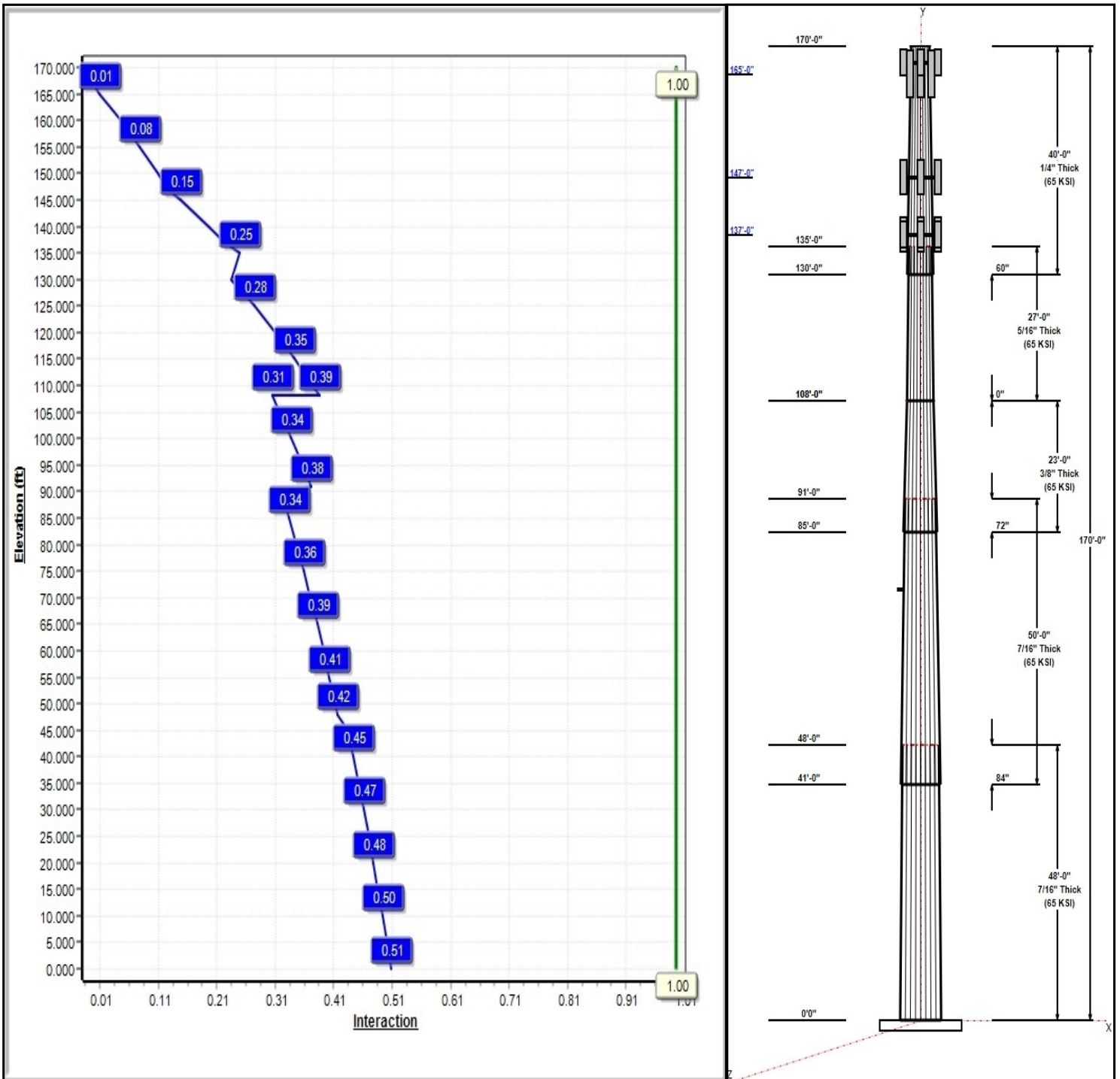
**Dead Load Factor:** 1.20  
**Wind Load Factor:** 1.60

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



**Iterations:** 23

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## Structure: CT04066-S-SBA

**Type:** Tapered  
**Site Name:** North Branford East  
**Height:** 170.00 (ft)  
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.25074

5/3/2017

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### Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	48.00	52.46	64.50	0.438		0.25074	65
2	50.00	42.56	55.09	0.438	Slip	0.25074	65
3	23.00	39.05	44.81	0.375	Slip	0.25074	65
4	27.00	32.28	39.05	0.313	Butt	0.25074	65
5	40.00	24.00	34.03	0.250	Slip	0.25074	65

### Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
170.00	170.00	1	6' Lightning rod	T-Mobile
167.00	167.00	3	AIR21 B2A/B4P	T-Mobile
167.00	167.00	3	AIR21 B4A/B2P	T-Mobile
167.00	167.00	3	KRY 112 114-1 - Double	T-Mobile
167.00	167.00	1	Low Profile	T-Mobile
167.00	167.00	3	S11B12 - RRU	T-Mobile
165.00	165.00	3	LNx-6515DS-A1M	T-Mobile
147.00	147.00	6	7770	AT&T
147.00	147.00	3	AM-X-CD-16-65-00T	AT&T
147.00	147.00	6	LGP 21401 - TMA	AT&T
147.00	147.00	6	LGP 21903 - Diplexers	AT&T
147.00	147.00	1	DC6-48-60-18-8F - SP	AT&T
147.00	147.00	6	RRUS-11 800 MHz - RRU	AT&T
147.00	147.00	1	Low Profile	AT&T
137.00	137.00	3	APXVSP18-C-A20	Sprint
137.00	137.00	3	APXVTM14-C-I20	Sprint
137.00	137.00	3	800MHz - RRH	Sprint
137.00	137.00	3	1900MHz - RRH	Sprint
137.00	137.00	3	TD-RRH8x20-25 - RRU	Sprint
137.00	137.00	4	ACU-A20-N - RET	Sprint
137.00	137.00	3	ALU - 800MHz Filter	Sprint
137.00	137.00	1	Low Profile	Sprint
75.00	75.00	1	Standoff	Sprint
75.00	75.00	1	GPS	Sprint

### Linear Appurtenances

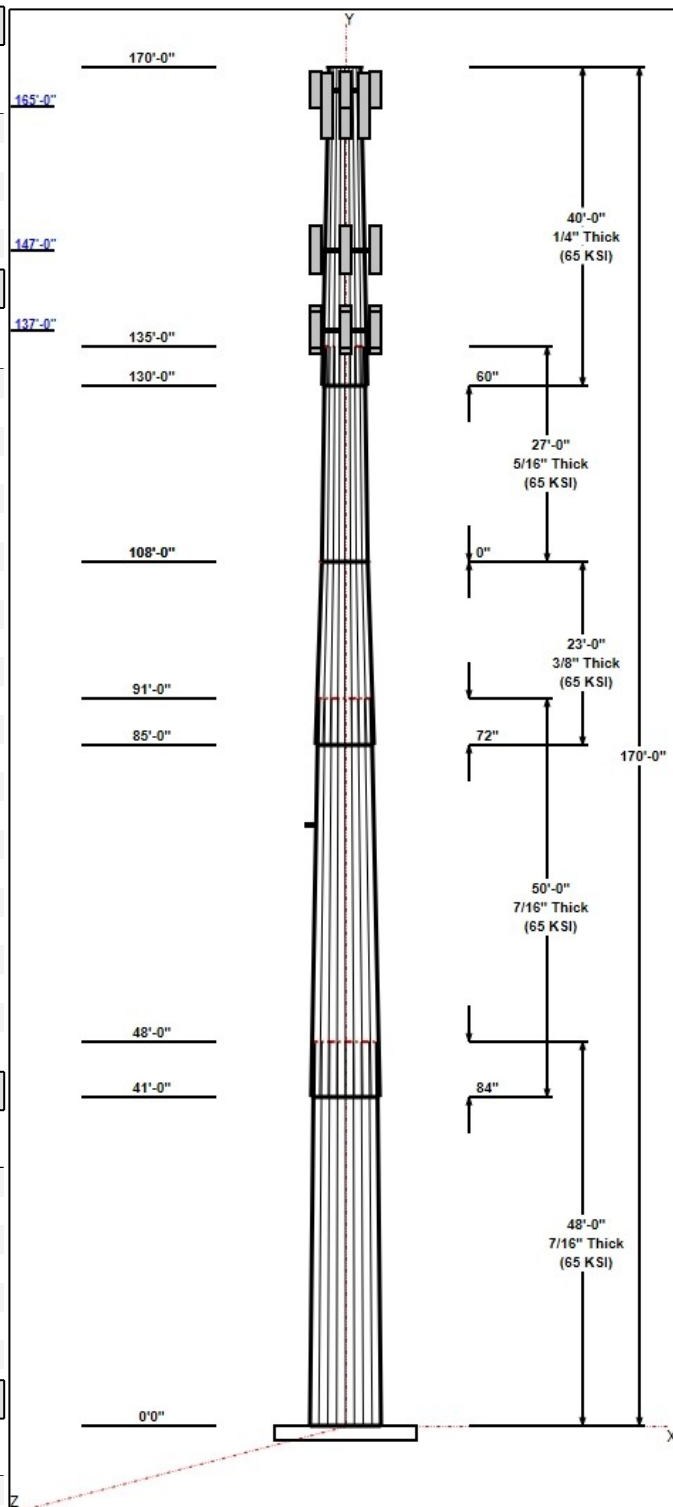
Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	167.00	Inside	1 5/8" Coax	T-Mobile
0.00	167.00	Inside	1 5/8" Fiber	T-Mobile
0.00	147.00	Inside	1 5/8" Coax	AT&T
0.00	147.00	Inside	1/2" DC	AT&T
0.00	147.00	Inside	3/8" Fiber	AT&T
0.00	137.00	Inside	1 1/4" Coax	Sprint
0.00	75.00	Inside	1/2" Coax	Sprint

### Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
29	2.00" A687	105.0	Radial

### Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry





## Structure: CT04066-S-SBA

**Type:** Tapered  
**Site Name:** North Branford East  
**Height:** 170.00 (ft)  
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.25074

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2.2500      64.5      50.0      Round

### Reactions

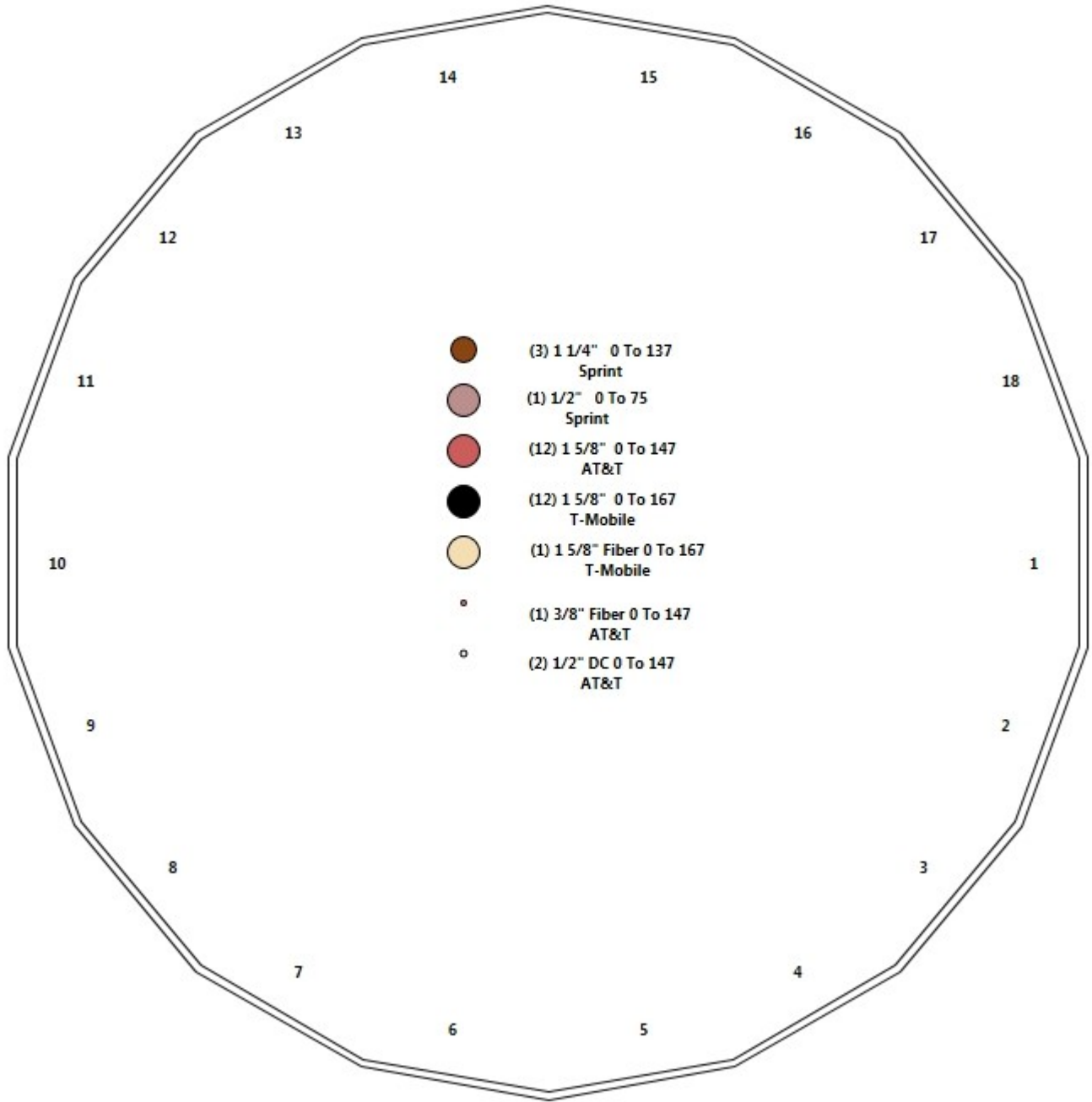
Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 101 mph Wind	3850.9	34.4	55.8
0.9D + 1.6W 101 mph Wind	3822.9	34.4	41.8
1.2D + 1.0Di + 1.0Wi 50 mph Wind	1025.5	9.4	79.5
1.2D + 1.0E	197.8	1.7	55.8
0.9D + 1.0E	196.3	1.7	41.9
1.0D + 1.0W 60 mph Wind	845.7	7.6	46.5

# Structure: CT04066-S-SBA - Coax Line Placement

**Type:** Monopole  
**Site Name:** North Branford East  
**Height:** 170.00 (ft)

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## Shaft Properties

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	48.000	0.4375	65		0.00	13,165
2	18	50.000	0.4375	65	Slip	84.00	11,432
3	18	23.000	0.3750	65	Slip	72.00	3,871
4	18	27.000	0.3125	65	Flange	0.00	3,221
5	18	40.000	0.2500	65	Slip	60.00	3,107
<b>Total Shaft Weight:</b>							<b>34,795</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	64.50	0.00	88.96	46124.76	24.59	147.43	52.46	48.00	72.24	24706.6	19.73	119.9	0.250735
2	55.09	41.00	75.90	28646.28	20.79	125.93	42.56	91.00	58.49	13110.0	15.74	97.28	0.250735
3	44.81	85.00	52.89	13195.46	19.66	119.50	39.05	108.00	46.03	8695.97	16.95	104.1	0.250735
4	39.05	108.0	38.42	7281.83	20.62	124.95	32.28	135.00	31.70	4092.10	16.80	103.2	0.250735
5	34.03	130.0	26.80	3864.03	22.59	136.12	24.00	170.00	18.84	1343.00	15.52	96.00	0.250735

## Load Summary

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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### Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
1	170.00	6' Lightning rod	1	6.50	0.38	1.00	43.26	1.481	1.00	0.00	0.00
2	167.00	AIR21 B2A/B4P	3	91.50	6.09	0.84	262.57	7.200	0.85	0.00	0.00
3	167.00	AIR21 B4A/B2P	3	90.40	6.09	0.85	261.47	7.200	0.85	0.00	0.00
4	167.00	KRY 112 114-1 - Double TMA	3	11.00	0.41	0.70	21.90	0.890	0.74	0.00	0.00
5	167.00	Low Profile Platform-Round	1	1500.00	22.00	1.00	2823.04	39.852	1.00	0.00	0.00
6	167.00	S11B12 - RRU	3	51.00	2.83	0.67	121.35	3.509	0.69	0.00	0.00
7	165.00	LNx-6515DS-A1M	3	49.80	11.47	0.80	281.55	14.768	0.80	0.00	0.00
8	147.00	7770	6	35.00	5.50	0.80	169.84	6.563	0.82	0.00	0.00
9	147.00	AM-X-CD-16-65-00T	3	48.50	8.02	0.82	210.45	10.808	0.83	0.00	0.00
10	147.00	LGP 21401 - TMA	6	14.10	1.29	0.78	39.05	2.124	0.80	0.00	0.00
11	147.00	LGP 21903 - Diplexers	6	5.50	0.27	0.78	13.91	0.667	0.80	0.00	0.00
12	147.00	DC6-48-60-18-8F - SP	1	31.80	0.92	1.00	93.50	1.357	1.00	0.00	0.00
13	147.00	RRUS-11 800 MHz - RRU	6	54.00	2.94	0.67	142.97	3.170	0.69	0.00	0.00
14	147.00	Low Profile Platform-Round	1	1500.00	22.00	1.00	2806.27	39.626	1.00	0.00	0.00
15	137.00	APXVSP18-C-A20	3	57.00	8.02	0.85	228.29	10.789	0.86	0.00	0.00
16	137.00	APXVTM14-C-I20	3	56.00	6.34	0.86	214.67	7.443	0.88	0.00	0.00
17	137.00	800MHz - RRH	3	53.00	2.49	0.67	126.29	3.623	0.69	0.00	0.00
18	137.00	1900MHz - RRH	3	44.00	3.80	0.67	152.18	5.178	0.69	0.00	0.00
19	137.00	TD-RRH8x20-25 - RRU	3	70.00	4.05	0.67	179.26	4.855	0.69	0.00	0.00
20	137.00	ACU-A20-N - RET	4	1.00	0.14	0.78	5.26	0.434	0.80	0.00	0.00
21	137.00	ALU - 800MHz Filter	3	8.80	0.78	0.50	26.28	1.421	0.55	0.00	0.00
22	137.00	Low Profile Platform-Round	1	1500.00	22.00	1.00	2797.10	39.502	1.00	0.00	0.00
23	75.00	Standoff	1	40.00	2.63	0.75	114.90	8.199	0.75	0.00	0.00
24	75.00	GPS	1	10.00	1.00	1.00	37.36	1.664	1.00	0.00	0.00
<b>Totals:</b>			<b>71</b>	<b>7,136.90</b>			<b>17,189.90</b>				

### Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	167.00	(12) 1 5/8" Coax	0.00	Inside
0.00	167.00	(1) 1 5/8" Fiber	0.00	Inside
0.00	147.00	(12) 1 5/8" Coax	0.00	Inside
0.00	147.00	(2) 1/2" DC	0.00	Inside
0.00	147.00	(1) 3/8" Fiber	0.00	Inside
0.00	137.00	(3) 1 1/4" Coax	0.00	Inside
0.00	75.00	(1) 1/2" Coax	0.00	Inside



## Shaft Section Properties

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**Increment Length:** 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in^3)	Weight (lb)
0.00		0.4375	64.500	88.956	46124.8	24.59	147.43	72.5	1408.	0.0
5.00		0.4375	63.246	87.215	43469.5	24.08	144.56	73.1	1353.	1498.7
10.00		0.4375	61.993	85.474	40918.1	23.57	141.70	73.7	1300.	1469.1
15.00		0.4375	60.739	83.733	38468.6	23.07	138.83	74.3	1247.	1439.4
20.00		0.4375	59.485	81.992	36118.8	22.56	135.97	74.9	1195.	1409.8
25.00		0.4375	58.232	80.251	33866.7	22.06	133.10	75.5	1145.	1380.2
30.00		0.4375	56.978	78.511	31710.3	21.55	130.24	76.1	1096.	1350.6
35.00		0.4375	55.724	76.770	29647.4	21.05	127.37	76.6	1047.	1321.0
40.00		0.4375	54.471	75.029	27675.9	20.54	124.50	77.2	1000.	1291.3
41.00	Bot - Section 2	0.4375	54.220	74.681	27292.4	20.44	123.93	77.4	991.4	254.7
45.00		0.4375	53.217	73.288	25793.8	20.04	121.64	77.8	954.7	2030.6
48.00	Top - Section 1	0.4375	53.340	73.459	25974.3	20.09	121.92	0.0	0.0	1498.0
50.00		0.4375	52.838	72.762	25242.6	19.88	120.77	78.0	941.0	497.6
55.00		0.4375	51.585	71.022	23473.9	19.38	117.91	78.6	896.3	1223.2
60.00		0.4375	50.331	69.281	21789.7	18.87	115.04	79.2	852.7	1193.5
65.00		0.4375	49.077	67.540	20188.1	18.37	112.18	79.8	810.2	1163.9
70.00		0.4375	47.824	65.799	18667.0	17.86	109.31	80.4	768.8	1134.3
75.00		0.4375	46.570	64.058	17224.2	17.36	106.45	81.0	728.5	1104.7
80.00		0.4375	45.316	62.317	15857.8	16.85	103.58	81.6	689.2	1075.1
85.00	Bot - Section 3	0.4375	44.063	60.577	14565.6	16.35	100.71	82.2	651.1	1045.5
90.00		0.4375	42.809	58.836	13345.6	15.84	97.85	82.5	614.0	1903.0
91.00	Top - Section 2	0.3750	43.308	51.099	11900.1	18.95	115.49	0.0	0.0	374.0
95.00		0.3750	42.305	49.906	11085.5	18.48	112.81	79.7	516.1	687.4
100.00		0.3750	41.051	48.413	10120.6	17.89	109.47	80.4	485.6	836.4
105.00		0.3750	39.798	46.921	9213.4	17.30	106.13	81.0	456.0	811.0
108.00	Top - Section 3	0.3750	39.046	46.026	8696.0	16.95	104.12	81.5	438.7	474.4
108.00	Bot - Section 4	0.3125	39.046	38.417	7281.8	20.34	124.95	77.1	367.3	
110.00		0.3125	38.544	37.920	7002.6	20.34	123.34	77.5	357.8	259.8
115.00		0.3125	37.290	36.676	6336.1	19.63	119.33	78.3	334.7	634.6
120.00		0.3125	36.037	35.433	5713.3	18.92	115.32	79.1	312.3	613.4
125.00		0.3125	34.783	34.189	5132.6	18.22	111.31	80.0	290.6	592.3
130.00	Bot - Section 5	0.3125	33.529	32.946	4592.7	17.51	107.29	80.8	269.8	571.1
135.00	Top - Section 4	0.2500	32.776	25.808	3449.6	21.71	131.10	0.0	0.0	997.5
137.00		0.2500	32.274	25.410	3292.5	21.35	129.10	76.3	200.9	174.3
140.00		0.2500	31.522	24.813	3065.9	20.82	126.09	76.9	191.6	256.4
145.00		0.2500	30.268	23.819	2711.7	19.94	121.07	78.0	176.5	413.7
147.00		0.2500	29.767	23.421	2578.1	19.58	119.07	78.4	170.6	160.7
150.00		0.2500	29.015	22.824	2386.0	19.05	116.06	79.0	162.0	236.0
155.00		0.2500	27.761	21.829	2087.4	18.17	111.04	80.0	148.1	379.9
160.00		0.2500	26.507	20.834	1814.8	17.29	106.03	81.1	134.9	362.9
165.00		0.2500	25.254	19.840	1567.1	16.40	101.01	82.1	122.2	346.0
167.00		0.2500	24.752	19.442	1474.7	16.05	99.01	82.5	117.3	133.7
170.00		0.2500	24.000	18.845	1343.0	15.52	96.00	82.5	110.2	195.4

**34795.0**

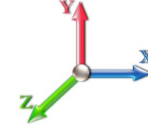
## Wind Loading - Shaft

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 23

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	21.088	23.20	508.23	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	21.088	23.20	498.35	0.650	0.000	5.00	27.024	17.57	651.9	0.0	1798.4
10.00		1.00	0.85	21.088	23.20	488.47	0.650	0.000	5.00	26.494	17.22	639.1	0.0	1762.9
15.00		1.00	0.85	21.088	23.20	478.59	0.650	0.000	5.00	25.964	16.88	626.3	0.0	1727.3
20.00		1.00	0.90	22.375	24.61	482.81	0.650	0.000	5.00	25.433	16.53	651.0	0.0	1691.8
25.00		1.00	0.95	23.451	25.80	483.87	0.650	0.000	5.00	24.903	16.19	668.1	0.0	1656.2
30.00		1.00	0.98	24.369	26.81	482.62	0.650	0.000	5.00	24.372	15.84	679.4	0.0	1620.7
35.00		1.00	1.01	25.172	27.69	479.72	0.650	0.000	5.00	23.842	15.50	686.6	0.0	1585.2
40.00		1.00	1.04	25.890	28.48	475.57	0.650	0.000	5.00	23.311	15.15	690.4	0.0	1549.6
41.00	Bot - Section 2	1.00	1.05	26.025	28.63	474.61	0.650	0.000	1.00	4.599	2.99	136.9	0.0	305.7
45.00		1.00	1.07	26.540	29.19	470.42	0.650	0.000	4.00	18.479	12.01	561.0	0.0	2436.7
48.00	Top - Section 1	1.00	1.08	26.903	29.59	466.93	0.650	0.000	3.00	13.636	8.86	419.7	0.0	1797.6
50.00		1.00	1.09	27.135	29.85	472.28	0.650	0.000	2.00	8.985	5.84	278.9	0.0	597.1
55.00		1.00	1.12	27.685	30.45	465.73	0.650	0.000	5.00	22.090	14.36	699.6	0.0	1467.8
60.00		1.00	1.14	28.197	31.02	458.59	0.650	0.000	5.00	21.560	14.01	695.5	0.0	1432.3
65.00		1.00	1.16	28.676	31.54	450.95	0.650	0.000	5.00	21.030	13.67	689.9	0.0	1396.7
70.00		1.00	1.17	29.127	32.04	442.87	0.650	0.000	5.00	20.499	13.32	683.1	0.0	1361.2
75.00	Appurtenance(s)	1.00	1.19	29.553	32.51	434.40	0.650	0.000	5.00	19.969	12.98	675.1	0.0	1325.6
80.00		1.00	1.21	29.958	32.95	425.59	0.650	0.000	5.00	19.438	12.63	666.2	0.0	1290.1
85.00	Bot - Section 3	1.00	1.22	30.342	33.38	416.47	0.650	0.000	5.00	18.908	12.29	656.3	0.0	1254.5
90.00		1.00	1.24	30.710	33.78	407.06	0.650	0.000	5.00	18.695	12.15	656.8	0.0	2283.6
91.00	Top - Section 2	1.00	1.24	30.781	33.86	405.15	0.650	0.000	1.00	3.675	2.39	129.4	0.0	448.8
95.00		1.00	1.25	31.061	34.17	404.57	0.650	0.000	4.00	14.489	9.42	514.9	0.0	824.9
100.00		1.00	1.27	31.399	34.54	394.70	0.650	0.000	5.00	17.634	11.46	633.4	0.0	1003.7
105.00		1.00	1.28	31.723	34.89	384.62	0.650	0.000	5.00	17.103	11.12	620.7	0.0	973.2
108.00	Top - Section 3	1.00	1.29	31.911	35.10	378.47	0.650	0.000	3.00	10.007	6.50	365.3	0.0	569.3
110.00		1.00	1.29	32.035	35.24	374.33	0.650	0.000	2.00	6.566	4.27	240.6	0.0	311.7
115.00		1.00	1.30	32.336	35.57	363.85	0.650	0.000	5.00	16.043	10.43	593.5	0.0	761.5
120.00		1.00	1.32	32.627	35.89	353.20	0.650	0.000	5.00	15.512	10.08	579.0	0.0	736.1
125.00		1.00	1.33	32.909	36.20	342.38	0.650	0.000	5.00	14.982	9.74	564.0	0.0	710.7
130.00	Bot - Section 5	1.00	1.34	33.182	36.50	331.41	0.650	0.000	5.00	14.451	9.39	548.6	0.0	685.3
135.00	Top - Section 4	1.00	1.35	33.446	36.79	320.28	0.650	0.000	5.00	14.132	9.19	540.7	0.0	1197.0
137.00	Appurtenance(s)	1.00	1.35	33.550	36.90	320.77	0.650	0.000	2.00	5.504	3.58	211.3	0.0	209.1
140.00		1.00	1.36	33.703	37.07	314.01	0.650	0.000	3.00	8.098	5.26	312.2	0.0	307.6
145.00		1.00	1.37	33.953	37.35	302.63	0.650	0.000	5.00	13.072	8.50	507.7	0.0	496.5
147.00	Appurtenance(s)	1.00	1.37	34.051	37.46	298.05	0.650	0.000	2.00	5.080	3.30	197.9	0.0	192.9
150.00		1.00	1.38	34.196	37.62	291.13	0.650	0.000	3.00	7.461	4.85	291.9	0.0	283.2
155.00		1.00	1.39	34.433	37.88	279.52	0.650	0.000	5.00	12.011	7.81	473.1	0.0	455.8
160.00		1.00	1.40	34.664	38.13	267.79	0.650	0.000	5.00	11.480	7.46	455.3	0.0	435.5
165.00	Appurtenance(s)	1.00	1.41	34.890	38.38	255.95	0.650	0.000	5.00	10.950	7.12	437.1	0.0	415.2
167.00	Appurtenance(s)	1.00	1.41	34.978	38.48	251.19	0.650	0.000	2.00	4.231	2.75	169.3	0.0	160.4
170.00	Appurtenance(s)	1.00	1.42	35.110	38.62	244.01	0.650	0.000	3.00	6.188	4.02	248.5	0.0	234.5
<b>Totals:</b>									<b>170.00</b>			<b>20,746.4</b>		<b>41,754.0</b>

## Discrete Appurtenance Forces

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 23

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	170.00	6' Lightning rod	1	35.110	38.620	1.00	1.00	0.38	7.80	0.000	0.000	23.48	0.00	0.00
2	167.00	KRY 112 114-1 - Double	3	34.978	38.476	0.56	0.80	0.69	39.60	0.000	0.000	42.40	0.00	0.00
3	167.00	AIR21 B4A/B2P	3	34.978	38.476	0.77	0.90	13.98	325.44	0.000	0.000	860.42	0.00	0.00
4	167.00	AIR21 B2A/B4P	3	34.978	38.476	0.76	0.90	13.81	329.40	0.000	0.000	850.30	0.00	0.00
5	167.00	Low Profile	1	34.978	38.476	1.00	1.00	22.00	1800.00	0.000	0.000	1354.35	0.00	0.00
6	167.00	S11B12 - RRU	3	34.978	38.476	0.54	0.80	4.55	183.60	0.000	0.000	280.14	0.00	0.00
7	165.00	LNx-6515DS-A1M	3	34.890	38.378	0.72	0.90	24.78	179.28	0.000	0.000	1521.34	0.00	0.00
8	147.00	Low Profile	1	34.051	37.456	1.00	1.00	22.00	1800.00	0.000	0.000	1318.47	0.00	0.00
9	147.00	RRUS-11 800 MHz - RRU	6	34.051	37.456	0.54	0.80	9.46	388.80	0.000	0.000	566.64	0.00	0.00
10	147.00	DC6-48-60-18-8F - SP	1	34.051	37.456	0.80	0.80	0.74	38.16	0.000	0.000	44.11	0.00	0.00
11	147.00	LGP 21903 - Diplexers	6	34.051	37.456	0.62	0.80	1.01	39.60	0.000	0.000	60.58	0.00	0.00
12	147.00	LGP 21401 - TMA	6	34.051	37.456	0.62	0.80	4.83	101.52	0.000	0.000	289.45	0.00	0.00
13	147.00	AM-X-CD-16-65-00T	3	34.051	37.456	0.66	0.80	15.78	174.60	0.000	0.000	945.90	0.00	0.00
14	147.00	7770	6	34.051	37.456	0.64	0.80	21.12	252.00	0.000	0.000	1265.73	0.00	0.00
15	137.00	APXVSP18-C-A20	3	33.550	36.905	0.68	0.80	16.36	205.20	0.000	0.000	966.07	0.00	0.00
16	137.00	APXVTM14-C-I20	3	33.550	36.905	0.69	0.80	13.09	201.60	0.000	0.000	772.69	0.00	0.00
17	137.00	800MHz - RRH	3	33.550	36.905	0.54	0.80	4.00	190.80	0.000	0.000	236.42	0.00	0.00
18	137.00	1900MHz - RRH	3	33.550	36.905	0.54	0.80	6.11	158.40	0.000	0.000	360.81	0.00	0.00
19	137.00	TD-RRH8x20-25 - RRU	3	33.550	36.905	0.54	0.80	6.51	252.00	0.000	0.000	384.54	0.00	0.00
20	137.00	ACU-A20-N - RET	4	33.550	36.905	0.62	0.80	0.35	4.80	0.000	0.000	20.63	0.00	0.00
21	137.00	ALU - 800MHz Filter	3	33.550	36.905	0.40	0.80	0.94	31.68	0.000	0.000	55.27	0.00	0.00
22	137.00	Low Profile	1	33.550	36.905	1.00	1.00	22.00	1800.00	0.000	0.000	1299.06	0.00	0.00
23	75.00	GPS	1	29.553	32.509	0.80	0.80	0.80	12.00	0.000	0.000	41.61	0.00	0.00
24	75.00	Standoff	1	29.553	32.509	0.56	0.75	1.48	48.00	0.000	0.000	76.95	0.00	0.00
<b>Totals:</b>									<b>8,564.28</b>			<b>13,637.37</b>		

## Total Applied Force Summary

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**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		651.94	1978.05	0.00	0.00
10.00		639.14	1942.50	0.00	0.00
15.00		626.35	1906.96	0.00	0.00
20.00		651.00	1871.42	0.00	0.00
25.00		668.09	1835.88	0.00	0.00
30.00		679.44	1800.34	0.00	0.00
35.00		686.58	1764.79	0.00	0.00
40.00		690.44	1729.25	0.00	0.00
41.00		136.91	341.59	0.00	0.00
45.00		561.04	2580.38	0.00	0.00
48.00		419.68	1905.43	0.00	0.00
50.00		278.91	668.93	0.00	0.00
55.00		699.64	1647.43	0.00	0.00
60.00		695.47	1611.89	0.00	0.00
65.00		689.89	1576.35	0.00	0.00
70.00		683.06	1540.81	0.00	0.00
75.00	(2) attachments	793.68	1565.27	0.00	0.00
80.00		666.18	1463.48	0.00	0.00
85.00		656.32	1427.94	0.00	0.00
90.00		656.78	2457.00	0.00	0.00
91.00		129.42	483.48	0.00	0.00
95.00		514.85	963.59	0.00	0.00
100.00		633.41	1177.07	0.00	0.00
105.00		620.70	1146.61	0.00	0.00
108.00		365.34	673.34	0.00	0.00
110.00		240.61	381.07	0.00	0.00
115.00		593.46	934.90	0.00	0.00
120.00		579.00	909.51	0.00	0.00
125.00		564.03	884.12	0.00	0.00
130.00		548.57	858.74	0.00	0.00
135.00		540.74	1370.42	0.00	0.00
137.00	(23) attachments	4306.76	3122.98	0.00	0.00
140.00		312.21	404.53	0.00	0.00
145.00		507.73	657.97	0.00	0.00
147.00	(29) attachments	4688.78	3052.18	0.00	0.00
150.00		291.88	332.14	0.00	0.00
155.00		473.12	537.31	0.00	0.00
160.00		455.26	517.01	0.00	0.00
165.00	(3) attachments	1958.39	675.98	0.00	0.00
167.00	(13) attachments	3556.94	2871.03	0.00	0.00
170.00	(1) attachments	272.03	242.31	0.00	0.00
	<b>Totals:</b>	<b>34,383.77</b>	<b>55,812.01</b>	<b>0.00</b>	<b>0.00</b>



## Calculated Forces

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

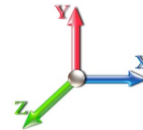


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**Load Case:** 1.2D + 1.6W 101 mph Wind

**Iterations** 23

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



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-55.78	-34.44	0.00	-3850.8	0.00	3850.89	5803.10	2901.55	15291.3	7657.05	0.00	0.000	0.000	0.513
5.00	-53.73	-33.90	0.00	-3678.6	0.00	3678.69	5736.18	2868.09	14817.2	7419.63	0.06	-0.116	0.000	0.505
10.00	-51.72	-33.36	0.00	-3509.2	0.00	3509.20	5667.41	2833.70	14345.3	7183.34	0.25	-0.234	0.000	0.498
15.00	-49.75	-32.83	0.00	-3342.4	0.00	3342.41	5596.76	2798.38	13875.9	6948.30	0.56	-0.353	0.000	0.490
20.00	-47.81	-32.26	0.00	-3178.2	0.00	3178.28	5524.26	2762.13	13409.4	6714.68	0.99	-0.473	0.000	0.482
25.00	-45.92	-31.68	0.00	-3016.9	0.00	3016.96	5449.89	2724.95	12945.9	6482.61	1.55	-0.595	0.000	0.474
30.00	-44.06	-31.07	0.00	-2858.5	0.00	2858.58	5373.66	2686.83	12485.9	6252.24	2.24	-0.719	0.000	0.466
35.00	-42.23	-30.45	0.00	-2703.2	0.00	2703.22	5295.57	2647.79	12029.5	6023.71	3.06	-0.844	0.000	0.457
40.00	-40.48	-29.79	0.00	-2550.9	0.00	2550.95	5215.62	2607.81	11577.1	5797.18	4.02	-0.970	0.000	0.448
41.00	-40.10	-29.69	0.00	-2521.1	0.00	2521.16	5199.41	2599.70	11487.1	5752.13	4.22	-0.996	0.000	0.446
45.00	-37.49	-29.14	0.00	-2402.3	0.00	2402.39	5133.81	2566.90	11129.0	5572.78	5.10	-1.098	0.000	0.439
48.00	-35.56	-28.73	0.00	-2314.9	0.00	2314.97	5141.90	2570.95	11172.7	5594.66	5.82	-1.176	0.000	0.421
50.00	-34.85	-28.49	0.00	-2257.5	0.00	2257.51	5108.73	2554.36	10994.5	5505.45	6.32	-1.229	0.000	0.417
55.00	-33.16	-27.82	0.00	-2115.0	0.00	2115.08	5024.49	2512.24	10552.4	5284.05	7.67	-1.352	0.000	0.407
60.00	-31.51	-27.16	0.00	-1975.9	0.00	1975.97	4938.39	2469.19	10115.2	5065.12	9.16	-1.476	0.000	0.397
65.00	-29.89	-26.49	0.00	-1840.1	0.00	1840.19	4850.42	2425.21	9683.22	4848.81	10.77	-1.601	0.000	0.386
70.00	-28.32	-25.82	0.00	-1707.7	0.00	1707.75	4760.60	2380.30	9256.75	4635.26	12.51	-1.726	0.000	0.374
75.00	-26.72	-25.04	0.00	-1578.6	0.00	1578.64	4668.91	2334.45	8836.09	4424.61	14.39	-1.851	0.000	0.363
80.00	-25.23	-24.38	0.00	-1453.4	0.00	1453.44	4575.36	2287.68	8421.51	4217.02	16.40	-1.976	0.000	0.350
85.00	-23.77	-23.72	0.00	-1331.5	0.00	1331.54	4479.95	2239.97	8013.32	4012.62	18.53	-2.101	0.000	0.337
90.00	-21.31	-23.00	0.00	-1212.9	0.00	1212.92	4371.20	2185.60	7591.89	3801.59	20.80	-2.225	0.000	0.324
91.00	-20.81	-22.88	0.00	-1189.9	0.00	1189.92	4368.14	2181.07	7591.89	3801.59	21.27	-2.251	0.000	0.376
95.00	-19.82	-22.37	0.00	-1098.4	0.00	1098.41	4357.07	2178.93	7591.89	3801.59	23.20	-2.350	0.000	0.362
100.00	-18.62	-21.73	0.00	-986.58	0.00	986.58	4350.29	2175.65	7591.89	3801.59	25.73	-2.484	0.000	0.343
105.00	-17.47	-21.09	0.00	-877.95	0.00	877.95	4342.66	2171.33	7591.89	3801.59	28.40	-2.615	0.000	0.322
108.00	-16.79	-20.71	0.00	-814.69	0.00	814.69	4337.59	2168.29	7591.89	3801.59	30.07	-2.693	0.000	0.309
108.00	-16.79	-20.71	0.00	-814.69	0.00	814.69	4333.69	2167.38	7591.89	3801.59	30.07	-2.693	0.000	0.390
110.00	-16.38	-20.48	0.00	-773.28	0.00	773.28	4324.20	2164.20	7591.89	3801.59	31.21	-2.745	0.000	0.378
115.00	-15.43	-19.88	0.00	-670.88	0.00	670.88	4284.96	2129.48	7591.89	3801.59	34.17	-2.892	0.000	0.348
120.00	-14.50	-19.29	0.00	-571.48	0.00	571.48	4253.85	2126.93	7591.89	3801.59	37.27	-3.032	0.000	0.314
125.00	-13.61	-18.71	0.00	-475.03	0.00	475.03	4240.88	2123.44	7591.89	3801.59	40.52	-3.162	0.000	0.278
130.00	-12.75	-18.14	0.00	-381.50	0.00	381.50	4239.05	2119.83	7591.89	3801.59	43.89	-3.281	0.000	0.239
135.00	-11.39	-17.53	0.00	-290.82	0.00	290.82	4227.27	2118.13	7591.89	3801.59	47.38	-3.385	0.000	0.253
137.00	-8.52	-13.05	0.00	-255.76	0.00	255.76	4224.61	2117.31	7591.89	3801.59	48.81	-3.423	0.000	0.228
140.00	-8.12	-12.73	0.00	-216.60	0.00	216.60	4221.57	2117.57	7591.89	3801.59	50.98	-3.484	0.000	0.201
145.00	-7.48	-12.19	0.00	-152.96	0.00	152.96	4217.00	2117.00	7591.89	3801.59	54.68	-3.570	0.000	0.153
147.00	-4.72	-7.32	0.00	-128.58	0.00	128.58	4215.86	2116.86	7591.89	3801.59	56.18	-3.599	0.000	0.131
150.00	-4.40	-7.01	0.00	-106.62	0.00	106.62	4212.58	2116.25	7591.89	3801.59	58.45	-3.638	0.000	0.114
155.00	-3.89	-6.51	0.00	-71.56	0.00	71.56	4212.29	2115.29	7591.89	3801.59	62.29	-3.691	0.000	0.083
160.00	-3.40	-6.02	0.00	-39.02	0.00	39.02	4210.15	2115.15	7591.89	3801.59	66.17	-3.729	0.000	0.050
165.00	-2.86	-4.02	0.00	-8.91	0.00	8.91	4210.13	2115.13	7591.89	3801.59	70.09	-3.748	0.000	0.014
167.00	-0.22	-0.29	0.00	-0.86	0.00	0.86	4210.01	2115.01	7591.89	3801.59	71.66	-3.749	0.000	0.001
170.00	0.00	-0.27	0.00	0.00	0.00	0.00	4210.09	2115.04	7591.89	3801.59	74.01	-3.750	0.000	0.000

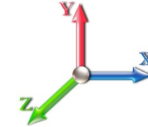
## Wind Loading - Shaft

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 23

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	21.088	23.20	508.23	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	21.088	23.20	498.35	0.650	0.000	5.00	27.024	17.57	651.9	0.0	1348.8
10.00		1.00	0.85	21.088	23.20	488.47	0.650	0.000	5.00	26.494	17.22	639.1	0.0	1322.1
15.00		1.00	0.85	21.088	23.20	478.59	0.650	0.000	5.00	25.964	16.88	626.3	0.0	1295.5
20.00		1.00	0.90	22.375	24.61	482.81	0.650	0.000	5.00	25.433	16.53	651.0	0.0	1268.8
25.00		1.00	0.95	23.451	25.80	483.87	0.650	0.000	5.00	24.903	16.19	668.1	0.0	1242.2
30.00		1.00	0.98	24.369	26.81	482.62	0.650	0.000	5.00	24.372	15.84	679.4	0.0	1215.5
35.00		1.00	1.01	25.172	27.69	479.72	0.650	0.000	5.00	23.842	15.50	686.6	0.0	1188.9
40.00		1.00	1.04	25.890	28.48	475.57	0.650	0.000	5.00	23.311	15.15	690.4	0.0	1162.2
41.00	Bot - Section 2	1.00	1.05	26.025	28.63	474.61	0.650	0.000	1.00	4.599	2.99	136.9	0.0	229.2
45.00		1.00	1.07	26.540	29.19	470.42	0.650	0.000	4.00	18.479	12.01	561.0	0.0	1827.5
48.00	Top - Section 1	1.00	1.08	26.903	29.59	466.93	0.650	0.000	3.00	13.636	8.86	419.7	0.0	1348.2
50.00		1.00	1.09	27.135	29.85	472.28	0.650	0.000	2.00	8.985	5.84	278.9	0.0	447.8
55.00		1.00	1.12	27.685	30.45	465.73	0.650	0.000	5.00	22.090	14.36	699.6	0.0	1100.8
60.00		1.00	1.14	28.197	31.02	458.59	0.650	0.000	5.00	21.560	14.01	695.5	0.0	1074.2
65.00		1.00	1.16	28.676	31.54	450.95	0.650	0.000	5.00	21.030	13.67	689.9	0.0	1047.5
70.00		1.00	1.17	29.127	32.04	442.87	0.650	0.000	5.00	20.499	13.32	683.1	0.0	1020.9
75.00	Appurtenance(s)	1.00	1.19	29.553	32.51	434.40	0.650	0.000	5.00	19.969	12.98	675.1	0.0	994.2
80.00		1.00	1.21	29.958	32.95	425.59	0.650	0.000	5.00	19.438	12.63	666.2	0.0	967.6
85.00	Bot - Section 3	1.00	1.22	30.342	33.38	416.47	0.650	0.000	5.00	18.908	12.29	656.3	0.0	940.9
90.00		1.00	1.24	30.710	33.78	407.06	0.650	0.000	5.00	18.695	12.15	656.8	0.0	1712.7
91.00	Top - Section 2	1.00	1.24	30.781	33.86	405.15	0.650	0.000	1.00	3.675	2.39	129.4	0.0	336.6
95.00		1.00	1.25	31.061	34.17	404.57	0.650	0.000	4.00	14.489	9.42	514.9	0.0	618.7
100.00		1.00	1.27	31.399	34.54	394.70	0.650	0.000	5.00	17.634	11.46	633.4	0.0	752.8
105.00		1.00	1.28	31.723	34.89	384.62	0.650	0.000	5.00	17.103	11.12	620.7	0.0	729.9
108.00	Top - Section 3	1.00	1.29	31.911	35.10	378.47	0.650	0.000	3.00	10.007	6.50	365.3	0.0	427.0
110.00		1.00	1.29	32.035	35.24	374.33	0.650	0.000	2.00	6.566	4.27	240.6	0.0	233.8
115.00		1.00	1.30	32.336	35.57	363.85	0.650	0.000	5.00	16.043	10.43	593.5	0.0	571.1
120.00		1.00	1.32	32.627	35.89	353.20	0.650	0.000	5.00	15.512	10.08	579.0	0.0	552.1
125.00		1.00	1.33	32.909	36.20	342.38	0.650	0.000	5.00	14.982	9.74	564.0	0.0	533.0
130.00	Bot - Section 5	1.00	1.34	33.182	36.50	331.41	0.650	0.000	5.00	14.451	9.39	548.6	0.0	514.0
135.00	Top - Section 4	1.00	1.35	33.446	36.79	320.28	0.650	0.000	5.00	14.132	9.19	540.7	0.0	897.8
137.00	Appurtenance(s)	1.00	1.35	33.550	36.90	320.77	0.650	0.000	2.00	5.504	3.58	211.3	0.0	156.9
140.00		1.00	1.36	33.703	37.07	314.01	0.650	0.000	3.00	8.098	5.26	312.2	0.0	230.7
145.00		1.00	1.37	33.953	37.35	302.63	0.650	0.000	5.00	13.072	8.50	507.7	0.0	372.3
147.00	Appurtenance(s)	1.00	1.37	34.051	37.46	298.05	0.650	0.000	2.00	5.080	3.30	197.9	0.0	144.7
150.00		1.00	1.38	34.196	37.62	291.13	0.650	0.000	3.00	7.461	4.85	291.9	0.0	212.4
155.00		1.00	1.39	34.433	37.88	279.52	0.650	0.000	5.00	12.011	7.81	473.1	0.0	341.9
160.00		1.00	1.40	34.664	38.13	267.79	0.650	0.000	5.00	11.480	7.46	455.3	0.0	326.6
165.00	Appurtenance(s)	1.00	1.41	34.890	38.38	255.95	0.650	0.000	5.00	10.950	7.12	437.1	0.0	311.4
167.00	Appurtenance(s)	1.00	1.41	34.978	38.48	251.19	0.650	0.000	2.00	4.231	2.75	169.3	0.0	120.3
170.00	Appurtenance(s)	1.00	1.42	35.110	38.62	244.01	0.650	0.000	3.00	6.188	4.02	248.5	0.0	175.9
<b>Totals:</b>									<b>170.00</b>			<b>20,746.4</b>		<b>31,315.5</b>

## Discrete Appurtenance Forces

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 23

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	170.00	6' Lightning rod	1	35.110	38.620	1.00	1.00	0.38	5.85	0.000	0.000	23.48	0.00	0.00
2	167.00	KRY 112 114-1 - Double	3	34.978	38.476	0.56	0.80	0.69	29.70	0.000	0.000	42.40	0.00	0.00
3	167.00	AIR21 B4A/B2P	3	34.978	38.476	0.77	0.90	13.98	244.08	0.000	0.000	860.42	0.00	0.00
4	167.00	AIR21 B2A/B4P	3	34.978	38.476	0.76	0.90	13.81	247.05	0.000	0.000	850.30	0.00	0.00
5	167.00	Low Profile	1	34.978	38.476	1.00	1.00	22.00	1350.00	0.000	0.000	1354.35	0.00	0.00
6	167.00	S11B12 - RRU	3	34.978	38.476	0.54	0.80	4.55	137.70	0.000	0.000	280.14	0.00	0.00
7	165.00	LNx-6515DS-A1M	3	34.890	38.378	0.72	0.90	24.78	134.46	0.000	0.000	1521.34	0.00	0.00
8	147.00	Low Profile	1	34.051	37.456	1.00	1.00	22.00	1350.00	0.000	0.000	1318.47	0.00	0.00
9	147.00	RRUS-11 800 MHz - RRU	6	34.051	37.456	0.54	0.80	9.46	291.60	0.000	0.000	566.64	0.00	0.00
10	147.00	DC6-48-60-18-8F - SP	1	34.051	37.456	0.80	0.80	0.74	28.62	0.000	0.000	44.11	0.00	0.00
11	147.00	LGP 21903 - Diplexers	6	34.051	37.456	0.62	0.80	1.01	29.70	0.000	0.000	60.58	0.00	0.00
12	147.00	LGP 21401 - TMA	6	34.051	37.456	0.62	0.80	4.83	76.14	0.000	0.000	289.45	0.00	0.00
13	147.00	AM-X-CD-16-65-00T	3	34.051	37.456	0.66	0.80	15.78	130.95	0.000	0.000	945.90	0.00	0.00
14	147.00	7770	6	34.051	37.456	0.64	0.80	21.12	189.00	0.000	0.000	1265.73	0.00	0.00
15	137.00	APXVSP18-C-A20	3	33.550	36.905	0.68	0.80	16.36	153.90	0.000	0.000	966.07	0.00	0.00
16	137.00	APXVTM14-C-I20	3	33.550	36.905	0.69	0.80	13.09	151.20	0.000	0.000	772.69	0.00	0.00
17	137.00	800MHz - RRH	3	33.550	36.905	0.54	0.80	4.00	143.10	0.000	0.000	236.42	0.00	0.00
18	137.00	1900MHz - RRH	3	33.550	36.905	0.54	0.80	6.11	118.80	0.000	0.000	360.81	0.00	0.00
19	137.00	TD-RRH8x20-25 - RRU	3	33.550	36.905	0.54	0.80	6.51	189.00	0.000	0.000	384.54	0.00	0.00
20	137.00	ACU-A20-N - RET	4	33.550	36.905	0.62	0.80	0.35	3.60	0.000	0.000	20.63	0.00	0.00
21	137.00	ALU - 800MHz Filter	3	33.550	36.905	0.40	0.80	0.94	23.76	0.000	0.000	55.27	0.00	0.00
22	137.00	Low Profile	1	33.550	36.905	1.00	1.00	22.00	1350.00	0.000	0.000	1299.06	0.00	0.00
23	75.00	GPS	1	29.553	32.509	0.80	0.80	0.80	9.00	0.000	0.000	41.61	0.00	0.00
24	75.00	Standoff	1	29.553	32.509	0.56	0.75	1.48	36.00	0.000	0.000	76.95	0.00	0.00
<b>Totals:</b>									<b>6,423.21</b>			<b>13,637.37</b>		

## Total Applied Force Summary

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**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		651.94	1483.53	0.00	0.00
10.00		639.14	1456.88	0.00	0.00
15.00		626.35	1430.22	0.00	0.00
20.00		651.00	1403.57	0.00	0.00
25.00		668.09	1376.91	0.00	0.00
30.00		679.44	1350.25	0.00	0.00
35.00		686.58	1323.60	0.00	0.00
40.00		690.44	1296.94	0.00	0.00
41.00		136.91	256.19	0.00	0.00
45.00		561.04	1935.29	0.00	0.00
48.00		419.68	1429.07	0.00	0.00
50.00		278.91	501.69	0.00	0.00
55.00		699.64	1235.58	0.00	0.00
60.00		695.47	1208.92	0.00	0.00
65.00		689.89	1182.26	0.00	0.00
70.00		683.06	1155.61	0.00	0.00
75.00	(2) attachments	793.68	1173.95	0.00	0.00
80.00		666.18	1097.61	0.00	0.00
85.00		656.32	1070.96	0.00	0.00
90.00		656.78	1842.75	0.00	0.00
91.00		129.42	362.61	0.00	0.00
95.00		514.85	722.69	0.00	0.00
100.00		633.41	882.80	0.00	0.00
105.00		620.70	859.96	0.00	0.00
108.00		365.34	505.01	0.00	0.00
110.00		240.61	285.80	0.00	0.00
115.00		593.46	701.17	0.00	0.00
120.00		579.00	682.13	0.00	0.00
125.00		564.03	663.09	0.00	0.00
130.00		548.57	644.05	0.00	0.00
135.00		540.74	1027.82	0.00	0.00
137.00	(23) attachments	4306.76	2342.24	0.00	0.00
140.00		312.21	303.40	0.00	0.00
145.00		507.73	493.48	0.00	0.00
147.00	(29) attachments	4688.78	2289.14	0.00	0.00
150.00		291.88	249.10	0.00	0.00
155.00		473.12	402.99	0.00	0.00
160.00		455.26	387.75	0.00	0.00
165.00	(3) attachments	1958.39	506.98	0.00	0.00
167.00	(13) attachments	3556.94	2153.27	0.00	0.00
170.00	(1) attachments	272.03	181.73	0.00	0.00
	<b>Totals:</b>	<b>34,383.77</b>	<b>41,859.00</b>	<b>0.00</b>	<b>0.00</b>



## Calculated Forces

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

**Iterations** 23

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-41.82	-34.43	0.00	-3822.8	0.00	3822.88	5803.10	2901.55	15291.3	7657.05	0.00	0.000	0.000	0.507
5.00	-40.27	-33.85	0.00	-3650.7	0.00	3650.75	5736.18	2868.09	14817.2	7419.63	0.06	-0.115	0.000	0.499
10.00	-38.75	-33.29	0.00	-3481.4	0.00	3481.48	5667.41	2833.70	14345.3	7183.34	0.25	-0.232	0.000	0.492
15.00	-37.25	-32.73	0.00	-3315.0	0.00	3315.03	5596.76	2798.38	13875.9	6948.30	0.55	-0.350	0.000	0.484
20.00	-35.79	-32.15	0.00	-3151.3	0.00	3151.36	5524.26	2762.13	13409.4	6714.68	0.98	-0.470	0.000	0.476
25.00	-34.35	-31.54	0.00	-2990.6	0.00	2990.62	5449.89	2724.95	12945.9	6482.61	1.54	-0.591	0.000	0.468
30.00	-32.94	-30.92	0.00	-2832.9	0.00	2832.92	5373.66	2686.83	12485.9	6252.24	2.23	-0.713	0.000	0.459
35.00	-31.56	-30.28	0.00	-2678.3	0.00	2678.33	5295.57	2647.79	12029.5	6023.71	3.04	-0.837	0.000	0.451
40.00	-30.24	-29.61	0.00	-2526.9	0.00	2526.93	5215.62	2607.81	11577.1	5797.18	3.98	-0.961	0.000	0.442
41.00	-29.95	-29.50	0.00	-2497.3	0.00	2497.32	5199.41	2599.70	11487.1	5752.13	4.19	-0.987	0.000	0.440
45.00	-27.98	-28.95	0.00	-2379.3	0.00	2379.32	5133.81	2566.90	11129.0	5572.78	5.06	-1.089	0.000	0.433
48.00	-26.53	-28.53	0.00	-2292.4	0.00	2292.47	5141.90	2570.95	11172.7	5594.66	5.77	-1.166	0.000	0.415
50.00	-25.99	-28.28	0.00	-2235.4	0.00	2235.41	5108.73	2554.36	10994.5	5505.45	6.27	-1.218	0.000	0.411
55.00	-24.71	-27.61	0.00	-2094.0	0.00	2094.00	5024.49	2512.24	10552.4	5284.05	7.61	-1.340	0.000	0.401
60.00	-23.46	-26.93	0.00	-1955.9	0.00	1955.96	4938.39	2469.19	10115.2	5065.12	9.08	-1.463	0.000	0.391
65.00	-22.24	-26.26	0.00	-1821.3	0.00	1821.30	4850.42	2425.21	9683.22	4848.81	10.68	-1.586	0.000	0.380
70.00	-21.05	-25.59	0.00	-1690.0	0.00	1690.00	4760.60	2380.30	9256.75	4635.26	12.41	-1.710	0.000	0.369
75.00	-19.85	-24.80	0.00	-1562.0	0.00	1562.05	4668.91	2334.45	8836.09	4424.61	14.27	-1.834	0.000	0.357
80.00	-18.72	-24.14	0.00	-1438.0	0.00	1438.03	4575.36	2287.68	8421.51	4217.02	16.25	-1.958	0.000	0.345
85.00	-17.62	-23.49	0.00	-1317.3	0.00	1317.33	4479.95	2239.97	8013.32	4012.62	18.37	-2.081	0.000	0.332
90.00	-15.78	-22.78	0.00	-1199.9	0.00	1199.90	4371.20	2185.60	7591.89	3801.59	20.62	-2.204	0.000	0.319
91.00	-15.40	-22.65	0.00	-1177.1	0.00	1177.12	4368.14	2189.07	7591.89	3801.59	20.62	-2.204	0.000	0.319
95.00	-14.65	-22.14	0.00	-1086.5	0.00	1086.51	4357.07	2189.03	7591.89	3801.59	20.62	-2.204	0.000	0.319
100.00	-13.74	-21.50	0.00	-975.80	0.00	975.80	4350.29	2185.65	7591.89	3801.59	20.62	-2.204	0.000	0.319
105.00	-12.87	-20.87	0.00	-868.29	0.00	868.29	4342.66	2185.33	7591.89	3801.59	20.62	-2.204	0.000	0.319
108.00	-12.36	-20.49	0.00	-805.69	0.00	805.69	4337.59	2185.29	7591.89	3801.59	20.62	-2.204	0.000	0.319
108.00	-12.36	-20.49	0.00	-805.69	0.00	805.69	4333.69	2185.39	7591.89	3801.59	20.62	-2.204	0.000	0.319
110.00	-12.05	-20.26	0.00	-764.71	0.00	764.71	4322.10	2185.60	7591.89	3801.59	20.62	-2.204	0.000	0.319
115.00	-11.33	-19.66	0.00	-663.40	0.00	663.40	4284.96	2185.48	7591.89	3801.59	20.62	-2.204	0.000	0.319
120.00	-10.64	-19.07	0.00	-565.10	0.00	565.10	4253.85	2185.93	7591.89	3801.59	20.62	-2.204	0.000	0.319
125.00	-9.97	-18.50	0.00	-469.73	0.00	469.73	4240.88	2185.44	7591.89	3801.59	20.62	-2.204	0.000	0.319
130.00	-9.32	-17.93	0.00	-377.25	0.00	377.25	4239.05	2185.03	7591.89	3801.59	20.62	-2.204	0.000	0.319
135.00	-8.30	-17.34	0.00	-287.60	0.00	287.60	4227.27	2185.13	7591.89	3801.59	20.62	-2.204	0.000	0.319
137.00	-6.21	-12.91	0.00	-252.92	0.00	252.92	4224.61	2185.31	7591.89	3801.59	20.62	-2.204	0.000	0.319
140.00	-5.91	-12.59	0.00	-214.19	0.00	214.19	4217.57	2185.78	7591.89	3801.59	20.62	-2.204	0.000	0.319
145.00	-5.43	-12.06	0.00	-151.25	0.00	151.25	4210.00	2185.50	7591.89	3801.59	20.62	-2.204	0.000	0.319
147.00	-3.44	-7.24	0.00	-127.14	0.00	127.14	4201.86	2185.93	7591.89	3801.59	20.62	-2.204	0.000	0.319
150.00	-3.20	-6.93	0.00	-105.43	0.00	105.43	4202.58	2185.29	7591.89	3801.59	20.62	-2.204	0.000	0.319
155.00	-2.82	-6.44	0.00	-70.77	0.00	70.77	4202.29	2185.15	7591.89	3801.59	20.62	-2.204	0.000	0.319
160.00	-2.46	-5.96	0.00	-38.59	0.00	38.59	4202.15	2185.07	7591.89	3801.59	20.62	-2.204	0.000	0.319
165.00	-2.08	-3.97	0.00	-8.79	0.00	8.79	4202.13	2185.03	7591.89	3801.59	20.62	-2.204	0.000	0.319
167.00	-0.16	-0.28	0.00	-0.85	0.00	0.85	4202.01	2185.00	7591.89	3801.59	20.62	-2.204	0.000	0.319
170.00	0.00	-0.27	0.00	0.00	0.00	0.00	4202.09	2185.04	7591.89	3801.59	20.62	-2.204	0.000	0.319

## Wind Loading - Shaft

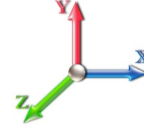
<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	<b>5/3/2017</b>
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

**Iterations** 22

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



Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	5.168	5.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	5.168	5.68	0.00	1.200	1.242	5.00	28.059	33.67	191.4	501.8	2300.2
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.331	5.00	27.603	33.12	188.3	528.1	2290.9
15.00		1.00	0.85	5.168	5.68	0.00	1.200	1.386	5.00	27.119	32.54	185.0	539.5	2266.8
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.427	5.00	26.622	31.95	192.7	544.4	2236.2
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.459	5.00	26.118	31.34	198.1	545.5	2201.8
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.486	5.00	25.610	30.73	201.9	544.1	2164.8
35.00		1.00	1.01	6.169	6.79	0.00	1.200	1.509	5.00	25.099	30.12	204.4	540.9	2126.1
40.00		1.00	1.04	6.345	6.98	0.00	1.200	1.529	5.00	24.586	29.50	205.9	536.4	2086.0
41.00	Bot - Section 2	1.00	1.05	6.378	7.02	0.00	1.200	1.533	1.00	4.854	5.82	40.9	107.1	412.7
45.00		1.00	1.07	6.504	7.15	0.00	1.200	1.547	4.00	19.510	23.41	167.5	431.4	2868.1
48.00	Top - Section 1	1.00	1.08	6.593	7.25	0.00	1.200	1.557	3.00	14.415	17.30	125.5	321.3	2118.9
50.00		1.00	1.09	6.650	7.32	0.00	1.200	1.564	2.00	9.506	11.41	83.4	213.1	810.2
55.00		1.00	1.12	6.785	7.46	0.00	1.200	1.579	5.00	23.406	28.09	209.6	525.7	1993.5
60.00		1.00	1.14	6.910	7.60	0.00	1.200	1.592	5.00	22.887	27.46	208.8	517.9	1950.2
65.00		1.00	1.16	7.028	7.73	0.00	1.200	1.605	5.00	22.367	26.84	207.5	509.6	1906.3
70.00		1.00	1.17	7.138	7.85	0.00	1.200	1.617	5.00	21.847	26.22	205.9	500.8	1862.0
75.00	Appurtenance(s)	1.00	1.19	7.243	7.97	0.00	1.200	1.628	5.00	21.326	25.59	203.9	491.6	1817.2
80.00		1.00	1.21	7.342	8.08	0.00	1.200	1.639	5.00	20.804	24.96	201.6	482.0	1772.1
85.00	Bot - Section 3	1.00	1.22	7.436	8.18	0.00	1.200	1.649	5.00	20.282	24.34	199.1	472.1	1726.6
90.00		1.00	1.24	7.526	8.28	0.00	1.200	1.658	5.00	20.077	24.09	199.5	469.6	2753.2
91.00	Top - Section 2	1.00	1.24	7.544	8.30	0.00	1.200	1.660	1.00	3.952	4.74	39.4	93.5	542.3
95.00		1.00	1.25	7.612	8.37	0.00	1.200	1.667	4.00	15.601	18.72	156.8	367.3	1192.2
100.00		1.00	1.27	7.695	8.46	0.00	1.200	1.676	5.00	19.030	22.84	193.3	448.5	1452.1
105.00		1.00	1.28	7.774	8.55	0.00	1.200	1.684	5.00	18.507	22.21	189.9	437.5	1410.7
108.00	Top - Section 3	1.00	1.29	7.821	8.60	0.00	1.200	1.689	3.00	10.852	13.02	112.0	258.5	827.8
110.00		1.00	1.29	7.851	8.64	0.00	1.200	1.692	2.00	7.130	8.56	73.9	170.5	482.2
115.00		1.00	1.30	7.925	8.72	0.00	1.200	1.699	5.00	17.459	20.95	182.6	415.0	1176.5
120.00		1.00	1.32	7.996	8.80	0.00	1.200	1.707	5.00	16.934	20.32	178.7	403.4	1139.5
125.00		1.00	1.33	8.065	8.87	0.00	1.200	1.714	5.00	16.410	19.69	174.7	391.7	1102.4
130.00	Bot - Section 5	1.00	1.34	8.132	8.95	0.00	1.200	1.720	5.00	15.885	19.06	170.5	379.8	1065.1
135.00	Top - Section 4	1.00	1.35	8.197	9.02	0.00	1.200	1.727	5.00	15.572	18.69	168.5	373.1	1570.1
137.00	Appurtenance(s)	1.00	1.35	8.222	9.04	0.00	1.200	1.729	2.00	6.081	7.30	66.0	147.3	356.4
140.00		1.00	1.36	8.260	9.09	0.00	1.200	1.733	3.00	8.964	10.76	97.7	216.5	524.2
145.00		1.00	1.37	8.321	9.15	0.00	1.200	1.739	5.00	14.521	17.43	159.5	348.6	845.0
147.00	Appurtenance(s)	1.00	1.37	8.345	9.18	0.00	1.200	1.742	2.00	5.661	6.79	62.4	137.4	330.3
150.00		1.00	1.38	8.381	9.22	0.00	1.200	1.745	3.00	8.334	10.00	92.2	201.7	484.9
155.00		1.00	1.39	8.439	9.28	0.00	1.200	1.751	5.00	13.470	16.16	150.0	323.5	779.4
160.00		1.00	1.40	8.495	9.34	0.00	1.200	1.757	5.00	12.944	15.53	145.2	310.8	746.3
165.00	Appurtenance(s)	1.00	1.41	8.551	9.41	0.00	1.200	1.762	5.00	12.418	14.90	140.2	298.0	713.2
167.00	Appurtenance(s)	1.00	1.41	8.572	9.43	0.00	1.200	1.764	2.00	4.819	5.78	54.5	117.1	277.5
170.00	Appurtenance(s)	1.00	1.42	8.604	9.46	0.00	1.200	1.767	3.00	7.072	8.49	80.3	171.0	405.5
<b>Totals:</b>									<b>170.00</b>			<b>6,309.1</b>		<b>57,087.7</b>

## Discrete Appurtenance Forces

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 22

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)	
1	170.00	6' Lightning rod	1	8.604	9.465	1.00	1.00	1.48	39.26	0.000	0.000	14.02	0.00	0.00	
2	167.00	KRY 112 114-1 - Double	3	8.572	9.429	0.59	0.80	1.58	62.99	0.000	0.000	14.91	0.00	0.00	
3	167.00	AIR21 B4A/B2P	3	8.572	9.429	0.77	0.90	16.52	838.64	0.000	0.000	155.81	0.00	0.00	
4	167.00	AIR21 B2A/B4P	3	8.572	9.429	0.77	0.90	16.52	842.60	0.000	0.000	155.81	0.00	0.00	
5	167.00	Low Profile	1	8.572	9.429	1.00	1.00	39.85	2823.04	0.000	0.000	375.78	0.00	0.00	
6	167.00	S11B12 - RRU	3	8.572	9.429	0.55	0.80	5.81	346.36	0.000	0.000	54.79	0.00	0.00	
7	165.00	LNx-6515DS-A1M	3	8.551	9.406	0.72	0.90	31.90	677.13	0.000	0.000	300.03	0.00	0.00	
8	147.00	Low Profile	1	8.345	9.180	1.00	1.00	39.63	2806.27	0.000	0.000	363.75	0.00	0.00	
9	147.00	RRUS-11 800 MHz - RRU	6	8.345	9.180	0.55	0.80	10.50	922.64	0.000	0.000	96.37	0.00	0.00	
10	147.00	DC6-48-60-18-8F - SP	1	8.345	9.180	0.80	0.80	1.09	82.16	0.000	0.000	9.97	0.00	0.00	
11	147.00	LGP 21903 - Diplexers	6	8.345	9.180	0.64	0.80	2.56	75.66	0.000	0.000	23.51	0.00	0.00	
12	147.00	LGP 21401 - TMA	6	8.345	9.180	0.64	0.80	8.16	208.62	0.000	0.000	74.87	0.00	0.00	
13	147.00	AM-X-CD-16-65-00T	3	8.345	9.180	0.66	0.80	21.53	520.95	0.000	0.000	197.63	0.00	0.00	
14	147.00	7770	6	8.345	9.180	0.66	0.80	25.83	1061.03	0.000	0.000	237.12	0.00	0.00	
15	137.00	APXVSP18-C-A20	3	8.222	9.044	0.69	0.80	22.27	570.58	0.000	0.000	201.40	0.00	0.00	
16	137.00	APXVTM14-C-I20	3	8.222	9.044	0.70	0.80	15.72	677.62	0.000	0.000	142.17	0.00	0.00	
17	137.00	800MHz - RRH	3	8.222	9.044	0.55	0.80	6.00	347.38	0.000	0.000	54.27	0.00	0.00	
18	137.00	1900MHz - RRH	3	8.222	9.044	0.55	0.80	8.57	389.34	0.000	0.000	77.55	0.00	0.00	
19	137.00	TD-RRH8x20-25 - RRU	3	8.222	9.044	0.55	0.80	8.04	579.78	0.000	0.000	72.72	0.00	0.00	
20	137.00	ACU-A20-N - RET	4	8.222	9.044	0.64	0.80	1.11	16.63	0.000	0.000	10.05	0.00	0.00	
21	137.00	ALU - 800MHz Filter	3	8.222	9.044	0.44	0.80	1.88	69.13	0.000	0.000	16.97	0.00	0.00	
22	137.00	Low Profile	1	8.222	9.044	1.00	1.00	39.50	2797.10	0.000	0.000	357.28	0.00	0.00	
23	75.00	GPS	1	7.243	7.967	0.80	0.80	1.33	31.36	0.000	0.000	10.61	0.00	0.00	
24	75.00	Standoff	1	7.243	7.967	0.56	0.75	4.61	99.90	0.000	0.000	36.74	0.00	0.00	
<b>Totals:</b>									<b>16,886.18</b>						<b>3,054.13</b>

## Total Applied Force Summary

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 22

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		191.41	2479.84	0.00	0.00
10.00		188.30	2470.59	0.00	0.00
15.00		185.00	2446.48	0.00	0.00
20.00		192.69	2415.83	0.00	0.00
25.00		198.14	2381.40	0.00	0.00
30.00		201.89	2344.47	0.00	0.00
35.00		204.39	2305.74	0.00	0.00
40.00		205.91	2265.65	0.00	0.00
41.00		40.87	448.66	0.00	0.00
45.00		167.51	3011.79	0.00	0.00
48.00		125.45	2226.73	0.00	0.00
50.00		83.44	882.06	0.00	0.00
55.00		209.63	2173.12	0.00	0.00
60.00		208.77	2129.80	0.00	0.00
65.00		207.49	2085.93	0.00	0.00
70.00		205.85	2041.60	0.00	0.00
75.00	(2) attachments	251.23	2128.10	0.00	0.00
80.00		201.62	1945.47	0.00	0.00
85.00		199.08	1900.01	0.00	0.00
90.00		199.45	2926.64	0.00	0.00
91.00		39.35	576.99	0.00	0.00
95.00		156.76	1330.93	0.00	0.00
100.00		193.30	1625.53	0.00	0.00
105.00		189.92	1584.11	0.00	0.00
108.00		112.03	931.84	0.00	0.00
110.00		73.88	551.60	0.00	0.00
115.00		182.63	1349.86	0.00	0.00
120.00		178.74	1312.91	0.00	0.00
125.00		174.70	1275.79	0.00	0.00
130.00		170.51	1238.49	0.00	0.00
135.00		168.48	1743.53	0.00	0.00
137.00	(23) attachments	998.39	5873.35	0.00	0.00
140.00		97.74	621.08	0.00	0.00
145.00		159.50	1006.56	0.00	0.00
147.00	(29) attachments	1065.58	6072.29	0.00	0.00
150.00		92.19	533.81	0.00	0.00
155.00		150.04	860.84	0.00	0.00
160.00		145.15	827.82	0.00	0.00
165.00	(3) attachments	440.19	1471.82	0.00	0.00
167.00	(13) attachments	811.64	5223.76	0.00	0.00
170.00	(1) attachments	94.34	444.80	0.00	0.00
	<b>Totals:</b>	<b>9,363.20</b>	<b>79,467.65</b>	<b>0.00</b>	<b>0.00</b>

## Calculated Forces

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

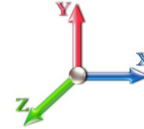


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**Load Case:** 1.2D + 1.0Di + 1.0Wi 50 mph Wind

**Iterations** 22

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



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-79.46	-9.38	0.00	-1025.4	0.00	1025.49	5803.10	2901.55	15291.3	7657.05	0.00	0.000	0.000	0.148
5.00	-76.98	-9.23	0.00	-978.56	0.00	978.56	5736.18	2868.09	14817.2	7419.63	0.02	-0.031	0.000	0.145
10.00	-74.50	-9.09	0.00	-932.39	0.00	932.39	5667.41	2833.70	14345.3	7183.34	0.07	-0.062	0.000	0.143
15.00	-72.05	-8.94	0.00	-886.97	0.00	886.97	5596.76	2798.38	13875.9	6948.30	0.15	-0.094	0.000	0.141
20.00	-69.63	-8.78	0.00	-842.29	0.00	842.29	5524.26	2762.13	13409.4	6714.68	0.26	-0.126	0.000	0.138
25.00	-67.25	-8.61	0.00	-798.40	0.00	798.40	5449.89	2724.95	12945.9	6482.61	0.41	-0.158	0.000	0.136
30.00	-64.90	-8.44	0.00	-755.34	0.00	755.34	5373.66	2686.83	12485.9	6252.24	0.60	-0.191	0.000	0.133
35.00	-62.59	-8.26	0.00	-713.13	0.00	713.13	5295.57	2647.79	12029.5	6023.71	0.81	-0.224	0.000	0.130
40.00	-60.32	-8.07	0.00	-671.82	0.00	671.82	5215.62	2607.81	11577.1	5797.18	1.07	-0.257	0.000	0.127
41.00	-59.87	-8.04	0.00	-663.75	0.00	663.75	5199.41	2599.70	11487.1	5752.13	1.12	-0.264	0.000	0.127
45.00	-56.86	-7.89	0.00	-631.57	0.00	631.57	5133.81	2566.90	11129.0	5572.78	1.35	-0.291	0.000	0.124
48.00	-54.63	-7.76	0.00	-607.91	0.00	607.91	5141.90	2570.95	11172.7	5594.66	1.54	-0.311	0.000	0.119
50.00	-53.74	-7.70	0.00	-592.38	0.00	592.38	5108.73	2554.36	10994.5	5505.45	1.68	-0.325	0.000	0.118
55.00	-51.57	-7.50	0.00	-553.89	0.00	553.89	5024.49	2512.24	10552.4	5284.05	2.03	-0.357	0.000	0.115
60.00	-49.43	-7.31	0.00	-516.37	0.00	516.37	4938.39	2469.19	10115.2	5065.12	2.43	-0.390	0.000	0.112
65.00	-47.35	-7.11	0.00	-479.82	0.00	479.82	4850.42	2425.21	9683.22	4848.81	2.85	-0.422	0.000	0.109
70.00	-45.30	-6.92	0.00	-444.25	0.00	444.25	4760.60	2380.30	9256.75	4635.26	3.31	-0.455	0.000	0.105
75.00	-43.17	-6.67	0.00	-409.65	0.00	409.65	4668.91	2334.45	8836.09	4424.61	3.81	-0.487	0.000	0.102
80.00	-41.23	-6.48	0.00	-376.28	0.00	376.28	4575.36	2287.68	8421.51	4217.02	4.33	-0.520	0.000	0.098
85.00	-39.32	-6.28	0.00	-343.88	0.00	343.88	4479.95	2239.97	8013.32	4012.62	4.90	-0.552	0.000	0.094
90.00	-36.40	-6.07	0.00	-312.46	0.00	312.46	4371.20	2185.60	7591.89	3801.59	5.49	-0.584	0.000	0.091
91.00	-35.82	-6.03	0.00	-306.39	0.00	306.39	4368.14	2181.07	7591.89	3801.59	5.49	-0.584	0.000	0.091
95.00	-34.49	-5.88	0.00	-282.26	0.00	282.26	4357.07	2178.93	7591.89	3801.59	5.49	-0.584	0.000	0.091
100.00	-32.86	-5.69	0.00	-252.86	0.00	252.86	4350.29	2175.65	7591.89	3801.59	5.49	-0.584	0.000	0.091
105.00	-31.28	-5.49	0.00	-224.41	0.00	224.41	4322.66	2171.33	7591.89	3801.59	5.49	-0.584	0.000	0.090
108.00	-30.34	-5.38	0.00	-207.93	0.00	207.93	4374.59	2168.29	7591.89	3801.59	5.49	-0.584	0.000	0.087
108.00	-30.34	-5.38	0.00	-207.93	0.00	207.93	4374.59	2168.29	7591.89	3801.59	5.49	-0.584	0.000	0.087
110.00	-29.79	-5.31	0.00	-197.17	0.00	197.17	4324.20	2164.20	7591.89	3801.59	5.49	-0.584	0.000	0.106
115.00	-28.44	-5.13	0.00	-170.60	0.00	170.60	4258.96	2129.48	7591.89	3801.59	5.49	-0.584	0.000	0.098
120.00	-27.13	-4.95	0.00	-144.95	0.00	144.95	4253.85	2126.93	7591.89	3801.59	5.49	-0.584	0.000	0.089
125.00	-25.85	-4.77	0.00	-120.19	0.00	120.19	4260.88	2123.44	7591.89	3801.59	5.49	-0.584	0.000	0.079
130.00	-24.61	-4.60	0.00	-96.33	0.00	96.33	4239.05	2119.03	7591.89	3801.59	5.49	-0.584	0.000	0.069
135.00	-22.87	-4.41	0.00	-73.35	0.00	73.35	4262.27	2118.13	7591.89	3801.59	5.49	-0.584	0.000	0.075
137.00	-17.01	-3.32	0.00	-64.53	0.00	64.53	4244.61	2117.31	7591.89	3801.59	5.49	-0.584	0.000	0.066
140.00	-16.39	-3.22	0.00	-54.57	0.00	54.57	4217.57	2117.57	7591.89	3801.59	5.49	-0.584	0.000	0.059
145.00	-15.39	-3.05	0.00	-38.46	0.00	38.46	4217.00	2117.00	7591.89	3801.59	5.49	-0.584	0.000	0.047
147.00	-9.33	-1.89	0.00	-32.36	0.00	32.36	4216.51	2116.51	7591.89	3801.59	5.49	-0.584	0.000	0.038
150.00	-8.80	-1.79	0.00	-26.70	0.00	26.70	4216.58	2116.58	7591.89	3801.59	5.49	-0.584	0.000	0.033
155.00	-7.94	-1.62	0.00	-17.77	0.00	17.77	4216.29	2116.29	7591.89	3801.59	5.49	-0.584	0.000	0.025
160.00	-7.12	-1.47	0.00	-9.64	0.00	9.64	4216.15	2116.15	7591.89	3801.59	5.49	-0.584	0.000	0.016
165.00	-5.65	-1.00	0.00	-2.31	0.00	2.31	4216.13	2116.13	7591.89	3801.59	5.49	-0.584	0.000	0.007
167.00	-0.44	-0.10	0.00	-0.31	0.00	0.31	4216.01	2116.01	7591.89	3801.59	5.49	-0.584	0.000	0.001
170.00	0.00	-0.09	0.00	0.00	0.00	0.00	4216.09	2116.04	7591.89	3801.59	5.49	-0.584	0.000	0.000



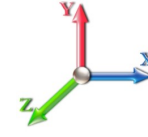
## Seismic Segment Forces (Factored)

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Load Case:</b> 1.2D + 1.0E					<b>Iterations</b> 20
<b>Gust Response Factor</b>	1.10	<b>Sds</b>	0.19	<b>Ss</b>	0.18
<b>Dead Load Factor</b>	1.20	<b>Seismic Load Factor</b>	1.00	<b>Sd1</b>	0.10
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.39	<b>SA</b>	0.04
					<b>Seismic Importance Factor</b> 1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1498.6	0.00	0.03	0.02	23.48	
10.00		1469.0	0.01	0.05	0.03	34.70	
15.00		1439.4	0.01	0.06	0.04	40.19	
20.00		1409.8	0.03	0.07	0.04	42.73	
25.00		1380.2	0.04	0.07	0.04	43.76	
30.00		1350.5	0.06	0.07	0.04	44.08	
35.00		1320.9	0.08	0.07	0.04	44.13	
40.00		1291.3	0.10	0.07	0.04	44.09	
41.00	Bot - Section 2	254.71	0.11	0.07	0.04	8.73	
45.00		2030.5	0.13	0.07	0.03	70.74	
48.00	Top - Section 1	1498.0	0.15	0.07	0.03	52.71	
50.00		497.56	0.16	0.07	0.03	17.60	
55.00		1223.1	0.20	0.06	0.02	43.43	
60.00		1193.5	0.24	0.06	0.02	41.68	
65.00		1163.9	0.28	0.05	0.01	38.64	
70.00		1134.3	0.32	0.04	0.01	33.90	
75.00	Appurtenance(s)	1154.6	0.37	0.03	0.01	28.39	
80.00		1075.0	0.42	0.01	0.01	18.37	
85.00	Bot - Section 3	1045.4	0.47	-0.01	0.01	7.95	
90.00		1903.0	0.53	-0.03	0.01	-5.87	
91.00	Top - Section 2	374.00	0.54	-0.03	0.01	-1.97	
95.00		687.39	0.59	-0.05	0.01	-9.44	
100.00		836.39	0.65	-0.07	0.02	-19.16	
105.00		811.01	0.72	-0.09	0.03	-23.86	
108.00	Top - Section 3	474.42	0.76	-0.10	0.04	-15.04	
110.00		259.76	0.79	-0.11	0.05	-8.44	
115.00		634.58	0.86	-0.12	0.07	-20.14	
120.00		613.43	0.94	-0.12	0.10	-16.58	
125.00		592.27	1.02	-0.10	0.14	-10.87	
130.00	Bot - Section 5	571.11	1.11	-0.07	0.19	-3.28	
135.00	Top - Section 4	997.52	1.19	0.00	0.25	10.76	
137.00	Appurtenance(s)	2544.6	1.23	0.03	0.28	47.09	
140.00		256.35	1.28	0.10	0.32	8.01	
145.00		413.71	1.37	0.24	0.41	23.05	
147.00	Appurtenance(s)	2489.6	1.41	0.31	0.45	165.83	
150.00		236.04	1.47	0.43	0.51	19.87	
155.00		379.86	1.57	0.69	0.63	44.34	
160.00		362.94	1.67	1.03	0.78	55.68	
165.00	Appurtenance(s)	495.41	1.78	1.45	0.94	96.29	
167.00	Appurtenance(s)	2365.3	1.82	1.65	1.02	501.33	
170.00	Appurtenance(s)	201.92	1.89	1.98	1.14	48.39	
<b>Totals:</b>		<b>41,931.9</b>				<b>1,565.3</b>	<b>Total Wind: 34,383.8</b>

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

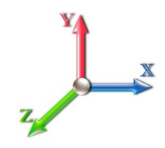
## Calculated Forces

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Load Case: 1.2D + 1.0E</b>										<b>Iterations</b> 20
<b>Gust Response Factor</b>	1.10						<b>Sds</b>	0.19		<b>Ss</b> 0.18
<b>Dead Load Factor</b>	1.20	<b>Seismic Load Factor</b>	1.00	<b>Sd1</b>	0.10					<b>S1</b> 0.06
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.39	<b>SA</b>	0.04	<b>Seismic Importance Factor</b>	1.00			



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-55.81	-1.70	0.00	-197.82	0.00	197.82	5803.10	2901.55	15291.3	7657.05	0.00	0.00	0.00	0.035
5.00	-53.83	-1.68	0.00	-189.32	0.00	189.32	5736.18	2868.09	14817.2	7419.63	0.00	-0.01	0.035	
10.00	-51.89	-1.65	0.00	-180.90	0.00	180.90	5667.41	2833.70	14345.3	7183.34	0.01	-0.01	0.034	
15.00	-49.98	-1.62	0.00	-172.63	0.00	172.63	5596.76	2798.38	13875.9	6948.30	0.03	-0.02	0.034	
20.00	-48.11	-1.58	0.00	-164.53	0.00	164.53	5524.26	2762.13	13409.4	6714.68	0.05	-0.02	0.033	
25.00	-46.28	-1.54	0.00	-156.63	0.00	156.63	5449.89	2724.95	12945.9	6482.61	0.08	-0.03	0.033	
30.00	-44.48	-1.50	0.00	-148.92	0.00	148.92	5373.66	2686.83	12485.9	6252.24	0.12	-0.04	0.032	
35.00	-42.71	-1.46	0.00	-141.42	0.00	141.42	5295.57	2647.79	12029.5	6023.71	0.16	-0.04	0.032	
40.00	-40.98	-1.42	0.00	-134.11	0.00	134.11	5215.62	2607.81	11577.1	5797.18	0.21	-0.05	0.031	
41.00	-40.64	-1.41	0.00	-132.70	0.00	132.70	5199.41	2599.70	11487.1	5752.13	0.22	-0.05	0.031	
45.00	-38.06	-1.34	0.00	-127.05	0.00	127.05	5133.81	2566.90	11129.0	5572.78	0.26	-0.06	0.030	
48.00	-36.15	-1.29	0.00	-123.03	0.00	123.03	5141.90	2570.95	11172.7	5594.66	0.30	-0.06	0.029	
50.00	-35.48	-1.27	0.00	-120.45	0.00	120.45	5108.73	2554.36	10994.5	5505.45	0.33	-0.06	0.029	
55.00	-33.84	-1.23	0.00	-114.08	0.00	114.08	5024.49	2512.24	10552.4	5284.05	0.40	-0.07	0.028	
60.00	-32.23	-1.19	0.00	-107.92	0.00	107.92	4938.39	2469.19	10115.2	5065.12	0.48	-0.08	0.028	
65.00	-30.65	-1.15	0.00	-101.96	0.00	101.96	4850.42	2425.21	9683.22	4848.81	0.56	-0.08	0.027	
70.00	-29.11	-1.12	0.00	-96.19	0.00	96.19	4760.60	2380.30	9256.75	4635.26	0.65	-0.09	0.027	
75.00	-27.54	-1.09	0.00	-90.58	0.00	90.58	4668.91	2334.45	8836.09	4424.61	0.75	-0.10	0.026	
80.00	-26.08	-1.08	0.00	-85.10	0.00	85.10	4575.36	2287.68	8421.51	4217.02	0.86	-0.11	0.026	
85.00	-24.65	-1.07	0.00	-79.72	0.00	79.72	4479.95	2239.97	8013.32	4012.62	0.97	-0.11	0.025	
90.00	-22.19	-1.07	0.00	-74.37	0.00	74.37	4371.20	2185.60	7591.89	3801.59	1.09	-0.12	0.025	
91.00	-21.71	-1.07	0.00	-73.30	0.00	73.30	4368.14	2181.07	7591.89	3801.59	1.12	-0.12	0.029	
95.00	-20.75	-1.07	0.00	-69.03	0.00	69.03	4357.07	2178.03	7591.89	3803.62	1.23	-0.13	0.028	
100.00	-19.57	-1.07	0.00	-63.70	0.00	63.70	4350.29	2175.05	7591.89	3801.59	1.36	-0.14	0.027	
105.00	-18.42	-1.07	0.00	-58.36	0.00	58.36	4322.66	2171.33	7591.89	3801.59	1.51	-0.15	0.026	
108.00	-17.75	-1.07	0.00	-55.16	0.00	55.16	4374.59	2168.29	7591.89	3801.59	1.60	-0.15	0.026	
108.00	-17.75	-1.07	0.00	-55.16	0.00	55.16	2667.38	1333.69	4244.39	2125.35	1.60	-0.15	0.033	
110.00	-17.37	-1.07	0.00	-53.02	0.00	53.02	2644.20	1322.10	4152.60	2079.39	1.67	-0.15	0.032	
115.00	-16.43	-1.07	0.00	-47.68	0.00	47.68	2584.96	1292.48	3925.36	1965.60	1.84	-0.16	0.031	
120.00	-15.52	-1.07	0.00	-42.34	0.00	42.34	2523.85	1261.93	3701.54	1853.52	2.01	-0.17	0.029	
125.00	-14.64	-1.07	0.00	-37.00	0.00	37.00	2460.88	1230.44	3481.44	1743.31	2.20	-0.18	0.027	
130.00	-13.78	-1.07	0.00	-31.66	0.00	31.66	2396.05	1198.03	3265.33	1635.09	2.40	-0.19	0.025	
135.00	-12.41	-1.05	0.00	-26.32	0.00	26.32	1762.27	881.13	2355.65	1179.58	2.61	-0.20	0.029	
137.00	-9.29	-1.00	0.00	-24.21	0.00	24.21	1744.61	872.31	2295.82	1149.62	2.69	-0.21	0.026	
140.00	-8.88	-0.99	0.00	-21.23	0.00	21.23	1717.57	858.78	2206.74	1105.01	2.82	-0.21	0.024	
145.00	-8.22	-0.96	0.00	-16.29	0.00	16.29	1671.00	835.50	2060.16	1031.61	3.05	-0.22	0.021	
147.00	-5.17	-0.79	0.00	-14.36	0.00	14.36	1651.86	825.93	2002.25	1002.61	3.15	-0.22	0.017	
150.00	-4.84	-0.77	0.00	-12.00	0.00	12.00	1622.58	811.29	1916.22	959.54	3.29	-0.23	0.015	
155.00	-4.30	-0.72	0.00	-8.18	0.00	8.18	1572.29	786.15	1775.21	888.92	3.53	-0.23	0.012	
160.00	-3.79	-0.66	0.00	-4.58	0.00	4.58	1520.15	760.07	1637.42	819.92	3.78	-0.24	0.008	
165.00	-3.11	-0.56	0.00	-1.27	0.00	1.27	1466.13	733.07	1503.13	752.68	4.03	-0.24	0.004	
167.00	-0.24	-0.05	0.00	-0.15	0.00	0.15	1444.01	722.00	1450.46	726.31	4.13	-0.24	0.000	
170.00	0.00	-0.05	0.00	0.00	0.00	0.00	1400.09	700.04	1362.73	682.38	4.28	-0.24	0.000	

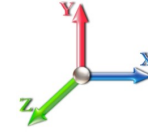
## Seismic Segment Forces (Factored)

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Load Case: 0.9D + 1.0E</b>					<b>Iterations</b> 20
<b>Gust Response Factor</b>	1.10	<b>Sds</b>	0.19	<b>Ss</b>	0.18
<b>Dead Load Factor</b>	0.90	<b>Seismic Load Factor</b>	1.00	<b>Sd1</b>	0.10
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.39	<b>SA</b>	0.04
					<b>Seismic Importance Factor</b> 1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1498.6	0.00	0.03	0.02	23.48	
10.00		1469.0	0.01	0.05	0.03	34.70	
15.00		1439.4	0.01	0.06	0.04	40.19	
20.00		1409.8	0.03	0.07	0.04	42.73	
25.00		1380.2	0.04	0.07	0.04	43.76	
30.00		1350.5	0.06	0.07	0.04	44.08	
35.00		1320.9	0.08	0.07	0.04	44.13	
40.00		1291.3	0.10	0.07	0.04	44.09	
41.00	Bot - Section 2	254.71	0.11	0.07	0.04	8.73	
45.00		2030.5	0.13	0.07	0.03	70.74	
48.00	Top - Section 1	1498.0	0.15	0.07	0.03	52.71	
50.00		497.56	0.16	0.07	0.03	17.60	
55.00		1223.1	0.20	0.06	0.02	43.43	
60.00		1193.5	0.24	0.06	0.02	41.68	
65.00		1163.9	0.28	0.05	0.01	38.64	
70.00		1134.3	0.32	0.04	0.01	33.90	
75.00	Appurtenance(s)	1154.6	0.37	0.03	0.01	28.39	
80.00		1075.0	0.42	0.01	0.01	18.37	
85.00	Bot - Section 3	1045.4	0.47	-0.01	0.01	7.95	
90.00		1903.0	0.53	-0.03	0.01	-5.87	
91.00	Top - Section 2	374.00	0.54	-0.03	0.01	-1.97	
95.00		687.39	0.59	-0.05	0.01	-9.44	
100.00		836.39	0.65	-0.07	0.02	-19.16	
105.00		811.01	0.72	-0.09	0.03	-23.86	
108.00	Top - Section 3	474.42	0.76	-0.10	0.04	-15.04	
110.00		259.76	0.79	-0.11	0.05	-8.44	
115.00		634.58	0.86	-0.12	0.07	-20.14	
120.00		613.43	0.94	-0.12	0.10	-16.58	
125.00		592.27	1.02	-0.10	0.14	-10.87	
130.00	Bot - Section 5	571.11	1.11	-0.07	0.19	-3.28	
135.00	Top - Section 4	997.52	1.19	0.00	0.25	10.76	
137.00	Appurtenance(s)	2544.6	1.23	0.03	0.28	47.09	
140.00		256.35	1.28	0.10	0.32	8.01	
145.00		413.71	1.37	0.24	0.41	23.05	
147.00	Appurtenance(s)	2489.6	1.41	0.31	0.45	165.83	
150.00		236.04	1.47	0.43	0.51	19.87	
155.00		379.86	1.57	0.69	0.63	44.34	
160.00		362.94	1.67	1.03	0.78	55.68	
165.00	Appurtenance(s)	495.41	1.78	1.45	0.94	96.29	
167.00	Appurtenance(s)	2365.3	1.82	1.65	1.02	501.33	
170.00	Appurtenance(s)	201.92	1.89	1.98	1.14	48.39	
<b>Totals:</b>		<b>41,931.9</b>				<b>1,565.3</b>	<b>Total Wind: 34,383.8</b>

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

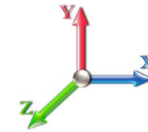
## Calculated Forces

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Load Case:</b> 0.9D + 1.0E						<b>Iterations</b> 20
<b>Gust Response Factor</b>	1.10			<b>Sds</b>	0.19	<b>Ss</b> 0.18
<b>Dead Load Factor</b>	0.90	<b>Seismic Load Factor</b>	1.00	<b>Sd1</b>	0.10	<b>S1</b> 0.06
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.39	<b>SA</b>	0.04	<b>Seismic Importance Factor</b> 1.00



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-41.86	-1.70	0.00	-196.29	0.00	196.29	5803.10	2901.55	15291.3	7657.05	0.00	0.00	0.00	0.033
5.00	-40.38	-1.68	0.00	-187.78	0.00	187.78	5736.18	2868.09	14817.2	7419.63	0.00	-0.01	0.032	
10.00	-38.92	-1.65	0.00	-179.37	0.00	179.37	5667.41	2833.70	14345.3	7183.34	0.01	-0.01	0.032	
15.00	-37.49	-1.61	0.00	-171.12	0.00	171.12	5596.76	2798.38	13875.9	6948.30	0.03	-0.02	0.031	
20.00	-36.08	-1.57	0.00	-163.05	0.00	163.05	5524.26	2762.13	13409.4	6714.68	0.05	-0.02	0.031	
25.00	-34.71	-1.53	0.00	-155.18	0.00	155.18	5449.89	2724.95	12945.9	6482.61	0.08	-0.03	0.030	
30.00	-33.36	-1.49	0.00	-147.50	0.00	147.50	5373.66	2686.83	12485.9	6252.24	0.11	-0.04	0.030	
35.00	-32.03	-1.45	0.00	-140.04	0.00	140.04	5295.57	2647.79	12029.5	6023.71	0.16	-0.04	0.029	
40.00	-30.74	-1.41	0.00	-132.78	0.00	132.78	5215.62	2607.81	11577.1	5797.18	0.21	-0.05	0.029	
41.00	-30.48	-1.40	0.00	-131.37	0.00	131.37	5199.41	2599.70	11487.1	5752.13	0.22	-0.05	0.029	
45.00	-28.54	-1.33	0.00	-125.77	0.00	125.77	5133.81	2566.90	11129.0	5572.78	0.26	-0.06	0.028	
48.00	-27.12	-1.28	0.00	-121.77	0.00	121.77	5141.90	2570.95	11172.7	5594.66	0.30	-0.06	0.027	
50.00	-26.61	-1.26	0.00	-119.22	0.00	119.22	5108.73	2554.36	10994.5	5505.45	0.32	-0.06	0.027	
55.00	-25.38	-1.22	0.00	-112.90	0.00	112.90	5024.49	2512.24	10552.4	5284.05	0.39	-0.07	0.026	
60.00	-24.17	-1.18	0.00	-106.80	0.00	106.80	4938.39	2469.19	10115.2	5065.12	0.47	-0.08	0.026	
65.00	-22.99	-1.14	0.00	-100.90	0.00	100.90	4850.42	2425.21	9683.22	4848.81	0.55	-0.08	0.026	
70.00	-21.83	-1.11	0.00	-95.18	0.00	95.18	4760.60	2380.30	9256.75	4635.26	0.65	-0.09	0.025	
75.00	-20.66	-1.08	0.00	-89.63	0.00	89.63	4668.91	2334.45	8836.09	4424.61	0.74	-0.10	0.025	
80.00	-19.56	-1.06	0.00	-84.22	0.00	84.22	4575.36	2287.68	8421.51	4217.02	0.85	-0.10	0.024	
85.00	-18.49	-1.06	0.00	-78.90	0.00	78.90	4479.95	2239.97	8013.32	4012.62	0.96	-0.11	0.024	
90.00	-16.65	-1.05	0.00	-73.61	0.00	73.61	4371.20	2185.60	7591.89	3801.59	1.08	-0.12	0.023	
91.00	-16.28	-1.05	0.00	-72.56	0.00	72.56	3638.14	1819.07	6412.59	3211.06	1.11	-0.12	0.027	
95.00	-15.56	-1.06	0.00	-68.34	0.00	68.34	3578.07	1789.03	6158.09	3083.62	1.21	-0.13	0.027	
100.00	-14.68	-1.06	0.00	-63.06	0.00	63.06	3501.29	1750.65	5844.19	2926.44	1.35	-0.14	0.026	
105.00	-13.82	-1.06	0.00	-57.79	0.00	57.79	3422.66	1711.33	5535.26	2771.74	1.50	-0.14	0.025	
108.00	-13.31	-1.05	0.00	-54.62	0.00	54.62	3374.59	1687.29	5352.40	2680.18	1.59	-0.15	0.024	
108.00	-13.31	-1.05	0.00	-54.62	0.00	54.62	2667.38	1333.69	4244.39	2125.35	1.59	-0.15	0.031	
110.00	-13.03	-1.06	0.00	-52.51	0.00	52.51	2644.20	1322.10	4152.60	2079.39	1.65	-0.15	0.030	
115.00	-12.32	-1.06	0.00	-47.24	0.00	47.24	2584.96	1292.48	3925.36	1965.60	1.82	-0.16	0.029	
120.00	-11.64	-1.06	0.00	-41.96	0.00	41.96	2523.85	1261.93	3701.54	1853.52	1.99	-0.17	0.027	
125.00	-10.98	-1.06	0.00	-36.68	0.00	36.68	2460.88	1230.44	3481.44	1743.31	2.18	-0.18	0.026	
130.00	-10.33	-1.06	0.00	-31.40	0.00	31.40	2396.05	1198.03	3265.33	1635.09	2.38	-0.19	0.024	
135.00	-9.31	-1.04	0.00	-26.12	0.00	26.12	1762.27	881.13	2355.65	1179.58	2.58	-0.20	0.027	
137.00	-6.96	-0.99	0.00	-24.04	0.00	24.04	1744.61	872.31	2295.82	1149.62	2.67	-0.20	0.025	
140.00	-6.66	-0.98	0.00	-21.08	0.00	21.08	1717.57	858.78	2206.74	1105.01	2.80	-0.21	0.023	
145.00	-6.17	-0.95	0.00	-16.18	0.00	16.18	1671.00	835.50	2060.16	1031.61	3.02	-0.22	0.019	
147.00	-3.88	-0.78	0.00	-14.27	0.00	14.27	1651.86	825.93	2002.25	1002.61	3.12	-0.22	0.017	
150.00	-3.63	-0.76	0.00	-11.93	0.00	11.93	1622.58	811.29	1916.22	959.54	3.26	-0.23	0.015	
155.00	-3.23	-0.71	0.00	-8.13	0.00	8.13	1572.29	786.15	1775.21	888.92	3.50	-0.23	0.011	
160.00	-2.84	-0.66	0.00	-4.55	0.00	4.55	1520.15	760.07	1637.42	819.92	3.74	-0.24	0.007	
165.00	-2.33	-0.56	0.00	-1.27	0.00	1.27	1466.13	733.07	1503.13	752.68	3.99	-0.24	0.003	
167.00	-0.18	-0.05	0.00	-0.15	0.00	0.15	1444.01	722.00	1450.46	726.31	4.09	-0.24	0.000	
170.00	0.00	-0.05	0.00	0.00	0.00	0.00	1400.09	700.04	1362.73	682.38	4.24	-0.24	0.000	

## Wind Loading - Shaft

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 22

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	7.442	8.19	301.92	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	7.442	8.19	296.05	0.650	0.000	5.00	27.024	17.57	143.8	0.0	1498.7
10.00		1.00	0.85	7.442	8.19	290.18	0.650	0.000	5.00	26.494	17.22	141.0	0.0	1469.1
15.00		1.00	0.85	7.442	8.19	284.31	0.650	0.000	5.00	25.964	16.88	138.2	0.0	1439.4
20.00		1.00	0.90	7.896	8.69	286.82	0.650	0.000	5.00	25.433	16.53	143.6	0.0	1409.8
25.00		1.00	0.95	8.276	9.10	287.44	0.650	0.000	5.00	24.903	16.19	147.4	0.0	1380.2
30.00		1.00	0.98	8.600	9.46	286.71	0.650	0.000	5.00	24.372	15.84	149.9	0.0	1350.6
35.00		1.00	1.01	8.883	9.77	284.98	0.650	0.000	5.00	23.842	15.50	151.4	0.0	1321.0
40.00		1.00	1.04	9.137	10.05	282.52	0.650	0.000	5.00	23.311	15.15	152.3	0.0	1291.3
41.00	Bot - Section 2	1.00	1.05	9.184	10.10	281.95	0.650	0.000	1.00	4.599	2.99	30.2	0.0	254.7
45.00		1.00	1.07	9.366	10.30	279.46	0.650	0.000	4.00	18.479	12.01	123.7	0.0	2030.6
48.00	Top - Section 1	1.00	1.08	9.494	10.44	277.39	0.650	0.000	3.00	13.636	8.86	92.6	0.0	1498.0
50.00		1.00	1.09	9.576	10.53	280.56	0.650	0.000	2.00	8.985	5.84	61.5	0.0	497.6
55.00		1.00	1.12	9.770	10.75	276.67	0.650	0.000	5.00	22.090	14.36	154.3	0.0	1223.2
60.00		1.00	1.14	9.951	10.95	272.43	0.650	0.000	5.00	21.560	14.01	153.4	0.0	1193.5
65.00		1.00	1.16	10.120	11.13	267.89	0.650	0.000	5.00	21.030	13.67	152.2	0.0	1163.9
70.00		1.00	1.17	10.279	11.31	263.09	0.650	0.000	5.00	20.499	13.32	150.7	0.0	1134.3
75.00	Appurtenance(s)	1.00	1.19	10.430	11.47	258.06	0.650	0.000	5.00	19.969	12.98	148.9	0.0	1104.7
80.00		1.00	1.21	10.572	11.63	252.83	0.650	0.000	5.00	19.438	12.63	146.9	0.0	1075.1
85.00	Bot - Section 3	1.00	1.22	10.708	11.78	247.41	0.650	0.000	5.00	18.908	12.29	144.8	0.0	1045.5
90.00		1.00	1.24	10.838	11.92	241.82	0.650	0.000	5.00	18.695	12.15	144.9	0.0	1903.0
91.00	Top - Section 2	1.00	1.24	10.863	11.95	240.68	0.650	0.000	1.00	3.675	2.39	28.5	0.0	374.0
95.00		1.00	1.25	10.962	12.06	240.34	0.650	0.000	4.00	14.489	9.42	113.6	0.0	687.4
100.00		1.00	1.27	11.081	12.19	234.48	0.650	0.000	5.00	17.634	11.46	139.7	0.0	836.4
105.00		1.00	1.28	11.195	12.31	228.49	0.650	0.000	5.00	17.103	11.12	136.9	0.0	811.0
108.00	Top - Section 3	1.00	1.29	11.262	12.39	224.83	0.650	0.000	3.00	10.007	6.50	80.6	0.0	474.4
110.00		1.00	1.29	11.305	12.44	222.37	0.650	0.000	2.00	6.566	4.27	53.1	0.0	259.8
115.00		1.00	1.30	11.412	12.55	216.15	0.650	0.000	5.00	16.043	10.43	130.9	0.0	634.6
120.00		1.00	1.32	11.514	12.67	209.82	0.650	0.000	5.00	15.512	10.08	127.7	0.0	613.4
125.00		1.00	1.33	11.614	12.78	203.39	0.650	0.000	5.00	14.982	9.74	124.4	0.0	592.3
130.00	Bot - Section 5	1.00	1.34	11.710	12.88	196.87	0.650	0.000	5.00	14.451	9.39	121.0	0.0	571.1
135.00	Top - Section 4	1.00	1.35	11.803	12.98	190.27	0.650	0.000	5.00	14.132	9.19	119.3	0.0	997.5
137.00	Appurtenance(s)	1.00	1.35	11.840	13.02	190.55	0.650	0.000	2.00	5.504	3.58	46.6	0.0	174.3
140.00		1.00	1.36	11.894	13.08	186.54	0.650	0.000	3.00	8.098	5.26	68.9	0.0	256.4
145.00		1.00	1.37	11.982	13.18	179.78	0.650	0.000	5.00	13.072	8.50	112.0	0.0	413.7
147.00	Appurtenance(s)	1.00	1.37	12.017	13.22	177.06	0.650	0.000	2.00	5.080	3.30	43.6	0.0	160.7
150.00		1.00	1.38	12.068	13.27	172.95	0.650	0.000	3.00	7.461	4.85	64.4	0.0	236.0
155.00		1.00	1.39	12.152	13.37	166.05	0.650	0.000	5.00	12.011	7.81	104.4	0.0	379.9
160.00		1.00	1.40	12.233	13.46	159.08	0.650	0.000	5.00	11.480	7.46	100.4	0.0	362.9
165.00	Appurtenance(s)	1.00	1.41	12.313	13.54	152.05	0.650	0.000	5.00	10.950	7.12	96.4	0.0	346.0
167.00	Appurtenance(s)	1.00	1.41	12.344	13.58	149.22	0.650	0.000	2.00	4.231	2.75	37.3	0.0	133.7
170.00	Appurtenance(s)	1.00	1.42	12.390	13.63	144.96	0.650	0.000	3.00	6.188	4.02	54.8	0.0	195.4
<b>Totals:</b>									<b>170.00</b>			<b>4,576.0</b>		<b>34,795.0</b>



## Discrete Appurtenance Forces

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 22

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)	
1	170.00	6' Lightning rod	1	12.390	13.629	1.00	1.00	0.38	6.50	0.000	0.000	5.18	0.00	0.00	
2	167.00	KRY 112 114-1 - Double	3	12.344	13.578	0.56	0.80	0.69	33.00	0.000	0.000	9.35	0.00	0.00	
3	167.00	AIR21 B4A/B2P	3	12.344	13.578	0.77	0.90	13.98	271.20	0.000	0.000	189.78	0.00	0.00	
4	167.00	AIR21 B2A/B4P	3	12.344	13.578	0.76	0.90	13.81	274.50	0.000	0.000	187.55	0.00	0.00	
5	167.00	Low Profile	1	12.344	13.578	1.00	1.00	22.00	1500.00	0.000	0.000	298.73	0.00	0.00	
6	167.00	S11B12 - RRU	3	12.344	13.578	0.54	0.80	4.55	153.00	0.000	0.000	61.79	0.00	0.00	
7	165.00	LNx-6515DS-A1M	3	12.313	13.544	0.72	0.90	24.78	149.40	0.000	0.000	335.56	0.00	0.00	
8	147.00	Low Profile	1	12.017	13.219	1.00	1.00	22.00	1500.00	0.000	0.000	290.81	0.00	0.00	
9	147.00	RRUS-11 800 MHz - RRU	6	12.017	13.219	0.54	0.80	9.46	324.00	0.000	0.000	124.98	0.00	0.00	
10	147.00	DC6-48-60-18-8F - SP	1	12.017	13.219	0.80	0.80	0.74	31.80	0.000	0.000	9.73	0.00	0.00	
11	147.00	LGP 21903 - Diplexers	6	12.017	13.219	0.62	0.80	1.01	33.00	0.000	0.000	13.36	0.00	0.00	
12	147.00	LGP 21401 - TMA	6	12.017	13.219	0.62	0.80	4.83	84.60	0.000	0.000	63.84	0.00	0.00	
13	147.00	AM-X-CD-16-65-00T	3	12.017	13.219	0.66	0.80	15.78	145.50	0.000	0.000	208.63	0.00	0.00	
14	147.00	7770	6	12.017	13.219	0.64	0.80	21.12	210.00	0.000	0.000	279.18	0.00	0.00	
15	137.00	APXVSP18-C-A20	3	11.840	13.024	0.68	0.80	16.36	171.00	0.000	0.000	213.08	0.00	0.00	
16	137.00	APXVTM14-C-I20	3	11.840	13.024	0.69	0.80	13.09	168.00	0.000	0.000	170.43	0.00	0.00	
17	137.00	800MHz - RRH	3	11.840	13.024	0.54	0.80	4.00	159.00	0.000	0.000	52.15	0.00	0.00	
18	137.00	1900MHz - RRH	3	11.840	13.024	0.54	0.80	6.11	132.00	0.000	0.000	79.58	0.00	0.00	
19	137.00	TD-RRH8x20-25 - RRU	3	11.840	13.024	0.54	0.80	6.51	210.00	0.000	0.000	84.82	0.00	0.00	
20	137.00	ACU-A20-N - RET	4	11.840	13.024	0.62	0.80	0.35	4.00	0.000	0.000	4.55	0.00	0.00	
21	137.00	ALU - 800MHz Filter	3	11.840	13.024	0.40	0.80	0.94	26.40	0.000	0.000	12.19	0.00	0.00	
22	137.00	Low Profile	1	11.840	13.024	1.00	1.00	22.00	1500.00	0.000	0.000	286.53	0.00	0.00	
23	75.00	GPS	1	10.430	11.473	0.80	0.80	0.80	10.00	0.000	0.000	9.18	0.00	0.00	
24	75.00	Standoff	1	10.430	11.473	0.56	0.75	1.48	40.00	0.000	0.000	16.97	0.00	0.00	
<b>Totals:</b>									<b>7,136.90</b>						<b>3,007.95</b>

## Total Applied Force Summary

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

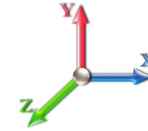


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**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00



**Iterations** 22

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		143.80	1648.37	0.00	0.00
10.00		140.97	1618.75	0.00	0.00
15.00		138.15	1589.13	0.00	0.00
20.00		143.59	1559.52	0.00	0.00
25.00		147.36	1529.90	0.00	0.00
30.00		149.86	1500.28	0.00	0.00
35.00		151.44	1470.66	0.00	0.00
40.00		152.29	1441.04	0.00	0.00
41.00		30.20	284.65	0.00	0.00
45.00		123.75	2150.32	0.00	0.00
48.00		92.57	1587.86	0.00	0.00
50.00		61.52	557.44	0.00	0.00
55.00		154.32	1372.86	0.00	0.00
60.00		153.40	1343.24	0.00	0.00
65.00		152.17	1313.63	0.00	0.00
70.00		150.66	1284.01	0.00	0.00
75.00	(2) attachments	175.06	1304.39	0.00	0.00
80.00		146.94	1219.57	0.00	0.00
85.00		144.76	1189.95	0.00	0.00
90.00		144.86	2047.50	0.00	0.00
91.00		28.55	402.90	0.00	0.00
95.00		113.56	802.99	0.00	0.00
100.00		139.71	980.89	0.00	0.00
105.00		136.90	955.51	0.00	0.00
108.00		80.58	561.12	0.00	0.00
110.00		53.07	317.56	0.00	0.00
115.00		130.90	779.08	0.00	0.00
120.00		127.71	757.93	0.00	0.00
125.00		124.41	736.77	0.00	0.00
130.00		121.00	715.61	0.00	0.00
135.00		119.27	1142.02	0.00	0.00
137.00	(23) attachments	949.93	2602.49	0.00	0.00
140.00		68.86	337.11	0.00	0.00
145.00		111.99	548.31	0.00	0.00
147.00	(29) attachments	1034.19	2543.49	0.00	0.00
150.00		64.38	276.78	0.00	0.00
155.00		104.36	447.76	0.00	0.00
160.00		100.42	430.84	0.00	0.00
165.00	(3) attachments	431.95	563.31	0.00	0.00
167.00	(13) attachments	784.54	2392.53	0.00	0.00
170.00	(1) attachments	60.00	201.92	0.00	0.00
	<b>Totals:</b>	<b>7,583.91</b>	<b>46,510.00</b>	<b>0.00</b>	<b>0.00</b>

## Calculated Forces

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



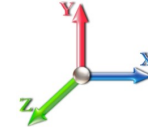
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**Load Case:** 1.0D + 1.0W 60 mph Wind

**Iterations** 22

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-46.51	-7.59	0.00	-845.68	0.00	845.68	5803.10	2901.55	15291.3	7657.05	0.00	0.000	0.000	0.118
5.00	-44.86	-7.47	0.00	-807.71	0.00	807.71	5736.18	2868.09	14817.2	7419.63	0.01	-0.025	0.000	0.117
10.00	-43.23	-7.35	0.00	-770.36	0.00	770.36	5667.41	2833.70	14345.3	7183.34	0.05	-0.051	0.000	0.115
15.00	-41.64	-7.23	0.00	-733.62	0.00	733.62	5596.76	2798.38	13875.9	6948.30	0.12	-0.077	0.000	0.113
20.00	-40.08	-7.10	0.00	-697.49	0.00	697.49	5524.26	2762.13	13409.4	6714.68	0.22	-0.104	0.000	0.111
25.00	-38.55	-6.97	0.00	-661.99	0.00	661.99	5449.89	2724.95	12945.9	6482.61	0.34	-0.131	0.000	0.109
30.00	-37.04	-6.83	0.00	-627.16	0.00	627.16	5373.66	2686.83	12485.9	6252.24	0.49	-0.158	0.000	0.107
35.00	-35.57	-6.69	0.00	-593.01	0.00	593.01	5295.57	2647.79	12029.5	6023.71	0.67	-0.185	0.000	0.105
40.00	-34.13	-6.54	0.00	-559.55	0.00	559.55	5215.62	2607.81	11577.1	5797.18	0.88	-0.213	0.000	0.103
41.00	-33.84	-6.52	0.00	-553.00	0.00	553.00	5199.41	2599.70	11487.1	5752.13	0.93	-0.219	0.000	0.103
45.00	-31.69	-6.40	0.00	-526.91	0.00	526.91	5133.81	2566.90	11129.0	5572.78	1.12	-0.241	0.000	0.101
48.00	-30.10	-6.31	0.00	-507.71	0.00	507.71	5141.90	2570.95	11172.7	5594.66	1.28	-0.258	0.000	0.097
50.00	-29.54	-6.25	0.00	-495.10	0.00	495.10	5108.73	2554.36	10994.5	5505.45	1.39	-0.270	0.000	0.096
55.00	-28.17	-6.11	0.00	-463.82	0.00	463.82	5024.49	2512.24	10552.4	5284.05	1.68	-0.297	0.000	0.093
60.00	-26.82	-5.96	0.00	-433.29	0.00	433.29	4938.39	2469.19	10115.2	5065.12	2.01	-0.324	0.000	0.091
65.00	-25.51	-5.81	0.00	-403.50	0.00	403.50	4850.42	2425.21	9683.22	4848.81	2.36	-0.351	0.000	0.088
70.00	-24.22	-5.66	0.00	-374.44	0.00	374.44	4760.60	2380.30	9256.75	4635.26	2.75	-0.379	0.000	0.086
75.00	-22.91	-5.49	0.00	-346.13	0.00	346.13	4668.91	2334.45	8836.09	4424.61	3.16	-0.406	0.000	0.083
80.00	-21.69	-5.35	0.00	-318.67	0.00	318.67	4575.36	2287.68	8421.51	4217.02	3.60	-0.434	0.000	0.080
85.00	-20.50	-5.20	0.00	-291.95	0.00	291.95	4479.95	2239.97	8013.32	4012.62	4.07	-0.461	0.000	0.077
90.00	-18.45	-5.04	0.00	-265.94	0.00	265.94	4371.20	2185.60	7591.89	3801.59	4.56	-0.488	0.000	0.074
91.00	-18.05	-5.02	0.00	-260.90	0.00	260.90	4368.14	2181.07	7591.89	3801.59	4.56	-0.488	0.000	0.074
95.00	-17.25	-4.90	0.00	-240.83	0.00	240.83	4357.07	2178.93	7591.89	3801.59	4.56	-0.488	0.000	0.074
100.00	-16.26	-4.76	0.00	-216.31	0.00	216.31	4350.29	2175.65	7591.89	3801.59	4.56	-0.488	0.000	0.074
105.00	-15.31	-4.62	0.00	-192.50	0.00	192.50	4322.66	2171.33	7591.89	3801.59	4.56	-0.488	0.000	0.074
108.00	-14.75	-4.54	0.00	-178.63	0.00	178.63	4374.59	2168.29	7591.89	3801.59	4.56	-0.488	0.000	0.074
108.00	-14.75	-4.54	0.00	-178.63	0.00	178.63	4374.59	2168.29	7591.89	3801.59	4.56	-0.488	0.000	0.074
110.00	-14.43	-4.49	0.00	-169.55	0.00	169.55	4322.10	2162.10	7591.89	3801.59	4.56	-0.488	0.000	0.074
115.00	-13.65	-4.36	0.00	-147.10	0.00	147.10	4258.96	2129.48	7591.89	3801.59	4.56	-0.488	0.000	0.074
120.00	-12.89	-4.23	0.00	-125.31	0.00	125.31	4253.85	2126.93	7591.89	3801.59	4.56	-0.488	0.000	0.074
125.00	-12.15	-4.10	0.00	-104.17	0.00	104.17	4240.88	2123.44	7591.89	3801.59	4.56	-0.488	0.000	0.074
130.00	-11.44	-3.98	0.00	-83.66	0.00	83.66	4239.05	2119.83	7591.89	3801.59	4.56	-0.488	0.000	0.074
135.00	-10.30	-3.84	0.00	-63.78	0.00	63.78	4227.27	2118.13	7591.89	3801.59	4.56	-0.488	0.000	0.074
137.00	-7.70	-2.86	0.00	-56.09	0.00	56.09	4244.61	2117.31	7591.89	3801.59	4.56	-0.488	0.000	0.074
140.00	-7.37	-2.79	0.00	-47.51	0.00	47.51	4217.57	2117.57	7591.89	3801.59	4.56	-0.488	0.000	0.074
145.00	-6.82	-2.67	0.00	-33.55	0.00	33.55	4217.00	2117.00	7591.89	3801.59	4.56	-0.488	0.000	0.074
147.00	-4.29	-1.61	0.00	-28.20	0.00	28.20	4216.51	2116.51	7591.89	3801.59	4.56	-0.488	0.000	0.074
150.00	-4.02	-1.54	0.00	-23.39	0.00	23.39	4216.22	2116.22	7591.89	3801.59	4.56	-0.488	0.000	0.074
155.00	-3.57	-1.43	0.00	-15.70	0.00	15.70	4215.29	2115.29	7591.89	3801.59	4.56	-0.488	0.000	0.074
160.00	-3.14	-1.32	0.00	-8.56	0.00	8.56	4215.15	2115.15	7591.89	3801.59	4.56	-0.488	0.000	0.074
165.00	-2.58	-0.88	0.00	-1.95	0.00	1.95	4214.63	2114.63	7591.89	3801.59	4.56	-0.488	0.000	0.074
167.00	-0.20	-0.06	0.00	-0.19	0.00	0.19	4214.01	2114.01	7591.89	3801.59	4.56	-0.488	0.000	0.074
170.00	0.00	-0.06	0.00	0.00	0.00	0.00	4214.09	2114.09	7591.89	3801.59	4.56	-0.488	0.000	0.074

## Final Analysis Summary

<b>Structure:</b> CT04066-S-SBA	<b>Code:</b> EIA/TIA-222-G	5/3/2017
<b>Site Name:</b> North Branford East	<b>Exposure:</b> C	
<b>Height:</b> 170.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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### Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 101 mph Wind	34.4	0.00	55.78	0.00	0.00	3850.89
0.9D + 1.6W 101 mph Wind	34.4	0.00	41.82	0.00	0.00	3822.88
1.2D + 1.0Di + 1.0Wi 50 mph Wind	9.4	0.00	79.46	0.00	0.00	1025.49
1.2D + 1.0E	1.7	0.00	55.81	0.00	0.00	197.82
0.9D + 1.0E	1.7	0.00	41.86	0.00	0.00	196.29
1.0D + 1.0W 60 mph Wind	7.6	0.00	46.51	0.00	0.00	845.68

### Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 101 mph Wind	-55.78	-34.44	0.00	-3850.8	0.00	-3850.8	5803.10	2901.5	15291.3	7657.05	0.00	0.513
0.9D + 1.6W 101 mph Wind	-41.82	-34.43	0.00	-3822.8	0.00	-3822.8	5803.10	2901.5	15291.3	7657.05	0.00	0.507
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-79.46	-9.38	0.00	-1025.4	0.00	-1025.4	5803.10	2901.5	15291.3	7657.05	0.00	0.148
1.2D + 1.0E	-55.81	-1.70	0.00	-197.82	0.00	-197.82	5803.10	2901.5	15291.3	7657.05	0.00	0.035
0.9D + 1.0E	-41.86	-1.70	0.00	-196.29	0.00	-196.29	5803.10	2901.5	15291.3	7657.05	0.00	0.033
1.0D + 1.0W 60 mph Wind	-46.51	-7.59	0.00	-845.68	0.00	-845.68	5803.10	2901.5	15291.3	7657.05	0.00	0.118



# Monopole Mat Foundation Design

Date

5/3/2017

<b>Customer Name:</b>	T-Mobile	<b>EIA/TIA Standard:</b>	EIA-222-G
<b>Site Name:</b>	North Branford	<b>Structure Height (Ft.):</b>	170
<b>Site Number:</b>	CT04066-S-SBA	<b>Engineer Name:</b>	S. Hesselbeir
<b>Engr. Number:</b>	33643	<b>Engineer Login ID:</b>	

**Foundation Info Obtained from:**

Drawings/Calculations

**Structure Type:**

Monopole

**Analysis or Design?**

Analysis

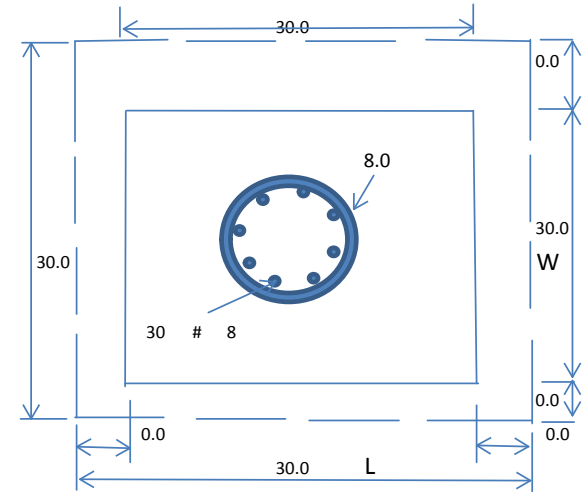
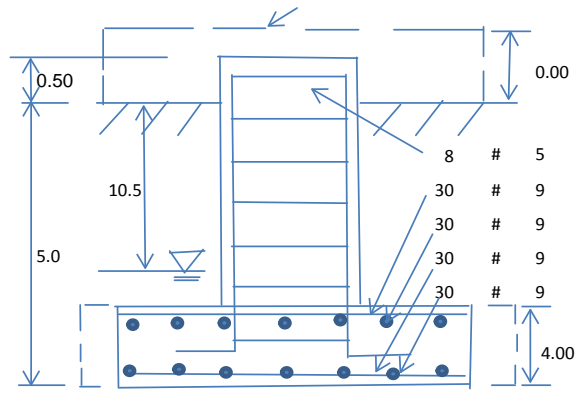
**Base Reactions (Factored):**

Axial Load (Kips):	55.8	Shear Force (Kips):	34.4
Uplift Force (Kips):	0.0	Moment (Kips-ft):	3850.9

Allowable overstress %: 5.0%

**Foundation Geometries:**

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	8.0	Depth of Base BG (ft.):	5.0
Pier Height A. G. (ft.):	0.50	Thickness of Pad (ft):	4.00
Length of Pad (ft.):	30	Width of Pad (ft.):	30
Final Length of pad (ft)	30.0	Final width of pad (ft):	30.0
Control Value for Cell D18:	0	Control Value for Cell F18:	0



**Material Properties and Rebar Info:**

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	8	Tie / Stirrup Size #:	5	
Qty. of Vertical Rebars:	30	Tie Spacing (in):	9.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	9	
Concrete Cover (in.):	4	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	30	Qty. of Rebar in Pad (W):	30	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	30	Qty. of Rebar in Pad (W):	30	

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):	10.5	Unit Weight of Water:	62.4	pcf
Ultimate Bearing Pressure (psf):	80000	Ultimate Skin Friction:	175	Psf
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No	
Consider soil hor. resist. for OTM.:	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:**

Uplift Strength Reduction Factor:	0.75	Compression Strength Reduction Factor:	0.75
Total Dry Soil Volume (cu. Ft.):	849.73	Total Dry Soil Weight (Kips):	101.97
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	101.97	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	3675.40	Total Dry Concrete Weight (Kips):	551.31
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	551.31	Total Vertical Load on Base (Kips):	709.08

**Check Soil Capacities:**

Calculated Maxium Net Soil Pressure under the base (psf):	1685	<	Allowable Factored Soil Bearing (psf):	60000	0.03	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	9656.3	>	Design Factored Momont (kips-ft):	4040	0.42	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.39					OK!

Load/  
Capacity  
Ratio



**Check the capacities of Reinforcing Concrete:**

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

**(1) Concrete Pier:**

Vertical Steel Rebar Area (sq. in./each):	0.79	Tie / Stirrup Area (sq. in./each):	0.31		
Calculated Moment Capacity (Mn,Kips-Ft):	4665.7	> Design Factored Moment (Mu, Kips-Ft)	3902.5	0.84	OK!
Calculated Shear Capacity (Kips):	912.1	> Design Factored Shear (Kips):	34.4	0.04	OK!
Calculated Tension Capacity (Tn, Kips):	1279.8	> Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	9566.5	> Design Factored Axial Load (Pu Kips):	55.8	0.01	OK!
Moment & Axial Strength Combination:	0.84	OK! Check Tie Spacing (Design/Required):		0.75	OK!
Pier Reinforcement Ratio:	0.003	Reinforcement Ratio is too small			

**(2).Concrete Pad:**

One-Way Design Shear Capacity (L-Direction, Kips):	1284.8	> One-Way Factored Shear (L-D. Kips):	234.3	0.18	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1284.8	> One-Way Factored Shear (W-D., Kips)	234.3	0.18	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	1474.3	> One-Way Factored Shear (C-C, Kips):	213.4	0.14	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct. ):	0.0019	OK! Lower Steel Pad Reinf. Ratio (W-Direc	0.0019		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	5731.7	> Moment at Bottom ( L-Direct. K-Ft):	864.5	0.15	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	5731.7	> Moment at Bottom ( W-Direct. K-Ft):	864.5	0.15	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	8062.4	> Moment at Bottom ( C-C Dir. K-Ft):	1222.5	0.15	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct. ):	0.0019	OK! Upper Steel Reinf. Ratio (W-Direct. ):	0.0019		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	5731.7	> Moment at the top (L-Dir Kips-Ft):	36.7	0.01	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	5731.7	> Moment at the top (W-Dir Kips-Ft):	36.7	0.01	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	8062.4	> Moment at the top (C-C Direc. K-Ft):	512.1	0.06	OK!

# SITE NAME: SBA N BRANFORD EAST

39 CIRO ROAD  
NORTH BRANFORD, CT 06471

**SITE NUMBER: CT11372B**  
**PROJECT: T-MOBILE L700**

**CONFIGURATION: 702Cu**

T-MOBILE TECHNICIAN SITE SAFETY NOTES	
LOCATION	SPECIAL RESTRICTIONS
ANTENNA/TMA/RRU	
SECTOR A:	ACCESS NOT PERMITTED
SECTOR B:	ACCESS NOT PERMITTED
SECTOR C:	ACCESS NOT PERMITTED
GPS/LMU:	UNRESTRICTED*
	(*CAUTION: OSHA-APPROVED PORTABLE 8' STEP-LADDER REQUIRED)
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE



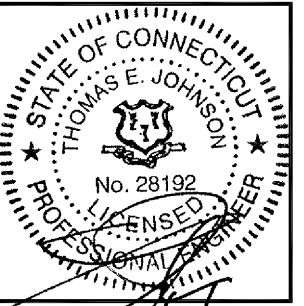
**T-MOBILE NORTHEAST LLC**  
35 GRIFFIN ROAD SOUTH  
BLOOMFIELD, CT 06002  
OFFICE: (860) 648-1116



SBA COMMUNICATIONS CORP.  
134 FLANDERS ROAD, SUITE 125  
WESTBOROUGH, MA 01581 TEL: (508) 251-0720



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



CHECKED BY: *JMM/TEJ*

APPROVED BY: JMM/TEJ

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
1	06/20/17	ISSUED FOR CONSTRUCTION	JEB
0	05/15/17	ISSUED FOR REVIEW	TBO/JEB

SITE NUMBER:  
**CT11372B**  
SITE NAME:  
**SBA N BRANFORD EAST**  
  
SITE ADDRESS:  
39 CIRO ROAD  
NORTH BRANFORD, CT 06471

SHEET TITLE  
TITLE SHEET

SHEET NUMBER  
T-1

### GENERAL NOTES

- THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF T-MOBILE NORTHEAST, LLC. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
- THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
- CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE T-MOBILE NORTHEAST, LLC REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

### SPECIAL CONSTRUCTION NOTES

- TOWER OWNER SHALL PROVIDE GLOBAL STRUCTURAL STABILITY ANALYSIS OF EXISTING ANTENNA SUPPORT STRUCTURE. GENERAL CONTRACTOR SCOPE OF WORK SHALL INCLUDE ALL REQUIRED STRUCTURAL MODIFICATIONS, RE-BUNDLING OF COAXIAL CABLES OR OTHER SPECIAL MODIFICATIONS AS OUTLINED THEREIN.
- PROTERRA DESIGN GROUP ASSUMES THAT THE TOWER IS PROPERLY CONSTRUCTED AND MAINTAINED. ALL STRUCTURAL MEMBERS AND THEIR CONNECTION ARE ASSUMED TO BE IN GOOD CONDITION AND ARE FREE FROM DEFECTS WITH NO DETERIORATION TO ITS MEMBER CAPACITIES



### PROJECT INFORMATION

SCOPE OF WORK: UNMANNED TELECOMMUNICATIONS FACILITY T-MOBILE EQUIPMENT MODERNIZATION

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

T-MOBILE E911 ADDRESS: 39 CIRO ROAD NORTH BRANFORD, CT 06471

SBA BUSINESS ADDRESS: 39 CIRO ROAD NORTH BRANFORD, CT 06471

LATITUDE: 41.331059 (FROM T-MOBILE RFDS)

LONGITUDE: -72.756173 (FROM T-MOBILE RFDS)

JURISDICTION: TOWN OF NORTH BRANFORD

BUILDING CODE: 2016 CONNECTICUT STATE BUILDING CODE WITH AMENDMENTS

ELECTRICAL CODE: 2014 NATIONAL ELECTRICAL CODE AND AMENDMENTS

CURRENT USE: TELECOMMUNICATIONS FACILITY

PROPOSED USE: TELECOMMUNICATIONS FACILITY

TOWER OWNER: SBA PROPERTIES, LLC

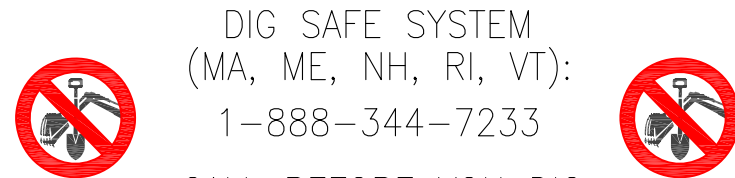
SBA SITE ID: CT04066-S

SBA SITE NAME: NORTH BRANFORD EAST

SBA REGIONAL SITE MANAGER: STEPHEN ROTH (860) 539-4920

### APPROVALS

PROJECT MANAGER	DATE
CONSTRUCTION	DATE
RF ENGINEERING	DATE
ZONING / SITE ACQ.	DATE
OPERATIONS	DATE
TOWER OWNER	DATE



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UNDERGROUND SERVICE ALERT

### DRAWING INDEX

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## GROUNDING NOTES

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

## GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:  
  
CONTRACTOR – SBA COMMUNICATIONS CORP.  
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)  
OWNER – T-MOBILE
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
14. ANY NEW CONCRETE NEEDED FOR CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (FY = 36 KSI) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (FY = 35 KSI). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH UMS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF T-MOBILE SITES."
17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
20. APPLICABLE BUILDING CODES:  
SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.  
  
SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:  
  
AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;  
  
AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), STEEL CONSTRUCTION MANUAL, 14TH EDITION;  
  
TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-G, STRUCTURAL STANDARDS FOR STEEL  
  
ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.  
  
FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

## ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BTCW	BARE TINNED SOLID COPPER WIRE	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BGR	BURIED GROUND RING	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BTS	BASE TRANSCEIVER STATION	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
EXISTING	EXISTING OR (E)	PROPOSED	NEW OR (P)	TYP	TYPICAL
EGB	EQUIPMENT GROUND BAR	N.T.S.	NOT TO SCALE	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	RAD	RADIATION CENTERLINE (ANTENNA)		
		REF	REFERENCE		

**T-Mobile**

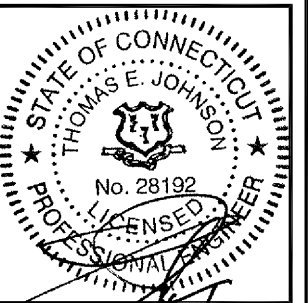
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Suite 200  
Hadley, MA 01035 Ph: (413) 320-4918



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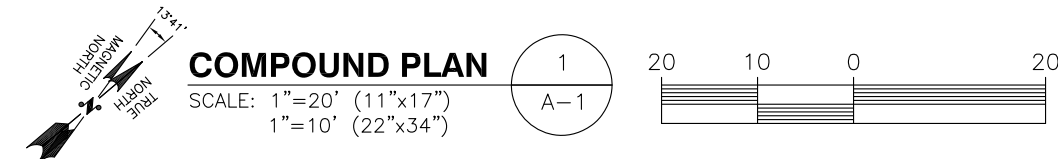
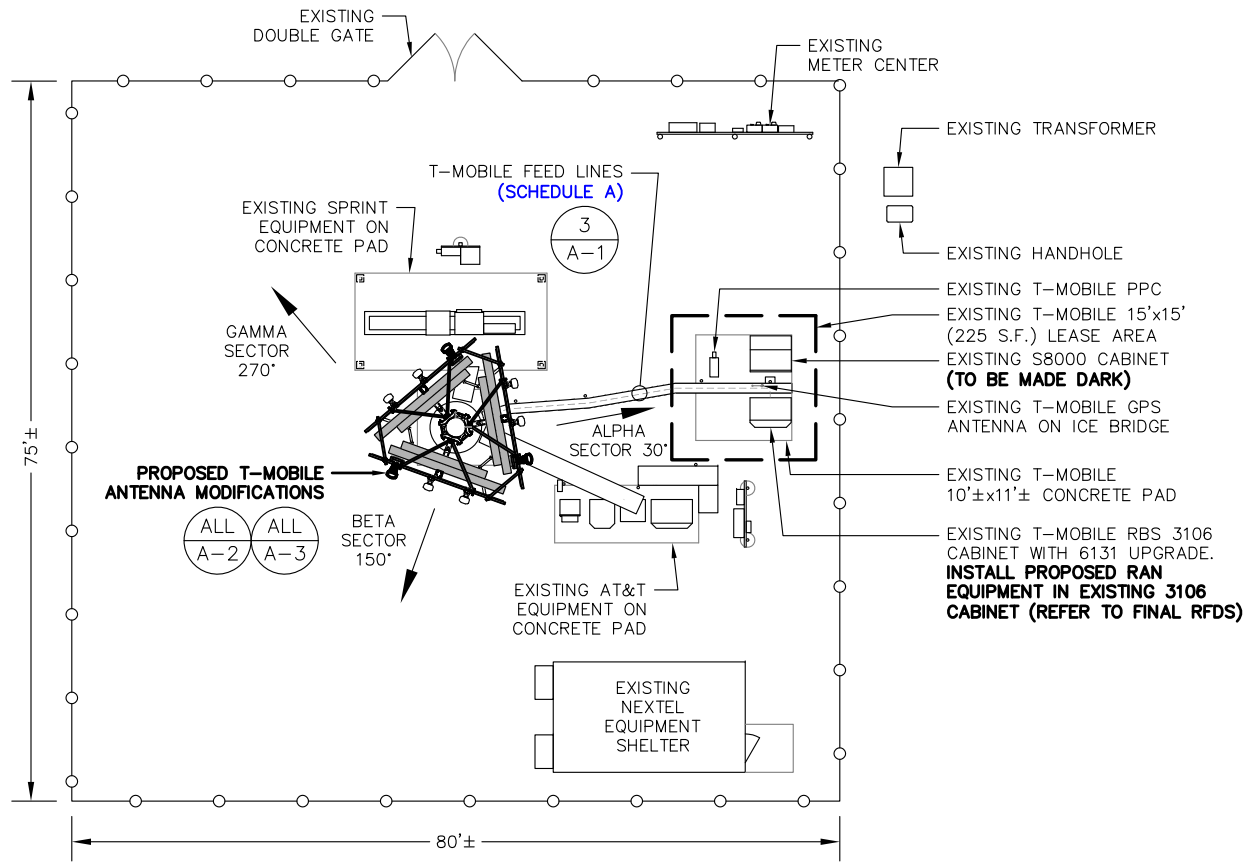
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0	05/15/17	ISSUED FOR REVIEW	TBJ/EB

SITE NUMBER:  
**CT11372B**  
SITE NAME:  
**SBA N BRANFORD EAST**  
  
SITE ADDRESS:  
39 CIRO ROAD  
NORTH BRANFORD, CT 06471

SHEET TITLE  
**GENERAL NOTES**

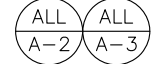
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**GN-1**





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

☉ OF PROPOSED T-MOBILE ANTENNAS  
 ELEV.= 167'± AGL (SBA DATABASE)



FEEDLINE SCHEDULE	FEEDLINE DESCRIPTION	LOCATION
A	EXISTING: TO REMAIN: (6) 1/8" COAX TO 167' RAD TO REMAIN: (1) HYBRID TO 167' RAD	UP INSIDE MONOPOLE TO RAD

NOTE: EXISTING T-MOBILE EQUIPMENT FEEDLINE INVENTORY BASED ON OBSERVED FIELD CONDITIONS. RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER

**T-MOBILE FEED LINES (REFER TO SBA-PROVIDED STRUCTURAL ANALYSIS FOR SPECIAL FEEDLINE INSTALLATION REQUIREMENTS, STACKING, BUNDLING, SHIELDING, MOUNTING AND RELOCATION OF EXISTING OR PROPOSED FEEDLINES)**



IMAGE SOURCE: PROTERRA 05/03/17

**FEEDLINE PHOTO  
 DETAIL AT TOWER BASE** 3/A-1  
 SCALE: N.T.S.



T-MOBILE FEED LINES  
 EXISTING 170'± MONOPOLE

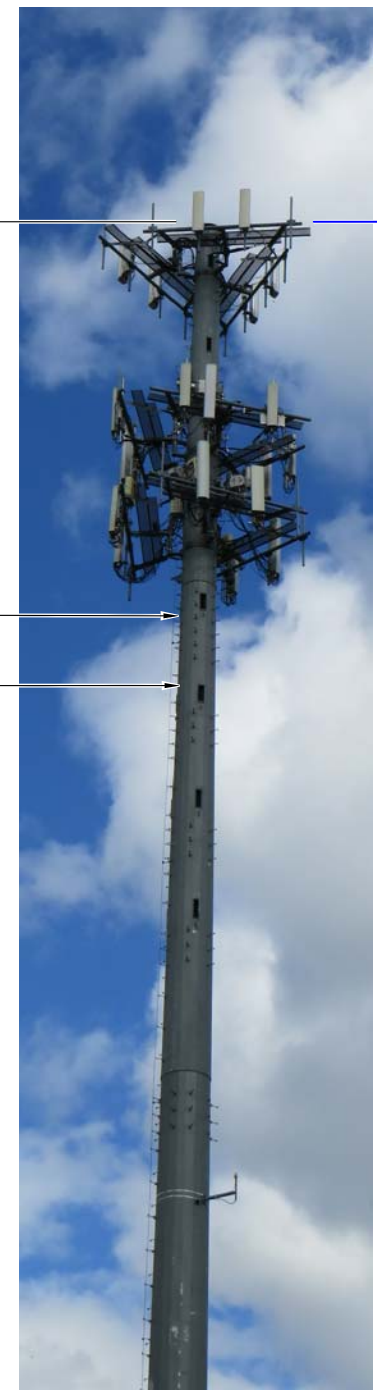


IMAGE SOURCE: PROTERRA 05/03/17

**PARTIAL ELEVATION  
 PHOTO DETAIL** 4/A-1  
 SCALE: N.T.S.

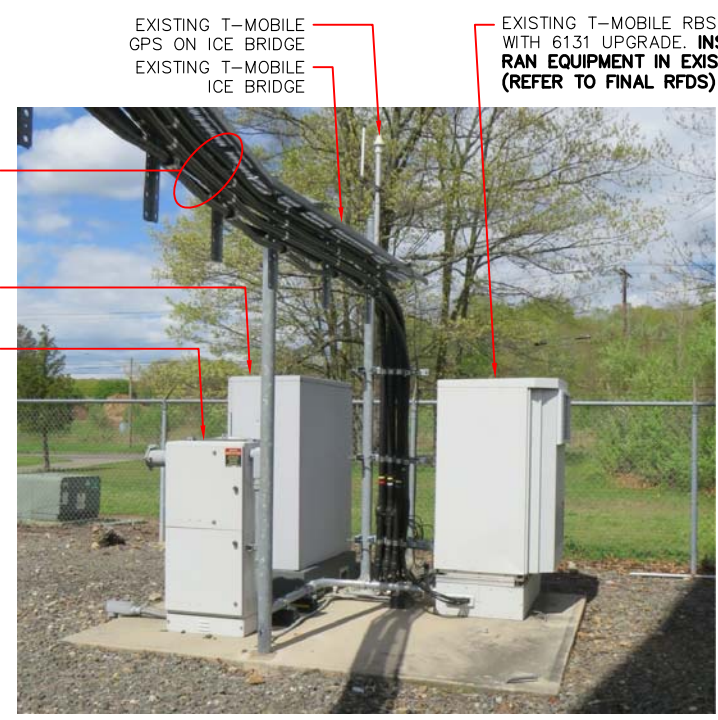


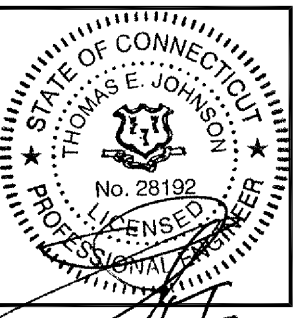
IMAGE SOURCE: PROTERRA 05/03/17

**EQUIPMENT PHOTO DETAIL** 2/A-1  
 SCALE: N.T.S.

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 Hadley, MA 01035 Ph: (413) 320-4918



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SHEET TITLE  
**COMPOUND &  
 ELEVATION PLAN**

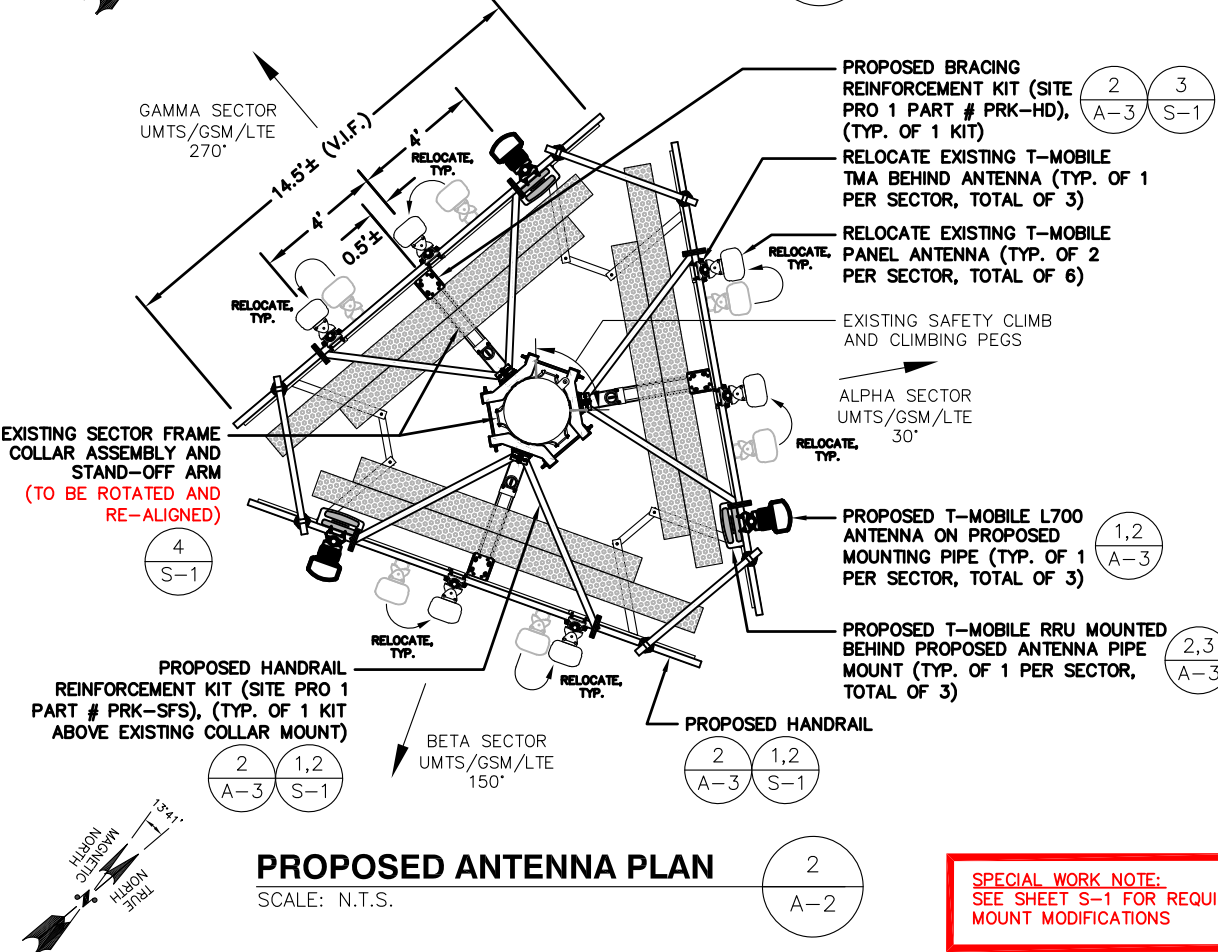
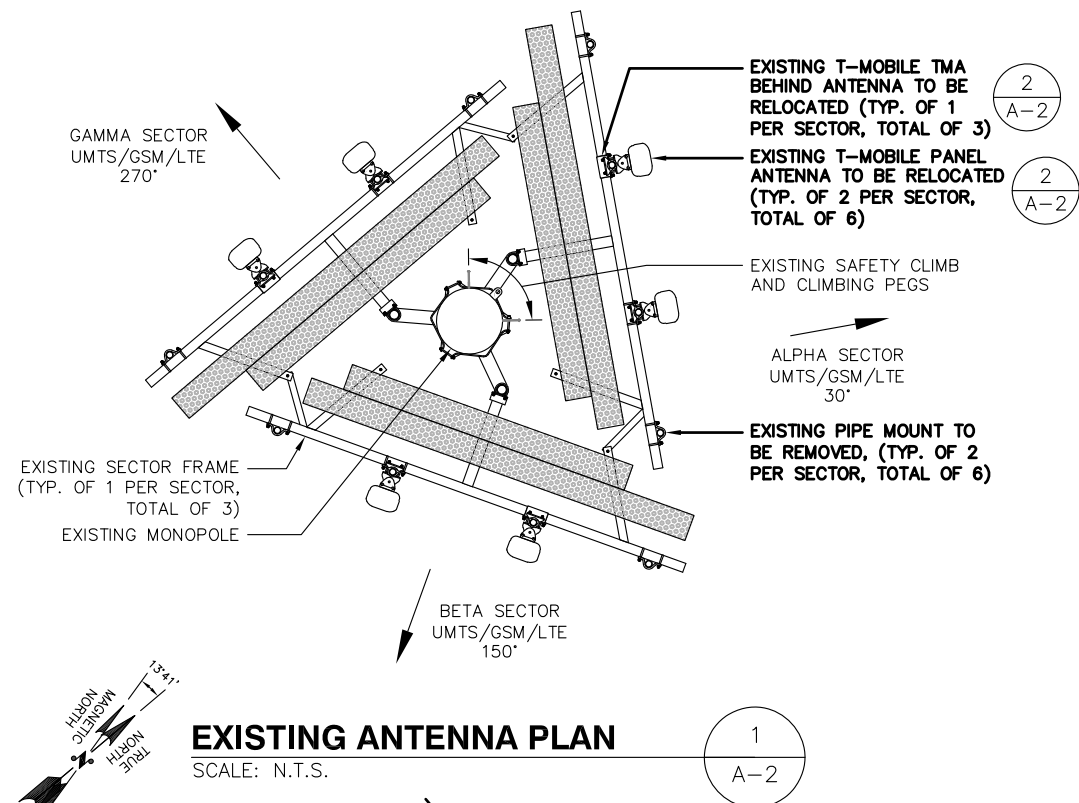
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**A-1**



**SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):**  
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**SPECIAL WORK NOTE:**  
 SEE SHEET S-1 FOR REQUIRED MOUNT MODIFICATIONS

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



**SPECIAL WORK NOTE:**  
 SEE SHEET S-1 FOR REQUIRED MOUNT MODIFICATIONS

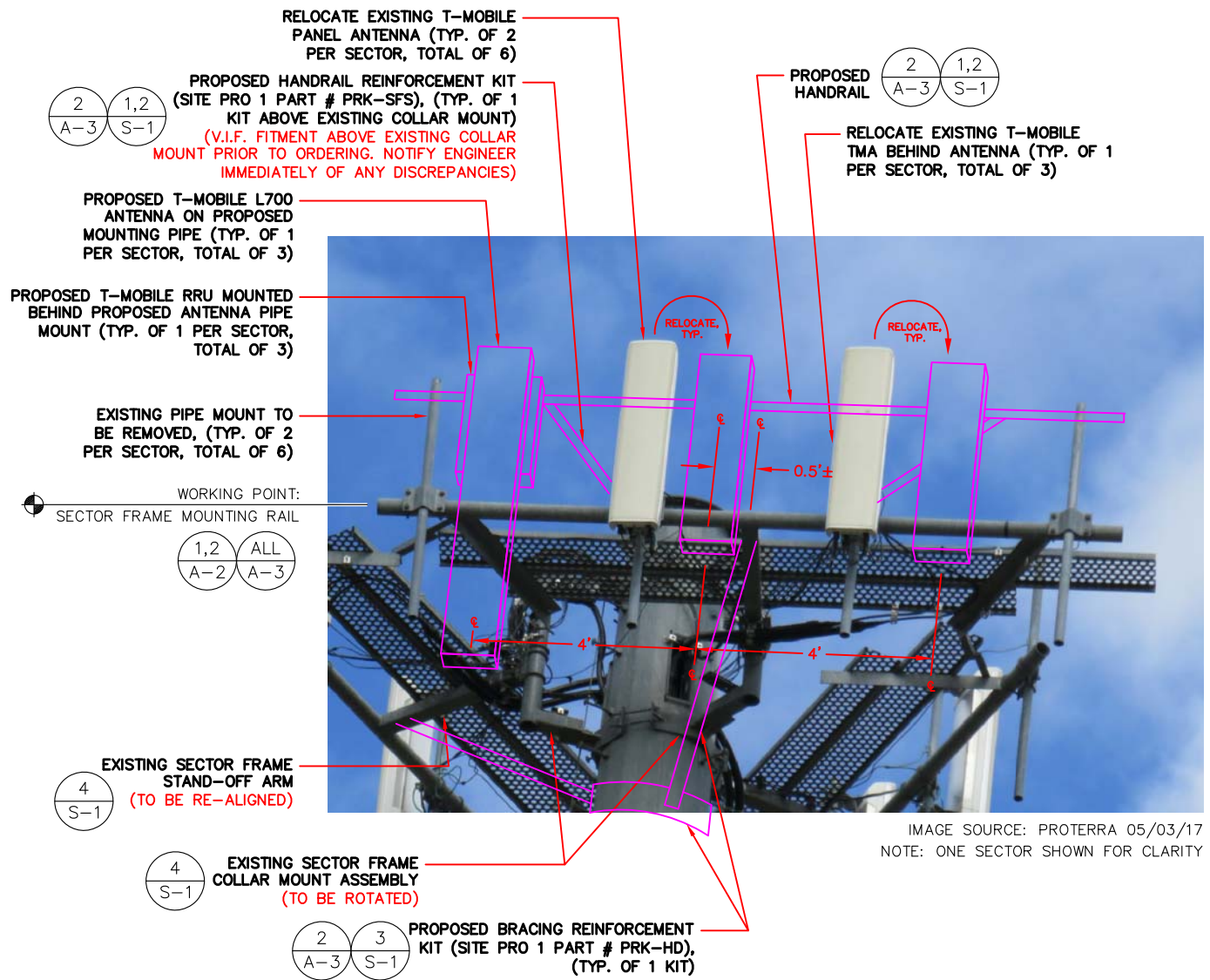


IMAGE SOURCE: PROTERRA 05/03/17  
 NOTE: ONE SECTOR SHOWN FOR CLARITY

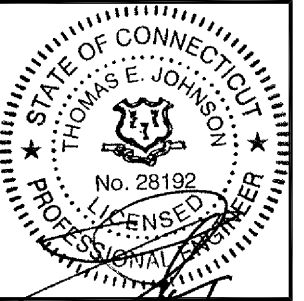
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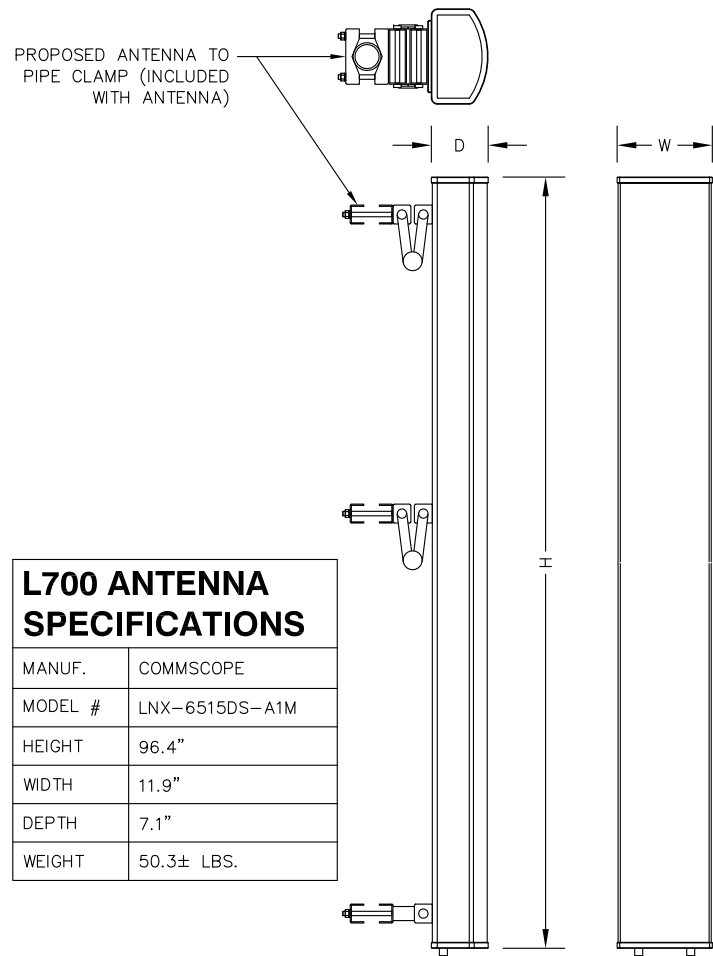
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 SBA N BRANFORD EAST  
 SITE ADDRESS:  
 39 CIRO ROAD  
 NORTH BRANFORD, CT 06471

SHEET TITLE  
 EXISTING & PROPOSED ANTENNA PLAN

SHEET NUMBER  
 A-2

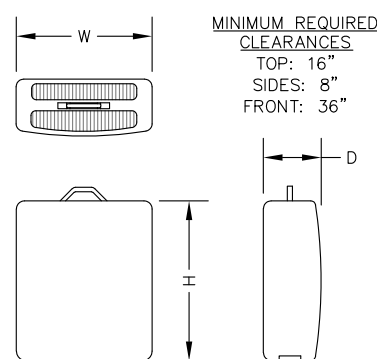




**L700 ANTENNA SPECIFICATIONS**

MANUF.	COMMSCOPE
MODEL #	LNx-6515DS-A1M
HEIGHT	96.4"
WIDTH	11.9"
DEPTH	7.1"
WEIGHT	50.3± LBS.

**L700 ANTENNA DETAIL**  
SCALE: N.T.S.

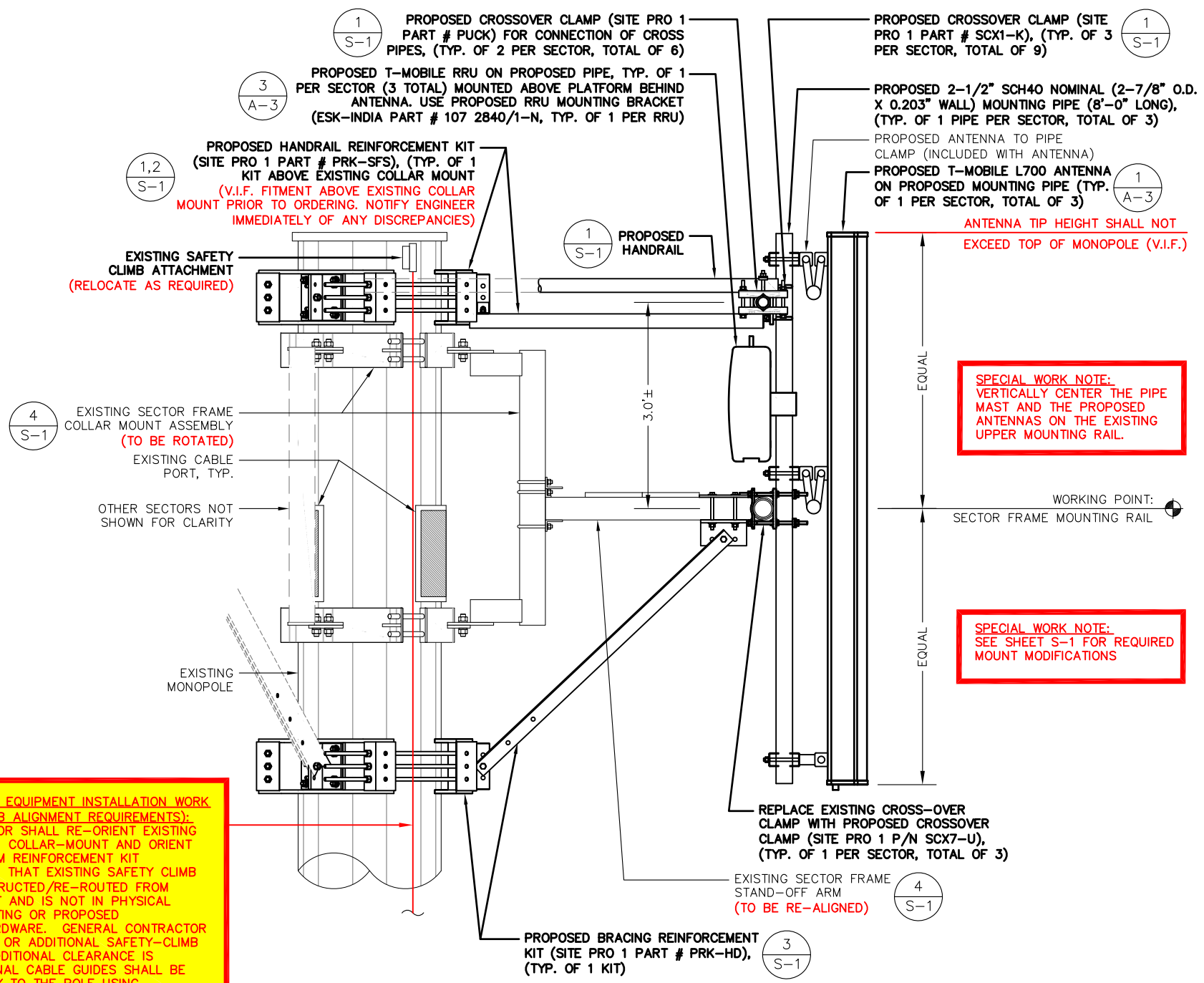


**RRU SPECIFICATIONS**

MANUF.	ERICSSON
MODEL #	RRUS11 B12
HEIGHT	20"
WIDTH	17"
DEPTH	7"
WEIGHT	50.7 LBS.

**REMOTE RADIO UNIT (RRU)**  
SCALE: N.T.S.

**SPECIAL TOWER TOP EQUIPMENT INSTALLATION WORK NOTE (SAFETY-CLIMB ALIGNMENT REQUIREMENTS):** GENERAL CONTRACTOR SHALL RE-ORIENT EXISTING T-MOBILE PLATFORM COLLAR-MOUNT AND ORIENT PROPOSED PLATFORM REINFORCEMENT KIT COLLAR-MOUNTS SO THAT EXISTING SAFETY CLIMB CABLE IS NOT OBSTRUCTED/RE-ROUTED FROM VERTICAL ALIGNMENT AND IS NOT IN PHYSICAL CONTACT WITH EXISTING OR PROPOSED COLLAR-MOUNT HARDWARE. GENERAL CONTRACTOR SHALL INSTALL NEW OR ADDITIONAL SAFETY-CLIMB CABLE GUIDES IF ADDITIONAL CLEARANCE IS REQUIRED. ADDITIONAL CABLE GUIDES SHALL BE ATTACHED SECURELY TO THE POLE USING MECHANICAL FASTENERS OR FIELD WELDED BY A CERTIFIED WELDING TECHNICIAN.



**PROPOSED ANTENNA MOUNTING DETAIL**  
SCALE: N.T.S.

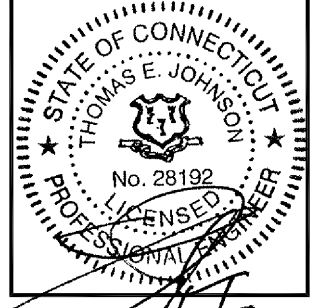
**SPECIAL WORK NOTE:**  
VERTICALLY CENTER THE PIPE MAST AND THE PROPOSED ANTENNAS ON THE EXISTING UPPER MOUNTING RAIL.

**SPECIAL WORK NOTE:**  
SEE SHEET S-1 FOR REQUIRED MOUNT MODIFICATIONS

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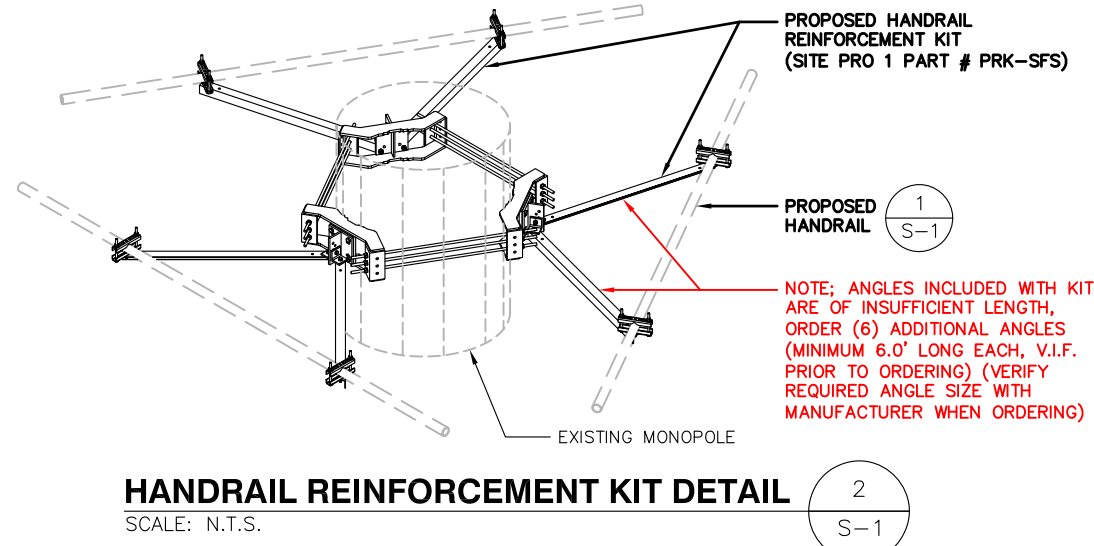
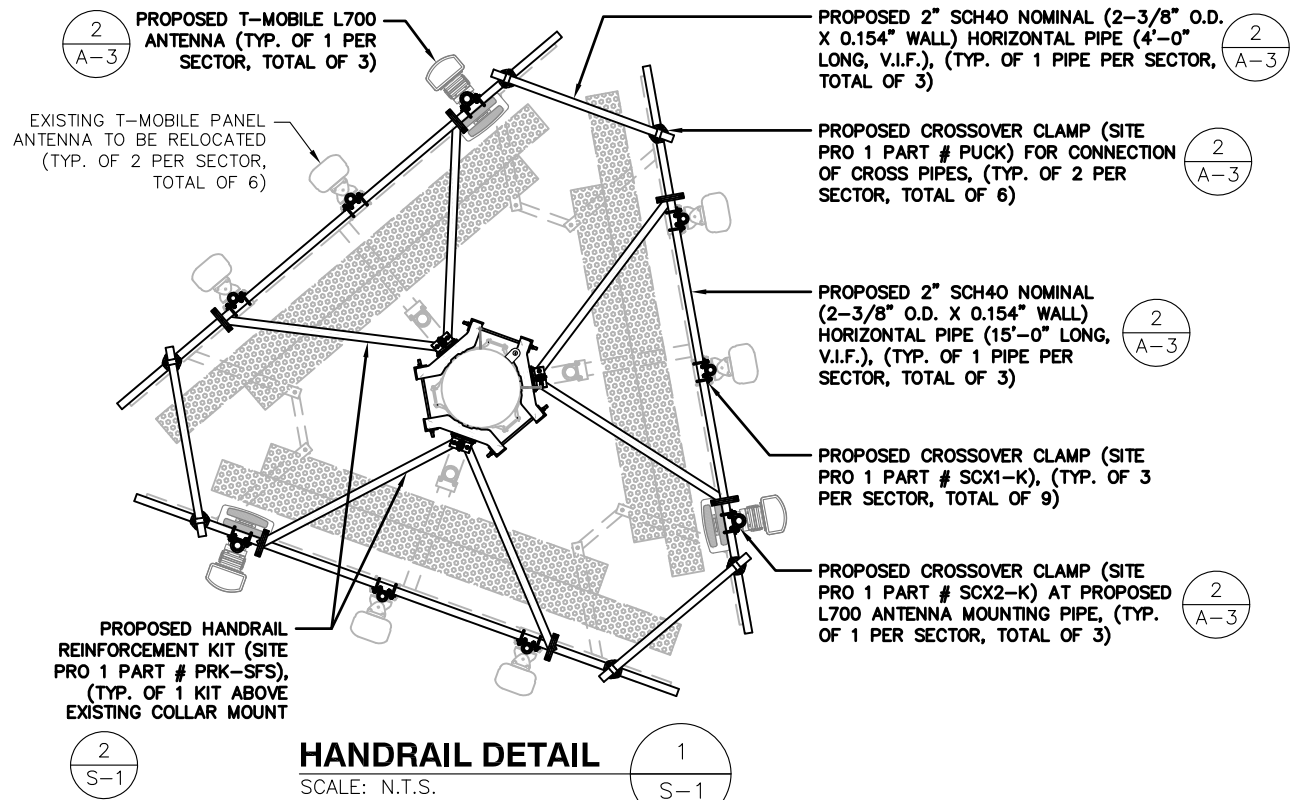
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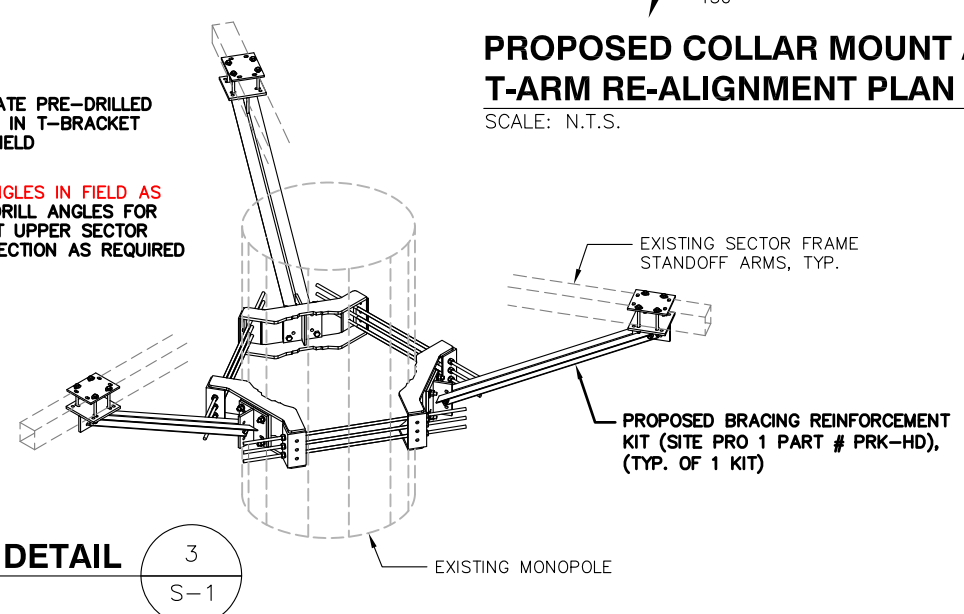
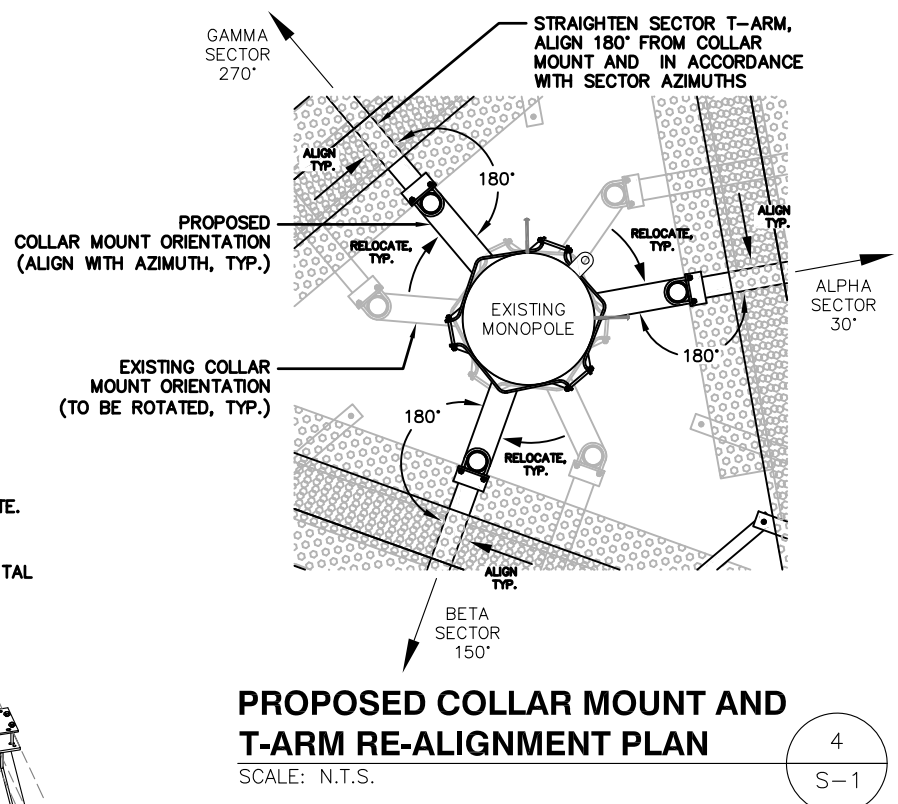
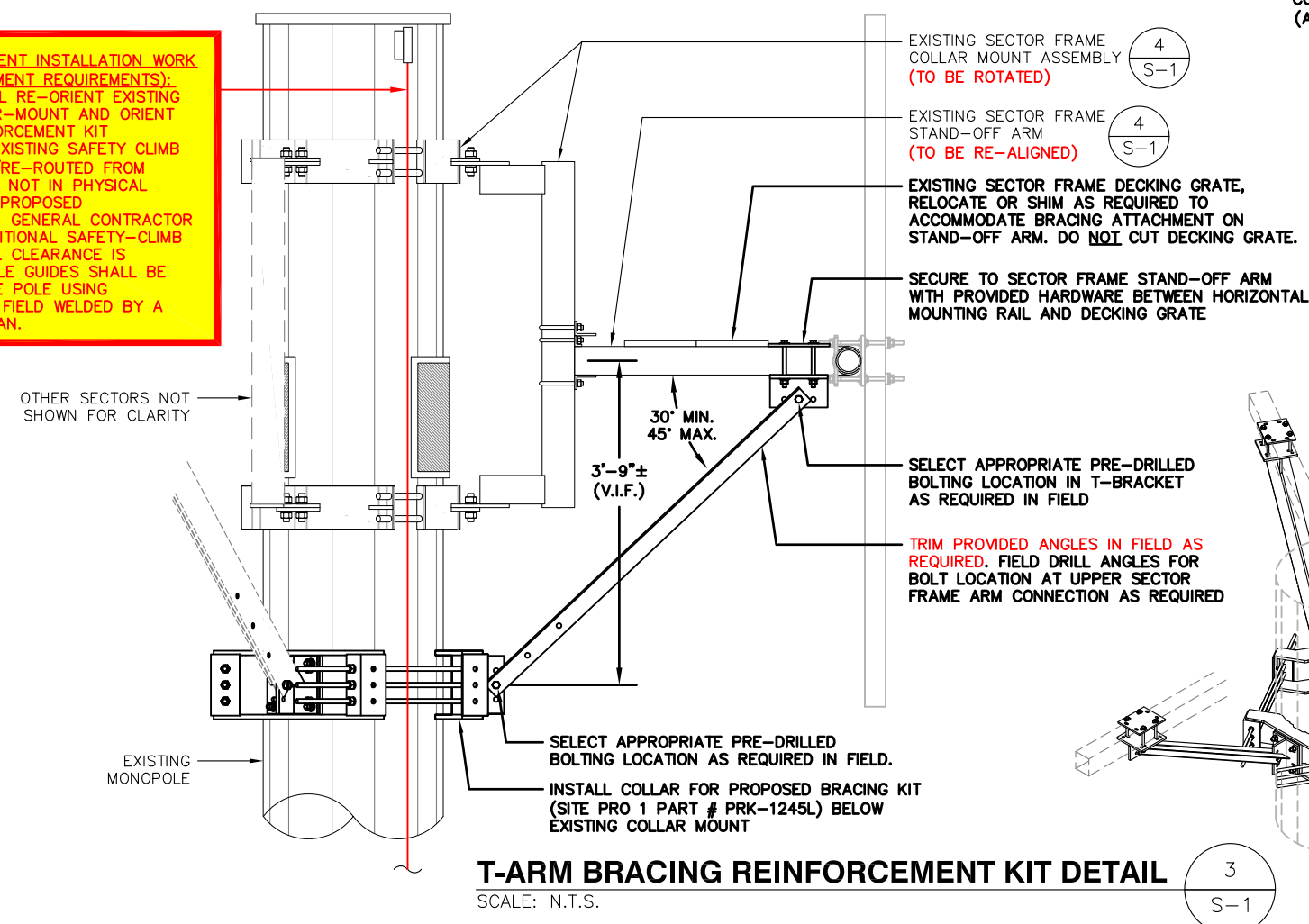
SITE NUMBER:  
CT11372B  
SITE NAME:  
SBA N BRANFORD EAST  
SITE ADDRESS:  
39 CIRO ROAD  
NORTH BRANFORD, CT 06471

SHEET TITLE  
DETAILS

SHEET NUMBER  
A-3



**SPECIAL TOWER TOP EQUIPMENT INSTALLATION WORK NOTE (SAFETY-CLIMB ALIGNMENT REQUIREMENTS):**  
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STATE OF CONNECTICUT  
THOMAS E. JOHNSON  
No. 28192  
PROFESSIONAL ENGINEER

CHECKED BY: JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

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1	06/20/17	ISSUED FOR CONSTRUCTION	JEB
0	05/15/17	ISSUED FOR REVIEW	TBQ/JEB

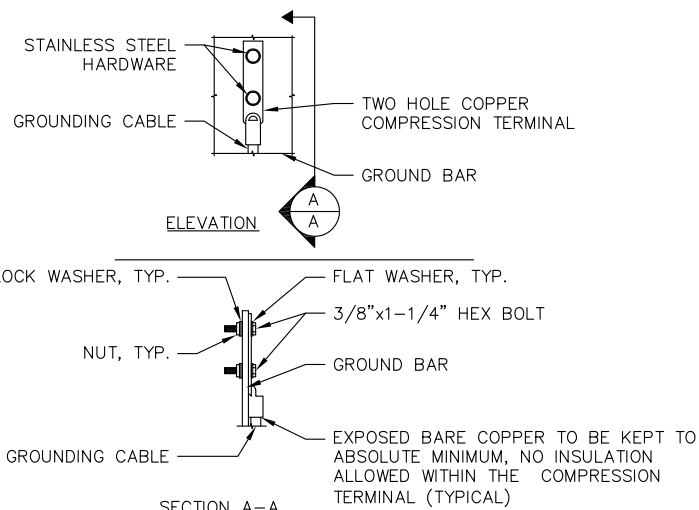
SITE NUMBER:  
CT11372B  
SITE NAME:  
SBA N BRANFORD EAST

SITE ADDRESS:  
39 CIRO ROAD  
NORTH BRANFORD, CT 06471

SHEET TITLE  
DETAILS

SHEET NUMBER  
S-1



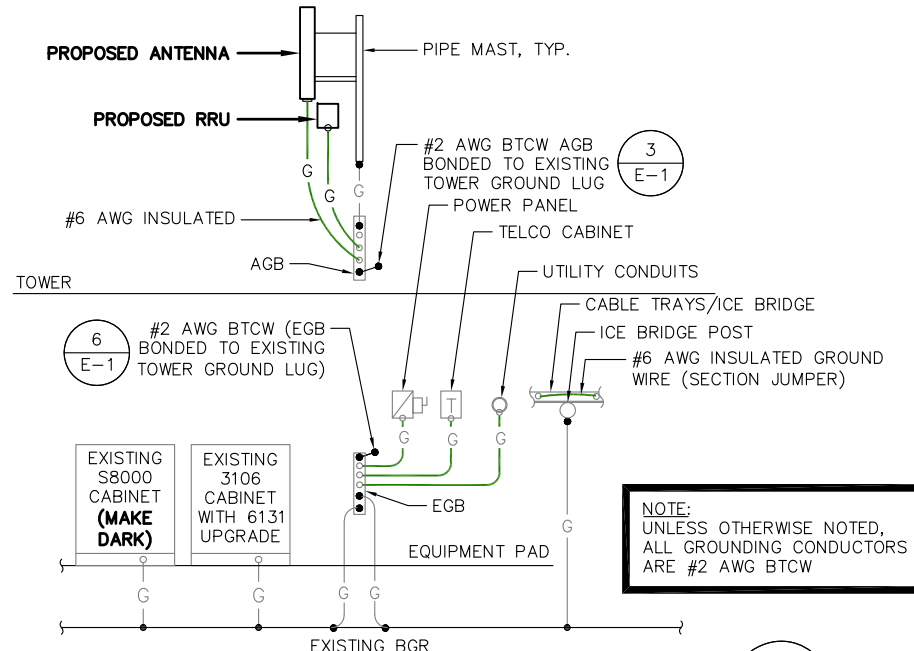


- NOTES:**
- "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
  - OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
  - CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

### TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.

1  
E-1

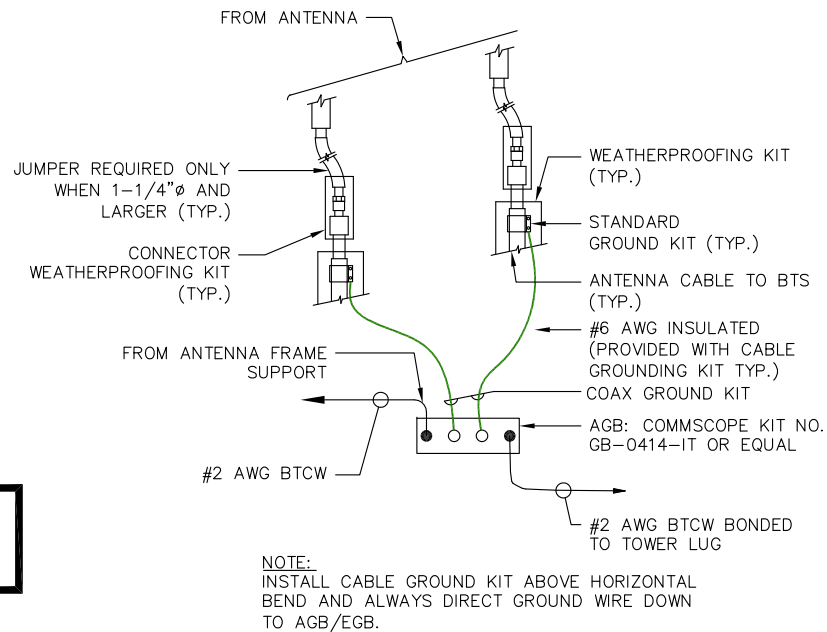


**NOTE:**  
UNLESS OTHERWISE NOTED, ALL GROUNDING CONDUCTORS ARE #2 AWG BTCW

### TYPICAL GROUNDING RISER DIAGRAM

SCALE: N.T.S.

2  
E-1

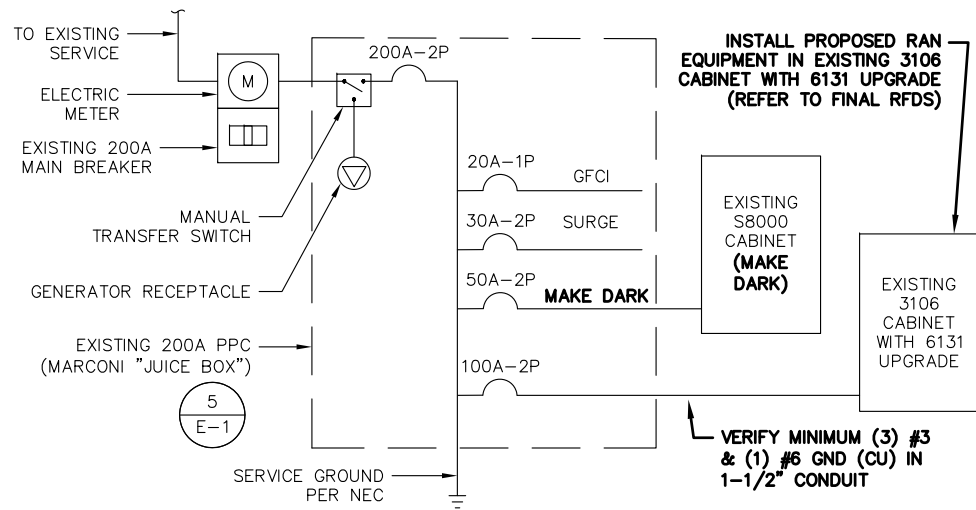


**NOTE:**  
INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB.

### TOWER TOP CABLE GROUNDING DETAIL

SCALE: N.T.S.

3  
E-1



### ONE LINE POWER SCHEMATIC

SCALE: N.T.S.

4  
E-1



IMAGE SOURCE: PROTERRA 05/03/17

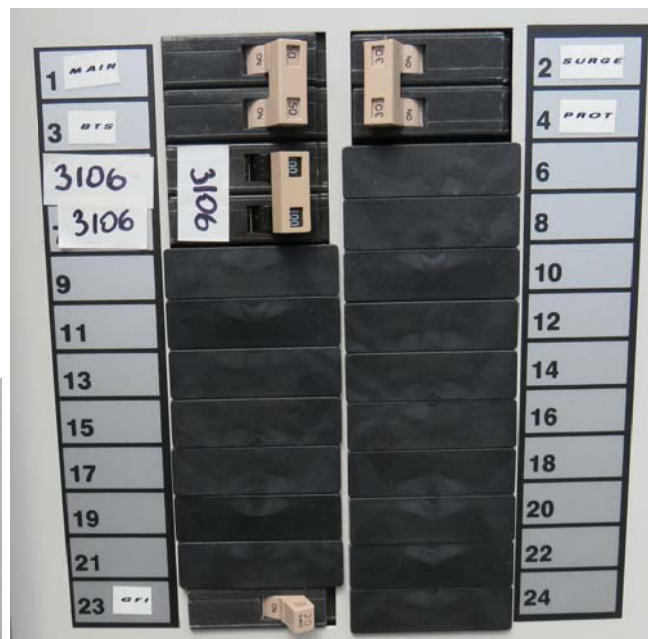
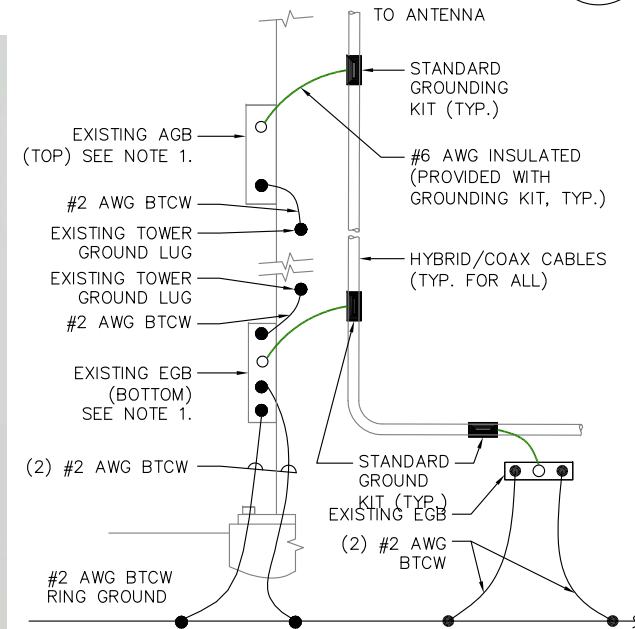


IMAGE SOURCE: PROTERRA 05/03/17

### PHOTO DETAIL: PPC PANEL

SCALE: N.T.S.

5  
E-1



- NOTE:**
- NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION, AND CONNECTION ORIENTATION. PROVIDE ADDITIONAL AGB/EGB AS REQUIRED.
  - A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED

### TOWER BOTTOM CABLE GROUNDING DETAIL

SCALE: N.T.S.

6  
E-1

ELECTRICAL LEGEND	
A	AMPERE
V	VOLT
KWH	KILOWATT - HOUR
C	CONDUIT
GRC	GALVANIZED RIGID CONDUIT
BTCW	BARE TINNED (SOLID) COPPER WIRE (#2 AWG, UNLESS NOTES OTHERWISE)
G	GROUND
MGB	MASTER GROUND BAR
AGB/EGB	EQUIPMENT GROUND BAR/ANTENNA GROUND BAR
C	GROUND COPPER WIRE, SIZE AS NOTED
—	EXPOSED WIRING
—	INSULATED GROUNDING CONDUCTOR (#6 AWG STRANDED, UNLESS NOTED OTHERWISE)
—	5/8"x10" COPPER CLAD STAINLESS STEEL GROUND ROD
—	EXOTHERMIC (CAD WELD) OR MECHANICAL (COMPRESSION TYPE) CONNECTION
PPC	POWER PROTECTION CABINET
⊗	OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL
○	MECHANICAL CONNECTION
●	CADWELD CONNECTION

**CONTRACTOR NOTE:**  
G.C. TO VERIFY THAT THE EXISTING CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSED LOADING IN ACCORDANCE WITH NEC AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.

### ELECTRICAL & GROUNDING NOTES:

- ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) 2014 AS WELL AS APPLICABLE STATE AND LOCAL CODES.
- ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
- THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATIONS INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
- GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
- ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
- RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
- ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHN INSULATION AS REQUIRED BY NEC.
- RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE POWER PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
- RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON DRAWING A-1. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
- ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
- GROUNDING SHALL COMPLY WITH NEC ART. 250.
- GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
- USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
- ALL GROUND CONNECTIONS TO BE BURNDY HYDROGEN COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
- ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
- CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PRODUCERS (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON-SURGING OBJECTS (EGB GROUND IN BTS UNIT).
- CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LYGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
- APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
- BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
- BOND ANTENNA EGB'S AND MGB TO WATER MAIN/GROUND RING.
- TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
- BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
- VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.

**T-Mobile**  
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**ProTerra**  
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Suite 200  
Hadley, MA 01035 Ph: (413)320-4918

STATE OF CONNECTICUT  
THOMAS E. JOHNSON  
No. 28192  
PROFESSIONAL ENGINEER

CHECKED BY: JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
1	06/20/17	ISSUED FOR CONSTRUCTION	JEB
0	05/15/17	ISSUED FOR REVIEW	TBO/EB

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SHEET TITLE  
ONE-LINE DIAGRAM & GROUNDING DETAILS

SHEET NUMBER  
E-1