ROBINSON & COLE LLP

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

July 26, 2013

David Martin
Siting Analyst
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **EM-VER-108-121023A – Cellco Partnership d/b/a Verizon Wireless**
20 Great Oak Road, Oxford, Connecticut

Dear Mr. Martin:

On November 13, 2012, the Siting Council acknowledged receipt of Cellco's notice of intent to modify its telecommunications facility at 20 Great Oak Road in Oxford. The modification involved the replacement of certain antennas and the installation of additional coax cables.

As a condition of the acknowledgement, Cellco was required to provide the Council with a letter stating that the recommendations specified in the structural report were implemented. Attached is a Tower Modification Certification Letter verifying that these conditions have been satisfied. All construction associated with these modifications has now been completed.

If you have any questions please do not hesitate to contact me or Rachel Mayo.

Sincerely,

Kenneth C. Baldwin

Attachment
Copy to:
Sandy M. Carter
Brian Ragozzine
Mark Gauger

CENTEK engineering

Centered on Solutions℠

July 22, 2013

Mr. Mark Gauger
Verizon Wireless
99 East River Drive
East Hartford, Connecticut 06108

Re: Existing Telecommunications Facility Tower Modification Certification Letter

Project: **Verizon ~ Oxford West**
120 Great Oak Road
Oxford, CT

Tower Owner: **Crown Castle**
349 West Commercial Street
East Rochester, NY 14445

Engineer: **Paul J. Ford & Company**
250 East Broad Street, Suite 1500, Columbus, OH 43215

Centek Project No.: 13008.024

Dear Mr. Gauger,

We are providing this "Existing Telecommunications Facility Tower Modification Certification Letter" with regard to the antenna upgrade by Verizon Wireless at the above referenced project.

The following are the basis for substantiating compliance with the Paul J. Ford Structural Modification Report (Paul J. Ford Project No. 37512-1818 Sabre) dated July 19, 2012:

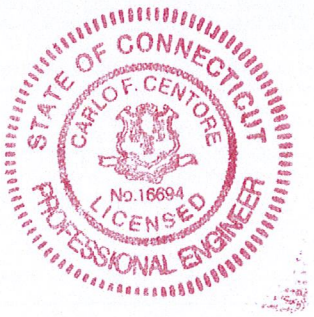
- Review of the Paul J. Ford & Company Modification Drawings S-1B thru S-9B dated 07/19/2012.
- Review of the Tower Engineering Professionals Modification Inspection Report (TEP Project Number No. 126580) dated 03/22/2013.
- Field observations by Centek personnel on 07/19/2013 of the completed modification.

With the completed modifications, the tower and foundation do not exceed 100 percent of their post-construction structural rating.

The work under this Contract has been reviewed and found, to the Engineer's best knowledge, information and belief, to be completed in general compliance with the documents referenced above.

Sincerely,

Carlo F. Centore, PE
Principal ~Structural Engineer



CC: Rachel Mayo, Tim Parks, Steve Schadler

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

November 13, 2012

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: **EM-VER-108-121023A** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 20 Great Oak Road, Oxford, Connecticut.

Dear Attorney Baldwin:

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

- Prior to antenna installation, the modifications identified in the Structural Modification Report prepared by Paul J. Ford and Company dated July 19, 2012, and stamped by Joseph Pachicarah Jacobs shall be implemented;
- Not more than 45 days following completion of the antenna installation, a signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the recommended modifications have been completed and the tower and foundation do not exceed 100 percent of the post-construction structural rating;
- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated October 22, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

Very truly yours,

Linda Roberts MMB

Linda Roberts
Executive Director

LR/CDM/jbw

c: The Honorable George R. Temple, First Selectman, Town of Oxford
Vincent Vizzo, Planning & Zoning Chairman, Town of Oxford
Crown Castle

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

October 26, 2012

The Honorable George R. Temple
First Selectman
Town of Oxford
486 Oxford Road
Route 67
Oxford, CT 06478-1298

RE: **EM-VER-108-121023A** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 20 Great Oak Road, Oxford, Connecticut.

EM-VER-108-121023B - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at Coppermine Road, Oxford, Connecticut.

Dear First Selectman Temple:

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

If you have any questions or comments regarding the proposal, please call me or inform the Council by November 9, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

LRoberts

Linda Roberts
Executive Director

LR/jbw

c: Vincent Vizzo, Planning & Zoning Chairman, Town of Oxford

ROBINSON & COLE

EM-VER-108-121023A

KENNETH C. BALDWIN

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Also admitted in Massachusetts

October 22, 2012

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

Re: **Notice of Exempt Modification – Antenna Swap**
20 Great Oak Road, Oxford, Connecticut

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 140-foot level on an existing 150-foot tower at the above-referenced address. The tower is owned by Crown Castle. Cellco's use of the tower was approved by the Council in 2002. Cellco now intends to replace all of its existing antennas with six (6) model LPA-80063-6CF cellular antennas; three (3) model BXA-171063-12BF PCS antennas; and three 93) model BXA-70063-6CF LTE antennas, all at the same 140-foot level. Cellco also intends to install six (6) coax cables inside the monopole tower. Attached behind Tab 1 are the specifications for the replacement antennas.

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 George R. Temple, First Selectman of the Town of Oxford. The Town of Oxford is the owner of the property on which the tower is located.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas will be located at the 140-foot level on the existing 150-foot tower.

2. The proposed modifications do not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

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

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The tower and its foundation, with certain modifications, can support Cellco's proposed modifications. (*See* Structural Modification Report included behind Tab 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:
George R. Temple, Oxford First Selectman
Sandy M. Carter

Amphenol ANTENNA SOLUTIONS

LPA-80063-6CF-EDIN-X

V-Pol | Log Periodic | 63° | 14.5 dBd

Replace "X" with desired electrical downtilt.

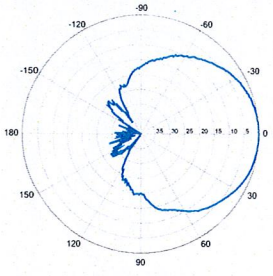
Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	
Frequency bands	806-960 MHz
Polarization	Vertical
Horizontal beamwidth	63°
Vertical beamwidth	10°
Gain	14.5 dBd (16.6 dBi)
Electrical downtilt (X)	0, 2, 4, 5, 6, 8, 10
Impedance	50Ω
VSWR	≤1.4:1
Null fill	5% (-26.02 dB)
Input power	500 W
Lightning protection	Direct Ground
Connector(s)	1 Port / EDIN or NE / Female / Center (Back)

Mechanical Characteristics		
Dimensions Length x Width x Depth	1805 x 385 x 332 mm	71.1 x 15.2 x 13.1 in
Depth of antenna with z-bracket	372 mm	14.6 in
Weight without mounting brackets	12.3 kg	27 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.70 m^2 Side: 0.59 m^2	Front: 7.5 ft^2 Side: 6.3 ft^2
Wind load @ 161 km/hr (100 mph)	Front: 885 N Side: 757 N	Front: 199 lbf Side: 170 lbf

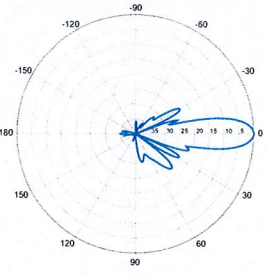
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit (0-20°)	21700000	50-102 mm 2.0-4.0 in	11 kg 25 lbs
Lock-Down Brace	If the lock-down brace is used, the maximum diameter of the mounting pipe is 88.9 mm or 3.5 in.		

LPA-80063-6CF-EDIN-X



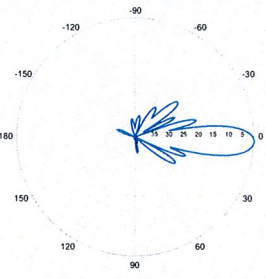
Horizontal

LPA-80063-6CF-EDIN-0



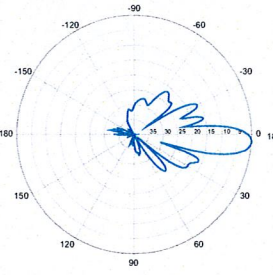
0° | Vertical

LPA-80063-6CF-EDIN-2



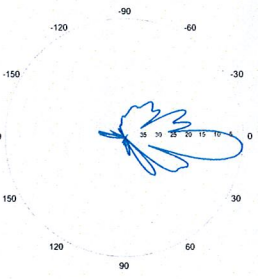
2° | Vertical

LPA-80063-6CF-EDIN-4



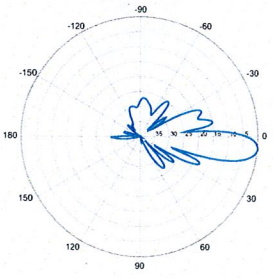
4° | Vertical

LPA-80063-6CF-EDIN-5



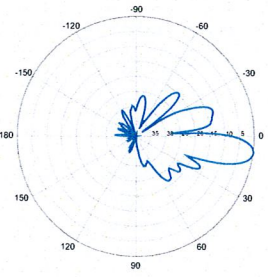
5° | Vertical

LPA-80063-6CF-EDIN-6



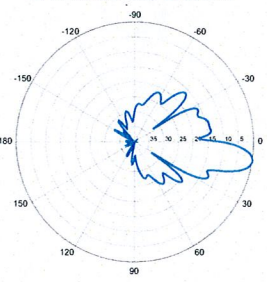
6° | Vertical

LPA-80063-6CF-EDIN-8



8° | Vertical

LPA-80063-6CF-EDIN-10



10° | Vertical

Amphenol ANTENNA SOLUTIONS

BXA-171063-12BF-EDIN-X

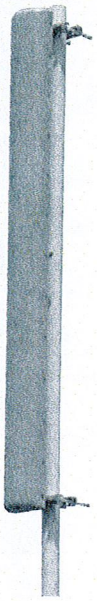
Replace "X" with desired electrical downtilt.

X-Pol | FET Panel | 63° | 19.0 dBi

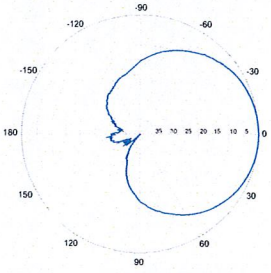
Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	68°	65°	60°
Vertical beamwidth	4.5°	4.5°	4.5°
Gain	16.1 dBd / 18.2 dBi	16.5 dBd / 18.6 dBi	16.9 dBd / 19.0 dBi
Electrical downtilt (X)	0, 2, 5		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back ratio	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Bottom		
Operating temperature	-40° to +60° C / -40° to +140° F		

Mechanical Characteristics		
Dimensions Length x Width x Depth	1820 x 154 x 105 mm	71.7 x 6.1 x 4.1 in
Depth with z-brackets	133 mm	5.2 in
Weight without mounting brackets	6.8 kg	15 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.28 m² Side: 0.19 m²	Front: 3.1 ft² Side: 2.1 ft²
Wind load @ 161 km/hr (100 mph)	Front: 460 N Side: 304 N	Front: 103 lbf Side: 68 lbf

Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-12BF-EDIN-X-FP		

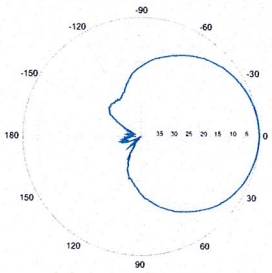


BXA-171063-12BF-EDIN-X



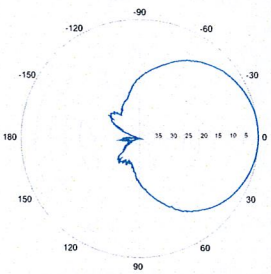
Horizontal | 1710-1880 MHz

BXA-171063-12BF-EDIN-X



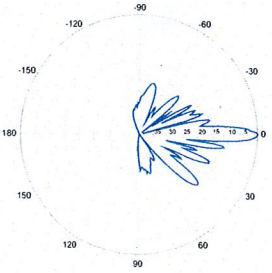
Horizontal | 1850-1990 MHz

BXA-171063-12BF-EDIN-X



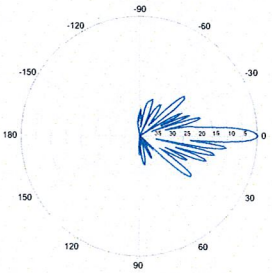
Horizontal | 1920-2170 MHz

BXA-171063-12BF-EDIN-0



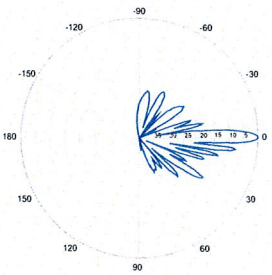
0° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-0



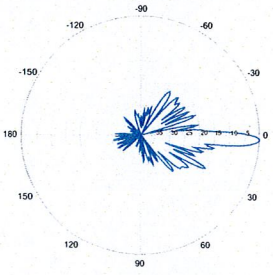
0° | Vertical | 1920-2170 MHz

Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.

BXA-171063-12BF-EDIN-X

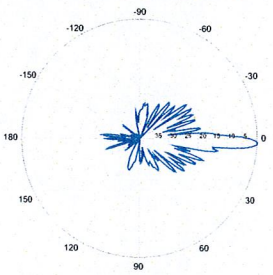
X-Pol | FET Panel | 63° | 19.0 dBi

BXA-171063-12BF-EDIN-2



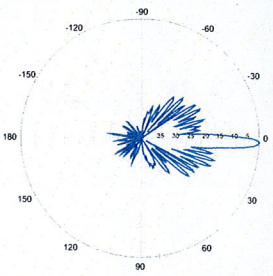
2° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-2



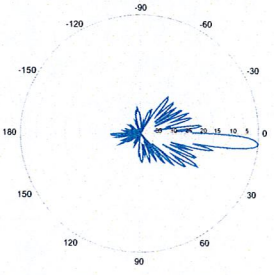
2° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-2



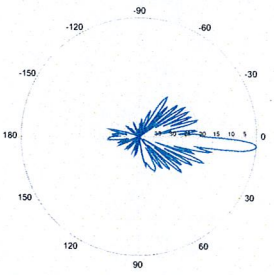
2° | Vertical | 1920-2170 MHz

BXA-171063-12BF-EDIN-5



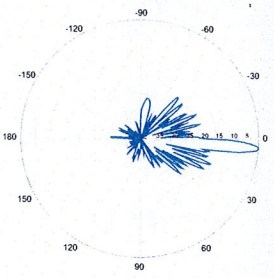
5° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-5



5° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-5



5° | Vertical | 1920-2170 MHz

Amphenol ANTENNA SOLUTIONS

BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

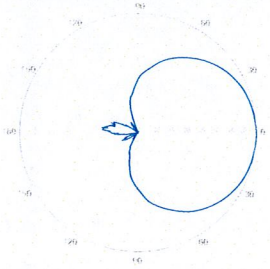
Replace "X" with desired electrical downtilt

Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	696-900 MHz	
Frequency bands	696-806 MHz	806-900 MHz
Polarization	±45°	
Horizontal beamwidth	65°	63°
Vertical beamwidth	13°	11°
Gain	14.0 dBd (16.1 dBi)	14.5 dBd (16.6 dBi)
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10	
Impedance	50Ω	
VSWR	≤1.35:1	
Upper sidelobe suppression (0°)	-18.3 dB	-18.2 dB
Front-to-back ratio (+/-30°)	-33.4 dB	-36.3 dB
Null fill	5% (-26.02 dB)	
Isolation between ports	< -25 dB	
Input power with EDIN connectors	500 W	
Input power with NE connectors	300 W	
Lightning protection	Direct Ground	
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)	
Mechanical Characteristics		
Dimensions Length x Width x Depth	1804 x 285 x 132 mm	71.0 x 11.2 x 5.2 in
Depth with z-brackets	172 mm	6.8 in
Weight without mounting brackets	7.9 kg	17 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.51 m^2 Side: 0.24 m^2	Front: 5.5 ft^2 Side: 2.6 ft^2
Wind load @ 161 km/hr (100 mph)	Front: 759 N Side: 391 N	Front: 169 lbf Side: 89 lbf

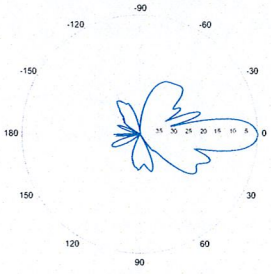
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs
Concealment Configurations	For concealment configurations, order BXA-70063-6CF-EDIN-X-FP		

BXA-70063-6CF-EDIN-X



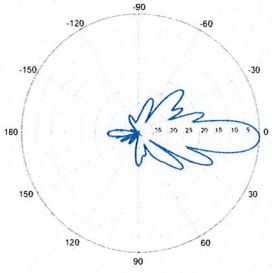
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

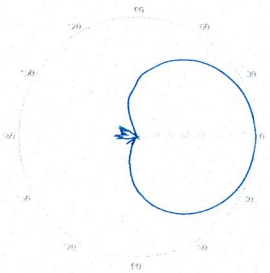


0° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-2

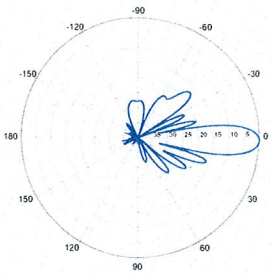


2° | Vertical | 750 MHz



Horizontal | 850 MHz

0° | Vertical | 850 MHz

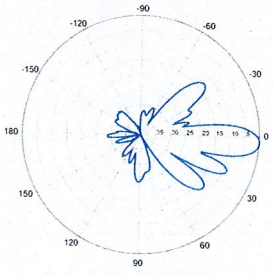


2° | Vertical | 850 MHz

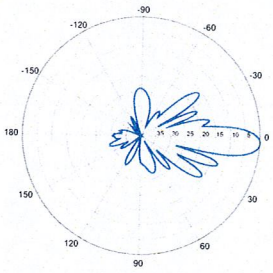
BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

BXA-70063-6CF-EDIN-3

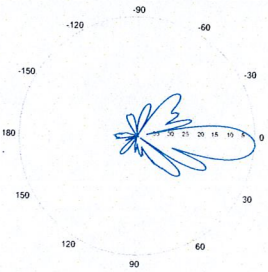


3° | Vertical | 750 MHz

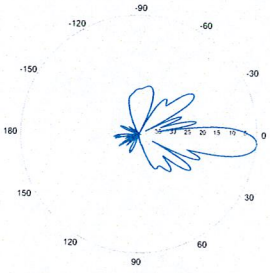


3° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-4

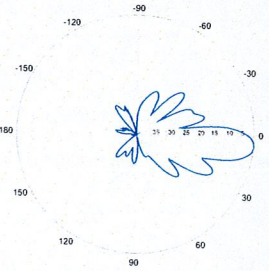


4° | Vertical | 750 MHz

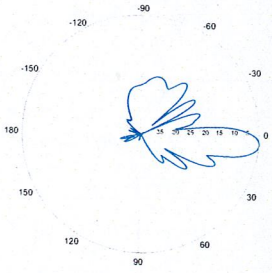


4° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-5

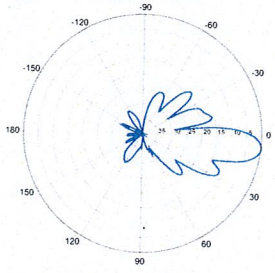


5° | Vertical | 750 MHz

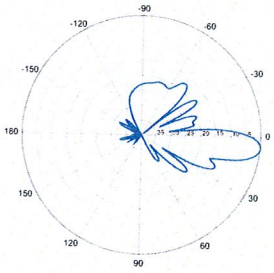


5° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-6

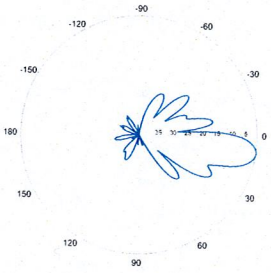


6° | Vertical | 750 MHz

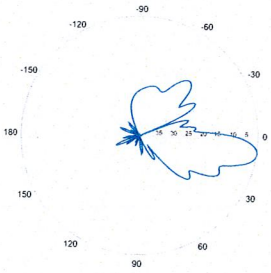


6° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-8

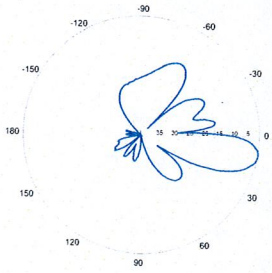


8° | Vertical | 750 MHz



8° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-10



10° | Vertical | 750 MHz

10° | Vertical | 850 MHz

	General	Power	Density					
Site Name: Oxford W								
Tower Height: Verizon @ 140Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Sprint	4	500	150	0.0320	1955	1.0000	3.20%	
*AT&T UMTS	2	1077	128	0.0473	880	0.5867	8.06%	
*AT&T UMTS	2	1556	128	0.0683	1900	1.0000	6.83%	
*AT&T GSM	1	538	128	0.0118	880	0.5867	2.01%	
*AT&T GSM	4	934	128	0.0820	1900	1.0000	8.20%	
*AT&T LTE	1	1375	128	0.0302	734	0.4893	6.17%	
Verizon PCS	**7**	**244**	**140**	**0.0313**	**1970**	**1.0000**	**3.13%**	
Verizon Cellular	**9**	**253**	**140**	**0.0418**	**869**	**0.5793**	**7.21%**	
Verizon AWS	**1**	**592**	**140**	**0.0109**	**2145**	**1.0000**	**1.09%**	
Verizon 700	**1**	**831**	**140**	**0.0152**	**698**	**0.4653**	**3.28%**	
								49.17%
* Source: Siting Council								

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

Date: **July 19, 2012**

Ben Goodhart
Crown Castle USA Inc.
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

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

Subject: **Structural Modification Report**

Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	N/A
	Carrier Site Name:	Oxford West, CT
Crown Castle Designation:	**Crown Castle BU Number:**	876361
	Crown Castle Site Name:	Seymour 2 / Oxford Town Garage
	Crown Castle JDE Job Number:	183553
	Crown Castle Work Order Number:	505239
	Crown Castle Application Number:	150104 Rev. 0
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37512-1818 Sabre
Site Data:	**20 Great Oak Rd., OXFORD, New Haven County, CT** **Latitude *41° 25' 34.91"*, Longitude *-73° 8' 39.33"*** **150 Foot - Monopole Tower**	

Dear Ben Goodhart,

Paul J Ford and Company is pleased to submit this **"Structural Modification Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 476428, in accordance with application 150104, revision 0.

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

LC4.7: Modified Structure w/ Existing + Reserved + Proposed — **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2005 CT State Building Code based upon a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

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

Respectfully submitted by:

Corey McCartney, E.I.
Structural Engineer

tnxTower Report - version 6.0.3.0

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

JUL 19 2012

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150-ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in October of 1999. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 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
138.0	140.0	3	antel	BXA-171063-12BF w/ Mount Pipe	6	1-5/8	-
		3	antel	BXA-70063-6CF-2 w/ Mount Pipe			
		6	antel	LPA-80063-6CF-EDIN-2 w/ Mount Pipe			

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
152.0	152.0	1	crown mounts	Platform Mount [LP 602-1]	-	-	1
	148.0	6	decibel	980H90T3R-M w/ Mount Pipe	6	1-5/8	3
	147.0	3	alcatel lucent	1900MHz RRH (65MHz)	3	1-1/4	2
		3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		3	alcatel lucent	800MHZ RRH			
		9	rfs celwave	ACU-A20-N			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
138.0	140.0	6	antel	LPA-185080/12CF w/ Mount Pipe	-	-	3
		6	antel	LPA-80080/8CF w/ Mount Pipe			
	138.0	1	crown mounts	Platform Mount [LP 601-1]	12	1-5/8	1
129.0	129.0	1	crown mounts	Side Arm Mount [SO 102-3]	-	-	2
		6	ericsson	RRUS-11			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
127.0	128.0	3	powerwave	7770.00 w/ Mount Pipe	-	-	3
		6	powerwave	LGP21401			
		6	andrew	SBNH-1D6565C w/ Mount Pipe	1 2	3/8 3/4	2
		6	cci	DTMABP7819VG12A			
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
	127.0	1	crown mounts	T-Arm Mount [TA 601-3]			
		1	crown mounts	Pipe Mount [PM 601-3]	-	-	3
		-	-	-	6	1-1/4	1
85.0	86.0	1	lucent	KS24019-L112A	1	1/2	1
	85.0	1	crown mounts	Side Arm Mount [SO 701-1]			

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

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
GEOTECHNICAL REPORTS	Dr. Clarence Welti, CT23XC507, 09/22/99	1532984	CCISITES
TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	EEI, CT23XC507, 06/23/00	1447042	CCISITES
TOWER MANUFACTURER DRAWINGS	EEI, 5723, 10/01/99	1446979	CCISITES
TOWER STRUCTURAL ANALYSIS REPORTS	FDH, 12-04574E S4, 06/18/12	3241229	CCISITES
TOWER PROPOSED MODIFICATION DRAWINGS	PJF, 37512-1818, 06/28/12	-	PJF

3.1) Analysis Method

tnxTower (version 6.0.3.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 123.423	Pole	TP20.66x15x0.1875	1	-4.87	612.53	82.6	Pass
L2	123.423 - 119	Pole	TP21.23x19.6105x0.25	2	-5.68	865.46	92.4	Pass
L3	119 - 105.5	Pole	TP24.1106x21.23x0.4571	3	-7.67	1264.38	98.8	Pass
L4	105.5 - 85.96	Pole	TP28.28x24.1106x0.5825	4	-10.68	2049.77	82.0	Pass
L5	85.96 - 70.5	Pole	TP31.078x26.2437x0.6019	5	-15.75	2418.74	89.8	Pass
L6	70.5 - 42.413	Pole	TP37.07x31.078x0.633	6	-21.82	3055.84	86.1	Pass
L7	42.413 - 35.5	Pole	TP37.9215x34.7017x0.6798	7	-24.59	3294.47	85.3	Pass
L8	35.5 - 22.75	Pole	TP40.6434x37.9215x0.5885	8	-28.85	3046.34	99.0	Pass
L9	22.75 - 18.25	Pole	TP41.604x40.6434x0.6536	9	-30.41	3365.33	92.5	Pass
L10	18.25 - 0	Pole	TP45.5x41.604x0.6026	10	-31.89	3285.71	96.7	Pass
							Summary	
						Pole (L8)	99.0	Pass
						RATING =	**99.0**	**Pass**

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	93.9	Pass
1	Base Plate	0	92.3	Pass
1	Base Foundation Steel	0	78.6	Pass
1	Base Foundation Soil Interaction	0	89.0	Pass

Structure Rating (max from all components) =	**99.0%**

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

4.1) Recommendations

1) See attached modification drawings

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

1) Tower is located in New Haven County, Connecticut.
2) Basic wind speed of 85 mph.
3) Nominal ice thickness of 0.7500 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56.00 pcf.
6) A wind speed of 38 mph is used in combination with ice.
7) Temperature drop of 50 °F.
8) Deflections calculated using a wind speed of 50 mph.
9) A non-linear (P-delta) analysis was used.
10) Pressures are calculated at each section.
11) Stress ratio used in pole design is 1.333.
12) Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	√ Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	Use Clear Spans For KL/r	SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	All Leg Panels Have Same Allowable
√ Escalate Ice	√ Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	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		

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.0000-123.4230	26.5770	3.17	18	15.0000	20.6600	0.1875	0.7500	A572-65 (65 ksi)
L2	123.4230-119.0000	7.5900	0.00	18	19.6105	21.2300	0.2500	1.0000	A572-65 (65 ksi)
L3	119.0000-105.5000	13.5000	0.00	18	21.2300	24.1106	0.4571	1.8282	Reinf 46.07 ksi (46 ksi)
L4	105.5000-85.9600	19.5400	4.08	18	24.1106	28.2800	0.5825	2.3301	Reinf 51.67 ksi (52 ksi)
L5	85.9600-70.5000	19.5430	0.00	18	26.2437	31.0780	0.6019	2.4077	Reinf 51.94 ksi (52 ksi)
L6	70.5000-42.4130	28.0870	5.17	18	31.0780	37.0700	0.6330	2.5320	Reinf 53.82 ksi (54 ksi)
L7	42.4130-35.5000	12.0800	0.00	18	34.7017	37.9215	0.6798	2.7192	Reinf 53.93 ksi (54 ksi)
L8	35.5000-22.7500	12.7500	0.00	18	37.9215	40.6434	0.5885	2.3541	Reinf 52.39 ksi (52 ksi)
L9	22.7500-18.2500	4.5000	0.00	18	40.6434	41.6040	0.6536	2.6144	Reinf 50.72 ksi (51 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L10	18.2500-0.0000	18.2500		18	41.6040	45.5000	0.6026	2.4102	Reinf 52.39 ksi (52 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	15.2314	8.8153	244.3603	5.2584	7.6200	32.0683	489.0422	4.4085	2.3100	12.32
	20.9787	12.1837	645.1464	7.2677	10.4953	61.4701	1291.1417	6.0930	3.3062	17.633
L2	20.5992	15.3626	727.5059	6.8730	9.9622	73.0270	1455.9691	7.6828	3.0115	12.046
	21.5575	16.6477	925.7691	7.4479	10.7849	85.8397	1852.7564	8.3254	3.2965	13.186
L3	21.5575	30.1355	1642.9085	7.3744	10.7849	152.3348	3287.9787	15.0706	2.9321	6.415
	24.4826	34.3144	2425.5327	8.3970	12.2482	198.0318	4854.2569	17.1605	3.4390	7.524
L4	24.4826	43.5023	3042.4447	8.3525	12.2482	248.3994	6088.8926	21.7553	3.2182	5.525
	28.7163	51.2112	4963.4422	9.8326	14.3662	345.4935	9933.4155	25.6105	3.9520	6.784
L5	27.6742	48.9885	4069.3855	9.1028	13.3318	305.2388	8144.1255	24.4989	3.5595	5.914
	31.5575	58.2244	6832.2184	10.8190	15.7876	432.7574	13673.426 9	29.1177	4.4104	7.327
L6	31.5575	61.1674	7162.9327	10.8080	15.7876	453.7051	14335.290 5	30.5895	4.3557	6.881
	37.6419	73.2060	12279.181 5	12.9351	18.8316	652.0533	24574.520 2	36.6099	5.4103	8.547
L7	36.6355	73.4075	10734.843 1	12.0778	17.6285	608.9492	21483.811 3	36.7107	4.9111	7.224
	38.5065	80.3547	14080.195 5	13.2208	19.2641	730.9021	28178.918 1	40.1850	5.4778	8.058
L8	38.5065	69.7366	12279.601 4	13.2532	19.2641	637.4334	24575.360 6	34.8749	5.6384	9.581
	41.2704	74.8210	15165.995 7	14.2195	20.6468	734.5435	30351.947 2	37.4176	6.1174	10.395
L9	41.2704	82.9598	16761.123 8	14.1964	20.6468	811.8012	33544.302 4	41.4878	6.0029	9.184
	42.2458	84.9527	17998.300 4	14.5374	21.1348	851.5938	36020.283 5	42.4844	6.1720	9.443
L10	42.2458	78.4151	16654.659 0	14.5555	21.1348	788.0191	33331.232 7	39.2150	6.2618	10.392
	46.2019	85.8661	21867.668 9	15.9386	23.1140	946.0790	43764.111 9	42.9412	6.9475	11.53

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 klf
HB114-1-0813U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	150.0000 - 0.0000	1	No Ice	0.1540	0.00
						1/2" Ice	0.2540	0.00
						1" Ice	0.3540	0.00
						2" Ice	0.5540	0.01
						4" Ice	0.9540	0.03
HB114-1-0813U4-M5J(1 1/4")	C	No	Inside Pole	150.0000 - 0.0000	2	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
**								
LDF7-50A(1-5/8")	C	No	Inside Pole	138.0000 - 0.0000	12	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	138.0000 - 0.0000	1	No Ice	0.1980	0.00
						1/2" Ice	0.2980	0.00
						1" Ice	0.3980	0.00
						2" Ice	0.5980	0.01
						4" Ice	0.9980	0.03
LDF7-50A(1-5/8")	C	No	Inside Pole	138.0000 - 0.0000	5	No Ice	0.0000	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
**								
LDF6-50A(1-1/4")	C	No	Inside Pole	127.0000 - 0.0000	6	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
FB-L98B-002-75000(3/8")	C	No	Inside Pole	127.0000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	127.0000 - 0.0000	2	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
**								
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	85.0000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.01
						4" Ice	0.0000	0.02
**								
**								
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	120.5000 - 0.0000	1	No Ice	0.2083	0.00
						1/2" Ice	0.3194	0.00
						1" Ice	0.4306	0.00
						2" Ice	0.6528	0.00
						4" Ice	1.0972	0.00

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	150.0000-123.4230	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.979	0.33
L2	123.4230-119.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.869	0.10
L3	119.0000-105.5000	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	7.564	0.32
L4	105.5000-85.9600	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	10.949	0.46
L5	85.9600-70.5000	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	8.663	0.37
L6	70.5000-42.4130	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	15.738	0.67
L7	42.4130-35.5000	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	3.874	0.16
L8	35.5000-22.7500	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	7.144	0.30
L9	22.7500-18.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.521	0.11
L10	18.2500-0.0000	A	0.000	0.000	0.000	0.000	0.00

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
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	10.226	0.43

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	150.0000-123.4230	A	0.889	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	14.296	0.45
L2	123.4230-119.0000	A	0.877	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	3.738	0.13
L3	119.0000-105.5000	A	0.869	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	14.860	0.39
L4	105.5000-85.9600	A	0.852	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	21.307	0.57
L5	85.9600-70.5000	A	0.832	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	16.858	0.48
L6	70.5000-42.4130	A	0.799	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	29.706	0.85
L7	42.4130-35.5000	A	0.765	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	7.311	0.21
L8	35.5000-22.7500	A	0.750	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	13.094	0.38
L9	22.7500-18.2500	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	4.622	0.13
L10	18.2500-0.0000	A	0.750	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	18.743	0.54

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.0000-123.4230	-0.2985	0.1723	-0.4912	0.2836
L2	123.4230-119.0000	-0.4423	0.2554	-0.6992	0.4037
L3	119.0000-105.5000	-0.5614	0.3241	-0.8618	0.4975
L4	105.5000-85.9600	-0.5792	0.3344	-0.9054	0.5227
L5	85.9600-70.5000	-0.5915	0.3415	-0.9399	0.5427
L6	70.5000-42.4130	-0.6079	0.3510	-0.9680	0.5588
L7	42.4130-35.5000	-0.6160	0.3556	-0.9911	0.5722
L8	35.5000-22.7500	-0.6215	0.3588	-0.9868	0.5697
L9	22.7500-18.2500	-0.6256	0.3612	-0.9985	0.5765
L10	18.2500-0.0000	-0.6305	0.3640	-1.0127	0.5847

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
1900MHz RRH (65MHz)	A	From Face	4.0000 0.00 -5.00	0.00	152.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.6979 2.9362 3.1832 3.7030 4.8463	2.7708 3.0111 3.2600 3.7837 4.9348	0.06 0.08 0.11 0.18 0.35
800 EXTERNAL NOTCH FILTER	A	From Face	4.0000 0.00 -5.00	0.00	152.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.7701 0.8898 1.0181 1.3007 1.9696	0.3747 0.4647 0.5634 0.7868 1.3372	0.01 0.02 0.02 0.04 0.11
800MHZ RRH	A	From Face	4.0000 0.00 -5.00	0.00	152.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4899 2.7061 2.9310 3.4068 4.4620	2.0685 2.2705 2.4812 2.9284 3.9265	0.05 0.07 0.10 0.16 0.32
(3) ACU-A20-N	A	From Face	4.0000 0.00 -5.00	0.00	152.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.0778 0.1210 0.1728 0.3025 0.6654	0.1361 0.1890 0.2506 0.3997 0.8015	0.00 0.00 0.00 0.01 0.04
APXVSPP18-C-A20 w/ Mount Pipe	A	From Face	4.0000 0.00 -5.00	0.00	152.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.9458 8.1266 9.0212 10.8440 14.8507	0.08 0.15 0.22 0.41 0.91
1900MHz RRH (65MHz)	B	From Face	4.0000 0.00 -5.00	0.00	152.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.6979 2.9362 3.1832 3.7030 4.8463	2.7708 3.0111 3.2600 3.7837 4.9348	0.06 0.08 0.11 0.18 0.35
800 EXTERNAL NOTCH FILTER	B	From Face	4.0000 0.00 -5.00	0.00	152.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.7701 0.8898 1.0181 1.3007 1.9696	0.3747 0.4647 0.5634 0.7868 1.3372	0.01 0.02 0.02 0.04 0.11
800MHZ RRH	B	From Face	4.0000 0.00 -5.00	0.00	152.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4899 2.7061 2.9310 3.4068 4.4620	2.0685 2.2705 2.4812 2.9284 3.9265	0.05 0.07 0.10 0.16 0.32
(3) ACU-A20-N	B	From Face	4.0000 0.00 -5.00	0.00	152.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.0778 0.1210 0.1728 0.3025 0.6654	0.1361 0.1890 0.2506 0.3997 0.8015	0.00 0.00 0.00 0.01 0.04
APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	4.0000 0.00 -5.00	0.00	152.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.9458 8.1266 9.0212 10.8440 14.8507	0.08 0.15 0.22 0.41 0.91
1900MHz RRH (65MHz)	C	From Face	4.0000 0.00	0.00	152.0000	No Ice 1/2"	2.6979 2.9362	2.7708 3.0111	0.06 0.08

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
				-5.00			Ice	3.1832	3.2600	0.11
							1" Ice	3.7030	3.7837	0.18
							2" Ice	4.8463	4.9348	0.35
							4" Ice			
800 EXTERNAL NOTCH FILTER	C	From Face	4.0000		0.00	152.0000	No Ice	0.7701	0.3747	0.01
			0.00				1/2"	0.8898	0.4647	0.02
			-5.00				Ice	1.0181	0.5634	0.02
							1" Ice	1.3007	0.7868	0.04
							2" Ice	1.9696	1.3372	0.11
							4" Ice			
800MHZ RRH	C	From Face	4.0000		0.00	152.0000	No Ice	2.4899	2.0685	0.05
			0.00				1/2"	2.7061	2.2705	0.07
			-5.00				Ice	2.9310	2.4812	0.10
							1" Ice	3.4068	2.9284	0.16
							2" Ice	4.4620	3.9265	0.32
							4" Ice			
(3) ACU-A20-N	C	From Face	4.0000		0.00	152.0000	No Ice	0.0778	0.1361	0.00
			0.00				1/2"	0.1210	0.1890	0.00
			-5.00				Ice	0.1728	0.2506	0.00
							1" Ice	0.3025	0.3997	0.01
							2" Ice	0.6654	0.8015	0.04
							4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	4.0000		0.00	152.0000	No Ice	8.4975	6.9458	0.08
			0.00				1/2"	9.1490	8.1266	0.15
			-5.00				Ice	9.7672	9.0212	0.22
							1" Ice	11.0311	10.8440	0.41
							2" Ice	13.6786	14.8507	0.91
							4" Ice			
Platform Mount [LP 602-1]	C	None			0.00	152.0000	No Ice	32.0300	32.0300	1.34
							1/2"	38.7100	38.7100	1.80
							Ice	45.3900	45.3900	2.26
							1" Ice	58.7500	58.7500	3.17
							2" Ice	85.4700	85.4700	5.00
							4" Ice			
(3) 6' x 2.375" Pipe Mount	A	From Face	4.0000		0.00	152.0000	No Ice	1.4250	1.4250	0.02
			0.00				1/2"	1.9250	1.9250	0.03
			-5.00				Ice	2.2939	2.2939	0.05
							1" Ice	3.0596	3.0596	0.09
							2" Ice	4.7022	4.7022	0.23
							4" Ice			
(3) 6' x 2.375" Pipe Mount	B	From Face	4.0000		0.00	152.0000	No Ice	1.4250	1.4250	0.02
			0.00				1/2"	1.9250	1.9250	0.03
			-5.00				Ice	2.2939	2.2939	0.05
							1" Ice	3.0596	3.0596	0.09
							2" Ice	4.7022	4.7022	0.23
							4" Ice			
(3) 6' x 2.375" Pipe Mount	C	From Face	4.0000		0.00	152.0000	No Ice	1.4250	1.4250	0.02
			0.00				1/2"	1.9250	1.9250	0.03
			-5.00				Ice	2.2939	2.2939	0.05
							1" Ice	3.0596	3.0596	0.09
							2" Ice	4.7022	4.7022	0.23
							4" Ice			
***										
BXA-171063-12BF w/ Mount Pipe	A	From Face	4.0000		0.00	138.0000	No Ice	4.9710	5.2283	0.04
			0.00				1/2"	5.5211	6.3892	0.08
			2.00				Ice	6.0361	7.2610	0.14
							1" Ice	7.0911	9.0462	0.27
							2" Ice	9.3593	12.8165	0.67
							4" Ice			
BXA-70063-6CF-2 w/ Mount Pipe	A	From Face	4.0000		0.00	138.0000	No Ice	7.9686	5.8008	0.04
			0.00				1/2"	8.6091	6.9529	0.10
			2.00				Ice	9.2158	7.8191	0.17
							1" Ice	10.4591	9.6015	0.34
							2" Ice	13.0655	13.3662	0.80
							4" Ice			

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
(2) LPA-80063-6CF-EDIN-2 w/ Mount Pipe	A	From Face	4.0000 0.00 2.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.7445 11.4117 12.0450 13.3414 16.0541	10.7001 11.9672 12.9479 14.9632 19.2085	0.05 0.14 0.25 0.48 1.09
BXA-171063-12BF w/ Mount Pipe	B	From Face	4.0000 0.00 2.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.9710 5.5211 6.0361 7.0911 9.3593	5.2283 6.3892 7.2610 9.0462 12.8165	0.04 0.08 0.14 0.27 0.67
BXA-70063-6CF-2 w/ Mount Pipe	B	From Face	4.0000 0.00 2.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.9686 8.6091 9.2158 10.4591 13.0655	5.8008 6.9529 7.8191 9.6015 13.3662	0.04 0.10 0.17 0.34 0.80
(2) LPA-80063-6CF-EDIN-2 w/ Mount Pipe	B	From Face	4.0000 0.00 2.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.7445 11.4117 12.0450 13.3414 16.0541	10.7001 11.9672 12.9479 14.9632 19.2085	0.05 0.14 0.25 0.48 1.09
BXA-70063-6CF-2 w/ Mount Pipe	C	From Face	4.0000 0.00 2.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.9686 8.6091 9.2158 10.4591 13.0655	5.8008 6.9529 7.8191 9.6015 13.3662	0.04 0.10 0.17 0.34 0.80
(2) LPA-80063-6CF-EDIN-2 w/ Mount Pipe	C	From Face	4.0000 0.00 2.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.7445 11.4117 12.0450 13.3414 16.0541	10.7001 11.9672 12.9479 14.9632 19.2085	0.05 0.14 0.25 0.48 1.09
BXA-171063-12BF w/ Mount Pipe	C	From Face	4.0000 0.00 2.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.9710 5.5211 6.0361 7.0911 9.3593	5.2283 6.3892 7.2610 9.0462 12.8165	0.04 0.08 0.14 0.27 0.67
Platform Mount [LP 601-1]	C	None		0.00	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.4700 33.5900 38.7100 48.9500 69.4300	28.4700 33.5900 38.7100 48.9500 69.4300	1.12 1.51 1.91 2.69 4.26
***									
(3) SBNH-1D6565C w/ Mount Pipe	A	From Face	4.0000 0.00 1.00	0.00	127.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	11.5561 12.2227 12.8929 14.2911 17.4280	9.7151 11.1857 12.5942 14.8689 19.6184	0.09 0.18 0.28 0.51 1.14
(2) DTMABP7819VG12A	A	From Face	4.0000 0.00 1.00	0.00	127.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.1389 1.2835 1.4368 1.7693 2.5380	0.3907 0.4884 0.5947 0.8334 1.4144	0.02 0.03 0.04 0.06 0.14
(2) RRUS-11	A	From Face	4.0000 0.00 0.00	0.00	129.0000	No Ice 1/2" Ice Ice 1" Ice	3.2486 3.4905 3.7411 4.2682	1.3726 1.5510 1.7380 2.1381	0.05 0.07 0.09 0.15

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
DC6-48-60-18-8F	A	From Face	4.0000 0.00 1.00	0.00	127.0000	2" Ice 4" Ice	5.4260	3.0418	0.31
						No Ice	2.5667	4.3167	0.02
						1/2" Ice	2.7978	4.5965	0.05
							3.0377	4.8849	0.09
						1" Ice	3.5432	5.4877	0.17
						2" Ice 4" Ice	4.6580	6.7969	0.38
(2) DTMABP7819VG12A	B	From Face	4.0000 0.00 1.00	0.00	127.0000	No Ice	1.1389	0.3907	0.02
						1/2" Ice	1.2835	0.4884	0.03
							1.4368	0.5947	0.04
						1" Ice	1.7693	0.8334	0.06
						2" Ice 4" Ice	2.5380	1.4144	0.14
(2) RRUS-11	B	From Face	4.0000 0.00 0.00	0.00	129.0000	No Ice	3.2486	1.3726	0.05
						1/2" Ice	3.4905	1.5510	0.07
							3.7411	1.7380	0.09
						1" Ice	4.2682	2.1381	0.15
						2" Ice 4" Ice	5.4260	3.0418	0.31
(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Face	4.0000 0.00 1.00	0.00	127.0000	No Ice	8.4975	6.3042	0.07
						1/2" Ice	9.1490	7.4790	0.14
							9.7672	8.3676	0.21
						1" Ice	11.0311	10.1785	0.38
						2" Ice 4" Ice	13.6786	14.0237	0.87
(3) SBNH-1D6565C w/ Mount Pipe	C	From Face	4.0000 0.00 1.00	0.00	127.0000	No Ice	11.5561	9.7151	0.09
						1/2" Ice	12.2227	11.1857	0.18
							12.8929	12.5942	0.28
						1" Ice	14.2911	14.8689	0.51
						2" Ice 4" Ice	17.4280	19.6184	1.14
(2) DTMABP7819VG12A	C	From Face	4.0000 0.00 1.00	0.00	127.0000	No Ice	1.1389	0.3907	0.02
						1/2" Ice	1.2835	0.4884	0.03
							1.4368	0.5947	0.04
						1" Ice	1.7693	0.8334	0.06
						2" Ice 4" Ice	2.5380	1.4144	0.14
(2) RRUS-11	C	From Face	4.0000 0.00 0.00	0.00	129.0000	No Ice	3.2486	1.3726	0.05
						1/2" Ice	3.4905	1.5510	0.07
							3.7411	1.7380	0.09
						1" Ice	4.2682	2.1381	0.15
						2" Ice 4" Ice	5.4260	3.0418	0.31
T-Arm Mount [TA 601-3]	C	None		0.00	127.0000	No Ice	10.9000	10.9000	0.73
						1/2" Ice	14.6500	14.6500	0.93
							18.4000	18.4000	1.13
						1" Ice	25.9000	25.9000	1.52
						2" Ice 4" Ice	40.9000	40.9000	2.32
Side Arm Mount [SO 102-3]	C	None		0.00	129.0000	No Ice	3.0000	3.0000	0.08
						1/2" Ice	3.4800	3.4800	0.11
							3.9600	3.9600	0.14
						1" Ice	4.9200	4.9200	0.20
						2" Ice 4" Ice	6.8400	6.8400	0.32
***									
KS24019-L112A	A	From Face	4.0000 0.00 1.00	0.00	85.0000	No Ice	0.1556	0.1556	0.01
						1/2" Ice	0.2247	0.2247	0.01
							0.3025	0.3025	0.01
						1" Ice	0.4840	0.4840	0.02
						2" Ice 4" Ice	0.9506	0.9506	0.06
Side Arm Mount [SO 701-1]	A	None		0.00	85.0000	No Ice	0.8500	1.6700	0.07
						1/2"	1.1400	2.3400	0.08

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
						Ice	1.4300	3.0100	0.09
						1" Ice	2.0100	4.3500	0.12
						2" Ice	3.1700	7.0300	0.18
						4" Ice			

Tower Pressures - No Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z ksf	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 150.0000-123.4230	136.0084	1.499	0.03	39.489	A	0.000	39.489	39.489	100.00	0.000	0.000
					B	0.000	39.489		100.00	0.000	0.000
					C	0.000	39.489		100.00	0.000	6.979
L2 123.4230-119.0000	121.1947	1.45	0.03	7.651	A	0.000	7.651	7.651	100.00	0.000	0.000
					B	0.000	7.651		100.00	0.000	0.000
					C	0.000	7.651		100.00	0.000	1.869
L3 119.0000-105.5000	112.1071	1.418	0.03	25.504	A	0.000	25.504	25.504	100.00	0.000	0.000
					B	0.000	25.504		100.00	0.000	0.000
					C	0.000	25.504		100.00	0.000	7.564
L4 105.5000-85.9600	95.4708	1.355	0.03	42.655	A	0.000	42.655	42.655	100.00	0.000	0.000
					B	0.000	42.655		100.00	0.000	0.000
					C	0.000	42.655		100.00	0.000	10.949
L5 85.9600-70.5000	78.0611	1.279	0.02	37.575	A	0.000	37.575	37.575	100.00	0.000	0.000
					B	0.000	37.575		100.00	0.000	0.000
					C	0.000	37.575		100.00	0.000	8.663
L6 70.5000-42.4130	56.0449	1.163	0.02	79.753	A	0.000	79.753	79.753	100.00	0.000	0.000
					B	0.000	79.753		100.00	0.000	0.000
					C	0.000	79.753		100.00	0.000	15.738
L7 42.4130-35.5000	38.9278	1.048	0.02	21.315	A	0.000	21.315	21.315	100.00	0.000	0.000
					B	0.000	21.315		100.00	0.000	0.000
					C	0.000	21.315		100.00	0.000	3.874
L8 35.5000-22.7500	29.0514	1	0.02	41.738	A	0.000	41.738	41.738	100.00	0.000	0.000
					B	0.000	41.738		100.00	0.000	0.000
					C	0.000	41.738		100.00	0.000	7.144
L9 22.7500-18.2500	20.4912	1	0.02	15.421	A	0.000	15.421	15.421	100.00	0.000	0.000
					B	0.000	15.421		100.00	0.000	0.000
					C	0.000	15.421		100.00	0.000	2.521
L10 18.2500-0.0000	8.9890	1	0.02	66.235	A	0.000	66.235	66.235	100.00	0.000	0.000
					B	0.000	66.235		100.00	0.000	0.000
					C	0.000	66.235		100.00	0.000	10.226

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	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 150.0000-123.4230	136.0084	1.499	0.01	0.8889	43.427	A	0.000	43.427	43.427	100.00	0.000	0.000
						B	0.000	43.427		100.00	0.000	0.000
						C	0.000	43.427		100.00	0.000	14.296
L2 123.4230-119.0000	121.1947	1.45	0.01	0.8767	8.306	A	0.000	8.306	8.306	100.00	0.000	0.000
						B	0.000	8.306		100.00	0.000	0.000
						C	0.000	8.306		100.00	0.000	3.738
L3 119.0000-105.5000	112.1071	1.418	0.01	0.8686	27.458	A	0.000	27.458	27.458	100.00	0.000	0.000
						B	0.000	27.458		100.00	0.000	0.000
						C	0.000	27.458		100.00	0.000	14.860

Section Elevation ft	z ft	K_Z	q_z ksf	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
L4 105.5000-85.9600	95.4708	1.355	0.00	0.8520	45.429	A	0.000	45.429	45.429	100.00	0.000	0.000
						B	0.000	45.429		100.00	0.000	0.000
						C	0.000	45.429		100.00	0.000	21.307
L5 85.9600-70.5000	78.0611	1.279	0.00	0.8316	39.771	A	0.000	39.771	39.771	100.00	0.000	0.000
						B	0.000	39.771		100.00	0.000	0.000
						C	0.000	39.771		100.00	0.000	16.858
L6 70.5000-42.4130	56.0449	1.163	0.00	0.7992	83.494	A	0.000	83.494	83.494	100.00	0.000	0.000
						B	0.000	83.494		100.00	0.000	0.000
						C	0.000	83.494		100.00	0.000	29.706
L7 42.4130-35.5000	38.9278	1.048	0.00	0.7650	22.236	A	0.000	22.236	22.236	100.00	0.000	0.000
						B	0.000	22.236		100.00	0.000	0.000
						C	0.000	22.236		100.00	0.000	7.311
L8 35.5000-22.7500	29.0514	1	0.00	0.7500	43.331	A	0.000	43.331	43.331	100.00	0.000	0.000
						B	0.000	43.331		100.00	0.000	0.000
						C	0.000	43.331		100.00	0.000	13.094
L9 22.7500-18.2500	20.4912	1	0.00	0.7500	15.984	A	0.000	15.984	15.984	100.00	0.000	0.000
						B	0.000	15.984		100.00	0.000	0.000
						C	0.000	15.984		100.00	0.000	4.622
L10 18.2500-0.0000	8.9890	1	0.00	0.7500	68.517	A	0.000	68.517	68.517	100.00	0.000	0.000
						B	0.000	68.517		100.00	0.000	0.000
						C	0.000	68.517		100.00	0.000	18.743

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z ksf	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 150.0000-123.4230	136.0084	1.499	0.01	39.489	A	0.000	39.489	39.489	100.00	0.000	0.000
					B	0.000	39.489		100.00	0.000	0.000
					C	0.000	39.489		100.00	0.000	6.979
L2 123.4230-119.0000	121.1947	1.45	0.01	7.651	A	0.000	7.651	7.651	100.00	0.000	0.000
					B	0.000	7.651		100.00	0.000	0.000
					C	0.000	7.651		100.00	0.000	1.869
L3 119.0000-105.5000	112.1071	1.418	0.01	25.504	A	0.000	25.504	25.504	100.00	0.000	0.000
					B	0.000	25.504		100.00	0.000	0.000
					C	0.000	25.504		100.00	0.000	7.564
L4 105.5000-85.9600	95.4708	1.355	0.01	42.655	A	0.000	42.655	42.655	100.00	0.000	0.000
					B	0.000	42.655		100.00	0.000	0.000
					C	0.000	42.655		100.00	0.000	10.949
L5 85.9600-70.5000	78.0611	1.279	0.01	37.575	A	0.000	37.575	37.575	100.00	0.000	0.000
					B	0.000	37.575		100.00	0.000	0.000
					C	0.000	37.575		100.00	0.000	8.663
L6 70.5000-42.4130	56.0449	1.163	0.01	79.753	A	0.000	79.753	79.753	100.00	0.000	0.000
					B	0.000	79.753		100.00	0.000	0.000
					C	0.000	79.753		100.00	0.000	15.738
L7 42.4130-35.5000	38.9278	1.048	0.01	21.315	A	0.000	21.315	21.315	100.00	0.000	0.000
					B	0.000	21.315		100.00	0.000	0.000
					C	0.000	21.315		100.00	0.000	3.874
L8 35.5000-22.7500	29.0514	1	0.01	41.738	A	0.000	41.738	41.738	100.00	0.000	0.000
					B	0.000	41.738		100.00	0.000	0.000
					C	0.000	41.738		100.00	0.000	7.144
L9 22.7500-18.2500	20.4912	1	0.01	15.421	A	0.000	15.421	15.421	100.00	0.000	0.000
					B	0.000	15.421		100.00	0.000	0.000
					C	0.000	15.421		100.00	0.000	2.521
L10 18.2500-0.0000	8.9890	1	0.01	66.235	A	0.000	66.235	66.235	100.00	0.000	0.000
					B	0.000	66.235		100.00	0.000	0.000
					C	0.000	66.235		100.00	0.000	10.226

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	150 - 123.423	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-13.70	1.20	-0.31
			Max. Mx	11	-4.88	202.77	-0.16
			Max. My	8	-4.88	0.23	-202.55
			Max. Vy	11	-17.80	202.77	-0.16
			Max. Vx	8	17.82	0.23	-202.55
			Max. Torque	8			-2.80
L2	123.423 - 119	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-14.67	1.26	-0.34
			Max. Mx	11	-5.69	339.92	-0.61
			Max. My	8	-5.69	0.73	-339.82
			Max. Vy	11	-18.34	339.92	-0.61
			Max. Vx	8	18.35	0.73	-339.82
			Max. Torque	2			2.81
L3	119 - 105.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-16.89	1.38	-0.40
			Max. Mx	11	-7.68	595.00	-1.42
			Max. My	8	-7.68	1.60	-595.11
			Max. Vy	11	-19.47	595.00	-1.42

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L4	105.5 - 85.96	Pole	Max. Vx	8	19.49	1.60	-595.11
			Max. Torque	2			2.86
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-20.22	1.50	-0.47
			Max. Mx	11	-10.69	906.31	-2.34
			Max. My	8	-10.69	2.57	-906.65
			Max. Vy	11	-20.83	906.31	-2.34
			Max. Vx	8	20.85	2.57	-906.65
L5	85.96 - 70.5	Pole	Max. Torque	2			2.91
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-25.90	1.72	-0.55
			Max. Mx	11	-15.75	1332.24	-3.50
			Max. My	8	-15.75	3.81	-1332.84
			Max. Vy	11	-22.66	1332.24	-3.50
			Max. Vx	8	22.68	3.81	-1332.84
L6	70.5 - 42.413	Pole	Max. Torque	2			3.02
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32.54	1.97	-0.70
			Max. Mx	11	-21.83	1872.49	-4.88
			Max. My	8	-21.83	5.23	-1873.45
			Max. Vy	11	-24.52	1872.49	-4.88
			Max. Vx	8	24.53	5.23	-1873.45
L7	42.413 - 35.5	Pole	Max. Torque	2			3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-37.94	2.10	-0.77
			Max. Mx	11	-26.70	2175.27	-5.60
			Max. My	8	-26.70	5.97	-2176.42
			Max. Vy	11	-25.55	2175.27	-5.60
			Max. Vx	8	25.56	5.97	-2176.42
L8	35.5 - 22.75	Pole	Max. Torque	13			3.17
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41.93	2.25	-0.86
			Max. Mx	11	-30.39	2506.18	-6.35
			Max. My	8	-30.39	6.74	-2507.52
			Max. Vy	5	26.39	-2504.89	5.87
			Max. Vx	8	26.40	6.74	-2507.52
L9	22.75 - 18.25	Pole	Max. Torque	13			3.23
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-43.52	2.31	-0.89
			Max. Mx	11	-31.87	2625.57	-6.62
			Max. My	8	-31.87	7.02	-2626.97
			Max. Vy	5	26.70	-2624.24	6.12
			Max. Vx	8	26.71	7.02	-2626.97
L10	18.25 - 0	Pole	Max. Torque	13			3.25
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-49.91	2.54	-1.03
			Max. Mx	11	-37.76	3123.73	-7.68
			Max. My	8	-37.76	8.10	-3125.40
			Max. Vy	5	27.93	-3122.28	7.12
			Max. Vx	8	27.94	8.10	-3125.40
			Max. Torque	13			3.35

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	49.91	0.00	-0.00
	Max. H_x	11	37.77	27.91	-0.06
	Max. H_z	2	37.77	-0.06	27.93
	Max. M_x	2	3124.82	-0.06	27.93
	Max. M_z	5	3122.28	-27.91	0.06

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. Torsion	13	3.35	13.91	24.16
	Min. Vert	1	37.77	0.00	0.00
	Min. H_x	5	37.77	-27.91	0.06
	Min. H_z	8	37.77	0.06	-27.93
	Min. M_x	8	-3125.40	0.06	-27.93
	Min. M_z	11	-3123.73	27.91	-0.06
	Min. Torsion	7	-3.35	-13.91	-24.16

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	37.77	0.00	0.00	0.28	0.70	0.00
Dead+Wind 0 deg - No Ice	37.77	0.06	-27.93	-3124.82	-6.70	-3.33
Dead+Wind 30 deg - No Ice	37.77	14.00	-24.21	-2709.81	-1567.19	-2.41
Dead+Wind 60 deg - No Ice	37.77	24.20	-14.01	-1568.66	-2707.56	-0.84
Dead+Wind 90 deg - No Ice	37.77	27.91	-0.06	-7.12	-3122.28	0.95
Dead+Wind 120 deg - No Ice	37.77	24.14	13.92	1556.44	-2700.21	2.48
Dead+Wind 150 deg - No Ice	37.77	13.91	24.16	2703.03	-1554.40	3.35
Dead+Wind 180 deg - No Ice	37.77	-0.06	27.93	3125.40	8.10	3.33
Dead+Wind 210 deg - No Ice	37.77	-14.00	24.21	2710.40	1568.61	2.41
Dead+Wind 240 deg - No Ice	37.77	-24.20	14.01	1569.25	2709.00	0.84
Dead+Wind 270 deg - No Ice	37.77	-27.91	0.06	7.68	3123.73	-0.95
Dead+Wind 300 deg - No Ice	37.77	-24.14	-13.92	-1555.89	2701.64	-2.48
Dead+Wind 330 deg - No Ice	37.77	-13.91	-24.16	-2702.47	1555.81	-3.35
Dead+Ice+Temp	49.91	-0.00	0.00	1.03	2.54	-0.00
Dead+Wind 0 deg+Ice+Temp	49.91	0.02	-6.85	-787.99	0.11	-0.86
Dead+Wind 30 deg+Ice+Temp	49.91	3.44	-5.94	-683.54	-394.42	-0.61
Dead+Wind 60 deg+Ice+Temp	49.91	5.95	-3.44	-395.66	-682.56	-0.19
Dead+Wind 90 deg+Ice+Temp	49.91	6.86	-0.02	-1.47	-787.10	0.28
Dead+Wind 120 deg+Ice+Temp	49.91	5.93	3.41	393.40	-680.02	0.68
Dead+Wind 150 deg+Ice+Temp	49.91	3.41	5.92	683.14	-390.03	0.89
Dead+Wind 180 deg+Ice+Temp	49.91	-0.02	6.85	790.12	5.19	0.86
Dead+Wind 210 deg+Ice+Temp	49.91	-3.44	5.94	685.68	399.72	0.61
Dead+Wind 240 deg+Ice+Temp	49.91	-5.95	3.44	397.79	687.86	0.19
Dead+Wind 270 deg+Ice+Temp	49.91	-6.86	0.02	3.61	792.39	-0.28
Dead+Wind 300 deg+Ice+Temp	49.91	-5.93	-3.41	-391.26	685.32	-0.68
Dead+Wind 330 deg+Ice+Temp	49.91	-3.41	-5.92	-681.00	395.32	-0.89
Dead+Wind 0 deg - Service	37.77	0.02	-9.66	-1083.07	-1.84	-1.17
Dead+Wind 30 deg - Service	37.77	4.85	-8.38	-939.21	-542.81	-0.84
Dead+Wind 60 deg - Service	37.77	8.37	-4.85	-543.61	-938.14	-0.30
Dead+Wind 90 deg - Service	37.77	9.66	-0.02	-2.27	-1081.90	0.33
Dead+Wind 120 deg - Service	37.77	8.35	4.81	539.75	-935.58	0.87
Dead+Wind 150 deg - Service	37.77	4.81	8.36	937.23	-538.37	1.18
Dead+Wind 180 deg - Service	37.77	-0.02	9.66	1083.66	3.29	1.17
Dead+Wind 210 deg - Service	37.77	-4.85	8.38	939.80	544.27	0.84
Dead+Wind 240 deg - Service	37.77	-8.37	4.85	544.20	939.60	0.30
Dead+Wind 270 deg -	37.77	-9.66	0.02	2.86	1083.36	-0.33

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Service						
Dead+Wind 300 deg - Service	37.77	-8.35	-4.81	-539.17	937.04	-0.87
Dead+Wind 330 deg - Service	37.77	-4.81	-8.36	-936.65	539.83	-1.18

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	-37.77	0.00	0.00	37.77	0.00	0.000%
2	0.06	-37.77	-27.93	-0.06	37.77	27.93	0.000%
3	14.00	-37.77	-24.21	-14.00	37.77	24.21	0.000%
4	24.20	-37.77	-14.01	-24.20	37.77	14.01	0.000%
5	27.91	-37.77	-0.06	-27.91	37.77	0.06	0.000%
6	24.14	-37.77	13.92	-24.14	37.77	-13.92	0.000%
7	13.91	-37.77	24.16	-13.91	37.77	-24.16	0.000%
8	-0.06	-37.77	27.93	0.06	37.77	-27.93	0.000%
9	-14.00	-37.77	24.21	14.00	37.77	-24.21	0.000%
10	-24.20	-37.77	14.01	24.20	37.77	-14.01	0.000%
11	-27.91	-37.77	0.06	27.91	37.77	-0.06	0.000%
12	-24.14	-37.77	-13.92	24.14	37.77	13.92	0.000%
13	-13.91	-37.77	-24.16	13.91	37.77	24.16	0.000%
14	0.00	-49.91	0.00	0.00	49.91	-0.00	0.000%
15	0.02	-49.91	-6.85	-0.02	49.91	6.85	0.000%
16	3.44	-49.91	-5.94	-3.44	49.91	5.94	0.000%
17	5.95	-49.91	-3.44	-5.95	49.91	3.44	0.000%
18	6.86	-49.91	-0.02	-6.86	49.91	0.02	0.000%
19	5.93	-49.91	3.41	-5.93	49.91	-3.41	0.000%
20	3.41	-49.91	5.92	-3.41	49.91	-5.92	0.000%
21	-0.02	-49.91	6.85	0.02	49.91	-6.85	0.000%
22	-3.44	-49.91	5.94	3.44	49.91	-5.94	0.000%
23	-5.95	-49.91	3.44	5.95	49.91	-3.44	0.000%
24	-6.86	-49.91	0.02	6.86	49.91	-0.02	0.000%
25	-5.93	-49.91	-3.41	5.93	49.91	3.41	0.000%
26	-3.41	-49.91	-5.92	3.41	49.91	5.92	0.000%
27	0.02	-37.77	-9.66	-0.02	37.77	9.66	0.000%
28	4.85	-37.77	-8.38	-4.85	37.77	8.38	0.000%
29	8.37	-37.77	-4.85	-8.37	37.77	4.85	0.000%
30	9.66	-37.77	-0.02	-9.66	37.77	0.02	0.000%
31	8.35	-37.77	4.81	-8.35	37.77	-4.81	0.000%
32	4.81	-37.77	8.36	-4.81	37.77	-8.36	0.000%
33	-0.02	-37.77	9.66	0.02	37.77	-9.66	0.000%
34	-4.85	-37.77	8.38	4.85	37.77	-8.38	0.000%
35	-8.37	-37.77	4.85	8.37	37.77	-4.85	0.000%
36	-9.66	-37.77	0.02	9.66	37.77	-0.02	0.000%
37	-8.35	-37.77	-4.81	8.35	37.77	4.81	0.000%
38	-4.81	-37.77	-8.36	4.81	37.77	8.36	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 123.423	39.89	34	2.66	0.01
L2	126.59 - 119	27.44	34	2.28	0.01
L3	119 - 105.5	23.94	34	2.08	0.01
L4	105.5 - 85.96	18.49	34	1.77	0.00
L5	90.043 - 70.5	13.25	34	1.46	0.00
L6	70.5 - 42.413	7.93	34	1.11	0.00
L7	47.58 - 35.5	3.60	34	0.70	0.00
L8	35.5 - 22.75	1.98	34	0.55	0.00
L9	22.75 - 18.25	0.80	34	0.34	0.00
L10	18.25 - 0	0.51	34	0.27	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.0000	1900MHz RRH (65MHz)	34	39.89	2.66	0.01	9034
138.0000	BXA-171063-12BF w/ Mount Pipe	34	33.29	2.51	0.01	3763
129.0000	(2) RRUS-11	34	28.62	2.34	0.01	2166
127.0000	(3) SBNH-1D6565C w/ Mount Pipe	34	27.64	2.29	0.01	2042
85.0000	KS24019-L112A	34	11.73	1.37	0.00	3222

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 123.423	114.54	9	7.63	0.03
L2	126.59 - 119	78.89	9	6.57	0.03
L3	119 - 105.5	68.86	9	5.98	0.02
L4	105.5 - 85.96	53.20	9	5.10	0.01
L5	90.043 - 70.5	38.14	9	4.22	0.01
L6	70.5 - 42.413	22.84	9	3.19	0.01
L7	47.58 - 35.5	10.37	9	2.03	0.00
L8	35.5 - 22.75	5.71	9	1.59	0.00
L9	22.75 - 18.25	2.29	9	0.97	0.00
L10	18.25 - 0	1.47	9	0.78	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.0000	1900MHz RRH (65MHz)	9	114.54	7.63	0.03	3246
138.0000	BXA-171063-12BF w/ Mount Pipe	9	95.65	7.20	0.03	1350
129.0000	(2) RRUS-11	9	82.27	6.73	0.03	775
127.0000	(3) SBNH-1D6565C w/ Mount Pipe	9	79.46	6.60	0.03	730
85.0000	KS24019-L112A	9	33.79	3.95	0.01	1132

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	150 - 123.423 (1)	TP20.66x15x0.1875	26.5770	0.0000	0.0	39.00	11.7823	-4.87	459.51	0.011
L2	123.423 - 119 (2)	TP21.23x19.6105x0.25	7.5900	0.0000	0.0	39.00	16.6477	-5.68	649.26	0.009
L3	119 - 105.5 (3)	TP24.1106x21.23x0.4571	13.5000	0.0000	0.0	27.64	34.3144	-7.67	948.52	0.008
L4	105.5 - 85.96 (4)	TP28.28x24.1106x0.5825	19.5400	0.0000	0.0	31.00	49.6004	-10.68	1537.71	0.007
L5	85.96 - 70.5 (5)	TP31.078x26.2437x0.6019	19.5430	0.0000	0.0	31.16	58.2244	-15.75	1814.51	0.009
L6	70.5 - 42.413 (6)	TP37.07x31.078x0.633	28.0870	0.0000	0.0	32.29	70.9913	-21.82	2292.45	0.010
L7	42.413 - 35.5 (7)	TP37.9215x34.7017x0.6798	12.0800	0.0000	0.0	32.36	76.3791	-24.59	2471.47	0.010
L8	35.5 - 22.75	TP40.6434x37.9215x0.588	12.7500	0.0000	0.0	31.43	72.7025	-28.85	2285.33	0.013

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 $\frac{P}{P_a}$
L9	22.75 - 18.25 (8)	TP41.604x40.6434x0.6536 5	4.5000	0.0000	0.0	30.43	82.9598	-30.41	2524.63	0.012
L10	18.25 - 0 (9)	TP45.5x41.604x0.6026	18.2500	0.0000	0.0	31.43	78.4151	-31.89	2464.90	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	150 - 123.423 (1)	TP20.66x15x0.1875	202.79	42.34	39.00	1.086	0.00	0.00	39.00	0.000
L2	123.423 - 119 (2)	TP21.23x19.6105x0.25	340.40	47.59	39.00	1.220	0.00	0.00	39.00	0.000
L3	119 - 105.5 (3)	TP24.1106x21.23x0.4571	596.32	36.13	27.64	1.307	0.00	0.00	27.64	0.000
L4	105.5 - 85.96 (4)	TP28.28x24.1106x0.5825	908.58	33.66	31.00	1.086	0.00	0.00	31.00	0.000
L5	85.96 - 70.5 (5)	TP31.078x26.2437x0.6019	1335.72	37.04	31.16	1.188	0.00	0.00	31.16	0.000
L6	70.5 - 42.413 (6)	TP37.07x31.078x0.633	1877.40	36.76	32.29	1.138	0.00	0.00	32.29	0.000
L7	42.413 - 35.5 (7)	TP37.9215x34.7017x0.6798	2005.72	36.48	32.36	1.127	0.00	0.00	32.36	0.000
L8	35.5 - 22.75 (8)	TP40.6434x37.9215x0.5885	2373.13	41.08	31.43	1.307	0.00	0.00	31.43	0.000
L9	22.75 - 18.25 (9)	TP41.604x40.6434x0.6536	2512.64	37.14	30.43	1.220	0.00	0.00	30.43	0.000
L10	18.25 - 0 (10)	TP45.5x41.604x0.6026	2632.30	40.08	31.43	1.275	0.00	0.00	31.43	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	150 - 123.423 (1)	TP20.66x15x0.1875	17.86	1.52	26.00	0.117	2.09	0.21	26.00	0.008
L2	123.423 - 119 (2)	TP21.23x19.6105x0.25	18.40	1.11	26.00	0.085	2.10	0.14	26.00	0.005
L3	119 - 105.5 (3)	TP24.1106x21.23x0.4571	19.53	0.57	18.43	0.062	2.12	0.06	18.43	0.003
L4	105.5 - 85.96 (4)	TP28.28x24.1106x0.5825	20.89	0.42	20.67	0.041	2.15	0.04	20.67	0.002
L5	85.96 - 70.5 (5)	TP31.078x26.2437x0.6019	22.72	0.39	20.78	0.038	2.23	0.03	20.78	0.001
L6	70.5 - 42.413 (6)	TP37.07x31.078x0.633	24.58	0.35	21.53	0.032	2.28	0.02	21.53	0.001
L7	42.413 - 35.5 (7)	TP37.9215x34.7017x0.6798	25.19	0.33	21.57	0.030	2.30	0.02	21.57	0.001
L8	35.5 - 22.75 (8)	TP40.6434x37.9215x0.5885	26.16	0.36	20.96	0.034	2.33	0.02	20.96	0.001
L9	22.75 - 18.25 (9)	TP41.604x40.6434x0.6536	26.52	0.32	20.29	0.031	2.35	0.02	20.29	0.001
L10	18.25 - 0 (10)	TP45.5x41.604x0.6026	26.82	0.34	20.96	0.032	2.36	0.02	20.96	0.001

Pole Interaction Design Data

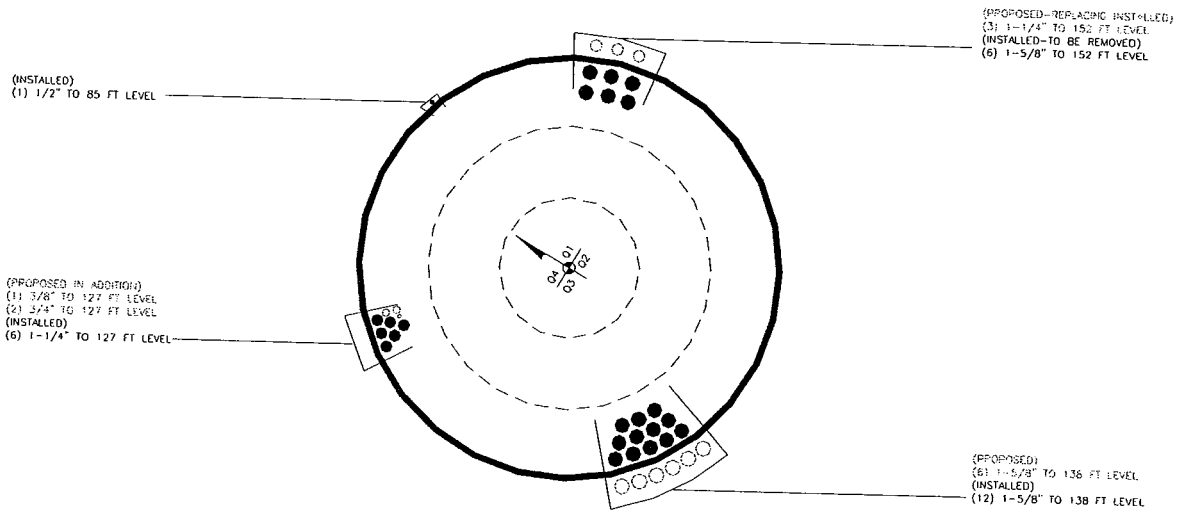
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 123.423 (1)	0.011	1.086	0.000	0.117	0.008	1.101 ✓	1.333	H1-3+VT ✓
L2	123.423 - 119 (2)	0.009	1.220	0.000	0.085	0.005	1.231 ✓	1.333	H1-3+VT ✓
L3	119 - 105.5 (3)	0.008	1.307	0.000	0.062	0.003	1.316 ✓	1.333	H1-3+VT ✓
L4	105.5 - 85.96 (4)	0.007	1.086	0.000	0.041	0.002	1.093 ✓	1.333	H1-3+VT ✓
L5	85.96 - 70.5 (5)	0.009	1.188	0.000	0.038	0.001	1.198 ✓	1.333	H1-3+VT ✓
L6	70.5 - 42.413 (6)	0.010	1.138	0.000	0.032	0.001	1.148 ✓	1.333	H1-3+VT ✓
L7	42.413 - 35.5 (7)	0.010	1.127	0.000	0.030	0.001	1.138 ✓	1.333	H1-3+VT ✓
L8	35.5 - 22.75 (8)	0.013	1.307	0.000	0.034	0.001	1.320 ✓	1.333	H1-3+VT ✓
L9	22.75 - 18.25 (9)	0.012	1.220	0.000	0.031	0.001	1.233 ✓	1.333	H1-3+VT ✓
L10	18.25 - 0 (10)	0.013	1.275	0.000	0.032	0.001	1.288 ✓	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	150 - 123.423	Pole	TP20.66x15x0.1875	1	-4.87	612.53	82.6	Pass
L2	123.423 - 119	Pole	TP21.23x19.6105x0.25	2	-5.68	865.46	92.4	Pass
L3	119 - 105.5	Pole	TP24.1106x21.23x0.4571	3	-7.67	1264.38	98.8	Pass
L4	105.5 - 85.96	Pole	TP28.28x24.1106x0.5825	4	-10.68	2049.77	82.0	Pass
L5	85.96 - 70.5	Pole	TP31.078x26.2437x0.6019	5	-15.75	2418.74	89.8	Pass
L6	70.5 - 42.413	Pole	TP37.07x31.078x0.633	6	-21.82	3055.84	86.1	Pass
L7	42.413 - 35.5	Pole	TP37.9215x34.7017x0.6798	7	-24.59	3294.47	85.3	Pass
L8	35.5 - 22.75	Pole	TP40.6434x37.9215x0.5885	8	-28.85	3046.34	99.0	Pass
L9	22.75 - 18.25	Pole	TP41.604x40.6434x0.6536	9	-30.41	3365.33	92.5	Pass
L10	18.25 - 0	Pole	TP45.5x41.604x0.6026	10	-31.89	3285.71	96.7	Pass
							Summary	
						Pole (L8)	99.0	Pass
						RATING =	**99.0**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



APPENDIX C

ADDITIONAL CALCULATIONS

Program Version 6.0.3.0 - 12/7/2011 File:G:/TOWER/375_Crown_Castle/2012/37512-1818 BU 876361/37512-1818_Reinforced_SABRE.eri

37512-1818 PERMIT.DWG

CROWN CASTLE PROJECT: BU #876361; SEYMOUR 2/OXFORD TOWN GARAGE; OXFORD, CT
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

UPON THE SUCCESSFUL AND COMPLETE INSTALLATION OF THE REINFORCING SYSTEM SPECIFIED IN THESE PLANS, THE REINFORCED POLE MEETS THE WIND DESIGN RECOMMENDATIONS OF THE TIA/EIA-222-F-1996 STANDARD FOR WIND SPEEDS OF 85 MPH AND 38 MPH + 3/4" RADIAL ICE

A. GENERAL NOTES

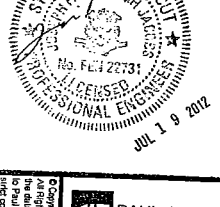
1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO FABRICATION AND CONSTRUCTION. THESE DRAWINGS WERE PREPARED FROM INFORMATION AND DOCUMENTS PROVIDED TO PAUL J. FORD & COMPANY BY CROWN CASTLE. THIS INFORMATION PROVIDED HAS NOT BEEN FIELD 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. "LOW HEAT" WELDING PROCEDURES:

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

C. SPECIAL INSPECTION AND TESTING

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.



SABRE SHAFT REINFORCING OPTION

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MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

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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

1. THE CONTRACTOR SHALL PROTECT THE EXISTING MONOPOLE STRUCTURE, AS WELL AS ANY OTHER NEARBY EXISTING FOUNDATIONS FOR OTHER STRUCTURES OR EQUIPMENT, FROM LOSS OF SOIL AROUND AND/OR BENEATH FOOTINGS DURING ANY REQUIRED EXCAVATION. THE CONTRACTOR SHALL BRACE THE SIDES OF THE OPEN EXCAVATION AS REQUIRED.
2. THE EFFECT OF ADDITIONAL EXCAVATION (WHERE REQUIRED) FOR THE NEW MAT FOOTING (WHERE REQUIRED) OR OTHER FOUNDATION AUGMENTATION AND REINFORCING (WHERE REQUIRED) MAY HAVE IMPACT ON EXISTING EQUIPMENT AND/OR OTHER EXISTING STRUCTURES NEAR THE EXCAVATION. (ENGINEER-OF- RECORD) HAS NOT BEEN PROVIDED WITH ANY SPECIFIC INFORMATION OR DETAILS REGARDING EXISTING EQUIPMENT OR OTHER EXISTING STRUCTURES ON THE SITE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE IMPACT OR EFFECT THAT ANY REQUIRED EXCAVATION WORK HAS ON ANY EXISTING NEARBY EQUIPMENT AND/OR STRUCTURES. CONTRACTOR SHALL COORDINATE THIS SITE-SPECIFIC INFORMATION WITH THE OWNER AND TESTING AGENCY PRIOR TO CONSTRUCTION AND FOUNDATION WORK. THE CONTRACTOR SHALL ADEQUATELY BRACE, SHORE, AND/OR RELOCATE (AFTER OBTAINING THE PRIOR WRITTEN PERMISSION OF THE OWNER), AS NECESSARY, THE INTERFERING EXISTING NEARBY EQUIPMENT AND/OR STRUCTURES.

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 ¼ TURN OF NUT.

I. TOUCH UP OF GALVANIZING

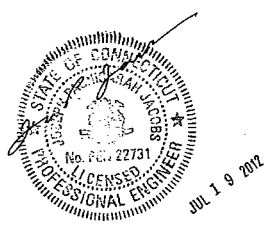
1. THE CONTRACTOR SHALL TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL 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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SABRE SHAFT REINFORCING OPTION

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BU #876361; SEYMOUR 2/OXFORD TOWN GARAGE
OXFORD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37512-1818	ISSUE DATE OF PERMIT: 6-28-2012
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CHECKED BY: C.M.M.	
APPROVED BY:	S-2B
DATE: 6-28-2012	

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AJAX BOLT NOTE SHEET: REV. 1.2, 01-23-2012

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 3/4" 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.

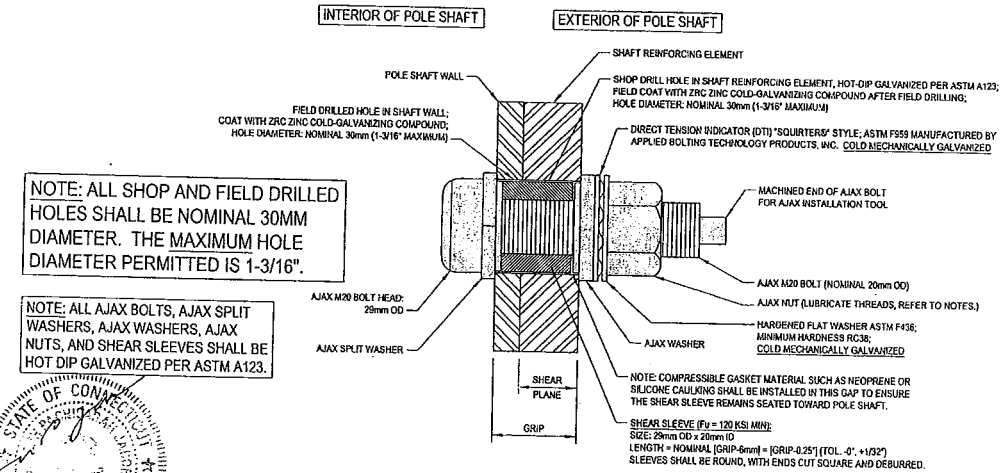
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 3/4" NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY GALVANIZED BY THE COLD MECHANICAL PROCESS. ALTERNATIVELY, CORRECTLY MADE HOT DIP GALVANIZED HARDENED FLAT WASHERS HAVING A MINIMUM HARDNESS OF RC 38 CAN BE USED; CONTRACTOR SHALL PROVIDE DOCUMENTATION OF WASHER SPECIFICATION AND HARDNESS.

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

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

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

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



TYPICAL AJAX BOLT DETAIL 1 S-3B

STATE OF CONNECTICUT
CHRISTOPHER M. SABRE
22731
LICENSED PROFESSIONAL ENGINEER
JUL 19 2012

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

THIS POLE REINFORCEMENT DRAWING IS FOR THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF CO-LOCATION ANALYSIS FOR THIS SITE (PJF#37512-1818), DATED 6-28-2012.

POLE SPECIFICATIONS	
POLE SHAPE TYPE:	18-SIDED POLYGON
TAPER:	0.2133329 IN/FT
SHAFT STEEL:	ASTM A572 GRADE 65
BASE PL STEEL:	ASTM A633 GR. E (60 KSI)
ANCHOR RODS:	2 1/4"Ø #18J ASTM A615 GRADE 75

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	26.58	0.1875	38.00	15.000	20.660
2	40.83	0.2500	49.00	19.611	28.280
3	47.63	0.3125	62.00	26.909	37.070
4	47.58	0.3750		35.343	45.500

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

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

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 ON SHEET S-3 FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

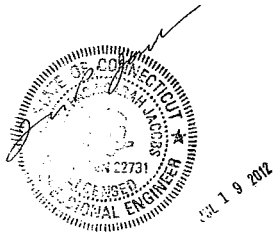
4. DTI'S REQUIRED: * ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. DTI'S SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F959 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.

5. NUT LUBRICATION REQUIRED: * PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING. REFER TO SHEET S-3.

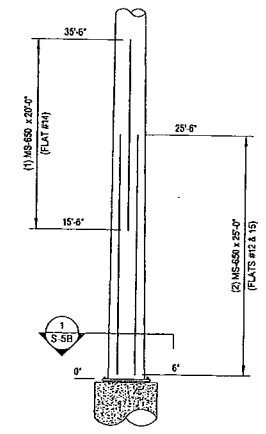
6. AJAX BOLT HOLE SIZE: ALL SHOP- AND FIELD-DRILLED HOLES SHALL BE NOMINAL 30MM DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1-3/16". REFER TO SHEET S-3.

* AS OF 5/30/2012, UNTIL FURTHER NOTICE, CROWN CASTLE WILL ACCEPT AJAX BOLTS TIGHTENED USING AISC "TURN-OF-THE-NUT" METHODOLOGY. INSTALLERS SHALL FOLLOW CROWN GUIDELINES FOR AISC "TURN-OF-THE-NUT" METHOD AND ALSO PROVIDE COMPLETE INSPECTION DOCUMENTATION IN THE PMI.

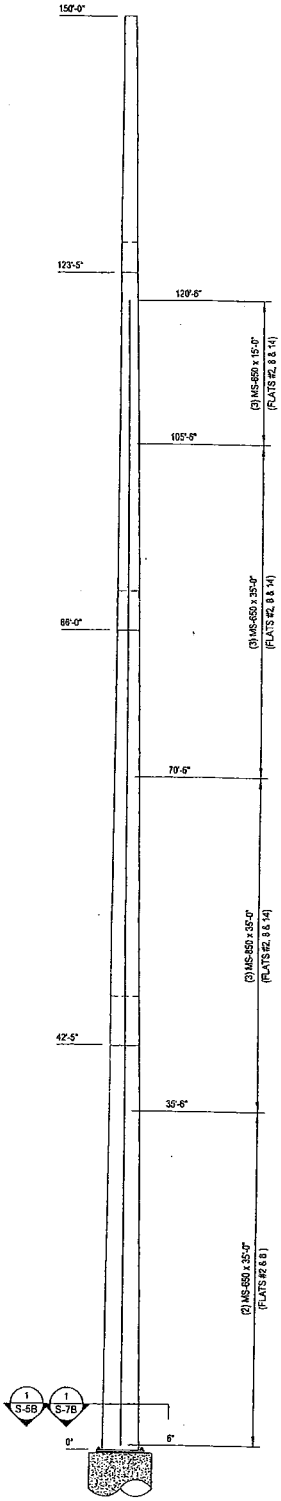
NDE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. PLEASE SEE ENG-SOW-1033 : TOWER BASE PLATE NDE AND ENG-BUL-10051 : NDE REQUIREMENTS FOR MONOPOLE BASE PLATE TO PREVENT CONNECTION FAILURE. NOTIFY THE EOR AND CROWN ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR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



JUL 19 2012



POLE ELEVATION 2 S-4B



POLE ELEVATION 1 S-4B

SABRE SHAFT REINFORCING OPTION

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BU #876361; SEYMOUR 2/OXFORD TOWN GARAGE
OXFORD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

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DRAWN BY: B.M.S.
CHECKED BY: C.M.M.
APPROVED BY:
DATE: 6-28-2012

ISSUE DATE OF PERMIT: 6-28-2012

S-4B

37512-1818 PERMIT.DWG

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.

PROVIDE NON-SHRINK GROUT (NS GROUT BY EUCLID OR APPROVED. EQUAL; 7500 PSI MIN.) BELOW EXIST. BASE PLATE AND NEW BEARING PLATES. PRIOR TO GROUTING, INSTALL FOUR 1-INCH DIAMETER PVC DRAIN PIPES AT APPROXIMATELY NINETY (90) DEGREES APART THROUGH GROUT SPACE. 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 UNDER ENTIRE SURFACE OF BASE PLATE FROM OUTSIDE EDGE TO INSIDE EDGE.

GENERAL NOTES:

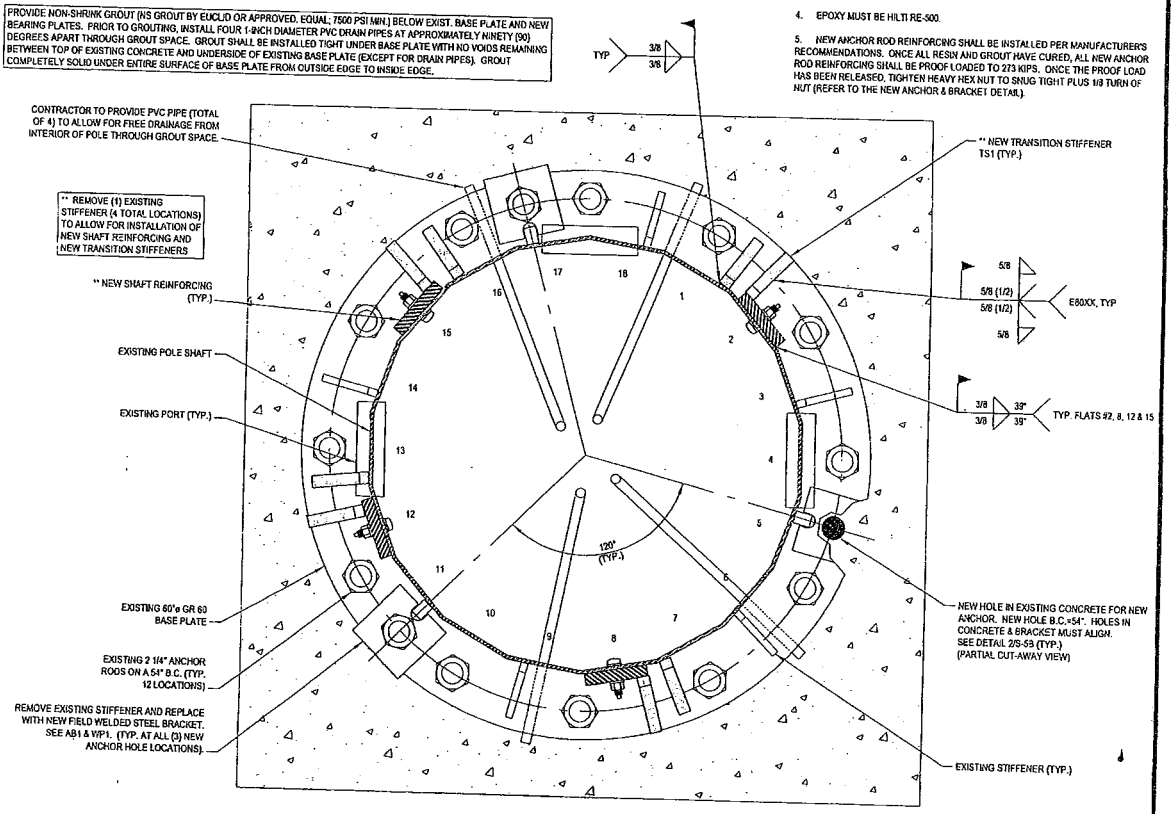
1. AJAX BOLTS ARE TO BE 20 mm Ø WITH CORRESPONDING 29 mm Ø SHEAR SLEEVE WITH MATCHING STEEL GRADE. DRILLED HOLE DIAMETERS IN REINFORCING STEEL AND EXISTING SHAFT SHALL BE 1 3/16"ø MAX.

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.

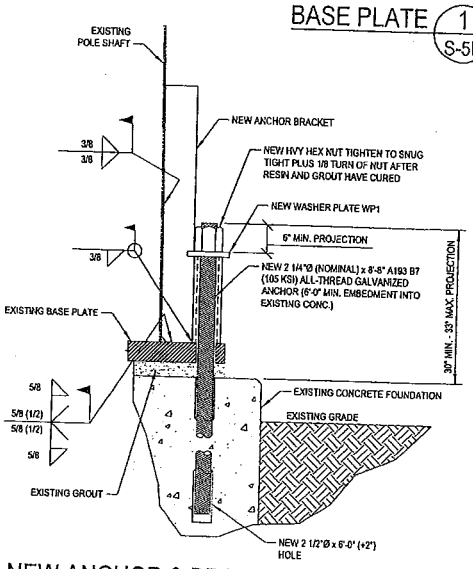
3. ALL SHAFT REINFORCING IS A572 GR 65.

4. EPOXY MUST BE HILTI RE-500.

5. NEW ANCHOR ROD REINFORCING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ONCE ALL RESIN AND GROUT HAVE CURED, ALL NEW ANCHOR ROD REINFORCING SHALL BE PROOF LOADED TO 273 KIPS. ONCE THE PROOF LOAD HAS BEEN RELEASED, TIGHTEN HEAVY HEX NUT TO SNUG TIGHT PLUS 1/8 TURN OF NUT (REFER TO THE NEW ANCHOR & BRACKET DETAIL).



BASE PLATE 1 S-5B



NEW ANCHOR & BRACKET DETAIL 2 S-5B

STATE OF CONNECTICUT — CHRISTOPHER M. MORSE — No. PEN 22731 — LICENSED PROFESSIONAL ENGINEER

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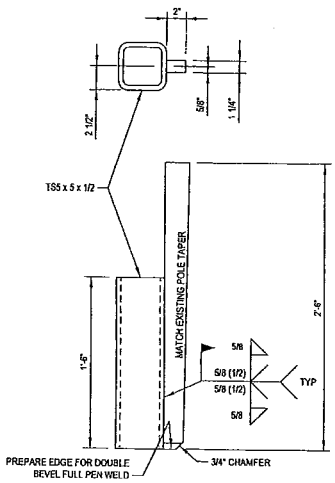
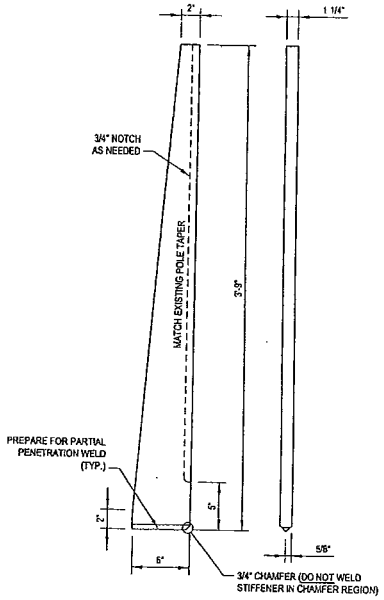


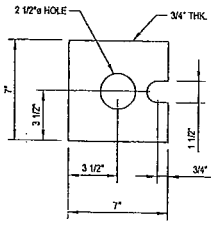
ANCHOR BRACKET MK~AB1

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



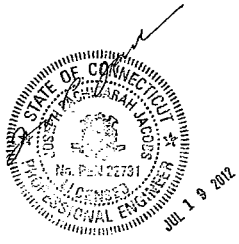
TRANSITION STIFFENER MK~TS1

(8 TOTAL REQUIRED: 4 NOTCHED) (Fy = 65 KSI)



WASHER PLATE MK~WP1

(3 REQUIRED) (Fy = 50 KSI)



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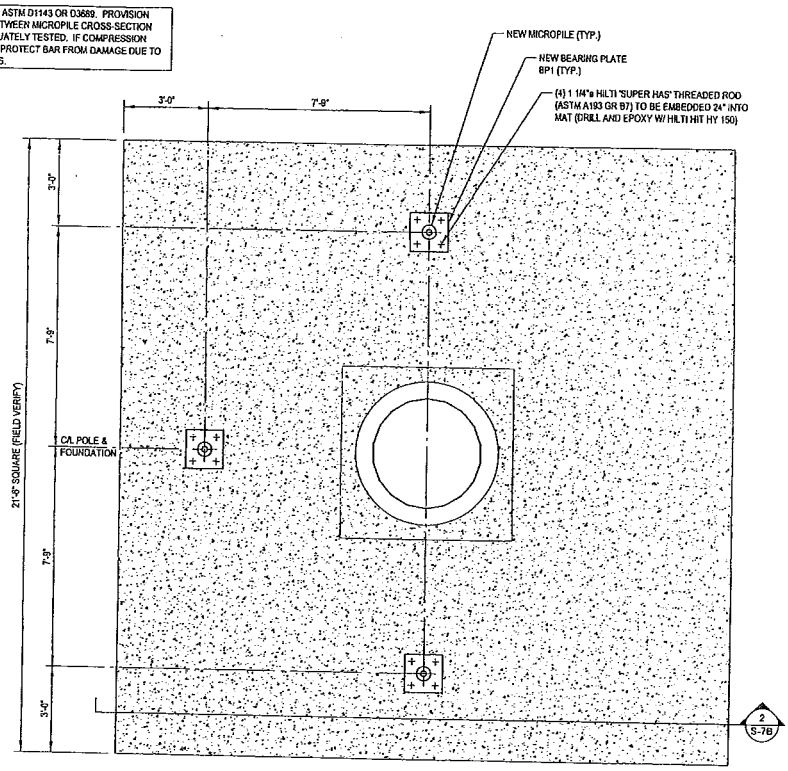
MICROPILE TESTING REQUIREMENTS

A MINIMUM OF 2 IN-PLACE MICROPILES (TEST PILES SHALL BE IN OPPOSITE CORNERS OF FOUNDATION) ARE TO BE TESTED TO 94.5k IN TENSION.

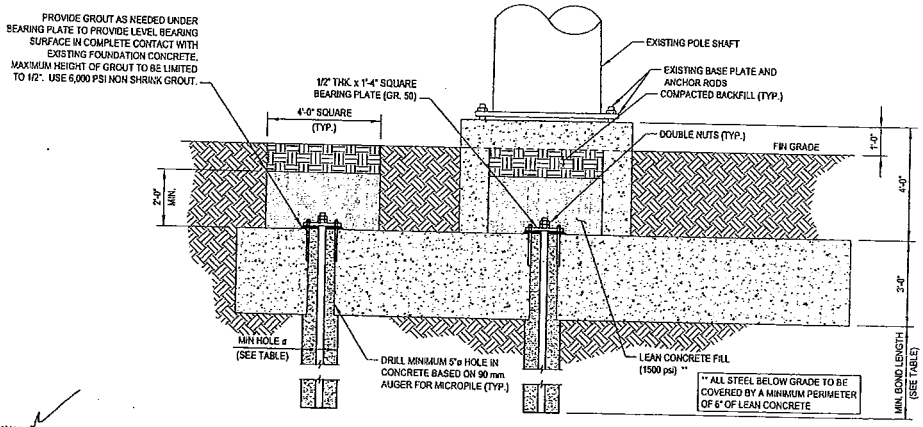
PROVIDE REPORT OF TEST RESULTS TO STRUCTURAL ENGINEER AND GEOTECHNICAL ENGINEER ALONG WITH RECOMMENDATIONS (IF ANY) FOR PRODUCTION PILE LENGTHS TO ACHIEVE THE 94.5K PILE WORKING CAPACITIES. (SF=2.0)

ALL PILE TESTING SHALL BE CARRIED OUT PER ASTM D1143 OR D3689. PROVISION SHALL BE MADE TO ALLOW FOR MOVEMENT BETWEEN MICROPILE CROSS-SECTION AND SOIL SO THAT GROUT BOND LINE IS ADEQUATELY TESTED. IF COMPRESSION TESTING IS PERFORMED, CONTRACTOR SHALL PROTECT BAR FROM DAMAGE DUE TO BUCKLING FOR LENGTH WITHIN MAT THICKNESS.

CONTECH'S 40/16 HOLLOW BAR MICROPILE OR EQUIVALENT SYSTEM.



FOUNDATION REINFORCING PLAN 1 S-7B



FOUNDATION REINFORCING 2 S-7B

STATE OF CONNECTICUT
SARAH JACOBS
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER
JUL 19 2012

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OXFORD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37512-1818	ISSUE DATE OF PERMIT: 6-28-2012
DRAWN BY: B.M.S.	
CHECKED BY: C.M.M.	
APPROVED BY:	S-7B
DATE: 6-28-2012	

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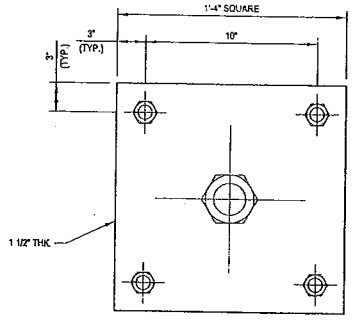
MICROPILE NOTES:

1. ALL BEARING PLATE STEEL SHALL CONFORM TO ASTM A572 (FY=50 KSI).
2. WELDED CONNECTIONS SHALL CONFORM TO THE LAST REVISED CODE OF THE AMERICAN WELDING SOCIETY A.W.S. D1.1.
3. FOUNDATION DESIGN IS BASED ON GEOTECHNICAL REPORT PREPARED BY DR. CLARENCE WELTI, P.E., P.C. DATED SEPTEMBER 22 1999, PROJECT NAME CT23XC507
4. MICROPILE DESIGN BASED ON (3) 4"Ø DRILLED/GROUTED MICROPILES (MICROPILES MUST PROVIDE A 94.5 KIPS WORKING LOAD CAPACITY @ 25' MIN. ROCK EMBEDMENT) OR EQUIVALENT.
5. GROUT TO BE 4,000 PSI MIN COMPRESSION STRENGTH WITH 0.5 (MAXIMUM WATER/CEMENT) W/C RATIO (TO BE COLOIDALLY MIXED FOR MICROPILE).
6. ALL THREADED RODS TO BE GALVANIZED PER ASTM A153, PLATES GALVANIZED PER ASTM A123.

PILE DESIGN PARAMETER SCHEDULE

PARAMETER / OPTIONS	a/STEEL AREA	PILE CAPACITY (kips)	ULTIMATE SKIN FRICTION (PSF)	PRESTRESSING LENGTH	FRICTION DEVELOPMENT LENGTH/BOND LENGTH	ROCK SOCKET/ PLUNGE LENGTH	TOTAL EMBEDMENT LENGTH
MICROPILE	4"ø / 1.36 IN^2 MIN.	94.5K	10000 PSF	0	20' MIN.	N.A.	25'

*INSTALLED GROUT COLUMN IS BASED ON A 90MM ANGER W/ 52 ADAPTOR FOR ROCK



NEW BEARING PLATE MK~BP1

(Fy=50 KSI) (TYP. 3 LOCATIONS)

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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.

A.L 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 MI-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

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

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

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AN ENG-SOW-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 AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

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

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND 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
X	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
X	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	INSPECTION OF BOLT PRETENSION PER AISC BOLT SPEC.
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	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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SARAH JACOBS
LICENSED PROFESSIONAL ENGINEER
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