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

November 8, 2017

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

Notice of Exempt Modification
193 Windham Center Road, Windham, CT
41 41 24.2 N
-72 9 45.13 W
Sprint #: CT72XC043_2.5

Dear Ms. Bachman:

Sprint currently maintains antennas at the 167-foot of the existing 180-foot Monopole Tower at 193 Windham Center Road, Windham, CT. The tower is owned by SBA Properties, LLC. The property is owned by the Town of Windham. Sprint now intends to add (3) newer technology cell antennas at the 167-foot level of the tower.

Please note: previous approval was given by the Siting Council on 6/23/2014 under EM-SPRINT-163-140602. A Notification of Construction Not Complete was sent 9/15/2015. Sprint now intends to resume construction. The proposed full scope of work is as follows:

Remove: None

Remove and Replace: None

Install:
(3) RFS - APXVTM14-C-I20 – Panel Antennas
(3) Alcatel Lucent TD-RRH8x20-25 RRHs
(1) 1-1/4" Hybrid Lines

Existing Equipment to Remain (Including entitlements):
(3) RFS - APXVSPP18-C-A20 – Panel Antennas
(4) RFS ACU-A20-N RETs
(3) Alcatel Lucent 1900 MHz RRHs
(3) Alcatel Lucent 800 MHz RRHs
(3) Alcatel Lucent 800 MHz Filters
(3) 1-1/4" Hybrid Lines

This facility was approved prior to Council's jurisdiction. The Town of Windham's Zoning Board of Appeals granted a Variance May 4, 2000. The Town's Conservation Commission approved a Declaratory Ruling for the construction of a cell tower on May 11, 2000. And, a Special Permit was issued by the Town's Zoning Commission on June 15, 2000. No conditions were noted. As such, this modification is in full compliance.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16.50j-72(b)(2). In accordance with R.C.S.A. § 16.50j-73, a copy of this letter is being sent to Ernest Eldridge, Mayor of Windham and representative for the town as Landowner, and Matthew Vertefeuille, Director of Code Enforcement for the Town of Windham. (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@sbasite.com

Attachments

cc: Ernest Eldridge, Mayor / with attachments
Town of Windham, Windham Town Hall, 979 Main Street, 1st Floor, Willimantic CT 06226-2217
Matthew Vertefeuille, Director of Code Enforcement / with attachments
Town of Windham, Windham Town Hall, 979 Main Street, 1st Floor, Willimantic CT 06226-2217

POWER DENSITY

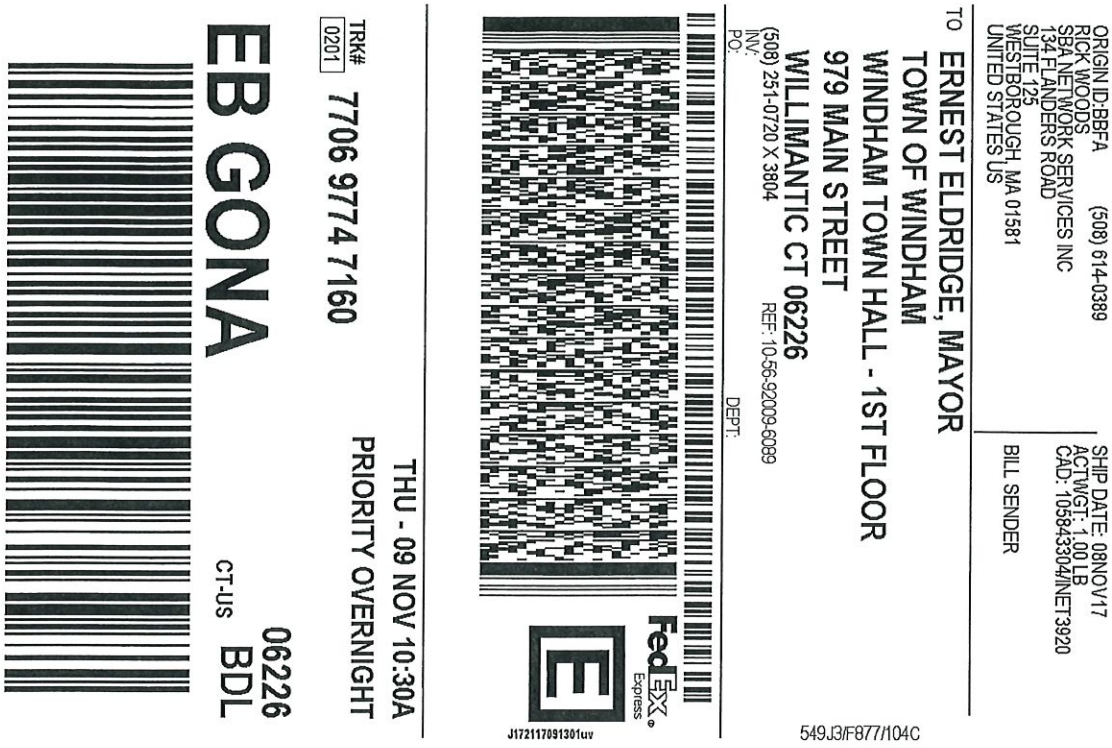
SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	**167 feet**	Height (AGL):	**167 feet**	Height (AGL):	**167 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	7,537.38	ERP (W):	7,537.38	ERP (W):	7,537.38
Antenna A1 MPE%	**1.18 %**	Antenna B1 MPE%	**1.18 %**	Antenna C1 MPE%	**1.18 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-C-120	Make / Model:	RFS APXVTM14-C-120	Make / Model:	RFS APXVTM14-C-120
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**167 feet**	Height (AGL):	**167 feet**	Height (AGL):	**167 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**0.86 %**	Antenna B2 MPE%	**0.86 %**	Antenna C2 MPE%	**0.86 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**2.05 %**
Verizon Wireless	1.05 %
AT&T	2.16 %
Site Total MPE %:	**5.26 %**

SPRINT Sector A Total:	2.05 %
SPRINT Sector B Total:	2.05 %
SPRINT Sector C Total:	2.05 %
Site Total:	5.26 %

SPRINT _ Max Values per Frequency Band / Technology Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	437.55	167	0.61	850 MHz	567	0.12%
Sprint 850 MHz LTE	2	437.55	167	1.21	850 MHz	567	0.22%
Sprint 1900 MHz (PCS) CDMA	5	622.47	167	4.32	1900 MHz (PCS)	1000	0.43%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	167	4.32	1900 MHz (PCS)	1000	0.43%
Sprint 2500 MHz (BRS) LTE	8	778.09	167	8.63	2500 MHz (BRS)	1000	0.86%
						Total:	**2.06%**



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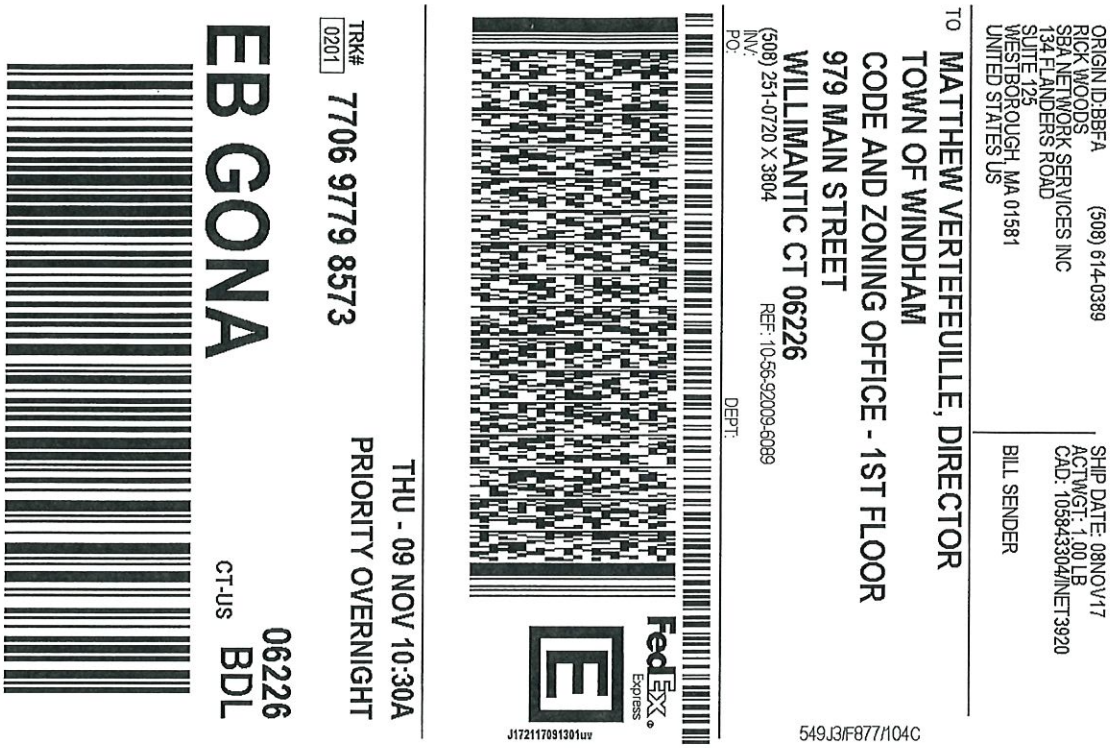
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you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



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Property Location: 193 WINDHAM CENTER RD | MAP ID: 6/9 240/ 29/ / | Bldg Name: | State Use: 925

Vision ID: 5764 | Account # 00168600 | Bldg #: 1 of 2 | Sec #: 1 of 1 | Card 1 of 2 | Print Date: 08/10/2016 10:53

CURRENT OWNER	TOPO.	UTILITIES	STRT./ROAD	LOCATION
WINDHAM TOWN OF WINDHAM CENTER CEMETERY 979 MAIN ST WILLIMANTIC, CT 06226 Additional Owners:	1 Level	5 Well	1 Paved	
		6 Septic		
		0 None		

SUPPLEMENTAL DATA			
Other ID:	6- 9/240/ 29	LCI	C
Zoning	M2	ParcelStatus	
Neighborhood	350 - 0	Cost Flag	
Living Units	0	Lot Number	0
Census	08005	A_D	
District No	1		
GIS ID:		ASSOC PID#	

CURRENT ASSESSMENT

Description	Code	Appraised Value	Assessed Value
EX COM LN	21	517,230	
EX COM BL	22	68,400	
EX CM OTB	25	3,770	
	Total	585,630	409,940

6163
WINDHAM, CT

VISION

RECORD OF OWNERSHIP	BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.
WINDHAM TOWN OF	234/ 304	12/12/1972	U	I	0	

PREVIOUS ASSESSMENTS (HISTORY)

Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
2016	200	47,880	2005	200	50,260			
2016	200	362,061	2005	200	402,290			
	Total:	409,940		Total:	452,550		Total:	

EXEMPTIONS

Year	Type	Description	Amount
		Total:	

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm. Int.

This signature acknowledges a visit by a Data Collector or Assessor

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	68,400
Appraised XF (B) Value (Bldg)	0
Appraised OB (L) Value (Bldg)	3,770
Appraised Land Value (Bldg)	517,230
Special Land Value	0
Total Appraised Parcel Value	585,630
Valuation Method:	C
Adjustment:	0
Net Total Appraised Parcel Value	**585,630**

ASSESSING NEIGHBORHOOD

NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
0001/A			900	E

NOTES

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments
29320	07/07/2014	BP		15,000		100		53
27523	01/22/2013	BP		15,000		100		53
27217	10/19/2012	BP		25,000	12/30/2013	100	12/30/2013	53-26
26609	06/05/2012	BP		15,000		100		53
18969	09/27/2006	BP		25,000		100		53
17261	08/30/2005	BP		6,000		0		06
16797	08/02/2005	BP		50,000		100		05

VISIT/ CHANGE HISTORY

Date	Type	IS	ID	Cd.	Purpose/Result
10/11/2010			AO	8	NO RESPONSE
09/26/2003			BM	8	NO RESPONSE

LAND LINE VALUATION SECTION

B #	Use Code	Use Description	Zone	D	Front	Depth	Units		Unit Price	I. Factor	S.A.	Acre Disc	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing	S Adj Fact	Adj. Unit Price	Land Value
1	925	Exempt Comm	M2				0.92	AC	337,500.00	1.0000	0	0.0000	1.00	350	1.00			.00		323,100
1	925	Exempt Comm					24.00	AC	7,920.00	1.0000	0	0.0000	1.00		0.00			.00		190,080
1	925	Exempt Comm					6.00	AC	675.00	1.0000	0	0.0000	1.00		0.00			.00		4,050

Total Card Land Area: 30.92 AC | Total Land Value: 517,230

Property Location: 193 WINDHAM CENTER RD **MAP ID:** 6/9 240/ 29/ / **Bldg Name:** **State Use:** 925

Vision ID: 5764 **Account #** 00168600 **Bldg #:** 1 of 2 **Sec #:** 1 of 1 **Card** 1 of 2 **Print Date:** 08/10/2016 10:53

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
Style	48		Warehouse
Model	94		Commercial
Grade	03		Average
Stories	1.0		
Occupancy	1		
Exterior Wall 1	24		Reinforc Concr
Level From	01		01
Level To	01		01
Uncov Parking	0		
Perimeter	64		
Identical Units	1		
Efficiency	0		
1 Bedroom	0		
2 Bedroom	0		
3 Bedroom	0		
AC Type	03		Central
Structure Type	710		710
Bldg Use	925		Exempt Comm
Percent Finish	100		
Heating	08		Heat Pump
Frame Type	06		Fireprf Steel
Plumbing	00		None
Local Modifier	2.75		
Partitions	02		Average
Wall Height	9		
Size	240		

CONSTRUCTION DETAIL (CONTINUED)

Element	Cd.	Ch.	Description

MIXED USE

Code	Description	Percentage
925	Exempt Comm	100

COST/MARKET VALUATION

Adj. Base Rate:	58.87
AYB	2003
Dep Code	A
Remodel Rating	
Year Remodeled	
Dep %	7
Functional Obslnc	
External Obslnc	
Cost Trend Factor	
Condition	
% Complete	
Overall % Cond	93
Apprais Val	68,400
Dep % Ovr	0
Dep Ovr Comment	
Misc Imp Ovr	0
Misc Imp Ovr Comment	
Cost to Cure Ovr	0
Cost to Cure Ovr Comment	

OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)

Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value
PC3O	PAVING CONC			L	576	1.00	2000				Null	3,040
AP1O	FENCE CHAIN			L	280	1.00	2000				Null	730

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Gross Area
BAS	First Floor	240

Property Location: 193 WINDHAM CENTER RD | MAP ID: 6/9 240/ 29/ / | Bldg Name: | State Use: 925

Vision ID: 5764 | Account # 00168600 | Bldg #: 2 of 2 | Sec #: 1 of 1 | Card 2 of 2 | Print Date: 08/10/2016 10:53

CURRENT OWNER	TOPO.	UTILITIES	STRT./ROAD	LOCATION
WINDHAM TOWN OF WINDHAM CENTER CEMETERY 979 MAIN ST WILLIMANTIC, CT 06226 Additional Owners:	1 Level	5 Well	1 Paved	
		6 Septic		
		0 None		

SUPPLEMENTAL DATA

Other ID:	6- 9/240/ 29	LCI	C
Zoning	M2	ParcelStatus	
Neighborhood	350 - 0	Cost Flag	
Living Units	0	Lot Number	0
Census	08005	A_D	
District No	1		
GIS ID:		ASSOC PID#	

CURRENT ASSESSMENT

Description	Code	Appraised Value	Assessed Value
EX COM LN	21	517,230	
EX COM BL	22	68,400	
EX CM OTB	25	3,770	
	Total	585,630	409,940

6163
WINDHAM, CT

VISION

RECORD OF OWNERSHIP

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2016	200	47,880	2005	200	50,260			
2016	200	362,061	2005	200	402,290			
	Total:	409,940		Total:	452,550		Total:	

EXEMPTIONS

Year	Type	Description	Amount
		Total:	

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm. Int.

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APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	68,400
Appraised XF (B) Value (Bldg)	0
Appraised OB (L) Value (Bldg)	0
Appraised Land Value (Bldg)	0
Special Land Value	0
Total Appraised Parcel Value	585,630
Valuation Method:	C
Adjustment:	0
Net Total Appraised Parcel Value	585,630

ASSESSING NEIGHBORHOOD

NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
0001/A			900	E

NOTES

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments

VISIT/ CHANGE HISTORY

Date	Type	IS	ID	Cd.	Purpose/Result
10/11/2010			AO	8	NO RESPONSE
09/26/2003			BM	8	NO RESPONSE

LAND LINE VALUATION SECTION

B #	Use Code	Use Description	Zone	D	Front	Depth	Units		Unit Price	I. Factor	S.A.	Acre Disc	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing	S Adj Fact	Adj. Unit Price	Land Value
2	925	Exempt Comm					0.00	AC	0.00	1.0000	0	0.0000	1.00		0.00			.00		0

Total Card Land Area: 30.92 AC | Total Land Value: 0

Property Location: 193 WINDHAM CENTER RD **MAP ID:** 6/9 240/ 29/ / **Bldg Name:** **State Use:** 925

Vision ID: 5764 **Account #** 00168600 **Bldg #:** 2 of 2 **Sec #:** 1 of 1 **Card** 2 of 2 **Print Date:** 08/10/2016 10:53

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
Style	48		Warehouse
Model	94		Commercial
Grade	03		Average
Stories	1.0		
Occupancy	1		
Exterior Wall 1	24		Reinforc Concr
Level From	01		01
Level To	01		01
Uncov Parking	0		
Perimeter	84		
Identical Units	1		
Efficiency	0		
1 Bedroom	0		
2 Bedroom	0		
3 Bedroom	0		
AC Type	03		Central
Structure Type	710		710
Bldg Use	925		Exempt Comm
Percent Finish	100		
Heating	08		Heat Pump
Frame Type	06		Fireprf Steel
Plumbing	00		None
Local Modifier	2.75		
Partitions	02		Average
Wall Height	9		
Size	360		

CONSTRUCTION DETAIL (CONTINUED)

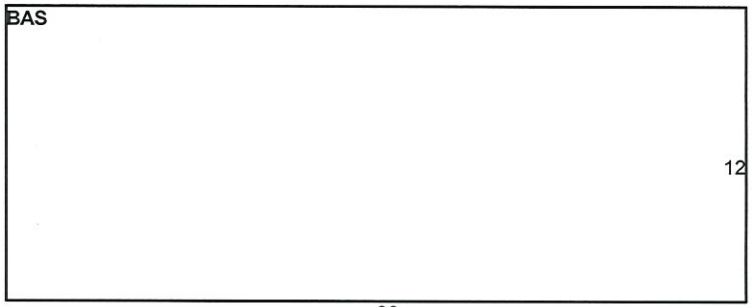
Element	Cd.	Ch.	Description

MIXED USE

Code	Description	Percentage
925	Exempt Comm	100

COST/MARKET VALUATION

Adj. Base Rate:	58.87
AYB	2005
Dep Code	A
Remodel Rating	
Year Remodeled	
Dep %	7
Functional Obslnc	
External Obslnc	
Cost Trend Factor	
Condition	
% Complete	
Overall % Cond	93
Apprais Val	68,400
Dep % Ovr	0
Dep Ovr Comment	
Misc Imp Ovr	0
Misc Imp Ovr Comment	
Cost to Cure Ovr	0
Cost to Cure Ovr Comment	



No Photo On Record

OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)

Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Gross Area
BAS	First Floor	360

EBI Consulting
environmental | engineering | due diligence

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

SPRINT Existing Facility

Site ID: CT72XC043

CT1054-Ring To Existing-(R2E) PH 1A
193 Windham Center Road
Windham, CT 06280

October 25, 2017

EBI Project Number: 6217004748

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	5.26 %

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

EBI Consulting
environmental | engineering | due diligence

October 25, 2017

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

Emissions Analysis for Site: **CT72XC043 – CT1054-Ring To Existing-(R2E) PH 1A**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **193 Windham Center Road, Windham, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **193 Windham Center Road, Windham, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

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

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

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

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

6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

7) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

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

9) The antenna mounting height centerlines of the proposed antennas are **167 feet** above ground level (AGL) for **Sector A**, **167 feet** above ground level (AGL) for **Sector B** and **167 feet** above ground level (AGL) for Sector C.

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

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

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	**167 feet**	Height (AGL):	**167 feet**	Height (AGL):	**167 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	7,537.38	ERP (W):	7,537.38	ERP (W):	7,537.38
Antenna A1 MPE%	**1.18 %**	Antenna B1 MPE%	**1.18 %**	Antenna C1 MPE%	**1.18 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-C-120	Make / Model:	RFS APXVTM14-C-120	Make / Model:	RFS APXVTM14-C-120
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**167 feet**	Height (AGL):	**167 feet**	Height (AGL):	**167 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**0.86 %**	Antenna B2 MPE%	**0.86 %**	Antenna C2 MPE%	**0.86 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**2.05 %**
Verizon Wireless	1.05 %
AT&T	2.16 %
Site Total MPE %:	**5.26 %**

SPRINT Sector A Total:	2.05 %
SPRINT Sector B Total:	2.05 %
SPRINT Sector C Total:	2.05 %
Site Total:	5.26 %

SPRINT _ Max Values per Frequency Band / Technology Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	437.55	167	0.61	850 MHz	567	0.12%
Sprint 850 MHz LTE	2	437.55	167	1.21	850 MHz	567	0.22%
Sprint 1900 MHz (PCS) CDMA	5	622.47	167	4.32	1900 MHz (PCS)	1000	0.43%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	167	4.32	1900 MHz (PCS)	1000	0.43%
Sprint 2500 MHz (BRS) LTE	8	778.09	167	8.63	2500 MHz (BRS)	1000	0.86%
						Total:	**2.06%**

Summary

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

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

SPRINT Sector	Power Density Value (%)
Sector A:	2.05 %
Sector B:	2.05 %
Sector C:	2.05 %
SPRINT Maximum Total (per sector):	2.05 %
Site Total:	5.26 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **5.26 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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

Structural Analysis Report

Existing 180 ft Valmont Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT02721-S

Customer Site Name: South Windham

Carrier Name: Sprint Nextel

Carrier Site ID / Name: CT72XC043 / South Windham

Site Location: 193 Windham Center Road

Windham, Connecticut

Windham County

Latitude: 41.690055

Longitude: -72.162536

Analysis Result:

Max Structural Usage: 66.8% [Pass]

Max Foundation Usage: 47.0% [Pass]

Report Prepared By : Tawfeeq Alajaj

Introduction

The purpose of this report is to summarize the analysis results on the 180 ft Valmont Monopole to support the existing antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Valmont#: 11872-00. dated 06/23/2000.
Foundation Drawing	Valmont#: 11872-00. dated 06/23/2000.
Geotechnical Report	FDH Project Number 1202237EG1 Revision 1. Dated 08/16/2012.
Modification Drawings	N/A

Analysis Criteria

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

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} = 130.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 101.0 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 1" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2012 IBC / 2016 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.173, S_1 = 0.062

Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	177.0	3	Antel - BXA-70063-6CF - Panel	Low Profile Platform	(12) 1 5/8"	Verizon
2		6	Antel - LPA-80080-4CF - Panel			
3		3	Antel - BXA-171085-8BF - Panel			
4		6	RFS FD9R6004-2C-3L Diplexers			
5	167.0	3	RFS - APXVTM14-C-I20 - Panel	Low Profile Platform	(4) 1-1/4" Hybrid	Sprint Nextel
6		3	RFS - APXVSPP18-C-A20 - Panel			
7		4	RFS ACU-A20-N RET			
8		3	Alcatel Lucent TD-RRH8x20-25			
9		3	Alcatel Lucent 1900 MHz RRH			
10		3	Alcatel Lucent 800 MHz RRH			
11		3	Alcatel Lucent 800 MHz Filter			
12	147.0	2	KMW - AM-X-CD-17-65-00T - Panel	Low Profile Platform	(12) 1 5/8"	AT&T
13		6	Powerwave - 7770.00 - Panel			
14		1	Powerwave - P65-17-XLH-RR - Panel			
15		6	CCI DTMABP7819VG12A TMA			
16		6	Ericsson RRUS-11 RRU			
17		1	Raycap DC6-48-60-18-8F			

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:	**66.8%**	**62.6%**	**46.3%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)
Original Design Reactions	5047.0	40.1
Analysis Reactions	4423.9	37.8
Factored Reactions*	6813.5	54.1
% of Design Reactions	64.9%	69.9%

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

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

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the existing equipment is 1.1913 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

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

Standard Conditions

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

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

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

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

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

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

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

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

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

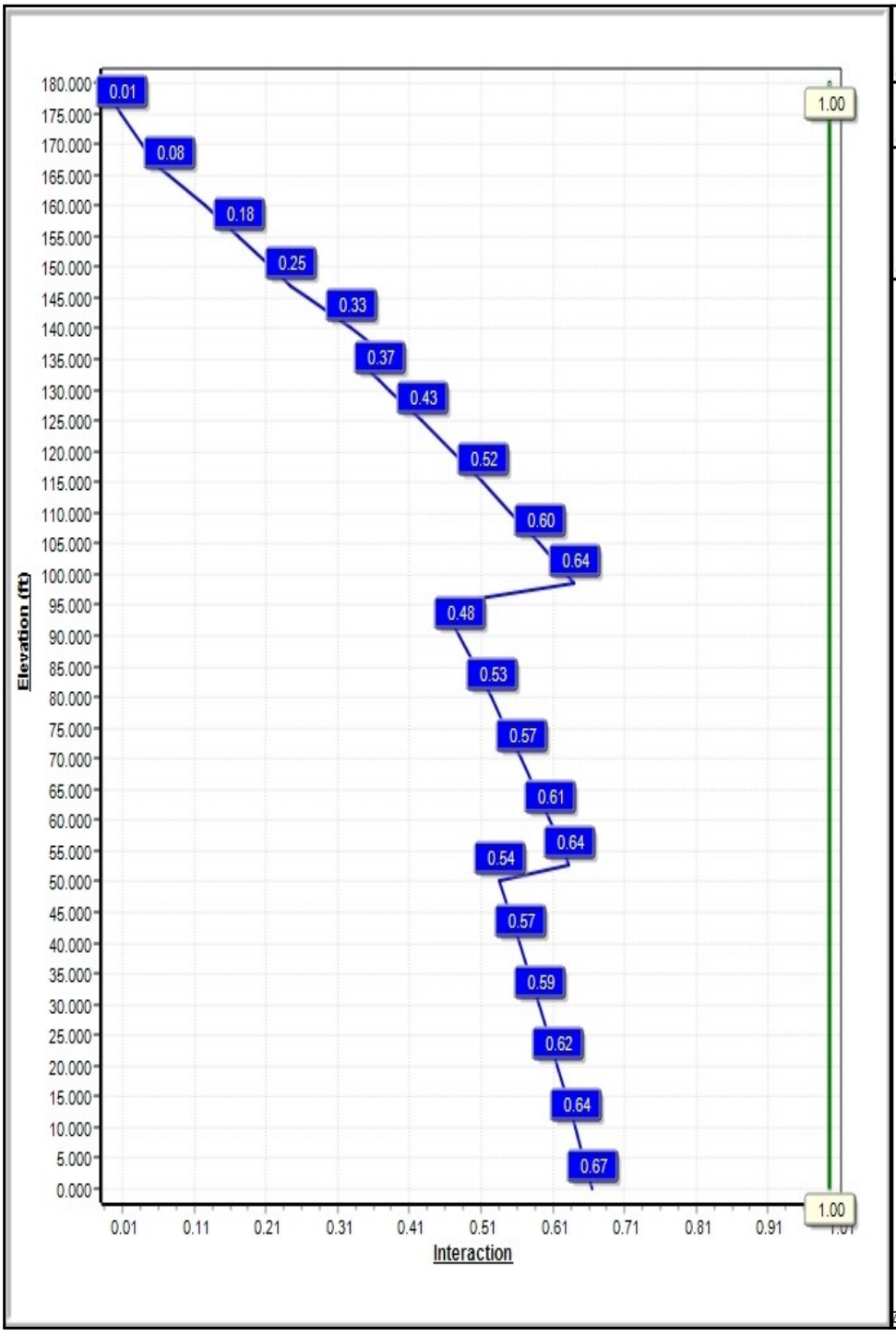
Usage Diagram - Max Ratio 66.84% at 0.0ft

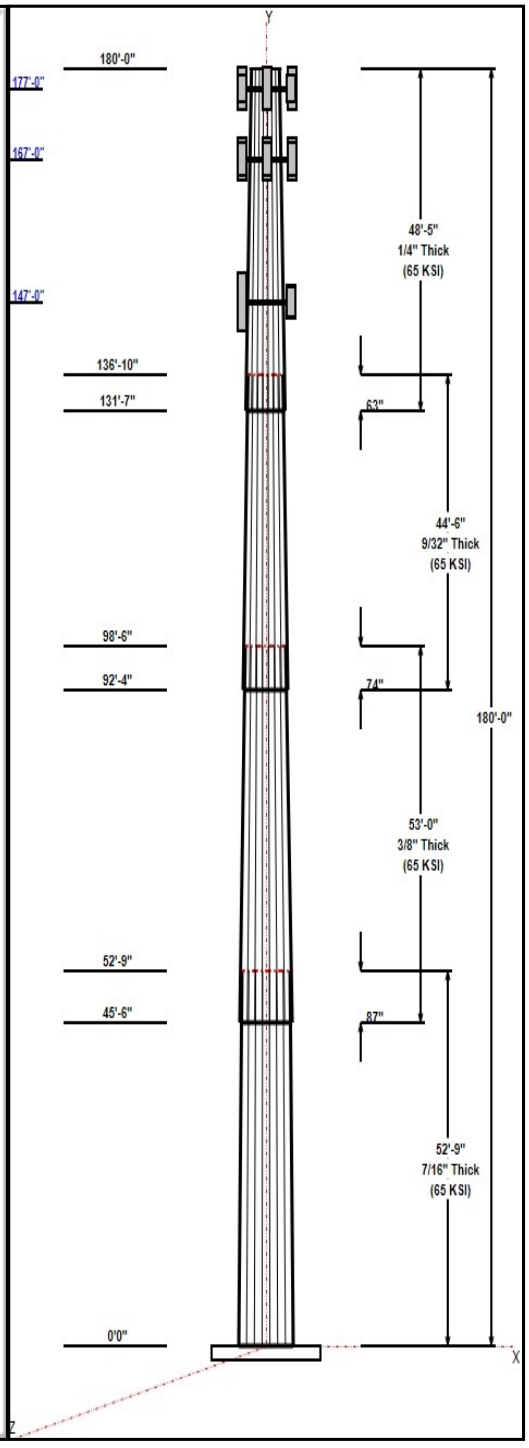
Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017
Site Name:	South Windham	**Exposure:**	C	
Height:	180.00 (ft)	**Gh:**	1.1	
Base Elev:	0.000 (ft)			Page: 1

Tower Engineering Solutions

Dead Load Factor:	1.20	**Iterations:**	25
Wind Load Factor:	1.60		

Load Case : 1.2D + 1.6W 101 mph Wind





Structure: CT02721-S-SBA

Type: Tapered
Site Name: South Windham
Height: 180.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 16 Sided
Taper: 0.19501

10/24/2017

Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	52.75	49.71	60.00	0.438		0.19501	65
2	53.00	41.54	51.88	0.375	Slip	0.19501	65
3	44.50	34.63	43.31	0.281	Slip	0.19501	65
4	48.42	26.71	36.15	0.250	Slip	0.19501	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
177.00	177.00	3	BXA-70063-6CF	Verizon
177.00	177.00	6	LPA-80080-4CF	Verizon
177.00	177.00	3	BXA-171085-8BF	Verizon
177.00	177.00	6	RFS FD9R6004-2C-3L	Verizon
177.00	177.00	1	Low Profile Platform	Verizon
167.00	167.00	1	Low Profile Platform	Sprint Nextel
167.00	167.00	3	APXVTM14-C-I20	Sprint Nextel
167.00	167.00	3	APXVSPP18-C-A20	Sprint Nextel
167.00	167.00	4	RFS ACU-A20-N RET	Sprint Nextel
167.00	167.00	3	Alcatel Lucent	Sprint Nextel
167.00	167.00	3	Alcatel Lucent 1900 MHz	Sprint Nextel
167.00	167.00	3	Alcatel Lucent 800 MHz	Sprint Nextel
167.00	167.00	3	Alcatel Lucent 800 MHz	Sprint Nextel
147.00	147.00	1	Low Profile Platform	AT&T
147.00	147.00	2	AM-X-CD-17-65-00T	AT&T
147.00	147.00	6	7770.00	AT&T
147.00	147.00	1	P65-17-XLH-RR	AT&T
147.00	147.00	6	CCI DTMABP7819VG12A	AT&T
147.00	147.00	6	Ericsson RRUS-11 RRU	AT&T
147.00	147.00	1	Raycap DC6-48-60-18-8F	AT&T

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	177.00	Inside	1 5/8" Coax	Verizon
0.00	167.00	Inside	1-1/4" Hybrid	Sprint Nextel
0.00	147.00	Inside	1 5/8" Coax	AT&T

Anchor Bolts

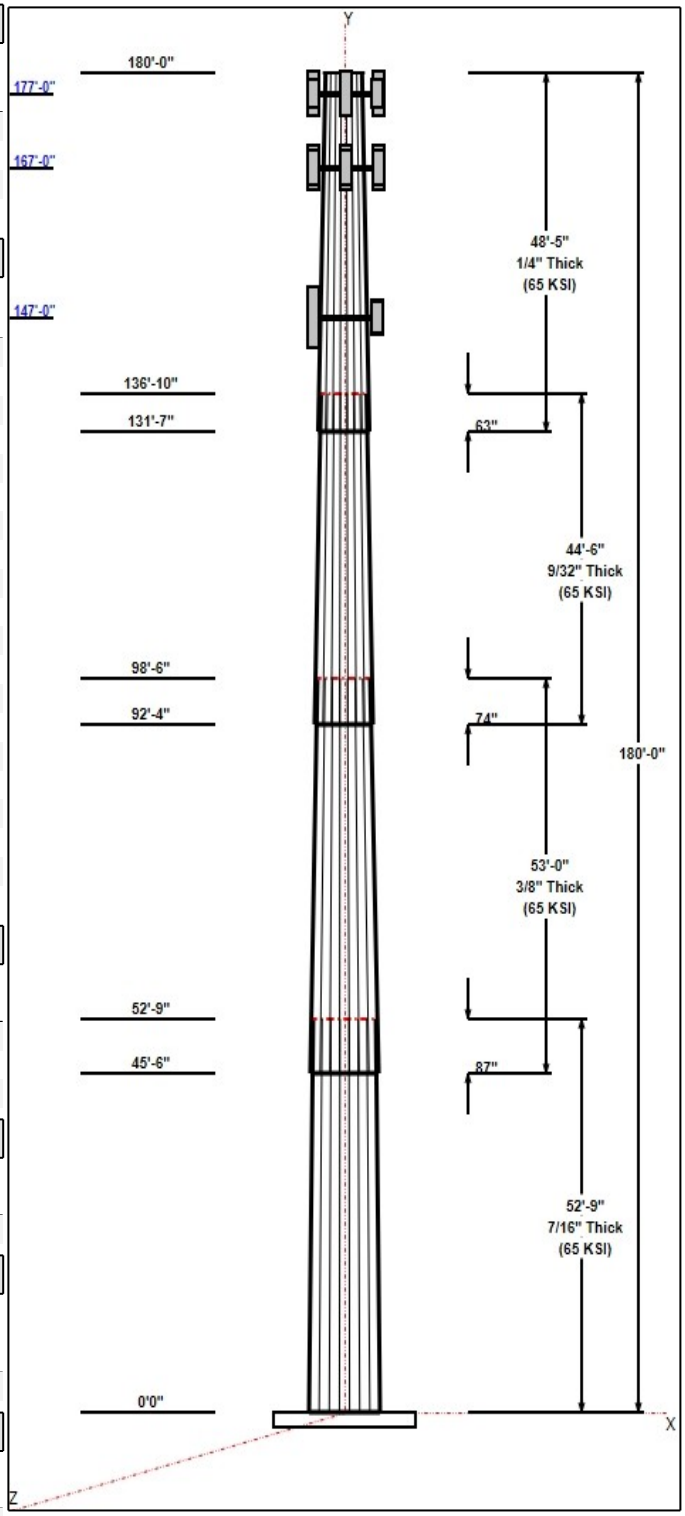
Qty	Specifications	Grade (ksi)	Arrangement
20	2.25" 18J	75.0	Radial

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
3.0000	74.6	50.0	Round

Reactions

Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 101 mph Wind	4423.9	37.8	51.8
0.9D + 1.6W 101 mph Wind	4383.0	37.8	38.9
1.2D + 1.0Di + 1.0Wi 50 mph Wind	1221.5	10.1	84.2
1.2D + 1.0E	208.5	1.7	51.9
0.9D + 1.0E	206.4	1.7	38.9



1.0D + 1.0W 60 mph Wind	970.8	8.3	43.2

Structure: CT02721-S-SBA - Coax Line Placement

Type: Monopole
Site Name: South Windham
Height: 180.00 (ft)

10/24/2017

Tower Engineering Solutions

Shaft Properties

Structure:	CT02721-S-SBA		**Code:**	EIA/TIA-222-G	10/24/2017
Site Name:	South Windham		**Exposure:**	C	
Height:	180.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	16	52.750	0.4375	65		0.00	13,633
2	16	53.000	0.3750	65	Slip	87.00	9,996
3	16	44.500	0.2813	65	Slip	74.00	5,256
4	16	48.417	0.2500	65	Slip	63.00	4,097
					Total Shaft Weight:		**32,982**

	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	60.00	0.00	83.13	37256.48	25.69	137.14	49.71	52.75	68.77	21095.3	21.01	113.6	0.195007
2	51.88	45.50	61.61	20644.91	25.93	138.34	41.54	98.50	49.25	10543.3	20.44	110.7	0.195007
3	43.31	92.33	38.60	9027.72	29.04	153.98	34.63	136.83	30.82	4592.96	22.90	123.1	0.195007
4	36.15	131.5	28.63	4662.62	27.17	144.61	26.71	180.00	21.10	1866.70	19.66	106.8	0.195007

Load Summary

Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 6	

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Discrete Appurtenances

				No Ice			Ice				
No.	**Elev (ft)**	**Description**	**Qty**	**Weight (lb)**	**CaAa (sf)**	**CaAa Factor**	**Weight (lb)**	**CaAa (sf)**	**CaAa Factor**	**Hor. Ecc. (ft)**	**Vert Ecc (ft)**
1	177.00	BXA-70063-6CF	3	17.00	7.57	0.73	271.32	9.322	0.73	0.00	0.00
2	177.00	LPA-80080-4CF	6	12.00	2.61	1.70	168.73	3.828	1.70	0.00	0.00
3	177.00	BXA-171085-8BF	3	10.50	2.94	0.84	99.35	5.188	0.84	0.00	0.00
4	177.00	RFS FD9R6004-2C-3L Diplexers	6	3.10	0.37	0.62	13.98	0.988	0.62	0.00	0.00
5	177.00	Low Profile Platform	1	1500.00	22.00	1.00	3274.34	45.942	1.00	0.00	0.00
6	167.00	Low Profile Platform	1	1200.00	25.00	1.00	2611.24	53.225	1.00	0.00	0.00
7	167.00	APXVTM14-C-I20	3	56.20	6.34	0.77	287.82	7.874	0.77	0.00	0.00
8	167.00	APXVSPP18-C-A20	3	57.00	8.02	0.83	289.96	11.785	0.83	0.00	0.00
9	167.00	RFS ACU-A20-N RET	4	1.00	0.14	0.79	6.79	0.540	0.79	0.00	0.00
10	167.00	Alcatel Lucent TD-RRH8x20-25	3	70.00	4.05	0.67	229.90	5.175	0.67	0.00	0.00
11	167.00	Alcatel Lucent 1900 MHz RRH	3	60.00	2.77	0.67	172.45	4.480	0.67	0.00	0.00
12	167.00	Alcatel Lucent 800 MHz RRH	3	53.00	2.49	0.67	152.68	4.032	0.67	0.00	0.00
13	167.00	Alcatel Lucent 800 MHz Filter	3	8.80	0.78	0.69	32.58	1.652	0.69	0.00	0.00
14	147.00	Low Profile Platform	1	1200.00	25.00	1.00	2593.35	52.867	1.00	0.00	0.00
15	147.00	AM-X-CD-17-65-00T	2	30.80	5.00	0.75	179.83	7.494	0.75	0.00	0.00
16	147.00	7770.00	6	35.00	5.50	0.73	228.61	6.948	0.73	0.00	0.00
17	147.00	P65-17-XLH-RR	1	59.00	11.44	0.75	347.22	15.744	0.75	0.00	0.00
18	147.00	CCI DTMABP7819VG12A TMA	6	19.20	1.14	0.67	53.16	2.164	0.67	0.00	0.00
19	147.00	Ericsson RRUS-11 RRU	6	50.70	2.52	0.67	178.44	3.412	0.67	0.00	0.00
20	147.00	Raycap DC6-48-60-18-8F	1	31.80	0.92	1.00	114.07	1.503	1.00	0.00	0.00
		Totals:	**65**	**5,773.90**			**17,792.77**				

Linear Appurtenances

Bottom Elev. (ft)	**Top Elev. (ft)**	**Description**	**Exposed Width**	**Exposed**
0.00	177.00	(12) 1 5/8" Coax	0.00	Inside
0.00	167.00	(4) 1-1/4" Hybrid	0.00	Inside
0.00	147.00	(12) 1 5/8" Coax	0.00	Inside

Shaft Section Properties

Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 7	

Increment Length: **5 (ft)**

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in^3)	Weight (lb)
0.00		0.4375	60.000	83.127	37256.5	25.69	137.14	73.5	1218.	0.0
5.00		0.4375	59.025	81.766	35456.6	25.24	134.91	74.0	1178.	1402.7
10.00		0.4375	58.050	80.405	33715.7	24.80	132.69	74.5	1139.	1379.6
15.00		0.4375	57.075	79.045	32032.6	24.36	130.46	75.0	1100.	1356.4
20.00		0.4375	56.100	77.684	30406.6	23.91	128.23	75.5	1063.	1333.3
25.00		0.4375	55.125	76.323	28836.5	23.47	126.00	76.0	1026.	1310.1
30.00		0.4375	54.150	74.962	27321.5	23.03	123.77	76.5	989.7	1287.0
35.00		0.4375	53.175	73.601	25860.4	22.58	121.54	77.0	954.0	1263.8
40.00		0.4375	52.200	72.241	24452.4	22.14	119.31	77.5	918.9	1240.7
45.00		0.4375	51.225	70.880	23096.5	21.70	117.08	78.0	884.4	1217.5
45.50	Bot - Section 2	0.4375	51.127	70.744	22963.7	21.65	116.86	78.1	881.0	120.5
50.00		0.4375	50.250	69.519	21791.6	21.26	114.86	78.5	850.7	2009.2
52.75	Top - Section 1	0.3750	50.463	59.918	18991.0	25.18	134.57	0.0	0.0	1210.7
55.00		0.3750	50.025	59.393	18496.2	24.94	133.40	74.3	725.3	456.7
60.00		0.3750	49.050	58.227	17427.8	24.43	130.80	74.9	697.0	1000.6
65.00		0.3750	48.075	57.061	16401.3	23.91	128.20	75.5	669.2	980.7
70.00		0.3750	47.099	55.894	15415.9	23.39	125.60	76.1	642.0	960.9
75.00		0.3750	46.124	54.728	14470.9	22.87	123.00	76.7	615.4	941.1
80.00		0.3750	45.149	53.561	13565.2	22.36	120.40	77.3	589.4	921.2
85.00		0.3750	44.174	52.395	12698.1	21.84	117.80	77.9	563.9	901.4
90.00		0.3750	43.199	51.229	11868.9	21.32	115.20	78.4	538.9	881.5
92.33	Bot - Section 3	0.3750	42.744	50.684	11494.5	21.08	113.98	78.7	527.5	404.6
95.00		0.3750	42.224	50.062	11076.5	20.81	112.60	79.0	514.6	805.3
98.50	Top - Section 2	0.2813	42.104	37.523	8291.7	28.19	149.70	0.0	0.0	1041.9
100.00		0.2813	41.812	37.261	8119.0	27.98	148.66	70.9	380.9	190.9
105.00		0.2813	40.837	36.386	7560.4	27.29	145.20	71.7	363.2	626.5
110.00		0.2813	39.862	35.511	7028.1	26.60	141.73	72.5	345.9	611.6
115.00		0.2813	38.887	34.636	6521.4	25.91	138.26	73.3	329.0	596.7
120.00		0.2813	37.912	33.762	6039.7	25.22	134.80	74.0	312.5	581.9
125.00		0.2813	36.937	32.887	5582.3	24.53	131.33	74.8	296.5	567.0
130.00		0.2813	35.962	32.012	5148.5	23.84	127.86	75.6	280.8	552.1
131.58	Bot - Section 4	0.2813	35.653	31.735	5016.0	23.62	126.77	75.8	276.0	171.7
135.00		0.2813	34.987	31.137	4737.9	23.15	124.40	76.4	265.6	695.3
136.83	Top - Section 3	0.2500	35.129	27.816	4275.0	26.36	140.52	0.0	0.0	367.7
140.00		0.2500	34.511	27.324	4051.9	25.87	138.05	73.3	230.3	297.1
145.00		0.2500	33.536	26.546	3715.8	25.09	134.15	74.2	217.3	458.3
147.00		0.2500	33.146	26.235	3586.7	24.78	132.59	74.5	212.3	179.6
150.00		0.2500	32.561	25.768	3398.7	24.32	130.25	75.1	204.7	265.4
155.00		0.2500	31.586	24.991	3100.2	23.54	126.35	75.9	192.5	431.8
160.00		0.2500	30.611	24.213	2819.7	22.76	122.45	76.8	180.7	418.6
165.00		0.2500	29.636	23.436	2556.7	21.99	118.55	77.7	169.2	405.3
167.00		0.2500	29.246	23.125	2456.2	21.68	116.99	78.0	164.7	158.4
170.00		0.2500	28.661	22.658	2310.6	21.21	114.65	78.6	158.1	233.7
175.00		0.2500	27.686	21.880	2080.7	20.44	110.74	79.4	147.4	378.9
177.00		0.2500	27.296	21.569	1993.3	20.13	109.18	79.8	143.2	147.8
180.00		0.2500	26.711	21.103	1866.7	19.66	106.84	80.3	137.1	217.8
										32981.5

Wind Loading - Shaft

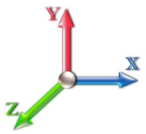
Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	21.088	23.20	474.71	0.750	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	21.088	23.20	466.99	0.750	0.000	5.00	25.283	18.96	703.8	0.0	1683.3
10.00		1.00	0.85	21.088	23.20	459.28	0.750	0.000	5.00	24.868	18.65	692.2	0.0	1655.5
15.00		1.00	0.85	21.088	23.20	451.57	0.750	0.000	5.00	24.454	18.34	680.7	0.0	1627.7
20.00		1.00	0.90	22.375	24.61	457.20	0.750	0.000	5.00	24.040	18.03	710.0	0.0	1599.9
25.00		1.00	0.95	23.451	25.80	459.93	0.750	0.000	5.00	23.626	17.72	731.3	0.0	1572.2
30.00		1.00	0.98	24.369	26.81	460.55	0.750	0.000	5.00	23.212	17.41	746.6	0.0	1544.4
35.00		1.00	1.01	25.172	27.69	459.65	0.750	0.000	5.00	22.797	17.10	757.5	0.0	1516.6
40.00		1.00	1.04	25.890	28.48	457.61	0.750	0.000	5.00	22.383	16.79	764.9	0.0	1488.8
45.00		1.00	1.07	26.540	29.19	454.67	0.750	0.000	5.00	21.969	16.48	769.6	0.0	1461.0
45.50	Bot - Section 2	1.00	1.07	26.602	29.26	454.33	0.750	0.000	0.50	2.174	1.63	76.3	0.0	144.6
50.00		1.00	1.09	27.135	29.85	450.99	0.750	0.000	4.50	19.667	14.75	704.5	0.0	2411.1
52.75	Top - Section 1	1.00	1.11	27.443	30.19	448.69	0.750	0.000	2.75	11.854	8.89	429.4	0.0	1452.9
55.00		1.00	1.12	27.685	30.45	453.49	0.750	0.000	2.25	9.605	7.20	351.0	0.0	548.1
60.00		1.00	1.14	28.197	31.02	448.75	0.750	0.000	5.00	21.045	15.78	783.3	0.0	1200.7
65.00		1.00	1.16	28.676	31.54	443.55	0.750	0.000	5.00	20.631	15.47	780.9	0.0	1176.9
70.00		1.00	1.17	29.127	32.04	437.95	0.750	0.000	5.00	20.216	15.16	777.3	0.0	1153.1
75.00		1.00	1.19	29.553	32.51	432.01	0.750	0.000	5.00	19.802	14.85	772.5	0.0	1129.3
80.00		1.00	1.21	29.958	32.95	425.76	0.750	0.000	5.00	19.388	14.54	766.7	0.0	1105.5
85.00		1.00	1.22	30.342	33.38	419.24	0.750	0.000	5.00	18.974	14.23	759.9	0.0	1081.6
90.00		1.00	1.24	30.710	33.78	412.46	0.750	0.000	5.00	18.559	13.92	752.3	0.0	1057.8
92.33	Bot - Section 3	1.00	1.24	30.876	33.96	409.21	0.750	0.000	2.33	8.519	6.39	347.2	0.0	485.5
95.00		1.00	1.25	31.061	34.17	405.45	0.750	0.000	2.67	9.753	7.32	399.9	0.0	966.3
98.50	Top - Section 2	1.00	1.26	31.299	34.43	400.42	0.750	0.000	3.50	12.622	9.47	521.5	0.0	1250.3
100.00		1.00	1.27	31.399	34.54	403.66	0.750	0.000	1.50	5.348	4.01	221.6	0.0	229.0
105.00		1.00	1.28	31.723	34.89	396.28	0.750	0.000	5.00	17.556	13.17	735.1	0.0	751.8
110.00		1.00	1.29	32.035	35.24	388.71	0.750	0.000	5.00	17.142	12.86	724.8	0.0	733.9
115.00		1.00	1.30	32.336	35.57	380.98	0.750	0.000	5.00	16.727	12.55	714.0	0.0	716.1
120.00		1.00	1.32	32.627	35.89	373.10	0.750	0.000	5.00	16.313	12.23	702.6	0.0	698.2
125.00		1.00	1.33	32.909	36.20	365.07	0.750	0.000	5.00	15.899	11.92	690.6	0.0	680.4
130.00		1.00	1.34	33.182	36.50	356.90	0.750	0.000	5.00	15.485	11.61	678.2	0.0	662.5
131.58	Bot - Section 4	1.00	1.34	33.266	36.59	354.29	0.750	0.000	1.58	4.817	3.61	211.5	0.0	206.1
135.00		1.00	1.35	33.446	36.79	348.61	0.750	0.000	3.42	10.398	7.80	459.1	0.0	834.3
136.83	Top - Section 3	1.00	1.35	33.541	36.90	345.54	0.750	0.000	1.83	5.500	4.12	243.5	0.0	441.2
140.00		1.00	1.36	33.703	37.07	345.19	0.750	0.000	3.17	9.369	7.03	416.8	0.0	356.5
145.00		1.00	1.37	33.953	37.35	336.68	0.750	0.000	5.00	14.454	10.84	647.8	0.0	549.9
147.00	Appurtenance(s)	1.00	1.37	34.051	37.46	333.25	0.750	0.000	2.00	5.666	4.25	254.7	0.0	215.5
150.00		1.00	1.38	34.196	37.62	328.06	0.750	0.000	3.00	8.374	6.28	378.0	0.0	318.5
155.00		1.00	1.39	34.433	37.88	319.34	0.750	0.000	5.00	13.626	10.22	619.3	0.0	518.2
160.00		1.00	1.40	34.664	38.13	310.52	0.750	0.000	5.00	13.212	9.91	604.5	0.0	502.3
165.00		1.00	1.41	34.890	38.38	301.60	0.750	0.000	5.00	12.797	9.60	589.4	0.0	486.4
167.00	Appurtenance(s)	1.00	1.41	34.978	38.48	298.01	0.750	0.000	2.00	5.003	3.75	231.0	0.0	190.1
170.00		1.00	1.42	35.110	38.62	292.60	0.750	0.000	3.00	7.380	5.54	342.0	0.0	280.4
175.00		1.00	1.42	35.324	38.86	283.51	0.750	0.000	5.00	11.969	8.98	558.1	0.0	454.7
177.00	Appurtenance(s)	1.00	1.43	35.409	38.95	279.85	0.750	0.000	2.00	4.672	3.50	218.4	0.0	177.4
180.00		1.00	1.43	35.535	39.09	274.34	0.750	0.000	3.00	6.883	5.16	322.9	0.0	261.4

Wind Loading - Shaft

Structure:	CT02721-S-SBA		**Code:**	EIA/TIA-222-G	10/24/2017
Site Name:	South Windham		**Exposure:**	C	
Height:	180.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 9

Tower Engineering Solutions

Totals:	**180.00**	**25,343.5**	**39,577.8**

Discrete Appurtenance Forces

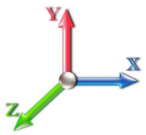
Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 10	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	177.00	RFS FD9R6004-2C-3L	6	35.409	38.950	0.50	0.80	1.10	22.32	0.000	0.000	68.62	0.00	0.00
2	177.00	BXA-171085-8BF	3	35.409	38.950	0.67	0.80	5.93	37.80	0.000	0.000	369.37	0.00	0.00
3	177.00	LPA-80080-4CF	6	35.409	38.950	1.36	0.80	21.30	86.40	0.000	0.000	1327.26	0.00	0.00
4	177.00	BXA-70063-6CF	3	35.409	38.950	0.58	0.80	13.26	61.20	0.000	0.000	826.53	0.00	0.00
5	177.00	Low Profile Platform	1	35.409	38.950	1.00	1.00	22.00	1800.00	0.000	0.000	1371.04	0.00	0.00
6	167.00	RFS ACU-A20-N RET	4	34.978	38.476	0.63	0.80	0.35	4.80	0.000	0.000	21.79	0.00	0.00
7	167.00	Alcatel Lucent 800 MHz	3	34.978	38.476	0.55	0.80	1.29	31.68	0.000	0.000	79.52	0.00	0.00
8	167.00	Alcatel Lucent 800 MHz	3	34.978	38.476	0.54	0.80	4.00	190.80	0.000	0.000	246.49	0.00	0.00
9	167.00	Alcatel Lucent 1900 MHz	3	34.978	38.476	0.54	0.80	4.45	216.00	0.000	0.000	274.21	0.00	0.00
10	167.00	Alcatel Lucent	3	34.978	38.476	0.54	0.80	6.51	252.00	0.000	0.000	400.91	0.00	0.00
11	167.00	APXVSPP18-C-A20	3	34.978	38.476	0.66	0.80	15.98	205.20	0.000	0.000	983.50	0.00	0.00
12	167.00	APXVTM14-C-I20	3	34.978	38.476	0.62	0.80	11.72	202.32	0.000	0.000	721.27	0.00	0.00
13	167.00	Low Profile Platform	1	34.978	38.476	1.00	1.00	25.00	1440.00	0.000	0.000	1539.04	0.00	0.00
14	147.00	Raycap DC6-48-60-18-8F	1	34.051	37.456	0.80	0.80	0.74	38.16	0.000	0.000	44.11	0.00	0.00
15	147.00	Ericsson RRUS-11 RRU	6	34.051	37.456	0.54	0.80	8.10	365.04	0.000	0.000	485.69	0.00	0.00
16	147.00	CCI DTMABP7819VG12A	6	34.051	37.456	0.54	0.80	3.67	138.24	0.000	0.000	219.72	0.00	0.00
17	147.00	P65-17-XLH-RR	1	34.051	37.456	0.60	0.80	6.86	70.80	0.000	0.000	411.36	0.00	0.00
18	147.00	7770.00	6	34.051	37.456	0.58	0.80	19.27	252.00	0.000	0.000	1154.98	0.00	0.00
19	147.00	AM-X-CD-17-65-00T	2	34.051	37.456	0.60	0.80	6.00	73.92	0.000	0.000	359.58	0.00	0.00
20	147.00	Low Profile Platform	1	34.051	37.456	1.00	1.00	25.00	1440.00	0.000	0.000	1498.26	0.00	0.00
							Totals:		**6,928.68**			**12,403.25**		

Total Applied Force Summary

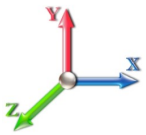
Structure:	CT02721-S-SBA		**Code:**	EIA/TIA-222-G	10/24/2017
Site Name:	South Windham		**Exposure:**	C	
Height:	180.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 11

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		703.76	1848.88	0.00	0.00
10.00		692.23	1821.10	0.00	0.00
15.00		680.70	1793.32	0.00	0.00
20.00		710.01	1765.54	0.00	0.00
25.00		731.34	1737.75	0.00	0.00
30.00		746.63	1709.97	0.00	0.00
35.00		757.50	1682.19	0.00	0.00
40.00		764.94	1654.40	0.00	0.00
45.00		769.63	1626.62	0.00	0.00
45.50		76.34	161.13	0.00	0.00
50.00		704.45	2560.13	0.00	0.00
52.75		429.40	1543.95	0.00	0.00
55.00		351.02	622.61	0.00	0.00
60.00		783.29	1366.31	0.00	0.00
65.00		780.92	1342.49	0.00	0.00
70.00		777.28	1318.68	0.00	0.00
75.00		772.49	1294.87	0.00	0.00
80.00		766.68	1271.05	0.00	0.00
85.00		759.93	1247.24	0.00	0.00
90.00		752.34	1223.42	0.00	0.00
92.33		347.21	562.78	0.00	0.00
95.00		399.90	1054.62	0.00	0.00
98.50		521.49	1366.20	0.00	0.00
100.00		221.63	278.71	0.00	0.00
105.00		735.13	917.41	0.00	0.00
110.00		724.85	899.55	0.00	0.00
115.00		713.98	881.69	0.00	0.00
120.00		702.57	863.83	0.00	0.00
125.00		690.64	845.97	0.00	0.00
130.00		678.22	828.11	0.00	0.00
131.58		211.53	258.51	0.00	0.00
135.00		459.08	947.49	0.00	0.00
136.83		243.51	501.92	0.00	0.00
140.00		416.80	461.37	0.00	0.00
145.00		647.82	715.52	0.00	0.00
147.00	(23) attachments	4428.36	2659.92	0.00	0.00
150.00		378.01	372.95	0.00	0.00
155.00		619.33	608.89	0.00	0.00
160.00		604.53	593.01	0.00	0.00
165.00		589.38	577.13	0.00	0.00
167.00	(23) attachments	4497.72	2769.21	0.00	0.00
170.00		342.03	325.35	0.00	0.00
175.00		558.10	529.54	0.00	0.00
177.00	(19) attachments	4181.17	2215.09	0.00	0.00
180.00		322.86	261.37	0.00	0.00

Total Applied Force Summary

Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Totals:	**37,746.74**	**51,887.79**	**0.00**	**0.00**

Calculated Forces

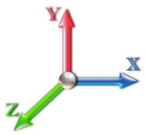
Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

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	-51.83	-37.82	0.00	-4423.8	0.00	4423.87	5499.24	2749.62	13525.8	6714.82	0.00	0.000	0.000	0.668
5.00	-49.88	-37.26	0.00	-4234.7	0.00	4234.76	5446.13	2723.06	13174.3	6540.31	0.09	-0.165	0.000	0.657
10.00	-47.95	-36.70	0.00	-4048.4	0.00	4048.47	5391.79	2695.89	12824.2	6366.50	0.35	-0.331	0.000	0.645
15.00	-46.06	-36.14	0.00	-3864.9	0.00	3864.97	5336.22	2668.11	12475.6	6193.44	0.79	-0.498	0.000	0.633
20.00	-44.20	-35.54	0.00	-3684.2	0.00	3684.27	5279.42	2639.71	12128.7	6021.23	1.40	-0.666	0.000	0.620
25.00	-42.37	-34.91	0.00	-3506.5	0.00	3506.56	5221.40	2610.70	11783.6	5849.92	2.19	-0.834	0.000	0.608
30.00	-40.57	-34.26	0.00	-3332.0	0.00	3332.00	5162.14	2581.07	11440.6	5679.60	3.15	-1.003	0.000	0.595
35.00	-38.80	-33.58	0.00	-3160.7	0.00	3160.71	5101.66	2550.83	11099.6	5510.34	4.29	-1.172	0.000	0.581
40.00	-37.07	-32.89	0.00	-2992.8	0.00	2992.80	5039.95	2519.97	10760.9	5342.21	5.61	-1.341	0.000	0.568
45.00	-35.41	-32.14	0.00	-2828.3	0.00	2828.34	4977.01	2488.50	10424.7	5175.29	7.11	-1.510	0.000	0.554
45.50	-35.20	-32.11	0.00	-2812.2	0.00	2812.27	4970.65	2485.32	10391.2	5158.66	7.27	-1.528	0.000	0.552
50.00	-32.59	-31.41	0.00	-2667.7	0.00	2667.77	4912.84	2456.42	10091.1	5009.65	8.78	-1.681	0.000	0.539
52.75	-31.02	-30.98	0.00	-2581.4	0.00	2581.40	3995.11	1997.56	8262.19	4101.70	9.78	-1.775	0.000	0.637
55.00	-30.33	-30.68	0.00	-2511.7	0.00	2511.70	3974.19	1987.10	8146.39	4044.21	10.63	-1.852	0.000	0.629
60.00	-28.90	-29.94	0.00	-2358.3	0.00	2358.32	3926.81	1963.41	7890.01	3916.93	12.67	-2.039	0.000	0.610
65.00	-27.49	-29.20	0.00	-2208.6	0.00	2208.62	3878.20	1939.10	7635.05	3790.36	14.91	-2.226	0.000	0.590
70.00	-26.11	-28.46	0.00	-2062.6	0.00	2062.61	3828.36	1914.18	7381.67	3664.57	17.34	-2.411	0.000	0.570
75.00	-24.77	-27.71	0.00	-1920.3	0.00	1920.34	3777.30	1888.65	7130.01	3539.64	19.96	-2.595	0.000	0.549
80.00	-23.45	-26.95	0.00	-1781.8	0.00	1781.81	3725.00	1862.50	6880.23	3415.63	22.78	-2.777	0.000	0.528
85.00	-22.16	-26.20	0.00	-1647.0	0.00	1647.04	3671.48	1835.74	6632.46	3292.63	25.78	-2.957	0.000	0.506
90.00	-20.92	-25.43	0.00	-1516.0	0.00	1516.03	3616.73	1808.36	6386.87	3170.71	28.97	-3.134	0.000	0.484
92.33	-20.34	-25.09	0.00	-1456.6	0.00	1456.69	3590.75	1795.38	6273.05	3114.21	30.53	-3.217	0.000	0.474
95.00	-19.26	-24.66	0.00	-1389.7	0.00	1389.79	3560.74	1780.37	6143.61	3049.94	32.35	-3.311	0.000	0.461
98.50	-17.89	-24.09	0.00	-1303.4	0.00	1303.47	2386.86	1193.43	4124.78	2047.71	34.82	-3.432	0.000	0.644
100.00	-17.57	-23.89	0.00	-1267.3	0.00	1267.34	2378.02	1189.01	4080.56	2025.76	35.91	-3.484	0.000	0.633
105.00	-16.62	-23.16	0.00	-1147.8	0.00	1147.87	2347.74	1173.87	3933.38	1952.70	39.67	-3.695	0.000	0.595
110.00	-15.69	-22.43	0.00	-1032.0	0.00	1032.06	2316.23	1158.11	3786.65	1879.85	43.65	-3.901	0.000	0.556
115.00	-14.79	-21.71	0.00	-919.89	0.00	919.89	2283.49	1141.75	3640.52	1807.31	47.84	-4.098	0.000	0.516
120.00	-13.91	-20.99	0.00	-811.34	0.00	811.34	2249.53	1124.76	3495.14	1735.13	52.23	-4.287	0.000	0.474
125.00	-13.06	-20.28	0.00	-706.38	0.00	706.38	2214.33	1107.17	3350.65	1663.40	56.81	-4.466	0.000	0.431
130.00	-12.25	-19.56	0.00	-604.99	0.00	604.99	2177.91	1088.96	3207.21	1592.19	61.57	-4.633	0.000	0.386
131.58	-11.98	-19.34	0.00	-574.02	0.00	574.02	2166.12	1083.06	3162.03	1569.76	63.12	-4.684	0.000	0.372
135.00	-11.05	-18.82	0.00	-507.93	0.00	507.93	2140.26	1070.13	3064.96	1521.58	66.50	-4.789	0.000	0.339
136.83	-10.55	-18.55	0.00	-473.42	0.00	473.42	1821.16	910.58	2623.48	1302.41	68.35	-4.843	0.000	0.370
140.00	-10.09	-18.12	0.00	-414.68	0.00	414.68	1802.58	901.29	2550.43	1266.14	71.59	-4.930	0.000	0.334
145.00	-9.40	-17.42	0.00	-324.09	0.00	324.09	1772.26	886.13	2435.64	1209.15	76.82	-5.060	0.000	0.274
147.00	-7.14	-12.78	0.00	-289.25	0.00	289.25	1759.78	879.89	2389.94	1186.47	78.95	-5.107	0.000	0.248
150.00	-6.78	-12.38	0.00	-250.90	0.00	250.90	1740.70	870.35	2321.67	1152.58	82.18	-5.171	0.000	0.222
155.00	-6.21	-11.72	0.00	-188.98	0.00	188.98	1707.91	853.96	2208.68	1096.48	87.64	-5.263	0.000	0.176
160.00	-5.67	-11.07	0.00	-130.38	0.00	130.38	1673.90	836.95	2096.80	1040.94	93.18	-5.336	0.000	0.129
165.00	-5.14	-10.43	0.00	-75.04	0.00	75.04	1638.66	819.33	1986.20	986.03	98.79	-5.388	0.000	0.079
167.00	-2.81	-5.69	0.00	-54.17	0.00	54.17	1624.22	812.11	1942.34	964.26	101.05	-5.403	0.000	0.058
170.00	-2.51	-5.32	0.00	-37.09	0.00	37.09	1602.19	801.09	1877.01	931.83	104.45	-5.419	0.000	0.041
175.00	-2.04	-4.72	0.00	-10.47	0.00	10.47	1564.49	782.24	1769.40	878.40	110.12	-5.433	0.000	0.013
177.00	-0.23	-0.35	0.00	-1.04	0.00	1.04	1549.06	774.53	1726.82	857.27	112.40	-5.435	0.000	0.001
180.00	0.00	-0.32	0.00	0.00	0.00	0.00	1525.56	762.78	1663.50	825.83	115.81	-5.435	0.000	0.000

Wind Loading - Shaft

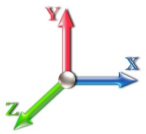
Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 25

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	21.088	23.20	474.71	0.750	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	21.088	23.20	466.99	0.750	0.000	5.00	25.283	18.96	703.8	0.0	1262.5
10.00		1.00	0.85	21.088	23.20	459.28	0.750	0.000	5.00	24.868	18.65	692.2	0.0	1241.6
15.00		1.00	0.85	21.088	23.20	451.57	0.750	0.000	5.00	24.454	18.34	680.7	0.0	1220.8
20.00		1.00	0.90	22.375	24.61	457.20	0.750	0.000	5.00	24.040	18.03	710.0	0.0	1200.0
25.00		1.00	0.95	23.451	25.80	459.93	0.750	0.000	5.00	23.626	17.72	731.3	0.0	1179.1
30.00		1.00	0.98	24.369	26.81	460.55	0.750	0.000	5.00	23.212	17.41	746.6	0.0	1158.3
35.00		1.00	1.01	25.172	27.69	459.65	0.750	0.000	5.00	22.797	17.10	757.5	0.0	1137.4
40.00		1.00	1.04	25.890	28.48	457.61	0.750	0.000	5.00	22.383	16.79	764.9	0.0	1116.6
45.00		1.00	1.07	26.540	29.19	454.67	0.750	0.000	5.00	21.969	16.48	769.6	0.0	1095.8
45.50	Bot - Section 2	1.00	1.07	26.602	29.26	454.33	0.750	0.000	0.50	2.174	1.63	76.3	0.0	108.4
50.00		1.00	1.09	27.135	29.85	450.99	0.750	0.000	4.50	19.667	14.75	704.5	0.0	1808.3
52.75	Top - Section 1	1.00	1.11	27.443	30.19	448.69	0.750	0.000	2.75	11.854	8.89	429.4	0.0	1089.7
55.00		1.00	1.12	27.685	30.45	453.49	0.750	0.000	2.25	9.605	7.20	351.0	0.0	411.1
60.00		1.00	1.14	28.197	31.02	448.75	0.750	0.000	5.00	21.045	15.78	783.3	0.0	900.5
65.00		1.00	1.16	28.676	31.54	443.55	0.750	0.000	5.00	20.631	15.47	780.9	0.0	882.7
70.00		1.00	1.17	29.127	32.04	437.95	0.750	0.000	5.00	20.216	15.16	777.3	0.0	864.8
75.00		1.00	1.19	29.553	32.51	432.01	0.750	0.000	5.00	19.802	14.85	772.5	0.0	846.9
80.00		1.00	1.21	29.958	32.95	425.76	0.750	0.000	5.00	19.388	14.54	766.7	0.0	829.1
85.00		1.00	1.22	30.342	33.38	419.24	0.750	0.000	5.00	18.974	14.23	759.9	0.0	811.2
90.00		1.00	1.24	30.710	33.78	412.46	0.750	0.000	5.00	18.559	13.92	752.3	0.0	793.4
92.33	Bot - Section 3	1.00	1.24	30.876	33.96	409.21	0.750	0.000	2.33	8.519	6.39	347.2	0.0	364.1
95.00		1.00	1.25	31.061	34.17	405.45	0.750	0.000	2.67	9.753	7.32	399.9	0.0	724.7
98.50	Top - Section 2	1.00	1.26	31.299	34.43	400.42	0.750	0.000	3.50	12.622	9.47	521.5	0.0	937.7
100.00		1.00	1.27	31.399	34.54	403.66	0.750	0.000	1.50	5.348	4.01	221.6	0.0	171.8
105.00		1.00	1.28	31.723	34.89	396.28	0.750	0.000	5.00	17.556	13.17	735.1	0.0	563.9
110.00		1.00	1.29	32.035	35.24	388.71	0.750	0.000	5.00	17.142	12.86	724.8	0.0	550.5
115.00		1.00	1.30	32.336	35.57	380.98	0.750	0.000	5.00	16.727	12.55	714.0	0.0	537.1
120.00		1.00	1.32	32.627	35.89	373.10	0.750	0.000	5.00	16.313	12.23	702.6	0.0	523.7
125.00		1.00	1.33	32.909	36.20	365.07	0.750	0.000	5.00	15.899	11.92	690.6	0.0	510.3
130.00		1.00	1.34	33.182	36.50	356.90	0.750	0.000	5.00	15.485	11.61	678.2	0.0	496.9
131.58	Bot - Section 4	1.00	1.34	33.266	36.59	354.29	0.750	0.000	1.58	4.817	3.61	211.5	0.0	154.6
135.00		1.00	1.35	33.446	36.79	348.61	0.750	0.000	3.42	10.398	7.80	459.1	0.0	625.7
136.83	Top - Section 3	1.00	1.35	33.541	36.90	345.54	0.750	0.000	1.83	5.500	4.12	243.5	0.0	330.9
140.00		1.00	1.36	33.703	37.07	345.19	0.750	0.000	3.17	9.369	7.03	416.8	0.0	267.4
145.00		1.00	1.37	33.953	37.35	336.68	0.750	0.000	5.00	14.454	10.84	647.8	0.0	412.4
147.00	Appurtenance(s)	1.00	1.37	34.051	37.46	333.25	0.750	0.000	2.00	5.666	4.25	254.7	0.0	161.6
150.00		1.00	1.38	34.196	37.62	328.06	0.750	0.000	3.00	8.374	6.28	378.0	0.0	238.9
155.00		1.00	1.39	34.433	37.88	319.34	0.750	0.000	5.00	13.626	10.22	619.3	0.0	388.6
160.00		1.00	1.40	34.664	38.13	310.52	0.750	0.000	5.00	13.212	9.91	604.5	0.0	376.7
165.00		1.00	1.41	34.890	38.38	301.60	0.750	0.000	5.00	12.797	9.60	589.4	0.0	364.8
167.00	Appurtenance(s)	1.00	1.41	34.978	38.48	298.01	0.750	0.000	2.00	5.003	3.75	231.0	0.0	142.6
170.00		1.00	1.42	35.110	38.62	292.60	0.750	0.000	3.00	7.380	5.54	342.0	0.0	210.3
175.00		1.00	1.42	35.324	38.86	283.51	0.750	0.000	5.00	11.969	8.98	558.1	0.0	341.0
177.00	Appurtenance(s)	1.00	1.43	35.409	38.95	279.85	0.750	0.000	2.00	4.672	3.50	218.4	0.0	133.1
180.00		1.00	1.43	35.535	39.09	274.34	0.750	0.000	3.00	6.883	5.16	322.9	0.0	196.0

Wind Loading - Shaft

Structure:	CT02721-S-SBA		**Code:**	EIA/TIA-222-G	10/24/2017
Site Name:	South Windham		**Exposure:**	C	
Height:	180.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 15

Totals:	**180.00**	**25,343.5**	**29,683.4**

Discrete Appurtenance Forces

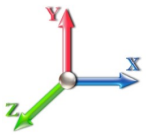
Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	177.00	RFS FD9R6004-2C-3L	6	35.409	38.950	0.50	0.80	1.10	16.74	0.000	0.000	68.62	0.00	0.00
2	177.00	BXA-171085-8BF	3	35.409	38.950	0.67	0.80	5.93	28.35	0.000	0.000	369.37	0.00	0.00
3	177.00	LPA-80080-4CF	6	35.409	38.950	1.36	0.80	21.30	64.80	0.000	0.000	1327.26	0.00	0.00
4	177.00	BXA-70063-6CF	3	35.409	38.950	0.58	0.80	13.26	45.90	0.000	0.000	826.53	0.00	0.00
5	177.00	Low Profile Platform	1	35.409	38.950	1.00	1.00	22.00	1350.00	0.000	0.000	1371.04	0.00	0.00
6	167.00	RFS ACU-A20-N RET	4	34.978	38.476	0.63	0.80	0.35	3.60	0.000	0.000	21.79	0.00	0.00
7	167.00	Alcatel Lucent 800 MHz	3	34.978	38.476	0.55	0.80	1.29	23.76	0.000	0.000	79.52	0.00	0.00
8	167.00	Alcatel Lucent 800 MHz	3	34.978	38.476	0.54	0.80	4.00	143.10	0.000	0.000	246.49	0.00	0.00
9	167.00	Alcatel Lucent 1900 MHz	3	34.978	38.476	0.54	0.80	4.45	162.00	0.000	0.000	274.21	0.00	0.00
10	167.00	Alcatel Lucent	3	34.978	38.476	0.54	0.80	6.51	189.00	0.000	0.000	400.91	0.00	0.00
11	167.00	APXVSPP18-C-A20	3	34.978	38.476	0.66	0.80	15.98	153.90	0.000	0.000	983.50	0.00	0.00
12	167.00	APXVTM14-C-I20	3	34.978	38.476	0.62	0.80	11.72	151.74	0.000	0.000	721.27	0.00	0.00
13	167.00	Low Profile Platform	1	34.978	38.476	1.00	1.00	25.00	1080.00	0.000	0.000	1539.04	0.00	0.00
14	147.00	Raycap DC6-48-60-18-8F	1	34.051	37.456	0.80	0.80	0.74	28.62	0.000	0.000	44.11	0.00	0.00
15	147.00	Ericsson RRUS-11 RRU	6	34.051	37.456	0.54	0.80	8.10	273.78	0.000	0.000	485.69	0.00	0.00
16	147.00	CCI DTMABP7819VG12A	6	34.051	37.456	0.54	0.80	3.67	103.68	0.000	0.000	219.72	0.00	0.00
17	147.00	P65-17-XLH-RR	1	34.051	37.456	0.60	0.80	6.86	53.10	0.000	0.000	411.36	0.00	0.00
18	147.00	7770.00	6	34.051	37.456	0.58	0.80	19.27	189.00	0.000	0.000	1154.98	0.00	0.00
19	147.00	AM-X-CD-17-65-00T	2	34.051	37.456	0.60	0.80	6.00	55.44	0.000	0.000	359.58	0.00	0.00
20	147.00	Low Profile Platform	1	34.051	37.456	1.00	1.00	25.00	1080.00	0.000	0.000	1498.26	0.00	0.00
							Totals:		**5,196.51**			**12,403.25**		

Total Applied Force Summary

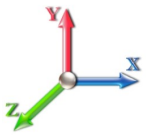
Structure:	CT02721-S-SBA		**Code:**	EIA/TIA-222-G	10/24/2017
Site Name:	South Windham		**Exposure:**	C	
Height:	180.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 17

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 25

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		703.76	1386.66	0.00	0.00
10.00		692.23	1365.83	0.00	0.00
15.00		680.70	1344.99	0.00	0.00
20.00		710.01	1324.15	0.00	0.00
25.00		731.34	1303.31	0.00	0.00
30.00		746.63	1282.48	0.00	0.00
35.00		757.50	1261.64	0.00	0.00
40.00		764.94	1240.80	0.00	0.00
45.00		769.63	1219.97	0.00	0.00
45.50		76.34	120.85	0.00	0.00
50.00		704.45	1920.10	0.00	0.00
52.75		429.40	1157.96	0.00	0.00
55.00		351.02	466.96	0.00	0.00
60.00		783.29	1024.73	0.00	0.00
65.00		780.92	1006.87	0.00	0.00
70.00		777.28	989.01	0.00	0.00
75.00		772.49	971.15	0.00	0.00
80.00		766.68	953.29	0.00	0.00
85.00		759.93	935.43	0.00	0.00
90.00		752.34	917.57	0.00	0.00
92.33		347.21	422.09	0.00	0.00
95.00		399.90	790.97	0.00	0.00
98.50		521.49	1024.65	0.00	0.00
100.00		221.63	209.03	0.00	0.00
105.00		735.13	688.06	0.00	0.00
110.00		724.85	674.66	0.00	0.00
115.00		713.98	661.27	0.00	0.00
120.00		702.57	647.87	0.00	0.00
125.00		690.64	634.48	0.00	0.00
130.00		678.22	621.08	0.00	0.00
131.58		211.53	193.88	0.00	0.00
135.00		459.08	710.62	0.00	0.00
136.83		243.51	376.44	0.00	0.00
140.00		416.80	346.03	0.00	0.00
145.00		647.82	536.64	0.00	0.00
147.00	(23) attachments	4428.36	1994.94	0.00	0.00
150.00		378.01	279.71	0.00	0.00
155.00		619.33	456.66	0.00	0.00
160.00		604.53	444.76	0.00	0.00
165.00		589.38	432.85	0.00	0.00
167.00	(23) attachments	4497.72	2076.91	0.00	0.00
170.00		342.03	244.01	0.00	0.00
175.00		558.10	397.16	0.00	0.00
177.00	(19) attachments	4181.17	1661.32	0.00	0.00
180.00		322.86	196.03	0.00	0.00

Total Applied Force Summary

Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 18	

Totals:	**37,746.74**	**38,915.84**	**0.00**	**0.00**

Calculated Forces

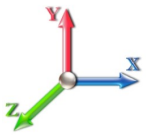
Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 25

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	-38.86	-37.80	0.00	-4383.0	0.00	4383.04	5499.24	2749.62	13525.8	6714.82	0.00	0.000	0.000	0.660
5.00	-37.37	-37.20	0.00	-4194.0	0.00	4194.03	5446.13	2723.06	13174.3	6540.31	0.09	-0.164	0.000	0.648
10.00	-35.90	-36.61	0.00	-4008.0	0.00	4008.02	5391.79	2695.89	12824.2	6366.50	0.35	-0.328	0.000	0.636
15.00	-34.46	-36.02	0.00	-3824.9	0.00	3824.97	5336.22	2668.11	12475.6	6193.44	0.78	-0.494	0.000	0.624
20.00	-33.04	-35.39	0.00	-3644.8	0.00	3644.88	5279.42	2639.71	12128.7	6021.23	1.39	-0.659	0.000	0.612
25.00	-31.64	-34.74	0.00	-3467.9	0.00	3467.93	5221.40	2610.70	11783.6	5849.92	2.17	-0.826	0.000	0.599
30.00	-30.27	-34.06	0.00	-3294.2	0.00	3294.25	5162.14	2581.07	11440.6	5679.60	3.12	-0.993	0.000	0.586
35.00	-28.93	-33.36	0.00	-3123.9	0.00	3123.97	5101.66	2550.83	11099.6	5510.34	4.25	-1.160	0.000	0.573
40.00	-27.61	-32.65	0.00	-2957.1	0.00	2957.17	5039.95	2519.97	10760.9	5342.21	5.56	-1.327	0.000	0.559
45.00	-26.36	-31.89	0.00	-2793.9	0.00	2793.93	4977.01	2488.50	10424.7	5175.29	7.04	-1.494	0.000	0.545
45.50	-26.19	-31.85	0.00	-2777.9	0.00	2777.98	4970.65	2485.32	10391.2	5158.66	7.19	-1.511	0.000	0.544
50.00	-24.23	-31.15	0.00	-2634.6	0.00	2634.65	4912.84	2456.42	10091.1	5009.65	8.69	-1.662	0.000	0.531
52.75	-23.04	-30.72	0.00	-2549.0	0.00	2549.01	3995.11	1997.56	8262.19	4101.70	9.68	-1.755	0.000	0.627
55.00	-22.51	-30.40	0.00	-2479.9	0.00	2479.90	3974.19	1987.10	8146.39	4044.21	10.52	-1.832	0.000	0.619
60.00	-21.42	-29.65	0.00	-2327.8	0.00	2327.89	3926.81	1963.41	7890.01	3916.93	12.54	-2.016	0.000	0.600
65.00	-20.35	-28.90	0.00	-2179.6	0.00	2179.63	3878.20	1939.10	7635.05	3790.36	14.75	-2.200	0.000	0.581
70.00	-19.30	-28.15	0.00	-2035.1	0.00	2035.12	3828.36	1914.18	7381.67	3664.57	17.15	-2.383	0.000	0.561
75.00	-18.28	-27.39	0.00	-1894.3	0.00	1894.39	3777.30	1888.65	7130.01	3539.64	19.75	-2.564	0.000	0.540
80.00	-17.28	-26.63	0.00	-1757.4	0.00	1757.44	3725.00	1862.50	6880.23	3415.63	22.53	-2.744	0.000	0.519
85.00	-16.30	-25.88	0.00	-1624.2	0.00	1624.27	3671.48	1835.74	6632.46	3292.63	25.50	-2.921	0.000	0.498
90.00	-15.37	-25.11	0.00	-1494.8	0.00	1494.87	3616.73	1808.36	6386.87	3170.71	28.65	-3.096	0.000	0.476
92.33	-14.93	-24.77	0.00	-1436.2	0.00	1436.27	3590.75	1795.38	6273.05	3114.21	30.18	-3.178	0.000	0.466
95.00	-14.12	-24.35	0.00	-1370.2	0.00	1370.23	3560.74	1780.37	6143.61	3049.94	31.98	-3.271	0.000	0.453
98.50	-13.09	-23.79	0.00	-1285.0	0.00	1285.01	2386.86	1193.43	4124.78	2047.71	34.42	-3.390	0.000	0.633
100.00	-12.84	-23.58	0.00	-1249.3	0.00	1249.32	2378.02	1189.01	4080.56	2025.76	35.50	-3.441	0.000	0.623
105.00	-12.12	-22.85	0.00	-1131.4	0.00	1131.40	2347.74	1173.87	3933.38	1952.70	39.21	-3.650	0.000	0.585
110.00	-11.41	-22.12	0.00	-1017.1	0.00	1017.14	2316.23	1158.11	3786.65	1879.85	43.14	-3.852	0.000	0.546
115.00	-10.73	-21.40	0.00	-906.52	0.00	906.52	2283.49	1141.75	3640.52	1807.31	47.28	-4.047	0.000	0.507
120.00	-10.07	-20.69	0.00	-799.51	0.00	799.51	2249.53	1124.76	3495.14	1735.13	51.61	-4.233	0.000	0.466
125.00	-9.43	-19.98	0.00	-696.08	0.00	696.08	2214.33	1107.17	3350.65	1663.40	56.14	-4.409	0.000	0.423
130.00	-8.83	-19.27	0.00	-596.19	0.00	596.19	2177.91	1088.96	3207.21	1592.19	60.84	-4.573	0.000	0.379
131.58	-8.63	-19.06	0.00	-565.68	0.00	565.68	2166.12	1083.06	3162.03	1569.76	62.37	-4.624	0.000	0.365
135.00	-7.93	-18.55	0.00	-500.57	0.00	500.57	2140.26	1070.13	3064.96	1521.58	65.71	-4.728	0.000	0.333
136.83	-7.56	-18.29	0.00	-466.56	0.00	466.56	1821.16	910.58	2623.48	1302.41	67.54	-4.781	0.000	0.363
140.00	-7.21	-17.86	0.00	-408.66	0.00	408.66	1802.58	901.29	2550.43	1266.14	70.73	-4.867	0.000	0.327
145.00	-6.71	-17.17	0.00	-319.38	0.00	319.38	1772.26	886.13	2435.64	1209.15	75.90	-4.994	0.000	0.268
147.00	-5.10	-12.59	0.00	-285.03	0.00	285.03	1759.78	879.89	2389.94	1186.47	78.00	-5.041	0.000	0.243
150.00	-4.83	-12.20	0.00	-247.26	0.00	247.26	1740.70	870.35	2321.67	1152.58	81.18	-5.104	0.000	0.217
155.00	-4.42	-11.55	0.00	-186.27	0.00	186.27	1707.91	853.96	2208.68	1096.48	86.57	-5.195	0.000	0.173
160.00	-4.02	-10.91	0.00	-128.53	0.00	128.53	1673.90	836.95	2096.80	1040.94	92.04	-5.267	0.000	0.126
165.00	-3.64	-10.28	0.00	-73.99	0.00	73.99	1638.66	819.33	1986.20	986.03	97.58	-5.318	0.000	0.077
167.00	-1.98	-5.61	0.00	-53.43	0.00	53.43	1624.22	812.11	1942.34	964.26	99.81	-5.332	0.000	0.057
170.00	-1.77	-5.25	0.00	-36.59	0.00	36.59	1602.19	801.09	1877.01	931.83	103.16	-5.348	0.000	0.040
175.00	-1.43	-4.66	0.00	-10.33	0.00	10.33	1564.49	782.24	1769.40	878.40	108.76	-5.362	0.000	0.013
177.00	-0.16	-0.34	0.00	-1.02	0.00	1.02	1549.06	774.53	1726.82	857.27	111.01	-5.364	0.000	0.001
180.00	0.00	-0.32	0.00	0.00	0.00	0.00	1525.56	762.78	1663.50	825.83	114.37	-5.364	0.000	0.000

Wind Loading - Shaft

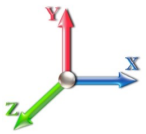
Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 20	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 25

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	5.168	5.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	5.168	5.68	0.00	1.200	1.656	5.00	26.663	32.00	181.9	635.2	2318.5
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.775	5.00	26.348	31.62	179.7	671.2	2326.7
15.00		1.00	0.85	5.168	5.68	0.00	1.200	1.848	5.00	25.995	31.19	177.3	688.4	2316.1
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.902	5.00	25.625	30.75	185.5	697.4	2297.3
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.945	5.00	25.247	30.30	191.5	701.6	2273.8
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.981	5.00	24.862	29.83	196.0	702.8	2247.1
35.00		1.00	1.01	6.169	6.79	0.00	1.200	2.012	5.00	24.474	29.37	199.3	701.7	2218.2
40.00		1.00	1.04	6.345	6.98	0.00	1.200	2.039	5.00	24.082	28.90	201.7	698.9	2187.7
45.00		1.00	1.07	6.504	7.15	0.00	1.200	2.063	5.00	23.688	28.43	203.4	694.7	2155.8
45.50	Bot - Section 2	1.00	1.07	6.519	7.17	0.00	1.200	2.065	0.50	2.346	2.82	20.2	69.4	214.0
50.00		1.00	1.09	6.650	7.32	0.00	1.200	2.085	4.50	21.231	25.48	186.4	629.5	3040.6
52.75	Top - Section 1	1.00	1.11	6.726	7.40	0.00	1.200	2.096	2.75	12.814	15.38	113.8	382.9	1835.8
55.00		1.00	1.12	6.785	7.46	0.00	1.200	2.105	2.25	10.395	12.47	93.1	312.0	860.1
60.00		1.00	1.14	6.910	7.60	0.00	1.200	2.123	5.00	22.814	27.38	208.1	686.6	1887.3
65.00		1.00	1.16	7.028	7.73	0.00	1.200	2.140	5.00	22.414	26.90	207.9	679.1	1856.0
70.00		1.00	1.17	7.138	7.85	0.00	1.200	2.156	5.00	22.013	26.42	207.4	671.1	1824.2
75.00		1.00	1.19	7.243	7.97	0.00	1.200	2.171	5.00	21.611	25.93	206.6	662.6	1791.8
80.00		1.00	1.21	7.342	8.08	0.00	1.200	2.185	5.00	21.209	25.45	205.5	653.6	1759.0
85.00		1.00	1.22	7.436	8.18	0.00	1.200	2.198	5.00	20.806	24.97	204.2	644.2	1725.8
90.00		1.00	1.24	7.526	8.28	0.00	1.200	2.211	5.00	20.402	24.48	202.7	634.4	1692.2
92.33	Bot - Section 3	1.00	1.24	7.567	8.32	0.00	1.200	2.217	2.33	9.381	11.26	93.7	293.9	779.4
95.00		1.00	1.25	7.612	8.37	0.00	1.200	2.223	2.67	10.741	12.89	107.9	337.2	1303.5
98.50	Top - Section 2	1.00	1.26	7.671	8.44	0.00	1.200	2.231	3.50	13.924	16.71	141.0	437.5	1687.8
100.00		1.00	1.27	7.695	8.46	0.00	1.200	2.234	1.50	5.906	7.09	60.0	186.6	415.6
105.00		1.00	1.28	7.774	8.55	0.00	1.200	2.245	5.00	19.427	23.31	199.4	611.2	1363.0
110.00		1.00	1.29	7.851	8.64	0.00	1.200	2.256	5.00	19.021	22.83	197.1	600.3	1334.2
115.00		1.00	1.30	7.925	8.72	0.00	1.200	2.266	5.00	18.616	22.34	194.7	589.1	1305.2
120.00		1.00	1.32	7.996	8.80	0.00	1.200	2.276	5.00	18.209	21.85	192.2	577.7	1276.0
125.00		1.00	1.33	8.065	8.87	0.00	1.200	2.285	5.00	17.803	21.36	189.5	566.1	1246.5
130.00		1.00	1.34	8.132	8.95	0.00	1.200	2.294	5.00	17.396	20.88	186.7	554.3	1216.8
131.58	Bot - Section 4	1.00	1.34	8.153	8.97	0.00	1.200	2.297	1.58	5.423	6.51	58.4	174.3	380.4
135.00		1.00	1.35	8.197	9.02	0.00	1.200	2.303	3.42	11.710	14.05	126.7	375.6	1209.9
136.83	Top - Section 3	1.00	1.35	8.220	9.04	0.00	1.200	2.306	1.83	6.204	7.45	67.3	199.9	641.1
140.00		1.00	1.36	8.260	9.09	0.00	1.200	2.311	3.17	10.588	12.71	115.4	340.4	696.9
145.00		1.00	1.37	8.321	9.15	0.00	1.200	2.319	5.00	16.387	19.66	180.0	525.2	1075.1
147.00	Appurtenance(s)	1.00	1.37	8.345	9.18	0.00	1.200	2.322	2.00	6.440	7.73	70.9	208.1	423.6
150.00		1.00	1.38	8.381	9.22	0.00	1.200	2.327	3.00	9.538	11.45	105.5	307.7	626.2
155.00		1.00	1.39	8.439	9.28	0.00	1.200	2.335	5.00	15.571	18.69	173.5	500.2	1018.3
160.00		1.00	1.40	8.495	9.34	0.00	1.200	2.342	5.00	15.163	18.20	170.0	487.4	989.7
165.00		1.00	1.41	8.551	9.41	0.00	1.200	2.349	5.00	14.755	17.71	166.5	474.5	961.0
167.00	Appurtenance(s)	1.00	1.41	8.572	9.43	0.00	1.200	2.352	2.00	5.787	6.94	65.5	187.7	377.9
170.00		1.00	1.42	8.604	9.46	0.00	1.200	2.356	3.00	8.558	10.27	97.2	276.9	557.3
175.00		1.00	1.42	8.657	9.52	0.00	1.200	2.363	5.00	13.938	16.73	159.3	448.4	903.1
177.00	Appurtenance(s)	1.00	1.43	8.678	9.55	0.00	1.200	2.366	2.00	5.460	6.55	62.5	177.2	354.7
180.00		1.00	1.43	8.709	9.58	0.00	1.200	2.370	3.00	8.068	9.68	92.7	261.1	522.5

Wind Loading - Shaft

Structure:	CT02721-S-SBA		**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham		**Exposure:**	C		
Height:	180.00 (ft)		**Crest Height:**	0.00		
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil		
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 21	

Totals:	**180.00**	**6,846.1**	**61,493.6**

Discrete Appurtenance Forces

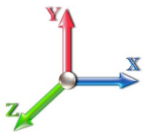
Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 22	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	177.00	RFS FD9R6004-2C-3L	6	8.678	9.546	0.50	0.80	2.94	73.80	0.000	0.000	28.06	0.00	0.00
2	177.00	BXA-171085-8BF	3	8.678	9.546	0.67	0.80	10.46	248.25	0.000	0.000	99.84	0.00	0.00
3	177.00	LPA-80080-4CF	6	8.678	9.546	1.36	0.80	31.23	828.20	0.000	0.000	298.14	0.00	0.00
4	177.00	BXA-70063-6CF	3	8.678	9.546	0.58	0.80	16.33	824.17	0.000	0.000	155.91	0.00	0.00
5	177.00	Low Profile Platform	1	8.678	9.546	1.00	1.00	45.94	3274.34	0.000	0.000	438.54	0.00	0.00
6	167.00	RFS ACU-A20-N RET	4	8.572	9.429	0.63	0.80	1.36	22.76	0.000	0.000	12.87	0.00	0.00
7	167.00	Alcatel Lucent 800 MHz	3	8.572	9.429	0.55	0.80	2.74	88.01	0.000	0.000	25.79	0.00	0.00
8	167.00	Alcatel Lucent 800 MHz	3	8.572	9.429	0.54	0.80	6.48	426.53	0.000	0.000	61.13	0.00	0.00
9	167.00	Alcatel Lucent 1900 MHz	3	8.572	9.429	0.54	0.80	7.20	481.64	0.000	0.000	67.92	0.00	0.00
10	167.00	Alcatel Lucent	3	8.572	9.429	0.54	0.80	8.32	731.70	0.000	0.000	78.47	0.00	0.00
11	167.00	APXVSPP18-C-A20	3	8.572	9.429	0.66	0.80	23.48	755.57	0.000	0.000	221.37	0.00	0.00
12	167.00	APXVTM14-C-I20	3	8.572	9.429	0.62	0.80	14.55	897.18	0.000	0.000	137.21	0.00	0.00
13	167.00	Low Profile Platform	1	8.572	9.429	1.00	1.00	53.22	2551.24	0.000	0.000	501.88	0.00	0.00
14	147.00	Raycap DC6-48-60-18-8F	1	8.345	9.180	0.80	0.80	1.20	102.73	0.000	0.000	11.04	0.00	0.00
15	147.00	Ericsson RRUS-11 RRU	6	8.345	9.180	0.54	0.80	10.97	1131.49	0.000	0.000	100.73	0.00	0.00
16	147.00	CCI DTMABP7819VG12A	6	8.345	9.180	0.54	0.80	6.96	298.19	0.000	0.000	63.88	0.00	0.00
17	147.00	P65-17-XLH-RR	1	8.345	9.180	0.60	0.80	9.45	297.02	0.000	0.000	86.71	0.00	0.00
18	147.00	7770.00	6	8.345	9.180	0.58	0.80	24.35	1413.69	0.000	0.000	223.49	0.00	0.00
19	147.00	AM-X-CD-17-65-00T	2	8.345	9.180	0.60	0.80	8.99	307.58	0.000	0.000	82.55	0.00	0.00
20	147.00	Low Profile Platform	1	8.345	9.180	1.00	1.00	52.87	2533.35	0.000	0.000	485.30	0.00	0.00
							Totals:		**17,287.45**			**3,180.84**		

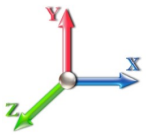
Total Applied Force Summary

Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 23	

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 25

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		181.89	2484.09	0.00	0.00
10.00		179.74	2492.26	0.00	0.00
15.00		177.33	2481.69	0.00	0.00
20.00		185.48	2462.91	0.00	0.00
25.00		191.53	2439.38	0.00	0.00
30.00		195.99	2412.73	0.00	0.00
35.00		199.30	2383.85	0.00	0.00
40.00		201.70	2353.27	0.00	0.00
45.00		203.38	2321.35	0.00	0.00
45.50		20.19	230.56	0.00	0.00
50.00		186.37	3189.60	0.00	0.00
52.75		113.76	1926.86	0.00	0.00
55.00		93.10	934.63	0.00	0.00
60.00		208.10	2052.90	0.00	0.00
65.00		207.93	2021.63	0.00	0.00
70.00		207.42	1989.79	0.00	0.00
75.00		206.61	1957.43	0.00	0.00
80.00		205.54	1924.62	0.00	0.00
85.00		204.22	1891.41	0.00	0.00
90.00		202.68	1857.83	0.00	0.00
92.33		93.70	856.65	0.00	0.00
95.00		107.93	1391.80	0.00	0.00
98.50		140.98	1803.69	0.00	0.00
100.00		59.99	465.26	0.00	0.00
105.00		199.36	1528.59	0.00	0.00
110.00		197.12	1499.82	0.00	0.00
115.00		194.73	1470.80	0.00	0.00
120.00		192.20	1441.56	0.00	0.00
125.00		189.53	1412.10	0.00	0.00
130.00		186.73	1382.45	0.00	0.00
131.58		58.36	432.86	0.00	0.00
135.00		126.70	1323.08	0.00	0.00
136.83		67.32	701.83	0.00	0.00
140.00		115.44	801.80	0.00	0.00
145.00		179.99	1240.74	0.00	0.00
147.00	(23) attachments	1124.65	6573.91	0.00	0.00
150.00		105.51	680.61	0.00	0.00
155.00		173.45	1109.06	0.00	0.00
160.00		170.04	1080.44	0.00	0.00
165.00		166.54	1051.68	0.00	0.00
167.00	(23) attachments	1172.12	6368.79	0.00	0.00
170.00		97.20	602.27	0.00	0.00
175.00		159.28	977.95	0.00	0.00
177.00	(19) attachments	1083.03	5633.38	0.00	0.00
180.00		92.75	522.46	0.00	0.00

Total Applied Force Summary

Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

Totals:	**10,026.93**	**84,162.36**	**0.00**	**0.00**

Calculated Forces

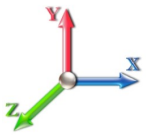
Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 25

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	-84.16	-10.06	0.00	-1221.4	0.00	1221.48	5499.24	2749.62	13525.8	6714.82	0.00	0.000	0.000	0.197
5.00	-81.67	-9.94	0.00	-1171.1	0.00	1171.18	5446.13	2723.06	13174.3	6540.31	0.02	-0.046	0.000	0.194
10.00	-79.17	-9.82	0.00	-1121.4	0.00	1121.47	5391.79	2695.89	12824.2	6366.50	0.10	-0.092	0.000	0.191
15.00	-76.68	-9.70	0.00	-1072.3	0.00	1072.35	5336.22	2668.11	12475.6	6193.44	0.22	-0.138	0.000	0.188
20.00	-74.21	-9.57	0.00	-1023.8	0.00	1023.83	5279.42	2639.71	12128.7	6021.23	0.39	-0.184	0.000	0.184
25.00	-71.76	-9.43	0.00	-975.97	0.00	975.97	5221.40	2610.70	11783.6	5849.92	0.61	-0.231	0.000	0.181
30.00	-69.34	-9.28	0.00	-928.82	0.00	928.82	5162.14	2581.07	11440.6	5679.60	0.87	-0.278	0.000	0.177
35.00	-66.95	-9.12	0.00	-882.42	0.00	882.42	5101.66	2550.83	11099.6	5510.34	1.19	-0.325	0.000	0.173
40.00	-64.59	-8.96	0.00	-836.80	0.00	836.80	5039.95	2519.97	10760.9	5342.21	1.56	-0.373	0.000	0.169
45.00	-62.27	-8.77	0.00	-791.99	0.00	791.99	4977.01	2488.50	10424.7	5175.29	1.97	-0.420	0.000	0.166
45.50	-62.03	-8.77	0.00	-787.61	0.00	787.61	4970.65	2485.32	10391.2	5158.66	2.02	-0.425	0.000	0.165
50.00	-58.84	-8.60	0.00	-748.12	0.00	748.12	4912.84	2456.42	10091.1	5009.65	2.44	-0.468	0.000	0.161
52.75	-56.91	-8.49	0.00	-724.48	0.00	724.48	3995.11	1997.56	8262.19	4101.70	2.72	-0.494	0.000	0.191
55.00	-55.97	-8.43	0.00	-705.37	0.00	705.37	3974.19	1987.10	8146.39	4044.21	2.95	-0.516	0.000	0.189
60.00	-53.91	-8.25	0.00	-663.24	0.00	663.24	3926.81	1963.41	7890.01	3916.93	3.52	-0.568	0.000	0.183
65.00	-51.89	-8.07	0.00	-621.99	0.00	621.99	3878.20	1939.10	7635.05	3790.36	4.15	-0.621	0.000	0.177
70.00	-49.89	-7.88	0.00	-581.65	0.00	581.65	3828.36	1914.18	7381.67	3664.57	4.82	-0.673	0.000	0.172
75.00	-47.93	-7.70	0.00	-542.24	0.00	542.24	3777.30	1888.65	7130.01	3539.64	5.56	-0.725	0.000	0.166
80.00	-46.00	-7.51	0.00	-503.76	0.00	503.76	3725.00	1862.50	6880.23	3415.63	6.34	-0.776	0.000	0.160
85.00	-44.11	-7.31	0.00	-466.23	0.00	466.23	3671.48	1835.74	6632.46	3292.63	7.18	-0.827	0.000	0.154
90.00	-42.25	-7.11	0.00	-429.66	0.00	429.66	3616.73	1808.36	6386.87	3170.71	8.08	-0.877	0.000	0.147
92.33	-41.39	-7.02	0.00	-413.06	0.00	413.06	3590.75	1795.38	6273.05	3114.21	8.51	-0.901	0.000	0.144
95.00	-40.00	-6.91	0.00	-394.34	0.00	394.34	3560.74	1780.37	6143.61	3049.94	9.02	-0.928	0.000	0.141
98.50	-38.19	-6.76	0.00	-370.14	0.00	370.14	2386.86	1193.43	4124.78	2047.71	9.72	-0.962	0.000	0.197
100.00	-37.72	-6.72	0.00	-360.00	0.00	360.00	2378.02	1189.01	4080.56	2025.76	10.02	-0.977	0.000	0.194
105.00	-36.19	-6.53	0.00	-326.42	0.00	326.42	2347.74	1173.87	3933.38	1952.70	11.08	-1.037	0.000	0.183
110.00	-34.69	-6.34	0.00	-293.78	0.00	293.78	2316.23	1158.11	3786.65	1879.85	12.19	-1.095	0.000	0.171
115.00	-33.22	-6.15	0.00	-262.10	0.00	262.10	2283.49	1141.75	3640.52	1807.31	13.37	-1.152	0.000	0.160
120.00	-31.77	-5.95	0.00	-231.37	0.00	231.37	2249.53	1124.76	3495.14	1735.13	14.61	-1.205	0.000	0.147
125.00	-30.36	-5.76	0.00	-201.61	0.00	201.61	2214.33	1107.17	3350.65	1663.40	15.90	-1.256	0.000	0.135
130.00	-28.98	-5.56	0.00	-172.81	0.00	172.81	2177.91	1088.96	3207.21	1592.19	17.24	-1.304	0.000	0.122
131.58	-28.55	-5.50	0.00	-164.01	0.00	164.01	2166.12	1083.06	3162.03	1569.76	17.67	-1.319	0.000	0.118
135.00	-27.23	-5.35	0.00	-145.22	0.00	145.22	2140.26	1070.13	3064.96	1521.58	18.63	-1.349	0.000	0.108
136.83	-26.52	-5.28	0.00	-135.41	0.00	135.41	1821.16	910.58	2623.48	1302.41	19.15	-1.364	0.000	0.119
140.00	-25.72	-5.16	0.00	-118.69	0.00	118.69	1802.58	901.29	2550.43	1266.14	20.06	-1.389	0.000	0.108
145.00	-24.48	-4.96	0.00	-92.90	0.00	92.90	1772.26	886.13	2435.64	1209.15	21.54	-1.426	0.000	0.091
147.00	-17.94	-3.67	0.00	-82.98	0.00	82.98	1759.78	879.89	2389.94	1186.47	22.14	-1.440	0.000	0.080
150.00	-17.26	-3.56	0.00	-71.96	0.00	71.96	1740.70	870.35	2321.67	1152.58	23.05	-1.458	0.000	0.072
155.00	-16.15	-3.36	0.00	-54.17	0.00	54.17	1707.91	853.96	2208.68	1096.48	24.59	-1.485	0.000	0.059
160.00	-15.08	-3.17	0.00	-37.35	0.00	37.35	1673.90	836.95	2096.80	1040.94	26.16	-1.506	0.000	0.045
165.00	-14.03	-2.98	0.00	-21.50	0.00	21.50	1638.66	819.33	1986.20	986.03	27.75	-1.520	0.000	0.030
167.00	-7.70	-1.64	0.00	-15.54	0.00	15.54	1624.22	812.11	1942.34	964.26	28.38	-1.525	0.000	0.021
170.00	-7.10	-1.53	0.00	-10.63	0.00	10.63	1602.19	801.09	1877.01	931.83	29.34	-1.529	0.000	0.016
175.00	-6.12	-1.34	0.00	-3.00	0.00	3.00	1564.49	782.24	1769.40	878.40	30.95	-1.533	0.000	0.007
177.00	-0.52	-0.11	0.00	-0.32	0.00	0.32	1549.06	774.53	1726.82	857.27	31.59	-1.534	0.000	0.001
180.00	0.00	-0.09	0.00	0.00	0.00	0.00	1525.56	762.78	1663.50	825.83	32.55	-1.534	0.000	0.000

Seismic Segment Forces (Factored)

Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 26	

Tower Engineering Solutions

Load Case:	1.2D + 1.0E							**Iterations**	23
Gust Response Factor	1.10				**Sds**	0.18		**Ss**	0.17
Dead Load Factor	1.20	**Seismic Load Factor**	1.00		**Sd1**	0.10		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.35		**SA**	0.03	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1402.7	0.00	0.03	0.02	21.68	
10.00		1379.5	0.01	0.05	0.03	32.18	
15.00		1356.4	0.01	0.06	0.03	37.52	
20.00		1333.2	0.02	0.07	0.04	40.14	
25.00		1310.1	0.04	0.07	0.04	41.33	
30.00		1286.9	0.05	0.07	0.04	41.81	
35.00		1263.8	0.07	0.07	0.04	41.98	
40.00		1240.6	0.09	0.07	0.04	42.07	
45.00		1217.5	0.12	0.07	0.03	42.10	
45.50	Bot - Section 2	120.48	0.12	0.07	0.03	4.17	
50.00		2009.2	0.15	0.07	0.03	70.70	
52.75	Top - Section 1	1210.7	0.16	0.07	0.03	42.91	
55.00		456.74	0.18	0.07	0.03	16.25	
60.00		1000.5	0.21	0.06	0.02	35.52	
65.00		980.74	0.25	0.06	0.02	33.98	
70.00		960.90	0.29	0.05	0.01	31.34	
75.00		941.05	0.33	0.04	0.01	27.29	
80.00		921.21	0.37	0.03	0.01	21.58	
85.00		901.37	0.42	0.01	0.01	14.20	
90.00		881.52	0.47	-0.01	0.01	5.50	
92.33	Bot - Section 3	404.58	0.50	-0.02	0.01	0.55	
95.00		805.25	0.53	-0.03	0.01	-3.52	
98.50	Top - Section 2	1041.9	0.57	-0.04	0.01	-12.31	
100.00		190.85	0.58	-0.05	0.01	-2.84	
105.00		626.51	0.64	-0.07	0.02	-15.02	
110.00		611.62	0.71	-0.09	0.03	-18.72	
115.00		596.74	0.77	-0.11	0.05	-20.38	
120.00		581.86	0.84	-0.12	0.07	-19.96	
125.00		566.97	0.91	-0.12	0.09	-17.57	
130.00		552.09	0.99	-0.11	0.12	-13.37	
131.58	Bot - Section 4	171.73	1.01	-0.11	0.14	-3.67	
135.00		695.28	1.06	-0.09	0.16	-9.78	
136.83	Top - Section 3	367.66	1.09	-0.07	0.18	-3.49	
140.00		297.08	1.14	-0.04	0.21	-0.16	
145.00		458.26	1.23	0.03	0.27	7.50	
147.00	Appurtenance(s)	2161.4	1.26	0.07	0.30	52.01	
150.00		265.43	1.31	0.14	0.35	9.73	
155.00		431.80	1.40	0.29	0.43	26.06	
160.00		418.58	1.49	0.48	0.53	36.64	
165.00		405.35	1.59	0.74	0.65	47.93	
167.00	Appurtenance(s)	2277.4	1.63	0.86	0.71	299.54	
170.00		233.68	1.69	1.07	0.79	35.65	
175.00		378.89	1.79	1.48	0.95	72.18	
177.00	Appurtenance(s)	1820.9	1.83	1.67	1.03	376.47	
180.00		217.81	1.89	1.98	1.14	50.58	

Seismic Segment Forces (Factored)

Structure:	CT02721-S-SBA		**Code:**	EIA/TIA-222-G	10/24/2017
Site Name:	South Windham		**Exposure:**	C	
Height:	180.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 27

Totals:	**38,755.4**	**1,518.3**	**Total Wind:**	**37,746.7**

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

Calculated Forces

Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 28	

Tower Engineering Solutions

Load Case: 1.2D + 1.0E

Gust Response Factor	1.10			**Sds**	0.18			**Iterations**	23
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.10			**Ss**	0.17
Wind Load Factor	0.00	**Structure Frequency**	0.35	**SA**	0.03			**S1**	0.06
								Seismic Importance Factor	1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-51.89	-1.66	0.00	-208.54	0.00	208.54	5499.24	2749.62	13525.8	6714.82		0.00	0.00	0.040
5.00	-50.04	-1.65	0.00	-200.23	0.00	200.23	5446.13	2723.06	13174.3	6540.31		0.00	-0.01	0.040
10.00	-48.22	-1.62	0.00	-191.99	0.00	191.99	5391.79	2695.89	12824.2	6366.50		0.02	-0.02	0.039
15.00	-46.42	-1.59	0.00	-183.88	0.00	183.88	5336.22	2668.11	12475.6	6193.44		0.04	-0.02	0.038
20.00	-44.66	-1.55	0.00	-175.94	0.00	175.94	5279.42	2639.71	12128.7	6021.23		0.07	-0.03	0.038
25.00	-42.92	-1.52	0.00	-168.16	0.00	168.16	5221.40	2610.70	11783.6	5849.92		0.10	-0.04	0.037
30.00	-41.21	-1.48	0.00	-160.57	0.00	160.57	5162.14	2581.07	11440.6	5679.60		0.15	-0.05	0.036
35.00	-39.53	-1.44	0.00	-153.17	0.00	153.17	5101.66	2550.83	11099.6	5510.34		0.20	-0.06	0.036
40.00	-37.87	-1.40	0.00	-145.95	0.00	145.95	5039.95	2519.97	10760.9	5342.21		0.27	-0.06	0.035
45.00	-36.25	-1.36	0.00	-138.93	0.00	138.93	4977.01	2488.50	10424.7	5175.29		0.34	-0.07	0.034
45.50	-36.09	-1.36	0.00	-138.24	0.00	138.24	4970.65	2485.32	10391.2	5158.66		0.35	-0.07	0.034
50.00	-33.52	-1.29	0.00	-132.12	0.00	132.12	4912.84	2456.42	10091.1	5009.65		0.42	-0.08	0.033
52.75	-31.98	-1.25	0.00	-128.56	0.00	128.56	3995.11	1997.56	8262.19	4101.70		0.47	-0.09	0.039
55.00	-31.36	-1.24	0.00	-125.75	0.00	125.75	3974.19	1987.10	8146.39	4044.21		0.51	-0.09	0.039
60.00	-29.99	-1.20	0.00	-119.58	0.00	119.58	3926.81	1963.41	7890.01	3916.93		0.61	-0.10	0.038
65.00	-28.65	-1.17	0.00	-113.57	0.00	113.57	3878.20	1939.10	7635.05	3790.36		0.72	-0.11	0.037
70.00	-27.33	-1.14	0.00	-107.71	0.00	107.71	3828.36	1914.18	7381.67	3664.57		0.83	-0.12	0.037
75.00	-26.04	-1.12	0.00	-102.01	0.00	102.01	3777.30	1888.65	7130.01	3539.64		0.96	-0.13	0.036
80.00	-24.76	-1.10	0.00	-96.43	0.00	96.43	3725.00	1862.50	6880.23	3415.63		1.10	-0.14	0.035
85.00	-23.52	-1.08	0.00	-90.95	0.00	90.95	3671.48	1835.74	6632.46	3292.63		1.25	-0.15	0.034
90.00	-22.29	-1.08	0.00	-85.54	0.00	85.54	3616.73	1808.36	6386.87	3170.71		1.41	-0.16	0.033
92.33	-21.73	-1.08	0.00	-83.03	0.00	83.03	3590.75	1795.38	6273.05	3114.21		1.49	-0.16	0.033
95.00	-20.68	-1.08	0.00	-80.16	0.00	80.16	3560.74	1780.37	6143.61	3049.94		1.58	-0.17	0.032
98.50	-19.31	-1.07	0.00	-76.40	0.00	76.40	2386.86	1193.43	4124.78	2047.71		1.70	-0.17	0.045
100.00	-19.03	-1.07	0.00	-74.79	0.00	74.79	2378.02	1189.01	4080.56	2025.76		1.76	-0.18	0.045
105.00	-18.11	-1.08	0.00	-69.41	0.00	69.41	2347.74	1173.87	3933.38	1952.70		1.95	-0.19	0.043
110.00	-17.21	-1.08	0.00	-64.03	0.00	64.03	2316.23	1158.11	3786.65	1879.85		2.16	-0.20	0.041
115.00	-16.33	-1.08	0.00	-58.65	0.00	58.65	2283.49	1141.75	3640.52	1807.31		2.38	-0.21	0.040
120.00	-15.47	-1.08	0.00	-53.27	0.00	53.27	2249.53	1124.76	3495.14	1735.13		2.61	-0.23	0.038
125.00	-14.62	-1.08	0.00	-47.88	0.00	47.88	2214.33	1107.17	3350.65	1663.40		2.85	-0.24	0.035
130.00	-13.79	-1.07	0.00	-42.50	0.00	42.50	2177.91	1088.96	3207.21	1592.19		3.11	-0.25	0.033
131.58	-13.53	-1.07	0.00	-40.80	0.00	40.80	2166.12	1083.06	3162.03	1569.76		3.19	-0.25	0.032
135.00	-12.59	-1.07	0.00	-37.13	0.00	37.13	2140.26	1070.13	3064.96	1521.58		3.38	-0.26	0.030
136.83	-12.08	-1.07	0.00	-35.16	0.00	35.16	1821.16	910.58	2623.48	1302.41		3.48	-0.27	0.034
140.00	-11.62	-1.07	0.00	-31.77	0.00	31.77	1802.58	901.29	2550.43	1266.14		3.66	-0.27	0.032
145.00	-10.91	-1.06	0.00	-26.42	0.00	26.42	1772.26	886.13	2435.64	1209.15		3.95	-0.28	0.028
147.00	-8.25	-1.00	0.00	-24.30	0.00	24.30	1759.78	879.89	2389.94	1186.47		4.07	-0.29	0.025
150.00	-7.87	-0.99	0.00	-21.31	0.00	21.31	1740.70	870.35	2321.67	1152.58		4.25	-0.29	0.023
155.00	-7.27	-0.96	0.00	-16.39	0.00	16.39	1707.91	853.96	2208.68	1096.48		4.56	-0.30	0.019
160.00	-6.67	-0.92	0.00	-11.60	0.00	11.60	1673.90	836.95	2096.80	1040.94		4.88	-0.31	0.015
165.00	-6.10	-0.87	0.00	-7.01	0.00	7.01	1638.66	819.33	1986.20	986.03		5.20	-0.31	0.011
167.00	-3.33	-0.55	0.00	-5.27	0.00	5.27	1624.22	812.11	1942.34	964.26		5.33	-0.31	0.008
170.00	-3.00	-0.52	0.00	-3.62	0.00	3.62	1602.19	801.09	1877.01	931.83		5.53	-0.31	0.006
175.00	-2.47	-0.44	0.00	-1.04	0.00	1.04	1564.49	782.24	1769.40	878.40		5.86	-0.32	0.003
177.00	-0.26	-0.05	0.00	-0.16	0.00	0.16	1549.06	774.53	1726.82	857.27		5.99	-0.32	0.000
180.00	0.00	-0.05	0.00	0.00	0.00	0.00	1525.56	762.78	1663.50	825.83		6.19	-0.32	0.000

Calculated Forces

Structure:	CT02721-S-SBA			**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham			**Exposure:**	C		
Height:	180.00 (ft)			**Crest Height:**	0.00		
Base Elev:	0.000 (ft)			**Site Class:**	D - Stiff Soil		
Gh:	1.1	**Topography:**	1	**Struct Class:**	II	Page: 29	

Seismic Segment Forces (Factored)

Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 30	

Tower Engineering Solutions

Load Case:	0.9D + 1.0E							**Iterations**	23
Gust Response Factor	1.10				**Sds**	0.18		**Ss**	0.17
Dead Load Factor	0.90	**Seismic Load Factor**	1.00		**Sd1**	0.10		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.35		**SA**	0.03	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1402.7	0.00	0.03	0.02	21.68	
10.00		1379.5	0.01	0.05	0.03	32.18	
15.00		1356.4	0.01	0.06	0.03	37.52	
20.00		1333.2	0.02	0.07	0.04	40.14	
25.00		1310.1	0.04	0.07	0.04	41.33	
30.00		1286.9	0.05	0.07	0.04	41.81	
35.00		1263.8	0.07	0.07	0.04	41.98	
40.00		1240.6	0.09	0.07	0.04	42.07	
45.00		1217.5	0.12	0.07	0.03	42.10	
45.50	Bot - Section 2	120.48	0.12	0.07	0.03	4.17	
50.00		2009.2	0.15	0.07	0.03	70.70	
52.75	Top - Section 1	1210.7	0.16	0.07	0.03	42.91	
55.00		456.74	0.18	0.07	0.03	16.25	
60.00		1000.5	0.21	0.06	0.02	35.52	
65.00		980.74	0.25	0.06	0.02	33.98	
70.00		960.90	0.29	0.05	0.01	31.34	
75.00		941.05	0.33	0.04	0.01	27.29	
80.00		921.21	0.37	0.03	0.01	21.58	
85.00		901.37	0.42	0.01	0.01	14.20	
90.00		881.52	0.47	-0.01	0.01	5.50	
92.33	Bot - Section 3	404.58	0.50	-0.02	0.01	0.55	
95.00		805.25	0.53	-0.03	0.01	-3.52	
98.50	Top - Section 2	1041.9	0.57	-0.04	0.01	-12.31	
100.00		190.85	0.58	-0.05	0.01	-2.84	
105.00		626.51	0.64	-0.07	0.02	-15.02	
110.00		611.62	0.71	-0.09	0.03	-18.72	
115.00		596.74	0.77	-0.11	0.05	-20.38	
120.00		581.86	0.84	-0.12	0.07	-19.96	
125.00		566.97	0.91	-0.12	0.09	-17.57	
130.00		552.09	0.99	-0.11	0.12	-13.37	
131.58	Bot - Section 4	171.73	1.01	-0.11	0.14	-3.67	
135.00		695.28	1.06	-0.09	0.16	-9.78	
136.83	Top - Section 3	367.66	1.09	-0.07	0.18	-3.49	
140.00		297.08	1.14	-0.04	0.21	-0.16	
145.00		458.26	1.23	0.03	0.27	7.50	
147.00	Appurtenance(s)	2161.4	1.26	0.07	0.30	52.01	
150.00		265.43	1.31	0.14	0.35	9.73	
155.00		431.80	1.40	0.29	0.43	26.06	
160.00		418.58	1.49	0.48	0.53	36.64	
165.00		405.35	1.59	0.74	0.65	47.93	
167.00	Appurtenance(s)	2277.4	1.63	0.86	0.71	299.54	
170.00		233.68	1.69	1.07	0.79	35.65	
175.00		378.89	1.79	1.48	0.95	72.18	
177.00	Appurtenance(s)	1820.9	1.83	1.67	1.03	376.47	
180.00		217.81	1.89	1.98	1.14	50.58	

Seismic Segment Forces (Factored)

Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 31

Totals:	**38,755.4**	**1,518.3**	**Total Wind:**	**37,746.7**

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

Calculated Forces

Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 32	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E

Gust Response Factor	1.10			**Sds**	0.18			**Iterations**	23
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10			**Ss**	0.17
Wind Load Factor	0.00	**Structure Frequency**	0.35	**SA**	0.03			**S1**	0.06
								Seismic Importance Factor	1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-38.92	-1.66	0.00	-206.44	0.00	206.44	5499.24	2749.62	13525.8	6714.82		0.00	0.00	0.038
5.00	-37.53	-1.64	0.00	-198.14	0.00	198.14	5446.13	2723.06	13174.3	6540.31		0.00	-0.01	0.037
10.00	-36.16	-1.62	0.00	-189.91	0.00	189.91	5391.79	2695.89	12824.2	6366.50		0.02	-0.02	0.037
15.00	-34.82	-1.58	0.00	-181.83	0.00	181.83	5336.22	2668.11	12475.6	6193.44		0.04	-0.02	0.036
20.00	-33.49	-1.55	0.00	-173.91	0.00	173.91	5279.42	2639.71	12128.7	6021.23		0.07	-0.03	0.035
25.00	-32.19	-1.51	0.00	-166.17	0.00	166.17	5221.40	2610.70	11783.6	5849.92		0.10	-0.04	0.035
30.00	-30.91	-1.47	0.00	-158.62	0.00	158.62	5162.14	2581.07	11440.6	5679.60		0.15	-0.05	0.034
35.00	-29.65	-1.43	0.00	-151.27	0.00	151.27	5101.66	2550.83	11099.6	5510.34		0.20	-0.06	0.033
40.00	-28.40	-1.39	0.00	-144.10	0.00	144.10	5039.95	2519.97	10760.9	5342.21		0.26	-0.06	0.033
45.00	-27.18	-1.35	0.00	-137.14	0.00	137.14	4977.01	2488.50	10424.7	5175.29		0.33	-0.07	0.032
45.50	-27.06	-1.35	0.00	-136.46	0.00	136.46	4970.65	2485.32	10391.2	5158.66		0.34	-0.07	0.032
50.00	-25.14	-1.28	0.00	-130.39	0.00	130.39	4912.84	2456.42	10091.1	5009.65		0.41	-0.08	0.031
52.75	-23.99	-1.24	0.00	-126.87	0.00	126.87	3995.11	1997.56	8262.19	4101.70		0.46	-0.08	0.037
55.00	-23.52	-1.22	0.00	-124.09	0.00	124.09	3974.19	1987.10	8146.39	4044.21		0.50	-0.09	0.037
60.00	-22.49	-1.19	0.00	-117.98	0.00	117.98	3926.81	1963.41	7890.01	3916.93		0.60	-0.10	0.036
65.00	-21.49	-1.16	0.00	-112.04	0.00	112.04	3878.20	1939.10	7635.05	3790.36		0.71	-0.11	0.035
70.00	-20.50	-1.13	0.00	-106.26	0.00	106.26	3828.36	1914.18	7381.67	3664.57		0.82	-0.12	0.034
75.00	-19.53	-1.10	0.00	-100.63	0.00	100.63	3777.30	1888.65	7130.01	3539.64		0.95	-0.13	0.034
80.00	-18.57	-1.08	0.00	-95.13	0.00	95.13	3725.00	1862.50	6880.23	3415.63		1.09	-0.14	0.033
85.00	-17.64	-1.07	0.00	-89.73	0.00	89.73	3671.48	1835.74	6632.46	3292.63		1.24	-0.15	0.032
90.00	-16.72	-1.06	0.00	-84.40	0.00	84.40	3616.73	1808.36	6386.87	3170.71		1.39	-0.16	0.031
92.33	-16.30	-1.06	0.00	-81.93	0.00	81.93	3590.75	1795.38	6273.05	3114.21		1.47	-0.16	0.031
95.00	-15.51	-1.06	0.00	-79.10	0.00	79.10	3560.74	1780.37	6143.61	3049.94		1.56	-0.17	0.030
98.50	-14.48	-1.06	0.00	-75.39	0.00	75.39	2386.86	1193.43	4124.78	2047.71		1.68	-0.17	0.043
100.00	-14.27	-1.06	0.00	-73.81	0.00	73.81	2378.02	1189.01	4080.56	2025.76		1.74	-0.18	0.042
105.00	-13.58	-1.06	0.00	-68.51	0.00	68.51	2347.74	1173.87	3933.38	1952.70		1.93	-0.19	0.041
110.00	-12.91	-1.06	0.00	-63.21	0.00	63.21	2316.23	1158.11	3786.65	1879.85		2.13	-0.20	0.039
115.00	-12.25	-1.06	0.00	-57.91	0.00	57.91	2283.49	1141.75	3640.52	1807.31		2.35	-0.21	0.037
120.00	-11.60	-1.06	0.00	-52.61	0.00	52.61	2249.53	1124.76	3495.14	1735.13		2.58	-0.22	0.035
125.00	-10.96	-1.06	0.00	-47.31	0.00	47.31	2214.33	1107.17	3350.65	1663.40		2.82	-0.24	0.033
130.00	-10.34	-1.06	0.00	-42.01	0.00	42.01	2177.91	1088.96	3207.21	1592.19		3.07	-0.25	0.031
131.58	-10.15	-1.06	0.00	-40.33	0.00	40.33	2166.12	1083.06	3162.03	1569.76		3.15	-0.25	0.030
135.00	-9.44	-1.06	0.00	-36.71	0.00	36.71	2140.26	1070.13	3064.96	1521.58		3.34	-0.26	0.029
136.83	-9.06	-1.06	0.00	-34.77	0.00	34.77	1821.16	910.58	2623.48	1302.41		3.44	-0.26	0.032
140.00	-8.72	-1.06	0.00	-31.43	0.00	31.43	1802.58	901.29	2550.43	1266.14		3.61	-0.27	0.030
145.00	-8.18	-1.05	0.00	-26.15	0.00	26.15	1772.26	886.13	2435.64	1209.15		3.90	-0.28	0.026
147.00	-6.18	-0.99	0.00	-24.06	0.00	24.06	1759.78	879.89	2389.94	1186.47		4.02	-0.28	0.024
150.00	-5.90	-0.97	0.00	-21.10	0.00	21.10	1740.70	870.35	2321.67	1152.58		4.20	-0.29	0.022
155.00	-5.45	-0.95	0.00	-16.23	0.00	16.23	1707.91	853.96	2208.68	1096.48		4.50	-0.30	0.018
160.00	-5.00	-0.91	0.00	-11.49	0.00	11.49	1673.90	836.95	2096.80	1040.94		4.82	-0.30	0.014
165.00	-4.57	-0.86	0.00	-6.95	0.00	6.95	1638.66	819.33	1986.20	986.03		5.14	-0.31	0.010
167.00	-2.50	-0.55	0.00	-5.23	0.00	5.23	1624.22	812.11	1942.34	964.26		5.26	-0.31	0.007
170.00	-2.25	-0.51	0.00	-3.59	0.00	3.59	1602.19	801.09	1877.01	931.83		5.46	-0.31	0.005
175.00	-1.85	-0.44	0.00	-1.03	0.00	1.03	1564.49	782.24	1769.40	878.40		5.78	-0.31	0.002
177.00	-0.20	-0.05	0.00	-0.15	0.00	0.15	1549.06	774.53	1726.82	857.27		5.91	-0.31	0.000
180.00	0.00	-0.05	0.00	0.00	0.00	0.00	1525.56	762.78	1663.50	825.83		6.11	-0.31	0.000

Calculated Forces

Structure:	CT02721-S-SBA			**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham			**Exposure:**	C		
Height:	180.00 (ft)			**Crest Height:**	0.00		
Base Elev:	0.000 (ft)			**Site Class:**	D - Stiff Soil		
Gh:	1.1	**Topography:**	1	**Struct Class:**	II	Page: 33	

Wind Loading - Shaft

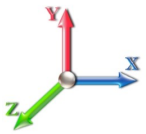
Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 34	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



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	7.442	8.19	282.00	0.750	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	7.442	8.19	277.42	0.750	0.000	5.00	25.283	18.96	155.2	0.0	1402.7
10.00		1.00	0.85	7.442	8.19	272.84	0.750	0.000	5.00	24.868	18.65	152.7	0.0	1379.6
15.00		1.00	0.85	7.442	8.19	268.26	0.750	0.000	5.00	24.454	18.34	150.1	0.0	1356.4
20.00		1.00	0.90	7.896	8.69	271.60	0.750	0.000	5.00	24.040	18.03	156.6	0.0	1333.3
25.00		1.00	0.95	8.276	9.10	273.22	0.750	0.000	5.00	23.626	17.72	161.3	0.0	1310.1
30.00		1.00	0.98	8.600	9.46	273.59	0.750	0.000	5.00	23.212	17.41	164.7	0.0	1287.0
35.00		1.00	1.01	8.883	9.77	273.06	0.750	0.000	5.00	22.797	17.10	167.1	0.0	1263.8
40.00		1.00	1.04	9.137	10.05	271.85	0.750	0.000	5.00	22.383	16.79	168.7	0.0	1240.7
45.00		1.00	1.07	9.366	10.30	270.10	0.750	0.000	5.00	21.969	16.48	169.8	0.0	1217.5
45.50	Bot - Section 2	1.00	1.07	9.388	10.33	269.90	0.750	0.000	0.50	2.174	1.63	16.8	0.0	120.5
50.00		1.00	1.09	9.576	10.53	267.91	0.750	0.000	4.50	19.667	14.75	155.4	0.0	2009.2
52.75	Top - Section 1	1.00	1.11	9.685	10.65	266.55	0.750	0.000	2.75	11.854	8.89	94.7	0.0	1210.7
55.00		1.00	1.12	9.770	10.75	269.40	0.750	0.000	2.25	9.605	7.20	77.4	0.0	456.7
60.00		1.00	1.14	9.951	10.95	266.58	0.750	0.000	5.00	21.045	15.78	172.8	0.0	1000.6
65.00		1.00	1.16	10.120	11.13	263.49	0.750	0.000	5.00	20.631	15.47	172.2	0.0	980.7
70.00		1.00	1.17	10.279	11.31	260.17	0.750	0.000	5.00	20.216	15.16	171.4	0.0	960.9
75.00		1.00	1.19	10.430	11.47	256.64	0.750	0.000	5.00	19.802	14.85	170.4	0.0	941.1
80.00		1.00	1.21	10.572	11.63	252.93	0.750	0.000	5.00	19.388	14.54	169.1	0.0	921.2
85.00		1.00	1.22	10.708	11.78	249.05	0.750	0.000	5.00	18.974	14.23	167.6	0.0	901.4
90.00		1.00	1.24	10.838	11.92	245.02	0.750	0.000	5.00	18.559	13.92	165.9	0.0	881.5
92.33	Bot - Section 3	1.00	1.24	10.896	11.99	243.10	0.750	0.000	2.33	8.519	6.39	76.6	0.0	404.6
95.00		1.00	1.25	10.962	12.06	240.86	0.750	0.000	2.67	9.753	7.32	88.2	0.0	805.3
98.50	Top - Section 2	1.00	1.26	11.046	12.15	237.87	0.750	0.000	3.50	12.622	9.47	115.0	0.0	1041.9
100.00		1.00	1.27	11.081	12.19	239.80	0.750	0.000	1.50	5.348	4.01	48.9	0.0	190.9
105.00		1.00	1.28	11.195	12.31	235.41	0.750	0.000	5.00	17.556	13.17	162.1	0.0	626.5
110.00		1.00	1.29	11.305	12.44	230.92	0.750	0.000	5.00	17.142	12.86	159.9	0.0	611.6
115.00		1.00	1.30	11.412	12.55	226.33	0.750	0.000	5.00	16.727	12.55	157.5	0.0	596.7
120.00		1.00	1.32	11.514	12.67	221.64	0.750	0.000	5.00	16.313	12.23	155.0	0.0	581.9
125.00		1.00	1.33	11.614	12.78	216.87	0.750	0.000	5.00	15.899	11.92	152.3	0.0	567.0
130.00		1.00	1.34	11.710	12.88	212.02	0.750	0.000	5.00	15.485	11.61	149.6	0.0	552.1
131.58	Bot - Section 4	1.00	1.34	11.740	12.91	210.47	0.750	0.000	1.58	4.817	3.61	46.7	0.0	171.7
135.00		1.00	1.35	11.803	12.98	207.09	0.750	0.000	3.42	10.398	7.80	101.3	0.0	695.3
136.83	Top - Section 3	1.00	1.35	11.837	13.02	205.27	0.750	0.000	1.83	5.500	4.12	53.7	0.0	367.7
140.00		1.00	1.36	11.894	13.08	205.07	0.750	0.000	3.17	9.369	7.03	91.9	0.0	297.1
145.00		1.00	1.37	11.982	13.18	200.01	0.750	0.000	5.00	14.454	10.84	142.9	0.0	458.3
147.00	Appurtenance(s)	1.00	1.37	12.017	13.22	197.97	0.750	0.000	2.00	5.666	4.25	56.2	0.0	179.6
150.00		1.00	1.38	12.068	13.27	194.89	0.750	0.000	3.00	8.374	6.28	83.4	0.0	265.4
155.00		1.00	1.39	12.152	13.37	189.71	0.750	0.000	5.00	13.626	10.22	136.6	0.0	431.8
160.00		1.00	1.40	12.233	13.46	184.47	0.750	0.000	5.00	13.212	9.91	133.3	0.0	418.6
165.00		1.00	1.41	12.313	13.54	179.17	0.750	0.000	5.00	12.797	9.60	130.0	0.0	405.3
167.00	Appurtenance(s)	1.00	1.41	12.344	13.58	177.04	0.750	0.000	2.00	5.003	3.75	50.9	0.0	158.4
170.00		1.00	1.42	12.390	13.63	173.82	0.750	0.000	3.00	7.380	5.54	75.4	0.0	233.7
175.00		1.00	1.42	12.466	13.71	168.42	0.750	0.000	5.00	11.969	8.98	123.1	0.0	378.9
177.00	Appurtenance(s)	1.00	1.43	12.496	13.75	166.25	0.750	0.000	2.00	4.672	3.50	48.2	0.0	147.8
180.00		1.00	1.43	12.540	13.79	162.97	0.750	0.000	3.00	6.883	5.16	71.2	0.0	217.8

Wind Loading - Shaft

Structure:	CT02721-S-SBA			**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham			**Exposure:**	C		
Height:	180.00 (ft)			**Crest Height:**	0.00		
Base Elev:	0.000 (ft)			**Site Class:**	D - Stiff Soil		
Gh:	1.1	**Topography:**	1	**Struct Class:**	II	Page: 35	

Totals:	**180.00**	**5,589.9**	**32,981.5**

Discrete Appurtenance Forces

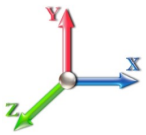
Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 36	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



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	177.00	RFS FD9R6004-2C-3L	6	12.496	13.746	0.50	0.80	1.10	18.60	0.000	0.000	15.14	0.00	0.00
2	177.00	BXA-171085-8BF	3	12.496	13.746	0.67	0.80	5.93	31.50	0.000	0.000	81.47	0.00	0.00
3	177.00	LPA-80080-4CF	6	12.496	13.746	1.36	0.80	21.30	72.00	0.000	0.000	292.75	0.00	0.00
4	177.00	BXA-70063-6CF	3	12.496	13.746	0.58	0.80	13.26	51.00	0.000	0.000	182.30	0.00	0.00
5	177.00	Low Profile Platform	1	12.496	13.746	1.00	1.00	22.00	1500.00	0.000	0.000	302.41	0.00	0.00
6	167.00	RFS ACU-A20-N RET	4	12.344	13.578	0.63	0.80	0.35	4.00	0.000	0.000	4.81	0.00	0.00
7	167.00	Alcatel Lucent 800 MHz	3	12.344	13.578	0.55	0.80	1.29	26.40	0.000	0.000	17.54	0.00	0.00
8	167.00	Alcatel Lucent 800 MHz	3	12.344	13.578	0.54	0.80	4.00	159.00	0.000	0.000	54.37	0.00	0.00
9	167.00	Alcatel Lucent 1900 MHz	3	12.344	13.578	0.54	0.80	4.45	180.00	0.000	0.000	60.48	0.00	0.00
10	167.00	Alcatel Lucent	3	12.344	13.578	0.54	0.80	6.51	210.00	0.000	0.000	88.43	0.00	0.00
11	167.00	APXVSPP18-C-A20	3	12.344	13.578	0.66	0.80	15.98	171.00	0.000	0.000	216.93	0.00	0.00
12	167.00	APXVTM14-C-I20	3	12.344	13.578	0.62	0.80	11.72	168.60	0.000	0.000	159.09	0.00	0.00
13	167.00	Low Profile Platform	1	12.344	13.578	1.00	1.00	25.00	1200.00	0.000	0.000	339.46	0.00	0.00
14	147.00	Raycap DC6-48-60-18-8F	1	12.017	13.219	0.80	0.80	0.74	31.80	0.000	0.000	9.73	0.00	0.00
15	147.00	Ericsson RRUS-11 RRU	6	12.017	13.219	0.54	0.80	8.10	304.20	0.000	0.000	107.13	0.00	0.00
16	147.00	CCI DTMABP7819VG12A	6	12.017	13.219	0.54	0.80	3.67	115.20	0.000	0.000	48.46	0.00	0.00
17	147.00	P65-17-XLH-RR	1	12.017	13.219	0.60	0.80	6.86	59.00	0.000	0.000	90.73	0.00	0.00
18	147.00	7770.00	6	12.017	13.219	0.58	0.80	19.27	210.00	0.000	0.000	254.75	0.00	0.00
19	147.00	AM-X-CD-17-65-00T	2	12.017	13.219	0.60	0.80	6.00	61.60	0.000	0.000	79.31	0.00	0.00
20	147.00	Low Profile Platform	1	12.017	13.219	1.00	1.00	25.00	1200.00	0.000	0.000	330.47	0.00	0.00
							Totals:		**5,773.90**			**2,735.74**		

Total Applied Force Summary

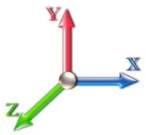
Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 37	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



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		155.23	1540.74	0.00	0.00
10.00		152.68	1517.58	0.00	0.00
15.00		150.14	1494.43	0.00	0.00
20.00		156.61	1471.28	0.00	0.00
25.00		161.31	1448.13	0.00	0.00
30.00		164.68	1424.97	0.00	0.00
35.00		167.08	1401.82	0.00	0.00
40.00		168.72	1378.67	0.00	0.00
45.00		169.76	1355.52	0.00	0.00
45.50		16.84	134.28	0.00	0.00
50.00		155.38	2133.45	0.00	0.00
52.75		94.71	1286.63	0.00	0.00
55.00		77.42	518.84	0.00	0.00
60.00		172.77	1138.59	0.00	0.00
65.00		172.25	1118.74	0.00	0.00
70.00		171.44	1098.90	0.00	0.00
75.00		170.39	1079.05	0.00	0.00
80.00		169.10	1059.21	0.00	0.00
85.00		167.62	1039.37	0.00	0.00
90.00		165.94	1019.52	0.00	0.00
92.33		76.58	468.98	0.00	0.00
95.00		88.20	878.85	0.00	0.00
98.50		115.02	1138.50	0.00	0.00
100.00		48.88	232.25	0.00	0.00
105.00		162.15	764.51	0.00	0.00
110.00		159.88	749.62	0.00	0.00
115.00		157.48	734.74	0.00	0.00
120.00		154.96	719.86	0.00	0.00
125.00		152.33	704.97	0.00	0.00
130.00		149.59	690.09	0.00	0.00
131.58		46.66	215.43	0.00	0.00
135.00		101.26	789.58	0.00	0.00
136.83		53.71	418.26	0.00	0.00
140.00		91.93	384.48	0.00	0.00
145.00		142.89	596.26	0.00	0.00
147.00	(23) attachments	976.75	2216.60	0.00	0.00
150.00		83.38	310.79	0.00	0.00
155.00		136.60	507.40	0.00	0.00
160.00		133.34	494.18	0.00	0.00
165.00		130.00	480.95	0.00	0.00
167.00	(23) attachments	992.05	2307.67	0.00	0.00
170.00		75.44	271.12	0.00	0.00
175.00		123.10	441.29	0.00	0.00
177.00	(19) attachments	922.23	1845.91	0.00	0.00
180.00		71.21	217.81	0.00	0.00

Total Applied Force Summary

Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 38	

Totals:	**8,325.67**	**43,239.82**	**0.00**	**0.00**

Calculated Forces

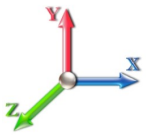
Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 39	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 24

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	-43.24	-8.34	0.00	-970.85	0.00	970.85	5499.24	2749.62	13525.8	6714.82	0.00	0.000	0.000	0.152
5.00	-41.69	-8.21	0.00	-929.15	0.00	929.15	5446.13	2723.06	13174.3	6540.31	0.02	-0.036	0.000	0.150
10.00	-40.17	-8.08	0.00	-888.11	0.00	888.11	5391.79	2695.89	12824.2	6366.50	0.08	-0.073	0.000	0.147
15.00	-38.67	-7.95	0.00	-847.70	0.00	847.70	5336.22	2668.11	12475.6	6193.44	0.17	-0.109	0.000	0.144
20.00	-37.19	-7.82	0.00	-807.94	0.00	807.94	5279.42	2639.71	12128.7	6021.23	0.31	-0.146	0.000	0.141
25.00	-35.74	-7.67	0.00	-768.85	0.00	768.85	5221.40	2610.70	11783.6	5849.92	0.48	-0.183	0.000	0.138
30.00	-34.31	-7.53	0.00	-730.48	0.00	730.48	5162.14	2581.07	11440.6	5679.60	0.69	-0.220	0.000	0.135
35.00	-32.91	-7.38	0.00	-692.84	0.00	692.84	5101.66	2550.83	11099.6	5510.34	0.94	-0.257	0.000	0.132
40.00	-31.52	-7.22	0.00	-655.96	0.00	655.96	5039.95	2519.97	10760.9	5342.21	1.23	-0.294	0.000	0.129
45.00	-30.17	-7.05	0.00	-619.86	0.00	619.86	4977.01	2488.50	10424.7	5175.29	1.56	-0.331	0.000	0.126
45.50	-30.03	-7.05	0.00	-616.33	0.00	616.33	4970.65	2485.32	10391.2	5158.66	1.59	-0.335	0.000	0.126
50.00	-27.89	-6.89	0.00	-584.62	0.00	584.62	4912.84	2456.42	10091.1	5009.65	1.93	-0.369	0.000	0.122
52.75	-26.61	-6.80	0.00	-565.67	0.00	565.67	3995.11	1997.56	8262.19	4101.70	2.14	-0.389	0.000	0.145
55.00	-26.08	-6.73	0.00	-550.38	0.00	550.38	3974.19	1987.10	8146.39	4044.21	2.33	-0.406	0.000	0.143
60.00	-24.94	-6.57	0.00	-516.73	0.00	516.73	3926.81	1963.41	7890.01	3916.93	2.78	-0.447	0.000	0.138
65.00	-23.82	-6.40	0.00	-483.91	0.00	483.91	3878.20	1939.10	7635.05	3790.36	3.27	-0.488	0.000	0.134
70.00	-22.72	-6.24	0.00	-451.90	0.00	451.90	3828.36	1914.18	7381.67	3664.57	3.80	-0.529	0.000	0.129
75.00	-21.64	-6.07	0.00	-420.72	0.00	420.72	3777.30	1888.65	7130.01	3539.64	4.38	-0.569	0.000	0.125
80.00	-20.58	-5.90	0.00	-390.37	0.00	390.37	3725.00	1862.50	6880.23	3415.63	5.00	-0.609	0.000	0.120
85.00	-19.53	-5.74	0.00	-360.85	0.00	360.85	3671.48	1835.74	6632.46	3292.63	5.65	-0.648	0.000	0.115
90.00	-18.51	-5.57	0.00	-332.15	0.00	332.15	3616.73	1808.36	6386.87	3170.71	6.35	-0.687	0.000	0.110
92.33	-18.04	-5.49	0.00	-319.16	0.00	319.16	3590.75	1795.38	6273.05	3114.21	6.69	-0.705	0.000	0.108
95.00	-17.16	-5.40	0.00	-304.51	0.00	304.51	3560.74	1780.37	6143.61	3049.94	7.09	-0.726	0.000	0.105
98.50	-16.03	-5.28	0.00	-285.60	0.00	285.60	2386.86	1193.43	4124.78	2047.71	7.64	-0.752	0.000	0.146
100.00	-15.79	-5.23	0.00	-277.68	0.00	277.68	2378.02	1189.01	4080.56	2025.76	7.87	-0.764	0.000	0.144
105.00	-15.02	-5.07	0.00	-251.51	0.00	251.51	2347.74	1173.87	3933.38	1952.70	8.70	-0.810	0.000	0.135
110.00	-14.27	-4.91	0.00	-226.15	0.00	226.15	2316.23	1158.11	3786.65	1879.85	9.57	-0.855	0.000	0.126
115.00	-13.54	-4.75	0.00	-201.58	0.00	201.58	2283.49	1141.75	3640.52	1807.31	10.49	-0.898	0.000	0.117
120.00	-12.82	-4.60	0.00	-177.81	0.00	177.81	2249.53	1124.76	3495.14	1735.13	11.45	-0.940	0.000	0.108
125.00	-12.11	-4.44	0.00	-154.82	0.00	154.82	2214.33	1107.17	3350.65	1663.40	12.46	-0.979	0.000	0.099
130.00	-11.42	-4.28	0.00	-132.62	0.00	132.62	2177.91	1088.96	3207.21	1592.19	13.50	-1.015	0.000	0.089
131.58	-11.21	-4.24	0.00	-125.83	0.00	125.83	2166.12	1083.06	3162.03	1569.76	13.84	-1.027	0.000	0.085
135.00	-10.42	-4.12	0.00	-111.36	0.00	111.36	2140.26	1070.13	3064.96	1521.58	14.59	-1.050	0.000	0.078
136.83	-10.00	-4.07	0.00	-103.80	0.00	103.80	1821.16	910.58	2623.48	1302.41	14.99	-1.061	0.000	0.085
140.00	-9.62	-3.97	0.00	-90.92	0.00	90.92	1802.58	901.29	2550.43	1266.14	15.70	-1.081	0.000	0.077
145.00	-9.02	-3.82	0.00	-71.06	0.00	71.06	1772.26	886.13	2435.64	1209.15	16.85	-1.109	0.000	0.064
147.00	-6.82	-2.80	0.00	-63.42	0.00	63.42	1759.78	879.89	2389.94	1186.47	17.32	-1.119	0.000	0.057
150.00	-6.51	-2.71	0.00	-55.02	0.00	55.02	1740.70	870.35	2321.67	1152.58	18.03	-1.133	0.000	0.051
155.00	-6.01	-2.57	0.00	-41.45	0.00	41.45	1707.91	853.96	2208.68	1096.48	19.22	-1.154	0.000	0.041
160.00	-5.52	-2.43	0.00	-28.60	0.00	28.60	1673.90	836.95	2096.80	1040.94	20.44	-1.170	0.000	0.031
165.00	-5.04	-2.29	0.00	-16.46	0.00	16.46	1638.66	819.33	1986.20	986.03	21.67	-1.181	0.000	0.020
167.00	-2.75	-1.25	0.00	-11.89	0.00	11.89	1624.22	812.11	1942.34	964.26	22.17	-1.184	0.000	0.014
170.00	-2.48	-1.17	0.00	-8.14	0.00	8.14	1602.19	801.09	1877.01	931.83	22.91	-1.188	0.000	0.010
175.00	-2.04	-1.04	0.00	-2.30	0.00	2.30	1564.49	782.24	1769.40	878.40	24.16	-1.191	0.000	0.004
177.00	-0.22	-0.08	0.00	-0.23	0.00	0.23	1549.06	774.53	1726.82	857.27	24.66	-1.191	0.000	0.000
180.00	0.00	-0.07	0.00	0.00	0.00	0.00	1525.56	762.78	1663.50	825.83	25.41	-1.191	0.000	0.000

Final Analysis Summary

Structure:	CT02721-S-SBA	**Code:**	EIA/TIA-222-G	10/24/2017	
Site Name:	South Windham	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 40	

Tower Engineering Solutions

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 101 mph Wind	37.8	0.00	51.83	0.00	0.00	4423.87
0.9D + 1.6W 101 mph Wind	37.8	0.00	38.86	0.00	0.00	4383.04
1.2D + 1.0Di + 1.0Wi 50 mph Wind	10.1	0.00	84.16	0.00	0.00	1221.48
1.2D + 1.0E	1.7	0.00	51.89	0.00	0.00	208.54
0.9D + 1.0E	1.7	0.00	38.92	0.00	0.00	206.44
1.0D + 1.0W 60 mph Wind	8.3	0.00	43.24	0.00	0.00	970.85

Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 101 mph Wind	-51.83	-37.82	0.00	-4423.8	0.00	-4423.8	5499.24	2749.6	13525.8	6714.82	0.00	0.668
0.9D + 1.6W 101 mph Wind	-38.86	-37.80	0.00	-4383.0	0.00	-4383.0	5499.24	2749.6	13525.8	6714.82	0.00	0.660
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-84.16	-10.06	0.00	-1221.4	0.00	-1221.4	5499.24	2749.6	13525.8	6714.82	0.00	0.197
1.2D + 1.0E	-19.31	-1.07	0.00	-76.40	0.00	-76.40	2386.86	1193.4	4124.78	2047.71	98.50	0.045
0.9D + 1.0E	-14.48	-1.06	0.00	-75.39	0.00	-75.39	2386.86	1193.4	4124.78	2047.71	98.50	0.043
1.0D + 1.0W 60 mph Wind	-43.24	-8.34	0.00	-970.85	0.00	-970.85	5499.24	2749.6	13525.8	6714.82	0.00	0.152

Base Plate Summary

Structure:	CT02721-S-SB		**Code:**	EIA/TIA-222-G	10/24/2017
Site Name:	South Windham		**Exposure:**	C	
Height:	180.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 41

Tower Engineering Solutions

Reactions		Base Plate		Anchor Bolts	
Original Design		**Yield (ksi):**	50.00	**Bolt Circle:**	68.62
Moment (kip-ft):	5047.00	**Width (in):**	74.62	**Number Bolts:**	20.00
Axial (kip):	57.10	**Style:**	Round	**Bolt Type:**	2.25" 18J
Shear (kip):	40.10	**Polygon Sides:**	0.00	**Bolt Diameter (in):**	2.25
Analysis		**Clip Length (in):**	0.00	**Yield (ksi):**	75.00
Moment (kip-ft):	4423.87	**Effective Len (in):**	14.60	**Ultimate (ksi):**	100.00
Axial (kip):	84.16	**Moment (kip-in):**	685.00	**Arrangement:**	Radial
Shear (kip):	37.82	**Allow Stress (ksi):**	67.50	**Cluster Dist (in):**	0.00
		Applied Stress (ksi):	0.00	**Start Angle (deg):**	0.00
Moment Design %:	87.65	**Stress Ratio:**	0.46	Compression	
				Force (kip):	158.93
				Allowable (kip):	260.00
				Ratio:	0.63
				Tension	
				Force (kip):	150.52
				Allowable (kip):	260.00
				Ratio:	0.59

Monopole Mat Foundation Design

			Date: 10/24/2017
Customer Name:	SBA Communcations Corp	**EIA/TIA Standard:**	EIA-222-G
Site Name:		**Structure Height (Ft.):**	180
Site Number:	CT02721	**Engineer Name:**	T. Alajaj
Engr. Number:		**Engineer Login ID:**	

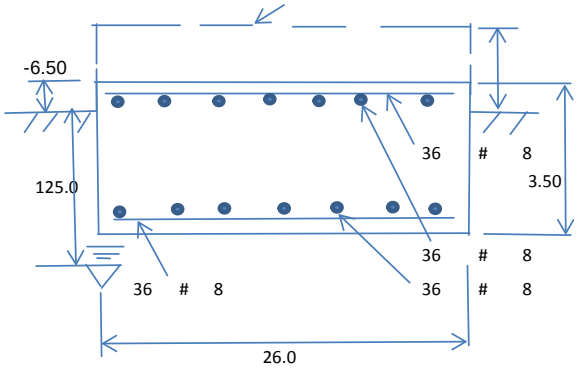
Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

Analysis or Design? Analysis

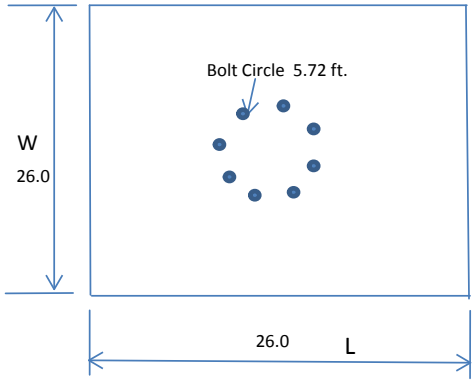
Base Reactions (Factored):

Axial Load (Kips):	84.2	Shear Force (Kips):	37.8
Uplift Force (Kips):	0.0	Moment (Kips-ft):	4423.9
Allowable overstress %:	5.0%		



Foundation Geometries:

		Mods required -Yes/No ?:	No
Anchor Bolt Circle (ft.):	5.72	Depth of Base BG (ft.):	10.00
Thickness of Pad (ft):	3.50		
Length of Pad (ft.):	26	Width of Pad (ft.):	26
Final Length of pad (ft)	26.0	Final width of pad (ft):	26.0



Material Properties and Reabr Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Pad Rebar Yield (Ksi):	60	Tie Spacing (in):	12.0	
Pad Steel Rebar Size (#):	8			
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	36	Qty. of Rebar in Pad (W):	36	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	36	Qty. of Rebar in Pad (W):	36	
Apply 1.35 factor for e/w Per G:	1.35			

Soil Design Parameters:

Water Table B.G.S. (ft):	125.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	30000	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	No	Reduction factor on the maximum soil bearing pressure:	1.00			

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

Total Dry Soil Volume (cu. Ft.):	4196.49	Total Dry Soil Weight (Kips):	419.65
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	419.65	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	2366.00	Total Dry Concrete Weight (Kips):	354.90
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	354.90	Total Vertical Load on Base (Kips):	858.75

Check Soil Capacities:

				Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	3013	<	Allowable Factored Soil Bearing (psf): 22500	0.13	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	10156.8	>	Design Factored Momont (kips-ft): 4804	0.47	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.11	OK!			

Check the capacities of Reinforceing Concrete:

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

Concrete Pad:

One-Way Design Shear Capacity (L-Direction, Kips):	986.9	>	One-Way Factored Shear (L-D. Kips):	305.0	0.31	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	986.9	>	One-Way Factored Shear (W-D., Kips)	305.0	0.31	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	1159.6	>	One-Way Factored Shear (C-C, Kips):	518.6	0.45	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0024	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0024		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	4790.0	>	Moment at Bottom (L-Direct. K-Ft):	1019.0	0.21	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	4790.0	>	Moment at Bottom (W-Direct. K-Ft):	1019.0	0.21	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	6734.5	>	Moment at Bottom (C-C Dir. K-Ft):	1441.1	0.21	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0024	OK!	Upper Steel Reinf. Ratio (W-Direct.):	0.0024		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	4790.0	>	Moment at the top (L-Dir Kips-Ft):	200.1	0.04	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	4790.0	>	Moment at the top (W-Dir Kips-Ft):	200.1	0.04	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	6734.5	>	Moment at the top (C-C Direc. K-Ft):	660.2	0.10	OK!

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

Sprint

NOTE:

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

NOTE:
THESE PLANS ARE BASED ON INFORMATION OBTAINED SITE VISIT ON MAY 01, 2014. THE SPRINT CONTRACTOR IS RESPONSIBLE TO VERIFYING ALL ITEMS AND NOTIFYING THE ENGINEER OF RECORD AND DISCREPANCIES.

PROJECT: 2.5 EQUIPMENT DEPLOYMENT

SITE NAME: CT1054-RING TO EXISTING-(R2E) PH 1A

SITE CASCADE: CT72XC043-A

MARKET: NORTHERN CONNECTICUT

SBA SITE ID: CT02721-S/SOUTH WINDHAM

SITE ADDRESS: 193 WINDHAM CENTER ROAD
WINDHAM, CT 06280

SITE TYPE: 180' MONOPOLE

SITE INFORMATION

PROPERTY OWNER:
TOWN OF WINDHAM
979 MAIN ST
WILLIMANTIC, CT 06226

TOWER OWNER:
SBA PROPERTIES, LLC.
8051 CONGRESS AVENUE
BOCA RATON, FL 33487
PHONE: (561)995-7670

SBA REGIONAL SITE MANAGER:
STEPHEN ROTH
PHONE: 860-539-4920
SRoth@sbasite.com

LATITUDE (NAD83):
GOOGLE EARTH 2-C CONFIRMATION
41° 41' 24.22" N
41.690100°

LONGITUDE (NAD83):
GOOGLE EARTH 2-C CONFIRMATION
-72° 9' 45.27" W
-72.162500°

COUNTY:
WINDHAM

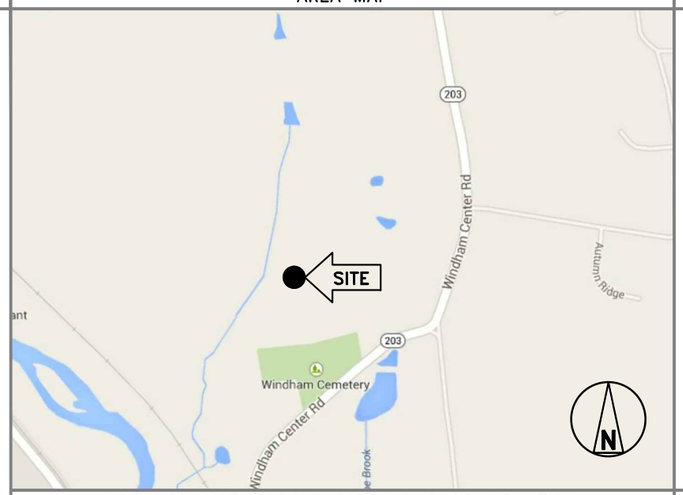
POWER COMPANY:
CLP

AAV PROVIDER:
VERIZON

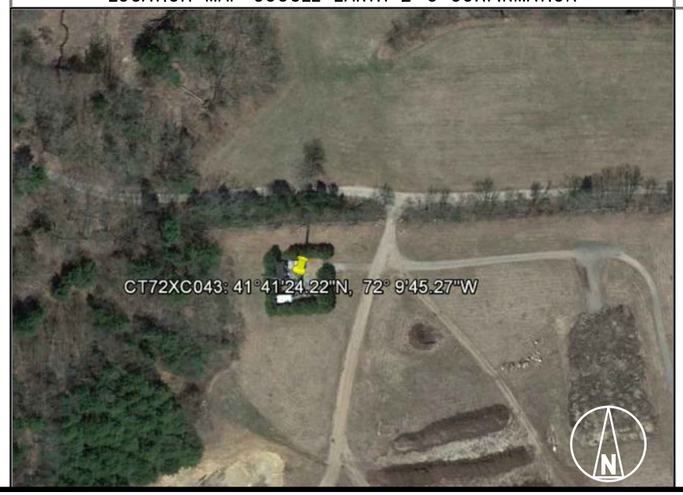
SPRINT CONSTRUCTION MANAGER:
MICHAEL DELIA
PHONE: 781-316-6348
Michael.DeLia@sprint.com

EQUIPMENT SUPPLIER:
ALCATEL-LUCENT
600 MOUNTAIN AVENUE
MURRAY HILL, NJ 07974

AREA MAP



LOCATION MAP GOOGLE EARTH 2-C CONFIRMATION



PROJECT DESCRIPTION

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

GROUND-LEVEL RAN EQUIPMENT, CONSISTING OF:
* RETROFIT EXISTING MMBTS CABINET WITH (1) RECTIFIER SHELF, (3) RECTIFIERS, 2.5 RADIO ACCESS NETWORK (RAN) EQUIPMENT & BBU KIT
* INSUFFICIENT SPACE IN EXISTING BBU RACK FOR ADDITIONAL BATTERY STRINGS.

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

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

GENERAL NOTES

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

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DRAWING INDEX

SHEET NO:	SHEET TITLE	REV	CHK	BY
T-1	TITLE SHEET	2	BB	DJM
SP-1	OUTLINE SPECIFICATIONS	2	BB	DJM
SP-2	OUTLINE SPECIFICATIONS	2	BB	DJM
SP-3	OUTLINE SPECIFICATIONS	2	BB	DJM
A-1	COMPOUND PLAN	2	BB	DJM
A-2	ELEVATION AND ANTENNA PLANS	2	BB	DJM
A-3	RF DATA SHEET	2	BB	DJM
A-4	RAN WIRING DIAGRAM	2	BB	DJM
A-5	EQUIPMENT DETAILS	2	BB	DJM
S-1	STRUCTURAL DETAILS	2	BB	DJM
E-1	ONE LINE DIAGRAM	2	BB	DJM
E-2	GROUNDING DETAILS AND NOTES	2	BB	DJM

APPROVALS

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

SPRINT: _____ DATE: _____

CONSTRUCTION MANAGER: _____ DATE: _____

LEASING/ SITE ACQUISITION: _____ DATE: _____

RF ENGINEER: _____ DATE: _____

LANDLORD/ TOWER OWNER: _____ DATE: _____

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
FAX: (508) 251-1755

HDG HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
No. 25554
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	10/30/17	REVISED - CODE UPDATE	DJM
1	05/16/14	ISSUED FOR CONSTRUCTION	SF
0	04/30/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:
CT72XC043-A
SITE NAME:
CT1054-RING TO EXISTING-(R2E) PH 1A
SITE ADDRESS:
193 WINDHAM CENTER ROAD
WINDHAM, CT 06280

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

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

SECTION 01 100 – SCOPE OF WORK

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

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

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

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

1.5 DEFINITIONS:

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

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

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

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

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

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

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

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

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

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

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

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

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

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

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

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

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

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

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:

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

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

3.2 DELIVERABLES:

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

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

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

SECTION 01 300 – CELL SITE CONSTRUCTION

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 NOTICE TO PROCEED:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FUNCTIONAL REQUIREMENTS:

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

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

C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES

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

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

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

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

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

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

E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

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

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

CONTINUE SHEET SP–2

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STATE OF CONNECTICUT
DEREK J. CREASER
No. 23551
LICENSED
PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	10/30/17	REVISED – CODE UPDATE	DJM
1	05/16/14	ISSUED FOR CONSTRUCTION	SF
0	04/30/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:
CT72XC043–A

SITE NAME:
CT1054–RING TO EXISTING–(R2E) PH 1A

SITE ADDRESS:
193 WINDHAM CENTER ROAD
WINDHAM, CT 06280

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 RADII).
23. TOWER GROUND–RING TRENCH WITH GROUND–WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
24. FENCE GROUND–RING TRENCH WITH GROUND–WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
25. ALL BTS GROUND CONNECTIONS.
26. ALL GROUND TEST WELLS.
27. ANTENNA GROUND BAR AND EQUIPMENT GROUND BAR.
28. ADDITIONAL GROUNDING POINTS ON TOWERS ABOVE 200'.
29. HVAC UNITS INCLUDING CONDENSERS ON SPLIT SYSTEMS.
30. GPS ANTENNAS.
31. CABLE TRAY AND/OR WAVEGUIDE BRIDGE.
32. DOGHOUSE/CABLE EXIT FROM ROOF.
33. EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA.
34. MASTER BUS BAR.
35. TELCO BOARD AND NIU.
36. ELECTRICAL DISTRIBUTION WALL.
37. CABLE ENTRY WITH SURGE SUPPRESSION.
38. ENTRANCE TO EQUIPMENT ROOM.
39. COAX WEATHERPROOFING–TOP AND BOTTOM OF TOWER.
40. COAX GROUNDING –TOP AND BOTTOM OF TOWER.
41. ANTENNA AND MAST GROUNDING.
42. LANDSCAPING – WHERE APPLICABLE.

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

SECTION 07 500 – ROOF CUTTING, PATCHING AND REPAIR

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

1.4 SUBMITTALS:

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

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

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

SECTION 09 900 – PAINTING

QUALITY ASSURANCE:

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

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

CONTINUE SHEET SP–3

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STATE OF CONNECTICUT
DEREK J. CREASER
No. 23551
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	10/30/17	REVISED – CODE UPDATE	DJM
1	05/16/14	ISSUED FOR CONSTRUCTION	SF
0	04/30/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:
CT72XC043–A
SITE NAME:
CT1054–RING TO EXISTING–(R2E) PH 1A
SITE ADDRESS:
193 WINDHAM CENTER ROAD
WINDHAM, CT 06280

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:

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

TOUCHUP PAINTING:

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

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

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

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

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

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

REMOTE ELECTRICAL TILT (RET) CABLES:

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

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

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

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

HYBRID CABLES INSTALLATION:

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

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

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

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

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

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

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

SUMMARY:

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

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

C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

DC CIRCUIT BREAKER LABELING

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

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

SUMMARY:

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

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

C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

SUPPORTING DEVICES:

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

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

SUPPORTING DEVICES:

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

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

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

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

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

ELECTRICAL IDENTIFICATION:

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

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

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

CONDUIT:

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

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

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

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

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

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

HUBS AND BOXES:

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

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

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

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

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

SUPPLEMENTAL GROUNDING SYSTEM

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

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

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

EXISTING STRUCTURE:

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

CONDUIT AND CONDUCTOR INSTALLATION:

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

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

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HDG
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Design Group LLC
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TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
No. 23551
LICENSED
PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	10/30/17	REVISED - CODE UPDATE	DJM
1	05/16/14	ISSUED FOR CONSTRUCTION	SF
0	04/30/14	ISSUED FOR CONSTRUCTION	SF

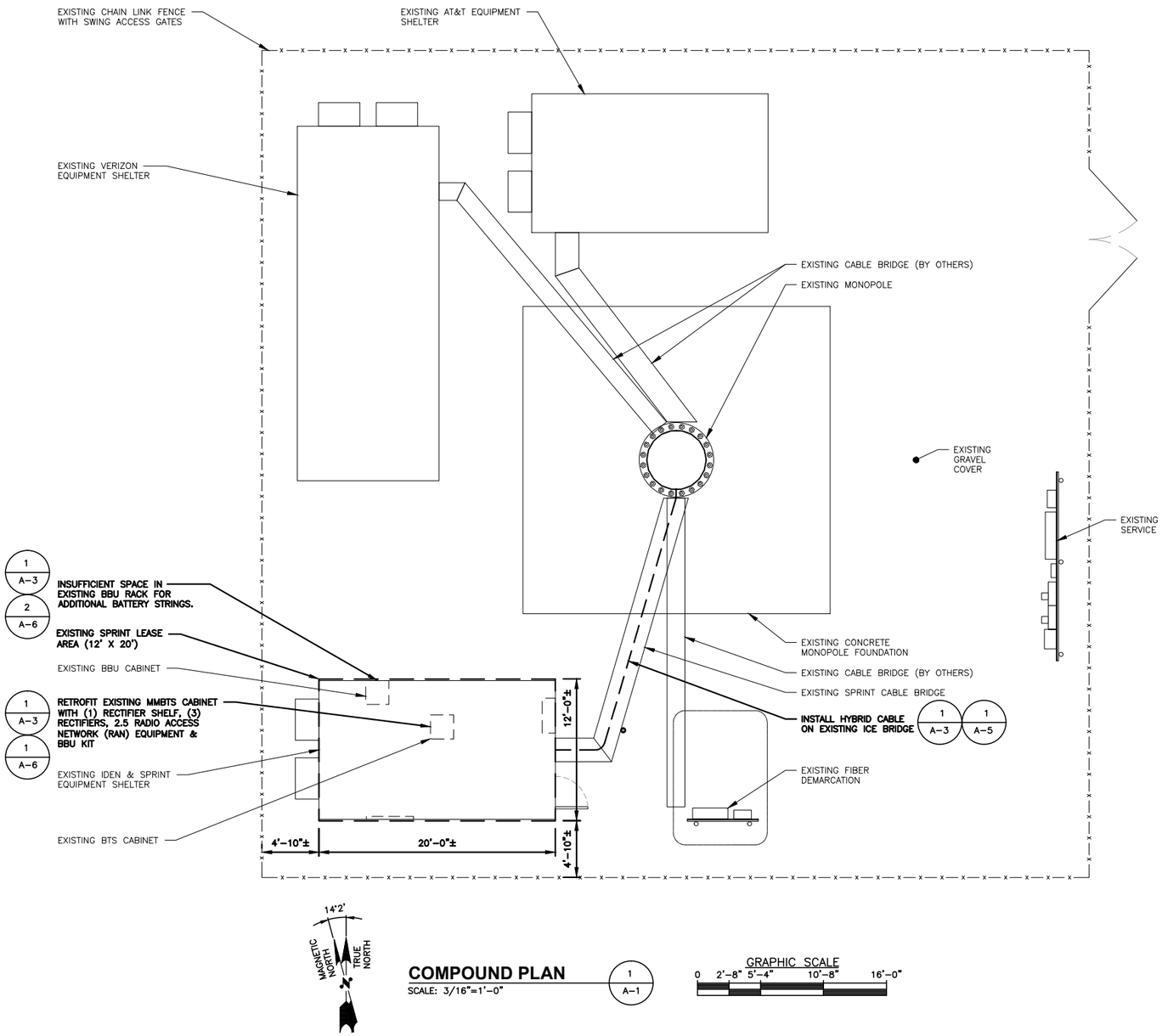
SITE NUMBER:
CT72XC043-A

SITE NAME:
CT1054-RING TO EXISTING-(R2E) PH 1A

SITE ADDRESS:
193 WINDHAM CENTER ROAD
WINDHAM, CT 06280

SHEET TITLE
OUTLINE SPECIFICATIONS

SHEET NUMBER
SP-3



COMPOUND PLAN

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

1 A-1

GRAPHIC SCALE

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

1 A-6 / 1 A-3 **RETROFIT EXISTING MMBTS CABINET WITH (1) RECTIFIER SHELF, (3) RECTIFIERS, 2.5 RADIO ACCESS NETWORK (RAN) EQUIPMENT & BBU KIT**

SOURCE: SPRINT SITE AUDIT 10-10-13

RAN EQUIPMENT PHOTO DETAIL

SCALE: N.T.S.

2 A-1

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STATE OF CONNECTICUT
DEREK J. CREASER
No. 23557
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
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CT72XC043-A

SITE NAME:
CT1054-RING TO EXISTING-(R2E) PH 1A

SITE ADDRESS:
193 WINDHAM CENTER ROAD
WINDHAM, CT 06280

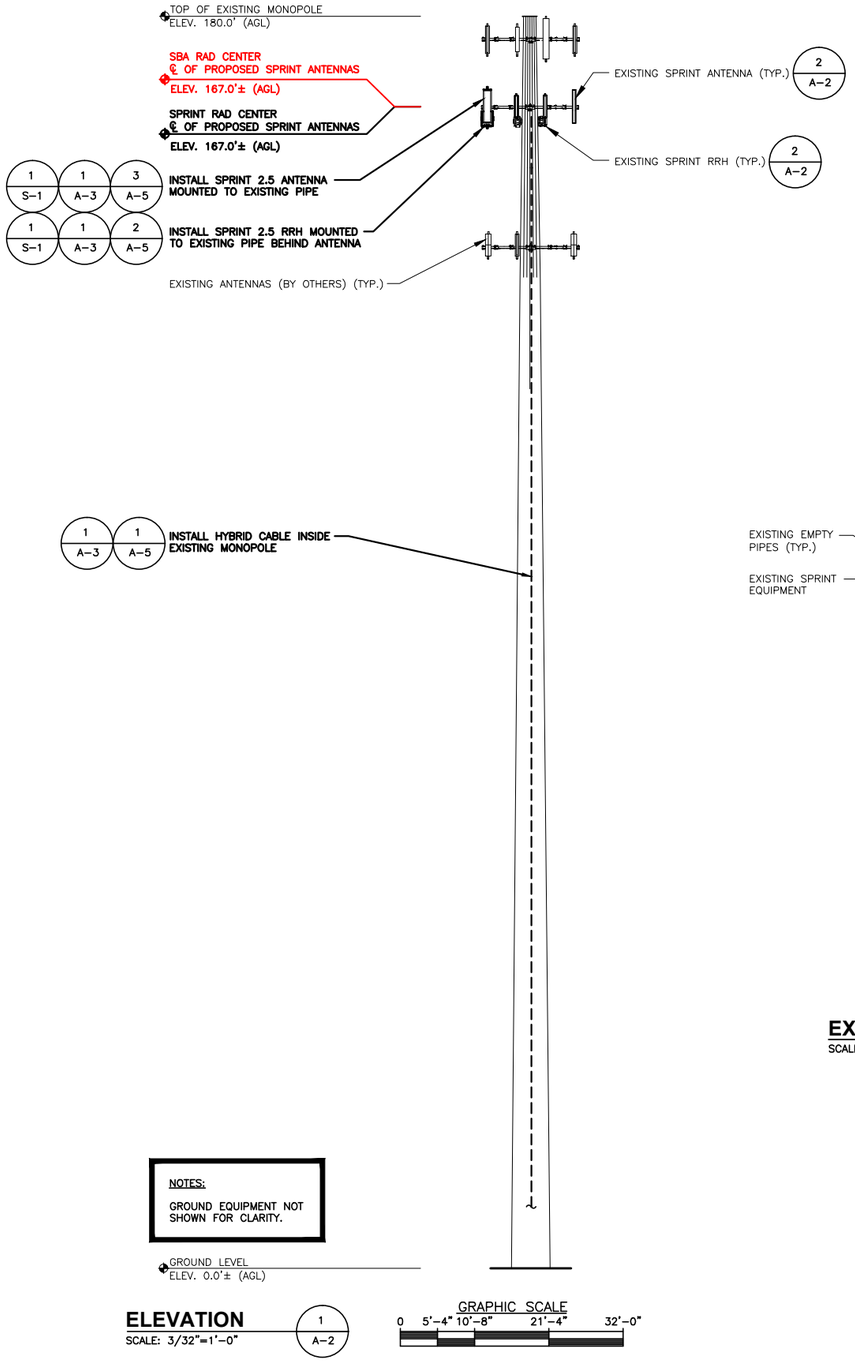
SHEET TITLE
COMPOUND PLAN

SHEET NUMBER
A-1

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

NOTE:
EXISTING AZIMUTHS FROM SPRINT SITE AUDIT DATED 10/10/13

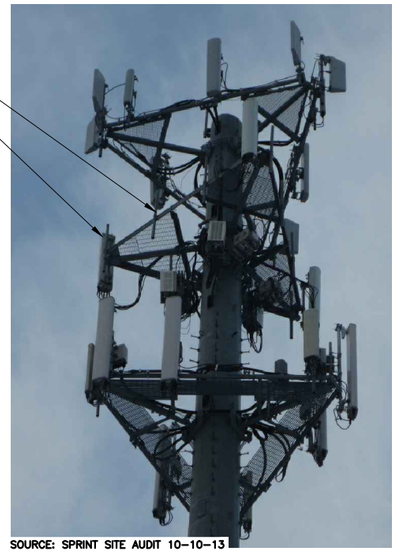
NOTE:
SPRINT RAD CENTER SHOWN IN RED TEXT BASED ON SBA-PROVIDED COLLOCATION APPLICATION, EQUIPMENT DATABASE, AND STRUCTURAL ANALYSIS. THE SBA-PROVIDED ANTENNA RAD CENTER SHALL SUPERSEDE ANY CONFLICTING INFORMATION DERIVED FROM THE SPRINT NV 2.5 RFDS.



NOTES:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

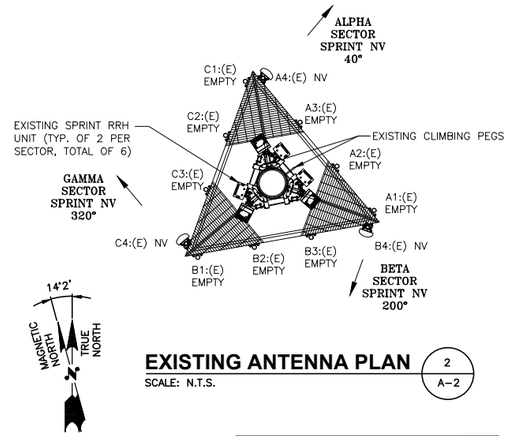
ELEVATION 1 A-2
SCALE: 3/32"=1'-0"

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



SOURCE: SPRINT SITE AUDIT 10-10-13

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

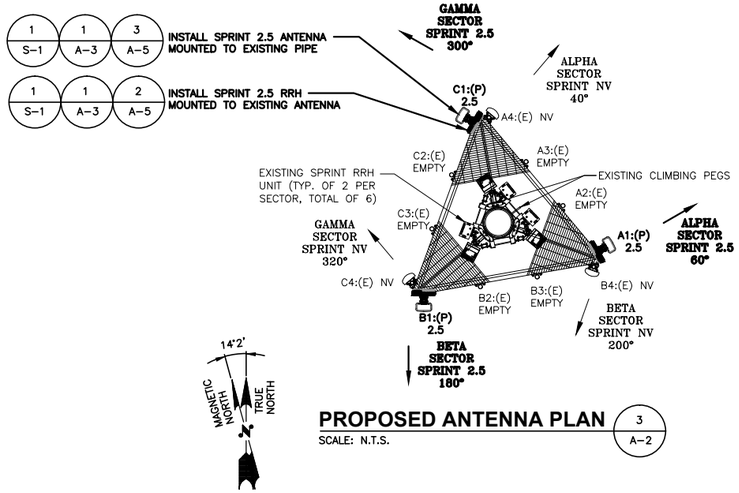


EXISTING ANTENNA PLAN 2 A-2
SCALE: N.T.S.

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

NOTES:
1) VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION
2) EXISTING RRH'S NOT SHOWN FOR CLARITY

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



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

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STATE OF CONNECTICUT
DEREK J. CREASER
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LICENSED PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
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SITE NUMBER:
CT72XC043-A
SITE NAME:
CT1054-RING TO EXISTING-(R2E) PH 1A
SITE ADDRESS:
193 WINDHAM CENTER ROAD
WINDHAM, CT 06280

SHEET TITLE
ELEVATION AND ANTENNA PLANS

SHEET NUMBER
A-2

Sp

Gene

Site I
Mark
Regic
MLA
Struc
BTS T

Solut

Base

BBU I
BBU I

Grow
Grow
Grow
Grow

RF Pa

RRH
RRH (
RRH I
RRH \
RRH I
Powe
Cable
Weig
Diam
Hybri
Coax
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A&E 200

A&E 5

A&E 5

SBA 167'

RF DATA SHEET
SCALE: N.T.S.

1
A-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 2.5G ANTENNA AT SAME CL HEIGHT AS 1.9G ANTENNA AND EMAIL CORRECT CL HEIGHT AND AZIMUTH TO SPRINT RF ENGINEER. UPDATE AS–BUILD DRAWING WITH CORRECT CL HEIGHT. ALSO EMAIL CORRECT 1900 MHZ AND 800 MHZ ANTENNA CL HEIGHT, AZIMUTH AND MECHANICAL DOWNTILT TO RF ENGINEER.
- AISG TESTS TO VERIFY OPERATION IS TO BE PERFORMED AFTER FINAL INSTALLATION OF ANTENNAS AND AISG CABLES HAVE BEEN CONNECTED. VERIFY OPERATION OF ALL EXISTING SPRINT AISG EQUIPMENT INCLUDING 800MHZ, 1.9GHZ AND 2.5G. TEST INCLUDE COMPLETE DOWNTILT, AZIMUTH (IF APPLICABLE) AND BEAMWIDTH SWINGS (IF APPLICABLE). DOCUMENT AISG TEST RESULTS IN COAX SWEEP TEST SPREADSHEET.
- GENERAL CONTRACTOR MUST INSURE THAT NO OBJECT IS LOCATED IN FRONT OF ANTENNA. THIS MEANS NO OBJECT IS TO BE LOCATED 45 DEGREES LEFT AND RIGHT OF FRONT OF ANTENNA OR 7 DEGREES UP AND DOWN FROM CENTER OF ANTENNA. IF THIS IS NOT POSSIBLE, CONTACT RF ENGINEER FOR FURTHER INSTRUCTION. IN ADDITION, 2.5G ANTENNA IS NOT TO BE PLACED IN FRONT OF ANY OTHER ANTENNA USING THE SAME 45 DEGREE RULE. THIS INCLUDES SPRINT AND NON–SPRINT ANTENNAS.
- GENERAL CONTRACT IS REQUIRED TO USE A DIGITAL ALIGNMENT TOOL TO SET AZIMUTH, ROLL AND DOWNTILT. AZIMUTH ACCURACY IS TO BE WITHIN 1 DEGREES. DOWNTILT AND ROLL (LEFT TO RIGHT TILT) IS TO BE WITHIN 0.1 DEGREES. IF FOR SOME REASON THIS ACCURACY CANNOT BE ACHIEVED, UPDATE AS–BUILT DRAWINGS AND EMAIL SPRINT RF ENGINEER WITH AS–BUILT SETTINGS. USE 3Z RF ALIGNMENT TOOL OR EQUIVALENT TOOL. HTTP://WWW.3ZTELECOM.COM/ANTENNA–ALIGNMENT–TOOL/.

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

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HDG
HUDSON
Design Group LLC
45 BEECHWOOD DRIVE
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STATE OF CONNECTICUT
DEREK J. CREASER
No. 23551
LICENSED
PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	10/30/17	REVISED – CODE UPDATE	DJM
1	05/16/14	ISSUED FOR CONSTRUCTION	SF
0	04/30/14	ISSUED FOR CONSTRUCTION	SF

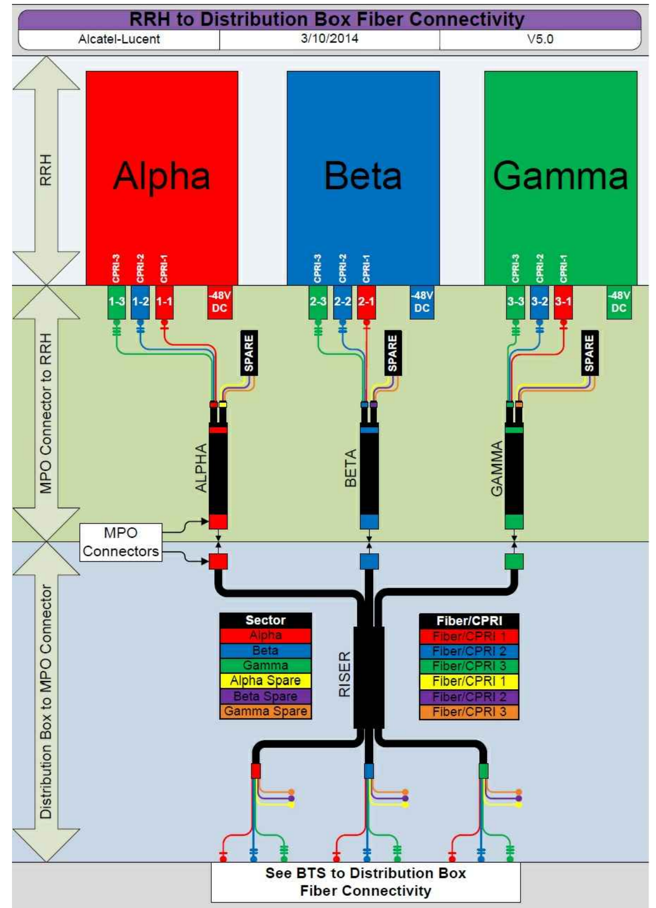
SITE NUMBER:
CT72XC043–A

SITE NAME:
CT1054–RING TO EXISTING–(R2E) PH 1A

SITE ADDRESS:
193 WINDHAM CENTER ROAD
WINDHAM, CT 06280

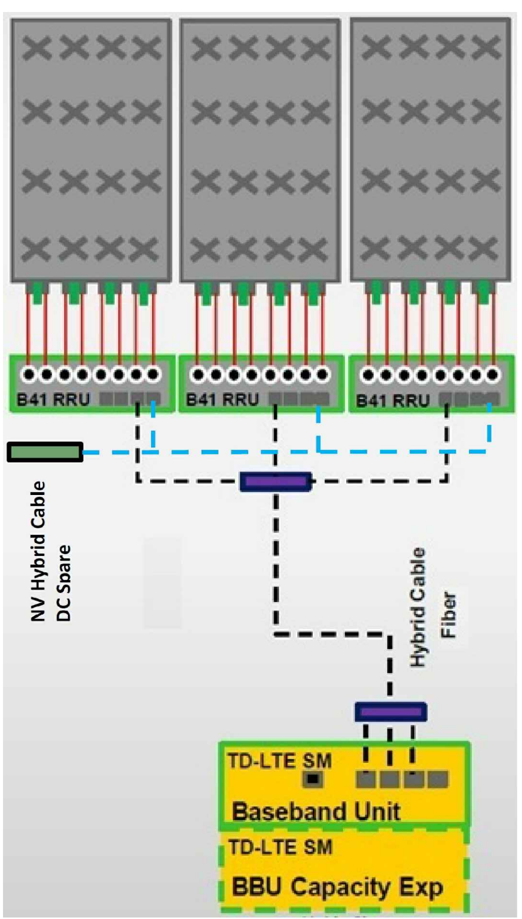
SHEET TITLE
RF DATA SHEET

SHEET NUMBER
A–3



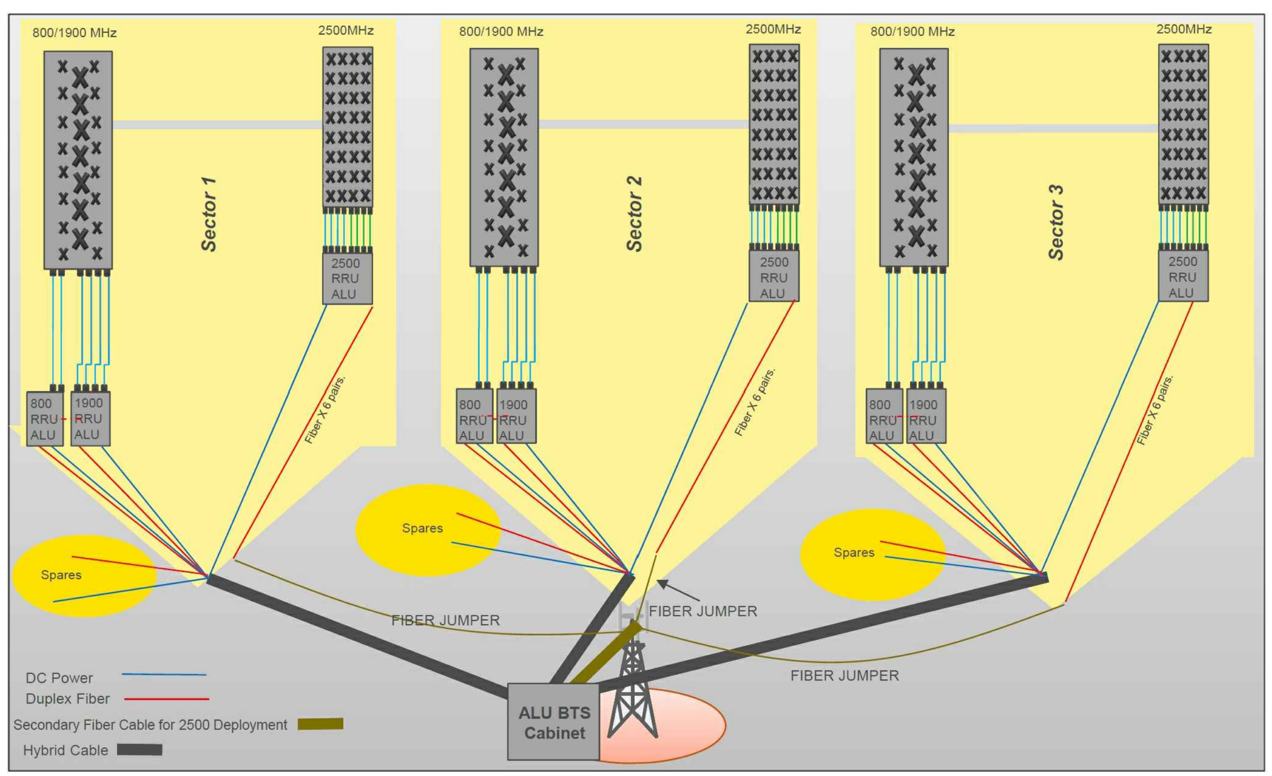
CABLE COLOR CODING DIAGRAM

SCALE: N.T.S.



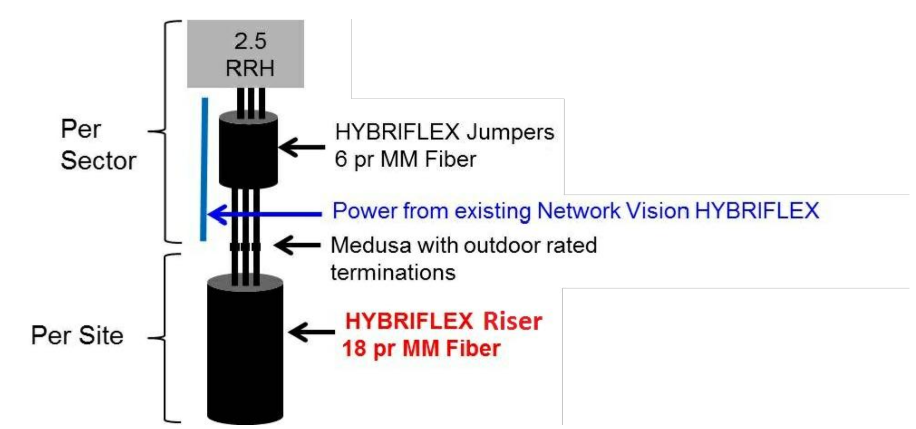
ALU 2.5 ALU SCENARIO 1

SCALE: N.T.S.



RAN WIRING DIAGRAM: ALU EQUIPMENT

SCALE: N.T.S.



RFS 2.5 ALU SCENARIO 1

SCALE: N.T.S.

NOTE:

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

DC POWER INSTALLATION NOTE (FIBER–ONLY SCENARIO):

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

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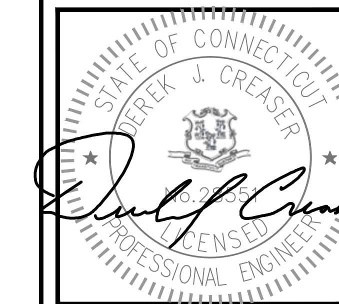

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APPROVED BY: DJC

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WINDHAM, CT 06280

SHEET TITLE
RAN WIRING DIAGRAM

SHEET NUMBER
A–4

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

RFS HYBRIFLEX RISER CABLE SCHEDULE

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

RFS HYBRIFLEX JUMPER CABLE SCHEDULE

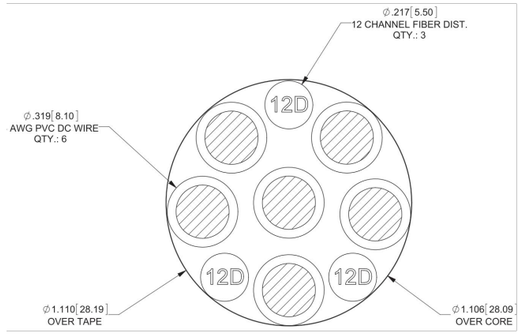
Fiber Only	**Hybrid Jumper cable** (*) MN: HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN: HBF012-M3-10F1	10 ft
	MN: HBF012-M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CM OF ANY DISCREPANCY.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

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

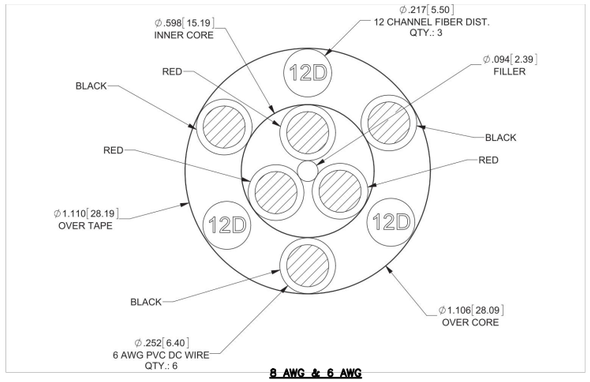
2.5 HYBRID CABLE X-SECTION AND DATA

SCALE: N.T.S.

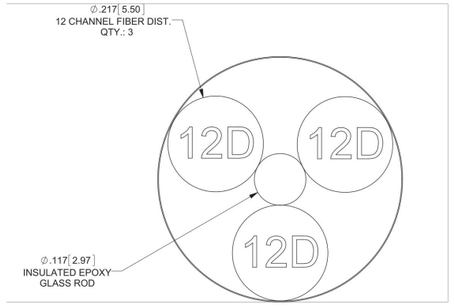
1 / A-5



4 AWG

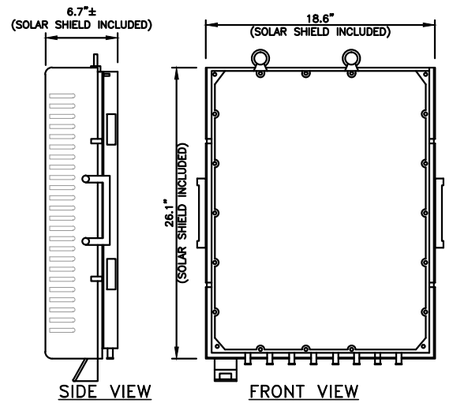


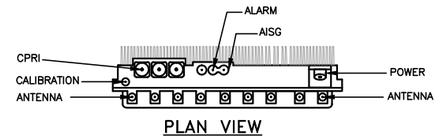
8 AWG & 6 AWG



FIBER ONLY

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



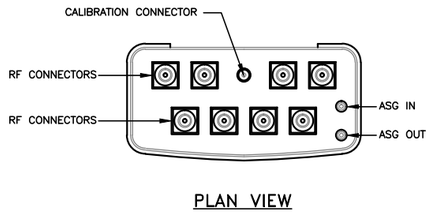


2.5 RRH'S

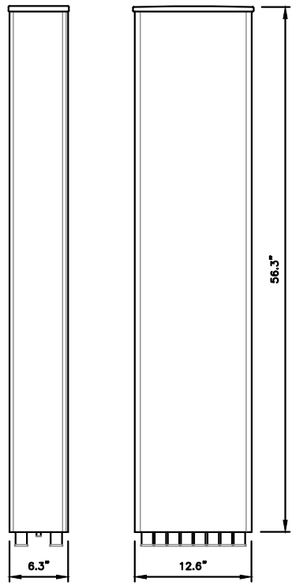
SCALE: N.T.S.

2 / A-5

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



PLAN VIEW



2.5 ANTENNA SPECIFICATIONS

SCALE: N.T.S.

3 / A-5

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
FAX: (508) 251-1755

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
No. 23551
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
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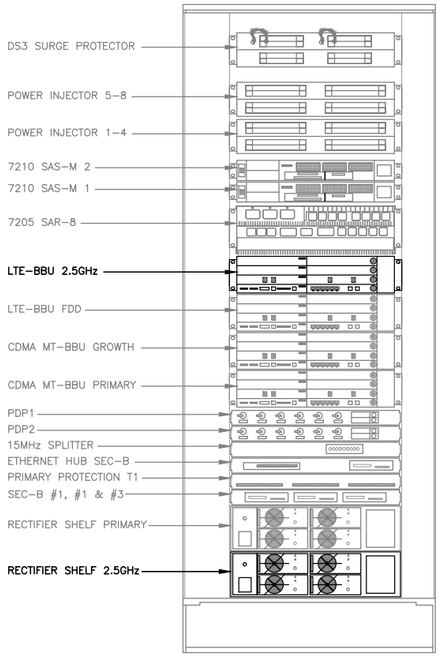
SITE NUMBER:
CT72XC043-A

SITE NAME:
CT1054-RING TO EXISTING-(R2E) PH 1A

SITE ADDRESS:
193 WINDHAM CENTER ROAD
WINDHAM, CT 06280

SHEET TITLE
EQUIPMENT DETAILS

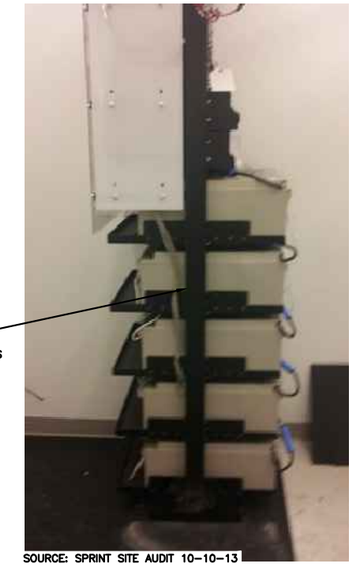
SHEET NUMBER
A-5



FRONT VIEW

EXISTING MMBTS OUTDOOR CABINET WITH 2.5 EQUIPMENT (1 / A–6)

SCALE: N.T.S.



SOURCE: SPRINT SITE AUDIT 10–10–13

FRONT VIEW

EXISTING 2.5 POWER BBU CABINET (2 / A–6)

SCALE: N.T.S.

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STATE OF CONNECTICUT
DEREK J. CREASER
NO. 23567
LICENSED
PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

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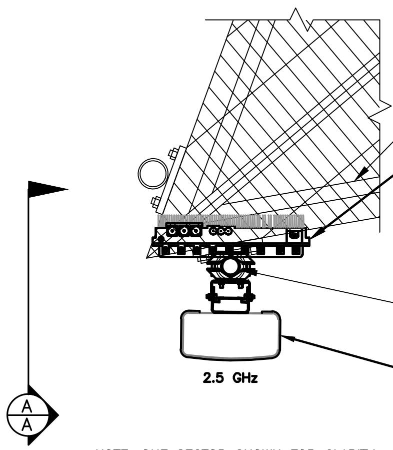
193 WINDHAM CENTER ROAD
WINDHAM, CT 06280

SHEET TITLE

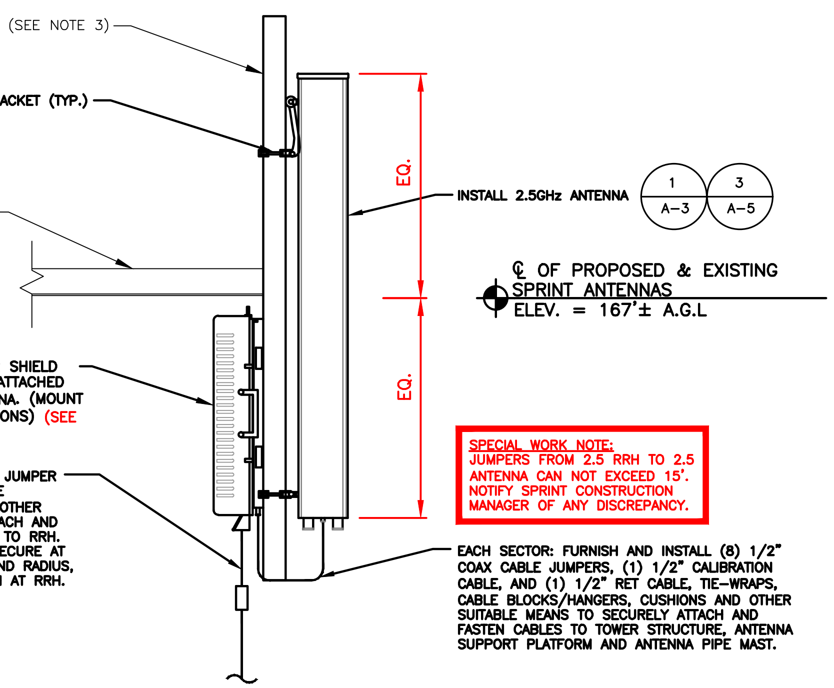
EQUIPMENT DETAILS

SHEET NUMBER

A–6



NOTE: ONE SECTOR SHOWN FOR CLARITY



NOTE: ONE SECTOR SHOWN FOR CLARITY

SECTION A-A

2.5 ANTENNA AND RRH MOUNTING DETAIL (1 / S-1)

SCALE: N.T.S.

INSTALLATION NOTES:

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

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

SOURCE: SPRINT SITE AUDIT 10-10-13

NOTE: ONE SECTOR SHOWN FOR CLARITY

2.5 ANTENNA AND RRH PHOTO DETAIL AND EQUIPMENT SCHEMATIC (2 / S-1)

SCALE: N.T.S.

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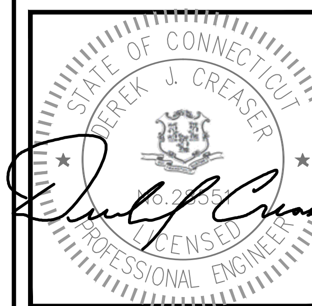

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SITE NAME:
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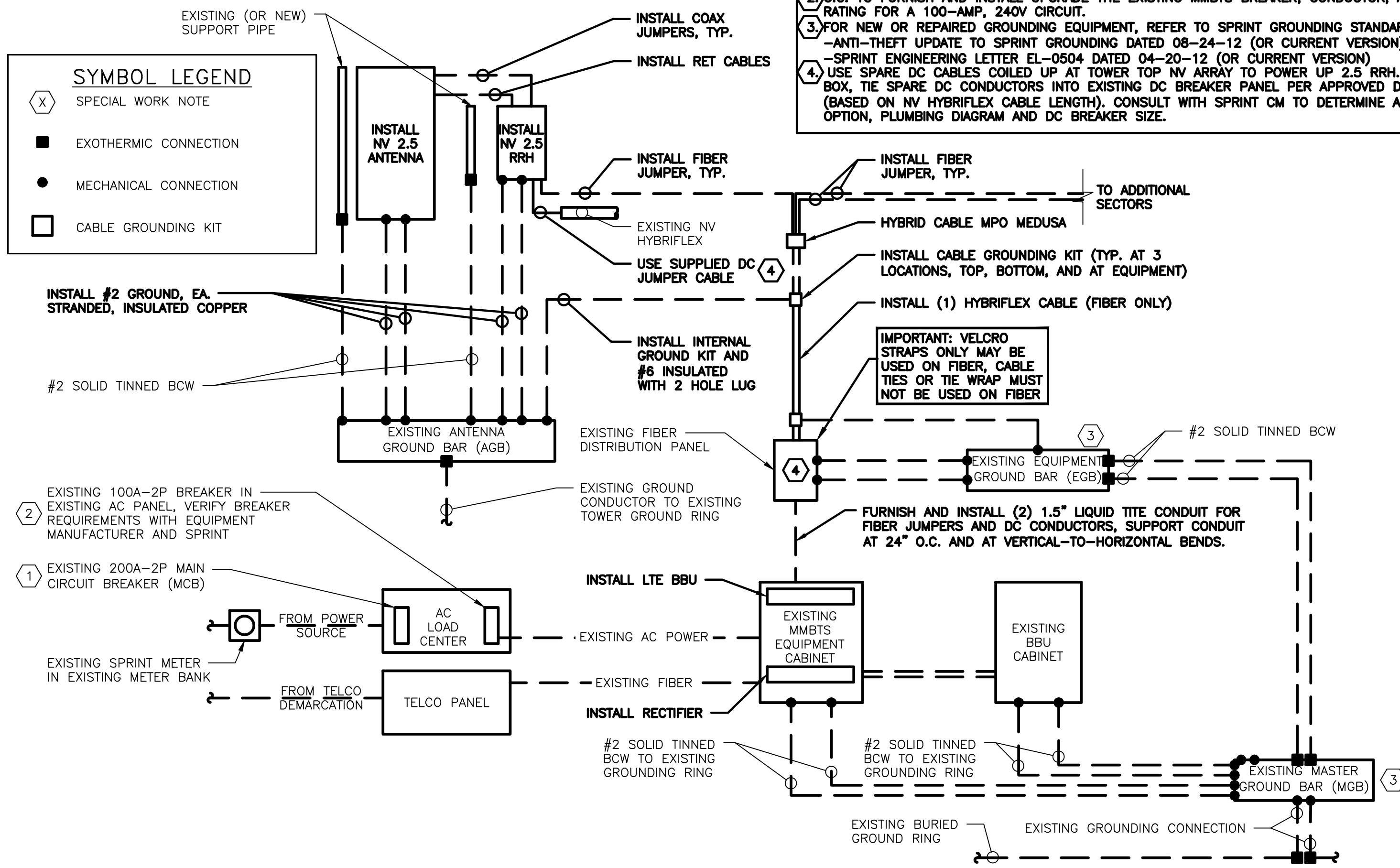
SITE ADDRESS:
193 WINDHAM CENTER ROAD
WINDHAM, CT 06280

SHEET TITLE
STRUCTURAL 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 FOR A 100-AMP, 240V CIRCUIT.
3. FOR NEW OR REPAIRED GROUNDING EQUIPMENT, REFER TO SPRINT GROUNDING STANDARDS AND FOLLOWING (SUPPLEMENTS): -ANTI-THEFT UPDATE TO SPRINT GROUNDING DATED 08-24-12 (OR CURRENT VERSION) -SPRINT ENGINEERING LETTER EL-0504 DATED 04-20-12 (OR CURRENT VERSION)
4. USE SPARE DC CABLES COILED UP AT TOWER TOP NV ARRAY TO POWER UP 2.5 RRH. INSIDE EXISTING FIBER DISTRIBUTION BOX, TIE SPARE DC CONDUCTORS INTO EXISTING DC BREAKER PANEL PER APPROVED DC WIRING CONNECTIVITY OPTION (BASED ON NV HYBRIFLEX CABLE LENGTH). CONSULT WITH SPRINT CM TO DETERMINE APPROPRIATE DC CONNECTIVITY OPTION, PLUMBING DIAGRAM AND DC BREAKER SIZE.



TYPICAL POWER AND GROUNDING ONE LINE DIAGRAMS

SCALE: N.T.S.

1
E-1

ELECTRICAL NOTES

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

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

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

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

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

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

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

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

9) ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.

10) BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.

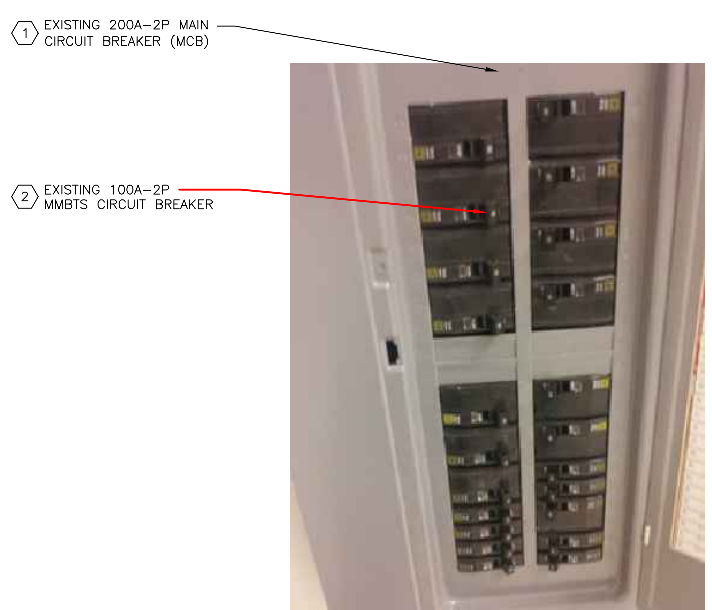
11) ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.

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

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

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

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



SOURCE: SPRINT SITE AUDIT 10-10-13

EXISTING AC BREAKER PANEL

SCALE: N.T.S.

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STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	10/30/17	REVISED - CODE UPDATE	DJM
1	05/16/14	ISSUED FOR CONSTRUCTION	SF
0	04/30/14	ISSUED FOR CONSTRUCTION	SF

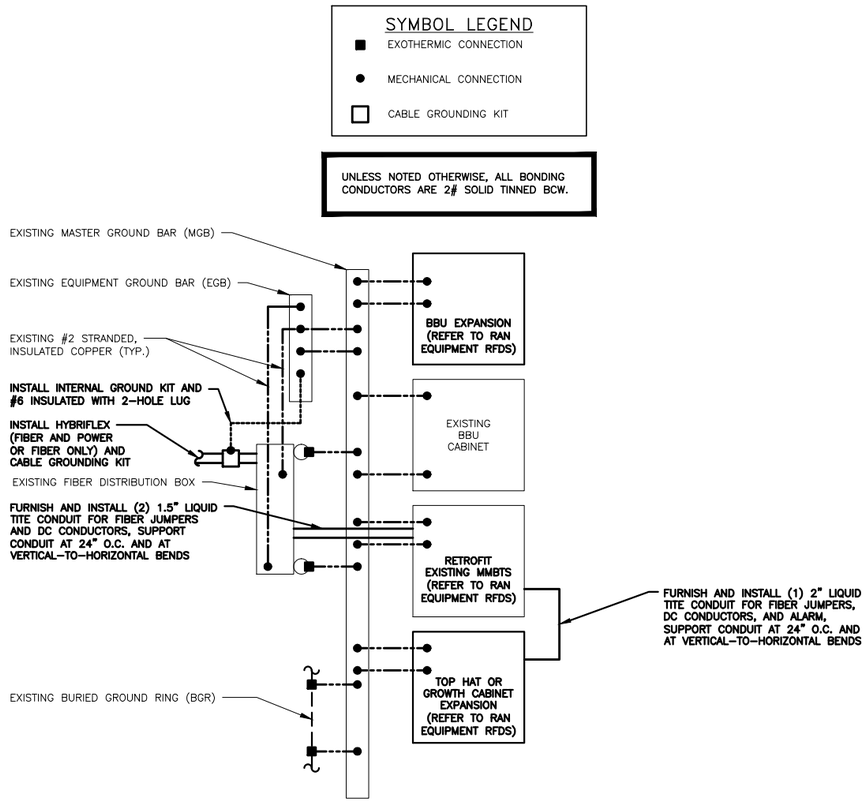
SITE NUMBER:
CT72XC043-A

SITE NAME:
CT1054-RING TO EXISTING-(R2E) PH 1A

SITE ADDRESS:
193 WINDHAM CENTER ROAD
WINDHAM, CT 06280

SHEET TITLE
ONE LINE DIAGRAM

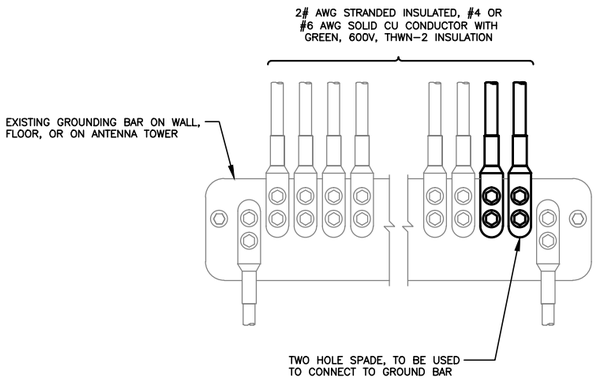
SHEET NUMBER
E-1



2.5 RAN EQUIPMENT GROUNDING SCHEMATIC

SCALE: N.T.S.

1 / E-2



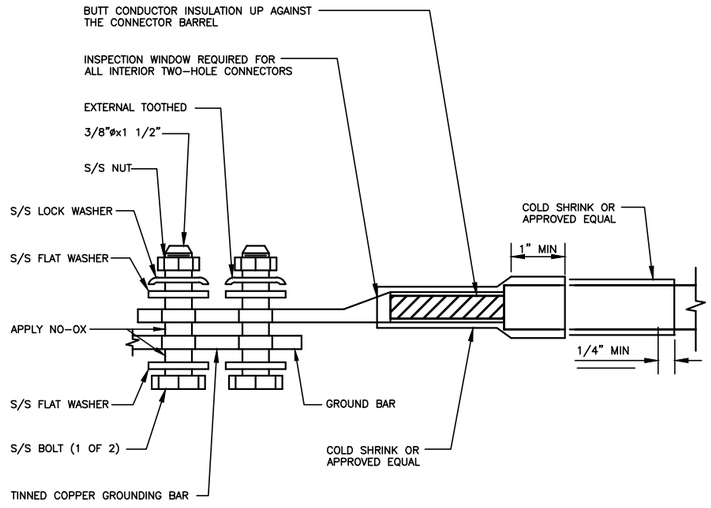
NOTES

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

INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR

SCALE: N.T.S.

2 / E-2



TWO HOLE LUG

SCALE: N.T.S.

3 / E-2

PROTECTIVE GROUNDING SYSTEMS GENERAL NOTES:

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

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STATE OF CONNECTICUT
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LICENSED PROFESSIONAL ENGINEER

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SHEET TITLE
GROUNDING DETAILS AND NOTES

SHEET NUMBER
E-2