



June 20<sup>th</sup>, 2018

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

**RE: Notice of Exempt Modification – Antenna Swap for wireless facility located at 158 ROBERTS ST, EAST HARTFORD CONNECTICUT – CT52XC030 (lat. 41° 46' 24.0" N, long. - 72° 36' 48.4" W)**

Dear Ms. Bachman:

Sprint Spectrum, LP ("Sprint") currently maintains wireless telecommunications antennas at the (128-foot level) on an existing (130-foot monopole tower) at the above-referenced address. The property is owned by the Town of EAST HARTFORD, and the tower is owned by American Tower Corporation.

Sprint's proposed work involves antenna replacement and tower work. Sprint intends to replace three (3) antennas, add three (3) new antennas, and add nine (9) new RRHs onto the tower. 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 MARCIA LECLERC, MAYOR, and JEFFREY CORMIER, Town Planner of the Town of EAST HARTFORD. A copy of this letter is also being sent to JUSTINE PAUL the manager for AMERICAN TOWER CORPORATION who manages the site.

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) 350-4222 or email me to [aperkowski@airosmithdevelopment.com](mailto:aperkowski@airosmithdevelopment.com)

Kind Regards,

A handwritten signature in black ink, appearing to read 'Arthur Perkowski', enclosed within a hand-drawn oval shape.

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: MARCIA LECLERC (MAYOR, EAST HARTFORD, CT)  
JUSTINE PAUL (Manager, AMERICAN TOWER CORPORATION)  
JEFFREY CORMIER (Town Planner / EAST HARTFORD, CT)

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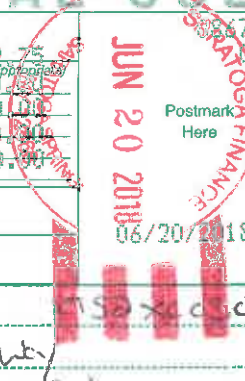
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Sent To: Jeffrey Cormier  
Street and Apt. No., or PO Box No. 740 Main St  
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# Town of East Hartford Property Summary Report

## 150 ROBERTS ST

<b>MAP LOT:</b>	36-18-A	<b>CAMA PID:</b>	16786
<b>LOCATION:</b>	150 ROBERTS ST		
<b>OWNER NAME:</b>	TOWN OF EAST HARTFORD		



16786 03/26/2016

<b>OWNER OF RECORD</b>
TOWN OF EAST HARTFORD
740 MAIN ST
EAST HARTFORD, CT 06108



<b>LIVING AREA:</b>	null	<b>ZONING:</b>	I2	<b>ACREAGE:</b>	27.41
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### SALES HISTORY

OWNER	BOOK / PAGE	SALE DATE	SALE PRICE
TOWN OF EAST HARTFORD	1942/ 192	11-Dec-2000	\$0.00
ELKS BENEVOLENT	365/ 358	11-Nov-2000	\$0.00

### CURRENT PARCEL ASSESSMENT

<b>TOTAL:</b>	\$193,070.00	<b>IMPROVEMENTS:</b>	\$0.00	<b>LAND:</b>	\$193,070.00
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### ASSESSING HISTORY

FISCAL YEAR	TOTAL VALUE	IMPROVEMENT VALUE	LAND VALUE
2017	\$193,070.00	\$0.00	\$193,070.00
2016	\$193,070.00	\$0.00	\$193,070.00
2015	\$193,070.00	\$0.00	\$193,070.00
2014	\$193,070.00	\$0.00	\$193,070.00
2013	\$193,070.00	\$0.00	\$193,070.00



CT52XC030



Property Information

Property ID 09003043-16786  
 Location 150 ROBERTS ST  
 Owner



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.



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

SPRINT Existing Facility

Site ID: CT52XC030

Global Tower CT-5037  
158 Roberts Street  
East Hartford, CT 06108

**June 8, 2018**

**EBI Project Number: 6218004303**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>19.34 %</b>



June 8, 2018

SPRINT

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

## Emissions Analysis for Site: **CT52XC030 – Global Tower CT-5037**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **158 Roberts Street, East Hartford, 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 population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

General population 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), 2500 MHz (BRS), 11 GHz microwave and 18 GHz microwave bands is  $1000 \mu\text{W}/\text{cm}^2$ . Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.





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

Additional details can be found in FCC OET 65.

## CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **158 Roberts Street, East Hartford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.
- 2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 50 Watts per Channel.
- 3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.
- 4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.
- 6) 1 microwave backhaul channel (11 GHz) was considered for each sector of the proposed installation. This channel has a transmit power of 1 Watt.



- 7) 1 microwave backhaul channel (18 GHz) was considered for Sector A of the proposed installation. This channel has a transmit power of 1 Watt
- 8) 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.
- 9) 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.
- 10) The antennas used in this modeling are the **Commscope NNVV-65B-R4 and the Nokia AAHC** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands, the **Dragonwave A-ANT-18G-2-C** microwave dish for 18 GHz and an additional **2-foot microwave dish** for 11 GHz microwave backhaul. 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.
- 11) The antenna mounting height centerlines of the proposed and existing panel and 18 GHz microwave antennas are **128 feet** above ground level (AGL) for **Sector A**, **128 feet** above ground level (AGL) for **Sector B** and **128 feet** above ground level (AGL) for Sector C. The existing 11 GHz microwave dish at Sector A is located at **70 feet** above ground level (AGL).
- 12) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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



## SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	<b>1</b>	Antenna #:	<b>1</b>	Antenna #:	<b>1</b>
Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4
Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd
Height (AGL):	<b>128 feet</b>	Height (AGL):	<b>128 feet</b>	Height (AGL):	<b>128 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	10	Channel Count	10	Channel Count	10
Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts
ERP (W):	7,378.61	ERP (W):	7,378.61	ERP (W):	7,378.61
Antenna A1 MPE%	<b>2.20 %</b>	Antenna B1 MPE%	<b>2.20 %</b>	Antenna C1 MPE%	<b>2.20 %</b>
Antenna #:	<b>2</b>	Antenna #:	<b>2</b>	Antenna #:	<b>2</b>
Make / Model:	Nokia AAHC	Make / Model:	Nokia AAHC	Make / Model:	Nokia AAHC
Gain:	15.05 dBd	Gain:	15.05 dBd	Gain:	15.05 dBd
Height (AGL):	<b>128 feet</b>	Height (AGL):	<b>128 feet</b>	Height (AGL):	<b>128 feet</b>
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	5,118.23	ERP (W):	5,118.23	ERP (W):	5,118.23
Antenna A2 MPE%	<b>1.24 %</b>	Antenna B2 MPE%	<b>1.24 %</b>	Antenna C2 MPE%	<b>1.24 %</b>

## Microwave Backhaul Data

Antenna Type:	Gain (dBd)	Height (feet AGL):	Frequency Bands	Channel Count	Total TX Power(W)	ERP (W)	MPE %	Sector
Dragonwave A-ANT-18G-2 C	36.45 dBd	128	18 GHz	1	1	4,415.70	<b>0.11</b>	A
2-foot parabolic dish	32.35 dBd	70	11 GHz	1	1	1,717.91	<b>0.15</b>	A
Dragonwave A-ANT-18G-2 C	36.45 dBd	128	18 GHz	1	1	4,415.70	<b>0.11</b>	B
Dragonwave A-ANT-18G-2 C	36.45 dBd	128	18 GHz	1	1	4,415.70	<b>0.11</b>	C

Site Composite MPE%	
Carrier	MPE%
SPRINT – Max per sector	<b>3.69 %</b>
T-Mobile	6.66 %
Verizon Wireless	6.69 %
Clearwire	0.12 %
AT&T	2.18 %
<b>Site Total MPE %:</b>	<b>19.34 %</b>

SPRINT Sector A Total:	<b>3.69 %</b>
SPRINT Sector B Total:	3.54 %
SPRINT Sector C Total:	3.54 %
<hr/>	
Site Total*:	<b>19.34 %</b>





## Sprint Max Power Values (Sector A)

SPRINT _ Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
Sprint 850 MHz CDMA	1	376.73	128	0.91	850 MHz	567	0.16%
Sprint 850 MHz LTE	2	941.82	128	4.55	850 MHz	567	0.80%
Sprint 1900 MHz (PCS) CDMA	5	511.82	128	6.18	1900 MHz (PCS)	1000	0.62%
Sprint 1900 MHz (PCS) LTE	2	1,279.56	128	6.18	1900 MHz (PCS)	1000	0.62%
Sprint 2500 MHz (BRS) LTE	8	639.78	128	12.36	2500 MHz (BRS)	1000	1.24%
Sprint 18 GHz Microwave	1	4,415.70	128	1.07	18 GHz	1000	0.11%
Sprint 11 GHz Microwave	1	1,717.91	70	1.51	11 GHz	1000	0.15%
						<b>Total*:</b>	<b>3.69%</b>

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



## Summary

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

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

SPRINT Sector	Power Density Value (%)
Sector A:	3.69 %
Sector B:	3.54 %
Sector C:	3.54 %
SPRINT Maximum Total (per sector):	3.69 %
Site Total:	19.34 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **19.34 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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



**AMERICAN TOWER®**  
CORPORATION

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## Structural Analysis Report

**Structure** : 130 ft Monopole  
**ATC Site Name** : East Hartford, CT  
**ATC Site Number** : 370626  
**Engineering Number** : OAA714909\_C3\_04  
**Proposed Carrier** : Clearwire  
**Carrier Site Name** : Global Tower CT-5037  
**Carrier Site Number** : CT52XC030  
**Site Location** : 148 Roberts St.  
East Hartford, CT 06108-0000  
41.773300,-72.613400  
**County** : Hartford  
**Date** : June 26, 2018  
**Max Usage** : 72%  
**Result** : Pass

Prepared By:  
Christophe S. Quenum  
Structural Engineer I

Reviewed By:

**COA: PEC.0001553**



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## Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 130 ft monopole to reflect the change in loading by Clearwire.

## Supporting Documents

<b>Tower Drawings</b>	Glen Martin Engineering Drawing #MP1400800-0001, dated August 20, 2003
<b>Foundation Drawing</b>	Glen Martin Engineering Drawing #GME-03309, dated August 26, 2003
<b>Geotechnical Report</b>	Geotechnical Engineering Project Name: The Marcus Group, dated April 25, 2003

## Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

<b>Basic Wind Speed:</b>	97 mph (3-Second Gust $V_{asd}$ ) / 125 mph (3-second Gust $V_{ult}$ )
<b>Basic Wind Speed w/ Ice:</b>	50 mph (3-Second Gust) w/ 1" radial ice concurrent
<b>Code:</b>	ANSI/TIA-222-G / 2012 IBC / 2016 Connecticut State Building Code
<b>Structure Class:</b>	II
<b>Exposure Category:</b>	B
<b>Topographic Category:</b>	1
<b>Crest Height:</b>	0 ft
<b>Spectral Response:</b>	$S_s = 0.18, S_1 = 0.06$
<b>Site Class:</b>	D - Stiff Soil

## Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at [Engineering@americantower.com](mailto:Engineering@americantower.com). Please include the American Tower site name, site number, and engineering number in the subject line for any questions.



**Existing and Reserved Equipment**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
128.0	128.0	3	DragonWave Horizon Compact (11.5 lbs)	-	(3) 1/2" Coax (3) 5/8" Coax	Clearwire
		3	DragonWave A-ANT-18G-2-C			
119.0	120.0	2	RFS DB-T1-6Z-8AB-0Z	Low Profile Platform w/ Handrail Kit	(6) 1 5/8" Coax (2) 1 5/8" Fiber	Verizon
	119.0	3	Nokia AirScale RRH 4T4R B5 160W AHCA			
		3	Alcatel-Lucent RRH2x60 700			
		3	Alcatel-Lucent PCS B25 RRH2x60/4x30			
		3	Alcatel-Lucent RRH4X45-B66 w/ Solar Shield			
		3	Andrew DB844G65ZAXY			
		3	Antel BX-A-70063-6CF-EDIN-X			
		6	Commscope JAHH-65B-R3B			
109.0	109.0	9	48" x 12" Panel	Low Profile Platform	(9) 1 5/8" Coax	Sprint Nextel
98.0	98.0	3	Ericsson AIR 21, 1.3M, B2A B4P	T-Arms	(12) 7/8" Coax (2) 1 5/8" Hybriflex	Metro PCS
		3	Ericsson AIR-32 B2A/B66Aa			
90.0	90.0	2	Raycap DC6-48-60-18-8F	Platform w/ Handrails	(3) 1/2" Coax (8) 0.78" 8 AWG 6 (2) 0.39" Fiber Trunk	AT&T Mobility
		2	Raycap DC6-48-60-0-8F			
		3	Ericsson RRUS 4478 B14			
		3	Ericsson RRUS 32 B2			
		3	Ericsson RRUS 32 B66			
		3	Ericsson RRUS E2 B29			
		3	Ericsson RRUS-32 (77 lbs)			
		6	Ericsson RRUS-11			
12	CCI HPA-65R-BUU-H8					
70.0	70.0	1	2' Std. Dish	Leg	(1) 1 5/8" Coax	Sprint Nextel
50.0	50.0	1	GPS	Side Arm	(1) 1/2" Coax	





**Equipment to be Removed**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
128.0	128.0	3	Argus LLPX310R	Side Arms	(3) 1 5/8" Fiber	Clearwire
		3	BTS			

**Proposed Equipment**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
128.0	128.0	6	Alcatel-Lucent RRH2x50-08	Infinity T-Arm CT52XC030s	(3) 1 1/4" Hybriflex (2) 0.41" Fiber (1) 1.7" Hybrid	Clearwire
		3	Alcatel-Lucent 1900MHz 4x45 RRH			
		3	Nokia 2.5G MAA - AAHC(64T64R)			
		3	Commscope NNVV-65B-R4			

<sup>1</sup>Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).

Install proposed coax inside the pole shaft.



**Structure Usages**

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	44%	Pass
Shaft	64%	Pass
Base Plate	41%	Pass

**Foundations**

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	2,486.6	64%
Axial (Kips)	81.4	72%
Shear (Kips)	26.9	28%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

**Deflection and Sway\***

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
128.0	Alcatel-Lucent RRH2x50-08	Clearwire	1.359	1.060
	Alcatel-Lucent 1900 MHz 4x45 RRH			
	Nokia 2.5G MAA - AAHC(64T64R)			
	DragonWave A-ANT-18G-2-C			
	Commscope NNVV-65B-R4			
70.0	2' Std. Dish	Sprint Nextel	0.414	0.702

\*Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-G



## Standard Conditions

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

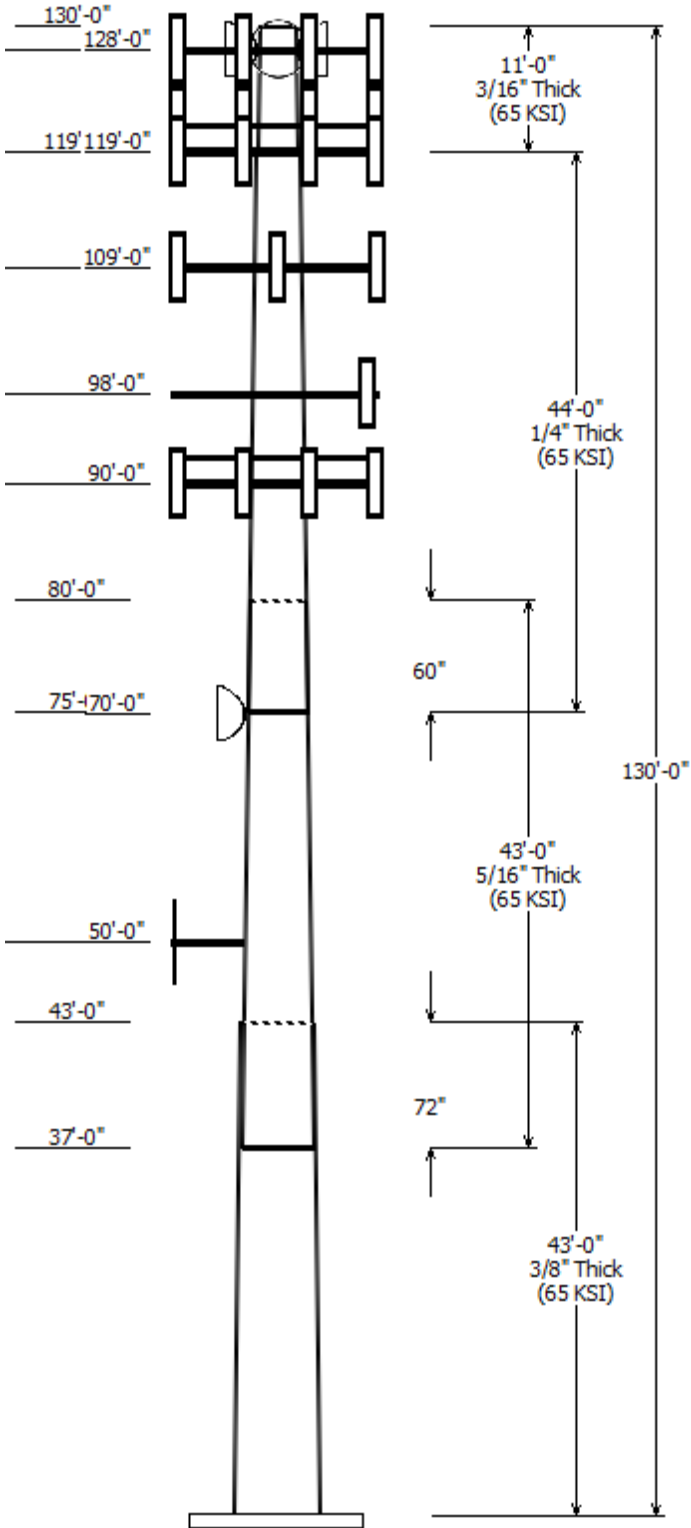
It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

All assets of American Tower Corporation, its affiliates and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

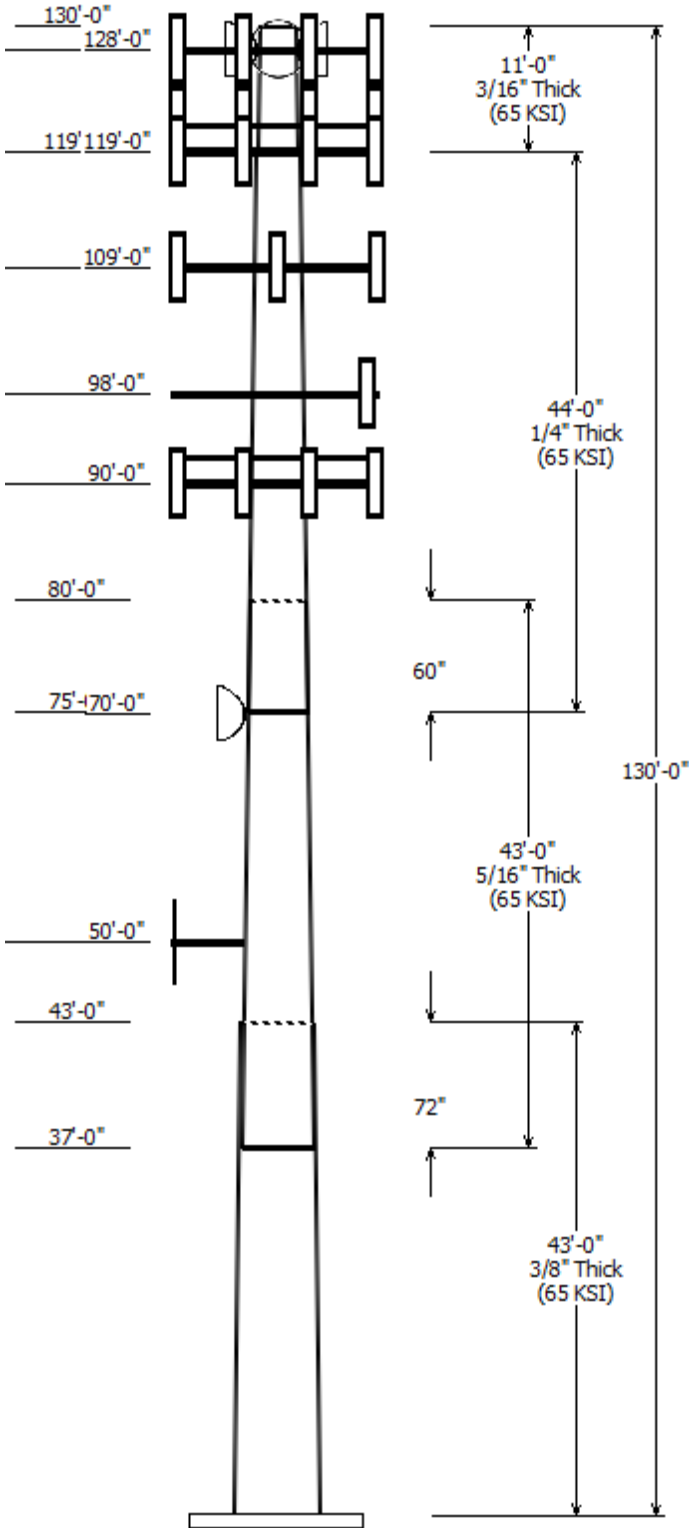
Job Information	
Pole : 370626	Code: ANSI/TIA-222-G
Location : East Hartford, CT	
Description : 130 ft. Monopole	
Client : CLEARWIRE CORPORATION	System Class : II
Shape : 16 Sides	Exposure : B
Height : 130.00 (ft)	Topo : 1
Base Elev (ft): 0.00	
Taper: 0.233192in/ft	



Sections Properties							
Shaft Section	Length (ft)	Diameter (in)		Thick (in)	Joint Type	Overlap Length (in)	Steel Grade
		Across Flats Top	Across Flats Bottom				
1	43.000	39.16	49.19	0.375		0.000	16 Sides 65
2	43.000	31.16	41.18	0.313	Slip Joint	72.000	16 Sides 65
3	44.000	22.56	32.82	0.250	Slip Joint	60.000	16 Sides 65
4	11.000	20.00	22.56	0.188	Butt Joint	0.000	16 Sides 65

Discrete Appurtenance			
Attach Elev (ft)	Force Elev (ft)	Qty	Description
128.000	128.000	3	Commscope NNVV-65B-R4
128.000	128.000	3	Nokia 2.5G MAA -
128.000	128.000	3	Alcatel-Lucent 1900 MHz 4x45
128.000	128.000	6	Alcatel-Lucent RRH2x50-08
128.000	128.000	3	DragonWave A-ANT-18G-2-C
128.000	128.000	3	DragonWave Horizon Compact
128.000	128.000	3	Infinity T-Arm CT52XC030
119.000	119.000	1	Low Profile Platform w/
119.000	119.000	6	Commscope JAHH-65B-R3B
119.000	119.000	3	Antel BXA-70063-6CF-EDIN-X
119.000	120.000	2	RFS DB-T1-6Z-8AB-0Z
119.000	119.000	3	Andrew DB844G65ZAXY
119.000	119.000	3	Alcatel-Lucent RRH4X45-B66
119.000	119.000	3	Alcatel-Lucent PCS B25
119.000	119.000	3	Alcatel-Lucent RRH2x60 700
119.000	119.000	3	Nokia AirScale RRH 4T4R B5 160
109.000	109.000	1	Round Low Profile Platform
109.000	109.000	9	48" x 12" Panel
98.000	98.000	3	Round T-Arm
98.000	98.000	3	Ericsson AIR-32 B2A/B66Aa
98.000	98.000	3	Ericsson AIR 21, 1.3M, B2A B4P
90.000	90.000	3	Ericsson RRUS E2 B29
90.000	90.000	3	Ericsson RRUS 32 B66
90.000	90.000	3	Ericsson RRUS 32 B2
90.000	90.000	3	Ericsson RRUS 4478 B14
90.000	90.000	2	Raycap DC6-48-60-0-8F
90.000	90.000	1	Round Platform w/ Handrails
90.000	90.000	12	CCI HPA-65R-BUU-H8
90.000	90.000	6	Ericsson RRUS-11
90.000	90.000	3	Ericsson RRUS-32 (77 lbs)
90.000	90.000	2	Raycap DC6-48-60-18-8F
70.000	70.000	1	2' Std. Dish
50.000	50.000	1	GPS
50.000	50.000	1	Flat Side Arm

Linear Appurtenance			
Elev (ft)		Description	Exposed To Wind
From	To		
0.000	50.000	1/2" Coax	No
0.000	70.000	1 5/8" Coax	No
0.000	90.000	0.39" (10mm)	No



0.000	90.000	0.78" (19.7mm) 8	No
0.000	90.000	1/2" Coax	No
0.000	98.000	1 5/8" Hybriflex	Yes
0.000	98.000	7/8" Coax	No
0.000	98.000	7/8" Coax	Yes
0.000	109.0	1 5/8" Coax	No
0.000	119.0	1 5/8" (1.63"-	Yes
0.000	119.0	1 5/8" Coax	Yes
0.000	128.0	0.41" (10.3mm)	No
0.000	128.0	1 1/4" Hybriflex	No
0.000	128.0	1.7" (43.2mm)	No
0.000	128.0	1/2" Coax	No
0.000	128.0	5/8" Coax	No

### Load Cases

1.2D + 1.6W	97 mph with No Ice
0.9D + 1.6W	97 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 1.00 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Lateral
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Modal
1.0D + 1.0W	Serviceability 60 mph

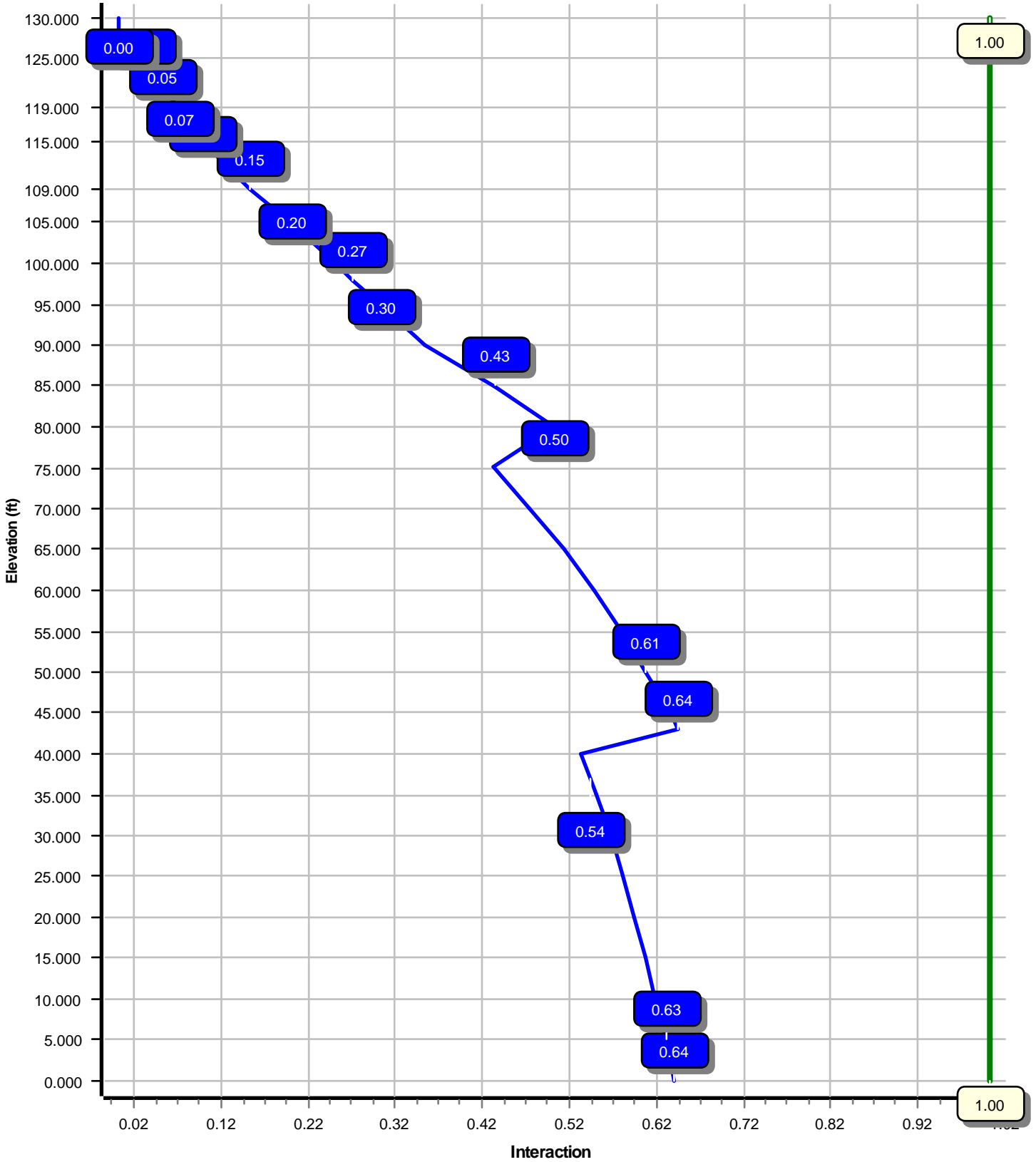
### Reactions

Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.6W	2486.61	26.91	39.21
0.9D + 1.6W	2385.39	25.92	29.40
1.2D + 1.0Di + 1.0Wi	670.38	6.91	81.36
(1.2 + 0.2Sds) * DL + E ELFM	112.57	1.09	39.09
(1.2 + 0.2Sds) * DL + E EMAM	133.80	1.28	39.09
(0.9 - 0.2Sds) * DL + E ELFM	111.15	1.09	27.20
(0.9 - 0.2Sds) * DL + E EMAM	131.95	1.28	27.20
1.0D + 1.0W	572.83	6.20	32.71

### Dish Deflections

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W	70.00	4.967	0.702
1.0D + 1.0W	128.00	16.307	1.060

Load Case : 1.2D + 1.6W  
Max Ratio 64.28% at 43.0 ft





Site Number: 370626

Code: ANSI/TIA-222-G

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Site Name: East Hartford, CT

Engineering Number: OAA714909\_C3\_04

6/26/2018 7:13:23 PM

Customer: CLEARWIRE

Analysis Parameters

Location :	HARTFORD County, CT	Height (ft) :	130
Code :	ANSI/TIA-222-G	Base Diameter (in) :	49.19
Shape :	16 Sides	Top Diameter (in) :	20.00
Pole Type :	Taper	Taper (in/ft) :	0.233
Pole Manufacturer :	Glen Martin	Rotation (deg) :	0.00

Ice & Wind Parameters

Structure Class:	II	Design Wind Speed Without Ice:	97 mph
Exposure Category:	B	Design Wind Speed With Ice:	50 mph
Topographic Category:	1	Operational Wind Speed:	60 mph
Crest Height:	0 ft	Design Ice Thickness:	1.00 in

Seismic Parameters

Analysis Method:	Equivalent Modal Analysis & Equivalent Lateral Force Methods		
Site Class:	D - Stiff Soil		
Period Based on Rayleigh Method (sec):	2.06		
T <sub>L</sub> (sec):	6	p:	1
S <sub>s</sub> :	0.180	S <sub>1</sub> :	0.064
F <sub>a</sub> :	1.600	F <sub>v</sub> :	2.400
S <sub>ds</sub> :	0.192	S <sub>d1</sub> :	0.102
		C <sub>s</sub> :	0.033
		C <sub>s</sub> Max:	0.033
		C <sub>s</sub> Min:	0.030

Load Cases

1.2D + 1.6W	97 mph with No Ice
0.9D + 1.6W	97 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 1.00 in Radial Ice
(1.2 + 0.2S <sub>ds</sub> ) * DL + E ELFM	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2S <sub>ds</sub> ) * DL + E EMAM	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2S <sub>ds</sub> ) * DL + E ELFM	Seismic (Reduced DL) Equivalent Lateral Forces Method
(0.9 - 0.2S <sub>ds</sub> ) * DL + E EMAM	Seismic (Reduced DL) Equivalent Modal Analysis Method
1.0D + 1.0W	Serviceability 60 mph

Site Number: 370626

Code: ANSI/TIA-222-G

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Site Name: East Hartford, CT

Engineering Number: OAA714909\_C3\_04

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Customer: CLEARWIRE

**Shaft Section Properties**

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Joint Len (in)	Weight (lb)	Bottom						Top							
							Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Taper (in/ft)	
1-16	43.000	0.3750	65		0.00	7,667	49.19	0.00	58.39	17579.1	24.10	131.17	39.16	43.00	46.40	8819.0	18.78	104.43	0.233192	
2-16	43.000	0.3125	65	Slip	72.00	5,231	41.18	37.00	40.75	8600.2	24.23	131.80	31.16	80.00	30.75	3696.6	17.84	99.71	0.233192	
3-16	44.000	0.2500	65	Slip	60.00	3,277	32.82	75.00	25.98	3482.7	24.13	131.30	22.56	119.00	17.80	1119.5	15.96	90.26	0.233192	
4-16	11.000	0.1875	65	Butt	0.00	472	22.56	119.00	13.38	846.7	21.95	120.35	20.00	130.00	11.85	587.7	19.23	106.67	0.233192	
Shaft Weight						16,647														

**Discrete Appurtenance Properties**

Attach Elev (ft)	Description	Qty	Distance From Face (ft)	Vert Ecc (ft)	Weight (lb)	No Ice EPAa (sf)	Orientation Factor
128.00	Alcatel-Lucent 1900 MHz 4x45 R	3	0.000	0.000	60.00	2.320	0.67
128.00	Alcatel-Lucent RRH2x50-08	6	0.000	0.000	52.90	1.700	0.50
128.00	Commscope NNVV-65B-R4	3	0.000	0.000	77.40	12.270	0.64
128.00	DragonWave A-ANT-18G-2-C	3	0.000	0.000	27.10	4.690	1.00
128.00	DragonWave Horizon Compact	3	0.000	0.000	11.50	0.840	0.50
128.00	Infinity T-Arm CT52XC030	3	0.000	0.000	250.00	9.700	0.67
128.00	Nokia 2.5G MAA - AAHC(64T64R)	3	0.000	0.000	103.60	4.200	0.64
119.00	Alcatel-Lucent PCS B25 RRH2x60	3	0.000	0.000	55.00	2.200	0.67
119.00	Alcatel-Lucent RRH2x60 700	3	0.000	0.000	56.70	2.150	0.67
119.00	Alcatel-Lucent RRH4X45-B66 w/	3	0.000	0.000	64.00	2.660	0.67
119.00	Andrew DB844G65ZAXY	3	0.000	0.000	12.00	4.340	0.75
119.00	Antel BXA-70063-6CF-EDIN-X	3	0.000	0.000	17.00	7.570	0.66
119.00	Commscope JAHH-65B-R3B	6	0.000	0.000	60.60	9.110	0.69
119.00	Low Profile Platform w/ Handra	1	0.000	0.000	1761.72	27.200	1.00
119.00	Nokia AirScale RRH 4T4R B5 160	3	0.000	0.000	35.30	1.290	0.50
119.00	RFS DB-T1-6Z-8AB-0Z	2	0.000	1.000	44.00	4.800	0.67
109.00	48" x 12" Panel	9	0.000	0.000	30.00	5.070	0.78
109.00	Round Low Profile Platform	1	0.000	0.000	1500.00	21.700	1.00
98.00	Ericsson AIR 21, 1.3M, B2A B4P	3	0.000	0.000	91.50	6.040	0.85
98.00	Ericsson AIR-32 B2A/B66Aa	3	0.000	0.000	132.20	6.510	0.86
98.00	Round T-Arm	3	0.000	0.000	250.00	9.700	0.67
90.00	CCI HPA-65R-BUU-H8	12	0.000	0.000	68.00	12.980	0.79
90.00	Ericsson RRUS 32 B2	3	0.000	0.000	53.00	2.740	0.67
90.00	Ericsson RRUS 32 B66	3	0.000	0.000	53.00	2.740	0.67
90.00	Ericsson RRUS 4478 B14	3	0.000	0.000	59.40	2.020	0.67
90.00	Ericsson RRUS E2 B29	3	0.000	0.000	60.00	3.150	0.67
90.00	Ericsson RRUS-11	6	0.000	0.000	55.00	3.790	0.67
90.00	Ericsson RRUS-32 (77 lbs)	3	0.000	0.000	77.00	3.310	0.67
90.00	Raycap DC6-48-60-0-8F	2	0.000	0.000	32.80	1.190	1.00
90.00	Raycap DC6-48-60-18-8F	2	0.000	0.000	20.00	1.110	1.00
90.00	Round Platform w/ Handrails	1	0.000	0.000	2000.00	27.200	1.00
70.00	2' Std. Dish	1	0.000	0.000	14.00	5.230	1.00
50.00	Flat Side Arm	1	0.000	0.000	150.00	6.300	1.00
50.00	GPS	1	0.000	0.000	10.00	1.000	1.00
Totals	Num Loadings:34	111			12363.42		

**Linear Appurtenance Properties**

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Diameter (in)	Coax Weight (lb/ft)	Projected Width Flat (in)	Exposed To Wind	Carrier	
0.00	128.00	2	0.41" (10.3mm) Fiber	0.41	0.09	N	0.00	N	Clearwire
0.00	128.00	3	1 1/4" Hybriflex Cable	1.54	1.00	N	0.00	N	Clearwire
0.00	128.00	1	1.7" (43.2mm) Hybrid	1.70	1.78	N	0.00	N	Clearwire

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Site Number: 370626

Code: ANSI/TIA-222-G

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Site Name: East Hartford, CT

Engineering Number: OAA714909\_C3\_04

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Customer: CLEARWIRE

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0.00	128.00	3 1/2" Coax	0.63	0.15	N	0.00	N	Clearwire
0.00	128.00	3 5/8" Coax	0.87	0.15	N	0.00	N	Clearwire
0.00	119.00	2 1 5/8" (1.63"-41.3mm)	1.63	1.61	N	0.00	Y	Verizon
0.00	119.00	6 1 5/8" Coax	1.98	0.82	N	3.96	Y	Verizon
0.00	109.00	9 1 5/8" Coax	1.98	0.82	N	0.00	N	Sprint Nextel
0.00	98.00	2 1 5/8" Hybriflex	1.98	1.30	N	0.00	Y	Metro PCS
0.00	98.00	6 7/8" Coax	1.09	0.33	N	0.00	N	Metro PCS
0.00	98.00	6 7/8" Coax	1.09	0.33	N	1.09	Y	Metro PCS
0.00	90.00	2 0.39" (10mm) Fiber	0.39	0.06	N	0.00	N	AT&T Mobility
0.00	90.00	8 0.78" (19.7mm) 8 AWG	0.78	0.59	N	0.00	N	AT&T Mobility
0.00	90.00	3 1/2" Coax	0.63	0.15	N	0.00	N	AT&T Mobility
0.00	70.00	1 1 5/8" Coax	1.98	0.82	N	0.00	N	Sprint Nextel
0.00	50.00	1 1/2" Coax	0.63	0.15	N	0.00	N	Sprint Nextel

Segment Properties (Max Len : 5. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	F'y (ksi)	S (in <sup>3</sup> )	Z (in <sup>3</sup> )	Weight (lb)
0.00		0.3750	49.190	58.395	17,579.1	24.10	131.17	75.3	701.0	0.0	0.0
5.00		0.3750	48.024	57.000	16,349.3	23.48	128.06	76.0	667.8	0.0	981.7
10.00		0.3750	46.858	55.605	15,178.2	22.87	124.95	76.7	635.4	0.0	957.9
15.00		0.3750	45.692	54.211	14,064.5	22.25	121.85	77.4	603.8	0.0	934.2
20.00		0.3750	44.526	52.816	13,006.6	21.63	118.74	78.1	573.0	0.0	910.5
25.00		0.3750	43.360	51.421	12,003.1	21.01	115.63	78.8	543.0	0.0	886.7
30.00		0.3750	42.194	50.026	11,052.6	20.39	112.52	79.5	513.8	0.0	863.0
35.00		0.3750	41.028	48.631	10,153.7	19.77	109.41	80.2	485.4	0.0	839.3
37.00	Bot - Section 2	0.3750	40.562	48.074	9,808.2	19.53	108.17	80.5	474.3	0.0	329.1
40.00		0.3750	39.862	47.237	9,304.8	19.16	106.30	80.9	457.9	0.0	898.9
43.00	Top - Section 1	0.3125	39.788	39.352	7,746.9	23.34	127.32	76.2	381.9	0.0	883.2
45.00		0.3125	39.321	38.887	7,475.6	23.04	125.83	76.5	372.9	0.0	266.2
50.00		0.3125	38.155	37.725	6,825.1	22.30	122.10	77.3	350.9	0.0	651.7
55.00		0.3125	36.989	36.562	6,213.5	21.56	118.37	78.2	329.5	0.0	632.0
60.00		0.3125	35.823	35.400	5,639.5	20.81	114.64	79.0	308.8	0.0	612.2
65.00		0.3125	34.657	34.238	5,102.1	20.07	110.90	79.9	288.8	0.0	592.4
70.00		0.3125	33.492	33.075	4,599.9	19.33	107.17	80.7	269.4	0.0	572.6
75.00	Bot - Section 3	0.3125	32.326	31.913	4,131.8	18.59	103.44	81.5	250.7	0.0	552.9
80.00	Top - Section 2	0.2500	31.660	25.049	3,122.0	23.20	126.64	76.3	193.4	0.0	967.2
85.00		0.2500	30.494	24.119	2,787.1	22.27	121.97	77.4	179.3	0.0	418.3
90.00		0.2500	29.328	23.189	2,477.0	21.35	117.31	78.4	165.7	0.0	402.5
95.00		0.2500	28.162	22.260	2,190.8	20.42	112.65	79.5	152.6	0.0	386.6
98.00		0.2500	27.462	21.702	2,030.2	19.86	109.85	80.1	145.0	0.0	224.4
100.0		0.2500	26.996	21.330	1,927.6	19.49	107.98	80.5	140.1	0.0	146.4
105.0		0.2500	25.830	20.400	1,686.3	18.56	103.32	81.6	128.1	0.0	355.0
109.0		0.2500	24.897	19.656	1,508.5	17.82	99.59	82.4	118.8	0.0	272.6
110.0		0.2500	24.664	19.470	1,466.1	17.63	98.66	82.6	116.6	0.0	66.6
115.0		0.2500	23.498	18.540	1,265.9	16.71	93.99	82.6	105.7	0.0	323.4
119.0	Top - Section 3	0.2500	22.565	17.796	1,119.5	15.96	90.26	82.6	97.3	0.0	247.3
119.0	Bot - Section 4	0.1875	22.565	13.385	846.7	21.95	120.35	77.7	73.6	0.0	
120.0		0.1875	22.332	13.245	820.5	21.70	119.10	78.0	72.1	0.0	45.3
125.0		0.1875	21.166	12.548	697.6	20.47	112.89	79.4	64.7	0.0	219.4
128.0		0.1875	20.466	12.129	630.1	19.72	109.15	80.3	60.4	0.0	126.0
130.0		0.1875	20.000	11.850	587.7	19.23	106.67	80.8	57.6	0.0	81.6
16,646.8											

<b>Load Case:</b> 1.2D + 1.6W	97 mph with No Ice	23 Iterations
Gust Response Factor :1.10		Wind Importance Factor :1.00
Dead Load Factor :1.20		
Wind Load Factor :1.60		

**Applied Segment Forces Summary**

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		219.5	0.0					0.0	0.0	219.5	0.0	0.0	0.0
5.00		435.4	1,178.0					0.0	205.2	435.4	1,383.2	0.0	0.0
10.00		428.1	1,149.5					0.0	205.2	428.1	1,354.7	0.0	0.0
15.00		420.8	1,121.0					0.0	205.2	420.8	1,326.2	0.0	0.0
20.00		413.4	1,092.6					0.0	205.2	413.4	1,297.8	0.0	0.0
25.00		406.1	1,064.1					0.0	205.2	406.1	1,269.3	0.0	0.0
30.00		403.5	1,035.6					0.0	205.2	403.5	1,240.8	0.0	0.0
35.00		284.5	1,007.1					0.0	205.2	284.5	1,212.3	0.0	0.0
37.00	Bot - Section 2	208.7	394.9					0.0	82.1	208.7	477.0	0.0	0.0
40.00		254.3	1,078.7					0.0	123.1	254.3	1,201.8	0.0	0.0
43.00	Top - Section 1	213.1	1,059.9					0.0	123.1	213.1	1,183.0	0.0	0.0
45.00		300.5	319.5					0.0	82.1	300.5	401.6	0.0	0.0
50.00	Appurtenance(s)	432.2	782.1	238.3	0.0	0.0	192.0	0.0	205.2	670.6	1,179.3	0.0	0.0
55.00		435.5	758.3					0.0	204.3	435.5	962.6	0.0	0.0
60.00		437.5	734.6					0.0	204.3	437.5	938.9	0.0	0.0
65.00		438.5	710.9					0.0	204.3	438.5	915.2	0.0	0.0
70.00	Appurtenance(s)	438.6	687.2	188.0	0.0	0.0	16.8	0.0	204.3	626.5	908.3	0.0	0.0
75.00	Bot - Section 3	441.2	663.4					0.0	199.4	441.2	862.8	0.0	0.0
80.00	Top - Section 2	441.8	1,160.6					0.0	199.4	441.8	1,360.0	0.0	0.0
85.00		438.2	501.9					0.0	199.4	438.2	701.3	0.0	0.0
90.00	Appurtenance(s)	435.4	482.9	6,001.8	0.0	0.0	4,990.6	0.0	199.4	6,437.2	5,672.9	0.0	0.0
95.00		346.2	464.0					0.0	167.6	346.2	631.6	0.0	0.0
98.00	Appurtenance(s)	206.9	269.3	1,597.9	0.0	0.0	1,705.3	0.0	100.6	1,804.8	2,075.2	0.0	0.0
100.00		270.1	175.7					0.0	51.3	270.1	227.0	0.0	0.0
105.00		344.5	426.0					0.0	128.3	344.5	554.3	0.0	0.0
109.00	Appurtenance(s)	189.8	327.1	2,046.6	0.0	0.0	2,124.0	0.0	102.6	2,236.5	2,553.7	0.0	0.0
110.00		224.7	79.9					0.0	16.8	224.7	96.7	0.0	0.0
115.00		334.3	388.0					0.0	84.0	334.3	472.0	0.0	0.0
119.00	Top - Section 3	177.3	296.7	3,802.4	0.0	202.3	3,520.0	0.0	67.2	3,979.7	3,883.9	0.0	0.0
120.00		176.1	54.4					0.0	7.0	176.1	61.4	0.0	0.0
125.00		230.8	263.3					0.0	35.2	230.8	298.5	0.0	0.0
128.00	Appurtenance(s)	139.9	151.1	2,562.3	0.0	0.0	2,287.4	0.0	21.1	2,702.2	2,459.7	0.0	0.0
130.00		55.2	97.9					0.0	0.0	55.2	97.9	0.0	0.0
<b>Totals:</b>										27,060.0	39,260.7	0.00	0.00

Load Case: 1.2D + 1.6W

97 mph with No Ice

23 Iterations

Gust Response Factor :1.10

Wind Importance Factor :1.00

Dead Load Factor :1.20

Wind Load Factor :1.60

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-39.21	-26.91	0.00	-2,486.61	0.00	2,486.61	3,957.37	1,978.68	7,974.52	3,958.89	0.00	0.00	0.638
5.00	-37.74	-26.60	0.00	-2,352.07	0.00	2,352.07	3,898.74	1,949.37	7,667.30	3,806.37	0.11	-0.20	0.628
10.00	-36.30	-26.29	0.00	-2,219.06	0.00	2,219.06	3,838.36	1,919.18	7,362.40	3,655.00	0.42	-0.39	0.617
15.00	-34.88	-25.98	0.00	-2,087.60	0.00	2,087.60	3,776.22	1,888.11	7,060.07	3,504.92	0.94	-0.60	0.605
20.00	-33.50	-25.68	0.00	-1,957.68	0.00	1,957.68	3,712.32	1,856.16	6,760.57	3,356.23	1.67	-0.80	0.593
25.00	-32.14	-25.37	0.00	-1,829.30	0.00	1,829.30	3,646.67	1,823.34	6,464.15	3,209.08	2.62	-1.01	0.579
30.00	-30.82	-25.05	0.00	-1,702.47	0.00	1,702.47	3,579.26	1,789.63	6,171.08	3,063.58	3.79	-1.22	0.565
35.00	-29.55	-24.82	0.00	-1,577.21	0.00	1,577.21	3,510.10	1,755.05	5,881.60	2,919.87	5.18	-1.43	0.549
37.00	-29.03	-24.65	0.00	-1,527.58	0.00	1,527.58	3,481.94	1,740.97	5,766.87	2,862.92	5.80	-1.52	0.542
40.00	-27.78	-24.43	0.00	-1,453.63	0.00	1,453.63	3,439.17	1,719.59	5,595.97	2,778.07	6.79	-1.65	0.532
43.00	-26.56	-24.23	0.00	-1,380.35	0.00	1,380.35	2,697.55	1,348.77	4,394.78	2,181.75	7.87	-1.78	0.643
45.00	-26.10	-23.99	0.00	-1,331.89	0.00	1,331.89	2,677.43	1,338.72	4,310.07	2,139.70	8.63	-1.86	0.633
50.00	-24.84	-23.39	0.00	-1,211.94	0.00	1,211.94	2,625.91	1,312.96	4,099.79	2,035.31	10.71	-2.10	0.605
55.00	-23.80	-23.01	0.00	-1,095.02	0.00	1,095.02	2,572.64	1,286.32	3,891.84	1,932.08	13.05	-2.35	0.576
60.00	-22.79	-22.63	0.00	-979.96	0.00	979.96	2,517.61	1,258.80	3,686.50	1,830.13	15.63	-2.58	0.545
65.00	-21.81	-22.23	0.00	-866.82	0.00	866.82	2,460.82	1,230.41	3,484.00	1,729.60	18.46	-2.82	0.510
70.00	-20.85	-21.64	0.00	-755.65	0.00	755.65	2,402.27	1,201.14	3,284.61	1,630.62	21.53	-3.04	0.472
75.00	-19.93	-21.23	0.00	-647.44	0.00	647.44	2,341.97	1,170.99	3,088.58	1,533.30	24.84	-3.26	0.431
80.00	-18.53	-20.77	0.00	-541.29	0.00	541.29	1,720.57	860.28	2,230.28	1,107.20	28.36	-3.46	0.500
85.00	-17.79	-20.35	0.00	-437.44	0.00	437.44	1,679.48	839.74	2,095.57	1,040.33	32.09	-3.65	0.432
90.00	-12.51	-13.60	0.00	-335.68	0.00	335.68	1,636.64	818.32	1,962.74	974.39	36.02	-3.85	0.352
95.00	-11.87	-13.24	0.00	-267.70	0.00	267.70	1,592.04	796.02	1,832.05	909.51	40.14	-4.02	0.302
98.00	-9.91	-11.30	0.00	-228.00	0.00	228.00	1,564.44	782.22	1,754.76	871.14	42.70	-4.12	0.268
100.00	-9.69	-11.03	0.00	-205.39	0.00	205.39	1,545.69	772.84	1,703.74	845.81	44.44	-4.18	0.249
105.00	-9.14	-10.66	0.00	-150.23	0.00	150.23	1,497.58	748.79	1,578.09	783.43	48.89	-4.31	0.198
109.00	-6.76	-8.25	0.00	-107.58	0.00	107.58	1,457.82	728.91	1,479.63	734.55	52.53	-4.40	0.151
110.00	-6.67	-8.02	0.00	-99.33	0.00	99.33	1,446.53	723.26	1,454.14	721.90	53.46	-4.42	0.142
115.00	-6.22	-7.66	0.00	-59.23	0.00	59.23	1,377.44	688.72	1,317.89	654.26	58.12	-4.49	0.095
119.00	-2.66	-3.39	0.00	-28.40	0.00	28.40	1,322.18	661.09	1,213.72	602.54	61.90	-4.53	0.049
119.00	-2.66	-3.39	0.00	-28.40	0.00	28.40	936.41	468.21	864.42	429.14	61.90	-4.53	0.069
120.00	-2.61	-3.21	0.00	-25.01	0.00	25.01	929.99	465.00	849.47	421.71	62.85	-4.54	0.062
125.00	-2.33	-2.95	0.00	-8.98	0.00	8.98	896.83	448.41	775.69	385.08	67.62	-4.57	0.026
128.00	-0.09	-0.06	0.00	-0.13	0.00	0.13	876.09	438.04	732.26	363.52	70.49	-4.58	0.000
130.00	0.00	-0.06	0.00	0.00	0.00	0.00	861.91	430.96	703.69	349.34	72.41	-4.58	0.000



<b>Load Case:</b> 0.9D + 1.6W	97 mph with No Ice (Reduced DL)	23 Iterations
Gust Response Factor :1.10		Wind Importance Factor :1.00
Dead Load Factor :0.90		
Wind Load Factor :1.60		

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		218.3	0.0					0.0	0.0	218.3	0.0	0.0	0.0
5.00		431.4	883.5					0.0	153.9	431.4	1,037.4	0.0	0.0
10.00		420.9	862.1					0.0	153.9	420.9	1,016.0	0.0	0.0
15.00		410.4	840.8					0.0	153.9	410.4	994.7	0.0	0.0
20.00		400.0	819.4					0.0	153.9	400.0	973.3	0.0	0.0
25.00		389.5	798.1					0.0	153.9	389.5	952.0	0.0	0.0
30.00		383.5	776.7					0.0	153.9	383.5	930.6	0.0	0.0
35.00		268.6	755.3					0.0	153.9	268.6	909.2	0.0	0.0
37.00	Bot - Section 2	195.5	296.2					0.0	61.6	195.5	357.7	0.0	0.0
40.00		237.0	809.0					0.0	92.3	237.0	901.3	0.0	0.0
43.00	Top - Section 1	198.1	794.9					0.0	92.3	198.1	887.2	0.0	0.0
45.00		277.9	239.6					0.0	61.6	277.9	301.2	0.0	0.0
50.00	Appurtenance(s)	396.7	586.6	238.3	0.0	0.0	144.0	0.0	153.9	635.1	884.5	0.0	0.0
55.00		395.2	568.8					0.0	153.2	395.2	722.0	0.0	0.0
60.00		392.4	551.0					0.0	153.2	392.4	704.2	0.0	0.0
65.00		388.5	533.2					0.0	153.2	388.5	686.4	0.0	0.0
70.00	Appurtenance(s)	383.4	515.4	188.0	0.0	0.0	12.6	0.0	153.2	571.4	681.2	0.0	0.0
75.00	Bot - Section 3	380.4	497.6					0.0	149.5	380.4	647.1	0.0	0.0
80.00	Top - Section 2	376.6	870.5					0.0	149.5	376.6	1,020.0	0.0	0.0
85.00		369.1	376.4					0.0	149.5	369.1	526.0	0.0	0.0
90.00	Appurtenance(s)	360.8	362.2	6,001.8	0.0	0.0	3,742.9	0.0	149.5	6,362.6	4,254.7	0.0	0.0
95.00		283.0	348.0					0.0	125.7	283.0	473.7	0.0	0.0
98.00	Appurtenance(s)	173.6	201.9	1,597.9	0.0	0.0	1,279.0	0.0	75.4	1,771.5	1,556.4	0.0	0.0
100.00		237.5	131.8					0.0	38.5	237.5	170.3	0.0	0.0
105.00		299.8	319.5					0.0	96.2	299.8	415.7	0.0	0.0
109.00	Appurtenance(s)	163.4	245.3	2,046.6	0.0	0.0	1,593.0	0.0	77.0	2,210.1	1,915.3	0.0	0.0
110.00		190.2	59.9					0.0	12.6	190.2	72.5	0.0	0.0
115.00		280.1	291.0					0.0	63.0	280.1	354.0	0.0	0.0
119.00	Top - Section 3	152.1	222.6	3,802.4	0.0	202.3	2,640.0	0.0	50.4	3,954.5	2,912.9	0.0	0.0
120.00		176.1	40.8					0.0	5.3	176.1	46.1	0.0	0.0
125.00		230.8	197.5					0.0	26.4	230.8	223.8	0.0	0.0
128.00	Appurtenance(s)	139.9	113.4	2,562.3	0.0	0.0	1,715.6	0.0	15.8	2,702.2	1,844.8	0.0	0.0
130.00		55.2	73.4					0.0	0.0	55.2	73.4	0.0	0.0
<b>Totals:</b>										26,093.3	29,445.5	0.00	0.00

**Load Case:** 0.9D + 1.6W

97 mph with No Ice (Reduced DL)

23 Iterations

Gust Response Factor :1.10

Wind Importance Factor :1.00

Dead Load Factor :0.90

Wind Load Factor :1.60

**Calculated Forces**

Seg	Pu	Vu	Tu	Mu	Mu	Resultant	phi	phi	phi	phi	Total		
Elev	FY (-)	FX (-)	MY	MZ	MX	Moment	Pn	Vn	Tn	Mn	Deflect	Rotation	Ratio
(ft)	(kips)	(kips)	(ft-kips)	(ft-kips)	(ft-kips)	(ft-kips)	(kips)	(kips)	(ft-kips)	(ft-kips)	(in)	(deg)	
0.00	-29.40	-25.92	0.00	-2,385.39	0.00	2,385.39	3,957.37	1,978.68	7,974.52	3,958.89	0.00	0.00	0.610
5.00	-28.28	-25.58	0.00	-2,255.77	0.00	2,255.77	3,898.74	1,949.37	7,667.30	3,806.37	0.10	-0.19	0.600
10.00	-27.18	-25.25	0.00	-2,127.85	0.00	2,127.85	3,838.36	1,919.18	7,362.40	3,655.00	0.40	-0.38	0.589
15.00	-26.11	-24.92	0.00	-2,001.60	0.00	2,001.60	3,776.22	1,888.11	7,060.07	3,504.92	0.90	-0.57	0.578
20.00	-25.05	-24.60	0.00	-1,877.00	0.00	1,877.00	3,712.32	1,856.16	6,760.57	3,356.23	1.61	-0.77	0.566
25.00	-24.02	-24.28	0.00	-1,754.03	0.00	1,754.03	3,646.67	1,823.34	6,464.15	3,209.08	2.52	-0.97	0.553
30.00	-23.02	-23.96	0.00	-1,632.65	0.00	1,632.65	3,579.26	1,789.63	6,171.08	3,063.58	3.64	-1.17	0.540
35.00	-22.05	-23.72	0.00	-1,512.87	0.00	1,512.87	3,510.10	1,755.05	5,881.60	2,919.87	4.97	-1.37	0.525
37.00	-21.66	-23.56	0.00	-1,465.43	0.00	1,465.43	3,481.94	1,740.97	5,766.87	2,862.92	5.56	-1.45	0.518
40.00	-20.71	-23.34	0.00	-1,394.76	0.00	1,394.76	3,439.17	1,719.59	5,595.97	2,778.07	6.51	-1.58	0.508
43.00	-19.79	-23.15	0.00	-1,324.74	0.00	1,324.74	2,697.55	1,348.77	4,394.78	2,181.75	7.55	-1.70	0.615
45.00	-19.43	-22.92	0.00	-1,278.43	0.00	1,278.43	2,677.43	1,338.72	4,310.07	2,139.70	8.28	-1.79	0.605
50.00	-18.48	-22.33	0.00	-1,163.83	0.00	1,163.83	2,625.91	1,312.96	4,099.79	2,035.31	10.27	-2.02	0.579
55.00	-17.69	-21.98	0.00	-1,052.17	0.00	1,052.17	2,572.64	1,286.32	3,891.84	1,932.08	12.51	-2.25	0.552
60.00	-16.91	-21.63	0.00	-942.27	0.00	942.27	2,517.61	1,258.80	3,686.50	1,830.13	14.99	-2.48	0.522
65.00	-16.16	-21.27	0.00	-834.14	0.00	834.14	2,460.82	1,230.41	3,484.00	1,729.60	17.71	-2.70	0.489
70.00	-15.43	-20.72	0.00	-727.79	0.00	727.79	2,402.27	1,201.14	3,284.61	1,630.62	20.66	-2.92	0.453
75.00	-14.73	-20.36	0.00	-624.17	0.00	624.17	2,341.97	1,170.99	3,088.58	1,533.30	23.83	-3.13	0.414
80.00	-13.67	-19.97	0.00	-522.36	0.00	522.36	1,720.57	860.28	2,230.28	1,107.20	27.21	-3.33	0.480
85.00	-13.10	-19.62	0.00	-422.49	0.00	422.49	1,679.48	839.74	2,095.57	1,040.33	30.79	-3.51	0.414
90.00	-9.22	-13.03	0.00	-324.41	0.00	324.41	1,636.64	818.32	1,962.74	974.39	34.57	-3.70	0.339
95.00	-8.74	-12.73	0.00	-259.27	0.00	259.27	1,592.04	796.02	1,832.05	909.51	38.54	-3.87	0.291
98.00	-7.29	-10.87	0.00	-221.07	0.00	221.07	1,564.44	782.22	1,754.76	871.14	40.99	-3.96	0.259
100.00	-7.12	-10.63	0.00	-199.33	0.00	199.33	1,545.69	772.84	1,703.74	845.81	42.67	-4.02	0.240
105.00	-6.71	-10.32	0.00	-146.16	0.00	146.16	1,497.58	748.79	1,578.09	783.43	46.94	-4.15	0.191
109.00	-4.95	-7.98	0.00	-104.90	0.00	104.90	1,457.82	728.91	1,479.63	734.55	50.45	-4.23	0.146
110.00	-4.89	-7.79	0.00	-96.92	0.00	96.92	1,446.53	723.26	1,454.14	721.90	51.34	-4.25	0.138
115.00	-4.55	-7.48	0.00	-57.99	0.00	57.99	1,377.44	688.72	1,317.89	654.26	55.83	-4.33	0.092
119.00	-1.94	-3.32	0.00	-27.85	0.00	27.85	1,322.18	661.09	1,213.72	602.54	59.47	-4.36	0.048
119.00	-1.94	-3.32	0.00	-27.85	0.00	27.85	936.41	468.21	864.42	429.14	59.47	-4.36	0.067
120.00	-1.91	-3.14	0.00	-24.53	0.00	24.53	929.99	465.00	849.47	421.71	60.38	-4.37	0.060
125.00	-1.70	-2.90	0.00	-8.81	0.00	8.81	896.83	448.41	775.69	385.08	64.97	-4.40	0.025
128.00	-0.07	-0.06	0.00	-0.12	0.00	0.12	876.09	438.04	732.26	363.52	67.74	-4.40	0.000
130.00	0.00	-0.06	0.00	0.00	0.00	0.00	861.91	430.96	703.69	349.34	69.58	-4.40	0.000

<b>Load Case:</b> 1.2D + 1.0Di + 1.0Wi	50 mph with 1.00 in Radial Ice	23 Iterations
Gust Response Factor :1.10	Ice Dead Load Factor :1.00	Wind Importance Factor :1.00
Dead Load Factor :1.20		Ice Importance Factor :1.00
Wind Load Factor :1.00		

**Applied Segment Forces Summary**

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		61.6	0.0					0.0	0.0	61.6	0.0	0.0	0.0
5.00		122.3	1,662.1					0.0	435.9	122.3	2,098.0	0.0	0.0
10.00		120.1	1,679.0					0.0	468.1	120.1	2,147.1	0.0	0.0
15.00		117.7	1,665.9					0.0	484.9	117.7	2,150.9	0.0	0.0
20.00		115.2	1,643.0					0.0	496.7	115.2	2,139.7	0.0	0.0
25.00		112.6	1,614.9					0.0	505.9	112.6	2,120.8	0.0	0.0
30.00		111.3	1,583.6					0.0	513.5	111.3	2,097.1	0.0	0.0
35.00		78.2	1,550.0					0.0	520.0	78.2	2,070.1	0.0	0.0
37.00	Bot - Section 2	57.0	612.0					0.0	209.6	57.0	821.6	0.0	0.0
40.00		69.2	1,406.0					0.0	316.1	69.2	1,722.1	0.0	0.0
43.00	Top - Section 1	57.9	1,384.4					0.0	317.9	57.9	1,702.3	0.0	0.0
45.00		81.5	534.7					0.0	212.9	81.5	747.6	0.0	0.0
50.00	Appurtenance(s)	116.7	1,309.3	55.6	0.0	0.0	247.9	0.0	535.4	116.7	2,092.6	0.0	0.0
55.00		116.7	1,275.7					0.0	538.7	116.7	1,814.4	0.0	0.0
60.00		116.4	1,241.3					0.0	542.6	116.4	1,783.9	0.0	0.0
65.00		115.7	1,206.4					0.0	546.2	115.7	1,752.6	0.0	0.0
70.00	Appurtenance(s)	114.7	1,170.8	42.6	0.0	0.0	69.2	0.0	549.6	114.7	1,789.7	0.0	0.0
75.00	Bot - Section 3	114.3	1,134.8					0.0	547.8	114.3	1,682.6	0.0	0.0
80.00	Top - Section 2	113.6	1,626.2					0.0	550.8	113.6	2,177.0	0.0	0.0
85.00		111.9	954.4					0.0	553.6	111.9	1,508.1	0.0	0.0
90.00	Appurtenance(s)	110.0	922.0	1,385.3	0.0	0.0	13,980.8	0.0	556.3	1,495.4	15,459.1	0.0	0.0
95.00		86.7	889.3					0.0	527.1	86.7	1,416.4	0.0	0.0
98.00	Appurtenance(s)	53.4	519.7	408.9	0.0	0.0	3,728.4	0.0	317.4	462.3	4,565.5	0.0	0.0
100.00		73.5	340.5					0.0	133.0	73.5	473.6	0.0	0.0
105.00		93.2	823.0					0.0	333.5	93.2	1,156.5	0.0	0.0
109.00	Appurtenance(s)	51.0	635.6	557.0	0.0	0.0	4,405.4	0.0	267.7	608.0	5,308.7	0.0	0.0
110.00		59.8	156.5					0.0	58.2	59.8	214.7	0.0	0.0
115.00		88.4	755.7					0.0	291.6	88.4	1,047.3	0.0	0.0
119.00	Top - Section 3	48.3	581.5	969.0	0.0	41.7	9,064.9	0.0	234.1	1,017.3	9,880.4	0.0	0.0
120.00		56.4	125.0					0.0	7.0	56.4	132.1	0.0	0.0
125.00		74.2	600.8					0.0	35.2	74.2	636.0	0.0	0.0
128.00	Appurtenance(s)	45.3	348.3	629.6	0.0	0.0	6,057.8	0.0	21.1	674.9	6,427.2	0.0	0.0
130.00		17.9	226.9					0.0	0.0	17.9	226.9	0.0	0.0
<b>Totals:</b>										<b>6,931.00</b>	<b>81,362.8</b>	<b>0.00</b>	<b>0.00</b>

**Load Case: 1.2D + 1.0Di + 1.0Wi**

50 mph with 1.00 in Radial Ice

23 Iterations

Gust Response Factor :1.10

Ice Dead Load Factor :1.00

Wind Importance Factor :1.00

Dead Load Factor :1.20

Ice Importance Factor :1.00

Wind Load Factor :1.00

**Calculated Forces**

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-81.36	-6.91	0.00	-670.38	0.00	670.38	3,957.37	1,978.68	7,974.52	3,958.89	0.00	0.00	0.190
5.00	-79.26	-6.86	0.00	-635.84	0.00	635.84	3,898.74	1,949.37	7,667.30	3,806.37	0.03	-0.05	0.187
10.00	-77.10	-6.81	0.00	-601.55	0.00	601.55	3,838.36	1,919.18	7,362.40	3,655.00	0.11	-0.11	0.185
15.00	-74.94	-6.76	0.00	-567.51	0.00	567.51	3,776.22	1,888.11	7,060.07	3,504.92	0.25	-0.16	0.182
20.00	-72.80	-6.71	0.00	-533.73	0.00	533.73	3,712.32	1,856.16	6,760.57	3,356.23	0.45	-0.22	0.179
25.00	-70.67	-6.66	0.00	-500.19	0.00	500.19	3,646.67	1,823.34	6,464.15	3,209.08	0.71	-0.27	0.175
30.00	-68.57	-6.60	0.00	-466.92	0.00	466.92	3,579.26	1,789.63	6,171.08	3,063.58	1.03	-0.33	0.172
35.00	-66.49	-6.56	0.00	-433.91	0.00	433.91	3,510.10	1,755.05	5,881.60	2,919.87	1.41	-0.39	0.168
37.00	-65.67	-6.53	0.00	-420.79	0.00	420.79	3,481.94	1,740.97	5,766.87	2,862.92	1.57	-0.41	0.166
40.00	-63.94	-6.49	0.00	-401.21	0.00	401.21	3,439.17	1,719.59	5,595.97	2,778.07	1.85	-0.45	0.163
43.00	-62.24	-6.45	0.00	-381.74	0.00	381.74	2,697.55	1,348.77	4,394.78	2,181.75	2.14	-0.48	0.198
45.00	-61.49	-6.41	0.00	-368.85	0.00	368.85	2,677.43	1,338.72	4,310.07	2,139.70	2.35	-0.51	0.195
50.00	-59.39	-6.29	0.00	-336.80	0.00	336.80	2,625.91	1,312.96	4,099.79	2,035.31	2.92	-0.58	0.188
55.00	-57.57	-6.22	0.00	-305.37	0.00	305.37	2,572.64	1,286.32	3,891.84	1,932.08	3.56	-0.64	0.180
60.00	-55.78	-6.14	0.00	-274.28	0.00	274.28	2,517.61	1,258.80	3,686.50	1,830.13	4.27	-0.71	0.172
65.00	-54.02	-6.07	0.00	-243.56	0.00	243.56	2,460.82	1,230.41	3,484.00	1,729.60	5.04	-0.77	0.163
70.00	-52.23	-5.94	0.00	-213.22	0.00	213.22	2,402.27	1,201.14	3,284.61	1,630.62	5.89	-0.84	0.153
75.00	-50.54	-5.85	0.00	-183.51	0.00	183.51	2,341.97	1,170.99	3,088.58	1,533.30	6.80	-0.90	0.141
80.00	-48.36	-5.75	0.00	-154.24	0.00	154.24	1,720.57	860.28	2,230.28	1,107.20	7.77	-0.96	0.167
85.00	-46.85	-5.66	0.00	-125.48	0.00	125.48	1,679.48	839.74	2,095.57	1,040.33	8.81	-1.01	0.149
90.00	-31.42	-3.91	0.00	-97.18	0.00	97.18	1,636.64	818.32	1,962.74	974.39	9.90	-1.07	0.119
95.00	-30.00	-3.82	0.00	-77.61	0.00	77.61	1,592.04	796.02	1,832.05	909.51	11.04	-1.12	0.104
98.00	-25.44	-3.28	0.00	-66.15	0.00	66.15	1,564.44	782.22	1,754.76	871.14	11.76	-1.15	0.092
100.00	-24.97	-3.21	0.00	-59.60	0.00	59.60	1,545.69	772.84	1,703.74	845.81	12.24	-1.16	0.087
105.00	-23.81	-3.10	0.00	-43.56	0.00	43.56	1,497.58	748.79	1,578.09	783.43	13.48	-1.20	0.072
109.00	-18.52	-2.39	0.00	-31.15	0.00	31.15	1,457.82	728.91	1,479.63	734.55	14.50	-1.23	0.055
110.00	-18.30	-2.33	0.00	-28.76	0.00	28.76	1,446.53	723.26	1,454.14	721.90	14.76	-1.23	0.053
115.00	-17.26	-2.22	0.00	-17.13	0.00	17.13	1,377.44	688.72	1,317.89	654.26	16.06	-1.26	0.039
119.00	-7.40	-0.99	0.00	-8.20	0.00	8.20	1,322.18	661.09	1,213.72	602.54	17.12	-1.27	0.019
119.00	-7.40	-0.99	0.00	-8.20	0.00	8.20	936.41	468.21	864.42	429.14	17.12	-1.27	0.027
120.00	-7.27	-0.93	0.00	-7.21	0.00	7.21	929.99	465.00	849.47	421.71	17.39	-1.27	0.025
125.00	-6.64	-0.84	0.00	-2.57	0.00	2.57	896.83	448.41	775.69	385.08	18.72	-1.28	0.014
128.00	-0.23	-0.02	0.00	-0.05	0.00	0.05	876.09	438.04	732.26	363.52	19.52	-1.28	0.000
130.00	0.00	-0.02	0.00	0.00	0.00	0.00	861.91	430.96	703.69	349.34	20.06	-1.28	0.000

<b>Load Case:</b> 1.0D + 1.0W	Serviceability 60 mph	22 Iterations
Gust Response Factor :1.10		Wind Importance Factor :1.00
Dead Load Factor :1.00		
Wind Load Factor :1.00		

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		52.2	0.0					0.0	0.0	52.2	0.0	0.0	0.0
5.00		103.2	981.7					0.0	171.0	103.2	1,152.7	0.0	0.0
10.00		100.7	957.9					0.0	171.0	100.7	1,128.9	0.0	0.0
15.00		98.1	934.2					0.0	171.0	98.1	1,105.2	0.0	0.0
20.00		95.6	910.5					0.0	171.0	95.6	1,081.5	0.0	0.0
25.00		93.1	886.7					0.0	171.0	93.1	1,057.7	0.0	0.0
30.00		91.7	863.0					0.0	171.0	91.7	1,034.0	0.0	0.0
35.00		64.2	839.3					0.0	171.0	64.2	1,010.3	0.0	0.0
37.00	Bot - Section 2	46.8	329.1					0.0	68.4	46.8	397.5	0.0	0.0
40.00		56.7	898.9					0.0	102.6	56.7	1,001.5	0.0	0.0
43.00	Top - Section 1	47.4	883.2					0.0	102.6	47.4	985.8	0.0	0.0
45.00		66.5	266.2					0.0	68.4	66.5	334.6	0.0	0.0
50.00	Appurtenance(s)	94.9	651.7	57.0	0.0	0.0	160.0	0.0	171.0	151.9	982.7	0.0	0.0
55.00		94.5	632.0					0.0	170.3	94.5	802.2	0.0	0.0
60.00		93.8	612.2					0.0	170.3	93.8	782.4	0.0	0.0
65.00		92.9	592.4					0.0	170.3	92.9	762.7	0.0	0.0
70.00	Appurtenance(s)	91.7	572.6	45.0	0.0	0.0	14.0	0.0	170.3	136.6	756.9	0.0	0.0
75.00	Bot - Section 3	91.0	552.9					0.0	166.2	91.0	719.0	0.0	0.0
80.00	Top - Section 2	90.1	967.2					0.0	166.2	90.1	1,133.3	0.0	0.0
85.00		88.3	418.3					0.0	166.2	88.3	584.4	0.0	0.0
90.00	Appurtenance(s)	86.3	402.5	1,435.2	0.0	0.0	4,158.8	0.0	166.2	1,521.5	4,727.4	0.0	0.0
95.00		67.7	386.6					0.0	139.7	67.7	526.3	0.0	0.0
98.00	Appurtenance(s)	41.5	224.4	382.1	0.0	0.0	1,421.1	0.0	83.8	423.6	1,729.3	0.0	0.0
100.00		56.8	146.4					0.0	42.8	56.8	189.2	0.0	0.0
105.00		71.7	355.0					0.0	106.9	71.7	461.9	0.0	0.0
109.00	Appurtenance(s)	39.1	272.6	489.4	0.0	0.0	1,770.0	0.0	85.5	528.5	2,128.1	0.0	0.0
110.00		45.5	66.6					0.0	14.0	45.5	80.6	0.0	0.0
115.00		67.0	323.4					0.0	70.0	67.0	393.4	0.0	0.0
119.00	Top - Section 3	36.4	247.3	909.3	0.0	48.4	2,933.3	0.0	56.0	945.7	3,236.6	0.0	0.0
120.00		42.1	45.3					0.0	5.9	42.1	51.2	0.0	0.0
125.00		55.2	219.4					0.0	29.3	55.2	248.7	0.0	0.0
128.00	Appurtenance(s)	33.5	126.0	612.7	0.0	0.0	1,906.2	0.0	17.6	646.2	2,049.7	0.0	0.0
130.00		13.2	81.6					0.0	0.0	13.2	81.6	0.0	0.0
								Totals:	6,239.77	32,717.2	0.00	0.00	

Load Case: 1.0D + 1.0W

Serviceability 60 mph

22 Iterations

Gust Response Factor :1.10

Wind Importance Factor :1.00

Dead Load Factor :1.00

Wind Load Factor :1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-32.71	-6.20	0.00	-572.83	0.00	572.83	3,957.37	1,978.68	7,974.52	3,958.89	0.00	0.00	0.153
5.00	-31.56	-6.12	0.00	-541.83	0.00	541.83	3,898.74	1,949.37	7,667.30	3,806.37	0.02	-0.05	0.150
10.00	-30.42	-6.04	0.00	-511.22	0.00	511.22	3,838.36	1,919.18	7,362.40	3,655.00	0.10	-0.09	0.148
15.00	-29.31	-5.97	0.00	-481.00	0.00	481.00	3,776.22	1,888.11	7,060.07	3,504.92	0.22	-0.14	0.145
20.00	-28.23	-5.89	0.00	-451.16	0.00	451.16	3,712.32	1,856.16	6,760.57	3,356.23	0.39	-0.18	0.142
25.00	-27.17	-5.82	0.00	-421.70	0.00	421.70	3,646.67	1,823.34	6,464.15	3,209.08	0.60	-0.23	0.139
30.00	-26.13	-5.74	0.00	-392.61	0.00	392.61	3,579.26	1,789.63	6,171.08	3,063.58	0.87	-0.28	0.135
35.00	-25.11	-5.69	0.00	-363.89	0.00	363.89	3,510.10	1,755.05	5,881.60	2,919.87	1.19	-0.33	0.132
37.00	-24.71	-5.65	0.00	-352.51	0.00	352.51	3,481.94	1,740.97	5,766.87	2,862.92	1.34	-0.35	0.130
40.00	-23.71	-5.60	0.00	-335.56	0.00	335.56	3,439.17	1,719.59	5,595.97	2,778.07	1.57	-0.38	0.128
43.00	-22.72	-5.56	0.00	-318.76	0.00	318.76	2,697.55	1,348.77	4,394.78	2,181.75	1.81	-0.41	0.155
45.00	-22.38	-5.50	0.00	-307.64	0.00	307.64	2,677.43	1,338.72	4,310.07	2,139.70	1.99	-0.43	0.152
50.00	-21.40	-5.36	0.00	-280.13	0.00	280.13	2,625.91	1,312.96	4,099.79	2,035.31	2.47	-0.49	0.146
55.00	-20.59	-5.28	0.00	-253.31	0.00	253.31	2,572.64	1,286.32	3,891.84	1,932.08	3.01	-0.54	0.139
60.00	-19.80	-5.20	0.00	-226.91	0.00	226.91	2,517.61	1,258.80	3,686.50	1,830.13	3.60	-0.60	0.132
65.00	-19.04	-5.12	0.00	-200.91	0.00	200.91	2,460.82	1,230.41	3,484.00	1,729.60	4.26	-0.65	0.124
70.00	-18.28	-4.99	0.00	-175.33	0.00	175.33	2,402.27	1,201.14	3,284.61	1,630.62	4.97	-0.70	0.115
75.00	-17.56	-4.90	0.00	-150.40	0.00	150.40	2,341.97	1,170.99	3,088.58	1,533.30	5.73	-0.75	0.106
80.00	-16.42	-4.81	0.00	-125.90	0.00	125.90	1,720.57	860.28	2,230.28	1,107.20	6.54	-0.80	0.123
85.00	-15.83	-4.72	0.00	-101.85	0.00	101.85	1,679.48	839.74	2,095.57	1,040.33	7.41	-0.84	0.107
90.00	-11.13	-3.14	0.00	-78.23	0.00	78.23	1,636.64	818.32	1,962.74	974.39	8.32	-0.89	0.087
95.00	-10.60	-3.07	0.00	-62.53	0.00	62.53	1,592.04	796.02	1,832.05	909.51	9.27	-0.93	0.075
98.00	-8.88	-2.62	0.00	-53.32	0.00	53.32	1,564.44	782.22	1,754.76	871.14	9.86	-0.95	0.067
100.00	-8.69	-2.56	0.00	-48.08	0.00	48.08	1,545.69	772.84	1,703.74	845.81	10.27	-0.97	0.062
105.00	-8.23	-2.49	0.00	-35.26	0.00	35.26	1,497.58	748.79	1,578.09	783.43	11.30	-1.00	0.051
109.00	-6.11	-1.92	0.00	-25.30	0.00	25.30	1,457.82	728.91	1,479.63	734.55	12.14	-1.02	0.039
110.00	-6.03	-1.88	0.00	-23.38	0.00	23.38	1,446.53	723.26	1,454.14	721.90	12.36	-1.02	0.037
115.00	-5.64	-1.81	0.00	-13.99	0.00	13.99	1,377.44	688.72	1,317.89	654.26	13.44	-1.04	0.025
119.00	-2.42	-0.80	0.00	-6.72	0.00	6.72	1,322.18	661.09	1,213.72	602.54	14.31	-1.05	0.013
119.00	-2.42	-0.80	0.00	-6.72	0.00	6.72	936.41	468.21	864.42	429.14	14.31	-1.05	0.018
120.00	-2.37	-0.76	0.00	-5.92	0.00	5.92	929.99	465.00	849.47	421.71	14.53	-1.05	0.017
125.00	-2.12	-0.70	0.00	-2.13	0.00	2.13	896.83	448.41	775.69	385.08	15.64	-1.06	0.008
128.00	-0.08	-0.01	0.00	-0.03	0.00	0.03	876.09	438.04	732.26	363.52	16.31	-1.06	0.000
130.00	0.00	-0.01	0.00	0.00	0.00	0.00	861.91	430.96	703.69	349.34	16.75	-1.06	0.000

### Equivalent Lateral Forces Method Analysis

(Based on ASCE7-10 Chapters 11, 12, 15)

Spectral Response Acceleration for Short Period ( $S_s$ ):	0.18
Spectral Response Acceleration at 1.0 Second Period ( $S_1$ ):	0.06
Long-Period Transition Period ( $T_L$ ):	6
Importance Factor ( $I_E$ ):	1.00
Site Coefficient $F_a$ :	1.60
Site Coefficient $F_v$ :	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period ( $S_{ds}$ ):	0.19
Design Spectral Response Acceleration at 1.0 Second Period ( $S_{d1}$ ):	0.10
Seismic Response Coefficient ( $C_s$ ):	0.03
Upper Limit $C_s$	0.03
Lower Limit $C_s$	0.03
Period based on Rayleigh Method (sec):	2.06
Redundancy Factor ( $\rho$ ):	1.00
Seismic Force Distribution Exponent (k):	1.78
Total Unfactored Dead Load:	32.72 k
Seismic Base Shear (E):	1.09 k

**Load Case (1.2 + 0.2Sds) \* DL + E ELFM**

**Seismic Equivalent Lateral Forces Method**

Segment	Height Above Base (ft)	Weight (lb)	$W_z$ (lb-ft)	$C_{vx}$	Horizontal Force (lb)	Vertical Force (lb)
32	129.00	82	461	0.006	6	101
31	126.50	144	783	0.010	11	178
30	122.50	249	1,281	0.016	18	308
29	119.50	51	252	0.003	3	63
28	117.00	303	1,440	0.018	20	376
27	112.50	393	1,741	0.022	24	487
26	109.50	81	340	0.004	5	100
25	107.00	358	1,450	0.018	20	443
24	102.50	462	1,733	0.022	24	572
23	99.00	189	667	0.009	9	234
22	96.50	308	1,039	0.013	14	382
21	92.50	526	1,645	0.021	23	652
20	87.50	569	1,610	0.021	22	704
19	82.50	584	1,491	0.019	21	724
18	77.50	1,133	2,587	0.033	36	1,404
17	72.50	719	1,458	0.019	20	890
16	67.50	743	1,326	0.017	18	920
15	62.50	763	1,188	0.015	16	944
14	57.50	782	1,051	0.013	15	969
13	52.50	802	916	0.012	13	993
12	47.50	823	787	0.010	11	1,019
11	44.00	335	279	0.004	4	414
10	41.50	986	741	0.009	10	1,221

9	38.50	1,001	659	0.008	9	1,240
8	36.00	397	232	0.003	3	492
7	32.50	1,010	492	0.006	7	1,251
6	27.50	1,034	374	0.005	5	1,281
5	22.50	1,058	268	0.003	4	1,310
4	17.50	1,081	175	0.002	2	1,339
3	12.50	1,105	98	0.001	1	1,369
2	7.50	1,129	41	0.001	1	1,398
1	2.50	1,153	6	0.000	0	1,427
DragonWave Horizon C	128.00	34	192	0.002	3	43
Alcatel-Lucent RRH2x	128.00	317	1,767	0.023	24	393
Alcatel-Lucent 1900	128.00	180	1,002	0.013	14	223
Nokia 2.5G MAA - AAH	128.00	311	1,731	0.022	24	385
DragonWave A-ANT-18G	128.00	81	453	0.006	6	101
Infinity T-Arm CT52X	128.00	750	4,176	0.053	58	929
Commscope NNVV-65B-R	128.00	232	1,293	0.016	18	288
Nokia AirScale RRH 4	119.00	106	518	0.007	7	131
Alcatel-Lucent RRH2x	119.00	170	832	0.011	12	211
Alcatel-Lucent PCS B	119.00	165	807	0.010	11	204
Alcatel-Lucent RRH4X	119.00	192	939	0.012	13	238
Andrew DB844G65ZAXY	119.00	36	176	0.002	2	45
RFS DB-T1-6Z-8AB-0Z	119.00	88	430	0.005	6	109
Antel BXA-70063-6CF-	119.00	51	249	0.003	3	63
Commscope JAHH-65B-R	119.00	364	1,779	0.023	25	450
Low Profile Platform	119.00	1,762	8,618	0.110	119	2,182
48" x 12" Panel	109.00	270	1,130	0.014	16	334
Round Low Profile PI	109.00	1,500	6,278	0.080	87	1,858
Ericsson AIR 21, 1.3	98.00	275	951	0.012	13	340
Ericsson AIR-32 B2A/	98.00	397	1,374	0.018	19	491
Round T-Arm	98.00	750	2,598	0.033	36	929
Raycap DC6-48-60-18-	90.00	40	119	0.002	2	50
Raycap DC6-48-60-0-8	90.00	66	195	0.002	3	81
Ericsson RRUS 4478 B	90.00	178	531	0.007	7	221
Ericsson RRUS 32 B2	90.00	159	473	0.006	7	197
Ericsson RRUS 32 B66	90.00	159	473	0.006	7	197
Ericsson RRUS E2 B29	90.00	180	536	0.007	7	223
Ericsson RRUS-32 (77	90.00	231	688	0.009	10	286
Ericsson RRUS-11	90.00	330	983	0.013	14	409
CCI HPA-65R-BUU-H8	90.00	816	2,430	0.031	34	1,011
Round Platform w/ Ha	90.00	2,000	5,955	0.076	82	2,477
2' Std. Dish	70.00	14	27	0.000	0	17
GPS	50.00	10	10	0.000	0	12
Flat Side Arm	50.00	150	157	0.002	2	186
		32,717	78,481	1.000	1,087	40,517

Load Case (0.9 - 0.2Sds) \* DL + E ELFM

Seismic (Reduced DL) Equivalent Lateral Forces Method

Segment	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
32	129.00	82	461	0.006	6	70
31	126.50	144	783	0.010	11	124
30	122.50	249	1,281	0.016	18	214
29	119.50	51	252	0.003	3	44
28	117.00	303	1,440	0.018	20	261
27	112.50	393	1,741	0.022	24	339
26	109.50	81	340	0.004	5	69
25	107.00	358	1,450	0.018	20	309
24	102.50	462	1,733	0.022	24	398
23	99.00	189	667	0.009	9	163
22	96.50	308	1,039	0.013	14	266



Site Number: 370626

Code: ANSI/TIA-222-G

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Site Name: East Hartford, CT

Engineering Number: OAA714909\_C3\_04

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Customer: CLEARWIRE

21	92.50	526	1,645	0.021	23	453
20	87.50	569	1,610	0.021	22	490
19	82.50	584	1,491	0.019	21	504
18	77.50	1,133	2,587	0.033	36	976
17	72.50	719	1,458	0.019	20	619
16	67.50	743	1,326	0.017	18	640
15	62.50	763	1,188	0.015	16	657
14	57.50	782	1,051	0.013	15	674
13	52.50	802	916	0.012	13	691
12	47.50	823	787	0.010	11	709
11	44.00	335	279	0.004	4	288
10	41.50	986	741	0.009	10	849
9	38.50	1,001	659	0.008	9	863
8	36.00	397	232	0.003	3	342
7	32.50	1,010	492	0.006	7	870
6	27.50	1,034	374	0.005	5	891
5	22.50	1,058	268	0.003	4	911
4	17.50	1,081	175	0.002	2	932
3	12.50	1,105	98	0.001	1	952
2	7.50	1,129	41	0.001	1	973
1	2.50	1,153	6	0.000	0	993
DragonWave Horizon C	128.00	34	192	0.002	3	30
Alcatel-Lucent RRH2x	128.00	317	1,767	0.023	24	273
Alcatel-Lucent 1900	128.00	180	1,002	0.013	14	155
Nokia 2.5G MAA - AAH	128.00	311	1,731	0.022	24	268
DragonWave A-ANT-18G	128.00	81	453	0.006	6	70
Infinity T-Arm CT52X	128.00	750	4,176	0.053	58	646
Commscope NNVV-65B-R	128.00	232	1,293	0.016	18	200
Nokia AirScale RRH 4	119.00	106	518	0.007	7	91
Alcatel-Lucent RRH2x	119.00	170	832	0.011	12	147
Alcatel-Lucent PCS B	119.00	165	807	0.010	11	142
Alcatel-Lucent RRH4X	119.00	192	939	0.012	13	165
Andrew DB844G65ZAXY	119.00	36	176	0.002	2	31
RFS DB-T1-6Z-8AB-0Z	119.00	88	430	0.005	6	76
Antel BXA-70063-6CF-	119.00	51	249	0.003	3	44
Commscope JAHH-65B-R	119.00	364	1,779	0.023	25	313
Low Profile Platform	119.00	1,762	8,618	0.110	119	1,518
48" x 12" Panel	109.00	270	1,130	0.014	16	233
Round Low Profile PI	109.00	1,500	6,278	0.080	87	1,292
Ericsson AIR 21, 1.3	98.00	275	951	0.012	13	237
Ericsson AIR-32 B2A/	98.00	397	1,374	0.018	19	342
Round T-Arm	98.00	750	2,598	0.033	36	646
Raycap DC6-48-60-18-	90.00	40	119	0.002	2	34
Raycap DC6-48-60-0-8	90.00	66	195	0.002	3	57
Ericsson RRUS 4478 B	90.00	178	531	0.007	7	154
Ericsson RRUS 32 B2	90.00	159	473	0.006	7	137
Ericsson RRUS 32 B66	90.00	159	473	0.006	7	137
Ericsson RRUS E2 B29	90.00	180	536	0.007	7	155
Ericsson RRUS-32 (77	90.00	231	688	0.009	10	199
Ericsson RRUS-11	90.00	330	983	0.013	14	284
CCI HPA-65R-BUU-H8	90.00	816	2,430	0.031	34	703
Round Platform w/ Ha	90.00	2,000	5,955	0.076	82	1,723
2' Std. Dish	70.00	14	27	0.000	0	12
GPS	50.00	10	10	0.000	0	9
Flat Side Arm	50.00	150	157	0.002	2	129
		32,717	78,481	1.000	1,087	28,189

Load Case (1.2 + 0.2Sds) \* DL + E ELFM Seismic Equivalent Lateral Forces Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-39.09	-1.09	0.00	-112.57	0.00	112.57	3,957.37	1,978.68	7,974.52	3,958.89	0.00	0.00	0.038
5.00	-37.69	-1.09	0.00	-107.13	0.00	107.13	3,898.74	1,949.37	7,667.30	3,806.37	0.00	-0.01	0.038
10.00	-36.32	-1.10	0.00	-101.66	0.00	101.66	3,838.36	1,919.18	7,362.40	3,655.00	0.02	-0.02	0.037
15.00	-34.98	-1.10	0.00	-96.17	0.00	96.17	3,776.22	1,888.11	7,060.07	3,504.92	0.04	-0.03	0.037
20.00	-33.67	-1.10	0.00	-90.66	0.00	90.66	3,712.32	1,856.16	6,760.57	3,356.23	0.08	-0.04	0.036
25.00	-32.39	-1.10	0.00	-85.15	0.00	85.15	3,646.67	1,823.34	6,464.15	3,209.08	0.12	-0.05	0.035
30.00	-31.14	-1.10	0.00	-79.65	0.00	79.65	3,579.26	1,789.63	6,171.08	3,063.58	0.17	-0.06	0.035
35.00	-30.65	-1.10	0.00	-74.15	0.00	74.15	3,510.10	1,755.05	5,881.60	2,919.87	0.24	-0.07	0.034
37.00	-29.41	-1.09	0.00	-71.95	0.00	71.95	3,481.94	1,740.97	5,766.87	2,862.92	0.27	-0.07	0.034
40.00	-28.19	-1.08	0.00	-68.68	0.00	68.68	3,439.17	1,719.59	5,595.97	2,778.07	0.31	-0.08	0.033
43.00	-27.77	-1.08	0.00	-65.44	0.00	65.44	2,697.55	1,348.77	4,394.78	2,181.75	0.36	-0.08	0.040
45.00	-26.75	-1.07	0.00	-63.28	0.00	63.28	2,677.43	1,338.72	4,310.07	2,139.70	0.40	-0.09	0.040
50.00	-25.56	-1.06	0.00	-57.92	0.00	57.92	2,625.91	1,312.96	4,099.79	2,035.31	0.49	-0.10	0.038
55.00	-24.59	-1.05	0.00	-52.62	0.00	52.62	2,572.64	1,286.32	3,891.84	1,932.08	0.60	-0.11	0.037
60.00	-23.65	-1.03	0.00	-47.38	0.00	47.38	2,517.61	1,258.80	3,686.50	1,830.13	0.72	-0.12	0.035
65.00	-22.73	-1.02	0.00	-42.21	0.00	42.21	2,460.82	1,230.41	3,484.00	1,729.60	0.86	-0.13	0.034
70.00	-21.82	-1.00	0.00	-37.11	0.00	37.11	2,402.27	1,201.14	3,284.61	1,630.62	1.00	-0.14	0.032
75.00	-20.42	-0.96	0.00	-32.11	0.00	32.11	2,341.97	1,170.99	3,088.58	1,533.30	1.16	-0.15	0.030
80.00	-19.69	-0.95	0.00	-27.29	0.00	27.29	1,720.57	860.28	2,230.28	1,107.20	1.32	-0.16	0.036
85.00	-18.99	-0.92	0.00	-22.56	0.00	22.56	1,679.48	839.74	2,095.57	1,040.33	1.50	-0.17	0.033
90.00	-13.19	-0.71	0.00	-17.94	0.00	17.94	1,636.64	818.32	1,962.74	974.39	1.69	-0.18	0.026
95.00	-12.81	-0.70	0.00	-14.37	0.00	14.37	1,592.04	796.02	1,832.05	909.51	1.89	-0.19	0.024
98.00	-10.81	-0.62	0.00	-12.27	0.00	12.27	1,564.44	782.22	1,754.76	871.14	2.01	-0.20	0.021
100.00	-10.24	-0.59	0.00	-11.04	0.00	11.04	1,545.69	772.84	1,703.74	845.81	2.09	-0.20	0.020
105.00	-9.80	-0.57	0.00	-8.08	0.00	8.08	1,497.58	748.79	1,578.09	783.43	2.31	-0.21	0.017
109.00	-7.50	-0.46	0.00	-5.80	0.00	5.80	1,457.82	728.91	1,479.63	734.55	2.49	-0.21	0.013
110.00	-7.02	-0.43	0.00	-5.34	0.00	5.34	1,446.53	723.26	1,454.14	721.90	2.53	-0.21	0.012
115.00	-6.64	-0.41	0.00	-3.19	0.00	3.19	1,377.44	688.72	1,317.89	654.26	2.76	-0.22	0.010
119.00	-2.95	-0.19	0.00	-1.55	0.00	1.55	1,322.18	661.09	1,213.72	602.54	2.94	-0.22	0.005
119.00	-2.95	-0.19	0.00	-1.55	0.00	1.55	936.41	468.21	864.42	429.14	2.94	-0.22	0.007
120.00	-2.64	-0.17	0.00	-1.36	0.00	1.36	929.99	465.00	849.47	421.71	2.99	-0.22	0.006
125.00	-2.46	-0.16	0.00	-0.49	0.00	0.49	896.83	448.41	775.69	385.08	3.22	-0.22	0.004
128.00	0.00	0.00	0.00	0.00	0.00	0.00	876.09	438.04	732.26	363.52	3.36	-0.22	0.000
130.00	0.00	0.00	0.00	0.00	0.00	0.00	861.91	430.96	703.69	349.34	3.46	-0.22	0.000

Load Case (0.9 - 0.2Sds) \* DL + E ELMF

Seismic (Reduced DL) Equivalent Lateral Forces Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-27.20	-1.09	0.00	-111.15	0.00	111.15	3,957.37	1,978.68	7,974.52	3,958.89	0.00	0.00	0.035
5.00	-26.22	-1.09	0.00	-105.71	0.00	105.71	3,898.74	1,949.37	7,667.30	3,806.37	0.00	-0.01	0.034
10.00	-25.27	-1.09	0.00	-100.25	0.00	100.25	3,838.36	1,919.18	7,362.40	3,655.00	0.02	-0.02	0.034
15.00	-24.34	-1.09	0.00	-94.78	0.00	94.78	3,776.22	1,888.11	7,060.07	3,504.92	0.04	-0.03	0.033
20.00	-23.43	-1.09	0.00	-89.31	0.00	89.31	3,712.32	1,856.16	6,760.57	3,356.23	0.08	-0.04	0.033
25.00	-22.54	-1.09	0.00	-83.84	0.00	83.84	3,646.67	1,823.34	6,464.15	3,209.08	0.12	-0.05	0.032
30.00	-21.67	-1.09	0.00	-78.38	0.00	78.38	3,579.26	1,789.63	6,171.08	3,063.58	0.17	-0.06	0.032
35.00	-21.32	-1.09	0.00	-72.93	0.00	72.93	3,510.10	1,755.05	5,881.60	2,919.87	0.23	-0.07	0.031
37.00	-20.46	-1.08	0.00	-70.76	0.00	70.76	3,481.94	1,740.97	5,766.87	2,862.92	0.26	-0.07	0.031
40.00	-19.61	-1.07	0.00	-67.52	0.00	67.52	3,439.17	1,719.59	5,595.97	2,778.07	0.31	-0.08	0.030
43.00	-19.32	-1.07	0.00	-64.31	0.00	64.31	2,697.55	1,348.77	4,394.78	2,181.75	0.36	-0.08	0.037
45.00	-18.61	-1.06	0.00	-62.18	0.00	62.18	2,677.43	1,338.72	4,310.07	2,139.70	0.39	-0.09	0.036
50.00	-17.78	-1.05	0.00	-56.89	0.00	56.89	2,625.91	1,312.96	4,099.79	2,035.31	0.49	-0.10	0.035
55.00	-17.11	-1.03	0.00	-51.66	0.00	51.66	2,572.64	1,286.32	3,891.84	1,932.08	0.59	-0.11	0.033
60.00	-16.45	-1.02	0.00	-46.50	0.00	46.50	2,517.61	1,258.80	3,686.50	1,830.13	0.71	-0.12	0.032
65.00	-15.81	-1.00	0.00	-41.41	0.00	41.41	2,460.82	1,230.41	3,484.00	1,729.60	0.84	-0.13	0.030
70.00	-15.18	-0.98	0.00	-36.40	0.00	36.40	2,402.27	1,201.14	3,284.61	1,630.62	0.99	-0.14	0.029
75.00	-14.20	-0.95	0.00	-31.49	0.00	31.49	2,341.97	1,170.99	3,088.58	1,533.30	1.14	-0.15	0.027
80.00	-13.70	-0.93	0.00	-26.76	0.00	26.76	1,720.57	860.28	2,230.28	1,107.20	1.30	-0.16	0.032
85.00	-13.21	-0.91	0.00	-22.12	0.00	22.12	1,679.48	839.74	2,095.57	1,040.33	1.48	-0.17	0.029
90.00	-9.17	-0.70	0.00	-17.59	0.00	17.59	1,636.64	818.32	1,962.74	974.39	1.66	-0.18	0.024
95.00	-8.91	-0.69	0.00	-14.09	0.00	14.09	1,592.04	796.02	1,832.05	909.51	1.86	-0.19	0.021
98.00	-7.52	-0.60	0.00	-12.03	0.00	12.03	1,564.44	782.22	1,754.76	871.14	1.98	-0.20	0.019
100.00	-7.12	-0.58	0.00	-10.82	0.00	10.82	1,545.69	772.84	1,703.74	845.81	2.06	-0.20	0.017
105.00	-6.81	-0.56	0.00	-7.92	0.00	7.92	1,497.58	748.79	1,578.09	783.43	2.27	-0.21	0.015
109.00	-5.22	-0.45	0.00	-5.68	0.00	5.68	1,457.82	728.91	1,479.63	734.55	2.45	-0.21	0.011
110.00	-4.88	-0.42	0.00	-5.24	0.00	5.24	1,446.53	723.26	1,454.14	721.90	2.49	-0.21	0.011
115.00	-4.62	-0.40	0.00	-3.13	0.00	3.13	1,377.44	688.72	1,317.89	654.26	2.71	-0.22	0.008
119.00	-2.05	-0.19	0.00	-1.52	0.00	1.52	1,322.18	661.09	1,213.72	602.54	2.90	-0.22	0.004
119.00	-2.05	-0.19	0.00	-1.52	0.00	1.52	936.41	468.21	864.42	429.14	2.90	-0.22	0.006
120.00	-1.84	-0.17	0.00	-1.33	0.00	1.33	929.99	465.00	849.47	421.71	2.94	-0.22	0.005
125.00	-1.71	-0.16	0.00	-0.48	0.00	0.48	896.83	448.41	775.69	385.08	3.17	-0.22	0.003
128.00	0.00	0.00	0.00	0.00	0.00	0.00	876.09	438.04	732.26	363.52	3.31	-0.22	0.000
130.00	0.00	0.00	0.00	0.00	0.00	0.00	861.91	430.96	703.69	349.34	3.40	-0.22	0.000

### Equivalent Modal Forces Analysis

(Based on ASCE7-10 Chapters 11, 12 & 15 and ANSI/TIA-G, section 2.7)

Spectral Response Acceleration for Short Period ( $S_s$ ):	0.18
Spectral Response Acceleration at 1.0 Second Period ( $S_1$ ):	0.06
Importance Factor ( $I_E$ ):	1.00
Site Coefficient $F_a$ :	1.60
Site Coefficient $F_v$ :	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period ( $S_{ds}$ ):	0.19
Design Spectral Response Acceleration at 1.0 Second Period ( $S_{d1}$ ):	0.10
Period Based on Rayleigh Method (sec):	2.06
Redundancy Factor ( $\rho$ ):	1.00

**Load Case (1.2 + 0.2Sds) \* DL + E EMAM**      Seismic Equivalent Modal Analysis Method

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
32	129.00	82	1.861	1.831	1.086	0.350	19	101
31	126.50	144	1.790	1.492	0.959	0.305	29	178
30	122.50	249	1.678	1.041	0.782	0.241	40	308
29	119.50	51	1.597	0.769	0.666	0.197	7	63
28	117.00	303	1.531	0.580	0.580	0.163	33	376
27	112.50	393	1.415	0.314	0.448	0.109	29	487
26	109.50	81	1.341	0.181	0.373	0.079	4	100
25	107.00	358	1.280	0.094	0.319	0.056	13	443
24	102.50	462	1.175	-0.018	0.237	0.021	7	572
23	99.00	189	1.096	-0.072	0.184	0.001	0	234
22	96.50	308	1.041	-0.097	0.153	-0.011	-2	382
21	92.50	526	0.957	-0.118	0.111	-0.024	-9	652
20	87.50	569	0.856	-0.120	0.071	-0.032	-12	704
19	82.50	584	0.761	-0.104	0.043	-0.030	-12	724
18	77.50	1,133	0.672	-0.078	0.025	-0.021	-16	1,404
17	72.50	719	0.588	-0.049	0.013	-0.006	-3	890
16	67.50	743	0.510	-0.020	0.007	0.010	5	920
15	62.50	763	0.437	0.006	0.006	0.025	13	944
14	57.50	782	0.370	0.027	0.008	0.037	19	969
13	52.50	802	0.308	0.043	0.012	0.044	23	993
12	47.50	823	0.252	0.055	0.017	0.048	26	1,019
11	44.00	335	0.217	0.061	0.021	0.049	11	414
10	41.50	986	0.193	0.064	0.024	0.049	32	1,221
9	38.50	1,001	0.166	0.067	0.028	0.048	32	1,240
8	36.00	397	0.145	0.068	0.031	0.048	13	492
7	32.50	1,010	0.118	0.070	0.035	0.047	32	1,251
6	27.50	1,034	0.085	0.071	0.039	0.045	31	1,281
5	22.50	1,058	0.057	0.071	0.042	0.044	31	1,310
4	17.50	1,081	0.034	0.069	0.041	0.042	30	1,339
3	12.50	1,105	0.017	0.062	0.037	0.038	28	1,369
2	7.50	1,129	0.006	0.048	0.027	0.030	23	1,398
1	2.50	1,153	0.001	0.021	0.011	0.014	11	1,427
DragonWave Horizon C	128.00	34	1.832	1.689	1.034	0.332	8	43
Alcatel-Lucent RRH2x	128.00	317	1.832	1.689	1.034	0.332	70	393

Site Number: 370626

Code: ANSI/TIA-222-G

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Site Name: East Hartford, CT

Engineering Number: OAA714909\_C3\_04

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Customer: CLEARWIRE

Alcatel-Lucent 1900	128.00	180	1.832	1.689	1.034	0.332	40	223
Nokia 2.5G MAA - AAH	128.00	311	1.832	1.689	1.034	0.332	69	385
DragonWave A-ANT-18G	128.00	81	1.832	1.689	1.034	0.332	18	101
Infinity T-Arm CT52X	128.00	750	1.832	1.689	1.034	0.332	166	929
Commscope NNVV-	128.00	232	1.832	1.689	1.034	0.332	51	288
Nokia AirScale RRH 4	119.00	106	1.584	0.729	0.648	0.190	13	131
Alcatel-Lucent RRH2x	119.00	170	1.584	0.729	0.648	0.190	22	211
Alcatel-Lucent PCS B	119.00	165	1.584	0.729	0.648	0.190	21	204
Alcatel-Lucent RRH4X	119.00	192	1.584	0.729	0.648	0.190	24	238
Andrew DB844G65ZAXY	119.00	36	1.584	0.729	0.648	0.190	5	45
RFS DB-T1-6Z-8AB-0Z	119.00	88	1.584	0.729	0.648	0.190	11	109
Antel BXA-70063-6CF-	119.00	51	1.584	0.729	0.648	0.190	6	63
Commscope JAHH-65B-	119.00	364	1.584	0.729	0.648	0.190	46	450
Low Profile Platform	119.00	1,762	1.584	0.729	0.648	0.190	223	2,182
48" x 12" Panel	109.00	270	1.329	0.162	0.362	0.074	13	334
Round Low Profile PI	109.00	1,500	1.329	0.162	0.362	0.074	74	1,858
Ericsson AIR 21, 1.3	98.00	275	1.074	-0.083	0.171	-0.004	-1	340
Ericsson AIR-32 B2A/	98.00	397	1.074	-0.083	0.171	-0.004	-1	491
Round T-Arm	98.00	750	1.074	-0.083	0.171	-0.004	-2	929
Raycap DC6-48-60-18-	90.00	40	0.906	-0.122	0.090	-0.029	-1	50
Raycap DC6-48-60-0-8	90.00	66	0.906	-0.122	0.090	-0.029	-1	81
Ericsson RRUS 4478 B	90.00	178	0.906	-0.122	0.090	-0.029	-3	221
Ericsson RRUS 32 B2	90.00	159	0.906	-0.122	0.090	-0.029	-3	197
Ericsson RRUS 32 B66	90.00	159	0.906	-0.122	0.090	-0.029	-3	197
Ericsson RRUS E2 B29	90.00	180	0.906	-0.122	0.090	-0.029	-4	223
Ericsson RRUS-32 (77	90.00	231	0.906	-0.122	0.090	-0.029	-5	286
Ericsson RRUS-11	90.00	330	0.906	-0.122	0.090	-0.029	-6	409
CCI HPA-65R-BUU-H8	90.00	816	0.906	-0.122	0.090	-0.029	-16	1,011
Round Platform w/ Ha	90.00	2,000	0.906	-0.122	0.090	-0.029	-39	2,477
2' Std. Dish	70.00	14	0.548	-0.034	0.010	0.002	0	17
GPS	50.00	10	0.280	0.050	0.014	0.046	0	12
Flat Side Arm	50.00	150	0.280	0.050	0.014	0.046	5	186
		32,717	65.679	23.740	21.678	5.977	1,286	40,517

Load Case (0.9 - 0.2Sds) \* DL + E EMAM

Seismic (Reduced DL) Equivalent Modal Analysis Method

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
32	129.00	82	1.861	1.831	1.086	0.350	19	70
31	126.50	144	1.790	1.492	0.959	0.305	29	124
30	122.50	249	1.678	1.041	0.782	0.241	40	214
29	119.50	51	1.597	0.769	0.666	0.197	7	44
28	117.00	303	1.531	0.580	0.580	0.163	33	261
27	112.50	393	1.415	0.314	0.448	0.109	29	339
26	109.50	81	1.341	0.181	0.373	0.079	4	69
25	107.00	358	1.280	0.094	0.319	0.056	13	309
24	102.50	462	1.175	-0.018	0.237	0.021	7	398
23	99.00	189	1.096	-0.072	0.184	0.001	0	163
22	96.50	308	1.041	-0.097	0.153	-0.011	-2	266
21	92.50	526	0.957	-0.118	0.111	-0.024	-9	453
20	87.50	569	0.856	-0.120	0.071	-0.032	-12	490
19	82.50	584	0.761	-0.104	0.043	-0.030	-12	504
18	77.50	1,133	0.672	-0.078	0.025	-0.021	-16	976
17	72.50	719	0.588	-0.049	0.013	-0.006	-3	619
16	67.50	743	0.510	-0.020	0.007	0.010	5	640
15	62.50	763	0.437	0.006	0.006	0.025	13	657
14	57.50	782	0.370	0.027	0.008	0.037	19	674
13	52.50	802	0.308	0.043	0.012	0.044	23	691
12	47.50	823	0.252	0.055	0.017	0.048	26	709

11	44.00	335	0.217	0.061	0.021	0.049	11	288
10	41.50	986	0.193	0.064	0.024	0.049	32	849
9	38.50	1,001	0.166	0.067	0.028	0.048	32	863
8	36.00	397	0.145	0.068	0.031	0.048	13	342
7	32.50	1,010	0.118	0.070	0.035	0.047	32	870
6	27.50	1,034	0.085	0.071	0.039	0.045	31	891
5	22.50	1,058	0.057	0.071	0.042	0.044	31	911
4	17.50	1,081	0.034	0.069	0.041	0.042	30	932
3	12.50	1,105	0.017	0.062	0.037	0.038	28	952
2	7.50	1,129	0.006	0.048	0.027	0.030	23	973
1	2.50	1,153	0.001	0.021	0.011	0.014	11	993
DragonWave Horizon C	128.00	34	1.832	1.689	1.034	0.332	8	30
Alcatel-Lucent RRH2x	128.00	317	1.832	1.689	1.034	0.332	70	273
Alcatel-Lucent 1900	128.00	180	1.832	1.689	1.034	0.332	40	155
Nokia 2.5G MAA - AAH	128.00	311	1.832	1.689	1.034	0.332	69	268
DragonWave A-ANT-18G	128.00	81	1.832	1.689	1.034	0.332	18	70
Infinity T-Arm CT52X	128.00	750	1.832	1.689	1.034	0.332	166	646
Commscope NNVV-	128.00	232	1.832	1.689	1.034	0.332	51	200
Nokia AirScale RRH 4	119.00	106	1.584	0.729	0.648	0.190	13	91
Alcatel-Lucent RRH2x	119.00	170	1.584	0.729	0.648	0.190	22	147
Alcatel-Lucent PCS B	119.00	165	1.584	0.729	0.648	0.190	21	142
Alcatel-Lucent RRH4X	119.00	192	1.584	0.729	0.648	0.190	24	165
Andrew DB844G65ZAXY	119.00	36	1.584	0.729	0.648	0.190	5	31
RFS DB-T1-6Z-8AB-0Z	119.00	88	1.584	0.729	0.648	0.190	11	76
Antel BXA-70063-6CF-	119.00	51	1.584	0.729	0.648	0.190	6	44
Commscope JAHH-65B-	119.00	364	1.584	0.729	0.648	0.190	46	313
Low Profile Platform	119.00	1,762	1.584	0.729	0.648	0.190	223	1,518
48" x 12" Panel	109.00	270	1.329	0.162	0.362	0.074	13	233
Round Low Profile PI	109.00	1,500	1.329	0.162	0.362	0.074	74	1,292
Ericsson AIR 21, 1.3	98.00	275	1.074	-0.083	0.171	-0.004	-1	237
Ericsson AIR-32 B2A/	98.00	397	1.074	-0.083	0.171	-0.004	-1	342
Round T-Arm	98.00	750	1.074	-0.083	0.171	-0.004	-2	646
Raycap DC6-48-60-18-	90.00	40	0.906	-0.122	0.090	-0.029	-1	34
Raycap DC6-48-60-0-8	90.00	66	0.906	-0.122	0.090	-0.029	-1	57
Ericsson RRUS 4478 B	90.00	178	0.906	-0.122	0.090	-0.029	-3	154
Ericsson RRUS 32 B2	90.00	159	0.906	-0.122	0.090	-0.029	-3	137
Ericsson RRUS 32 B66	90.00	159	0.906	-0.122	0.090	-0.029	-3	137
Ericsson RRUS E2 B29	90.00	180	0.906	-0.122	0.090	-0.029	-4	155
Ericsson RRUS-32 (77	90.00	231	0.906	-0.122	0.090	-0.029	-5	199
Ericsson RRUS-11	90.00	330	0.906	-0.122	0.090	-0.029	-6	284
CCI HPA-65R-BUU-H8	90.00	816	0.906	-0.122	0.090	-0.029	-16	703
Round Platform w/ Ha	90.00	2,000	0.906	-0.122	0.090	-0.029	-39	1,723
2' Std. Dish	70.00	14	0.548	-0.034	0.010	0.002	0	12
GPS	50.00	10	0.280	0.050	0.014	0.046	0	9
Flat Side Arm	50.00	150	0.280	0.050	0.014	0.046	5	129
		32,717	65.679	23.740	21.678	5.977	1,286	28,189

Load Case (1.2 + 0.2Sds) \* DL + E EMAM Seismic Equivalent Modal Analysis Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-39.09	-1.28	0.00	-133.80	0.00	133.80	3,957.37	1,978.68	7,974.52	3,958.89	0.00	0.00	0.044
5.00	-37.69	-1.26	0.00	-127.41	0.00	127.41	3,898.74	1,949.37	7,667.30	3,806.37	0.01	-0.01	0.043
10.00	-36.32	-1.24	0.00	-121.10	0.00	121.10	3,838.36	1,919.18	7,362.40	3,655.00	0.02	-0.02	0.043
15.00	-34.98	-1.22	0.00	-114.90	0.00	114.90	3,776.22	1,888.11	7,060.07	3,504.92	0.05	-0.03	0.042
20.00	-33.67	-1.19	0.00	-108.81	0.00	108.81	3,712.32	1,856.16	6,760.57	3,356.23	0.09	-0.04	0.041
25.00	-32.39	-1.17	0.00	-102.85	0.00	102.85	3,646.67	1,823.34	6,464.15	3,209.08	0.14	-0.06	0.041
30.00	-31.14	-1.14	0.00	-97.02	0.00	97.02	3,579.26	1,789.63	6,171.08	3,063.58	0.21	-0.07	0.040
35.00	-30.65	-1.13	0.00	-91.32	0.00	91.32	3,510.10	1,755.05	5,881.60	2,919.87	0.28	-0.08	0.040
37.00	-29.41	-1.10	0.00	-89.06	0.00	89.06	3,481.94	1,740.97	5,766.87	2,862.92	0.32	-0.08	0.040
40.00	-28.19	-1.07	0.00	-85.76	0.00	85.76	3,439.17	1,719.59	5,595.97	2,778.07	0.37	-0.09	0.039
43.00	-27.77	-1.06	0.00	-82.55	0.00	82.55	2,697.55	1,348.77	4,394.78	2,181.75	0.43	-0.10	0.048
45.00	-26.75	-1.04	0.00	-80.42	0.00	80.42	2,677.43	1,338.72	4,310.07	2,139.70	0.48	-0.10	0.048
50.00	-25.56	-1.01	0.00	-75.23	0.00	75.23	2,625.91	1,312.96	4,099.79	2,035.31	0.59	-0.12	0.047
55.00	-24.59	-1.00	0.00	-70.16	0.00	70.16	2,572.64	1,286.32	3,891.84	1,932.08	0.73	-0.13	0.046
60.00	-23.65	-0.99	0.00	-65.16	0.00	65.16	2,517.61	1,258.80	3,686.50	1,830.13	0.88	-0.15	0.045
65.00	-22.73	-0.99	0.00	-60.20	0.00	60.20	2,460.82	1,230.41	3,484.00	1,729.60	1.04	-0.17	0.044
70.00	-21.82	-1.00	0.00	-55.25	0.00	55.25	2,402.27	1,201.14	3,284.61	1,630.62	1.23	-0.18	0.043
75.00	-20.42	-1.01	0.00	-50.27	0.00	50.27	2,341.97	1,170.99	3,088.58	1,533.30	1.43	-0.20	0.042
80.00	-19.69	-1.03	0.00	-45.20	0.00	45.20	1,720.57	860.28	2,230.28	1,107.20	1.64	-0.22	0.052
85.00	-18.99	-1.04	0.00	-40.06	0.00	40.06	1,679.48	839.74	2,095.57	1,040.33	1.88	-0.23	0.050
90.00	-13.18	-1.11	0.00	-34.85	0.00	34.85	1,636.64	818.32	1,962.74	974.39	2.13	-0.25	0.044
95.00	-12.80	-1.12	0.00	-29.28	0.00	29.28	1,592.04	796.02	1,832.05	909.51	2.40	-0.27	0.040
98.00	-10.81	-1.11	0.00	-25.93	0.00	25.93	1,564.44	782.22	1,754.76	871.14	2.58	-0.28	0.037
100.00	-10.24	-1.11	0.00	-23.70	0.00	23.70	1,545.69	772.84	1,703.74	845.81	2.69	-0.29	0.035
105.00	-9.79	-1.09	0.00	-18.17	0.00	18.17	1,497.58	748.79	1,578.09	783.43	3.00	-0.30	0.030
109.00	-7.50	-0.99	0.00	-13.80	0.00	13.80	1,457.82	728.91	1,479.63	734.55	3.26	-0.31	0.024
110.00	-7.01	-0.96	0.00	-12.81	0.00	12.81	1,446.53	723.26	1,454.14	721.90	3.33	-0.32	0.023
115.00	-6.64	-0.93	0.00	-8.02	0.00	8.02	1,377.44	688.72	1,317.89	654.26	3.66	-0.33	0.017
119.00	-2.94	-0.53	0.00	-4.32	0.00	4.32	1,322.18	661.09	1,213.72	602.54	3.94	-0.33	0.009
119.00	-2.94	-0.53	0.00	-4.32	0.00	4.32	936.41	468.21	864.42	429.14	3.94	-0.33	0.013
120.00	-2.64	-0.49	0.00	-3.79	0.00	3.79	929.99	465.00	849.47	421.71	4.01	-0.33	0.012
125.00	-2.46	-0.45	0.00	-1.36	0.00	1.36	896.83	448.41	775.69	385.08	4.36	-0.34	0.006
128.00	0.00	0.00	0.00	0.00	0.00	0.00	876.09	438.04	732.26	363.52	4.57	-0.34	0.000
130.00	0.00	0.00	0.00	0.00	0.00	0.00	861.91	430.96	703.69	349.34	4.71	-0.34	0.000

Load Case (0.9 - 0.2Sds) \* DL + E EMAM Seismic (Reduced DL) Equivalent Modal Analysis Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-27.20	-1.28	0.00	-131.95	0.00	131.95	3,957.37	1,978.68	7,974.52	3,958.89	0.00	0.00	0.040
5.00	-26.22	-1.26	0.00	-125.56	0.00	125.56	3,898.74	1,949.37	7,667.30	3,806.37	0.01	-0.01	0.040
10.00	-25.27	-1.24	0.00	-119.27	0.00	119.27	3,838.36	1,919.18	7,362.40	3,655.00	0.02	-0.02	0.039
15.00	-24.34	-1.21	0.00	-113.09	0.00	113.09	3,776.22	1,888.11	7,060.07	3,504.92	0.05	-0.03	0.039
20.00	-23.43	-1.18	0.00	-107.04	0.00	107.04	3,712.32	1,856.16	6,760.57	3,356.23	0.09	-0.04	0.038
25.00	-22.54	-1.16	0.00	-101.13	0.00	101.13	3,646.67	1,823.34	6,464.15	3,209.08	0.14	-0.05	0.038
30.00	-21.67	-1.13	0.00	-95.35	0.00	95.35	3,579.26	1,789.63	6,171.08	3,063.58	0.20	-0.07	0.037
35.00	-21.32	-1.12	0.00	-89.71	0.00	89.71	3,510.10	1,755.05	5,881.60	2,919.87	0.28	-0.08	0.037
37.00	-20.46	-1.09	0.00	-87.48	0.00	87.48	3,481.94	1,740.97	5,766.87	2,862.92	0.31	-0.08	0.036
40.00	-19.61	-1.06	0.00	-84.22	0.00	84.22	3,439.17	1,719.59	5,595.97	2,778.07	0.37	-0.09	0.036
43.00	-19.32	-1.05	0.00	-81.05	0.00	81.05	2,697.55	1,348.77	4,394.78	2,181.75	0.43	-0.10	0.044
45.00	-18.61	-1.02	0.00	-78.96	0.00	78.96	2,677.43	1,338.72	4,310.07	2,139.70	0.47	-0.10	0.044
50.00	-17.78	-1.00	0.00	-73.85	0.00	73.85	2,625.91	1,312.96	4,099.79	2,035.31	0.59	-0.12	0.043
55.00	-17.11	-0.98	0.00	-68.87	0.00	68.87	2,572.64	1,286.32	3,891.84	1,932.08	0.72	-0.13	0.042
60.00	-16.45	-0.97	0.00	-63.96	0.00	63.96	2,517.61	1,258.80	3,686.50	1,830.13	0.86	-0.15	0.041
65.00	-15.81	-0.97	0.00	-59.11	0.00	59.11	2,460.82	1,230.41	3,484.00	1,729.60	1.03	-0.16	0.041
70.00	-15.18	-0.97	0.00	-54.27	0.00	54.27	2,402.27	1,201.14	3,284.61	1,630.62	1.21	-0.18	0.040
75.00	-14.20	-0.99	0.00	-49.40	0.00	49.40	2,341.97	1,170.99	3,088.58	1,533.30	1.40	-0.20	0.038
80.00	-13.70	-1.00	0.00	-44.45	0.00	44.45	1,720.57	860.28	2,230.28	1,107.20	1.62	-0.21	0.048
85.00	-13.21	-1.02	0.00	-39.43	0.00	39.43	1,679.48	839.74	2,095.57	1,040.33	1.85	-0.23	0.046
90.00	-9.17	-1.09	0.00	-34.34	0.00	34.34	1,636.64	818.32	1,962.74	974.39	2.09	-0.25	0.041
95.00	-8.91	-1.10	0.00	-28.87	0.00	28.87	1,592.04	796.02	1,832.05	909.51	2.36	-0.26	0.037
98.00	-7.52	-1.10	0.00	-25.58	0.00	25.58	1,564.44	782.22	1,754.76	871.14	2.53	-0.28	0.034
100.00	-7.12	-1.09	0.00	-23.39	0.00	23.39	1,545.69	772.84	1,703.74	845.81	2.65	-0.28	0.032
105.00	-6.81	-1.08	0.00	-17.94	0.00	17.94	1,497.58	748.79	1,578.09	783.43	2.95	-0.30	0.027
109.00	-5.22	-0.98	0.00	-13.64	0.00	13.64	1,457.82	728.91	1,479.63	734.55	3.21	-0.31	0.022
110.00	-4.88	-0.95	0.00	-12.66	0.00	12.66	1,446.53	723.26	1,454.14	721.90	3.27	-0.31	0.021
115.00	-4.62	-0.91	0.00	-7.93	0.00	7.93	1,377.44	688.72	1,317.89	654.26	3.60	-0.32	0.015
119.00	-2.05	-0.52	0.00	-4.27	0.00	4.27	1,322.18	661.09	1,213.72	602.54	3.87	-0.33	0.009
119.00	-2.05	-0.52	0.00	-4.27	0.00	4.27	936.41	468.21	864.42	429.14	3.87	-0.33	0.012
120.00	-1.83	-0.48	0.00	-3.75	0.00	3.75	929.99	465.00	849.47	421.71	3.94	-0.33	0.011
125.00	-1.71	-0.45	0.00	-1.35	0.00	1.35	896.83	448.41	775.69	385.08	4.29	-0.33	0.005
128.00	0.00	0.00	0.00	0.00	0.00	0.00	876.09	438.04	732.26	363.52	4.49	-0.33	0.000
130.00	0.00	0.00	0.00	0.00	0.00	0.00	861.91	430.96	703.69	349.34	4.63	-0.33	0.000



Site Number: 370626

Code: ANSI/TIA-222-G

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Site Name: East Hartford, CT

Engineering Number: OAA714909\_C3\_04

6/26/2018 7:13:41 PM

Customer: CLEARWIRE

## Analysis Summary

Load Case	Reactions						Max Usage	
	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.6W	26.91	0.00	39.21	0.00	0.00	2486.61	43.00	0.64
0.9D + 1.6W	25.92	0.00	29.40	0.00	0.00	2385.39	43.00	0.61
1.2D + 1.0Di + 1.0Wi	6.91	0.00	81.36	0.00	0.00	670.38	43.00	0.20
(1.2 + 0.2Sds) * DL + E ELFM	1.09	0.00	39.09	0.00	0.00	112.57	43.00	0.04
(1.2 + 0.2Sds) * DL + E EMAM	1.28	0.00	39.09	0.00	0.00	133.80	80.00	0.05
(0.9 - 0.2Sds) * DL + E ELFM	1.09	0.00	27.20	0.00	0.00	111.15	43.00	0.04
(0.9 - 0.2Sds) * DL + E EMAM	1.28	0.00	27.20	0.00	0.00	131.95	80.00	0.05
1.0D + 1.0W	6.20	0.00	32.71	0.00	0.00	572.83	43.00	0.15



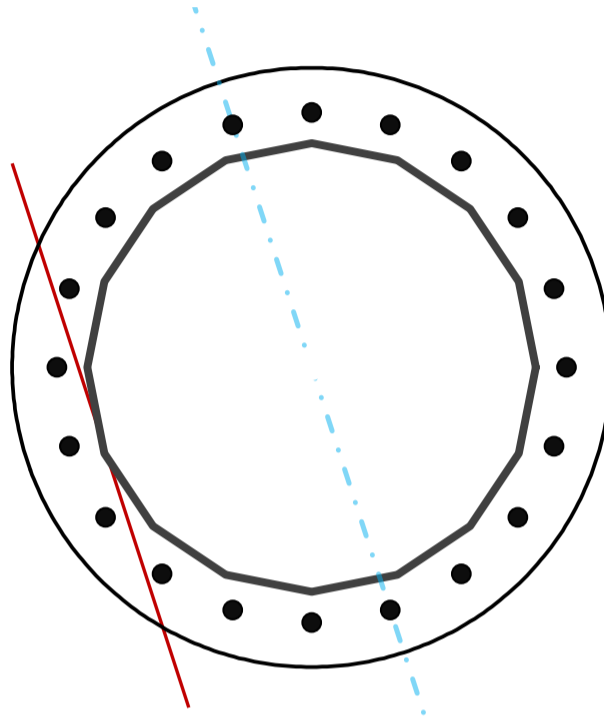
## Base Plate & Anchor Rod Analysis

Pole Dimensions		
Number of Sides	16	-
Diameter	49.19	in
Thickness	0.375	in
Orientation Offset	0	°

Base Reactions		
Moment, Mu	2486.6	k-ft
Axial, Pu	39.2	k
Shear, Vu	26.9	k
Neutral Axis	108	°

Report Capacities		
Component	Capacity	Result
Base Plate	41%	Pass
Anchor Rods	44%	Pass
Dwyidag	-	-

Base Plate		
Shape	Round	-
Diameter, $\phi$	67	in
Thickness	2 1/2	in
Grade	Other	-
Yield Strength, Fy	55	ksi
Tensile Strength, Fu	75	ksi
Clip	N/A	in
Orientation Offset	0	°
Anchor Rod Detail	a	$\eta=0.9$
Clear Distance	N/A	in
Applied Moment, Mu	925.5	k
Bending Stress, $\phi Mn$	2231.7	k



Original Anchor Rods		
Arrangement	Radial	-
Quantity	20	-
Diameter, $\phi$	2 1/2	in
Bolt Circle	57	in
Grade	Other	-
Yield Strength, Fy	55	ksi
Tensile Strength, Fu	75	ksi
Spacing	9.0	in
Orientation Offset	0	°
Applied Force, Pu	106.6	k
Anchor Rods, $\phi Pn$	239.9	k

# Calculations for Monopole Base Plate & Anchor Rod Analysis

## Reaction Distribution

Reaction	Shear Vu	Moment Mu	Factor
-	k	k-ft	-
Base Forces	26.9	2486.6	1.00
Anchor Rod Forces	26.9	2486.6	1.00
Additional Bolt (Grp1) Forces	0.0	0.0	0.00
Additional Bolt (Grp2) Forces	0.0	0.0	0.00
Dywidag Forces	0.0	0.0	0.00
Stiffener Forces	0.0	0.0	0.00

## Geometric Properties

Section	Gross Area	Net Area	Individual Inertia	Threads per Inch	Moment of Inertia
-	in <sup>2</sup>	in <sup>2</sup>	in <sup>4</sup>	#	in <sup>4</sup>
Pole	57.1400	3.5712	0.1680		17022.57
Bolt	4.9087	3.9988	1.2725	4	32505.93
Bolt1	0.0000	0.0000	0.0000	0	0.00
Bolt2	0.0000	0.0000	0.0000	0	0.00
Dywidag	0.0000	0.0000	0.0000		0.00
Stiffener	0.0000	0.0000	0.0000		0.00

Base Plate		
Shape	Round	-
Diameter, D	67	in
Thickness, t	2.5	in
Yield Strength, Fy	55	ksi
Tensile Strength, Fu	75	ksi
Base Plate Chord	45.490	in
Detail Type	a	-
Detail Factor	0.90	-
Clear Distance	N/A	-

Anchor Rods		
Anchor Rod Quantity, N	20	-
Rod Diameter, d	2.5	in
Bolt Circle, BC	57	in
Yield Strength, Fy	55	ksi
Tensile Strength, Fu	75	ksi
Applied Axial, Pu	106.6	k
Applied Shear, Vu	0.0	k
Compressive Capacity, φPn	239.9	k
Tensile Capacity, φRnt	0.444	OK
Interaction Capacity	0.444	OK

Base Plate Stiffeners		
Applied Axial Force, Pu	0.0	k
Applied Horizontal Force, Vu	0.00	k

External Base Plate		
Chord Length AA	33.918	in
Additional AA	5.000	in
Section Modulus, Z	60.809	in <sup>3</sup>
Applied Moment, Mu	925.5	k-ft
Bending Capacity, φMn	3010.0	k-ft
Capacity, Mu/φMn	0.307	OK

Additional Bolt Group 1		
Bolt Quantity, N	0	-
Bolt Diameter, d	0	in
Bolt Circle, BC	0	in
Yield Strength, Fy	0	ksi
Tensile Strength, Fu	0	ksi
Applied Axial, Pu	0.0	k
Applied Shear, Vu	0.0	k
Compressive Capacity, φPn	0.0	k
Compressive Capacity, φPn		
Interaction Capacity		

Vertical Weld		
Vert.-to-Stiffener a=e <sub>x</sub> /l	#DIV/0!	-
Spacing Ratio, k	#DIV/0!	-
Weld Coefficient, C	#DIV/0!	-
Compressive Capacity, φPn	#DIV/0!	k
Vert.-to-Plate a=e <sub>x</sub> /l	#DIV/0!	-
Spacing Ratio, k	#DIV/0!	-
Weld Coefficient, C	#DIV/0!	-
Shear Capacity, φVn	#DIV/0!	k
P <sub>u</sub> /φ <sub>p</sub> P <sub>n</sub> + V <sub>u</sub> /φ <sub>v</sub> V <sub>n</sub>		

Chord Length AB	32.476	in
Additional AB	5.000	in
Section Modulus, Z	58.556	in <sup>3</sup>
Applied Moment, Mu	776.4	k-ft
Bending Capacity, φMn	2898.5	k-ft
Capacity, Mu/φMn	0.268	OK

Additional Bolt Group 2		
Bolt Quantity, N	0	-
Bolt Diameter, d	0	in
Bolt Circle, BC	0	in
Yield Strength, Fy	0	ksi
Tensile Strength, Fu	0	ksi
Applied Axial, Pu	0.0	k
Applied Shear, Vu	0.0	k
Compressive Capacity, φPn	0.0	k
Compressive Capacity, φPn		
Interaction Capacity		

Horizontal Weld		
Horz.-to-Stiffener a=e <sub>x</sub> /l	0.000	-
Spacing Ratio, k	#DIV/0!	-
Weld Coefficient, C	#DIV/0!	-
Effective Fillet	0.000	in
Compressive Capacity, φPn	#DIV/0!	k
Horz.-to-Pole a=e <sub>x</sub> /l	#DIV/0!	-
Spacing Ratio, k	#DIV/0!	-
Weld Coefficient, C	#DIV/0!	-
Shear Capacity, φVn	#DIV/0!	k
P <sub>u</sub> /φ <sub>p</sub> P <sub>n</sub> + V <sub>u</sub> /φ <sub>v</sub> V <sub>n</sub>		

Bend Line Length	28.855	in
Additional Bend Line	0.000	in
Section Modulus, Z	45.085	in <sup>3</sup>
Applied Moment, Mu	925.5	k-ft
Bending Capacity, φMn	2231.7	k-ft
Capacity, Mu/φMn	0.415	OK

Dywidag Reinforcement		
Dywidag Quantity, N	0	-
Dywidag Diameter, d	2.5	in
Bolt Circle, BC	56.06999	in
Yield Strength, Fy	80	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	0.0	k
Compressive Capacity, φPn	0.0	k
Capacity, Pu/φPn		

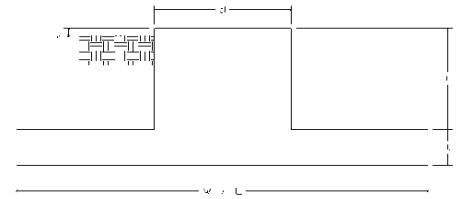
Plate Tension		
Gross Cross Section	0.000	in <sup>2</sup>
Net Cross Section	0.000	in <sup>2</sup>
Tensile Capacity, φTn	0.0	k
Capacity, Tu/φTn		

Internal Base Plate		
Arc Length	0.000	in
Section Modulus, Z	0.000	in <sup>3</sup>
Moment Arm	0.000	in
Applied Moment, Mu	0.0	k-ft
Bending Capacity, φMn	0.0	k-ft
Capacity, Mu/φMn		

Plate Compression		
Radius of Gyration	#DIV/0!	in <sup>3</sup>
kl/r	#DIV/0!	-
4.71 √(E/Fy)	0.00	-
Buckling Stress(F <sub>e</sub> )	0.0	-
Crit. Buckling Stress(F <sub>cr</sub> )	0.0	ksi
Compressive Capacity, φPn	0.0	k
Capacity, Pu/φPn		

Site Name: East Hartford, CT  
 Site Number: 370626  
 Engineering Number: OAA714909  
 Engineer: Christophe.Quenum  
 Date: 06/26/18  
 Tower Type: MP

Program Last Updated: 5/13/2014



**Design Loads (Factored) - Analysis per TIA-222-G Standards**

Design / Analysis / Mapping:	Analysis		
Compression/Leg:	39.2 k	Concrete Strength ( $f'_c$ ):	5000 psi
Uplift/Leg:	0.0 k	Pad Tension Steel Depth:	20.00 in
Total Shear:	26.9 k	$\phi_{\text{Shear}}$ :	0.75
Moment:	2486.6 k-ft	$\phi_{\text{Flexure / Tension}}$ :	0.90
Tower + Appurtenance Weight:	32.7 k	$\phi_{\text{Compression}}$ :	0.65
Depth to Base of Foundation (l + t - h):	6.00 ft	$\beta$ :	0.80
Diameter of Pier (d):	7.00 ft	Bottom Pad Rebar Size #:	9
Height of Pier above Ground (h):	1.00	# of Bottom Pad Rebar:	34
Width of Pad (W):	23.00 ft	Pad Bottom Steel Area:	34.00 in <sup>2</sup>
Length of Pad (L):	23.00 ft	Pad Steel $F_y$ :	60000 psi
Thickness of Pad (t):	2.00 ft	Top Pad Rebar Size #:	9
Tower Leg Center to Center:	0.00 ft	# of Top Pad Rebar:	34
Number of Tower Legs:	1.0 (1 if MP or GT)	Pad Top Steel Area:	34.00 in <sup>2</sup>
Tower Center from Mat Center:	0.00 ft	Pier Rebar Size #:	11
Depth Below Ground Surface to Water Table:	3.50 ft	Pier Steel Area (Single Bar):	1.56 in <sup>2</sup>
Unit Weight of Concrete:	150.0 pcf	# of Pier Rebar:	24
Unit Weight of Soil Above Water Table:	125.0 pcf	Pier Steel $F_y$ :	60000 psi
Unit Weight of Water:	62.4 pcf	Pier Cage Diameter:	76.0 in
Unit Weight of Soil Below Water Table:	62.6 pcf	Rebar Strain Limit:	0.008
Friction Angle of Uplift:	15.0 Degrees	Steel Elastic Modulus:	29000 ksi
Ultimate Coefficient of Shear Friction:	0.50	Tie Rebar Size #:	4
Ultimate Compressive Bearing Pressure:	4000.0 psf	Tie Steel Area (Single Bar):	0.20 in <sup>2</sup>
Ultimate Passive Pressure on Pad Face:	0.0 psf	Tie Spacing:	6 in
$\phi_{\text{Soil and Concrete Weight}}$ :	0.9	Tie Steel $F_y$ :	60000 psi
$\phi_{\text{Soil}}$ :	0.75		

**Overturning Moment Usage**

Design OTM: 2675.0 k-ft  
 OTM Resistance: 4176.1 k-ft  
 Design OTM / OTM Resistance: 0.64 Result: OK

**Soil Bearing Pressure Usage**

Net Bearing Pressure: 2150 psf  
 Factored Nominal Bearing Pressure: 3000 psf  
 Net Bearing Pressure/Factored Nominal Bearing Pressure: 0.72 Result: OK  
 Load Direction Controlling Design Bearing Pressure: Diagonal to Pad Edge

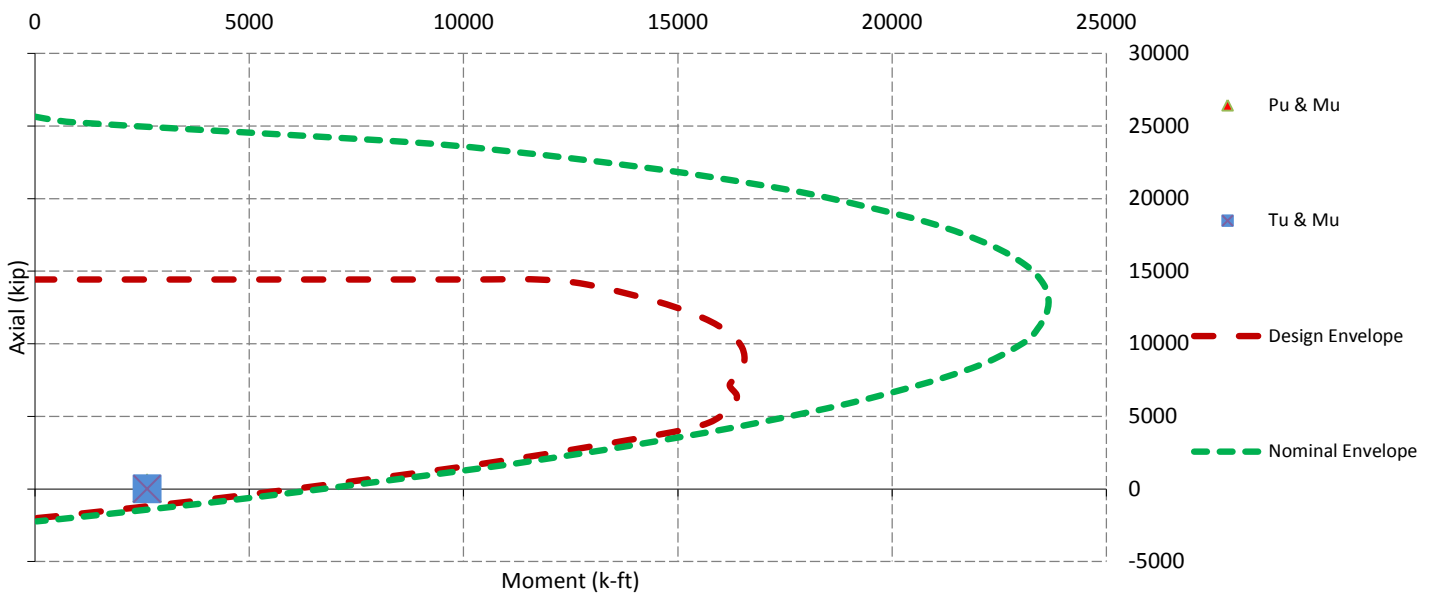
**Sliding Factor of Safety**

Total Factored Sliding Resistance: 141.6 k  
 Sliding Design / Sliding Resistance: 0.19 Result: OK

## One Way Shear, Flexural Capacity, and Punching Shear

Factored One Way Shear ( $V_u$ ):	166.7 k
One Way Shear Capacity ( $\phi V_c$ ):	585.5 k - ACI11.3.1.1
$V_u / \phi V_c$ :	0.28 Result: OK
Load Direction Controlling Shear Capacity:	Parallel to Pad Edge
Lower Steel Pad Factored Moment ( $M_u$ ):	884.6 k-ft
Lower Steel Pad Moment Capacity ( $\phi M_n$ ):	2946.9 k-ft - ACI10.3
$M_u / \phi M_n$ :	0.30 Result: OK
Load Direction Controlling Flexural Capacity:	Parallel to Pad Edge
Upper Steel Pad Factored Moment ( $M_u$ ):	644.8 k-ft
Upper Steel Pad Moment Capacity ( $\phi M_n$ ):	2946.9 k-ft
$M_u / \phi M_n$ :	0.22 Result: OK
Lower Pad Flexural Reinforcement Ratio:	0.0062 OK - Minimum Reinforcement Ratio Met - ACI10.5.1
Upper Pad Flexural Reinforcement Ratio:	0.0062 OK - Minimum Reinforcement Ratio Met - ACI10.5.1
Lower Pad Reinforcement Spacing:	8 in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4
Upper Pad Reinforcement Spacing:	8 in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4
Factored Punching Shear ( $V_u$ ):	0.0 k
Nominal Punching Shear Capacity ( $\phi_c V_n$ ):	1386.2 k - ACI11.12.2.1
$V_u / \phi V_c$ :	0.00 Result: OK
Factored Moment in Pier ( $M_u$ ):	2621.2 k-ft
Pier Moment Capacity ( $\phi M_n$ ):	6269.8 k-ft
$M_u / \phi M_n$ :	0.42 Result: OK
Factored Shear in Pier ( $V_u$ ):	26.9 k
Pier Shear Capacity ( $\phi V_n$ ):	589.9 k
$V_u / \phi V_c$ :	0.05 Result: OK
Pier Shear Reinforcement Ratio:	0.0004 No Ties Necessary for Shear - ACI11.5.6.1
Factored Tension in Pier ( $T_u$ ):	0.0 k
Pier Tension Capacity ( $\phi T_n$ ):	2021.8 k
$T_u / \phi T_n$ :	0.00 Result: OK
Factored Compression in Pier ( $P_u$ ):	39.2 k
Pier Compression Capacity ( $\phi P_n$ ):	12164.6 k - ACI10.3.6.2
$P_u / \phi P_n$ :	0.00 Result: OK
Pier Compression Reinforcement Ratio:	0.007 OK - Reinforcement Ratio Met - ACI10.9.1 & 10.8.4
$M_u / \phi_B M_n + T_u / \phi_T T_n$ :	0.42 Result: OK

Nominal and Design Moment Capacity and Factored Design Loads



# INFINIGY

FROM ZERO TO INFINIGY  
the solutions are endless

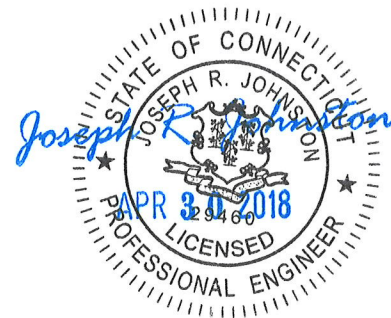
1033 WATERVLiet SHAKER RD, ALBANY, NY 12205

## Mount Analysis Report

April 28, 2018

Site Name	CT52XC030
Infinigy Job Number	526-104
Client	Airosmith
Proposed Carrier	Sprint
Site Location	148 Roberts St. East Hartford, CT 06108 41.77330° N NAD83 71.61340° W NAD83
Mount Centerline El.	128.0 ft
Mount Classification	T-Arm
Failing Structural Usage	> 200%
Passing Structural Usage	45.9%
Overall Result	<b>Contingent Pass- See Required Modification Below.</b>
Note	<b>Existing mounts must be replaced with (3) SitePro1 RDS-272 T-Arm mounts prior to installation of proposed appurtenances.</b>

Upon reviewing the results of this analysis, it is our opinion that the structure meets the specified TIA code requirements. The mounts for the proposed carrier are therefore deemed adequate to support the final loading configuration as listed in this report.



Nathaniel R. Ober, E.I.T.  
Northeast Structural Region Lead

AZ CA CO FL GA MD NC NH NJ NY TX WA

INFINIGY

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Mount Connection Reactions.....	4
Assumptions and Limitations.....	5
Calculations.....	Appended

**Introduction**

Infinigy Engineering has been requested to perform a mount analysis on the existing Sprint mounts. All supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The mount was analyzed using RISA-3D Version 16.0.0 analysis software.

**Supporting Documentation**

<b>Structural Analysis</b>	ATC Eng #oAA714909_C3_03, dated April 10, 2018
----------------------------	--

**Analysis Code Requirements**

Wind Speed	97 mph (3-Second Gust, Vasd) / 125 mph (3-Second Gust, Vult)
Wind Speed w/ ice	50 mph (3-Second Gust, Vasd) w/ 1" Ice
TIA Revision	ANSI/TIA-222-G
Adopted IBC	2012 IBC
Jurisdictional Code	2016 Connecticut State Building Code
Structure Class	II
Exposure Category	B
Topographic Category	1
Calculated Crest Height	0 ft.

**Conclusion**

Upon reviewing the results of this analysis, it is our opinion that the structure meets the specified TIA code requirements. The mounts for the proposed carrier are therefore deemed adequate to support the final loading configuration as listed in this report.

If you have any questions, require additional information, or actual conditions differ from those as detailed in this report please contact me via the information below:

Nathaniel R Ober E.I.T.  
 Northeast Structural Region Lead | Infinigy  
 1033 Watervliet Shaker Road, Albany, NY 12205  
 (O) (518) 690-0790 | (M) (303) 704-0322  
[nober@infinigy.com](mailto:nober@infinigy.com) | [www.infinigy.com](http://www.infinigy.com)



**Final Configuration Loading**

Mount CL (ft)	Rad. HT (ft)	Vert. O/S (ft)	Horiz. O/S (ft)*	Qty	Appurtenance	Carrier
128.0	128.0	0.0	0.0	3	Commscope NNVV-65B-R4	Sprint
			6.0	3	Nokia AAHC	
			6.0	3	Alcatel Lucent 1900 MHz RRH w/ S.S.	
			0.0, 6.0	6	Alcatel Lucent 800 MHz 2x50W RRH	
			0.0	3	DragonWave A-ANT-18G-2-C	
			0.0	3	DragonWave Horizon Compact	

\*Horizontal Offset is defined as the distance from the left most edge of the mount face horizontal when viewed facing the tower

**Structure Usages**

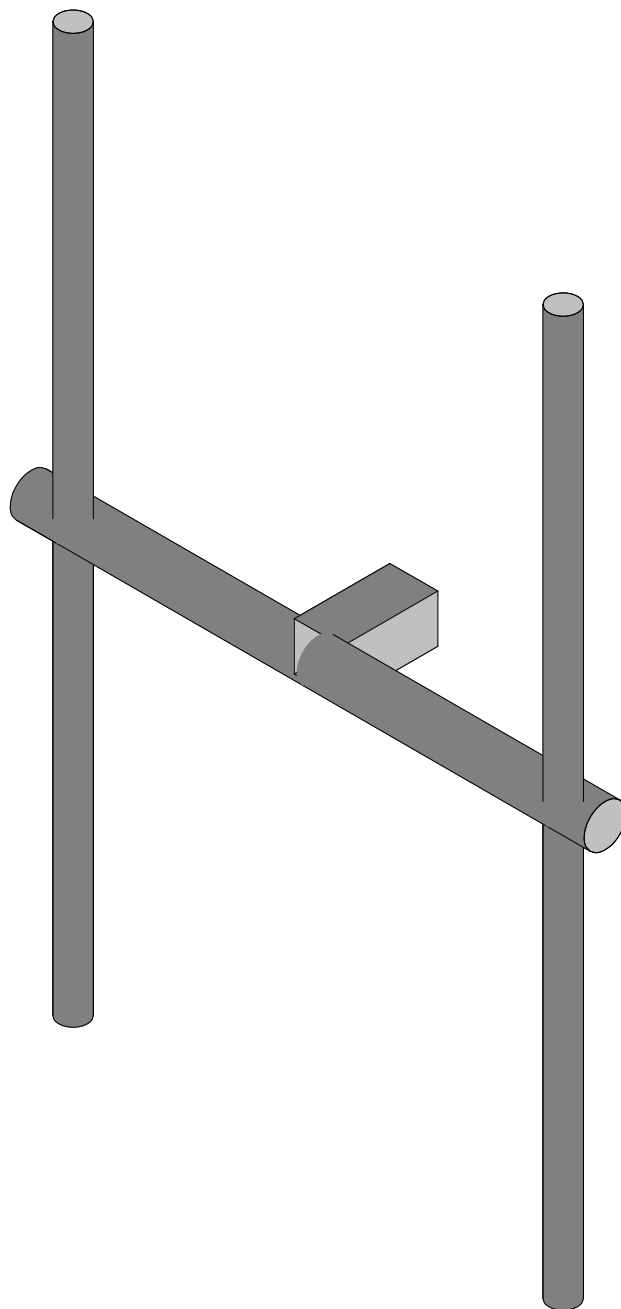
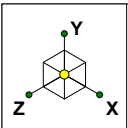
Stand off	12.9	Pass
Horizontal	32.0	Pass
Mount Pipe	45.9	Pass
<b>RATING =</b>	<b>45.9</b>	<b>Pass</b>

**Assumptions and Limitations**

Our structural calculations are completed assuming all information provided to Infinigy Engineering is accurate and applicable to this site. For the purposes of calculations, we assume an overall structure condition of “like new” and all members and connections to be free of corrosion and/or structural defects. The structure owner and/or contractor shall verify the structure’s condition prior to installation of any proposed equipment. If actual conditions differ from those described in this report Infinigy Engineering should be notified immediately to complete a revised evaluation.

Our evaluation is completed using standard TIA, AISC, ACI, and ASCE methods and procedures. Our structural results are proprietary and should not be used by others as their own. Infinigy Engineering is not responsible for decisions made by others that are or are not based on our supplied assumptions and conclusions.

This report is an evaluation of the proposed carriers mount structure only and does not reflect adequacy of the existing tower, other mounts, or coax mounting attachments. These elements are assumed to be adequate for the purposes of this analysis and are assumed to have been installed per their manufacturer requirements.



Envelope Only Solution

Infinigy Engineering, PLLC  
NRO  
526-104

CT52XC030

Apr 28, 2018 at 10:35 PM  
RDS-272.r3d



## Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2			3" STD Pipe	Beam	None	A53 Gr.B	Typical
2	M2	N3	N4			HSS 4"x4"x1/4"	Beam	None	A53 Gr.B	Typical
3	MP2	N22	N23			2" STD Pipe	Beam	None	A53 Gr.B	Typical
4	MP1	N20	N21			2" STD Pipe	Beam	None	A53 Gr.B	Typical

## Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	Hot Rolled Steel				
2	A53 Gr.B	HSS4x4x4	1	8	0
3	A53 Gr.B	PIPE 2.0	2	144	0
4	A53 Gr.B	PIPE 3.0	1	48	0
5	Total HR Steel		4	200	0

## Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut..	Area(M...	Surface...
1	Self Weight	DL		-1			8			
2	Wind Load AZI 000	WLZ					8		1	
3	Wind Load AZI 090	WLX					8		1	
4	Ice Weight	OL1					8	4		
5	Wind + Ice Load AZI 000	OL2					8		1	
6	Wind + Ice Load AZI 090	OL3					8		1	
7	Service Live 1	LL					2			
8	BLC 2 Transient Area Loads	None						3		
9	BLC 3 Transient Area Loads	None						3		
10	BLC 5 Transient Area Loads	None						3		
11	BLC 6 Transient Area Loads	None						3		

## Load Combinations

	Description	So..	P...	S...	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..
1	1.4D	Yes	Y		DL	1.4									
2	1.2D + 1.6W AZI 000	Yes	Y		DL	1.2	W...	1.6							
3	1.2D + 1.6W AZI 030	Yes	Y		DL	1.2	W...	1.3...	W...	.8					
4	1.2D + 1.6W AZI 060	Yes	Y		DL	1.2	W...	.8	W...	1.3...					
5	1.2D + 1.6W AZI 090	Yes	Y		DL	1.2			W...	1.6					
6	1.2D + 1.6W AZI 120	Yes	Y		DL	1.2	W...	-.8	W...	1.3...					
7	1.2D + 1.6W AZI 150	Yes	Y		DL	1.2	W...	-1.3...	W...	.8					
8	1.2D + 1.6W AZI 180	Yes	Y		DL	1.2	W...	-1.6							
9	1.2D + 1.6W AZI 210	Yes	Y		DL	1.2	W...	-1.3...	W...	-.8					
10	1.2D + 1.6W AZI 240	Yes	Y		DL	1.2	W...	-.8	W...	-1.3...					
11	1.2D + 1.6W AZI 270	Yes	Y		DL	1.2			W...	-1.6					
12	1.2D + 1.6W AZI 300	Yes	Y		DL	1.2	W...	.8	W...	-1.3...					
13	1.2D + 1.6W AZI 330	Yes	Y		DL	1.2	W...	1.3...	W...	-.8					
14	0.9D + 1.6W AZI 000	Yes	Y		DL	.9	W...	1.6							
15	0.9D + 1.6W AZI 030	Yes	Y		DL	.9	W...	1.3...	W...	.8					
16	0.9D + 1.6W AZI 060	Yes	Y		DL	.9	W...	.8	W...	1.3...					
17	0.9D + 1.6W AZI 090	Yes	Y		DL	.9			W...	1.6					
18	0.9D + 1.6W AZI 120	Yes	Y		DL	.9	W...	-.8	W...	1.3...					
19	0.9D + 1.6W AZI 150	Yes	Y		DL	.9	W...	-1.3...	W...	.8					
20	0.9D + 1.6W AZI 180	Yes	Y		DL	.9	W...	-1.6							
21	0.9D + 1.6W AZI 210	Yes	Y		DL	.9	W...	-1.3...	W...	-.8					
22	0.9D + 1.6W AZI 240	Yes	Y		DL	.9	W...	-.8	W...	-1.3...					

## Load Combinations (Continued)

	Description	So...	P...	S...	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..
23	0.9D + 1.6W AZI 270	Yes	Y		DL	.9			W...	-1.6				
24	0.9D + 1.6W AZI 300	Yes	Y		DL	.9	W...	.8	W...	-1.3...				
25	0.9D + 1.6W AZI 330	Yes	Y		DL	.9	W...	1.3...	W...	-.8				
26	1.2D + 1.0Di	Yes	Y		DL	1.2	OL1	1						
27	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		DL	1.2	OL1	1	OL2	1				
28	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	.5		
29	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	.866		
30	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		DL	1.2	OL1	1			OL3	1		
31	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	.866		
32	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	.5		
33	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		DL	1.2	OL1	1	OL2	-1				
34	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	-.5		
35	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	-.866		
36	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		DL	1.2	OL1	1			OL3	-1		
37	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	-.866		
38	1.2D + 1.0Di + 1.0Wi A...	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	-.5		
39	1.2D + 1.5L + 1.0WL (...)	Yes	Y		DL	1.2	LL	1.5	W...	.111				
40	1.2D + 1.5L + 1.0WL (...)	Yes	Y		DL	1.2	LL	1.5	W...	.096	W...	.056		
41	1.2D + 1.5L + 1.0WL (...)	Yes	Y		DL	1.2	LL	1.5	W...	.056	W...	.096		
42	1.2D + 1.5L + 1.0WL (...)	Yes	Y		DL	1.2	LL	1.5			W...	.111		
43	1.2D + 1.5L + 1.0WL (...)	Yes	Y		DL	1.2	LL	1.5	W...	-.056	W...	.096		
44	1.2D + 1.5L + 1.0WL (...)	Yes	Y		DL	1.2	LL	1.5	W...	-.096	W...	.056		
45	1.2D + 1.5L + 1.0WL (...)	Yes	Y		DL	1.2	LL	1.5	W...	-.111				
46	1.2D + 1.5L + 1.0WL (...)	Yes	Y		DL	1.2	LL	1.5	W...	-.096	W...	-.056		
47	1.2D + 1.5L + 1.0WL (...)	Yes	Y		DL	1.2	LL	1.5	W...	-.056	W...	-.096		
48	1.2D + 1.5L + 1.0WL (...)	Yes	Y		DL	1.2	LL	1.5			W...	-.111		
49	1.2D + 1.5L + 1.0WL (...)	Yes	Y		DL	1.2	LL	1.5	W...	.056	W...	-.096		
50	1.2D + 1.5L + 1.0WL (...)	Yes	Y		DL	1.2	LL	1.5	W...	.096	W...	-.056		

## Envelope Joint Reactions

Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC	
1	N4	max	751.467	5	2117.691	27	1286.446	2	-97.044	14	572.807	6	154.923	36
2		min	-751.467	11	420.903	18	-1286.446	8	-1457.539	33	-571.321	12	-74.875	17
3	Totals:	max	751.467	5	2117.691	27	1286.446	2						
4		min	-751.467	11	420.903	18	-1286.446	8						

## Envelope AISC 14th(360-10): LRFD Steel Code Checks

Member	Shape	Code Check	Lo.....	Shear C...	Loc[in]...	LC	phi*Pnc...	phi*Pnt...	phi*...	phi*...	Eqn
1	MP1 PIPE 2.0	.459	36	8	.038	36	20	20866....	32130	1871...	1871.... H1-...
2	M1 PIPE 3.0	.320	24	...	.081	24	8	64194....	65205	5748...	5748... 1 H1-...
3	MP2 PIPE 2.0	.273	36	8	.029	36	20	20866....	32130	1871...	1871.... H1-...
4	M2 HSS4x...	.129	8	...	.088	8	y 36	106004...	106155	1231...	1231.... H1-...



# Sprint



PROJECT: DO MACRO UPGRADE  
 SITE NAME: GLOBAL TOWER CT-5037  
 SITE CASCADE: CT52XC030  
 SITE ADDRESS: 158 ROBERTS ST  
 EAST HARTFORD, CT 06108  
 SITE TYPE: MONOPOLE TOWER  
 MARKET: NORTHERN CONNECTICUT

PLANS PREPARED FOR:



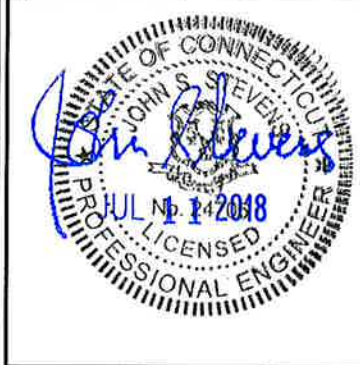
PLANS PREPARED BY:

**INFINIGY**  
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 1033 Watervliet Shaker Rd | Albany, NY 12203  
 Phone: 518-690-0790 | Fax: 518-690-0793  
 www.infinigy.com  
 JOB NUMBER 526-104

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.
REVISED/ ISSUED FOR PERMIT	07/11/18	JJM	1
ISSUED FOR PERMIT	05/23/18	ETC	0

SITE NAME:

**GLOBAL TOWER  
 CT-5037**

SITE NUMBER:

**CT52XC030**

SITE ADDRESS:

**158 ROBERTS ST  
 EAST HARTFORD, CT 06108**

SHEET DESCRIPTION:

**TITLE SHEET  
 & PROJECT DATA**

SHEET NUMBER:

**T-1**

**SITE INFORMATION**

**TOWER OWNER:**  
 AMERICAN TOWER CORPORATION  
 10 PRESIDENTIAL WAY  
 WOBURN, MA 01801

**LATITUDE (NAD83):**  
 41° 46' 24.0" N  
 41.773320

**LONGITUDE (NAD83):**  
 72° 36' 48.4" W  
 -72.613440

**COUNTY:**  
 HARTFORD

**ZONING JURISDICTION:**  
 CONNECTICUT SITING COUNCIL

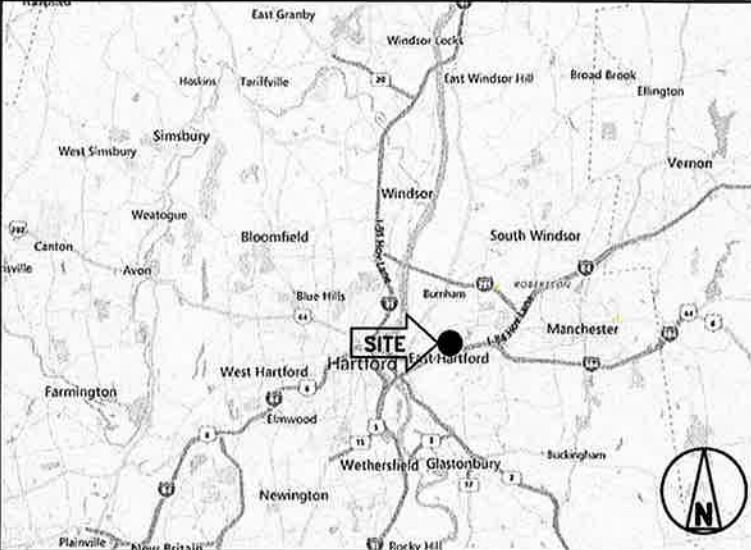
**ZONING DISTRICT:**  
 TBD

**POWER COMPANY:**  
 CL&P  
 PHONE: (800) 286-2000

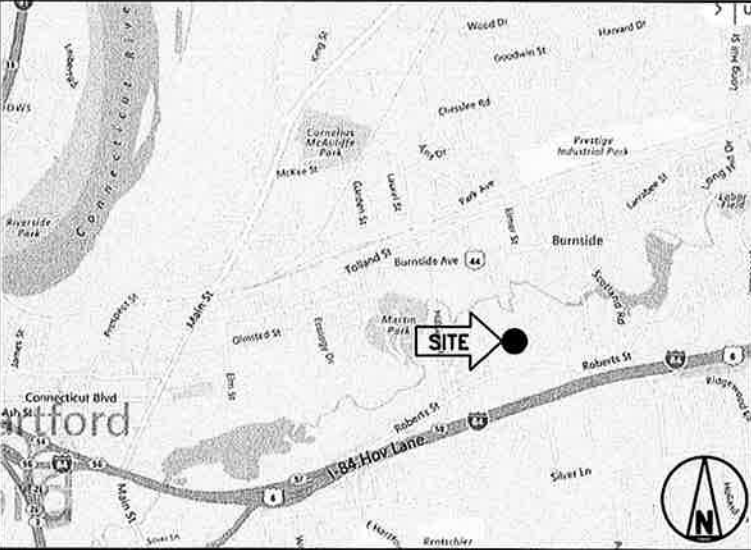
**AAV PROVIDER:**  
 TBD

**PROJECT MANAGER:**  
 AIROSMITH DEVELOPMENT  
 TERRI BURKHOLDER  
 (315) 719-2928  
 TBURKHOLDER@AIROSMITHDEVELOPMENT.COM

**AREA MAP**



**LOCATION MAP**



**PROJECT DESCRIPTION**

SPRINT PROPOSES TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.

- REMOVE (3) PANEL ANTENNAS AND RRR'S
- INSTALL (6) PANEL ANTENNAS
- INSTALL (6) 800 MHz RRR'S BEHIND DUAL BAND ANTENNAS
- INSTALL (3) 1900 MHz RRR'S BEHIND DUAL BAND ANTENNAS
- INSTALL (48) JUMPER CABLES
- INSTALL (3) 1-1/4" HYBRIFLEX CABLES & (1) 1.7" HYBRID CABLE
- REMOVE EXISTING CLEARWIRE GROUND EQUIPMENT
- INSTALL (2) EQUIPMENT CABINETS WITHIN EXISTING LEASE AREA
- INSTALL 7'x7' CONCRETE EQUIPMENT PAD

THESE PLANS HAVE BEEN DEVELOPED FOR THE MODIFICATION OF AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY OWNED OR LEASED BY SPRINT IN ACCORDANCE WITH THE SCOPE OF WORK PROVIDED BY SPRINT. INFINIGY HAS INCORPORATED THIS SCOPE OF WORK IN THE PLANS. THESE PLANS ARE NOT FOR CONSTRUCTION UNLESS ACCOMPANIED BY A PASSING STRUCTURAL STABILITY ANALYSIS PREPARED BY A LICENSED STRUCTURAL ENGINEER. STRUCTURAL ANALYSIS MUST INCLUDE BOTH TOWER AND MOUNT.

**APPLICABLE CODES**

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALL IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

- INTERNATIONAL BUILDING CODE (2015 IBC)
- TIA-222-G OR LATEST EDITION
- NFPA 780 - LIGHTNING PROTECTION CODE
- 2011 NATIONAL ELECTRIC CODE OR LATEST EDITION
- ANY OTHER NATIONAL OR LOCAL APPLICABLE CODES, MOST RECENT EDITIONS
- CT BUILDING CODE
- LOCAL BUILDING CODE
- CITY/COUNTY ORDINANCES

**DRAWING INDEX**

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SP-2	SPRINT SPECIFICATIONS	1
SP-3	SPRINT SPECIFICATIONS	1
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A-2	TOWER ELEVATION	1
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A-4	EQUIPMENT & MOUNTING DETAILS	1
A-5	EQUIPMENT DETAILS	1
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E-1	ONE LINE & NOTES	1
E-2	ELECTRICAL & GROUNDING DETAILS	1
E-3	ELECTRICAL & GROUNDING DETAILS	1





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

**SECTION 01 100 – SCOPE OF WORK**

**PART 1 – GENERAL**

- 1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT CONSTRUCTION STANDARDS FOR WIRELESS SITES, CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.
- 1.2 RELATED DOCUMENTS:
  - A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.
  - B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HERewith.
- 1.3 PRECEDENCE: SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES INCLUDING THE STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. NOTIFY SPRINT CONSTRUCTION MANAGER IF THIS OCCURS.
- 1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:
  - A. THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
    1. GR-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.

**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:



PROJECT MANAGER:



ENGINEERING LICENSE:



DRAWING NOTICE:

THESE DOCUMENTS ARE CONFIDENTIAL AND ARE THE SOLE PROPERTY OF SPRINT AND MAY NOT BE REPRODUCED, DISSEMINATED OR REDISTRIBUTED WITHOUT THE EXPRESS WRITTEN CONSENT OF SPRINT.

REVISIONS:

DESCRIPTION	DATE	BY	REV.
REVISED / ISSUED FOR PERMIT	07/11/18	JLM	1
ISSUED FOR PERMIT	05/23/18	ETC	0

SITE NAME:

**GLOBAL TOWER  
CT-5037**

SITE NUMBER:

**CT52XC030**

SITE ADDRESS:

**158 ROBERTS ST  
EAST HARTFORD, CT 06108**

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 465. INSTALLED AZIMUTH, DOWNTILT, AND AGL MUST CONFORM TO THE RF DATA SHEETS. SWEEP AND FIBER TESTS
  2. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
  3. ALL AVAILABLE JURISDICTIONAL INFORMATION
  4. PDF SCAN OF REDLINES PRODUCED IN FIELD

5. ELECTRONIC AS-BUILT DRAWINGS IN AUTOCAD AND PDF FORMATS. ANY FIELD CHANGE MUST BE REFLECTED BY MODIFYING THE PLANS, ELEVATIONS, AND DETAILS IN THE DRAWING SETS. GENERAL NOTES INDICATING MODIFICATIONS WILL NOT BE ACCEPTED. CHANGES SHALL BE HIGHLIGHTED AS "CLOUDS" IDENTIFIED AS THE "AS-BUILT" CONDITION.
6. LIEN WAIVERS
7. FINAL PAYMENT APPLICATION
8. REQUIRED FINAL CONSTRUCTION PHOTOS
9. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
10. ALL POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINTS DOCUMENT REPOSITORY OF RECORD).

1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPs

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

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

**PART 3 - EXECUTION**

**3.1 REQUIREMENTS FOR TESTING:**

- A. THIRD PARTY TESTING AGENCY:**
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, AASJTO, AND OTHER METHODS IS NEEDED.
  4. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.

**3.2 REQUIRED TESTS:**

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

**3.3 REQUIRED INSPECTIONS**

- A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.**
- B. CONDUCT INSPECTIONS INCLUDING BUT NOT LIMITED TO THE FOLLOWING:**
1. GROUNDING SYSTEM INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
  2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
  3. COMPACTION OF BACKFILL MATERIALS; AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS; ASPHALT PAVING; AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
  4. PRE- AND POST-CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES.
  5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
  6. ANTENNA AZIMUTH , DOWN TILT AND PER SUNLIGHT TOOL SUNSIGHT INSTRUMENTS - ANTENNALIGN ALIGNMENT TOOL (AAT)

PLANS PREPARED FOR:



PLANS PREPARED BY:

**INFINIGY**  
FROM ZERO TO INFINIGY  
the solutions are endless  
1033 Watervliet Shaker Rd | Albany, NY 12203  
Phone: 518-690-0790 | Fax: 518-690-0793  
www.infinigy.com  
JOB NUMBER 526-104

PROJECT MANAGER:

**AIRSMITH**  
DEVELOPMENT  
32 CLINTON ST.  
SARATOGA SPRINGS, NY 12866  
OFFICER, (518) 308-3740

ENGINEERING LICENSE:



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REVISIONS:

DESCRIPTION	DATE	BY	REV.
REVISED/ ISSUED FOR PERMIT	07/11/18	JJM	1
ISSUED FOR PERMIT	05/23/18	ETC	0

SITE NAME:

**GLOBAL TOWER  
CT-5037**

SITE NUMBER:

**CT52XC030**

SITE ADDRESS:

**158 ROBERTS ST  
EAST HARTFORD, CT 06108**

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

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

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

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JOB NUMBER 526-104

PROJECT MANAGER:

**AIRSMITH**  
DEVELOPMENT  
32 CLINTON ST.  
SARATOGA SPRINGS, NY 12866  
OFFICER (518) 308-3740

ENGINEERING LICENSE:



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REVISIONS:	DESCRIPTION	DATE	BY	REV
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ISSUED FOR PERMIT		05/23/18	ETC	0

SITE NAME:

**GLOBAL TOWER  
CT-5037**

SITE NUMBER:

**CT52XC030**

SITE ADDRESS:

**158 ROBERTS ST  
EAST HARTFORD, CT 06108**

SHEET DESCRIPTION:

**SPRINT SPECIFICATIONS**

SHEET NUMBER:

**SP-3**

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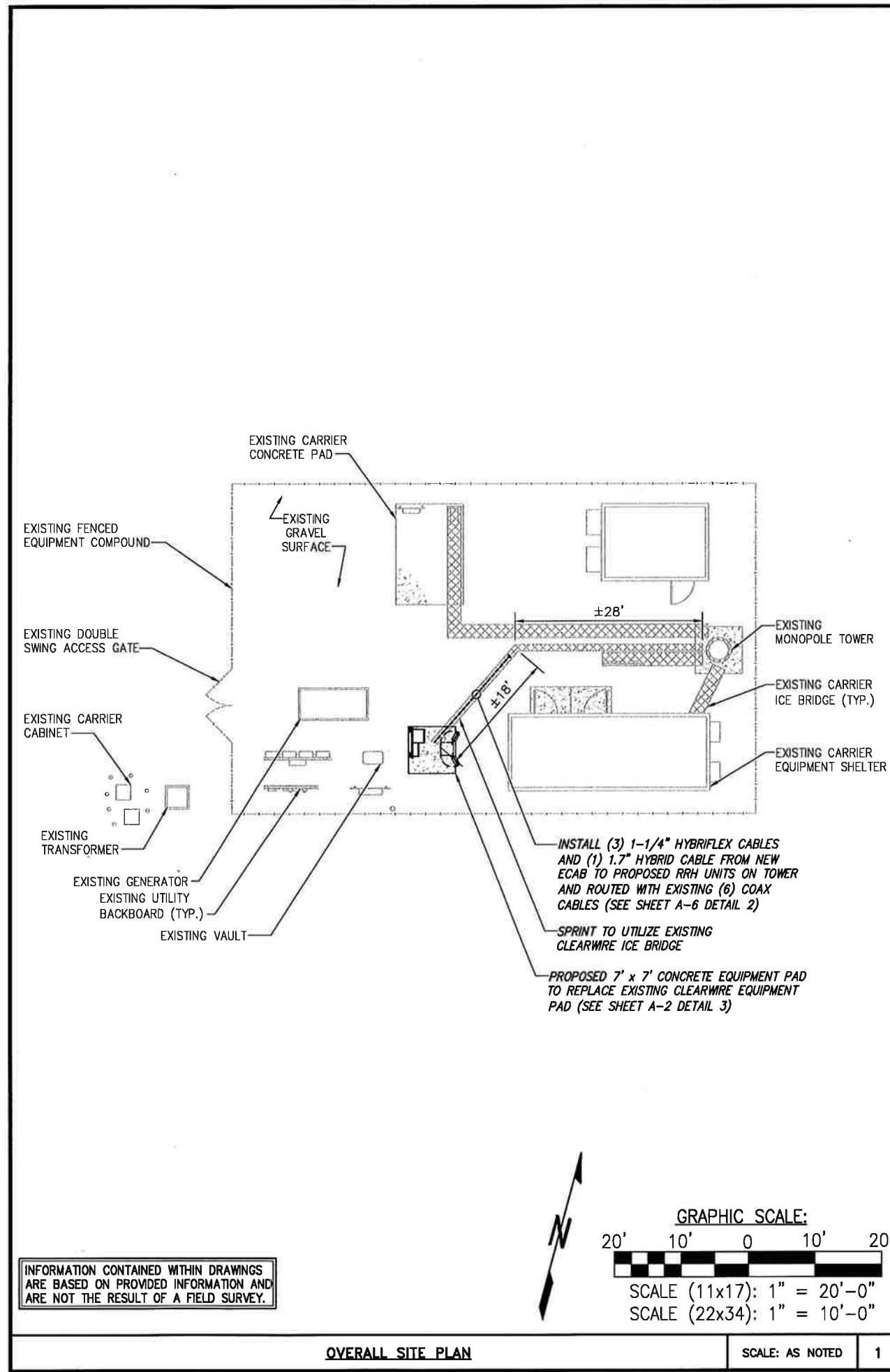
158 ROBERTS ST  
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SHEET DESCRIPTION:

SITE PLAN

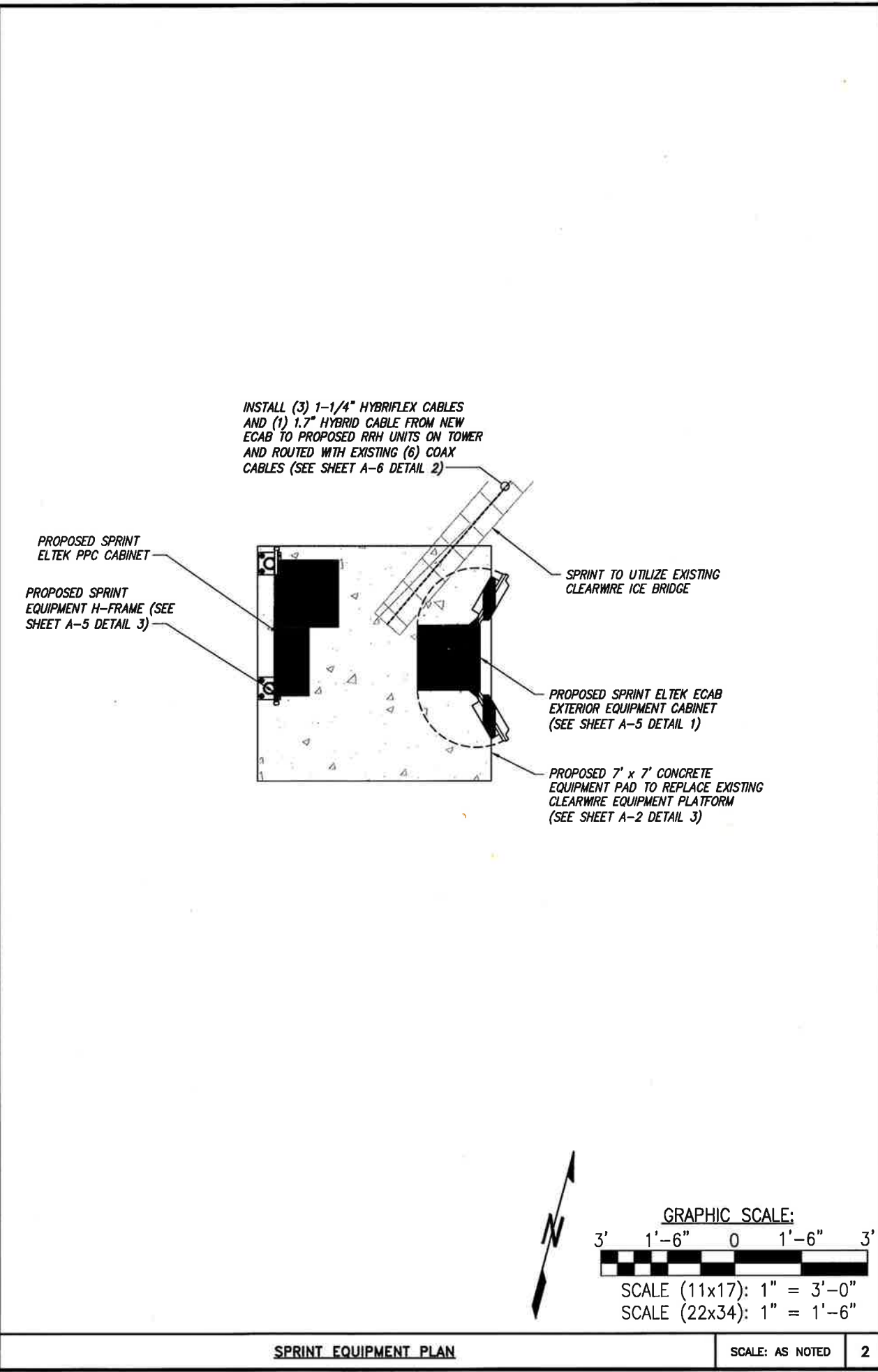
SHEET NUMBER:

A-1



OVERALL SITE PLAN

SCALE: AS NOTED 1



SPRINT EQUIPMENT PLAN

SCALE: AS NOTED 2



**NOTE:**  
 INFINIGY ENGINEERING HAS NOT EVALUATED THE EXISTING STRUCTURE FOR THIS SITE, AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY. REFER TO STRUCTURAL ANALYSIS BY OTHERS PRIOR TO ANY CONSTRUCTION.

**NOTE:**  
 SEE DETAIL 2 ON A-3 FOR ANTENNA LAYOUT

⊙ OF EXISTING/TO BE INSTALLED SPRINT ANTENNAS  
 ELEV. = 128'-0" A.G.L.

INSTALL (2) SPRINT 800 MHz RRH MOUNTED BEHIND PROPOSED ANTENNA EACH SECTOR (SEE SHEET A-4 DETAIL 4)

INSTALL (1) SPRINT 1900 MHz RRH MOUNTED BEHIND PROPOSED ANTENNA EACH SECTOR (SEE SHEET A-4 DETAIL 2)

INSTALL (1) SPRINT DUAL BAND ANTENNA EACH SECTOR (SEE SHEET A-4 DETAIL 3)

EXISTING (3) CLEARWIRE MICROWAVE DISHES TO BE RELOCATED ON NEW ANTENNA MOUNT

INSTALL (1) SPRINT MASSIVE MIMO ANTENNA TO REPLACE EXISTING ANTENNA EACH SECTOR (SEE SHEET A-4 DETAIL 1)

INSTALL (1) SITEPRO1 P/N: RDS-272 T-ARM MOUNT

EXISTING CARRIER PANEL ANTENNA (TYP.)

EXISTING MONOPOLE TOWER

INSTALL (3) 1-1/4" HYBRIFLEX CABLES AND (1) 1.7" HYBRID CABLE FROM NEW ECAB TO PROPOSED RRH UNITS ON TOWER AND ROUTED WITH EXISTING (6) COAX CABLES (SEE SHEET A-6 DETAIL 2)

GROUND LEVEL

TOP OF TOWER  
 ELEV. = ±130'-0" A.G.L.

**NOTE:**

- STRUCTURAL ANALYSIS COMPLETED BY AMERICAN TOWER CORPORATION. FOR ADDITIONAL INFORMATION SEE REPORT TITLED: "STRUCTURAL ANALYSIS REPORT, ATC SITE NUMBER: "370626", DATED: "JUNE 26, 2018". ACCORDING TO RESULTS OF STRUCTURAL MODIFICATION REPORT, THE STRUCTURE HAS SUFFICIENT CAPACITY TO SUPPORT THE PROPOSED LOADING.
- ANTENNA AND RRH SUPPORT EVALUATION COMPLETED BY INFINIGY. FOR ADDITIONAL INFORMATION SEE REPORT TITLED: "SPRINT DO MACRO PROJECT MOUNT ANALYSIS", DATED: "APRIL 28, 2018". ACCORDING TO THE RESULTS OF REVIEW, THE ANTENNA AND RRH SUPPORTS WILL BE ADEQUATE TO SUPPORT THE PROPOSED LOADING WITH THE FOLLOWING MODIFICATION: REPLACE EXISTING MOUNTS WITH (3) SITE PRO 1 RDS-272 T-ARM MOUNTS PRIOR TO THE INSTALLATION OF PROPOSED APPURTENANCES.

TOWER ELEVATION

NO SCALE

1

**SITE LOADING CHART**

SECTOR	EXISTING/PROPOSED	ANTENNA MODEL #	VENDOR	AZIMUTH	QTY.	REMAIN/REMOVED	RRH (QTY/MODEL)	CABLE	CABLE LENGTH	RAD CENTER
ALPHA	PROPOSED	AAHC	NOKIA	0°	1	-	(2) 800 MHz 2X50W RRH W/ FILTER	SEE SHEET A-5 DETAIL 1	±128' AGL	±128' AGL
	PROPOSED	NNVV-65B-R4	COMMSCOPE	0°	1	-	(1) 1900 MHz 4X45 RRH	SEE SHEET A-5 DETAIL 1		
	EXISTING	LLPX310R	ARGUS	0°	1	REMOVE	EXISTING COAX			
BETA	PROPOSED	AAHC	NOKIA	120°	1	-	(2) 800 MHz 2X50W RRH W/ FILTER	SEE SHEET A-5 DETAIL 1	±182*	±128' AGL
	PROPOSED	NNVV-65B-R4	COMMSCOPE	120°	1	-	(1) 1900 MHz 4X45 RRH	SEE SHEET A-5 DETAIL 1		
	EXISTING	LLPX310R	ARGUS	120°	1	REMOVE	EXISTING COAX			
GAMMA	PROPOSED	AAHC	NOKIA	240°	1	-	(2) 800 MHz 2X50W RRH W/ FILTER	SEE SHEET A-5 DETAIL 1	±128' AGL	±128' AGL
	PROPOSED	NNVV-65B-R4	COMMSCOPE	240°	1	-	(1) 1900 MHz 4X45 RRH	SEE SHEET A-5 DETAIL 1		
	EXISTING	LLPX310R	ARGUS	240°	1	REMOVE	EXISTING COAX			

**PROJECT SCOPE:**

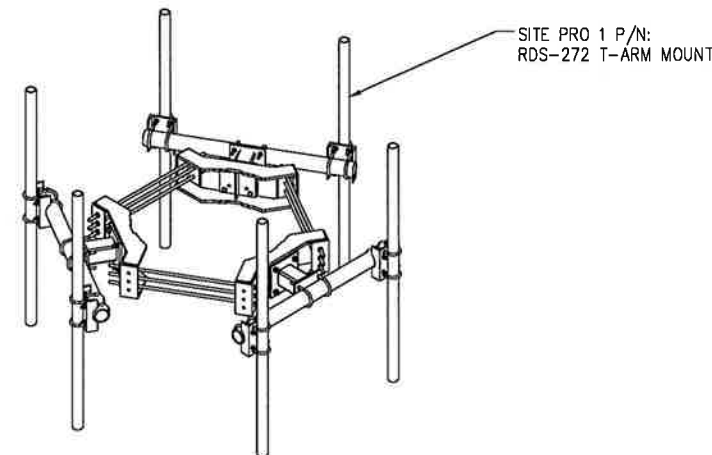
REMOVE: (3) PANEL ANTENNAS INSTALL: (6) PANEL ANTENNAS AND (9) RRH'S

\* PROPOSED CABLE LENGTH WAS DETERMINED USING THE SUM OF THE RAD CENTER OF ANTENNAS, AND DISTANCE FROM EXISTING EQUIPMENT AREA TO TOWER BASE WITH AN ADDITIONAL 20' BUFFER. LENGTH TO BE VERIFIED IN FIELD PRIOR TO ORDERING MATERIALS.

**SITE LOADING CHART**

NO SCALE

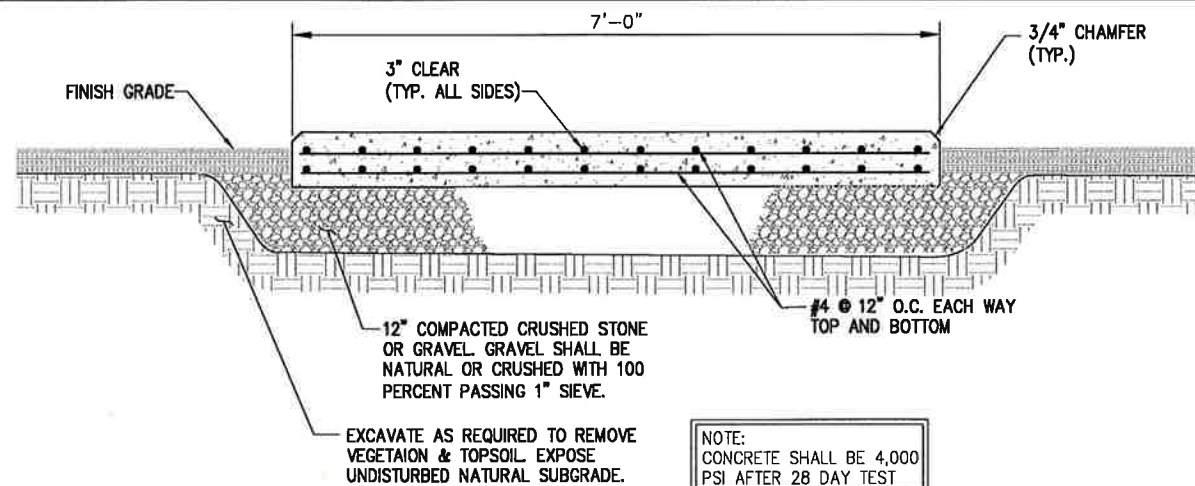
2



**PROPOSED MOUNT DETAIL**

NO SCALE

3



**NOTE:**  
 CONCRETE SHALL BE 4,000 PSI AFTER 28 DAY TEST

**EQUIPMENT CABINET FOUNDATION**

NO SCALE

4

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SITE ADDRESS:

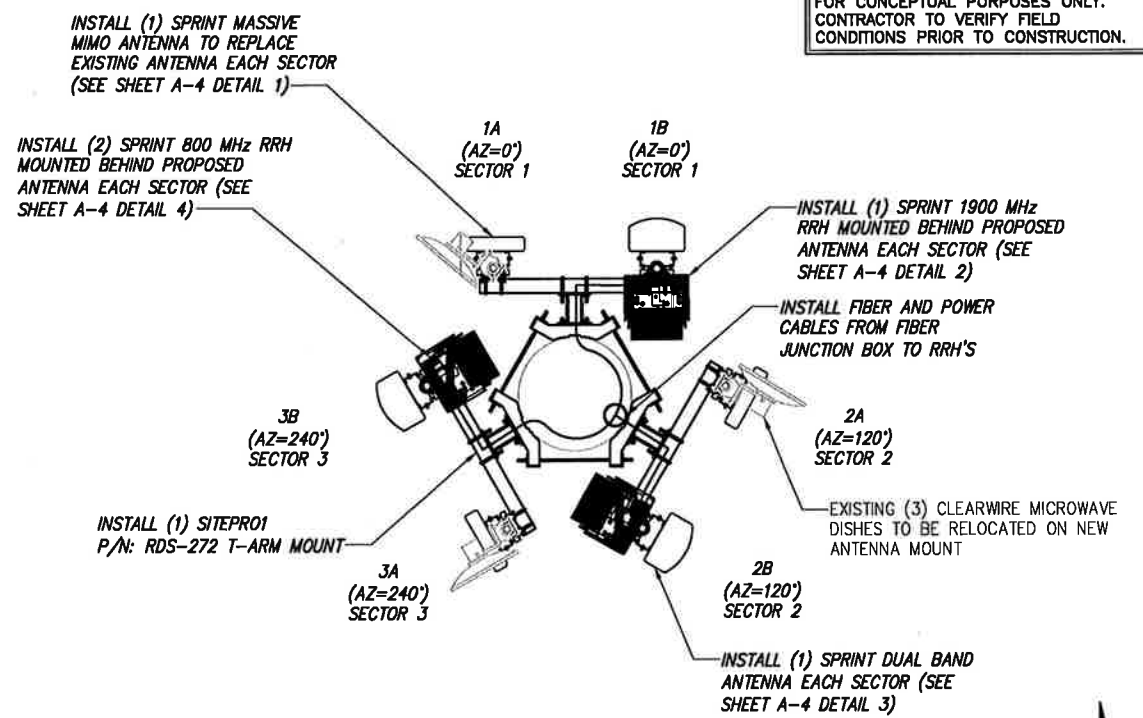
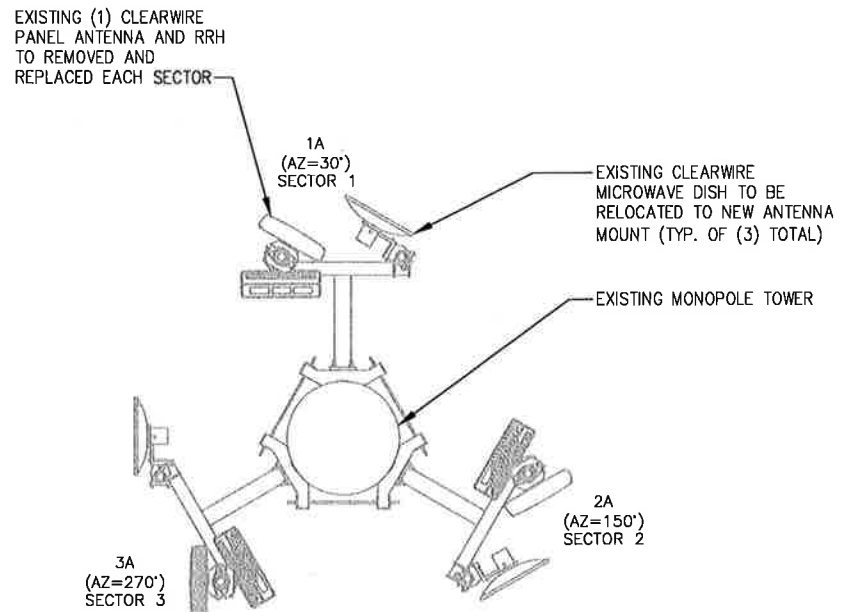
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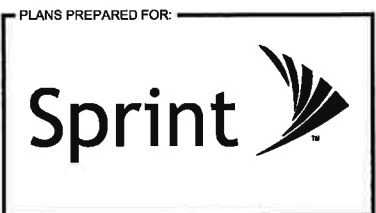
TOWER ELEVATION

SHEET NUMBER:

A-2



THE CONFIGURATION PLANS ARE BASED ON PROVIDED INFORMATION AND ARE FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR TO VERIFY FIELD CONDITIONS PRIOR TO CONSTRUCTION.



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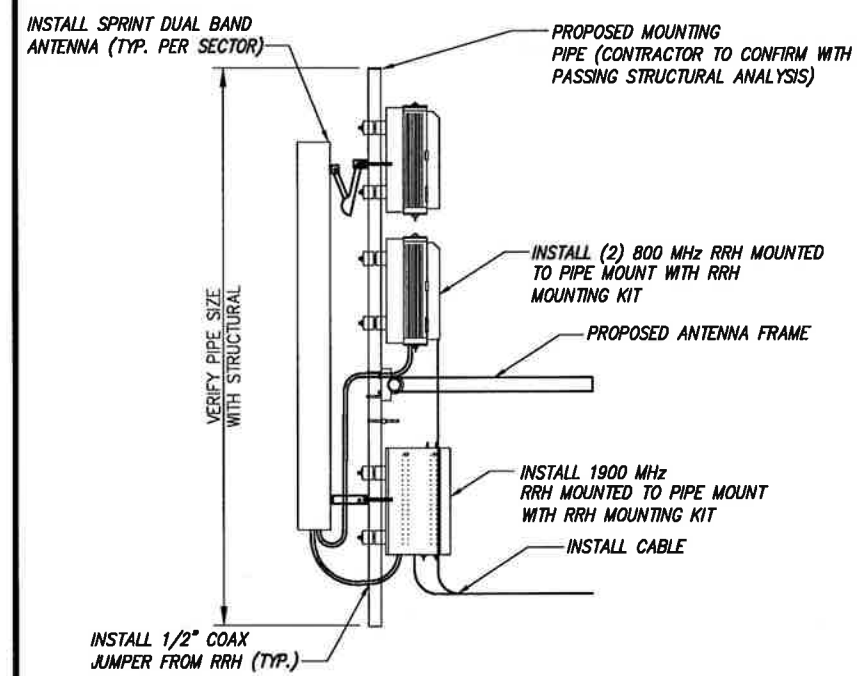


EXISTING ANTENNA LAYOUT

NO SCALE 1

FINAL ANTENNA & RRH LAYOUT

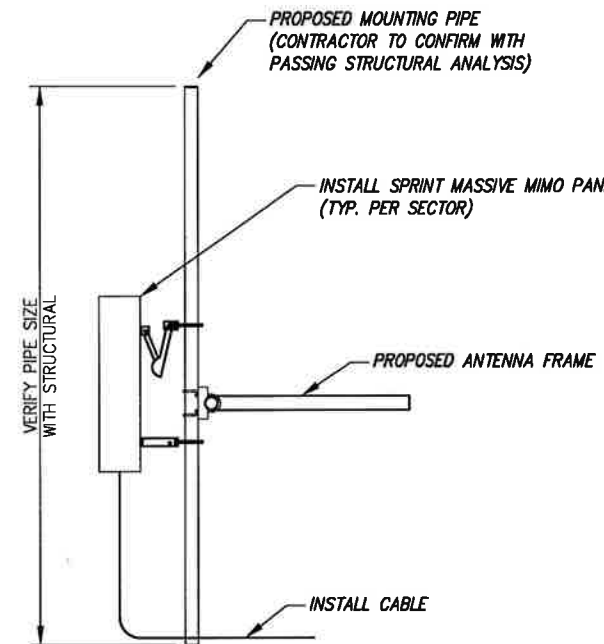
NO SCALE 2



**NOTE:**  
 CONTRACTOR TO POSITION RRH ON MOUNT BEHIND ANTENNA SUCH THAT THE RRH DOES NOT INTERFERE WITH THE EXISTING PLATFORM/T-ARM MOUNTING HARDWARE.

**NOTE:**  
 THE DIAGRAM IS FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR IS TO REFER TO PASSING STRUCTURAL ANALYSIS FOR ANTENNA AND RRH MOUNTING DETAILS

- NOTES:**
1. CUT DC CONDUCTORS TO LENGTH.
  2. COIL FIBER CABLE AND SECURE AT SIDE OF RRH.
  3. DO NO EXCEED BEND RADIUS.



**NOTE:**  
 CONTRACTOR TO POSITION RRH ON MOUNT BEHIND ANTENNA SUCH THAT THE RRH DOES NOT INTERFERE WITH THE EXISTING PLATFORM/T-ARM MOUNTING HARDWARE.

**NOTE:**  
 THE DIAGRAM IS FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR IS TO REFER TO PASSING STRUCTURAL ANALYSIS FOR ANTENNA AND RRH MOUNTING DETAILS

- NOTES:**
1. CUT DC CONDUCTORS TO LENGTH.
  2. COIL FIBER CABLE AND SECURE AT SIDE OF RRH.
  3. DO NO EXCEED BEND RADIUS.

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SITE NUMBER:  
**CT52XC030**

SITE ADDRESS:  
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 EAST HARTFORD, CT 06108**

SHEET DESCRIPTION:  
**ANTENNA LAYOUT & MOUNTING DETAILS**

SHEET NUMBER:  
**A-3**

TYPICAL DUAL BAND ANTENNA & RRH MOUNTING DETAILS

NO SCALE 3

TYPICAL MASSIVE MIMO ANTENNA MOUNTING DETAILS

NO SCALE 4



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SITE NAME:

**GLOBAL TOWER  
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SITE NUMBER:

**CT52XC030**

SITE ADDRESS:

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SHEET DESCRIPTION:

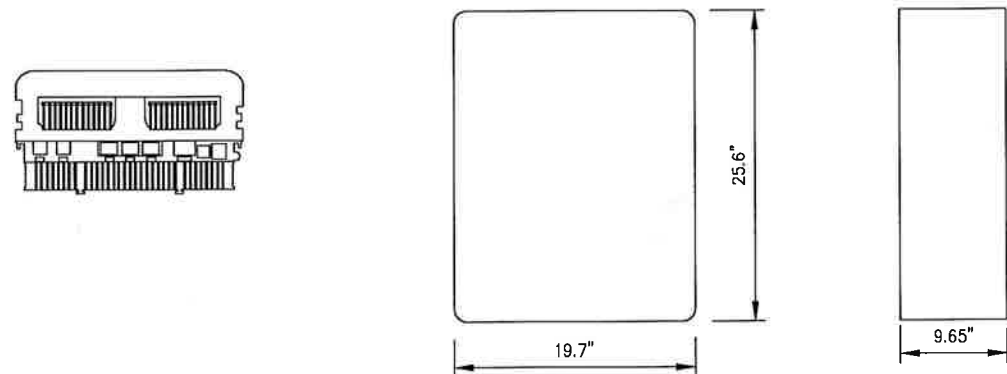
**EQUIPMENT &  
MOUNTING DETAILS**

SHEET NUMBER:

**A-4**

**ANTENNA: NOKIA AAHC**

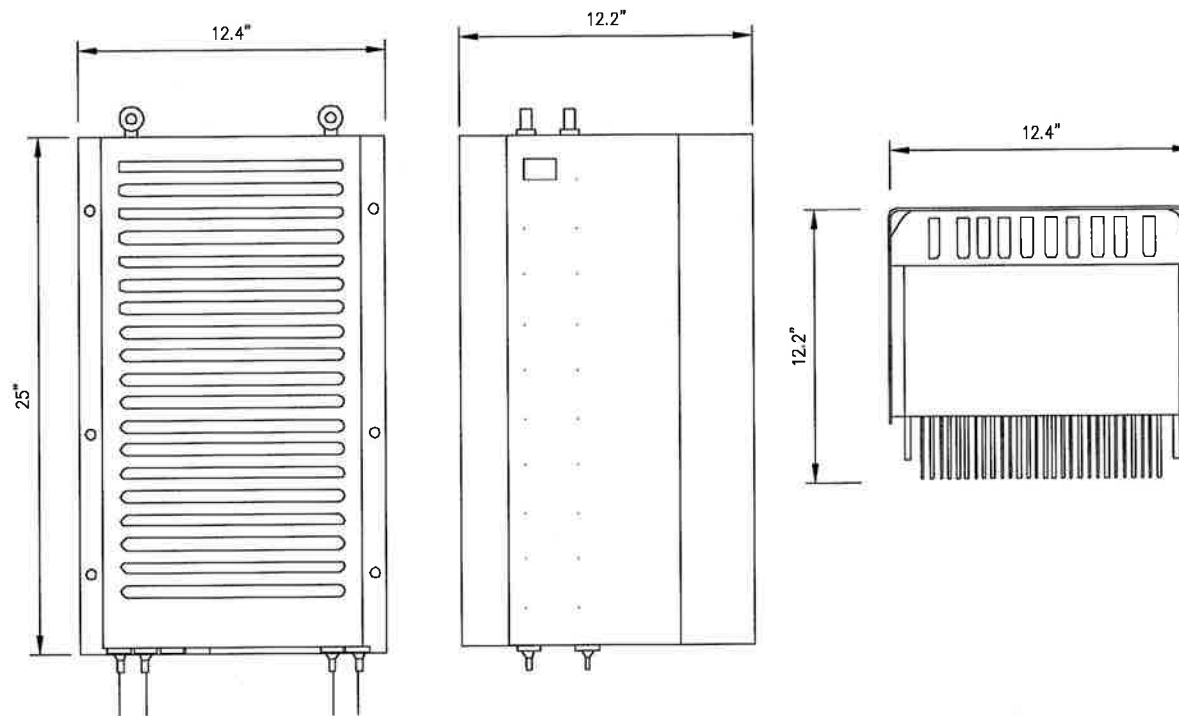
RADOME MATERIAL: FIBERGLASS  
RADOME COLOR: LIGHT GREY  
DIMENSIONS, HxWxD.in(mim): 25.6"x19.7"x9.65" (651x501x245mm)  
WEIGHT: 103.6 lbs



**MASSIVE MIMO ANTENNA DETAIL**

NO SCALE 1

**RRH: ALCATEL LUCENT 1900 MHz  
COLOR: LIGHT GREY  
WEIGHT: 70 LBS.  
(INCLUDING OPTIONAL SOLAR SHIELD)**



**FRONT VIEW**

**SIDE VIEW**

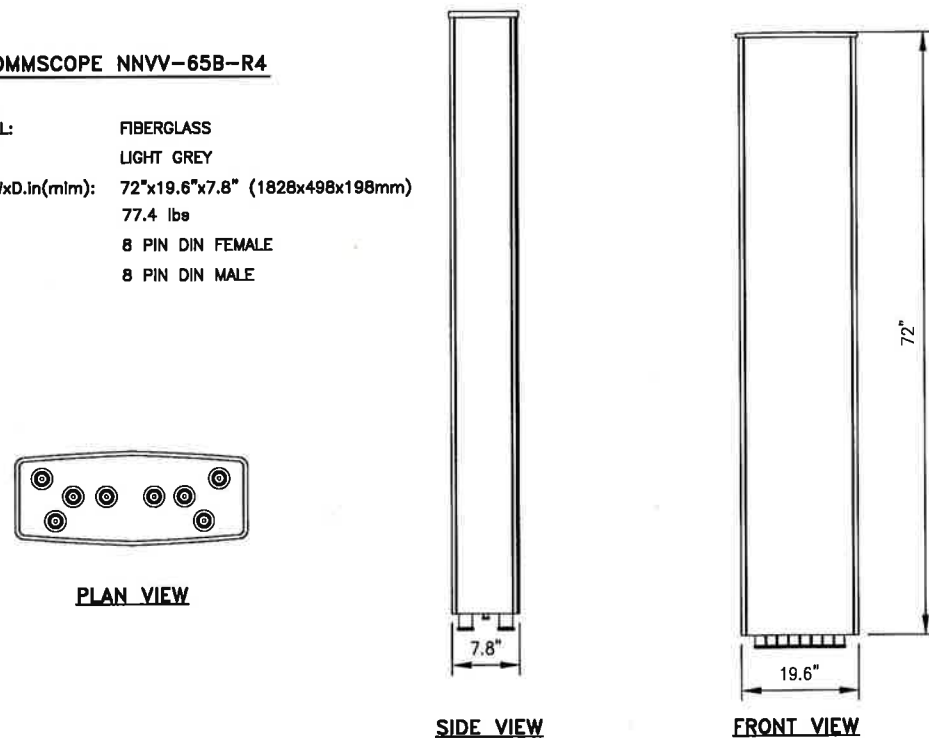
**TOP VIEW**

**1900 MHz RRH**

NO SCALE 2

**ANTENNA COMMSCOPE NNV-65B-R4**

RADOME MATERIAL: FIBERGLASS  
RADOME COLOR: LIGHT GREY  
DIMENSIONS, HxWxD.in(mim): 72"x19.6"x7.8" (1828x498x198mm)  
WEIGHT: 77.4 lbs  
CONNECTORS: 8 PIN DIN FEMALE  
8 PIN DIN MALE



**PLAN VIEW**

**SIDE VIEW**

**FRONT VIEW**

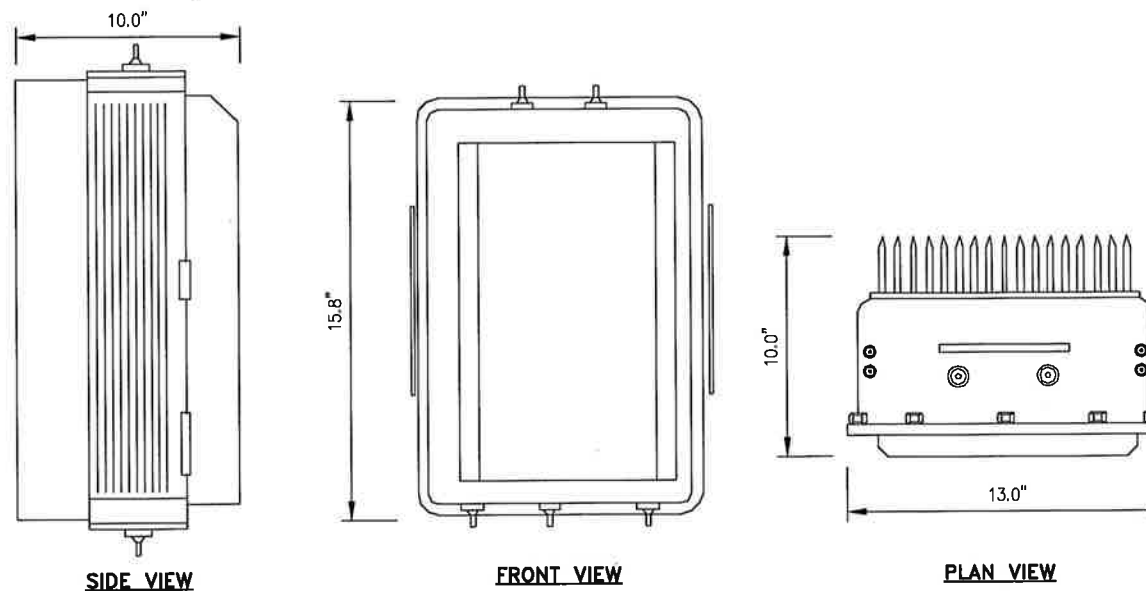
**DUAL BAND ANTENNA DETAIL**

NO SCALE 3

**RRH: ALCATEL LUCENT RRH 800 MHz 2x50W  
COLOR: LIGHT GREY  
WEIGHT: 53 LBS.**

**NOTES**

COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRH'S RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING. DO NOT OPEN RRH PACKAGES IN THE RAIN.



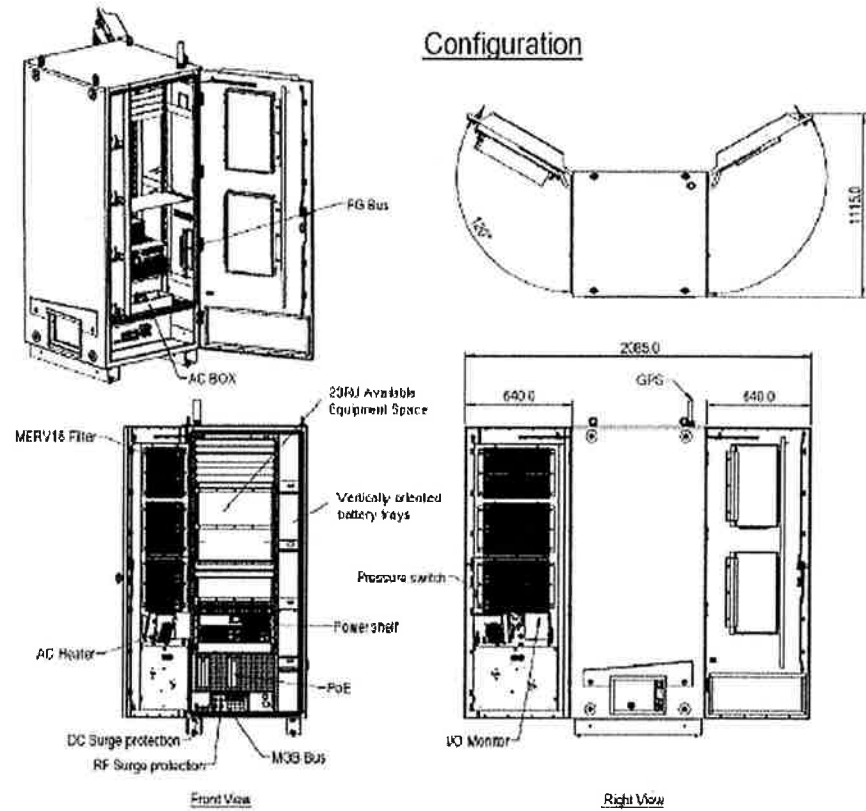
**SIDE VIEW**

**FRONT VIEW**

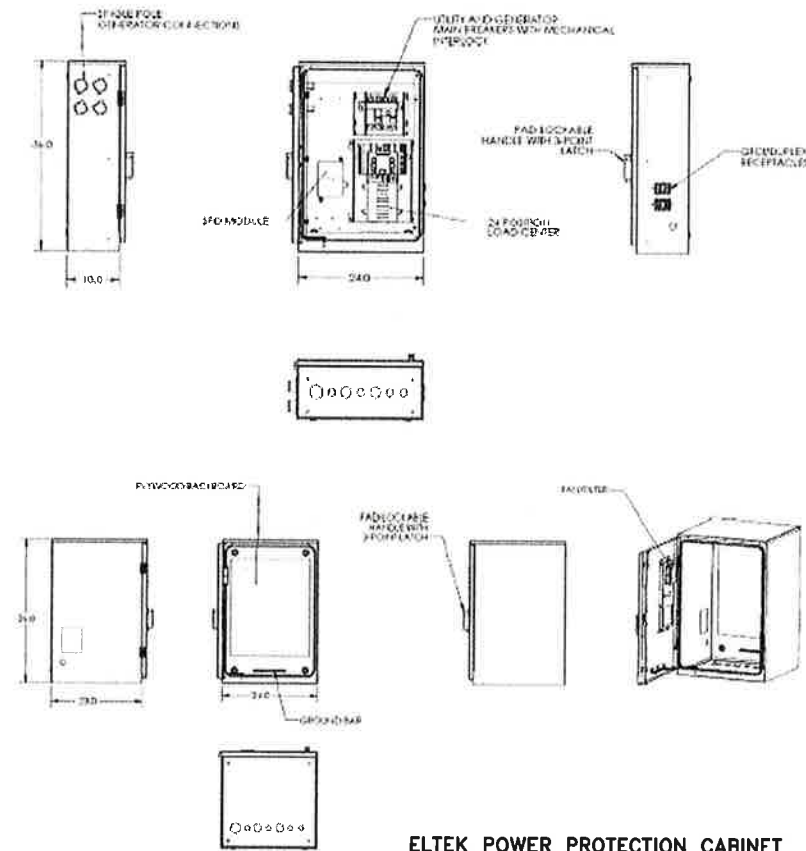
**PLAN VIEW**

**800 MHz RRH**

NO SCALE 4



**ELTEK ECAB EXTERIOR CABINET**  
P/N: ES0A220-SCA02



**ELTEK POWER PROTECTION CABINET**  
P/N: 5811122212

**EQUIPMENT CABINET DETAIL**

NO SCALE

1

**EQUIPMENT CABINET DETAIL**

NO SCALE

2

PLANS PREPARED FOR:



PLANS PREPARED BY:

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www.infinigy.com  
JOB NUMBER 526-104

PROJECT MANAGER:

**AIRSMITH**  
DEVELOPMENT

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OFFICER, (518) 308-3740

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SITE NAME:

**GLOBAL TOWER**  
CT-5037

SITE NUMBER:

**CT52XC030**

SITE ADDRESS:

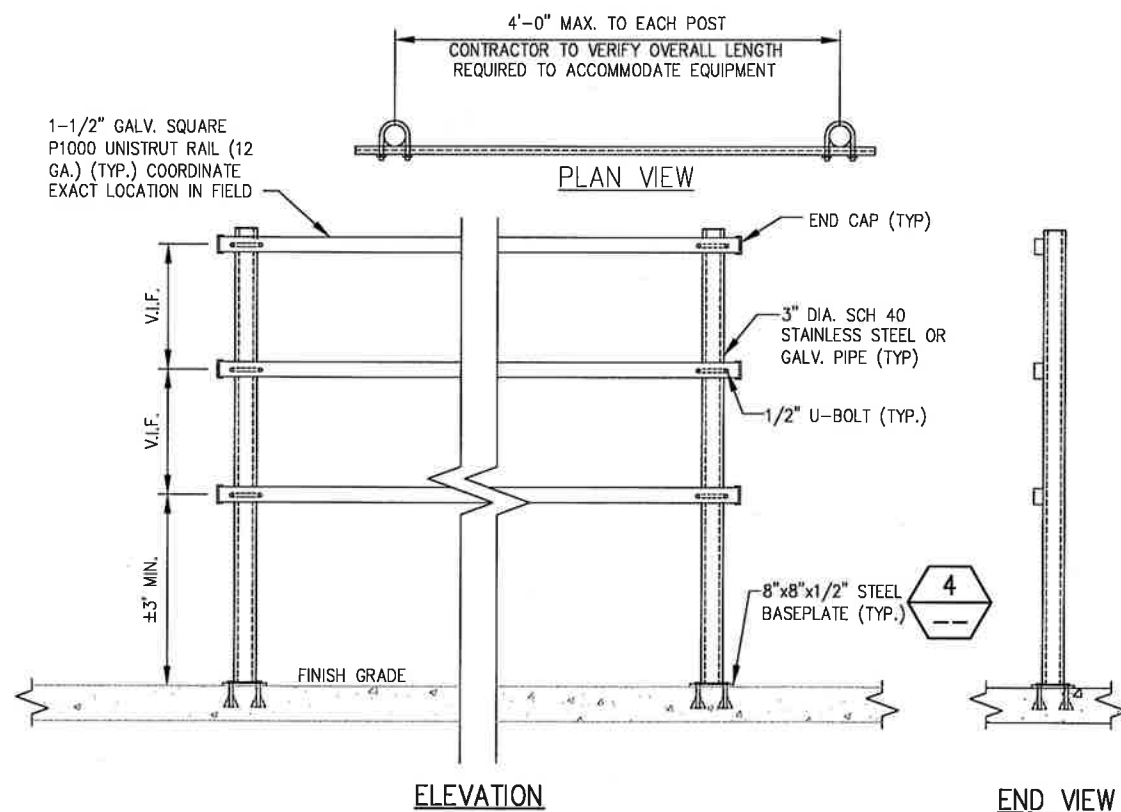
**158 ROBERTS ST**  
**EAST HARTFORD, CT 06108**

SHEET DESCRIPTION:

**EQUIPMENT &**  
**MOUNTING DETAILS**

SHEET NUMBER:

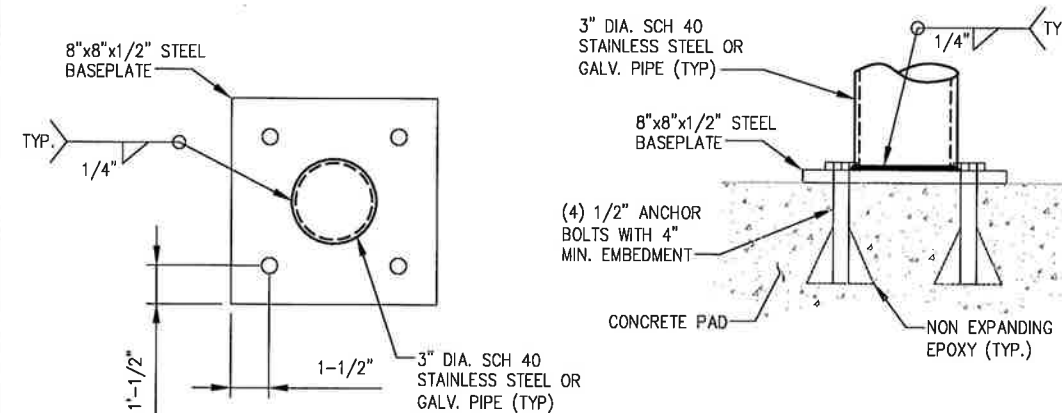
**A-5**



**H-FRAME DETAIL**

NO SCALE

3



**SUPPORT POST MOUNTING DETAIL**

NO SCALE

4



RFS HYBRIFLEX RISER CABLE SCHEDULE

Fiber Only (Existing DC Power)	Hybrid cable MN: HB058-M12-050F 12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom: LC Connectors: 5/8 cable, 50 ft	50 ft
	MN: HB058-M12-075F	75 ft
	MN: HB058-M12-100F	100 ft
	MN: HB058-M12-125F	125 ft
	MN: HB058-M12-150F	150 ft
	MN: HB058-M12-175F	175 ft
	MN: HB058-M12-200F	200 ft

8 AWG Power	Hybrid cable MN: HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors: 1 1/4 cable, 50 ft	50 ft
	MN: HB114-08U3M12-075F	75 ft
	MN: HB114-08U3M12-100F	100 ft
	MN: HB114-08U3M12-125F	125 ft
	MN: HB114-08U3M12-150F	150 ft
	MN: HB114-08U3M12-175F	175 ft
	MN: HB114-08U3M12-200F	200 ft

6 AWG Power	Hybrid cable MN: HB114-13U3M12-225F 3x 6 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors: 1 1/4 cable, 225 ft	225 ft
	MN: HB114-13U3M12-250F	250 ft
	MN: HB114-13U3M12-275F	275 ft
	MN: HB114-13U3M12-300F	300 ft

4 AWG Power	Hybrid cable MN: HB114-21U3M12-325F 3x 4 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors: 1 1/2 cable, 325 ft	325 ft
	MN: HB114-21U3M12-350F	350 ft
	MN: HB114-21U3M12-375F	375 ft

RFS HYBRIFLEX JUMPER CABLE SCHEDULE

Fiber Only	Hybrid Jumper cable MN: HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN: HBF012-M3-10F1	10 ft
	MN: HBF012-M3-15F1	15 ft
	MN: HBF012-M3-20F1	20 ft
	MN: HBF012-M3-25F1	25 ft
	MN: HBF012-M3-30F1	30 ft

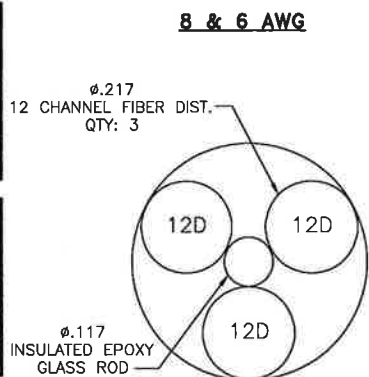
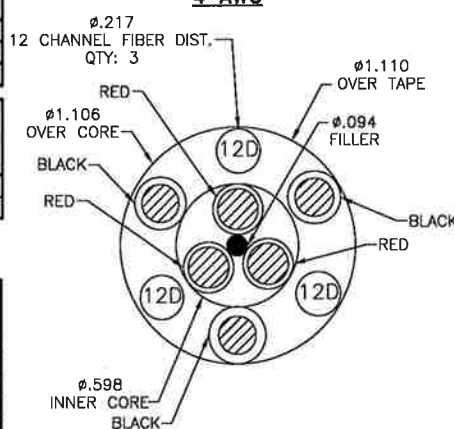
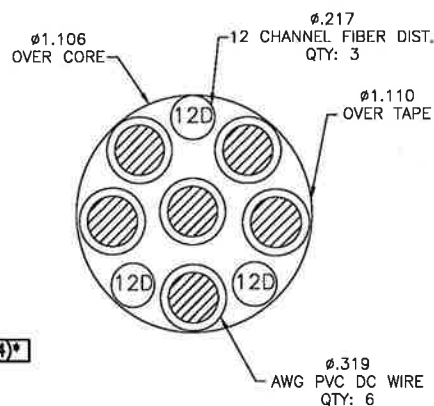
8 AWG Power	Hybrid Jumper cable MN: HBF058-08U1M3-5F1 5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-08U1M3-10F1	10 ft
	MN: HBF058-08U1M3-15F1	15 ft
	MN: HBF058-08U1M3-20F1	20 ft
	MN: HBF058-08U1M3-25F1	25 ft
	MN: HBF058-08U1M3-30F1	30 ft

6 AWG Power	Hybrid Jumper cable MN: HBF058-13U1M3-5F1 5 ft, 1x 6 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-13U1M3-10F1	10 ft
	MN: HBF058-13U1M3-15F1	15 ft
	MN: HBF058-13U1M3-20F1	20 ft
	MN: HBF058-13U1M3-25F1	25 ft
	MN: HBF058-13U1M3-30F1	30 ft

4 AWG Power	Hybrid Jumper cable MN: HBF078-21U1M3-5F1 5 ft, 1x 4 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 7/8 cable	5 ft
	MN: HBF078-21U1M3-10F1	10 ft
	MN: HBF078-21U1M3-15F1	15 ft
	MN: HBF078-21U1M3-20F1	20 ft
	MN: HBF078-21U1M3-25F1	25 ft
	MN: HBF078-21U1M3-30F1	30 ft

NOTE:  
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE  
AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF  
HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.

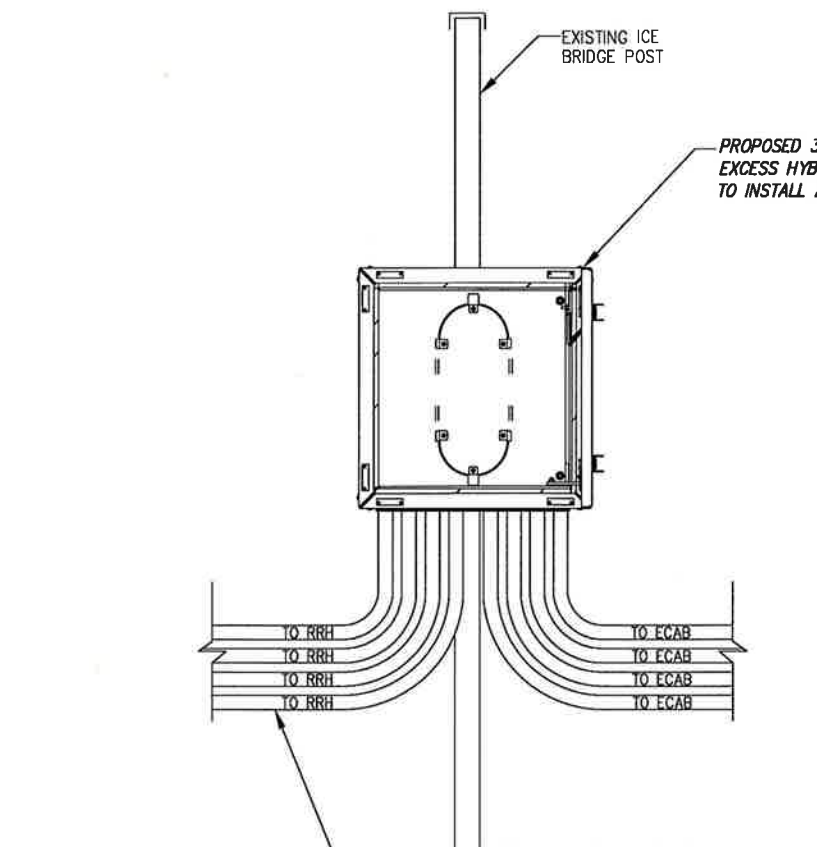
\* PROPOSED CABLE LENGTH WAS DETERMINED USING THE SUM OF THE RAD CENTER OF ANTENNAS, AND DISTANCE FROM EXISTING EQUIPMENT AREA TO TOWER BASE WITH AN ADDITIONAL 20' BUFFER. LENGTH TO BE VERIFIED IN FIELD PRIOR TO ORDERING MATERIALS.



FIBER ONLY

800/1900/2500 CABLE CROSS SECTION DATA

NO SCALE 1



OPTIONAL HYBRID SLACK BOX

NO SCALE 2

DETAIL NOT USED

NO SCALE 3

PLANS PREPARED FOR:



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CT-5037

SITE NUMBER:

CT52XC030

SITE ADDRESS:

158 ROBERTS ST  
EAST HARTFORD, CT 06108

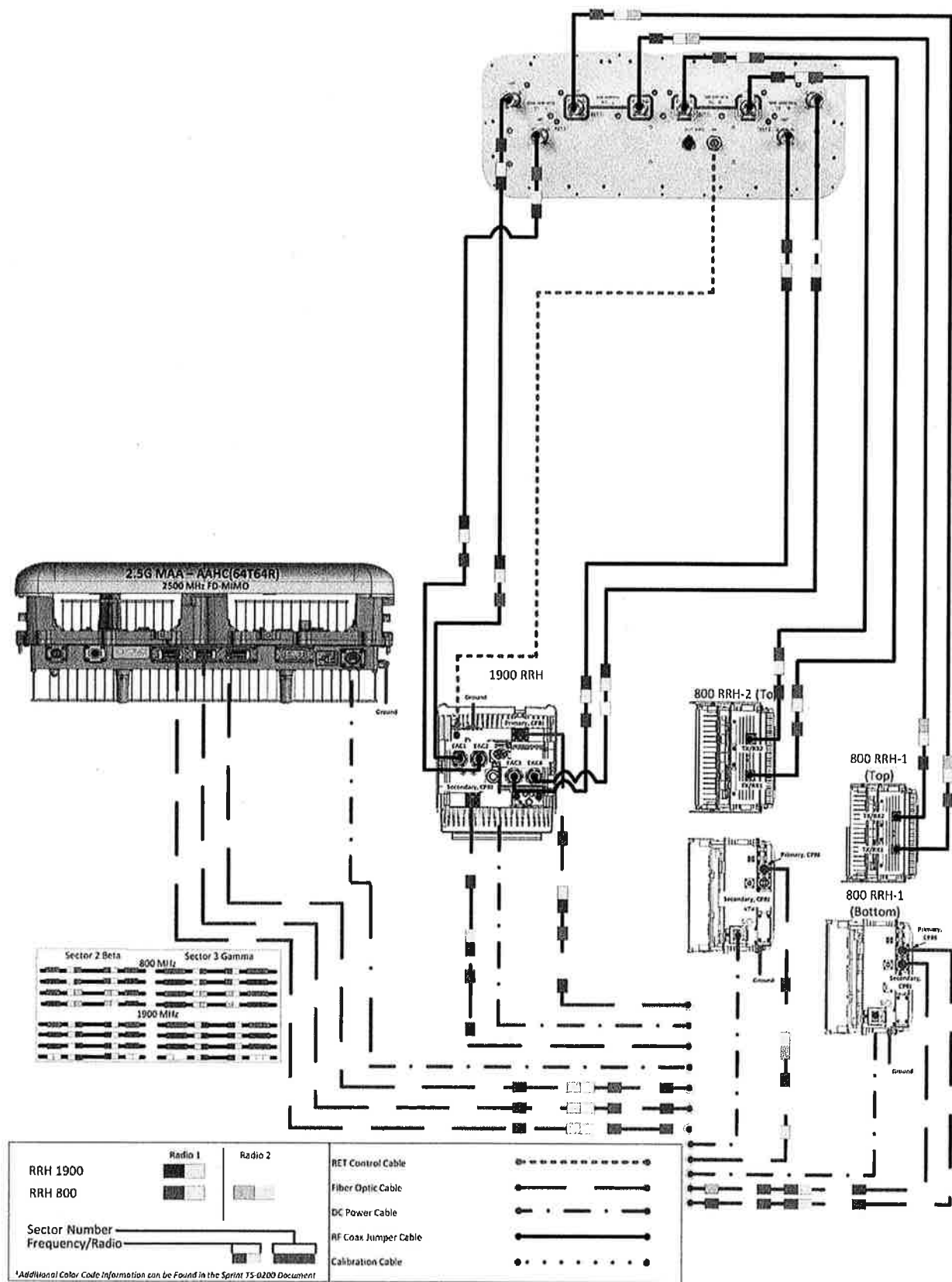
SHEET DESCRIPTION:

CIVIL DETAILS

SHEET NUMBER:

A-6

ALU 21-MIMO NNVV-65B-R4 wo Filters



Not to Scale

PLUMBING DIAGRAM

NO SCALE

1

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PLANS PREPARED BY:

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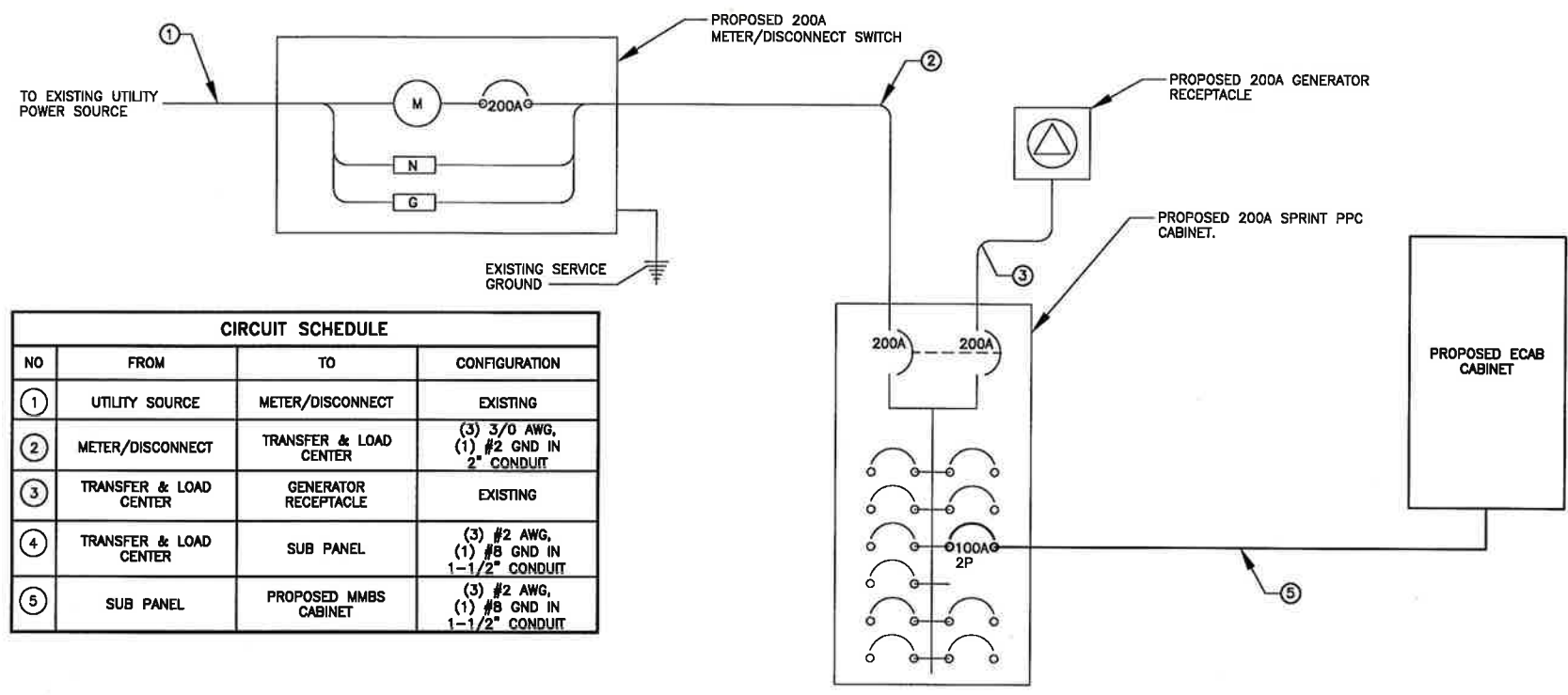
SHEET DESCRIPTION:

PLUMBING DIAGRAM

SHEET NUMBER:

A-7





CIRCUIT SCHEDULE			
NO	FROM	TO	CONFIGURATION
①	UTILITY SOURCE	METER/DISCONNECT	EXISTING
②	METER/DISCONNECT	TRANSFER & LOAD CENTER	(3) 3/0 AWG, (1) #2 GND IN 2" CONDUIT
③	TRANSFER & LOAD CENTER	GENERATOR RECEPTACLE	EXISTING
④	TRANSFER & LOAD CENTER	SUB PANEL	(3) #2 AWG, (1) #8 GND IN 1-1/2" CONDUIT
⑤	SUB PANEL	PROPOSED MMBS CABINET	(3) #2 AWG, (1) #8 GND IN 1-1/2" CONDUIT

ONE LINE DIAGRAM

NO SCALE 1

**GENERAL ELECTRICAL NOTES:**

- ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE NATIONAL ELECTRICAL CODE AND ALL LOCAL AND STATE CODES, LAWS, AND ORDINANCES.
- ALL UNDERGROUND CONDUIT SHALL BE PVC SCHEDULE 40 UNLESS OTHERWISE INDICATED. CONDUITS EXPOSED ABOVE GROUND SHALL BE RIGID GALVANIZED STEEL. ALL UNDERGROUND CONDUIT SHALL TRANSITION FROM PVC TO RIGID ABOVE GRADE. PROVIDE 36" SEPARATION BETWEEN UNDERGROUND POWER AND TELEPHONE CONDUITS. SUPPLY UTILITY MARKING TAPE BURIED 12" BELOW GRADE ALONG ENTIRE LENGTH OF UNDERGROUND CONDUITS.
- ALL CONDUCTORS SHALL BE COPPER WITH THHN/THWN INSULATION. CONTROL CONDUCTORS SHALL BE STRANDED, POWER & LIGHTING CONDUCTORS SHALL BE SOLID FOR #10 & #12 CONDUCTORS AND STRANDED FOR ALL OTHER SIZES. ELECTRICAL DRAWINGS ARE IN PART DIAGRAMMATIC. COORDINATE ELECTRICAL WORK WITH SITE CONDITIONS.
- LOCATE ALL UNDERGROUND UTILITIES BEFORE TRENCHING. IF CONFLICTS ARISE, CONTACT UTILITY COMPANY AND ENGINEER IMMEDIATELY.
- ALL EXPOSED CONDUITS SHALL HAVE WEATHERPROOF CAPS NOT DUCT TAPE.
- PROVIDE 200 LB TEST PULL WIRES IN EACH TELEPHONE AND POWER CONDUIT.
- PULL BOXES SHALL BE INSTALLED AS NEEDED PER NEC UTILITY REQUIREMENTS.

**GENERAL GROUNDING NOTES:**

- TO ENSURE PROPER BONDING, ALL CONNECTIONS SHALL BE AS FOLLOWS:  
 - #2/0 BARE TINNED SOLID COPPER CONDUCTOR: CADWELD TO RODS OR GROUND RING  
 - LUGS AND BUS BAR (UNLESS NOTED OTHERWISE): SANDED CLEAN, COATED WITH OXIDE INHIBITOR AND BOLTED FOR MAXIMUM SURFACE CONTACT. ALL LUGS SHALL BE COPPER (NO ALUMINUM SHALL BE PERMITTED). PROVIDE LOCK WASHERS FOR ALL MECHANICAL CONNECTIONS FOR GROUND CONDUCTORS. USE STAINLESS STEEL HARDWARE THROUGHOUT.
- ALL GROUNDING CABLE IN CONCRETE OR THROUGH WALLS SHALL BE IN 3/4" PVC CONDUIT. SEAL AROUND CONDUIT THROUGH WALLS. NO METALLIC CONDUIT SHALL BE USED FOR GROUNDING CONDUCTORS.
- OWNER'S REPRESENTATIVE WILL INSPECT CADWELDS AND CONDUCT MEGGER TEST PRIOR TO BURIAL. MAXIMUM 5 OHMS RESISTANCE IS REQUIRED.
- DO NOT INSTALL GROUND RING OUTSIDE OF LEASED AREA.
- MAKE ALL GROUND CONNECTIONS AS SHORT AND DIRECT AS POSSIBLE. AVOID SHARP BENDS. ALL BENDS SHALL BE A MINIMUM 8" RADIUS AND NO GREATER THAN 90 DEGREES.
- ALL CADWELDS TO BURIED GROUND RING SHALL BE THE PARALLEL TYPE, EXCEPT FOR THE GROUND RODS WHICH SHALL BE THE TEE TYPE.
- BOND SERVICE CONDUITS TO GROUND RING AS THEY CROSS. DO NOT EXOTHERMICALLY WELD TO CONDUITS.
- THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER WHEN THE GROUNDING SYSTEM IS COMPLETE. THE CONSTRUCTION MANAGER SHALL INSPECT THE GROUNDING SYSTEM PRIOR TO BACKFILLING.
- THE MINIMUM SPACING BETWEEN GROUND RODS SHALL BE 10'-0" (MAX. 15'-0").
- BOND CIGBE TO EXTERNAL GROUND RING WITH 2 RUNS OF #2 BARE, TINNED, SOLID COPPER CONDUCTOR IN PVC. CONNECT BAR END WITH 2 HOLE LUG, AND "CADWELD" THE OTHER END TO THE EXTERNAL GROUND ROD.
- THE PREFERRED LOCATION FOR COAX GROUNDING IS AT THE BASE OF THE TOWER PRIOR TO THE COAX BEND. BONDING IS SHOWN ON THE ICE BRIDGE DUE TO DIFFICULTY WITH WELDING OR ATTACHING TO TOWER LEGS. CONTRACTOR SHALL ADVISE CONSTRUCTION MANAGER PRIOR TO PLACING CIGBE ON ICE BRIDGE IF MOUNTING TO TOWER LEG IS POSSIBLE.
- BONDING OF THE GROUNDED CONDUCTOR (NEUTRAL) AND THE GROUNDING CONDUCTOR SHALL BE AT THE SERVICE DISCONNECTING MEANS. BONDING JUMPER SHALL BE INSTALLED PER N.E.C. ARTICLE 250-30.

ELECTRICAL NOTES

NO SCALE 2

GROUNDING NOTES

NO SCALE 3

PLANS PREPARED FOR:



PLANS PREPARED BY:

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 JOB NUMBER 526-104

PROJECT MANAGER:

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 DEVELOPMENT  
 32 CLINTON ST.  
 SARATOGA SPRINGS, NY 12866  
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SITE NAME:

**GLOBAL TOWER  
CT-5037**

SITE NUMBER:

**CT52XC030**

SITE ADDRESS:

**158 ROBERTS ST  
EAST HARTFORD, CT 06108**

SHEET DESCRIPTION:

**ELECTRICAL &  
GROUNDING PLAN**

SHEET NUMBER:

**E-1**



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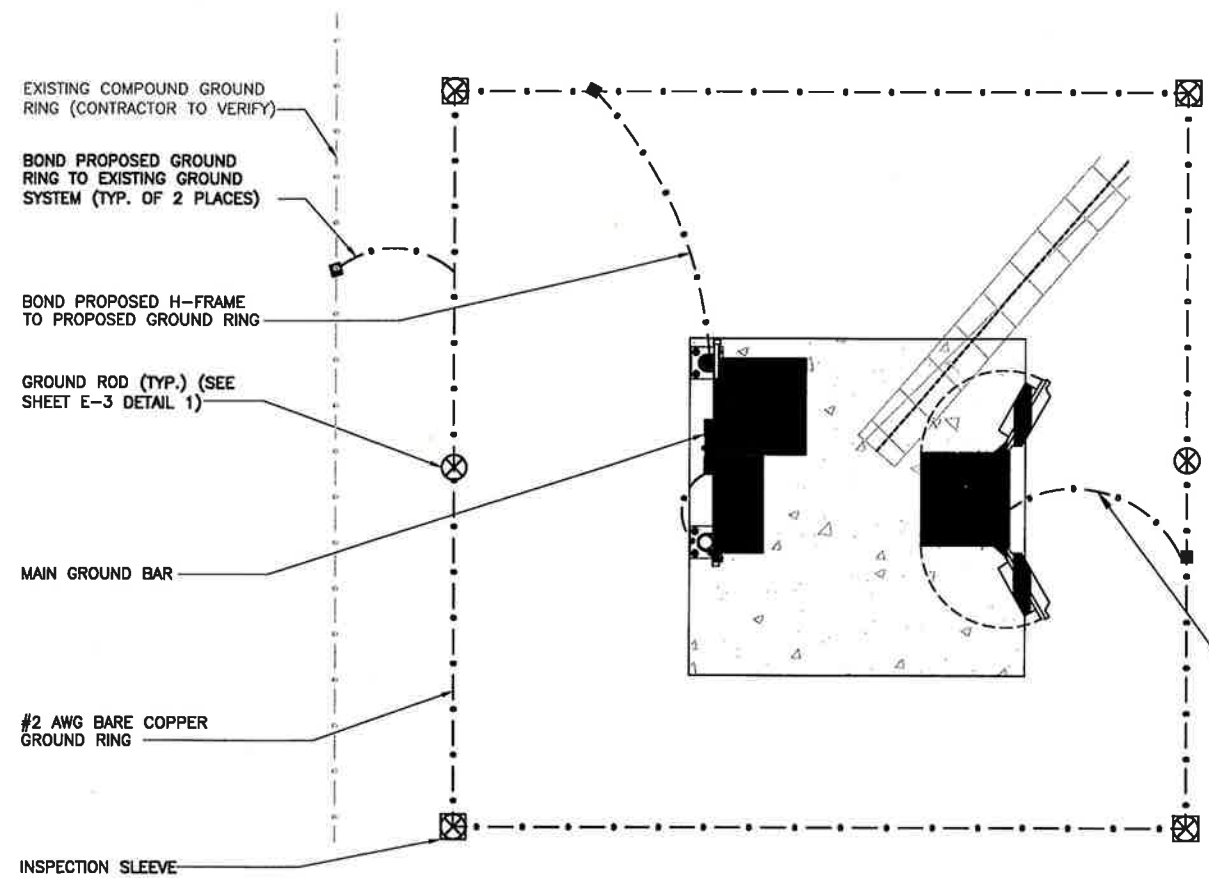
**GLOBAL TOWER  
 CT-5037**

**CT52XC030**

**158 ROBERTS ST  
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**ELECTRICAL &  
 GROUNDING PLAN**

**E-2**



**LEGEND:**

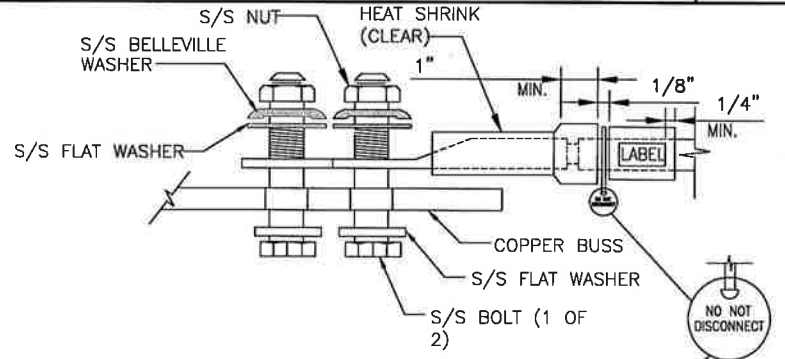
- EXISTING GROUND RING
- CADWELD CONNECTION (EXOTHERMIC WELD)
- ▲ MECHANICAL CONNECTION
- ⊗ GROUND ROD

- #2 AWG BARE COPPER GROUND RING
- ⊗ INSPECTION SLEEVE

**GROUNDING PLAN**

NO SCALE 1

- NOTE:**
- COPPER GROUND BAR 1/4"x4"x24" 2-HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
  - SIMILAR INSTALLATION FOR TOP AND BOTTOM TOWER GROUND BARS AND FOR COAX ENTRY PORT GROUND BARS.

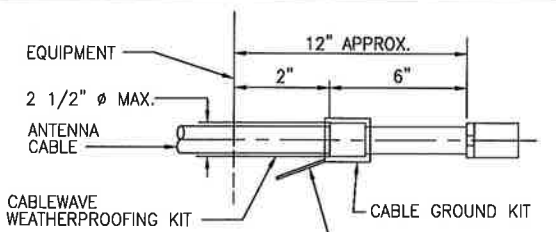


**NOTE:**  
 ALL MECHANICAL EXTERNAL TERMINATION SURFACES SHALL BE TREATED WITH T&B KOPR-SHIELD CP8 ANTI-OXIDATION COMPOUND.

"DO NOT DISCONNECT" TAG ON ALL GROUND BAR INTERCONNECTS

**EQUIPMENT GROUND CONNECTION**

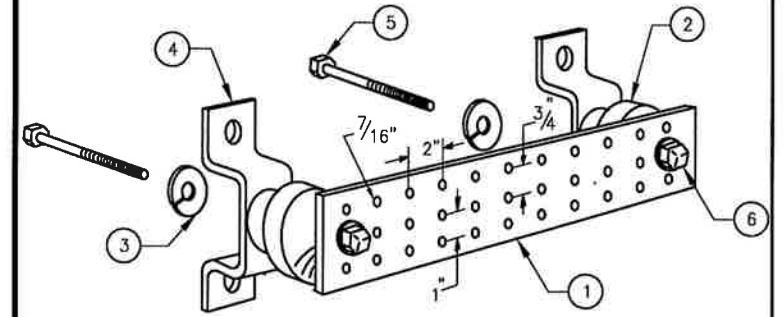
NO SCALE 4



**NOTE:**  
 DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

**CABLE GROUND KIT CONNECTION**

NO SCALE 5

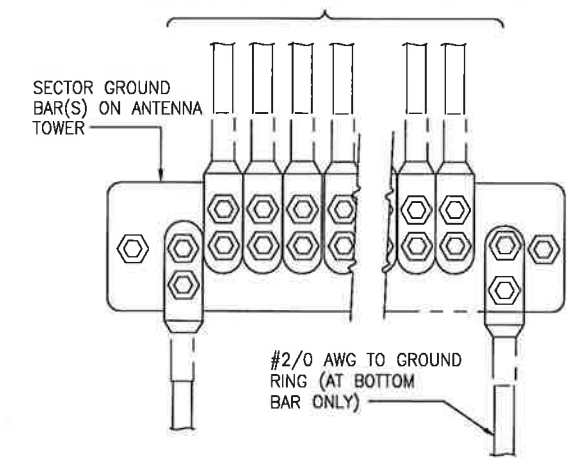


**LEGEND**

- TINNED COPPER GROUND BAR, 1/4"x 4"x 24"
- INSULATORS (NO INSULATORS ON TOWER)
- 5/8" LOCK WASHERS
- MOUNTING BRACKET (MOUNT HORIZONTAL ON VERTICAL CABLE LADDER)
- 5/8-11 X 1" H.H.C.S. BOLTS
- "LOCTITE" THREAD LOCK (RED) ON ALL REMOVABLE BOLTS

**TINNED GROUND BAR DETAIL**

NO SCALE 2



**ANTENNA GROUND WIRE INSTALLATION**

NO SCALE 3





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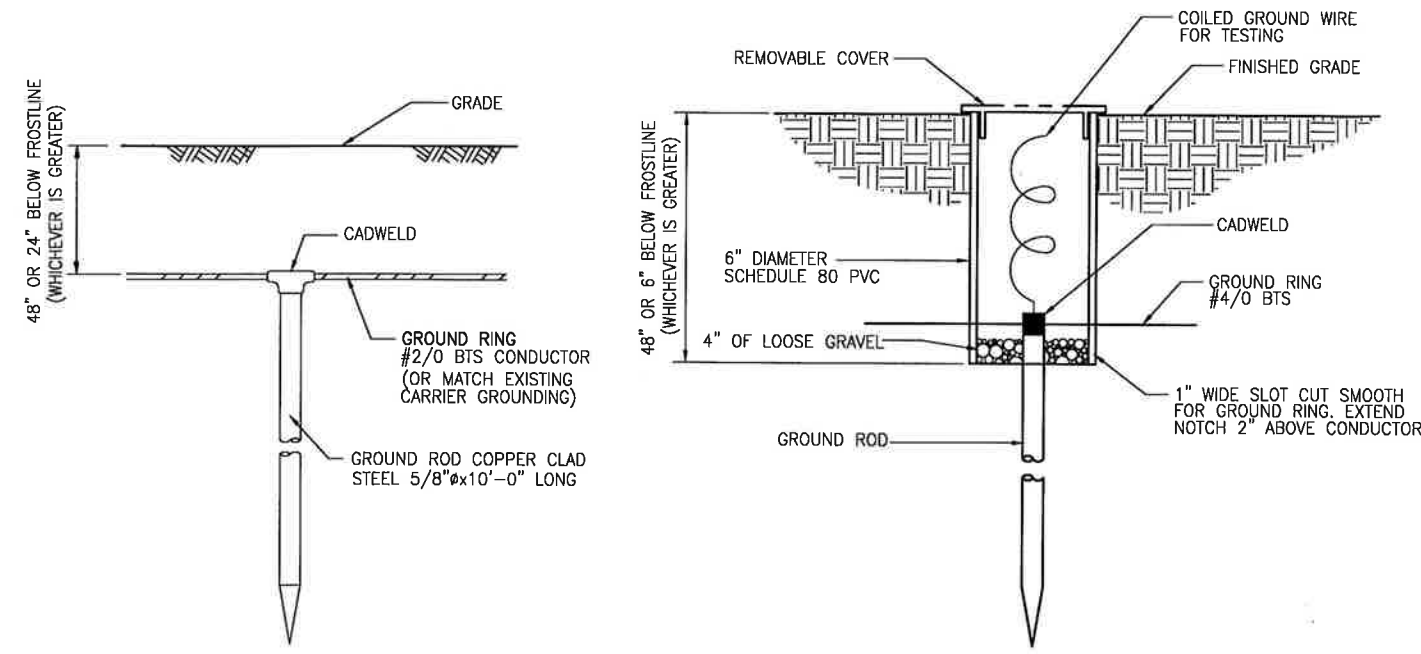
**GLOBAL TOWER  
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**CT52XC030**

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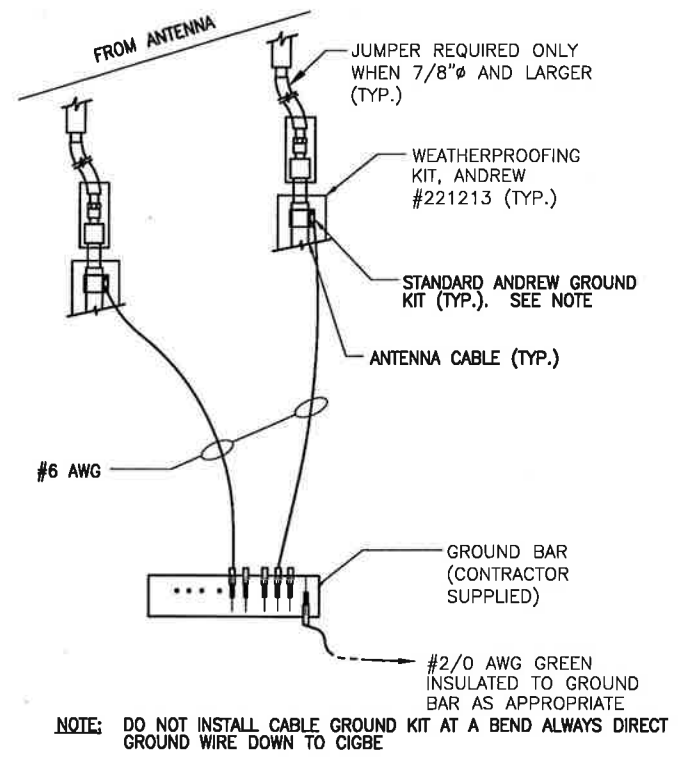
**ELECTRICAL &  
 GROUNDING DETAILS**

**E-3**



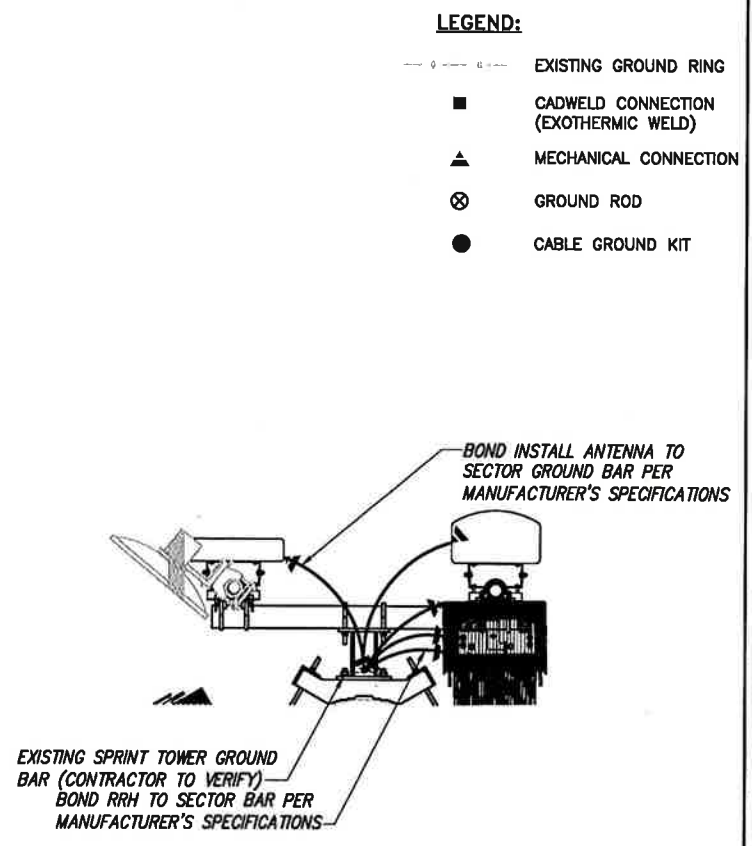
**GROUND ROD & INSPECTION SLEEVE DETAIL**

NO SCALE 1



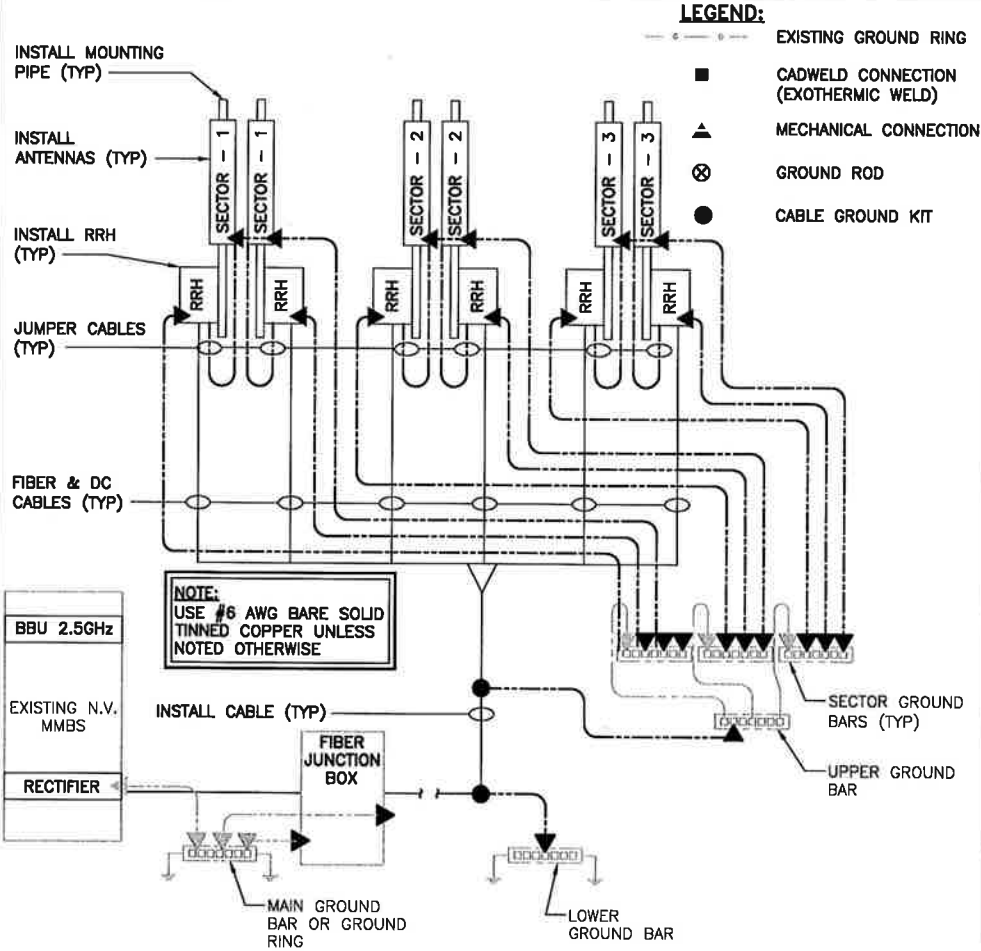
**CONNECTION OF GROUND WIRES  
 TO GROUND BARS & ANTENNAS**

NO SCALE 2



**TYPICAL ANTENNA GROUNDING PLAN**

NO SCALE 3



**GROUNDING RISER DIAGRAM**

NO SCALE 4