Robinson+Cole

KENNETH C. BALDWIN

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Also admitted in Massachusetts

April 16, 2015

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

Re: **Notice of Exempt Modification – Facility Modification**
699 Old Main Street, Rocky Hill, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) antennas at the 140-foot level on the existing 147.5-foot tower at 699 Old Main Street in Rocky Hill, Connecticut (the "Property"). The tower is owned by Crown Castle. The Council approved Cellco's shared use of this tower in 2008. Cellco now intends to modify its facility by replacing all of its existing antennas with three (3) model LNX-6514DS-VTM, 850 MHz antennas; two (2) model X7C-FRO-6601, 700 MHz antennas; one (1) model LNX-6514DS-VTM, 700 MHz antenna; three (3) model HBXX-6517DS-VTM, 1900 MHz antennas; and three (3) model HBXX-6517DS-VTM, 2100 MHz antennas, all at the same 140-foot 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 of 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 to Henry Vasel, Mayor for the Town of Rocky Hill. The Town of Rocky Hill 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).

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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 140-foot level of the 147.5-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 Analysis Report and Reinforcement Design drawing 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:
Henry Vasel, Rocky Hill Mayor
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

LNX-6514DS-VTM

Andrew® Antenna, 698–896 MHz, 65° horizontal beamwidth, RET compatible

POWERED BY ANDREW.

Electrical Specifications

Frequency Band, MHz	698–806	806–896
Gain, dBi	15.7	16.3
Beamwidth, Horizontal, degrees	65	65
Beamwidth, Vertical, degrees	12.5	11.2
Beam Tilt, degrees	0–10	0–10
USLS, typical, dB	17	18
Front-to-Back Ratio at 180°, dB	32	30
CPR at Boresight, dB	20	20
CPR at Sector, dB	10	10
Isolation, dB	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153
Input Power per Port, maximum, watts	400	400
Polarization	±45°	±45°

Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896
Beamwidth, Horizontal Tolerance, degrees	±3	±3

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

Mechanical Specifications

Color | Radome Material	Light gray | Fiberglass, UV resistant
Connector Interface | Location | Quantity	7-16 DIN Female | Bottom | 2
Wind Loading, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph
Antenna Dimensions, L x W x D	1847.0 mm x 301.0 mm x 181.0 mm | 72.7 in x 11.9 in x 7.1 in
Net Weight	14.2 kg | 31.3 lb
Model with factory installed AISG 2.0 RET	LNX-6514DS-A1M

Product Specifications

COMMSCOPE®

HBXX-6517DS-VTM

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

POWERED BY ANDREW.

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

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.

[illegible]

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.

[illegible]

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.

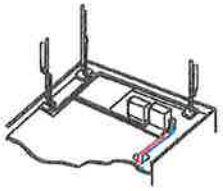
[illegible]

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.

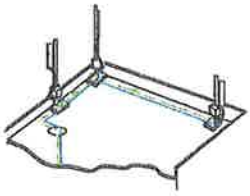
The Alcatel-Lucent RRH2x60-AWS is a zero-footprint solution and is convection cooled without fans for silent operation, simplifying negotiations with site property owners and minimizing environmental impacts.

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

- 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
- 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.

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 daisychaining 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)

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)

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

AT THE SPEED OF IDEAS™

Alcatel·Lucent

Product Data Sheet HB158-1-08U8-S8J18

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.

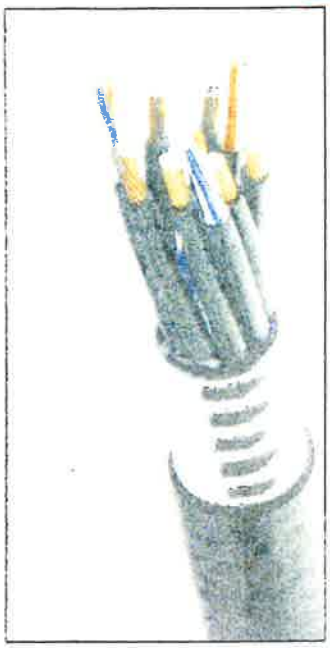


Figure 1: HYBRIFLEX Series

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

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)]	.068 (0.205)
DC-Resistance Power Cable, 8.4mm²(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, UL1666 RoHS Compliant
Size (Power)		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm² (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 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 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

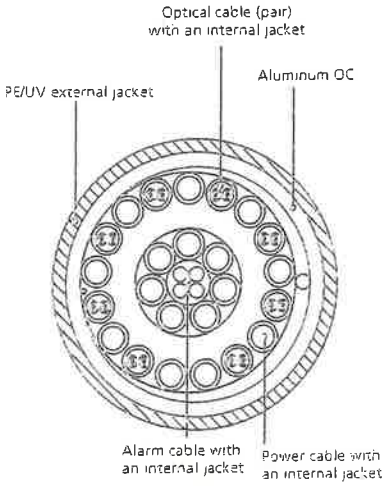


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Rocky Hill E								
Tower Height: 147.5Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Rocky Hill PD	1	40	148.5	0.0006	458.5	0.3057	0.19%	
*Rocky Hill FD	1	40	148.5	0.0006	453.4125	0.3023	0.19%	
*Rocky Hill PW	1	100	148.5	0.0016	45.84	0.2000	0.81%	
*Rocky Hill Hotline	1	100	75	0.0072	45.86	0.2000	3.62%	
*Rocky Hill Intercity	1	45	75	0.0077	154.265	0.2000	3.87%	
*RAFS	1	40	50	0.0093	465.075	0.3101	3.01%	
*Rocky Hill PD	1	40	50	0.0111	458.925	0.3060	3.63%	
*Rocky Hill PD	1	40	40	0.0177	458.575	0.3057	5.79%	
*Wethersfield	1	40	40	0.0225	458.275	0.3055	7.37%	
*Sprint	11	534	130	0.1250	1962.5	1.0000	12.50%	
*T-Mobile PCS/AWS	2	953	145	0.0326	1900	1.0000	3.26%	
*T-Mobile PCS/AWS	4	476	145	0.0326	2100	1.0000	3.26%	
*T-Mobile LTE	1	445	145	0.0076	700	0.4667	1.63%	
*MetroPCS CDMA	3	727	95	0.0869	2135	1.0000	8.69%	
*MetroPCS LTE	1	1200	95	0.0478	2130	1.0000	4.78%	
*AT&T UMTS	2	649	105	0.0423	880	0.5867	0.72%	
*AT&T UMTS	2	1387	105	0.0905	1900	1.0000	0.90%	
*AT&T GSM	1	324	105	0.0106	880	0.5867	0.18%	
*AT&T GSM	4	832	105	0.1085	1900	1.0000	1.09%	
*AT&T LTE	1	1615	105	0.0527	734	0.4893	1.08%	
*Nextel	12	100	115	0.0326	851	0.5673	5.75%	
Verizon PCS	**11**	**418**	**140**	**0.0844**	**1970**	**1.0000**	**8.44%**	
Verizon Cellular	**9**	**392**	**140**	**0.0647**	**869**	**0.5793**	**11.17%**	
Verizon AWS	**1**	**1750**	**140**	**0.0321**	**2145**	**1.0000**	**3.21%**	
Verizon 700	**1**	**1050**	**140**	**0.0193**	**698**	**0.4973**	**3.87%**	
								98.99%
* Source: Siting Council								

ATTACHMENT 3

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

Date: **March 18, 2015**

Sean Dempsey
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 Analysis Report**

Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	N/A
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	827050
	Crown Castle Site Name:	Rocky Hill/ Rte 160_1
	Crown Castle JDE Job Number:	246894
	Crown Castle Work Order Number:	1024962
	Crown Castle Application Number:	200492 Rev. 11
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37515-0126.002.7805
Site Data:	**699 Old Main St., Rocky Hill, Hartford County, CT**	
	Latitude *41° 40' 5.77"*, Longitude *-72° 38' 16.93"*	
	147.5 Foot - Monopole Tower	

Dear Sean Dempsey,

Paul J. Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 767317, in accordance with application 200492, revision 11.

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:

LC4.5: Modified Structure w/ Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing loading, respectively.

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

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

Joey Meinerding, E.I.
Structural Designer

3.19.15

tnxTower Report - version 6.1.4.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 147.5 ft. monopole tower designed by PIROD MANUFACTURES INC. in July of 1999. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
140.0	140.0	3	alcatel lucent	RRH2X60-AWS	1	1-5/8	--
		3	alcatel lucent	RRH2X60-PCS			
		6	commscope	HBXX-6517DS-A2M w/ Mount Pipe			
		3	commscope	LNX-6514DS-A1M w/ Mount Pipe			
		1	andrew	LNX-6514DS-A1M w/ Mount Pipe			
		2	css	X7C-FRO-660-V w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		1	tower mounts	Platform Mount [LP 403-1]			

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
148.0	157.0	1	rfs celwave	1142-2C	1 4 13	1/2 7/8 1-5/8	1
	154.0	2	rfs celwave	201-1N			
	152.0	1	radiowaves	HPD2-4.7			
	149.0	3	commscope	LNX-6515DS-VTM w/ Mount Pipe			
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe			
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
		3	ericsson	RRUS 11 B12			
	148.0	1	tower mounts	Platform Mount [LP 405-1]			
140.0	140.0	6	rfs celwave	FD9R6004/2C-3L	12	1-5/8	1
		3	andrew	DB846F65ZAXY w/ Mount Pipe	--	--	2
		3	antel	BXA-171063-12BF-EDIN-X w/ Mount Pipe			
		1	antel	BXA-171063/12CF w/ Mount Pipe			
		1	antel	BXA-70063/4CF w/ Mount Pipe			
		2	decibel	DB846H80E-SX w/ Mount Pipe			
		2	swedcom	SLCP 2x6014 w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 303-1]			
130.0	130.0	6	decibel	DB980H65E-M w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Platform Mount [LP 405-1]			
105.0	105.0	6	ericsson	RRUS-11	2 1 12	3/8 7/16 1-5/8	1
		1	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		6	powerwave technologies	LGP21903			
		2	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 303-1]			
95.0	95.0	3	rfs celwave	APXV18-206516S-C w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
89.0	95.0	1	rfs celwave	1142-2C	1	1/2	1
	89.0	1	tower mounts	Side Arm Mount [SO 701-1]			
72.0	74.0	1	gps	GPS_A	--	--	1
	72.0	1	tower mounts	Side Arm Mount [SO 701-1]			
54.0	64.0	1	rfs celwave	220-8N	2	7/8	1
	61.0	1	rfs celwave	201-1N			
	54.0	2	tower mounts	Side Arm Mount [SO 701-1]			
49.0	49.0	1	decibel	DB436-C	1	7/8	1
		1	tower mounts	Pipe Mount [PM 601-1]			
45.0	45.0	1	decibel	DB436-C	1	7/8	1
		1	tower mounts	Pipe Mount [PM 601-1]			
40.0	40.0	1	decibel	DB436-C	1	7/8	1
		1	tower mounts	Pipe Mount [PM 601-1]			
37.0	37.0	1	decibel	DB436-C	1	7/8	1
		1	tower mounts	Pipe Mount [PM 601-1]			

Notes:
1) Existing Equipment
2) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	French And Parrello, 98A190ER1, 10/12/1998	3464587	CCISITES
4-POST-MODIFICATION INSPECTION	ETS, 129342, 3/13/2013	3774967	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 102048, 12/3/2010	3774968	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PiRod, A-115401, 7/20/1999	3674483	CCISITES
4-TOWER MANUFACTURER DRAWINGS	PiRod, A-115401, 7/20/1999	3464619	CCISITES
4-TOWER PROPOSED REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37513-1388, 05/20/2013	4424839	CCISITES

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) In accordance with discussions with CCI Corporate Engineering: Based on the assumption that the monopole manufacturer (PiRod) has designed the flange plates at splices to adequately develop the full capacity of the unreinforced shaft section using unpublished and/or proprietary methodologies, we are assuming that if our analysis shows that both the existing shaft and the existing flange bolts are at a usage capacity of 100% or less, then the existing flange plates are at a usage capacity of 100% or less and no additional analysis of the flange plate is required.
5) Monopole has been reinforced in conformance with the referenced modification documents.
6) The existing flange jump reinforcing is ineffective at 20' and 40'. The flange jump at 60' may need to be removed for this reinforcing system to be installed; as such it has been ignored for this modification.
7) Monopole will be reinforced in conformance with the referenced proposed modification drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	147.5 - 125	Pole	P24x0.375	1	-9.51	934.94	47.1	Pass
L2	125 - 100	Pole	30" x 0.375"	2	-15.72	1166.57	88.9	Pass
L3	100 - 94.25	Pole	36" x 0.375"	3	-17.12	1325.68	77.0	Pass
L4	94.25 - 80	Pole	RPS 36" x 0.49398"	4	-20.64	1582.11	83.6	Pass
L5	80 - 60	Pole	RPS 42" x 0.57927"	5	-26.89	2073.29	79.1	Pass
L6	60 - 40	Pole	RPS 48" x 0.61655"	6	-34.50	2442.19	78.8	Pass
L7	40 - 20	Pole	RPS 54" x 0.65281"	7	-43.19	2834.26	77.1	Pass
L8	20 - 0	Pole	RPS 60" x 0.62207"	8	-52.21	2942.08	82.2	Pass
							Summary	
						Pole (L2)	88.9	Pass
						Rating =	88.9	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	69.0	Pass
1	Base Plate	0	70.5	Pass
1	Base Foundation Structural Steel	0	59.5	Pass
1,2	Base Foundation Soil Interaction	0	76.0	Pass
1	Flange Connection	20	75.5	Pass
1	Flange Connection	40	80.8	Pass
1	Flange Connection	60	70.7	Pass
1	Flange Connection	80	70.1	Pass
1,3	Flange Connection	100	88.9	Pass
1,3	Flange Connection	125	47.1	Pass

Structure Rating (max from all components) =	88.9%

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.
3) See assumption #4.

4.1) Recommendations

Install the proposed modifications per the referenced 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 density of 56 pcf.
5) A wind speed of 38 mph is used in combination with ice.
6) Temperature drop of 50 °F.
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	

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	147.50-125.00	22.50	P24x0.375	A53-B-42 (42 ksi)	
L2	125.00-100.00	25.00	30" x 0.375"	A53-B-42 (42 ksi)	
L3	100.00-94.25	5.75	36" x 0.375"	A53-B-42 (42 ksi)	
L4	94.25-80.00	14.25	RPS 36" x 0.49398"	Reinf 35.90 ksi (36 ksi)	
L5	80.00-60.00	20.00	RPS 42" x 0.57927"	Reinf 34.39 ksi (34 ksi)	
L6	60.00-40.00	20.00	RPS 48" x 0.61655"	Reinf 33.27 ksi (33 ksi)	
L7	40.00-20.00	20.00	RPS 54" x 0.65281"	Reinf 32.39 ksi (32 ksi)	
L8	20.00-0.00	20.00	RPS 60" x	Reinf 31.70	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
			0.62207"	ksi (32 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 147.50-125.00				1	1	1		
L2 125.00-100.00				1	1	1		
L3 100.00-94.25				1	1	1		
L4 94.25-80.00				1	1	1		
L5 80.00-60.00				1	1	1		
L6 60.00-40.00				1	1	1		
L7 40.00-20.00				1	1	1		
L8 20.00-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	147.50 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.84
						1" Ice	0.00	2.14
LCF78-50A(7/8")	C	No	CaAa (Out Of Face)	147.50 - 0.00	2	No Ice	0.00	0.34
						1/2" Ice	0.00	1.31
						1" Ice	0.00	2.89
AVA5-50(7/8")	C	No	CaAa (Out Of Face)	130.00 - 0.00	2	No Ice	0.00	0.30
						1/2" Ice	0.00	1.28
						1" Ice	0.00	2.87
AVA5-50(7/8")	C	No	CaAa (Out Of Face)	147.50 - 130.00	2	No Ice	0.11	0.30
						1/2" Ice	0.21	1.28
						1" Ice	0.31	2.87
FLC 158-50J(1-5/8")	C	No	Inside Pole	147.50 - 0.00	12	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	CaAa (Out Of Face)	105.00 - 0.00	1	No Ice	0.00	1.07
						1/2" Ice	0.00	2.37
						1" Ice	0.00	4.28
MLE Hybrid 9Power/18Fiber RL 2(1 5/8) ***	C	No	CaAa (Out Of Face)	147.50 - 105.00	1	No Ice	0.16	1.07
						1/2" Ice	0.26	2.37
						1" Ice	0.36	4.28
LDF7-50A(1-5/8")	C	No	Inside Pole	140.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
HB158-1-08U8-S8J18(1-5/8) ***	C	No	CaAa (Out Of Face)	140.00 - 0.00	1	No Ice	0.00	1.30
						1/2" Ice	0.00	2.81
						1" Ice	0.00	4.94
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	130.00 - 0.00	5	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	130.00 - 0.00	1	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.40	4.46
***								
LDF2-50(3/8")	C	No	Inside Pole	105.00 - 0.00	2	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
100266(7/16")	C	No	Inside Pole	105.00 - 0.00	1	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
2" Conduit	C	No	CaAa (Out Of Face)	105.00 - 0.00	1	No Ice	0.00	1.16
						1/2" Ice	0.00	2.53
						1" Ice	0.00	4.51
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	105.00 - 0.00	10	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	105.00 - 0.00	2	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
						1" Ice	0.40	4.46
***								
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	95.00 - 0.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
***								
LDF4-50A(1/2")	C	No	Inside Pole	89.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
***								
LCF78-50A(7/8")	C	No	Inside Pole	54.00 - 0.00	2	No Ice	0.00	0.34
						1/2" Ice	0.00	0.34
						1" Ice	0.00	0.34
***								
LCF78-50A(7/8")	C	No	Inside Pole	49.00 - 0.00	1	No Ice	0.00	0.34
						1/2" Ice	0.00	0.34
						1" Ice	0.00	0.34
***								
LCF78-50A(7/8")	C	No	Inside Pole	45.00 - 0.00	1	No Ice	0.00	0.34
						1/2" Ice	0.00	0.34
						1" Ice	0.00	0.34
***								
LCF78-50A(7/8")	C	No	Inside Pole	40.00 - 0.00	1	No Ice	0.00	0.34
						1/2" Ice	0.00	0.34
						1" Ice	0.00	0.34
***								
LCF78-50A(7/8")	C	No	Inside Pole	37.00 - 0.00	1	No Ice	0.00	0.34
						1/2" Ice	0.00	0.34
						1" Ice	0.00	0.34
***								
2" Solid Rod Reinforcing	C	No	CaAa (Out Of Face)	42.50 - 37.50	1	No Ice	0.20	0.00
						1/2" Ice	0.30	0.00
						1" Ice	0.40	0.00
2" Solid Rod Reinforcing	C	No	CaAa (Out Of Face)	22.50 - 17.50	1	No Ice	0.20	0.00
						1/2" Ice	0.30	0.00
						1" Ice	0.40	0.00
***								
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	60.00 - 0.00	2	No Ice	0.21	0.00
						1/2" Ice	0.32	0.00
						1" Ice	0.43	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	80.00 - 60.00	2	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00
3/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	95.00 - 80.00	2	No Ice	0.13	0.00
						1/2" Ice	0.24	0.00
						1" Ice	0.35	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	147.50-125.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	8.503	0.50
L2	125.00-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	10.180	0.80
L3	100.00-94.25	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	3.603	0.24
L4	94.25-80.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	12.027	0.65
L5	80.00-60.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	18.547	0.92
L6	60.00-40.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	20.713	0.93
L7	40.00-20.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	21.213	0.96
L8	20.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	20.713	0.96

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_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	147.50-125.00	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	21.003	1.01
L2	125.00-100.00	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	21.180	2.05
L3	100.00-94.25	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	7.386	0.76
L4	94.25-80.00	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	26.910	2.22
L5	80.00-60.00	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	39.436	3.11
L6	60.00-40.00	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	42.103	3.13
L7	40.00-20.00	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	43.103	3.15
L8	20.00-0.00	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	42.103	3.16

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	147.50-125.00	-0.4129	0.2384	-0.7823	0.4517
L2	125.00-100.00	-0.4549	0.2626	-0.7830	0.4521

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L3	100.00-94.25	-0.6733	0.3888	-1.1247	0.6493
L4	94.25-80.00	-0.8557	0.4940	-1.4559	0.8405
L5	80.00-60.00	-0.9523	0.5498	-1.5900	0.9180
L6	60.00-40.00	-1.0687	0.6170	-1.7441	1.0070
L7	40.00-20.00	-1.1150	0.6438	-1.8468	1.0662
L8	20.00-0.00	-1.1145	0.6435	-1.8803	1.0856

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
1142-2C	A	From Leg	4.00 0.00 9.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	2.09 3.37 4.67	2.09 3.37 4.67	0.02 0.04 0.07
201-1N	B	From Leg	4.00 0.00 6.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	1.49 2.41 3.34	1.49 2.41 3.34	0.01 0.02 0.04
201-1N	C	From Leg	4.00 0.00 6.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	1.49 2.41 3.34	1.49 2.41 3.34	0.01 0.02 0.04
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	6.82 7.34 7.85	5.63 6.47 7.25	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	6.82 7.34 7.85	5.63 6.47 7.25	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	6.82 7.34 7.85	5.63 6.47 7.25	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	6.83 7.35 7.86	5.64 6.48 7.26	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	6.83 7.35 7.86	5.64 6.48 7.26	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	6.83 7.35 7.86	5.64 6.48 7.26	0.11 0.17 0.23
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
KRY 112 144/1	A	From Leg	4.00	0.0000	148.00	No Ice	0.41	0.20	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00					1/2" Ice	0.50	0.27	0.01
			1.00					1" Ice	0.59	0.35	0.02
KRY 112 144/1	B	From Leg	4.00			0.0000	148.00	No Ice	0.41	0.20	0.01
			0.00					1/2" Ice	0.50	0.27	0.01
			1.00					1" Ice	0.59	0.35	0.02
KRY 112 144/1	C	From Leg	4.00			0.0000	148.00	No Ice	0.41	0.20	0.01
			0.00					1/2" Ice	0.50	0.27	0.01
			1.00					1" Ice	0.59	0.35	0.02
RRUS 11 B12	A	From Leg	4.00			0.0000	148.00	No Ice	3.31	1.36	0.05
			0.00					1/2" Ice	3.55	1.54	0.07
			1.00					1" Ice	3.80	1.73	0.10
RRUS 11 B12	B	From Leg	4.00			0.0000	148.00	No Ice	3.31	1.36	0.05
			0.00					1/2" Ice	3.55	1.54	0.07
			1.00					1" Ice	3.80	1.73	0.10
RRUS 11 B12	C	From Leg	4.00			0.0000	148.00	No Ice	3.31	1.36	0.05
			0.00					1/2" Ice	3.55	1.54	0.07
			1.00					1" Ice	3.80	1.73	0.10
Platform Mount [LP 405-1]	C	None				0.0000	148.00	No Ice	20.80	20.80	1.80
								1/2" Ice	28.10	28.10	2.07
								1" Ice	35.40	35.40	2.33
***											
(2) FD9R6004/2C-3L	A	From Leg	4.00			0.0000	140.00	No Ice	0.37	0.08	0.00
			0.00					1/2" Ice	0.45	0.14	0.01
			0.00					1" Ice	0.54	0.20	0.01
(2) FD9R6004/2C-3L	B	From Leg	4.00			0.0000	140.00	No Ice	0.37	0.08	0.00
			0.00					1/2" Ice	0.45	0.14	0.01
			0.00					1" Ice	0.54	0.20	0.01
(2) FD9R6004/2C-3L	C	From Leg	4.00			0.0000	140.00	No Ice	0.37	0.08	0.00
			0.00					1/2" Ice	0.45	0.14	0.01
			0.00					1" Ice	0.54	0.20	0.01
(2) HBXX-6517DS-A2M w/ Mount Pipe	A	From Leg	4.00			0.0000	140.00	No Ice	8.98	6.96	0.07
			0.00					1/2" Ice	9.65	8.18	0.14
			0.00					1" Ice	10.29	9.14	0.21
(2) HBXX-6517DS-A2M w/ Mount Pipe	B	From Leg	4.00			0.0000	140.00	No Ice	8.98	6.96	0.07
			0.00					1/2" Ice	9.65	8.18	0.14
			0.00					1" Ice	10.29	9.14	0.21
(2) HBXX-6517DS-A2M w/ Mount Pipe	C	From Leg	4.00			0.0000	140.00	No Ice	8.98	6.96	0.07
			0.00					1/2" Ice	9.65	8.18	0.14
			0.00					1" Ice	10.29	9.14	0.21
LNX-6514DS-A1M w/ Mount Pipe	A	From Leg	4.00			0.0000	140.00	No Ice	8.65	7.08	0.06
			0.00					1/2" Ice	9.31	8.27	0.13
			0.00					1" Ice	9.93	9.18	0.21
LNX-6514DS-A1M w/ Mount Pipe	B	From Leg	4.00			0.0000	140.00	No Ice	8.65	7.08	0.06
			0.00					1/2" Ice	9.31	8.27	0.13
			0.00					1" Ice	9.93	9.18	0.21
(2) LNX-6514DS-A1M w/ Mount Pipe	C	From Leg	4.00			0.0000	140.00	No Ice	8.65	7.08	0.06
			0.00					1/2" Ice	9.31	8.27	0.13
			0.00					1" Ice	9.93	9.18	0.21
X7C-FRO-660-V w/ Mount	A	From Leg	4.00			0.0000	140.00	No Ice	10.46	7.53	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Pipe			0.00				1/2" Ice	11.13	8.72	0.14
			0.00				1" Ice	11.76	9.62	0.22
X7C-FRO-660-V w/ Mount Pipe	B	From Leg	4.00		0.0000	140.00	No Ice	10.46	7.53	0.06
			0.00				1/2" Ice	11.13	8.72	0.14
			0.00				1" Ice	11.76	9.62	0.22
RRH2X60-PCS	A	From Leg	4.00		0.0000	140.00	No Ice	2.57	2.01	0.06
			0.00				1/2" Ice	2.79	2.22	0.08
			0.00				1" Ice	3.02	2.43	0.10
RRH2X60-PCS	B	From Leg	4.00		0.0000	140.00	No Ice	2.57	2.01	0.06
			0.00				1/2" Ice	2.79	2.22	0.08
			0.00				1" Ice	3.02	2.43	0.10
RRH2X60-PCS	C	From Leg	4.00		0.0000	140.00	No Ice	2.57	2.01	0.06
			0.00				1/2" Ice	2.79	2.22	0.08
			0.00				1" Ice	3.02	2.43	0.10
RRH2X60-AWS	A	From Leg	4.00		0.0000	140.00	No Ice	2.19	1.43	0.04
			0.00				1/2" Ice	2.40	1.61	0.06
			0.00				1" Ice	2.61	1.80	0.08
RRH2X60-AWS	B	From Leg	4.00		0.0000	140.00	No Ice	2.19	1.43	0.04
			0.00				1/2" Ice	2.40	1.61	0.06
			0.00				1" Ice	2.61	1.80	0.08
RRH2X60-AWS	C	From Leg	4.00		0.0000	140.00	No Ice	2.19	1.43	0.04
			0.00				1/2" Ice	2.40	1.61	0.06
			0.00				1" Ice	2.61	1.80	0.08
DB-T1-6Z-8AB-0Z	C	From Leg	4.00		0.0000	140.00	No Ice	5.60	2.33	0.04
			0.00				1/2" Ice	5.92	2.56	0.08
			0.00				1" Ice	6.24	2.79	0.12
Platform Mount [LP 403-1]	C	None			0.0000	140.00	No Ice	18.85	18.85	1.50
							1/2" Ice	24.30	24.30	1.80
							1" Ice	29.75	29.75	2.09
***										
(2) DB980H65E-M w/ Mount Pipe	A	From Leg	4.00		0.0000	130.00	No Ice	4.04	3.62	0.03
			0.00				1/2" Ice	4.50	4.48	0.07
			0.00				1" Ice	4.95	5.22	0.11
(2) DB980H65E-M w/ Mount Pipe	B	From Leg	4.00		0.0000	130.00	No Ice	4.04	3.62	0.03
			0.00				1/2" Ice	4.50	4.48	0.07
			0.00				1" Ice	4.95	5.22	0.11
(2) DB980H65E-M w/ Mount Pipe	C	From Leg	4.00		0.0000	130.00	No Ice	4.04	3.62	0.03
			0.00				1/2" Ice	4.50	4.48	0.07
			0.00				1" Ice	4.95	5.22	0.11
Platform Mount [LP 405-1]	C	None			0.0000	130.00	No Ice	20.80	20.80	1.80
							1/2" Ice	28.10	28.10	2.07
							1" Ice	35.40	35.40	2.33
***										
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00		0.0000	105.00	No Ice	6.22	4.82	0.09
			0.00				1/2" Ice	6.71	5.51	0.14
			0.00				1" Ice	7.22	6.21	0.21
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00		0.0000	105.00	No Ice	6.22	4.82	0.09
			0.00				1/2" Ice	6.71	5.51	0.14
			0.00				1" Ice	7.22	6.21	0.21

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	6.22 6.71 7.22	4.82 5.51 6.21	0.09 0.14 0.21
P65-17-XLH-RR w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	11.82 12.59 13.38	9.06 10.62 12.21	0.09 0.18 0.28
P65-17-XLH-RR w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	11.82 12.59 13.38	9.06 10.62 12.21	0.09 0.18 0.28
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	8.50 9.15 9.77	6.30 7.48 8.37	0.07 0.14 0.21
(2) LGP21401	A	From Leg	4.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	1.29 1.45 1.61	0.36 0.48 0.60	0.01 0.02 0.03
(2) LGP21401	B	From Leg	4.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	1.29 1.45 1.61	0.36 0.48 0.60	0.01 0.02 0.03
(2) LGP21401	C	From Leg	4.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	1.29 1.45 1.61	0.36 0.48 0.60	0.01 0.02 0.03
(2) LGP21903	A	From Leg	4.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	0.27 0.34 0.43	0.18 0.25 0.32	0.01 0.01 0.02
(2) LGP21903	B	From Leg	4.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	0.27 0.34 0.43	0.18 0.25 0.32	0.01 0.01 0.02
(2) LGP21903	C	From Leg	4.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	0.27 0.34 0.43	0.18 0.25 0.32	0.01 0.01 0.02
(2) RRUS-11	A	From Leg	4.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74	1.37 1.55 1.74	0.05 0.07 0.09
(2) RRUS-11	B	From Leg	4.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74	1.37 1.55 1.74	0.05 0.07 0.09
(2) RRUS-11	C	From Leg	4.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74	1.37 1.55 1.74	0.05 0.07 0.09
DC6-48-60-18-8F	A	From Leg	4.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	1.47 1.67 1.88	1.47 1.67 1.88	0.02 0.04 0.06
Platform Mount [LP 303-1]	C	None		0.0000	105.00	No Ice 1/2" Ice 1" Ice	14.66 18.87 23.08	14.66 18.87 23.08	1.25 1.48 1.71
***									
APXV18-206516S-C w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	3.86 4.27 4.73	3.30 4.00 4.67	0.04 0.07 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXV18-206516S-C w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	3.86 4.27 4.73	3.30 4.00 4.67	0.04 0.07 0.11
APXV18-206516S-C w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	3.86 4.27 4.73	3.30 4.00 4.67	0.04 0.07 0.11
Pipe Mount [PM 601-3]	C	None		0.0000	95.00	No Ice 1/2" Ice 1" Ice	4.39 5.48 6.57	4.39 5.48 6.57	0.20 0.24 0.28
***									
1142-2C	C	From Leg	3.00 0.00 6.00	0.0000	89.00	No Ice 1/2" Ice 1" Ice	2.09 3.37 4.67	2.09 3.37 4.67	0.02 0.04 0.07
Side Arm Mount [SO 701-1]	C	None		0.0000	89.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
***									
GPS_A	A	From Leg	3.00 0.00 2.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	0.30 0.37 0.46	0.30 0.37 0.46	0.00 0.00 0.01
Side Arm Mount [SO 701-1]	A	None		0.0000	72.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
***									
201-1N	A	From Leg	3.00 0.00 7.00	0.0000	54.00	No Ice 1/2" Ice 1" Ice	1.49 2.41 3.34	1.49 2.41 3.34	0.01 0.02 0.04
220-8N	C	From Leg	3.00 0.00 10.00	0.0000	54.00	No Ice 1/2" Ice 1" Ice	5.18 7.09 9.03	5.18 7.09 9.03	0.02 0.06 0.11
Side Arm Mount [SO 701-1]	A	None		0.0000	54.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
Side Arm Mount [SO 701-1]	C	None		0.0000	54.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
***									
DB436-C	A	From Leg	1.00 0.00 0.00	0.0000	49.00	No Ice 1/2" Ice 1" Ice	0.45 0.81 1.17	0.45 0.81 1.17	0.01 0.01 0.01
Pipe Mount [PM 601-1]	A	None		0.0000	49.00	No Ice 1/2" Ice 1" Ice	3.00 3.74 4.48	0.90 1.12 1.34	0.07 0.08 0.09
***									
DB436-C	A	From Leg	1.00 0.00 0.00	0.0000	45.00	No Ice 1/2" Ice 1" Ice	0.45 0.81 1.17	0.45 0.81 1.17	0.01 0.01 0.01
Pipe Mount [PM 601-1]	A	None		0.0000	45.00	No Ice 1/2" Ice 1" Ice	3.00 3.74 4.48	0.90 1.12 1.34	0.07 0.08 0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***									
DB436-C	A	From Leg	1.00 0.00 0.00	0.0000	40.00	No Ice 1/2" Ice 1" Ice	0.45 0.81 1.17	0.45 0.81 1.17	0.01 0.01 0.01
Pipe Mount [PM 601-1]	A	None		0.0000	40.00	No Ice 1/2" Ice 1" Ice	3.00 3.74 4.48	0.90 1.12 1.34	0.07 0.08 0.09
***									
DB436-C	A	From Leg	1.00 0.00 0.00	0.0000	37.00	No Ice 1/2" Ice 1" Ice	0.45 0.81 1.17	0.45 0.81 1.17	0.01 0.01 0.01
Pipe Mount [PM 601-1]	A	None		0.0000	37.00	No Ice 1/2" Ice 1" Ice	3.00 3.74 4.48	0.90 1.12 1.34	0.07 0.08 0.09

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
HPD2-4.7	A	Paraboloid w/o Radome	From Leg	4.00 0.00 4.00	0.0000		148.00	2.04	No Ice 1/2" Ice 1" Ice	3.27 3.55 3.82	0.03 0.05 0.06

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 147.50-125.00	136.25	1.5	25	45.000	A	0.000	45.000	45.000	100.00	0.000	0.000
					B	0.000	45.000		100.00	0.000	0.000
					C	0.000	45.000		100.00	0.000	8.503
L2 125.00-100.00	112.50	1.42	23	62.500	A	0.000	62.500	62.500	100.00	0.000	0.000
					B	0.000	62.500		100.00	0.000	0.000
					C	0.000	62.500		100.00	0.000	10.180
L3 100.00-94.25	97.13	1.361	22	17.250	A	0.000	17.250	17.250	100.00	0.000	0.000
					B	0.000	17.250		100.00	0.000	0.000
					C	0.000	17.250		100.00	0.000	3.603
L4 94.25-80.00	87.13	1.32	22	42.750	A	0.000	42.750	42.750	100.00	0.000	0.000
					B	0.000	42.750		100.00	0.000	0.000
					C	0.000	42.750		100.00	0.000	12.027
L5 80.00-60.00	70.00	1.24	20	70.000	A	0.000	70.000	70.000	100.00	0.000	0.000
					B	0.000	70.000		100.00	0.000	0.000
					C	0.000	70.000		100.00	0.000	18.547
L6 60.00-40.00	50.00	1.126	18	80.000	A	0.000	80.000	80.000	100.00	0.000	0.000
					B	0.000	80.000		100.00	0.000	0.000
					C	0.000	80.000		100.00	0.000	20.713

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L7 40.00-20.00	30.00	1	16	90.000	A	0.000	90.000	90.000	100.00	0.000	0.000
					B	0.000	90.000		100.00	0.000	0.000
					C	0.000	90.000		100.00	0.000	21.213
L8 20.00-0.00	10.00	1	16	100.000	A	0.000	100.000	100.000	100.00	0.000	0.000
					B	0.000	100.000		100.00	0.000	0.000
					C	0.000	100.000		100.00	0.000	20.713

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 147.50-125.00	136.25	1.5	5	1.0000	48.750	A	0.000	48.750	48.750	100.00	0.000	0.000
						B	0.000	48.750		100.00	0.000	0.000
						C	0.000	48.750		100.00	0.000	21.003
L2 125.00-100.00	112.50	1.42	5	1.0000	66.667	A	0.000	66.667	66.667	100.00	0.000	0.000
						B	0.000	66.667		100.00	0.000	0.000
						C	0.000	66.667		100.00	0.000	21.180
L3 100.00-94.25	97.13	1.361	5	1.0000	18.208	A	0.000	18.208	18.208	100.00	0.000	0.000
						B	0.000	18.208		100.00	0.000	0.000
						C	0.000	18.208		100.00	0.000	7.386
L4 94.25-80.00	87.13	1.32	5	1.0000	45.125	A	0.000	45.125	45.125	100.00	0.000	0.000
						B	0.000	45.125		100.00	0.000	0.000
						C	0.000	45.125		100.00	0.000	26.910
L5 80.00-60.00	70.00	1.24	4	1.0000	73.333	A	0.000	73.333	73.333	100.00	0.000	0.000
						B	0.000	73.333		100.00	0.000	0.000
						C	0.000	73.333		100.00	0.000	39.436
L6 60.00-40.00	50.00	1.126	4	1.0000	83.333	A	0.000	83.333	83.333	100.00	0.000	0.000
						B	0.000	83.333		100.00	0.000	0.000
						C	0.000	83.333		100.00	0.000	42.103
L7 40.00-20.00	30.00	1	4	1.0000	93.333	A	0.000	93.333	93.333	100.00	0.000	0.000
						B	0.000	93.333		100.00	0.000	0.000
						C	0.000	93.333		100.00	0.000	43.103
L8 20.00-0.00	10.00	1	4	1.0000	103.333	A	0.000	103.333	103.333	100.00	0.000	0.000
						B	0.000	103.333		100.00	0.000	0.000
						C	0.000	103.333		100.00	0.000	42.103

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 147.50-125.00	136.25	1.5	10	45.000	A	0.000	45.000	45.000	100.00	0.000	0.000
					B	0.000	45.000		100.00	0.000	0.000
					C	0.000	45.000		100.00	0.000	8.503
L2 125.00-100.00	112.50	1.42	9	62.500	A	0.000	62.500	62.500	100.00	0.000	0.000
					B	0.000	62.500		100.00	0.000	0.000
					C	0.000	62.500		100.00	0.000	10.180
L3 100.00-94.25	97.13	1.361	9	17.250	A	0.000	17.250	17.250	100.00	0.000	0.000
					B	0.000	17.250		100.00	0.000	0.000
					C	0.000	17.250		100.00	0.000	3.603
L4 94.25-80.00	87.13	1.32	8	42.750	A	0.000	42.750	42.750	100.00	0.000	0.000
					B	0.000	42.750		100.00	0.000	0.000
					C	0.000	42.750		100.00	0.000	12.027

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L5 80.00-60.00	70.00	1.24	8	70.000	A	0.000	70.000	70.000	100.00	0.000	0.000
					B	0.000	70.000		100.00	0.000	0.000
					C	0.000	70.000		100.00	0.000	18.547
L6 60.00-40.00	50.00	1.126	7	80.000	A	0.000	80.000	80.000	100.00	0.000	0.000
					B	0.000	80.000		100.00	0.000	0.000
					C	0.000	80.000		100.00	0.000	20.713
L7 40.00-20.00	30.00	1	6	90.000	A	0.000	90.000	90.000	100.00	0.000	0.000
					B	0.000	90.000		100.00	0.000	0.000
					C	0.000	90.000		100.00	0.000	21.213
L8 20.00-0.00	10.00	1	6	100.000	A	0.000	100.000	100.000	100.00	0.000	0.000
					B	0.000	100.000		100.00	0.000	0.000
					C	0.000	100.000		100.00	0.000	20.713

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	147.5 - 125	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	14	-17.27	1.07	-0.16
			Max. Mx	11	-9.52	224.47	-0.42
			Max. My	8	-9.51	0.79	-228.20
			Max. Vy	11	-13.80	224.47	-0.42
			Max. Vx	8	13.94	0.79	-228.20
			Max. Torque	3			0.60
L2	125 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27.86	2.55	-0.70
			Max. Mx	11	-15.73	612.63	-1.25
			Max. My	8	-15.72	1.87	-619.61
			Max. Vy	11	-19.51	612.63	-1.25
			Max. Vx	8	19.66	1.87	-619.61
			Max. Torque	12			-0.79
L3	100 - 94.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30.32	3.41	-1.19
			Max. Mx	11	-17.13	726.82	-1.47
			Max. My	8	-17.12	2.18	-734.59
			Max. Vy	11	-20.59	726.82	-1.47
			Max. Vx	8	20.74	2.18	-734.59
			Max. Torque	12			-0.78
L4	94.25 - 80	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-36.01	6.24	-2.82
			Max. Mx	11	-20.65	1032.01	-2.12
			Max. My	8	-20.64	3.09	-1041.66
			Max. Vy	11	-22.06	1032.01	-2.12
			Max. Vx	8	22.21	3.09	-1041.66
			Max. Torque	3			0.76
L5	80 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-45.41	10.41	-5.18
			Max. Mx	11	-26.89	1494.96	-3.04
			Max. My	8	-26.89	4.37	-1507.22
			Max. Vy	11	-24.13	1494.96	-3.04
			Max. Vx	8	24.28	4.37	-1507.22
			Max. Torque	3			0.88
L6	60 - 40	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-56.52	15.62	-7.94
			Max. Mx	11	-34.50	2007.02	-3.99
			Max. My	8	-34.50	5.82	-2021.75
			Max. Vy	11	-26.69	2007.02	-3.99
			Max. Vx	8	26.84	5.82	-2021.75
			Max. Torque	3			1.59
L7	40 - 20	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-68.68	20.83	-10.88
			Max. Mx	11	-43.20	2564.68	-4.98
			Max. My	8	-43.19	7.30	-2581.88
			Max. Vy	11	-28.80	2564.68	-4.98
			Max. Vx	8	28.94	7.30	-2581.88
			Max. Torque	3			1.74
L8	20 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-81.22	26.60	-14.21
			Max. Mx	11	-52.21	3161.43	-6.06
			Max. My	8	-52.21	8.87	-3181.08
			Max. Vy	11	-30.76	3161.43	-6.06
			Max. Vx	8	30.91	8.87	-3181.08
			Max. Torque	2			1.90

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	81.22	-0.00	0.00
	Max. H_x	11	52.22	30.76	-0.02
	Max. H_z	2	52.22	-0.02	30.83
	Max. M_x	2	3165.48	-0.02	30.83

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. M_z	5	3151.54	-30.76	0.03
	Max. Torsion	2	1.90	-0.02	30.83
	Min. Vert	11	52.22	30.76	-0.02
	Min. H_x	5	52.22	-30.76	0.03
	Min. H_z	8	52.22	0.02	-30.90
	Min. M_x	8	-3181.08	0.02	-30.90
	Min. M_z	11	-3161.43	30.76	-0.02
	Min. Torsion	8	-1.90	0.02	-30.90

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	52.22	-0.00	0.00	2.36	4.87	0.00
Dead+Wind 0 deg - No Ice	52.22	0.02	-30.83	-3165.48	1.03	-1.90
Dead+Wind 30 deg - No Ice	52.22	15.43	-26.69	-2740.13	-1581.76	-1.85
Dead+Wind 60 deg - No Ice	52.22	26.67	-15.43	-1583.50	-2734.60	-1.15
Dead+Wind 90 deg - No Ice	52.22	30.76	-0.03	-1.78	-3151.54	-0.08
Dead+Wind 120 deg - No Ice	52.22	26.62	15.55	1607.50	-2725.99	1.01
Dead+Wind 150 deg - No Ice	52.22	15.33	26.78	2758.05	-1565.76	1.80
Dead+Wind 180 deg - No Ice	52.22	-0.02	30.90	3181.08	8.87	1.90
Dead+Wind 210 deg - No Ice	52.22	-15.37	26.80	2761.96	1582.45	1.49
Dead+Wind 240 deg - No Ice	52.22	-26.64	15.59	1614.28	2739.80	0.89
Dead+Wind 270 deg - No Ice	52.22	-30.76	0.02	6.06	3161.43	0.08
Dead+Wind 300 deg - No Ice	52.22	-26.65	-15.38	-1576.71	2740.58	-0.76
Dead+Wind 330 deg - No Ice	52.22	-15.39	-26.67	-2736.22	1584.87	-1.44
Dead+Ice+Temp	81.22	0.00	-0.00	14.21	26.60	0.00
Dead+Wind 0 deg+Ice+Temp	81.22	0.01	-9.18	-939.96	25.68	-0.88
Dead+Wind 30 deg+Ice+Temp	81.22	4.60	-7.95	-811.94	-451.28	-0.78
Dead+Wind 60 deg+Ice+Temp	81.22	7.95	-4.60	-463.49	-798.84	-0.43
Dead+Wind 90 deg+Ice+Temp	81.22	9.16	-0.01	13.04	-924.79	0.04
Dead+Wind 120 deg+Ice+Temp	81.22	7.93	4.62	496.88	-796.32	0.50
Dead+Wind 150 deg+Ice+Temp	81.22	4.57	7.97	843.91	-446.64	0.83
Dead+Wind 180 deg+Ice+Temp	81.22	-0.01	9.20	971.58	28.24	0.88
Dead+Wind 210 deg+Ice+Temp	81.22	-4.58	7.98	845.20	502.78	0.69
Dead+Wind 240 deg+Ice+Temp	81.22	-7.94	4.64	499.10	851.53	0.37
Dead+Wind 270 deg+Ice+Temp	81.22	-9.16	0.01	15.61	978.71	-0.04
Dead+Wind 300 deg+Ice+Temp	81.22	-7.94	-4.58	-461.27	851.47	-0.44
Dead+Wind 330 deg+Ice+Temp	81.22	-4.58	-7.94	-810.65	502.98	-0.74
Dead+Wind 0 deg - Service	52.22	0.01	-12.04	-1235.24	3.42	-0.74
Dead+Wind 30 deg - Service	52.22	6.03	-10.43	-1069.00	-614.92	-0.73
Dead+Wind 60 deg - Service	52.22	10.42	-6.03	-617.23	-1065.43	-0.45
Dead+Wind 90 deg - Service	52.22	12.01	-0.01	0.76	-1228.40	-0.03
Dead+Wind 120 deg - Service	52.22	10.40	6.07	629.53	-1062.06	0.39
Dead+Wind 150 deg - Service	52.22	5.99	10.46	1078.93	-608.67	0.70
Dead+Wind 180 deg - Service	52.22	-0.01	12.07	1244.27	6.48	0.74
Dead+Wind 210 deg - Service	52.22	-6.00	10.47	1080.60	621.30	0.59
Dead+Wind 240 deg -	52.22	-10.41	6.09	632.10	1073.35	0.36

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
Service Dead+Wind 270 deg - Service	52.22	-12.01	0.01	3.83	1238.30	0.03
Service Dead+Wind 300 deg - Service	52.22	-10.41	-6.01	-614.50	1073.65	-0.30
Service Dead+Wind 330 deg - Service	52.22	-6.01	-10.42	-1067.61	622.24	-0.56

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-52.22	0.00	0.00	52.22	-0.00	0.000%
2	0.02	-52.22	-30.83	-0.02	52.22	30.83	0.003%
3	15.43	-52.22	-26.69	-15.43	52.22	26.69	0.000%
4	26.67	-52.22	-15.43	-26.67	52.22	15.43	0.000%
5	30.76	-52.22	-0.03	-30.76	52.22	0.03	0.009%
6	26.62	-52.22	15.55	-26.62	52.22	-15.55	0.000%
7	15.33	-52.22	26.78	-15.33	52.22	-26.78	0.000%
8	-0.02	-52.22	30.90	0.02	52.22	-30.90	0.003%
9	-15.37	-52.22	26.80	15.37	52.22	-26.80	0.000%
10	-26.64	-52.22	15.59	26.64	52.22	-15.59	0.000%
11	-30.76	-52.22	0.02	30.76	52.22	-0.02	0.009%
12	-26.65	-52.22	-15.38	26.65	52.22	15.38	0.000%
13	-15.39	-52.22	-26.67	15.39	52.22	26.67	0.000%
14	0.00	-81.22	0.00	-0.00	81.22	0.00	0.002%
15	0.01	-81.22	-9.18	-0.01	81.22	9.18	0.000%
16	4.60	-81.22	-7.95	-4.60	81.22	7.95	0.000%
17	7.95	-81.22	-4.60	-7.95	81.22	4.60	0.000%
18	9.16	-81.22	-0.01	-9.16	81.22	0.01	0.000%
19	7.93	-81.22	4.62	-7.93	81.22	-4.62	0.000%
20	4.57	-81.22	7.97	-4.57	81.22	-7.97	0.000%
21	-0.01	-81.22	9.20	0.01	81.22	-9.20	0.000%
22	-4.58	-81.22	7.98	4.58	81.22	-7.98	0.000%
23	-7.94	-81.22	4.64	7.94	81.22	-4.64	0.000%
24	-9.16	-81.22	0.01	9.16	81.22	-0.01	0.000%
25	-7.94	-81.22	-4.58	7.94	81.22	4.58	0.000%
26	-4.58	-81.22	-7.94	4.58	81.22	7.94	0.000%
27	0.01	-52.22	-12.04	-0.01	52.22	12.04	0.004%
28	6.03	-52.22	-10.43	-6.03	52.22	10.43	0.004%
29	10.42	-52.22	-6.03	-10.42	52.22	6.03	0.001%
30	12.02	-52.22	-0.01	-12.01	52.22	0.01	0.004%
31	10.40	-52.22	6.07	-10.40	52.22	-6.07	0.001%
32	5.99	-52.22	10.46	-5.99	52.22	-10.46	0.004%
33	-0.01	-52.22	12.07	0.01	52.22	-12.07	0.004%
34	-6.01	-52.22	10.47	6.00	52.22	-10.47	0.001%
35	-10.41	-52.22	6.09	10.41	52.22	-6.09	0.004%
36	-12.02	-52.22	0.01	12.01	52.22	-0.01	0.004%
37	-10.41	-52.22	-6.01	10.41	52.22	6.01	0.004%
38	-6.01	-52.22	-10.42	6.01	52.22	10.42	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	12	0.00004537	0.00007461
3	Yes	14	0.00000001	0.00013356
4	Yes	14	0.00000001	0.00014251
5	Yes	11	0.00013022	0.00014231
6	Yes	14	0.00000001	0.00014106

7	Yes	14	0.00000001	0.00013458
8	Yes	12	0.00004537	0.00008011
9	Yes	14	0.00000001	0.00014380
10	Yes	14	0.00000001	0.00013939
11	Yes	11	0.00013020	0.00013595
12	Yes	14	0.00000001	0.00013784
13	Yes	14	0.00000001	0.00013972
14	Yes	7	0.00000001	0.00001719
15	Yes	14	0.00000001	0.00008006
16	Yes	14	0.00000001	0.00008239
17	Yes	14	0.00000001	0.00008211
18	Yes	14	0.00000001	0.00007872
19	Yes	14	0.00000001	0.00008339
20	Yes	14	0.00000001	0.00008411
21	Yes	14	0.00000001	0.00008217
22	Yes	14	0.00000001	0.00008691
23	Yes	14	0.00000001	0.00008708
24	Yes	14	0.00000001	0.00008246
25	Yes	14	0.00000001	0.00008529
26	Yes	14	0.00000001	0.00008468
27	Yes	11	0.00013253	0.00006571
28	Yes	11	0.00013237	0.00013005
29	Yes	12	0.00000001	0.00007223
30	Yes	11	0.00013250	0.00006046
31	Yes	12	0.00000001	0.00006792
32	Yes	11	0.00013235	0.00013486
33	Yes	11	0.00013251	0.00006658
34	Yes	12	0.00000001	0.00007312
35	Yes	11	0.00013233	0.00014194
36	Yes	11	0.00013247	0.00006066
37	Yes	11	0.00013232	0.00014704
38	Yes	12	0.00000001	0.00006859

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147.5 - 125	18.341	34	1.2363	0.0013
L2	125 - 100	12.696	34	1.1115	0.0008
L3	100 - 94.25	7.540	34	0.8117	0.0005
L4	94.25 - 80	6.601	34	0.7466	0.0005
L5	80 - 60	4.600	34	0.5846	0.0004
L6	60 - 40	2.496	34	0.4094	0.0004
L7	40 - 20	1.084	34	0.2571	0.0002
L8	20 - 0	0.272	34	0.1255	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.00	HPD2-4.7	34	18.341	1.2363	0.0022	27142
148.00	1142-2C	34	18.341	1.2363	0.0022	27142
140.00	(2) FD9R6004/2C-3L	34	16.410	1.2067	0.0019	18095
130.00	(2) DB980H65E-M w/ Mount Pipe	34	13.899	1.1516	0.0015	7754
105.00	(2) 7770.00 w/ Mount Pipe	34	8.437	0.8730	0.0008	4100
95.00	APXV18-206516S-C w/ Mount Pipe	34	6.718	0.7551	0.0007	4923
89.00	1142-2C	34	5.812	0.6860	0.0006	5472
72.00	GPS_A	34	3.666	0.5079	0.0005	6138
54.00	201-1N	34	2.006	0.3623	0.0003	7392
49.00	DB436-C	34	1.643	0.3237	0.0003	7779
45.00	DB436-C	34	1.380	0.2935	0.0003	8120

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
40.00	DB436-C	34	1.084	0.2571	0.0002	8438
37.00	DB436-C	34	0.924	0.2361	0.0002	8329

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147.5 - 125	46.833	9	3.1588	0.0033
L2	125 - 100	32.419	9	2.8395	0.0021
L3	100 - 94.25	19.255	9	2.0734	0.0013
L4	94.25 - 80	16.856	9	1.9071	0.0013
L5	80 - 60	11.747	9	1.4931	0.0011
L6	60 - 40	6.374	9	1.0456	0.0009
L7	40 - 20	2.769	9	0.6566	0.0006
L8	20 - 0	0.694	9	0.3204	0.0003

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.00	HPD2-4.7	9	46.833	3.1588	0.0055	10662
148.00	1142-2C	9	46.833	3.1588	0.0055	10662
140.00	(2) FD9R6004/2C-3L	9	41.901	3.0830	0.0048	7107
130.00	(2) DB980H65E-M w/ Mount Pipe	9	35.490	2.9422	0.0038	3045
105.00	(2) 7770.00 w/ Mount Pipe	9	21.544	2.2301	0.0021	1609
95.00	APXV18-206516S-C w/ Mount Pipe	9	17.156	1.9287	0.0018	1930
89.00	1142-2C	9	14.842	1.7521	0.0016	2145
72.00	GPS_A	9	9.361	1.2972	0.0012	2405
54.00	201-1N	9	5.123	0.9252	0.0008	2896
49.00	DB436-C	9	4.195	0.8266	0.0007	3047
45.00	DB436-C	9	3.524	0.7495	0.0007	3180
40.00	DB436-C	9	2.769	0.6566	0.0006	3305
37.00	DB436-C	9	2.360	0.6030	0.0005	3262

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	147.5 - 125 (1)	P24x0.375	22.50	0.00	0.0	25.200	27.8325	-9.51	701.38	0.014
L2	125 - 100 (2)	30" x 0.375"	25.00	0.00	0.0	25.075	34.9011	-15.72	875.15	0.018
L3	100 - 94.25 (3)	36" x 0.375"	5.75	0.00	0.0	23.696	41.9697	-17.12	994.51	0.017
L4	94.25 - 80 (4)	RPS 36" x 0.49398"	14.25	0.00	0.0	21.540	55.1012	-20.64	1186.88	0.017
L5	80 - 60 (5)	RPS 42" x 0.57927"	20.00	0.00	0.0	20.634	75.3787	-26.89	1555.36	0.017
L6	60 - 40 (6)	RPS 48" x 0.61655"	20.00	0.00	0.0	19.962	91.7793	-34.50	1832.10	0.019
L7	40 - 20 (7)	RPS 54" x 0.65281"	20.00	0.00	0.0	19.434	109.4080	-43.19	2126.23	0.020
L8	20 - 0 (8)	RPS 60" x 0.62207"	20.00	0.00	0.0	19.020	116.0420	-52.21	2207.11	0.024

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 $\frac{P}{P_a}$

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	147.5 - 125 (1)	P24x0.375	228.20	16.918	27.720	0.610	0.00	0.000	27.720	0.000
L2	125 - 100 (2)	30" x 0.375"	619.85	29.135	25.075	1.162	0.00	0.000	25.075	0.000
L3	100 - 94.25 (3)	36" x 0.375"	734.88	23.838	23.696	1.006	0.00	0.000	23.696	0.000
L4	94.25 - 80 (4)	RPS 36" x 0.49398"	1042.18	25.920	23.694	1.094	0.00	0.000	23.694	0.000
L5	80 - 60 (5)	RPS 42" x 0.57927"	1508.05	23.504	22.697	1.036	0.00	0.000	22.697	0.000
L6	60 - 40 (6)	RPS 48" x 0.61655"	2022.99	22.615	21.958	1.030	0.00	0.000	21.958	0.000
L7	40 - 20 (7)	RPS 54" x 0.65281"	2583.53	21.504	21.377	1.006	0.00	0.000	21.377	0.000
L8	20 - 0 (8)	RPS 60" x 0.62207"	3183.18	22.405	20.922	1.071	0.00	0.000	20.922	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	147.5 - 125 (1)	P24x0.375	13.94	1.002	16.800	0.060	0.39	0.014	16.800	0.001
L2	125 - 100 (2)	30" x 0.375"	19.66	1.127	16.800	0.067	0.15	0.003	15.644	0.000
L3	100 - 94.25 (3)	36" x 0.375"	20.74	0.988	16.800	0.059	0.16	0.003	11.901	0.000
L4	94.25 - 80 (4)	RPS 36" x 0.49398"	22.21	0.806	14.360	0.056	0.40	0.005	14.360	0.000
L5	80 - 60 (5)	RPS 42" x 0.57927"	24.28	0.644	13.756	0.047	0.51	0.004	13.756	0.000
L6	60 - 40 (6)	RPS 48" x 0.61655"	26.84	0.585	13.308	0.044	1.22	0.007	13.308	0.001
L7	40 - 20 (7)	RPS 54" x 0.65281"	28.94	0.529	12.956	0.041	1.37	0.006	12.956	0.000
L8	20 - 0 (8)	RPS 60" x 0.62207"	30.91	0.533	12.680	0.042	1.49	0.005	12.680	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	147.5 - 125 (1)	0.014	0.610	0.000	0.060	0.001	0.628 ✔	1.333	H1-3+VT ✔
L2	125 - 100 (2)	0.018	1.162	0.000	0.067	0.000	1.184 ✔	1.333	H1-3+VT ✔
L3	100 - 94.25 (3)	0.017	1.006	0.000	0.059	0.000	1.027 ✔	1.333	H1-3+VT ✔
L4	94.25 - 80 (4)	0.017	1.094	0.000	0.056	0.000	1.115 ✔	1.333	H1-3+VT ✔
L5	80 - 60 (5)	0.017	1.036	0.000	0.047	0.000	1.055 ✔	1.333	H1-3+VT ✔

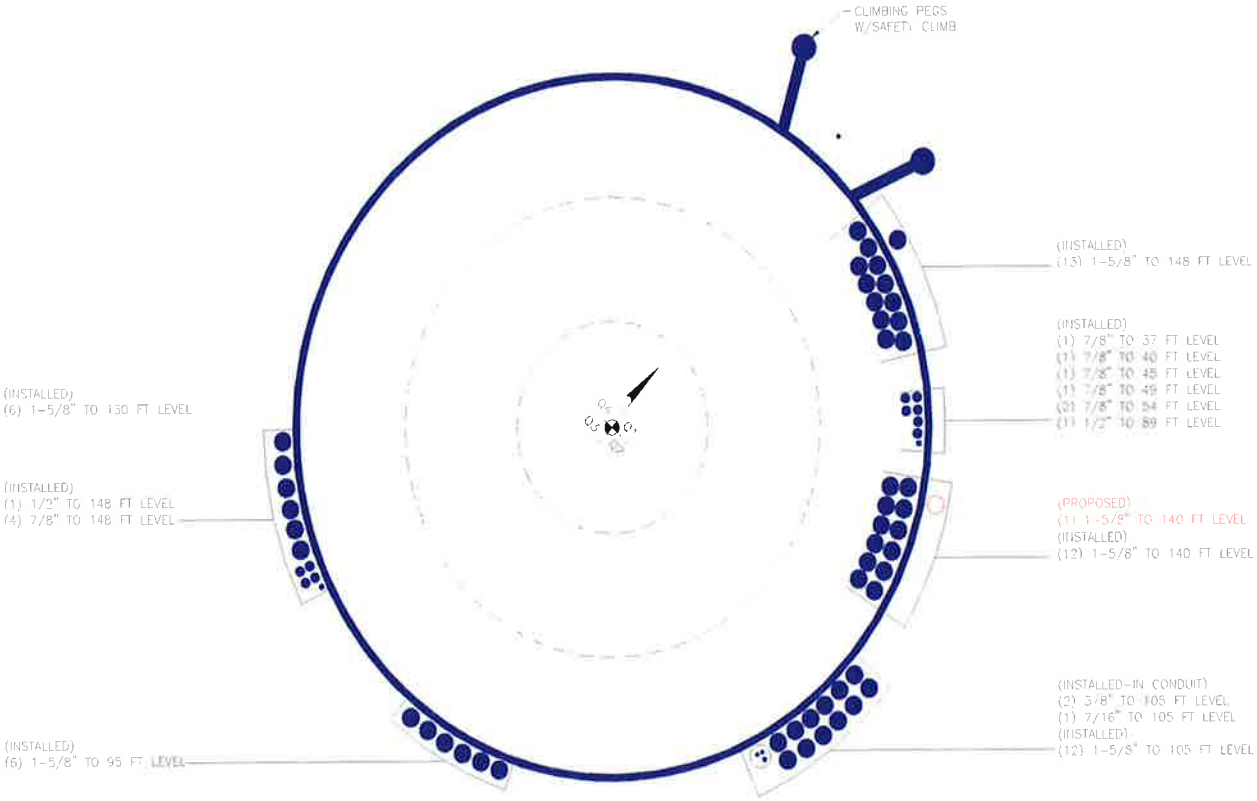
Section No.	Elevation ft	Ratio P / P_a	Ratio f_{bx} / F_{bx}	Ratio f_{by} / F_{by}	Ratio f_v / F_v	Ratio f_{vt} / F_{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L6	60 - 40 (6)	0.019	1.030	0.000	0.044	0.001	1.051 ✔	1.333	H1-3+VT ✔
L7	40 - 20 (7)	0.020	1.006	0.000	0.041	0.000	1.028 ✔	1.333	H1-3+VT ✔
L8	20 - 0 (8)	0.024	1.071	0.000	0.042	0.000	1.096 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	147.5 - 125	Pole	P24x0.375	1	-9.51	934.94	47.1	Pass
L2	125 - 100	Pole	30" x 0.375"	2	-15.72	1166.57	88.9	Pass
L3	100 - 94.25	Pole	36" x 0.375"	3	-17.12	1325.68	77.0	Pass
L4	94.25 - 80	Pole	RPS 36" x 0.49398"	4	-20.64	1582.11	83.6	Pass
L5	80 - 60	Pole	RPS 42" x 0.57927"	5	-26.89	2073.29	79.1	Pass
L6	60 - 40	Pole	RPS 48" x 0.61655"	6	-34.50	2442.19	78.8	Pass
L7	40 - 20	Pole	RPS 54" x 0.65281"	7	-43.19	2834.26	77.1	Pass
L8	20 - 0	Pole	RPS 60" x 0.62207"	8	-52.21	2942.08	82.2	Pass
							Summary	
						Pole (L2)	88.9	Pass
						RATING =	**88.9**	**Pass**

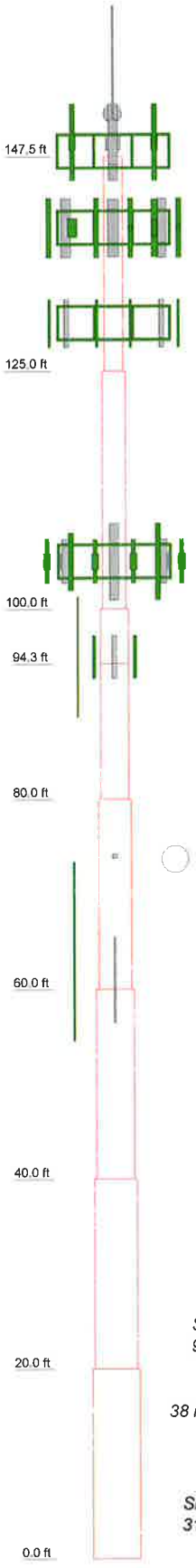
APPENDIX B

BASE LEVEL DRAWING


CLIMBING PEGS
W/SAFETY CLIMB
(INSTALLED)
(13) 1-5/8" TO 148 FT LEVEL
(INSTALLED)
(1) 7/8" TO 37 FT LEVEL
(1) 7/8" TO 40 FT LEVEL
(1) 7/8" TO 45 FT LEVEL
(1) 7/8" TO 49 FT LEVEL
(21) 7/8" TO 54 FT LEVEL
(11) 1/2" TO 89 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 130 FT LEVEL
(INSTALLED)
(1) 1/2" TO 148 FT LEVEL
(4) 7/8" TO 148 FT LEVEL
(PROPOSED)
(11) 1-5/8" TO 140 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 140 FT LEVEL
(INSTALLED-IN CONDUIT)
(2) 3/8" TO 105 FT LEVEL
(1) 7/16" TO 105 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 105 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 95 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS



Section	Size	Length (ft)	Grade	Weight (K)
1	P24x0.375	22.50	A53-B-42	2.1
2	30" x 0.375"	25.00		3.0
3	36" x 0.375"	5.75		0.8
4	RPS 36" x 0.49398"	14.25	Reinf 35.90 ksi	2.7
5	RPS 42" x 0.57927"	20.00	Reinf 34.39 ksi	5.1
6	RPS 48" x 0.61655"	20.00	Reinf 33.27 ksi	6.2
7	RPS 54" x 0.65281"	20.00	Reinf 32.39 ksi	7.4
8	RPS 60" x 0.62207"	20.00	Reinf 31.70 ksi	7.9
				35.3

AXIAL
81 K

SHEAR
9 K

MOMENT
987 kip-ft

TORQUE 1 kip-ft
38 mph WIND - 1.0000 in ICE

AXIAL
52 K

SHEAR
31 K

MOMENT
3183 kip-ft

TORQUE 2 kip-ft
REACTIONS - 80 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
1142-2C	148	(2) FD9R6004/2C-3L	140
201-1N	148	(2) DB980H65E-M w/ Mount Pipe	130
201-1N	148	(2) DB980H65E-M w/ Mount Pipe	130
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	148	Platform Mount [LP 405-1]	130
		(2) DB980H65E-M w/ Mount Pipe	130
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	148	(2) 7770.00 w/ Mount Pipe	105
		(2) 7770.00 w/ Mount Pipe	105
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	148	P65-17-XLH-RR w/ Mount Pipe	105
		P65-17-XLH-RR w/ Mount Pipe	105
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	148	AM-X-CD-16-65-00T-RET w/ Mount Pipe	105
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	148	(2) LGP21401	105
		(2) LGP21401	105
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	148	(2) LGP21401	105
LNX-6515DS-VTM w/ Mount Pipe	148	(2) LGP21903	105
LNX-6515DS-VTM w/ Mount Pipe	148	(2) LGP21903	105
LNX-6515DS-VTM w/ Mount Pipe	148	(2) LGP21903	105
KRY 112 144/1	148	(2) RRUS-11	105
KRY 112 144/1	148	(2) RRUS-11	105
KRY 112 144/1	148	(2) RRUS-11	105
RRUS 11 B12	148	DC6-48-60-18-8F	105
RRUS 11 B12	148	Platform Mount [LP 303-1]	105
RRUS 11 B12	148	(2) 7770.00 w/ Mount Pipe	105
Platform Mount [LP 405-1]	148	APXV18-206516S-C w/ Mount Pipe	95
HPD2-4.7	148	APXV18-206516S-C w/ Mount Pipe	95
(2) FD9R6004/2C-3L	140	Pipe Mount [PM 601-3]	95
(2) FD9R6004/2C-3L	140	APXV18-206516S-C w/ Mount Pipe	95
(2) HBXX-6517DS-A2M w/ Mount Pipe	140	Side Arm Mount [SO 701-1]	89
(2) HBXX-6517DS-A2M w/ Mount Pipe	140	1142-2C	89
(2) HBXX-6517DS-A2M w/ Mount Pipe	140	Side Arm Mount [SO 701-1]	72
LNX-6514DS-A1M w/ Mount Pipe	140	GPS_A	72
LNX-6514DS-A1M w/ Mount Pipe	140	220-8N	54
(2) LNX-6514DS-A1M w/ Mount Pipe	140	Side Arm Mount [SO 701-1]	54
X7C-FRO-660-V w/ Mount Pipe	140	Side Arm Mount [SO 701-1]	54
X7C-FRO-660-V w/ Mount Pipe	140	201-1N	54
RRH2X60-PCS	140	Pipe Mount [PM 601-1]	49
RRH2X60-PCS	140	DB436-C	49
RRH2X60-PCS	140	Pipe Mount [PM 601-1]	45
RRH2X60-AWS	140	DB436-C	45
RRH2X60-AWS	140	Pipe Mount [PM 601-1]	40
RRH2X60-AWS	140	DB436-C	40
DB-T1-6Z-8AB-0Z	140	Pipe Mount [PM 601-1]	37
Platform Mount [LP 403-1]	140	DB436-C	37

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi	Reinf 33.27 ksi	33 ksi	42 ksi
Reinf 35.90 ksi	36 ksi	45 ksi	Reinf 32.39 ksi	32 ksi	41 ksi
Reinf 34.39 ksi	34 ksi	43 ksi	Reinf 31.70 ksi	32 ksi	40 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.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 88.9%

Paul J. Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
Phone: 614.221.6679
FAX: 614.448.4105

Job:	*148 ft Monopole / Rocky Hill/ Rte 160_*
Project:	*PJF 37515-0126 / BU 827050*
Client: CCI	Drawn by: Joey Meinerding App'd:
Code: TIA/EIA-222-F	Date: 03/18/15 Scale: N
Path:	Dwg No.

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *827050*
Site Name: *Rocky Hill/ Rte 160_1*
App #:

Pole Manufacturer:	Pirod

Bolt Data			
Qty:	20		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle (in.):	27		

Plate Data		
Diam:	30	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.77	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0	<-- Disregard
Groove Angle:	0	<-- Disregard
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	24	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.3333333	

Reactions		
Moment:	228.2	ft-kips
Axial:	9.51	kips
Shear:	13.94	kips
Elevation:	125	feet

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

Flange Bolt Results

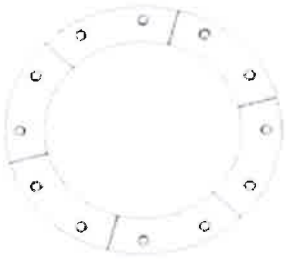
		Rigid
Bolt Tension Capacity, **B**:	46.08 kips	Service, ASD
Max Bolt directly applied T:	19.81 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.427 in	
Min PL "treq" for actual **T w/ Pry**:	0.714 in	
Min PL "t1" for actual **T w/o Pry**:	0.936 in	
T allowable with Prying:	42.50 kips	0≤α'≤1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	19.81 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	43.0% Pass	

Exterior Flange Plate Results Flexural Check

		Rigid
Compression Side Plate Stress:	Rohn/Pirod, OK	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	Rohn/Pirod, OK	Comp. Y.L. Length:
No Prying		12.37
Tension Side Stress Ratio, (treq/t)^2:	32.6% Pass	

b/Le>2, Stiffeners are not fully effective

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt
** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *827050*
Site Name: *Rocky Hill/ Rte 160_1*
App #:

Manufacturer:	Pirod

Reactions		
Moment:	228.2	ft-kips
Axial:	9.51	kips
Shear:	13.94	kips
Exterior Flange Run, T+Q:	19.81	kips

Elevation: 125 feet

Bolt Data			
Qty:	20		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle:	27	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	19.8 Kips, Ext. Flange T+Q
Allowable Tension:	46.1 Kips
Bolt Stress Ratio:	43.0% Pass

Plate Data		
Plate Outer Diam:	29.25	in
Plate Inner Diam:	21	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.59	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	20.8 Kips, Ext. C= Interior C
Plate Stress:	Rohn/Pirod OK
Allowable Plate Stress:	36.0 ksi
Plate Stress Ratio:	Rohn/Pirod OK

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0	<-- Disregard
Groove Angle:	0	<-- Disregard
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Stiffener Results N/A for Rohn / Pirod

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		
Pole OuterDiam:	30	in
Thick:	0.375	in
Pole Inner Diam:	29.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.3333333	

* 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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *827050*
Site Name: *Rocky Hill/ Rte 160_1*
App #:

Pole Manufacturer:	Pirod

Bolt Data			
Qty:	24		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty: 44.00
N/A:	0	<-- Disregard	
Circle (in.):	33		

Plate Data		
Diam:	36	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.93	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0	<-- Disregard
Groove Angle:	0	<-- Disregard
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	30	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.3333333	

Reactions		
Moment:	619.85	ft-kips
Axial:	15.72	kips
Shear:	19.66	kips
Elevation:	100	feet

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

Flange Bolt Results

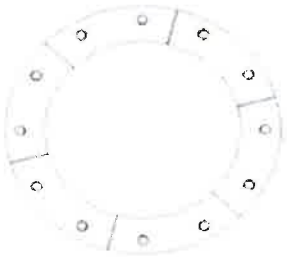
		Rigid
Bolt Tension Capacity, B:	46.08 kips	Service, ASD
Max Bolt directly applied T:	36.91 Kips	Fty*ASIF
Min. PL "tc" for B cap. w/o Pry:	1.398 in	
Min PL "treq" for actual T w/ Pry:	0.952 in	
Min PL "t1" for actual T w/o Pry:	1.252 in	
T allowable with Prying:	42.99 kips	0≤α'≤1 case
Prying Force, Q:	0.05 kips	
Total Bolt Tension=T+Q:	36.96 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	80.2% Pass	

Exterior Flange Plate Results Flexural Check

		Rigid
Compression Side Plate Stress:	Rohn/Pirod, OK	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	Rohn/Pirod, OK	Comp. Y.L. Length: 13.75
Prying Occurs, Plate Check:		
Tension Side Stress Ratio, (treq/t)^2:	58.0% Pass	

b/Le>2, Stiffeners are not fully effective

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt
** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *827050*
Site Name: *Rocky Hill/ Rte 160_1*
App #:

Manufacturer:	Pirod

Reactions		
Moment:	619.85	ft-kips
Axial:	15.72	kips
Shear:	19.66	kips
Exterior Flange Run, T+Q:	36.96	kips

Elevation: 100 feet

Bolt Data			
Qty:	24		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty: 44.00
N/A:	0	<-- Disregard	
Circle:	33	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	37.0	Kips, Ext. Flange T+Q
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	80.2%	Pass

Plate Data		
Plate Outer Diam:	35.25	in
Plate Inner Diam:	27	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.61	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	38.2	Kips, Ext. C= Interior C
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0	<-- Disregard
Groove Angle:	0	<-- Disregard
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Stiffener Results N/A for Rohn / Pirod

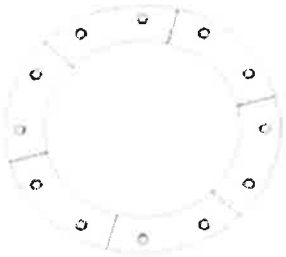
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Data		
Pole OuterDiam:	36	in
Thick:	0.375	in
Pole Inner Diam:	35.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Pole Results

Pole Punching Shear Check: N/A

Stress Increase Factor		
ASIF:	1.3333333	



* 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

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v4.4 - Effective 7-12-13

Date: 3/18/2015
PJF Project: 37515-0126.002.7805
Client Ref. # 827050
Site Name: Rocky Hill/ Rte 160_1
Description: 80' Flange
Owner: CCI
Engineer: JWM

Asymmetric Bolt Analysis

Moment =	1042	k-ft	TIA Ref.	F	Location =	Flange Plate	
Axial =	20.6	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9
Shear =	22.2	kips	Max Ratio =	105.0%	Threads =	N/A	for FP, Rev. G
Anchor Qty =	32						

** For Flange Plates: Prying action is not considered in the bolt loads. **

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in²	Area, in²	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.000	A325	92	120	0.0	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
2	1.000	A325	92	120	12.9	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
3	1.000	A325	92	120	25.7	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
4	1.000	A325	92	120	38.6	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
5	1.000	A325	92	120	51.4	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
6	1.000	A325	92	120	64.3	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
7	1.000	A325	92	120	77.1	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
8	1.000	A325	92	120	90.0	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
9	1.000	A325	92	120	102.9	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
10	1.000	A325	92	120	115.7	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
11	1.000	A325	92	120	128.6	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
12	1.000	A325	92	120	141.4	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
13	1.000	A325	92	120	154.3	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
14	1.000	A325	92	120	167.1	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
15	1.000	A325	92	120	180.0	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
16	1.000	A325	92	120	192.9	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
17	1.000	A325	92	120	205.7	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
18	1.000	A325	92	120	218.6	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
19	1.000	A325	92	120	231.4	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
20	1.000	A325	92	120	244.3	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
21	1.000	A325	92	120	257.1	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
22	1.000	A325	92	120	270.0	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
23	1.000	A325	92	120	282.9	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
24	1.000	A325	92	120	295.7	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
25	1.000	A325	92	120	308.6	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
26	1.000	A325	92	120	321.4	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
27	1.000	A325	92	120	334.3	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
28	1.000	A325	92	120	347.1	39.00	0.00	0.79	19.93	19.22	19.22	0.00	46.08	41.7%
29	0.000	CCI 6 x 1 (65 ksi)	65	80	0.0	43.22	6.00	6.00	168.41	163.03	168.41	241.73	241.73	69.7%
30	0.000	CCI 6 x 1 (65 ksi)	65	80	90.0	43.22	6.00	6.00	168.41	163.03	168.41	241.73	241.73	69.7%
31	0.000	CCI 6 x 1 (65 ksi)	65	80	180.0	43.22	6.00	6.00	168.41	163.03	168.41	241.73	241.73	69.7%
32	0.000	CCI 6 x 1 (65 ksi)	65	80	270.0	43.22	6.00	6.00	168.41	163.03	168.41	241.73	241.73	69.7%
								45.99						

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *827050*
Site Name: *Rocky Hill/ Rte 160_1*
App #:

Pole Manufacturer:	Other

Bolt Data			
Qty:	28		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle (in.):	39		

Plate Data		
Diam:	42	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.04	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0	<-- Disregard
Groove Angle:	0	<-- Disregard
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor	
ASIF:	1.3333333

Reactions		
Moment:	445.3	ft-kips
Axial:	9.9	kips
Shear:	10.6	kips
Elevation:	80	feet

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

Flange Bolt Results

		Rigid
Bolt Tension Capacity, **B**:	46.08 kips	Service, ASD
Max Bolt directly applied T:	19.22 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.379 in	
Min PL "treq" for actual **T w/ Pry**:	0.676 in	
Min PL "t1" for actual **T w/o Pry**:	0.891 in	
T allowable with Prying:	43.34 kips	0≤α'≤1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	19.22 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	41.7% Pass	

Exterior Flange Plate Results — Flexural Check

		Rigid
Compression Side Plate Stress:	17.9 ksi	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	49.7% Pass	Comp. Y.L. Length:
No Prying		15.00
Tension Side Stress Ratio, (treq/t)^2:	29.2% Pass	

b/Le>2, Stiffeners are not fully effective

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a

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

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

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *827050*
Site Name: *Rocky Hill/ Rte 160_1*
App #:

Manufacturer:	Other

Reactions		
Moment:	445.3	ft-kips
Axial:	9.9	kips
Shear:	10.6	kips
Exterior Flange Run, T+Q:	19.22	kips

Elevation: 80 feet

Bolt Data			
Qty:	28		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty: 44.00
N/A:	0	<-- Disregard	
Circle:	39	in	

Plate Data		
Plate Outer Diam:	41.25	in
Plate Inner Diam:	33	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.63	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0	<-- Disregard
Groove Angle:	0	<-- Disregard
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	42	in
Thick:	0.375	in
Pole Inner Diam:	41.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.3333333	

Interior Flange Bolt Results

Maximum Bolt Tension:	19.2	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	41.7%	Pass

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	19.9	Kips, Ext. C= Interior C
Plate Stress:	25.2	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	70.1%	Pass

Stiffener Results

Horizontal Weld :	33.6%	Pass
Vertical Weld:	22.8%	Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	17.1%	Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	28.3%	Pass
Plate Comp. (AISC Bracket):	43.3%	Pass

Pole Results

Pole Punching Shear Check:	13.8%	Pass

* 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

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v4.4 - Effective 7-12-13

Date: 3/18/2015
PJF Project: 37515-0126.002.7805
Client Ref. # 827050
Site Name: Rocky Hill/ Rte 160_1
Description: 60' Flange
Owner: CCI
Engineer: JWM

Asymmetric Bolt Analysis

Moment =	1508	k-ft	TIA Ref.	F	Location =	Flange Plate		
Axial =	26.9	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	24.3	kips	Max Ratio =	105.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	36							

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.000	A325	92	120	0.0	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
2	1.000	A325	92	120	11.3	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
3	1.000	A325	92	120	22.5	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
4	1.000	A325	92	120	33.8	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
5	1.000	A325	92	120	45.0	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
6	1.000	A325	92	120	56.3	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
7	1.000	A325	92	120	67.5	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
8	1.000	A325	92	120	78.8	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
9	1.000	A325	92	120	90.0	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
10	1.000	A325	92	120	101.3	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
11	1.000	A325	92	120	112.5	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
12	1.000	A325	92	120	123.8	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
13	1.000	A325	92	120	135.0	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
14	1.000	A325	92	120	146.3	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
15	1.000	A325	92	120	157.5	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
16	1.000	A325	92	120	168.8	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
17	1.000	A325	92	120	180.0	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
18	1.000	A325	92	120	191.3	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
19	1.000	A325	92	120	202.5	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
20	1.000	A325	92	120	213.8	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
21	1.000	A325	92	120	225.0	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
22	1.000	A325	92	120	236.3	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
23	1.000	A325	92	120	247.5	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
24	1.000	A325	92	120	258.8	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
25	1.000	A325	92	120	270.0	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
26	1.000	A325	92	120	281.3	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
27	1.000	A325	92	120	292.5	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
28	1.000	A325	92	120	303.8	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
29	1.000	A325	92	120	315.0	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
30	1.000	A325	92	120	326.3	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
31	1.000	A325	92	120	337.5	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
32	1.000	A325	92	120	348.8	45.00	0.00	0.79	20.09	19.36	19.36	0.00	46.08	42.0%
33	0.000	CCI 6.5 x 1.25 (65 ksi)	65	80	0.0	49.25	8.13	8.13	227.09	219.50	227.09	347.22	347.22	65.4%
34	0.000	CCI 6.5 x 1.25 (65 ksi)	65	80	90.0	49.25	8.13	8.13	227.09	219.50	227.09	347.22	347.22	65.4%
35	0.000	CCI 6.5 x 1.25 (65 ksi)	65	80	180.0	49.25	8.13	8.13	227.09	219.50	227.09	347.22	347.22	65.4%
36	0.000	CCI 6.5 x 1.25 (65 ksi)	65	80	270.0	49.25	8.13	8.13	227.09	219.50	227.09	347.22	347.22	65.4%
								57.63						

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *827050*
Site Name: *Rocky Hill/ Rte 160_1*
App #:

Pole Manufacturer:	Other

Bolt Data			
Qty:	32		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle (in.):	45		

Plate Data		
Diam:	48	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.12	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0	<-- Disregard
Groove Angle:	0	<-- Disregard
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	42	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.3333333	

Reactions		
Moment:	591.7	ft-kips
Axial:	11.7	kips
Shear:	10.6	kips
Elevation:	60	feet

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

Flange Bolt Results

			Rigid
Bolt Tension Capacity, B:	46.08	kips	Service, ASD
Max Bolt directly applied T:	19.36	Kips	Fty*ASIF
Min. PL "tc" for B cap. w/o Pry:	1.365	in	
Min PL "treq" for actual T w/ Pry:	0.670	in	
Min PL "t1" for actual T w/o Pry:	0.885	in	
T allowable with Prying:	43.60	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	19.36	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	42.0%	Pass	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	18.1	ksi	Service ASD
Allowable Plate Stress:	36.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	50.2%	Pass	Comp. Y.L. Length:
No Prying			16.16
Tension Side Stress Ratio, (treq/t)^2:	28.7%	Pass	

b/Le>2, Stiffeners are not fully effective

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a

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

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

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *827050*
Site Name: *Rocky Hill/ Rte 160_1*
App #:

Manufacturer:	Other

Reactions		
Moment:	591.7	ft-kips
Axial:	11.7	kips
Shear:	10.6	kips
Exterior Flange Run, T+Q:	19.36	kips

Elevation: 60 feet

Bolt Data			
Qty:	32		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty: 44.00
N/A:	0	<-- Disregard	
Circle:	45	in	

Plate Data		
Plate Outer Diam:	47.25	in
Plate Inner Diam:	39	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.64	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0	<-- Disregard
Groove Angle:	0	<-- Disregard
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	48	in
Thick:	0.375	in
Pole Inner Diam:	47.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.3333333	

Interior Flange Bolt Results

Maximum Bolt Tension:	19.4	Kips, Ext. Flange T+Q
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	42.0%	Pass

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	20.1	Kips, Ext. C= Interior C
Plate Stress:	25.4	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	70.7%	Pass

Stiffener Results

Horizontal Weld :	34.3%	Pass
Vertical Weld:	23.3%	Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	17.6%	Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	29.0%	Pass
Plate Comp. (AISC Bracket):	44.3%	Pass

Pole Results

Pole Punching Shear Check:	14.2%	Pass

* 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

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v4.4 - Effective 7-12-13

Date: 3/18/2015
PJF Project: 37515-0126.002.7805
Client Ref. # 827050
Site Name: Rocky Hill/ Rte 160_1
Description: 40' Flange
Owner: CCI
Engineer: JWM

Asymmetric Bolt Analysis

Moment =	2023	k-ft	TIA Ref.	F	Location =	Flange Plate		
Axial =	34.5	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	26.8	kips	Max Ratio =	105.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	40							

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.000	A325	92	120	0.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
2	1.000	A325	92	120	10.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
3	1.000	A325	92	120	20.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
4	1.000	A325	92	120	30.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
5	1.000	A325	92	120	40.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
6	1.000	A325	92	120	50.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
7	1.000	A325	92	120	60.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
8	1.000	A325	92	120	70.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
9	1.000	A325	92	120	80.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
10	1.000	A325	92	120	90.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
11	1.000	A325	92	120	100.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
12	1.000	A325	92	120	110.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
13	1.000	A325	92	120	120.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
14	1.000	A325	92	120	130.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
15	1.000	A325	92	120	140.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
16	1.000	A325	92	120	150.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
17	1.000	A325	92	120	160.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
18	1.000	A325	92	120	170.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
19	1.000	A325	92	120	180.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
20	1.000	A325	92	120	190.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
21	1.000	A325	92	120	200.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
22	1.000	A325	92	120	210.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
23	1.000	A325	92	120	220.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
24	1.000	A325	92	120	230.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
25	1.000	A325	92	120	240.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
26	1.000	A325	92	120	250.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
27	1.000	A325	92	120	260.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
28	1.000	A325	92	120	270.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
29	1.000	A325	92	120	280.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
30	1.000	A325	92	120	290.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
31	1.000	A325	92	120	300.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
32	1.000	A325	92	120	310.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
33	1.000	A325	92	120	320.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
34	1.000	A325	92	120	330.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
35	1.000	A325	92	120	340.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
36	1.000	A325	92	120	350.0	51.00	0.00	0.79	22.96	22.07	22.07	0.00	46.08	47.9%
37	0.000	CCI 6.5 x 1.25 (65 ksi)	65	80	0.0	55.25	8.13	8.13	256.95	247.72	256.95	347.22	347.22	74.0%
38	0.000	CCI 6.5 x 1.25 (65 ksi)	65	80	90.0	55.25	8.13	8.13	256.95	247.72	256.95	347.22	347.22	74.0%
39	0.000	CCI 6.5 x 1.25 (65 ksi)	65	80	180.0	55.25	8.13	8.13	256.95	247.72	256.95	347.22	347.22	74.0%
40	0.000	CCI 6.5 x 1.25 (65 ksi)	65	80	270.0	55.25	8.13	8.13	256.95	247.72	256.95	347.22	347.22	74.0%
								60.77						

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *827050*
Site Name: *Rocky Hill/ Rte 160_1*
App #:

Pole Manufacturer:	Other

Bolt Data			
Qty:	36		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle (in.):	51		

Plate Data		
Diam:	54	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.19	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0	<-- Disregard
Groove Angle:	0	<-- Disregard
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	48	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.3333333	

Reactions		
Moment:	861.2	ft-kips
Axial:	16.1	kips
Shear:	12.5	kips
Elevation:	40	feet

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

Flange Bolt Results

		Rigid
Bolt Tension Capacity, B:	46.08 kips	Service, ASD
Max Bolt directly applied T:	22.07 Kips	Fty*ASIF
Min. PL "tc" for B cap. w/o Pry:	1.354 in	
Min PL "treq" for actual T w/ Pry:	0.709 in	
Min PL "t1" for actual T w/o Pry:	0.937 in	
T allowable with Prying:	43.81 kips	0≤α'≤1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	22.07 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	47.9% Pass	

Exterior Flange Plate Results Flexural Check

		Rigid
Compression Side Plate Stress:	20.5 ksi	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	57.1% Pass	Comp. Y.L. Length:
No Prying		17.23
Tension Side Stress Ratio, (treq/t)^2:	32.2% Pass	

b/Le>2, Stiffeners are not fully effective

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a

* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt
** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *827050*
Site Name: *Rocky Hill/ Rte 160_1*
App #:

Manufacturer:	Other

Reactions		
Moment:	861.2	ft-kips
Axial:	16.1	kips
Shear:	12.5	kips
Exterior Flange Run, T+Q:	22.07	kips

Elevation: 40 feet

Bolt Data			
Qty:	36		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle:	51	in	

Plate Data		
Plate Outer Diam:	53.25	in
Plate Inner Diam:	45	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.65	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0	<-- Disregard
Groove Angle:	0	<-- Disregard
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	54	in
Thick:	0.375	in
Pole Inner Diam:	53.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.3333333	

Interior Flange Bolt Results

Maximum Bolt Tension:	22.1 Kips, Ext. Flange T+Q
Allowable Tension:	46.1 Kips
Bolt Stress Ratio:	47.9% Pass

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	23.0 Kips, Ext. C= Interior C
Plate Stress:	29.1 ksi
Allowable Plate Stress:	36.0 ksi
Plate Stress Ratio:	80.8% Pass

Stiffener Results

Horizontal Weld :	39.7% Pass
Vertical Weld:	26.9% Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	21.1% Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	34.2% Pass
Plate Comp. (AISC Bracket):	51.1% Pass

Pole Results

Pole Punching Shear Check:	16.3% Pass

* 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

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Date: 3/18/2015
PJF Project: 37515-0126.001.7805
Client Ref. # 827050
Site Name: Rocky Hill/ Rte 160_1
Description: 20' Flange
Owner: CCI
Engineer: JWM

v4.4 - Effective 7-12-13

Asymmetric Anchor Rod Analysis

Moment =	2584	k-ft	TIA Ref.	F	Location =	Base Plate		
Axial =	43.2	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	28.9	kips	Max Ratio =	105.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	52							

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

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.000	A325	92	120	0.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
2	1.000	A325	92	120	7.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
3	1.000	A325	92	120	15.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
4	1.000	A325	92	120	22.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
5	1.000	A325	92	120	30.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
6	1.000	A325	92	120	37.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
7	1.000	A325	92	120	45.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
8	1.000	A325	92	120	52.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
9	1.000	A325	92	120	60.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
10	1.000	A325	92	120	67.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
11	1.000	A325	92	120	75.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
12	1.000	A325	92	120	82.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
13	1.000	A325	92	120	90.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
14	1.000	A325	92	120	97.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
15	1.000	A325	92	120	105.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
16	1.000	A325	92	120	112.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
17	1.000	A325	92	120	120.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
18	1.000	A325	92	120	127.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
19	1.000	A325	92	120	135.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
20	1.000	A325	92	120	142.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
21	1.000	A325	92	120	150.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
22	1.000	A325	92	120	157.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
23	1.000	A325	92	120	165.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
24	1.000	A325	92	120	172.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
25	1.000	A325	92	120	180.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
26	1.000	A325	92	120	187.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
27	1.000	A325	92	120	195.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
28	1.000	A325	92	120	202.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
29	1.000	A325	92	120	210.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
30	1.000	A325	92	120	217.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
31	1.000	A325	92	120	225.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
32	1.000	A325	92	120	232.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
33	1.000	A325	92	120	240.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
34	1.000	A325	92	120	247.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
35	1.000	A325	92	120	255.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
36	1.000	A325	92	120	262.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
37	1.000	A325	92	120	270.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
38	1.000	A325	92	120	277.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
39	1.000	A325	92	120	285.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
40	1.000	A325	92	120	292.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
41	1.000	A325	92	120	300.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
42	1.000	A325	92	120	307.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
43	1.000	A325	92	120	315.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
44	1.000	A325	92	120	322.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
45	1.000	A325	92	120	330.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
46	1.000	A325	92	120	337.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
47	1.000	A325	92	120	345.0	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
48	1.000	A325	92	120	352.5	57.00	0.00	0.79	20.11	19.27	19.27	0.00	46.08	41.8%
49	0.000	CCI 8.5 x 1.25 (65 ksi)	65	80	0.0	61.25	10.63	10.63	291.98	280.53	291.98	461.09	461.09	63.3%
50	0.000	CCI 8.5 x 1.25 (65 ksi)	65	80	90.0	61.25	10.63	10.63	291.98	280.53	291.98	461.09	461.09	63.3%
51	0.000	CCI 8.5 x 1.25 (65 ksi)	65	80	180.0	61.25	10.63	10.63	291.98	280.53	291.98	461.09	461.09	63.3%
52	0.000	CCI 8.5 x 1.25 (65 ksi)	65	80	270.0	61.25	10.63	10.63	291.98	280.53	291.98	461.09	461.09	63.3%
								80.20						

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *827050*
Site Name: *Rocky Hill/ Rte 160_1*
App #:

Pole Manufacturer:	Other

Bolt Data			
Qty:	48		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle (in.):	57		

Plate Data		
Diam:	60	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.53	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0	<-- Disregard
Groove Angle:	0	<-- Disregard
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	54	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.3333333	

Reactions		
Moment:	1122.4	ft-kips
Axial:	20.3	kips
Shear:	13.6	kips
Elevation:	20	feet

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

Flange Bolt Results

		Stiffened
Bolt Tension Capacity, **B**:	46.08 kips	Service, ASD
Max Bolt directly applied T:	19.27 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	Stiffened in	
Min PL "treq" for actual **T w/ Pry**:	Stiffened in	
Min PL "t1" for actual **T w/o Pry**:	Stiffened in	
T allowable	46.08 kips	<-- B, Stiffened
Prying Force, Q:	0.00 kips	Stiffened
Total Bolt Tension=T+Q:	19.27 kips	
Non-Prying Bolt Stress Ratio, T/B:	41.8% Pass	

Exterior Flange Plate Results Flexural Check

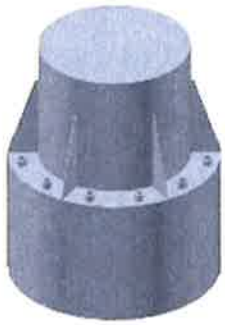
		Stiffened
Compression Side Plate Stress:	27.2 ksi	Service, ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	75.5% Pass	Comp. Y.L. Length:
Stiffened		N/A, Roark
Tension Side Stress Ratio, (treq/t)^2:	N/A	

Stiffener Results

Horizontal Weld :	49.0% Pass
Vertical Weld:	33.3% Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	27.8% Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	43.7% Pass
Plate Comp. (AISC Bracket):	63.2% Pass

Pole Results

Pole Punching Shear Check:	20.2% Pass



* 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

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *827050*
Site Name: *Rocky Hill/ Rte 160_1*
App #:

Reactions		
Moment:	1122.4	ft-kips
Axial:	20.3	kips
Shear:	13.6	kips
Exterior Flange Run, T+Q:	19.27	kips

Manufacturer:	Other

Elevation: 20 feet

Bolt Data			
Qty:	48		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	Bolt Fty: 44.00
N/A:	0	<-- Disregard	
Circle:	57	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	19.3	Kips, Ext. Flange T+Q
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	41.8%	Pass

Plate Data		
Plate Outer Diam:	59.25	in
Plate Inner Diam:	51	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	3.88	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	20.1	Kips, Ext. C= Interior C
Plate Stress:	26.1	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	72.5%	Pass

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0	<-- Disregard
Groove Angle:	0	<-- Disregard
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

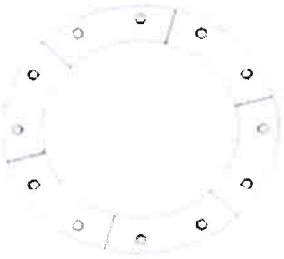
Stiffener Results

Horizontal Weld :	39.8%	Pass
Vertical Weld:	27.0%	Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	21.2%	Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	34.3%	Pass
Plate Comp. (AISC Bracket):	51.3%	Pass

Pole Results

Pole Punching Shear Check:	16.4%	Pass

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.375	in
Pole Inner Diam:	59.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi



Stress Increase Factor		
ASIF:	1.3333333	

* 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

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

Date: 3/18/2015
PJF Project: 37515-0126.002.7805
Client Ref. # 827050
Site Name: Rocky Hill/ Rte 160_1
Description: 148.5' Pole
Owner: CCI
Engineer: JWM

v4.4 - Effective 7-12-13

Asymmetric Anchor Rod Analysis

Moment =	3183	k-ft	TIA Ref.	F	Location =	Base Plate		
Axial =	52.0	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	31.0	kips	Max Ratio =	105.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	52							

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

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in²	Area, in²	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.000	A687	105	150	0.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
2	1.000	A687	105	150	7.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
3	1.000	A687	105	150	15.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
4	1.000	A687	105	150	22.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
5	1.000	A687	105	150	30.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
6	1.000	A687	105	150	37.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
7	1.000	A687	105	150	45.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
8	1.000	A687	105	150	52.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
9	1.000	A687	105	150	60.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
10	1.000	A687	105	150	67.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
11	1.000	A687	105	150	75.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
12	1.000	A687	105	150	82.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
13	1.000	A687	105	150	90.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
14	1.000	A687	105	150	97.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
15	1.000	A687	105	150	105.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
16	1.000	A687	105	150	112.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
17	1.000	A687	105	150	120.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
18	1.000	A687	105	150	127.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
19	1.000	A687	105	150	135.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
20	1.000	A687	105	150	142.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
21	1.000	A687	105	150	150.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
22	1.000	A687	105	150	157.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
23	1.000	A687	105	150	165.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
24	1.000	A687	105	150	172.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
25	1.000	A687	105	150	180.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
26	1.000	A687	105	150	187.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
27	1.000	A687	105	150	195.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
28	1.000	A687	105	150	202.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
29	1.000	A687	105	150	210.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
30	1.000	A687	105	150	217.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
31	1.000	A687	105	150	225.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
32	1.000	A687	105	150	232.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
33	1.000	A687	105	150	240.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
34	1.000	A687	105	150	247.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
35	1.000	A687	105	150	255.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
36	1.000	A687	105	150	262.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
37	1.000	A687	105	150	270.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
38	1.000	A687	105	150	277.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
39	1.000	A687	105	150	285.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
40	1.000	A687	105	150	292.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
41	1.000	A687	105	150	300.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
42	1.000	A687	105	150	307.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
43	1.000	A687	105	150	315.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
44	1.000	A687	105	150	322.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
45	1.000	A687	105	150	330.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
46	1.000	A687	105	150	337.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
47	1.000	A687	105	150	345.0	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
48	1.000	A687	105	150	352.5	63.00	0.00	0.79	33.17	31.67	31.67	0.00	51.84	61.1%
49	2.250	Williams R71	127.7	150	3.8	71.00	0.00	4.14	196.75	188.80	188.80	0.00	273.50	69.0%
50	2.250	Williams R71	127.7	150	93.8	71.00	0.00	4.14	196.75	188.80	188.80	0.00	273.50	69.0%
51	2.250	Williams R71	127.7	150	183.8	71.00	0.00	4.14	196.75	188.80	188.80	0.00	273.50	69.0%
52	2.250	Williams R71	127.7	150	273.8	71.00	0.00	4.14	196.75	188.80	188.80	0.00	273.50	69.0%

54.28

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

TIA Rev F

Site Data

BU#: *827050*
Site Name: *Rocky Hill/ Rte 160_1*
App #:

Pole Manufacturer:	*Other*

Reactions		
Moment:	2042.4	ft-kips
Axial:	36.1	kips
Shear:	21.5	kips

Reactions adjusted to account for additional anchor rods.

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

Anchor Rod Data		
Qty:	48	
Diam:	1	in
Rod Material:	Other	
Strength (Fu):	150	ksi
Yield (Fy):	105	ksi
Bolt Circle:	63	in

Plate Data		
Diam:	66	in
Thick:	1.25	in
Grade:	36	ksi
Single-Rod B-eff:	3.93	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	60	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Anchor Rod Results

		Stiffened
Maximum Rod Tension:	31.7 Kips	Service, ASD
Allowable Tension:	51.8 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	61.1% Pass	

Base Plate Results

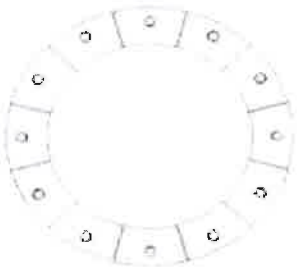
	Shear Check Only	Stiffened
Base Plate Stress:	4.4 ksi	Service, ASD
Allowable Plate Stress:	19.2 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	23.0% Pass	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	54.7% Pass
Vertical Weld:	37.1% Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	32.1% Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	49.8% Pass
Plate Comp. (AISC Bracket):	70.5% Pass

Pole Results

Pole Punching Shear Check:	22.5% Pass



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

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

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

Unfactored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, M =	3183.0		k-ft
Shear, V =	31.0		kips
Axial Load, P =	52.0		kips
OTM =	3198.5	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 =	7	ft
Height Above Grade =	0.5	ft
Depth Below Grade =	36	ft
fc' =	3	ksi
εc =	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

1. Ult. Skin Friction/2.00 + Ult. End Bearing/2.00 + Effective Soil Wt. - Buoyant Conc. Wt. ≥ Comp.
2. Ult. Skin Friction/2.00 + Buoyant Conc. Wt./1.25 ≥ Uplift
3. Ult. Skin Friction/1.50 + Buoyant Conc. Wt./1.50 ≥ Uplift

Steel Parameters

Number of Bars =	28	
Rebar Size =	#9	
Rebar Fy =	60	ksi
Rebar MOE =	29000	ksi
Tie Size =	#5	
Side Clear Cover to Ties =	3	in

Soil Parameters

Water Table Depth =	10.00	ft
Depth to Ignore Soil =	3.50	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?	Ground	

Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)
Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)

Direct Embed Pole Shaft Parameters

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

Maximum Capacity Ratios

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

Define Soil Layers

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

Layer	Thickness ft	Unit Weight pcf	Cohesion psf	Friction Angle degrees	Soil Type	Ultimate End Bearing psf	Comp. Ult. Skin Friction psf	Tension Ult. Skin Friction psf	Depth ft
1	12	125	1000	0	Clay				12
2	24	110	500	0	Clay	16000			36
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

Soil Results: Overturning

Depth to COR =	16.96	ft, from Grade
Bending Moment, M =	3724.17	k-ft, from COR
Resisting Moment, Ma =	4901.73	k-ft, from COR

MOMENT RATIO = 76.0% OK

Shear, V =	31.00	kips
Resisting Shear, Va =	40.80	kips

SHEAR RATIO = 76.0% OK

Soil Results: Uplift

Uplift, T =	0.00	kips
Allowable Uplift Cap., Ta =	118.61	kips

UPLIFT RATIO = 0.0% OK

Soil Results: Compression

Compression, C =	52.00	kips
Allowable Comp. Cap., Ca =	256.50	kips

COMPRESSION RATIO = 20.3% OK

Steel Results (ACI 318-02):

Minimum Steel Area =	18.47	sq in
Actual Steel Area =	28.00	sq in
Allowable Min Axial, Pa =	-1163.08	kips, Where Ma = 0 k-ft
Allowable Max Axial, Pa =	6296.04	kips, Where Ma = 0 k-ft

Axial Load, P =	79.42	kips @ 4.25 ft Below Grade
Moment, M =	3324.27	k-ft @ 4.25 ft Below Grade
Allowable Moment, Ma =	3611.69	k-ft

MOMENT RATIO = SEE NEXT SHEET

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

Job Number: 37515-0126,002,7805
Site Number: 827050
Site Name: Rocky Hill/ Rte 160_1
By: JWM
Date: 3/18/2015

DRILLED PIER STEEL ANALYSIS - STEEL CALCULATIONS - TIA/EIA-222-F

BASED ON ACI 318-02, SECTIONS 9 & 10 (ASSUMING TIE REINFORCEMENT)

Unfactored Internal Loads from Analysis

Reference Standard =	TIA/EIA-222-F	
ACI Code =	ACI 318-02	
Maximum Ratio =	100.0%	
Axial Load, P =	79.4	kips, (+Comp, -Tension)
Moment, M =	3324.3	k-ft (Must be Positive)
Depth to Analysis Section =	4.25	ft, from Grade

Factored Internal Loads

Load Factor =	1.3	
Axial Load, Pu = ΦPn =	103.2	kips
Moment, Mu =	4321.5	k-ft

Drilled Pier Geometry and Concrete Specifications

Diameter =	84	in
fc' =	3	ksi
εc =	0.003	in/in
β1 =	0.85	
Ag =	5541.8	in^2
Height Above Grade =	0.5	ft
Depth Below Grade =	36	ft

Nominal Axial Load and Moment

ΦPn(max) =	8825.4	kips
ΦPn(min) =	-2657.1	kips
ΦPn =	103.2	kips
Φ =	0.900	
ΦMn (Resultant) =	7260.6	k-ft
at θ =	180	degrees
NA Depth =	16.76	in

Rebar Size and Specifications

	Existing	New	
Bar Size =	#9		
Override Bar Diameter =		2.2500	in
Bar Diameter =	1.1280	2.2500	in
Bar Area =	1.0000	3.9761	in^2
Effective Bar Area =	1.0000	3.9761	in^2
Number Bars =	28	4	
Spacing =	Symmetric	Symmetric	
fy =	60	80	ksi
Es =	29000	29000	ksi
εy =	0.00207	0.00276	in/in
Tie Size =	#5		
Clear Cover to Ties =	3		in
Bar Circle =	75.622	71	in
Adjust =	0.0000	315.0000	degrees
% of Area Effective =	100.0%	100.0%	

AXIAL RATIO = 1.2% OK

MOMENT RATIO = 59.5% OK

Minimum Required Steel

Seismic Design Category =	D		
As(min) =	18.47	sq in	ACI Section 10.5
As =	43.90	sq in	
Stl Area Reduction Factor =	1.00		

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER; SITE NAME

BU #827050; ROCK HILL/RTE 160_1

APP: 180401 REV. 1; WO: 610479

SITE ADDRESS

699 OLD MAIN ST.
ROCKY HILL, CT 06067
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
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
CONTACT: STEVE TUTTLE
PH: (585) 899-3445

STRUCTURAL ENGINEER OF RECORD (EOR):
PAUL J. FORD AND COMPANY
250 EAST BROAD STREET, SUITE 1500
COLUMBUS, OHIO 43215-3708
CONTACT: JOHN WOOLLEY AT JWOOLLEY@PJFWEB.COM
PHONE: 614-221-6679

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 (FASTEST MILE) 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#37513-1388), DATED 5-20-2013.

THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:
FLANGE BRIDGE STIFFENERS
SHAFT REINFORCING
FIELD WELDED STIFFENERS
FIELD WELDED ANCHOR BRACKETS
POST INSTALLED ANCHOR RODS
HIGH STRENGTH GROUT

SHEET INDEX

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CROWN CASTLE PROJECT: BU #827050; ROCK HILL/RTE 160_1; ROCKY HILL, CT
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 TIA/EIA-222-F BASIC WIND SPEEDS. DO NOT INSTALL ANY ADDITIONAL OR NEW ANTENNA AND PLATFORM LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
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 '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 INSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
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 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 CONTINUOUS ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
   B. FOUNDATIONS, CONCRETE, 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. SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS:
      (1.) PRIOR TO CONSTRUCTION, TESTING AGENCY SHALL INSPECT CONDITION OF EXISTING SHAFT-TO-BASE-PLATE WELD CONNECTION. ALSO INSPECT EXISTING STIFFENERS IF PRESENT. THE INSPECTOR SHALL USE THE FOLLOWING INSPECTION METHODS, OR COMBINATION OF METHODS, AS REQUIRED TO IDENTIFY ANY CRACKS: VISUAL, MAGNETIC PARTICLE, AND/OR ULTRA-SONIC. IN ADDITION, OTHER TEST METHODS MAY ALSO BE USED AT THE RECOMMENDATION OF THE TESTING AGENCY AND UPON THE APPROVAL OF THE OWNER AND THE ENGINEER. THE TESTING AGENCY SHALL PROVIDE CAREFUL AND THOROUGH DOCUMENTATION OF THIS INSPECTION TO THE OWNER AND THE ENGINEER. TESTING AGENCY SHALL COORDINATE THESE INSPECTION ACTIVITIES WITH THE OWNER'S REQUIRED PROCESSES AND PROCEDURES. IMPORTANT: THE TESTING AGENCY SHALL IMMEDIATELY REPORT ANY INDICATIONS OF CRACKS, FRACTURES, DISTRESS, AND/OR CORROSION TO THE OWNER AND ENGINEER.
      (2.) AFTER CONSTRUCTION, TESTING AGENCY SHALL INSPECT ANY AND ALL FIELD REPAIRS IMPLEMENTED AS REQUIRED BY THE OWNER FROM THE RESULTS OF THE INSPECTION IN THE PREVIOUS NOTE 5.F.(1.) ABOVE.
      (3.) REFER TO CROWN CASTLE DOCUMENTS ENG-SOW-10033 AND ENG-BUL-10051 FOR SPECIFICATIONS.
   G. 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 #827050; ROCK HILL/RTE 160_1
ROCKY HILL, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1388	ISSUE DATE OF PERMIT: 5-20-2013
DRAWN BY: B.M.S.	
CHECKED BY: J.J.W.	
APPROVED BY:	S-1
DATE: 5-20-2013	

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

1. NEW GROUT FOR THE POLE BASE SHALL BE NON-SHRINK, NON-METALLIC, GROUT (EUCO NS GROUT BY EUCLID, OR APPROVED EQUAL) WITH A 7500 PSI MINIMUM COMPRESSIVE STRENGTH. PVC DRAINAGE PIPES SHALL BE PROVIDED FROM INSIDE THE POLE SHAFT OUT THROUGH THE GROUT SPACE UNDER THE BASE PLATE IN ORDER TO ALLOW MOISTURE TO ADEQUATELY DRAIN FROM THE INTERIOR OF THE POLE SHAFT. CONTRACTOR SHALL SUBMIT PROPOSED GROUT SPECIFICATION INFORMATION TO THE OWNER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. CONTRACTOR SHALL FOLLOW GROUT MANUFACTURER'S SPECIFICATIONS FOR COLD WEATHER GROUTING PROCEDURES (IF NECESSARY) AND THE TESTING AGENCY SHALL PREPARE GROUT SAMPLE SPECIMENS FOR COMPRESSIVE STRENGTH TESTING AND VERIFICATION.
2. GROUT SHALL BE INSTALLED TIGHT UNDER BASE PLATE WITH NO VOIDS REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF EXISTING BASE PLATE (EXCEPT FOR DRAIN PIPES). GROUT COMPLETELY SOLID (EXCEPT FOR DRAIN PIPES) UNDER ENTIRE SURFACE OF BASE PLATE FROM OUTSIDE EDGE TO INSIDE EDGE.

F. FOUNDATION WORK - (NOT REQUIRED)

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

H. EPOXY GROUTED REINFORCING ANCHOR RODS

1. UNLESS OTHERWISE NOTED, REINFORCING ANCHOR RODS SHALL BE 150 KSI ALL-THREAD BAR CONFORMING TO ASTM A722. RECOMMENDED MANUFACTURERS/SUPPLIERS OF 150 KSI ALL-THREAD BAR ARE WILLIAMS FORM ENGINEERING CORPORATION AND DYWIDAG SYSTEMS INTERNATIONAL.
2. ALL REINFORCING ANCHOR RODS SHALL BE HOT DIP GALVANIZED PER ASTM A153. ALTERNATIVELY, ALL REINFORCING ANCHOR RODS MAY BE EPOXY COATED PER ASTM A775.
3. THE CORE-DRILLED HOLES IN THE CONCRETE FOR THE ANCHOR RODS SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE ANCHOR ROD AND EPOXY MANUFACTURERS' INSTRUCTIONS, PRIOR TO PLACEMENT OF ANCHOR RODS AND EPOXY. CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD AND EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF RODS, EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
4. ULTRABOND 1, HILTI HIT RE-500 OR ANCHORTITE EPOXY SHALL BE USED TO ANCHOR THE 150 KSI ALL-THREAD BAR IN THE DRILL HOLES. IF CONTRACTOR WISHES TO USE A DIFFERENT EPOXY, A REQUEST INCLUDING THE EPOXY TECHNICAL DATA SHEET(S) SHALL BE SUBMITTED TO PAUL J FORD AND COMPANY FOR REVIEW PRIOR TO CONSTRUCTION. AS NOTED ABOVE, FOLLOW ALL EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
5. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN INSTALLED AND ALL EPOXY AND GROUT HAVE CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED PRIOR TO TESTING), ALL REINFORCING ANCHOR RODS SHALL BE LOAD TESTED PER CROWN CASTLE ENGINEERING DOCUMENT #ENG-PRC-10119. REFER TO THE NEW ANCHOR & BRACKET DETAIL ON FOLLOWING DRAWING SHEETS FOR SPECIFIED ANCHOR ROD PROOF LOAD.
6. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED AND BASE PLATE / BEARING PLATE GROUT HAS CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED AFTER TESTING), CONTRACTOR SHALL TIGHTEN ALL HEAVY HEX ANCHOR NUTS TO SNUG TIGHT PLUS 1/8 TURN OF NUT.

I. TOUCH UP OF GALVANIZING

1. THE CONTRACTOR SHALL TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. **GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.**
2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. THE OWNER'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
3. THE OWNER'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE INADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

J. HOT DIP GALVANIZING

1. HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING.
3. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES AS REQUIRED.
4. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

K. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER

1. AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MONOPOLE REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY THE OWNER, THE OWNER WILL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEM.
2. THE MONOPOLE REINFORCING SYSTEM INDICATED IN THESE DOCUMENTS USES REINFORCING COMPONENTS THAT INVOLVE FIELD WELDING STEEL MEMBERS TO THE EXISTING GALVANIZED STEEL POLE STRUCTURE. THESE FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. **ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE CONNECTED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT THE OWNER REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.**
3. THE OWNER SHALL REFER TO TIA/EIA-222-F-1996, SECTION 14 AND ANNEX E FOR RECOMMENDATIONS FOR MAINTENANCE AND INSPECTION. THE FREQUENCY OF THE INSPECTION AND MAINTENANCE INTERVALS IS TO BE DETERMINED BY THE OWNER BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. **PAUL J. FORD & COMPANY RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT.** ACCORDING TO TIA/EIA-222-F-1996 SECTION 14.1, NOTE 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".

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BU #827050; ROCK HILL/RTE 160_1
ROCKY HILL, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1388	ISSUE DATE OF PERMIT: 5-20-2013
DRAWN BY: B.M.S.	
CHECKED BY: J.J.W.	
APPROVED BY:	S-2
DATE: 5-20-2013	

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

NOTES:

1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

3. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL BELOW FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

4. ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. DTI'S SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F959 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.

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

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

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

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

DISTRIBUTORS OF SQUIRTER® DTI'S:
HTTP://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRIBUTORS.HTML

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.

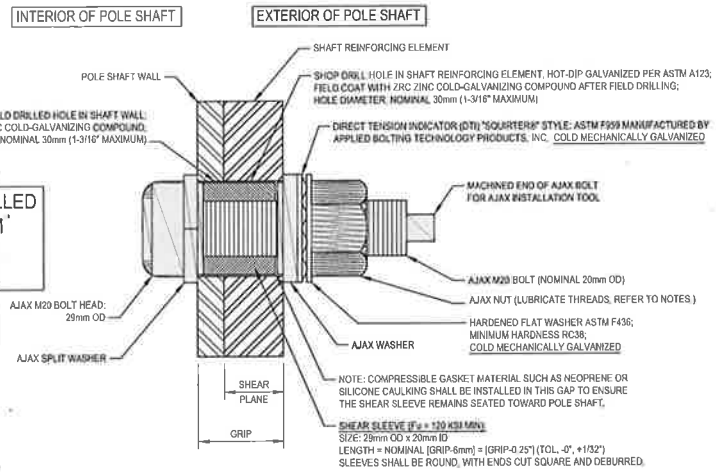
NOTE: COMPLETELY COMPRESSED DTI'S SHOWING NO VISIBLE REMAINING GAP ARE ACCEPTABLE. DTI WASHERS SHALL BE PLACED DIRECTLY AGAINST THE OUTER AJAX WASHER WITH THE DTI BUMPS FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND THE AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE UNDERSIDE 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.

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 #827050; ROCK HILL/RTE 160_1
ROCKY HILL, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1388	ISSUE DATE OF PERMIT: 5-20-2013
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POLE SPECIFICATIONS	
POLE SHAPE TYPE:	ROUND
TAPER:	N/A
SHAFT STEEL:	ASTM A53-B-42
BASE PL STEEL:	ASTM A36
ANCHOR RODS:	1"ø ASTM A36

SHAFT SECTION DATA					
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN) @ TOP	DIAMETER ACROSS FLATS (IN) @ BOTTOM
1	22.50	0.3750		24.000	24.000
2	25.00	0.3750		30.000	30.000
3	20.00	0.3750		36.000	36.000
4	20.00	0.3750		42.000	42.000
5	20.00	0.3750		48.000	48.000
6	20.00	0.3750		54.000	54.000
7	20.00	0.3750		60.000	60.000

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

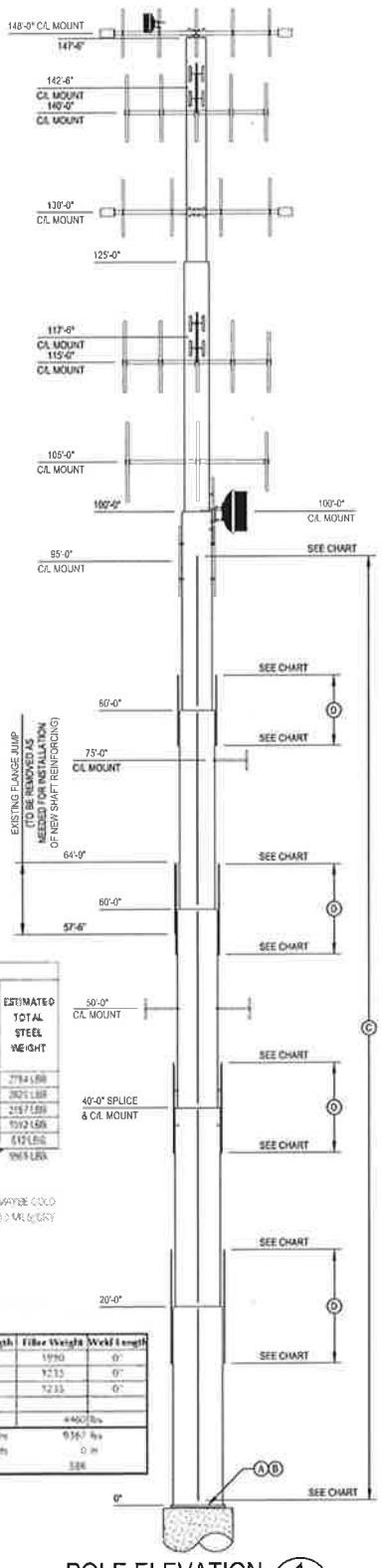
MODIFICATIONS:

(A) INSTALL (4) NEW ANCHOR ROD AT BASE PLATE, SEE SHEET S-5.

(B) INSTALL (4) NEW TRANSITION STIFFENERS AT BASE PLATE, SEE SHEET S-5.

(C) INSTALL NEW SHAFT REINFORCING, SEE CHART.

(D) INSTALL NEW FLANGE JUMPS, SEE CHART AND SHEET S-7.



POLE ELEVATION 1 / S-4

NEW AEROSOLUTIONS MP3 REINFORCING

ELEVATION	DEGREE SPACING AROUND POLE	REINFORCING ELEMENT
0'-6" TO 19'-9"	0°, 90°, 180° & 270°	MP308
22'-3" TO 39'-9"	0°, 90°, 180° & 270°	MP308
42'-3" TO 59'-9"	0°, 90°, 180° & 270°	MP308
62'-3" TO 79'-9"	0°, 90°, 180° & 270°	MP305
82'-3" TO 85'-3"	0°, 99°, 180° & 270°	MP303
FLANGE JUMP @ 20'-0"	EQUALLY SPACED	(4) MP308
FLANGE JUMP @ 40'-0"	EQUALLY SPACED	(4) MP306
FLANGE JUMP @ 60'-0"	EQUALLY SPACED	(4) MP305
FLANGE JUMP @ 80'-0"	EQUALLY SPACED	(4) MP304

ALL BOLTS SHALL BE AJAX M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 GR 4140, MIN. Fu=120 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE & BOLTS) AND INSTALLATION PROCEDURES.

NEW CCI 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'-6"	19'-9"	0, 90, 180 & 270	1-1/4" x 8-1/2"	17'-3"	4	43	172	15	15	17"	2784 LBS
20'-9"	39'-9"	0, 90, 180 & 270	1-1/4" x 8-1/2"	17'-6"	4	43	172	15	15	17"	2825 LBS
40'-3"	59'-9"	0, 90, 180 & 270	1-1/4" x 8-1/2"	17'-6"	4	32	128	12	12	19"	2157 LBS
60'-3"	79'-9"	0, 90, 180 & 270	1" x 8"	17'-6"	4	29	116	9	9	19"	1912 LBS
80'-3"	99'-3"	0, 90, 180 & 270	3/4" x 4"	17'-0"	4	17	68	4	4	18"	612 LBS
							536				9965 LBS

NOTES:

1.) AJAX BOLTS ARE TO BE 20mm DIAMETER (M18 CORRESPONDING) 25mm DIAMETER SLEEVE WITH MATCHING STEEL WASHER.

2.) ALL STEEL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZINC RICH ORGANIC ZINC RICH EPOXY OR URETHANE GALVANIZING COMPOUND. 5 MILS THICKNESS PER COAT SHALL BE MET. 3.) MIL QUALITY 15 MILS. APPLY PER ZRC MANUFACTURER'S RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-654-3275 FOR PRODUCT INFORMATION.

3.) ALL REINFORCING SHALL BE ASTM A572 GR. 65.

4.) WELDS ARE ASSUMED E 80XX OR GREATER. TERMINATION WELDS SHALL BE 360° FILLET WELDS.

5.) HOLES FOR AJAX BOLTS AND SHEAR SLEEVES ARE 10mm OVERSIZED UNLESS NOTED OTHERWISE.

6.) ALL STEEL SHALL BE ASTM A36.

Jump Plate Size			Distance Between Flanges					Filler Plate Size					
Level	QNTY	Width	Thk	(Bolt Spacing at Flange)	Jump Plate Length	Jump Weight	Bottom Bolts	Top Bolts	Width	Thk	Shim Thk	Filler Plate Length	Filler Weight	Weld Length
20'	4	6.5"	1.25"	17"	155	1067	28	28	5"	3"	0	78"	1930	0"
40'	4	6.5"	1.25"	18"	1170	93	31	6"	3"	0	66"	1235	0"	
60'	4	6.5"	1.25"	19"	177"	1170	33	33	6"	3"	0	66"	1235	0"
80'	4	6.0"	1.00"	16"	183	990	32	32	5"	3"	0			
				Total Jump Wt.		4907 lbs						Total Jump Wt.	4400 lbs	
												Total Steel Weight	9367 lbs	
												Total Weld Length	0 in	
												Total AJAX bolts	536	

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DATE: 5-20-2013	

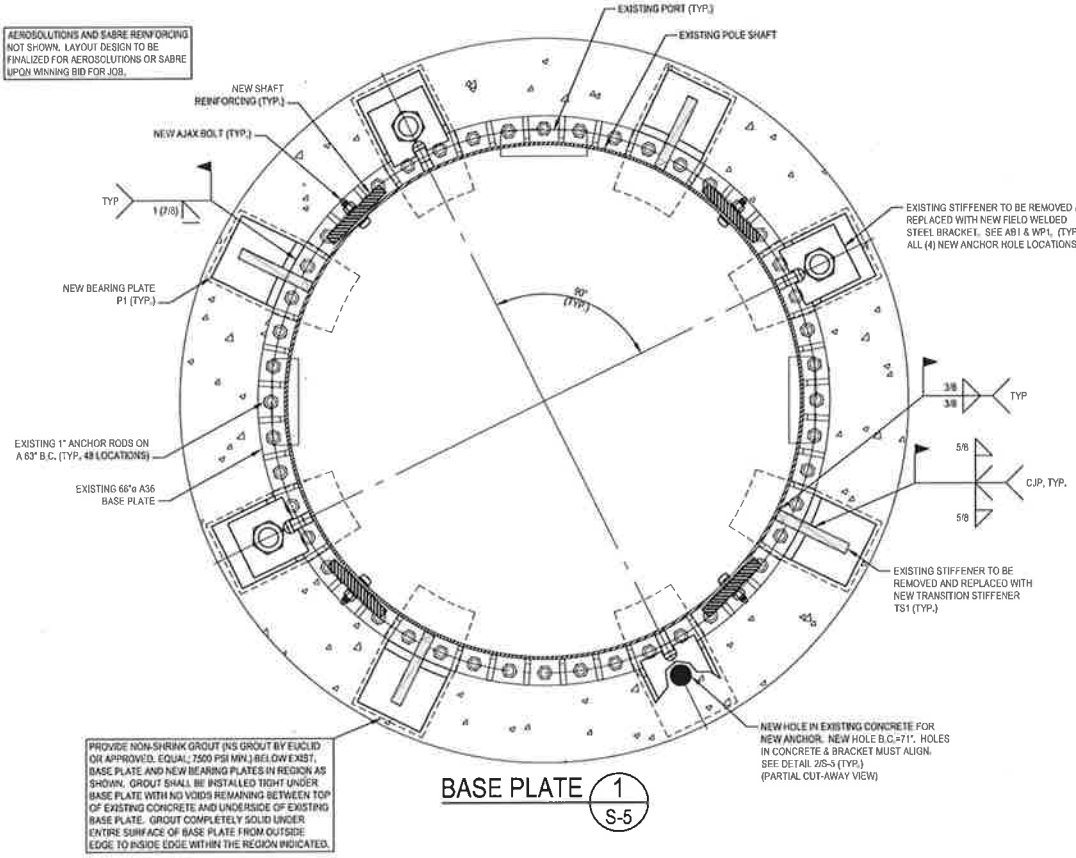
SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS:

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

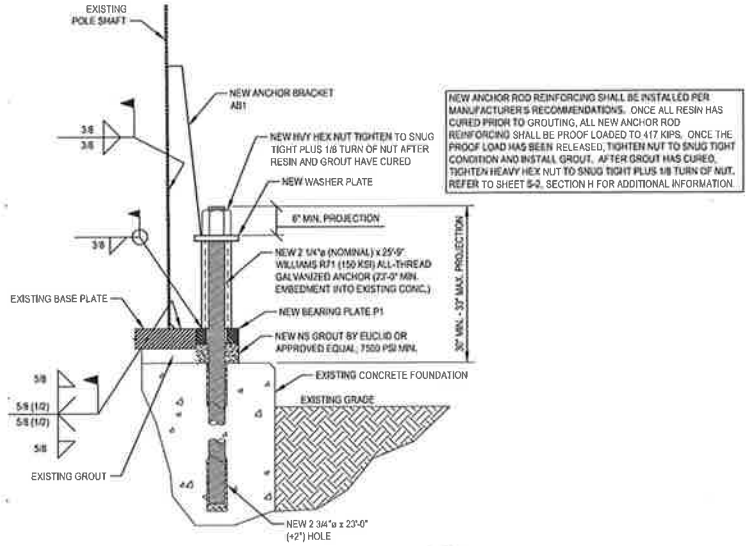
(2.) AFTER CONSTRUCTION, TESTING AGENCY SHALL INSPECT ANY AND ALL FIELD WELDS AND FIELD REPAIRS IMPLEMENTED AS REQUIRED BY THE OWNER FROM THE RESULTS OF THE INSPECTION IN THE PREVIOUS NOTE (1) ABOVE.

GENERAL NOTES:

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



BASE PLATE 1 / S-5



NEW ANCHOR & BRACKET DETAIL 2 / S-5

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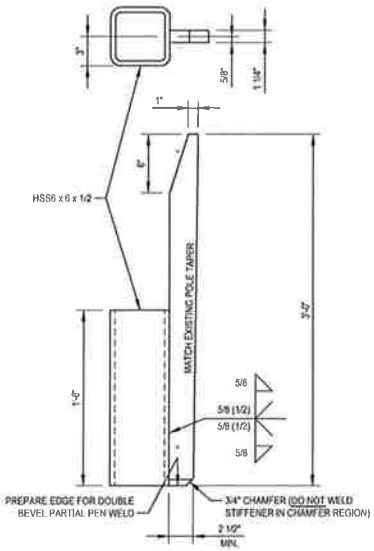
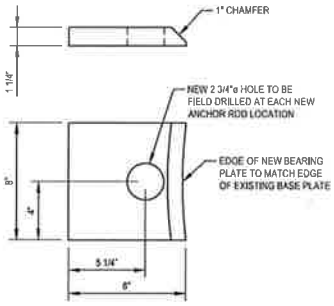
BU #827050; ROCK HILL/RTE 160_1
ROCKY HILL, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1388	ISSUE DATE OF PERMIT: 5-20-2013
DRAWN BY: B.M.S.	
CHECKED BY: J.J.W.	
APPROVED BY:	S-5
DATE: 5-20-2013	



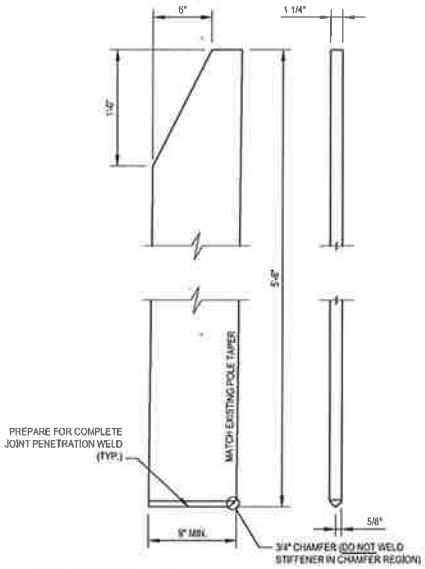
ANCHOR BRACKET MK~AB1

(4 REQUIRED) (TUBE Fy = 46 KSI) (STIFFENER Fy = 65 KSI)



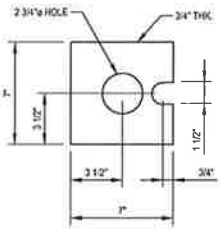
BEARING PLATE MK~P1

(8 REQUIRED) (Fy = 50 KSI)



TRANSITION STIFFENER MK~TS1

(4 REQUIRED) (Fy = 65 KSI)



WASHER PLATE MK~WP1

(4 REQUIRED) (Fy = 50 KSI)

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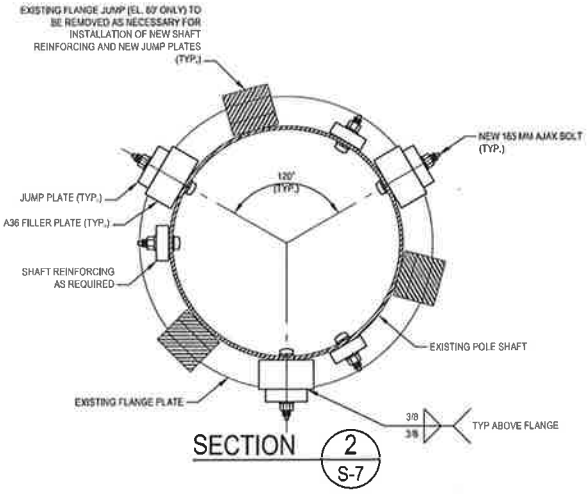
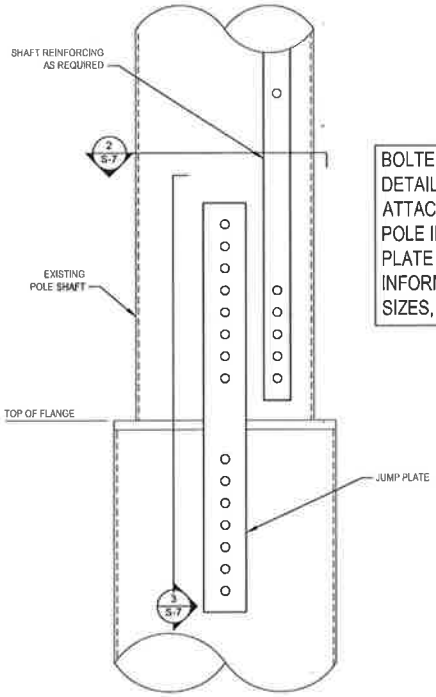
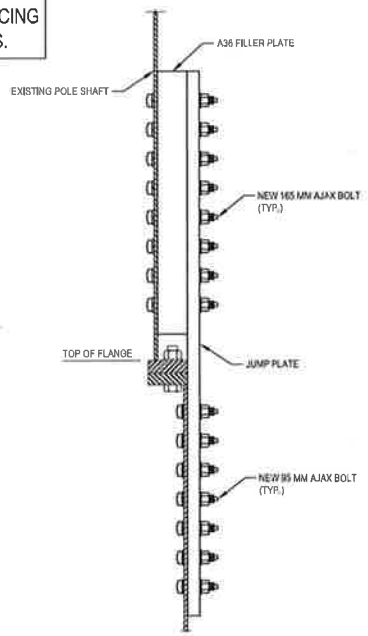


SECTION 2 / S-7



PARTIAL ELEVATION 1 / S-7

BOLTED FLANGE JUMP STANDARD DETAILS. CONTRACTOR TO SEE ATTACHED DOCUMENTS FOR EXISTING POLE INFORMATION, EXISTING FLANGE PLATE INFORMATION, FLANGE BOLT INFORMATION AND SHAFT REINFORCING SIZES, INCLUDING AJAX QUANTITIES.



SECTION 3 / S-7

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BU #827050; ROCK HILL/RTE 160_1
ROCKY HILL, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1368	ISSUE DATE OF PERMIT: 5-20-2013
DRAWN BY: B.M.S.	
CHECKED BY: J.J.W.	
APPROVED BY:	S-7
DATE: 5-20-2013	

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 MI'S 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-10173 LIST OF APPROVED MI VENDORS.

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

REFER TO 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 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 DENG-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 MI'S
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 INSPECTION(S) 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 AE/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 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 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 APPROVED SHOP DRAWINGS
NA	FABRICATION INSPECTION
X	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
X	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
X	POST INSTALLED ANCHOR ROD VERIFICATION
X	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
X	THIRD PARTY ONSITE INSPECTION OF BOLT PRETENSION PER CROWN REQUIREMENTS
X	INSPECTION OF AJAX BOLTS AND DTI'S PER REQUIREMENTS ON SHEET S-3
ADDITIONAL TESTING AND INSPECTIONS:	
	POST-CONSTRUCTION
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	THIRD PARTY ONSITE BOLT INSPECTION REPORT
X	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

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

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BU #827050; ROCK HILL/RTE 160_1
ROCKY HILL, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1388	ISSUE DATE OF PERMIT: 5-20-2013
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APPROVED BY:	S-8
DATE: 5-20-2013	

37513-1388 PERMIT.DWG

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER; SITE NAME

BU #827050; ROCK HILL/RTE 160_1

APP: 180401 REV. 1; WO: 610479

SITE ADDRESS

699 OLD MAIN ST.
ROCKY HILL, CT 06067
HARTFORD COUNTY

PROJECT NOTES

1. DETAILED FIELD INFORMATION REGARDING INTERFERENCES AND/OR EXISTING FIELD CONDITIONS MAY BE AVAILABLE ON CROWN'S COSITES 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
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
CONTACT: STEVE TUTTLE
PH: (585) 899-3445

STRUCTURAL ENGINEER OF RECORD (EOR):
PAUL J. FORD AND COMPANY
250 EAST BROAD STREET, SUITE 1500
COLUMBUS, OHIO 43215-3708
CONTACT: JOHN WOOLLEY AT JWOOLLEY@PJFWEB.COM
PHONE: 614-221-6679

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 (FASTEST MILE) 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#37513-1388), DATED 5-20-2013.

THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:

FLANGE BRIDGE STIFFENERS
SHAFT REINFORCING
FIELD WELDED STIFFENERS
FIELD WELDED ANCHOR BRACKETS
POST INSTALLED ANCHOR **RODS**
HIGH STRENGTH GROUT

SHEET INDEX

STATE OF CONNECTICUT
JOSEPH YACHCARAH JACOBS
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER

MAY 2 3 2013

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APPROVED BY:	T-1
DATE: 5-20-2013	

CROWN CASTLE PROJECT: BU #827050; ROCK HILL/RTE 160_1; ROCKY HILL, CT
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 TIA/EIA-222-F BASIC WIND SPEEDS. DO NOT INSTALL ANY ADDITIONAL OR NEW ANTENNA AND PLATFORM LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
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 CUTTING AND WELDING PLAN (DOC # ENG-PLN-10033) 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 INSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
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-10086 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 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 CONTINUOUS ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.

B. FOUNDATIONS, CONCRETE, 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. SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS:
   - (1.) PRIOR TO CONSTRUCTION, TESTING AGENCY SHALL INSPECT CONDITION OF EXISTING SHAFT-TO-BASE-PLATE WELD CONNECTION. ALSO INSPECT EXISTING STIFFENERS IF PRESENT. THE INSPECTOR SHALL USE THE FOLLOWING INSPECTION METHODS, OR COMBINATION OF METHODS, AS REQUIRED TO IDENTIFY ANY CRACKS: VISUAL, MAGNETIC PARTICLE, AND/OR ULTRA-SONIC. IN ADDITION, OTHER TEST METHODS MAY ALSO BE USED AT THE RECOMMENDATION OF THE TESTING AGENCY AND UPON THE APPROVAL OF THE OWNER AND THE ENGINEER. THE TESTING AGENCY SHALL PROVIDE CAREFUL AND THOROUGH DOCUMENTATION OF THIS INSPECTION TO THE OWNER AND THE ENGINEER. TESTING AGENCY SHALL COORDINATE THESE INSPECTION ACTIVITIES WITH THE OWNER'S REQUIRED PROCESSES AND PROCEDURES. IMPORTANT: THE TESTING AGENCY SHALL IMMEDIATELY REPORT ANY INDICATIONS OF CRACKS, FRACTURES, DISTRESS, AND/OR CORROSION TO THE OWNER AND ENGINEER.
   - (2.) AFTER CONSTRUCTION, TESTING AGENCY SHALL INSPECT ANY AND ALL FIELD REPAIRS IMPLEMENTED AS REQUIRED BY THE OWNER FROM THE RESULTS OF THE INSPECTION IN THE PREVIOUS NOTE 5.F.(1.) ABOVE.
   - (3.) REFER TO CROWN CASTLE DOCUMENTS ENG-SOW-10033 AND ENG-BUL-10051 FOR SPECIFICATIONS.

G. 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.

STATE OF CONNECTICUT
JOSEPH PACHICARAH JACOBS
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LICENSED PROFESSIONAL ENGINEER

AY 2 2 2013

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CROWN CASTLE
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BU #827050; ROCK HILL/RTE 160_1
ROCKY HILL, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1368
DRAWN BY: B.M.S.
CHECKED BY: J.J.W.
APPROVED BY:
DATE: 5-20-2013

ISSUE DATE OF PERMIT: 5-20-2013

S-1

D. **STRUCTURAL STEEL**

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

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

(A.) "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."

(B.) "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.

(C.) "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (PARAGRAPH 4.2.1 SPECIFICALLY EXCLUDED)

B. BY THE AMERICAN WELDING SOCIETY (AWS)

(A.) "STRUCTURAL WELDING CODE - STEEL D1.1"

(B.) "SYMBOLS FOR WELDING AND NON-DESTRUCTIVE TESTING"

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

3. TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AJAX M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC "TURN OF THE NUT" METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.

4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.

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

6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.

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

1. NEW GROUT FOR THE POLE BASE SHALL BE NON-SHRINK, NON-METALLIC, GROUT (EUCO NS GROUT BY EUCLID, OR APPROVED EQUAL) WITH A 7500 PSI MINIMUM COMPRESSIVE STRENGTH. PVC DRAINAGE PIPES SHALL BE PROVIDED FROM INSIDE THE POLE SHAFT OUT THROUGH THE GROUT SPACE UNDER THE BASE PLATE IN ORDER TO ALLOW MOISTURE TO ADEQUATELY DRAIN FROM THE INTERIOR OF THE POLE SHAFT. CONTRACTOR SHALL SUBMIT PROPOSED GROUT SPECIFICATION INFORMATION TO THE OWNER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. CONTRACTOR SHALL FOLLOW GROUT MANUFACTURER'S SPECIFICATIONS FOR COLD WEATHER GROUTING PROCEDURES (IF NECESSARY) AND THE TESTING AGENCY SHALL PREPARE GROUT SAMPLE SPECIMENS FOR COMPRESSIVE STRENGTH TESTING AND VERIFICATION.

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

F. FOUNDATION WORK - (NOT REQUIRED)

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

H. **EPOXY GROUTED REINFORCING ANCHOR RODS**

1. UNLESS OTHERWISE NOTED, REINFORCING ANCHOR RODS SHALL BE 150 KSI ALL-THREAD BAR CONFORMING TO ASTM A722. RECOMMENDED MANUFACTURERS/SUPPLIERS OF 150 KSI ALL-THREAD BAR ARE WILLIAMS FORM ENGINEERING CORPORATION AND DYWIDAG SYSTEMS INTERNATIONAL.

2. ALL REINFORCING ANCHOR RODS SHALL BE HOT DIP GALVANIZED PER ASTM A153. ALTERNATIVELY, ALL REINFORCING ANCHOR RODS MAY BE EPOXY COATED PER ASTM A775.

3. THE CORE-DRILLED HOLES IN THE CONCRETE FOR THE ANCHOR RODS SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE ANCHOR ROD AND EPOXY MANUFACTURERS' INSTRUCTIONS, PRIOR TO PLACEMENT OF ANCHOR RODS AND EPOXY. CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD AND EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF RODS, EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.

4. ULTRABOND 1, HILTI HIT RE-500 OR ANCHORTITE EPOXY SHALL BE USED TO ANCHOR THE 150 KSI ALL-THREAD BAR IN THE DRILL HOLES. IF CONTRACTOR WISHES TO USE A DIFFERENT EPOXY, A REQUEST INCLUDING THE EPOXY TECHNICAL DATA SHEET(S) SHALL BE SUBMITTED TO PAUL J FORD AND COMPANY FOR REVIEW PRIOR TO CONSTRUCTION. AS NOTED ABOVE, FOLLOW ALL EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.

5. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN INSTALLED AND ALL EPOXY AND GROUT HAVE CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED PRIOR TO TESTING), ALL REINFORCING ANCHOR RODS SHALL BE LOAD TESTED PER CROWN CASTLE ENGINEERING DOCUMENT #ENG-PRC-10119. REFER TO THE NEW ANCHOR & BRACKET DETAIL ON FOLLOWING DRAWING SHEETS FOR SPECIFIED ANCHOR ROD PROOF LOAD.

6. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED AND BASE PLATE / BEARING PLATE GROUT HAS CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED AFTER TESTING), CONTRACTOR SHALL TIGHTEN ALL HEAVY HEX ANCHOR NUTS TO SNUG TIGHT PLUS 1/6 TURN OF NUT.

I. **TOUCH UP OF GALVANIZING**

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

2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. THE OWNER'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.

3. THE OWNER'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE INADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

J. **HOT DIP GALVANIZING**

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

2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING.

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

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

K. **PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER**

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

2. THE MONOPOLE REINFORCING SYSTEM INDICATED IN THESE DOCUMENTS USES REINFORCING COMPONENTS THAT INVOLVE FIELD WELDING STEEL MEMBERS TO THE EXISTING GALVANIZED STEEL POLE STRUCTURE. THESE FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. **ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE CONNECTED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT THE OWNER REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.**

3. THE OWNER SHALL REFER TO TIA/EIA-222-F-1996, SECTION 14 AND ANNEX E FOR RECOMMENDATIONS FOR MAINTENANCE AND INSPECTION. THE FREQUENCY OF THE INSPECTION AND MAINTENANCE INTERVALS IS TO BE DETERMINED BY THE OWNER BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. **PAUL J. FORD & COMPANY RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT.** ACCORDING TO TIA/EIA-222-F-1996 SECTION 14.1, NOTE 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".

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BU #827050; ROCK HILL/RTE 160_1
ROCKY HILL, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1388	ISSUE DATE OF PERMIT: 5-20-2013
DRAWN BY: B.M.S.	
CHECKED BY: J.J.W.	
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AJAX BOLT NOTE SHEET: REV. 1.3, 11-07-2012

NOTES:

1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

3. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL BELOW FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

4. ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. DTI'S SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F959 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.

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

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

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

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

DISTRIBUTORS OF SQUIRTER® DTI'S:
HTTP://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRIBUTORS.HTML

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.

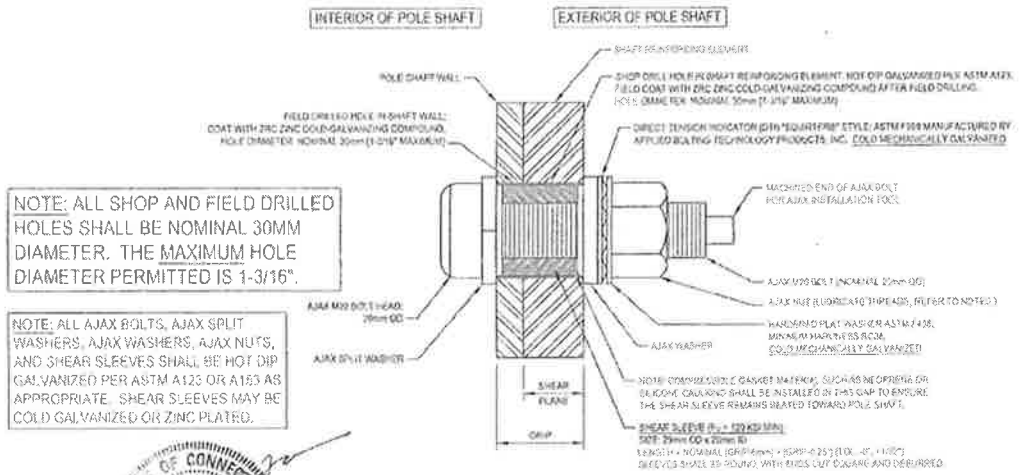
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY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



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 #827050; ROCK HILL/RTE 160_1
ROCKY HILL, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1368
DRAWN BY: B.M.S
CHECKED BY: J.J.W
APPROVED BY:
DATE: 5-20-2013

ISSUE DATE OF PERMIT: 5-20-2013

S-3

POLE SPECIFICATIONS	
POLE SHAPE TYPE	ROUND
TAPER	3/4"
SHAFT STEEL	ASTM A572 GR 42
BASE PL STEEL	ASTM A36
ANCHOR RODS	1"ø ASTM A36

SHAFT SECTION DATA					
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN) @ TOP	@ BOTTOM
1	22.50	0.3750		24.000	34.000
2	25.00	0.3125		30.000	36.000
3	20.00	0.3125		36.000	42.000
4	20.00	0.3750		42.000	48.000
5	20.00	0.3125		48.000	54.000
6	20.00	0.3125		54.000	60.000
7	20.00	0.2700		60.000	66.000

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

MODIFICATIONS:

(A) INSTALL (4) NEW ANCHOR ROD AT BASE PLATE. SEE SHEET S-3

(B) INSTALL (6) NEW TRANSITION STIFFENERS AT BASE PLATE. SEE SHEET S-5

(C) INSTALL NEW SHAFT REINFORCING. SEE CHART.

(D) INSTALL NEW FLANGE JUMPS. SEE CHART AND SHEET S-7

NEW AEROSOLUTIONS MP3 REINFORCING

ELEVATION	DEGREE SPACING AROUND POLE	REINFORCING ELEMENT
0'-0" TO 19'-9"	0°, 90°, 180° & 270°	MP308
20'-3" TO 39'-9"	0°, 90°, 180° & 270°	MP308
40'-3" TO 59'-9"	0°, 90°, 180° & 270°	MP308
60'-3" TO 79'-9"	0°, 90°, 180° & 270°	MP308
80'-3" TO 99'-3"	0°, 90°, 180° & 270°	MP308
FLANGE JUMP @ 20'-0"	EQUALLY SPACED	(4) MP308
FLANGE JUMP @ 40'-0"	EQUALLY SPACED	(4) MP308
FLANGE JUMP @ 60'-0"	EQUALLY SPACED	(4) MP308
FLANGE JUMP @ 80'-0"	EQUALLY SPACED	(4) MP308

ALL BOLTS SHALL BE AJAX M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM GR A710, MIN. Fy=120 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE & BOLTS) AND INSTALLATION PROCEDURES.

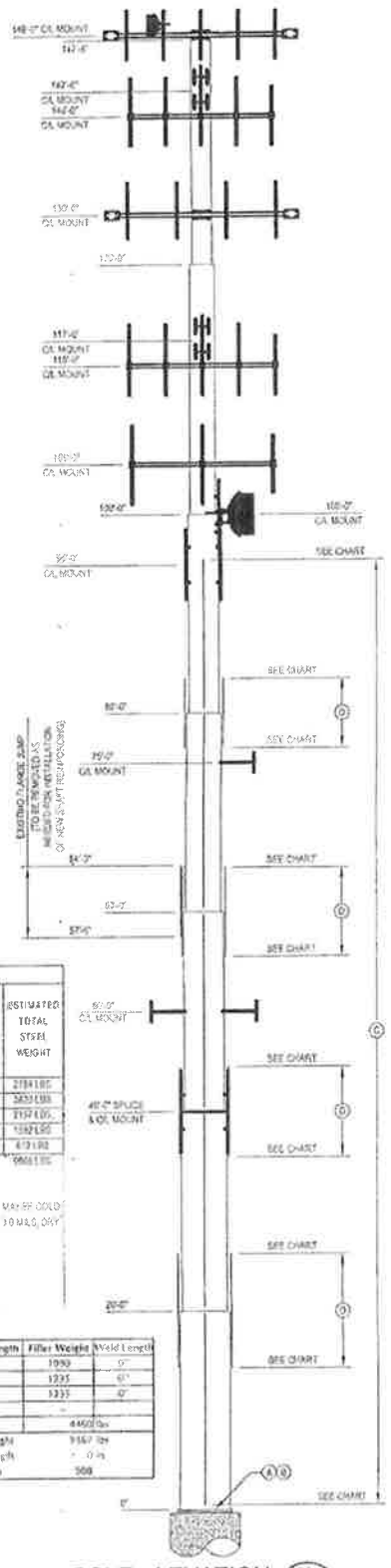
NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE

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"	19'-9"	0, 90, 180 & 270	0.375" x 6.125"	19'-3"	4	43	172	18	18	12"	2784 LBS
20'-3"	39'-9"	0, 90, 180 & 270	0.375" x 6.125"	19'-5"	4	43	172	18	18	12"	2803 LBS
40'-3"	59'-9"	0, 90, 180 & 270	0.375" x 6.125"	19'-5"	4	32	128	12	12	19"	2197 LBS
60'-3"	79'-9"	0, 90, 180 & 270	0.3" x 6"	19'-6"	4	23	110	9	9	18"	1582 LBS
80'-3"	99'-3"	0, 90, 180 & 270	0.3" x 6"	19'-0"	4	27	98	4	4	18"	1731 LBS
							690				9966 LBS

NOTES:

1) AJAX BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 24mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.
2) ALL STEEL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZINC-RICH COLD GALVANIZING COMPOUND. DFT THICKNESS PER COAT SHALL BE WET 3.0 MILS, DRY 1.5 MILS. APPLY PER ZRC MANUFACTURER'S RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-634-3276 FOR PRODUCT INFORMATION.
3) ALL REINFORCING SHALL BE ASTM A572 GR. 65.
4) WELDS ARE ASSUMED E80XX 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 A 36.

Level	Jump Plate Size QNTY	Width	Thk	Unbraced Length (Bolt Spacing at Flange)	Jump Plate Length	Jump Weight	Bottom Bolts	Top Bolts	Filler Plate Size Width	Thk	SPLICE	Filler Plate Length	Filler Weight	Weld Length
20'	4	8.5"	1.25"	17"	155"	1867	21	25	6"	3"	0	76"	1950	0"
40'	4	8.5"	1.25"	18"	127"	1170	15	21	6"	3"	0	55"	1235	0"
60'	4	8.5"	1.25"	19"	127"	1170	15	21	6"	3"	0	55"	1235	0"
80'	4	6.0"	1.00"	16"	103"	700	12	17	3"	3"	0	-	-	-
					Total Jump Wt.	4900 lbs						Total Jump Wt.	4420 lbs	
												Total Steel Weight	9167 lbs	
												Total Weld Length	0 in	
												Total AJAX bolts	368	



POLE ELEVATION 1 S-4

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ROCKY HILL, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1339
DRAWN BY: B.M.S.
CHECKED BY: S.J.W.
APPROVED BY:
DATE: 5-20-2013

ISSUE DATE OF PERMIT: 5-20-2013

S-4

SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS:

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

(2) AFTER CONSTRUCTION, TESTING AGENCY SHALL INSPECT ANY AND ALL FIELD WELDS AND FIELD REPAIRS IMPLEMENTED AS REQUIRED BY THE OWNER FROM THE RESULTS OF THE INSPECTION IN THE PREVIOUS NOTE (1) ABOVE.

GENERAL NOTES:

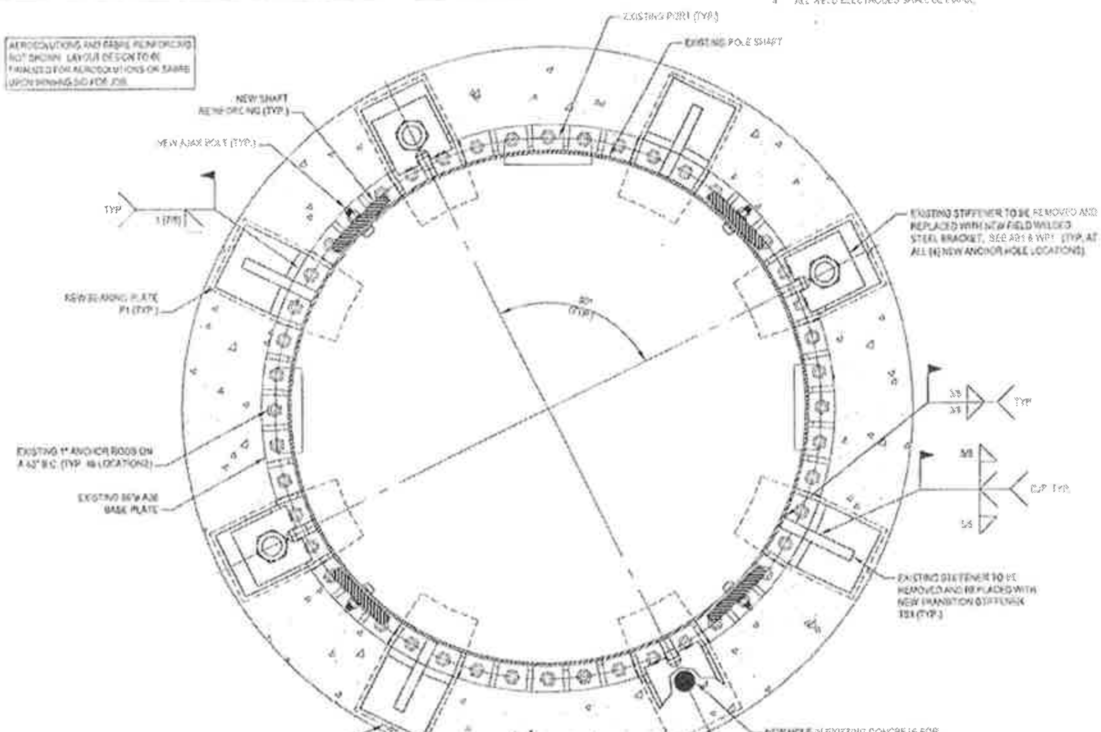
1. AJAX BOLTS ARE TO BE 20 mm Ø WITH CORRESPONDING 29 mm Ø SHEAR SLEEVE WITH MATCHING STEEL GRADE. DRILLED HOLE DIAMETERS IN REINFORCING STEEL AND EXISTING SHAFT SHALL BE 1 3/16" Ø MAX.

2. ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.

3. EPOXY MUST BE HILTI RE-500.

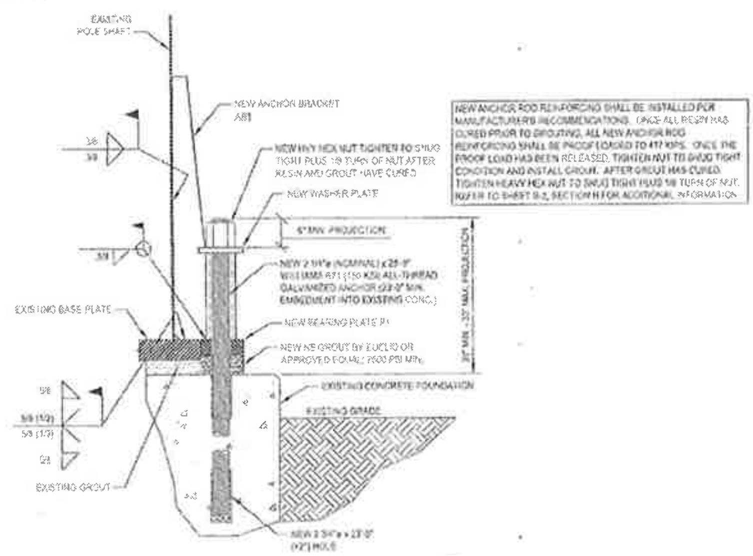
4. ALL WELD ELECTRODES SHALL BE E80XX.

AERODAMPING AND CABLE REINFORCING NOT SHOWN. LAYOUT DESIGN TO BE FINALIZED FOR AERODAMPING OR CABLE UPON BINDING BID FOR JOB.



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

BASE PLATE (1 / S-5)

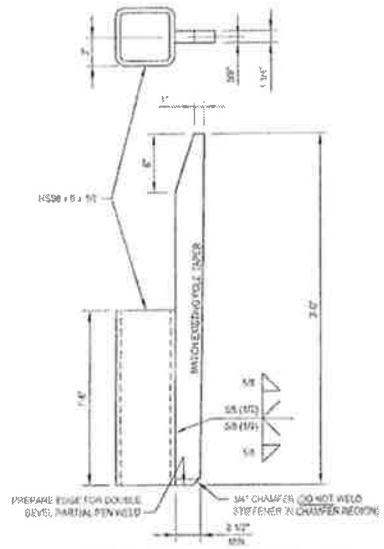


STATE OF CONNECTICUT — JOSEPH RICHARD JACOBS — No. PEN 22731 — LICENSED PROFESSIONAL ENGINEER

NEW ANCHOR & BRACKET DETAIL (2 / S-5)

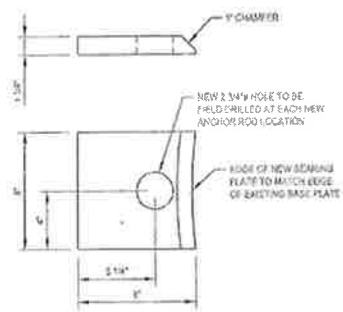
PAUL J. FORD AND COMPANY STRUCTURAL ENGINEERS CROWN CASTLE 8 PARKMEADOW DRIVE, PITTSFORD, NY 14534	BU #827050; ROCK HILL/RTE 160_1 ROCKY HILL, CT MONOPOLE REINFORCEMENT AND RETROFIT PROJECT	PROJECT No: 37513-1388 DRAWN BY: B.M.S. CHECKED BY: J.J.W. APPROVED BY: DATE: 5-20-2013	ISSUE DATE OF PERMIT: 5-20-2013 S-5

37513-1386 PERMIT.DWG



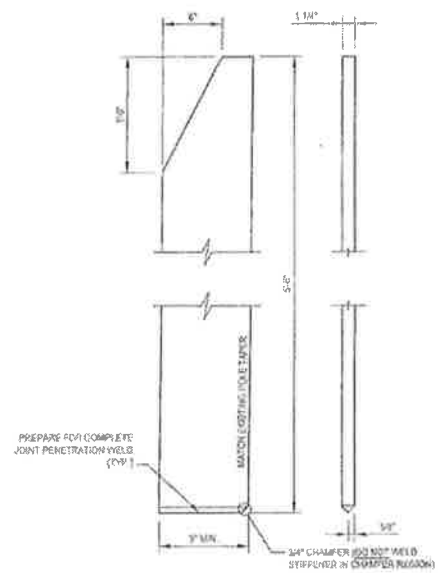
ANCHOR BRACKET MK~AB1

(4 REQUIRED) (TUBE Fy = 46 KSI) (STIFFENER Fy = 65 KSI)



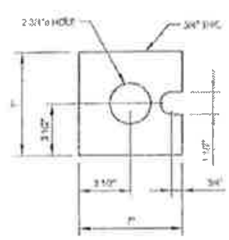
BEARING PLATE MK~P1

(4 REQUIRED) (Fy = 50 KSI)



TRANSITION STIFFENER MK~TS1

(4 REQUIRED) (Fy = 65 KSI)



WASHER PLATE MK~WP1

(4 REQUIRED) (Fy = 50 KSI)

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PROJECT No: 37513-1386	ISSUE DATE OF PERMIT: 5-20-2013
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CHECKED BY: J.J.W.	
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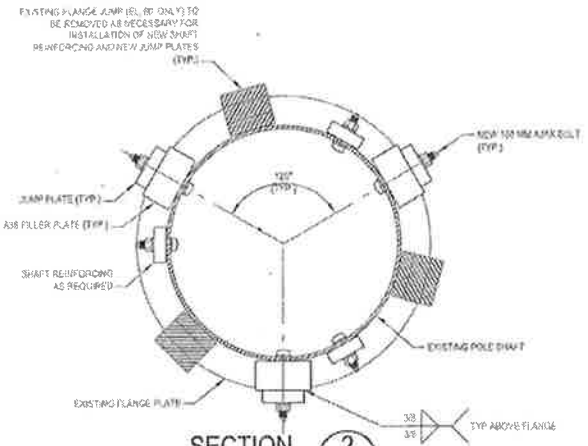
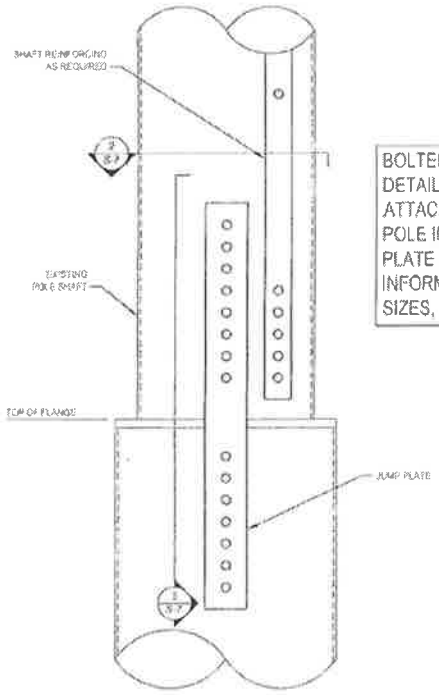
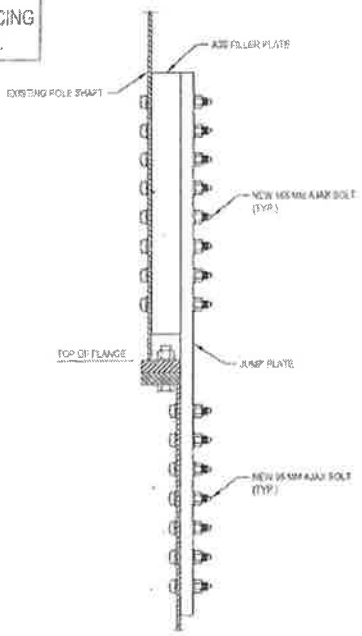


SECTION 2 / S-7



PARTIAL ELEVATION 1 / S-7

BOLTED FLANGE JUMP STANDARD DETAILS. CONTRACTOR TO SEE ATTACHED DOCUMENTS FOR EXISTING POLE INFORMATION, EXISTING FLANGE PLATE INFORMATION, FLANGE BOLT INFORMATION AND SHAFT REINFORCING SIZES, INCLUDING AJAX QUANTITIES.



SECTION 3 / S-7

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CHECKED BY: J.J.W.	S-7
APPROVED BY:	
DATE: 5-20-2013	

37513-1388 PERMIT.DWG

MODIFICATION INSPECTION NOTES:

GENERAL
THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTION 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 IT RELIEVE THE CONTRACTOR FROM OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY REMAINS WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEVE OR ENGINTEGRA) SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENGINEERING LIST OF APPROVED MI VENDORS.

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

REFER TO 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 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 SURVEY 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 AFFORD 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 REPHASING/TUNING OPERATIONS.
- IT MAY BE ADVANTAGEOUS TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW EXCAVATION AND MI INSPECTION(S) TO CONTINUE 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 SCHEDULE
IF THE GC AND/OR MI INSPECTOR ARRIVE TO A SITE ON A VISIT 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 TAXI, FLIGHTS, AND LODGING COSTS OR KEEPING EQUIPMENT ON SITE, ETC.). IF CROWN CONTRACTS DIRECTLY WITH A THIRD PARTY, ANY 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 FAILURES
IF THE MODIFICATION INSTALLATION WOULD FAIL THE INITIATED MI, THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILURE ISSUE 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 INSPECTION(S) 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 AE/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASS/NO MI" OR "PASS AS NOTED/ NO MI" REPORT FOR THE ORIGINAL PROJECT.

PHOTOGRAPHS
DETAILS ON THE GROUND THE MI INSPECTOR FOR THE FOLLOWING PHOTOGRAPHS, AS 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 INSTALLED 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 APPROVED SHOP DRAWINGS
NA	FABRICATION INSPECTION
X	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 INSPECTION
X	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
X	POST INSTALLED ANCHOR ROD VERIFICATION
X	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
X	THIRD PARTY ONSITE INSPECTION OF BOLT PRETENTION PER CROWN REQUIREMENTS
X	INSPECTION OF AJAX ROD 15 AND 07-15 PER REQUIREMENTS ON SHEET S-3
ADDITIONAL TESTING AND INSPECTIONS:	
	POST-CONSTRUCTION
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	THIRD PARTY ONSITE BOLT INSPECTION REPORT
X	POST-INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

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

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BU #827050; ROCK HILL/RTE 160_1
ROCKY HILL, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1388
DRAWN BY: B.M.S.
CHECKED BY: J.J.W.
APPROVED BY:
DATE: 5-20-2013

ISSUE DATE OF PERMIT: 5-20-2013

S-8