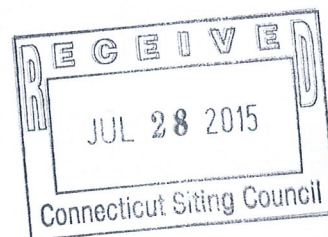




Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

July 27, 2015

ORIGINAL



Melanie A. Bachman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: **Sprint Modification - EM-SPRINT-049-130201; Crown: 806373**
Sprint Site ID: CT03XC092
Located at: 4 Oliver Road, Enfield, CT 06082

Dear Ms. Bachman:

This letter is to confirm that all construction activity has been completed. Pursuant to the Connecticut Siting Council approval of **EM-SPRINT-049-130201**, this letter is to satisfy item number three of the approval letter that the CSC will be notified in writing within 45 days after completion of construction.

Please contact me if you have any questions.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Jeff Barbadora'.

Jeff Barbadora
Real Estate Specialist
781-970-0053



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

March 1, 2013

Kevin Savage
Crown Castle
3530 Torrington Way, Suite 300
Charlotte, NC 28277

RE: **EM-SPRINT-NEXTEL-049-130201** - Sprint Nextel Corporation notice of intent to modify an existing telecommunications facility located at 4 Oliver Road, Enfield, Connecticut.

Dear Mr. Savage:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Prior to antenna installation, the reinforcements identified in the modification drawings referenced in the Structural Analysis Report prepared by Paul J. Ford and Company dated October 23, 2012, and stamped by Joseph Jacobs shall be implemented;
- Within 45 days following completion of the antenna installation, a signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the recommended modifications have been completed and the structure and foundation do not exceed 100 percent of the post-construction structural rating.
- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated January 30, 2013. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General

Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

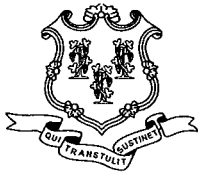
Very truly yours,



Linda Roberts
Executive Director

LR/CDM/cm

c: The Honorable Scott Kaupin, Mayor, Town of Enfield
Jose Giner, Director of Planning and Community Development, Town of Enfield



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

February 19, 2013

The Honorable Scott Kaupin
Mayor
Town of Enfield
820 Enfield Street
Enfield, CT 06082

RE: **EM-SPRINT-NEXTEL-049-130201** - Sprint Nextel Corporation notice of intent to modify an existing telecommunications facility located at 4 Oliver Road, Enfield, Connecticut.

Dear Mayor Kaupin:

The Connecticut Siting Council (Council) received a request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72, a copy of which has already been provided to you.

If you have any questions or comments regarding the proposal, please call me or inform the Council by March 5, 2013.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts
Executive Director

LR/laf

c: Matthew W. Coppler, Town Manager, Town of Enfield
Jose Giner, Director of Planning and Community Development, Town of Enfield



Crown Castle
3530 Torrington Way Suite 300
Charlotte NC 28277

Tel 704-405-6560
Fax 724-416-4911
www.crowncastle.com

ORIGINAL

January 30, 2013

Ms. Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

RECEIVED
FEB - 1 2013

**CONNECTICUT
SITING COUNCIL**

RE: Sprint Nextel-Exempt Modification Request- Crown Site BU 806373 Sprint
Nextel Site CT03XC092 – Located at – 4 Oliver Road Enfield, CT 06082.

Dear Ms. Roberts:

This letter and attachments are submitted on behalf of Sprint Nextel (Sprint). Sprint is making modifications to certain existing sites in its Connecticut system in order to implement their network vision technology. Please accept this letter and attachments as notification, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies ("R.S.C.A."), of construction that constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the Town Manager Matthew Coppler for the Town of Enfield.

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at 4 Oliver Road Enfield, CT 06082. Attached are a compound plan and elevation depicting the planned changes, and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration. Also included is a power density report reflecting the modification to Sprints operations at the site.

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for the R.C.S.A. Section 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. Sprints replacement antennas and will be located at the same elevation on the existing tower.
2. Although the proposed modifications will involve replacing the ground-mounted equipment the proposed change will not require the extension of the site boundaries.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted a safely standard. A cumulative General Power Density table for Sprint modified facility is included behind Tab 2.

Also attached is a Structural Report confirming that the tower and foundation can support Sprints proposed modifications. (See Tab 3).

For the foregoing reasons, Sprint respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b) (2).

Sincerely,

A handwritten signature in black ink, appearing to read "Kevin Savage". The signature is fluid and cursive, with the first name "Kevin" and last name "Savage" clearly distinguishable.

Kevin Savage

Enclosures

Copy to: Town of Enfield, Town Manager Matthew Coppler



EBI Consulting

environmental | engineering | due diligence

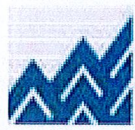
RADIO FREQUENCY EMISSIONS ANALYSIS REPORT EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

Sprint Existing Facility

Site ID: CT03XC092

Enfield (Crown)
4 Oliver Road
Enfield, CT 06082

December 13, 2012



EBI Consulting

environmental | engineering | due diligence

December 13, 2012

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

Re: Emissions Values for Site: **CT03XC092 – Enfield (Crown)**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 4 Oliver Road, Enfield, CT, for the purpose of determining whether the emissions from the proposed Sprint equipment upgrades 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 limit for the cellular band is approximately 567 $\mu\text{W}/\text{cm}^2$, and the general population exposure limit for the 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 upgrades to the existing Sprint Wireless antenna facility located at 4 Oliver Road, Enfield, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario. Actual values seen from this site will be dramatically less than those shown in this report. 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 emissions were calculated using the following assumptions:

- 1) 3 CDMA Carriers (1900 MHz) were considered for each sector of the proposed installation.
- 2) 1 CDMA Carrier (850 MHz) was considered for each sector of the proposed installation
- 3) 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.
- 4) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
- 5) The antennas used in this modeling are the APXVSPP18-C-A20 and the APXV9ERR18-C-A20. This is based on feedback from the carrier with regards to anticipated antenna selection. These antennas have a 15.9 dBd and a 14.9 dBd gain value respectively at their main lobe at 1900 MHz and 13.4 dBd and 11.9 dBd gain value respectively at their main lobe for 850 MHz. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario.



EBI Consulting

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- 6) The antenna mounting height centerline of the proposed antennas is **136 feet** above ground level (AGL) for sectors 1&3 and **135 feet** above ground level (AGL) for sector 2.
- 7) 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 calculation were done with respect to uncontrolled / general public threshold limits

Site IDCTC3XC092 - Enfield (Crown) Site Address4 Oliver Road, Enfield, CT, 06082 Site TypeMonopole																	
Sector 1																	
Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Tec-nology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBi)	Antenna Height (ft)	analysis height (ft)	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	RFS	AP VSP218-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	15.9	136	130	1/2 "	0.5	0	2080.4211	44.25583	4.42558%
1a	RFS	AP VSP218-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	136	130	1/2 "	0.5	0	389.96892	8.295628	1.46307%
Sector total Power Density Value: 5.889%																	
Sector 2																	
Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Tec-nology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBi)	Antenna Height (ft)	analysis height (ft)	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
2a	RFS	AP VSERR18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	14.9	135	129	1/2 "	0.5	0	1652.5372	35.70079	3.57008%
2a	RFS	AP VSERR18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	11.9	135	129	1/2 "	0.5	0	276.07685	5.96426	1.05190%
Sector total Power Density Value: 4.622%																	
Sector 3																	
Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Tec-nology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBi)	Antenna Height (ft)	analysis height (ft)	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
3a	RFS	AP VSP218-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	15.9	136	130	1/2 "	0.5	0	2080.4211	44.25583	4.42558%
3a	RFS	AP VSP218-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	136	130	1/2 "	0.5	0	389.96892	8.295628	1.46307%
Sector total Power Density Value: 5.889%																	

Site Composite MPE %	
Carrier	MPE %
Sprint	16.399%
AT&T	12.740%
Verizon Wireless	11.570%
T-Mobile	6.830%
Clearwire	0.980%
Metro PCS	6.980%
Nextel	2.030%
XM Satellite Radio	1.170%
PageNet	2.450%
Total Site MPE %	61.149%

Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **16.399% (5.889% from sectors 1 & 3 each and 4.622% from sector 2)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **61.149%** 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



Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803



PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

Date: **October 23, 2012**

Cheryl Schultz
Crown Castle USA Inc.
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6632

Paul J. Ford and Company
250 East Broad Street, Suite 1500
Columbus, Ohio 43215
(614) 221-6679
kthorpe@pjfweb.com

Subject: Structural Analysis Report

Carrier Designation:	Sprint PCS Co-Locate – Final Loading	
	Carrier Site Number:	CT03XC092
	Carrier Site Name:	CT03XC092
Crown Castle Designation:	Crown Castle BU Number:	806373
	Crown Castle Site Name:	HRT 101 943232
	Crown Castle JDE Job Number:	190487
	Crown Castle Work Order Number:	540896
Engineering Firm Designation:	Paul J. Ford and Company Project Number:	37512-1571 R1 B
Site Data:	4 Oliver Road, ENFIELD, Hartford County, CT	
	Latitude 41° 57' 36.2", Longitude -72° 35' 32.3"	
	160 Foot - Monopole Tower	

Dear Cheryl Schultz,

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 497572, in accordance with application 165446, revision 1.

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

LC4.7: Existing + Reserved + Proposed Equipment + Proposed Modifications
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

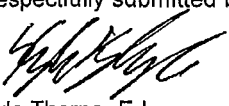
Sufficient Capacity

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

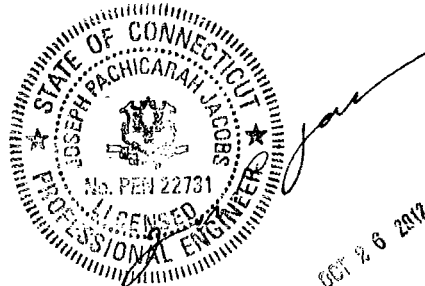
All modifications and equipment proposed in this report shall be installed in accordance with the referenced drawings (CCI ID# 3277409) for the determined available structural capacity to be effective.

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

Respectfully submitted by:


Kyle Thorpe, E.I.
Structural Engineer

inxTower Report - version 6.0.3.0





PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

Date: **October 23, 2012**

Cheryl Schultz
Crown Castle USA Inc.
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6632

Paul J. Ford and Company
250 East Broad Street, Suite 1500
Columbus, Ohio 43215
(614) 221-6679
kthorpe@pjfweb.com

Subject: Structural Analysis Report

Carrier Designation:	Sprint PCS Co-Locate – Final Loading	
	Carrier Site Number:	CT03XC092
	Carrier Site Name:	CT03XC092
Crown Castle Designation:	Crown Castle BU Number:	806373
	Crown Castle Site Name:	HRT 101 943232
	Crown Castle JDE Job Number:	190487
	Crown Castle Work Order Number:	540896
Engineering Firm Designation:	Paul J. Ford and Company Project Number:	37512-1571 R1 B
Site Data:	4 Oliver Road, ENFIELD, Hartford County, CT	
	Latitude 41° 57' 36.2", Longitude -72° 35' 32.3"	
	160 Foot - Monopole Tower	

Dear Cheryl Schultz,

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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:

LC4.7: Existing + Reserved + Proposed Equipment + Proposed Modifications	Sufficient Capacity
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.	

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

All modifications and equipment proposed in this report shall be installed in accordance with the referenced drawings (CCI ID# 3277409) for the determined available structural capacity to be effective.

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

Respectfully submitted by:

Kyle Thorpe, E.I.
Structural Engineer

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TNXTower Output

6) APPENDIX B

Base Level Drawing

7) APPENDIX C

Additional Calculations

1) INTRODUCTION

This tower is a 160 ft Monopole tower designed by VALMONT in November of 1991.
 The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-E.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

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
135.0	136.0	2	rfs celwave	APXVSP18-C-A20 w/ Pipe	3	1-1/4	-
	135.0	1		APXV9ERR18-C-A20 w/ Pipe			
132.0	132.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-	-
		3		PCS 1900MHz 4x45W-65MHz			
		1	tower mounts	Side Arm Mount [SO 102-3]			

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
158.0	161.0	6	powerwave technologies	LGP13519	12	1-5/8	2
		6		LGP21401			
		6		7770.00 w/ Mount Pipe			
	158.0	3	andrew	SBNH-1D6565C w/ Mount Pipe	2	3/4 3/8	3
		6	ericsson	RRUS-11			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 301-1]			
151.0	151.0	1	tower mounts	Side Arm Mount [SO 101-3]	-	-	4
		1		Side Arm Mount [SO 701-3]			
149.0	149.0	1	antel	BXA-185063/8CF w/ Pipe	12	7/8	1
		2		BXA-185090/8CFx2 w/ Pipe			
		2		BXA-70063/6CFx4 w/ Pipe			
		1		BXA-70063/6CFx6 w/ Pipe			
		2		LPA-80063/4CF w/ Mount Pipe			
		4		LPA-80080/4CF w/ Mount Pipe			
		6	rfs celwave	FD9R6004/2C-3L			
		1	tower mounts	Platform Mount [LP 602-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
135.0	139.0	2	andrew	VHLP2.5-11	6 3	1/4 1/2	1
		2	dragonwave	HORIZON COMPACT			
	135.0	3	argus technologies	LLPX310R-V1 w/ Mount Pipe			
		1	motorola	TIMING 2000			
		3	samsung telecommunications	WIMAX DAP HEAD			
		6	decibel	DB980H90E-M w/ Mount Pipe	6	1-5/8	4
		1	tower mounts	Platform Mount [LP 602-1]	-	-	1
126.0	127.0	9	decibel	DB844H90E-XY w/ Mount Pipe	9	7/8	1
	126.0	1	tower mounts	T-Arm Mount [TA 901-3]			
116.0	117.0	3	andrew	ONEBASE TWIN DUAL DUPLEX TMA	6 6	1-1/4 1-5/8	1
		3	ems wireless	RR90-17-02DP w/ Mount Pipe			
		3	ericsson	KRY 112 71/1			
		3	rfs celwave	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe			
	116.0	1	tower mounts	Side Arm Mount [SO 103-3]			
		1		Side Arm Mount [SO 701-3]			
106.0	108.0	3	andrew	ATM200-A20	6 1	7/8 5/16	1
		3		HBX-6516DS-VTM w/ Pipe			
	106.0	1	tower mounts	T-Arm Mount [TA 602-3]			
50.0	50.0	1	symmetricom	58532A	1	1/2	3
		1	tower mounts	Platform Mount [LP 301-1]			
47.0	48.0	1	lucent	KS24019-L112A	1	1/2	1
	47.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:

- 1) Existing Equipment
- 2) Existing equipment to be relocated to the 158-ft level from the 151' level.
- 3) Reserved Equipment
- 4) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering 07/26/2007	821582	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	SAC Engineering, Inc. 11/16/1991	821581	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont 11/09/1991	822743	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37512-1571 BP, 07/24/2012	3277409	CCISITES

3.1) Analysis Method

tnxTower (version 6.0.3.0), 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.
- 4) Monopole will be reinforced in conformance with the referenced proposed modification drawings (CCI ID# 3277409).

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)	SE*P _{allow} (K)	% Capacity	Pass / Fail
L1	160 - 150.5	Pole	TP20x20x0.25	1	-2.43	434.22	25.2	Pass
L2	150.5 - 150	Pole	TP20.3x20x0.25	2	-2.45	440.81	26.0	Pass
L3	150 - 119	Pole	TP26.6545x20.3x0.25	3	-8.71	1105.02	88.3	Pass
L4	119 - 97.1667	Pole	TP31.13x26.6545x0.3512	4	-12.64	1695.47	91.1	Pass
L5	97.1667 - 90.5	Pole	TP31.9973x29.4368x0.472	5	-15.48	2414.52	80.8	Pass
L6	90.5 - 60.5	Pole	TP38.149x31.9973x0.4827	6	-22.56	2943.93	95.2	Pass
L7	60.5 - 55	Pole	TP39.2768x38.149x0.5056	7	-24.04	3281.19	89.9	Pass
L8	55 - 30.5	Pole	TP43.5485x39.2768x0.5553	8	-33.19	3996.63	91.3	Pass
L9	30.5 - 0	Pole	TP49.8x43.5485x0.5594	9	-43.73	4610.85	94.4	Pass
							Summary	
						Pole (L6)	95.2	Pass
						RATING =	95.2	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC4.7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Extension Connection	150	26.8	Pass
1	Anchor Rods	0	95.9	Pass
1	Base Plate	0	65.2	Pass
1	Base Foundation Structural Steel	0	69.0	Pass
1,2	Base Foundation Soil Interaction	0	86.8	Pass

Structure Rating (max from all components) =	95.9%
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Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) According to the procedures prescribed and agreed to by the Crown Castle Engineering Foundation Committee, held in January 2010, the existing caisson foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the caisson is the greater of the geotechnical report's recommendation, the frost depth of the site or half of the caisson diameter.

4.1) Recommendations

Reinforce the monopole in conformance with the referenced proposed modification drawings (CCI ID# 3277409).

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in Hartford County, Connecticut.

Basic wind speed of 80.00 mph.

Nominal ice thickness of 1.0000 in.

Ice thickness is considered to increase with height.

Ice density of 56.00 pcf.

A wind speed of 37.60 mph is used in combination with ice.

Temperature drop of 50.00 °F.

Deflections calculated using a wind speed of 50.00 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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

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	160.0000- 150.5000	9.5000	0.00	Round	20.0000	20.0000	0.2500		A53-B-35 (35 ksi)
L2	150.5000- 150.0000	0.5000	0.00	Round	20.0000	20.3000	0.2500		A53-B-35 (35 ksi)
L3	150.0000- 119.0000	31.0000	0.00	12	20.3000	26.6545	0.2500	1.0000	A572-65 (65 ksi)
L4	119.0000- 97.1667	21.8333	4.83	12	26.6545	31.1300	0.3512	1.4048	Reinf 62.93 ksi (63 ksi)
L5	97.1667- 90.5000	11.5000	0.00	12	29.4368	31.9973	0.4720	1.8879	Reinf 63.01 ksi (63 ksi)
L6	90.5000- 60.5000	30.0000	0.00	12	31.9973	38.1490	0.4827	1.9309	Reinf 62.87 ksi (63 ksi)
L7	60.5000- 55.0000	5.5000	0.00	12	38.1490	39.2768	0.5056	2.0222	Reinf 65.00 ksi (65 ksi)
L8	55.0000-	24.5000	0.00	12	39.2768	43.5485	0.5553	2.2213	Reinf 65.00 ksi

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L9	30.5000 30.5000- 0.0000	30.5000		12	43.5485	49.8000	0.5594	2.2375	(65 ksi) Reinf 65.00 ksi (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	20.0000	15.5116	756.8919	6.9915	10.0000	75.6892	1511.7218	7.7512	0.0000	0
L2	20.0000	15.5116	756.8919	6.9915	10.0000	75.6892	1511.7218	7.7512	0.0000	0
L3	21.0161	16.1403	828.1804	7.1779	10.5154	78.7588	1678.1181	7.9437	4.7704	19.082
L4	27.5948	29.7455	2626.8062	9.4166	13.8070	190.2512	5322.6215	14.6398	6.2022	17.66
L5	31.5894	44.0201	4713.8930	10.3694	15.2483	309.1425	9551.6252	21.6653	6.6242	14.035
L6	33.1261	48.9850	6209.7330	11.2822	16.5746	374.6532	12582.602	24.1089	7.2816	15.085
L7	39.4947	61.2798	11083.605	13.4763	19.7612	560.8782	22458.389	30.1601	8.8690	17.543
L8	40.6623	69.2390	13250.714	13.8623	20.3454	651.2894	26849.540	34.0773	9.0379	16.275
L9	45.0847	77.4322	18265.199	15.3901	22.5581	809.6950	37010.246	38.1098	10.1719	18.184
	51.5568	88.6924	27448.542	17.6281	25.7964	1064.0455	55618.189	43.6517	11.8473	21.179

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 160.0000- 150.5000				1	1	1		
L2 150.5000- 150.0000				1	1	1		
L3 150.0000- 119.0000				1	1	1		
L4 119.0000- 97.1667				1	1	1		
L5 97.1667- 90.5000				1	1	1		
L6 90.5000- 60.5000				1	1	1		
L7 60.5000- 55.0000				1	1	1		
L8 55.0000- 30.5000				1	1	1		
L9 30.5000- 0.0000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
FB-L98B-002-75000(3/8")	C	No	CaAa (Out Of Face)	158.0000 - 0.0000	1	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.60
						1" Ice	0.0000	1.76
						2" Ice	0.0000	5.91
						4" Ice	0.0000	21.53
WR-VG86ST-BRD(3/4)	C	No	CaAa (Out Of Face)	158.0000 - 0.0000	2	No Ice	0.0000	0.59
						1/2" Ice	0.0000	1.37
						1" Ice	0.0000	2.76
						2" Ice	0.0000	7.37
						4" Ice	0.0000	23.92
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	158.0000 - 0.0000	3	No Ice	0.1980	0.82
						1/2" Ice	0.2980	2.33
						1" Ice	0.3980	4.46
						2" Ice	0.5980	10.54
						4" Ice	0.9980	30.04
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	158.0000 - 0.0000	9	No Ice	0.0000	0.82
						1/2" Ice	0.0000	2.33
						1" Ice	0.0000	4.46
						2" Ice	0.0000	10.54
						4" Ice	0.0000	30.04
**								
LDF5-50A(7/8")	C	No	Inside Pole	149.0000 - 0.0000	12	No Ice	0.0000	0.33
						1/2" Ice	0.0000	0.33
						1" Ice	0.0000	0.33
						2" Ice	0.0000	0.33
						4" Ice	0.0000	0.33
**								
FSJ4-50B(1/2")	C	No	CaAa (Out Of Face)	135.0000 - 0.0000	3	No Ice	0.0000	0.14
						1/2" Ice	0.0000	0.76
						1" Ice	0.0000	2.00
						2" Ice	0.0000	6.30
						4" Ice	0.0000	22.23
LDF1-50A(1/4")	C	No	Inside Pole	135.0000 - 0.0000	6	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
						2" Ice	0.0000	0.06
						4" Ice	0.0000	0.06
2" Conduit	C	No	CaAa (Out Of Face)	135.0000 - 0.0000	1	No Ice	0.2000	0.95
						1/2" Ice	0.3000	2.48
						1" Ice	0.4000	4.62
						2" Ice	0.6000	10.72
						4" Ice	1.0000	30.27
HB114-1-08U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	135.0000 - 0.0000	3	No Ice	0.0000	1.08
						1/2" Ice	0.0000	2.33
						1" Ice	0.0000	4.18
						2" Ice	0.0000	9.73
						4" Ice	0.0000	28.15
**								
LDF5-50A(7/8")	C	No	CaAa (Out Of Face)	126.0000 - 0.0000	9	No Ice	0.0000	0.33
						1/2" Ice	0.0000	1.30
						1" Ice	0.0000	2.88
						2" Ice	0.0000	7.88
						4" Ice	0.0000	25.20
**								
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	116.0000 - 0.0000	6	No Ice	0.0000	0.82
						1/2" Ice	0.0000	2.33
						1" Ice	0.0000	4.46
						2" Ice	0.0000	10.54
						4" Ice	0.0000	30.04
LDF6-50A(1-1/4")	C	No	CaAa (Out Of Face)	116.0000 - 0.0000	6	No Ice	0.0000	0.66
						1/2" Ice	0.0000	1.91
						1" Ice	0.0000	3.78
						2" Ice	0.0000	9.33
						4" Ice	0.0000	27.78
**								
FXL 780 PE(7/8)	C	No	CaAa (Out Of Face)	106.0000 - 0.0000	6	No Ice	0.0000	0.25

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
			Face)			1/2" Ice	0.0000	1.22
						1" Ice	0.0000	2.80
						2" Ice	0.0000	7.80
						4" Ice	0.0000	25.12
ATCB-B01(5/16)	C	No	CaAa (Out Of Face)	106.0000 - 0.0000	1	No Ice	0.0000	0.07
						1/2" Ice	0.0000	0.57
						1" Ice	0.0000	1.68
						2" Ice	0.0000	5.73
						4" Ice	0.0000	21.16
**								
FLC 12-50J(1/2")	C	No	CaAa (Out Of Face)	50.0000 - 0.0000	1	No Ice	0.0000	0.17
						1/2" Ice	0.0000	0.87
						1" Ice	0.0000	2.17
						2" Ice	0.0000	6.62
						4" Ice	0.0000	22.85
**								
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	47.0000 - 0.0000	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.84
						1" Ice	0.0000	2.14
						2" Ice	0.0000	6.58
						4" Ice	0.0000	22.78

1" Flat Reinforcement	C	No	CaAa (Out Of Face)	90.5000 - 0.0000	1	No Ice	0.1667	0.00
						1/2" Ice	0.2778	0.00
						1" Ice	0.3889	0.00
						2" Ice	0.6111	0.00
						4" Ice	1.0556	0.00
3/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	120.5000 - 90.5000	1	No Ice	0.1250	0.00
						1/2" Ice	0.2361	0.00
						1" Ice	0.3472	0.00
						2" Ice	0.5694	0.00
						4" Ice	1.0139	0.00

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
SBNH-1D6565C w/ Mount Pipe	A	From Face	4.0000 0.00 0.00	0.0000	158.0000	No Ice	11.5561	9.7151	0.09
						1/2"	12.2227	11.1857	0.18
						Ice	12.8929	12.5942	0.28
						1" Ice	14.2911	14.8689	0.51
						2" Ice	17.4280	19.6184	1.14
						4" Ice			
SBNH-1D6565C w/ Mount Pipe	B	From Face	4.0000 0.00 0.00	0.0000	158.0000	No Ice	11.5561	9.7151	0.09
						1/2"	12.2227	11.1857	0.18
						Ice	12.8929	12.5942	0.28
						1" Ice	14.2911	14.8689	0.51
						2" Ice	17.4280	19.6184	1.14
						4" Ice			
SBNH 1D6565C w/ Mount Pipe	C	From Face	4.0000 0.00 0.00	0.0000	158.0000	No Ice	11.5561	9.7151	0.09
						1/2"	12.2227	11.1857	0.18
						Ice	12.8929	12.5942	0.28
						1" Ice	14.2911	14.8689	0.51
						2" Ice	17.4280	19.6184	1.14
						4" Ice			
(2) 7770.00 w/ Mount Pipe	A	From Face	4.0000 0.00 3.00	0.0000	158.0000	No Ice	6.1194	4.2543	0.06
						1/2"	6.6258	5.0137	0.10
						Ice	7.1283	5.7109	0.16
						1" Ice	8.1643	7.1553	0.29

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
						2" Ice	10.3599	10.4117	0.66
						4" Ice			
(2) 7770.00 w/ Mount Pipe	B	From Face	4.0000	0.0000	158.0000	No Ice	6.1194	4.2543	0.06
			0.00			1/2"	6.6258	5.0137	0.10
			3.00			Ice	7.1283	5.7109	0.16
						1" Ice	8.1643	7.1553	0.29
						2" Ice	10.3599	10.4117	0.66
						4" Ice			
(2) 7770.00 w/ Mount Pipe	C	From Face	4.0000	0.0000	158.0000	No Ice	6.1194	4.2543	0.06
			0.00			1/2"	6.6258	5.0137	0.10
			3.00			Ice	7.1283	5.7109	0.16
						1" Ice	8.1643	7.1553	0.29
						2" Ice	10.3599	10.4117	0.66
						4" Ice			
DC6-48-60-18-8F	A	From Face	4.0000	0.0000	158.0000	No Ice	1.4667	1.4667	0.02
			0.00			1/2"	1.6667	1.6667	0.04
			0.00			Ice	1.8778	1.8778	0.06
						1" Ice	2.3333	2.3333	0.11
						2" Ice	3.3778	3.3778	0.24
						4" Ice			
(2) RRUS-11	A	From Face	4.0000	0.0000	158.0000	No Ice	3.2486	1.3726	0.05
			0.00			1/2"	3.4905	1.5510	0.07
			0.00			Ice	3.7411	1.7380	0.09
						1" Ice	4.2682	2.1381	0.15
						2" Ice	5.4260	3.0418	0.31
						4" Ice			
(2) RRUS-11	B	From Face	4.0000	0.0000	158.0000	No Ice	3.2486	1.3726	0.05
			0.00			1/2"	3.4905	1.5510	0.07
			0.00			Ice	3.7411	1.7380	0.09
						1" Ice	4.2682	2.1381	0.15
						2" Ice	5.4260	3.0418	0.31
						4" Ice			
(2) RRUS-11	C	From Face	4.0000	0.0000	158.0000	No Ice	3.2486	1.3726	0.05
			0.00			1/2"	3.4905	1.5510	0.07
			0.00			Ice	3.7411	1.7380	0.09
						1" Ice	4.2682	2.1381	0.15
						2" Ice	5.4260	3.0418	0.31
						4" Ice			
(2) LGP13519	A	From Face	4.0000	0.0000	158.0000	No Ice	0.3379	0.2074	0.01
			0.00			1/2"	0.4220	0.2804	0.01
			3.00			Ice	0.5147	0.3621	0.01
						1" Ice	0.7260	0.5513	0.02
						2" Ice	1.2523	1.0335	0.07
						4" Ice			
(2) LGP13519	B	From Face	4.0000	0.0000	158.0000	No Ice	0.3379	0.2074	0.01
			0.00			1/2"	0.4220	0.2804	0.01
			3.00			Ice	0.5147	0.3621	0.01
						1" Ice	0.7260	0.5513	0.02
						2" Ice	1.2523	1.0335	0.07
						4" Ice			
(2) LGP13519	C	From Face	4.0000	0.0000	158.0000	No Ice	0.3379	0.2074	0.01
			0.00			1/2"	0.4220	0.2804	0.01
			3.00			Ice	0.5147	0.3621	0.01
						1" Ice	0.7260	0.5513	0.02
						2" Ice	1.2523	1.0335	0.07
						4" Ice			
(2) LGP21401	A	From Face	4.0000	0.0000	158.0000	No Ice	1.2880	0.2326	0.01
			0.00			1/2"	1.4453	0.3134	0.02
			3.00			Ice	1.6112	0.4028	0.03
						1" Ice	1.9690	0.6076	0.05
						2" Ice	2.7882	1.1210	0.14
						4" Ice			
(2) LGP21401	B	From Face	4.0000	0.0000	158.0000	No Ice	1.2880	0.2326	0.01
			0.00			1/2"	1.4453	0.3134	0.02
			3.00			Ice	1.6112	0.4028	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
						1" Ice	1.9690	0.6076	0.05
						2" Ice	2.7882	1.1210	0.14
						4" Ice			
(2) LGP21401	C	From Face	4.0000	0.0000	158.0000	No Ice	1.2880	0.2326	0.01
			0.00			1/2"	1.4453	0.3134	0.02
			3.00			Ice	1.6112	0.4028	0.03
						1" Ice	1.9690	0.6076	0.05
						2" Ice	2.7882	1.1210	0.14
						4" Ice			
Platform Mount [LP 301-1]	C	None		0.0000	158.0000	No Ice	30.1000	30.1000	1.59
						1/2"	40.8000	40.8000	2.03
						Ice	51.5000	51.5000	2.47
						1" Ice	72.9000	72.9000	3.35
						2" Ice	115.7000	115.7000	5.11
						4" Ice			

(2) LPA-80063/4CF w/ Mount Pipe	A	From Face	4.0000	0.0000	149.0000	No Ice	7.2481	7.2599	0.04
			0.00			1/2"	7.7190	7.9574	0.10
			0.00			Ice	8.2003	8.6723	0.18
						1" Ice	9.1945	10.1556	0.34
						2" Ice	11.3199	13.3910	0.80
						4" Ice			
(2) LPA-80080/4CF w/ Mount Pipe	B	From Face	4.0000	0.0000	149.0000	No Ice	2.8561	7.2274	0.03
			0.00			1/2"	3.2195	7.9217	0.07
			0.00			Ice	3.5922	8.6338	0.13
						1" Ice	4.4498	10.1119	0.25
						2" Ice	6.3182	13.3391	0.61
						4" Ice			
(2) LPA-80080/4CF w/ Mount Pipe	C	From Face	4.0000	0.0000	149.0000	No Ice	2.8561	7.2274	0.03
			0.00			1/2"	3.2195	7.9217	0.07
			0.00			Ice	3.5922	8.6338	0.13
						1" Ice	4.4498	10.1119	0.25
						2" Ice	6.3182	13.3391	0.61
						4" Ice			
BXA-70063/6CFx6 w/ Mount Pipe	A	From Face	4.0000	0.0000	149.0000	No Ice	7.9686	5.3981	0.04
			0.00			1/2"	8.6091	6.5465	0.10
			0.00			Ice	9.2158	7.4089	0.17
						1" Ice	10.4591	9.1837	0.33
						2" Ice	13.0655	12.9333	0.79
						4" Ice			
BXA-70063/6CFx4 w/ Mount Pipe	B	From Face	4.0000	0.0000	149.0000	No Ice	7.9686	5.3981	0.04
			0.00			1/2"	8.6091	6.5465	0.10
			0.00			Ice	9.2158	7.4089	0.17
						1" Ice	10.4591	9.1837	0.33
						2" Ice	13.0655	12.9333	0.79
						4" Ice			
BXA-70063/6CFx4 w/ Mount Pipe	C	From Face	4.0000	0.0000	149.0000	No Ice	7.9686	5.3981	0.04
			0.00			1/2"	8.6091	6.5465	0.10
			0.00			Ice	9.2158	7.4089	0.17
						1" Ice	10.4591	9.1837	0.33
						2" Ice	13.0655	12.9333	0.79
						4" Ice			
BXA-185063/8CF w/ Mount Pipe	A	From Face	4.0000	0.0000	149.0000	No Ice	3.1811	2.9966	0.03
			0.00			1/2"	3.5589	3.6145	0.06
			0.00			Ice	3.9527	4.2361	0.09
						1" Ice	4.8550	5.5293	0.19
						2" Ice	6.7735	8.4233	0.47
						4" Ice			
BXA-185090/8CFx2 w/ Mount Pipe	B	From Face	4.0000	0.0000	149.0000	No Ice	3.1574	3.3303	0.03
			0.00			1/2"	3.5312	3.9423	0.06
			0.00			Ice	3.9415	4.5633	0.10
						1" Ice	4.8273	5.8553	0.19
						2" Ice	6.7342	8.8407	0.49
						4" Ice			
BXA-185090/8CFx2 w/	C	From Face	4.0000	0.0000	149.0000	No Ice	3.1574	3.3303	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
Mount Pipe			0.00 0.00			1/2" Ice	3.5312 3.9415	3.9423 4.5633	0.06 0.10
						1" Ice	4.8273	5.8553	0.19
						2" Ice	6.7342	8.8407	0.49
						4" Ice			
(2) FD9R6004/2C-3L	A	From Face	4.0000 0.00 0.00	0.0000	149.0000	No Ice	0.3665	0.0846	0.00
						1/2"	0.4506	0.1362	0.01
						Ice	0.5433	0.1965	0.01
						1" Ice	0.7546	0.3430	0.02
						2" Ice	1.2808	0.7396	0.06
						4" Ice			
(2) FD9R6004/2C-3L	B	From Face	4.0000 0.00 0.00	0.0000	149.0000	No Ice	0.3665	0.0846	0.00
						1/2"	0.4506	0.1362	0.01
						Ice	0.5433	0.1965	0.01
						1" Ice	0.7546	0.3430	0.02
						2" Ice	1.2808	0.7396	0.06
						4" Ice			
(2) FD9R6004/2C-3L	C	From Face	4.0000 0.00 0.00	0.0000	149.0000	No Ice	0.3665	0.0846	0.00
						1/2"	0.4506	0.1362	0.01
						Ice	0.5433	0.1965	0.01
						1" Ice	0.7546	0.3430	0.02
						2" Ice	1.2808	0.7396	0.06
						4" Ice			
Platform Mount [LP 602-1]	C	None		0.0000	149.0000	No Ice	32.0300	32.0300	1.34
						1/2"	38.7100	38.7100	1.80
						Ice	45.3900	45.3900	2.26
						1" Ice	58.7500	58.7500	3.17
						2" Ice	85.4700	85.4700	5.00
						4" Ice			

LLPX310R-V1 w/ Mount Pipe	A	From Face	4.0000 0.00 0.00	0.0000	135.0000	No Ice	5.0651	2.9834	0.05
						1/2"	5.4798	3.5263	0.08
						Ice	5.9052	4.0859	0.13
						1" Ice	6.7881	5.3127	0.23
						2" Ice	8.7045	8.1308	0.54
						4" Ice			
LLPX310R-V1 w/ Mount Pipe	B	From Face	4.0000 0.00 0.00	0.0000	135.0000	No Ice	5.0651	2.9834	0.05
						1/2"	5.4798	3.5263	0.08
						Ice	5.9052	4.0859	0.13
						1" Ice	6.7881	5.3127	0.23
						2" Ice	8.7045	8.1308	0.54
						4" Ice			
LLPX310R-V1 w/ Mount Pipe	C	From Face	4.0000 0.00 0.00	0.0000	135.0000	No Ice	5.0651	2.9834	0.05
						1/2"	5.4798	3.5263	0.08
						Ice	5.9052	4.0859	0.13
						1" Ice	6.7881	5.3127	0.23
						2" Ice	8.7045	8.1308	0.54
						4" Ice			
WIMAX DAP HEAD	A	From Face	4.0000 0.00 0.00	0.0000	135.0000	No Ice	1.8044	0.7778	0.03
						1/2"	1.9877	0.9182	0.04
						Ice	2.1795	1.0673	0.06
						1" Ice	2.5891	1.3914	0.09
						2" Ice	3.5121	2.1432	0.20
						4" Ice			
WIMAX DAP HEAD	B	From Face	4.0000 0.00 0.00	0.0000	135.0000	No Ice	1.8044	0.7778	0.03
						1/2"	1.9877	0.9182	0.04
						Ice	2.1795	1.0673	0.06
						1" Ice	2.5891	1.3914	0.09
						2" Ice	3.5121	2.1432	0.20
						4" Ice			
WIMAX DAP HEAD	C	From Face	4.0000 0.00 0.00	0.0000	135.0000	No Ice	1.8044	0.7778	0.03
						1/2"	1.9877	0.9182	0.04
						Ice	2.1795	1.0673	0.06
						1" Ice	2.5891	1.3914	0.09
						2" Ice	3.5121	2.1432	0.20

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
HORIZON COMPACT	A	From Face	4.0000 0.00 4.00	0.0000	135.0000	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.8409 0.9658 1.0993 1.3922 2.0819	0.4295 0.5249 0.6289 0.8629 1.4345	0.01 0.02 0.03 0.05 0.12
HORIZON COMPACT	C	From Face	4.0000 0.00 4.00	0.0000	135.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.8409 0.9658 1.0993 1.3922 2.0819	0.4295 0.5249 0.6289 0.8629 1.4345	0.01 0.02 0.03 0.05 0.12
TIMING 2000	A	From Face	4.0000 0.00 0.00	0.0000	135.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.1258 0.1771 0.2370 0.3827 0.7778	0.1258 0.1771 0.2370 0.3827 0.7778	0.00 0.00 0.01 0.01 0.05
APXVSP18-C-A20 w/ Mount Pipe	A	From Face	4.0000 0.00 0.00	0.0000	135.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.9458 8.1266 9.0212 10.8440 14.8507	0.08 0.15 0.22 0.41 0.91
APXV9ERR18-C-A20 w/ Mount Pipe	B	From Face	4.0000 0.00 0.00	0.0000	135.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	7.4708 8.6564 9.5559 11.3884 15.5274	0.09 0.16 0.23 0.42 0.94
APXVSP18-C-A20 w/ Mount Pipe	C	From Face	4.0000 0.00 1.00	0.0000	135.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.9458 8.1266 9.0212 10.8440 14.8507	0.08 0.15 0.22 0.41 0.91
Platform Mount [LP 602-1]	C	None		0.0000	135.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	32.0300 38.7100 45.3900 58.7500 85.4700	32.0300 38.7100 45.3900 58.7500 85.4700	1.34 1.80 2.26 3.17 5.00

800MHz 2X50W RRH W/FILTER	A	From Face	2.0000 0.00 0.00	0.0000	132.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4014 2.6131 2.8335 3.3002 4.3372	2.2536 2.4602 2.6753 3.1316 4.1479	0.06 0.09 0.11 0.17 0.34
800MHz 2X50W RRH W/FILTER	B	From Face	2.0000 0.00 0.00	0.0000	132.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4014 2.6131 2.8335 3.3002 4.3372	2.2536 2.4602 2.6753 3.1316 4.1479	0.06 0.09 0.11 0.17 0.34
800MHz 2X50W RRH W/FILTER	C	From Face	2.0000 0.00 0.00	0.0000	132.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4014 2.6131 2.8335 3.3002 4.3372	2.2536 2.4602 2.6753 3.1316 4.1479	0.06 0.09 0.11 0.17 0.34
PCS 1900MHz 4x45W- 65MHz	A	From Face	2.0000 0.00 0.00	0.0000	132.0000	No Ice 1/2" Ice	2.7087 2.9477 3.1953	2.6111 2.8475 3.0925	0.06 0.08 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
						1" Ice	3.7164	3.6084	0.17
						2" Ice	4.8623	4.7439	0.35
						4" Ice			
PCS 1900MHz 4x45W- 65MHz	B	From Face	2.0000 0.00 0.00	0.0000	132.0000	No Ice	2.7087	2.6111	0.06
						1/2" Ice	2.9477	2.8475	0.08
						Ice	3.1953	3.0925	0.11
						1" Ice	3.7164	3.6084	0.17
						2" Ice	4.8623	4.7439	0.35
						4" Ice			
PCS 1900MHz 4x45W- 65MHz	C	From Face	2.0000 0.00 0.00	0.0000	132.0000	No Ice	2.7087	2.6111	0.06
						1/2" Ice	2.9477	2.8475	0.08
						Ice	3.1953	3.0925	0.11
						1" Ice	3.7164	3.6084	0.17
						2" Ice	4.8623	4.7439	0.35
						4" Ice			
Side Arm Mount [SO 102- 3]	C	None		0.0000	132.0000	No Ice	3.0000	3.0000	0.08
						1/2" Ice	3.4800	3.4800	0.11
						Ice	3.9600	3.9600	0.14
						1" Ice	4.9200	4.9200	0.20
						2" Ice	6.8400	6.8400	0.32
						4" Ice			

(3) DB844H90E-XY w/ Mount Pipe	A	From Face	4.0000 0.00 1.00	0.0000	126.0000	No Ice	3.2986	4.9208	0.03
						1/2" Ice	3.6900	5.5962	0.07
						Ice	4.1185	6.2837	0.12
						1" Ice	5.0070	7.7123	0.23
						2" Ice	6.9197	10.8330	0.56
						4" Ice			
(3) DB844H90E-XY w/ Mount Pipe	B	From Face	4.0000 0.00 1.00	0.0000	126.0000	No Ice	3.2986	4.9208	0.03
						1/2" Ice	3.6900	5.5962	0.07
						Ice	4.1185	6.2837	0.12
						1" Ice	5.0070	7.7123	0.23
						2" Ice	6.9197	10.8330	0.56
						4" Ice			
(3) DB844H90E-XY w/ Mount Pipe	C	From Face	4.0000 0.00 1.00	0.0000	126.0000	No Ice	3.2986	4.9208	0.03
						1/2" Ice	3.6900	5.5962	0.07
						Ice	4.1185	6.2837	0.12
						1" Ice	5.0070	7.7123	0.23
						2" Ice	6.9197	10.8330	0.56
						4" Ice			
T-Arm Mount [TA 901-3]	C	None		0.0000	126.0000	No Ice	17.5000	17.5000	0.75
						1/2" Ice	20.7000	20.7000	1.00
						Ice	23.9000	23.9000	1.26
						1" Ice	30.3000	30.3000	1.76
						2" Ice	43.1000	43.1000	2.76
						4" Ice			

APX16DWV-16DWV-S-E- ACU w/ Mount Pipe	A	From Face	4.0000 0.00 1.00	0.0000	116.0000	No Ice	6.9361	3.2893	0.06
						1/2" Ice	7.4389	3.9953	0.10
						Ice	7.9415	4.6615	0.16
						1" Ice	8.9779	6.0439	0.28
						2" Ice	11.1750	9.0230	0.65
						4" Ice			
APX16DWV-16DWV-S-E- ACU w/ Mount Pipe	B	From Face	4.0000 0.00 1.00	0.0000	116.0000	No Ice	6.9361	3.2893	0.06
						1/2" Ice	7.4389	3.9953	0.10
						Ice	7.9415	4.6615	0.16
						1" Ice	8.9779	6.0439	0.28
						2" Ice	11.1750	9.0230	0.65
						4" Ice			
APX16DWV-16DWV-S-E- ACU w/ Mount Pipe	C	From Face	4.0000 0.00 1.00	0.0000	116.0000	No Ice	6.9361	3.2893	0.06
						1/2" Ice	7.4389	3.9953	0.10
						Ice	7.9415	4.6615	0.16
						1" Ice	8.9779	6.0439	0.28
						2" Ice	11.1750	9.0230	0.65
						4" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
RR90-17-02DP w/ Mount Pipe	A	From Face	4.0000 0.00 1.00	0.0000	116.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.5931 5.0883 5.5778 6.5876 8.7306	3.3194 4.0888 4.7844 6.2255 9.3076	0.03 0.07 0.11 0.22 0.56
RR90-17-02DP w/ Mount Pipe	B	From Face	4.0000 0.00 1.00	0.0000	116.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.5931 5.0883 5.5778 6.5876 8.7306	3.3194 4.0888 4.7844 6.2255 9.3076	0.03 0.07 0.11 0.22 0.56
RR90-17-02DP w/ Mount Pipe	C	From Face	4.0000 0.00 1.00	0.0000	116.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.5931 5.0883 5.5778 6.5876 8.7306	3.3194 4.0888 4.7844 6.2255 9.3076	0.03 0.07 0.11 0.22 0.56
KRY 112 71/1	A	From Face	4.0000 0.00 1.00	0.0000	116.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.6806 0.8022 0.9325 1.2190 1.8956	0.4497 0.5590 0.6769 0.9388 1.5662	0.01 0.02 0.03 0.04 0.11
KRY 112 71/1	B	From Face	4.0000 0.00 1.00	0.0000	116.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.6806 0.8022 0.9325 1.2190 1.8956	0.4497 0.5590 0.6769 0.9388 1.5662	0.01 0.02 0.03 0.04 0.11
KRY 112 71/1	C	From Face	4.0000 0.00 1.00	0.0000	116.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.6806 0.8022 0.9325 1.2190 1.8956	0.4497 0.5590 0.6769 0.9388 1.5662	0.01 0.02 0.03 0.04 0.11
ONEBASE TWIN DUAL DUPLEX TMA	A	From Face	4.0000 0.00 1.00	0.0000	116.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.6737 0.7863 0.9075 1.1758 1.8162	0.3063 0.3916 0.4856 0.6995 1.2309	0.01 0.02 0.02 0.04 0.10
ONEBASE TWIN DUAL DUPLEX TMA	B	From Face	4.0000 0.00 1.00	0.0000	116.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.6737 0.7863 0.9075 1.1758 1.8162	0.3063 0.3916 0.4856 0.6995 1.2309	0.01 0.02 0.02 0.04 0.10
ONEBASE TWIN DUAL DUPLEX TMA	C	From Face	4.0000 0.00 1.00	0.0000	116.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.6737 0.7863 0.9075 1.1758 1.8162	0.3063 0.3916 0.4856 0.6995 1.2309	0.01 0.02 0.02 0.04 0.10
Side Arm Mount [SO 103- 3j]	C	None		0.0000	116.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	9.5000 11.8000 14.1000 18.7000 27.9000	9.5000 11.8000 14.1000 18.7000 27.9000	0.22 0.32 0.41 0.60 0.97
Side Arm Mount [SO 701- 3j]	C	None		0.0000	116.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.8300 3.9200 5.0100 7.1900 11.5500	2.8300 3.9200 5.0100 7.1900 11.5500	0.20 0.24 0.28 0.36 0.53

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
						4" Ice			
*** HBX-6516DS-VTM w/ Mount Pipe	A	From Face	4.0000 0.00 2.00	0.0000	106.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.5975 3.9981 4.4346 5.3677 7.3611	3.2406 3.9135 4.5638 5.9143 8.8773	0.03 0.06 0.10 0.20 0.50
HBX-6516DS-VTM w/ Mount Pipe	B	From Face	4.0000 0.00 2.00	0.0000	106.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.5975 3.9981 4.4346 5.3677 7.3611	3.2406 3.9135 4.5638 5.9143 8.8773	0.03 0.06 0.10 0.20 0.50
HBX-6516DS-VTM w/ Mount Pipe	C	From Face	4.0000 0.00 2.00	0.0000	106.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.5975 3.9981 4.4346 5.3677 7.3611	3.2406 3.9135 4.5638 5.9143 8.8773	0.03 0.06 0.10 0.20 0.50
ATM200-A20	A	From Face	4.0000 0.00 2.00	0.0000	106.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.2178 0.2921 0.3751 0.5669 1.0543	0.1633 0.2331 0.3115 0.4943 0.9636	0.00 0.00 0.01 0.02 0.06
ATM200-A20	B	From Face	4.0000 0.00 2.00	0.0000	106.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.2178 0.2921 0.3751 0.5669 1.0543	0.1633 0.2331 0.3115 0.4943 0.9636	0.00 0.00 0.01 0.02 0.06
ATM200-A20	C	From Face	4.0000 0.00 2.00	0.0000	106.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.2178 0.2921 0.3751 0.5669 1.0543	0.1633 0.2331 0.3115 0.4943 0.9636	0.00 0.00 0.01 0.02 0.06
T-Arm Mount [TA 602-3]	C	None		0.0000	106.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.5900 15.4400 19.2900 26.9900 42.3900	11.5900 15.4400 19.2900 26.9900 42.3900	0.77 0.99 1.21 1.64 2.50
*** 58532A	C	From Face	2.0000 0.00 0.00	0.0000	50.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.2209 0.2897 0.3672 0.5481 1.0137	0.2209 0.2897 0.3672 0.5481 1.0137	0.00 0.00 0.01 0.02 0.06
Platform Mount [LP 301-1]	C	None		0.0000	50.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	30.1000 40.8000 51.5000 72.9000 115.7000	30.1000 40.8000 51.5000 72.9000 115.7000	1.59 2.03 2.47 3.35 5.11
*** KS24019-L112A	B	From Face	2.0000 0.00 1.00	0.0000	47.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.1556 0.2247 0.3025 0.4840 0.9506	0.1556 0.2247 0.3025 0.4840 0.9506	0.01 0.01 0.01 0.02 0.06
Side Arm Mount [SO 701-	B	None		0.0000	47.0000	No Ice	0.8500	1.6700	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
1]					1/2" Ice	1.1400 1.4300	2.3400 3.0100	0.08 0.09
					1" Ice	2.0100	4.3500	0.12
					2" Ice	3.1700	7.0300	0.18
					4" Ice			

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K
VHLP2.5-11	A	Paraboloid w/Shroud (HP)	From Face	4.0000 0.00 4.00	0.0000		135.0000	2.9167	No Ice 6.6800 1/2" Ice 7.0700 1" Ice 7.4600 2" Ice 8.2300 4" Ice 9.7800	0.05 0.08 0.12 0.19 0.34
VHLP2.5-11	C	Paraboloid w/Shroud (HP)	From Face	4.0000 0.00 4.00	0.0000		135.0000	2.9167	No Ice 6.6800 1/2" Ice 7.0700 1" Ice 7.4600 2" Ice 8.2300 4" Ice 9.7800	0.05 0.08 0.12 0.19 0.34

Tower Pressures - No Ice

$$G_H = 1.690$$

Section Elevation ft	z ft	K _Z	q _Z psf	A _G ft ²	F a 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 160.0000- 150.5000	155.2500	1.556	25.50	15.833	A	0.000	15.833	15.833	100.00	0.000	0.000
					B	0.000	15.833		100.00	0.000	0.000
					C	0.000	15.833		100.00	0.000	4.455
L2 150.5000- 150.0000	150.2494	1.542	25.26	0.840	A	0.000	0.840	0.840	100.00	0.000	0.000
					B	0.000	0.840		100.00	0.000	0.000
					C	0.000	0.840		100.00	0.000	0.297
L3 150.0000- 119.0000	133.9278	1.492	24.43	60.650	A	0.000	60.650	60.650	100.00	0.000	0.000
					B	0.000	60.650		100.00	0.000	0.000
					C	0.000	60.650		100.00	0.000	21.802
L4 119.0000- 97.1667	107.8015	1.402	22.98	52.568	A	0.000	52.568	52.568	100.00	0.000	0.000
					B	0.000	52.568		100.00	0.000	0.000
					C	0.000	52.568		100.00	0.000	20.065
L5 97.1667- 90.5000	93.8070	1.348	22.08	17.364	A	0.000	17.364	17.364	100.00	0.000	0.000
					B	0.000	17.364		100.00	0.000	0.000
					C	0.000	17.364		100.00	0.000	6.127
L6 90.5000- 60.5000	75.0615	1.265	20.72	87.683	A	0.000	87.683	87.683	100.00	0.000	0.000
					B	0.000	87.683		100.00	0.000	0.000
					C	0.000	87.683		100.00	0.000	28.820
L7 60.5000- 55.0000	57.7366	1.173	19.22	17.743	A	0.000	17.743	17.743	100.00	0.000	0.000
					B	0.000	17.743		100.00	0.000	0.000
					C	0.000	17.743		100.00	0.000	5.284
L8 55.0000- 30.5000	42.5394	1.075	17.62	84.551	A	0.000	84.551	84.551	100.00	0.000	0.000
					B	0.000	84.551		100.00	0.000	0.000
					C	0.000	84.551		100.00	0.000	23.536

Section Elevation	z	K _z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			
L9 30.5000- 0.0000	14.9096	1	16.38	118.63 0	A	0.000	118.630	118.630	100.00	0.000	0.000
					B	0.000	118.630		100.00	0.000	0.000
					C	0.000	118.630		100.00	0.000	29.300

Tower Pressure - With Ice

$$G_H = 1.690$$

Section Elevation	z	K _z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	in	ft ²		ft ²	ft ²	ft ²		ft ²	ft ²
L1 160.0000- 150.5000	155.2500	1.556	5.63	1.2042	17.740	A	0.000	17.740	17.740	100.00	0.000	0.000
						B	0.000	17.740		100.00	0.000	0.000
						C	0.000	17.740		100.00	0.000	9.874
L2 150.5000- 150.0000	150.2494	1.542	5.58	1.1995	0.940	A	0.000	0.940	0.940	100.00	0.000	0.000
						B	0.000	0.940		100.00	0.000	0.000
						C	0.000	0.940		100.00	0.000	0.657
L3 150.0000- 119.0000	133.9278	1.492	5.40	1.1830	66.762	A	0.000	66.762	66.762	100.00	0.000	0.000
						B	0.000	66.762		100.00	0.000	0.000
						C	0.000	66.762		100.00	0.000	47.987
L4 119.0000- 97.1667	107.8015	1.402	5.08	1.1526	56.762	A	0.000	56.762	56.762	100.00	0.000	0.000
						B	0.000	56.762		100.00	0.000	0.000
						C	0.000	56.762		100.00	0.000	45.790
L5 97.1667- 90.5000	93.8070	1.348	4.88	1.1336	18.645	A	0.000	18.645	18.645	100.00	0.000	0.000
						B	0.000	18.645		100.00	0.000	0.000
						C	0.000	18.645		100.00	0.000	13.982
L6 90.5000- 60.5000	75.0615	1.265	4.58	1.1036	93.201	A	0.000	93.201	93.201	100.00	0.000	0.000
						B	0.000	93.201		100.00	0.000	0.000
						C	0.000	93.201		100.00	0.000	62.665
L7 60.5000- 55.0000	57.7366	1.173	4.25	1.0694	18.724	A	0.000	18.724	18.724	100.00	0.000	0.000
						B	0.000	18.724		100.00	0.000	0.000
						C	0.000	18.724		100.00	0.000	11.296
L8 55.0000- 30.5000	42.5394	1.075	3.89	1.0309	88.760	A	0.000	88.760	88.760	100.00	0.000	0.000
						B	0.000	88.760		100.00	0.000	0.000
						C	0.000	88.760		100.00	0.000	49.356
L9 30.5000- 0.0000	14.9096	1	3.62	1.0000	123.714	A	0.000	123.714	123.714	100.00	0.000	0.000
						B	0.000	123.714		100.00	0.000	0.000
						C	0.000	123.714		100.00	0.000	60.478

Tower Pressure - Service

$$G_H = 1.690$$

Section Elevation	z	K _z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²		ft ²	ft ²
L1 160.0000- 150.5000	155.2500	1.556	9.96	15.833	A	0.000	15.833	15.833	100.00	0.000	0.000
					B	0.000	15.833		100.00	0.000	0.000
					C	0.000	15.833		100.00	0.000	4.455
L2 150.5000- 150.0000	150.2494	1.542	9.87	0.840	A	0.000	0.840	0.840	100.00	0.000	0.000
					B	0.000	0.840		100.00	0.000	0.000
					C	0.000	0.840		100.00	0.000	0.297
L3 150.0000- 119.0000	133.9278	1.492	9.54	60.650	A	0.000	60.650	60.650	100.00	0.000	0.000
					B	0.000	60.650		100.00	0.000	0.000
					C	0.000	60.650		100.00	0.000	21.802
L4 119.0000- 97.1667	107.8015	1.402	8.98	52.568	A	0.000	52.568	52.568	100.00	0.000	0.000
					B	0.000	52.568		100.00	0.000	0.000
					C	0.000	52.568		100.00	0.000	20.065

Section Elevation ft	z ft	K _z	q _z psf	A _G ft ²	F a 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
L5 97.1667- 90.5000	93.8070	1.348	8.63	17.364	A	0.000	17.364	17.364	100.00	0.000	0.000
					B	0.000	17.364		100.00	0.000	0.000
					C	0.000	17.364		100.00	0.000	6.127
L6 90.5000- 60.5000	75.0615	1.265	8.09	87.683	A	0.000	87.683	87.683	100.00	0.000	0.000
					B	0.000	87.683		100.00	0.000	0.000
					C	0.000	87.683		100.00	0.000	28.820
L7 60.5000- 55.0000	57.7366	1.173	7.51	17.743	A	0.000	17.743	17.743	100.00	0.000	0.000
					B	0.000	17.743		100.00	0.000	0.000
					C	0.000	17.743		100.00	0.000	5.284
L8 55.0000- 30.5000	42.5394	1.075	6.88	84.551	A	0.000	84.551	84.551	100.00	0.000	0.000
					B	0.000	84.551		100.00	0.000	0.000
					C	0.000	84.551		100.00	0.000	23.536
L9 30.5000- 0.0000	14.9096	1	6.40	118.630	A	0.000	118.630	118.630	100.00	0.000	0.000
				0	B	0.000	118.630		100.00	0.000	0.000
					C	0.000	118.630		100.00	0.000	29.300

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 150.5	54.056	37	3.1072	0.0053
L2	150.5 - 150	47.896	37	3.0780	0.0049
L3	150 - 119	47.574	37	3.0745	0.0049
L4	119 - 97.1667	29.214	37	2.4624	0.0029
L5	102 - 90.5	21.178	37	2.0389	0.0021
L6	90.5 - 60.5	16.487	37	1.8289	0.0017
L7	60.5 - 55	7.118	37	1.1532	0.0010
L8	55 - 30.5	5.858	37	1.0361	0.0009
L9	30.5 - 0	1.762	37	0.5604	0.0004

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
158.0000	SBNH-1D6565C w/ Mount Pipe	37	52.755	3.1046	0.0058	16732
149.0000	(2) LPA-80063/4CF w/ Mount Pipe	37	46.932	3.0667	0.0053	6418
139.0000	VHLP2.5-11	37	40.641	2.9320	0.0046	3558
135.0000	LLPX310R-V1 w/ Mount Pipe	37	38.211	2.8543	0.0043	3056
132.0000	800MHz 2X50W RRH W/FILTER	37	36.430	2.7892	0.0040	2764
126.0000	(3) DB844H90E-XY w/ Mount Pipe	37	32.990	2.6452	0.0035	2320
116.0000	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	37	27.684	2.3820	0.0028	2085
106.0000	HBX-6516DS-VTM w/ Mount Pipe	37	22.941	2.1268	0.0022	2651
50.0000	58532A	37	4.814	0.9342	0.0008	3026
47.0000	KS24019-L112A	37	4.235	0.8746	0.0007	2893

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 150.5	137.320	6	7.9041	0.0135

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L2	150.5 - 150	121.726	6	7.8303	0.0129
L3	150 - 119	120.911	6	7.8215	0.0128
L4	119 - 97.1667	74.366	6	6.2720	0.0075
L5	102 - 90.5	53.947	6	5.1959	0.0053
L6	90.5 - 60.5	42.011	6	4.6617	0.0045
L7	60.5 - 55	18.154	6	2.9411	0.0025
L8	55 - 30.5	14.940	6	2.6426	0.0022
L9	30.5 - 0	4.495	6	1.4298	0.0011

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
158.0000	SBNH-1D6565C w/ Mount Pipe	6	134.026	7.8974	0.0142	6834
149.0000	(2) LPA-80063/4CF w/ Mount Pipe	6	119.285	7.8016	0.0131	2623
139.0000	VHLP2.5-11	6	103.350	7.4605	0.0115	1452
135.0000	LLPX310R-V1 w/ Mount Pipe	6	97.193	7.2639	0.0107	1244
132.0000	800MHz 2X50W RRH W/FILTER	6	92.677	7.0993	0.0101	1123
126.0000	(3) DB844H90E-XY w/ Mount Pipe	6	83.950	6.7351	0.0089	940
116.0000	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	6	70.481	6.0679	0.0070	840
106.0000	HBX-6516DS-VTM w/ Mount Pipe	6	58.429	5.4193	0.0057	1063
50.0000	58532A	6	12.280	2.3829	0.0019	1192
47.0000	KS24019-L112A	6	10.803	2.2309	0.0018	1139

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
L1	160 - 150.5 (1)	TP20x20x0.25	9.5000	0.0000	0.0	21.000	15.5116	-2.43	325.74	0.007
L2	150.5 - 150 (2)	TP20.3x20x0.25	0.5000	0.0000	0.0	21.000	15.7472	-2.45	330.69	0.007
L3	150 - 119 (3)	TP26.6545x20.3x0.25	31.0000	0.0000	0.0	39.000	21.2556	-8.71	828.97	0.011
L4	119 - 97.1667 (4)	TP31.13x26.6545x0.3512	21.8333	0.0000	0.0	37.758	33.6862	-12.64	1271.92	0.010
L5	97.1667 - 90.5 (5)	TP31.9973x29.4368x0.472	11.5000	0.0000	0.0	37.806	47.9115	-15.48	1811.34	0.009
L6	90.5 - 60.5 (6)	TP38.149x31.9973x0.4827	30.0000	0.0000	0.0	37.722	58.5468	-22.56	2208.50	0.010
L7	60.5 - 55 (7)	TP39.2768x38.149x0.5056	5.5000	0.0000	0.0	39.000	63.1157	-24.04	2461.51	0.010
L8	55 - 30.5 (8)	TP43.5485x39.2768x0.555	24.5000	0.0000	0.0	39.000	76.8774	-33.19	2998.22	0.011
L9	30.5 - 0 (9)	TP49.8x43.5485x0.5594	30.5000	0.0000	0.0	39.000	88.6924	-43.73	3459.00	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x kip-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
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Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	160 - 150.5 (1)	TP20x20x0.25	47.83	7.583	23.100	0.328	0.00	0.000	23.100	0.000
L2	150.5 - 150 (2)	TP20.3x20x0.25	50.82	7.816	23.100	0.338	0.00	0.000	23.100	0.000
L3	150 - 119 (3)	TP26.6545x20.3x0.25	518.89	45.450	39.000	1.165	0.00	0.000	39.000	0.000
L4	119 - 97.1667 (4)	TP31.13x26.6545x0.3512	925.77	45.459	37.758	1.204	0.00	0.000	37.758	0.000
L5	97.1667 - 90.5 (5)	TP31.9973x29.4368x0.47 2	1234.5 0	40.399	37.806	1.069	0.00	0.000	37.806	0.000
L6	90.5 - 60.5 (6)	TP38.149x31.9973x0.482 7	2123.2 5	47.490	37.722	1.259	0.00	0.000	37.722	0.000
L7	60.5 - 55 (7)	TP39.2768x38.149x0.505 6	2299.3 6	46.357	39.000	1.189	0.00	0.000	39.000	0.000
L8	55 - 30.5 (8)	TP43.5485x39.2768x0.55 53	3148.9 3	46.996	39.000	1.205	0.00	0.000	39.000	0.000
L9	30.5 - 0 (9)	TP49.8x43.5485x0.5594	4308.6 8	48.592	39.000	1.246	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	160 - 150.5 (1)	TP20x20x0.25	5.96	0.384	14.000	0.055	0.03	0.002	14.000	0.000
L2	150.5 - 150 (2)	TP20.3x20x0.25	6.01	0.382	14.000	0.055	0.03	0.002	14.000	0.000
L3	150 - 119 (3)	TP26.6545x20.3x0.25	21.01	0.989	26.000	0.077	0.72	0.030	26.000	0.001
L4	119 - 97.1667 (4)	TP31.13x26.6545x0.3512	26.01	0.772	25.172	0.062	1.05	0.024	25.172	0.001
L5	97.1667 - 90.5 (5)	TP31.9973x29.4368x0.47 2	27.68	0.578	25.204	0.047	1.16	0.018	25.204	0.001
L6	90.5 - 60.5 (6)	TP38.149x31.9973x0.482 7	31.71	0.542	25.148	0.044	1.48	0.016	25.148	0.001
L7	60.5 - 55 (7)	TP39.2768x38.149x0.505 6	32.41	0.514	26.000	0.040	1.54	0.015	26.000	0.001
L8	55 - 30.5 (8)	TP43.5485x39.2768x0.55 53	36.41	0.474	26.000	0.037	1.81	0.013	26.000	0.000
L9	30.5 - 0 (9)	TP49.8x43.5485x0.5594	39.77	0.448	26.000	0.035	2.16	0.011	26.000	0.000

Pole Interaction Design Data

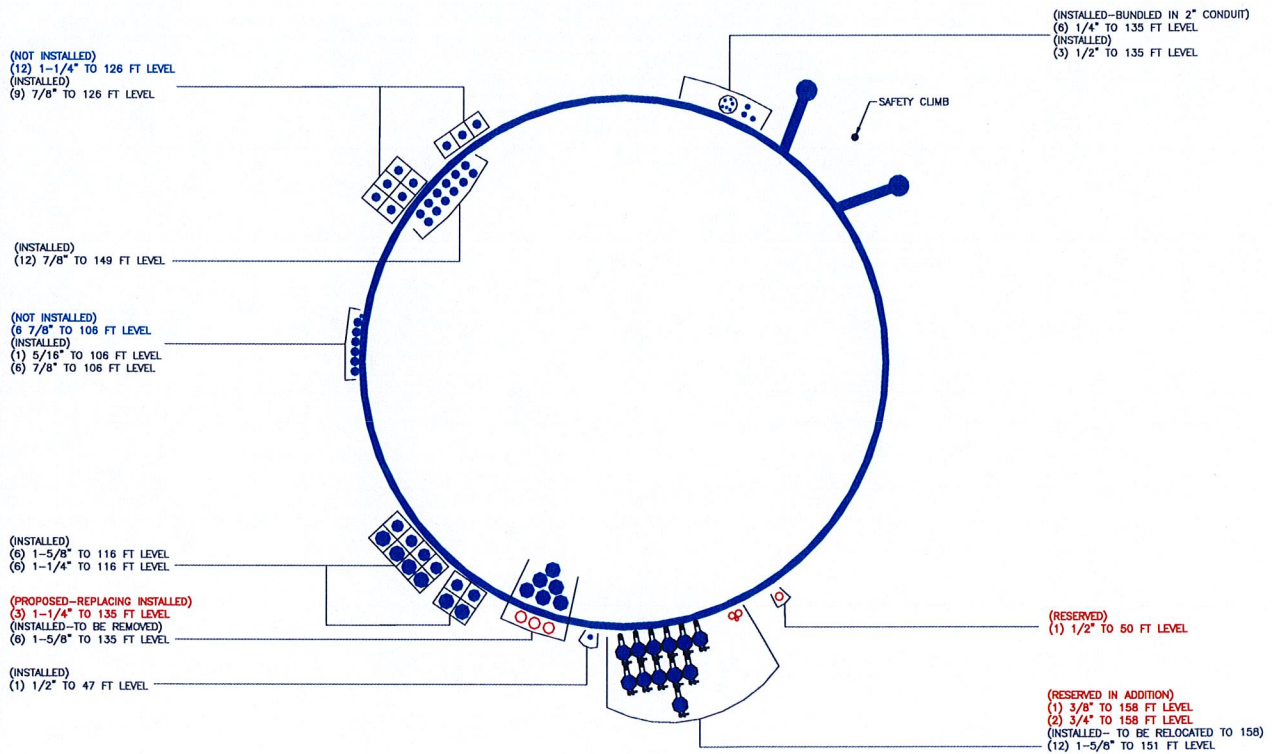
Section No.	Elevation ft	Ratio P P_a	Ratio f_{bx} F_{bx}	Ratio f_{by} F_{by}	Ratio f_v F_v	Ratio f_{vt} F_{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	160 - 150.5 (1)	0.007	0.328	0.000	0.055	0.000	0.336	1.333	H1-3+VT ✓
L2	150.5 - 150 (2)	0.007	0.338	0.000	0.055	0.000	0.347	1.333	H1-3+VT ✓
L3	150 - 119 (3)	0.011	1.165	0.000	0.077	0.001	1.177	1.333	H1-3+VT ✓
L4	119 - 97.1667 (4)	0.010	1.204	0.000	0.062	0.001	1.215	1.333	H1-3+VT ✓
L5	97.1667 - 90.5 (5)	0.009	1.069	0.000	0.047	0.001	1.078	1.333	H1-3+VT ✓
L6	90.5 - 60.5 (6)	0.010	1.259	0.000	0.044	0.001	1.270	1.333	H1-3+VT ✓
L7	60.5 - 55 (7)	0.010	1.189	0.000	0.040	0.001	1.199	1.333	H1-3+VT ✓

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L8	55 - 30.5 (8)	0.011	1.205	0.000	0.037	0.000	1.216	1.333	H1-3+VT ✓
L9	30.5 - 0 (9)	0.013	1.246	0.000	0.035	0.000	1.259	1.333	H1-3+VT ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
L1	160 - 150.5	Pole	TP20x20x0.25	1	-2.43	434.22	25.2	Pass
L2	150.5 - 150	Pole	TP20.3x20x0.25	2	-2.45	440.81	26.0	Pass
L3	150 - 119	Pole	TP26.6545x20.3x0.25	3	-8.71	1105.02	88.3	Pass
L4	119 - 97.1667	Pole	TP31.13x26.6545x0.3512	4	-12.64	1695.47	91.1	Pass
L5	97.1667 - 90.5	Pole	TP31.9973x29.4368x0.472	5	-15.48	2414.52	80.8	Pass
L6	90.5 - 60.5	Pole	TP38.149x31.9973x0.4827	6	-22.56	2943.93	95.2	Pass
L7	60.5 - 55	Pole	TP39.2768x38.149x0.5056	7	-24.04	3281.19	89.9	Pass
L8	55 - 30.5	Pole	TP43.5485x39.2768x0.5553	8	-33.19	3996.63	91.3	Pass
L9	30.5 - 0	Pole	TP49.8x43.5485x0.5594	9	-43.73	4610.85	94.4	Pass
							Summary	
							Pole (L6)	95.2 Pass
							RATING =	95.2 Pass

APPENDIX B BASE LEVEL DRAWING

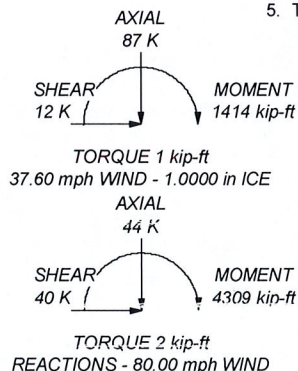


APPENDIX C
ADDITIONAL CALCULATIONS

TYPE	ELEVATION	TYPE	ELEVATION
SBNH-1D6565C w/ Mount Pipe	158	Platform Mount [LP 602-1]	135
SBNH-1D6565C w/ Mount Pipe	158	VHLP2.5-11	135
SBNH-1D6565C w/ Mount Pipe	158	VHLP2.5-11	135
(2) 7770.00 w/ Mount Pipe	158	800MHz 2X50W RRH W/FILTER	132
(2) 7770.00 w/ Mount Pipe	158	PCS 1900MHz 4x45W-65MHz	132
(2) 7770.00 w/ Mount Pipe	158	PCS 1900MHz 4x45W-65MHz	132
DC6-48-60-18-8F	158	PCS 1900MHz 4x45W-65MHz	132
(2) RRUS-11	158	Side Arm Mount [SO 102-3]	132
(2) RRUS-11	158	800MHz 2X50W RRH W/FILTER	132
(2) RRUS-11	158	800MHz 2X50W RRH W/FILTER	132
(2) LGP13519	158	(3) DB844H90E-XY w/ Mount Pipe	126
(2) LGP13519	158	T-Arm Mount [TA 901-3]	126
(2) LGP13519	158	(3) DB844H90E-XY w/ Mount Pipe	126
(2) LGP21401	158	(3) DB844H90E-XY w/ Mount Pipe	126
(2) LGP21401	158	APX16DWW-16DWW-S-E-ACU w/ Mount Pipe	116
(2) LGP21401	158		
Platform Mount [LP 301-1]	158	RR90-17-02DP w/ Mount Pipe	116
(2) LPA-80063/4CF w/ Mount Pipe	149	RR90-17-02DP w/ Mount Pipe	116
(2) LPA-80080/4CF w/ Mount Pipe	149	RR90-17-02DP w/ Mount Pipe	116
(2) LPA-80080/4CF w/ Mount Pipe	149	KRY 112 71/1	116
BXA-70063/6CFx6 w/ Mount Pipe	149	KRY 112 71/1	116
BXA-70063/6CFx4 w/ Mount Pipe	149	KRY 112 71/1	116
BXA-70063/6CFx4 w/ Mount Pipe	149	ONEBASE TWIN DUAL DUPLEX TMA	116
BXA-185063/8CF w/ Mount Pipe	149	ONEBASE TWIN DUAL DUPLEX TMA	116
BXA-185090/8CFx2 w/ Mount Pipe	149	ONEBASE TWIN DUAL DUPLEX TMA	116
BXA-185090/8CFx2 w/ Mount Pipe	149	Side Arm Mount [SO 103-3]	116
(2) FD9R6004/2C-3L	149	Side Arm Mount [SO 701-3]	116
(2) FD9R6004/2C-3L	149	APX16DWW-16DWW-S-E-ACU w/ Mount Pipe	116
(2) FD9R6004/2C-3L	149	APX16DWW-16DWW-S-E-ACU w/ Mount Pipe	116
Platform Mount [LP 602-1]	149		
LLPX310R-V1 w/ Mount Pipe	135	HBX-6516DS-VTM w/ Mount Pipe	106
LLPX310R-V1 w/ Mount Pipe	135	ATM200-A20	106
LLPX310R-V1 w/ Mount Pipe	135	ATM200-A20	106
WIMAX DAP HEAD	135	ATM200-A20	106
WIMAX DAP HEAD	135	T-Arm Mount [TA 602-3]	106
WIMAX DAP HEAD	135	HBX-6516DS-VTM w/ Mount Pipe	106
HORIZON COMPACT	135	HBX-6516DS-VTM w/ Mount Pipe	106
HORIZON COMPACT	135	58532A	50
TIMING 2000	135		
APXVSP18-C-A20 w/ Mount Pipe	135	Platform Mount [LP 301-1]	50
APXV9ERR18-C-A20 w/ Mount Pipe	135	KS24019-L112A	47
APXVSP18-C-A20 w/ Mount Pipe	135	Side Arm Mount [SO 701-1]	47

GRADE		Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	Reinf 63.01 ksi	63 ksi		79 ksi
A572-65	65 ksi	80 ksi	Reinf 62.87 ksi	63 ksi		79 ksi
Reinf 62.93 ksi	63 ksi	79 ksi	Reinf 65.00 ksi	65 ksi		65 ksi

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80.00 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 37.60 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50.00 mph wind.
5. TOWER RATING: 95.2%



Paul J. Ford and Company
 250 East Broad Street, Suite 1500
 Columbus, Ohio 43215
 Phone: (614) 221-6679
 FAX: (614) 448-4118



PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

Page 1 of 1
By KAT Date 10/25/2012
Project 37512-1571 R1
Client Crown Castle
PROJ# 806373

Stilt Extension Connection

@ 150' elevation

Assume 3 legs w/ 22.54" Channel Circle

Revision = F

Reactions from TNXTower:

Moment = 50.82 k-ft

Axial = 2.45 kips

Shear = 6.01 kips

Unbraced length = 12 in.

K = 1

Top Pole Shaft Diameter = 20.3 in.

Number of Bolt Rows (N) = 6 Even Number

Bolt Spacing (S) = 3

Allowable Stress Increase = 1.33333

$$I = \frac{N * (B.C.)^2}{8}$$

$$I = 190.5 \text{ in}^2$$

$$M_y/I = 36.1 \text{ kips}$$

$$\text{Axial/leg} = 0.8167 \text{ kips}$$

$$T = 35.3 \text{ kips}$$

$$C = 36.9 \text{ kips}$$

$$M = 72.12 \text{ k-in}$$

$$x = 1.12 \text{ in}$$

$$A = 8.37 \text{ in}^2$$

$$r = 1.16 \text{ in}$$

$$S = 3.99 \text{ in}^3$$

$$Z = 7.59 \text{ in}^3$$

$$I = 11.3 \text{ in}^4$$

Using MC10X28.5

Fy = 50 ksi

Available Strength in Axial Compression

$$Kl/r = 10.34 \quad C_c = 107.00$$

$$Kl/rC_c = 0.097$$

$$C_A = 0.551 \text{ Use Table 3 on page 5-119 of Green Book}$$

$$F_a = 36.73 \text{ ksi} \quad F_a = 4/3 * F_y * C_c$$

$$P = 36.07 \text{ kips} \quad P = T + \text{Axial} / \# \text{legs}$$

$$f_a = 4.31 \text{ ksi} \quad f_a = P/A$$

$$\text{Ratio} = 11.7\%$$

Available Flexural Strength

$$F_b = 40.00 \text{ ksi} \quad F_b = 4/3 * 0.6 * F_y$$

$$M_b = 24.04 \text{ kip-in} \quad M_b = \text{Shear} * l_u / \# \text{legs}$$

$$f_b = 6.03 \text{ ksi} \quad f_b = M_b / S$$

$$\text{Ratio} = 15.1\%$$

Combined Strength

$$f_a/F_a = 0.12 < 0.15 \text{ Use H1-3 of Green Book}$$

$$F_e' = 1860.559 \text{ ksi}$$

Eqn H1-1

Eqn H1-2

$$\text{Eqn H1-3} \quad 0.2680$$

$$\text{Ratio} = 26.8\%$$

Bolt Check

$$\text{Tension Force } (T_{\text{applied}}) = 36.074534$$

$$\text{Eccentricity } (e) = 1.12$$

$$V_{\text{allow}} (\text{Ajax Bolt}) = 31.0 \text{ kips}$$

$$T_{\text{allow}} (\text{Ajax Bolt}) = 12.0 \text{ kips}$$

$$\text{Sum } r^2 = 157.5$$

$$R_y (\text{Shear Force}) = 6.012$$

$$R_x (\text{Tension Force}) = 3.069$$

$$\text{Stress Ratio} = 16.8\%$$



PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
 250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708
 Phone 614-221-6679 • Fax 614-448-4105 • www.PJFweb.com

Date: 7/24/2012

PJF Project: 37512-1571 R1

Client Ref. # BU 806373

Site Name: HRT 101 943232

Description: 151-ft pole w/ 10-ft propped extension

Owner: CROWN

Engineer: KAT

v4.1 - Effective 7-3-12

Asymmetric Anchor Rod Analysis

Moment = 4309 k-ft
 Axial = 44.0 kips
 Shear = 40.0 kips
 Anchor Qty = 19

TIA Ref. F
 ASIF = 1.3333
 Max Ratio = 100.0%

Location = Base Plate
 η = N/A for BP, Rev. G Sect. 4.9.9
 Threads = N/A for FP, Rev. G

**** For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. ****

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in ²	Area, in ²	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	2.250	#18J A615 Gr 75	75	100	0.0	58.06	0.00	3.98	186.70	182.06	182.06	0.00	195.00	93.4%
2	2.250	#18J A615 Gr 75	75	100	22.5	58.06	0.00	3.98	182.86	178.22	178.22	0.00	195.00	91.4%
3	2.250	#18J A615 Gr 75	75	100	45.0	58.06	0.00	3.98	180.59	175.96	175.96	0.00	195.00	90.2%
4	2.250	#18J A615 Gr 75	75	100	67.5	58.06	0.00	3.98	180.89	176.26	176.26	0.00	195.00	90.4%
5	2.250	#18J A615 Gr 75	75	100	90.0	58.06	0.00	3.98	183.17	178.54	178.54	0.00	195.00	91.6%
6	2.250	#18J A615 Gr 75	75	100	112.5	58.06	0.00	3.98	185.72	181.09	181.09	0.00	195.00	92.9%
7	2.250	#18J A615 Gr 75	75	100	135.0	58.06	0.00	3.98	186.84	182.21	182.21	0.00	195.00	93.4%
8	2.250	#18J A615 Gr 75	75	100	157.5	58.06	0.00	3.98	185.81	181.18	181.18	0.00	195.00	92.9%
9	2.250	#18J A615 Gr 75	75	100	180.0	58.06	0.00	3.98	183.30	178.66	178.66	0.00	195.00	91.6%
10	2.250	#18J A615 Gr 75	75	100	202.5	58.06	0.00	3.98	180.96	176.33	176.33	0.00	195.00	90.4%
11	2.250	#18J A615 Gr 75	75	100	225.0	58.06	0.00	3.98	180.55	175.92	175.92	0.00	195.00	90.2%
12	2.250	#18J A615 Gr 75	75	100	247.5	58.06	0.00	3.98	182.71	178.08	178.08	0.00	195.00	91.3%
13	2.250	#18J A615 Gr 75	75	100	270.0	58.06	0.00	3.98	186.52	181.89	181.89	0.00	195.00	93.3%
14	2.250	#18J A615 Gr 75	75	100	292.5	58.06	0.00	3.98	190.04	185.41	185.41	0.00	195.00	95.1%
15	2.250	#18J A615 Gr 75	75	100	315.0	58.06	0.00	3.98	191.50	186.87	186.87	0.00	195.00	95.8%
16	2.250	#18J A615 Gr 75	75	100	337.5	58.06	0.00	3.98	190.16	185.53	185.53	0.00	195.00	95.1%
17	2.250	A193 Gr B7	105	125	22.5	63.00	0.00	3.98	197.94	193.31	193.31	0.00	218.68	88.4%
18	2.250	A193 Gr B7	105	125	135.5	63.00	0.00	3.98	202.54	197.91	197.91	0.00	218.68	90.5%
19	2.250	A193 Gr B7	105	125	248.5	63.00	0.00	3.98	197.94	193.31	193.31	0.00	218.68	88.4%

75.61

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

TIA Rev F

Site Data

BU#:	806373
Site Name:	HRT 101 943232
App #:	
Pole Manufacturer:	Other

Anchor Rod Data

Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	58.06	in

Plate Data

Diam:	64.06	in
Thick:	2.75	in
Grade:	60	ksi
Single-Rod B-eff:	10.01	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:	49.8	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF:	1.333
-------	-------

Reactions

Moment:	3661.4	ft-kips	Reactions modified to account for post-installed anchors
Axial:	37.1	kips	
Shear:	33.7	kips	

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

Anchor Rod Results

Maximum Rod Tension: 186.9 Kips
 Allowable Tension: 195.0 Kips
 Anchor Rod Stress Ratio: 95.9% **Pass**

Rigid
Service ASD
Fty*ASIF

Base Plate Results

Base Plate Stress: 39.1 ksi
 Allowable Plate Stress: 60.0 ksi
 Base Plate Stress Ratio: 65.2% **Pass**

Flexural Check

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length:
29.85

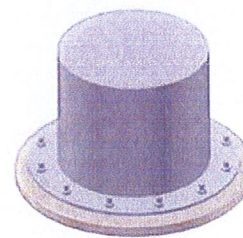
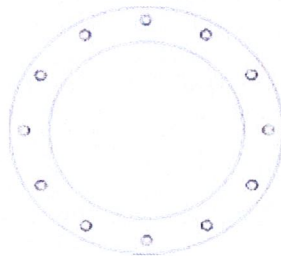
n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a



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

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



DRILLED PIER SOIL AND STEEL ANALYSIS - TIA/EIA-222-F

Unfactored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, M =	4309.0		k-ft
Shear, V =	40.0		kips
Axial Load, P =	44.0		kips
OTM =	4349.0	0.0	k-ft @ Ground

Safety Factors / Load Factors / ϕ Factors

Tower Type =	Monopole DP
ACI Code =	ACI 318-02
Seismic Design Category =	D
Reference Standard =	TIA/EIA-222-F
Use 1.3 Load Factor?	Yes
Load Factor =	1.30

Drilled Pier Parameters

Diameter =	7	ft
Height Above Grade =	1	ft
Depth Below Grade =	24.5	ft
fc' =	3	ksi
ec =	0.003	in/in
Mat Ftdn. Cap Width =		ft
Mat Ftdn. Cap Length =		ft
Depth Below Grade =		ft

	Safety Factor	ϕ Factor
Soil Lateral Resistance =	2.00	0.75
Skin Friction =	2.00	0.75
End Bearing =	2.00	0.75
Concrete Wt. Resist Uplift =	1.25	

Load Combinations Checked per TIA/EIA-222-F

- Ult. Skin Friction/2.00 + Ult. End Bearing/2.00
+ Effective Soil Wt. - Buoyant Conc. Wt. $\geq$ Compression
- Ult. Skin Friction/2.00 + Buoyant Conc. Wt./1.25 $\geq$ Uplift
- Ult. Skin Friction/1.50 + Buoyant Conc. Wt./1.50 $\geq$ Uplift

Steel Parameters

Number of Bars =	36
Rebar Size =	#11
Rebar Fy =	60 ksi
Rebar MOE =	29000 ksi
Tie Size =	#4
Side Clear Cover to Ties =	3 in

Soil Parameters

Water Table Depth =	5.00	ft
Depth to Ignore Soil =	3.50	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?	Ground	
Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)		
Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)		

Direct Embed Pole Shaft Parameters

Dia @ Grade =		in
Dia @ Depth Below Grade =		in
Number of Sides =		
Thickness =		in
Fy =		ksi
Backfill Condition =		

Maximum Capacity Ratios

Maximum Soil Ratio =	100.0%
Maximum Steel Ratio =	100.0%

Define Soil Layers

Note: Cohesion = Undrained Shear Strength = Unconfined Compressive Strength / 2

Layer	Thickness ft	Unit Weight pcf	Cohesion psf	Friction Angle degrees	Soil Type	Ultimate End Bearing psf	Comp. Ult. Skin Friction psf	Tension Ult. Skin Friction psf	Depth ft
1	3.5	100							3.5
2	0.5	100	0	28	Sand	78000			4
3	1	125	0	42	Sand	78000			5
4	26.5	127.4	0	42	Sand	78000			31.5
5									
6									
7									
8									
9									
10									
11									
12									

Soil Results: Overturning

Depth to COR =	17.36	ft, from Grade
Bending Moment, M =	5043.28	k-ft, from COR
Resisting Moment, Ma =	5807.55	k-ft, from COR

MOMENT RATIO = 86.8% OK

Shear, V =	40.00	kips
Resisting Shear, Va =	46.06	kips

SHEAR RATIO = 86.8% OK

Soil Results: Uplift

Uplift, T =	0.00	kips
Allowable Uplift Cap., Ta =	80.30	kips

UPLIFT RATIO = 0.0% OK

Soil Results: Compression

Compression, C =	44.00	kips
Allowable Comp. Cap., Ca =	1469.50	kips

COMPRESSION RATIO = 3.0% OK

Steel Results (ACI 318-02):

Minimum Steel Area =	18.47	sq in
Actual Steel Area =	56.16	sq in

Allowable Min Axial, Pa =	-2332.80	kips, Where Ma = 0 k-ft
Allowable Max Axial, Pa =	6943.16	kips, Where Ma = 0 k-ft

Axial Load, P =	79.48	kips @ 5.25 ft Below Grade
Moment, M =	4535.68	k-ft @ 5.25 ft Below Grade
Allowable Moment, Ma =	6573.05	k-ft

MOMENT RATIO = 69.0% OK

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: 806373	
Site Name: HRT 101 943232	
App #:	

Enter Load Factors Below:

For M (WL)	1.3	<---- Enter Factor
For P (DL)	1.3	<---- Enter Factor

Pier Properties

Concrete:

Pier Diameter = 7.0 ft
Concrete Area = 5541.8 in²

Reinforcement:

Clear Cover to Tie = 3.00 in
Horiz. Tie Bar Size = 4
Vert. Cage Diameter = 6.30 ft
Vert. Cage Diameter = 75.59 in
Vertical Bar Size = 11
Bar Diameter = 1.41 in
Bar Area = 1.56 in²
Number of Bars = 36
As Total = 56.16 in²
A s/ Aconc, Rho: 0.0101 1.01%

ACI 10.5, ACI 21.10.4, and IBC 1810.

Min As for Flexural, Tension Controlled, Shafts:

(3)*(Sqrt(f'c)/Fy: 0.0027
200 / Fy: 0.0033

Minimum Rho Check:

Actual Req'd Min. Rho: 0.33% Flexural
Provided Rho: 1.01% **OK**

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = ($\phi=0.65$) Pn:		
Pn per ACI 318 (10-2)	9026.11	kips
at Mu=($\phi=0.65$)Mn=	5472.88	ft-kips
Max Tu, ($\phi=0.9$) Tn =	3032.64	kips
at Mu= $\phi=(0.90)$ Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces

TIA Revision:	F	
Max. Service Shaft M:	4535.68	ft-kips (* Note)
Max. Service Shaft P:	79.48	kips
Max Axial Force Type:	Comp.	

(* Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

Load Factor	Shaft Factored Loads	
1.30	Mu:	5896.384 ft-kips
1.30	Pu:	103.324 kips

Material Properties

Concrete Comp. strength, f'c = 3000 psi
Reinforcement yield strength, Fy = 60 ksi
Reinforcing Modulus of Elasticity, E = 29000 ksi
Reinforcement yield strain = 0.00207
Limiting compressive strain = 0.003

ACI 318 Code

Select Analysis ACI Code = 2002

Seismic Properties

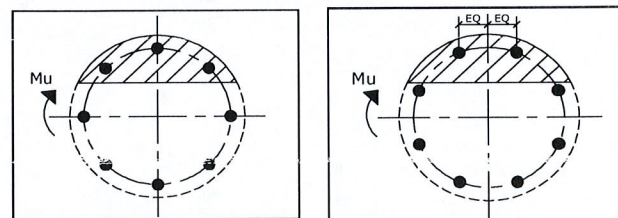
Seismic Design Category = D
Seismic Risk = High

Solve
(Run)

<-- Press Upon Completing All Input

Results:

Governing Orientation Case: 2



Case 1

Case 2

Dist. From Edge to Neutral Axis: 17.65 in

Extreme Steel Strain, ϵ_t : 0.0105

$\epsilon_t > 0.0050$, Tension Controlled

Reduction Factor, ϕ : 0.900

Output Note: Negative Pu=Tension

For Axial Compression, ϕ Pn = Pu: 103.32 kips
Drilled Shaft Moment Capacity, ϕ Mn: 8544.97 ft-kips
Drilled Shaft Superimposed Mu: 5896.38 ft-kips

(Mu/ ϕ Mn, Drilled Shaft Flexure CSR: 69.0%

SHEET INDEX	
NO.	DESCRIPTION
T1	TITLE SHEET
C1	GENERAL NOTES
C2	COMPOUND SITE PLAN & ELEVATION
C3	EQUIPMENT SITE PLANS
C4	EQUIPMENT DETAILS
C5	ANTENNA PLANS
C6	ANTENNA CABLE RISER
C7	EQUIPMENT DETAILS
C8	RF AND CABLE DETAILS
C9	FIBER DISTRIBUTION BOX DETAILS
E1	UTILITY SITE PLAN
E2	DETAILS
E3	GROUNDING PLAN AND DETAILS

DRIVING DIRECTIONS

1. HEAD NORTH ON INTERNATIONAL BLVD/PARK ST TOWARD QUEENSLAND RD.
2. TAKE THE 3RD RIGHT ONTO PARK LN.
3. CONTINUE STRAIGHT ONTO LEISURE LN.
4. CONTINUE ONTO NJ-17 N.
5. TAKE THE NEW JERSEY 17 N/INTERSTATE 287 N EXIT TOWARD INTERSTATE 87/NORTH Y. THRUWAY.
6. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR I-287 N/I-87/NJ-17 N/NY. THRUWAY AND MERGE ONTO I-287 N/NJ-17 N.
7. KEEP RIGHT AT THE FORK, FOLLOW SIGNS FOR I-87 S/I-287/TAPPAN ZEE BR/NEW YORK CITY/NEW YORK THRUWAY AND MERGE ONTO I-287 E/I-87 S.
8. TAKE THE EXIT ONTO I-95 N.
9. TAKE EXIT 48 ON THE LEFT TO MERGE ONTO I-91 N TOWARD HARTFORD.
10. TAKE EXIT 46 FOR US-5/KING ST.
11. TURN RIGHT ONTO U.S. ROUTE 5 N/KING ST/US-5 N.
12. TAKE THE 1ST RIGHT ONTO OLIVER RD.

DESTINATION WILL BE ON THE RIGHT.

VICINITY MAP



Sprint



NETWORK VISION MMBTS LAUNCH
NORTHERN CONNECTICUT MARKET

SPRINT SITE NAME

ENFIELD (CROWN)

SPRINT SITE NUMBER

CT03XC092

CROWN SITE NAME

HRT 101 94232

CROWN SITE NUMBER

806373

SITE ADDRESS

**4 OLIVER ROAD
ENFIELD, CT 06082**

STRUCTURE TYPE

MONOPOLE

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

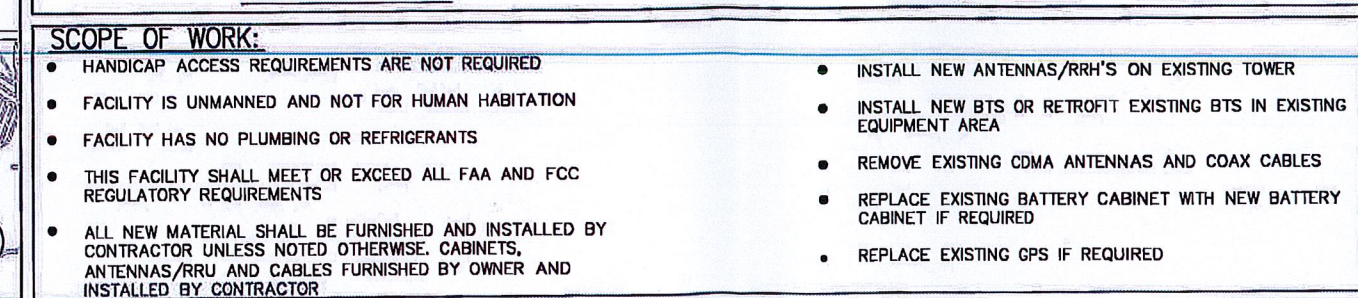
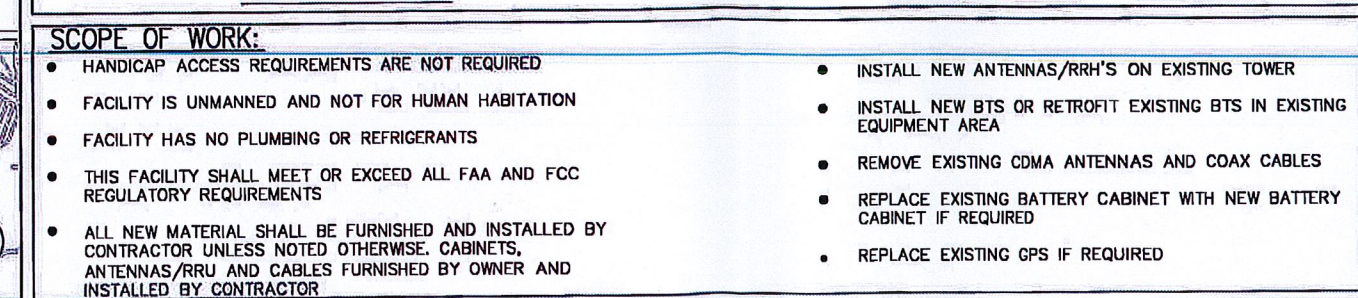
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	PROJECT TEAM
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PROJECT SUMMARY

<u>SITE NAME:</u>	ENFIELD (CROWN)
<u>SITE NO.:</u>	CT03XC092
<u>SITE ADDRESS:</u>	4 OLIVER ROAD ENFIELD, CT 06082
<u>COUNTY:</u>	HARTFORD
<u>SITE COORDINATES:</u>	
<u>LATITUDE:</u>	41.96005556° N (NAD 83)
<u>LONGITUDE:</u>	72.59230556° W (NAD 83)
<u>GROUND ELEV.:</u>	±109' (AMSL)
<u>JURISDICTION:</u>	CONNECTICUT SITING COUNCIL
<u>ZONING CLASSIFICATION:</u>	TBD
<u>LANDLORD:</u>	CROWN ATLANTIC COMPANY 2000 CORPORATE DRIVE CANONSBURG, PA 15317
<u>CONTACT:</u>	PROJECT MANAGER: JOSH MOSTOW (201) 236-9059 CONSTRUCTION MANAGER: MIKE CALLAHAN (860) 919-7278
<u>APPLICANT:</u>	SPRINT 1 INTERNATIONAL BLVD

PROJECT MANAGER:	ALCATEL LUCENT 1 ROBBINS ROAD WESTFORD, MA 01886
CONTACT:	CAMILLE MULLIGAN - (845) 313-6920
CONSTRUCTION MANAGER:	TRACEY SWEARINGEN (518) 944-8794 (CELL)
ENGINEER:	INFINIGY 11 HERBERT DRIVE LATHAM, NY 12110
CONTACT:	PAUL FANOS -- (518) 690-0790
BUILDING CODE:	2003 INTERNATIONAL BUILDING CODE 2005 CONNECTICUT BUILDING CODE W/ 2009 AMENDMENT UNIFORM MECHANICAL CODE UNIFORM PLUMBING CODE LOCAL BUILDING CODE CITY/COUNTY ORDINANCES
ELECTRICAL CODE:	2005 NATIONAL ELECTRICAL CODE

ENGINEER'S LICENSE

CERTIFICATION STATEMENT:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY
ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE
LAWS OF THE STATE OF CONNECTICUT.

LICENSED ENGINEER - STATE OF CONNECTICUT

APPROVALS

SPRINT CONST.	DATE
ALU RF	DATE
ALU LEASING/SITE ACQ.	DATE
IN-MARKET CONSTRUCTION LEAD	DATE
SITE OWNER	NAME/COMPANY: TITLE: DATE

INFINIGY Design. Build. Deliver. 11 Herbert Drive Latham, NY 12110 Office # (518) 690-0790 Fax # (518) 690-0793			
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Drawn: KWF		Date: 11/28/12	
Designed: ASD		Date: 11/28/12	
Checked: ASD		Date: 11/28/12	
Project Number 284-037			
Project Title			
ENFIELD (CROWN) CT03XC092			
4 OLIVER ROAD ENFIELD, CT 06082			
Prepared For			
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Designed: _____ ASD		Date:	11/28/12
Checked: _____ ASD		Date:	11/28/12

Project Number 294-037

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**ENFIELD (CROWN)
CT03XC092**

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ENFIELD, CT 06082**

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GENERAL NOTES

PART 1 – GENERAL REQUIREMENTS

- 1.1 THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
- A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
 - B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
 - C. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC").
 - D. AND NFPA 101 (LIFE SAFETY CODE).
 - E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM).
 - F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE).
- 1.2 DEFINITIONS:
- A: WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
 - B: COMPANY: SPRINT NEXTEL 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.
- 1.3 POINT OF CONTACT: COMMUNICATION BETWEEN THE COMPANY AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE COMPANY SITE DEVELOPMENT SPECIALIST OR OTHER PROJECT COORDINATOR APPOINTED TO MANAGE THE PROJECT FOR THE COMPANY.
- 1.4 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.
- 1.5 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 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.
- 1.6 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.
- 1.7 NOTICE TO PROCEED:
- A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED.
 - B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT NEXTEL WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – EXECUTION

- 2.1 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.
- 2.2 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.
- 2.3 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.

- 2.4 COMPANY FURNISHED MATERIAL AND EQUIPMENT: ALL HANDLING, STORAGE AND INSTALLATION OF COMPANY FURNISHED MATERIAL AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
- A. CONTRACTOR SHALL PROCURE ALL OTHER REQUIRED WORK RELATED MATERIALS NOT PROVIDED BY SPRINT NEXTEL TO SUCCESSFULLY CONSTRUCT A WIRELESS FACILITY.
- 2.5 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.
- 2.6 EXISTING CONDITIONS: NOTIFY THE COMPANY REPRESENTATIVE 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.

PART 3 – RECEIPT OF MATERIAL & EQUIPMENT

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

PART 4 – GENERAL REQUIREMENTS FOR CONSTRUCTION

- 4.1 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.
- 4.2 EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.
- 4.3 CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
- A. 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.
 - B. 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.
- 4.4 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.
- 4.5 CONDUCT TESTING AS REQUIRED HEREIN.

PART 5 – TESTS AND INSPECTIONS

- 5.1 TESTS AND INSPECTIONS:
- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
 - B. CONTRACTOR SHALL COORDINATE TEST AND INSPECTION SCHEDULES WITH COMPANY'S REPRESENTATIVE WHO MUST BE ON SITE TO WITNESS SUCH TESTS AND INSPECTIONS.
 - C. 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.
 - D. 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.
 - E. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
 - F. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS. HYBERFLEX TESTING NOT LIMITED TO COAX SWEEPS.
 - G. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

PART 6 – TRENCHING AND BACKFILLING

- 6.1 TRENCHING AND BACKFILLING: THE CONTRACTOR SHALL PERFORM ALL EXCAVATION OF EVERY DESCRIPTION AND OF WHATEVER SUBSTANCES ENCOUNTERED, TO THE DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS OTHERWISE SPECIFIED.
- A. PROTECTION OF EXISTING UTILITIES: THE CONTRACTOR SHALL CHECK WITH THE LOCAL UTILITIES AND THE RESPECTIVE UTILITY LOCATOR COMPANIES PRIOR TO STARTING EXCAVATION OPERATIONS IN EACH RESPECTIVE AREA TO ASCERTAIN THE LOCATIONS OF KNOWN UTILITY LINES. THE LOCATIONS, NUMBER AND TYPES OF EXISTING UTILITY LINES DETAILED ON THE CONSTRUCTION DRAWINGS ARE APPROXIMATE AND DO NOT REPRESENT EXACT INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL LINES DAMAGED DURING EXCAVATION AND ALL ASSOCIATED OPERATIONS. ALL UTILITY LINES UNCOVERED DURING THE EXCAVATION OPERATIONS, SHALL BE PROTECTED FROM DAMAGE DURING EXCAVATION AND ASSOCIATED OPERATIONS. ALL REPAIRS SHALL BE APPROVED BY THE UTILITY COMPANY.
 - B. HAND DIGGING: UNLESS APPROVED IN WRITING OTHERWISE, ALL DIGGING WITHIN AN EXISTING CELL SITE COMPOUND IS TO BE DONE BY HAND.
 - C. DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING AND TO PREVENT SLIDES OR CAVE-INS. ALL EXCAVATED MATERIALS NOT REQUIRED OR SUITABLE FOR BACKFILL SHALL BE REMOVED AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE.
 - D. GRADING SHALL BE DONE AS MAY BE NECESSARY TO PREVENT SURFACE WATER FROM FLOWING INTO TRENCHES OR OTHER EXCAVATIONS, AND ANY WATER ACCUMULATING THEREIN SHALL BE REMOVED BY PUMPING OR BY OTHER APPROVED METHOD.
 - E. SHEETING AND SHORING SHALL BE DONE AS NECESSARY FOR THE PROTECTION OF THE WORK AND FOR THE SAFETY OF PERSONNEL. UNLESS OTHERWISE INDICATED, EXCAVATION SHALL BE BY OPEN CUT, EXCEPT THAT SHORT SECTIONS OF A TRENCH MAY BE TUNNELED IF, THE CONDUIT CAN BE SAFELY AND PROPERLY INSTALLED AND BACKFILL CAN BE PROPERLY TAMPED IN SUCH TUNNEL SECTIONS. EARTH EXCAVATION SHALL COMPRISE ALL MATERIALS AND SHALL INCLUDE CLAY, SILT, SAND, MUCK, GRAVEL, HARDPAN, LOOSE SHALE, AND LOOSE STONE.
 - F. TRENCHES SHALL BE OF NECESSARY WIDTH FOR THE PROPER LAYING OF THE CONDUIT OR CABLE, AND THE BANKS SHALL BE AS NEARLY VERTICAL AS PRACTICABLE. THE BOTTOM OF THE TRENCHES SHALL BE ACCURATELY GRADED TO PROVIDE UNIFORM BEARING AND SUPPORT FOR EACH SECTION OF THE CONDUIT OR CABLE ON UNDISTURBED SOIL AT EVERY POINT ALONG ITS ENTIRE LENGTH. EXCEPT WHERE ROCK IS ENCOUNTERED, CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED. WHERE ROCK EXCAVATIONS ARE NECESSARY, THE ROCK SHALL BE EXCAVATED TO A MINIMUM OVER DEPTH OF 6 INCHES BELOW THE TRENCH DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR SPECIFIED. OVER DEPTHS IN THE ROCK EXCAVATION AND UNAUTHORIZED OVER DEPTHS SHALL BE THOROUGHLY BACK FILLED AND TAMPED TO THE APPROPRIATE GRADE. WHENEVER WET OR OTHERWISE UNSTABLE SOIL THAT IS INCAPABLE OF PROPERLY SUPPORTING THE CONDUIT OR CABLE IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, SUCH SOLID SHALL BE REMOVED TO A MINIMUM OVER DEPTH OF 6 INCHES AND THE TRENCH BACKFILLED TO THE PROPER GRADE WITH EARTH OF OTHER SUITABLE MATERIAL, AS HEREINAFTER SPECIFIED.
 - G. BACKFILLING OF TRENCHES. TRENCHES SHALL NOT BE BACKFILLED UNTIL ALL SPECIFIED TESTS HAVE BEEN PERFORMED AND ACCEPTED. WHERE COMPACTED BACKFILL IS NOT INDICATED THE TRENCHES SHALL BE CAREFULLY BACKFILLED WITH SELECT MATERIAL SUCH AS EXCAVATED SOILS THAT ARE FREE OF ICE, SNOW, ROOTS, SOD, RUBBISH OR STONES, DEPOSITED IN 6 INCH LAYERS AND THOROUGHLY AND CAREFULLY RAMMED UNTIL THE CONDUIT OR CABLE HAS A COVER OF NOT LESS THAN 1 FOOT. THE REMAINDER OF THE BACKFILL MATERIAL SHALL BE GRANULAR IN NATURE AND SHALL NOT CONTAIN ICE, SNOW ROOTS, SOD, RUBBISH, OR STONES OF 2-1/2 INCH MAXIMUM DIMENSION. BACKFILL SHALL BE CAREFULLY PLACED IN THE TRENCH AND IN 1 FOOT LAYERS AND EACH LAYER TAMPED. SETTLING THE BACKFILL WITH WATER WILL BE PERMITTED. THE SURFACE SHALL BE GRADED TO A REASONABLE UNIFORMITY AND THE MOUNDING OVER THE TRENCHES LEFT IN A UNIFORM AND NEAT CONDITION.

PROJECT INFORMATION

THIS IS AN UNMANNED AND RESTRICTED ACCESS EQUIPMENT FACILITY AND WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNALS FOR THE PURPOSE OF PROVIDING PUBLIC WIRELESS COMMUNICATIONS SERVICE.

NO POTABLE WATER SUPPLY IS TO BE PROVIDED AT THIS LOCATION.

NO WASTE WATER WILL BE GENERATED AT THIS LOCATION.

NO SOLID WASTE WILL BE GENERATED AT THIS LOCATION.

SPRINT MAINTENANCE CREW (TYPICALLY ONE PERSON) WILL MAKE AN AVERAGE OF ONE TRIP PER MONTH AT ONE HOUR PER VISIT.

LEGEND

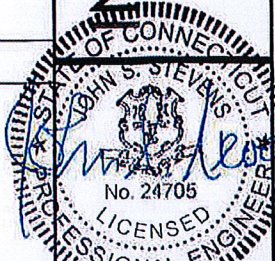
SYMBOL	DESCRIPTION
	CIRCUIT BREAKER
	NON-FUSIBLE DISCONNECT SWITCH
	FUSIBLE DISCONNECT SWITCH
	SURFACE MOUNTED PANEL BOARD
	TRANSFORMER
	KILOWATT HOUR METER
	JUNCTION BOX
	PULL BOX TO NEC/TELCO STANDARDS
	UNDERGROUND UTILITIES
	DENOTES REFERENCE NOTE
	EXOTHERMIC WELD CONNECTION
	MECHANICAL CONNECTION
	GROUND ROD
	GROUND ROD WITH INSPECTION SLEEVE
	GROUND BAR
	PIN AND SLEEVE RECEPTACLE
	120AC DUPLEX RECEPTACLE
	GROUND CONDUCTOR
	REPRESENTS DETAIL NUMBER
	REF. DRAWING NUMBER

ABBREVIATIONS

CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
MIGB	MASTER ISOLATED GROUND BAR
SST	SELF SUPPORTING TOWER
GPS	GLOBAL POSITIONING SYSTEM
TYP.	TYPICAL
DWG	DRAWING
BCW	BARE COPPER WIRE
BFG	BELOW FINISH GRADE
PVC	POLYVINYL CHLORIDE
CAB	CABINET
C	CONDUIT
SS	STAINLESS STEEL
G	GROUND
AWG	AMERICAN WIRE GAUGE
RGS	RIGID GALVANIZED STEEL
AHJ	AUTHORITY HAVING JURISDICTION
TTLNA	TOWER TOP LOW NOISE AMPLIFIER
UNO	UNLESS NOTED OTHERWISE
EMT	ELECTRICAL METALLIC TUBING
AGL	ABOVE GROUND LEVEL

Design.
Build.
Deliver.

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Latham, NY 12110
Office # (518) 690-0790
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Project Number 294-037

Project Title
**ENFIELD (CROWN)
CT03XC092**

4 OLIVER ROAD
ENFIELD, CT 06082

Prepared For



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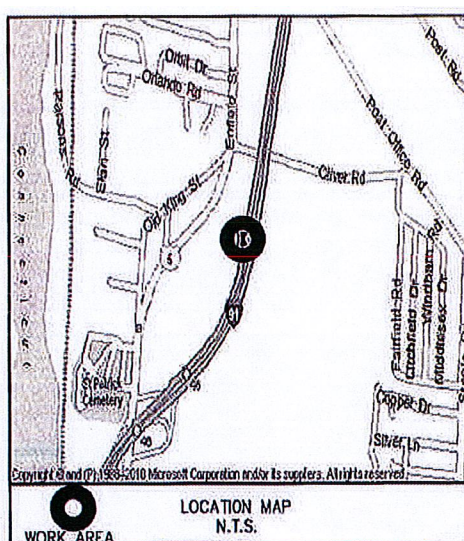
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Drawing Title

**GENERAL
NOTES**

Drawing Number

C1



INFORMATION CONTAINED WITHIN DRAWINGS ARE BASED ON PROVIDED INFORMATION.

FOR ADDITIONAL STRUCTURAL INFORMATION SEE STRUCTURAL ANALYSIS COMPLETED BY PAUL J FORD & CO. DATED: 10/23/12.

EXISTING CARRIER EQUIPMENT SHELTER (TYP.)

EXISTING CARRIER EQUIPMENT PAD (TYP.)

PROPOSED HYBRIFLEX CABLES ROUTED FROM PROPOSED FIBER JUNCTION BOX TO PROPOSED RRH TO FOLLOW EXISTING CABLES (CONTRACTOR TO VERIFY) (TYP. OF (1) PER SECTOR)

3
C7
PROPOSED ICE BRIDGE EXTENSION FURNISHED AND INSTALLED BY CONTRACTOR

2
C4
PROPOSED BATTERY BACKUP CABINET

3
C4
PROPOSED MULTIMODAL BTS CABINET

EXISTING CW CABINET

1,2
C7
PROPOSED SPRINT FIBER/POWER JUNCTION BOX MOUNTED TO NEW H-FRAME

1,2
C9

GRAPHIC SCALE
10' 5' 0 5' 10'
SCALE (11x17): 1" = 10'-0"
SCALE (22x34): 1" = 5'-0"

CALLLED NORTH

1

COMPOUND SITE PLAN
SCALE: AS NOTED

NOTE:
CONTRACTOR SHALL NOT STACK THE HYBRIFLEX CABLES ON TOP OF THE EXISTING COAXIAL CABLES AS TO PREVENT THE COAXIAL CABLES FROM BEING REMOVED.

NOTE:
1. REFER TO: CONSTRUCTION STANDARDS-SPRINT DOCUMENT: "EXHIBIT A - STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES REV 4.0 - 02.15.2011.DOCM"
2. REFER TO: "WEATHERPROOFING SPECS: EXCERPT EXH A - WTHRPRF - STD CONSTR SPECS_15720110421855429.DOCM"
3. REFER TO: "COLOR CODING-SPRINT NEXTEL ANT AND LINE COLOR CODING (DRAFT) V3 09-08-11.PDF"
4. CONTRACTOR TO VERIFY LATEST REV AND DATE PRIOR TO CONSTRUCTION.

TOP OF EXISTING MONOPOLE = ±160' AGL

CENTERLINE OF SPRINT PANEL ANTENNAS = ±135' AGL

EXISTING CARRIER PANEL ANTENNA (TYP.)

(1) PROPOSED MULTIMODAL ANTENNA TO REPLACE EXISTING SPRINT PANEL ANTENNA (TYP. OF (1) PER SECTOR)

5,6
C4
1-3
C5

PROPOSED RRH (TYP.) MOUNTED ON PROPOSED PIPE MOUNT. PIPE MOUNT TO BE INSTALLED JUST ABOVE OR BELOW EXISTING MOUNT. ADJUST PIPES UP OR DOWN AS REQUIRED TO REMAIN IN EXISTING RAD CENTER

1,4
C4

EXISTING MONOPOLE

PROPOSED SPRINT GPS TO REPLACE EXISTING

GROUND LEVEL

2

SITE ELEVATION
NOT TO SCALE

Design:
Build:
Deliver:
INFINIGY

11 Herbert Drive
Latham, NY 12110
Office # (518) 680-0790
Fax # (518) 680-0793



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0	ISSUED FOR REVIEW	KMF	11/28/12

Drawn: KMF Date: 11/28/12
Designed: A.D. Date: 11/28/12
Checked: ALF Date: 11/28/12

Project Number
294-037

Project Title

ENFIELD (CROWN)
CT03XC092

4 OLIVER ROAD
ENFIELD, CT 06082

Prepared For

Sprint
VISION
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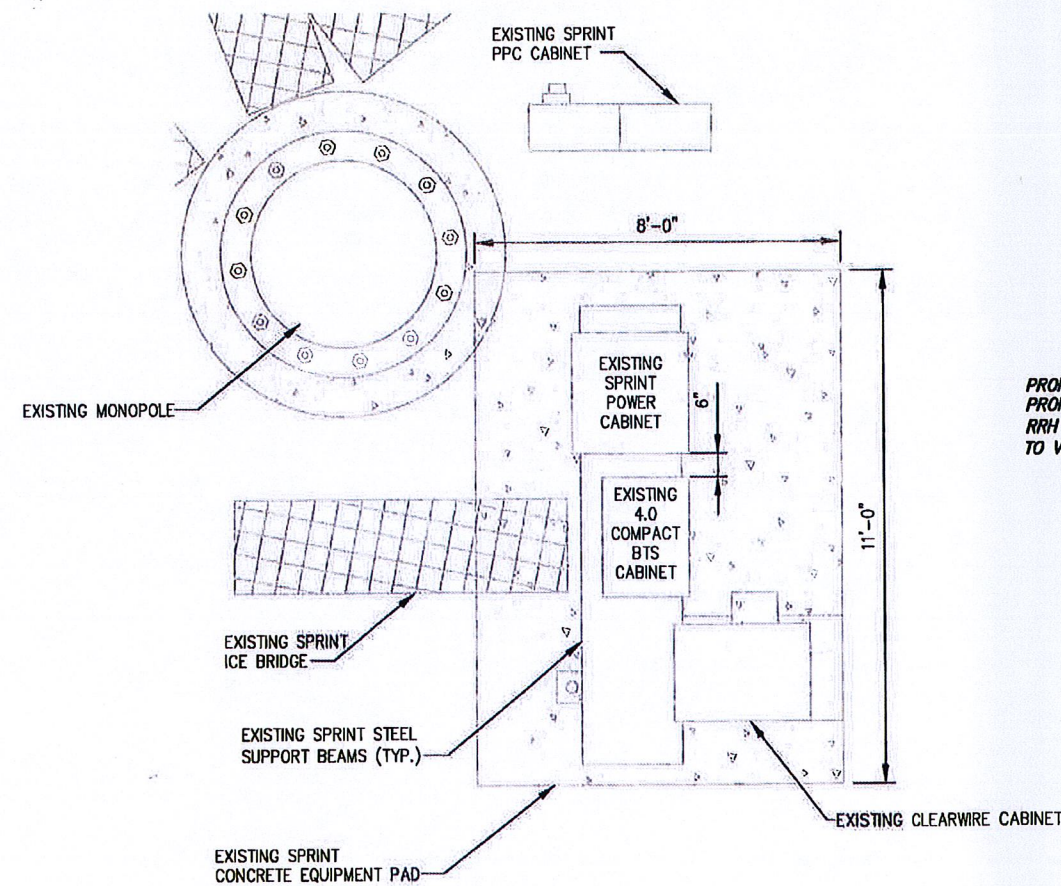
Drawing Scale:
AS NOTED
Date:
1/17/13

Drawing Title

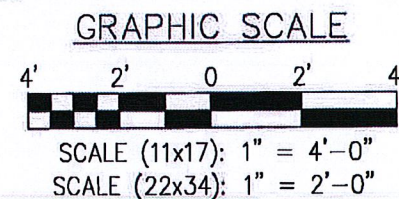
COMPOUND SITE PLAN & ELEVATION

Drawing Number

C2

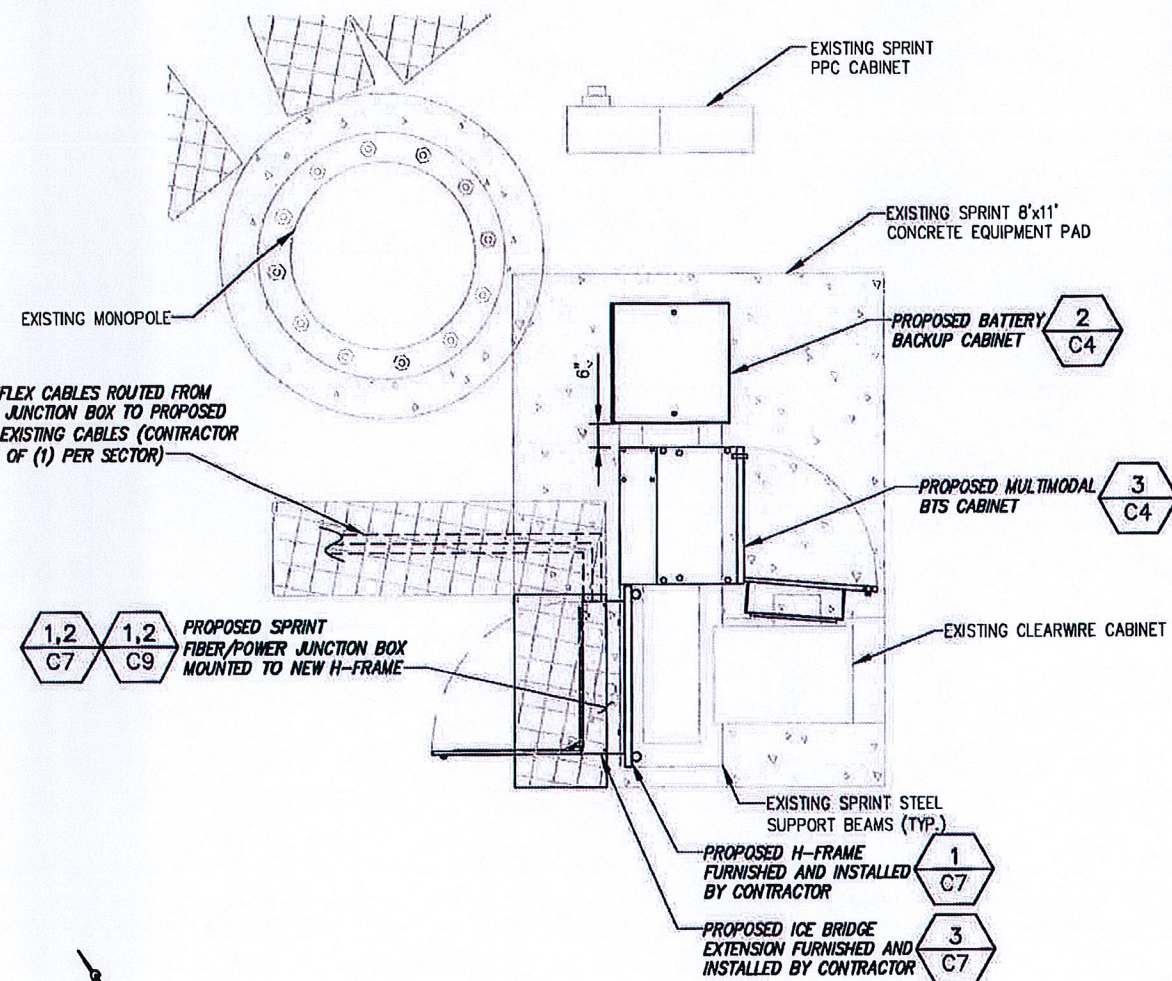


1 EQUIPMENT SITE PLAN (EXISTING)
SCALE: AS NOTED

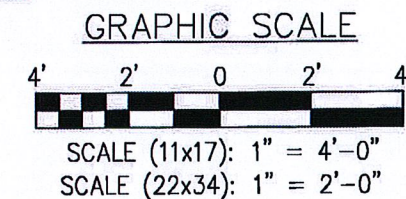


NOTE:
CONTRACTOR SHALL NOT STACK THE HYBRIFLEX CABLES ON TOP OF THE EXISTING COAXIAL CABLES AS TO PREVENT THE COAXIAL CABLES FROM BEING REMOVED.

- NOTE:
1. REFER TO: CONSTRUCTION STANDARDS-SPRINT DOCUMENT: "EXHIBIT A - STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES REV 4.0 - 02.15.2011.DOCM"
 2. REFER TO: "WEATHERPROOFING SPECS: EXCERPT EXH A - WTHRPRF - STD CONSTR SPECS_157201110421855429.DOCM"
 3. REFER TO: "COLOR CODING-SPRINT NEXTEL ANT AND LINE COLOR CODING (DRAFT) V3 09-08-11.PDF"
 4. CONTRACTOR TO VERIFY LATEST REV AND DATE PRIOR TO CONSTRUCTION.



2 EQUIPMENT SITE PLAN (FINAL/PERMANENT)
SCALE: AS NOTED



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Build.
Deliver.

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Fax # (518) 690-0793



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ENFIELD (CROWN)
CT03XC092

4 OLIVER ROAD
ENFIELD, CT 06062

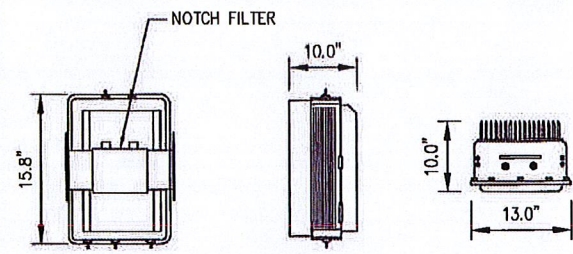


Drawing Scale:
AS NOTED

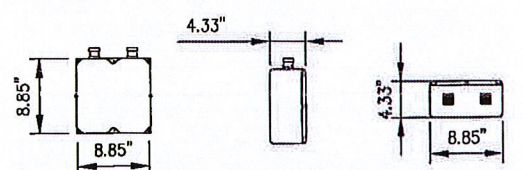
Date:
1/17/13

Drawing Title
EQUIPMENT
SITE PLANS

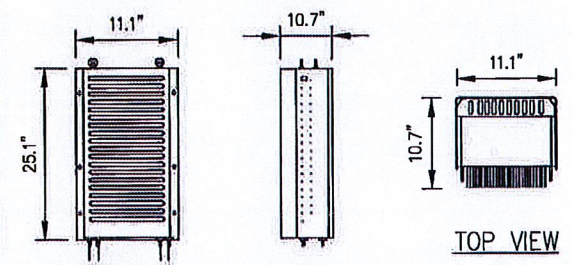
Drawing Number
C3



800 MHz RRH (ALU)
 WEIGHT = 50.6 LBS.



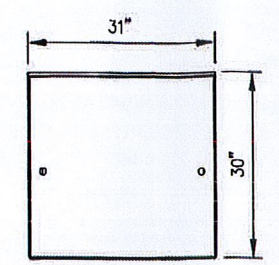
850 MHz NOTCH FILTERS
 WEIGHT = 11 LBS.



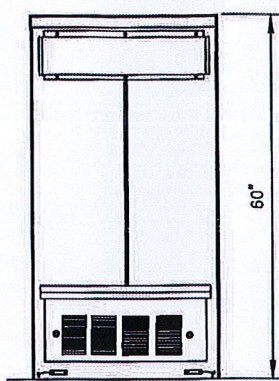
1900 MHz RRH (ALU)
 WEIGHT = 60 LBS.

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

1 RRH EQUIPMENT DETAILS
 NOT TO SCALE

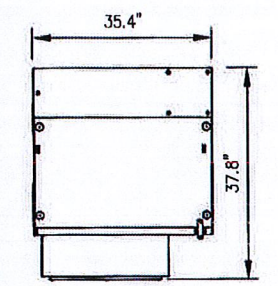


TOP VIEW

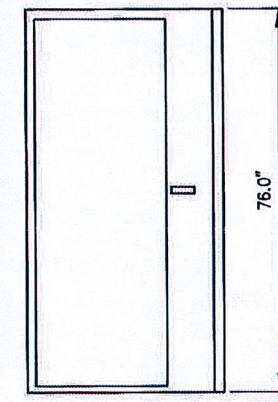


REAR VIEW

2 BATTERY CABINET PROFILE
 NOT TO SCALE



TOP VIEW



FRONT VIEW

3 BTS CABINET PROFILE
 NOT TO SCALE

DESIGN CRITERIA:

2009 INTERNATIONAL BUILDING CODE W/ STATE MODIFICATION

WIND SPEED (ASCE-7-05) 90 MPH

EXPOSURE B

IMPORTANCE FACTOR 1.0

SEISMIC SITE CLASS D

S_s=0.152 S₁=0.050

SEISMIC IMPORTANCE FACTOR 1.0

SEISMIC DESIGN CATEGORY B

CABINET WEIGHT:

9928 MM BTS CABINET 1074 LBS.

60EC V2 BATTERY CABINET 2830 LBS.

MATERIAL SPECIFICATIONS

C-, M-, AND ANGLE SHAPES: ASTM A36

HIGH-STRENGTH BOLTS: ASTM A325SC OR (A325N)

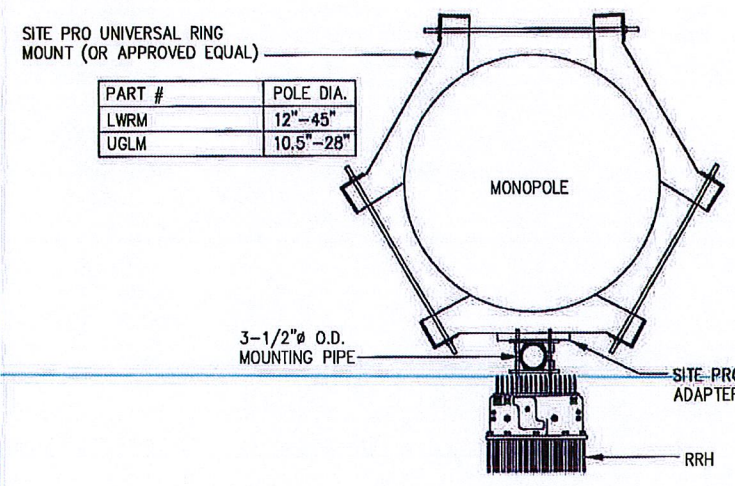
STRUCTURAL WF SHAPES: ASTM A572-GR50

TUBE STEEL & PIPE COLUMNS: ASTM A500, GRADE B

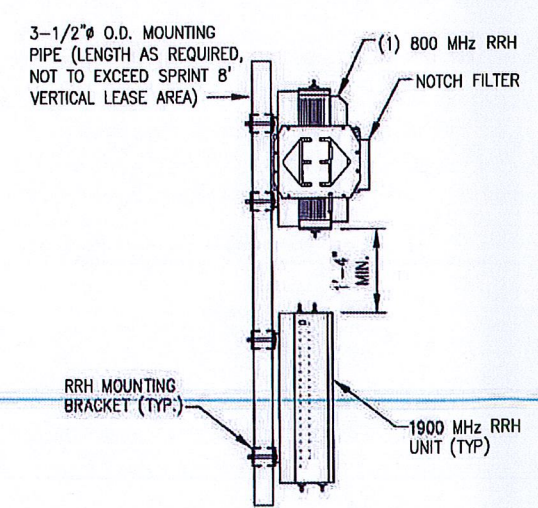
WELDING ELECTRODES: E70XX

W - SHAPES: ASTM A992, GRADE 50

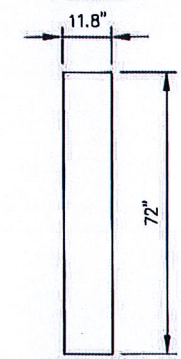
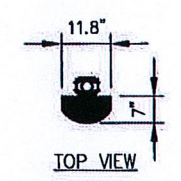
U-BOLTS: ASTM A36



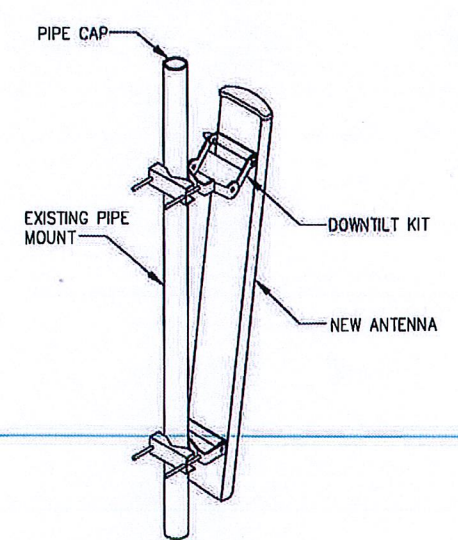
4 RRH MOUNTING DETAIL (TYP.)
 NOT TO SCALE



5 ANTENNA DETAILS
 NOT TO SCALE



FRONT VIEW
 800/1900
 MULTI-MODE
 RFS ANTENNA
 P/N: APXVSP18-C-A20



6 PANEL ANTENNA MOUNT DETAIL
 NOT TO SCALE

Design. Build. Deliver.

NFINIGY

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STATE OF CONNECTICUT
 PROFESSIONAL ENGINEER
 No. 24705
 LICENSED

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Project Title

ENFIELD (CROWN)
 CT03XC092

4 OLIVER ROAD
 ENFIELD, CT 06082

Prepared For

Sprint VISION

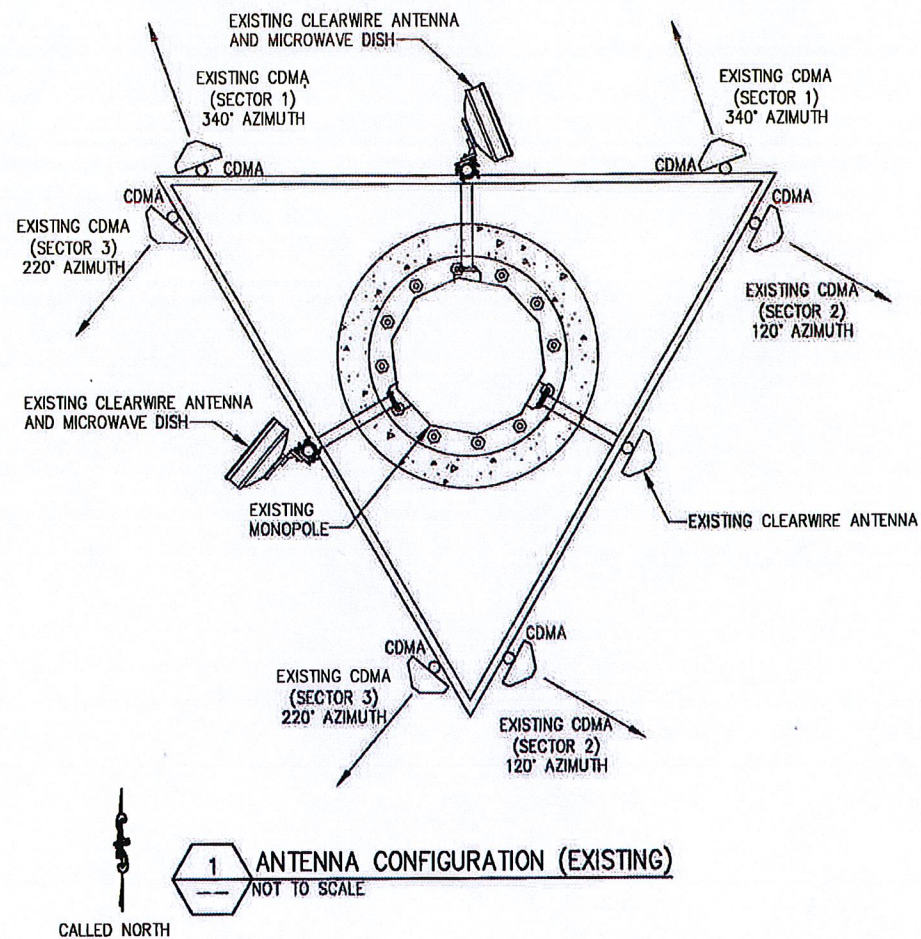
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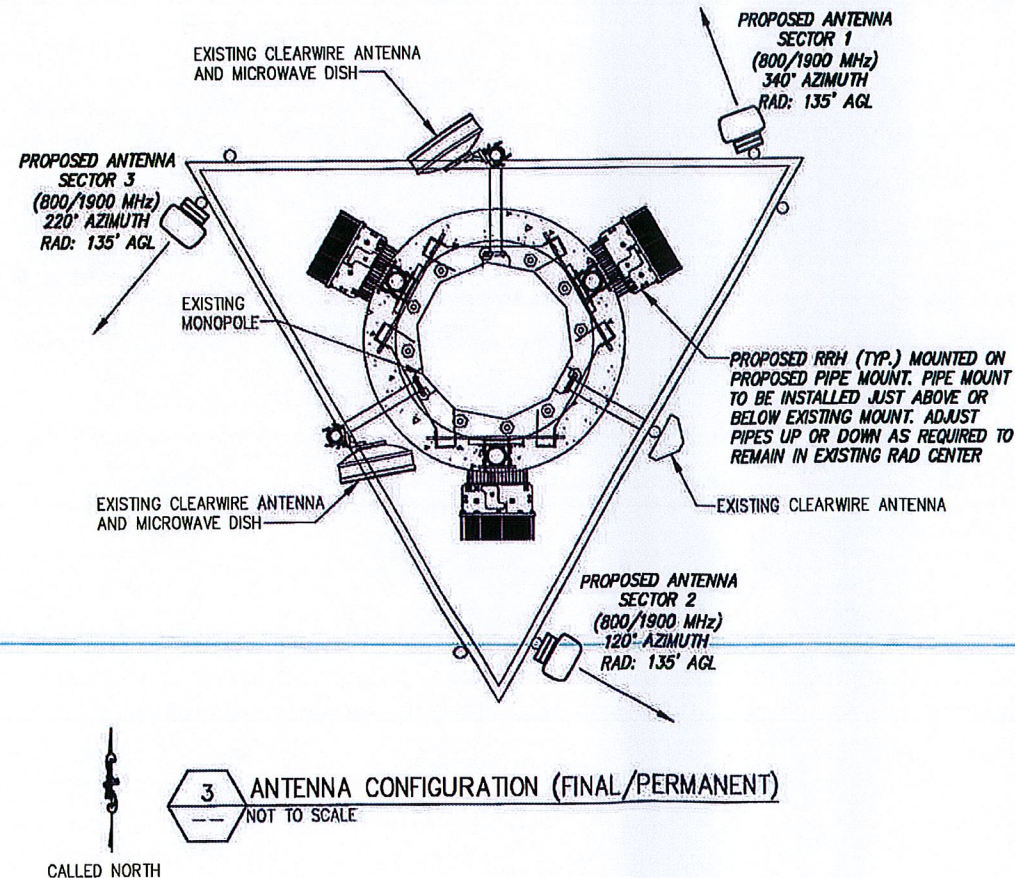
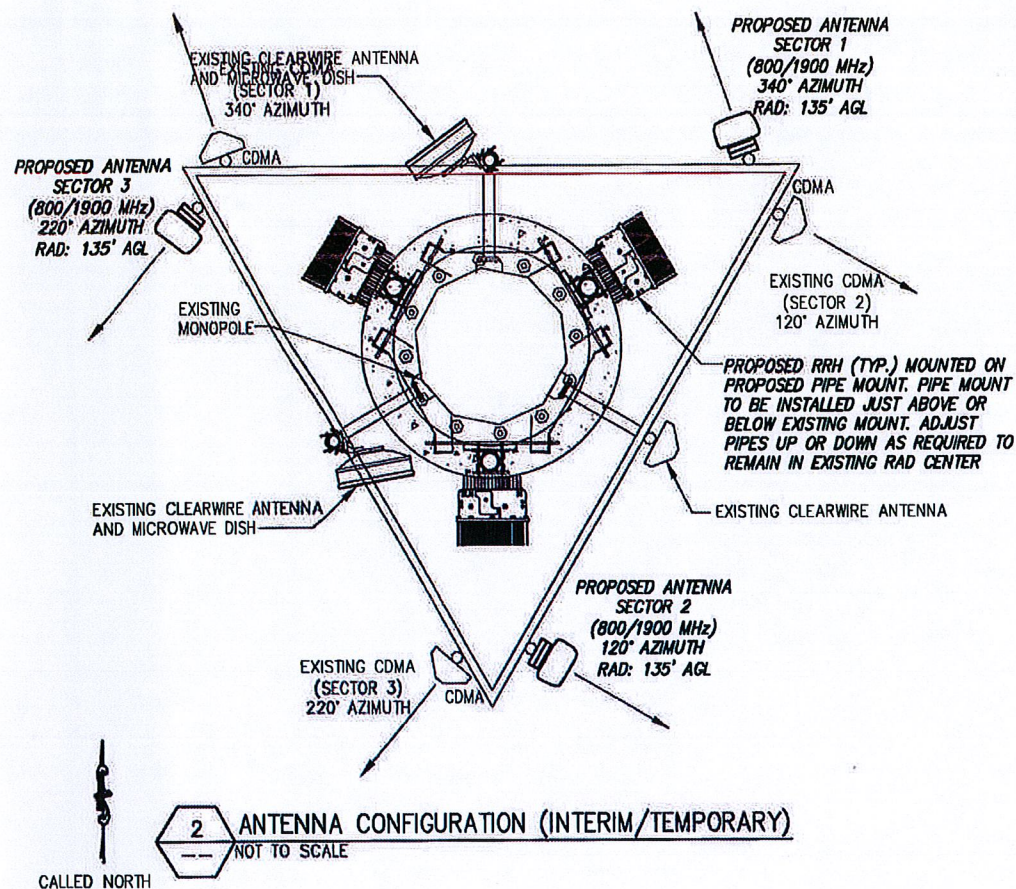
EQUIPMENT DETAILS

Drawing Number

C4



NOTE:
ALL ANTENNAS, EQUIPMENT
AND COAX TO BE INSTALLED
IN ACCORDANCE WITH THE
STRUCTURAL ANALYSIS
PROVIDED BY CROWN CASTLE



NOTE:
REQUIRED PIPE MOUNTS TO BE
SUPPLIED BY CONTRACTOR.

FOR ADDITIONAL STRUCTURAL INFORMATION
SEE STRUCTURAL ANALYSIS COMPLETED BY
PAUL J FORD & CO. DATED: 10/23/12.

GENERAL NOTES:

1. NEW SPRINT PANEL ANTENNAS TO MEET RF DESIGN REQUIREMENTS PER EBTS, PER APPROVED STRUCTURAL ANALYSIS.
2. CONTRACTOR TO PROVIDE EXISTING ANTENNA VERIFICATION AND TO INCLUDE MOUNTING HEIGHT, RAD CENTER, TOP AND BOTTOM OF ANTENNAS.
3. THE CONFIGURATION PLANS ARE FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR TO VERIFY FIELD CONDITIONS.
4. THE ANTENNA INSTALLATION SHALL BE DONE IN ACCORDANCE WITH THE STRUCTURAL ANALYSIS AND ASSOCIATED DETAILS THEREIN. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO WORK ON THE STRUCTURE.
5. CONTRACTOR SHALL VERIFY NEW PARTS BEFORE ORDERING.
6. REFER TO SHEET C4 & C8 FOR ANTENNA SPECS.
7. CONTRACTOR TO USE PROPER TORQUE WHEN INSTALLING AND TIGHTENING CONNECTORS TO INSURE PROPER FIT.
8. ALL HYBRID CABLES SHALL BE MARKED WITHIN 24" OF THE END OF EACH CABLE WITH 2" WIDE VINYL TAPE. THIS INCLUDES ALL JUMPERS AND MAIN LINE HYBRID CABLES.
9. CDMA ANTENNAS SHALL NOT BE REMOVED UNTIL ALL NEW MULTI-MODE ANTENNAS ARE INSTALLED AND ON-AIR.

RRH NOTES:

- SEE PAGE C4 FOR RRH MOUNTING INFORMATION (TYP. ALL SECTORS).
- REFER TO RF SCHEDULE ON SHEET CB FOR RRH UNIT SPECS AND QUANTITIES.

Design.
Build.
Deliver.



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Designed:	AJD	Date:	11/28/12
Checked:	AGF	Date:	11/28/12

Project Number
294-037

Project Title

ENFIELD (CROWN)
CT03XC092

4 OLIVER ROAD
ENFIELD, CT 06082

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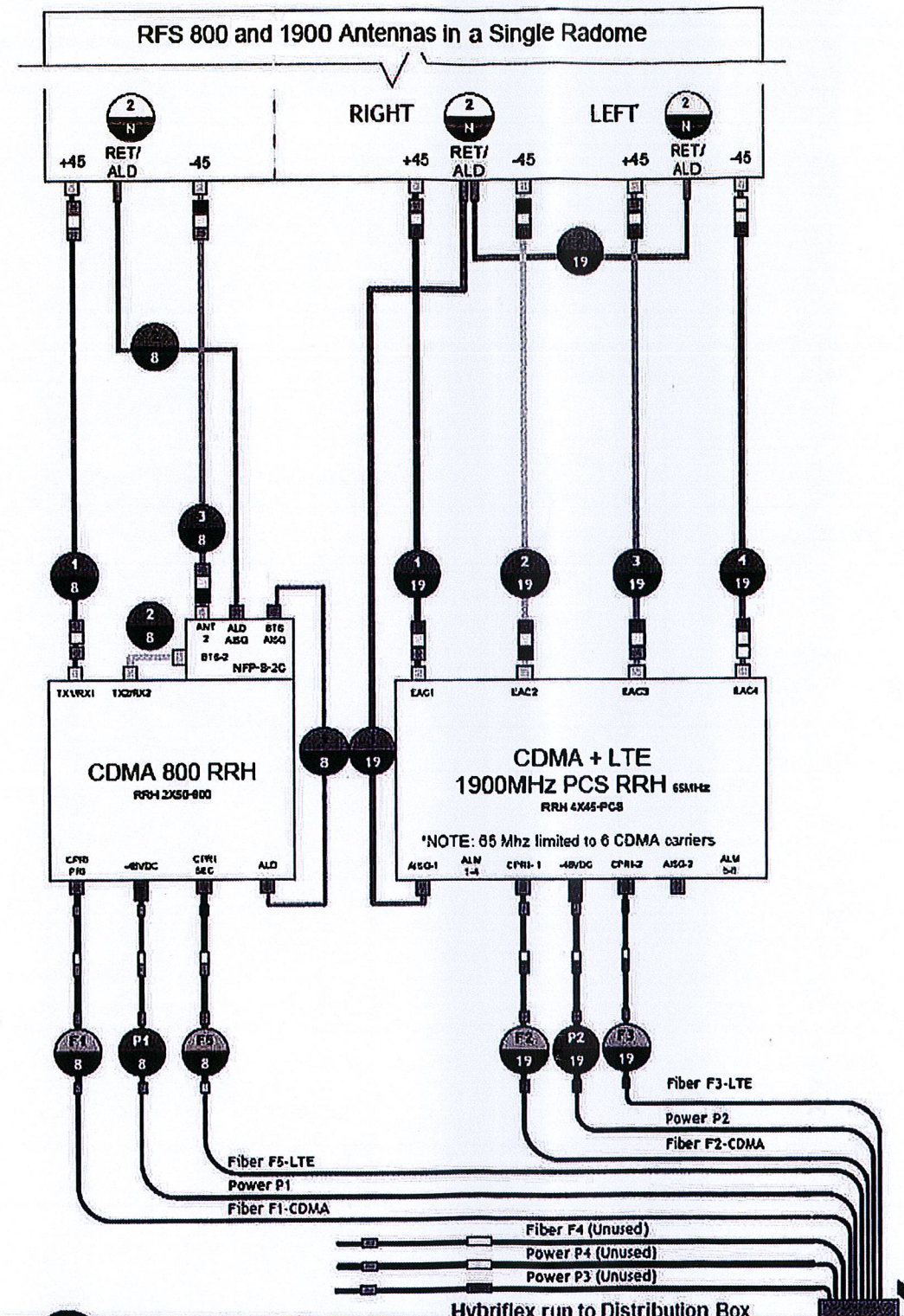
Date:
1/17/13

Drawing Title

**ANTENNA
PLANS**

Drawing Number

C5



RRH JUMPER NOTES:

1. FOR DISTANCES BETWEEN RRH'S AND ANTENNAS LESS THAN 10'-0" USE A 1/2" JUMPER.
2. FOR DISTANCES BETWEEN RRH'S AND ANTENNAS GREATER THAN 10'-0" USE A 7/8" JUMPER.

WEATHERPROOFING CONNECTORS AND GROUND KIT NOTES:

1. ALL CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED USING BUTYL RUBBER WEATHERPROOFING AND TAPE. THIS INSTALLATION MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION OR PER THE FOLLOWING INSTRUCTIONS (WHICHEVER IS GREATER).
2. THE COAXIAL CABLE CONNECTION OR GROUND KIT CAN BE ENCOMPASSED INTO COLD SHRINK AND COMPLETELY WRAPPED WITH 2 IN. WIDE ELECTRICAL TAPE OVERLAPPING EACH ROW BY APPROXIMATELY 1/2" AND EXTENDING PAST THE CONNECTION BY TWO INCHES AND DISCUSSED BELOW; OR
3. THE COAXIAL CABLE CONNECTION OR GROUND KIT CAN BE WRAPPED WITH LAYERS OF ELECTRICAL/BUTYL RUBBER/ELECTRICAL TAPE AS DISCUSSED BELOW OR;
4. THE COAXIAL CABLE CONNECTION OR GROUND KIT CAN BE WRAPPED WITH TWO LAYERS OF 1.5 INCH WIDE SELF-AMALGAMATING TAPE COVERED WITH TWO LAYERS OF ELECTRICAL TAPE.

1 Lower top block diagram
BD1 Scale: N.T.S.

SCENARIO 124 v2.0

1 ANTENNA CABLE RISER DIAGRAM
NOT TO SCALE

INSTALLER VERIFY LATEST PLUMBING/WIRING DIAGRAMS, PRIOR TO INSTALLATION.

INFINIGY

Design. Build. Deliver.

11 Herbert Drive
Latham, NY 12110
Office # (518) 690-0790
Fax # (518) 690-0793

JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

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Checked: AGE Date: 11/28/12

Project Number: 294-037

Project Title: ENFIELD (CROWN) CT03XC092

4 OLIVER ROAD
ENFIELD, CT 06082

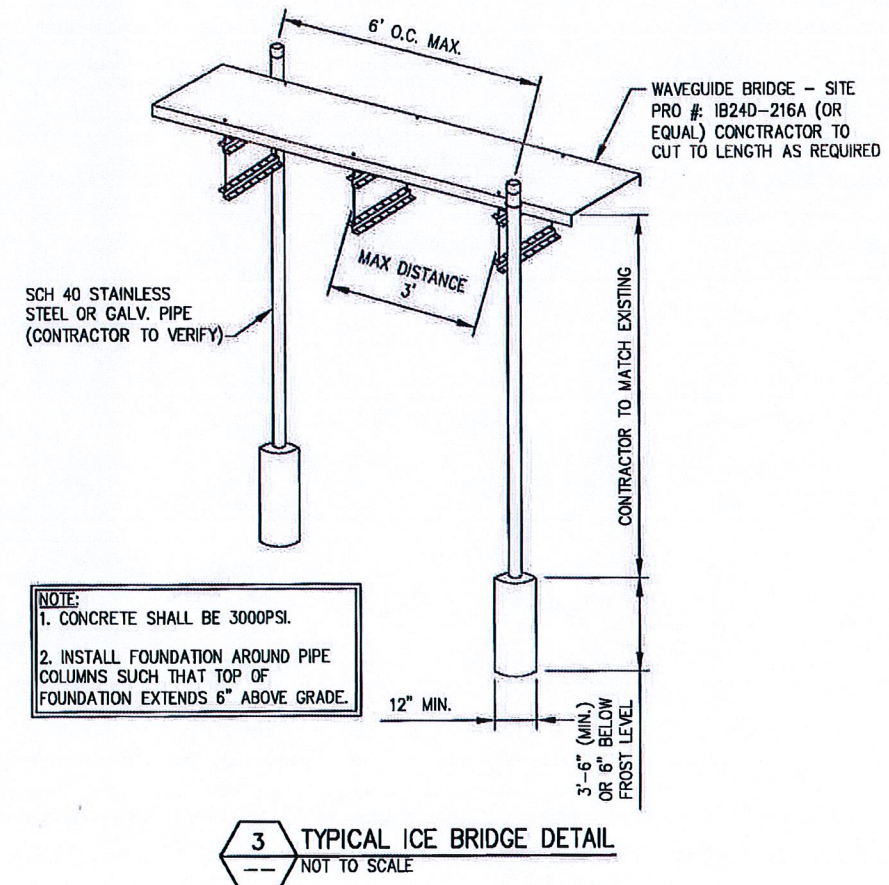
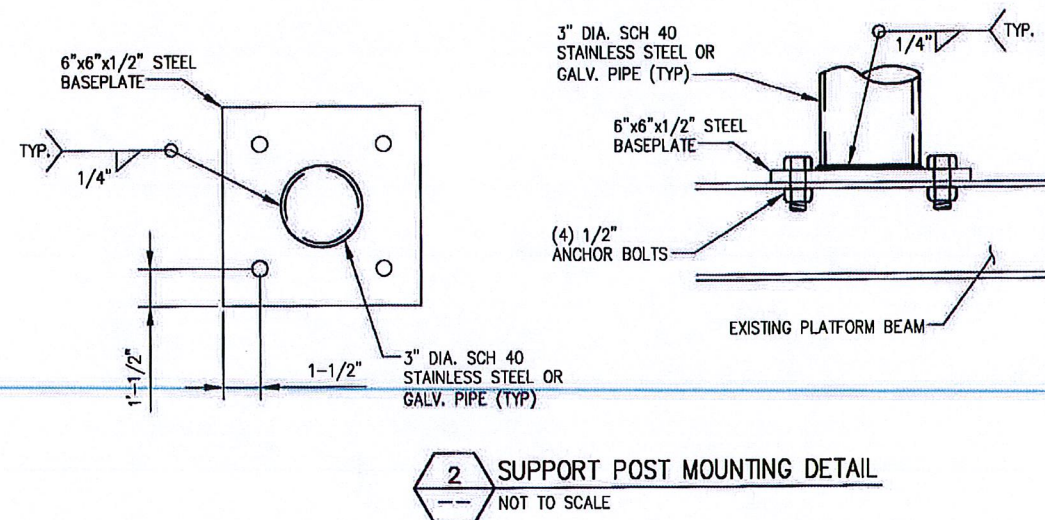
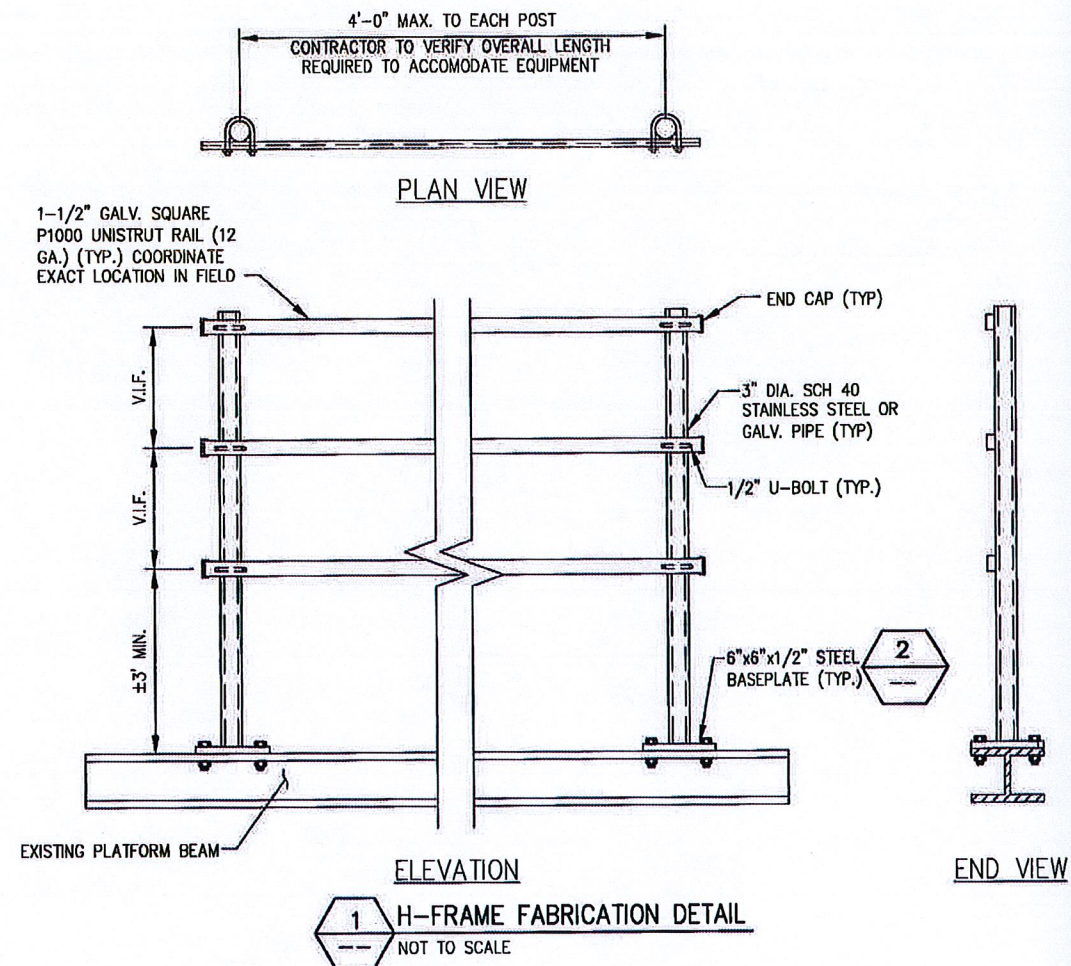
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Date: 1/17/13

Drawing Title: **ANTENNA CABLE RISER DETAILS**

Drawing Number: **C6**



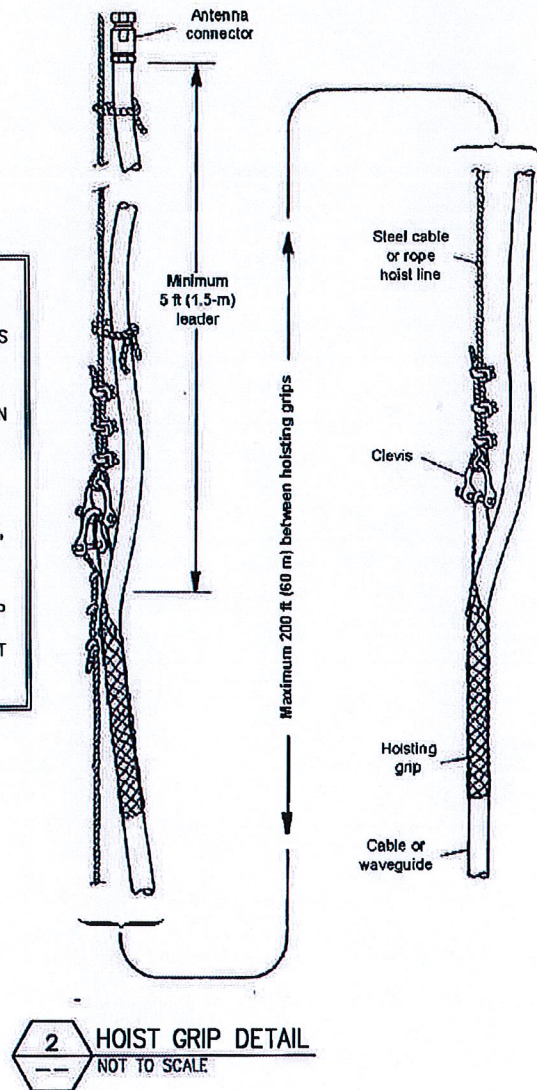
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Drawing Title: EQUIPMENT DETAILS			
Drawing Number: C7			

Market		Northern Connecticut		
Cascade ID		CT03XC092		
		SECTOR 1	SECTOR 2	SECTOR 3
1900	Split sector present	No	No	No
	1900MHz_Azimuth	340	120	220
	1900MHz_No_of_Antennas	1	1	1
	1900MHz_RADCenter(ft)	135	135	135
	1900MHz_Antenna Make	RFS	RFS	RFS
	1900MHz_Antenna Model	APXVSP18-C-A20	APXV9ERR18-C-A20	APXVSP18-C-A20
	1900MHz_Horizontal_Beamwidth	65	80	65
	1900MHz_Vertical_Beamwidth	5.5	5.5	5.5
	1900MHz_AntennaHeight (ft)	6	6	6
	1900MHz_AntennaGain(dBd)	15.9	14.9	15.9
	1900MHz_E_Tilt	0	0	0
	1900MHz_M_Tilt	0	-2	0
	1900MHz_Carrier_Forecast_Year_2013	3	3	3
	1900MHz_RRH Manufacturer	ALU	ALU	ALU
	1900MHz_RRH Model	RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz
	1900MHz_RRH Count	1	1	1
	1900MHz_RRH Location	Top of the Pole/Tower	Top of the Pole/Tower	Top of the Pole/Tower
	1900MHz Combiner Model	No Combiner Required	No Combiner Required	No Combiner Required
	1900MHz_Top_Jumper #1_Length (RRH or Combiner-to-Antenna for TT or Main Coax to	10	10	10
	1900MHz_Top_Jumper #1_Cable_Model (RRH or Combiner-to-Antenna for TT or Main Coax	LCF12-50J	LCF12-50J	LCF12-50J
	1900MHz_Top_Jumper #2_Length (RRH to Combiner for TT if applicable, ft)	N/A	N/A	N/A
	1900MHz_Top_Jumper #2_Cable_Model (RRH to Combiner for TT if applicable)	N/A	N/A	N/A
	1900MHz_Main_Coax_Cable_Length (ft)	N/A	N/A	N/A
	1900MHz_Main_Coax_Cable_Model	N/A	N/A	N/A
	1900MHz_Bottom_Jumper #1_Length (Ground based RRH to Combiner-OR-Main Coax, ft)	N/A	N/A	N/A
	1900MHz_Bottom_Jumper #1_Cable_Model (Ground based RRH to Combiner-OR-Main Coax)	N/A	N/A	N/A
	1900MHz_Bottom_Jumper #2_Length (Ground based-Combiner to Main Coax, ft)	N/A	N/A	N/A
	1900MHz_Bottom_Jumper #2_Cable_Model (Ground based-Combiner to Main Coax)	N/A	N/A	N/A
800	800MHz_Azimuth	340	120	220
	800MHz_No_of_Antennas	0	0	0
	800MHz_RADCenter(ft)	135	135	135
	800MHz_AntennaMake	RFS	RFS	RFS
	800MHz_AntennaModel	APXVSP18-C-A20 (Shared w/1900)	APXV9ERR18-C-A20 (Shared w/1900)	APXVSP18-C-A20 (Shared w/1900)
	800MHz_Horizontal_Beamwidth	65	80	65
	800MHz_Vertical_Beamwidth	11.5	10.5	11.5
	800MHz_AntennaHeight (ft)	6	6	6
	800MHz_AntennaGain (dBd)	13.4	11.9	13.4
	800MHz_E_Tilt	-8	-2	0
	800MHz_M_Tilt	0	-2	0
	800MHz_RRH Manufacturer	ALU	ALU	ALU
	800MHz_RRH Model	800 MHz RRH 2x50W	800 MHz RRH 2x50W	800 MHz RRH 2x50W
	800MHz_RRH Count	1	1	1
	800MHz_RRH Location	Top of the Pole/Tower	Top of the Pole/Tower	Top of the Pole/Tower
	800_Top_Jumper #1_Length (RRH to Antenna for TT or Main Coax to Antenna for GM)	10	10	10
	800_Top_Jumper_Cable_Model (RRH to Antenna for TT or Main Coax to Antenna for GM)	LCF12-50J	LCF12-50J	LCF12-50J
	800MHz_Main_Coax_Cable_Length (ft)	N/A	N/A	N/A
	800MHz_Main_Coax_Cable_Model	N/A	N/A	N/A
	800_Bottom_Jumper #1_Length (Ground based RRH to Main Coax)	N/A	N/A	N/A
	800_Bottom_Jumper #1_Cable_Model (Ground based RRH to Main Coax)	N/A	N/A	N/A
	Plumbing Scenario *	124	124	124
	* If plumbing scenario does not match the material received, please contact your Construction Manager			
	11/9/2012			
Comments				

- DO NOT USE ONE HOISTING GRIP FOR HOISTING TWO OR MORE CABLES OR CABLE TRAYS. THIS CAN CAUSE THE HOISTING GRIP TO BREAK OR THE CABLES OR WAVE- GUIDES TO FALL.
- DO NOT USE THE HOISTING GRIP FOR LOWERING CABLE OR CABLE TRAY. SNAGGING OF THE CABLE OR CABLE TRAY MAY LOOSEN THE GRIP AND POSSIBLY CAUSE THE CABLE TO CABLE TRAY TO SWAY OR FALL.
- DO NOT REUSE HOISTING GRIPS. USED GRIPS MAY HAVE LOST ELASTICITY, STRETCHED, OR BECOME WEAKENED. REUSING A GRIP CAN CAUSE THE CABLE OR CABLE TRAY TO SLIP, BREAK, OR FALL.
- USE HOISTING GRIPS AT INTERVALS OF NO MORE THAN 200 FT (60 M).
- MAKE SURE THAT THE PROPER HOISTING GRIP IS USED FOR THE CABLE OR CABLE TRAY BEING INSTALLED. SLIPPAGE OR INSUFFICIENT GRIPPING STRENGTH WILL RESULT IF YOU ARE USING THE WRONG HOISTING GRIP.



- NOTE:
- REFER TO: CONSTRUCTION STANDARDS-SPRINT DOCUMENT: "EXHIBIT A - STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES REV 4.0 - 02.15.2011.DOCM"
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Design. build. deliver.

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11 Herbert Drive
Latham, NY 12110
Office # (518) 690-0790
Fax # (518) 690-0793

JOHN S. STEVENS
No. 24705
PROFESSIONAL ENGINEER

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Project Number: 294-037

Project Title: ENFIELD (CROWN) CT03XC092

4 OLIVER ROAD
ENFIELD, CT 06082

Prepared For: **sprint** VISION

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Drawing Scale: AS NOTED
Date: 1/17/13

Drawing Title: **RF AND CABLE DETAILS**

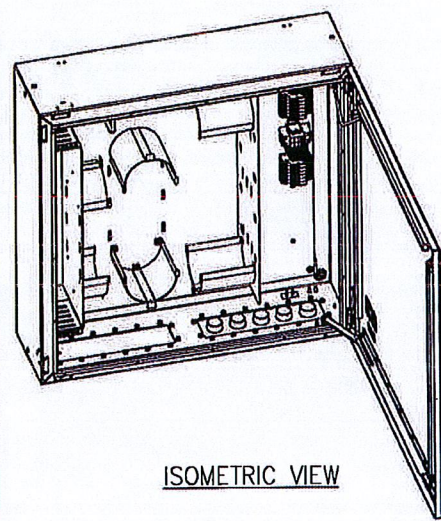
Drawing Number: **C8**

NOTE:
RFDS SHOWN PROVIDED BY
SPRINT DATED 11/09/12.

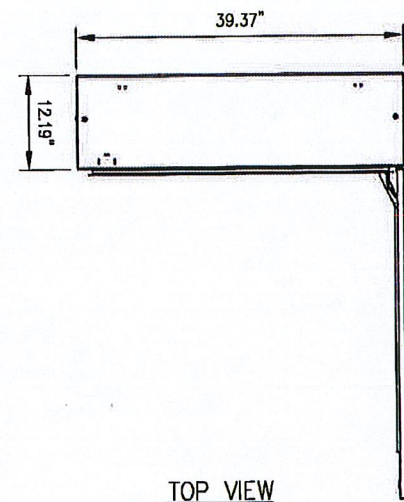
NOTE:
COORDINATE RF ANTENNA INSTALLATION WITH
FINAL SPRINT RFDS. COORDINATE RF MW DISH
(IF APPLICABLE) INSTALLATION WITH FINAL
SPRINT RFDS.

1 SPRINT RFDS
NOT TO SCALE

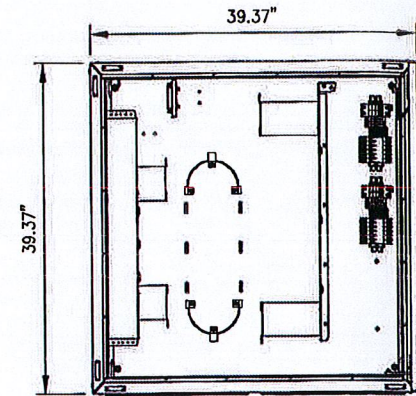
CHECK FST FOR LATEST
VERSION OF RFDS



ISOMETRIC VIEW



TOP VIEW

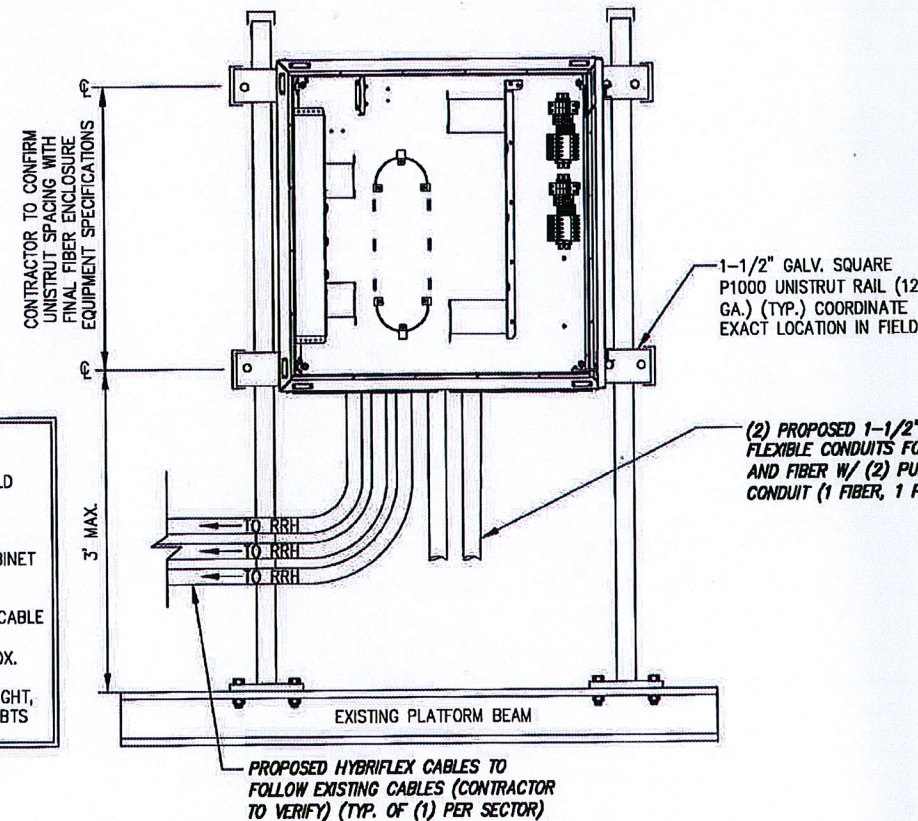


FRONT VIEW



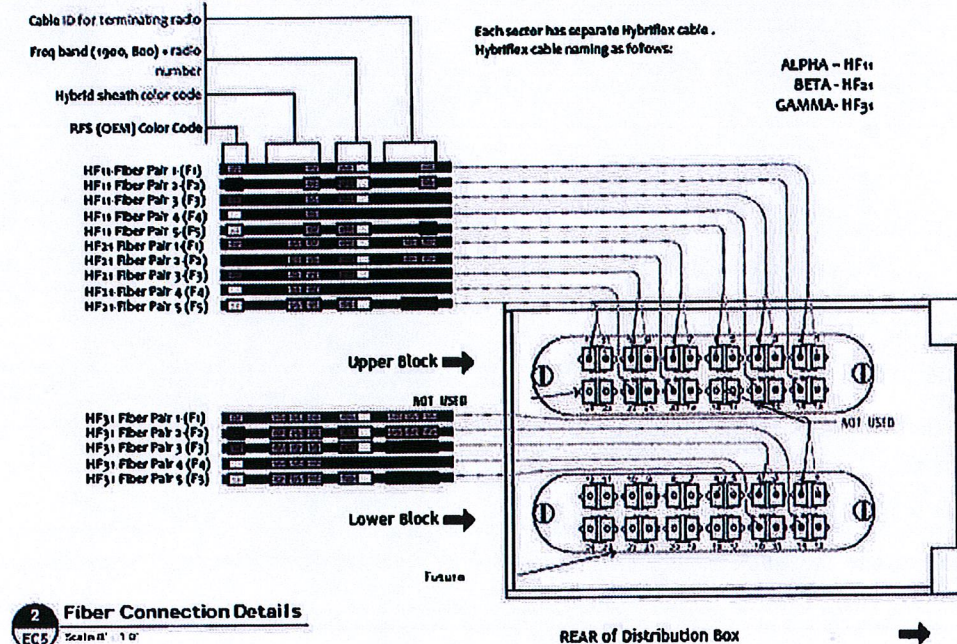
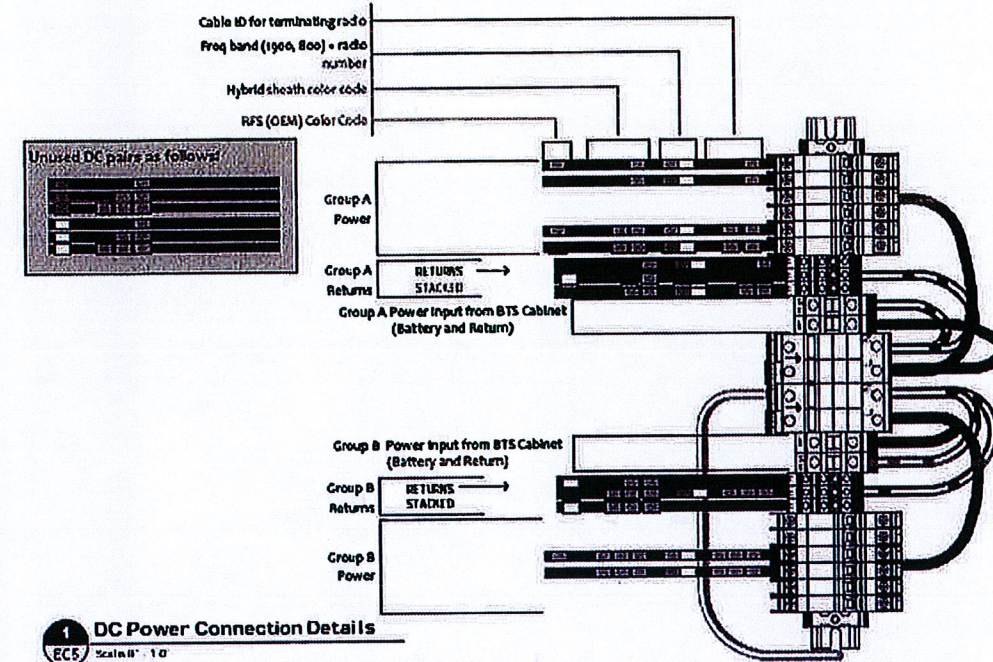
SIDE VIEW

1 DISTRIBUTION BOX DETAIL
NOT TO SCALE



- NOTE:
1. ANCHORS AND UNISTRUT CHANNEL SHALL HAVE HOT-DIPPED GALVANIZED FINISH.
 2. MOUNT FIBER AND POWER DISTRIBUTION BOX WITH FOUR (4) 1/4" UNISTRUT BOLTING HARDWARE AND SPRING NUTS.

2 TYPICAL DISTRIBUTION BOX ON H-FRAME DETAIL
NOT TO SCALE

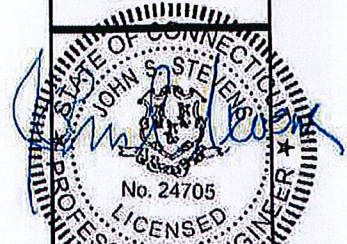


SCENARIO 124 v2.0

3 FIBER & DC CONNECTION DETAILS
NOT TO SCALE

Design:
Subd.
Deliver:
INFINIGY

11 Herbert Drive
Latham, NY 12110
Office # (518) 690-0790
Fax # (518) 690-0793



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**ENFIELD (CROWN)
CT03XC092**

4 OLIVER ROAD
ENFIELD, CT 06082

Prepared For



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Date:
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Drawing Title

**FIBER
DISTRIBUTION
BOX DETAILS**

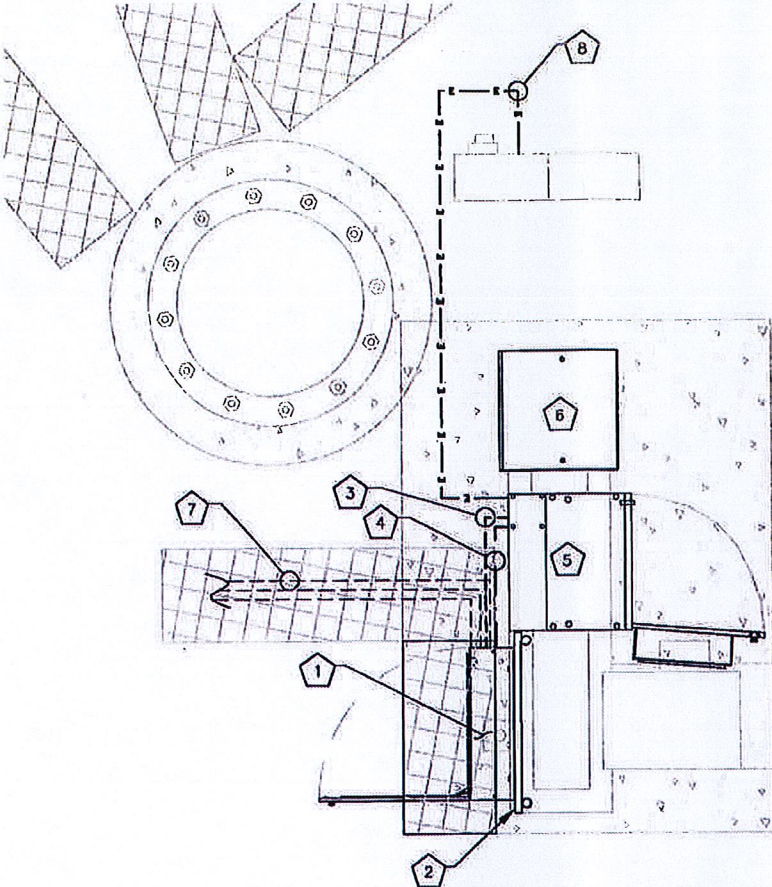
Drawing Number

C9

CODED NOTES:

- 1 PROPOSED SPRINT FIBER/POWER JUNCTION BOX MOUNTED TO NEW H-FRAME
- 2 PROPOSED H-FRAME FURNISHED AND INSTALLED BY CONTRACTOR
- 3 PROPOSED 1-1/2" LIQUID TIGHT CONDUIT WITH PULL-STRING FOR TELCO FROM FIBER JUNCTION BOX TO RADIO EQUIPMENT CABINET, 5'
- 4 PROPOSED 1-1/2" LIQUID TIGHT CONDUIT WITH PULL-STRING FOR DC POWER FROM FIBER JUNCTION BOX TO RADIO EQUIPMENT CABINET, 5'
- 5 PROPOSED MULTIMODAL BTS CABINET
- 6 PROPOSED BATTERY BACKUP CABINET
- 7 PROPOSED HYBRIFLEX CABLES ROUTED FROM PROPOSED FIBER JUNCTION BOX TO PROPOSED RRH TO FOLLOW EXISTING CABLES (CONTRACTOR TO VERIFY) (TYP. OF (1) PER SECTOR)
- 8 PROPOSED 2" LIQUID TIGHT CONDUIT ROUTED FROM BTS TO EXISTING PPC CABINET

NOTE:
CONTRACTOR SHALL NOT STACK THE HYBRIFLEX CABLES ON TOP OF THE EXISTING COAXIAL CABLES AS TO PREVENT THE COAXIAL CABLES FROM BEING REMOVED.



1 UTILITY SITE PLAN
SCALE: AS NOTED
CALLED NORTH

GRAPHIC SCALE
4' 2' 0' 2' 4'
SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"



UNDERGROUND SERVICE ALERT
CALL TOLL FREE 1-800-922-4455
THREE WORKING DAYS BEFORE YOU DIG

NOTES:
CONTRACTOR TO USE EXISTING SPARE CONDUITS, IF AVAILABLE. CONDUIT SIZES MUST BE EQUAL TO OR GREATER THAN THAT ALLOWED BY CODE.
EXISTING ALARMS NEED TO BE RE-ROUTED AND VERIFIED IN PROPER WORKING CONDITION WHEN NEW MMBTS EQUIPMENT IS INSTALLED.
REMAINING GROUND LEADS FROM REMOVED CABINETS TO BE COILED (NOT ON WALKING SURFACE).
REMAINING UNUSED CONDUITS FROM EXISTING CABINETS TO BE COVERED WITH WATERPROOF CAPS (NOT DUCT TAPE).

EXISTING PANELBOARD											
PANEL RATING: 120/240V, 60 HZ, 1Ø, 100A											
BUS AMPS		LOAD	POLES	AMPS	BUS		AMPS	POLES	LOAD	BUS AMPS	
L1	L2				L1	L2				L1	L2
		NOT LABELED	2	--	1-7	--	2		AC SURGE		
					2-8	--					
		MM BTS	2	100	3-9	--	2		CLEARWIRE		
					4-10	--					
		NOT LABELED	1	--	5-11	--	1		NOT LABELED		
		NOT LABELED	1	--	6-12	--			NOT USED		

2 EXISTING PANELBOARD SCHEDULE
NOT TO SCALE
NOTE:
CONTRACTOR IS TO ENSURE THE INSTALLATION INSTRUCTIONS FOR EACH CABINET ARE FOLLOWED AND THAT THE MANUFACTURER'S REQUIREMENTS ARE MET.

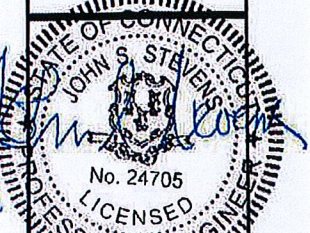
ELECTRICAL NOTES:

- ALL ELECTRICAL WORK SHALL CONFORM TO THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (N.E.C.), AND APPLICABLE LOCAL CODES
- GROUNDING SHALL COMPLY WITH THE ARTICLE 250 OF NATIONAL ELECTRICAL CODE.
- ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED.
- ALL WIRES SHALL BE AWG MIN #12 THIN COPPER UNLESS NOTED.
- CONDUCTORS SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT UNLESS NOTED OTHERWISE.
- LABEL SPRINT SERVICE DISCONNECTS WITH SWITCH AND PPC CABINET WITH ENGRAVED LAMACOID LABELS, LETTERS 1" IN HEIGHT.
- ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. BEND GROUNDING LEADS WITH A MINIMUM 8" RADIUS.
- ENGAGE AN INDEPENDENT TESTING FIRM TO TEST AND VERIFY THAT RESISTANCE DOES NOT EXCEED 10 OHMS TO GROUND. TEST GROUND RING RESISTANCE PRIOR TO MAKING FINAL GROUND CONNECTIONS TO INFRASTRUCTURE AND EQUIPMENT. GROUNDING AND OTHER OPERATIONAL TESTING SHALL BE WITNESSED BY SPRINTS REPRESENTATIVE.
- PROVIDE PULL BOXES AND JUNCTION BOXES WHERE REQUIRED SO THAT CONDUIT BENDS DO NOT EXCEED 360 DEGREES.
- OBTAIN PERMITS AND PAY FEES RELATED TO ELECTRICAL WORK PERFORMED ON THIS PROJECT. DELIVER COPIES OF ALL PERMITS TO SPRINT REPRESENTATIVE.
- SCHEDULE AND ATTEND INSPECTIONS RELATED TO ELECTRICAL WORK REQUIRED BY JURISDICTION HAVING AUTHORITY. CORRECT AND PAY FOR ANY WORK REQUIRED TO PASS ANY FAILED INSPECTION.
- REDLINED AS-BUILTS ARE TO BE DELIVERED TO A SPRINT REPRESENTATIVE.
- PROVIDE TWO COPIES OF OPERATION AND MAINTENANCE MANUALS IN THREE-RING BINDER.
- FURNISH AND INSTALL THE COMPLETE ELECTRICAL SERVICE, TELCO CONDUIT, AND THE COMPLETE GROUNDING SYSTEM.
- ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL APPLICABLE BUILDING CODES AND LOCAL ORDINANCES, INSTALLED IN A NEAT MANNER AND SHALL BE SUBJECT TO APPROVAL BY A SPRINT REPRESENTATIVE.
- CONDUCT A PRE-CONSTRUCTION SITE VISIT AND VERIFY EXISTING SITE CONDITIONS AFFECTING THIS WORK. REPORT ANY OMISSIONS OR DISCREPANCIES FOR CLARIFICATION PRIOR TO THE START OF CONSTRUCTION.
- PROJECT ADJACENT STRUCTURES AND FINISHES FROM DAMAGE, REPAIR TO ORIGINAL CONDITION ANY DAMAGED AREA.
- REMOVE DEBRIS ON A DAILY BASIS. DEBRIS NOT REMOVED IN A TIMELY FASHION WILL BE REMOVED BY OTHERS AND THE RESPONSIBLE SUBCONTRACTOR SHALL BE CHARGED ACCORDINGLY. REMOVAL OF DEBRIS SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE. DEBRIS SHALL BE REMOVED FROM THE PROPERTY AND DISPOSED OF LEGALLY.
- UPON COMPLETION OF WORK, THE SITE SHALL BE CLEAN AND FREE OF DUST AND FINGERPRINTS.
- PRIOR TO ANY TRENCHING, CONTACT LOCAL UTILITY TO VERIFY LOCATION OF ANY EXISTING BURIED SERVICE CONDUITS.
- DOCUMENT GROUND RING INSTALLATION AND CONNECTIONS TO IT WITH PHOTOGRAPHS PRIOR TO BACKFILLING SITE. PRESENT PHOTO ARCHIVE A SITE "PUNCH LIST" WALK TO SPRINT'S REPRESENTATIVE.

NOTE:
INFINIGY ENGINEERING HAS NOT CONDUCTED AN ELECTRICAL LOAD STUDY FOR THIS SITE. CONTRACTOR IS TO VERIFY EXISTING ELECTRICAL LOADS PRIOR TO CONSTRUCTION TO ENSURE THERE IS AMPLE SERVICE AVAILABLE TO ACCOMMODATE THE EXISTING AND PROPOSED EQUIPMENT.

Design. Build. Deliver.
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Office # (518) 690-0790
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Project Number 294-037

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ENFIELD (CROWN)
CT03XC092

4 OLIVER ROAD
ENFIELD, CT 06082

Prepared For



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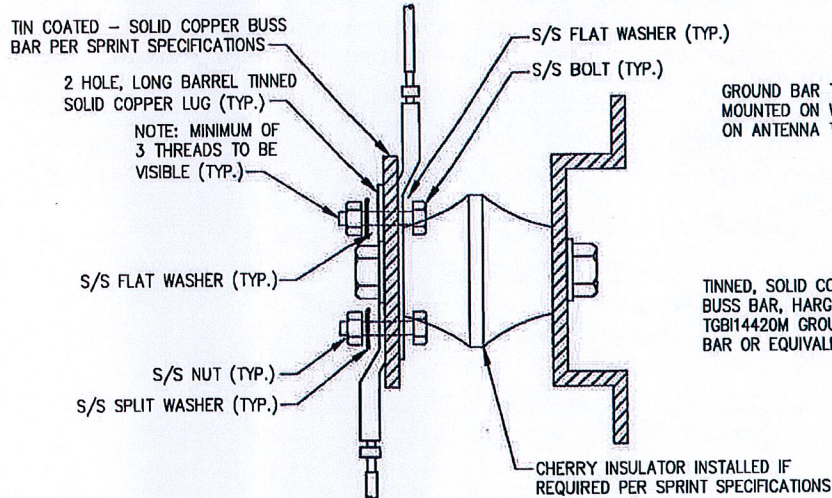
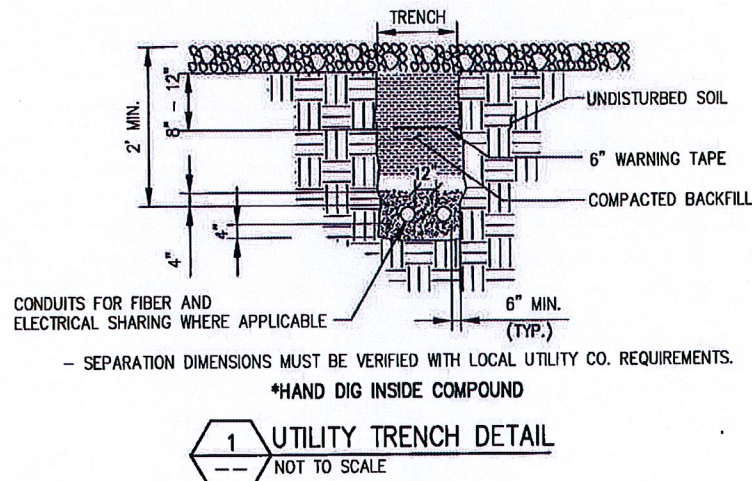
Drawing Title

UTILITY SITE PLAN

Drawing Number

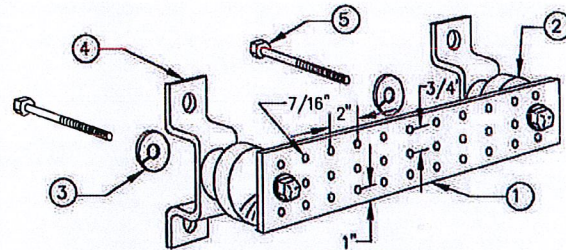
E1

GROUNDING NOTES:
IN ADDITION TO POWER SERVICE GROUNDING AS REQUIRED BY NEC, CONTRACTOR SHALL BE RESPONSIBLE TO COORD AND INSTALL ALL SURGE AND LIGHTING PROTECTION GROUNDING AS REQUIRED AND SPECIFIED BY SPRINT.



- NOTE:**
- 1) ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
 - 2) COAT WIRE END WITH ANTI-OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.
 - 3) APPLY ANTI-OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

GROUND LUG

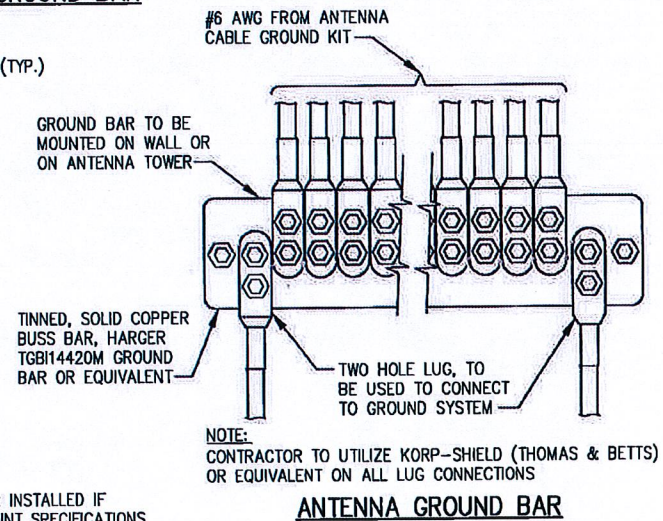


LEGEND

1. TINNED COPPER GROUND BAR, 1/4"x4"x20", NEWTON INSTRUMENT CO., HARGER TGB114420M, OR EQUIVALENT. HOLE CENTERS TO MATCH
2. NEMA DOUBLE LUG CONFIGURATION.
3. INSULATORS, NEWTON INSTRUMENT CO. CAT. NO. 3061-4 OR HARGER EQUIVALENT.
4. 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8 OR EQUIVALENT.
5. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT. NO. A-6056 OR HARGER EQUIVALENT.
6. 5/8-11"x1" H.H.C.S. BOLTS, NEWTON INSTRUMENT CO. CAT. NO. 3012-1 OR HARGER EQUIVALENT.

- NOTE:**
- 1) ALL MOUNTING HARDWARE CAN ALSO BE USED ON 6", 12", 18", ETC. GROUND BARS.
 - 2) ENTIRE ESSEMBLY AVAILABLE FROM NEWTON INSTRUMENT CO. CAT. NO. 2106060010 OR AS HARGER TGB114420M.

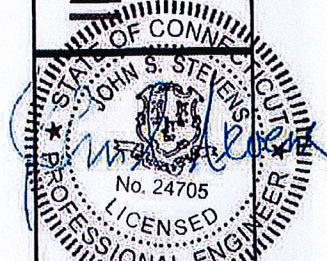
GROUND BAR



2 GROUND BAR DETAILS
NOT TO SCALE

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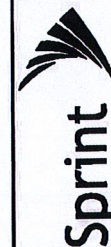
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CT03XC092

4 OLIVER ROAD
ENFIELD, CT 06082

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DETAILS

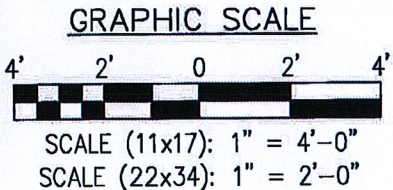
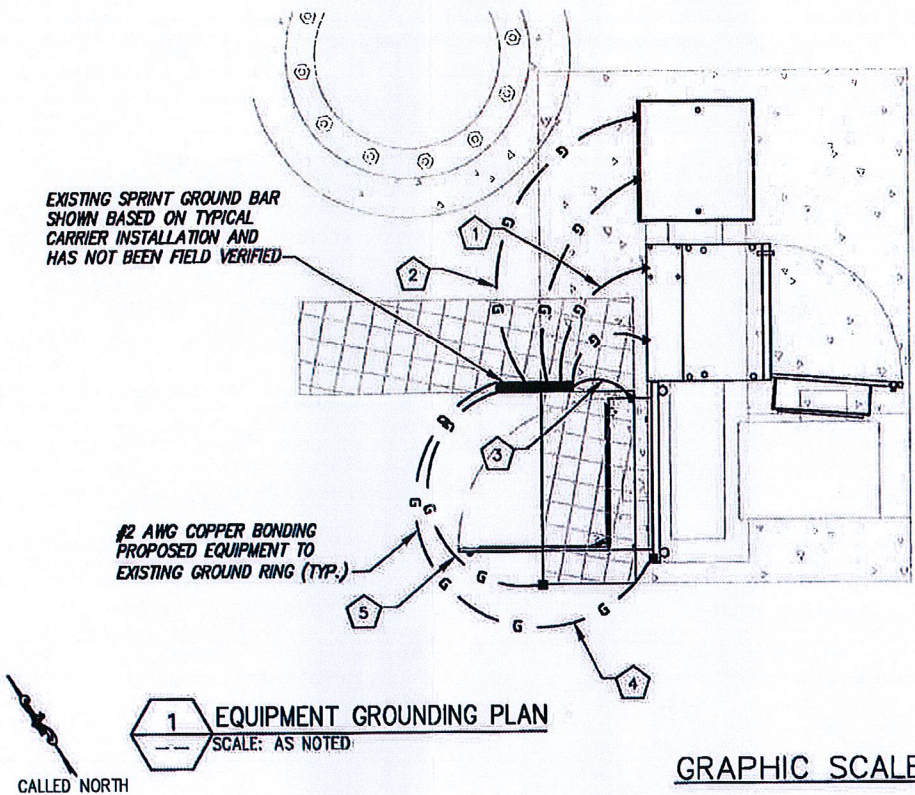
Drawing Number

E2

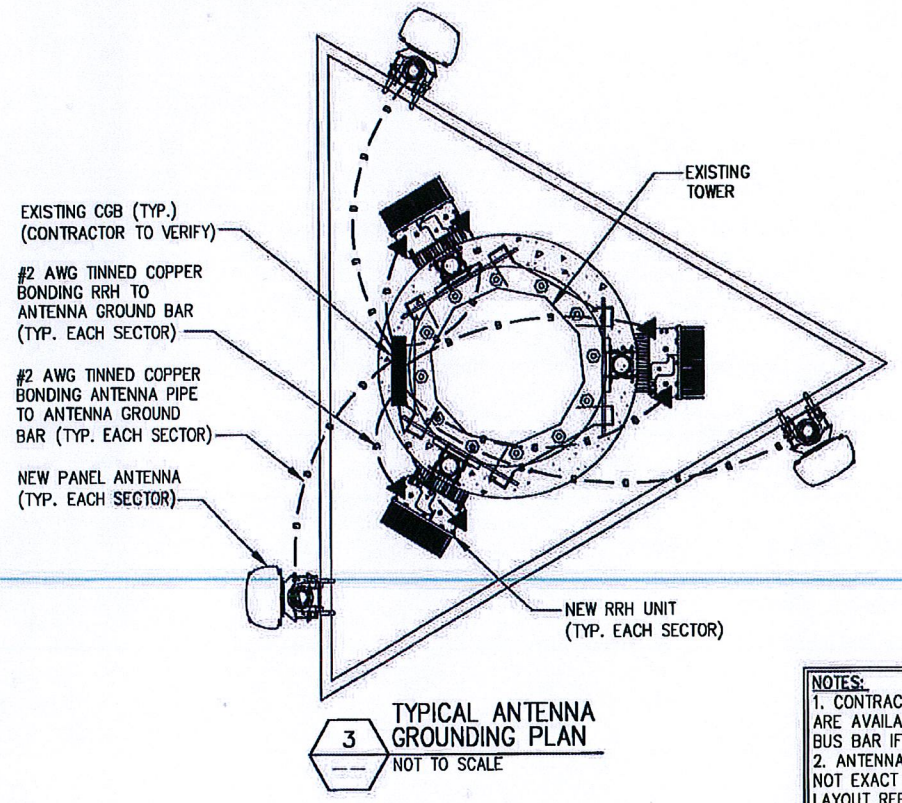
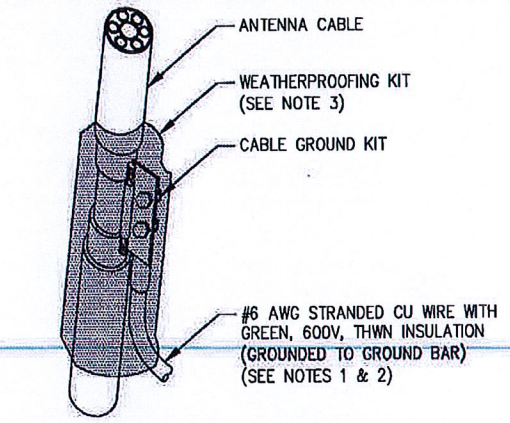
CODED NOTES:

- 1 PROPOSED MULTIMODAL
BTS CABINET
- 2 PROPOSED BATTERY
BACKUP CABINET
- 3 PROPOSED SPRINT
FIBER/POWER JUNCTION BOX
MOUNTED TO NEW H-FRAME
- 4 PROPOSED H-FRAME FURNISHED
AND INSTALLED BY CONTRACTOR
- 5 PROPOSED ICE BRIDGE
EXTENSION FURNISHED AND
INSTALLED BY CONTRACTOR

SYMBOL	
⊗	COPPER GROUND ROD
▶	CONNECT PER MANUFACTURER SPECS
■	CADWELD CONNECTION
•	MECHANICAL CONNECTION
—	GROUND BAR



- NOTES:
- 1) DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
- 2) GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
- 3) WEATHERPROOFING SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.



- NOTES:
1. CONTRACTOR TO VERIFY EXISTING LUG SPACES ARE AVAILABLE ON GROUND BAR. ADD ADDITIONAL BUS BAR IF NO LUG SPACES ARE AVAILABLE.
2. ANTENNA GROUNDING CONNECTIONS SHOWN ARE NOT EXACT TO THIS SITE. FOR EXACT ANTENNA LAYOUT REFER TO ANTENNA CONFIGURATION SHEET.

GROUNDING NOTES:

1. ALL DOWN CONDUCTORS AND GROUND RING AND CONDUCTOR SHALL BE #2 AWG, SOLID, BARE, TINNED COPPER, UNO. ALL CONNECTIONS TO GROUND RING SHALL BE EXOTHERMICALLY WELDED. CONDUCTOR SHALL BE A MINIMUM DEPTH BELOW GRADE OF 30 INCHES OR TO THE LEDGE. MINIMUM BEND RADIUS SHALL BE 8 INCHES. CONDUCTOR SHALL BE AT LEAST 24 INCHES FROM ANY FOUNDATION, UNO.
2. WHERE MECHANICAL CONDUCTOR CONNECTIONS ARE SPECIFIED, BOLTED, COMPRESSION-TYPE CLAMPS OR SPLIT-BOLT TYPE CONNECTORS SHALL BE USED.
3. GRIND OFF GALVANIZING IN AFFECTED AREA. EXOTHERMICALLY WELD #2 CONDUCTOR AT 6 INCHES ABOVE GRADE R FOUNDATION, WHICHEVER IS HIGHER. COLD-GALV AFTER. EXOTHERMICALLY WELD OTHER END TO THE GROUND.
4. GROUND CONDUCTORS ON EXTERIOR WALL OF SHELTER SHALL BE ENCASED IN PVC CONDUIT TO GRADE. MOUNT PVC WITH GALVANIZED "C" CLAMPS. SEAL TOP ENDS.
5. FOLLOWING COMPLETION OF WORK, CONDUCT GROUND TEST. SUBMIT WRITTEN TEST TO CONSTRUCTION MANAGER AND PROJECT MANAGER.
6. ALL GROUNDING WORK SHALL COMPLY WITH CARRIER(S) STANDARDS.
7. GROUNDING REQUIREMENTS SHOWN ON THIS PLAN ARE FOR ITEMS THAT ARE LOCATED NEAR GRADE LEVEL AND THAT NEED TO BE TIED TO THE BELOW GRADE GROUND RING.
8. UNLESS NOTED OTHERWISE, ALL GROUNDING SHALL BE IN ACCORDANCE WITH SPRINT'S SSEQ DOCUMENTS 3.018.02.004 "BONDING, GROUNDING AND TRANSIENT PROTECTION FOR CELL SITES", AND 3.018.10.002 "SITE RESISTANCE TO EARTH TESTING". ALL GROUNDING SHALL ALSO COMPLY WITH ALL STATE AND LOCAL CODES, AND THE NATIONAL ELECTRICAL CODE (NEC).
9. UNLESS NOTED OTHERWISE, ALL GROUNDING CONNECTIONS SHALL BE MADE BY AN EXOTHERMIC WELD.
10. RESISTANCE TO EARTH TESTING IS REQUIRED PER SPRINT STANDARDS ON ALL NEW SITES.
11. REFER TO "ANTI-THEFT UPDATE TO SPRINT GROUNDING 082412.PDF" FOR GUIDELINE TO SUSPECTED OR ACTUAL THEFT OF GROUND RING.

Design. Build. Deliver.

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11 Herbert Drive
Latham, NY 12110
Office # (518) 860-0790
Fax # (518) 860-0793

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
REGISTERED PROFESSIONAL ENGINEER
ELECTRICAL

REVISED PER COMMENTS	DATE
2	1/17/13
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Drawing Title:
**GROUNDING
PLAN AND
DETAILS**

Drawing Number
E3