



May 8<sup>th</sup>, 2017

Melanie Bachman, Executive Director  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

**RE: Notice of Exempt Modification – Antenna Swap &  
Additional Ground Based Equipment for wireless facility located  
at 14 THOMPSON HILL ROAD, COLUMBIA, CONNECTICUT –  
CT33XC571 (41°43'3.44"N, - 72°17'59.09"W)**

Dear Ms. Bachman:

Sprint Spectrum, LP ("Sprint") currently maintains wireless telecommunications antennas at the (180-foot level) on an existing (180-foot tower) at the above-referenced address. The tower is owned by Crown Castle, and the property is owned by Lanati Joshua & Eileen

Sprint's proposed work involves antenna replacement and tower work. Sprint intends to replace three (3) antennas and add six (6) RET Cables, (3) Diplexers on the tower. Sprint is also proposing to add three (3) ground based remote radio heads (RRH's) and (3) Diplexers to an existing H frame. All the proposed work is contained within the existing fenced area. Please refer to the attached drawings for site plans prepared by Infinigy Engineering.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to CARMEN L. VANCE, First Selectman of the Town of Columbia. A copy of this letter is also being sent to LANATI JOSHUA & EILEEN the owner of the property on which the tower is located.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b).

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The antennas work is a one-for-one replacement of facility components.
3. The proposed modifications will include the addition of ground base equipment as depicted on the attached drawings; however, the proposed equipment will not require



an extension of the site boundaries.

4. The proposed modifications will not increase noise levels at the facility by six decibels or more.
5. The additional ground based equipment will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard.

For the foregoing reasons, Sprint respectfully submits that the proposed modifications to the above referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b).

If you have any questions or require any additional information regarding this request, please do not hesitate to give me a call at (518) 306-1711 or email me to [aperkowski@airosmithdevelopment.com](mailto:aperkowski@airosmithdevelopment.com)

Kind Regards,

Arthur Perkowski  
Airosmith Development Inc.  
32 Clinton Street  
Saratoga Springs, NY 12866  
518-306-1711 desk & fax  
518-871-3707 cell  
[aperkowski@airosmithdevelopment.com](mailto:aperkowski@airosmithdevelopment.com)

Attachment

CC: LANATI JOSHUA & EILEEN (Land Owner)  
CARMEN L. VANCE (1<sup>st</sup> Selectman, Columbia, CT)  
Maryellen Perrotta, Crown Castle (Tower Owner)

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**Carmen Vance, First Selectman**  
**Columbia Town Hall**  
**323 Route 87**  
**Columbia, CT 06237**

CT33XC571

PS Form 3800, April 2013 PSN 7530-02-000-9077 for instructions

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**Joshua & Eileen Lanati**  
**14 Thompson Hill Road**  
**Columbia, CT 06237**

CT33XC571

PS Form 3800, April 2013 PSN 7530-02-000-9077 for instructions

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Total Postage and Fees	\$7.71

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**Crown Castle**  
**Attn: Maryellen Perrotta**  
**12 Gill Street, Suite 5800**  
**Woburn, MA 01801**

PS Form 3800, April 2013 PSN 7530-02-000-9077 See Reverse for Instructions



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

SPRINT Existing Facility

Site ID: CT33XC571

Columbia / Deojay  
14 Thompson Hill Road  
Columbia, CT 06237

**April 26, 2017**

**EBI Project Number: 6217001788**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general public allowable limit:	<b>7.19 %</b>



April 26, 2017

SPRINT

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

## Emissions Analysis for Site: **CT33XC571 – Columbia / Deojay**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **14 Thompson Hill Road, Columbia, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

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

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

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

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



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

Additional details can be found in FCC OET 65.

## CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **14 Thompson Hill Road, Columbia, 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) 2 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 2 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 4) Since the Remote Radio Heads (RRH) radios are ground mounted there are additional cabling losses accounted for. For each ground mounted RF path the following losses were calculated. 1.80 dB of additional cable loss for all ground mounted 850 MHz Channels and 2.96 dB of additional cable loss for all ground mounted 1900 MHz channels were factored into the calculations used for this analysis. This is based on manufacturers Specifications for 235 feet of 1-1/4" coax cable on each path.



- 5) 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.
- 6) 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.
- 7) The antennas used in this modeling are the **RFS APXVSP18-C-A20** for transmission in the 850 MHz and 1900 MHz (PCS) and 2300 MHz (WCS) 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.
- 8) The antenna mounting height centerlines of the proposed antennas are **180 feet** above ground level (AGL) for **Sector A**, **180 feet** above ground level (AGL) for **Sector B** and **180 feet** above ground level (AGL) for Sector C.
- 9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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



## SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	<b>1</b>	Antenna #:	<b>1</b>	Antenna #:	<b>1</b>
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):	<b>180 feet</b>	Height (AGL):	<b>180 feet</b>	Height (AGL):	<b>180 feet</b>
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	4,409.46	ERP (W):	4,409.46	ERP (W):	4,409.46
Antenna A1 MPE%	<b>0.60 %</b>	Antenna B1 MPE%	<b>0.60 %</b>	Antenna C1 MPE%	<b>0.60 %</b>

Site Composite MPE%	
Carrier	MPE%
SPRINT – Max per sector	<b>0.60 %</b>
AT&T	2.64 %
Verizon Wireless	2.61 %
T-Mobile	1.34 %
<b>Site Total MPE %:</b>	<b>7.19 %</b>

SPRINT Sector A Total:	0.60 %
SPRINT Sector B Total:	0.60 %
SPRINT Sector C Total:	0.60 %
<b>Site Total:</b>	<b>7.19 %</b>

SPRINT _ Max Values per Frequency Band / Technology	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
Sprint 850 MHz CDMA	2	433.63	180	1.03	850 MHz	567	0.18%
Sprint 1900 MHz (PCS) CDMA	2	590.37	180	1.40	1900 MHz (PCS)	1000	0.14%
Sprint 1900 MHz (PCS) LTE	2	1,180.73	180	2.80	1900 MHz (PCS)	1000	0.28%
						<b>Total:</b>	<b>0.60%</b>





## Summary

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

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

SPRINT Sector	Power Density Value (%)
Sector A:	0.60 %
Sector B:	0.60 %
Sector C:	0.60 %
SPRINT Maximum Total (per sector):	0.60 %
Site Total:	7.19 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **7.19 %** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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



Date: January 12, 2017

Kevin Morrow  
Crown Castle  
3530 Toringdon Way, Suite 300  
Charlotte, NC 28277  
(704) 405-6619

Paul J Ford and Company  
250 E. Broad Street, Suite 600  
Columbus, OH 43215  
614.221.6679  
kthorpe@pjfweb.com

**Subject: Structural Analysis Report**

**Carrier Designation:** *Sprint PCS Co-Locate*  
**Carrier Site Number:** CT33XC571  
**Carrier Site Name:** Columbia/Deojay

**Crown Castle Designation:**  
**Crown Castle BU Number:** 876391  
**Crown Castle Site Name:** COLUMBIA / DEOJAY  
**Crown Castle JDE Job Number:** 414996  
**Crown Castle Work Order Number:** 1346596  
**Crown Castle Application Number:** 373221 Rev. 1

**Engineering Firm Designation:** Paul J Ford and Company Project Number: 37517-0133.001.7805

**Site Data:** 14 Thompson Hill Rd, COLUMBIA, Tolland County, CT  
 Latitude 41° 43' 3.44", Longitude -72° 17' 59.09"  
 180 Foot - Monopole Tower

Dear Kevin Morrow,

Paul J Ford and Company is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 988453, in accordance with application 373221, revision 1.

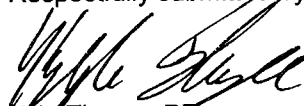
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

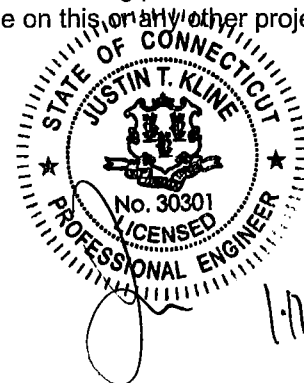
**LC7: Existing + Reserved + Proposed Equipment** **Sufficient Capacity**  
 Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 130 mph converted to a nominal 3-second gust wind speed of 101 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1.0 were used in this analysis.

We at Paul J Ford and Company appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

  
 Kyle Thorpe, PE  
 Project Engineer



1.12.17

Date: **January 12, 2017**

Kevin Morrow  
Crown Castle  
3530 Toringdon Way, Suite 300  
Charlotte, NC 28277  
(704) 405-6619

Paul J Ford and Company  
250 E. Broad Street, Suite 600  
Columbus, OH 43215  
614.221.6679  
kthorpe@pjfweb.com

**Subject: Structural Analysis Report**

**Carrier Designation:** **Sprint PCS Co-Locate**  
**Carrier Site Number:** CT33XC571  
**Carrier Site Name:** Columbia/Deojay

**Crown Castle Designation:** **Crown Castle BU Number:** 876391  
**Crown Castle Site Name:** COLUMBIA / DEOJAY  
**Crown Castle JDE Job Number:** 414996  
**Crown Castle Work Order Number:** 1346596  
**Crown Castle Application Number:** 373221 Rev. 1

**Engineering Firm Designation:** **Paul J Ford and Company Project Number:** 37517-0133.001.7805

**Site Data:** **14 Thompson Hill Rd, COLUMBIA, Tolland County, CT**  
**Latitude 41° 43' 3.44", Longitude -72° 17' 59.09"**  
**180 Foot - Monopole Tower**

Dear Kevin Morrow,

*Paul J Ford and Company* is pleased to submit this "**Structural Analysis Report**" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 988453, in accordance with application 373221, revision 1.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Existing + Reserved + Proposed Equipment

**Sufficient Capacity**

Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 130 mph converted to a nominal 3-second gust wind speed of 101 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1.0 were used in this analysis.

We at *Paul J Ford and Company* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Kyle Thorpe, PE  
Project Engineer

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tnxTower Output

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## 1) INTRODUCTION

This tower is a 180 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in November of 1999. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

## 2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 130 mph converted to a nominal 3-second gust wind speed of 101 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1.0 were used in this analysis.

**Table 1 - Proposed Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
180.0	181.0	3	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe	6 (I)	5/16	1
		3	rfs celwave	FD9R6004/1C-3L			
83.0	83.0	-	-	-	2 (E)	1/2	1

Notes:

- 1) Proposed Equipment
- (E) Coax mounted externally and exposed to the wind. See coax layout in Appendix B.
- (I) Coax mounted internally and shielded from the wind. See coax layout in Appendix B.

**Table 2 - Existing and Reserved Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
180.0	181.0	2	decibel	950F65T2ZE-M w/ Mount Pipe	-	-	3
		4	decibel	DB980H90E-M w/ Mount Pipe			
	180.0	1	tower mounts	Platform Mount [LP 601-1]			
161.0	162.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	1 (I)	1-5/8	1
		3	ericsson	Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe			
		3	ericsson	RRUS 11 B12			
	161.0	1	tower mounts	Platform Mount [LP 305-1]			
147.0	150.0	3	alcatel lucent	RRH2X60-AWS	1 (I) 12 (I) 2 (E)	1/2 1-5/8 1-5/8	1
		3	alcatel lucent	RRH2X60-PCS			
		6	andrew	HBXX-6517DS-A2M w/ Mount Pipe			
		6	andrew	LNX-6514DS-A1M w/ Mount Pipe			
		1	lucent	KS24019-L112A			
		2	rfs celwave	DB-T1-6Z-8AB-0Z			
	6	rfs celwave	FD9R6004/1C-3L				
	147.0	1	tower mounts	Platform Mount [LP 712-1]			
141.0	141.0	1	tower mounts	Pipe Mount [PM 601-3]	-	-	1
	138.0	3	ericsson	TME-RRUS 11 BAND 12			
140.0	140.0	3	powerwave technologies	1001940	1 (C)	3/8	2
		3	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	2 (C) 12 (I)	7/16 1-5/8	1
		3	ericsson	RRUS 12			
		3	ericsson	RRUS A2			
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP 17201			
		6	powerwave technologies	LGP21901			
		1	raycap	DC6-48-60-18-8F			
1	tower mounts	Platform Mount [LP 303-1]					
83.0	84.0	2	kathrein	OG-860/1920/GPS-A	2 (E)	1-1/4	1
	83.0	2	tower mounts	Side Arm Mount [SO 701-1]			
78.0	79.0	1	kathrein	OG-860/1920/GPS-A	1 (E)	1/2	1
	78.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) Equipment To Be Removed
- (E) Coax mounted externally and exposed to the wind. See coax layout in Appendix B.
- (I) Coax mounted internally and shielded from the wind. See coax layout in Appendix B.
- (C) Coax mounted within a 2" internally mounted conduit and shielded from the wind. See coax layout in Appendix B.

### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Goodkind & O'Dea, Inc., CT33XC519, 06/08/99	1613526	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	EEl, 6151, 12/20/99	1613632	CCISITES
4-TOWER MANUFACTURER DRAWINGS	EEl, 6151, 12/20/1999	1614546	CCISITES
4-TOWER MANUFACTURER DESIGN CALCULATIONS	EEl, 99-1429, 11/22/1999	1440653	CCISITES

#### 3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

#### 3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company should be notified to determine the effect on the structural integrity of the tower.

#### 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	180 - 131.75	Pole	TP31.39x21x0.25	1	-12.56	1686.69	49.2	Pass
L2	131.75 - 86.71	Pole	TP40.46x29.921x0.375	2	-22.31	3408.11	64.5	Pass
L3	86.71 - 43.16	Pole	TP48.96x38.5229x0.4375	3	-36.28	4767.07	69.5	Pass
L4	43.16 - 0	Pole	TP57.25x46.668x0.5	4	-57.81	6465.70	69.0	Pass
							Summary	
						Pole (L3)	69.5	Pass
						Rating =	69.5	Pass

**Table 5 - Tower Component Stresses vs. Capacity – LC7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	74.5	Pass
1	Base Plate	0	81.3	Pass
1	Base Foundation Structural Steel	0	77.1	Pass
1	Base Foundation Soil Interaction	0	41.1	Pass

<b>Structure Rating (max from all components) =</b>	<b>81.3%</b>
-----------------------------------------------------	--------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

#### 4.1) Recommendations

The monopole and its foundation have sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.



## APPENDIX A

### TNXTOWER OUTPUT

### Tower Input Data

There is a pole section.  
 This tower is designed using the TIA-222-G standard.  
 The following design criteria apply:  
     Tower is located in Tolland County, Connecticut.  
     ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).  
     Basic wind speed of 101 mph.  
     Structure Class II.  
     Exposure Category C.  
     Topographic Category 1.  
     Crest Height 0.0000 ft.  
     Nominal ice thickness of 1.0000 in.  
     Ice thickness is considered to increase with height.  
     Ice density of 56.00 pcf.  
     A wind speed of 50 mph is used in combination with ice.  
     Temperature drop of 50 °F.  
     Deflections calculated using a wind speed of 60 mph.  
     A non-linear (P-delta) analysis was used.  
     Pressures are calculated at each section.  
     Stress ratio used in pole design is 1.  
     Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

### Options

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Consider Moments - Legs<br>Consider Moments - Horizontals<br>Consider Moments - Diagonals<br>Use Moment Magnification<br>✓ Use Code Stress Ratios<br>✓ Use Code Safety Factors - Guys<br>Escalate Ice<br>Always Use Max Kz<br>Use Special Wind Profile<br><br>Include Bolts In Member Capacity<br><br>Leg Bolts Are At Top Of Section<br>Secondary Horizontal Braces Leg<br>Use Diamond Inner Bracing (4 Sided)<br>SR Members Have Cut Ends<br>SR Members Are Concentric | Distribute Leg Loads As Uniform<br>Assume Legs Pinned<br>✓ Assume Rigid Index Plate<br>✓ Use Clear Spans For Wind Area<br>Use Clear Spans For KL/r<br>Retension Guys To Initial Tension<br>✓ Bypass Mast Stability Checks<br>✓ Use Azimuth Dish Coefficients<br>✓ Project Wind Area of Appurt.<br><br>✓ Autocalc Torque Arm Areas<br><br>Add IBC .6D+W Combination<br>Sort Capacity Reports By Component<br>Triangulate Diamond Inner Bracing<br>Treat Feed Line Bundles As Cylinder | Use ASCE 10 X-Brace Ly Rules<br>Calculate Redundant Bracing Forces<br>Ignore Redundant Members in FEA<br>SR Leg Bolts Resist Compression<br>All Leg Panels Have Same Allowable<br>Offset Girt At Foundation<br>✓ Consider Feed Line Torque<br>Include Angle Block Shear Check<br>Use TIA-222-G Bracing Resist.<br>Exemption<br>Use TIA-222-G Tension Splice<br>Exemption<br><br><div style="text-align: center; background-color: #e0e0e0; padding: 2px;"><b>Poles</b></div> ✓ Include Shear-Torsion Interaction<br>Always Use Sub-Critical Flow<br>Use Top Mounted Sockets |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	180.0000- 131.7500	48.2500	4.50	18	21.0000	31.3900	0.2500	1.0000	A572-65 (65 ksi)
L2	131.7500- 86.7100	49.5400	5.58	18	29.9210	40.4600	0.3750	1.5000	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	86.7100-43.1600	49.1300	6.67	18	38.5229	48.9600	0.4375	1.7500	A572-65 (65 ksi)
L4	43.1600-0.0000	49.8300		18	46.6680	57.2500	0.5000	2.0000	A572-65 (65 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L1	21.3240	16.4651	895.6507	7.3663	10.6680	83.9568	1792.4800	8.2341	3.2560	13.024
	31.8742	24.7096	3027.1937	11.0547	15.9461	189.8389	6058.3706	12.3571	5.0846	20.339
L2	31.3547	35.1671	3878.5647	10.4888	15.1999	255.1711	7762.2328	17.5869	4.6061	12.283
	41.0842	47.7112	9685.4835	14.2302	20.5537	471.2287	19383.711	23.8601	6.4610	17.229
L3	40.3209	52.8864	9691.6750	13.5203	19.5696	495.2402	19396.102	26.4482	6.0100	13.737
	49.7153	67.3796	20042.502	17.2255	24.8717	805.8363	40111.376	33.6962	7.8470	17.936
L4	48.8263	73.2687	19730.526	16.3897	23.7074	832.2531	39487.013	36.6413	7.3336	14.667
	58.1332	90.0622	36644.767	20.1462	29.0830	1260.0065	73337.753	45.0397	9.1960	18.392

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 180.0000-131.7500				1	1	1			
L2 131.7500-86.7100				1	1	1			
L3 86.7100-43.1600				1	1	1			
L4 43.1600-0.0000				1	1	1			

### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
LDF7-50A(1-5/8)	C	No	Inside Pole	180.0000 - 0.0000	6	No Ice	0.0000
						1/2" Ice	0.0000
						1" Ice	0.0000
ATCB-B01-006(5/16)	C	No	Inside Pole	180.0000 - 0.0000	6	No Ice	0.0000
						1/2" Ice	0.0000
						1" Ice	0.0000
** MLE Hybrid 9Power/18Fiber RL 2(1-5/8) **	C	No	Inside Pole	161.0000 - 0.0000	1	No Ice	0.0000
1/2" Ice						0.0000	
1" Ice						0.0000	
LDF4-50A(1/2)	C	No	Inside Pole	147.0000 - 0.0000	1	No Ice	0.0000
						1/2" Ice	0.0000
						1" Ice	0.0000
LDF7-50A(1-5/8)	C	No	CaAa (Out Of Face)	147.0000 - 0.0000	12	No Ice	0.0000
						1/2" Ice	0.0000
						1" Ice	0.0000
HB158-1-08U8-S8J18(1-5/8)	C	No	CaAa (Out Of Face)	147.0000 - 0.0000	1	No Ice	0.0000
						1/2" Ice	0.0000
						1" Ice	0.0000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub>		Weight
							ft <sup>2</sup> /ft	plf	
HB158-1-08U8-S8J18(1-5/8)	C	No	CaAa (Out Of Face)	147.0000 - 0.0000	1	No Ice	0.1980	1.30	
						1/2" Ice	0.2980	2.81	
						1" Ice	0.3980	4.94	
**									
FB-L98B-034-XXX(3/8)	C	No	Inside Pole	140.0000 - 0.0000	1	No Ice	0.0000	0.06	
						1/2" Ice	0.0000	0.06	
						1" Ice	0.0000	0.06	
WR-VG122ST-BRDA(7/16)	C	No	Inside Pole	140.0000 - 0.0000	2	No Ice	0.0000	0.14	
						1/2" Ice	0.0000	0.14	
						1" Ice	0.0000	0.14	
LDF7-50A(1-5/8)	C	No	Inside Pole	140.0000 - 0.0000	12	No Ice	0.0000	0.82	
						1/2" Ice	0.0000	0.82	
						1" Ice	0.0000	0.82	
ICE 200(2)	C	No	Inside Pole	140.0000 - 0.0000	1	No Ice	0.0000	0.23	
						1/2" Ice	0.0000	0.23	
						1" Ice	0.0000	0.23	
**									
LDF6-50A(1-1/4)	C	No	CaAa (Out Of Face)	83.0000 - 0.0000	1	No Ice	0.0000	0.60	
						1/2" Ice	0.0000	1.85	
						1" Ice	0.0000	3.72	
LDF6-50A(1-1/4)	C	No	CaAa (Out Of Face)	83.0000 - 0.0000	1	No Ice	0.1550	0.60	
						1/2" Ice	0.2550	1.85	
						1" Ice	0.3550	3.72	
LDF4-50A(1/2)	C	No	CaAa (Out Of Face)	83.0000 - 0.0000	2	No Ice	0.0000	0.15	
						1/2" Ice	0.0000	0.84	
						1" Ice	0.0000	2.14	
**									
LDF4-50A(1/2)	C	No	CaAa (Out Of Face)	78.0000 - 0.0000	1	No Ice	0.0000	0.15	
						1/2" Ice	0.0000	0.84	
						1" Ice	0.0000	2.14	
**									

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustmen t	Placement ft	C <sub>A</sub> A <sub>A</sub>		Weight K
			Horz Lateral ft ft ft	Vert ft			Front ft <sup>2</sup>	Side ft <sup>2</sup>	
APXVSP18-C-A20 w/ Mount Pipe	A	From Leg	4.0000	0.00	180.0000	No Ice	8.2619	6.9458	0.08
						1/2" Ice	8.8215	8.1266	0.15
						1" Ice	9.3462	9.0212	0.23
APXVSP18-C-A20 w/ Mount Pipe	B	From Leg	4.0000	0.00	180.0000	No Ice	8.2619	6.9458	0.08
						1/2" Ice	8.8215	8.1266	0.15
						1" Ice	9.3462	9.0212	0.23
APXVSP18-C-A20 w/ Mount Pipe	C	From Leg	4.0000	0.00	180.0000	No Ice	8.2619	6.9458	0.08
						1/2" Ice	8.8215	8.1266	0.15
						1" Ice	9.3462	9.0212	0.23
FD9R6004/1C-3L	A	From Leg	4.0000	0.00	180.0000	No Ice	0.3142	0.0762	0.00
						1/2" Ice	0.3862	0.1189	0.00
						1" Ice	0.4656	0.1685	0.01
FD9R6004/1C-3L	B	From Leg	4.0000	0.00	180.0000	No Ice	0.3142	0.0762	0.00
						1/2" Ice	0.3862	0.1189	0.00
						1" Ice	0.4656	0.1685	0.01
FD9R6004/1C-3L	C	From Leg	4.0000	0.00	180.0000	No Ice	0.3142	0.0762	0.00
						1/2" Ice	0.3862	0.1189	0.00
						1" Ice	0.4656	0.1685	0.01
Platform Mount [LP 601-1]	C	None		0.00	180.0000	No Ice	28.4700	28.4700	1.12
						1/2" Ice	33.5900	33.5900	1.51

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
						Ice	38.7100	38.7100	1.91
8-ft Ladder	C	From Leg	2.0000	0.00	180.0000	1" Ice			
			0.00			No Ice	7.0700	7.0700	0.04
			-2.00			1/2"	9.7300	9.7300	0.07
						Ice	11.1900	11.1900	0.08
(3) 2.375" OD x 6' Mount Pipe	A	From Leg	4.0000	0.00	180.0000	1" Ice			
			0.00			No Ice	1.4250	1.4250	0.03
			1.00			1/2"	1.9250	1.9250	0.04
						Ice	2.2939	2.2939	0.05
(3) 2.375" OD x 6' Mount Pipe	B	From Leg	4.0000	0.00	180.0000	1" Ice			
			0.00			No Ice	1.4250	1.4250	0.03
			1.00			1/2"	1.9250	1.9250	0.04
						Ice	2.2939	2.2939	0.05
(3) 2.375" OD x 6' Mount Pipe	C	From Leg	4.0000	0.00	180.0000	1" Ice			
			0.00			No Ice	1.4250	1.4250	0.03
			1.00			1/2"	1.9250	1.9250	0.04
						Ice	2.2939	2.2939	0.05
***						1" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.0000	0.00	161.0000	No Ice	6.3292	5.6424	0.11
			0.00			1/2"	6.7751	6.4259	0.17
			1.00			Ice	7.2137	7.1313	0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.0000	0.00	161.0000	1" Ice			
			0.00			No Ice	6.3292	5.6424	0.11
			1.00			1/2"	6.7751	6.4259	0.17
						Ice	7.2137	7.1313	0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.0000	0.00	161.0000	1" Ice			
			0.00			No Ice	6.3292	5.6424	0.11
			1.00			1/2"	6.7751	6.4259	0.17
						Ice	7.2137	7.1313	0.23
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	A	From Leg	4.0000	0.00	161.0000	1" Ice			
			0.00			No Ice	7.8625	6.8796	0.16
			1.00			1/2"	8.3076	7.5944	0.23
						Ice	8.7610	8.3255	0.31
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	B	From Leg	4.0000	0.00	161.0000	1" Ice			
			0.00			No Ice	7.8625	6.8796	0.16
			1.00			1/2"	8.3076	7.5944	0.23
						Ice	8.7610	8.3255	0.31
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	C	From Leg	4.0000	0.00	161.0000	1" Ice			
			0.00			No Ice	7.8625	6.8796	0.16
			1.00			1/2"	8.3076	7.5944	0.23
						Ice	8.7610	8.3255	0.31
RRUS 11 B12	A	From Leg	4.0000	0.00	161.0000	1" Ice			
			0.00			No Ice	2.8333	1.1821	0.05
			1.00			1/2"	3.0426	1.3299	0.07
						Ice	3.2593	1.4848	0.10
RRUS 11 B12	B	From Leg	4.0000	0.00	161.0000	1" Ice			
			0.00			No Ice	2.8333	1.1821	0.05
			1.00			1/2"	3.0426	1.3299	0.07
						Ice	3.2593	1.4848	0.10
RRUS 11 B12	C	From Leg	4.0000	0.00	161.0000	1" Ice			
			0.00			No Ice	2.8333	1.1821	0.05
			1.00			1/2"	3.0426	1.3299	0.07
						Ice	3.2593	1.4848	0.10
Platform Mount [LP 305-1]	C	None		0.00	161.0000	1" Ice			
						No Ice	18.0100	18.0100	1.12
						1/2"	23.3300	23.3300	1.35
						Ice	28.6500	28.6500	1.58
2.375" OD x 6' Mount Pipe	C	From Leg	4.0000	0.00	161.0000	1" Ice			
			0.00			No Ice	1.4250	1.4250	0.03
			0.00			1/2"	1.9250	1.9250	0.04
						Ice	2.2939	2.2939	0.05
**						1" Ice			
(2) LNX-6514DS-A1M w/	A	From Leg	4.0000	0.00	147.0000	No Ice	8.4106	7.0817	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
Mount Pipe			0.00 3.00			1/2" Ice 9.5048	8.2729 9.1847	0.13 0.21
(2) LNX-6514DS-A1M w/ Mount Pipe	B	From Leg	4.0000 0.00 3.00	0.00	147.0000	1" Ice No Ice 1/2" Ice 9.5048	8.4106 8.2729 8.2729 9.1847	0.06 0.13 0.21
(2) LNX-6514DS-A1M w/ Mount Pipe	C	From Leg	4.0000 0.00 3.00	0.00	147.0000	1" Ice No Ice 1/2" Ice 9.5048	8.4106 8.2729 8.2729 9.1847	0.06 0.13 0.21
(2) HBXX-6517DS-A2M w/ Mount Pipe	A	From Leg	4.0000 0.00 3.00	0.00	147.0000	1" Ice No Ice 1/2" Ice 9.8885	8.7655 9.3417 8.1817 9.1436	0.07 0.14 0.21
(2) HBXX-6517DS-A2M w/ Mount Pipe	B	From Leg	4.0000 0.00 3.00	0.00	147.0000	1" Ice No Ice 1/2" Ice 9.8885	8.7655 9.3417 8.1817 9.1436	0.07 0.14 0.21
(2) HBXX-6517DS-A2M w/ Mount Pipe	C	From Leg	4.0000 0.00 3.00	0.00	147.0000	1" Ice No Ice 1/2" Ice 9.8885	8.7655 9.3417 8.1817 9.1436	0.07 0.14 0.21
KS24019-L112A	B	From Leg	4.0000 0.00 3.00	0.00	147.0000	1" Ice No Ice 1/2" Ice 0.2621	0.1407 0.1979 0.1979 0.2621	0.01 0.01 0.01
(2) FD9R6004/1C-3L	A	From Leg	4.0000 0.00 3.00	0.00	147.0000	1" Ice No Ice 1/2" Ice 0.4656	0.3142 0.0762 0.1189 0.1685	0.00 0.00 0.01
(2) FD9R6004/1C-3L	B	From Leg	4.0000 0.00 3.00	0.00	147.0000	1" Ice No Ice 1/2" Ice 0.4656	0.3142 0.0762 0.1189 0.1685	0.00 0.00 0.01
(2) FD9R6004/1C-3L	C	From Leg	4.0000 0.00 3.00	0.00	147.0000	1" Ice No Ice 1/2" Ice 0.4656	0.3142 0.0762 0.1189 0.1685	0.00 0.00 0.01
RRH2X60-AWS	A	From Leg	4.0000 0.00 3.00	0.00	147.0000	1" Ice No Ice 1/2" Ice 2.2401	1.8775 1.2359 1.3858 1.5441	0.04 0.06 0.08
RRH2X60-AWS	B	From Leg	4.0000 0.00 3.00	0.00	147.0000	1" Ice No Ice 1/2" Ice 2.2401	1.8775 1.2359 1.3858 1.5441	0.04 0.06 0.08
RRH2X60-AWS	C	From Leg	4.0000 0.00 3.00	0.00	147.0000	1" Ice No Ice 1/2" Ice 2.2401	1.8775 1.2359 1.3858 1.5441	0.04 0.06 0.08
DB-T1-6Z-8AB-OZ	A	From Leg	4.0000 0.00 3.00	0.00	147.0000	1" Ice No Ice 1/2" Ice 5.3481	4.8000 2.0000 2.1926 2.3926	0.04 0.08 0.12
DB-T1-6Z-8AB-OZ	B	From Leg	4.0000 0.00 3.00	0.00	147.0000	1" Ice No Ice 1/2" Ice 5.3481	4.8000 2.0000 2.1926 2.3926	0.04 0.08 0.12
RRH2X60-PCS	A	From Leg	4.0000 0.00 3.00	0.00	147.0000	1" Ice No Ice 1/2" Ice 2.5926	1.7233 1.9015 1.9015 2.0870	0.06 0.08 0.10
RRH2X60-PCS	B	From Leg	4.0000 0.00	0.00	147.0000	1" Ice No Ice 1/2"	1.7233 1.9015	0.06 0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
			3.00			Ice 2.5926	2.0870	0.10
RRH2X60-PCS	C	From Leg	4.0000 0.00 3.00	0.00	147.0000	1" Ice No Ice 2.2000 1/2" 2.3926 Ice 2.5926	1.7233 1.9015 2.0870	0.06 0.08 0.10
Platform Mount [LP 712-1]	C	None		0.00	147.0000	1" Ice No Ice 24.5300 1/2" 29.9400 Ice 35.3500 1" Ice	24.5300 29.9400 35.3500	1.34 1.65 1.96
**								
TME-RRUS 11 BAND 12	A	From Leg	1.0000 0.00 -3.00	0.00	141.0000	No Ice 2.5662 1/2" 2.7649 Ice 2.9710 1" Ice	1.0828 1.2260 1.3765	0.05 0.07 0.09
TME-RRUS 11 BAND 12	B	From Leg	1.0000 0.00 -3.00	0.00	141.0000	No Ice 2.5662 1/2" 2.7649 Ice 2.9710 1" Ice	1.0828 1.2260 1.3765	0.05 0.07 0.09
TME-RRUS 11 BAND 12	C	From Leg	1.0000 0.00 -3.00	0.00	141.0000	No Ice 2.5662 1/2" 2.7649 Ice 2.9710 1" Ice	1.0828 1.2260 1.3765	0.05 0.07 0.09
Pipe Mount [PM 601-3]	C	None		0.00	141.0000	No Ice 4.3900 1/2" 5.4800 Ice 6.5700 1" Ice	4.3900 5.4800 6.5700	0.20 0.24 0.28
***								
1001940	A	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 0.1758 1/2" 0.2317 Ice 0.2950 1" Ice	0.0833 0.1264 0.1778	0.00 0.00 0.01
1001940	B	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 0.1758 1/2" 0.2317 Ice 0.2950 1" Ice	0.0833 0.1264 0.1778	0.00 0.00 0.01
1001940	C	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 0.1758 1/2" 0.2317 Ice 0.2950 1" Ice	0.0833 0.1264 0.1778	0.00 0.00 0.01
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 5.7981 1/2" 6.2677 Ice 6.6966 1" Ice	4.5454 5.5082 6.2127	0.09 0.14 0.21
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 5.7981 1/2" 6.2677 Ice 6.6966 1" Ice	4.5454 5.5082 6.2127	0.09 0.14 0.21
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 5.7981 1/2" 6.2677 Ice 6.6966 1" Ice	4.5454 5.5082 6.2127	0.09 0.14 0.21
(2) LGP 17201	A	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1.6680 1/2" 1.8289 Ice 1.9973 1" Ice	0.4669 0.5676 0.6752	0.03 0.04 0.06
(2) LGP 17201	B	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1.6680 1/2" 1.8289 Ice 1.9973 1" Ice	0.4669 0.5676 0.6752	0.03 0.04 0.06
(2) LGP 17201	C	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1.6680 1/2" 1.8289 Ice 1.9973 1" Ice	0.4669 0.5676 0.6752	0.03 0.04 0.06
(2) LGP21901	A	From Leg	4.0000	0.00	140.0000	No Ice 0.2310	0.1575	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
			0.00			1/2"	0.2941	0.2129	0.01
			0.00			Ice	0.3647	0.2756	0.01
(2) LGP21901	B	From Leg	4.0000	0.00	140.0000	1" Ice	0.2310	0.1575	0.01
			0.00			No Ice	0.2941	0.2129	0.01
			0.00			1/2"	0.2941	0.2129	0.01
			0.00			Ice	0.3647	0.2756	0.01
(2) LGP21901	C	From Leg	4.0000	0.00	140.0000	1" Ice	0.2310	0.1575	0.01
			0.00			No Ice	0.2941	0.2129	0.01
			0.00			1/2"	0.2941	0.2129	0.01
			0.00			Ice	0.3647	0.2756	0.01
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.0000	0.00	140.0000	1" Ice	9.8953	8.1125	0.08
			0.00			No Ice	10.4700	9.3041	0.16
			0.00			1/2"	10.4700	9.3041	0.16
			0.00			Ice	11.0098	10.2095	0.25
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.0000	0.00	140.0000	1" Ice	9.8953	8.1125	0.08
			0.00			No Ice	10.4700	9.3041	0.16
			0.00			1/2"	10.4700	9.3041	0.16
			0.00			Ice	11.0098	10.2095	0.25
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.0000	0.00	140.0000	1" Ice	9.8953	8.1125	0.08
			0.00			No Ice	10.4700	9.3041	0.16
			0.00			1/2"	10.4700	9.3041	0.16
			0.00			Ice	11.0098	10.2095	0.25
RRUS 12	A	From Leg	4.0000	0.00	140.0000	1" Ice	3.1450	1.2854	0.06
			0.00			No Ice	3.3648	1.4379	0.08
			0.00			1/2"	3.3648	1.4379	0.08
			0.00			Ice	3.5920	1.5998	0.11
RRUS 12	B	From Leg	4.0000	0.00	140.0000	1" Ice	3.1450	1.2854	0.06
			0.00			No Ice	3.3648	1.4379	0.08
			0.00			1/2"	3.3648	1.4379	0.08
			0.00			Ice	3.5920	1.5998	0.11
RRUS 12	C	From Leg	4.0000	0.00	140.0000	1" Ice	3.1450	1.2854	0.06
			0.00			No Ice	3.3648	1.4379	0.08
			0.00			1/2"	3.3648	1.4379	0.08
			0.00			Ice	3.5920	1.5998	0.11
RRUS A2	A	From Leg	4.0000	0.00	140.0000	1" Ice	2.0663	0.4988	0.02
			0.00			No Ice	2.2451	0.6087	0.03
			0.00			1/2"	2.2451	0.6087	0.03
			0.00			Ice	2.4313	0.7255	0.05
RRUS A2	B	From Leg	4.0000	0.00	140.0000	1" Ice	2.0663	0.4988	0.02
			0.00			No Ice	2.2451	0.6087	0.03
			0.00			1/2"	2.2451	0.6087	0.03
			0.00			Ice	2.4313	0.7255	0.05
RRUS A2	C	From Leg	4.0000	0.00	140.0000	1" Ice	2.0663	0.4988	0.02
			0.00			No Ice	2.2451	0.6087	0.03
			0.00			1/2"	2.2451	0.6087	0.03
			0.00			Ice	2.4313	0.7255	0.05
DC6-48-60-18-8F	C	From Leg	4.0000	0.00	140.0000	1" Ice	0.9167	0.9167	0.02
			0.00			No Ice	1.4583	1.4583	0.04
			0.00			1/2"	1.4583	1.4583	0.04
			0.00			Ice	1.6431	1.6431	0.06
Platform Mount [LP 303-1]	C	None		0.00	140.0000	1" Ice	14.6600	14.6600	1.25
						No Ice	18.8700	18.8700	1.48
						1/2"	18.8700	18.8700	1.48
						Ice	23.0800	23.0800	1.71
						1" Ice			
**									
OG-860/1920/GPS-A	A	From Leg	3.0000	0.00	83.0000	No Ice	0.3077	0.3667	0.00
			0.00			1/2"	0.3952	0.4572	0.01
			1.00			Ice	0.4897	0.5548	0.01
OG-860/1920/GPS-A	B	From Leg	3.0000	0.00	83.0000	1" Ice	0.3077	0.3667	0.00
			0.00			No Ice	0.3952	0.4572	0.01
			1.00			1/2"	0.3952	0.4572	0.01
			1.00			Ice	0.4897	0.5548	0.01
Side Arm Mount [SO 701-	A	None		0.00	83.0000	1" Ice	0.8500	1.6700	0.07
						No Ice	0.8500	1.6700	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> <sub>Front</sub> ft <sup>2</sup>	C <sub>AA</sub> <sub>Side</sub> ft <sup>2</sup>	Weight K	
1]					1/2"	1.1400	2.3400	0.08	
					Ice	1.4300	3.0100	0.09	
Side Arm Mount [SO 701-1]	B	None		0.00	83.0000	No Ice	0.8500	1.6700	0.07
					1" Ice	1.1400	2.3400	0.08	
					Ice	1.4300	3.0100	0.09	
					1" Ice				
***									
OG-860/1920/GPS-A	B	From Leg	3.0000 0.00 1.00	0.00	78.0000	No Ice	0.3077	0.3667	0.00
					1/2"	0.3952	0.4572	0.01	
					Ice	0.4897	0.5548	0.01	
					1" Ice				
Side Arm Mount [SO 701-1]	B	None		0.00	78.0000	No Ice	0.8500	1.6700	0.07
					1/2"	1.1400	2.3400	0.08	
					Ice	1.4300	3.0100	0.09	
					1" Ice				
**									

**Tower Pressures - No Ice**

$G_H = 1.100$

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> psf	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>AA</sub> <sub>In</sub> Face ft <sup>2</sup>	C <sub>AA</sub> <sub>Out</sub> Face ft <sup>2</sup>
L1 180.0000-131.7500	154.4747	1.387	34.38	106.95	A	0.000	106.951	106.951	100.00	0.000	0.000
					B	0.000	106.951	106.951	100.00	0.000	0.000
					C	0.000	106.951	106.951	100.00	0.000	3.019
L2 131.7500-86.7100	108.4660	1.287	31.90	135.94	A	0.000	135.944	135.944	100.00	0.000	0.000
					B	0.000	135.944	135.944	100.00	0.000	0.000
					C	0.000	135.944	135.944	100.00	0.000	8.918
L3 86.7100-43.1600	64.5656	1.154	28.53	163.37	A	0.000	163.378	163.378	100.00	0.000	0.000
					B	0.000	163.378	163.378	100.00	0.000	0.000
					C	0.000	163.378	163.378	100.00	0.000	14.798
L4 43.1600-0.0000	21.8139	0.919	22.83	192.34	A	0.000	192.349	192.349	100.00	0.000	0.000
					B	0.000	192.349	192.349	100.00	0.000	0.000
					C	0.000	192.349	192.349	100.00	0.000	15.235

**Tower Pressure - With Ice**

$G_H = 1.100$

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> psf	t <sub>z</sub> in	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>AA</sub> <sub>In</sub> Face ft <sup>2</sup>	C <sub>AA</sub> <sub>Out</sub> Face ft <sup>2</sup>
L1 180.0000-131.7500	154.4747	1.387	8.43	2.3338	125.718	A	0.000	125.718	125.718	100.00	0.000	0.000
						B	0.000	125.718	125.718	100.00	0.000	0.000
						C	0.000	125.718	125.718	100.00	0.000	10.138
L2 131.7500-86.7100	108.4660	1.287	7.82	2.2527	153.463	A	0.000	153.463	153.463	100.00	0.000	0.000
						B	0.000	153.463	153.463	100.00	0.000	0.000
						C	0.000	153.463	153.463	100.00	0.000	29.941
L3 86.7100-43.1600	64.5656	1.154	6.99	2.1388	179.729	A	0.000	179.729	179.729	100.00	0.000	0.000
						B	0.000	179.729	179.729	100.00	0.000	0.000



Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> psf	t <sub>z</sub> in	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>
L4 43.1600-0.0000	21.8139	0.919	5.60	1.9189	207.734	C	0.000	179.729	207.734	100.00	0.000	52.369
						A	0.000	207.734		100.00	0.000	0.000
						B	0.000	207.734		100.00	0.000	0.000
						C	0.000	207.734		100.00	0.000	52.160

### Tower Pressure - Service

**G<sub>H</sub> = 1.100**

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> psf	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>
L1 180.0000-131.7500	154.4747	1.387	10.86	106.95	A	0.000	106.951	106.951	100.00	0.000	0.000
					B	0.000	106.951		100.00	0.000	0.000
					C	0.000	106.951		100.00	0.000	3.019
L2 131.7500-86.7100	108.4660	1.287	10.07	135.94	A	0.000	135.944	135.944	100.00	0.000	0.000
					B	0.000	135.944		100.00	0.000	0.000
					C	0.000	135.944		100.00	0.000	8.918
L3 86.7100-43.1600	64.5656	1.154	9.01	163.37	A	0.000	163.378	163.378	100.00	0.000	0.000
					B	0.000	163.378		100.00	0.000	0.000
					C	0.000	163.378		100.00	0.000	14.798
L4 43.1600-0.0000	21.8139	0.919	7.21	192.34	A	0.000	192.349	192.349	100.00	0.000	0.000
					B	0.000	192.349		100.00	0.000	0.000
					C	0.000	192.349		100.00	0.000	15.235

### Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

### Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	180 - 131.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.32	3.98	-2.44
			Max. Mx	20	-12.58	504.62	0.65
			Max. My	14	-12.56	-0.56	-505.52
			Max. Vy	20	-25.25	504.62	0.65
			Max. Vx	14	25.32	-0.56	-505.52
			Max. Torque	24			1.85
L2	131.75 - 86.71	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.97	16.36	-9.61
			Max. Mx	20	-22.32	1731.88	2.83
			Max. My	14	-22.31	-2.36	-1735.65
			Max. Vy	8	30.60	-1729.64	-4.29
			Max. Vx	14	30.68	-2.36	-1735.65
			Max. Torque	24			2.28
L3	86.71 - 43.16	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-93.03	32.92	-19.32
			Max. Mx	20	-36.29	3161.23	4.69
			Max. My	14	-36.28	-3.74	-3167.65
			Max. Vy	8	36.42	-3156.87	-7.47
			Max. Vx	14	36.49	-3.74	-3167.65
			Max. Torque	24			3.38
L4	43.16 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-130.53	53.90	-31.44
			Max. Mx	20	-57.81	5120.32	6.63
			Max. My	14	-57.81	-5.02	-5129.67
			Max. Vy	8	41.77	-5112.93	-11.23
			Max. Vx	14	41.83	-5.02	-5129.67
			Max. Torque	24			4.94

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	130.53	-0.00	0.00
	Max. H <sub>x</sub>	21	43.38	41.72	0.06

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. H <sub>z</sub>	3	43.38	0.06	41.79
	Max. M <sub>x</sub>	2	5125.06	0.06	41.79
	Max. M <sub>z</sub>	8	5112.93	-41.72	-0.06
	Max. Torsion	24	4.94	20.91	36.22
	Min. Vert	15	43.38	-0.06	-41.79
	Min. H <sub>x</sub>	8	57.84	-41.72	-0.06
	Min. H <sub>z</sub>	14	57.84	-0.06	-41.79
	Min. M <sub>x</sub>	14	-5129.67	-0.06	-41.79
	Min. M <sub>z</sub>	20	-5120.32	41.72	0.06
	Min. Torsion	12	-4.94	-20.91	-36.22

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	48.20	0.00	-0.00	1.85	3.15	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	57.84	-0.06	-41.79	-5125.06	12.84	-4.22
0.9 Dead+1.6 Wind 0 deg - No Ice	43.38	-0.06	-41.79	-5068.92	11.72	-4.22
1.2 Dead+1.6 Wind 30 deg - No Ice	57.84	20.81	-36.16	-4433.96	-2546.93	-2.37
0.9 Dead+1.6 Wind 30 deg - No Ice	43.38	20.81	-36.16	-4385.38	-2519.68	-2.37
1.2 Dead+1.6 Wind 60 deg - No Ice	57.84	36.10	-20.85	-2553.83	-4423.22	0.11
0.9 Dead+1.6 Wind 60 deg - No Ice	43.38	36.10	-20.85	-2526.10	-4375.17	0.11
1.2 Dead+1.6 Wind 90 deg - No Ice	57.84	41.72	0.06	11.23	-5112.93	2.56
0.9 Dead+1.6 Wind 90 deg - No Ice	43.38	41.72	0.06	10.53	-5057.04	2.56
1.2 Dead+1.6 Wind 120 deg - No Ice	57.84	36.16	20.94	2573.86	-4432.09	4.33
0.9 Dead+1.6 Wind 120 deg - No Ice	43.38	36.16	20.94	2544.76	-4383.94	4.32
1.2 Dead+1.6 Wind 150 deg - No Ice	57.84	20.91	36.22	4447.43	-2562.37	4.94
0.9 Dead+1.6 Wind 150 deg - No Ice	43.38	20.91	36.22	4397.57	-2534.93	4.94
1.2 Dead+1.6 Wind 180 deg - No Ice	57.84	0.06	41.79	5129.67	-5.02	4.23
0.9 Dead+1.6 Wind 180 deg - No Ice	43.38	0.06	41.79	5072.05	-5.92	4.23
1.2 Dead+1.6 Wind 210 deg - No Ice	57.84	-20.81	36.16	4438.58	2554.76	2.38
0.9 Dead+1.6 Wind 210 deg - No Ice	43.38	-20.81	36.16	4388.81	2525.49	2.38
1.2 Dead+1.6 Wind 240 deg - No Ice	57.84	-36.10	20.85	2558.45	4431.07	-0.11
0.9 Dead+1.6 Wind 240 deg - No Ice	43.38	-36.10	20.85	2529.52	4380.99	-0.11
1.2 Dead+1.6 Wind 270 deg - No Ice	57.84	-41.72	-0.06	-6.63	5120.32	-2.57
0.9 Dead+1.6 Wind 270 deg - No Ice	43.38	-41.72	-0.06	-7.12	5062.86	-2.57
1.2 Dead+1.6 Wind 300 deg - No Ice	57.84	-36.16	-20.94	-2569.27	4439.92	-4.34
0.9 Dead+1.6 Wind 300 deg - No Ice	43.38	-36.16	-20.94	-2541.36	4389.75	-4.34
1.2 Dead+1.6 Wind 330 deg - No Ice	57.84	-20.91	-36.22	-4442.83	2570.18	-4.94
0.9 Dead+1.6 Wind 330 deg - No Ice	43.38	-20.91	-36.22	-4394.16	2540.73	-4.94

Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overturning Moment, M <sub>x</sub>	Overturning Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Ice+1.0 Temp	130.53	0.00	-0.00	31.44	53.90	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	130.53	-0.01	-12.58	-1579.36	55.70	-2.10
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	130.53	6.27	-10.89	-1362.71	-748.97	-1.19
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	130.53	10.88	-6.28	-772.47	-1338.48	0.04
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	130.53	12.57	0.01	33.19	-1554.87	1.26
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	130.53	10.89	6.30	838.40	-1340.16	2.14
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	130.53	6.29	10.90	1427.40	-751.88	2.45
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	130.53	0.01	12.58	1642.37	52.34	2.10
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	130.53	-6.27	10.89	1425.71	857.00	1.19
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	130.53	-10.88	6.28	835.48	1446.50	-0.04
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	130.53	-12.57	-0.01	29.83	1662.88	-1.26
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	130.53	-10.89	-6.30	-775.38	1448.18	-2.14
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	130.53	-6.29	-10.90	-1364.38	859.91	-2.45
Dead+Wind 0 deg - Service	48.20	-0.01	-8.25	-1004.45	5.01	-0.21
Dead+Wind 30 deg - Service	48.20	4.11	-7.14	-868.75	-497.37	-0.11
Dead+Wind 60 deg - Service	48.20	7.12	-4.11	-499.75	-865.61	0.02
Dead+Wind 90 deg - Service	48.20	8.23	0.01	3.67	-1001.03	0.15
Dead+Wind 120 deg - Service	48.20	7.14	4.13	506.62	-867.36	0.23
Dead+Wind 150 deg - Service	48.20	4.13	7.15	874.34	-500.40	0.26
Dead+Wind 180 deg - Service	48.20	0.01	8.25	1008.29	1.51	0.21
Dead+Wind 210 deg - Service	48.20	-4.11	7.14	872.59	503.89	0.11
Dead+Wind 240 deg - Service	48.20	-7.12	4.11	503.59	872.13	-0.02
Dead+Wind 270 deg - Service	48.20	-8.23	-0.01	0.17	1007.56	-0.15
Dead+Wind 300 deg - Service	48.20	-7.14	-4.13	-502.78	873.89	-0.23
Dead+Wind 330 deg - Service	48.20	-4.13	-7.15	-870.50	506.93	-0.26

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-48.20	0.00	-0.00	48.20	0.00	0.000%
2	-0.06	-57.84	-41.79	0.06	57.84	41.79	0.003%
3	-0.06	-43.38	-41.79	0.06	43.38	41.79	0.002%
4	20.81	-57.84	-36.16	-20.81	57.84	36.16	0.000%
5	20.81	-43.38	-36.16	-20.81	43.38	36.16	0.000%
6	36.10	-57.84	-20.85	-36.10	57.84	20.85	0.000%
7	36.10	-43.38	-20.85	-36.10	43.38	20.85	0.000%
8	41.72	-57.84	0.06	-41.72	57.84	-0.06	0.003%
9	41.72	-43.38	0.06	-41.72	43.38	-0.06	0.006%
10	36.16	-57.84	20.94	-36.16	57.84	-20.94	0.000%
11	36.16	-43.38	20.94	-36.16	43.38	-20.94	0.000%
12	20.91	-57.84	36.22	-20.91	57.84	-36.22	0.000%
13	20.91	-43.38	36.22	-20.91	43.38	-36.22	0.000%
14	0.06	-57.84	41.79	-0.06	57.84	-41.79	0.003%
15	0.06	-43.38	41.79	-0.06	43.38	-41.79	0.006%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
16	-20.81	-57.84	36.16	20.81	57.84	-36.16	0.000%
17	-20.81	-43.38	36.16	20.81	43.38	-36.16	0.000%
18	-36.10	-57.84	20.85	36.10	57.84	-20.85	0.000%
19	-36.10	-43.38	20.85	36.10	43.38	-20.85	0.000%
20	-41.72	-57.84	-0.06	41.72	57.84	0.06	0.007%
21	-41.72	-43.38	-0.06	41.72	43.38	0.06	0.006%
22	-36.16	-57.84	-20.94	36.16	57.84	20.94	0.000%
23	-36.16	-43.38	-20.94	36.16	43.38	20.94	0.000%
24	-20.91	-57.84	-36.22	20.91	57.84	36.22	0.000%
25	-20.91	-43.38	-36.22	20.91	43.38	36.22	0.000%
26	0.00	-130.53	0.00	-0.00	130.53	0.00	0.000%
27	-0.01	-130.53	-12.58	0.01	130.53	12.58	0.001%
28	6.28	-130.53	-10.89	-6.27	130.53	10.89	0.001%
29	10.88	-130.53	-6.28	-10.88	130.53	6.28	0.001%
30	12.57	-130.53	0.01	-12.57	130.53	-0.01	0.001%
31	10.89	-130.53	6.30	-10.89	130.53	-6.30	0.001%
32	6.29	-130.53	10.90	-6.29	130.53	-10.90	0.001%
33	0.01	-130.53	12.58	-0.01	130.53	-12.58	0.001%
34	-6.28	-130.53	10.89	6.27	130.53	-10.89	0.001%
35	-10.88	-130.53	6.28	10.88	130.53	-6.28	0.001%
36	-12.57	-130.53	-0.01	12.57	130.53	0.01	0.001%
37	-10.89	-130.53	-6.30	10.89	130.53	6.30	0.001%
38	-6.29	-130.53	-10.90	6.29	130.53	10.90	0.001%
39	-0.01	-48.20	-8.25	0.01	48.20	8.25	0.002%
40	4.11	-48.20	-7.14	-4.11	48.20	7.14	0.002%
41	7.13	-48.20	-4.11	-7.12	48.20	4.11	0.002%
42	8.23	-48.20	0.01	-8.23	48.20	-0.01	0.002%
43	7.14	-48.20	4.13	-7.14	48.20	-4.13	0.002%
44	4.13	-48.20	7.15	-4.13	48.20	-7.15	0.002%
45	0.01	-48.20	8.25	-0.01	48.20	-8.25	0.002%
46	-4.11	-48.20	7.14	4.11	48.20	-7.14	0.002%
47	-7.13	-48.20	4.11	7.12	48.20	-4.11	0.002%
48	-8.23	-48.20	-0.01	8.23	48.20	0.01	0.002%
49	-7.14	-48.20	-4.13	7.14	48.20	4.13	0.002%
50	-4.13	-48.20	-7.15	4.13	48.20	7.15	0.002%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	15	0.00003911	0.00008700
3	Yes	15	0.00002563	0.00006789
4	Yes	18	0.00000001	0.00012194
5	Yes	18	0.00000001	0.00008634
6	Yes	18	0.00000001	0.00012326
7	Yes	18	0.00000001	0.00008732
8	Yes	15	0.00003913	0.00006799
9	Yes	14	0.00006153	0.00012208
10	Yes	18	0.00000001	0.00012752
11	Yes	18	0.00000001	0.00009034
12	Yes	18	0.00000001	0.00012184
13	Yes	18	0.00000001	0.00008614
14	Yes	15	0.00003911	0.00007642
15	Yes	14	0.00006149	0.00013567
16	Yes	18	0.00000001	0.00012552
17	Yes	18	0.00000001	0.00008885
18	Yes	18	0.00000001	0.00012399
19	Yes	18	0.00000001	0.00008774
20	Yes	14	0.00009200	0.00013549
21	Yes	14	0.00006152	0.00010953
22	Yes	18	0.00000001	0.00012228
23	Yes	18	0.00000001	0.00008645
24	Yes	18	0.00000001	0.00012818
25	Yes	18	0.00000001	0.00009078

26	Yes	13	0.00000001	0.00001886
27	Yes	16	0.00012275	0.00008169
28	Yes	16	0.00012250	0.00012335
29	Yes	16	0.00012250	0.00012516
30	Yes	16	0.00012279	0.00007930
31	Yes	16	0.00012241	0.00013631
32	Yes	16	0.00012240	0.00012835
33	Yes	16	0.00012266	0.00008468
34	Yes	16	0.00012226	0.00014616
35	Yes	16	0.00012226	0.00014384
36	Yes	16	0.00012262	0.00008441
37	Yes	16	0.00012234	0.00013347
38	Yes	16	0.00012235	0.00014196
39	Yes	14	0.00000001	0.00003165
40	Yes	14	0.00000001	0.00002837
41	Yes	14	0.00000001	0.00002921
42	Yes	14	0.00000001	0.00003140
43	Yes	14	0.00000001	0.00003195
44	Yes	14	0.00000001	0.00002763
45	Yes	14	0.00000001	0.00003174
46	Yes	14	0.00000001	0.00003105
47	Yes	14	0.00000001	0.00002994
48	Yes	14	0.00000001	0.00003158
49	Yes	14	0.00000001	0.00002790
50	Yes	14	0.00000001	0.00003248

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 131.75	29.07	45	1.42	0.00
L2	136.25 - 86.71	16.76	45	1.20	0.00
L3	92.29 - 43.16	7.44	45	0.79	0.00
L4	49.83 - 0	2.12	45	0.39	0.00

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.0000	APXVSP18-C-A20 w/ Mount Pipe	45	29.07	1.42	0.00	56160
161.0000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	45	23.51	1.34	0.00	14778
147.0000	(2) LNX-6514DS-A1M w/ Mount Pipe	45	19.59	1.27	0.00	8508
141.0000	TME-RRUS 11 BAND 12	45	17.99	1.23	0.00	7199
140.0000	1001940	45	17.72	1.23	0.00	7021
83.0000	OG-860/1920/GPS-A	45	5.95	0.69	0.00	5881
78.0000	OG-860/1920/GPS-A	45	5.23	0.64	0.00	5798

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist
L1	180 - 131.75	147.76	14	7.21	0.03
L2	136.25 - 86.71	85.26	14	6.12	0.01
L3	92.29 - 43.16	37.87	12	4.00	0.01

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L4	49.83 - 0	10.79	12	1.99	0.00

### Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.0000	APXVSPP18-C-A20 w/ Mount Pipe	14	147.76	7.21	0.03	11372
161.0000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	14	119.55	6.83	0.02	2989
147.0000	(2) LNX-6514DS-A1M w/ Mount Pipe	14	99.64	6.48	0.01	1717
141.0000	TME-RRUS 11 BAND 12	14	91.49	6.29	0.01	1451
140.0000	1001940	14	90.16	6.26	0.01	1415
83.0000	OG-860/1920/GPS-A	12	30.31	3.53	0.00	1163
78.0000	OG-860/1920/GPS-A	12	26.61	3.28	0.00	1146

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	KI/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
L1	180 - 131.75 (1)	TP31.39x21x0.25	48.250 0	0.0000	0.0	23.940 7	-12.56	1686.69	0.007
L2	131.75 - 86.71 (2)	TP40.46x29.921x0.375	49.540 0	0.0000	0.0	46.298 3	-22.31	3408.11	0.007
L3	86.71 - 43.16 (3)	TP48.96x38.5229x0.4375	49.130 0	0.0000	0.0	65.411 9	-36.28	4767.07	0.008
L4	43.16 - 0 (4)	TP57.25x46.668x0.5	49.830 0	0.0000	0.0	90.062 2	-57.81	6465.70	0.009

### Pole Bending Design Data

Section No.	Elevation ft	Size	M <sub>ux</sub> kip-ft	φM <sub>nx</sub> kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M <sub>uy</sub> kip-ft	φM <sub>ny</sub> kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	180 - 131.75 (1)	TP31.39x21x0.25	505.83	1046.01	0.484	0.00	1046.01	0.000
L2	131.75 - 86.71 (2)	TP40.46x29.921x0.375	1737.10	2721.23	0.638	0.00	2721.23	0.000
L3	86.71 - 43.16 (3)	TP48.96x38.5229x0.4375	3169.97	4611.06	0.687	0.00	4611.06	0.000
L4	43.16 - 0 (4)	TP57.25x46.668x0.5	5132.77	7538.14	0.681	0.00	7538.14	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	180 - 131.75 (1)	TP31.39x21x0.25	25.36	843.35	0.030	1.62	2094.57	0.001
L2	131.75 - 86.71 (2)	TP40.46x29.921x0.375	30.72	1704.05	0.018	2.28	5449.12	0.000
L3	86.71 - 43.16 (3)	TP48.96x38.5229x0.4375	36.53	2383.53	0.015	3.38	9233.42	0.000
L4	43.16 - 0 (4)	TP57.25x46.668x0.5	41.87	3232.85	0.013	4.94	15094.75	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $P_u$ $\phi P_n$	Ratio $M_{ux}$ $\phi M_{nx}$	Ratio $M_{uy}$ $\phi M_{ny}$	Ratio $V_u$ $\phi V_n$	Ratio $T_u$ $\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	180 - 131.75 (1)	0.007	0.484	0.000	0.030	0.001	0.492	1.000	4.8.2 ✓
L2	131.75 - 86.71 (2)	0.007	0.638	0.000	0.018	0.000	0.645	1.000	4.8.2 ✓
L3	86.71 - 43.16 (3)	0.008	0.687	0.000	0.015	0.000	0.695	1.000	4.8.2 ✓
L4	43.16 - 0 (4)	0.009	0.681	0.000	0.013	0.000	0.690	1.000	4.8.2 ✓

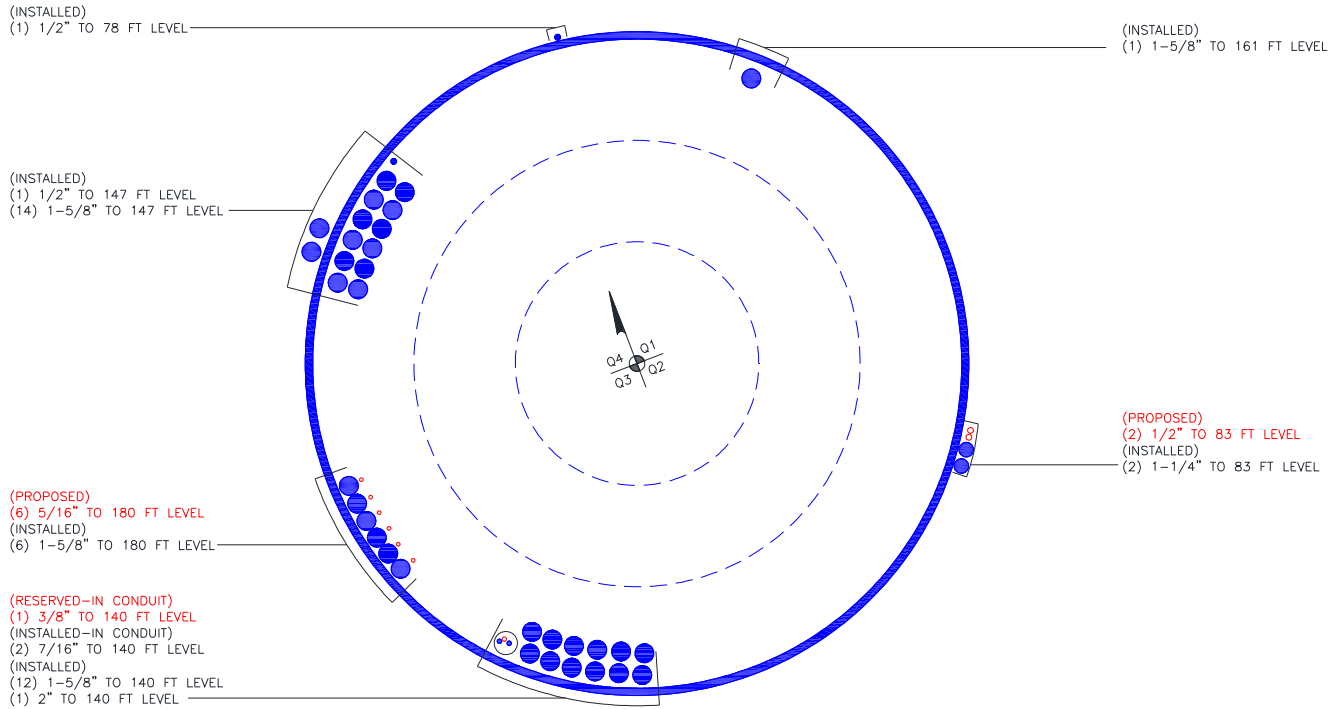
### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail	
L1	180 - 131.75	Pole	TP31.39x21x0.25	1	-12.56	1686.69	49.2	Pass	
L2	131.75 - 86.71	Pole	TP40.46x29.921x0.375	2	-22.31	3408.11	64.5	Pass	
L3	86.71 - 43.16	Pole	TP48.96x38.5229x0.4375	3	-36.28	4767.07	69.5	Pass	
L4	43.16 - 0	Pole	TP57.25x46.668x0.5	4	-57.81	6465.70	69.0	Pass	
							Summary		
							Pole (L3)	69.5	Pass
							<b>RATING =</b>	<b>69.5</b>	<b>Pass</b>



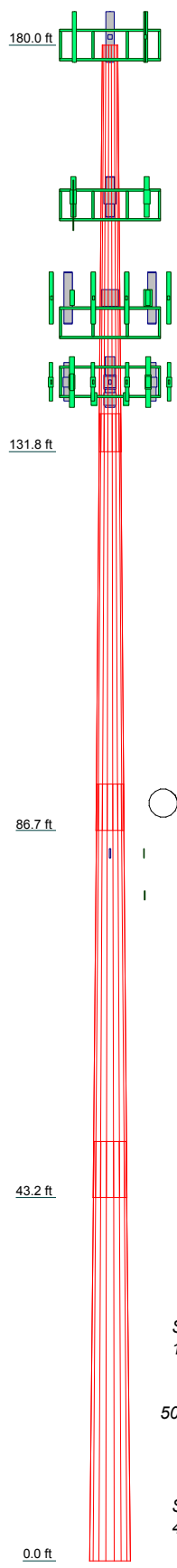
## APPENDIX B

### BASE LEVEL DRAWING



**APPENDIX C**  
**ADDITIONAL CALCULATIONS**

Section	1	2	3	4	
Length (ft)	48.2500	49.5400	49.1300	49.8300	
Number of Sides	18	18	18	18	
Thickness (in)	0.2500	0.3750	0.4375	0.5000	
Socket Length (ft)	4.5000	5.5800	6.6700	6.6700	
Top Dia (in)	21.0000	29.9210	38.5229	46.6680	
Bot Dia (in)	31.3900	40.4600	48.9600	57.2500	
Grade	3.4	7.0	10.1	13.8	
Weight (K)					34.3



**DESIGNED APPURTENANCE LOADING**

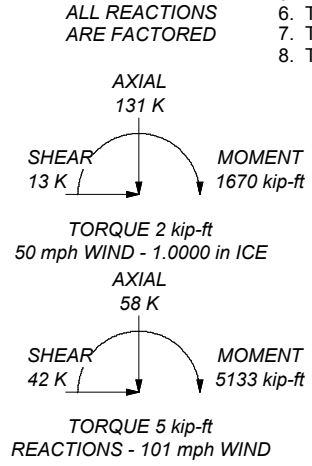
TYPE	ELEVATION	TYPE	ELEVATION
APXVSP18-C-A20 w/ Mount Pipe	180	RRH2X60-AWS	147
APXVSP18-C-A20 w/ Mount Pipe	180	DB-T1-6Z-8AB-0Z	147
APXVSP18-C-A20 w/ Mount Pipe	180	DB-T1-6Z-8AB-0Z	147
FD9R6004/1C-3L	180	RRH2X60-PCS	147
FD9R6004/1C-3L	180	RRH2X60-PCS	147
FD9R6004/1C-3L	180	RRH2X60-PCS	147
Platform Mount [LP 601-1]	180	Platform Mount [LP 712-1]	147
8-ft Ladder	180	TME-RRUS 11 BAND 12	141
(3) 2.375" OD x 6" Mount Pipe	180	TME-RRUS 11 BAND 12	141
(3) 2.375" OD x 6" Mount Pipe	180	TME-RRUS 11 BAND 12	141
(3) 2.375" OD x 6" Mount Pipe	180	Pipe Mount [PM 601-3]	141
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	161	1001940	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	161	1001940	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	161	1001940	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	161	(2) 7770.00 w/ Mount Pipe	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	161	(2) 7770.00 w/ Mount Pipe	140
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	161	(2) 7770.00 w/ Mount Pipe	140
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	161	(2) LGP 17201	140
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	161	(2) LGP 17201	140
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	161	(2) LGP 17201	140
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	161	(2) LGP 17201	140
RRUS 11 B12	161	(2) LGP 21901	140
RRUS 11 B12	161	(2) LGP 21901	140
RRUS 11 B12	161	HPA-65R-BUU-H6 w/ Mount Pipe	140
RRUS 11 B12	161	HPA-65R-BUU-H6 w/ Mount Pipe	140
Platform Mount [LP 305-1]	161	HPA-65R-BUU-H6 w/ Mount Pipe	140
2.375" OD x 6" Mount Pipe	161	RRUS 12	140
(2) LNX-6514DS-A1M w/ Mount Pipe	147	RRUS 12	140
(2) LNX-6514DS-A1M w/ Mount Pipe	147	RRUS 12	140
(2) LNX-6514DS-A1M w/ Mount Pipe	147	RRUS A2	140
(2) HBXX-6517DS-A2M w/ Mount Pipe	147	RRUS A2	140
(2) HBXX-6517DS-A2M w/ Mount Pipe	147	RRUS A2	140
(2) HBXX-6517DS-A2M w/ Mount Pipe	147	RRUS A2	140
(2) HBXX-6517DS-A2M w/ Mount Pipe	147	RRUS A2	140
KS24019-L112A	147	DC6-48-60-18-8F	140
(2) FD9R6004/1C-3L	147	Platform Mount [LP 303-1]	140
(2) FD9R6004/1C-3L	147	OG-860/1920/GPS-A	83
(2) FD9R6004/1C-3L	147	OG-860/1920/GPS-A	83
(2) FD9R6004/1C-3L	147	OG-860/1920/GPS-A	83
RRH2X60-AWS	147	Side Arm Mount [SO 701-1]	83
RRH2X60-AWS	147	Side Arm Mount [SO 701-1]	83
RRH2X60-AWS	147	OG-860/1920/GPS-A	78
		Side Arm Mount [SO 701-1]	78

**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

**TOWER DESIGN NOTES**

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TOWER RATING: 69.5%



<b>Paul J Ford and Company</b> 250 E. Broad Street Suite 600 Columbus, OH 43215 Phone: 614.221.6679 FAX: 614.448.4105	<b>Job: 180' Monopole / Columbia/Deojay</b> Project: <b>PJF 37516-0222 / BU 876391</b>	
	Client: Crown Castle Code: TIA-222-G Path:	Drawn by: Kyle Thorpe Date: 01/12/17

## Stiffened or Unstiffened, UngROUTed, Circular Base Plate - Any Rod Material

**TIA Rev G**

Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)\*(Rod Diameter)

### Site Data

BU#: 876391
Site Name: Columbia / Deojay
App #:
Pole Manufacturer: <i>Other</i>

### Anchor Rod Data

Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	66	in

### Plate Data

Diam:	72	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	9.09	in

### Stiffener Data (Welding at both sides)

Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

### Pole Data

Diam:	57.25	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

### Reactions

Mu:	5133	ft-kips
Axial, Pu:	58	kips
Shear, Vu:	42	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

If No stiffeners, Criteria: **AISC LRFD** <-Only Applicable to Unstiffened Cases

### Anchor Rod Results

Max Rod ( $C_u + V_u/r$ ): 193.8 Kips  
 Allowable Axial,  $\Phi * F_u * A_{net}$ : 260.0 Kips  
 Anchor Rod Stress Ratio: 74.5% **Pass**

Rigid
AISC LRFD
$\phi * T_n$

### Base Plate Results

Base Plate Stress: 43.9 ksi  
 Allowable Plate Stress: 54.0 ksi  
 Base Plate Stress Ratio: 81.3% **Pass**

### Flexural Check

Rigid
AISC LRFD
$\phi * F_y$
Y.L. Length: 32.84

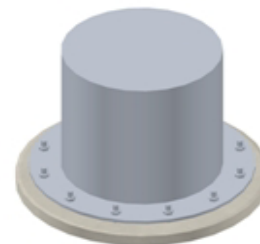
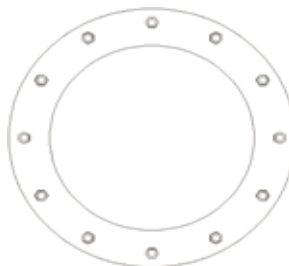
**n/a**

### Stiffener Results

Horizontal Weld : n/a  
 Vertical Weld: n/a  
 Plate Flex+Shear,  $f_b/F_b + (f_v/F_v)^2$ : n/a  
 Plate Tension+Shear,  $f_t/F_t + (f_v/F_v)^2$ : n/a  
 Plate Comp. (AISC Bracket): n/a

### Pole Results

Pole Punching Shear Check: n/a



\* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

\*\* Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

**Factored Foundation Loads:**

	LC1	LC2	
Factored Axial Load (+Comp, -Ten) =	<b>58</b>	<b>43.5</b>	kips
Factored Horiz. Load at Top of Pier =	<b>42</b>	<b>42</b>	kips
Factored OTM at Top of Pier =	<b>5133</b>	<b>5133</b>	kips

**LRFD Resistance and Load Factors:**

	$\Phi$	Dead Load Factors	
Soil Bearing =	<b>0.75</b>		
Soil Weight =	<b>0.75</b>	1.2	0.9
Concrete Weight =	<b>0.75</b>	1.2	0.9

**Soil Properties:**

Depth to Water Table =	<b>5</b> ft
Uplift Cone from	<b>Top</b> of footing

Soil Wedges have been included to counteract overturning.

Layer Thk ft	Soil Density pcf	Cohesion ksf	Friction Angle degrees	Ult Bearing ksf	Depth ft
<b>7</b>	<b>100</b>	<b>0</b>	<b>30</b>	<b>12</b>	<b>7.00</b>

**Dimensions:**

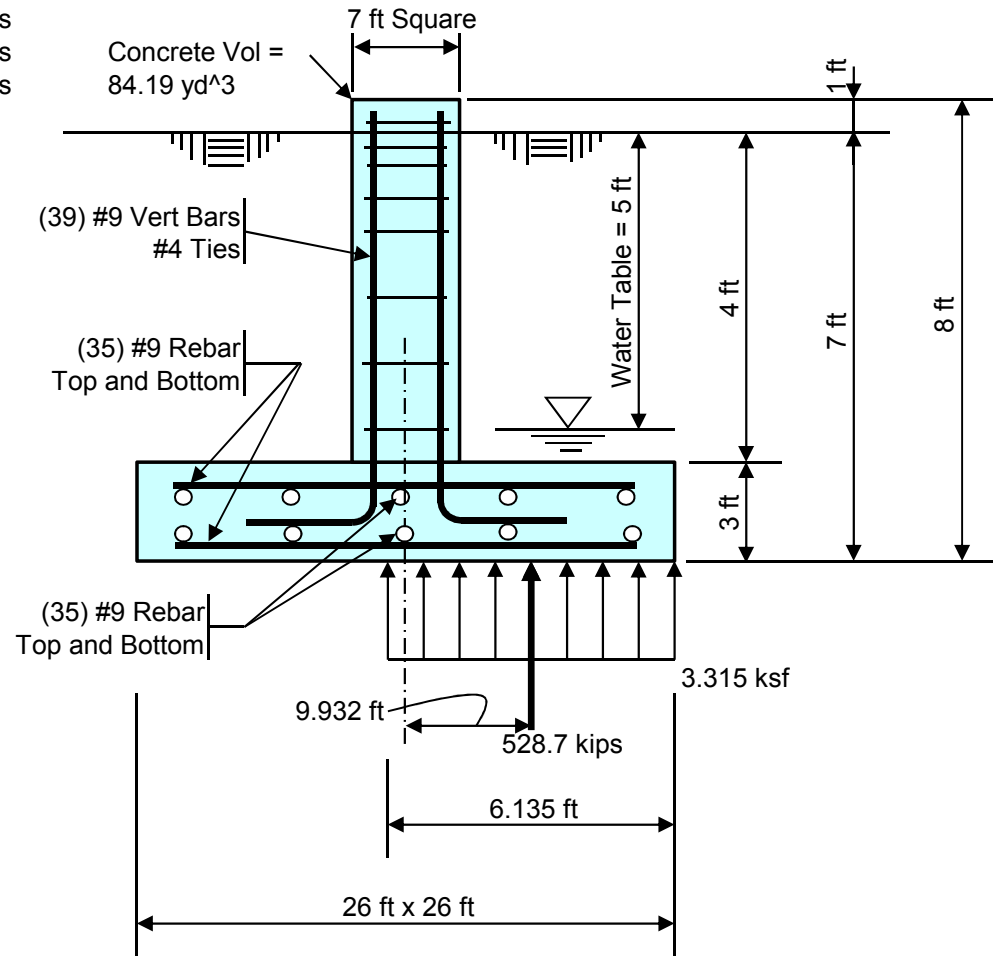
Pier Shape =	<b>Square</b>
Pier Width =	<b>7</b> ft Square
Pier Height above Grade =	<b>1</b> ft
Depth to Bottom of Footing =	<b>7</b> ft
Footing Thickness =	<b>3</b> ft
Footing Width, B =	<b>26</b> ft
Footing Length, L =	<b>26</b> ft

**Concrete:**

Concrete Strength =	<b>4</b> ksi
Rebar Strength =	<b>60</b> ksi

**Summary Results:**

	Required	Available
Maximum Net Soil Bearing =	<b>3.701</b> ksf	<b>9.000</b> ksf
Uplift =	<b>0.0</b> kips	<b>418.7</b> kips
Punching Shear Stress =	<b>0.054</b> ksi	<b>0.190</b> ksi
Bending Shear Stress =	<b>378.4</b> kips	<b>926.7</b> kips
Bending Moment =	<b>2635.4</b> k-ft	<b>4775.1</b> k-ft
Conc Pier Reinforcing Steel =	<b>5343.0</b> k-ft	<b>6933.3</b> k-ft



Total Pad Reinf Stl =	<b>70.00</b> in <sup>2</sup> >= 20.22 in <sup>2</sup> = Min Stl, OK
Total Pier Reinf Stl =	<b>39.00</b> in <sup>2</sup> >= 35.28 in <sup>2</sup> = Min Stl, OK
Footing Thickness =	<b>3.00</b> ft >= 1.5 ft = Min Ftg Thk, OK

Stress Ratio =	<b>41.1%</b> in Soil Bearing
Stress Ratio =	<b>0.0%</b> in Uplift
Stress Ratio =	<b>28.6%</b> in Punching Shear
Stress Ratio =	<b>40.8%</b> in Bending Shear
Stress Ratio =	<b>55.2%</b> in Bending Moment
Stress Ratio =	<b>77.1%</b> in Pier Rebar

# 14 THOMPSON HILL RD

**Location** 14 THOMPSON HILL RD

**Mblu** 011/ / 069/ /

**Acct#** 00054300

**Owner** LANATI JOSHUA & EILEEN

**Assessment** \$250,400

**Appraisal** \$502,300

**PID** 543

**Building Count** 1

## Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2016	\$127,400	\$374,900	\$502,300

Assessment			
Valuation Year	Improvements	Land	Total
2016	\$89,200	\$161,200	\$250,400

## Owner of Record

**Owner** LANATI JOSHUA & EILEEN  
**Co-Owner**  
**Address** 14 THOMPSON HILL RD  
COLUMBIA, CT 06237

**Sale Price** \$155,000  
**Certificate**  
**Book & Page** 0197/0163  
**Sale Date** 04/14/2011  
**Instrument** 28

## Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
LANATI JOSHUA & EILEEN	\$155,000		0197/0163	28	04/14/2011
DEOJAY THOMAS R ESTATE OF	\$0		0122/0722	25	09/23/2010
DEOJAY THOMAS R	\$0		0122/0722		10/25/1999
DEOJAY THOMAS R & WILLIE JO	\$0		0059/0018		05/18/1982

## Building Information

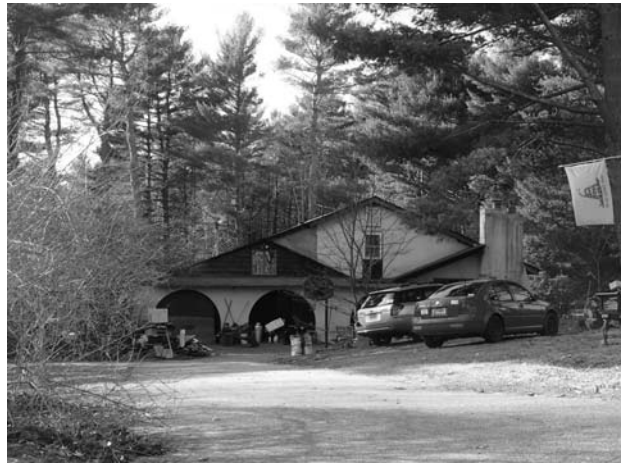
### Building 1 : Section 1

**Year Built:** 1955  
**Living Area:** 1,677  
**Replacement Cost:** \$190,432  
**Building Percent Good:** 66

**Replacement Cost**  
**Less Depreciation:** \$125,700

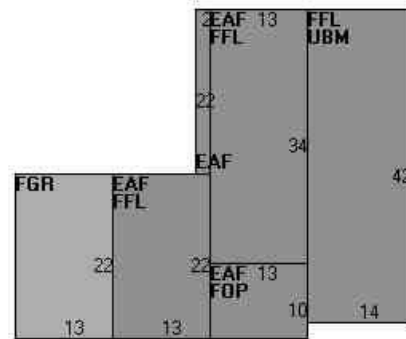
Building Attributes	
Field	Description
Style	Conventional
Model	Residential
Grade:	Average +20
Stories:	1 1/2 Stories
Occupancy	1
Exterior Wall 1	Stucco/Masonry
Exterior Wall 2	Wood Shingle
Roof Structure:	Gable/Hip
Roof Cover	Asphalt
Interior Wall 1	Drywall/Sheet
Interior Wall 2	
Interior Flr 1	Pine/Soft Wood
Interior Flr 2	
Heat Fuel	Electric
Heat Type:	Electr Basebrd
AC Type:	None
Total Bedrooms:	3 Bedrooms
Total Bthrms:	2
Total Half Baths:	1
Total Xtra Fixtrs:	
Total Rooms:	8 Rooms
Bath Style:	Average
Kitchen Style:	Average
Whirlpool	
Fireplace(s)	1
Fndtn. Level	

**Building Photo**



(<http://images.vgsi.com/photos2/ColumbiaCTPhotos//\00\00\75/>)

**Building Layout**



Building Sub-Areas (sq ft)			<u>Legend</u>
Code	Description	Gross Area	Living Area
FFL	First Floor Living	1,316	1,316
EAF	Attic, Expansion, Finished	902	361
FGR	Garage, Framed	286	0
FOP	Porch, Open, Finished	130	0
UBM	Basement, Unfinished	588	0
		3,222	1,677

**Extra Features**

Extra Features	<u>Legend</u>
No Data for Extra Features	

**Land**

**Land Use**

**Land Line Valuation**

**Land Use**

**Use Code** 1010  
**Description** Single Fam  
**Zone** RA  
**Neighborhood** 12  
**Alt Land Appr Category** No

**Land Use Valuation**

**Size (Acres)** 29.4  
**Frontage** 0  
**Depth** 0  
**Assessed Value** \$161,200  
**Appraised Value** \$374,900

**Outbuildings**

<b>Outbuildings</b>						<b>Legend</b>
<b>Code</b>	<b>Description</b>	<b>Sub Code</b>	<b>Sub Description</b>	<b>Size</b>	<b>Value</b>	<b>Bldg #</b>
BRN3	Barn 1 St. w Loft			540 S.F.	\$1,300	1
SHD1	Shed Frame			64 S.F.	\$400	1

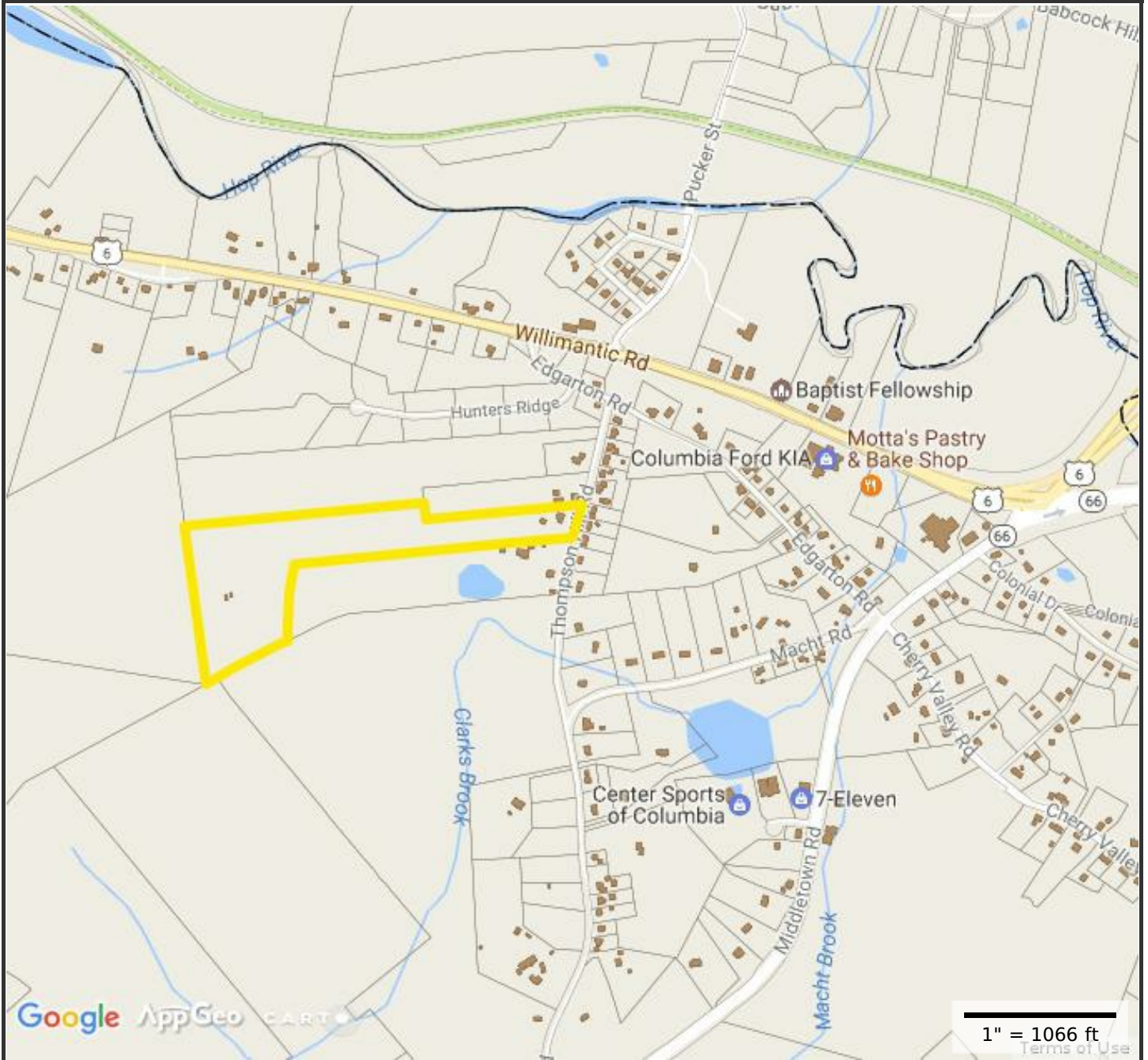
**Valuation History**

<b>Appraisal</b>			
<b>Valuation Year</b>	<b>Improvements</b>	<b>Land</b>	<b>Total</b>
2015	\$123,000	\$374,900	\$497,900
2014	\$123,000	\$374,900	\$497,900
2013	\$123,000	\$374,900	\$497,900

<b>Assessment</b>			
<b>Valuation Year</b>	<b>Improvements</b>	<b>Land</b>	<b>Total</b>
2015	\$86,100	\$160,330	\$246,430
2014	\$86,100	\$160,330	\$246,430
2013	\$86,100	\$160,330	\$246,430



# 14 Thompson Hill Road, Columbia Map



**Property Information**

**Property ID** 09013030-011-069  
**Location** 14 THOMPSON HILL RD  
**Owner** CROWN CABLE TOWERS 09 LLC



**MAP FOR REFERENCE ONLY  
 NOT A LEGAL DOCUMENT**

CRCOG makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.





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-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
    5. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
    3. GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY –GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
    4. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC") AND NFPA 101 (LIFE SAFETY CODE).
    5. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
    6. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
    7. AMERICAN CONCRETE INSTITUTE (ACI)
    8. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
    9. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
    10. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
    11. PORTLAND CEMENT ASSOCIATION (PCA)
    12. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
    13. BRICK INDUSTRY ASSOCIATION (BIA)
    14. AMERICAN WELDING SOCIETY (AWS)
    15. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
    16. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
    17. DOOR AND HARDWARE INSTITUTE (DHI)
    18. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
    19. 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.
 

NOTE: IN SHORT-FORM SPECIFICATIONS ON THE DRAWINGS, A/E TO INSERT LIST OF APPLICABLE MOPS INCLUDING EN-2012-001, EN-2013-002, EL-0568, AND TS-0193
- 1.15 USE OF ELECTRONIC PROJECT 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. 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 CO.**

**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.

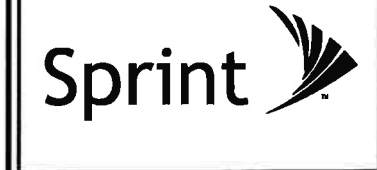
**TOWER OWNER NOTIFICATION**  
 ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE NOTICE TO PROCEED, CONTRACTOR WILL CONTACT THE CROWN CASTLE CONSTRUCTION MANAGER OF RECORD (NOTED ON THE FIRST PAGE ON THIS CONSTRUCTION DRAWING) A MINIMUM OF 48 HOURS PRIOR TO WORK START. UPON ARRIVAL TO THE JOB SITE, CONTRACTOR CREW IS REQUIRED CALL 1-800-788-7011 TO NOTIFY THE CROWN CASTLE NOC WORK HAS BEGUN.

**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:

PLANS PREPARED FOR:



PLANS PREPARED BY:

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 Phone: 518-690-0790 | Fax: 518-690-0793  
 www.infinigy.com  
 JOB NUMBER 514-000

PROJECT MANAGER:

**AIROSMITH**  
 DEVELOPMENT  
 32 CLINTON ST.  
 SARATOGA SPRINGS, NY 12866  
 OFFICE# (518) 306-3740

ENGINEERING LICENSE:



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REVISIONS:	DESCRIPTION	DATE	BY	REV
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ISSUED FOR REVIEW		1/18/17	SKB	A

SITE NAME:

**COLUMBIA / DEOJAY**

SITE NUMBER:

**CT33XC571**

SITE ADDRESS:

**14 THOMPSON HILL RD  
 COLUMBIA, CT 06237**

SHEET DESCRIPTION:

**SPRINT SPECIFICATIONS**

SHEET NUMBER:

**SP-1**



**CONTINUE FROM SP-1**

1. PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
2. PREPARE GROUND SITES; PROVIDE DE-GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
3. MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND TELCO BACKHAUL.
4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEM.
5. INSTALL ABOVE GROUND GROUNDING SYSTEMS.
6. PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
7. INSTALL "H-FRAMES", CABINETS AND SHELTERS AS INDICATED.
8. INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
9. ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.
10. PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.
11. PROVIDE SLABS AND EQUIPMENT PLATFORMS.
12. INSTALL COMPOUND FENCING, SIGHT SHIELDING, LANDSCAPING AND ACCESS BARRIERS.
13. PERFORM INSPECTION AND MATERIAL TESTING AS REQUIRED HEREINAFTER.
14. CONDUCT SITE RESISTANCE TO EARTH TESTING AS REQUIRED HEREINAFTER.
15. INSTALL FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS.
16. INSTALL TOWERS, ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.
17. INSTALL CELL SITE RADIOS, MICROWAVE, GPS, COAXIAL MAINLINE, ANTENNAS, CROSS BAND COUPLERS, TOWER TOP AMPLIFIERS, LOW NOISE AMPLIFIERS AND RELATED EQUIPMENT.
18. PERFORM, DOCUMENT, AND CLOSE OUT ANY CONSTRUCTION CONTROL DOCUMENTS THAT MAY BE REQUIRED BY GOVERNMENT AGENCIES AND LANDLORDS.
19. PERFORM ANTENNA AND COAX SWEEP TESTING AND MAKE ANY AND ALL NECESSARY CORRECTIONS.
20. REMAIN ON SITE MOBILIZED THROUGHOUT HAND-OFF AND INTEGRATION TO ASSIST AS NEEDED UNTIL SITE IS DEEMED SUBSTANTIALLY COMPLETE AND PLACED "ON AIR."

**3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:**

- A. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.
- B. EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.
- C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
  1. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
  2. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.
- D. CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION
- E. CONDUCT TESTING AS REQUIRED HEREIN.

**3.3 DELIVERABLES:**

- A. CONTRACTOR SHALL REVIEW, APPROVE, AND SUBMIT TO SPRINT SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND SIMILAR SUBMITTALS AS REQUIRED HEREINAFTER
- B. PROVIDE DOCUMENTATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING. DOCUMENTATION SHALL BE FORWARDED IN ORIGINAL FORMAT AND/OR UPLOADED INTO SMS.
  1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
  2. PROJECT PROGRESS REPORTS.
  3. CIVIL CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
  4. ELECTRICAL SERVICE COMPLETION DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).

5. LINES AND ANTENNA INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
6. POWER INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
7. TELCO READY DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
8. PPC (OR SHELTER) INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
9. TOWER CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
10. TOWER CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
11. BTS AND RADIO EQUIPMENT DELIVERED AT SITE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
12. NETWORK OPERATIONS HANDOFF CHECKLIST (HOC WALK) COMPLETE (UPLOAD FORM IN SMS)
13. CIVIL CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
14. SITE CONSTRUCTION PROGRESS PHOTOS UNLOADED INTO SMS.

**SECTION 01 400 - SUBMITTALS & TESTS**

**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
- D. 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 TS-0200 REV 4 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 485. 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:**

1. 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.
2. 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.
3. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASHTO, AND OTHER METHODS IS NEEDED.
4. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASHTO, 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 - ANTENNA ALIGNMENT TOOL (AAT)

PLANS PREPARED FOR:



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PROJECT MANAGER:



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ISSUED FOR REVIEW		1/18/17	SKB	A

SITE NAME:

**COLUMBIA / DEOJAY**

SITE NUMBER:

**CT33XC571**

SITE ADDRESS:

**14 THOMPSON HILL RD  
COLUMBIA, CT 06237**

SHEET DESCRIPTION:

**SPRINT SPECIFICATIONS**

SHEET NUMBER:

**SP-2**



**CONTINUE FROM SP-2**

- 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
- C. 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.
- D. 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 01 400 - SUBMITTALS & TESTS**

**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.

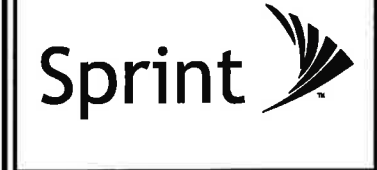
**PART 2 - PRODUCTS (NOT USED)**

**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.

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**AIRSMITH**  
DEVELOPMENT  
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OFFICE: (518) 306-3740

ENGINEERING LICENSE:



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ISSUED FOR PERMIT		2/13/17	JM	0
ISSUED FOR REVIEW		1/18/17	SKB	A

SITE NAME:

COLUMBIA / DEOJAY

SITE NUMBER:

CT33XC571

SITE ADDRESS:

14 THOMPSON HILL RD  
COLUMBIA, CT 06237

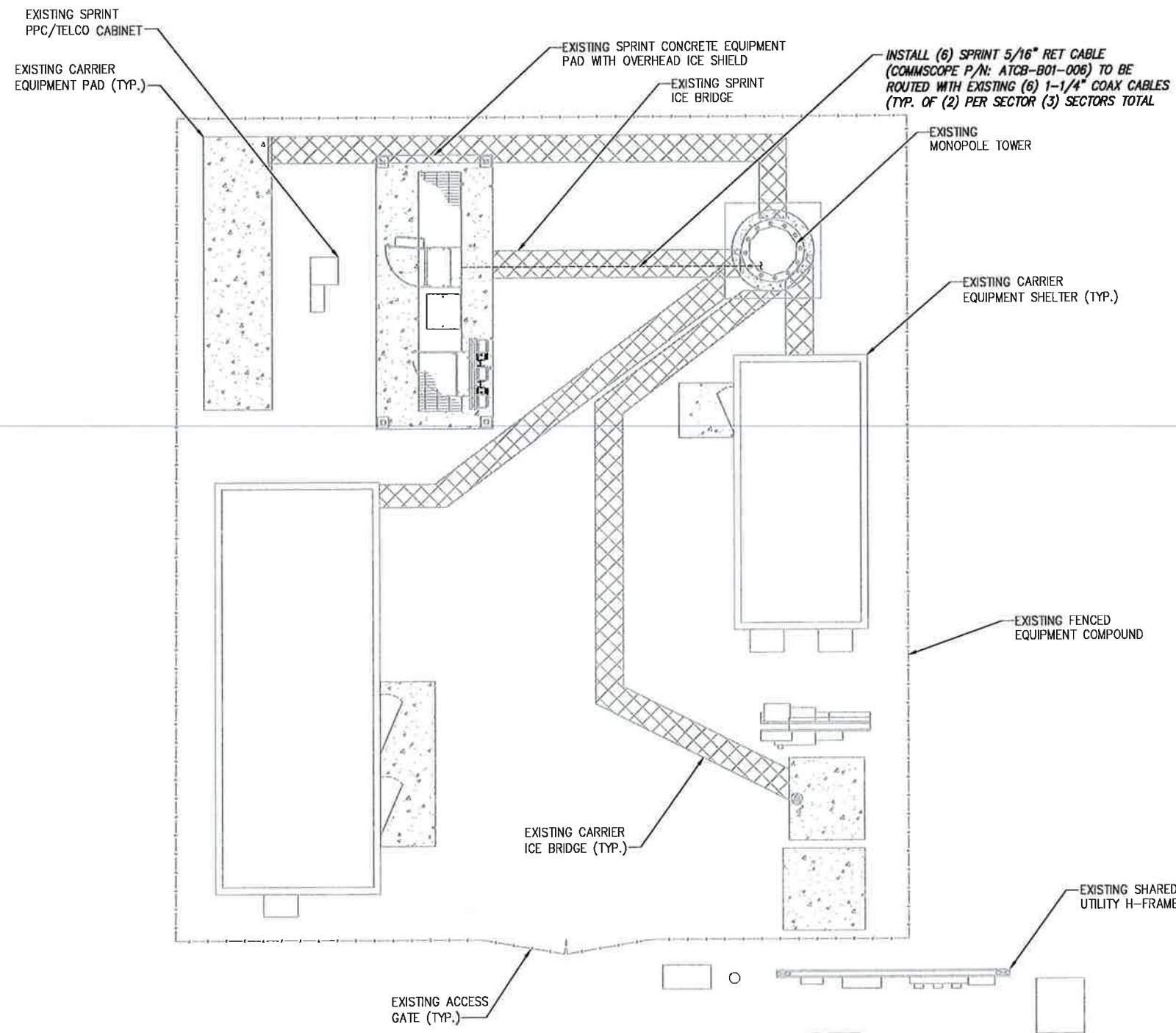
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SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-3

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SITE NUMBER:

CT33XC571

SITE ADDRESS:

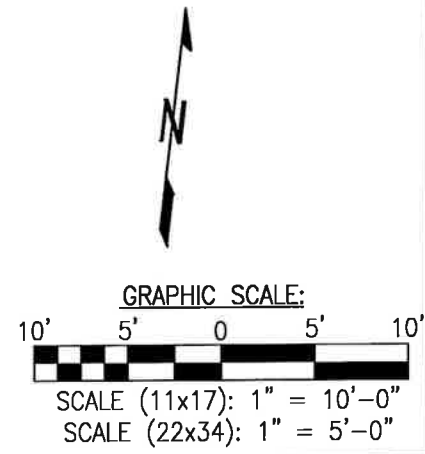
14 THOMPSON HILL RD  
 COLUMBIA, CT 06237

SHEET DESCRIPTION:

OVERALL SITE PLAN

SHEET NUMBER:

A-1



OVERALL SITE PLAN

SCALE: AS NOTED 1



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COLUMBIA / DEOJAY

SITE NUMBER:

CT33XC571

SITE ADDRESS:

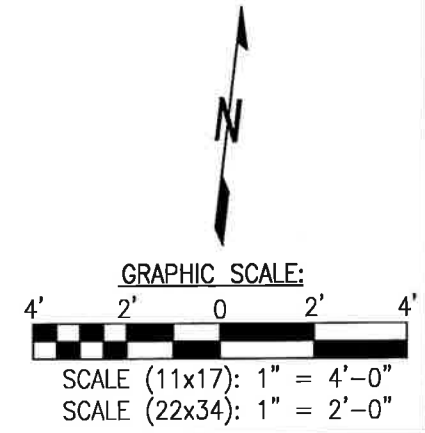
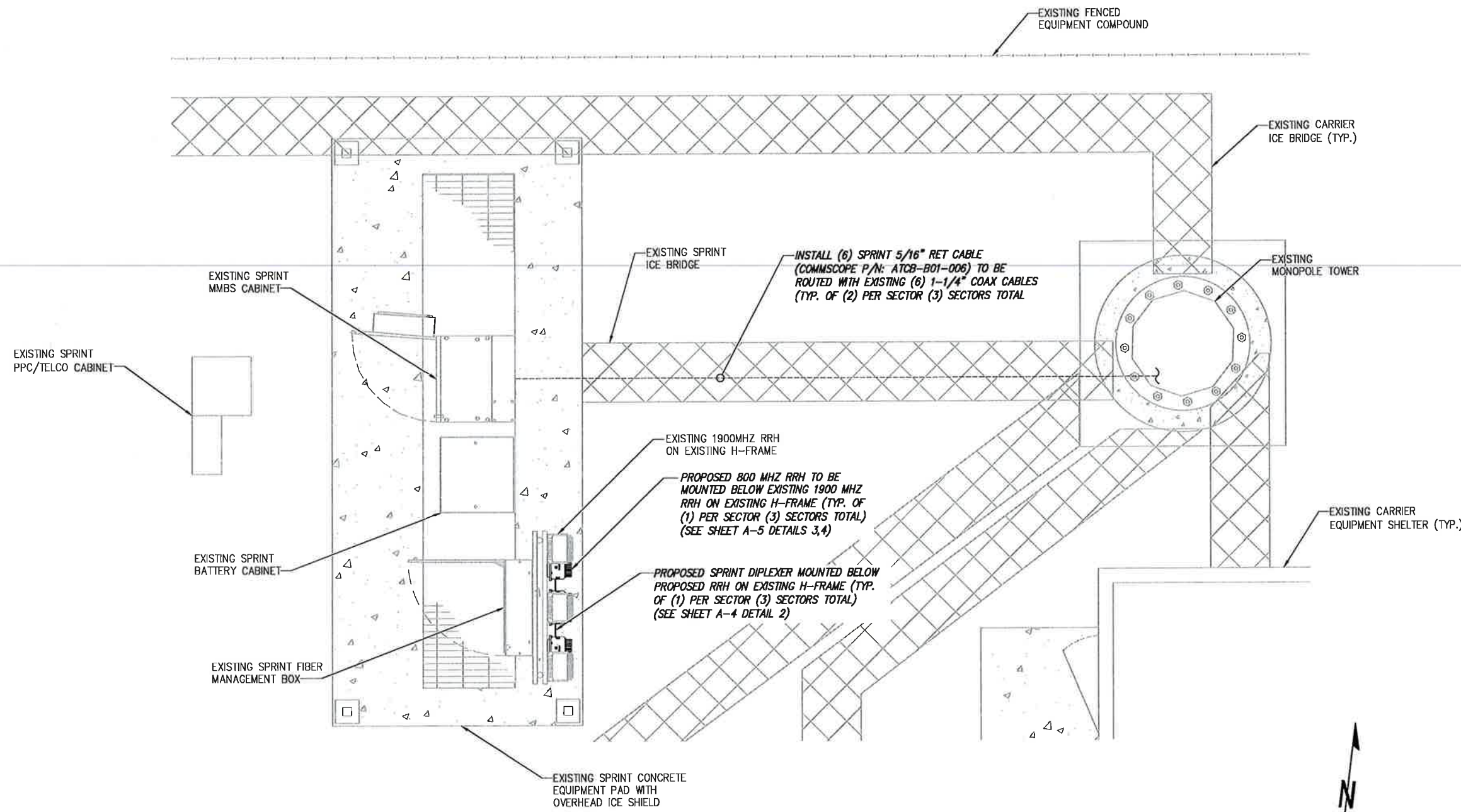
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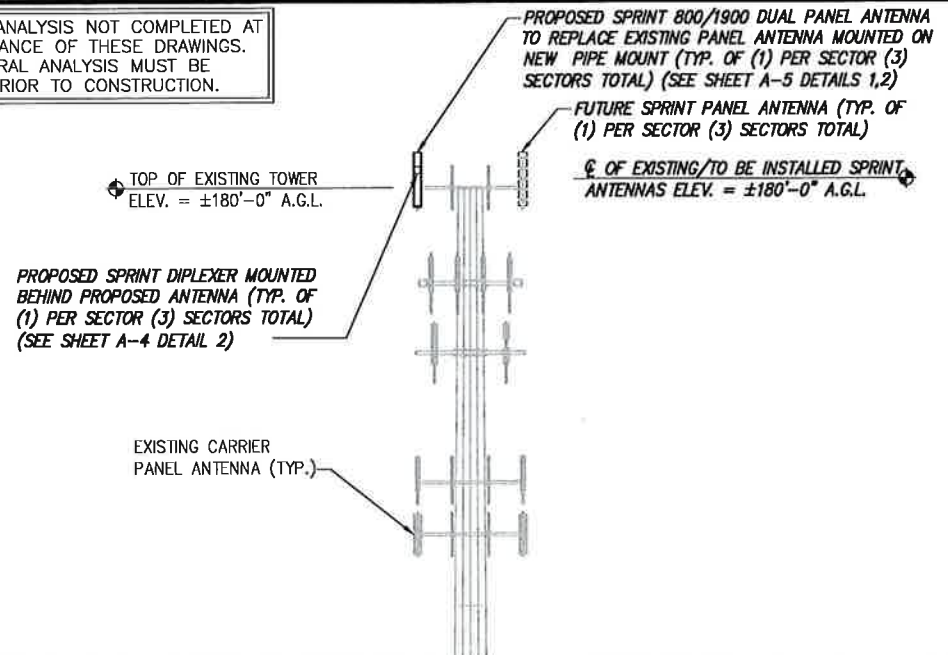
SITE PLAN

SHEET NUMBER:

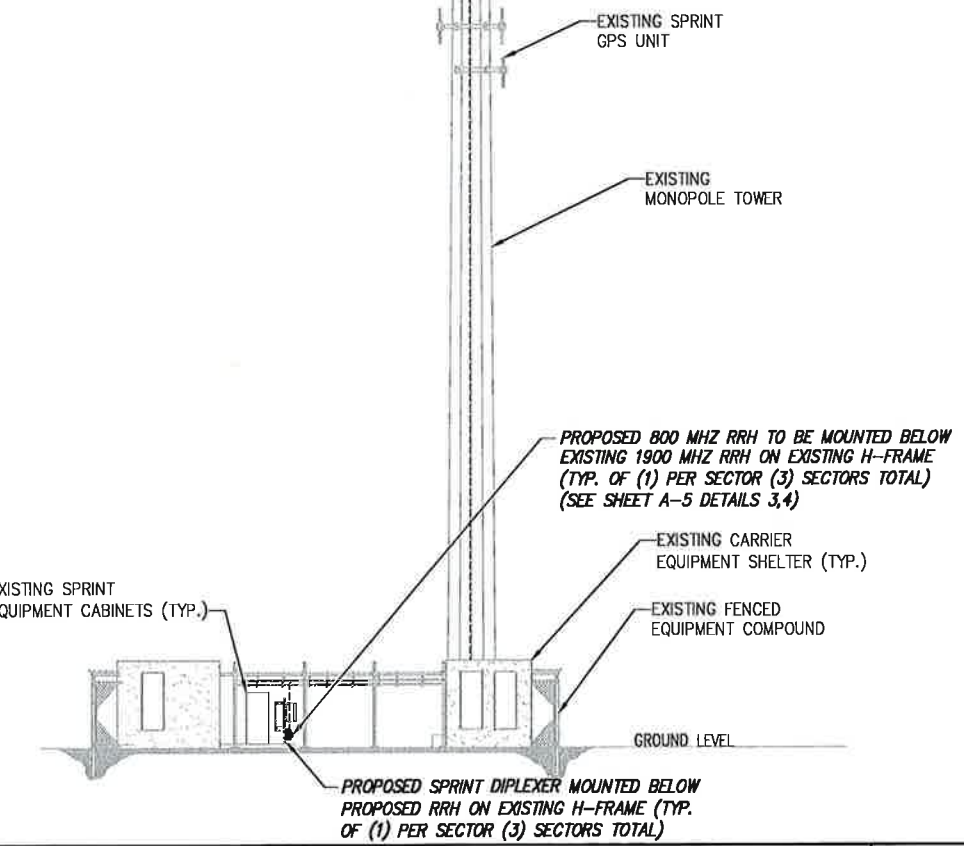
A-2



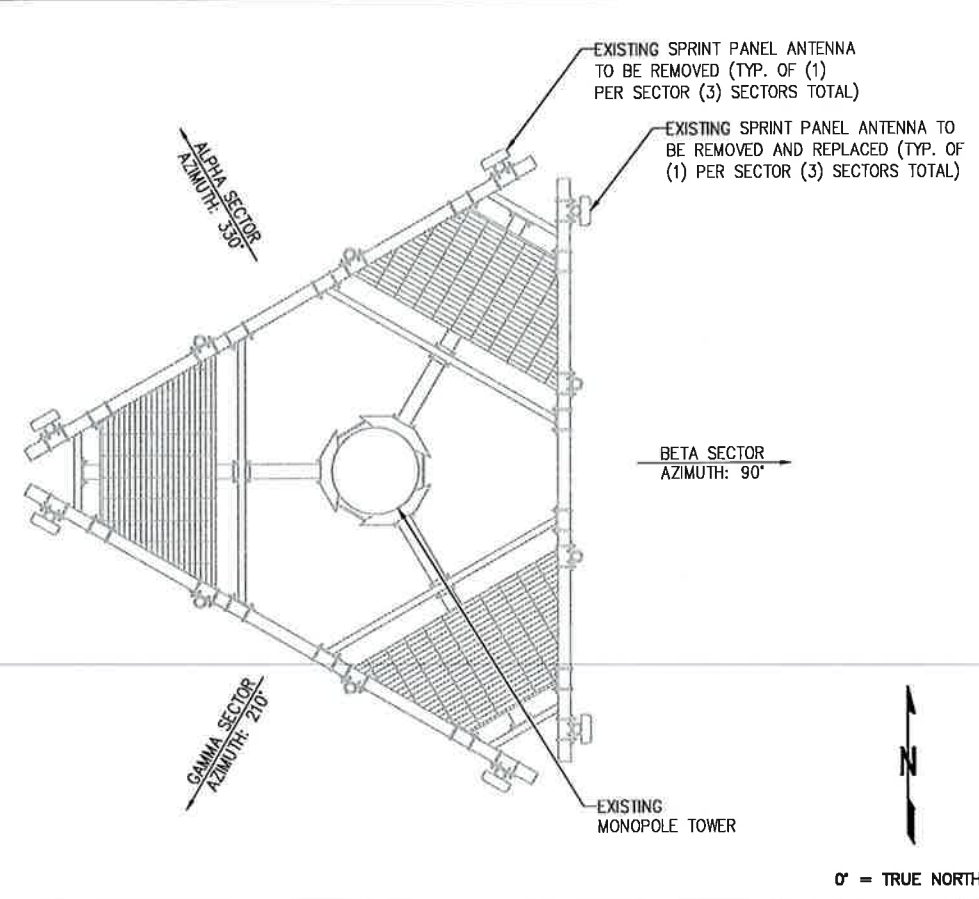
STRUCTURAL ANALYSIS NOT COMPLETED AT TIME OF ISSUANCE OF THESE DRAWINGS. THE STRUCTURAL ANALYSIS MUST BE COMPLETED PRIOR TO CONSTRUCTION.



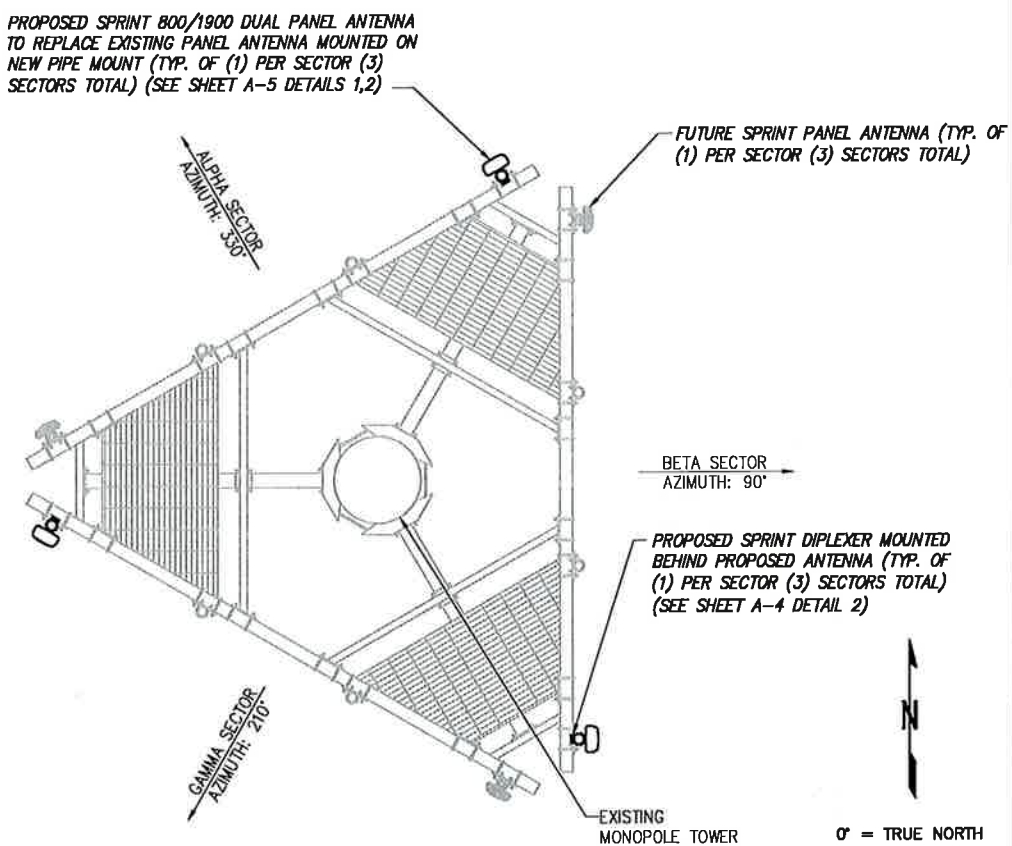
INSTALL (6) SPRINT 5/16" RET CABLE (COMMSCOPE P/N: ATCB-B01-006) TO BE ROUTED WITH EXISTING (6) 1-1/4" COAX CABLES (TYP. OF (2) PER SECTOR (3) SECTORS TOTAL)



**TOWER ELEVATION** NO SCALE 1



**EXISTING ANTENNA LAYOUT** NO SCALE 2



**PROPOSED ANTENNA LAYOUT** NO SCALE 3

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SITE NAME:

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SITE NUMBER:

**CT33XC571**

SITE ADDRESS:

**14 THOMPSON HILL RD  
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SHEET DESCRIPTION:

**TOWER ELEVATION  
& ANTENNA LAYOUT**

SHEET NUMBER:

**A-3**





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SITE NUMBER: **CT33XC571**

SITE ADDRESS: **14 THOMPSON HILL RD  
COLUMBIA, CT 06237**

SHEET DESCRIPTION: **ANTENNA LOADING & COLOR CODING CHARTS**

SHEET NUMBER: **A-4**

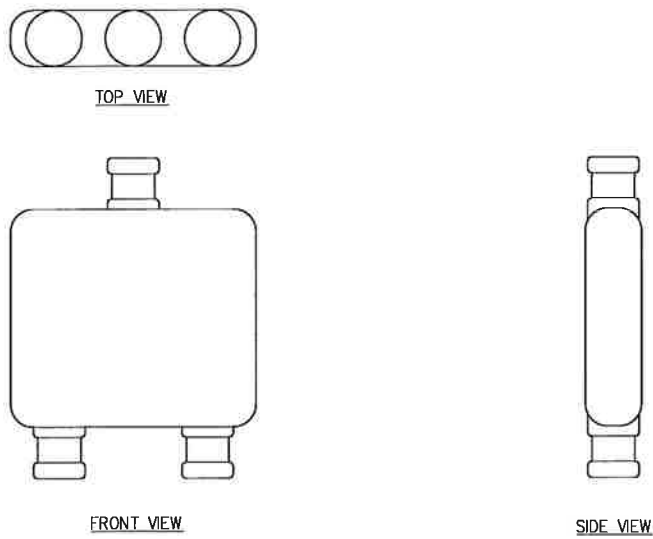
SECTOR	EXISTING/PROPOSED	BAND	ANTENNA	ANTENNA C HEIGHT	AZIMUTH	RRH	JUNCTION CYLINDERS	CABLE	CABLE LENGTH
ALPHA	FUTURE	---	---	---	---	---	---	---	---
	PROPOSED	800MHZ / 1900MHZ	RFS/CELWAVE APXVSPP18-C-A20	180'-0"	330°	(P) GROUND MOUNTED 800 MHZ RRH (E) GROUND MOUNTED 1900 MHZ RRH	---	(2) (P) RET CABLES (2) (E) 1-1/4" COAX	±235' EXISTING
BETA	FUTURE	---	---	---	---	---	---	---	---
	PROPOSED	800MHZ / 1900MHZ	RFS/CELWAVE APXVSPP18-C-A20	180'-0"	90°	(P) GROUND MOUNTED 800 MHZ RRH (E) GROUND MOUNTED 1900 MHZ RRH	---	(2) (P) RET CABLES (2) (E) 1-1/4" COAX	±235' EXISTING
GAMMA	FUTURE	---	---	---	---	---	---	---	---
	PROPOSED	800MHZ / 1900MHZ	RFS/CELWAVE APXVSPP18-C-A20	180'-0"	210°	(P) GROUND MOUNTED 800 MHZ RRH (E) GROUND MOUNTED 1900 MHZ RRH	---	(2) (P) RET CABLES (2) (E) 1-1/4" COAX	±235' EXISTING

SECTOR	CABLE	FIRST RING	SECOND RING	THIRD RING
1 ALPHA	1	GREEN	NO TAPE	NO TAPE
1	2	BLUE	NO TAPE	NO TAPE
1	3	BROWN	NO TAPE	NO TAPE
1	4	WHITE	NO TAPE	NO TAPE
1	5		NO TAPE	NO TAPE
1	6	SLATE	NO TAPE	NO TAPE
1	7	PURPLE	NO TAPE	NO TAPE
1	8	ORANGE	NO TAPE	NO TAPE
2 BETA	1	GREEN	GREEN	NO TAPE
2	2	BLUE	BLUE	NO TAPE
2	3	BROWN	BROWN	NO TAPE
2	4			NO TAPE
2	5			NO TAPE
2	6	SLATE	SLATE	NO TAPE
2	7	PURPLE	PURPLE	NO TAPE
2	8	ORANGE	ORANGE	NO TAPE
3 GAMMA	1	GREEN	GREEN	GREEN
3	2	BLUE	BLUE	BLUE
3	3	BROWN	BROWN	BROWN
3	4			
3	5			
3	6	SLATE	SLATE	SLATE
3	7	PURPLE	PURPLE	PURPLE
3	8	ORANGE	ORANGE	ORANGE

ANTENNA LOADING CHART NO SCALE 1

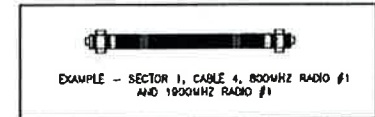
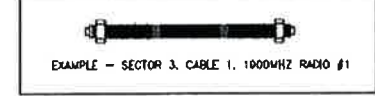
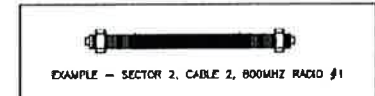
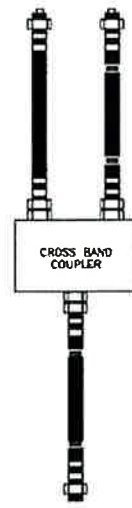
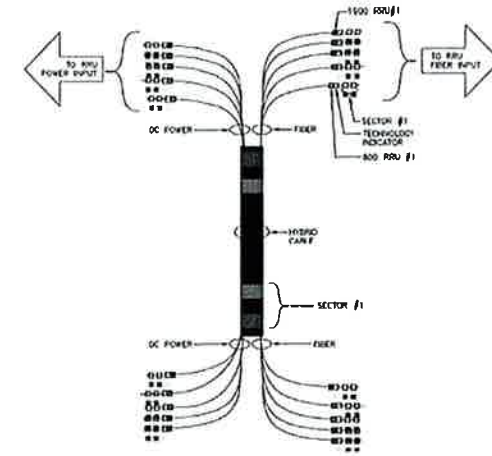
DIPLEXER: RFS/CELWAVE FD9R6004/1C-3L

HOUSING: ALUMINUM  
 DIMENSIONS, HxWxD.in(mim): 5.8"x6.5"x1.5" (147x164x37mm)  
 WEIGHT, kg (lb): 1.2 (2.6 lb)  
 CONNECTORS: in-line long-neck 7-16-female



DIPLEXER DETAIL NO SCALE 2

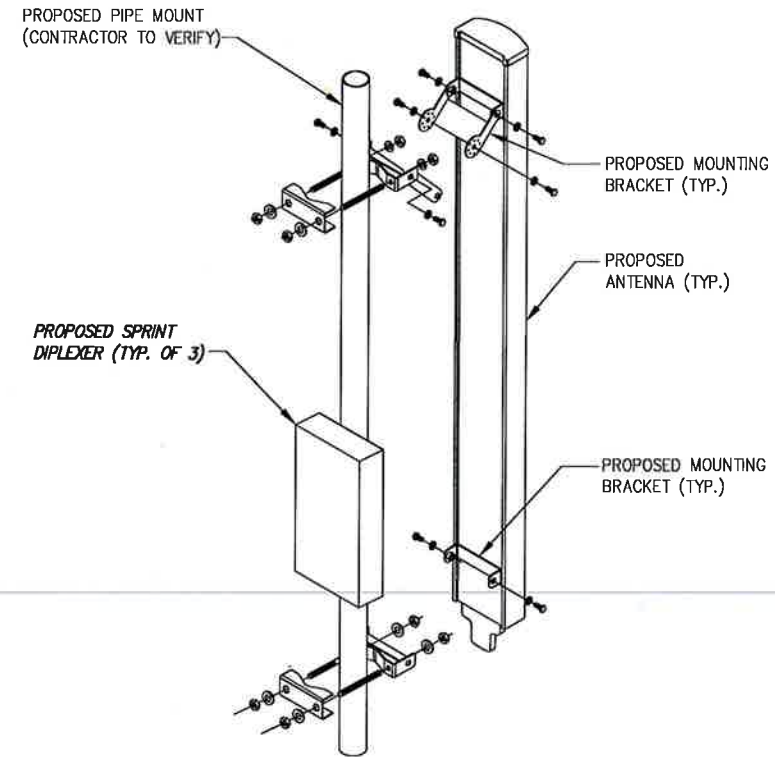
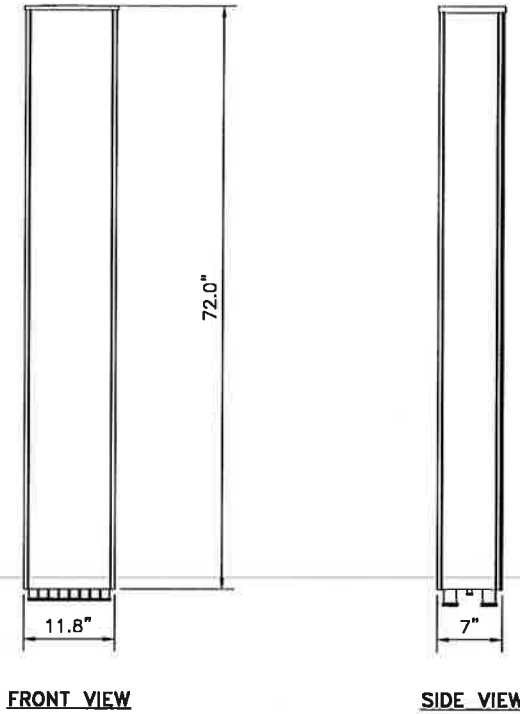
FREQUENCY	INDICATOR	ID
800#1	YELLOW	
1900#1	YELLOW	RED
1900#2	YELLOW	
RESERVED	YELLOW	
RESERVED	YELLOW	
RESERVED	YELLOW	
RESERVED	YELLOW	WHITE
1600#1	YELLOW	



COLOR CODING CHARTS NO SCALE 3

**ANTENNA: RFS/CELWAVE APXVSP18-C-A20**

RADOME MATERIAL: ASA  
 RADOME COLOR: LIGHT GRAY  
 DIMENSIONS, HxWxD.in.(mm): 72.0"x11.8"x7" (1829x302x178mm)  
 WEIGHT: 25.8 lbs  
 CONNECTORS: (6) 7/16" DIN FEMALE/BOTTOM

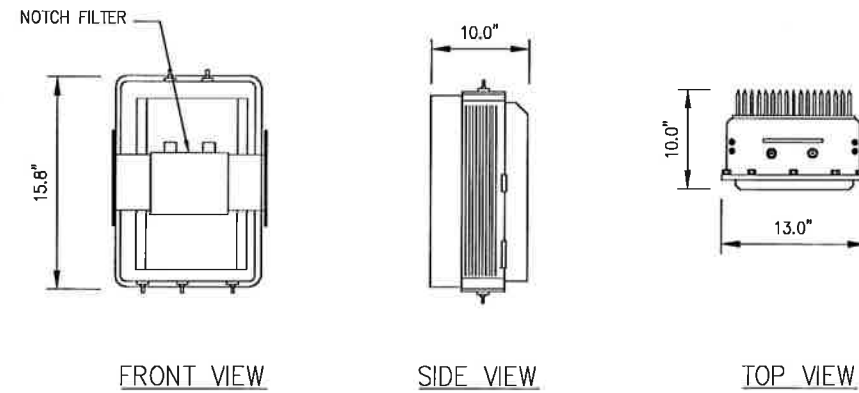


**PANEL ANTENNA DETAIL**

NO SCALE 1

**PANEL ANTENNA MOUNTING DETAIL**

NO SCALE 2

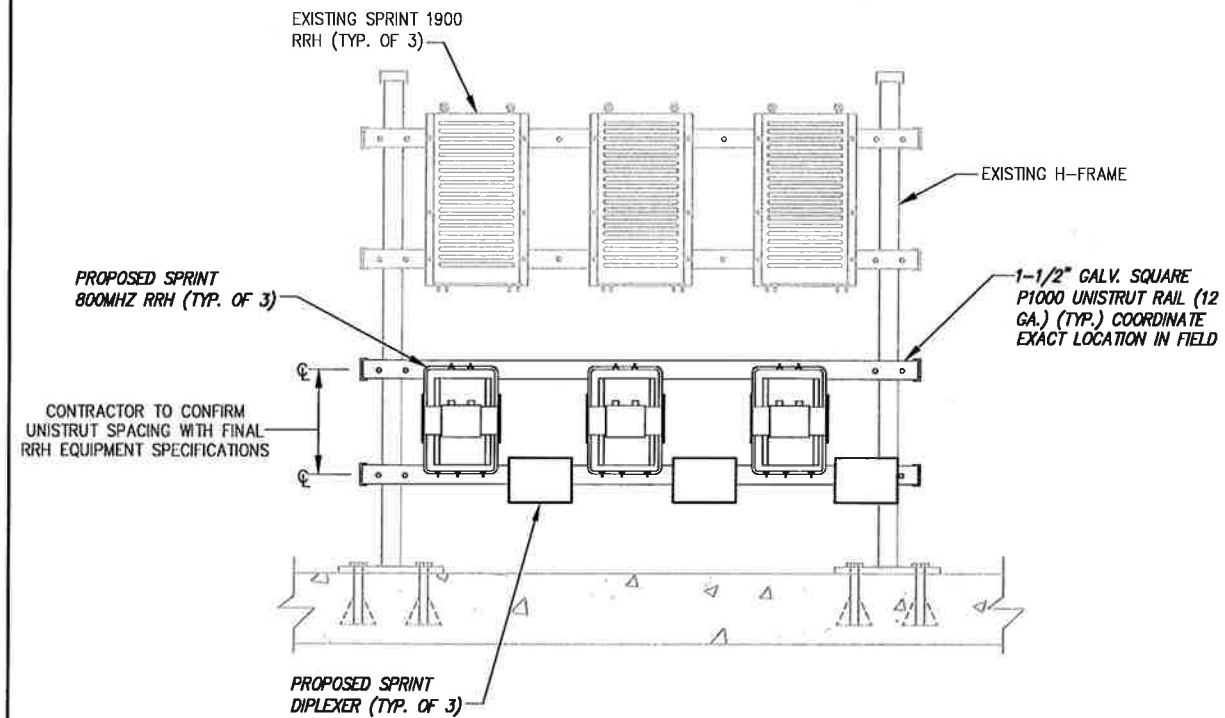


800 MHz RRH  
 (ALU)  
 WEIGHT = 53 LBS.

NOTE:  
 REFER TO R.F. SYSTEM SCHEDULE FOR EXACT  
 RRH SPECIFICATIONS AND QUANTITIES.

**RRH DETAIL**

NO SCALE 3



**RRH MOUNTING DETAILS**

NO SCALE 4

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SITE NAME:  
**COLUMBIA / DEOJAY**

SITE NUMBER:  
**CT33XC571**

SITE ADDRESS:  
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 COLUMBIA, CT 06237**

SHEET DESCRIPTION:  
**EQUIPMENT  
 & MOUNTING DETAILS**

SHEET NUMBER:  
**A-5**





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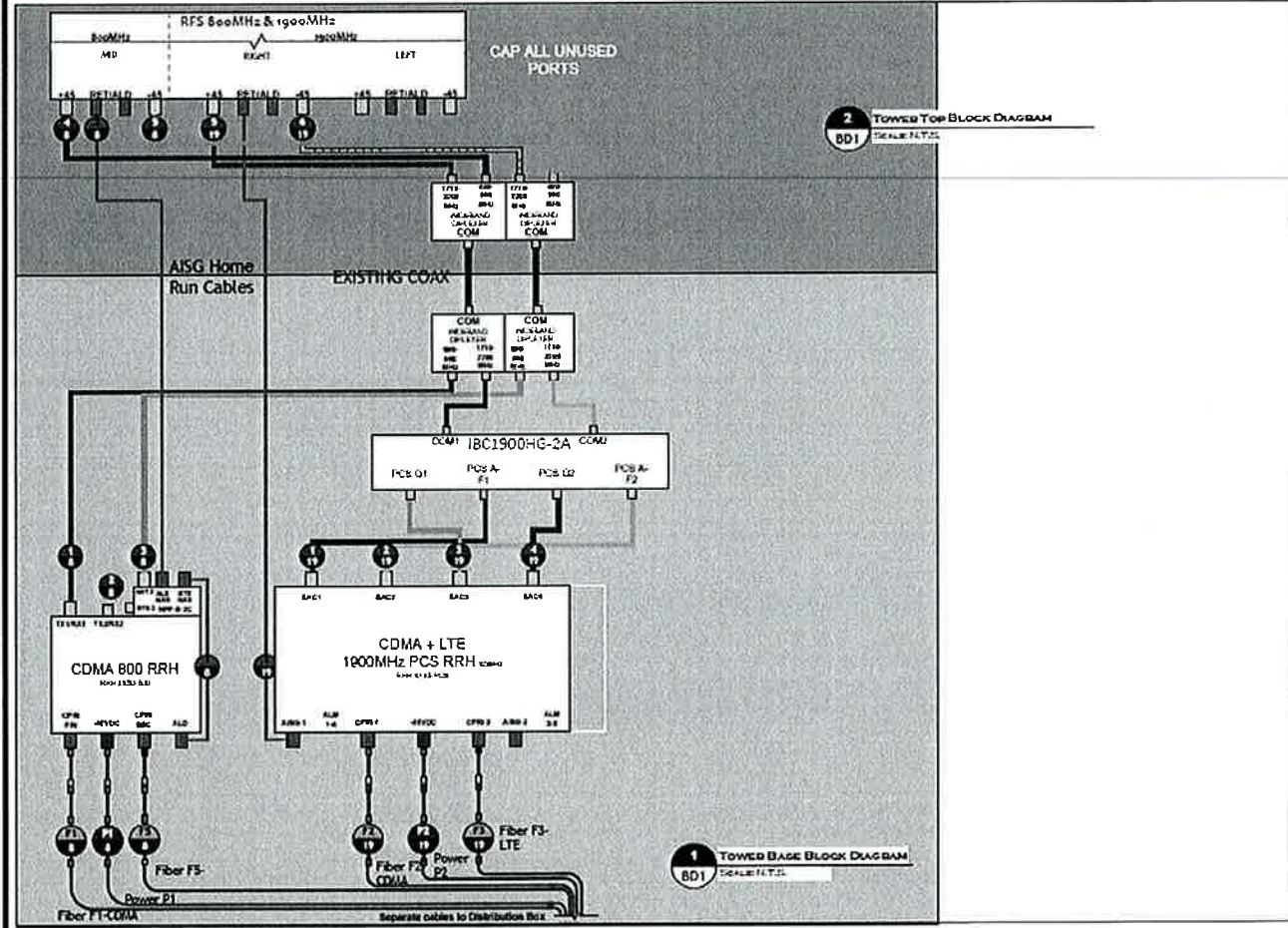
COLUMBIA / DEOJAY

CT33XC571

14 THOMPSON HILL RD  
COLUMBIA, CT 06237

SCENARIO 354 V2.5  
SPECIFICATIONS

A-6



J. STEVE WALKER  
PHYSICAL DESIGNER  
P# 511246007

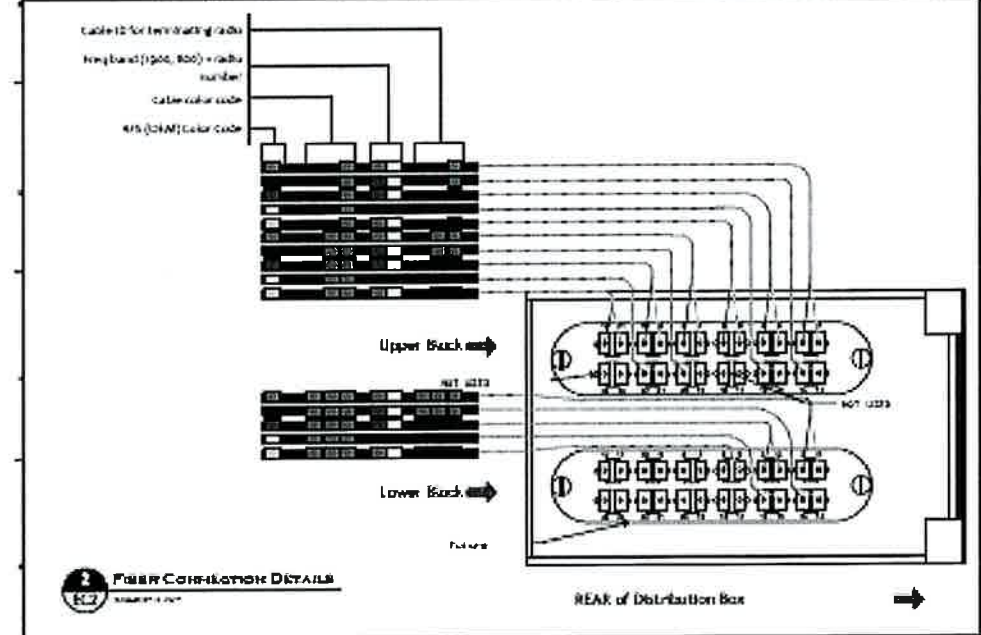
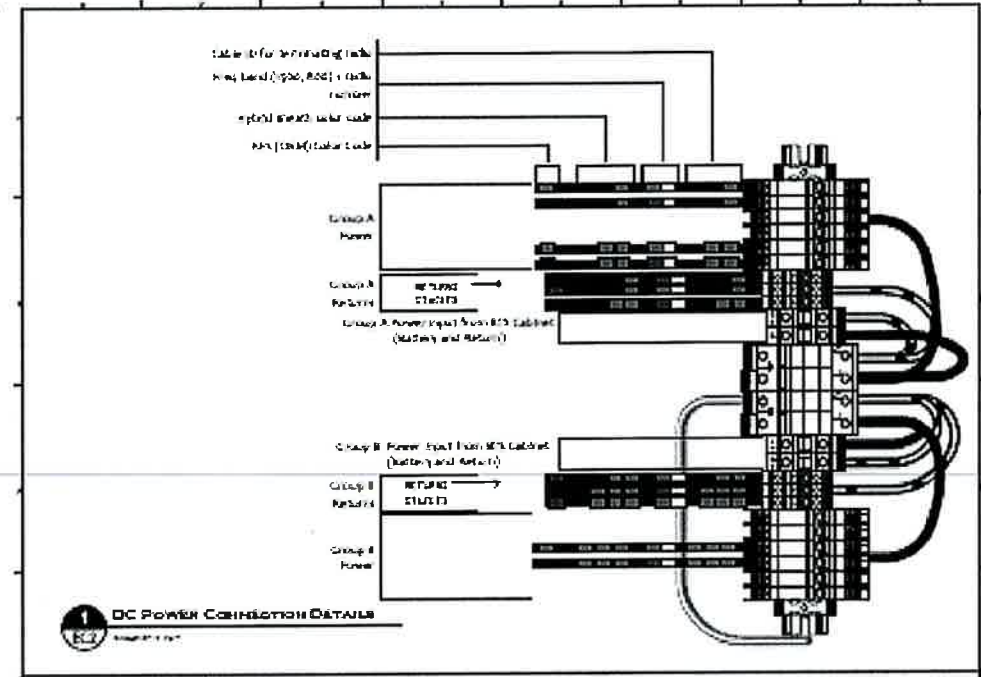
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1 FIBER COAX  
2 FIBER POWER NOTES  
3 FREQ  
4 DIAGRAM LEGEND  
5 BACK TO TITLE SHEET

SCENARIO 354\_V2.5\_V00

SHEET DESCRIPTION:  
GROUND MOUNTED BLOCK  
DIAGRAM

SHEET NUMBER:  
BD1



J. STEVE WALKER  
PHYSICAL DESIGNER  
P# 511246007

Sprint  
NETWORK VISION  
Alcatel-Lucent

SCENARIO 354\_V2.5\_V00

BACK TO TITLE SHEET





