



May 8th, 2017

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

RE: Notice of Exempt Modification – Antenna Swap & Additional Ground Based Equipment for wireless facility located at 73 NORTH MAIN STREET, MARLBOROUGH, CONNECTICUT - CT03XC210 (41°37'47.33"N, - 72°27'59.04"W)

Dear Ms. Bachman:

Sprint Spectrum, LP ("Sprint") currently maintains wireless telecommunications antennas at the (128-foot level) on an existing (160-foot tower) at the above-referenced address. The tower is owned by Crown Castle, and the property is owned by Village Properties LLC

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

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to AMY TRAVERSA, FIRST SELECTMAN of the Town of MARLBOROUGH. A copy of this letter is also being sent to VILLAGE PROPERTIES, LLC the owner of the property on which the tower is located.

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

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



an extension of the site boundaries.

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

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

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

Kind Regards,

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

Attachment

CC: VILLAGE PROPERTIES, LLC (Land Owner)
AMY TRAVERSA (1st Selectman, Marlborough, CT)
Maryellen Perrotta, Crown Castle (Tower Owner)

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Total Postage and Fees	\$6.59

Sent To:
 Village Properties LLC (Lester Leaned)
 Street and Apt. No., or PO Box No.
 PO Box 296 CT03XC210
 City, State, ZIP+4®
 Middle Haddam CT 06456

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



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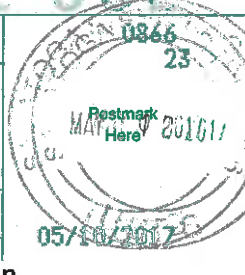
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MARLBOROUGH, CT 06447

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<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.49
Total Postage and Fees	\$6.59

Sent To:
 Amy Traversa, First Selectman
 26 North Main Street
 PO Box 29
 Marlborough, CT 06447

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



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WOBBURN, MA 01801

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<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$1.61
Total Postage and Fees	\$7.71

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

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





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

SPRINT Existing Facility

Site ID: CT03XC210

Marlborough
47 North Main Street
Marlborough, CT 06447

April 24, 2017

EBI Project Number: 6217001784

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	17.88 %



April 24, 2017

SPRINT

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

Emissions Analysis for Site: **CT03XC210 – Marlborough**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **47 North Main Street, Marlborough, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

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

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

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

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



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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **47 North Main Street, Marlborough, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 2 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 2 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 4) Since the Remote Radio Heads (RRH) radios are ground mounted there are additional cabling losses accounted for. For each ground mounted RF path the following losses were calculated. 0.98 dB of additional cable loss for all ground mounted 850 MHz Channels and 1.65 dB of additional cable loss for all ground mounted 1900 MHz channels were factored into the calculations used for this analysis. This is based on manufacturers Specifications for 130 feet of 1-5/8" coax cable on each path.



- 5) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 6) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 7) The antennas used in this modeling are the **RFS APXVSP18-C-A20** for transmission in the 850 MHz and 1900 MHz (PCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 8) The antenna mounting height centerlines of the proposed antennas are **130 feet** above ground level (AGL) for **Sector A**, **130 feet** above ground level (AGL) for **Sector B** and **130 feet** above ground level (AGL) for Sector C.
- 9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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



SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXVSPPI8-C-A20	Make / Model:	RFS APXVSPPI8-C-A20	Make / Model:	RFS APXVSPPI8-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	130 feet	Height (AGL):	130 feet	Height (AGL):	130 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	5,836.80	ERP (W):	5,836.80	ERP (W):	5,836.80
Antenna A1 MPE%	1.55 %	Antenna B1 MPE%	1.55 %	Antenna C1 MPE%	1.55 %

Site Composite MPE%	
Carrier	MPE%
SPRINT – Max per sector	1.55 %
AT&T	2.86 %
MetroPCS	0.41 %
Verizon Wireless	3.59 %
T-Mobile	3.44 %
Town	6.03 %
Site Total MPE %:	17.88 %

SPRINT Sector A Total:	1.55 %
SPRINT Sector B Total:	1.55 %
SPRINT Sector C Total:	1.55 %
Site Total:	17.88 %

SPRINT _ Max Values per Frequency Band / Technology	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
Sprint 850 MHz CDMA	2	523.75	130	2.45	850 MHz	567	0.43%
Sprint 1900 MHz (PCS) CDMA	2	798.22	130	3.73	1900 MHz (PCS)	1000	0.37%
Sprint 1900 MHz (PCS) LTE	2	1,596.44	130	7.47	1900 MHz (PCS)	1000	0.75%
						Total:	1.55%



Summary

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

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

SPRINT Sector	Power Density Value (%)
Sector A:	1.55 %
Sector B:	1.55 %
Sector C:	1.55 %
SPRINT Maximum Total (per sector):	1.55 %
Site Total:	17.88 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **17.88 %** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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



Date: January 11, 2017

Kevin Morrow
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
704.405.6619

Paul J. Ford and Company
250 E Broad St, Suite 600
Columbus, OH 43215
(614) 221-6679
mherbert@pjfweb.com

Subject: Structural Analysis Report

Carrier Designation: *Sprint PCS Co-Locate*
Carrier Site Number: CT03XC210
Carrier Site Name: Marlborough

Crown Castle Designation:
Crown Castle BU Number: 806366
Crown Castle Site Name: HRT 107(C) 943204
Crown Castle JDE Job Number: 414993
Crown Castle Work Order Number: 1346714
Crown Castle Application Number: 372578 Rev. 3

Engineering Firm Designation: Paul J. Ford and Company Project Number: 37517-0154.001.7805

Site Data: 73 North Main Street, MARLBOROUGH, Hartford County, CT
Latitude 41° 37' 47.3", Longitude -72° 27' 59.4"
155.5 Foot - Monopole Tower

Dear Kevin Morrow,

Paul J. Ford and Company is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 988500, in accordance with application 372578, revision 3.

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

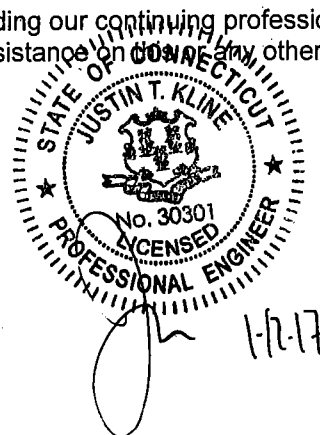
LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

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

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

Respectfully submitted by:

Michelle Herbert
Structural Designer JMM



Date: **January 11, 2017**

Kevin Morrow
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
704.405.6619

Paul J. Ford and Company
250 E Broad St, Suite 600
Columbus, OH 43215
(614) 221-6679
mherbert@pjfweb.com

Subject: Structural Analysis Report

Carrier Designation:

Sprint PCS Co-Locate

Carrier Site Number:

CT03XC210

Carrier Site Name:

Marlborough

Crown Castle Designation:

Crown Castle BU Number:

806366

Crown Castle Site Name:

HRT 107(C) 943204

Crown Castle JDE Job Number:

414993

Crown Castle Work Order Number:

1346714

Crown Castle Application Number:

372578 Rev. 3

Engineering Firm Designation:

Paul J. Ford and Company Project Number: 37517-0154.001.7805

Site Data:

73 North Main Street, MARLBOROUGH, Hartford County, CT

Latitude 41° 37' 47.3", Longitude -72° 27' 59.4"

155.5 Foot - Monopole Tower

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LC7: Existing + Reserved + Proposed Equipment

Sufficient Capacity

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

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

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

Respectfully submitted by:

Michelle Herbert
Structural Designer

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1) INTRODUCTION

This tower is a 155.5 ft Monopole tower designed by FWT INC. in December of 1997. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
126.0	128.0	3	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe	1	1-5/8	--
		3	rfs celwave	FD9R6004/1C-3L			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note			
156.0	159.0	3	alcatel lucent	RRH2x60-700	--	--	2			
		6	andrew	SBNHH-1D65B w/ Mount Pipe						
		3	alcatel lucent	RRH2X60-AWS	17	1-5/8	1			
		3	alcatel lucent	RRH2X60-PCS						
		3	commscope	LNX-6514DS-A1M w/ Mount Pipe						
		2	commscope	LNX-6514DS-AIM w/ Mount Pipe						
		1	commscope	LNX-8513DS-VTM w/ Mount Pipe						
		3	decibel	DB809K-Y						
		2	rfs celwave	DB-T1-6Z-8AB-0Z						
	156.0	1	tower mounts	Platform Mount [LP 1001-1]						
144.0	144.0	3	ericsson	RRUS 12				--	--	2
		12	kathrein	860 10025						
		3	powerwave	1001940						
		3	ericsson	RRUS-11	1 2 12 2	3/8 3/4 1-1/4 Conduit	1			
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe						
		6	powerwave	7770.00 w/ Mount Pipe						
		6	powerwave	LGP 17201						
		6	powerwave	LGP21903						
		1	raycap	DC6-48-60-18-8F						
		1	tower mounts	Platform Mount [LP 1001-1]						
135.0	135.0	3	kathrein	742 213 w/ Mount Pipe	6	1-1/4	1			
		1	tower mounts	Pipe Mount [PM 601-3]						
126.0	128.0	6	decibel	DB980H90E-M w/ Mount Pipe	--	--	3			
	126.0	1	tower mounts	Sector Mount [SM 401-3]	6	1-1/4	1			
	120.0	3	decibel	DB809K-Y	--	--	3			
100.0	100.0	6	andrew	ETM19V2S12UB	12	1-1/4	1			
		3	commscope	ATBT-BOTTOM-24V						
		3	commscope	LNX-6515DS-VTM w/ Mount Pipe						
		3	ems wireless	RV90-17-00DP w/ Mount Pipe						
		1	tower mounts	Side Arm Mount [SO 701-3]						

- Notes:
 1) Existing Equipment
 2) Reserved Equipment
 3) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 08-02029G, 02/07/2008	2208816	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	FWT, 15829, 12/31/1997	823125	CCISITES
4-TOWER MANUFACTURER DRAWINGS	FWT, 15829, 12/31/1997	823126	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	155.5 - 110	Pole	TP64.606x58.6x0.375	1	-24.08	3989.11	17.6	Pass
L2	110 - 72.5	Pole	TP68.805x62.8x0.4375	2	-42.80	5321.74	33.0	Pass
L3	72.5 - 36	Pole	TP72.748x66.8082x0.5	3	-64.49	6775.62	44.1	Pass
L4	36 - 0	Pole	TP76.5x70.56x0.5	4	-93.55	6928.62	67.2	Pass
							Summary	
						Pole (L4)	67.2	Pass
						RATING =	67.2	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	67.9	Pass
1	Base Plate	0	30.6	Pass
1	Base Foundation Structural Steel	0	50.1	Pass
1	Base Foundation Soil Interaction	0	5.8	Pass

Structure Rating (max from all components) =	67.9%
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Notes:

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

4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

Tower Input Data

There is a pole section.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

- 1) Tower is located in Hartford County, Connecticut.
- 2) ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
- 3) Basic wind speed of 101 mph.
- 4) Structure Class II.
- 5) Exposure Category C.
- 6) Topographic Category 1.
- 7) Crest Height 0.00 ft.
- 8) Nominal ice thickness of 1.0000 in.
- 9) Ice thickness is considered to increase with height.
- 10) Ice density of 56 pcf.
- 11) A wind speed of 50 mph is used in combination with ice.
- 12) Temperature drop of 50 °F.
- 13) Deflections calculated using a wind speed of 60 mph.
- 14) A non-linear (P-delta) analysis was used.
- 15) Pressures are calculated at each section.
- 16) Stress ratio used in pole design is 1.
- 17) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	155.50-110.00	45.50	8.00	12	58.6000	64.6060	0.3750	1.5000	A572-65 (65 ksi)
L2	110.00-72.50	45.50	8.50	12	62.8000	68.8050	0.4375	1.7500	A572-65 (65 ksi)
L3	72.50-36.00	45.00	9.00	12	66.8082	72.7480	0.5000	2.0000	A572-65 (65 ksi)
L4	36.00-0.00	45.00		12	70.5600	76.5000	0.5000	2.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	60.6672	70.3067	30422.968 0	20.8446	30.3548	1002.2457	61645.181 3	34.6028	14.6998	39.199
	66.8851	77.5589	40842.013 1	22.9947	33.4659	1220.4065	82756.991 3	38.1721	16.3094	43.492
L2	66.1084	87.8532	43610.436 1	22.3258	32.5304	1340.6056	88366.567 0	43.2387	15.6579	35.789
	71.2322	96.3127	57460.444 0	24.4756	35.6410	1612.2011	116430.43 78	47.4022	17.2672	39.468
L3	70.3265	106.7562	59911.926 8	23.7383	34.6066	1731.2263	121397.80 66	52.5421	16.5646	33.129
	75.3143	116.3193	77497.789 3	25.8648	37.6835	2056.5463	157031.53 18	57.2488	18.1565	36.313
L4	74.2790	112.7967	70668.018 4	25.0815	36.5501	1933.4563	143192.56 43	55.5151	17.5701	35.14
	79.1986	122.3600	90209.568 0	27.2080	39.6270	2276.4673	182789.04 18	60.2219	19.1620	38.324

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in
L1 155.50-110.00				1	1	1			
L2 110.00-72.50				1	1	1			
L3 72.50-36.00				1	1	1			
L4 36.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number	C _A A _A	Weight
				ft		ft ² /ft	plf

561(1-5/8)	C	No	Inside Pole	155.50 - 0.00	12	No Ice 1/2" Ice 1" Ice	1.35 1.35 1.35
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	155.50 - 0.00	2	No Ice 1/2" Ice 1" Ice	1.30 1.30 1.30
LDF7-50A(1-5/8)	C	No	Inside Pole	155.50 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.82 0.82 0.82

FB-L98B-002-75000(3/8)	C	No	Inside Pole	144.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.06 0.06 0.06
2" (Nominal) Conduit	C	No	Inside Pole	144.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.72 0.72 0.72
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	144.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.58 0.58 0.58
UCF114-50JA(1-1/4)	C	No	Inside Pole	144.00 - 0.00	12	No Ice 1/2" Ice 1" Ice	0.55 0.55 0.55

AVA6-50(1-1/4)	C	No	Inside Pole	135.00 - 0.00	6	No Ice	0.46

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A		Weight
						ft ² /ft	plf	
						1/2" Ice	0.00	0.46
						1" Ice	0.00	0.46
*** LDF6-50A(1-1/4)	C	No	Inside Pole	126.00 - 0.00	6	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60
HYBRID 12C4 2-FOC SHLD PVC(1-5/8)	C	No	Inside Pole	126.00 - 0.00	1	No Ice	0.00	2.30
						1/2" Ice	0.00	2.30
						1" Ice	0.00	2.30
*** AVA6-50(1-1/4)	C	No	Inside Pole	100.00 - 0.00	6	No Ice	0.00	0.46
						1/2" Ice	0.00	0.46
						1" Ice	0.00	0.46
LDF6-50A(1-1/4)	C	No	Inside Pole	100.00 - 0.00	6	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R	A _F	C _A A _A In Face	C _A A _A Out Face	Weight
			ft ²	ft ²	ft ²	ft ²	K
L1	155.50-110.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.42
L2	110.00-72.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.62
L3	72.50-36.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.64
L4	36.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.61

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R	A _F	C _A A _A In Face	C _A A _A Out Face	Weight
				ft ²	ft ²	ft ²	ft ²	K
L1	155.50-110.00	A	2.298	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.42
L2	110.00-72.50	A	2.214	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.62
L3	72.50-36.00	A	2.102	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.64
L4	36.00-0.00	A	1.886	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.61

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	155.50-110.00	0.0000	0.0000	0.0000	0.0000

Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L2	110.00-72.50	0.0000	0.0000	0.0000	0.0000
L3	72.50-36.00	0.0000	0.0000	0.0000	0.0000
L4	36.00-0.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _a A _a Front ft ²	C _a A _a Side ft ²	Weight K	

DB809K-Y	A	From Leg	4.00	0.0000	156.00	No Ice	2.85	2.85	0.03
			0.00			1/2"	4.03	4.03	0.05
			3.00			Ice	5.21	5.21	0.08
						1" Ice			
DB809K-Y	B	From Leg	4.00	0.0000	156.00	No Ice	2.85	2.85	0.03
			0.00			1/2"	4.03	4.03	0.05
			3.00			Ice	5.21	5.21	0.08
						1" Ice			
DB809K-Y	C	From Leg	4.00	0.0000	156.00	No Ice	2.85	2.85	0.03
			0.00			1/2"	4.03	4.03	0.05
			3.00			Ice	5.21	5.21	0.08
						1" Ice			
LNX-6514DS-A1M w/ Mount Pipe	A	From Leg	4.00	0.0000	156.00	No Ice	8.41	7.08	0.06
			0.00			1/2"	8.97	8.27	0.13
			3.00			Ice	9.50	9.18	0.21
						1" Ice			
LNX-6514DS-A1M w/ Mount Pipe	B	From Leg	4.00	0.0000	156.00	No Ice	8.41	7.08	0.06
			0.00			1/2"	8.97	8.27	0.13
			3.00			Ice	9.50	9.18	0.21
						1" Ice			
LNX-6514DS-A1M w/ Mount Pipe	C	From Leg	4.00	0.0000	156.00	No Ice	8.41	7.08	0.06
			0.00			1/2"	8.97	8.27	0.13
			3.00			Ice	9.50	9.18	0.21
						1" Ice			
LNX-8513DS-VTM w/ Mount Pipe	A	From Leg	4.00	0.0000	156.00	No Ice	8.41	7.08	0.06
			0.00			1/2"	8.97	8.27	0.13
			3.00			Ice	9.50	9.18	0.21
						1" Ice			
LNX-6514DS-AIM w/ Mount Pipe	B	From Leg	4.00	0.0000	156.00	No Ice	8.41	7.08	0.06
			0.00			1/2"	8.97	8.27	0.13
			3.00			Ice	9.50	9.18	0.21
						1" Ice			
LNX-6514DS-AIM w/ Mount Pipe	C	From Leg	4.00	0.0000	156.00	No Ice	8.41	7.08	0.06
			0.00			1/2"	8.97	8.27	0.13
			3.00			Ice	9.50	9.18	0.21
						1" Ice			
RRH2X60-AWS	A	From Leg	4.00	0.0000	156.00	No Ice	1.88	1.24	0.04
			0.00			1/2"	2.06	1.39	0.06
			3.00			Ice	2.24	1.54	0.08
						1" Ice			
RRH2X60-AWS	B	From Leg	4.00	0.0000	156.00	No Ice	1.88	1.24	0.04
			0.00			1/2"	2.06	1.39	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
			3.00						
						Ice	2.24	1.54	0.08
						1" Ice			
RRH2X60-AWS	C	From Leg	4.00	0.0000	156.00	No Ice	1.88	1.24	0.04
			0.00			1/2"	2.06	1.39	0.06
			3.00			Ice	2.24	1.54	0.08
						1" Ice			
(2) DB-T1-6Z-8AB-0Z	A	From Leg	4.00	0.0000	156.00	No Ice	4.80	2.00	0.04
			0.00			1/2"	5.07	2.19	0.08
			3.00			Ice	5.35	2.39	0.12
						1" Ice			
RRH2X60-PCS	A	From Leg	4.00	0.0000	156.00	No Ice	2.20	1.72	0.06
			0.00			1/2"	2.39	1.90	0.08
			3.00			Ice	2.59	2.09	0.10
						1" Ice			
RRH2X60-PCS	B	From Leg	4.00	0.0000	156.00	No Ice	2.20	1.72	0.06
			0.00			1/2"	2.39	1.90	0.08
			3.00			Ice	2.59	2.09	0.10
						1" Ice			
RRH2X60-PCS	C	From Leg	4.00	0.0000	156.00	No Ice	2.20	1.72	0.06
			0.00			1/2"	2.39	1.90	0.08
			3.00			Ice	2.59	2.09	0.10
						1" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00	0.0000	156.00	No Ice	8.42	7.42	0.08
			0.00			1/2"	8.96	8.45	0.15
			3.00			Ice	9.48	9.35	0.23
						1" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00	0.0000	156.00	No Ice	8.42	7.42	0.08
			0.00			1/2"	8.96	8.45	0.15
			3.00			Ice	9.48	9.35	0.23
						1" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00	0.0000	156.00	No Ice	8.42	7.42	0.08
			0.00			1/2"	8.96	8.45	0.15
			3.00			Ice	9.48	9.35	0.23
						1" Ice			
RRH2x60-700	A	From Leg	4.00	0.0000	156.00	No Ice	3.50	1.82	0.06
			0.00			1/2"	3.76	2.05	0.08
			3.00			Ice	4.03	2.29	0.11
						1" Ice			
RRH2x60-700	B	From Leg	4.00	0.0000	156.00	No Ice	3.50	1.82	0.06
			0.00			1/2"	3.76	2.05	0.08
			3.00			Ice	4.03	2.29	0.11
						1" Ice			
RRH2x60-700	C	From Leg	4.00	0.0000	156.00	No Ice	3.50	1.82	0.06
			0.00			1/2"	3.76	2.05	0.08
			3.00			Ice	4.03	2.29	0.11
						1" Ice			
Platform Mount [LP 1001-1]	C	None		0.0000	156.00	No Ice	47.70	47.70	3.02
						1/2"	59.50	59.50	3.62
						Ice	71.30	71.30	4.22
						1" Ice			

(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00	0.0000	144.00	No Ice	5.80	4.54	0.09
			0.00			1/2"	6.27	5.51	0.14
			0.00			Ice	6.70	6.21	0.21
						1" Ice			
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00	0.0000	144.00	No Ice	5.80	4.54	0.09
			0.00			1/2"	6.27	5.51	0.14
			0.00			Ice	6.70	6.21	0.21
						1" Ice			
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00	0.0000	144.00	No Ice	5.80	4.54	0.09
			0.00			1/2"	6.27	5.51	0.14
			0.00			Ice	6.70	6.21	0.21
						1" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.00	0.0000	144.00	No Ice	8.26	6.30	0.07
			0.00			1/2"	8.82	7.48	0.14

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz	Lateral	Vert					
			ft	ft	ft	°	ft	ft ²	ft ²	K
			0.00							
							Ice	9.35	8.37	0.21
							1" Ice			
AM-X-CD-16-65-00T-RET	B	From Leg	4.00	0.0000	144.00		No Ice	8.26	6.30	0.07
w/ Mount Pipe			0.00				1/2"	8.82	7.48	0.14
			0.00				Ice	9.35	8.37	0.21
							1" Ice			
AM-X-CD-16-65-00T-RET	C	From Leg	4.00	0.0000	144.00		No Ice	8.26	6.30	0.07
w/ Mount Pipe			0.00				1/2"	8.82	7.48	0.14
			0.00				Ice	9.35	8.37	0.21
							1" Ice			
(2) LGP 17201	A	From Leg	4.00	0.0000	144.00		No Ice	1.67	0.47	0.03
			0.00				1/2"	1.83	0.57	0.04
			0.00				Ice	2.00	0.68	0.06
							1" Ice			
(2) LGP 17201	B	From Leg	4.00	0.0000	144.00		No Ice	1.67	0.47	0.03
			0.00				1/2"	1.83	0.57	0.04
			0.00				Ice	2.00	0.68	0.06
							1" Ice			
(2) LGP 17201	C	From Leg	4.00	0.0000	144.00		No Ice	1.67	0.47	0.03
			0.00				1/2"	1.83	0.57	0.04
			0.00				Ice	2.00	0.68	0.06
							1" Ice			
DC6-48-60-18-8F	B	From Leg	4.00	0.0000	144.00		No Ice	0.92	0.92	0.02
			0.00				1/2"	1.46	1.46	0.04
			0.00				Ice	1.64	1.64	0.06
							1" Ice			
RRUS-11	A	From Leg	4.00	0.0000	144.00		No Ice	2.79	1.19	0.05
			0.00				1/2"	3.00	1.34	0.07
			0.00				Ice	3.21	1.50	0.09
							1" Ice			
RRUS-11	B	From Leg	4.00	0.0000	144.00		No Ice	2.79	1.19	0.05
			0.00				1/2"	3.00	1.34	0.07
			0.00				Ice	3.21	1.50	0.09
							1" Ice			
RRUS-11	C	From Leg	4.00	0.0000	144.00		No Ice	2.79	1.19	0.05
			0.00				1/2"	3.00	1.34	0.07
			0.00				Ice	3.21	1.50	0.09
							1" Ice			
(2) LGP21903	A	From Leg	4.00	0.0000	144.00		No Ice	0.23	0.16	0.01
			0.00				1/2"	0.29	0.21	0.01
			0.00				Ice	0.36	0.28	0.02
							1" Ice			
(2) LGP21903	B	From Leg	4.00	0.0000	144.00		No Ice	0.23	0.16	0.01
			0.00				1/2"	0.29	0.21	0.01
			0.00				Ice	0.36	0.28	0.02
							1" Ice			
(2) LGP21903	C	From Leg	4.00	0.0000	144.00		No Ice	0.23	0.16	0.01
			0.00				1/2"	0.29	0.21	0.01
			0.00				Ice	0.36	0.28	0.02
							1" Ice			
(4) 860 10025	A	From Leg	4.00	0.0000	144.00		No Ice	0.14	0.12	0.00
			0.00				1/2"	0.19	0.17	0.00
			0.00				Ice	0.25	0.23	0.01
							1" Ice			
(4) 860 10025	B	From Leg	4.00	0.0000	144.00		No Ice	0.14	0.12	0.00
			0.00				1/2"	0.19	0.17	0.00
			0.00				Ice	0.25	0.23	0.01
							1" Ice			
(4) 860 10025	C	From Leg	4.00	0.0000	144.00		No Ice	0.14	0.12	0.00
			0.00				1/2"	0.19	0.17	0.00
			0.00				Ice	0.25	0.23	0.01
							1" Ice			
RRUS 12	A	From Leg	4.00	0.0000	144.00		No Ice	3.15	1.29	0.06
			0.00				1/2"	3.36	1.44	0.08
			0.00				Ice	3.59	1.60	0.11

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	K
RRUS 12	B	From Leg	4.00	0.0000	144.00	1" Ice	3.15	1.29	0.06
			0.00			No Ice	3.15	1.29	0.06
			0.00			1/2"	3.36	1.44	0.08
RRUS 12	C	From Leg	4.00	0.0000	144.00	Ice	3.59	1.60	0.11
			0.00			1" Ice	3.15	1.29	0.06
			0.00			No Ice	3.15	1.29	0.06
1001940	A	From Leg	4.00	0.0000	144.00	1/2"	3.36	1.44	0.08
			0.00			Ice	3.59	1.60	0.11
			0.00			1" Ice	3.15	1.29	0.06
1001940	B	From Leg	4.00	0.0000	144.00	No Ice	0.18	0.08	0.00
			0.00			1/2"	0.23	0.13	0.00
			0.00			Ice	0.30	0.18	0.01
1001940	C	From Leg	4.00	0.0000	144.00	1" Ice	0.18	0.08	0.00
			0.00			No Ice	0.18	0.08	0.00
			0.00			1/2"	0.23	0.13	0.00
Platform Mount [LP 1001-1]	C	None		0.0000	144.00	Ice	0.30	0.18	0.01
						1" Ice	0.18	0.08	0.00
						No Ice	0.18	0.08	0.00
*** 742 213 w/ Mount Pipe	A	From Leg	1.00	0.0000	135.00	1/2"	59.50	59.50	3.62
			0.00			Ice	71.30	71.30	4.22
			0.00			1" Ice	47.70	47.70	3.02
742 213 w/ Mount Pipe	B	From Leg	1.00	0.0000	135.00	No Ice	47.70	47.70	3.02
			0.00			1/2"	59.50	59.50	3.62
			0.00			Ice	71.30	71.30	4.22
742 213 w/ Mount Pipe	C	From Leg	1.00	0.0000	135.00	1" Ice	47.70	47.70	3.02
			0.00			No Ice	47.70	47.70	3.02
			0.00			1/2"	59.50	59.50	3.62
Pipe Mount [PM 601-3]	C	None		0.0000	135.00	Ice	71.30	71.30	4.22
						1" Ice	47.70	47.70	3.02
						No Ice	47.70	47.70	3.02
*** APXVSP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.0000	126.00	1/2"	5.37	4.62	0.05
			0.00			Ice	6.50	6.98	0.15
			2.00			1" Ice	5.37	4.62	0.05
APXVSP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.0000	126.00	No Ice	5.37	4.62	0.05
			0.00			1/2"	5.95	6.00	0.09
			2.00			Ice	6.50	6.98	0.15
APXVSP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.0000	126.00	1" Ice	5.37	4.62	0.05
			0.00			No Ice	5.37	4.62	0.05
			2.00			1/2"	5.95	6.00	0.09
FD9R6004/1C-3L	A	From Leg	4.00	0.0000	126.00	Ice	6.50	6.98	0.15
			0.00			1" Ice	5.37	4.62	0.05
			2.00			No Ice	5.37	4.62	0.05
FD9R6004/1C-3L	B	From Leg	4.00	0.0000	126.00	1/2"	5.95	6.00	0.09
			0.00			Ice	6.50	6.98	0.15
			2.00			1" Ice	5.37	4.62	0.05
FD9R6004/1C-3L	C	From Leg	4.00	0.0000	126.00	No Ice	4.39	4.39	0.20
			0.00			1/2"	5.48	5.48	0.24
			2.00			Ice	6.57	6.57	0.28
FD9R6004/1C-3L	A	From Leg	4.00	0.0000	126.00	1" Ice	4.39	4.39	0.20
			0.00			No Ice	4.39	4.39	0.20
			2.00			1/2"	5.48	5.48	0.24
FD9R6004/1C-3L	B	From Leg	4.00	0.0000	126.00	Ice	6.57	6.57	0.28
			0.00			1" Ice	4.39	4.39	0.20
			2.00			No Ice	4.39	4.39	0.20
FD9R6004/1C-3L	C	From Leg	4.00	0.0000	126.00	1/2"	5.48	5.48	0.24
			0.00			Ice	6.57	6.57	0.28
			2.00			1" Ice	4.39	4.39	0.20

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
			2.00			Ice	0.47	0.17	0.01
Sector Mount [SM 401-3]	C	None		0.0000	126.00	1" Ice			
						No Ice	17.87	17.87	0.80
						1/2"	25.31	25.31	1.16
						Ice	32.75	32.75	1.52
						1" Ice			

LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice	11.68	9.84	0.08
						1/2"	12.40	11.37	0.17
						Ice	13.14	12.91	0.27
						1" Ice			
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice	11.68	9.84	0.08
						1/2"	12.40	11.37	0.17
						Ice	13.14	12.91	0.27
						1" Ice			
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice	11.68	9.84	0.08
						1/2"	12.40	11.37	0.17
						Ice	13.14	12.91	0.27
						1" Ice			
RV90-17-00DP w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice	4.59	3.32	0.04
						1/2"	5.02	4.09	0.08
						Ice	5.44	4.78	0.12
						1" Ice			
RV90-17-00DP w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice	4.59	3.32	0.04
						1/2"	5.02	4.09	0.08
						Ice	5.44	4.78	0.12
						1" Ice			
RV90-17-00DP w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice	4.59	3.32	0.04
						1/2"	5.02	4.09	0.08
						Ice	5.44	4.78	0.12
						1" Ice			
ATBT-BOTTOM-24V	A	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice	0.10	0.06	0.00
						1/2"	0.15	0.10	0.00
						Ice	0.20	0.15	0.01
						1" Ice			
ATBT-BOTTOM-24V	B	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice	0.10	0.06	0.00
						1/2"	0.15	0.10	0.00
						Ice	0.20	0.15	0.01
						1" Ice			
ATBT-BOTTOM-24V	C	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice	0.10	0.06	0.00
						1/2"	0.15	0.10	0.00
						Ice	0.20	0.15	0.01
						1" Ice			
(2) ETM19V2S12UB	A	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice	0.72	0.20	0.01
						1/2"	0.82	0.27	0.02
						Ice	0.94	0.35	0.02
						1" Ice			
(2) ETM19V2S12UB	B	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice	0.72	0.20	0.01
						1/2"	0.82	0.27	0.02
						Ice	0.94	0.35	0.02
						1" Ice			
(2) ETM19V2S12UB	C	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice	0.72	0.20	0.01
						1/2"	0.82	0.27	0.02
						Ice	0.94	0.35	0.02
						1" Ice			
Side Arm Mount [SO 701-3]	C	None		0.0000	100.00	No Ice	2.83	2.83	0.20
						1/2"	3.92	3.92	0.24
						Ice	5.01	5.01	0.28
						1" Ice			

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_z	q_z psf	A_G ft ²	Face A B C e	A_F ft ²	A_R ft ²	A_{leg} ft ²	Leg %	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²
L1 155.50-110.00	132.59	1.343	33.29	241.81	A	0.000	241.818	241.818	100.00	0.000	0.000
					B	0.000	241.818	100.00	0.000	0.000	
					C	0.000	241.818	100.00	0.000	0.000	
L2 110.00-72.50	91.22	1.241	30.76	214.59	A	0.000	214.595	214.595	100.00	0.000	0.000
					B	0.000	214.595	100.00	0.000	0.000	
					C	0.000	214.595	100.00	0.000	0.000	
L3 72.50-36.00	54.37	1.113	27.52	221.49	A	0.000	221.495	221.495	100.00	0.000	0.000
					B	0.000	221.495	100.00	0.000	0.000	
					C	0.000	221.495	100.00	0.000	0.000	
L4 36.00-0.00	18.36	0.886	22.43	230.21	A	0.000	230.216	230.216	100.00	0.000	0.000
					B	0.000	230.216	100.00	0.000	0.000	
					C	0.000	230.216	100.00	0.000	0.000	

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_z	q_z psf	t_z in	A_G ft ²	Face A B C e	A_F ft ²	A_R ft ²	A_{leg} ft ²	Leg %	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²
L1 155.50-110.00	132.59	1.343	8.16	2.2984	259.247	A	0.000	259.247	259.247	100.00	0.000	0.000
						B	0.000	259.247	100.00	0.000	0.000	
						C	0.000	259.247	100.00	0.000	0.000	
L2 110.00-72.50	91.22	1.241	7.54	2.2141	228.960	A	0.000	228.960	228.960	100.00	0.000	0.000
						B	0.000	228.960	100.00	0.000	0.000	
						C	0.000	228.960	100.00	0.000	0.000	
L3 72.50-36.00	54.37	1.113	6.74	2.1024	234.964	A	0.000	234.964	234.964	100.00	0.000	0.000
						B	0.000	234.964	100.00	0.000	0.000	
						C	0.000	234.964	100.00	0.000	0.000	
L4 36.00-0.00	18.36	0.886	5.50	1.8861	242.831	A	0.000	242.831	242.831	100.00	0.000	0.000
						B	0.000	242.831	100.00	0.000	0.000	
						C	0.000	242.831	100.00	0.000	0.000	

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_z	q_z psf	A_G ft ²	Face A B C e	A_F ft ²	A_R ft ²	A_{leg} ft ²	Leg %	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²
L1 155.50-110.00	132.59	1.343	10.51	241.81	A	0.000	241.818	241.818	100.00	0.000	0.000
					B	0.000	241.818	100.00	0.000	0.000	
					C	0.000	241.818	100.00	0.000	0.000	
L2 110.00-72.50	91.22	1.241	9.71	214.59	A	0.000	214.595	214.595	100.00	0.000	0.000
					B	0.000	214.595	100.00	0.000	0.000	
					C	0.000	214.595	100.00	0.000	0.000	
L3 72.50-36.00	54.37	1.113	8.69	221.49	A	0.000	221.495	221.495	100.00	0.000	0.000
					B	0.000	221.495	100.00	0.000	0.000	
					C	0.000	221.495	100.00	0.000	0.000	
L4 36.00-0.00	18.36	0.886	7.08	230.21	A	0.000	230.216	230.216	100.00	0.000	0.000
					B	0.000	230.216	100.00	0.000	0.000	
					C	0.000	230.216	100.00	0.000	0.000	

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	155.5 - 110	Pole	Max Tension	40	0.00	0.00	-0.00
			Max. Compression	26	-53.54	-0.74	2.95
			Max. Mx	8	-24.10	-859.46	0.52
			Max. My	2	-24.08	-0.13	873.96
			Max. Vy	8	32.37	-859.46	0.52
			Max. Vx	2	-32.72	-0.13	873.96

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L2	110 - 72.5	Pole	Max. Torque	8			1.59
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-83.54	-0.74	2.95
			Max. M _x	8	-42.81	-2320.58	0.54
			Max. M _y	2	-42.80	-0.14	2347.88
			Max. V _y	8	46.41	-2320.58	0.54
			Max. V _x	2	-46.76	-0.14	2347.88
L3	72.5 - 36	Pole	Max. Torque	8			1.44
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-113.51	-0.74	2.95
			Max. M _x	8	-64.50	-4189.42	0.55
			Max. M _y	2	-64.49	-0.14	4229.15
			Max. V _y	8	57.15	-4189.42	0.55
			Max. V _x	2	-57.50	-0.14	4229.15
L4	36 - 0	Pole	Max. Torque	8			1.44
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-151.57	-0.74	2.95
			Max. M _x	8	-93.55	-7019.06	0.55
			Max. M _y	2	-93.55	-0.14	7074.16
			Max. V _y	8	67.95	-7019.06	0.55
			Max. V _x	2	-68.29	-0.14	7074.16
			Max. Torque	8			1.44

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	151.57	-0.00	0.00
	Max. H _x	21	70.18	67.92	0.00
	Max. H _z	3	70.18	-0.00	68.25
	Max. M _x	2	7074.16	-0.00	68.25
	Max. M _z	8	7019.06	-67.92	0.00
	Max. Torsion	8	1.44	-67.92	0.00
	Min. Vert	3	70.18	-0.00	68.25
	Min. H _x	9	70.18	-67.92	0.00
	Min. H _z	15	70.18	-0.00	-68.25
	Min. M _x	14	-7073.05	-0.00	-68.25
	Min. M _z	20	-7018.78	67.92	0.00
	Min. Torsion	20	-1.44	67.92	0.00

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	77.98	0.00	0.00	-0.45	-0.11	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	93.58	0.00	-68.25	-7074.16	-0.14	0.25
0.9 Dead+1.6 Wind 0 deg - No Ice	70.18	0.00	-68.25	-7045.33	-0.10	0.25
1.2 Dead+1.6 Wind 30 deg - No Ice	93.58	33.96	-59.11	-6127.07	-3509.65	-0.52
0.9 Dead+1.6 Wind 30 deg - No Ice	70.18	33.96	-59.11	-6101.91	-3495.30	-0.52
1.2 Dead+1.6 Wind 60 deg - No Ice	93.58	58.82	-34.13	-3537.70	-6078.80	-1.14
0.9 Dead+1.6 Wind 60 deg - No Ice	70.18	58.82	-34.13	-3523.12	-6053.98	-1.13
1.2 Dead+1.6 Wind 90 deg - No Ice	93.58	67.92	-0.00	-0.55	-7019.06	-1.44

Load Combination	Vertical	Shear _x	Shear _z	Overtuning Moment, M _x	Overtuning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.6 Wind 90 deg - No Ice	70.18	67.92	-0.00	-0.41	-6990.44	-1.44
1.2 Dead+1.6 Wind 120 deg - No Ice	93.58	58.82	34.13	3536.60	-6078.80	-1.36
0.9 Dead+1.6 Wind 120 deg - No Ice	70.18	58.82	34.13	3522.29	-6053.97	-1.36
1.2 Dead+1.6 Wind 150 deg - No Ice	93.58	33.96	59.11	6125.96	-3509.65	-0.92
0.9 Dead+1.6 Wind 150 deg - No Ice	70.18	33.96	59.11	6101.09	-3495.30	-0.92
1.2 Dead+1.6 Wind 180 deg - No Ice	93.58	0.00	68.25	7073.05	-0.14	-0.25
0.9 Dead+1.6 Wind 180 deg - No Ice	70.18	0.00	68.25	7044.51	-0.10	-0.25
1.2 Dead+1.6 Wind 210 deg - No Ice	93.58	-33.96	59.11	6125.96	3509.37	0.50
0.9 Dead+1.6 Wind 210 deg - No Ice	70.18	-33.96	59.11	6101.09	3495.10	0.50
1.2 Dead+1.6 Wind 240 deg - No Ice	93.58	-58.82	34.13	3536.60	6078.52	1.12
0.9 Dead+1.6 Wind 240 deg - No Ice	70.18	-58.82	34.13	3522.29	6053.76	1.11
1.2 Dead+1.6 Wind 270 deg - No Ice	93.58	-67.92	-0.00	-0.55	7018.78	1.44
0.9 Dead+1.6 Wind 270 deg - No Ice	70.18	-67.92	-0.00	-0.41	6990.23	1.44
1.2 Dead+1.6 Wind 300 deg - No Ice	93.58	-58.82	-34.13	-3537.70	6078.52	1.38
0.9 Dead+1.6 Wind 300 deg - No Ice	70.18	-58.82	-34.13	-3523.12	6053.77	1.38
1.2 Dead+1.6 Wind 330 deg - No Ice	93.58	-33.96	-59.11	-6127.07	3509.37	0.95
0.9 Dead+1.6 Wind 330 deg - No Ice	70.18	-33.96	-59.11	-6101.91	3495.09	0.94
1.2 Dead+1.0 Ice+1.0 Temp	151.57	0.00	-0.00	-2.95	-0.74	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	151.57	-0.00	-15.55	-1727.98	-0.77	0.11
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	151.57	7.74	-13.46	-1496.89	-858.34	-0.06
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	151.57	13.41	-7.77	-865.54	-1486.13	-0.22
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	151.57	15.49	0.00	-3.11	-1715.91	-0.32
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	151.57	13.41	7.77	859.33	-1486.13	-0.33
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	151.57	7.74	13.46	1490.68	-858.34	-0.26
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	151.57	-0.00	15.55	1721.77	-0.77	-0.11
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	151.57	-7.74	13.46	1490.68	856.79	0.06
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	151.57	-13.41	7.77	859.33	1484.58	0.22
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	151.57	-15.49	0.00	-3.11	1714.36	0.32
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	151.57	-13.41	-7.77	-865.54	1484.58	0.33
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	151.57	-7.74	-13.46	-1496.89	856.79	0.26
Dead+Wind 0 deg - Service	77.98	-0.00	-13.47	-1392.87	-0.12	0.05
Dead+Wind 30 deg - Service	77.98	6.70	-11.66	-1205.96	-690.67	-0.10
Dead+Wind 60 deg - Service	77.98	11.60	-6.73	-696.45	-1196.20	-0.22
Dead+Wind 90 deg - Service	77.98	13.40	0.00	-0.46	-1381.65	-0.28
Dead+Wind 120 deg - Service	77.98	11.60	6.73	695.53	-1196.20	-0.27
Dead+Wind 150 deg - Service	77.98	6.70	11.66	1205.04	-690.67	-0.18
Dead+Wind 180 deg - Service	77.98	-0.00	13.47	1391.95	-0.12	-0.05

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
Dead+Wind 210 deg - Service	77.98	-6.70	11.66	1205.04	690.44	0.10
Dead+Wind 240 deg - Service	77.98	-11.60	6.73	695.53	1195.97	0.22
Dead+Wind 270 deg - Service	77.98	-13.40	0.00	-0.46	1381.42	0.28
Dead+Wind 300 deg - Service	77.98	-11.60	-6.73	-696.45	1195.97	0.27
Dead+Wind 330 deg - Service	77.98	-6.70	-11.66	-1205.96	690.44	0.18

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-77.98	0.00	0.00	77.98	0.00	0.000%
2	0.00	-93.58	-68.26	-0.00	93.58	68.25	0.005%
3	0.00	-70.18	-68.26	-0.00	70.18	68.25	0.004%
4	33.96	-93.58	-59.11	-33.96	93.58	59.11	0.000%
5	33.96	-70.18	-59.11	-33.96	70.18	59.11	0.000%
6	58.82	-93.58	-34.13	-58.82	93.58	34.13	0.000%
7	58.82	-70.18	-34.13	-58.82	70.18	34.13	0.000%
8	67.92	-93.58	0.00	-67.92	93.58	0.00	0.001%
9	67.92	-70.18	0.00	-67.92	70.18	0.00	0.001%
10	58.82	-93.58	34.13	-58.82	93.58	-34.13	0.000%
11	58.82	-70.18	34.13	-58.82	70.18	-34.13	0.000%
12	33.96	-93.58	59.11	-33.96	93.58	-59.11	0.000%
13	33.96	-70.18	59.11	-33.96	70.18	-59.11	0.000%
14	0.00	-93.58	68.26	-0.00	93.58	-68.25	0.005%
15	0.00	-70.18	68.26	-0.00	70.18	-68.25	0.004%
16	-33.96	-93.58	59.11	33.96	93.58	-59.11	0.000%
17	-33.96	-70.18	59.11	33.96	70.18	-59.11	0.000%
18	-58.82	-93.58	34.13	58.82	93.58	-34.13	0.000%
19	-58.82	-70.18	34.13	58.82	70.18	-34.13	0.000%
20	-67.92	-93.58	0.00	67.92	93.58	0.00	0.001%
21	-67.92	-70.18	0.00	67.92	70.18	0.00	0.001%
22	-58.82	-93.58	-34.13	58.82	93.58	34.13	0.000%
23	-58.82	-70.18	-34.13	58.82	70.18	34.13	0.000%
24	-33.96	-93.58	-59.11	33.96	93.58	59.11	0.000%
25	-33.96	-70.18	-59.11	33.96	70.18	59.11	0.000%
26	0.00	-151.57	0.00	-0.00	151.57	0.00	0.000%
27	0.00	-151.57	-15.55	0.00	151.57	15.55	0.000%
28	7.74	-151.57	-13.46	-7.74	151.57	13.46	0.000%
29	13.41	-151.57	-7.77	-13.41	151.57	7.77	0.000%
30	15.49	-151.57	0.00	-15.49	151.57	-0.00	0.000%
31	13.41	-151.57	7.77	-13.41	151.57	-7.77	0.000%
32	7.74	-151.57	13.46	-7.74	151.57	-13.46	0.000%
33	0.00	-151.57	15.55	0.00	151.57	-15.55	0.000%
34	-7.74	-151.57	13.46	7.74	151.57	-13.46	0.000%
35	-13.41	-151.57	7.77	13.41	151.57	-7.77	0.000%
36	-15.49	-151.57	0.00	15.49	151.57	-0.00	0.000%
37	-13.41	-151.57	-7.77	13.41	151.57	7.77	0.000%
38	-7.74	-151.57	-13.46	7.74	151.57	13.46	0.000%
39	0.00	-77.98	-13.47	0.00	77.98	13.47	0.001%
40	6.70	-77.98	-11.67	-6.70	77.98	11.66	0.005%
41	11.61	-77.98	-6.74	-11.60	77.98	6.73	0.005%
42	13.40	-77.98	0.00	-13.40	77.98	-0.00	0.001%
43	11.61	-77.98	6.74	-11.60	77.98	-6.73	0.005%
44	6.70	-77.98	11.67	-6.70	77.98	-11.66	0.005%
45	0.00	-77.98	13.47	0.00	77.98	-13.47	0.001%
46	-6.70	-77.98	11.67	6.70	77.98	-11.66	0.005%
47	-11.61	-77.98	6.74	11.60	77.98	-6.73	0.005%
48	-13.40	-77.98	0.00	13.40	77.98	-0.00	0.001%
49	-11.61	-77.98	-6.74	11.60	77.98	6.73	0.005%
50	-6.70	-77.98	-11.67	6.70	77.98	11.66	0.005%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	8	0.00008088	0.00011247
3	Yes	8	0.00000001	0.00011314
4	Yes	11	0.00000001	0.00003415
5	Yes	10	0.00000001	0.00014998
6	Yes	11	0.00000001	0.00003494
7	Yes	11	0.00000001	0.00002762
8	Yes	9	0.00000001	0.00004620
9	Yes	9	0.00000001	0.00003814
10	Yes	11	0.00000001	0.00003357
11	Yes	10	0.00000001	0.00014746
12	Yes	11	0.00000001	0.00003494
13	Yes	11	0.00000001	0.00002761
14	Yes	8	0.00008088	0.00011244
15	Yes	8	0.00000001	0.00011312
16	Yes	11	0.00000001	0.00003469
17	Yes	11	0.00000001	0.00002741
18	Yes	11	0.00000001	0.00003369
19	Yes	10	0.00000001	0.00014801
20	Yes	9	0.00000001	0.00004619
21	Yes	9	0.00000001	0.00003814
22	Yes	11	0.00000001	0.00003507
23	Yes	11	0.00000001	0.00002773
24	Yes	11	0.00000001	0.00003391
25	Yes	10	0.00000001	0.00014892
26	Yes	6	0.00000001	0.00000001
27	Yes	10	0.00000001	0.00012155
28	Yes	10	0.00000001	0.00012531
29	Yes	10	0.00000001	0.00012486
30	Yes	10	0.00000001	0.00012047
31	Yes	10	0.00000001	0.00012436
32	Yes	10	0.00000001	0.00012463
33	Yes	10	0.00000001	0.00012078
34	Yes	10	0.00000001	0.00012450
35	Yes	10	0.00000001	0.00012419
36	Yes	10	0.00000001	0.00012028
37	Yes	10	0.00000001	0.00012469
38	Yes	10	0.00000001	0.00012519
39	Yes	8	0.00000001	0.00003082
40	Yes	7	0.00000001	0.00013232
41	Yes	7	0.00000001	0.00013506
42	Yes	8	0.00000001	0.00003120
43	Yes	7	0.00000001	0.00013018
44	Yes	7	0.00000001	0.00013539
45	Yes	8	0.00000001	0.00003079
46	Yes	7	0.00000001	0.00013429
47	Yes	7	0.00000001	0.00013043
48	Yes	8	0.00000001	0.00003119
49	Yes	7	0.00000001	0.00013572
50	Yes	7	0.00000001	0.00013163

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	155.5 - 110	7.175	39	0.3305	0.0003
L2	118 - 72.5	4.636	39	0.3085	0.0002
L3	81 - 36	2.435	39	0.2479	0.0001

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L4	45 - 0	0.849	39	0.1595	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
156.00	DB809K-Y	39	7.175	0.3305	0.0003	372179
144.00	(2) 7770.00 w/ Mount Pipe	39	6.381	0.3263	0.0002	161817
135.00	742 213 w/ Mount Pipe	39	5.765	0.3219	0.0002	90775
126.00	APXVSP18-C-A20 w/ Mount Pipe	39	5.160	0.3159	0.0002	63081
100.00	LNx-6515DS-VTM w/ Mount Pipe	39	3.513	0.2836	0.0001	39939

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	155.5 - 110	36.447	2	1.6785	0.0015
L2	118 - 72.5	23.549	2	1.5671	0.0009
L3	81 - 36	12.369	2	1.2597	0.0005
L4	45 - 0	4.311	2	0.8104	0.0003

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
156.00	DB809K-Y	2	36.447	1.6785	0.0015	73555
144.00	(2) 7770.00 w/ Mount Pipe	2	32.412	1.6571	0.0013	31980
135.00	742 213 w/ Mount Pipe	2	29.286	1.6352	0.0011	17939
126.00	APXVSP18-C-A20 w/ Mount Pipe	2	26.214	1.6046	0.0010	12466
100.00	LNx-6515DS-VTM w/ Mount Pipe	2	17.848	1.4408	0.0007	7879

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L1	155.5 - 110 (1)	TP64.606x58.6x0.375	45.50	0.00	0.0	76.283 8	-24.08	3989.11	0.006
L2	110 - 72.5 (2)	TP68.805x62.8x0.4375	45.50	0.00	0.0	94.732 4	-42.80	5321.74	0.008
L3	72.5 - 36 (3)	TP72.748x66.8082x0.5	45.00	0.00	0.0	114.40 70	-64.49	6775.62	0.010
L4	36 - 0 (4)	TP76.5x70.56x0.5	45.00	0.00	0.0	122.36	-93.55	6928.62	0.014

Section No.	Elevation ft	Size	L ft	L_u ft	KI/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
						00			

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	155.5 - 110 (1)	TP64.606x58.6x0.375	873.96	5144.30	0.170	0.00	5144.30	0.000
L2	110 - 72.5 (2)	TP68.805x62.8x0.4375	2347.88	7300.90	0.322	0.00	7300.90	0.000
L3	72.5 - 36 (3)	TP72.748x66.8082x0.5	4229.15	9817.58	0.431	0.00	9817.58	0.000
L4	36 - 0 (4)	TP76.5x70.56x0.5	7074.16	10742.08	0.659	0.00	10742.08	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	155.5 - 110 (1)	TP64.606x58.6x0.375	32.72	1994.56	0.016	0.25	10431.00	0.000
L2	110 - 72.5 (2)	TP68.805x62.8x0.4375	46.76	2660.87	0.018	0.25	14803.92	0.000
L3	72.5 - 36 (3)	TP72.748x66.8082x0.5	57.50	3387.81	0.017	0.25	19907.00	0.000
L4	36 - 0 (4)	TP76.5x70.56x0.5	68.29	3464.31	0.020	0.25	21781.58	0.000

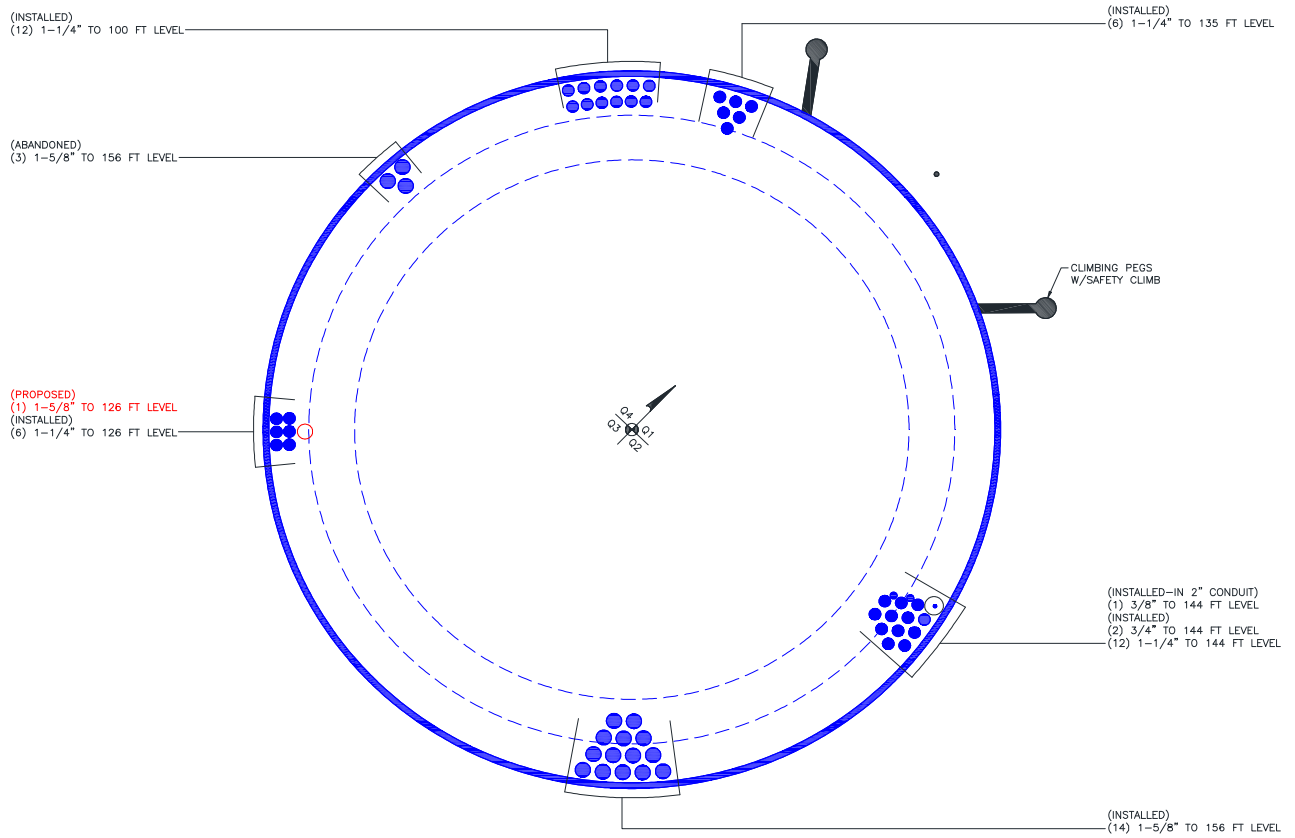
Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	155.5 - 110 (1)	0.006	0.170	0.000	0.016	0.000	0.176	1.000	4.8.2 ✓
L2	110 - 72.5 (2)	0.008	0.322	0.000	0.018	0.000	0.330	1.000	4.8.2 ✓
L3	72.5 - 36 (3)	0.010	0.431	0.000	0.017	0.000	0.441	1.000	4.8.2 ✓
L4	36 - 0 (4)	0.014	0.659	0.000	0.020	0.000	0.672	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	155.5 - 110	Pole	TP64.606x58.6x0.375	1	-24.08	3989.11	17.6	Pass
L2	110 - 72.5	Pole	TP68.805x62.8x0.4375	2	-42.80	5321.74	33.0	Pass
L3	72.5 - 36	Pole	TP72.748x66.8082x0.5	3	-64.49	6775.62	44.1	Pass
L4	36 - 0	Pole	TP76.5x70.56x0.5	4	-93.55	6928.62	67.2	Pass
Summary								
Pole (L4)							67.2	Pass
RATING =							67.2	Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
DB809K-Y	156	RRUS-11	144
DB809K-Y	156	(2) LGP21903	144
DB809K-Y	156	(2) LGP21903	144
LNX-6514DS-A1M w/ Mount Pipe	156	(2) LGP21903	144
LNX-6514DS-A1M w/ Mount Pipe	156	(4) 860 10025	144
LNX-6514DS-A1M w/ Mount Pipe	156	(4) 860 10025	144
LNX-8513DS-VTM w/ Mount Pipe	156	(4) 860 10025	144
LNX-6514DS-AIM w/ Mount Pipe	156	RRUS 12	144
LNX-6514DS-AIM w/ Mount Pipe	156	RRUS 12	144
RRH2X60-AWS	156	RRUS 12	144
RRH2X60-AWS	156	1001940	144
RRH2X60-AWS	156	1001940	144
(2) DB-T1-6Z-8AB-0Z	156	1001940	144
RRH2X60-PCS	156	Platform Mount [LP 1001-1]	144
RRH2X60-PCS	156	742 213 w/ Mount Pipe	135
RRH2X60-PCS	156	742 213 w/ Mount Pipe	135
(2) SBNHH-1D65B w/ Mount Pipe	156	742 213 w/ Mount Pipe	135
(2) SBNHH-1D65B w/ Mount Pipe	156	Pipe Mount [PM 601-3]	135
(2) SBNHH-1D65B w/ Mount Pipe	156	APXVSP18-C-A20 w/ Mount Pipe	126
RRH2x60-700	156	APXVSP18-C-A20 w/ Mount Pipe	126
RRH2x60-700	156	APXVSP18-C-A20 w/ Mount Pipe	126
RRH2x60-700	156	FD9R6004/1C-3L	126
Platform Mount [LP 1001-1]	156	FD9R6004/1C-3L	126
(2) 7770.00 w/ Mount Pipe	144	FD9R6004/1C-3L	126
(2) 7770.00 w/ Mount Pipe	144	Sector Mount [SM 401-3]	126
(2) 7770.00 w/ Mount Pipe	144	LNX-6515DS-VTM w/ Mount Pipe	100
AM-X-CD-16-65-00T-RET w/ Mount Pipe	144	LNX-6515DS-VTM w/ Mount Pipe	100
AM-X-CD-16-65-00T-RET w/ Mount Pipe	144	RV90-17-00DP w/ Mount Pipe	100
AM-X-CD-16-65-00T-RET w/ Mount Pipe	144	RV90-17-00DP w/ Mount Pipe	100
AM-X-CD-16-65-00T-RET w/ Mount Pipe	144	RV90-17-00DP w/ Mount Pipe	100
(2) LGP 17201	144	ATBT-BOTTOM-24V	100
(2) LGP 17201	144	ATBT-BOTTOM-24V	100
(2) LGP 17201	144	ATBT-BOTTOM-24V	100
DC6-48-60-18-8F	144	(2) ETM19V2S12UB	100
RRUS-11	144	(2) ETM19V2S12UB	100
RRUS-11	144	(2) ETM19V2S12UB	100
		Side Arm Mount [SO 701-3]	100

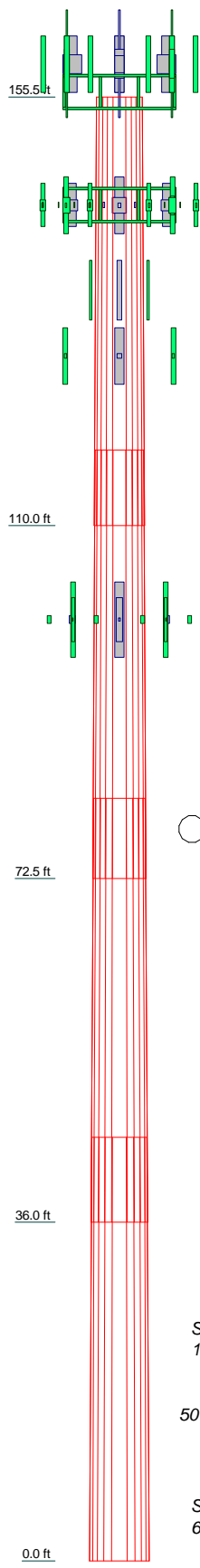
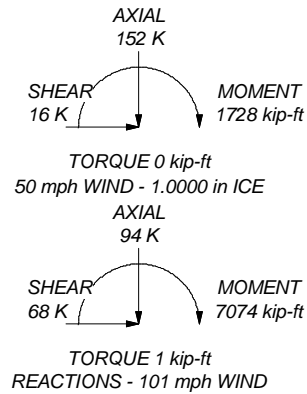
MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 67.2%

ALL REACTIONS ARE FACTORED



Section	1	2	3	4						
Length (ft)	45.50	45.50	45.00	45.00						
Number of Sides	12	12	12	12						
Thickness (in)	0.3750	0.4375	0.5000	0.5000						
Socket Length (ft)	8.00	8.50	9.00	9.00						
Top Dia (in)	58.6000	62.8000	66.8082	70.5600						
Bot Dia (in)	64.6060	68.8050	72.7480	76.5000						
Grade		A572-65								
Weight (K)	11.4	14.3	17.1	18.0						

Paul J. Ford and Company
 250 E Broad St, Suite 600
 Columbus, OH 43215
 Phone: (614) 221-6679
 FAX: (555) 555-1235

Job: **155-Ft. Monopole / HRT 107(C) 943204**
 Project: **37517-0154.001.7805 / BU 806366**
 Client: **Crown Castle** Drawn by: **mherbert** App'd:
 Code: **TIA-222-G** Date: **01/12/17** Scale: **NTS**
 Path: Dwg No. **E-1**

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

TIA Rev G

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

Site Data	
BU#: 806366	
Site Name: HRT 107© 943204	
App #:	
Pole Manufacturer:	Other

Anchor Rod Data	
Qty:	24
Diam:	2.25 in
Rod Material:	A615-J
Strength (Fu):	100 ksi
Yield (Fy):	75 ksi
Bolt Circle:	84.75 in

Plate Data	
Diam:	91 in
Thick:	3.25 in
Grade:	60 ksi
Single-Rod B-eff:	10.25 in

Stiffener Data (Welding at both sides)	
Config:	0 *
Weld Type:	
Groove Depth:	in **
Groove Angle:	degrees
Fillet H. Weld:	<-- Disregard
Fillet V. Weld:	in
Width:	in
Height:	in
Thick:	in
Notch:	in
Grade:	ksi
Weld str.:	ksi

Pole Data	
Diam:	76.5 in
Thick:	0.5 in
Grade:	65 ksi
# of Sides:	12 "0" IF Round
Fu	80 ksi
Reinf. Fillet Weld	0 "0" if None

Reactions		
Mu:	7074	ft-kips
Axial, Pu:	94	kips
Shear, Vu:	68	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

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

Anchor Rod Results

Max Rod (Cu+ Vu/r): 176.5 Kips
 Allowable Axial, Φ*Fu*Anet: 260.0 Kips
 Anchor Rod Stress Ratio: 67.9% Pass

Rigid
AISC LRFD
φ*Tn

Base Plate Results

Base Plate Stress: 16.5 ksi
 Allowable Plate Stress: 54.0 ksi
 Base Plate Stress Ratio: 30.6% Pass

Flexural Check

Rigid
AISC LRFD
φ*Fy
Y.L. Length: 36.47

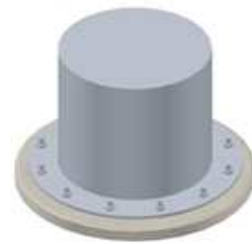
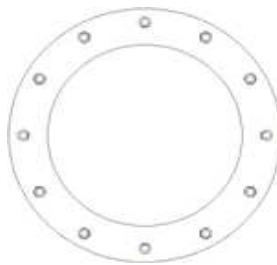
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Stiffener Results

Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, fb/Fb+(fv/Fv)^2: n/a
 Plate Tension+Shear, ft/Ft+(fv/Fv)^2: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

Pole Punching Shear Check: n/a



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

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

Factored Foundation Loads:

	LC1	LC2	
Factored Axial Load (+Comp, -Ten) =	94	70.5	kips
Factored Horiz. Load at Top of Pier =	68	68	kips
Factored OTM at Top of Pier =	7074	7074	kips

LRFD Resistance and Load Factors:

	Φ	Dead Load Factors	
Soil Bearing =	0.75		
Soil Weight =	0.75	1.2	0.9
Concrete Weight =	0.75	1.2	0.9

Soil Properties:

Depth to Water Table =	14.5	ft
Uplift Cone from	Top	of footing

Layer Thk ft	Soil Density pcf	Cohesion ksf	Friction Angle degrees	Ult Bearing ksf	Depth ft
8	130	0	40	21	8.00

Dimensions:

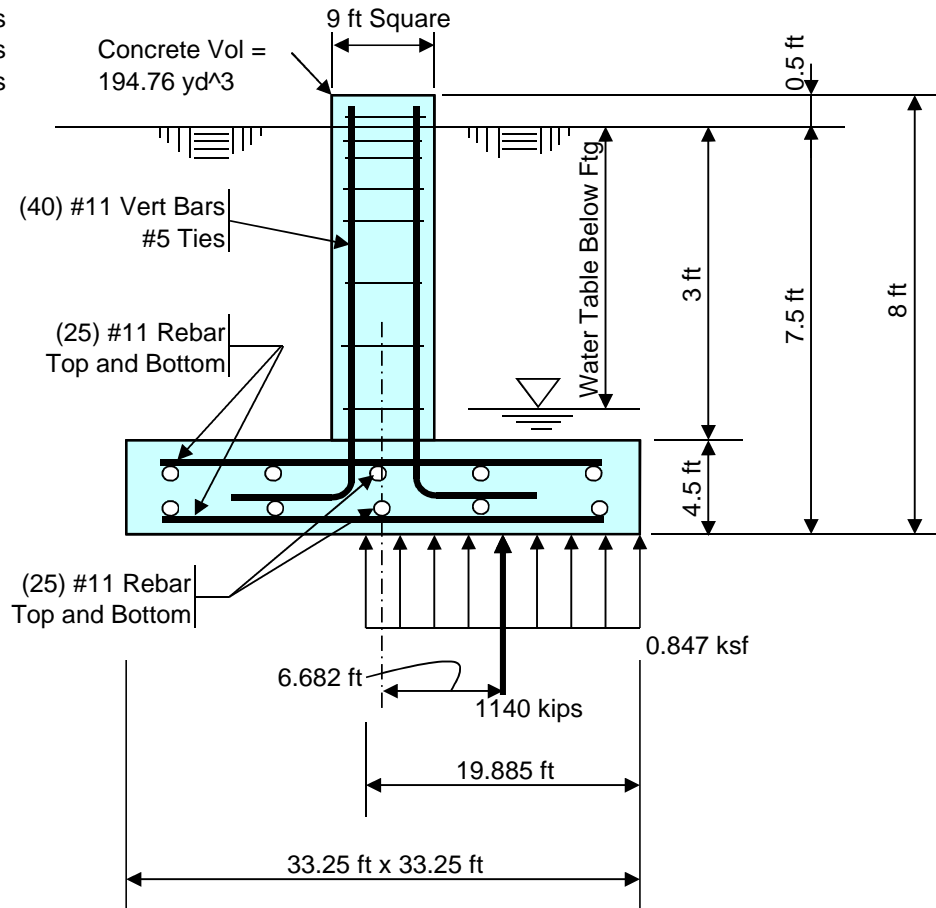
Pier Shape =	Square
Pier Width =	9 ft Square
Pier Height above Grade =	0.5 ft
Depth to Bottom of Footing =	7.5 ft
Footing Thickness =	4.5 ft
Footing Width, B =	33.25 ft
Footing Length, L =	33.25 ft

Concrete:

Concrete Strength =	4	ksi
Rebar Strength =	60	ksi

Summary Results:

	Required	Available
Maximum Net Soil Bearing =	0.913 ksf	15.750 ksf
Uplift =	0.0 kips	942.7 kips
Punching Shear Stress =	0.025 ksi	0.190 ksi
Bending Shear Stress =	278.2 kips	1850.4 kips
Bending Moment =	2537.1 k-ft	8428.0 k-ft
Conc Pier Reinforcing Steel =	7312.0 k-ft	14606.5 k-ft



Total Pad Reinf Stl =	78.00	in ² >= 38.78 in ² = Min Stl, OK
Total Pier Reinf Stl =	62.40	in ² >= 58.32 in ² = Min Stl, OK
Footing Thickness =	4.50	ft >= 1.81 ft = Min Ftg Thk, OK

Stress Ratio =	5.8%	in Soil Bearing
Stress Ratio =	0.0%	in Uplift
Stress Ratio =	13.0%	in Punching Shear
Stress Ratio =	15.0%	in Bending Shear
Stress Ratio =	30.1%	in Bending Moment
Stress Ratio =	50.1%	in Pier Rebar

CURRENT OWNER		TOPO.	UTILITIES	STRT./ROAD	LOCATION	CURRENT ASSESSMENT			
VILLAGE PROPERTIES LLC C/O CROWN ATLANTIC CO PMB 353 4017 WASHINGTON RD MCMURRAY, PA 15317 Additional Owners:		2 Above Street		1 Paved		Description	Code	Appraised Value	Assessed Value
						Comm Land	2-1	121,900	85,330
						Comm Bldg	2-2	80,600	56,420
						Comm OB	2-5	826,600	578,620
SUPPLEMENTAL DATA									
Other ID: 2014T		EXEMPT CO							
Census		Lake Area							
Dev. Lot		Photo Retake							
Dev. Map		CB Letter							
GIS ID: 6/26/65T		ASSOC PID#							
						Total		1,029,100	720,370

6079
MARLBOROUGH, CT

VISION

RECORD OF OWNERSHIP		BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.	PREVIOUS ASSESSMENTS (HISTORY)								
VILLAGE PROPERTIES LLC		127/ 9	02/03/1999	U	I		29	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
								2015	2-1	85,330	2014	2-1	90,300	2014	2-1	90,300
								2015	2-2	56,420	2014	2-2	25,270	2014	2-2	25,270
								2015	2-5	578,620	2014	2-5	463,260	2014	2-5	463,260
								Total:		720,370	Total:		578,830	Total:		578,830

EXEMPTIONS				OTHER ASSESSMENTS				
Year	Type	Description	Amount	Code	Description	Number	Amount	Comm. Int.
Total:								

This signature acknowledges a visit by a Data Collector or Assessor

ASSESSING NEIGHBORHOOD				
NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
0001/A				

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	80,600
Appraised XF (B) Value (Bldg)	0
Appraised OB (L) Value (Bldg)	826,600
Appraised Land Value (Bldg)	121,900
Special Land Value	0
Total Appraised Parcel Value	1,029,100
Valuation Method:	C
Adjustment:	0
Net Total Appraised Parcel Value	1,029,100

NOTES	
CELL TOWER LOCATED BEHIND MARLBORO BARN CELLULAR TOWER; GATED 500 FT LF FALL DOWN ZONE = 5.74 AC 1.84 COMMERCIAL SITE 3.9 COMMERCIAL EXCESS	CELL TOWER VALUE = \$2083/MONTH-5% VAC- 15% EXPENSES = \$20,184 CAPPED AT 10% = \$201,880 PER SITE X 5 SITES = \$1,009,400

BUILDING PERMIT RECORD										VISIT/ CHANGE HISTORY					
Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments	Date	Type	IS	ID	Cd.	Purpose/Result	
15-101	05/12/2015	CM	Commercial	0	07/27/2015	100		ANTENNA UPGRADE	07/27/2015			LM	99	Vacant Land	
1128	12/27/2012	CM	Commercial	0	07/27/2015	100		GROUND MOUNTED C							
500	12/13/2011	CM	Commercial	0	07/27/2015	100		CHANGE SEVEN (7) AN							

LAND LINE VALUATION SECTION

B #	Use Code	Use Description	Zone	D	Front	Depth	Units	Unit Price	I. Factor	S.A.	Acre Disc	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing	S Adj Fact	Adj. Unit Price	Land Value
1	200	Commercial	R	A	181		1.84	76,000.00	0.6150	C	1.0000	1.00	D	1.10			1.00		94,600
1	200	Commercial	R	A			3.90	7,000.00	1.0000	0	1.0000	1.00		0.00			1.00		27,300

CONSTRUCTION DETAIL				CONSTRUCTION DETAIL (CONTINUED)			
Element	Cd.	Ch.	Description	Element	Cd.	Ch.	Description
Style	91		Support Shed				
Model	94		Commercial				
Grade	03		Average				
Stories	1						
Occupancy	1						
Exterior Wall A	24		Reinforc Concr				
Exterior Wall B							
Roof Structure	01		Flat				
Roof Cover	04		T&G/Rubber				
Interior Wall A	01		Minimum				
Interior Wall B							
Interior Floor A	03		Concrete				
Interior Floor B							
Heating Fuel	01		Coal or Wood				
Heating Type	01		None				
AC Type	03		Central				
Bldg Use	200		Commercial				
Heat/AC	02		HEAT/AC SPLIT				
Frame Type	04		Reinforced Cnc				
Baths/Plumbing	00		None				
Ceiling/Walls	00		None				
Rooms/Prtns	01		Light				
Wall Height	8						
% Comn Wall							

BAS	20	42
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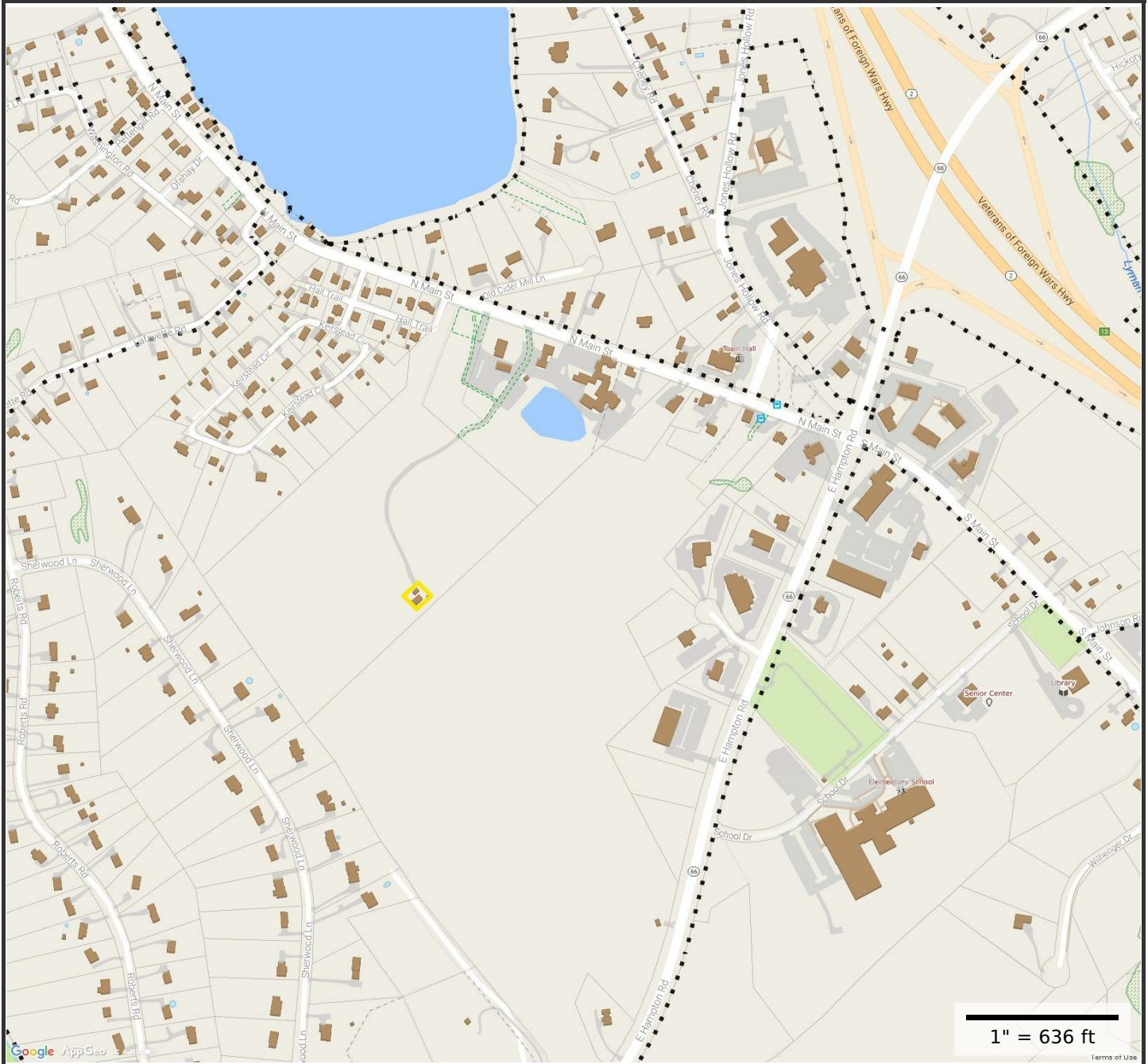
OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)												
Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value
SHD1	Shed	FR	Frame	L	360	20.00	1999			5	60	4,300
FN4	Fence 8'			L	322	20.00	2000			5	60	3,900
PAT1	Patio	CR	Concrete	L	192	3.50	2000				60	400
CELL	Cell Tower			L	5	163,600.00	2011		0		100	818,000

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Gross Area	Eff. Area	Unit Cost	Undeprec. Value
BAS	First Floor	840	840	840		92,669
Ttl. Gross Liv/Lease Area:		840	840	840		92,669



Village Properties LLC Parcel - No Main Street, Marlborough CT



Property Information

Property ID 6/26/65T
Location 73 NO MAIN ST
Owner VILLAGE PROPERTIES LLC



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

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

Parcels updated 10/1/2016
 Properties updated 05/10/2017

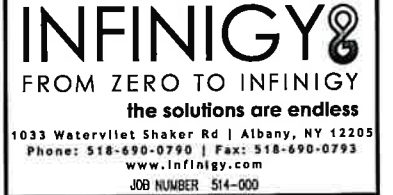


PROJECT: DO ESS GROUND MOUNT OPTION 2
 SITE NAME: MARLBOROUGH (CROWN)
 SITE CASCADE: CTO3XC210
 SITE ADDRESS: 47 NORTH MAIN STREET
 MARLBOROUGH, CT 06447
 SITE TYPE: MONOPOLE TOWER
 MARKET: NORTHERN CONNECTICUT

PLANS PREPARED FOR:



PLANS PREPARED BY:



PROJECT MANAGER:



ENGINEERING LICENSE:



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

REVISIONS:	DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION		3/02/17	JJM	0
ISSUED FOR REVIEW		1/18/17	JJM	A

SITE NAME:
MARLBOROUGH (CROWN)

SITE NUMBER:
CT03XC210

SITE ADDRESS:
**47 NORTH MAIN ST
 MARLBOROUGH, CT 06447**

SHEET DESCRIPTION:
TITLE SHEET & PROJECT DATA

SHEET NUMBER:
T-1

SITE INFORMATION	AREA MAP	PROJECT DESCRIPTION	DRAWING INDEX																																							
<p>TOWER OWNER: CROWN ATLANTIC COMPANY LLC. 2000 CORPORATE DRIVE CANONSBURG, PA 15317 (704) 405-6555</p> <p>LATITUDE (NAD83): 41° 37' 47.32" N 41.629811111°</p> <p>LONGITUDE (NAD83): 72° 27' 59.41" W -72.46650277°</p> <p>COUNTY: HARTFORD</p> <p>ZONING JURISDICTION: CONNECTICUT SITING COUNCIL</p> <p>ZONING DISTRICT: N/A</p> <p>PROJECT MANAGER: AIROSMITH DEVELOPMENT TERRI BURKHOLDER (315) 719-2928 TBURKHOLDER@AIROSMITHDEVELOPMENT.COM</p>	<p>Copyright © and (P) 1988-2012 Microsoft Corporation and/or its suppliers. All rights reserved.</p>	<p>SPRINT PROPOSES TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.</p> <ul style="list-style-type: none"> REMOVE (6) PANEL ANTENNAS INSTALL (3) PANEL ANTENNAS INSTALL (3) DIPLEXERS TO TOWER TOP INSTALL (3) DIPLEXERS TO EXISTING H-FRAME INSTALL (3) RRH'S TO EXISTING H-FRAME INSTALL (6) RET CABLES <p>THESE PLANS HAVE BEEN DEVELOPED FOR THE MODIFICATION OF AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY OWNED OR LEASED BY SPRINT IN ACCORDANCE WITH THE SCOPE OF WORK PROVIDED BY SPRINT. INFINIGY HAS INCORPORATED THIS SCOPE OF WORK IN THE PLANS. THESE PLANS ARE NOT FOR CONSTRUCTION UNLESS ACCOMPANIED BY A PASSING STRUCTURAL STABILITY ANALYSIS PREPARED BY A LICENSED STRUCTURAL ENGINEER. STRUCTURAL ANALYSIS MUST INCLUDE BOTH TOWER AND MOUNT.</p>	<table border="1"> <thead> <tr> <th>SHEET NO:</th> <th>SHEET TITLE</th> <th>REV</th> </tr> </thead> <tbody> <tr> <td>T-1</td> <td>TITLE SHEET & PROJECT DATA</td> <td>0</td> </tr> <tr> <td>SP-1</td> <td>SPRINT SPECIFICATIONS</td> <td>0</td> </tr> <tr> <td>SP-2</td> <td>SPRINT SPECIFICATIONS</td> <td>0</td> </tr> <tr> <td>SP-3</td> <td>SPRINT SPECIFICATIONS</td> <td>0</td> </tr> <tr> <td>A-1</td> <td>OVERALL SITE PLAN</td> <td>0</td> </tr> <tr> <td>A-2</td> <td>SITE PLAN</td> <td>0</td> </tr> <tr> <td>A-3</td> <td>TOWER ELEVATION & ANTENNA LAYOUT</td> <td>0</td> </tr> <tr> <td>A-4</td> <td>ANTENNA LOADING AND COLOR CODING CHART</td> <td>0</td> </tr> <tr> <td>A-5</td> <td>EQUIPMENT & MOUNTING DETAILS</td> <td>0</td> </tr> <tr> <td>A-6</td> <td>SCENARIO 354 V2.5 SPECIFICATIONS</td> <td>0</td> </tr> <tr> <td>A-7</td> <td>SCENARIO 354 V2.5 SPECIFICATIONS</td> <td>0</td> </tr> <tr> <td>E-1</td> <td>ELECTRICAL & GROUNDING PLAN</td> <td>0</td> </tr> </tbody> </table>	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	OVERALL SITE PLAN	0	A-2	SITE PLAN	0	A-3	TOWER ELEVATION & ANTENNA LAYOUT	0	A-4	ANTENNA LOADING AND COLOR CODING CHART	0	A-5	EQUIPMENT & MOUNTING DETAILS	0	A-6	SCENARIO 354 V2.5 SPECIFICATIONS	0	A-7	SCENARIO 354 V2.5 SPECIFICATIONS	0	E-1	ELECTRICAL & GROUNDING PLAN	0
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E-1	ELECTRICAL & GROUNDING PLAN	0																																								
	<p>LOCATION MAP</p> <p>Copyright © and (P) 1988-2012 Microsoft Corporation and/or its suppliers. All rights reserved.</p>	<p>APPLICABLE CODES</p> <p>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.</p> <ol style="list-style-type: none"> INTERNATIONAL BUILDING CODE (2012 IBC) TIA-EIA-222-F OR LATEST EDITION NFPA 780 - LIGHTNING PROTECTION CODE 2011 NATIONAL ELECTRIC CODE OR LATEST EDITION ANY OTHER NATIONAL OR LOCAL APPLICABLE CODES, MOST RECENT EDITIONS CT BUILDING CODE CITY/COUNTY ORDINANCES 																																								



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

SECTION 01 100 – SCOPE OF WORK

PART 1 – GENERAL

- 1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT CONSTRUCTION STANDARDS FOR WIRELESS SITES, CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.
- 1.2 RELATED DOCUMENTS:
 - A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.
 - B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HERewith.
- 1.3 PRECEDENCE: SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES INCLUDING THE STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. NOTIFY SPRINT CONSTRUCTION MANAGER IF THIS OCCURS.
- 1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:
 - A. THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
 1. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
 5. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
 3. GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY -GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
 4. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE - "NEC") AND NFPA 101 (LIFE SAFETY CODE).
 5. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
 6. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
 7. AMERICAN CONCRETE INSTITUTE (ACI)
 8. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
 9. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
 10. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
 11. PORTLAND CEMENT ASSOCIATION (PCA)
 12. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
 13. BRICK INDUSTRY ASSOCIATION (BIA)
 14. AMERICAN WELDING SOCIETY (AWS)
 15. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
 16. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
 17. DOOR AND HARDWARE INSTITUTE (DHI)
 18. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
 19. APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.

1.5 DEFINITIONS:

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

- 1.6 SITE FAMILIARITY: CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OR FIELD CONDITIONS.
- 1.7 POINT OF CONTACT: COMMUNICATION BETWEEN SPRINT AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE SPRINT CONSTRUCTION MANAGER APPOINTED TO MANAGE THE PROJECT FOR SPRINT.
- 1.8 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.
- 1.9 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
 - A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN RED PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.
 - B. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK.
 - C. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SPRINT CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH THE WORK.
- 1.10 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.
- 1.11 UTILITIES SERVICES: WHERE NECESSARY TO CUT EXISTING PIPES, ELECTRICAL WIRES, CONDUITS, CABLES, ETC., OF UTILITY SERVICES, OR OF FIRE PROTECTION OR COMMUNICATIONS SYSTEMS, THEY SHALL BE CUT AND CAPPED AT SUITABLE PLACES OR WHERE SHOWN. ALL SUCH ACTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANY INVOLVED:
- 1.12 PERMITS / FEES: WHEN REQUIRED THAT A PERMIT OR CONNECTION FEE BE PAID TO A PUBLIC UTILITY PROVIDER FOR NEW SERVICE TO THE CONSTRUCTION PROJECT, PAYMENT OF SUCH FEE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- 1.13 CONTRACTOR SHALL TAKE ALL MEASURES AND PROVIDE ALL MATERIAL NECESSARY FOR PROTECTING EXISTING EQUIPMENT AND PROPERTY.
- 1.14 METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION: CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN THE FOLLOWING INSTALLATION AND COMMISSIONING MOPS.

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

- 3.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.
- 3.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.
- 3.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HERewith, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.
- 3.4 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

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

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

- 3.1 RECEIPT OF MATERIAL AND EQUIPMENT:
 - A. A COMPANY FURNISHED MATERIAL AND EQUIPMENT IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DOCUMENTS.
 - B. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
 1. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
 2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
 3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
 4. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
 5. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
 6. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.
- 3.2 DELIVERABLES:
 - A. COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.
 - B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE WITH COMPANY PRACTICE, AND AS DIRECTED BY COMPANY.
 - C. UPLOAD DOCUMENTATION INTO SPRINT SITE MANAGEMENT SYSTEM (SMS) AND/OR PROVIDE HARD COPY DOCUMENTATION AS REQUESTED.

SECTION 01 300 – CELL SITE CONSTRUCTION CO.

PART 1 – GENERAL

- 1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.
- 1.2 RELATED DOCUMENTS:
 - A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.
 - B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HERewith.
- 1.3 NOTICE TO PROCEED
 - A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF THE WORK ORDER.
 - B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT WITH AN OPERATIONAL WIRELESS FACILITY.

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

- 3.1 FUNCTIONAL REQUIREMENTS:
 - A. THE ACTIVITIES DESCRIBED IN THIS PARAGRAPH REPRESENT MINIMUM ACTIONS AND PROCESSES REQUIRED TO SUCCESSFULLY COMPLETE THE WORK. THE ACTIVITIES DESCRIBED ARE NOT EXHAUSTIVE, AND CONTRACTOR SHALL TAKE ANY AND ALL ACTIONS AS NECESSARY TO SUCCESSFULLY COMPLETE THE CONSTRUCTION OF A FULLY FUNCTIONING WIRELESS FACILITY AT THE SITE IN ACCORDANCE WITH COMPANY PROCESSES.
 - B. SUBMIT SPECIFIC DOCUMENTATION AS INDICATED HEREIN, AND OBTAIN REQUIRED APPROVALS WHILE THE WORK IS BEING PERFORMED.
 - C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES
 - D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

PLANS PREPARED FOR:



PLANS PREPARED BY:

INFINIGY
 FROM ZERO TO INFINIGY
 the solutions are endless
 1033 Watervliet Shaker Rd | Albany, NY 12205
 Phone: 518-690-0790 | Fax: 518-690-0793
 www.infinigy.com
 JOB NUMBER 514-000

PROJECT MANAGER:

AIROSMITH
 DEVELOPMENT
 32 CLINTON ST.
 SARATOGA SPRINGS, NY 12868
 OFFICE# (518) 306-3740

ENGINEERING LICENSE:



DRAWING NOTICE:

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REVISIONS:	DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION		3/02/17	JJM	0
ISSUED FOR REVIEW		1/18/17	JJM	A

SITE NAME:

MARLBOROUGH (CROWN)

SITE NUMBER:

CT03XC210

SITE ADDRESS:

**47 NORTH MAIN ST
 MARLBOROUGH, CT 06447**

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, AASHTO, AND OTHER METHODS IS NEEDED.
4. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASHTO, AND OTHER METHODS IS NEEDED.

3.2 REQUIRED TESTS:

A. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. CONCRETE CYLINDER BREAK TESTS FOR THE TOWER AND ANCHOR FOUNDATIONS AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
2. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED IN SECTION: HOT MIX ASPHALT PAVING.
3. FIELD QUALITY CONTROL TESTING AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
4. TESTING REQUIRED UNDER SECTION: AGGREGATE BASE FOR ACCESS ROADS, PADS AND ANCHOR LOCATIONS
5. STRUCTURAL BACKFILL COMPACTION TESTS FOR THE TOWER FOUNDATION.
6. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
7. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
8. GROUNDING AT ANTENNA MASTS FOR GPS AND ANTENNAS
9. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

3.3 REQUIRED INSPECTIONS

A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.

B. CONDUCT INSPECTIONS INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. GROUNDING SYSTEM INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
3. COMPACTION OF BACKFILL MATERIALS; AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS; ASPHALT PAVING; AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
4. PRE- AND POST-CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES.
5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
6. ANTENNA AZIMUTH, DOWN TILT AND PER SUNLIGHT TOOL SUNSIGHT INSTRUMENTS - ANTENNALIGN ALIGNMENT TOOL (AAT)

PLANS PREPARED FOR:



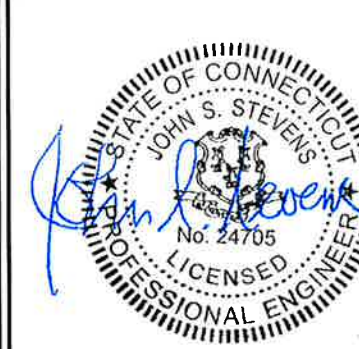
PLANS PREPARED BY:

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 514-000

PROJECT MANAGER:

AIRSMITH
DEVELOPMENT
32 CLINTON ST.
SARATOGA SPRINGS, NY 12866
OFFICE#: (518) 308-3740

ENGINEERING LICENSE:



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REVISIONS:	DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION		3/02/17	JLM	0
ISSUED FOR REVIEW		1/18/17	JLM	A

SITE NAME:

MARLBOROUGH (CROWN)

SITE NUMBER:

CT03XC210

SITE ADDRESS:

**47 NORTH MAIN ST
MARLBOROUGH, CT 06447**

SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-2

CONTINUE FROM SP-2

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

SECTION 01 400 - SUBMITTALS & TESTS

PART 1 - GENERAL

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

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

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

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

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PROJECT MANAGER:

AIRSMITH
DEVELOPMENT
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OFFICE#: (518) 306-3740

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ISSUED FOR REVIEW		1/18/17	J.M.	A

SITE NAME:

**MARLBOROUGH
(CROWN)**

SITE NUMBER:

CT03XC210

SITE ADDRESS:

**47 NORTH MAIN ST
MARLBOROUGH, CT 06447**

SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-3

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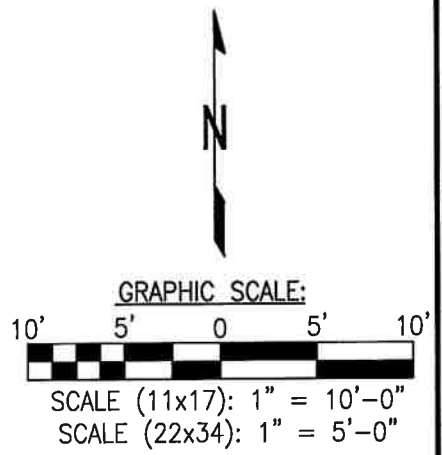
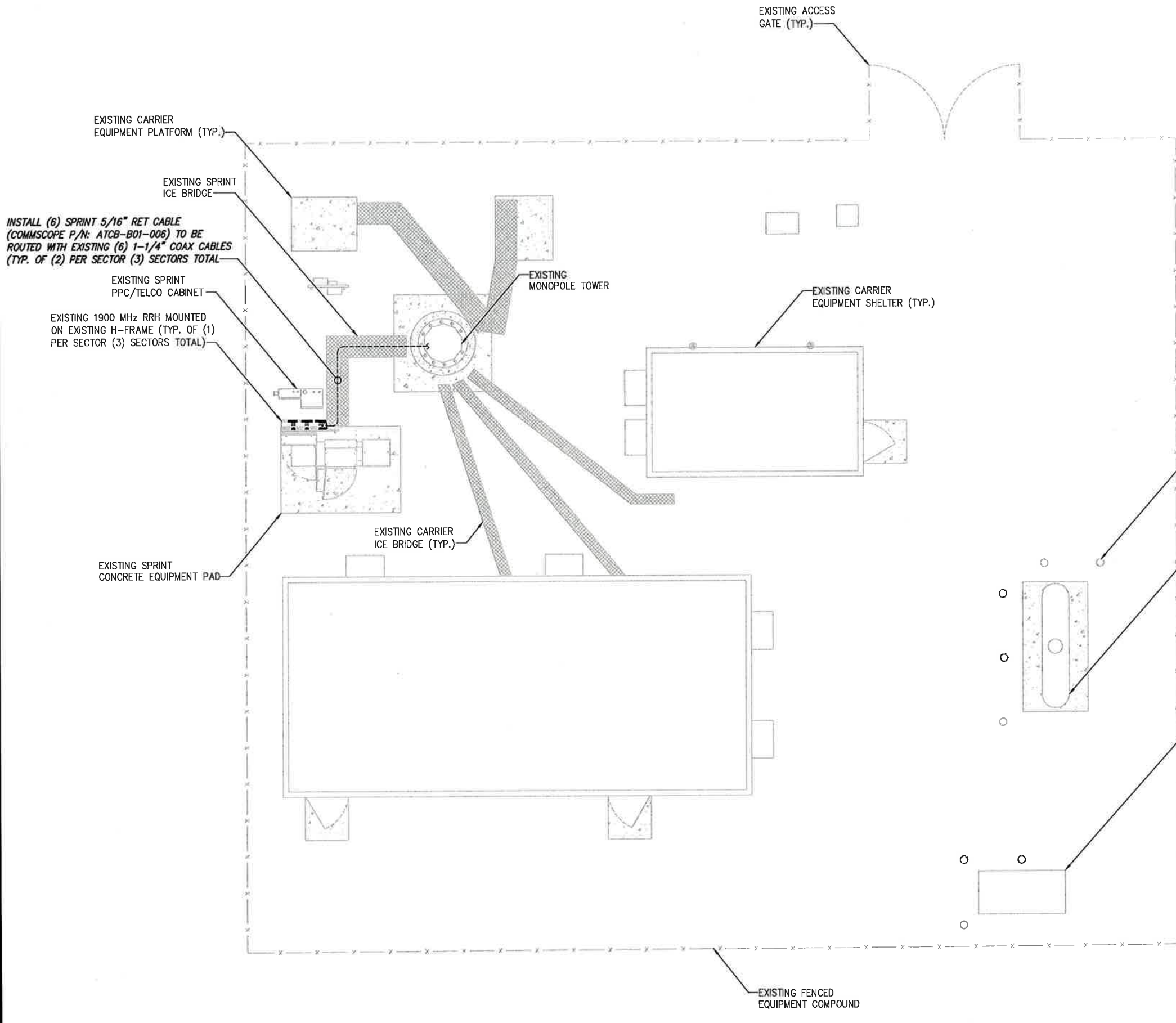
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SITE NUMBER:
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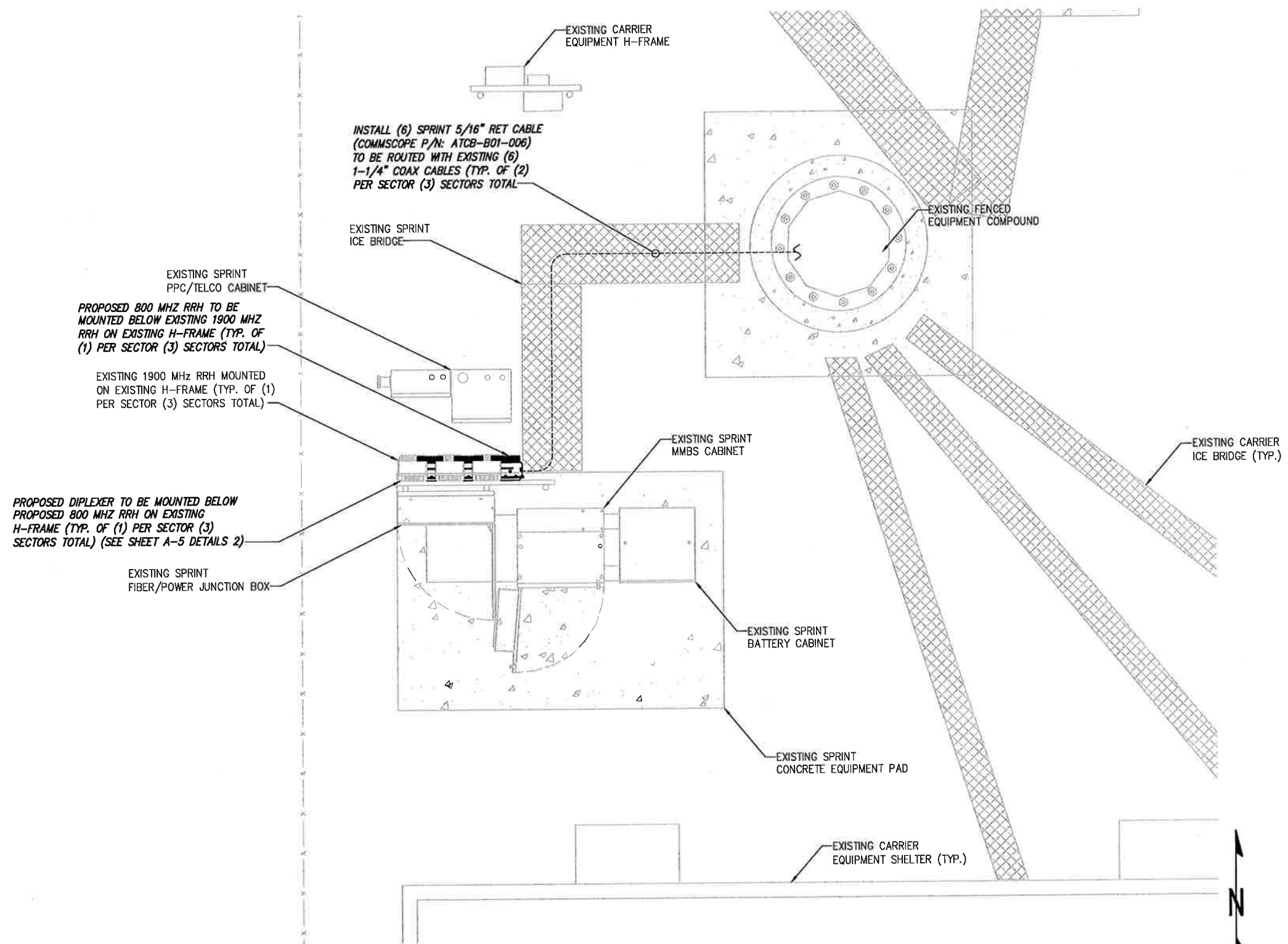
SITE ADDRESS:
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 MARLBOROUGH, CT 06447**

SHEET DESCRIPTION:
OVERALL SITE PLAN

SHEET NUMBER:
A-1



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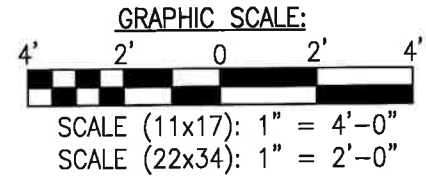
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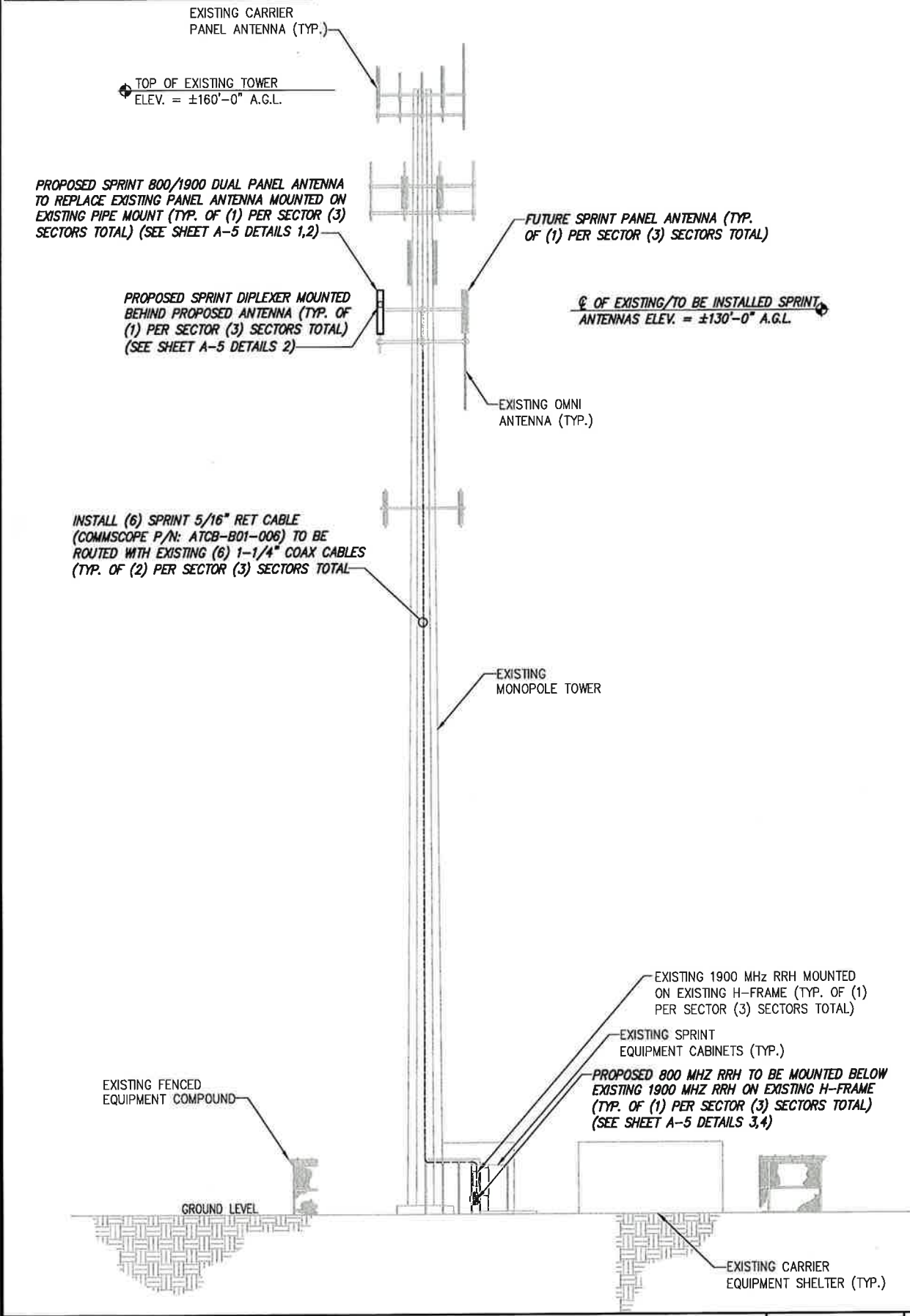
SITE ADDRESS:
**47 NORTH MAIN ST
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SHEET DESCRIPTION:
SITE PLAN

SHEET NUMBER:
A-2



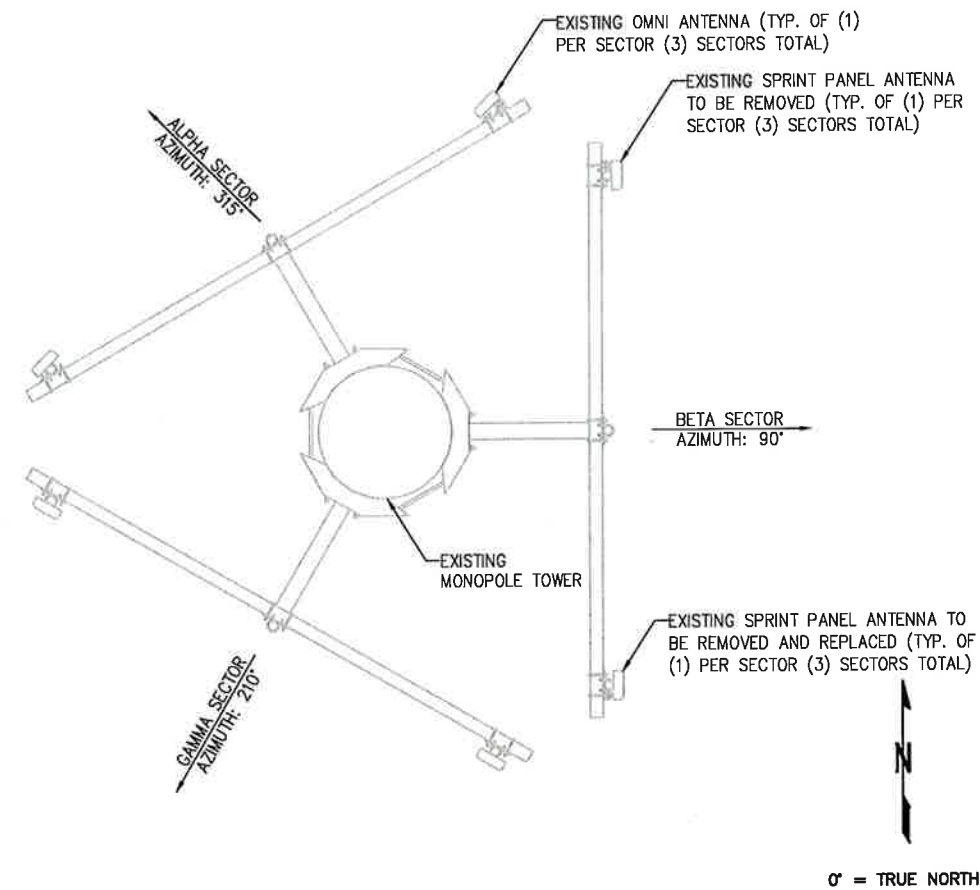
STRUCTURAL ANALYSIS NOT COMPLETED AT TIME OF ISSUANCE OF THESE DRAWINGS. THE STRUCTURAL ANALYSIS MUST BE COMPLETED PRIOR TO CONSTRUCTION.



TOWER ELEVATION

NO SCALE

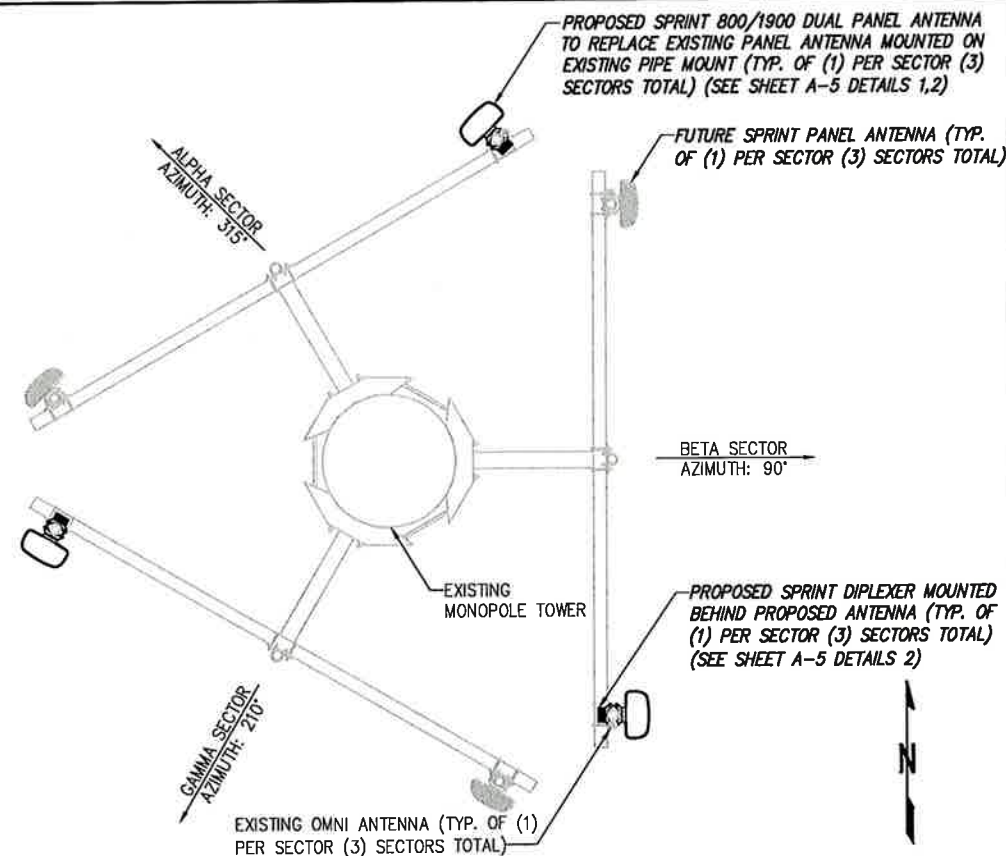
1



EXISTING ANTENNA LAYOUT

NO SCALE

2



PROPOSED ANTENNA LAYOUT

NO SCALE

3

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**MARLBOROUGH
(CROWN)**

SITE NUMBER:

CT03XC210

SITE ADDRESS:

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MARLBOROUGH, CT 06447**

SHEET DESCRIPTION:

**TOWER ELEVATION
& ANTENNA LAYOUT**

SHEET NUMBER:

A-3



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 JOHN S. STEVENS
 No. 24705
 LICENSED PROFESSIONAL ENGINEER

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SITE NUMBER:
CT03XC210

SITE ADDRESS:
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 MARLBOROUGH, CT 06447**

SHEET DESCRIPTION:
ANTENNA LOADING & COLOR CODING CHARTS

SHEET NUMBER:
A-4

SECTOR	EXISTING/PROPOSED	BAND	ANTENNA	ANTENNA C HEIGHT	AZIMUTH	RRH	JUNCTION CYLINDERS	CABLE	CABLE LENGTH
ALPHA	FUTURE	---	---	---	---	---	---	---	---
	PROPOSED	800MHZ / 1900MHZ	RFS/CELWAVE APXVSP18-C-A20	130'-0"	315°	(P) GROUND MOUNTED 800 MHZ RRH (E) GROUND MOUNTED 1900 MHZ RRH	---	(2) (P) RET CABLES (2) (E) 1-1/4" COAX	±160' EXISTING
BETA	FUTURE	---	---	---	---	---	---	---	---
	PROPOSED	800MHZ / 1900MHZ	RFS/CELWAVE APXVSP18-C-A20	130'-0"	90°	(P) GROUND MOUNTED 800 MHZ RRH (E) GROUND MOUNTED 1900 MHZ RRH	---	(2) (P) RET CABLES (2) (E) 1-1/4" COAX	±160' EXISTING
GAMMA	FUTURE	---	---	---	---	---	---	---	---
	PROPOSED	800MHZ / 1900MHZ	RFS/CELWAVE APXVSP18-C-A20	130'-0"	210°	(P) GROUND MOUNTED 800 MHZ RRH (E) GROUND MOUNTED 1900 MHZ RRH	---	(2) (P) RET CABLES (2) (E) 1-1/4" COAX	±160' EXISTING

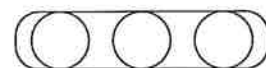
SECTOR	CABLE	FIRST RING	SECOND RING	THIRD RING
1 ALPHA	1	GREEN	NO TAPE	NO TAPE
1	2	BLUE	NO TAPE	NO TAPE
1	3	BROWN	NO TAPE	NO TAPE
1	4	WHITE	NO TAPE	NO TAPE
1	5		NO TAPE	NO TAPE
1	6	SLATE	NO TAPE	NO TAPE
1	7	PURPLE	NO TAPE	NO TAPE
1	8	ORANGE	NO TAPE	NO TAPE
2 BETA	1	GREEN	GREEN	NO TAPE
2	2	BLUE	BLUE	NO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

ANTENNA LOADING CHART

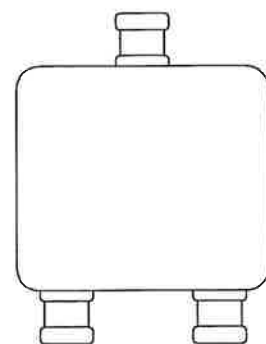
NO SCALE 1

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

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



TOP VIEW



FRONT VIEW

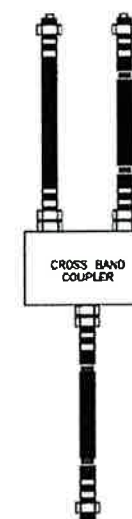


SIDE VIEW

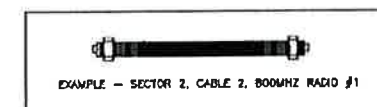
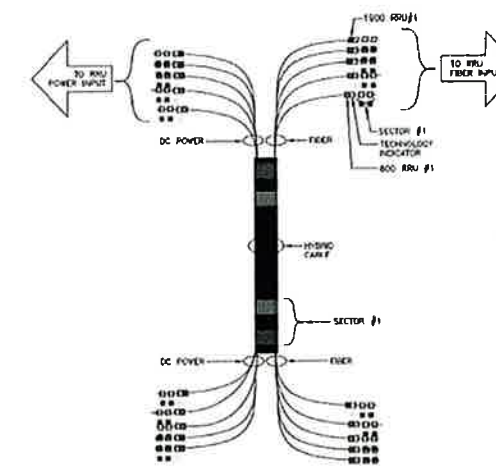
DIPLEXER DETAIL

NO SCALE 2

FREQUENCY	INDICATOR	ID
800#1	YELLOW	
1900#1	YELLOW	RED
1900#2	YELLOW	
RESERVED	YELLOW	
RESERVED	YELLOW	SLATE
RESERVED	YELLOW	
RESERVED	YELLOW	WHITE
RESERVED	YELLOW	
1800#1	YELLOW	



CROSS BAND COUPLER



EXAMPLE - SECTOR 2, CABLE 2, 800MHZ RADIO #1



EXAMPLE - SECTOR 3, CABLE 1, 1900MHZ RADIO #1



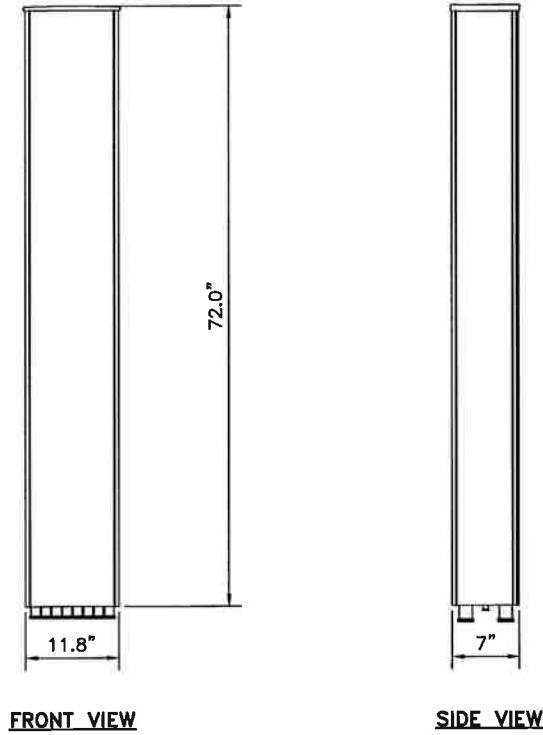
EXAMPLE - SECTOR 1, CABLE 4, 800MHZ RADIO #1 AND 1900MHZ RADIO #1

COLOR CODING CHARTS

NO SCALE 3

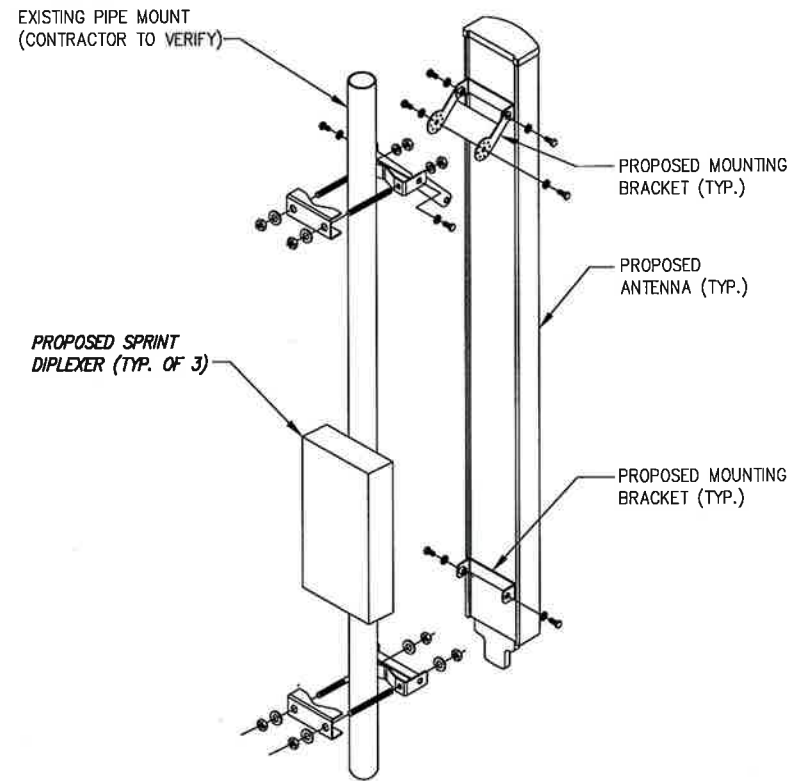
ANTENNA: RFS/CELWAVE APXVSP18-C-A20

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



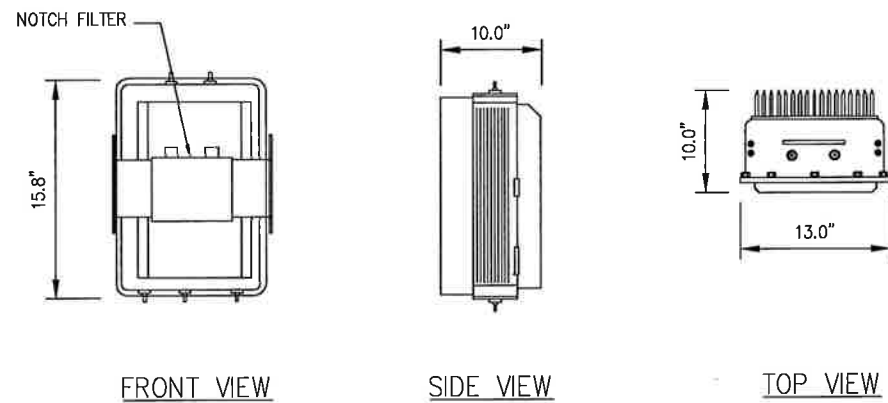
PANEL ANTENNA DETAIL

NO SCALE 1



PANEL ANTENNA MOUNTING DETAIL

NO SCALE 2

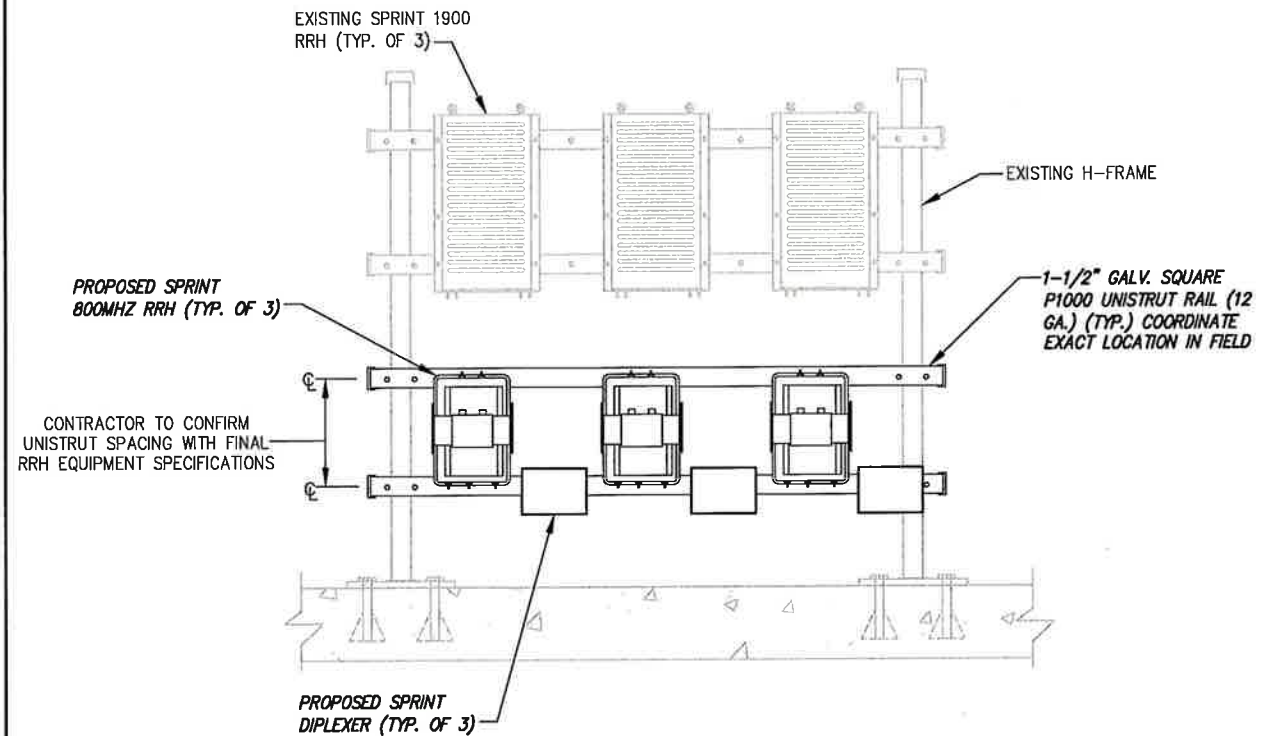


800 MHz RRH
 (ALU)
 WEIGHT = 53 LBS.

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

RRH DETAIL

NO SCALE 3



RRH MOUNTING DETAILS

NO SCALE 4

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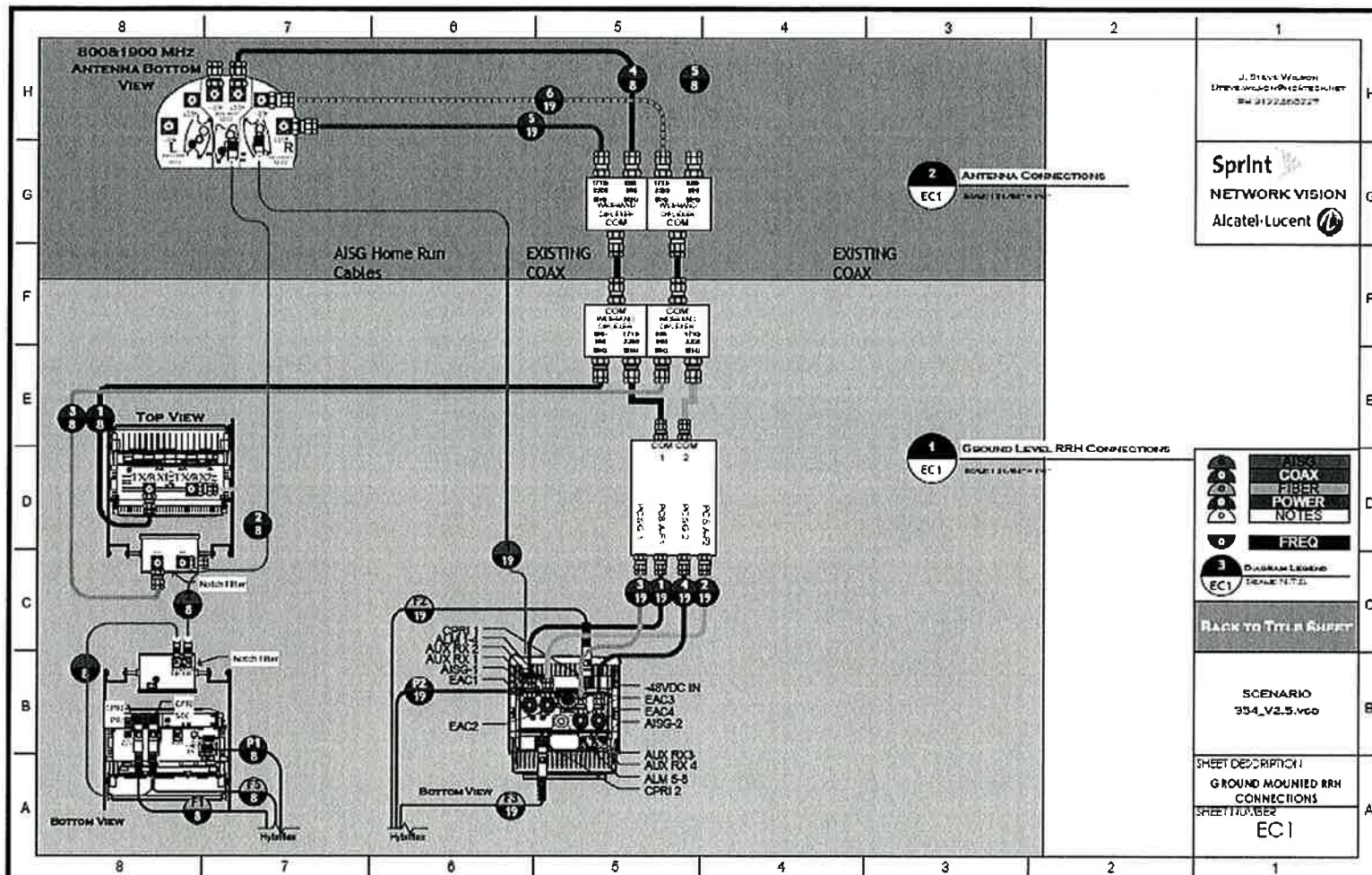
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SITE NUMBER:
CT03XC210

SITE ADDRESS:
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SHEET DESCRIPTION:
**EQUIPMENT
 & MOUNTING DETAILS**

SHEET NUMBER:
A-5



J. Steve Wilson
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 Westborough, MA 01581
 508-853-0227

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COAX
POWER
NOTES

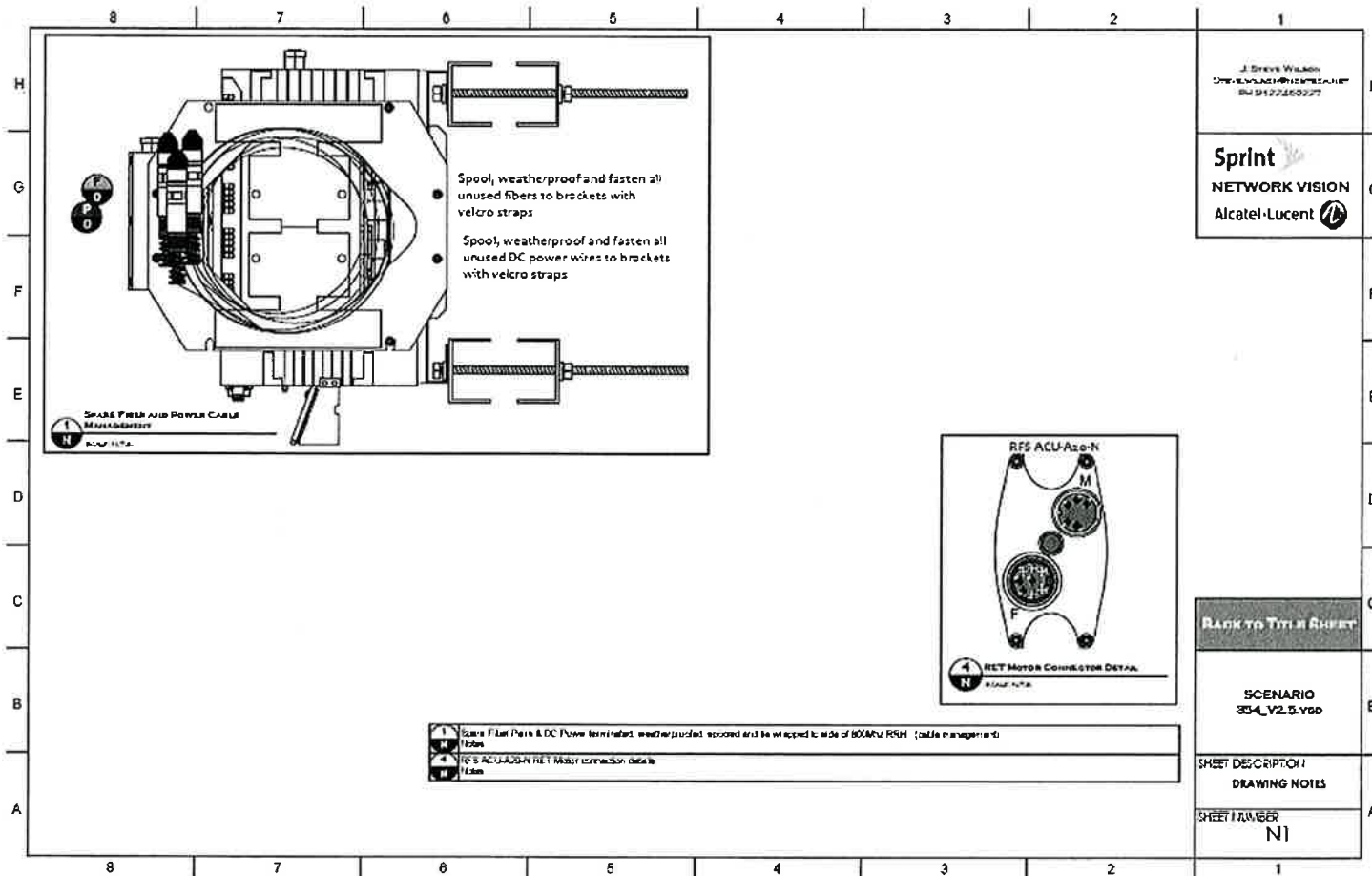
FREQ

Diagram Legend
 EC1

BACK TO TITLE SHEET

SCENARIO
 354_V2.5_v00

SHEET DESCRIPTION
 GROUND MOUNTED RRH CONNECTIONS
SHEET NUMBER
 EC1



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BACK TO TITLE SHEET

SCENARIO
 354_V2.5_v00

SHEET DESCRIPTION
 DRAWING NOTES

SHEET NUMBER
 N1

- 1 Spare Fiber Pairs & DC Power terminated, weatherproofed, spooled and to be secured to side of 60MM RRH (cable management)
- 2 RET MOTOR CONNECTOR DETAIL
- 3 RET MOTOR CONNECTOR DETAIL

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SITE ADDRESS:
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SHEET DESCRIPTION:
SCENARIO 354 V2.5 SPECIFICATIONS

SHEET NUMBER:
A-7

