

February 6, 2015

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

Re: **Notice of Exempt Modification – Facility Modification
599 Matianuck Avenue, Windsor, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) antennas at the top of the existing 100-foot tower at 599 Matianuck Avenue in Windsor (the “Property”). The tower is owned by Crown Castle. Cellco’s shared use of this tower was approved by the Council in 1990. Cellco now intends to modify its facility by replacing six (6) of its existing antennas with three (3) model HBXX-6517DS-VTM, 1900 MHz and three (3) model HBXX-6517DS-VTM, 2100 MHz antennas, all at the same level on the tower. Cellco also intends to install six (6) remote radio heads (“RRHs”) behind its 1900 MHz and 2100 MHz antennas and one (1) HYBRIFLEX™ antenna cable attached to the outside the monopole tower. Included in Attachment 1 are specifications for Cellco’s replacement antennas, RRHs and HYBRIFLEX™ cable.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent Peter Souza, Town Manager for the Town of Windsor. Please note that the Town of Windsor is the owner of the Property.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

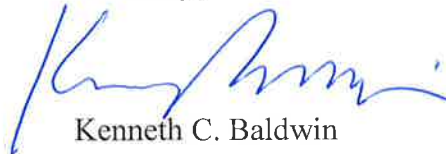
Robinson+Cole

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1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRHs will be installed on its existing antenna platform at the top of the 100-foot tower.
2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
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) safety standard. A cumulative General Power Density table for Cellco's modified facility is included in Attachment 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation, with certain modifications, can support Cellco's proposed modifications. (*See* Structural Modification Report and Tower Modification Drawings included in Attachment 3).

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

Sincerely,



Kenneth C. Baldwin

Enclosures

Copy to:

Peter Souza, Windsor Town Manager
Sandy M. Carter

ATTACHMENT 1

Product Specifications

COMMSCOPE®

HBXX-6517DS-VTM

Andrew® Quad Port Teletilt® Antenna, 1710–2180 MHz, 65° horizontal beamwidth, RET compatible



Electrical Specifications

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain by all Beam Tilts, average, dBi	18.5	18.6	18.8
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3	±0.4
Gain by Beam Tilt, average, dBi	0° 18.4 3° 18.7 6° 18.4	0° 18.4 3° 18.7 6° 18.5	0° 18.7 3° 18.9 6° 18.6
Beamwidth, Horizontal, degrees	67	66	65
Beamwidth, Horizontal Tolerance, degrees	±2.4	±1.7	±2.9
Beamwidth, Vertical, degrees	5.0	4.7	4.4
Beamwidth, Vertical Tolerance, degrees	±0.3	±0.3	±0.3
Beam Tilt, degrees	0–6	0–6	0–6
USLS, dB	18	19	19
Front-to-Back Total Power at 180° ± 30°, dB	25	26	26
CPR at Boresight, dB	22	23	22
CPR at Sector, dB	10	10	9
Isolation, dB	30	30	30
VSWR Return Loss, dB	1.4 15.6	1.4 15.6	1.4 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°

*Values calculated using NGMN Alliance N-P-BASTA v9.6

Mechanical Specifications

Color Radome Material	Light gray PVC, UV resistant
Connector Interface Location Quantity	7-16 DIN Female Bottom 4
Wind Loading, maximum	668.0 N @ 150 km/h 150.2 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h 149.8 mph
Antenna Dimensions, L x W x D	1903.0 mm x 305.0 mm x 166.0 mm 74.9 in x 12.0 in x 6.5 in
Net Weight	19.5 kg 43.0 lb
Model with factory installed AISG 2.0 RET	HBXX-6517DS-A2M



PCS RF MODULES

RRH1900 2X60 - HW CHARACTERISTICS

LA6.0.1/13.3

RRH2x60	
RF Output Power	2X60W
Instantaneous Bandwidth	20MHz
Transmitter	2 TX
Receiver	1900 HW version 1900A HW version
Features	2 Branch RX – LA6.0.1 4 Branch RX – LR13.3 AISG 2.0 for RET/TMA Internal Smart Bias-T
Power	-48VDC
CPRI Ports	2 CPRI Rate 3 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (top mounted)



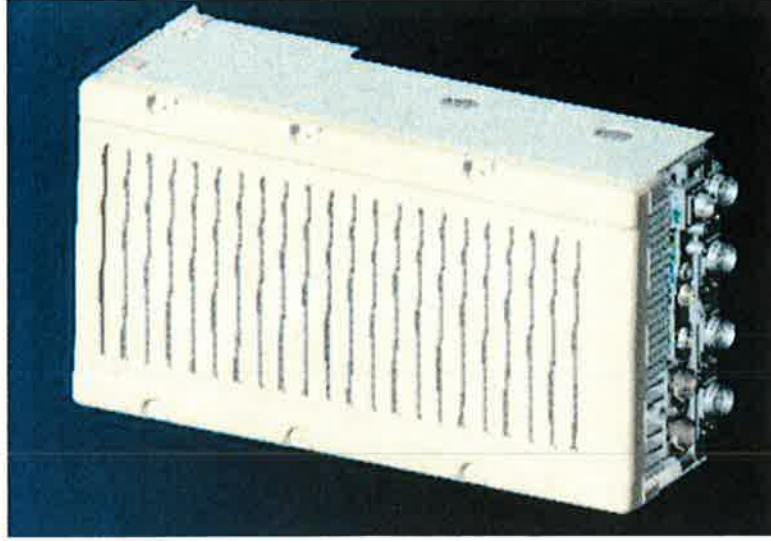
** Not a Verizon Wireless deployed product

NEW PCS RF MODULES FOR VZW

RRH2X60 - HW CHARACTERISTICS

LR14.3

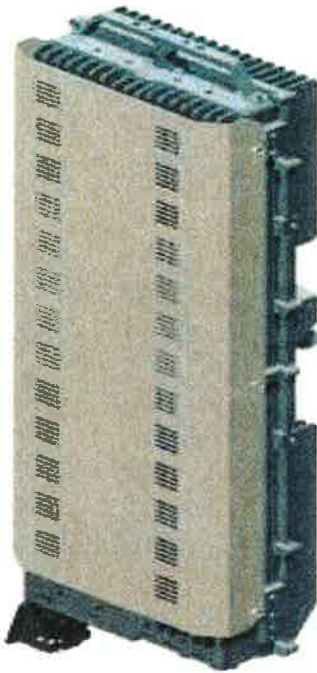
RRH2X60	
RF Output Power	2x60W (4x30W HW Ready)
Instantaneous Bandwidth	60MHz
Target Reliability (Annual Return Rate)	<2%
Receiver	4 Branch Rx
Features	AISG 2.0 for RET/TMA
Power	-48VDC Internal Smart Bias-T
CPRI Ports	2 CPRI Rate 5 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX, RX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (downward facing)
Dimensions	22"(h) x 12"(w) x 9.4" (d)**
Weight	55lb**



** - Includes solar shield but not mounting brackets (8 lbs.)

ALCATEL-LUCENT WIRELESS PRODUCT DATASHEET RRH2X60-AWS FOR BAND 4 APPLICATIONS

The Alcatel-Lucent RRH2x60-AWS is a high power, small form factor Remote Radio Head operating in the AWS frequency band (3GPP Band 4) for LTE technology. It is designed with an eco-efficient approach, providing operators with the means to achieve high quality and high capacity coverage with minimum site requirements and efficient operation.



A distributed Node B expands the deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of a Node B to be installed separately, within the same site or several kilometers apart.

The Alcatel-Lucent RRH2x60-AWS is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals

along with operations, administration and maintenance (OA&M) information.

SUPERIOR RF PERFORMANCE

The Alcatel-Lucent RRH2x60-AWS integrates all the latest technologies. This allows to offer best-in-class characteristics.

It delivers an outstanding 120 watts of total RF power thanks to its two transmit RF paths of 60 W each.

It is ideally suited to support multiple-input multiple-output (MIMO) 2x2 operation.

It includes four RF receivers to natively support 4-way uplink reception diversity. This improves the radio uplink coverage and this can be used to extend the cell radius commensurate with 2x2MIMO 2x60 W for the downlink.

It supports multiple discontinuous LTE carriers within an instantaneous bandwidth of 45 MHz corresponding to the entire AWS B4 spectrum.

The latest generation power amplifiers (PA) used in this product achieve high efficiency (>40%), resulting in improved power consumption figures.

OPTIMIZED TCO

The Alcatel-Lucent RRH2x60-AWS is designed to make available all the benefits of a distributed Node B, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX).

The Alcatel-Lucent RRH2x60-AWS is a very cost-effective solution to deploy LTE MIMO.

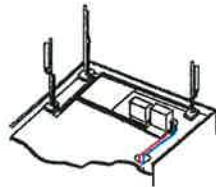
EASY INSTALLATION

The RRH2x60-AWS includes a reversible mounting bracket which allows for ease of installation behind an antenna, or on a rooftop knee wall while providing easy access to the mid body RF connectors.

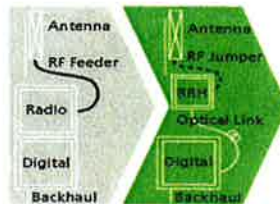
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

The Alcatel-Lucent RRH2x60-AWS is a zero-footprint solution and is convection cooled without fans for silent operation, simplifying negotiations with site property owners and minimizing environmental impacts.

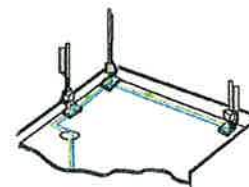
Installation can easily be done by a single person as the Alcatel-Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

FEATURES

- RRH2x60-AWS integrates two power amplifiers of 60W rating (at each antenna connector)
- Support multiple carriers over the entire 3GPP band 4
- RRH2x60-AWS is optimized for LTE operation
- RRH2x60-AWS is a very compact and lightweight product
- Advanced power management techniques are embedded to provide power savings, such as PA bias control

BENEFITS

- MIMO LTE operation with only one single unit per sector
- Improved uplink coverage with built-in 4-way receive diversity capability
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and

silent solutions, with minimum impact on the neighborhood, which ease the deployment

- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-Tees. Bias-Tees support AISG DC supply and signaling.

TECHNICAL SPECIFICATIONS

Specifications listed are hardware capabilities. Some capabilities depend on support in a specific software release or future release.

Dimensions and weights

- HxWxD : 510x285x186mm (27 l with solar shield)
- Weight : 20 kg (44 lbs)

Electrical Data

- Power Supply : -48V DC (-40.5 to -57V)
- Power Consumption (ETSI average traffic load reference) : 250W @2x60W

RF Characteristics

- Frequency band: 1710-1755, UL / 2110-2155 MHz, DL (3GPP band 4)
- Output power: 2x60W at antenna connectors
- Technology supported: LTE
- Instantaneous bandwidth: 45 MHz
- Rx diversity: 2-way and 4-way uplink reception
- Typical sensitivity without Rx diversity: -105 dBm for LTE

Connectivity

- Two CPRI optical ports for daisy chaining and up to six RRHs per fiber
- Type of optical fiber: Single-Mode (SM) and Multi-Mode (MM) SFPs
- Optical fiber length: up to 500m using MM fiber, up to 20km using SM fiber
- TMA/RETA : AISG 2.0 (RS485 connector and internal Bias-Tee)
- Six external alarms
- Surge protection for all external ports (DC and RF)

Safety and Regulatory Data

- EMC : 3GPP 25113, EN 301 489-1, EN 301 489-23, GR 1089, GR 3108, OET-65
- Safety : IEC60950-1, EN 60825-1, UL, ANSI/NFPA 70, CAN/CSA-C22.2
- Regulatory : FCC Part 15 Class B, CE Mark – European Directive : 2002/95/EC (ROHS); 2002/96/EC (WEEE); 1999/5/EC (R&TTE)
- Health : EN 50385

Environmental specifications

- Operating temperature: -40°C to 55°C including solar load
- Operating relative humidity: 8% to 100%
- Environmental Conditions : ETS 300 019-1-4 class 4.1E
- Ingress Protection : IEC 60529 IP65
- Acoustic Noise : Noiseless (natural convection cooling)

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HYBRIFLEX™ RRH Hybrid Feeder Cabling Solution, 1-5/8", Single-Mode Fiber

Product Description

RFS' HYBRIFLEX Remote Radio Head (RRH) hybrid feeder cabling solution combines optical fiber and DC power for RRHs in a single lightweight aluminum corrugated cable, making it the world's most innovative solution for RRH deployments.

It was developed to reduce installation complexity and costs at Cellular sites. HYBRIFLEX allows mobile operators deploying an RRH architecture to standardize the RRH installation process and eliminate the need for and cost of cable grounding. HYBRIFLEX combines optical fiber (multi-mode or single-mode) and power in a single corrugated cable. It eliminates the need for junction boxes and can connect multiple RRHs with a single feeder. Standard RFS CELLFLEX® accessories can be used with HYBRIFLEX cable. Both pre-connectorized and on-site options are available.

Features/Benefits

- Aluminum corrugated armor with outstanding bending characteristics - minimizes installation time and enables mechanical protection and shielding
- Same accessories as 1 5/8" coaxial cable
- Outer conductor grounding - Eliminates typical grounding requirements and saves on installation costs
- Lightweight solution and compact design - Decreases tower loading
- Robust cabling - Eliminates need for expensive cable trays and ducts
- Installation of tight bundled fiber optic cable pairs directly to the RRH - Reduces CAPEX and wind load by eliminating need for interconnection
- Optical fiber and power cables housed in single corrugated cable - Saves CAPEX by standardizing RRH cable installation and reducing installation requirements
- Outdoor polyethylene jacket - Ensures long-lasting cable protection

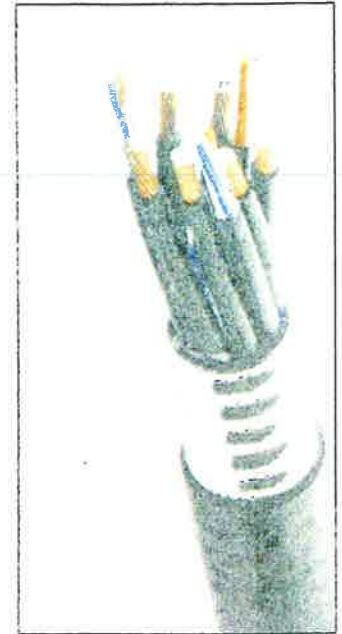


Figure 1: HYBRIFLEX Series

Technical Specifications

Outer Conductor Armor	Corrugated Aluminum	(mm (in))	46.5 (1.83)
Jacket	Polyethylene, PE	(mm (in))	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
Weight, Approximate		(kg/m (lb/ft))	1.9 (1.30)
Minimum Bending Radius, Single Bending		(mm (in))	200 (8)
Minimum Bending Radius, Repeated Bending		(mm (in))	500 (20)
Recommended/Maximum Clamp Spacing		(m (ft))	1.0 / 1.2 (3.25 / 4.0)
DC-Resistance Outer Conductor Armor		(Ω/km (Ω/1000ft))	0.68 (0.255)
DC-Resistance Power Cable 8 4mm ² (8AWG)		(Ω/km (Ω/1000ft))	2.1 (0.307)
Version:			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		(μm)	50/125
Primary Coating (Acrylate)		(μm)	245
Buffer Diameter, Nominal		(μm)	900
Secondary Protection, Jacket, Nominal		(mm (in))	2.0 (0.08)
Minimum Bending Radius		(mm (in))	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL94-V0 UL1566 RoHS Compliant
Size (Power)		(mm (AWG))	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		(mm (AWG))	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		(mm (in))	6.3 (0.27)
Standards (Meets or exceeds)			NFPA 130, IEC 60332-1, IEC 60332-3 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Installation Temperature		(°C (°F))	-40 to +65 (-40 to 149)
Operation Temperature		(°C (°F))	-40 to +65 (-40 to 149)

* This data is provisional and subject to change

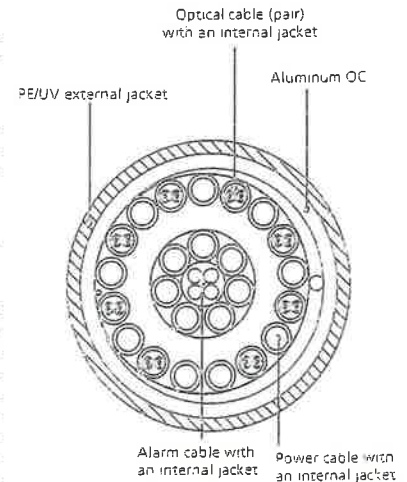


Figure 2: Construction Detail

All information contained in the present datasheet is subject to confirmation at time of ordering

ATTACHMENT 2

ATTACHMENT 3



PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: November 21, 2014

Timothy Howell
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614-221-6679

Subject: Structural Modification Report

Carrier Designation:

Verizon Wireless Co-Locate

Carrier Site Number:

119716

Carrier Site Name:

Windsor South

Crown Castle Designation:

Crown Castle BU Number:

806371

Crown Castle Site Name:

HRT 096 943227

Crown Castle JDE Job Number:

311340

Crown Castle Work Order Number:

965888

Crown Castle Application Number:

269459 Rev. 0

Engineering Firm Designation:

Paul J Ford and Company Project Number: 37514-2522.001.7700

Site Data:

**HRT 96599 MATIANUCK AVE, WINDSOR, Hartford County, CT
Latitude 41° 49' 16.04", Longitude -72° 40' 36.29"
100 Foot - Monopole Tower**

Dear Timothy Howell,

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 729299, in accordance with application 269459, revision 0.

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.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 80 mph fastest mile.

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. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Corey McCartney, EI
Structural Designer

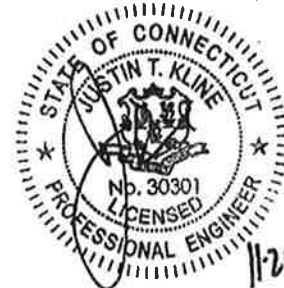


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1) INTRODUCTION

This tower is a 100-ft Monopole tower designed by VALMONT in January of 1991. The tower was originally designed for a wind speed of 90 mph per EIA-222-D.

2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 80 mph fastest mile.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
98.0	101.0	3	alcatel lucent	RRH 2x60W-1900MHz	1	1-5/8	-
		3	alcatel lucent	RRH2x60-AWS			
		6	commscope	HBXX-6517DS-A2M w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
98.0	104.0	1	gps	GPS_A	18	1/2 1-5/8	1
	101.0	2	antel	BXA-70063/6CFx2 w/ Mount Pipe			
		1	antel	BXA-70063/6CFx4 w/ Mount Pipe			
		6	decibel	950G65VTZE-M w/ Mount Pipe			
		6	decibel	DB844G65ZAXY w/ Mount Pipe			
	98.0	1	tower mounts	Platform Mount [LP 102-1]			
85.0	85.0	3	andrew	VHLP2-23	6	1/2 5/16	2
		3	argus technologies	LLPX310R W/ Mount Pipe			
		3	samsung	FDD_R6_RRH			
		1	tower mounts	Platform Mount [LP 601-1]			
75.0	75.0	12	cci antennas	HPA-65R-BUU-H8 w/ Mount Pipe	8	3/8 5/16 3/4	2
		3	ericsson	KRF 102 361/1			
		9	ericsson	RRU-11			
		6	ericsson	RRUS 12-B2			
		6	ericsson	RRUS A2			
		3	ericsson	RRUS E2 B29			
		3	ericsson	RRUS-32 B30			
		4	raycap	DC6-48-60-18-8F			
1	tower mounts	Platform Mount [LP 1303-1]					

Notes:

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

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
-	-	-	-	-	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 1463CQ1600, 04/16/14	262194	CCSITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	EDP, 19038, 04/26/91	262191	CCSITES
4-TOWER MANUFACTURER DRAWINGS	Valmont, DC0728Z, 01/22/91	2562465	CCSITES
4-PROPOSED TOWER REINFORCEMENT DRAWINGS	PJF, 37514-2522.001.7700, 11/21/14	-	PJF

3.1) Analysis Method

tnxTower (version 6.1.4.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) Monopole will be reinforced in conformance with the attached 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 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	100 - 63.0833	Pole	TP23.6275x14.76x0.281	1	-12.51	1098.19	88.1	Pass
L2	63.0833 - 50.8333	Pole	TP26.57x23.6275x0.5355	2	-14.05	1806.47	69.4	Pass
L3	50.8333 - 32	Pole	TP30.5241x24.4982x0.5529	3	-19.56	2249.09	84.8	Pass
L4	32 - 4	Pole	TP37.2405x30.5241x0.5729	4	-26.87	2894.12	86.2	Pass
L5	4 - 0	Pole	TP38.2x37.2405x0.6335	5	-28.10	3438.38	74.9	Pass
							Summary	
						Pole (L1)	88.1	Pass
						RATING =	88.1	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC4.7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	84.9	Pass
1	Base Plate	0	64.3	Pass
1	Base Foundation Steel	0	99.4	Pass
1, 2	Base Foundation Soil Interaction	0	12.5	Pass

Structure Rating (max from all components) =	99.4%
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Notes:

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

4.1) Recommendations

- 1) See attached proposed 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, feed line supports, and appurtenance mounts are not considered.

Options

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

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	100.0000- 63.0833	36.9167	0.00	12	14.7600	23.6275	0.2810	1.1240	A572-65 (65 ksi)
L2	63.0833- 50.8333	12.2500	4.17	12	23.6275	26.5700	0.5354	2.1418	Reinf 52.33 ksi (52 ksi)
L3	50.8333- 32.0000	23.0000	0.00	12	24.4982	30.5241	0.5529	2.2116	Reinf 52.70 ksi (53 ksi)
L4	32.0000- 4.0000	28.0000	0.00	12	30.5241	37.2405	0.5728	2.2914	Reinf 53.50 ksi (54 ksi)
L5	4.0000-0.0000	4.0000		12	37.2405	38.2000	0.6335	2.5340	Reinf 56.10 ksi (56 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	I/Q in ²	w in	w/t
L1	15.2807 24.4610	13.1009 21.1244	350.5612 1469.6504	5.1835 8.3581	7.6457 12.2391	45.8509 120.0788	710.3320 2977.9102	6.4479 10.3968	3.2026 5.5791	11.397 19.854

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
L2	24.4610	39.8142	2709.8720	8.2670	12.2391	221.4120	5490.9353	19.5953	4.8972	9.146
L3	27.5073	44.8874	3883.3897	9.3204	13.7633	282.1562	7868.8003	22.0922	5.6858	10.619
	31.6009	53.3599	6118.0008	10.7297	15.8115	386.9336	12396.7283	26.2621	6.6987	12.115
L4	31.6009	55.2474	6325.9958	10.7226	15.8115	400.0883	12818.1826	27.1911	6.6452	11.6
	38.5542	67.6363	11607.3394	13.1270	19.2906	601.7099	23519.6164	33.2885	8.4452	14.742
L5	38.5542	74.6747	12772.8576	13.1053	19.2906	662.1289	25881.2724	36.7526	8.2827	13.074
	39.5476	76.6320	13803.7522	13.4488	19.7876	697.5961	27970.1443	37.7159	8.5398	13.48

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 100.0000-63.0833				1	1	1		
L2 63.0833-50.8333				1	1	1		
L3 50.8333-32.0000				1	1	1		
L4 32.0000-4.0000				1	1	1		
L5 4.0000-0.0000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
FSJ4-50B(1/2")	C	No	Inside Pole	98.0000 - 0.0000	1	No Ice	0.0000	0.14
						1/2" Ice	0.0000	0.14
						1" Ice	0.0000	0.14
						2" Ice	0.0000	0.14
						4" Ice	0.0000	0.14
HJ7-50A(1-5/8")	C	No	Inside Pole	98.0000 - 0.0000	18	No Ice	0.0000	1.04
						1/2" Ice	0.0000	1.04
						1" Ice	0.0000	1.04
						2" Ice	0.0000	1.04
						4" Ice	0.0000	1.04
HB158-1-08U8-S8J18(1-5/8)	C	No	CaAa (Out Of Face)	98.0000 - 0.0000	1	No Ice	0.1980	1.30
						1/2" Ice	0.2980	2.81
						1" Ice	0.3980	4.94
						2" Ice	0.5980	11.02
						4" Ice	0.9980	30.52
HB158-1-08U8-S8J18(1-5/8)	C	No	CaAa (Out Of Face)	98.0000 - 0.0000	2	No Ice	0.0000	1.30
						1/2" Ice	0.0000	2.81
						1" Ice	0.0000	4.94
						2" Ice	0.0000	11.02
						4" Ice	0.0000	30.52
2" Bundle	C	No	CaAa (Out Of Face)	85.0000 - 0.0000	1	No Ice	0.2000	1.22
						1/2" Ice	0.3000	2.74
						1" Ice	0.4000	4.88
						2" Ice	0.6000	10.99
						4" Ice	1.0000	30.54
2" Bundle	C	No	CaAa (Out Of Face)	85.0000 - 0.0000	2	No Ice	0.0000	1.22
						1/2" Ice	0.0000	2.74
						1" Ice	0.0000	4.88
						2" Ice	0.0000	10.99
						4" Ice	0.0000	30.54
ATCB-B01-001 (5/16")	C	No	Inside Pole	85.0000 - 0.0000	6	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
FSJ4-50B(1/2")	C	No	Inside Pole	85.0000 - 0.0000	3	1" Ice	0.0000	0.06
						2" Ice	0.0000	0.06
						4" Ice	0.0000	0.06
						No Ice	0.0000	0.14
						1/2" Ice	0.0000	0.14
						1" Ice	0.0000	0.14
						2" Ice	0.0000	0.14
4" Ice	0.0000	0.14						

ATCB-B01-060(5/16)	C	No	CaAa (Out Of Face)	75.0000 - 0.0000	3	No Ice	0.0000	0.07
						1/2" Ice	0.0000	0.57
						1" Ice	0.0000	1.68
						2" Ice	0.0000	5.73
L98B-002-XXX_DB(3/8")	C	No	Inside Pole	75.0000 - 0.0000	2	4" Ice	0.0000	21.16
						No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
WR-VG86ST-BRD(3/4)	C	No	CaAa (Out Of Face)	75.0000 - 0.0000	8	2" Ice	0.0000	0.06
						4" Ice	0.0000	0.06
						No Ice	0.0000	0.59
						1/2" Ice	0.0000	1.37
1" conduit	C	No	CaAa (Out Of Face)	75.0000 - 0.0000	1	1" Ice	0.0000	2.76
						2" Ice	0.0000	7.37
						4" Ice	0.0000	23.92
						No Ice	0.0000	0.46
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	35.5000 - 0.0000	1	1/2" Ice	0.0000	0.46
						1" Ice	0.0000	0.46
						2" Ice	0.0000	0.46
						4" Ice	0.0000	0.46
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	65.5000 - 35.5000	1	No Ice	0.2083	0.00
						1/2" Ice	0.3194	0.00
						1" Ice	0.4306	0.00
						2" Ice	0.6528	0.00
						4" Ice	1.0972	0.00
						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 n	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	100.0000-63.0833	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	11.700	0.96
L2	63.0833-50.8333	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.917	0.40
L3	50.8333-32.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	10.780	0.62
L4	32.0000-4.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	16.977	0.92
L5	4.0000-0.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.425	0.13

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	100.0000-63.0833	A	1.113	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	24.946	2.03
L2	63.0833-50.8333	A	1.067	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	15.053	1.01
L3	50.8333-32.0000	A	1.027	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	23.289	1.55
L4	32.0000-4.0000	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	34.400	2.15
L5	4.0000-0.0000	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	4.914	0.31

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
L1	100.0000-63.0833	-0.3608	0.2083	-0.5996	0.3462
L2	63.0833-50.8333	-0.5776	0.3335	-0.9544	0.5510
L3	50.8333-32.0000	-0.5979	0.3452	-1.0013	0.5781
L4	32.0000-4.0000	-0.6484	0.3744	-1.0681	0.6167
L5	4.0000-0.0000	-0.6603	0.3812	-1.1053	0.6382

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
BXA-70063/6CFx2 w/ Mount Pipe	A	From Leg	4.0000 0.00 3.00	0.00	98.0000	No Ice	7.9686	5.3981	0.04
						1/2" Ice	8.6091	6.5465	0.10
						Ice	9.2158	7.4089	0.17
						1" Ice	10.4591	9.1837	0.33
						2" Ice	13.0655	12.9333	0.79
(2) DB844G65ZAXY w/ Mount Pipe	A	From Leg	4.0000 0.00 3.00	0.00	98.0000	No Ice	4.9042	4.9208	0.03
						1/2" Ice	5.3460	5.5962	0.08
						Ice	5.7972	6.2837	0.13
						1" Ice	6.7311	7.7123	0.26
						2" Ice	8.7345	10.8330	0.62
(2) RRH2x60-AWS	A	From Leg	4.0000 0.00 3.00	0.00	98.0000	No Ice	3.9569	2.1583	0.06
						1/2" Ice	4.2724	2.4414	0.08
						Ice	4.5965	2.7330	0.11
						1" Ice	5.2705	3.3423	0.18
						2" Ice	6.7224	4.6645	0.37
(2) HBXX-6517DS-A2M w/ Mount Pipe	A	From Leg	4.0000 0.00 3.00	0.00	98.0000	No Ice	8.9758	6.9629	0.07
						1/2" Ice	9.6473	8.1817	0.14
						Ice	10.2909	9.1436	0.21
						1" Ice	11.5946	11.0219	0.40
						2" Ice	14.3212	15.0267	0.91
DB-T1-6Z-8AB-OZ	A	From Leg	4.0000 0.00 3.00	0.00	98.0000	No Ice	5.6000	2.3333	0.04
						1/2" Ice	5.9154	2.5580	0.08
						Ice	6.2395	2.7914	0.12

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	
						1" Ice	6.9136	3.2840	0.21
						2" Ice	8.3654	4.3728	0.45
						4" Ice			
BXA-70063/6CFx4 w/ Mount Pipe	B	From Leg	4.0000 0.00 3.00	0.00	98.0000	No Ice	7.9686	5.3981	0.04
						1/2"	8.6091	6.5465	0.10
						Ice	9.2158	7.4089	0.17
						1" Ice	10.4591	9.1837	0.33
						2" Ice	13.0655	12.9333	0.79
						4" Ice			
(2) DB844G65ZAXY w/ Mount Pipe	B	From Leg	4.0000 0.00 3.00	0.00	98.0000	No Ice	4.9042	4.9208	0.03
						1/2"	5.3460	5.5962	0.08
						Ice	5.7972	6.2837	0.13
						1" Ice	6.7311	7.7123	0.26
						2" Ice	8.7345	10.8330	0.62
						4" Ice			
RRH 2x60W-1900MHz	B	From Leg	4.0000 0.00 3.00	0.00	98.0000	No Ice	2.1904	1.4056	0.04
						1/2"	2.3976	1.5867	0.06
						Ice	2.6134	1.7765	0.08
						1" Ice	3.0710	2.1820	0.12
						2" Ice	4.0899	3.0967	0.26
						4" Ice			
RRH2x60-AWS	B	From Leg	4.0000 0.00 3.00	0.00	98.0000	No Ice	3.9569	2.1583	0.06
						1/2"	4.2724	2.4414	0.08
						Ice	4.5965	2.7330	0.11
						1" Ice	5.2705	3.3423	0.18
						2" Ice	6.7224	4.6645	0.37
						4" Ice			
(2) HBXX-6517DS-A2M w/ Mount Pipe	B	From Leg	4.0000 0.00 3.00	0.00	98.0000	No Ice	8.9758	6.9629	0.07
						1/2"	9.6473	8.1817	0.14
						Ice	10.2909	9.1436	0.21
						1" Ice	11.5946	11.0219	0.40
						2" Ice	14.3212	15.0267	0.91
						4" Ice			
BXA-70063/6CFx2 w/ Mount Pipe	C	From Leg	4.0000 0.00 3.00	0.00	98.0000	No Ice	7.9686	5.3981	0.04
						1/2"	8.6091	6.5465	0.10
						Ice	9.2158	7.4089	0.17
						1" Ice	10.4591	9.1837	0.33
						2" Ice	13.0655	12.9333	0.79
						4" Ice			
(2) DB844G65ZAXY w/ Mount Pipe	C	From Leg	4.0000 0.00 3.00	0.00	98.0000	No Ice	4.9042	4.9208	0.03
						1/2"	5.3460	5.5962	0.08
						Ice	5.7972	6.2837	0.13
						1" Ice	6.7311	7.7123	0.26
						2" Ice	8.7345	10.8330	0.62
						4" Ice			
GPS_A	C	From Leg	4.0000 0.00 6.00	0.00	98.0000	No Ice	0.2975	0.2975	0.00
						1/2"	0.3739	0.3739	0.00
						Ice	0.4589	0.4589	0.01
						1" Ice	0.6549	0.6549	0.02
						2" Ice	1.1506	1.1506	0.08
						4" Ice			
(2) RRH 2x60W-1900MHz	C	From Leg	4.0000 0.00 3.00	0.00	98.0000	No Ice	2.1904	1.4056	0.04
						1/2"	2.3976	1.5867	0.06
						Ice	2.6134	1.7765	0.08
						1" Ice	3.0710	2.1820	0.12
						2" Ice	4.0899	3.0967	0.26
						4" Ice			
(2) HBXX-6517DS-A2M w/ Mount Pipe	C	From Leg	4.0000 0.00 3.00	0.00	98.0000	No Ice	8.9758	6.9629	0.07
						1/2"	9.6473	8.1817	0.14
						Ice	10.2909	9.1436	0.21
						1" Ice	11.5946	11.0219	0.40
						2" Ice	14.3212	15.0267	0.91
						4" Ice			
Platform Mount [LP 102-1]	C	None		0.00	98.0000	No Ice	45.0000	45.0000	2.84
						1/2"	53.2500	53.2500	3.38

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment	Placement ft	Ice	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
						Ice	61.5000	61.5000	3.92
						1" Ice	78.0000	78.0000	5.01
						2" Ice	111.0000	111.0000	7.20
						4" Ice			

LLPX310R W/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	85.0000	No Ice	4.9623	2.8484	0.04
						1/2"	5.3512	3.3668	0.08
						Ice	5.7501	3.9019	0.12
						1" Ice	6.5777	5.0799	0.23
						2" Ice	8.3714	7.8368	0.53
						4" Ice			
LLPX310R W/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	85.0000	No Ice	4.9623	2.8484	0.04
						1/2"	5.3512	3.3668	0.08
						Ice	5.7501	3.9019	0.12
						1" Ice	6.5777	5.0799	0.23
						2" Ice	8.3714	7.8368	0.53
						4" Ice			
LLPX310R W/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	85.0000	No Ice	4.9623	2.8484	0.04
						1/2"	5.3512	3.3668	0.08
						Ice	5.7501	3.9019	0.12
						1" Ice	6.5777	5.0799	0.23
						2" Ice	8.3714	7.8368	0.53
						4" Ice			
FDD_R6_RRH	A	From Leg	4.0000 0.00 0.00	0.00	85.0000	No Ice	1.7889	0.7778	0.03
						1/2"	1.9715	0.9182	0.04
						Ice	2.1627	1.0673	0.06
						1" Ice	2.5710	1.3914	0.09
						2" Ice	3.4914	2.1432	0.20
						4" Ice			
FDD_R6_RRH	B	From Leg	4.0000 0.00 0.00	0.00	85.0000	No Ice	1.7889	0.7778	0.03
						1/2"	1.9715	0.9182	0.04
						Ice	2.1627	1.0673	0.06
						1" Ice	2.5710	1.3914	0.09
						2" Ice	3.4914	2.1432	0.20
						4" Ice			
FDD_R6_RRH	C	From Leg	4.0000 0.00 0.00	0.00	85.0000	No Ice	1.7889	0.7778	0.03
						1/2"	1.9715	0.9182	0.04
						Ice	2.1627	1.0673	0.06
						1" Ice	2.5710	1.3914	0.09
						2" Ice	3.4914	2.1432	0.20
						4" Ice			
Platform Mount [LP 601-1]	C	None		0.00	85.0000	No Ice	28.4700	28.4700	1.12
						1/2"	33.5900	33.5900	1.51
						Ice	38.7100	38.7100	1.91
						1" Ice	48.9500	48.9500	2.69
						2" Ice	69.4300	69.4300	4.26
						4" Ice			
6' x 2" Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	85.0000	No Ice	1.4250	1.4250	0.02
						1/2"	1.9250	1.9250	0.03
						Ice	2.2939	2.2939	0.05
						1" Ice	3.0596	3.0596	0.09
						2" Ice	4.7022	4.7022	0.23
						4" Ice			
6' x 2" Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	85.0000	No Ice	1.4250	1.4250	0.02
						1/2"	1.9250	1.9250	0.03
						Ice	2.2939	2.2939	0.05
						1" Ice	3.0596	3.0596	0.09
						2" Ice	4.7022	4.7022	0.23
						4" Ice			
6' x 2" Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	85.0000	No Ice	1.4250	1.4250	0.02
						1/2"	1.9250	1.9250	0.03
						Ice	2.2939	2.2939	0.05
						1" Ice	3.0596	3.0596	0.09
						2" Ice	4.7022	4.7022	0.23
						4" Ice			

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

(4) HPA-65R-BUU-H8 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	75.0000	No Ice	13.5328	9.5823	0.10
						1/2" Ice	14.3352	11.0517	0.20
						Ice	15.1425	12.4963	0.30
						1" Ice	16.7076	14.7516	0.55
						2" Ice	19.9544	19.4621	1.22
KRF 102 361/1	A	From Leg	4.0000 0.00 0.00	0.00	75.0000	No Ice	2.2619	0.6306	0.03
						1/2" Ice	2.4645	0.7561	0.04
						Ice	2.6758	0.8903	0.06
						1" Ice	3.1243	1.1845	0.09
						2" Ice	4.1251	1.8768	0.21
(3) RRU-11	A	From Leg	4.0000 0.00 0.00	0.00	75.0000	No Ice	1.9116	1.4717	0.04
						1/2" Ice	2.1019	1.6452	0.06
						Ice	2.3009	1.8274	0.08
						1" Ice	2.7248	2.2176	0.12
						2" Ice	3.6763	3.1016	0.25
(2) RRUS 12-B2	A	From Leg	4.0000 0.00 0.00	0.00	75.0000	No Ice	3.6674	1.4828	0.06
						1/2" Ice	3.9238	1.6678	0.08
						Ice	4.1888	1.8614	0.11
						1" Ice	4.7448	2.2745	0.17
						2" Ice	5.9604	3.2045	0.34
(2) RRUS A2	A	From Leg	4.0000 0.00 0.00	0.00	75.0000	No Ice	2.4107	0.5424	0.02
						1/2" Ice	2.6193	0.6752	0.03
						Ice	2.8366	0.8165	0.05
						1" Ice	3.2970	1.1252	0.09
						2" Ice	4.3216	1.8462	0.20
RRUS E2 B29	A	From Leg	4.0000 0.00 0.00	0.00	75.0000	No Ice	3.6692	1.4875	0.06
						1/2" Ice	3.9256	1.6727	0.08
						Ice	4.1907	1.8665	0.11
						1" Ice	4.7468	2.2800	0.17
						2" Ice	5.9627	3.2107	0.35
RRUS-32 B30	A	From Leg	4.0000 0.00 0.00	0.00	75.0000	No Ice	3.8662	2.7616	0.08
						1/2" Ice	4.1506	3.0213	0.10
						Ice	4.4435	3.2896	0.14
						1" Ice	5.0554	3.8522	0.21
						2" Ice	6.3828	5.0811	0.41
DC6-48-60-18-8F	A	From Leg	4.0000 0.00 0.00	0.00	75.0000	No Ice	1.4667	1.4667	0.02
						1/2" Ice	1.6667	1.6667	0.04
						Ice	1.8778	1.8778	0.06
						1" Ice	2.3333	2.3333	0.11
						2" Ice	3.3778	3.3778	0.24
(4) HPA-65R-BUU-H8 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	75.0000	No Ice	13.5328	9.5823	0.10
						1/2" Ice	14.3352	11.0517	0.20
						Ice	15.1425	12.4963	0.30
						1" Ice	16.7076	14.7516	0.55
						2" Ice	19.9544	19.4621	1.22
KRF 102 361/1	B	From Leg	4.0000 0.00 0.00	0.00	75.0000	No Ice	2.2619	0.6306	0.03
						1/2" Ice	2.4645	0.7561	0.04
						Ice	2.6758	0.8903	0.06
						1" Ice	3.1243	1.1845	0.09
						2" Ice	4.1251	1.8768	0.21
(3) RRU-11	B	From Leg	4.0000 0.00 0.00	0.00	75.0000	No Ice	1.9116	1.4717	0.04
						1/2" Ice	2.1019	1.6452	0.06
						Ice	2.3009	1.8274	0.08
						1" Ice	2.7248	2.2176	0.12

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
(2) RRUS 12-B2	B	From Leg	4.0000 0.00 0.00	0.00	75.0000	2" Ice	3.6763	3.1016	0.25
						4" Ice			
						No Ice	3.6674	1.4828	0.06
						1/2" Ice	3.9238	1.6678	0.08
						Ice	4.1888	1.8614	0.11
(2) RRUS A2	B	From Leg	4.0000 0.00 0.00	0.00	75.0000	1" Ice	4.7448	2.2745	0.17
						2" Ice	5.9604	3.2045	0.34
						4" Ice			
						No Ice	2.4107	0.5424	0.02
						1/2" Ice	2.6193	0.6752	0.03
RRUS E2 B29	B	From Leg	4.0000 0.00 0.00	0.00	75.0000	Ice	2.8366	0.8165	0.05
						1" Ice	3.2970	1.1252	0.09
						2" Ice	4.3216	1.8462	0.20
						4" Ice			
						No Ice	3.6692	1.4875	0.06
RRUS-32 B30	B	From Leg	4.0000 0.00 0.00	0.00	75.0000	1/2" Ice	3.9256	1.6727	0.08
						Ice	4.1907	1.8665	0.11
						1" Ice	4.7468	2.2800	0.17
						2" Ice	5.9627	3.2107	0.35
						4" Ice			
(2) DC6-48-60-18-8F	B	From Leg	4.0000 0.00 0.00	0.00	75.0000	No Ice	3.8662	2.7616	0.08
						1/2" Ice	4.1506	3.0213	0.10
						Ice	4.4435	3.2896	0.14
						1" Ice	5.0554	3.8522	0.21
						2" Ice	6.3828	5.0811	0.41
(2) DC6-48-60-18-8F	B	From Leg	4.0000 0.00 0.00	0.00	75.0000	4" Ice			
						No Ice	1.4667	1.4667	0.02
						1/2" Ice	1.6667	1.6667	0.04
						Ice	1.8778	1.8778	0.06
						1" Ice	2.3333	2.3333	0.11
(4) HPA-65R-BUU-H8 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	75.0000	2" Ice	3.3778	3.3778	0.24
						4" Ice			
						No Ice	13.5328	9.5823	0.10
						1/2" Ice	14.3352	11.0517	0.20
						Ice	15.1425	12.4963	0.30
KRF 102 361/1	C	From Leg	4.0000 0.00 0.00	0.00	75.0000	1" Ice	16.7076	14.7516	0.55
						2" Ice	19.9544	19.4621	1.22
						4" Ice			
						No Ice	2.2619	0.6306	0.03
						1/2" Ice	2.4645	0.7561	0.04
(3) RRU-11	C	From Leg	4.0000 0.00 0.00	0.00	75.0000	Ice	2.6758	0.8903	0.06
						1" Ice	3.1243	1.1845	0.09
						2" Ice	4.1251	1.8768	0.21
						4" Ice			
						No Ice	1.9116	1.4717	0.04
(2) RRUS 12-B2	C	From Leg	4.0000 0.00 0.00	0.00	75.0000	1/2" Ice	2.1019	1.6452	0.06
						Ice	2.3009	1.8274	0.08
						1" Ice	2.7248	2.2176	0.12
						2" Ice	3.6763	3.1016	0.25
						4" Ice			
(2) RRUS 12-B2	C	From Leg	4.0000 0.00 0.00	0.00	75.0000	No Ice	3.6674	1.4828	0.06
						1/2" Ice	3.9238	1.6678	0.08
						Ice	4.1888	1.8614	0.11
						1" Ice	4.7448	2.2745	0.17
						2" Ice	5.9604	3.2045	0.34
(2) RRUS A2	C	From Leg	4.0000 0.00 0.00	0.00	75.0000	4" Ice			
						No Ice	2.4107	0.5424	0.02
						1/2" Ice	2.6193	0.6752	0.03
						Ice	2.8366	0.8165	0.05
						1" Ice	3.2970	1.1252	0.09
RRUS E2 B29	C	From Leg	4.0000 0.00 0.00	0.00	75.0000	2" Ice	4.3216	1.8462	0.20
						4" Ice			
						No Ice	3.6692	1.4875	0.06
						1/2" Ice	3.9256	1.6727	0.08
						Ice	4.1907	1.8665	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
RRUS-32 B30	C	From Leg	4.0000 0.00 0.00	0.00	75.0000	1" Ice	4.7468	2.2800	0.17
						2" Ice	5.9627	3.2107	0.35
						4" Ice			
						No Ice	3.8662	2.7616	0.08
						1/2"	4.1506	3.0213	0.10
DC6-48-60-18-8F	C	From Leg	4.0000 0.00 0.00	0.00	75.0000	Ice	4.4435	3.2896	0.14
						1" Ice	5.0554	3.8522	0.21
						2" Ice	6.3828	5.0811	0.41
						4" Ice			
						No Ice	1.4667	1.4667	0.02
Platform Mount [LP 1303-1]	C	None		0.00	75.0000	1/2"	1.6667	1.6667	0.04
						Ice	1.8778	1.8778	0.06
						1" Ice	2.3333	2.3333	0.11
						2" Ice	3.3778	3.3778	0.24
						4" Ice			
						No Ice	56.8000	56.8000	2.53
						1/2"	70.8000	70.8000	3.38
						Ice	84.8000	84.8000	4.24
						1" Ice	112.8000	112.8000	5.96
						2" Ice	168.8000	168.8000	9.38

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment	3 dB Beam Width	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K	
VHLP2-23	A	Paraboloid w/o Radome	From Leg	4.0000 0.00 0.00	0.00		85.0000	2.1750	No Ice	3.7200	0.03
									1/2" Ice	4.0100	0.05
									1" Ice	4.3000	0.07
									2" Ice	4.8800	0.11
									4" Ice	6.0400	0.20
VHLP2-23	B	Paraboloid w/o Radome	From Leg	4.0000 0.00 0.00	0.00		85.0000	2.1750	No Ice	3.7200	0.03
									1/2" Ice	4.0100	0.05
									1" Ice	4.3000	0.07
									2" Ice	4.8800	0.11
									4" Ice	6.0400	0.20
VHLP2-23	C	Paraboloid w/o Radome	From Leg	4.0000 0.00 0.00	0.00		85.0000	2.1750	No Ice	3.7200	0.03
									1/2" Ice	4.0100	0.05
									1" Ice	4.3000	0.07
									2" Ice	4.8800	0.11
									4" Ice	6.0400	0.20

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 100.0000-63.0833	80.4157	1.29	21.08	59.048	A	0.000	59.048	100.00	0.000	0.000
					B	0.000	59.048	100.00	0.000	0.000
					C	0.000	59.048	100.00	0.000	11.700
L2 63.0833-50.8333	56.8386	1.168	19.14	25.622	A	0.000	25.622	100.00	0.000	0.000
					B	0.000	25.622	100.00	0.000	0.000
					C	0.000	25.622	100.00	0.000	6.917
L3 50.8333-32.0000	41.1406	1.065	17.45	44.034	A	0.000	44.034	100.00	0.000	0.000
					B	0.000	44.034	100.00	0.000	0.000

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
L4 32.0000- 4.0000	17.5375	1	16.38	79.059	C	0.000	44.034	79.059	100.00	0.000	10.780
					A	0.000	79.059		100.00	0.000	0.000
					B	0.000	79.059		100.00	0.000	0.000
L5 4.0000- 0.0000	1.9915	1	16.38	12.573	C	0.000	79.059	12.573	100.00	0.000	16.977
					A	0.000	12.573		100.00	0.000	0.000
					B	0.000	12.573		100.00	0.000	0.000
					C	0.000	12.573		100.00	0.000	2.425

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 100.0000- 63.0833	80.4157	1.29	4.66	1.1128	65.894	A	0.000	65.894	65.894	100.00	0.000	0.000
						B	0.000	65.894		100.00	0.000	0.000
						C	0.000	65.894		100.00	0.000	24.946
L2 63.0833- 50.8333	56.8386	1.168	4.23	1.0674	27.801	A	0.000	27.801	27.801	100.00	0.000	0.000
						B	0.000	27.801		100.00	0.000	0.000
						C	0.000	27.801		100.00	0.000	15.053
L3 50.8333- 32.0000	41.1406	1.065	3.85	1.0268	47.384	A	0.000	47.384	47.384	100.00	0.000	0.000
						B	0.000	47.384		100.00	0.000	0.000
						C	0.000	47.384		100.00	0.000	23.289
L4 32.0000- 4.0000	17.5375	1	3.62	1.0000	83.725	A	0.000	83.725	83.725	100.00	0.000	0.000
						B	0.000	83.725		100.00	0.000	0.000
						C	0.000	83.725		100.00	0.000	34.400
L5 4.0000- 0.0000	1.9915	1	3.62	1.0000	13.240	A	0.000	13.240	13.240	100.00	0.000	0.000
						B	0.000	13.240		100.00	0.000	0.000
						C	0.000	13.240		100.00	0.000	4.914

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 100.0000- 63.0833	80.4157	1.29	8.24	59.048	A	0.000	59.048	59.048	100.00	0.000	0.000
					B	0.000	59.048		100.00	0.000	0.000
					C	0.000	59.048		100.00	0.000	11.700
L2 63.0833- 50.8333	56.8386	1.168	7.48	25.622	A	0.000	25.622	25.622	100.00	0.000	0.000
					B	0.000	25.622		100.00	0.000	0.000
					C	0.000	25.622		100.00	0.000	6.917
L3 50.8333- 32.0000	41.1406	1.065	6.82	44.034	A	0.000	44.034	44.034	100.00	0.000	0.000
					B	0.000	44.034		100.00	0.000	0.000
					C	0.000	44.034		100.00	0.000	10.780
L4 32.0000- 4.0000	17.5375	1	6.40	79.059	A	0.000	79.059	79.059	100.00	0.000	0.000
					B	0.000	79.059		100.00	0.000	0.000
					C	0.000	79.059		100.00	0.000	16.977
L5 4.0000- 0.0000	1.9915	1	6.40	12.573	A	0.000	12.573	12.573	100.00	0.000	0.000
					B	0.000	12.573		100.00	0.000	0.000
					C	0.000	12.573		100.00	0.000	2.425

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice

Comb. No.	Description
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

Sectio n No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	100 - 63.0833	Pole	Max Tension	15	0.00	-0.00	-0.00
			Max. Compression	14	-27.27	0.73	0.11
			Max. Mx	11	-12.55	442.60	3.16
			Max. My	2	-12.51	0.72	451.63
			Max. Vy	11	-20.63	442.60	3.16
			Max. Vx	2	-20.90	0.72	451.63
			Max. Torque	11			-0.59
L2	63.0833 - 50.8333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-29.36	1.21	-0.16
			Max. Mx	11	-14.08	612.01	4.12
			Max. My	2	-14.05	0.95	623.08
			Max. Vy	11	-21.29	612.01	4.12
			Max. Vx	2	-21.56	0.95	623.08
			Max. Torque	12			-0.48
L3	50.8333 - 32	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-36.64	2.68	-1.00
			Max. Mx	11	-19.57	1124.08	6.81
			Max. My	2	-19.56	1.65	1140.89
			Max. Vy	11	-23.18	1124.08	6.81
			Max. Vx	2	-23.45	1.65	1140.89
			Max. Torque	12			-0.43
L4	32 - 4	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-45.87	4.63	-2.13
			Max. Mx	11	-26.87	1804.55	9.97

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L5	4 - 0	Pole	Max. My	2	-26.87	2.58	1828.09
			Max. Vy	11	-25.47	1804.55	9.97
			Max. Vx	2	-25.73	2.58	1828.09
			Max. Torque	11			-0.36
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-47.40	4.95	-2.31
			Max. Mx	11	-28.10	1907.14	10.41
			Max. My	2	-28.10	2.71	1931.61
			Max. Vy	11	-25.81	1907.14	10.41
			Max. Vx	2	-26.08	2.71	1931.61
Max. Torque	4			0.27			

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	23	47.40	6.38	-3.70
	Max. H _x	11	28.11	25.80	0.12
	Max. H _z	2	28.11	0.02	26.07
	Max. M _x	2	1931.61	0.02	26.07
	Max. M _z	5	1905.20	-25.80	0.09
	Max. Torsion	4	0.27	-22.37	13.00
	Min. Vert	1	28.11	0.00	0.00
	Min. H _x	5	28.11	-25.80	0.09
	Min. H _z	8	28.11	-0.02	-26.02
	Min. M _x	8	-1928.55	-0.02	-26.02
	Min. M _z	11	-1907.14	25.80	0.12
	Min. Torsion	10	-0.26	22.41	-13.02

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	28.11	0.00	0.00	0.37	0.95	0.00
Dead+Wind 0 deg - No Ice	28.11	-0.02	-26.07	-1931.61	2.71	-0.10
Dead+Wind 30 deg - No Ice	28.11	12.98	-22.44	-1661.46	-958.42	-0.21
Dead+Wind 60 deg - No Ice	28.11	22.37	-13.00	-962.23	-1651.59	-0.27
Dead+Wind 90 deg - No Ice	28.11	25.80	-0.09	-6.93	-1905.20	-0.26
Dead+Wind 120 deg - No Ice	28.11	22.42	13.05	967.88	-1656.61	-0.16
Dead+Wind 150 deg - No Ice	28.11	12.83	22.57	1672.98	-945.77	-0.03
Dead+Wind 180 deg - No Ice	28.11	0.02	26.02	1928.55	-0.77	0.10
Dead+Wind 210 deg - No Ice	28.11	-12.80	22.55	1671.24	944.70	0.20
Dead+Wind 240 deg - No Ice	28.11	-22.41	13.02	964.87	1656.82	0.26
Dead+Wind 270 deg - No Ice	28.11	-25.80	-0.12	-10.41	1907.14	0.26
Dead+Wind 300 deg - No Ice	28.11	-22.39	-13.03	-965.24	1655.26	0.18
Dead+Wind 330 deg - No Ice	28.11	-13.01	-22.46	-1663.20	963.38	0.04
Dead+Ice	47.40	-0.00	0.00	2.31	4.95	0.00
Dead+Wind 0 deg+Ice	47.40	-0.00	-7.41	-564.13	5.43	-0.10
Dead+Wind 30 deg+Ice	47.40	3.69	-6.38	-485.24	-276.77	-0.10
Dead+Wind 60 deg+Ice	47.40	6.37	-3.70	-280.04	-480.54	-0.08
Dead+Wind 90 deg+Ice	47.40	7.35	-0.02	0.34	-555.08	-0.04
Dead+Wind 120 deg+Ice	47.40	6.38	3.71	285.93	-481.83	0.02
Dead+Wind 150 deg+Ice	47.40	3.65	6.41	492.74	-273.29	0.07
Dead+Wind 180 deg+Ice	47.40	0.00	7.40	567.80	4.62	0.10
Dead+Wind 210 deg+Ice	47.40	-3.65	6.41	492.34	282.64	0.10
Dead+Wind 240 deg+Ice	47.40	-6.38	3.70	285.23	491.47	0.08
Dead+Wind 270 deg+Ice	47.40	-7.35	-0.03	-0.47	565.12	0.04
Dead+Wind 300 deg+Ice	47.40	-6.37	-3.70	-280.73	490.99	-0.02
Dead+Wind 330 deg+Ice	47.40	-3.70	-6.39	-485.65	287.51	-0.07
Dead+Wind 0 deg - Service	28.11	-0.01	-10.18	-754.90	1.65	-0.04
Dead+Wind 30 deg - Service	28.11	5.07	-8.77	-649.28	-374.08	-0.08
Dead+Wind 60 deg - Service	28.11	8.74	-5.08	-375.93	-645.05	-0.11

Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 90 deg - Service	28.11	10.08	-0.03	-2.49	-744.19	-0.10
Dead+Wind 120 deg - Service	28.11	8.76	5.10	378.59	-647.02	-0.07
Dead+Wind 150 deg - Service	28.11	5.01	8.81	654.24	-369.14	-0.01
Dead+Wind 180 deg - Service	28.11	0.01	10.16	754.15	0.29	0.04
Dead+Wind 210 deg - Service	28.11	-5.00	8.81	653.55	369.90	0.08
Dead+Wind 240 deg - Service	28.11	-8.75	5.09	377.41	648.28	0.10
Dead+Wind 270 deg - Service	28.11	-10.08	-0.05	-3.85	746.13	0.10
Dead+Wind 300 deg - Service	28.11	-8.74	-5.09	-377.11	647.67	0.07
Dead+Wind 330 deg - Service	28.11	-5.08	-8.77	-649.96	377.20	0.02

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	-28.11	0.00	0.00	28.11	0.00	0.000%
2	-0.02	-28.11	-26.07	0.02	28.11	26.07	0.000%
3	12.98	-28.11	-22.44	-12.98	28.11	22.44	0.000%
4	22.37	-28.11	-13.00	-22.37	28.11	13.00	0.000%
5	25.80	-28.11	-0.09	-25.80	28.11	0.09	0.000%
6	22.42	-28.11	13.05	-22.42	28.11	-13.05	0.000%
7	12.83	-28.11	22.57	-12.83	28.11	-22.57	0.000%
8	0.02	-28.11	26.02	-0.02	28.11	-26.02	0.000%
9	-12.80	-28.11	22.55	12.80	28.11	-22.55	0.000%
10	-22.41	-28.11	13.02	22.41	28.11	-13.02	0.000%
11	-25.80	-28.11	-0.12	25.80	28.11	0.12	0.000%
12	-22.39	-28.11	-13.03	22.39	28.11	13.03	0.000%
13	-13.01	-28.11	-22.46	13.01	28.11	22.46	0.000%
14	0.00	-47.40	0.00	0.00	47.40	-0.00	0.000%
15	-0.00	-47.40	-7.41	0.00	47.40	7.41	0.000%
16	3.69	-47.40	-6.38	-3.69	47.40	6.38	0.000%
17	6.37	-47.40	-3.70	-6.37	47.40	3.70	0.000%
18	7.35	-47.40	-0.02	-7.35	47.40	0.02	0.000%
19	6.38	-47.40	3.71	-6.38	47.40	-3.71	0.000%
20	3.65	-47.40	6.41	-3.65	47.40	-6.41	0.000%
21	0.00	-47.40	7.40	-0.00	47.40	-7.40	0.000%
22	-3.65	-47.40	6.41	3.65	47.40	-6.41	0.000%
23	-6.38	-47.40	3.70	6.38	47.40	-3.70	0.000%
24	-7.35	-47.40	-0.03	7.35	47.40	0.03	0.000%
25	-6.37	-47.40	-3.70	6.37	47.40	3.70	0.000%
26	-3.70	-47.40	-6.39	3.70	47.40	6.39	0.000%
27	-0.01	-28.11	-10.18	0.01	28.11	10.18	0.000%
28	5.07	-28.11	-8.77	-5.07	28.11	8.77	0.000%
29	8.74	-28.11	-5.08	-8.74	28.11	5.08	0.000%
30	10.08	-28.11	-0.03	-10.08	28.11	0.03	0.000%
31	8.76	-28.11	5.10	-8.76	28.11	-5.10	0.000%
32	5.01	-28.11	8.81	-5.01	28.11	-8.81	0.000%
33	0.01	-28.11	10.16	-0.01	28.11	-10.16	0.000%
34	-5.00	-28.11	8.81	5.00	28.11	-8.81	0.000%
35	-8.75	-28.11	5.09	8.75	28.11	-5.09	0.000%
36	-10.08	-28.11	-0.05	10.08	28.11	0.05	0.000%
37	-8.74	-28.11	-5.09	8.74	28.11	5.09	0.000%
38	-5.08	-28.11	-8.77	5.08	28.11	8.77	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.0000001	0.0000001
2	Yes	4	0.0000001	0.00008875
3	Yes	5	0.0000001	0.00019737
4	Yes	5	0.0000001	0.00019921
5	Yes	4	0.0000001	0.00021970
6	Yes	5	0.0000001	0.00019682
7	Yes	5	0.0000001	0.00019886
8	Yes	4	0.0000001	0.00009655
9	Yes	5	0.0000001	0.00019733
10	Yes	5	0.0000001	0.00019660
11	Yes	4	0.0000001	0.00024828
12	Yes	5	0.0000001	0.00020091
13	Yes	5	0.0000001	0.00019778
14	Yes	4	0.0000001	0.00000001
15	Yes	4	0.0000001	0.00016280
16	Yes	4	0.0000001	0.00063444
17	Yes	4	0.0000001	0.00065320
18	Yes	4	0.0000001	0.00016153
19	Yes	4	0.0000001	0.00064635
20	Yes	4	0.0000001	0.00064775
21	Yes	4	0.0000001	0.00016279
22	Yes	4	0.0000001	0.00067339
23	Yes	4	0.0000001	0.00065803
24	Yes	4	0.0000001	0.00016473
25	Yes	4	0.0000001	0.00067155
26	Yes	4	0.0000001	0.00066599
27	Yes	4	0.0000001	0.00005192
28	Yes	4	0.0000001	0.00060714
29	Yes	4	0.0000001	0.00061978
30	Yes	4	0.0000001	0.00006392
31	Yes	4	0.0000001	0.00060183
32	Yes	4	0.0000001	0.00061931
33	Yes	4	0.0000001	0.00005210
34	Yes	4	0.0000001	0.00061242
35	Yes	4	0.0000001	0.00060285
36	Yes	4	0.0000001	0.00006574
37	Yes	4	0.0000001	0.00062931
38	Yes	4	0.0000001	0.00060887

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	100 - 63.0833	20.62	27	1.92	0.00
L2	63.0833 - 50.8333	7.82	27	1.20	0.00
L3	55 - 32	5.92	27	1.04	0.00
L4	32 - 4	1.91	27	0.59	0.00
L5	4 - 0	0.03	27	0.06	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
98.0000	BXA-70063/6CFx2 w/ Mount Pipe	27	19.84	1.88	0.00	12411
85.0000	VHLP2-23	27	14.87	1.63	0.00	4137
75.0000	(4) HPA-65R-BUU-H8 w/ Mount Pipe	27	11.36	1.43	0.00	2481

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	100 - 63.0833	52.68	2	4.90	0.01
L2	63.0833 - 50.8333	20.01	2	3.07	0.00
L3	55 - 32	15.15	2	2.67	0.00
L4	32 - 4	4.88	2	1.51	0.00
L5	4 - 0	0.07	2	0.16	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
98.0000	BXA-70063/6CFx2 w/ Mount Pipe	2	50.68	4.80	0.01	4919
85.0000	VHLP2-23	2	38.00	4.15	0.01	1638
75.0000	(4) HPA-65R-BUU-H8 w/ Mount Pipe	2	29.04	3.66	0.00	981

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 $\frac{P}{P_a}$
L1	100 - 63.0833 (1)	TP23.6275x14.76x0.281	36.9167	0.0000	0.0	39.00	21.1244	-12.51	823.85	0.015
L2	63.0833 - 50.8333 (2)	TP26.57x23.6275x0.5355	12.2500	0.0000	0.0	31.40	43.1618	-14.05	1355.19	0.010
L3	50.8333 - 32 (3)	TP30.5241x24.4982x0.552	23.0000	0.0000	0.0	31.62	53.3599	-19.56	1687.24	0.012
L4	32 - 4 (4)	TP37.2405x30.5241x0.572	28.0000	0.0000	0.0	32.10	67.6363	-26.87	2171.13	0.012
L5	4 - 0 (5)	TP38.2x37.2405x0.6335	4.0000	0.0000	0.0	33.66	76.6320	-28.10	2579.43	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x kip-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	100 - 63.0833 (1)	TP23.6275x14.76x0.281	451.63	45.13	39.00	1.157	0.00	0.00	39.00	0.000
L2	63.0833 - 50.8333 (2)	TP26.57x23.6275x0.5355	623.08	28.68	31.40	0.914	0.00	0.00	31.40	0.000
L3	50.8333 - 32 (3)	TP30.5241x24.4982x0.55	1140.8	35.38	31.62	1.119	0.00	0.00	31.62	0.000
L4	32 - 4 (4)	TP37.2405x30.5241x0.57	1828.0	36.46	32.10	1.136	0.00	0.00	32.10	0.000
L5	4 - 0 (5)	TP38.2x37.2405x0.6335	1931.6	33.23	33.66	0.987	0.00	0.00	33.66	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	100 - 63.0833 (1)	TP23.6275x14.76x0.281	20.90	0.99	26.00	0.077	0.21	0.01	26.00	0.000
L2	63.0833 - 50.8333 (2)	TP26.57x23.6275x0.5355	21.56	0.50	20.93	0.048	0.18	0.00	20.93	0.000
L3	50.8333 - 32 (3)	TP30.5241x24.4982x0.5529	23.45	0.44	21.08	0.042	0.08	0.00	21.08	0.000
L4	32 - 4 (4)	TP37.2405x30.5241x0.5729	25.73	0.38	21.40	0.036	0.08	0.00	21.40	0.000
L5	4 - 0 (5)	TP38.2x37.2405x0.6335	26.08	0.34	22.44	0.031	0.10	0.00	22.44	0.000

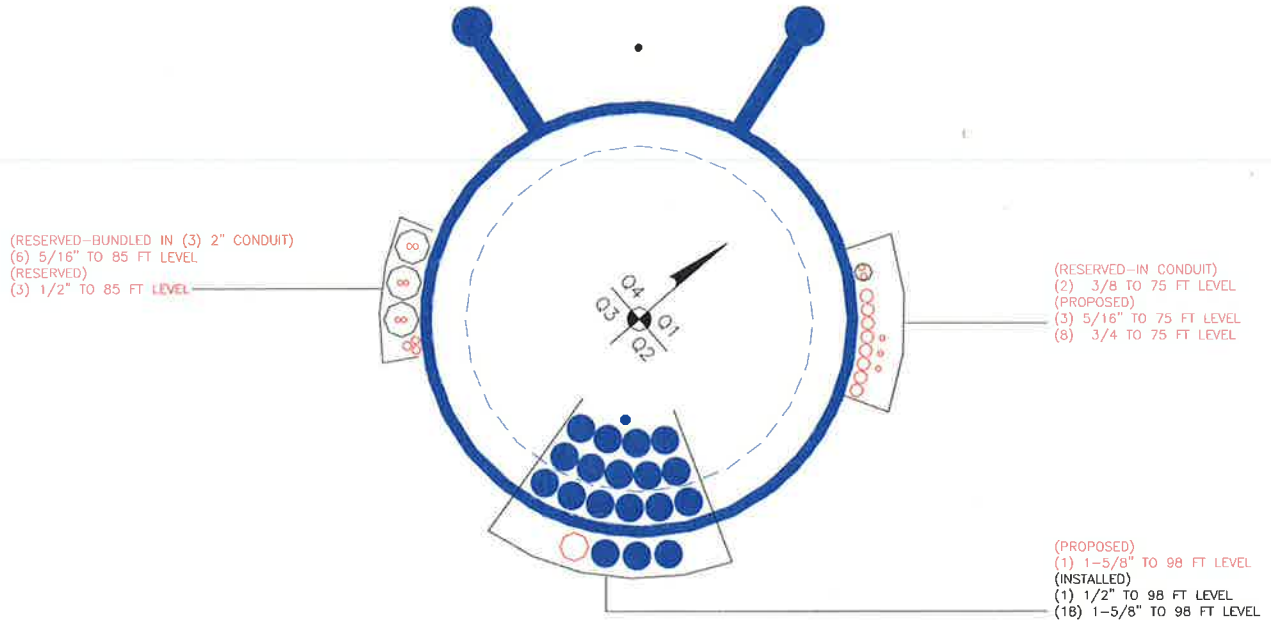
Pole Interaction Design Data

Section No.	Elevation ft	Ratio P P_a	Ratio f_{bx} F_{bx}	Ratio f_{by} F_{by}	Ratio f_v F_v	Ratio f_{vt} F_{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	100 - 63.0833 (1)	0.015	1.157	0.000	0.077	0.000	1.174	1.333	H1-3+VT ✓
L2	63.0833 - 50.8333 (2)	0.010	0.914	0.000	0.048	0.000	0.925	1.333	H1-3+VT ✓
L3	50.8333 - 32 (3)	0.012	1.119	0.000	0.042	0.000	1.131	1.333	H1-3+VT ✓
L4	32 - 4 (4)	0.012	1.136	0.000	0.036	0.000	1.148	1.333	H1-3+VT ✓
L5	4 - 0 (5)	0.011	0.987	0.000	0.031	0.000	0.998	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	100 - 63.0833	Pole	TP23.6275x14.76x0.281	1	-12.51	1098.19	88.1	Pass
L2	63.0833 - 50.8333	Pole	TP26.57x23.6275x0.5355	2	-14.05	1806.47	69.4	Pass
L3	50.8333 - 32	Pole	TP30.5241x24.4982x0.5529	3	-19.56	2249.09	84.8	Pass
L4	32 - 4	Pole	TP37.2405x30.5241x0.5729	4	-26.87	2894.12	86.2	Pass
L5	4 - 0	Pole	TP38.2x37.2405x0.6335	5	-28.10	3438.38	74.9	Pass
Summary								
Pole (L1)							88.1	Pass
RATING =							88.1	Pass

APPENDIX B BASE LEVEL DRAWING

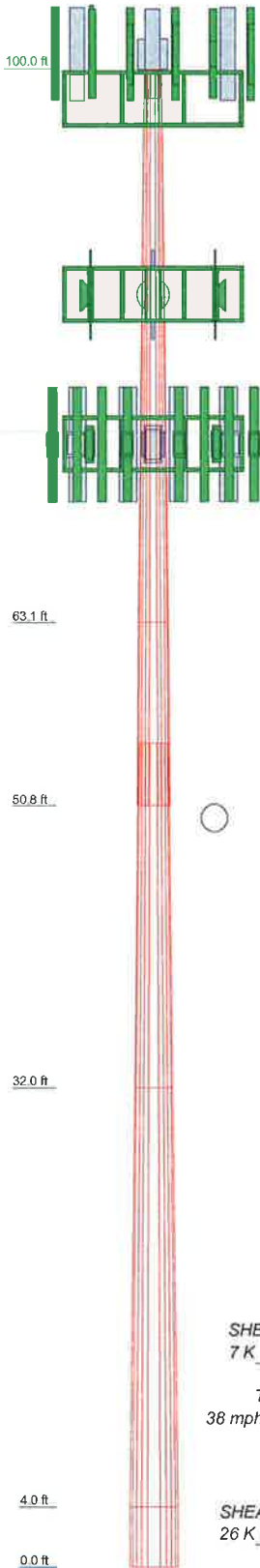


APPENDIX C

ADDITIONAL CALCULATIONS

Program Version 6.1.4.1 - 12/17/2013 File:G:/TOWER/375_Crown_Castle/2014/37514-2522 BU 806371/WO 965888 BU 806371 SDD
001/37514-2522.001.7700_Reinforced.eri

Section	1	2	3	4	5
Length (ft)	36.9167	12.2500	23.0000	28.0000	4.0000
Number of Sides	12	12	12	12	12
Thickness (in)	0.2810	0.5354	0.5529	0.5728	0.6335
Socket Length (ft)		4.1687			
Top Dia (in)	14.7600	23.6275	24.4982	30.5241	37.2405
Bot Dia (in)	23.6275	26.5700	30.5241	37.2405	39.2000
Grade	A572-65	Reinf 52.33 ksi	Reinf 52.70 ksi	Reinf 53.50 ksi	Reinf 53.10 ksi
Weight (K)	2.1	1.8	3.8	5.9	1.0



DESIGNED APPURTENANCE LOADING

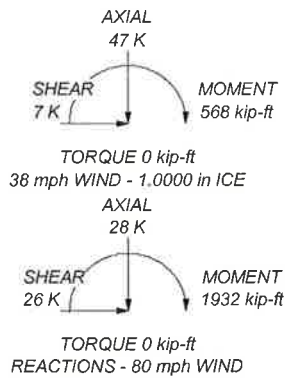
TYPE	ELEVATION	TYPE	ELEVATION
BXA-70063/6CFx2 w/ Mount Pipe	98	VHLP2-23	85
(2) DB844G65ZAXY w/ Mount Pipe	98	VHLP2-23	85
(2) RRH2x60-AWS	98	(2) RRUS 12-B2	75
(2) HBXX-6517DS-A2M w/ Mount Pipe	98	(2) RRUS A2	75
DB-T1-6Z-8AB-0Z	98	RRUS E2 B29	75
BXA-70063/6CFx4 w/ Mount Pipe	98	RRUS-32 B30	75
(2) DB844G65ZAXY w/ Mount Pipe	98	DC6-48-60-18-8F	75
RRH 2x60W-1900MHz	98	(4) HPA-65R-BUU-H8 w/ Mount Pipe	75
RRH2x60-AWS	98	KRF 102 361/1	75
(2) HBXX-6517DS-A2M w/ Mount Pipe	98	(3) RRU-11	75
BXA-70063/6CFx2 w/ Mount Pipe	98	RRUS 12-B2	75
(2) DB844G65ZAXY w/ Mount Pipe	98	(2) RRUS A2	75
GPS_A	98	RRUS E2 B29	75
(2) RRH 2x60W-1900MHz	98	RRUS-32 B30	75
(2) HBXX-6517DS-A2M w/ Mount Pipe	98	(2) DC6-48-60-18-8F	75
Platform Mount [LP 102-1]	98	(4) HPA-65R-BUU-H8 w/ Mount Pipe	75
LLPX310R W/ Mount Pipe	85	KRF 102 361/1	75
LLPX310R W/ Mount Pipe	85	(3) RRU-11	75
LLPX310R W/ Mount Pipe	85	(2) RRUS 12-B2	75
FDD_R6_RRH	85	(2) RRUS A2	75
FDD_R6_RRH	85	RRUS E2 B29	75
FDD_R6_RRH	85	RRUS-32 B30	75
Platform Mount [LP 601-1]	85	DC6-48-60-18-8F	75
6' x 2" Mount Pipe	85	Platform Mount [LP 1303-1]	75
6' x 2" Mount Pipe	85	(4) HPA-65R-BUU-H8 w/ Mount Pipe	75
6' x 2" Mount Pipe	85	KRF 102 361/1	75
VHLP2-23	85	(3) RRU-11	75

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	Reinf 53 50 ksi	54 ksi	67 ksi
Reinf 52 33 ksi	52 ksi	66 ksi	Reinf 56 10 ksi	56 ksi	71 ksi
Reinf 52 70 ksi	53 ksi	66 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: 88.1%



Paul J Ford and Company
 250 E. Broad Street Suite 600
 Columbus, OH 43215
 Phone: 614-221-6679
 FAX: 614-448.4105

Job: **100' MP; HRT 096 943227; Windsor, CT**

Project: **PJF# 37514-2522.001.7700 (BU# 806371)**

Client: **CCI** Drawn by: **Corey McCartney** App'd:

Code: **TIA/EIA-222-F** Date: **11/24/14** Scale: **NTS**

Path: **E-1** Dwg No **E-1**



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

Unfactored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, M =	1932.0		k-ft
Shear, V =	26.0		kips
Axial Load, P =	28.0		kips
OTM =	1938.5	0.0	k-ft @ Ground

Safety Factors / Load Factors / Φ Factors

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

Drilled Pier Parameters

Diameter =	6	ft
Height Above Grade =	0.25	ft
Depth Below Grade =	70	ft
fc' =	3	ksi
ec =	0.003	in/in
Mat Ftdn. Cap Width =		ft
Mat Ftdn. Cap Length =		ft
Depth Below Grade =		ft

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

Load Combinations Checked per TIA/EIA-222-F

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

Steel Parameters

Number of Bars =	24	
Rebar Size =	#8	
Rebar Fy =	60	ksi
Rebar MOE =	29000	ksi
Tie Size =	#4	
Side Clear Cover to Ties =	3	in

Soil Parameters

Water Table Depth =	10.00	ft
Depth to Ignore Soil =	5.00	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?	Ground	
Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)		
Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)		

Direct Embed Pole Shaft Parameters

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

Maximum Capacity Ratios

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

Define Soil Layers

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

Layer	Thickness ft	Unit Weight pcf	Cohesion psf	Friction Angle degrees	Soil Type	Ultimate End Bearing psf	Comp. Ult. Skin Friction psf	Tension Ult. Skin Friction psf	Depth ft
1	5	110	0	30	Sand	0	0		5
2	5	110	0	30	Sand	840	480		10
3	25	115	300	0	Clay	0	200		35
4	5	100	0	25	Sand	150	370		40
5	10	105	0	28	Sand	1720	660		50
6	5	110	0	30	Sand	480	1070		55
7	10	105	0	28	Sand	60	740		65
8	4	105	0	28	Sand	0	770		69
9	1	105	0	28	Sand	0	780		70
10									
11									
12									

Soil Results: Overturning

Depth to COR =	54.48	ft, from Grade
Bending Moment, M =	3355.06	k-ft, from COR
Resisting Moment, Ma =	34146.04	k-ft, from COR

MOMENT RATIO = 9.8% OK

Shear, V =	26.00	kips
Resisting Shear, Va =	264.61	kips

SHEAR RATIO = 9.8% OK

Soil Results: Uplift

Uplift, T =	0.00	kips
Allowable Uplift Cap., Ta =	153.67	kips

UPLIFT RATIO = 0.0% OK

Soil Results: Compression

Compression, C =	28.00	kips
Allowable Comp. Cap., Ca =	224.29	kips

COMPRESSION RATIO = 12.5% OK

Steel Results (ACI 318-02):

Minimum Steel Area =	13.57	sq in
Actual Steel Area =	18.96	sq in

Allowable Min Axial, Pa =	-787.57	kips, Where Ma = 0 k-ft
Allowable Max Axial, Pa =	4588.63	kips, Where Ma = 0 k-ft

Axial Load, P =	74.81	kips @ 27.50 ft Below Grade
Moment, M =	2329.35	k-ft @ 27.50 ft Below Grade
Allowable Moment, Ma =	2146.01	k-ft

SEE ATTACHED L-PILE CALCULATIONS

LPIle Plus for Windows, Version 6 (6.0.22)

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

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Files Used for Analysis

Path to file locations: T:\375_Crown_Castle\2014\37514-2522 BU 806371\WO 965888 BU 806371 SDD 001\LPile\
Name of input data file: 37514-2522.lp6d
Name of output report file: 37514-2522.lp6o
Name of plot output file: 37514-2522.lp6p
Name of runtime message file: 37514-2522.lp6r

Date and Time of Analysis

Date: November 24, 2014 Time: 12:39:04

Problem Title

Project Name: 806371, HRT 096 943227

Job Number: 37514-2522

Client: Crown Castle

Engineer: RH

Description: 100-ft Pole

Program Options

Engineering units are US Customary Units: pounds, inches, feet

Basic Program Options:

This analysis computes nonlinear bending stiffness and nominal moment capacity with pile response computed using nonlinear EI

Computation Options:

- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip

- Analysis for fixed-length pile or shaft only
- No computation of foundation stiffness matrix elements
- Output pile response for full length of pile
- Analysis assumes no soil movements acting on pile
- No p-y curves to be computed and output for user-specified depths

Solution Control Parameters:

- Number of pile increments = 100
- Maximum number of iterations allowed = 100
- Deflection tolerance for convergence = 1.0000E-04 in
- Maximum allowable deflection = 100.0000 in

Pile Response Output Options:

- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (nodal spacing of output points) = 1

Pile Structural Properties and Geometry

- Total Number of Sections = 1
- Total Pile Length = 70.00 ft
- Depth of ground surface below top of pile = 0.25 ft
- Slope angle of ground surface = 0.00 deg.

Pile dimensions used for p-y curve computations defined using 2 points. p-y curves are computed using values of pile diameter interpolated over the length of the pile.

Point	Depth X ft	Pile Diameter in
1	0.00000	72.0000000
2	70.000000	72.0000000

Input Structural Properties:

Pile Section No. 1:

- Section Type = Drilled Shaft (Bored Pile)
- Section Length = 70.000 ft
- Section Diameter = 72.000 in

Ground Slope and Pile Batter Angles

- Ground Slope Angle = 0.000 degrees
= 0.000 radians
- Pile Batter Angle = 0.000 degrees
= 0.000 radians

 Soil and Rock Layering Information

The soil profile is modelled using 7 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer = 0.250 ft
 Distance from top of pile to bottom of layer = 5.250 ft

Layer 2 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 5.250 ft
 Distance from top of pile to bottom of layer = 10.250 ft
 p-y subgrade modulus k for top of soil layer = 25.000 lbs/in**3
 p-y subgrade modulus k for bottom of layer = 25.000 lbs/in**3

Layer 3 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer = 10.250 ft
 Distance from top of pile to bottom of layer = 35.250 ft

Layer 4 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 35.250 ft
 Distance from top of pile to bottom of layer = 40.250 ft
 p-y subgrade modulus k for top of soil layer = 20.000 lbs/in**3
 p-y subgrade modulus k for bottom of layer = 20.000 lbs/in**3

Layer 5 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 40.250 ft
 Distance from top of pile to bottom of layer = 50.250 ft
 p-y subgrade modulus k for top of soil layer = 20.000 lbs/in**3
 p-y subgrade modulus k for bottom of layer = 20.000 lbs/in**3

Layer 6 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 50.250 ft
 Distance from top of pile to bottom of layer = 55.250 ft
 p-y subgrade modulus k for top of soil layer = 60.000 lbs/in**3
 p-y subgrade modulus k for bottom of layer = 60.000 lbs/in**3

Layer 7 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 55.250 ft
 Distance from top of pile to bottom of layer = 85.250 ft
 p-y subgrade modulus k for top of soil layer = 20.000 lbs/in**3
 p-y subgrade modulus k for bottom of layer = 20.000 lbs/in**3

(Depth of lowest layer extends 15.25 ft below pile tip)

 Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 14 points

Point No.	Depth X ft	Eff. Unit Weight pcf

1	0.25	110.00000
2	5.25	110.00000
3	5.25	110.00000
4	10.25	110.00000
5	10.25	53.00000
6	35.25	53.00000
7	35.25	38.00000
8	40.25	38.00000
9	40.25	43.00000
10	50.25	43.00000
11	50.25	48.00000
12	55.25	48.00000
13	55.25	43.00000
14	85.25	43.00000

Summary of Soil Properties

Layer Emass Num.	Soil Type krm Test Type (p-y Curve Criteria)	Depth Test Prop. ft	Eff. Unit Elas. Subgr. Wt., pcf	Cohesion psf	Friction Ang., deg.	qu psi	RQD percent	Epsilon 50 pci	kpy psi	Rock
1	Soft Clay	0.250	110.000	1.00E-03	-	-	0.00	-	-	-
		5.250	110.000	1.00E-03	-	-	0.00	-	-	-
2	Sand (Reese, et al.)	5.250	110.000	-	30.000	-	-	25.000	-	-
		10.250	110.000	-	30.000	-	-	25.000	-	-
3	Soft Clay	10.250	53.000	300.000	-	-	0.03000	-	-	-
		35.250	53.000	300.000	-	-	0.03000	-	-	-
4	Sand (Reese, et al.)	35.250	38.000	-	25.000	-	-	20.000	-	-
		40.250	38.000	-	25.000	-	-	20.000	-	-
5	Sand (Reese, et al.)	40.250	43.000	-	28.000	-	-	20.000	-	-
		50.250	43.000	-	28.000	-	-	20.000	-	-
6	Sand (Reese, et al.)	50.250	48.000	-	30.000	-	-	60.000	-	-
		55.250	48.000	-	30.000	-	-	60.000	-	-
7	Sand (Reese, et al.)	55.250	43.000	-	28.000	-	-	20.000	-	-
		85.250	43.000	-	28.000	-	-	20.000	-	-

Loading Type

Static loading criteria were used when computing p-y curves for all analyses.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load No.	Load Type	Condition 1	Condition 2	Axial Thrust
			Force, lbs	
1	V	= 26000.000 lbs	M = 23184000.000 in-lbs	28000.000

V = perpendicular shear force applied to pile head

M = bending moment applied to pile head

y = lateral deflection relative to pile axis

S = pile slope relative to original pile batter angle

R = rotational stiffness applied to pile head

Axial thrust is assumed to be acting axially

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Dimensions and Properties of Drilled Shaft:

Length of Section	=	70.00000000 ft
Shaft Diameter	=	72.00000000 in
Concrete Cover Thickness	=	3.00000000 in
Number of Reinforcing Bars	=	24 bars
Yield Stress of Reinforcing Bars	=	60.00000000 ksi
Modulus of Elasticity of Reinforcing Bars	=	29000. ksi
Gross Area of Shaft	=	4071.50407905 sq. in.
Total Area of Reinforcing Steel	=	18.96000000 sq. in.
Area Ratio of Steel Reinforcement	=	0.47 percent
Edge-to-Edge Bar Spacing	=	7.48420249 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	11471.588 kips
Tensile Load for Cracking of Concrete	=	-1530.869 kips
Nominal Axial Tensile Capacity	=	-1137.600 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
1	1.00000	0.79000	32.50000	0.00000
2	1.00000	0.79000	31.39259	8.41162
3	1.00000	0.79000	28.14583	16.25000
4	1.00000	0.79000	22.98097	22.98097
5	1.00000	0.79000	16.25000	28.14583
6	1.00000	0.79000	8.41162	31.39259
7	1.00000	0.79000	0.00000	32.50000
8	1.00000	0.79000	-8.41162	31.39259
9	1.00000	0.79000	-16.25000	28.14583

10	1.00000	0.79000	-22.98097	22.98097
11	1.00000	0.79000	-28.14583	16.25000
12	1.00000	0.79000	-31.39259	8.41162
13	1.00000	0.79000	-32.50000	0.00000
14	1.00000	0.79000	-31.39259	-8.41162
15	1.00000	0.79000	-28.14583	-16.25000
16	1.00000	0.79000	-22.98097	-22.98097
17	1.00000	0.79000	-16.25000	-28.14583
18	1.00000	0.79000	-8.41162	-31.39259
19	1.00000	0.79000	0.00000	-32.50000
20	1.00000	0.79000	8.41162	-31.39259
21	1.00000	0.79000	16.25000	-28.14583
22	1.00000	0.79000	22.98097	-22.98097
23	1.00000	0.79000	28.14583	-16.25000
24	1.00000	0.79000	31.39259	-8.41162

Concrete Properties:

Compressive Strength of Concrete	=	3.0000000 ksi
Modulus of Elasticity of Concrete	=	3122.0185778 ksi
Modulus of Rupture of Concrete	=	-0.4107919 ksi
Compression Strain at Peak Stress	=	0.0016336
Tensile Strain at Fracture of Concrete	=	-0.0001160
Maximum Coarse Aggregate Size	=	0.7500000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 1

Number	Axial Thrust Force kips
1	28.000

Definitions of Run Messages and Notes:

- C = concrete in section has cracked in tension
- Y = stress in reinforcing steel has reached yield stress
- T = tensile strain in reinforcement exceeds 0.005 when compressive strain in concrete is less than 0.003.
- Z = depth of tensile zone in concrete section is less than 10 percent of section depth
- Bending Stiffness (EI) = Bending Moment / Curvature
- Position of neutral axis is computed from compression side of pile
- Compressive stresses are positive in sign. Tensile stresses are negative in sign.

Axial Thrust Force = 28.000 kips

Bending Curvature rad/in.	Bending Moment in-kip	Bending Stiffness kip-in ²	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain ksi	Max Concrete Stress ksi	Max Steel Stress ksi	Run
0.000000417	2118.3687460	5084084990.	40.3703974	0.0000768	-0.0000132	0.0609195	0.4834590	
0.000000833	4224.4828217	5069379386.	38.1934538	0.0000318	-0.0000282	0.1146832	0.9143085	
0.000001250	6318.1141795	5054491344.	37.4678612	0.0000468	-0.0000432	0.1679509	1.3451600	
0.000001667	8399.2623786	5039557427.	37.1050991	0.0000618	-0.0000582	0.2207225	1.7760131	
0.000002083	10468.	5024605141.	36.8874687	0.0000768	-0.0000732	0.2729980	2.2068678	
0.000002500	12524.	5009643658.	36.7424035	0.0000919	-0.0000881	0.3247774	2.6377242	
0.000002917	14568.	4994676919.	36.6388045	0.0001069	-0.0001031	0.3760606	3.0685822	
0.000003333	14568.	4370342304.	17.1391754	0.0000571	-0.0001829	0.2019141	-5.2684131	C
0.000003750	14568.	3884748715.	16.8559010	0.0000632	-0.0002068	0.2229062	-5.9577708	C
0.000004167	14568.	3496273843.	16.6209959	0.0000693	-0.0002307	0.2436976	-6.6481297	C

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0.000004583	14568.	3178430767.	16.4295999	0.0000753	-0.0002547	0.2644238	-7.3383823	C
0.000005000	14568.	2913561536.	16.2708381	0.0000814	-0.0002786	0.2850845	-8.0285285	C
0.000005417	14568.	2689441418.	16.1337539	0.0000874	-0.0003026	0.3056152	-8.7191061	C
0.000005833	14568.	2497338460.	16.0135959	0.0000934	-0.0003266	0.3260142	-9.4101333	C
0.000006250	14568.	2330849229.	15.9100690	0.0000994	-0.0003506	0.3463488	-10.1010500	C
0.000006667	14568.	2185171152.	15.8200566	0.0001055	-0.0003745	0.3666190	-10.7918557	C
0.000007083	14568.	2056631673.	15.7411757	0.0001115	-0.0003985	0.3868247	-11.4825501	C
0.000007500	14568.	1942374357.	15.6715725	0.0001175	-0.0004225	0.4069656	-12.1731330	C
0.000007917	14568.	1840144128.	15.6097838	0.0001236	-0.0004464	0.4270418	-12.8636038	C
0.000008333	14568.	1748136922.	15.5546390	0.0001296	-0.0004704	0.4470531	-13.5539622	C
0.000008750	14568.	1664892306.	15.5051903	0.0001357	-0.0004943	0.4669994	-14.2442079	C
0.000009167	14568.	1589215383.	15.4595542	0.0001417	-0.0005183	0.4868464	-14.9346351	C
0.000009583	14568.	1520119062.	15.4169957	0.0001477	-0.0005423	0.5065868	-15.6253099	C
0.0000100	14568.	1456780768.	15.3783930	0.0001538	-0.0005662	0.5262630	-16.3158660	C
0.0000104	14568.	1398509537.	15.3432728	0.0001598	-0.0005902	0.5458748	-17.0063030	C
0.0000108	14568.	1344720709.	15.3112347	0.0001659	-0.0006141	0.5654223	-17.6966204	C
0.0000113	14568.	1294916238.	15.2819375	0.0001719	-0.0006381	0.5849053	-18.3868179	C
0.0000117	14568.	1248669230.	15.2550887	0.0001780	-0.0006620	0.6043236	-19.0768949	C
0.0000121	14568.	1205611670.	15.2304364	0.0001840	-0.0006860	0.6236771	-19.7668512	C
0.0000125	14568.	1165424614.	15.2077621	0.0001901	-0.0007099	0.6429658	-20.4566862	C
0.0000129	14568.	1127830272.	15.1868754	0.0001962	-0.0007338	0.6621894	-21.1463995	C
0.0000133	14568.	1092585576.	15.1676100	0.0002022	-0.0007578	0.6813480	-21.8359908	C
0.0000138	14568.	1059476922.	15.1498196	0.0002083	-0.0007817	0.7004413	-22.5254594	C
0.0000142	14568.	1028315836.	15.1333751	0.0002144	-0.0008056	0.7194692	-23.2148054	C
0.0000146	14568.	998935384.	15.1181621	0.0002205	-0.0008295	0.7384317	-23.9040276	C
0.0000150	14568.	971187179.	15.1040792	0.0002266	-0.0008534	0.7573286	-24.5931258	C
0.0000154	14568.	944938877.	15.0910356	0.0002327	-0.0008773	0.7761598	-25.2820997	C
0.0000158	14568.	920072064.	15.0789504	0.0002388	-0.0009012	0.7949251	-25.9709488	C
0.0000163	14568.	896480473.	15.0677508	0.0002449	-0.0009251	0.8136244	-26.6596727	C
0.0000171	14568.	852749718.	15.0477527	0.0002571	-0.0009729	0.8508248	-28.0367424	C
0.0000179	14568.	813086940.	15.0305901	0.0002693	-0.0010207	0.8877598	-29.4133058	C
0.0000188	14568.	776949743.	15.0158918	0.0002815	-0.0010685	0.9244284	-30.7893588	C
0.0000196	14568.	743888052.	15.0033500	0.0002938	-0.0011162	0.9608296	-32.1648979	C
0.0000204	14568.	713525274.	14.9927071	0.0003061	-0.0011639	0.9969624	-33.5399183	C
0.0000213	14568.	685543891.	14.9837462	0.0003184	-0.0012116	1.0328258	-34.9144166	C
0.0000221	14799.	670136049.	14.9762831	0.0003307	-0.0012593	1.0684187	-36.2883889	C
0.0000229	15328.	668861840.	14.9701604	0.0003431	-0.0013069	1.1037401	-37.6618310	C
0.0000238	15857.	667656806.	14.9652432	0.0003554	-0.0013546	1.1387888	-39.0347388	C
0.0000246	16385.	666513783.	14.9614145	0.0003678	-0.0014022	1.1735638	-40.4071082	C
0.0000254	16913.	665426542.	14.9585731	0.0003802	-0.0014498	1.2080639	-41.7789350	C
0.0000263	17440.	664389646.	14.9566307	0.0003926	-0.0014974	1.2422881	-43.1502149	C
0.0000271	17967.	663398322.	14.9555096	0.0004050	-0.0015450	1.2762353	-44.5209434	C
0.0000279	18493.	662448368.	14.9551419	0.0004175	-0.0015925	1.3099043	-45.8911163	C
0.0000288	19019.	661536068.	14.9554674	0.0004300	-0.0016400	1.3432939	-47.2607289	C
0.0000296	19544.	660658120.	14.9564329	0.0004425	-0.0016875	1.3764030	-48.6297769	C
0.0000304	20069.	659811586.	14.9579909	0.0004550	-0.0017350	1.4092305	-49.9982555	C
0.0000313	20594.	658993837.	14.9600991	0.0004675	-0.0017825	1.4417751	-51.3661601	C
0.0000321	21117.	658202518.	14.9627200	0.0004801	-0.0018299	1.4740356	-52.7334859	C
0.0000329	21641.	657435509.	14.9658194	0.0004926	-0.0018774	1.5060108	-54.1002282	C
0.0000338	22163.	656690898.	14.9693671	0.0005052	-0.0019248	1.5376994	-55.4663819	C
0.0000346	22686.	655966957.	14.9733356	0.0005178	-0.0019722	1.5691004	-56.8319423	C
0.0000354	23207.	655262118.	14.9777000	0.0005305	-0.0020195	1.6002122	-58.1969041	C
0.0000363	23728.	654574957.	14.9824379	0.0005431	-0.0020669	1.6310338	-59.5612623	C
0.0000371	24249.	653904174.	14.9875290	0.0005558	-0.0021142	1.6615638	-60.0000000	CY
0.0000379	24769.	653248585.	14.9929549	0.0005685	-0.0021615	1.6918008	-60.0000000	CY
0.0000387	25277.	652321812.	14.9965548	0.0005811	-0.0022089	1.7215444	-60.0000000	CY
0.0000396	25731.	650056374.	14.9901611	0.0005934	-0.0022566	1.7500225	-60.0000000	CY
0.0000404	26090.	645514580.	14.9662145	0.0006049	-0.0023051	1.7764914	-60.0000000	CY
0.0000412	26446.	641103418.	14.9432703	0.0006164	-0.0023536	1.8026804	-60.0000000	CY
0.0000421	26781.	636371845.	14.9175966	0.0006278	-0.0024022	1.8282346	-60.0000000	CY
0.0000429	27052.	630342965.	14.8810188	0.0006386	-0.0024514	1.8523531	-60.0000000	CY
0.0000437	27309.	624202170.	14.8433187	0.0006494	-0.0025006	1.8759734	-60.0000000	CY
0.0000446	27565.	618285127.	14.8073180	0.0006602	-0.0025498	1.8993769	-60.0000000	CY
0.0000454	27821.	612579488.	14.7729247	0.0006709	-0.0025991	1.9225627	-60.0000000	CY
0.0000462	28077.	607067868.	14.7386423	0.0006817	-0.0026483	1.9453881	-60.0000000	CY
0.0000471	28297.	601002335.	14.6976467	0.0006920	-0.0026980	1.9671650	-60.0000000	CY

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0.0000479	28469.	594137189.	14.6482065	0.0007019	-0.0027481	1.9877058	-60.0000000	CY
0.0000487	28641.	587503119.	14.6006772	0.0007118	-0.0027982	2.0080630	-60.0000000	CY
0.0000496	28812.	581088456.	14.5549635	0.0007217	-0.0028483	2.0282360	-60.0000000	CY
0.0000529	29497.	557416226.	14.3885698	0.0007614	-0.0030486	2.1070744	-60.0000000	CY
0.0000562	30046.	534157192.	14.2172188	0.0007997	-0.0032503	2.1799146	-60.0000000	CY
0.0000596	30472.	511419370.	14.0432597	0.0008367	-0.0034533	2.2472703	-60.0000000	CY
0.0000629	30891.	490987165.	13.8779490	0.0008732	-0.0036568	2.3106567	-60.0000000	CY
0.0000662	31308.	472566398.	13.7310792	0.0009097	-0.0038603	2.3714568	-60.0000000	CY
0.0000696	31603.	454169685.	13.5727462	0.0009444	-0.0040656	2.4266009	-60.0000000	CY
0.0000729	31841.	436682002.	13.4184253	0.0009784	-0.0042716	2.4780453	-60.0000000	CY
0.0000762	32077.	420685117.	13.2756965	0.0010123	-0.0044777	2.5268610	-60.0000000	CY
0.0000796	32308.	405968188.	13.1386262	0.0010456	-0.0046844	2.5725859	-60.0000000	CY
0.0000829	32538.	392418644.	13.0141324	0.0010791	-0.0048909	2.6161572	-60.0000000	CY
0.0000862	32766.	379900860.	12.9007812	0.0011127	-0.0050973	2.6575493	-60.0000000	CY
0.0000896	32968.	368013588.	12.7905569	0.0011458	-0.0053042	2.6960248	-60.0000000	CY
0.0000929	33102.	356252709.	12.6723103	0.0011775	-0.0055125	2.7305813	-60.0000000	CY
0.0000963	33220.	345139481.	12.5560554	0.0012085	-0.0057215	2.7624371	-60.0000000	CY
0.0000996	33333.	334728135.	12.4419144	0.0012390	-0.0059310	2.7917434	-60.0000000	CY
0.0001029	33446.	324982745.	12.3362701	0.0012696	-0.0061404	2.8192234	-60.0000000	CY
0.0001063	33558.	315840494.	12.2383378	0.0013003	-0.0063497	2.8448561	-60.0000000	CY
0.0001096	33669.	307246189.	12.1474290	0.0013312	-0.0065588	2.8686198	-60.0000000	CY
0.0001129	33779.	299151151.	12.0629369	0.0013621	-0.0067679	2.8904923	-60.0000000	CY
0.0001163	33888.	291512281.	11.9843249	0.0013932	-0.0069768	2.9104510	-60.0000000	CY
0.0001196	33996.	284291282.	11.9111169	0.0014244	-0.0071856	2.9284728	-60.0000000	CY
0.0001229	34102.	277439502.	11.8385377	0.0014552	-0.0073948	2.9442664	-60.0000000	CY
0.0001263	34205.	270930552.	11.7673244	0.0014856	-0.0076044	2.9579571	-60.0000000	CY
0.0001296	34302.	264713087.	11.6990965	0.0015160	-0.0078140	2.9696889	-60.0000000	CY
0.0001329	34362.	258520192.	11.6224447	0.0015448	-0.0080252	2.9790250	-60.0000000	CY
0.0001363	34414.	252576364.	11.5480367	0.0015734	-0.0082366	2.9865969	-60.0000000	CY
0.0001396	34460.	246878662.	11.4763970	0.0016019	-0.0084481	2.9924601	-60.0000000	CY
0.0001429	34506.	241442260.	11.4088807	0.0016305	-0.0086595	2.9966621	-60.0000000	CY
0.0001462	34551.	236249203.	11.3452170	0.0016592	-0.0088708	2.9991822	-60.0000000	CY
0.0001496	34596.	231283084.	11.2851652	0.0016881	-0.0090819	2.9998621	-60.0000000	CY
0.0001529	34640.	226527247.	11.2286871	0.0017171	-0.0092929	2.9940916	-60.0000000	CY
0.0001562	34683.	221970507.	11.1753106	0.0017461	-0.0095039	2.9964535	-60.0000000	CY
0.0001596	34723.	217587076.	11.1197911	0.0017745	-0.0097155	2.9988933	-60.0000000	CY
0.0001629	34762.	213374247.	11.0651099	0.0018027	-0.0099273	2.9999477	-60.0000000	CY
0.0001662	34800.	209325291.	11.0135487	0.0018310	-0.0101390	2.9962832	-60.0000000	CY
0.0001696	34838.	205432247.	10.9646846	0.0018594	-0.0103506	2.9929159	-60.0000000	CY
0.0001729	34875.	201686842.	10.9182582	0.0018879	-0.0105621	2.9963654	-60.0000000	CY
0.0001762	34912.	198080657.	10.8741397	0.0019166	-0.0107734	2.9986819	-60.0000000	CY
0.0001796	34948.	194605893.	10.8322095	0.0019453	-0.0109847	2.9998507	-60.0000000	CY
0.0001829	34984.	191253980.	10.7925687	0.0019741	-0.0111959	2.9976462	-60.0000000	CY
0.0002029	35188.	173410924.	10.5922454	0.0021493	-0.0124607	2.9990789	60.0000000	CY
0.0002229	35366.	158653322.	10.4371221	0.0023266	-0.0137234	2.9990414	60.0000000	CY
0.0002429	35433.	145865123.	10.2465112	0.0024890	-0.0150010	2.9872583	60.0000000	CY
0.0002629	35487.	134972462.	10.0869532	0.0026520	-0.0162780	2.9994217	60.0000000	CY
0.0002829	35536.	125605402.	9.9570219	0.0028170	-0.0175530	2.9868935	60.0000000	CY
0.0003029	35583.	117467375.	9.8488371	0.0029834	-0.0188266	2.9948273	60.0000000	CY
0.0003229	35625.	110322368.	9.7607759	0.0031519	-0.0200981	2.9985234	60.0000000	CY
0.0003429	35657.	103981978.	9.6848053	0.0033211	-0.0213689	2.9828277	60.0000000	CY
0.0003629	35686.	98330888.	9.6096316	0.0034875	-0.0226425	2.9874128	60.0000000	CY
0.0003829	35709.	93254363.	9.5515760	0.0036575	-0.0239125	2.9978382	60.0000000	CY
0.0004029	35728.	88674429.	9.5046155	0.0038296	-0.0251804	2.9957918	60.0000000	CY

Summary of Results for Nominal (Unfactored) Moment Capacity for Section 1

Moment values interpolated at maximum compressive strain = 0.003 or maximum developed moment if pile fails at smaller strains.

Load No.	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain
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1 28.000 35586.979 0.00300000

Note note that the values of moment capacity in the table above are not factored by a strength reduction factor (phi-factor).

In ACI 318-08, the value of the strength reduction factor depends on whether the transverse reinforcing steel bars are spirals or tied hoops.

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318-08, Section 9.3.2.2 or the value required by the design standard being followed.

Computed Values of Pile Loading and Deflection
for Lateral Loading for Load Case Number 1

Pile-head conditions are Shear and Moment (Loading Type 1)

Horizontal shear force at pile head = 26000.000 lbs
Applied moment at pile head = 23184000.000 in-lbs
Axial thrust load on pile head = 28000.000 lbs

Depth	Deflect.	Bending	Shear	Slope	Total	Bending	Soil Res.	Soil Spr.	Distrib.
X	y	Moment	Force	S	Stress	Stiffness	p	Es*h	Lat. Load
inches	inches	in-lbs	lbs	radians	psi*	lb-in^2	lb/in	lb/inch	lb/inch
0.00	2.0706	23184000.	26000.	-0.0123	0.000	6.550E+11	0.000	0.000	0.000
8.400	1.9684	23405262.	26000.	-0.0120	0.000	6.550E+11	-0.001840	0.007852	0.000
16.800	1.8687	23626453.	26000.	-0.0117	0.000	6.550E+11	-0.001808	0.008128	0.000
25.200	1.7716	23847573.	26000.	-0.0114	0.000	6.544E+11	-0.001776	0.008423	0.000
33.600	1.6770	24068621.	26000.	-0.0111	0.000	6.541E+11	-0.001744	0.008737	0.000
42.000	1.5850	24289596.	26000.	-0.0108	0.000	6.539E+11	-0.001712	0.009072	0.000
50.400	1.4957	24510497.	26000.	-0.0105	0.000	6.536E+11	-0.001679	0.009429	0.000
58.800	1.4090	24731324.	26000.	-0.0102	0.000	6.533E+11	-0.001646	0.009812	0.000
67.200	1.3249	24952076.	25514.	-0.009844	0.000	6.529E+11	-115.7850	734.0820	0.000
75.600	1.2436	25164583.	23533.	-0.009522	0.000	6.525E+11	-355.7429	2402.9566	0.000
84.000	1.1649	25351913.	19505.	-0.009196	0.000	6.519E+11	-603.3650	4350.6433	0.000
92.400	1.0891	25496592.	13608.	-0.008869	0.000	6.512E+11	-800.6744	6175.6151	0.000
100.800	1.0160	25584699.	6211.9968	-0.008539	0.000	6.508E+11	-960.2704	7939.6151	0.000
109.200	0.9456	25604971.	-2409.0604	-0.008209	0.000	6.507E+11	-1092.3623	9703.6151	0.000
117.600	0.8780	25548088.	-12032.	-0.007879	0.000	6.510E+11	-1198.7013	11468.	0.000
126.000	0.8133	25406547.	-18334.	-0.007550	0.000	6.517E+11	-301.8749	3118.0436	0.000
134.400	0.7512	25243629.	-20866.	-0.007224	0.000	6.524E+11	-301.0672	3366.5429	0.000
142.800	0.6919	25059391.	-23390.	-0.006900	0.000	6.527E+11	-299.8069	3639.8498	0.000
151.200	0.6353	24853923.	-25901.	-0.006579	0.000	6.531E+11	-298.0861	3941.4166	0.000
159.600	0.5814	24627347.	-28396.	-0.006261	0.000	6.534E+11	-295.8962	4275.3330	0.000
168.000	0.5301	24379818.	-30870.	-0.005946	0.000	6.537E+11	-293.2278	4646.4744	0.000
176.400	0.4815	24111525.	-33320.	-0.005634	0.000	6.541E+11	-290.0708	5060.6954	0.000
184.800	0.4354	23822692.	-35741.	-0.005327	0.000	6.545E+11	-286.4136	5525.0846	0.000
193.200	0.3920	23513577.	-38127.	-0.005023	0.000	6.549E+11	-281.5867	6034.2205	0.000
201.600	0.3511	23184523.	-40450.	-0.004724	0.000	6.553E+11	-271.4246	6494.5343	0.000
210.000	0.3126	22836248.	-42686.	-0.004429	0.000	6.558E+11	-261.1354	7016.4185	0.000
218.400	0.2767	22469477.	-44836.	-0.004139	0.000	6.563E+11	-250.7088	7612.1656	0.000
226.800	0.2431	22084950.	-46898.	-0.003854	0.000	6.568E+11	-240.1324	8297.4785	0.000
235.200	0.2119	21683411.	-48870.	-0.003574	0.000	6.574E+11	-229.3912	9092.7267	0.000
243.600	0.1831	21265622.	-50751.	-0.003300	0.000	6.580E+11	-218.4668	10025.	0.000
252.000	0.1565	20832354.	-52539.	-0.003031	0.000	6.586E+11	-207.3367	11130.	0.000
260.400	0.1321	20384394.	-54233.	-0.002768	0.000	6.593E+11	-195.9727	12458.	0.000
268.800	0.1100	19922545.	-55830.	-0.002512	0.000	6.600E+11	-184.3383	14080.	0.000
277.200	0.0899	19447630.	-57328.	-0.002261	0.000	6.608E+11	-172.3857	16100.	0.000
285.600	0.0720	18960493.	-58725.	-0.002017	0.000	6.616E+11	-160.0503	18677.	0.000
294.000	0.0560	18462006.	-60015.	-0.001780	0.000	6.625E+11	-147.2405	22067.	0.000

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302.400	0.0421	17953074.	-61196.	-0.001549	0.000	6.634E+11	-133.8197	26713.	0.000
310.800	0.0300	17434647.	-62260.	-0.001325	0.000	6.644E+11	-119.5685	33456.	0.000
319.200	0.0198	16907731.	-63199.	-0.001108	0.000	6.654E+11	-104.0937	44130.	0.000
327.600	0.0114	16373421.	-64000.	-0.000899	0.000	6.665E+11	-86.5574	63784.	0.000
336.000	0.004718	15832954.	-64634.	-0.000696	0.000	6.677E+11	-64.4592	114772.	0.000
344.400	-0.000291	15287892.	-64796.	-0.000500	0.000	6.690E+11	26.0129	752042.	0.000
352.800	-0.003686	14744620.	-64436.	-0.000358	0.000	1.329E+12	59.5402	135676.	0.000
361.200	-0.006299	14205528.	-63888.	-0.000291	0.000	3.026E+12	71.0668	94770.	0.000
369.600	-0.008581	13671441.	-63259.	-0.000260	0.000	5.001E+12	78.7769	77119.	0.000
378.000	-0.0107	13142907.	-62572.	-0.000238	0.000	5.005E+12	84.7090	66692.	0.000
386.400	-0.0126	12620345.	-61840.	-0.000216	0.000	5.009E+12	89.4722	59778.	0.000
394.800	-0.0143	12104091.	-61072.	-0.000195	0.000	5.012E+12	93.3905	54865.	0.000
403.200	-0.0159	11594422.	-60274.	-0.000175	0.000	5.016E+12	96.6601	51216.	0.000
411.600	-0.0172	11091568.	-59451.	-0.000156	0.000	5.019E+12	99.4098	48421.	0.000
420.000	-0.0185	10595725.	-58606.	-0.000138	0.000	5.024E+12	101.7301	46237.	0.000
428.400	-0.0196	10107055.	-57799.	-0.000121	0.000	5.027E+12	90.4531	38827.	0.000
436.800	-0.0205	9624764.	-57006.	-0.000105	0.000	5.030E+12	98.2697	40238.	0.000
445.200	-0.0213	9149403.	-56149.	-8.885E-05	0.000	5.033E+12	105.7346	41649.	0.000
453.600	-0.0220	8681499.	-55231.	-7.397E-05	0.000	5.037E+12	112.8142	43061.	0.000
462.000	-0.0226	8221552.	-54256.	-5.988E-05	0.000	5.041E+12	119.4793	44472.	0.000
470.400	-0.0230	7770032.	-53226.	-4.656E-05	0.000	5.043E+12	125.7040	45883.	0.000
478.800	-0.0233	7327379.	-52146.	-3.399E-05	0.000	5.046E+12	131.4664	47294.	0.000
487.200	-0.0236	6893999.	-51076.	-2.216E-05	0.000	5.049E+12	123.1534	43863.	0.000
495.600	-0.0237	6469307.	-50022.	-1.105E-05	0.000	5.053E+12	127.8593	45275.	0.000
504.000	-0.0238	6053633.	-48930.	-6.435E-07	0.000	5.056E+12	132.1095	46686.	0.000
512.400	-0.0237	5647279.	-47805.	9.075E-06	0.000	5.058E+12	135.8919	48097.	0.000
520.800	-0.0236	5250511.	-46649.	1.812E-05	0.000	5.061E+12	139.1976	49508.	0.000
529.200	-0.0234	4863562.	-45468.	2.651E-05	0.000	5.063E+12	142.0208	50919.	0.000
537.600	-0.0232	4486633.	-44265.	3.427E-05	0.000	5.067E+12	144.3582	52331.	0.000
546.000	-0.0229	4119888.	-43045.	4.140E-05	0.000	5.070E+12	146.2097	53742.	0.000
554.400	-0.0225	3763458.	-41811.	4.793E-05	0.000	5.071E+12	147.5775	55153.	0.000
562.800	-0.0220	3417440.	-40568.	5.388E-05	0.000	5.073E+12	148.4661	56564.	0.000
571.200	-0.0216	3081896.	-39319.	5.926E-05	0.000	5.075E+12	148.8827	57975.	0.000
579.600	-0.0211	2756855.	-38068.	6.409E-05	0.000	5.077E+12	148.8363	59387.	0.000
588.000	-0.0205	2442316.	-36820.	6.839E-05	0.000	5.080E+12	148.3381	60798.	0.000
596.400	-0.0199	2138243.	-35578.	7.217E-05	0.000	5.084E+12	147.4014	62209.	0.000
604.800	-0.0193	1844569.	-33214.	7.546E-05	0.000	5.084E+12	415.4008	180962.	0.000
613.200	-0.0186	1580205.	-29744.	7.829E-05	0.000	5.084E+12	410.8617	185196.	0.000
621.600	-0.0180	1344831.	-26317.	8.071E-05	0.000	5.084E+12	405.1761	189429.	0.000
630.000	-0.0173	1138046.	-22942.	8.276E-05	0.000	5.084E+12	398.3862	193663.	0.000
638.400	-0.0166	959371.	-19628.	8.449E-05	0.000	5.084E+12	390.5314	197896.	0.000
646.800	-0.0159	808251.	-16385.	8.595E-05	0.000	5.084E+12	381.6476	202130.	0.000
655.200	-0.0151	684060.	-13221.	8.718E-05	0.000	5.084E+12	371.7661	206364.	0.000
663.600	-0.0144	586100.	-11119.	8.823E-05	0.000	5.084E+12	128.6787	75086.	0.000
672.000	-0.0137	497219.	-10056.	8.913E-05	0.000	5.084E+12	124.3105	76497.	0.000
680.400	-0.0129	417110.	-9031.8668	8.988E-05	0.000	5.084E+12	119.6279	77908.	0.000
688.800	-0.0121	345442.	-8047.9503	9.051E-05	0.000	5.084E+12	114.6379	79319.	0.000
697.200	-0.0114	281862.	-7107.2127	9.103E-05	0.000	5.084E+12	109.3472	80730.	0.000
705.600	-0.0106	225998.	-6212.1540	9.145E-05	0.000	5.084E+12	103.7620	82142.	0.000
714.000	-0.009841	177455.	-5365.2243	9.179E-05	0.000	5.084E+12	97.8880	83553.	0.000
722.400	-0.009069	135819.	-4568.8272	9.204E-05	0.000	5.084E+12	91.7304	84964.	0.000
730.800	-0.008295	100655.	-3825.3249	9.224E-05	0.000	5.084E+12	85.2940	86375.	0.000
739.200	-0.007519	71510.	-3137.0423	9.238E-05	0.000	5.084E+12	78.5828	87786.	0.000
747.600	-0.006743	47910.	-2506.2719	9.248E-05	0.000	5.084E+12	71.6006	89198.	0.000
756.000	-0.005966	29361.	-1935.2781	9.254E-05	0.000	5.084E+12	64.3503	90609.	0.000
764.400	-0.005188	15353.	-1426.3025	9.258E-05	0.000	5.084E+12	56.8344	92020.	0.000
772.800	-0.004410	5355.7019	-981.5677	9.260E-05	0.000	5.084E+12	49.0549	93431.	0.000
781.200	-0.003632	-1180.5914	-603.2821	9.260E-05	0.000	5.084E+12	41.0131	94842.	0.000
789.600	-0.002855	-4822.9974	-293.6439	9.260E-05	0.000	5.084E+12	32.7102	96254.	0.000
798.000	-0.002077	-6157.3664	-54.8444	9.259E-05	0.000	5.084E+12	24.1468	97665.	0.000
806.400	-0.001299	-5787.9358	110.9287	9.258E-05	0.000	5.084E+12	15.3230	99076.	0.000
814.800	-0.000522	-4337.3126	201.4885	9.257E-05	0.000	5.084E+12	6.2389	100487.	0.000
823.200	0.000256	-2446.4738	214.6472	9.256E-05	0.000	5.084E+12	-3.1058	101898.	0.000
831.600	0.001034	-774.7808	148.2151	9.256E-05	0.000	5.084E+12	-12.7113	103310.	0.000
840.000	0.001811	0.000	0.000	9.256E-05	0.000	5.084E+12	-22.5780	52360.	0.000

* This analysis makes computations of pile response using nonlinear moment-curvature relationships. The above values of total stress are computed for combined axial stress and do not equal the actual stresses in concrete and steel in the range of nonlinear bending.

Output Verification: Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 1:

Pile-head deflection = 2.0706211 inches
 Computed slope at pile head = -0.0123168 radians
 Maximum bending moment = 25604971. inch-lbs
 Maximum shear force = -64796. lbs
 Depth of maximum bending moment = 109.2000000 inches below pile head
 Depth of maximum shear force = 344.4000000 inches below pile head
 Number of iterations = 26
 Number of zero deflection points = 2

Summary of Pile Response(s)

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, lbs, and Load 2 = Moment, in-lbs
 Load Type 2: Load 1 = Shear, lbs, and Load 2 = Slope, radians
 Load Type 3: Load 1 = Shear, lbs, and Load 2 = Rotational Stiffness, in-lbs/radian
 Load Type 4: Load 1 = Top Deflection, inches, and Load 2 = Moment, in-lbs
 Load Type 5: Load 1 = Top Deflection, inches, and Load 2 = Slope, radians

Load Case No.	Load Type No.	Pile-head V(lbs) or y(inches)	Pile-head Condition 1 in-lb, rad., or in-lb/rad.	Axial Loading lbs	Pile-head Deflection inches	Maximum Moment in-lbs	Maximum Shear lbs	Maximum Rotation radians	Pile-head
1	1	V = 26000.	M = 23184000.	28000.	2.07062106	25604971.	-64796.	-0.01231679	

The analysis ended normally.

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

TIA Rev F

Site Data

BU#:	
Site Name:	
App #:	
Pole Manufacturer:	Other

Reactions

Moment:	1932	ft-kips
Axial:	28	kips
Shear:	26	kips

Anchor Rod Data

Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	46.05	in

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

Anchor Rod Results

Maximum Rod Tension:	165.5 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	84.9% Pass

Rigid
Service, ASD
Fty*ASIF

Plate Data

Diam:	52.05	in
Thick:	2.5	in
Grade:	60	ksi
Single-Rod B-eff:	10.24	in

Base Plate Results

Base Plate Stress:	38.6 ksi	Flexural Check
Allowable Plate Stress:	60.0 ksi	
Base Plate Stress Ratio:	64.3% Pass	

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length: 25.72

Stiffener Data (Welding at both sides)

Config:		*
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

n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a

Pole Data

Diam:	38.2	in
Thick:	0.344	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

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



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

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

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER; SITE NAME
BU #806371; HRT 096 943227

APP: 269459 REV. 0; WO: 965888

SITE ADDRESS
**HRT 96 599 MATIANUCK AVE
 WINDSOR, CONNECTICUT 06095
 HARTFORD COUNTY**

PROJECT NOTES

1. DETAILED FIELD INFORMATION REGARDING INTERFERENCES AND/OR EXISTING FIELD CONDITIONS MAY BE AVAILABLE ON CROWN'S CSITES AND FROM CONTRACTOR'S PRE-MOD MAPPING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AND COORDINATE WITH THE AVAILABLE SOURCES OF INFORMATION ABOVE AND WITH THE PROJECT PLANS BEFORE PROCEEDING WITH THE WORK. CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL BEFORE PROCEEDING WITH THE WORK.
2. 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.
3. ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
4. (A.) DTI'S REQUIRED: ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. 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 DETAILS ON SHEET S-3 FOR REQUIREMENTS ON THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

(B.) EFFECTIVE 5/30/2012: UNTIL FURTHER NOTICE, CROWN CASTLE WILL ACCEPT AJAX BOLTS TIGHTENED USING AISC "TURN-OF-NUT" METHOD. INSTALLERS SHALL FOLLOW CROWN GUIDELINES FOR AISC "TURN-OF-NUT" METHOD AND ALSO PROVIDE COMPLETE INSPECTION DOCUMENTATION IN THE P.M.I. PRIOR TO STARTING WORK, CONTRACTOR SHALL CONSULT WITH CROWN ENGINEERING TO DETERMINE WHETHER THIS POLICY IS STILL IN PLACE.

(C.) REQUIREMENT EFFECTIVE 04/20/2013, PER CROWN CASTLE DIRECTIVE: ANY AND ALL STRUCTURAL BOLTS THAT ARE TIGHTENED TO THE PRETENSIONED CONDITION USING THE AISC "TURN-OF-NUT" TENSIONING PROCEDURE (NON-TENSION CONTROLLED [NON-TC] BOLTS AND/OR BOLTS WITHOUT DTI'S INSTALLED) SHALL BE INSPECTED ONSITE BY AN INDEPENDENT THIRD-PARTY BOLT INSPECTOR, AS APPROVED BY CROWN. THIS INSPECTION IS REQUIRED TO BE AN ONSITE FIELD INSPECTION. THE THIRD-PARTY BOLT INSPECTOR SHALL FOLLOW THE PUBLISHED CROWN CASTLE INSPECTION PROCEDURE "MI NON-TC BOLT INSPECTION", DATED APRIL 2013. THE THIRD-PARTY BOLT INSPECTOR SHALL PREPARE A FULLY DOCUMENTED BOLT INSPECTION REPORT, AS SPECIFIED BY CROWN, AND SHALL SUBMIT A COPY OF THE BOLT INSPECTION REPORT TO THE MI INSPECTOR, THE EOR, AND TO CROWN CASTLE.
5. NDE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. SEE CCI DOCUMENTS 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. ANY FULL PENETRATION WELDING TO THE BASE PLATE REQUIRED AS PART OF THIS ACTIVE REINFORCEMENT DESIGN SHALL BE INCLUDED IN THE NDE SCOPE OF WORK.

PROJECT CONTACTS:

MONOPOLE OWNER:

CROWN CASTLE
 3530 TORINGDON WAY SUITE 300 CHARLOTTE, NC 28277

MOD PM: JERRY BRUNO AT JERRY.BRUNO.CONTRACTOR@CROWNCastle.COM
 PH: (781) 970-0069

DESIGN STANDARD

THIS REINFORCEMENT DESIGN IS BASED UPON THE REQUIREMENTS OF THE TIA/EIA-222-F-1996 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, USING A DESIGN BASIC WIND SPEED OF 80 MPH (3-SEC GUST) WITH NO ICE, 38 MPH WITH 1 INCH ICE AND 50 MPH SERVICE LOADS.

REFER TO THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF STRUCTURAL ANALYSIS FOR THIS SITE (PJF#37514-2522.001.7700), DATED 11-21-2014.

THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:

SHAFT REINFORCING

FIELD WELDED STIFFENERS

SHEET INDEX

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S-4	MONOPOLE PROFILE
S-5	BASE PLATE DETAILS
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BU #806371; HRT 096 943227
 WINDSOR, CONNECTICUT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37514-2522.001.7700

DRAWN BY:
1JM

CHECKED BY:
C.M.M.

APPROVED BY:

DATE:
11-21-2014

TITLE SHEET

T-1

CROWN CASTLE PROJECT BU #806371; HRT 096 943227; WINDSOR, CONNECTICUT
 MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

A. GENERAL NOTES

1. 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.
2. 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 TRIPLE-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.
3. 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, SPECIFIED OR NOTED SHALL BE PROVIDED.
4. 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 BRACINGS, GUYS OR THE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN 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 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."
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 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.
6. 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.
7. 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.
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 ENSURE 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.
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 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.
11. 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. (SECTION NOT USED)

C. SPECIAL INSPECTION AND TESTING

1. 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.
2. 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.
3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
4. 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.
 - (A.) ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
 - (B.) 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.
5. 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 AND 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.
 - A. GENERAL:
 - (1.) PERFORM PERIODIC 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.
 - B. FOUNDATIONS, CONCRETE, AND SOIL PREPARATION - (NOT REQUIRED)
 - C. CONCRETE TESTING PER A/CI - (NOT REQUIRED)
 - D. STRUCTURAL STEEL:
 - (1.) CHECK THE STEEL ON THE JOB WITH THE PLANS.
 - (2.) CHECK MILL CERTIFICATIONS.
 - (3.) CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
 - (4.) INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
 - (5.) CALL FOR LABORATORY TEST REPORTS WHEN IN DOUBT.
 - (6.) CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
 - (7.) CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
 - (8.) CHECK BOLT TIGHTENING ACCORDING TO AISC "TURN OF THE NUT" METHOD.
 - E. WELDING:
 - (1.) VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PRE-QUALIFIED, IN ACCORDANCE WITH AWS D1.1.
 - (2.) INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND IN ACCORDANCE WITH AWS D1.1.
 - (3.) APPROVE FIELD WELDING SEQUENCE.
 - (A.) 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.
 - (4.) INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
 - (A.) INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE AND WORKING CONDITIONS.
 - (B.) VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
 - (C.) INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
 - (D.) VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1.
 - (E.) SPOT TEST AT LEAST ONE RILLLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE OR DYE PENETRANT.
 - (F.) INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED PLANS.
 - (G.) VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
 - (H.) REVIEW THE REPORTS BY TESTING LABS.
 - (I.) CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
 - (J.) INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
 - (K.) CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
 - F. REPORTS:
 - (1.) COMPILER AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.
6. 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.
7. 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.
8. 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.

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BU #806371; HRT 096 943227
WINDSOR, CONNECTICUT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37514-2522.001.7700	
DRAWN BY: J.M.	GENERAL NOTES
CHECKED BY: C.M.M.	
APPROVED BY:	
DATE: 11-21-2014	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 WELDING.
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 - (NOT REQUIRED)**
- F. FOUNDATION WORK - (NOT REQUIRED)**

- G. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)**
- H. EPOXY GROUTED REINFORCING ANCHOR RODS - (NOT REQUIRED)**
- 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. 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.
2. 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".

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 PH: (774) 418-2000

BU #806371; HRT 096 943227
WINDSOR, CONNECTICUT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37514-2522.001.7700	
DRAWN BY: LM	GENERAL NOTES
CHECKED BY: C.M.M.	
APPROVED BY:	S-2
DATE: 11-21-2014	

AJAX BOLT NOTE SHEET: REV. 1.5, 5-12-2014

- 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 (DTIS) AND HARDENED WASHERS. DTIS 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 (DTIS):

DTIS REQUIRED: DTIS SHALL BE "SELF-INDICATING" SQUIRTER® STYLE DTIS MADE WITH RED DURABLE SQUIRT MEDIA EMBEDDED IN THEM, INSPECTED BY MEANS OF THE VISUAL EJECTION OF SILICONE AS THE DTI PROTRUSIONS COMPRESS. SQUIRTER® DTIS 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.:

PART NUMBER: 2DTIM208MGAFSIF

DESCRIPTION: P.C. 8.8 DTI SQUIRTER WASHER WITH RED DURABLE SQUIRT MEDIA DESIGNED SPECIFICALLY FOR THE AJAX M20 ONESIDE BOLT, FINISH SHALL BE ZINC GALVANIZED AS PROVIDED BY THE DTI MANUFACTURER.

DISTRIBUTOR CONTACT DETAILS:

ALLFASTENERS
 15401 COMMERCE PARK DR.
 BROOKPARK, OHIO 44142
 PHONE: 440-232-6060
 E-MAIL: SALES@ALLFASTENERS.COM

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.

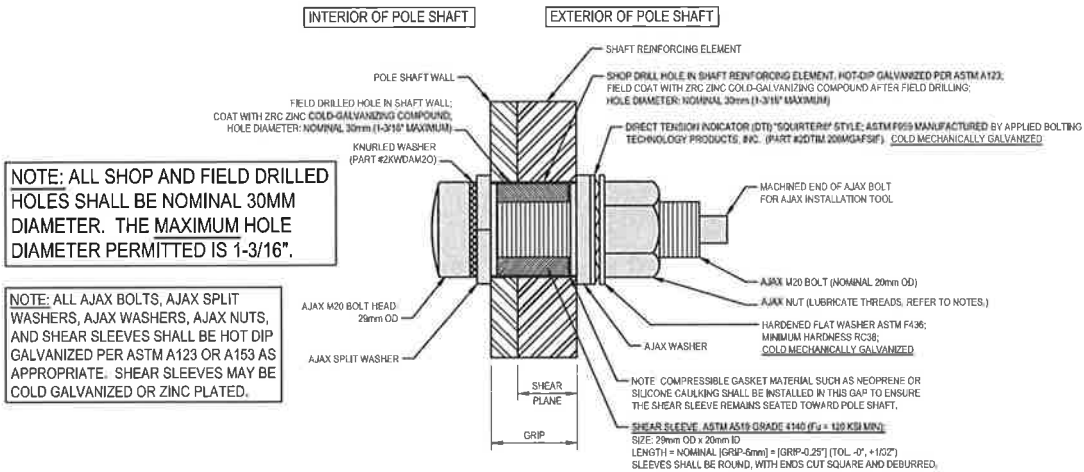
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY 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 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 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

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BU #806371; HRT 096 943227
 WINDSOR, CONNECTICUT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37514-2522.001.7700	
DRAWN BY: J.M.	AJAX BOLT DETAIL
CHECKED BY: C.M.M.	
APPROVED BY:	S-3
DATE: 11-21-2014	

POLE SPECIFICATIONS	
POLE SHAPE TYPE:	13-SIDED POLYGON
TAPER:	0.242 IN/FT
SHAFT STEEL:	ASTM A572 GRADE 65
BASE PL. STEEL:	ASTM A513 GR. E (60 KSI)
ANCHOR RODS:	7 M ¹⁶ #18J ASTM A615 GRADE 75

SHAFT SECTION DATA					
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPICE (IN)	DIAMETER ACROSS FLATS (IN)	
				TOP	BOTTOM
1	49.166	0.2810	50.00	14.760	26.570
2	56.00	0.3440		25.007	38.200

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

CONTRACTOR SHALL PROVIDE ASTM A36 SHIM PLATES BELOW SLIP JOINTS. THE SHIM PLATES SHALL BE PLACED BETWEEN THE NEW SHAFT REINFORCEMENT AND THE EXISTING POLE SHAFT FROM THE SLIP JOINT TO THE NEW SHAFT REINFORCEMENT SPLICE PLATE LOCATION AND A EXTRA LONG "SPLICE SHIM" SHALL BE PLACED BETWEEN THE NEW UPPER AND LOWER SHAFT REINFORCEMENT PLATES AT THE SHAFT REINFORCEMENT SPLICE PLATE LOCATION AND ALL TERMINATION POINTS, AS REQUIRED.

- MODIFICATIONS:
- (A) INSTALL NEW TRANSITION STIFFENERS AT BASE PLATE. SEE SHEET S-5.
 - (B) INSTALL NEW SHAFT REINFORCING. SEE CHART.

NEW CCL FLAT PLATE (55 KSI) REINFORCING SCHEDULE											
BOTTOM ELEVATION	TOP ELEVATION	FLAT # / DEGREE SEPARATION	ELEMENT	ELEMENT LENGTH	ELEMENT QUANTITY	APPROXIMATE AJAX BOLTS PER ELEMENT	APPROXIMATE TOTAL AJAX BOLT QUANTITY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	ESTIMATED TOTAL STEEL WEIGHT
0'-0"	30'-0"	F2, F8 & F9	COL/P #8@12S15	30'-0"	3	45	135	11	11	60"	200 LBS
30'-0"	60'-0"	F2, F8 & F9	COL/P #8@12S15	30'-0"	3	36	108	11	11	60"	180 LBS
20'											474 LBS

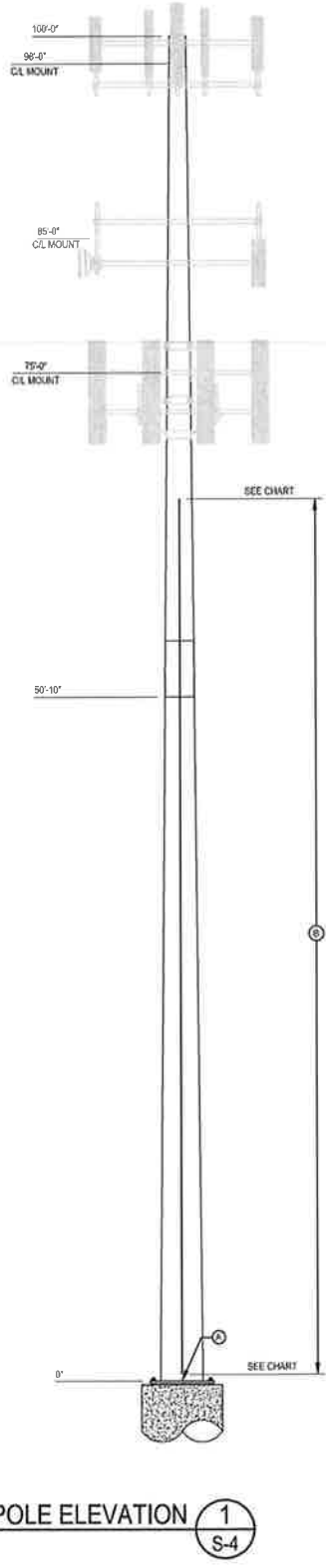
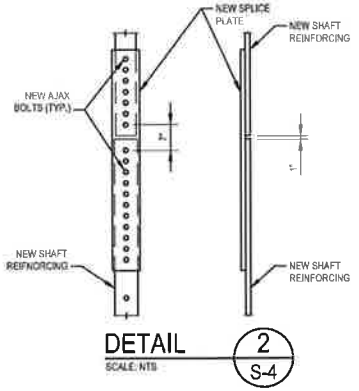
- NOTES:
1. AJAX BOLTS SHALL BE 30mm (1 1/8") DIA. WITH 100 HOUR SPRAYED ZINC CHROME TREATMENT WITH DRY COATED STEEL GRADE.
 2. ALL STEEL SHALL BE HOT DIP GALVANIZED WITH 100 HOUR SPRAYED ZINC CHROME TREATMENT WITH ASTM A513. ALTERNATIVELY ALL METAL SURFACES SHALL BE PROTECTED GALVANIZED AS FOLLOWS: A MINIMUM OF TWO COATS OF ZINC RICH PRIMER AND A RICH COAT GALVANIZING COMPOUND. PLATE THICKNESS PER COAT SHALL BE AT LEAST 0.0145 IN. IS MILDLY APPLIED PER MANUFACTURER'S RECOMMENDED PROCEDURES. CONTACT TRC AT 1-877-631-8275 FOR PRODUCT INFORMATION.
 3. ALL REINFORCEMENT SHALL BE ASTM A572 GR. 65.
 4. WELDS SHALL BE 60% OR GREATER. TERMINATION WELDS SHALL BE 35% FLET WELD.
 5. HOLES FOR AJAX BOLTS AND SHIM BOLTS SHALL BE 3mm UNLESS NOTED OTHERWISE.
 6. ALL SHIMS SHALL BE ASTM A36.

SPLICE PLATE INSTALLATION CHART								
ELEVATION	FLAT PLATE THICKNESS	FLAT PLATE WIDTH	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	WELD LENGTH PER SIDE	TOTAL WELD LENGTH	AJAX BOLTS PER SPLICE	TOTAL STEEL WEIGHT
30'-0"	1/4"	4'-0"	6'-0"	3	0"	0"	24	348 LBS

* BOLTS INCLUDED IN THE TOTAL QUANTITY LISTED IN THE FLAT PLATE INSTALLATION CHART.

NEW SHIM CHART				
1/4" SHIM QUANTITY	1/2" SHIM QUANTITY	SHIM WIDTH	SHIM LENGTH	HOLE DIAMETER
6	3	6"	4"	1 1/4"

SHIMS ARE FOR BIDDING PURPOSES ONLY. FINAL SHIM REQUIREMENTS TO BE DETERMINED BY CONTRACTOR DURING FABRICATION.



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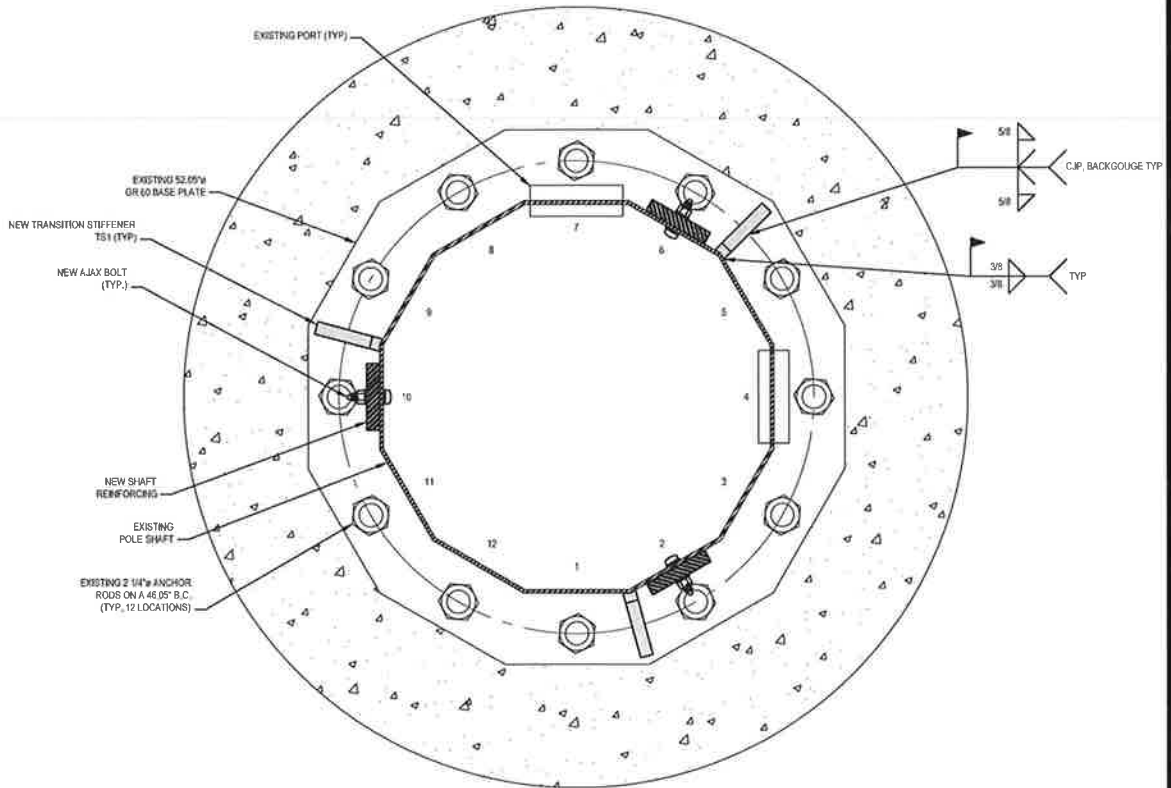
PROJECT: 37514-2522.001.7700

DRAWN BY: LM
CHECKED BY: C.M.M.
APPROVED BY:

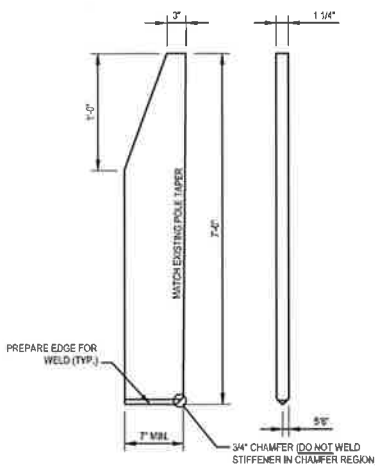
MONOPOLE PROFILE

DATE: 11-21-2014

S-4



BASE PLATE (1)
S-5



TRANSITION STIFFENER MK-TS1
(3 REQUIRED) (Fy = 65 KSI)

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PROJECT: 37514-2522.001.7700	
DRAWN BY: L.M.	BASE PLATE DETAILS
CHECKED BY: C.M.M.	
APPROVED BY:	S-5
DATE: 11-21-2014	

MODIFICATION INSPECTION NOTES:

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS 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 INTEGRITY REMAINS WITH THE EOR AT ALL TIMES.

ALL MIs SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (CEV) OR ENGINEERING SERVICE VENDOR (ESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENCL-BUL-1013 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 BE ON 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 ENG-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 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 TURNKEY 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 ENG-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 INSPECTOR(S) 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 RE-ANALYZE 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 ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT A/E/S/E/V 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/ERECTION AND INSPECTION:
 - RAW WATERLUS
 - PHOTOS OF ALL CRITICAL DETAILS
 - FOUNDATION MODIFICATIONS
 - WELD PREPARATION
 - BOLT INSTALLATION AND TORQUE
 - FINAL INSTALLED CONDITION
 - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
 - FINAL INFIELD 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 ENG-SOW-10007.

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWINGS
X	EOR REVIEW
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
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	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	DC AS-BUILT DOCUMENTS
X	INSPECTION OF AJAX BOLTS AND DT'S PER REQUIREMENTS ON SHEET S-3
NA	INSPECTOR/ERECTOR ANCHOR INSTALLER'S DRILLING AND INSTALLATION LOGS AND DANGC DOCUMENTS
NA	REFER TO MONOPOLE/ERECTOR ANCHOR NOTES FOR SPECIAL INSPECTION AND TESTING REQUIREMENTS
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

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

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BU #806371; HRT 096 943227
WINDSOR, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37514-2522.001.7700

DRAWN BY: LM

CHECKED BY: C.M.M.

APPROVED BY:

DATE: 11-21-2014

MI CHECKLIST

S-6

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER; SITE NAME
BU #806371; HRT 096 943227

APP: 269459 REV. 0; WO: 965888

SITE ADDRESS
**HRT 96 599 MATIANUCK AVE
 WINDSOR, CONNECTICUT 06095
 HARTFORD COUNTY**

PROJECT NOTES

1. DETAILED FIELD INFORMATION REGARDING INTERFERENCES AND/OR EXISTING FIELD CONDITIONS MAY BE AVAILABLE ON CROWN'S CCISITES AND FROM CONTRACTOR'S PRE-MOD MAPPING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AND COORDINATE WITH THE AVAILABLE SOURCES OF INFORMATION ABOVE AND WITH THE PROJECT PLANS BEFORE PROCEEDING WITH THE WORK. CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL BEFORE PROCEEDING WITH THE WORK.
2. 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.
3. ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
4. (A.) DTI'S REQUIRED: ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. 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 DETAILS ON SHEET S-3 FOR REQUIREMENTS ON THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

 (B.) EFFECTIVE 5/30/2012: UNTIL FURTHER NOTICE, CROWN CASTLE WILL ACCEPT AJAX BOLTS TIGHTENED USING AISC "TURN-OF-NUT" METHOD. INSTALLERS SHALL FOLLOW CROWN GUIDELINES FOR AISC "TURN-OF-NUT" METHOD AND ALSO PROVIDE COMPLETE INSPECTION DOCUMENTATION IN THE PMI. PRIOR TO STARTING WORK, CONTRACTOR SHALL CONSULT WITH CROWN ENGINEERING TO DETERMINE WHETHER THIS POLICY IS STILL IN PLACE.

 (C.) REQUIREMENT EFFECTIVE 04/20/2013, PER CROWN CASTLE DIRECTIVE: ANY AND ALL STRUCTURAL BOLTS THAT ARE TIGHTENED TO THE PRETENSIONED CONDITION USING THE AISC "TURN-OF-NUT" TENSIONING PROCEDURE (NON-TENSION CONTROLLED [NON-TC] BOLTS AND/OR BOLTS WITHOUT DTI'S INSTALLED) SHALL BE INSPECTED ONSITE BY AN INDEPENDENT THIRD-PARTY BOLT INSPECTOR, AS APPROVED BY CROWN. THIS INSPECTION IS REQUIRED TO BE AN ONSITE FIELD INSPECTION. THE THIRD-PARTY BOLT INSPECTOR SHALL FOLLOW THE PUBLISHED CROWN CASTLE INSPECTION PROCEDURE "MI NON-TC BOLT INSPECTION", DATED APRIL 2013. THE THIRD-PARTY BOLT INSPECTOR SHALL PREPARE A FULLY DOCUMENTED BOLT INSPECTION REPORT, AS SPECIFIED BY CROWN, AND SHALL SUBMIT A COPY OF THE BOLT INSPECTION REPORT TO THE MI INSPECTOR, THE EOR, AND TO CROWN CASTLE.
5. NDE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. SEE CCI DOCUMENTS 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. ANY FULL PENETRATION WELDING TO THE BASE PLATE REQUIRED AS PART OF THIS ACTIVE REINFORCEMENT DESIGN SHALL BE INCLUDED IN THE NDE SCOPE OF WORK.

PROJECT CONTACTS:

MONOPOLE OWNER:
 CROWN CASTLE
 3530 TORINGDON WAY SUITE 300 CHARLOTTE, NC 28277

 MOD PM: JERRY BRUNO AT JERRY.BRUNO.CONTRACTOR@CROWNCastle.COM
 PH: (781) 970-0069

DESIGN STANDARD

THIS REINFORCEMENT DESIGN IS BASED UPON THE REQUIREMENTS OF THE TIA/EIA-222-F-1996 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, USING A DESIGN BASIC WIND SPEED OF 80 MPH (3-SEC GUST) WITH NO ICE, 38 MPH WITH 1 INCH ICE AND 50 MPH SERVICE LOADS.

REFER TO THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE P/J STRUCTURAL ANALYSIS FOR THIS SITE (P/JF#37514-2522.001.7700), DATED 11-21-2014.

**THIS PROJECT INCLUDES THE FOLLOWING
 REINFORCING ELEMENTS:**

- SHAFT REINFORCING
- FIELD WELDED STIFFENERS

SHEET INDEX

SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
S-1	GENERAL NOTES
S-2	GENERAL NOTES
S-3	AJAX BOLT DETAIL
S-4	MONOPOLE PROFILE
S-5	BASE PLATE DETAILS
S-6	MI CHECKLIST

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BU #806371; HRT 096 943227
 WINDSOR, CONNECTICUT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37514-2522.001.7700	
DRAWN BY: I.M.	TITLE SHEET
CHECKED BY: C.M.M.	
APPROVED BY:	
DATE: 11-21-2014	T-1

CROWN CASTLE PROJECT: BU #806371; HRT 096 943227; WINDSOR, CONNECTICUT
 MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

A. GENERAL NOTES

1. 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.
2. 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 116/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.
3. 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, SPECIFIED OR NOTED SHALL BE PROVIDED.
4. 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. IMPORTANT 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 WITH THE SAFE WELDING PRACTICES (DOC # ENG-P14-10015) 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 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.
6. 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.
7. 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.
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 ENSURE 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.
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 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.
11. 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. (SECTION NOT USED)

C. SPECIAL INSPECTION AND TESTING

1. 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.
2. 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.
3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
4. 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.
 - (A) ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
 - (B) 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.
5. 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 MUST HAVE THE NECESSARY TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.
 - A. GENERAL:
 - (1) PERFORM PERIODIC 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.
 - B. FOUNDATIONS, GRADE, AND SOIL PREPARATION - (NOT REQUIRED)
 - C. CONCRETE TESTING PER ACI - (NOT REQUIRED)
 - D. STRUCTURAL STEEL
 - (1) CHECK THE STEEL ON THE JOB WITH THE PLANS.
 - (2) CHECK MILL CERTIFICATIONS.
 - (3) CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
 - (4) INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
 - (5) CALL FOR LABORATORY TEST REPORTS WHEN IN DOUBT.
 - (6) CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
 - (7) CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
 - (8) CHECK BOLT TIGHTENING ACCORDING TO AISC "TURN OF THE NUT" METHOD.
 - E. WELDING:
 - (1) VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
 - (2) INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND IN ACCORDANCE WITH AWS D1.1.
 - (3) APPROVE FIELD WELDING SEQUENCE.
 - (A) 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.
 - (4) INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
 - (A) INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE AND WORKING CONDITIONS.
 - (B) VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
 - (C) INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
 - (D) VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1.
 - (E) SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE OR DYE PENETRANT.
 - (F) INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED PLANS.
 - (G) VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
 - (H) REVIEW THE REPORTS BY TESTING LABS.
 - (I) CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
 - (J) INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
 - (K) CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
 - F. REPORTS:
 - (1) COMPILE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.
6. 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.
7. 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.
8. 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.

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BU #806371; HRT 096 943227
WINDSOR, CONNECTICUT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37514-2522.001.7700	
DRAWN BY: I.M.	GENERAL NOTES
CHECKED BY: C.M.M.	
APPROVED BY:	S-1
DATE: 11-21-2014	

- 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 A/JAX 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 WELDING.
 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 - (NOT REQUIRED)**
- F. FOUNDATION WORK - (NOT REQUIRED)**

- G. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)**
- H. EPOXY GROUTED REINFORCING ANCHOR RODS - (NOT REQUIRED)**
- 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. 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.
 2. 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. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING.
 2. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES AS REQUIRED.
 3. 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.

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BU #806371; HRT 096 943227
WINDSOR, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37514-2522.001.7700	
DRAWN BY: LM	GENERAL NOTES
CHECKED BY: C.M.M.	
APPROVED BY:	S-2
DATE: 11-21-2014	

AJAX BOLT NOTE SHEET: REV. 1.5, 5-12-2014

- 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 RED DURABLE SQUIRT MEDIA 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.:

PART NUMBER: 2DTIM208MGAFSIF

DESCRIPTION: P.C. 8.8 DTI SQUIRTER WASHER WITH RED DURABLE SQUIRT MEDIA DESIGNED SPECIFICALLY FOR THE AJAX M20 ONESIDE BOLT. FINISH SHALL BE ZINC GALVANIZED AS PROVIDED BY THE DTI MANUFACTURER.

DISTRIBUTOR CONTACT DETAILS:

ALLFASTENERS
15401 COMMERCE PARK DR.
BROOKPARK, OHIO 44142
PHONE: 440-232-6060
E-MAIL: SALES@ALLFASTENERS.COM

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.

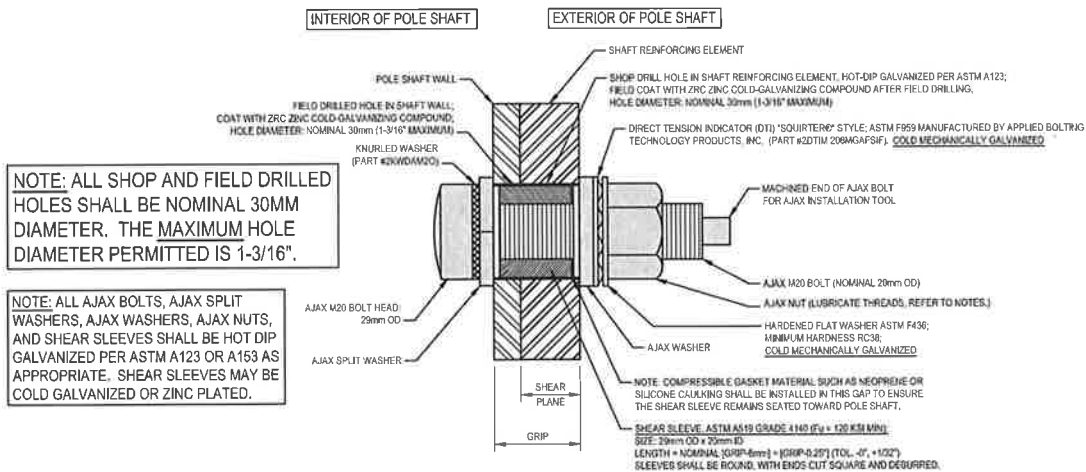
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY 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

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BU #806371; HRT 096 943227
WINDSOR, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37514-2522.001.7700

DRAWN BY: I.M.	AJAX BOLT DETAIL
CHECKED BY: C.M.M.	
APPROVED BY:	S-3
DATE: 11-21-2014	

POLE SPECIFICATIONS	
POLE SHAPE TYPE:	12-SIDED POLYGON
TAPER:	0.240 IN/FT
SHAFT STEEL:	ASTM A572 GRADE 65
BASE PL. STEEL:	ASTM A633 GR. E (50 KSI)
ANCHOR RODS:	3 1/4" #18J ASTM A615 GRADE 75

SHAFT SECTION DATA					
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPICE (IN)	DIAMETER ACROSS FLATS (IN)	
				TOP	BOTTOM
1	49.156	0.2810	50.00	14.760	26.570
2	55.00	0.3440		25.007	38.200

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

CONTRACTOR SHALL PROVIDE ASTM A36 SHIM PLATES BELOW SLIP JOINTS, THE SHIM PLATES SHALL BE PLACED BETWEEN THE NEW SHAFT REINFORCEMENT AND THE EXISTING POLE SHAFT FROM THE SLIP JOINT TO THE NEW SHAFT REINFORCEMENT SPICE PLATE LOCATION AND A EXTRA LONG "SPICE SHIM" SHALL BE PLACED BETWEEN THE NEW UPPER AND LOWER SHAFT REINFORCEMENT PLATES AT THE SHAFT REINFORCEMENT SPICE PLATE LOCATION AND ALL TERMINATION POINTS, AS REQUIRED.

- MODIFICATIONS:
- (A) INSTALL NEW TRANSITION STIFFENERS AT BASE PLATE, SEE SHEET S-5.
 - (B) INSTALL NEW SHAFT REINFORCING, SEE CHART.

NEW C/C FLAT PLATE (55 KSI) REINFORCING SCHEDULE											
BOTTOM ELEVATION	TOP ELEVATION	FLAT # / DEGREE SEPARATION	ELEMENT	ELEMENT LENGTH	ELEMENT QUANTITY	APPROXIMATE AJAX BOLTS PER ELEMENT	APPROXIMATE TOTAL AJAX BOLT QUANTITY	TERMINATION BOLTS BOTTOM	TERMINATION BOLTS TOP	MAXIMUM INTERMEDIATE BOLT SPACING	ESTIMATED TOTAL STEEL WEIGHT
2'-0"	20'-0"	F2 F8&F10	COL.F.F. (0611252)	20'-0"	3	45	135	54	14	12"	2043.05
20'-0"	80'-0"	F2 F8&F10	COL.F.F. (0611252)	30'-0"	3	35	105	80	43	8"	1638.05
281											
8741.05											

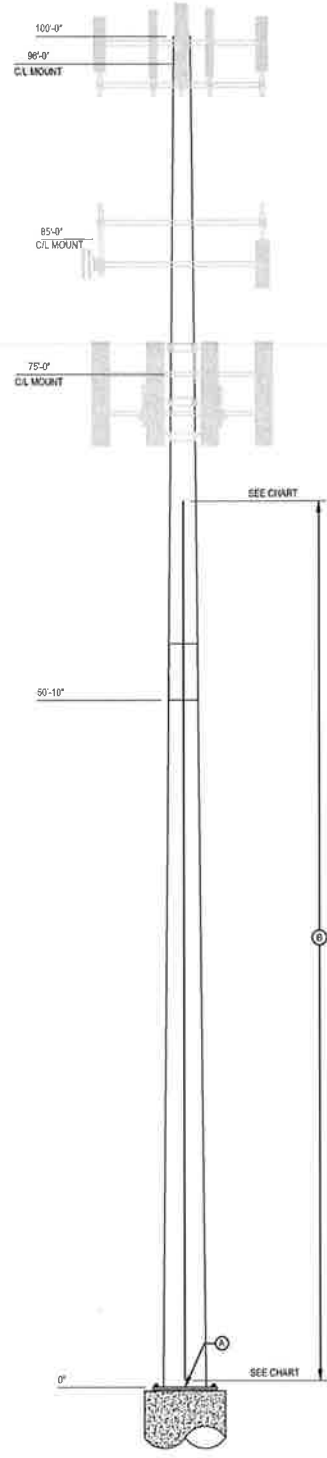
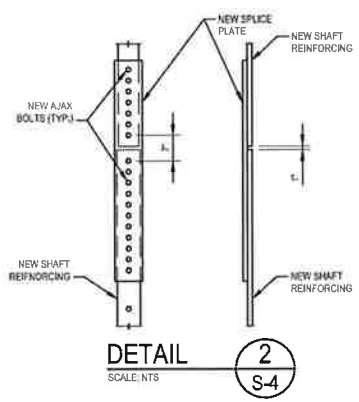
- NOTES:
- 1) ALL BOLTS ARE TO BE 3/8" DIAMETER WITH COARSE THREADS FROM DIAMETER TO USE WITH MATCHING STEEL WRENCH.
 - 2) ALL 3/8" DIAMETER BOLTS TO BE GALVANIZED WITH AN APPLICATION ACCORDING TO ASTM A593. ALL TERMINATION AND NEW SHAFT REINFORCEMENT SHALL BE GALVANIZED TO CONFORM TO A MINIMUM OF TWO COATS OF ZINC-BLENDED, RIDGE/DIEA VINYL COMPOUND. FLAT THICKNESS PER COAT SHALL BE 0.0015 IN. PER 15 MILS. APPLY PER THE MANUFACTURER'S RECOMMENDED PROCEDURES. CONTACT TRITAC 1-800-831-5724 FOR FURTHER INFORMATION.
 - 3) ALL REINFORCING SHALL BE ASTM A572 GR. 65.
 - 4) WELDS SHALL BE LAP JOINTS OR T-BUTTS. TERMINATION WELDS SHALL BE 3/8" DEEP WELDS.
 - 5) HOLES FOR AJAX BOLT SHIMS SHALL BE 1/8" OVER UNLESS NOTED OTHERWISE.
 - 6) ALL SHIMS SHALL BE ASTM A36.

SPICE PLATE INSTALLATION CHART									
ELEVATION	FLAT PLATE THICKNESS	FLAT PLATE WIDTH	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	WELD LENGTH PER SIDE	TOTAL WELD LENGTH	AJAX BOLTS PER SPICE	TOTAL STEEL WEIGHT	
20'-0"	1/8"	8'-10"	8'-0"	3	6"	90'	24	540.00	
20'-0"	1/8"	8'-10"	8'-0"	3	6"	90'	24	540.00	

* BOLTS INCLUDED IN THE TOTAL QUANTITY LISTED IN THE FLAT PLATE INSTALLATION CHART.

NEW SHIM CHART				
1/8" SHIM QUANTITY	1/4" SHIM QUANTITY	3/8" SHIM QUANTITY	SHIM LENGTH	HOLE DIAMETER
3	3	3	8"	1 1/4"

SHIMS ARE FOR BIDDING PURPOSES ONLY, FINAL SHIM REQUIREMENTS TO BE DETERMINED BY CONTRACTOR DURING FABRICATION.



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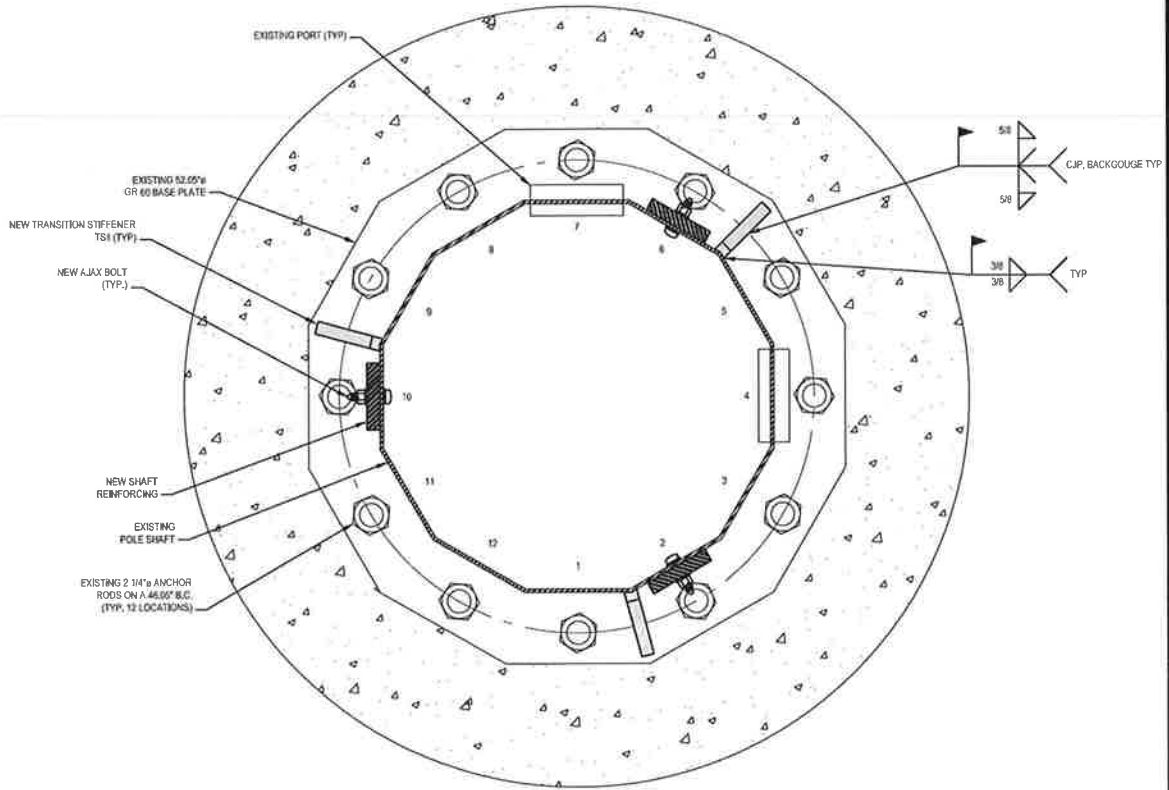
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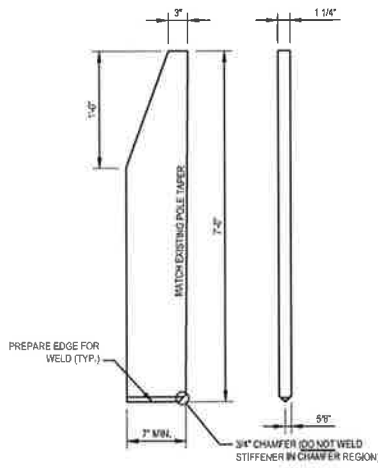
BU #806371; HRT 096 943227
 WINDSOR, CONNECTICUT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37514-2522.001.7700

DRAWN BY: I.M.	MONOPOLE PROFILE
CHECKED BY: C.M.M.	
APPROVED BY:	S-4
DATE: 11-21-2014	



BASE PLATE 1
S-5



TRANSITION STIFFENER MK~TS1
(3 REQUIRED) (Fy = 65 KSI)

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PROJECT: 37514-2522.001.7700

DRAWN BY:
J.M.
CHECKED BY:
C.M.M.
APPROVED BY:
DATE:
11-21-2014

BASE PLATE DETAILS

S-5

MODIFICATION INSPECTION NOTES

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS 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 INTEGRITY 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 END-BUL. 0173 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 COORDINATING 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 ENG-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 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 TURNKEY PROJECT 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 ENG-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 RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) 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 RE-ANALYZE 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 ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV 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/ERECTION AND MI INSPECTION
 - RAW MATERIALS
 - PHOTOS OF ALL CRITICAL DETAILS
 - FOUNDATION MODIFICATIONS
 - WELD PREPARATION
 - BOLT INSTALLATION AND TORQUE
 - FINAL INSTALLED CONDITION
 - SURFACE COATINGS 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 ENG-SOW-10007.

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWINGS
X	EOR REVIEW
X	FABRICATION 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
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: LIFT AND DENSITY
X	ON-SITE COLD GALVANIZING VERIFICATION
NA	BUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
X	INSPECTION OF AJAX BOLTS AND DTIS PER REQUIREMENTS ON SHEET S-3
NA	MICROPIER/ROCK ANCHOR INSTALLER'S DRILLING AND INSTALLATION LOGS AND LOGS DOCUMENTS
NA	REFER TO MICROPIER/ROCK ANCHOR NOTES FOR SPECIAL INSPECTION AND TESTING REQUIREMENTS.
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	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

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BU #806371; HRT 096 943227
WINDSOR, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37514-2522.001.7700

DRAWN BY: I.M.	MI CHECKLIST
CHECKED BY: C.M.M.	
APPROVED BY:	S-6
DATE: 11-21-2014	

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER, SITE NAME

BU #806371; HRT 096 943227

APP: 269459 REV. 0; WO: 965888

SITE ADDRESS

HRT 96 599 MATIANUCK AVE

WINDSOR, CONNECTICUT 06095

HARTFORD COUNTY

PROJECT NOTES

1. DETAILED FIELD INFORMATION REGARDING INTERFERENCES AND/OR EXISTING FIELD CONDITIONS MAY BE AVAILABLE ON CROWN'S ACISTES AND FROM CONTRACTORS PRE-LOAD MAPPING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AND COORDINATE WITH THE AVAILABLE SOURCES OF INFORMATION ABOVE AND WITH THE PROJECT PLANS BEFORE PROCEEDING WITH THE WORK. CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL BEFORE PROCEEDING WITH THE WORK.
2. 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.
3. ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS.
4. (A) DITS REQUIRED: ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DITS) AND HARDENED WASHERS. ALL AJAX M20 BOLTS WITH SHEAR LEAVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAILS ON SHEET S-3 FOR REQUIREMENTS ON THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

5. (B) EFFECTIVE 5/20/2012, UNTIL FURTHER NOTICE, CROWN CASTLE WILL ACCEPT AJAX BOLTS TIGHTENED USING AISC TURN-OFF-MUT METHOD. INSTALLERS SHALL FOLLOW CROWN GUIDELINES FOR AISC TURN-OFF-MUT METHOD AND ALSO PROVIDE COMPLETE INSPECTION DOCUMENTATION IN THE PM, PRIOR TO STARTING WORK. CONTRACTOR SHALL CONSULT WITH CROWN ENGINEERING TO DETERMINE WHETHER THIS POLICY IS STILL IN PLACE.
- (C) REQUIREMENT EFFECTIVE 04/20/2013, PER CROWN CASTLE DIRECTIVE, ANY AND ALL STRUCTURAL BOLTS THAT ARE TIGHTENED TO THE PRETENSIONED CONDITION USING THE AISC TURN-OFF-MUT TENSIONING PROCEDURE (NON-TENSION CONTROL POINT) BOLTS AND/OR BOLTS WITHOUT DITS INSTALLED) SHALL BE INSPECTED ON-SITE BY AN INDEPENDENT THIRD-PARTY BOLT INSPECTOR, AS APPROVED BY CROWN. THIS INSPECTION IS REQUIRED TO BE AN ON-SITE FIELD INSPECTION. THE THIRD-PARTY BOLT INSPECTOR SHALL FOLLOW THE PUBLISHED CROWN CASTLE INSPECTION PROCEDURE. NON-TO BOLT INSPECTION, DATED APRIL 2013. THE THIRD-PARTY BOLT INSPECTOR SHALL PREPARE A FULLY DOCUMENTED BOLT INSPECTION REPORT, AS SPECIFIED BY CROWN, AND SHALL SUBMIT A COPY OF THE BOLT INSPECTION REPORT TO THE MI INSPECTOR, THE FOR, AND TO CROWN CASTLE.

5. NOE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. SEE CCI DOCUMENTS ENG-SOW-1033 TOWER BASE PLATE NOE AND ENG-BUL-1031 NOE 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 NOE SHALL INCLUDE ALL EXISTING REINFORCEMENTS THAT HAVE BEEN WELDED TO THE BASE PLATE. ANY FULL PENETRATION WELDING TO THE BASE PLATE REQUIRED AS PART OF THIS ACTIVE REINFORCEMENT DESIGN SHALL BE INCLUDED IN THE NOE SCOPE OF WORK.

PROJECT CONTACTS:
 MONOPOLE OWNER:
 CROWN CASTLE
 3530 TORNINGDON WAY SUITE 300 CHARLOTTE, NC 28277
 PH: (781) 970-6069
 MOD PM: JERRY BRUND AT JERRY.BRUND.CONTRACTOR@CROWNCASTLE.COM

DESIGN STANDARD
 THIS REINFORCEMENT DESIGN IS BASED UPON THE REQUIREMENTS OF THE TIAEIA-222-F-1996 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, USING A DESIGN BASIC WIND SPEED OF 80 MPH (3-SEC GUST) WITH NO ICE, 38 MPH WITH 1 INCH ICE AND 50 MPH SERVICE LOADS.
 REFER TO THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PUF STRUCTURAL ANALYSIS FOR THIS SITE (PUF#37514-2522.001.7700), DATED 11-21-2014.
THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:
 SHAFT REINFORCING
 FIELD WELDED STIFFENERS

SHEET INDEX	
SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
S-1	GENERAL NOTES
S-2	GENERAL NOTES
S-3	AJAX BOLT DETAIL
S-4	MONOPOLE PROFILE
S-5	BASE PLATE DETAILS
S-6	MI CHECKLIST



PROJECT: 37514-2522.001.7700
 DRAWN BY: TM
 CHECKED BY: CMM
 APPROVED BY: [Signature]
 DATE: 11-21-2014
 BU #806371; HRT 096 943227
 WINDSOR, CONNECTICUT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

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CROWN CASTLE PROJECT: BU #806371; HRT 096 943227; WINDSOR, CONNECTICUT
 MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

A. GENERAL NOTES

1. 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.
2. 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 TIAEIA-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.
3. 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, SPECIFIED OR NOTED SHALL BE PROVIDED.
4. 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 BRACINGS, CHAINS 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. IMPORTANT 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# ENO-PIN-T0101) 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 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.
6. 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 CONSIDERED AS SUPERVISION OF CONSTRUCTION.
7. 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.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANTICIPATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE 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.
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 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.
11. 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. (SECTION NOT USED)

C. SPECIAL INSPECTION AND TESTING

1. 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.
 2. 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 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 CONSIDERED AS SUPERVISION OF CONSTRUCTION.
 3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
 4. 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.
 - (A) ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
 - (B) 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.
 5. 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.
 - A. GENERAL:
 - (1) PERFORM PERIODIC 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.
 - B. FOUNDATIONS, CONCRETE, AND SOIL PREPARATION - (NOT REQUIRED)
 - C. CONCRETE TESTING PER AG - (NOT REQUIRED)
 - D. STRUCTURAL STEEL:
 - (1) CHECK THE STEEL ON THE JOB WITH THE PLANS
 - (2) CHECK MILL CERTIFICATIONS.
 - (3) CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
 - (4) INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
 - (5) CALL FOR LABORATORY TEST REPORTS WHEN IN DOUBT.
 - (6) CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
 - (7) CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
 - (8) CHECK BOLT TIGHTENING ACCORDING TO AISC "TURN OF THE NUT" METHOD.
 - E. WELDING:
 - (1) VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
 - (2) INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND IN ACCORDANCE WITH AWS D1.1.
 - (3) APPROVE FIELD WELDING SEQUENCE:
 - (A) 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.
 - (4) INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
 - (A) INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE AND WORKING CONDITIONS.
 - (B) VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
 - (C) INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
 - (D) VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1.
 - (E) SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE OR DYE PENETRANT.
 - (F) INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED PLANS.
 - (G) VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
 - (H) REVIEW THE REPORTS BY TESTING LABS.
 - (I) CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
 - (J) INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
 - (K) CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
 - F. REPORTS:
 - (1) COMPILER AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.
6. 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.
7. 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.
8. 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.




1-24-14


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BU #806371; HRT 096 943227
WINDSOR, CONNECTICUT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37514-2522.001.7700	
DRAWN BY: I.M.	GENERAL NOTES
CHECKED BY: C.M.M.	
APPROVED BY: 	S-1
DATE: 11-21-2014	

- 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 E60XX 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 WELDING.
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 GRINDING SMOOTH AND DEBURRED. 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 - (NOT REQUIRED)**
- F. FOUNDATION WORK - (NOT REQUIRED)**

- G. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)**
- H. EPOXY GROUTED REINFORCING ANCHOR RODS - (NOT REQUIRED)**
- 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 OR 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 IIA/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 IIA/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".



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BU #806371; HRT 096 943227
WINDSOR, CONNECTICUT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37514-2522.001.7700	
DRAWN BY: IM	GENERAL NOTES
CHECKED BY: C.M.M.	
APPROVED BY: <i>[Signature]</i>	S-2
DATE: 11-21-2014	

AJAX BOLT NOTE SHEET: REV. 1.5, 5-12-2014

- 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 F359 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 RED DURABLE SQUIRT MEDIA 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.:

PART NUMBER: 2DTIM208MGAFSIF

DESCRIPTION: P.C. 8.8 DTI SQUIRTER WASHER WITH RED DURABLE SQUIRT MEDIA DESIGNED SPECIFICALLY FOR THE AJAX M20 ONESIDE BOLT. FINISH SHALL BE ZINC GALVANIZED AS PROVIDED BY THE DTI MANUFACTURER.

DISTRIBUTOR CONTACT DETAILS:

ALLFASTENERS
 15401 COMMERCE PARK DR.
 BROOKPARK, OHIO 44142
 PHONE: 440-232-6060
 E-MAIL: SALES@ALLFASTENERS.COM

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.

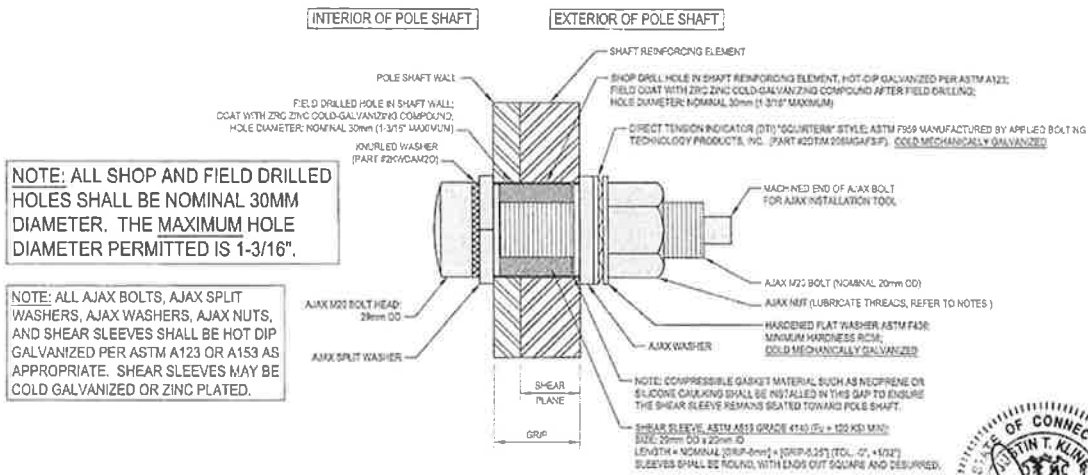
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY 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
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WINDSOR, CONNECTICUT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37514-2522.001.7700	
DRAWN BY: I.M.	AJAX BOLT DETAIL
CHECKED BY: C.M.L.	
APPROVED BY: <i>[Signature]</i>	S-3
DATE: 11-21-2014	

POLE SPECIFICATIONS	
POLE SHAPE TYPE:	13-SIDED POLYGON
TAPER:	0.243 IN/FT
SHAFT STEEL:	ASTM A572 GRADE 65
BASE PL. STEEL:	ASTM A532 GR. E (S&K2)
ANCHOR RODS:	2 1/2" ϕ
	#18 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	49.160	0.2810	50.00	14.750	26.970
2	55.00	0.3440		25.007	38.700

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

CONTRACTOR SHALL PROVIDE ASTM A572 SHIM PLATES BELOW SLP JOINTS. THE SHIM PLATES SHALL BE PLACED BETWEEN THE NEW SHAFT REINFORCEMENT AND THE EXISTING POLE SHAFT FROM THE SLP JOINT TO THE NEW SHAFT REINFORCEMENT SPLICE PLATE LOCATION AND AN EXTRA 100% SPLICE SHIM SHALL BE PLACED BETWEEN THE NEW UPPER AND LOWER SHAFT REINFORCEMENT PLATES AT THE SHAFT REINFORCEMENT SPLICE PLATE LOCATION AND ALL TERMINATION POINTS, AS REQUIRED.

- MODIFICATIONS:**
- (A) INSTALL NEW TRANSITION STIFFENERS AT BASE PLATE. SEE SHEET S-5.
 - (B) INSTALL NEW SHAFT REINFORCING. SEE CHART.

NEW GCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE											
BOTTOM ELEVATION	TOP ELEVATION	FLAT # / DEGREE SEPARATION	ELEMENT	ELEMENT LENGTH	ELEMENT QUANTITY	APPROXIMATE AJAX BOLTS PER ELEMENT	TOTAL AJAX BOLT QUANTITY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	ESTIMATED TOTAL STEEL WEIGHT
0'-0"	35'-0"	F2, F5 & F10	CGR.FP. 26512635	33'-0"	3	45	135	14	14	10"	2903 LBS.
35'-0"	85'-0"	F2, F5 & F10	CGR.FP. 26512030	30'-0"	3	38	114	10	10	10"	1833 LBS.
						243					4741 LBS.

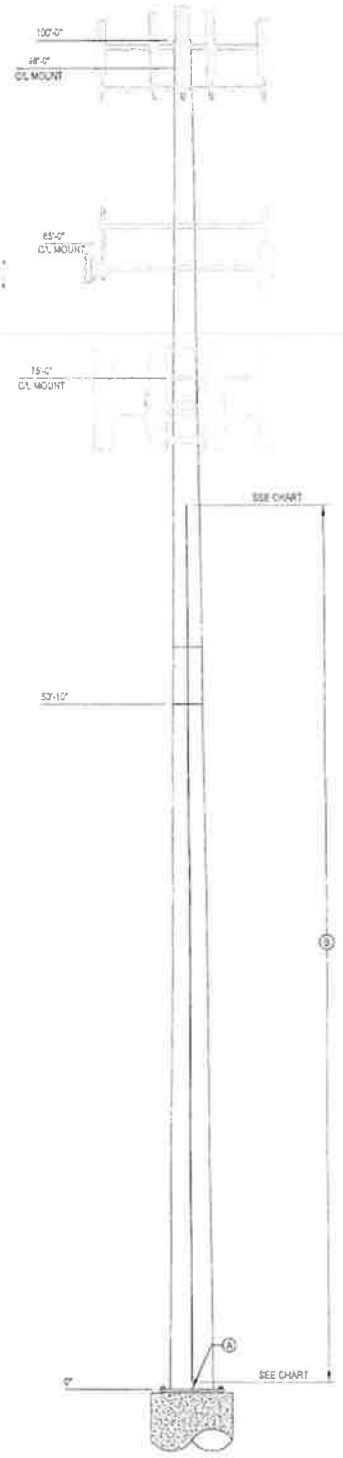
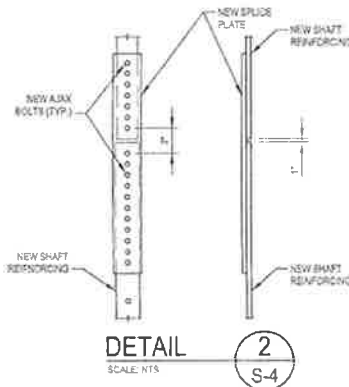
- NOTES:**
- 1) AJAX BOLTS ARE TO BE 20mm DIAMET 6A WITH CO. CORRESPONDING 20mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.
 - 2) ALL STEEL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A153. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE MET 3.0 MILS. DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3215 FOR PRODUCT INFORMATION.
 - 3) ALL REINFORCING SHALL BE ASTM A572 GR. 65.
 - 4) WELDS SHALL BE E308 OR GREATER. TERMINATION WELDS SHALL BE 3/8" FILLET WELDS.
 - 5) HOLES FOR AJAX BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
 - 6) ALL SHIMS SHALL BE ASTM A36.

SPLICE PLATE INSTALLATION CHART								
ELEVATION	FLAT PLATE / FLAT PLATE THICKNESS	FLAT PLATE WIDTH	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	WELD LENGTH PER SIDE	TOTAL WELD LENGTH	AXIAX BOLTS PER SPLICE	TOTAL STEEL WEIGHT
35'-0"	F2, F5	6'-10"	8'-3"	3	0"	0"	24	345 LBS. SPLICE

* BOLTS INCLUDED IN THE TOTAL QUANTITY LISTED IN THE FLAT PLATE INSTALLATION CHART.

NEW SHIM CHART			
1/4" SHIM QUANTITY	1/2" SHIM QUANTITY	SHIM WIDTH	SHIM LENGTH
3	3	3"	4"

SHIMS ARE FOR BIDDING PURPOSES ONLY. FINAL SHIM REQUIREMENTS TO BE DETERMINED BY CONTRACTOR DURING FABRICATION.



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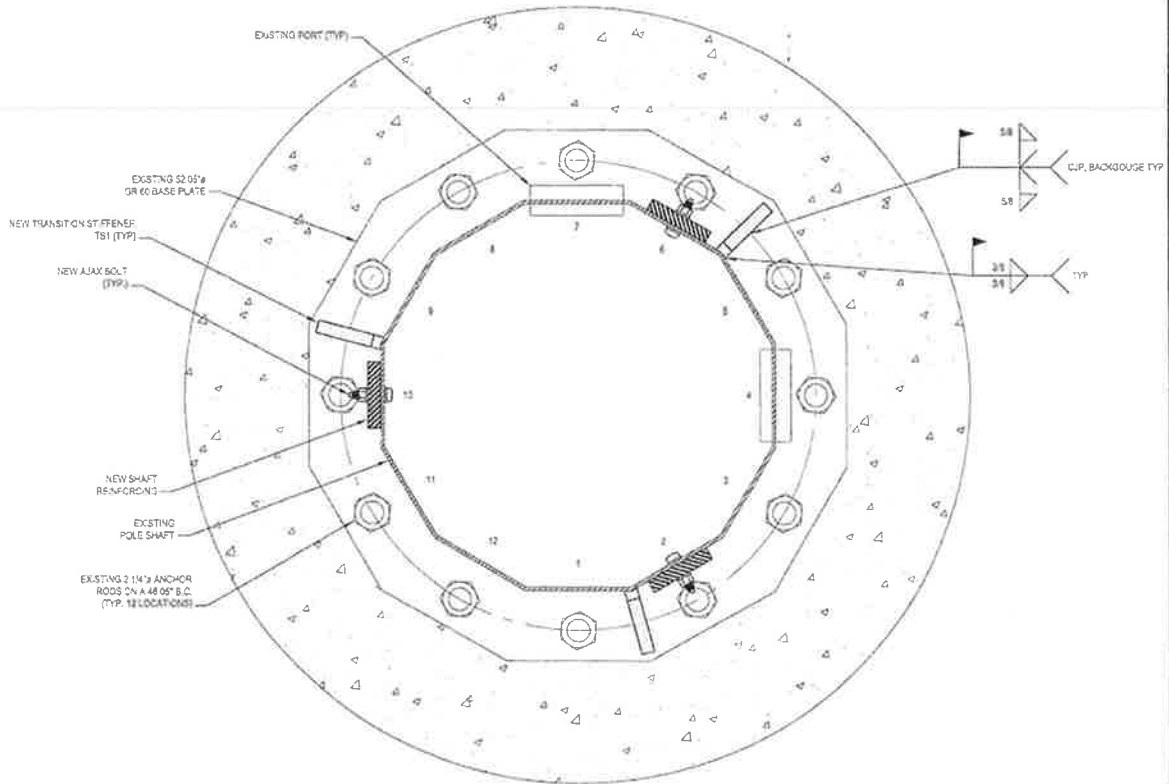
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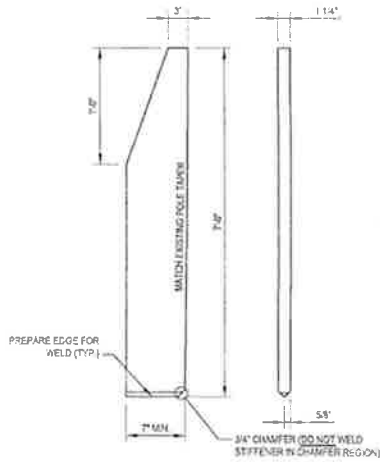
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PROJECT: 37514-2522.001.7700

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CHECKED BY: C.M.M.	
APPROVED BY: [Signature]	S-4
DATE: 11-21-2014	



BASE PLATE 1
S-5



TRANSITION STIFFENER MK~TS1
(3 REQ; REQ1; F_y = 66 KSI)



11-24-14

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PROJECT: 37514-2522.001.7700

DRAWN BY: I.M.
CHECKED BY: C.M.M.
APPROVED BY: [Signature]
DATE: 11-21-2014

BASE PLATE DETAILS

S-5

MODIFICATION INSPECTOR NOTES

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS 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. NEITHER DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN, OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY REMAINS 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 ENG-BUL-15173 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 BEGAIN 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 ENG-SOW-10027, 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 TURNKEY 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 AN ENG-SOW-10027.

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 RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND RE-TENSIONING TO COME 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 LOGGING COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY, 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 SUPPLEMENTAL
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE 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 ENG-SOW-10027.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEA/AVS 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/ERECTION AND INSPECTION
 - 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 ENG-SOW-10027.

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWINGS
X	EOR REVIEW
X	FABRICATION 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
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE DRIFT 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 ALUX BOLTS AND DTTS PER REQUIREMENTS ON SHEET S-1
NA	MONOPOLE/ROCK ANCHOR INSTALLER'S DRILLING AND INSTALLATION LOGS AND LOGDOC DOCUMENTS
NA	REFER TO MONOPOLE/ROCK ANCHOR NOTES FOR SPECIAL INSPECTION AND TESTING REQUIREMENTS.
ADDITIONAL TESTING AND INSPECTIONS	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS	

NOTE: A CHECKER A DOCUMENT NEEDED FOR THE MI REPORT. NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT.



1/24/14

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BU #806371; HRT 096 943227
WINDSOR, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37514-2522.001.7700

DRAWN BY: IM
CHECKED BY: C.M.M.
APPROVED BY: JTB
DATE: 11-21-2014

MI CHECKLIST

S-6