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

January 31, 2018

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

Notice of Exempt Modification
225 Grist Mill Road, Simsbury, CT 06070
41 52 0.15 N
-72 48 56.78 W
Sprint #: CT70XC140

Dear Ms. Bachman:

Sprint currently maintains antennas at the 150-foot level of the existing 150-foot Monopole Tower at 225 Grist Mill Road in Simsbury, CT. The property is owned by Ensign-Bickford Realty Corporation. The Tower is owned by SBA Towers II LLC. Sprint now intends to add (3) newer technology cell antennas at the 150-foot level of the tower. The proposed full scope of work is as follows below.

Please note: previous approval was given by the Siting Council on 6/23/14 under EM-SPRINT-128-140602. A Notification of Construction Not Complete was sent 9/15/15. Sprint now intends to resume construction. The proposed full scope of work is as follows:

Remove: N/A

Remove and Replace: N/A

Install:

- (3) RFS APXVTM14-C-I20 – Panel Antennas
- (3) Alcatel Lucent TD-RRH8x20-25
- (1) 1-1/4" fiber

*At ground level: *No change to compound area or size / work on existing pad in leased area*

- (1) equipment cabinet on existing pad

Existing Equipment to Remain (Including entitlements):

- (3) RFS APXVSPP18-C-A20 – Panel Antennas
- (3) Alcatel Lucent 1900 MHz
- (6) Alcatel Lucent 800 MHz
- (4) RFS ACU-A20-N RETs
- (3) 1-1/4" fiber

This facility was originally approved by the Council on 11/7/01 under Docket 203. Approval was given for a monopole no taller than necessary to provide proposed telecom services sufficient to accommodate the antennas of the Town, carriers and other entities public and private. A recalculated EMF report was to be produced when circumstances in operation caused a change in power density. A D&M plan was to be produced and shared space given for fair consideration. Upon the establishment of any applicable new State or Federal radio frequency standards, the facility was to be brought into compliance. Obsolete antennas were to be removed within 60 days and any modifications/collocations were to go through the CSC for review. The original approved height was 130', unless a sufficient number of carriers committed to the placement of antennas when no space existed below 130', and, if approved by Petition to the Council. A Staff Report dated 5/21/2002 shows such Petition regarding Docket 203 and an approved extension of tower height from 130' to 150'. This modification complies with all aforementioned conditions.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16.50j-72(b)(2). In accordance with R.C.S.A. § 16.50j-73, a copy of this letter is being sent to the Town of Simsbury's First Selectman, Eric Wellman and Director of Planning and Community Development, James D. Rabbitt, as well as to the Property Owner. (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.

For the foregoing reasons, Sprint 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
kpelletier@sbasite.com
Attachments
cc: Eric Wellman, First Selectman / with attachments
Town of Simsbury, 933 Hopmeadow Street, Simsbury CT 06070
James D. Rabbitt, Director of Planning and Community Development / with attachments
Town of Simsbury, 933 Hopmeadow Street, Simsbury CT 06070
Ensign-Bickford Realty Corporation / with attachments
For FedEx Delivery: 125 Powder Forest Drive, Simsbury, CT 06070

POWER DENSITY

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	**123 feet**	Height (AGL):	**123 feet**	Height (AGL):	**123 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	7,537.38	ERP (W):	7,537.38	ERP (W):	7,537.38
Antenna A1 MPE%	**2.25 %**	Antenna B1 MPE%	**2.25 %**	Antenna C1 MPE%	**2.25 %**
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVTM14-C-120	Make / Model:	RFS APXVTM14-C-120	Make / Model:	RFS APXVTM14-C-120
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**123 feet**	Height (AGL):	**123 feet**	Height (AGL):	**123 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**1.63 %**	Antenna B2 MPE%	**1.63 %**	Antenna C2 MPE%	**1.63 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**3.88 %**
AT&T	3.47 %
Verizon Wireless	3.63 %
T-Mobile	4.06 %
Nextel	0.52 %
Site Total MPE %:	**15.56 %**

SPRINT Sector A Total:	3.88 %
SPRINT Sector B Total:	3.88 %
SPRINT Sector C Total:	3.88 %
Site Total:	15.56 %

SPRINT _ Max Values per Frequency Band / Technology Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	437.55	123	1.15	850 MHz	567	0.20%
Sprint 850 MHz LTE	2	437.55	123	2.30	850 MHz	567	0.41%
Sprint 1900 MHz (PCS) CDMA	5	622.47	123	8.17	1900 MHz (PCS)	1000	0.82%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	123	8.17	1900 MHz (PCS)	1000	0.82%
Sprint 2500 MHz (BRS) LTE	8	778.09	123	16.35	2500 MHz (BRS)	1000	1.63%
						Total:	**3.88%**

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

SHIP DATE: 31JAN18
ACTWGT: 1.00 LB
CAD: 105843304/INET3980

BILL SENDER

TO **ERIC WELLMAN, FIRST SELECTMAN**
TOWN OF SIMSBURY
933 HOPMEADOW STREET

SIMSBURY CT 06070
(508) 251-0720 X 3804 REF: 10-56-92009-6089
INV:
PO: DEPT:

552J1/122D/DCA5

J181118012601uv

THU - 01 FEB 10:30A
PRIORITY OVERNIGHT

TRK# **7713 7254 1790**
0201

EB MPEA

06070
CT-US **BDL**

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Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

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

SHIP DATE: 31JAN18
ACTWGT: 1.00 LB
CAD: 105843304/INET3980

BILL SENDER

TO **JAMES D. RABBITT, DIR OF PLANNING**
TOWN OF SIMSBURY
OFFICE OF PLANNING & COMMUNITY DEV.
933 HOPMEADOW STREET

SIMSBURY CT 06070
(508) 251-0720 X 3804 REF: 10-56-92009-6089
INV:
PO: DEPT:

552J1/122D/DCA5

FedEx Express

J181118012601uv

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PRIORITY OVERNIGHT

TRK# 0201 **7713 7256 6923**

EB MPEA

06070
CT-US **BDL**

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

SHIP DATE: 31JAN18
ACTWGT: 1.00 LB
CAD: 105843304/INET3980

BILL SENDER

TO MANAGER RE: TELECOM FACILITY
ENSIGN-BICKFORD REALTY CORP.
125 POWDER FOREST DRIVE

SIMSBURY CT 06070
(508) 251-0720 X 3804

REF: 10-56-92009-6089
INV:
PO:
DEPT:

552J1/122D/DCA5

J1811180126olurv

FedEx Express

TRK# 0201 7713 7259 6694

THU - 01 FEB 10:30A
PRIORITY OVERNIGHT

EB MPEA

06070
CT-US BDL

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SBA Network Services, LLC

To: CONNECTICUT SITING COUNCIL 129986

Check Number: 2125749
Date: 10/17/2017

Invoice Number	Invoice Date	Description	Gross Amount	Taxes Withheld	Net Amount
PRSF10171713	10/18/2017	CSC Fee_~~CT33XC544_Do~~ Macro	$ 625.00	$ 0.00	$ 625.00

CT740XC140

$ 625.00	$ 0.00	$ 625.00

SBA Network Services, LLC
8051 Congress Avenue
Boca Raton, FL 33487
(561) 995-7670

Wells Fargo Bank **2125749**

061209756 129986

DATE	AMOUNT
10/17/2017	$ 625.00

Void After 120 Days

Six Hundred Twenty Five Dollars And 00 Cents

Pay to the Order of:

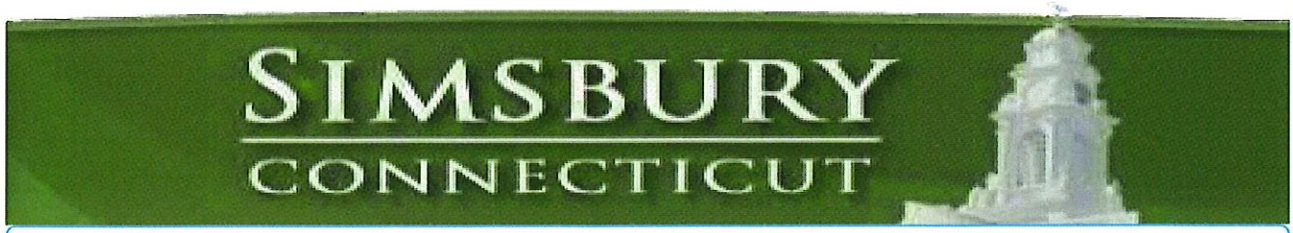
CONNECTICUT SITING COUNCIL
ACCOUNTS RECEIVABLE
TEN FRANKLIN SQUARE

NEW BRITAIN, CT 06051

Brian Lazarus

⑈2125749⑈ ⑆061209756⑆ 2079900424566⑈

The values and data are for the 2017 Revaluation Grand List. Assessments are 70% of the estimated market value of the property as of October 1, 2017. If you believe the value is incorrect, you can make an appointment for an informal hearing by calling Municipal Valuation Services, LLC at (203) 292-5500 or on line at www.munival.com/Simsbury (http://www.munival.com/Simsbury). Please do not call the Assessor's Office for a hearing.



Information on the Property Records for the Municipality of Simsbury Reval was last updated on 1/12/2018.

Parcel Information

Location:	225 GRIST MILL ROAD	Property Use:	Vacant Land	Primary Use:	Commercial Vacant Land
Unique ID:	30569027	Map Block Lot:	F11 103 005	Acres:	0.23
490 Acres:	0.00	Zone:	I-2	Volume / Page:	0294/0600
Developers Map / Lot:		Census:			

Value Information

	Appraised Value	70% Assessed Value

	Appraised Value	70% Assessed Value
Land	490,188	343,130
Buildings	0	0
Detached Outbuildings	120,000	84,000
Total	610,188	427,130

Owner's Information

Owner's Data
ENSIGN-BICKFORD REALTY CORPORATION P O BOX 711 SIMSBURY, CT 06070

Detached Outbuildings

Type:	Year Built:	Length:	Width:	Area:
Cell Tower Tower	0000			1

Owner History - Sales

Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
ENSIGN-BICKFORD REALTY CORPORATION	0294	0600	11/25/1985		No	$0

For FedEx: 125 Powder Forest Dr. Simsbury, CT 06070

Information Published With Permission From The Assessor

EBI Consulting
environmental | engineering | due diligence

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

SPRINT Existing Facility

Site ID: CT70XC140

NESM Tower
100 Grist Mill Road
Simsbury, CT 06070

October 25, 2017

EBI Project Number: 6217004749

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	15.56 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

October 25, 2017

SPRINT
Attn: RF Engineering Manager
1 International Boulevard, Suite 800
Mahwah, NJ 07495

Emissions Analysis for Site: **CT70XC140 – NESM Tower**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **100 Grist Mill Road, Simsbury, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 850 MHz Band is approximately 567 $\mu W/cm^2$. The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) bands is 1000 $\mu W/cm^2$. 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 SPRINT Wireless antenna facility located at **100 Grist Mill Road, Simsbury, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT 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) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.

4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

6) 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.

7) 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.

8) The antennas used in this modeling are the **RFS APXVSPP18-C-A20 and the RFS APXVTM14-C-120** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerlines of the proposed antennas are **123 feet** above ground level (AGL) for **Sector A**, **123 feet** above ground level (AGL) for **Sector B** and **123 feet** above ground level (AGL) for Sector C.

10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	**123 feet**	Height (AGL):	**123 feet**	Height (AGL):	**123 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	7,537.38	ERP (W):	7,537.38	ERP (W):	7,537.38
Antenna A1 MPE%	**2.25 %**	Antenna B1 MPE%	**2.25 %**	Antenna C1 MPE%	**2.25 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-C-120	Make / Model:	RFS APXVTM14-C-120	Make / Model:	RFS APXVTM14-C-120
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**123 feet**	Height (AGL):	**123 feet**	Height (AGL):	**123 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**1.63 %**	Antenna B2 MPE%	**1.63 %**	Antenna C2 MPE%	**1.63 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**3.88 %**
AT&T	3.47 %
Verizon Wireless	3.63 %
T-Mobile	4.06 %
Nextel	0.52 %
Site Total MPE %:	**15.56 %**

SPRINT Sector A Total:	3.88 %
SPRINT Sector B Total:	3.88 %
SPRINT Sector C Total:	3.88 %
Site Total:	15.56 %

SPRINT _ Max Values per Frequency Band / Technology Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	437.55	123	1.15	850 MHz	567	0.20%
Sprint 850 MHz LTE	2	437.55	123	2.30	850 MHz	567	0.41%
Sprint 1900 MHz (PCS) CDMA	5	622.47	123	8.17	1900 MHz (PCS)	1000	0.82%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	123	8.17	1900 MHz (PCS)	1000	0.82%
Sprint 2500 MHz (BRS) LTE	8	778.09	123	16.35	2500 MHz (BRS)	1000	1.63%
						Total:	**3.88%**

Summary

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

The anticipated maximum composite contributions from the SPRINT facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

SPRINT Sector	Power Density Value (%)
Sector A:	3.88 %
Sector B:	3.88 %
Sector C:	3.88 %
SPRINT Maximum Total (per sector):	3.88 %
Site Total:	15.56 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **15.56 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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

Structural Analysis Report

Existing 150 ft. Rohn Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT10022-A

Customer Site Name: Simsbury 2, CT

Carrier Name: Sprint Nextel

Carrier Site ID / Name: CT70XC140 / Simsbury 2, CT

Site Location: 225 Grist Mill Road

Simsbury, Connecticut

Hartford County

Latitude: 41.866708

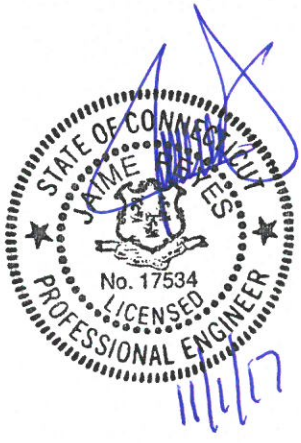
Longitude: -72.815772

Analysis Result:

Max Structural Usage: 84.7% [Pass]

Max Foundation Usage: 64.0% [Pass]

Report Prepared By : Delu Zhou



Introduction

The purpose of this report is to summarize the analysis results on the 150 ft. Rohn Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Rohn Industries, Inc., File No. 50754AE, Drawing No. A020293, dated February 13, 2002
Foundation Drawing	Rohn Industries, Inc., File No. 50754AE, Drawing No. A020294 1-3, dated February 13, 2002
Geotechnical Report	FDH Engineering, Inc., Project No. 15BGSH1600, dated March 19, 2015
Modification Drawings	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.

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} = 120.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 93.0 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 1" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2012 IBC / 2016 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft.
Seismic Parameters:	S_S = 0.179, S_1 = 0.064

Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft.)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	150.0	2	Powerwave P65-17-XLH-RR - Panel	Low Profile Platform	(12) 1 5/8" (2) 1/2" DC (4) 3/8" Fiber (1) 3" Conduit	AT&T
2		1	KMW AM-X-CD-16-65-00T-RET - Panel			
3		3	Kathrein 800 10121 - Panel			
4		2	CCI TPA-65R-LCUUUU-H8 - Panel			
5		1	Quintel QS66512-3 - Panel			
6		6	CCI DTMABP7819VG12A-TMAs			
7		3	Ericsson RRUS-11-RRUs			
8		3	Ericsson RRUS-32-RRHs			
9		3	Ericsson RRUS 32 B2-RRHs			
10		6	CCI TPX-070821-Diplexers			
11		3	CSS DBC-750-Combiners			
12		1	Commscope ABT-DRDM-ADBH-Bias T			
13		1	LMU			
14		2	Raycap DC6-48-60-18-8F-DC			
15	141.0	3	Alcatel Lucent RRH2X60-700 - RRU	Low Profile Platform	(12) 1 5/8" (2) 1 5/8" Hybrid	Verizon
16		3	Alcatel Lucent RRH2X60-AWS - RRU			
17		3	Alcatel Lucent RRH2X60-PCS - RRU			
18		3	Antel BXA-70063-6CF-EDIN-0 - Panel			
19		3	Antel BXA-70080-4CF-EDIN-0 - Panel			
20		6	Commscope SBNHH-1D65B - Panel			
21		2	RFS DB-T1-6Z-8AB-0Z – Distribution Box			
22	131.0	3	Commscope LNX-6515DS - Panel	(3) T-Arms (Site Pro P/N UDS-NPL)	(18) 7/8"	T-Mobile
23		3	Ericsson KRY 144/1			
24		3	Kathrein 782 11056			
25		3	RFS APX16DWV-16DWVS-C - Panel			
26		3	RFS ATM1412D-1A20			
-	123.0	3	Alcatel Lucent 1900 MHz	Low Profile Platform	(4) 1-1/4" Fiber	Sprint Nextel
-		6	Alcatel Lucent 800 MHz			
-		3	Alcatel Lucent TD-RRH8x20-25			
-		4	RFS ACU-A20-N			
-		3	RFS APXVSPP18-C-A20 - Panel			
-		3	RFS APXVTM14-C-I30 - Panel			

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
27	123.0	2	RFS - APXVSPP18-C-A20 - Panel	Low Profile Platform	(4) 1-1/4" Fiber	Sprint Nextel
28		1	RFS - APXVSPP18-C-A20 (50 lb) - Panel			
29		3	RFS - APXVTM14-C-I20 - Panel			
30		4	RFS - ACU-A20-N - RET			
31		3	ALU - TD-RRH8x20-25 - RRU			
32		3	ALU - 1900 MHz RRH			
33		3	ALU - 800 MHz RRH			
34		3	ALU - 800 MHz Filter			

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:	**84.7%**	**73.7%**	**79.2%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	3577.8	32.2	80.4

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

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 1.1038 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

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

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC.** Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.

2. The analysis is based on the presumption that the tower members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.

3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion.

4. An initial tension of 10% of the break strength on all the existing guy wires was assumed in all the structural analyses of guyed towers unless different values were provided by the client. **TES** cannot take responsibility for the deviations in the analysis results because of differences in the initial tension forces of the existing guy wires.

5. Secondary component or connection secondary components, welds and bolts are assumed to be able to carry their intended original design loads. **TES** cannot take responsibility for verification of the adequacy on the connections, bolts and welds present in the structure.

6. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

7. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.

8. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.

9. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

Usage Diagram - Max Ratio 84.73% at 0.0ft

Structure:	CT10022-A-SBA	**Code:**	EIA/TIA-222-G	11/1/2017	
Site Name:	Simsbury 2, CT	**Exposure:**	C		
Height:	150.00 (ft)	**Gh:**	1.1		
Base Elev:	0.000 (ft)			Page: 1	

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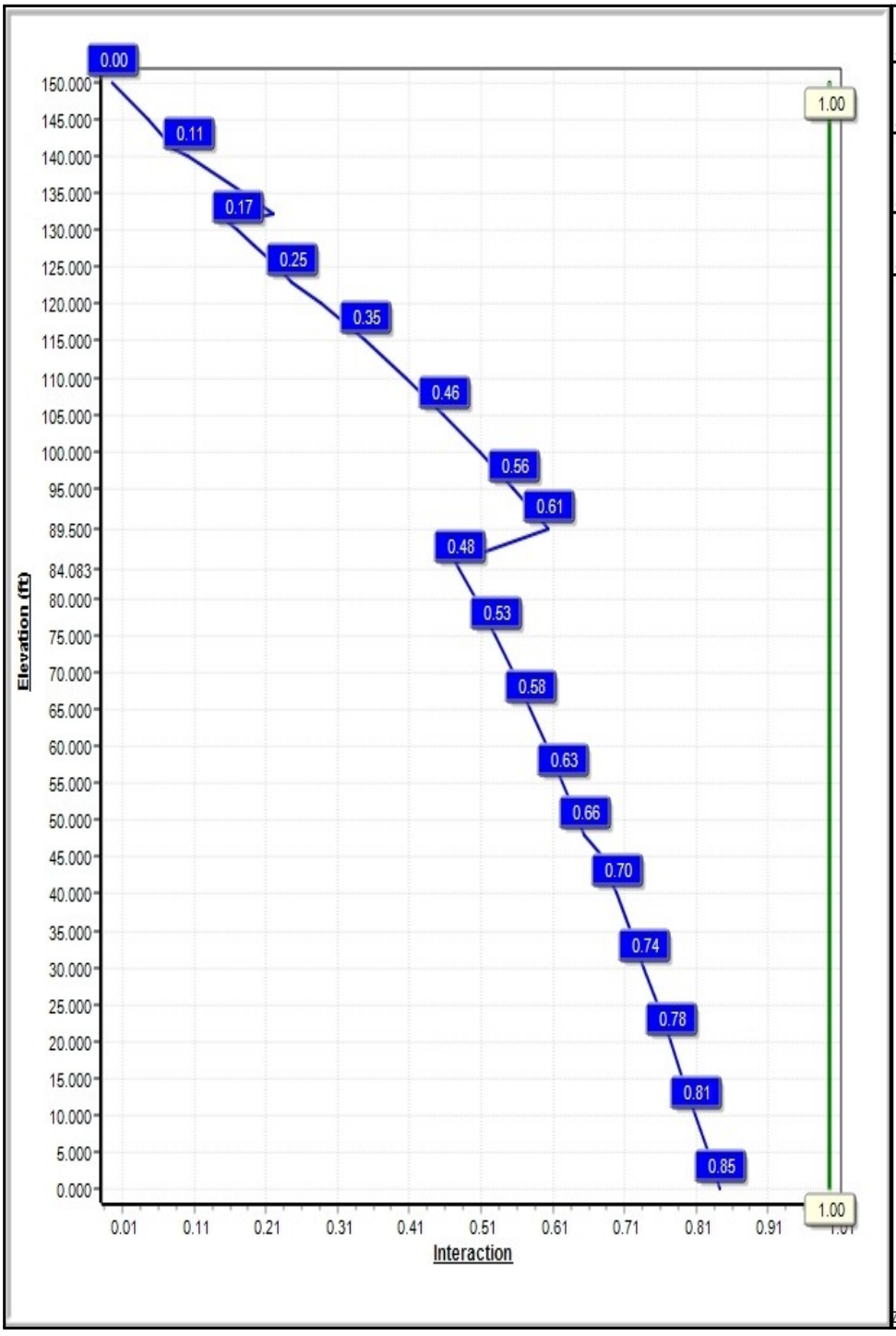
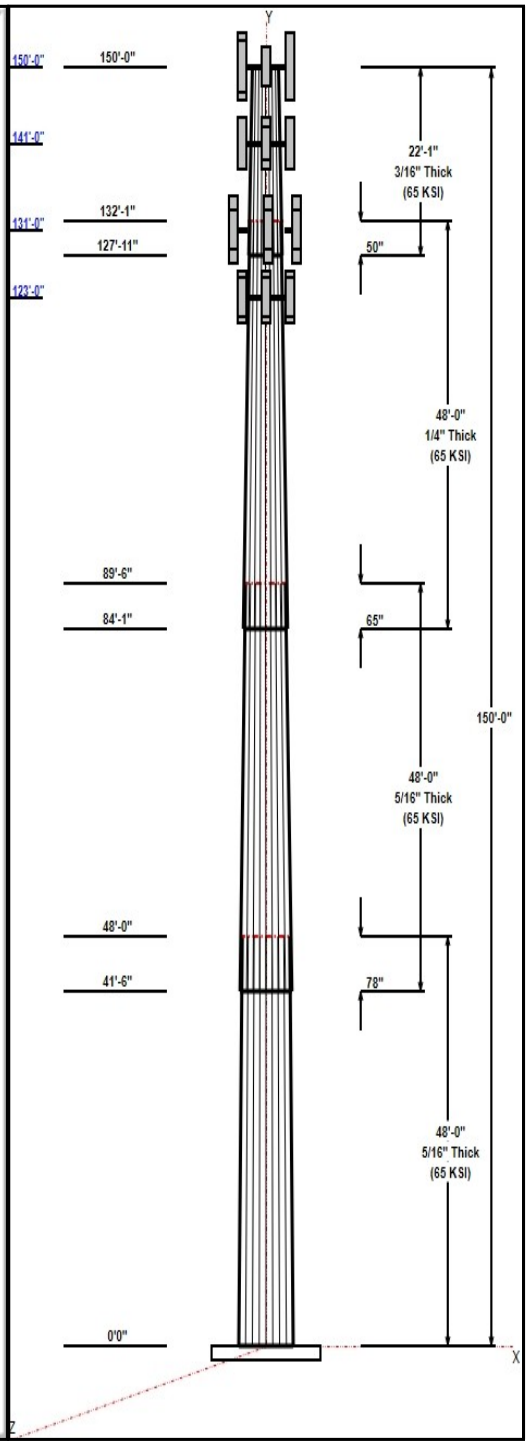
Dead Load Factor:	1.20	**Iterations:**	23
Wind Load Factor:	1.60		

Load Case : 1.2D + 1.6W 93 mph Wind





Structure: CT10022-A-SBA

Type: Tapered
Site Name: Simsbury 2, CT
Height: 150.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.23136

11/1/2017

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Shaft Properties

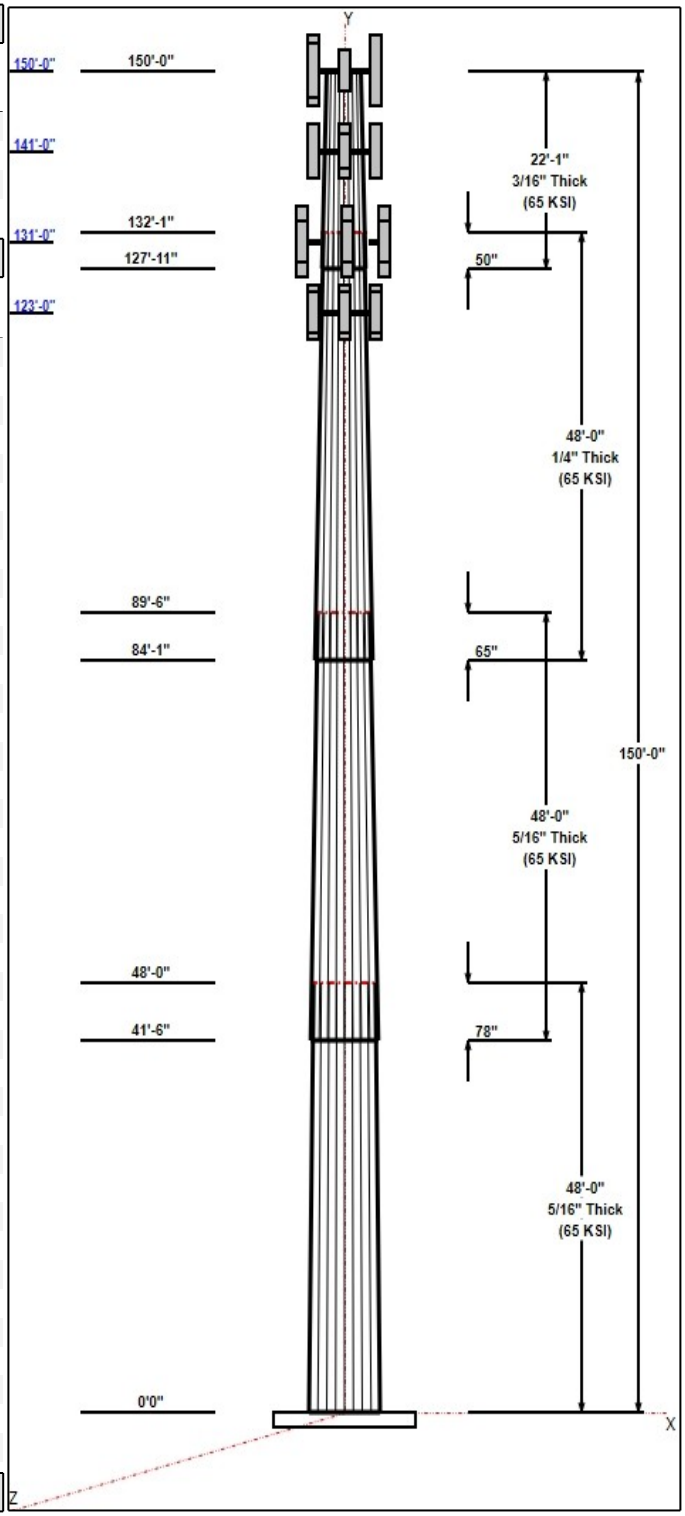
Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	48.00	50.39	61.50	0.313		0.23136	65
2	48.00	41.42	52.52	0.313	Slip	0.23136	65
3	48.00	32.07	43.17	0.250	Slip	0.23136	65
4	22.08	28.30	33.41	0.188	Slip	0.23136	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
150.00	150.00	1	KMW	AT&T
150.00	150.00	2	Powerwave	AT&T
150.00	150.00	3	Kathrein 800 10121	AT&T
150.00	150.00	6	CCI	AT&T
150.00	150.00	3	Ericsson RRUS-11-RRUs	AT&T
150.00	150.00	1	Commscope	AT&T
150.00	150.00	3	CSS DBC-750-Combiners	AT&T
150.00	149.00	1	Low Profile Platform	AT&T
150.00	151.00	2	Raycap	AT&T
150.00	150.00	2	CCI	AT&T
150.00	150.00	1	Quintel QS66512-3	AT&T
150.00	150.00	6	CCI TPX-070821-Diplexers	AT&T
150.00	150.00	3	Ericsson RRUS-32-RRHs	AT&T
150.00	150.00	3	Ericsson RRUS 32	AT&T
150.00	150.00	1	LMU	AT&T
141.00	141.00	3	Antel	Verizon
141.00	141.00	6	Commscope	Verizon
141.00	141.00	3	Antel	Verizon
141.00	141.00	3	Alcatel Lucent	Verizon
141.00	141.00	3	Alcatel Lucent	Verizon
141.00	141.00	3	Alcatel Lucent	Verizon
141.00	141.00	1	RFS DB-T1-6Z-8AB-0Z	Verizon
141.00	141.00	1	Low Profile Platform	Verizon
141.00	141.00	1	RFS DB-T1-6Z-8AB-0Z	Verizon
131.00	131.00	3	RFS	T-Mobile
131.00	131.00	3	Commscope LNX-6515DS	T-Mobile
131.00	131.00	3	RFS ATM1412D-1A20	T-Mobile
131.00	131.00	3	Ericsson KRY 144/1	T-Mobile
131.00	131.00	3	Kathrein 782 11056	T-Mobile
131.00	131.00	3	T-Arms (Site Pro P/N	T-Mobile
123.00	123.00	3	APXVTM14-C-I20	Sprint Nextel
123.00	123.00	2	APXVSPP18-C-A20	Sprint Nextel
123.00	123.00	3	ALU - TD-RRH8x20-25 -	Sprint Nextel
123.00	123.00	3	ALU - 1900 MHz RRH	Sprint Nextel
123.00	123.00	3	ALU - 800 MHz RRH	Sprint Nextel
123.00	123.00	1	APXVSPP18-C-A20	Sprint Nextel
123.00	123.00	3	ALU - 800 MHz Filter	Sprint Nextel
123.00	123.00	4	RFS - ACU-A20-N - RET	Sprint Nextel
123.00	123.00	1	Low Profile Platform	Sprint Nextel

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	150.00	Inside	1 5/8" Coax	AT&T
0.00	150.00	Inside	1/2" DC	AT&T
0.00	150.00	Inside	3" Conduit	AT&T



0.00	150.00	Inside	3/8" Fiber	AT&T
0.00	141.00	Inside	1 5/8" Coax	Verizon
0.00	141.00	Inside	1 5/8" Hybrid	Verizon
0.00	131.00	Inside	7/8" Coax	T-Mobile
0.00	123.00	Inside	1-1/4" Fiber	Sprint Nextel

Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
14	2.25" 18J	75.0	Radial

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.0000	73.5	50.0	Round

Reactions

Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 93 mph Wind	3577.8	32.2	45.3
0.9D + 1.6W 93 mph Wind	3545.0	32.2	34.0
1.2D + 1.0Di + 1.0Wi 50 mph Wind	1214.8	10.7	80.4
1.2D + 1.0E	248.4	2.0	45.3
0.9D + 1.0E	246.0	2.0	34.0
1.0D + 1.0W 60 mph Wind	925.9	8.4	37.8

Structure: CT10022-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Simsbury 2, CT
Height: 150.00 (ft)

11/1/2017

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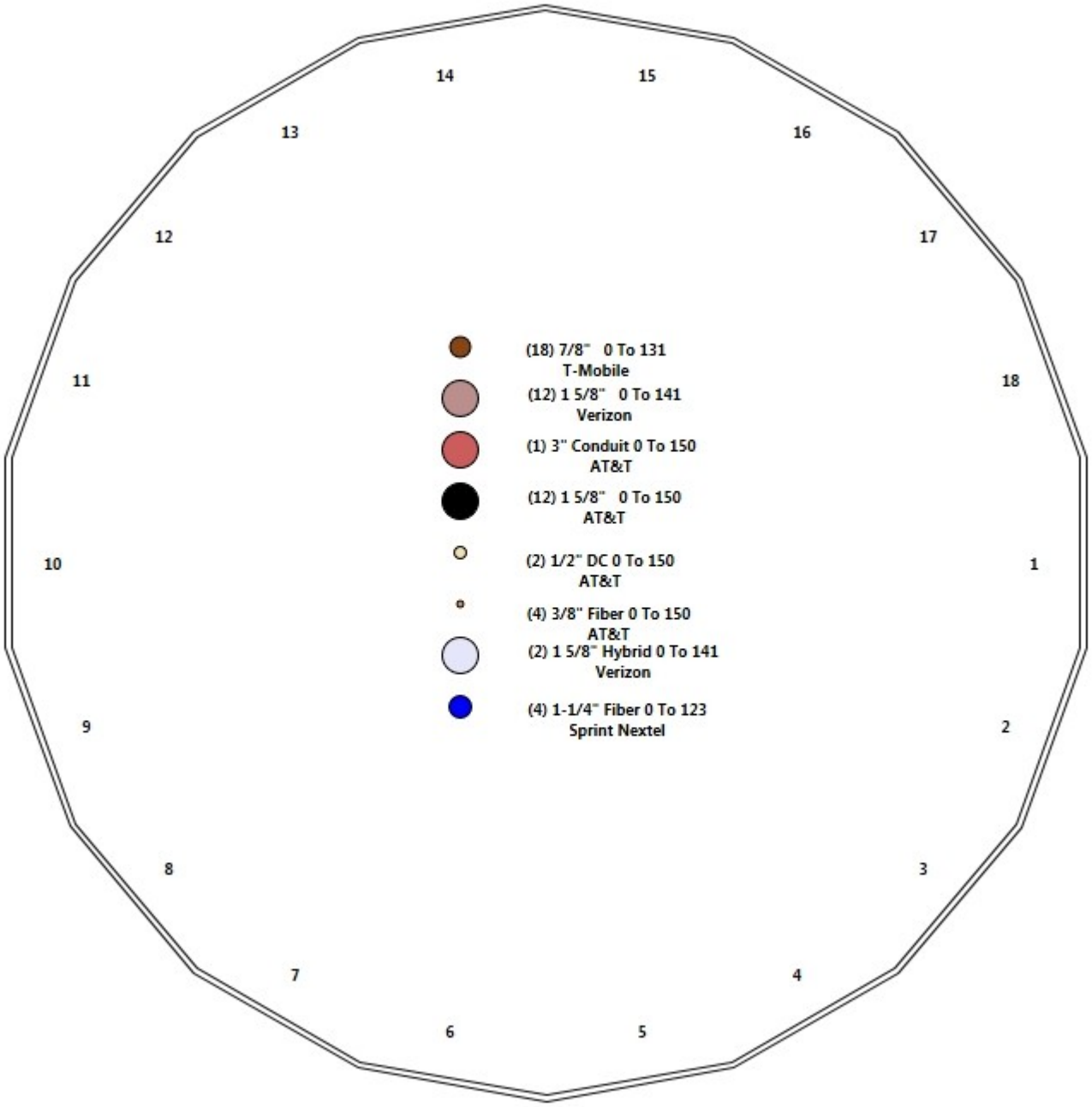

Shaft Properties

Structure:	CT10022-A-SBA		**Code:**	EIA/TIA-222-G	11/1/2017
Site Name:	Simsbury 2, CT		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	48.000	0.3125	65		0.00	9,013
2	18	48.000	0.3125	65	Slip	78.00	7,559
3	18	48.000	0.2500	65	Slip	65.00	4,843
4	18	22.083	0.1875	65	Slip	50.00	1,371
					Total Shaft Weight:		**22,786**

	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	61.50	0.00	60.69	28706.65	33.29	196.80	50.39	48.00	49.67	15741.4	27.02	161.2	0.231360
2	52.52	41.50	51.78	17835.36	28.23	168.08	41.42	89.50	40.77	8703.68	21.96	132.5	0.231360
3	43.17	84.08	34.06	7926.99	29.04	172.69	32.07	132.08	25.25	3228.71	21.21	128.2	0.231360
4	33.41	127.9	19.77	2755.84	30.00	178.16	28.30	150.00	16.73	1669.78	25.20	150.9	0.231360

Load Summary

Structure:	CT10022-A-SBA		**Code:**	EIA/TIA-222-G	11/1/2017
Site Name:	Simsbury 2, CT		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 6

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Discrete Appurtenances

				No Ice			Ice				
No.	Elev (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	150.00	KMW AM-X-CD-16-65-00T-RET	1	70.50	8.02	0.87	385.02	11.745	0.90	0.00	0.00
2	150.00	Powerwave P65-17-XLH-RR	2	88.30	11.44	0.88	520.53	15.752	0.92	0.00	0.00
3	150.00	Kathrein 800 10121	3	62.40	5.15	0.90	279.10	7.959	0.92	0.00	0.00
4	150.00	CCI DTMABP7819VG12A-TMAs	6	19.20	1.14	0.67	53.23	2.166	0.70	0.00	0.00
5	150.00	Ericsson RRUS-11-RRUs	3	55.00	2.52	0.67	158.92	3.364	1.00	0.00	0.00
6	150.00	Commscope ABT-DRDM-ADBH-Bias	1	1.10	0.05	0.67	4.07	0.307	1.00	0.00	0.00
7	150.00	CSS DBC-750-Combiners	3	4.80	0.51	0.67	17.69	1.216	1.00	0.00	0.00
8	150.00	Low Profile Platform	1	1500.00	22.00	1.00	3245.22	45.549	1.00	0.00	-1.00
9	150.00	Raycap DC6-48-60-18-8F-DC Surge	2	32.80	1.47	0.67	117.83	2.403	1.00	0.00	1.00
10	150.00	CCI TPA-65R-LCUUUU-H8	2	75.00	13.43	0.79	641.29	18.405	0.84	0.00	0.00
11	150.00	Quintel QS66512-3	1	105.00	8.13	0.90	425.90	9.900	0.96	0.00	0.00
12	150.00	CCI TPX-070821-Diplexers	6	3.30	0.43	0.67	15.18	1.122	0.75	0.00	0.00
13	150.00	Ericsson RRUS-32-RRHs	3	77.00	3.87	0.67	239.13	4.396	1.00	0.00	0.00
14	150.00	Ericsson RRUS 32 B2-RRHs	3	53.00	2.74	0.67	179.89	3.737	1.00	0.00	0.00
15	150.00	LMU	1	28.00	0.88	0.67	100.43	1.765	1.00	0.00	0.00
16	141.00	Antel BXA-70080-4CF-EDIN-0	3	30.30	3.56	1.02	325.95	6.007	1.04	0.00	0.00
17	141.00	Commscope SBNHH-1D65B	6	72.70	8.08	0.91	356.08	9.802	0.93	0.00	0.00
18	141.00	Antel BXA-70063-6CF-EDIN-0	3	39.00	7.57	0.86	286.06	9.279	0.89	0.00	0.00
19	141.00	Alcatel Lucent RRH2X60-AWS	3	60.00	3.50	0.50	175.67	4.546	0.79	0.00	0.00
20	141.00	Alcatel Lucent RRH2X60-PCS	3	55.00	1.51	0.90	175.77	3.068	0.90	0.00	0.00
21	141.00	Alcatel Lucent RRH2X60-700	3	60.00	3.50	0.50	175.67	4.546	0.79	0.00	0.00
22	141.00	RFS DB-T1-6Z-8AB-0Z	1	21.40	4.10	0.96	178.58	5.162	0.99	0.00	0.00
23	141.00	Low Profile Platform	1	1500.00	22.00	1.00	3234.45	45.404	1.00	0.00	0.00
24	141.00	RFS DB-T1-6Z-8AB-0Z	1	21.40	4.10	0.96	178.58	5.162	0.99	0.00	0.00
25	131.00	RFS APX16DWV-16DWVS-C	3	62.70	6.46	0.74	295.76	9.313	0.78	0.00	0.00
26	131.00	Commscope LNX-6515DS	3	79.10	11.47	0.92	558.70	15.767	0.95	0.00	0.00
27	131.00	RFS ATM1412D-1A20	3	13.00	1.17	0.73	47.96	2.199	0.76	0.00	0.00
28	131.00	Ericsson KRY 144/1	3	11.00	0.41	0.70	25.18	1.035	0.73	0.00	0.00
29	131.00	Kathrein 782 11056	3	11.00	0.66	0.76	31.75	1.462	0.79	0.00	0.00
30	131.00	T-Arms (Site Pro P/N UDS-NPL)	3	132.00	8.00	0.75	253.21	17.183	1.00	0.00	0.00
31	123.00	APXVTM14-C-I20	3	55.00	6.34	0.85	277.88	7.824	0.88	0.00	0.00
32	123.00	APXVSPP18-C-A20	2	57.00	8.02	0.91	248.19	11.672	0.83	0.00	0.00
33	123.00	ALU - TD-RRH8x20-25 - RRU	3	70.00	4.05	0.69	223.81	5.138	0.75	0.00	0.00
34	123.00	ALU - 1900 MHz RRH	3	60.00	2.71	0.98	165.56	4.362	1.00	0.00	0.00
35	123.00	ALU - 800 MHz RRH	3	53.00	2.49	0.92	149.68	3.985	0.95	0.00	0.00
36	123.00	APXVSPP18-C-A20	1	50.00	8.02	0.91	248.19	11.672	0.83	0.00	0.00
37	123.00	ALU - 800 MHz Filter	3	8.80	0.78	0.67	31.86	1.626	0.67	0.00	0.00
38	123.00	RFS - ACU-A20-N - RET	4	1.00	0.14	0.79	6.62	0.528	0.82	0.00	0.00
39	123.00	Low Profile Platform	1	1500.00	22.00	1.00	3210.92	45.086	1.00	0.00	0.00
		Totals:	**103**	**9,035.10**			**29,066.02**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	150.00	(12) 1 5/8" Coax	0.00	Inside
0.00	150.00	(2) 1/2" DC	0.00	Inside

Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	No Ice CaAa Factor	Ice Weight (lb)	Ice CaAa (sf)	Ice CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
0.00	150.00	(1) 3" Conduit			0.00	Inside					
0.00	150.00	(4) 3/8" Fiber			0.00	Inside					
0.00	141.00	(12) 1 5/8" Coax			0.00	Inside					
0.00	141.00	(2) 1 5/8" Hybrid			0.00	Inside					
0.00	131.00	(18) 7/8" Coax			0.00	Inside					
0.00	123.00	(4) 1-1/4" Fiber			0.00	Inside					

Shaft Section Properties

Structure:	CT10022-A-SBA		**Code:**	EIA/TIA-222-G	11/1/2017
Site Name:	Simsbury 2, CT		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 8

Tower Engineering Solutions

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		0.3125	61.500	60.688	28706.7	33.29	196.80	62.2	919.4	0.0
5.00		0.3125	60.343	59.541	27109.1	32.64	193.10	63.0	884.8	1022.8
10.00		0.3125	59.186	58.393	25571.9	31.99	189.40	63.8	851.0	1003.3
15.00		0.3125	58.030	57.246	24093.9	31.33	185.69	64.5	817.8	983.7
20.00		0.3125	56.873	56.099	22674.1	30.68	181.99	65.3	785.2	964.2
25.00		0.3125	55.716	54.951	21311.1	30.03	178.29	66.1	753.4	944.7
30.00		0.3125	54.559	53.804	20003.9	29.37	174.59	66.9	722.2	925.2
35.00		0.3125	53.402	52.657	18751.2	28.72	170.89	67.6	691.6	905.7
40.00		0.3125	52.246	51.509	17552.0	28.07	167.19	68.4	661.7	886.1
41.50	Bot - Section 2	0.3125	51.899	51.165	17202.5	27.87	166.08	68.6	652.9	262.0
45.00		0.3125	51.089	50.362	16405.0	27.42	163.48	69.2	632.5	1216.5
48.00	Top - Section 1	0.3125	51.020	50.293	16338.2	27.38	163.26	0.0	0.0	1027.5
50.00		0.3125	50.557	49.834	15895.0	27.12	161.78	69.5	619.2	340.7
55.00		0.3125	49.400	48.687	14822.2	26.46	158.08	70.3	591.0	838.1
60.00		0.3125	48.243	47.540	13798.8	25.81	154.38	71.0	563.4	818.6
65.00		0.3125	47.087	46.392	12823.6	25.16	150.68	71.8	536.4	799.1
70.00		0.3125	45.930	45.245	11895.5	24.51	146.98	72.6	510.1	779.6
75.00		0.3125	44.773	44.098	11013.3	23.85	143.27	73.3	484.5	760.0
80.00		0.3125	43.616	42.950	10175.8	23.20	139.57	74.1	459.5	740.5
84.08	Bot - Section 3	0.3125	42.671	42.013	9524.3	22.67	136.55	74.7	439.6	590.3
85.00		0.3125	42.459	41.803	9381.9	22.55	135.87	74.9	435.2	236.7
89.50	Top - Section 2	0.2500	41.918	33.063	7252.7	28.15	167.67	0.0	0.0	1144.8
90.00		0.2500	41.803	32.971	7192.5	28.07	167.21	68.4	338.9	56.2
95.00		0.2500	40.646	32.053	6608.3	27.26	162.58	69.3	320.2	553.2
100.00		0.2500	39.489	31.135	6056.7	26.44	157.96	70.3	302.1	537.5
105.00		0.2500	38.332	30.217	5536.7	25.63	153.33	71.3	284.5	521.9
110.00		0.2500	37.175	29.299	5047.3	24.81	148.70	72.2	267.4	506.3
115.00		0.2500	36.019	28.381	4587.6	23.99	144.07	73.2	250.9	490.7
120.00		0.2500	34.862	27.463	4156.8	23.18	139.45	74.1	234.8	475.1
123.00		0.2500	34.168	26.913	3911.7	22.69	136.67	74.7	225.5	277.5
125.00		0.2500	33.705	26.546	3753.8	22.36	134.82	75.1	219.4	181.9
127.92	Bot - Section 4	0.2500	33.030	26.010	3531.2	21.89	132.12	75.7	210.6	260.8
130.00		0.2500	32.548	25.628	3377.7	21.55	130.19	76.1	204.4	322.2
131.00		0.2500	32.317	25.444	3305.6	21.38	129.27	76.3	201.5	152.9
132.08	Top - Section 3	0.1875	32.441	19.194	2522.8	29.10	173.02	0.0	0.0	164.5
135.00		0.1875	31.766	18.793	2367.8	28.46	169.42	67.9	146.8	188.5
140.00		0.1875	30.610	18.104	2117.0	27.37	163.25	69.2	136.2	313.9
141.00		0.1875	30.378	17.967	2069.0	27.16	162.02	69.5	134.1	61.4
145.00		0.1875	29.453	17.416	1884.5	26.29	157.08	70.5	126.0	240.8
150.00		0.1875	28.296	16.727	1669.8	25.20	150.91	71.8	116.2	290.5
										22785.8

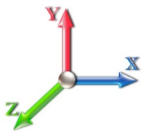
Wind Loading - Shaft

Structure:	CT10022-A-SBA	**Code:**	EIA/TIA-222-G	11/1/2017	
Site Name:	Simsbury 2, CT	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

Load Case: 1.2D + 1.6W 93 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	17.879	19.67	446.21	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	17.879	19.67	437.81	0.650	0.000	5.00	25.776	16.75	527.2	0.0	1227.3
10.00		1.00	0.85	17.879	19.67	429.42	0.650	0.000	5.00	25.286	16.44	517.2	0.0	1203.9
15.00		1.00	0.85	17.879	19.67	421.03	0.650	0.000	5.00	24.797	16.12	507.2	0.0	1180.5
20.00		1.00	0.90	18.971	20.87	425.04	0.650	0.000	5.00	24.307	15.80	527.5	0.0	1157.1
25.00		1.00	0.95	19.883	21.87	426.29	0.650	0.000	5.00	23.818	15.48	541.8	0.0	1133.6
30.00		1.00	0.98	20.661	22.73	425.53	0.650	0.000	5.00	23.328	15.16	551.4	0.0	1110.2
35.00		1.00	1.01	21.343	23.48	423.32	0.650	0.000	5.00	22.839	14.85	557.6	0.0	1086.8
40.00		1.00	1.04	21.951	24.15	420.01	0.650	0.000	5.00	22.350	14.53	561.2	0.0	1063.4
41.50	Bot - Section 2	1.00	1.05	22.122	24.33	418.84	0.650	0.000	1.50	6.609	4.30	167.3	0.0	314.4
45.00		1.00	1.07	22.502	24.75	415.84	0.650	0.000	3.50	15.436	10.03	397.4	0.0	1459.8
48.00	Top - Section 1	1.00	1.08	22.810	25.09	412.98	0.650	0.000	3.00	13.040	8.48	340.3	0.0	1233.0
50.00		1.00	1.09	23.007	25.31	416.10	0.650	0.000	2.00	8.595	5.59	226.2	0.0	408.9
55.00		1.00	1.12	23.473	25.82	410.68	0.650	0.000	5.00	21.146	13.74	567.8	0.0	1005.7
60.00		1.00	1.14	23.907	26.30	404.75	0.650	0.000	5.00	20.656	13.43	564.9	0.0	982.3
65.00		1.00	1.16	24.313	26.74	398.39	0.650	0.000	5.00	20.167	13.11	560.9	0.0	958.9
70.00		1.00	1.17	24.696	27.17	391.64	0.650	0.000	5.00	19.677	12.79	555.9	0.0	935.5
75.00		1.00	1.19	25.057	27.56	384.56	0.650	0.000	5.00	19.188	12.47	550.0	0.0	912.0
80.00		1.00	1.21	25.400	27.94	377.18	0.650	0.000	5.00	18.698	12.15	543.3	0.0	888.6
84.08	Bot - Section 3	1.00	1.22	25.667	28.23	370.95	0.650	0.000	4.08	14.907	9.69	437.7	0.0	708.3
85.00		1.00	1.22	25.726	28.30	369.53	0.650	0.000	0.92	3.340	2.17	98.3	0.0	284.0
89.50	Top - Section 2	1.00	1.24	26.007	28.61	362.43	0.650	0.000	4.50	16.160	10.50	480.8	0.0	1373.8
90.00		1.00	1.24	26.037	28.64	366.01	0.650	0.000	0.50	1.771	1.15	52.8	0.0	67.4
95.00		1.00	1.25	26.336	28.97	357.91	0.650	0.000	5.00	17.442	11.34	525.5	0.0	663.8
100.00		1.00	1.27	26.621	29.28	349.61	0.650	0.000	5.00	16.952	11.02	516.3	0.0	645.0
105.00		1.00	1.28	26.896	29.59	341.11	0.650	0.000	5.00	16.463	10.70	506.6	0.0	626.3
110.00		1.00	1.29	27.161	29.88	332.44	0.650	0.000	5.00	15.973	10.38	496.3	0.0	607.6
115.00		1.00	1.30	27.416	30.16	323.61	0.650	0.000	5.00	15.484	10.06	485.6	0.0	588.8
120.00		1.00	1.32	27.663	30.43	314.62	0.650	0.000	5.00	14.995	9.75	474.5	0.0	570.1
123.00	Appurtenance(s)	1.00	1.32	27.807	30.59	309.16	0.650	0.000	3.00	8.762	5.70	278.7	0.0	333.1
125.00		1.00	1.33	27.902	30.69	305.49	0.650	0.000	2.00	5.743	3.73	183.3	0.0	218.3
127.92	Bot - Section 4	1.00	1.33	28.038	30.84	300.10	0.650	0.000	2.92	8.235	5.35	264.1	0.0	313.0
130.00		1.00	1.34	28.133	30.95	296.23	0.650	0.000	2.08	5.846	3.80	188.2	0.0	386.6
131.00	Appurtenance(s)	1.00	1.34	28.179	31.00	294.36	0.650	0.000	1.00	2.776	1.80	89.5	0.0	183.5
132.08	Top - Section 3	1.00	1.34	28.228	31.05	292.33	0.650	0.000	1.08	2.985	1.94	96.4	0.0	197.4
135.00		1.00	1.35	28.358	31.19	290.26	0.650	0.000	2.92	7.923	5.15	257.0	0.0	226.2
140.00		1.00	1.36	28.576	31.43	280.76	0.650	0.000	5.00	13.195	8.58	431.4	0.0	376.7
141.00	Appurtenance(s)	1.00	1.36	28.619	31.48	278.85	0.650	0.000	1.00	2.580	1.68	84.5	0.0	73.6
145.00		1.00	1.37	28.788	31.67	271.15	0.650	0.000	4.00	10.126	6.58	333.5	0.0	289.0
150.00	Appurtenance(s)	1.00	1.38	28.994	31.89	261.43	0.650	0.000	5.00	12.217	7.94	405.2	0.0	348.5
								Totals:	**150.00**			**15,451.5**		**27,342.9**

Discrete Appurtenance Forces

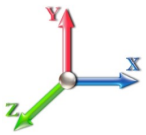
Structure:	CT10022-A-SBA	**Code:**	EIA/TIA-222-G	11/1/2017	
Site Name:	Simsbury 2, CT	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 10	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 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	150.00	CSS DBC-750-Combiners	3	28.994	31.893	0.60	0.90	0.92	17.28	0.000	0.000	47.08	0.00	0.00
2	150.00	KMW	1	28.994	31.893	0.78	0.90	6.26	84.60	0.000	0.000	319.34	0.00	0.00
3	150.00	Powerwave	2	28.994	31.893	0.79	0.90	18.10	211.92	0.000	0.000	923.64	0.00	0.00
4	150.00	Kathrein 800 10121	3	28.994	31.893	0.81	0.90	12.57	224.64	0.000	0.000	641.44	0.00	0.00
5	150.00	CCI	6	28.994	31.893	0.60	0.90	4.12	138.24	0.000	0.000	210.47	0.00	0.00
6	150.00	Ericsson RRUS-11-RRUs	3	28.994	31.893	0.60	0.90	4.56	198.00	0.000	0.000	232.62	0.00	0.00
7	150.00	Commscope	1	28.994	31.893	0.60	0.90	0.03	1.32	0.000	0.000	1.54	0.00	0.00
8	150.00	CCI	6	28.994	31.893	0.60	0.90	1.56	23.76	0.000	0.000	79.39	0.00	0.00
9	150.00	Raycap	2	29.034	31.938	0.60	0.90	1.77	78.72	0.000	1.000	90.59	0.00	90.59
10	150.00	Quintel QS66512-3	1	28.994	31.893	0.81	0.90	6.59	126.00	0.000	0.000	336.04	0.00	0.00
11	150.00	CCI	2	28.994	31.893	0.71	0.90	19.10	180.00	0.000	0.000	974.52	0.00	0.00
12	150.00	Low Profile Platform	1	28.953	31.848	1.00	1.00	22.00	1800.00	0.000	-1.000	1121.06	0.00	-1121.06
13	150.00	LMU	1	28.994	31.893	0.60	0.90	0.53	33.60	0.000	0.000	27.08	0.00	0.00
14	150.00	Ericsson RRUS 32	3	28.994	31.893	0.60	0.90	4.96	190.80	0.000	0.000	252.93	0.00	0.00
15	150.00	Ericsson RRUS-32-RRHs	3	28.994	31.893	0.60	0.90	7.00	277.20	0.000	0.000	357.25	0.00	0.00
16	141.00	RFS DB-T1-6Z-8AB-0Z	1	28.619	31.480	0.77	0.80	3.15	25.68	0.000	0.000	158.60	0.00	0.00
17	141.00	Low Profile Platform	1	28.619	31.480	0.80	0.80	17.60	1800.00	0.000	0.000	886.49	0.00	0.00
18	141.00	RFS DB-T1-6Z-8AB-0Z	1	28.619	31.480	0.77	0.80	3.15	25.68	0.000	0.000	158.60	0.00	0.00
19	141.00	Alcatel Lucent	3	28.619	31.480	0.40	0.80	4.20	216.00	0.000	0.000	211.55	0.00	0.00
20	141.00	Alcatel Lucent	3	28.619	31.480	0.72	0.80	3.26	198.00	0.000	0.000	164.28	0.00	0.00
21	141.00	Antel	3	28.619	31.480	0.69	0.80	15.62	140.40	0.000	0.000	786.98	0.00	0.00
22	141.00	Commscope	6	28.619	31.480	0.73	0.80	35.22	523.44	0.000	0.000	1773.77	0.00	0.00
23	141.00	Antel	3	28.619	31.480	0.82	0.80	8.71	109.08	0.000	0.000	438.96	0.00	0.00
24	141.00	Alcatel Lucent	3	28.619	31.480	0.40	0.80	4.20	216.00	0.000	0.000	211.55	0.00	0.00
25	131.00	RFS ATM1412D-1A20	3	28.179	30.997	0.58	0.80	2.05	46.80	0.000	0.000	101.66	0.00	0.00
26	131.00	Commscope LNX-6515DS	3	28.179	30.997	0.74	0.80	25.30	284.76	0.000	0.000	1254.65	0.00	0.00
27	131.00	RFS	3	28.179	30.997	0.60	0.80	11.55	225.72	0.000	0.000	572.84	0.00	0.00
28	131.00	Kathrein 782 11056	3	28.179	30.997	0.61	0.80	1.20	39.60	0.000	0.000	59.70	0.00	0.00
29	131.00	T-Arms (Site Pro P/N	3	28.179	30.997	0.56	0.75	13.50	475.20	0.000	0.000	669.53	0.00	0.00
30	131.00	Ericsson KRY 144/1	3	28.179	30.997	0.56	0.80	0.69	39.60	0.000	0.000	34.16	0.00	0.00
31	123.00	ALU - 1900 MHz RRH	3	27.807	30.588	0.78	0.80	6.37	216.00	0.000	0.000	311.95	0.00	0.00
32	123.00	APXVTM14-C-I20	3	27.807	30.588	0.68	0.80	12.96	198.00	0.000	0.000	634.47	0.00	0.00
33	123.00	APXVSPP18-C-A20	2	27.807	30.588	0.72	0.80	11.63	136.80	0.000	0.000	568.98	0.00	0.00
34	123.00	ALU - TD-RRH8x20-25 -	3	27.807	30.588	0.55	0.80	6.71	252.00	0.000	0.000	328.24	0.00	0.00
35	123.00	Low Profile Platform	1	27.807	30.588	1.00	1.00	22.00	1800.00	0.000	0.000	1076.70	0.00	0.00
36	123.00	ALU - 800 MHz RRH	3	27.807	30.588	0.74	0.80	5.50	190.80	0.000	0.000	269.07	0.00	0.00
37	123.00	RFS - ACU-A20-N - RET	4	27.807	30.588	0.63	0.80	0.35	4.80	0.000	0.000	17.32	0.00	0.00
38	123.00	APXVSPP18-C-A20	1	27.807	30.588	0.72	0.80	5.81	60.00	0.000	0.000	284.49	0.00	0.00
39	123.00	ALU - 800 MHz Filter	3	27.807	30.588	0.54	0.80	1.25	31.68	0.000	0.000	61.38	0.00	0.00
							Totals:		**10,842.12**			**16,650.92**		

Total Applied Force Summary

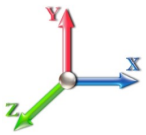
Structure:	CT10022-A-SBA		**Code:**	EIA/TIA-222-G	11/1/2017
Site Name:	Simsbury 2, CT		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 11

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 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		527.21	1482.37	0.00	0.00
10.00		517.20	1458.95	0.00	0.00
15.00		507.19	1435.52	0.00	0.00
20.00		527.53	1412.10	0.00	0.00
25.00		541.77	1388.67	0.00	0.00
30.00		551.40	1365.25	0.00	0.00
35.00		557.63	1341.82	0.00	0.00
40.00		561.24	1318.40	0.00	0.00
41.50		167.27	390.95	0.00	0.00
45.00		397.36	1638.37	0.00	0.00
48.00		340.27	1386.05	0.00	0.00
50.00		226.23	510.87	0.00	0.00
55.00		567.83	1260.78	0.00	0.00
60.00		564.94	1237.35	0.00	0.00
65.00		560.93	1213.93	0.00	0.00
70.00		555.92	1190.50	0.00	0.00
75.00		550.03	1167.08	0.00	0.00
80.00		543.33	1143.65	0.00	0.00
84.08		437.73	916.60	0.00	0.00
85.00		98.31	330.78	0.00	0.00
89.50		480.79	1603.29	0.00	0.00
90.00		52.76	92.91	0.00	0.00
95.00		525.48	918.82	0.00	0.00
100.00		516.28	900.08	0.00	0.00
105.00		506.55	881.34	0.00	0.00
110.00		496.33	862.60	0.00	0.00
115.00		485.65	843.86	0.00	0.00
120.00		474.53	825.12	0.00	0.00
123.00	(23) attachments	3831.33	3376.16	0.00	0.00
125.00		183.33	311.14	0.00	0.00
127.92		264.15	448.38	0.00	0.00
130.00		188.17	483.31	0.00	0.00
131.00	(18) attachments	2782.04	1341.65	0.00	0.00
132.08		96.41	235.48	0.00	0.00
135.00		257.04	328.86	0.00	0.00
140.00		431.37	552.64	0.00	0.00
141.00	(24) attachments	4875.26	3363.12	0.00	0.00
145.00		333.47	359.28	0.00	0.00
150.00	(38) attachments	6020.20	4022.53	0.00	-1030.47
	Totals:	**32,102.43**	**45,340.55**	**0.00**	**-1,030.47**

Calculated Forces

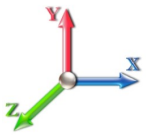
Structure:	CT10022-A-SBA	**Code:**	EIA/TIA-222-G	11/1/2017	
Site Name:	Simsbury 2, CT	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 23

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	-45.29	-32.17	0.00	-3577.7	0.00	3577.78	3399.80	1699.90	8571.22	4291.98	0.00	0.000	0.000	0.847
5.00	-43.71	-31.78	0.00	-3416.9	0.00	3416.93	3376.67	1688.33	8351.12	4181.77	0.09	-0.173	0.000	0.830
10.00	-42.16	-31.38	0.00	-3258.0	0.00	3258.05	3351.94	1675.97	8129.40	4070.74	0.37	-0.348	0.000	0.813
15.00	-40.63	-30.99	0.00	-3101.1	0.00	3101.14	3325.63	1662.82	7906.28	3959.02	0.83	-0.525	0.000	0.796
20.00	-39.13	-30.57	0.00	-2946.2	0.00	2946.20	3297.74	1648.87	7681.99	3846.70	1.48	-0.704	0.000	0.778
25.00	-37.65	-30.13	0.00	-2793.3	0.00	2793.35	3268.26	1634.13	7456.75	3733.92	2.31	-0.884	0.000	0.760
30.00	-36.20	-29.67	0.00	-2642.7	0.00	2642.72	3237.20	1618.60	7230.79	3620.77	3.33	-1.065	0.000	0.741
35.00	-34.78	-29.20	0.00	-2494.3	0.00	2494.38	3204.54	1602.27	7004.35	3507.38	4.55	-1.248	0.000	0.722
40.00	-33.42	-28.67	0.00	-2348.4	0.00	2348.41	3170.31	1585.15	6777.64	3393.86	5.96	-1.432	0.000	0.703
41.50	-32.98	-28.55	0.00	-2305.4	0.00	2305.40	3159.73	1579.86	6709.61	3359.79	6.41	-1.488	0.000	0.697
45.00	-31.30	-28.17	0.00	-2205.4	0.00	2205.48	3134.49	1567.24	6550.90	3280.32	7.56	-1.619	0.000	0.683
48.00	-29.88	-27.84	0.00	-2120.9	0.00	2120.96	3132.30	1566.15	6537.37	3273.54	8.61	-1.731	0.000	0.658
50.00	-29.31	-27.67	0.00	-2065.2	0.00	2065.27	3117.49	1558.74	6446.72	3228.15	9.35	-1.807	0.000	0.649
55.00	-27.98	-27.14	0.00	-1926.9	0.00	1926.95	3079.35	1539.68	6220.34	3114.79	11.34	-1.986	0.000	0.628
60.00	-26.69	-26.62	0.00	-1791.2	0.00	1791.23	3039.63	1519.81	5994.49	3001.70	13.52	-2.164	0.000	0.606
65.00	-25.41	-26.09	0.00	-1658.1	0.00	1658.14	2998.32	1499.16	5769.39	2888.98	15.88	-2.342	0.000	0.583
70.00	-24.17	-25.56	0.00	-1527.7	0.00	1527.70	2955.43	1477.72	5545.28	2776.76	18.43	-2.519	0.000	0.559
75.00	-22.95	-25.02	0.00	-1399.9	0.00	1399.92	2910.95	1455.48	5322.38	2665.15	21.16	-2.694	0.000	0.533
80.00	-21.77	-24.49	0.00	-1274.8	0.00	1274.80	2864.89	1432.44	5100.92	2554.25	24.07	-2.866	0.000	0.507
84.08	-20.84	-24.03	0.00	-1174.8	0.00	1174.82	2826.09	1413.05	4921.28	2464.30	26.58	-3.006	0.000	0.484
85.00	-20.48	-23.95	0.00	-1152.7	0.00	1152.79	2817.24	1408.62	4881.12	2444.19	27.16	-3.038	0.000	0.479
89.50	-18.87	-23.41	0.00	-1045.0	0.00	1045.02	2031.94	1015.97	3485.43	1745.31	30.10	-3.188	0.000	0.609
90.00	-18.74	-23.39	0.00	-1033.3	0.00	1033.32	2029.15	1014.57	3470.92	1738.04	30.43	-3.205	0.000	0.604
95.00	-17.77	-22.87	0.00	-916.39	0.00	916.39	2000.34	1000.17	3325.82	1665.38	33.89	-3.398	0.000	0.560
100.00	-16.84	-22.35	0.00	-802.05	0.00	802.05	1969.95	984.97	3180.92	1592.82	37.55	-3.583	0.000	0.513
105.00	-15.93	-21.84	0.00	-690.30	0.00	690.30	1937.97	968.98	3036.44	1520.48	41.40	-3.758	0.000	0.463
110.00	-15.04	-21.32	0.00	-581.12	0.00	581.12	1904.40	952.20	2892.62	1448.46	45.42	-3.921	0.000	0.410
115.00	-14.18	-20.82	0.00	-474.50	0.00	474.50	1869.25	934.63	2749.69	1376.89	49.61	-4.070	0.000	0.353
120.00	-13.36	-20.31	0.00	-370.43	0.00	370.43	1832.52	916.26	2607.87	1305.87	53.94	-4.201	0.000	0.291
123.00	-10.26	-16.24	0.00	-309.51	0.00	309.51	1809.72	904.86	2523.40	1263.58	56.60	-4.271	0.000	0.251
125.00	-9.95	-16.05	0.00	-277.02	0.00	277.02	1794.20	897.10	2467.38	1235.52	58.40	-4.314	0.000	0.230
127.92	-9.51	-15.76	0.00	-230.22	0.00	230.22	1771.11	885.56	2386.14	1194.84	61.05	-4.370	0.000	0.198
130.00	-9.03	-15.54	0.00	-197.39	0.00	197.39	1754.29	877.15	2328.47	1165.96	62.97	-4.405	0.000	0.175
131.00	-7.91	-12.66	0.00	-181.85	0.00	181.85	1746.12	873.06	2300.89	1152.16	63.89	-4.421	0.000	0.163
132.08	-7.67	-12.55	0.00	-168.14	0.00	168.14	1160.48	580.24	1541.12	771.71	64.89	-4.438	0.000	0.225
135.00	-7.35	-12.28	0.00	-131.53	0.00	131.53	1148.82	574.41	1493.54	747.88	67.62	-4.476	0.000	0.183
140.00	-6.83	-11.81	0.00	-70.14	0.00	70.14	1127.58	563.79	1411.91	707.01	72.34	-4.537	0.000	0.106
141.00	-3.86	-6.68	0.00	-58.34	0.00	58.34	1123.15	561.57	1395.60	698.84	73.29	-4.545	0.000	0.087
145.00	-3.53	-6.32	0.00	-31.61	0.00	31.61	1104.76	552.38	1330.41	666.20	77.10	-4.570	0.000	0.051
150.00	0.00	-6.02	0.00	0.00	0.00	0.00	1080.36	540.18	1249.27	625.56	81.89	-4.582	0.000	0.000

Wind Loading - Shaft

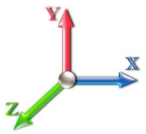
Structure:	CT10022-A-SBA	**Code:**	EIA/TIA-222-G	11/1/2017	
Site Name:	Simsbury 2, CT	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 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	17.879	19.67	446.21	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	17.879	19.67	437.81	0.650	0.000	5.00	25.776	16.75	527.2	0.0	920.5
10.00		1.00	0.85	17.879	19.67	429.42	0.650	0.000	5.00	25.286	16.44	517.2	0.0	902.9
15.00		1.00	0.85	17.879	19.67	421.03	0.650	0.000	5.00	24.797	16.12	507.2	0.0	885.4
20.00		1.00	0.90	18.971	20.87	425.04	0.650	0.000	5.00	24.307	15.80	527.5	0.0	867.8
25.00		1.00	0.95	19.883	21.87	426.29	0.650	0.000	5.00	23.818	15.48	541.8	0.0	850.2
30.00		1.00	0.98	20.661	22.73	425.53	0.650	0.000	5.00	23.328	15.16	551.4	0.0	832.7
35.00		1.00	1.01	21.343	23.48	423.32	0.650	0.000	5.00	22.839	14.85	557.6	0.0	815.1
40.00		1.00	1.04	21.951	24.15	420.01	0.650	0.000	5.00	22.350	14.53	561.2	0.0	797.5
41.50	Bot - Section 2	1.00	1.05	22.122	24.33	418.84	0.650	0.000	1.50	6.609	4.30	167.3	0.0	235.8
45.00		1.00	1.07	22.502	24.75	415.84	0.650	0.000	3.50	15.436	10.03	397.4	0.0	1094.9
48.00	Top - Section 1	1.00	1.08	22.810	25.09	412.98	0.650	0.000	3.00	13.040	8.48	340.3	0.0	924.8
50.00		1.00	1.09	23.007	25.31	416.10	0.650	0.000	2.00	8.595	5.59	226.2	0.0	306.6
55.00		1.00	1.12	23.473	25.82	410.68	0.650	0.000	5.00	21.146	13.74	567.8	0.0	754.3
60.00		1.00	1.14	23.907	26.30	404.75	0.650	0.000	5.00	20.656	13.43	564.9	0.0	736.7
65.00		1.00	1.16	24.313	26.74	398.39	0.650	0.000	5.00	20.167	13.11	560.9	0.0	719.2
70.00		1.00	1.17	24.696	27.17	391.64	0.650	0.000	5.00	19.677	12.79	555.9	0.0	701.6
75.00		1.00	1.19	25.057	27.56	384.56	0.650	0.000	5.00	19.188	12.47	550.0	0.0	684.0
80.00		1.00	1.21	25.400	27.94	377.18	0.650	0.000	5.00	18.698	12.15	543.3	0.0	666.5
84.08	Bot - Section 3	1.00	1.22	25.667	28.23	370.95	0.650	0.000	4.08	14.907	9.69	437.7	0.0	531.2
85.00		1.00	1.22	25.726	28.30	369.53	0.650	0.000	0.92	3.340	2.17	98.3	0.0	213.0
89.50	Top - Section 2	1.00	1.24	26.007	28.61	362.43	0.650	0.000	4.50	16.160	10.50	480.8	0.0	1030.3
90.00		1.00	1.24	26.037	28.64	366.01	0.650	0.000	0.50	1.771	1.15	52.8	0.0	50.6
95.00		1.00	1.25	26.336	28.97	357.91	0.650	0.000	5.00	17.442	11.34	525.5	0.0	497.8
100.00		1.00	1.27	26.621	29.28	349.61	0.650	0.000	5.00	16.952	11.02	516.3	0.0	483.8
105.00		1.00	1.28	26.896	29.59	341.11	0.650	0.000	5.00	16.463	10.70	506.6	0.0	469.7
110.00		1.00	1.29	27.161	29.88	332.44	0.650	0.000	5.00	15.973	10.38	496.3	0.0	455.7
115.00		1.00	1.30	27.416	30.16	323.61	0.650	0.000	5.00	15.484	10.06	485.6	0.0	441.6
120.00		1.00	1.32	27.663	30.43	314.62	0.650	0.000	5.00	14.995	9.75	474.5	0.0	427.6
123.00	Appurtenance(s)	1.00	1.32	27.807	30.59	309.16	0.650	0.000	3.00	8.762	5.70	278.7	0.0	249.8
125.00		1.00	1.33	27.902	30.69	305.49	0.650	0.000	2.00	5.743	3.73	183.3	0.0	163.7
127.92	Bot - Section 4	1.00	1.33	28.038	30.84	300.10	0.650	0.000	2.92	8.235	5.35	264.1	0.0	234.7
130.00		1.00	1.34	28.133	30.95	296.23	0.650	0.000	2.08	5.846	3.80	188.2	0.0	289.9
131.00	Appurtenance(s)	1.00	1.34	28.179	31.00	294.36	0.650	0.000	1.00	2.776	1.80	89.5	0.0	137.7
132.08	Top - Section 3	1.00	1.34	28.228	31.05	292.33	0.650	0.000	1.08	2.985	1.94	96.4	0.0	148.0
135.00		1.00	1.35	28.358	31.19	290.26	0.650	0.000	2.92	7.923	5.15	257.0	0.0	169.7
140.00		1.00	1.36	28.576	31.43	280.76	0.650	0.000	5.00	13.195	8.58	431.4	0.0	282.5
141.00	Appurtenance(s)	1.00	1.36	28.619	31.48	278.85	0.650	0.000	1.00	2.580	1.68	84.5	0.0	55.2
145.00		1.00	1.37	28.788	31.67	271.15	0.650	0.000	4.00	10.126	6.58	333.5	0.0	216.7
150.00	Appurtenance(s)	1.00	1.38	28.994	31.89	261.43	0.650	0.000	5.00	12.217	7.94	405.2	0.0	261.4
								Totals:	**150.00**			**15,451.5**		**20,507.2**

Discrete Appurtenance Forces

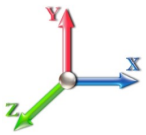
Structure:	CT10022-A-SBA	**Code:**	EIA/TIA-222-G	11/1/2017	
Site Name:	Simsbury 2, CT	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 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	150.00	CSS DBC-750-Combiners	3	28.994	31.893	0.60	0.90	0.92	12.96	0.000	0.000	47.08	0.00	0.00
2	150.00	KMW	1	28.994	31.893	0.78	0.90	6.26	63.45	0.000	0.000	319.34	0.00	0.00
3	150.00	Powerwave	2	28.994	31.893	0.79	0.90	18.10	158.94	0.000	0.000	923.64	0.00	0.00
4	150.00	Kathrein 800 10121	3	28.994	31.893	0.81	0.90	12.57	168.48	0.000	0.000	641.44	0.00	0.00
5	150.00	CCI	6	28.994	31.893	0.60	0.90	4.12	103.68	0.000	0.000	210.47	0.00	0.00
6	150.00	Ericsson RRUS-11-RRUs	3	28.994	31.893	0.60	0.90	4.56	148.50	0.000	0.000	232.62	0.00	0.00
7	150.00	Commscope	1	28.994	31.893	0.60	0.90	0.03	0.99	0.000	0.000	1.54	0.00	0.00
8	150.00	CCI	6	28.994	31.893	0.60	0.90	1.56	17.82	0.000	0.000	79.39	0.00	0.00
9	150.00	Raycap	2	29.034	31.938	0.60	0.90	1.77	59.04	0.000	1.000	90.59	0.00	90.59
10	150.00	Quintel QS66512-3	1	28.994	31.893	0.81	0.90	6.59	94.50	0.000	0.000	336.04	0.00	0.00
11	150.00	CCI	2	28.994	31.893	0.71	0.90	19.10	135.00	0.000	0.000	974.52	0.00	0.00
12	150.00	Low Profile Platform	1	28.953	31.848	1.00	1.00	22.00	1350.00	0.000	-1.000	1121.06	0.00	-1121.06
13	150.00	LMU	1	28.994	31.893	0.60	0.90	0.53	25.20	0.000	0.000	27.08	0.00	0.00
14	150.00	Ericsson RRUS 32	3	28.994	31.893	0.60	0.90	4.96	143.10	0.000	0.000	252.93	0.00	0.00
15	150.00	Ericsson RRUS-32-RRHs	3	28.994	31.893	0.60	0.90	7.00	207.90	0.000	0.000	357.25	0.00	0.00
16	141.00	RFS DB-T1-6Z-8AB-0Z	1	28.619	31.480	0.77	0.80	3.15	19.26	0.000	0.000	158.60	0.00	0.00
17	141.00	Low Profile Platform	1	28.619	31.480	0.80	0.80	17.60	1350.00	0.000	0.000	886.49	0.00	0.00
18	141.00	RFS DB-T1-6Z-8AB-0Z	1	28.619	31.480	0.77	0.80	3.15	19.26	0.000	0.000	158.60	0.00	0.00
19	141.00	Alcatel Lucent	3	28.619	31.480	0.40	0.80	4.20	162.00	0.000	0.000	211.55	0.00	0.00
20	141.00	Alcatel Lucent	3	28.619	31.480	0.72	0.80	3.26	148.50	0.000	0.000	164.28	0.00	0.00
21	141.00	Antel	3	28.619	31.480	0.69	0.80	15.62	105.30	0.000	0.000	786.98	0.00	0.00
22	141.00	Commscope	6	28.619	31.480	0.73	0.80	35.22	392.58	0.000	0.000	1773.77	0.00	0.00
23	141.00	Antel	3	28.619	31.480	0.82	0.80	8.71	81.81	0.000	0.000	438.96	0.00	0.00
24	141.00	Alcatel Lucent	3	28.619	31.480	0.40	0.80	4.20	162.00	0.000	0.000	211.55	0.00	0.00
25	131.00	RFS ATM1412D-1A20	3	28.179	30.997	0.58	0.80	2.05	35.10	0.000	0.000	101.66	0.00	0.00
26	131.00	Commscope LNX-6515DS	3	28.179	30.997	0.74	0.80	25.30	213.57	0.000	0.000	1254.65	0.00	0.00
27	131.00	RFS	3	28.179	30.997	0.60	0.80	11.55	169.29	0.000	0.000	572.84	0.00	0.00
28	131.00	Kathrein 782 11056	3	28.179	30.997	0.61	0.80	1.20	29.70	0.000	0.000	59.70	0.00	0.00
29	131.00	T-Arms (Site Pro P/N	3	28.179	30.997	0.56	0.75	13.50	356.40	0.000	0.000	669.53	0.00	0.00
30	131.00	Ericsson KRY 144/1	3	28.179	30.997	0.56	0.80	0.69	29.70	0.000	0.000	34.16	0.00	0.00
31	123.00	ALU - 1900 MHz RRH	3	27.807	30.588	0.78	0.80	6.37	162.00	0.000	0.000	311.95	0.00	0.00
32	123.00	APXVTM14-C-I20	3	27.807	30.588	0.68	0.80	12.96	148.50	0.000	0.000	634.47	0.00	0.00
33	123.00	APXVSPP18-C-A20	2	27.807	30.588	0.72	0.80	11.63	102.60	0.000	0.000	568.98	0.00	0.00
34	123.00	ALU - TD-RRH8x20-25 -	3	27.807	30.588	0.55	0.80	6.71	189.00	0.000	0.000	328.24	0.00	0.00
35	123.00	Low Profile Platform	1	27.807	30.588	1.00	1.00	22.00	1350.00	0.000	0.000	1076.70	0.00	0.00
36	123.00	ALU - 800 MHz RRH	3	27.807	30.588	0.74	0.80	5.50	143.10	0.000	0.000	269.07	0.00	0.00
37	123.00	RFS - ACU-A20-N - RET	4	27.807	30.588	0.63	0.80	0.35	3.60	0.000	0.000	17.32	0.00	0.00
38	123.00	APXVSPP18-C-A20	1	27.807	30.588	0.72	0.80	5.81	45.00	0.000	0.000	284.49	0.00	0.00
39	123.00	ALU - 800 MHz Filter	3	27.807	30.588	0.54	0.80	1.25	23.76	0.000	0.000	61.38	0.00	0.00
							Totals:		**8,131.59**			**16,650.92**		

Total Applied Force Summary

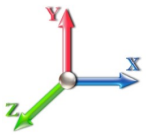
Structure:	CT10022-A-SBA		**Code:**	EIA/TIA-222-G	11/1/2017
Site Name:	Simsbury 2, CT		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 15

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 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		527.21	1111.78	0.00	0.00
10.00		517.20	1094.21	0.00	0.00
15.00		507.19	1076.64	0.00	0.00
20.00		527.53	1059.07	0.00	0.00
25.00		541.77	1041.50	0.00	0.00
30.00		551.40	1023.94	0.00	0.00
35.00		557.63	1006.37	0.00	0.00
40.00		561.24	988.80	0.00	0.00
41.50		167.27	293.21	0.00	0.00
45.00		397.36	1228.78	0.00	0.00
48.00		340.27	1039.54	0.00	0.00
50.00		226.23	383.15	0.00	0.00
55.00		567.83	945.58	0.00	0.00
60.00		564.94	928.01	0.00	0.00
65.00		560.93	910.44	0.00	0.00
70.00		555.92	892.88	0.00	0.00
75.00		550.03	875.31	0.00	0.00
80.00		543.33	857.74	0.00	0.00
84.08		437.73	687.45	0.00	0.00
85.00		98.31	248.09	0.00	0.00
89.50		480.79	1202.47	0.00	0.00
90.00		52.76	69.68	0.00	0.00
95.00		525.48	689.11	0.00	0.00
100.00		516.28	675.06	0.00	0.00
105.00		506.55	661.00	0.00	0.00
110.00		496.33	646.95	0.00	0.00
115.00		485.65	632.89	0.00	0.00
120.00		474.53	618.84	0.00	0.00
123.00	(23) attachments	3831.33	2532.12	0.00	0.00
125.00		183.33	233.36	0.00	0.00
127.92		264.15	336.28	0.00	0.00
130.00		188.17	362.48	0.00	0.00
131.00	(18) attachments	2782.04	1006.23	0.00	0.00
132.08		96.41	176.61	0.00	0.00
135.00		257.04	246.65	0.00	0.00
140.00		431.37	414.48	0.00	0.00
141.00	(24) attachments	4875.26	2522.34	0.00	0.00
145.00		333.47	269.46	0.00	0.00
150.00	(38) attachments	6020.20	3016.90	0.00	-1030.47
	Totals:	**32,102.43**	**34,005.42**	**0.00**	**-1,030.47**

Calculated Forces

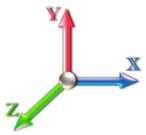
Structure:	CT10022-A-SBA	**Code:**	EIA/TIA-222-G	11/1/2017	
Site Name:	Simsbury 2, CT	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 23

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	-33.96	-32.15	0.00	-3544.9	0.00	3544.98	3399.80	1699.90	8571.22	4291.98	0.00	0.000	0.000	0.836
5.00	-32.75	-31.72	0.00	-3384.2	0.00	3384.21	3376.67	1688.33	8351.12	4181.77	0.09	-0.172	0.000	0.819
10.00	-31.56	-31.30	0.00	-3225.6	0.00	3225.60	3351.94	1675.97	8129.40	4070.74	0.37	-0.345	0.000	0.802
15.00	-30.40	-30.88	0.00	-3069.1	0.00	3069.11	3325.63	1662.82	7906.28	3959.02	0.82	-0.520	0.000	0.785
20.00	-29.25	-30.43	0.00	-2914.7	0.00	2914.73	3297.74	1648.87	7681.99	3846.70	1.46	-0.697	0.000	0.767
25.00	-28.12	-29.96	0.00	-2762.5	0.00	2762.59	3268.26	1634.13	7456.75	3733.92	2.29	-0.875	0.000	0.749
30.00	-27.01	-29.48	0.00	-2612.7	0.00	2612.79	3237.20	1618.60	7230.79	3620.77	3.30	-1.054	0.000	0.730
35.00	-25.93	-28.98	0.00	-2465.4	0.00	2465.41	3204.54	1602.27	7004.35	3507.38	4.50	-1.235	0.000	0.711
40.00	-24.89	-28.45	0.00	-2320.5	0.00	2320.51	3170.31	1585.15	6777.64	3393.86	5.89	-1.416	0.000	0.692
41.50	-24.56	-28.31	0.00	-2277.8	0.00	2277.84	3159.73	1579.86	6709.61	3359.79	6.35	-1.472	0.000	0.686
45.00	-23.28	-27.93	0.00	-2178.7	0.00	2178.74	3134.49	1567.24	6550.90	3280.32	7.48	-1.601	0.000	0.672
48.00	-22.21	-27.60	0.00	-2094.9	0.00	2094.95	3132.30	1566.15	6537.37	3273.54	8.52	-1.712	0.000	0.647
50.00	-21.77	-27.41	0.00	-2039.7	0.00	2039.75	3117.49	1558.74	6446.72	3228.15	9.25	-1.787	0.000	0.639
55.00	-20.76	-26.87	0.00	-1902.7	0.00	1902.72	3079.35	1539.68	6220.34	3114.79	11.22	-1.964	0.000	0.618
60.00	-19.77	-26.34	0.00	-1768.3	0.00	1768.35	3039.63	1519.81	5994.49	3001.70	13.37	-2.140	0.000	0.596
65.00	-18.81	-25.80	0.00	-1636.6	0.00	1636.67	2998.32	1499.16	5769.39	2888.98	15.71	-2.315	0.000	0.573
70.00	-17.86	-25.26	0.00	-1507.6	0.00	1507.68	2955.43	1477.72	5545.28	2776.76	18.23	-2.490	0.000	0.549
75.00	-16.94	-24.72	0.00	-1381.3	0.00	1381.39	2910.95	1455.48	5322.38	2665.15	20.93	-2.662	0.000	0.524
80.00	-16.04	-24.18	0.00	-1257.7	0.00	1257.78	2864.89	1432.44	5100.92	2554.25	23.81	-2.833	0.000	0.498
84.08	-15.34	-23.73	0.00	-1159.0	0.00	1159.04	2826.09	1413.05	4921.28	2464.30	26.29	-2.971	0.000	0.476
85.00	-15.06	-23.64	0.00	-1137.2	0.00	1137.29	2817.24	1408.62	4881.12	2444.19	26.86	-3.002	0.000	0.471
89.50	-13.86	-23.12	0.00	-1030.8	0.00	1030.89	2031.94	1015.97	3485.43	1745.31	29.76	-3.150	0.000	0.598
90.00	-13.75	-23.09	0.00	-1019.3	0.00	1019.33	2029.15	1014.57	3470.92	1738.04	30.10	-3.167	0.000	0.594
95.00	-13.02	-22.57	0.00	-903.90	0.00	903.90	2000.34	1000.17	3325.82	1665.38	33.51	-3.357	0.000	0.550
100.00	-12.30	-22.05	0.00	-791.06	0.00	791.06	1969.95	984.97	3180.92	1592.82	37.13	-3.540	0.000	0.503
105.00	-11.61	-21.54	0.00	-680.82	0.00	680.82	1937.97	968.98	3036.44	1520.48	40.93	-3.712	0.000	0.454
110.00	-10.95	-21.03	0.00	-573.14	0.00	573.14	1904.40	952.20	2892.62	1448.46	44.90	-3.874	0.000	0.402
115.00	-10.30	-20.52	0.00	-468.01	0.00	468.01	1869.25	934.63	2749.69	1376.89	49.04	-4.020	0.000	0.346
120.00	-9.68	-20.02	0.00	-365.39	0.00	365.39	1832.52	916.26	2607.87	1305.87	53.32	-4.149	0.000	0.286
123.00	-7.42	-16.02	0.00	-305.33	0.00	305.33	1809.72	904.86	2523.40	1263.58	55.95	-4.218	0.000	0.246
125.00	-7.19	-15.83	0.00	-273.28	0.00	273.28	1794.20	897.10	2467.38	1235.52	57.72	-4.260	0.000	0.226
127.92	-6.86	-15.55	0.00	-227.11	0.00	227.11	1771.11	885.56	2386.14	1194.84	60.34	-4.316	0.000	0.194
130.00	-6.51	-15.33	0.00	-194.72	0.00	194.72	1754.29	877.15	2328.47	1165.96	62.23	-4.351	0.000	0.171
131.00	-5.71	-12.49	0.00	-179.39	0.00	179.39	1746.12	873.06	2300.89	1152.16	63.14	-4.367	0.000	0.159
132.08	-5.54	-12.38	0.00	-165.86	0.00	165.86	1160.48	580.24	1541.12	771.71	64.14	-4.383	0.000	0.220
135.00	-5.30	-12.11	0.00	-129.75	0.00	129.75	1148.82	574.41	1493.54	747.88	66.82	-4.421	0.000	0.179
140.00	-4.91	-11.65	0.00	-69.21	0.00	69.21	1127.58	563.79	1411.91	707.01	71.49	-4.481	0.000	0.103
141.00	-2.78	-6.59	0.00	-57.56	0.00	57.56	1123.15	561.57	1395.60	698.84	72.42	-4.489	0.000	0.085
145.00	-2.53	-6.24	0.00	-31.20	0.00	31.20	1104.76	552.38	1330.41	666.20	76.19	-4.514	0.000	0.049
150.00	0.00	-6.02	0.00	0.00	0.00	0.00	1080.36	540.18	1249.27	625.56	80.93	-4.525	0.000	0.000

Wind Loading - Shaft

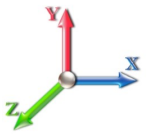
Structure:	CT10022-A-SBA	**Code:**	EIA/TIA-222-G	11/1/2017	
Site Name:	Simsbury 2, CT	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	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	1.656	5.00	27.156	32.59	185.2	643.2	1870.5
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.775	5.00	26.765	32.12	182.6	677.8	1881.7
15.00		1.00	0.85	5.168	5.68	0.00	1.200	1.848	5.00	26.337	31.60	179.7	693.2	1873.7
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.902	5.00	25.893	31.07	187.4	700.3	1857.4
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.945	5.00	25.439	30.53	193.0	702.5	1836.2
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.981	5.00	24.979	29.98	196.9	701.5	1811.8
35.00		1.00	1.01	6.169	6.79	0.00	1.200	2.012	5.00	24.515	29.42	199.6	698.2	1785.0
40.00		1.00	1.04	6.345	6.98	0.00	1.200	2.039	5.00	24.049	28.86	201.4	693.2	1756.5
41.50	Bot - Section 2	1.00	1.05	6.394	7.03	0.00	1.200	2.046	1.50	7.121	8.55	60.1	207.4	521.9
45.00		1.00	1.07	6.504	7.15	0.00	1.200	2.063	3.50	16.639	19.97	142.9	486.4	1946.2
48.00	Top - Section 1	1.00	1.08	6.593	7.25	0.00	1.200	2.076	3.00	14.078	16.89	122.5	414.3	1647.3
50.00		1.00	1.09	6.650	7.32	0.00	1.200	2.085	2.00	9.290	11.15	81.6	274.9	683.8
55.00		1.00	1.12	6.785	7.46	0.00	1.200	2.105	5.00	22.900	27.48	205.1	678.9	1684.7
60.00		1.00	1.14	6.910	7.60	0.00	1.200	2.123	5.00	22.426	26.91	204.6	669.7	1652.0
65.00		1.00	1.16	7.028	7.73	0.00	1.200	2.140	5.00	21.950	26.34	203.6	659.8	1618.7
70.00		1.00	1.17	7.138	7.85	0.00	1.200	2.156	5.00	21.474	25.77	202.3	649.3	1584.8
75.00		1.00	1.19	7.243	7.97	0.00	1.200	2.171	5.00	20.997	25.20	200.7	638.3	1550.3
80.00		1.00	1.21	7.342	8.08	0.00	1.200	2.185	5.00	20.519	24.62	198.9	626.7	1515.4
84.08	Bot - Section 3	1.00	1.22	7.419	8.16	0.00	1.200	2.196	4.08	16.402	19.68	160.6	503.9	1212.2
85.00		1.00	1.22	7.436	8.18	0.00	1.200	2.198	0.92	3.676	4.41	36.1	114.0	398.0
89.50	Top - Section 2	1.00	1.24	7.517	8.27	0.00	1.200	2.210	4.50	17.817	21.38	176.8	549.6	1923.3
90.00		1.00	1.24	7.526	8.28	0.00	1.200	2.211	0.50	1.955	2.35	19.4	60.9	128.3
95.00		1.00	1.25	7.612	8.37	0.00	1.200	2.223	5.00	19.294	23.15	193.9	596.7	1260.5
100.00		1.00	1.27	7.695	8.46	0.00	1.200	2.234	5.00	18.814	22.58	191.1	583.8	1228.8
105.00		1.00	1.28	7.774	8.55	0.00	1.200	2.245	5.00	18.334	22.00	188.1	570.5	1196.8
110.00		1.00	1.29	7.851	8.64	0.00	1.200	2.256	5.00	17.853	21.42	185.0	557.0	1164.5
115.00		1.00	1.30	7.925	8.72	0.00	1.200	2.266	5.00	17.372	20.85	181.7	543.1	1132.0
120.00		1.00	1.32	7.996	8.80	0.00	1.200	2.276	5.00	16.891	20.27	178.3	529.1	1099.2
123.00	Appurtenance(s)	1.00	1.32	8.038	8.84	0.00	1.200	2.281	3.00	9.902	11.88	105.1	312.3	645.4
125.00		1.00	1.33	8.065	8.87	0.00	1.200	2.285	2.00	6.505	7.81	69.3	205.9	424.2
127.92	Bot - Section 4	1.00	1.33	8.104	8.91	0.00	1.200	2.290	2.92	9.349	11.22	100.0	295.4	608.4
130.00		1.00	1.34	8.132	8.95	0.00	1.200	2.294	2.08	6.643	7.97	71.3	210.7	597.3
131.00	Appurtenance(s)	1.00	1.34	8.145	8.96	0.00	1.200	2.296	1.00	3.159	3.79	34.0	100.6	284.1
132.08	Top - Section 3	1.00	1.34	8.159	8.98	0.00	1.200	2.298	1.08	3.400	4.08	36.6	108.3	305.6
135.00		1.00	1.35	8.197	9.02	0.00	1.200	2.303	2.92	9.043	10.85	97.8	286.5	512.7
140.00		1.00	1.36	8.260	9.09	0.00	1.200	2.311	5.00	15.121	18.15	164.9	476.2	852.9
141.00	Appurtenance(s)	1.00	1.36	8.272	9.10	0.00	1.200	2.313	1.00	2.966	3.56	32.4	94.7	168.3
145.00		1.00	1.37	8.321	9.15	0.00	1.200	2.319	4.00	11.672	14.01	128.2	369.0	657.9
150.00	Appurtenance(s)	1.00	1.38	8.381	9.22	0.00	1.200	2.327	5.00	14.156	16.99	156.6	446.0	794.6
								Totals:	**150.00**			**5,655.3**		**45,672.9**

Discrete Appurtenance Forces

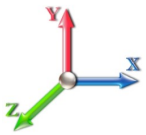
Structure:	CT10022-A-SBA	**Code:**	EIA/TIA-222-G	11/1/2017	
Site Name:	Simsbury 2, CT	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 18	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 23

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	150.00	CSS DBC-750-Combiners	3	8.381	9.219	0.90	0.90	3.28	47.25	0.000	0.000	30.26	0.00	0.00
2	150.00	KMW	1	8.381	9.219	0.81	0.90	9.46	345.42	0.000	0.000	87.21	0.00	0.00
3	150.00	Powerwave	2	8.381	9.219	0.82	0.90	25.97	931.37	0.000	0.000	239.44	0.00	0.00
4	150.00	Kathrein 800 10121	3	8.381	9.219	0.83	0.90	19.86	758.34	0.000	0.000	183.05	0.00	0.00
5	150.00	CCI	6	8.381	9.219	0.63	0.90	8.19	298.60	0.000	0.000	75.48	0.00	0.00
6	150.00	Ericsson RRUS-11-RRUs	3	8.381	9.219	0.90	0.90	9.08	499.57	0.000	0.000	83.74	0.00	0.00
7	150.00	Commscope	1	8.381	9.219	0.90	0.90	0.28	3.59	0.000	0.000	2.54	0.00	0.00
8	150.00	CCI	6	8.381	9.219	0.68	0.90	4.54	80.05	0.000	0.000	41.89	0.00	0.00
9	150.00	Raycap	2	8.392	9.232	0.90	0.90	4.33	215.37	0.000	1.000	39.93	0.00	39.93
10	150.00	Quintel QS66512-3	1	8.381	9.219	0.86	0.90	8.55	446.90	0.000	0.000	78.86	0.00	0.00
11	150.00	CCI	2	8.381	9.219	0.76	0.90	27.83	1203.57	0.000	0.000	256.54	0.00	0.00
12	150.00	Low Profile Platform	1	8.369	9.206	1.00	1.00	45.55	3245.22	0.000	-1.000	419.31	0.00	-419.31
13	150.00	LMU	1	8.381	9.219	0.90	0.90	1.59	113.83	0.000	0.000	14.65	0.00	0.00
14	150.00	Ericsson RRUS 32	3	8.381	9.219	0.90	0.90	10.09	571.48	0.000	0.000	93.02	0.00	0.00
15	150.00	Ericsson RRUS-32-RRHs	3	8.381	9.219	0.90	0.90	11.87	763.59	0.000	0.000	109.43	0.00	0.00
16	141.00	RFS DB-T1-6Z-8AB-0Z	1	8.272	9.099	0.79	0.80	4.09	153.16	0.000	0.000	37.20	0.00	0.00
17	141.00	Low Profile Platform	1	8.272	9.099	0.80	0.80	36.32	3234.45	0.000	0.000	330.52	0.00	0.00
18	141.00	RFS DB-T1-6Z-8AB-0Z	1	8.272	9.099	0.79	0.80	4.09	153.16	0.000	0.000	37.20	0.00	0.00
19	141.00	Alcatel Lucent	3	8.272	9.099	0.63	0.80	8.62	502.70	0.000	0.000	78.43	0.00	0.00
20	141.00	Alcatel Lucent	3	8.272	9.099	0.72	0.80	6.61	560.31	0.000	0.000	60.18	0.00	0.00
21	141.00	Antel	3	8.272	9.099	0.71	0.80	19.80	881.58	0.000	0.000	180.15	0.00	0.00
22	141.00	Commscope	6	8.272	9.099	0.75	0.80	43.94	2223.73	0.000	0.000	399.85	0.00	0.00
23	141.00	Antel	3	8.272	9.099	0.83	0.80	14.95	900.92	0.000	0.000	136.03	0.00	0.00
24	141.00	Alcatel Lucent	3	8.272	9.099	0.63	0.80	8.62	502.70	0.000	0.000	78.43	0.00	0.00
25	131.00	RFS ATM1412D-1A20	3	8.145	8.960	0.61	0.80	4.01	128.89	0.000	0.000	35.94	0.00	0.00
26	131.00	Commscope LNX-6515DS	3	8.145	8.960	0.76	0.80	36.14	1495.87	0.000	0.000	323.79	0.00	0.00
27	131.00	RFS	3	8.145	8.960	0.62	0.80	17.35	801.01	0.000	0.000	155.40	0.00	0.00
28	131.00	Kathrein 782 11056	3	8.145	8.960	0.63	0.80	2.77	88.04	0.000	0.000	24.84	0.00	0.00
29	131.00	T-Arms (Site Pro P/N	3	8.145	8.960	0.75	0.75	38.66	-25.17	0.000	0.000	346.39	0.00	0.00
30	131.00	Ericsson KRY 144/1	3	8.145	8.960	0.58	0.80	1.81	72.84	0.000	0.000	16.25	0.00	0.00
31	123.00	ALU - 1900 MHz RRH	3	8.038	8.842	0.80	0.80	10.47	463.37	0.000	0.000	92.56	0.00	0.00
32	123.00	APXVTM14-C-I20	3	8.038	8.842	0.70	0.80	16.51	866.62	0.000	0.000	145.93	0.00	0.00
33	123.00	APXVSPP18-C-A20	2	8.038	8.842	0.67	0.80	15.54	432.28	0.000	0.000	137.37	0.00	0.00
34	123.00	ALU - TD-RRH8x20-25 -	3	8.038	8.842	0.60	0.80	9.25	713.44	0.000	0.000	81.77	0.00	0.00
35	123.00	Low Profile Platform	1	8.038	8.842	1.00	1.00	45.09	3210.92	0.000	0.000	398.63	0.00	0.00
36	123.00	ALU - 800 MHz RRH	3	8.038	8.842	0.76	0.80	9.09	417.53	0.000	0.000	80.33	0.00	0.00
37	123.00	RFS - ACU-A20-N - RET	4	8.038	8.842	0.66	0.80	1.39	22.06	0.000	0.000	12.25	0.00	0.00
38	123.00	APXVSPP18-C-A20	1	8.038	8.842	0.67	0.80	7.77	172.99	0.000	0.000	68.69	0.00	0.00
39	123.00	ALU - 800 MHz Filter	3	8.038	8.842	0.54	0.80	2.61	85.87	0.000	0.000	23.11	0.00	0.00
							Totals:		**27,583.44**			**5,036.59**		

Total Applied Force Summary

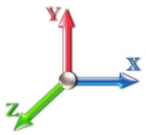
Structure:	CT10022-A-SBA		**Code:**	EIA/TIA-222-G	11/1/2017
Site Name:	Simsbury 2, CT		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 19

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		185.25	2125.54	0.00	0.00
10.00		182.59	2136.71	0.00	0.00
15.00		179.66	2128.77	0.00	0.00
20.00		187.41	2112.42	0.00	0.00
25.00		192.99	2091.21	0.00	0.00
30.00		196.92	2066.79	0.00	0.00
35.00		199.63	2040.06	0.00	0.00
40.00		201.42	2011.58	0.00	0.00
41.50		60.11	598.37	0.00	0.00
45.00		142.86	2124.75	0.00	0.00
48.00		122.52	1800.33	0.00	0.00
50.00		81.55	785.81	0.00	0.00
55.00		205.09	1939.72	0.00	0.00
60.00		204.56	1907.07	0.00	0.00
65.00		203.63	1873.74	0.00	0.00
70.00		202.34	1839.80	0.00	0.00
75.00		200.74	1805.33	0.00	0.00
80.00		198.86	1770.39	0.00	0.00
84.08		160.63	1420.50	0.00	0.00
85.00		36.09	444.76	0.00	0.00
89.50		176.80	2152.86	0.00	0.00
90.00		19.43	153.85	0.00	0.00
95.00		193.87	1515.56	0.00	0.00
100.00		191.10	1483.85	0.00	0.00
105.00		188.15	1451.84	0.00	0.00
110.00		185.02	1419.55	0.00	0.00
115.00		181.73	1387.00	0.00	0.00
120.00		178.28	1354.22	0.00	0.00
123.00	(23) attachments	1145.71	7183.50	0.00	0.00
125.00		69.25	517.08	0.00	0.00
127.92		100.01	743.78	0.00	0.00
130.00		71.31	694.04	0.00	0.00
131.00	(18) attachments	936.57	2892.03	0.00	0.00
132.08		36.62	343.74	0.00	0.00
135.00		97.84	615.33	0.00	0.00
140.00		164.87	1028.88	0.00	0.00
141.00	(24) attachments	1370.36	9316.21	0.00	0.00
145.00		128.20	728.26	0.00	0.00
150.00	(38) attachments	1911.96	10406.62	0.00	-379.38
	Totals:	**10,691.90**	**80,411.84**	**0.00**	**-379.38**

Calculated Forces

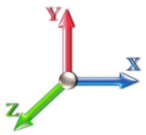
Structure:	CT10022-A-SBA	**Code:**	EIA/TIA-222-G	11/1/2017	
Site Name:	Simsbury 2, CT	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 20	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 23

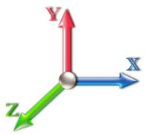
Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-80.41	-10.73	0.00	-1214.8	0.00	1214.85	3399.80	1699.90	8571.22	4291.98	0.00	0.000	0.000	0.307
5.00	-78.27	-10.63	0.00	-1161.1	0.00	1161.18	3376.67	1688.33	8351.12	4181.77	0.03	-0.059	0.000	0.301
10.00	-76.12	-10.52	0.00	-1108.0	0.00	1108.04	3351.94	1675.97	8129.40	4070.74	0.13	-0.118	0.000	0.295
15.00	-73.98	-10.42	0.00	-1055.4	0.00	1055.43	3325.63	1662.82	7906.28	3959.02	0.28	-0.179	0.000	0.289
20.00	-71.86	-10.30	0.00	-1003.3	0.00	1003.35	3297.74	1648.87	7681.99	3846.70	0.50	-0.239	0.000	0.283
25.00	-69.76	-10.17	0.00	-951.87	0.00	951.87	3268.26	1634.13	7456.75	3733.92	0.79	-0.301	0.000	0.276
30.00	-67.68	-10.03	0.00	-901.03	0.00	901.03	3237.20	1618.60	7230.79	3620.77	1.13	-0.363	0.000	0.270
35.00	-65.63	-9.89	0.00	-850.87	0.00	850.87	3204.54	1602.27	7004.35	3507.38	1.55	-0.425	0.000	0.263
40.00	-63.62	-9.72	0.00	-801.41	0.00	801.41	3170.31	1585.15	6777.64	3393.86	2.03	-0.487	0.000	0.256
41.50	-63.01	-9.69	0.00	-786.83	0.00	786.83	3159.73	1579.86	6709.61	3359.79	2.18	-0.507	0.000	0.254
45.00	-60.88	-9.57	0.00	-752.92	0.00	752.92	3134.49	1567.24	6550.90	3280.32	2.57	-0.551	0.000	0.249
48.00	-59.08	-9.46	0.00	-724.21	0.00	724.21	3132.30	1566.15	6537.37	3273.54	2.93	-0.590	0.000	0.240
50.00	-58.29	-9.42	0.00	-705.29	0.00	705.29	3117.49	1558.74	6446.72	3228.15	3.18	-0.616	0.000	0.237
55.00	-56.34	-9.25	0.00	-658.20	0.00	658.20	3079.35	1539.68	6220.34	3114.79	3.86	-0.677	0.000	0.230
60.00	-54.43	-9.08	0.00	-611.95	0.00	611.95	3039.63	1519.81	5994.49	3001.70	4.60	-0.738	0.000	0.222
65.00	-52.55	-8.91	0.00	-566.55	0.00	566.55	2998.32	1499.16	5769.39	2888.98	5.41	-0.798	0.000	0.214
70.00	-50.70	-8.73	0.00	-522.01	0.00	522.01	2955.43	1477.72	5545.28	2776.76	6.28	-0.859	0.000	0.205
75.00	-48.89	-8.55	0.00	-478.36	0.00	478.36	2910.95	1455.48	5322.38	2665.15	7.21	-0.919	0.000	0.196
80.00	-47.11	-8.37	0.00	-435.59	0.00	435.59	2864.89	1432.44	5100.92	2554.25	8.20	-0.978	0.000	0.187
84.08	-45.69	-8.21	0.00	-401.42	0.00	401.42	2826.09	1413.05	4921.28	2464.30	9.06	-1.025	0.000	0.179
85.00	-45.24	-8.19	0.00	-393.90	0.00	393.90	2817.24	1408.62	4881.12	2444.19	9.26	-1.036	0.000	0.177
89.50	-43.09	-7.99	0.00	-357.05	0.00	357.05	2031.94	1015.97	3485.43	1745.31	10.26	-1.087	0.000	0.226
90.00	-42.93	-8.00	0.00	-353.06	0.00	353.06	2029.15	1014.57	3470.92	1738.04	10.37	-1.093	0.000	0.224
95.00	-41.41	-7.82	0.00	-313.07	0.00	313.07	2000.34	1000.17	3325.82	1665.38	11.55	-1.159	0.000	0.209
100.00	-39.92	-7.64	0.00	-273.98	0.00	273.98	1969.95	984.97	3180.92	1592.82	12.80	-1.222	0.000	0.192
105.00	-38.47	-7.46	0.00	-235.77	0.00	235.77	1937.97	968.98	3036.44	1520.48	14.12	-1.282	0.000	0.175
110.00	-37.05	-7.28	0.00	-198.47	0.00	198.47	1904.40	952.20	2892.62	1448.46	15.49	-1.338	0.000	0.157
115.00	-35.66	-7.09	0.00	-162.09	0.00	162.09	1869.25	934.63	2749.69	1376.89	16.92	-1.389	0.000	0.137
120.00	-34.31	-6.90	0.00	-126.63	0.00	126.63	1832.52	916.26	2607.87	1305.87	18.40	-1.434	0.000	0.116
123.00	-27.15	-5.58	0.00	-105.93	0.00	105.93	1809.72	904.86	2523.40	1263.58	19.31	-1.457	0.000	0.099
125.00	-26.64	-5.51	0.00	-94.76	0.00	94.76	1794.20	897.10	2467.38	1235.52	19.92	-1.472	0.000	0.092
127.92	-25.89	-5.40	0.00	-78.69	0.00	78.69	1771.11	885.56	2386.14	1194.84	20.83	-1.491	0.000	0.081
130.00	-25.20	-5.31	0.00	-67.45	0.00	67.45	1754.29	877.15	2328.47	1165.96	21.48	-1.503	0.000	0.072
131.00	-22.33	-4.30	0.00	-62.14	0.00	62.14	1746.12	873.06	2300.89	1152.16	21.80	-1.509	0.000	0.067
132.08	-21.99	-4.26	0.00	-57.48	0.00	57.48	1160.48	580.24	1541.12	771.71	22.14	-1.514	0.000	0.093
135.00	-21.38	-4.15	0.00	-45.06	0.00	45.06	1148.82	574.41	1493.54	747.88	23.07	-1.528	0.000	0.079
140.00	-20.35	-3.96	0.00	-24.31	0.00	24.31	1127.58	563.79	1411.91	707.01	24.68	-1.548	0.000	0.052
141.00	-11.08	-2.34	0.00	-20.34	0.00	20.34	1123.15	561.57	1395.60	698.84	25.01	-1.551	0.000	0.039
145.00	-10.35	-2.20	0.00	-10.98	0.00	10.98	1104.76	552.38	1330.41	666.20	26.31	-1.560	0.000	0.026
150.00	0.00	-1.91	0.00	0.00	0.00	0.00	1080.36	540.18	1249.27	625.56	27.95	-1.564	0.000	0.000

Seismic Segment Forces (Factored)

Structure:	CT10022-A-SBA	**Code:**	EIA/TIA-222-G	11/1/2017	
Site Name:	Simsbury 2, CT	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 21	

Tower Engineering Solutions

Load Case: 1.2D + 1.0E						**Iterations**	21
Gust Response Factor	1.10			**Sds**	0.19	**Ss**	0.18
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.10	**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.39	**SA**	0.04	**Seismic Importance Factor**	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		1022.7	0.00	0.03	0.02	17.08	
10.00		1003.2	0.01	0.05	0.03	24.72	
15.00		983.74	0.02	0.06	0.04	28.19	
20.00		964.22	0.03	0.07	0.04	29.67	
25.00		944.70	0.05	0.07	0.04	30.24	
30.00		925.18	0.08	0.07	0.04	30.46	
35.00		905.65	0.10	0.07	0.04	30.57	
40.00		886.13	0.13	0.07	0.03	30.61	
41.50	Bot - Section 2	262.03	0.14	0.07	0.03	9.10	
45.00		1216.5	0.17	0.07	0.03	42.69	
48.00	Top - Section 1	1027.5	0.19	0.06	0.02	36.15	
50.00		340.71	0.21	0.06	0.02	11.95	
55.00		838.12	0.25	0.05	0.02	28.48	
60.00		818.60	0.30	0.04	0.01	25.55	
65.00		799.08	0.35	0.03	0.01	20.91	
70.00		779.55	0.41	0.01	0.01	14.40	
75.00		760.03	0.47	-0.01	0.01	6.27	
80.00		740.51	0.54	-0.03	0.01	-2.58	
84.08	Bot - Section 3	590.27	0.59	-0.05	0.01	-7.68	
85.00		236.69	0.61	-0.06	0.02	-3.56	
89.50	Top - Section 2	1144.8	0.67	-0.08	0.02	-27.04	
90.00		56.17	0.68	-0.08	0.03	-1.37	
95.00		553.15	0.76	-0.10	0.04	-16.64	
100.00		537.54	0.84	-0.12	0.07	-16.73	
105.00		521.92	0.93	-0.12	0.10	-14.16	
110.00		506.30	1.02	-0.11	0.14	-9.14	
115.00		490.69	1.11	-0.06	0.19	-1.89	
120.00		475.07	1.21	0.01	0.26	7.34	
123.00	Appurtenance(s)	2685.9	1.27	0.08	0.31	79.20	
125.00		181.91	1.31	0.14	0.35	7.25	
127.92	Bot - Section 4	260.80	1.37	0.24	0.41	14.73	
130.00		322.15	1.42	0.32	0.45	22.38	
131.00	Appurtenance(s)	1079.3	1.44	0.37	0.48	82.04	
132.08	Top - Section 3	164.46	1.47	0.42	0.50	13.71	
135.00		188.51	1.53	0.58	0.58	19.66	
140.00		313.88	1.65	0.93	0.73	45.35	
141.00	Appurtenance(s)	2773.2	1.67	1.01	0.77	424.80	
145.00		240.80	1.77	1.39	0.92	45.78	
150.00	Appurtenance(s)	3278.8	1.89	1.98	1.14	791.35	
	Totals:	**31,820.9**				**1,869.8**	**Total Wind:** **32,102.4**

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

Calculated Forces

Structure:	CT10022-A-SBA	**Code:**	EIA/TIA-222-G	11/1/2017	
Site Name:	Simsbury 2, CT	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 22	

Tower Engineering Solutions

Load Case: 1.2D + 1.0E

Gust Response Factor	1.10			**Sds**	0.19			**Iterations**	21
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.10			**Ss**	0.18
Wind Load Factor	0.00	**Structure Frequency**	0.39	**SA**	0.04			**S1**	0.06
								Seismic Importance Factor	1.00

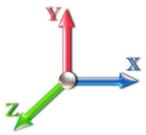
Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-45.34	-1.97	0.00	-248.43	0.00	248.43	3399.80	1699.90	8571.22	4291.98		0.00	0.00	0.071
5.00	-43.86	-1.97	0.00	-238.55	0.00	238.55	3376.67	1688.33	8351.12	4181.77		0.01	-0.01	0.070
10.00	-42.40	-1.95	0.00	-228.72	0.00	228.72	3351.94	1675.97	8129.40	4070.74		0.03	-0.02	0.069
15.00	-40.96	-1.93	0.00	-218.96	0.00	218.96	3325.63	1662.82	7906.28	3959.02		0.06	-0.04	0.068
20.00	-39.55	-1.91	0.00	-209.31	0.00	209.31	3297.74	1648.87	7681.99	3846.70		0.10	-0.05	0.066
25.00	-38.16	-1.89	0.00	-199.76	0.00	199.76	3268.26	1634.13	7456.75	3733.92		0.16	-0.06	0.065
30.00	-36.80	-1.86	0.00	-190.34	0.00	190.34	3237.20	1618.60	7230.79	3620.77		0.23	-0.08	0.064
35.00	-35.45	-1.84	0.00	-181.02	0.00	181.02	3204.54	1602.27	7004.35	3507.38		0.32	-0.09	0.063
40.00	-34.13	-1.81	0.00	-171.83	0.00	171.83	3170.31	1585.15	6777.64	3393.86		0.42	-0.10	0.061
41.50	-33.74	-1.80	0.00	-169.12	0.00	169.12	3159.73	1579.86	6709.61	3359.79		0.45	-0.11	0.061
45.00	-32.10	-1.76	0.00	-162.80	0.00	162.80	3134.49	1567.24	6550.90	3280.32		0.53	-0.12	0.060
48.00	-30.72	-1.73	0.00	-157.51	0.00	157.51	3132.30	1566.15	6537.37	3273.54		0.61	-0.12	0.058
50.00	-30.21	-1.72	0.00	-154.05	0.00	154.05	3117.49	1558.74	6446.72	3228.15		0.66	-0.13	0.057
55.00	-28.95	-1.70	0.00	-145.45	0.00	145.45	3079.35	1539.68	6220.34	3114.79		0.81	-0.14	0.056
60.00	-27.71	-1.67	0.00	-136.97	0.00	136.97	3039.63	1519.81	5994.49	3001.70		0.96	-0.16	0.055
65.00	-26.49	-1.66	0.00	-128.61	0.00	128.61	2998.32	1499.16	5769.39	2888.98		1.13	-0.17	0.053
70.00	-25.30	-1.64	0.00	-120.33	0.00	120.33	2955.43	1477.72	5545.28	2776.76		1.32	-0.18	0.052
75.00	-24.14	-1.64	0.00	-112.11	0.00	112.11	2910.95	1455.48	5322.38	2665.15		1.52	-0.20	0.050
80.00	-22.99	-1.64	0.00	-103.91	0.00	103.91	2864.89	1432.44	5100.92	2554.25		1.73	-0.21	0.049
84.08	-22.08	-1.64	0.00	-97.21	0.00	97.21	2826.09	1413.05	4921.28	2464.30		1.92	-0.22	0.047
85.00	-21.74	-1.64	0.00	-95.71	0.00	95.71	2817.24	1408.62	4881.12	2444.19		1.96	-0.23	0.047
89.50	-20.14	-1.64	0.00	-88.33	0.00	88.33	2031.94	1015.97	3485.43	1745.31		2.18	-0.24	0.061
90.00	-20.05	-1.64	0.00	-87.51	0.00	87.51	2029.15	1014.57	3470.92	1738.04		2.21	-0.24	0.060
95.00	-19.13	-1.64	0.00	-79.31	0.00	79.31	2000.34	1000.17	3325.82	1665.38		2.47	-0.26	0.057
100.00	-18.23	-1.64	0.00	-71.10	0.00	71.10	1969.95	984.97	3180.92	1592.82		2.75	-0.27	0.054
105.00	-17.35	-1.64	0.00	-62.89	0.00	62.89	1937.97	968.98	3036.44	1520.48		3.04	-0.29	0.050
110.00	-16.48	-1.64	0.00	-54.67	0.00	54.67	1904.40	952.20	2892.62	1448.46		3.35	-0.30	0.046
115.00	-15.64	-1.64	0.00	-46.46	0.00	46.46	1869.25	934.63	2749.69	1376.89		3.68	-0.32	0.042
120.00	-14.81	-1.63	0.00	-38.25	0.00	38.25	1832.52	916.26	2607.87	1305.87		4.02	-0.33	0.037
123.00	-11.44	-1.53	0.00	-33.35	0.00	33.35	1809.72	904.86	2523.40	1263.58		4.23	-0.34	0.033
125.00	-11.13	-1.53	0.00	-30.29	0.00	30.29	1794.20	897.10	2467.38	1235.52		4.37	-0.34	0.031
127.92	-10.68	-1.51	0.00	-25.83	0.00	25.83	1771.11	885.56	2386.14	1194.84		4.58	-0.35	0.028
130.00	-10.19	-1.49	0.00	-22.69	0.00	22.69	1754.29	877.15	2328.47	1165.96		4.73	-0.35	0.025
131.00	-8.85	-1.40	0.00	-21.20	0.00	21.20	1746.12	873.06	2300.89	1152.16		4.81	-0.36	0.023
132.08	-8.62	-1.38	0.00	-19.69	0.00	19.69	1160.48	580.24	1541.12	771.71		4.89	-0.36	0.033
135.00	-8.29	-1.36	0.00	-15.66	0.00	15.66	1148.82	574.41	1493.54	747.88		5.11	-0.36	0.028
140.00	-7.74	-1.31	0.00	-8.86	0.00	8.86	1127.58	563.79	1411.91	707.01		5.49	-0.37	0.019
141.00	-4.38	-0.87	0.00	-7.55	0.00	7.55	1123.15	561.57	1395.60	698.84		5.57	-0.37	0.015
145.00	-4.02	-0.82	0.00	-4.09	0.00	4.09	1104.76	552.38	1330.41	666.20		5.88	-0.37	0.010
150.00	0.00	-0.79	0.00	0.00	0.00	0.00	1080.36	540.18	1249.27	625.56		6.27	-0.37	0.000

Seismic Segment Forces (Factored)

Structure:	CT10022-A-SBA		**Code:**	EIA/TIA-222-G	11/1/2017
Site Name:	Simsbury 2, CT		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 23

Tower Engineering Solutions

Load Case: 0.9D + 1.0E



Gust Response Factor	1.10			**Sds**	0.19	**Iterations**	21
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10	**Ss**	0.18
Wind Load Factor	0.00	**Structure Frequency**	0.39	**SA**	0.04	**S1**	0.06
						Seismic Importance Factor	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		1022.7	0.00	0.03	0.02	17.08	
10.00		1003.2	0.01	0.05	0.03	24.72	
15.00		983.74	0.02	0.06	0.04	28.19	
20.00		964.22	0.03	0.07	0.04	29.67	
25.00		944.70	0.05	0.07	0.04	30.24	
30.00		925.18	0.08	0.07	0.04	30.46	
35.00		905.65	0.10	0.07	0.04	30.57	
40.00		886.13	0.13	0.07	0.03	30.61	
41.50	Bot - Section 2	262.03	0.14	0.07	0.03	9.10	
45.00		1216.5	0.17	0.07	0.03	42.69	
48.00	Top - Section 1	1027.5	0.19	0.06	0.02	36.15	
50.00		340.71	0.21	0.06	0.02	11.95	
55.00		838.12	0.25	0.05	0.02	28.48	
60.00		818.60	0.30	0.04	0.01	25.55	
65.00		799.08	0.35	0.03	0.01	20.91	
70.00		779.55	0.41	0.01	0.01	14.40	
75.00		760.03	0.47	-0.01	0.01	6.27	
80.00		740.51	0.54	-0.03	0.01	-2.58	
84.08	Bot - Section 3	590.27	0.59	-0.05	0.01	-7.68	
85.00		236.69	0.61	-0.06	0.02	-3.56	
89.50	Top - Section 2	1144.8	0.67	-0.08	0.02	-27.04	
90.00		56.17	0.68	-0.08	0.03	-1.37	
95.00		553.15	0.76	-0.10	0.04	-16.64	
100.00		537.54	0.84	-0.12	0.07	-16.73	
105.00		521.92	0.93	-0.12	0.10	-14.16	
110.00		506.30	1.02	-0.11	0.14	-9.14	
115.00		490.69	1.11	-0.06	0.19	-1.89	
120.00		475.07	1.21	0.01	0.26	7.34	
123.00	Appurtenance(s)	2685.9	1.27	0.08	0.31	79.20	
125.00		181.91	1.31	0.14	0.35	7.25	
127.92	Bot - Section 4	260.80	1.37	0.24	0.41	14.73	
130.00		322.15	1.42	0.32	0.45	22.38	
131.00	Appurtenance(s)	1079.3	1.44	0.37	0.48	82.04	
132.08	Top - Section 3	164.46	1.47	0.42	0.50	13.71	
135.00		188.51	1.53	0.58	0.58	19.66	
140.00		313.88	1.65	0.93	0.73	45.35	
141.00	Appurtenance(s)	2773.2	1.67	1.01	0.77	424.80	
145.00		240.80	1.77	1.39	0.92	45.78	
150.00	Appurtenance(s)	3278.8	1.89	1.98	1.14	791.35	
	Totals:	**31,820.9**				**1,869.8**	**Total Wind:** **32,102.4**

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

Calculated Forces

Structure:	CT10022-A-SBA	**Code:**	EIA/TIA-222-G	11/1/2017	
Site Name:	Simsbury 2, CT	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E

Gust Response Factor	1.10			**Sds**	0.19			**Iterations**	21
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10			**Ss**	0.18
Wind Load Factor	0.00	**Structure Frequency**	0.39	**SA**	0.04			**S1**	0.06
								Seismic Importance 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	-34.01	-1.97	0.00	-245.97	0.00	245.97	3399.80	1699.90	8571.22	4291.98		0.00	0.00	0.067
5.00	-32.89	-1.96	0.00	-236.10	0.00	236.10	3376.67	1688.33	8351.12	4181.77		0.01	-0.01	0.066
10.00	-31.80	-1.95	0.00	-226.29	0.00	226.29	3351.94	1675.97	8129.40	4070.74		0.03	-0.02	0.065
15.00	-30.72	-1.92	0.00	-216.56	0.00	216.56	3325.63	1662.82	7906.28	3959.02		0.06	-0.04	0.064
20.00	-29.66	-1.90	0.00	-206.95	0.00	206.95	3297.74	1648.87	7681.99	3846.70		0.10	-0.05	0.063
25.00	-28.62	-1.87	0.00	-197.45	0.00	197.45	3268.26	1634.13	7456.75	3733.92		0.16	-0.06	0.062
30.00	-27.60	-1.85	0.00	-188.08	0.00	188.08	3237.20	1618.60	7230.79	3620.77		0.23	-0.07	0.060
35.00	-26.59	-1.82	0.00	-178.84	0.00	178.84	3204.54	1602.27	7004.35	3507.38		0.32	-0.09	0.059
40.00	-25.60	-1.79	0.00	-169.72	0.00	169.72	3170.31	1585.15	6777.64	3393.86		0.42	-0.10	0.058
41.50	-25.31	-1.79	0.00	-167.03	0.00	167.03	3159.73	1579.86	6709.61	3359.79		0.45	-0.10	0.058
45.00	-24.08	-1.75	0.00	-160.78	0.00	160.78	3134.49	1567.24	6550.90	3280.32		0.53	-0.11	0.057
48.00	-23.04	-1.71	0.00	-155.54	0.00	155.54	3132.30	1566.15	6537.37	3273.54		0.60	-0.12	0.055
50.00	-22.65	-1.70	0.00	-152.11	0.00	152.11	3117.49	1558.74	6446.72	3228.15		0.66	-0.13	0.054
55.00	-21.71	-1.68	0.00	-143.60	0.00	143.60	3079.35	1539.68	6220.34	3114.79		0.80	-0.14	0.053
60.00	-20.78	-1.65	0.00	-135.22	0.00	135.22	3039.63	1519.81	5994.49	3001.70		0.95	-0.15	0.052
65.00	-19.87	-1.63	0.00	-126.96	0.00	126.96	2998.32	1499.16	5769.39	2888.98		1.12	-0.17	0.051
70.00	-18.98	-1.62	0.00	-118.79	0.00	118.79	2955.43	1477.72	5545.28	2776.76		1.30	-0.18	0.049
75.00	-18.10	-1.62	0.00	-110.68	0.00	110.68	2910.95	1455.48	5322.38	2665.15		1.50	-0.20	0.048
80.00	-17.24	-1.62	0.00	-102.59	0.00	102.59	2864.89	1432.44	5100.92	2554.25		1.71	-0.21	0.046
84.08	-16.55	-1.62	0.00	-95.99	0.00	95.99	2826.09	1413.05	4921.28	2464.30		1.90	-0.22	0.045
85.00	-16.31	-1.62	0.00	-94.50	0.00	94.50	2817.24	1408.62	4881.12	2444.19		1.94	-0.22	0.044
89.50	-15.10	-1.62	0.00	-87.22	0.00	87.22	2031.94	1015.97	3485.43	1745.31		2.16	-0.24	0.057
90.00	-15.03	-1.62	0.00	-86.41	0.00	86.41	2029.15	1014.57	3470.92	1738.04		2.18	-0.24	0.057
95.00	-14.34	-1.62	0.00	-78.33	0.00	78.33	2000.34	1000.17	3325.82	1665.38		2.44	-0.25	0.054
100.00	-13.67	-1.62	0.00	-70.23	0.00	70.23	1969.95	984.97	3180.92	1592.82		2.71	-0.27	0.051
105.00	-13.01	-1.62	0.00	-62.14	0.00	62.14	1937.97	968.98	3036.44	1520.48		3.00	-0.28	0.048
110.00	-12.36	-1.62	0.00	-54.04	0.00	54.04	1904.40	952.20	2892.62	1448.46		3.31	-0.30	0.044
115.00	-11.73	-1.62	0.00	-45.94	0.00	45.94	1869.25	934.63	2749.69	1376.89		3.63	-0.31	0.040
120.00	-11.11	-1.61	0.00	-37.85	0.00	37.85	1832.52	916.26	2607.87	1305.87		3.97	-0.33	0.035
123.00	-8.58	-1.52	0.00	-33.02	0.00	33.02	1809.72	904.86	2523.40	1263.58		4.18	-0.33	0.031
125.00	-8.34	-1.51	0.00	-29.98	0.00	29.98	1794.20	897.10	2467.38	1235.52		4.32	-0.34	0.029
127.92	-8.01	-1.49	0.00	-25.58	0.00	25.58	1771.11	885.56	2386.14	1194.84		4.53	-0.34	0.026
130.00	-7.64	-1.47	0.00	-22.47	0.00	22.47	1754.29	877.15	2328.47	1165.96		4.68	-0.35	0.024
131.00	-6.64	-1.38	0.00	-21.00	0.00	21.00	1746.12	873.06	2300.89	1152.16		4.75	-0.35	0.022
132.08	-6.46	-1.37	0.00	-19.50	0.00	19.50	1160.48	580.24	1541.12	771.71		4.83	-0.35	0.031
135.00	-6.21	-1.35	0.00	-15.52	0.00	15.52	1148.82	574.41	1493.54	747.88		5.05	-0.36	0.026
140.00	-5.80	-1.30	0.00	-8.79	0.00	8.79	1127.58	563.79	1411.91	707.01		5.43	-0.36	0.018
141.00	-3.28	-0.86	0.00	-7.49	0.00	7.49	1123.15	561.57	1395.60	698.84		5.50	-0.37	0.014
145.00	-3.01	-0.81	0.00	-4.05	0.00	4.05	1104.76	552.38	1330.41	666.20		5.81	-0.37	0.009
150.00	0.00	-0.79	0.00	0.00	0.00	0.00	1080.36	540.18	1249.27	625.56		6.20	-0.37	0.000

Wind Loading - Shaft

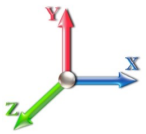
Structure:	CT10022-A-SBA	**Code:**	EIA/TIA-222-G	11/1/2017	
Site Name:	Simsbury 2, CT	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

Tower Engineering Solutions

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	287.87	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	282.46	0.650	0.000	5.00	25.776	16.75	137.2	0.0	1022.8
10.00		1.00	0.85	7.442	8.19	277.04	0.650	0.000	5.00	25.286	16.44	134.5	0.0	1003.3
15.00		1.00	0.85	7.442	8.19	271.63	0.650	0.000	5.00	24.797	16.12	131.9	0.0	983.7
20.00		1.00	0.90	7.896	8.69	274.22	0.650	0.000	5.00	24.307	15.80	137.2	0.0	964.2
25.00		1.00	0.95	8.276	9.10	275.03	0.650	0.000	5.00	23.818	15.48	140.9	0.0	944.7
30.00		1.00	0.98	8.600	9.46	274.54	0.650	0.000	5.00	23.328	15.16	143.4	0.0	925.2
35.00		1.00	1.01	8.883	9.77	273.11	0.650	0.000	5.00	22.839	14.85	145.1	0.0	905.7
40.00		1.00	1.04	9.137	10.05	270.98	0.650	0.000	5.00	22.350	14.53	146.0	0.0	886.1
41.50	Bot - Section 2	1.00	1.05	9.208	10.13	270.22	0.650	0.000	1.50	6.609	4.30	43.5	0.0	262.0
45.00		1.00	1.07	9.366	10.30	268.28	0.650	0.000	3.50	15.436	10.03	103.4	0.0	1216.5
48.00	Top - Section 1	1.00	1.08	9.494	10.44	266.44	0.650	0.000	3.00	13.040	8.48	88.5	0.0	1027.5
50.00		1.00	1.09	9.576	10.53	268.45	0.650	0.000	2.00	8.595	5.59	58.9	0.0	340.7
55.00		1.00	1.12	9.770	10.75	264.95	0.650	0.000	5.00	21.146	13.74	147.7	0.0	838.1
60.00		1.00	1.14	9.951	10.95	261.13	0.650	0.000	5.00	20.656	13.43	147.0	0.0	818.6
65.00		1.00	1.16	10.120	11.13	257.02	0.650	0.000	5.00	20.167	13.11	145.9	0.0	799.1
70.00		1.00	1.17	10.279	11.31	252.67	0.650	0.000	5.00	19.677	12.79	144.6	0.0	779.6
75.00		1.00	1.19	10.430	11.47	248.10	0.650	0.000	5.00	19.188	12.47	143.1	0.0	760.0
80.00		1.00	1.21	10.572	11.63	243.34	0.650	0.000	5.00	18.698	12.15	141.3	0.0	740.5
84.08	Bot - Section 3	1.00	1.22	10.684	11.75	239.32	0.650	0.000	4.08	14.907	9.69	113.9	0.0	590.3
85.00		1.00	1.22	10.708	11.78	238.40	0.650	0.000	0.92	3.340	2.17	25.6	0.0	236.7
89.50	Top - Section 2	1.00	1.24	10.825	11.91	233.82	0.650	0.000	4.50	16.160	10.50	125.1	0.0	1144.8
90.00		1.00	1.24	10.838	11.92	236.13	0.650	0.000	0.50	1.771	1.15	13.7	0.0	56.2
95.00		1.00	1.25	10.962	12.06	230.91	0.650	0.000	5.00	17.442	11.34	136.7	0.0	553.2
100.00		1.00	1.27	11.081	12.19	225.55	0.650	0.000	5.00	16.952	11.02	134.3	0.0	537.5
105.00		1.00	1.28	11.195	12.31	220.07	0.650	0.000	5.00	16.463	10.70	131.8	0.0	521.9
110.00		1.00	1.29	11.305	12.44	214.48	0.650	0.000	5.00	15.973	10.38	129.1	0.0	506.3
115.00		1.00	1.30	11.412	12.55	208.78	0.650	0.000	5.00	15.484	10.06	126.3	0.0	490.7
120.00		1.00	1.32	11.514	12.67	202.98	0.650	0.000	5.00	14.995	9.75	123.4	0.0	475.1
123.00	Appurtenance(s)	1.00	1.32	11.574	12.73	199.46	0.650	0.000	3.00	8.762	5.70	72.5	0.0	277.5
125.00		1.00	1.33	11.614	12.78	197.09	0.650	0.000	2.00	5.743	3.73	47.7	0.0	181.9
127.92	Bot - Section 4	1.00	1.33	11.670	12.84	193.61	0.650	0.000	2.92	8.235	5.35	68.7	0.0	260.8
130.00		1.00	1.34	11.710	12.88	191.11	0.650	0.000	2.08	5.846	3.80	49.0	0.0	322.2
131.00	Appurtenance(s)	1.00	1.34	11.729	12.90	189.91	0.650	0.000	1.00	2.776	1.80	23.3	0.0	152.9
132.08	Top - Section 3	1.00	1.34	11.749	12.92	188.60	0.650	0.000	1.08	2.985	1.94	25.1	0.0	164.5
135.00		1.00	1.35	11.803	12.98	187.27	0.650	0.000	2.92	7.923	5.15	66.9	0.0	188.5
140.00		1.00	1.36	11.894	13.08	181.14	0.650	0.000	5.00	13.195	8.58	112.2	0.0	313.9
141.00	Appurtenance(s)	1.00	1.36	11.912	13.10	179.90	0.650	0.000	1.00	2.580	1.68	22.0	0.0	61.4
145.00		1.00	1.37	11.982	13.18	174.94	0.650	0.000	4.00	10.126	6.58	86.8	0.0	240.8
150.00	Appurtenance(s)	1.00	1.38	12.068	13.27	168.67	0.650	0.000	5.00	12.217	7.94	105.4	0.0	290.5
								Totals:	**150.00**			**4,019.6**		**22,785.8**

Discrete Appurtenance Forces

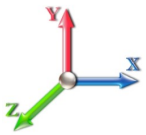
Structure:	CT10022-A-SBA	**Code:**	EIA/TIA-222-G	11/1/2017	
Site Name:	Simsbury 2, CT	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 26	

Tower Engineering Solutions

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	150.00	CSS DBC-750-Combiners	3	12.068	13.275	0.60	0.90	0.92	14.40	0.000	0.000	12.25	0.00	0.00
2	150.00	KMW	1	12.068	13.275	0.78	0.90	6.26	70.50	0.000	0.000	83.07	0.00	0.00
3	150.00	Powerwave	2	12.068	13.275	0.79	0.90	18.10	176.60	0.000	0.000	240.28	0.00	0.00
4	150.00	Kathrein 800 10121	3	12.068	13.275	0.81	0.90	12.57	187.20	0.000	0.000	166.87	0.00	0.00
5	150.00	CCI	6	12.068	13.275	0.60	0.90	4.12	115.20	0.000	0.000	54.75	0.00	0.00
6	150.00	Ericsson RRUS-11-RRUs	3	12.068	13.275	0.60	0.90	4.56	165.00	0.000	0.000	60.52	0.00	0.00
7	150.00	Commscope	1	12.068	13.275	0.60	0.90	0.03	1.10	0.000	0.000	0.40	0.00	0.00
8	150.00	CCI	6	12.068	13.275	0.60	0.90	1.56	19.80	0.000	0.000	20.65	0.00	0.00
9	150.00	Raycap	2	12.085	13.294	0.60	0.90	1.77	65.60	0.000	1.000	23.57	0.00	23.57
10	150.00	Quintel QS66512-3	1	12.068	13.275	0.81	0.90	6.59	105.00	0.000	0.000	87.42	0.00	0.00
11	150.00	CCI	2	12.068	13.275	0.71	0.90	19.10	150.00	0.000	0.000	253.52	0.00	0.00
12	150.00	Low Profile Platform	1	12.051	13.256	1.00	1.00	22.00	1500.00	0.000	-1.000	291.64	0.00	-291.64
13	150.00	LMU	1	12.068	13.275	0.60	0.90	0.53	28.00	0.000	0.000	7.04	0.00	0.00
14	150.00	Ericsson RRUS 32	3	12.068	13.275	0.60	0.90	4.96	159.00	0.000	0.000	65.80	0.00	0.00
15	150.00	Ericsson RRUS-32-RRHs	3	12.068	13.275	0.60	0.90	7.00	231.00	0.000	0.000	92.94	0.00	0.00
16	141.00	RFS DB-T1-6Z-8AB-0Z	1	11.912	13.103	0.77	0.80	3.15	21.40	0.000	0.000	41.26	0.00	0.00
17	141.00	Low Profile Platform	1	11.912	13.103	0.80	0.80	17.60	1500.00	0.000	0.000	230.62	0.00	0.00
18	141.00	RFS DB-T1-6Z-8AB-0Z	1	11.912	13.103	0.77	0.80	3.15	21.40	0.000	0.000	41.26	0.00	0.00
19	141.00	Alcatel Lucent	3	11.912	13.103	0.40	0.80	4.20	180.00	0.000	0.000	55.03	0.00	0.00
20	141.00	Alcatel Lucent	3	11.912	13.103	0.72	0.80	3.26	165.00	0.000	0.000	42.74	0.00	0.00
21	141.00	Antel	3	11.912	13.103	0.69	0.80	15.62	117.00	0.000	0.000	204.73	0.00	0.00
22	141.00	Commscope	6	11.912	13.103	0.73	0.80	35.22	436.20	0.000	0.000	461.44	0.00	0.00
23	141.00	Antel	3	11.912	13.103	0.82	0.80	8.71	90.90	0.000	0.000	114.19	0.00	0.00
24	141.00	Alcatel Lucent	3	11.912	13.103	0.40	0.80	4.20	180.00	0.000	0.000	55.03	0.00	0.00
25	131.00	RFS ATM1412D-1A20	3	11.729	12.902	0.58	0.80	2.05	39.00	0.000	0.000	26.45	0.00	0.00
26	131.00	Commscope LNX-6515DS	3	11.729	12.902	0.74	0.80	25.30	237.30	0.000	0.000	326.39	0.00	0.00
27	131.00	RFS	3	11.729	12.902	0.60	0.80	11.55	188.10	0.000	0.000	149.02	0.00	0.00
28	131.00	Kathrein 782 11056	3	11.729	12.902	0.61	0.80	1.20	33.00	0.000	0.000	15.53	0.00	0.00
29	131.00	T-Arms (Site Pro P/N	3	11.729	12.902	0.56	0.75	13.50	396.00	0.000	0.000	174.17	0.00	0.00
30	131.00	Ericsson KRY 144/1	3	11.729	12.902	0.56	0.80	0.69	33.00	0.000	0.000	8.89	0.00	0.00
31	123.00	ALU - 1900 MHz RRH	3	11.574	12.732	0.78	0.80	6.37	180.00	0.000	0.000	81.15	0.00	0.00
32	123.00	APXVTM14-C-I20	3	11.574	12.732	0.68	0.80	12.96	165.00	0.000	0.000	165.06	0.00	0.00
33	123.00	APXVSPP18-C-A20	2	11.574	12.732	0.72	0.80	11.63	114.00	0.000	0.000	148.02	0.00	0.00
34	123.00	ALU - TD-RRH8x20-25 -	3	11.574	12.732	0.55	0.80	6.71	210.00	0.000	0.000	85.39	0.00	0.00
35	123.00	Low Profile Platform	1	11.574	12.732	1.00	1.00	22.00	1500.00	0.000	0.000	280.10	0.00	0.00
36	123.00	ALU - 800 MHz RRH	3	11.574	12.732	0.74	0.80	5.50	159.00	0.000	0.000	70.00	0.00	0.00
37	123.00	RFS - ACU-A20-N - RET	4	11.574	12.732	0.63	0.80	0.35	4.00	0.000	0.000	4.51	0.00	0.00
38	123.00	APXVSPP18-C-A20	1	11.574	12.732	0.72	0.80	5.81	50.00	0.000	0.000	74.01	0.00	0.00
39	123.00	ALU - 800 MHz Filter	3	11.574	12.732	0.54	0.80	1.25	26.40	0.000	0.000	15.97	0.00	0.00
							Totals:		**9,035.10**			**4,331.66**		

Total Applied Force Summary

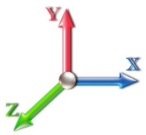
Structure:	CT10022-A-SBA		**Code:**	EIA/TIA-222-G	11/1/2017
Site Name:	Simsbury 2, CT		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 27

Tower Engineering Solutions

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		137.15	1235.31	0.00	0.00
10.00		134.55	1215.79	0.00	0.00
15.00		131.94	1196.27	0.00	0.00
20.00		137.23	1176.75	0.00	0.00
25.00		140.94	1157.23	0.00	0.00
30.00		143.44	1137.71	0.00	0.00
35.00		145.07	1118.18	0.00	0.00
40.00		146.00	1098.66	0.00	0.00
41.50		43.51	325.79	0.00	0.00
45.00		103.37	1365.31	0.00	0.00
48.00		88.52	1155.04	0.00	0.00
50.00		58.85	425.72	0.00	0.00
55.00		147.72	1050.65	0.00	0.00
60.00		146.97	1031.13	0.00	0.00
65.00		145.92	1011.61	0.00	0.00
70.00		144.62	992.08	0.00	0.00
75.00		143.09	972.56	0.00	0.00
80.00		141.34	953.04	0.00	0.00
84.08		113.87	763.84	0.00	0.00
85.00		25.58	275.65	0.00	0.00
89.50		125.08	1336.07	0.00	0.00
90.00		13.72	77.43	0.00	0.00
95.00		136.70	765.68	0.00	0.00
100.00		134.31	750.07	0.00	0.00
105.00		131.78	734.45	0.00	0.00
110.00		129.12	718.83	0.00	0.00
115.00		126.34	703.22	0.00	0.00
120.00		123.45	687.60	0.00	0.00
123.00	(23) attachments	996.70	2813.46	0.00	0.00
125.00		47.69	259.29	0.00	0.00
127.92		68.72	373.65	0.00	0.00
130.00		48.95	402.76	0.00	0.00
131.00	(18) attachments	723.74	1118.04	0.00	0.00
132.08		25.08	196.24	0.00	0.00
135.00		66.87	274.05	0.00	0.00
140.00		112.22	460.53	0.00	0.00
141.00	(24) attachments	1268.28	2802.60	0.00	0.00
145.00		86.75	299.40	0.00	0.00
150.00	(38) attachments	1566.13	3352.11	0.00	-268.07
	Totals:	**8,351.31**	**37,783.79**	**0.00**	**-268.07**

Calculated Forces

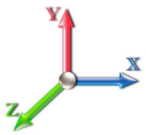
Structure:	CT10022-A-SBA	**Code:**	EIA/TIA-222-G	11/1/2017	
Site Name:	Simsbury 2, CT	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 28	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 22

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	-37.78	-8.37	0.00	-925.88	0.00	925.88	3399.80	1699.90	8571.22	4291.98	0.00	0.000	0.000	0.227
5.00	-36.54	-8.26	0.00	-884.05	0.00	884.05	3376.67	1688.33	8351.12	4181.77	0.02	-0.045	0.000	0.222
10.00	-35.32	-8.15	0.00	-842.77	0.00	842.77	3351.94	1675.97	8129.40	4070.74	0.10	-0.090	0.000	0.218
15.00	-34.11	-8.04	0.00	-802.03	0.00	802.03	3325.63	1662.82	7906.28	3959.02	0.21	-0.136	0.000	0.213
20.00	-32.93	-7.93	0.00	-761.82	0.00	761.82	3297.74	1648.87	7681.99	3846.70	0.38	-0.182	0.000	0.208
25.00	-31.77	-7.81	0.00	-722.18	0.00	722.18	3268.26	1634.13	7456.75	3733.92	0.60	-0.229	0.000	0.203
30.00	-30.62	-7.69	0.00	-683.13	0.00	683.13	3237.20	1618.60	7230.79	3620.77	0.86	-0.276	0.000	0.198
35.00	-29.50	-7.56	0.00	-644.70	0.00	644.70	3204.54	1602.27	7004.35	3507.38	1.18	-0.323	0.000	0.193
40.00	-28.40	-7.42	0.00	-606.91	0.00	606.91	3170.31	1585.15	6777.64	3393.86	1.54	-0.370	0.000	0.188
41.50	-28.07	-7.39	0.00	-595.77	0.00	595.77	3159.73	1579.86	6709.61	3359.79	1.66	-0.385	0.000	0.186
45.00	-26.70	-7.29	0.00	-569.92	0.00	569.92	3134.49	1567.24	6550.90	3280.32	1.95	-0.419	0.000	0.182
48.00	-25.54	-7.20	0.00	-548.05	0.00	548.05	3132.30	1566.15	6537.37	3273.54	2.23	-0.448	0.000	0.176
50.00	-25.12	-7.16	0.00	-533.64	0.00	533.64	3117.49	1558.74	6446.72	3228.15	2.42	-0.467	0.000	0.173
55.00	-24.06	-7.02	0.00	-497.86	0.00	497.86	3079.35	1539.68	6220.34	3114.79	2.93	-0.513	0.000	0.168
60.00	-23.03	-6.88	0.00	-462.77	0.00	462.77	3039.63	1519.81	5994.49	3001.70	3.50	-0.559	0.000	0.162
65.00	-22.01	-6.74	0.00	-428.37	0.00	428.37	2998.32	1499.16	5769.39	2888.98	4.11	-0.605	0.000	0.156
70.00	-21.01	-6.60	0.00	-394.66	0.00	394.66	2955.43	1477.72	5545.28	2776.76	4.76	-0.651	0.000	0.149
75.00	-20.04	-6.46	0.00	-361.65	0.00	361.65	2910.95	1455.48	5322.38	2665.15	5.47	-0.696	0.000	0.143
80.00	-19.08	-6.32	0.00	-329.33	0.00	329.33	2864.89	1432.44	5100.92	2554.25	6.22	-0.741	0.000	0.136
84.08	-18.32	-6.21	0.00	-303.51	0.00	303.51	2826.09	1413.05	4921.28	2464.30	6.87	-0.777	0.000	0.130
85.00	-18.04	-6.19	0.00	-297.82	0.00	297.82	2817.24	1408.62	4881.12	2444.19	7.02	-0.785	0.000	0.128
89.50	-16.70	-6.05	0.00	-269.98	0.00	269.98	2031.94	1015.97	3485.43	1745.31	7.78	-0.824	0.000	0.163
90.00	-16.62	-6.04	0.00	-266.96	0.00	266.96	2029.15	1014.57	3470.92	1738.04	7.87	-0.828	0.000	0.162
95.00	-15.86	-5.91	0.00	-236.76	0.00	236.76	2000.34	1000.17	3325.82	1665.38	8.77	-0.878	0.000	0.150
100.00	-15.10	-5.77	0.00	-207.23	0.00	207.23	1969.95	984.97	3180.92	1592.82	9.71	-0.926	0.000	0.138
105.00	-14.37	-5.64	0.00	-178.36	0.00	178.36	1937.97	968.98	3036.44	1520.48	10.71	-0.971	0.000	0.125
110.00	-13.65	-5.51	0.00	-150.17	0.00	150.17	1904.40	952.20	2892.62	1448.46	11.75	-1.013	0.000	0.111
115.00	-12.94	-5.38	0.00	-122.63	0.00	122.63	1869.25	934.63	2749.69	1376.89	12.83	-1.052	0.000	0.096
120.00	-12.25	-5.25	0.00	-95.74	0.00	95.74	1832.52	916.26	2607.87	1305.87	13.95	-1.086	0.000	0.080
123.00	-9.46	-4.20	0.00	-80.01	0.00	80.01	1809.72	904.86	2523.40	1263.58	14.64	-1.104	0.000	0.069
125.00	-9.20	-4.15	0.00	-71.61	0.00	71.61	1794.20	897.10	2467.38	1235.52	15.10	-1.115	0.000	0.063
127.92	-8.83	-4.07	0.00	-59.51	0.00	59.51	1771.11	885.56	2386.14	1194.84	15.79	-1.129	0.000	0.055
130.00	-8.42	-4.02	0.00	-51.03	0.00	51.03	1754.29	877.15	2328.47	1165.96	16.28	-1.139	0.000	0.049
131.00	-7.32	-3.27	0.00	-47.01	0.00	47.01	1746.12	873.06	2300.89	1152.16	16.52	-1.143	0.000	0.045
132.08	-7.12	-3.24	0.00	-43.47	0.00	43.47	1160.48	580.24	1541.12	771.71	16.78	-1.147	0.000	0.062
135.00	-6.85	-3.17	0.00	-34.00	0.00	34.00	1148.82	574.41	1493.54	747.88	17.49	-1.157	0.000	0.051
140.00	-6.39	-3.05	0.00	-18.14	0.00	18.14	1127.58	563.79	1411.91	707.01	18.71	-1.173	0.000	0.031
141.00	-3.62	-1.73	0.00	-15.09	0.00	15.09	1123.15	561.57	1395.60	698.84	18.95	-1.175	0.000	0.025
145.00	-3.32	-1.63	0.00	-8.17	0.00	8.17	1104.76	552.38	1330.41	666.20	19.94	-1.181	0.000	0.015
150.00	0.00	-1.57	0.00	0.00	0.00	0.00	1080.36	540.18	1249.27	625.56	21.18	-1.184	0.000	0.000

Final Analysis Summary

Structure:	CT10022-A-SBA		**Code:**	EIA/TIA-222-G	11/1/2017
Site Name:	Simsbury 2, CT		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 29

Tower Engineering Solutions

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 93 mph Wind	32.2	0.00	45.29	0.00	0.00	3577.78
0.9D + 1.6W 93 mph Wind	32.2	0.00	33.96	0.00	0.00	3544.98
1.2D + 1.0Di + 1.0Wi 50 mph Wind	10.7	0.00	80.41	0.00	0.00	1214.85
1.2D + 1.0E	2.0	0.00	45.34	0.00	0.00	248.43
0.9D + 1.0E	2.0	0.00	34.01	0.00	0.00	245.97
1.0D + 1.0W 60 mph Wind	8.4	0.00	37.78	0.00	0.00	925.88

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 93 mph Wind	-45.29	-32.17	0.00	-3577.7	0.00	-3577.7	3399.80	1699.9	8571.22	4291.98	0.00	0.847
0.9D + 1.6W 93 mph Wind	-33.96	-32.15	0.00	-3544.9	0.00	-3544.9	3399.80	1699.9	8571.22	4291.98	0.00	0.836
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-80.41	-10.73	0.00	-1214.8	0.00	-1214.8	3399.80	1699.9	8571.22	4291.98	0.00	0.307
1.2D + 1.0E	-45.34	-1.97	0.00	-248.43	0.00	-248.43	3399.80	1699.9	8571.22	4291.98	0.00	0.071
0.9D + 1.0E	-34.01	-1.97	0.00	-245.97	0.00	-245.97	3399.80	1699.9	8571.22	4291.98	0.00	0.067
1.0D + 1.0W 60 mph Wind	-37.78	-8.37	0.00	-925.88	0.00	-925.88	3399.80	1699.9	8571.22	4291.98	0.00	0.227

Base Plate Summary

Structure:	CT10022-A-SB		**Code:**	EIA/TIA-222-G	11/1/2017
Site Name:	Simsbury 2, CT		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 30

Tower Engineering Solutions

Reactions	
Original Design	
Moment (kip-ft):	3324.00
Axial (kip):	65.60
Shear (kip):	26.40
Analysis	
Moment (kip-ft):	3577.78
Axial (kip):	80.41
Shear (kip):	32.17
Moment Design %:	107.63

Base Plate	
Yield (ksi):	50.00
Width (in):	73.50
Style:	Round
Polygon Sides:	0.00
Clip Length (in):	0.00
Effective Len (in):	16.10
Moment (kip-in):	573.53
Allow Stress (ksi):	67.50
Applied Stress (ksi):	0.00
Stress Ratio:	0.79

Anchor Bolts	
Bolt Circle:	67.63
Number Bolts:	14.00
Bolt Type:	2.25" 18J
Bolt Diameter (in):	2.25
Yield (ksi):	75.00
Ultimate (ksi):	100.00
Arrangement:	Radial
Cluster Dist (in):	0.00
Start Angle (deg):	0.00
Compression	
Force (kip):	187.12
Allowable (kip):	260.00
Ratio:	0.74
Tension	
Force (kip):	175.64
Allowable (kip):	260.00
Ratio:	0.69

Monopole Mat Foundation Design

			Date: 11/1/2017
Customer Name:	Sprint Nextel	**EIA/TIA Standard:**	EIA-222-G
Site Name:		**Structure Height (Ft.):**	150
Site Number:	CT10022-A-SBA	**Engineer Name:**	D. Zhou
Engr. Number:	42142	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

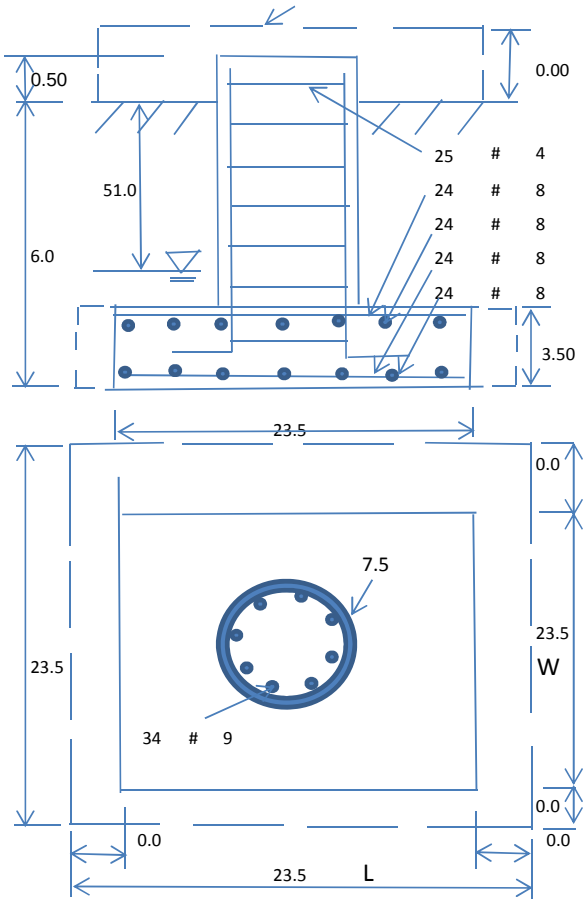
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	80.4	Shear Force (Kips):	32.2
Uplift Force (Kips):	0.0	Moment (Kips-ft):	3577.8
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	7.5	Depth of Base BG (ft.):	6.0
Pier Height A. G. (ft.):	0.50	Thickness of Pad (ft):	3.50
Length of Pad (ft.):	23.5	Width of Pad (ft.):	23.5
Final Length of pad (ft)	23.5	Final width of pad (ft):	23.5
Control Value for Cell D18:	0	Control Value for Cell F18:	0



Material Properties and Reabr Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	9	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	34	Tie Spacing (in):	3.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	8	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	24	Qty. of Rebar in Pad (W):	24	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	24	Qty. of Rebar in Pad (W):	24	
Apply 1.35 factor for e/w Per G:	1.35			

Soil Design Parameters:

Soil Unit Weight (pcf):	125.0	Soil Buoyant Weight:	60.0	Pcf		
Water Table B.G.S. (ft):	51.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	14000	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hori. force for O.T.M.:	No	Reduction factor on the maximum soil bearing pressure:	1.00			

Foundation Analysis and Design: Uplift Strength Reduction Factor: 0.75 — Compression Strength Reduction Factor: 0.75

Total Dry Soil Volume (cu. Ft.):	1270.18	Total Dry Soil Weight (Kips):	158.77
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	158.77	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	2065.41	Total Dry Concrete Weight (Kips):	309.81
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	309.81	Total Vertical Load on Base (Kips):	548.98

Check Soil Capacities:

				Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	3236	<	Allowable Factored Soil Bearing (psf): 10500	0.31	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	5900.0	>	Design Factored Momont (kips-ft): 3787	0.64	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.56	OK!			

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75		
Strength reduction factor (Axial compresion):	0.65	Wind Load Factor on Concrete Design:	1.00		
				Load/ Capacity Ratio	
(1) Concrete Pier:					
Vertical Steel Rebar Area (sq. in./each):	1.00	Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	6200.6 >	Design Factored Moment (Mu, Kips-F	3674.4	0.59	OK!
Calculated Shear Capacity (Kips):	1098.7 >	Design Factored Shear (Kips):	32.2	0.03	OK!
Calculated Tension Capacity (Tn, Kips):	1836.0 >	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	8390.6 >	Design Factored Axial Load (Pu Kips):	80.4	0.01	OK!
Moment & Axial Strength Combination(Pu/Pn+Mu/Mn):	0.60 OK!	Check Tie Spacing (Design/Required):		0.25	OK!
Pier Reinforcement Ratio:	0.005	Reinforcement Ratio is satisfied per ACI			
(2).Concrete Pad:					
One-Way Design Shear Capacity (L-Direction, Kips):	881.9 >	One-Way Factored Shear (L-D. Kips):	213.7	0.24	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	881.9 >	One-Way Factored Shear (W-D., Kips)	213.7	0.24	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	965.7 >	One-Way Factored Shear (C-C, Kips):	412.9	0.43	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0018 OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0018		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	3180.0 >	Moment at Bottom (L-Direct. K-Ft):	515.9	0.16	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	3180.0 >	Moment at Bottom (W-Direct. K-Ft):	515.9	0.16	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	4469.4 >	Moment at Bottom (C-C Dir. K-Ft):	729.7	0.16	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0018 OK!	Upper Steel Reinf. Ratio (W-Direct.):	0.0018		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	3180.0 >	Moment at the top (L-Dir Kips-Ft):	194.1	0.06	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	3180.0 >	Moment at the top (W-Dir Kips-Ft):	194.1	0.06	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	4469.4 >	Moment at the top (C-C Direc. K-Ft):	381.7	0.09	OK!

SPECIAL CONSTRUCTION NOTE:
SPRINT TOWER TOP WORK IS CONTINGENT ON THE FOLLOWING:
* COMPLETION OF A GLOBAL STRUCTURAL STABILITY ANALYSIS.
* COMPLETION OF AN ANTENNA/RRH MOUNT STRUCTURAL ASSESSMENT.
* GC SHALL FURNISH, INSTALL AND COMPLETE ALL REQUIRED STRUCTURAL MODIFICATIONS AS INDICATED IN BEFORE-MENTIONED ANALYSIS AND ASSESSMENT.
* SBA COMMUNICATIONS CORPORATION SHALL PROVIDE WRITTEN ACCEPTANCE/APPROVAL FOR THE COMPLETION OF ALL TOWER/FOUNDATION STRUCTURAL MODIFICATIONS INCLUDING (AS NECESSARY) CONTROLLED CONSTRUCTION INSPECTIONS, SHOP-DRAWING APPROVALS, MATERIALS TEST RESULTS, AND FINAL ENGINEER'S AFFIDAVIT.

Sprint

NOTE:

OWNER AND TENANT MAY, FROM TIME TO TIME AT TENANT'S OPTION, REPLACE THIS EXHIBIT WITH AN EXHIBIT SETTING FORTH THE LEGAL DESCRIPTION OF THE SITE, OR WITH ENGINEERED OR AS-BUILT DRAWING DEPICTING THE SITE OR ILLUSTRATING STRUCTURAL MODIFICATIONS OR CONSTRUCTION PLANS OF THE SITE. ANY VISUAL OR TEXTUAL REPRESENTATION OF THE EQUIPMENT LOCATED WITHIN THE SITE CONTAINED IN THESE OTHER DOCUMENTS IS ILLUSTRATIVE ONLY, AND DOES NOT LIMIT THE RIGHTS OF SPRINT AS PROVIDED FOR IN THE AGREEMENT. THE LOCATIONS OF ANY ACCESS AND UTILITY EASEMENTS ARE ILLUSTRATIVE ONLY. ACTUAL LOCATIONS MAY BE DETERMINED BY TENANT AND/OR THE SERVICING UTILITY COMPANY IN COMPLIANCE WITH LOCAL LAWS AND REGULATIONS.

NOTE:
THESE PLANS ARE BASED ON INFORMATION OBTAINED SITE VISIT ON MARCH 21, 2014. THE SPRINT CONTRACTOR IS RESPONSIBLE TO VERIFYING ALL ITEMS AND NOTIFYING THE ENGINEER OF RECORD AND DISCREPANCIES.

PROJECT:	DO MACRO EQUIPMENT DEPLOYMENT
SITE NAME:	NESM TOWER
SITE CASCADE:	CT70XC140-A
MARKET:	NORTHERN CONNECTICUT
SBA SITE ID:	CT10022-A/SIMSBURY 2, CT
SITE ADDRESS:	100 GRIST MILL ROAD SIMSBURY, CT 06070
SITE TYPE:	150' MONOPOLE

SITE INFORMATION

PROPERTY OWNER:

MICHAEL F MCKENNA
100 GRIST MILL ROAD
WETHERSFIELD, CT 06109

TOWER OWNER:

SBA TOWERS II, LLC.
8051 CONGRESS AVENUE
BOCA RATON, FL 33487
PHONE: (561)995-7670

SBA REGIONAL SITE MANAGER:

STEPHEN ROTH
PHONE: 860-539-4920
SRoth@sbasite.com

LATITUDE (NAD83):
GOOGLE EARTH 2-C CONFIRMATION

41°52'00.15"N
41.866700

LONGITUDE (NAD83):
GOOGLE EARTH 2-C CONFIRMATION

72°48'56.78"W
-72.815700

COUNTY:

HARTFORD

POWER COMPANY:

CL&P

AAV PROVIDER:

COX COMMUNICATIONS

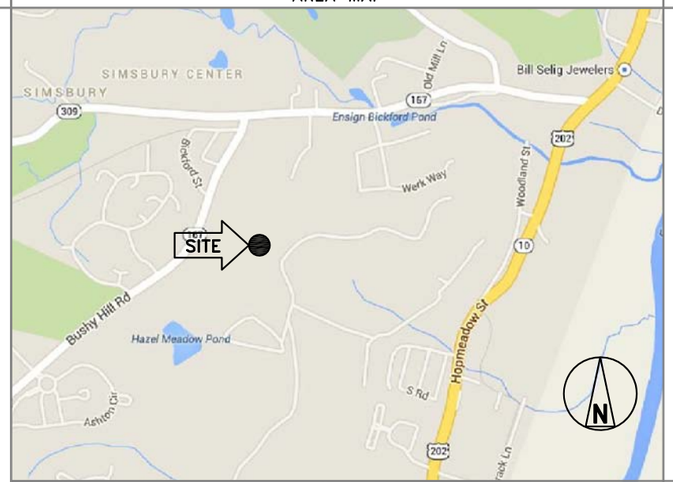
SPRINT CONSTRUCTION MANAGER:

MICHAEL DELIA
PHONE: 781-316-6348
Michael.DeLia@sprint.com

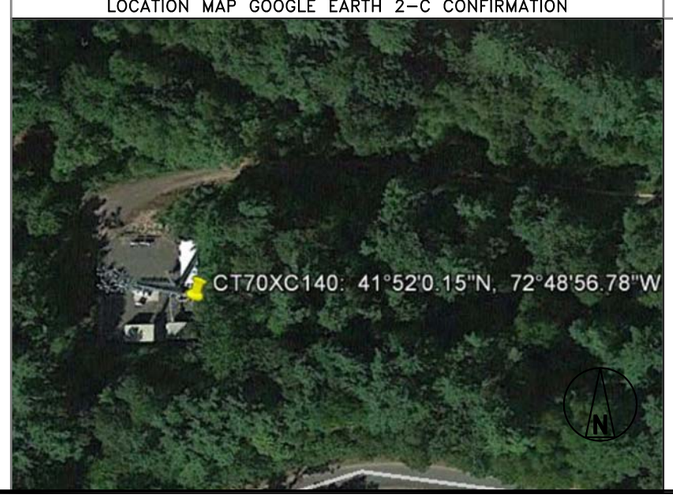
EQUIPMENT SUPPLIER:

ALCATEL-LUCENT
600 MOUNTAIN AVENUE
MURRAY HILL, NJ 07974

AREA MAP



LOCATION MAP GOOGLE EARTH 2-C CONFIRMATION



PROJECT DESCRIPTION

SPRINT EQUIPMENT MODIFICATIONS REQUIRED TO SUPPORT MODERNIZATION OF AN EXISTING WIRELESS COMMUNICATIONS FACILITY AND UTILIZATION OF FCC BROADBAND SPECTRUM LICENSE FOR 2.5GHz FREQUENCY, INCLUDING INSTALLATION OF:

GROUND-LEVEL RAN EQUIPMENT, CONSISTING OF:
* NEW GROWTH CABINET WITH 2.5 RADIO ACCESS NETWORK (RAN) EQUIPMENT & (2) BATTERY STRINGS

TOWER-TOP EQUIPMENT, INCLUDING INSTALLATION OF:
* (3) PANEL ANTENNAS
* (3) REMOTE RADIO HEADS (RRH)
* (1) HYBRID CABLE (AND ASSOCIATED FIBER, DC POWER, COAXIAL CABLE JUMPERS AND ANTENNA REMOTE ELECTRICAL-TILT (RET) CABLE

SPECIAL ZONING NOTE:
BASED ON INFORMATION PROVIDE BY SPRINT REGULATORY COMPLIANCE PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS CONSIDERED AND ELIGIBLE FACILITY UNDER THE TAX RELIEF ACT OF 2012, 47 USC 1455(A), AND IS SUBJECT TO AN EXPEDITED ELIGIBLE FACILITIES REQUEST/REVIEW AND ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW, ADMINISTRATIVE REVIEW).

GENERAL NOTES

1. THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION:
- ADA COMPLIANCE NOT REQUIRED.
- POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
- NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
2. CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACE THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
3. NEW CONSTRUCTION WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
BUILDING CODE: IBC 2012 W/ 2016 CT STATE BUILDING CODE AMENDMENTS
ELECTRICAL CODE: 2014 NATIONAL ELECTRICAL CODE
STRUCTURAL CODE: (TIA) 222-G STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

811 Know what's below. Call before you dig. www.CBYD.com

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A-5	EQUIPMENT DETAILS	2	BB	DJM
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APPROVALS

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND MAY IMPOSE CHANGES OR MODIFICATIONS.

SPRINT:		DATE:	
CONSTRUCTION MANAGER:		DATE:	
LEASING/ SITE ACQUISITION:		DATE:	
RF ENGINEER:		DATE:	
LANDLORD/ TOWER OWNER:		DATE:	

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STATE OF CONNECTICUT
DEREK J. CREASER
No. 23567
LICENSED ENGINEER

CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	01/26/18	ISSUED FOR CONSTRUCTION	DJM
1	05/22/14	ISSUED FOR CONSTRUCTION	SF
0	05/14/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:
CT70XC140-A

SITE NAME:
NESM TOWER

SITE ADDRESS:
100 GRIST MILL ROAD
SIMSBURY, CT 06070

SHEET TITLE
TITLE SHEET
(DO MACRO)

SHEET NUMBER
T-1

THESE OUTLINE SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT STANDARD CONSTRUCTION SPECIFICATIONS, INCLUDING CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

SECTION 01 100 – SCOPE OF WORK

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT CONSTRUCTION STANDARDS FOR WIRELESS SITES, CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 PRECEDENCE: SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES INCLUDING THE STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. NOTIFY SPRINT CONSTRUCTION MANAGER IF THIS OCCURS.

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

A. THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
1. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
2. GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY –GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
3. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC") AND NFPA 101 (LIFE SAFETY CODE).
4. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
5. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
6. AMERICAN CONCRETE INSTITUTE (ACI)
7. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
8. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
9. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
10. PORTLAND CEMENT ASSOCIATION (PCA)
11. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
12. BRICK INDUSTRY ASSOCIATION (BIA)
13. AMERICAN WELDING SOCIETY (AWS)
14. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
15. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
16. DOOR AND HARDWARE INSTITUTE (DHI)
17. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
18. APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.

1.5 DEFINITIONS:

A. WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B. COMPANY: SPRINT CORPORATION
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D. CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E. THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.
F. OFCI: OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT.
G. CONSTRUCTION MANAGER – ALL PROJECTS RELATED COMMUNICATION TO FLOW THROUGH SPRINT REPRESENTATIVE IN CHARGE OF PROJECT...

1.6 SITE FAMILIARITY: CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OR FIELD CONDITIONS.

1.7 POINT OF CONTACT: COMMUNICATION BETWEEN SPRINT AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE SPRINT CONSTRUCTION MANAGER APPOINTED TO MANAGE THE PROJECT FOR SPRINT.

1.8 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.9 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.

A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN RED PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.
B. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK.
C. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SPRINT CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH THE WORK.

1.10 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.11 UTILITIES SERVICES: WHERE NECESSARY TO CUT EXISTING PIPES, ELECTRICAL WIRES, CONDUITS, CABLES, ETC., OF UTILITY SERVICES, OR OF FIRE PROTECTION OR COMMUNICATIONS SYSTEMS, THEY SHALL BE CUT AND CAPPED AT SUITABLE PLACES OR WHERE SHOWN. ALL SUCH ACTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANY INVOLVED:

1.12 PERMITS / FEES: WHEN REQUIRED THAT A PERMIT OR CONNECTION FEE BE PAID TO A PUBLIC UTILITY PROVIDER FOR NEW SERVICE TO THE CONSTRUCTION PROJECT, PAYMENT OF SUCH FEE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

1.13 CONTRACTOR SHALL TAKE ALL MEASURES AND PROVIDE ALL MATERIAL NECESSARY FOR PROTECTING EXISTING EQUIPMENT AND PROPERTY.

1.14 METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION: CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN THE FOLLOWING INSTALLATION AND COMMISSIONING MOPS.

A. TOP HAT
B. HOW TO INSTALL A NEW CABINET
C. BASE BAND UNIT IN EXISTING UNIT
D. INSTALLATION OF BATTERIES
E. INSTALLATION OF HYBRID CABLE
F. INSTALLATION OF RRH'S
G. CABLING
H. SPRINT TS-0200 (CURRENT VERSION) – ANTENNA LINE ACCEPTANCE STANDARDS
I. SPRINT CELL SITE ENGINEERING NOTICE – EN 2012-001, REV 1.
J. COMMISSIONING MOPS
K. SPRINT CELL SITE ENGINEERING NOTICE – EN-2013-002
L. SPRINT ENGINEERING LETTER – EL-0504
M. SPRINT ENGINEERING LETTER – EL-0568
N. SPRINT TECHNICAL SPECIFICATION – TS-0193

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

A. CONTRACTOR WILL UTILIZE ITS BEST EFFORTS TO WORK WITH SPRINT ELECTRONIC PROJECT MANAGEMENT SYSTEMS. CONTRACTOR UNDERSTANDS THAT SUFFICIENT INTERNET ACCESS, EQUIVALENT TO "BROADBAND" OR BETTER, IS REQUIRED TO TIMELY AND EFFECTIVELY UTILIZE SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS AND AGREES TO MAINTAIN APPROPRIATE CONNECTIONS FOR CONTRACTOR'S STAFF AND OFFICES THAT ARE COMPATIBLE WITH SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

3.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

3.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

3.4 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

3.5 EXISTING CONDITIONS: NOTIFY THE SPRINT CONSTRUCTION MANAGER OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:

A. COMPANY FURNISHED MATERIAL AND EQUIPMENT IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DOCUMENTS.

B. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
1. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
4. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
5. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
6. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

3.2 DELIVERABLES:

A. COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.

B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE WITH COMPANY PRACTICE, AND AS DIRECTED BY COMPANY.

C. UPLOAD DOCUMENTATION INTO SPRINT SITE MANAGEMENT SYSTEM (SMS) AND/OR PROVIDE HARD COPY DOCUMENTATION AS REQUESTED.

SECTION 01 300 – CELL SITE CONSTRUCTION

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 NOTICE TO PROCEED:

A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF THE WORK ORDER.

B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FUNCTIONAL REQUIREMENTS:

A. THE ACTIVITIES DESCRIBED IN THIS PARAGRAPH REPRESENT MINIMUM ACTIONS AND PROCESSES REQUIRED TO SUCCESSFULLY COMPLETE THE WORK. THE ACTIVITIES DESCRIBED ARE NOT EXHAUSTIVE, AND CONTRACTOR SHALL TAKE ANY AND ALL ACTIONS AS NECESSARY TO SUCCESSFULLY COMPLETE THE CONSTRUCTION OF A FULLY FUNCTIONING WIRELESS FACILITY AT THE SITE IN ACCORDANCE WITH COMPANY PROCESSES.

B. SUBMIT SPECIFIC DOCUMENTATION AS INDICATED HEREIN, AND OBTAIN REQUIRED APPROVALS WHILE THE WORK IS BEING PERFORMED.

C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES

D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
2. PREPARE GROUND SITES; PROVIDE DE-GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
3. MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND TELCO BACKHAUL.
4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEM.
5. INSTALL ABOVE GROUND GROUNDING SYSTEMS.
6. PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
7. INSTALL "H-FRAMES", CABINETS AND SHELTERS AS INDICATED.
8. INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
9. ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.
10. PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.
11. PROVIDE SLABS AND EQUIPMENT PLATFORMS.
12. INSTALL COMPOUND FENCING, SIGHT SHIELDING, LANDSCAPING AND ACCESS BARRIERS.
13. PERFORM INSPECTION AND MATERIAL TESTING AS REQUIRED HEREINAFTER.
14. CONDUCT SITE RESISTANCE TO EARTH TESTING AS REQUIRED HEREINAFTER
15. INSTALL FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS.
16. INSTALL TOWERS, ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.
17. INSTALL CELL SITE RADIOS, MICROWAVE, GPS, COAXIAL MAINLINE, ANTENNAS, CROSS BAND COUPLERS, TOWER TOP AMPLIFIERS, LOW NOISE AMPLIFIERS AND RELATED EQUIPMENT.
18. PERFORM, DOCUMENT, AND CLOSE OUT ANY CONSTRUCTION CONTROL DOCUMENTS THAT MAY BE REQUIRED BY GOVERNMENT AGENCIES AND LANDLORDS.
19. PERFORM ANTENNAL AND COAX SWEEP TESTING AND MAKE ANY AND ALL NECESSARY CORRECTIONS.
20. REMAIN ON SITE MOBILIZED THROUGHOUT HAND-OFF AND INTEGRATION TO ASSIST AS NEEDED UNTIL SITE IS DEEMED SUBSTANTIALLY COMPLETE AND PLACED "ON AIR."

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

A. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

B. EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
1. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
2. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

D. CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO THEIR ORIGINAL CONDITION

E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

A. CONTRACTOR SHALL REVIEW, APPROVE, AND SUBMIT TO SPRINT SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND SIMILAR SUBMITTALS AS REQUIRED HEREINAFTER

B. PROVIDE DOCUMENTATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING. DOCUMENTATION SHALL BE FORWARDED IN ORIGINAL FORMAT AND/OR UPLOADED INTO SMS.
1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
2. PROJECT PROGRESS REPORTS.
3. CIVIL CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
4. ELECTRICAL SERVICE COMPLETION DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
5. LINES AND ANTENNA INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
6. POWER INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
7. TELCO READY DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
8. PPC (OR SHELTER) INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
9. TOWER CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
10. TOWER CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
11. BTS AND RADIO EQUIPMENT DELIVERED AT SITE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
12. NETWORK OPERATIONS HANDOFF CHECKLIST (HOC WALK) COMPLETE (UPLOAD FORM IN SMS)
13. CIVIL CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
14. SITE CONSTRUCTION PROGRESS PHOTOS UNLOADED INTO SMS.

CONTINUE SHEET SP-2

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FAX: (978) 336-5586

CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	01/26/18	ISSUED FOR CONSTRUCTION	DJM
1	05/22/14	ISSUED FOR CONSTRUCTION	SF
0	05/14/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:
CT70XC140-A

SITE NAME:
NESM TOWER

SITE ADDRESS:
100 GRIST MILL ROAD
SIMSBURY, CT 06070

SHEET TITLE

OUTLINE SPECIFICATIONS
(DO MACRO)

SHEET NUMBER

SP-1

CONTINUED FROM SP-1:

SECTION 01 400 – SUBMITTALS, TESTS, AND INSPECTIONS

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 SUBMITTALS:

A. THE WORK IN ALL ASPECTS SHALL COMPLY WITH THE CONSTRUCTION DRAWINGS AND THESE SPECIFICATIONS.

B. SUBMIT THE FOLLOWING TO COMPANY REPRESENTATIVE FOR APPROVAL.
1. CONCRETE MIX–DESIGNS FOR TOWER FOUNDATIONS, ANCHORS PIERS, AND CONCRETE PAVING.
2. CONCRETE BREAK TESTS AS SPECIFIED HEREIN.
3. SPECIAL FINISHES FOR INTERIOR SPACES, IF ANY.
4. ALL EQUIPMENT AND MATERIALS SO IDENTIFIED ON THE CONSTRUCTION DRAWINGS.
5. CHEMICAL GROUNDING DESIGN.

C. ALTERNATES: AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO BEING SHIPPED TO SITE. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED. SUBMITTAL FOR APPROVAL SHALL INCLUDE A STATEMENT OF COST REDUCTION PROPOSED FOR USE OF ALTERNATE PRODUCT.

1.4 TESTS AND INSPECTIONS:

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.

B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. COAX SWEEPS AND FIBER TESTS PER SPRINT TS–0200 (CURRENT VERSION) ANTENNA LINE ACCEPTANCE STANDARDS.
2. AGL, AZIMUTH AND DOWNTILT USING ELECTRONIC COMMERCIAL MADE–FOR–THE–PURPOSE ANTENNA ALIGNMENT TOOL.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

C. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING;
1. AZIMUTH, DOWNTILT, AGL – UPLOAD REPORT FROM ANTENNA ALIGNMENT TOOL TO SITERRA TASK 465. INSTALLED AZIMUTH, DOWNTILT, AND AGL MUST CONFORM TO THE RF DATA SHEETS. SWEEP AND FIBER TESTS
2. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
3. ALL AVAILABLE JURISDICTIONAL INFORMATION
4. PDF SCAN OF REDLINES PRODUCED IN FIELD
5. ELECTRONIC AS–BUILT DRAWINGS IN AUTOCAD AND PDF FORMATS. ANY FIELD CHANGE MUST BE REFLECTED BY MODIFYING THE PLANS, ELEVATIONS, AND DETAILS IN THE DRAWING SETS. GENERAL NOTES INDICATING MODIFICATIONS WILL NOT BE ACCEPTED. CHANGES SHALL BE HIGHLIGHTED AS "CLOUDS" IDENTIFIED AS THE "AS–BUILT" CONDITION.
6. LIEN WAIVERS
7. FINAL PAYMENT APPLICATION
8. REQUIRED FINAL CONSTRUCTION PHOTOS
9. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
10. ALL POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINTS DOCUMENT REPOSITORY OF RECORD).

1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPS

1.6 INTEGRATION: PERFORM ALL INTEGRATION ACTIVITIES AS REQUIRED BY APPLICABLE MOPS

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 REQUIREMENTS FOR TESTING:

A. THIRD PARTY TESTING AGENCY: WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
1. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
2. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.
3. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.

3.2 REQUIRED TESTS:

A. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. CONCRETE CYLINDER BREAK TESTS FOR THE TOWER AND ANCHOR FOUNDATIONS AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
2. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED IN SECTION: HOT MIX ASPHALT PAVING.
3. FIELD QUALITY CONTROL TESTING AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
4. TESTING REQUIRED UNDER SECTION: AGGREGATE BASE FOR ACCESS ROADS, PADS AND ANCHOR LOCATIONS
5. STRUCTURAL BACKFILL COMPACTION TESTS FOR THE TOWER FOUNDATION.
6. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
7. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
8. GROUNDING AT ANTENNA MASTS FOR GPS AND ANTENNAS
9. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

3.3 REQUIRED INSPECTIONS:

A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.

B. CONDUCT INSPECTIONS INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. GROUNDING SYSTEM INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
3. COMPACTION OF BACKFILL MATERIALS; AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS; ASPHALT PAVING; AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
4. PRE– AND POST–CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES.
5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
6. ANTENNA AZIMUTH , DOWN TILT AND PER SUNLIGHT TOOL SUNSIGHT INSTRUMENTS – ANTENNALIGN ALIGNMENT TOOL (AAT)
7. VERIFICATION DOCUMENTED WITH THE ANTENNA CHECKLIST REPORT, BY A&E, SITE DEVELOPMENT REP, OR RF REP.
8. FINAL INSPECTION CHECKLIST AND HANDOFF WALK (HOC.). SIGNED FORM SHOWING ACCEPTANCE BY FIELD OPS IS TO BE UPLOADED INTO SMS.
9. COAX SWEEP AND FIBER TESTING DOCUMENTS SUBMITTED VIA SMS FOR RF APPROVAL.
10. SCAN–ABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
11. ALL AVAILABLE JURISDICTIONAL INFORMATION
12. PDF SCAN OF REDLINES PRODUCED IN FIELD

E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

F. CONSTRUCTION INSPECTIONS AND CORRECTIVE MEASURES SHALL BE DOCUMENTED BY THE CONTRACTOR WITH WRITTEN REPORTS AND PHOTOGRAPHS. PHOTOGRAPHS MUST BE DIGITAL AND OF SUFFICIENT QUALITY TO CLEARLY SHOW THE SITE CONSTRUCTION. PHOTOGRAPHS MUST CLEARLY IDENTIFY THE PHOTOGRAPHED ITEM AND BE LABELED WITH THE SITE CASCADE NUMBER, SITE NAME, DESCRIPTION, AND DATE.

3.4 DELIVERABLES: TEST AND INSPECTION REPORTS AND CLOSEOUT DOCUMENTATION SHALL BE UPLOADED TO THE SMS AND/OR FORWARDED TO SPRINT FOR INCLUSION INTO THE PERMANENT SITE FILES.

A. THE FOLLOWING TEST AND INSPECTION REPORTS SHALL BE PROVIDED AS APPLICABLE.
1. CONCRETE MIX AND CYLINDER BREAK REPORTS.
2. STRUCTURAL BACKFILL COMPACTION REPORTS.
3. SITE RESISTANCE TO EARTH TEST.
4. ANTENNA AZIMUTH AND DOWN TILT VERIFICATION
5. TOWER ERECTION INSPECTIONS AND MEASUREMENTS DOCUMENTING TOWER INSTALLED PER SUPPLIER'S REQUIREMENTS AND THE APPLICABLE SECTIONS HEREIN.
6. COAX CABLE SWEEP TESTS PER COMPANY'S "ANTENNA LINE ACCEPTANCE STANDARDS".

B. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES THE FOLLOWING;
1. TEST WELLS AND TRENCHES: PHOTOGRAPHS OF ALL TEST WELLS; PHOTOGRAPHS SHOWING ALL OPEN EXCAVATIONS AND TRENCHING PRIOR TO BACKFILLING SHOWING A TAPE MEASURE VISIBLE IN THE EXCAVATIONS INDICATING DEPTH.
2. CONDUITS, CONDUCTORS AND GROUNDING: PHOTOGRAPHS SHOWING TYPICAL INSTALLATION OF CONDUCTORS AND CONNECTORS; PHOTOGRAPHS SHOWING TYPICAL BEND RADIUS OF INSTALLED GROUND WIRES AND GROUND ROD SPACING;
3. CONCRETE FORMS AND REINFORCING: CONCRETE FORMING AT TOWER AND EQUIPMENT/SHELTER PAD/FOUNDATIONS – PHOTOGRAPHS SHOWING ALL REINFORCING STEEL, UTILITY AND CONDUIT STUB OUTS; PHOTOGRAPHS SHOWING CONCRETE POUR OF SHELTER SLAB/FOUNDATION, TOWER FOUNDATION AND GUY ANCHORS WITH VIBRATOR IN USE; PHOTOGRAPHS SHOWING EACH ANCHOR ON GUYED TOWERS, BEFORE CONCRETE POUR.
4. TOWER, ANTENNAS AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAX LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING, AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING – TOP AND BOTTOM; PHOTOS OF COAX GROUNDING––TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
5. ROOF TOPS: PRE–CONSTRUCTION AND POST–CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;
6. SITE LAYOUT – PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.
7. FINISHED UTILITIES: CLOSE–UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE–UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE–UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.
8. REQUIRED MATERIALS CERTIFICATIONS: CONCRETE MIX DESIGNS; MILL CERTIFICATION FOR ALL REINFORCING AND STRUCTURAL STEEL; AND ASPHALT PAVING MIX DESIGN.
9. ANY AND ALL SUBMITTALS BY THE JURISDICTION OR COMPANY.

SECTION 01 500 – PROJECT REPORTING

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 WEEKLY REPORTS:

A. CONTRACTOR SHALL PROVIDE SPRINT WITH WEEKLY REPORTS SHOWING PROJECT STATUS. THIS STATUS REPORT FORMAT WILL BE PROVIDED TO THE CONTRACTOR BY SPRINT. THE REPORT WILL CONTAIN SITE ID NUMBER, THE MILESTONES FOR EACH SITE, INCLUDING THE BASELINE DATE, ESTIMATED COMPLETION DATE AND ACTUAL COMPLETION DATE.

B. REPORT INFORMATION WILL BE TRANSMITTED TO SPRINT VIA ELECTRONIC MEANS AS REQUIRED. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.

3.2 PROJECT CONFERENCE CALLS:

A. SPRINT MAY HOLD WEEKLY PROJECT CONFERENCE CALLS. CONTRACTOR WILL BE REQUIRED TO COMMUNICATE SITE STATUS, MILESTONE COMPLETIONS AND UPCOMING MILESTONE PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY.

3.3 PROJECT TRACKING IN SMS:

A. CONTRACTOR SHALL PROVIDE SCHEDULE UPDATES AND PROJECTIONS IN THE SMS SYSTEM ON A WEEKLY BASIS.

3.4 ADDITIONAL REPORTING:

A. ADDITIONAL OR ALTERNATE REPORTING REQUIREMENTS MAY BE ADDED TO THE REPORT AS DETERMINED TO BE REASONABLY NECESSARY BY COMPANY.

3.5 PROJECT PHOTOGRAPHS:

A. FILE DIGITAL PHOTOGRAPHS OF COMPLETED SITE IN JPEG FORMAT IN THE SMS PHOTO LIBRARY FOR THE RESPECTIVE SITE. PHOTOGRAPHS SHALL BE CLEARLY LABELED WITH SITE NUMBER, NAME AND DESCRIPTION, AND SHALL INCLUDE AT A MINIMUM THE FOLLOWING AS APPLICABLE:
1. SHELTER AND TOWER OVERVIEW.
2. TOWER FOUNDATION(S) – FORMS AND STEEL BEFORE POUR (EACH ANCHOR ON GUYED TOWERS).
3. TOWER FOUNDATION(S) POUR WITH VIBRATOR IN USE (EACH ANCHOR ON GUYED TOWERS).
4. TOWER STEEL AS BEING INSTALLED INTO HOLE (SHOW ANCHOR STEEL ON GUYED TOWERS).
5. PHOTOS OF TOWER SECTION STACKING.
6. CONCRETE TESTING / SAMPLES.
7. PLACING OF ANCHOR BOLTS IN TOWER FOUNDATION.
8. BUILDING/WATER TANK FROM ROAD FOR TENANT IMPROVEMENTS OR COMMENTS.
9. SHELTER FOUNDATION––FORMS AND STEEL BEFORE POURING.
10. SHELTER FOUNDATION POUR WITH VIBRATOR IN USE.
11. COAX CABLE ENTRY INTO SHELTER.
12. PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
13. ROOFTOP PRE AND POST CONSTRUCTION PHOTOS TO INCLUDE PENETRATIONS AND INTERIOR CEILING.
14. PHOTOS OF TOWER TOP COAX LINE COLOR CODING AND COLOR CODING AT GROUND LEVEL.
15. PHOTOS OF ALL APPROPRIATE COMPANY OR REGULATORY SIGNAGE.
16. PHOTOS OF EQUIPMENT BOLT DOWN INSIDE SHELTER.
17. POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE AND POWER AND TELCO SUPPLY LOCATIONS INCLUDING METER/DISCONNECT.
18. ELECTRICAL TRENCH(S) WITH ELECTRICAL / CONDUIT BEFORE BACKFILL.
19. ELECTRICAL TRENCH(S) WITH FOIL–BACKED TAPE BEFORE FURTHER BACKFILL.
20. TELCO TRENCH WITH TELEPHONE / CONDUIT BEFORE BACKFILL.
21. TELCO TRENCH WITH FOIL–BACKED TAPE BEFORE FURTHER BACKFILL.
22. SHELTER GROUND–RING TRENCH WITH GROUND–WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
23. TOWER GROUND–RING TRENCH WITH GROUND–WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
24. FENCE GROUND–RING TRENCH WITH GROUND–WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
25. ALL BTS GROUND CONNECTIONS.
26. ALL GROUND TEST WELLS.
27. ANTENNA GROUND BAR AND EQUIPMENT GROUND BAR.
28. ADDITIONAL GROUNDING POINTS ON TOWERS ABOVE 200'.
29. HVAC UNITS INCLUDING CONDENSERS ON SPLIT SYSTEMS.
30. GPS ANTENNAS.
31. CABLE TRAY AND/OR WAVEGUIDE BRIDGE.
32. DOGHOUSE/CABLE EXIT FROM ROOF.
33. EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA.
34. MASTER BUS BAR.
35. TELCO BOARD AND NIU.
36. ELECTRICAL DISTRIBUTION WALL.
37. CABLE ENTRY WITH SURGE SUPPRESSION.
38. ENTRANCE TO EQUIPMENT ROOM.
39. COAX WEATHERPROOFING–TOP AND BOTTOM OF TOWER.
40. COAX GROUNDING –TOP AND BOTTOM OF TOWER.
41. ANTENNA AND MAST GROUNDING.
42. LANDSCAPING – WHERE APPLICABLE.

3.6 FINAL PROJECT ACCEPTANCE: COMPLETE ALL REQUIRED REPORTING TASKS PER CONTRACT, CONTRACT DOCUMENTS OR THE SPRINT INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES AND UPLOAD INTO SITERRA.

SECTION 07 500 – ROOF CUTTING, PATCHING AND REPAIR

SUMMARY:
THIS SECTION SPECIFIES CUTTING AND PATCHING EXISTING ROOFING SYSTEMS WHERE CONDUIT OR CABLES EXIT THE BUILDING ONTO THE ROOF OR BUILDING–MOUNTED ANTENNAS, AND AS REQUIRED FOR WATERTIGHT PERFORMANCE. ROOFTOP ENTRY OPENINGS IN MEMBRANE ROOFTOPS SHALL BE CONSTRUCTED TO COMPLY WITH LANDLORD, ANY EXISTING WARRANTY, AND LOCAL JURISDICTIONAL STANDARDS.

1.4 SUBMITTALS:

A. PRE–CONSTRUCTION ROOF PHOTOS: COMPLETE A ROOF INSPECTION PRIOR TO THE INSTALLATION OF SPRINT EQUIPMENT ON ANY ROOFTOP BUILD. AT A MINIMUM INSPECT AND PHOTOGRAPH (MINIMUM 3 EA.) ALL AREAS IMPACTED BY THE ADDITION OF THE SPRINT EQUIPMENT.

B. PROVIDE SIMILAR PHOTOGRAPHS SHOWING ROOF CONDITIONS AFTER CONSTRUCTION (MINIMUM 3 EA.)

C. ROOF INSPECTION PHOTOGRAPHS SHOULD BE UPLOADED WITH CLOSEOUT PHOTOGRAPHS.

SECTION 09 900 – PAINTING

QUALITY ASSURANCE:

A. COMPLY WITH GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS OF ACCEPTABLE MANUFACTURERS WHICH HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR THREE YEARS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, AND STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

B. COMPLY WITH ALL ENVIRONMENTAL REGULATIONS FOR VOLATILE ORGANIC COMPOUNDS.

CONTINUE SHEET SP–3

Sprint
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MAHWAH, NJ 07495
TEL: (800) 357-7641

SBA
SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
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HDG HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
No. 23581
LICENSED PROFESSIONAL ENGINEER

CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	01/26/18	ISSUED FOR CONSTRUCTION	DJM
1	05/22/14	ISSUED FOR CONSTRUCTION	SF
0	05/14/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:
CT70XC140–A

SITE NAME:
NESM TOWER

SITE ADDRESS:
100 GRIST MILL ROAD
SIMSBURY, CT 06070

SHEET TITLE
OUTLINE SPECIFICATIONS
(DO MACRO)

SHEET NUMBER
SP–2

CONTINUED FROM SP-2:

MATERIALS:

A. MANUFACTURERS: BENJAMIN MOORE, ICI DEVOE COATINGS, PPG, SHERWIN WILLIAMS OR APPROVED EQUAL. PROVIDE PREMIUM GRADE, PROFESSIONAL-QUALITY PRODUCTS FOR COATING SYSTEMS.

PAINT SCHEDULE:

A. EXTERIOR ANTENNAE AND ANTENNA MOUNTING HARDWARE: ONE COAT OF PRIMER AND TWO FINISH COATS. PAINT FOR ANTENNAE SHALL BE NON-METALLIC BASED AND CONTAIN NO METALLIC PARTICLES. PROVIDE COLORS AND PATTERNS AS REQUIRED TO MASK APPEARANCE OF ANTENNAE ON ADJACENT BUILDING SURFACES AND AS ACCEPTABLE TO THE OWNER. REFER TO ANTENNA MANUFACTURER'S INSTRUCTIONS WHENEVER POSSIBLE.

B. ROOF TOP CONSTRUCTION: TOUCH UP - PREPARE SURFACES TO BE REPAIRED. FOLLOW INDUSTRY STANDARDS AND REQUIREMENTS OF OWNER TO MATCH EXISTING COATING AND FINISH.

PAINTING APPLICATION:

1. INSPECT SURFACES, REPORT UNSATISFACTORY CONDITIONS IN WRITING; BEGINNING WORK MEANS ACCEPTANCE OF SUBSTRATE.
2. COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR PREPARATION, PRIMING AND COATING WORK. COORDINATE WITH WORK OF OTHER SECTIONS.
3. MATCH APPROVED MOCK-UPS FOR COLOR, TEXTURE, AND PATTERN. RE-COAT OR REMOVE AND REPLACE WORK WHICH DOES NOT MATCH OR SHOWS LOSS OF ADHESION.
4. CLEAN UP, TOUCH UP AND PROTECT WORK.

TOUCHUP PAINTING:

1. GALVANIZING DAMAGE AND ALL BOLTS AND NUTS SHALL BE TOUCHED UP AFTER TOWER ERECTION WITH "GALVANOX," "DRY GALV," OR "ZINC-IT."
2. FIELD TOUCHUP PAINT SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
3. ALL METAL COMPONENTS SHALL BE HANDLED WITH CARE TO PREVENT DAMAGE TO THE COMPONENTS, THEIR PRESERVATIVE TREATMENT, OR THEIR PROTECTIVE COATINGS.

SECTION 11 700 - ANTENNA ASSEMBLY, REMOTE RADIO HEADS AND CABLE INSTALLATION

SUMMARY:
THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, RRH'S, AND CABLE EQUIPMENT, INSTALLATION, AND TESTING OF COAXIAL FIBER CABLE.

ANTENNAS AND RRH'S:
THE NUMBER AND TYPE OF ANTENNAS AND RRH'S TO BE INSTALLED IS DETAILED ON THE CONSTRUCTION DRAWINGS.

HYBRID CABLE:
HYBRID CABLE WILL BE DC/FIBER AND FURNISHED FOR INSTALLATION AT EACH SITE. CABLE SHALL BE INSTALLED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE MANUFACTURER'S REQUIREMENTS.

JUMPERS AND CONNECTORS:
FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRH'S AND ANTENNAS. JUMPERS SHALL BE TYPE LDF 4, FLC 12-50, CR 540, OR FXL 540. SUPER-FLEX CABLES ARE NOT ACCEPTABLE. JUMPERS BETWEEN THE RRH'S AND ANTENNAS OR TOWER TOP AMPLIFIERS SHALL CONSIST OF 1/2 INCH FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE. DO NOT USE SUPERFLEX OUTDOORS. JUMPERS SHALL BE FACTORY FABRICATED IN APPROPRIATE LENGTHS WITH A MAXIMUM OF 4 FEET EXCESS PER JUMPER AND HAVE CONNECTORS AT EACH END, MANUFACTURED BY SUPPLIER. IF JUMPERS ARE FIELD FABRICATED, FOLLOW MANUFACTURER'S REQUIREMENTS FOR INSTALLATION OF CONNECTORS

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS:
INSTALL SPLITTERS, COMBINERS, FILTERS PER RF DATA SHEET, FURNISHED BY SPRINT.

ANTENNA INSTALLATION:
THE CONTRACTOR SHALL ASSEMBLE ALL ANTENNAS ONSITE IN ACCORDANCE WITH THE INSTRUCTIONS SUPPLIED BY THE MANUFACTURER. ANTENNA HEIGHT, AZIMUTH, AND FEED ORIENTATION INFORMATION SHALL BE A DESIGNATED ON THE CONSTRUCTION DRAWINGS.

A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.

B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE DRAWINGS.

HYBRID CABLES INSTALLATION:

A. THE CONTRACTOR SHALL ROUTE, TEST, AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAN THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.

C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.
   1. FASTENING MAIN HYBRID CABLES: ALL CABLES SHALL BE PERMANENTLY FASTENED TO THE COAX LADDER AT 4'-0" OC USING NON-MAGNETIC STAINLESS STEEL CLIPS.
   2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MMBTS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES:
      a. FIBER: SUPPORT FIBER BUNDLES USING ½" VELCRO STRAPS OF THE REQUIRED LENGTH @ 18" OC. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.
      b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.
   3. FASTENING JUMPERS: SECURE JUMPERS TO THE SIDE ARMS OR HEAD FRAMES USING STAINLESS STEEL TIE WRAPS OR STAINLESS STEEL BUTTERFLY CLIPS.
   4. CABLE INSTALLATION:
      a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE, NOTIFY THE CONSTRUCTION MANAGER.
      b. CABLE ROUTING: CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOP AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.
      c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURES RECOMMENDED MAXIMUM BEND RADIUS.
   5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
   6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED IN TS 0200 REV 4.
   7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

A. ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.

B. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.
   1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CXS SERIES OR EQUAL.
   2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF-AMALGAMATING TAPE.
   3. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
   4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE STATIONS (MMBTS) AND RELATED EQUIPMENT

SUMMARY:

A. THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.

C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

DC CIRCUIT BREAKER LABELING

A. LABEL CIRCUIT BREAKERS ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1.

SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE TRANSCIEVER STATIONS (MMBTS) AND RELATED EQUIPMENT

SUMMARY:

A. THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.

C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

SUPPORTING DEVICES:

A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:
   1. ALLIED TUBE AND CONDUIT
   2. B-LINE SYSTEM
   3. UNISTRUT DIVERSIFIED PRODUCTS
   4. THOMAS & BETTS

B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:
   1. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
   2. POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.
   3. FASTEN BY MEANS OF WOOD SCREWS ON WOOD.
   4. TOGGLE BOLTS ON HOLLOW MASONRY UNITS.
   5. CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY.
   6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL.
   7. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE SHALL NOT BE PERMITTED.
   8. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES.
   9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

SUPPORTING DEVICES:

A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC.

B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.

C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH THE FOLLOWING:

D. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.

E. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:

A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET, INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.

B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PANELBOARD.

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

CONDUIT:

A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS AND FOR ENCASED RUNS IN CONCRETE. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. FITTINGS SHALL BE THREADED - SET SCREW OR COMPRESSION FITTINGS WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.

B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.

C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.

D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.

E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRE BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.

F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

HUBS AND BOXES:

A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.

B. CABLE TERMINATION FITTINGS FOR CONDUIT
   1. CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL.
   2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO - CL2075; OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.

C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.

D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKETED COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION. PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.

E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED EQUAL.

SUPPLEMENTAL GROUNDING SYSTEM

A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM AS INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS AS INDICATED.

B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO HOLE SPADES WITH NO OX.

C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CM FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

EXISTING STRUCTURE:

A. EXISTING EXPOSED WIRING AND ALL EXPOSED OUTLETS, RECEPTACLES, SWITCHES, DEVICES, BOXES, AND OTHER EQUIPMENT THAT ARE NOT TO BE UTILIZED IN THE COMPLETED PROJECT SHALL BE REMOVED OR DE-ENERGIZED AND CAPPED IN THE WALL, CEILING, OR FLOOR SO THAT THEY ARE CONCEALED AND SAFE. WALL, CEILING, OR FLOOR SHALL BE PATCHED TO MATCH THE ADJACENT CONSTRUCTION.

CONDUIT AND CONDUCTOR INSTALLATION:

A. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.

B. CONDUCTORS SHALL BE PULLED IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE.

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STATE OF CONNECTICUT
DEREK J. CREASER
No. 28581
LICENSED ENGINEER
PROFESSIONAL

CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	01/26/18	ISSUED FOR CONSTRUCTION	DJM
1	05/22/14	ISSUED FOR CONSTRUCTION	SF
0	05/14/14	ISSUED FOR CONSTRUCTION	SF

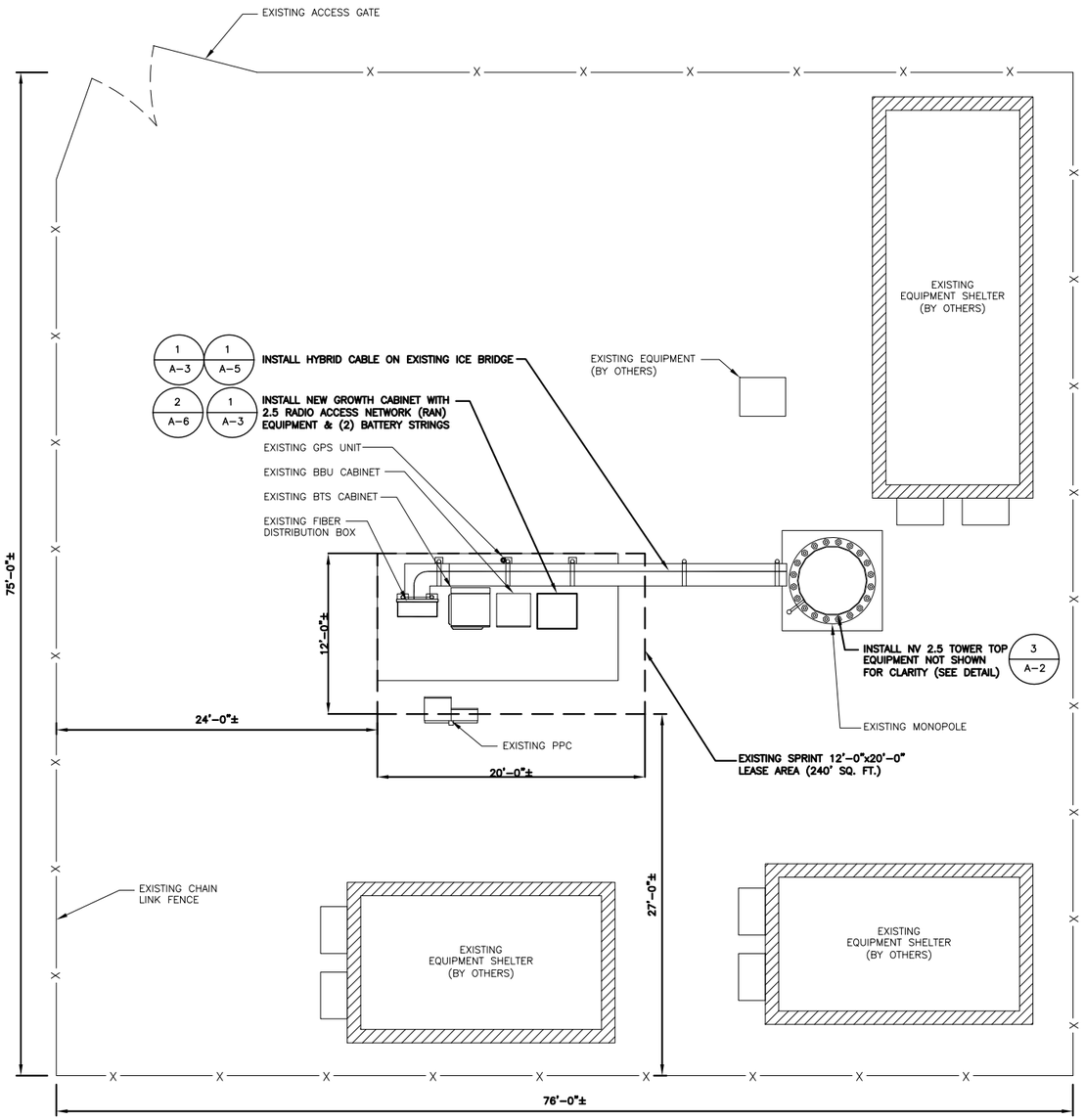
SITE NUMBER:
CT70XC140-A

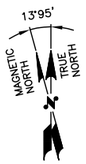
SITE NAME:
NESM TOWER

SITE ADDRESS:
100 GRIST MILL ROAD
SIMSBURY, CT 06070

SHEET TITLE
OUTLINE SPECIFICATIONS
(DO MACRO)

SHEET NUMBER
SP-3





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

1 / A-1

GRAPHIC SCALE
0 2'-8" 5'-4" 10'-8" 16'-0"

SOURCE: SPRINT SITE AUDIT PHOTO 10-15-13

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

2 / A-1

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STATE OF CONNECTICUT
DEREK J. CREASER
No. 23556
LICENSED PROFESSIONAL ENGINEER

CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY:	BB
APPROVED BY:	DJC

SUBMITTALS

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0	05/14/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:
CT70XC140-A

SITE NAME:
NESM TOWER

SITE ADDRESS:
100 GRIST MILL ROAD
SIMSBURY, CT 06070

SHEET TITLE
COMPOUND PLAN
(DO MACRO)

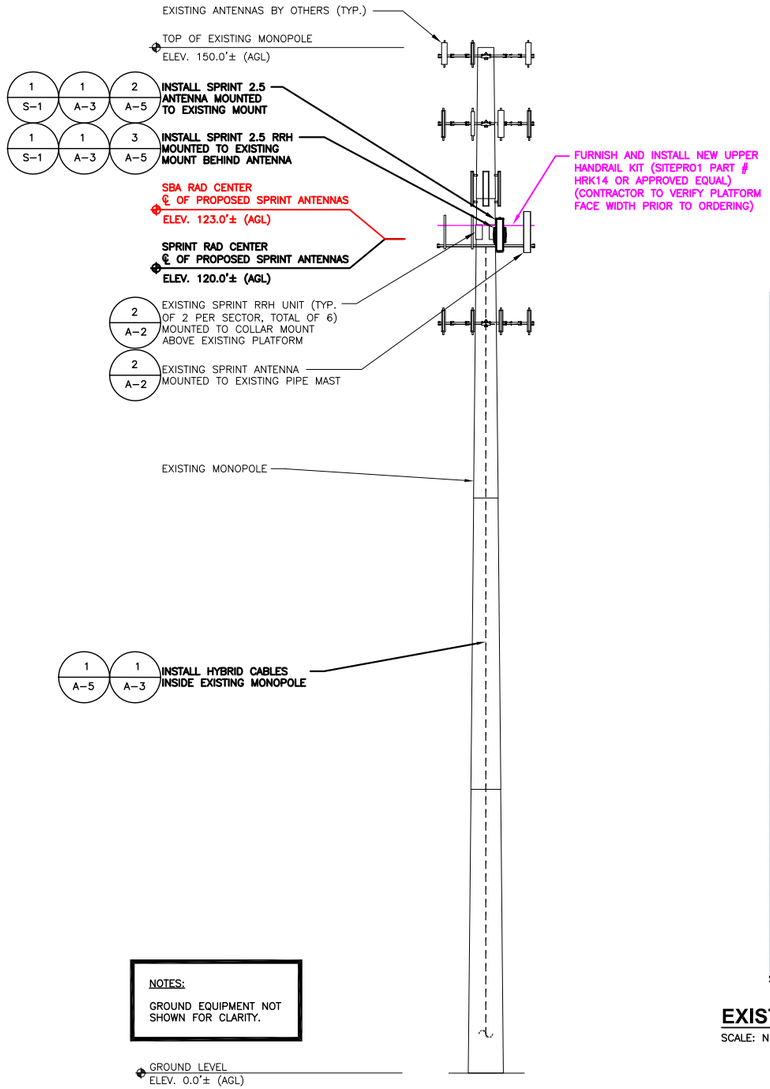
SHEET NUMBER
A-1

NOTE:
SPRINT RAD CENTER SHOWN IN RED TEXT BASED ON SBA-PROVIDED COLLOCATION APPLICATION, EQUIPMENT DATABASE, AND STRUCTURAL ANALYSIS. THE SBA-PROVIDED ANTENNA RAD CENTER SHALL SUPERSEDE ANY CONFLICTING INFORMATION DERIVED FROM THE SPRINT NV 2.5 RFDS.

SPECIAL CONSTRUCTION NOTE:
SPRINT TOWER TOP WORK IS CONTINGENT ON THE FOLLOWING:
* COMPLETION OF A GLOBAL STRUCTURAL STABILITY ANALYSIS.
* COMPLETION OF AN ANTENNA/RRH MOUNT STRUCTURAL ASSESSMENT.
* GC SHALL FURNISH, INSTALL AND COMPLETE ALL REQUIRED STRUCTURAL MODIFICATIONS AS INDICATED IN BEFORE-MENTIONED ANALYSIS AND ASSESSMENT.
* SBA COMMUNICATIONS CORPORATION SHALL PROVIDE WRITTEN ACCEPTANCE/APPROVAL FOR THE COMPLETION OF ALL TOWER/FOUNDATION STRUCTURAL MODIFICATIONS INCLUDING (AS NECESSARY) CONTROLLED CONSTRUCTION INSPECTIONS, SHOP-DRAWING APPROVALS, MATERIALS TEST RESULTS, AND FINAL ENGINEER'S AFFIDAVIT.

NOTE:
EXISTING AZIMUTHS FROM SPRINT SITE AUDIT DATED 10-15-13

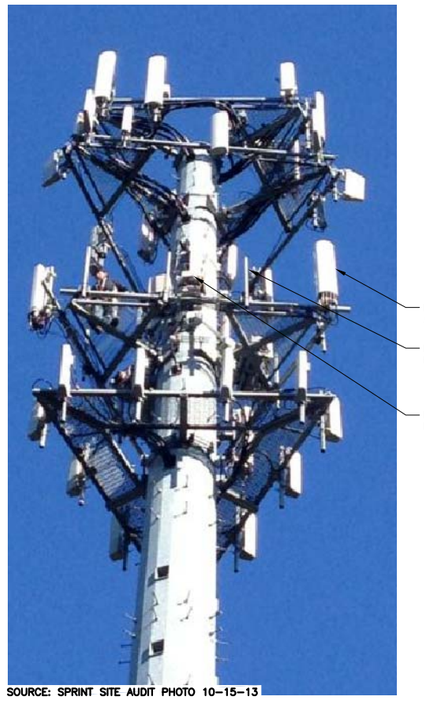
STRUCTURAL NOTES:
PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO MOUNT ANALYSIS PROVIDED BY HDG DATED 1/18/2018 TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.



NOTES:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

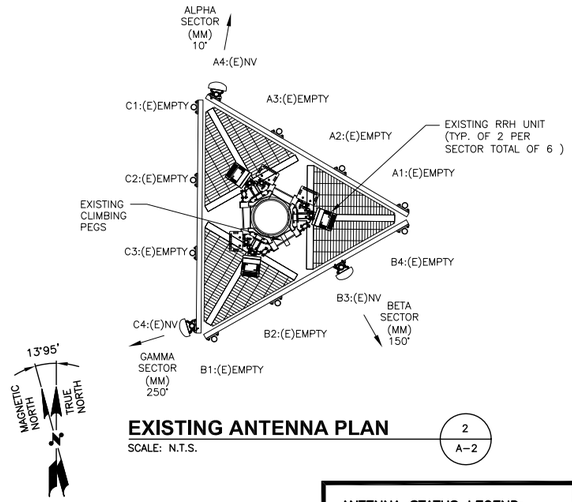
ELEVATION
SCALE: 3/32"=1' — 1 / A-2

GRAPHIC SCALE
0 5'-4" 10'-8" 21'-4" 32'-0"



SOURCE: SPRINT SITE AUDIT PHOTO 10-15-13

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

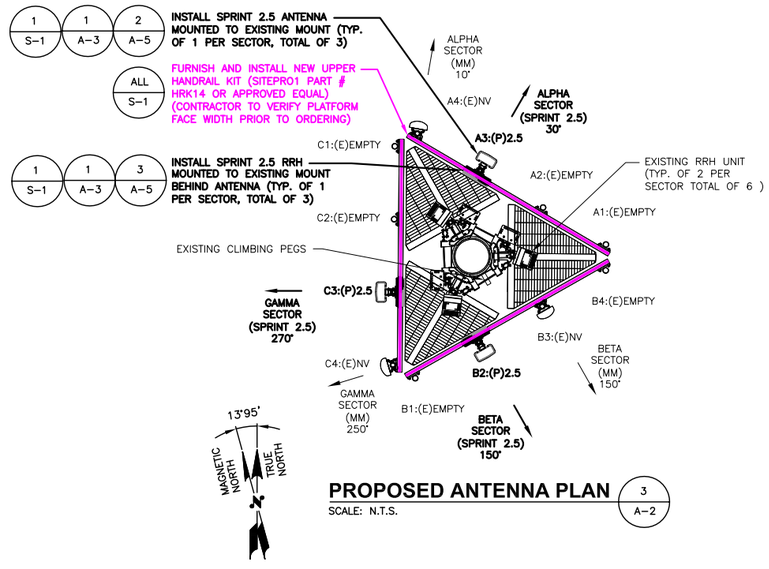


EXISTING ANTENNA PLAN
SCALE: N.T.S. — 2 / A-2

SPECIAL WORK NOTE:
JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA CAN NOT EXCEED 15'. NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY DISCREPANCY.

NOTES:
1) VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION.

ANTENNA STATUS LEGEND:
EMPTY – EMPTY PIPE
(E) – EXISTING
(P) – INSTALL
NV – SPRINT ANTENNA MODEL (APXVSPP18-C-A20)
2.5 – SPRINT ANTENNA



PROPOSED ANTENNA PLAN
SCALE: N.T.S. — 3 / A-2

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STATE OF CONNECTICUT
DEREK J. CREASER
No. 23581
LICENSED ENGINEER

CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
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1	05/22/14	ISSUED FOR CONSTRUCTION	SF
0	05/14/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:
CT70XC140-A

SITE NAME:
NESM TOWER

SITE ADDRESS:
100 GRIST MILL ROAD
SIMSBURY, CT 06070

SHEET TITLE
ELEVATION AND ANTENNA PLANS
(DO MACRO)

SHEET NUMBER
A-2

Sprint

RFDS Sheet

(by SBA Network Services 4/8/14. NOTE: General Contractor/Tower Crew shall verify that the latest RFDS is used for equipment installation.)

General Site Information

Site ID	CT70XC140	Equipment Vendor	ALU
Market	Northern Connecticut	Latitude	41.855700
Region	East	Longitude	-72.815700
MLA	SBA	LL SITE ID	CT19022-A
Structure Type	MONOPOLE		
BTS Type	Outdoor Macro		
Solution ID	Not Available	Sitarra SR Equipment Type	Outdoor Macro
		Equipment Vendor	ALU
		Incremental Power Draw Needed by Added Equipment	100

A&E 40A

Base Equipment

BBU Kit:	ALU BBU Kit	Top Hat	None
BBU Kit Qty	0	Top Hat Qty	N/A
		Top Hat Dimensions (inches)	N/A
Growth Cabinet	ALU 9929 Expansion Cabinet	Top Hat Weight (Lbs.)	N/A
Growth Cabinet Qty	1		
Growth Cabinet Dimensions (inches)	63.65" X 31.9" X 35.3"		
Growth Cabinet Weight (Lbs.)	1,500		

RF Path Information

RRH		TD-RRH8x20-25	
RRH Qty		3	
RRH Dimensions (inches)		26.1" x 18.6" x 8.7"	
RRH Weight (Lbs.)		70.0	
RRH Mount Weight (Lbs.)		10	
Power and Fiber Cable		ALU Fiber only	
Cable Qty		1	
Weight per Foot (Lbs.)		0.242	
Diameter (inches)		0.730	
Hybrid Cable Length (Feet)	(**A&E 175)	144	(Estimated by Sprint as Antenna CL plus 20%: DO NOT BOM using this length.)
Coax Jumper		Coax Jumper. Mfg TBD.	
Coax Jumper Qty		27	
Coax Jumper Length (Feet)	(**A&E 5)	8	
Coax Jumper Weight (Lbs.)		1.7	
Coax Jumper Diameter (inches)		0.5	
AISG Cable		Commscope ATCS-801-006	
AISG Cable Qty		3	
AISG Diameter (inches)		0.315	
AISG Cable Length (Feet)	(**A&E 5)	8	
Weight of Entire AISG Cable (Lbs.)		1.3	

Antenna Sector Information

	Sector 1	Sector 2	Sector 3
Antenna Make/Model	RFS APXV9TM14-ALU-I20	RFS APXV9TM14-ALU-I20	RFS APXV9TM14-ALU-I20
Antenna Qty	1	1	1
Antenna Dimensions (inches)	56.3 x 12.6 x 6.3	56.3 x 12.6 x 6.3	56.3 x 12.6 x 6.3
Antenna Weight (Lbs.)	55.1	55.1	55.1
Antenna Mounting Kit Weight (Lbs.)	11.5	11.5	11.5
CL Height (Feet) (* SBA 123')	120.0	120.0	120.0
Antenna Azimuth (Degrees)	30	150	270
Antenna Mechanical Downtilt (Degrees)	0	0	0
Antenna Etilt (Degrees)	-2	-2	-2
RF Filter Make/Model	N/A	N/A	N/A

Comments

RFDS generated 4/8/14 by SBA Network Services from Sprint Plan of Record dated 4/2/14.

Comments in Red Text provided by A&E Vendor.

IMPORTANT CONSTRUCTION NOTE: General Contractor/Tower Crew shall verify that the latest RFDS is used for equipment installation.

* Note: Antenna Rad Center based on SBA-Provided Collocation Application, Equipment Database, and Structural Analysis. The SBA-Provided Antenna Rad Center shall supersede any conflicting information derived from the Sprint NV 2.5 Database.

** Note: Sprint CM shall confirm Hybrid Cable Length, Coax Jumper Length and AISG Cable Length before preparing BOM. A&E Recommended Hybrid Cable Length based on NV 2.5 Equipment Audit plus 20 Feet for (2) 10-foot solls at each end of the fiber trunk.

RF DATA SHEET 1 / A-3
SCALE: N.T.S.

SPRINT CONSTRUCTION STANDARDS:

GENERAL CONTRACTOR SHALL ADHERE TO THE FOLLOWING SPRINT CONSTRUCTION STANDARDS.

- CONSTRUCTION STANDARDS: INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES – (CURRENT VERSION), INCLUDING EXHIBITS A–M.
- CONSTRUCTION SPECIFICATIONS: CONSTRUCTION STANDARDS EXHIBIT A – STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES (CURRENT VERSION).
- GROUNDING STANDARDS: EXTERIOR GROUNDING SYSTEM DESIGN. GROUNDING STANDARDS (SUPPLEMENT): ANTI–THEFT UPDATE TO SPRINT GROUNDING 082412 AND SPRINT ENGINEERING LETTER EL–0504 DATED 04.20.12.
- WEATHER PROOFING STANDARDS: EXCERPT FROM CONSTRUCTION STANDARDS EXHIBIT A, SECTION 3.6 WEATHERPROOFING CONNECTORS AND GROUND KITS.
- COLOR CODING: SPRINT NEXTEL ANT AND LINE COLOR CODING PER SPRINT TS–0200 CURRENT VERSION.
- GENERAL CONTRACTOR TO FIELD VERIFY AZIMUTH AND CL HEIGHT AND MECHANICAL DOWNTILT. IF DIFFERENT THAN CALLED OUT IN RFDS, HALT ANTENNA WORK FOR ONE HOUR, CALL SPRINT RF ENGINEER (OR MANAGER IF RF ENGINEER DOES NOT ANSWER, BUT STILL LEAVE A MESSAGE TO RF ENGINEER) USING SPRINT–PROVIDED CONTACT INFORMATION FOR FURTHER INSTRUCTIONS. IF SPRINT DOES NOT RESPOND WITHIN ONE HOUR, PLACE 2.5G ANTENNA AT SAME CL HEIGHT AS 1.9G ANTENNA AND EMAIL CORRECT CL HEIGHT AND AZIMUTH TO SPRINT RF ENGINEER. UPDATE AS–BUILD DRAWING WITH CORRECT CL HEIGHT. ALSO EMAIL CORRECT 1900 MHZ AND 800 MHZ ANTENNA CL HEIGHT, AZIMUTH AND MECHANICAL DOWNTILT TO RF ENGINEER.
- AISG TESTS TO VERIFY OPERATION IS TO BE PERFORMED AFTER FINAL INSTALLATION OF ANTENNAS AND AISG CABLES HAVE BEEN CONNECTED. VERIFY OPERATION OF ALL EXISTING SPRINT AISG EQUIPMENT INCLUDING 800MHZ, 1.9GHZ AND 2.5G. TEST INCLUDE COMPLETE DOWNTILT, AZIMUTH (IF APPLICABLE) AND BEAMWIDTH SWINGS (IF APPLICABLE). DOCUMENT AISG TEST RESULTS IN COAX SWEEP TEST SPREADSHEET.
- GENERAL CONTRACTOR MUST INSURE THAT NO OBJECT IS LOCATED IN FRONT OF ANTENNA. THIS MEANS NO OBJECT IS TO BE LOCATED 45 DEGREES LEFT AND RIGHT OF FRONT OF ANTENNA OR 7 DEGREES UP AND DOWN FROM CENTER OF ANTENNA. IF THIS IS NOT POSSIBLE, CONTACT RF ENGINEER FOR FURTHER INSTRUCTION. IN ADDITION, 2.5G ANTENNA IS NOT TO BE PLACED IN FRONT OF ANY OTHER ANTENNA USING THE SAME 45 DEGREE RULE. THIS INCLUDES SPRINT AND NON–SPRINT ANTENNAS.
- GENERAL CONTRACT IS REQUIRED TO USE A DIGITAL ALIGNMENT TOOL TO SET AZIMUTH, ROLL AND DOWNTILT. AZIMUTH ACCURACY IS TO BE WITHIN 1 DEGREES. DOWNTILT AND ROLL (LEFT TO RIGHT TILT) IS TO BE WITHIN 0.1 DEGREES. IF FOR SOME REASON THIS ACCURACY CANNOT BE ACHIEVED, UPDATE AS–BUILT DRAWINGS AND EMAIL SPRINT RF ENGINEER WITH AS–BUILT SETTINGS. USE 3Z RF ALIGNMENT TOOL OR EQUIVALENT TOOL. HTTP://WWW.3ZTELECOM.COM/ANTENNA–ALIGNMENT–TOOL/.

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HUDSON Design Group LLC
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TEL: (978) 557-5553
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STATE OF CONNECTICUT
DEREK J. CREASER
No. 23958
LICENSED ENGINEER

CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
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1	05/22/14	ISSUED FOR CONSTRUCTION	SF
0	05/14/14	ISSUED FOR CONSTRUCTION	SF

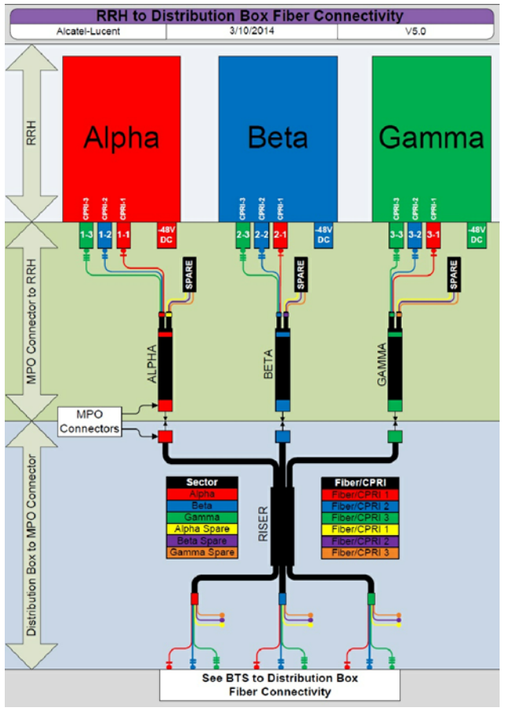
SITE NUMBER:
CT70XC140–A

SITE NAME:
NESM TOWER

SITE ADDRESS:
100 GRIST MILL ROAD
SIMSBURY, CT 06070

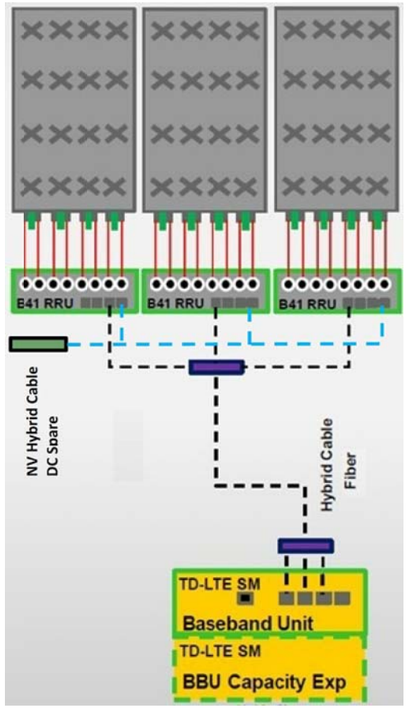
SHEET TITLE
RF DATA SHEET
(DO MACRO)

SHEET NUMBER
A–3



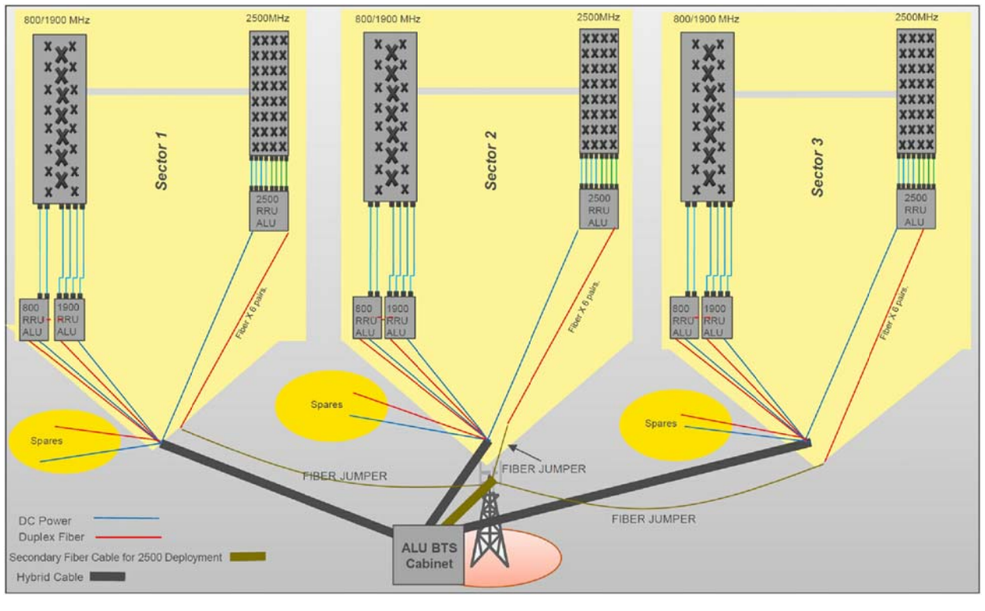
CABLE COLOR CODING DIAGRAM

SCALE: N.T.S.



ALU 2.5 ALU SCENARIO 1

SCALE: N.T.S.

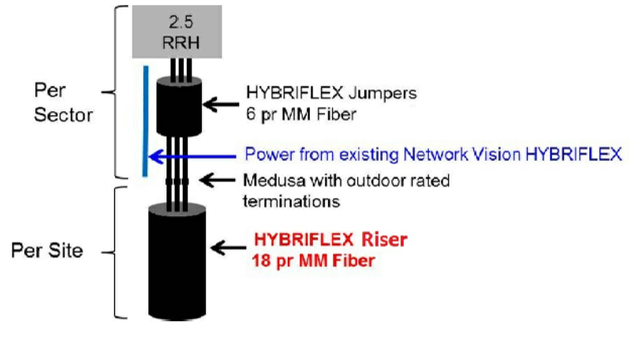


RAN WIRING DIAGRAM: ALU EQUIPMENT

SCALE: N.T.S.

NOTE:

GENERAL CONTRACTOR/TOWER CREW SHALL VERIFY THAT THE LATEST RF DATA SHEET IS USED FOR EQUIPMENT INSTALLATION.



RFS 2.5 ALU SCENARIO 1

SCALE: N.T.S.

DC POWER INSTALLATION NOTE (FIBER–ONLY SCENARIO):

USE SPACE DC CABLES COILED UP AT TOWER TOP NV ARRAY TO POWER UP 2.5 RRH. INSIDE EXISTING FIBER DISTRIBUTION BOX, TIE SPARE DC CONDUCTORS INTO EXISTING DC BREAKER PANEL PER APPROVED DC WIRING CONNECTIVITY OPTION (BASED ON NV HYBRIFLEX CABLE LENGTH). CONSULT WITH SPRINT CM TO DETERMINE APPROPRIATE DC CONNECTIVITY OPTION, PLUMBING DIAGRAM AND DC BREAKER SIZE.

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No. 23581
LICENSED PROFESSIONAL ENGINEER

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APPROVED BY:	DJC

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SIMSBURY, CT 06070

SHEET TITLE
RAN WIRING DIAGRAM
(DO MACRO)

SHEET NUMBER
A–4

HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE
MANUF: RFS

	CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
(*)	FIBER ONLY	VARIES	USE NV HYBRIFLEX	5/8"
	HYBRIFLEX	<200'	8 AWG	1-1/4"
	HYBRIFLEX	225-300'	6 AWG	1-1/4"
	HYBRIFLEX	325-375'	4 AWG	1-1/4"

RFS HYBRIFLEX RISER CABLE SCHEDULE

Fiber Only (Existing DC Power)		**Hybrid cable** MN: HB058-M12-050F 12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom: LC Connectors, 5/8 cable, 50 ft	50 ft
		MN: HB058-M12-075F	75 ft
		MN: HB058-M12-100F	100 ft
		MN: HB058-M12-125F	125 ft
		MN: HB058-M12-150F	150 ft
	(*)	MN: HB058-M12-175F	175 ft
		MN: HB058-M12-200F	200 ft
8 AWG Power		**Hybrid cable** MN: HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 50 ft	50 ft
		MN: HB114-08U3M12-075F	75 ft
		MN: HB114-08U3M12-100F	100 ft
		MN: HB114-08U3M12-125F	125 ft
		MN: HB114-08U3M12-150F	150 ft
		MN: HB114-08U3M12-175F	175 ft
		MN: HB114-08U3M12-200F	200 ft
6 AWG Power		**Hybrid cable** MN: HB114-13U3M12-225F 3x 6 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225 ft	225 ft
		MN: HB114-13U3M12-250F	250 ft
		MN: HB114-13U3M12-275F	275 ft
		MN: HB114-13U3M12-300F	300 ft
4 AWG Power		**Hybrid cable** MN: HB114-21U3M12-325F 3x 4 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 325 ft	325 ft
		MN: HB114-21U3M12-350F	350 ft
		MN: HB114-21U3M12-375F	375 ft

RFS HYBRIFLEX JUMPER CABLE SCHEDULE

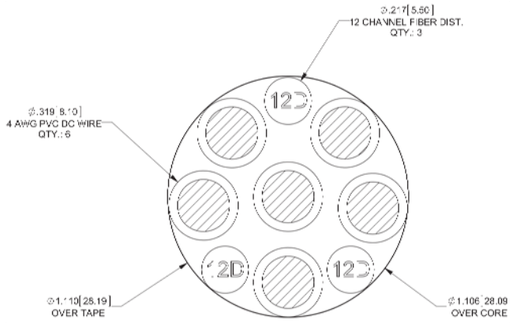
Fiber Only	(*)	**Hybrid Jumper cable** MN: HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
		MN: HBF012-M3-10F1	10 ft
		MN: HBF012-M3-15F1	15 ft
		SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CM OF ANY DISCREPANCY.	
8 AWG Power		**Hybrid Jumper cable** MN: HBF058-08U1M3-5F1 5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
		MN: HBF058-08U1M3-10F1	10 ft
		MN: HBF058-08U1M3-15F1	15 ft
		SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CM OF ANY DISCREPANCY.	
6 AWG Power		**Hybrid Jumper cable** MN: HBF058-13U1M3-5F1 5 ft, 1x 6 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
		MN: HBF058-13U1M3-10F1	10 ft
		MN: HBF058-13U1M3-15F1	15 ft
		SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CM OF ANY DISCREPANCY.	
4 AWG Power		**Hybrid Jumper cable** MN: HBF078-21U1M3-5F1 5 ft, 1x 4 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 7/8 cable	5 ft
		MN: HBF078-21U1M3-10F1	10 ft
		MN: HBF078-21U1M3-15F1	15 ft
		SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CM OF ANY DISCREPANCY.	

* NOTE: SPRINT CM TO CONFIRM HYBRID RISER CABLE AND HYBRID JUMPER CABLE MODEL NUMBERS BEFORE PREPARING BOM.

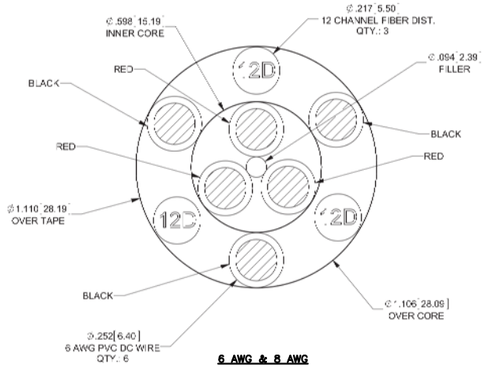
2.5 HYBRID CABLE X-SECTION AND DATA

SCALE: N.T.S.

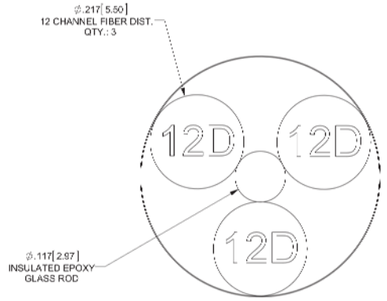
1 A-5



4 AWG

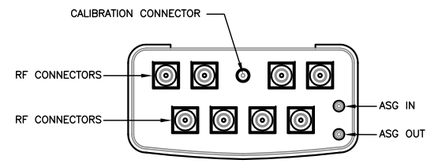


6 AWG & 8 AWG

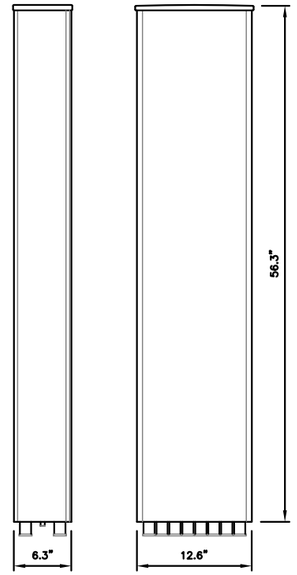


FIBER ONLY

MANUF:	RFS
MODEL:	APXV9TM14-ALU-I20
LENGTH:	56.3
WIDTH:	12.6
DEPTH:	6.3
WEIGHT:	55.1 LBS
AREA:	4.9 SF



PLAN VIEW

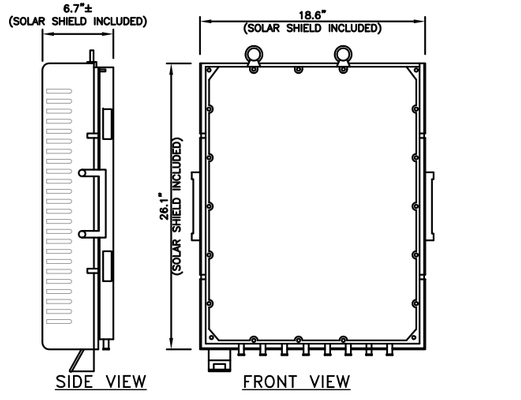


2.5 ANTENNA SPECIFICATIONS

SCALE: N.T.S.

2 A-5

MANUF:	ALCATEL-LUCENT
MODEL:	TD-RRH8x20-25
LENGTH:	26.1
WIDTH:	18.6
DEPTH:	6.7
WEIGHT:	70 LBS
AREA:	3.5 SF



2.5 RRH'S

SCALE: N.T.S.

3 A-5

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STATE OF CONNECTICUT
DEREK J. CREASER
No. 23581
LICENSED PROFESSIONAL ENGINEER

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SITE NAME:
NESM TOWER

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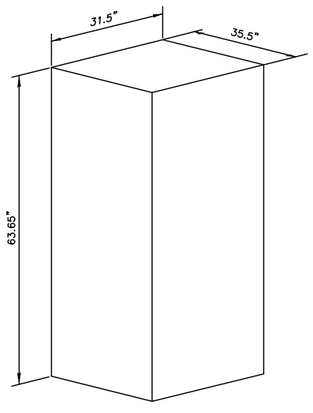
100 GRIST MILL ROAD
SIMSBURY, CT 06070

SHEET TITLE
EQUIPMENT DETAILS
(DO MACRO)

SHEET NUMBER
A-5



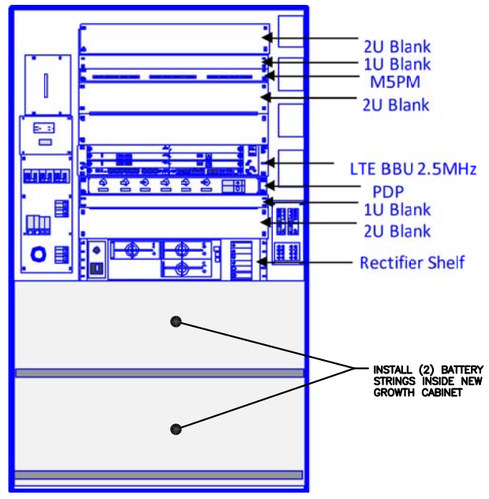
MANUFACTURER	ALU
MODEL	9929
HEIGHT	63.65"
WIDTH	31.5"
DEPTH	35.5"
TOTAL WEIGHT (FULLY LOADED)	1600 lbs

NOTE:
EQUIPMENT SHALL BE ANCHORED PER MANUFACTURERS SPECIFICATIONS.

9929 MMBTS OUTDOOR CABINET

SCALE: N.T.S.

1
A-6



FRONT VIEW

PROPOSED MMBTS OUTDOOR CABINET WITH LTE 2.5 BBU EQUIPMENT

SCALE: N.T.S.

2
A-6

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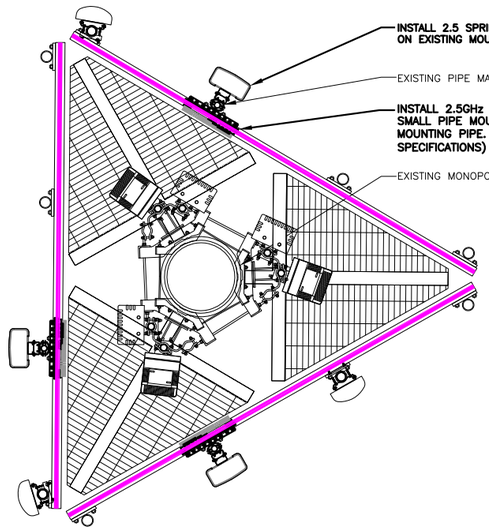
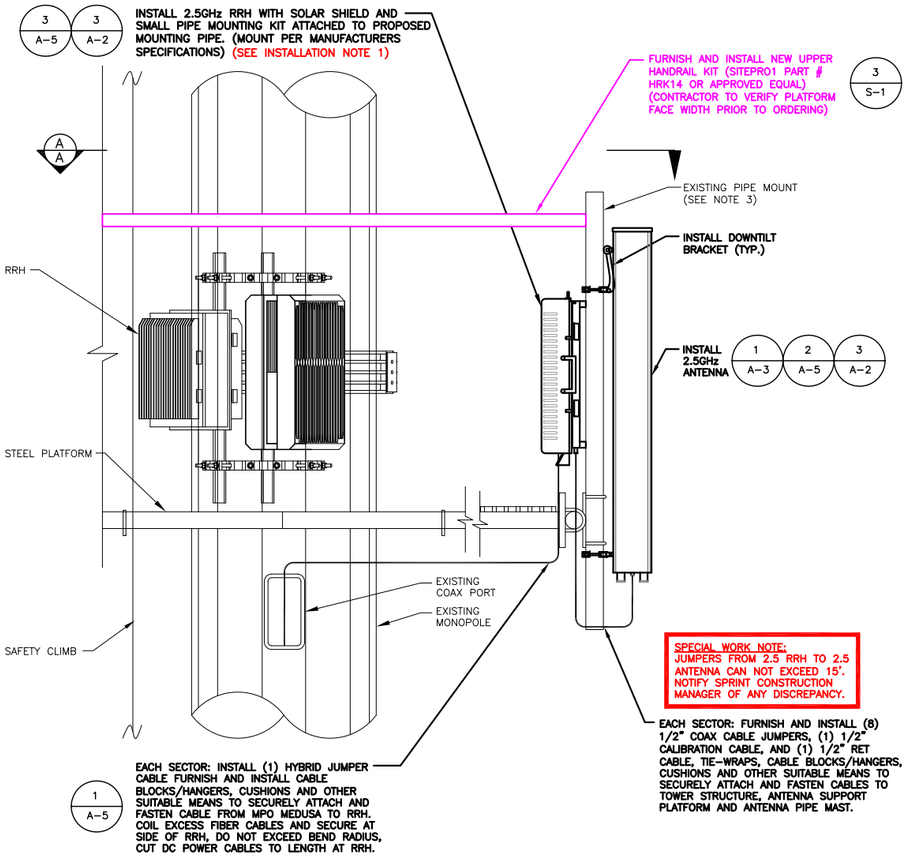
EQUIPMENT DETAILS
(DO MACRO)

SHEET NUMBER

A-6



SECTION A-A



NOTE: ONE SECTOR SHOWN FOR CLARITY

2.5 ANTENNA AND RRH MOUNTING DETAIL

SCALE: N.T.S.

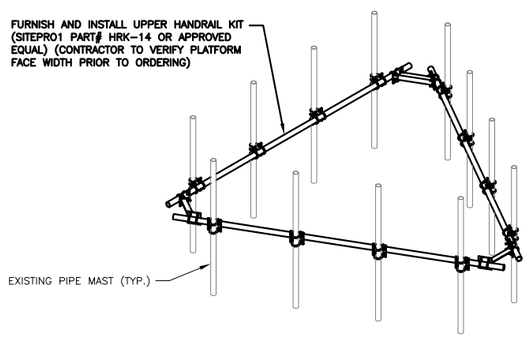
1 S-1

SOURCE: SPRINT SITE AUDIT PHOTO 10-15-13

2.5 ANTENNA AND RRH PHOTO DETAIL AND EQUIPMENT SCHEMATIC

SCALE: N.T.S.

2 S-1



HANDRAIL KIT DETAIL

SCALE: N.T.S.

3 S-1

INSTALLATION NOTES:

1. CONTRACTOR TO ENSURE THAT RRH MOUNTING DOES NOT INTERFERE WITH CLIMBING LADDER/PEGS, CABLE CLIMB, OR COAX PORTS. MONOPOLE: COLLAR-MOUNT RRH CLUSTER SHALL PROVIDE AN OPENING BETWEEN ADJACENT RRH AT LEAST 30" WIDE CENTERED ON THE EXISTING SAFETY-CLIMB AND 30" DEEP FROM THE FACE OF THE POLE. SELF-SUPPORT: RRH LEG-MOUNT OR FACE-MOUNT SHALL PROVIDE AN UNOBSTRUCTED VERTICAL CLIMBING PASSAGE AT LEAST 30" WIDE AND 30" DEEP CENTERED ON THE LEG WITH THE CLIMBING LADDER/PEGS.
2. CONTRACTOR TO VERIFY DIAMETER OF EXISTING MONOPOLE BEFORE ORDERING PARTS.
3. CONTRACTOR TO VERIFY IN FIELD SIZE OF EXISTING MOUNTING PIPE TO BE 2-1/2" STD (2.88 O.D.) PIPE MAST (6'-0" LONG).
4. VERIFY EXACT RRH AND ANTENNA MODEL & AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION.
5. ROTATE EXISTING ANTENNA FRAME AS NEEDED TO ACCOMMODATE INSTALL ANTENNAS.
6. RRH PLACEMENT FOR REFERENCE ONLY. CONTRACTOR SHALL PLACE RRH IN CORRECT ORDER MATCHING INSTALL ANTENNA PLACEMENT AND ENSURE THAT THERE IS ENOUGH CLEARANCE FOR RRHS TO BE PLACED ON THE INSIDE ON THE ANTENNA FRAME.
7. INSTALL EQUIPMENT TO BE MOUNTED PER MANUFACTURERS SPECIFICATIONS.

SPECIAL CONSTRUCTION NOTE:
SPRINT TOWER TOP WORK IS CONTINGENT ON THE FOLLOWING:

* COMPLETION OF A GLOBAL STRUCTURAL STABILITY ANALYSIS (PROVIDED BY TOWER OWNER).
* COMPLETION OF AN ANTENNA/RRH MOUNT STRUCTURAL ASSESSMENT (PROVIDED BY A&E VENDOR).
* GC SHALL FURNISH, INSTALL AND COMPLETE ALL REQUIRED STRUCTURAL MODIFICATIONS AS INDICATED IN BEFORE-MENTIONED ANALYSIS AND ASSESSMENT.
* SBA COMMUNICATIONS CORPORATION SHALL PROVIDE WRITTEN ACCEPTANCE/APPROVAL FOR THE COMPLETION OF ALL TOWER/FOUNDATION STRUCTURAL MODIFICATIONS INCLUDING (AS NECESSARY) CONTROLLED CONSTRUCTION INSPECTIONS, SHOP-DRAWING APPROVALS, MATERIALS TEST RESULTS, AND FINAL ENGINEER'S AFFIDAVIT.

STRUCTURAL NOTES:
PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO MOUNT ANALYSIS PROVIDED BY HDG DATED 1/18/2018 TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.

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HDG HUDSON Design Group LLC
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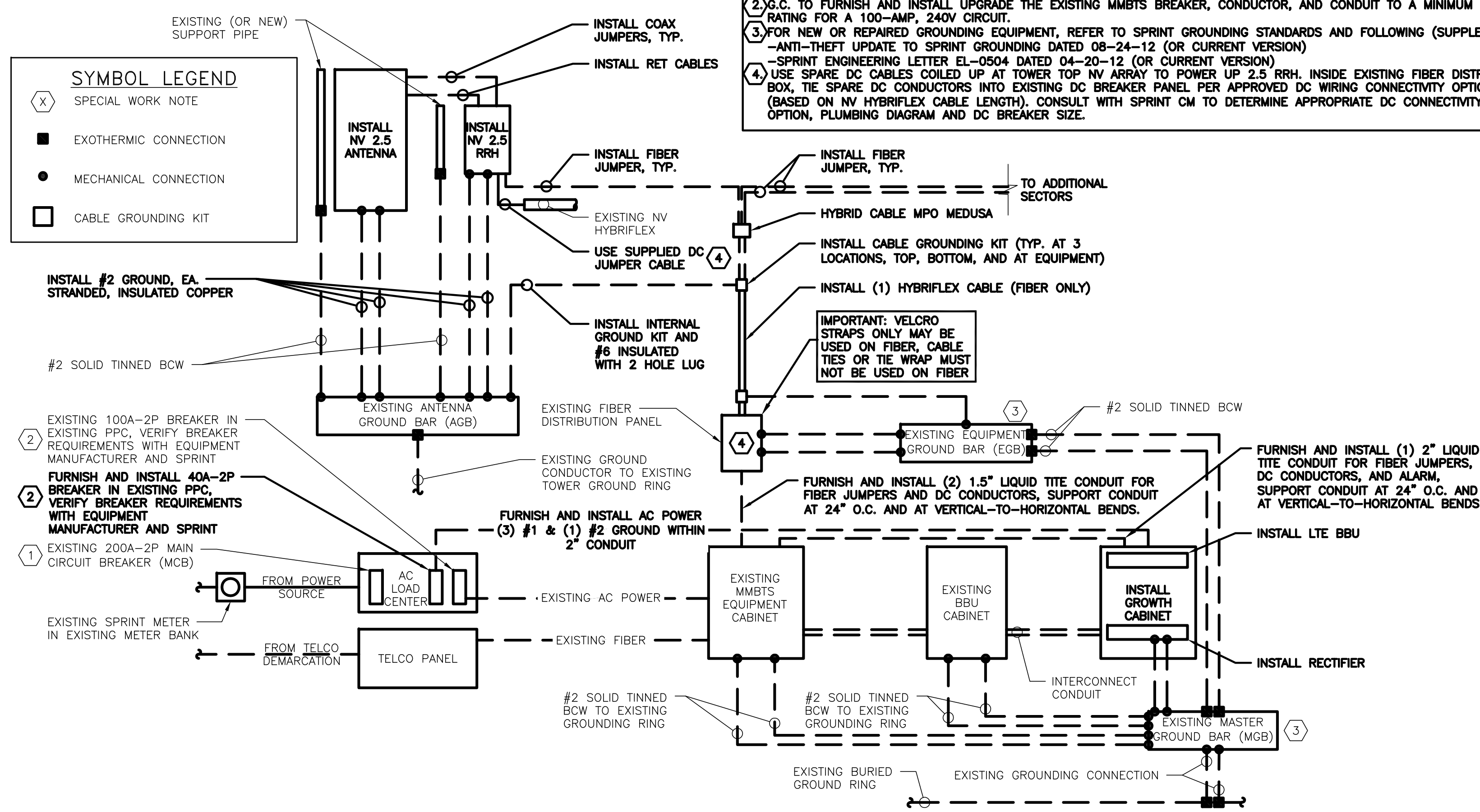
SIMSBURY, CT 06070

SHEET TITLE
STRUCTURAL DETAILS
(DO MACRO)

SHEET NUMBER
S-1

SPECIAL WORK NOTE:

1. G.C. TO FURNISH AND INSTALL ALL COMPONENTS TO UPGRADE EXISTING ELECTRICAL SERVICE, CONDUIT, CONDUCTOR, PPC AND MCB IN ACCORDANCE WITH SPRINT CONSTRUCTION STANDARDS NV 2.5 ADDENDUM "ENGINEERING NOTICE 2013-002 (POWER UPGRADES) REV.0" (OR CURRENT VERSION)
2. G.C. TO FURNISH AND INSTALL UPGRADE THE EXISTING MMBTS BREAKER, CONDUCTOR, AND CONDUIT TO A MINIMUM NEC RATING FOR A 100-AMP, 240V CIRCUIT.
3. FOR NEW OR REPAIRED GROUNDING EQUIPMENT, REFER TO SPRINT GROUNDING STANDARDS AND FOLLOWING (SUPPLEMENTS): -ANTI-THEFT UPDATE TO SPRINT GROUNDING DATED 08-24-12 (OR CURRENT VERSION) -SPRINT ENGINEERING LETTER EL-0504 DATED 04-20-12 (OR CURRENT VERSION)
4. USE SPARE DC CABLES COILED UP AT TOWER TOP NV ARRAY TO POWER UP 2.5 RRH. INSIDE EXISTING FIBER DISTRIBUTION BOX, TIE SPARE DC CONDUCTORS INTO EXISTING DC BREAKER PANEL PER APPROVED DC WIRING CONNECTIVITY OPTION (BASED ON NV HYBRIFLEX CABLE LENGTH). CONSULT WITH SPRINT CM TO DETERMINE APPROPRIATE DC CONNECTIVITY OPTION, PLUMBING DIAGRAM AND DC BREAKER SIZE.



TYPICAL POWER AND GROUNDING ONE LINE DIAGRAMS

SCALE: N.T.S.

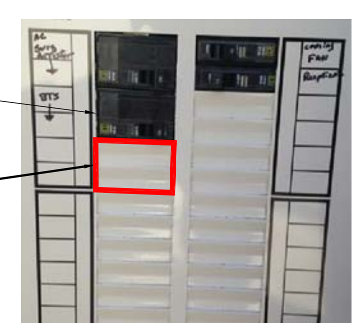
1 / E-1

(1) EXISTING 200A-2P MAIN CIRCUIT BREAKER (MCB)

SOURCE: SPRINT SITE AUDIT PHOTO 10-15-13

(2) EXISTING 100A-2P MMBTS CIRCUIT BREAKER

(2) FURNISH AND INSTALL 40A-2P BREAKER IN EXISTING PPC, VERIFY BREAKER REQUIREMENTS WITH EQUIPMENT MANUFACTURER AND SPRINT



SOURCE: SPRINT SITE AUDIT PHOTO 10-15-13

EXISTING PPC BREAKER PANEL

SCALE: N.T.S.

ELECTRICAL NOTES

1) ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.

2) THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL CONDUIT ROUTING WITH LOCAL UTILITY COMPANIES AND SPRINT CONSTRUCTION MANAGER.

3) ALL CONDUITS ROUTED BELOW GRADE SHALL TRANSITION TO RIGID GALVANIZED ELBOWS WITH RIGID GALVANIZED STEEL CONDUIT ABOVE GRADE.

4) ALL METAL CONDUITS SHALL BE PROVIDED WITH GROUNDING BUSHINGS.

5) GENERAL CONTRACTOR SHALL PROVIDE ALL DIRECT BURIED CONDUITS WITH PLASTIC WARNING TAPE IDENTIFYING CONTENTS. TAPE COLORS SHALL BE ORANGE FOR TELEPHONE AND RED FOR ELECTRIC.

6) ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.

7) THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIALS DESCRIBED BY DRAWINGS AND SPECIFICATIONS INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.

8) GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.

9) 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.

10) BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.

11) ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.

12) RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE PPC AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.

13) RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.

14) FIBER OPTIC CIRCUITS SHALL BE IN ACCORDANCE WITH NEC ARTICLE 770-OPTICAL FIBER CABLES AND RACEWAYS.

15) COMMUNICATIONS CIRCUITS SHALL BE IN ACCORDANCE WITH NEC ARTICLE 800-COMMUNICATIONS SYSTEMS.

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STATE OF CONNECTICUT · DEREK J. CREASER · LICENSED PROFESSIONAL ENGINEER

CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	01/26/18	ISSUED FOR CONSTRUCTION	DJM
1	05/22/14	ISSUED FOR CONSTRUCTION	SF
0	05/14/14	ISSUED FOR CONSTRUCTION	SF

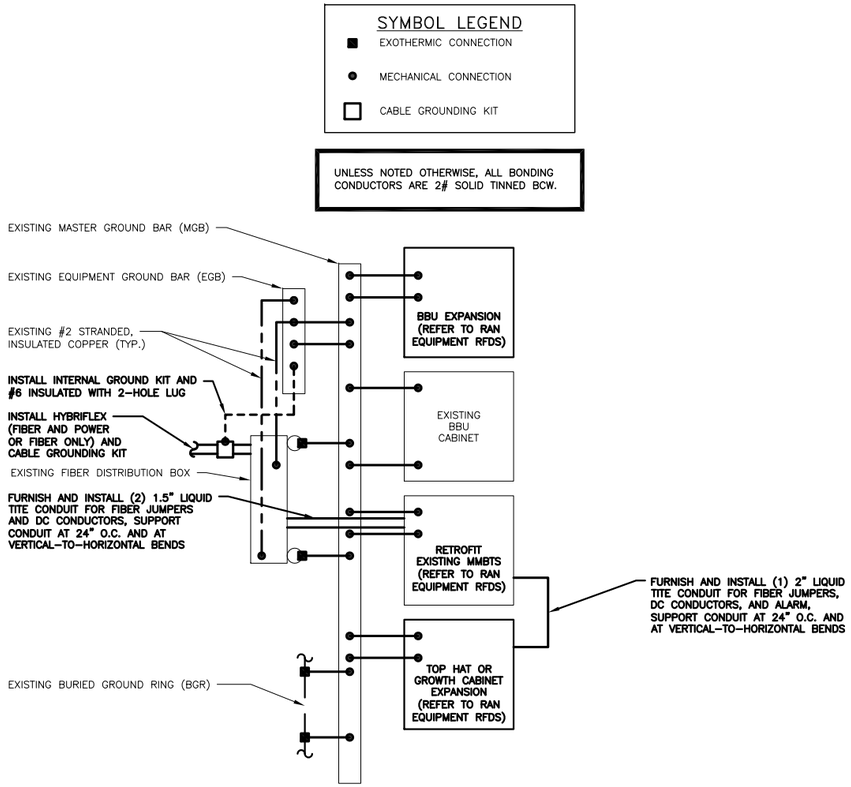
SITE NUMBER:
CT70XC140-A

SITE NAME:
NESM TOWER

SITE ADDRESS:
100 GRIST MILL ROAD
SIMSBURY, CT 06070

SHEET TITLE
ONE LINE DIAGRAM
(DO MACRO)

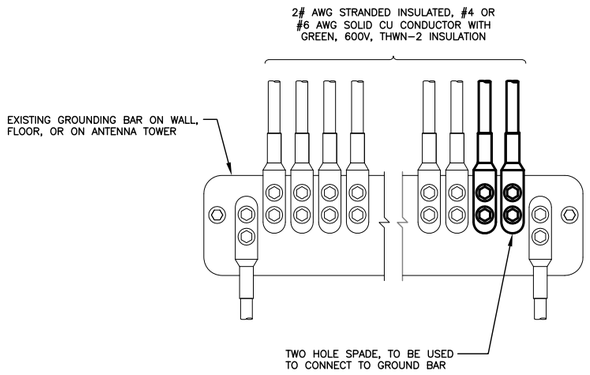
SHEET NUMBER
E-1



2.5 RAN EQUIPMENT GROUNDING SCHEMATIC

SCALE: N.T.S.

1 / E-2



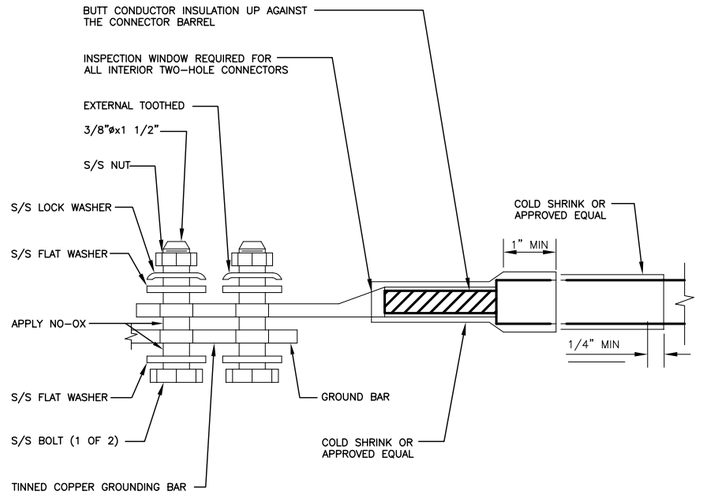
NOTES

1. APPLY NO-OX TO LUG AND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.
2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR

SCALE: N.T.S.

2 / E-2



TWO HOLE LUG

SCALE: N.T.S.

3 / E-2

PROTECTIVE GROUNDING SYSTEMS GENERAL NOTES:

1. GROUNDING SHALL BE IN ACCORDANCE WITH NEC ARTICLE 250-GROUNDING AND BONDING.
2. GROUNDING SHALL BE IN ACCORDANCE WITH SPRINT SSEO DOCUMENTS 3.018.02.004 "BONDING, GROUNDING AND TRANSIENT PROTECTION FOR CELL SITES" AND 3.018.10.002 "SITE RESISTANCE TO EARTH TESTING".
3. PROVIDE GROUND CONNECTIONS FOR ALL METALLIC STRUCTURES, ENCLOSURES, RACEWAYS AND OTHER CONDUCTIVE ITEMS ASSOCIATED WITH THE INSTALLATION OF CARRIER'S EQUIPMENT.
4. GROUND CONNECTIONS: CLEAN SURFACES THOROUGHLY BEFORE APPLYING GROUND LUGS OR CLAMPS. IF SURFACE IS COATED, REMOVE THE COATING, APPLY A NON-CORROSIVE APPROVED COMPOUND TO CLEAN SURFACE AND INSTALL LUGS OR CLAMPS. WHERE GALVANIZING IS REMOVED FROM METAL, IT SHALL BE PAINTED OR TOUCHED UP WITH "GALVAMOX" OR EQUAL.
5. ALL GROUNDING WIRES SHALL PROVIDE A STRAIGHT, DOWNWARD PATH TO GROUND WITH GRADUAL BENDS AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
6. ALL CLAMPS AND SUPPORTS USED TO SUPPORT THE GROUNDING SYSTEM CONDUCTORS AND PVC CONDUITS SHALL BE PVC TYPE (NON CONDUCTIVE). DO NOT USE METAL BRACKETS OR SUPPORTS WHICH WOULD FORM A COMPLETE RING AROUND ANY GROUNDING CONDUCTOR.
7. ALL GROUND WIRES SHALL BE #2 SOLID TINNED BCW UNLESS NOTED OTHERWISE.
8. PROVIDE DEDICATED #2 AWG COPPER GROUND WIRE FROM EACH ANTENNA MOUNTING PIPE TO ASSOCIATED CIGBE.
9. GROUND ANTENNA BASES, FRAMES, CABLE RACKS, AND OTHER METALLIC COMPONENTS WITH #2 INSULATED TINNED STRANDED COPPER GROUNDING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNDING.
10. EACH EQUIPMENT CABINET SHALL BE CONNECTED TO THE MASTER ISOLATION GROUND BAR (MGB) WITH #2 SOLID TINNED BCW EQUIPMENT CABINETS WALL HAVE (2) CONNECTIONS.
11. GROUND HYBRIFLEX SHIELD AT TOP, BOTTOM AND AT TRANSITION TO HYBRIFLEX JUMPER CABLES AT EQUIPMENT CABINET ENTRANCE USING MANUFACTURER'S GUIDELINES. WHEN HYBRIFLEX CABLE EXCEEDS 200', GROUND AT INTERVALS NOT EXCEEDING 100'.
12. THE CONTRACTOR SHALL VERIFY THAT THE EXISTING GROUND BARS HAVE ENOUGH SPACE/HOLES FOR ADDITIONAL TWO HOLE LUGS.
13. EXOTHERMIC WELDING IS RECOMMENDED FOR GROUNDING CONNECTION WHERE PRACTICAL OTHERWISE. THE CONNECTION SHALL BE MADE USING COMPRESSION TYPE-2 HOLES, LONG BARREL LUGS OR DOUBLE CRIMP "C" CLAMP. THE COPPER CABLES SHALL BE COATED WITH AN ANTI-OXIDANT (THOMAS BETTS KOPR-SHILD) BEFORE MAKING THE CRIMP CONNECTIONS THE CONTRACTOR SHALL FOLLOW MANUFACTURER'S RECOMMENDED TORQUES ON THE BOLT ASSEMBLY TO SECURE CONNECTIONS.
14. AT ALL TERMINATIONS AT EQUIPMENT ENCLOSURES, PANEL, AND FRAMES OF EQUIPMENT AND WHERE EXPOSED FOR GROUNDING. CONDUCTOR TERMINATION SHALL BE PERFORMED UTILIZING TWO HOLE BOLTED TONGUE COMPRESSION TYPE LUGS WITH STAINLESS STEEL SELF-TAPPING SCREWS.
15. THE MASTER GROUND BAR (MGB) SHALL BE MADE OF BARE 1/4"x2" COPPER (FOR OUTDOOR APPLICATIONS IT SHALL BE TINNED COPPER) AND LARGE ENOUGH TO ACCOMMODATE THE REQUIRED NUMBER OF GROUND CONNECTIONS. THE HARDWARE SECURING THE MGB SHALL ELECTRICAL INSULATE THE MGB FROM ANY STRUCTURE TO WHICH IT IS FASTENED.
16. ALL BOLTS, WASHERS, AND NUTS USED ON GROUNDING CONNECTIONS SHALL BE STAINLESS STEEL.
17. ALL GROUNDING CONNECTIONS SHALL BE COATED WITH A COPPER SHIELD ANTI-CORROSIVE AGENT SUCH AS T&B KOPR SHIELD. VERIFY PRODUCT WITH SPRINT CONSTRUCTION MANAGER.
18. FOR NEW OR REPAIRED GROUNDING EQUIPMENT. REFER TO SPRINT GROUNDING STANDARDS AND FOLLOWING (SUPPLEMENTS):
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STATE OF CONNECTICUT
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SHEET TITLE
GROUNDING DETAILS AND NOTES
(DO MACRO)

SHEET NUMBER
E-2