



December 13th, 2019

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 289 MOUNTAIN STREET, HARTFORD, CONNECTICUT 06106 – CT52XC041 (lat. 41° 43' 35.7594"N, long. - 72° 42' 29.52" W)

Dear Ms. Bachman:

Sprint Spectrum, LP ("Sprint") currently maintains wireless telecommunications antennas at the (110-foot level) on an existing (110-foot monopole tower) at the above-referenced address. The property is owned by SPRINGWICH CELLULAR TOWER HOLDINGS LLC, 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, and 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 LUKE BRONIN, MAYOR, and AIMEE CHAMBERS DIRECTOR OF PLANNING of the City of HARTFORD. A copy of this letter is also being sent to JUSTINE PAUL the manager for AMERICAN TOWER CORPORATION who manages the site and to the SPRINGWICH CELLULAR TOWER HOLDINGS LLC who own the land.

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

Kind Regards,

A handwritten signature in black ink, consisting of a large, sweeping loop followed by a smaller, more intricate flourish.

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

Attachment

CC: LUKE BRONIN (MAYOR, HARTFORD, CT)
JUSTINE PAUL (Manager, AMERICAN TOWER CORPORATION)
AIMEE CHAMBERS (DIRECTOR OF PLANNING / HARTFORD, CT)
SPRINGWHICH CELLULAR TOWER HOLDINGS LLC (Land Owner)

7019 0160 0001 0396 3088

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Woburn MA

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Aimee Chambers CTSAX041
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260 Constitution Plaza
City, State, ZIP+4®
Hartford CT 06103

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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909 Chestnut
City, State, ZIP+4®
St Louis MO 63101

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

| Printable Record Card | Previous Assessment | Condo
Info | Sales | Zoning | Comments |

WebPro

Card 1 of 1

Location 289-H MOUNTAIN ST	Property Account Number	Parcel ID 144-714-129
---------------------------------------	-------------------------	------------------------------

Old Parcel ID **I-E PEN 16-1**

Current Property Mailing Address

Owner SPRINGWHICH CELLULAR TOWER HOLDINGS LLC	City ST LOUIS
Address 909 CHESTNUT, RM 36-M-1 AT & T MOBILITY LLC	State MO Zip 63101 Zoning CAMP

Current Property Sales Information

Sale Date 7/7/2003	Legal Reference 04797-0166
Sale Price 0	Grantor(Seller) METROPOLITAN DISTR BUREAU OF

Current Property Assessment

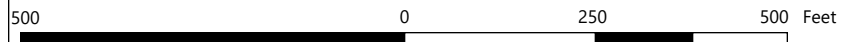
	<u>Card 1 Value</u>
Year 2019	Building Value 18,970
	Xtra Features Value 0
Land Area -	Land Value 0
	Total Value 18,970

Narrative Description

This property contains - of land mainly classified as **OTHER UTILTY** with a(n) **MFG/PROCE**
style building, built about **1984**, having **Brick** exterior and **Membrane** roof cover with 0



City of Hartford - Property Map



The planimetric and topographic information depicted on this map was compiled by The Sanbor Map Company and is based on an aerial flight performed in April 2015. In addition, the City's GIS staff has been updating limited planimetric features on a yearly basis. The intent of this map is to depict a graphical representation of real property information relative to the planimetric features for the City of Hartford and is subject to change as a more accurate survey may disclose. The City of Hartford and the mapping company assume no legal responsibility for the information contained in this data. THIS MAP IS NOT TO BE USED FOR THE TRANSFER OF PROPERTY



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

Sprint Existing Facility

Site ID: CT52XC041

HRFR - South
Mountain Street
Hartford, Connecticut 06106

December 5, 2019

EBI Project Number: 6219006118

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	45.47%

December 5, 2019

Sprint

Attn: RF Engineering Manager

1 International Boulevard, Suite 800

Mahwah, New Jersey 07495

Emissions Analysis for Site: CT52XC041 - HRFR - South

EBI Consulting was directed to analyze the proposed Sprint facility located at **Mountain Street** in **Hartford, Connecticut** 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.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately $400 \mu\text{W}/\text{cm}^2$ and $467 \mu\text{W}/\text{cm}^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency 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 Mountain Street in Hartford, Connecticut 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 manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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) 4 CDMA channels (800 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 50 Watts per Channel.
- 2) 4 PCS channels (1900 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 45 Watts per Channel.
- 3) 3 BRS channels (2500 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 4) 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.

- 5) 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 manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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.
- 6) The antennas used in this modeling are the Nokia MAA-AAHC for the 2500 MHz channel(s), the Commscope NNVV-65B-R4 for the 800 MHz / 1900 MHz channel(s) in Sector A, the Nokia MAA-AAHC for the 2500 MHz channel(s), the Commscope NNVV-65B-R4 for the 800 MHz / 1900 MHz channel(s) in Sector B, the Nokia MAA-AAHC for the 2500 MHz channel(s), the Commscope NNVV-65B-R4 for the 800 MHz / 1900 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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.
- 7) The antenna mounting height centerline of the proposed antennas is 112 feet above ground level (AGL).
- 8) 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.
- 9) All calculations were done with respect to uncontrolled / general population threshold limits.

Sprint Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Nokia MAA-AAHC	Make / Model:	Nokia MAA-AAHC	Make / Model:	Nokia MAA-AAHC
Frequency Bands:	2500 MHz	Frequency Bands:	2500 MHz	Frequency Bands:	2500 MHz
Gain:	13.05 dBd	Gain:	13.05 dBd	Gain:	13.05 dBd
Height (AGL):	112 feet	Height (AGL):	112 feet	Height (AGL):	112 feet
Channel Count:	3	Channel Count:	3	Channel Count:	3
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	2,422.04	ERP (W):	2,422.04	ERP (W):	2,422.04
Antenna A1 MPE %:	0.69%	Antenna B1 MPE %:	0.69%	Antenna C1 MPE %:	0.69%
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4
Frequency Bands:	800 MHz / 1900 MHz	Frequency Bands:	800 MHz / 1900 MHz	Frequency Bands:	800 MHz / 1900 MHz
Gain:	12.35 dBd / 15.05 dBd	Gain:	12.35 dBd / 15.05 dBd	Gain:	12.35 dBd / 15.05 dBd
Height (AGL):	112 feet	Height (AGL):	112 feet	Height (AGL):	112 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts
ERP (W):	9,193.83	ERP (W):	9,193.83	ERP (W):	9,193.83
Antenna A2 MPE %:	3.50%	Antenna B2 MPE %:	3.50%	Antenna C2 MPE %:	3.50%

Site Composite MPE %	
Carrier	MPE %
Sprint (Max at Sector A):	4.19%
AT&T	14.53%
Metro PCS	2.97%
Town of W. Hartford	0.98%
T-Mobile	8.22%
Verizon	14.51%
Clearwire	0.07%
Site Total MPE % :	45.47%

Sprint MPE % Per Sector	
Sprint Sector A Total:	4.19%
Sprint Sector B Total:	4.19%
Sprint Sector C Total:	4.19%
Site Total MPE % :	45.47%

Sprint Maximum MPE 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 2500 MHz BRS	3	807.35	112.0	6.94	2500 MHz BRS	1000	0.69%
Sprint 800 MHz CDMA	4	858.95	112.0	9.85	800 MHz CDMA	533	1.85%
Sprint 1900 MHz PCS	4	1439.50	112.0	16.50	1900 MHz PCS	1000	1.65%
						Total:	4.19%

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

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:	4.19%
Sector B:	4.19%
Sector C:	4.19%
Sprint Maximum MPE % (Sector A):	4.19%
Site Total:	45.47%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **45.47%** 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.

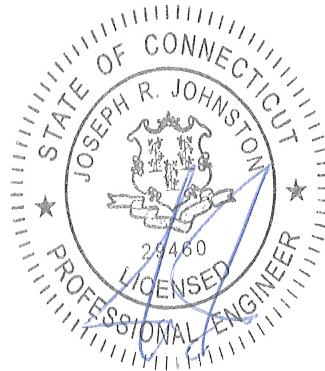
FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100%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

Mount Analysis Report

January 10, 2019

Site ID	CT52XC041
Site Name	HRFR – South
Client	Airosmith
Carrier	Sprint
Infinigy Job Number	526-104
Site Location	Mountain Street Hartford, CT 06106 41° 43' 35.65" N NAD83 72° 42' 29.41" W NAD83
Mount Centerline EL.	110.0 ft
Mount Classification	Platform
Mount Usage	56.2%
Overall Result	Pass

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



1/10/19

Kevin Berger Jr.

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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 17.0.2 analysis software.

Supporting Documentation

Colo App	Sprint Site ID #CT52XC041, dated April 4, 2018
Construction Drawing	Infinigy Engineering Job #526-104, dated December 20, 2018
Structural Analysis	ATC Site #302481, dated October 12, 2017

Analysis Code Requirements

Wind Speed	97 mph (3-Second Gust, V_{ASD}) / 125 mph (3-Second Gust, V_{ULT})
Wind Speed w/ ice	50 mph (3-Second Gust, V_{ASD}) w/ 1" ice
TIA Revision	ANSI/TIA-222-G
Adopted IBC	2015 IBC/ 2018 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 mount meets the specified TIA code requirements. The mounts and connections 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:

Kevin Berger Jr.
1033 Watervliet Shaker Road
Albany NY 12205
(O) 518-690-0790 | Structural@Infinigy.com

Final Configuration Loading

Mount CL (ft)	Rad. HT(ft)	Vert. O/S(ft)	Horiz. O/S(ft) ⁽¹⁾	Qty	Appurtenance ⁽²⁾	Carrier
110.0	110.0	0.0	6.3	3	Commscope NNVV-65B-R4	Sprint
			11.3	3	Nokia 2.5G MAA-AAHC	
			6.3, 11.3	6	Alcatel-Lucent 800 MHz 2x50 RRH	
			6.3	3	Alcatel-Lucent 1900 MHz 4x45	
			1.3	2	DragonWave A-ANT-11G-2.5-C	
			1.3	1	DragonWave A-ANT-23G-1-C	
			1.3	3	DragonWave Horizon Compact	

(1)Horizontal Offset is defined as the distance from the left most edge of the mount when viewed facing the tower.

(2)Radios are mounted behind antennas at respective locations see appended documents for vertical locations.

Structure Usages

Standoff	56.2%	Pass
Horizontal	27.5%	Pass
Mount Pipe	45.8%	Pass
Results	56.2%	Pass

Mount Connection Reactions

Reaction Data	Design Reactions	Analysis Reactions	Result
Max Tension (lbs)	19660.0	1244.1	6.3%
Max Shear (lbs)	12340.0	2764.4	22.4%
Unity Check	--	--	28.7%

*Assumed (2) 5/8" A307 Anchors. Contractor to field to verify anchor diameters prior to proper installation.

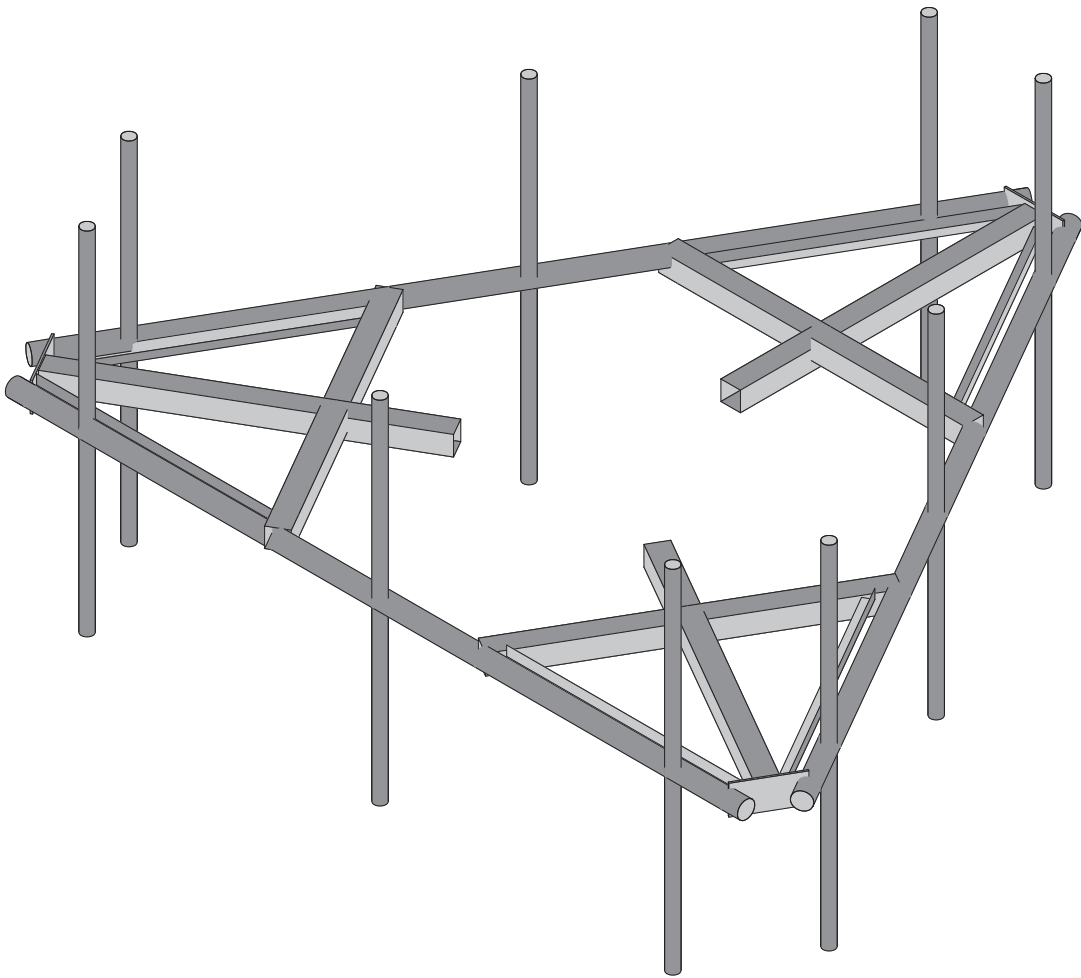
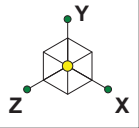
- Anchor reactions are acceptable when compared to manufacturer's listed capacities.

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.

KLB

526-104

CT52XC041

Final Configuration

Jan 10, 2019 at 10:43 AM

CT52XC041.r3d

Site Name: CT52XC041
 Client: Airosmith
 Carrier: Sprint
 Engineer: KLB
 Date: 1/10/2019



INFINIGY WIND LOAD CALCULATOR 3.0.2

Site Information Inputs:

Adopted Building Code: 2015 IBC
 Structure Load Standard: TIA-222-G
 Antenna Load Standard: TIA-222-G
 Structure Risk Category: II
 Structure Type: Mount - Platform
 Number of Sectors: 3
 Structure Shape 1: Round

Rooftop Inputs:

Rooftop Wind Speed-Up?: No

Wind Loading Inputs:

Design Wind Velocity: 97 mph (nominal 3-second gust)
 Wind Centerline 1 (z_1): 110.0 ft
 Side Face Angle (θ): 60 degrees
 Exposure Category: B
 Topographic Category: 1

Wind with No Ice		
q_z (psf)	Gh	F_{ST} (psf)
23.24	1.00	27.89

Wind with Ice		
q_z (psf)	Gh	F_{ST} (psf)
6.17	1.00	20.45

Ice Loading Inputs:

Is Ice Loading Needed?: Yes
 Ice Wind Velocity: 50 mph (nominal 3-second gust)
 Base Ice Thickness: 1.00 in

Input Appurtenance Information and Load Placements:

Appurtenance Name	Elevation (ft)	Total Quantity	K_a	Front Shape	Side Shape	q_z (psf)	EPA (ft^2)	Fz (lbs)	Fx (lbs)	Fz(60) (lbs)	Fx(30) (lbs)
Commscope NNVV-65B-R4	110.0	3	1.00	Flat	Flat	23.24	12.27	285.15	133.62	171.50	247.27
Nokia 2.5G MAA-AAHC	110.0	3	1.00	Flat	Flat	23.24	4.20	97.66	47.88	60.33	85.22
Alcatel-Lucent 800 MHz 2x50 RRH	110.0	3	1.00	Flat	Flat	23.24	2.06	47.83	31.64	35.69	43.78
Alcatel-Lucent 800 MHz 2x50 RRH	110.0	3	1.00	Flat	Flat	23.24	2.06	47.83	31.64	35.69	43.78
Alcatel-Lucent 1900 MHz 4x45 RRH	110.0	3	1.00	Flat	Flat	23.24	2.31	53.74	55.19	54.83	54.10
DragonWave A-ANT-11G-2.5-C	110.0	2	1.00	Round	Round	23.24	0.04	0.99	1.00	1.00	0.99
DragonWave A-ANT-23G-1-C	110.0	1	1.00	Round	Round	23.24	0.01	0.19	0.29	0.26	0.21
DragonWave Horizon Compact	110.0	3	1.00	Flat	Flat	23.24	0.36	8.46	8.46	8.46	8.46



Company : Infinigy Engineering, PLLC.
 Designer : KLB
 Job Number : 526-104
 Model Name : CT52XC041

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Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2			HSS 4"x4"x1/4"	Beam	None	A53 Gr.B	Typical
2	M2	N3	N4			Corner Plate	Beam	None	A53 Gr.B	Typical
3	M3	N5	N8			HSS 4"x4"x1/4"	Beam	None	A53 Gr.B	Typical
4	M4	N9	N10			Corner Plate	Beam	None	A53 Gr.B	Typical
5	M5	N6	N11			HSS 4"x4"x1/4"	Beam	None	A53 Gr.B	Typical
6	M6	N12	N13			Corner Plate	Beam	None	A53 Gr.B	Typical
7	M7	N16	N15			3" STD Pipe	Beam	None	A53 Gr.B	Typical
8	M8	N19	N18			3" STD Pipe	Beam	None	A53 Gr.B	Typical
9	M9	N22	N21			3" STD Pipe	Beam	None	A53 Gr.B	Typical
10	M10	N26	N27			HSS 4"x4"x1/4"	Beam	None	A53 Gr.B	Typical
11	M11	N28	N29			HSS 4"x4"x1/4"	Beam	None	A53 Gr.B	Typical
12	M12	N30	N31			HSS 4"x4"x1/4"	Beam	None	A53 Gr.B	Typical
13	M13	N33	N34			L2"x2"x1/8"	Beam	None	A36 Gr.36	Typical
14	M14	N32	N35		270	L2"x2"x1/8"	Beam	None	A36 Gr.36	Typical
15	M15	N37	N38			L2"x2"x1/8"	Beam	None	A36 Gr.36	Typical
16	M16	N36	N39		270	L2"x2"x1/8"	Beam	None	A36 Gr.36	Typical
17	M17	N41	N42			L2"x2"x1/8"	Beam	None	A36 Gr.36	Typical
18	M18	N40	N43		270	L2"x2"x1/8"	Beam	None	A36 Gr.36	Typical
19	MP1	N100	N101			2" STD Pipe	Beam	None	A53 Gr.B	Typical
20	MP2	N102	N103			2" STD Pipe	Beam	None	A53 Gr.B	Typical
21	MP3	N104	N105			2" STD Pipe	Beam	None	A53 Gr.B	Typical
22	MP7	N112	N113			2" STD Pipe	Beam	None	A53 Gr.B	Typical
23	MP8	N114	N115			2" STD Pipe	Beam	None	A53 Gr.B	Typical
24	MP9	N116	N117			2" STD Pipe	Beam	None	A53 Gr.B	Typical
25	MP4	N106	N107			2" STD Pipe	Beam	None	A53 Gr.B	Typical
26	MP5	N108	N109			2" STD Pipe	Beam	None	A53 Gr.B	Typical
27	MP6	N110	N111			2" STD Pipe	Beam	None	A53 Gr.B	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	Hot Rolled Steel				
2	A36 Gr.36	L2x2x2	6	303.1	0
3	A53 Gr.B	6"x0.37" Plate	3	36	0
4	A53 Gr.B	HSS4x4x4	6	374.3	.4
5	A53 Gr.B	PIPE 2.0	9	648	.2
6	A53 Gr.B	PIPE 3.0	3	450	.3
7	Total HR Steel		27	1811.4	.9

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...	Surface(P...
1	Self Weight	DL		-1			27	3	
2	Wind Load AZI 000	WLZ					27	1	
3	Wind Load AZI 090	WLX					27	1	
4	Ice Weight	OL1					27	27	3
5	Wind + Ice Load AZI ...	OL2					27	1	
6	Wind + Ice Load AZI ...	OL3					27	1	
7	Service Live 1	LL				6			
8	BLC 1 Transient Area...	None						60	
9	BLC 2 Transient Area...	None						26	
10	BLC 3 Transient Area...	None						22	
11	BLC 4 Transient Area...	None						60	
12	BLC 5 Transient Area...	None						26	
13	BLC 6 Transient Area...	None						22	



Company : Infinigy Engineering, PLLC.
 Designer : KLB
 Job Number : 526-104
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Load Combinations

	Description	Sol.	PD	SR	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.
1	1.4D	Yes	Y		DL	1.4								
2	1.2D + 1.6..	Yes	Y		DL	1.2	WLZ	1.6						
3	1.2D + 1.6..	Yes	Y		DL	1.2	WLZ	1.386	W...	.8				
4	1.2D + 1.6..	Yes	Y		DL	1.2	WLZ	.8	W...	1.386				
5	1.2D + 1.6..	Yes	Y		DL	1.2			W...	1.6				
6	1.2D + 1.6..	Yes	Y		DL	1.2	WLZ	-.8	W...	1.386				
7	1.2D + 1.6..	Yes	Y		DL	1.2	WLZ	-1.3...	W...	.8				
8	1.2D + 1.6..	Yes	Y		DL	1.2	WLZ	-1.6						
9	1.2D + 1.6..	Yes	Y		DL	1.2	WLZ	-1.3...	W...	-.8				
10	1.2D + 1.6..	Yes	Y		DL	1.2	WLZ	-.8	W...	-1.3...				
11	1.2D + 1.6..	Yes	Y		DL	1.2			W...	-1.6				
12	1.2D + 1.6..	Yes	Y		DL	1.2	WLZ	.8	W...	-1.3...				
13	1.2D + 1.6..	Yes	Y		DL	1.2	WLZ	1.386	W...	-.8				
14	0.9D + 1.6..	Yes	Y		DL	.9	WLZ	1.6						
15	0.9D + 1.6..	Yes	Y		DL	.9	WLZ	1.386	W...	.8				
16	0.9D + 1.6..	Yes	Y		DL	.9	WLZ	.8	W...	1.386				
17	0.9D + 1.6..	Yes	Y		DL	.9			W...	1.6				
18	0.9D + 1.6..	Yes	Y		DL	.9	WLZ	-.8	W...	1.386				
19	0.9D + 1.6..	Yes	Y		DL	.9	WLZ	-1.3...	W...	.8				
20	0.9D + 1.6..	Yes	Y		DL	.9	WLZ	-1.6						
21	0.9D + 1.6..	Yes	Y		DL	.9	WLZ	-1.3...	W...	-.8				
22	0.9D + 1.6..	Yes	Y		DL	.9	WLZ	-.8	W...	-1.3...				
23	0.9D + 1.6..	Yes	Y		DL	.9			W...	-1.6				
24	0.9D + 1.6..	Yes	Y		DL	.9	WLZ	.8	W...	-1.3...				
25	0.9D + 1.6..	Yes	Y		DL	.9	WLZ	1.386	W...	-.8				
26	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1						
27	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	1				
28	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	.5		
29	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	.866		
30	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1			OL3	1		
31	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	.866		
32	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	.5		
33	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	-.1				
34	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	-.5		
35	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	-.866		
36	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1			OL3	-.1		
37	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	-.866		
38	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	-.5		
39	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	.111				
40	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	.096	W...	.056		
41	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	.056	W...	.096		
42	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5			W...	.111		
43	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	-.056	W...	.096		
44	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	-.096	W...	.056		
45	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	-.111				
46	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	-.096	W...	-.056		
47	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	-.056	W...	-.096		
48	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5			W...	-.111		
49	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	.056	W...	-.096		
50	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	.096	W...	-.056		



Company : Infinigy Engineering, PLLC.
 Designer : KLB
 Job Number : 526-104
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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	N6	max	1205.343	17	2723.89	36	959.757	14	6427.648	45	2218.995	11	216.702	34
2		min	-1205.343	23	706.93	17	-959.757	8	1695.886	14	-2219.933	5	19.838	23
3	N5	max	1036.196	4	2662.914	33	1244.079	14	-394.736	20	971.551	7	5072.077	30
4		min	-1035.783	22	620.683	14	-1244.136	8	-3227.235	39	-970.468	25	596.72	23
5	N1	max	1115.735	18	2764.351	27	1099.446	2	-484.797	14	897.473	15	-832.151	23
6		min	-1116.222	12	674.925	20	-1099.389	20	-3201.4	45	-898.888	9	-5361.779	30
7	Totals:	max	3236.708	17	8127.476	38	3303.275	2						
8		min	-3236.708	23	2091.448	19	-3303.275	8						

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

Member	Shape	Code Check	Loc[in]	LC	Shear	Loc[in]	Dir	LC	phi*Pnc	phi*Pnt	phi*Mn	phi*Mn	Cb	Eqn	
1	M5	HSS4x4x4	.562	0	30	.115	0	y	33	101755...	106155	12311.25	12311.25	1	H1-1b
2	M1	HSS4x4x4	.517	0	29	.113	0	y	28	101755...	106155	12311.25	12311.25	1	H1-1b
3	M3	HSS4x4x4	.504	0	31	.125	0	y	38	101755...	106155	12311.25	12311.25	1	H1-1b
4	MP2	PIPE 2.0	.458	36	8	.035	36		20	20866.7...	32130	1871.625	1871.625	1...	H1-1b
5	MP8	PIPE 2.0	.406	36	11	.032	36		23	20866.7...	32130	1871.625	1871.625	1...	H1-1b
6	MP5	PIPE 2.0	.405	36	5	.032	36		17	20866.7...	32130	1871.625	1871.625	1...	H1-1b
7	M16	L2x2x2	.361	50.52	4	.015	50.52	z	5	6508.508	15908.4	402.563	799.795	2...	H2-1
8	M15	L2x2x2	.308	50.52	6	.015	50.52	y	6	6508.508	15908.4	402.563	812.386	2...	H2-1
9	M14	L2x2x2	.306	50.52	12	.014	50.52	z	38	6508.508	15908.4	402.563	801.073	2...	H2-1
10	M7	PIPE 3.0	.275	53.125	11	.154	75		4	59302.8...	65205	5748.75	5748.75	1	H1-1b
11	M17	L2x2x2	.270	50.52	10	.015	50.52	y	35	6508.508	15908.4	402.563	814.749	2...	H2-1
12	M9	PIPE 3.0	.268	96.875	11	.154	75		12	59302.8...	65205	5748.75	5748.75	1	H1-1b
13	M10	HSS4x4x4	.230	31.26	35	.135	3.907	y	10	103885...	106155	12311.25	12311.25	1	H1-1b
14	M11	HSS4x4x4	.228	31.26	27	.129	58.6...	y	4	103885...	106155	12311.25	12311.25	1	H1-1b
15	M13	L2x2x2	.220	50.52	9	.013	50.52	y	27	6508.508	15908.4	402.563	803.313	2...	H2-1
16	M12	HSS4x4x4	.218	31.26	33	.136	3.907	y	6	103885...	106155	12311.25	12311.25	1	H1-1b
17	M18	L2x2x2	.204	50.52	33	.013	50.52	z	38	6508.508	15908.4	402.563	772.305	1...	H2-1
18	M4	6"x0.37" Pl...	.189	6	9	.323	12	y	6	32988.6...	69930	539.044	8741.25	1...	H1-1b
19	M8	PIPE 3.0	.184	54.688	28	.036	54.6...		27	59302.8...	65205	5748.75	5748.75	1	H1-1b
20	M2	6"x0.37" Pl...	.160	6	7	.319	3.875	y	10	32988.6...	69930	539.044	8741.25	1...	H1-1b
21	M6	6"x0.37" Pl...	.124	6	3	.420	4	y	5	32988.6...	69930	539.044	8741.25	1...	H1-1b
22	MP1	PIPE 2.0	.110	36	8	.019	36		8	20866.7...	32130	1871.625	1871.625	1...	H1-1b
23	MP7	PIPE 2.0	.102	36	11	.017	36		11	20866.7...	32130	1871.625	1871.625	1...	H1-1b
24	MP4	PIPE 2.0	.101	36	5	.017	36		5	20866.7...	32130	1871.625	1871.625	1...	H1-1b
25	MP3	PIPE 2.0	.030	36	6	.004	36		6	20866.7...	32130	1871.625	1871.625	1...	H1-1b
26	MP6	PIPE 2.0	.030	36	13	.004	36		13	20866.7...	32130	1871.625	1871.625	1...	H1-1b
27	MP9	PIPE 2.0	.029	36	9	.004	36		9	20866.7...	32130	1871.625	1871.625	1...	H1-1b



DEPARTMENT OF ADMINISTRATIVE SERVICES

December 12, 2019

Art Perkowski, Site Acquisition Specialist
Airosmith Development
32 Clinton Street
Saratoga Springs, NY 12866

Re: Structural Analysis Report for Site #CT52XC041
289 Mountain Road, Hartford, CT

Mr. Perkowski,

Based on the Structural Analysis Report by American Tower Corporation, dated October 1, 2019, the proposed additions to this tower comply with the structural requirements of the 2018 Connecticut State Building Code.

If you have any questions you may contact me as 860-713-5900.

Sincerely,

A handwritten signature in blue ink, appearing to read "JCassidy".

Joseph V. Cassidy, P.E.
State Building Inspector



AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure : 110 ft Monopole
ATC Site Name : Hrfr - South, CT
ATC Asset Number : 302481
Engineering Number : OAA713366_C3_13
Proposed Carrier : CLEARWIRE CORPORATION
Carrier Site Name : Hrfr - South
Carrier Site Number : CT52XC041
Site Location : 289 Mountain Street
Hartford, CT 06106-4121
41.726600,-72.708200
County : Hartford
Date : October 1, 2019
Max Usage : 100%
Result : Pass

Prepared By:
Cole Melody Koffi
Structural Engineer I

Reviewed By:

COA: PEC.0001553



Table of Contents

Introduction	1
Supporting Documents	1
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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 110 ft monopole to reflect the change in loading by CLEARWIRE CORPORATION.

Supporting Documents

Tower Drawings	Mapped by Smith Cullum Site #CT-0017(A), dated June 6, 2001
Foundation Drawing	Girard & Co Engineering Job #39902, dated April 29, 1988
Geotechnical Report	TEP Project #071162.01, dated July 23, 2007
Modifications	ATC Project #42719232, dated January 12, 2009 ATC Project #43595333, dated July 1, 2009 ATC Project #43930034, dated September 15, 2009 ATC Project #44662232, dated March 30, 2010 ATC Project #OAA739695_C6_06, dated February 25, 2019 (Pending)

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.

Basic Wind Speed:	118 mph (3-Second Gust)
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 1-1/2" radial ice concurrent
Code:	ANSI/TIA-222-H / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	B
Risk Category:	II
Topographic Factor Procedure:	Method 3
Topographic Category:	4
Crest Height (H):	36 ft
Spectral Response:	$S_s = 0.19, S_1 = 0.05$
Site Class:	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. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.



Existing and Reserved Equipment

Elev. ¹ (ft)	Qty	Antenna	Mount Type	Lines	Carrier
110.0	1	DragonWave Horizon Compact	-	(1) 1/2" Coax	CLEARWIRE CORPORATION
102.0	1	CCI TPA-65R-LCUUUU-H8	Platform with Handrails	(2) 0.39" Fiber Trunk (6) 0.78" 8 AWG 6 (12) 1 5/8" Coax (1) 3" conduit	AT&T MOBILITY
	6	Powerwave Allgon 7020.00 Dual Band RET			
	1	Kathrein Scala 80010966			
	2	Kathrein Scala 80010965			
	6	Powerwave Allgon LGP21401			
	1	Raycap DC6-48-60-0-8F (24" Height)			
	2	Raycap DC6-48-60-18-8F(32.8 lbs)			
	3	Ericsson RRUS 4426 B66			
	3	Ericsson RRUS 4478 B5			
	3	Ericsson RRUS 4478 B14			
	3	Ericsson RRUS-11 (50 lbs.)			
	3	Ericsson RRUS 32 B2			
	3	Ericsson RRUS-32 (77 lbs)			
	3	Powerwave Allgon 7770.00			
	2	Quintel QS66512-2			
	2	CCI OPA-65R-LCUU-H6			
	1	CCI OPA-65R-LCUU-H8 (92.7")			
6	Kaelus DBCT108F1V92-1	Low Profile Platform	(3) 1 1/4" Fiber (18) 1 5/8" Coax	T-MOBILE	
6	CCI TPX-070821				
3	Ericsson Radio 4449 B12,B71				
3	Ericsson KRY 112 489/1				
3	Ericsson KRY 112 144/1				
3	Kathrein Scala Smart Bias Tee				
3	Ericsson AIR32 B66Aa/B2a				
3	RFS APXVAARR24_43-U-NA20				
3	Ericsson Air 3246 B66	Low Profile Platform	(12) 1 5/8" Coax (2) 1 5/8" Hybriflex	VERIZON WIRELESS	
1	Raycap RVZDC-6627-PF-48				
6	Commscope JAHH-65B-R3B (63.3 lb)				
3	Nokia AirScale RRH 4T4R B5 160W AHCA				
3	Alcatel-Lucent B25 RRH4x30				
3	Alcatel-Lucent B13 RRH4x30-4R				
3	Alcatel-Lucent B66A RRH 4x45	Stand-Offs	(1) 7/8" Coax	TOWN OF WEST HARTFORD	
77.0	TX RX Systems 421-86A-10-18-12-N				
77.0	Scala 840 10212	Side Arms	(6) 1 5/8" Coax	METRO PCS INC	
70.0	RFS APXV18-206517S-C				
60.0	1	Scala 840 10212	Stand-Offs	(2) 0.41" LMR-400 (1) 7/8" Coax	TOWN OF WEST HARTFORD
	1	Radio Waves SP2-4.7			



Equipment to be Removed

Elev. ¹ (ft)	Qty	Antenna	Mount Type	Lines	Carrier
110.0	2	DragonWave Horizon Compact	Side Arms	(2) 1/2" Coax (6) 5/16" Coax	CLEARWIRE CORPORATION
	1	DragonWave A-ANT-23G-1-C			
	2	DragonWave A-ANT-11G-2.5-C			
	3	Argus LLPX310R			
	3	NextNet BTS-2500			

Proposed Equipment

Elev. ¹ (ft)	Qty	Antenna	Mount Type	Lines	Carrier
112.0	1	Generic 12" x 12" Junction Box	Low Profile Platform	(3) 1 5/8" Fiber (1) 2" conduit	CLEARWIRE CORPORATION
	6	Alcatel-Lucent RRH2x50-08			
	3	Alcatel-Lucent 1900 MHz 4X45 RRH			
	3	Nokia 2.5G MAA - AAHC(64T64R)			
	3	Commscope NNVV-65B-R4			
110.0	1	Andrew VHLP2-11			

¹ Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.

Install proposed lines inside the pole shaft.



Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	44%	Pass
Shaft	95%	Pass
Base Plate	87%	Pass
Flanges	10%	Pass
Reinforcement	92%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	1,882.1	97%
Axial (Kips)	40.2	15%
Shear (Kips)	25.5	100%

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) (°)
110.0	Generic 12" x 12" Junction Box	CLEARWIRE CORPORATION	1.462	1.391
	Alcatel-Lucent RRH2x50-08			
	Alcatel-Lucent 1900 MHz 4X45 RRH			
	Nokia 2.5G MAA - AAHC(64T64R)			
	Andrew VHLP2-11			
60.0	Commscope NNVV-65B-R4	TOWN OF WEST HARTFORD	0.449	0.888
	Radio Waves SP2-4.7			

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



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

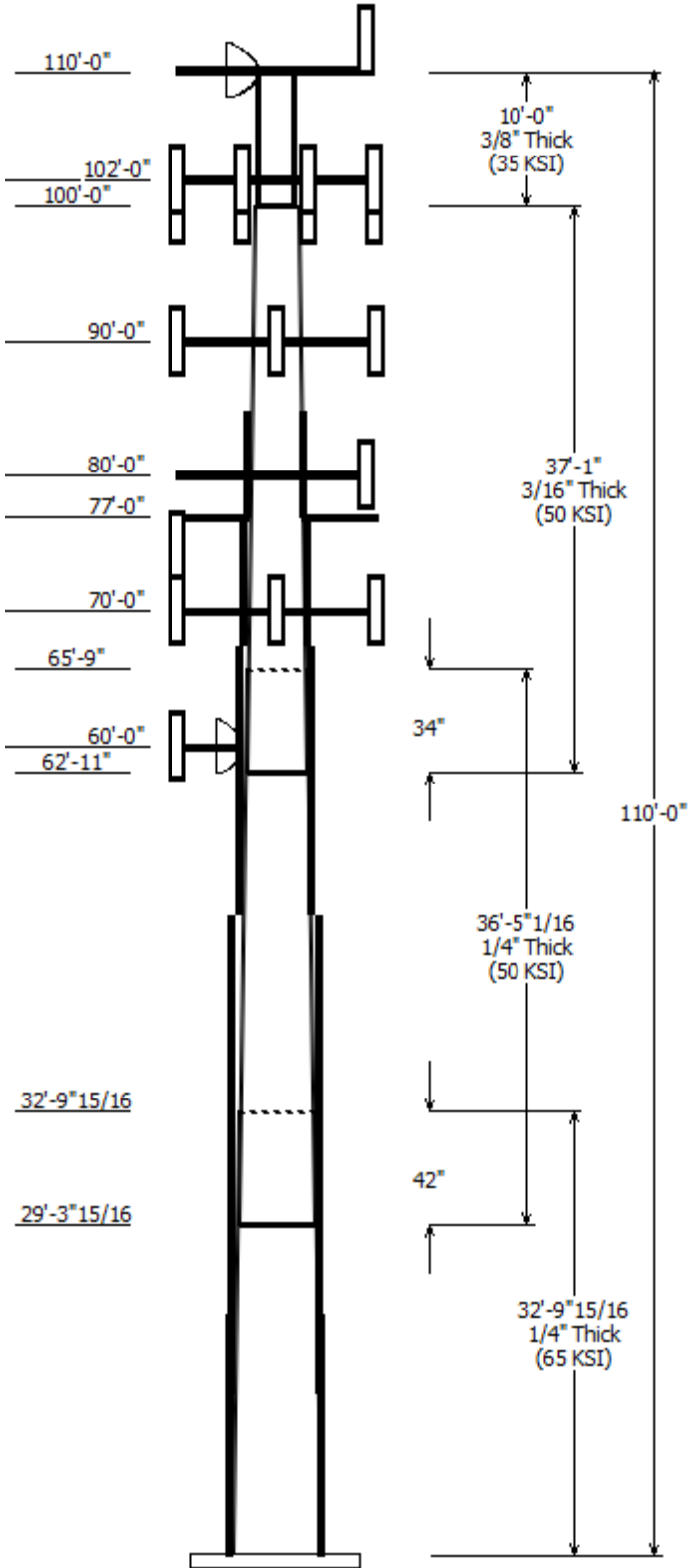
It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

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	
Client : CLEARWIRE CORPORATION	
Pole : 302481	Code: ANSI/TIA-222-H
Location : Hrfr - South, CT	
Description : 110 ft ITT Meyer Mono Pole	Risk Category : II
Shape : 12 Sides	Exposure : B
Height : 110.00 (ft)	Topo Method : Method 3
Base Elev (ft): 0.00	Topographic Category : 4
Taper: 0.16400@in/ft	



Sections Properties						
Shaft Section	Length (ft)	Diameter (in)		Thick Joint (in)	Overlap Length (in)	Steel Grade
		Across Flats Top	Across Flats Bottom			
1	32.830	24.62	30.00	0.250	0.000	12 Sides 65
2	36.420	19.73	25.69	0.250	42.000	12 Sides 50
3	37.083	14.50	20.57	0.188	34.000	12 Sides 50
4	10.000	12.75	12.75	0.375	0.000	Round 35

Discrete Appurtenance			
Attach Elev (ft)	Force Elev (ft)	Qty	Description
110.000	112.000	3	Commscope NNVV-65B-R4
110.000	112.000	3	Nokia 2.5G MAA -
110.000	112.000	3	Alcatel-Lucent 1900 MHz 4X45
110.000	112.000	6	Alcatel-Lucent RRH2x50-08
110.000	112.000	1	Generic 12" x 12" Junction Box
110.000	110.000	1	Andrew VHLP2-11
110.000	110.000	1	DragonWave Horizon Compact
110.000	110.000	1	Flat Low Profile Platform
102.000	102.000	1	Kathrein Scala 80010966
102.000	102.000	2	Kathrein Scala 80010965
102.000	100.000	1	CCI TPA-65R-LCUUUU-H8
102.000	100.000	1	CCI OPA-65R-LCUU-H8 (92.7")
102.000	100.000	2	CCI OPA-65R-LCUU-H6
102.000	100.000	2	Quintel QS66512-2
102.000	100.000	3	Powerwave Allgon 7770.00
102.000	100.000	3	Ericsson RRUS-32 (77 lbs)
102.000	100.000	3	Ericsson RRUS 32 B2
102.000	100.000	3	Ericsson RRUS-11 (50 lbs.)
102.000	102.000	3	Ericsson RRUS 4478 B14
102.000	102.000	3	Ericsson RRUS 4478 B5
102.000	102.000	3	Ericsson RRUS 4426 B66
102.000	100.000	2	Raycap DC6-48-60-18-8F(32.8 lb
102.000	102.000	1	Raycap DC6-48-60-0-8F (24" Hei
102.000	100.000	6	Powerwave Allgon LGP21401
102.000	102.000	6	Kaelus DBCT108F1V92-1
102.000	100.000	6	CCI TPX-070821
102.000	102.000	6	Powerwave Allgon 7020.00
102.000	102.000	1	Flat Platform w/ Handrails
90.000	90.000	3	RFS APXVAARR24_43-U-NA20
90.000	90.000	3	Ericsson Air 3246 B66
90.000	90.000	3	Ericsson AIR32 B66Aa/B2a
90.000	90.000	3	Ericsson Radio 4449 B12,B71
90.000	90.000	3	Ericsson KRY 112 489/1
90.000	90.000	3	Ericsson KRY 112 144/1
90.000	90.000	3	Kathrein Scala Smart Bias Tee
90.000	90.000	1	Flat Low Profile Platform
80.000	80.000	6	Commscope JAHH-65B-R3B
80.000	80.000	1	Raycap RVZDC-6627-PF-48
80.000	80.000	3	Alcatel-Lucent B66A RRH 4x45
80.000	80.000	3	Alcatel-Lucent B13 RRH4x30-4R
80.000	80.000	3	Alcatel-Lucent B25 RRH4x30
80.000	80.000	3	Nokia AirScale RRH 4T4R B5 160
80.000	80.000	1	Round Low Profile Platform
77.000	75.000	1	TX RX Systems 421-86A-10-18-

77.000	75.000	1	Scala 840 10212
77.000	77.000	2	Stand Offs
70.000	70.000	3	RFS APXV18-206517S-C
70.000	70.000	3	Round Side Arms
60.000	60.000	1	Scala 840 10212
60.000	60.000	1	Generic Radio/ODU
60.000	60.000	1	Stand Off
60.000	60.000	1	Radio Waves SP2-4.7

Linear Appurtenance

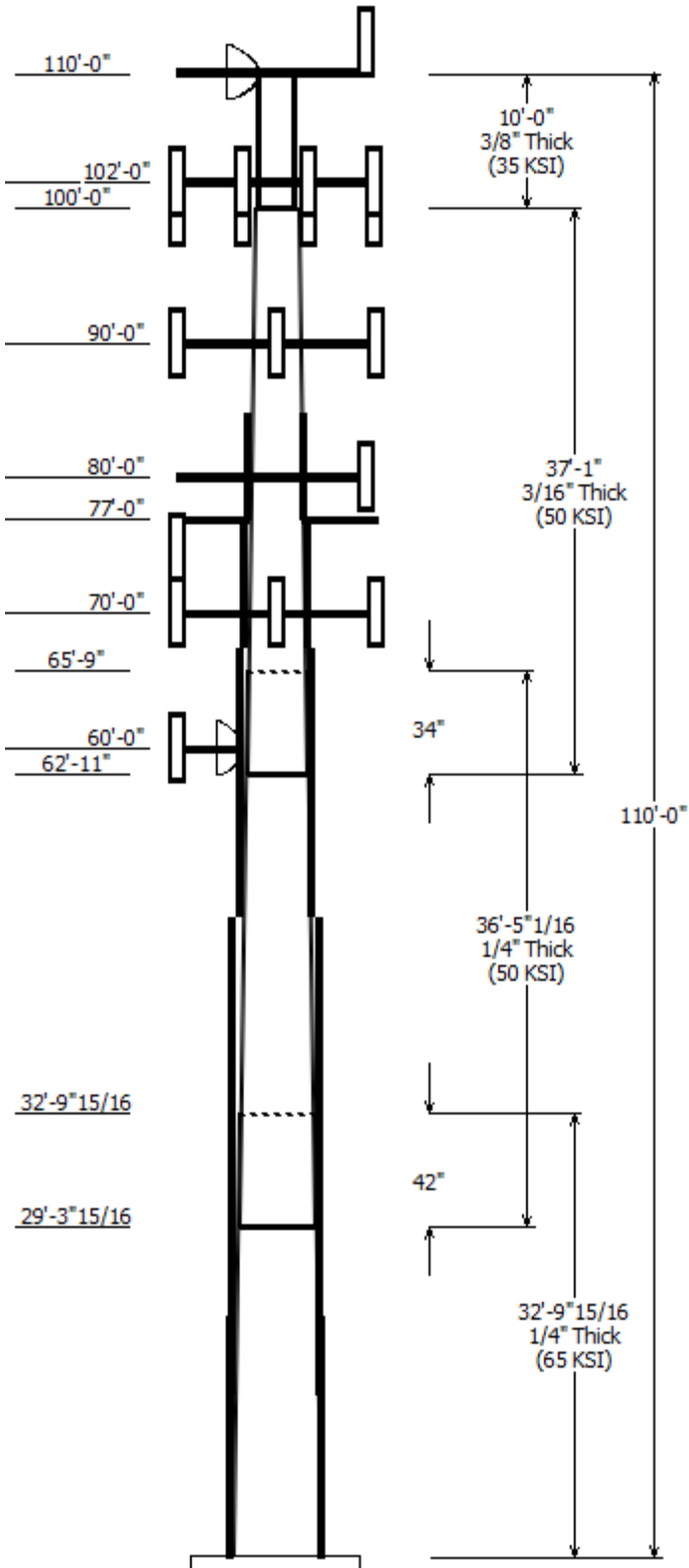
Elev (ft)		Description	Exposed To Wind
From	To		
75.000	87.000	PL 5" x 1.25"	Yes
75.000	87.000	PL 5" x 1.25"	Yes
75.000	87.000	PL 5" x 1.25"	Yes
75.000	87.000	PL 5" x 1.25"	Yes
0.000	90.000	1 1/4" (1.25"-	No
0.000	90.000	1 5/8" Coax	Yes
0.000	102.0	0.39" (10mm)	No
0.000	102.0	0.39" (10mm)	Yes
0.000	102.0	0.78" (19.7mm) 8	Yes
0.000	102.0	0.78" (19.7mm) 8	No
0.000	102.0	1 5/8" Coax	Yes
0.000	102.0	1 5/8" Coax	No
0.000	102.0	3" conduit	No
0.000	110.0	1/2" Coax	Yes
0.000	112.0	1 5/8" (1.63"-	No
0.000	112.0	2" conduit	No
0.000	20.000	PL 6 x 1.25	Yes
0.000	20.000	PL 6 x 1.25	Yes
0.000	20.000	PL 6 x 1.25	Yes
0.000	20.000	PL 6 x 1.25	Yes
0.000	60.000	0.41" (10.3mm)	Yes
0.000	60.000	7/8" Coax	Yes
0.000	70.000	1 5/8" Coax	Yes
0.000	77.000	7/8" Coax	Yes
0.000	80.000	1 5/8" Coax	No
0.000	80.000	1 5/8" Hybriflex	Yes
0.000	81.000	#20 DYWIDAG	Yes
0.000	81.000	#20 DYWIDAG	Yes
0.000	81.000	#20 DYWIDAG	Yes
0.000	81.000	#20 DYWIDAG	Yes

Load Cases

1.2D + 1.0W	118 mph with No Ice
0.9D + 1.0W	118 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 1.50 in Radial Ice
1.2D + 1.0Ev + 1.0Eh	Seismic
0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)
1.0D + 1.0W	Serviceability 60 mph

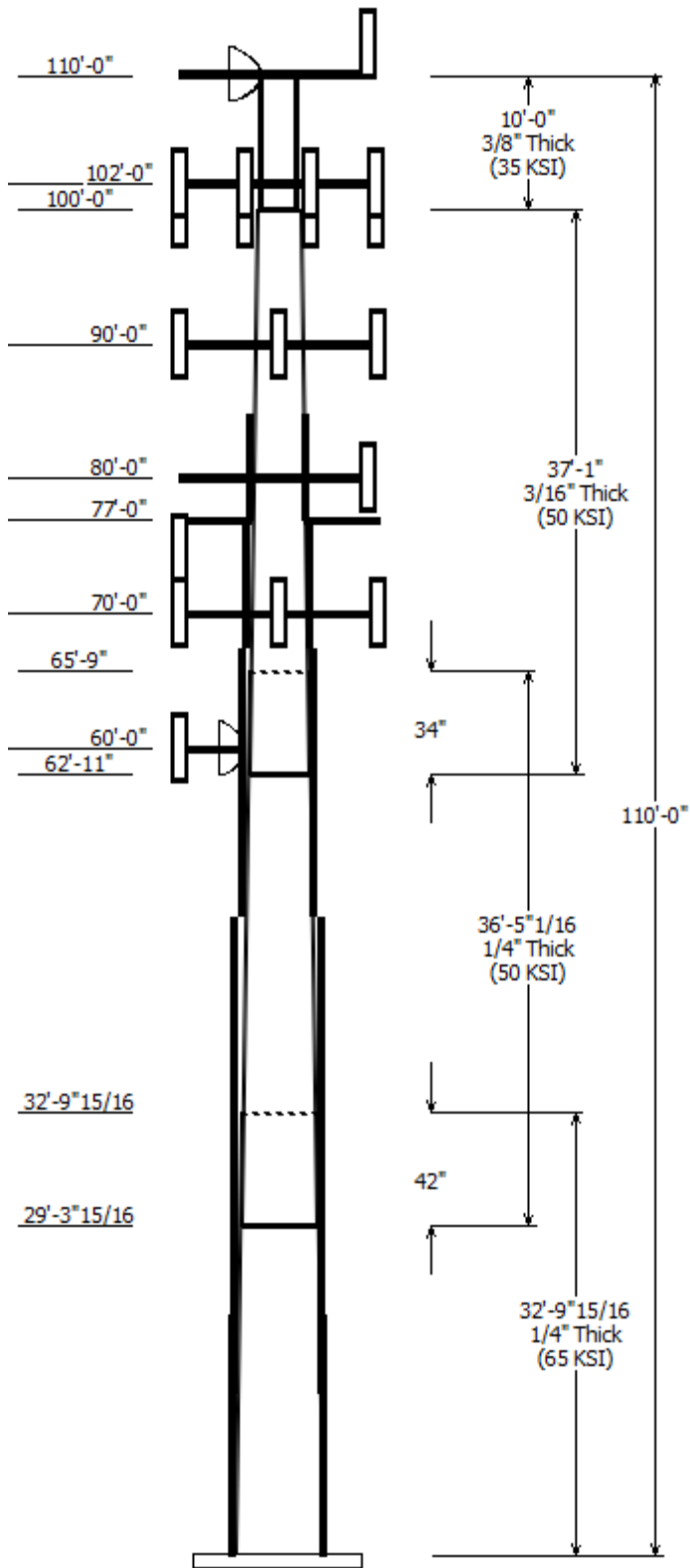
Reactions

Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.0W	1882.14	25.53	40.18
0.9D + 1.0W	1851.87	25.50	30.12
1.2D + 1.0Di + 1.0Wi	571.08	7.50	72.69
1.2D + 1.0Ev + 1.0Eh	95.99	1.01	39.66
0.9D - 1.0Ev + 1.0Eh	93.95	1.01	27.45
1.0D + 1.0W	433.18	5.95	33.53

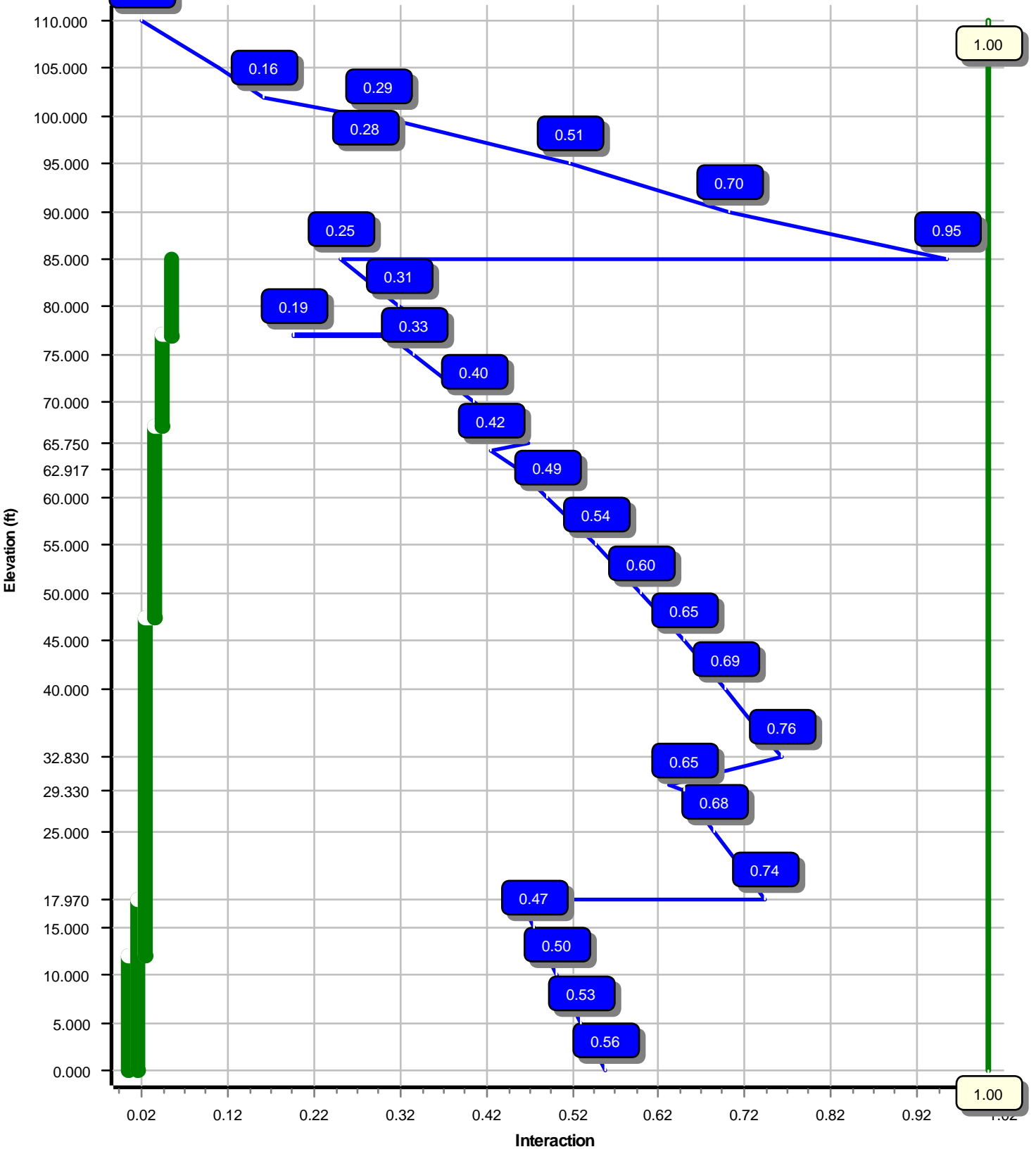


Dish Deflections

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W	60.00	5.389	0.888
1.0D + 1.0W	110.00	17.550	1.391



Load Case : 1.2D + 1.0W
Max Ratio 95.22% at 85.0 ft



Site Number: 302481

Code: ANSI/TIA-222-H

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Site Name: Hrfr - South, CT

Engineering Number: OAA713366_C3_13

10/1/2019 7:40:23 AM

Customer: CLEARWIRE CORPORATION

Analysis Parameters

Location :	Hartford County, CT	Height (ft) :	110
Code :	ANSI/TIA-222-H	Base Diameter (in) :	30.00
Shape :	12 Sides, Sect 4: Round	Top Diameter (in) :	12.75
Pole Type :	Custom	Taper (in/ft) :	0.164
Pole Manufacturer :	ITT Meyer	Rotation (deg) :	0.00
Kd (non-service) :	0.95	Ke :	0.99

Ice & Wind Parameters

Exposure Category:	B	Design Wind Speed Without Ice:	118 mph
Risk Category:	II	Design Wind Speed With Ice:	50 mph
Topographic Factor Procedure:	Method 3	Operational Wind Speed:	60 mph
Topographic Category:	4	Design Ice Thickness:	1.50 in
Crest Height:	36 ft	HMSL:	286.00 ft

Seismic Parameters

Analysis Method:	Equivalent Lateral Force Method		
Site Class:	D - Stiff Soil		
Period Based on Rayleigh Method (sec):	2.43		
T _L (sec):	6	p:	1
S _s :	0.192	S ₁ :	0.055
F _a :	1.600	F _v :	2.400
S _{ds} :	0.205	S _{d1} :	0.088
		C _s :	0.030
		C _s Max:	0.030
		C _s Min:	0.030

Load Cases

1.2D + 1.0W	118 mph with No Ice
0.9D + 1.0W	118 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 1.50 in Radial Ice
1.2D + 1.0Ev + 1.0Eh	Seismic
0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)
1.0D + 1.0W	Serviceability 60 mph

Site Number: 302481

Code: ANSI/TIA-222-H

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Site Name: Hrfr - South, CT

Engineering Number: OAA713366_C3_13

10/1/2019 7:40:23 AM

Customer: CLEARWIRE CORPORATION

Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Slip		Weight (lb)	Bottom						Top						
				Joint Type	Joint Len (in)		Dia (in)	Elev (ft)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Taper (in/ft)
1-12	32.830	0.2500	65		0.00	2,434	30.00	0.00	23.95	2705.5	29.47	120.00	24.62	32.83	19.62	1487.9	23.71	98.50	0.163750
2-12	36.420	0.2500	50	Slip	42.00	2,241	25.69	29.33	20.49	1693.2	24.86	102.79	19.73	65.75	15.68	759.9	18.47	78.93	0.163750
3-12	37.083	0.1875	50	Slip	34.00	1,322	20.57	62.92	12.31	652.8	26.72	109.72	14.50	100.00	8.64	225.9	18.04	77.33	0.163750
4-R	10.000	0.3750	35	Butt	0.00	496	12.75	100.00	14.58	279.3	0.00	34.00	12.75	110.00	14.58	279.3	0.00	34.00	0.000000
Shaft Weight						6,493													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	Ka	Vert Ecc (ft)	Weight (lb)	No Ice EPAa (sf)	Orientation Factor	Weight (lb)	Ice EPAa (sf)	Orientation Factor
110.00	DragonWave Horizon Compact	1	0.80	0.000	10.60	0.720	0.50	32.51	1.274	0.50
110.00	Generic 12" x 12" Junction Box	1	0.80	2.000	10.00	1.200	0.50	50.59	1.907	0.50
110.00	Alcatel-Lucent RRH2x50-08	6	0.80	2.000	52.90	1.700	0.50	110.65	2.540	0.50
110.00	Alcatel-Lucent 1900 MHz 4X45	3	0.80	2.000	60.00	2.320	0.50	138.53	3.372	0.50
110.00	Nokia 2.5G MAA - AAHC(64T64R)	3	0.80	2.000	103.60	4.200	0.64	213.45	5.506	0.64
110.00	Andrew VHLP2-11	1	1.00	0.000	27.00	4.680	1.00	122.17	5.919	1.00
110.00	Commscope NNVV-65B-R4	3	0.80	2.000	77.40	12.270	0.64	322.25	15.002	0.64
110.00	Flat Low Profile Platform	1	1.00	0.000	1,500.00	17.490	1.00	2,131.34	29.957	1.00
102.00	Powerwave Allgon 7020.00 Dual	6	0.75	0.000	2.20	0.340	0.50	12.11	0.738	0.50
102.00	CCI TPX-070821	6	0.75	-2.000	7.50	0.470	0.50	19.26	0.936	0.50
102.00	Kaelus DBCT108F1V92-1	6	0.75	0.000	13.90	0.630	0.50	38.31	1.157	0.50
102.00	Powerwave Allgon LGP21401	6	0.75	-2.000	14.10	1.100	0.50	38.30	1.790	0.50
102.00	Raycap DC6-48-60-0-8F (24"	1	0.75	0.000	32.80	1.470	0.50	136.69	2.147	0.50
102.00	Raycap DC6-48-60-18-8F(32.8	2	0.75	-2.000	32.80	1.470	0.50	92.64	2.147	0.50
102.00	Ericsson RRUS 4426 B66	3	0.75	0.000	48.40	1.650	0.50	91.70	2.474	0.50
102.00	Ericsson RRUS 4478 B5	3	0.75	0.000	59.90	1.840	0.50	113.53	2.709	0.50
102.00	Ericsson RRUS 4478 B14	3	0.75	0.000	59.40	2.020	0.50	118.93	2.935	0.50
102.00	Ericsson RRUS-11 (50 lbs.)	3	0.75	-2.000	50.00	2.570	0.50	116.12	3.588	0.50
102.00	Ericsson RRUS 32 B2	3	0.75	-2.000	53.00	2.740	0.50	124.34	3.873	0.50
102.00	Ericsson RRUS-32 (77 lbs)	3	0.75	-2.000	77.00	3.310	0.50	171.34	4.554	0.50
102.00	Powerwave Allgon 7770.00	3	0.75	-2.000	35.00	5.510	0.65	164.90	6.529	0.65
102.00	Quintel QS66512-2	2	0.75	-2.000	111.00	8.130	0.74	304.30	10.833	0.74
102.00	CCI OPA-65R-LCUU-H6	2	0.75	-2.000	73.00	9.660	0.66	270.42	12.349	0.66
102.00	CCI OPA-65R-LCUU-H8 (92.7")	1	0.75	-2.000	88.00	12.750	0.67	328.84	16.239	0.67
102.00	CCI TPA-65R-LCUUUU-H8	1	0.75	-2.000	81.60	13.300	0.69	350.08	16.922	0.69
102.00	Kathrein Scala 80010965	2	0.75	0.000	97.60	13.810	0.72	356.20	16.768	0.72
102.00	Kathrein Scala 80010966	1	0.75	0.000	114.60	17.360	0.69	426.07	20.938	0.69
102.00	Flat Platform w/ Handrails	1	1.00	0.000	2,000.00	34.800	1.00	3,378.51	51.496	1.00
90.00	Kathrein Scala Smart Bias Tee	3	0.80	0.000	3.30	0.080	0.50	6.46	0.280	0.50
90.00	Ericsson KRY 112 144/1	3	0.80	0.000	11.00	0.350	0.50	21.34	0.739	0.50
90.00	Ericsson KRY 112 489/1	3	0.80	0.000	15.40	0.560	0.50	32.30	1.066	0.50
90.00	Ericsson Radio 4449 B12,B71	3	0.80	0.000	74.00	1.640	0.50	127.81	2.452	0.50
90.00	Ericsson AIR32 B66Aa/B2a	3	0.80	0.000	132.20	6.510	0.50	285.60	8.615	0.50
90.00	Ericsson Air 3246 B66	3	0.80	0.000	180.00	7.940	0.69	2,779.01	10.120	0.69
90.00	RFS APXVAARR24_43-U-NA20	3	0.80	0.000	127.90	20.240	0.63	505.23	23.804	0.63
90.00	Flat Low Profile Platform	1	1.00	0.000	1,500.00	26.100	1.00	2,122.71	44.450	1.00
80.00	Nokia AirScale RRH 4T4R B5	3	0.80	0.000	35.30	1.290	0.50	72.89	2.012	0.50
80.00	Alcatel-Lucent B25 RRH4x30	3	0.80	0.000	53.00	2.120	0.50	110.71	3.069	0.50
80.00	Alcatel-Lucent B13 RRH4x30-4R	3	0.80	0.000	57.80	2.140	0.50	123.74	3.095	0.50
80.00	Alcatel-Lucent B66A RRH 4x45	3	0.80	0.000	67.00	2.580	0.50	135.00	3.659	0.50
80.00	Raycap RVZDC-6627-PF-48	1	0.80	0.000	32.00	3.780	0.50	136.83	5.044	0.50
80.00	Commscope JAHH-65B-R3B	6	0.80	0.000	63.30	9.110	0.69	256.71	11.761	0.69
80.00	Round Low Profile Platform	1	1.00	0.000	1,500.00	21.700	1.00	2,119.34	40.053	1.00
77.00	Scala 840 10212	1	0.90	-2.000	6.70	2.170	0.50	54.65	3.198	0.50
77.00	TX RX Systems 421-86A-10-18-	1	0.90	-2.000	15.00	2.220	0.50	59.70	3.163	0.50
77.00	Stand Offs	2	1.00	0.000	75.00	2.500	1.00	109.92	3.431	1.00
70.00	Round Side Arms	3	1.00	0.000	100.00	4.000	0.67	146.40	5.988	0.67

Site Number: 302481

Code: ANSI/TIA-222-H

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Site Name: Hrfr - South, CT

Engineering Number: OAA713366_C3_13

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Customer: CLEARWIRE CORPORATION

70.00	RFS APXV18-206517S-C	3	0.80	0.000	26.40	5.160	0.68	114.56	7.410	0.68
60.00	Generic Radio/ODU	1	1.00	0.000	30.00	1.600	0.50	78.52	2.398	0.50
60.00	Scala 840 10212	1	1.00	0.000	6.70	2.170	0.50	54.36	3.191	0.50
60.00	Stand Off	1	1.00	0.000	75.00	2.500	1.00	109.70	3.739	1.00
60.00	Radio Waves SP2-4.7	1	1.00	0.000	22.00	5.230	1.00	74.56	6.699	1.00
Totals	Num Loadings:52	133			13,275.20			34,994.58		

Linear Appurtenance Properties Load Case Azimuth (deg) : 90

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Dia (in)	Coax Wt (lb/ft)	Max Flat	Coax / Row	Dist Between Rows (in)	Dist Between Cols (in)	Azimuth (deg)	Dist From Face (in)	Exposed To Wind	Carrier
0.00	112.00	3	1 5/8" (1.63"-41.3mm)	1.63	1.61	N	0	0.00	0.00	0	0.00	N	CLEARWIRE
0.00	112.00	1	2" conduit	2.38	3.65	N	0	0.00	0.00	0	0.00	N	CLEARWIRE
0.00	110.00	1	1/2" Coax	0.63	0.15	N	1	0.00	0.00	290	0.50	Y	CLEARWIRE
0.00	102.00	1	0.39" (10mm) Fiber	0.39	0.06	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	102.00	1	0.39" (10mm) Fiber	0.39	0.06	N	1	0.00	0.00	8	0.50	Y	AT&T MOBILITY
0.00	102.00	2	0.78" (19.7mm) 8 AWG	0.78	0.59	N	2	0.50	0.50	13	0.50	Y	AT&T MOBILITY
0.00	102.00	4	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	102.00	6	1 5/8" Coax	1.98	0.82	N	3	0.00	0.00	30	0.50	Y	AT&T MOBILITY
0.00	102.00	6	1 5/8" Coax	1.98	0.82	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	102.00	1	3" conduit	3.50	7.58	N	1	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	90.00	3	1 1/4" (1.25"- 31.8mm)	1.25	1.05	N	0	0.00	0.00	0	0.00	N	T-MOBILE
0.00	90.00	18	1 5/8" Coax	1.98	0.82	N	6	0.50	0.50	38	0.50	Y	T-MOBILE
75.00	87.00	1	PL 5" x 1.25"	1.25	0.00	N	1	0.00	0.00	75	0.00	Y	
75.00	87.00	1	PL 5" x 1.25"	1.25	0.00	N	1	0.00	0.00	165	0.00	Y	
75.00	87.00	1	PL 5" x 1.25"	1.25	0.00	N	1	0.00	0.00	255	0.00	Y	
75.00	87.00	1	PL 5" x 1.25"	1.25	0.00	N	1	0.00	0.00	345	0.00	Y	
0.00	81.00	1	#20 DYWIDAG	4.00	0.00	N	1	0.00	0.00	90	0.00	Y	
0.00	81.00	1	#20 DYWIDAG	4.00	0.00	N	1	0.00	0.00	270	0.00	Y	
0.00	81.00	1	#20 DYWIDAG	4.00	0.00	N	1	0.00	0.00	180	0.00	Y	
0.00	81.00	1	#20 DYWIDAG	4.00	0.00	N	1	0.00	0.00	0	0.00	Y	
0.00	80.00	12	1 5/8" Coax	1.98	0.82	N	0	0.00	0.00	0	0.00	N	VERIZON WIRELESS
0.00	80.00	2	1 5/8" Hybriflex	1.98	1.30	N	2	0.25	0.25	55	0.50	Y	VERIZON WIRELESS
0.00	77.00	1	7/8" Coax	1.09	0.33	N	1	0.00	0.00	79	0.50	Y	TOWN OF WEST
0.00	70.00	6	1 5/8" Coax	1.98	0.82	N	3	0.50	0.50	310	0.50	Y	METRO PCS INC
0.00	60.00	2	0.41" (10.3mm) LMR-	0.41	0.07	N	2	0.25	0.25	73	0.50	Y	TOWN OF WEST
0.00	60.00	1	7/8" Coax	1.09	0.33	N	1	0.00	0.00	69	0.50	Y	TOWN OF WEST
0.00	20.00	1	PL 6 x 1.25	1.25	0.00	N	1	0.00	0.00	345	0.00	Y	
0.00	20.00	1	PL 6 x 1.25	1.25	0.00	N	1	0.00	0.00	255	0.00	Y	
0.00	20.00	1	PL 6 x 1.25	1.25	0.00	N	1	0.00	0.00	165	0.00	Y	
0.00	20.00	1	PL 6 x 1.25	1.25	0.00	N	1	0.00	0.00	75	0.00	Y	

Additional Steel

Elev From (ft)	Elev To (ft)	Qty	Description	Fy (ksi)	Offset (in)	— Intermediate Connections —		Connectors	Continuation?	
					Description	Spacing (in)	Len (in)			
0.00	12.00	4	SOL #20 All Thread	80	2.31	6" Angle Bracket	39.0	3.31	5/8" A36 U-Bolt	No
0.00	17.97	4	PL PL 6 x 1.25	59	0.00	AJAX M20 Class	24.0	3.00	AJAX M20 Class	No
12.00	47.50	4	SOL #20 All Thread	80	2.31	6" Angle Bracket	30.0	3.31	5/8" A36 U-Bolt	Yes
47.50	67.50	4	SOL #20 All Thread	80	2.31	6" Angle Bracket	30.0	3.31	5/8" A36 U-Bolt	Yes

Site Number: 302481

Code: ANSI/TIA-222-H

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Site Name: Hrfr - South, CT

Engineering Number: OAA713366_C3_13

10/1/2019 7:40:23 AM

Customer: CLEARWIRE CORPORATION

67.50	77.04	4	SOL	#20 All Thread	80	2.31	6" Angle Bracket	30.0	3.31	5/8" A36 U-Bolt	Yes
77.00	85.00	4	PL	PL 5" x 1.25"	56	0.00	AJAX M20 Class	24.0	3.00	AJAX M20 Class	No

Segment Properties (Max Len : 5. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in ³)	Z (in ³)	Weight (lb)	Additional Reinforcing		
												Area (in ²)	Ix (in ⁴)	Weight (lb)
0.00		0.2500	30.000	23.949	2,705.5	29.47	120.00	72.6	174.2	0.0	0.0	49.64	7,171	0.0
5.00		0.2500	29.181	23.290	2,488.2	28.60	116.72	73.5	164.7	0.0	401.9	49.64	6,828	844.0
10.00		0.2500	28.362	22.631	2,282.9	27.72	113.45	74.5	155.5	0.0	390.6	49.64	6,492	844.0
12.00	Reinf. Top Reinf	0.2500	28.035	22.367	2,204.0	27.37	112.14	74.9	151.9	0.0	153.1	49.64	6,361	337.6
15.00		0.2500	27.544	21.971	2,089.2	26.84	110.18	75.4	146.5	0.0	226.3	49.64	6,166	506.4
17.97	Reinf. Top	0.2500	27.057	21.580	1,979.5	26.32	108.23	76.0	141.3	0.0	220.1	49.64	5,976	501.3
20.00		0.2500	26.725	21.312	1,906.7	25.96	106.90	76.4	137.8	0.0	148.1	19.64	2,866	135.6
25.00		0.2500	25.906	20.653	1,735.2	25.09	103.63	77.4	129.4	0.0	357.0	19.64	2,726	334.0
29.33	Bot - Section 2	0.2500	25.197	20.083	1,595.3	24.33	100.79	78.2	122.3	0.0	300.1	19.64	2,607	289.2
30.00		0.2500	25.087	19.994	1,574.4	24.21	100.35	78.3	121.2	0.0	92.3	19.64	2,672	44.8
32.83	Top - Section 1	0.2500	25.124	20.024	1,581.3	24.25	100.50	62.7	121.6	0.0	385.4	19.64	2,595	189.0
35.00		0.2500	24.769	19.738	1,514.5	23.87	99.07	63.0	118.1	0.0	146.8	19.64	2,537	145.0
40.00		0.2500	23.950	19.078	1,367.8	22.99	95.80	63.0	110.3	0.0	330.2	19.64	2,405	334.0
45.00		0.2500	23.131	18.419	1,230.9	22.11	92.53	63.0	102.8	0.0	319.0	19.64	2,277	334.0
47.50	Reinf. Top Reinf	0.2500	22.722	18.090	1,166.0	21.67	90.89	63.0	99.1	0.0	155.3	19.64	2,214	167.0
50.00		0.2500	22.313	17.760	1,103.4	21.23	89.25	63.0	95.5	0.0	152.5	19.64	2,152	167.0
55.00		0.2500	21.494	17.101	985.1	20.36	85.97	63.0	88.5	0.0	296.6	19.64	2,031	334.0
60.00		0.2500	20.675	16.442	875.5	19.48	82.70	63.0	81.8	0.0	285.4	19.64	1,913	334.0
62.92	Bot - Section 3	0.2500	20.197	16.058	815.5	18.97	80.79	63.0	78.0	0.0	161.3	19.64	1,846	194.8
65.00		0.2500	19.856	15.783	774.4	18.60	79.43	63.0	75.3	0.0	199.4	19.64	1,850	139.2
65.75	Top - Section 2	0.1875	20.108	12.027	609.2	26.06	107.25	61.4	58.5	0.0	70.9	19.64	1,833	50.1
67.50	Reinf. Top Reinf	0.1875	19.822	11.854	583.3	25.65	105.72	61.7	56.8	0.0	71.1	19.64	1,794	116.9
70.00		0.1875	19.413	11.607	547.6	25.06	103.53	62.1	54.5	0.0	99.8	19.64	1,738	167.0
75.00		0.1875	18.594	11.113	480.6	23.89	99.17	63.0	49.9	0.0	193.3	19.64	1,629	334.0
77.00	Reinf Bottom	0.1875	18.266	10.915	455.4	23.42	97.42	63.0	48.2	0.0	75.0	19.64	1,587	133.6
77.04	Reinf. Top	0.1875	18.259	10.911	454.8	23.41	97.38	63.0	48.1	0.0	1.5	44.64	2,803	6.3
80.00		0.1875	17.775	10.618	419.2	22.72	94.80	63.0	45.6	0.0	108.4	25.00	1,158	252.1
85.00	Reinf. Top	0.1875	16.956	10.124	363.4	21.55	90.43	63.0	41.4	0.0	176.5	25.00	1,063	426.0
90.00		0.1875	16.138	9.630	312.7	20.38	86.07	63.0	37.4	0.0	168.0			
95.00		0.1875	15.319	9.135	267.0	19.21	81.70	63.0	33.7	0.0	159.6			
100.0	Top - Section 3	0.1875	14.500	8.641	225.9	18.04	77.33	63.0	30.1	0.0	151.2			
100.0	Bot - Section 4	0.3750	12.750	14.579	279.3	0.00	34.00	35.0	43.8	57.4				
102.0		0.3750	12.750	14.579	279.3	0.00	34.00	35.0	43.8	57.4	99.2			
105.0		0.3750	12.750	14.579	279.3	0.00	34.00	35.0	43.8	57.4	148.8			
110.0		0.3750	12.750	14.579	279.3	0.00	34.00	35.0	43.8	57.4	248.0			
											6,492.7			7,660.9

Load Case: 1.2D + 1.0W	118 mph with No Ice	23 Iterations
Gust Response Factor :1.10		
Dead Load Factor :1.20		
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		496.2	0.0					0.0	0.0	496.2	0.0	0.0	0.0
5.00		914.7	482.2					262.1	1,407.5	1,176.8	1,889.7	0.0	0.0
10.00		568.7	468.8					240.9	1,407.5	809.5	1,876.2	0.0	0.0
12.00	Reinf. Top Reinf	359.6	183.7					105.7	563.0	465.3	746.7	0.0	0.0
15.00		400.6	271.6					152.8	844.5	553.4	1,116.1	0.0	0.0
17.97	Reinf. Top	313.7	264.1					145.3	836.0	459.0	1,100.1	0.0	0.0
20.00		400.0	177.8					96.3	323.0	496.3	500.7	0.0	0.0
25.00		494.4	428.4					157.4	795.5	651.7	1,223.9	0.0	0.0
29.33	Bot - Section 2	249.5	360.1					132.1	688.9	381.6	1,049.0	0.0	0.0
30.00		167.3	110.8					20.1	106.6	187.5	217.4	0.0	0.0
32.83	Top - Section 1	235.7	462.4					84.5	450.2	320.2	912.6	0.0	0.0
35.00		325.7	176.2					64.3	345.3	390.0	521.4	0.0	0.0
40.00		440.0	396.2					147.5	795.5	587.4	1,191.7	0.0	0.0
45.00		319.4	382.8					147.1	795.5	466.5	1,178.3	0.0	0.0
47.50	Reinf. Top Reinf	206.4	186.3					73.6	397.7	280.0	584.1	0.0	0.0
50.00		300.5	183.0					73.7	397.7	374.2	580.7	0.0	0.0
55.00		389.3	355.9					147.9	795.5	537.1	1,151.4	0.0	0.0
60.00	Appurtenance(s)	299.1	342.4	336.7	0.0	0.0	160.4	148.9	795.5	784.7	1,298.3	0.0	0.0
62.92	Bot - Section 3	185.4	193.5					87.4	462.4	272.8	655.9	0.0	0.0
65.00		104.8	239.3					62.8	330.3	167.5	569.6	0.0	0.0
65.75	Top - Section 2	91.2	85.1					22.7	118.9	113.8	204.0	0.0	0.0
67.50	Reinf. Top Reinf	153.2	85.3					52.9	277.4	206.1	362.8	0.0	0.0
70.00	Appurtenance(s)	263.9	119.8	581.5	0.0	0.0	455.0	75.9	396.3	921.3	971.1	0.0	0.0
75.00		242.3	231.9					153.2	763.1	395.4	995.1	0.0	0.0
77.00	Reinf Bottom	69.4	89.9	248.6	0.0	-140.5	206.0	61.8	305.3	379.8	601.2	0.0	0.0
77.04	Reinf. Top	100.1	1.9					1.3	10.6	101.3	12.4	0.0	0.0
80.00	Appurtenance(s)	260.4	130.0	2,263.0	0.0	0.0	3,061.3	92.1	515.7	2,615.5	3,707.0	0.0	0.0
85.00	Reinf. Top	317.3	211.7					157.3	796.9	474.6	1,008.7	0.0	0.0
90.00	Appurtenance(s)	332.6	201.7	2,948.6	0.0	0.0	3,757.7	140.0	285.7	3,421.2	4,245.1	0.0	0.0
95.00		347.5	191.6					8.0	178.3	355.5	369.8	0.0	0.0
100.00	Top - Section 3	205.5	181.5					8.4	178.3	214.0	359.7	0.0	0.0
102.00	Appurtenance(s)	71.0	119.1	4,545.0	0.0	-4,037.8	5,184.1	3.6	71.3	4,619.7	5,374.5	0.0	0.0
105.00		96.0	178.6					0.0	31.1	96.0	209.7	0.0	0.0
110.00	Appurtenance(s)	60.2	297.7	2,096.7	0.0	2,488.3	3,105.6	0.0	51.8	2,156.9	3,455.0	0.0	0.0
Totals:										25,928.9	40,240.0	0.00	0.00

Load Case: 1.2D + 1.0W

118 mph with No Ice

23 Iterations

Gust Response Factor :1.10

Dead Load Factor :1.20

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	-40.18	-25.53	0.00	-1,882.14	0.00	1,882.14	1,564.13	420.30	1,179.53	948.21	0.00	0.00	0.556
5.00	-38.18	-24.52	0.00	-1,754.50	0.00	1,754.50	1,541.15	408.73	1,115.51	908.35	0.14	-0.26	0.527
10.00	-36.24	-23.81	0.00	-1,631.90	0.00	1,631.90	1,517.03	397.17	1,053.29	868.61	0.56	-0.52	0.500
12.00	-35.44	-23.42	0.00	-1,584.28	0.00	1,584.28	1,507.06	392.54	1,028.90	852.76	0.80	-0.62	0.489
12.00	-35.44	-23.42	0.00	-1,584.28	0.00	1,584.28	1,507.06	392.54	1,028.90	852.76	0.80	-0.62	0.489
15.00	-34.27	-22.94	0.00	-1,514.02	0.00	1,514.02	1,491.77	385.60	992.85	829.06	1.24	-0.78	0.473
17.97	-33.13	-22.54	0.00	-1,445.88	0.00	1,445.88	1,476.23	378.73	957.79	805.67	1.78	-0.93	0.457
17.97	-33.13	-22.54	0.00	-1,445.88	0.00	1,445.88	1,476.23	378.73	957.79	805.67	1.78	-0.93	0.740
20.00	-32.54	-22.18	0.00	-1,400.12	0.00	1,400.12	1,465.38	374.03	934.19	789.74	2.20	-1.03	0.723
25.00	-31.19	-21.71	0.00	-1,289.21	0.00	1,289.21	1,437.85	362.47	877.32	750.71	3.50	-1.43	0.683
29.33	-30.08	-21.40	0.00	-1,195.23	0.00	1,195.23	1,413.10	352.45	829.52	717.20	4.96	-1.78	0.647
30.00	-29.82	-21.28	0.00	-1,180.89	0.00	1,180.89	1,409.19	350.90	822.24	712.04	5.21	-1.83	0.629
32.83	-28.84	-21.02	0.00	-1,120.68	0.00	1,120.68	1,130.07	270.32	634.36	571.86	6.37	-2.05	0.761
35.00	-28.24	-20.74	0.00	-1,075.07	0.00	1,075.07	1,119.12	266.46	616.37	558.15	7.34	-2.22	0.739
40.00	-26.95	-20.27	0.00	-971.35	0.00	971.35	1,081.75	257.56	575.90	521.31	9.85	-2.57	0.694
45.00	-25.71	-19.87	0.00	-869.99	0.00	869.99	1,044.38	248.66	536.82	485.73	12.74	-2.92	0.647
47.50	-25.08	-19.63	0.00	-820.33	0.00	820.33	1,025.69	244.21	517.79	468.42	14.31	-3.09	0.622
47.50	-25.08	-19.63	0.00	-820.33	0.00	820.33	1,025.69	244.21	517.79	468.42	14.31	-3.09	0.622
50.00	-24.44	-19.33	0.00	-771.26	0.00	771.26	1,007.01	239.76	499.10	451.41	15.98	-3.26	0.597
55.00	-23.22	-18.85	0.00	-674.62	0.00	674.62	969.64	230.87	462.76	418.35	19.57	-3.58	0.545
60.00	-21.91	-18.07	0.00	-580.38	0.00	580.38	932.27	221.97	427.79	386.54	23.47	-3.87	0.489
62.92	-21.23	-17.80	0.00	-527.69	0.00	527.69	910.47	216.78	408.02	368.57	25.89	-4.04	0.456
65.00	-20.65	-17.62	0.00	-490.60	0.00	490.60	894.90	213.07	394.19	355.99	27.68	-4.15	0.424
65.75	-20.43	-17.52	0.00	-477.39	0.00	477.39	664.38	162.37	305.14	269.42	28.33	-4.19	0.465
67.50	-20.05	-17.32	0.00	-446.74	0.00	446.74	658.03	160.03	296.43	262.98	29.88	-4.28	0.440
67.50	-20.05	-17.32	0.00	-446.74	0.00	446.74	658.03	160.03	296.43	262.98	29.88	-4.28	0.440
70.00	-19.10	-16.39	0.00	-403.43	0.00	403.43	648.81	156.70	284.20	253.83	32.16	-4.41	0.403
75.00	-18.10	-15.96	0.00	-321.49	0.00	321.49	629.79	150.02	260.52	235.80	36.90	-4.63	0.332
77.00	-17.52	-15.55	0.00	-289.56	0.00	289.56	618.88	147.35	251.33	227.55	38.85	-4.71	0.305
77.04	-17.51	-15.46	0.00	-288.92	0.00	288.92	618.65	147.30	251.14	227.38	38.90	-4.72	0.194
77.04	-17.51	-15.46	0.00	-288.92	0.00	288.92	618.65	147.30	251.14	227.38	38.90	-4.72	0.365
80.00	-14.00	-12.58	0.00	-243.19	0.00	243.19	602.07	143.35	237.86	215.29	41.84	-4.78	0.315
85.00	-13.00	-12.06	0.00	-180.30	0.00	180.30	574.04	136.68	216.24	195.61	46.95	-4.98	0.249
85.00	-13.00	-12.06	0.00	-180.30	0.00	180.30	574.04	136.68	216.24	195.61	46.95	-4.98	0.952
90.00	-9.03	-8.32	0.00	-120.02	0.00	120.02	546.01	130.00	195.65	176.87	52.24	-5.12	0.699
95.00	-8.64	-7.99	0.00	-78.41	0.00	78.41	517.98	123.33	176.08	159.08	57.86	-5.58	0.514
100.00	-8.28	-7.77	0.00	-38.44	0.00	38.44	489.95	116.66	157.55	142.23	63.87	-5.89	0.292
100.00	-8.28	-7.77	0.00	-38.44	0.00	38.44	459.24	137.77	149.89	150.79	63.87	-5.89	0.276
102.00	-3.41	-2.62	0.00	-22.90	0.00	22.90	459.24	137.77	149.89	150.79	66.35	-5.96	0.160
105.00	-3.21	-2.51	0.00	-15.03	0.00	15.03	459.24	137.77	149.89	150.79	70.12	-6.02	0.107
110.00	0.00	-2.16	0.00	-2.49	0.00	2.49	459.24	137.77	149.89	150.79	76.44	-6.07	0.017

Load Case: 0.9D + 1.0W	118 mph with No Ice (Reduced DL)	23 Iterations
Gust Response Factor :1.10		
Dead Load Factor :0.90		
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		496.2	0.0					0.0	0.0	496.2	0.0	0.0	0.0
5.00		914.7	361.7					262.1	1,055.6	1,176.8	1,417.3	0.0	0.0
10.00		568.7	351.6					240.9	1,055.6	809.5	1,407.2	0.0	0.0
12.00	Reinf. Top Reinf	359.6	137.8					105.7	422.2	465.3	560.0	0.0	0.0
15.00		400.6	203.7					152.8	633.4	553.4	837.0	0.0	0.0
17.97	Reinf. Top	313.7	198.1					145.3	627.0	459.0	825.1	0.0	0.0
20.00		400.0	133.3					96.3	242.2	496.3	375.6	0.0	0.0
25.00		494.4	321.3					157.4	596.6	651.7	917.9	0.0	0.0
29.33	Bot - Section 2	249.5	270.1					132.1	516.7	381.6	786.7	0.0	0.0
30.00		167.3	83.1					20.1	80.0	187.5	163.0	0.0	0.0
32.83	Top - Section 1	235.7	346.8					84.5	337.7	320.2	684.5	0.0	0.0
35.00		325.7	132.1					64.3	258.9	390.0	391.1	0.0	0.0
40.00		440.0	297.2					147.5	596.6	587.4	893.8	0.0	0.0
45.00		319.4	287.1					147.1	596.6	466.5	883.7	0.0	0.0
47.50	Reinf. Top Reinf	206.4	139.8					73.6	298.3	280.0	438.1	0.0	0.0
50.00		300.5	137.2					73.7	298.3	374.2	435.5	0.0	0.0
55.00		389.3	266.9					147.9	596.6	537.1	863.5	0.0	0.0
60.00	Appurtenance(s)	299.1	256.8	336.7	0.0	0.0	120.3	148.9	596.6	784.7	973.8	0.0	0.0
62.92	Bot - Section 3	185.4	145.1					87.4	346.8	272.8	491.9	0.0	0.0
65.00		104.8	179.5					62.8	247.7	167.5	427.2	0.0	0.0
65.75	Top - Section 2	91.2	63.8					22.7	89.2	113.8	153.0	0.0	0.0
67.50	Reinf. Top Reinf	153.2	64.0					52.9	208.1	206.1	272.1	0.0	0.0
70.00	Appurtenance(s)	263.9	89.8	581.5	0.0	0.0	341.3	75.9	297.2	921.3	728.3	0.0	0.0
75.00		242.3	173.9					153.2	572.4	395.4	746.3	0.0	0.0
77.00	Reinf Bottom	69.4	67.5	248.6	0.0	-140.5	154.5	61.8	228.9	379.8	450.9	0.0	0.0
77.04	Reinf. Top	100.1	1.4					1.3	7.9	101.3	9.3	0.0	0.0
80.00	Appurtenance(s)	260.4	97.5	2,263.0	0.0	0.0	2,296.0	92.1	386.8	2,615.5	2,780.3	0.0	0.0
85.00	Reinf. Top	317.3	158.8					157.3	597.7	474.6	756.5	0.0	0.0
90.00	Appurtenance(s)	332.6	151.2	2,948.6	0.0	0.0	2,818.3	140.0	214.3	3,421.2	3,183.8	0.0	0.0
95.00		347.5	143.7					8.0	133.7	355.5	277.4	0.0	0.0
100.00	Top - Section 3	205.5	136.1					8.4	133.7	214.0	269.8	0.0	0.0
102.00	Appurtenance(s)	71.0	89.3	4,545.0	0.0	-4,037.8	3,888.1	3.6	53.5	4,619.7	4,030.9	0.0	0.0
105.00		96.0	133.9					0.0	23.3	96.0	157.2	0.0	0.0
110.00	Appurtenance(s)	60.2	223.2	2,096.7	0.0	2,488.3	2,329.2	0.0	38.8	2,156.9	2,591.3	0.0	0.0
Totals:										25,928.9	30,180.0	0.00	0.00

Load Case: 0.9D + 1.0W

118 mph with No Ice (Reduced DL)

23 Iterations

Gust Response Factor :1.10

Dead Load Factor :0.90

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	-30.12	-25.50	0.00	-1,851.87	0.00	1,851.87	1,564.13	420.30	1,179.53	948.21	0.00	0.00	0.545
5.00	-28.60	-24.45	0.00	-1,724.36	0.00	1,724.36	1,541.15	408.73	1,115.51	908.35	0.14	-0.26	0.517
10.00	-27.12	-23.72	0.00	-1,602.11	0.00	1,602.11	1,517.03	397.17	1,053.29	868.61	0.55	-0.51	0.489
12.00	-26.52	-23.30	0.00	-1,554.68	0.00	1,554.68	1,507.06	392.54	1,028.90	852.76	0.79	-0.61	0.478
12.00	-26.52	-23.30	0.00	-1,554.68	0.00	1,554.68	1,507.06	392.54	1,028.90	852.76	0.79	-0.61	0.478
15.00	-25.63	-22.81	0.00	-1,484.77	0.00	1,484.77	1,491.77	385.60	992.85	829.06	1.22	-0.77	0.462
17.97	-24.76	-22.39	0.00	-1,417.03	0.00	1,417.03	1,476.23	378.73	957.79	805.67	1.75	-0.91	0.446
17.97	-24.76	-22.39	0.00	-1,417.03	0.00	1,417.03	1,476.23	378.73	957.79	805.67	1.75	-0.91	0.722
20.00	-24.30	-21.99	0.00	-1,371.58	0.00	1,371.58	1,465.38	374.03	934.19	789.74	2.16	-1.01	0.706
25.00	-23.26	-21.47	0.00	-1,261.61	0.00	1,261.61	1,437.85	362.47	877.32	750.71	3.44	-1.41	0.665
29.33	-22.41	-21.14	0.00	-1,168.65	0.00	1,168.65	1,413.10	352.45	829.52	717.20	4.87	-1.74	0.630
30.00	-22.20	-21.00	0.00	-1,154.49	0.00	1,154.49	1,409.19	350.90	822.24	712.04	5.12	-1.80	0.613
32.83	-21.46	-20.73	0.00	-1,095.05	0.00	1,095.05	1,130.07	270.32	634.36	571.86	6.25	-2.01	0.740
35.00	-20.99	-20.42	0.00	-1,050.07	0.00	1,050.07	1,119.12	266.46	616.37	558.15	7.20	-2.17	0.719
40.00	-20.01	-19.92	0.00	-947.97	0.00	947.97	1,081.75	257.56	575.90	521.31	9.66	-2.52	0.674
45.00	-19.06	-19.49	0.00	-848.39	0.00	848.39	1,044.38	248.66	536.82	485.73	12.49	-2.86	0.628
47.50	-18.58	-19.24	0.00	-799.65	0.00	799.65	1,025.69	244.21	517.79	468.42	14.03	-3.03	0.604
47.50	-18.58	-19.24	0.00	-799.65	0.00	799.65	1,025.69	244.21	517.79	468.42	14.03	-3.03	0.604
50.00	-18.09	-18.92	0.00	-751.54	0.00	751.54	1,007.01	239.76	499.10	451.41	15.66	-3.19	0.579
55.00	-17.16	-18.43	0.00	-656.93	0.00	656.93	969.64	230.87	462.76	418.35	19.17	-3.50	0.527
60.00	-16.17	-17.64	0.00	-564.80	0.00	564.80	932.27	221.97	427.79	386.54	22.99	-3.79	0.473
62.92	-15.66	-17.37	0.00	-513.34	0.00	513.34	910.47	216.78	408.02	368.57	25.35	-3.95	0.441
65.00	-15.22	-17.20	0.00	-477.14	0.00	477.14	894.90	213.07	394.19	355.99	27.10	-4.06	0.409
65.75	-15.06	-17.09	0.00	-464.25	0.00	464.25	664.38	162.37	305.14	269.42	27.74	-4.10	0.449
67.50	-14.77	-16.89	0.00	-434.34	0.00	434.34	658.03	160.03	296.43	262.98	29.26	-4.18	0.425
67.50	-14.77	-16.89	0.00	-434.34	0.00	434.34	658.03	160.03	296.43	262.98	29.26	-4.18	0.425
70.00	-14.06	-15.96	0.00	-392.11	0.00	392.11	648.81	156.70	284.20	253.83	31.48	-4.31	0.388
75.00	-13.31	-15.54	0.00	-312.30	0.00	312.30	629.79	150.02	260.52	235.80	36.11	-4.52	0.320
77.00	-12.88	-15.14	0.00	-281.21	0.00	281.21	618.88	147.35	251.33	227.55	38.02	-4.60	0.293
77.04	-12.87	-15.04	0.00	-280.58	0.00	280.58	618.65	147.30	251.14	227.38	38.06	-4.61	0.187
77.04	-12.87	-15.04	0.00	-280.58	0.00	280.58	618.65	147.30	251.14	227.38	38.06	-4.61	0.352
80.00	-10.28	-12.24	0.00	-236.08	0.00	236.08	602.07	143.35	237.86	215.29	40.94	-4.67	0.304
85.00	-9.54	-11.73	0.00	-174.90	0.00	174.90	574.04	136.68	216.24	195.61	45.93	-4.86	0.240
85.00	-9.54	-11.73	0.00	-174.90	0.00	174.90	574.04	136.68	216.24	195.61	45.93	-4.86	0.918
90.00	-6.62	-8.08	0.00	-116.26	0.00	116.26	546.01	130.00	195.65	176.87	51.10	-5.00	0.673
95.00	-6.32	-7.74	0.00	-75.86	0.00	75.86	517.98	123.33	176.08	159.08	56.58	-5.44	0.493
100.00	-6.05	-7.52	0.00	-37.15	0.00	37.15	489.95	116.66	157.55	142.23	62.45	-5.74	0.278
100.00	-6.05	-7.52	0.00	-37.15	0.00	37.15	459.24	137.77	149.89	150.79	62.45	-5.74	0.263
102.00	-2.50	-2.52	0.00	-22.11	0.00	22.11	459.24	137.77	149.89	150.79	64.86	-5.82	0.152
105.00	-2.36	-2.41	0.00	-14.55	0.00	14.55	459.24	137.77	149.89	150.79	68.53	-5.87	0.102
110.00	0.00	-2.16	0.00	-2.49	0.00	2.49	459.24	137.77	149.89	150.79	74.70	-5.92	0.017

Load Case: 1.2D + 1.0Di + 1.0Wi

50 mph with 1.50 in Radial Ice

22 Iterations

Gust Response Factor :1.10

Ice Dead Load 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		107.4	0.0					0.0	0.0	107.4	0.0	0.0	0.0	
5.00		199.2	800.8					106.2	1,981.3	305.3	2,782.1	0.0	0.0	
10.00		124.8	799.1					110.7	2,016.0	235.5	2,815.1	0.0	0.0	
12.00	Reinf. Top Reinf	79.3	315.4					41.1	808.2	120.4	1,123.6	0.0	0.0	
15.00		88.5	465.9					58.7	1,212.4	147.3	1,678.2	0.0	0.0	
17.97	Reinf. Top	69.5	452.8					61.9	1,199.4	131.4	1,652.2	0.0	0.0	
20.00		88.7	304.8					43.0	570.6	131.7	875.4	0.0	0.0	
25.00		110.2	730.8					105.7	1,359.0	215.9	2,089.8	0.0	0.0	
29.33	Bot - Section 2	56.0	613.4					90.2	1,173.8	146.2	1,787.2	0.0	0.0	
30.00		37.9	150.4					13.8	181.4	51.7	331.8	0.0	0.0	
32.83	Top - Section 1	53.4	626.6					58.9	765.5	112.4	1,392.1	0.0	0.0	
35.00		74.4	300.0					44.5	586.4	118.9	886.4	0.0	0.0	
40.00		101.6	671.8					104.8	1,349.4	206.4	2,021.2	0.0	0.0	
45.00		74.6	648.5					107.9	1,347.5	182.5	1,996.1	0.0	0.0	
47.50	Reinf. Top Reinf	48.7	316.8					55.1	673.3	103.8	990.1	0.0	0.0	
50.00		71.6	311.1					55.8	673.1	127.4	984.2	0.0	0.0	
55.00		93.6	603.2					114.0	1,345.9	207.6	1,949.0	0.0	0.0	
60.00	Appurtenance(s)	72.7	581.0	83.2	0.0	0.0	282.3	117.2	1,345.9	273.0	2,209.1	0.0	0.0	
62.92	Bot - Section 3	45.5	329.8					69.8	768.0	115.3	1,097.8	0.0	0.0	
65.00		25.8	336.8					50.5	548.8	76.4	885.6	0.0	0.0	
65.75	Top - Section 2	22.6	120.0					21.3	197.5	43.9	317.6	0.0	0.0	
67.50	Reinf. Top Reinf	38.1	165.8					49.6	461.1	87.7	626.9	0.0	0.0	
70.00	Appurtenance(s)	66.2	232.6	153.1	0.0	0.0	718.5	71.7	658.9	291.0	1,610.0	0.0	0.0	
75.00		61.1	449.2					117.8	1,202.8	178.9	1,652.1	0.0	0.0	
77.00	Reinf Bottom	17.5	175.6	62.2	0.0	-36.6	312.5	48.1	498.3	127.8	986.5	0.0	0.0	
77.04	Reinf. Top	25.4	3.6					1.0	14.5	26.4	18.2	0.0	0.0	
80.00	Appurtenance(s)	66.4	253.8	612.8	0.0	0.0	4,748.4	72.1	795.9	751.2	5,798.1	0.0	0.0	
85.00	Reinf. Top	76.4	412.6					67.0	1,151.1	143.4	1,563.7	0.0	0.0	
90.00	Appurtenance(s)	67.4	394.3	740.1	0.0	0.0	13,107.3	59.5	595.5	867.0	14,097.1	0.0	0.0	
95.00		63.6	376.0					18.5	282.2	82.0	658.2	0.0	0.0	
100.00	Top - Section 3	42.0	357.6					19.2	282.6	61.2	640.3	0.0	0.0	
102.00	Appurtenance(s)	27.1	178.6	1,115.5	0.0	-961.5	9,267.4	12.5	113.2	1,155.0	9,559.3	0.0	0.0	
105.00		43.6	268.1					4.3	35.6	47.9	303.8	0.0	0.0	
110.00	Appurtenance(s)	27.4	447.4	538.2	0.0	580.4	4,809.7	7.2	59.4	572.8	5,316.5	0.0	0.0	
Totals:											7,552.98	72,695.2	0.00	0.00

Load Case: 1.2D + 1.0Di + 1.0Wi

50 mph with 1.50 in Radial Ice

22 Iterations

Gust Response Factor :1.10

Ice Dead Load 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	-72.69	-7.50	0.00	-571.08	0.00	571.08	1,564.13	420.30	1,179.53	948.21	0.00	0.00	0.180
5.00	-69.90	-7.29	0.00	-533.59	0.00	533.59	1,541.15	408.73	1,115.51	908.35	0.04	-0.08	0.172
10.00	-67.08	-7.11	0.00	-497.16	0.00	497.16	1,517.03	397.17	1,053.29	868.61	0.17	-0.16	0.163
12.00	-65.95	-7.03	0.00	-482.94	0.00	482.94	1,507.06	392.54	1,028.90	852.76	0.24	-0.19	0.160
12.00	-65.95	-7.03	0.00	-482.94	0.00	482.94	1,507.06	392.54	1,028.90	852.76	0.24	-0.19	0.160
15.00	-64.27	-6.93	0.00	-461.85	0.00	461.85	1,491.77	385.60	992.85	829.06	0.38	-0.24	0.155
17.97	-62.61	-6.83	0.00	-441.27	0.00	441.27	1,476.23	378.73	957.79	805.67	0.54	-0.28	0.149
17.97	-62.61	-6.83	0.00	-441.27	0.00	441.27	1,476.23	378.73	957.79	805.67	0.54	-0.28	0.244
20.00	-61.73	-6.78	0.00	-427.39	0.00	427.39	1,465.38	374.03	934.19	789.74	0.67	-0.31	0.238
25.00	-59.62	-6.67	0.00	-393.49	0.00	393.49	1,437.85	362.47	877.32	750.71	1.06	-0.44	0.225
29.33	-57.83	-6.57	0.00	-364.62	0.00	364.62	1,413.10	352.45	829.52	717.20	1.51	-0.54	0.214
30.00	-57.49	-6.56	0.00	-360.22	0.00	360.22	1,409.19	350.90	822.24	712.04	1.59	-0.56	0.208
32.83	-56.10	-6.49	0.00	-341.67	0.00	341.67	1,130.07	270.32	634.36	571.86	1.94	-0.62	0.252
35.00	-55.20	-6.43	0.00	-327.59	0.00	327.59	1,119.12	266.46	616.37	558.15	2.24	-0.68	0.245
40.00	-53.17	-6.30	0.00	-295.42	0.00	295.42	1,081.75	257.56	575.90	521.31	3.00	-0.78	0.230
45.00	-51.17	-6.16	0.00	-263.92	0.00	263.92	1,044.38	248.66	536.82	485.73	3.88	-0.89	0.215
47.50	-50.18	-6.09	0.00	-248.52	0.00	248.52	1,025.69	244.21	517.79	468.42	4.36	-0.94	0.207
47.50	-50.18	-6.09	0.00	-248.52	0.00	248.52	1,025.69	244.21	517.79	468.42	4.36	-0.94	0.207
50.00	-49.19	-6.00	0.00	-233.31	0.00	233.31	1,007.01	239.76	499.10	451.41	4.87	-0.99	0.199
55.00	-47.23	-5.84	0.00	-203.29	0.00	203.29	969.64	230.87	462.76	418.35	5.96	-1.09	0.182
60.00	-45.02	-5.57	0.00	-174.10	0.00	174.10	932.27	221.97	427.79	386.54	7.15	-1.18	0.164
62.92	-43.93	-5.47	0.00	-157.84	0.00	157.84	910.47	216.78	408.02	368.57	7.89	-1.23	0.154
65.00	-43.04	-5.39	0.00	-146.45	0.00	146.45	894.90	213.07	394.19	355.99	8.43	-1.26	0.143
65.75	-42.72	-5.35	0.00	-142.41	0.00	142.41	664.38	162.37	305.14	269.42	8.63	-1.27	0.157
67.50	-42.09	-5.28	0.00	-133.04	0.00	133.04	658.03	160.03	296.43	262.98	9.10	-1.30	0.149
67.50	-42.09	-5.28	0.00	-133.04	0.00	133.04	658.03	160.03	296.43	262.98	9.10	-1.30	0.149
70.00	-40.49	-4.98	0.00	-119.85	0.00	119.85	648.81	156.70	284.20	253.83	9.79	-1.34	0.137
75.00	-38.83	-4.80	0.00	-94.93	0.00	94.93	629.79	150.02	260.52	235.80	11.23	-1.40	0.115
77.00	-37.85	-4.65	0.00	-85.34	0.00	85.34	618.88	147.35	251.33	227.55	11.82	-1.43	0.106
77.04	-37.83	-4.63	0.00	-85.15	0.00	85.15	618.65	147.30	251.14	227.38	11.83	-1.43	0.065
77.04	-37.83	-4.63	0.00	-85.15	0.00	85.15	618.65	147.30	251.14	227.38	11.83	-1.43	0.121
80.00	-32.05	-3.76	0.00	-71.44	0.00	71.44	602.07	143.35	237.86	215.29	12.73	-1.45	0.105
85.00	-30.49	-3.60	0.00	-52.65	0.00	52.65	574.04	136.68	216.24	195.61	14.27	-1.50	0.085
85.00	-30.49	-3.60	0.00	-52.65	0.00	52.65	574.04	136.68	216.24	195.61	14.27	-1.50	0.323
90.00	-16.42	-2.38	0.00	-34.65	0.00	34.65	546.01	130.00	195.65	176.87	15.88	-1.55	0.226
95.00	-15.76	-2.31	0.00	-22.73	0.00	22.73	517.98	123.33	176.08	159.08	17.57	-1.68	0.174
100.00	-15.12	-2.25	0.00	-11.17	0.00	11.17	489.95	116.66	157.55	142.23	19.38	-1.77	0.110
100.00	-15.12	-2.25	0.00	-11.17	0.00	11.17	459.24	137.77	149.89	150.79	19.38	-1.77	0.107
102.00	-5.60	-0.80	0.00	-6.68	0.00	6.68	459.24	137.77	149.89	150.79	20.13	-1.79	0.056
105.00	-5.30	-0.74	0.00	-4.28	0.00	4.28	459.24	137.77	149.89	150.79	21.26	-1.81	0.040
110.00	0.00	-0.57	0.00	-0.58	0.00	0.58	459.24	137.77	149.89	150.79	23.16	-1.82	0.004

Load Case: 1.0D + 1.0W	Serviceability 60 mph	22 Iterations
Gust Response Factor :1.10		
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		114.8	0.0					0.0	0.0	114.8	0.0	0.0	0.0
5.00		211.6	401.9					74.2	1,172.9	285.8	1,574.8	0.0	0.0
10.00		131.5	390.6					64.8	1,172.9	196.4	1,563.5	0.0	0.0
12.00	Reinf. Top Reinf	83.2	153.1					27.2	469.2	110.3	622.3	0.0	0.0
15.00		92.7	226.3					38.6	703.7	131.2	930.0	0.0	0.0
17.97	Reinf. Top	72.6	220.1					36.0	696.7	108.5	916.8	0.0	0.0
20.00		92.5	148.1					23.5	269.1	116.0	417.3	0.0	0.0
25.00		114.4	357.0					38.2	662.9	152.6	1,019.9	0.0	0.0
29.33	Bot - Section 2	57.7	300.1					31.0	574.1	88.7	874.1	0.0	0.0
30.00		38.7	92.3					4.7	88.8	43.4	181.1	0.0	0.0
32.83	Top - Section 1	54.5	385.4					19.6	375.2	74.1	760.5	0.0	0.0
35.00		75.4	146.8					14.9	287.7	90.2	434.5	0.0	0.0
40.00		101.8	330.2					34.1	662.9	135.9	993.1	0.0	0.0
45.00		73.9	319.0					34.0	662.9	107.9	981.9	0.0	0.0
47.50	Reinf. Top Reinf	47.7	155.3					17.0	331.4	64.8	486.7	0.0	0.0
50.00		69.5	152.5					17.0	331.4	86.6	483.9	0.0	0.0
55.00		90.1	296.6					34.2	662.9	124.3	959.5	0.0	0.0
60.00	Appurtenance(s)	69.2	285.4	77.9	0.0	0.0	133.7	34.4	662.9	181.5	1,081.9	0.0	0.0
62.92	Bot - Section 3	42.9	161.3					20.2	385.3	63.1	546.6	0.0	0.0
65.00		24.2	199.4					14.5	275.2	38.8	474.6	0.0	0.0
65.75	Top - Section 2	21.1	70.9					5.2	99.1	26.3	170.0	0.0	0.0
67.50	Reinf. Top Reinf	35.4	71.1					12.2	231.2	47.7	302.3	0.0	0.0
70.00	Appurtenance(s)	61.0	99.8	134.5	0.0	0.0	379.2	17.6	330.3	213.1	809.3	0.0	0.0
75.00		56.0	193.3					35.4	635.9	91.5	829.2	0.0	0.0
77.00	Reinf Bottom	16.0	75.0	57.5	0.0	-32.5	171.7	14.3	254.4	87.9	501.0	0.0	0.0
77.04	Reinf. Top	23.1	1.5					0.3	8.8	23.4	10.4	0.0	0.0
80.00	Appurtenance(s)	60.2	108.4	523.5	0.0	0.0	2,551.1	21.3	429.7	605.0	3,089.2	0.0	0.0
85.00	Reinf. Top	73.4	176.5					36.4	664.1	109.8	840.6	0.0	0.0
90.00	Appurtenance(s)	77.0	168.0	682.1	0.0	0.0	3,131.4	32.4	238.1	791.4	3,537.5	0.0	0.0
95.00		80.5	159.6					1.8	148.6	82.4	308.2	0.0	0.0
100.00	Top - Section 3	49.5	151.2					2.0	148.6	51.5	299.8	0.0	0.0
102.00	Appurtenance(s)	20.1	99.2	1,051.4	0.0	-934.1	4,320.1	0.8	59.4	1,072.3	4,478.7	0.0	0.0
105.00		27.0	148.8					0.0	25.9	27.0	174.7	0.0	0.0
110.00	Appurtenance(s)	16.9	248.0	485.0	0.0	575.6	2,588.0	0.0	43.1	501.9	2,879.2	0.0	0.0
								Totals:		6,046.18	33,533.3	0.00	0.00

Load Case: 1.0D + 1.0W

Serviceability 60 mph

22 Iterations

Gust Response Factor :1.10

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	-33.53	-5.95	0.00	-433.18	0.00	433.18	1,564.13	420.30	1,179.53	948.21	0.00	0.00	0.132
5.00	-31.95	-5.70	0.00	-403.43	0.00	403.43	1,541.15	408.73	1,115.51	908.35	0.03	-0.06	0.125
10.00	-30.38	-5.52	0.00	-374.95	0.00	374.95	1,517.03	397.17	1,053.29	868.61	0.13	-0.12	0.119
12.00	-29.76	-5.42	0.00	-363.91	0.00	363.91	1,507.06	392.54	1,028.90	852.76	0.18	-0.14	0.116
12.00	-29.76	-5.42	0.00	-363.91	0.00	363.91	1,507.06	392.54	1,028.90	852.76	0.18	-0.14	0.116
15.00	-28.82	-5.31	0.00	-347.64	0.00	347.64	1,491.77	385.60	992.85	829.06	0.29	-0.18	0.112
17.97	-27.91	-5.21	0.00	-331.88	0.00	331.88	1,476.23	378.73	957.79	805.67	0.41	-0.21	0.108
17.97	-27.91	-5.21	0.00	-331.88	0.00	331.88	1,476.23	378.73	957.79	805.67	0.41	-0.21	0.176
20.00	-27.48	-5.12	0.00	-321.31	0.00	321.31	1,465.38	374.03	934.19	789.74	0.51	-0.24	0.172
25.00	-26.46	-5.00	0.00	-295.71	0.00	295.71	1,437.85	362.47	877.32	750.71	0.80	-0.33	0.163
29.33	-25.58	-4.93	0.00	-274.06	0.00	274.06	1,413.10	352.45	829.52	717.20	1.14	-0.41	0.154
30.00	-25.40	-4.90	0.00	-270.76	0.00	270.76	1,409.19	350.90	822.24	712.04	1.20	-0.42	0.150
32.83	-24.63	-4.84	0.00	-256.90	0.00	256.90	1,130.07	270.32	634.36	571.86	1.46	-0.47	0.181
35.00	-24.19	-4.77	0.00	-246.41	0.00	246.41	1,119.12	266.46	616.37	558.15	1.69	-0.51	0.176
40.00	-23.20	-4.65	0.00	-222.57	0.00	222.57	1,081.75	257.56	575.90	521.31	2.26	-0.59	0.166
45.00	-22.21	-4.56	0.00	-199.30	0.00	199.30	1,044.38	248.66	536.82	485.73	2.93	-0.67	0.155
47.50	-21.72	-4.50	0.00	-187.91	0.00	187.91	1,025.69	244.21	517.79	468.42	3.29	-0.71	0.149
47.50	-21.72	-4.50	0.00	-187.91	0.00	187.91	1,025.69	244.21	517.79	468.42	3.29	-0.71	0.149
50.00	-21.23	-4.43	0.00	-176.65	0.00	176.65	1,007.01	239.76	499.10	451.41	3.67	-0.75	0.143
55.00	-20.27	-4.32	0.00	-154.50	0.00	154.50	969.64	230.87	462.76	418.35	4.49	-0.82	0.131
60.00	-19.19	-4.14	0.00	-132.91	0.00	132.91	932.27	221.97	427.79	386.54	5.39	-0.89	0.118
62.92	-18.64	-4.08	0.00	-120.85	0.00	120.85	910.47	216.78	408.02	368.57	5.94	-0.93	0.110
65.00	-18.17	-4.04	0.00	-112.35	0.00	112.35	894.90	213.07	394.19	355.99	6.35	-0.95	0.102
65.75	-17.99	-4.01	0.00	-109.33	0.00	109.33	664.38	162.37	305.14	269.42	6.50	-0.96	0.112
67.50	-17.69	-3.97	0.00	-102.31	0.00	102.31	658.03	160.03	296.43	262.98	6.86	-0.98	0.106
67.50	-17.69	-3.97	0.00	-102.31	0.00	102.31	658.03	160.03	296.43	262.98	6.86	-0.98	0.106
70.00	-16.88	-3.75	0.00	-92.40	0.00	92.40	648.81	156.70	284.20	253.83	7.38	-1.01	0.097
75.00	-16.05	-3.65	0.00	-73.64	0.00	73.64	629.79	150.02	260.52	235.80	8.47	-1.06	0.081
77.00	-15.55	-3.56	0.00	-66.34	0.00	66.34	618.88	147.35	251.33	227.55	8.92	-1.08	0.075
77.04	-15.54	-3.54	0.00	-66.19	0.00	66.19	618.65	147.30	251.14	227.38	8.93	-1.08	0.046
77.04	-15.54	-3.54	0.00	-66.19	0.00	66.19	618.65	147.30	251.14	227.38	8.93	-1.08	0.087
80.00	-12.46	-2.88	0.00	-55.72	0.00	55.72	602.07	143.35	237.86	215.29	9.61	-1.10	0.075
85.00	-11.62	-2.76	0.00	-41.32	0.00	41.32	574.04	136.68	216.24	195.61	10.78	-1.14	0.060
85.00	-11.62	-2.76	0.00	-41.32	0.00	41.32	574.04	136.68	216.24	195.61	10.78	-1.14	0.232
90.00	-8.10	-1.91	0.00	-27.51	0.00	27.51	546.01	130.00	195.65	176.87	11.99	-1.18	0.171
95.00	-7.79	-1.83	0.00	-17.96	0.00	17.96	517.98	123.33	176.08	159.08	13.28	-1.28	0.128
100.00	-7.49	-1.78	0.00	-8.80	0.00	8.80	489.95	116.66	157.55	142.23	14.66	-1.35	0.077
100.00	-7.49	-1.78	0.00	-8.80	0.00	8.80	459.24	137.77	149.89	150.79	14.66	-1.35	0.075
102.00	-3.04	-0.60	0.00	-5.24	0.00	5.24	459.24	137.77	149.89	150.79	15.23	-1.37	0.041
105.00	-2.87	-0.57	0.00	-3.43	0.00	3.43	459.24	137.77	149.89	150.79	16.10	-1.38	0.029
110.00	0.00	-0.50	0.00	-0.58	0.00	0.58	459.24	137.77	149.89	150.79	17.55	-1.39	0.004

Equivalent Lateral Forces Method Analysis

Spectral Response Acceleration for Short Period (S_s):	0.19
Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.05
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}):	0.20
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.09
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):	2.43
Redundancy Factor (ρ):	1.00
Seismic Force Distribution Exponent (k):	1.97
Total Unfactored Dead Load:	33.53 k
Seismic Base Shear (E):	1.01 k

Load Case 1.2D + 1.0Ev + 1.0Eh

Seismic

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
33	107.50	291	2,867	0.019	19	361
32	103.50	175	1,597	0.011	11	217
31	101.00	159	1,382	0.009	9	197
30	97.50	300	2,436	0.016	16	372
29	92.50	308	2,259	0.015	15	382
28	87.50	406	2,668	0.018	18	504
27	82.50	841	4,919	0.033	33	1,043
26	78.52	538	2,858	0.019	19	668
25	77.02	10	53	0.000	0	13
24	76.00	329	1,640	0.011	11	409
23	72.50	829	3,764	0.025	25	1,029
22	68.75	430	1,759	0.012	12	534
21	66.62	302	1,162	0.008	8	375
20	65.37	170	630	0.004	4	211
19	63.96	475	1,684	0.011	11	589
18	61.46	547	1,793	0.012	12	678
17	57.50	948	2,729	0.018	18	1,177
16	52.50	959	2,309	0.015	15	1,191
15	48.75	484	1,007	0.007	7	601
14	46.25	487	913	0.006	6	604
13	42.50	982	1,560	0.010	10	1,218
12	37.50	993	1,234	0.008	8	1,232
11	33.91	435	443	0.003	3	539
10	31.41	761	667	0.004	4	944
9	29.66	181	142	0.001	1	225

8	27.16	874	576	0.004	4	1,085
7	22.50	1,020	464	0.003	3	1,266
6	18.99	417	136	0.001	1	518
5	16.49	917	226	0.002	2	1,138
4	13.50	930	155	0.001	1	1,154
3	11.00	622	69	0.000	0	772
2	7.50	1,564	82	0.001	1	1,940
1	2.50	1,575	10	0.000	0	1,954
DragonWave Horizon C	110.00	11	109	0.001	1	13
Generic 12" x 12" Ju	110.00	10	103	0.001	1	12
Alcatel-Lucent RRH2x	110.00	317	3,270	0.022	22	394
Alcatel-Lucent 1900	110.00	180	1,854	0.012	12	223
Nokia 2.5G MAA - AAH	110.00	311	3,202	0.021	21	386
Andrew VHLP2-11	110.00	27	278	0.002	2	34
Commscope NNVV-65B-R	110.00	232	2,392	0.016	16	288
Flat Low Profile Pla	110.00	1,500	15,454	0.103	104	1,861
Powerwave Allgon 702	102.00	13	117	0.001	1	16
CCI TPX-070821	102.00	45	400	0.003	3	56
Kaelus DBCT108F1V92-	102.00	83	741	0.005	5	103
Powerwave Allgon LGP	102.00	85	751	0.005	5	105
Raycap DC6-48-60-0-8	102.00	33	291	0.002	2	41
Raycap DC6-48-60-18-	102.00	66	583	0.004	4	81
Ericsson RRUS 4426 B	102.00	145	1,290	0.009	9	180
Ericsson RRUS 4478 B	102.00	180	1,596	0.011	11	223
Ericsson RRUS 4478 B	102.00	178	1,583	0.011	11	221
Ericsson RRUS-11 (50	102.00	150	1,332	0.009	9	186
Ericsson RRUS 32 B2	102.00	159	1,412	0.009	9	197
Ericsson RRUS-32 (77	102.00	231	2,052	0.014	14	287
Powerwave Allgon 777	102.00	105	933	0.006	6	130
Quintel QS66512-2	102.00	222	1,972	0.013	13	275
CCI OPA-65R-LCUU-H6	102.00	146	1,297	0.009	9	181
CCI OPA-65R-LCUU-H8	102.00	88	782	0.005	5	109
CCI TPA-65R-LCUUUU-H	102.00	82	725	0.005	5	101
Kathrein Scala 80010	102.00	195	1,734	0.012	12	242
Kathrein Scala 80010	102.00	115	1,018	0.007	7	142
Flat Platform w/ Han	102.00	2,000	17,763	0.118	119	2,482
Kathrein Scala Smart	90.00	10	69	0.000	0	12
Ericsson KRY 112 144	90.00	33	229	0.002	2	41
Ericsson KRY 112 489	90.00	46	321	0.002	2	57
Ericsson Radio 4449	90.00	222	1,542	0.010	10	275
Ericsson AIR32 B66Aa	90.00	397	2,754	0.018	18	492
Ericsson Air 3246 B6	90.00	540	3,750	0.025	25	670
RFS APXVAARR24_43-U-	90.00	384	2,665	0.018	18	476
Flat Low Profile Pla	90.00	1,500	10,416	0.069	70	1,861
Nokia AirScale RRH 4	80.00	106	583	0.004	4	131
Alcatel-Lucent B25 R	80.00	159	876	0.006	6	197
Alcatel-Lucent B13 R	80.00	173	955	0.006	6	215
Alcatel-Lucent B66A	80.00	201	1,107	0.007	7	249
Raycap RVZDC-6627-PF	80.00	32	176	0.001	1	40
Commscope JAHH-65B-R	80.00	380	2,092	0.014	14	471
Round Low Profile PI	80.00	1,500	8,263	0.055	55	1,861
Scala 840 10212	77.00	7	34	0.000	0	8
TX RX Systems 421-86	77.00	15	77	0.001	1	19
Stand Offs	77.00	150	767	0.005	5	186
Round Side Arms	70.00	300	1,271	0.008	9	372
RFS APXV18-206517S-C	70.00	79	336	0.002	2	98
Generic Radio/ODU	60.00	30	94	0.001	1	37
Scala 840 10212	60.00	7	21	0.000	0	8
Stand Off	60.00	75	235	0.002	2	93
Radio Waves SP2-4.7	60.00	22	69	0.000	0	27
		33,533	149,929	1.000	1,006	41,614

Load Case 0.9D - 1.0Ev + 1.0Eh

Seismic (Reduced DL)

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
33	107.50	291	2,867	0.019	19	250
32	103.50	175	1,597	0.011	11	150
31	101.00	159	1,382	0.009	9	136
30	97.50	300	2,436	0.016	16	258
29	92.50	308	2,259	0.015	15	265
28	87.50	406	2,668	0.018	18	349
27	82.50	841	4,919	0.033	33	722
26	78.52	538	2,858	0.019	19	462
25	77.02	10	53	0.000	0	9
24	76.00	329	1,640	0.011	11	283
23	72.50	829	3,764	0.025	25	712
22	68.75	430	1,759	0.012	12	369
21	66.62	302	1,162	0.008	8	260
20	65.37	170	630	0.004	4	146
19	63.96	475	1,684	0.011	11	408
18	61.46	547	1,793	0.012	12	470
17	57.50	948	2,729	0.018	18	815
16	52.50	959	2,309	0.015	15	824
15	48.75	484	1,007	0.007	7	416
14	46.25	487	913	0.006	6	418
13	42.50	982	1,560	0.010	10	843
12	37.50	993	1,234	0.008	8	853
11	33.91	435	443	0.003	3	373
10	31.41	761	667	0.004	4	653
9	29.66	181	142	0.001	1	156
8	27.16	874	576	0.004	4	751
7	22.50	1,020	464	0.003	3	876
6	18.99	417	136	0.001	1	358
5	16.49	917	226	0.002	2	788
4	13.50	930	155	0.001	1	799
3	11.00	622	69	0.000	0	535
2	7.50	1,564	82	0.001	1	1,343
1	2.50	1,575	10	0.000	0	1,353
DragonWave Horizon C	110.00	11	109	0.001	1	9
Generic 12" x 12" Ju	110.00	10	103	0.001	1	9
Alcatel-Lucent RRH2x	110.00	317	3,270	0.022	22	273
Alcatel-Lucent 1900	110.00	180	1,854	0.012	12	155
Nokia 2.5G MAA - AAH	110.00	311	3,202	0.021	21	267
Andrew VHLP2-11	110.00	27	278	0.002	2	23
Commscope NNVV-65B-R	110.00	232	2,392	0.016	16	199
Flat Low Profile Pla	110.00	1,500	15,454	0.103	104	1,289
Powerwave Allgon 702	102.00	13	117	0.001	1	11
CCI TPX-070821	102.00	45	400	0.003	3	39
Kaelus DBCT108F1V92-	102.00	83	741	0.005	5	72
Powerwave Allgon LGP	102.00	85	751	0.005	5	73
Raycap DC6-48-60-0-8	102.00	33	291	0.002	2	28
Raycap DC6-48-60-18-	102.00	66	583	0.004	4	56
Ericsson RRUS 4426 B	102.00	145	1,290	0.009	9	125
Ericsson RRUS 4478 B	102.00	180	1,596	0.011	11	154
Ericsson RRUS 4478 B	102.00	178	1,583	0.011	11	153
Ericsson RRUS-11 (50	102.00	150	1,332	0.009	9	129
Ericsson RRUS 32 B2	102.00	159	1,412	0.009	9	137
Ericsson RRUS-32 (77	102.00	231	2,052	0.014	14	198
Powerwave Allgon 777	102.00	105	933	0.006	6	90
Quintel QS66512-2	102.00	222	1,972	0.013	13	191
CCI OPA-65R-LCUU-H6	102.00	146	1,297	0.009	9	125
CCI OPA-65R-LCUU-H8	102.00	88	782	0.005	5	76

Site Number: 302481

Code: ANSI/TIA-222-H

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Site Name: Hrfr - South, CT

Engineering Number: OAA713366_C3_13

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Customer: CLEARWIRE CORPORATION

CCI TPA-65R-LCUUUU-H	102.00	82	725	0.005	5	70
Kathrein Scala 80010	102.00	195	1,734	0.012	12	168
Kathrein Scala 80010	102.00	115	1,018	0.007	7	98
Flat Platform w/ Han	102.00	2,000	17,763	0.118	119	1,718
Kathrein Scala Smart	90.00	10	69	0.000	0	9
Ericsson KRY 112 144	90.00	33	229	0.002	2	28
Ericsson KRY 112 489	90.00	46	321	0.002	2	40
Ericsson Radio 4449	90.00	222	1,542	0.010	10	191
Ericsson AIR32 B66Aa	90.00	397	2,754	0.018	18	341
Ericsson Air 3246 B6	90.00	540	3,750	0.025	25	464
RFS APXVAARR24_43-U-	90.00	384	2,665	0.018	18	330
Flat Low Profile Pla	90.00	1,500	10,416	0.069	70	1,289
Nokia AirScale RRH 4	80.00	106	583	0.004	4	91
Alcatel-Lucent B25 R	80.00	159	876	0.006	6	137
Alcatel-Lucent B13 R	80.00	173	955	0.006	6	149
Alcatel-Lucent B66A	80.00	201	1,107	0.007	7	173
Raycap RVZDC-6627-PF	80.00	32	176	0.001	1	27
Commscope JAHH-65B-R	80.00	380	2,092	0.014	14	326
Round Low Profile PI	80.00	1,500	8,263	0.055	55	1,289
Scala 840 10212	77.00	7	34	0.000	0	6
TX RX Systems 421-86	77.00	15	77	0.001	1	13
Stand Offs	77.00	150	767	0.005	5	129
Round Side Arms	70.00	300	1,271	0.008	9	258
RFS APXV18-206517S-C	70.00	79	336	0.002	2	68
Generic Radio/ODU	60.00	30	94	0.001	1	26
Scala 840 10212	60.00	7	21	0.000	0	6
Stand Off	60.00	75	235	0.002	2	64
Radio Waves SP2-4.7	60.00	22	69	0.000	0	19
		33,533	149,929	1.000	1,006	28,806

Load Case 1.2D + 1.0Ev + 1.0Eh

Seismic

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	-39.66	-1.01	0.00	-95.99	0.00	95.99	1,564.13	420.30	1,179.53	948.21	0.00	0.00	0.036
5.00	-37.72	-1.02	0.00	-90.94	0.00	90.94	1,541.15	408.73	1,115.51	908.35	0.01	-0.01	0.035
10.00	-36.95	-1.02	0.00	-85.85	0.00	85.85	1,517.03	397.17	1,053.29	868.61	0.03	-0.03	0.033
12.00	-35.79	-1.03	0.00	-83.80	0.00	83.80	1,507.06	392.54	1,028.90	852.76	0.04	-0.03	0.033
12.00	-35.79	-1.03	0.00	-83.80	0.00	83.80	1,507.06	392.54	1,028.90	852.76	0.04	-0.03	0.033
15.00	-34.65	-1.03	0.00	-80.72	0.00	80.72	1,491.77	385.60	992.85	829.06	0.06	-0.04	0.032
17.97	-34.14	-1.03	0.00	-77.67	0.00	77.67	1,476.23	378.73	957.79	805.67	0.09	-0.05	0.031
17.97	-34.14	-1.03	0.00	-77.67	0.00	77.67	1,476.23	378.73	957.79	805.67	0.09	-0.05	0.051
20.00	-32.87	-1.03	0.00	-75.58	0.00	75.58	1,465.38	374.03	934.19	789.74	0.11	-0.05	0.050
25.00	-31.79	-1.04	0.00	-70.40	0.00	70.40	1,437.85	362.47	877.32	750.71	0.18	-0.08	0.048
29.33	-31.56	-1.05	0.00	-65.89	0.00	65.89	1,413.10	352.45	829.52	717.20	0.26	-0.09	0.046
30.00	-30.62	-1.04	0.00	-65.19	0.00	65.19	1,409.19	350.90	822.24	712.04	0.27	-0.10	0.045
32.83	-30.08	-1.05	0.00	-62.24	0.00	62.24	1,130.07	270.32	634.36	571.86	0.34	-0.11	0.055
35.00	-28.84	-1.04	0.00	-59.97	0.00	59.97	1,119.12	266.46	616.37	558.15	0.39	-0.12	0.053
40.00	-27.63	-1.04	0.00	-54.76	0.00	54.76	1,081.75	257.56	575.90	521.31	0.52	-0.14	0.051
45.00	-27.02	-1.04	0.00	-49.57	0.00	49.57	1,044.38	248.66	536.82	485.73	0.68	-0.16	0.048
47.50	-26.42	-1.03	0.00	-46.97	0.00	46.97	1,025.69	244.21	517.79	468.42	0.77	-0.17	0.047
47.50	-26.42	-1.03	0.00	-46.97	0.00	46.97	1,025.69	244.21	517.79	468.42	0.77	-0.17	0.047
50.00	-25.23	-1.02	0.00	-44.39	0.00	44.39	1,007.01	239.76	499.10	451.41	0.86	-0.18	0.045
55.00	-24.05	-1.01	0.00	-39.29	0.00	39.29	969.64	230.87	462.76	418.35	1.05	-0.20	0.042
60.00	-23.21	-0.99	0.00	-34.25	0.00	34.25	932.27	221.97	427.79	386.54	1.27	-0.21	0.039
62.92	-22.62	-0.98	0.00	-31.36	0.00	31.36	910.47	216.78	408.02	368.57	1.40	-0.22	0.037
65.00	-22.41	-0.98	0.00	-29.31	0.00	29.31	894.90	213.07	394.19	355.99	1.50	-0.23	0.035
65.75	-22.03	-0.97	0.00	-28.57	0.00	28.57	664.38	162.37	305.14	269.42	1.54	-0.23	0.039
67.50	-21.50	-0.96	0.00	-26.87	0.00	26.87	658.03	160.03	296.43	262.98	1.63	-0.24	0.037
67.50	-21.50	-0.96	0.00	-26.87	0.00	26.87	658.03	160.03	296.43	262.98	1.63	-0.24	0.037
70.00	-20.00	-0.92	0.00	-24.47	0.00	24.47	648.81	156.70	284.20	253.83	1.75	-0.25	0.035
75.00	-19.59	-0.91	0.00	-19.86	0.00	19.86	629.79	150.02	260.52	235.80	2.02	-0.26	0.030
77.00	-19.36	-0.91	0.00	-18.03	0.00	18.03	618.88	147.35	251.33	227.55	2.13	-0.26	0.029
77.04	-18.70	-0.88	0.00	-17.99	0.00	17.99	618.65	147.30	251.14	227.38	2.13	-0.26	0.017
77.04	-18.70	-0.88	0.00	-17.99	0.00	17.99	618.65	147.30	251.14	227.38	2.13	-0.26	0.031
80.00	-14.49	-0.74	0.00	-15.38	0.00	15.38	602.07	143.35	237.86	215.29	2.30	-0.27	0.026
85.00	-13.98	-0.72	0.00	-11.68	0.00	11.68	574.04	136.68	216.24	195.61	2.58	-0.28	0.022
85.00	-13.98	-0.72	0.00	-11.68	0.00	11.68	574.04	136.68	216.24	195.61	2.58	-0.28	0.084
90.00	-9.72	-0.54	0.00	-8.06	0.00	8.06	546.01	130.00	195.65	176.87	2.89	-0.29	0.063
95.00	-9.34	-0.53	0.00	-5.34	0.00	5.34	517.98	123.33	176.08	159.08	3.21	-0.32	0.052
100.00	-9.15	-0.52	0.00	-2.70	0.00	2.70	489.95	116.66	157.55	142.23	3.56	-0.34	0.038
100.00	-9.15	-0.52	0.00	-2.70	0.00	2.70	459.24	137.77	149.89	150.79	3.56	-0.34	0.038
102.00	-3.57	-0.22	0.00	-1.65	0.00	1.65	459.24	137.77	149.89	150.79	3.70	-0.35	0.019
105.00	-3.21	-0.20	0.00	-0.99	0.00	0.99	459.24	137.77	149.89	150.79	3.92	-0.35	0.014
110.00	0.00	-0.18	0.00	0.00	0.00	0.00	459.24	137.77	149.89	150.79	4.29	-0.36	0.000

Load Case 0.9D - 1.0Ev + 1.0Eh

Seismic (Reduced DL)

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	-27.45	-1.01	0.00	-93.95	0.00	93.95	1,564.13	420.30	1,179.53	948.21	0.00	0.00	0.033
5.00	-26.11	-1.01	0.00	-88.91	0.00	88.91	1,541.15	408.73	1,115.51	908.35	0.01	-0.01	0.032
10.00	-25.58	-1.02	0.00	-83.84	0.00	83.84	1,517.03	397.17	1,053.29	868.61	0.03	-0.03	0.030
12.00	-24.78	-1.02	0.00	-81.80	0.00	81.80	1,507.06	392.54	1,028.90	852.76	0.04	-0.03	0.030
12.00	-24.78	-1.02	0.00	-81.80	0.00	81.80	1,507.06	392.54	1,028.90	852.76	0.04	-0.03	0.030
15.00	-23.99	-1.02	0.00	-78.75	0.00	78.75	1,491.77	385.60	992.85	829.06	0.06	-0.04	0.029
17.97	-23.63	-1.02	0.00	-75.72	0.00	75.72	1,476.23	378.73	957.79	805.67	0.09	-0.05	0.028
17.97	-23.63	-1.02	0.00	-75.72	0.00	75.72	1,476.23	378.73	957.79	805.67	0.09	-0.05	0.046
20.00	-22.75	-1.02	0.00	-73.64	0.00	73.64	1,465.38	374.03	934.19	789.74	0.11	-0.05	0.045
25.00	-22.00	-1.03	0.00	-68.53	0.00	68.53	1,437.85	362.47	877.32	750.71	0.18	-0.07	0.043
29.33	-21.85	-1.03	0.00	-64.09	0.00	64.09	1,413.10	352.45	829.52	717.20	0.25	-0.09	0.042
30.00	-21.19	-1.03	0.00	-63.40	0.00	63.40	1,409.19	350.90	822.24	712.04	0.27	-0.10	0.041
32.83	-20.82	-1.03	0.00	-60.50	0.00	60.50	1,130.07	270.32	634.36	571.86	0.33	-0.11	0.049
35.00	-19.97	-1.02	0.00	-58.27	0.00	58.27	1,119.12	266.46	616.37	558.15	0.38	-0.12	0.048
40.00	-19.12	-1.02	0.00	-53.17	0.00	53.17	1,081.75	257.56	575.90	521.31	0.51	-0.14	0.046
45.00	-18.70	-1.01	0.00	-48.09	0.00	48.09	1,044.38	248.66	536.82	485.73	0.66	-0.15	0.043
47.50	-18.29	-1.01	0.00	-45.56	0.00	45.56	1,025.69	244.21	517.79	468.42	0.75	-0.16	0.042
47.50	-18.29	-1.01	0.00	-45.56	0.00	45.56	1,025.69	244.21	517.79	468.42	0.75	-0.16	0.042
50.00	-17.46	-0.99	0.00	-43.04	0.00	43.04	1,007.01	239.76	499.10	451.41	0.84	-0.17	0.041
55.00	-16.65	-0.98	0.00	-38.07	0.00	38.07	969.64	230.87	462.76	418.35	1.03	-0.19	0.038
60.00	-16.06	-0.96	0.00	-33.18	0.00	33.18	932.27	221.97	427.79	386.54	1.24	-0.21	0.035
62.92	-15.66	-0.95	0.00	-30.37	0.00	30.37	910.47	216.78	408.02	368.57	1.37	-0.22	0.033
65.00	-15.51	-0.95	0.00	-28.38	0.00	28.38	894.90	213.07	394.19	355.99	1.46	-0.22	0.031
65.75	-15.25	-0.94	0.00	-27.67	0.00	27.67	664.38	162.37	305.14	269.42	1.50	-0.23	0.034
67.50	-14.88	-0.93	0.00	-26.02	0.00	26.02	658.03	160.03	296.43	262.98	1.58	-0.23	0.033
67.50	-14.88	-0.93	0.00	-26.02	0.00	26.02	658.03	160.03	296.43	262.98	1.58	-0.23	0.033
70.00	-13.84	-0.89	0.00	-23.69	0.00	23.69	648.81	156.70	284.20	253.83	1.71	-0.24	0.030
75.00	-13.56	-0.88	0.00	-19.22	0.00	19.22	629.79	150.02	260.52	235.80	1.96	-0.25	0.026
77.00	-13.40	-0.88	0.00	-17.45	0.00	17.45	618.88	147.35	251.33	227.55	2.07	-0.26	0.025
77.04	-12.94	-0.86	0.00	-17.42	0.00	17.42	618.65	147.30	251.14	227.38	2.07	-0.26	0.015
77.04	-12.94	-0.86	0.00	-17.42	0.00	17.42	618.65	147.30	251.14	227.38	2.07	-0.26	0.027
80.00	-10.03	-0.72	0.00	-14.88	0.00	14.88	602.07	143.35	237.86	215.29	2.23	-0.26	0.023
85.00	-9.68	-0.70	0.00	-11.30	0.00	11.30	574.04	136.68	216.24	195.61	2.52	-0.27	0.020
85.00	-9.68	-0.70	0.00	-11.30	0.00	11.30	574.04	136.68	216.24	195.61	2.52	-0.27	0.075
90.00	-6.73	-0.53	0.00	-7.80	0.00	7.80	546.01	130.00	195.65	176.87	2.81	-0.28	0.056
95.00	-6.47	-0.51	0.00	-5.16	0.00	5.16	517.98	123.33	176.08	159.08	3.12	-0.31	0.045
100.00	-6.33	-0.50	0.00	-2.61	0.00	2.61	489.95	116.66	157.55	142.23	3.46	-0.33	0.031
100.00	-6.33	-0.50	0.00	-2.61	0.00	2.61	459.24	137.77	149.89	150.79	3.46	-0.33	0.031
102.00	-2.47	-0.21	0.00	-1.60	0.00	1.60	459.24	137.77	149.89	150.79	3.60	-0.34	0.016
105.00	-2.22	-0.19	0.00	-0.96	0.00	0.96	459.24	137.77	149.89	150.79	3.81	-0.34	0.011
110.00	0.00	-0.18	0.00	0.00	0.00	0.00	459.24	137.77	149.89	150.79	4.17	-0.34	0.000

Site Number: 302481

Code: ANSI/TIA-222-H

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Site Name: Hrfr - South, CT

Engineering Number: OAA713366_C3_13

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Customer: CLEARWIRE CORPORATION

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 + 1.0W	25.53	0.00	40.18	0.00	0.00	1882.14	85.00	0.95
0.9D + 1.0W	25.50	0.00	30.12	0.00	0.00	1851.87	85.00	0.92
1.2D + 1.0Di + 1.0Wi	7.50	0.00	72.69	0.00	0.00	571.08	85.00	0.32
1.2D + 1.0Ev + 1.0Eh	1.01	0.00	39.66	0.00	0.00	95.99	85.00	0.08
0.9D - 1.0Ev + 1.0Eh	1.01	0.00	27.45	0.00	0.00	93.95	85.00	0.07
1.0D + 1.0W	5.95	0.00	33.53	0.00	0.00	433.18	85.00	0.23

Additional Steel Summary

			Intermediate Connectors				Max Member		
Elev From (ft)	Elev To (ft)	Member	VQ/I (lb/in)	Shear Applied (kips)	Shear phiVn (kips)	Ratio	Pu (kip)	phiPn (kip)	Ratio
0.00	12.00	(4) SOL-#20 All Thread Bar	238.6	9.3	16.8	0.554	213.3	315.5	0.676
0.00	17.97	(4) PL-PL 6 x 1.25	302.9	7.3	38.3	0.190	272.1	362.0	0.751
12.00	47.50	(4) SOL-#20 All Thread Bar	427.4	12.8	16.8	0.763	303.3	330.5	0.918
47.50	67.50	(4) SOL-#20 All Thread Bar	482.5	14.5	16.8	0.861	217.6	330.5	0.658
67.50	77.04	(4) SOL-#20 All Thread Bar	482.5	14.5	16.8	0.861	152.5	330.5	0.461
77.00	85.00	(4) PL-PL 5" x 1.25"	563.7	13.5	38.3	0.353	129.5	287.7	0.450

			Upper Termination Connectors				Lower Termination Connectors					
Elev From (ft)	Elev To (ft)	Member	MQ/I (kips)	phiVn (kips)	Num Reqd	Num Actual	Ratio	MQ/I (kips)	phiVn (kips)	Num Reqd	Num Actual	Ratio
0.00	12.00	(4) SOL-#20 All Thread Bar	0.0	12.0	0	0	0.000	0.0	12.0	0	0	0.000
0.00	17.97	(4) PL-PL 6 x 1.25	231.5	38.3	7	8	0.756	0.0	38.3	0	0	0.000
12.00	47.50	(4) SOL-#20 All Thread Bar	0.0	12.0	0	0	0.000	0.0	12.0	0	0	0.000
47.50	67.50	(4) SOL-#20 All Thread Bar	0.0	12.0	0	0	0.000	0.0	12.0	0	0	0.000
67.50	77.04	(4) SOL-#20 All Thread Bar	66.2	12.0	6	7	0.789	0.0	12.0	0	0	0.000
77.00	85.00	(4) PL-PL 5" x 1.25"	0.0	38.3	0	8	0.000	0.0	38.3	0	8	0.000

Site Name: Hrfr-South, CT
 Site Number: 302481
 Engineering Number: OAA713366
 Engineer: Cole.Koffi
 Date: 10/1/2019

Design Base Loads (Factored) - Design per TIA-222-H Standard

Moment (Overturning) (M_u): 1882.1 k-ft
 Shear (V_u): 25.5 k
 Axial (P_u): 40.2 k

Tower Type (GT / SST / MP):

MP

Length / Width of Block:	6.0	9.0 ft
Thickness of Block:	6.0	ft
Block Height Above Ground:	0.5	ft
Depth Below Ground Surface to Water Table (w):	99.0	ft
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Soil:	125.0	pcf
Unit Weight of Water:	62.4	pcf
Ultimate Compressive Bearing Pressure:	10000	psf
Capacity Increase (Due to Transient Loads):	1.00	
Pullout Angle:	30.0	degrees
Rod Diameter:	1.00	in
Rod Ultimate Strength:	105	ksi
Original Rod Net Area:	0.76	in ²
New Rod Net Area:	0.78	in ²
Number of Rods:	18	
Diameter of Cored Hole:	2.00	in
Ultimate Grout / Rock Interface Bond Strength:	200	psi
Ultimate Grout / Rock Anchor Interface Bond Strength:	600	psi
Overall Rod Embedment Length:	72	in
Rod Exposure Above Lock Off Nut in Foundation:	60	in
Rod Embedment Circle:	96	in
Free Stress Length:	0	in
Soil / Concrete Friction Coefficient:	0.44	
Rock Anchor Design Plastic or Elastic:	Elastic	
Ignore Pullout Weight Resistance (Y/N):	Y	
Volume of Concrete:	324.0	ft ³
Compressive Bearing Resistance:	424.1	k
Soil Strength Reduction Factor (ϕ_s):	0.75	
Factored Nominal Moment Capacity per Leg ($\phi_s M_n$):	2109.0	k
Factored Nominal Uplift Capacity per Leg ($\phi_s T_n$):	1151.2	k
Factored Nominal Compressive Capacity per Leg ($\phi_s P_n$):	318.1	k
Factored Nominal Shear Capacity per Leg ($\phi_s V_n$):	660.0	k
M_u :	2035.3	k-ft
T_u :	0.0	k
P_u :	49.1	k
V_u :	25.5	k
$T_u / \phi_s T_n + M_u / \phi_s M_n$:	0.97	Result: OK
$P_u / \phi_s P_n$:	0.15	Result: OK
$V_u / \phi_s V_n$:	0.04	Result: OK

Caisson Strength Capacity

Concrete Compressive Strength (f'_c):	3000 psi
Vertical Steel Rebar Size #:	11
Vertical Steel Rebar Area:	1.56 in ²
# of Vertical Steel Rebars:	78 Minimum # of vertical rebar met
Vertical Steel Rebar Yield Strength (F_y):	60 ksi
Horizontal Tie / Stirrup Size #:	5
Horizontal Tie / Stirrup Area:	0.31 in ²
Horizontal Tie / Stirrup Spacing:	11.0 in
Horizontal Tie / Stirrup Steel Yield Strength (F_y):	60 ksi
Rod Bearing Plate Diameter:	8.0 in
Rod Bearing Plate Thickness:	1.0 in
Anchor Bearing Plate Yield Strength:	36 ksi
Anchor Rod Nut Diameter:	2.02 in
Rebar Cage Diameter:	82.0 in
Strength Bending/Tension Reduction Factor (ϕ_B):	0.90 ACI318-05 - 9.3.2.1
Strength Shear Reduction Factor (ϕ_V):	0.75 ACI318-05 - 9.3.2.3
Strength Compression/Bearing Reduction Factor ($\phi_{P/B}$):	0.65 ACI318-05 - 9.3.2.2
Steel Elastic Modulus:	29000 ksi
Design Moment (M_u):	2035.3 k-ft
Factored Nominal Moment Capacity ($\phi_B M_n$):	21953.2 k-ft - ACI318-05 - 10.2
$M_u/\phi_B M_n$:	0.09 Result: OK
Design Shear (V_u):	503.8 k
Factored Nominal Shear Capacity ($\phi_V V_n$):	502.8 k - ACI318-05 - 11.3.1.1 or 11.5.7.2
$V_u/\phi_V V_n$:	1.00 Result: Acceptable Overstress
Design Tension (T_u):	0.0 k
Factored Nominal Tension Capacity ($\phi_T T_n$):	6570.7 k - ACI318-05 - 10.2
$T_u/\phi_T T_n$:	0.00 Result: OK
Design Compression (P_u):	40.2 k
Factored Nominal Compression Capacity ($\phi_P P_n$):	6161.7 k - ACI318-05 - 10.3.6.2
$P_u/\phi_P P_n$:	0.01 Result: OK



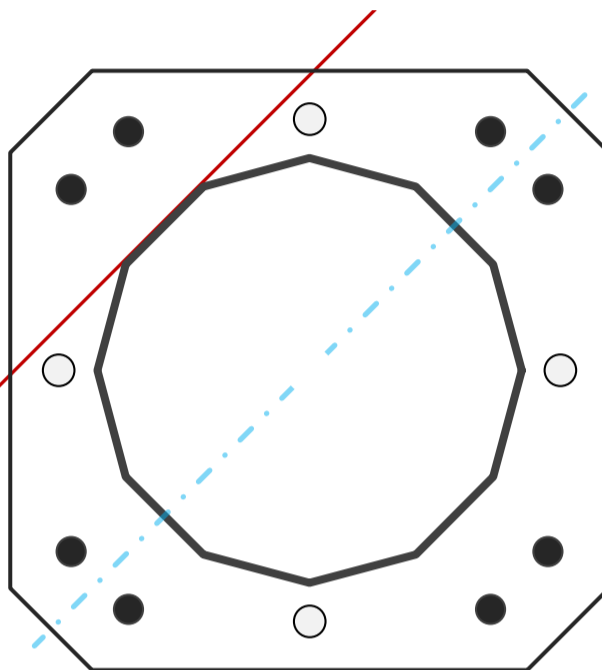
Base Plate & Anchor Rod Analysis

Pole Dimensions		
Number of Sides	12	-
Diameter	30	in
Thickness	0.25	in
Orientation Offset	0	°

Base Reactions		
Moment, Mu	1882.1	k-ft
Axial, Pu	40.2	k
Shear, Vu	25.5	k
Neutral Axis	45	°

Report Capacities		
Component	Capacity	Result
Base Plate	87%	Pass
Anchor Rods	44%	Pass
Dwyidag	64%	Pass

Base Plate		
Shape	Square	-
Width	44	in
Thickness	2	in
Grade	A572-60	
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	75	ksi
Clip	6	in
Orientation Offset	0	°
Anchor Rod Detail	c	$\eta=0.55$
Clear Distance	N/A	in
Applied Moment, Mu	1510.7	k
Bending Stress, ϕMn	1733.4	k



Dwyidag Reinforcement		
Quantity	4	-
Bar Size	#20	in
Diameter, ϕ	2.5	in
Bracket Type	Angle	-
Circle	36.88	in
Orientation Offset	0	°
Applied Force, Pu	250.6	k
Dwyidag Bar, ϕPn	392.7	k

Original Anchor Rods		
Arrangement	Cluster	-
Quantity	8	-
Diameter, ϕ	2 1/4	in
Bolt Circle	44	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Spacing	6.0	in
Orientation Offset	0	°
Applied Force, Pu	112.2	k
Anchor Rods, ϕPn	259.8	k

Calculations for Monopole Base Plate & Anchor Rod Analysis

Reaction Distribution

Reaction	Shear Vu	Moment Mu	Factor
-	k	k-ft	-
Base Forces	25.5	815.1	0.43
Anchor Rod Forces	25.5	815.1	0.43
Additional Bolt (Grp1) Forces	0.0	0.0	0.00
Additional Bolt (Grp2) Forces	0.0	0.0	0.00
Dywidag Forces	0.0	1067.0	0.57
Stiffener Forces	0.0	0.0	0.00

Geometric Properties

Section	Gross Area	Net Area	Individual Inertia	Threads per Inch	Moment of Inertia
-	in ²	in ²	in ⁴	#	in ⁴
Pole	23.0996	1.9250	0.0403		2556.06
Bolt	3.9761	3.2477	0.8393	4.5	6294.24
Bolt1	0.0000	0.0000	0.0000	0	0.00
Bolt2	0.0000	0.0000	0.0000	0	0.00
Dywidag	4.9087	4.9087	1.9175		3345.94
Stiffener	0.0000	0.0000	0.0000		0.00

Base Plate

Shape	Square	-
Width, W	44	in
Thickness, t	2	in
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	75	ksi
Base Plate Chord	32.187	in
Detail Type	c	-
Detail Factor	0.55	-
Clear Distance	N/A	-

Anchor Rods

Anchor Rod Quantity, N	8	-
Rod Diameter, d	2.25	in
Bolt Circle, BC	44	in
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	112.2	k
Applied Shear, Vu	0.8	k
Compressive Capacity, φPn	259.8	k
Tensile Capacity, φRnt	0.432	OK
Interaction Capacity	0.437	OK

External Base Plate

Chord Length AA	32.100	in
Additional AA	0.000	in
Section Modulus, Z	32.100	in ³
Applied Moment, Mu	1510.7	k-ft
Bending Capacity, φMn	1733.4	k-ft
Capacity, Mu/φMn	0.871	OK

Chord Length AB	31.038	in
Additional AB	0.000	in
Section Modulus, Z	31.038	in ³
Applied Moment, Mu	1391.4	k-ft
Bending Capacity, φMn	1676.0	k-ft
Capacity, Mu/φMn	0.830	OK

Bend Line Length	0.000	in
Additional Bend Line	0.000	in
Section Modulus, Z	0.000	in ³
Applied Moment, Mu	0.0	k-ft
Bending Capacity, φMn	0.0	k-ft
Capacity, Mu/φMn		

Internal Base Plate

Arc Length	0.000	in
Section Modulus, Z	0.000	in ³
Moment Arm	0.000	in
Applied Moment, Mu	0.0	k-ft
Bending Capacity, φMn	0.0	k-ft
Capacity, Mu/φMn		

Dywidag Reinforcement

Dywidag Quantity, N	4	-
Dywidag Diameter, d	2.5	in
Bolt Circle, BC	36.88	in
Yield Strength, Fy	80	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	250.6	k
Compressive Capacity, φPn	392.7	k
Capacity, Pu/φPn	0.638	OK

Flange Plate Analysis

Flange Plate	Plate Type	Flange	100 ft
	Pole Diameter	12.75	in
	Pole Thickness	0.375	in
	Plate Diameter	28.5	in
	Plate Thickness	15	in
	Plate Fy	36	ksi
	Weld Length	0.25	in
	f _s Resistance Applied	6083.40	k-in
		30.34	k-in

Code Rev. **G**

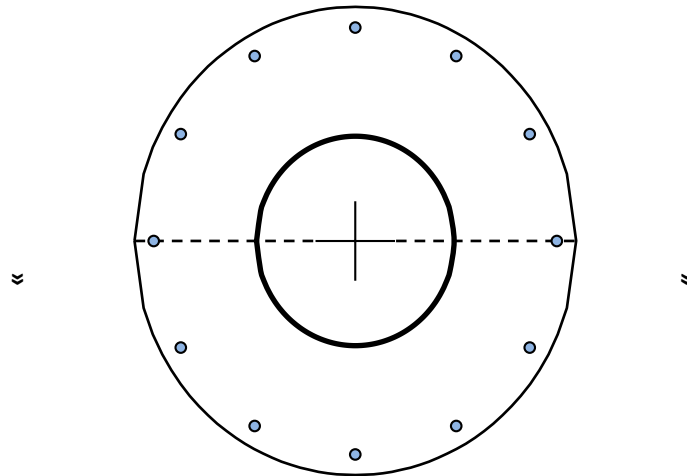
Date	10/1/2019
Engineer	Cole.Koffi
Site #	302481
Carrier	CLEARWIRE CORPORATION

Moment **38.4 k-ft**
Axial **8.3 k**

Required Flange Thickness:
1.06 in OK

Stiffeners	#	
------------	---	--

Bolts	#	12	
	Bolt Circle (R)adial / (S)quare	26	in
		R	
	Bolt Gap	6	in
	Diameter	1	in
	Hole Diameter	1.125	in
	Type	A325	
	Fy	92	ksi
	Fu	120	ksi
	f _s Resistance Applied	54.52	k
	5.22	k	



Reinforcement	#	
---------------	---	--

Plate Stress Ratio:
0% Pass

Bolt Stress Ratio:
10% Pass

Extra Bolts	O	#	
-------------	---	---	--

Sprint



PROJECT: DO MACRO UPGRADE
 SITE NAME: HRFR - SOUTH
 SITE CASCADE: CT52XC041
 SITE ADDRESS: MOUNTAIN STREET
 HARTFORD, CT 06106
 SITE TYPE: MONOPOLE TOWER
 MARKET: NORTHERN CONNECTICUT

PLANS PREPARED FOR:

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY ENGINEERING, PLLC
 1033 Watervliet Shaker Rd | Albany, NY 12205
 Phone: 518-690-0790 | Fax: 518-690-0793
 www.infinigy.com
 JOB NUMBER 526-104

MLA PARTNER:

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

ENGINEERING LICENSE:

11/27/2019

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REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	11/18/19	MAP	0

SITE NAME:

HRFR - SOUTH

SITE CASCADE:

CT52XC041

SITE ADDRESS:

MOUNTAIN STREET
HARTFORD, CT 06106

SHEET DESCRIPTION:

TITLE SHEET & PROJECT DATA

SHEET NUMBER:

T-1

SITE INFORMATION

TOWER OWNER:
 AMERICAN TOWER CORPORATION
 116 HUNTINGTON AVE. 11TH FLOOR
 BOSTON, MA 02116

LATITUDE (NAD83):
 41° 43' 35.694"
 N 41.72658157

LONGITUDE (NAD83):
 -72° 42' 29.515"
 W -72.70819855

COUNTY:
 HARTFORD

ZONING JURISDICTION:
 CONNECTICUT SITING COUNCIL /
 CITY OF HARTFORD (SUP)

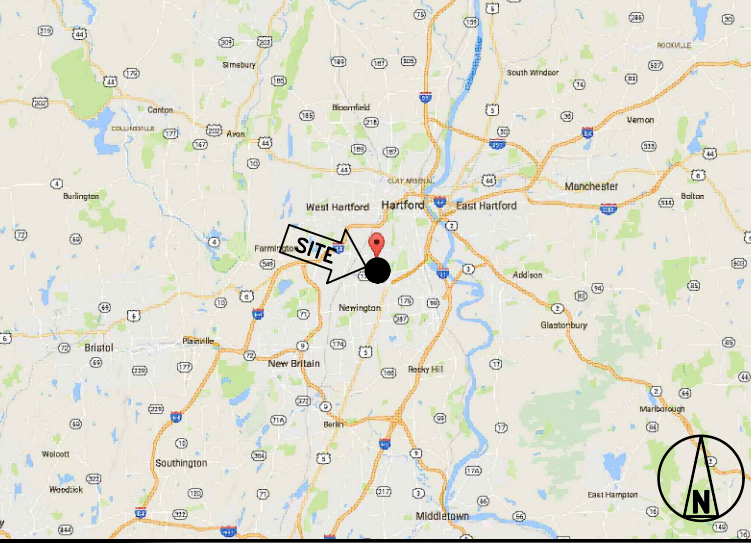
ZONING DISTRICT:
 TBD

POWER COMPANY:
 NORTHEAST UTILITIES SERVICE COMPANY

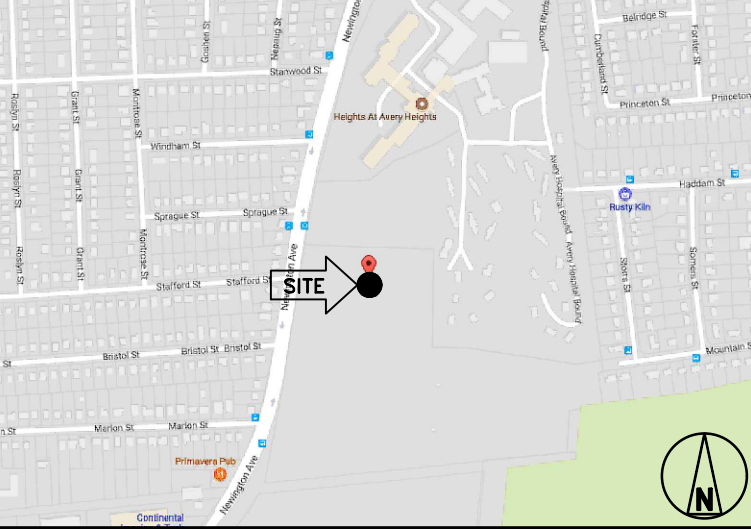
AAV PROVIDER:
 FRONTIER
 PHONE: (800) 921-8101

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) EXISTING PANEL ANTENNAS AND RRH'S
 - INSTALL (6) PANEL ANTENNAS
 - INSTALL (3) 1900 MHz RRH'S BEHIND ANTENNAS
 - INSTALL (6) 800 MHz RRH'S BEHIND ANTENNAS
 - INSTALL (48) JUMPER CABLES
 - INSTALL (4) HYBRID CABLE
 - REMOVE EXISTING CLEARWIRE GROUND EQUIPMENT
 - INSTALL (2) EQUIPMENT CABINETS WITHIN EXISTING LEASE AREA
 - INSTALL 7' x 7' CONCRETE EQUIPMENT PAD
 - REMOVE (2) MICROWAVE DISHES AND RADIOS
 - REMOVE (2) 1/2" COAX CABLES

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. 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
 - ME BUILDING CODE
 - LOCAL BUILDING CODE
 - CITY/COUNTY ORDINANCES



DRAWING INDEX

SHEET NO.	SHEET TITLE	REV.
T-1	TITLE SHEET & PROJECT DATA	0
SP-1	SPRINT SPECIFICATIONS	0
SP-2	SPRINT SPECIFICATIONS	0
SP-3	SPRINT SPECIFICATIONS	0
A-1	SITE PLAN	0
A-2	TOWER ELEVATION	0
A-3	ANTENNA LAYOUT & MOUNTING DETAILS	0
A-4	EQUIPMENT & MOUNTING DETAILS	0
A-5	EQUIPMENT DETAILS	0
A-6	CIVIL DETAILS	0
A-7	PLUMBING DIAGRAM	0
E-1	ONE LINE & NOTES	0
E-2	ELECTRICAL & GROUNDING DETAILS	0
E-3	ELECTRICAL & GROUNDING DETAILS	0

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:



6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:



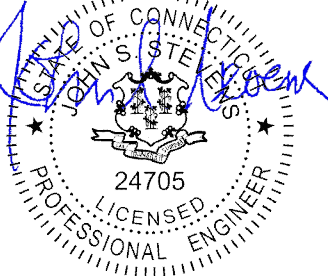
INFINIGY ENGINEERING, PLLC
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

MLA PARTNER:



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

ENGINEERING LICENSE



11/27/2019

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REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	11/18/19	MAP	0

SITE NAME:

HRFR - SOUTH

SITE CASCADE:

CT52XC041

SITE ADDRESS:

**MOUNTAIN STREET
HARTFORD, CT 06106**

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:



MLA PARTNER:



ENGINEERING LICENSE:



DRAWING NOTICE:

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REVISIONS:	DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION		11/18/19	MAP	0

SITE NAME:

HRFR - SOUTH

SITE CASCADE:

CT52XC041

SITE ADDRESS:

**MOUNTAIN STREET
HARTFORD, CT 06106**

SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-2

CONTINUE FROM SP-2

7. VERIFICATION DOCUMENTED WITH THE ANTENNA CHECKLIST REPORT, BY A&E, SITE DEVELOPMENT REP, OR RF REP.
 8. FINAL INSPECTION CHECKLIST AND HANDOFF WALK (HOC.). SIGNED FORM SHOWING ACCEPTANCE BY FIELD OPS IS TO BE UPLOADED INTO SMS.
 9. COAX SWEEP AND FIBER TESTING DOCUMENTS SUBMITTED VIA SMS FOR RF APPROVAL.
 10. SCAN-ABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
 11. ALL AVAILABLE JURISDICTIONAL INFORMATION
 12. PDF SCAN OF REDLINES PRODUCED IN FIELD
- C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.
- D. CONSTRUCTION INSPECTIONS AND CORRECTIVE MEASURES SHALL BE DOCUMENTED BY THE CONTRACTOR WITH WRITTEN REPORTS AND PHOTOGRAPHS. PHOTOGRAPHS MUST BE DIGITAL AND OF SUFFICIENT QUALITY TO CLEARLY SHOW THE SITE CONSTRUCTION. PHOTOGRAPHS MUST CLEARLY IDENTIFY THE PHOTOGRAPHED ITEM AND BE LABELED WITH THE SITE CASCADE NUMBER, SITE NAME, DESCRIPTION, AND DATE.
- 3.4 DELIVERABLES: TEST AND INSPECTION REPORTS AND CLOSEOUT DOCUMENTATION SHALL BE UPLOADED TO THE SMS AND/OR FORWARDED TO SPRINT FOR INCLUSION INTO THE PERMANENT SITE FILES.
- A. THE FOLLOWING TEST AND INSPECTION REPORTS SHALL BE PROVIDED AS APPLICABLE.
1. CONCRETE MIX AND CYLINDER BREAK REPORTS.
 2. STRUCTURAL BACKFILL COMPACTION REPORTS.
 3. SITE RESISTANCE TO EARTH TEST.
 4. ANTENNA AZIMUTH AND DOWN TILT VERIFICATION
 5. TOWER ERECTION INSPECTIONS AND MEASUREMENTS DOCUMENTING TOWER INSTALLED PER SUPPLIER'S REQUIREMENTS AND THE APPLICABLE SECTIONS HEREIN.
 6. COAX CABLE SWEEP TESTS PER COMPANY'S "ANTENNA LINE ACCEPTANCE STANDARDS".
- B. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES THE FOLLOWING:
1. TEST WELLS AND TRENCHES: PHOTOGRAPHS OF ALL TEST WELLS; PHOTOGRAPHS SHOWING ALL OPEN EXCAVATIONS AND TRENCHING PRIOR TO BACKFILLING SHOWING A TAPE MEASURE VISIBLE IN THE EXCAVATIONS INDICATING DEPTH.
 2. CONDUITS, CONDUCTORS AND GROUNDING: PHOTOGRAPHS SHOWING TYPICAL INSTALLATION OF CONDUCTORS AND CONNECTORS; PHOTOGRAPHS SHOWING TYPICAL BEND RADIUS OF INSTALLED GROUND WIRES AND GROUND ROD SPACING;
 3. CONCRETE FORMS AND REINFORCING: CONCRETE FORMING AT TOWER AND EQUIPMENT/SHELTER PAD/FOUNDATIONS - PHOTOGRAPHS SHOWING ALL REINFORCING STEEL, UTILITY AND CONDUIT STUB OUTS; PHOTOGRAPHS SHOWING CONCRETE POUR OF SHELTER SLAB/FOUNDATION, TOWER FOUNDATION AND GUY ANCHORS WITH VIBRATOR IN USE; PHOTOGRAPHS SHOWING EACH ANCHOR ON GUYED TOWERS, BEFORE CONCRETE POUR.
 4. TOWER, ANTENNAS AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAX LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING, AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING - TOP AND BOTTOM; PHOTOS OF COAX GROUNDING--TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
 5. ROOF TOPS: PRE-CONSTRUCTION AND POST-CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;
 6. SITE LAYOUT - PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.
 7. FINISHED UTILITIES: CLOSE-UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE-UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.
 8. REQUIRED MATERIALS CERTIFICATIONS: CONCRETE MIX DESIGNS; MILL CERTIFICATION FOR ALL REINFORCING AND STRUCTURAL STEEL; AND ASPHALT PAVING MIX DESIGN.
 9. ANY AND ALL SUBMITTALS BY THE JURISDICTION OR COMPANY.

SECTION 01 400 - SUBMITTALS & TESTS

PART 1 - GENERAL

- 1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.
- 1.2 RELATED DOCUMENTS:
 - A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.
 - B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HERewith.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

- 3.1 WEEKLY REPORTS:
 - A. CONTRACTOR SHALL PROVIDE SPRINT WITH WEEKLY REPORTS SHOWING PROJECT STATUS. THIS STATUS REPORT FORMAT WILL BE PROVIDED TO THE CONTRACTOR BY SPRINT. THE REPORT WILL CONTAIN SITE ID NUMBER, THE MILESTONES FOR EACH SITE, INCLUDING THE BASELINE DATE, ESTIMATED COMPLETION DATE AND ACTUAL COMPLETION DATE.
 - B. REPORT INFORMATION WILL BE TRANSMITTED TO SPRINT VIA ELECTRONIC MEANS AS REQUIRED. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.
- 3.2 PROJECT CONFERENCE CALLS:
 - A. SPRINT MAY HOLD WEEKLY PROJECT CONFERENCE CALLS. CONTRACTOR WILL BE REQUIRED TO COMMUNICATE SITE STATUS, MILESTONE COMPLETIONS AND UPCOMING MILESTONE PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY.
- 3.3 PROJECT TRACKING IN SMS:
 - A. CONTRACTOR SHALL PROVIDE SCHEDULE UPDATES AND PROJECTIONS IN THE SMS SYSTEM ON A WEEKLY BASIS.
- 3.4 ADDITIONAL REPORTING:
 - A. ADDITIONAL OR ALTERNATE REPORTING REQUIREMENTS MAY BE ADDED TO THE REPORT AS DETERMINED TO BE REASONABLY NECESSARY BY COMPANY.
- 3.5 PROJECT PHOTOGRAPHS:
 - A. FILE DIGITAL PHOTOGRAPHS OF COMPLETED SITE IN JPEG FORMAT IN THE SMS PHOTO LIBRARY FOR THE RESPECTIVE SITE. PHOTOGRAPHS SHALL BE CLEARLY LABELED WITH SITE NUMBER, NAME AND DESCRIPTION, AND SHALL INCLUDE AT A MINIMUM THE FOLLOWING AS APPLICABLE:
 1. SHELTER AND TOWER OVERVIEW.
 2. TOWER FOUNDATION(S) - FORMS AND STEEL BEFORE POUR (EACH ANCHOR ON GUYED TOWERS).
 3. TOWER FOUNDATION(S) POUR WITH VIBRATOR IN USE (EACH ANCHOR ON GUYED TOWERS).
 4. TOWER STEEL AS BEING INSTALLED INTO HOLE (SHOW ANCHOR STEEL ON GUYED TOWERS).
 5. PHOTOS OF TOWER SECTION STACKING.
 6. CONCRETE TESTING / SAMPLES.
 7. PLACING OF ANCHOR BOLTS IN TOWER FOUNDATION.
 8. BUILDING/WATER TANK FROM ROAD FOR TENANT IMPROVEMENTS OR COMMENTS.
 9. SHELTER FOUNDATION--FORMS AND STEEL BEFORE POURING.
 10. SHELTER FOUNDATION POUR WITH VIBRATOR IN USE.
 11. COAX CABLE ENTRY INTO SHELTER.
 12. PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
 13. ROOFTOP PRE AND POST CONSTRUCTION PHOTOS TO INCLUDE PENETRATIONS AND INTERIOR CEILING.
 14. PHOTOS OF TOWER TOP COAX LINE COLOR CODING AND COLOR CODING AT GROUND LEVEL.
 15. PHOTOS OF ALL APPROPRIATE COMPANY OR REGULATORY SIGNAGE.
 16. PHOTOS OF EQUIPMENT BOLT DOWN INSIDE SHELTER.
 17. POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE AND POWER AND TELCO SUPPLY LOCATIONS INCLUDING METER/DISCONNECT.
 18. ELECTRICAL TRENCH(S) WITH ELECTRICAL / CONDUIT BEFORE BACKFILL.
 19. ELECTRICAL TRENCH(S) WITH FOIL-BACKED TAPE BEFORE FURTHER BACKFILL.
 20. TELCO TRENCH WITH TELEPHONE / CONDUIT BEFORE BACKFILL.
 21. TELCO TRENCH WITH FOIL-BACKED TAPE BEFORE FURTHER BACKFILL.
 22. SHELTER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
 23. TOWER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).

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

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

PLANS PREPARED FOR:



6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:



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www.infinigy.com
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MLA PARTNER:



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

ENGINEERING LICENSE:



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REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	11/18/19	MAP	0

SITE NAME:

HRFR - SOUTH

SITE CASCADE:

CT52XC041

SITE ADDRESS:

MOUNTAIN STREET
HARTFORD, CT 06106

SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-3

NOTE:
CABLE LENGTH IS THE ESTIMATED DISTANCE FROM
EXISTING EQUIPMENT AREA TO PROPOSED TOWER
MOUNTED APPURTENANCES WITH AN ADDITIONAL 15%.

PLANS PREPARED FOR:



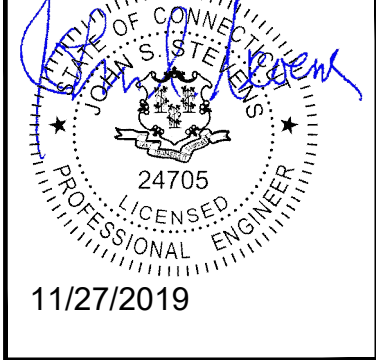
PLANS PREPARED BY:



MLA PARTNER:



ENGINEERING LICENSE:



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HRFR - SOUTH

SITE CASCADE:

CT52XC041

SITE ADDRESS:

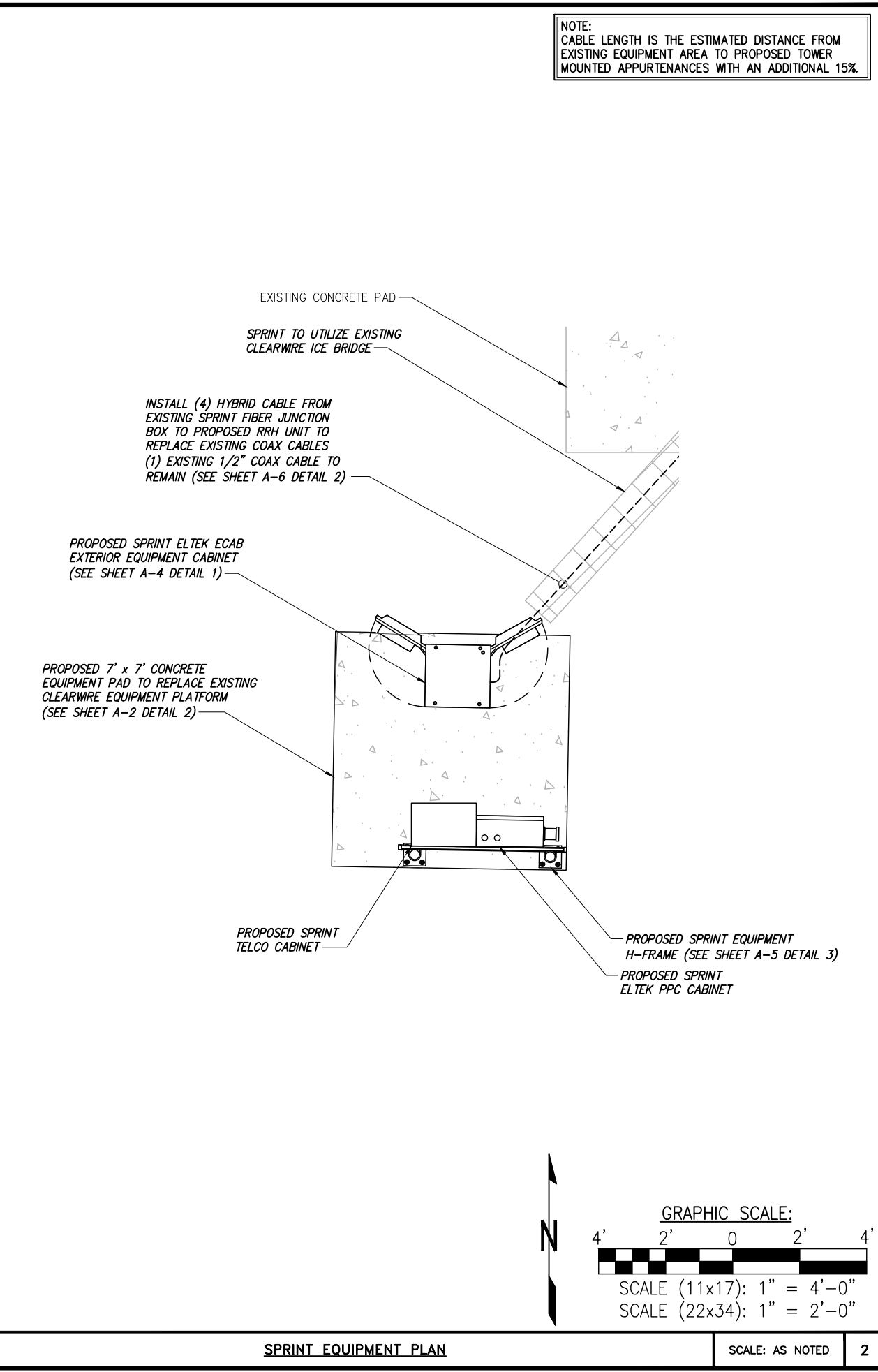
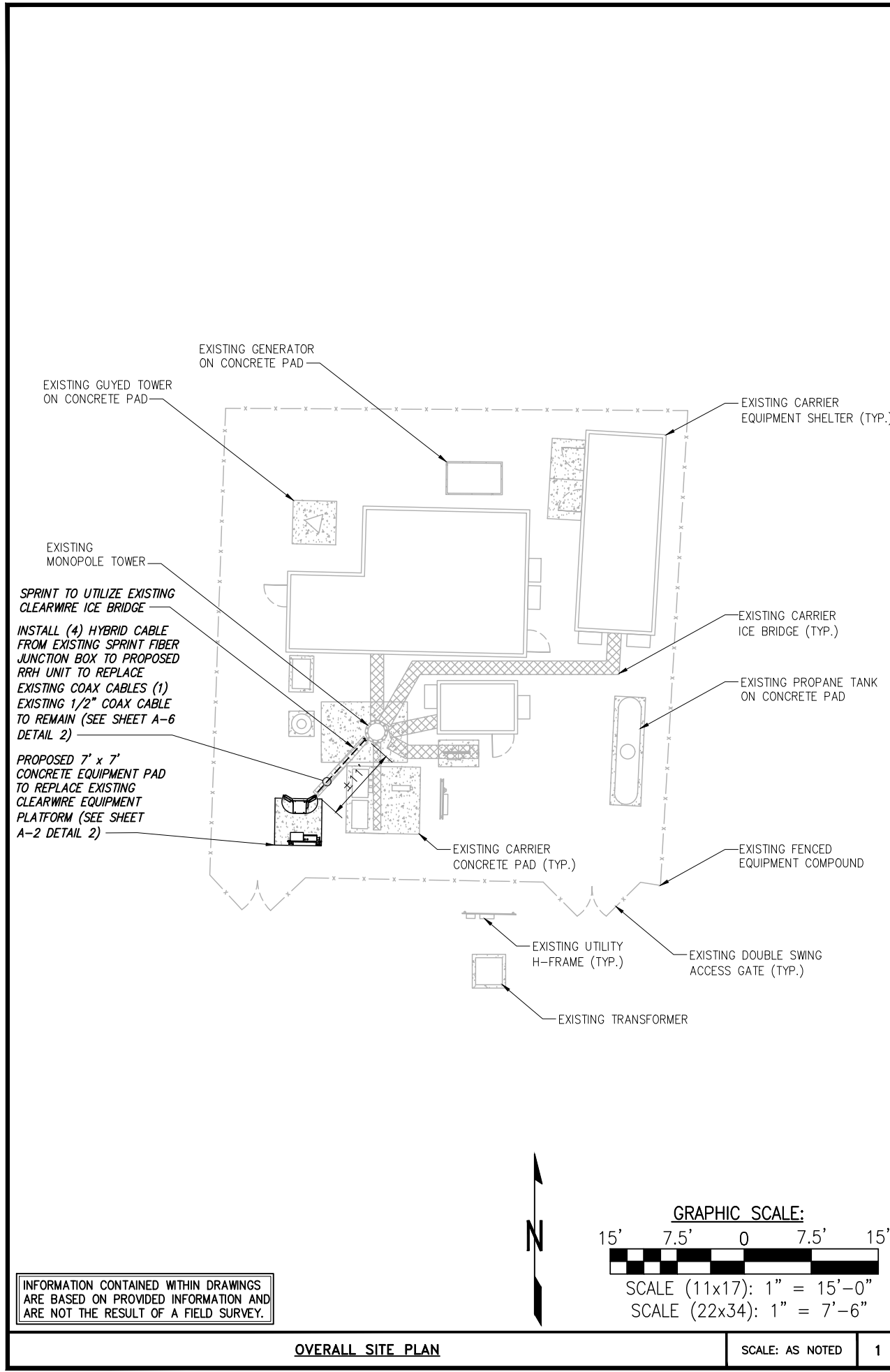
MOUNTAIN STREET
HARTFORD, CT 06106

SHEET DESCRIPTION:

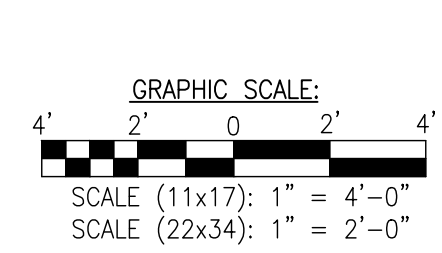
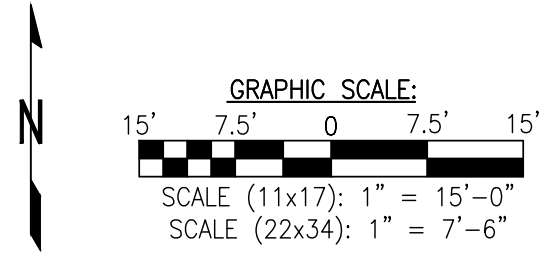
SITE PLAN

SHEET NUMBER:

A-1



INFORMATION CONTAINED WITHIN DRAWINGS ARE BASED ON PROVIDED INFORMATION AND ARE NOT THE RESULT OF A FIELD SURVEY.



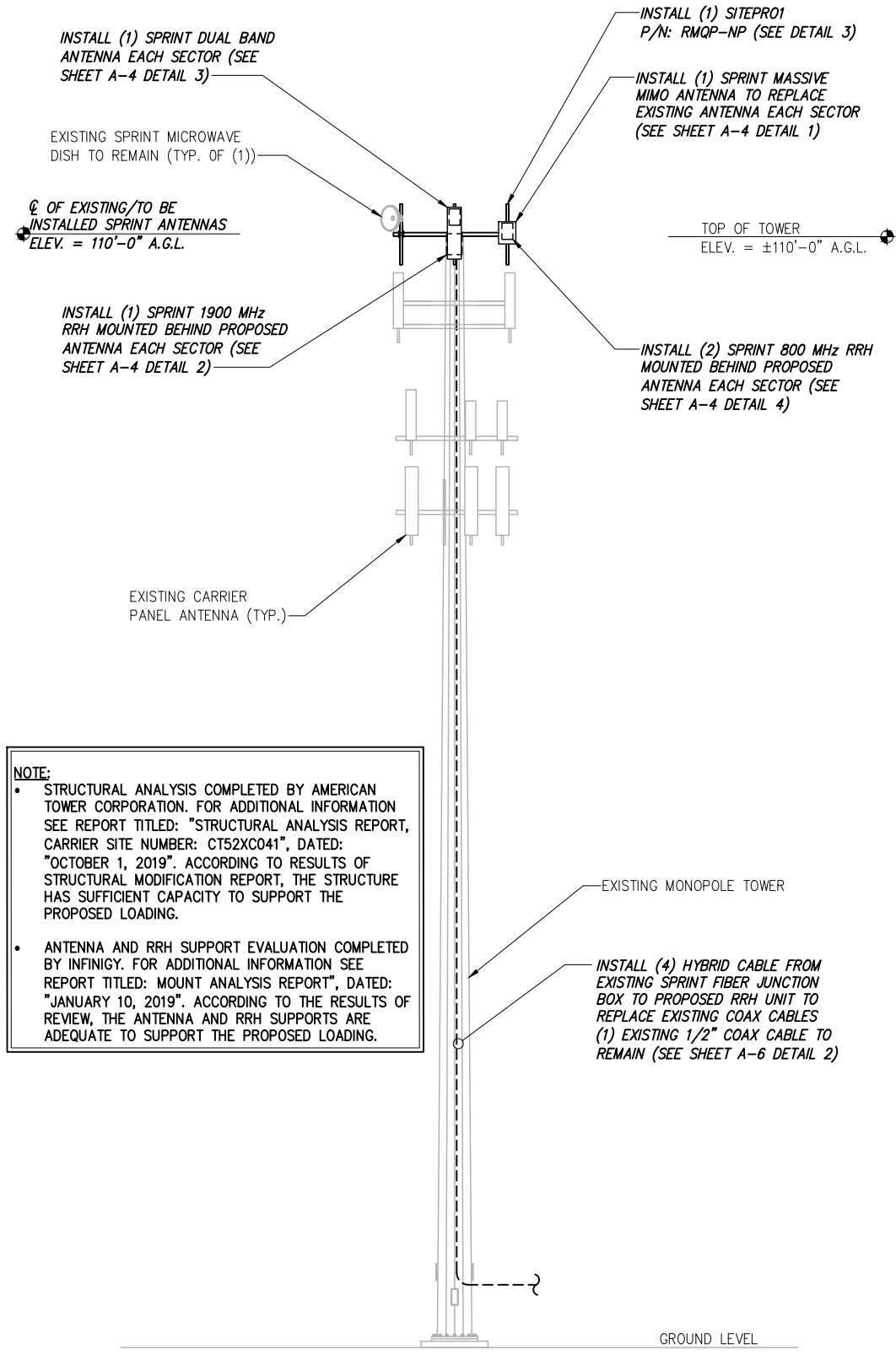
OVERALL SITE PLAN

SCALE: AS NOTED 1

SPRINT EQUIPMENT PLAN

SCALE: AS NOTED 2

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



NOTE:

- STRUCTURAL ANALYSIS COMPLETED BY AMERICAN TOWER CORPORATION. FOR ADDITIONAL INFORMATION SEE REPORT TITLED: "STRUCTURAL ANALYSIS REPORT, CARRIER SITE NUMBER: CT52XC041", DATED: "OCTOBER 1, 2019". 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: "MOUNT ANALYSIS REPORT", DATED: "JANUARY 10, 2019". ACCORDING TO THE RESULTS OF REVIEW, THE ANTENNA AND RRH SUPPORTS ARE ADEQUATE TO SUPPORT THE PROPOSED LOADING.

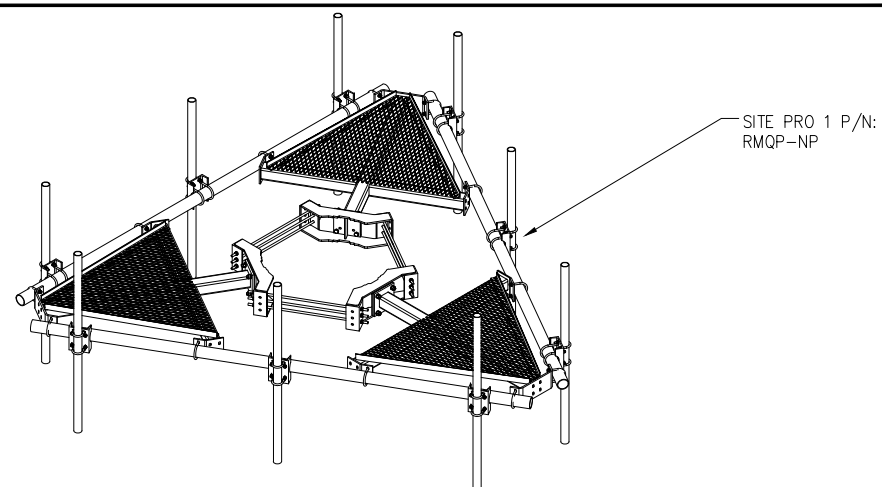
SECTOR	EXISTING/PROPOSED	ANTENNA MODEL #	VENDOR	AZIMUTH	QTY.	REMAIN/REMOVED	RRH (QTY/MODEL)	CABLE	CABLE LENGTH	RAD CENTER
ALPHA	PROPOSED	AAHC	NOKIA	0°	1	-	(2) 800 MHZ 2X50W RRH	SEE SHEET A-5 DETAIL 1	±132*	±110' AGL
	PROPOSED	NNVV-65B-R4	COMMSCOPE	0°	1	-		SEE SHEET A-5 DETAIL 1		
	EXISTING	LLPX310R	ARGUS	0°	1	REMOVE	(1) 1900 MHZ 4X45 RRH	EXISTING COAX		
BETA	PROPOSED	AAHC	NOKIA	120°	1	-	(2) 800 MHZ 2X50W RRH	SEE SHEET A-5 DETAIL 1	±110' AGL	
	PROPOSED	NNVV-65B-R4	COMMSCOPE	120°	1	-		SEE SHEET A-5 DETAIL 1		
	EXISTING	LLPX310R	ARGUS	120°	1	REMOVE	(1) 1900 MHZ 4X45 RRH	EXISTING COAX		
GAMMA	PROPOSED	AAHC	NOKIA	240°	1	-	(2) 800 MHZ 2X50W RRH	SEE SHEET A-5 DETAIL 1	±110' AGL	
	PROPOSED	NNVV-65B-R4	COMMSCOPE	240°	1	-		SEE SHEET A-5 DETAIL 1		
	EXISTING	LLPX310R	ARGUS	240°	1	REMOVE	(1) 1900 MHZ 4X45 RRH	EXISTING COAX		
MW DISH	EXISTING	A-ANT-11G-2.5-C	DRAGONWAVE	31°/130°	2	REMOVE	-	EXISTING COAX	EXISTING	±110' AGL
	EXISTING	A-ANT-23G-1-C	DRAGONWAVE	N/A	1	REMOVE	-	EXISTING COAX		
	EXISTING	VHP2-11	ANDREW	181.1679°	1	-	-	(1) EXISTING 1/2" COAX		

PROJECT SCOPE:
REMOVE: (3) PANEL ANTENNAS & (2) MW DISHES 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.

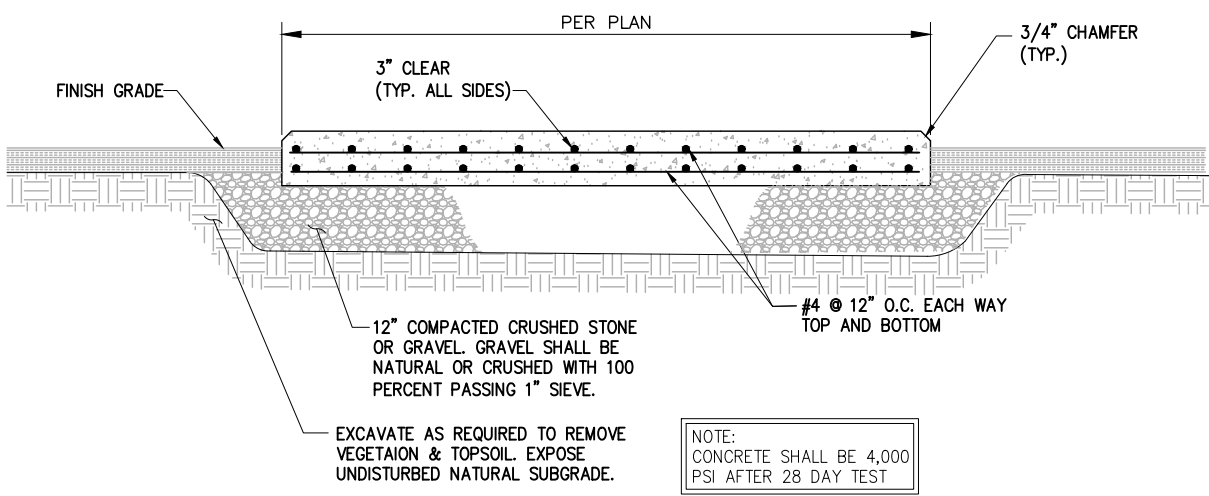
SITE LOADING CHART

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

TOWER ELEVATION

NO SCALE 1

PLANS PREPARED FOR:

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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JOB NUMBER 526-104

MLA PARTNER:

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

ENGINEERING LICENSE:

11/27/2019

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REVISIONS:	DESCRIPTION	DATE	BY	REV

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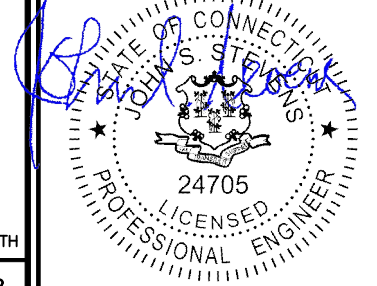
SITE NAME:
HRFR - SOUTH

SITE CASCADE:
CT52XC041

SITE ADDRESS:
MOUNTAIN STREET
HARTFORD, CT 06106

SHEET DESCRIPTION:
TOWER ELEVATION

SHEET NUMBER:
A-2



11/27/2019

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HRFR - SOUTH

CT52XC041

MOUNTAIN STREET
HARTFORD, CT 06106

ANTENNA LAYOUT
& MOUNTING DETAILS

A-3

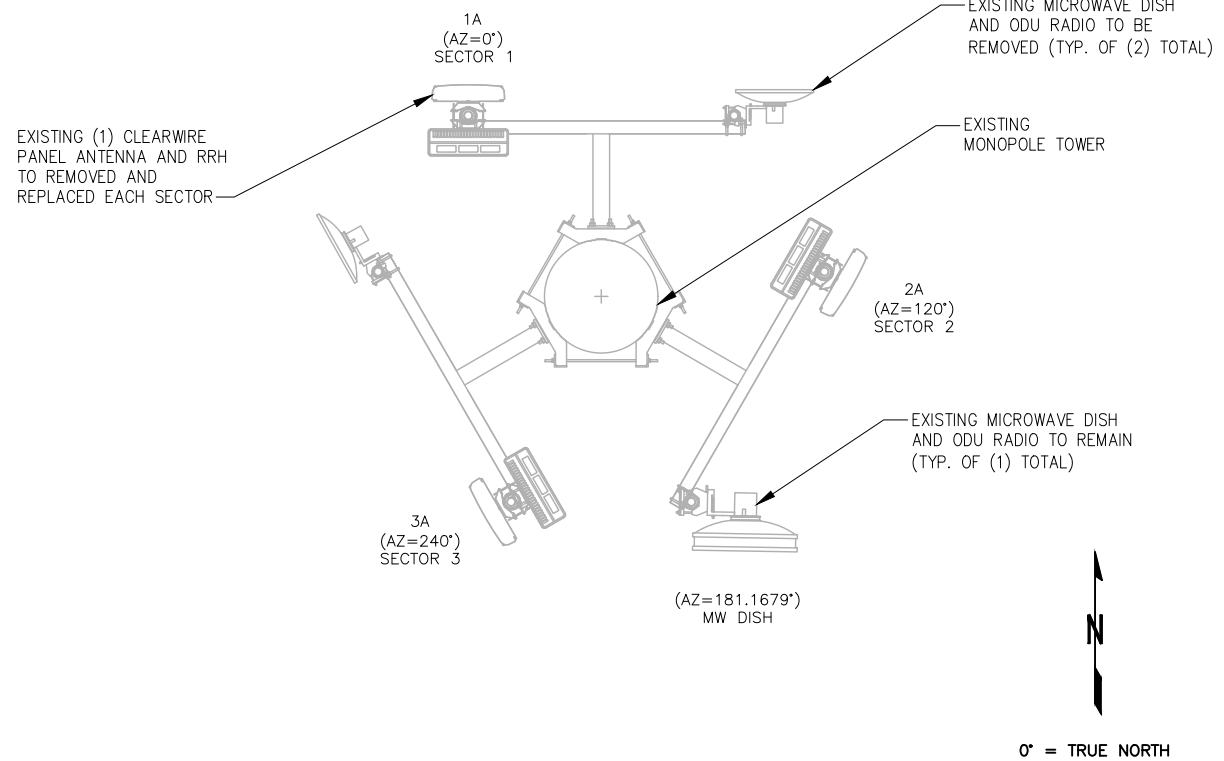
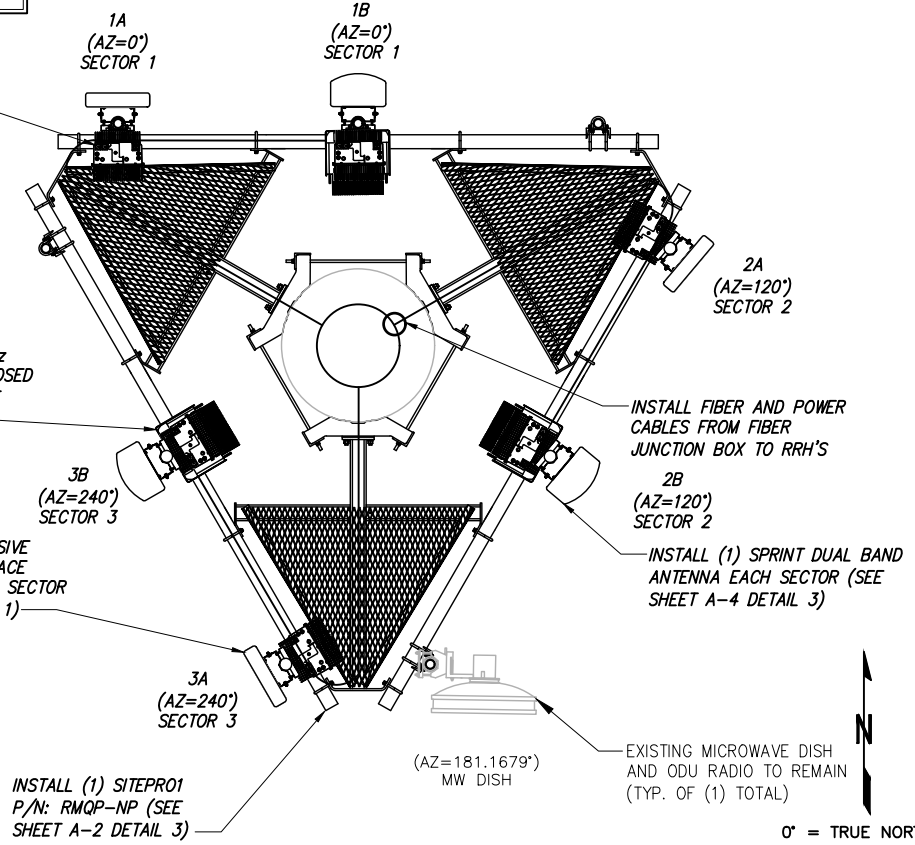
THE CONFIGURATION PLANS ARE BASED ON PROVIDED INFORMATION AND ARE FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR TO VERIFY FIELD CONDITIONS PRIOR TO CONSTRUCTION.

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

NOTE: JUMPERS FROM 2.5 RRH TO THE 2.5 ANTENNA CANNOT EXCEED 15 FEET



EXISTING ANTENNA & RRH LAYOUT

NO SCALE 1

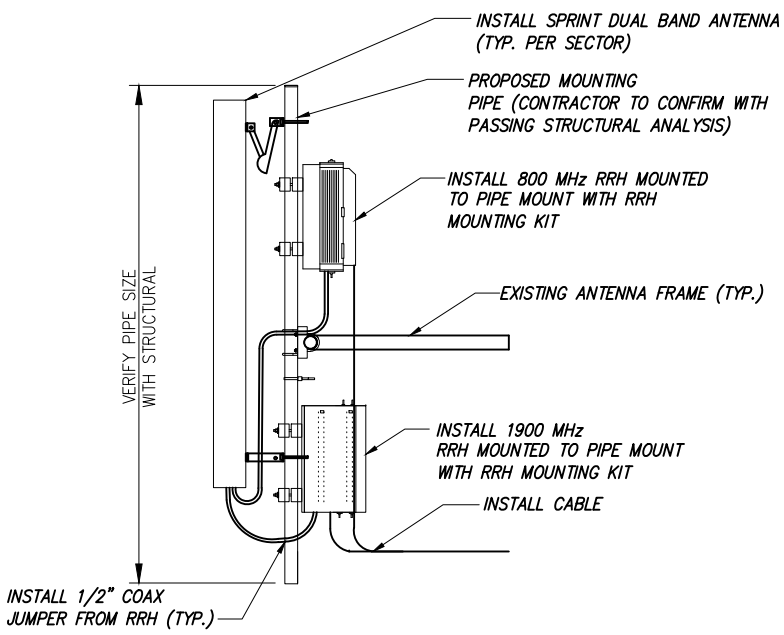
FINAL ANTENNA LAYOUT

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:
- CUT DC CONDUCTORS TO LENGTH.
 - COIL FIBER CABLE AND SECURE AT SIDE OF RRH.
 - DO NOT EXCEED BEND RADIUS.



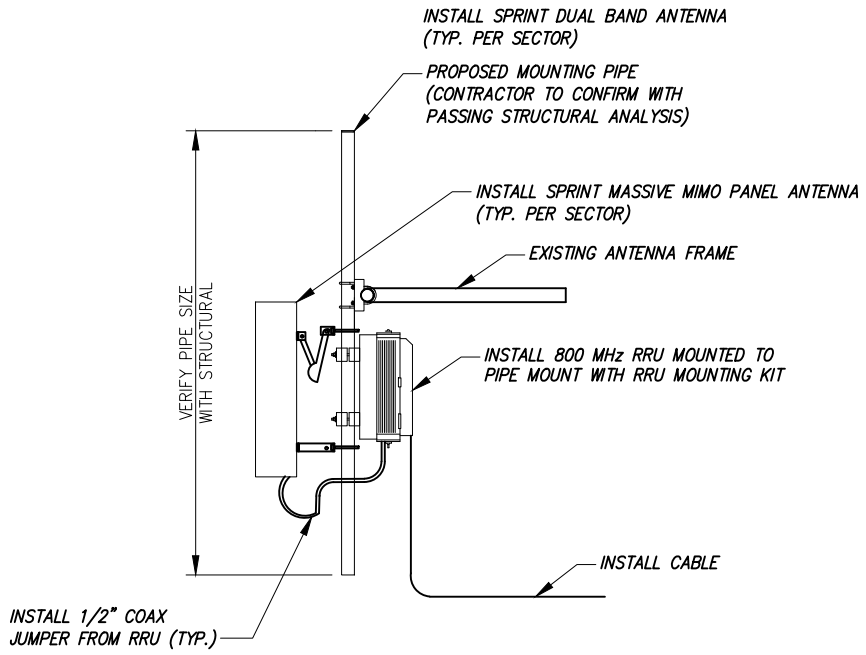
TYPICAL DUAL BAND ANTENNA & RRH MOUNTING DETAILS

NO SCALE 3

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:
- CUT DC CONDUCTORS TO LENGTH.
 - COIL FIBER CABLE AND SECURE AT SIDE OF RRH.
 - DO NOT EXCEED BEND RADIUS.

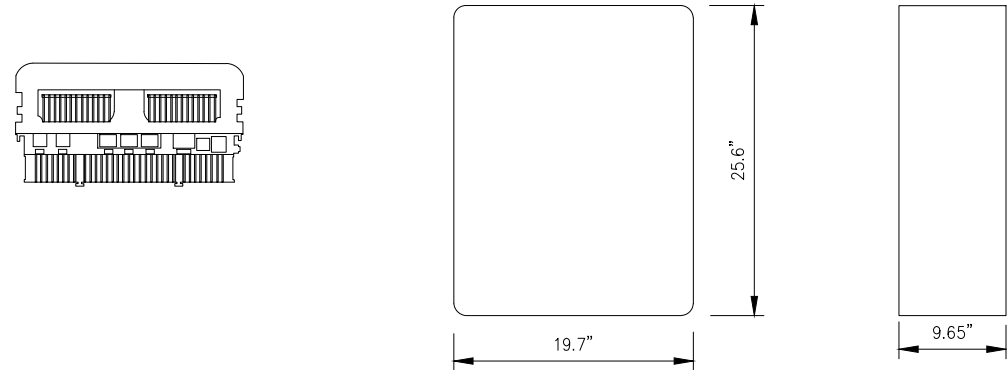


TYPICAL MASSIVE MIMO ANTENNA & RRH MOUNTING DETAILS

NO SCALE 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

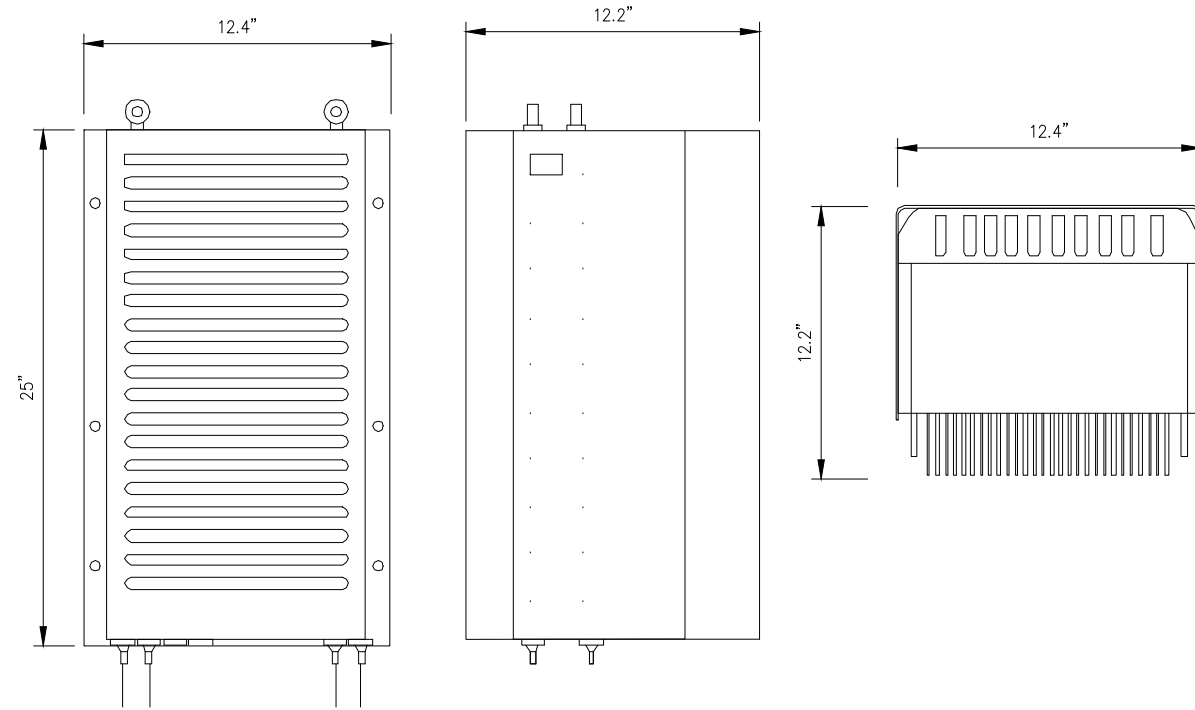


MASSIVE MIMO ANTENNA DETAIL

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

PLANS PREPARED FOR:

6580 Sprint Parkway
 Overland Park, Kansas 66251

PLANS PREPARED BY:

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 1033 Watervliet Shaker Rd | Albany, NY 12205
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 www.infinigy.com
 JOB NUMBER 526-104

MLA PARTNER:

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

ENGINEERING LICENSE:

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REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	11/18/19	MAP	0

SITE NAME:
HRFR - SOUTH

SITE CASCADE:
CT52XC041

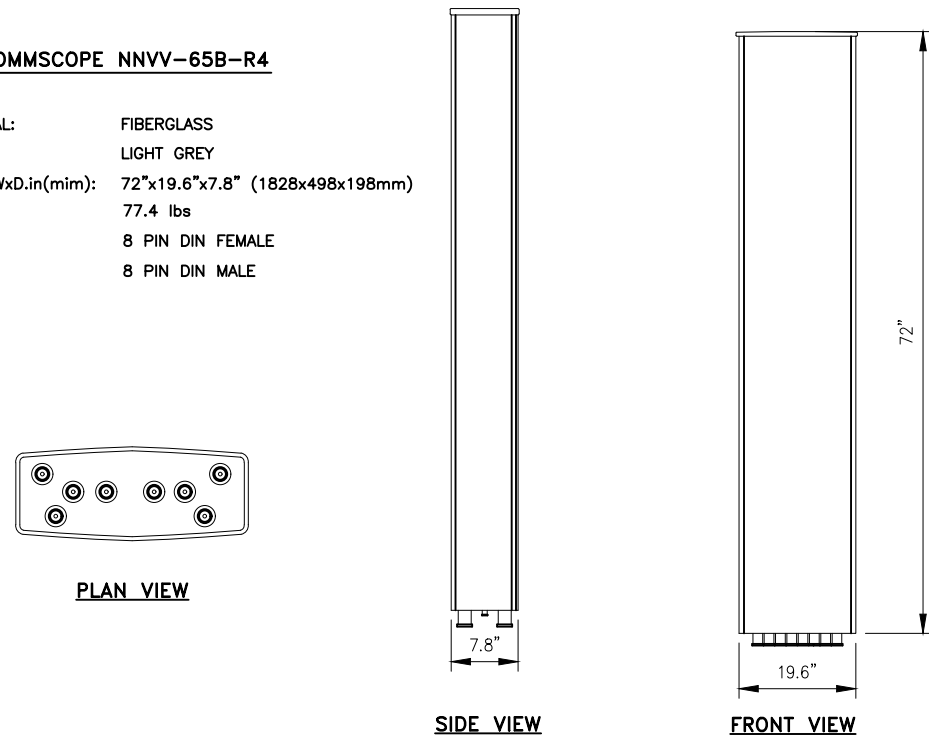
SITE ADDRESS:
**MOUNTAIN STREET
 HARTFORD, CT 06106**

SHEET DESCRIPTION:
**EQUIPMENT &
 MOUNTING DETAILS**

SHEET NUMBER:
A-4

ANTENNA COMMSCOPE NNVV-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

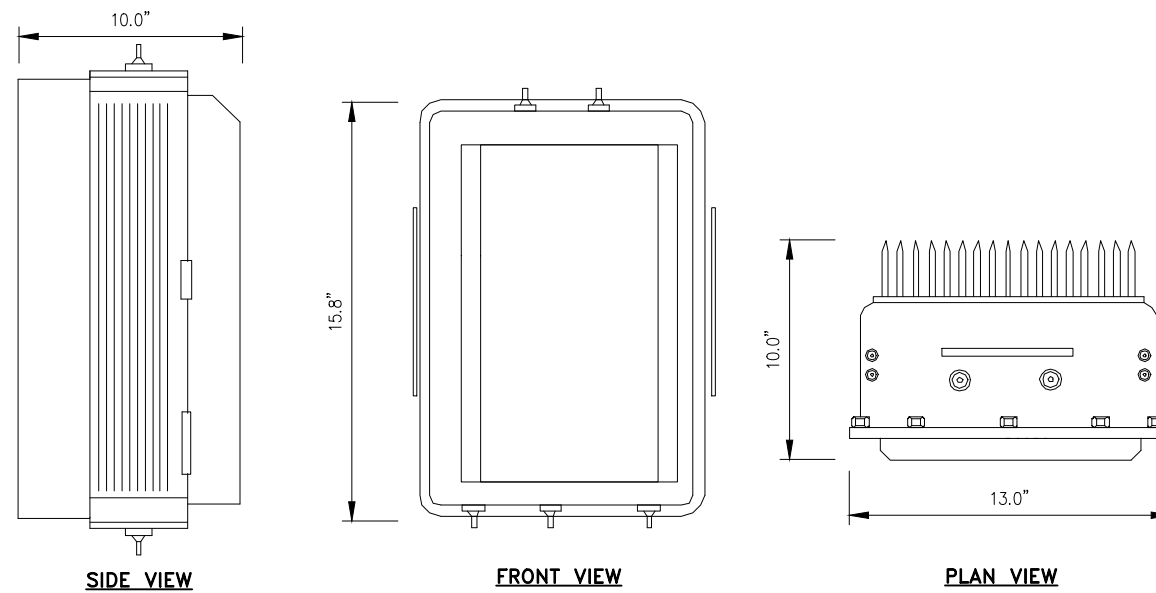
NO SCALE

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

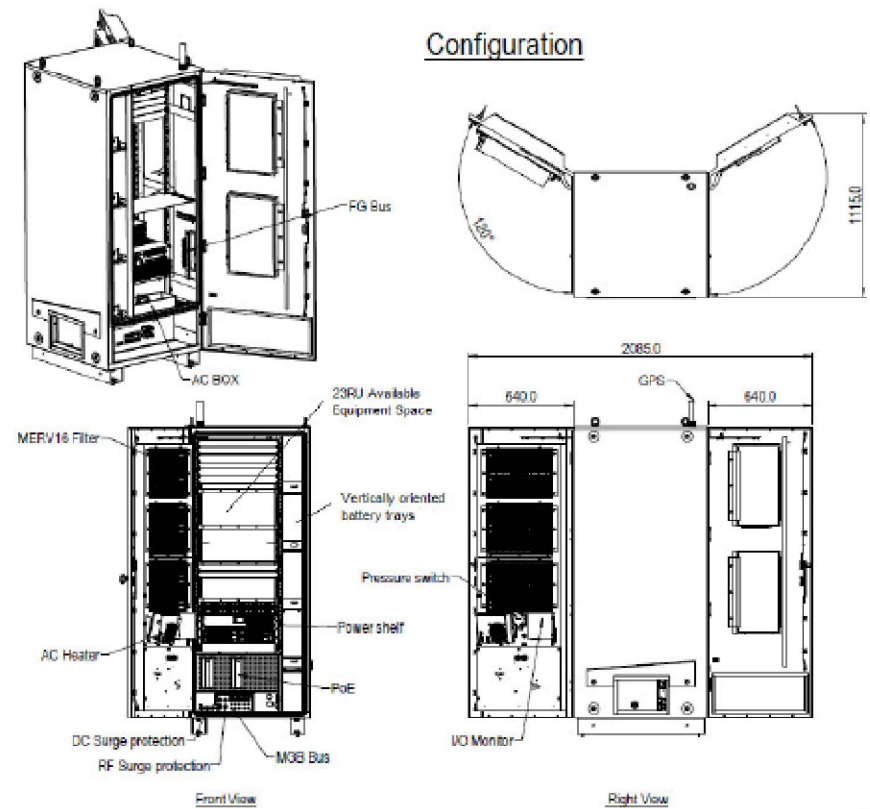
FRONT VIEW

PLAN VIEW

800 MHz RRH

NO SCALE

4

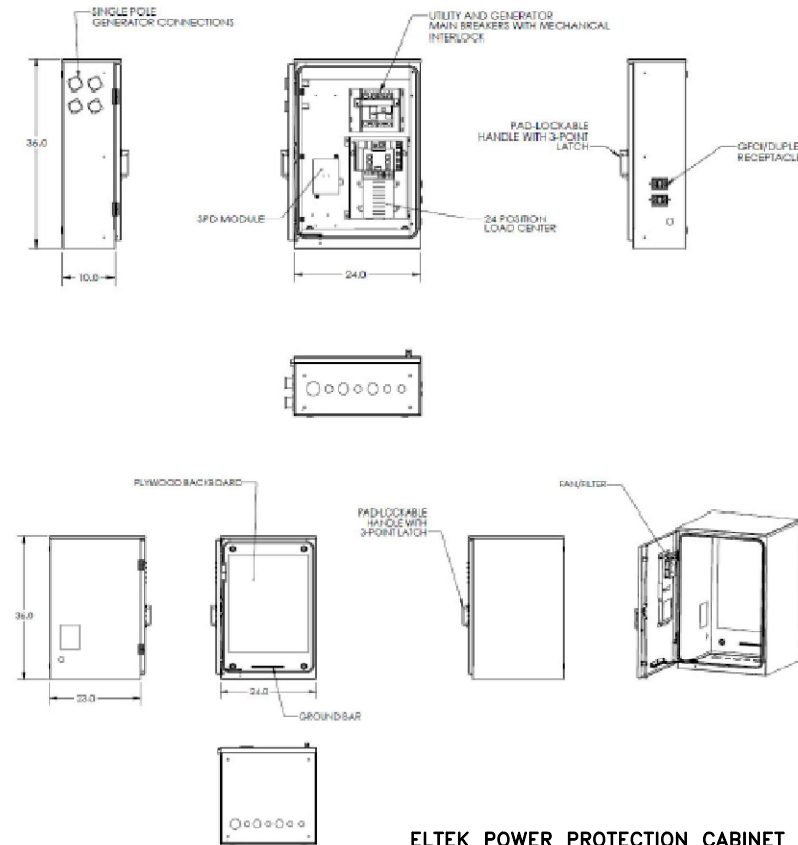


ELTEK ECAB EXTERIOR CABINET
P/N: ESOA220-SCA02

EQUIPMENT CABINET DETAIL

NO SCALE

1

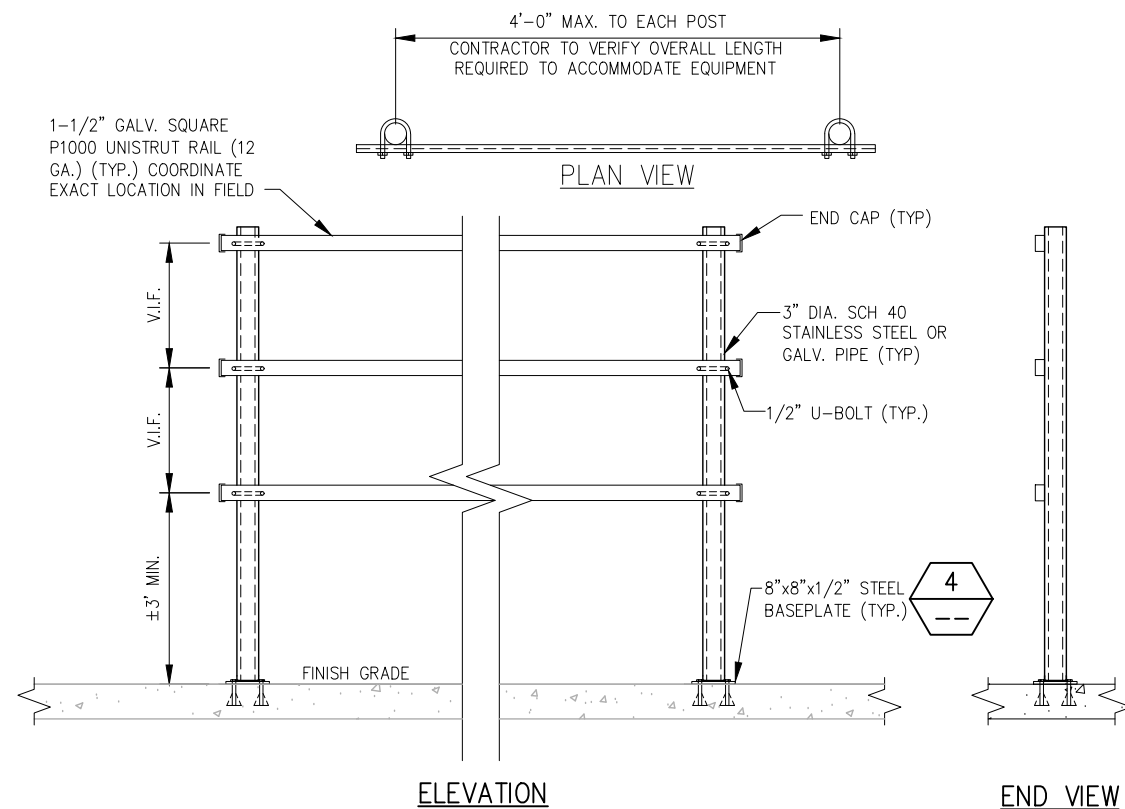


ELTEK POWER PROTECTION CABINET
P/N: 5811122212

EQUIPMENT CABINET DETAIL

NO SCALE

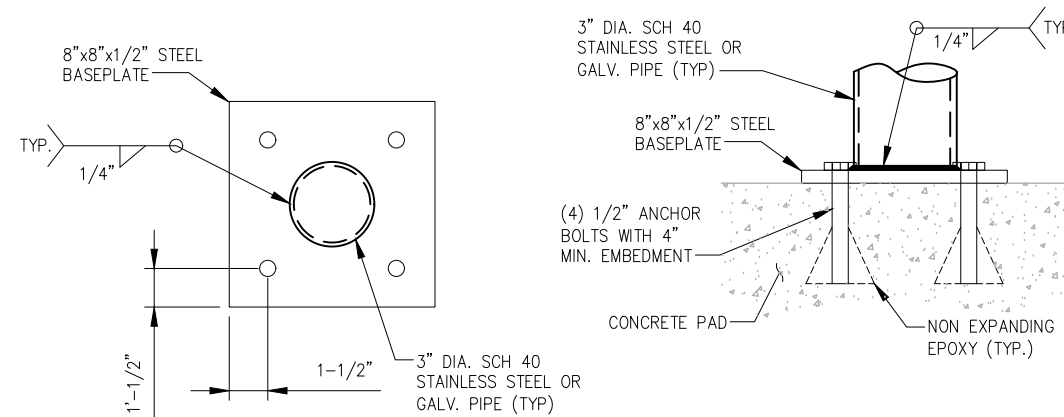
2



H-FRAME DETAIL

NO SCALE

3



SUPPORT POST MOUNTING DETAIL

NO SCALE

4

PLANS PREPARED FOR:



PLANS PREPARED BY:



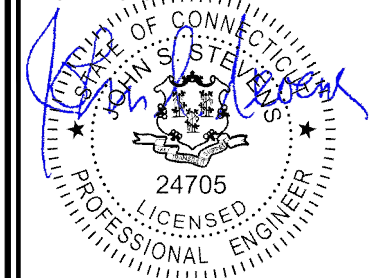
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HRFR - SOUTH

SITE CASCADE:

CT52XC041

SITE ADDRESS:

MOUNTAIN STREET
HARTFORD, CT 06106

SHEET DESCRIPTION:

EQUIPMENT
DETAILS

SHEET NUMBER:

A-5

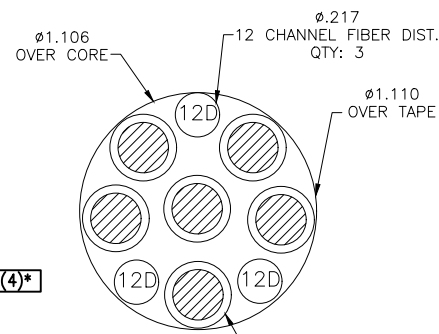
RFS HYBRIFLEX RISER CABLE SCHEDULE

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

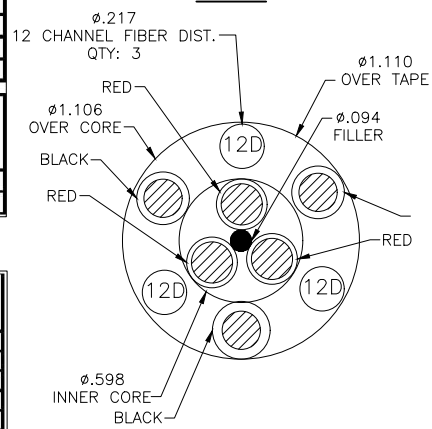
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

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

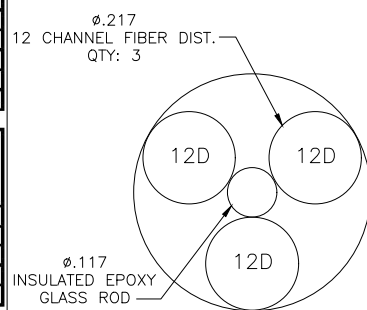
NOTE:
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE
AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF
HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.



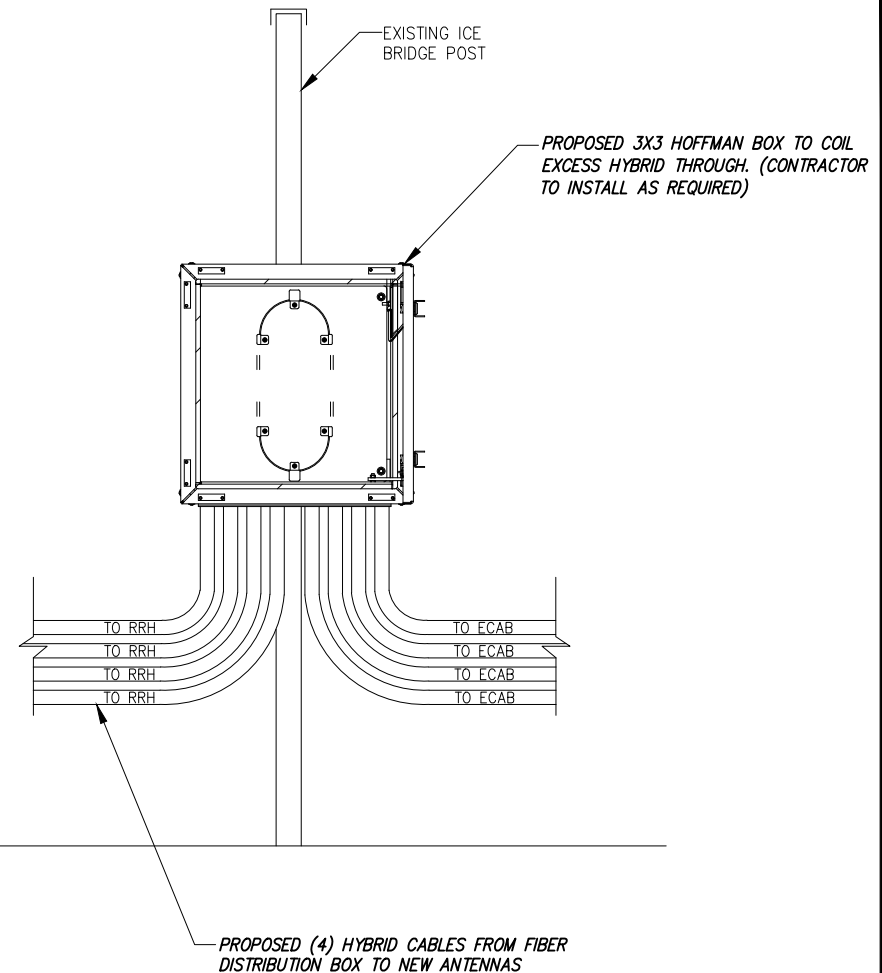
4 AWG



8 & 6 AWG



FIBER ONLY



OPTIONAL HYBRID SLACK BOX

NO SCALE

2

PLANS PREPARED FOR:

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY ENGINEERING, PLLC
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

MLA PARTNER:

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

ENGINEERING LICENSE:

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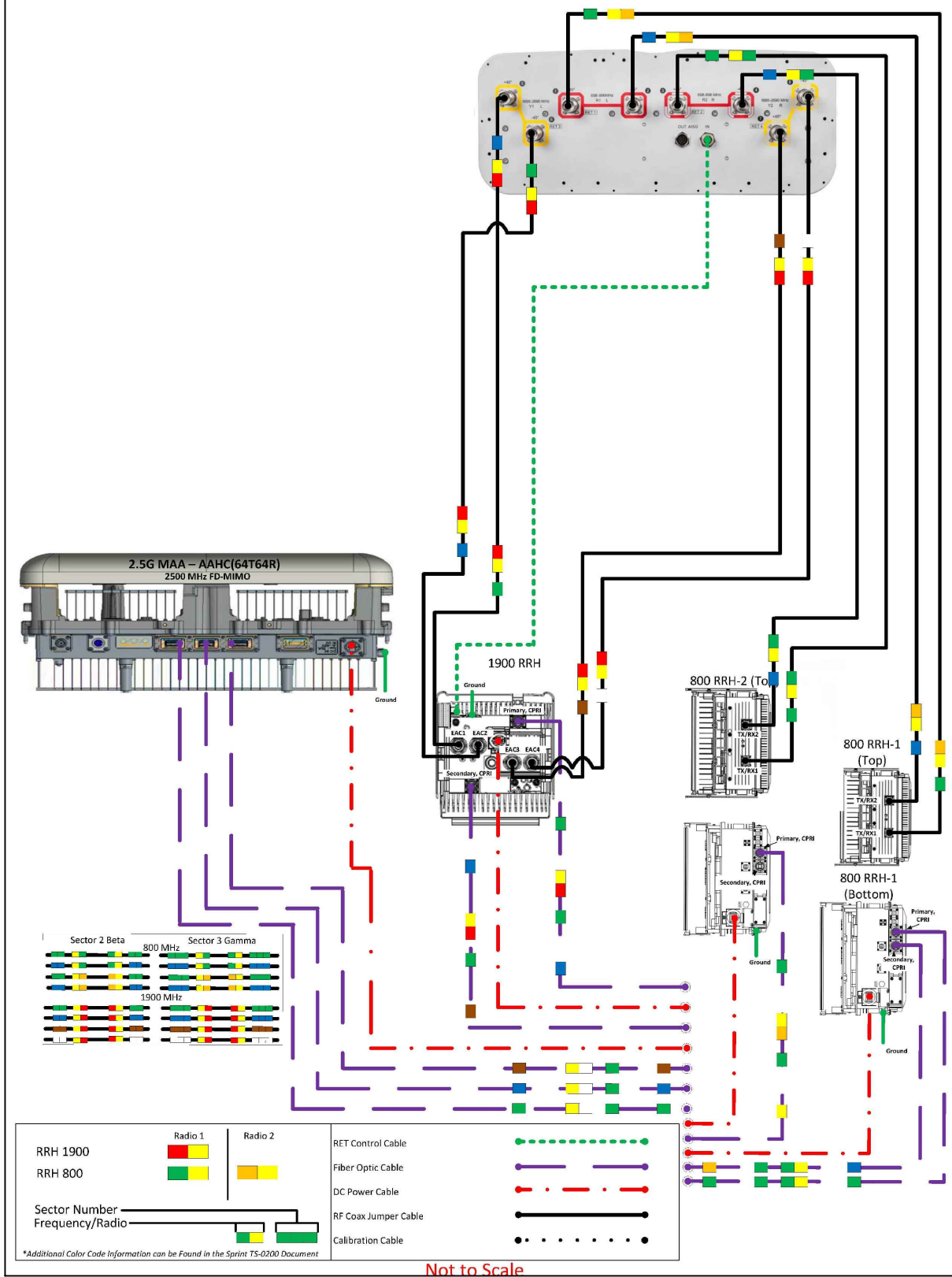
SITE CASCADE:
CT52XC041

SITE ADDRESS:
**MOUNTAIN STREET
HARTFORD, CT 06106**

SHEET DESCRIPTION:
CIVIL DETAILS

SHEET NUMBER:
A-6

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



PLANS PREPARED FOR:



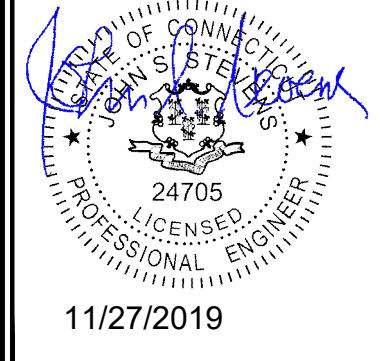
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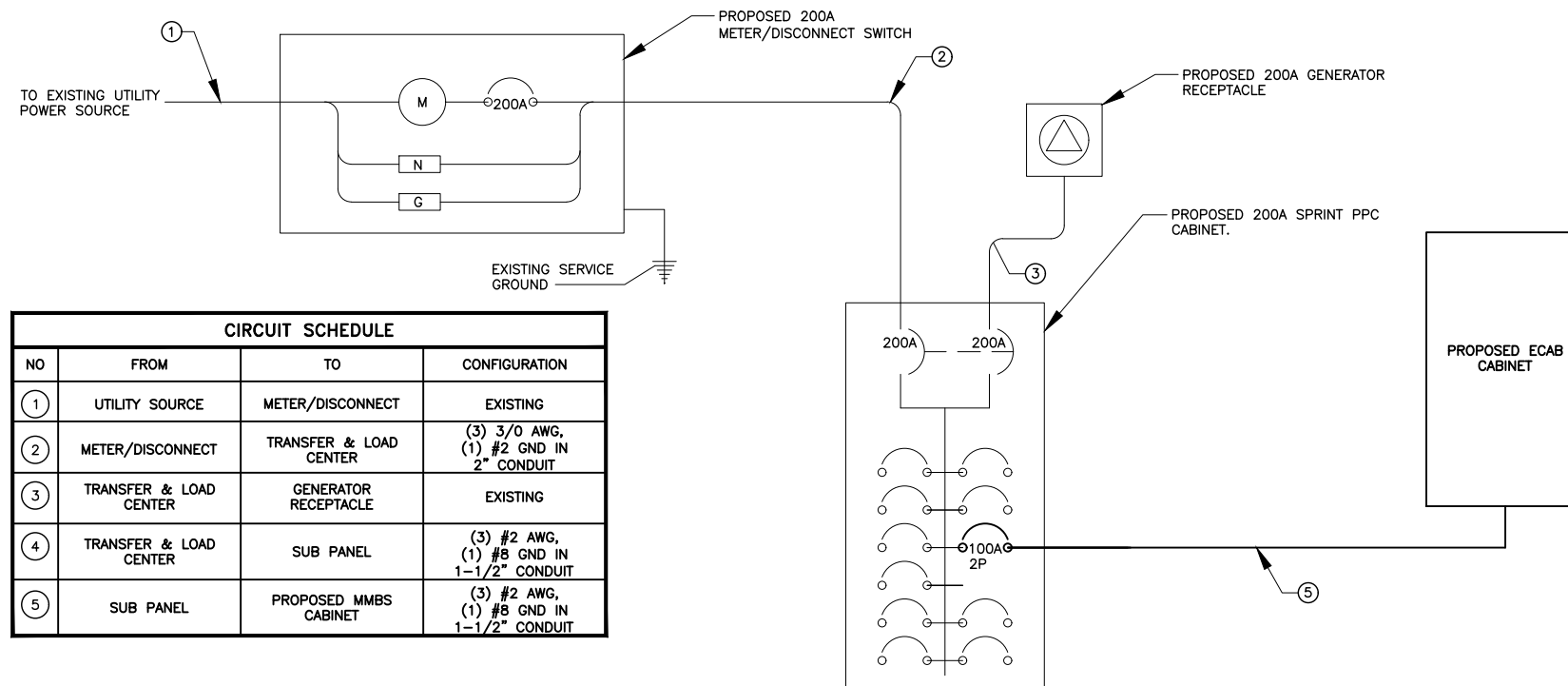
MOUNTAIN STREET
HARTFORD, CT 06106

SHEET DESCRIPTION:

PLUMBING DIAGRAM

SHEET NUMBER:

A-7



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.
- BONDING 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: CADWELDED 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:



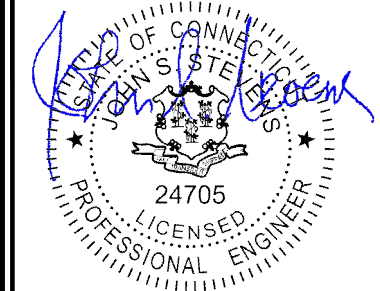
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MLA PARTNER:



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SITE ADDRESS:

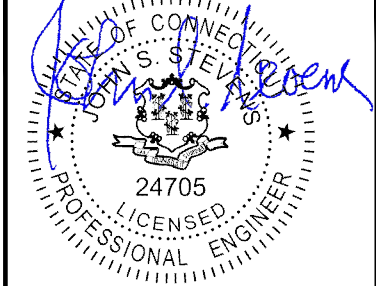
MOUNTAIN STREET
HARTFORD, CT 06106

SHEET DESCRIPTION:

ELECTRICAL &
GROUNDING PLAN

SHEET NUMBER:

E-1



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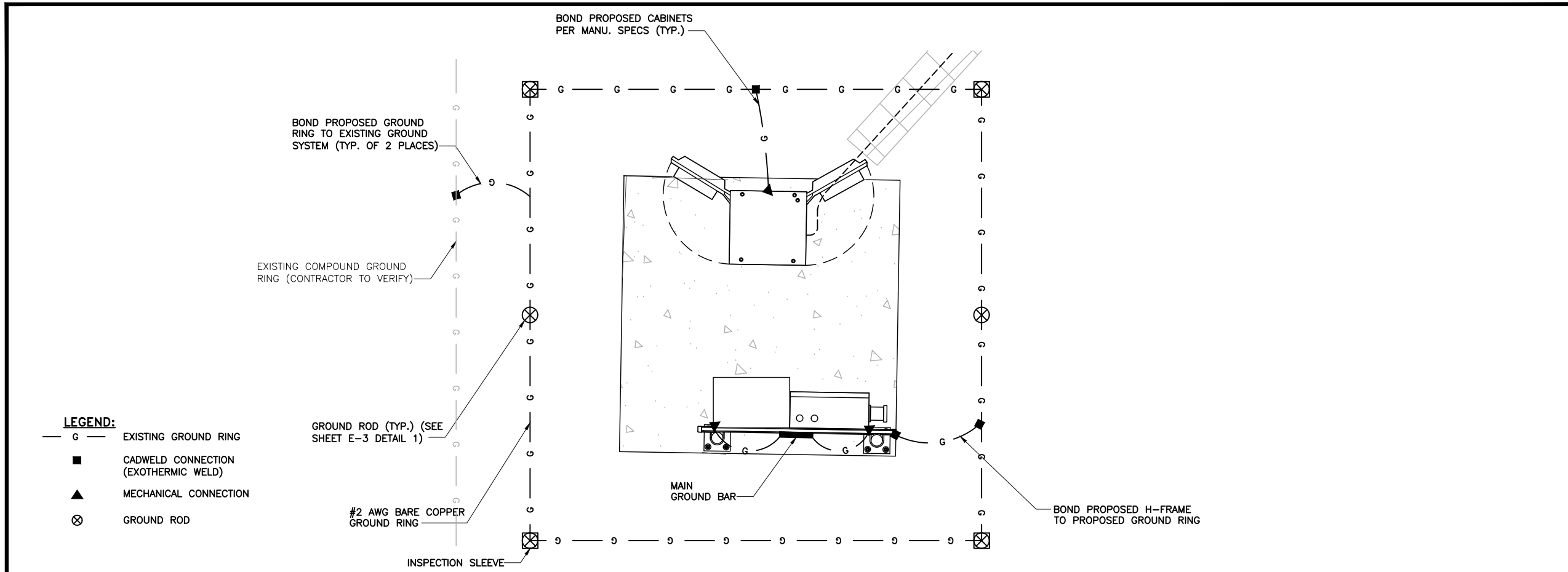
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MOUNTAIN STREET
HARTFORD, CT 06106

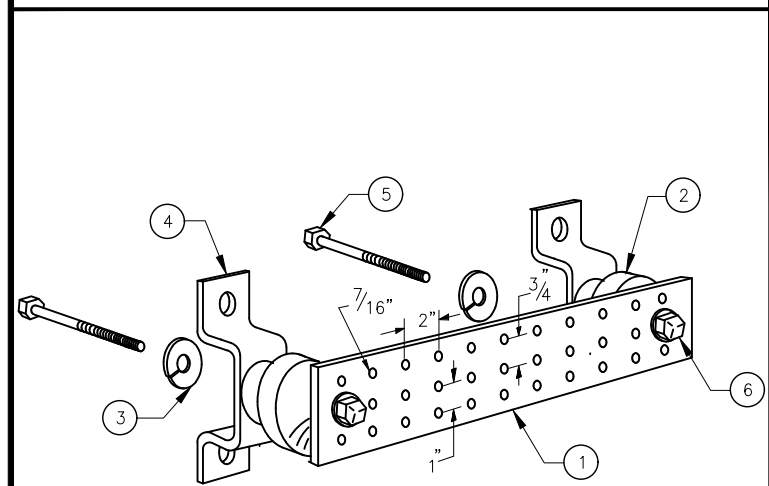
ONE LINE & NOTES

E-2



GROUNDING PLAN

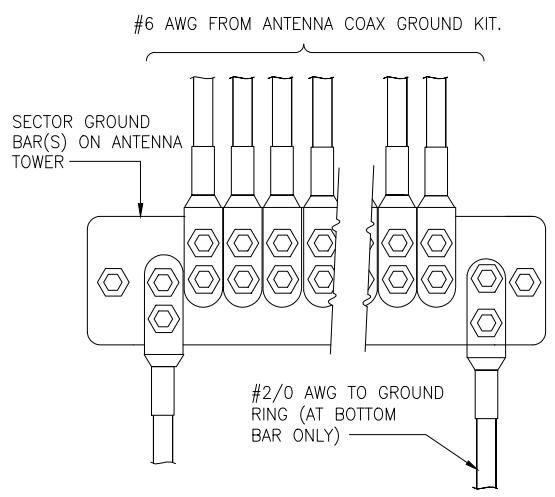
NO SCALE 1



TINNED GROUND BAR DETAIL

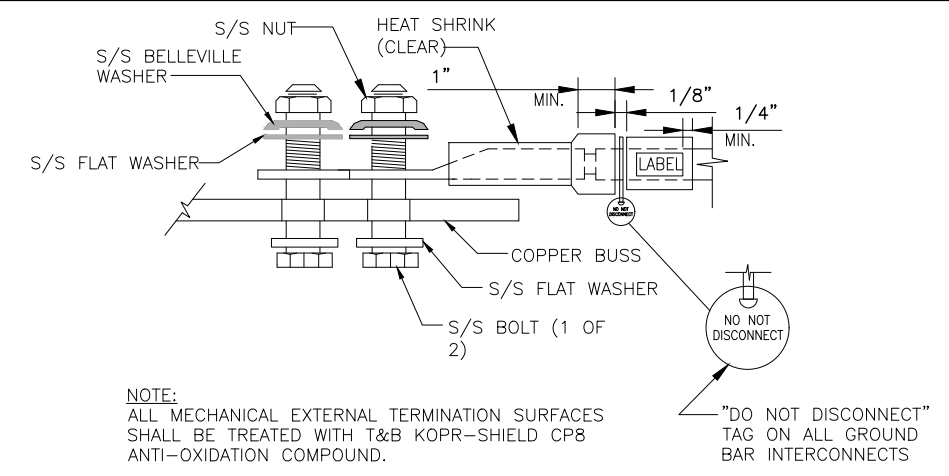
NO SCALE 2

- 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.



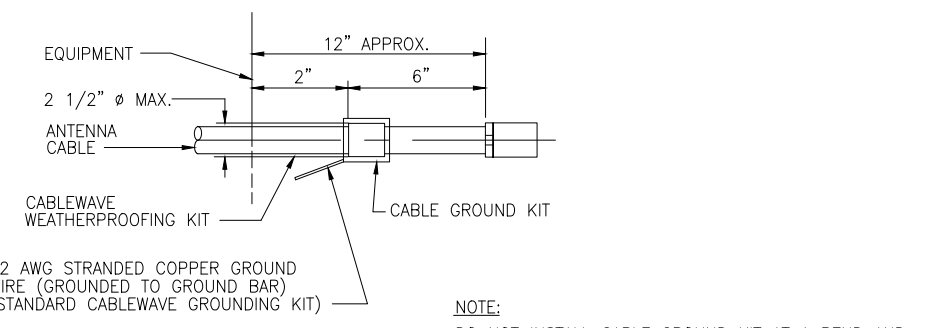
ANTENNA GROUND WIRE INSTALLATION

NO SCALE 3



EQUIPMENT GROUND CONNECTION

NO SCALE 4



CABLE GROUND KIT CONNECTION

NO SCALE 5

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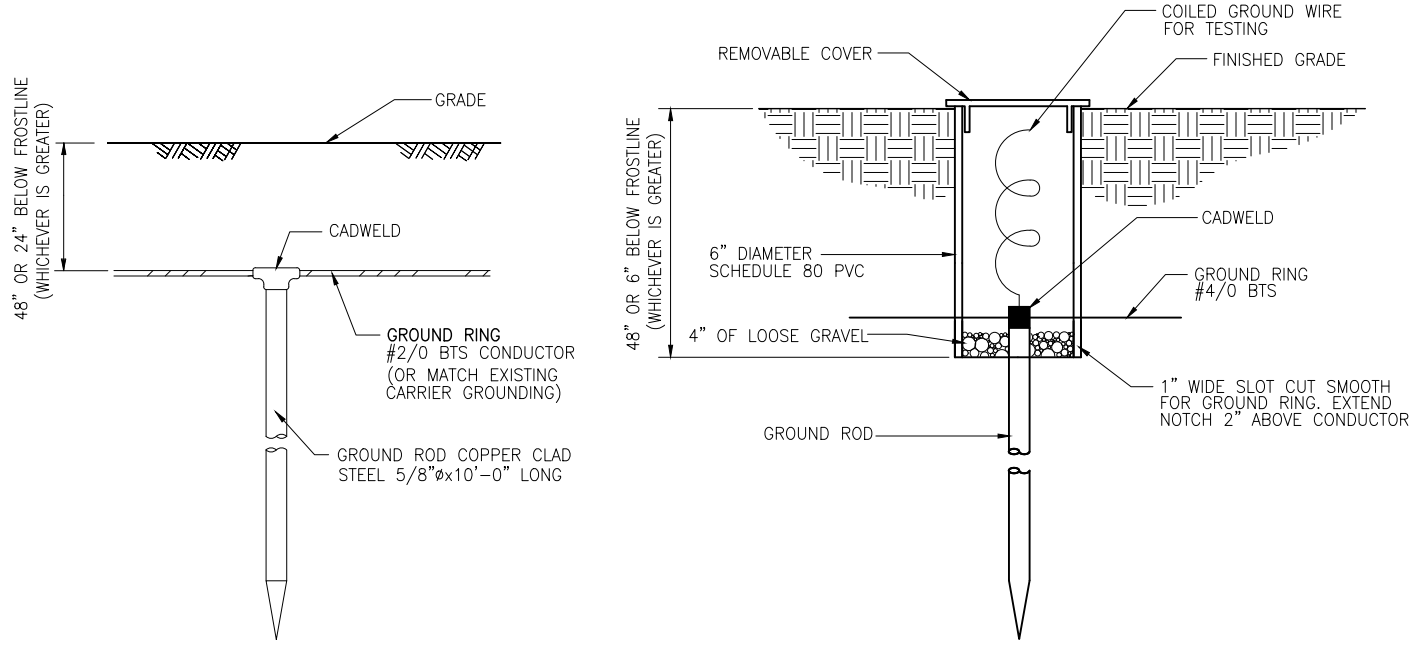
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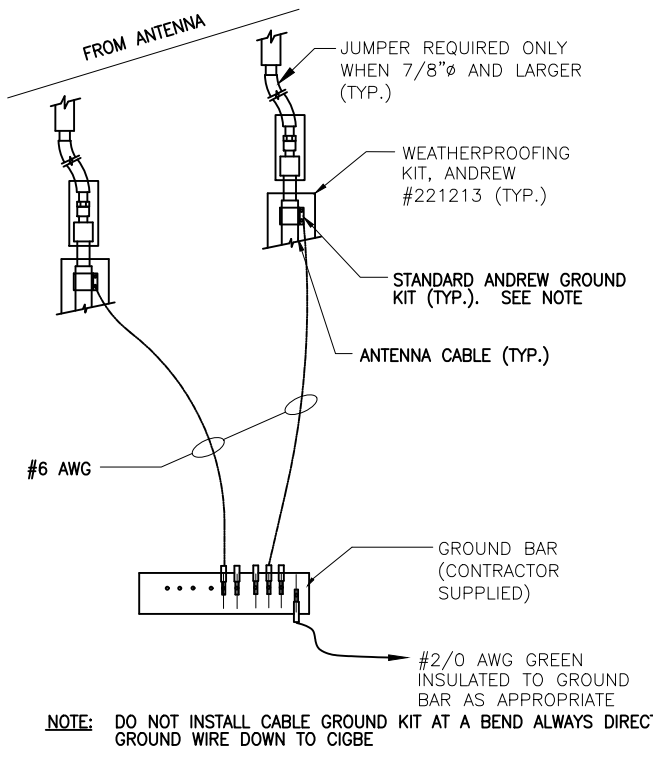
SHEET DESCRIPTION:
**ELECTRICAL &
 GROUNDING DETAILS**

SHEET NUMBER:
E-3



GROUND ROD & INSPECTION SLEEVE DETAIL

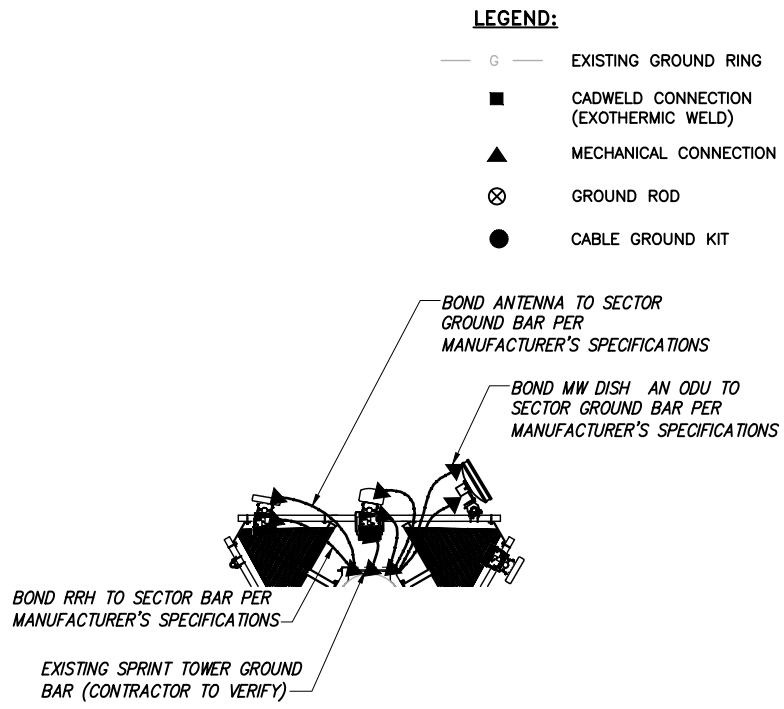
NO SCALE 1



NOTE: DO NOT INSTALL CABLE GROUND KIT AT A BEND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

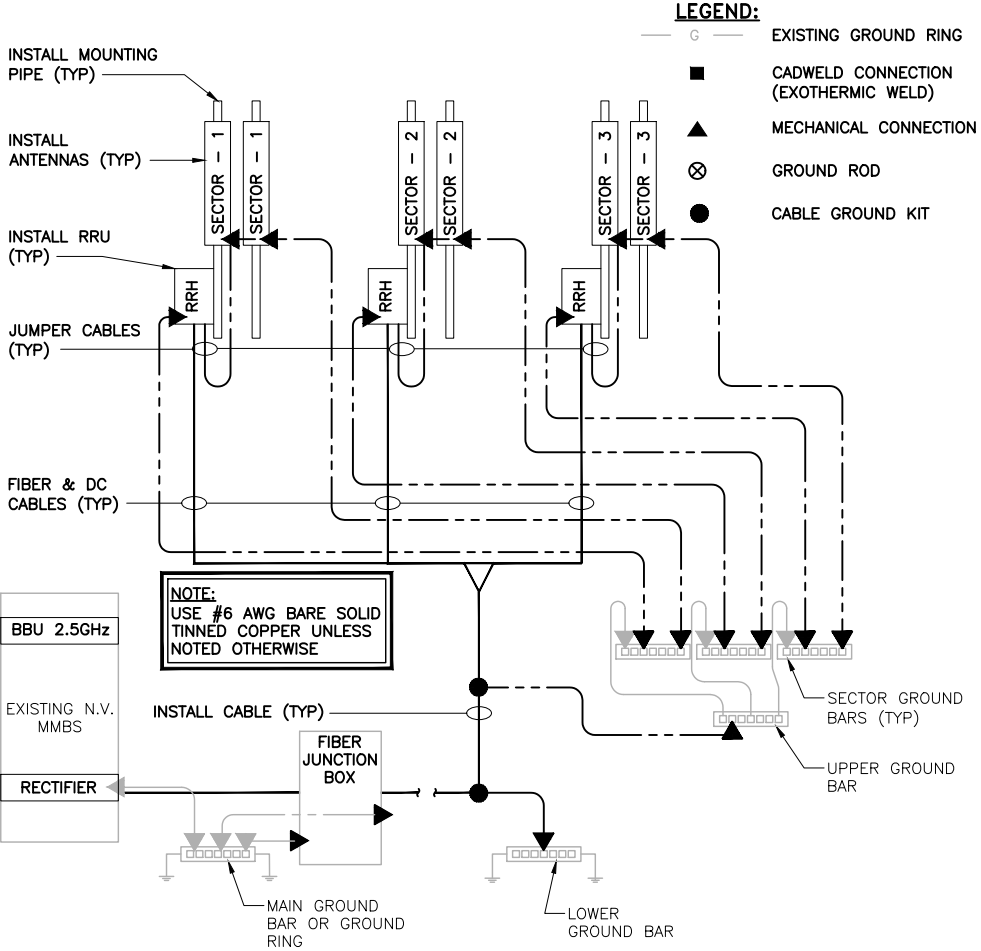
CONNECTION OF GROUND WIRES TO GROUND BARS @ ANTENNAS

NO SCALE 2



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 3



GROUNDING RISER DIAGRAM

NO SCALE 4