



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

May 17, 2013

Jeff Barbadora
Crown Castle
3530 Torrington Way, Suite 300
Charlotte, NC 28277

RE: **EM-SPRINT-NEXTEL-049-130429** – Sprint Nextel notice of intent to modify an existing telecommunications facility located at Bright Meadow Boulevard, Enfield, Connecticut.

Dear Mr. Barbadora:

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 tower modifications depicted in modifications drawings attached to the Structural Modification Report prepared by Paul J. Ford and Company dated February 27, 2013, 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 the 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 April 25, 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.

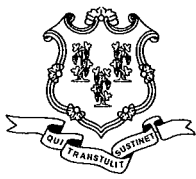
Very truly yours,



Melanie A. Bachman
Acting Executive Director

MAB/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

May 1, 2013

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

RE: **EM-SPRINT-NEXTEL-049-130429** – Sprint Nextel notice of intent to modify an existing telecommunications facility located at Bright Meadow Boulevard, 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 May 15, 2013.

Thank you for your cooperation and consideration.

Very truly yours,

Melanie Bachman
Acting Executive Director

MB/cm

c: Jose Giner, Director of Planning and Community Development, Town of Enfield

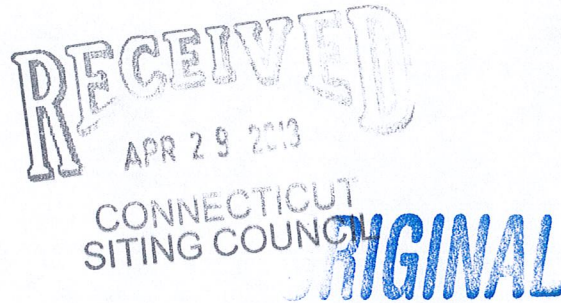


Tel: 704-405-6600
EM-SPRINT-NEXTEL-049-130429

Crown Castle
3530 Toringdon Way
Suite 300
Charlotte, NC 28277

April 25, 2013

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



RE: **Sprint Nextel-Exempt Modification - Crown Site BU: 876348**
Sprint Nextel Site ID: CT03XC221
Located at: Bright Meadow Blvd., Enfield, CT 06082

Dear Ms. Roberts:

This letter and exhibits 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 exhibits as notification, pursuant to § 16-50j-73 of the Regulations of Connecticut State Agencies ("R.C.S.A."), of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In compliance with R.C.S.A. § 16-50j-73, a copy of this letter and exhibits is being sent to The Honorable Scott R. Kaupin, Mayor for the Town of Enfield.

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at **Bright Meadow Blvd., Enfield, CT 06082**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to Sprint's operations at the site (Exhibit-3).

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") § 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 in the R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. Sprint's replacement antennas 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 safety standard. A cumulative General Power Density table report for Sprint's modified facility is included as Exhibit-3.
5. A Structural Modification Report confirming that the tower and foundation can support Sprint's proposed modifications is included as Exhibit-2.

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

Sincerely,



Jeff Barbadora
Property Specialist

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: General Power Density Table Report (RF Emissions Analysis Report)
Tab 3: Exhibit-3: Structural Modification Report

CC: The Honorable Scott R. Kaupin, Mayor, Town of Enfield

Exhibit – 1

Full Construction Drawings, Stamped & Sealed

(Insert A&E Drawings Complete – FST Task 25.0)

Exhibit – 2

General Power Density Table – (RF Emissions Analysis Report)

(Insert MPE Certification – FST Task 37.5)



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: CT03XC221

Enfield
Bright Meadow Boulevard
Enfield, CT 06082

December 28, 2012

December 28, 2012

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

Re: Emissions Values for Site: **CT03XC221 – Enfield**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at Bright Meadow Boulevard, 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 Bright Meadow Boulevard, 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 antenna used in this modeling is the APXVSPP18-C-A20. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its 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.



- 6) The antenna mounting height centerline of the proposed antennas is **148 feet** above ground level (AGL)
- 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 ID: C103XC231 - Enfield		Site Address: Bright Meadow Boulevard, Enfield, CT, 06082		Site Type: Monopole													
Sector 1																	
Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBD)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	15.9	148	142	1/2"	0.5	0	2080.4211	37.09202	3.70920%
1a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	148	142	1/2"	0.5	0	389.96892	6.952793	1.22624%
Sector 2																	
Sector total Power Density Value: 4.9355%																	
Sector 3																	
Sector total Power Density Value: 4.9355%																	

Site Composite MPE %	
Carrier	MPE %
Sprint	14.806%
AT&T	23.030%
MetroPCS	5.950%
Clearwire	0.860%
Verizon Wireless	18.100%
Nextel	3.540%
XM	1.090%
Total Site MPE %	67.376%



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 **14.803%** (**4.935% from each sector**) 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 **67.376%** 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

Exhibit – 3

Structural Modification Report

(Insert SA– FST Task 9.8)



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

Date: February 27, 2013

David Smith
 Crown Castle USA Inc.
 3530 Toringdon Way Suite 300
 Charlotte, NC 28277

Paul J Ford and Company
 250 E. Broad Street Suite 1500
 Columbus, OH 43215
 614.221.6679
 jfrybarger@pjfweb.com

Subject: Structural Modification Report

Carrier Designation: *Sprint PCS Co-Locate*
Carrier Site Number: CT03XC221
Carrier Site Name: CT03XC221

Crown Castle Designation:
Crown Castle BU Number: 876348
Crown Castle Site Name: ENFIELD
Crown Castle JDE Job Number: 190530
Crown Castle Work Order Number: 581560
Crown Castle Application Number: 165583 Rev. 1

Engineering Firm Designation: Paul J Ford and Company Project Number: 37513-0644 BP

Site Data: Bright Meadow Blvd., ENFIELD, Hartford County, CT
 Latitude 42° 1' 14.91", Longitude -72° 35' 6.59"
 147.5 Foot - Monopole Tower

Dear David Smith,

Paul J Ford and Company is pleased to submit this "Structural Modification 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 525500, in accordance with application 165583, 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: Modified Structure w/ Existing + Reserved + Proposed Equipment **Sufficient Capacity**
 Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

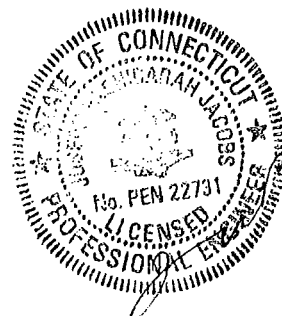
The analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2005 CT State Building Code based upon a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings 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:


 Joshua Frybarger, E.I.T.
 Structural Engineer *BKK*





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

Date: **February 27, 2013**

David Smith
 Crown Castle USA Inc.
 3530 Toringdon Way Suite 300
 Charlotte, NC 28277

Paul J Ford and Company
 250 E. Broad Street Suite 1500
 Columbus, OH 43215
 614.221.6679
 jfrybarger@pjfweb.com

Subject: Structural Modification Report

Carrier Designation: **Sprint PCS Co-Locate**
Carrier Site Number: CT03XC221
Carrier Site Name: CT03XC221

Crown Castle Designation: **Crown Castle BU Number:** 876348
Crown Castle Site Name: ENFIELD
Crown Castle JDE Job Number: 190530
Crown Castle Work Order Number: 581560
Crown Castle Application Number: 165583 Rev. 1

Engineering Firm Designation: **Paul J Ford and Company Project Number:** 37513-0644 BP

Site Data: **Bright Meadow Blvd., ENFIELD, Hartford County, CT**
Latitude 42° 1' 14.91", Longitude -72° 35' 6.59"
147.5 Foot - Monopole Tower

Dear David Smith,

Paul J Ford and Company is pleased to submit this **“Structural Modification 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 525500, in accordance with application 165583, 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: Modified Structure w/ Existing + Reserved + Proposed Equipment **Sufficient Capacity**
 Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2005 CT State Building Code based upon 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 attached drawings 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:

Joshua Frybarger, E.I.T.
 Structural Engineer

TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA

Table 1 - Proposed Antenna and Cable Information

Table 2 - Existing and Reserved Antenna and Cable Information

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Table 5 - Tower Component Stresses vs. Capacity

4.1) Recommendations

5) APPENDIX A

tnxTower Output

6) APPENDIX B

Base Level Drawing

7) APPENDIX C

Additional Calculations

1) INTRODUCTION

This tower is a 147.5 ft Monopole tower designed by SUMMIT in September of 1998. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of 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)	Cable Elevation (ft)	Number of Antenna	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Config	Note
147.0	147.0	3	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe	3	1 1/4	-
145.0	145.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER			
		3	alcatel lucent	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)	Cable Elevation (ft)	Number of Antenna	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Config	Note
147.0	147.0	6	decibel	DB980H90E-M w/Mount Pipe	6	1 5/8	3
		1	tower mounts	Platform Mount [LP 712-1]	-	-	1
132.0	134.0	3	antel	BXA-171063-8BF-EDIN-2 w/ Mount Pipe	6	1 5/8	2
		3	antel	BXA-70063-6CF-EDIN-2 w/ Mount Pipe			
		6	antel	LPA-80063/4CF w/ Mount Pipe			
		6	antel	WPA-80090/4CF w/ Mount Pipe	-	-	3
		6	decibel	DB948F85T2E-M w/ Mount Pipe			
	1	tower mounts	Platform Mount [LP 712-1]	12	1 5/8	1	
127.0	129.0	12	decibel	DB844H90E-XY w/ Mount Pipe	12	7/8	1
	127.0	1	tower mounts	Platform Mount [LP 712-1]			
117.0	119.0	1	andrew	SBNH-1D6565C w/ Mount Pipe	9 2 1	1 5/8 3/4 3/8	1
		1	kmw communications	AM-X-CD-14-65-00T-RET w/ Mount Pipe			
		1	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		3	powerwave	7770.00 w/ Mount Pipe			
		6	powerwave	LGP21401			
	1	tower mounts	Platform Mount [LP 712-1]				
115.0	119.0	3	ericsson	RRU-11			
	115.0	1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Pipe Mount [PM 601-3]			

Mounting Level (ft)	Antenna Height (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
107.0	107.0	3	rfs celwave	APXV18-206517S-C w/ Mount Pipe	6	1 5/8	1
49.0	50.0	1	symmetricom	58532A	1	1/2	1
	49.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:

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

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 1204604EG1, 8/20/12	1532963	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PJF, 29298-598, 9/15/98	1613614	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit, 3960, 9/11/98	1613591	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	Crown Castle, 540637, 10/30/12	3360766	CCISITES
Proposed Modification Drawings	PJF, 37513-0644, 2/27/13	-	PJF

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.

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	Elevation (ft)	Component Type	Size	Index	P (K)	SFP allow (K)	% Capacity	Pass / Fail
L1	147.5 - 108.5	Pole	TP29.41x22x0.25	1	-9.14	1083.24	52.4	Pass
L2	108.5 - 72.25	Pole	TP35.798x28.1975x0.25	2	-14.13	1431.15	98.9	Pass
L3	72.25 - 46	Pole	TP40.2847x34.4429x0.3125	3	-20.07	2061.15	99.0	Pass
L4	46 - 41	Pole	TP41.2346x40.2847x0.4637	4	-21.33	2481.13	86.5	Pass
L5	41 - 0	Pole	TP48.4x41.2346x0.375	5	-30.97	2971.67	95.4	Pass
							Summary	
							Pole (L3)	99.0 Pass
							Rating =	99.0 Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	88.5	Pass
1	Base Plate	0	79.5	Pass
1	Base Foundation Steel	0	50.4	Pass
1	Base Foundation Soil Interaction	0	72.6	Pass

Structure Rating (max from all components)	99%
---	------------

Notes:

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

4.1) Recommendations

See attached modification drawings.

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:

- 1) Tower is located in Hartford County, Connecticut.
- 2) Basic wind speed of 80 mph.
- 3) Nominal ice thickness of 1.0000 in.
- 4) Ice thickness is considered to increase with height.
- 5) Ice density of 56.00 pcf.
- 6) A wind speed of 38 mph is used in combination with ice.
- 7) Deflections calculated using a wind speed of 50 mph.
- 8) A non-linear (P-delta) analysis was used.
- 9) Pressures are calculated at each section.
- 10) Stress ratio used in pole design is 1.333.
- 11) Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

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	147.5000-108.5000	39.0000	3.75	18	22.0000	29.4100	0.2500	1.0000	A572-60 (60 ksi)
L2	108.5000-72.2500	40.0000	4.50	18	28.1975	35.7980	0.2500	1.0000	A607-65 (65 ksi)
L3	72.2500-46.0000	30.7500	0.00	18	34.4429	40.2847	0.3125	1.2500	A607-65 (65 ksi)
L4	46.0000-41.0000	5.0000	0.00	18	40.2847	41.2346	0.4637	1.8547	Reinf 51.70 ksi (52 ksi)
L5	41.0000-0.0000	41.0000		18	41.2346	48.4000	0.3750	1.5000	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	22.3394	17.2586	1031.4832	7.7212	11.1760	92.2945	2064.3237	8.6310	3.4320	13.728
	29.8637	23.1385	2485.6899	10.3518	14.9403	166.3751	4974.6504	11.5714	4.7362	18.945
L2	29.3560	22.1763	2188.3323	9.9214	14.3243	152.7703	4379.5441	11.0903	4.5228	18.091
	36.3502	28.2073	4503.2898	12.6195	18.1854	247.6324	9012.5051	14.1063	5.8604	23.442
L3	35.8424	33.8531	4982.1874	12.1163	17.4970	284.7450	9970.9304	16.9298	5.5120	17.638
	40.9062	39.6475	8003.3079	14.1901	20.4646	391.0798	16017.1468	19.8275	6.5401	20.928
L4	40.9062	58.6054	11740.8857	14.1365	20.4646	573.7156	23497.2203	29.3083	6.2740	13.531
	41.8707	60.0034	12601.2872	14.4737	20.9472	601.5742	25219.1555	30.0074	6.4412	13.892
L5	41.8707	48.6332	10257.9035	14.5052	20.9472	489.7032	20529.3047	24.3212	6.5973	17.593
	49.1466	57.1618	16656.2703	17.0489	24.5872	677.4366	33334.4574	28.5863	7.8584	20.956

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
HB114-1-08U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	147.0000 - 0.0000	1	No Ice	0.1540
						1/2" Ice	0.2540
						1" Ice	0.3540
						2" Ice	0.5540
						4" Ice	0.9540
1 1/4"	C	No	CaAa (Out Of Face)	147.0000 - 0.0000	2	No Ice	0.0000
						1/2" Ice	0.0000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
						1" Ice	0.0000	4.18
						2" Ice	0.0000	9.73
						4" Ice	0.0000	28.15

LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	132.0000 - 0.0000	6	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
						2" Ice	0.0000	0.82
						4" Ice	0.0000	0.82
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	132.0000 - 0.0000	12	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
						2" Ice	0.0000	0.82
						4" Ice	0.0000	0.82

LDF5-50A (7/8 FOAM)	B	No	Inside Pole	127.0000 - 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

LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	117.0000 - 0.0000	9	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
						2" Ice	0.0000	0.82
						4" Ice	0.0000	0.82
WR-VG86ST-BRD (3/4")	B	No	Inside Pole	117.0000 - 0.0000	2	No Ice	0.0000	0.88
						1/2" Ice	0.0000	0.88
						1" Ice	0.0000	0.88
						2" Ice	0.0000	0.88
						4" Ice	0.0000	0.88
FB-L98B-002-75000(3/8")	B	No	Inside Pole	117.0000 - 0.0000	1	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

LDF7-50A (1-5/8 FOAM)	C	No	CaAa (Out Of Face)	107.0000 - 0.0000	1	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
1-5/8 FOAM	C	No	CaAa (Out Of Face)	107.0000 - 0.0000	5	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

LDF4-50A (1/2 FOAM)	C	No	Inside Pole	49.0000 - 0.0000	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.15
						1" Ice	0.0000	0.15
						2" Ice	0.0000	0.15
						4" Ice	0.0000	0.15

1" Flat Reinforcement	C	No	CaAa (Out Of Face)	48.0000 - 38.0000	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

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	147.5000-108.5000	A	0.000	0.000	0.000	0.000	0.35
		B	0.000	0.000	0.000	0.000	0.15

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L2	108.5000-72.2500	C	0.000	0.000	0.000	5.929	0.12
		A	0.000	0.000	0.000	0.000	0.54
		B	0.000	0.000	0.000	0.000	0.48
L3	72.2500-46.0000	C	0.000	0.000	0.000	12.463	0.29
		A	0.000	0.000	0.000	0.000	0.39
		B	0.000	0.000	0.000	0.000	0.35
L4	46.0000-41.0000	C	0.000	0.000	0.000	9.573	0.21
		A	0.000	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.000	0.000	0.07
L5	41.0000-0.0000	C	0.000	0.000	0.000	2.593	0.04
		A	0.000	0.000	0.000	0.000	0.61
		B	0.000	0.000	0.000	0.000	0.54
		C	0.000	0.000	0.000	14.932	0.34

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	147.5000-108.5000	A	1.176	0.000	0.000	0.000	0.000	0.35
		B		0.000	0.000	0.000	0.000	0.15
		C		0.000	0.000	0.000	14.983	0.60
L2	108.5000-72.2500	A	1.128	0.000	0.000	0.000	0.000	0.54
		B		0.000	0.000	0.000	0.000	0.48
		C		0.000	0.000	0.000	29.160	1.71
L3	72.2500-46.0000	A	1.072	0.000	0.000	0.000	0.000	0.39
		B		0.000	0.000	0.000	0.000	0.35
		C		0.000	0.000	0.000	21.918	1.21
L4	46.0000-41.0000	A	1.034	0.000	0.000	0.000	0.000	0.07
		B		0.000	0.000	0.000	0.000	0.07
		C		0.000	0.000	0.000	5.809	0.21
L5	41.0000-0.0000	A	1.000	0.000	0.000	0.000	0.000	0.61
		B		0.000	0.000	0.000	0.000	0.54
		C		0.000	0.000	0.000	31.999	1.62

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	147.5000-108.5000	-0.1847	0.1067	-0.3934	0.2271
L2	108.5000-72.2500	-0.3971	0.2292	-0.7639	0.4410
L3	72.2500-46.0000	-0.4255	0.2457	-0.8206	0.4738
L4	46.0000-41.0000	-0.5845	0.3375	-1.0836	0.6256
L5	41.0000-0.0000	-0.4300	0.2483	-0.8066	0.4657

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft	Azimuth Adjustment t	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
APXVSPP18-C-A20 w/ Mount Pipe	A	From Face	4.0000 0.00 0.00	0.00	147.0000	No Ice	6.9458	0.08
						1/2" Ice	8.1266	0.15
						1" Ice	9.0212	0.22
						2" Ice	10.8440	0.41
APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	4.0000 0.00 0.00	0.00	147.0000	4" Ice	14.8507	0.91
						No Ice	6.9458	0.08
						1/2" Ice	8.1266	0.15
						1" Ice	9.0212	0.22

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement		$C_A A_A$	$C_A A_A$	Weight
			Horz	Lateral				Front	Side	
			ft	ft	°	ft	ft ²	ft ²	K	
APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	4.0000	0.00	0.00	147.0000	2" Ice	11.0311	10.8440	0.41
							4" Ice	13.6786	14.8507	0.91
							No Ice	8.4975	6.9458	0.08
							1/2" Ice	9.1490	8.1266	0.15
							1" Ice	9.7672	9.0212	0.22
							2" Ice	11.0311	10.8440	0.41
PCS 1900MHz 4x45W- 65MHz	A	From Face	1.0000	0.00	0.00	145.0000	4" Ice	13.6786	14.8507	0.91
							No Ice	2.7087	2.6111	0.06
							1/2" Ice	2.9477	2.8475	0.08
							1" Ice	3.1953	3.0925	0.11
							2" Ice	3.7164	3.6084	0.17
							4" Ice	4.8623	4.7439	0.35
PCS 1900MHz 4x45W- 65MHz	B	From Face	1.0000	0.00	0.00	145.0000	No Ice	2.7087	2.6111	0.06
							1/2" Ice	2.9477	2.8475	0.08
							1" Ice	3.1953	3.0925	0.11
							2" Ice	3.7164	3.6084	0.17
							4" Ice	4.8623	4.7439	0.35
							No Ice	2.7087	2.6111	0.06
PCS 1900MHz 4x45W- 65MHz	C	From Face	1.0000	0.00	0.00	145.0000	1/2" Ice	2.9477	2.8475	0.08
							1" Ice	3.1953	3.0925	0.11
							2" Ice	3.7164	3.6084	0.17
							4" Ice	4.8623	4.7439	0.35
							No Ice	2.7087	2.6111	0.06
							1/2" Ice	2.9477	2.8475	0.08
800MHz 2X50W RRH W/FILTER	A	From Face	1.0000	0.00	0.00	145.0000	1" Ice	3.1953	3.0925	0.11
							2" Ice	3.7164	3.6084	0.17
							4" Ice	4.8623	4.7439	0.35
							No Ice	2.4014	2.2536	0.06
							1/2" Ice	2.6131	2.4602	0.09
							1" Ice	2.8335	2.6753	0.11
800MHz 2X50W RRH W/FILTER	B	From Face	1.0000	0.00	0.00	145.0000	2" Ice	3.3002	3.1316	0.17
							4" Ice	4.3372	4.1479	0.34
							No Ice	2.4014	2.2536	0.06
							1/2" Ice	2.6131	2.4602	0.09
							1" Ice	2.8335	2.6753	0.11
							2" Ice	3.3002	3.1316	0.17
800MHz 2X50W RRH W/FILTER	C	From Face	1.0000	0.00	0.00	145.0000	4" Ice	4.3372	4.1479	0.34
							No Ice	2.4014	2.2536	0.06
							1/2" Ice	2.6131	2.4602	0.09
							1" Ice	2.8335	2.6753	0.11
							2" Ice	3.3002	3.1316	0.17
							4" Ice	4.3372	4.1479	0.34
Side Arm Mount [SO 102- 3]	C	None			0.00	145.0000	No Ice	3.0000	3.0000	0.08
							1/2" Ice	3.4800	3.4800	0.11
							1" Ice	3.9600	3.9600	0.14
							2" Ice	4.9200	4.9200	0.20
							4" Ice	6.8400	6.8400	0.32
							No Ice	1.4250	1.4250	0.02
(3) 6' x 2.375" Pipe Mount	A	From Face	4.0000	0.00	0.00	147.0000	1/2" Ice	1.9250	1.9250	0.03
							1" Ice	2.2939	2.2939	0.05
							2" Ice	3.0596	3.0596	0.09
							4" Ice	4.7022	4.7022	0.23
							No Ice	1.4250	1.4250	0.02
							1/2" Ice	1.9250	1.9250	0.03
(3) 6' x 2.375" Pipe Mount	B	From Face	4.0000	0.00	0.00	147.0000	1" Ice	2.2939	2.2939	0.05
							2" Ice	3.0596	3.0596	0.09
							4" Ice	4.7022	4.7022	0.23
							No Ice	1.4250	1.4250	0.02
							1/2" Ice	1.9250	1.9250	0.03
							1" Ice	2.2939	2.2939	0.05
(3) 6' x 2.375" Pipe Mount	C	From Face	4.0000	0.00	0.00	147.0000	2" Ice	3.0596	3.0596	0.09
							4" Ice	4.7022	4.7022	0.23
							No Ice	1.4250	1.4250	0.02
							1/2" Ice	1.9250	1.9250	0.03
							1" Ice	2.2939	2.2939	0.05
							2" Ice	3.0596	3.0596	0.09
Platform Mount [LP 712-1]	C	None			0.00	147.0000	4" Ice	4.7022	4.7022	0.23
							No Ice	24.5300	24.5300	1.34
							1/2" Ice	29.9400	29.9400	1.65
							1" Ice	35.3500	35.3500	1.96
							2" Ice	46.1700	46.1700	2.58
							4" Ice	67.8100	67.8100	3.82

(2) LPA-80063/4CF w/ Mount Pipe	A	From Face	4.0000	0.00	0.00	132.0000	No Ice	7.2481	7.2599	0.04
							1/2" Ice	7.7190	7.9574	0.10

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	
			2.00						
(2) LPA-80063/4CF w/ Mount Pipe	B	From Face	4.0000 0.00 2.00	0.00	132.0000	1" Ice	8.2003	8.6723	0.18
						2" Ice	9.1945	10.1556	0.34
						4" Ice	11.3199	13.3910	0.80
						No Ice	7.2481	7.2599	0.04
						1/2" Ice	7.7190	7.9574	0.10
(2) LPA-80063/4CF w/ Mount Pipe	C	From Face	4.0000 0.00 2.00	0.00	132.0000	1" Ice	8.2003	8.6723	0.18
						2" Ice	9.1945	10.1556	0.34
						4" Ice	11.3199	13.3910	0.80
						No Ice	7.2481	7.2599	0.04
						1/2" Ice	7.7190	7.9574	0.10
BXA-70063-6CF-EDIN-2 w/ Mount Pipe	A	From Face	4.0000 0.00 2.00	0.00	132.0000	1" Ice	8.2003	8.6723	0.18
						2" Ice	9.1945	10.1556	0.34
						4" Ice	11.3199	13.3910	0.80
						No Ice	7.9686	5.8008	0.04
						1/2" Ice	8.6091	6.9529	0.10
BXA-70063-6CF-EDIN-2 w/ Mount Pipe	B	From Face	4.0000 0.00 2.00	0.00	132.0000	1" Ice	9.2158	7.8191	0.17
						2" Ice	10.4591	9.6015	0.34
						4" Ice	13.0655	13.3662	0.80
						No Ice	7.9686	5.8008	0.04
						1/2" Ice	8.6091	6.9529	0.10
BXA-70063-6CF-EDIN-2 w/ Mount Pipe	C	From Face	4.0000 0.00 2.00	0.00	132.0000	1" Ice	9.2158	7.8191	0.17
						2" Ice	10.4591	9.6015	0.34
						4" Ice	13.0655	13.3662	0.80
						No Ice	7.9686	5.8008	0.04
						1/2" Ice	8.6091	6.9529	0.10
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	A	From Face	4.0000 0.00 2.00	0.00	132.0000	1" Ice	9.2158	7.8191	0.17
						2" Ice	10.4591	9.6015	0.34
						4" Ice	13.0655	13.3662	0.80
						No Ice	3.1789	3.3530	0.03
						1/2" Ice	3.5550	3.9709	0.06
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	B	From Face	4.0000 0.00 2.00	0.00	132.0000	1" Ice	3.9637	4.5951	0.10
						2" Ice	4.8533	5.8933	0.19
						4" Ice	6.7671	8.8855	0.49
						No Ice	3.1789	3.3530	0.03
						1/2" Ice	3.5550	3.9709	0.06
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	C	From Face	4.0000 0.00 2.00	0.00	132.0000	1" Ice	3.9637	4.5951	0.10
						2" Ice	4.8533	5.8933	0.19
						4" Ice	6.7671	8.8855	0.49
						No Ice	3.1789	3.3530	0.03
						1/2" Ice	3.5550	3.9709	0.06
Platform Mount [LP 712-1]	C	None		0.00	132.0000	1" Ice	3.9637	4.5951	0.10
						2" Ice	4.8533	5.8933	0.19
						4" Ice	6.7671	8.8855	0.49
						No Ice	24.5300	24.5300	1.34
						1/2" Ice	29.9400	29.9400	1.65

(4) DB844H90E-XY w/ Mount Pipe	A	From Face	4.0000 0.00 2.00	0.00	127.0000	1" Ice	4.1185	6.2837	0.12
						2" Ice	5.0070	7.7123	0.23
						4" Ice	6.9197	10.8330	0.56
						No Ice	3.2986	4.9208	0.03
						1/2" Ice	3.6900	5.5962	0.07
(4) DB844H90E-XY w/ Mount Pipe	B	From Face	4.0000 0.00 2.00	0.00	127.0000	1" Ice	4.1185	6.2837	0.12
						2" Ice	5.0070	7.7123	0.23
						4" Ice	6.9197	10.8330	0.56
						No Ice	3.2986	4.9208	0.03
						1/2" Ice	3.6900	5.5962	0.07
(4) DB844H90E-XY w/ Mount Pipe	C	From Face	4.0000 0.00 2.00	0.00	127.0000	1" Ice	4.1185	6.2837	0.12
						2" Ice	5.0070	7.7123	0.23
						4" Ice	6.9197	10.8330	0.56
						No Ice	3.2986	4.9208	0.03
						1/2" Ice	3.6900	5.5962	0.07
Platform Mount [LP 712-1]	C	None		0.00	127.0000	1" Ice	4.1185	6.2837	0.12
						2" Ice	5.0070	7.7123	0.23
						4" Ice	6.9197	10.8330	0.56
						No Ice	24.5300	24.5300	1.34
						1/2" Ice	29.9400	29.9400	1.65

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
						1/2" Ice	29.9400	29.9400	1.65
						1" Ice	35.3500	35.3500	1.96
						2" Ice	46.1700	46.1700	2.58
						4" Ice	67.8100	67.8100	3.82

7770.00 w/ Mount Pipe	A	From Face	4.0000 0.00 2.00	0.00	117.0000	No Ice	6.1194	4.2543	0.06
						1/2" Ice	6.6258	5.0137	0.10
						1" Ice	7.1283	5.7109	0.16
						2" Ice	8.1643	7.1553	0.29
						4" Ice	10.3599	10.4117	0.66
7770.00 w/ Mount Pipe	B	From Face	4.0000 0.00 2.00	0.00	117.0000	No Ice	6.1194	4.2543	0.06
						1/2" Ice	6.6258	5.0137	0.10
						1" Ice	7.1283	5.7109	0.16
						2" Ice	8.1643	7.1553	0.29
						4" Ice	10.3599	10.4117	0.66
7770.00 w/ Mount Pipe	C	From Face	4.0000 0.00 2.00	0.00	117.0000	No Ice	6.1194	4.2543	0.06
						1/2" Ice	6.6258	5.0137	0.10
						1" Ice	7.1283	5.7109	0.16
						2" Ice	8.1643	7.1553	0.29
						4" Ice	10.3599	10.4117	0.66
SBNH-1D6565C w/ Mount Pipe	A	From Face	4.0000 0.00 2.00	0.00	117.0000	No Ice	11.5561	9.7151	0.09
						1/2" Ice	12.2227	11.1857	0.18
						1" Ice	12.8929	12.5942	0.28
						2" Ice	14.2911	14.8689	0.51
						4" Ice	17.4280	19.6184	1.14
AM-X-CD-14-65-00T-RET w/ Mount Pipe	B	From Face	4.0000 0.00 2.00	0.00	117.0000	No Ice	5.7442	4.0153	0.03
						1/2" Ice	6.1977	4.6330	0.08
						1" Ice	6.6606	5.2765	0.13
						2" Ice	7.6178	6.6779	0.25
						4" Ice	9.6678	9.7441	0.61
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Face	4.0000 0.00 2.00	0.00	117.0000	No Ice	8.4975	6.3042	0.07
						1/2" Ice	9.1490	7.4790	0.14
						1" Ice	9.7672	8.3676	0.21
						2" Ice	11.0311	10.1785	0.38
						4" Ice	13.6786	14.0237	0.87
(2) LGP21401	A	From Face	4.0000 0.00 2.00	0.00	117.0000	No Ice	1.2880	0.2326	0.01
						1/2" Ice	1.4453	0.3134	0.02
						1" Ice	1.6112	0.4028	0.03
						2" Ice	1.9690	0.6076	0.05
						4" Ice	2.7882	1.1210	0.14
(2) LGP21401	B	From Face	4.0000 0.00 2.00	0.00	117.0000	No Ice	1.2880	0.2326	0.01
						1/2" Ice	1.4453	0.3134	0.02
						1" Ice	1.6112	0.4028	0.03
						2" Ice	1.9690	0.6076	0.05
						4" Ice	2.7882	1.1210	0.14
(2) LGP21401	C	From Face	4.0000 0.00 2.00	0.00	117.0000	No Ice	1.2880	0.2326	0.01
						1/2" Ice	1.4453	0.3134	0.02
						1" Ice	1.6112	0.4028	0.03
						2" Ice	1.9690	0.6076	0.05
						4" Ice	2.7882	1.1210	0.14
(2) 6' x 2.375" Pipe Mount	A	From Face	4.0000 0.00 0.00	0.00	117.0000	No Ice	1.4250	1.4250	0.02
						1/2" Ice	1.9250	1.9250	0.03
						1" Ice	2.2939	2.2939	0.05
						2" Ice	3.0596	3.0596	0.09
						4" Ice	4.7022	4.7022	0.23
(2) 6' x 2.375" Pipe Mount	B	From Face	4.0000 0.00 0.00	0.00	117.0000	No Ice	1.4250	1.4250	0.02
						1/2" Ice	1.9250	1.9250	0.03
						1" Ice	2.2939	2.2939	0.05
						2" Ice	3.0596	3.0596	0.09
						4" Ice	4.7022	4.7022	0.23
(2) 6' x 2.375" Pipe Mount	C	From Face	4.0000 0.00 0.00	0.00	117.0000	No Ice	1.4250	1.4250	0.02
						1/2" Ice	1.9250	1.9250	0.03
						1" Ice	2.2939	2.2939	0.05
						2" Ice	3.0596	3.0596	0.09
						4" Ice	4.7022	4.7022	0.23

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
Platform Mount [LP 712-1]	C	None		0.00	117.0000	No Ice	24.5300	24.5300	1.34
						1/2" Ice	29.9400	29.9400	1.65
						1" Ice	35.3500	35.3500	1.96
						2" Ice	46.1700	46.1700	2.58
						4" Ice	67.8100	67.8100	3.82
RRU-11	A	From Face	1.0000 0.00 4.00	0.00	115.0000	No Ice	1.9116	1.4717	0.04
						1/2" Ice	2.1019	1.6452	0.06
						1" Ice	2.3009	1.8274	0.08
						2" Ice	2.7248	2.2176	0.12
						4" Ice	3.6763	3.1016	0.25
RRU-11	B	From Face	1.0000 0.00 4.00	0.00	115.0000	No Ice	1.9116	1.4717	0.04
						1/2" Ice	2.1019	1.6452	0.06
						1" Ice	2.3009	1.8274	0.08
						2" Ice	2.7248	2.2176	0.12
						4" Ice	3.6763	3.1016	0.25
RRU-11	C	From Face	1.0000 0.00 4.00	0.00	115.0000	No Ice	1.9116	1.4717	0.04
						1/2" Ice	2.1019	1.6452	0.06
						1" Ice	2.3009	1.8274	0.08
						2" Ice	2.7248	2.2176	0.12
						4" Ice	3.6763	3.1016	0.25
DC6-48-60-18-8F	A	From Face	1.0000 0.00 4.00	0.00	115.0000	No Ice	1.4667	1.4667	0.02
						1/2" Ice	1.6667	1.6667	0.04
						1" Ice	1.8778	1.8778	0.06
						2" Ice	2.3333	2.3333	0.11
						4" Ice	3.3778	3.3778	0.24
Pipe Mount [PM 601-3]	C	None		0.00	115.0000	No Ice	4.3900	4.3900	0.20
						1/2" Ice	5.4800	5.4800	0.24
						1" Ice	6.5700	6.5700	0.28
						2" Ice	8.7500	8.7500	0.36
						4" Ice	13.1100	13.1100	0.53

APXV18-206517S-C w/ Mount Pipe	A	From Face	1.0000 0.00 0.00	0.00	107.0000	No Ice	5.4042	4.7000	0.05
						1/2" Ice	5.9597	5.8600	0.09
						1" Ice	6.4808	6.7338	0.15
						2" Ice	7.5467	8.5150	0.28
						4" Ice	9.9193	12.2774	0.68
APXV18-206517S-C w/ Mount Pipe	B	From Face	1.0000 0.00 0.00	0.00	107.0000	No Ice	5.4042	4.7000	0.05
						1/2" Ice	5.9597	5.8600	0.09
						1" Ice	6.4808	6.7338	0.15
						2" Ice	7.5467	8.5150	0.28
						4" Ice	9.9193	12.2774	0.68
APXV18-206517S-C w/ Mount Pipe	C	From Face	1.0000 0.00 0.00	0.00	107.0000	No Ice	5.4042	4.7000	0.05
						1/2" Ice	5.9597	5.8600	0.09
						1" Ice	6.4808	6.7338	0.15
						2" Ice	7.5467	8.5150	0.28
						4" Ice	9.9193	12.2774	0.68

58532A	A	From Face	2.0000 0.00 1.00	0.00	49.0000	No Ice	0.2209	0.2209	0.00
						1/2" Ice	0.2897	0.2897	0.00
						1" Ice	0.3672	0.3672	0.01
						2" Ice	0.5481	0.5481	0.02
						4" Ice	1.0137	1.0137	0.06
Side Arm Mount [SO 701-1]	A	From Face	1.0000 0.00 0.00	0.00	49.0000	No Ice	0.8500	1.6700	0.07
						1/2" Ice	1.1400	2.3400	0.08
						1" Ice	1.4300	3.0100	0.09
						2" Ice	2.0100	4.3500	0.12
						4" Ice	3.1700	7.0300	0.18

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 147.5000-108.5000	127.2746	1.471	24.07	83.541	A	0.000	83.541	83.541	100.00	0.000	0.000
					B	0.000	83.541	100.00	0.000	0.000	
					C	0.000	83.541	100.00	0.000	5.929	
L2 108.5000-72.2500	89.9920	1.332	21.78	97.736	A	0.000	97.736	97.736	100.00	0.000	0.000
					B	0.000	97.736	100.00	0.000	0.000	
					C	0.000	97.736	100.00	0.000	12.463	
L3 72.2500-46.0000	58.8363	1.18	19.33	82.668	A	0.000	82.668	82.668	100.00	0.000	0.000
					B	0.000	82.668	100.00	0.000	0.000	
					C	0.000	82.668	100.00	0.000	9.573	
L4 46.0000-41.0000	43.4903	1.082	17.73	16.983	A	0.000	16.983	16.983	100.00	0.000	0.000
					B	0.000	16.983	100.00	0.000	0.000	
					C	0.000	16.983	100.00	0.000	2.593	
L5 41.0000-0.0000	19.9537	1	16.38	153.126	A	0.000	153.126	153.126	100.00	0.000	0.000
					B	0.000	153.126	100.00	0.000	0.000	
					C	0.000	153.126	100.00	0.000	14.932	

Tower Pressure - With Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_z	q_z psf	t_z in	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 147.5000-108.5000	127.2746	1.471	5.32	1.1758	91.184	A	0.000	91.184	91.184	100.00	0.000	0.000
						B	0.000	91.184	100.00	0.000	0.000	
						C	0.000	91.184	100.00	0.000	14.983	
L2 108.5000-72.2500	89.9920	1.332	4.81	1.1279	104.840	A	0.000	104.840	104.840	100.00	0.000	0.000
						B	0.000	104.840	100.00	0.000	0.000	
						C	0.000	104.840	100.00	0.000	29.160	
L3 72.2500-46.0000	58.8363	1.18	4.27	1.0719	87.603	A	0.000	87.603	87.603	100.00	0.000	0.000
						B	0.000	87.603	100.00	0.000	0.000	
						C	0.000	87.603	100.00	0.000	21.918	
L4 46.0000-41.0000	43.4903	1.082	3.92	1.0337	17.845	A	0.000	17.845	17.845	100.00	0.000	0.000
						B	0.000	17.845	100.00	0.000	0.000	
						C	0.000	17.845	100.00	0.000	5.809	
L5 41.0000-0.0000	19.9537	1	3.62	1.0000	159.959	A	0.000	159.959	159.959	100.00	0.000	0.000
						B	0.000	159.959	100.00	0.000	0.000	
						C	0.000	159.959	100.00	0.000	31.999	

Tower Pressure - Service

$G_H = 1.690$

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 147.5000-108.5000	127.2746	1.471	9.40	83.541	A	0.000	83.541	83.541	100.00	0.000	0.000
					B	0.000	83.541	100.00	0.000	0.000	
					C	0.000	83.541	100.00	0.000	5.929	
L2 108.5000-72.2500	89.9920	1.332	8.51	97.736	A	0.000	97.736	97.736	100.00	0.000	0.000
					B	0.000	97.736	100.00	0.000	0.000	
					C	0.000	97.736	100.00	0.000	12.463	
L3 72.2500-46.0000	58.8363	1.18	7.55	82.668	A	0.000	82.668	82.668	100.00	0.000	0.000
					B	0.000	82.668	100.00	0.000	0.000	
					C	0.000	82.668	100.00	0.000	9.573	
L4 46.0000-41.0000	43.4903	1.082	6.93	16.983	A	0.000	16.983	16.983	100.00	0.000	0.000
					B	0.000	16.983	100.00	0.000	0.000	
					C	0.000	16.983	100.00	0.000	2.593	
L5 41.0000-0.0000	19.9537	1	6.40	153.126	A	0.000	153.126	153.126	100.00	0.000	0.000
					B	0.000	153.126	100.00	0.000	0.000	
					C	0.000	153.126	100.00	0.000	14.932	

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	147.5 - 108.5	Pole	Max Tension	24	0.00	-0.00	0.00
			Max. Compression	14	-21.38	1.50	-0.31
			Max. Mx	11	-9.14	326.06	-0.09
			Max. My	8	-9.14	0.34	-325.86
			Max. Vy	11	-17.09	326.06	-0.09
			Max. Vx	8	17.10	0.34	-325.86
			Max. Torque	8			-1.14
L2	108.5 - 72.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-29.47	3.59	-1.48
			Max. Mx	11	-14.13	998.82	-0.20
			Max. My	8	-14.13	0.65	-999.08
			Max. Vy	11	-20.35	998.82	-0.20
			Max. Vx	8	20.37	0.65	-999.08
			Max. Torque	8			-1.22
L3	72.25 - 46	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-37.92	5.92	-2.52
			Max. Mx	11	-20.07	1660.01	-0.29
			Max. My	8	-20.07	1.14	-1660.45

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L4	46 - 41	Pole	Max. Vy	11	-22.61	1660.01	-0.29
			Max. Vx	8	22.64	1.14	-1660.45
			Max. Torque	8			-1.44
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-39.54	6.24	-2.71
			Max. Mx	11	-21.33	1773.99	-0.37
			Max. My	8	-21.33	1.25	-1774.55
L5	41 - 0	Pole	Max. Vy	11	-22.98	1773.99	-0.37
			Max. Vx	8	23.01	1.25	-1774.55
			Max. Torque	8			-1.46
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-52.00	8.88	-4.23
			Max. Mx	11	-30.97	2766.21	-1.06
			Max. My	8	-30.97	2.18	-2767.74
			Max. Vy	11	-25.41	2766.21	-1.06
			Max. Vx	8	25.44	2.18	-2767.74
			Max. Torque	8			-1.57

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	24	52.00	7.37	-0.01
	Max. H _x	11	30.99	25.39	-0.01
	Max. H _z	2	30.99	-0.01	25.42
	Max. M _x	2	2766.24	-0.01	25.42
	Max. M _z	5	2762.46	-25.39	0.01
	Max. Torsion	2	1.57	-0.01	25.42
	Min. Vert	1	30.99	0.00	0.00
	Min. H _x	5	30.99	-25.39	0.01
	Min. H _z	8	30.99	0.01	-25.42
	Min. M _x	8	-2767.74	0.01	-25.42
	Min. M _z	11	-2766.21	25.39	-0.01
	Min. Torsion	8	-1.57	0.01	-25.42

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
Dead Only	30.99	0.00	0.00	0.72	1.80	0.00
Dead+Wind 0 deg - No Ice	30.99	0.01	-25.42	-2766.24	1.56	-1.57
Dead+Wind 30 deg - No Ice	30.99	12.70	-22.02	-2395.69	-1380.57	-1.39
Dead+Wind 60 deg - No Ice	30.99	21.99	-12.72	-1383.01	-2392.28	-0.84
Dead+Wind 90 deg - No Ice	30.99	25.39	-0.01	0.44	-2762.46	-0.07
Dead+Wind 120 deg - No Ice	30.99	21.98	12.70	1383.98	-2391.96	0.73
Dead+Wind 150 deg - No Ice	30.99	12.69	22.01	2396.88	-1380.03	1.33
Dead+Wind 180 deg - No Ice	30.99	-0.01	25.42	2767.74	2.18	1.57
Dead+Wind 210 deg - No Ice	30.99	-12.70	22.02	2397.19	1384.30	1.39
Dead+Wind 240 deg - No Ice	30.99	-21.99	12.72	1384.52	2396.02	0.84
Dead+Wind 270 deg - No Ice	30.99	-25.39	0.01	1.06	2766.21	0.07
Dead+Wind 300 deg - No Ice	30.99	-21.98	-12.70	-1382.48	2395.71	-0.73
Dead+Wind 330 deg - No Ice	30.99	-12.69	-22.01	-2395.39	1383.77	-1.33
Dead+Ice	52.00	-0.00	0.00	4.23	8.88	-0.00
Dead+Wind 0 deg+Ice	52.00	0.01	-7.38	-847.52	8.14	-0.55
Dead+Wind 30 deg+Ice	52.00	3.69	-6.40	-733.81	-417.18	-0.46
Dead+Wind 60 deg+Ice	52.00	6.39	-3.70	-422.34	-728.31	-0.25
Dead+Wind 90 deg+Ice	52.00	7.37	-0.01	3.45	-841.83	0.03
Dead+Wind 120 deg+Ice	52.00	6.38	3.68	429.45	-727.50	0.30
Dead+Wind 150 deg+Ice	52.00	3.68	6.39	741.52	-415.77	0.49
Dead+Wind 180 deg+Ice	52.00	-0.01	7.38	856.04	9.76	0.55
Dead+Wind 210 deg+Ice	52.00	-3.69	6.40	742.33	435.07	0.46
Dead+Wind 240 deg+Ice	52.00	-6.39	3.70	430.85	746.21	0.25

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
Dead+Wind 270 deg+Ice	52.00	-7.37	0.01	5.07	859.73	-0.03
Dead+Wind 300 deg+Ice	52.00	-6.38	-3.68	-420.93	745.40	-0.30
Dead+Wind 330 deg+Ice	52.00	-3.68	-6.39	-733.00	433.67	-0.49
Dead+Wind 0 deg - Service	30.99	0.00	-9.93	-1082.05	1.76	-0.62
Dead+Wind 30 deg - Service	30.99	4.96	-8.60	-937.04	-539.10	-0.55
Dead+Wind 60 deg - Service	30.99	8.59	-4.97	-540.75	-935.01	-0.33
Dead+Wind 90 deg - Service	30.99	9.92	-0.00	0.63	-1079.87	-0.03
Dead+Wind 120 deg - Service	30.99	8.59	4.96	542.05	-934.89	0.29
Dead+Wind 150 deg - Service	30.99	4.96	8.60	938.42	-538.89	0.52
Dead+Wind 180 deg - Service	30.99	-0.00	9.93	1083.55	2.00	0.62
Dead+Wind 210 deg - Service	30.99	-4.96	8.60	938.54	542.87	0.55
Dead+Wind 240 deg - Service	30.99	-8.59	4.97	542.26	938.78	0.33
Dead+Wind 270 deg - Service	30.99	-9.92	0.00	0.87	1083.64	0.03
Dead+Wind 300 deg - Service	30.99	-8.59	-4.96	-540.55	938.66	-0.29
Dead+Wind 330 deg - Service	30.99	-4.96	-8.60	-936.92	542.66	-0.52

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-30.99	0.00	0.00	30.99	0.00	0.000%
2	0.01	-30.99	-25.42	-0.01	30.99	25.42	0.000%
3	12.70	-30.99	-22.02	-12.70	30.99	22.02	0.000%
4	21.99	-30.99	-12.72	-21.99	30.99	12.72	0.000%
5	25.39	-30.99	-0.01	-25.39	30.99	0.01	0.000%
6	21.98	-30.99	12.70	-21.98	30.99	-12.70	0.000%
7	12.69	-30.99	22.01	-12.69	30.99	-22.01	0.000%
8	-0.01	-30.99	25.42	0.01	30.99	-25.42	0.000%
9	-12.70	-30.99	22.02	12.70	30.99	-22.02	0.000%
10	-21.99	-30.99	12.72	21.99	30.99	-12.72	0.000%
11	-25.39	-30.99	0.01	25.39	30.99	-0.01	0.000%
12	-21.98	-30.99	-12.70	21.98	30.99	12.70	0.000%
13	-12.69	-30.99	-22.01	12.69	30.99	22.01	0.000%
14	0.00	-52.00	0.00	0.00	52.00	-0.00	0.000%
15	0.01	-52.00	-7.38	-0.01	52.00	7.38	0.000%
16	3.69	-52.00	-6.40	-3.69	52.00	6.40	0.000%
17	6.39	-52.00	-3.70	-6.39	52.00	3.70	0.000%
18	7.37	-52.00	-0.01	-7.37	52.00	0.01	0.000%
19	6.38	-52.00	3.68	-6.38	52.00	-3.68	0.000%
20	3.68	-52.00	6.39	-3.68	52.00	-6.39	0.000%
21	-0.01	-52.00	7.38	0.01	52.00	-7.38	0.000%
22	-3.69	-52.00	6.40	3.69	52.00	-6.40	0.000%
23	-6.39	-52.00	3.70	6.39	52.00	-3.70	0.000%
24	-7.37	-52.00	0.01	7.37	52.00	-0.01	0.000%
25	-6.38	-52.00	-3.68	6.38	52.00	3.68	0.000%
26	-3.68	-52.00	-6.39	3.68	52.00	6.39	0.000%
27	0.00	-30.99	-9.93	-0.00	30.99	9.93	0.000%
28	4.96	-30.99	-8.60	-4.96	30.99	8.60	0.000%
29	8.59	-30.99	-4.97	-8.59	30.99	4.97	0.000%
30	9.92	-30.99	-0.00	-9.92	30.99	0.00	0.000%
31	8.59	-30.99	4.96	-8.59	30.99	-4.96	0.000%
32	4.96	-30.99	8.60	-4.96	30.99	-8.60	0.000%
33	-0.00	-30.99	9.93	0.00	30.99	-9.93	0.000%
34	-4.96	-30.99	8.60	4.96	30.99	-8.60	0.000%
35	-8.59	-30.99	4.97	8.59	30.99	-4.97	0.000%
36	-9.92	-30.99	0.00	9.92	30.99	-0.00	0.000%
37	-8.59	-30.99	-4.96	8.59	30.99	4.96	0.000%
38	-4.96	-30.99	-8.60	4.96	30.99	8.60	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00008631

3	Yes	6	0.00000001	0.00008707
4	Yes	6	0.00000001	0.00009049
5	Yes	4	0.00000001	0.00058408
6	Yes	6	0.00000001	0.00009021
7	Yes	6	0.00000001	0.00008731
8	Yes	5	0.00000001	0.00008650
9	Yes	6	0.00000001	0.00009152
10	Yes	6	0.00000001	0.00008804
11	Yes	4	0.00000001	0.00058423
12	Yes	6	0.00000001	0.00008830
13	Yes	6	0.00000001	0.00009126
14	Yes	4	0.00000001	0.00000789
15	Yes	5	0.00000001	0.00009142
16	Yes	5	0.00000001	0.00045979
17	Yes	5	0.00000001	0.00049377
18	Yes	4	0.00010362	0.00089788
19	Yes	5	0.00000001	0.00050209
20	Yes	5	0.00000001	0.00046567
21	Yes	5	0.00000001	0.00009358
22	Yes	5	0.00000001	0.00053732
23	Yes	5	0.00000001	0.00050072
24	Yes	4	0.00010354	0.00092971
25	Yes	5	0.00000001	0.00048698
26	Yes	5	0.00000001	0.00052550
27	Yes	4	0.00000001	0.00048205
28	Yes	5	0.00000001	0.00021888
29	Yes	5	0.00000001	0.00023379
30	Yes	4	0.00000001	0.00024722
31	Yes	5	0.00000001	0.00023293
32	Yes	5	0.00000001	0.00022022
33	Yes	4	0.00000001	0.00048303
34	Yes	5	0.00000001	0.00024021
35	Yes	5	0.00000001	0.00022442
36	Yes	4	0.00000001	0.00024830
37	Yes	5	0.00000001	0.00022507
38	Yes	5	0.00000001	0.00023863

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147.5 - 108.5	44.71	35	2.54	0.00
L2	112.25 - 72.25	26.50	35	2.30	0.00
L3	76.75 - 46	11.98	34	1.52	0.00
L4	46 - 41	4.18	34	0.86	0.00
L5	41 - 0	3.33	34	0.78	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
147.0000	APXVSPP18-C-A20 w/ Mount Pipe	35	44.44	2.54	0.00	26074
145.0000	PCS 1900MHz 4x45W-65MHz	35	43.37	2.53	0.00	26074
132.0000	(2) LPA-80063/4CF w/ Mount Pipe	35	36.47	2.48	0.00	8410
127.0000	(4) DB844H90E-XY w/ Mount Pipe	35	33.86	2.45	0.00	6358
117.0000	7770.00 w/ Mount Pipe	35	28.81	2.36	0.00	4273
115.0000	RRU-11	35	27.83	2.34	0.00	4013
107.0000	APXV18-206517S-C w/ Mount Pipe	35	24.04	2.21	0.00	3398
49.0000	58532A	34	4.75	0.91	0.00	2751

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147.5 - 108.5	113.87	8	6.47	0.01
L2	112.25 - 72.25	67.55	8	5.86	0.01
L3	76.75 - 46	30.56	8	3.88	0.00
L4	46 - 41	10.68	9	2.19	0.00
L5	41 - 0	8.49	9	1.99	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
147.0000	APXVSP18-C-A20 w/ Mount Pipe	8	113.19	6.47	0.01	10470
145.0000	PCS 1900MHz 4x45W-65MHz	8	110.47	6.45	0.01	10470
132.0000	(2) LPA-80063/4CF w/ Mount Pipe	8	92.90	6.33	0.01	3375
127.0000	(4) DB844H90E-XY w/ Mount Pipe	8	86.28	6.25	0.01	2550
117.0000	7770.00 w/ Mount Pipe	8	73.42	6.02	0.01	1711
115.0000	RRU-11	8	70.93	5.96	0.01	1607
107.0000	APXV18-206517S-C w/ Mount Pipe	8	61.28	5.65	0.01	1357
49.0000	58532A	9	12.13	2.32	0.00	1082

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
L1	147.5 - 108.5 (1)	TP29.41x22x0.25	39.0000	0.0000	0.0	36.00	22.5731	-9.14	812.63	0.011
L2	108.5 - 72.25 (2)	TP35.798x28.1975x0.25	40.0000	0.0000	0.0	39.00	27.5289	-14.13	1073.63	0.013
L3	72.25 - 46 (3)	TP40.2847x34.4429x0.3125	30.7500	0.0000	0.0	39.00	39.6475	-20.07	1546.25	0.013
L4	46 - 41 (4)	TP41.2346x40.2847x0.4637	5.0000	0.0000	0.0	31.02	60.0034	-21.33	1861.31	0.011
L5	41 - 0 (5)	TP48.4x41.2346x0.375	41.0000	0.0000	0.0	39.00	57.1618	-30.97	2229.31	0.014

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x kip-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio f _{bx} F _{bx}	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio f _{by} F _{by}
L1	147.5 - 108.5 (1)	TP29.41x22x0.25	326.08	24.72	36.00	0.687	0.00	0.00	36.00	0.000
L2	108.5 - 72.25 (2)	TP35.798x28.1975x0.25	999.17	50.84	39.00	1.304	0.00	0.00	39.00	0.000
L3	72.25 - 46 (3)	TP40.2847x34.4429x0.3125	1660.61	50.95	39.00	1.307	0.00	0.00	39.00	0.000
L4	46 - 41 (4)	TP41.2346x40.2847x0.4637	1774.73	35.40	31.02	1.141	0.00	0.00	31.02	0.000
L5	41 - 0 (5)	TP48.4x41.2346x0.375	2768.18	49.04	39.00	1.257	0.00	0.00	39.00	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	147.5 - 108.5 (1)	TP29.41x22x0.25	17.09	0.76	24.00	0.063	0.71	0.03	24.00	0.001
L2	108.5 - 72.25 (2)	TP35.798x28.1975x0.25	20.36	0.74	26.00	0.057	1.11	0.03	26.00	0.001
L3	72.25 - 46 (3)	TP40.2847x34.4429x0.3125	22.64	0.57	26.00	0.044	1.32	0.02	26.00	0.001
L4	46 - 41 (4)	TP41.2346x40.2847x0.4637	23.01	0.38	20.68	0.037	1.33	0.01	20.68	0.001
L5	41 - 0 (5)	TP48.4x41.2346x0.375	25.44	0.45	26.00	0.034	1.39	0.01	26.00	0.000

Pole Interaction Design Data

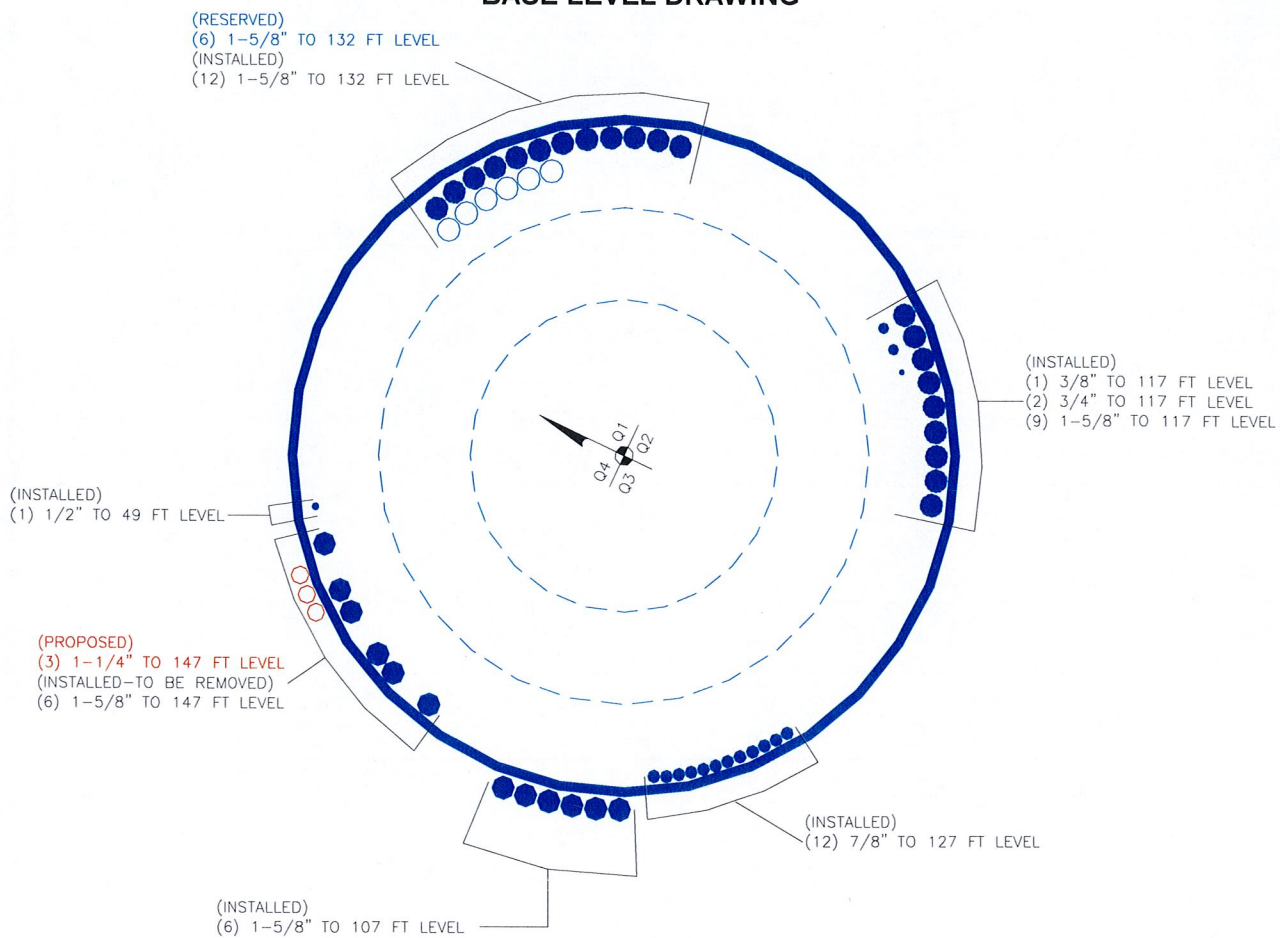
Section No.	Elevation ft	Ratio P	Ratio f_{bx}	Ratio f_{by}	Ratio f_v	Ratio f_{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_a	F_{bx}	F_{by}	F_v	F_{vt}			
L1	147.5 - 108.5 (1)	0.011	0.687	0.000	0.063	0.001	0.699 ✓	1.333	H1-3+VT ✓
L2	108.5 - 72.25 (2)	0.013	1.304	0.000	0.057	0.001	1.318 ✓	1.333	H1-3+VT ✓
L3	72.25 - 46 (3)	0.013	1.307	0.000	0.044	0.001	1.320 ✓	1.333	H1-3+VT ✓
L4	46 - 41 (4)	0.011	1.141	0.000	0.037	0.001	1.153 ✓	1.333	H1-3+VT ✓
L5	41 - 0 (5)	0.014	1.257	0.000	0.034	0.000	1.272 ✓	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	147.5 - 108.5	Pole	TP29.41x22x0.25	1	-9.14	1083.24	52.4	Pass	
L2	108.5 - 72.25	Pole	TP35.798x28.1975x0.25	2	-14.13	1431.15	98.9	Pass	
L3	72.25 - 46	Pole	TP40.2847x34.4429x0.3125	3	-20.07	2061.15	99.0	Pass	
L4	46 - 41	Pole	TP41.2346x40.2847x0.4637	4	-21.33	2481.13	86.5	Pass	
L5	41 - 0	Pole	TP48.4x41.2346x0.375	5	-30.97	2971.67	95.4	Pass	
							Summary		
							Pole (L3)	99.0	Pass
							RATING =	99.0	Pass

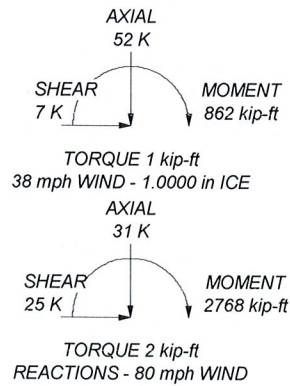
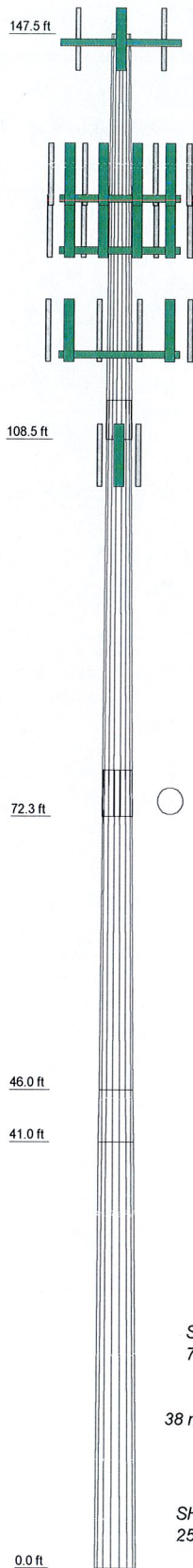
APPENDIX B

BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

Section	1	2	3	4	5	
Length (ft)	39.0000	40.0000	30.7500	5.0000	41.0000	
Number of Sides	18	18	18	18	18	
Thickness (in)	0.2500	0.2500	0.3125	0.4637	0.3750	
Socket Length (ft)	3.7500	4.5000			41.2346	
Top Dia (in)	22.0000	28.1975	34.4429	40.2847	41.2346	
Bot Dia (in)	29.4100	35.7980	40.2847	41.2346	48.4000	
Grade	A572-60		A607-65		A607-65	Reinf 51.70 ksi
Weight (K)	2.7	3.4	3.8	1.0	7.4	18.3



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVSP18-C-A20 w/ Mount Pipe	147	(4) DB844H90E-XY w/ Mount Pipe	127
APXVSP18-C-A20 w/ Mount Pipe	147	(4) DB844H90E-XY w/ Mount Pipe	127
APXVSP18-C-A20 w/ Mount Pipe	147	(4) DB844H90E-XY w/ Mount Pipe	127
(3) 6' x 2.375" Pipe Mount	147	Platform Mount [LP 712-1]	127
(3) 6' x 2.375" Pipe Mount	147	7770.00 w/ Mount Pipe	117
(3) 6' x 2.375" Pipe Mount	147	7770.00 w/ Mount Pipe	117
Platform Mount [LP 712-1]	147	7770.00 w/ Mount Pipe	117
800MHz 2X50W RRH W/FILTER	145	SBNH-1D6565C w/ Mount Pipe	117
800MHz 2X50W RRH W/FILTER	145	AM-X-CD-14-65-00T-RET w/ Mount Pipe	117
Side Arm Mount [SO 102-3]	145		
PCS 1900MHz 4x45W-65MHz	145	AM-X-CD-16-65-00T-RET w/ Mount Pipe	117
PCS 1900MHz 4x45W-65MHz	145		
PCS 1900MHz 4x45W-65MHz	145	(2) LGP21401	117
800MHz 2X50W RRH W/FILTER	145	(2) LGP21401	117
(2) LPA-80063/4CF w/ Mount Pipe	132	(2) 6' x 2.375" Pipe Mount	117
(2) LPA-80063/4CF w/ Mount Pipe	132	(2) 6' x 2.375" Pipe Mount	117
(2) LPA-80063/4CF w/ Mount Pipe	132	(2) 6' x 2.375" Pipe Mount	117
BXA-70063-6CF-EDIN-2 w/ Mount Pipe	132	Platform Mount [LP 712-1]	117
BXA-70063-6CF-EDIN-2 w/ Mount Pipe	132	RRU-11	115
BXA-70063-6CF-EDIN-2 w/ Mount Pipe	132	RRU-11	115
BXA-70063-6CF-EDIN-2 w/ Mount Pipe	132	RRU-11	115
BXA-70063-6CF-EDIN-2 w/ Mount Pipe	132	DC6-48-60-18-8F	115
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	132	Pipe Mount [PM 601-3]	115
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	132	APXV18-206517S-C w/ Mount Pipe	107
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	132	APXV18-206517S-C w/ Mount Pipe	107
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	132	APXV18-206517S-C w/ Mount Pipe	107
Platform Mount [LP 712-1]	132	58532A	49
		Side Arm Mount [SO 701-1]	49

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-60	60 ksi	75 ksi	Reinf 51.70 ksi	52 ksi	65 ksi
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 99%



Paul J Ford and Company
 250 E. Broad Street Suite 1500
 Columbus, OH 43215
 Phone: 614.221.6679
 FAX: 614.448.4105

Job: 147' MP; Enfield, CT; Enfield		
Project: PJF 37513-0644 (BU 876348)		
Client: Crown Castle	Drawn by: Joshua Frybarger	App'd:
Code: TIA/EIA-222-F	Date: 02/28/13	Scale: NTS
Path:		Dwg No. E-1

G:\TOWER\37513_Crown_Castle\2013\37513-0644\BU 876348\37513-0644 BP.dwg

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

- Assumptions:**
- 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
 - 2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
 - 3) Clear space between bottom of leveling nut and top of concrete **not** exceeding $(1) \times (\text{Rod Diameter})$

Site Data

BU#:	
Site Name:	
App #:	
Anchor Rod Data	
Qty:	12
Diam:	2.25 in
Rod Material:	A615-J
Yield, Fy:	75 ksi
Strength, Fu:	100 ksi
Bolt Circle:	55 in
Anchor Spacing:	6 in

Plate Data

W=Side:	52 in
Thick:	3 in
Grade:	50 ksi
Clip Distance:	4 in

Stiffener Data (Welding at both sides)

Configuration:	Unstiffened
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:	48.4 in
Thick:	0.375 in
Grade:	65 ksi
# of Sides:	18 "0" IF Round

Stress Increase Factor

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

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

Base Reactions

TIA Revision:	F	
Unfactored Moment, M:	2403.3	ft-kips
Unfactored Axial, P:	26.9	kips
Unfactored Shear, V:	21.7	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	172.5 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	88.5% Pass

Base Plate Results

Base Plate Stress:	39.7 ksi	Flexural Check
Allowable PL Bending Stress:	50.0 ksi	
Base Plate Stress Ratio:	79.5% Pass	

PL Ref. Data

Yield Line (in):	25.14
Max PL Length:	25.14

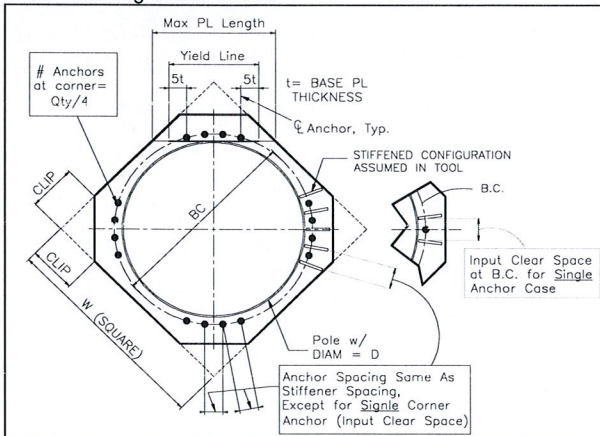
N/A - Unstiffened

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
----------------------------	-----





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: 2/28/2013
 PJF Project: 37513-0644 BP
 Client Ref. # BU 876348
 Site Name: Enfield
 Description: 147.5' MP
 Owner: Crown Castle
 Engineer: JJF

v4.1 - Effective 7-3-12

Asymmetric Anchor Rod Analysis

Moment = 2768 k-ft
 Axial = 31.0 kips
 Shear = 25.0 kips
 Anchor Qty = 15

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	32.4	55.00	0.00	3.98	172.47	167.98	167.98	0.00	195.00	86.1%
2	2.250	#18J A615 Gr 75	75	100	45.0	55.00	0.00	3.98	170.84	166.35	166.35	0.00	195.00	85.3%
3	2.250	#18J A615 Gr 75	75	100	57.6	55.00	0.00	3.98	169.28	164.79	164.79	0.00	195.00	84.5%
4	2.250	#18J A615 Gr 75	75	100	122.4	55.00	0.00	3.98	172.24	167.75	167.75	0.00	195.00	86.0%
5	2.250	#18J A615 Gr 75	75	100	135.0	55.00	0.00	3.98	174.70	170.21	170.21	0.00	195.00	87.3%
6	2.250	#18J A615 Gr 75	75	100	147.6	55.00	0.00	3.98	177.03	172.54	172.54	0.00	195.00	88.5%
7	2.250	#18J A615 Gr 75	75	100	212.4	55.00	0.00	3.98	177.03	172.54	172.54	0.00	195.00	88.5%
8	2.250	#18J A615 Gr 75	75	100	225.0	55.00	0.00	3.98	174.70	170.21	170.21	0.00	195.00	87.3%
9	2.250	#18J A615 Gr 75	75	100	237.6	55.00	0.00	3.98	172.24	167.75	167.75	0.00	195.00	86.0%
10	2.250	#18J A615 Gr 75	75	100	302.4	55.00	0.00	3.98	169.28	164.79	164.79	0.00	195.00	84.5%
11	2.250	#18J A615 Gr 75	75	100	315.0	55.00	0.00	3.98	170.84	166.35	166.35	0.00	195.00	85.3%
12	2.250	#18J A615 Gr 75	75	100	327.6	55.00	0.00	3.98	172.47	167.98	167.98	0.00	195.00	86.1%
13	1.750	A193 Gr B7	105	125	0.0	60.40	0.00	2.41	115.99	113.28	113.28	0.00	132.29	85.6%
14	1.750	A193 Gr B7	105	125	110.0	60.40	0.00	2.41	112.70	109.98	109.98	0.00	132.29	83.1%
15	1.750	A193 Gr B7	105	125	250.0	60.40	0.00	2.41	112.70	109.98	109.98	0.00	132.29	83.1%

54.98

Foundation Loads:

Pole weight or tower leg compression = 31 (kips)
 Horizontal load at top of pier = 25 (kips)
 Overturning moment at top of pier = 2768 (ft-kips)

Design criteria:

Safety factor against overturning = 1.5

Soil Properties:

Soil density = 100 (pcf)
 Allowable soil bearing = 3.25 (ksf)
 Depth to water table = 4 (ft)

Dimensions:

Pier shape (round or square) S ("R" or "S")
 Pier width = 8 (ft)
 Pier height above grade = 0.5 (ft)
 depth to bottom of footing = 10 (ft)
 Footing thickness = 3 (ft)
 Footing width = 23.5 (ft)
 Footing length = 23.5 (ft)

Concrete:

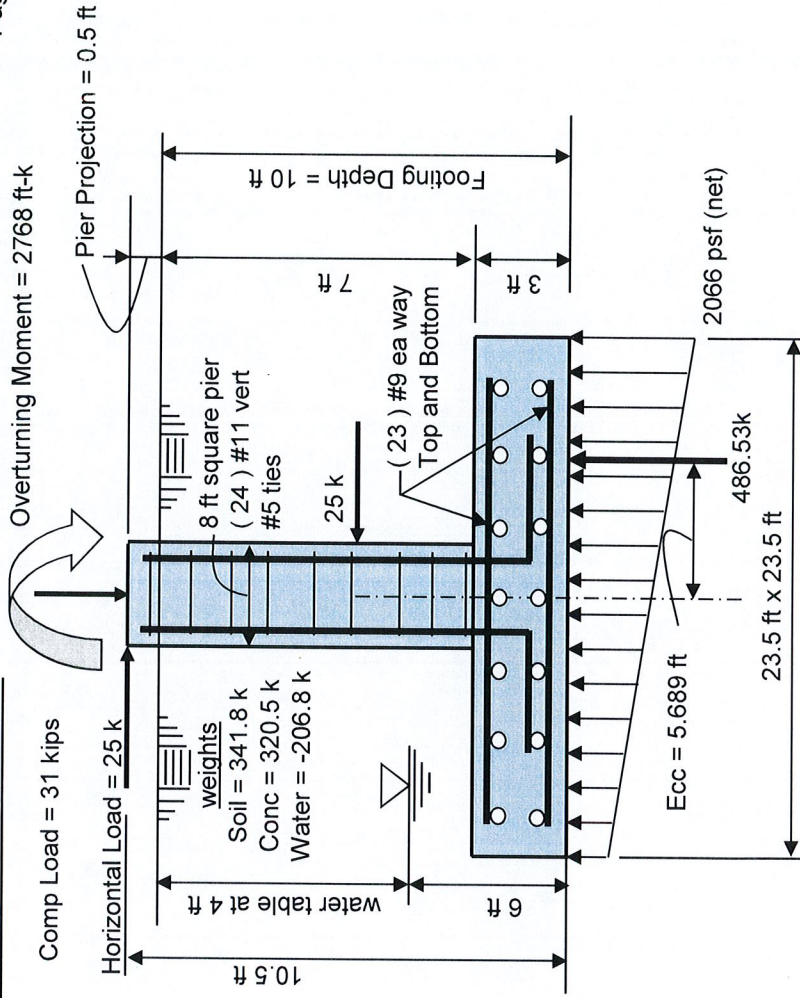
Concrete strength = 3 (ksi)
 Rebar strength = 60 (ksi)
 ultimate load factor = 1.3

Reinforcing Steel:

minimum cover over rebar = 3 inches
 size of pad rebar = #9 bar
 quantity of pad rebar = 23 (ea direction)

Reinforcing Steel:

size of vert rebar in pier = #11 bar
 vertical rebar quantity = 24
 size of pier ties = #5 bar
 minimum cover over rebar = 3 inches
 Total volume of concrete = 79.1 cu yd



Summary of analysis results	
Maximum Net Soil Bearing = 2.066 ksf	Ult Bending Shear Capacity = 110 psi
Allowable Net Soil Bearing = 3.25 ksf	Ult Bending Shear Stress = 29 psi
Soil Bearing Stress Ratio = 0.64 Okay	Bending Shear Stress Ratio = 0.26 Okay
Ftg Overturning Resistance = 5717 ft-kips	Pad Bending Moment Capacity = 3142 ft-k
Overturning Moment = 2768 ft-kips	Pad Bending Moment = 1081 ft-k
Required Overturning Safety Factor = 1.5	Bending Moment Stress Ratio = 0.34 OK
Overturning Safety Factor = 2.065	Ratio = 0.73 Okay

General Information:

=====
 File Name: T:\375_Crown_Castle\2013\37513-0644 BU 876348\37513-0644 BP.col
 Project: 37513-0644 BP
 Column: Engineer:
 Code: ACI 318-11 Units: English

 Run Option: Investigation Slenderness: Not considered
 Run Axis: X-axis Column Type: Structural

Material Properties:

=====
 f'c = 3 ksi fy = 60 ksi
 Ec = 3122.02 ksi Es = 29000 ksi
 Ultimate strain = 0.003 in/in
 Beta1 = 0.85

Section:

=====
 Rectangular: Width = 96 in Depth = 96 in

 Gross section area, Ag = 9216 in^2
 Ix = 7.07789e+006 in^4 Iy = 7.07789e+006 in^4
 rx = 27.7128 in ry = 27.7128 in
 Xo = 0 in Yo = 0 in

Reinforcement:

=====
 Bar Set: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #5 ties with #10 bars, #5 with larger bars.
 phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

Layout: Rectangular
 Pattern: All Sides Equal (Cover to transverse reinforcement)
 Total steel area: As = 37.44 in^2 at rho = 0.41% (Note: rho < 0.50%)
 Minimum clear spacing = 13.15 in

24 #11 Cover = 3 in

Factored Loads and Moments with Corresponding Capacities:

=====

No.	Pu kip	Mux k-ft	PhiMnx k-ft	PhiMn/Mu	NA depth in	Dt depth in	eps_t	Phi
1	31.00	3842.15	7630.31	1.986	6.45	91.67	0.03966	0.900

*** End of output ***

CROWN CASTLE PROJECT: BU #876348; ENFIELD, ENFIELD, CT
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2. 1/22/2009)

UPON THE SUCCESSFUL AND COMPLETE INSTALLATION OF THE REINFORCING SYSTEM SPECIFIED IN THESE PLANS, THE REINFORCED POLE MEETS THE WIND DESIGN RECOMMENDATIONS OF THE TIA/EIA-222-F-1996 STANDARD FOR WIND SPEEDS OF 80 MPH AND 38 MPH + 1' RADIAL ICE

A. GENERAL NOTES

- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO FABRICATION AND CONSTRUCTION. THESE DRAWINGS WERE PREPARED FROM INFORMATION AND DOCUMENTS PROVIDED TO PAUL J. FORD & COMPANY BY CROWN CASTLE. THIS INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY PAUL J. FORD & COMPANY FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. ANY DISCREPANCIES AND/OR CHANGES BETWEEN THE INFORMATION CONTAINED IN THESE DRAWINGS AND THE ACTUAL VERIFIED SITE CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF CROWN CASTLE AND PAUL J. FORD & COMPANY SO THAT ANY CHANGES AND/OR ADJUSTMENTS, IF NECESSARY, CAN BE MADE TO THE DESIGN AND DRAWINGS.
- THE EXISTING UNREINFORCED MONOPOLE STRUCTURE DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE ANTENNA AND PLATFORM LOADS SHOWN ON THESE DRAWINGS AT THE REQUIRED MINIMUM TIA/EIA-222-F BASIC WIND SPEEDS. DO NOT INSTALL ANY ADDITIONAL OR NEW ANTENNA AND PLATFORM LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
- IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED SHALL BE PROVIDED.
- THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN PROPERLY AND ADEQUATELY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO INSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT. IMPACT CUTTING, WELDING AND SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES FROM CROWN CASTLE. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY CUTTING AND WELDING PLAN (DOC # ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT."
- THE STRUCTURAL CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES.
- ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY THE INSPECTION/TESTING AGENCY. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- ALL MATERIALS AND EQUIPMENT FURNISHED WILL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO INSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
- ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED, AND/OR RELOCATED AND/OR REPLACED AND RE-INSTALLED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH THE OWNER, TESTING AGENCY, AND ENGINEER.
- ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS. IN NO CASE SHALL ANY NEW AND/OR ADDITIONAL PLATFORMS AND/OR ANTENNAS AND/OR COAX CABLES AND/OR OTHER EQUIPMENT BE INSTALLED ON THE MONOPOLE UNTIL THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF ALL OF THE REQUIRED STRUCTURAL REINFORCING SYSTEM COMPONENTS.

B. "LOW HEAT" WELDING PROCEDURES:

- ANY AND ALL FIELD WELDING REQUIRED ON THIS PROJECT SHALL BE PERFORMED BY AWS CERTIFIED WELDERS USING "LOW HEAT" WELDING TECHNIQUES.
- FOR THE PURPOSES OF THIS PROJECT, "LOW HEAT" WELDING IS DEFINED AS A CAREFUL AND CONTROLLED WELDING PROCESS, PERFORMED BY EXPERIENCED AWS CERTIFIED WELDERS, SUCH THAT THE CORRECT AMOUNT OF WELD METAL IS DEPOSITED AND IS PROPERLY FUSED IN SUCH A WAY THAT EXCESSIVE AMOUNTS OF HEAT BUILDUP AT THE WELDED JOINT, DUE TO EXCESSIVE MOLTEN WELD METAL POOLING, IS AVOIDED.
- THE "LOW HEAT" WELDING PROCESS SHALL BE SET UP SO THAT ANY FIELD WELDING ACTIVITY ON THE POLE STRUCTURE DOES NOT SCORCH OR OTHERWISE DAMAGE THE EXISTING GALVANIZED SURFACE ON THE INSIDE OF THE POLE SHAFT IN AND AROUND THE REGION OF THE WELD.
- THE "LOW HEAT" WELDING PROCESS, USED IN CONJUNCTION WITH THE CASTLE COAX PROTECTION AND FIRE SAFETY GUIDELINES, SHALL BE SET UP SO THAT ANY FIELD WELDING ACTIVITY ON THE POLE STRUCTURE DOES NOT SCORCH AND/OR OTHERWISE DAMAGE THE EXISTING COAX CABLES THAT RUN ON THE INSIDE AND/OR OUTSIDE OF THE POLE SHAFT IN AND AROUND THE REGION OF THE WELD.
- "LOW HEAT" WELD DEMONSTRATION REQUIRED: PRIOR TO BEGINNING THE FIELD WELDING FOR THE REINFORCEMENT WORK, THE CONTRACTOR'S AWS CERTIFIED WELDER SHALL DEMONSTRATE THE "LOW HEAT" WELDING PROCESS THAT WILL BE USED ON THIS PROJECT SO THAT CROWN CASTLE REPRESENTATIVES CAN OBSERVE AND VERIFY THAT THE PROPOSED PROCESS DOES NOT DAMAGE THE EXISTING GALVANIZED SURFACE ON THE BACK SIDE OF THE SAMPLE PLATE THAT IS BEING WELDED. THE CONTRACTOR SHALL USE TEMPERATURE MONITORING DEVICES SUCH AS THERMOCOUPLE, HEAT CRAYON, AND/OR INFRARED SENSOR TO MEASURE AND DEMONSTRATE THE TEMPERATURE OF THE STEEL ON THE BACK SURFACE IN THE REGION OF THE WELD. THE "LOW HEAT" WELD DEMONSTRATION SHALL BE CARRIED OUT ON-SITE AND USING A GALVANIZED STEEL PLATE SAMPLE WITH A THICKNESS EQUAL TO THE MINIMUM SHAFT THICKNESS THAT WILL BE REINFORCED. ONLY AFTER THE "LOW HEAT" TECHNIQUES HAVE BEEN SUCCESSFULLY DEMONSTRATED AND ARE APPROVED BY CROWN CASTLE REPRESENTATIVES, CAN THE CONTRACTOR PROCEED WITH THE FIELD WELDING ON THE STRUCTURE. CAUTION: THE CONTRACTOR SHALL CAREFULLY FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE SAFETY, AND ALL OTHER SAFETY GUIDELINES WHICH ALSO INCLUDE "LOW HEAT WELDING" TECHNIQUES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR MAINTAINING THE SAFETY AND STABILITY OF THE STRUCTURE DURING CONSTRUCTION. THE CONTRACTOR SHALL BE HELD FULLY LIABLE FOR ANY DAMAGE (INCLUDING HEAT AND FIRE DAMAGE CAUSED BY FIELD WELDING) TO THE STRUCTURE AND ANY OF ITS COMPONENTS WHICH OCCURS DURING CONSTRUCTION.

C. SPECIAL INSPECTION AND TESTING

- ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY THE OWNER'S REPRESENTATIVE AND THE OWNER'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY. REFER TO CROWN CASTLE DOCUMENT ENG-SOW-10066 FOR SPECIFICATION.
- ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE PERFORMED SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
- AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY THE OWNER FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
 - ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
 - THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
- THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES FOR THE OWNER. THE TESTING AGENCY SHALL INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.
 - GENERAL:
 - PERFORM CONTINUOUS ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
 - FOUNDATIONS, CONCRETE, AND SOIL PREPARATION - (NOT REQUIRED)
 - CONCRETE TESTING PER ACI - (NOT REQUIRED)
 - STRUCTURAL STEEL
 - CHECK THE STEEL ON THE JOB WITH THE PLANS.
 - CHECK MILL CERTIFICATIONS.
 - CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
 - INSPECT FOR DISTORTION OR EXCESSIVE RUST, FLAWS AND BURNED HOLES.
 - CALL FOR LABORATORY TEST REPORTS WHEN IN DOUBT.
 - CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
 - CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
 - CHECK BOLT TIGHTENING ACCORDING TO AISC "TURN OF THE NUT" METHOD.
 - WELDING:
 - VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
 - INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND IN ACCORDANCE WITH AWS D1.1.
 - APPROVE FIELD WELDING SEQUENCE
 - A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO THE OWNER BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM THE OWNER.
 - INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
 - INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE AND WORKING CONDITIONS.
 - VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
 - INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
 - VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1.
 - SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE OR DYE PENETRANT.
 - INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED PLANS.
 - VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
 - REVIEW THE REPORTS BY TESTING LABS.
 - CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
 - INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
 - CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
 - SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS:
 - PRIOR TO CONSTRUCTION, TESTING AGENCY SHALL INSPECT CONDITION OF EXISTING SHAFT-TO-BASE-PLATE WELD CONNECTION. ALSO INSPECT EXISTING STIFFENERS IF PRESENT. THE INSPECTOR SHALL USE THE FOLLOWING INSPECTION METHODS, OR COMBINATION OF METHODS, AS REQUIRED TO IDENTIFY ANY CRACKS: VISUAL, MAGNETIC PARTICLE, AND/OR ULTRASONIC. IN ADDITION, OTHER TEST METHODS MAY ALSO BE USED AT THE RECOMMENDATION OF THE TESTING AGENCY AND UPON THE APPROVAL OF THE OWNER AND THE ENGINEER. THE TESTING AGENCY SHALL PROVIDE CAREFUL AND THOROUGH DOCUMENTATION OF THIS INSPECTION TO THE OWNER AND THE ENGINEER. TESTING AGENCY SHALL COORDINATE THESE INSPECTION ACTIVITIES WITH THE OWNER'S REQUIRED PROCESSES AND PROCEDURES. IMPORTANT: THE TESTING AGENCY SHALL IMMEDIATELY REPORT ANY INDICATIONS OF CRACKS, FRACTURES, DISTRESS, AND/OR CORROSION TO THE OWNER AND ENGINEER.
 - AFTER CONSTRUCTION, TESTING AGENCY SHALL INSPECT ANY AND ALL FIELD REPAIRS IMPLEMENTED AS REQUIRED BY THE OWNER FROM THE RESULTS OF THE INSPECTION IN THE PREVIOUS NOTE 5.F.(1.) ABOVE.
 - REFER TO CROWN CASTLE DOCUMENTS ENG-SOW-10033 AND ENG-BUL-10051 FOR SPECIFICATIONS.
- REPORTS:
 - COMPILE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.
- THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES AND PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO THE OWNER'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT THE OWNER'S REVIEW AND SPECIFIC WRITTEN CONSENT. THE OWNER RESERVES THE RIGHT TO DETERMINE WHAT IS AN ACCEPTABLE RESOLUTION OF DISCREPANCIES AND PROBLEMS.
- AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO THE OWNER. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
- RESPONSIBILITY: THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.

Copyright © 2011 by Paul J. Ford and Company. All Rights Reserved. This document and its data contained herein is proprietary to Paul J. Ford and Company, issued in confidence and shall remain the property of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for the specific project.

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street - Suite 1500 - Columbus, Ohio 43215
(614) 221-6679 www.pjweb.com

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
PH: (704) 405-6618 FAX: (704) 405-6618

BU #876348; ENFIELD
ENFIELD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-0644	ISSUE DATE OF PERMIT: 2-27-2013
DRAWN BY: B.M.S.	
CHECKED BY: J.J.F.	
APPROVED BY:	
DATE: 2-27-2013	S-1

- D. STRUCTURAL STEEL**
1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
 - A. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
 - (A.) *SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS.
 - (B.) *SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS,* AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
 - (C.) *CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES* (PARAGRAPH 4.2.1 SPECIFICALLY EXCLUDED).
 - B. BY THE AMERICAN WELDING SOCIETY (AWS):
 - (A.) *STRUCTURAL WELDING CODE - STEEL D1.1.*
 - (B.) *SYMBOLS FOR WELDING AND NON-DESTRUCTIVE TESTING*
 2. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
 3. TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AJAX M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC "TURN OF THE NUT" METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.
 4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
 5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO THE OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
 6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
 7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH-UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD GALVANIZING.
 8. UNLESS OTHERWISE NOTED, ALL STEEL MEMBERS SHALL BE HOT-DIP GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH ASTM A123. SEE SECTION J FOR FURTHER NOTES AND FOR EXCEPTIONS (IF ANY).
 9. ALL WELDS SHALL BE VISUALLY INSPECTED BY THE OWNER'S APPROVED TESTING AGENCY. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY IN THEIR TESTING EFFORTS.
 10. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
 11. FIELD CUTTING OF STEEL:
 - (A.) PRIOR TO ANY FIELD CUTTING, THE CONTRACTOR SHALL MARK THE CUT OUTLINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS.
 - (B.) ANY REQUIRED CUTS IN THE STEEL SHALL BE CAREFULLY CUT BY MECHANICAL METHODS SUCH AS DRILLING, SAW CUTTING, AND GRINDING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE. DURING THE CUTTING WORK, ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
 - (C.) ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
- E. BASE PLATE GROUT**
1. NEW GROUT FOR THE POLE BASE SHALL BE NON-SHRINK, NON-METALLIC, GROUT (EUCO NS GROUT BY EUCLID, OR APPROVED EQUAL) WITH A 7500 PSI MINIMUM COMPRESSIVE STRENGTH. PVC DRAINAGE PIPES SHALL BE PROVIDED FROM INSIDE THE POLE SHAFT OUT THROUGH THE GROUT SPACE UNDER THE BASE PLATE IN ORDER TO ALLOW MOISTURE TO ADEQUATELY DRAIN FROM THE INTERIOR OF THE POLE SHAFT. CONTRACTOR SHALL SUBMIT PROPOSED GROUT SPECIFICATION INFORMATION TO THE OWNER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. CONTRACTOR SHALL FOLLOW GROUT MANUFACTURER'S SPECIFICATIONS FOR COLD WEATHER GROUTING PROCEDURES (IF NECESSARY) AND THE TESTING AGENCY SHALL PREPARE GROUT SAMPLE SPECIMENS FOR COMPRESSIVE STRENGTH TESTING AND VERIFICATION.
 2. GROUT SHALL BE INSTALLED TIGHT UNDER BASE PLATE WITH NO VOIDS REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF EXISTING BASE PLATE (EXCEPT FOR DRAIN PIPES). GROUT COMPLETELY SOLID (EXCEPT FOR DRAIN PIPES) UNDER ENTIRE SURFACE OF BASE PLATE FROM OUTSIDE EDGE TO INSIDE EDGE.
- F. FOUNDATION WORK - (NOT REQUIRED)**
- G. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)**
- H. EPOXY GROUDED REINFORCING ANCHOR RODS**
1. UNLESS OTHERWISE NOTED, REINFORCING ANCHOR RODS SHALL BE 150 KSI ALL-THREAD BAR CONFORMING TO ASTM A722. RECOMMENDED MANUFACTURERS/SUPPLIERS OF 150 KSI ALL-THREAD BAR ARE WILLIAMS FORM ENGINEERING CORPORATION AND DWYDAG SYSTEMS INTERNATIONAL. ALL REINFORCING ANCHOR RODS SHALL BE HOT DIP GALVANIZED PER ASTM A153. ALTERNATIVELY, ALL REINFORCING ANCHOR RODS MAY BE EPOXY COATED PER ASTM A775.
 2. THE CORE-DRILLED HOLES IN THE CONCRETE FOR THE ANCHOR RODS SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE ANCHOR ROD AND EPOXY MANUFACTURERS' INSTRUCTIONS, PRIOR TO PLACEMENT OF ANCHOR RODS AND EPOXY. CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD AND EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF RODS, EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
 3. THE CORE-DRILLED HOLES IN THE CONCRETE FOR THE ANCHOR RODS SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE ANCHOR ROD AND EPOXY MANUFACTURERS' INSTRUCTIONS, PRIOR TO PLACEMENT OF ANCHOR RODS AND EPOXY. CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD AND EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF RODS, EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
 4. ULTRABOND 1, MILT HIT RE-500 OR ANCHORTITE EPOXY SHALL BE USED TO ANCHOR THE 150 KSI ALL-THREAD BAR IN THE DRILL HOLES. IF CONTRACTOR WISHES TO USE A DIFFERENT EPOXY, A REQUEST INCLUDING THE EPOXY TECHNICAL DATA SHEET(S) SHALL BE SUBMITTED TO PAUL J. FORD AND COMPANY FOR REVIEW PRIOR TO CONSTRUCTION. AS NOTED ABOVE, FOLLOW ALL EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
 5. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN INSTALLED AND ALL EPOXY AND GROUT HAVE CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED PRIOR TO TESTING), ALL REINFORCING ANCHOR RODS SHALL BE LOAD TESTED PER CROWN CASTLE ENGINEERING DOCUMENT #ENG-PRC-10119. REFER TO THE NEW ANCHOR & BRACKET DETAIL ON FOLLOWING DRAWING SHEETS FOR SPECIFIED ANCHOR ROD PROOF LOAD.
 6. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC. (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED AFTER TESTING), CONTRACTOR SHALL TIGHTEN ALL HEAVY HEX ANCHOR NUTS TO SNUG TIGHT PLUS 1/8 TURN OF NUT.
- I. TOUCH UP OF GALVANIZING**
1. THE CONTRACTOR SHALL TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
 2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. THE OWNER'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
 3. THE OWNER'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE INADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.
- J. HOT DIP GALVANIZING**
1. HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
 2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING.
 3. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES AS REQUIRED.
 4. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.
- K. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER**
1. AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MONOPOLE REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY THE OWNER, THE OWNER WILL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEM.
 2. THE MONOPOLE REINFORCING SYSTEM INDICATED IN THESE DOCUMENTS USES REINFORCING COMPONENTS THAT INVOLVE FIELD WELDING STEEL MEMBERS TO THE EXISTING GALVANIZED STEEL POLE STRUCTURE. THESE FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE CONNECTED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT THE OWNER REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.
 3. THE OWNER SHALL REFER TO TIA/EIA-222-F-1996, SECTION 14 AND ANNEX E FOR RECOMMENDATIONS FOR MAINTENANCE AND INSPECTION. THE FREQUENCY OF THE INSPECTION AND MAINTENANCE INTERVALS IS TO BE DETERMINED BY THE OWNER BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. PAUL J. FORD & COMPANY RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT, ACCORDING TO TIA/EIA-222-F-1996 SECTION 14.1, NOTE 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".

© Copyright 2011 by Paul J. Ford and Company. All Rights Reserved. This document and the data contained herein is proprietary information and shall not be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written permission of Paul J. Ford and Company. It is reproduced, copied or used for any purpose other than the intended use of this specific project.

PAUL J. FORD AND COMPANY
 STRUCTURAL ENGINEERS
 150 East 10th Street - Suite 1300 - Columbus, Ohio 43215
 (614) 221-6679 www.pjfweb.com

CROWN CASTLE
 3530 TORINGOOD WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (704) 405-6618 FAX: (704) 405-6618

BU #876348; ENFIELD
ENFIELD, CT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:
37513-0644

DRAWN BY:
B.M.S.

CHECKED BY:
J.J.F.

APPROVED BY:

DATE:
2-27-2013

ISSUE DATE OF PERMIT: 2-27-2013

S-2

AJAX BOLT NOTE SHEET: REV. 1.3, 11-07-2012

- NOTES:**
1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
 2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
 3. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL BELOW FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.
 4. ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. DTI'S SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F959 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.

NOTES FOR AJAX M20 'ONE-SIDE' BOLTS WITH DIRECT TENSION INDICATORS (DTI'S):

DTI'S REQUIRED: DTI'S SHALL BE "SELF-INDICATING" SQUIRTER® STYLE DTI'S MADE WITH SILICONE EMBEDDED IN THEM, INSPECTED BY MEANS OF THE VISUAL EJECTION OF SILICONE AS THE DTI PROTRUSIONS COMPRESS. SQUIRTER® DTI'S SHALL BE CALIBRATED PER MANUFACTURER'S INSTRUCTIONS PRIOR TO USE.

THE DIRECT TENSION INDICATOR (DTI) WASHERS SHALL BE THE "SQUIRTER® STYLE" AS MANUFACTURED BY:

APPLIED BOLTING TECHNOLOGY PRODUCTS, INC.
 1413 ROCKINGHAM ROAD BELLOW FALLS, VERMONT, USA 05101
 PHONE 1-800-552-1999
 WEBSITE: WWW.APPLIEDBOLTING.COM

DISTRIBUTORS OF SQUIRTER® DTI'S:
[HTTP://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRIBUTORS.HTML](http://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRIBUTORS.HTML)

DTI: USE DIRECT TENSION INDICATOR (DTI) WASHERS COMPATIBLE WITH 20 MM (M20) NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTI'S SHALL NOT BE HOT-DIP GALVANIZED. DTI'S SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.

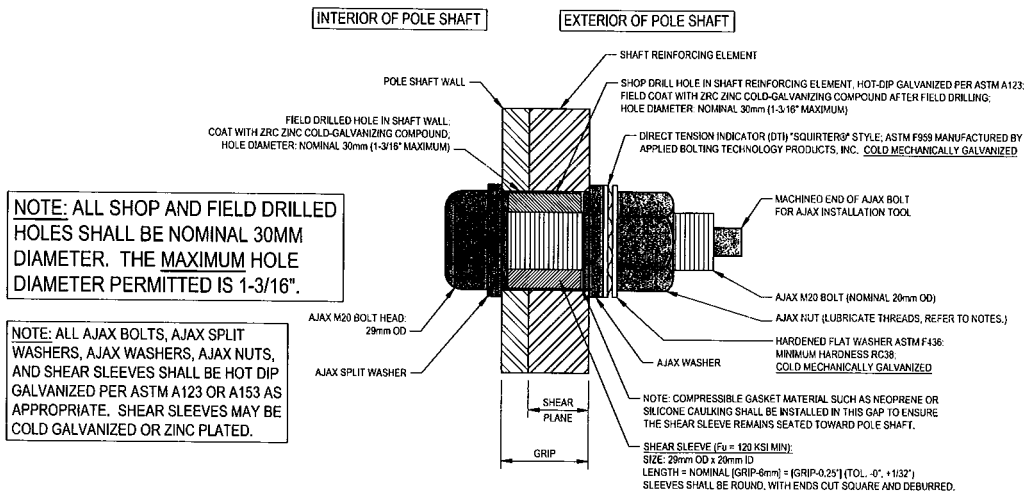
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY GALVANIZED BY THE COLD MECHANICAL PROCESS. ALTERNATIVELY, CORRECTLY MADE HOT DIP GALVANIZED HARDENED FLAT WASHERS HAVING A MINIMUM HARDNESS OF RC 38 CAN BE USED; CONTRACTOR SHALL PROVIDE DOCUMENTATION OF WASHER SPECIFICATION AND HARDNESS.

NUT LUBRICATION REQUIRED: PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING.

NOTE: COMPLETELY COMPRESSED DTI'S SHOWING NO VISIBLE REMAINING GAP ARE ACCEPTABLE. DTI WASHERS SHALL BE PLACED DIRECTLY AGAINST THE OUTER AJAX WASHER WITH THE DTI BUMPS FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND THE AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

INSPECTION REQUIRED: ALL AJAX BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009, BY A QUALIFIED BOLT INSPECTOR. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE AJAX BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TENSIONING PROCEDURE. IN ADDITION, ALL AJAX BOLTS AND DTI'S SHALL BE VISUALLY INSPECTED ACCORDING TO THE DTI MANUFACTURER'S INSTRUCTIONS. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE PHOTO DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTI'S.



TYPICAL AJAX BOLT DETAIL 1 / S-3

© 2009/11/2012 By Paul J. Ford and Company
 All Rights Reserved. This document may not be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written permission of Paul J. Ford and Company. For reproduction, contact Paul J. Ford and Company.
PAUL J. FORD AND COMPANY
 STRUCTURAL ENGINEERS
 240 East Broad Street - Suite 1500 - Columbus, Ohio 43215
 (614) 221-6679 www.pjfw.com

CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (704) 405-6618 FAX: (704) 405-6618

BU #876348; ENFIELD
ENFIELD, CT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-0644	ISSUE DATE OF PERMIT: 2-27-2013
DRAWN BY: B.M.S.	S-3
CHECKED BY: J.J.F.	
APPROVED BY:	
DATE: 2-27-2013	

NOTE: NO DETAILED INFORMATION REGARDING INTERFERENCES WAS PROVIDED. THEREFORE, CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL IMMEDIATELY.

THIS POLE REINFORCEMENT DRAWING IS FOR THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF CO-LOCATION ANALYSIS FOR THIS SITE (PJF#37513-0644), DATED 2-27-2013.

POLE SPECIFICATIONS	
POLE SHAPE TYPE:	18-SIDED POLYGON
TAPER:	0.190010 IN/FT
SHAFT STEEL:	ASTM A507 GRADE 65 & A572 GRADE 60
BASE PL. STEEL:	ASTM A572 GRADE 50
ANCHOR RODS:	2 1/4"Ø
	#1&1/2 ASTM A615 GRADE 75

SHAFT SECTION DATA					
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN)	
				@ TOP	@ BOTTOM
1	39.00	0.2500	45.00	22.000	29.410
2	40.00	0.2500	54.00	28.198	35.798
3	41.00	0.3125	63.00	34.443	42.232
4	41.00	0.3750		40.610	48.400

NOTE. DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

- NOTES:**
- ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS, DEC. 31, 2009.
 - ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS, DEC. 31, 2009.
 - ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL ON SHEET S-3 FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.
 - DTIS REQUIRED: * ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTIS) AND HARDENED WASHERS. DTIS SHALL BE THE SOURTHERS STYLE, MADE TO ASTM F569 LATEST REVISION, AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.
 - NUT LUBRICATION REQUIRED: * PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING. REFER TO SHEET S-3.
 - AJAX BOLT HOLE SIZE: ALL SHOP- AND FIELD-DRILLED HOLES SHALL BE NOMINAL 30MM DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1-3/16". REFER TO SHEET S-3.

AS OF 9/30/2012, UNTIL FURTHER NOTICE, CROWN CASTLE WILL ACCEPT AJAX BOLTS TIGHTENED USING AISC "TURN-OF-THE-NUT" METHODOLOGY. INSTALLERS SHALL FOLLOW CROWN GUIDELINES FOR AISC "TURN-OF-THE-NUT" METHOD AND ALSO PROVIDE COMPLETE INSPECTION DOCUMENTATION IN THE PMU.

NDE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. PLEASE SEE ENG-SOW-1033 - TOWER BASE PLATE NDE AND ENG-BUL-10051 - NDE REQUIREMENTS FOR MONOPOLE BASE PLATE TO PREVENT CONNECTION FAILURE. NOTIFY THE EOR AND CROWN ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING REINFORCEMENTS THAT HAVE BEEN WELDED TO THE BASE PLATE. FULL PENETRATION WELDING TO THE BASE PLATE REQUIRED AS PART OF THIS ACTIVE REINFORCEMENT DESIGN SHALL BE INCLUDED IN THE NDE SCOPE OF WORK.

NEW AEROSOLUTIONS MP3 REINFORCING (OPTION #1)		
ELEVATION	FLAT #	REINFORCING ELEMENT
39'-0" TO 49'-0"	1, 7 & 13	MP303

ALL BOLTS SHALL BE AJAX M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. Fu=105 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE & BOLTS) AND INSTALLATION PROCEDURES.

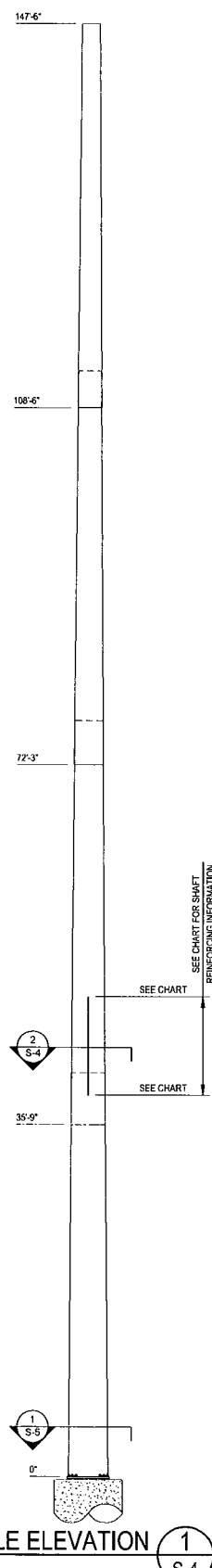
NEW SABRE FLAT PLATE REINFORCING (OPTION #2)		
ELEVATION	FLAT #	REINFORCING ELEMENT
38'-0" TO 48'-0"	1, 7 & 13	MS-600

ALL BOLTS SHALL BE AJAX M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. Fu=105 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE & BOLTS) AND INSTALLATION PROCEDURES.

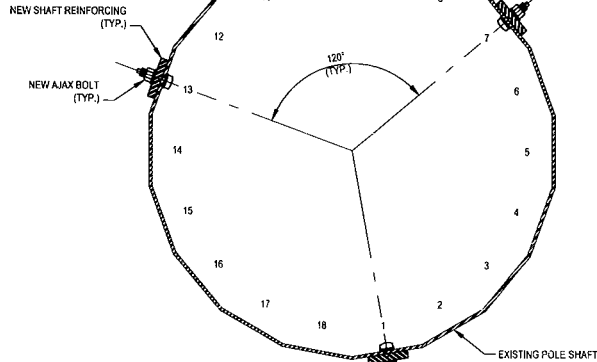
NEW CCI FLAT PLATE (100 KSI) REINFORCING (OPTION #3)		
ELEVATION	FLAT #	REINFORCING ELEMENT
38'-9" TO 48'-9"	1, 7 & 13	ISP-UR-0754

NOTES FOR CROWN REINFORCING OPTION (100 KSI) MATERIAL:

- DO NOT FIELD WELD DIRECTLY TO THE 100 KSI MATERIAL.
- THE 100 KSI MATERIAL SHALL CONFORM TO THE FOLLOWING:
 - A. MATERIAL SHALL BE ASTM A514, GRADE A, GRADE E, OR GRADE P, HAVING A MINIMUM TENSILE STRENGTH (Fu) OF 110 KSI AND A MINIMUM YIELD STRENGTH (Fy) OF 100 KSI.
 - B. MATERIAL SHALL BE HEAT TREATED, QUENCHED AND TEMPERED PER ASTM A514.
 - C. MATERIAL SHALL HAVE CHARPY V-NOTCH (CVN) IMPACT VALUES OF NOT LESS THAN 15 FT-LB AT -20 DEGREES F, IN ACCORDANCE WITH ASTM A370.
 - D. MINIMUM INSIDE BEND RADIUS FOR COLD BENDING, PER ASTM A6 TABLE X.4.2, SHALL BE 4.5X MINIMUM.
 - E. ANY AND ALL WELDING TO THE MATERIAL SHALL BE PERFORMED ACCORDING TO AN APPROVED WELDING PROCEDURE SPECIFICATION (WPS) SUITABLE FOR THE GRADE AND INTENDED USE AND SERVICE. THE WPS SHALL BE DEVELOPED BY A QUALIFIED CWI AND IN ACCORDANCE WITH AWS D1.1. PRIOR TO ANY WORK, FABRICATION OR WELDING, THE WPS SHALL BE SUBMITTED TO CROWN CASTLE AND PAUL J. FORD AND COMPANY FOR REVIEW.



AEROSOLUTIONS AND SABRE REINFORCING NOT SHOWN. LAYOUT DESIGN TO BE FINALIZED FOR AEROSOLUTIONS OR SABRE UPON WINNING BID FOR JOB.



SECTION 2 S-4

POLE ELEVATION 1 S-4

© Copyright 2012 by Paul J. Ford and Company. All Rights Reserved. This document and the data contained herein is proprietary to Paul J. Ford and Company, and its use without the prior written permission of Paul J. Ford and Company, is prohibited. Copying or reuse for any purpose other than the intended use in the specific project.

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street - Suite 1500 - Columbus, Ohio 43215
(614) 221-6679 www.pjf.com

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
PH: (704) 405-6618 FAX: (704) 405-6618

BU #876348; ENFIELD ENFIELD, CT

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:
37513-0644

DRAWN BY:
B.M.S.

CHECKED BY:
J.J.F.

APPROVED BY:

DATE:
2-27-2013

ISSUE DATE OF PERMIT: 2-27-2013

S-4

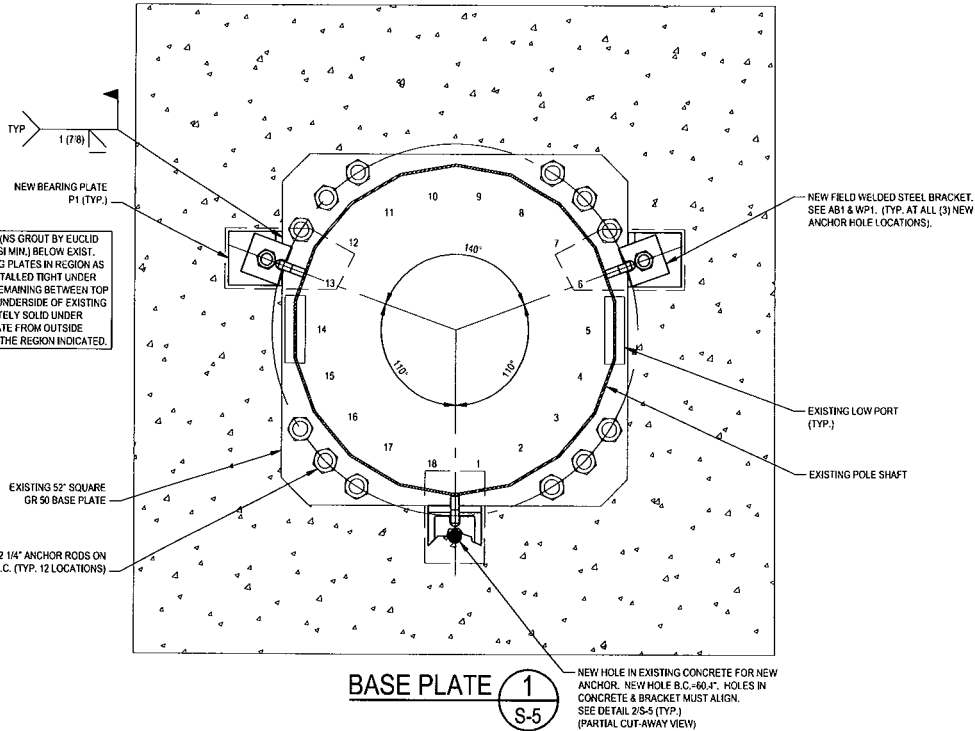
SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS

- (1) PRIOR TO CONSTRUCTION, CONTRACTOR'S INSPECTION AGENCY SHALL INSPECT CONDITION OF EXISTING SHAFT-TO-BASE-PLATE WELD CONNECTION. ALSO INSPECT EXISTING STIFFENERS IF PRESENT. THE CONTRACTOR'S INSPECTION AGENCY SHALL USE THE FOLLOWING INSPECTION METHODS, OR COMBINATION OF METHODS, AS REQUIRED TO IDENTIFY ANY CRACKS: VISUAL, MAGNETIC PARTICLE, AND/OR ULTRA-SONIC. IN ADDITION, OTHER TEST METHODS MAY ALSO BE USED AT THE RECOMMENDATION OF THE TESTING AGENCY AND UPON THE APPROVAL OF THE OWNER AND THE ENGINEER. CONTRACTOR SHALL PROVIDE CAREFUL AND THOROUGH DOCUMENTATION OF THIS INSPECTION TO THE OWNER AND THE ENGINEER BEFORE PROCEEDING WITH WORK. CONTRACTOR SHALL COORDINATE THESE INSPECTION ACTIVITIES WITH THE OWNER'S REQUIRED PROCESSES AND PROCEDURES. IMPORTANT: THE TESTING AGENCY SHALL IMMEDIATELY REPORT ANY INDICATIONS OF CRACKS, FRACTURES, DISTRESS, AND/OR CORROSION TO THE OWNER AND ENGINEER.
- (2) AFTER CONSTRUCTION, TESTING AGENCY SHALL INSPECT ANY AND ALL FIELD WELDS AND FIELD REPAIRS IMPLEMENTED AS REQUIRED BY THE OWNER FROM THE RESULTS OF THE INSPECTION IN THE PREVIOUS NOTE (1) ABOVE.

GENERAL NOTES

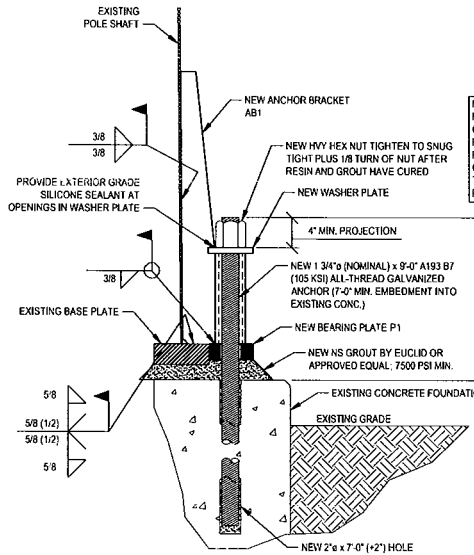
1. AXIAL BOLTS ARE TO BE 20 mm Ø WITH CORRESPONDING 29 mm Ø SHEAR SLEEVE WITH MATCHING STEEL GRADE. DRILLED HOLE DIAMETERS IN REINFORCING STEEL AND EXISTING SHAFT SHALL BE 1 3/16" MAX.
2. ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL, REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE WET 3.0 MILS, DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-631-3275 FOR PRODUCT INFORMATION.
3. EPOXY MUST BE HILTI RE-500.
4. ALL WELD ELECTRODES SHALL BE E80XX.

PROVIDE NON-SHRINK GROUT (NS GROUT BY EUCLID OR APPROVED, EQUAL 7500 PSI MIN.) BELOW EXIST. BASE PLATE AND NEW BEARING PLATES IN REGION AS SHOWN. GROUT SHALL BE INSTALLED TIGHT UNDER BASE PLATE WITH NO VOIDS REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF EXISTING BASE PLATE. GROUT COMPLETELY SOLID UNDER ENTIRE SURFACE OF BASE PLATE FROM OUTSIDE EDGE TO INSIDE EDGE WITHIN THE REGION INDICATED.





BASE PLATE 1
S-5

NEW ANCHOR ROD REINFORCING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ONCE ALL RESIN HAS CURED PRIOR TO GROUTING, ALL NEW ANCHOR ROD REINFORCING SHALL BE PROOF LOADED TO 180 KIPS. ONCE THE PROOF LOAD HAS BEEN RELEASED, TIGHTEN NUT TO SNUG TIGHT CONDITION AND INSTALL GROUT. AFTER GROUT HAS CURED, TIGHTEN HEAVY HEX NUT TO SKUG TIGHT PLUS 1/8 TURN OF NUT. REFER TO SHEET S-2, SECTION H FOR ADDITIONAL INFORMATION.



NEW ANCHOR & BRACKET DETAIL 2
S-5

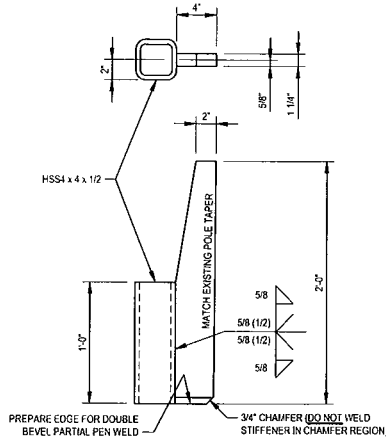

PAUL J. FORD AND COMPANY
 STRUCTURAL ENGINEERS
 250 East Broad Street - Suite 1500 - Columbus, Ohio 43215
 (614) 221-6679 www.pjfweb.com


CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (704) 405-6618 FAX: (704) 405-6618

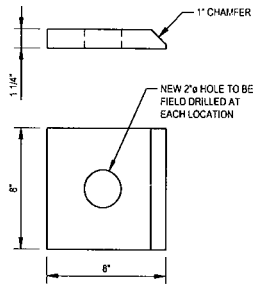
BU #876348; ENFIELD
ENFIELD, CT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-0644 DRAWN BY: B.M.S. CHECKED BY: J.J.F. APPROVED BY:	ISSUE DATE OF PERMIT: 2-27-2013
DATE: 2-27-2013	S-5

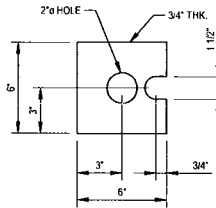
© Copyright 2013 by Paul J. Ford and Company. All rights reserved. This drawing is the property of Paul J. Ford and Company, Inc. and is to be used only for the specific project mentioned herein. No part of this drawing may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without the prior written permission of Paul J. Ford and Company, Inc.



ANCHOR BRACKET MK~AB1
 (3 REQUIRED) (TUBE Fy = 46 KSI) (STIFFENER Fy = 65 KSI)



BEARING PLATE MK~P1
 (3 REQUIRED) (Fy = 50 KSI)



WASHER PLATE MK~WP1
 (3 REQUIRED) (Fy = 50 KSI)

Copyright 2013 by Paul J. Ford and Company. All rights reserved. This document and the data contained herein is proprietary to Paul J. Ford and Company, and its use is restricted to the project for which it was prepared. No part of this document may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written permission of Paul J. Ford and Company. No part of this document may be used for any purpose other than the intended use for this specific project.

PAUL J. FORD AND COMPANY
 STRUCTURAL ENGINEERS
 250 East Broad Street - Suite 1500 - Columbus, Ohio 43215
 (614) 221-6679 www.pjweb.com

CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (704) 405-6618 FAX: (704) 405-6618

BU #876348; ENFIELD
ENFIELD, CT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:
 37513-0944
 DRAWN BY:
 B.M.S.
 CHECKED BY:
 J.J.F.
 APPROVED BY:

ISSUE DATE OF
 PERMIT: 2-27-2013

S-6

DATE:
 2-27-2013

MODIFICATION INSPECTION NOTES:

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTORS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF. NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND IF NECESSARY RESIDES WITH THE EOR AT ALL TIMES.

ALL MIs SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENGS-BUL-10173 LIST OF APPROVED MI VENDORS.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENGS-SOW-10007 MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENGS-SOW-10007.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RETENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTIONS TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON-SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MIs

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI (FAILED MI), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO REANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

MI VERIFICATION INSPECTIONS

CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTIONS ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENGS-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AESV/ESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

PHOTOGRAPHS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTOR AND INSPECTOR:
 - RAW MATERIALS
 - PHOTOS OF ALL CRITICAL DETAILS
 - FOUNDATION MODIFICATIONS
 - WELD PREPARATION
 - BOLT INSTALLATION AND TORQUE
 - FINAL INSTALLED CONDITION
 - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
 - FINAL IN-FIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENGS-SOW-10007.

MI CHECKLIST	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWINGS
X	EOR APPROVED SHOP DRAWINGS
X	FABRICATOR INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
X	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
X	POST INSTALLED ANCHOR ROD VERIFICATION
X	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: LIFT AND DENSITY
X	ON-SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
X	INSPECTION OF BOLT PRETENSION PER AISC BOLT SPEC.
X	INSPECTION OF AJAX BOLTS AND DTIS PER REQUIREMENTS ON SHEET S-3
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

© Copyright 2012 by Paul J. Ford and Company, All Rights Reserved. This document and its contents are the property of Paul J. Ford and Company, and its use without the written permission of Paul J. Ford and Company is prohibited. Printed on recycled paper with 50% post consumer waste.

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
750 Ford Road Street, Suite 1500, Columbus, Ohio 43215
(614) 221-6678 www.pjfeeb.com

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
PH (704) 405-6618 FAX (704) 405-6618

BU #876348; ENFIELD
ENFIELD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:
37513-0644

DRAWN BY:
B.M.S.

CHECKED BY:
J.J.F.

APPROVED BY:

DATE:
2-27-2013

ISSUE DATE OF PERMIT: 2-27-2013

S-7

CROWN CASTLE PROJECT, BU #876348, ENFIELD, CT
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 10/20/04)

UPON THE SUCCESSFUL AND COMPLETE INSTALLATION OF THE REINFORCEMENT SYSTEM SPECIFIED IN THESE PLANS, THE REINFORCED POLE MEETS THE WINDSPEED REQUIREMENTS OF THE TIA-222-F-106 STANDARD FOR WIND SPEEDS OF 90 MPH AND 130 MPH + 1 RADIAL ICE.

1. GENERAL NOTES

1. THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY ALL INSTALLATION CONDITIONS AND DIMENSIONS PRIOR TO FABRICATION AND CONSTRUCTION. THESE DRAWINGS WERE PREPARED FROM INFORMATION AND DOCUMENTS PROVIDED TO PAUL J. FORD & COMPANY BY CROWN CASTLE. THE INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY PAUL J. FORD & COMPANY FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE IMMEDIATELY REPORTED. ANY DISCREPANCIES AND/OR CHANGES BETWEEN THE INFORMATION CONTAINED IN THESE DRAWINGS AND THE ACTUAL VERIFIED SITE CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF CROWN CASTLE AND PAUL J. FORD & COMPANY SO THAT ANY CHANGES OR CORRECTIONS, IF NECESSARY, CAN BE MADE TO THE DESIGN AND DRAWINGS.
2. THE EXISTING UNREINFORCED MONOPOLE STRUCTURE DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE ANTENNA AND PLATFORM LOADS SPECIFIED IN THESE DRAWINGS AT THE REQUIRED WINDMILL TIA-222-F BASIC WIND SPEEDS. DO NOT INSTALL ANY ADDITIONAL OR NEW ANTENNA AND PLATFORM LOADS UNTIL THE MONOPOLE REINFORCEMENT SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
3. MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES. THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
4. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCEMENT SYSTEM HAS BEEN PROPERLY AND ADEQUATELY COMPLETED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND SUPPORTING PLATFORMS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR COWLS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL RETURN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT. IMPORTANT CUTTING, WELDING AND SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDE LINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES FROM CROWN CASTLE. PER THE TIA-222-F CROWN CASTLE DIRECTIVE, ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY NOTING AND WELDING PLAN (DOC# BK-02-0015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT.
5. THE STRUCTURAL CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT BE USED AS INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES.
6. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISCLOSED FROM CONTRACTORS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY THE TESTING AGENCY. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND COMPLIANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTORS' PERFORMANCE AND SHALL NOT BE CONSIDERED AS SUPERVISION OF CONSTRUCTION.
7. ALL MATERIALS AND EQUIPMENT FURNISHED WILL BE NEW AND OF GOOD QUALITY, FREE FROM DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ALL ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO INSURE THAT THIS PROJECT AND RELATED WORK COMPLETES WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
10. ANY EXISTING ATTACHMENTS AND/OR PROTECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCEMENT SYSTEM WILL HAVE TO BE REMOVED, A/DOR RELOCATED, A/DOR REPLACED AND REINSTALLED AFTER THE REINFORCEMENT IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND REMOVE THESE ITEMS PRIOR TO CONSTRUCTION WITH THE OWNER, TESTING AGENCY, AND ENGINEER.
11. ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING WILL BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PLUMB. NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE NEW AND/OR EXISTING ANTENNA AND/OR PLATFORMS AND/OR ANTENNA AND/OR COAXIAL CABLES AND/OR OTHER EQUIPMENT TO BE INSTALLED ON THE MONOPOLE. UNTIL THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF ALL OF THE REQUIRED STRUCTURAL REINFORCEMENT SYSTEM COMPONENTS.

12. LOW HEAT WELDING PROCEDURES:

1. ANY AND ALL FIELD WELDING REQUIRED ON THIS PROJECT SHALL BE PERFORMED BY AWS CERTIFIED WELDERS USING LOW HEAT WELDING TECHNIQUES.
2. FOR THE PURPOSES OF THIS PROJECT, LOW HEAT WELDING IS DEFINED AS A CAREFUL AND CONTROLLED WELDING PROCESS, PERFORMED BY EXPERIENCED AND CERTIFIED WELDERS, SUCH THAT THE CORRECT AMOUNT OF WELD METAL IS DEPOSITED AND IS PROPERLY FUSED IN SUCH A WAY THAT EXCESSIVE AMOUNTS OF HEAT BUILDUP AT THE WELDED JOINT. DUE TO EXCESSIVE JOINT WELD METAL BUILDUP, IS AVOIDED.
3. THE LOW HEAT WELDING PROCESS SHALL BE SET UP SO THAT ANY FIELD WELDING ACTIVITY ON THE POLE STRUCTURE DOES NOT SCORCH OR OTHERWISE DAMAGE THE EXISTING GALVANIZED SURFACE ON THE INSIDE OF THE POLE SHAFT IN AND AROUND THE REGION OF THE WELD.
4. THE LOW HEAT WELDING PROCESS, USED IN CONJUNCTION WITH THE CAST FLOWAX PROTECTION AND FIRE SAFETY GUIDELINES, SHALL BE SET UP SO THAT ANY FIELD WELDING ACTIVITY ON THE POLE SHAFT DOES NOT SCORCH OR OTHERWISE DAMAGE THE EXISTING COAXIAL CABLES THAT RUN ON THE INSIDE AND/OR OUTSIDE OF THE POLE SHAFT IN THE REGION OF THE WELD.
5. LOW HEAT WELD DEMONSTRATION (REQUIRED): PRIOR TO BEGINNING THE FIELD WELDING FOR THE REINFORCEMENT WORK, THE CONTRACTOR'S AWS CERTIFIED WELDER SHALL DEMONSTRATE THE LOW HEAT WELDING PROCESS THAT WILL BE USED ON THIS PROJECT SO THAT CROWN CASTLE REPRESENTATIVES CAN OBSERVE AND VERIFY THAT THE PROPOSED WELDING PROCESS DOES NOT DAMAGE THE EXISTING GALVANIZED SURFACE ON THE BACKSIDE OF THE SAMPLE PLATE THAT IS BEING WELDED. THE CONTRACTOR SHALL USE TEMPERATURE MONITORING DEVICES SUCH AS THERMOCOUPLE, HEAT CRYAL, AND/OR INFRARED SENSORS TO MEASURE AND DEMONSTRATE THE TEMPERATURE OF THE STEEL ON THE BACK SURFACE IN THE REGION OF THE WELD. THE "LOW HEAT WELD DEMONSTRATION" SHALL BE CARRIED OUT ON-SITE AND USING A GALVANIZED STEEL SAMPLE PLATE WITH A THICKNESS EQUAL TO THE MONOPOLE SHAFT THICKNESS THAT WILL BE REINFORCED. ONLY AFTER THE "LOW HEAT WELDING DEMONSTRATION" HAS BEEN SUCCESSFULLY DEMONSTRATED AND APPROVED BY CROWN CASTLE REPRESENTATIVES, CAN THE CONTRACTOR PROCEED WITH THE FIELD WELDING ON THE STRUCTURE. CAUTION: THE CONTRACTOR SHALL CAREFULLY FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE SAFETY, AND ALL OTHER SAFETY GUIDELINES WHICH ALSO INCLUDE "LOW HEAT WELDING TECHNIQUES". THE CONTRACTOR'S SOLELY RESPONSIBLE FOR MAINTAINING THE SAFETY AND STABILITY OF THE STRUCTURE DURING CONSTRUCTION. THE CONTRACTOR SHALL BE HELD FULLY LIABLE FOR ANY AND ALL INJURIES, HEAT AND FIRE DAMAGE CAUSED BY FIELD WELDING TO THE STRUCTURE AND ANY OF ITS COMPONENTS WHICH OCCURS DURING CONSTRUCTION.

6. SPECIAL INSPECTION AND TESTING

1. ALL WELDING SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY THE TESTING AGENCY REPRESENTATIVE AND THE OWNER'S AUTHORIZED REPRESENTATIVE (SPECIAL INSPECTION) AT THE PROJECT LOCATION. CASTLE DOCUMENTS SHALL BE PROVIDED BY THE CONTRACTOR TO THE TESTING AGENCY REPRESENTATIVE AND THE OWNER'S AUTHORIZED REPRESENTATIVE FOR SPECIAL INSPECTION AND TESTING. THE TESTING AGENCY REPRESENTATIVE SHALL BE RESPONSIBLE FOR THE SPECIAL INSPECTION AND TESTING. THESE SPECIAL SERVICES PERFORMED BY THE ENGINEER ARE SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND COMPLIANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTORS' PERFORMANCE AND SHALL NOT BE CONSIDERED AS SUPERVISION OF CONSTRUCTION.
 2. CROWN CASTLE REPRESENTATIVES BETWEEN THE WORKING AND CONTRACT DOCUMENTS SHALL BE CONDUCTED BY THE CONTRACTOR AT THE PROJECT LOCATION.
 3. AN INDEPENDENT QUALIFIED INSPECTOR (TESTING AGENCY) SHALL BE SPECIFIED, SELECTION AND Hired FOR BY THE OWNER FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
 4. ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PROVIDED AT ALL TIMES.
 5. THE TESTING AGENCY SHALL SOON AFTER THE WORKING AND CONTRACT DOCUMENTS SHALL BE INTERFERED WITH AND COORDINATE WITH THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
 6. THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES FOR THE OWNER. THE TESTING AGENCY SHALL INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE TESTING AGENCY SHALL SUBMIT REPORTS ON THIS SITE AND OTHER ITEMS AS NECESSARY TO FULLY INFORM THE OWNER. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED TRAINED INSPECTORS INCLUDING WELDERS, FIELD ENGINEERS, INSPECTORS, AND COMPETITORS SHALL HAVE THE TRAINING, SKILLS, AND EXPERIENCE APPROPRIATE FOR AND CORRELATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.
- A. GENERAL
1. PROVIDE CONTINUOUS ON-SITE OBSERVATION, AS NECESSARY, OF ALL ACTIVITIES DURING THE TIME THE CONTRACTOR IS WORKING ON THE PROJECT. SHALL NOT BE OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
 2. FOUNDATIONS, CONCRETE, AND SOIL PREPARATION (NOT REQUIRED)
 3. CONCRETE TESTING PER AGENCY (NOT REQUIRED)
 4. STRUCTURAL STEEL
 1. CHECK ALL STEEL ON THE JOB WITH THE PLANS
 2. CHECK ALL CERTIFICATIONS
 3. CHECK GRADE OF STEEL MEMBERS, ALL BOLTS FOR CONFORMANCE WITH DRAWINGS
 4. INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURLED HOLES
 5. CALL FOR LABORATORY TEST REPORTS WHEN IN DOUBT
 6. CHECK STEEL MEMBERS FOR SIZES, WEIGHTS AND DIMENSIONAL TOLERANCES
 7. CHECK FOR SURFACE FINISH SPECIFIED ON DRAWINGS
 8. CHECK BOLT TIGHTENING ACCORDING TO A PORTION OF THE LUT METHOD
- E. WELDING:
1. VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING PROCEDURES NOT DEVIATE FROM APPROVED, IN ACCORDANCE WITH AWS D1.1
 2. INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED IN AWS D1.1 AND AS REQUIRED BY THE CONTRACT DOCUMENTS
 3. APPROVE WELDING SEQUENCE
 1. A PROGRAM OF THE APPROVED WELDING SEQUENCE SHALL BE SUBMITTED TO THE OWNER BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCE SHALL BE MADE WITHOUT PERMISSION FROM THE OWNER.
 2. INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1
 1. INSPECT WELDING EQUIPMENT FOR CAPABILITY, MAINTENANCE AND WELDING QUALIFICATION
 2. VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS
 3. INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1
 4. VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1
 5. SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER BEING WELDED TO DETERMINE PENETRANT
 6. INSPECT FOR SIZE, SPACING, TYPE AND LOCATION OF ALL WELDED JOINTS
 7. VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS
 8. REVIEW THE REPORTS BY TESTING AGENCY
 9. CHECK TO SEE THAT WELDS ARE CLEAN AND PROTECTED AS REQUIRED
 10. INSPECT FOR PROTECTION OF WELDS AS REQUIRED BY THE CONTRACT DOCUMENTS
 11. CHECK FOR DEFECTIVE WELDS AND CORRECTIVE ACTION TO BE TAKEN IMMEDIATELY
- F. SPECIAL INSPECTION OF EXISTING AND NEW WELDED JOINTS
1. THE TESTING AGENCY SHALL INSPECT ALL WELDED JOINTS ON THE MONOPOLE SHAFT AND ON THE PLATFORM WELD CONNECTIONS. A SPECIAL INSPECTION CHECKLIST SHALL BE PROVIDED TO THE INSPECTOR. THE INSPECTOR SHALL USE THE FOLLOWING INSPECTION METHODS TO IDENTIFY ANY CRACKS, HISS, DISCONTINUITIES, AND DEFECTS. IN ADDITION, OTHER TEST METHODS MAY ALSO BE USED AT THE DISCRETION OF THE TESTING AGENCY AND UPON THE APPROVAL OF THE OWNER AND THE ENGINEER. THE TESTING AGENCY SHALL PROVIDE CHECKLIST AND TYPICAL OCCURRENCE OF THIS INSPECTION TO THE OWNER AND THE ENGINEER. THE TESTING AGENCY SHALL COORDINATE THESE INSPECTION ACTIVITIES WITH THE CONTRACTOR'S PROTECTIVE MEASURES AND PROCEDURES. IT IS IMPORTANT THAT THE TESTING AGENCY SHALL REPORT ANY INDICATIONS OF CRACKS, FRACTURES, DISTRESS, AND/OR CORROSION TO THE TESTING AGENCY ENGINEER.
 2. AFTER CONSTRUCTION, TESTING AGENCY SHALL REPEAT AN AND ALL FIELD WELDED WELDED AS REQUIRED BY THE OWNER FROM THE RESULTS OF THE INSPECTION AND PREVIOUS WELDING ABOVE.
 3. REFER TO CROWN CASTLE DOCUMENTS ENGINEERING AND SPECIAL INSPECTION FOR SPECIFICATIONS.
- G. REPORTS:
1. (TYPICAL AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.

THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL INSPECTION ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL INCLUSIVE. IT DOES NOT IMPLY THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACT DOCUMENTS TO DETERMINE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S SUBJECTIVE MEASUREMENTS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES AND DEFECTS SHALL BE BROUGHT IMMEDIATELY TO THE OWNER'S ATTENTION. REVISIONS ARE NOT TO BE MADE WITHOUT THE OWNER'S REVIEW AND SPECIFIC WRITTEN CONSENT. THE OWNER RESERVES THE RIGHT TO DEFERRE THAT AN ACCEPTABLE RESULT OF DISCREPANCIES AND DEFECTS. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACTION PLAN. THIS WRITTEN ACTION PLAN WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED IN ORDER TO CONTINUE CONSTRUCTION AND/OR LOADING OF STRUCTURAL ITEMS.

RESPONSIBILITY: THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR OF ANY AND ALL STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ALL DECISIONS FROM THE CROWN CASTLE DOCUMENTS. THE TESTING AGENCY WILL NOT REPRESENT THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.



FEB 23 2015

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
300 Park Street, Suite 100, Cromwell, CT 06430
860.421.3876 www.pjfc.com

CROWN CASTLE
3830 CORN BIDDY WAY, SUITE 300, CHARRLOTTE, NC 28277
704.992.0525 FAX 704.992.0526

BU #876348; ENFIELD
ENFIELD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 3751-064
DRAWN BY: B.M.S.
CHECKED BY: J.F.F.
APPROVED BY: _____

ISSUE DATE OF PERMIT: 2-27-2015

DATE: 2-27-2015

S-1

D. STRUCTURAL STEEL

1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:

A. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):

(1) SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS

(2) SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A502 OR A503 BOLTS AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION

(3) "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" PARAGRAPH 12.1 SPECIFICALLY EXCLUDED

B. BY THE AMERICAN WELDERING SOCIETY (AWS):

(1) STRUCTURAL STEEL CODE "STEEL CONSTRUCTION"

(2) SYMBOLS FOR WELDING AND NON-Destructive TESTING

2. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.

3. ALL STRUCTURAL CONNECTIONS, INCLUDING THE A190 BOLTS WITH SHEAR SLEEVES, MUST BE TO THE REQUIREMENTS OF THE AISC METHOD. TIGHTEN BOLTS IN TURN PAST THE SLIGHT CONTACT AS DEFINED BY AISC.

4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDERING SOCIETY, AWS D11.1. ALL WELD ELECTRODES SHALL BE EXACT UNLESS NOTED OTHERWISE ON THE DRAWINGS.

5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO THE OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.

6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 OR A572 GRADE 50 UNLESS NOTED OTHERWISE ON THE DRAWINGS.

7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS SECTION 1 NOTES REGARDING TOUCH-UP OF GALVANIZED SURFACES DAMAGED DURING FABRICATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.

8. UNLESS OTHERWISE NOTED ALL STEEL MEMBERS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AWS D11.2. SEE SECTION J FOR FURTHER NOTES AND FOR EXCEPTIONS, IF ANY.

9. ALL WELDS SHALL BE VISUALLY INSPECTED BY THE OWNER'S APPROVED TESTING AGENCY. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY IN THEIR TESTING EFFORTS.

10. FIELD WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.

C. FIELD CUTTING OF STEEL

(1) PRIOR TO ANY FIELD CUTTING, THE CONTRACTOR SHALL MARK THE CUT LINES ON THE STEEL AND THE INSPECTOR/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION AND DIMENSIONS.

(2) ANY REQUIRED CUTS IN THE STEEL SHALL BE CAREFULLY CUT BY MECHANICAL METHODS SUCH AS DRILLING, SAW CUTTING, AND GRINDING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AIRLINES OR OTHER EQUIPMENT AND/OR THE STRUCTURE DURING THE CUTTING WORK. ANY DAMAGE TO THE COAX CABLES, AIRLINES OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTOR/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

(3) ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE CUT LINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GRIND SMOOTH AND DEBURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D11.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTOR/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

E. BASE PLATE GROUT

1. NEW GROUT FOR THE POLE BASE SHALL BE NON-SHRINK, NON-METALLIC GROUT (EUCON NE GROUT BY EUCLID, OR APPROVED EQUAL WITH A 7000 PSI MINIMUM COMPRESSIVE STRENGTH. PVC DRAINAGE PIPES SHALL BE PROVIDED FROM INSIDE OF THE POLE SHAFT OUT THROUGH THE GROUT SPACE UNDER THE BASE PLATE IN ORDER TO ALLOW MOISTURE TO ADEQUATELY DRAIN FROM THE INTERIOR OF THE POLE SHAFT. CONTRACTOR SHALL SUBMIT PROPOSED GROUT SPECIFICATION INFORMATION TO THE OWNER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.

2. CONTRACTOR SHALL FOLLOW GROUT MANUFACTURER'S SPECIFICATIONS FOR COLD WEATHER GROUTING PROCEDURES. IF NECESSARY, THE TESTING AGENCY SHALL PREPARE GROUT SAMPLE SPECIMENS FOR COMPRESSIVE STRENGTH TESTING AND VERIFICATION.

3. GROUT SHALL BE INSTALLED TIGHT UNDER BASE PLATE WITH NO VOIDS REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF EXISTING BASE PLATE (EXCEPT FOR DRAIN PIPES). GROUT COMPLETELY SOLID (EXCEPT FOR DRAIN PIPES) UNDER ENTIRE SURFACE OF BASE PLATE FROM OUTSIDE EDGE TO INSIDE EDGE.

F. FOUNDATION WORK - (NOT REQUIRED)

G. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)

H. EPOXY GROUTED REINFORCING ANCHOR RODS

1. UNLESS OTHERWISE NOTED, REINFORCING ANCHOR RODS SHALL BE 1/2" DIA. ALL REINFORCING ANCHOR RODS SHALL BE EPOXY GROUTED PER THE FOLLOWING:

(1) ALL REINFORCING ANCHOR RODS SHALL BE PREPARED AND INSTALLED PER THE FOLLOWING:

(a) ALL REINFORCING ANCHOR RODS SHALL BE PREPARED AND INSTALLED PER THE FOLLOWING:

(b) THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ANCHOR RODS TO BE INSTALLED PER THE FOLLOWING:

(c) UNLESS OTHERWISE NOTED, REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(d) CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD MANUFACTURER'S RECOMMENDATIONS REGARDING HANDLING OF RODS, EPOXY, ACCEPTABLE AMBIENT TEMPERATURES DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON CURE CURING TIME, PREPARATION OF HOLES, ETC.

(e) ULTRASONIC FLEET 2000 OR ANCHORITTE EPOXY SHALL BE USED TO ANCHOR THE RODS. ALL PREPARED HOLES IN THE CONCRETE SHALL BE 1/8" OVER SIZE OF THE RODS. IF CONTRACTOR WISHES TO USE AN EPOXY OTHER THAN A REQUEST INCLUDING THE EPOXY TECHNICAL DATA SHEET SHALL BE SUBMITTED TO THE OWNER AND COMPANY FOR REVIEW PRIOR TO CONSTRUCTION. CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD MANUFACTURER'S RECOMMENDATIONS REGARDING HANDLING OF EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON CURE CURING TIME, PREPARATION OF HOLES, ETC.

(f) ALL REINFORCING ANCHOR RODS HAVE BEEN FIELD WELDED TO THE EXISTING REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(g) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(h) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(i) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(j) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(k) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(l) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(m) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(n) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(o) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(p) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(q) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(r) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(s) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(t) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(u) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(v) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(w) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(x) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(y) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

(z) REINFORCING ANCHOR RODS SHALL BE INSTALLED PER THE FOLLOWING:

2. TOUCH UP OF GALVANIZING

1. THE CONTRACTOR SHALL TOUCH UP ANY AND ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRASIONED DURING CONSTRUCTION GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS TOUCHED UP WITH TWO (2) COATS OF ZINC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND, FLM THICKNESS PER COAT SHALL BE WET 3.0 MILS, DRY 1.5 MILS, APPLY PER ZRC MANUFACTURER'S RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.

2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS OR GALVANIZED AND PAINTED SURFACES FOR TOUCH UP COATING IN ACCORDANCE WITH AWS D11.1. THE OWNER'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH UP COATING.

3. THE OWNER'S TESTING AGENCY SHALL TEST AND VERIFY THE TOUCH UP COATING AFTER THE CONTRACTOR HAS APPLIED THE ZINC-BRAND GALVANIZING COMPOUND AND IT HAS BEEN FULLY DRIED. AREAS FOUND TO BE INADEQUATELY COATED, SHALL BE RE-APPLIED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

J. HOT DIP GALVANIZING

1. HOT DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153 AS APPROPRIATE.

2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING.

3. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES AS REQUIRED.

4. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

K. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER

1. AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MONOPOLE REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY THE OWNER, THE OWNER SHALL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEM.

2. THE MONOPOLE REINFORCING SYSTEM INDICATED IN THESE DOCUMENTS UNDER THE WORKING COMPONENTS THAT INVOLVE FIELD WELDING IS PERMANENT BY THE EXISTING SHOWN ON THE POLE STRUCTURE. THESE FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND CORRECTED. THE CONTRACTOR SHALL PREVENTIVE CORROSION SUCH AS THE DRUG GALVANIZING COMPOUND, PROTECTIVE FIELD WELDS, THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM, STRUCTURAL LOADS, THE INSTALLATION AND QUALITY, MAINTAINED SOUND CONDITION, AND FIELD WELDED FIELD WELDED CONNECTIONS. ANY CORROSION OF DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE CONNECTED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT THE OWNER REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.

3. THE OWNER SHALL REFER TO TABLE 2.1 OF SECTION 14.11.1 ANNEXE FOR RECOMMENDATIONS FOR MAINTENANCE AND INSPECTION. THE FREQUENCY OF THE INSPECTION AND MAINTENANCE INTERVALS IS TO BE DETERMINED BY THE OWNER BASED UPON LOCAL SITE AND ENVIRONMENTAL CONDITIONS. PAUL J. FORD & COMPANY RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT. ACCORDING TO TABLE 2.1 OF SECTION 14.11.1, NOTE 1 IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR GRADE STORMS OR OTHER EXTREMELY LOADING CONDITIONS.

STATE OF CONNECTICUT
PAUL J. FORD & COMPANY, INC.
No. PER 22731
LICENSED PROFESSIONAL ENGINEER

FEB 29 2016

<p>PAUL J. FORD AND COMPANY STRUCTURAL ENGINEERS 20141 221 STREET ENFIELD, CT 06033 www.pjfc.com</p>	<p>BU #876348; ENFIELD ENFIELD, CT</p> <p>MONOPOLE REINFORCEMENT AND RETROFIT PROJECT</p>		<p>PROJECT NO. 37512-051</p> <p>DRAWN BY BWS</p> <p>CHECKED BY JLF</p> <p>APPROVED BY</p>	<p>ISSUE DATE OF PERMIT: 02-27-2016</p>
	<p>CROWN CASTLE</p> <p>3636 SPRINGWOOD WAY, SUITE 300 CHARLOTTE, NC 28277 PH: 704.455.0016 FAX: 704.455.4615</p>		<p>DATE: 2-27-2016</p>	<p>S-2</p>

- NOTES:**
1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISI 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
 2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISI 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
 3. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL BELOW FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.
 4. ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTIS) AND HARDENED WASHERS. DTIS SHALL BE THE SQUIRTERS® STYLE, MADE TO ASTM F959 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.

NOTES FOR AJAX M20 'ONE-SIDE' BOLTS WITH DIRECT TENSION INDICATORS (DTIS):

DTIS REQUIRED: DTIS SHALL BE "SELF-INDICATING" SQUIRTERS® STYLE DTIS MADE WITH SILICONE EMBEDDED IN THEM. INSPECTED BY MEANS OF THE VISUAL ELUCIDATION OF SILICONE AS THE DTI PROTRUSIONS COMPRESS. SQUIRTERS® DTIS SHALL BE CALIBRATED PER MANUFACTURER'S INSTRUCTIONS PRIOR TO USE.

THE DIRECT TENSION INDICATOR (DTI) WASHERS SHALL BE THE 'SQUIRTERS® STYLE' AS MANUFACTURED BY:

APPLIED BOLTING TECHNOLOGY PRODUCTS, INC.
 1413 ROCKINGHAM ROAD BELL CLOWS FALLS, VERMONT USA 05101
 PHONE 1-800-552-1999
 WEBSITE: WWW.APPLIEDBOLTING.COM

DISTRIBUTORS OF SQUIRTERS® DTIS:
[HTTP://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRIBUTORS.HTML](http://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRIBUTORS.HTML)

DTI USE: DIRECT TENSION INDICATOR (DTI) WASHERS COMPATIBLE WITH 20 MM (M20) NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTIS SHALL NOT BE HOT-DIP GALVANIZED. DTIS SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.

HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY GALVANIZED BY THE COLD MECHANICAL PROCESS. ALTERNATIVELY, CORRECTLY MADE HOT-DIP GALVANIZED HARDENED FLAT WASHERS HAVING A MINIMUM HARDNESS OF RC 38 CAN BE USED; CONTRACTOR SHALL PROVIDE DOCUMENTATION OF WASHER SPECIFICATION AND HARDNESS.

NUT LUBRICATION REQUIRED: PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING.

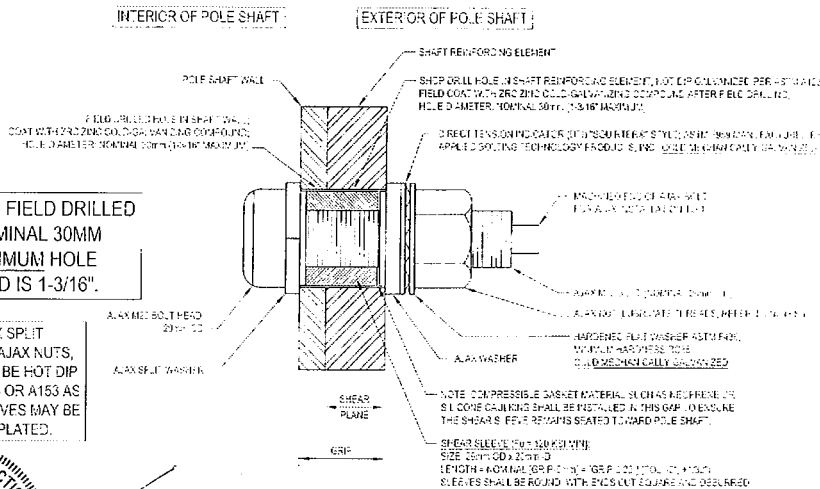
NOTE: COMPLETELY COMPRESSED DTIS SHOWING NO VISIBLE REMAINING GAP ARE ACCEPTABLE. DTI WASHERS SHALL BE PLACED DIRECTLY AGAINST THE OUTER FLAT WASHER WITH THE DTI BUMP FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND THE AJAX NUT. THE DTI BUMP SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

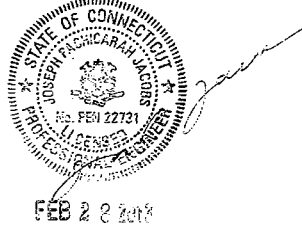
INSPECTION REQUIRED: ALL AJAX BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISI 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009, BY A QUALIFIED BOLT INSPECTOR. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE AJAX BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TIGHTENING PROCEDURE. IN ADDITION, ALL AJAX BOLTS AND DTIS SHALL BE VISUALLY INSPECTED ACCORDING TO THE DTI MANUFACTURER'S INSTRUCTIONS. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE PHOTO DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTIS.

NOTE: ALL SHOP AND FIELD DRILLED HOLES SHALL BE NOMINAL 30MM DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1-3/16".

NOTE: ALL AJAX BOLTS, AJAX SPLIT WASHERS, AJAX WASHERS, AJAX NUTS, AND SHEAR SLEEVES SHALL BE HOT-DIP GALVANIZED PER ASTM A123 OR A153 AS APPROPRIATE. SHEAR SLEEVES MAY BE COLD GALVANIZED OR ZINC PLATED.



TYPICAL AJAX BOLT DETAIL 1
 S-3



PAUL J. FORD AND COMPANY
 STRUCTURAL ENGINEERS
 285 Enfield Street, Suite 107, Enfield, CT 06033
 (414) 255-0079

CROWN CASTLE
 255 Rockingham Way, Suite 309, Charlestown, MA 02632
 Tel: (617) 454-6611 Fax: (617) 454-6611

BU #876348; ENFIELD
ENFIELD, CT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT NO: 1751-024
 DRAWN BY: BMS
 CHECKED BY: JCT
 APPROVED BY: [Signature]
 DATE: 2-27-2013

ISSUE DATE OF PERMIT: 2-27-2013

S-3

NOTE: NO DETAILED INFORMATION REGARDING INTERFERENCES WAS PROVIDED. THEREFORE, CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL IMMEDIATELY.

THIS POLE REINFORCEMENT DRAWING IS FOR THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF CO-LOCATION ANALYSIS FOR THIS SITE (PJF#37513-0644), DATED 2-27-2013.

POLE SPECIFICATIONS	
POLE SUBTYPE	DESIGNED POLYCON
INLET	3.000 (1.000)
SHAFT STEEL	ASTM A500 GRADE B & A572 GRADE 50
BASE PLATE STEEL	ASTM A572 GRADE 50
WASHER TYPE	316L SS
	316L SS 4015 GRADE 25

SHAFT SECTION DATA					
SHEATH SECTION	SECTION HEIGHT (FT)	PLATE THICKNESS (IN)	JOB SPACE (IN)	DIAMETER AUGER DEPTHS (IN)	
				TOP	BOTTOM
1	40.00	0.250	48.00	22.000	25.419
2	40.00	0.250	54.00	28.196	35.780
3	40.00	0.250	60.00	34.445	42.235
4	40.00	0.250	66.00	40.711	48.811

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

- NOTES:**
- ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC SPECIFICATIONS FOR STRUCTURAL JOINTS USING HIGH STRENGTH BOLTS, DEC. 31, 2003.
 - ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH STRENGTH BOLTS, DEC. 31, 2003.
 - ALL AXIAL BOLTS WITH SHEAR SLEEVES SHALL BE PRE-TENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PRE-TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL ON SHEET S-3 FOR THE USE OF DIRECT TENSIONING OPTION DTI WASHERS WITH THE AXIAL BOLTS.
 - DTI'S REQUIRED: ALL AXIAL BOLTS SHALL BE INSTALLED USING DIRECT TENSIONING OPTION AND UNBOLDED WASHERS. DTI'S SHALL BE THE SQUARE STYLE, MADE TO ASTM F590 LATEST REVISION, AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF 600R OR HIGHER.
 - ALL TUBES SHALL BE PROPERLY BRACED TO THE TOP OF THE SHAFT TO PREVENT BUCKLING. CONTRACTOR SHALL FOLLOW MANUFACTURER'S PRACTICES FOR PROPER BRACING AND TIGHTENING REFER TO SHEET S-3.
 - ALL EXISTING HOLES: ALL SUCH HOLES AND FIELD-DRILLED HOLES SHALL BE NOMINAL 3/8" DIA. PER THE MAXIMUM HOLE DIAMETER PERMITTED, S-3. REFER TO SHEET S-3.

FOR FURTHER INFORMATION REGARDING THE DESIGN OF THE POLE, REFER TO THE PROJECT MANUAL AND THE PROJECT SPECIFICATIONS. THE CONTRACTOR SHALL PROVIDE COMPLETE INSPECTION AND REPORTS TO THE FIELD PERSONNEL.

THE CONTRACTOR SHALL FURTHER NOTICED CROWN CASTLE WILL ACCEPT ALL BOLTS TO BE WELDED TO THE SHAFT. THE CONTRACTOR SHALL PROVIDE COMPLETE INSPECTION AND REPORTS TO THE FIELD PERSONNEL.

THE CONTRACTOR SHALL FURTHER NOTICED CROWN CASTLE WILL ACCEPT ALL BOLTS TO BE WELDED TO THE SHAFT. THE CONTRACTOR SHALL PROVIDE COMPLETE INSPECTION AND REPORTS TO THE FIELD PERSONNEL.

NEW AEROSOLUTIONS MP3 REINFORCING (OPTION #1)		
ELEVATION	PLATE	REINFORCING ELEMENT
39.0 TO 40.0	1.75 THK	MS 60

ALL BOLTS SHALL BE AXIAL BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (AS MADE WITH 316L SS) CONTACT SUPPLIER FOR MATERIAL, PLATE & BOLTS AND INSTALLATION PROCEDURES.

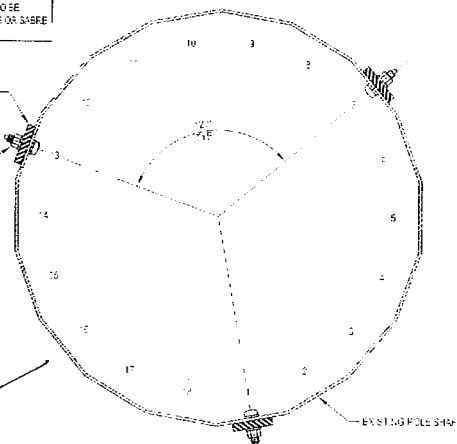
NEW SABRE FLAT PLATE REINFORCING (OPTION #2)		
ELEVATION	PLATE	REINFORCING ELEMENT
39.0 TO 40.0	1.75 THK	MS 60

ALL BOLTS SHALL BE AXIAL BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (AS MADE WITH 316L SS) CONTACT SUPPLIER FOR MATERIAL, PLATE & BOLTS AND INSTALLATION PROCEDURES.

NEW CCI FLAT PLATE (100 KSI) REINFORCING (OPTION #3)		
ELEVATION	PLATE	REINFORCING ELEMENT
39.0 TO 40.0	1.75 THK	MS 60

NOTES FOR CROWN CASTLE DESIGN OPTION #3 (100 KSI MATERIAL):
 1. DO NOT FIELD WELD DIRECTLY TO THE 100 KSI MATERIAL.
 2. THE 100 KSI MATERIAL SHALL CONFORM TO THE FOLLOWING:
 A. MATERIAL SHALL BE ASTM A574 GRADE A, GRADE E, OR GRADE F.
 B. 100 KSI MINIMUM TENSILE STRENGTH PER SECTION 5.1.1.1.
 C. MATERIAL SHALL BE HEAT TREATED, QUENCHED AND TEMPERED PER ASTM A574.
 3. CONTRACTOR SHALL HAVE A QUALIFIED WELDER, WELDING PROCESSES OF NOT LESS THAN 1/8" THK, 1/4" JOINT DEPTHS PER AISC 360 GRADE 100 HAS MAXIMUM.
 4. DIMENSIONS OF WELD SHALL BE AS SHOWN IN THE DRAWING.
 5. AN ANVIL COLLING OF THE ANVIL SHALL BE PERFORMED ACCORDING TO THE APPROVED WELDING PROCEDURE SPECIFICATION (WPS) FOR THE GRADE AND THICKNESS OF THE SERVICE.
 6. THE WPS SHALL BE DEVELOPED BY A QUALIFIED SERVICE ENGINEER WITH A B.S. IN WELDING OR FABRICATION. ALL WPS SHALL BE SUBMITTED TO CROWN CASTLE AND SHALL BE APPROVED BY CROWN CASTLE.

AEROSOLUTIONS AND SABRE REINFORCING SHALL BE INSTALLED TO BE FINISHED FOR AEROSOLUTIONS OR SABRE UPON WORKING BID FOR USE.



FEB 25 2013

PAUL J. FORD AND COMPANY
 STRUCTURAL ENGINEERS
 1000 South Street, Suite 100, Enfield, CT 06033
 (860) 221-8878

CROWN CASTLE
 5800 TORRINGTON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: 704-405-0715 FAX: 704-405-0713

BU #876348; ENFIELD ENFIELD, CT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

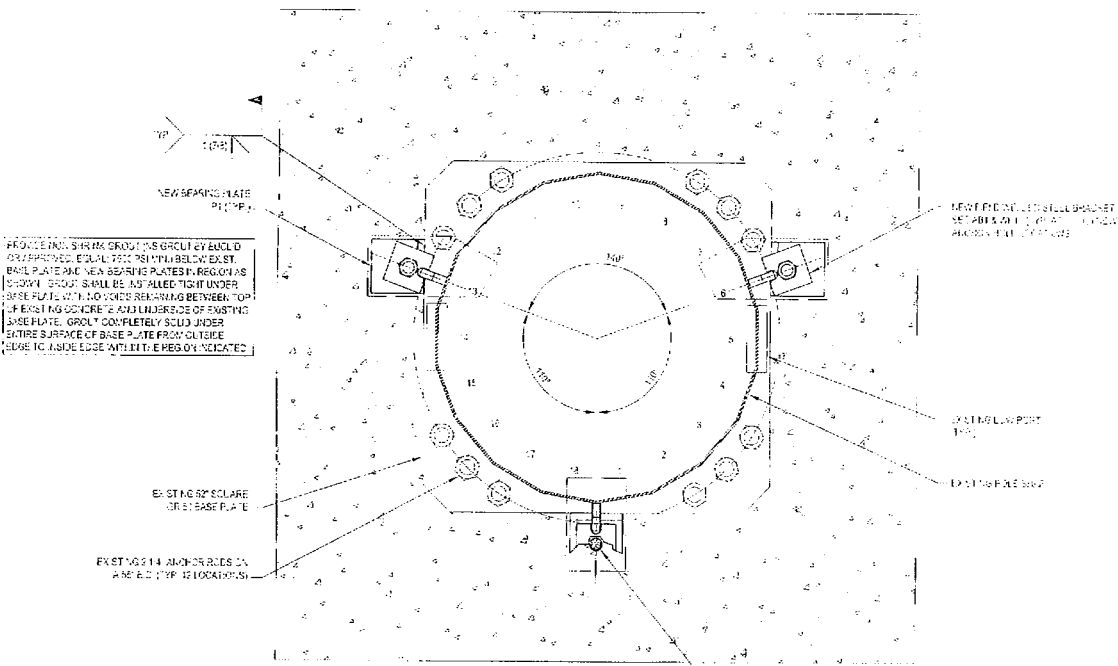
PROJECT NO: 876348
 DRAWN BY: BVS
 CHECKED BY: JJJ
 APPROVED BY: [Signature]
 DATE: 2-27-2013

ISSUE DATE OF PERMIT: 2-27-2013
S-4

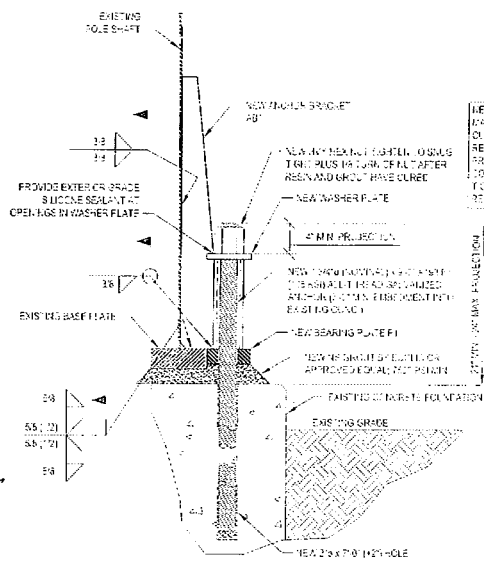
SECTION 5 - SPECIAL PROVISIONS TO DIVISION 5 - CONCRETE

1. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE TESTING AGENCY OF THE LOCATION OF ALL EXISTING AND NEW REINFORCING BARS AND THE LOCATION OF ALL EXISTING AND NEW WELDED CONNECTIONS. THE TESTING AGENCY SHALL USE THE FOLLOWING INSPECTION METHODS OR COMBINATIONS THEREOF AS REQUIRED TO IDENTIFY AND LOCATE ALL REINFORCING BARS AND WELDED CONNECTIONS. THE TESTING AGENCY SHALL NOT BE RESPONSIBLE FOR THE LOCATION OF ALL REINFORCING BARS AND WELDED CONNECTIONS. THE TESTING AGENCY SHALL NOT BE RESPONSIBLE FOR THE LOCATION OF ALL REINFORCING BARS AND WELDED CONNECTIONS. THE TESTING AGENCY SHALL NOT BE RESPONSIBLE FOR THE LOCATION OF ALL REINFORCING BARS AND WELDED CONNECTIONS.
2. THE TESTING AGENCY SHALL INSPECT AND REPORT ON ALL REINFORCING BARS AND WELDED CONNECTIONS. THE TESTING AGENCY SHALL NOT BE RESPONSIBLE FOR THE LOCATION OF ALL REINFORCING BARS AND WELDED CONNECTIONS.

1. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH THE WELDING CODES AND STANDARDS APPLICABLE TO THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FOR WELDING OPERATIONS.
2. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH THE WELDING CODES AND STANDARDS APPLICABLE TO THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FOR WELDING OPERATIONS.
3. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH THE WELDING CODES AND STANDARDS APPLICABLE TO THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FOR WELDING OPERATIONS.



BASE PLATE 1
S-5



NEW ANCHOR & BRACKET DETAIL 2
S-5



FEB 28 2012

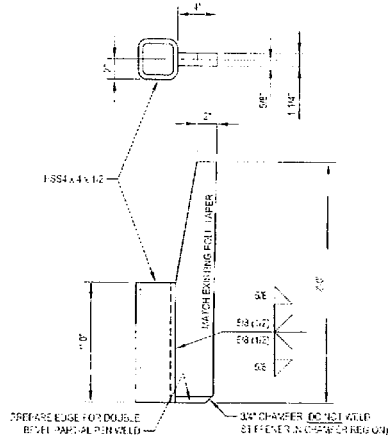
PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
245 East Main Street, Suite 1050 • Enfield, CT 06033
(860) 251-6679 www.pjfc.com

CROWN CASTLE
2532 TORINGTON WAY, SUITE 200, C-40, CT, NO. 38277
PH: 203-445-6915 FAX: 203-445-6518

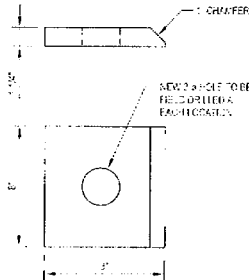
BU #876348; ENFIELD
ENFIELD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT NO. 3751-384-	ISSUE DATE OF PERMIT 2/28/2012
DRAWN BY B.M.S.	
CHECKED BY J.F.	
APPROVED BY	
DATE 2/27/2012	

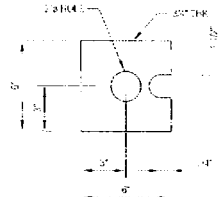
S-5



ANCHOR BRACKET MK-AB1
 (3) REQUIRED; (CUBE $F_c = 45$ KSI; STIFFENER $F_y = 65$ KSI)



BEARING PLATE MK~P1
 (2) REQUIRED; ($F_y = 50$ KSI)



WASHER PLATE MK~WP1
 (3) REQUIRED; ($F_y = 65$ KSI)



FEB 8 9 2013

PAUL J. FORD AND COMPANY
 STRUCTURAL ENGINEERS
 250 East Broad Street, Suite 1100, Enfield, CT 06029
 (860) 221-6672

CROWN CASTLE
 3500 FORTHINGTON WAY, SUITE 203, CHARLOTTE, NC 28227
 P: (704) 426-6672 FAX: (704) 405-0978

BU #876348; ENFIELD
ENFIELD, CT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT NO. 37512-004	ISSUE DATE OF PERMIT: 2-27-2013
DRAWN BY B.M.S.	S-6
CHECKED BY J.J.F.	
APPROVED BY	DATE: 2-27-2013

THIS DRAWING IS THE PROPERTY OF PAUL J. FORD AND COMPANY. IT IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED HEREON. IT IS NOT TO BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF PAUL J. FORD AND COMPANY. ANY UNAUTHORIZED USE OF THIS DRAWING IS PROHIBITED AND WILL BE PROSECUTED TO THE FULL EXTENT OF THE LAW.

WOOF CHECKLIST INSPECTION NOTES:

GENERAL

The following inspection was a visual inspection of the construction and... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

THE SITE TO CORRECT... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

ALL THIS SHOULD BE COLLECTED BY A CROWN ENGINEERING... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

TO ENSURE THAT THE REQUIREMENTS OF THE MONUMENT... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

BEFORE THE MONUMENT... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

N. INSPECTOR

THE INSPECTOR IS REQUIRED TO CONTACT THE GC... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

- REVIEW THE REQUIREMENTS OF THE CHECKLIST
NOTE WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS...

THE N. INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE INSPECTOR AS SOON AS... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

- REVIEW THE REQUIREMENTS OF THE CHECKLIST
NOTE WITH THE INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS...

THE GC SHALL PREPARE AND RECORD THE TEST AND INSPECT... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

- IT IS SUGGESTED THAT THE GC PROVIDE A SUMMARY OF BUSINESS...
THE GC SHALL BE RESPONSIBLE FOR THEM TO BE CONSIDERED...

CANCELLATION OR DELAYS IN SCHEDULED

IF THE GC AND THE INSPECTOR AGREE TO A DATE ON WHICH... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

CORRECTION OF FAILURES

IF THE WOOF CHECKLIST INSPECTION WOULD FAIL, THE... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS...
OR WITH DELAYS APPROVAL, THE GC MAY WORK WITH THE GC TO RE-EVALUATE...

M. VERIFICATION INSPECTIONS

CROWN RESERVES THE RIGHT TO CONDUCT ADDITIONAL... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

ALL VERIFICATION INSPECTIONS SHALL BE... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

VERIFICATION INSPECTIONS MAY BE CONDUCTED BY... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

PHOTOGRAPHS

BETWEEN THE GC AND THE INSPECTOR... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

- PRE-CONSTRUCTION GENERAL SITE CONSTRUCTION
PHOTOGRAPHS DURING THE REPAIR/RECONSTRUCTION...
PHOTOS OF 4. CRITICAL DETAILS
FOOTING/FOUNDATION DETAILS
WEED PREPARATION
BOLT INSTALLATION AND TIGHTENING
FINAL INSTALLED CONNECTION
SURFACE CONDITION REPAIR
POST CONSTRUCTION PHOTOGRAPHS
FINAL TIE-UP CONNECTION

PICTURES OF THE VEHICLE HOOD FUNCTIONS... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

THIS IS NOT A COMPLETE LIST OF REQUIRED... THE CONTRACTOR HAS BEEN ADVISED TO CORRECT...

M CHECKLIST

Table with 2 columns: Item, Status (X or NA). Rows include PRE-CONSTRUCTION items like CONTRACT DOCUMENTS, UFP APPROVED SHOP DRAWINGS, FABRICATION INSPECTIONS, etc.

ADDITIONAL TESTING AND INSPECTIONS

CONSTRUCTION

Table with 2 columns: Item, Status (X or NA). Rows include CONSTRUCTION INSPECTIONS, FOUNDATION INSPECTIONS, COLORED CONCRETE REINFORCING ELEMENTS, etc.

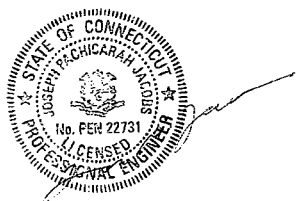
ADDITIONAL TESTING AND INSPECTIONS

POST-CONSTRUCTION

Table with 2 columns: Item, Status (X or NA). Rows include INSPECTOR FIELD REPORT, POST-INSTALLATION AND/OR POST-INSTALLATION, etc.

ADDITIONAL TESTING AND INSPECTIONS

NOTE: X DENOTES DOCUMENT NEEDED FOR THE PM REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PM REPORT



FEB 23 2013

Logo for Paul J. Ford and Company, Inc. Engineers, and Crown Castle logo with address: 2650 TORRINGDON WAY, SUITE 300, CHANDELIER, NH 03027.

BU #876348; ENFIELD
ENFIELD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT LOCATION: ENFIELD, CT
DRAWN BY: JLF
CHECKED BY: JLF
APPROVED BY:
DATE: 2-27-2013

SUBMIT DATE OF PERMIT: 2-27-2013

S-7

SHEET INDEX

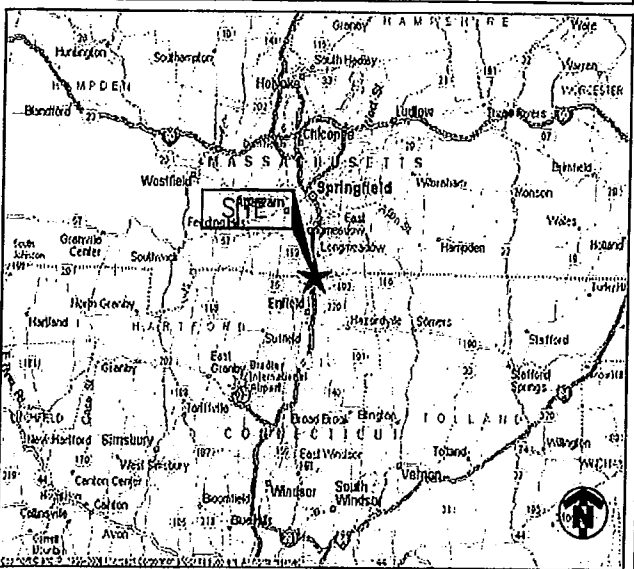
NO.	DESCRIPTION
T1	TITLE SHEET
C1	GENERAL NOTES
C2	COMPOUND SITE PLAN & ELEVATION
C3	EQUIPMENT SITE PLANS
C4	EQUIPMENT DETAILS
C5	ANTENNA PLANS
C6	ANTENNA CABLE RISER & GPS DETAILS
C7	EQUIPMENT DETAILS
C8	RF AND CABLE DETAILS
C9	FIBER DISTRIBUTION BOX DETAILS
E1	UTILITY SITE PLAN
E2	DETAILS
E3	GROUNDING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

DRIVING DIRECTIONS

DEPART FROM SPRINT:
1 INTERNATIONAL BLVD MAHWAH, NJ 07430

1. HEAD NORTH ON INTERNATIONAL BLVD/PARK ST TOWARD QUEENSLAND RD. CONTINUE TO FOLLOW INTERNATIONAL BLVD.
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/N Y. THRUWAY AND MERGE ONTO I-287 N/NJ-17 N. ENTERING NEW YORK.
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. CONTINUE TO FOLLOW I-287 E.
8. TAKE THE EXIT ONTO I-95 N. ENTERING CONNECTICUT.
9. TAKE EXIT 48 ON THE LEFT TO MERGE ONTO I-91 N TOWARD HARTFORD.
10. TAKE EXIT 49 TO MERGE ONTO U.S. ROUTE 5 N/ENFIELD ST/US-5 N.
11. TURN RIGHT ONTO BRIGHT MEADOW BLVD. DESTINATION WILL BE ON THE LEFT.

VICINITY MAP



NETWORK VISION MMBTS LAUNCH
NORTHERN CONNECTICUT MARKET

SPRINT SITE NAME
ENFIELD

CROWN CASTLE SITE NAME
ENFIELD

SPRINT SITE NUMBER
CT03XC221

CROWN CASTLE NUMBER
876348

SITE ADDRESS
**BRIGHT MEADOW BLVD.
ENFIELD, CT 06082**

STRUCTURE TYPE
MONOPOLE

OWNER AND TENANT MAY, FROM TIME TO TIME AT TENANT'S OPTION, REPLACE THIS EXHIBIT WITH AND 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.



PROJECT TEAM

 1 ROBBINS ROAD WESTFORD, MA 01886 PROJECT MANAGER	 11 Herbert Drive Latham, NY 12110 OFFICE #: (518) 690-0790 FAX #: (518) 690-0793 ENGINEER
---	---

- SCOPE OF WORK:**
- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED
 - FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
 - FACILITY HAS NO PLUMBING OR REFRIGERANTS
 - THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS
 - ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. CABINETS, ANTENNAS/RRU AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR
 - INSTALL NEW ANTENNAS/RRH'S ON EXISTING TOWER
 - INSTALL NEW BTS OR RETROFIT EXISTING BTS IN EXISTING EQUIPMENT AREA
 - REMOVE EXISTING CDMA ANTENNAS AND COAX CABLES
 - REPLACE EXISTING BATTERY CABINET WITH NEW BATTERY CABINET IF REQUIRED
 - REPLACE EXISTING GPS IF REQUIRED

PROJECT SUMMARY

SITE NAME: ENFIELD

SITE NO.: CT03XC221

SITE ADDRESS: BRIGHT MEADOW BLVD. ENFIELD, CT 06082

COUNTY: HARTFORD

SITE COORDINATES:
 LATITUDE: 42° 1' 14.93" N (NAD 83)
 LONGITUDE: 72° 35' 6.62" W (NAD 83)
 GROUND ELEV.: ±106' (AMSL)

POWER COMPANY: CL&P: (860) 947-2000

PHONE COMPANY: AT&T: (800) 288-2020

JURISDICTION: TOWN OF BRUNSWICK

LANDLORD: CROWN ATLANTIC COMPANY LLC. 2000 CORPORATE DRIVE CANONSBURG, PA 15317 (704) 405-6555

APPLICANT: SPRINT 1 INTERNATIONAL BLVD. MAHWAH, NJ 07495

PROJECT MANAGER: ALCATEL LUCENT 1 ROBBINS ROAD WESTFORD, MA 01886

CONTACT: ISAM ELHALWANI (617) 851-6133

CONSTRUCTION MANAGER: MIKE CALLAHAN (860) 919-7278

ENGINEER: INFINIGY 11 HERBERT DRIVE LATHAM, NY 12110

CONTACT: PAUL FANOS (518) 690-0790

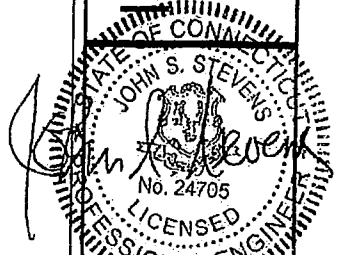
BUILDING CODE: 2003 INTERNATIONAL BUILDING CODE 2005 CONNECTICUT BUILDING CODE W/ 2009 AMENDMENT UNIFORM MECHANICAL CODE UNIFORM PLUMBING CODE LOCAL BUILDING CODE CITY/COUNTY ORDINANCES

ELECTRICAL CODE: 2005 NATIONAL ELECTRICAL CODE

Design. Build. Deliver.

INFINIGY

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



2	REVISED PER COMMENTS	AS	4/15/13
1	REVISED PER COMMENTS	AS	3/21/13
0	ISSUED FOR REVIEW	AS	11/13/12
No.	Submitted / Revision	App'd	Date
Drawn:	AS	Date:	11/13/12
Designed:	AS	Date:	11/13/12
Checked:	AS	Date:	11/13/12
Project Number	284-053		
Project Title	ENFIELD CT03XC221		
	BRIGHT MEADOW BLVD. ENFIELD, CT 06082		
Prepared For	VISION THIS DOCUMENT IS THE DESIGN PROPERTY AND NOT BE LOANED, REPRODUCED, COPIED, OR FOR THE EXCLUSIVE USE OF ANY CLIENT. ANY REPRODUCTION OR USE WITHOUT EXPRESS WRITTEN PERMISSION OF THE CREATOR IS STRICTLY PROHIBITED.		
Drawing Scale:	AS NOTED		
Date:	4/16/13		
Drawing Title	TITLE SHEET		
Drawing Number	T1		

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

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

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.

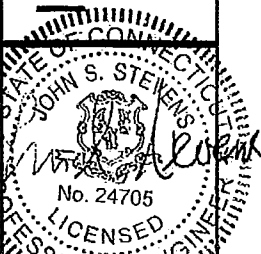
LEGEND

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.



UNLICENSED PRACTICE OF AN ENGINEER TO THIS PROJECT IS A VIOLATION OF APPLICABLE STATE AND LOCAL LAWS

No.	Submittal / Revision	App'd	Date
2	REVISED PER COMMENTS	AMS	4/75/13
1	REVISED PER COMMENTS	AMS	3/21/13
0	ISSUED FOR REVIEW	AMS	11/13/12

Drawn: AMS Date: 11/13/12
Designed: AM Date: 11/13/12
Checked: ASZ Date: 11/13/12

Project Number: 294-059

Project Title: ENFIELD CT03XC221

BRIGHT MEADOW BLVD.
ENFIELD, CT 06082

Prepared For: SPRINT VISION

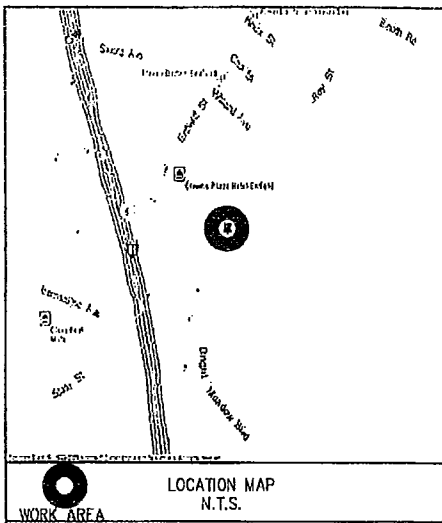
THIS DOCUMENT IS THE DESIGN PROPERTY AND NOT BE LOANED, REPRODUCED, COPIED, OR FOR THE EXCLUSIVE USE BY THE TITLE CLEAR. ANY REPLICATION OR USE WITHOUT EXPRESS WRITTEN PERMISSION OF THE CREATOR IS STRICTLY PROHIBITED.

Drawing Scale: AS NOTED

Date: 4/15/13

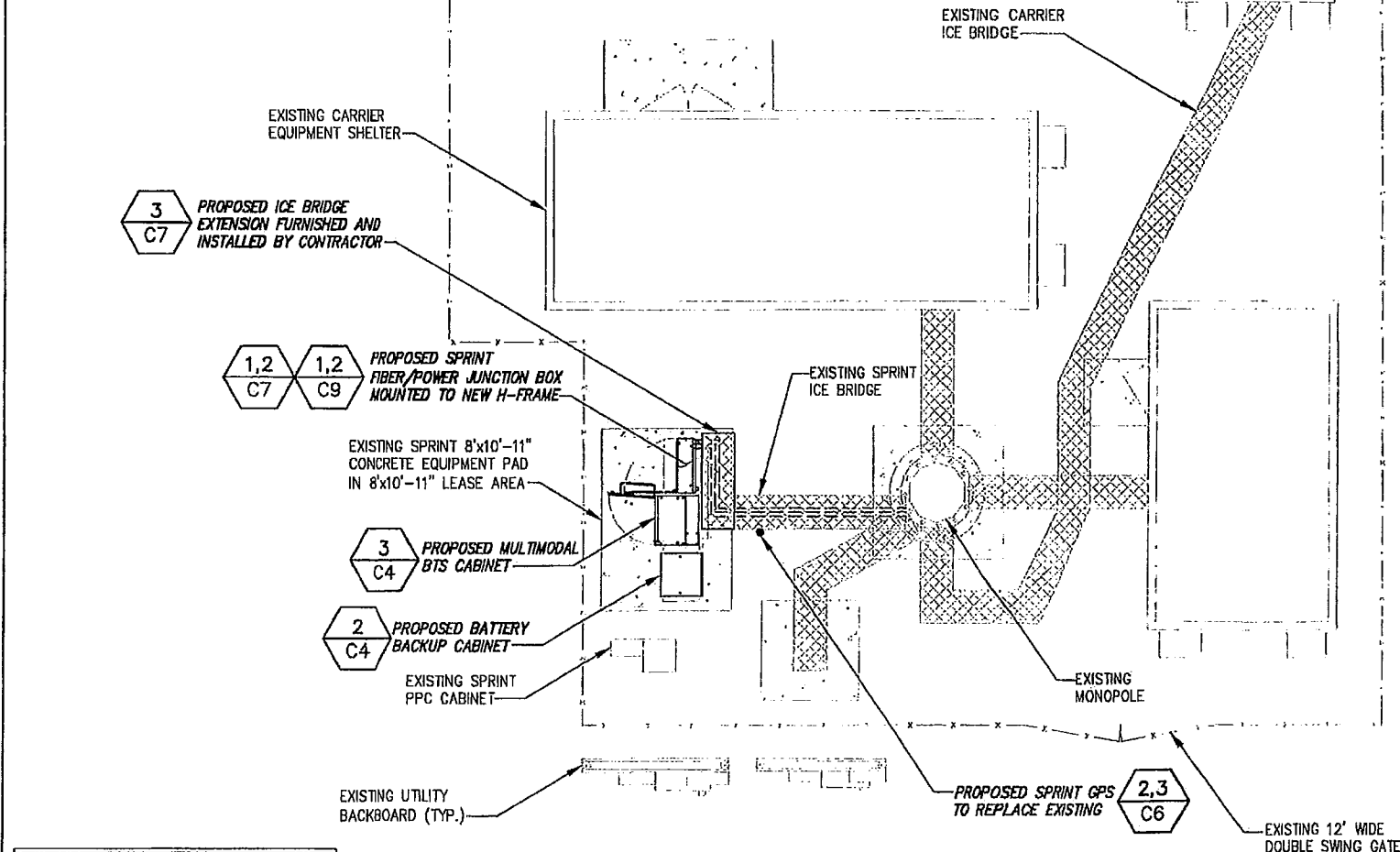
Drawing Title: GENERAL NOTES

Drawing Number: C1



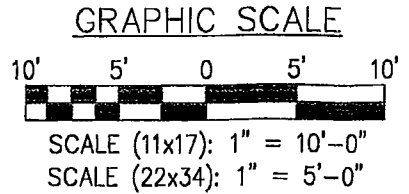
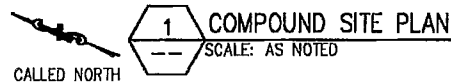
INFORMATION CONTAINED WITHIN DRAWINGS ARE BASED ON PROVIDED INFORMATION.

EXISTING FENCED EQUIPMENT COMPOUND

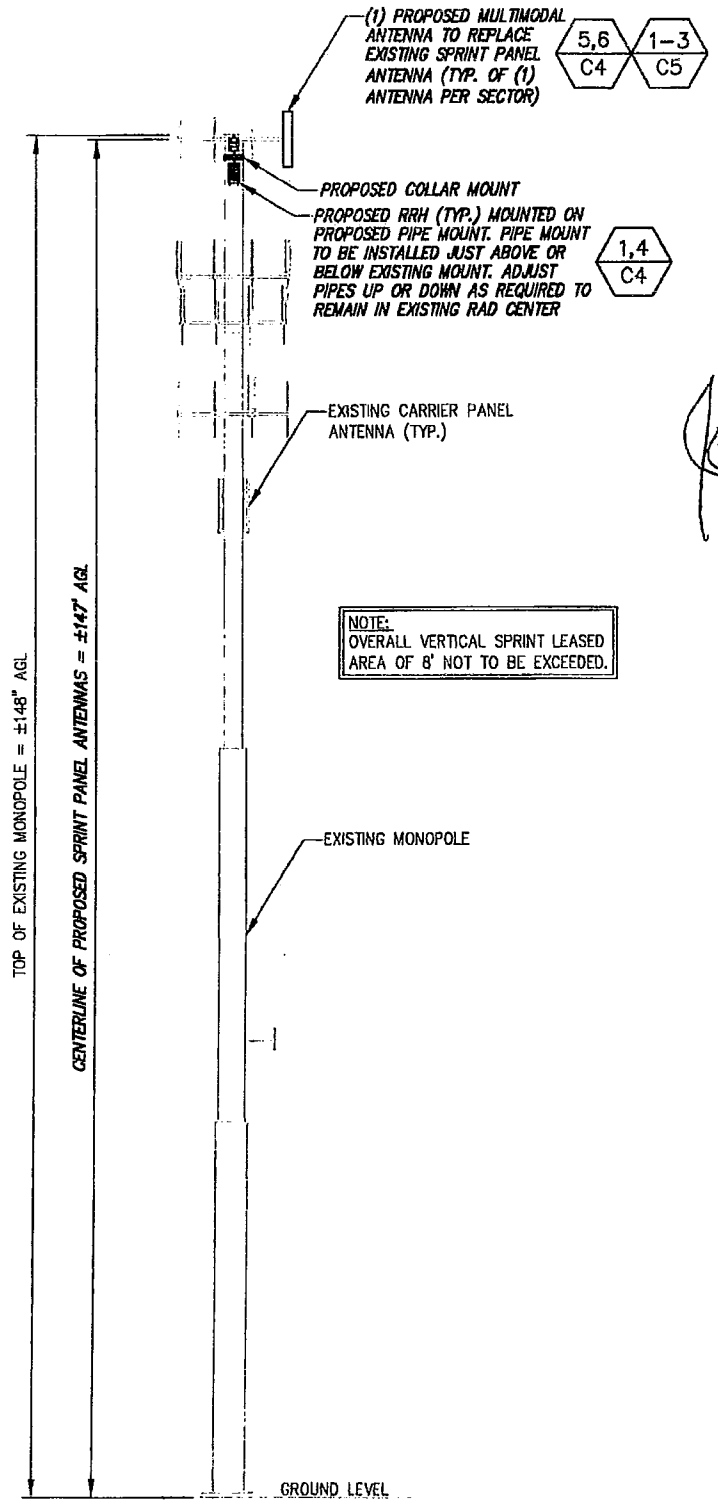


NOTE:
CONTRACTOR SHALL NOT STACK THE HYBRIFLEX CABLES ON TOP OF THE EXISTING COAXIAL CABLES AS TO PREVENT THE COAXIAL CABLES FROM BEING REMOVED.

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



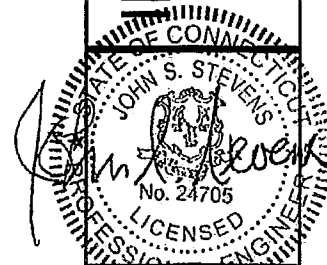
FOR ADDITIONAL STRUCTURAL INFORMATION SEE STRUCTURAL ANALYSIS COMPLETED BY PAUL J. FORD DATED: 2/27/13



Design. Build. Deliver.

INFINIGY

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



UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

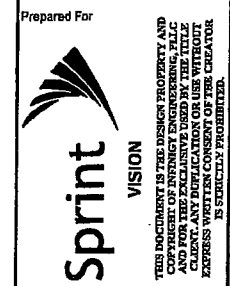
Rev	Submitted / Revisions	App'd	Date
2	REVISED PER COMMENTS	AS	4/16/13
1	REVISED PER COMMENTS	AS	3/21/13
0	ISSUED FOR REVIEW	AS	11/13/12

Drawn: AS Date: 11/13/12
Designed: AD Date: 11/13/12
Checked: AF Date: 11/13/12

Project Number: 294-053

Project Title: ENFIELD CT03XC221

BRIGHT MEADOW BLVD.
ENFIELD, CT 06082

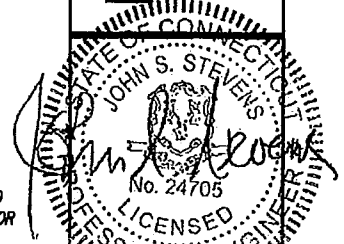


Drawing Scale: AS NOTED

Date: 4/16/13

Drawing Title: **COMPOUND SITE PLAN & ELEVATION**

Drawing Number: **C2**



USA Registered Professional Engineer in the State of Connecticut
No. 24705

No.	Submittal/Revision	App'd	Date
2	REVISED PER COMMENTS	AS	4/15/13
1	REVISED PER COMMENTS	AS	3/21/13
0	ISSUED FOR REVIEW	AS	11/13/12

Drawn: AS Date: 11/13/12
Designed: AS Date: 11/13/12
Checked: AS Date: 11/13/12

Project Number: 294-053

Project Title: ENFIELD CT03XC221

BRIGHT MEADOW BLVD.
ENFIELD, CT 06082

Prepared For: **Sprint** VISION

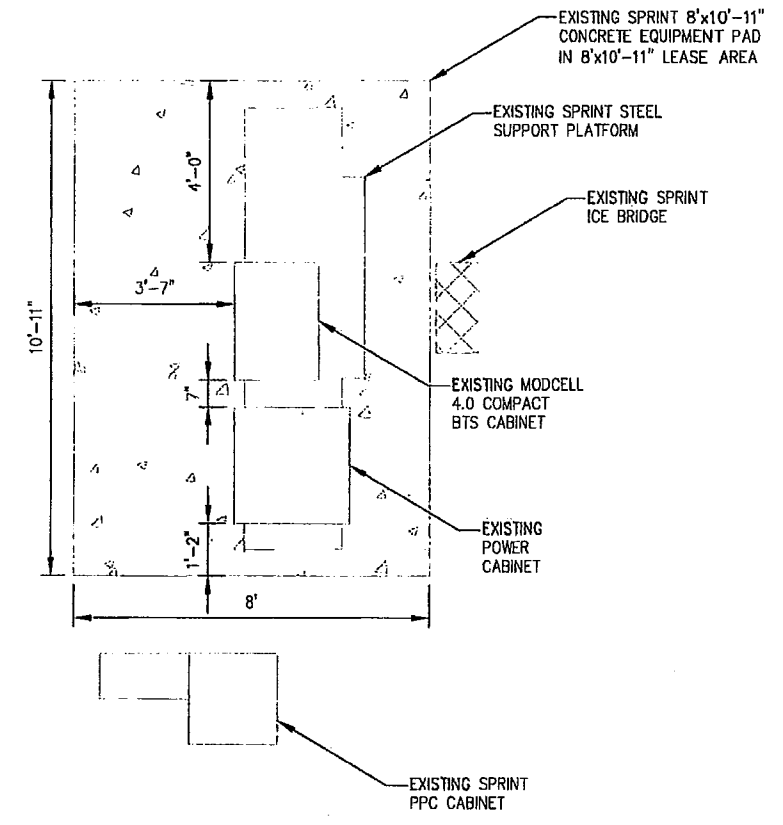
THIS DOCUMENT IS THE DESIGN PROPERTY OF INFINIGY AND IS NOT TO BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT EXPRESS WRITTEN PERMISSION FROM INFINIGY.

Drawing Scale: AS NOTED

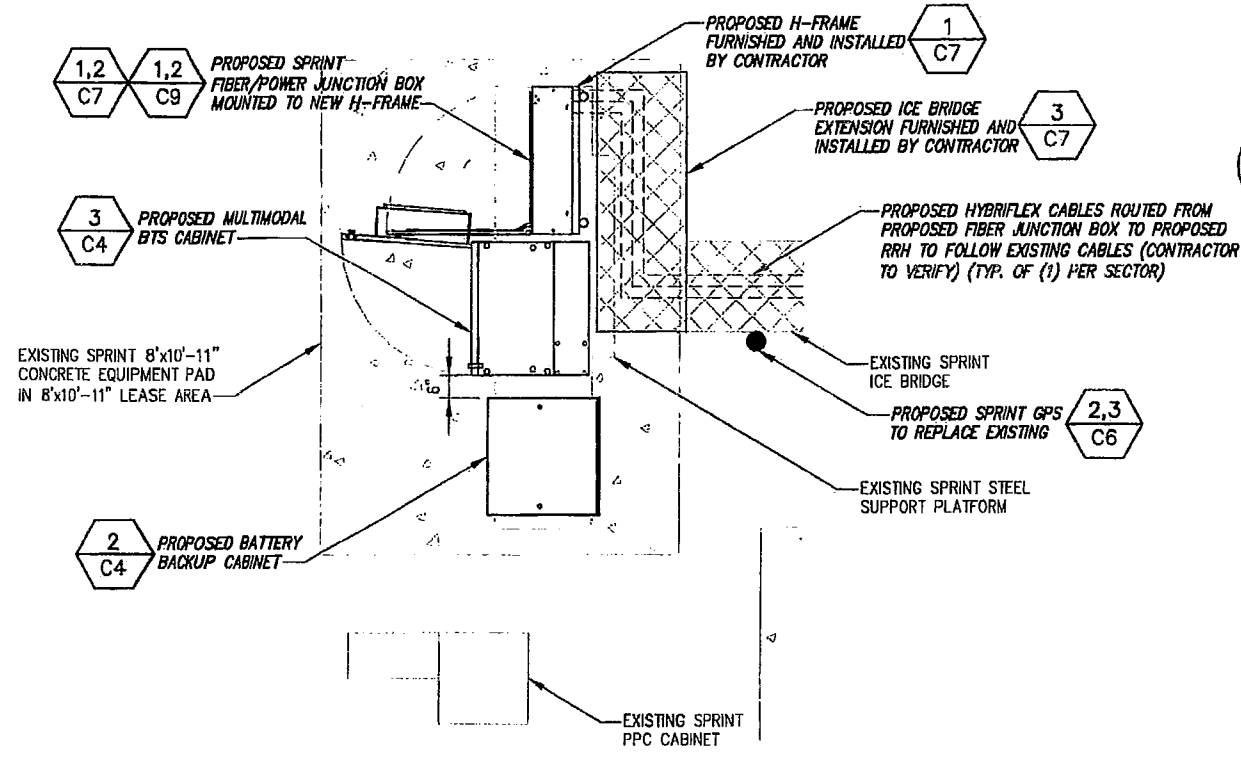
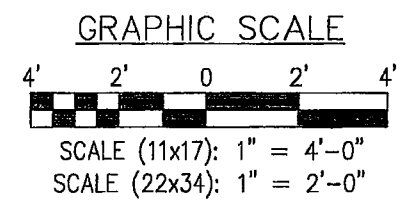
Date: 4/16/13

Drawing Title: **EQUIPMENT SITE PLANS**

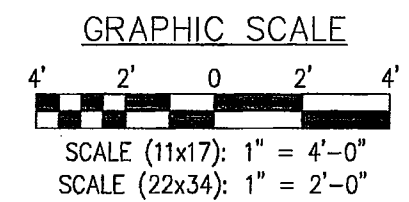
Drawing Number: **C3**



1 EQUIPMENT SITE PLAN (EXISTING)
SCALE: AS NOTED
CALLED NORTH

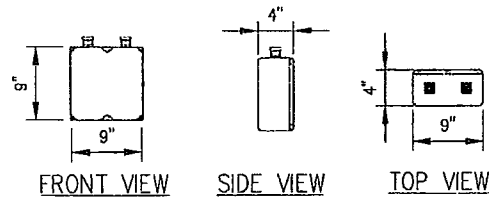
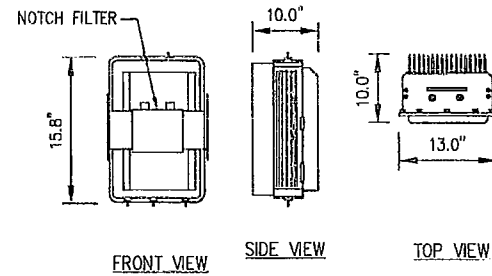


2 EQUIPMENT SITE PLAN (FINAL/PERMANENT)
SCALE: AS NOTED
CALLED NORTH

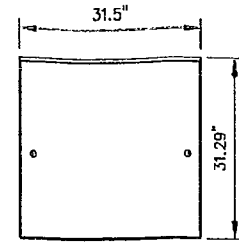


NOTE:
CONTRACTOR SHALL NOT STACK THE HYBRIFLEX CABLES ON TOP OF THE EXISTING COAXIAL CABLES AS TO PREVENT THE COAXIAL CABLES FROM BEING REMOVED.

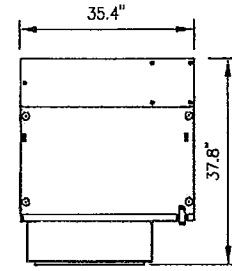
- NOTE:**
- REFER TO: CONSTRUCTION STANDARDS-SPRINT DOCUMENT: "EXHIBIT A - STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES REV 4.0 - 02.15.2011.DOCM"
 - REFER TO: "WEATHERPROOFING SPECS: EXCERPT EXH A - WTHRPRF - STD CONSTR SPECS...157201110421855429.DOCM"
 - REFER TO: "COLOR CODING-SPRINT NEXTEL ANT AND LINE COLOR CODING (DRAFT) V3 09-08-11.PDF"
 - CONTRACTOR TO VERIFY LATEST REV AND DATE PRIOR TO CONSTRUCTION.



850 MHz NOTCH FILTERS
WEIGHT = 11 LBS.



TOP VIEW



TOP VIEW

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

9928 MM BTS CABINET WEIGHT: 1074 LBS.

EMERSON BATTERY CABINET SPECIFICATIONS:
(31.29"x31.5"x63.65")

WEIGHTS:

SHIPPING WEIGHT: 600 LBS.

LIFT WEIGHT: 540 LBS.

TOTAL WEIGHT: 2640 LBS (WITH BATTERIES)

INDIVIDUAL BATTERY WEIGHT: 105 LBS
(DO NOT LIFT WITH BATTERIES IN CABINET)

MATERIAL SPECIFICATIONS

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

HIGH-STRENGTH BOLTS: ASTM A325SC OR (A325N)

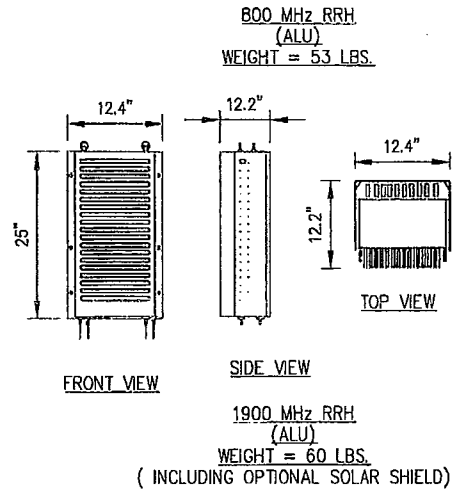
STRUCTURAL WF SHAPES: ASTM A572-GR50

TUBE STEEL & PIPE COLUMNS: ASTM A500, GRADE B

WELDING ELECTRODES: E70XX

W - SHAPES: ASTM A992, GRADE 50

U-BOLTS: ASTM A36



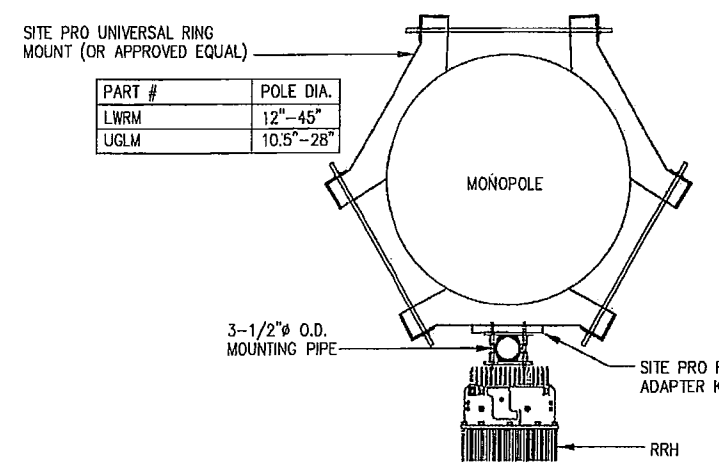
NOTE:
REFER TO R.F. SYSTEM SCHEDULE FOR EXACT
RRH SPECIFICATIONS AND QUANTITIES.

1 RRH EQUIPMENT DETAILS
NOT TO SCALE

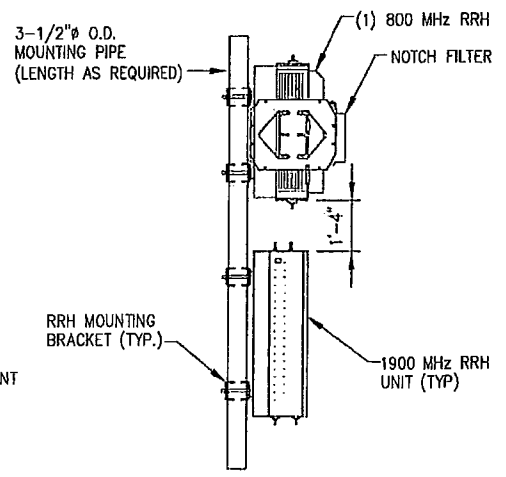
2 BATTERY CABINET PROFILE
NOT TO SCALE

3 BTS CABINET PROFILE
NOT TO SCALE

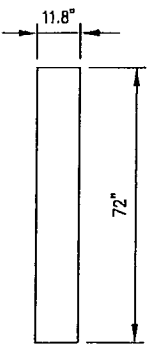
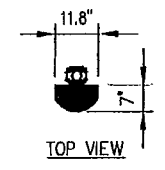
NOTE:
OVERALL VERTICAL SPRINT LEASED
AREA OF 8' NOT TO BE EXCEEDED.



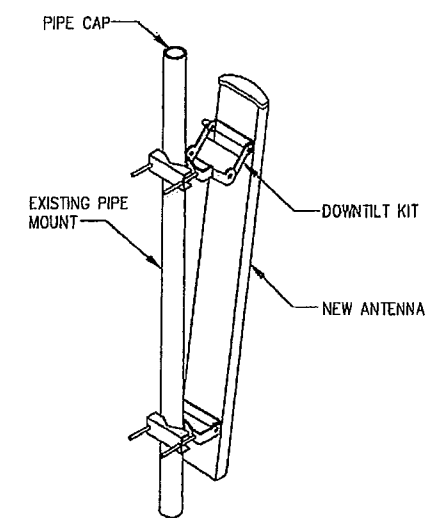
4 RRH MOUNTING DETAIL (TYP.)
NOT TO SCALE



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

INFINIGY
 Design. Build. Deliver.
 11 Herbert Drive
 Latham, NY 12110
 Office # (518) 690-0790
 Fax # (518) 690-0793

STATE OF CONNECTICUT
 JOHN S. STEVENS
 No. 24705
 LICENSED PROFESSIONAL ENGINEER

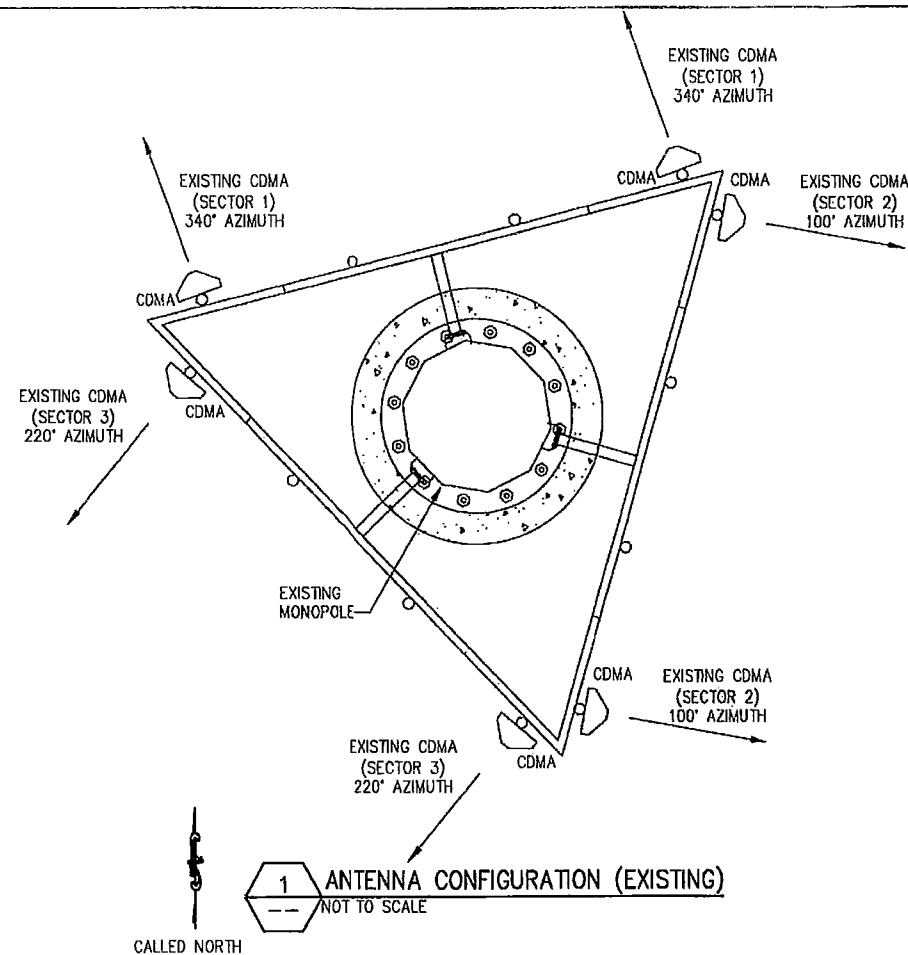
No.	Revised / Revision	App'd	Date
2	REVISED FOR COMMENTS	AHS	4/15/13
1	REVISED FOR COMMENTS	AHS	3/21/13
0	ISSUED FOR REVIEW	AHS	11/13/12

Drawn: AHS Date: 11/13/12
 Designed: AHS Date: 11/13/12
 Checked: ASF Date: 11/13/12

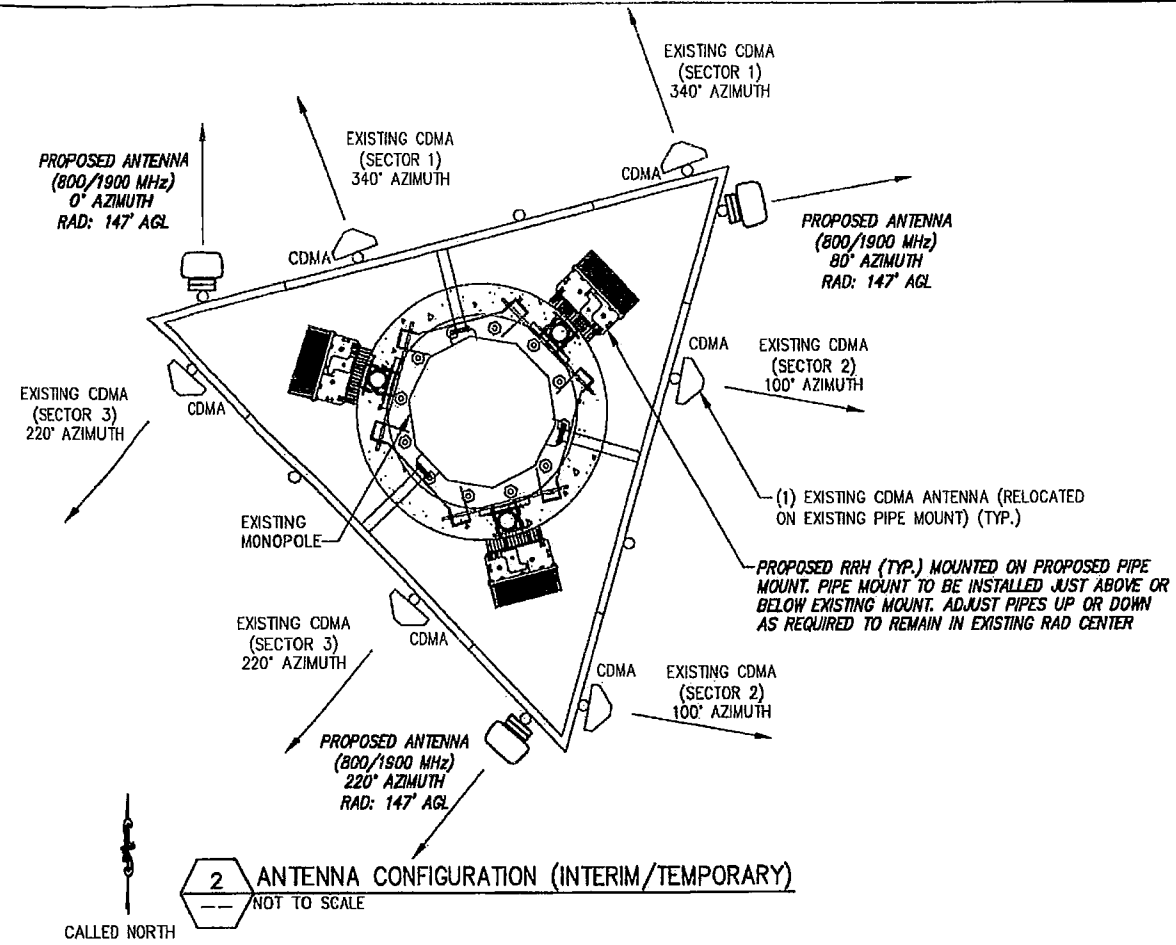
Project Number: 294-053
 Project Title: ENFIELD CT03XC221
 BRIGHT MEADOW BLVD.
 ENFIELD, CT 06082

Prepared For: **Sprint** VISION
 THIS DOCUMENT IS THE DESIGN PROPERTY AND COPYRIGHT OF INFINIGY ENGINEERING, LLC AND FOR THE EXCLUSIVE USE OF THE TITLE COMPANY. NO PART OF THIS DOCUMENT IS TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT THE EXPRESS WRITTEN CONSENT OF THE CREATOR. THIS IS STRICTLY PROHIBITED.

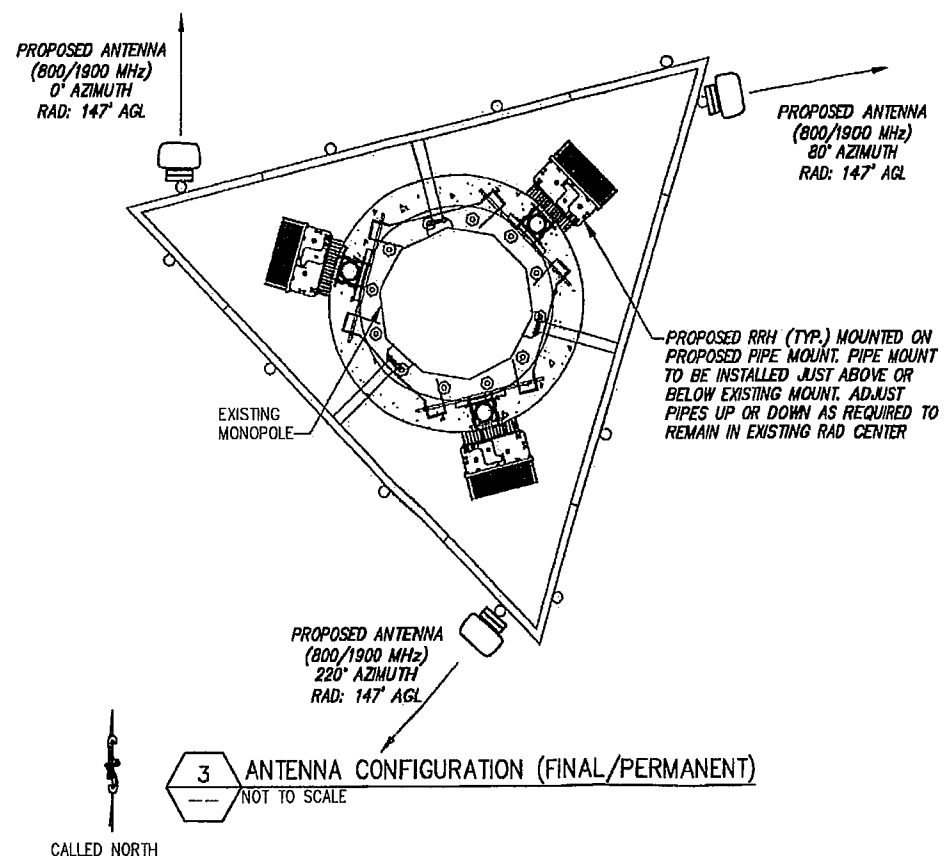
Drawing Scale: AS NOTED
 Date: 4/15/13
 Drawing Title: **EQUIPMENT DETAILS**
 Drawing Number: **C4**



1 ANTENNA CONFIGURATION (EXISTING)
NOT TO SCALE



2 ANTENNA CONFIGURATION (INTERIM/TEMPORARY)
NOT TO SCALE



3 ANTENNA CONFIGURATION (FINAL/PERMANENT)
NOT TO SCALE

NOTE:
REQUIRED PIPE MOUNTS TO BE SUPPLIED BY CONTRACTOR.

FOR ADDITIONAL STRUCTURAL INFORMATION SEE STRUCTURAL ANALYSIS COMPLETED BY PAUL J. FORD DATED: 2/27/13

NOTE:
CONTRACTOR TO VERIFY A PASSING SIGNED AND SEALED ANTENNA MOUNT/PLATFORM STRUCTURAL ANALYSIS HAS BEEN COMPLETED FOR INTERIM AND FINAL RF CONFIGURATION. NO ANTENNA MOUNT/PLATFORM MODIFICATIONS SHOULD COMMENCE OR INSTALLATION OF ANTENNAS, RRH OR TOWER MOUNTED EQUIPMENT WITHOUT VERIFYING THE MOUNT/PLATFORM ANALYSIS HAS BEEN COMPLETED FOR THE SPECIFIC LOADING. ADDITIONALLY ALL MOUNTS, ANTENNA AND COAX TO BE INSTALLED IN ACCORDANCE WITH TOWER STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE.

RRH NOTES:
- SEE PAGE C4 FOR RRH MOUNTING INFORMATION (TYP. ALL SECTORS).
- REFER TO RF SCHEDULE ON SHEET C8 FOR RRH UNIT SPECS AND QUANTITIES.

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.

Design. Build. Deliver.

INFINIGY

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

JOHN S. STEINHILBER
No. 24705
LICENSED PROFESSIONAL ENGINEER

No.	Submitted / Revision	App'd	Date
2	REVISED PER COMMENTS	AHS	4/15/13
1	REVISED PER COMMENTS	AHS	3/21/13
0	ISSUED FOR REVIEW	AHS	11/13/12

Drawn: AHS Date: 11/13/12
Designed: AHS Date: 11/13/12
Checked: ASG Date: 11/13/12

Project Number: 294-053

Project Title: ENFIELD CT03XC221

BRIGHT MEADOW BLVD.
ENFIELD, CT 06062

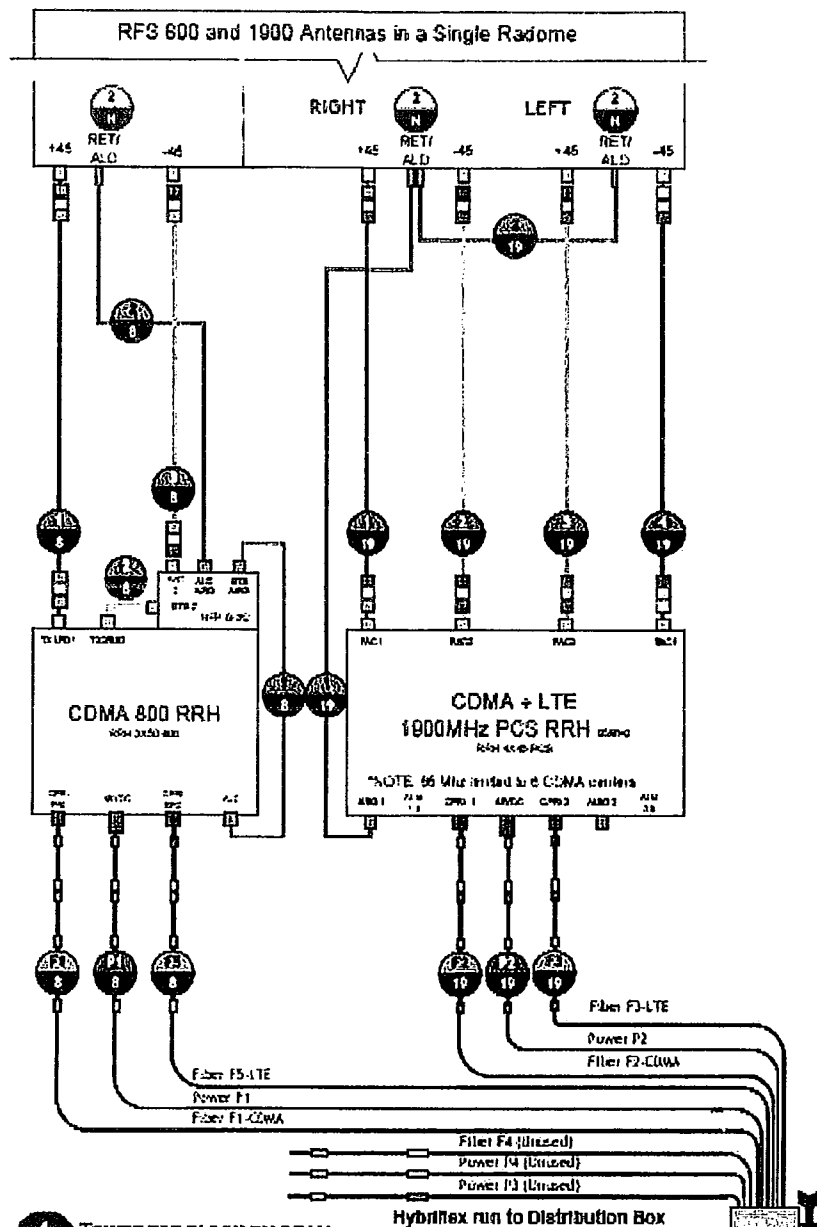
Prepared For:

THIS DOCUMENT IS THE DESIGN PROPERTY AND COPYRIGHT OF INFINIGY ENGINEERING, PLLC. IT IS TO BE USED ONLY BY THE CLIENT FOR THE PROJECT AND WITHOUT THE EXPRESS WRITTEN CONSENT OF THE CREATOR IS STRICTLY PROHIBITED.

Drawing Scale: AS NOTED	
Date: 4/16/13	

Drawing Title: **ANTENNA PLANS**

Drawing Number: **C5**



1 TOWED TOP BLOCK DIAGRAM
BD1 SCALE: N.T.S.

SCENARIO 124 v2.3

1 ANTENNA CABLE RISER DIAGRAM
NOT TO SCALE

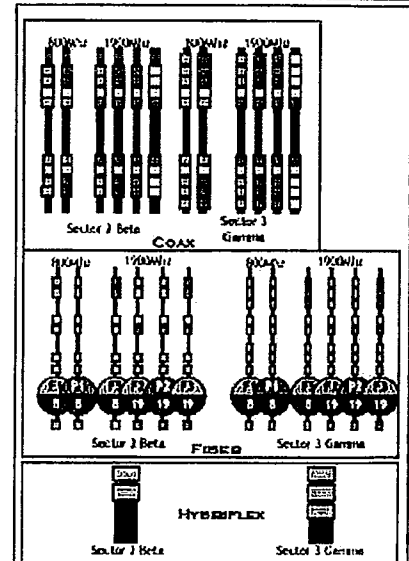
Power Feed Polarity Definition:
IF WIRES ARE BLACK AND BLACK/WHITE STRIPE:
 ■ Black - -48VDC Feed (Battery)
 ■ Black/White StriPE - Return

IF WIRES ARE RED AND BLACK:
 ■ Red - -48VDC Feed (Battery)
 ■ Black - Return

NOTE: For power feed use the same Hybriflex OEM color designator as the fiber.

■ MM Pair 1 - F1 - Green - P1 (Green)
 ■ MM Pair 2 - F2 - Blue - P2 (Blue)
 ■ MM Pair 3 - F3 - Red - P3 (Red)
 ■ MM Pair 4 - F4 - Yellow - P4 (Yellow)
 ■ MM Pair 5 - F5 - Orange - (No P5 power feed)

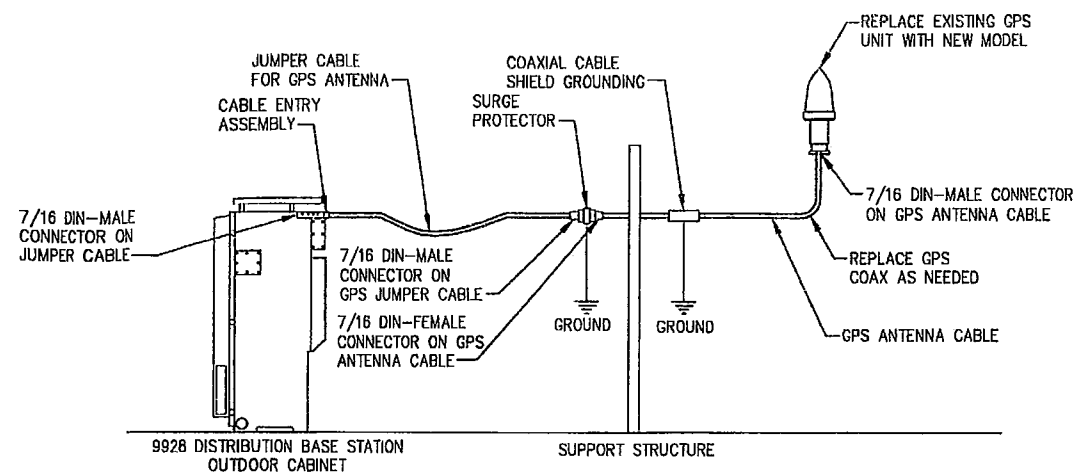
2 HYBRIFLEX OEM COLOR CODE
BD1 SCALE: N.T.S.



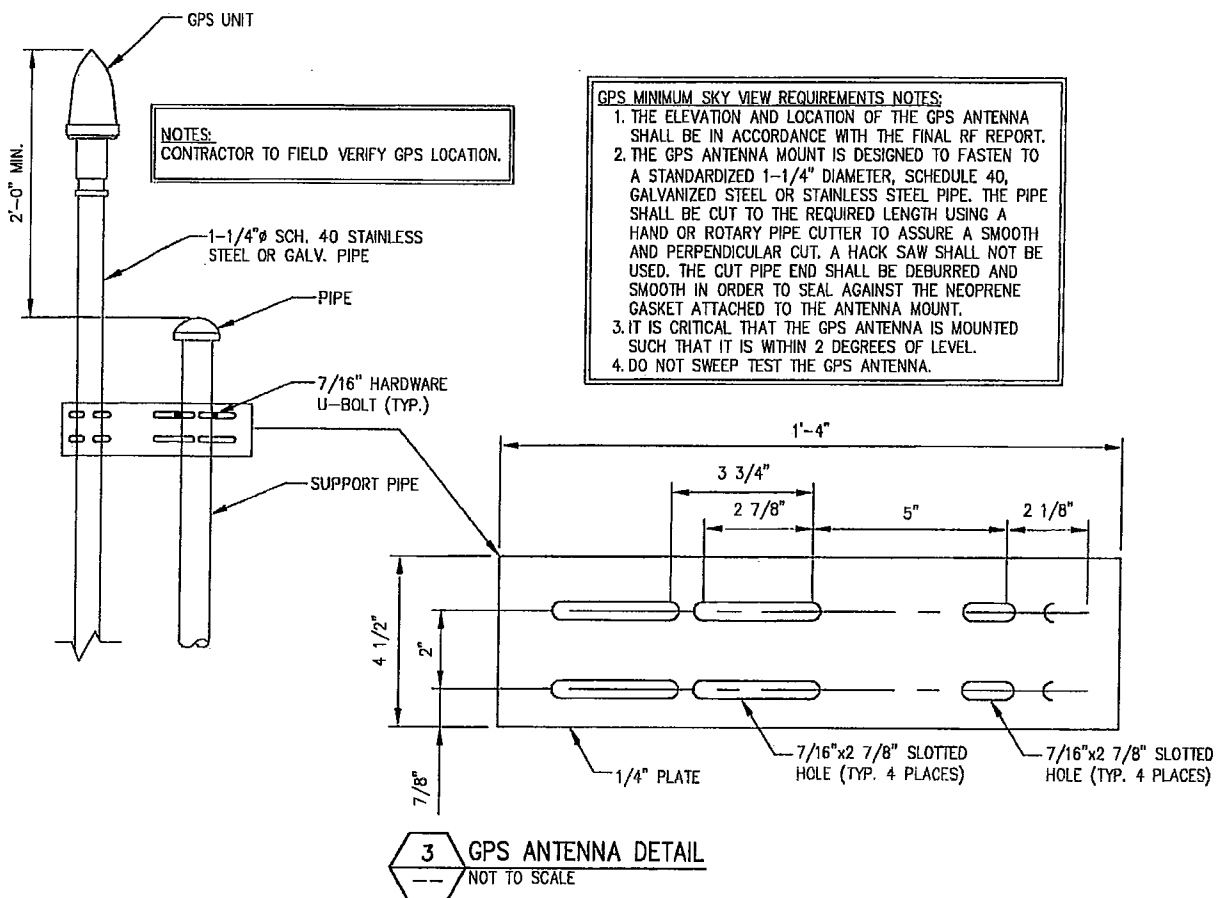
INSTALLER VERIFY LATEST PLUMBING/WIRING DIAGRAMS, PRIOR TO INSTALLATION.

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 OR 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.



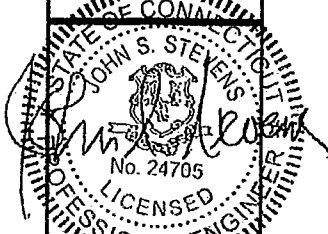
NOTE:
 THE GPS SURGE NEEDS TO BE INSTALLED AWAY FROM AND SEPARATE FROM THE MMBTS CABINET (PER THE SITE PREP GUIDE)
 • THE JUMPERS ARE DESIGNED TO BE INSTALLED BEFORE/AFTER THE GPS SURGE.
 • THE GPS SURGE NEED TO BE CONNECTED TO THE GROUND SYSTEM, VIA A GROUND LEAD.



GPS MINIMUM SKY VIEW REQUIREMENTS NOTES:
 1. THE ELEVATION AND LOCATION OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT.
 2. THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARDIZED 1-1/4" DIAMETER, SCHEDULE 40, GALVANIZED STEEL OR STAINLESS STEEL PIPE. THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH USING A HAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH AND PERPENDICULAR CUT. A HACK SAW SHALL NOT BE USED. THE CUT PIPE END SHALL BE DEBURRED AND SMOOTH IN ORDER TO SEAL AGAINST THE NEOPRENE GASKET ATTACHED TO THE ANTENNA MOUNT.
 3. IT IS CRITICAL THAT THE GPS ANTENNA IS MOUNTED SUCH THAT IT IS WITHIN 2 DEGREES OF LEVEL.
 4. DO NOT SWEEP TEST THE GPS ANTENNA.

NOTES:
 CONTRACTOR TO FIELD VERIFY GPS LOCATION.

INFINIGY
 Design. Build. Deliver.
 11 Herbert Drive
 Latham, NY 12110
 Office # (518) 680-0790
 Fax # (518) 680-0793



UNAUTHORIZED ALTERATION OF THIS DOCUMENT IS A VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS.

Rev.	Submitted / Revision	Appr.	Date
2	REVISED PER COMMENTS	AMS	4/15/13
1	REVISED PER COMMENTS	AMS	3/21/13
0	ISSUED FOR REVIEW	AMS	11/13/12

Drawn: AMS Date: 11/13/12
 Designer: AD Date: 11/13/12
 Checked: AG Date: 11/13/12

Project Number: 294-053
 Project Title: ENFIELD CT03XC221

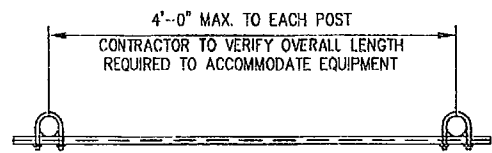
BRIGHT MEADOW BLVD.
 ENFIELD, CT 06082



Drawing Scale: AS NOTED
 Date: 4/15/13

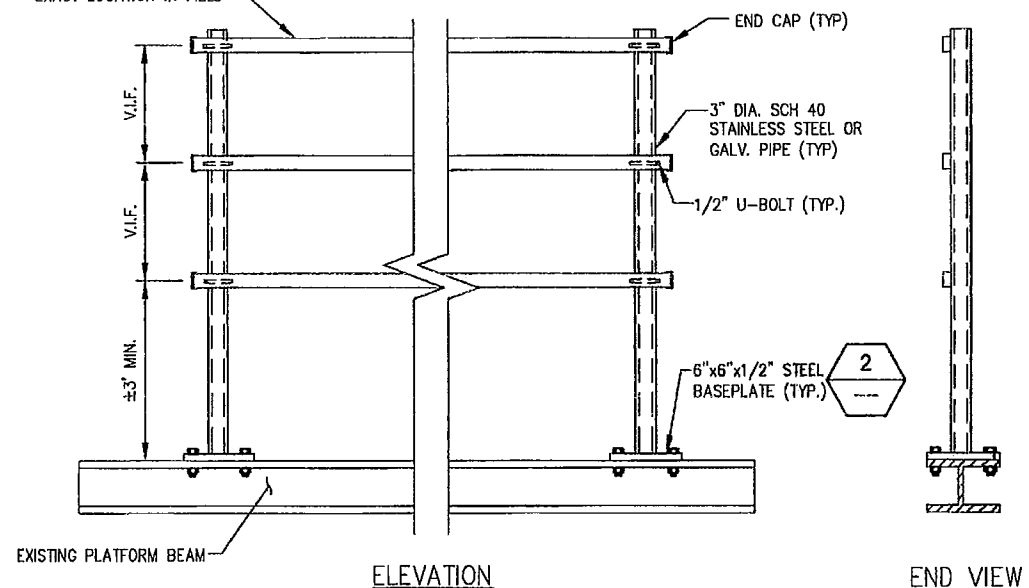
Drawing Title: **ANTENNA CABLE RISER AND GPS DETAILS**

Drawing Number: **C6**



PLAN VIEW

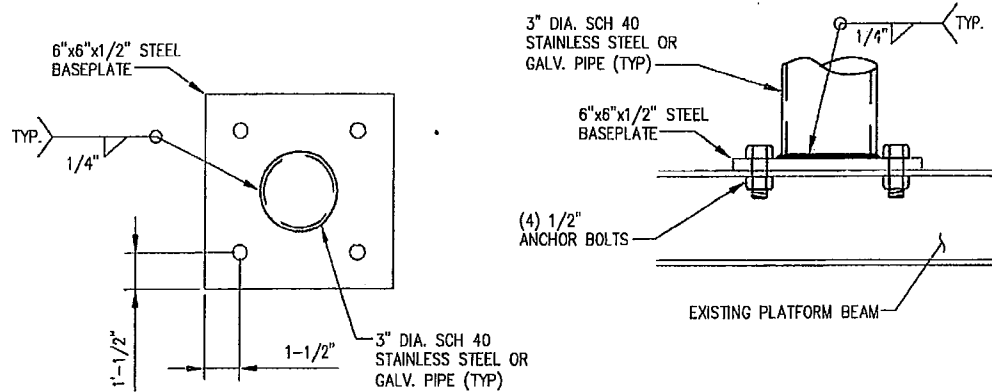
1-1/2" GALV. SQUARE
P1000 UNISTRUT RAIL (12
GA.) (TYP.) COORDINATE
EXACT LOCATION IN FIELD



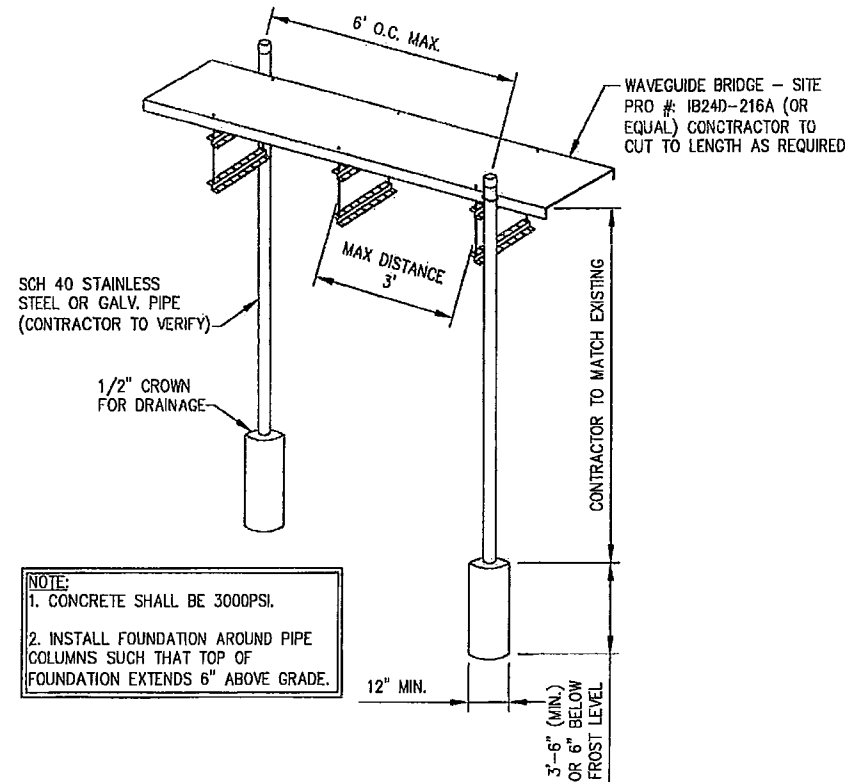
ELEVATION

END VIEW

1 H-FRAME FABRICATION DETAIL
NOT TO SCALE



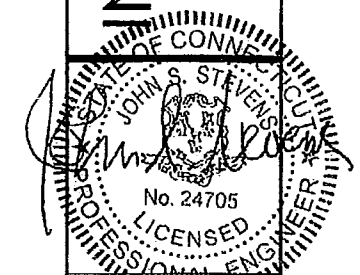
2 SUPPORT POST MOUNTING DETAIL
NOT TO SCALE



NOTE:
1. CONCRETE SHALL BE 3000PSI.
2. INSTALL FOUNDATION AROUND PIPE COLUMNS SUCH THAT TOP OF FOUNDATION EXTENDS 6" ABOVE GRADE.

3 TYPICAL ICE BRIDGE DETAIL
NOT TO SCALE

Design. Build. Deliver.
INFINIGY
11 Herbert Drive
Latham, NY 12110
Office # (518) 690-0790
Fax # (518) 690-0793



UNAUTHORIZED REPRODUCTION OR USE OF THIS DOCUMENT IS A VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS

No.	Submittal / Revision	App'd	Date
2	REVISED PER COMMENTS	AS	4/15/13
1	REVISED PER COMMENTS	AS	2/21/13
0	ISSUED FOR REVIEW	AS	11/13/12

Drawn: AS Date: 11/13/12
Designed: AS Date: 11/13/12
Checked: AS Date: 11/13/12

Project Number: 294-053
Project Title: ENFIELD CT03XC221
BRIGHT MEADOW BLVD.
ENFIELD, CT 06082

Prepared For: **sprint** VISION

THIS DOCUMENT IS THE DESIGN PROPERTY AND COPYRIGHT OF INFINIGY ENGINEERING, P.A. AND FOR THE EXCLUSIVE USE BY THE TITLE CONTRACTOR. ANY REPRODUCTION WITHOUT EXPRESS WRITTEN CONSENT OF THE CONTRACTOR IS STRICTLY PROHIBITED.

Drawing Scale: AS NOTED
Date: 4/15/13

Drawing Title: **EQUIPMENT DETAILS**

Drawing Number: **C7**

		Market	Northern Connecticut		
		Cascade ID	CT03XC221		
			SECTOR 1	SECTOR 2	SECTOR 3
1900	Split sector present		No	No	No
	1900MHz_Azimuth		0	80	220
	1900MHz_No_of_Antennas		1	1	1
	1900MHz_RADCenter(ft)		147	147	147
	1900MHz_Antenna Make		RFS	RFS	RFS
	1900MHz_Antenna Model		APXVSP18-C-A20	APXVSP18-C-A20	APXVSP18-C-A20
	1900MHz_Horizontal_Beamwidth		65	65	65
	1900MHz_Vertical_Beamwidth		5.5	5.5	5.5
	1900MHz_AntennaHeight (ft)		6	6	6
	1900MHz_AntennaGain(dBd)		15.9	15.9	15.9
	1900MHz_E_Tilt		0	0	-1
	1900MHz_M_Tilt		0	0	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		0	80	220
	800MHz_No_of_Antennas		0	0	0
	800MHz_RADCenter(ft)		147	147	147
	800MHz_AntennaMake		RFS	RFS	RFS
	800MHz_AntennaModel		APXVSP18-C-A20 (Shared w/1900)	APXVSP18-C-A20 (Shared w/1900)	APXVSP18-C-A20 (Shared w/1900)
	800MHz_Horizontal_Beamwidth		65	65	65
	800MHz_Vertical_Beamwidth		11.5	11.5	11.5
	800MHz_AntennaHeight (ft)		6	6	6
	800MHz_AntennaGain (dBd)		13.4	13.4	13.4
	800MHz_E_Tilt		-8	-4	-8
	800MHz_M_Tilt		0	0	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

Comments

* If plumbing scenario does not match the material received, please contact your Construction Manager
11/9/2012

NOTE:
RFDS SHOWN PROVIDED BY
SPRINT DATED 11/9/12.

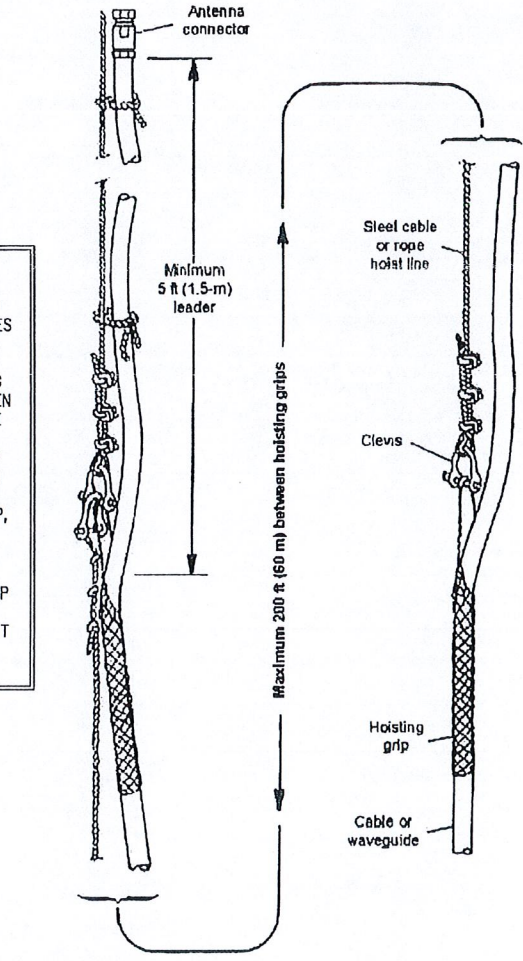
NOTE:
COORDINATE RF ANTENNA INSTALLATION WITH
FINAL SPRINT RFDS. COORDINATE RF MW DISH
(IF APPLICABLE) INSTALLATION WITH FINAL
SPRINT RFDS.

1 SPRINT RFDS
NOT TO SCALE

CHECK FST FOR LATEST
VERSION OF RFDS

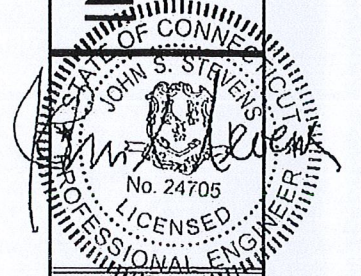
NOTE:
1. REFER TO: CONSTRUCTION STANDARDS-SPRINT DOCUMENT:
"EXHIBIT A - STANDARD CONSTRUCTION SPECIFICATIONS FOR
WIRELESS SITES REV 4.0 - 02.15.2011.DOCM"
2. REFER TO: "WEATHERPROOFING SPECS: EXCERPT EXH A -
WTHRPRF - STD CONSTR SPECS_157201110421855429.DOCM"
3. REFER TO: "COLOR CODING-SPRINT NEXTEL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

- 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.



2 HOIST GRIP DETAIL
NOT TO SCALE

Design. Build. Deliver.
INFINIGY
11 Herbert Drive
Latham, NY 12110
Office # (518) 680-0790
Fax # (518) 680-0793



No.	Revised/Revision	App'd	Date
2	REVISED PER COMMENTS	ANS	4/15/13
1	REVISED PER COMMENTS	ANS	2/21/13
0	ISSUED FOR REVIEW	ANS	11/13/12

Drawn: ANS Date: 11/13/12
Designed: ANS Date: 11/13/12
Checked: ASG Date: 11/13/12

Project Number
294-053

Project Title
**ENFIELD
CT03XC221**

BRIGHT MEADOW BLVD.
ENFIELD, CT 06082

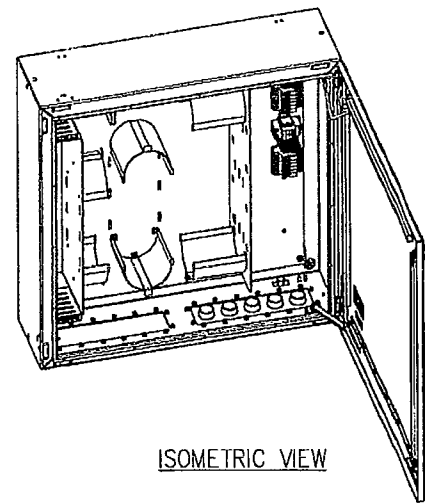
Prepared For

VISION
THIS DOCUMENT IS THE DESIGN PROPERTY AND COPYRIGHT OF INFINIGY ENGINEERING, PLLC AND FOR THE EXCLUSIVE USE BY THE TITLE CONTRACTOR. ANY REUSE OR REPRODUCTION WITHOUT THE WRITTEN CONSENT OF THE CONTRACTOR IS STRICTLY PROHIBITED.

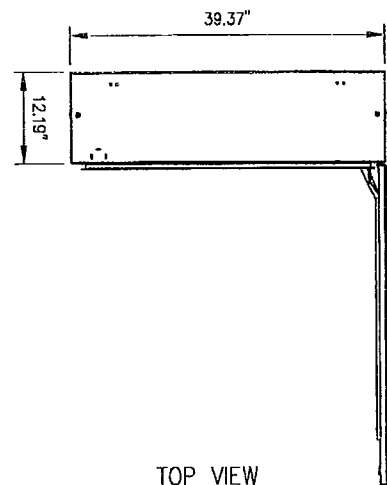
Drawing Scale:
AS NOTED
Date:
4/15/13

Drawing Title
**RF AND
CABLE DETAILS**

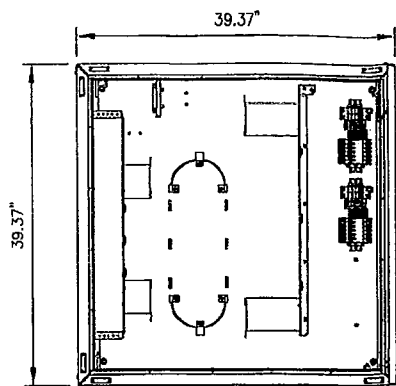
Drawing Number
C8



ISOMETRIC VIEW



TOP VIEW

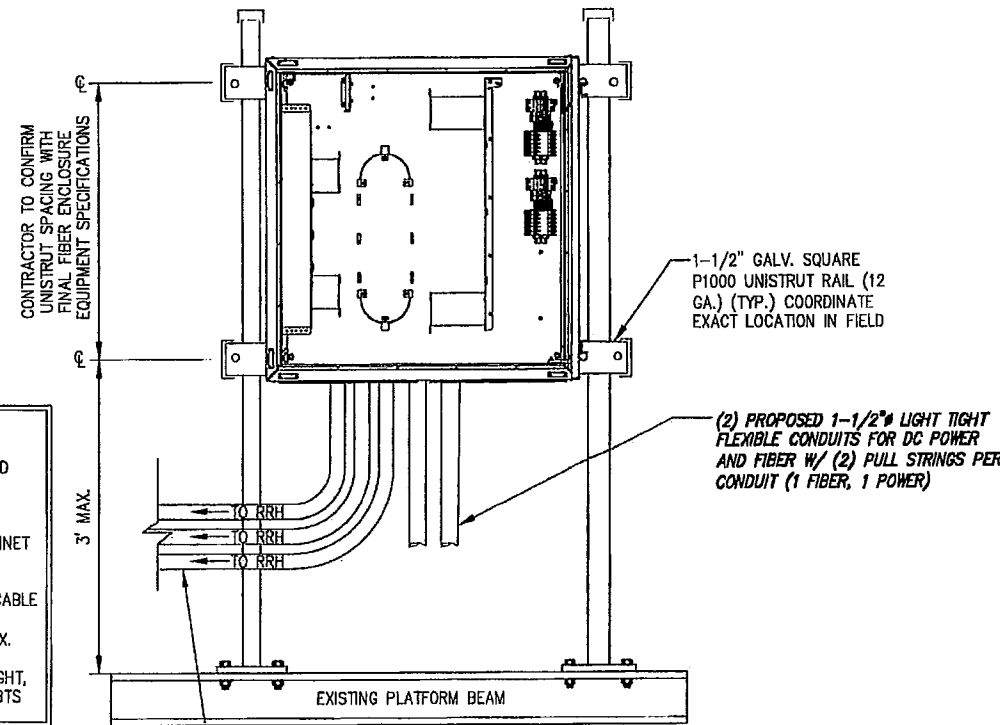


FRONT VIEW



SIDE VIEW

1 DISTRIBUTION BOX DETAIL
NOT TO SCALE



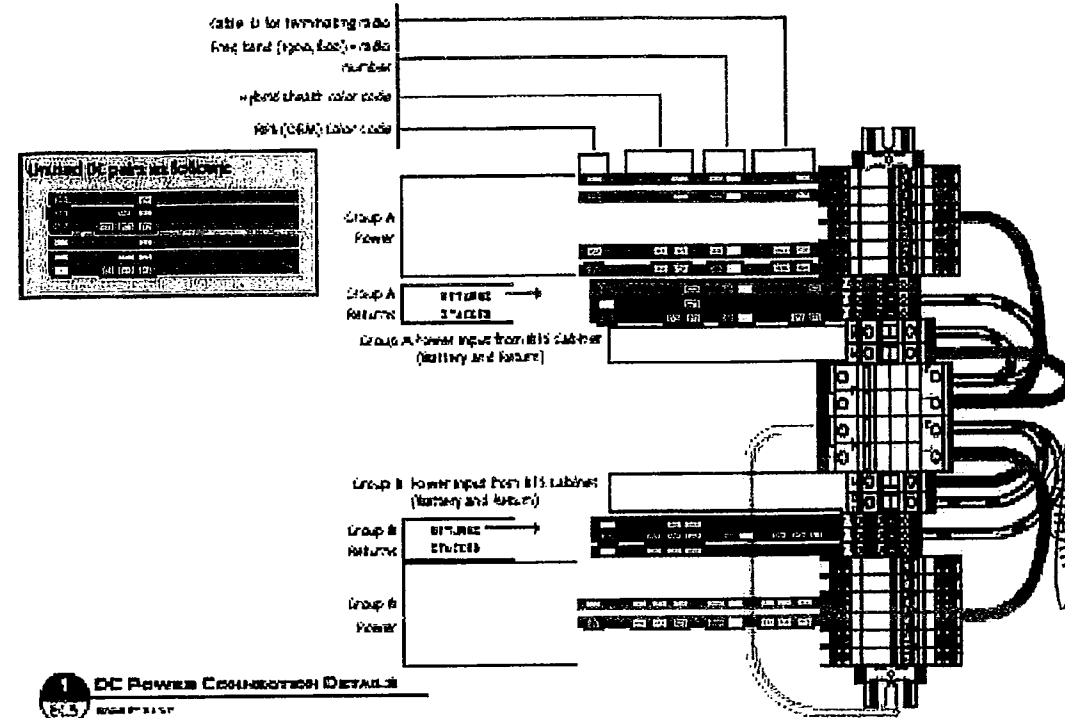
PROPOSED HYBRIFLEX CABLES TO FOLLOW EXISTING CABLES (CONTRACTOR TO VERIFY) (TYP. OF (1) PER SECTOR)

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

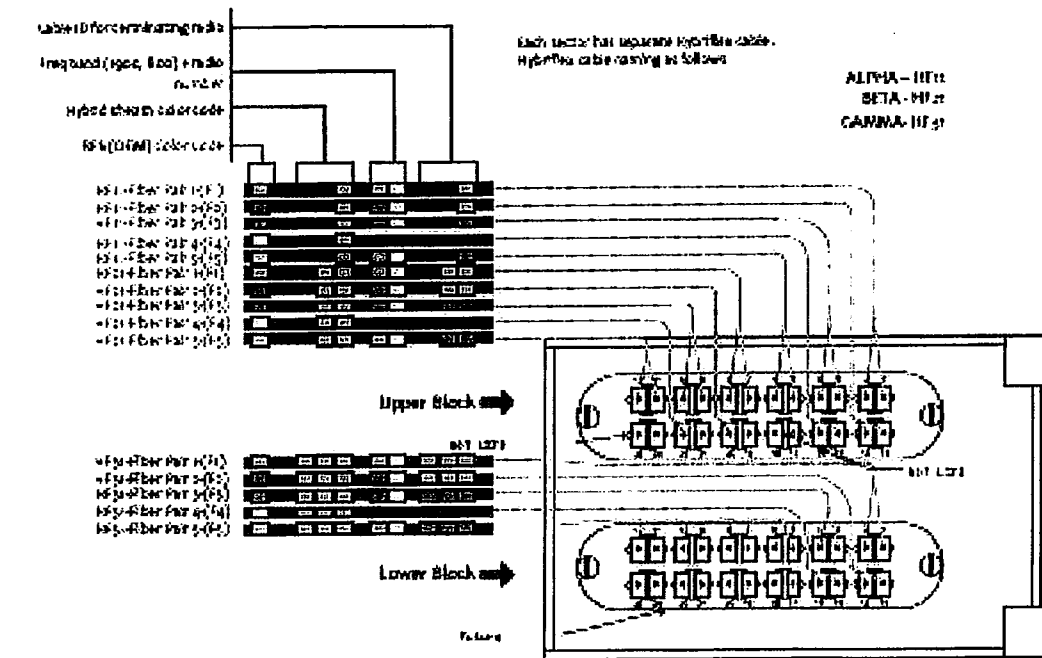
2 TYPICAL DISTRIBUTION BOX ON H-FRAME DETAIL
NOT TO SCALE

NOTE:

- DISTRIBUTION BOX IS KITTED WITH 50' OF 1-1/2" LIQUID-TIGHT CONDUIT AND CONNECTORS. THIS SHOULD BE:
 - * SPLIT IN HALF,
 - * TERMINATED TO THE DISTRIBUTION BOX AS SHOWN,
 - * RAN TO AND COILED AS CLOSE TO WHERE THE CABINET IS GOING TO BE MOUNTED AS POSSIBLE.
- DISTRIBUTION BOX IS KITTED WITH 2 AWG, POWER CABLE 35' x 2EA. RUNS RED AND 2EA. RUNS BLACK. THIS SHOULD BE COILED AND LEFT INSIDE DISTRIBUTION BOX.
- BTS INSTALLATION TEAM WILL TERMINATE LIQUID-TIGHT, RUN THE FIBER JUMPERS AND POWER CABLES FROM BTS CABINET TO DISTRIBUTION BOX.



1 DC POWER CONNECTION DETAILS
NOT TO SCALE

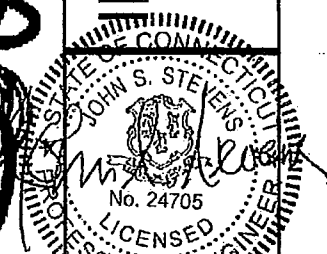


2 FIBER CONNECTION DETAILS
NOT TO SCALE

SCENARIO 124 v2.3

3 FIBER & DC CONNECTION DETAILS
NOT TO SCALE

Design, build, deliver.
INFINIGY
11 Herbert Drive
Latham, NY 12110
Office # (518) 660-0780
Fax # (518) 660-0783



UNIVERSITY OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	BY	CHKD.
2	4/15/13	REVISED PER COMMENTS	AS	AS
1	2/21/13	REVISED PER COMMENTS	AS	AS
0	11/13/12	ISSUED FOR REVIEW	AS	AS

Drawn: AS Date: 11/13/12
Designed: AS Date: 11/13/12
Checked: AS Date: 11/13/12

Project Number: 294-053

Project Title: ENFIELD CT03XC221

BRIGHT MEADOW BLVD.
ENFIELD, CT 06082

Prepared For: Sprint



Drawing Scale: AS NOTED
Date: 4/15/13

Drawing Title: **FIBER DISTRIBUTION BOX DETAILS**

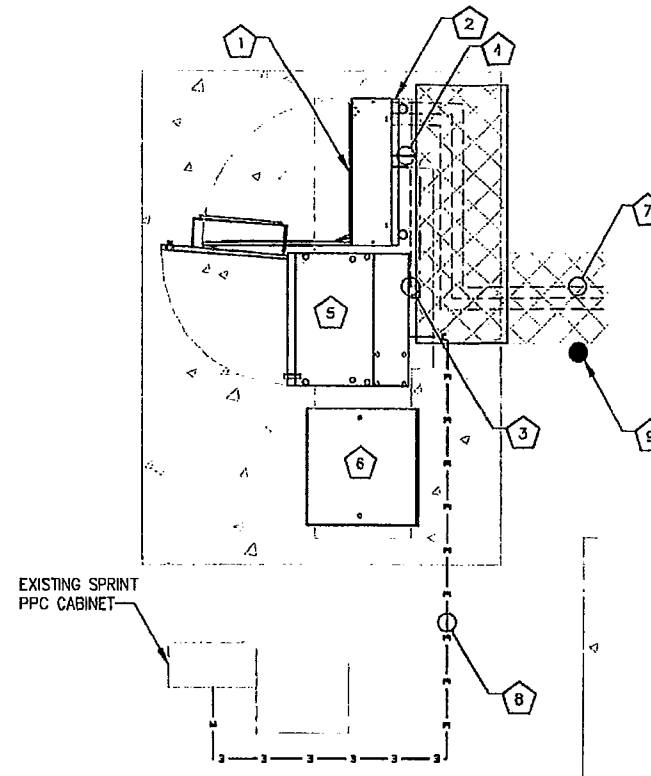
Drawing Number: **C9**

C9

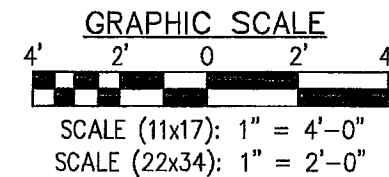
CODED NOTES:

- 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, 6'
- 5 PROPOSED MULTIMODAL BTS CABINET
- 6 PROPOSED BATTERY BACKUP CABINET
- 7 PROPOSED HYBRIFLEX CABLES ROUTED FROM PROPOSED FIBER JUNCTION BOX TO PROPOSED RRRH TO FOLLOW EXISTING CABLES (CONTRACTOR TO VERIFY) (TYP. OF (1) PER SECTOR)
- 8 PROPOSED 2" LIQUID TIGHT CONDUIT WITH (2) #1 AWG, (1) NEUTRAL #8 AND (1) #8 GROUND ROUTED FROM BTS TO EXISTING PPC CABINET
- 9 PROPOSED SPRINT GPS TO REPLACE EXISTING

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



ELECTRICAL NOTES:

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (N.E.C.), AND APPLICABLE LOCAL CODES
2. GROUNDING SHALL COMPLY WITH THE ARTICLE 250 OF NATIONAL ELECTRICAL CODE.
3. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED.
4. ALL WIRES SHALL BE AWG MIN #12 THHN COPPER UNLESS NOTED.
5. CONDUCTORS SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT UNLESS NOTED OTHERWISE.
6. LABEL SPRINT SERVICE DISCONNECTS WITH SWITCH AND PPC CABINET WITH ENGRAVED LAMACOID LABELS, LETTERS 1" IN HEIGHT.
7. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. BEND GROUNDING LEADS WITH A MINIMUM 8" RADIUS.
8. 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.
9. PROVIDE PULL BOXES AND JUNCTION BOXES WHERE REQUIRED SO THAT CONDUIT BENDS DO NOT EXCEED 360 DEGREES.
10. OBTAIN PERMITS AND PAY FEES RELATED TO ELECTRICAL WORK PERFORMED ON THIS PROJECT. DELIVER COPIES OF ALL PERMITS TO SPRINT REPRESENTATIVE.
11. 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.
12. REDLINED AS-BUILTS ARE TO BE DELIVERED TO A SPRINT REPRESENTATIVE.
13. PROVIDE TWO COPIES OF OPERATION AND MAINTENANCE MANUALS IN THREE-RING BINDER.
14. FURNISH AND INSTALL THE COMPLETE ELECTRICAL SERVICE, TELCO CONDUIT, AND THE COMPLETE GROUNDING SYSTEM.
15. 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.
16. 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.
17. PROTECT ADJACENT STRUCTURES AND FINISHES FROM DAMAGE, REPAIR TO ORIGINAL CONDITION ANY DAMAGED AREA.
18. 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.
19. UPON COMPLETION OF WORK, THE SITE SHALL BE CLEAN AND FREE OF DUST AND FINGERPRINTS.
20. PRIOR TO ANY TRENCHING, CONTACT LOCAL UTILITY TO VERIFY LOCATION OF ANY EXISTING BURIED SERVICE CONDUITS.
21. 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.



UNDERGROUND SERVICE ALERT
CALL TOLL FREE
1-800-922-4455

THREE WORKING DAYS BEFORE YOU DIG

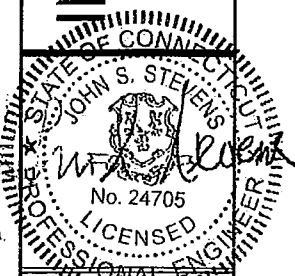
NOTES:
CONTRACTOR TO USE EXISTING SPARE CONDUITS, IF AVAILABLE. CONDUIT SIZES MUST BE EQUAL TO OR GREATER THAN THAT ALLOWED BY CODE.
EXISTING ALARMS NEED TO BE RE-ROUTED AND VERIFIED IN PROPER WORKING CONDITION WHEN NEW MMBTS EQUIPMENT IS INSTALLED.
REMAINING GROUND LEADS FROM REMOVED CABINETS TO BE 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	--	1-6	7	--	2	NOT LABELED		
		MM BTS	2	100	2-6	8	--	2	NOT LABELED		
		NOT LABELED	1	--	3-6	9	--	2	NOT LABELED		
		NOT LABELED	1	--	4-6	10	--	2	NOT LABELED		
		NOT LABELED	1	--	5-6	11	--	2	NOT LABELED		
		NOT LABELED	1	--	6-6	12	--	2	NOT LABELED		

NOTE:
CONTRACTOR IS TO ENSURE THE INSTALLATION INSTRUCTIONS FOR EACH CABINET ARE FOLLOWED AND THAT THE MANUFACTURER'S REQUIREMENTS ARE MET.

2 EXISTING PANELBOARD SCHEDULE
NOT TO SCALE

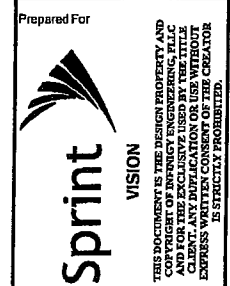
INFINIGY
Design. Build. Deliver.
11 Herbert Drive
Latham, NY 12110
Office # (518) 680-0790
Fax # (518) 680-0793



No.	Submitted / Revision	App'd	Date
2	REVISED PER COMMENTS	AHS	4/16/13
1	REVISED PER COMMENTS	AHS	3/21/13
0	ISSUED FOR REVIEW	AHS	11/13/12

Drawn: AHS Date: 11/13/12
Designed: AD Date: 11/13/12
Checked: ASE Date: 11/13/12

Project Number: 294-053
Project Title: ENFIELD CT03XC221
BRIGHT MEADOW BLVD.
ENFIELD, CT 06082



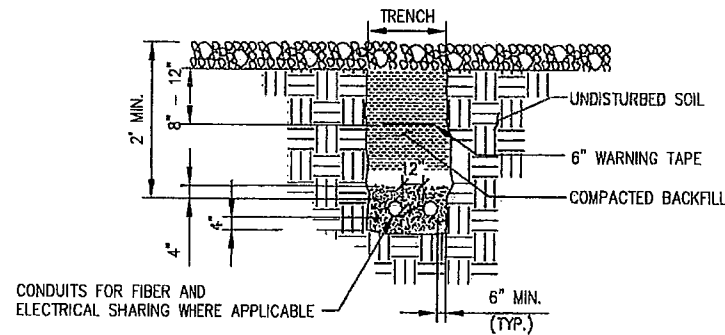
Drawing Scale: AS NOTED
Date: 4/16/13

Drawing Title: UTILITY SITE PLAN

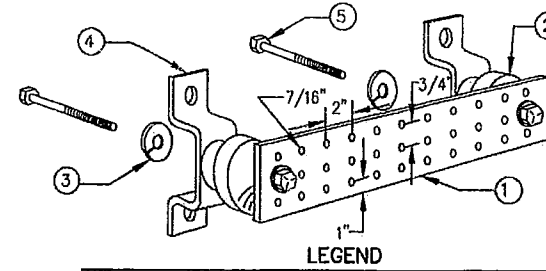
Drawing Number: E1

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.

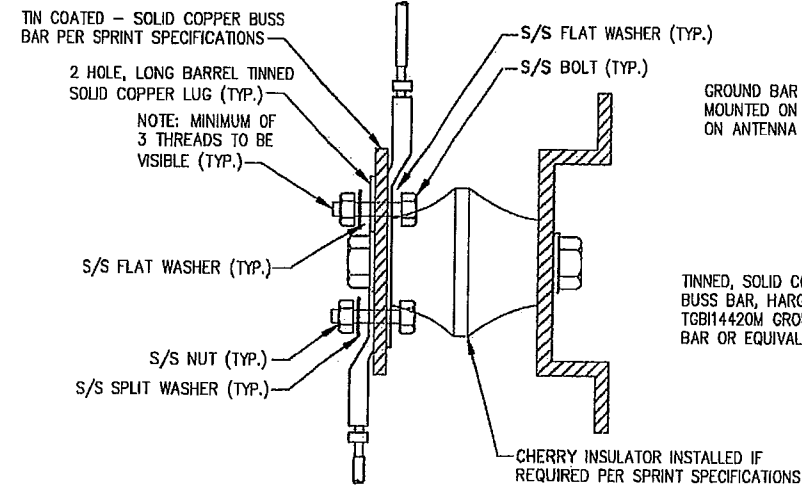


1 UTILITY TRENCH DETAIL
NOT TO SCALE



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

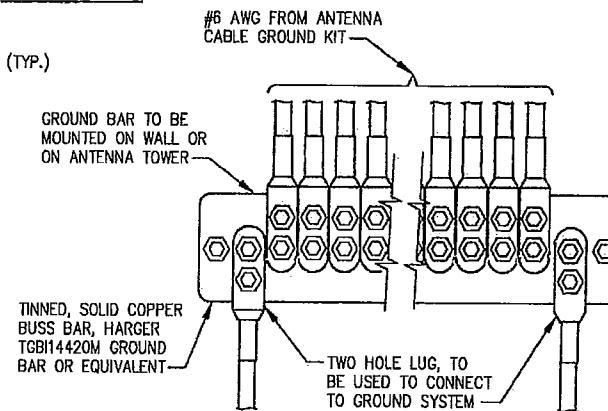
- NOTE:**
- ALL MOUNTING HARDWARE CAN ALSO BE USED ON 6", 12", 18", ETC. GROUND BARS.
 - ENTIRE ESSEMBLY AVAILABLE FROM NEWTON INSTRUMENT CO. CAT. NO. 2106060010 OR AS HARGER TGB114420M.



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

GROUND LUG

GROUND BAR

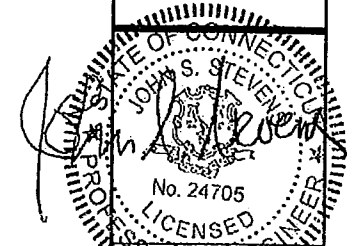


- NOTE:**
CONTRACTOR TO UTILIZE KORP-SHIELD (THOMAS & BETTS) OR EQUIVALENT ON ALL LUG CONNECTIONS

ANTENNA GROUND BAR

2 GROUND BAR DETAILS
NOT TO SCALE

INFINIGY
Design. Build. Deliver.
11 Herbert Drive
Latham, NY 12110
Office # (518) 680-0780
Fax # (518) 680-0785



THIS DOCUMENT IS THE PROPERTY OF INFINIGY. IT IS TO BE USED ONLY FOR THE PROJECT AND FOR THE LOCAL LAWS OF THE STATE AND/OR LOCAL LAWS.

No.	Submittal / Revision	Appr'd	Date
2	REVISED PER COMMENTS	AHS	4/15/13
1	REVISED PER COMMENTS	AHS	3/21/13
0	ISSUED FOR REVIEW	AHS	11/13/12

Drawn: AHS Date: 11/13/12
Designed: AD Date: 11/13/12
Checked: AF Date: 11/13/12

Project Number: 284-053

Project Title: ENFIELD CT03XC221

BRIGHT MEADOW BLVD.
ENFIELD, CT 06082

Prepared For:

THIS DOCUMENT IS THE DESIGN PROPERTY AND INTELLECTUAL PROPERTY OF INFINIGY, INC. AND SHALL BE USED ONLY FOR THE PROJECT AND FOR THE LOCAL LAWS OF THE STATE AND/OR LOCAL LAWS. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT OF THE CREATOR IS STRICTLY PROHIBITED.

Drawing Scale: AS NOTED
Date: 4/15/13

Drawing Title: **DETAILS**

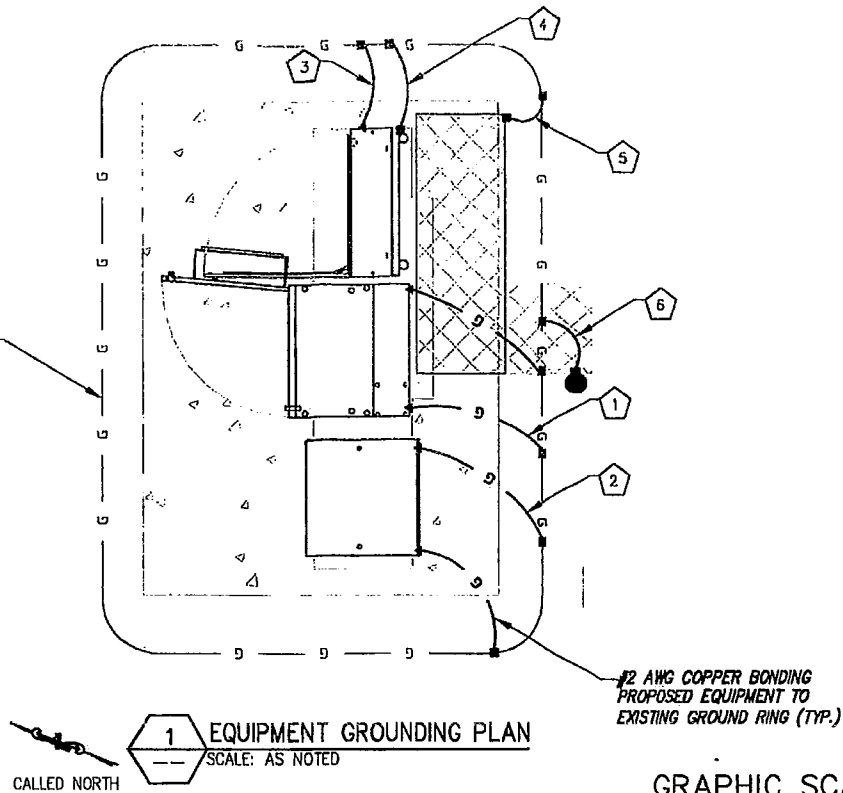
Drawing Number: **E2**

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
- 6 PROPOSED SPRINT GPS TO REPLACE EXISTING

SYMBOL	
⊗	COPPER GROUND ROD
▶	CONNECT PER MANUFACTURER SPECS
•	CADWELD CONNECTION
●	MECHANICAL CONNECTION
▬	GROUND BAR

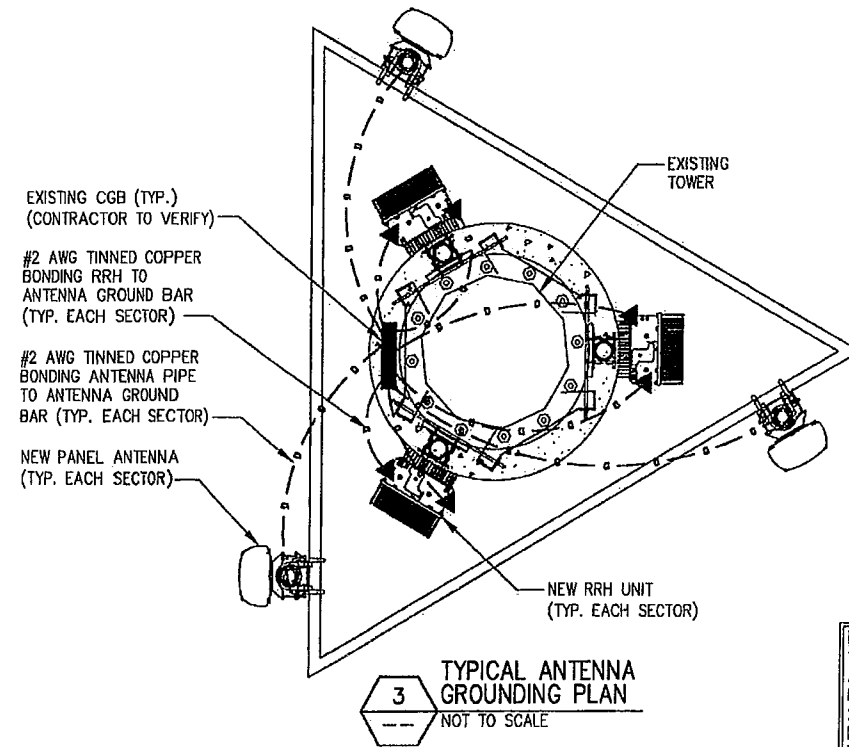
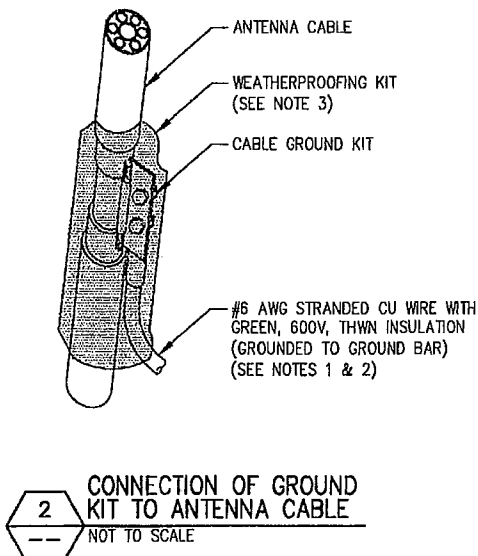
EXISTING SPRINT GROUND RING SHOWN BASED ON TYPICAL CARRIER INSTALLATION AND HAS NOT BEEN FIELD VERIFIED



GROUNDING NOTES:

- 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.
- WHERE MECHANICAL CONDUCTOR CONNECTIONS ARE SPECIFIED, BOLTED, COMPRESSION-TYPE CLAMPS OR SPLIT-BOLT TYPE CONNECTORS SHALL BE USED.
- 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.
- GROUND CONDUCTORS ON EXTERIOR WALL OF SHELTER SHALL BE ENCASED IN PVC CONDUIT TO GRADE. MOUNT PVC WITH GALVANIZED "C" CLAMPS. SEAL TOP ENDS.
- FOLLOWING COMPLETION OF WORK, CONDUCT GROUND TEST. SUBMIT WRITTEN TEST TO CONSTRUCTION MANAGER AND PROJECT MANAGER.
- ALL GROUNDING WORK SHALL COMPLY WITH CARRIER(S) STANDARDS.
- 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.
- 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).
- UNLESS NOTED OTHERWISE, ALL GROUNDING CONNECTIONS SHALL BE MADE BY AN EXOTHERMIC WELD.
- RESISTANCE TO EARTH TESTING IS REQUIRED PER SPRINT STANDARDS ON ALL NEW SITES.
- REFER TO "ANTI-THEFT UPDATE TO SPRINT GROUNDING 082412.PDF" FOR GUIDELINE TO SUSPECTED OR ACTUAL THEFT OF GROUND RING.

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



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

Design. Build. Deliver.

INFINIGY

11 Herbert Drive
Latham, NY 12110
Office # (518) 690-0760
Fax # (518) 690-0793

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

2	REVISED PER COMMENTS	AHS	4/16/13
1	REVISED PER COMMENTS	AHS	3/21/13
0	ISSUED FOR REVIEW	AHS	11/19/12
No.	Submittal / Revision	App'd	Date

Drawn: AHS Date: 11/13/12
Designed: AHS Date: 11/13/12
Checked: AHS Date: 11/13/12

Project Number: 284-053

Project Title: ENFIELD CT03XC221

BRIGHT MEADOW BLVD.
ENFIELD, CT 06082

Prepared For: Sprint VISION

THIS DOCUMENT IS THE DESIGN PROPERTY AND COPYRIGHT OF INFINIGY ENGINEERING, PLLC AND FOR THE EXCLUSIVE USE BY THE TITLE CLIENT. ANY REUSE OR REPRODUCTION WITHOUT EXPRESS WRITTEN CONSENT OF THE CREATOR IS STRICTLY PROHIBITED.

Drawing Scale: AS NOTED
Date: 4/15/13

Drawing Title: **GROUNDING PLAN AND DETAILS**

Drawing Number: **E3**