



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

January 30, 2018

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

**Notice of Exempt Modification**  
**51 Stony Lane, Stafford Springs, CT, 06076**  
**42 0 59.1 N**  
**-72 18 35.8 W**  
**Sprint #: CT54XC732\_DOMU**

Dear Ms. Bachman:

Sprint currently maintains antennas at the 78-foot and 118-foot levels of the existing 118-foot Monopole Tower at 51 Stony Lane, Stafford Springs, CT. The tower is owned by SBA 2012 TC Assets, LLC. The property is owned by the Susan A Cashman Living Trust. Sprint now intends to replace (6) existing cell antennas with (3) newer technology cell antennas at the 118-foot level of the tower. Sprint's proposed full scope of work is as follows:

Remove:

- (6) 1-5/8" coax

Remove and Replace:

- Remove (6) Andrew - 980F65T2EMS – Panel Antennas / Replace with (3) KMW ETCR654L12H6 Panel Antennas

Install:

- (6) ALU 800 MHz RRUs
- (3) ALU 1900 MHz RRUs
- (3) ALU TD-RRH8x20-25 RRUs
- Hand Rails and V-Brace Kit (to existing platform)
- (4) 1-1/4" fiber

Existing Equipment to Remain (Including entitlements): N/A

At 78'

- GPS
- (1) Standoff
- (1) 1/2" line



This facility was approved by the Council under Docket #213 on March 21, 2002. Approval was given for a monopole tower no greater than 120 feet above ground level. RF reports were to be produced when there were changes to emissions at the facility. There were no conditions placed on the tower. It is SBA's opinion that this modification is in full compliance.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16.50j-72(b)(2). In accordance with R.C.S.A. § 16.50j-73, a copy of this letter is being sent to the Town of Stafford's First Selectman, Anthony Frassinelli, Zoning Enforcement Officer, David Perkins, as well as to the property owner. Separate notice is not being sent to tower owner, as it belongs to SBA.)

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

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modification will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modification will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, 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  
203.446.7700 + C  
kpelletier@sbsite.com

#### Attachments

cc: Anthony Frassinelli, First Selectman / with attachments  
*Town of Stafford, Warren Memorial Town Hall, 1<sup>st</sup> Fl, 1 Main Street, Stafford Springs, CT 06076*  
David Perkins, Zoning Enforcement Officer / with attachments  
*Town of Stafford, Warren Memorial Town Hall, 1<sup>st</sup> Fl, 1 Main Street, Stafford Springs, CT 06076*  
Susan Cashman Living Trust / with attachments  
51 Stony Lane, Stafford Sprints, CT 06076



## POWER DENSITY

### SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	<b>1</b>	Antenna #:	<b>1</b>	Antenna #:	<b>1</b>
Make / Model:	KMW ETCR-654L12H6	Make / Model:	KMW ETCR-654L12H6	Make / Model:	KMW ETCR-654L12H6
Gain:	13.35 / 15.25 / 15.05 dBd	Gain:	13.35 / 15.25 / 15.05 dBd	Gain:	13.35 / 15.25 / 15.05 dBd
Height (AGL):	<b>118 feet</b>	Height (AGL):	<b>118 feet</b>	Height (AGL):	<b>118 feet</b>
Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)
Channel Count	18	Channel Count	18	Channel Count	18
Total TX Power(W):	380 Watts	Total TX Power(W):	380 Watts	Total TX Power(W):	380 Watts
ERP (W):	11,775.31	ERP (W):	11,775.31	ERP (W):	11,775.31
Antenna A1 MPE%	<b>3.66 %</b>	Antenna B1 MPE%	<b>3.66 %</b>	Antenna C1 MPE%	<b>3.66 %</b>

Site Composite MPE%	
Carrier	MPE%
SPRINT – Max per sector	3.66 %
Verizon Wireless	3.78 %
<b>Site Total MPE %:</b>	<b>7.44 %</b>

SPRINT Sector A Total:	3.66 %
SPRINT Sector B Total:	3.66 %
SPRINT Sector C Total:	3.66 %
<b>Site Total:</b>	<b>7.44 %</b>

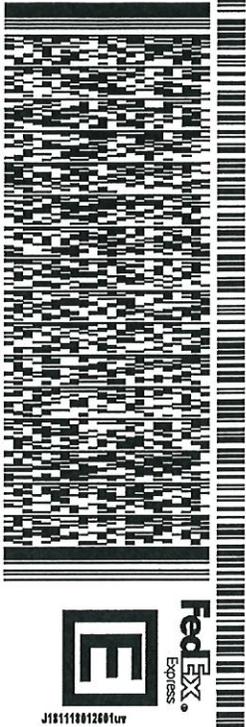
SPRINT_ Frequency Band / Technology (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
Sprint 850 MHz CDMA	1	432.54	118	1.24	850 MHz	567	0.21%
Sprint 850 MHz LTE	2	432.54	118	2.48	850 MHz	567	0.44%
Sprint 1900 MHz (PCS) CDMA	5	535.94	118	7.68	1900 MHz (PCS)	1000	0.77%
Sprint 1900 MHz (PCS) LTE	2	1,339.86	118	7.68	1900 MHz (PCS)	1000	0.77%
Sprint 2500 MHz (BRS) LTE	8	639.78	118	14.67	2500 MHz (BRS)	1000	1.47%
						<b>Total:</b>	<b>3.66%</b>

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: 30 JAN 18  
ACT WT: 1.00 LB  
CAD: 105843304IN/E13980  
BILL SENDER

TO ANTHONY FRASSINELLI/FIRST SELECTMAN  
TOWN OF STAFFORD  
WARREN MEMORIAL TOWN HALL - 1ST FL.  
1 MAIN STREET  
STAFFORD SPRINGS CT 06076  
(508) 251-0720 X 3804 REF: 10-56-92009-8089  
INVT: DEPT:  
PO:

552J11/1220/DCA5



TRK# 7713 5954 0959  
0201  
WED - 31 JAN 10:30A  
PRIORITY OVERNIGHT

EB QCWA  
06076  
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 Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

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SBA NETWORK SERVICES INC  
134 FLANDERS ROAD  
SUITE 125  
WESTBOROUGH, MA 01581  
UNITED STATES US

SHIP DATE: 30JAN18  
ACTWTG: 1.00 LB  
CAD: 105843304/NET3980

BILL SENDER

TO **DAVID PERKINS, ZONEING OFFICER**

**TOWN OF STAFFORD**

**WARREN MEMORIAL TOWN HALL / 1ST FL.**

**1 MAIN STREET**

**STAFFORD SPRINGS CT 06076**

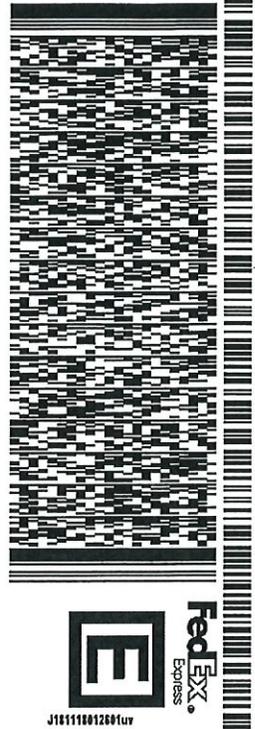
(508) 251-0720 X.3804

REF: 10-56-92009-6089

PO:

DEPT:

552J11122D/DCA5



TRK# 7713 5955 9795  
0201

WED - 31 JAN 10:30A  
PRIORITY OVERNIGHT

**EB QCWA**

06076  
CT-US BDL



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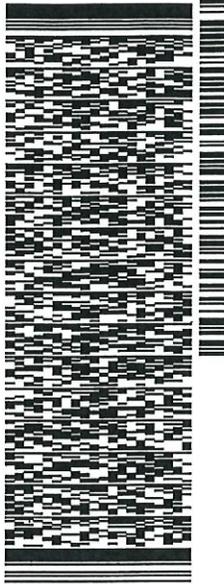
ORIGIN ID:BBFA (508) 614-0389  
RICK WOODS  
SBA NETWORK SERVICES INC  
134 FLANDERS ROAD  
SUITE 125  
WESTBOROUGH, MA 01581  
UNITED STATES US

SHIP DATE: 30 JAN 18  
ACTWT: 1.00 LB  
CAD: 105843304N1E13980  
BILL SENDER

TO **MANAGER**  
**SUSAN CASHMAN LIVING TRUST**  
**51 STONY LANE**

**STAFFORD SPRINGS CT 06076**  
INV: (508) 251-0720 X-3804 REF: 10-56-92009-8089  
PO: DEPT:

552J11/122D/0CA5



TRK# 7713 5957 4810  
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PRIORITY OVERNIGHT

**EB QCWA**  
CT-US **06076**  
**BDL**



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**51 STONY LA**

**Location** 51 STONY LA

**Mblu** 14/ / 43/ /

**Acct#** 14/043

**Owner** CASHMAN SUSAN A REV LIVING TRST

**Assessment** \$290,990

**Appraisal** \$595,100

**PID** 522

**Building Count** 1

**Current Value**

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$355,600	\$239,500	\$595,100

Assessment			
Valuation Year	Improvements	Land	Total
2015	\$248,920	\$42,070	\$290,990

**Owner of Record**

<b>Owner</b>	CASHMAN SUSAN A REV LIVING TRST	<b>Sale Price</b>	\$0
<b>Co-Owner</b>		<b>Certificate</b>	
<b>Address</b>	51 STONY LA SATTFORD SPRINGS, CT 06076	<b>Book &amp; Page</b>	645/ 687
		<b>Sale Date</b>	10/27/2016
		<b>Instrument</b>	01

**Ownership History**

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
CASHMAN SUSAN A REV LIVING TRST	\$0		645/ 687	01	10/27/2016
CASHMAN MARK S+SUSAN A	\$579,000		597/ 446	28	12/10/2012
RUSSO ROBERT P+PATRICIA LASINI	\$66,275	1	376/ 531	03	10/19/1999

**Building Information**

**Building 1 : Section 1**

**Year Built:** 2000  
**Living Area:** 2,594  
**Replacement Cost:** \$257,546  
**Building Percent Good:** 89  
**Replacement Cost Less Depreciation:** \$229,200

**Building Photo**

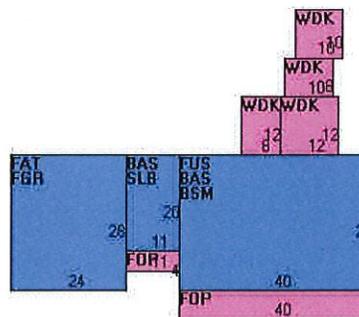
**Building Attributes**

Field	Description
Style	Colonial
Model	Residential
Grade:	B-
Occupancy	1
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt
Interior Wall 1	Average
Interior Wall 2	
Interior Flr 1	Average
Interior Flr 2	
Heat Fuel	Oil
Heat Type:	Forced Hot Air
AC Type:	Central
Total Bedrooms:	4
Full Bthrms:	2
Half Baths:	1
Extra Fixtures	0
Total Rooms:	7
Bath Style:	Average
Kitchen Style:	Average
Num Kitchens	1
Fireplaces	1
Extra Openings	
Prefab Fpl(s)	
Attic Type	None
Bsmt Type	Full
Bsmt Garage(s)	0
Fin Bsmnt	0
Fn. Bmt. Qual.	
Unfin Area	0



(<http://images.vgsi.com/photos2/StaffordCTPhotos/\00\00\96\75.jpg>)

**Building Layout**



Building Sub-Areas (sq ft)		Legend	
Code	Description	Gross Area	Living Area
BAS	First Floor	1,340	1,340
FUS	Finished Upper Story	1,120	1,120
FAT	Finished Attic	672	134
BSM	Basement	1,120	0
FGR	Garage	672	0
FOP	Open Porch	284	0
SLB	Slab	220	0
WDK	Deck	420	0
		5,848	2,594

**Extra Features**

Extra Features	Legend
No Data for Extra Features	

**Land**

**Land Use**

**Land Line Valuation**

**Use Code** 101  
**Description** Res Dwelling  
**Zone**  
**Neighborhood** 220  
**Alt Land Appr** No  
**Category**

**Size (Acres)** 51.49  
**Frontage**  
**Depth**  
**Assessed Value** \$42,070  
**Appraised Value** \$239,500

**Outbuildings**

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
SHD1	Shed	FR	Frame	64 S.F.	\$400	1
SHD1	Shed	FR	Frame	1000 S.F.	\$6,000	1
BRN1	1 Story Barn			10000 S.F.	\$120,000	1

**Valuation History**

Appraisal			
Valuation Year	Improvements	Land	Total
2016	\$355,600	\$239,500	\$595,100
2014	\$372,400	\$239,500	\$611,900
2013	\$372,400	\$239,500	\$611,900

Assessment			
Valuation Year	Improvements	Land	Total
2016	\$248,920	\$42,070	\$290,990
2014	\$260,680	\$40,670	\$301,350
2013	\$260,680	\$40,670	\$301,350

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

SPRINT Existing Facility

Site ID: CT54XC732

Russo Property/SSUSA  
51 Stony Lane  
Stafford Springs, CT 06076

**December 1, 2017**

**EBI Project Number: 6217005378**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general public allowable limit:	<b>7.44 %</b>



December 1, 2017

SPRINT

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

## Emissions Analysis for Site: **CT54XC732 – Russo Property/SSUSA**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **51 Stony Lane, Stafford Springs, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The number of  $\mu\text{W}/\text{cm}^2$  calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limits for the 850 MHz Band is approximately  $567 \mu\text{W}/\text{cm}^2$ . The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) bands is  $1000 \mu\text{W}/\text{cm}^2$ . Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.



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

Additional details can be found in FCC OET 65.

## CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **51 Stony Lane, Stafford Springs, 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 **KMW ETCR-654L12H6** 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 **118 feet** above ground level (AGL) for **Sector A**, **118 feet** above ground level (AGL) for **Sector B** and **118 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 public threshold limits.



## SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	<b>1</b>	Antenna #:	<b>1</b>	Antenna #:	<b>1</b>
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Gain:	13.35 / 15.25 / 15.05 dBd	Gain:	13.35 / 15.25 / 15.05 dBd	Gain:	13.35 / 15.25 / 15.05 dBd
Height (AGL):	<b>118 feet</b>	Height (AGL):	<b>118 feet</b>	Height (AGL):	<b>118 feet</b>
Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)
Channel Count	18	Channel Count	18	Channel Count	18
Total TX Power(W):	380 Watts	Total TX Power(W):	380 Watts	Total TX Power(W):	380 Watts
ERP (W):	11,775.31	ERP (W):	11,775.31	ERP (W):	11,775.31
Antenna A1 MPE%	<b>3.66 %</b>	Antenna B1 MPE%	<b>3.66 %</b>	Antenna C1 MPE%	<b>3.66 %</b>

Site Composite MPE%	
Carrier	MPE%
SPRINT – Max per sector	<b>3.66 %</b>
Verizon Wireless	3.78 %
<b>Site Total MPE %:</b>	<b>7.44 %</b>

SPRINT Sector A Total:	3.66 %
SPRINT Sector B Total:	3.66 %
SPRINT Sector C Total:	3.66 %
<b>Site Total:</b>	<b>7.44 %</b>

SPRINT _ Frequency Band / Technology (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
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Sprint 850 MHz LTE	2	432.54	118	2.48	850 MHz	567	0.44%
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Sprint 2500 MHz (BRS) LTE	8	639.78	118	14.67	2500 MHz (BRS)	1000	1.47%
						<b>Total:</b>	<b>3.66%</b>

## Summary

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

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

SPRINT Sector	Power Density Value (%)
Sector A:	3.66 %
Sector B:	3.66 %
Sector C:	3.66 %
SPRINT Maximum Total (per sector):	3.66 %
Site Total:	7.44 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **7.44 %** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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



**Tower Engineering Solutions**

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

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## **Structural Analysis Report**

**Existing 118 ft. SUMMIT Monopole**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT46148-A**

**Customer Site Name: Russo Property/ Ssusa**

**Carrier Name: Sprint Nextel**

**Carrier Site ID / Name: CT54XC732 / Russo Property**

**Site Location: 51 Stony Lane**

**Stafford Springs, Connecticut**

**Tolland County**

**Latitude: 42.016417**

**Longitude: -72.309944**



Exp.  
01/31/2018

**Analysis Result: 10/27/2017**

**Max Structural Usage: 71.3% [Pass]**

**Max Foundation Usage: 74% [Pass]**

**Report Prepared By : Stacey Hesselbein**

## Introduction

The purpose of this report is to summarize the analysis results on the 118 ft. SUMMIT Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

## Sources of Information

<b>Tower Drawings</b>	Paul J. ford and Company, Job # 29202-0158 Dated 03/28/2002
<b>Foundation Drawing</b>	Paul J. ford and Company, Job # 29202-0158 Dated 03/28/2002
<b>Geotechnical Report</b>	SEA Consultants, ref # 2001042.01-A Dated 04/04/2001
<b>Modification Drawings</b>	N/A

## Analysis Criteria

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

<b>Wind Speed Used in the Analysis:</b>	Ultimate Design Wind Speed $V_{ult} = 125$ mph (3-Sec. Gust)/ Nominal Design Wind Speed $V_{asd} = 97.0$ mph (3-Sec. Gust)
<b>Wind Speed with Ice:</b>	50 mph (3-Sec. Gust) with 3/4" radial ice concurrent
<b>Operational Wind Speed:</b>	60 mph + 0" Radial ice
<b>Standard/Codes:</b>	ANSI/TIA/EIA 222-G / 2012 IBC / 2016 Connecticut State Building Code
<b>Exposure Category:</b>	C
<b>Structure Class:</b>	II
<b>Topographic Category:</b>	1
<b>Crest Height:</b>	0 ft.
<b>Seismic Parameters:</b>	$S_S = 0.173$ , $S_1 = 0.065$

## **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
-	118.6	6	Andrew - 980F65T2EMS - Panel	Low Profile Platform	(6) 1 5/8"	Sprint Nextel
5	108.0	2	Antel - BXA 70080/6CF - Panel	Low Profile Platform	(18) 1 5/8"	Verizon
6		6	Antel - LPA 80080/6CF - Panel			
7		6	Antel - LPA 185080/12CF - Panel			
8		1	Antel - BXA-70063/6CF - Panel			
-	78.0	1	GPS	(1) Standoff	<sup>1</sup> (1) 1/2"	Sprint Nextel

1. Coax considered running outside the pole shaft.

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

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

Items	Elevation (ft.)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	118.0	3	KMW - ETCR-654L12H6 - Panel	Platform w/ Hand Rails and V-Brace Kit	(4) 1-1/4" Fiber	Sprint Nextel
2		6	ALU - 800 MHz - RRU			
3		3	ALU - 1900MHz - RRU			
4		3	ALU - TD-RRH8x20-25 - RRU			
9	78.0	1	GPS	(1) Standoff	(1) 1/2"	

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

## **Analysis Results**

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

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	<b>71.3%</b>	<b>52.9%</b>	<b>62.3%</b>
Pass/Fail	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>

## **Foundations**

	Moment (Kip-Ft)	Shear (Kips)
Original Design Reactions	1600.0	18.0
Analysis Reactions	1484.2	16.7
Factored Reactions*	2160.0	24.3
% of Design Reactions	68.7%	68.7%

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

The foundation has been analyzed using the supplied documents and was found adequate. Therefore, no modification to the foundation will be required. Geotechnical soil parameters were obtained from the original foundation calculations included with the referenced tower and foundation design drawings.

### **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 1.3343 degrees under the operational wind speed as specified in the Analysis Criteria.

### **Conclusions**

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

### **Antenna Mount Note:**

The new proposed mount contributes 3.1% of additional stress to the tower structure.

## 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 71.29% at 0.0ft

**Structure:** CT46148-A-SBA  
**Site Name:** Russo Property/ Ssusa  
**Height:** 118.00 (ft)  
**Base Elev:** 0.000 (ft)

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

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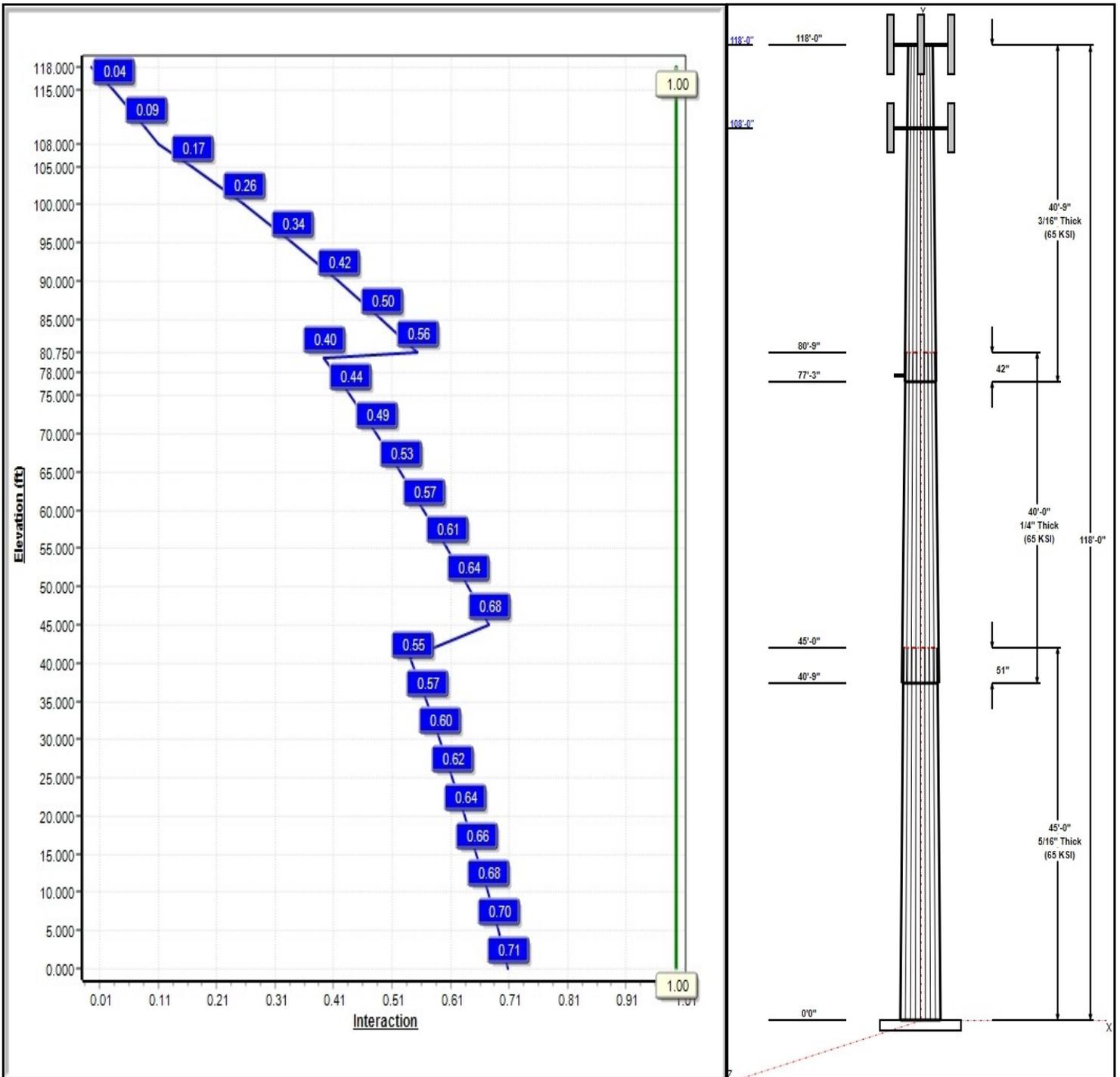
**Dead Load Factor:** 1.20  
**Wind Load Factor:** 1.60

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



**Iterations:** 24

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## Structure: CT46148-A-SBA

**Type:** Tapered  
**Site Name:** Russo Property/ Ssusa  
**Height:** 118.00 (ft)  
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.15004

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### Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	45.00	32.08	38.83	0.313		0.15004	65
2	40.00	27.21	33.22	0.250	Slip	0.15004	65
3	40.75	22.00	28.11	0.188	Slip	0.15004	65

### Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
118.00	118.00	1	6' Lightning rod	Sprint Nextel
118.00	118.00	3	KMW - ETCR-654L12H6	Sprint Nextel
118.00	118.00	3	ALU - 1900MHz - RRU	Sprint Nextel
118.00	118.00	6	ALU - 800 MHz - RRU	Sprint Nextel
118.00	118.00	3	ALU - TD-RRH8x20-25 -	Sprint Nextel
118.00	118.00	1	Platform w/ Hand Rails	Sprint Nextel
108.00	108.00	2	Antel - BXA 70080/6CF	Verizon
108.00	108.00	6	Antel - LPA 80080/6CF	Verizon
108.00	108.00	6	Antel - LPA 185080/12CF	Verizon
108.00	108.00	1	Antel - BXA-70063/6CF	Verizon
108.00	108.00	1	Low Profile Platform	Verizon
78.00	78.00	1	GPS	Sprint Nextel
78.00	78.00	1	Pipe Mount	Sprint Nextel

### Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	118.00	Inside	1-1/4" Fiber	Sprint Nextel
0.00	108.00	Inside	1 5/8" Coax	Verizon
0.00	78.00	Outside	1/2" Coax	Sprint Nextel

### Anchor Bolts

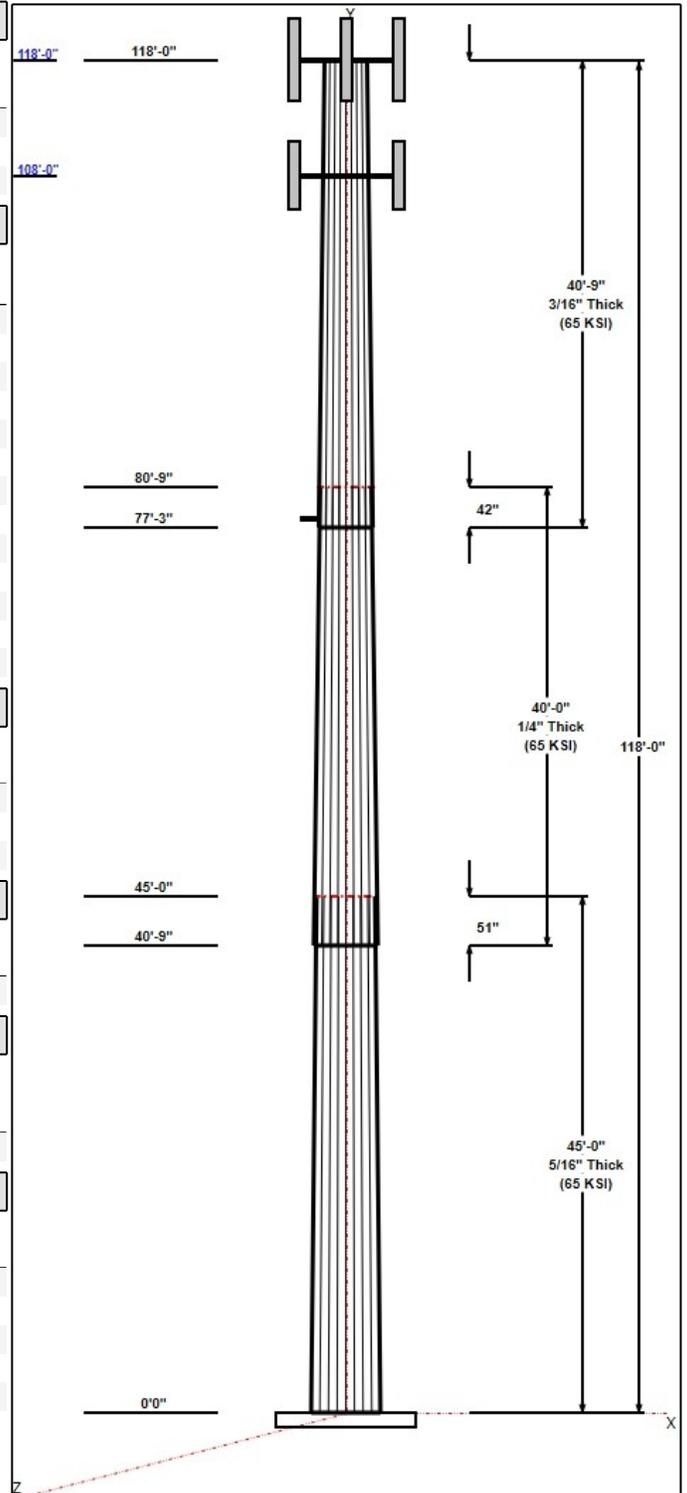
Qty	Specifications	Grade (ksi)	Arrangement
12	2.25" 18J	75.0	Cluster

### Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.5000	44.0	55.0	Clipped

### Reactions

Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 97 mph Wind	1484.2	16.7	20.9
0.9D + 1.6W 97 mph Wind	1468.5	16.7	15.7
1.2D + 1.0Di + 1.0Wi 50 mph Wind	436.2	4.9	34.8
1.2D + 1.0E	120.7	1.1	21.0
0.9D + 1.0E	119.3	1.1	15.7
1.0D + 1.0W 60 mph Wind	352.9	4.0	17.5



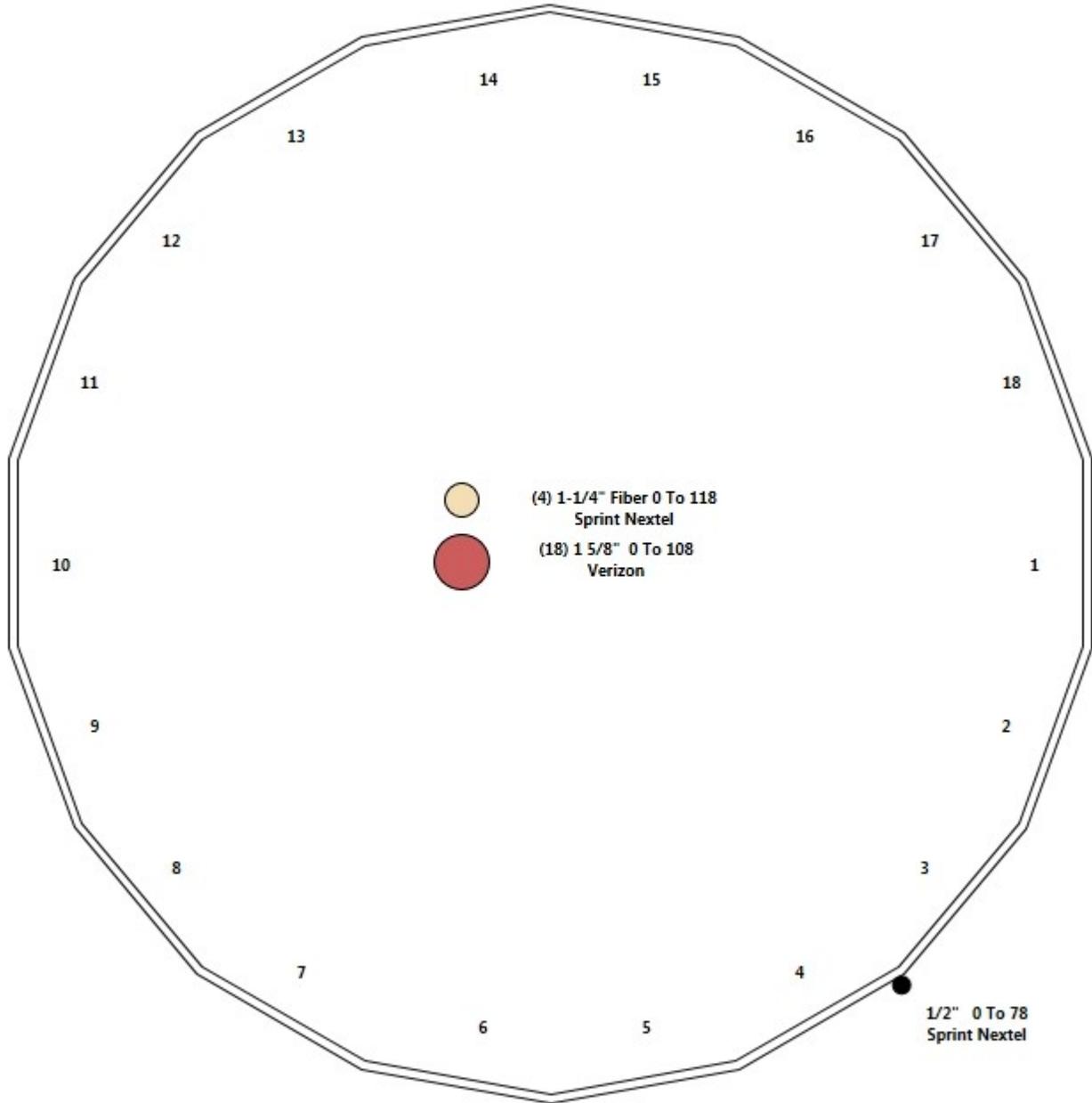
# Structure: CT46148-A-SBA - Coax Line Placement

**Type:** Monopole  
**Site Name:** Russo Property/ Ssusa  
**Height:** 118.00 (ft)

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## Shaft Properties

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	45.000	0.3125	65		0.00	5,337
2	18	40.000	0.2500	65	Slip	51.00	3,236
3	18	40.750	0.1875	65	Slip	42.00	2,052
<b>Total Shaft Weight:</b>							<b>10,626</b>

Bottom

Top

Sec. No.	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Taper
1	38.83	0.00	38.20	7160.92	20.50	124.26	32.08	45.00	31.51	4016.66	16.69	102.6	0.150042
2	33.22	40.75	26.16	3591.49	22.02	132.86	27.21	80.75	21.40	1965.36	17.78	108.8	0.150042
3	28.11	77.25	16.62	1637.59	25.03	149.94	22.00	118.00	12.98	780.30	19.28	117.3	0.150042

## Load Summary

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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### Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
1	118.00	6' Lightning rod	1	6.50	0.38	1.00	41.94	1.442	1.00	0.00	0.00
2	118.00	KMW - ETCR-654L12H6	3	99.00	15.71	0.71	413.08	17.348	0.72	0.00	0.00
3	118.00	ALU - 1900MHz - RRU	3	44.00	3.80	0.67	150.58	5.157	0.69	0.00	0.00
4	118.00	ALU - 800 MHz - RRU	6	53.00	2.49	0.67	125.21	3.607	0.69	0.00	0.00
5	118.00	ALU - TD-RRH8x20-25 - RRU	3	70.00	4.05	0.67	177.31	4.842	0.69	0.00	0.00
6	118.00	Platform w/ Hand Rails and V-Brace	1	1600.00	32.00	1.00	3650.06	59.261	1.00	0.00	0.00
7	108.00	Antel - BXA 70080/6CF	2	18.00	5.84	0.88	139.86	8.148	0.89	0.00	0.00
8	108.00	Antel - LPA 80080/6CF	6	21.00	4.33	0.85	208.45	5.468	0.86	0.00	0.00
9	108.00	Antel - LPA 185080/12CF	6	10.50	3.52	0.84	122.21	4.630	0.85	0.00	0.00
10	108.00	Antel - BXA-70063/6CF	1	17.00	7.57	0.84	154.13	10.245	0.85	0.00	0.00
11	108.00	Low Profile Platform	1	1500.00	22.00	1.00	2766.61	39.091	1.00	0.00	0.00
12	78.00	GPS	1	10.00	1.00	1.00	37.46	1.667	1.00	0.00	0.00
13	78.00	Pipe Mount	1	40.00	2.63	0.75	115.20	8.221	0.75	0.00	0.00
<b>Totals:</b>			<b>35</b>	<b>4,355.50</b>			<b>12,003.18</b>				

### Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	118.00	(4) 1-1/4" Fiber	0.00	Inside
0.00	108.00	(18) 1 5/8" Coax	0.00	Inside
0.00	78.00	(1) 1/2" Coax	1.00	Outside

## Shaft Section Properties

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**Increment Length:** 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in <sup>3</sup> )	Weight (lb)
0.00		0.3125	38.830	38.203	7160.9	20.50	124.26	77.3	363.2	0.0
5.00		0.3125	38.080	37.459	6750.6	20.08	121.86	77.8	349.2	643.7
10.00		0.3125	37.330	36.715	6356.2	19.65	119.45	78.3	335.4	631.0
15.00		0.3125	36.579	35.971	5977.6	19.23	117.05	78.8	321.9	618.3
20.00		0.3125	35.829	35.227	5614.2	18.81	114.65	79.3	308.6	605.7
25.00		0.3125	35.079	34.483	5265.9	18.38	112.25	79.8	295.7	593.0
30.00		0.3125	34.329	33.739	4932.3	17.96	109.85	80.3	283.0	580.4
35.00		0.3125	33.579	32.995	4613.1	17.54	107.45	80.8	270.6	567.7
40.00		0.3125	32.828	32.250	4308.0	17.11	105.05	81.3	258.5	555.0
40.75	Bot - Section 2	0.3125	32.716	32.139	4263.4	17.05	104.69	81.3	256.7	82.2
45.00	Top - Section 1	0.2500	32.578	25.651	3387.1	21.57	130.31	0.0	0.0	834.8
50.00		0.2500	31.828	25.056	3156.7	21.04	127.31	76.7	195.3	431.4
55.00		0.2500	31.078	24.461	2937.0	20.51	124.31	77.3	186.1	421.2
60.00		0.2500	30.327	23.866	2727.8	19.98	121.31	77.9	177.2	411.1
65.00		0.2500	29.577	23.270	2528.7	19.45	118.31	78.5	168.4	401.0
70.00		0.2500	28.827	22.675	2339.6	18.92	115.31	79.1	159.9	390.9
75.00		0.2500	28.077	22.080	2160.1	18.39	112.31	79.8	151.5	380.7
77.25	Bot - Section 3	0.2500	27.739	21.812	2082.4	18.15	110.96	80.0	147.9	168.0
78.00		0.2500	27.627	21.723	2057.0	18.07	110.51	80.1	146.6	97.9
80.00		0.2500	27.327	21.485	1990.1	17.86	109.31	80.4	143.4	259.1
80.75	Top - Section 2	0.1875	27.589	16.307	1546.9	24.53	147.14	0.0	0.0	96.4
85.00		0.1875	26.951	15.927	1441.4	23.93	143.74	73.2	105.3	233.1
90.00		0.1875	26.201	15.481	1323.6	23.23	139.74	74.1	99.5	267.2
95.00		0.1875	25.451	15.034	1212.3	22.52	135.74	74.9	93.8	259.6
100.00		0.1875	24.701	14.588	1107.5	21.82	131.74	75.7	88.3	252.0
105.00		0.1875	23.951	14.141	1008.9	21.11	127.74	76.6	83.0	244.4
108.00		0.1875	23.500	13.874	952.7	20.69	125.34	77.1	79.8	143.0
110.00		0.1875	23.200	13.695	916.3	20.41	123.74	77.4	77.8	93.8
115.00		0.1875	22.450	13.249	829.6	19.70	119.73	78.2	72.8	229.2
118.00		0.1875	22.000	12.981	780.3	19.28	117.33	78.7	69.9	133.9

**10625.6**

## Wind Loading - Shaft

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	19.450	21.40	293.84	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	19.450	21.40	288.17	0.650	0.000	5.00	16.270	10.58	362.0	0.0	772.4
10.00		1.00	0.85	19.450	21.40	282.49	0.650	0.000	5.00	15.953	10.37	355.0	0.0	757.2
15.00		1.00	0.85	19.450	21.40	276.81	0.650	0.000	5.00	15.635	10.16	347.9	0.0	742.0
20.00		1.00	0.90	20.638	22.70	279.29	0.650	0.000	5.00	15.318	9.96	361.6	0.0	726.8
25.00		1.00	0.95	21.630	23.79	279.94	0.650	0.000	5.00	15.000	9.75	371.2	0.0	711.6
30.00		1.00	0.98	22.477	24.72	279.26	0.650	0.000	5.00	14.683	9.54	377.5	0.0	696.4
35.00		1.00	1.01	23.218	25.54	277.63	0.650	0.000	5.00	14.366	9.34	381.6	0.0	681.2
40.00		1.00	1.04	23.880	26.27	275.26	0.650	0.000	5.00	14.048	9.13	383.8	0.0	666.0
40.75 Bot - Section 2		1.00	1.05	23.974	26.37	274.86	0.650	0.000	0.75	2.080	1.35	57.0	0.0	98.6
45.00 Top - Section 1		1.00	1.07	24.479	26.93	272.33	0.650	0.000	4.25	11.831	7.69	331.3	0.0	1001.8
50.00		1.00	1.09	25.029	27.53	273.22	0.650	0.000	5.00	13.625	8.86	390.1	0.0	517.6
55.00		1.00	1.12	25.536	28.09	269.47	0.650	0.000	5.00	13.307	8.65	388.8	0.0	505.5
60.00		1.00	1.14	26.008	28.61	265.38	0.650	0.000	5.00	12.990	8.44	386.5	0.0	493.3
65.00		1.00	1.16	26.450	29.09	261.01	0.650	0.000	5.00	12.673	8.24	383.5	0.0	481.2
70.00		1.00	1.17	26.866	29.55	256.38	0.650	0.000	5.00	12.355	8.03	379.7	0.0	469.0
75.00		1.00	1.19	27.259	29.98	251.53	0.650	0.000	5.00	12.038	7.82	375.4	0.0	456.9
77.25 Bot - Section 3		1.00	1.20	27.429	30.17	249.28	0.650	0.000	2.25	5.313	3.45	166.7	0.0	201.6
78.00 Appurtenance(s)		1.00	1.20	27.485	30.23	248.52	0.650	0.000	0.75	1.781	1.16	56.0	0.0	117.5
80.00		1.00	1.21	27.632	30.39	246.48	0.650	0.000	2.00	4.714	3.06	149.0	0.0	310.9
80.75 Top - Section 2		1.00	1.21	27.686	30.45	245.70	0.650	0.000	0.75	1.754	1.14	55.6	0.0	115.7
85.00		1.00	1.22	27.987	30.79	244.65	0.650	0.000	4.25	9.807	6.37	314.0	0.0	279.7
90.00		1.00	1.24	28.325	31.16	239.27	0.650	0.000	5.00	11.244	7.31	364.4	0.0	320.6
95.00		1.00	1.25	28.650	31.51	233.75	0.650	0.000	5.00	10.927	7.10	358.1	0.0	311.5
100.00		1.00	1.27	28.961	31.86	228.09	0.650	0.000	5.00	10.609	6.90	351.5	0.0	302.4
105.00		1.00	1.28	29.260	32.19	222.30	0.650	0.000	5.00	10.292	6.69	344.5	0.0	293.3
108.00 Appurtenance(s)		1.00	1.29	29.434	32.38	218.77	0.650	0.000	3.00	6.023	3.91	202.8	0.0	171.6
110.00		1.00	1.29	29.548	32.50	216.39	0.650	0.000	2.00	3.952	2.57	133.6	0.0	112.6
115.00		1.00	1.30	29.826	32.81	210.38	0.650	0.000	5.00	9.657	6.28	329.5	0.0	275.0
118.00 Appurtenance(s)		1.00	1.31	29.988	32.99	206.72	0.650	0.000	3.00	5.642	3.67	193.6	0.0	160.7
<b>Totals:</b>								<b>118.00</b>			<b>8,652.1</b>	<b>12,750.7</b>		

## Discrete Appurtenance Forces

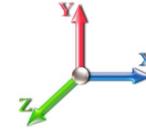
<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	118.00	Platform w/ Hand Rails	1	29.988	32.986	1.00	1.00	32.00	1920.00	0.000	0.000	1688.91	0.00	0.00
2	118.00	ALU - TD-RRH8x20-25 -	3	29.988	32.986	0.54	0.80	6.51	252.00	0.000	0.000	343.71	0.00	0.00
3	118.00	ALU - 800 MHz - RRU	6	29.988	32.986	0.54	0.80	8.01	381.60	0.000	0.000	422.64	0.00	0.00
4	118.00	ALU - 1900MHz - RRU	3	29.988	32.986	0.54	0.80	6.11	158.40	0.000	0.000	322.50	0.00	0.00
5	118.00	KMW - ETCR-654L12H6	3	29.988	32.986	0.64	0.90	30.12	356.40	0.000	0.000	1589.48	0.00	0.00
6	118.00	6' Lightning rod	1	29.988	32.986	1.00	1.00	0.38	7.80	0.000	0.000	20.06	0.00	0.00
7	108.00	Low Profile Platform	1	29.434	32.377	1.00	1.00	22.00	1800.00	0.000	0.000	1139.68	0.00	0.00
8	108.00	Antel - BXA-70063/6CF	1	29.434	32.377	0.67	0.80	5.09	20.40	0.000	0.000	263.53	0.00	0.00
9	108.00	Antel - LPA 185080/12CF	6	29.434	32.377	0.67	0.80	14.19	75.60	0.000	0.000	735.23	0.00	0.00
10	108.00	Antel - LPA 80080/6CF	6	29.434	32.377	0.68	0.80	17.67	151.20	0.000	0.000	915.18	0.00	0.00
11	108.00	Antel - BXA 70080/6CF	2	29.434	32.377	0.70	0.80	8.22	43.20	0.000	0.000	425.97	0.00	0.00
12	78.00	Pipe Mount	1	27.485	30.233	0.56	0.75	1.48	48.00	0.000	0.000	71.56	0.00	0.00
13	78.00	GPS	1	27.485	30.233	0.80	0.80	0.80	12.00	0.000	0.000	38.70	0.00	0.00
<b>Totals:</b>									<b>5,226.60</b>			<b>7,977.13</b>		

## Total Applied Force Summary

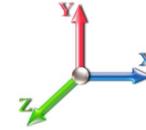
<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 24

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		362.03	908.56	0.00	0.00
10.00		354.96	893.37	0.00	0.00
15.00		347.90	878.18	0.00	0.00
20.00		361.64	862.99	0.00	0.00
25.00		371.18	847.79	0.00	0.00
30.00		377.55	832.60	0.00	0.00
35.00		381.57	817.41	0.00	0.00
40.00		383.78	802.22	0.00	0.00
40.75		57.04	119.02	0.00	0.00
45.00		331.31	1117.55	0.00	0.00
50.00		390.12	653.82	0.00	0.00
55.00		388.75	641.66	0.00	0.00
60.00		386.49	629.51	0.00	0.00
65.00		383.46	617.36	0.00	0.00
70.00		379.73	605.20	0.00	0.00
75.00		375.39	593.05	0.00	0.00
77.25		166.73	262.91	0.00	0.00
78.00	(2) attachments	166.25	197.88	0.00	0.00
80.00		149.00	364.96	0.00	0.00
80.75		55.57	135.98	0.00	0.00
85.00		313.99	394.63	0.00	0.00
90.00		364.36	455.84	0.00	0.00
95.00		358.13	446.73	0.00	0.00
100.00		351.50	437.61	0.00	0.00
105.00		344.51	428.50	0.00	0.00
108.00	(16) attachments	3682.38	2343.12	0.00	0.00
110.00		133.58	121.73	0.00	0.00
115.00		329.51	297.95	0.00	0.00
118.00	(17) attachments	4580.84	3250.59	0.00	0.00
	<b>Totals:</b>	<b>16,629.27</b>	<b>20,958.72</b>	<b>0.00</b>	<b>0.00</b>

## Linear Appurtenance Segment Forces (Factored)

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

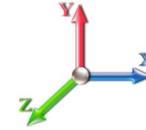


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**Load Case:** 1.2D + 1.6W 97 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60



**Iterations** 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.017	0.000	19.450	0.00	0.96
10.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.017	0.000	19.450	0.00	0.96
15.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.017	0.000	19.450	0.00	0.96
20.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.018	0.000	20.638	0.00	0.96
25.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.018	0.000	21.630	0.00	0.96
30.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.018	0.000	22.477	0.00	0.96
35.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.019	0.000	23.218	0.00	0.96
40.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.019	0.000	23.880	0.00	0.96
40.75	1/2" Coax	Yes	0.75	0.000	0.65	0.04	0.00	0.020	0.000	23.974	0.00	0.14
45.00	1/2" Coax	Yes	4.25	0.000	0.65	0.23	0.00	0.020	0.000	24.479	0.00	0.82
50.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.020	0.000	25.029	0.00	0.96
55.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.020	0.000	25.536	0.00	0.96
60.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.021	0.000	26.008	0.00	0.96
65.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.021	0.000	26.450	0.00	0.96
70.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.022	0.000	26.866	0.00	0.96
75.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.022	0.000	27.259	0.00	0.96
77.25	1/2" Coax	Yes	2.25	0.000	0.65	0.12	0.00	0.023	0.000	27.429	0.00	0.43
78.00	1/2" Coax	Yes	0.75	0.000	0.65	0.04	0.00	0.023	0.000	27.485	0.00	0.14
<b>Totals:</b>											<b>0.0</b>	<b>15.0</b>

## Calculated Forces

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Page:</b> 11
	<b>Struct Class:</b> II	



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

**Iterations** 24

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-20.92	-16.68	0.00	-1484.2	0.00	1484.24	2657.45	1328.73	4204.87	2105.56	0.00	0.000	0.000	0.713
5.00	-19.93	-16.42	0.00	-1400.8	0.00	1400.83	2622.48	1311.24	4068.06	2037.05	0.15	-0.287	0.000	0.695
10.00	-18.96	-16.15	0.00	-1318.7	0.00	1318.74	2586.84	1293.42	3932.41	1969.13	0.61	-0.573	0.000	0.677
15.00	-18.00	-15.88	0.00	-1237.9	0.00	1237.99	2550.53	1275.26	3797.98	1901.81	1.36	-0.859	0.000	0.658
20.00	-17.07	-15.59	0.00	-1158.5	0.00	1158.58	2513.55	1256.78	3664.83	1835.14	2.41	-1.144	0.000	0.638
25.00	-16.15	-15.28	0.00	-1080.6	0.00	1080.63	2475.91	1237.96	3533.03	1769.14	3.76	-1.428	0.000	0.617
30.00	-15.26	-14.95	0.00	-1004.2	0.00	1004.23	2437.60	1218.80	3402.64	1703.85	5.41	-1.710	0.000	0.596
35.00	-14.38	-14.62	0.00	-929.46	0.00	929.46	2398.63	1199.31	3273.71	1639.29	7.35	-1.988	0.000	0.573
40.00	-13.56	-14.24	0.00	-856.38	0.00	856.38	2358.98	1179.49	3146.32	1575.50	9.58	-2.264	0.000	0.549
40.75	-13.41	-14.21	0.00	-845.70	0.00	845.70	2352.98	1176.49	3127.35	1566.00	9.94	-2.306	0.000	0.546
45.00	-12.24	-13.89	0.00	-785.30	0.00	785.30	1755.34	877.67	2332.03	1167.75	12.10	-2.537	0.000	0.680
50.00	-11.54	-13.52	0.00	-715.87	0.00	715.87	1728.64	864.32	2242.86	1123.10	14.89	-2.803	0.000	0.644
55.00	-10.85	-13.16	0.00	-648.26	0.00	648.26	1701.27	850.64	2154.50	1078.85	17.99	-3.110	0.000	0.607
60.00	-10.18	-12.79	0.00	-582.46	0.00	582.46	1673.24	836.62	2067.01	1035.04	21.41	-3.408	0.000	0.569
65.00	-9.53	-12.42	0.00	-518.50	0.00	518.50	1644.54	822.27	1980.47	991.70	25.13	-3.696	0.000	0.529
70.00	-8.89	-12.04	0.00	-456.42	0.00	456.42	1615.17	807.59	1894.92	948.87	29.15	-3.970	0.000	0.487
75.00	-8.29	-11.65	0.00	-396.23	0.00	396.23	1585.14	792.57	1810.44	906.57	33.44	-4.229	0.000	0.443
77.25	-8.03	-11.47	0.00	-370.02	0.00	370.02	1571.40	785.70	1772.79	887.71	35.46	-4.343	0.000	0.422
78.00	-7.83	-11.30	0.00	-361.42	0.00	361.42	1566.79	783.40	1760.29	881.45	36.15	-4.380	0.000	0.415
80.00	-7.46	-11.13	0.00	-338.82	0.00	338.82	1554.43	777.22	1727.08	864.83	38.00	-4.477	0.000	0.397
80.75	-7.31	-11.08	0.00	-330.47	0.00	330.47	1064.66	532.33	1199.95	600.87	38.71	-4.513	0.000	0.557
85.00	-6.90	-10.76	0.00	-283.37	0.00	283.37	1050.00	525.00	1155.69	578.71	42.81	-4.702	0.000	0.497
90.00	-6.43	-10.39	0.00	-229.55	0.00	229.55	1032.12	516.06	1103.96	552.80	47.86	-4.955	0.000	0.422
95.00	-5.98	-10.01	0.00	-177.60	0.00	177.60	1013.59	506.79	1052.64	527.10	53.17	-5.173	0.000	0.343
100.00	-5.56	-9.64	0.00	-127.53	0.00	127.53	994.38	497.19	1001.80	501.65	58.68	-5.352	0.000	0.260
105.00	-5.15	-9.26	0.00	-79.34	0.00	79.34	974.51	487.26	951.51	476.46	64.35	-5.485	0.000	0.172
108.00	-3.16	-5.38	0.00	-51.55	0.00	51.55	962.27	481.13	921.62	461.49	67.82	-5.541	0.000	0.115
110.00	-3.05	-5.23	0.00	-40.79	0.00	40.79	953.97	476.99	901.82	451.58	70.14	-5.568	0.000	0.094
115.00	-2.79	-4.88	0.00	-14.63	0.00	14.63	932.77	466.38	852.80	427.03	75.99	-5.611	0.000	0.037
118.00	0.00	-4.58	0.00	0.00	0.00	0.00	919.72	459.86	823.73	412.48	79.51	-5.619	0.000	0.000

## Wind Loading - Shaft

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	19.450	21.40	293.84	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	19.450	21.40	288.17	0.650	0.000	5.00	16.270	10.58	362.0	0.0	579.3
10.00		1.00	0.85	19.450	21.40	282.49	0.650	0.000	5.00	15.953	10.37	355.0	0.0	567.9
15.00		1.00	0.85	19.450	21.40	276.81	0.650	0.000	5.00	15.635	10.16	347.9	0.0	556.5
20.00		1.00	0.90	20.638	22.70	279.29	0.650	0.000	5.00	15.318	9.96	361.6	0.0	545.1
25.00		1.00	0.95	21.630	23.79	279.94	0.650	0.000	5.00	15.000	9.75	371.2	0.0	533.7
30.00		1.00	0.98	22.477	24.72	279.26	0.650	0.000	5.00	14.683	9.54	377.5	0.0	522.3
35.00		1.00	1.01	23.218	25.54	277.63	0.650	0.000	5.00	14.366	9.34	381.6	0.0	510.9
40.00		1.00	1.04	23.880	26.27	275.26	0.650	0.000	5.00	14.048	9.13	383.8	0.0	499.5
40.75 Bot - Section 2		1.00	1.05	23.974	26.37	274.86	0.650	0.000	0.75	2.080	1.35	57.0	0.0	73.9
45.00 Top - Section 1		1.00	1.07	24.479	26.93	272.33	0.650	0.000	4.25	11.831	7.69	331.3	0.0	751.4
50.00		1.00	1.09	25.029	27.53	273.22	0.650	0.000	5.00	13.625	8.86	390.1	0.0	388.2
55.00		1.00	1.12	25.536	28.09	269.47	0.650	0.000	5.00	13.307	8.65	388.8	0.0	379.1
60.00		1.00	1.14	26.008	28.61	265.38	0.650	0.000	5.00	12.990	8.44	386.5	0.0	370.0
65.00		1.00	1.16	26.450	29.09	261.01	0.650	0.000	5.00	12.673	8.24	383.5	0.0	360.9
70.00		1.00	1.17	26.866	29.55	256.38	0.650	0.000	5.00	12.355	8.03	379.7	0.0	351.8
75.00		1.00	1.19	27.259	29.98	251.53	0.650	0.000	5.00	12.038	7.82	375.4	0.0	342.7
77.25 Bot - Section 3		1.00	1.20	27.429	30.17	249.28	0.650	0.000	2.25	5.313	3.45	166.7	0.0	151.2
78.00 Appurtenance(s)		1.00	1.20	27.485	30.23	248.52	0.650	0.000	0.75	1.781	1.16	56.0	0.0	88.1
80.00		1.00	1.21	27.632	30.39	246.48	0.650	0.000	2.00	4.714	3.06	149.0	0.0	233.2
80.75 Top - Section 2		1.00	1.21	27.686	30.45	245.70	0.650	0.000	0.75	1.754	1.14	55.6	0.0	86.8
85.00		1.00	1.22	27.987	30.79	244.65	0.650	0.000	4.25	9.807	6.37	314.0	0.0	209.8
90.00		1.00	1.24	28.325	31.16	239.27	0.650	0.000	5.00	11.244	7.31	364.4	0.0	240.5
95.00		1.00	1.25	28.650	31.51	233.75	0.650	0.000	5.00	10.927	7.10	358.1	0.0	233.6
100.00		1.00	1.27	28.961	31.86	228.09	0.650	0.000	5.00	10.609	6.90	351.5	0.0	226.8
105.00		1.00	1.28	29.260	32.19	222.30	0.650	0.000	5.00	10.292	6.69	344.5	0.0	220.0
108.00 Appurtenance(s)		1.00	1.29	29.434	32.38	218.77	0.650	0.000	3.00	6.023	3.91	202.8	0.0	128.7
110.00		1.00	1.29	29.548	32.50	216.39	0.650	0.000	2.00	3.952	2.57	133.6	0.0	84.4
115.00		1.00	1.30	29.826	32.81	210.38	0.650	0.000	5.00	9.657	6.28	329.5	0.0	206.3
118.00 Appurtenance(s)		1.00	1.31	29.988	32.99	206.72	0.650	0.000	3.00	5.642	3.67	193.6	0.0	120.5
<b>Totals:</b>								<b>118.00</b>			<b>8,652.1</b>	<b>9,563.0</b>		

## Discrete Appurtenance Forces

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

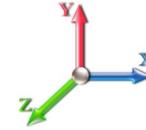


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**Load Case:** 0.9D + 1.6W 97 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60



**Iterations** 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	118.00	Platform w/ Hand Rails	1	29.988	32.986	1.00	1.00	32.00	1440.00	0.000	0.000	1688.91	0.00	0.00
2	118.00	ALU - TD-RRH8x20-25 -	3	29.988	32.986	0.54	0.80	6.51	189.00	0.000	0.000	343.71	0.00	0.00
3	118.00	ALU - 800 MHz - RRU	6	29.988	32.986	0.54	0.80	8.01	286.20	0.000	0.000	422.64	0.00	0.00
4	118.00	ALU - 1900MHz - RRU	3	29.988	32.986	0.54	0.80	6.11	118.80	0.000	0.000	322.50	0.00	0.00
5	118.00	KMW - ETCR-654L12H6	3	29.988	32.986	0.64	0.90	30.12	267.30	0.000	0.000	1589.48	0.00	0.00
6	118.00	6' Lightning rod	1	29.988	32.986	1.00	1.00	0.38	5.85	0.000	0.000	20.06	0.00	0.00
7	108.00	Low Profile Platform	1	29.434	32.377	1.00	1.00	22.00	1350.00	0.000	0.000	1139.68	0.00	0.00
8	108.00	Antel - BXA-70063/6CF	1	29.434	32.377	0.67	0.80	5.09	15.30	0.000	0.000	263.53	0.00	0.00
9	108.00	Antel - LPA 185080/12CF	6	29.434	32.377	0.67	0.80	14.19	56.70	0.000	0.000	735.23	0.00	0.00
10	108.00	Antel - LPA 80080/6CF	6	29.434	32.377	0.68	0.80	17.67	113.40	0.000	0.000	915.18	0.00	0.00
11	108.00	Antel - BXA 70080/6CF	2	29.434	32.377	0.70	0.80	8.22	32.40	0.000	0.000	425.97	0.00	0.00
12	78.00	Pipe Mount	1	27.485	30.233	0.56	0.75	1.48	36.00	0.000	0.000	71.56	0.00	0.00
13	78.00	GPS	1	27.485	30.233	0.80	0.80	0.80	9.00	0.000	0.000	38.70	0.00	0.00
<b>Totals:</b>									<b>3,919.95</b>			<b>7,977.13</b>		

## Total Applied Force Summary

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

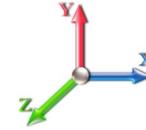


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**Load Case:** 0.9D + 1.6W 97 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60



**Iterations** 24

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		362.03	681.42	0.00	0.00
10.00		354.96	670.03	0.00	0.00
15.00		347.90	658.63	0.00	0.00
20.00		361.64	647.24	0.00	0.00
25.00		371.18	635.85	0.00	0.00
30.00		377.55	624.45	0.00	0.00
35.00		381.57	613.06	0.00	0.00
40.00		383.78	601.66	0.00	0.00
40.75		57.04	89.27	0.00	0.00
45.00		331.31	838.17	0.00	0.00
50.00		390.12	490.36	0.00	0.00
55.00		388.75	481.25	0.00	0.00
60.00		386.49	472.13	0.00	0.00
65.00		383.46	463.02	0.00	0.00
70.00		379.73	453.90	0.00	0.00
75.00		375.39	444.79	0.00	0.00
77.25		166.73	197.18	0.00	0.00
78.00	(2) attachments	166.25	148.41	0.00	0.00
80.00		149.00	273.72	0.00	0.00
80.75		55.57	101.99	0.00	0.00
85.00		313.99	295.97	0.00	0.00
90.00		364.36	341.88	0.00	0.00
95.00		358.13	335.04	0.00	0.00
100.00		351.50	328.21	0.00	0.00
105.00		344.51	321.37	0.00	0.00
108.00	(16) attachments	3682.38	1757.34	0.00	0.00
110.00		133.58	91.30	0.00	0.00
115.00		329.51	223.46	0.00	0.00
118.00	(17) attachments	4580.84	2437.94	0.00	0.00
	<b>Totals:</b>	<b>16,629.27</b>	<b>15,719.04</b>	<b>0.00</b>	<b>0.00</b>

## Linear Appurtenance Segment Forces (Factored)

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

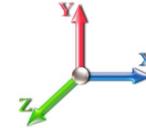


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**Load Case:** 0.9D + 1.6W 97 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60



**Iterations** 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.017	0.000	19.450	0.00	0.72
10.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.017	0.000	19.450	0.00	0.72
15.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.017	0.000	19.450	0.00	0.72
20.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.018	0.000	20.638	0.00	0.72
25.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.018	0.000	21.630	0.00	0.72
30.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.018	0.000	22.477	0.00	0.72
35.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.019	0.000	23.218	0.00	0.72
40.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.019	0.000	23.880	0.00	0.72
40.75	1/2" Coax	Yes	0.75	0.000	0.65	0.04	0.00	0.020	0.000	23.974	0.00	0.11
45.00	1/2" Coax	Yes	4.25	0.000	0.65	0.23	0.00	0.020	0.000	24.479	0.00	0.61
50.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.020	0.000	25.029	0.00	0.72
55.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.020	0.000	25.536	0.00	0.72
60.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.021	0.000	26.008	0.00	0.72
65.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.021	0.000	26.450	0.00	0.72
70.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.022	0.000	26.866	0.00	0.72
75.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.022	0.000	27.259	0.00	0.72
77.25	1/2" Coax	Yes	2.25	0.000	0.65	0.12	0.00	0.023	0.000	27.429	0.00	0.32
78.00	1/2" Coax	Yes	0.75	0.000	0.65	0.04	0.00	0.023	0.000	27.485	0.00	0.11
<b>Totals:</b>											<b>0.0</b>	<b>11.2</b>

## Calculated Forces

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



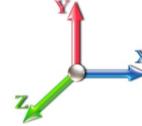
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**Load Case:** 0.9D + 1.6W 97 mph Wind

**Iterations** 24

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-15.68	-16.67	0.00	-1468.5	0.00	1468.54	2657.45	1328.73	4204.87	2105.56	0.00	0.000	0.000	0.704
5.00	-14.92	-16.38	0.00	-1385.2	0.00	1385.20	2622.48	1311.24	4068.06	2037.05	0.15	-0.283	0.000	0.686
10.00	-14.17	-16.09	0.00	-1303.3	0.00	1303.31	2586.84	1293.42	3932.41	1969.13	0.60	-0.567	0.000	0.668
15.00	-13.44	-15.80	0.00	-1222.8	0.00	1222.87	2550.53	1275.26	3797.98	1901.81	1.34	-0.849	0.000	0.648
20.00	-12.72	-15.49	0.00	-1143.8	0.00	1143.87	2513.55	1256.78	3664.83	1835.14	2.39	-1.131	0.000	0.629
25.00	-12.02	-15.16	0.00	-1066.4	0.00	1066.43	2475.91	1237.96	3533.03	1769.14	3.72	-1.411	0.000	0.608
30.00	-11.33	-14.82	0.00	-990.62	0.00	990.62	2437.60	1218.80	3402.64	1703.85	5.35	-1.689	0.000	0.586
35.00	-10.66	-14.47	0.00	-916.51	0.00	916.51	2398.63	1199.31	3273.71	1639.29	7.26	-1.964	0.000	0.564
40.00	-10.04	-14.09	0.00	-844.14	0.00	844.14	2358.98	1179.49	3146.32	1575.50	9.46	-2.235	0.000	0.540
40.75	-9.92	-14.06	0.00	-833.57	0.00	833.57	2352.98	1176.49	3127.35	1566.00	9.82	-2.277	0.000	0.537
45.00	-9.04	-13.73	0.00	-773.83	0.00	773.83	1755.34	877.67	2332.03	1167.75	11.95	-2.505	0.000	0.668
50.00	-8.50	-13.36	0.00	-705.18	0.00	705.18	1728.64	864.32	2242.86	1123.10	14.71	-2.767	0.000	0.633
55.00	-7.97	-12.99	0.00	-638.38	0.00	638.38	1701.27	850.64	2154.50	1078.85	17.77	-3.069	0.000	0.597
60.00	-7.46	-12.61	0.00	-573.43	0.00	573.43	1673.24	836.62	2067.01	1035.04	21.14	-3.363	0.000	0.559
65.00	-6.96	-12.24	0.00	-510.36	0.00	510.36	1644.54	822.27	1980.47	991.70	24.81	-3.646	0.000	0.519
70.00	-6.48	-11.86	0.00	-449.17	0.00	449.17	1615.17	807.59	1894.92	948.87	28.78	-3.915	0.000	0.478
75.00	-6.02	-11.47	0.00	-389.88	0.00	389.88	1585.14	792.57	1810.44	906.57	33.01	-4.170	0.000	0.434
77.25	-5.83	-11.30	0.00	-364.07	0.00	364.07	1571.40	785.70	1772.79	887.71	35.00	-4.282	0.000	0.414
78.00	-5.68	-11.13	0.00	-355.60	0.00	355.60	1566.79	783.40	1760.29	881.45	35.68	-4.319	0.000	0.407
80.00	-5.40	-10.96	0.00	-333.35	0.00	333.35	1554.43	777.22	1727.08	864.83	37.51	-4.414	0.000	0.389
80.75	-5.28	-10.91	0.00	-325.12	0.00	325.12	1064.66	532.33	1199.95	600.87	38.20	-4.450	0.000	0.546
85.00	-4.97	-10.59	0.00	-278.75	0.00	278.75	1050.00	525.00	1155.69	578.71	42.24	-4.635	0.000	0.487
90.00	-4.62	-10.22	0.00	-225.78	0.00	225.78	1032.12	516.06	1103.96	552.80	47.23	-4.884	0.000	0.413
95.00	-4.29	-9.85	0.00	-174.67	0.00	174.67	1013.59	506.79	1052.64	527.10	52.46	-5.100	0.000	0.336
100.00	-3.96	-9.48	0.00	-125.42	0.00	125.42	994.38	497.19	1001.80	501.65	57.89	-5.276	0.000	0.254
105.00	-3.66	-9.11	0.00	-78.01	0.00	78.01	974.51	487.26	951.51	476.46	63.48	-5.406	0.000	0.168
108.00	-2.26	-5.28	0.00	-50.67	0.00	50.67	962.27	481.13	921.62	461.49	66.90	-5.461	0.000	0.112
110.00	-2.18	-5.14	0.00	-40.10	0.00	40.10	953.97	476.99	901.82	451.58	69.19	-5.488	0.000	0.091
115.00	-1.98	-4.79	0.00	-14.38	0.00	14.38	932.77	466.38	852.80	427.03	74.95	-5.530	0.000	0.036
118.00	0.00	-4.58	0.00	0.00	0.00	0.00	919.72	459.86	823.73	412.48	78.43	-5.537	0.000	0.000

## Wind Loading - Shaft

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

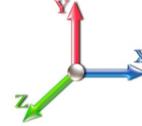


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**Load Case:** 1.2D + 1.0Di + 1.0Wi 50 mph Wind

**Iterations** 23

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



Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	5.168	5.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	5.168	5.68	0.00	1.200	1.242	5.00	17.305	20.77	118.1	305.9	1078.3
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.331	5.00	17.062	20.47	116.4	322.3	1079.5
15.00		1.00	0.85	5.168	5.68	0.00	1.200	1.386	5.00	16.790	20.15	114.5	329.6	1071.6
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.427	5.00	16.507	19.81	119.5	332.9	1059.7
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.459	5.00	16.216	19.46	123.0	333.8	1045.5
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.486	5.00	15.921	19.11	125.5	333.3	1029.7
35.00		1.00	1.01	6.169	6.79	0.00	1.200	1.509	5.00	15.623	18.75	127.2	331.5	1012.8
40.00		1.00	1.04	6.345	6.98	0.00	1.200	1.529	5.00	15.322	18.39	128.3	329.0	995.1
40.75 Bot - Section 2		1.00	1.05	6.370	7.01	0.00	1.200	1.532	0.75	2.271	2.73	19.1	49.3	147.9
45.00 Top - Section 1		1.00	1.07	6.504	7.15	0.00	1.200	1.547	4.25	12.927	15.51	111.0	281.1	1282.9
50.00		1.00	1.09	6.650	7.32	0.00	1.200	1.564	5.00	14.928	17.91	131.0	327.0	844.6
55.00		1.00	1.12	6.785	7.46	0.00	1.200	1.579	5.00	14.623	17.55	131.0	322.8	828.3
60.00		1.00	1.14	6.910	7.60	0.00	1.200	1.592	5.00	14.317	17.18	130.6	318.3	811.6
65.00		1.00	1.16	7.028	7.73	0.00	1.200	1.605	5.00	14.010	16.81	130.0	313.4	794.6
70.00		1.00	1.17	7.138	7.85	0.00	1.200	1.617	5.00	13.703	16.44	129.1	308.3	777.3
75.00		1.00	1.19	7.243	7.97	0.00	1.200	1.628	5.00	13.395	16.07	128.1	302.9	759.7
77.25 Bot - Section 3		1.00	1.20	7.288	8.02	0.00	1.200	1.633	2.25	5.926	7.11	57.0	135.2	336.8
78.00 Appurtenance(s)		1.00	1.20	7.303	8.03	0.00	1.200	1.635	0.75	1.985	2.38	19.1	45.5	163.0
80.00		1.00	1.21	7.342	8.08	0.00	1.200	1.639	2.00	5.260	6.31	51.0	120.4	431.3
80.75 Top - Section 2		1.00	1.21	7.356	8.09	0.00	1.200	1.640	0.75	1.960	2.35	19.0	45.0	160.7
85.00		1.00	1.22	7.436	8.18	0.00	1.200	1.649	4.25	10.975	13.17	107.7	251.0	530.7
90.00		1.00	1.24	7.526	8.28	0.00	1.200	1.658	5.00	12.626	15.15	125.4	289.3	609.9
95.00		1.00	1.25	7.612	8.37	0.00	1.200	1.667	5.00	12.316	14.78	123.8	283.1	594.6
100.00		1.00	1.27	7.695	8.46	0.00	1.200	1.676	5.00	12.006	14.41	121.9	276.7	579.1
105.00		1.00	1.28	7.774	8.55	0.00	1.200	1.684	5.00	11.695	14.03	120.0	270.3	563.5
108.00 Appurtenance(s)		1.00	1.29	7.821	8.60	0.00	1.200	1.689	3.00	6.867	8.24	70.9	159.8	331.4
110.00		1.00	1.29	7.851	8.64	0.00	1.200	1.692	2.00	4.516	5.42	46.8	105.5	218.0
115.00		1.00	1.30	7.925	8.72	0.00	1.200	1.699	5.00	11.073	13.29	115.8	256.9	532.0
118.00 Appurtenance(s)		1.00	1.31	7.968	8.76	0.00	1.200	1.704	3.00	6.494	7.79	68.3	151.7	312.3
<b>Totals:</b>								<b>118.00</b>				<b>2,929.2</b>		<b>19,982.4</b>

## Discrete Appurtenance Forces

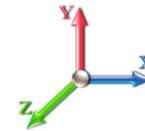
<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 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	118.00	Platform w/ Hand Rails	1	7.968	8.765	1.00	1.00	59.26	3370.06	0.000	0.000	519.40	0.00	0.00
2	118.00	ALU - TD-RRH8x20-25 -	3	7.968	8.765	0.55	0.80	8.02	573.93	0.000	0.000	70.28	0.00	0.00
3	118.00	ALU - 800 MHz - RRU	6	7.968	8.765	0.55	0.80	11.95	688.24	0.000	0.000	104.69	0.00	0.00
4	118.00	ALU - 1900MHz - RRU	3	7.968	8.765	0.55	0.80	8.54	384.53	0.000	0.000	74.85	0.00	0.00
5	118.00	KMW - ETCR-654L12H6	3	7.968	8.765	0.65	0.90	33.72	1298.63	0.000	0.000	295.58	0.00	0.00
6	118.00	6' Lightning rod	1	7.968	8.765	1.00	1.00	1.44	37.94	0.000	0.000	12.64	0.00	0.00
7	108.00	Low Profile Platform	1	7.821	8.603	1.00	1.00	39.09	2766.61	0.000	0.000	336.29	0.00	0.00
8	108.00	Antel - BXA-70063/6CF	1	7.821	8.603	0.68	0.80	6.97	116.93	0.000	0.000	59.93	0.00	0.00
9	108.00	Antel - LPA 185080/12CF	6	7.821	8.603	0.68	0.80	18.89	745.84	0.000	0.000	162.49	0.00	0.00
10	108.00	Antel - LPA 80080/6CF	6	7.821	8.603	0.69	0.80	22.57	1275.89	0.000	0.000	194.19	0.00	0.00
11	108.00	Antel - BXA 70080/6CF	2	7.821	8.603	0.71	0.80	11.60	214.92	0.000	0.000	99.81	0.00	0.00
12	78.00	Pipe Mount	1	7.303	8.033	0.56	0.75	4.62	100.20	0.000	0.000	37.15	0.00	0.00
13	78.00	GPS	1	7.303	8.033	0.80	0.80	1.33	31.46	0.000	0.000	10.71	0.00	0.00
<b>Totals:</b>								<b>11,605.18</b>				<b>1,978.02</b>		

## Total Applied Force Summary

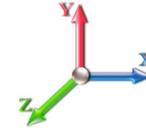
<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 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		118.05	1227.21	0.00	0.00
10.00		116.39	1230.08	0.00	0.00
15.00		114.54	1223.23	0.00	0.00
20.00		119.48	1212.11	0.00	0.00
25.00		123.02	1198.51	0.00	0.00
30.00		125.51	1183.27	0.00	0.00
35.00		127.22	1166.86	0.00	0.00
40.00		128.33	1149.55	0.00	0.00
40.75		19.10	171.07	0.00	0.00
45.00		110.98	1414.51	0.00	0.00
50.00		131.04	999.84	0.00	0.00
55.00		130.97	983.87	0.00	0.00
60.00		130.60	967.49	0.00	0.00
65.00		129.97	950.76	0.00	0.00
70.00		129.12	933.72	0.00	0.00
75.00		128.06	916.40	0.00	0.00
77.25		57.01	407.34	0.00	0.00
78.00	(2) attachments	66.99	318.14	0.00	0.00
80.00		50.97	485.40	0.00	0.00
80.75		19.03	181.02	0.00	0.00
85.00		107.73	645.60	0.00	0.00
90.00		125.44	745.09	0.00	0.00
95.00		123.76	729.80	0.00	0.00
100.00		121.95	714.35	0.00	0.00
105.00		120.02	698.76	0.00	0.00
108.00	(16) attachments	923.61	5532.70	0.00	0.00
110.00		46.80	227.19	0.00	0.00
115.00		115.84	554.86	0.00	0.00
118.00	(17) attachments	1145.75	6679.41	0.00	0.00
	<b>Totals:</b>	<b>4,907.26</b>	<b>34,848.15</b>	<b>0.00</b>	<b>0.00</b>

## Linear Appurtenance Segment Forces (Factored)

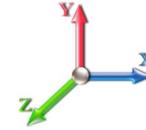
<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 23

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1/2" Coax	Yes	5.00	0.000	0.65	1.31	0.00	0.017	0.000	5.168	0.00	13.70
10.00	1/2" Coax	Yes	5.00	0.000	0.65	1.38	0.00	0.017	0.000	5.168	0.00	15.33
15.00	1/2" Coax	Yes	5.00	0.000	0.65	1.43	0.00	0.017	0.000	5.168	0.00	16.38
20.00	1/2" Coax	Yes	5.00	0.000	0.65	1.46	0.00	0.018	0.000	5.483	0.00	17.18
25.00	1/2" Coax	Yes	5.00	0.000	0.65	1.49	0.00	0.018	0.000	5.747	0.00	17.83
30.00	1/2" Coax	Yes	5.00	0.000	0.65	1.51	0.00	0.018	0.000	5.972	0.00	18.38
35.00	1/2" Coax	Yes	5.00	0.000	0.65	1.53	0.00	0.019	0.000	6.169	0.00	18.86
40.00	1/2" Coax	Yes	5.00	0.000	0.65	1.55	0.00	0.019	0.000	6.345	0.00	19.29
40.75	1/2" Coax	Yes	0.75	0.000	0.65	0.23	0.00	0.020	0.000	6.370	0.00	2.90
45.00	1/2" Coax	Yes	4.25	0.000	0.65	1.33	0.00	0.020	0.000	6.504	0.00	16.72
50.00	1/2" Coax	Yes	5.00	0.000	0.65	1.57	0.00	0.020	0.000	6.650	0.00	20.02
55.00	1/2" Coax	Yes	5.00	0.000	0.65	1.59	0.00	0.020	0.000	6.785	0.00	20.35
60.00	1/2" Coax	Yes	5.00	0.000	0.65	1.60	0.00	0.021	0.000	6.910	0.00	20.65
65.00	1/2" Coax	Yes	5.00	0.000	0.65	1.61	0.00	0.021	0.000	7.028	0.00	20.93
70.00	1/2" Coax	Yes	5.00	0.000	0.65	1.62	0.00	0.022	0.000	7.138	0.00	21.20
75.00	1/2" Coax	Yes	5.00	0.000	0.65	1.63	0.00	0.022	0.000	7.243	0.00	21.45
77.25	1/2" Coax	Yes	2.25	0.000	0.65	0.73	0.00	0.023	0.000	7.288	0.00	9.70
78.00	1/2" Coax	Yes	0.75	0.000	0.65	0.24	0.00	0.023	0.000	7.303	0.00	3.24
<b>Totals:</b>											<b>0.0</b>	<b>294.1</b>

## Calculated Forces

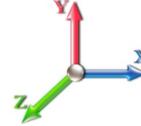
<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Page:</b> 21
	<b>Struct Class:</b> II	



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

**Iterations** 23

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



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-34.84	-4.93	0.00	-436.17	0.00	436.17	2657.45	1328.73	4204.87	2105.56	0.00	0.000	0.000	0.220
5.00	-33.61	-4.86	0.00	-411.51	0.00	411.51	2622.48	1311.24	4068.06	2037.05	0.05	-0.084	0.000	0.215
10.00	-32.37	-4.79	0.00	-387.20	0.00	387.20	2586.84	1293.42	3932.41	1969.13	0.18	-0.168	0.000	0.209
15.00	-31.14	-4.72	0.00	-363.24	0.00	363.24	2550.53	1275.26	3797.98	1901.81	0.40	-0.252	0.000	0.203
20.00	-29.93	-4.64	0.00	-339.65	0.00	339.65	2513.55	1256.78	3664.83	1835.14	0.71	-0.336	0.000	0.197
25.00	-28.72	-4.55	0.00	-316.47	0.00	316.47	2475.91	1237.96	3533.03	1769.14	1.10	-0.419	0.000	0.190
30.00	-27.53	-4.45	0.00	-293.74	0.00	293.74	2437.60	1218.80	3402.64	1703.85	1.59	-0.502	0.000	0.184
35.00	-26.36	-4.35	0.00	-271.49	0.00	271.49	2398.63	1199.31	3273.71	1639.29	2.16	-0.583	0.000	0.177
40.00	-25.21	-4.23	0.00	-249.74	0.00	249.74	2358.98	1179.49	3146.32	1575.50	2.81	-0.663	0.000	0.169
40.75	-25.04	-4.23	0.00	-246.57	0.00	246.57	2352.98	1176.49	3127.35	1566.00	2.92	-0.676	0.000	0.168
45.00	-23.62	-4.13	0.00	-228.61	0.00	228.61	1755.34	877.67	2332.03	1167.75	3.55	-0.743	0.000	0.209
50.00	-22.61	-4.02	0.00	-207.98	0.00	207.98	1728.64	864.32	2242.86	1123.10	4.37	-0.820	0.000	0.198
55.00	-21.63	-3.90	0.00	-187.90	0.00	187.90	1701.27	850.64	2154.50	1078.85	5.28	-0.910	0.000	0.187
60.00	-20.66	-3.79	0.00	-168.39	0.00	168.39	1673.24	836.62	2067.01	1035.04	6.27	-0.996	0.000	0.175
65.00	-19.70	-3.67	0.00	-149.46	0.00	149.46	1644.54	822.27	1980.47	991.70	7.36	-1.079	0.000	0.163
70.00	-18.77	-3.54	0.00	-131.12	0.00	131.12	1615.17	807.59	1894.92	948.87	8.53	-1.158	0.000	0.150
75.00	-17.85	-3.41	0.00	-113.40	0.00	113.40	1585.14	792.57	1810.44	906.57	9.79	-1.232	0.000	0.136
77.25	-17.44	-3.35	0.00	-105.72	0.00	105.72	1571.40	785.70	1772.79	887.71	10.38	-1.264	0.000	0.130
78.00	-17.12	-3.29	0.00	-103.20	0.00	103.20	1566.79	783.40	1760.29	881.45	10.57	-1.275	0.000	0.128
80.00	-16.64	-3.23	0.00	-96.63	0.00	96.63	1554.43	777.22	1727.08	864.83	11.12	-1.303	0.000	0.122
80.75	-16.46	-3.22	0.00	-94.21	0.00	94.21	1064.66	532.33	1199.95	600.87	11.32	-1.313	0.000	0.172
85.00	-15.81	-3.11	0.00	-80.54	0.00	80.54	1050.00	525.00	1155.69	578.71	12.51	-1.367	0.000	0.154
90.00	-15.07	-2.99	0.00	-64.98	0.00	64.98	1032.12	516.06	1103.96	552.80	13.99	-1.439	0.000	0.132
95.00	-14.34	-2.86	0.00	-50.06	0.00	50.06	1013.59	506.79	1052.64	527.10	15.53	-1.500	0.000	0.109
100.00	-13.62	-2.73	0.00	-35.77	0.00	35.77	994.38	497.19	1001.80	501.65	17.13	-1.551	0.000	0.085
105.00	-12.93	-2.59	0.00	-22.14	0.00	22.14	974.51	487.26	951.51	476.46	18.77	-1.588	0.000	0.060
108.00	-7.42	-1.52	0.00	-14.36	0.00	14.36	962.27	481.13	921.62	461.49	19.77	-1.603	0.000	0.039
110.00	-7.20	-1.47	0.00	-11.33	0.00	11.33	953.97	476.99	901.82	451.58	20.45	-1.611	0.000	0.033
115.00	-6.64	-1.33	0.00	-4.00	0.00	4.00	932.77	466.38	852.80	427.03	22.14	-1.623	0.000	0.017
118.00	0.00	-1.15	0.00	0.00	0.00	0.00	919.72	459.86	823.73	412.48	23.16	-1.625	0.000	0.000

## Seismic Segment Forces (Factored)

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Load Case: 1.2D + 1.0E</b>						<b>Iterations</b> 22
<b>Gust Response Factor</b>	1.10			<b>Sds</b>	0.18	<b>Ss</b> 0.17
<b>Dead Load Factor</b>	1.20	<b>Seismic Load Factor</b>	1.00	<b>Sd1</b>	0.10	<b>S1</b> 0.07
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.42	<b>SA</b>	0.04	<b>Seismic Importance Factor</b> 1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		643.65	0.00	0.04	0.02	11.19	
10.00		630.99	0.01	0.06	0.03	15.54	
15.00		618.33	0.03	0.07	0.04	17.20	
20.00		605.67	0.05	0.07	0.04	17.82	
25.00		593.02	0.08	0.07	0.04	18.11	
30.00		580.36	0.12	0.07	0.03	18.31	
35.00		567.70	0.17	0.07	0.03	18.35	
40.00		555.04	0.22	0.06	0.02	17.94	
40.75	Bot - Section 2	82.16	0.23	0.06	0.02	2.65	
45.00	Top - Section 1	834.84	0.27	0.05	0.01	25.60	
50.00		431.37	0.34	0.04	0.01	11.37	
55.00		421.24	0.41	0.01	0.01	7.81	
60.00		411.11	0.49	-0.01	0.01	3.03	
65.00		400.98	0.57	-0.04	0.01	-2.22	
70.00		390.85	0.67	-0.08	0.02	-6.70	
75.00		380.73	0.76	-0.10	0.04	-9.25	
77.25	Bot - Section 3	168.02	0.81	-0.11	0.06	-4.27	
78.00	Appurtenance(s)	147.88	0.83	-0.12	0.06	-3.77	
80.00		259.06	0.87	-0.12	0.08	-6.42	
80.75	Top - Section 2	96.42	0.89	-0.12	0.08	-2.33	
85.00		233.08	0.98	-0.11	0.12	-4.10	
90.00		267.19	1.10	-0.07	0.19	-0.65	
95.00		259.59	1.23	0.03	0.27	5.40	
100.00		252.00	1.36	0.21	0.39	13.15	
105.00		244.40	1.50	0.49	0.54	22.43	
108.00	Appurtenance(s)	1884.9	1.58	0.73	0.65	225.40	
110.00		93.81	1.64	0.92	0.73	13.11	
115.00		229.21	1.80	1.52	0.97	45.01	
118.00	Appurtenance(s)	2697.3	1.89	1.98	1.14	632.62	
<b>Totals:</b>		<b>14,981.1</b>				<b>1,102.3</b>	<b>Total Wind: 16,629.3</b>

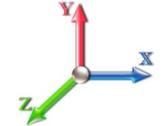
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

## Calculated Forces

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Load Case:</b> 1.2D + 1.0E							<b>Iterations</b> 22
<b>Gust Response Factor</b>	1.10			<b>Sds</b>	0.18	<b>Ss</b>	0.17
<b>Dead Load Factor</b>	1.20	<b>Seismic Load Factor</b>	1.00	<b>Sd1</b>	0.10	<b>S1</b>	0.07
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.42	<b>SA</b>	0.04	<b>Seismic Importance Factor</b>	1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-20.96	-1.15	0.00	-120.72	0.00	120.72	2657.45	1328.73	4204.87	2105.56	0.00	0.00	0.00	0.065
5.00	-20.05	-1.14	0.00	-114.99	0.00	114.99	2622.48	1311.24	4068.06	2037.05	0.01	-0.02	0.064	
10.00	-19.16	-1.13	0.00	-109.27	0.00	109.27	2586.84	1293.42	3932.41	1969.13	0.05	-0.05	0.063	
15.00	-18.28	-1.12	0.00	-103.60	0.00	103.60	2550.53	1275.26	3797.98	1901.81	0.11	-0.07	0.062	
20.00	-17.41	-1.11	0.00	-97.98	0.00	97.98	2513.55	1256.78	3664.83	1835.14	0.20	-0.09	0.060	
25.00	-16.57	-1.10	0.00	-92.42	0.00	92.42	2475.91	1237.96	3533.03	1769.14	0.31	-0.12	0.059	
30.00	-15.73	-1.09	0.00	-86.92	0.00	86.92	2437.60	1218.80	3402.64	1703.85	0.45	-0.14	0.057	
35.00	-14.91	-1.07	0.00	-81.49	0.00	81.49	2398.63	1199.31	3273.71	1639.29	0.61	-0.17	0.056	
40.00	-14.11	-1.05	0.00	-76.14	0.00	76.14	2358.98	1179.49	3146.32	1575.50	0.80	-0.19	0.054	
40.75	-13.99	-1.05	0.00	-75.34	0.00	75.34	2352.98	1176.49	3127.35	1566.00	0.83	-0.20	0.054	
45.00	-12.88	-1.03	0.00	-70.86	0.00	70.86	1755.34	877.67	2332.03	1167.75	1.01	-0.22	0.068	
50.00	-12.22	-1.02	0.00	-65.71	0.00	65.71	1728.64	864.32	2242.86	1123.10	1.25	-0.24	0.066	
55.00	-11.58	-1.02	0.00	-60.60	0.00	60.60	1701.27	850.64	2154.50	1078.85	1.52	-0.27	0.063	
60.00	-10.95	-1.02	0.00	-55.52	0.00	55.52	1673.24	836.62	2067.01	1035.04	1.82	-0.30	0.060	
65.00	-10.33	-1.02	0.00	-50.44	0.00	50.44	1644.54	822.27	1980.47	991.70	2.14	-0.32	0.057	
70.00	-9.73	-1.02	0.00	-45.35	0.00	45.35	1615.17	807.59	1894.92	948.87	2.50	-0.35	0.054	
75.00	-9.13	-1.02	0.00	-40.26	0.00	40.26	1585.14	792.57	1810.44	906.57	2.88	-0.38	0.050	
77.25	-8.87	-1.02	0.00	-37.97	0.00	37.97	1571.40	785.70	1772.79	887.71	3.06	-0.39	0.048	
78.00	-8.67	-1.02	0.00	-37.20	0.00	37.20	1566.79	783.40	1760.29	881.45	3.12	-0.39	0.048	
80.00	-8.31	-1.02	0.00	-35.17	0.00	35.17	1554.43	777.22	1727.08	864.83	3.29	-0.40	0.046	
80.75	-8.17	-1.02	0.00	-34.41	0.00	34.41	1064.66	532.33	1199.95	600.87	3.35	-0.41	0.065	
85.00	-7.77	-1.02	0.00	-30.09	0.00	30.09	1050.00	525.00	1155.69	578.71	3.72	-0.43	0.059	
90.00	-7.32	-1.02	0.00	-25.01	0.00	25.01	1032.12	516.06	1103.96	552.80	4.19	-0.45	0.052	
95.00	-6.87	-1.01	0.00	-19.93	0.00	19.93	1013.59	506.79	1052.64	527.10	4.67	-0.48	0.045	
100.00	-6.43	-1.00	0.00	-14.87	0.00	14.87	994.38	497.19	1001.80	501.65	5.19	-0.50	0.036	
105.00	-6.00	-0.97	0.00	-9.90	0.00	9.90	974.51	487.26	951.51	476.46	5.72	-0.51	0.027	
108.00	-3.66	-0.72	0.00	-6.99	0.00	6.99	962.27	481.13	921.62	461.49	6.04	-0.52	0.019	
110.00	-3.54	-0.71	0.00	-5.54	0.00	5.54	953.97	476.99	901.82	451.58	6.26	-0.53	0.016	
115.00	-3.24	-0.66	0.00	-1.99	0.00	1.99	932.77	466.38	852.80	427.03	6.82	-0.53	0.008	
118.00	0.00	-0.63	0.00	0.00	0.00	0.00	919.72	459.86	823.73	412.48	7.15	-0.53	0.000	

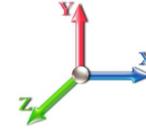
## Seismic Segment Forces (Factored)

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Load Case:</b> 0.9D + 1.0E					<b>Iterations</b> 22
<b>Gust Response Factor</b>	1.10	<b>Sds</b>	0.18	<b>Ss</b>	0.17
<b>Dead Load Factor</b>	0.90	<b>Seismic Load Factor</b>	1.00	<b>Sd1</b>	0.10
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.42	<b>SA</b>	0.04
					<b>Seismic Importance Factor</b> 1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		643.65	0.00	0.04	0.02	11.19	
10.00		630.99	0.01	0.06	0.03	15.54	
15.00		618.33	0.03	0.07	0.04	17.20	
20.00		605.67	0.05	0.07	0.04	17.82	
25.00		593.02	0.08	0.07	0.04	18.11	
30.00		580.36	0.12	0.07	0.03	18.31	
35.00		567.70	0.17	0.07	0.03	18.35	
40.00		555.04	0.22	0.06	0.02	17.94	
40.75	Bot - Section 2	82.16	0.23	0.06	0.02	2.65	
45.00	Top - Section 1	834.84	0.27	0.05	0.01	25.60	
50.00		431.37	0.34	0.04	0.01	11.37	
55.00		421.24	0.41	0.01	0.01	7.81	
60.00		411.11	0.49	-0.01	0.01	3.03	
65.00		400.98	0.57	-0.04	0.01	-2.22	
70.00		390.85	0.67	-0.08	0.02	-6.70	
75.00		380.73	0.76	-0.10	0.04	-9.25	
77.25	Bot - Section 3	168.02	0.81	-0.11	0.06	-4.27	
78.00	Appurtenance(s)	147.88	0.83	-0.12	0.06	-3.77	
80.00		259.06	0.87	-0.12	0.08	-6.42	
80.75	Top - Section 2	96.42	0.89	-0.12	0.08	-2.33	
85.00		233.08	0.98	-0.11	0.12	-4.10	
90.00		267.19	1.10	-0.07	0.19	-0.65	
95.00		259.59	1.23	0.03	0.27	5.40	
100.00		252.00	1.36	0.21	0.39	13.15	
105.00		244.40	1.50	0.49	0.54	22.43	
108.00	Appurtenance(s)	1884.9	1.58	0.73	0.65	225.40	
110.00		93.81	1.64	0.92	0.73	13.11	
115.00		229.21	1.80	1.52	0.97	45.01	
118.00	Appurtenance(s)	2697.3	1.89	1.98	1.14	632.62	
<b>Totals:</b>		<b>14,981.1</b>				<b>1,102.3</b>	<b>Total Wind: 16,629.3</b>

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

## Calculated Forces

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Load Case: 0.9D + 1.0E</b>							<b>Iterations</b> 22
<b>Gust Response Factor</b>	1.10			<b>Sds</b>	0.18		<b>Ss</b> 0.17
<b>Dead Load Factor</b>	0.90	<b>Seismic Load Factor</b>	1.00	<b>Sd1</b>	0.10		<b>S1</b> 0.07
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.42	<b>SA</b>	0.04	<b>Seismic Importance Factor</b>	1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-15.72	-1.14	0.00	-119.33	0.00	119.33	2657.45	1328.73	4204.87	2105.56	0.00	0.00	0.00	0.063
5.00	-15.04	-1.14	0.00	-113.60	0.00	113.60	2622.48	1311.24	4068.06	2037.05	0.01	-0.02	0.062	
10.00	-14.37	-1.13	0.00	-107.91	0.00	107.91	2586.84	1293.42	3932.41	1969.13	0.05	-0.05	0.060	
15.00	-13.71	-1.12	0.00	-102.26	0.00	102.26	2550.53	1275.26	3797.98	1901.81	0.11	-0.07	0.059	
20.00	-13.06	-1.10	0.00	-96.67	0.00	96.67	2513.55	1256.78	3664.83	1835.14	0.20	-0.09	0.058	
25.00	-12.42	-1.09	0.00	-91.15	0.00	91.15	2475.91	1237.96	3533.03	1769.14	0.31	-0.12	0.057	
30.00	-11.80	-1.07	0.00	-85.71	0.00	85.71	2437.60	1218.80	3402.64	1703.85	0.44	-0.14	0.055	
35.00	-11.19	-1.06	0.00	-80.33	0.00	80.33	2398.63	1199.31	3273.71	1639.29	0.60	-0.17	0.054	
40.00	-10.58	-1.04	0.00	-75.03	0.00	75.03	2358.98	1179.49	3146.32	1575.50	0.79	-0.19	0.052	
40.75	-10.49	-1.04	0.00	-74.25	0.00	74.25	2352.98	1176.49	3127.35	1566.00	0.82	-0.19	0.052	
45.00	-9.66	-1.02	0.00	-69.83	0.00	69.83	1755.34	877.67	2332.03	1167.75	1.00	-0.21	0.065	
50.00	-9.16	-1.01	0.00	-64.74	0.00	64.74	1728.64	864.32	2242.86	1123.10	1.24	-0.24	0.063	
55.00	-8.68	-1.00	0.00	-59.70	0.00	59.70	1701.27	850.64	2154.50	1078.85	1.50	-0.27	0.060	
60.00	-8.21	-1.00	0.00	-54.69	0.00	54.69	1673.24	836.62	2067.01	1035.04	1.79	-0.29	0.058	
65.00	-7.75	-1.00	0.00	-49.69	0.00	49.69	1644.54	822.27	1980.47	991.70	2.11	-0.32	0.055	
70.00	-7.29	-1.00	0.00	-44.68	0.00	44.68	1615.17	807.59	1894.92	948.87	2.46	-0.35	0.052	
75.00	-6.85	-1.00	0.00	-39.67	0.00	39.67	1585.14	792.57	1810.44	906.57	2.84	-0.37	0.048	
77.25	-6.65	-1.00	0.00	-37.42	0.00	37.42	1571.40	785.70	1772.79	887.71	3.02	-0.38	0.046	
78.00	-6.50	-1.00	0.00	-36.66	0.00	36.66	1566.79	783.40	1760.29	881.45	3.08	-0.39	0.046	
80.00	-6.23	-1.00	0.00	-34.66	0.00	34.66	1554.43	777.22	1727.08	864.83	3.24	-0.40	0.044	
80.75	-6.13	-1.00	0.00	-33.91	0.00	33.91	1064.66	532.33	1199.95	600.87	3.31	-0.40	0.062	
85.00	-5.83	-1.00	0.00	-29.66	0.00	29.66	1050.00	525.00	1155.69	578.71	3.67	-0.42	0.057	
90.00	-5.49	-1.00	0.00	-24.65	0.00	24.65	1032.12	516.06	1103.96	552.80	4.13	-0.45	0.050	
95.00	-5.15	-0.99	0.00	-19.65	0.00	19.65	1013.59	506.79	1052.64	527.10	4.61	-0.47	0.042	
100.00	-4.82	-0.98	0.00	-14.67	0.00	14.67	994.38	497.19	1001.80	501.65	5.11	-0.49	0.034	
105.00	-4.50	-0.96	0.00	-9.77	0.00	9.77	974.51	487.26	951.51	476.46	5.64	-0.51	0.025	
108.00	-2.75	-0.72	0.00	-6.90	0.00	6.90	962.27	481.13	921.62	461.49	5.96	-0.51	0.018	
110.00	-2.66	-0.70	0.00	-5.47	0.00	5.47	953.97	476.99	901.82	451.58	6.18	-0.52	0.015	
115.00	-2.43	-0.65	0.00	-1.96	0.00	1.96	932.77	466.38	852.80	427.03	6.72	-0.52	0.007	
118.00	0.00	-0.63	0.00	0.00	0.00	0.00	919.72	459.86	823.73	412.48	7.05	-0.52	0.000	

## Wind Loading - Shaft

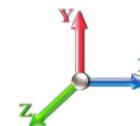
<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 23

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	7.442	8.19	181.76	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	178.25	0.650	0.000	5.00	16.270	10.58	86.6	0.0	643.7
10.00		1.00	0.85	7.442	8.19	174.74	0.650	0.000	5.00	15.953	10.37	84.9	0.0	631.0
15.00		1.00	0.85	7.442	8.19	171.22	0.650	0.000	5.00	15.635	10.16	83.2	0.0	618.3
20.00		1.00	0.90	7.896	8.69	172.76	0.650	0.000	5.00	15.318	9.96	86.5	0.0	605.7
25.00		1.00	0.95	8.276	9.10	173.16	0.650	0.000	5.00	15.000	9.75	88.8	0.0	593.0
30.00		1.00	0.98	8.600	9.46	172.74	0.650	0.000	5.00	14.683	9.54	90.3	0.0	580.4
35.00		1.00	1.01	8.883	9.77	171.73	0.650	0.000	5.00	14.366	9.34	91.2	0.0	567.7
40.00		1.00	1.04	9.137	10.05	170.27	0.650	0.000	5.00	14.048	9.13	91.8	0.0	555.0
40.75 Bot - Section 2		1.00	1.05	9.173	10.09	170.02	0.650	0.000	0.75	2.080	1.35	13.6	0.0	82.2
45.00 Top - Section 1		1.00	1.07	9.366	10.30	168.45	0.650	0.000	4.25	11.831	7.69	79.2	0.0	834.8
50.00		1.00	1.09	9.576	10.53	169.00	0.650	0.000	5.00	13.625	8.86	93.3	0.0	431.4
55.00		1.00	1.12	9.770	10.75	166.68	0.650	0.000	5.00	13.307	8.65	93.0	0.0	421.2
60.00		1.00	1.14	9.951	10.95	164.15	0.650	0.000	5.00	12.990	8.44	92.4	0.0	411.1
65.00		1.00	1.16	10.120	11.13	161.45	0.650	0.000	5.00	12.673	8.24	91.7	0.0	401.0
70.00		1.00	1.17	10.279	11.31	158.59	0.650	0.000	5.00	12.355	8.03	90.8	0.0	390.9
75.00		1.00	1.19	10.430	11.47	155.58	0.650	0.000	5.00	12.038	7.82	89.8	0.0	380.7
77.25 Bot - Section 3		1.00	1.20	10.495	11.54	154.19	0.650	0.000	2.25	5.313	3.45	39.9	0.0	168.0
78.00 Appurtenance(s)		1.00	1.20	10.516	11.57	153.72	0.650	0.000	0.75	1.781	1.16	13.4	0.0	97.9
80.00		1.00	1.21	10.572	11.63	152.46	0.650	0.000	2.00	4.714	3.06	35.6	0.0	259.1
80.75 Top - Section 2		1.00	1.21	10.593	11.65	151.98	0.650	0.000	0.75	1.754	1.14	13.3	0.0	96.4
85.00		1.00	1.22	10.708	11.78	151.33	0.650	0.000	4.25	9.807	6.37	75.1	0.0	233.1
90.00		1.00	1.24	10.838	11.92	148.00	0.650	0.000	5.00	11.244	7.31	87.1	0.0	267.2
95.00		1.00	1.25	10.962	12.06	144.59	0.650	0.000	5.00	10.927	7.10	85.6	0.0	259.6
100.00		1.00	1.27	11.081	12.19	141.08	0.650	0.000	5.00	10.609	6.90	84.1	0.0	252.0
105.00		1.00	1.28	11.195	12.31	137.50	0.650	0.000	5.00	10.292	6.69	82.4	0.0	244.4
108.00 Appurtenance(s)		1.00	1.29	11.262	12.39	135.32	0.650	0.000	3.00	6.023	3.91	48.5	0.0	143.0
110.00		1.00	1.29	11.305	12.44	133.85	0.650	0.000	2.00	3.952	2.57	31.9	0.0	93.8
115.00		1.00	1.30	11.412	12.55	130.13	0.650	0.000	5.00	9.657	6.28	78.8	0.0	229.2
118.00 Appurtenance(s)		1.00	1.31	11.474	12.62	127.87	0.650	0.000	3.00	5.642	3.67	46.3	0.0	133.9
<b>Totals:</b>								<b>118.00</b>			<b>2,069.0</b>	<b>10,625.6</b>		

## Discrete Appurtenance Forces

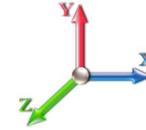
<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 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	118.00	Platform w/ Hand Rails	1	11.474	12.621	1.00	1.00	32.00	1600.00	0.000	0.000	403.87	0.00	0.00
2	118.00	ALU - TD-RRH8x20-25 -	3	11.474	12.621	0.54	0.80	6.51	210.00	0.000	0.000	82.19	0.00	0.00
3	118.00	ALU - 800 MHz - RRU	6	11.474	12.621	0.54	0.80	8.01	318.00	0.000	0.000	101.07	0.00	0.00
4	118.00	ALU - 1900MHz - RRU	3	11.474	12.621	0.54	0.80	6.11	132.00	0.000	0.000	77.12	0.00	0.00
5	118.00	KMW - ETCR-654L12H6	3	11.474	12.621	0.64	0.90	30.12	297.00	0.000	0.000	380.10	0.00	0.00
6	118.00	6' Lightning rod	1	11.474	12.621	1.00	1.00	0.38	6.50	0.000	0.000	4.80	0.00	0.00
7	108.00	Low Profile Platform	1	11.262	12.388	1.00	1.00	22.00	1500.00	0.000	0.000	272.53	0.00	0.00
8	108.00	Antel - BXA-70063/6CF	1	11.262	12.388	0.67	0.80	5.09	17.00	0.000	0.000	63.02	0.00	0.00
9	108.00	Antel - LPA 185080/12CF	6	11.262	12.388	0.67	0.80	14.19	63.00	0.000	0.000	175.82	0.00	0.00
10	108.00	Antel - LPA 80080/6CF	6	11.262	12.388	0.68	0.80	17.67	126.00	0.000	0.000	218.85	0.00	0.00
11	108.00	Antel - BXA 70080/6CF	2	11.262	12.388	0.70	0.80	8.22	36.00	0.000	0.000	101.86	0.00	0.00
12	78.00	Pipe Mount	1	10.516	11.568	0.56	0.75	1.48	40.00	0.000	0.000	17.11	0.00	0.00
13	78.00	GPS	1	10.516	11.568	0.80	0.80	0.80	10.00	0.000	0.000	9.25	0.00	0.00
<b>Totals:</b>									<b>4,355.50</b>			<b>1,907.59</b>		

## Total Applied Force Summary

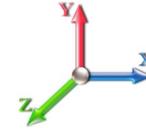
<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 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		86.57	757.13	0.00	0.00
10.00		84.88	744.47	0.00	0.00
15.00		83.19	731.81	0.00	0.00
20.00		86.48	719.15	0.00	0.00
25.00		88.76	706.50	0.00	0.00
30.00		90.28	693.84	0.00	0.00
35.00		91.25	681.18	0.00	0.00
40.00		91.77	668.52	0.00	0.00
40.75		13.64	99.19	0.00	0.00
45.00		79.23	931.29	0.00	0.00
50.00		93.29	544.85	0.00	0.00
55.00		92.96	534.72	0.00	0.00
60.00		92.42	524.59	0.00	0.00
65.00		91.70	514.46	0.00	0.00
70.00		90.81	504.33	0.00	0.00
75.00		89.77	494.21	0.00	0.00
77.25		39.87	219.09	0.00	0.00
78.00	(2) attachments	39.76	164.90	0.00	0.00
80.00		35.63	304.14	0.00	0.00
80.75		13.29	113.32	0.00	0.00
85.00		75.09	328.86	0.00	0.00
90.00		87.13	379.87	0.00	0.00
95.00		85.64	372.27	0.00	0.00
100.00		84.06	364.68	0.00	0.00
105.00		82.38	357.08	0.00	0.00
108.00	(16) attachments	880.58	1952.60	0.00	0.00
110.00		31.94	101.44	0.00	0.00
115.00		78.80	248.29	0.00	0.00
118.00	(17) attachments	1095.43	2708.83	0.00	0.00
	<b>Totals:</b>	<b>3,976.60</b>	<b>17,465.60</b>	<b>0.00</b>	<b>0.00</b>

## Linear Appurtenance Segment Forces (Factored)

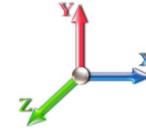
<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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

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



**Iterations** 23

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.017	0.000	7.442	0.00	0.80
10.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.017	0.000	7.442	0.00	0.80
15.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.017	0.000	7.442	0.00	0.80
20.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.018	0.000	7.896	0.00	0.80
25.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.018	0.000	8.276	0.00	0.80
30.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.018	0.000	8.600	0.00	0.80
35.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.019	0.000	8.883	0.00	0.80
40.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.019	0.000	9.137	0.00	0.80
40.75	1/2" Coax	Yes	0.75	0.000	0.65	0.04	0.00	0.020	0.000	9.173	0.00	0.12
45.00	1/2" Coax	Yes	4.25	0.000	0.65	0.23	0.00	0.020	0.000	9.366	0.00	0.68
50.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.020	0.000	9.576	0.00	0.80
55.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.020	0.000	9.770	0.00	0.80
60.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.021	0.000	9.951	0.00	0.80
65.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.021	0.000	10.120	0.00	0.80
70.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.022	0.000	10.279	0.00	0.80
75.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.022	0.000	10.430	0.00	0.80
77.25	1/2" Coax	Yes	2.25	0.000	0.65	0.12	0.00	0.023	0.000	10.495	0.00	0.36
78.00	1/2" Coax	Yes	0.75	0.000	0.65	0.04	0.00	0.023	0.000	10.516	0.00	0.12
<b>Totals:</b>											<b>0.0</b>	<b>12.5</b>

## Calculated Forces

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Page:</b> 30
	<b>Struct Class:</b> II	

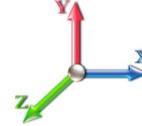


**Load Case:** 1.0D + 1.0W 60 mph Wind

**Iterations** 23

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-17.46	-3.99	0.00	-352.93	0.00	352.93	2657.45	1328.73	4204.87	2105.56	0.00	0.000	0.000	0.174
5.00	-16.70	-3.92	0.00	-333.00	0.00	333.00	2622.48	1311.24	4068.06	2037.05	0.04	-0.068	0.000	0.170
10.00	-15.95	-3.85	0.00	-313.40	0.00	313.40	2586.84	1293.42	3932.41	1969.13	0.14	-0.136	0.000	0.165
15.00	-15.22	-3.78	0.00	-294.14	0.00	294.14	2550.53	1275.26	3797.98	1901.81	0.32	-0.204	0.000	0.161
20.00	-14.49	-3.71	0.00	-275.22	0.00	275.22	2513.55	1256.78	3664.83	1835.14	0.57	-0.272	0.000	0.156
25.00	-13.78	-3.64	0.00	-256.66	0.00	256.66	2475.91	1237.96	3533.03	1769.14	0.89	-0.339	0.000	0.151
30.00	-13.09	-3.56	0.00	-238.48	0.00	238.48	2437.60	1218.80	3402.64	1703.85	1.29	-0.406	0.000	0.145
35.00	-12.40	-3.47	0.00	-220.69	0.00	220.69	2398.63	1199.31	3273.71	1639.29	1.75	-0.472	0.000	0.140
40.00	-11.73	-3.38	0.00	-203.32	0.00	203.32	2358.98	1179.49	3146.32	1575.50	2.28	-0.538	0.000	0.134
40.75	-11.63	-3.38	0.00	-200.78	0.00	200.78	2352.98	1176.49	3127.35	1566.00	2.36	-0.548	0.000	0.133
45.00	-10.70	-3.30	0.00	-186.43	0.00	186.43	1755.34	877.67	2332.03	1167.75	2.87	-0.603	0.000	0.166
50.00	-10.15	-3.21	0.00	-169.94	0.00	169.94	1728.64	864.32	2242.86	1123.10	3.54	-0.666	0.000	0.157
55.00	-9.61	-3.12	0.00	-153.88	0.00	153.88	1701.27	850.64	2154.50	1078.85	4.28	-0.739	0.000	0.148
60.00	-9.08	-3.04	0.00	-138.26	0.00	138.26	1673.24	836.62	2067.01	1035.04	5.09	-0.810	0.000	0.139
65.00	-8.57	-2.95	0.00	-123.08	0.00	123.08	1644.54	822.27	1980.47	991.70	5.97	-0.878	0.000	0.129
70.00	-8.06	-2.86	0.00	-108.35	0.00	108.35	1615.17	807.59	1894.92	948.87	6.93	-0.943	0.000	0.119
75.00	-7.57	-2.76	0.00	-94.07	0.00	94.07	1585.14	792.57	1810.44	906.57	7.95	-1.004	0.000	0.109
77.25	-7.35	-2.72	0.00	-87.85	0.00	87.85	1571.40	785.70	1772.79	887.71	8.43	-1.031	0.000	0.104
78.00	-7.18	-2.68	0.00	-85.81	0.00	85.81	1566.79	783.40	1760.29	881.45	8.59	-1.040	0.000	0.102
80.00	-6.88	-2.64	0.00	-80.44	0.00	80.44	1554.43	777.22	1727.08	864.83	9.03	-1.063	0.000	0.097
80.75	-6.76	-2.63	0.00	-78.46	0.00	78.46	1064.66	532.33	1199.95	600.87	9.20	-1.072	0.000	0.137
85.00	-6.44	-2.56	0.00	-67.28	0.00	67.28	1050.00	525.00	1155.69	578.71	10.17	-1.117	0.000	0.122
90.00	-6.05	-2.47	0.00	-54.51	0.00	54.51	1032.12	516.06	1103.96	552.80	11.38	-1.177	0.000	0.104
95.00	-5.68	-2.38	0.00	-42.17	0.00	42.17	1013.59	506.79	1052.64	527.10	12.64	-1.229	0.000	0.086
100.00	-5.32	-2.29	0.00	-30.29	0.00	30.29	994.38	497.19	1001.80	501.65	13.95	-1.271	0.000	0.066
105.00	-4.96	-2.20	0.00	-18.84	0.00	18.84	974.51	487.26	951.51	476.46	15.30	-1.303	0.000	0.045
108.00	-3.03	-1.28	0.00	-12.24	0.00	12.24	962.27	481.13	921.62	461.49	16.12	-1.316	0.000	0.030
110.00	-2.93	-1.24	0.00	-9.69	0.00	9.69	953.97	476.99	901.82	451.58	16.67	-1.322	0.000	0.025
115.00	-2.68	-1.16	0.00	-3.47	0.00	3.47	932.77	466.38	852.80	427.03	18.06	-1.333	0.000	0.011
118.00	0.00	-1.10	0.00	0.00	0.00	0.00	919.72	459.86	823.73	412.48	18.90	-1.334	0.000	0.000

## Final Analysis Summary

<b>Structure:</b> CT46148-A-SBA	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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### Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 97 mph Wind	16.7	0.00	20.92	0.00	0.00	1484.24
0.9D + 1.6W 97 mph Wind	16.7	0.00	15.68	0.00	0.00	1468.54
1.2D + 1.0Di + 1.0Wi 50 mph Wind	4.9	0.00	34.84	0.00	0.00	436.17
1.2D + 1.0E	1.1	0.00	20.96	0.00	0.00	120.72
0.9D + 1.0E	1.1	0.00	15.72	0.00	0.00	119.33
1.0D + 1.0W 60 mph Wind	4.0	0.00	17.46	0.00	0.00	352.93

### Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 97 mph Wind	-20.92	-16.68	0.00	-1484.2	0.00	-1484.2	2657.45	1328.7	4204.87	2105.56	0.00	0.713
0.9D + 1.6W 97 mph Wind	-15.68	-16.67	0.00	-1468.5	0.00	-1468.5	2657.45	1328.7	4204.87	2105.56	0.00	0.704
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-34.84	-4.93	0.00	-436.17	0.00	-436.17	2657.45	1328.7	4204.87	2105.56	0.00	0.220
1.2D + 1.0E	-12.88	-1.03	0.00	-70.86	0.00	-70.86	1755.34	877.67	2332.03	1167.75	45.00	0.068
0.9D + 1.0E	-9.66	-1.02	0.00	-69.83	0.00	-69.83	1755.34	877.67	2332.03	1167.75	45.00	0.065
1.0D + 1.0W 60 mph Wind	-17.46	-3.99	0.00	-352.93	0.00	-352.93	2657.45	1328.7	4204.87	2105.56	0.00	0.174

## Base Plate Summary

<b>Structure:</b> CT46148-A-SB	<b>Code:</b> EIA/TIA-222-G	10/27/2017
<b>Site Name:</b> Russo Property/ Ssusa	<b>Exposure:</b> C	
<b>Height:</b> 118.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> D - Stiff Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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Reactions	Base Plate	Anchor Bolts
Original Design	<b>Yield (ksi):</b> 55.00	<b>Bolt Circle:</b> 45.00
<b>Moment (kip-ft):</b> 1600.00	<b>Width (in):</b> 44.00	<b>Number Bolts:</b> 12.00
<b>Axial (kip):</b> 15.00	<b>Style:</b> Clipped	<b>Bolt Type:</b> 2.25" 18J
<b>Shear (kip):</b> 18.00	<b>Polygon Sides:</b> 0.00	<b>Bolt Diameter (in):</b> 2.25
Analysis	<b>Clip Length (in):</b> 8.00	<b>Yield (ksi):</b> 75.00
<b>Moment (kip-ft):</b> 1484.24	<b>Effective Len (in):</b> 8.63	<b>Ultimate (ksi):</b> 100.00
<b>Axial (kip):</b> 34.84	<b>Moment (kip-in):</b> 415.97	<b>Arrangement:</b> Clustered
<b>Shear (kip):</b> 16.68	<b>Allow Stress (ksi):</b> 74.25	<b>Cluster Dist (in):</b> 6.00
	<b>Applied Stress (ksi):</b> 0.00	<b>Start Angle (deg):</b> 45.00
<b>Moment Design %:</b> 92.76	<b>Stress Ratio:</b> 0.62	<b>Compression</b>
		<b>Force (kip):</b> 134.84
		<b>Allowable (kip):</b> 260.00
		<b>Ratio:</b> 0.53
		<b>Tension</b>
		<b>Force (kip):</b> 129.03
		<b>Allowable (kip):</b> 260.00
		<b>Ratio:</b> 0.51



Pier Foundation Design For Monopole			Date
			10/27/2017
Customer Name:	Sprint Nextel	EIA/TIA Standard:	EIA-222-G
Site Name:	Russo Property/Ssusa	Structure Height (Ft.):	118
Site Number:	CT46148-A-SBA	Engineer Name:	S. Hesselbein
Engr. Number:	41969	Engineer Login ID:	

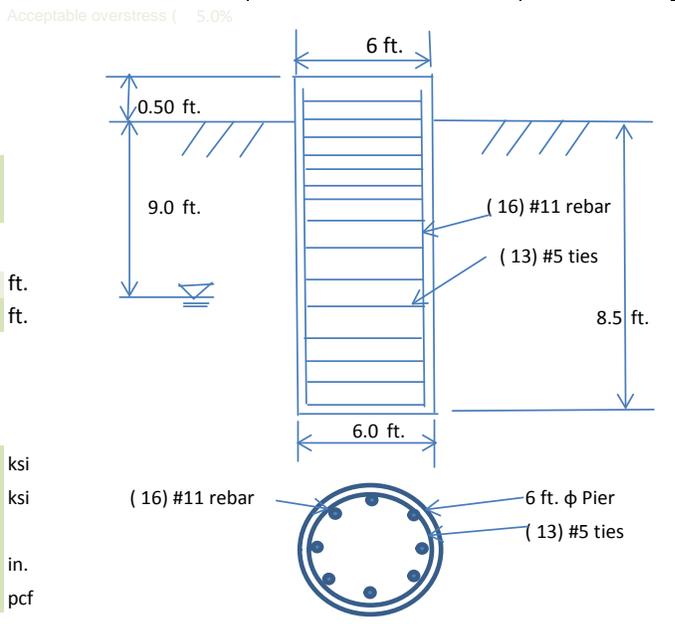
**Foundation Info Obtained from:** Drawings/Calculations  
**Structure Type:** Monopole  
**Analysis or Design?** Analysis

**Base Reactions (Factored):**  
 Axial Load (Kips): 20.9 Shear Force (Kips): 16.7  
 Uplift Force (Kips): 0.0 Moment (Kips-ft): 1484.2

**Foundation Geometries:**  
 Mods required -Yes/No?: No ft.  
 Diameter of Pier (ft.): 6.0 Depth of Base B. G. S.: 8.5 ft.  
 Pier Height A. G. (ft.): 0.50

**Material Properties and Reabr Info:**  
 Concrete Strength (psi): 3000 Steel Elastic Modulus: 29000 ksi  
 Vertical bar yield (ksi): 60 Tie steel yield strength: 60 ksi  
 Vertical Rebar Size #: 11 Tie / Stirrup Size #: 5  
 Qty. of Vertical Rebars: 16 Tie Spacing: 18.0 in.  
 Concrete Cover (in.): 4 Concrete unit weight: 150.0 pcf

**Soil Design Parameters:**  
 Water Table B.G.S. (ft): 9.0 Unit weight of water: 62.4 psf  
 Ratio of Uplift/Axial Skin Friction: 1.0 Pullout failure Angle: 30 (°)  
 Skin Frictions are to be obtained from: Soil Report



**Monopole Pier Foundation**

Depth of Layers (ft)		$\gamma_{soil}$ (pcf)	$\phi$ (°)	Cohesion (psf)	Ultimate Skin Friction (psf)	Ultimate Bearing (psf)	Soil Types					
Top	Bottom											
0.0	3.0	100	0	0		0	Clay					
3.0	6.0	125	0	10000	1500	0	Clay					
6.0	11.0	130	0	10000	1500	0	Clay					
11.0	17.0	125	0	10000	1500	0	Clay					
17.0	25.0	130	0	15000	2000	0	Clay					
25.0	30.0											

Soil weight Increase Factor for bouyant soils (1.0 to 1.15): 1.1

**Foundation Analysis and Design:**

Uplift Strength Reduction Factor:	0.75	Soil Bearing Strength Reduction Factor:	0.75
Total Dry Soil Volume from Conical Failure (cu. Ft.):	593	Dry Soil Weight from Conical Failure:	70 Kips
Total Buoyant Soil Volume from Conical Failure (cu. Ft.):	0	Buoyant Soil Weight from Conical Failure (Kips):	0 Kips
Total Dry Concrete Volume (cu. Ft.):	254	Total Dry Concrete Weight:	38.2 Kips
Total Buoyant Concrete Volume (cu. Ft.):	0.0	Total Buoyant Concrete Weight:	0.00 Kips
Total Effective Concrete Weight (Kips):	38.2	Total Effective Soil Weight:	70.2 Kips
Total Effective Vertical Load on Base (Kips):	30.7		

**Check Soil Capacities:**

Allowable Foundation Overturning Resistance (kips-ft.):	2664.3	>	Design Factored Moment (kips-ft):	1585	Usage	0.59	OK!
Factor of Safety of Passive Soil Resistance against Moment:	1.68	OK!					

**Check the capacities of Reinforcing Concrete:**

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

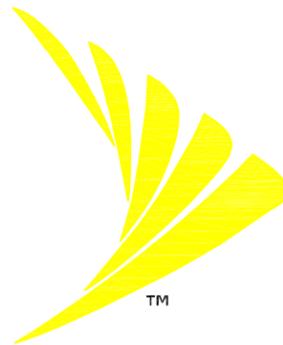
Reinforcing Concrete Pier:

Vertical Steel Rebar Area (sq. in./each):	1.56	Tie / Stirrup Area (sq. in./each):	0.31	Usage	
Calculated Moment Capacity (Mn, Kips-Ft):	3511.7	>	Design Factored Moment (Mu, K-Ft):	1542.2	0.44 OK!
Calculated Shear Capacity (Kips):	707.2	>	Design Factored Shear (Kips):	522.8	0.74 OK!
Calculated Tension Capacity (Tn, Kips):	1347.8	>	Design Factored Tension (Tu Kips):	0.0	0.00 OK!
Calculated Compression Capacity (Pn, Kips):	5366	>	Design Factored Axial Load (Pu Kips):	20.9	0.00 OK!
Moment & Axial Strength Combination:	0.44	OK!	Max. Allowable Tie/Stirrup Spacing:	10.33	in.
Pier Reinforcement Ratio:	0.006	Reinforcement Ratio is satisfied per ACI			



**SPECIAL CONSTRUCTION NOTE:**  
 SPRINT 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.

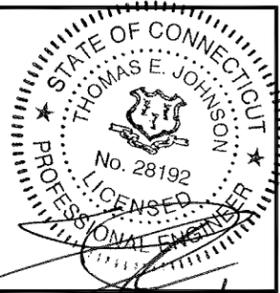
# Sprint®



**SITE NAME:** RUSSO PROPERTY/SSUSA  
**SITE NUMBER:** CT54XC732  
**AUGMENT ID:** CT54XC732Q17.2  
**SITE ADDRESS:** 51 STONY LANE  
 STAFFORD SPRINGS, CT 06076  
**JURISDICTION:** TOWN OF STAFFORD SPRINGS  
**SITE TYPE:** EXISTING 118' MONOPOLE  
**PROGRAM:** DO MACRO UPGRADE EQUIPMENT DEPLOYMENT



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



CHECKED BY: 1/29/18 EJU

APPROVED BY: JMM/TEJ

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
1	01/29/18	ISSUED FOR CONSTRUCTION	PN
0	11/06/17	ISSUED FOR REVIEW	JEB/EN

**SITE NUMBER:**  
 CT54XC732  
**SITE NAME:**  
 RUSSO PROPERTY/SSUSA  
  
**SITE ADDRESS:**  
 51 STONY LANE  
 STAFFORD SPRINGS, CT 06076

**SHEET TITLE**  
 TITLE SHEET

**SHEET NUMBER**  
 T-1

**PROJECT INFORMATION**

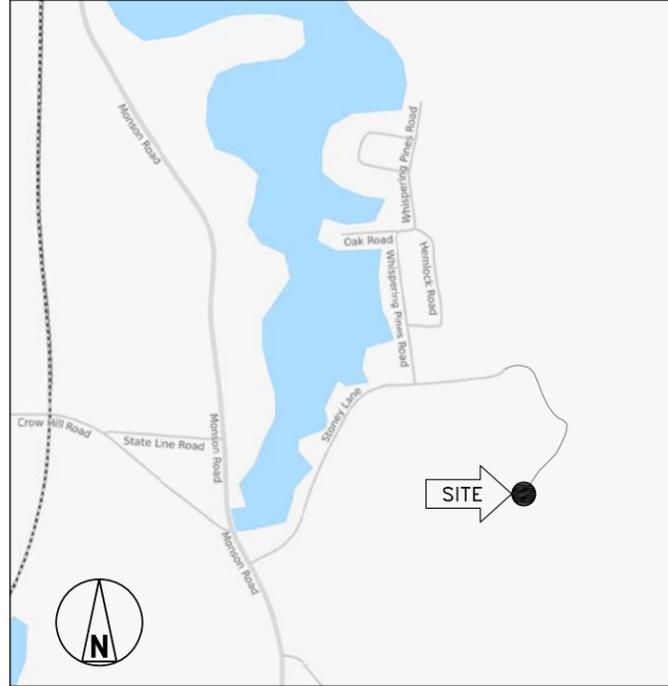
**SITE INFORMATION**  
 LATITUDE: 42° 00' 59.10" N (42.01642°)  
 LONGITUDE: 72° 18' 35.80" W (-72.30994°)  
 GROUND ELEVATION: 676'± AMSL (PER GOOGLE EARTH)  
 STRUCTURE HEIGHT: 118'± AGL (FROM RECORD STRUCTURAL)  
  
 STRUCTURE TYPE: MONOPOLE  
 ZONING JURISDICTION: TOWN OF STAFFORD SPRINGS/CT SITING COUNCIL  
 ZONING DISTRICT/OCCUPANCY: AAA (RURAL AND SINGLE FAMILY RESIDENCE)  
 COUNTY: TOLLAND

**APPLICANT**  
 SPRINT  
 1 INTERNATIONAL BLVD. SUITE 800  
 MAHWAH, NJ 07495  
**PROPERTY OWNER:**  
 N/F SUSAN A. CASHMAN, REVOCABLE LIVING TRUST  
 51 STONY LANE  
 STAFFORD SPRINGS, CT 06076  
**TOWER OWNER:**  
 SBA 2012 TC ASSETS, LLC  
 8051 CONGRESS AVENUE  
 BOCA RATON, FL 33487  
 (561) 995-7670  
 SBA SITE ID: CT46148-A  
 SBA SITE NAME: RUSSO PROPERTY/SSUSA  
**SBA CONTACT:**  
 STEPHEN ROTH  
 (860) 539-4920  
 SROth@sbasite.com

**LOCATION MAP N.T.S.**



**AREA MAP N.T.S.**



**SCOPE OF WORK**

- REMOVE (3) EXISTING SPRINT PANEL ANTENNAS.
- REMOVE (3) EXISTING SPRINT PANEL ANTENNAS AND REPLACE WITH (3) NEW SPRINT TRI-BAND PANEL ANTENNAS.
- INSTALL (1) PLATFORM REINFORCEMENT KIT.
- INSTALL (1) HANDRAIL KIT.
- INSTALL (3) BACK-TO-BACK PIPE MOUNTS WITH (6) PIPE MASTS.
- INSTALL (3) NEW SPRINT 2500 MHz RRHS.
- INSTALL (6) NEW SPRINT 800 MHz RRHS.
- RELOCATE (3) EXISTING SPRINT 1900 RRHS.

**GENERAL NOTES**

- 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.
- 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.

**DRAWING INDEX**

SHEET NO.	SHEET DESCRIPTION	REV. NO.
T-1	TITLE SHEET	1
SP-1	OUTLINE SPECIFICATIONS	1
SP-2	OUTLINE SPECIFICATIONS	1
SP-3	OUTLINE SPECIFICATIONS	1
A-1	COMPOUND PLAN	1
A-2	ELEVATION AND ANTENNA PLANS	1
A-3	TOWER EQUIPMENT DETAILS	1
S-1	ANTENNA AND RRH MOUNTING DETAILS	1
E-1	ELECTRICAL AND GROUNDING DETAILS	1
RF-1	RF DATA SHEET	1
RF-2	PLUMBING DIAGRAM AND RAN WIRING	1

**CODE COMPLIANCE**

- 2016 CONNECTICUT STATE BUILDING CODE WITH AMENDMENTS.
- 2014 NATIONAL ELECTRICAL CODE WITH AMENDMENTS
- TIA-EIA-222-G

BASED ON INFORMATION PROVIDED BY SPRINT, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS CONSIDERED AN 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).

**APPROVALS**

TITLE	SIGNATURE	DATE
PROJECT MANAGER:		
CONSTRUCTION:		
RF ENGINEER:		
ZONING/SITE ACQ:		
OPERATIONS:		
TOWER OWNER:		

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.

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 CALL 3 WORKING DAYS BEFORE YOU DIG!

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**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. TS-0200 REV 4 - 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 ANTENNA 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 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.



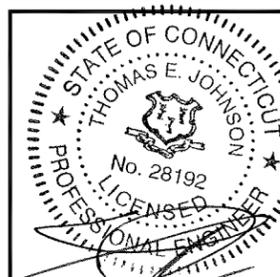
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CHECKED BY: JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
1	01/29/18	ISSUED FOR CONSTRUCTION	PN
0	11/06/17	ISSUED FOR REVIEW	JEB/EN

SITE NUMBER:  
**CT54XC732**  
SITE NAME:  
**RUSSO PROPERTY/SSUSA**  
  
SITE ADDRESS:  
51 STONY LANE  
STAFFORD SPRINGS, CT 06076

SHEET TITLE  
**OUTLINE SPECIFICATIONS**

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 RADI).
    - 23. TOWER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADI).
    - 24. FENCE GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADI).
    - 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**



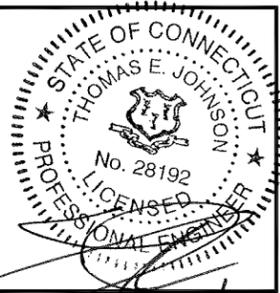
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CHECKED BY: JMM/TEJ

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SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
1	01/29/18	ISSUED FOR CONSTRUCTION	PN
0	11/06/17	ISSUED FOR REVIEW	JEB/EN

SITE NUMBER:  
**CT54XC732**  
SITE NAME:  
**RUSSO PROPERTY/SSUSA**

SITE ADDRESS:  
51 STONY LANE  
STAFFORD SPRINGS, CT 06076

SHEET TITLE  
**OUTLINE SPECIFICATIONS**

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:**

- INSPECT SURFACES, REPORT UNSATISFACTORY CONDITIONS IN WRITING; BEGINNING WORK MEANS ACCEPTANCE OF SUBSTRATE.
- COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR PREPARATION, PRIMING AND COATING WORK. COORDINATE WITH WORK OF OTHER SECTIONS.
- 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.
- CLEAN UP, TOUCH UP AND PROTECT WORK.

**TOUCHUP PAINTING:**

- GALVANIZING DAMAGE AND ALL BOLTS AND NUTS SHALL BE TOUCHED UP AFTER TOWER ERECTION WITH "GALVANOX," "DRY GALV," OR "ZINC-IT."
- FIELD TOUCHUP PAINT SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
- 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.
  - FASTENING MAIN HYBRID CABLES: ALL CABLES SHALL BE PERMANENTLY FASTENED TO THE COAX LADDER AT 4'-0" OC USING NON-MAGNETIC STAINLESS STEEL CLIPS.
  - FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MMBTS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES:
    - FIBER: SUPPORT FIBER BUNDLES USING 1/2" 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.
    - 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.
  - FASTENING JUMPERS: SECURE JUMPERS TO THE SIDE ARMS OR HEAD FRAMES USING STAINLESS STEEL TIE WRAPS OR STAINLESS STEEL BUTTERFLY CLIPS.
  - CABLE INSTALLATION:
    - INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE, NOTIFY THE CONSTRUCTION MANAGER.
    - 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.
    - HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM BEND RADIUS.

- GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
- HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED PER SPRINT TS 0200 CURRENT VERSION.
- 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.

- 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.
- 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.
- 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
- 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:
  - ALLIED TUBE AND CONDUIT
  - B-LINE SYSTEM
  - UNISTRUT DIVERSIFIED PRODUCTS
  - THOMAS & BETTS
- B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:
  - EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
  - POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.
  - FASTEN BY MEANS OF WOOD SCREWS ON WOOD.
  - TOGGLE BOLTS ON HOLLOW MASONRY UNITS.
  - CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY.
  - MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL.
  - EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE SHALL NOT BE PERMITTED.
  - DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES.
  - 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
  - CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL.
  - 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.



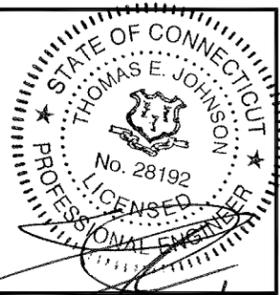
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SHEET TITLE  
**OUTLINE SPECIFICATIONS**

SHEET NUMBER  
**SP-3**



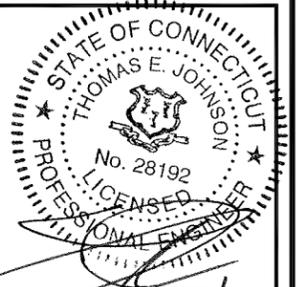
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134 FLANDERS ROAD, SUITE 125  
WESTBOROUGH, MA 01581 TEL: (508) 251-0720



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



CHECKED BY: 1/29/18 TEJ

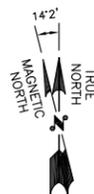
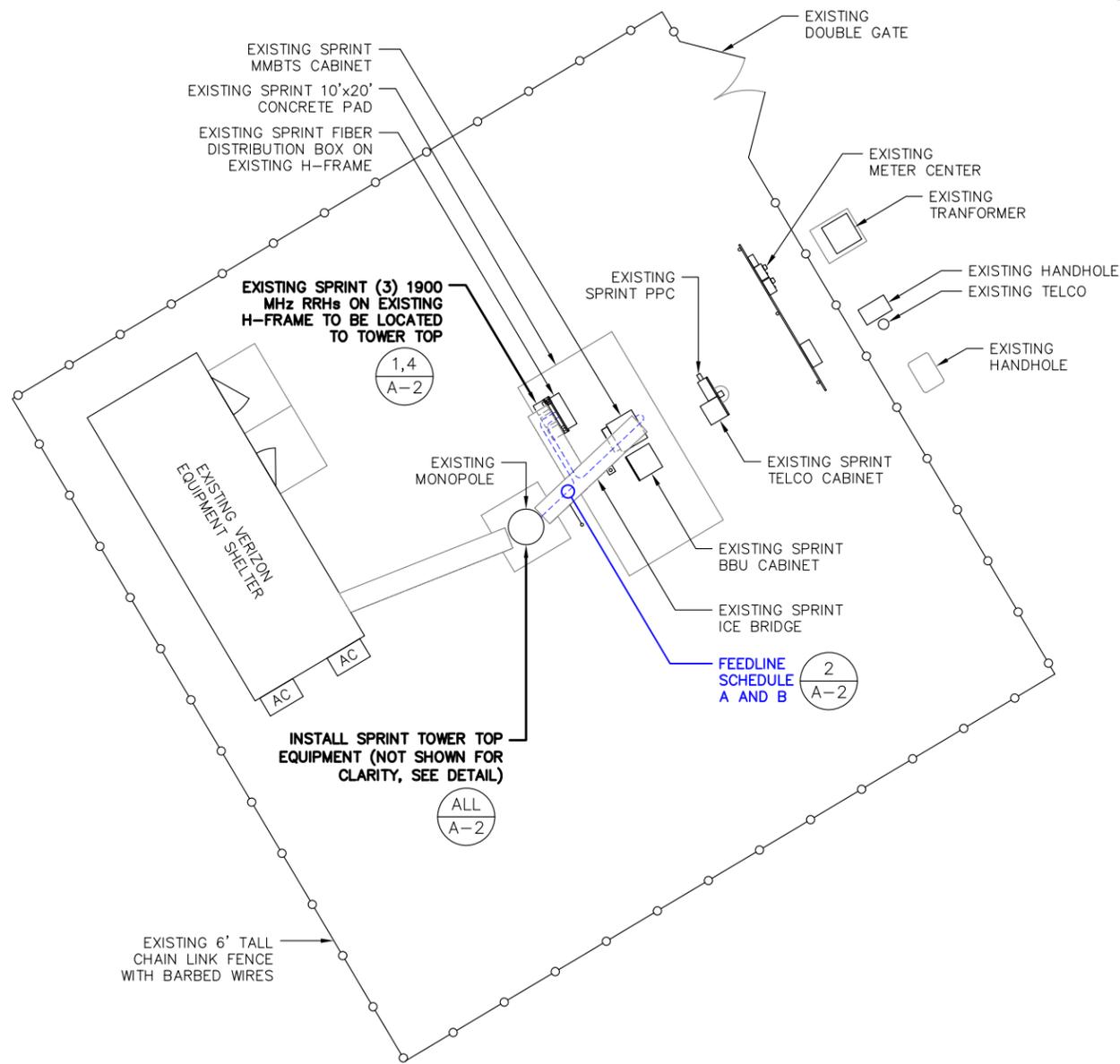
APPROVED BY: JMM/TEJ

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
1	01/29/18	ISSUED FOR CONSTRUCTION	PN
0	11/06/17	ISSUED FOR REVIEW	JEB/EN

SITE NUMBER:  
**CT54XC732**  
SITE NAME:  
**RUSSO PROPERTY/SSUSA**  
SITE ADDRESS:  
51 STONY LANE  
STAFFORD SPRINGS, CT 06076

SHEET TITLE  
**COMPOUND PLAN**

SHEET NUMBER  
**A-1**



**COMPOUND PLAN**  
SCALE: 1"=15' (11"x17")  
1"=7.5' (22"x34")

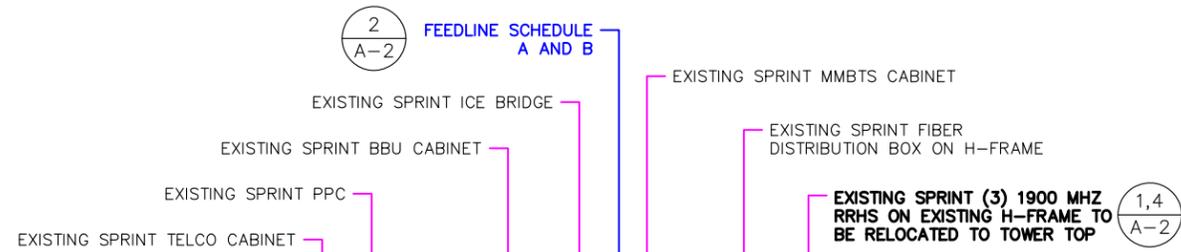
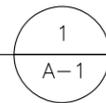


IMAGE SOURCE: PROTERRA 10/8/2017 (VIEW FROM NORTH)

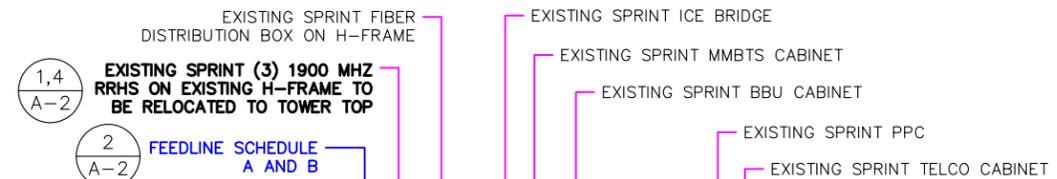
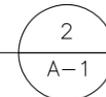


IMAGE SOURCE: PROTERRA 10/8/2017 (VIEW FROM SOUTHEAST)

**EQUIPMENT PLAN PHOTO DETAIL**  
SCALE: N.T.S.



TOP OF EXISTING MONOPOLE  
ELEV. = 118'± AGL  
(SBA DATABASE, RECORD STRUCTURAL)

CL OF EXISTING SPRINT PLATFORM  
ELEV. = 118'± AGL  
(SBA DATABASE, RECORD STRUCTURAL)

3,4  
A-2 ALL  
S-1

EXISTING ANTENNAS  
(BY OTHERS, TYP.)

EXISTING SPRINT GPS TO BE  
REMOVED AND RELOCATED  
TO ICE BRIDGE

EXISTING SPRINT GPS TO BE  
REMOVED AND RELOCATED  
TO ICE BRIDGE

FEEDLINE SCHEDULE  
A AND B

FEEDLINE SCHEDULE  
A AND B

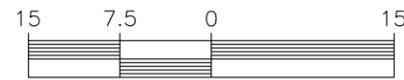
EXISTING MONOPOLE

NOTE:  
GROUND EQUIPMENT NOT  
SHOWN FOR CLARITY

GROUND ELEVATION  
ELEV. = 0.0' AGL

**ELEVATION**

SCALE: 1" = 15' (11"x17")  
1" = 7.5' (22"x34")



FEEDLINE SCHEDULE	FEEDLINE DESCRIPTION	LOCATION
A	EXISTING TO BE REMOVED: (6) 1/2" COAX TO 118' RAD EXISTING TO BE REMOVED: (1) 1/2" GPS CABLE TO 78'±	UP INSIDE MONOPOLE TO RAD
B	PROPOSED: (4) 1 1/2" HYBRID TO 118' RAD;	UP INSIDE MONOPOLE TO RAD

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

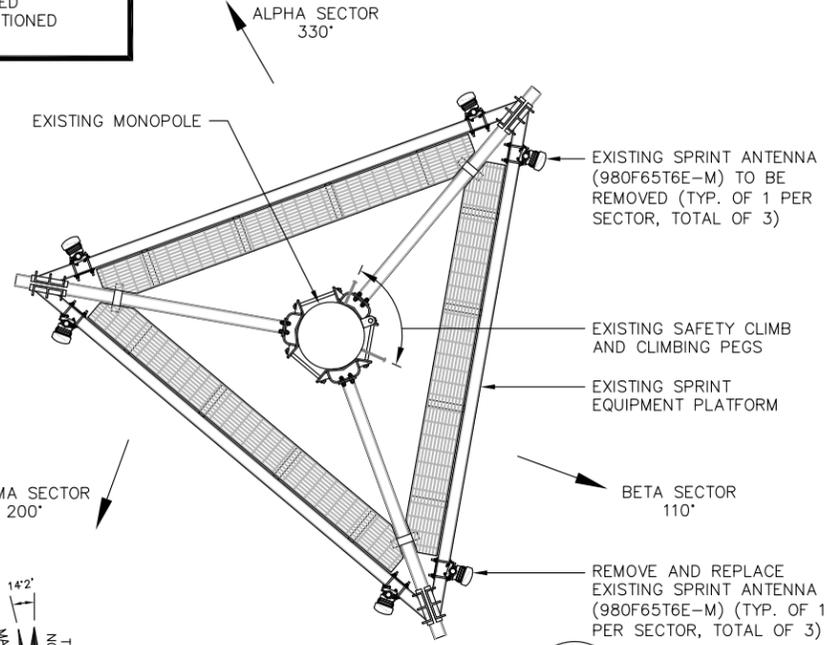
**TOWER ELEVATION PHOTO DETAIL**

SCALE: N.T.S.

**SPECIAL CONSTRUCTION NOTE:**  
SPRINT 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.

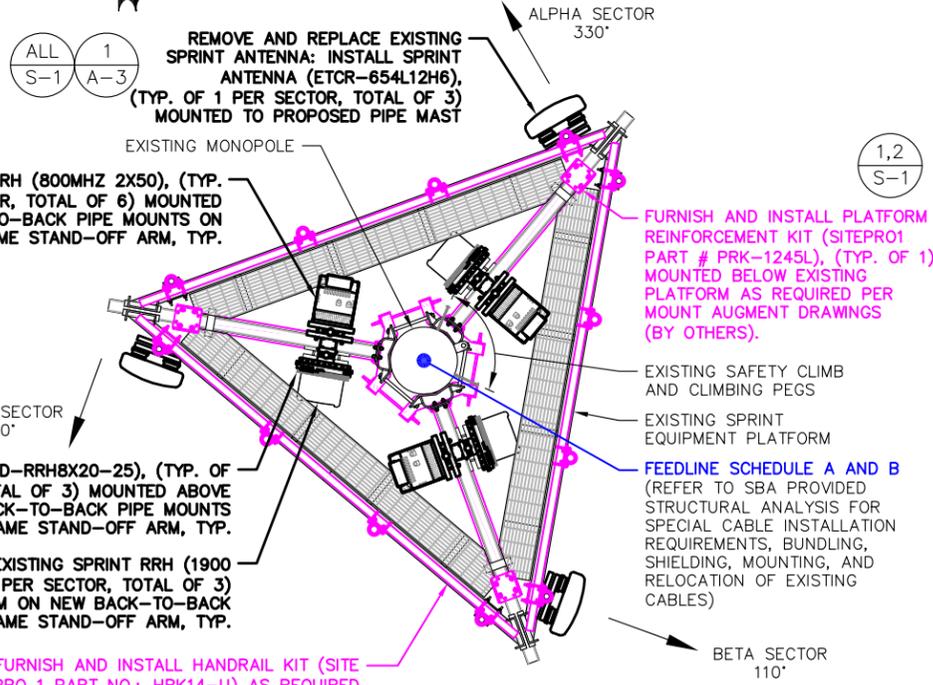
**SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS) SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):**  
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM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

**SPECIAL CONSTRUCTION NOTE (ANTENNA MOUNT STRUCTURAL AUGMENT SCHEMATIC DESIGN NOT FOR FINAL CONSTRUCTION):**  
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS AND STRUCTURAL MODIFICATIONS AT THE SPRINT RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM SBA-PROVIDED ANTENNA MOUNT STRUCTURAL ANALYSIS AND ANY SUPPLEMENTAL CONSTRUCTION DRAWINGS (PROVIDED BY OTHERS). SCHEMATIC DESIGNS DEPICTED IN MAGENTA ARE PRELIMINARY ONLY AND ARE NOT FOR FINAL CONSTRUCTION.



**EXISTING ANTENNA PLAN**

SCALE: N.T.S.



**PROPOSED ANTENNA PLAN**

SCALE: N.T.S.

**SPECIAL INSTALLATION NOTE:**  
JUMPERS FROM RRHs TO ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY DISCREPANCY

NOTE:  
VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION

**Sprint**  
1 INTERNATIONAL BLVD, SUITE 800  
MAHWAH, NJ 07495  
TEL: (800) 357-7641

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

**ProTerra**  
DESIGN GROUP, LLC  
4 Bay Road, Building A  
Suite 200  
Hadley, MA 01035 Ph: (413) 320-4918

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

CHECKED BY: JMM/TEJ  
APPROVED BY: JMM/TEJ

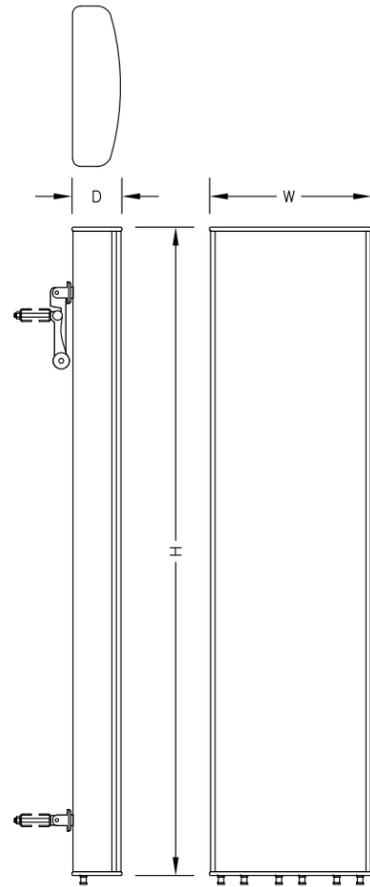
**SUBMITTALS**

REV.	DATE	DESCRIPTION	BY
1	01/29/18	ISSUED FOR CONSTRUCTION	PN
0	11/06/17	ISSUED FOR REVIEW	JEB/EN

SITE NUMBER:  
**CT54XC732**  
SITE NAME:  
**RUSSO PROPERTY/SSUSA**  
SITE ADDRESS:  
51 STONY LANE  
STAFFORD SPRINGS, CT 06076

SHEET TITLE  
**ELEVATION AND ANTENNA PLANS**

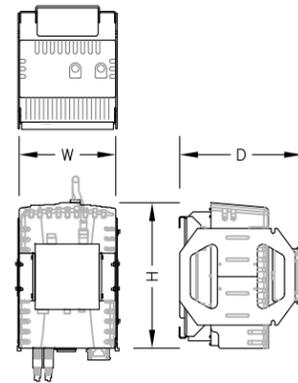
SHEET NUMBER  
**A-2**



ANTENNA SPECIFICATIONS	
MANUF.	KMW
MODEL #	ETCR-654L12H6
HEIGHT	84.9"
WIDTH	21.0"
DEPTH	6.3"
WEIGHT	84.9± LBS.

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

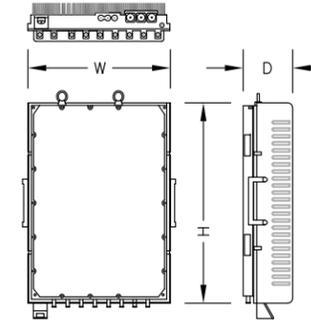
1  
A-3



800 MHZ RRH SPECIFICATIONS	
MANUF.	NOKIA (ALU)
MODEL #	800MHZ 2X50W
HEIGHT	19.7"
WIDTH	13"
DEPTH	10.8"
WEIGHT	53± LBS

**800 MHz RRH DETAIL**  
SCALE: N.T.S.

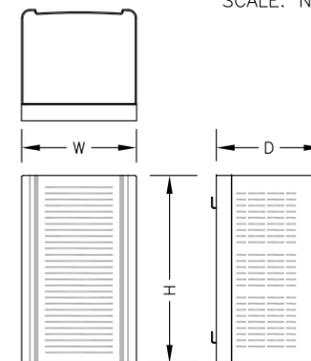
2  
A-3



2.5 GHZ RRH SPECIFICATIONS	
MANUF.	NOKIA (ALU)
MODEL #	TD-RRH8X20-25
HEIGHT	26.1"
WIDTH	18.6"
DEPTH	6.7"
WEIGHT	70± LBS

**2.5 GHz RRH DETAIL**  
SCALE: N.T.S.

3  
A-3



1900 MHZ RRH SPECIFICATIONS	
MANUF.	NOKIA (ALU)
MODEL #	1900 4X45 65MHZ
HEIGHT	25"
WIDTH	11.1"
DEPTH	11.4"
WEIGHT	60± LBS

**EXISTING 1900 MHz RRH DETAIL**  
SCALE: N.T.S.

5  
A-3

**MAJOR RF EQUIPMENT LIST**

(GC SHALL FURNISH AND INSTALL ALL OTHER MATERIALS AND EQUIPMENT NOT SUPPLIED BY SPRINT)

DESCRIPTION	QUANTITY	UNITS	MAKE/MODEL/MATERIAL	PROVIDED BY
ANTENNA	3	EA	KMW ETCR-654L12H6	SPRINT
2500 RRH	3	EA	NOKIA (ALU) TD-RRH8x20-25	SPRINT
RELOCATE EXISTING 1900 RRH	3	EA	NOKIA (ALU) 1900 4x45 65MHZ	EXISTING TO BE RELOCATED
800 RRH	6	EA	NOKIA (ALU) 800MHZ 2x50W	SPRINT
FIBER	4 @ 185'± FROM FIBER CABINET	LINEAR FEET LISTED [INCLUDES (2) 10' COILS]	1-1/4" HYBRIFLEX	SPRINT

**SPRINT-PROVIDED EQUIPMENT SCHEDULE**  
SCALE: N.T.S.

4  
A-3



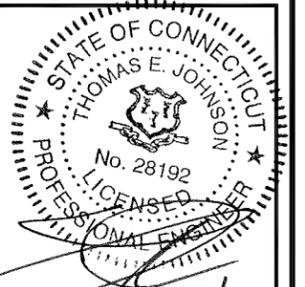
1 INTERNATIONAL BLVD, SUITE 800  
MAHWAH, NJ 07495  
TEL: (800) 357-7641



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



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



CHECKED BY: 1/29/18 TEJ

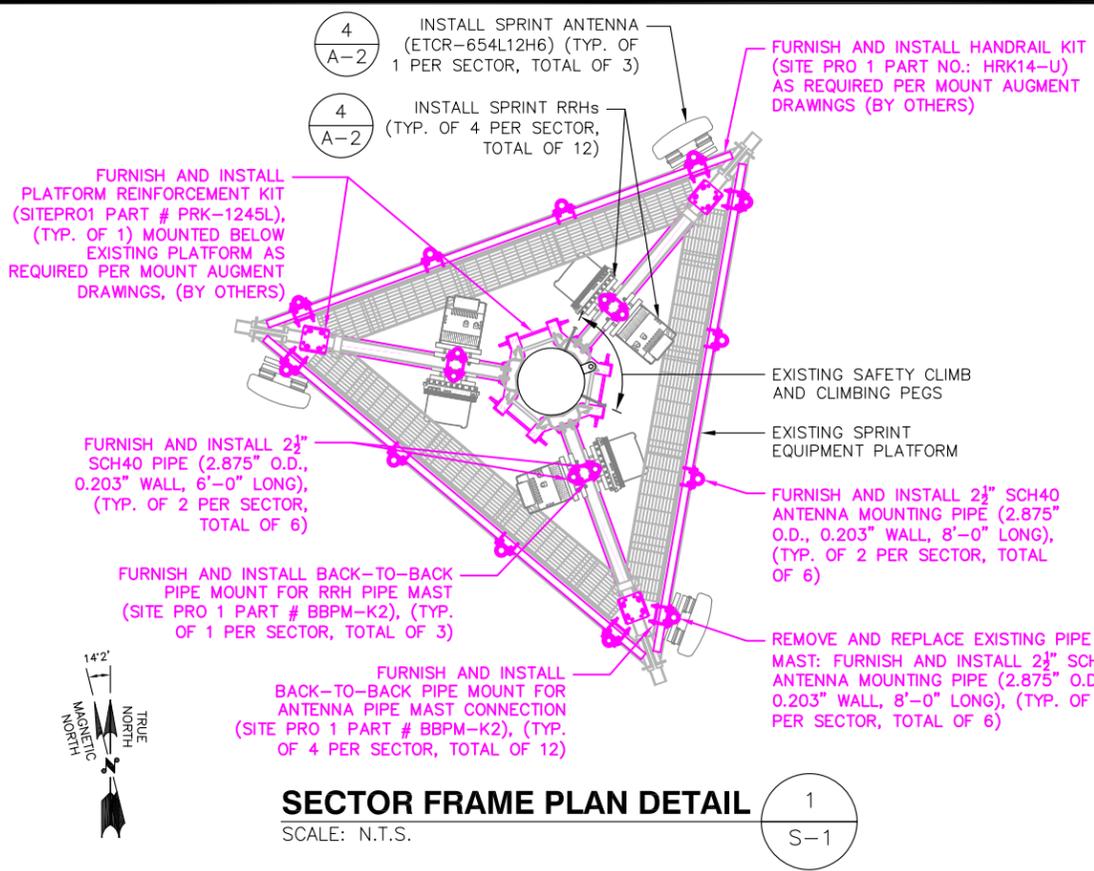
APPROVED BY: JMM/TEJ

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
1	01/29/18	ISSUED FOR CONSTRUCTION	PN
0	11/06/17	ISSUED FOR REVIEW	JEB/EN

SITE NUMBER:  
**CT54XC732**  
SITE NAME:  
**RUSSO PROPERTY/SSUSA**  
  
SITE ADDRESS:  
51 STONY LANE  
STAFFORD SPRINGS, CT 06076

SHEET TITLE  
**TOWER EQUIPMENT DETAILS**

SHEET NUMBER  
**A-3**



**SECTOR FRAME PLAN DETAIL**

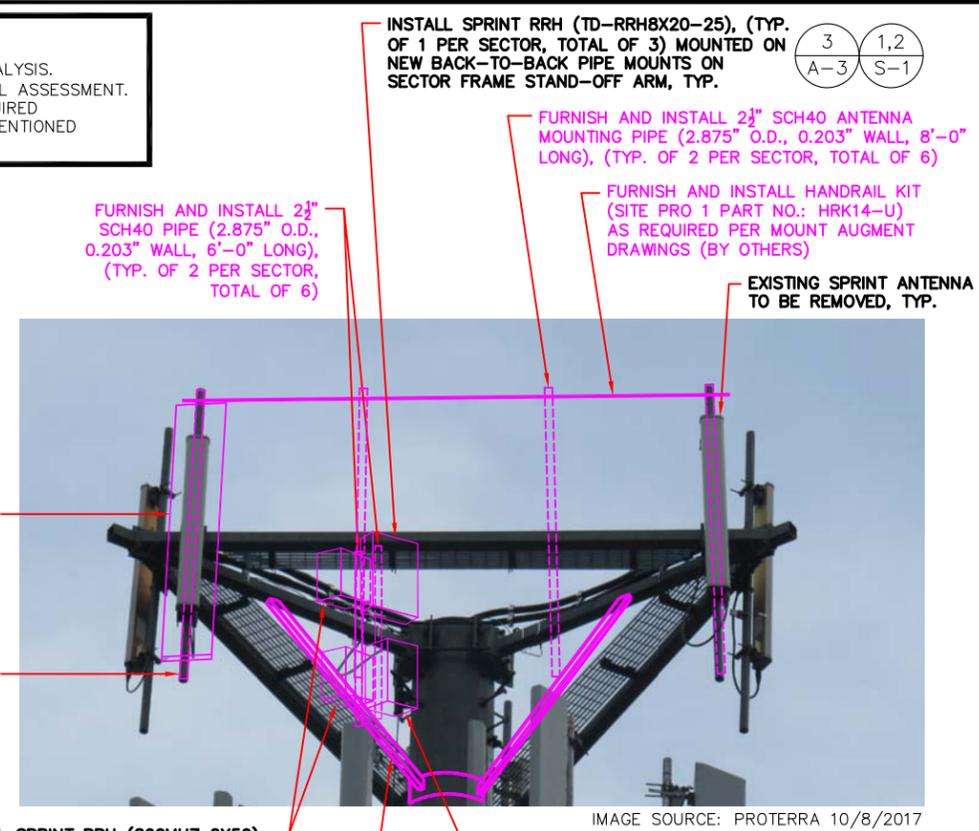
SCALE: N.T.S.

1  
S-1

**SPECIAL CONSTRUCTION NOTE:**  
 SPRINT 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.

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

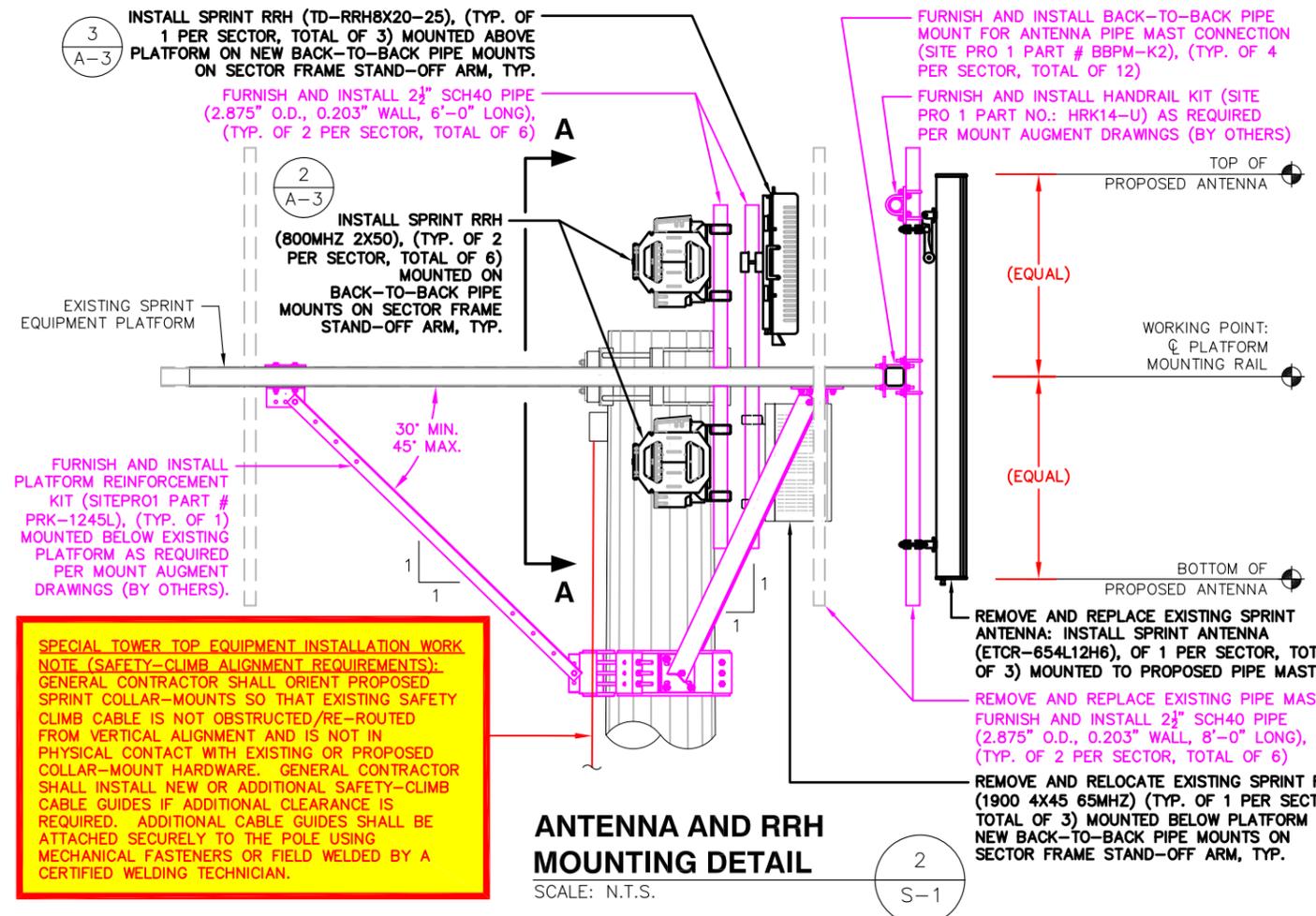
**NOTE:**  
 VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION



**ANTENNA AND RRH MOUNT PHOTO DETAIL**

SCALE: N.T.S.

3  
S-1

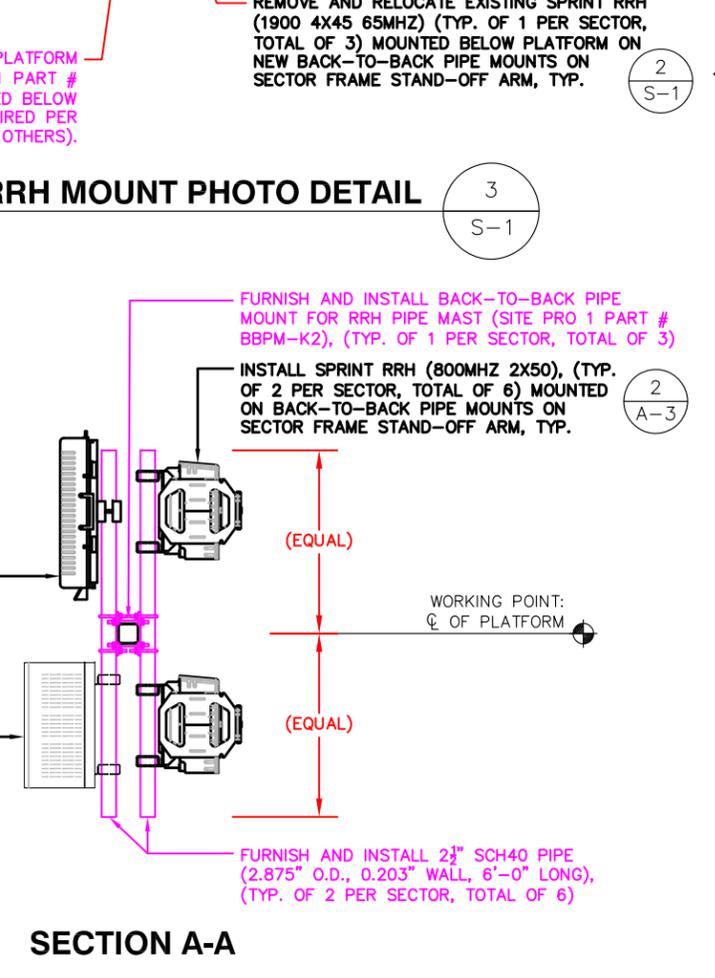


**ANTENNA AND RRH MOUNTING DETAIL**

SCALE: N.T.S.

2  
S-1

**SPECIAL CONSTRUCTION NOTE (ANTENNA MOUNT STRUCTURAL AUGMENT SCHEMATIC DESIGN NOT FOR FINAL CONSTRUCTION):**  
 GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS AND STRUCTURAL MODIFICATIONS AT THE SPRINT RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM SBA-PROVIDED ANTENNA MOUNT STRUCTURAL ANALYSIS AND ANY SUPPLEMENTAL CONSTRUCTION DRAWINGS (PROVIDED BY OTHERS). SCHEMATIC DESIGNS DEPICTED IN MAGENTA ARE PRELIMINARY ONLY AND ARE NOT FOR FINAL CONSTRUCTION.



**SECTION A-A**

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

**Sprint**  
 1 INTERNATIONAL BLVD, SUITE 800  
 MAHWAH, NJ 07495  
 TEL: (800) 357-7641

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

**ProTerra**  
 DESIGN GROUP, LLC  
 4 Bay Road, Building A  
 Suite 200  
 Hadley, MA 01035 Ph: (413)320-4918

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

CHECKED BY: 1/29/18 JEU  
 APPROVED BY: JMM/TEJ

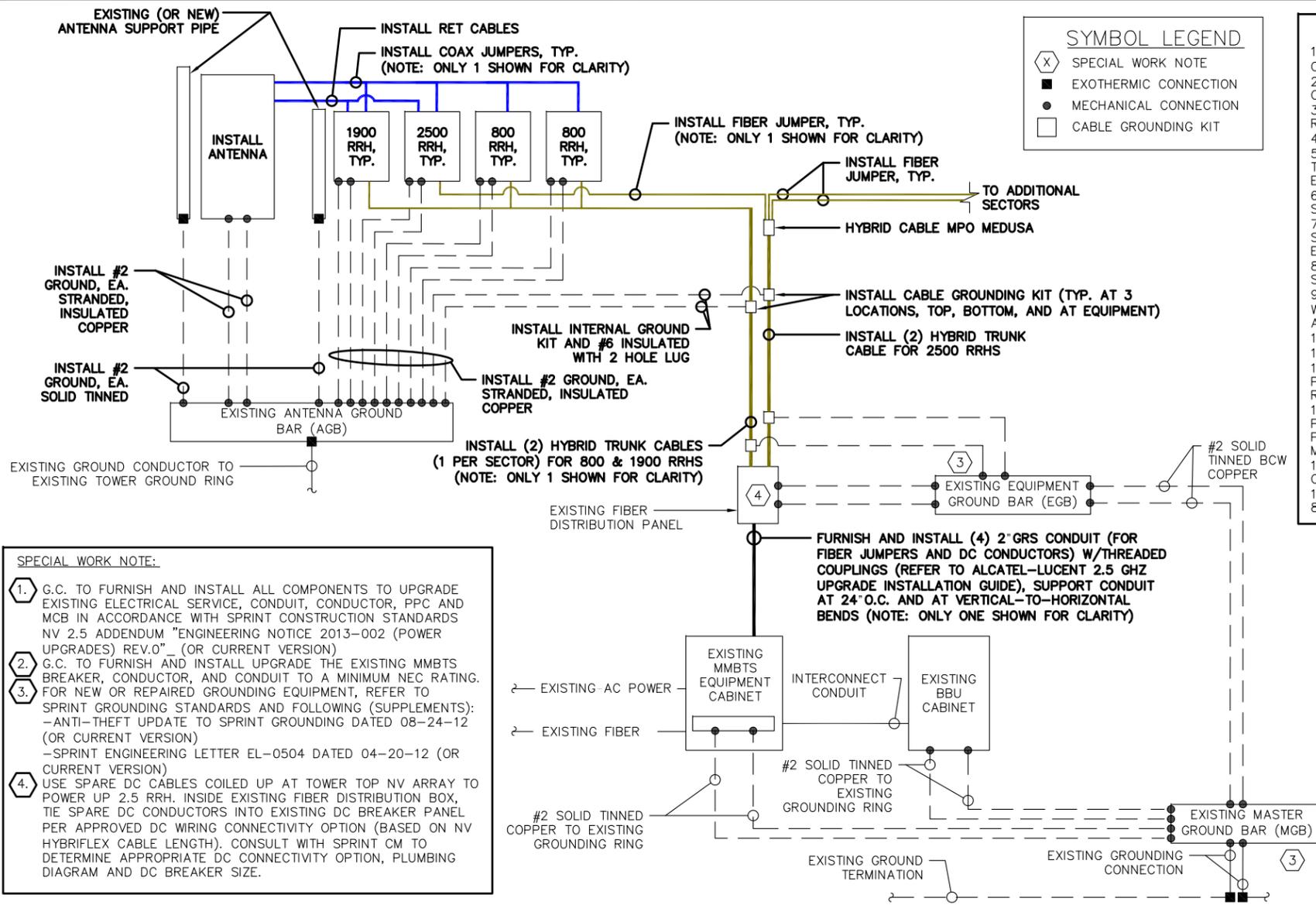
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 RUSSO PROPERTY/SSUSA  
 SITE ADDRESS:  
 51 STONY LANE  
 STAFFORD SPRINGS, CT 06076

SHEET TITLE  
 ANTENNA AND RRH MOUNTING DETAILS

SHEET NUMBER  
 S-1

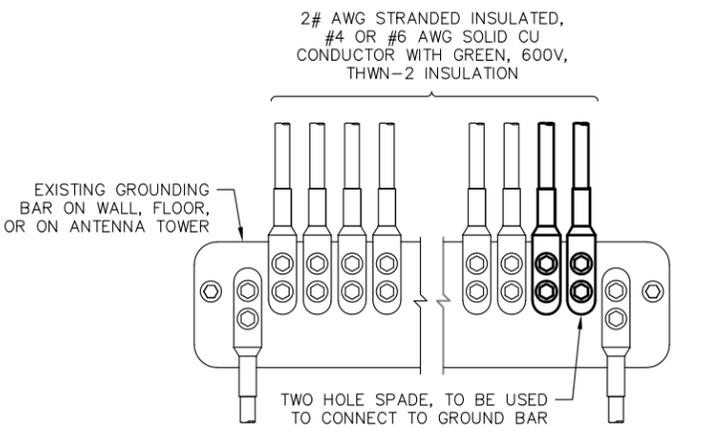


**SPECIAL WORK NOTE:**

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.
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**

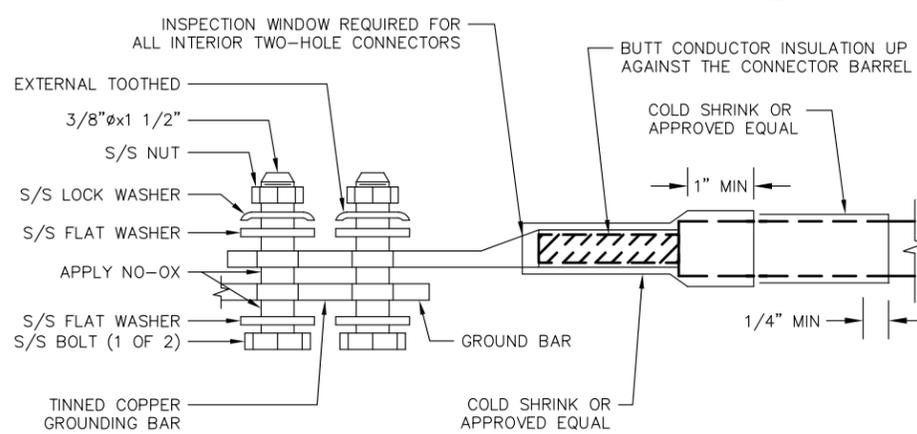
SCALE: N.T.S.



1. 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.



**TWO HOLE LUG**

SCALE: N.T.S.

**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):  
 -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)

**Sprint**

1 INTERNATIONAL BLVD, SUITE 800  
 MAHWAH, NJ 07495  
 TEL: (800) 357-7641

**SBA**

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

**ProTerra**  
 DESIGN GROUP, LLC

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

STATE OF CONNECTICUT  
 THOMAS E. JOHNSON  
 No. 28192  
 PROFESSIONAL ENGINEER  
 FOR SCHEMATIC ONLY

CHECKED BY: JMM/TEJ  
 APPROVED BY: JMM/TEJ

**SUBMITTALS**

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0	11/06/17	ISSUED FOR REVIEW	JEB/EN

SITE NUMBER:  
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 SITE NAME:  
**RUSSO PROPERTY/SSUSA**

SITE ADDRESS:  
 51 STONY LANE  
 STAFFORD SPRINGS, CT 06076

SHEET TITLE  
**ELECTRICAL AND GROUNDING DETAILS**

SHEET NUMBER  
**E-1**



# RF Design Sheet

Site Identification	
Cascade	CT54XC732
SMS Schedule ID	12343916
SMS Schedule Name	DO Macro Upgrade
PID	
RRU OEM	Alcatel Lucent
Switch OEM	ALU
RFDS Issue Date	
RFDS Revision Date	2017-03-20 00:00:00.0
RFDS Revision	1

Filter Analysis Complete	YES
RFDS - Issue Date	
Design Status	Complete
Border Analysis Complete	YES
Project Description	DO Macro Upgrade - Add 800 MHz (3G + 4G), 1900 MHz (4G)

Contact Information	
Engineer Email	Bill.M.Hastings@sprint.com
Sprint Badged RF Engineer	Bill Hastings
RF Engineer Email	Bill.M.Hastings@sprint.com
RF Engineer Phone	978-590-9700
RF Manager	Jonathan Hull
RF Manager Email	Jonathan.Hull@sprint.com
RF Manager Phone	617-233-2920

Carrier Count	
2500 LTE	
1900 LTE	
1900 EVDO	
1900 Voice	
800 LTE	
800 Voice	

Location Details	
Latitude	42.01641
Longitude	-72.30998
Market	Northern Connecticut
Region	Northeast
City	Waterbury
State	CT
Zip Code	CT/06706
County	Tolland

2500MHz	3
1900MHz	3
800MHz	3

### 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 ANTENNA AT SAME CL HEIGHT AS PLAN AND EMAIL CORRECT CL HEIGHT AND AZIMUTH TO SPRINT RF ENGINEER. UPDATE AS-BUILT DRAWING WITH CORRECT CL HEIGHT. ALSO EMAIL CORRECT 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.
  - GENERAL CONTRACTOR IS REQUIRED TO USE A DIGITAL ALIGNMENT TOOL TO SET AZIMUTH, ROLL AND DOWNTILT. AZIMUTH ACCURACY IS TO BE WITHIN 1 DEGREE. 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/.

NOTE:  
VERIFY PROPOSED AZIMUTHS  
WITH RF ENGINEER PRIOR TO  
INSTALLATION

Band: 2500	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
<b>Antenna 1</b>						
Model Number	Antenna assigned on a different band	Antenna assigned on a different band	Antenna assigned on a different band			
Weight (lbs)	0	0	0	N/A	N/A	N/A
Dimensions	0 x 0 x 0	0 x 0 x 0	0 x 0 x 0	N/A	N/A	N/A
Manufacturer	KMW	KMW	KMW	N/A	N/A	N/A
Ant1 Top Jumper Make/Mode/Qty	2.5 Jumper   8	2.5 Jumper   8	2.5 Jumper   8	N/A   0	N/A   0	N/A   0
Ant 1 RF requested Diameter	1/2"	1/2"	1/2"	N/A	N/A	N/A
Ant 1 RF requested Top Jumper Length(ft)	8	8	8	N/A	N/A	N/A
Antenna 1 Azimuth	330	110	200	N/A	N/A	N/A
Antenna 1 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Center Line (ft)	120	120	120	N/A	N/A	N/A
Antenna 1 Electrical DT	2	2	2	N/A	N/A	N/A
Antenna 1 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Twist	N/A	N/A	N/A	N/A	N/A	N/A
<b>Band: 1900</b>						
<b>Antenna 1</b>						
Model Number	ETCR-654L12H6	ETCR-654L12H6	ETCR-654L12H6			
Weight (lbs)	85	85	85	N/A	N/A	N/A
Dimensions	84.9 x 21 x 6.3	84.9 x 21 x 6.3	84.9 x 21 x 6.3	N/A	N/A	N/A
Manufacturer	KMW	KMW	KMW	N/A	N/A	N/A
Ant1 Top Jumper Make/Mode/Qty	N/A   0	N/A   0	N/A   0	N/A   0	N/A   0	N/A   0
Ant 1 RF requested Diameter	1/2"	1/2"	1/2"	N/A	N/A	N/A
Ant 1 RF requested Top Jumper Length(ft)	8	8	8	N/A	N/A	N/A
Antenna 1 Azimuth	330	110	200	N/A	N/A	N/A
Antenna 1 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Center Line (ft)	120	120	120	N/A	N/A	N/A
Antenna 1 Electrical DT	3	3	3	N/A	N/A	N/A
Antenna 1 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Twist	N/A	N/A	N/A	N/A	N/A	N/A
<b>Band: 800</b>						
<b>Antenna 1</b>						
Model Number	Antenna assigned on a different band	Antenna assigned on a different band	Antenna assigned on a different band			
Weight (lbs)	0	0	0	N/A	N/A	N/A
Dimensions	0 x 0 x 0	0 x 0 x 0	0 x 0 x 0	N/A	N/A	N/A
Manufacturer	KMW	KMW	KMW	N/A	N/A	N/A
Ant1 Top Jumper Make/Mode/Qty	800/1900 Jumper   4	800/1900 Jumper   4	800/1900 Jumper   4	N/A   0	N/A   0	N/A   0
Ant 1 RF requested Diameter	1/2"	1/2"	1/2"	N/A	N/A	N/A
Ant 1 RF requested Top Jumper Length(ft)	8	8	8	N/A	N/A	N/A
Antenna 1 Azimuth	330	110	200	N/A	N/A	N/A
Antenna 1 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Center Line (ft)	120	120	120	N/A	N/A	N/A
Antenna 1 Electrical DT	5	5	5	N/A	N/A	N/A
Antenna 1 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Twist	N/A	N/A	N/A	N/A	N/A	N/A

Band: 2500	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
<b>Radio Model</b>						
Model Number	TD-RRH8x20-25	TD-RRH8x20-25	TD-RRH8x20-25	N/A	N/A	N/A
Weight (lbs)	76.2	76.2	76.2	N/A	N/A	N/A
Dimensions	26 x 18.6 x 6.7	26 x 18.6 x 6.7	26 x 18.6 x 6.7	N/A	N/A	N/A
Manufacturer	ALU	ALU	ALU	N/A	N/A	N/A
Number of RRUs needed	1	1	1	0	0	0
<b>Trunk Cable 1</b>						
Model Number	N/A	Hybriflex	N/A	N/A	N/A	N/A
Weight (lbs.)	N/A	1	N/A	N/A	N/A	N/A
Dimensions (in.)	N/A	1.54	N/A	N/A	N/A	N/A
Manufacturer	N/A	ALU	N/A	N/A	N/A	N/A
<b>Band: 800</b>						
<b>Radio Model</b>						
Model Number	RRH-2x50-800	RRH-2x50-800	RRH-2x50-800	N/A	N/A	N/A
Weight (lbs)	69.1	69.1	69.1	N/A	N/A	N/A
Dimensions	16 x 13 x 10	16 x 13 x 10	16 x 13 x 10	N/A	N/A	N/A
Manufacturer	ALU	ALU	ALU	N/A	N/A	N/A
Number of RRUs needed	2	2	2	0	0	0

NOTE: RFDS PROVIDED BY SPRINT DATED 03/20/2017. EXCERPTS TAKEN DEPICT RELEVANT RF DESIGN INFORMATION. A&E VENDOR SCOPE OF WORK LIMITED TO DESIGN OF MECHANICAL/STRUCTURAL EQUIPMENT ATTACHMENTS.

## RF DATA SHEET

SCALE: N.T.S.

1  
RF-1



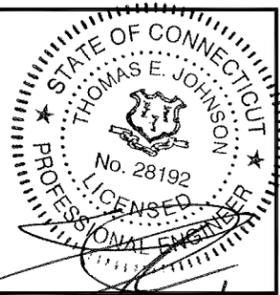
1 INTERNATIONAL BLVD, SUITE 800  
MAHWAH, NJ 07495  
TEL: (800) 357-7641



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



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



CHECKED BY: JMM/TEJ

APPROVED BY: JMM/TEJ

### SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	01/29/18	ISSUED FOR CONSTRUCTION	PN
0	11/06/17	ISSUED FOR REVIEW	JEB/EN

SITE NUMBER:  
CT54XC732  
SITE NAME:  
RUSSO PROPERTY/SSUSA

SITE ADDRESS:  
51 STONY LANE  
STAFFORD SPRINGS, CT 06076

SHEET TITLE  
RF DATA SHEET

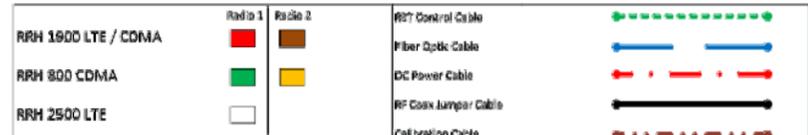
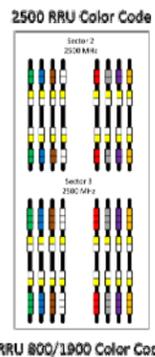
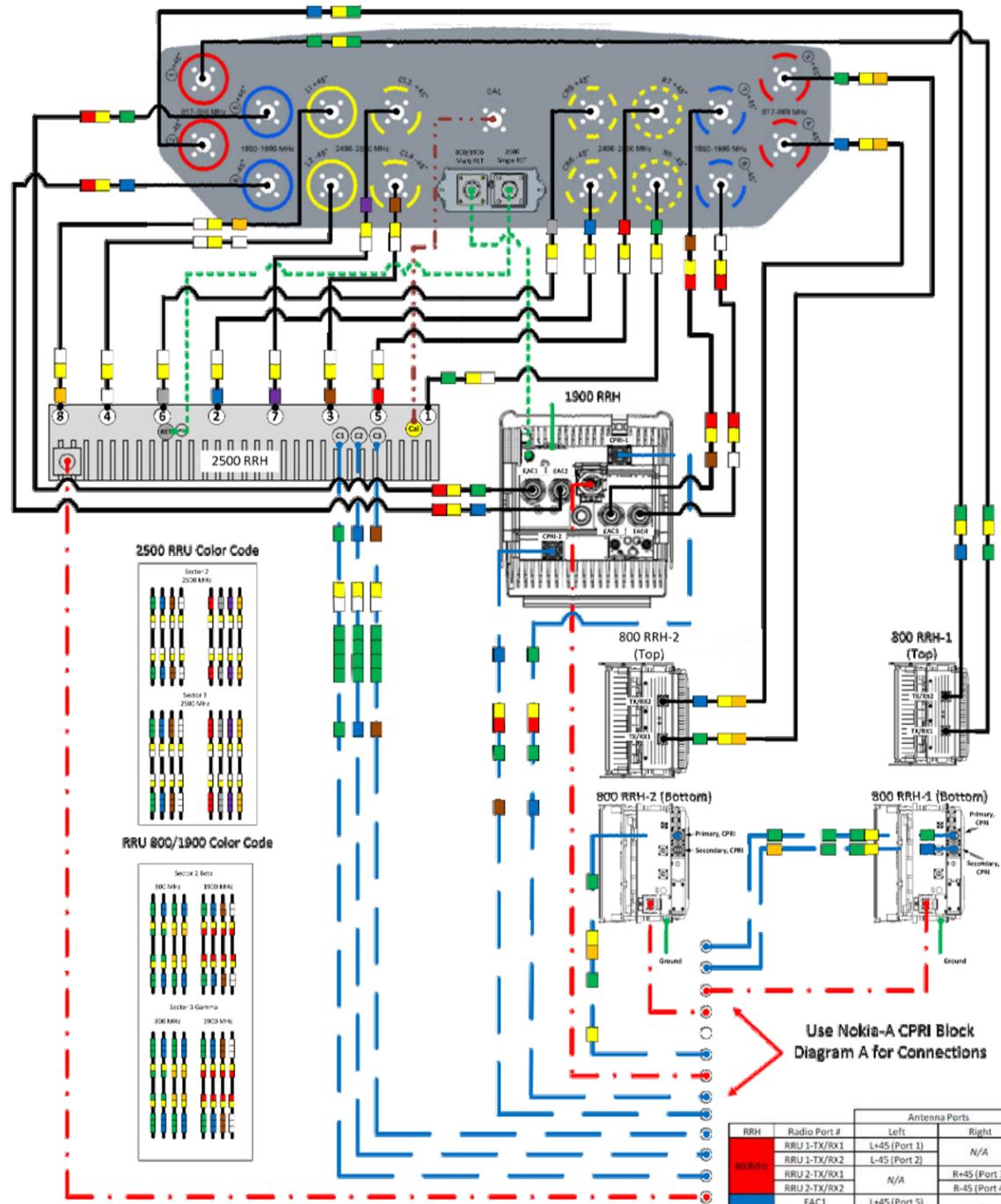
SHEET NUMBER  
RF-1

Prepared By  
**Mark Elliott**  
Approved By  
**TBD**

Creation Date  
**September 12, 2016**  
Revision Number  
**R-4**  
Approval Date  
**TBD**



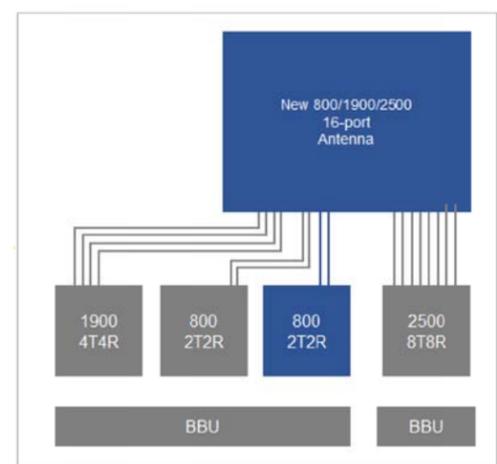
**KMW 16 Port Nokia-A RRH 800, 1900, and 2500 (Sprint Scenario 4)**



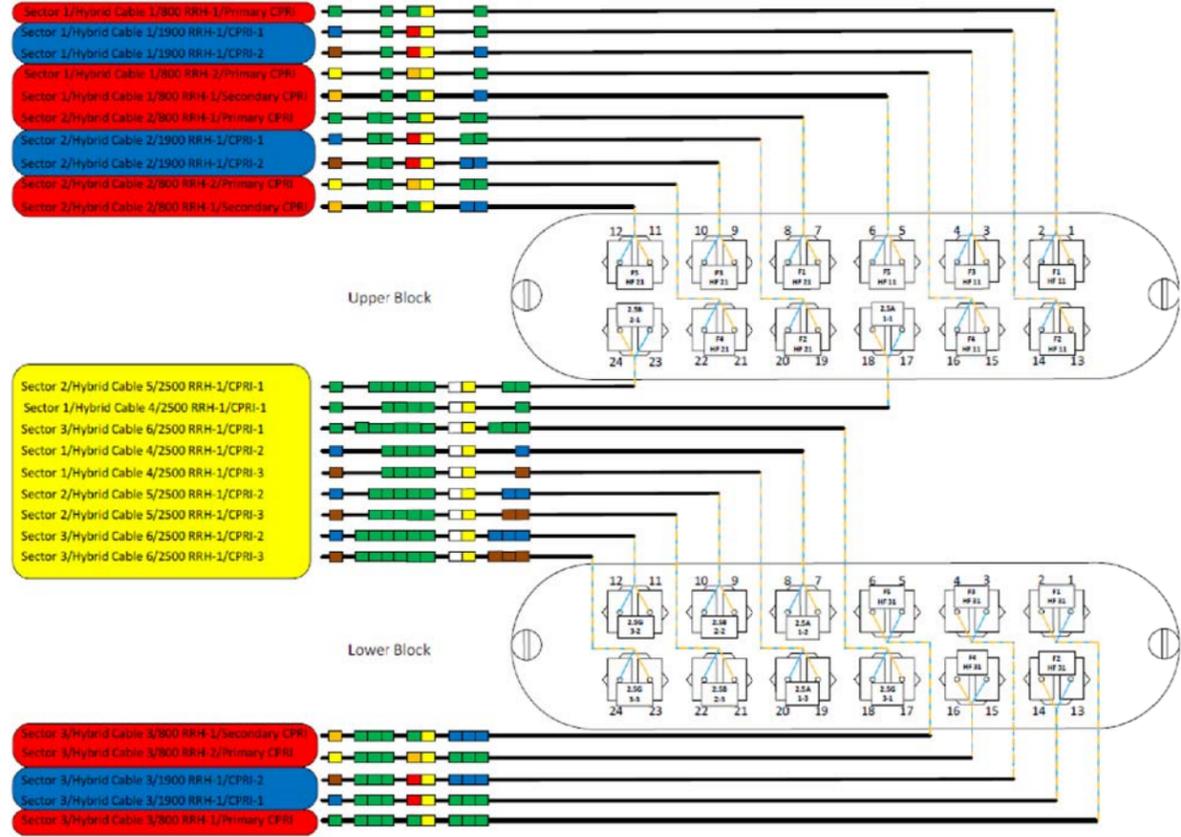
**Not to Scale**

Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
1	2	Blue	No Tape	No Tape
1	3	Brown	No Tape	No Tape
1	4	White	No Tape	No Tape
1	5	Red	No Tape	No Tape
1	6	Gray	No Tape	No Tape
1	7	Purple	No Tape	No Tape
1	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
2	2	Blue	Blue	No Tape
2	3	Brown	Brown	No Tape
2	4	White	White	No Tape
2	5	Red	Red	No Tape
2	6	Gray	Gray	No Tape
2	7	Purple	Purple	No Tape
2	8	Orange	Orange	No Tape
3 Gamma	1	Green	Green	Green
3	2	Blue	Blue	Blue
3	3	Brown	Brown	Brown
3	4	White	White	White
3	5	Red	Red	Red
3	6	Gray	Gray	Gray

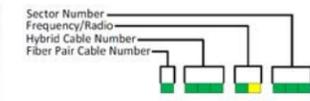
Future



**CPRI Block Connections for Sprint Scenario 4**



Frequency / Radio	Indicator	ID
800 #1	Yellow	Green
800 #2	Yellow	Orange
1900 #1	Yellow	Red
1900 #2	Yellow	Brown
1900 #3	Yellow	Blue
1900 #4	Yellow	Grey
2500 #1	Yellow	White
2500 #2	Yellow	Purple



RRH	Radio Port #	Antenna Ports	
		Left	Right
800MHz	RRU 1-TX/RX1	L-45 (Port 1)	N/A
	RRU 1-TX/RX2	L-45 (Port 2)	N/A
	RRU 2-TX/RX1	N/A	R-45 (Port 3)
	RRU 2-TX/RX2	N/A	R-45 (Port 4)
1900MHz	EAC1	L-45 (Port 5)	N/A
	EAC2	L-45 (Port 6)	N/A
	EAC3	N/A	R-45 (Port 7)
	EAC4	N/A	R-45 (Port 8)
2500MHz	1	N/A	R8-45
	2	N/A	CR6-45
	3	CL4-45	N/A
	4	L2-45	N/A
	5	N/A	R7-45
	6	N/A	CR5-45
	7	CL3-45	N/A
	8	L1-45	N/A

**Sprint**  
1 INTERNATIONAL BLVD, SUITE 800  
MAHWAH, NJ 07495  
TEL: (800) 357-7641

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

**ProTerra**  
DESIGN GROUP, LLC  
4 Bay Road, Building A  
Suite 200  
Hadley, MA 01035 Ph: (413)320-4918

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

CHECKED BY: **1/29/18** JEU  
APPROVED BY: **JMM/TEJ**

**SUBMITTALS**

REV.	DATE	DESCRIPTION	BY
1	01/29/18	ISSUED FOR CONSTRUCTION	PN
0	11/06/17	ISSUED FOR REVIEW	JEB/EN

SITE NUMBER:  
**CT54XC732**  
SITE NAME:  
**RUSSO PROPERTY/SSUSA**  
SITE ADDRESS:  
51 STONY LANE  
STAFFORD SPRINGS, CT 06076

SHEET TITLE  
**PLUMBING DIAGRAM AND RAN WIRING**

SHEET NUMBER  
**RF-2**